Southwest Florida Water Management District

2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
WaterMatters.org

MEETING NOTICE

AGENDA

Southwest Florida Water Management District
Proposed Minimum Flows for the Chassahowitzka and Homosassa River Systems
Public Workshop

TUESDAY, JUNE 11, 2019
5:00-8:00 p.m.

College of Central Florida, Citrus Campus
Citrus Conference Center (Building C4)
3800 S. Lecanto Highway, Lecanto, Florida 34461

5:00 p.m. Public Information Open House

5:30 p.m. Presentations begin, followed by public comments

1. Welcome and Introductions
   - Frank Gargano, Government Affairs Regional Manager, SWFWMD[1]

2. Proposed Minimum Flows
   - Gabe Herrick, PhD, Senior Environmental Scientist, SWFWMD[1]

3. Evaluation of Hydrologic Changes
   - Ron Basso, P.G., Chief Hydrogeologist, SWFWMD[1]

4. Public Comment Period, Facilitated by
   - Frank Gargano, Government Affairs Regional Manager, SWFWMD[1]

For questions regarding the meeting or the proposed minimum flows for these systems, please contact Gabe Herrick by email at Gabe.Herrick@WaterMatters.org, by telephone at 1-800-423-1476, extension 4275, or by mail at the address listed at the top of this agenda.

If you wish to speak during the public comment period, please fill out a speaker's card and give it to the moderator (Frank Gargano), who will call on you at the appropriate time during the meeting. Comments will typically be limited to three minutes per speaker.

[1]SWFWMD = Southwest Florida Water Management District

If you have any questions concerning this meeting, please call 1-800-423-1476, extension 4275.

MEETING SUMMARY

Southwest Florida Water Management District
Proposed Chassahowitzka and Homosassa River Systems
Minimum Flows Reevaluations Public Meeting

College of Central Florida, Lecanto, Florida
June 11, 2019, 5 to 8 p.m.

The Southwest Florida Water Management District (District) hosted a public meeting on the proposed minimum flow reevaluations for the Chassahowitzka and Homosassa River Systems in Citrus County. The meeting was held from 5 to 8 p.m. at the College of Central Florida located at 3800 S. Lecanto Highway, Lecanto, Florida and was advertised in the Florida Administrative Register, local newspapers and the District's website. In addition, numerous interested parties and local government staff and officials were notified of the meeting and a news release was distributed to the regional media.

A total of 82 people signed in, including Citrus County Commissioner Jeff Kinnard. The District received 18 written comments and 19 people gave oral comment. District representatives present included: Jennette Seachrist, Resource Management director; Eric DeHaven, Resource Management assistant director; Darrin Herbst, Water Use Permit Bureau chief; Sky Notestein, Springs & Environmental Flows manager; April Breton, Water Use Permit manager; Melissa Gulvin, Communications manager; Frank Gargano, government affairs regional manager; Gabe Herrick, senior environmental scientist; Virginia Singer, lead communications coordinator; Xinjian Chen, chief professional engineer; Lei Yang, chief professional engineer; Yonas Ghile, senior environmental scientist; Jeanette Lopez, business process technician; and Rebecca Glidden, NSR student.

The hybrid-style meeting included a 30-minute open house, a 20-minute District staff presentation and a public comment period. The open house portion allowed participants to view and ask questions about various posters that detailed groundwater use; aquifer recharge and water levels, water quality monitoring, hydrodynamic models; and minimum flows on the Chassahowitzka and Homosassa River Systems. The staff presentation informed the audience about the many topics associated with the proposed minimum flows.

Participants were made aware of the various opportunities available for stakeholders to submit input on the proposed minimum flows, including: providing oral or written comment during the workshop (comment cards were available for written comments, as were speaker cards used for participants to request the opportunity to speak); providing written or oral input to District staff via telephone, email or letter; or providing input directly to the District’s Governing Board at its October 2019 meeting when staff anticipates presenting the proposed minimum flow for Board approval.

Summary of Oral Comments Received During Public Comment Period

Commissioner Jeff Kinnard – opposed to increasing minimum flows; member of Withlacoochee Regional Water Supply Authority which Kinnard said has done nothing to move toward next supply of water; four-county region totally dependent on groundwater; reduce or hold minimum flows to force elected officials in the region to implement projects to reduce the need to rely on groundwater; they won’t do it without being forced; thank you for being here and letting us comment

Frank Kapocsi – president of Homosassa River Alliance represents more than 100 residents; projects to protect our river; additional withdrawal will decrease velocity of springs and have huge impact on the river; algae will form after good submerged aquatic vegetation is gone; already fighting *Lyngbya*; have to keep velocity flowing; change water temperature with less flow which will possibly affect the fish; we stand in opposition to taking any more water

Dennis Dutcher – lives in Lakeland; owns property in Citrus County; District doesn't identify shift in baselines over the last 40-50 years; opposed to any withdrawals; District should explore the economic value in losing habitat on these systems; dollar amount will help elected officials when they have the pressure to develop more water; District should take a dollars and sense approach; we know it costs a lot to restore habitat; Chassahowitzka refuge funded in the 1940s to protect the ducks, which aren't here anymore due to loss of fresh water

Kate Spratt – lives on Homosassa River; commends the District for pointing out sea-level rise in our report; it's why they don't support these minimum flows; already seeing changes from nature; we should make more changes before more problems occur; is 15% harm acceptable?; don't support these minimum flows

James Jaster – long-term Citrus County resident; are the panelist reviewing these reports from the state?; nature coast not industrial coast; we want to see these systems preserved; you should look at the long-term effects of cutting flow; this is just wrong; this is government at its worst

Ben Berauer – president of the Friends of the Chassahowitzka River; the Friends are opposed to setting an MFL at a level that may cause harm as the river already exhibits signs of degradation; any MFL set should not be based on additional loss of degradation but based on efforts to improve the system

David Blatt – Chassahowitzka resident; survey info starts in 2013, but the river system was already degraded by then; the trees on the river have all died (cedars, palms); why hasn't the state decided to put reservoirs in to save water when rivers flood; stop draining water and start saving water; the degradation has already began

Jere Hooker – common-sense point of view to find out what's going on with the river, you need to talk to the people who have lived there for years; Chassahowitzka is already deteriorating as is witnessed by long-term residents of the Chassahowitzka; trees dying further and further up the river; main spring used to boil 3-4 inches above the surface and now it's non-existent; 8% suggestion is way too much and will kill what we love most about our river; man should not pump more out; need to find another way to accommodate growth

Larry Hartman – president of TooFar; recommend a boundary way off the seven rivers in Citrus County that no wells can be added within that area; our organization has over 200 members that are opposed to allowing any more people to take water from our river; please let the Governing Board know how we feel

Dan Hilliard – the review cycle for these systems is how long? (*Gabe answered 10 years.)* The Florida Springs Council does not support the minimum flows because we are already suffering today; I urge the Governing Board to be cautious with this; if you won't exceed the cap in 2035, sit on the minimum flows now and reevaluate when you have more data

Donald Clark – Chassahowitzka is a federal preserve for the manatees, do you coordinate at all with the federal people?; you talk about salinity levels, do you have more info on salinity levels because the snook aren't a good measure because they can handle everything; I used to volunteer at Homosassa State Park as a diver to clean the windows, it's already more salty; the editor of our local paper says it doesn't make any sense to withdrawal more water from an already damaged river, I think we all agree; what is the minimum depth of water for a full-grown manatee to traverse the Chassahowitzka River? Have you calculated that?; Homosassa is an extremely popular park, last year there weren't any fish in the fishbowl at the park until forced to come in from cold weather

Joann Brown – a resident and member of TooFar; our lakes and rivers are worse; people have to drill their wells deeper; more water is desired throughout the county; condition of the Nature Coast isn't going to last if more isn't done; giving water away to a bottling water company shouldn't be allowed; there should be restrictions on them because as a resident I'm restricted on when I can water my yard; minimum flows need to be restricted too

Rodney MacRae – born and raised in Homosassa; spent my entire life on the Homosassa River; you guys did a great presentation, very professional; interesting how precise your numbers all worked out, I thought if all of what you said is true, then why is everyone upset; I have seen the Homosassa River go from a very pristine system to a dying river with no vegetation, very few fresh water fish, catfish, pinfish; U.S. Fish and Wildlife Service and state Fish and Wildlife Commission does studies and he asked what they found in their segments and they replied nothing; there's nothing there; as a kid there were a lot of bass and activity that isn't there anymore; degradation has been ongoing – global warming, sea-level rise, sewer, runoff, reduced flows; we need to stop the negative impacts; you guys are involved and funding some of the projects – sewer, runoff; they're vacuum dredging and revegetating; if we're trying to stop the degradation, it would seem reasonable not to take more water out of the spring and put more in it; I know for a fact the spring doesn't flow like it used to and to decrease it even more would be idiotic

Jack Brown – lived in Citrus County 18 years; we don't conserve our water well at all; there's a lot of rules set but not enforced; totally against these withdrawals; it's sinful and should be stopped

Maxine Connor – lives in Homosassa visited since the 1980s when you could see to the bottom of the blue water; personally disapprove of any more withdrawals; we need to find another way to get more water; rivers are in bad shape now, have no idea what they will be like if we don't do anything; sea-level rise is happening; sees progressive degradation; thinks District is between a rock and a hard place because the legislation put District in it; they are Outstanding Florida Waterways and need to be restored; if a legislative change can help, let's please talk

Megan Clark – three year resident, worked swimming in the water for 1.5 years; reduced flow allows *Lyngbya* to grow and gives people rashes; many people live and visit the community for water-related activities; if the degradation continues will people even want to move here and will you even need this more water

Brad Rimbey – lives in Chassahowitzka; 1.4 and 1.9% taken already from these systems; no one in this room will be alive when we reach those proposed numbers, so in what millennium will we even reach these MFLs; 2013 Governing Board threw out staff recommendation because of 200 people in the audience with pitch forks; I'm glad to see all the people here and hope we have even more at the

Governing Board meeting in October; I hope the USFWS gets involved because I can't imagine they will be in support of this

Ken Nash – resident since 1995; retired from the Air Force as a meteorologist; worked for a scientific non-profit and have been involved in many technical discussions with the District; taught science courses at the college; consider asking every current and former elected official to request that Citrus County has a Governing Board member from Citrus County, the last time was in 2003

David Stevens – I've been here since I was nine years old, the river was flourished with green grass and now it's only green slime that never used to be here; it's coming all the way up to the river; you need to stop reducing flows; white sand and alligators at Blue Springs, now it's just cattails; springs don't stop flowing iS

PUBLIC MEETING
Sign-In Sheet

Southwest Florida
Water Management District
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Name	Address/City/ZIP	Phone	Email Address
Bob Caldwell	10346 McClurdoop		
Rick Wedeman	8461 W Crane Ct.		
DAN HILLIARD	1629 N. CROOKED BRANCH DR		
Chris & Bay MacGarrett	275 104 NW Treasure Island		
ROBERT MILLS	8390 W HERON CIT HOMOSASSA FL. 34448		
[illegible]	[illegible] Ct. FL. 33558		
BRENDA Wilson	8462 W. La Parade Loop		
mike Wilson	8462 W. La Parade Loop		
Dennis Dutcher	137 John Carroll Rd East Lakeland FL	863-602-0113	Dennis3ds@aol.com
Ken & Dayna Peterson	10145 W. Blue Springs Ct Homosassa		walkadog@me.com
FRANK & PAT KAPOCSI	9530 WEST RIVER HOLLY PATH HOMOSASSA	863-949-8405	FNPKAP@AOL.COM
DENNIS DAMATO	1107 W POINTE VISTA PATH HERNANDO, FL 34442	(352) 563-7278	
Brad Rimbey	10028 S Riviera, Homosassa	813-417-9453	

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Southwest Florida Water Management District
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Name	Address/City/ZIP	Phone	Email Address
Jere Hooker	9761 E. Silver OAKS DR. Inverness, FL 34450	352-559-0598	—
Darlene Hooker	"	"	darlenehooker@hotmail.com
Larry Hartman	7379 North whippoorwill Dr. Hernando Fl.		jehovajirehPT@gmail.com
Michael Bates	Citrus Ct Chronicle		
IRIS HOLLIS	1920 NW 19th St CRYSTAL RIVER Fl 34428	352 795 3662	irisyoga7@gmail.com
Keith Rogers	11486 W. Priest Ln. Homosassa Fl. 34448	813-431-7471	
Jim Valade	871 N SUNCOAST BLVD Crystal River, FL 34429	352 563-2088	Jim_Valade@fws.gov
Dennis Blauer	PO Box 286		
Liz Blauer	Homosassa, FL 34448	3522283294	
W.L. McClaen	8445 W. Heron Ct	865-748-8225	
Jeff Phillips	Homosassa	813-478-8412	
Linda Blatt	Chassahowitzka	727-385-9470	
David Blatt	"	727-418-1379	

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Name	Address/City/ZIP	Phone	Email Address
Herman Shields	8370 Homosassa FL	(813) 967-1262	hrshields@yahoo.com
Joann Brown	730 N. Seton Ave	352-341-7741	JBrown437@tampabay.rr.com
Debra Harmon	8203 W. Ms. Maggie Dr Homosass	352-382-2721	
Ben Berauer	10332 S McClung Loop 34448	727-217-5971	President@friendsofchasschowl.org
Jodi Carier	6425 W. Appian St.	352-422-1122	naturegirl1512@icloud.com
Willy Baletti	1117 W Pointe Loop 34442		wg67677@hotmail.com
Cheryl Turman	8400 W. Scott CT	352-503-7560	Cheryl_turman@yahoo.com
Marie Grahe	8391 W. Scott Ct	352-503-7560	IamHis143@hotmail.com
Mark Hammer	484 S. Bauer Rd	352-302-6551	
Barb Fletcher	5752 S Beaver Pt	352-302-9966	fletcher_barb@yahoo.com
Duane Baker	8536 W Miss Maggie		
DAVID STEVENS	7550 W MISS MAGGIE	352-302-8398	
Maxine Connor	9 Browallia Ct Homosassa	352 503 2166	maxineconnor@gmail.com

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PUBLIC MEETING Sign-In Sheet

Southwest Florida Water Management District
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Name	Address/City/ZIP	Phone	Email Address
Jeff Kinnard	11970 W Bayshore	352 400-0947	jeff.Kinnard@citrusbocc.com
Bud Hurley	214 S. Jeffery St	609 733 3301	BudHurley222@Gmail
Gordon Colvin	11667 W. Riverhaven Dr.	631-766-9736	gcolvinnn@aol.com
Phil Rodgers	3259 S Michigan Blvd		philrock108@gmail.com
H. Gene Pelk	8440 W. Heron Ct	352-382 8961	98tonma77e@aol.com
Don Clark	9099 S. Great Oaks Dr, 34436	352-344-1355	don212@embarqmail.com
JACK BROWN	730 N SETON AVE LECANTO FL 34461	352-341-7741	—
Mark Bonaiuto	10064 South Riviera Pt	508 815-9445	Twoyutescc@gmail.com
MARIANNE BONAIUTO	10064 S. Riviera Pt.	508-815-9282	mbonaiuto55@gmail.com
Bill GARVIN	4380 S. BLUE WATER PT	352-628-4685	WGARVIN@TAMPABAY.RR.COM
Janet Garvin	4380 S Blue Water Pt 34448	352-628-4685	jmgarvin@tampabay.rr.com
Devon Villarreal-Dabbs	3600 W. Sovereign Path	352-527-5427	devon.villarreal@citrusbocc.com
Claudia Brockett	3475 W. Wild Dunes Lecanto 34461	746-2699	—

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PUBLIC MEETING
Sign-In Sheet

Southwest Florida Water Management District
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Name	Address/City/ZIP	Phone	Email Address
Jim Englebright	4105 S Roosevelt	352 621 0911	penglebright@yahoo.com
Priscilla Englebright	" "	"	" "
Joe Fornino	7402 W Turkey Neck CT 34448	(813) 690-0988	
Jessie Gourlie	8230 W Bounty CT	303-903-7133	puravida044@msn.com
Jill Desmond	8430 W. Milo Ct	3523024320	jtdesmond25@
Tim Biddle	8430 W Milo Ct	2565049109	gmail.com
Rosey Renduueles	10600 W. Bresler CT	352-628-5116	Roseclyde@Gmail.com
Clyde Renduueles	" " " " Homosassa	" " "	" " " " "
Stacy Windham	- ' Inverness FL	352-400 8675	— —
Kathy Shimcla	8416 W. Milo Ct	352601 7085	
Rick Spratt	4460 S Wandering Path Homosassa	352-302-1606	captainrickspratt@yahoo.com
Megan Clark	12 N. Jefferson St. B.H. 34465	802 747 8887	megjc90@gmail.com

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Sign-In Sheet

Southwest Florida Water Management District
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Name	Address/City/ZIP	Phone	Email Address
Rodney MacRae	10670 W. Halls River Rd	352-628-4314	
Ken Nash		352-464-4373	
Steve Cason	10973 So Lecanto hwy	352 857 1454	
Ruth Sutherll	6843 S. Pinebard	Pt 628-2766	
Marie Naw	119 Pine ST SMW Homosassa	352 382 2525	
Deborah Martinez	420 E Inverness Blvd	352. 792. 5826	
Lesia Bennett	4380 W. Milo Ct.	[illegible]	
Jim Bennett	Homosassa, FL 34448		
Kate Spratt	4460 S. Wandering Path	Homosassa, 34448	
Elaine Moore	9820 W) Yulee Dr	Homosassa 34448	
Kathleen O'Dongh	12551 W. Hunt Club D	Homosassa	

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PUBLIC MEETING
Sign-In Sheet

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Water Management District
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Name	Address/City/ZIP	Phone	Email Address
Trinity Ann Martinez	420E Inverness Blvd. Inverness FL 34452		
JAMES JASTER	7035 S. SORRELL AVE HOMOSASSA 34446		
Sandra Laydal	8200 W Bounty Ct Homosassa FL 34448		

PUBLIC MEETING
Sign-In Sheet

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Water Management District
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Name	Address/City/ZIP	Phone	Email Address
Irv+Bill Rose	Homosassa, FL 4124 S. Washington Pt	352-628-7481	ibrosefla@tampabay.rr.com
Mary Hedges	2505 N Stampede Beverly Hills, FL 34465		maryfran.hedges@gmail.com
Kurt Barkhouse	85 N Candle Pt Crystal River FL 34429	352-563-2276	KBarkhouse@sysna.com
Joey Barkhouse	" " "	" " "	Foxnphoeb@gmail.com

Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Jere Hooker **DATE:** 6-11-19

ADDRESS: 9761 E. Silver OAKS TR.
Inverness, FL 34450 **PHONE:** 352-559-0598

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT **YES** ___ **NO** ✓

REPRESENTING SELF: ✓ ***OR* BUSINESS/ORGANIZATION NAME:** ______

ISSUE TO BE ADDRESSED: Deterioration of Chass.

YOUR POSITION ON ISSUE: **FAVOR** ___ **OPPOSE** ✓ **OTHER** ______

To assure that all participants have an opportunity to speak, comments will be limited to three minutes per speaker. When appropriate, exceptions to the three-minute limit may be granted by the Chair. If several individuals wish to speak on the same issue/topic, the designation of one spokesperson is recommended.

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Larry A. Hartman **DATE:** 6-11-19

ADDRESS: 7379 N. Whippoorwill Tow
Hernando Fl. 34442 **PHONE:** 352 586-1071

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ___

REPRESENTING SELF: ___ *OR* BUSINESS/ORGANIZATION NAME: TOO FAR - prez

ISSUE TO BE ADDRESSED: minimum flows + Levels - on Chez.
I oppose the right to with draw 8% of existing flows

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ✓ OTHER ___

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Southwest Florida
Water Management District

Agenda Item No. ________

Request to Speak

(please print)

NAME: FRANK KABOCSI DATE: ________

ADDRESS: 9530 WEST RIVER HOLLY PATH

PHONE: 863-944-8405

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ___

REPRESENTING SELF: ___ *OR* BUSINESS/ORGANIZATION NAME: HOMOSASSA RIVER ALLIANCE "PRESIDENT"

ISSUE TO BE ADDRESSED: BLUE WATERS WATER FLOW

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ___ OTHER ✓

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Southwest Florida Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Jeff Kinnard DATE: 6/11/19

ADDRESS: 11970 W Bayshore Dr
Crystal River, FL PHONE: 352 400-0946

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO X

REPRESENTING SELF: X *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: Minimum withdrawals increase

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE X OTHER ______

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

Iris A. Rose (please print)

NAME: Iris A. Rose DATE: 6/11/19

ADDRESS: ______

______ PHONE: ______

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO X

REPRESENTING SELF: ___ *OR* BUSINESS/ORGANIZATION NAME: Homosassa River Alliance

ISSUE TO BE ADDRESSED: Water withdrawal procedure (?)

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ___ OTHER ______

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Bob Caldwell DATE: June 10 19

ADDRESS: 10346 McClung loop
Homosassa fla PHONE: ______

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ___

REPRESENTING SELF: ___ *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: ______

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ✓ OTHER ______

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: DAVID D STEVENS DATE: ______

ADDRESS: ______

______ PHONE: ______

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ___

REPRESENTING SELF: ___ *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: ______

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ___ OTHER ______

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Southwest Florida Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Ken Nash DATE: 6-11-19

ADDRESS: ______

______ PHONE: ______

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ✓

REPRESENTING SELF: ✓ *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: MFL

______

______

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ___ OTHER ✓

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Brad Rimbey DATE: 06-11-19

ADDRESS: 10028 S Riviera Pt.

Homosassa, FL 34448 PHONE: 813-417-9453

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO X

REPRESENTING SELF: ___ *OR* BUSINESS/ORGANIZATION NAME: Homosassa River Alliance

ISSUE TO BE ADDRESSED: MFL's for Chassahowitza + Homosassa

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE X OTHER ______

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Megan Clark **DATE:** June 10, 2019

ADDRESS: 12 N. Jefferson St.
Beverly Hills FL, 34465 **PHONE:** 802 7478887

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT **YES** ___ **NO** ✓

REPRESENTING SELF: ___ ***OR* BUSINESS/ORGANIZATION NAME:** ______

ISSUE TO BE ADDRESSED: Natural Systems – pollution – algae bloom as hazard to human health.

YOUR POSITION ON ISSUE: FAVOR ___ **OPPOSE** ___ **OTHER** ______

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Maxine Connor DATE: 6-11-19

ADDRESS: 9 Browallia Ct
Homosassa FL 34446 PHONE: 352 503-2166

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ✓

REPRESENTING SELF: ✓ *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: MFL'S

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ___ OTHER ______

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: JACK BROWN DATE: 6/11/2019

ADDRESS: 730 N SETON AVE

LECANTO, FL 34461 PHONE: ______

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ✓

REPRESENTING SELF: ✓ OR BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: WATER WITHDRAWAL FOR PROFIT!

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ✓ OTHER ______

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Rodney MacRae DATE: 6/11/19

ADDRESS: 10670 W. Hall's River Rd.

Homosassa 34448 PHONE: 352-628-4314

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ✓

REPRESENTING SELF: ✓ *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: Min Flow Levels on the Homosassa River

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ___ OTHER ______

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Southwest Florida Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Joann Brown DATE: 06-11-19

ADDRESS: 730 N. Seton Ave

Lecanto, FL 34461 PHONE: (352) 341-7741

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ___

REPRESENTING SELF: ✓ *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: allowing pumping Citrus County water by bottling company for small fee.

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ✓ OTHER ______

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Southwest Florida Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Donald Clark DATE: Jun 11, 2019

ADDRESS: 9099 S. Great Oaks Dr Floral City 34436

PHONE: 352-344-1355

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ✓

REPRESENTING SELF ✓ *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: Homosassa Springs/State Park, Chass, fed preserve manatees

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ✓ OTHER ______

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Southwest Florida Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: DAN HILLIARD DATE: 6-11-19

ADDRESS: 1629 N. CROOKED BRANCH DR

INVERNESS FL 34461 PHONE: 527-0023

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO X

REPRESENTING SELF: ___ *OR* BUSINESS/ORGANIZATION NAME: FSC, INC

ISSUE TO BE ADDRESSED: Chaz / Homosassa MFL

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE X OTHER ______

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Southwest Florida
Water Management District

Agenda Item No. ________

Request to Speak

(please print)

NAME: David Blatt DATE: ________

ADDRESS: 8456 West miss Maggie Dr

PHONE: 352-3820070

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO X

REPRESENTING SELF: X OR BUSINESS/ORGANIZATION NAME: ________

ISSUE TO BE ADDRESSED: Water Storage for Future use.

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE X OTHER alternative

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Ben Berauer DATE: June 11, 2019

ADDRESS: 10332 S McClung Loop
Homossasa, FL 34448 PHONE: 727-217-5971

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ✓

REPRESENTING SELF: ___ *OR* BUSINESS/ORGANIZATION NAME: The Friends of the Chassahowitzka

ISSUE TO BE ADDRESSED: MFL

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ✓ OTHER ______

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Southwest Florida Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: JAMES JASTER DATE: 6/11/19

ADDRESS: 7035 S. SORREL AVE

HOMOSASSA FL 34446 PHONE: 352 651 1993

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ___

REPRESENTING SELF: X *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: CUTTING WATER FLOW

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE X OTHER ______

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Southwest Florida Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Kate Spratt DATE: 6/11/19

ADDRESS: 4460 S. Wandering Path
Homosassa, FL 34448 PHONE: 352-400-9747

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ✓

REPRESENTING SELF: ✓ *OR* BUSINESS/ORGANIZATION NAME: ______

ISSUE TO BE ADDRESSED: MFL 2019 for Homosassa

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ✓ OTHER ______

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Southwest Florida
Water Management District

Agenda Item No. ______

Request to Speak

(please print)

NAME: Dennis Dutcher **DATE:** 6-11-19

ADDRESS: 137 John Carroll Rd East
Lakeland Florida **PHONE:** 863-602-0113

ARE YOU A LOBBYIST REGISTERED WITH THE DISTRICT YES ___ NO ✓

REPRESENTING SELF: ✓ ***OR*** **BUSINESS/ORGANIZATION NAME:** ______

ISSUE TO BE ADDRESSED: MFL'S

YOUR POSITION ON ISSUE: FAVOR ___ OPPOSE ___ OTHER ______

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Comment Card

Southwest Florida
Water Management District

WATERMATTERS.ORG · 1-800-423-1476

Meeting Date: Jun 11　　Meeting Location: CF College - Lecanto

Name: Kathy O'Donoghue　　Phone: 425-786-6012

Mailing Address: 1251 N Hunt Club Dr　　City/Zip: Hernando Fl, 34442

Email Address:

Questions and/or Comments:

Are you politician + parented crazy to
Continue the destruction of our nature coast.
leave our water alone
~~the~~ state does not need more bottle water -
use faucet or the bottle are another bad idea

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Southwest Florida
Water Management District

WATERMATTERS.ORG • 1-800-423-1476

Comment Card

Southwest Florida
Water Management District
WATERMATTERS.ORG • 1-800-423-1476

Meeting Date: 6-11-19 Meeting Location: Lecanto
Name: Dennis Dutcher Phone: 863-602-0113
Mailing Address: 137 John Carroll Rd East City/Zip: Lakeland FL 33801
Email Address: Dennis3ds@aol.Com

Questions and/or Comments:

The district should attempt to economically value the wildlife in dollar values of the impact of the flow reductions proposed. as an example, what would one Blue Crab, Red fish, trout etc's economic value be. when the estuary is impacted, what does it cost the public to provide water for human needs of development.

an economic study of the value of wildlife in dollars, not astentics. adding an economic component will give elected officals an additional quantifier to use when permitting development.

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Comment Card

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Meeting Date: 6-11-19 Meeting Location: CCF Lecanto

Name: Phil Rodgers Phone:

Mailing Address: 3259 S Michigan Blvd City/Zip: Homosassa, 34448

Email Address: philrock1083@gmail.com

Questions and/or Comments:

Concerned withdrawal will become too great as development is expected with new highway construction. Must end pumping for private bottling companies.

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Comment Card

Southwest Florida
Water Management District

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Meeting Date: 6-11-19 Meeting Location: CF - Lecanto, FL

Name: Elaine Moore Phone: 352 212-3131

Mailing Address: 9820 W Yulee Dr, City/Zip: Homosassa, FL 34448

Email Address: lotsmoore2@gmail.com

Questions and/or Comments:

The economic impacts of reduced flow levels. Water sports & water tourism are huge for our area. are critical to our successful economy. Many, many small businesses depend on the flow of the rivers to succeed. Real estate property values depend on the successful flow of the river.

0 reduction of water flows is absolutely necessary.

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Comment Card

Southwest Florida
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Meeting Date: 6/11/19 Meeting Location: CF

Name: Dennis Blauer Phone: 352 228 3294

Mailing Address: PO Box 286 34448 City/Zip: 34448

Email Address: chazcamp.db@gmail.com

Questions and/or Comments: what i observe is a giant disconnect between what your science shows and the real world i observe every day on the Chas. River 2019 has seen the worst filamentatious algae in the river Ever. I'm thinking of getting a mud motor just to get my jonboat thru the muck! "Reevaluation" is just another way for inevitable "moving of the goalposts", in my opinion.

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Comment Card

Southwest Florida
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Meeting Date: 6-11-2019 Meeting Location: CF Campus

Name: Lesia Bennett Phone:

Mailing Address: 8380 W. Mi 6 Ct City/Zip: Homosassa 34448

Email Address:

Questions and/or Comments:

No More Water From Chassahowitzka — period. We don't want growth - We are The Nature Coast. Who will re-imburse taxes for waterfront property when the River is dry? We are very tired of voicing these opinions over & over but decisions are made without community support & bad science. Bad data input into modeling results in bad science.

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Comment Card

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Meeting Date: 6/11/2019 Meeting Location: CF - LECANTO

Name: JIM BENNETT Phone:

Mailing Address: 8380 W. MILO CT. City/Zip: HOMOSASSA, FL 34448

Email Address:

Questions and/or Comments: SALINITY IS AN ISSUE — TEMPERATURE LESS SO. WHEN WILL YOU ADMIT THAT AQUATIC PLANT LIFE PROLIFERATION IS THE MAIN PROBLEM — BROUGHT ON BY EXCESS NUTRIENTS IN THE WATER. MILLIONS OF DOLLARS HAVE BEEN SPENT TO REPLACE SEPTIC TANKS IN THE COMMUNITY, AND TO DEMUCK THE MAIN SPRING AREA. THE CANALS AND THE SPRINGS ARE ANY BETTER NOW THAN THEY WERE. MOST NUTRIENTS IN CHASS. SPRING COMING FROM EAST OF THE BASIN, FROM AGRICULTURAL FERTILIZATION. SAME PROBLEM AS EVERGLADES/L. OKEECHOBEE PROBLEM. MAINTAIN WATER QUALITY? I DON'T THINK SO

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Comment Card

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Meeting Date: 6-11-19 Meeting Location: LECANTO

Name: KATHY SCHNEIDER Phone: 352 601 7085

Mailing Address: 8416 W. MILO CT City/Zip: CHASSAHOWITZKA

Email Address:

Questions and/or Comments:

LEAVE THE CHASS RIVER ALONE — WHY RUN US DRY.
DO YOU NOT KNOW THE MEANING OF "NATURE COAST"?
WHY DO YOU WANT US TO LOSE OUR CANALS?
WE WANT NO MORE TOURISTS OR THE BLIGHT THEY BRING.
ONCE OUR WATER IS GONE WE WON'T GET IT BACK.

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Meeting Date: ____________________ Meeting Location: ____________________

Name: ____________________ Phone: ____________________

Mailing Address: ____________________ City/Zip: ____________________

Email Address: ____________________

Questions and/or Comments:

Cook Hot Dogs

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Comment Card

Southwest Florida
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Meeting Date: 6/11/19 Meeting Location: Citrus Co Community College

Name: Ruth Wedeman Phone: 352-382-1000

Mailing Address: 8461 W. Crane Ct City/Zip: Homosassa, Fl 34448

Email Address: rwedeman@tampabay.rr.com

Questions and/or Comments:

I am not in favor of withdrawing any more water from the Chassahowitzka River. Our canals are low enough already & more salt intrusion into the river will also be a problem for the wildlife. The County also stopped us from using our wells & forced us to go to city water. (Also claimed our septics were polluting the water, yet I still don't have apple snails back in my canal after how many years of being off septic)

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Comment Card

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Meeting Date: 6-11-19 Meeting Location: CFCC - Lecanto

Name: Darlene Hooker Phone: 352-559-0598

Mailing Address: 9761 E. Silver OAKS TR. City/Zip: INVERNESS, FL 34450

Email Address: darlenehooker@hotmail.com

Questions and/or Comments:

Our fresh water Rivers are a very important part of Florida as we know it. If we keep drawing more + more, though it ~~be~~ changes only a little at a time, we will be ruining this part of Florida (the fresh water springs included.)

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Meeting Date: 6-11-19 Meeting Location: LECANTO FL
Name: IRIS HOLLIS Phone: 352 795 3662
Mailing Address: 1920 NW 19th St City/Zip: CRYSTAL RIVER FL 34428
Email Address: irisyoga7@gmail.com

Questions and/or Comments:

What are the statutes that govern what decisions the hardworking folks at Swiftmud have to make?

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Comment Card

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Meeting Date: 6-11-19 Meeting Location: Central Fl. Collage

Name: Keith Rogers Phone: (813) 431-7471

Mailing Address: 11486 W. Priest City/Zip: Homasassa Fl. 34448

Email Address:

Questions and/or Comments:

Do not increase MFLS

decrease MFLS

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Southwest Florida
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Comment Card

Southwest Florida
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WATERMATTERS.ORG · 1-800-423-1476

Meeting Date: 6/11/19 Meeting Location: C Fla College

Name: Ruth Luttrell Phone: 628-2766

Mailing Address: 6843 S. Pinebrook City/Zip: Homosassa, F 34448

Email Address:

Questions and/or Comments:

Do not take any water out of our River.

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Comment Card

Southwest Florida
Water Management District

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Meeting Date: 6/11/19 Meeting Location: Central FL C. College - Lecanto

Name: Barbara Fletcher Phone: 352-302-9966

Mailing Address: 5752 S Beaver Pt City/Zip: Homosassa, FL 34448

Email Address: Fletcher_barb @ yahoo.com

Questions and/or Comments:

Do Not increase but Lower MFLs in Citrus! We ~~or~~ need to protect our Rivers.

~~Sl opp~~

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Southwest Florida Water Management District
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Brooksville, FL 34604-6899

Southwest Florida Water Management District
WATERMATTERS.ORG · 1-800-423-1476

Comment Card

Southwest Florida
Water Management District
WATERMATTERS.ORG • 1-800-423-1476

Meeting Date: 6/11/2019 Meeting Location:

Name: EDWIN K BARKHOUSE Phone:

Mailing Address: 85 N CANDLE PT City/Zip: CRYSTAL RIVER FL.

Email Address: KBARKHOUSE@SISNA.COM

Questions and/or Comments:

I AM OPPOSED TO INCREASING MINIMUM FLOW LEVELS TO SUPPORT PRIVATE ENTERPRISES AND COMMUNITIES NOT IN CITRUS COUNTY. WE ARE CURRENTLY DEPENDENT UPON OUR ~~AQUA~~ AQUAFER FOR WATER, WE NEED OTHER SOURCES. SIMPLY PUT LET NESTLE GO SOMEWHERE ELSE.

Privacy Statement

Principal Purposes: *Information on this card is used to organize and conduct this meeting as well as for the information follow-up.*

Routine Uses: *This information is a public record and may be disclosed to anyone requesting a copy for any purpose pursuant to the Florida Public Records Act, Chapter 119, Florida Statutes. Under Florida law, email addresses are public records. If you do not want your email address released in response to a public records request, do not send electronic mail to this entity. Instead, contact this office by phone or in writing.*

For more information, call the Southwest Florida Water Management District at 1-800-423-1476 (Florida only) or (352) 796-7211.

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Meeting Date: 6/11/19 Meeting Location:

Name: Josephine Barkhouse Phone: 860 634 1700

Mailing Address: 85 N Candle Pt City/Zip: CR 34429

Email Address: foxnphoebe@gmail.com

Questions and/or Comments:

reducing the river flow increases the salinity soon wells will fail. The Chassahowitzka is barely navigable now. We need every drop of water these springs produce now. We need to have a long view. These rivers will be needed at full capacity to provide water for future generations

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Water Management District
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Meeting Date: 6-11-19 Meeting Location: CFCC
Name: JeRe HOOKeR Phone: 352 559 0598
Mailing Address: 9761 E. SilVeR OAKS TR. City/Zip: INVeRNeSS, Fl 34450
Email Address: jerehooker@hotmail.com

Fact #1

Fact # 2

Questions and/or Comments:
Trees are dying further & further up the Chass. river.
Several years ago the main spring at Chass. boiled up 3-4 inches above the natural water surface. This upward boil is virtually non-existent now.
Common sense says don't draw any more water from the Chass springs.

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Comment Card

Southwest Florida
Water Management District
WATERMATTERS.ORG · 1-800-423-1476

Meeting Date: 6/11/19 Meeting Location: Lecanto

Name: Rick Spratt Phone: 352-302-1606

Mailing Address: 4460 S Wandering Path City/Zip: Homosassa 34448

Email Address: captainrickspratt e yahoo.com

Questions and/or Comments:

Homosassa and Chass are designated Outstanding waterways and priority waterbodies in the SWIM program. How are lower MFL going to benefit these sensitive ecosystems? Flows are affected by rainfall and withdrawls. We only have control over withdrawls, not rainfall, which has been declining for 40 years. Water WILL become the most limiting factor in FL. You have to say "NO" sometime and that time is now! Why do we need lower MFL? Money? We passed Amendment 1 a few years ago for that!

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Minimum Flow Reevaluations for Chassahowitzka and Homosassa River Systems

Gabe Herrick PhD, Senior Environmental Scientist

Southwest Florida
Water Management District

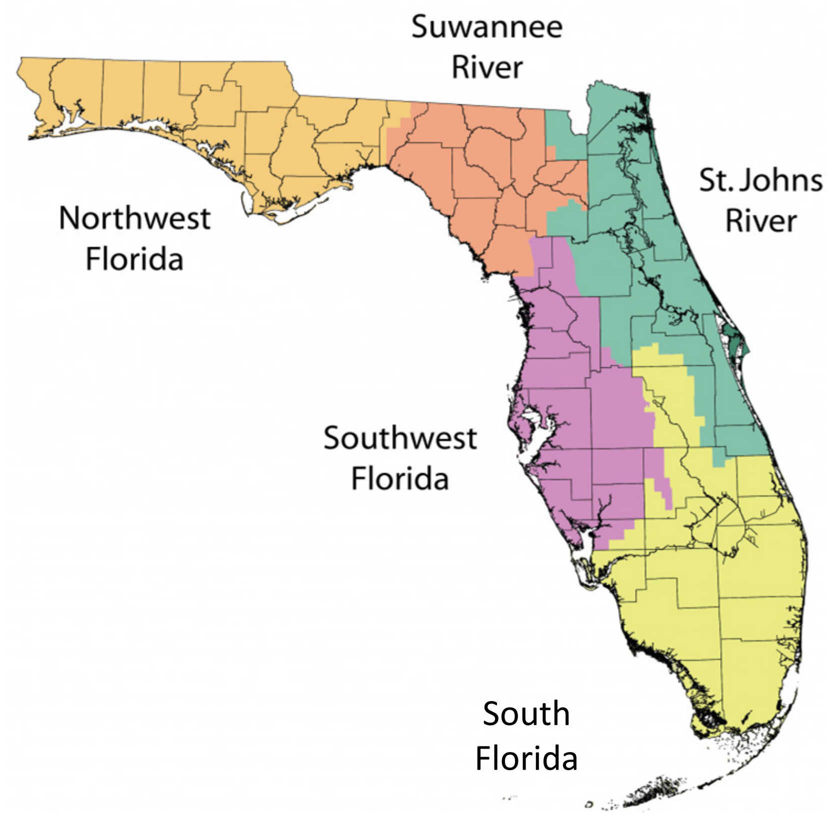
District Overview

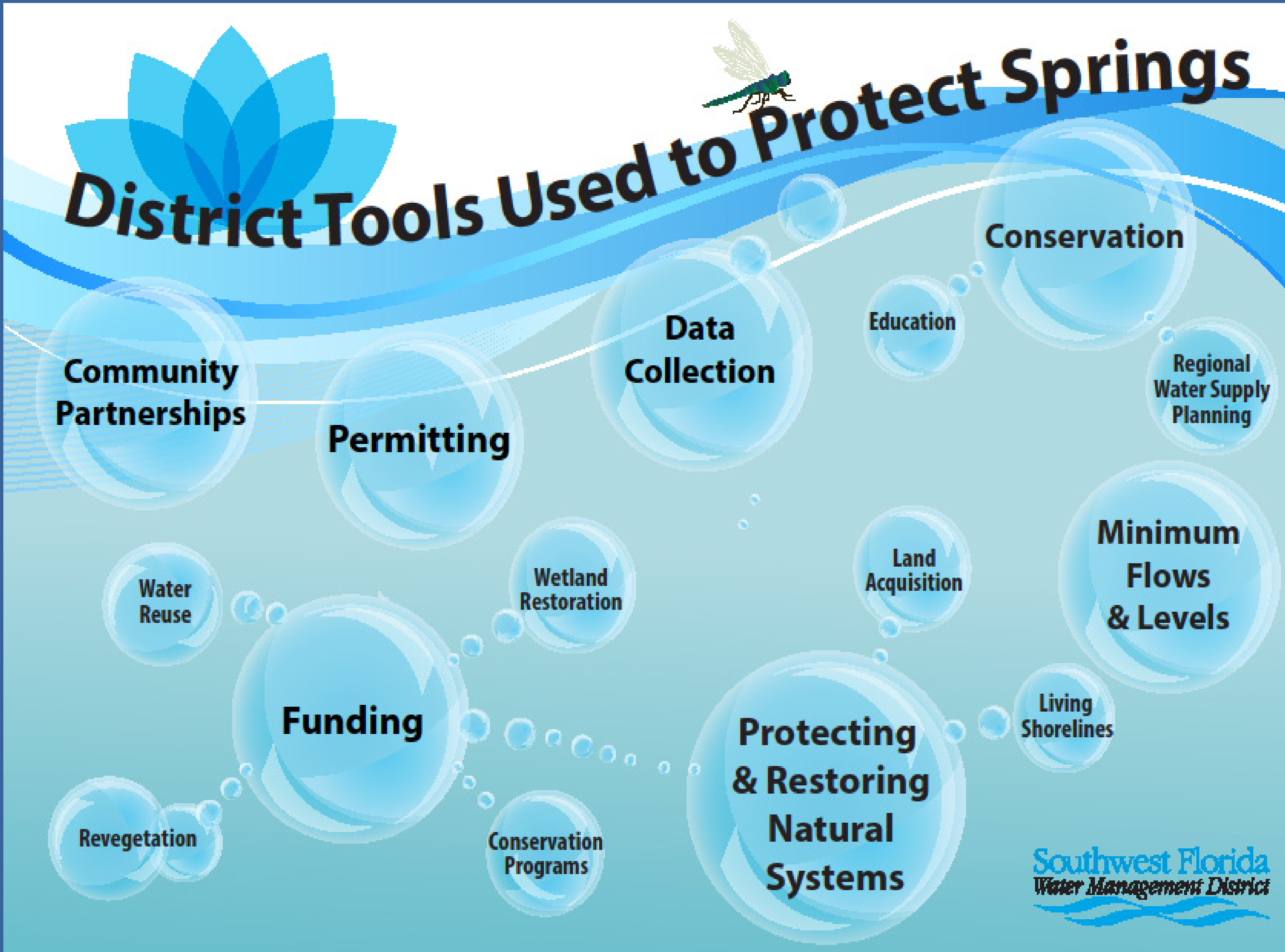
Water Supply

Water Quality

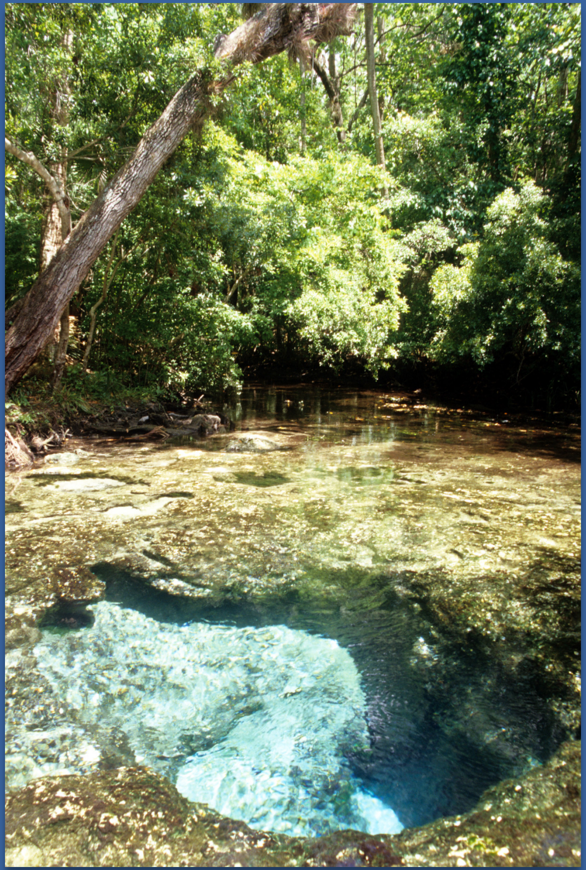
Natural Systems

Flood Protection




District Tools Used to Protect Springs
Community Partnerships
Permitting
Data Collection
Education
Conservation
Regional Water Supply Planning
Water Reuse
Wetland Restoration
Land Acquisition
Minimum Flows & Levels
Funding
Living Shorelines
Protecting & Restoring Natural Systems
Revegetation
Conservation Programs
Southwest Florida Water Management District

What are MFLs?



MFLs refer to **m**inimum **f**lows and minimum water **l**evels

- Minimum flows protect rivers, streams and springs
- Minimum water levels protect lakes, wetlands and aquifers

Southwest Florida
Water Management District

Why Establish MFLs?

- Required by law
- Limit at which further water withdrawals would be significantly harmful
- MFLs help the District:
    - Review requests for withdrawals
    - Plan for future water needs

Southwest Florida Water Management District

Schedule

- 2013 rules: Reevaluate in six years
- March-May 2019: Peer review
- March-June 2019: Stakeholder outreach
- June 11, 2019: Public workshop
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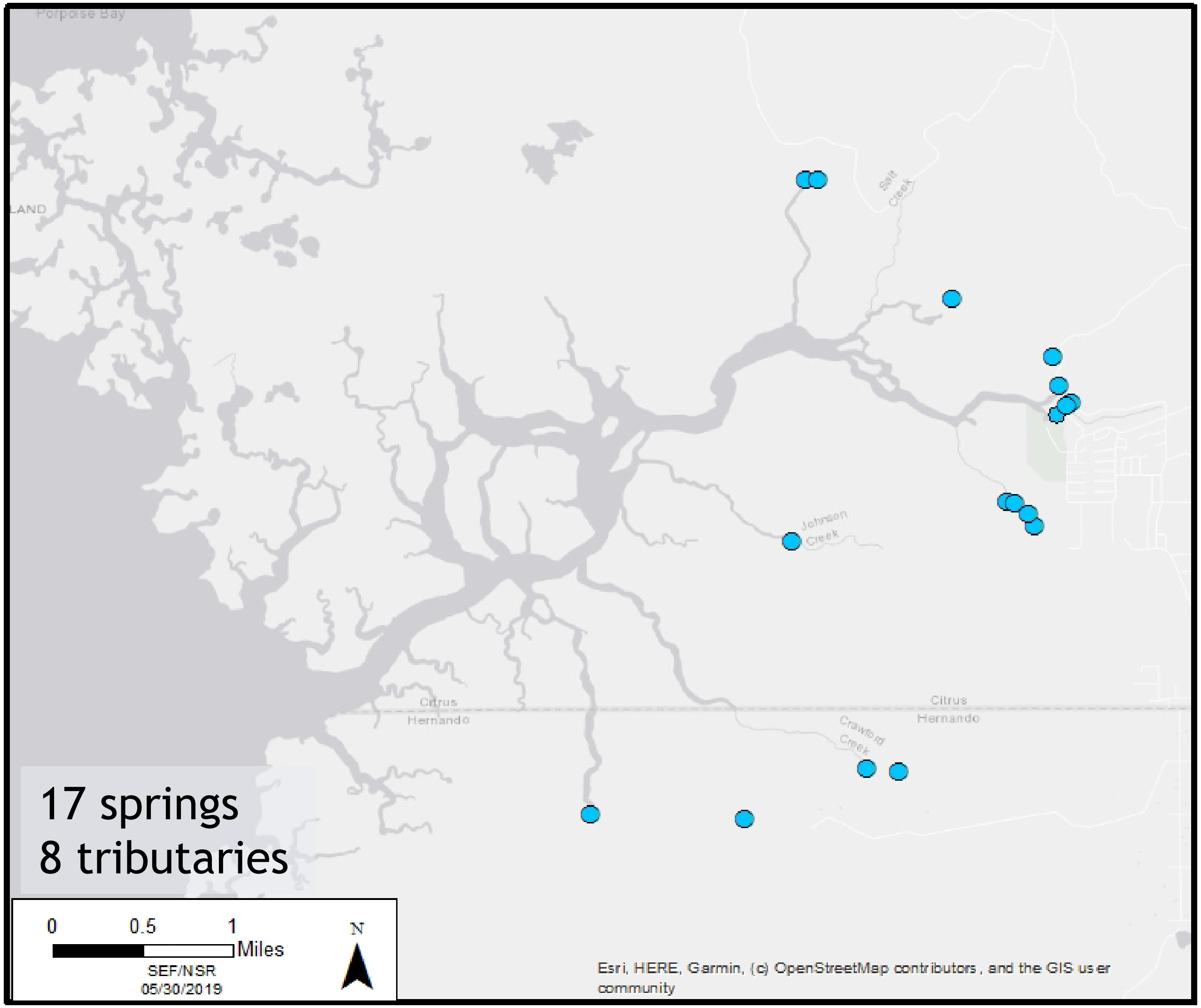
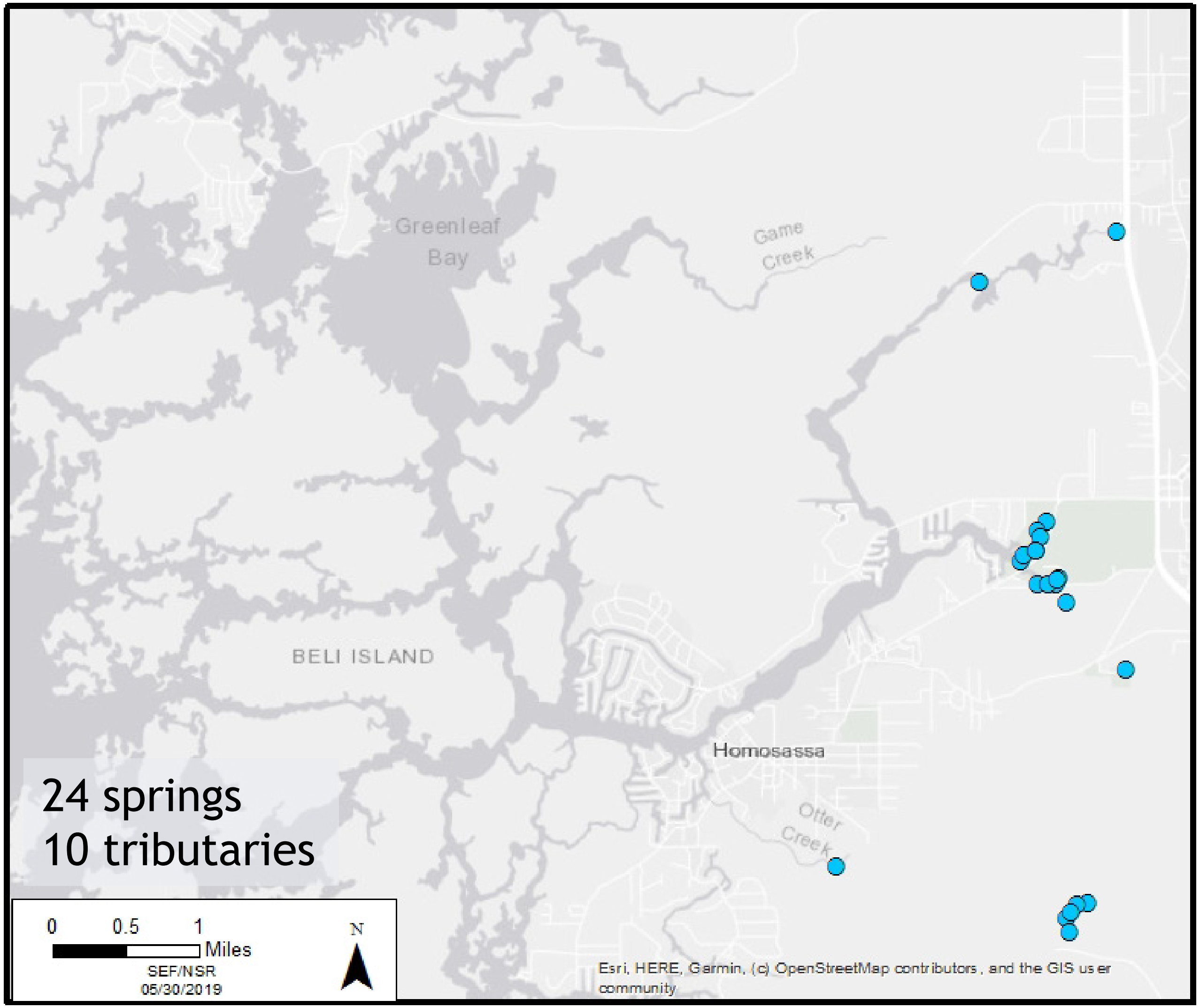
- December 2019: Rulemaking to adopt minimum flow

Southwest Florida Water Management District

Chassahowitzka River System



Homosassa River System



Ongoing Monitoring and Assessment

- Flow Data: 11 total gages funded
- Environmental Values
- WQ monitoring and analysis
- Surface water modeling
- Groundwater modeling
- Fish, vegetation, oysters, others

Environmental Values

- Recreation
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- Detritus
- Water supply
- Scenery
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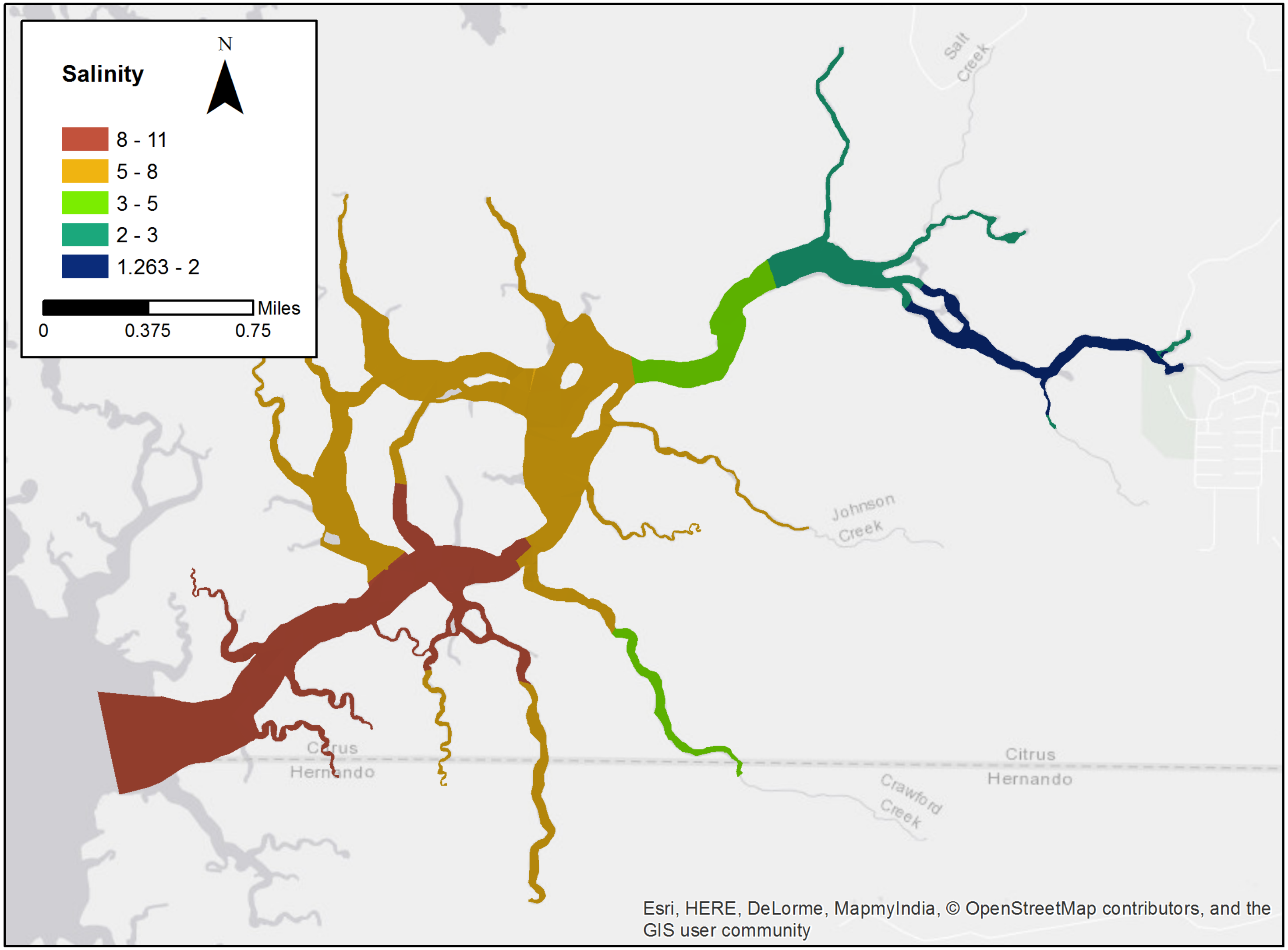
Using the criteria most sensitive to reductions in flow protects all environmental values.

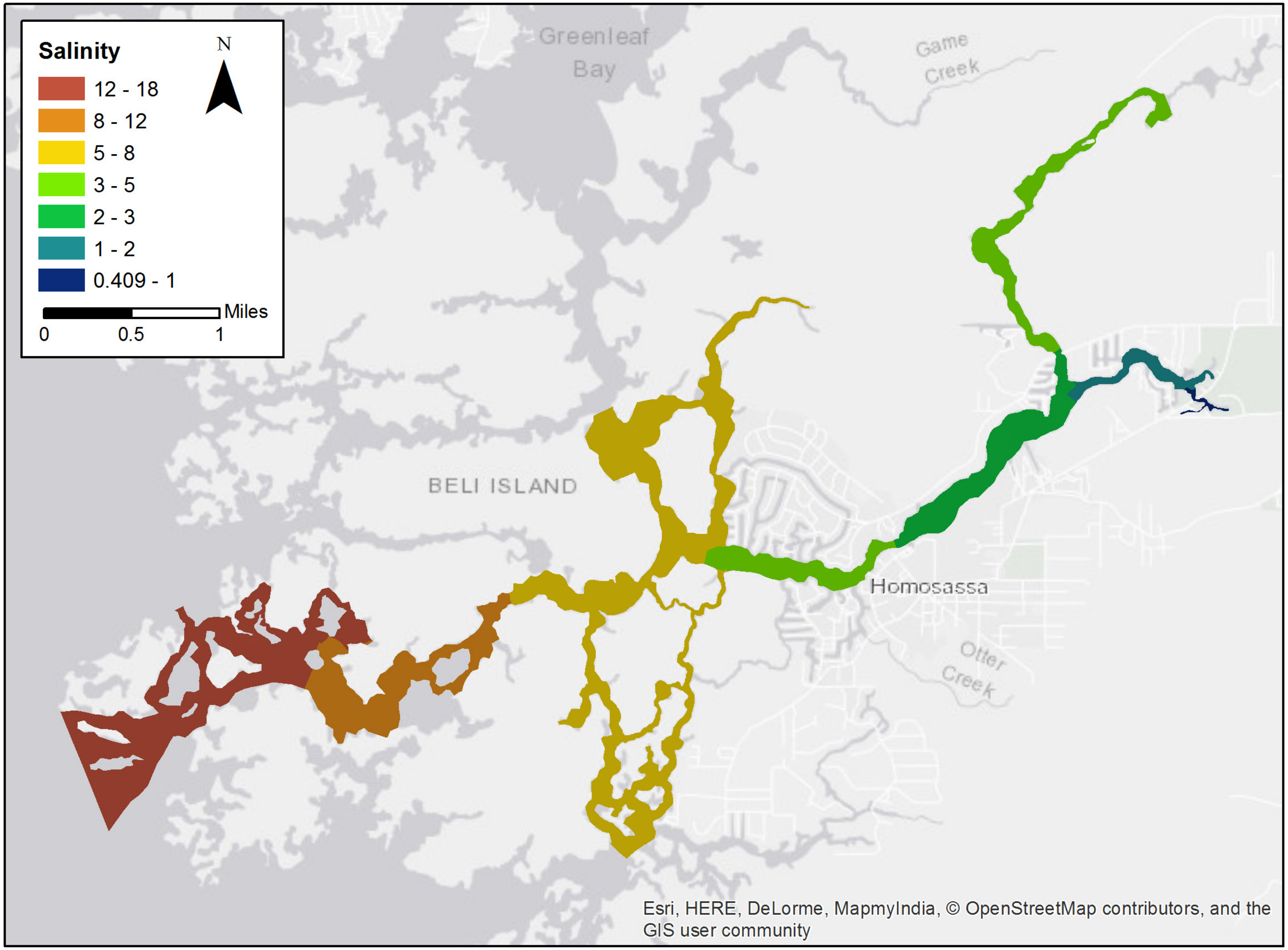
Significant Harm

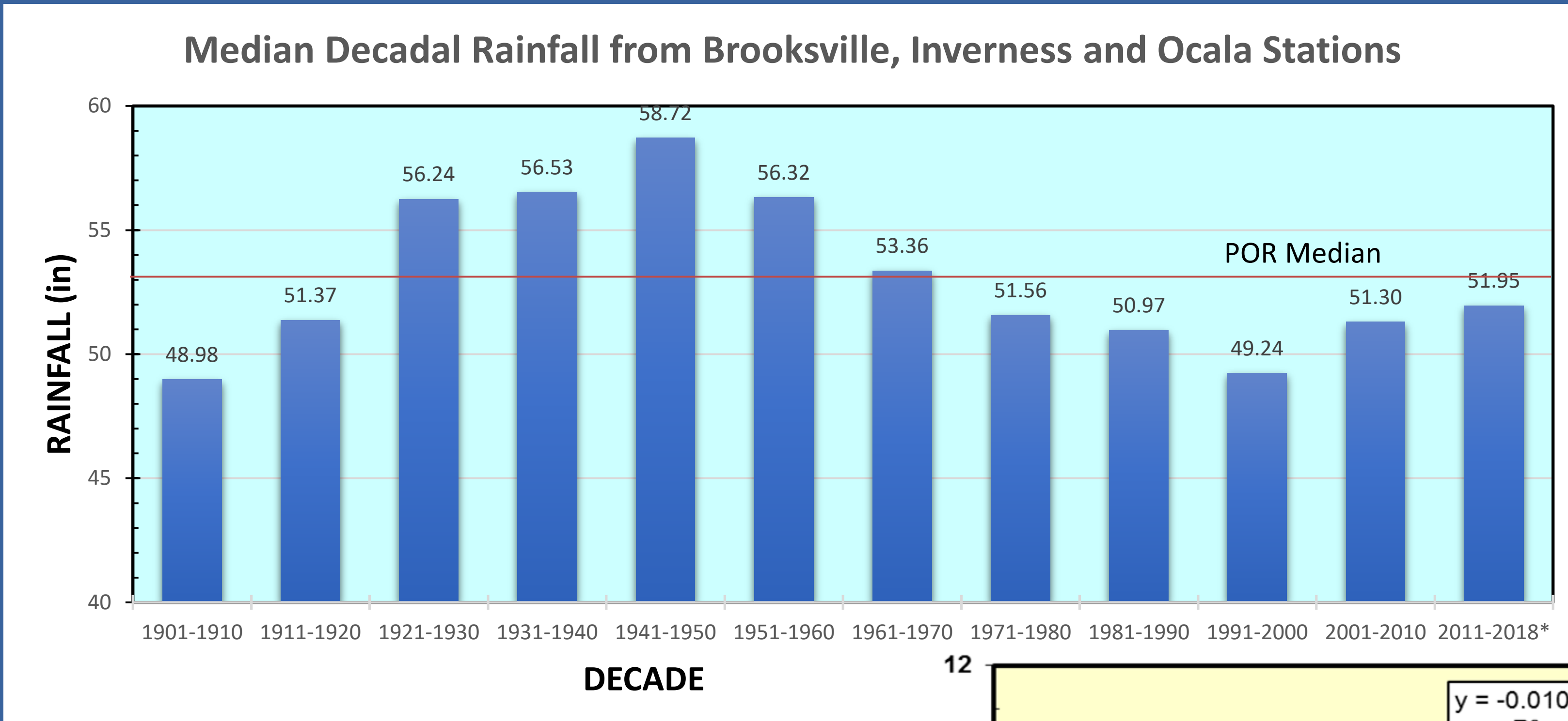
- Minimum flows are the limit at which further ***withdrawals*** would be ***significantly harmful*** to the water resources or ecology of the area
- Habitat-based 15% standard which is conservative and sensitive to differences among systems
- 20 panels: best available method

Chassahowitzka Modeling



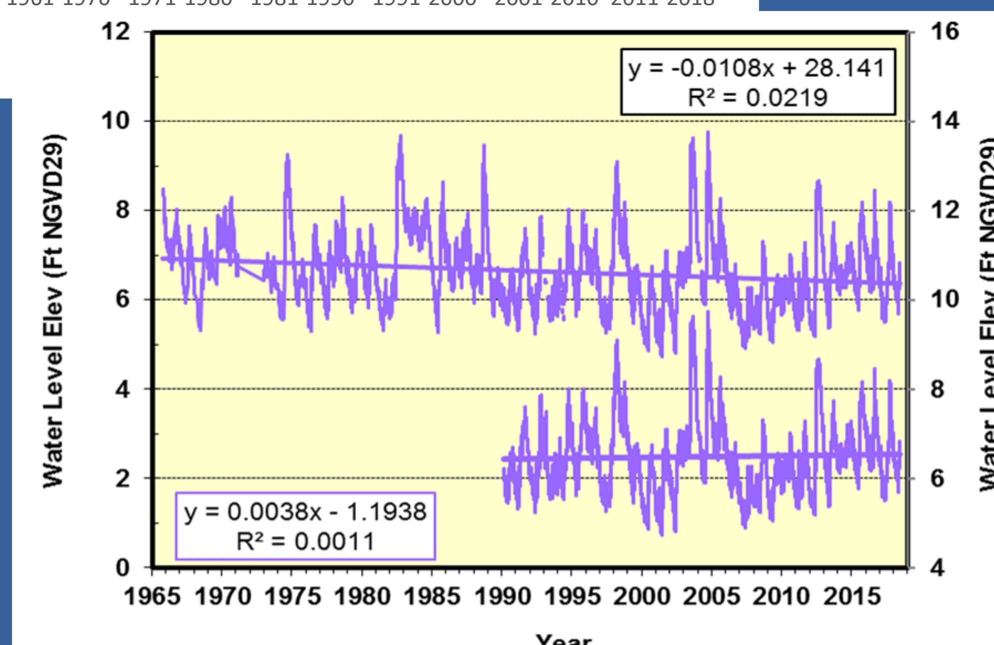
Homosassa Modeling





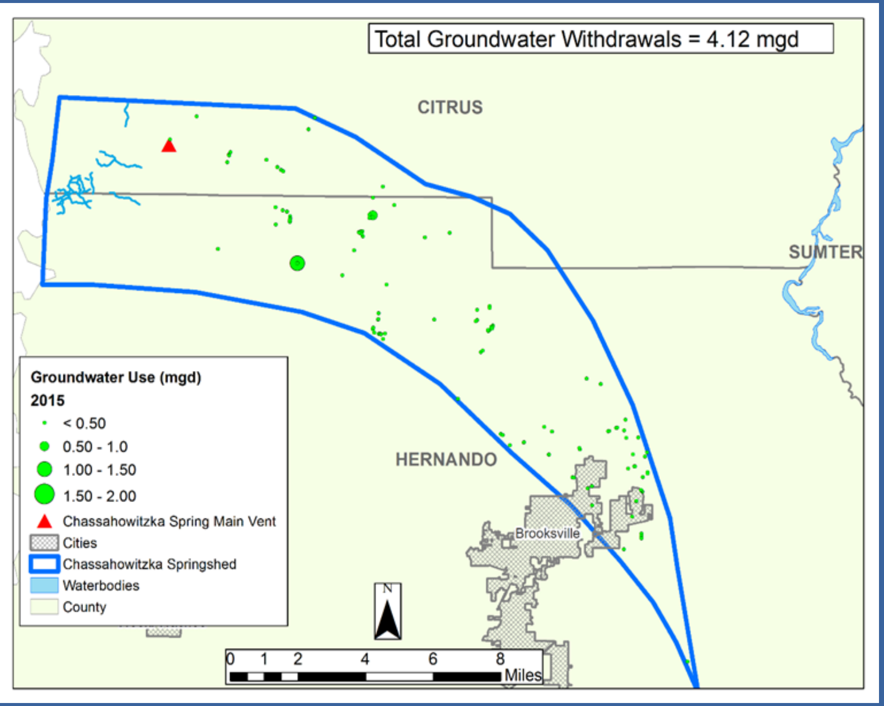
Long-term trend in Upper Floridan aquifer water levels at Chassahowitzka 1 Dp

Period of Record	Total Water Level Change (feet)
1965-2018	-0.56
1990-2018	+0.11

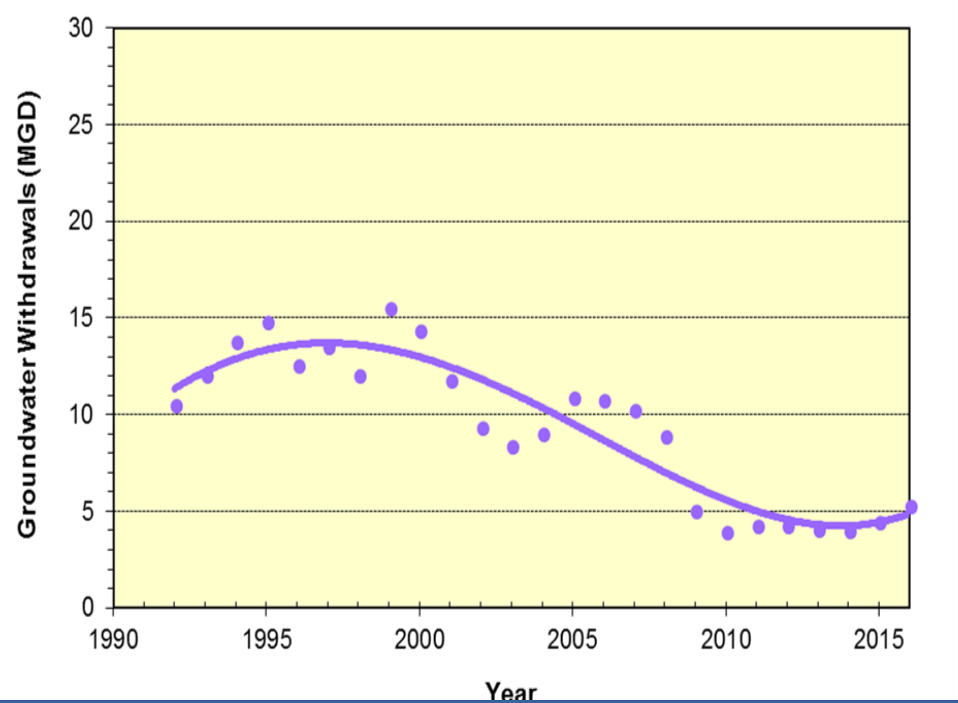


Chassahowitzka Springshed Groundwater Withdrawals (1992-2016)

2015 Water Use Permitted Withdrawals

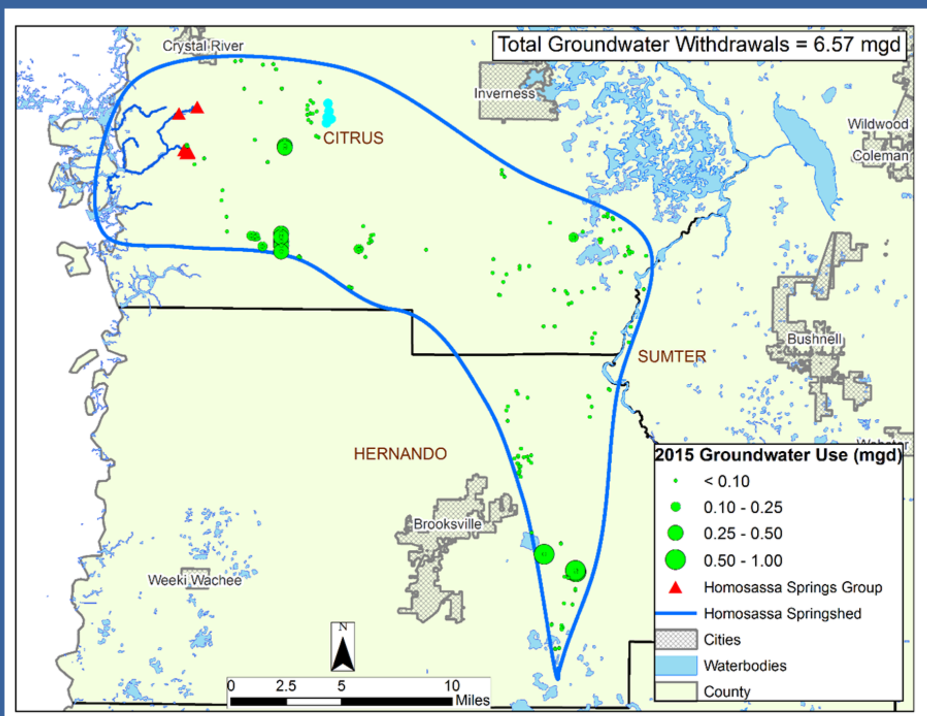


Estimated & Metered Groundwater Use History (Includes Domestic Self-Supply)

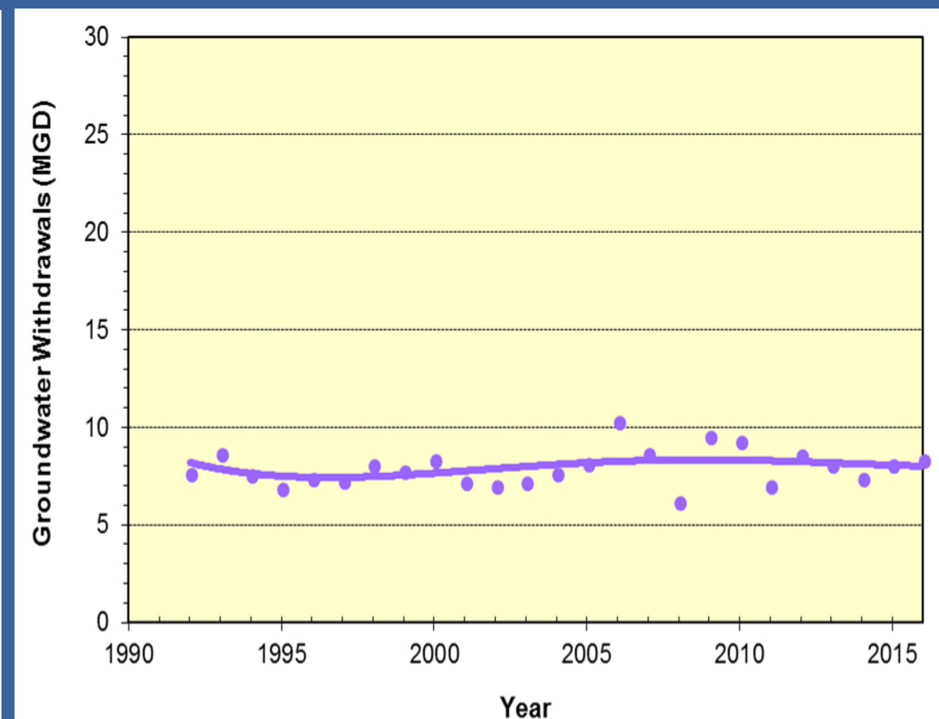


Homosassa Springshed
Groundwater Withdrawals (1992-2016)

2015 Water Use Permitted Withdrawals



Estimated & Metered Groundwater Use History (Includes Domestic Self-Supply)



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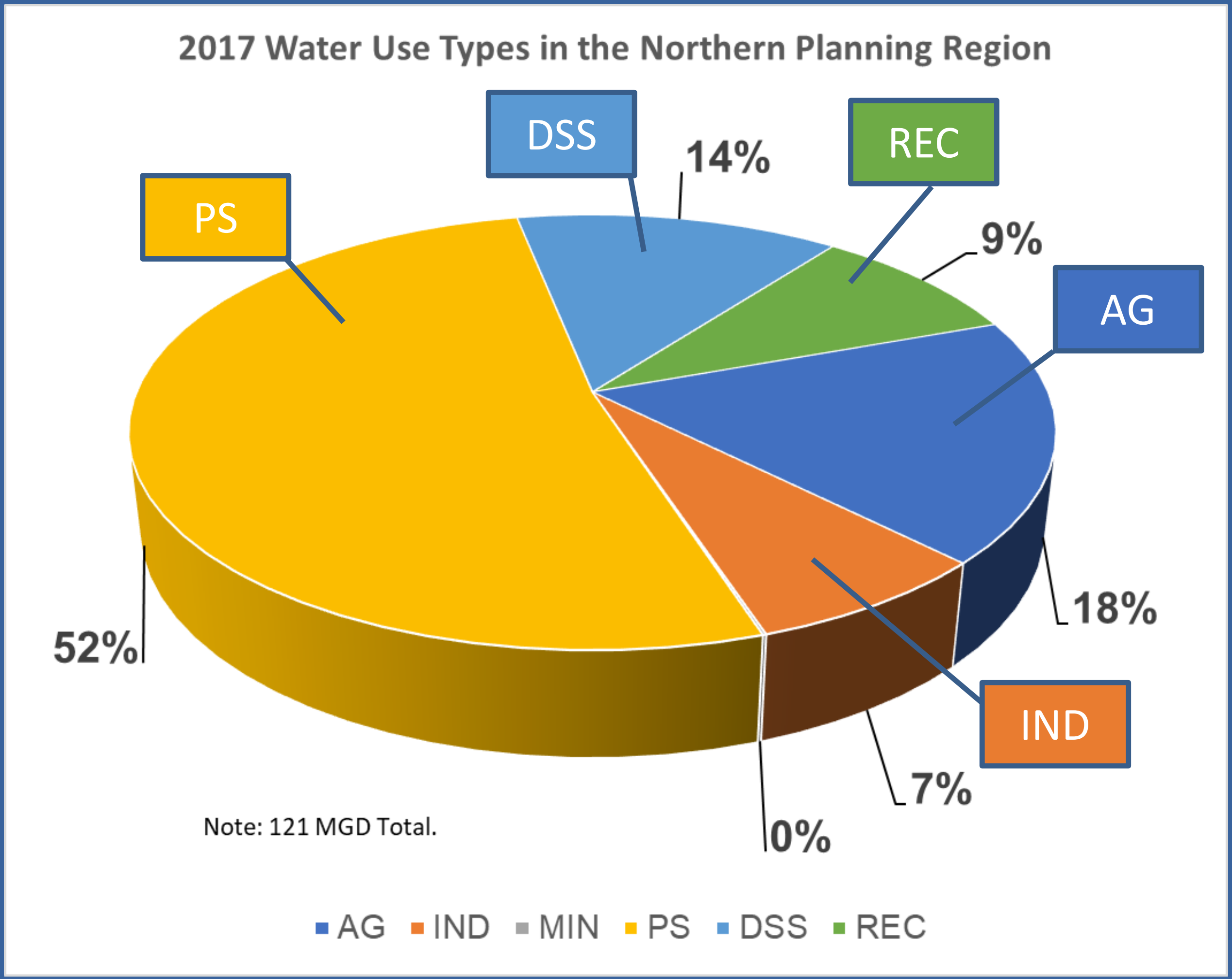
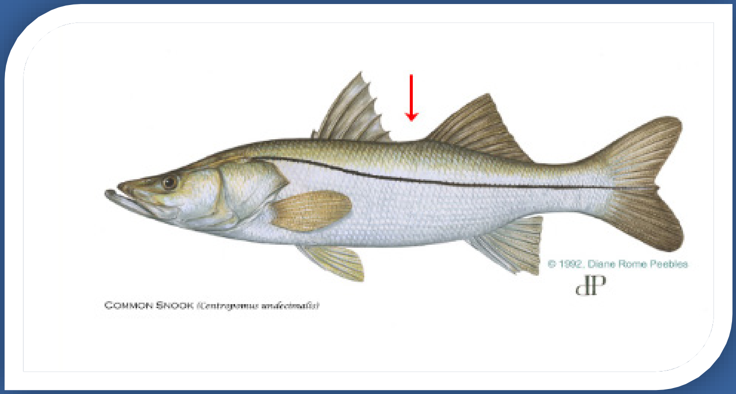
Water Management District

Water Use Types



Minimum Flows Results

Criteria	Chassahowitzka	Homosassa
Salinity	**8%**	11%
Common Snook Temperatures	**8%**	**5%**
Manatee Temperatures	10%	6%



Spring Flow Change from Groundwater Withdrawals

Year	Chassahowitzka (%)	Homosassa (%)
2010	1.3	1.8
2015	1.4	1.9
2035	2.0	3.0
2035 w/ Conserv & Reuse	1.7	2.6
2019 MFL	8	5

Note: Groundwater withdrawal impact based on Northern District Model Version 5

Southwest Florida Water Management District

Summary

- Minimum flows are based on most sensitive factors using best information available
- Rainfall drives long-term water levels
- Groundwater use has been steady over last 8 – 10 years
- MFLs allow maximum withdrawals of 8% for Chassahowitzka and 5% for Homosassa
- Withdrawal impacts are 1-2% increasing to 2-3% by 2035
- No recovery or additional prevention strategy is needed at this time

Southwest Florida Water Management District

Thank you

Southwest Florida

Water Management District

Reevaluation of Minimum Flows in Chassahowitzka and Homosassa

Friends of the Chassahowitzka River

March 19, 2019

With You Today

- **Gabe Herrick**, Senior Environmental Scientist
- **Doug Leeper**, Minimum Flows and Levels Program Lead
- **Sky Notestein**, Springs and Environmental Flows Manager
- **Frank Gargano**, Government Affairs Regional Manager

District Overview

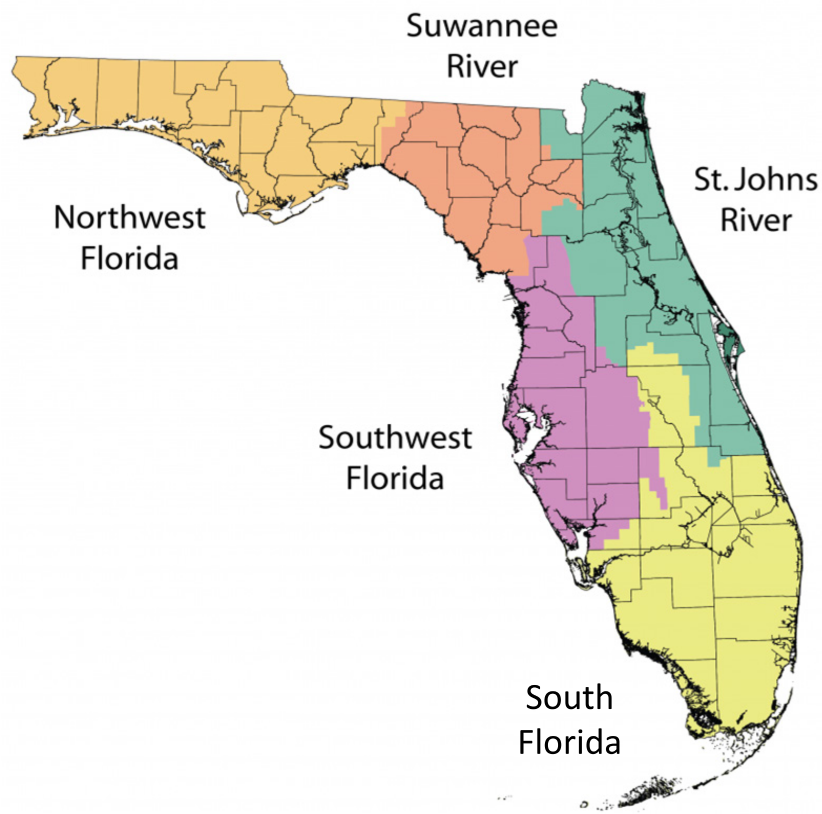
Water Supply

Water Quality

Natural Systems

Flood Protection

5 Districts



What are MFLs?

MFLs refer to <u>**m**</u>inimum <u>**f**</u>lows and minimum water <u>**l**</u>evels

- Minimum flows protect rivers, streams and springs
- Minimum water levels protect lakes, wetlands and aquifers

Why Establish MFLs?

- Required by law
- Established to protect water bodies from harm caused by ground and surface water withdrawals
- Tool used by the District to:
    - Review requests for withdrawals of ground and surface water
    - Plan for future water needs



Schedule Moving Forward

- January-June 2019: Stakeholder outreach
- June 2019: Public workshop TBD
- Fall 2019: District Governing Board meeting – Request to approve staff minimum flow recommendation and to initiate rulemaking
- December 2019: Rulemaking to adopt minimum flow

Activities from 2013 to 2019

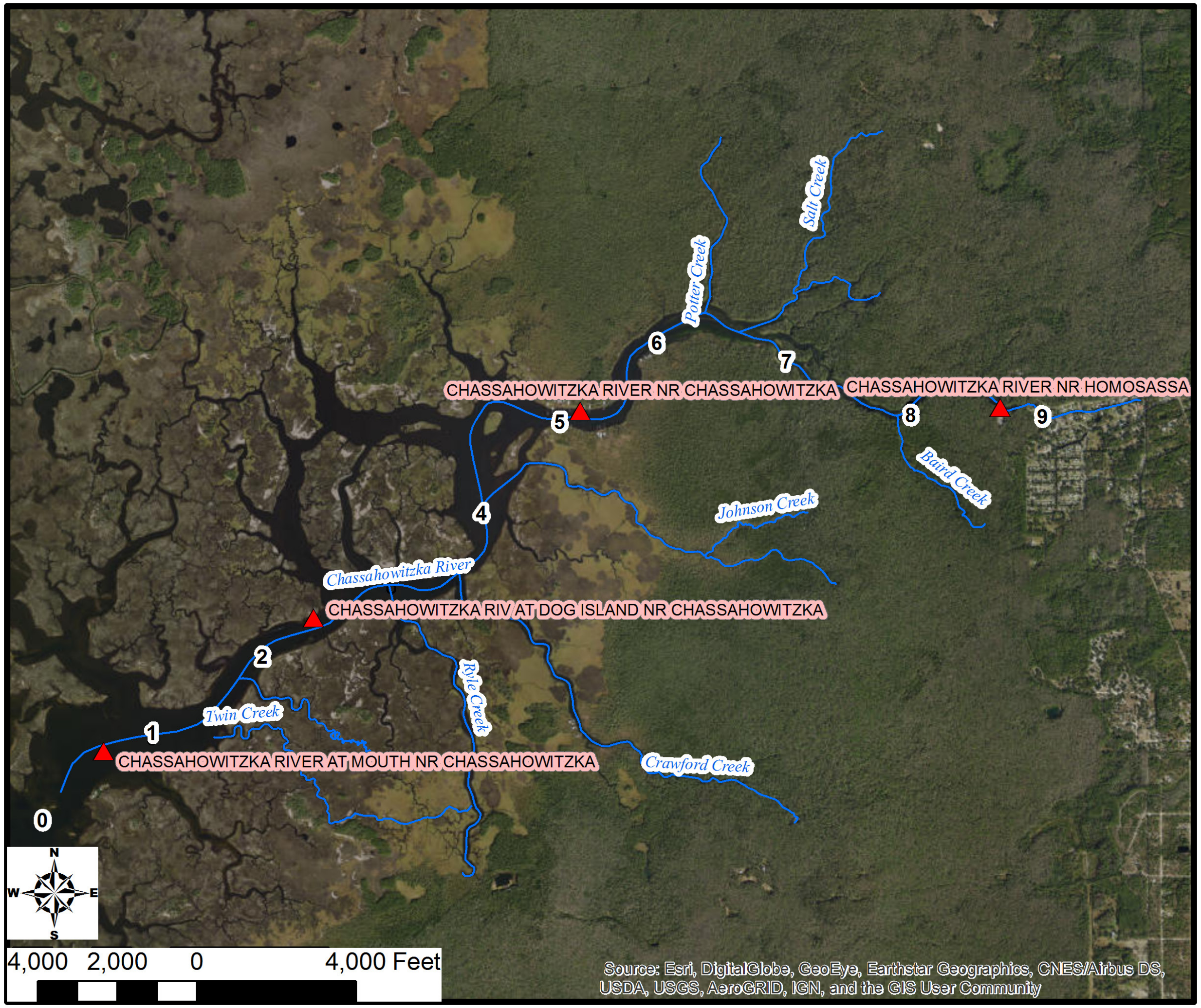
- Surface water modeling: predict flow impacts
- Environmental Values
- Flow Data: 6 more years of USGS gage data and targeted measurements in tributaries
- WQ monitoring and analysis
- Groundwater monitoring and prediction
- Fish, vegetation, oysters, etc.

Environmental Values

- Recreation
- Fish
- Estuaries
- Detritus
- Water supply
- Scenery
- Nutrients
- Sediment
- Water quality
- Navigation

❖ Using the criteria most sensitive to reductions in flow protects all environmental values.

Gages measure flows, levels, salinity and temperature



River Water Quality Monitored

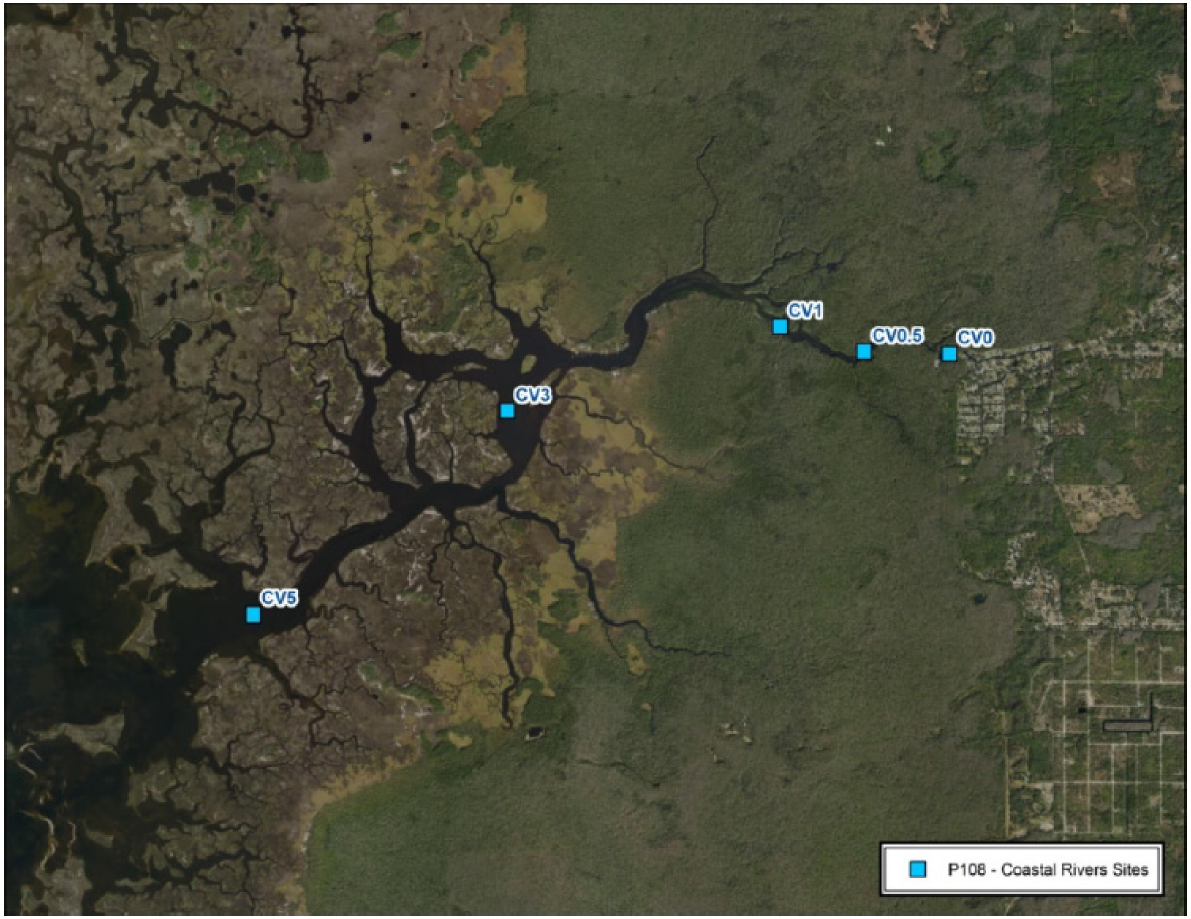


Figure 3-2. Active surface-water sampling locations for the Coastal Rivers Project P108 monitoring network.

Coastal Water Quality Monitored

Figure 3-3. COAST Project P529 sample locations. Ten stations were originally sampled until 2010 for a limited suite of water quality parameters. In 2013, the District expanded the suite of parameters and resumed sampling at seven of the ten original sites. Chassahowitzka Citrus 1, 2, and 3 were discontinued because of overlap with other active stations under project P108.

Springs Water Quality Monitored

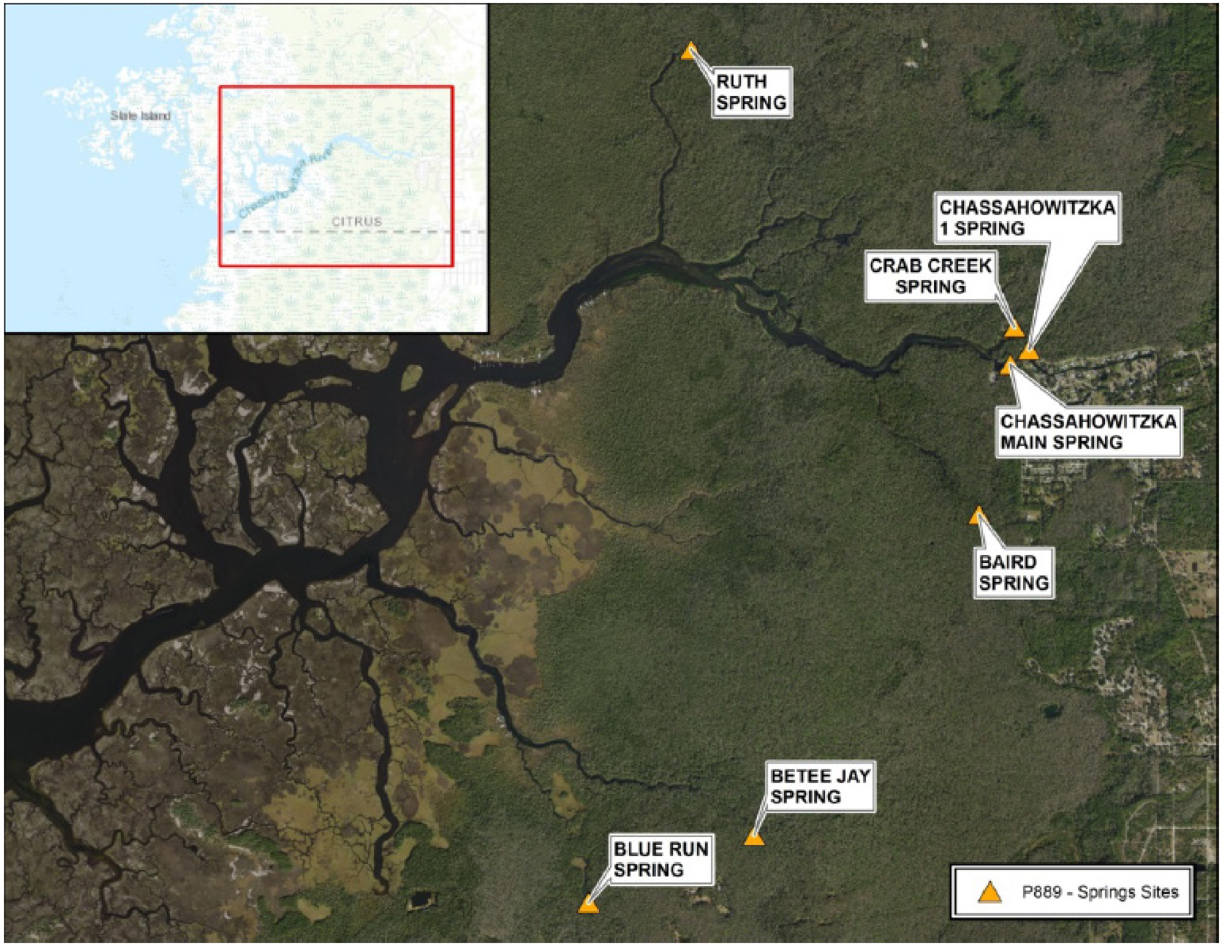


Figure 3-4. Active spring vent sampling locations for the Chassahowitzka River under the District's Spring Vents Project P889.

Plant Mapping

Sawgrass and Sabal palmetto

Shoreline Survey

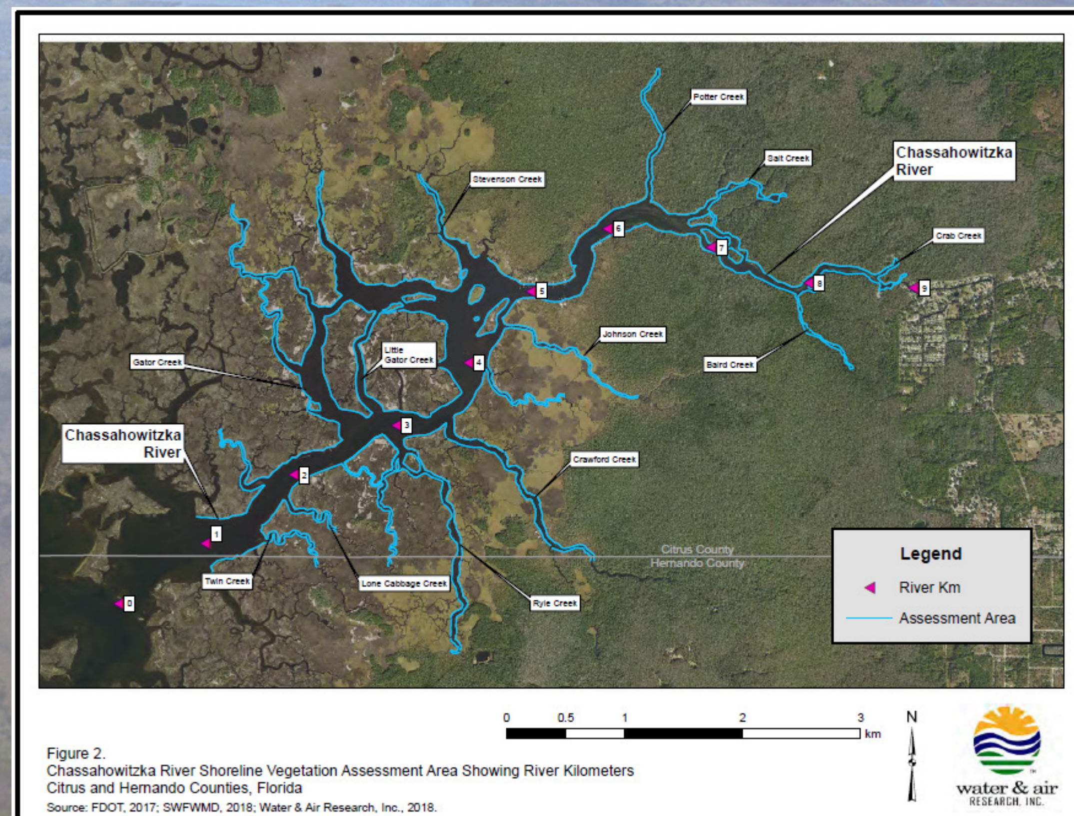
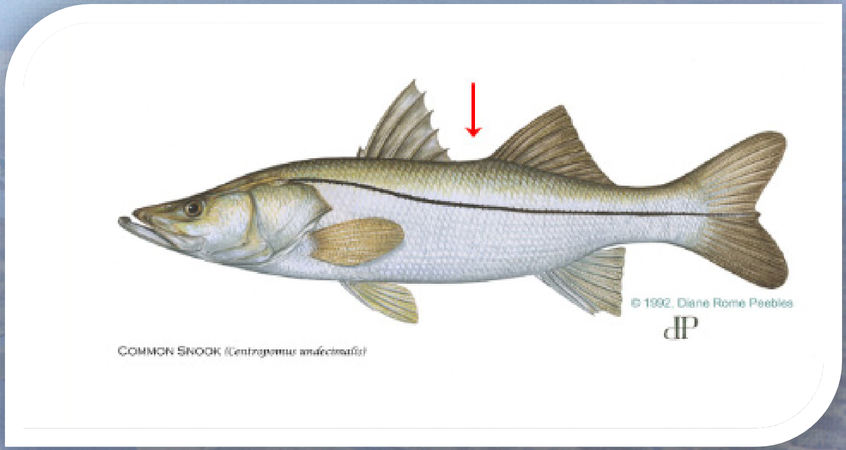


Figure 2.
Chassahowitzka River Shoreline Vegetation Assessment Area Showing River Kilometers
Citrus and Hernando Counties, Florida
Source: FDOT, 2017; SWFWMD, 2018; Water & Air Research, Inc., 2018.

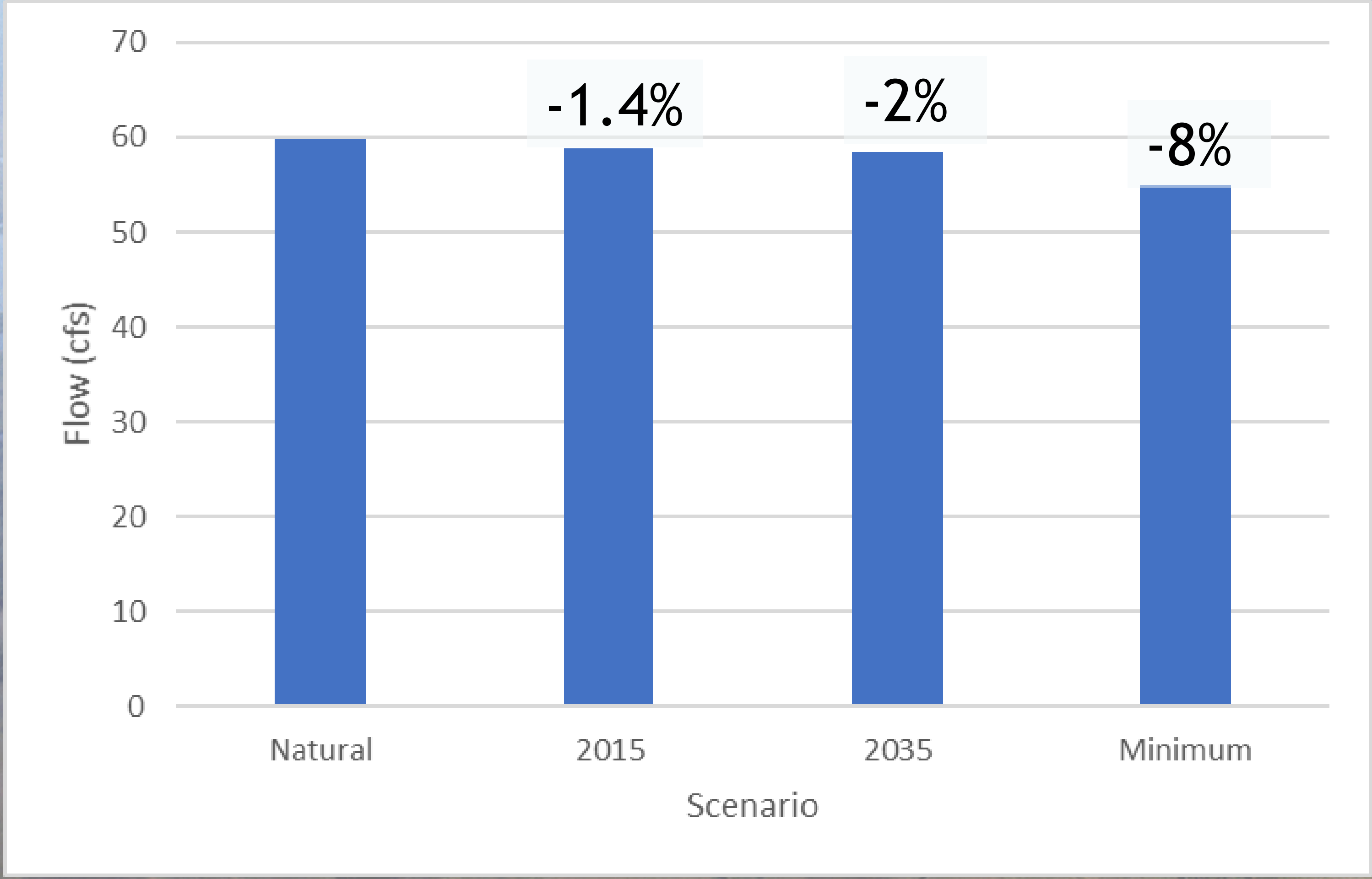
Fish Monitoring

Most Sensitive Criteria

Criteria	Flow loss %
Salinity	8%
Common Snook Temperatures	8%
Manatee Temperatures	10%



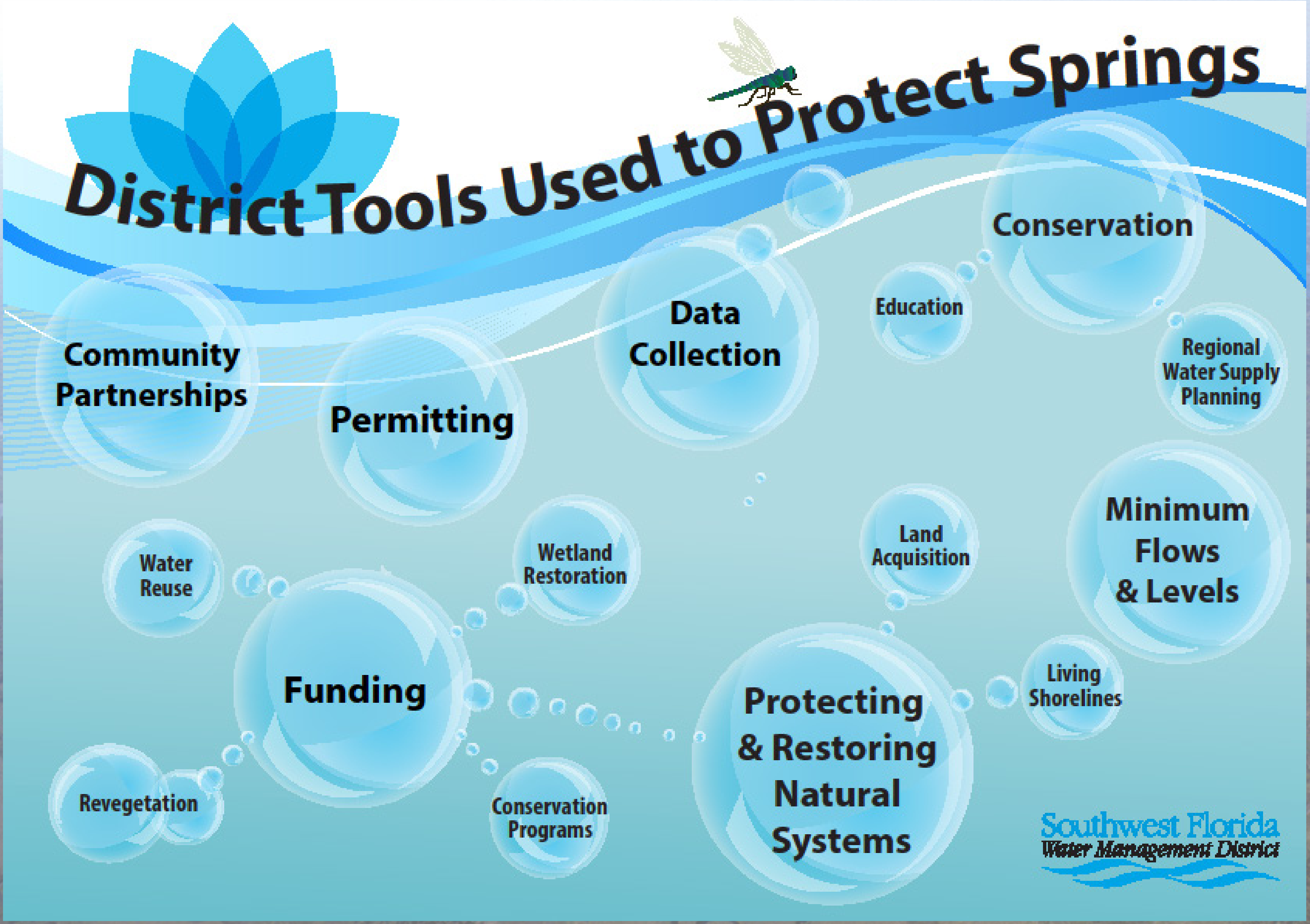
Current Flow Impacts are Small



Adaptive Management

The District:

- Updates MFLs with new and improved information
- Monitors and analyzes data
- Uses the most conservative numbers supported by data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Minimum Flow Reevaluations for Chassahowitzka and Homosassa River Systems

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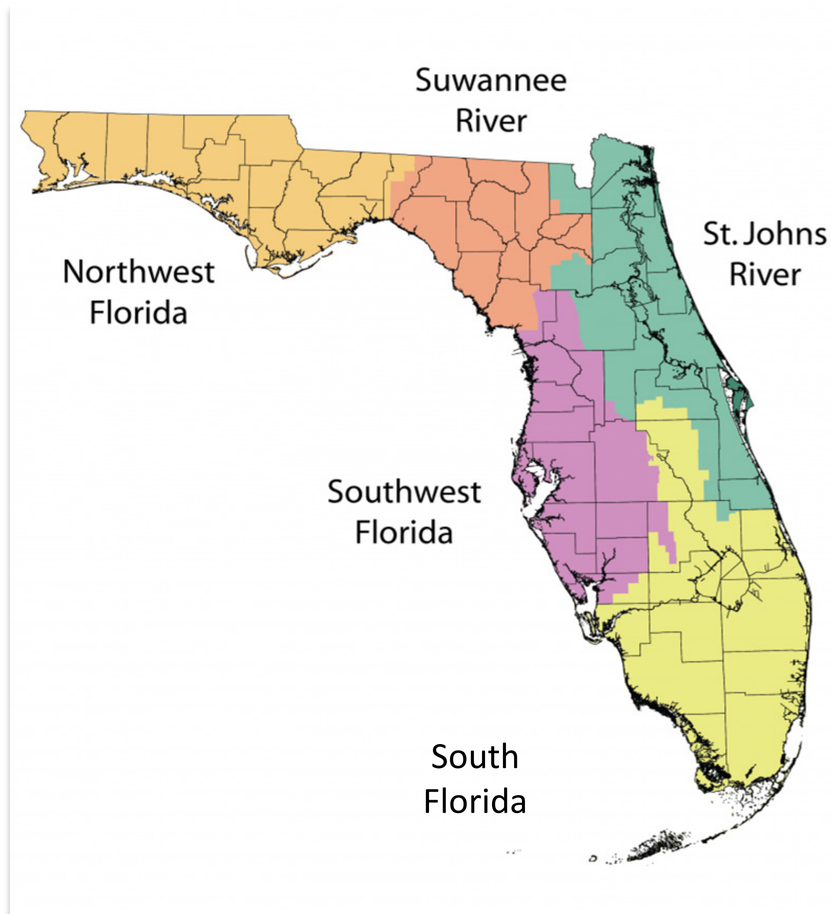
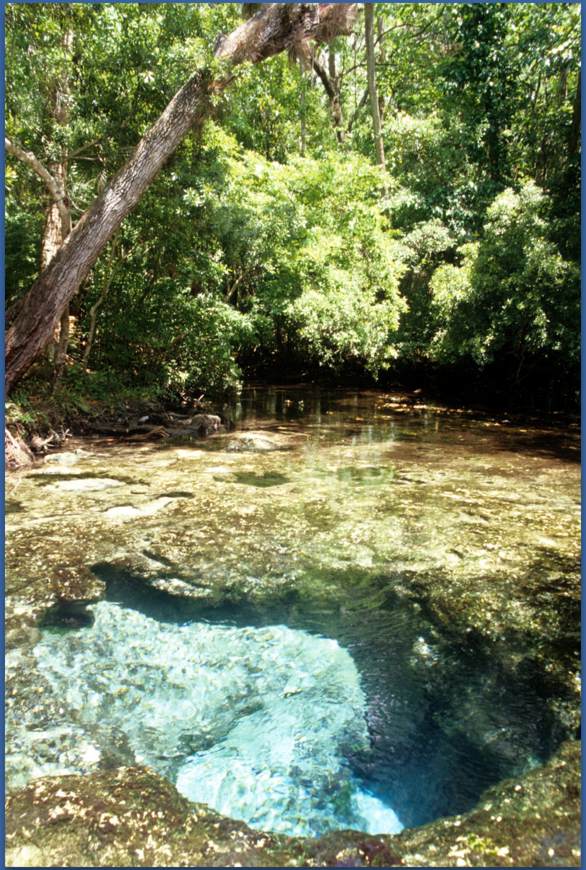
- **Water Supply**
- **Water Quality**
- **Natural Systems**
- **Flood Protection**



What are MFLs?



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Water Management District

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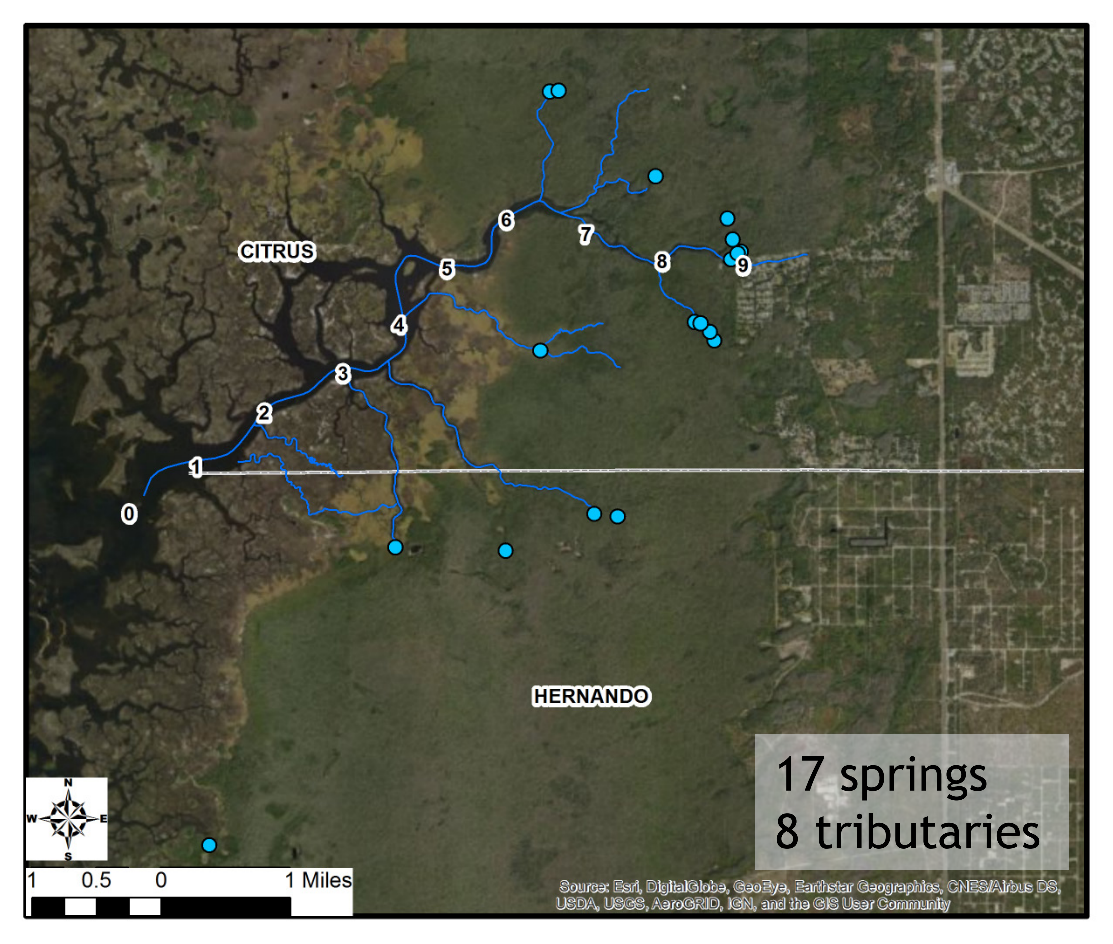
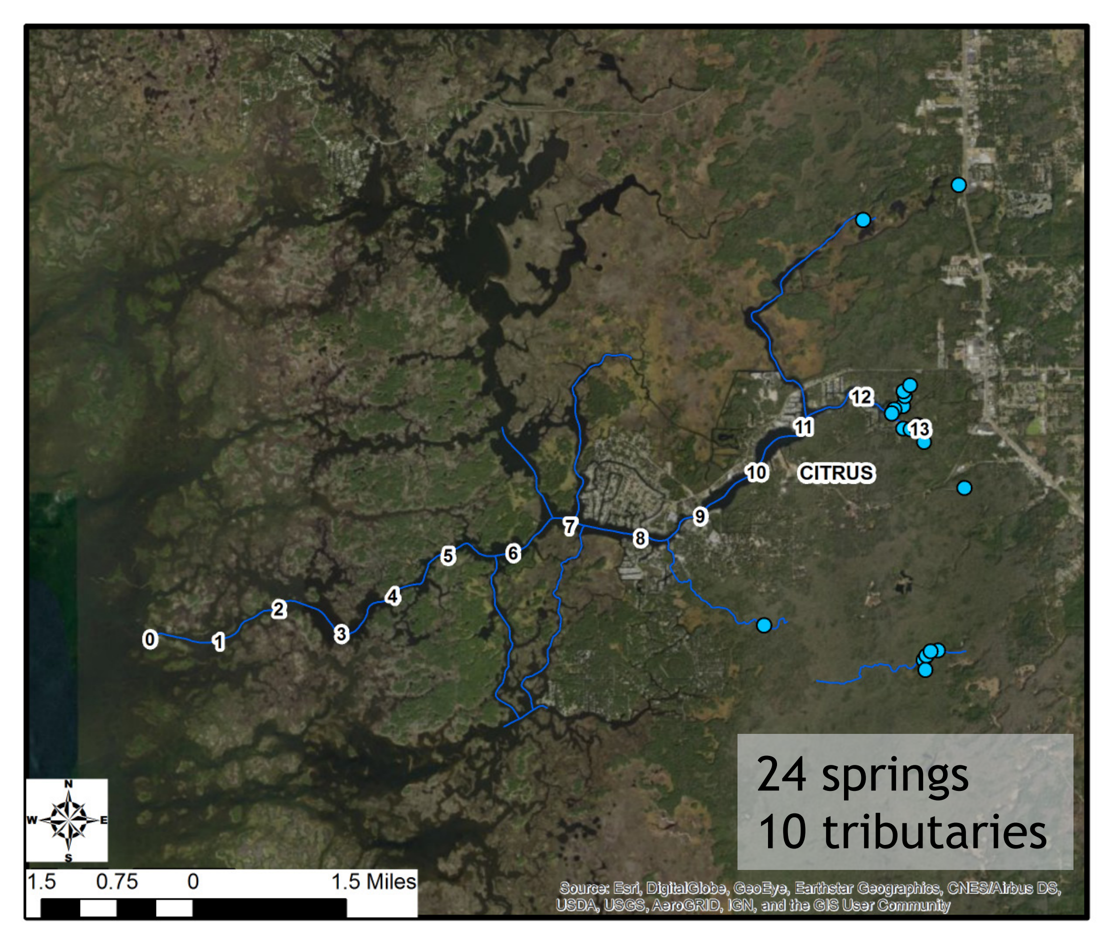
Chassahowitzka River System



Homosassa River System



Southwest Florida Water Management District

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- Environmental Values
- Flow Data: 11 total gages funded
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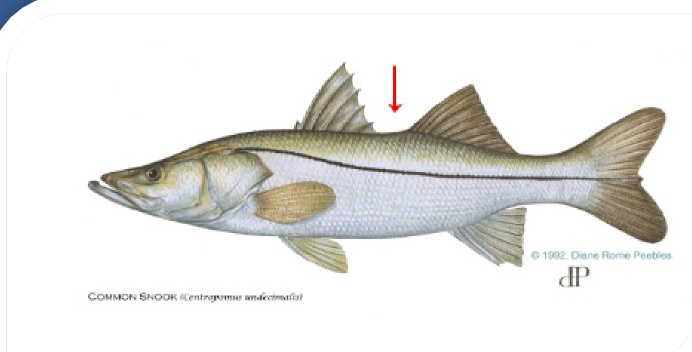
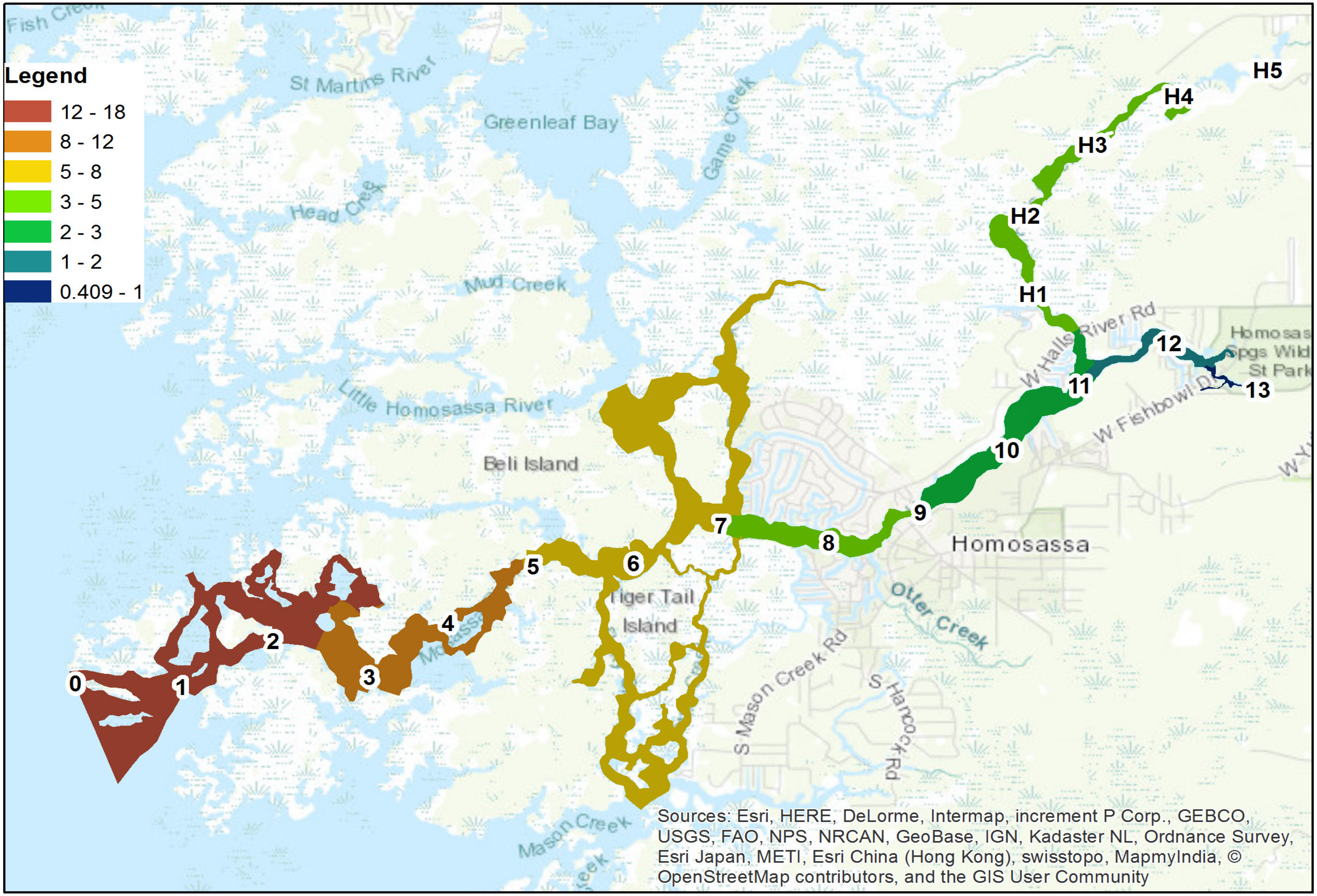
Minimum Flows results

Criteria	Chassahowitzka		Homosassa	
	2013	2019	2013	2019
Salinity	13%	**8%**	**3%**	11%
Common Snook Temperatures	--	**8%**	--	**5%**
Manatee Temperatures	**9%***	10%	8%	6%



* Governing Board revised to 3%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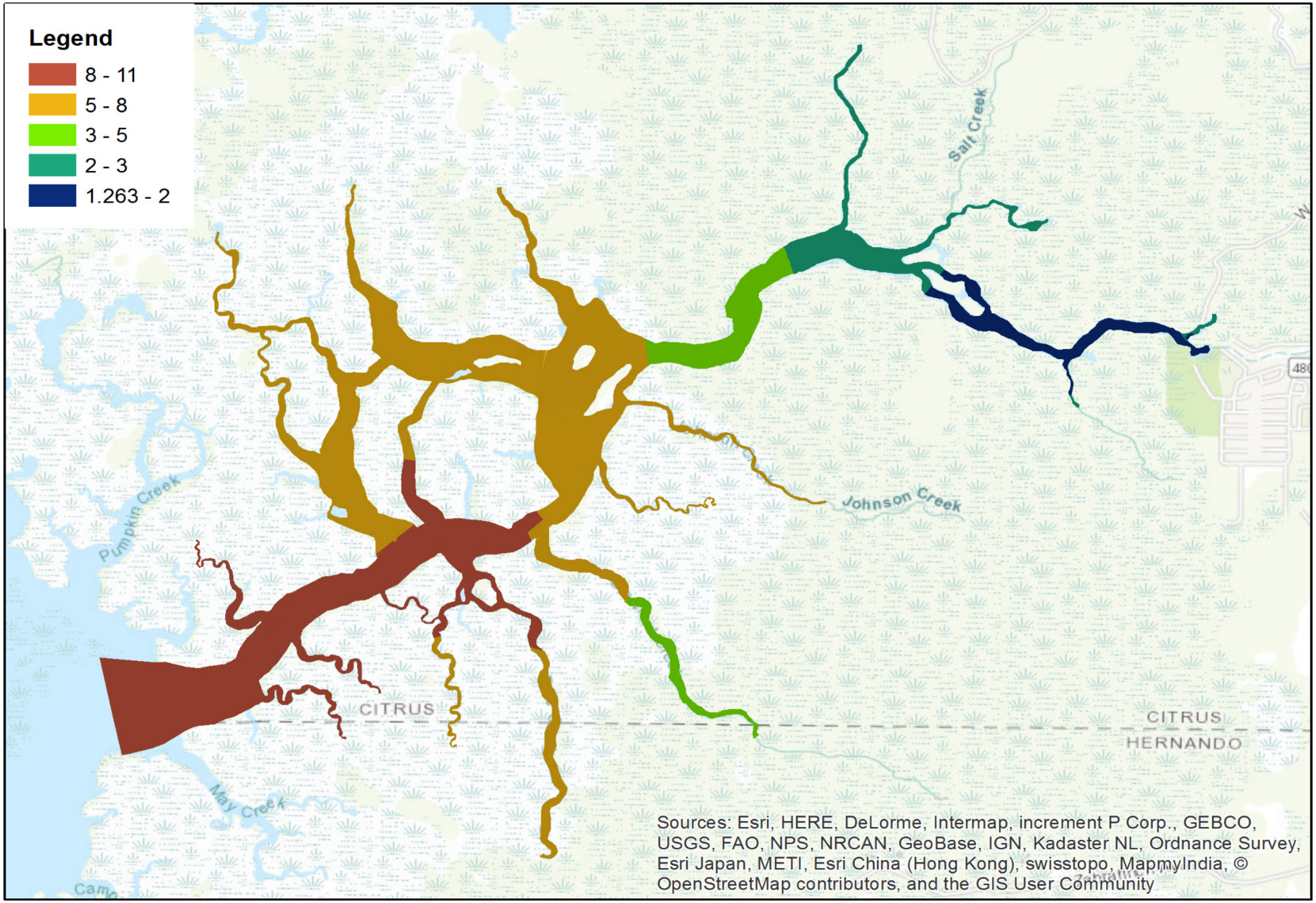
H5
St Martins River
Greenleaf Bay
Game Creek
Head Creek
Mud Creek
Little Homosassa River
Bell Island
Tiger Tail
Island
Homosassa
Otter Creek
S Mason Creek Rd
S Hancock Rd
W Halls River Rd
W Fishbowl Dr
Homosassa
Spgs Wild
St Park
Mason Creek
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community


Legend
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Salt Creek
Pumpkin Creek
Johnson Creek
May Creek
CITRUS
CITRUS
HERNANDO
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Chassahowitzka Spring Flow Change from Groundwater Withdrawals

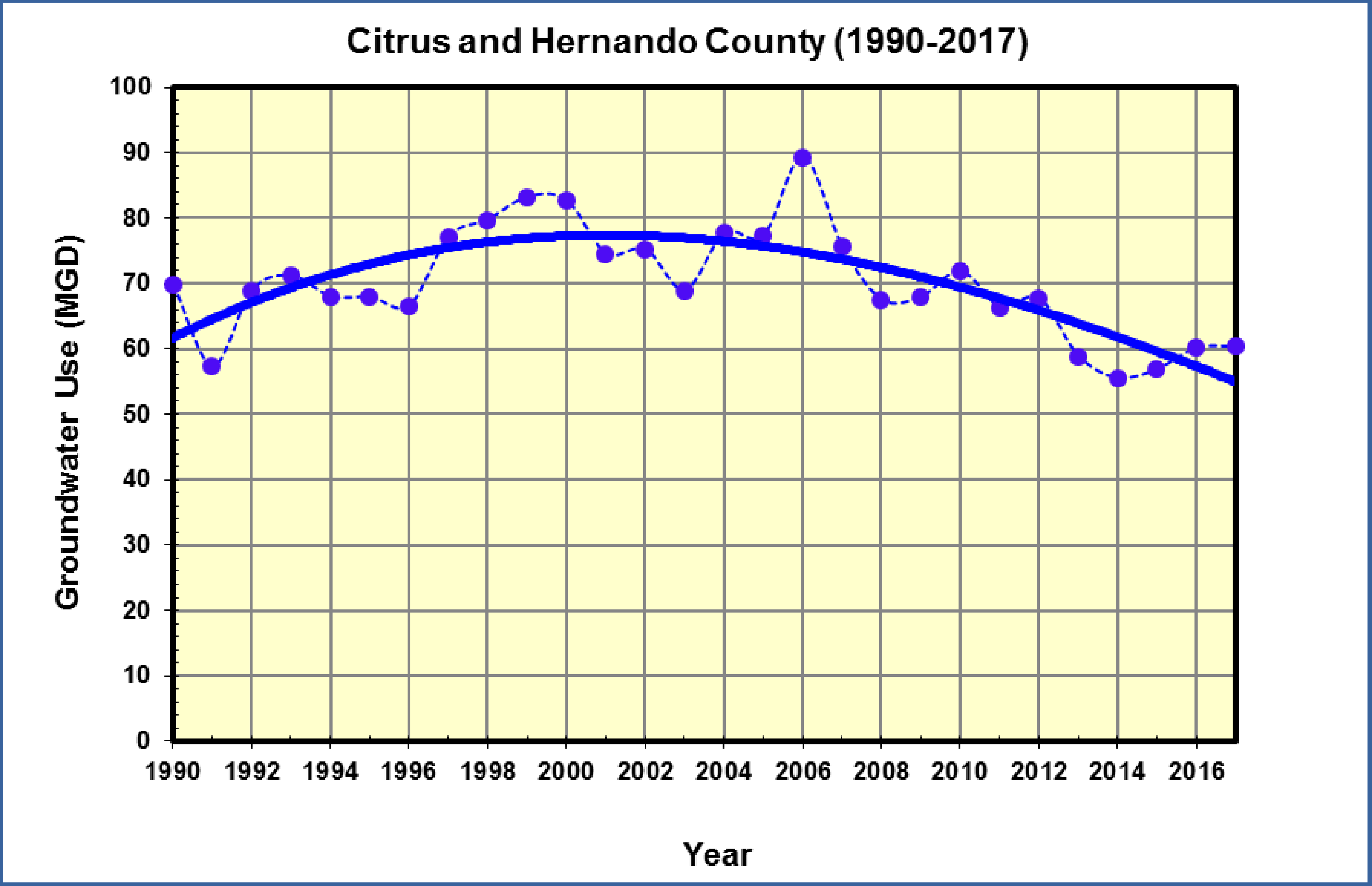
Year	Flow Reduction (cfs)	Flow Reduction (%)
2010	2.78	-1.3
2015	2.85	-1.4
2035	4.13	-2.0
2035 w/ Conserv & Reuse	3.48	-1.7

Note: Groundwater withdrawal impact based on Northern District Model Version 5

Homosassa Spring Flow Change from Groundwater Withdrawals

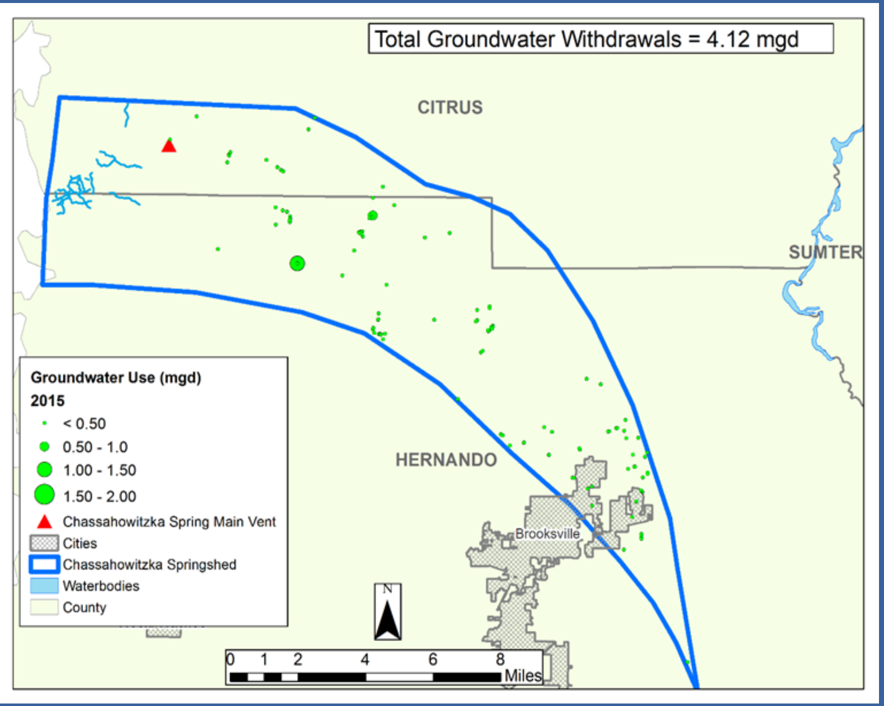
Year	Flow Reduction (cfs)	Flow Reduction (%)
2010	4.83	-1.8
2015	4.86	-1.9
2035	7.77	-3.0
2035 w/ Conserv & Reuse	6.70	-2.6

Note: Groundwater withdrawal impact based on Northern District Model Version 5

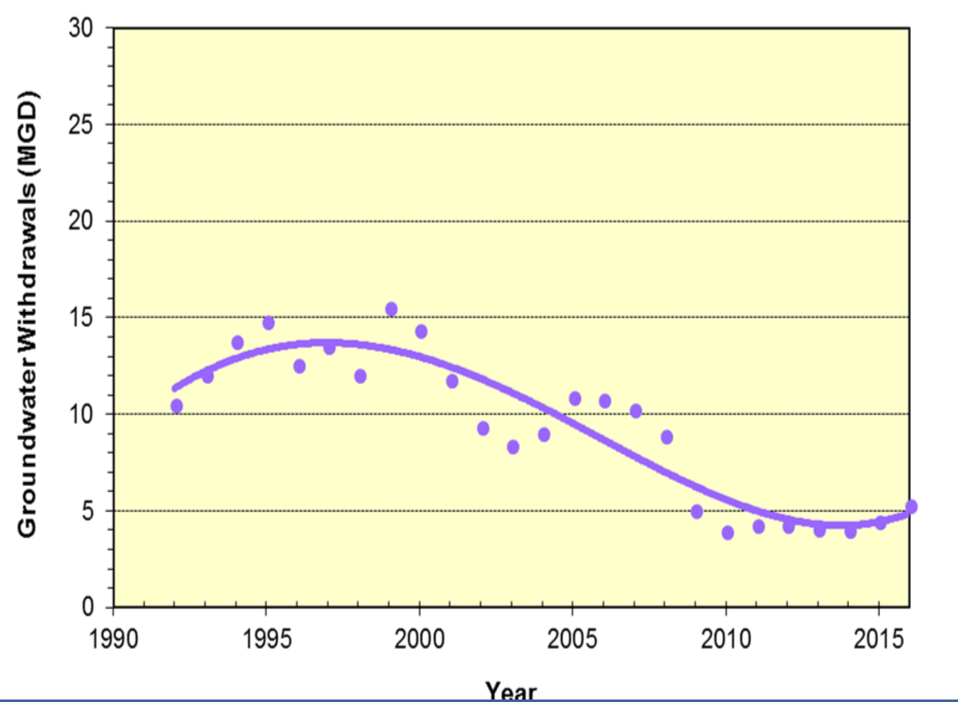

Citrus and Hernando County (1990-2017)
Groundwater Use (MGD)
100
90
80
70
60
50
40
30
20
10
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Year

Chassahowitzka Springshed Groundwater Withdrawals (1992-2016)

2015 Water Use Permitted Withdrawals

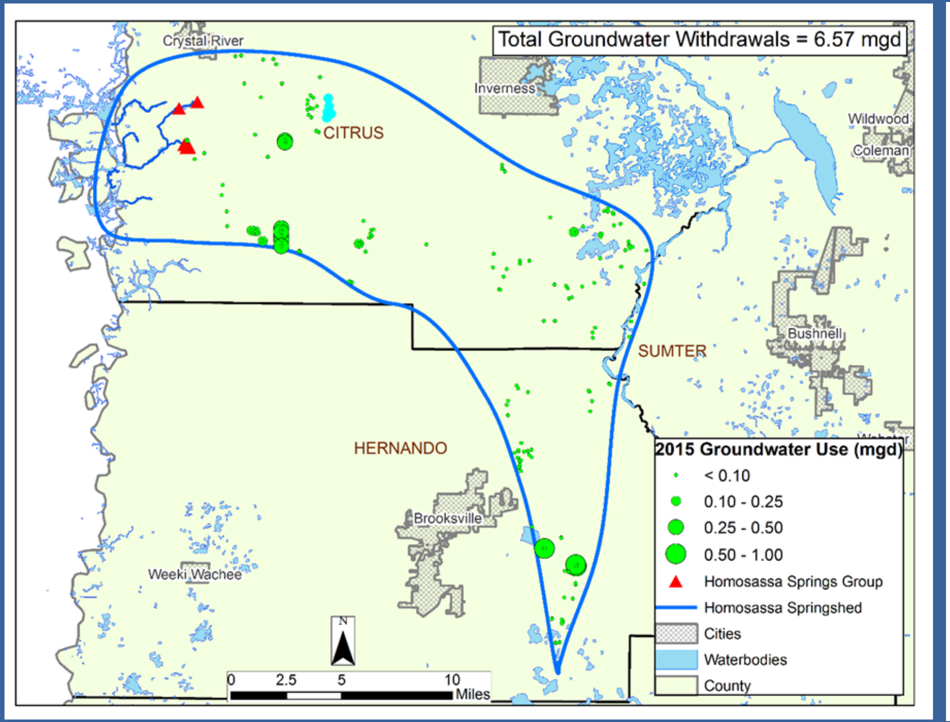


Estimated & Metered Groundwater Use History (Includes Domestic Self-Supply)

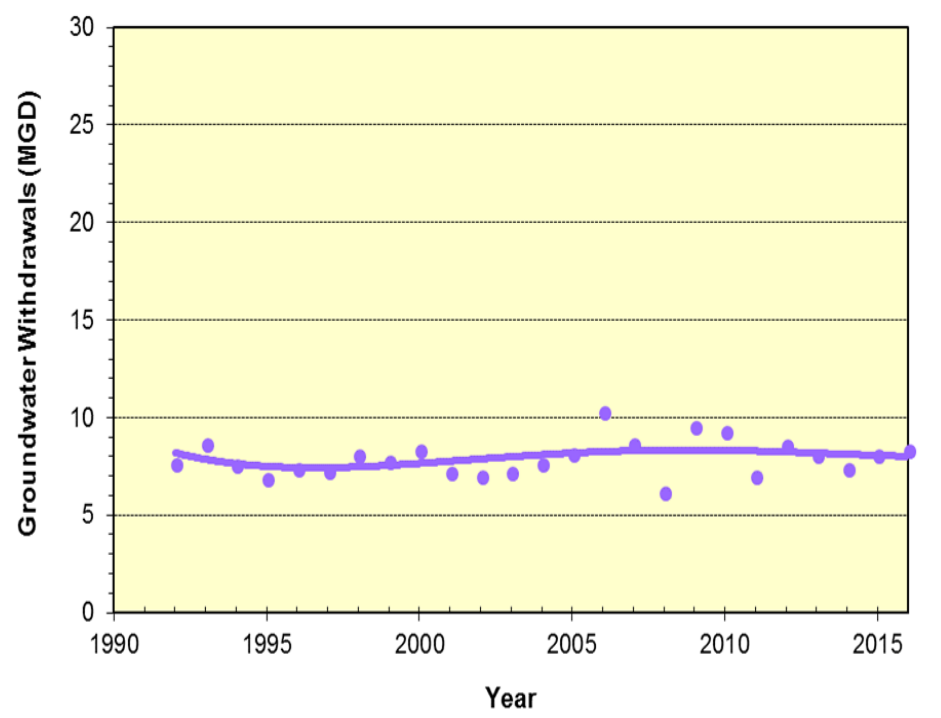


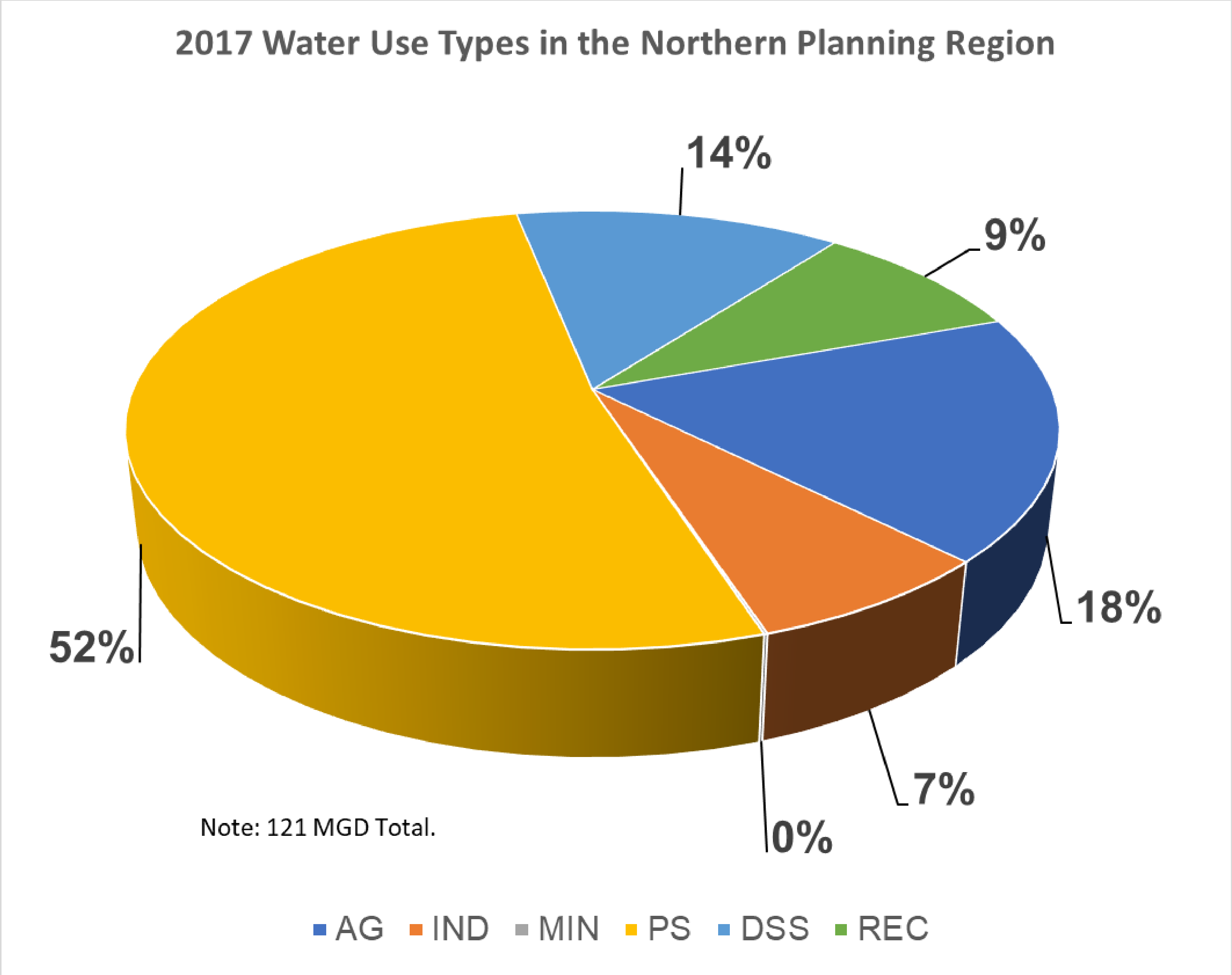
Homosassa Springshed Groundwater Withdrawals (1992-2016)

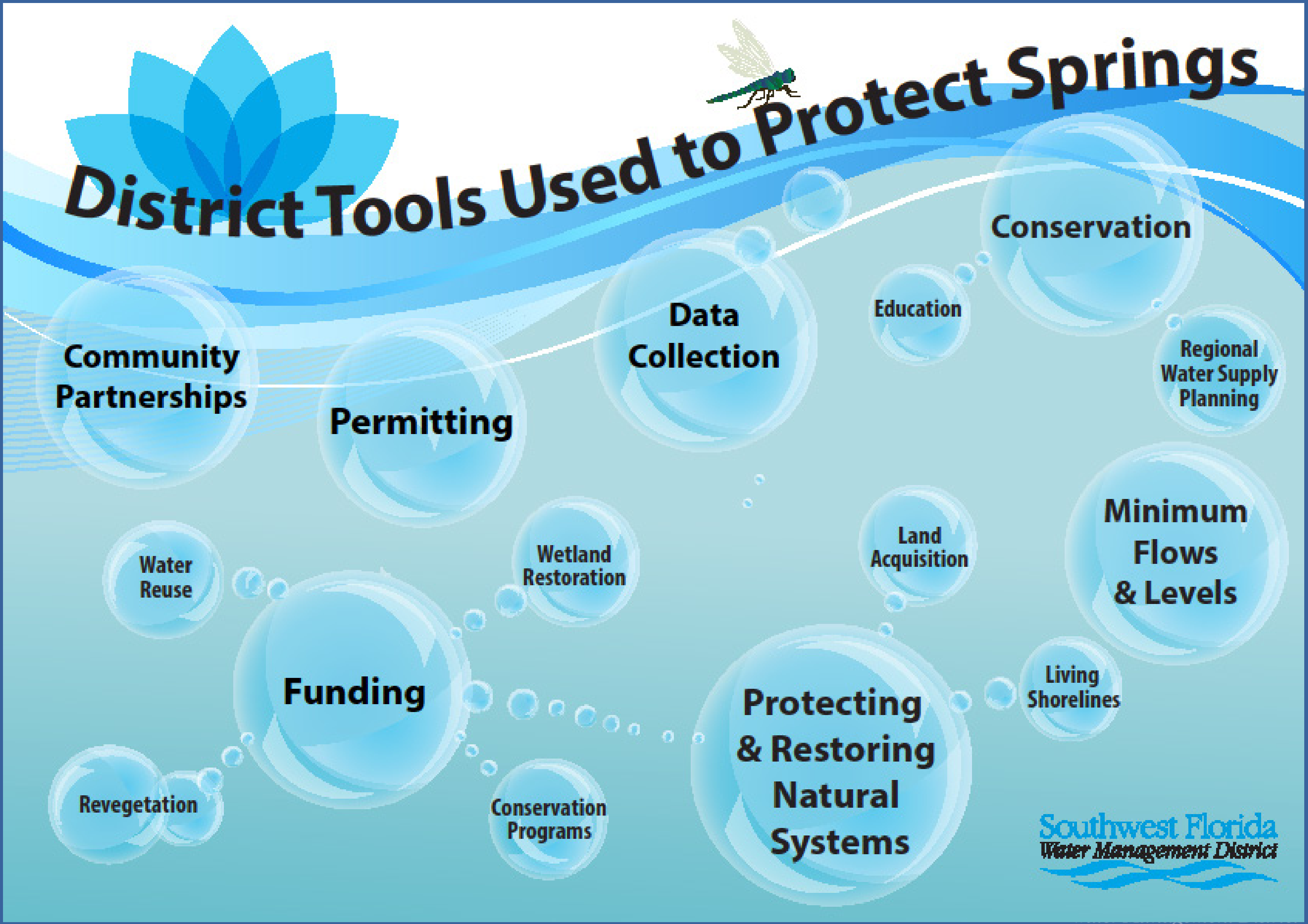
2015 Water Use Permitted Withdrawals



Estimated & Metered Groundwater Use History (Includes Domestic Self-Supply)




2017 Water Use Types in the Northern Planning Region
14%
9%
18%
7%
0%
52%
Note: 121 MGD Total.
AG
IND
MIN
PS
DSS
REC


District Tools Used to Protect Springs
Conservation
Education
Data Collection
Community Partnerships
Permitting
Regional Water Supply Planning
Minimum Flows & Levels
Land Acquisition
Wetland Restoration
Water Reuse
Funding
Living Shorelines
Protecting & Restoring Natural Systems
Revegetation
Conservation Programs
Southwest Florida Water Management District

Email comments to:

MFLComments@WaterMatters.org

For more information:

WaterMatters.org

Contacts:

- Gabe Herrick
- Sky Notestein
- Frank Gargano

Southwest Florida
Water Management District

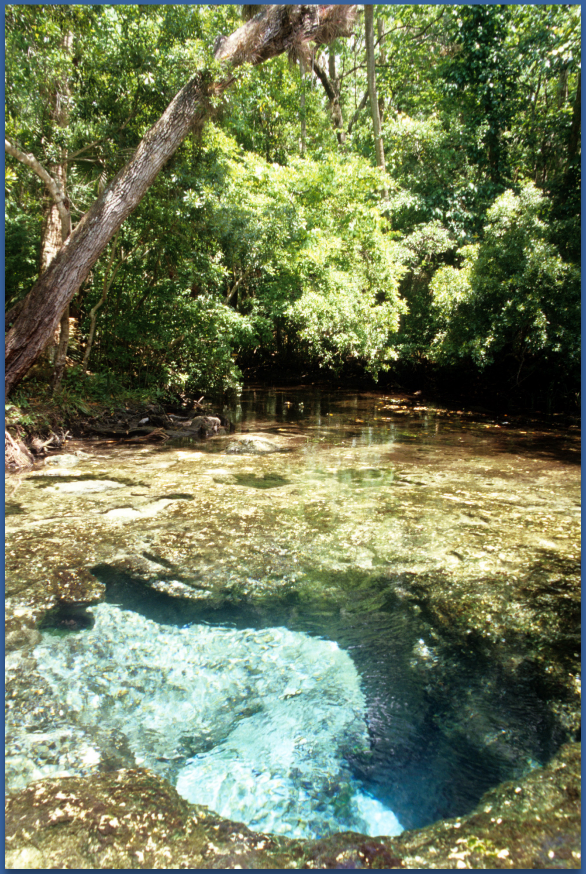
Minimum Flow Reevaluations for Chassahowitzka and Homosassa River Systems

Gabe Herrick, Senior Environmental Scientist

Ron Basso, P.G., Chief Hydrogeologist

Southwest Florida
Water Management District

What are MFLs?



MFLs refer to **m**inimum **f**lows and minimum water **l**evels

- Minimum flows protect rivers, streams and springs
- Minimum water levels protect lakes, wetlands and aquifers

Southwest Florida Water Management District

Why Establish MFLs?

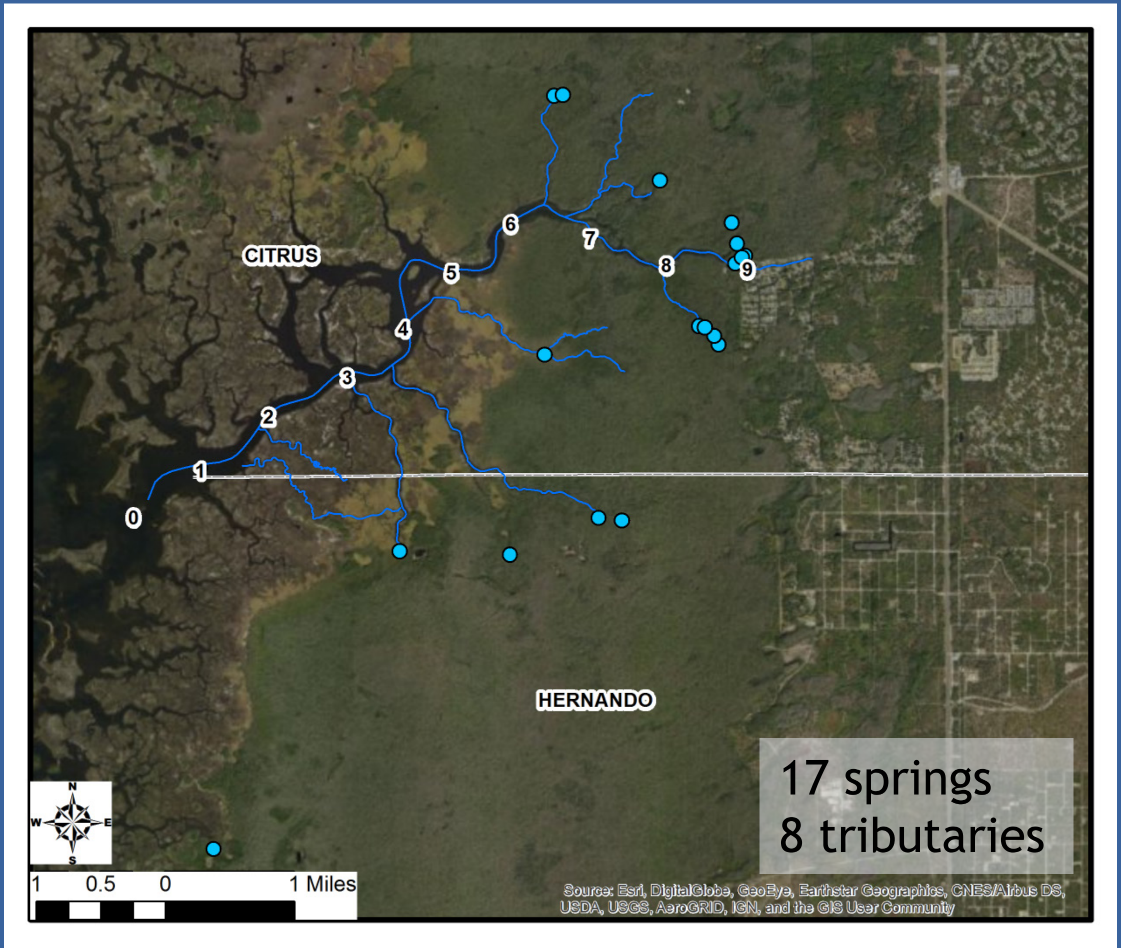
- Required by law
- Established to protect water bodies from harm caused by ground and surface water withdrawals
- Tool used by the District to:
    - Review requests for withdrawals of ground and surface water
    - Plan for future water needs

Southwest Florida
Water Management District

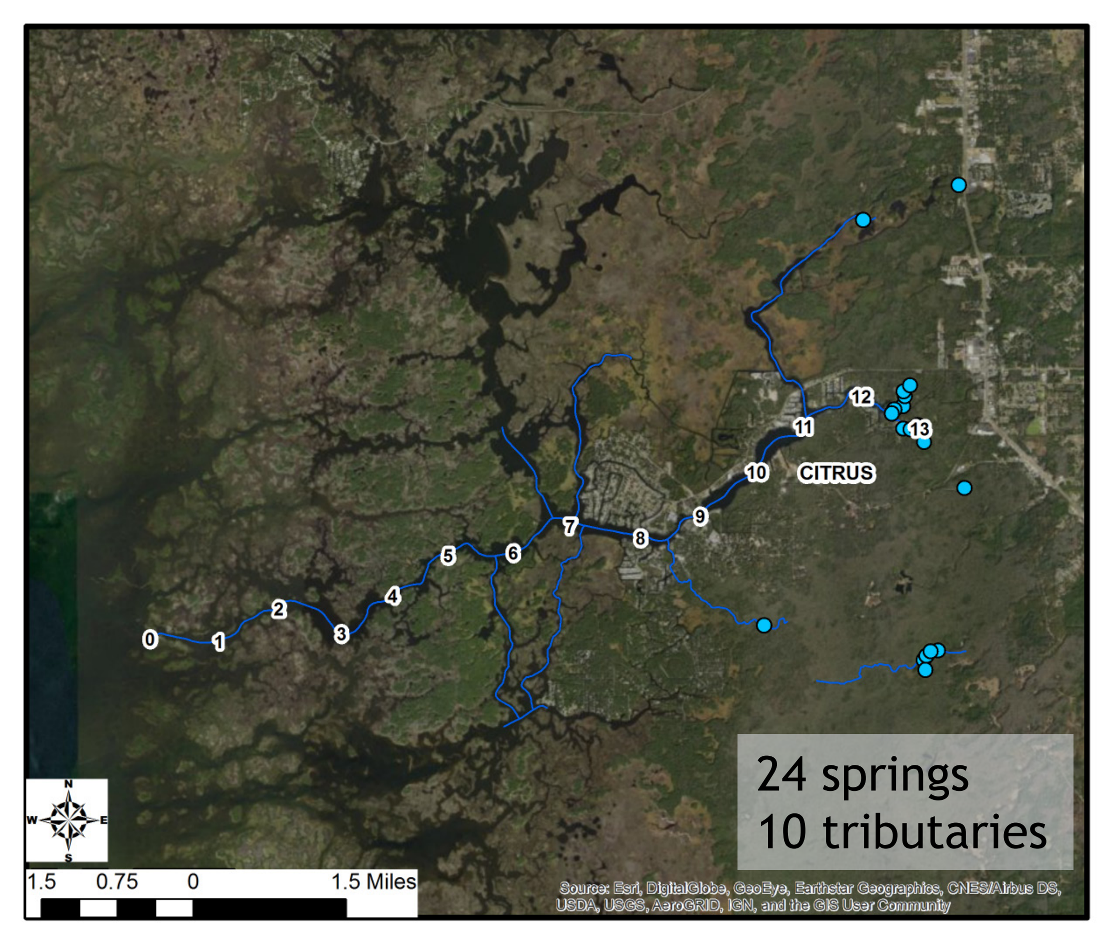
Schedule

- 2013 rules: Reevaluate in six years
- March-May 2019: Peer review
- March-June 2019: Stakeholder outreach
- June 2019: Public workshop TBD
- Fall 2019: District Governing Board meeting – Approve recommendation and initiate rulemaking
- December 2019: Rulemaking to adopt minimum flow

Chassahowitzka River System



Homosassa River System



Southwest Florida Water Management District

Ongoing monitoring and assessment

- Surface water modeling
- Environmental Values
- Flow Data: 11 total gages funded
- WQ monitoring and analysis
- Groundwater modeling
- Fish, vegetation, oysters, others

Environmental Values

- Recreation
- Fish
- Estuaries
- Detritus
- Water supply
- Scenery
- Nutrients
- Sediment
- Water quality
- Navigation

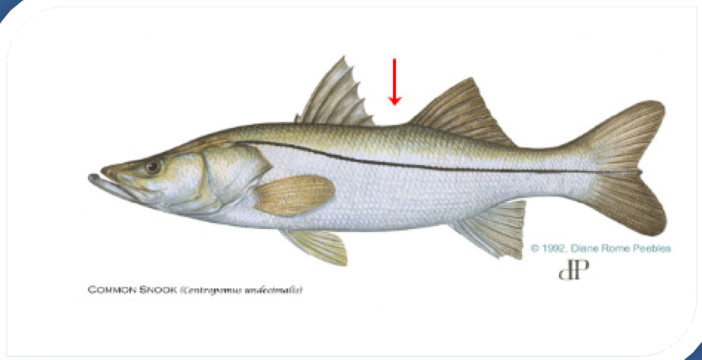
Using the criteria most sensitive to reductions in flow protects all environmental values.

Significant Harm

- Minimum flows are the limit at which further ***withdrawals*** would be ***significantly harmful*** to the water resources or ecology of the area
- Habitat-based 15% standard which is conservative and sensitive to differences among systems
- 17 panels: best available method

Minimum Flows results

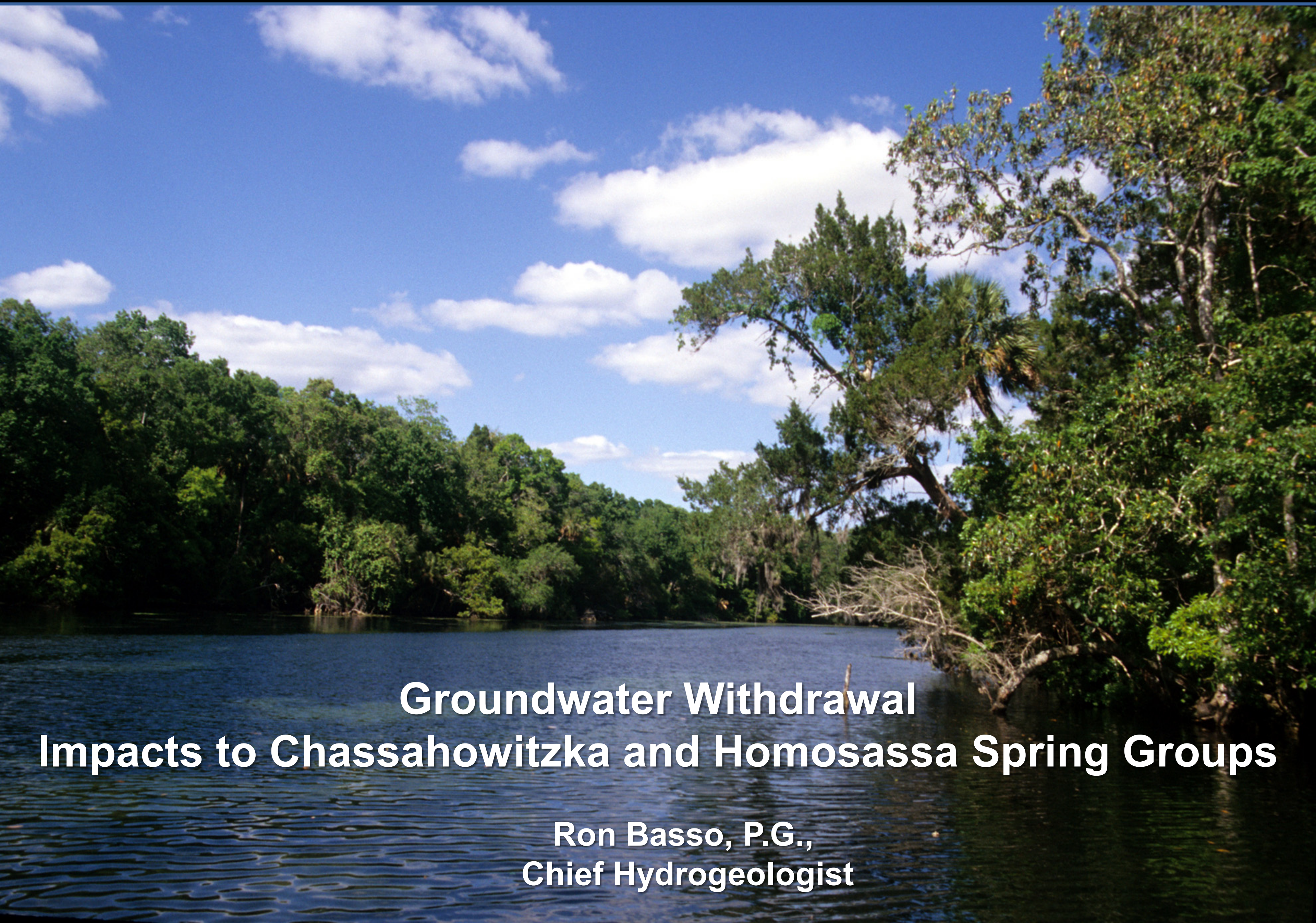
Criteria	Chassahowitzka		Homosassa	
	2013	2019	2013	2019
Salinity	13%	**8%**	3%	11%
Common Snook Temperatures	--	**8%**	--	**5%**
Manatee Temperatures	9%*	10%	8%	6%



* Governing Board revised to 3% based on policy decision

Southwest Florida Water Management District

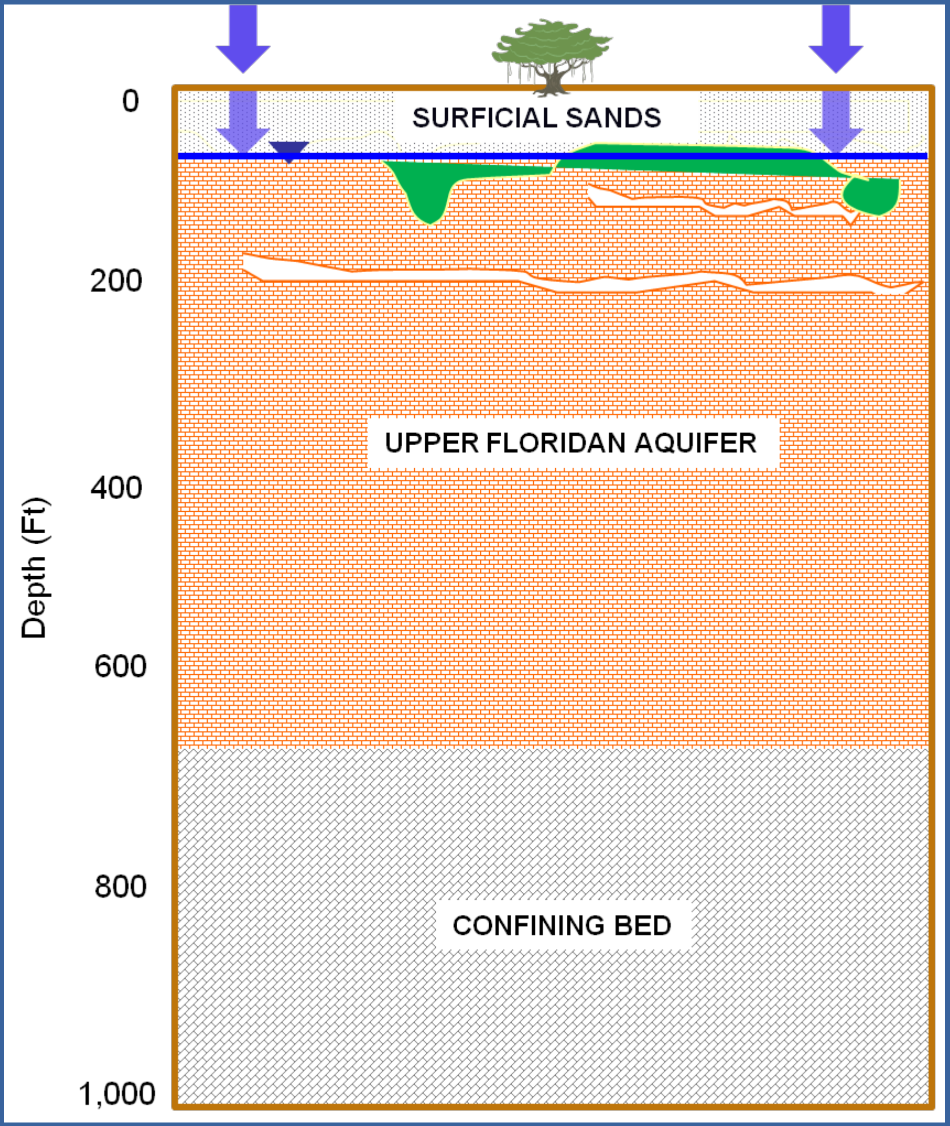
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

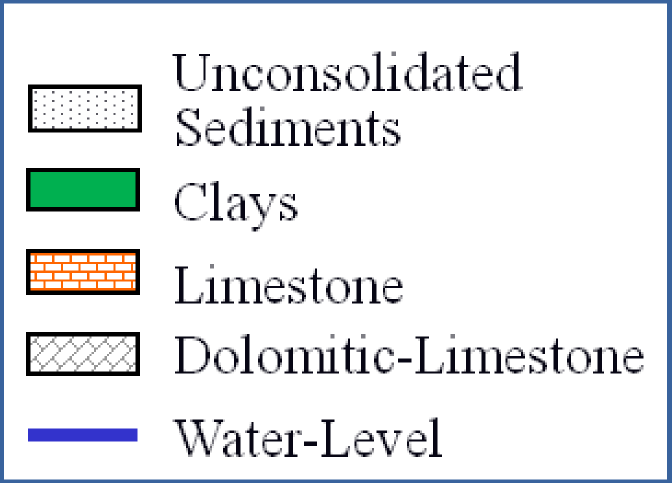


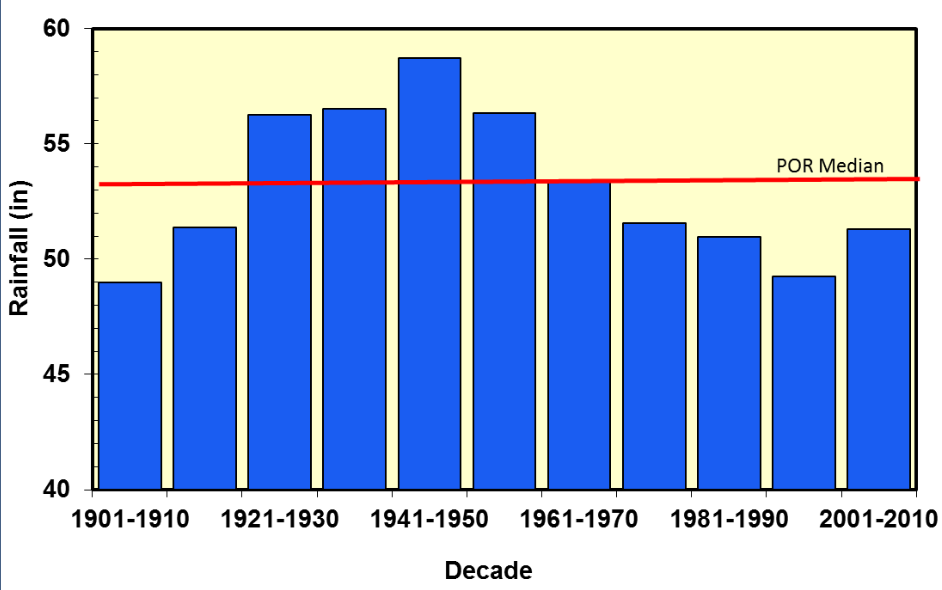
Groundwater Withdrawal Impacts to Chassahowitzka and Homosassa Spring Groups

Ron Basso, P.G.,
Chief Hydrogeologist

20 inches/year – Highest Recharge in the State



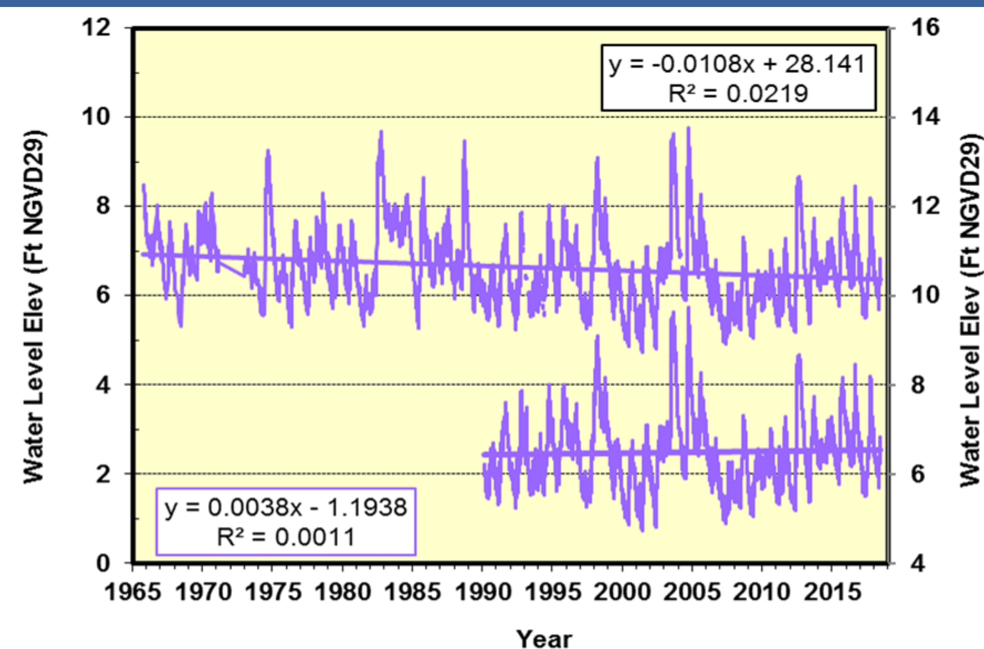




Long-term rainfall trends from Brooksville, Inverness, & Ocala

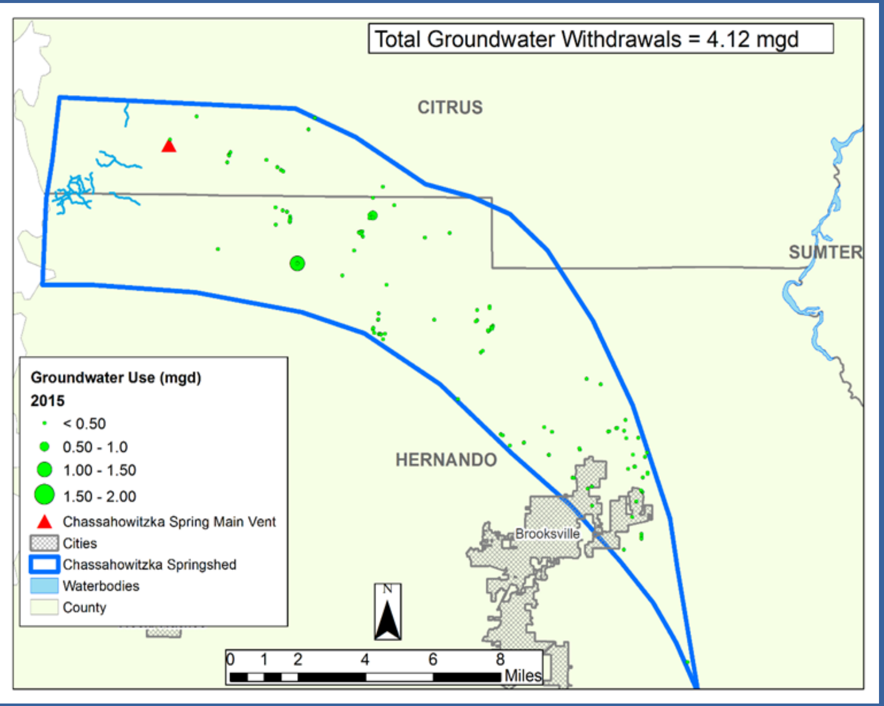
Long-term trend in Upper Floridan aquifer water levels at Chassahowitzka 1 Dp

Period of Record	Total Water Level Change (feet)
1965-2018	-0.56
1990-2018	+0.11

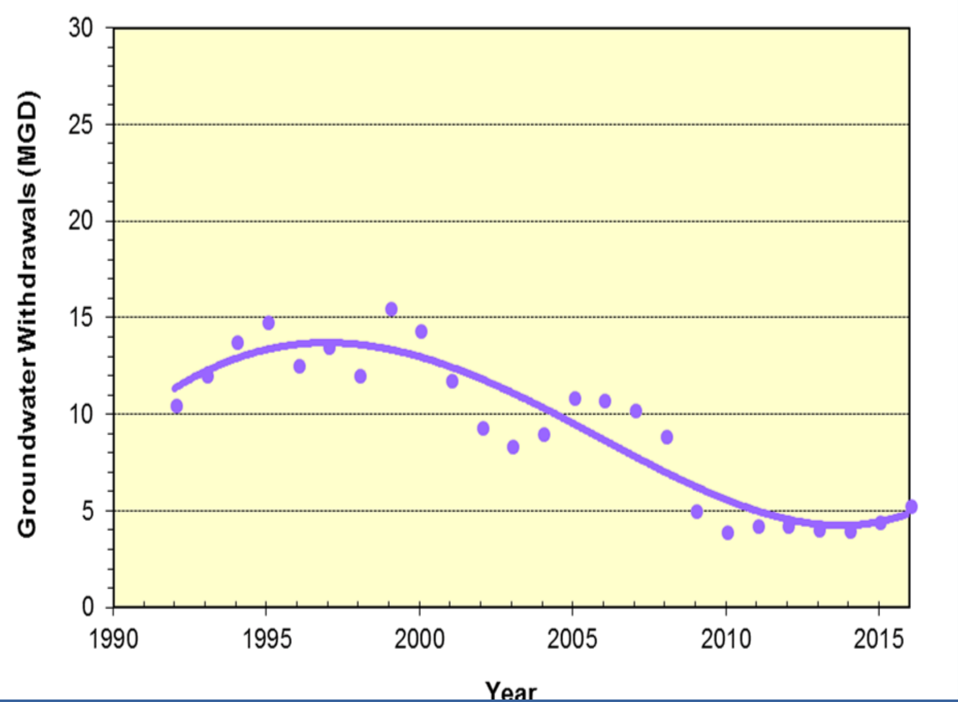


Chassahowitzka Springshed Groundwater Withdrawals (1992-2016)

2015 Water Use Permitted Withdrawals

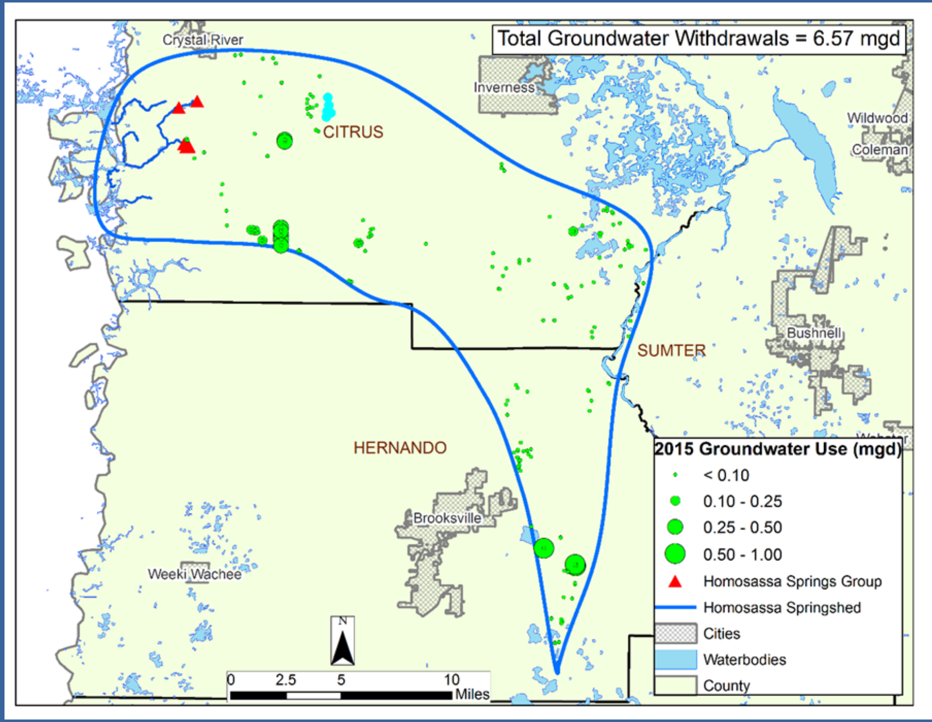


Estimated & Metered Groundwater Use History (Includes Domestic Self-Supply)

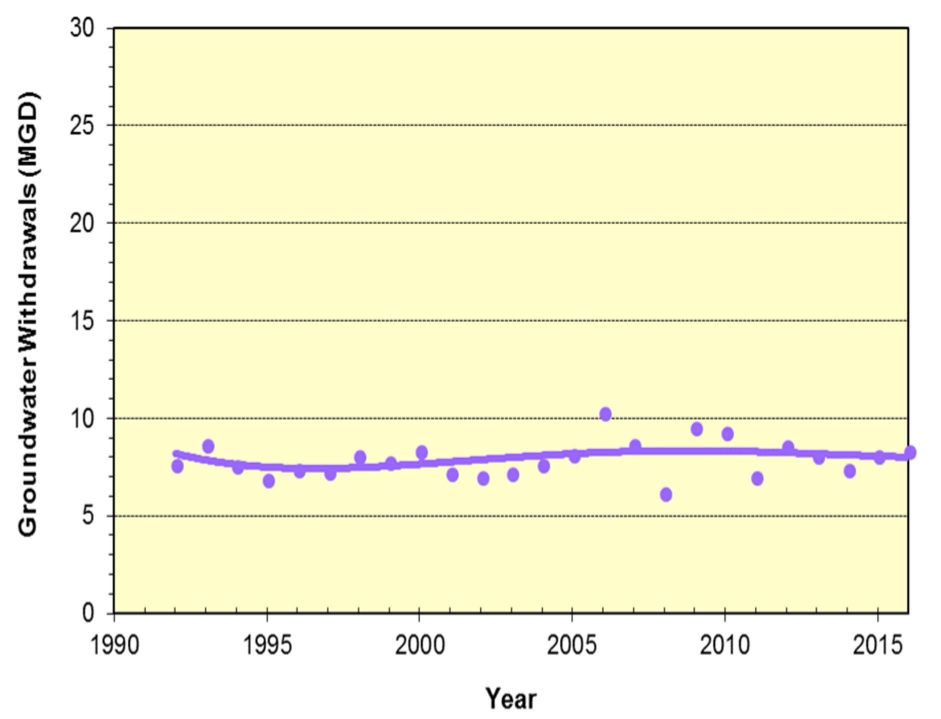


Homosassa Springshed
Groundwater Withdrawals (1992-2016)

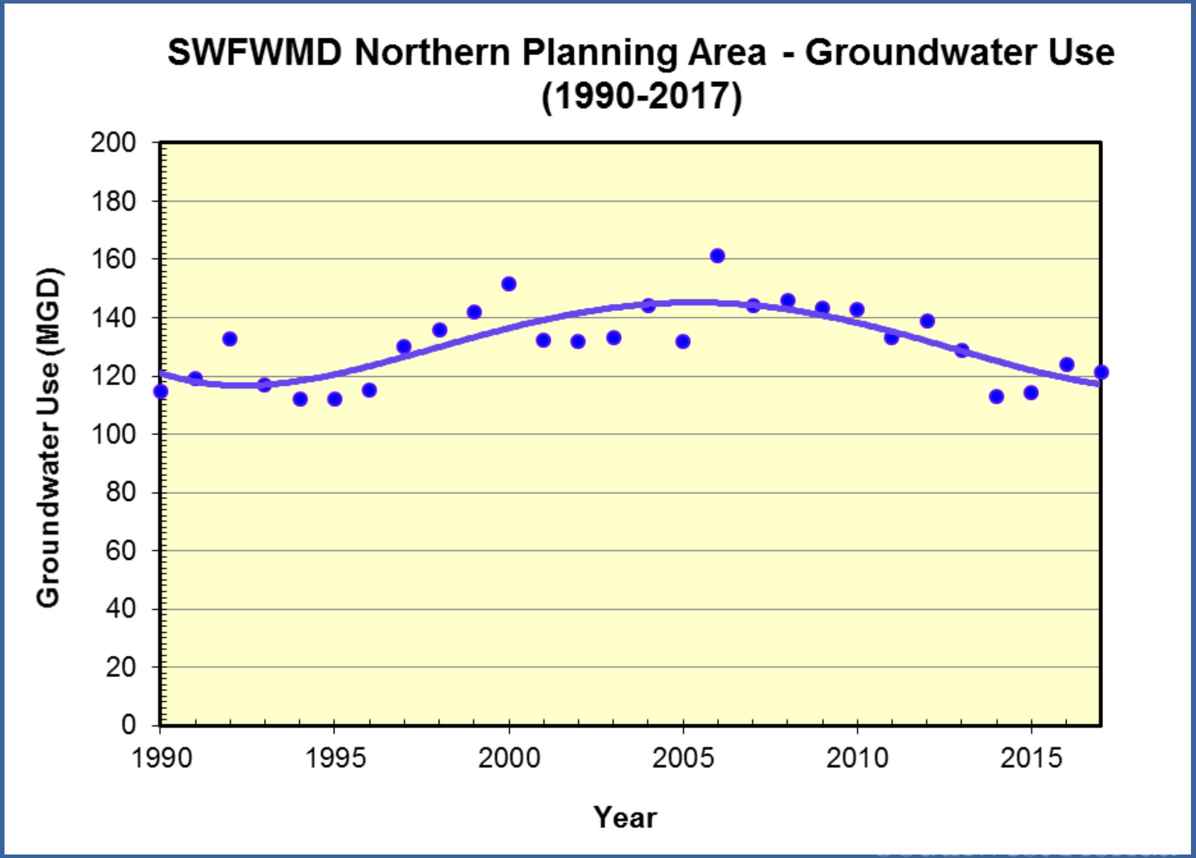
2015 Water Use Permitted Withdrawals



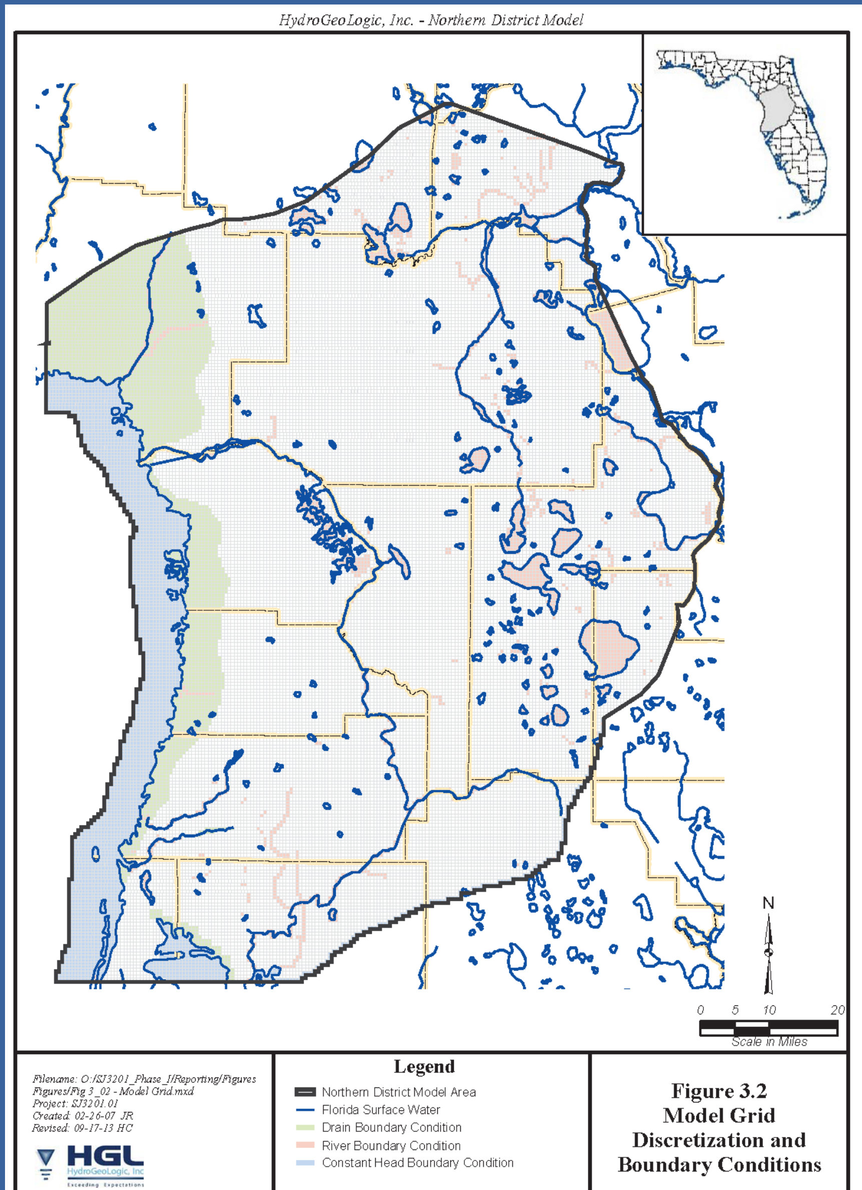
Estimated & Metered Groundwater Use History (Includes Domestic Self-Supply)



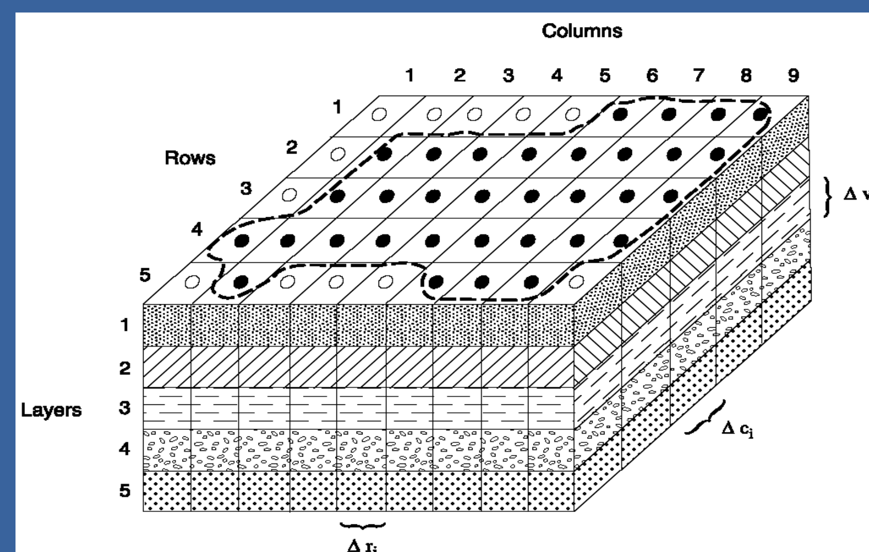
Northern Planning Region
Groundwater Withdrawal History (1990-2017)



Northern District Model (Version 5.0)



- Based on geologic data from 50 sites and matching 300 well water levels
- Peer Reviewed by Outside Experts
  "NDM, Version 5.0, is the best numerical groundwater flow model currently available for assessing the effects of withdrawals in the central (Florida) springs region."
- Model developed cooperatively with SJRWMD, Marion County, and WRWSA



Chassahowitzka Spring Flow Change from Groundwater Withdrawals

Year	Flow Reduction (cfs)	Flow Reduction (%)
2010	2.78	-1.3
2015	2.85	-1.4
2035	4.13	-2.0
2035 w/ Conserv & Reuse	3.48	-1.7

Note: Groundwater withdrawal impact based on Northern District Model Version 5

Homosassa Spring Flow Change from Groundwater Withdrawals

Year	Flow Reduction (cfs)	Flow Reduction (%)
2010	4.83	-1.8
2015	4.86	-1.9
2035	7.77	-3.0
2035 w/ Conserv & Reuse	6.70	-2.6

Note: Groundwater withdrawal impact based on Northern District Model Version 5

Southwest Florida Water Management District

Summary

- Geology and relatively low groundwater use have led to small flow changes of 1 to 2 percent
- Upper Floridan aquifer water levels are stable over the last three decades
- Current groundwater use trend is flat the last 8-10 years due to conservation, increased use of reclaimed water, and slower population growth
- The MFL allows an 8 percent reduction due to withdrawals at Chassahowitzka and a 5 percent reduction at Homosassa. Current springflow decline of 1 to 2 percent due to withdrawals. This is projected to increase to 2 to 3 percent in 2035. No recovery or additional prevention strategy is needed at this time.

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800 955-8770 (V)

MyFWC.com

March 29, 2019

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street
Brooksville, FL 34604
Doug.Leeper@WaterMatters.org

RE: Chassahowitzka River System Minimum Flows and Levels Draft Reevaluation Report and Appendices, Citrus and Hernando Counties

Dear Mr. Leeper:

Florida Fish and Wildlife Conservation Commission (FWC) staff have reviewed the above referenced minimum flows and levels (MFL) report and appendices for the Chassahowitzka River System. We provide the following comments and recommendations as technical assistance during your review of the draft MFL under Chapter 373, Florida Statutes, and in accordance with FWC's authorities under Chapter 379, Florida Statutes.

Executive Summary

This report identifies recommended minimum flows that were developed as part of the reevaluation of minimum flows currently established for the Chassahowitzka River System. District Rule (Section 40D-8.041(16), Florida Administrative Code) establishes minimum flows for the Chassahowitzka River System, and requires reevaluation of the minimum flows in 2019, six years from initial adoption in 2013. As part of the reevaluation, recommended minimum flows were developed using the best information available, as required by the Florida Statutes, and were based on all relevant environmental values identified in the Florida Water Resource Implementation Rule (Section 62-40.473, Florida Administrative Code) for consideration when setting minimum flows.

The Chassahowitzka River System includes the Chassahowitzka River, contributing tributaries, all unnamed and named springs that discharge to the river, and Blind Springs. This system description is applicable for the current minimum flows reevaluation; however, the system may also alternatively be referred to as the Chassahowitzka River/Chassahowitzka Spring Group and Blind Springs. The Chassahowitzka River flows approximately 6 miles (9.7 kilometers) through Citrus and Hernando Counties to the mouth in Chassahowitzka Bay, which is connected to the Gulf of Mexico. The Chassahowitzka River System is fed by 17 named springs. The entire system is influenced by tides and salt water from the Gulf of Mexico. All non-artificial water bodies in the Chassahowitzka River System are classified as Outstanding Florida Waters, a designation associated with Florida's anti-degradation policy (Rule 62-302.700, F.A.C.). In addition, the Chassahowitzka River is designated a Southwest Florida Water Management District (SWFWMD) Surface Water Improvement and Management (SWIM) Priority Waterbody and as such, has a comprehensive SWIM Plan approved by the Springs Coast Steering Committee and the SWFWMD Governing Board in August 2017.

The recommended minimum flows for the Chassahowitzka River system are 92 percent of flows that would occur in the absence of withdrawal impacts; allowing up to an 8 percent reduction from unimpacted flows. This recommendation is made on the basis of three criteria which are all equally sensitive to simulated reductions in flow: area and volume of salinity-based habitats less than or equal to 1 practical salinity unit (psu) and temperature-based habitat for Common Snook. Groundwater modeling (Northern District Model version 5.0) indicates current (2015) withdrawal impacts reduce flows by 1.4 percent, with projected demand increasing this to as much as 2.0 percent by 2035. Because current withdrawal impacts are less than the maximum allowable 8 percent reduction associated with the proposed minimum flow, development of a recovery strategy concurrent with adoption of the proposed minimum flow would not be necessary at this time. Likewise, a prevention strategy would not be needed because projected impacts of 2.0 percent are less than the maximum allowable of 8 percent reduction associated with the proposed minimum flow.

Updates to data collection and analysis supporting the minimum flow reevaluation included new shoreline vegetation mapping, submerged aquatic vegetation surveys, oyster health assessment, a barnacle survey, fish community sampling, development of a new hydrodynamic model for characterizing system salinities and temperatures, use of a new criterion associated with temperature-based habitat for Common Snook development and use of the updated Northern District groundwater flow model, and new water quality analysis. Findings associated with use of these improved data and tools are generally consistent with the previous work completed for the District's original minimum flows evaluation, which identified a minimum flow that would allow up to a 9 percent reduction in unimpacted flows. That original finding was not however incorporated into the conservative minimum flow for the river system that the Governing Board established in 2013 and which only allows up to a 3 percent reduction from unimpacted flows.

Simulations of reduced flows used for the minimum flow reevaluation were based on gaged flows at the United States Geological Survey (USGS) Chassahowitzka River near Homosassa, FL gage (No. 02310650). The long-term average flow for all "approved" daily data from February 20, 1997 to September 1, 2016 at this gage was 58.9 cubic feet per second (cfs). Adjusted for withdrawal impacts of 1.4 percent, the long-term unimpacted flows would average 59.7 cfs, and minimum flows, corresponding to 92 percent of the unimpacted flow would average 55 cfs over the same time period.
The SWFWMD will continue to implement its general, three-pronged prevention strategy that includes monitoring, protective water-use permitting, and regional water supply planning to ensure that the adopted minimum flow for the system continues to be met. In addition, the SWFWMD will continue to monitor flows in the system to further our understanding of the structure and functions of the Chassahowitzka River System and to develop and refine our minimum flow development methods.

Comments and Recommendations

Overall, FWC staff appreciate the job SWFWMD has done in using the best information available to reevaluate the recommended minimum flows and levels for the Chassahowitzka River System. We appreciate SWFWMD's collection of additional data from the system as well. We also support SWFWMD's three-pronged prevention strategy which includes monitoring, protective water-use permitting, and regional water supply planning to ensure that adopted MFLs for this system continue to be met. We do, however, believe SWFWMD should increase its monitoring frequency of groundwater and spring vent water quality parameters (specifically salinity, temperature and nutrients) in the Chassahowitzka River springshed. We feel that these variables are very important and can impact fish and wildlife resources. A healthy estuary represents a continuum from freshwater to marine. There seems to be a paucity of historic salinity data for the upper mainstem and tributary waters of Chassahowitzka which makes current values tough to gauge in terms of trends going forward. Any combination of increased saltwater intrusion into the aquifer locally and/or reduced freshwater vent flows, which allows saltwater to move further upstream, would be detrimental to freshwater organisms in the system. We are concerned this threat may already be occurring.

While groundwater modeling used by SWFWMD staff indicates current (2015) withdrawal impacts reduce flow by 1.4 percent, the proposed minimum flow would allow groundwater withdrawals to increase by up to 5.7 times the current levels. This withdrawal level is predicted to decrease volume and bottom area of less than or equal to 1 psu by 15 percent. We do not see any indication of how much total volume/area at less than or equal to 1 psu will be lost and/or remain in the river system. We have concerns that the area freshwater organisms occupy will be reduced without any significant upstream locations for them to relocate, as well as, the potential impacts of freshwater organisms being restricted to specific, non-continuous areas such as an individual spring head or small cluster of spring vents. We recommend a table be placed in the report documenting the current and lost extents of less than or equal to 1 psu habitat and a map highlighting where those areas exist and the connectivity between those areas.

While we agree that fish community samples taken by FWC staff over the past four years do not show any significant positive or negative population trends with regards to freshwater fish species, we are concerned about the future existence of freshwater fish communities within the Chassahowitzka River system (and other coastal spring-fed rivers). While many native freshwater fish species in spring-fed rivers can tolerate wide ranges of temperature and other water quality variables, they cannot tolerate elevated levels of salinity over long periods of time. We feel that periods of record for salinity do not exist back far enough to give a good indication of what levels throughout the river system were before the human population growth impacted groundwater levels. The long-term salinity threshhold for freshwater fish species to exist is about 6 parts per thousand (ppt) and some spring vents in the river system are already producing flows containing salinity values of 3-4 ppt while other vents have salinity values exceeding 6 ppt. If coastal saltwater intrusion continues to increase in the aquifer sections responsible for producing spring vent flow, then freshwater fish and invertebrate communities will be extirpated once salinity levels throughout the entire river system reach that critical threshold. Additionally, if freshwater flows in the Chassahowitzka River system are reduced enough to allow saltwater from the Gulf to move upstream and completely saturate the entire river's mainstem and tributaries, as a result of tidal activities or sea level rise, the system's entire freshwater fish and invertebrate community will be lost.

FWC recently received funding to monitor freshwater and marine fish species movements, as well as their associations with habitat and water quality variables (e.g. salinity, temperature) in the nearby Homosassa River System over the next year. We hope that information gained will help protect the integrity of coastal river systems and assist in providing SWFWMD with additional data for future MFL evaluations.

FWC supports the protection of salinity-based habitats as an effective method for protecting a diverse array of species and preventing significant harm to environmental values in the Chassahowitzka River and estuary system. Because submerged aquatic vegetation (SAV) has many positive impacts on the Chassahowitzka River system, management of salinity habitats to encourage the growth and expansion of beneficial vegetation is especially important. The restoration of native SAV will in turn have positive impacts on water quality throughout the system and is also critical forage for manatees using the system as a thermal refuge. FWC will continue work with the Florida Department of Environmental Protection (FDEP) and SWFWMD toward improving SAV habitat within the Chassahowitzka River system.

Modeling results demonstrate that manatee thermal refuge, at a 15 percent decrease in volume, would not currently limit the number of manatees using the Chassahowitzka River system as warm-water habitat. However, Federal and State manatee plans both support conserving and restoring natural warm-water refuges to provide optimal warm-water habitat for manatees. While using a metric to account for available manatee habitat is an effective measure for the current model, it is important to note that temperature and water depth are not the only factors that can affect the suitability of warm-water habitat for manatees. Lost volume of spring flow may have unintended consequences that result in the loss of preferred habitats. As such, FWC can offer continued technical assistance regarding manatee warm-water habitat and MFLs, and funding when working with FDEP and the SWFWMD toward improving warm-water habitat in the Chassahowitzka River system.

In Section 7.1 Basis of Minimum Flow Recommendation, the following statement is made: "Likewise, water quality parameters are stable and do not exhibit direct linear responses to flow that would allow for setting minimum flows based on water quality criteria (JEI 2018)." While we agree that this statement might be true, especially over a short period of record, we also believe that water quality parameters can change significantly over time and affect portions of or the entire river system depending on factors such as groundwater intrusion, spring vent flow rates, tidal fluctuations, rainfall rates, etc. If changes to a particular water quality parameter (e.g. salinity) were potentially harmful to plant or animal life in the system, that parameter (and hence water quality parameters) should be considered when developing minimum flows.

Sections 7.2.2 and 7.2.6 in the report appear to have copy/paste errors needing attention. There are references to the Homosassa River System in these sections.

In Section 4.1.2 Shoreline Vegetation Surveys, it would beneficial to see actual absence/presence locations on the maps by species over time in Figures 4-2, 4-3, and 4-4 if possible to better determine plant community changes.

In closing, we appreciate the opportunity to review the proposed MFL documents and look forward to working with you throughout the final approval process. If you need any further assistance, please do not hesitate to contact our office by email at FWCConservationPlanningServices@MyFWC.com. If you have specific technical questions regarding the content of this letter, please contact Eric Johnson at (863) 648-. 3809 or by email at eric.johnson@MyFWC.com.

Sincerely,

Jon Fury
Director
Division of Freshwater Fisheries Management

Chassahowitzka River System MFL 2019_38108_032919

Gabe I. Herrick

From: Doug Leeper
Sent: Tuesday, August 27, 2019 9:55 AM
To: Teresa Calleson
Cc: MFLComments; Gabe I. Herrick
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Terri:

We have drafted reports on recommended minimum flows for the Chassahowitzka and Homosassa River/Spring systems, completed peer review, and hosted a public meeting to seek input on the proposed minimum flows. We anticipate presenting the draft minimum flow reports and peer review findings to the District Governing Board soon, possibly in October. At that time we will also anticipate requesting approval for initiation of rulemaking for the revised minimum flows.

The draft reports (and appendices) are posted on our Minimum Flows and Levels Documents and Reports page at: https://www.swfwmd.state.fl.us/projects/mfl/documents-and-reports

The peer review reports are posted on our peer review webforum at: https://swfwmd.discussion.community/post/final-peer-review-reports-for-chassahowitzka-and-homosassa-mfls-10160207

Thanks,

Doug Leeper
MFLs Program Lead
Environmental Flows and Assessments Section
Natural Systems & Restoration Bureau
Southwest Florida Water Management District
2379 Broad Street (U.S. Hwy. 41 South)
Brooksville, FL 34604-6899
352-796-7211, Ext. 4272
1-800-423-1476, Ext. 4272
Doug.leeper@watermatters.org

From: Teresa Calleson <Teresa_Calleson@fws.gov>
Sent: Monday, August 26, 2019 4:32 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Doug,

Was just checking in on where the Chassahowitzka and Homosassa minimum flows were? Have they been finalized at this point? My apologies – as I've been out on worker's comp for the last month or so.

Terri Calleson
Florida Manatee Recovery Lead
U.S. Fish and Wildlife Service
7915 Baymeadows Way, Suite 200

Jacksonville, Florida 32256-7517
904-731-3286 (office)
Email: Teresa_Calleson@fws.gov
http:/www.fws.gov/northflorida

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 01, 2019 12:54 PM
To: Teresa_Calleson@fws.gov
Subject: [EXTERNAL] Chassahowitzka and Homosassa MFLs Reevaluations

Hi Terri:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
- January-June 2019: Stakeholder outreach and meetings
- June 2019: Public workshop date and location have not yet been determined
- Fall 2019: District Governing Board meeting – Request to approve staff minimum flow recommendations and initiate rulemaking
- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar. Please feel free to contact me if you would like to schedule a meeting with the District's technical staff to discuss the draft reports.

Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Tuesday, August 27, 2019 9:55 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

From: Teresa Calleson <Teresa_Calleson@fws.gov>
Sent: Monday, August 26, 2019 4:32 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Doug,

Was just checking in on where the Chassahowitzka and Homosassa minimum flows were? Have they been finalized at this point? My apologies – as I've been out on worker's comp for the last month or so.

Terri Calleson
Florida Manatee Recovery Lead
U.S. Fish and Wildlife Service
7915 Baymeadows Way, Suite 200
Jacksonville, Florida 32256-7517
904-731-3286 (office)
Email: Teresa_Calleson@fws.gov
http:/www.fws.gov/northflorida

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 01, 2019 12:54 PM
To: Teresa_Calleson@fws.gov
Subject: [EXTERNAL] Chassahowitzka and Homosassa MFLs Reevaluations

Hi Terri:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
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- June 2019: Public workshop date and location have not yet been determined

- Fall 2019: District Governing Board meeting – Request to approve staff minimum flow recommendations and initiate rulemaking
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Doug Leeper
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Springs and Environmental Flows Section
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1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, August 09, 2019 11:16 AM
To: MFLComments
Subject: FW: Chassahowitzka & Homosassa MFLs

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
(352) 796-7211 ext. 4275
Gabe.Herrick@watermatters.org

-----Original Message-----
From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
Sent: Friday, August 09, 2019 10:58 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka & Homosassa MFLs

Thanks Gabe.

Brad

On 8/9/2019 10:35 AM, Gabe I. Herrick wrote:
> Brad,
> Sorry for the slow reply, Doug has been out of the office and I have no excuse.
>
> The District does plan to produce a final peer response, and this will be available on the website prior to the Board meeting in which we present our MFLs recommendation and request to initiate rulemaking. The schedule at this time is to go to the Governing Board in October.
>
> Thanks,
>
> Gabe Herrick, PhD
> Senior Environmental Scientist
> Southwest Florida Water Management District
> (352) 796-7211 ext. 4275
> Gabe.Herrick@watermatters.org
>
> -----Original Message-----
> From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
> Sent: Wednesday, July 31, 2019 1:54 PM
> To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
> Subject: Chassahowitzka & Homosassa MFLs
>
> Hi Doug,

>
> I hope this finds you well.
>
> Does SWFWMD plan to produce a final report in response to the peer review comments on the Chassahowitzka & Homosassa MFLs? Gabe has indicated that staff's MFL recommendations are expected to go to SWFWMD's Governing Board in October. Do you anticipate SWFWMD's GB to address this topic in their Oct 22 meeting or some other date?
>
> Brad Rimbey
>
>
> ---
> This email has been checked for viruses by Avast antivirus software.
>
https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.avast.com%2Fantivirus&data=02%7C01%7CMFLComments%40swfwmd.state.fl.us%7Cc7e6e4db3be040a2e95108d71cdc854f%7C7d508ec009f9440283043a93bd40a972%7C0%7C0%7C637009605759243308&sdata=rUe22dsuLAGlPbSXpg5BVzU9MpzYTsmIvrutWalSCBU%3D&reserved=0
>

This email has been checked for viruses by Avast antivirus software.
https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.avast.com%2Fantivirus&data=02%7C01%7CMFLComments%40swfwmd.state.fl.us%7Cc7e6e4db3be040a2e95108d71cdc854f%7C7d508ec009f9440283043a93bd40a972%7C0%7C0%7C637009605759243308&sdata=rUe22dsuLAGlPbSXpg5BVzU9MpzYTsmIvrutWalSCBU%3D&reserved=0

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, August 09, 2019 10:35 AM
To: Brad Rimbey; Doug Leeper
Cc: MFLComments
Subject: RE: Chassahowitzka & Homosassa MFLs

Brad,
Sorry for the slow reply, Doug has been out of the office and I have no excuse.

The District does plan to produce a final peer response, and this will be available on the website prior to the Board meeting in which we present our MFLs recommendation and request to initiate rulemaking. The schedule at this time is to go to the Governing Board in October.

Thanks,

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
(352) 796-7211 ext. 4275
Gabe.Herrick@watermatters.org

-----Original Message-----
From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
Sent: Wednesday, July 31, 2019 1:54 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Chassahowitzka & Homosassa MFLs

Hi Doug,

I hope this finds you well.

Does SWFWMD plan to produce a final report in response to the peer review comments on the Chassahowitzka & Homosassa MFLs? Gabe has indicated that staff's MFL recommendations are expected to go to SWFWMD's Governing Board in October. Do you anticipate SWFWMD's GB to address this topic in their Oct 22 meeting or some other date?

Brad Rimbey

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, August 09, 2019 10:20 AM
To: MFLComments
Subject: FW: 08-06-2019 FDEP on Behalf of Claudia Brockett

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
(352) 796-7211 ext. 4275
Gabe.Herrick@watermatters.org

From: Eric DeHaven <Eric.Dehaven@swfwmd.state.fl.us>
Sent: Tuesday, August 06, 2019 10:36 AM
To: Jennette Seachrist <Jennette.Seachrist@swfwmd.state.fl.us>; Adrienne E. Vining <Adrienne.Vining@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: 08-06-2019 FDEP on Behalf of Claudia Brockett

Gabe, I think this is in regards to Homosassa and Chassahowitzka MFL Public Meeting. Please include in correspondence received. No response is required.

Eric DeHaven, P.G.
Southwest Florida Water Management District
Assistant Director, Resource Management Division
7601 HWY 301N Tampa FL 33637
(813) 985-7481 X2118

From: Jennette Seachrist <Jennette.Seachrist@swfwmd.state.fl.us>
Sent: Tuesday, August 6, 2019 8:09 AM
To: Adrienne E. Vining <Adrienne.Vining@swfwmd.state.fl.us>; Eric DeHaven <Eric.Dehaven@swfwmd.state.fl.us>
Subject: Fwd: 08-06-2019 FDEP on Behalf of Claudia Brockett

From: Lori Manuel <Lori.Manuel@swfwmd.state.fl.us>
Sent: Tuesday, August 6, 2019 8:04:24 AM
To: EXE_LeadershipTeam <EXE_LeadershipTeam@swfwmd.state.fl.us>
Cc: Cara S. Martin <Cara.Martin@swfwmd.state.fl.us>; Caroline M. Browning <Caroline.Browning@swfwmd.state.fl.us>; Robyn O. Felix <Robyn.Felix@swfwmd.state.fl.us>; Kelly J. Page <Kelly.Page@swfwmd.state.fl.us>
Subject: 08-06-2019 FDEP on Behalf of Claudia Brockett

For appropriate disposition, this has been assigned to: Jennette Seachrist with the response date of: 08-13-2019
Executive Log :08-06-2019 FDEP on Behalf of Claudia Brockett

https://swfwmd.sharepoint.com/sites/SWFWMDSC/CBS/BES/Admin/Exec/_layouts/15/DocIdRedir.aspx?ID=SWFD-288299596-5602

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, August 05, 2019 3:41 PM
To: MFLComments
Subject: FW: NO increased groundwater pumping

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
(352) 796-7211 ext. 4275
Gabe.Herrick@watermatters.org

-----Original Message-----
From: Claudia Brockett <cbrocket@tampabay.rr.com>
Sent: Monday, August 05, 2019 3:38 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: info <info@swfwmd.state.fl.us>; claudia <cbrocket@tampabay.rr.com>
Subject: NO increased groundwater pumping

Dear Mr. Herrick ,

I am a lifelong resident of Florida who currently lives in Citrus County. I recently attended my first SWFWMD workshop in Lecanto. I viewed the charts and graphs and listened to the state employed scientists explain how increased groundwater pumping will have no ill effect on our springs and rivers. But I've seen first hand the ill effects past pumping has ALREADY had!! It defies logic to state that increased pumping will be harmless to our environment.

Relying on groundwater as our primary water supply is a short-sighted solution. Instead, SWFWMD should be researching and promoting alternative water sources for our district's needs. We must make some difficult decisions to change course now, not later. The longer we wait the more difficult, damaging and expensive it will be. Our natural environment and our pocketbooks will pay the price for this short sighted policy.

STOP INCREASING GROUNDWATER PUMPING NOW!!!

Respectfully,

Claudia Brockett

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Wednesday, July 31, 2019 2:23 PM
To: MFLComments
Subject: FW: Chassahowitzka & Homosassa MFLs

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
(352) 796-7211 ext. 4275
Gabe.Herrick@watermatters.org

-----Original Message-----
From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
Sent: Wednesday, July 31, 2019 1:54 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Chassahowitzka & Homosassa MFLs

Hi Doug,

I hope this finds you well.

Does SWFWMD plan to produce a final report in response to the peer review comments on the Chassahowitzka & Homosassa MFLs? Gabe has indicated that staff's MFL recommendations are expected to go to SWFWMD's Governing Board in October. Do you anticipate SWFWMD's GB to address this topic in their Oct 22 meeting or some other date?

Brad Rimbey

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Wednesday, July 03, 2019 10:35 AM
To: Meg Taylor
Cc: MFLComments
Subject: RE: Proposed MFLs and Evaluation of Hydrologic Changes
Attachments: June11Wkshp_THIS_ONE.pdf

Meg,

Please see attached slides presented at the June 11 workshop.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Meg Taylor <MegT@hgslaw.com>
Sent: Monday, June 24, 2019 11:50 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Proposed MFLs and Evaluation of Hydrologic Changes

Good morning Dr. Herrick,

Did you happen to have any presentation materials for your agenda item (#2) at the District's 6/11/19 Public Workshop? If so, would you please forward them to me? Thanks!

Meg Taylor, Legal Assistant
Eric Olsen | Amelia Savage | Felicia Kitzmiller
. . . .
Hopping Green & Sams, P.A.
P.O. Box 6526 / 119 South Monroe Street, Suite 300
Tallahassee, FL 32314-6526 /32301
850.222.7500 | hgslaw.com

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, July 02, 2019 4:32 PM
To: MFLComments
Subject: FW: Proposed MFLs and Evaluation of Hydrologic Changes

---

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Meg Taylor <MegT@hgslaw.com>
Sent: Monday, June 24, 2019 11:50 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Proposed MFLs and Evaluation of Hydrologic Changes

Good morning Dr. Herrick,

Did you happen to have any presentation materials for your agenda item (#2) at the District's 6/11/19 Public Workshop? If so, would you please forward them to me? Thanks!

Meg Taylor, Legal Assistant
Eric Olsen | Amelia Savage | Felicia Kitzmiller
. . . .
Hopping Green & Sams, P.A.
P.O. Box 6526 / 119 South Monroe Street, Suite 300
Tallahassee, FL 32314-6526 /32301
850.222.7500 | hgslaw.com

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, June 24, 2019 8:23 AM
To: MFLComments
Subject: FW: Chaz Flow Records

-----Original Message-----
From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
Sent: Monday, June 24, 2019 7:57 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chaz Flow Records

Gabe,

I would appreciate a response.

Brad

On 6/15/2019 1:37 PM, Brad Rimbey wrote:
> Gabe,
>
> During your MFL presentation on Tuesday, you said Chassahowitzka had
> seventeen named springs. Attached is a table of Chaz springs and flows
> that I prepared back in 2011. I count twenty. In the map you showed, I
> did not see Blind Creek Spring. As you can see from the table, Blind
> had the second highest flow rate in the Chaz system and it is included
> in the Chaz MFL. Have you seen Florida Springs Institute's Interactive
> Springs Map? It's pretty cool.
> https://flor
> idaspringsinstitute.org%2Fsprings-map-2-0%2F&data=02%7C01%7Cdoug.l
> eeper%40swfwmd.state.fl.us%7C2f92a8a795714fc52d2808d6f89b18aa%7C7d508e
> c009f9440283043a93bd40a972%7C0%7C1%7C636969742368905047&sdata=i5YK
> rZDEy8UqL5nKbKtXuWbCYawbFAGYjIhG7cHT%2BVk%3D&reserved=0
>
> Also, could you email me a copy of your Tuesday presentation?
>
> You sure got an earful on Tuesday. We are passionate about our rivers.
> You handled yourself well but it has to be hard to listen to all the
> complaints.
>
> Brad Rimbey
>
>

---

bd40a972%7C0%7C0%7C636969757770521385&sdata=%2BWuAGFMwm1jPch7kX48nPKq%2FuFUiCOXnY9Q0m%2BaElgo%3D&reserved=0

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, June 21, 2019 8:41 AM
To: MFLComments
Subject: FW: MFL

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Karen Esty <karenesty@yahoo.com>
Sent: Thursday, June 20, 2019 7:31 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: MFL

Gabe,

When compiling data for minimum flow levels, in the formula does it include number of acres lost to development? As you know, development changes the amount of land available to recharge out aquifer. How much "less"water reaches our aquifer? It's critical to include lost acreage in the analysis.

Kind regards,

Karen Esty
Inverness, Fl. 34453

Gabe I. Herrick

From: Doug Leeper
Sent: Thursday, June 20, 2019 3:42 PM
To: MFLComments
Subject: FW: Homosassa Withdrawals

From: Frank And Pat <fnpkap@aol.com>
Sent: Thursday, June 20, 2019 3:37 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa Withdrawals

Thank you,Doug

Sent from my iPhone

On Jun 20, 2019, at 8:34 AM, Doug Leeper <Doug.Leeper@swfwmd.state.fl.us> wrote:

> Frank:
>
> Thanks for participating in the recent public meeting on proposed minimum flows for the Chassahowitzka and Homosassa river systems. Thanks also for your input from the Homosassa River Alliance regarding the proposed minimum flows.
>
> I've forwarded your June 17th email and this response to the District's MFLs Comments "in-box" (MFLComments@swfwmd.state.fl.us) so all staff working on the proposed minimum flows can review our correspondence.
>
> Doug Leeper
> MFLs Program Lead
> Southwest Florida Water Management District
> Springs and Environmental Flows Section
> 2379 Broad Street, Brookville, FL 34604
> 1-800-423-1476, extension 4272 (FL only)
> 352-796-7211, extension 4272
> doug.leeper@watermatters.org
>
> **From:** Patricia Kapocsi <fnpkap@aol.com>
> **Sent:** Monday, June 17, 2019 3:57 PM
> **To:** Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; g@aol.com
> **Subject:** Homosassa Withdrawals
>
> Hello Mr. Leeper, Just a quick note thanking you and your staff for a very informative meeting focusing on the mfls for the Homosassa and Chassahowizka rivers . I would also like you to understand why the members of the Alliance have taken a position against further withdrawals from our spring system. The goal of the Alliance is to protect the health of the Blue Waters and the entire river system. We know, just like you, that our springs and river will not benefit from additional withdrawals. The Homosassa SWIM plan clearly states that reduced flow levels have the potential to harm the health of the system. Our membership (well over 100) fully understand that spring flow and flow velocity are critical to our efforts.

Further withdrawals will only slow flow and velocity, impeding our goal of protecting the spring and river from further harm. The Homosassa River is an Outstanding Florida Waterway. A waterway designated worthy of special protection because of its natural attributes. This special designation is intended to protect existing good water quality. The Florida Springs and Protection act goal is to protect and restore flows and water quality in the states outstanding springs. It is clear that the state recognizes the need to protect our springs and river . That being said, how can there be any consideration for additional withdrawals from our system. Frank Kapocsi, President Homosassa River Alliance

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, June 20, 2019 8:50 AM
To: MFLComments; Doug Leeper; Xinjian Chen; Sky Notestein
Subject: Re: Area and Volume from Head Springs to USGS 02310700

Gabe,
Thanks for the information. This helps explain the equal or less than 5 psu area figure of 1522543 sq m in the report; Halls River was not in the 2012 study and is in the 2019.

The equal or less than 2 psu salinity zone of 319397 sq m, is still difficult to understand. Have any field salinity tests/verifications been conducted between the head springs and the confluence with Halls River. My testing around 2012/3 demonstrated reverse flow in the channel before the confluence and specific conductance readings of over 4000.
The area, 319397 sq m or 78 acres, appears to be almost 50% greater than all the river, headsprings to the confluence. The best estimate I can get from the head springs to the confluence is approx 55 acres.

Will be in Homosassa after the 4th and will run a few tests.

Snook thermal habitat.
Still have not found any volume or area for the snook habitat, only percent changes eg Table 27 29 (appendix). The only square feet figure 2067403 square feet on page 195 (main report) refers to manatee. When mentioned after the Homosssa River Alliance meeting you thought there is a figure for snook habitat from which the percentages are calculated. Would appreciate if you can locate this as it is the primary driver for the MFL albeit there is likely way more habitat (volume/area) than needed to support the population.
As I have pointed out before the issue with manatee is more critical as regards available food source, particularly when the SAV decrease is recognized.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, June 18, 2019 3:37 PM
To: Alan Martyn Johnson; MFLComments; Doug Leeper; Xinjian Chen; Sky Notestein
Subject: RE: Area and Volume from Head Springs to USGS 02310700

Martyn,

Based on measured data during 6/30/1997 – 3/13/2018, the mean water level at the USGS Homosassa River at Homosassa station was 0.107 m, NAVD88 during the 20+ years. At this level, the volume and area upstream of the station are roughly 1,374,070.3 m^3 and 1,279,414.5 m^2, respectively.

Thank you for your comments.

Gabe Herrick, PhD

Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, June 14, 2019 2:48 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>; Mark Hammond <mark.hammond@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: Re: Area and Volume from Head Springs to USGS 02310700

My e-mail to which you are responding did not ask about Net SGD for 02310700. I responded to your e-mail stating there was no A value for this some time ago saying I agreed.

The second question in my June 10 e-mail I thought was simple and clear:
What is the Volume and Area of the Homosassa River upstream of the USGS Gage Station 02310700 Homosassa R at Homosassa.

This was an attempt to simplify the request to have facts to understand the large differences presented in 2019 report Tables 9, 10 and 11 which are AVERAGE Volumes and Areas, to those in the 2012 report.

I agree the volume will vary with gage height, but area should not be significantly impacted (with the possible exception of the marsh areas along Halls River). So let me put the question again adding AVERAGE.

What is the AVERAGE Volume and Area of the Homosassa River upstream of the USGS Gage Station 02310700 Homosassa R at Homosassa?

The LAMFE output data for less than/equal 2 and 3 psu presented in Table 10 for Baseline and Existing appear to be out of line with reality.
78 acres less than/equal 2 psu (3800 microsiemens)
179 acres less than/equal 3 psu (5500 microsiemens)
let alone
376 acres less than/equal 5 psu (9000 microsiemens)

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, June 11, 2019 2:13 PM
To: Alan Martyn Johnson; MFLComments; Mark Hammond; Doug Leeper; Xinjian Chen; Sky Notestein
Subject: RE: NET SGD for Halla River 02310689

Martyn,

My previous email responses to your previous questions have answered that there is no A value or net SGD calculated for the 02310700 gage. The area and volume upstream of this gage are variable based on tides and flows. The banks of the river have not changed substantially, however the areas of the river included in the models are different. I have shown you maps of this in previous emails extracted from the MFLs reports and appendices. The differences in model measurements of habitats are affected by the simple fact that the models cover different mapped areas of the river. The newer LAMFE model covers more of the river than the older EFDC model, and in fact for these upper reaches, covers all of the area covered by the old model plus additional areas near the head springs.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, June 10, 2019 1:56 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>; Mark Hammond <mark.hammond@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: Fwd: NET SGD for Halla River 02310689

As far as I can see SWFWMD has not answered two very basic, but critical question I asked.
The first is detailed in this copy of my May 24 email.
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The second is the very basic question of what is the volume and area used in the LAMFE model from the springs to the location of the USGS have station 02310700 Homosassa R at Homosassa. the LAMFE model presumably must have this as the most basic fact. This fact must be the same for LAMFE 2019 study and the 2012 study. The "special domain" read 'banks of the river have not changed in this time period.
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I trust you will be in a position to answer these questions at this week's meeting, although a written response would be preferred.
Martyn

-------- Original Message --------
Subject: NET SGD for Halla River 02310689
From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 24, 2019, 2:23 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>,Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
CC: Doug Leeper <doug.leeper@swfwmd.state.fl.us>,"Gabe I. Herrick" <Gabe.Herrick@swfwmd.state.fl.us>
In my 5/22 e-mail I asked about the Net SGD for that morning.
I have attached a spreadsheet with the full days data for gage ht, specific conductance and USGS Discharge. I would very much appreciate if the NET SGD column could be completed so I can understand what NET SGD is in actual numbers not just as a concept.
I have provided the gage ht difference and the A value Gabe communicated recently.
This should be an easy task. If you have time a brief explanation of the NET SGD shown in the completed spreadsheet would be useful.

Thanks,
Martyn

Gabe I. Herrick

From: Doug Leeper
Sent: Thursday, June 20, 2019 8:35 AM
To: Patricia Kapocsi
Cc: MFLComments
Subject: RE: Homosassa Withdrawals

Frank:

Thanks for participating in the recent public meeting on proposed minimum flows for the Chassahowitzka and Homosassa river systems. Thanks also for your input from the Homosassa River Alliance regarding the proposed minimum flows.

I've forwarded your June 17th email and this response to the District's MFLs Comments "in-box" (MFLComments@swfwmd.state.fl.us) so all staff working on the proposed minimum flows can review our correspondence.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Patricia Kapocsi <fnpkap@aol.com>
Sent: Monday, June 17, 2019 3:57 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; g@aol.com
Subject: Homosassa Withdrawals

Hello Mr. Leeper, Just a quick note thanking you and your staff for a very informative meeting focusing on the mfls for the Homosassa and Chassahowizka rivers . I would also like you to understand why the members of the Alliance have taken a position against further withdrawals from our spring system. The goal of the Alliance is to protect the health of the Blue Waters and the entire river system. We know, just like you, that our springs and river will not benefit from additional withdrawals. The Homosassa SWIM plan clearly states that reduced flow levels have the potential to harm the health of the system. Our membership (well over 100) fully understand that spring flow and flow velocity are critical to our efforts. Further withdrawals will only slow flow and velocity, impeding our goal of protecting the spring and river from further harm. The Homosassa River is an Outstanding Florida Waterway. A waterway designated worthy of special protection because of its natural attributes. This special designation is intended to protect existing good water quality. The Florida Springs and Protection act goal is to protect and restore flows and water quality in the states outstanding springs. It is clear that the state recognizes the need to protect our springs and river . That being said, how can there be any consideration for additional withdrawals from our system. Frank Kapocsi, President Homosassa River Alliance

Gabe I. Herrick

From: Doug Leeper
Sent: Thursday, June 20, 2019 8:11 AM
To: MFLComments
Subject: FW: Homosassa Withdrawals

From: Patricia Kapocsi <fnpkap@aol.com>
Sent: Monday, June 17, 2019 3:57 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; g@aol.com
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Gabe I. Herrick

From: Noreply Webmaster
Sent: Wednesday, June 19, 2019 9:33 PM
To: Don Weaver
Subject: Homosassa MFLs

Submitted on Thu, 06/20/2019 - 01:33

Submit Your Comments

Topic
Homosassa River System MFLs

First name
Don

Last name
Weaver

Email
don.weaver@watermatters.org

Address
2379 Broad
Brooksville. 34604

County
Other

Other County
FL

Representing
Organization

If organization, name
SWFWMD

Comments
This is a test. This is only a test. The online public comment form is now activated for Homosassa and Chass. Again, this is only a test.

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Wednesday, June 19, 2019 3:24 PM
To: MFLComments
Subject: FW: Chassahowitzka flow reduction

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Steve Swiger <steve@swiger.com>
Sent: Wednesday, June 19, 2019 1:20 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Chassahowitzka flow reduction

Hello Gabe,
I got your email address from the Citrus County Chronicle article regarding the public workshop about Flow changes for the Homosassa and Chassahowitzka Rivers (https://www.chronicleonline.com/news/local/don-t-drain-our-rivers-citizens-tell-water-district/article_38a31900-8d29-11e9-8489-93fee429c701.html).

Our family owns property just west of Potters Creek on the Chassahowitzka River and has for almost 60 years. I grew up fishing and crabbing in the River and the Springs of many of the creeks, Potters being my favorite. I tell you this to give you an idea of the history we've seen as the flows have changed.

When I was in high school (1991), I took a picture of my Grandfather standing on the front porch of our house fishing. In the picture, the house is surrounded by a hardwood forest which supported many types of wildlife and provided protection during storms. The same picture today shows the stark reality of these "flow reductions". The hardwoods and corresponding wildlife are gone. Period. The trees died because of the saltwater intrusion that has been allowed because of these Flow Reductions. The shoreline has receded as well.

Last Thanksgiving I took my 11 year-old boys to the head of Potters Creek to see what we could see, and the devastation there is staggering. The spring is basically dead, with no discernable flow. The fish species in the creek have changed signficantly (and thinned out) since I was young. We did manage to have fun catching small Mangrove Snapper where we used to catch large Bream and Bass.

This is intensely personal for myself and my family. If, as the article above indicates, the Minimum Flow Levels are defined by "the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area" we're already far far beyond that point. The ecology has been devastated by these flow levels over the past 20 years.

I hope that this email will be taken into consideration. The proposed Flow Reductions will destroy more of the existing hardwood forest and allow the saltwater intrusion to push much further up the Chassahowitzka River than it already has. There will be no turning back, and the ecological wonder of this great river will be lost for future generations.

Respectfully,
Steve Swiger

Gabe I. Herrick

From: MFLComments
Sent: Tuesday, June 18, 2019 3:38 PM
To: Alan Martyn Johnson; MFLComments; Doug Leeper; Xinjian Chen; Sky Notestein
Subject: RE: Area and Volume from Head Springs to USGS 02310700

Martyn,

Based on measured data during 6/30/1997 – 3/13/2018, the mean water level at the USGS Homosassa River at Homosassa station was 0.107 m, NAVD88 during the 20+ years. At this level, the volume and area upstream of the station are roughly 1,374,070.3 m^3 and 1,279,414.5 m^2, respectively.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, June 14, 2019 2:48 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>; Mark Hammond <mark.hammond@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
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The second question in my June 10 e-mail I thought was simple and clear:
What is the Volume and Area of the Homosassa River upstream of the USGS Gage Station 02310700 Homosassa R at Homosassa.

This was an attempt to simplify the request to have facts to understand the large differences presented in 2019 report Tables 9, 10 and 11 which are AVERAGE Volumes and Areas, to those in the 2012 report.

I agree the volume will vary with gage height, but area should not be significantly impacted (with the possible exception of the marsh areas along Halls River). So let me put the question again adding AVERAGE.

What is the AVERAGE Volume and Area of the Homosassa River upstream of the USGS Gage Station 02310700 Homosassa R at Homosassa?

The LAMFE output data for less than/equal 2 and 3 psu presented in Table 10 for Baseline and Existing appear to be out of line with reality.

78 acres less than/equal 2 psu (3800 microsiemens)
179 acres less than/equal 3 psu (5500 microsiemens)
let alone
376 acres less than/equal 5 psu (9000 microsiemens)

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, June 11, 2019 2:13 PM
To: Alan Martyn Johnson; MFLComments; Mark Hammond; Doug Leeper; Xinjian Chen; Sky Notestein
Subject: RE: NET SGD for Halla River 02310689

Martyn,

My previous email responses to your previous questions have answered that there is no A value or net SGD calculated for the 02310700 gage. The area and volume upstream of this gage are variable based on tides and flows. The banks of the river have not changed substantially, however the areas of the river included in the models are different. I have shown you maps of this in previous emails extracted from the MFLs reports and appendices. The differences in model measurements of habitats are affected by the simple fact that the models cover different mapped areas of the river. The newer LAMFE model covers more of the river than the older EFDC model, and in fact for these upper reaches, covers all of the area covered by the old model plus additional areas near the head springs.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, June 10, 2019 1:56 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>; Mark Hammond <mark.hammond@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: Fwd: NET SGD for Halla River 02310689

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Subject: NET SGD for Halla River 02310689
From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 24, 2019, 2:23 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>,Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
CC: Doug Leeper <doug.leeper@swfwmd.state.fl.us>,"Gabe I. Herrick" <Gabe.Herrick@swfwmd.state.fl.us>

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I have provided the gage ht difference and the A value Gabe communicated recently.

This should be an easy task. If you have time a brief explanation of the NET SGD shown in the completed spreadsheet would be useful.

Thanks,

Martyn

Gabe I. Herrick

From: Doug Leeper
Sent: Tuesday, June 18, 2019 6:59 AM
To: MFLComments
Subject: FW: NET SGD for Halla River 02310689

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Sent: Monday, June 10, 2019 1:56 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>; Mark Hammond <mark.hammond@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
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Martyn

Gabe I. Herrick

From: Doug Leeper
Sent: Tuesday, June 18, 2019 6:53 AM
To: MFLComments
Subject: FW: Homosassa Withdrawals

From: Patricia Kapocsi <fnpkap@aol.com>
Sent: Monday, June 17, 2019 3:57 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; g@aol.com
Subject: Homosassa Withdrawals

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Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, June 17, 2019 8:51 AM
To: MFLComments
Subject: FW: Chaz Flow Records
Attachments: Chass Spring Flow Measurments.pdf

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

-----Original Message-----
From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
Sent: Saturday, June 15, 2019 1:38 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Chaz Flow Records

Gabe,

During your MFL presentation on Tuesday, you said Chassahowitzka had seventeen named springs. Attached is a table of Chaz springs and flows that I prepared back in 2011. I count twenty. In the map you showed, I did not see Blind Creek Spring. As you can see from the table, Blind had the second highest flow rate in the Chaz system and it is included in the Chaz MFL. Have you seen Florida Springs Institute's Interactive Springs Map? It's pretty cool.
https://gcc01.safelinks.protection.outlook.com/?url=https%3A%2F%2Ffloridaspringsinstitute.org%2Fsprings-map-2-0%2F&data=02%7C01%7CMFLComments%40swfwmd.state.fl.us%7Cf4200d653d21467cc37308d6f32262c8%7C7d508ec009f9440283043a93bd40a972%7C0%7C0%7C636963726701358947&sdata=ekRozfmDLl9dw26pX5reUtmvYZ46Ao%2BXTNNj%2BosmWiM%3D&reserved=0

Also, could you email me a copy of your Tuesday presentation?

You sure got an earful on Tuesday. We are passionate about our rivers.
You handled yourself well but it has to be hard to listen to all the complaints.

Brad Rimbey

bd40a972%7C0%7C0%7C636963726701368955&sdata=QgHf2irSnffQMv3YSvxN99EkuVeDONZdh1zumEED6Lw%3D
&reserved=0

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, June 17, 2019 8:51 AM
To: MFLComments
Subject: FW: Area and Volume from Head Springs to USGS 02310700

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Saturday, June 15, 2019 6:38 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Fw: Area and Volume from Head Springs to USGS 02310700

Looks like I missed addressing a copy of this to you yesterday. You probably got it from the MFLComments.
Sorry, jet lag may be!
Martyn

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, June 14, 2019 2:48 PM
To: MFLComments; Mark Hammond; Doug Leeper; Xinjian Chen; Sky Notestein
Subject: Re: Area and Volume from Head Springs to USGS 02310700

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Thanks,

Martyn

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, June 17, 2019 8:34 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFL

From: Doug Leeper
Sent: Friday, June 14, 2019 12:42 PM
To: Hinkle, Tammy <Tammy.Hinkle@freshfromflorida.com>
Subject: RE: Chassahowitzka and Homosassa MFL

Sorry to take so long to get back to you.

Crazy week. Next week will be better.

Anyway, I will try to do my best to answer questions you may have. Might be better to speak to Gabe, but I'll talk to you if you would prefer.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Hinkle, Tammy <Tammy.Hinkle@freshfromflorida.com>
Sent: Thursday, June 13, 2019 12:16 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Chassahowitzka and Homosassa MFL

Hi Doug,

Hope you doing well.

I have been getting requests asking what the new MFL for Chass and Homosassa are. I know you all are having upcoming meetings regarding these 2 but I wanted to see if there was any way that I could come talk with you about them and what the changes are?

I know you are busy but any help is greatly appreciated. I am at the office most of today if anytime works for you, or any other day??

Thanks so much and talk with you soon!

Tammy Hinkle
Environmental Specialist III
Office of Agricultural Water Policy

Florida Department of Agricultural and Consumer Services - FDACS
www.FreshFromFlorida.com

Office: 352-796-7211 ext. 4320
Cell: 850-815-1245
Tammy.Hinkle@FreshFromFlorida.com

Mailing Address:
2379 Broad Street
Brooksville, FL 34604

Please note that Florida has a broad public records law (Chapter 119, Florida Statutes). Most written communications to or from state employees are public records obtainable by the public upon request. Emails sent to me at this email address may be considered public, and will only be withheld from disclosure if deemed confidential pursuant to the laws of the State of Florida.

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, June 17, 2019 8:34 AM
To: MFLComments
Cc: Tammy Hinkle
Subject: FW: Chassahowitzka and Homosassa MFL

From: Hinkle, Tammy <Tammy.Hinkle@freshfromflorida.com>
Sent: Thursday, June 13, 2019 12:16 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Chassahowitzka and Homosassa MFL

Hi Doug,

Hope you doing well.

I have been getting requests asking what the new MFL for Chass and Homosassa are. I know you all are having upcoming meetings regarding these 2 but I wanted to see if there was any way that I could come talk with you about them and what the changes are?

I know you are busy but any help is greatly appreciated. I am at the office most of today if anytime works for you, or any other day??

Thanks so much and talk with you soon!

Tammy Hinkle
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Cell: 850-815-1245
Tammy.Hinkle@FreshFromFlorida.com

Mailing Address:
2379 Broad Street
Brooksville, FL 34604

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, June 14, 2019 2:48 PM
To: MFLComments; Mark Hammond; Doug Leeper; Xinjian Chen; Sky Notestein
Subject: Re: Area and Volume from Head Springs to USGS 02310700

My e-mail to which you are responding did not ask about Net SGD for 02310700. I responded to your e-mail stating there was no A value for this some time ago saying I agreed.

The second question in my June 10 e-mail I thought was simple and clear:
What is the Volume and Area of the Homosassa River upstream of the USGS Gage Station 02310700 Homosassa R at Homosassa.

This was an attempt to simplify the request to have facts to understand the large differences presented in 2019 report Tables 9, 10 and 11 which are AVERAGE Volumes and Areas, to those in the 2012 report.

I agree the volume will vary with gage height, but area should not be significantly impacted (with the possible exception of the marsh areas along Halls River). So let me put the question again adding AVERAGE.

What is the AVERAGE Volume and Area of the Homosassa River upstream of the USGS Gage Station 02310700 Homosassa R at Homosassa?

The LAMFE output data for less than/equal 2 and 3 psu presented in Table 10 for Baseline and Existing appear to be out of line with reality.
78 acres less than/equal 2 psu (3800 microsiemens)
179 acres less than/equal 3 psu (5500 microsiemens)
let alone
376 acres less than/equal 5 psu (9000 microsiemens)

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, June 11, 2019 2:13 PM
To: Alan Martyn Johnson; MFLComments; Mark Hammond; Doug Leeper; Xinjian Chen; Sky Notestein
Subject: RE: NET SGD for Halla River 02310689

Martyn,

My previous email responses to your previous questions have answered that there is no A value or net SGD calculated for the 02310700 gage. The area and volume upstream of this gage are variable based on tides and flows. The banks of the river have not changed substantially, however the areas of the river included in the models are different. I have shown you maps of this in previous emails extracted from the MFLs reports and appendices. The differences in model measurements of habitats are affected by the simple fact that the models cover different mapped areas of the river. The newer LAMFE model covers more of the river than the older EFDC model, and in fact for these upper reaches, covers all of the area covered by the old model plus additional areas near the head springs.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, June 10, 2019 1:56 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>; Mark Hammond <mark.hammond@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: Fwd: NET SGD for Halla River 02310689

As far as I can see SWFWMD has not answered two very basic, but critical question I asked.
The first is detailed in this copy of my May 24 email.
What is the net Spring Groundwater Discharge for Halls River for one day per the spreadsheet. I find my attempt to complete the spreadsheet provides meaningless net discharge.
The second is;
Area and volume from head springs to USGS 02310700
The second is the very basic question of what is the volume and area used in the LAMFE model from the springs to the location of the USGS have station 02310700 Homosassa R at Homosassa. the LAMFE model presumably must have this as the most basic fact. This fact must be the same for LAMFE 2019 study and the 2012 study. The "special domain" read 'banks of the river have not changed in this time period.
I have asked this question in a number of ways to help understand factually the very significant differences in the output results for salinity between the two models. This point, regarding output from the two models is in the Review Panel's report and has not been answered factually.
I trust you will be in a position to answer these questions at this week's meeting, although a written response would be preferred.
Martyn

-------- Original Message --------
Subject: NET SGD for Halla River 02310689
From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 24, 2019, 2:23 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>,Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
CC: Doug Leeper <doug.leeper@swfwmd.state.fl.us>,"Gabe I. Herrick" <Gabe.Herrick@swfwmd.state.fl.us>
In my 5/22 e-mail I asked about the Net SGD for that morning.
I have attached a spreadsheet with the full days data for gage ht, specific conductance and USGS Discharge. I would very much appreciate if the NET SGD column could be completed so I can understand what NET SGD is in actual numbers not just as a concept.
I have provided the gage ht difference and the A value Gabe communicated recently.
This should be an easy task. If you have time a brief explanation of the NET SGD shown in the completed spreadsheet would be useful.
Thanks,
Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, June 14, 2019 1:08 PM
To: Gabe I. Herrick; MFLComments; Xinjian Chen; Mark Hammond
Cc: Doug Leeper; Sky Notestein
Subject: Re: NET SGD for Halla River 02310689 17 May 2019

Thanks for the completed spreadsheet.

It is disappointing you have not been able to provide an explanation of this specific SWFWMD Net SGD data for Halls River. Could this be that you guys do not understand it?

The SWFWMD Net SGD match what I got, and as mentioned do not make sense to me.

The data is indicative of the Halls River Springs discharging water in a manner which is far from reality:

- 176 cfs @ 00:15
- Reverse Flow into the vents -87 cfs @ 05:15
- 172 cfs @ 12:30
- Reverse Flow into the vents -250 cfs @ 17:00
- 222 cfs @ 23:30

In my opinion this would be an interesting sight if true. The reality should be easily verified by a site visit. Dan Yobbi can most likely explain what he has seen at the Halls River Springs from his visits over many years.

If this is any indication of the data being used for development of the LAMFE Model it certainly brings the model's validity into serious question.
Further, the use of SWFWMD Net SGD and USGS Discharge data when considering flow reductions makes the output data 'unclear', to say the least.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Tuesday, June 11, 2019 1:58 PM
To: Alan Martyn Johnson; MFLComments; Xinjian Chen
Cc: Doug Leeper; Sky Notestein
Subject: RE: NET SGD for Halla River 02310689

Martyn,

Please see attached spreadsheet with Net SGD for the Halls River added.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist

Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 24, 2019 9:24 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: NET SGD for Halla River 02310689

In my 5/22 e-mail I asked about the Net SGD for that morning.

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I have provided the gage ht difference and the A value Gabe communicated recently.

This should be an easy task. If you have time a brief explanation of the NET SGD shown in the completed spreadsheet would be useful.

Thanks,
Martyn

Gabe I. Herrick

From: Devon A. Villareal <Devon.Villareal@citrusbocc.com>
Sent: Friday, June 14, 2019 10:44 AM
To: MFLComments
Subject: MFL Determination Questions

1. How are unmetered withdrawals in each area calculated/estimated?
2. Does the District have accurate records of all private domestic wells and irrigation wells in each springshed?
3. Why is the most recent data used from 2015 if withdrawals are reported monthly? 2017 was a low rainfall/drought year. Can the review only include years included in the most recent Regional Water Supply update?

Thank you.

Devon Villareal-Dabbs
Utilities Compliance Manager

Citrus County Department of Water Resources
3600 W. Sovereign Path, Suite 291
Lecanto, FL 34461
Office: (352)527-5427
Fax: (352)527-7644
Devon.Villareal@citrusbocc.com

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, June 14, 2019 9:49 AM
To: MFLComments
Subject: FW: Water Withdrawals

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Pat Englebright <penglebright@yahoo.com>
Sent: Friday, June 14, 2019 9:46 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Water Withdrawals

Dr. Herrick,

I don't know what I can add that wasn't said at the Tuesday night meeting. My thoughts were pretty much expressed by all the speakers. In the 20 years we've lived on the river it went from crystal clear to murky and brown. The degradation in incredible.

It is said by some that there are many different causes for this and that may be. However, water withdrawals will not improve the water quality! We need to keep our water and save our springs and rivers!!

Thank you.

Pat Englebright

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Thursday, June 13, 2019 3:12 PM
To: MFLComments
Subject: FW: MFL public comment

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Marie Nall <marie428@earthlink.net>
Sent: Thursday, June 13, 2019 1:50 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: MFL public comment

Gabe,
I attended the MFL presentation at the Friends of Chassahowitzka meeting in March and then the workshop in Lecanto on June 11th. Your presentation was excellent and easy for most of us to understand.
Perhaps the scientific findings show minimal damage if the MFL is raised, but there is so much more to consider, which was not empasized by the public comments. I am aware of the role of SWFMD and the efforts in place to preserve our waters and maintain optimal quality. Public education is imperative since it is generally the private home and landowners who make the greatest impact on our waters. Over watering, wasting water, polluting our ground water and aquafer is most likely contributing most to the degradation and that is what SWFMD must continue in working with local governments and general public. Allowing more water to be removed from our rivers and Springs will only add to this problem.
I'm imploring you and your team to recommend no increase in MFL's for the Chassahowitzka and Homosassa Rivers.
Thanks you for your hard work and efforts to educate the people who blame the condition on our rivers on water removal based on MFL's. I'm recommending that future public meetings include more emphasis on other issues that affect our waters. Posters might point that out, but spoken words by the SWFMD team will be more effective.
Sincerely,
Marie Nall, resident SMW

Gabe I. Herrick

From: Microsoft Outlook
To: Mark Hammond
Sent: Tuesday, June 11, 2019 2:13 PM
Subject: Undeliverable: RE: NET SGD for Halla River 02310689

Office 365

Your message to mark.hammond@swfwmd.state.fl.us couldn't be delivered.

mark.hammond wasn't found at swfwmd.state.fl.us.

MFLComments	Office 365	mark.hammond
Action Required		Recipient

Unknown To address

How to Fix It

The address may be misspelled or may not exist. Try one or more of the following:

- Send the message again following these steps: In Outlook, open this non-delivery report (NDR) and choose **Send Again** from the Report ribbon. In Outlook on the web, select this NDR, then select the link "**To send this message again, click here.**" Then delete and retype the entire recipient address. If prompted with an Auto-Complete List suggestion don't select it. After typing the complete address, click **Send**.
- Contact the recipient (by phone, for example) to check that the address exists and is correct.
- The recipient may have set up email forwarding to an incorrect address. Ask them to check that any forwarding they've set up is working correctly.
- Clear the recipient Auto-Complete List in Outlook or Outlook on the web by following the steps in this article: Fix email delivery issues for error code 5.1.10 in Office 365, and then send the message again. Retype the entire recipient address before selecting **Send**.

If the problem continues, forward this message to your email admin. If you're an email admin, refer to the **More Info for Email Admins** section below.

Was this helpful? [Send feedback to Microsoft](#).

More Info for Email Admins

Status code: 550 5.1.10

This error occurs because the sender sent a message to an email address hosted by Office 365 but the address is incorrect or doesn't exist at the destination domain. The error is reported by the recipient domain's email server, but most often it must be fixed by the person who sent the message. If the steps in the **How to Fix It** section above don't fix the problem, and you're the email admin for the recipient, try one or more of the following:

The email address exists and is correct - Confirm that the recipient address exists, is correct, and is accepting messages.

Synchronize your directories - If you have a hybrid environment and are using directory synchronization make sure the recipient's email address is synced correctly in both Office 365 and in your on-premises directory.

Errant forwarding rule - Check for forwarding rules that aren't behaving as expected. Forwarding can be set up by an admin via mail flow rules or mailbox forwarding address settings, or by the recipient via the Inbox Rules feature.

Recipient has a valid license - Make sure the recipient has an Office 365 license assigned to them. The recipient's email admin can use the Office 365 admin center to assign a license (Users > Active Users > select the recipient > Assigned License > Edit).

Mail flow settings and MX records are not correct - Misconfigured mail flow or MX record settings can cause this error. Check your Office 365 mail flow settings to make sure your domain and any mail flow connectors are set up correctly. Also, work with your domain registrar to make sure the MX records for your domain are configured correctly.

For more information and additional tips to fix this issue, see [Fix email delivery issues for error code 5.1.10 in Office 365](#).

Original Message Details

Created Date:	6/11/2019 6:13:04 PM
Sender Address:	MFLComments@swfwmd.state.fl.us
Recipient Address:	mark.hammond@swfwmd.state.fl.us
Subject:	RE: NET SGD for Halla River 02310689

Error Details

Reported error:	*550 5.1.10 RESOLVER.ADR.RecipientNotFound; Recipient mark.hammond@swfwmd.state.fl.us not found by SMTP address lookup*
DSN generated by:	DM6PR09MB3579.namprd09.prod.outlook.com

Message Hops

HOP	TIME (UTC)	FROM	TO	WITH
1	6/11/2019 6:13:05 PM	DM6PR09MB3945.namprd09.prod.outlook.com	DM6PR09MB3945.namprd09.prod.outlook.com	mapi
2	6/11/2019 6:13:05 PM	DM6PR09MB3945.namprd09.prod.outlook.com	DM6PR09MB3579.namprd09.prod.outlook.com	Microsoft SMTP Serv cipher=TLS_ECDHE_I

Original Message Headers

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Authentication-Results: spf=none (sender IP is )
 smtp.mailfrom=MFLComments@swfwmd.state.fl.us;
Received: from DM6PR09MB3945.namprd09.prod.outlook.com (10.141.165.139) by
 DM6PR09MB3579.namprd09.prod.outlook.com (20.179.51.212) with Microsoft SMTP
 Server (version=TLS1_2, cipher=TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384) id
 15.20.1965.17; Tue, 11 Jun 2019 18:13:05 +0000
Received: from DM6PR09MB3945.namprd09.prod.outlook.com
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 ([fe80::8927:5a38:bfc9:b00%7]) with mapi id 15.20.1987.010; Tue, 11 Jun 2019
 18:13:05 +0000
Content-Type: application/ms-tnef; name="winmail.dat"
Content-Transfer-Encoding: binary
From: MFLComments <MFLComments@swfwmd.state.fl.us>
To: Alan Martyn Johnson <martynellijay@hotmail.com>, MFLComments
	<MFLComments@swfwmd.state.fl.us>, Mark Hammond
	<mark.hammond@swfwmd.state.fl.us>, Doug Leeper
	<Doug.Leeper@swfwmd.state.fl.us>, Xinjian Chen
	<Xinjian.Chen@swfwmd.state.fl.us>, Sky Notestein
	<Sky.Notestein@swfwmd.state.fl.us>
Subject: RE: NET SGD for Halla River 02310689
Thread-Topic: NET SGD for Halla River 02310689
Thread-Index: AQHVH1EwArBuiIcyo0OPUas3GI/Gc6aWwGsQ
X-MS-Exchange-MessageSentRepresentingType: 1
Date: Tue, 11 Jun 2019 18:13:04 +0000
Message-ID:
<DM6PR09MB39454D643C095D253A1D3E29F0ED0@DM6PR09MB3945.namprd09.prod.outlook.com>
References:
<DM5PR15MB132485C89155202AD19CAA62AC130@DM5PR15MB1324.namprd15.prod.outlook.com>
In-Reply-To:
<DM5PR15MB132485C89155202AD19CAA62AC130@DM5PR15MB1324.namprd15.prod.outlook.com>
Accept-Language: en-US
Content-Language: en-US
X-MS-Has-Attach:
X-MS-TNEF-Correlator:
<DM6PR09MB39454D643C095D253A1D3E29F0ED0@DM6PR09MB3945.namprd09.prod.outlook.com>
MIME-Version: 1.0
```

X-Originating-IP: [204.76.240.236]

X-MS-PublicTrafficType: Email

Return-Path: MFLComments@swfwmd.state.fl.us

X-MS-Office365-Filtering-Correlation-Id: 983f140c-4eba-4479-14fb-08d6ee987312

X-Microsoft-Antispam:
BCL:0;PCL:0;RULEID:(2390118)(7020095)(4652040)(8989299)(4534185)(4627221)(201703031133081)(201702281549075)(8990200)(5600148)(711020)(4605104)(1401327)(2017052603328)(7193020);SRVR:DM6PR09MB3579;

X-MS-TrafficTypeDiagnostic: DM6PR09MB3579:

X-MS-Exchange-PUrlCount: 2

X-Microsoft-Antispam-PRVS:

<DM6PR09MB357958A50CA65647B7F37311D4ED0@DM6PR09MB3579.namprd09.prod.outlook.com>

X-MS-Oob-TLC-OOBClassifiers: OLM:10000;

X-Forefront-PRVS: 006546F32A

X-Forefront-Antispam-Report:

SFV:NSPM;SFS:(10009020)(136003)(396003)(366004)(346002)(39850400004)(376002)(199004)(189003)(13464003)(110136005)(55016002)(9686003)(54896002)(486006)(6306002)(236005)(229853002)(186003)(316002)(476003)(26005)(2906002)(66066001)(11346002)(6436002)(73956011)(33656002)(99286004)(66446008)(446003)(80792005)(52536014)(66556008)(76116006)(66946007)(64756008)(66476007)(7736002)(8936002)(102836004)(81166006)(25786009)(6506007)(45080400002)(72206003)(76176011)(71190400001)(53546011)(8676002)(478600001)(74316002)(81156014)(14454004)(6636002)(790700001)(3846002)(68736007)(6116002)(6246003)(71200400001)(86362001)(74482002)(14444005)(53936002)(7696005)(5024004)(5660300002)(256004);DIR:OUT;SFP:1101;SCL:1;SRVR:DM6PR09MB3579;H:DM6PR09MB3945.namprd09.prod.outlook.com;FPR:;SPF:None;LANG:en;PTR:InfoNoRecords;A:1;MX:1;

Received-SPF: None (protection.outlook.com: swfwmd.state.fl.us does not

designate permitted sender hosts)

X-MS-Exchange-SenderADCheck: 1

X-Microsoft-Antispam-Message-Info:

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Gabe I. Herrick

From: MFLComments
Sent: Tuesday, June 11, 2019 2:13 PM
To: Alan Martyn Johnson; MFLComments; Mark Hammond; Doug Leeper; Xinjian Chen; Sky Notestein
Subject: RE: NET SGD for Halla River 02310689

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352-796-0515 ext. 4275

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Subject: Fwd: NET SGD for Halla River 02310689

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Martyn

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Sent: Friday, May 24, 2019, 2:23 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>,Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
CC: Doug Leeper <doug.leeper@swfwmd.state.fl.us>,"Gabe I. Herrick" <Gabe.Herrick@swfwmd.state.fl.us>

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Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, June 11, 2019 1:59 PM
To: Alan Martyn Johnson; MFLComments; Xinjian Chen
Cc: Doug Leeper; Sky Notestein
Subject: RE: NET SGD for Halla River 02310689
Attachments: NET SGD Halls River 02310689 for May 17, 2019 - xjc.xlsx

Martyn,

Please see attached spreadsheet with Net SGD for the Halls River added.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 24, 2019 9:24 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: NET SGD for Halla River 02310689

In my 5/22 e-mail I asked about the Net SGD for that morning.

I have attached a spreadsheet with the full days data for gage ht, specific conductance and USGS Discharge. I would very much appreciate if the NET SGD column could be completed so I can understand what NET SGD is in actual numbers not just as a concept.

I have provided the gage ht difference and the A value Gabe communicated recently.

This should be an easy task. If you have time a brief explanation of the NET SGD shown in the completed spreadsheet would be useful.

Thanks,
Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, June 11, 2019 8:17 AM
To: MFLComments
Subject: FW: Tuesday Meeting Concerning MFLS for Chassahowitzka

---

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: mr2indy@aol.com <mr2indy@aol.com>
Sent: Monday, June 10, 2019 8:56 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Tuesday Meeting Concerning MFLS for Chassahowitzka

Dr. Herrick,

I wish I could attend the meting in person. I am writing to let you know of my concern for the aquifer in this area. With each year the flow seems to diminish and is affecting the quality of the river. The water is low and the algae is continuing to snuff out the river. We cannot cannot.allow any more pumping from the aquifer. Please listen to the community.

Respectfully,

Mark Retting
8367 S. Miss Maggie Dr.

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, June 11, 2019 8:16 AM
To: MFLComments
Subject: FW: Tuesday Meeting Concerning MFLS for Chassahowitzka

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Betsy Retting <betretting@yahoo.com>
Sent: Monday, June 10, 2019 8:29 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Tuesday Meeting Concerning MFLS for Chassahowitzka

Dr. Herrick,

I am unable to attend the meeting on the 11th but would like to voice my opinion. We have been part of the Chassahowitzka community for 10 years and have witnessed an unprecedented deterioration of the quality and level of the river. We have seen a marked increase of invasive harmful grasses, all the way up to the springs and areas we have never seen them before. The water levels are so low in the river it is often difficult to get our boat out. These changes have gradually worsened over the years, intensifying, progressively from one year to the next. We sincerely hope that NO MORE WATER will be pulled from this fragile and important aquatic system .
Thank you for your time.

Respectfully,

Betsy Retting

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, June 11, 2019 8:16 AM
To: MFLComments
Subject: FW: Chassahowitzka Water Flow Reduction

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Von Sansom <ysansom@verizon.net>
Sent: Monday, June 10, 2019 8:18 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Chassahowitzka Water Flow Reduction

We are opposed to the proposed water flow reduction of the Chassahowitzka River. We enjoy the aquatic and wildlife that live and visit the river.
We have a house on one of the canals in Chassahowitzka Village and will retire there in two years. We have an abundance of different species of fish, turtles, birds, alligators, otters and the occasional manatee and bobcat that frequent our area. It is hard to navigate the river in some areas now because of the water depth. Going out to the Gulf for fisherman and guides is somewhat of a challenge at times now. The local guides rely on this river for their livelihood. We would like to keep the river as natural as possible, not to interrupt the life cycle of the fish and wildlife. It is beautiful here and would like to keep it that way. Reducing the water flow would be detrimental in times of drought. We have not had a lengthy period of drought in a few years, but this cycle will come around again and we do not want to put our rivers and wildlife at risk. Please consider leaving our water flow as it is.

Thank you,
Lewis & Yvonne Sansom
8383 Dixie Ct
Homosassa, FL 34448 (Chassahowitzka)

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, June 10, 2019 4:23 PM
To: MFLComments
Subject: FW: Water Flows for Chassahowitzka and Homosassaa Rivers

---

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Helen Lefave <dutchmaid.28@gmail.com>
Sent: Monday, June 10, 2019 3:12 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Water Flows for Chassahowitzka and Homosassaa Rivers

I am a Citrus County resident and want to voice my opinion on the matter of water flows for the subject rivers. I am in favor of 3% for both rivers with the hope of keeping them at that percent for a set number of years, e.g. ten years. The rivers exist for use by residents, tourists and wild life and we should work to keep them resourceful for all by wise ecology methods such as planning water flows that issue ample water supplies. AND let's try to think not only of today's needs but to look towards the future and hope that our actions for water planning will sustain our rivers for years to come.
Thank you.
Helen A. Lefave
P.O. Box 3251
Homosassa Springs. FL 34447

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, June 10, 2019 1:02 PM
To: MFLComments
Subject: FW: Water withdrawal

Follow Up Flag: Follow up
Flag Status: Flagged

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Lois Moore <gimmymoore4@aol.com>
Sent: Monday, June 10, 2019 12:52 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Fwd: Water withdrawal

Begin forwarded message:

> **From:** Lois Moore <gimmymoore4@aol.com>
> **Date:** June 6, 2019 at 2:17:06 PM EDT
> **To:** Gabe.Herrick@WatterMatters.org
> **Cc:** gimmymoore4@aol.com
> **Subject: Water withdrawal**
>
> Dr. Herrick, I appreciate all your efforts managing our Citrus County waterways. As a full time resident I will take your offer of remarking to the issue of limiting ground and service levels.
>
> Most residents honor the residential regulations on water use, ie, relegating certain days to water lawns,stopping water while brushing teeth, minimum use of flushing toilets, etc. When pumping water out of the aquifer for bottling by a company for the purpose of financial profit was allowed, I questioned the intellect of members of SWFWMD.
> Our water in central Florida is a precious commodity . When it is compromised at low levels, the public safety is at risk. In my opinion, not one drop should be allowed for corporate gains. Not only would we be depleting our water supply but the addition of trucks and annoyances to the community is an important issue to be addressed.
>
> I am currently in the CCU unit of Bayfront hospital and will not be able to attend the meeting on 6/11. I feel so strongly about this issue that I want my voice to be on record among those who feel allowing

more water to be pumped is an idiotic and ludicrous venture.

Thank you....... Lois Moore

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, June 10, 2019 8:50 AM
To: MFLComments
Subject: FW: Chass water flow

Follow Up Flag: Follow up
Flag Status: Flagged

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: travis larsen <funkiepillow555@aim.com>
Sent: Sunday, June 09, 2019 10:39 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Chass water flow

Hello
My name is travis and i live in chassahowitzka.do you have more info on the problems and sollutions you are trying to propose on the river

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, June 10, 2019 8:49 AM
To: MFLComments
Subject: FW: WATER MATTERS

Follow Up Flag: Follow up
Flag Status: Flagged

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: LW <want2sailagain@yahoo.com>
Sent: Saturday, June 08, 2019 3:46 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: WATER MATTERS

Is exactly how I feel. I cannot be at the workshop Tuesday but wanted to express my feelings that you're messing with nature when you allow companies to take water out of our beautiful Springs. The flow is necessary to keep them in the pristine condition that benefits the people that see it and the Aquatic Life that lives there.

I think this is all about money and money is not everything. It can be replaced the Springs cannot

Lorraine willmann homeowner
322 Lilac Lane
Inverness fl34452

[Sent from Yahoo Mail on Android]

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, June 10, 2019 1:56 AM
To: MFLComments; Mark Hammond; Doug Leeper; Xinjian Chen; Gabe I. Herrick; Sky Notestein
Subject: Fwd: NET SGD for Halla River 02310689

Follow Up Flag: Follow up
Flag Status: Flagged

As far as I can see SWFWMD has not answered two very basic, but critical question I asked.
The first is detailed in this copy of my May 24 email.
What is the net Spring Groundwater Discharge for Halls River for one day per the spreadsheet. I find my attempt to complete the spreadsheet provides meaningless net discharge.

The second is;
Area and volume from head springs to USGS 02310700
The second is the very basic question of what is the volume and area used in the LAMFE model from the springs to the location of the USGS have station 02310700 Homosassa R at Homosassa. the LAMFE model presumably must have this as the most basic fact. This fact must be the same for LAMFE 2019 study and the 2012 study. The "special domain" read 'banks of the river have not changed in this time period.
I have asked this question in a number of ways to help understand factually the very significant differences in the output results for salinity between the two models. This point, regarding output from the two models is in the Review Panel's report and has not been answered factually.

I trust you will be in a position to answer these questions at this week's meeting, although a written response would be preferred.

Martyn

-------- Original Message --------
Subject: NET SGD for Halla River 02310689
From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 24, 2019, 2:23 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>,Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
CC: Doug Leeper <doug.leeper@swfwmd.state.fl.us>,"Gabe I. Herrick" <Gabe.Herrick@swfwmd.state.fl.us>

In my 5/22 e-mail I asked about the Net SGD for that morning.

I have attached a spreadsheet with the full days data for gage ht, specific conductance and USGS Discharge. I would very much appreciate if the NET SGD column could be completed so I can understand what NET SGD is in actual numbers not just as a concept.

I have provided the gage ht difference and the A value Gabe communicated recently.

This should be an easy task. If you have time a brief explanation of the NET SGD shown in the completed spreadsheet would be useful.

Thanks,

Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, June 07, 2019 9:01 AM
To: MFLComments
Subject: FW: Water

Follow Up Flag: Follow up
Flag Status: Flagged

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Jill Desmond <jtdesmond23@gmail.com>
Sent: Friday, June 07, 2019 7:30 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Water

Mr. Herrick,
I live in Chassahowitzka and you can bet there will be a lot of my neighbor in attendance at the meeting scheduled for Tuesday.
One of our burning questions is when are you going to finish cleaning out the canals? You know, the man made ones that the county sends a “weeder” through, not really cleaning. It scrapes the muck from the bottom and redistributes it down someone else’s canal.
Ten years ago “they” supposedly cleaned our head spring to bring back the flow but there was never any work done up the canals which contribute immensely to the quality of water in our river.
See you Tuesday,
Jill Desmond
Sent from Mail for Windows 10

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Thursday, June 06, 2019 8:33 AM
To: MFLComments
Subject: FW: Our Waters

Follow Up Flag: Follow up
Flag Status: Flagged

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Pat Holt <aholt10@tampabay.rr.com>
Sent: Thursday, June 06, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Pat Holt <aholt10@tampabay.rr.com>
Subject: Our Waters

Dr. Herrick

I am totally against any additional waters being drawn from our springs and rivers. I have seen the impact of this with the salt intrusion at my home on Price Creek in the last 15 years.
It is a disgrace and it is wrong for you to give our water away to these bottling companies. And for what - so they can pollute our world more with plastic water bottles and raise the fees for us to have our water.
We can barely water our lawns. It is disgraceful. Stop it! Now!
Patricia Holt
11933 W. Timberlane Dr.
Homosassa, Fl. 34448

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Wednesday, June 05, 2019 10:46 AM
To: MFLComments
Subject: FW: Homosassa/Chaz MFL workshop comments

Follow Up Flag: Follow up
Flag Status: Flagged

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Dan <bansheewun2@gmail.com>
Sent: Wednesday, June 05, 2019 10:44 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa/Chaz MFL workshop comments

Mr. Herrick,

There is much that will be said about the proposed amendments to the MFL rule for the subject spring systems and in the main I'll stand back and let the public vent on this matter at the 10 June workshop. With that said, I will offer a few thoughts for consideration.

Please understand my reference horizon regarding the state of Florida's waters goes back to the early 1950s, an era long before the majority of the state's residents came to be. Perhaps it is unfair of me to raise such perspectives, but they are my burden and I am inclined to drop them into your lap nonetheless. My first cogent memory of Florida waters was the view through the bottom of a boat on Silver Springs circa 1951. It left a mark on my soul and it was a vision that future generations will never see. Water resources are the primary driving force and largest contributor to Florida's economic gross product on an annual basis and I'm firmly of the opinion it should be protected vigorously lest the entire state turn into a guacamole engine of biblical proportions. An example is the Suwannee River basin which has the potential to make affairs in south Florida pale in comparison.

1. The state water districts are funded by tax dollars from current constituents within respective boundaries, not future estimates of population. The district's first and foremost responsibility is to those taxpayers who fund district operations.
2. There is no provision within the state constitution which guarantees current or future residents a cheap lifestyle.
3. The cost of remediation of the state's waters is on one hand the result of practices and methodologies from days gone by yet still in use, and which directly led us to the conundrums we face today. Continued reliance on such practices is not a solution, but rather a path to disaster. This view is based on the simple fact that the gross majority of the state's waters are impaired. See Item 2 above.
4. Hostility presented by district constituents is a result of the state of our waters and the perception that the state has not been an effective steward. They do not want band aids, but rather they seek solutions. As example, the Kings Bay

spring system suffers from algal proliferation despite rather low nutrient load concentrations. This is so due to prolonged residence time according to FDEP. Following that determination the SWFWMD rationalized authorization to limit future withdrawals at 11% of flow while estimates by the district put current use at 1-1.5%. Such rulings fly in the face of common sense and suggest several things to the public. A) The District cares not one whit about the health of our waters and B) it only seeks to fuel ever increasing population at any cost. C) It also suggests a serious lack of synergy between state regulatory agencies. See Item 2 above.

5. It is common for district staff to suggest that water quality and quantity (flow) are not directly related but that is not credible in the public eye, nor immune to criticism from a scientific perspective.

6. This is a country of innovation and we frequently create a problem solving path to achieve goals as we have demonstrated repeatedly. Lacking incentive(s) which the district is fully capable of creating, there is little likelihood of innovation when it comes to increased efficiency of use of our water resources. An example would be the implementation of requirements that all waste water treatment systems achieve reuse standards. It works on the International Space Station. Another incentive would be to limit agriculture's deposition of animal waste and fertilizer. The Gates Foundation recently provided significant research funding which led to the discovery that many row crops common in Florida could be prompted to benefit from nitrogen fixing bacteria, thus lowering the need for fertilizer application. https://www.forbes.com/sites/jennysplitter/2018/10/03/pivot-bio-secures-70-million-investment-for-nitrogen-producing-microbes/#63c674383d4b

7. The state's water districts were provided authority to set MFL rules nearly 50 years ago. With an additional boot in the backside they became more active following OFS legislation a very few years ago. It is for reasons such as this that the level of public cynicism regarding this topic is so robust. Increasing the allowable take of both the Homosassa and Chassahowitzka spring systems at a point in time when A) it is not needed according to District data and B) both systems are impaired, is a disconnect the public will never understand or gracefully accept. See Item 2 above.

I'm sure I could go on for several days about this, but I will leave with a couple of final thoughts. I have no intention of sounding disrespectful of district staff in regards to my comments above, they are merely the essence of what I have observed and/or heard during meetings/conferences with peers in the FSC/WAR landscape and district staff. My personal experience over the course of life here in Florida is that what was once a water wonderland has morphed into a wasteland. It is aesthetically disgusting and presents as remarkably detracting from economic success and sustainability. Fishing, boating and diving are all powerful economic undertakings, yet their benefit has been sharply diminished in recent decades. An example would be the collapse of biological productivity within Florida Bay and ongoing demise of coral reefs in the Florida Keys. Attesting to that fact is the dust that gathers on my fishing tackle and the fact that I could not earn today what I did in the late '70s as a commercial fisherman, a quantity that was 2-3 times greater than my earnings as a corporate pilot at the same time. I would not embark on a path today such as I did years ago which led to my expenditure of an estimated quarter million dollars for the purchase of boats, tackle and dive equipment from 1972 thru 2006.

It is a sad state of affairs to be sure, and I ask only this. The district has the power to act as a positive catalyst in remediation of the region's waters, an action that can lead to indefinitely sustainable productivity for benefit of residents and economic enterprise. The recommended increase of allowable take from the subject spring systems is not the path to that goal. We have an enormous availability of surface waters and we can promote innovation. I ask only that the district make it so. The expense of developing such infrastructure will be high no doubt, but it will be cheaper than trying to restore nature's gift. See Item 2 above.

Respectfully,

Dan Hilliard

President
W.A.R., Inc.
Florida Springs Council, Inc.

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 24, 2019 9:24 AM
To: MFLComments; Xinjian Chen
Cc: Doug Leeper; Gabe I. Herrick
Subject: NET SGD for Halla River 02310689
Attachments: NET SGD Halls River 02310689 for May 17, 2019.xlsx

Follow Up Flag: Follow up
Flag Status: Completed

In my 5/22 e-mail I asked about the Net SGD for that morning.

I have attached a spreadsheet with the full days data for gage ht, specific conductance and USGS Discharge. I would very much appreciate if the NET SGD column could be completed so I can understand what NET SGD is in actual numbers not just as a concept.

I have provided the gage ht difference and the A value Gabe communicated recently.

This should be an easy task. If you have time a brief explanation of the NET SGD shown in the completed spreadsheet would be useful.

Thanks,
Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 24, 2019 9:06 AM
To: Gabe I. Herrick
Cc: Doug Leeper; MFLComments; Xinjian Chen
Subject: Re: May 22 responses

Follow Up Flag: Follow up
Flag Status: Completed

1. Let me see if I understand this correctly:
   -For SE Fork 02310688 LAMFE uses NET SGD
   Official A value please, per my earlier request.

   -For Homosassa Springs 02310678 LAMFE uses USGS SGD

   -For Halls River 02310689 LAMFE uses NET SGS

   But,
   the discharge for SE Fork is combined with Homosassa Springs; is that apples and oranges?

   Now,
   What other locations does LAMFE get fed Net SGD?
   -For Homosassa R at Homosassa 02310700 I was informed that no NET SGD is calculated. I agree.

   -For Hidden River 02310675 is there an A value.

   What other locations does LAMFE get fed Net SGD? Or USGS discharge for that matter.

2. The comment in the Peer Review Panels Report regarding the degree of difference between the EFDC and LAMFE Models has not been addressed specifically as far as I can see. Are all the KUDOS about LAMFE a way of saying the EFDC Model was wrong?
   Where are the potential reasons given by staff documented as a full technical evaluation i.e. the large differences in river acres for salinity in terms of facts. You may recall I simplified my request by focusing on the area of river upstream of Homosassa R 02310700.

3. During the teleconference I thought Gabe said discharge measurements were given to the consultant. Sorry, thanks for confirming my understanding of who runs the LAMFE Model.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Wednesday, May 22, 2019 1:33 PM
To: Alan Martyn Johnson

Cc: Doug Leeper; MFLComments
Subject: RE: Today's Teleconference

Martyn,

Answers to your enumerated questions are as follows:

1. Yes, it was discussed that flow records were different based on different needs, and that LAMFE modeling required net SGDs at locations other than at gages.
2. Yes, Steve noted that the current LAMFE model is a significant improvement over the past model and that his comments in the final peer review report will make this clear.
3. Janicki Environmental Inc. did the water quality analysis. The LAMFE modeling of each system was done by District staff.

Thank you for your comments.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, May 22, 2019 12:22 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Today's Teleconference

Gabe,

Not sure if it showed on your screen, but I called back in just after 11:00 as the meeting was concluding. I decided to just hang up as I did not want to be rude and inject a couple of questions as the telecon was finishing.

Here they are;

1. On the flows did the discussion get around to clarifying if any of the flow data is NET SGD, as this is from previous wording what is 'fed' to LAMFE?

2. Has there been a staff response to the comment in the Peer Review Report March 19 page 2-6? Steve's comment about Panels response to the more general (assume that was not tabulated) comments will be forthcoming gave me the impression that there was a staff response to "the degree of difference here is problematic".
   Please clarify.

3. Your response to my request regarding which 'consultant' was provided with the flow data, Janick; left me puzzled. I thought the LAMFE Model was run in-house, not by a consulting firm. Pease clarify.

Overall it appears there is too much confusion/lack of clarity regarding these discharge and quality numbers; for example the combination of Homosassa Springs 02310678 and SE Fork 02310688, I thought it was clear that LAMFE can handle multiple inputs (exemplified by the arrows on the maps). And there is too much hypothesising as opposed to facts.

Still awaiting answers to my recent e-mail questions.

Sorry I had to leave the teleconference, but keeping an appointment with top cardiologist was not worth missing. The news on recent tests was good. His conclusion"see you again in a year" was a relief.

I will be in Europe at the time of the next teleconference, but may try the Skype link.

Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Wednesday, May 22, 2019 1:33 PM
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Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
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352-796-0515 ext. 4275

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To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
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Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Wednesday, May 22, 2019 12:25 PM
To: MFLComments
Subject: FW: Today's Teleconference

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, May 22, 2019 12:22 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Today's Teleconference

Gabe,
Not sure if it showed on your screen, but I called back in just after 11:00 as the meeting was concluding. I decided to just hang up as I did not want to be rude and inject a couple of questions as the telecon was finishing.
Here they are;

1. On the flows did the discussion get around to clarifying if any of the flow data is NET SGD, as this is from previous wording what is 'fed' to LAMFE?

2. Has there been a staff response to the comment in the Peer Review Report March 19 page 2-6? Steve's comment about Panels response to the more general (assume that was not tabulated) comments will be forthcoming gave me the impression that there was a staff response to "the degree of difference here is problematic".
   Please clarify.

3. Your response to my request regarding which 'consultant' was provided with the flow data, Janick; left me puzzled. I thought the LAMFE Model was run in-house, not by a consulting firm. Pease clarify.

Overall it appears there is too much confusion/lack of clarity regarding these discharge and quality numbers; for example the combination of Homosassa Springs 02310678 and SE Fork 02310688, I thought it was clear that LAMFE can handle multiple inputs (exemplified by the arrows on the maps). And there is too much hypothesising as opposed to facts.

Still awaiting answers to my recent e-mail questions.

Sorry I had to leave the teleconference, but keeping an appointment with top cardiologist was not worth missing. The news on recent tests was good. His conclusion"see you again in a year" was a relief.

I will be in Europe at the time of the next teleconference, but may try the Skype link.

Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, May 21, 2019 2:46 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper; Xinjian Chen; Sky Notestein
Subject: RE: What WAS/IS Homosassa SE Fork 02310688 Salinity LAMFE feed?

Martyn,

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comment has been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 17, 2019 9:38 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: What WAS/IS Homosassa SE Fork 02310688 Salinity LAMFE feed?

In my e-mail yesterday I referred to Figure 2-25 in the January Report, but did not ask if this should have been updated, as it appears the LAMFE model now is fed with USGS salinity data from the SE Fork that is modified by mathematical 'adjustment' per the following:
Quote from App 6, April 2019 Chen.
Net SGDs were added to the model domain at the most upstream grids of the main stem and branches of the estuarine system, instead of at the stations where discharges were measured or estimated. Orange arrows in Figure 14 indicate locations where SGDs enter the model domain.
Because no direct measurements of salinity in the spring vents were available for this modeling study, salinity in SGD was an unknown and needed to be reasonably estimated. This study used a trial and error approach to estimate salinities in all the SGDs. Based on measured
salinity at the SE Fork Homosassa Spring station, the Homosassa Springs at Homosassa Springs station, and the Halls River at Homosassa Springs station, a large number of salinity estimates were tested in model runs. After a careful analysis of simulated salinity results for all salinity
estimates for SGDs, it was found that it is suitable to use measured salinity at the Homosassa **Springs at Homosassa Spring for the Homosassa Main SGD and measured salinity at the Halls River at Homosassa Springs station for the Halls River SGD. For the SE Fork, the best SGD salinity estimate takes the following form**

/1.05,0.3 (4)

where represents measured salinity at the SE Fork Homosassa Spring station and is the estimated salinity in SGD entering the SE Fork.

Unquote

Sorry the mathematical formula does not copy. This is copied from page 28 of the Revised Draft April 2019 Appendix 6.

Side note: Are the 'no highlight SGS' SWFWMD Net SGD or USGS Discharge?

Take a look at page 28 and read to the bottom. Looks like the LAMFE Model wants the spring temperatures mathematically processed!!!!

Is there a modified Figure 2-25? Certainly not according to Figure 2-25 page 43 of the April Peer Review Response Draft.

ON A POSITIVE NOTE, I SHOULD RECOGNIZE THIS MATHEMATICAL PROCESSING OF SALINITY FOR THE SE FORK IS PARTIAL RECOGNITION THERE IS A QUESTION ABOUT THE SPIKES.

Ask me about a low cost way of demonstrating the 'Spikes' are due to eddie current.....if you are interested, but may be these mathematical and trial and error methods are superior to the actual measured data.

Martyn

P.S.

I almost forgot the Discharge for USGS 02130689 is now moved to the Halls River Head spring location...best I can read Figure 14.... So where does this mornings negative discharge of 130 to 140 cfs now go? Or are we considering Net SGS and, if so, what is that at 02:00 to 04:00 this morning?

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, May 21, 2019 2:45 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper; Xinjian Chen; Sky Notestein
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comment has been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, May 15, 2019 9:25 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

I often wonder who writes some of this stuff. Let me mention just a few as I do not have much time to spend on it this week.

1. Figure 7-1 is certainly in the old MFL, but details that this data was used to AMEND.....Run Control Find.
   Oh Sky, did you do that per our conversation.

2. I think these data are figures based on one meter depth for the manatee criteria, not for salinity.

3. The SE Fork area in the 2019 App C for less than 1 psu was about 5 acres (sorry but not wasting the time looking for the exact figure) with about 1+ acres downstream of the USGS Station (per recent e-mail).

4. The A Value for your NET SGD; Does it match the 13441 meters square (3.32 acres)? Do not recall your sharing the actual figure you use; I think I recall correctly you gave me Halls River and Chass.

5. Even if we add this 7.2 acres to the acreage differences previously mentioned it does not explain the "very significant difference of 2012 to 2019" previously detailed.

6. I have read/scanned the revised Appendix C and the inclusion of some sections of the April 15 Salinity SGD document by Dr Chen. Some parts of that 15 page salinity SGD document demonstrate a serious physical knowledge and detailed review of USGS data relating to the SE Fork and Chassahowitzka; let alone the influence of Hurricanes such as Colin, Erika and Hermine.

   Specifically:
   ---The clarity of which figures are NET SGD (SWFWMD calculation) and USGS Discharge remains a concern.

   ---Look at how/when Weeki Wachee well level went to over 20 feet in August 2015 and how that changes/distort the discharge for Homosassa Springs 02310678.

   ---Look at how high salinity resulting from hurricane storm surge reaches these upstream stations. Salinity of around 20,000 specific conductance influence the scatter plots.
   Some deep recollection of not including data at ends of the bell curve come to mind.
   HURRICANES I THINK ARE MAJOR INFLUENCES ON THE RIVERS HEALTH.

   ---Look at the increases in salinity as **discharge reverses** at the Chassahowitzka Station
   Crab Creek discharge is around 8000 at the spring and has confluence immediately downstream of the gage station. Making the increased salinity the logical result of Crab Creek water entering the upstream area.
   Chassahowitzka Main has low discharge and higher salinity compared to the Seven Sisters Spring which has lower specific conductance. The Seven Sisters water accumulates in the upstream canal system during the rising tide (WHAT OTHER SOURCE OF WATER FILLS THESE 7+ ACRES OF CANALS) and is then released as the tide drops resulting in the lower salinity water being seen at the gage station. Note where the less than 1500-1800 are compared to the 4000+ in the tidal/flow cycle.

Just very disappointed with the lack of logic and understanding.

Try a close look at the USGS data for the SE Fork for the time period you used in the Jan 17 2019 Draft Peer Review Report, Figure 2-25. How did all that higher salinity water hang around against continuous discharge. Again as mentioned above WHAT SOURCE OF WATER FILLS THIS WATER BODY
Beyond amazing!

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, May 13, 2019 10:03 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

The total area, volume, and shoreline of the most upstream portions of the river did not change in magnitude from 2012 to 2019. However, the portions of the river included in the hydrodynamic models used did change. The models do not predict changes to the river outside of their boundaries. A major limitation of the 2012 EFDC modeling application was that the model boundary did not include some of the freshwater habitat at the most upstream reach of the river. Figure 7-1 of 2012 report (copied below) shows areas not included in the 2012 EFDC application outlined in red. Tables 5-20, 5-

21, and 5-22 in 2012 report show EFDC modeled values that do not include the upstream portions of the river shown in red in figure 7-1. This is all described in the 2012 report. See also section 5.3.3 of the 2012 report. See also page 190, section 7.3.1 of the 2012 report. The EFDC application results were inadequate to set minimum flows based on the lowest salinity habitats due to the limited spatial domain and period of record (2007 was a dry year). The recent LAMFE modeling application does not suffer from these limitations (see figure 14, copied below, from 2019 hydrodynamic modeling appendix). The 2019 application of the LAMFE model has a 10-year period of record and its boundaries include freshwater habitats excluded by the 2012 EFDC application.

Thank you for your comments.

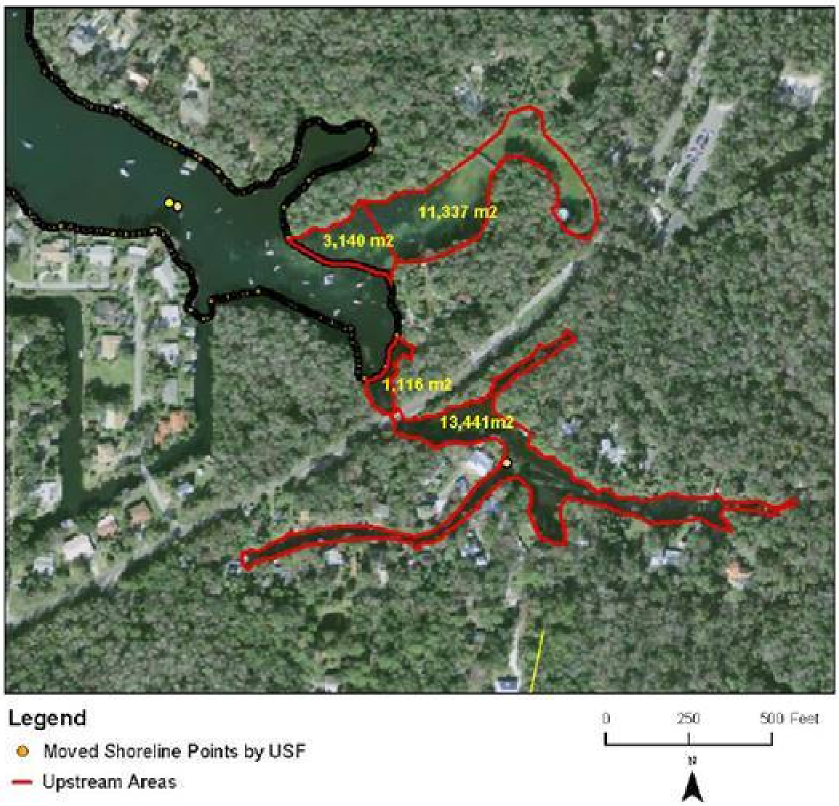

Figure 7-1. Upper areas of the Homosassa River and Southeast Fork Homosassa River that were not included in bathymetric data presented in Figures 2-30, 2-32 and 2-33.

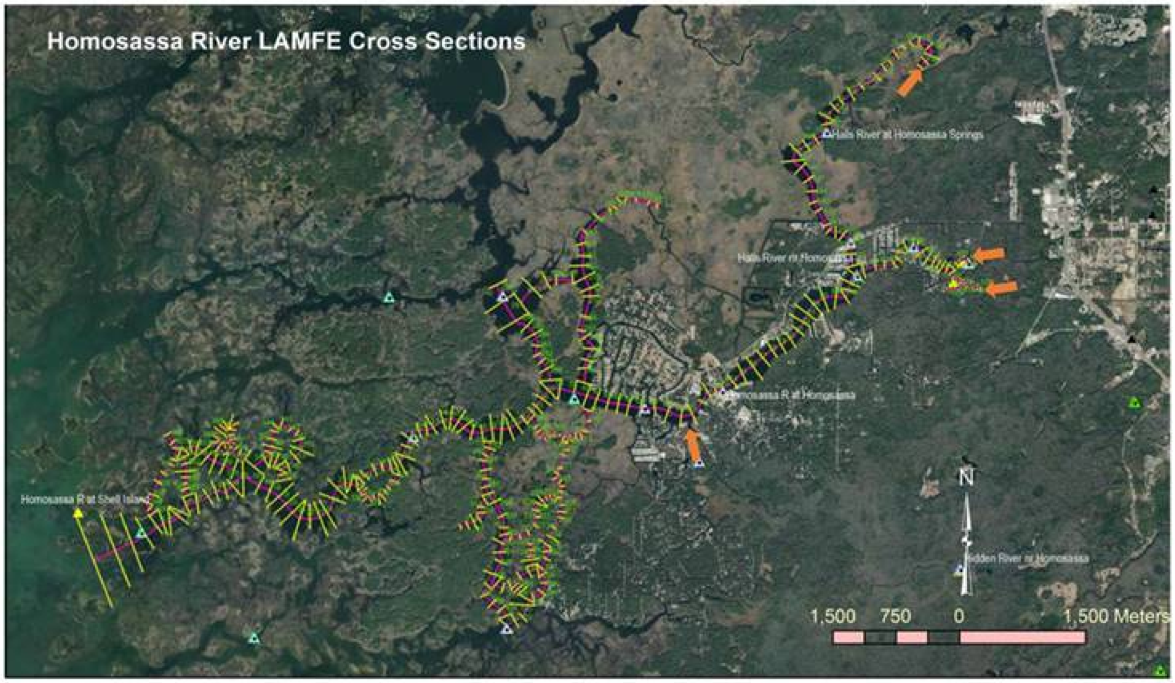

Figure 14. Cross sections (yellow segments) that form the LAMFE grids for the Homosassa River and its branches. Numbers in green are grid numbers in the longitudinal direction. Orange arrows are locations where SGDs enter the model domain.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, May 06, 2019 9:55 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Sorry, but that is not an explanation. Different how?....with emphasis on the river upstream of USGS 02310700 Homosassa R at Homosassa.

Remember I am not asking if the 2012 Report is more or less accurate, but why such a big difference. THE BANKS OF THE RIVER UPSTREAM OF MACRAE'S/HOMOSASSA R at HOMOSASSA 02310700 ARE THE SAME, NOT DIFFERENT.

I am getting a growing impression/concern the outputs from simulation in the LAMFE Model are flawed.

So in the interest of dispelling my potentially incorrect impression, let me put the question a different way; **forget salinity**.

WHAT IS THE AREA OF THE HOMOSASSA RIVER FROM HOMOSASSA R at HOMOSASSA 02310700 TO THE MAIN SPRINGS GAGE STATION 02310678, including how/when this was determined.

Specify the area by river kilometer if it is easier.

Wang is the only bathymetry study I am aware of. In that study SE Fork and most of Halls River were excluded (from memory, only first 2 km of Halls River main channel mapped).

Martyn

P.S. What is different from 2012 is, the river continues its slow death. Per Mark Hammond's own words on a boat trip about 2011 'this river is dead'.
Continued evidence of decline;
SAV much reduced (essential food for manatee and health of the river).
Increasing nitrate/nitrite in spring water and a trend of increasing salinity (seawater ingress) into the springs as indicated quantitatively from water sampling data.

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Thursday, May 2, 2019 9:24 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

The boundaries on the areas included in the 2012 model and the 2019 model are different.

Thank you for your comments.

Gabe Herrick, PhD
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7601 U.S. Highway 301 North
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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:21 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

I can only say that if you repeat yourself enough times you will eventually believe it.

I am not yet believing this explanation...What spacial domain are you referencing?
Agreed the dates are different, but the river and discharges are the same.

This answer/explanation does not address the area and volumes in the upper reaches of the river.
The physical banks are the same.
The discharges from 02310678 and 02310688 are the same.
So why is the area/volume for waters less than 3 psu so different.
If you do not understand the question relating to the difference 47 acres v 179 acres, please say so.

A map showing the 179 acres may help!

Martyn
More about snook as I get time later this week.

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:21 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

The application of the EFDC to the Homosassa River system in 2012 and the application of the LAMFE to the system in 2019 have different spatial domains and periods of record. These account for the differences in quantity of salinity-based habitats under baseline flow scenarios in, for example, Table 5-17 of the 2012 report and Table 9 of the initial hydrodynamic modeling report.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 23, 2019 8:49 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Please share/alert as appropriate.

In the 2012 Homosassa MFL Report the reported baseline area of water less than or equal to 3 psu was 164680 sq m (40.7 acres)' in the 2019 Draft the reported figure is 727974 sq m (179 acres). Water of 3 psu or less is confined to the upper reaches of the Homosassa (essentially close to and upstream of the Halls River confluence).
Big difference is an under statement. Explanation?

In the 2019 Draft Report a number of different SGD are used. Which one will be for reduced discharge in 40D-8.041 and which one is for LAMFE modeling.

Read on and I will detail my concern.

As some of you may be aware about a month ago I suggested that a comparison of Volume, Area and Shoreline presented in the 2019 Draft Homosassa MFL report and the 2012 Homosassa MFL reports should be undertaken because there are significant differences.

Attached is simple spread sheet with the key data for the well defined section of Homosassa River upstream of USGS 02310700/MacRaes/RKm 9 or however you want to define it. This section is a primary section of the river with most waters of salinity less than or equal to 5 psu and all salinities less than or equal to 3 psu.

I hope I have extracted the data accurately from the reports, my only editor/proofreader is myself. Data from the 2012 report is from the hydrodynamic modeling not the regression.

--

My e-mail about a month ago was essentially two part:

Quote

Model Output Volume Area Shoreline

I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

End Quote

The response was

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Not clear what this answer means regarding the first part as both efforts were/are to address what happens as discharge from the springs is reduced. How is the river different in terms of volumes, area and shoreline?

Certainly the area considered in the LAMFE Model is expanded towards the Gulf as depicted in Appendix 6 Figure 20, along with the commentary that reduction in spring discharge will have ***"very insignificant effect on salinity increase there."***

The second point (highlighted yellow) is why are all the scenarios showing decreases? Appendix 6 Tables 9, 10, 11
It appears logical that tidal forces will move seawater towards the springs (replacing the 'lost' spring discharge). At some point this must increase the salinity in some zones even though salinity segments (1 or 2 psu) are large compared to the gradual changes in the river. Presumably when simulations reach 30% reduction, the loss of 60+ cfs must allow more high salinity water past Gage Station 02310700 thus maintaining the same total volume/area/shoreline in that part of the river.

With the implied accuracy of the model (eg to predict shorelines down to 41 meters in 68 km for <15 psu from existing to 2.5% discharge reduction Table 5-11 Appendix 6) there should be the ability see the seawater 'replacement' of a 30% discharge reduction.

Sorry, but I do not buy this accuracy, or that all these modeled scenarios result in reductions. Tidal force must have an effect as hinted at in the commentary ***"very insignificant effect on salinity increase there."*** Note increase.

Additionally, spring discharge of differing quality appear to be combine/added not considered as individual feeds of different salinities.

I think we may all agree the section of the river upstream of USGS Gage Station 02310700 is:

- **The same for both reports/modeling**
- **Well defined with essentially vertical banks (other than Halls River which is primarily above 3psu). No beaches/mud flats/sand bars are exposed during normal tidal changes at present. These tidal changes represent the equivalent of over 15% discharge reduction from high to low tides and are strong factual indicators of average reductions (other than water depth) modeled in the scenarios and presented in the output Tables.**
- **The section of the river most influenced by changes (reductions) in spring discharge.**

For clarity the 2012 report qualifies the shoreline as natural shoreline as defined;
2.7 page 73 (2012 Report), ***so cannot be compared to shoreline in the 2019 Draft Report, although the 2019 report does present percentage changes to the altered and natural shoreline in Tables 15 and 16. Percent of the shoreline categorizations appear to have derived from Wang data in 2012 Report.***

2012 Quote
All surveyed shorelines were classified as natural, i.e., naturally vegetated or altered, with altered shorelines including areas of rip-rap, seawall, a combination of rip-rap and seawall and maintained or modified lands. Maintained shorelines include lawns and maintained landscaping. Modified shorelines were those with relatively natural vegetation that has been previously modified.

Natural vegetation occurs along approximately 71 percent of the combined 62,529 m shoreline mapped for the Halls River, Homosassa River and Southeast Fork of the Homosassa Rivers (Figure 2-35, Table 2-6). Most of Halls River upstream from the Halls River Road Bridge is naturally vegetated, including upstream areas that were not mapped or surveyed by PBS&J. Unaltered or natural shoreline is similarly dominant in the Homosassa River downstream from the Homosassa Community near river kilometer 7.2.
Unquote

The next point in need of clarification is:

WHAT SPRING DISCHARGE IS THE BASIS FOR THE SIMULATED REDUCTIONS? (eg 5% of what)

I would venture to suggest the 2012 report used the USGS discharge and did not include the speculative discharge of 100 cfs from Halls River.
For the 2019 Draft Report there are numerous discharges to consider;

- USGS data from the gage stations 02310678, 02310688, 02310689 (two of which have tidally filtered data).

- Daily Mean discharges as presented in Table 2-3B of the 2019 Draft Peer Review Report
- Discharge data from the three Gage Stations above, but with the SE Fork modified to represent the supposed 15 cfs lower discharge detailed in the report (Equation 6).
- Discharge data from the three Gage Stations above modified using the net discharge calculation (Equation 3)

The last one may be the most likely as from Appendix 6 page 26 ******See also my P.S.******

Quote

It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

End quote.

Which raises the question of which discharge was this equation/formula applied to; 15 minute data, daily data, tidally filtered data, lunar cycle data? (Note; it is unclear where Homosassa Springs 02310688 net discharge data is derived from, or how.).

Before, I get too far into the weeds let me get back to model output particularly for the section of the river upstream of Homosassa R 02310700.

The attached simple spreadsheet compares the 2012 hydrodynamic model output with LAMFE output.

As you look at the output data consider the typical specific conductance (psu) at each of the Gage Stations

Homosassa R at Homosassa 02310700 5000-9000 Spec C or 2.7 to 5 psu

Homosassa Spring at Homosassa 02310678 3000-4000 SpecC or 1.7 to 2.5 psu

South East Fork 02310688 1000 Spec C or 0.5 psu

Halls River 02310689 6000-9000 Spec C or 3 to 4.8 psu

Therefore:

1. All equal or less than 3 psu water is in the section of river from Rkm 9 to 13.
2. No equal or less than 3 psu is in Halls River
3. Some of the equal or less than 5 psu water is in the Halls River
4. Some of the equal or less than 5 psu is above RKm 9 and some is just downstream of RKM 9.

Unfortunately for some reason equal or less than 4 psu is omitted. This is a critical salinity zone in the river and possibly the one most difficult to model as the only data which could be used to section and calibrate this salinity zone is the old Halls River Gage Station 02310690 where Mean daily specific conductance is 4000 to 6000 Maximums are 6000 to 9000 and Minimums 3000 to 4000.

There is a lot to consider and explain;

Why so much difference in the data sets for the same river.
Where is all this area which LAMFE presents with no referenced bathymetry data source such as Wang in 2012 report. The only means I have of assessing the square meters (converted to acres) is by Google Earth and the Citrus County property maps which do give similar areas but are different to LAMFE's significantly larger numbers.

Put pretty simply, these differences influence the credibility of the reports, or maybe I am just confused.

Martyn

******See also my P.S.******

P.S. Somehow there appears to be a question about which flow are used in the simulations.
The Executive Summary Page X
Quote
Simulations of reduced flows were based on gaged flows at the United States Geological Survey (USGS) gaging stations Homosassa Springs at Homosassa Springs, FL (No. 02310678) and SE Fork Homosassa Spring at Homosassa Springs, FL (No. 02310688). The long-term average combined flow for all "approved" daily data from October 1, 2000 to October 12, 2017 at these gages was 146 cubic feet per second (cfs). Adjusted for withdrawal impacts of 1.9 percent, the long-term unimpacted flows would average 149 cfs, and minimum flows, corresponding to 95 percent of the unimpacted flow, would average 141 cfs over the same time period.
End Quote

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 17, 2019 9:38 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick; Xinjian Chen; Sky Notestein
Subject: What WAS/IS Homosassa SE Fork 02310688 Salinity LAMFE feed?

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salinity at the SE Fork Homosassa Spring station, the Homosassa Springs at Homosassa Springs station, and the Halls River at Homosassa Springs station, a large number of salinity estimates were tested in model runs. After a careful analysis of simulated salinity results for all salinity
estimates for SGDs, it was found that it is suitable to use measured salinity at the Homosassa **Springs at Homosassa Spring for the Homosassa Main SGD and measured salinity at the Halls River at Homosassa Springs station for the Halls River SGD. For the SE Fork, the best SGD salinity estimate takes the following form**

/1.05,0.3 (4)

where represents measured salinity at the SE Fork Homosassa Spring station and is the estimated salinity in SGD entering the SE Fork.
Unquote
Sorry the mathematical formula does not copy. This is copied from page 28 of the Revised Draft April 2019 Appendix 6.
Side note: Are the 'no highlight SGS' SWFWMD Net SGD or USGS Discharge?

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ON A POSITIVE NOTE, I SHOULD RECOGNIZE THIS MATHEMATICAL PROCESSING OF SALINITY FOR THE SE FORK IS PARTIAL RECOGNITION THERE IS A QUESTION ABOUT THE SPIKES.

Ask me about a low cost way of demonstrating the 'Spikes' are due to eddie current.....if you are interested, but may be these mathematical and trial and error methods are superior to the actual measured data.

Martyn
P.S.
I almost forgot the Discharge for USGS 02130689 is now moved to the Halls River Head spring location...best I can read Figure 14.... So where does this mornings negative discharge of 130 to 140 cfs now go? Or are we considering Net SGS and, if so, what is that at 02:00 to 04:00 this morning?

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, May 15, 2019 9:30 AM
To: Gabe I. Herrick; MFLComments; Sky Notestein; frank.gorgano@swfwmd.state.fl.us
Cc: Doug Leeper; Frank Gargano
Subject: Re: Note to File Audience Input?question Homosassa River Alliance 5/09/2019

Gabe,
Thanks I found it last Thursday.

Have not yet found all the changes or the area for snook habitat in terms of acres and location.

Saw some changes as per last e-mail.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, May 13, 2019 11:39 AM
To: Alan Martyn Johnson; MFLComments; Sky Notestein; frank.gorgano@swfwmd.state.fl.us
Cc: Doug Leeper; Frank Gargano
Subject: RE: Note to File Audience Input?question Homosassa River Alliance 5/09/2019

Martyn,

Revised hydrodynamic modeling reports have been linked to in the Web Forum for the peer review process.

Thank you for your comments.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 10, 2019 9:17 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; frank.gorgano@swfwmd.state.fl.us
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Note to File Audience Input?question Homosassa River Alliance 5/09/2019

Just a quick note regarding a couple of things from yesterday evening's meeting.

1. Audience Reaction re the slide that presented the flow reductions that result in harm for both Chassahowitzka and Homosassa with the 2013 and 2019. The salinity numbers for Homosassa of 3% for 2013 and 11% for 2019 was questioned along the lines of 'how can this be'. Specific question came from the left hand table as seen by the presenter. The response was along the line 'the models are different' to which someone from the back of the room pointed out 'but the Chassahowitzk number went down; presumably with reference to the 8% for 2019.

   I have expressed this same concern in reference to the Homosassa including the specific acreage data from the report. After the meeting I shared with Sky this concern and added the concern expressed in the Peer Review of March 2019 page 2-6 (quote copied below for ease of reference.

   Sky informed me that Dr. Chen has rewritten the report which may answer the concern. Apparently this rewrite does not change the numbers or the slide would likely have been updated.
   Sorry, I am going to be lazy...where is the rewrite posted?

2. As I pointed out to Sky, my detailed comments/questions are to try to help.
   Gabe, Sorry I did not include you in the discussion it was certainly not intentional, but you have heard my comments before.

On a second point for Gabe, your explanation of the 15% harm concept was the best articulated I have heard in some time, if ever. The concept in my opinion was spot on...polish the presentation of the concept/idea for future use. The basics are there idea started with presumably an environmental scientist (you did give a name) who was trying to address if he could with reasonable degree of certainty say if a water body had changed. His thought was that unless he could see a 15% change he could not state with reasonable certainty a change had occurred. You went on to explain that for different parameters that 15% may vary some but to remain consistent the 15% has been adopted as a standard and applied across the board.

Good job your explanation made logical sense. Polish it.

Martyn

From Peer Review report March 2019 page 2-6
In the previous MFL developed for the Homosassa River/Homosassa Springs Group, the MFL reductions were driven by changes in salinity habitats as simulated by the EFDC hydrodynamic model (SWFWMD, 2012). The allowable reduction was 3%. In the present analyses, the hydrodynamic modeling for the same habitat type (salinity) allowed for an 11% reduction. **The differences between the previous salinity habitat assessment**

and the present one are significant. While there are differences in model results that do occur, the degree of difference here is problematic indicating that one of the two models did not accurately simulate the salinity changes. During questioning on this aspect by the Peer Review Panel, District staff provided some potential reasons for these differences and Panel members noted that the explanations had merit. But given the differences in the analyses and their importance to the setting of the previous MFL, the District needs to provide a full technical evaluation of the differences and why the LAMFE model is more accurate.

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, May 15, 2019 9:25 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick; Xinjian Chen; Sky Notestein
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

I often wonder who writes some of this stuff. Let me mention just a few as I do not have much time to spend on it this week.

1. Figure 7-1 is certainly in the old MFL, but details that this data was used to AMEND.....Run Control Find.
   Oh Sky, did you do that per our conversation.

2. I think these data are figures based on one meter depth for the manatee criteria, not for salinity.

3. The SE Fork area in the 2019 App C for less than 1 psu was about 5 acres (sorry but not wasting the time looking for the exact figure) with about 1+ acres downstream of the USGS Station (per recent e-mail).

4. The A Value for your NET SGD; Does it match the 13441 meters square (3.32 acres)? Do not recall your sharing the actual figure you use; I think I recall correctly you gave me Halls River and Chass.

5. Even if we add this 7.2 acres to the acreage differences previously mentioned it does not explain the "very significant difference of 2012 to 2019" previously detailed.

6. I have read/scanned the revised Appendix C and the inclusion of some sections of the April 15 Salinity SGD document by Dr Chen. Some parts of that 15 page salinity SGD document demonstrate a serious physical knowledge and detailed review of USGS data relating to the SE Fork and Chassahowitzka; let alone the influence of Hurricanes such as Colin, Erika and Hermine.

   Specifically:
   ---The clarity of which figures are NET SGD (SWFWMD calculation) and USGS Discharge remains a concern.

   ---Look at how/when Weeki Wachee well level went to over 20 feet in August 2015 and how that changes/distort the discharge for Homosassa Springs 02310678.

   ---Look at how high salinity resulting from hurricane storm surge reaches these upstream stations. Salinity of around 20,000 specific conductance influence the scatter plots.
   Some deep recollection of not including data at ends of the bell curve come to mind.
   HURRICANES I THINK ARE MAJOR INFLUENCES ON THE RIVERS HEALTH.

   ---Look at the increases in salinity as **discharge reverses** at the Chassahowitzka Station
   Crab Creek discharge is around 8000 at the spring and has confluence immediately downstream of the gage station. Making the increased salinity the logical result of Crab Creek water entering the upstream area.

Chassahowitzka Main has low discharge and higher salinity compared to the Seven Sisters Spring which has lower specific conductance. The Seven Sisters water accumulates in the upstream canal system during the rising tide (WHAT OTHER SOURCE OF WATER FILLS THESE 7+ ACRES OF CANALS) and is then released as the tide drops resulting in the lower salinity water being seen at the gage station. Note where the less than 1500-1800 are compared to the 4000+ in the tidal/flow cycle.

Just very disappointed with the lack of logic and understanding.

Try a close look at the USGS data for the SE Fork for the time period you used in the Jan 17 2019 Draft Peer Review Report, Figure 2-25. How did all that higher salinity water hang around against continuous discharge. Again as mentioned above WHAT SOURCE OF WATER FILLS THIS WATER BODY
Beyond amazing!

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, May 13, 2019 10:03 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

The total area, volume, and shoreline of the most upstream portions of the river did not change in magnitude from 2012 to 2019. However, the portions of the river included in the hydrodynamic models used did change. The models do not predict changes to the river outside of their boundaries. A major limitation of the 2012 EFDC modeling application was that the model boundary did not include some of the freshwater habitat at the most upstream reach of the river. Figure 7-1 of 2012 report (copied below) shows areas not included in the 2012 EFDC application outlined in red. Tables 5-20, 5-21, and 5-22 in 2012 report show EFDC modeled values that do not include the upstream portions of the river shown in red in figure 7-1. This is all described in the 2012 report. See also section 5.3.3 of the 2012 report. See also page 190, section 7.3.1 of the 2012 report. The EFDC application results were inadequate to set minimum flows based on the lowest salinity habitats due to the limited spatial domain and period of record (2007 was a dry year). The recent LAMFE modeling application does not suffer from these limitations (see figure 14, copied below, from 2019 hydrodynamic modeling appendix). The 2019 application of the LAMFE model has a 10-year period of record and its boundaries include freshwater habitats excluded by the 2012 EFDC application.

Thank you for your comments.

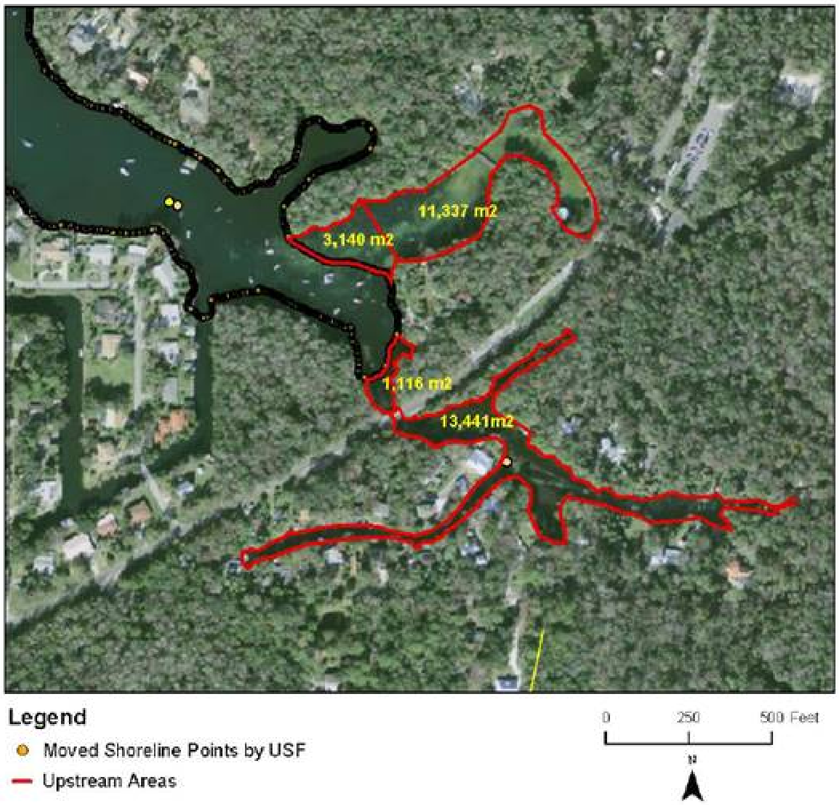

Figure 7-1. Upper areas of the Homosassa River and Southeast Fork Homosassa River that were not included in bathymetric data presented in Figures 2-30, 2-32 and 2-33.

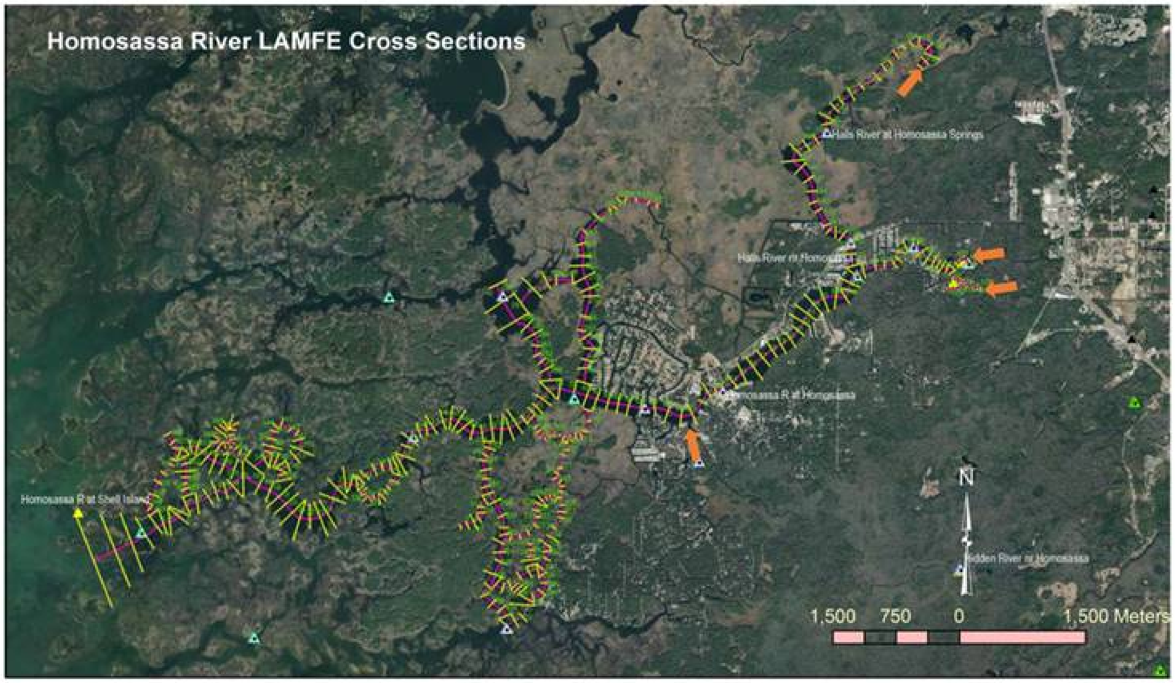

Figure 14. Cross sections (yellow segments) that form the LAMFE grids for the Homosassa River and its branches. Numbers in green are grid numbers in the longitudinal direction. Orange arrows are locations where SGDs enter the model domain.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, May 06, 2019 9:55 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Sorry, but that is not an explanation. Different how?....with emphasis on the river upstream of USGS 02310700 Homosassa R at Homosassa.

Remember I am not asking if the 2012 Report is more or less accurate, but why such a big difference. THE BANKS OF THE RIVER UPSTREAM OF MACRAE'S/HOMOSASSA R at HOMOSASSA 02310700 ARE THE SAME, NOT DIFFERENT.

I am getting a growing impression/concern the outputs from simulation in the LAMFE Model are flawed.

So in the interest of dispelling my potentially incorrect impression, let me put the question a different way; **forget salinity**.

WHAT IS THE AREA OF THE HOMOSASSA RIVER FROM HOMOSASSA R at HOMOSASSA 02310700 TO THE MAIN SPRINGS GAGE STATION 02310678, including how/when this was determined.

Specify the area by river kilometer if it is easier.

Wang is the only bathymetry study I am aware of. In that study SE Fork and most of Halls River were excluded (from memory, only first 2 km of Halls River main channel mapped).

Martyn

P.S. What is different from 2012 is, the river continues its slow death. Per Mark Hammond's own words on a boat trip about 2011 'this river is dead'.
Continued evidence of decline;
SAV much reduced (essential food for manatee and health of the river).
Increasing nitrate/nitrite in spring water and a trend of increasing salinity (seawater ingress) into the springs as indicated quantitatively from water sampling data.

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Thursday, May 2, 2019 9:24 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

The boundaries on the areas included in the 2012 model and the 2019 model are different.

Thank you for your comments.

Gabe Herrick, PhD
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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:21 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

I can only say that if you repeat yourself enough times you will eventually believe it.

I am not yet believing this explanation...What spacial domain are you referencing?
Agreed the dates are different, but the river and discharges are the same.

This answer/explanation does not address the area and volumes in the upper reaches of the river.
The physical banks are the same.
The discharges from 02310678 and 02310688 are the same.
So why is the area/volume for waters less than 3 psu so different.
If you do not understand the question relating to the difference 47 acres v 179 acres, please say so.

A map showing the 179 acres may help!

Martyn
More about snook as I get time later this week.

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:21 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

The application of the EFDC to the Homosassa River system in 2012 and the application of the LAMFE to the system in 2019 have different spatial domains and periods of record. These account for the differences in quantity of salinity-based habitats under baseline flow scenarios in, for example, Table 5-17 of the 2012 report and Table 9 of the initial hydrodynamic modeling report.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

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Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 23, 2019 8:49 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Please share/alert as appropriate.

In the 2012 Homosassa MFL Report the reported baseline area of water less than or equal to 3 psu was 164680 sq m (40.7 acres)' in the 2019 Draft the reported figure is 727974 sq m (179 acres). Water of 3 psu or less is confined to the upper reaches of the Homosassa (essentially close to and upstream of the Halls River confluence).
Big difference is an under statement. Explanation?

In the 2019 Draft Report a number of different SGD are used. Which one will be for reduced discharge in 40D-8.041 and which one is for LAMFE modeling.

Read on and I will detail my concern.

As some of you may be aware about a month ago I suggested that a comparison of Volume, Area and Shoreline presented in the 2019 Draft Homosassa MFL report and the 2012 Homosassa MFL reports should be undertaken because there are significant differences.
Attached is simple spread sheet with the key data for the well defined section of Homosassa River upstream of USGS 02310700/MacRaes/RKm 9 or however you want to define it. This section is a primary section of the river with most waters of salinity less than or equal to 5 psu and all salinities less than or equal to 3 psu.
I hope I have extracted the data accurately from the reports, my only editor/proofreader is myself. Data from the 2012 report is from the hydrodynamic modeling not the regression.

My e-mail about a month ago was essentially two part:

Quote
Model Output Volume Area Shoreline
I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.
End Quote
The response was
I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.
Not clear what this answer means regarding the first part as both efforts were/are to address what happens as discharge from the springs is reduced. How is the river different in terms of volumes, area and shoreline?

Certainly the area considered in the LAMFE Model is expanded towards the Gulf as depicted in Appendix 6 Figure 20, along with the commentary that reduction in spring discharge will have ***"very insignificant effect on salinity increase there."***

The second point (highlighted yellow) is why are all the scenarios showing decreases? Appendix 6 Tables 9, 10, 11
It appears logical that tidal forces will move seawater towards the springs (replacing the 'lost' spring discharge). At some point this must increase the salinity in some zones even though salinity segments (1 or 2 psu) are large compared to the gradual changes in the river. Presumably when simulations reach 30% reduction, the loss of 60+ cfs must allow more high salinity water past Gage Station 02310700 thus maintaining the same total volume/area/shoreline in that part of the river.

With the implied accuracy of the model (eg to predict shorelines down to 41 meters in 68 km for <15 psu from existing to 2.5% discharge reduction Table 5-11 Appendix 6) there should be the ability see the seawater 'replacement' of a 30% discharge reduction.

Sorry, but I do not buy this accuracy, or that all these modeled scenarios result in reductions. Tidal force must have an effect as hinted at in the commentary ***"very insignificant effect on salinity increase there."*** Note increase.

Additionally, spring discharge of differing quality appear to be combine/added not considered as individual feeds of different salinities.

I think we may all agree the section of the river upstream of USGS Gage Station 02310700 is:

- **The same for both reports/modeling**
- **Well defined with essentially vertical banks (other than Halls River which is primarily above 3psu). No beaches/mud flats/sand bars are exposed during normal tidal changes at present. These tidal changes represent the equivalent of over 15% discharge reduction from high to low tides and are strong factual indicators of average reductions (other than water depth) modeled in the scenarios and presented in the output Tables.**
- **The section of the river most influenced by changes (reductions) in spring discharge.**

For clarity the 2012 report qualifies the shoreline as natural shoreline as defined;
2.7 page 73 (2012 Report), ***so cannot be compared to shoreline in the 2019 Draft Report, although the 2019 report does present percentage changes to the altered and natural shoreline in Tables 15 and 16. Percent of the shoreline categorizations appear to have derived from Wang data in 2012 Report.***

2012 Quote
All surveyed shorelines were classified as natural, i.e., naturally vegetated or altered, with altered shorelines including areas of rip-rap, seawall, a combination of rip-rap and seawall and maintained or modified lands. Maintained shorelines include lawns and maintained landscaping. Modified shorelines were those with relatively natural vegetation that has been previously modified.

Natural vegetation occurs along approximately 71 percent of the combined 62,529 m shoreline mapped for the Halls River, Homosassa River and Southeast Fork of the Homosassa Rivers (Figure 2-35, Table 2-6). Most of Halls River upstream from the Halls River Road Bridge is naturally vegetated, including upstream areas that were not mapped or surveyed by PBS&J. Unaltered or natural shoreline is similarly dominant in the Homosassa River downstream from the Homosassa Community near river kilometer 7.2.
Unquote

The next point in need of clarification is:

WHAT SPRING DISCHARGE IS THE BASIS FOR THE SIMULATED REDUCTIONS? (eg 5% of what)

I would venture to suggest the 2012 report used the USGS discharge and did not include the speculative discharge of 100 cfs from Halls River.
For the 2019 Draft Report there are numerous discharges to consider;

- USGS data from the gage stations 02310678, 02310688, 02310689 (two of which have tidally filtered data).
- Daily Mean discharges as presented in Table 2-3B of the 2019 Draft Peer Review Report
- Discharge data from the three Gage Stations above, but with the SE Fork modified to represent the supposed 15 cfs lower discharge detailed in the report (Equation 6).
- Discharge data from the three Gage Stations above modified using the net discharge calculation (Equation 3)

The last one may be the most likely as from Appendix 6 page 26 ******See also my P.S.******
Quote
It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.
End quote.

Which raises the question of which discharge was this equation/formula applied to; 15 minute data, daily data, tidally filtered data, lunar cycle data? (Note; it is unclear where Homosassa Springs 02310688 net discharge data is derived from, or how.).

Before, I get too far into the weeds let me get back to model output particularly for the section of the river upstream of Homosassa R 02310700.

The attached simple spreadsheet compares the 2012 hydrodynamic model output with LAMFE output.

As you look at the output data consider the typical specific conductance (psu) at each of the Gage Stations

Homosassa R at Homosassa 02310700 5000-9000 Spec C or 2.7 to 5 psu

Homosassa Spring at Homosassa 02310678 3000-4000 SpecC or 1.7 to 2.5 psu

South East Fork 02310688 1000 Spec C or 0.5 psu

Halls River 02310689 6000-9000 Spec C or 3 to 4.8 psu

Therefore:

1. All equal or less than 3 psu water is in the section of river from Rkm 9 to 13.
2. No equal or less than 3 psu is in Halls River
3. Some of the equal or less than 5 psu water is in the Halls River
4. Some of the equal or less than 5 psu is above RKm 9 and some is just downstream of RKM 9.

Unfortunately for some reason equal or less than 4 psu is omitted. This is a critical salinity zone in the river and possibly the one most difficult to model as the only data which could be used to section and calibrate this salinity zone is the old Halls River Gage Station 02310690 where Mean daily specific conductance is 4000 to 6000 Maximums are 6000 to 9000 and Minimums 3000 to 4000.

There is a lot to consider and explain;

Why so much difference in the data sets for the same river.
Where is all this area which LAMFE presents with no referenced bathymetry data source such as Wang in 2012 report. The only means I have of assessing the square meters (converted to acres) is by Google Earth and the Citrus County property maps which do give similar areas but are different to LAMFE's significantly larger numbers.

Put pretty simply, these differences influence the credibility of the reports, or maybe I am just confused.

Martyn

******See also my P.S.******

P.S. Somehow there appears to be a question about which flow are used in the simulations.
The Executive Summary Page X
Quote
Simulations of reduced flows were based on gaged flows at the United States Geological Survey (USGS) gaging stations Homosassa Springs at Homosassa Springs, FL (No. 02310678) and SE Fork Homosassa Spring at Homosassa Springs, FL (No. 02310688). The long-term average combined flow for all "approved" daily data from October 1, 2000 to October

12, 2017 at these gages was 146 cubic feet per second (cfs). Adjusted for withdrawal impacts of 1.9 percent, the long-term unimpacted flows would average 149 cfs, and minimum flows, corresponding to 95 percent of the unimpacted flow, would average 141 cfs over the same time period.
End Quote

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, May 13, 2019 11:40 AM
To: Alan Martyn Johnson; MFLComments; Sky Notestein; frank.gorgano@swfwmd.state.fl.us
Cc: Doug Leeper; Frank Gargano
Subject: RE: Note to File Audience Input?question Homosassa River Alliance 5/09/2019

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Good job your explanation made logical sense. Polish it.

Martyn

From Peer Review report March 2019 page 2-6
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Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, May 13, 2019 11:38 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 6 (delete 7)

Martyn,

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, May 06, 2019 8:38 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 6 (delete 7)

1. So the 1.6 acres is an integral part of the SE Fork water body 5.5 acres. There is no other water in the Homosassa River in the 'less than 1 psu' category.
   I do not believe the fact there is a bridge across the water body makes any difference. In flow is from the springs, out flow is to the 'river' where the flow combines with Homosassa Main Spring water.
   Think about the fluid dynamics;
   -- the size of the water body in both depth and area changes during the tidal cycle
   --the quantity of water flowing out (think of it as pumped) is not location dependent as long as the level is dictated by the gage height which is dictated solely by the tide
   --the boundary, gate if it helps, moves down stream as the tide drops and upstream as the tide rises (how far there is no official data, but my testing from the time of the original Homosassa MFL indicates reasonably good mixing at all tidal stages eg at the overlook platform in the Park and at the upstream start of the manatee section area on the south bank).
   From a practical point of view the location of the boundary (gate) is not a clearly definable line, but the flow out of the water body SE Fork water will be the same 100 feet upstream of the bridge or 100 feet downstream of the bridge at any point of time; through the relationship area multiplied by velocity.

   To get net discharge, using the equation, it is necessary to have both the out flow and then subtract the area 'correction' for filling or emptying the SE Fork waterbody/pool (the only in flow is the springs).

The 'correction' has both gage height and area components; you can't consider only part of the pool/water body just because there is a bridge. As I said previously it is a hypothetical mathematical exercise with net result zero; but introduces error in the A factor.

The out flow/discharge measurement accuracy is simply a matter of how accurately the velocity can be measured and the cross section area measured. The bridge parapets provide a convenient vertical sided cross section and only lacks in that there is an inconvenient bend just before the bridge. Bottom line good location for the velocity meter.

One day I will be interested to meet your surveyor that arrives at figures like 15597.2 sq meters for the surface area upstream of the bridge, most impressive!!

2. Hall's River 02310689, which unlike SE Fork does have reverse flow, is best describe as almost useless when it comes to discharge measurements. I am personally,disappointed in having been involved in suggesting this as a site.

   Look at it carefully:
   -stream velocities at least twice SEF and Homosassa R
   -cross section sides predominantly root structures
   -flow path has sharp bend upstream and much straighter flow from downstream, likely resulting in different turbulence making Vi conversion to Vm a compromise between in and out flow (see also Field Measurements by USGS)
   -upstream both sides of the main channel are large shallow marshy areas which fill and drain relatively slowly (compare gage height data with SEF and the older Halls River Bridge station)

   Personally, I would advocate for moving the station to the Halls River Bridge once it is completed. Easier to maintain, much closer to laminar flow and clearly defined cross section. The best location of the velocity meter could be identified with the use of a River Cat or similar ADCP.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Thursday, May 2, 2019 9:21 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

The other 1.6 acres is downstream from the gage.

Thank you for your comments.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:08 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Thank you for providing this information.

Just a couple of comment.

I am slightly puzzled by:

1. The origin of SE Fork 15597.2 (3.854 acres) versus the Less than 1 psu of 22270 Table 10 App6, (5.5 acres). Where is the other 1.6 acres of less than 1 psu water? Such % differences have auditors asking questions.

2. Halls river 216156.6 (53 acres) appears to be open water surface and does not consider the many additional acres of shallow marshy areas which do change in depth from high to low tide (in similar manner to the Gage Station changes).
   I fully appreciate this is difficult if not impossible to estimate...but it is not small.

As far as I know neither of these numbers come from Wang as both these areas were excluded from the Wang study.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Subject: RE: Homosassa MFL Appendix 7

Martyn,

"A" in equation (3) is 216,156.6 sq m for Halls River and 15597.2 sq m for SE Fork.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 24, 2019 10:15 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Ladies and Gentlemen,

It is hard to find words to express my thoughts, but let me try.

1. Small point but this is Appendix 6 related.
2. It would be helpful to be specific and quantify the value of A in the equation for both SEF and Halls River.
   Please share the A values.
3. I am hopeful the correction/s resulting from the Peer Review regarding net flow are meaningful.

4. For the SEFork I think the value for A is in the range of 4 or 5 acres which makes the suggested correction for a 0.03 ft gage height change in 15 minutes (which is reasonably typical) in the order of 6 cfs. This 6 cfs is taken away from the USGS Reported discharge.
5. Recognizing that the 0.03 ft is either positive or negative and that the equation states A is negative the result is either positive (minus times minus) or negative.
6. Recognizing the USGS DISCHARGE IS ALWAYS POSITIVE this results in taking with one hand and giving with the other; the result no difference.

For the SE Fork this is a hypothetical mathematical exercise that has no basis in reality, as the result is net zero. The USGS DISCHARGE DATA IS GOOD AND SIMPLE ADDITION FOR ANY PERIOD IS THE NET.

Now, Halls Rriver is an entirely different and possibly unique situation. A clue is the USGS data attempting to Tidally Filter, some of the results make no sense.

Close examination of the discharge data and the gage height differences with the SE Fork indicate the narrow passage, just upstream of the Gage Station, acts like a choke on the flow of water. I have run the comparisons.
Add to that the strong potential for the turbulence across the cross-section to be different for inflow versus outflow and thus influencing stream velocity (this is indicated by the USGS Field Measurements compared with reported discharge at the same time...some significant differences).
Add to that the slow movement of water into and out of the shallow marshy areas (sponge effect as I referred to it recently).
RESULT DIFFICULTY IN DETERMINING THE TRUE DISCHARGE
Look at the data as you view the Halls River Springs.

I suggested that the other day...take a trip...fresh air is good.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, April 23, 2019 9:09 AM
To: Alan Martyn Johnson
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Here are relevant excerpts from the initial hydrodynamic modeling report (note report is being revised in response to peer review panel comments):

It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

$$q_t = -A\frac{\partial\eta}{\partial t} \tag{3}$$

where q_t is the tidal flow, with the positive flow pointing toward downstream, η is measured water level, t is time, and A is the surface water area upstream of the cross section.

The tidal flow (movement of water past the gage solely due to tides including storage of water upstream of the gage in the marsh) is equal to the area of the upstream water storage times the (negative) change in gage height with respect to time. You are correct in that the Halls River gage measures the tidal movement of water which travels up past the gage, is stored upstream of the gage, and then moves down past the gage when tides lower. The driving force behind this movement of water is differences in elevation, and this is captured in equation three above. When gage height is increasing, tidal flow is negative, and is equal to the product of the upstream area and the rate of change in water elevation at that site. When gage height is decreasing, tidal flow is positive (downstream), and likewise equal to product of area upstream and rate of change in water elevation.

Flows at the Halls River gage and the SE Fork gage are correlated once tidal flow is corrected for and averaged over half a lunar cycle.

flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving average using a time window of one half of the lunar cycle. The regression equation takes the following form

$$\overline{Q_{HR}} = 2.0483\overline{Q_{SE}} - 89.875 \tag{5}$$

where $\overline{Q_{HR}}$ and $\overline{Q_{SE}}$ moving averages of measured flows at the Halls River at Homosassa Springs and SE Fork Homosassa Spring stations, respectively. The above linear regression equation has a coefficient of determination of 0.704.

While the Halls River gage measures flows at a point with a larger upstream area for water to pool than does the SE Fork gage, they are both corrected by equation 3 above, which accounts for differences in upstream area.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 10:36 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Thanks for sharing.

Pleased to see this is being reconsidered.

My apology for having to used the word ridiculous when expressing concern about using SE Fork to hindcast Halls River, but I could not find a better word some weeks ago and still cannot.

This will not be solved by sitting in front of a computer screen.

Whoever is charged with the correction of this should take a trip to personally observe Halls River Springs and compare what they see there with any of the spring vents in the SE Fork, which are 5 to 10 cfs in round numbers (Pumphouse being visually the stronger).

A close look at the data output from USGS 02310689 the 'new' gage site on Halls River will help understand my assessment that Halls River in both directions from the gage is like a huge sponge (particularly upstream), resulting in flows which are not so directly related gage height at the gage site. The figures tend to show there maybe significant delays/accumulation of water, most likely in the shallow marshy areas.

It is the delta of gage height that is the driving force, but unfortunately I am not aware of any data on GH above the gage site eg at the main spring. The old gage does provide ssome input before it was decommission due to bridge construction.
Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Monday, April 15, 2019 9:28 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

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Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,

Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork
   -summed Homosassa Springs and -15 SEF
   -Halls River USGS (new site)
   -Halls River generated by regression from SE Fork, and lets not forget
   -Hidden River USGS, but I do not see this is used.

   Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

   To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
   QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report

is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report (2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted.
  For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River

There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

"Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?"

> Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

"IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?"

> This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

"As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River."

The results you are looking for are in chapter 3 “Presentation of Results” section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

“Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?”

The “model” in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as “linear models”. The percentage of total variability (“less than 50%”) in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The “models” are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found “The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge.”

“The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall’s River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
”

Answer:
The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system’s minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote

We reevaluated relationships between flow and all forms of available

nitrogen for completeness and found that while some statistically significant relationships with flow were established, the ***results were inconsistent and not directly useful*** *for supporting*

reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls

River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results ***were conflicting*** *with respect to the response as a function*

of flow.
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River.

Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.

The nitrate/nitrite data for Shell Island and Mud River is noted.

IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly, Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.

This is sad. The writer does not know Pumphouse Spring is in the SE Fork

----

****Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).**

But, not for this.

Quote from 3-1

The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).

There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage.

Therefore, spring flows in the Homosassa Springs Complex were

assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012 using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.

(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River

has only been gaged since 2012.

The District has estimated flows using regression based on

the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.

Unquote

WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.

The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, May 13, 2019 11:37 AM
To: Alan Martyn Johnson; Doug Leeper
Cc: MFLComments; Xinjian Chen
Subject: RE: SWFWMD WebBoards Digest

Martyn,

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, May 06, 2019 9:34 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
Subject: Re: SWFWMD WebBoards Digest

Somehow this is the answer I expected, possibly best summed up as, *sometimes we use NetSGD sometimes we do not*.

Regarding 40D it was just trying to get you thinking. Thinking about the wording and how a SWFWMD can publish the NetSGD data.

For right now;
What is the NetSGD for the SE Fork and Hall's River?

Presumably they are not as reported in Table 2-3B in the main report (2019).

Table 2-3B (2019) reports SE Fork as 60 cfs same as Table 2-3 (2012).
When the original MFL Report was written the SE Fork discharge was by using Weeki Wachee Well and gage height and reported **by USGS**. In 2019 an error of 15 cfs is documented, **by SWFWMD** and correction detailed by subtracting 15 cfs. **by SWFWMD**.
WHY IS THIS NOT REPORTED IN Table 2-3B (2019) and to repeat my question: Where is the 45 cfs (60 cfs-15 cfs) used?

To put this supposed error into context, this is almost a 10% error in the total SGD for 2010/2012 study/modeling with combined discharge 02310678 and 02310688 (25% from the lower salinity spring water 02310688). If true, an upfront disclosure in the Executive Report, possibly including impact of such an error on the 2012 findings and recommendations may be appropriate.
Is/was there an error or not?

Martyn
P.S. I do not recall net SGD in the main Jan 2019 report. Appendix 6 is the reference I find, but I have been wrong before finding three letters in so many pages!

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Thursday, May 2, 2019 9:50 AM
To: Alan Martyn Johnson; Doug Leeper
Cc: MFLComments; Xinjian Chen
Subject: RE: SWFWMD WebBoards Digest

Martyn,

There is no A value for gage no. 02310678 or 02310700; these calculations were not used at these gages. The A value for equation 2 of revised hydrodynamic model report for Chassahowitzka is 26,304 square meters. Net spring discharge is a model input described in the hydrodynamic modeling reports included as appendices and referenced in the main reports.

Rule language has not been developed yet.

Thank you for your comments.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

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Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, May 01, 2019 8:27 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Xinjian

Chen <Xinjian.Chen@swfwmd.state.fl.us>
Subject: Re: SWFWMD WebBoards Digest

Doug,

Thanks for the quick response.

I have downloaded the files so that I can look closer later in the week when not travelling/enjoying retirement.

Couple of questions from yesterdays rapid read Chen March 15, 2019.

1. What are the A values for Homosassa Springs 02310678, Homosassa R 02310700, and Chass (sorry if I do not recall the number correctly) 02310650.

2. Is net spring discharge used in the LAMFE modeling. I do not see any mention of NSGD.

   Where is NSGD used other than in the work/graphs in Chen March 15, 2019?

   All these different SGD are getting confusing.
   When reference is made to Reductions of Spring Flow it may be necessary to start specifying what flow is being reduced eg 02310678 plus 02310688 as reported by USGS or,
   02310678 plus 02310688 plus 02310689 as reported by USGS, and are those tidally filtered or not.

   What is Table 2-3B in the Jan 19 Review Draft Average Daily what.... Table 2-3A show tidally and not tidally filtered for some springs.

   Just how are all these going to play in 40D-8.041. I have mentioned this thought before, but now we have NSGD (to use my abbreviation for clarity).

   Still not clear where the Modified SGD -15 cfs for the SE Fork is used.

3. Tidally filtered salinity!!! Is this another way of saying correlation or what simple filter is used, but that is for another day.

Have a good day.

Martyn

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Tuesday, April 30, 2019 9:39 AM
To: Alan Martyn Johnson
Cc: MFLComments
Subject: RE: SWFWMD WebBoards Digest

Martyn:

The changes we've made to the draft minimum flow reports and appendices are identified in the District response documents.

Thanks,

Doug Leeper

MFLs Program Lead

Southwest Florida Water Management District

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doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 30, 2019 9:32 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Fw: SWFWMD WebBoards Digest

Doug,

I have just had a very quick look at the Homosassa mid review pdf. Are changes in anyway identified or have I just not looked far enough to see any?

Thanks,

Martyn

From: noreply@websitetoolbox.com <noreply@websitetoolbox.com> on behalf of SWFWMD WebBoards <noresponse@websitetoolbox.com>
Sent: Tuesday, April 30, 2019 7:07 AM
To: martynellijay@hotmail.com
Subject: SWFWMD WebBoards Digest

Hi MartynJ,

Here are the top topics at SWFWMD WebBoards since last week.

- **Mid-Review Documents for Peer Review Panel**
  Started by Doug Leeper in Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

Thank you,
SWFWMD WebBoards
https://swfwmd.discussion.community

This digest is sent when we haven't seen you in a while. If you'd rather not receive future emails, you can unsubscribe.

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, May 13, 2019 10:04 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

The total area, volume, and shoreline of the most upstream portions of the river did not change in magnitude from 2012 to 2019. However, the portions of the river included in the hydrodynamic models used did change. The models do not predict changes to the river outside of their boundaries. A major limitation of the 2012 EFDC modeling application was that the model boundary did not include some of the freshwater habitat at the most upstream reach of the river. Figure 7-1 of 2012 report (copied below) shows areas not included in the 2012 EFDC application outlined in red. Tables 5-20, 5-21, and 5-22 in 2012 report show EFDC modeled values that do not include the upstream portions of the river shown in red in figure 7-1. This is all described in the 2012 report. See also section 5.3.3 of the 2012 report. See also page 190, section 7.3.1 of the 2012 report. The EFDC application results were inadequate to set minimum flows based on the lowest salinity habitats due to the limited spatial domain and period of record (2007 was a dry year). The recent LAMFE modeling application does not suffer from these limitations (see figure 14, copied below, from 2019 hydrodynamic modeling appendix). The 2019 application of the LAMFE model has a 10-year period of record and its boundaries include freshwater habitats excluded by the 2012 EFDC application.

Thank you for your comments.

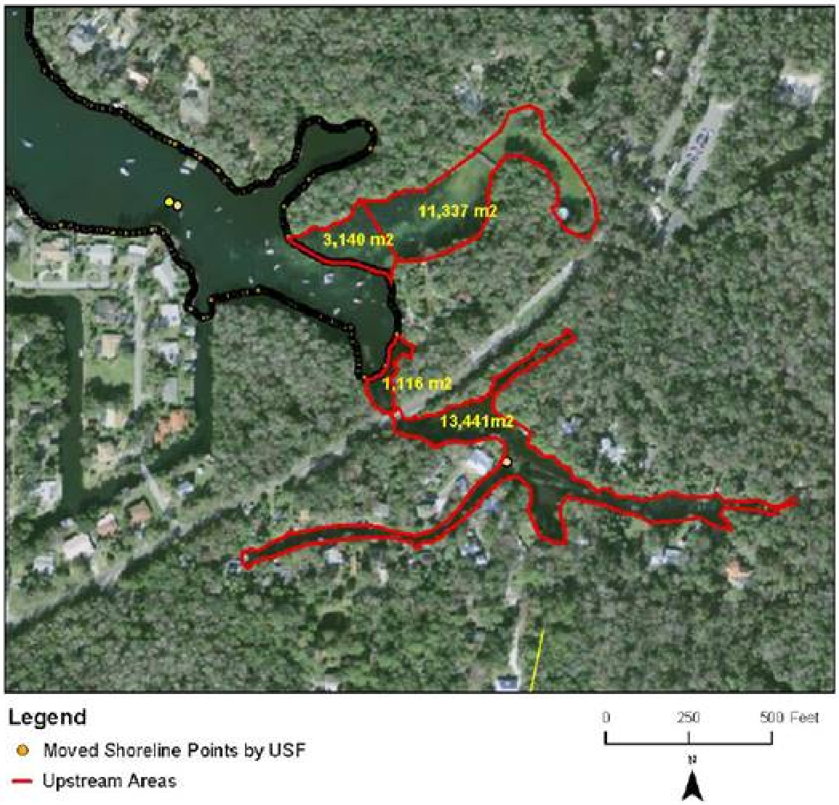

Figure 7-1. Upper areas of the Homosassa River and Southeast Fork Homosassa River that were not included in bathymetric data presented in Figures 2-30, 2-32 and 2-33.

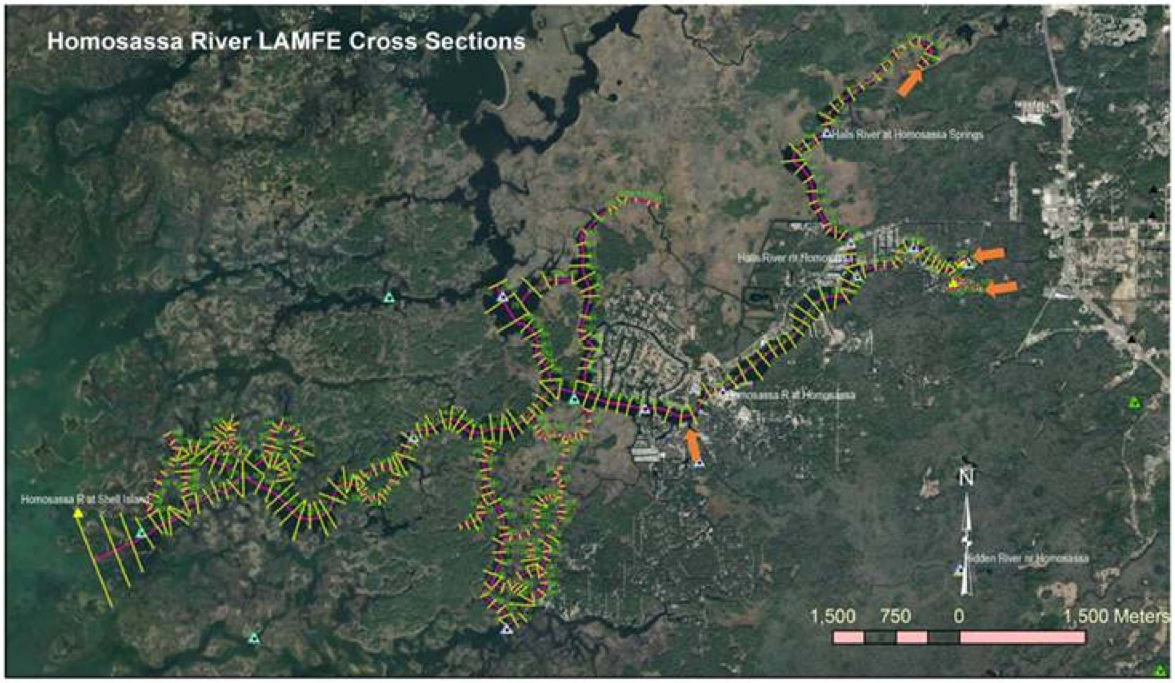

Figure 14. Cross sections (yellow segments) that form the LAMFE grids for the Homosassa River and its branches. Numbers in green are grid numbers in the longitudinal direction. Orange arrows are locations where SGDs enter the model domain.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, May 06, 2019 9:55 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Sorry, but that is not an explanation. Different how?....with emphasis on the river upstream of USGS 02310700 Homosassa R at Homosassa.

Remember I am not asking if the 2012 Report is more or less accurate, but why such a big difference. THE BANKS OF THE RIVER UPSTREAM OF MACRAE'S/HOMOSASSA R at HOMOSASSA 02310700 ARE THE SAME, NOT DIFFERENT.

I am getting a growing impression/concern the outputs from simulation in the LAMFE Model are flawed.

So in the interest of dispelling my potentially incorrect impression, let me put the question a different way; **forget salinity**.

WHAT IS THE AREA OF THE HOMOSASSA RIVER FROM HOMOSASSA R at HOMOSASSA 02310700 TO THE MAIN SPRINGS GAGE STATION 02310678, including how/when this was determined.

Specify the area by river kilometer if it is easier.

Wang is the only bathymetry study I am aware of. In that study SE Fork and most of Halls River were excluded (from memory, only first 2 km of Halls River main channel mapped).

Martyn

P.S. What is different from 2012 is, the river continues its slow death. Per Mark Hammond's own words on a boat trip about 2011 'this river is dead'.
Continued evidence of decline;
SAV much reduced (essential food for manatee and health of the river).
Increasing nitrate/nitrite in spring water and a trend of increasing salinity (seawater ingress) into the springs as indicated quantitatively from water sampling data.

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Thursday, May 2, 2019 9:24 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

The boundaries on the areas included in the 2012 model and the 2019 model are different.

Thank you for your comments.

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:21 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

I can only say that if you repeat yourself enough times you will eventually believe it.

I am not yet believing this explanation...What spacial domain are you referencing?
Agreed the dates are different, but the river and discharges are the same.

This answer/explanation does not address the area and volumes in the upper reaches of the river.
The physical banks are the same.
The discharges from 02310678 and 02310688 are the same.
So why is the area/volume for waters less than 3 psu so different.
If you do not understand the question relating to the difference 47 acres v 179 acres, please say so.

A map showing the 179 acres may help!

Martyn
More about snook as I get time later this week.

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:21 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

The application of the EFDC to the Homosassa River system in 2012 and the application of the LAMFE to the system in 2019 have different spatial domains and periods of record. These account for the differences in quantity of salinity-based habitats under baseline flow scenarios in, for example, Table 5-17 of the 2012 report and Table 9 of the initial hydrodynamic modeling report.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 23, 2019 8:49 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Please share/alert as appropriate.

In the 2012 Homosassa MFL Report the reported baseline area of water less than or equal to 3 psu was 164680 sq m (40.7 acres)' in the 2019 Draft the reported figure is 727974 sq m (179 acres). Water of 3 psu or less is confined to the upper reaches of the Homosassa (essentially close to and upstream of the Halls River confluence).
Big difference is an under statement. Explanation?

In the 2019 Draft Report a number of different SGD are used. Which one will be for reduced discharge in 40D-8.041 and which one is for LAMFE modeling.

Read on and I will detail my concern.

As some of you may be aware about a month ago I suggested that a comparison of Volume, Area and Shoreline presented in the 2019 Draft Homosassa MFL report and the 2012 Homosassa MFL reports should be undertaken because there are significant differences.

Attached is simple spread sheet with the key data for the well defined section of Homosassa River upstream of USGS 02310700/MacRaes/RKm 9 or however you want to define it. This section is a primary section of the river with most waters of salinity less than or equal to 5 psu and all salinities less than or equal to 3 psu.

I hope I have extracted the data accurately from the reports, my only editor/proofreader is myself. Data from the 2012 report is from the hydrodynamic modeling not the regression.

My e-mail about a month ago was essentially two part:

Quote

Model Output Volume Area Shoreline

I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

End Quote

The response was

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Not clear what this answer means regarding the first part as both efforts were/are to address what happens as discharge from the springs is reduced. How is the river different in terms of volumes, area and shoreline?

Certainly the area considered in the LAMFE Model is expanded towards the Gulf as depicted in Appendix 6 Figure 20, along with the commentary that reduction in spring discharge will have ***"very insignificant effect on salinity increase there."***

The second point (highlighted yellow) is why are all the scenarios showing decreases? Appendix 6 Tables 9, 10, 11
It appears logical that tidal forces will move seawater towards the springs (replacing the 'lost' spring discharge). At some point this must increase the salinity in some zones even though salinity segments (1 or 2 psu) are large compared to the gradual changes in the river. Presumably when simulations reach 30% reduction, the loss of 60+ cfs must allow more high salinity water past Gage Station 02310700 thus maintaining the same total volume/area/shoreline in that part of the river.

With the implied accuracy of the model (eg to predict shorelines down to 41 meters in 68 km for <15 psu from existing to 2.5% discharge reduction Table 5-11 Appendix 6) there should be the ability see the seawater 'replacement' of a 30% discharge reduction.

Sorry, but I do not buy this accuracy, or that all these modeled scenarios result in reductions. Tidal force must have an effect as hinted at in the commentary ***"very insignificant effect on salinity increase there."*** Note increase.

Additionally, spring discharge of differing quality appear to be combine/added not considered as individual feeds of different salinities.

I think we may all agree the section of the river upstream of USGS Gage Station 02310700 is:

- **The same for both reports/modeling**
- **Well defined with essentially vertical banks (other than Halls River which is primarily above 3psu). No beaches/mud flats/sand bars are exposed during normal tidal changes at present. These tidal changes represent the equivalent of over 15% discharge reduction from high to low tides and are strong factual indicators of average reductions (other than water depth) modeled in the scenarios and presented in the output Tables.**
- **The section of the river most influenced by changes (reductions) in spring discharge.**

For clarity the 2012 report qualifies the shoreline as natural shoreline as defined;
2.7 page 73 (2012 Report), ***so cannot be compared to shoreline in the 2019 Draft Report, although the 2019 report does present percentage changes to the altered and natural shoreline in Tables 15 and 16. Percent of the shoreline categorizations appear to have derived from Wang data in 2012 Report.***

2012 Quote
All surveyed shorelines were classified as natural, i.e., naturally vegetated or altered, with altered shorelines including areas of rip-rap, seawall, a combination of rip-rap and seawall and maintained or modified lands. Maintained shorelines include lawns and maintained landscaping. Modified shorelines were those with relatively natural vegetation that has been previously modified.

Natural vegetation occurs along approximately 71 percent of the combined 62,529 m shoreline mapped for the Halls River, Homosassa River and Southeast Fork of the Homosassa Rivers (Figure 2-35, Table 2-6). Most of Halls River upstream from the Halls River Road Bridge is naturally vegetated, including upstream areas that were not mapped or surveyed by PBS&J. Unaltered or natural shoreline is similarly dominant in the Homosassa River downstream from the Homosassa Community near river kilometer 7.2.
Unquote

The next point in need of clarification is:

WHAT SPRING DISCHARGE IS THE BASIS FOR THE SIMULATED REDUCTIONS? (eg 5% of what)

I would venture to suggest the 2012 report used the USGS discharge and did not include the speculative discharge of 100 cfs from Halls River.
For the 2019 Draft Report there are numerous discharges to consider;

- USGS data from the gage stations 02310678, 02310688, 02310689 (two of which have tidally filtered data).

- Daily Mean discharges as presented in Table 2-3B of the 2019 Draft Peer Review Report
- Discharge data from the three Gage Stations above, but with the SE Fork modified to represent the supposed 15 cfs lower discharge detailed in the report (Equation 6).
- Discharge data from the three Gage Stations above modified using the net discharge calculation (Equation 3)

The last one may be the most likely as from Appendix 6 page 26 ******See also my P.S.******

Quote

It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

End quote.

Which raises the question of which discharge was this equation/formula applied to; 15 minute data, daily data, tidally filtered data, lunar cycle data? (Note; it is unclear where Homosassa Springs 02310688 net discharge data is derived from, or how.).

Before, I get too far into the weeds let me get back to model output particularly for the section of the river upstream of Homosassa R 02310700.

The attached simple spreadsheet compares the 2012 hydrodynamic model output with LAMFE output.

As you look at the output data consider the typical specific conductance (psu) at each of the Gage Stations

Homosassa R at Homosassa 02310700 5000-9000 Spec C or 2.7 to 5 psu

Homosassa Spring at Homosassa 02310678 3000-4000 SpecC or 1.7 to 2.5 psu

South East Fork 02310688 1000 Spec C or 0.5 psu

Halls River 02310689 6000-9000 Spec C or 3 to 4.8 psu

Therefore:

1. All equal or less than 3 psu water is in the section of river from Rkm 9 to 13.
2. No equal or less than 3 psu is in Halls River
3. Some of the equal or less than 5 psu water is in the Halls River
4. Some of the equal or less than 5 psu is above RKm 9 and some is just downstream of RKM 9.

Unfortunately for some reason equal or less than 4 psu is omitted. This is a critical salinity zone in the river and possibly the one most difficult to model as the only data which could be used to section and calibrate this salinity zone is the old Halls River Gage Station 02310690 where Mean daily specific conductance is 4000 to 6000 Maximums are 6000 to 9000 and Minimums 3000 to 4000.

There is a lot to consider and explain;

Why so much difference in the data sets for the same river.
Where is all this area which LAMFE presents with no referenced bathymetry data source such as Wang in 2012 report. The only means I have of assessing the square meters (converted to acres) is by Google Earth and the Citrus County property maps which do give similar areas but are different to LAMFE's significantly larger numbers.

Put pretty simply, these differences influence the credibility of the reports, or maybe I am just confused.

Martyn

******See also my P.S.******

P.S. Somehow there appears to be a question about which flow are used in the simulations.
The Executive Summary Page X
Quote
Simulations of reduced flows were based on gaged flows at the United States Geological Survey (USGS) gaging stations Homosassa Springs at Homosassa Springs, FL (No. 02310678) and SE Fork Homosassa Spring at Homosassa Springs, FL (No. 02310688). The long-term average combined flow for all "approved" daily data from October 1, 2000 to October 12, 2017 at these gages was 146 cubic feet per second (cfs). Adjusted for withdrawal impacts of 1.9 percent, the long-term unimpacted flows would average 149 cfs, and minimum flows, corresponding to 95 percent of the unimpacted flow, would average 141 cfs over the same time period.
End Quote

Gabe I. Herrick

From:	Doug Leeper
Sent:	Friday, May 10, 2019 3:31 PM
To:	MFLComments
Cc:	Sid Flannery (sidflannery22@gmail.com)
Subject:	FW: Culter's barnacle report in the Homosassa report

From: Doug Leeper
Sent: Friday, May 10, 2019 3:30 PM
To: Sid Flannery (sidflannery22@gmail.com) <sidflannery22@gmail.com>
Cc: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Culter's barnacle report in the Homosassa report

Sid:

Following up on our phone conversation, I note that page 36 of the revised, draft Homosassa minimum flows report developed during the ongoing peer review process includes the following:

"Culter 2010 sampled from March to July 2009 focusing on upstream reaches. Barnacle settlement in the river appears to be inhibited by salinities less than 2 ppt, but barnacles were present at these low salinities. This suggests that once settled, barnacles can tolerate low salinity waters. The main spring run was devoid of barnacles. In the upper reaches of the river, barnacles were found near the bottom where salinities are higher, rather than in the intertidal zone, where barnacles typically occur."

Seem the citation above needs to be revised to "Culter (2010)" and the document needs to be added to the references cited section.

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Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, May 10, 2019 9:17 AM
To: MFLComments; Sky Notestein; Gabe I. Herrick; frank.gorgano@swfwmd.state.fl.us
Cc: Doug Leeper
Subject: Note to File Audience Input?question Homosassa River Alliance 5/09/2019

Just a quick note regarding a couple of things from yesterday evening's meeting.

1. Audience Reaction re the slide that presented the flow reductions that result in harm for both Chassahowitzka and Homosassa with the 2013 and 2019. The salinity numbers for Homosassa of 3% for 2013 and 11% for 2019 was questioned along the lines of 'how can this be'. Specific question came from the left hand table as seen by the presenter. The response was along the line 'the models are different' to which someone from the back of the room pointed out 'but the Chassahowitzk number went down; presumably with reference to the 8% for 2019.

   I have expressed this same concern in reference to the Homosassa including the specific acreage data from the report. After the meeting I shared with Sky this concern and added the concern expressed in the Peer Review of March 2019 page 2-6 (quote copied below for ease of reference.

   Sky informed me that Dr. Chen has rewritten the report which may answer the concern. Apparently this rewrite does not change the numbers or the slide would likely have been updated.
   Sorry, I am going to be lazy...where is the rewrite posted?

2. As I pointed out to Sky, my detailed comments/questions are to try to help.
   Gabe, Sorry I did not include you in the discussion it was certainly not intentional, but you have heard my comments before.

On a second point for Gabe, your explanation of the 15% harm concept was the best articulated I have heard in some time, if ever. The concept in my opinion was spot on...polish the presentation of the concept/idea for future use. The basics are there idea started with presumably an environmental scientist (you did give a name) who was trying to address if he could with reasonable degree of certainty say if a water body had changed. His thought was that unless he could see a 15% change he could not state with reasonable certainty a change had occurred. You went on to explain that for different parameters that 15% may vary some but to remain consistent the 15% has been adopted as a standard and applied across the board.

Good job your explanation made logical sense. Polish it.

Martyn

From Peer Review report March 2019 page 2-6
In the previous MFL developed for the Homosassa River/Homosassa Springs Group, the MFL reductions were driven by changes in salinity habitats as simulated by the EFDC hydrodynamic model (SWFWMD, 2012). The allowable reduction was 3%. In the present analyses, the hydrodynamic modeling for the same habitat type (salinity) allowed for an 11% reduction. **The differences between the previous salinity habitat assessment and the present one are significant. While there are differences in model results that do occur, the degree of**

difference here is problematic indicating that one of the two models did not accurately simulate the salinity changes. During questioning on this aspect by the Peer Review Panel, District staff provided some potential reasons for these differences and Panel members noted that the explanations had merit. But given the differences in the analyses and their importance to the setting of the previous MFL, the District needs to provide a full technical evaluation of the differences and why the LAMFE model is more accurate.

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, May 07, 2019 10:19 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Snook Thermal Habitat/Refuge
Attachments: Temp 2007 Nov to 2008 March.html; Temp 2010 Dec to 2011 Feb Bottom.html; Temps 2012 October to 2013 March.html; Shell Island Temp 2007 Nov to 2008 March.html; Shell Island Temp Operational Status 2009 2015.html; Temp Jan 2018.html

It is hard to know where to start regarding thermal habitat/refuge for snook, Appendix 6 Table 25 is a possibility: Where is the data to be found?

I initially looked at USGS Homosassa R at Homosassa 02310700. Examples of the data in graphic form direct from USGS are attached which speak for themselves No "Duration Days" as presented in Table 25. Possibly, consecutive is missing. As the graphs show there are many days in these "seasons" where water temperature at this Gage Station are above 15 C. Further, on the start dates/times USGS data shows:

- 2007-Nov-17 @ 09:30 Bottom 18.1 C Top 17.2 C
- 2008-Oct-3 @ 01:15 Bottom 25.1 C Top 25 C
- 2010-Dec-2 @ 23:45 Bottom 18.5 C Top18.4 C
- 2012-Oct 30 @ 07:45 Bottom 17.6 C Top 17.3 C
- 2016-Dec -10 @ 07:00 Bottom 17.6 C Top No Data

So Table 25 is not from USGS 02310700 data.

Then I thought Shell Island; I have attached one USGS grahic from 2007 to 2008 and one showing the inactive status from late 2009 to 2015. Again, no "Duration Days" as presented in Table 25. The inactive status rules Shell Island out (I know the gap was filled by correlation, but lets focus on USGS data).

So Table 25 is not from USGS 02310712

So where are Table 25 dates and times from?
Does the Table title give a clue "during each winter of the scenario simulation period". Surely the dates and times are not LAMFE output.
However, Figure 27 of Appendix 6 states "time series of simulated".

Whatever the origin of Table 25 is, this obscure idea of thermal refuge being defined by the time at which the first day less than 15 C is recorded to the last day less than 15 C is recorded appears not to be inconsequential to refuge. Refuge/winter habitat presumably is times and volumes where snook find favorable temperature water, not likely to die, so we can say water greater than 15 C for at least 24 hours (are we saying no depth limitation?).

The Appendix 6 snook presentation discusses percentages and never gets to volumes or areas other than Figure 27 (which appears to be defined by water depths greater than 1.158, manatee related.
Frankly Figure 27 is impossible to read rendering it worthless, unless one has the ability to isolate the various

lines.
By contrast, the 2012 MFL Report gave an indication of the favorable volumes Table 5-24. No comment on the accuracy of the numbers, but logically makes more sense than a 'snook season' (which includes many days above 15 C) and 'percentages'.

However the days are explained in the pages following Table 25 an explanation of data source for this Table would be useful.

So where does LAMFE/Appendix C present the thermal profile along the river for cold days?
Apparently, there are inputs of air temperature, wind speed wind direction which are presumably used in combination with surface area and volume to predict heat loss and thus temperature profile in much less than 5 C increments (see Figure 6.2 in the main report Peer Review Draft January 2019).

In conclusion, I am of the opinion snook thermal habitat/refuge is misrepresented in the reevaluation by both 'snook season' and the lack of specific area volume data.

I have looked carefully at the USGS Gage Stations 02310689, 02319690 and 02310700 data for days around that coldest air temperature recorded.
Quote
The coldest air temperature measured in the Homosassa/Chassahowitzka area during the entire 125 months of the simulation period was -9.13 oC, which was recorded at 7:30 AM on January 18, 2018 (Hour 158215.5) at the Lecanto High School.
End quote

So far I have not been able to take the USGS 3 station graphic output to a saved file, but I am sure you can look at it on line. For your quick reference I have attached the graph for only 02310700. I also extracted the 15 minute data for all three stations to an xl file in order to better understand flows in relation to the temperatures. I doubt you need that as you have LAMFE.

To sumarise:
At 02310700 Homosassa R at Homosassa
18 Jan temperature below 15 C from 05:30 to 12:00 Min 14.1 C @ 07:30
19 Jan temperature below 15 C from 05:00 to 14:00 Min 13.1 C @ 07:00
20 Jan temperature below 15 C from 05:00 to 12:00 Min 13.2 C @ 07:30

Looking at these temperatures there is strong indication that water flowing upstream (rising tide) was bringing some of the cold water in during those 6.5 hours, 9 hours and 4.5 hour periods.

Appears to me there is a lot of water >15 C upstream of 02310700 for the snook even on coldest days.
With the advantage of LAMFE you should be able to see temperatures at each cross section.

Does reporting of only percentages and avoidance of being specific about the actual area and volume of snook thermal habitat on these cold days have some underlying purpose, such as exaggerating the importance of thermal habitat for snook?

As far as I can find there are no reports of large numbers of snook in either the Homosassa or Chass on cold days. There are plenty of observations of the manatee and how they 'disappear/reduce in number' from areas like the Homosassa Blue Water by mid day. The speculation is they go down stream to find food.

Just some food for thought.

Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, May 06, 2019 9:55 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Follow Up Flag: Follow up
Flag Status: Flagged

Sorry, but that is not an explanation. Different how?....with emphasis on the river upstream of USGS 02310700 Homosassa R at Homosassa.

Remember I am not asking if the 2012 Report is more or less accurate, but why such a big difference. THE BANKS OF THE RIVER UPSTREAM OF MACRAE'S/HOMOSASSA R at HOMOSASSA 02310700 ARE THE SAME, NOT DIFFERENT.

I am getting a growing impression/concern the outputs from simulation in the LAMFE Model are flawed.

So in the interest of dispelling my potentially incorrect impression, let me put the question a different way; **forget salinity**.

WHAT IS THE AREA OF THE HOMOSASSA RIVER FROM HOMOSASSA R at HOMOSASSA 02310700 TO THE MAIN SPRINGS GAGE STATION 02310678, including how/when this was determined.

Specify the area by river kilometer if it is easier.

Wang is the only bathymetry study I am aware of. In that study SE Fork and most of Halls River were excluded (from memory, only first 2 km of Halls River main channel mapped).

Martyn

P.S. What is different from 2012 is, the river continues its slow death. Per Mark Hammond's own words on a boat trip about 2011 'this river is dead'.
Continued evidence of decline;
SAV much reduced (essential food for manatee and health of the river).
Increasing nitrate/nitrite in spring water and a trend of increasing salinity (seawater ingress) into the springs as indicated quantitatively from water sampling data.

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Thursday, May 2, 2019 9:24 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

The boundaries on the areas included in the 2012 model and the 2019 model are different.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:21 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

I can only say that if you repeat yourself enough times you will eventually believe it.

I am not yet believing this explanation...What spacial domain are you referencing?
Agreed the dates are different, but the river and discharges are the same.

This answer/explanation does not address the area and volumes in the upper reaches of the river.
The physical banks are the same.
The discharges from 02310678 and 02310688 are the same.
So why is the area/volume for waters less than 3 psu so different.
If you do not understand the question relating to the difference 47 acres v 179 acres, please say so.

A map showing the 179 acres may help!

Martyn
More about snook as I get time later this week.

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:21 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

The application of the EFDC to the Homosassa River system in 2012 and the application of the LAMFE to the system in 2019 have different spatial domains and periods of record. These account for the differences in quantity of salinity-based habitats under baseline flow scenarios in, for example, Table 5-17 of the 2012 report and Table 9 of the initial hydrodynamic modeling report.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 23, 2019 8:49 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Please share/alert as appropriate.

In the 2012 Homosassa MFL Report the reported baseline area of water less than or equal to 3 psu was 164680 sq m (40.7 acres)' in the 2019 Draft the reported figure is 727974 sq m (179 acres). Water of 3 psu or less is confined to the upper reaches of the Homosassa (essentially close to and upstream of the Halls River confluence).
Big difference is an under statement. Explanation?

In the 2019 Draft Report a number of different SGD are used. Which one will be for reduced discharge in 40D-8.041 and which one is for LAMFE modeling.

Read on and I will detail my concern.

As some of you may be aware about a month ago I suggested that a comparison of Volume, Area and Shoreline presented in the 2019 Draft Homosassa MFL report and the 2012 Homosassa MFL reports should be undertaken because there are significant differences.

Attached is simple spread sheet with the key data for the well defined section of Homosassa River upstream of USGS 02310700/MacRaes/RKm 9 or however you want to define it. This section is a primary section of the river with most waters of salinity less than or equal to 5 psu and all salinities less than or equal to 3 psu.

I hope I have extracted the data accurately from the reports, my only editor/proofreader is myself. Data from the 2012 report is from the hydrodynamic modeling not the regression.

My e-mail about a month ago was essentially two part:

Quote

Model Output Volume Area Shoreline

I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

End Quote

The response was

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Not clear what this answer means regarding the first part as both efforts were/are to address what happens as discharge from the springs is reduced. How is the river different in terms of volumes, area and shoreline?

Certainly the area considered in the LAMFE Model is expanded towards the Gulf as depicted in Appendix 6 Figure 20, along with the commentary that reduction in spring discharge will have ***"very insignificant effect on salinity increase there."***

The second point (highlighted yellow) is why are all the scenarios showing decreases? Appendix 6 Tables 9, 10, 11

It appears logical that tidal forces will move seawater towards the springs (replacing the 'lost' spring discharge). At some point this must increase the salinity in some zones even though salinity segments (1 or 2 psu) are large compared to the gradual changes in the river. Presumably when simulations reach 30% reduction, the loss of 60+ cfs must allow more high salinity water past Gage Station 02310700 thus maintaining the same total volume/area/shoreline in that part of the river.

With the implied accuracy of the model (eg to predict shorelines down to 41 meters in 68 km for <15 psu from existing to 2.5% discharge reduction Table 5-11 Appendix 6) there should be the ability see the seawater 'replacement' of a 30% discharge reduction.

Sorry, but I do not buy this accuracy, or that all these modeled scenarios result in reductions. Tidal force must have an effect as hinted at in the commentary ***"very insignificant effect on salinity increase there."*** Note increase.

Additionally, spring discharge of differing quality appear to be combine/added not considered as individual feeds of different salinities.

I think we may all agree the section of the river upstream of USGS Gage Station 02310700 is:

- **The same for both reports/modeling**
- **Well defined with essentially vertical banks (other than Halls River which is primarily above 3psu). No beaches/mud flats/sand bars are exposed during normal tidal changes at present. These tidal changes represent the equivalent of over 15% discharge reduction from high to low tides and are strong factual indicators of average reductions (other than water depth) modeled in the scenarios and presented in the output Tables.**
- **The section of the river most influenced by changes (reductions) in spring discharge.**

For clarity the 2012 report qualifies the shoreline as natural shoreline as defined;
2.7 page 73 (2012 Report), ***so cannot be compared to shoreline in the 2019 Draft Report, although the 2019 report does present percentage changes to the altered and natural shoreline in Tables 15 and 16. Percent of the shoreline categorizations appear to have derived from Wang data in 2012 Report.***

2012 Quote
All surveyed shorelines were classified as natural, i.e., naturally vegetated or altered, with altered shorelines including areas of rip-rap, seawall, a combination of rip-rap and seawall and maintained or modified lands. Maintained shorelines include lawns and maintained landscaping. Modified shorelines were those with relatively natural vegetation that has been previously modified.

Natural vegetation occurs along approximately 71 percent of the combined 62,529 m shoreline mapped for the Halls River, Homosassa River and Southeast Fork of the Homosassa Rivers (Figure 2-35, Table 2-6). Most of Halls River upstream from the Halls River Road Bridge is naturally vegetated, including upstream areas that were not mapped or surveyed by PBS&J. Unaltered or natural shoreline is similarly dominant in the Homosassa River downstream from the Homosassa Community near river kilometer 7.2.
Unquote

The next point in need of clarification is:

WHAT SPRING DISCHARGE IS THE BASIS FOR THE SIMULATED REDUCTIONS? (eg 5% of what)

I would venture to suggest the 2012 report used the USGS discharge and did not include the speculative discharge of 100 cfs from Halls River.
For the 2019 Draft Report there are numerous discharges to consider;

- USGS data from the gage stations 02310678, 02310688, 02310689 (two of which have tidally filtered data).
- Daily Mean discharges as presented in Table 2-3B of the 2019 Draft Peer Review Report
- Discharge data from the three Gage Stations above, but with the SE Fork modified to represent the supposed 15 cfs lower discharge detailed in the report (Equation 6).
- Discharge data from the three Gage Stations above modified using the net discharge calculation (Equation 3)

The last one may be the most likely as from Appendix 6 page 26 ******See also my P.S.******
Quote
It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.
End quote.

Which raises the question of which discharge was this equation/formula applied to; 15 minute data, daily data, tidally filtered data, lunar cycle data? (Note; it is unclear where Homosassa Springs 02310688 net discharge data is derived from, or how.).

Before, I get too far into the weeds let me get back to model output particularly for the section of the river upstream of Homosassa R 02310700.

The attached simple spreadsheet compares the 2012 hydrodynamic model output with LAMFE output.

As you look at the output data consider the typical specific conductance (psu) at each of the Gage Stations

Homosassa R at Homosassa 02310700 5000-9000 Spec C or 2.7 to 5 psu

Homosassa Spring at Homosassa 02310678 3000-4000 SpecC or 1.7 to 2.5 psu

South East Fork 02310688 1000 Spec C or 0.5 psu

Halls River 02310689 6000-9000 Spec C or 3 to 4.8 psu

Therefore:

1. All equal or less than 3 psu water is in the section of river from Rkm 9 to 13.
2. No equal or less than 3 psu is in Halls River
3. Some of the equal or less than 5 psu water is in the Halls River

4. Some of the equal or less than 5 psu is above RKm 9 and some is just downstream of RKM 9. Unfortunately for some reason equal or less than 4 psu is omitted. This is a critical salinity zone in the river and possibly the one most difficult to model as the only data which could be used to section and calibrate this salinity zone is the old Halls River Gage Station 02310690 where Mean daily specific conductance is 4000 to 6000 Maximums are 6000 to 9000 and Minimums 3000 to 4000.

There is a lot to consider and explain;

Why so much difference in the data sets for the same river.
Where is all this area which LAMFE presents with no referenced bathymetry data source such as Wang in 2012 report. The only means I have of assessing the square meters (converted to acres) is by Google Earth and the Citrus County property maps which do give similar areas but are different to LAMFE's significantly larger numbers.

Put pretty simply, these differences influence the credibility of the reports, or maybe I am just confused.

Martyn

******See also my P.S.******

P.S. Somehow there appears to be a question about which flow are used in the simulations.
The Executive Summary Page X
Quote
Simulations of reduced flows were based on gaged flows at the United States Geological Survey (USGS) gaging stations Homosassa Springs at Homosassa Springs, FL (No. 02310678) and SE Fork Homosassa Spring at Homosassa Springs, FL (No. 02310688). The long-term average combined flow for all "approved" daily data from October 1, 2000 to October 12, 2017 at these gages was 146 cubic feet per second (cfs). Adjusted for withdrawal impacts of 1.9 percent, the long-term unimpacted flows would average 149 cfs, and minimum flows, corresponding to 95 percent of the unimpacted flow, would average 141 cfs over the same time period.
End Quote

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, May 06, 2019 9:34 AM
To: Gabe I. Herrick; Doug Leeper
Cc: MFLComments; Xinjian Chen
Subject: Re: SWFWMD WebBoards Digest

Follow Up Flag: Follow up
Flag Status: Flagged

Somehow this is the answer I expected, possibly best summed up as, *sometimes we use NetSGD sometimes we do not*.

Regarding 40D it was just trying to get you thinking. Thinking about the wording and how a SWFWMD can publish the NetSGD data.

For right now;
What is the NetSGD for the SE Fork and Hall's River?

Presumably they are not as reported in Table 2-3B in the main report (2019).

Table 2-3B (2019) reports SE Fork as 60 cfs same as Table 2-3 (2012).
When the original MFL Report was written the SE Fork discharge was by using Weeki Wachee Well and gage height and reported **by USGS**. In 2019 an error of 15 cfs is documented, **by SWFWMD** and correction detailed by subtracting 15 cfs. **by SWFWMD**.
WHY IS THIS NOT REPORTED IN Table 2-3B (2019) and to repeat my question: Where is the 45 cfs (60 cfs-15 cfs) used?

To put this supposed error into context, this is almost a 10% error in the total SGD for 2010/2012 study/modeling with combined discharge 02310678 and 02310688 (25% from the lower salinity spring water 02310688). If true, an upfront disclosure in the Executive Report, possibly including impact of such an error on the 2012 findings and recommendations may be appropriate.
Is/was there an error or not?

Martyn
P.S. I do not recall net SGD in the main Jan 2019 report. Appendix 6 is the reference I find, but I have been wrong before finding three letters in so many pages!

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Thursday, May 2, 2019 9:50 AM
To: Alan Martyn Johnson; Doug Leeper
Cc: MFLComments; Xinjian Chen
Subject: RE: SWFWMD WebBoards Digest

Martyn,

There is no A value for gage no. 02310678 or 02310700; these calculations were not used at these gages. The A value for equation 2 of revised hydrodynamic model report for Chassahowitzka is 26,304 square meters. Net spring discharge is a model input described in the hydrodynamic modeling reports included as appendices and referenced in the main reports.

Rule language has not been developed yet.

Thank you for your comments.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, May 01, 2019 8:27 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
Subject: Re: SWFWMD WebBoards Digest

Doug,

Thanks for the quick response.

I have downloaded the files so that I can look closer later in the week when not travelling/enjoying retirement.

Couple of questions from yesterdays rapid read Chen March 15, 2019.

1. What are the A values for Homosassa Springs 02310678, Homosassa R 02310700, and Chass (sorry if I do not recall the number correctly) 02310650.

2. Is net spring discharge used in the LAMFE modeling. I do not see any mention of NSGD.

   Where is NSGD used other than in the work/graphs in Chen March 15, 2019?

   All these different SGD are getting confusing.
   When reference is made to Reductions of Spring Flow it may be necessary to start specifying what flow is being reduced eg 02310678 plus 02310688 as reported by USGS or,
   02310678 plus 02310688 plus 02310689 as reported by USGS, and are those tidally filtered or not.

   What is Table 2-3B in the Jan 19 Review Draft Average Daily what.... Table 2-3A show tidally and not tidally filtered for some springs.

   Just how are all these going to play in 40D-8.041. I have mentioned this thought before, but now we have NSGD (to use my abbreviation for clarity).

   Still not clear where the Modified SGD -15 cfs for the SE Fork is used.

3. Tidally filtered salinity!!! Is this another way of saying correlation or what simple filter is used, but that is for another day.

Have a good day.

Martyn

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Tuesday, April 30, 2019 9:39 AM
To: Alan Martyn Johnson
Cc: MFLComments
Subject: RE: SWFWMD WebBoards Digest

Martyn:

The changes we've made to the draft minimum flow reports and appendices are identified in the District response documents.

Thanks,

Doug Leeper

MFLs Program Lead

Southwest Florida Water Management District

Springs and Environmental Flows Section

2379 Broad Street, Brookville, FL 34604

1-800-423-1476, extension 4272 (FL only)

352-796-7211, extension 4272

doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 30, 2019 9:32 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Fw: SWFWMD WebBoards Digest

Doug,

I have just had a very quick look at the Homosassa mid review pdf. Are changes in anyway identified or have I just not looked far enough to see any?

Thanks,

Martyn

From: noreply@websitetoolbox.com <noreply@websitetoolbox.com> on behalf of SWFWMD WebBoards <noresponse@websitetoolbox.com>
Sent: Tuesday, April 30, 2019 7:07 AM
To: martynellijay@hotmail.com
Subject: SWFWMD WebBoards Digest

Hi MartynJ,
Here are the top topics at SWFWMD WebBoards since last week.

- **Mid-Review Documents for Peer Review Panel**
  Started by Doug Leeper in Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

Thank you,
SWFWMD WebBoards
https://swfwmd.discussion.community

This digest is sent when we haven't seen you in a while. If you'd rather not receive future emails, you can unsubscribe.

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, May 06, 2019 8:38 AM
To: Gabe I. Herrick; MFLComments
Cc: Doug Leeper
Subject: Re: Homosassa MFL Appendix 6 (delete 7)

Follow Up Flag: Follow up
Flag Status: Flagged

1. So the 1.6 acres is an integral part of the SE Fork water body 5.5 acres. There is no other water in the Homosassa River in the 'less than 1 psu' category.
   I do not believe the fact there is a bridge across the water body makes any difference. In flow is from the springs, out flow is to the 'river' where the flow combines with Homosassa Main Spring water.
   Think about the fluid dynamics;
   -- the size of the water body in both depth and area changes during the tidal cycle
   --the quantity of water flowing out (think of it as pumped) is not location dependent as long as the level is dictated by the gage height which is dictated solely by the tide
   --the boundary, gate if it helps, moves down stream as the tide drops and upstream as the tide rises (how far there is no official data, but my testing from the time of the original Homosassa MFL indicates reasonably good mixing at all tidal stages eg at the overlook platform in the Park and at the upstream start of the manatee section area on the south bank).
   From a practical point of view the location of the boundary (gate) is not a clearly definable line, but the flow out of the water body SE Fork water will be the same 100 feet upstream of the bridge or 100 feet downstream of the bridge at any point of time; through the relationship area multiplied by velocity.

   To get net discharge, using the equation, it is necessary to have both the out flow and then subtract the area 'correction' for filling or emptying the SE Fork waterbody/pool (the only in flow is the springs).

   The 'correction' has both gage height and area components; you can't consider only part of the pool/water body just because there is a bridge. As I said previously it is a hypothetical mathematical exercise with net result zero; but introduces error in the A factor.

   The out flow/discharge measurement accuracy is simply a matter of how accurately the velocity can be measured and the cross section area measured. The bridge parapets provide a convenient vertical sided cross section and only lacks in that there is an inconvenient bend just before the bridge. Bottom line good location for the velocity meter.

   One day I will be interested to meet your surveyor that arrives at figures like 15597.2 sq meters for the surface area upstream of the bridge, most impressive!!

2. Hall's River 02310689, which unlike SE Fork does have reverse flow, is best describe as almost useless when it comes to discharge measurements. I am personally,disappointed in having been involved in

suggesting this as a site.

Look at it carefully:
-stream velocities at least twice SEF and Homosassa R
-cross section sides predominantly root structures
-flow path has sharp bend upstream and much straighter flow from downstream, likely resulting in different turbulence making Vi conversion to Vm a compromise between in and out flow (see also Field Measurements by USGS)
-upstream both sides of the main channel are large shallow marshy areas which fill and drain relatively slowly (compare gage height data with SEF and the older Halls River Bridge station)

Personally, I would advocate for moving the station to the Halls River Bridge once it is completed. Easier to maintain, much closer to laminar flow and clearly defined cross section. The best location of the velocity meter could be identified with the use of a River Cat or similar ADCP.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Thursday, May 2, 2019 9:21 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

The other 1.6 acres is downstream from the gage.

Thank you for your comments.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:08 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Thank you for providing this information.

Just a couple of comment.

I am slightly puzzled by:

1. The origin of SE Fork 15597.2 (3.854 acres) versus the Less than 1 psu of 22270 Table 10 App6, (5.5 acres). Where is the other 1.6 acres of less than 1 psu water? Such % differences have auditors asking questions.

2. Halls river 216156.6 (53 acres) appears to be open water surface and does not consider the many additional acres of shallow marshy areas which do change in depth from high to low tide (in similar manner to the Gage Station changes).
   I fully appreciate this is difficult if not impossible to estimate...but it is not small.

As far as I know neither of these numbers come from Wang as both these areas were excluded from the Wang study.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Subject: RE: Homosassa MFL Appendix 7

Martyn,

"A" in equation (3) is 216,156.6 sq m for Halls River and 15597.2 sq m for SE Fork.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 24, 2019 10:15 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Ladies and Gentlemen,

It is hard to find words to express my thoughts, but let me try.

1. Small point but this is Appendix 6 related.
2. It would be helpful to be specific and quantify the value of A in the equation for both SEF and Halls River.
   Please share the A values.
3. I am hopeful the correction/s resulting from the Peer Review regarding net flow are meaningful.
4. For the SEFork I think the value for A is in the range of 4 or 5 acres which makes the suggested correction for a 0.03 ft gage height change in 15 minutes (which is reasonably typical) in the order of 6 cfs. This 6 cfs is taken away from the USGS Reported discharge.
5. Recognizing that the 0.03 ft is either positive or negative and that the equation states A is negative the result is either positive (minus times minus) or negative.
6. Recognizing the USGS DISCHARGE IS ALWAYS POSITIVE this results in taking with one hand and giving with the other; the result no difference.

For the SE Fork this is a hypothetical mathematical exercise that has no basis in reality, as the result is net zero. The USGS DISCHARGE DATA IS GOOD AND SIMPLE ADDITION FOR ANY PERIOD IS THE NET.

Now, Halls Rriver is an entirely different and possibly unique situation. A clue is the USGS data attempting to Tidally Filter, some of the results make no sense.

Close examination of the discharge data and the gage height differences with the SE Fork indicate the narrow passage, just upstream of the Gage Station, acts like a choke on the flow of water. I have run the comparisons.

Add to that the strong potential for the turbulence across the cross-section to be different for inflow versus outflow and thus influencing stream velocity (this is indicated by the USGS Field Measurements compared with reported discharge at the same time...some significant differences).
Add to that the slow movement of water into and out of the shallow marshy areas (sponge effect as I referred to it recently).
RESULT DIFFICULTY IN DETERMINING THE TRUE DISCHARGE
Look at the data as you view the Halls River Springs.

I suggested that the other day...take a trip...fresh air is good.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, April 23, 2019 9:09 AM
To: Alan Martyn Johnson
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Here are relevant excerpts from the initial hydrodynamic modeling report (note report is being revised in response to peer review panel comments):

It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

$$q_t = -A\frac{\partial \eta}{\partial t} \tag{3}$$

where q_t is the tidal flow, with the positive flow pointing toward downstream, η is measured water level, t is time, and A is the surface water area upstream of the cross section.

The tidal flow (movement of water past the gage solely due to tides including storage of water upstream of the gage in the marsh) is equal to the area of the upstream water storage times the (negative) change in gage height with respect to time. You are correct in that the Halls River gage measures the tidal movement of water which travels up past the gage, is stored upstream of the gage, and then moves down past the gage when tides lower. The driving force behind this movement of water is differences in elevation, and this is captured in equation three above. When gage height is increasing, tidal flow is negative, and is equal to the product of the upstream area and the rate of change in water elevation at that site. When gage height is decreasing, tidal flow is positive (downstream), and likewise equal to product of area upstream and rate of change in water elevation.

Flows at the Halls River gage and the SE Fork gage are correlated once tidal flow is corrected for and averaged over half a lunar cycle.

flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving average using a time window of one half of the lunar cycle. The regression equation takes the following form

$$\overline{Q_{HR}} = 2.0483\overline{Q_{SE}} - 89.875 \tag{5}$$

where $\overline{Q_{HR}}$ and $\overline{Q_{SE}}$ moving averages of measured flows at the Halls River at Homosassa Springs and SE Fork Homosassa Spring stations, respectively. The above linear regression equation has a coefficient of determination of 0.704.

While the Halls River gage measures flows at a point with a larger upstream area for water to pool than does the SE Fork gage, they are both corrected by equation 3 above, which accounts for differences in upstream area.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 10:36 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Thanks for sharing.

Pleased to see this is being reconsidered.

My apology for having to used the word ridiculous when expressing concern about using SE Fork to hindcast Halls River, but I could not find a better word some weeks ago and still cannot.

This will not be solved by sitting in front of a computer screen.

Whoever is charged with the correction of this should take a trip to personally observe Halls River Springs and compare what they see there with any of the spring vents in the SE Fork, which are 5 to 10 cfs in round numbers (Pumphouse being visually the stronger).

A close look at the data output from USGS 02310689 the 'new' gage site on Halls River will help understand my assessment that Halls River in both directions from the gage is like a huge sponge (particularly upstream), resulting in flows which are not so directly related gage height at the gage site. The figures tend to show there maybe significant delays/accumulation of water, most likely in the shallow marshy areas.

It is the delta of gage height that is the driving force, but unfortunately I am not aware of any data on GH above the gage site eg at the main spring. The old gage does provide ssome input before it was decommission due to bridge construction.
Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Monday, April 15, 2019 9:28 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,

Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork
   -summed Homosassa Springs and -15 SEF
   -Halls River USGS (new site)
   -Halls River generated by regression from SE Fork, and lets not forget
   -Hidden River USGS, but I do not see this is used.

   Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

   To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
   QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report

(2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted.
  For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River
There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

"Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?"

> Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

"IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?"

> This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

"As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River."

> The results you are looking for are in chapter 3 "Presentation of Results" section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

"Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?"

> The "model" in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as "linear models". The percentage of total variability ("less

than 50%") in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The "models" are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found "The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge."

"The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
"

Answer:
The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
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Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote
We reevaluated relationships between flow and all forms of available nitrogen for completeness and found that while some statistically significant relationships with flow were established, the ***results were <u>inconsistent</u> and not directly useful*** *for supporting reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results* ***were <u>conflicting</u>*** *with respect to the response as a function of flow.*
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River. Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.
The nitrate/nitrite data for Shell Island and Mud River is noted.

IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly, Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.
This is sad. The writer does not know Pumphouse Spring is in the SE Fork

----

****Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).**

But, not for this.
Quote from 3-1
The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).
There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage.
Therefore, spring flows in the Homosassa Springs Complex were
assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012 using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.
(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River
has only been gaged since 2012.
The District has estimated flows using regression based on
the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.
The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Thursday, May 02, 2019 9:51 AM
To: Alan Martyn Johnson; Doug Leeper
Cc: MFLComments; Xinjian Chen
Subject: RE: SWFWMD WebBoards Digest

Martyn,

There is no A value for gage no. 02310678 or 02310700; these calculations were not used at these gages. The A value for equation 2 of revised hydrodynamic model report for Chassahowitzka is 26,304 square meters. Net spring discharge is a model input described in the hydrodynamic modeling reports included as appendices and referenced in the main reports.

Rule language has not been developed yet.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, May 01, 2019 8:27 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Xinjian Chen <Xinjian.Chen@swfwmd.state.fl.us>
Subject: Re: SWFWMD WebBoards Digest

Doug,
Thanks for the quick response.

I have downloaded the files so that I can look closer later in the week when not travelling/enjoying retirement.

Couple of questions from yesterdays rapid read Chen March 15, 2019.

1. What are the A values for Homosassa Springs 02310678, Homosassa R 02310700, and Chass (sorry if I do not recall the number correctly) 02310650.

2. Is net spring discharge used in the LAMFE modeling. I do not see any mention of NSGD.

   Where is NSGD used other than in the work/graphs in Chen March 15, 2019?

   All these different SGD are getting confusing.

When reference is made to Reductions of Spring Flow it may be necessary to start specifying what flow is being reduced eg 02310678 plus 02310688 as reported by USGS or,
02310678 plus 02310688 plus 02310689 as reported by USGS, and are those tidally filtered or not.

What is Table 2-3B in the Jan 19 Review Draft Average Daily what.... Table 2-3A show tidally and not tidally filtered for some springs.

Just how are all these going to play in 40D-8.041. I have mentioned this thought before, but now we have NSGD (to use my abbreviation for clarity).

Still not clear where the Modified SGD -15 cfs for the SE Fork is used.

3. Tidally filtered salinity!!! Is this another way of saying correlation or what simple filter is used, but that is for another day.

Have a good day.

Martyn

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Tuesday, April 30, 2019 9:39 AM
To: Alan Martyn Johnson
Cc: MFLComments
Subject: RE: SWFWMD WebBoards Digest

Martyn:

The changes we've made to the draft minimum flow reports and appendices are identified in the District response documents.

Thanks,

Doug Leeper

MFLs Program Lead

Southwest Florida Water Management District

Springs and Environmental Flows Section

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1-800-423-1476, extension 4272 (FL only)

352-796-7211, extension 4272

doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 30, 2019 9:32 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Fw: SWFWMD WebBoards Digest

Doug,

I have just had a very quick look at the Homosassa mid review pdf. Are changes in anyway identified or have I just not looked far enough to see any?

Thanks,

Martyn

From: noreply@websitetoolbox.com <noreply@websitetoolbox.com> on behalf of SWFWMD WebBoards <noresponse@websitetoolbox.com>
Sent: Tuesday, April 30, 2019 7:07 AM
To: martynellijay@hotmail.com
Subject: SWFWMD WebBoards Digest

Hi MartynJ,

Here are the top topics at SWFWMD WebBoards since last week.

- **Mid-Review Documents for Peer Review Panel**
  Started by Doug Leeper in Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

Thank you,
SWFWMD WebBoards
https://swfwmd.discussion.community

This digest is sent when we haven't seen you in a while. If you'd rather not receive future emails, you can unsubscribe.

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Thursday, May 02, 2019 9:25 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

The boundaries on the areas included in the 2012 model and the 2019 model are different.

Thank you for your comments.

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:21 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

I can only say that if you repeat yourself enough times you will eventually believe it.

I am not yet believing this explanation...What spacial domain are you referencing?
Agreed the dates are different, but the river and discharges are the same.

This answer/explanation does not address the area and volumes in the upper reaches of the river.
The physical banks are the same.
The discharges from 02310678 and 02310688 are the same.
So why is the area/volume for waters less than 3 psu so different.
If you do not understand the question relating to the difference 47 acres v 179 acres, please say so.

A map showing the 179 acres may help!

Martyn
More about snook as I get time later this week.

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:21 PM
To: Alan Martyn Johnson; MFLComments

Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

The application of the EFDC to the Homosassa River system in 2012 and the application of the LAMFE to the system in 2019 have different spatial domains and periods of record. These account for the differences in quantity of salinity-based habitats under baseline flow scenarios in, for example, Table 5-17 of the 2012 report and Table 9 of the initial hydrodynamic modeling report.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 23, 2019 8:49 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Please share/alert as appropriate.

In the 2012 Homosassa MFL Report the reported baseline area of water less than or equal to 3 psu was 164680 sq m (40.7 acres)' in the 2019 Draft the reported figure is 727974 sq m (179 acres). Water of 3 psu or

less is confined to the upper reaches of the Homosassa (essentially close to and upstream of the Halls River confluence).
Big difference is an under statement. Explanation?

In the 2019 Draft Report a number of different SGD are used. Which one will be for reduced discharge in 40D-8.041 and which one is for LAMFE modeling.

Read on and I will detail my concern.

As some of you may be aware about a month ago I suggested that a comparison of Volume, Area and Shoreline presented in the 2019 Draft Homosassa MFL report and the 2012 Homosassa MFL reports should be undertaken because there are significant differences.

Attached is simple spread sheet with the key data for the well defined section of Homosassa River upstream of USGS 02310700/MacRaes/RKm 9 or however you want to define it. This section is a primary section of the river with most waters of salinity less than or equal to 5 psu and all salinities less than or equal to 3 psu.

I hope I have extracted the data accurately from the reports, my only editor/proofreader is myself. Data from the 2012 report is from the hydrodynamic modeling not the regression.

My e-mail about a month ago was essentially two part:

Quote

Model Output Volume Area Shoreline

I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

End Quote

The response was

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Not clear what this answer means regarding the first part as both efforts were/are to address what happens as discharge from the springs is reduced. How is the river different in terms of volumes, area and shoreline?

Certainly the area considered in the LAMFE Model is expanded towards the Gulf as depicted in Appendix 6 Figure 20, along with the commentary that reduction in spring discharge will have ***"very insignificant effect on salinity increase there."***

The second point (highlighted yellow) is why are all the scenarios showing decreases? Appendix 6 Tables 9, 10, 11

It appears logical that tidal forces will move seawater towards the springs (replacing the 'lost' spring discharge). At some point this must increase the salinity in some zones even though salinity segments (1 or 2 psu) are large compared to the gradual changes in the river. Presumably when simulations reach 30% reduction, the loss of 60+ cfs must allow more high salinity water past Gage Station 02310700 thus maintaining the same total volume/area/shoreline in that part of the river.

With the implied accuracy of the model (eg to predict shorelines down to 41 meters in 68 km for <15 psu from existing to 2.5% discharge reduction Table 5-11 Appendix 6) there should be the ability see the seawater 'replacement' of a 30% discharge reduction.

Sorry, but I do not buy this accuracy, or that all these modeled scenarios result in reductions. Tidal force must have an effect as hinted at in the commentary ***"very insignificant effect on salinity increase there."*** Note increase.

Additionally, spring discharge of differing quality appear to be combine/added not considered as individual feeds of different salinities.

I think we may all agree the section of the river upstream of USGS Gage Station 02310700 is:

- **The same for both reports/modeling**
- **Well defined with essentially vertical banks (other than Halls River which is primarily above 3psu). No beaches/mud flats/sand bars are exposed during normal tidal changes at present. These tidal changes represent the equivalent of over 15% discharge reduction from high to low tides and are strong factual indicators of average reductions (other than water depth) modeled in the scenarios and presented in the output Tables.**
- **The section of the river most influenced by changes (reductions) in spring discharge.**

For clarity the 2012 report qualifies the shoreline as natural shoreline as defined;
2.7 page 73 (2012 Report), ***so cannot be compared to shoreline in the 2019 Draft Report, although the 2019 report does present percentage changes to the altered and natural shoreline in Tables 15 and 16. Percent of the shoreline categorizations appear to have derived from Wang data in 2012 Report.***

2012 Quote
All surveyed shorelines were classified as natural, i.e., naturally vegetated or altered, with altered shorelines including areas of rip-rap, seawall, a combination of rip-rap and seawall and maintained or modified lands. Maintained shorelines include lawns and maintained landscaping. Modified shorelines were those with relatively natural vegetation that has been previously modified.

Natural vegetation occurs along approximately 71 percent of the combined 62,529 m shoreline mapped for the Halls River, Homosassa River and Southeast Fork of the Homosassa Rivers (Figure 2-35, Table 2-6). Most of Halls River upstream from the Halls River Road Bridge is naturally vegetated, including upstream areas that were not mapped or surveyed by PBS&J. Unaltered or natural shoreline is similarly dominant in the Homosassa River downstream from the Homosassa Community near river kilometer 7.2.
Unquote

The next point in need of clarification is:

WHAT SPRING DISCHARGE IS THE BASIS FOR THE SIMULATED REDUCTIONS? (eg 5% of what)

I would venture to suggest the 2012 report used the USGS discharge and did not include the speculative discharge of 100 cfs from Halls River.
For the 2019 Draft Report there are numerous discharges to consider;

- USGS data from the gage stations 02310678, 02310688, 02310689 (two of which have tidally filtered data).
- Daily Mean discharges as presented in Table 2-3B of the 2019 Draft Peer Review Report
- Discharge data from the three Gage Stations above, but with the SE Fork modified to represent the supposed 15 cfs lower discharge detailed in the report (Equation 6).
- Discharge data from the three Gage Stations above modified using the net discharge calculation (Equation 3)

The last one may be the most likely as from Appendix 6 page 26 ******See also my P.S.******

Quote
It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

End quote.

Which raises the question of which discharge was this equation/formula applied to; 15 minute data, daily data, tidally filtered data, lunar cycle data? (Note; it is unclear where Homosassa Springs 02310688 net discharge data is derived from, or how.).

Before, I get too far into the weeds let me get back to model output particularly for the section of the river upstream of Homosassa R 02310700.

The attached simple spreadsheet compares the 2012 hydrodynamic model output with LAMFE output.

As you look at the output data consider the typical specific conductance (psu) at each of the Gage Stations

Homosassa R at Homosassa 02310700 5000-9000 Spec C or 2.7 to 5 psu

Homosassa Spring at Homosassa 02310678 3000-4000 SpecC or 1.7 to 2.5 psu

South East Fork 02310688 1000 Spec C or 0.5 psu

Halls River 02310689 6000-9000 Spec C or 3 to 4.8 psu

Therefore:

1. All equal or less than 3 psu water is in the section of river from Rkm 9 to 13.
2. No equal or less than 3 psu is in Halls River
3. Some of the equal or less than 5 psu water is in the Halls River
4. Some of the equal or less than 5 psu is above RKm 9 and some is just downstream of RKM 9.

Unfortunately for some reason equal or less than 4 psu is omitted. This is a critical salinity zone in the river and possibly the one most difficult to model as the only data which could be used to section and calibrate this salinity zone is the old Halls River Gage Station 02310690 where Mean daily specific conductance is 4000 to 6000 Maximums are 6000 to 9000 and Minimums 3000 to 4000.

There is a lot to consider and explain;

Why so much difference in the data sets for the same river.
Where is all this area which LAMFE presents with no referenced bathymetry data source such as Wang in 2012 report. The only means I have of assessing the square meters (converted to acres) is by Google Earth and the Citrus County property maps which do give similar areas but are different to LAMFE's significantly larger numbers.

Put pretty simply, these differences influence the credibility of the reports, or maybe I am just confused.

Martyn

******See also my P.S.******

P.S. Somehow there appears to be a question about which flow are used in the simulations.
The Executive Summary Page X
Quote
Simulations of reduced flows were based on gaged flows at the United States Geological Survey (USGS) gaging stations Homosassa Springs at Homosassa Springs, FL (No. 02310678) and SE Fork Homosassa Spring at Homosassa Springs, FL (No. 02310688). The long-term average combined flow for all “approved” daily data from October 1, 2000 to October 12, 2017 at these gages was 146 cubic feet per second (cfs). Adjusted for withdrawal impacts of 1.9 percent, the long-term unimpacted flows would average 149 cfs, and minimum flows, corresponding to 95 percent of the unimpacted flow, would average 141 cfs over the same time period.
End Quote

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Thursday, May 02, 2019 9:22 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

The other 1.6 acres is downstream from the gage.

Thank you for your comments.

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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:08 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Thank you for providing this information.

Just a couple of comment.

I am slightly puzzled by:

1. The origin of SE Fork 15597.2 (3.854 acres) versus the Less than 1 psu of 22270 Table 10 App6, (5.5 acres). Where is the other 1.6 acres of less than 1 psu water? Such % differences have auditors asking questions.

2. Halls river 216156.6 (53 acres) appears to be open water surface and does not consider the many additional acres of shallow marshy areas which do change in depth from high to low tide (in similar manner to the Gage Station changes).
   I fully appreciate this is difficult if not impossible to estimate...but it is not small.

As far as I know neither of these numbers come from Wang as both these areas were excluded from the Wang study.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Subject: RE: Homosassa MFL Appendix 7

Martyn,

"A" in equation (3) is 216,156.6 sq m for Halls River and 15597.2 sq m for SE Fork.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 24, 2019 10:15 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Ladies and Gentlemen,

It is hard to find words to express my thoughts, but let me try.

1. Small point but this is Appendix 6 related.
2. It would be helpful to be specific and quantify the value of A in the equation for both SEF and Halls River.
   Please share the A values.
3. I am hopeful the correction/s resulting from the Peer Review regarding net flow are meaningful.

4. For the SEFork I think the value for A is in the range of 4 or 5 acres which makes the suggested correction for a 0.03 ft gage height change in 15 minutes (which is reasonably typical) in the order of 6 cfs. This 6 cfs is taken away from the USGS Reported discharge.
5. Recognizing that the 0.03 ft is either positive or negative and that the equation states A is negative the result is either positive (minus times minus) or negative.
6. Recognizing the USGS DISCHARGE IS ALWAYS POSITIVE this results in taking with one hand and giving with the other; the result no difference.

For the SE Fork this is a hypothetical mathematical exercise that has no basis in reality, as the result is net zero. The USGS DISCHARGE DATA IS GOOD AND SIMPLE ADDITION FOR ANY PERIOD IS THE NET.

Now, Halls Rriver is an entirely different and possibly unique situation. A clue is the USGS data attempting to Tidally Filter, some of the results make no sense.

Close examination of the discharge data and the gage height differences with the SE Fork indicate the narrow passage, just upstream of the Gage Station, acts like a choke on the flow of water. I have run the comparisons.
Add to that the strong potential for the turbulence across the cross-section to be different for inflow versus outflow and thus influencing stream velocity (this is indicated by the USGS Field Measurements compared with reported discharge at the same time...some significant differences).
Add to that the slow movement of water into and out of the shallow marshy areas (sponge effect as I referred to it recently).
RESULT DIFFICULTY IN DETERMINING THE TRUE DISCHARGE
Look at the data as you view the Halls River Springs.

I suggested that the other day...take a trip...fresh air is good.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, April 23, 2019 9:09 AM
To: Alan Martyn Johnson
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Here are relevant excerpts from the initial hydrodynamic modeling report (note report is being revised in response to peer review panel comments):

It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

$$q_t = -A\frac{\partial \eta}{\partial t} \quad (3)$$

where q_t is the tidal flow, with the positive flow pointing toward downstream, η is measured water level, t is time, and A is the surface water area upstream of the cross section.

The tidal flow (movement of water past the gage solely due to tides including storage of water upstream of the gage in the marsh) is equal to the area of the upstream water storage times the (negative) change in gage height with respect to time. You are correct in that the Halls River gage measures the tidal movement of water which travels up past the gage, is stored upstream of the gage, and then moves down past the gage when tides lower. The driving force behind this movement of water is differences in elevation, and this is captured in equation three above. When gage height is increasing, tidal flow is negative, and is equal to the product of the upstream area and the rate of change in water elevation at that site. When gage height is decreasing, tidal flow is positive (downstream), and likewise equal to product of area upstream and rate of change in water elevation.

Flows at the Halls River gage and the SE Fork gage are correlated once tidal flow is corrected for and averaged over half a lunar cycle.

flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving average using a time window of one half of the lunar cycle. The regression equation takes the following form

$$\overline{Q_{HR}} = 2.0483\overline{Q_{SE}} - 89.875 \qquad (5)$$

where $\overline{Q_{HR}}$ and $\overline{Q_{SE}}$ moving averages of measured flows at the Halls River at Homosassa Springs and SE Fork Homosassa Spring stations, respectively. The above linear regression equation has a coefficient of determination of 0.704.

While the Halls River gage measures flows at a point with a larger upstream area for water to pool than does the SE Fork gage, they are both corrected by equation 3 above, which accounts for differences in upstream area.

Thank you for your comments.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 10:36 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Thanks for sharing.

Pleased to see this is being reconsidered.

My apology for having to used the word ridiculous when expressing concern about using SE Fork to hindcast Halls River, but I could not find a better word some weeks ago and still cannot.

This will not be solved by sitting in front of a computer screen.

Whoever is charged with the correction of this should take a trip to personally observe Halls River Springs and compare what they see there with any of the spring vents in the SE Fork, which are 5 to 10 cfs in round numbers (Pumphouse being visually the stronger).

A close look at the data output from USGS 02310689 the 'new' gage site on Halls River will help understand my assessment that Halls River in both directions from the gage is like a huge sponge (particularly upstream), resulting in flows which are not so directly related gage height at the gage site. The figures tend to show there maybe significant delays/accumulation of water, most likely in the shallow marshy areas.

It is the delta of gage height that is the driving force, but unfortunately I am not aware of any data on GH above the gage site eg at the main spring. The old gage does provide ssome input before it was decommission due to bridge construction.
Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Monday, April 15, 2019 9:28 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,

Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork
   -summed Homosassa Springs and -15 SEF
   -Halls River USGS (new site)
   -Halls River generated by regression from SE Fork, and lets not forget
   -Hidden River USGS, but I do not see this is used.

   Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

   To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
   QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report

is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report (2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted.
  For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River

There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

"Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?"

> Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

"IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?"

> This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

"As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River."

The results you are looking for are in chapter 3 “Presentation of Results” section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

“Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?”

The “model” in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as “linear models”. The percentage of total variability (“less than 50%”) in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The “models” are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found “The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge.”

“The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall’s River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
”

Answer:
The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system’s minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote

We reevaluated relationships between flow and all forms of available

nitrogen for completeness and found that while some statistically significant relationships with flow were established, the ***results were <u>inconsistent</u> and not directly useful*** *for supporting*

reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls

River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results ***were <u>conflicting</u>*** *with respect to the response as a function*

of flow.
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River.

Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.

The nitrate/nitrite data for Shell Island and Mud River is noted.

IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly, Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.

This is sad.   The writer does not know Pumphouse Spring is in the SE Fork

----

Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).

But, not for this.

Quote from 3-1

The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).

There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage.

Therefore, spring flows in the Homosassa Springs Complex were

assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012 using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.

(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River

has only been gaged since 2012.

The District has estimated flows using regression based on

the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.

Unquote

WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.

The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, May 01, 2019 8:27 AM
To: Doug Leeper
Cc: MFLComments; Gabe I. Herrick; Xinjian Chen
Subject: Re: SWFWMD WebBoards Digest

Doug,
Thanks for the quick response.

I have downloaded the files so that I can look closer later in the week when not travelling/enjoying retirement.

Couple of questions from yesterdays rapid read Chen March 15, 2019.

1. What are the A values for Homosassa Springs 02310678, Homosassa R 02310700, and Chass (sorry if I do not recall the number correctly) 02310650.

2. Is net spring discharge used in the LAMFE modeling. I do not see any mention of NSGD.

   Where is NSGD used other than in the work/graphs in Chen March 15, 2019?

   All these different SGD are getting confusing.
   When reference is made to Reductions of Spring Flow it may be necessary to start specifying what flow is being reduced eg 02310678 plus 02310688 as reported by USGS or,
   02310678 plus 02310688 plus 02310689 as reported by USGS, and are those tidally filtered or not.

   What is Table 2-3B in the Jan 19 Review Draft Average Daily what.... Table 2-3A show tidally and not tidally filtered for some springs.

   Just how are all these going to play in 40D-8.041. I have mentioned this thought before, but now we have NSGD (to use my abbreviation for clarity).

   Still not clear where the Modified SGD -15 cfs for the SE Fork is used.

3. Tidally filtered salinity!!! Is this another way of saying correlation or what simple filter is used, but that is for another day.

Have a good day.

Martyn

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Tuesday, April 30, 2019 9:39 AM
To: Alan Martyn Johnson

Cc: MFLComments
Subject: RE: SWFWMD WebBoards Digest

Martyn:

The changes we've made to the draft minimum flow reports and appendices are identified in the District response documents.

Thanks,

Doug Leeper

MFLs Program Lead

Southwest Florida Water Management District

Springs and Environmental Flows Section

2379 Broad Street, Brookville, FL 34604

1-800-423-1476, extension 4272 (FL only)

352-796-7211, extension 4272

doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 30, 2019 9:32 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Fw: SWFWMD WebBoards Digest

Doug,

I have just had a very quick look at the Homosassa mid review pdf. Are changes in anyway identified or have I just not looked far enough to see any?

Thanks,

Martyn

From: noreply@websitetoolbox.com <noreply@websitetoolbox.com> on behalf of SWFWMD WebBoards <noresponse@websitetoolbox.com>
Sent: Tuesday, April 30, 2019 7:07 AM
To: martynellijay@hotmail.com
Subject: SWFWMD WebBoards Digest

Hi MartynJ,
Here are the top topics at SWFWMD WebBoards since last week.

- **Mid-Review Documents for Peer Review Panel**
  Started by Doug Leeper in Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

Thank you,
SWFWMD WebBoards
https://swfwmd.discussion.community

This digest is sent when we haven't seen you in a while. If you'd rather not receive future emails, you can unsubscribe.

Gabe I. Herrick

From: Doug Leeper
Sent: Tuesday, April 30, 2019 9:40 AM
To: Alan Martyn Johnson
Cc: MFLComments
Subject: RE: SWFWMD WebBoards Digest

Martyn:

The changes we've made to the draft minimum flow reports and appendices are identified in the District response documents.

Thanks,

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 30, 2019 9:32 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Fw: SWFWMD WebBoards Digest

Doug,
I have just had a very quick look at the Homosassa mid review pdf. Are changes in anyway identified or have I just not looked far enough to see any?
Thanks,
Martyn

From: noreply@websitetoolbox.com <noreply@websitetoolbox.com> on behalf of SWFWMD WebBoards <noresponse@websitetoolbox.com>
Sent: Tuesday, April 30, 2019 7:07 AM
To: martynellijay@hotmail.com
Subject: SWFWMD WebBoards Digest

Hi MartynJ,

Here are the top topics at SWFWMD WebBoards since last week.

- **Mid-Review Documents for Peer Review Panel**
  Started by Doug Leeper in Minimum Flows and Levels Reevaluation for the Chassahowitzka and Homosassa River/Spring Systems

Thank you,
SWFWMD WebBoards
https://swfwmd.discussion.community

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:21 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Re: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

I can only say that if you repeat yourself enough times you will eventually believe it.

I am not yet believing this explanation...What spacial domain are you referencing?
Agreed the dates are different, but the river and discharges are the same.

This answer/explanation does not address the area and volumes in the upper reaches of the river.
The physical banks are the same.
The discharges from 02310678 and 02310688 are the same.
So why is the area/volume for waters less than 3 psu so different.
If you do not understand the question relating to the difference 47 acres v 179 acres, please say so.

A map showing the 179 acres may help!

Martyn
More about snook as I get time later this week.

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:21 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

The application of the EFDC to the Homosassa River system in 2012 and the application of the LAMFE to the system in 2019 have different spatial domains and periods of record. These account for the differences in quantity of salinity-based habitats under baseline flow scenarios in, for example, Table 5-17 of the 2012 report and Table 9 of the initial hydrodynamic modeling report.

Thank you for providing comments on the Homosassa River system’s minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 23, 2019 8:49 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Please share/alert as appropriate.

In the 2012 Homosassa MFL Report the reported baseline area of water less than or equal to 3 psu was 164680 sq m (40.7 acres)' in the 2019 Draft the reported figure is 727974 sq m (179 acres). Water of 3 psu or less is confined to the upper reaches of the Homosassa (essentially close to and upstream of the Halls River confluence).
Big difference is an under statement. Explanation?

In the 2019 Draft Report a number of different SGD are used. Which one will be for reduced discharge in 40D-8.041 and which one is for LAMFE modeling.

Read on and I will detail my concern.

As some of you may be aware about a month ago I suggested that a comparison of Volume, Area and Shoreline presented in the 2019 Draft Homosassa MFL report and the 2012 Homosassa MFL reports should be undertaken because there are significant differences.

Attached is simple spread sheet with the key data for the well defined section of Homosassa River upstream of USGS 02310700/MacRaes/RKm 9 or however you want to define it. This section is a primary section of the river with most waters of salinity less than or equal to 5 psu and all salinities less than or equal to 3 psu.

I hope I have extracted the data accurately from the reports, my only editor/proofreader is myself. Data from the 2012 report is from the hydrodynamic modeling not the regression.

My e-mail about a month ago was essentially two part:

Quote

Model Output Volume Area Shoreline

I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

End Quote

The response was

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Not clear what this answer means regarding the first part as both efforts were/are to address what happens as discharge from the springs is reduced. How is the river different in terms of volumes, area and shoreline?

Certainly the area considered in the LAMFE Model is expanded towards the Gulf as depicted in Appendix 6 Figure 20, along with the commentary that reduction in spring discharge will have ***"very insignificant effect on salinity increase there."***

The second point (highlighted yellow) is why are all the scenarios showing decreases? Appendix 6 Tables 9, 10, 11

It appears logical that tidal forces will move seawater towards the springs (replacing the 'lost' spring discharge). At some point this must increase the salinity in some zones even though salinity segments (1 or 2 psu) are large compared to the gradual changes in the river. Presumably when simulations reach 30% reduction, the loss of 60+ cfs must allow more high salinity water past Gage Station 02310700 thus maintaining the same total volume/area/shoreline in that part of the river.

With the implied accuracy of the model (eg to predict shorelines down to 41 meters in 68 km for <15 psu from existing to 2.5% discharge reduction Table 5-11 Appendix 6) there should be the ability see the seawater 'replacement' of a 30% discharge reduction.

Sorry, but I do not buy this accuracy, or that all these modeled scenarios result in reductions. Tidal force must have an effect as hinted at in the commentary ***"very insignificant effect on salinity increase there."*** Note increase.

Additionally, spring discharge of differing quality appear to be combine/added not considered as individual feeds of different salinities.

I think we may all agree the section of the river upstream of USGS Gage Station 02310700 is:

- **The same for both reports/modeling**
- **Well defined with essentially vertical banks (other than Halls River which is primarily above 3psu). No beaches/mud flats/sand bars are exposed during normal tidal changes at present. These tidal changes represent the equivalent of over 15% discharge reduction from high to low tides and are strong factual indicators of average reductions (other than water depth) modeled in the scenarios and presented in the output Tables.**
- **The section of the river most influenced by changes (reductions) in spring discharge.**

For clarity the 2012 report qualifies the shoreline as natural shoreline as defined;
2.7 page 73 (2012 Report), ***so cannot be compared to shoreline in the 2019 Draft Report, although the 2019 report does present percentage changes to the altered and natural shoreline in Tables 15 and 16. Percent of the shoreline categorizations appear to have derived from Wang data in 2012 Report.***

2012 Quote
All surveyed shorelines were classified as natural, i.e., naturally vegetated or altered, with altered shorelines including areas of rip-rap, seawall, a combination of rip-rap and seawall and maintained or modified lands. Maintained shorelines include lawns and maintained landscaping. Modified shorelines were those with relatively natural vegetation that has been previously modified.

Natural vegetation occurs along approximately 71 percent of the combined 62,529 m shoreline mapped for the Halls River, Homosassa River and Southeast Fork of the Homosassa Rivers (Figure 2-35, Table 2-6). Most of Halls River upstream from the Halls River Road Bridge is naturally vegetated, including upstream areas that were not mapped or surveyed by PBS&J. Unaltered or natural shoreline is similarly dominant in the Homosassa River downstream from the Homosassa Community near river kilometer 7.2.
Unquote

The next point in need of clarification is:

WHAT SPRING DISCHARGE IS THE BASIS FOR THE SIMULATED REDUCTIONS? (eg 5% of what)

I would venture to suggest the 2012 report used the USGS discharge and did not include the speculative discharge of 100 cfs from Halls River.
For the 2019 Draft Report there are numerous discharges to consider;

- USGS data from the gage stations 02310678, 02310688, 02310689 (two of which have tidally filtered data).
- Daily Mean discharges as presented in Table 2-3B of the 2019 Draft Peer Review Report
- Discharge data from the three Gage Stations above, but with the SE Fork modified to represent the supposed 15 cfs lower discharge detailed in the report (Equation 6).

- Discharge data from the three Gage Stations above modified using the net discharge calculation (Equation 3)

The last one may be the most likely as from Appendix 6 page 26 ******See also my P.S.******

Quote

It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

End quote.

Which raises the question of which discharge was this equation/formula applied to; 15 minute data, daily data, tidally filtered data, lunar cycle data? (Note; it is unclear where Homosassa Springs 02310688 net discharge data is derived from, or how.).

Before, I get too far into the weeds let me get back to model output particularly for the section of the river upstream of Homosassa R 02310700.

The attached simple spreadsheet compares the 2012 hydrodynamic model output with LAMFE output.

As you look at the output data consider the typical specific conductance (psu) at each of the Gage Stations

Homosassa R at Homosassa 02310700 5000-9000 Spec C or 2.7 to 5 psu

Homosassa Spring at Homosassa 02310678 3000-4000 SpecC or 1.7 to 2.5 psu

South East Fork 02310688 1000 Spec C or 0.5 psu

Halls River 02310689 6000-9000 Spec C or 3 to 4.8 psu

Therefore:

1. All equal or less than 3 psu water is in the section of river from Rkm 9 to 13.
2. No equal or less than 3 psu is in Halls River
3. Some of the equal or less than 5 psu water is in the Halls River
4. Some of the equal or less than 5 psu is above RKm 9 and some is just downstream of RKM 9.

Unfortunately for some reason equal or less than 4 psu is omitted. This is a critical salinity zone in the river and possibly the one most difficult to model as the only data which could be used to section and calibrate this salinity zone is the old Halls River Gage Station 02310690 where Mean daily specific conductance is 4000 to 6000 Maximums are 6000 to 9000 and Minimums 3000 to 4000.

There is a lot to consider and explain;

Why so much difference in the data sets for the same river.

Where is all this area which LAMFE presents with no referenced bathymetry data source such as Wang in 2012 report. The only means I have of assessing the square meters (converted to acres) is by Google Earth and the

Citrus County property maps which do give similar areas but are different to LAMFE's significantly larger numbers.

Put pretty simply, these differences influence the credibility of the reports, or maybe I am just confused.

Martyn

******See also my P.S.******

P.S. Somehow there appears to be a question about which flow are used in the simulations.
The Executive Summary Page X
Quote
Simulations of reduced flows were based on gaged flows at the United States Geological Survey (USGS) gaging stations Homosassa Springs at Homosassa Springs, FL (No. 02310678) and SE Fork Homosassa Spring at Homosassa Springs, FL (No. 02310688). The long-term average combined flow for all "approved" daily data from October 1, 2000 to October 12, 2017 at these gages was 146 cubic feet per second (cfs). Adjusted for withdrawal impacts of 1.9 percent, the long-term unimpacted flows would average 149 cfs, and minimum flows, corresponding to 95 percent of the unimpacted flow, would average 141 cfs over the same time period.
End Quote

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 29, 2019 10:08 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Re: Homosassa MFL Appendix 7

Thank you for providing this information.

Just a couple of comment.

I am slightly puzzled by:

1. The origin of SE Fork 15597.2 (3.854 acres) versus the Less than 1 psu of 22270 Table 10 App6, (5.5 acres). Where is the other 1.6 acres of less than 1 psu water? Such % differences have auditors asking questions.

2. Halls river 216156.6 (53 acres) appears to be open water surface and does not consider the many additional acres of shallow marshy areas which do change in depth from high to low tide (in similar manner to the Gage Station changes).
   I fully appreciate this is difficult if not impossible to estimate...but it is not small.

As far as I know neither of these numbers come from Wang as both these areas were excluded from the Wang study.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, April 26, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Subject: RE: Homosassa MFL Appendix 7

Martyn,

“A” in equation (3) is 216,156.6 sq m for Halls River and 15597.2 sq m for SE Fork.

Thank you for providing comments on the Homosassa River system’s minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 24, 2019 10:15 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Ladies and Gentlemen,

It is hard to find words to express my thoughts, but let me try.

1. Small point but this is Appendix 6 related.
2. It would be helpful to be specific and quantify the value of A in the equation for both SEF and Halls River.
   Please share the A values.
3. I am hopeful the correction/s resulting from the Peer Review regarding net flow are meaningful.
4. For the SEFork I think the value for A is in the range of 4 or 5 acres which makes the suggested correction for a 0.03 ft gage height change in 15 minutes (which is reasonably typical) in the order of 6 cfs. This 6 cfs is taken away from the USGS Reported discharge.
5. Recognizing that the 0.03 ft is either positive or negative and that the equation states A is negative the result is either positive (minus times minus) or negative.
6. Recognizing the USGS DISCHARGE IS ALWAYS POSITIVE this results in taking with one hand and giving with the other; the result no difference.

For the SE Fork this is a hypothetical mathematical exercise that has no basis in reality, as the result is net zero. The USGS DISCHARGE DATA IS GOOD AND SIMPLE ADDITION FOR ANY PERIOD IS THE NET.

Now, Halls Rriver is an entirely different and possibly unique situation. A clue is the USGS data attempting to Tidally Filter, some of the results make no sense.

Close examination of the discharge data and the gage height differences with the SE Fork indicate the narrow passage, just upstream of the Gage Station, acts like a choke on the flow of water. I have run the comparisons.
Add to that the strong potential for the turbulence across the cross-section to be different for inflow versus outflow and thus influencing stream velocity (this is indicated by the USGS Field Measurements compared with reported discharge at the same time...some significant differences).
Add to that the slow movement of water into and out of the shallow marshy areas (sponge effect as I referred to it recently).
RESULT DIFFICULTY IN DETERMINING THE TRUE DISCHARGE
Look at the data as you view the Halls River Springs.

I suggested that the other day...take a trip...fresh air is good.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, April 23, 2019 9:09 AM
To: Alan Martyn Johnson
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Here are relevant excerpts from the initial hydrodynamic modeling report (note report is being revised in response to peer review panel comments):

> It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.
>
> $$q_t = -A\frac{\partial \eta}{\partial t} \qquad (3)$$
>
> where q_t is the tidal flow, with the positive flow pointing toward downstream, η is measured water level, t is time, and A is the surface water area upstream of the cross section.

The tidal flow (movement of water past the gage solely due to tides including storage of water upstream of the gage in the marsh) is equal to the area of the upstream water storage times the (negative) change in gage height with respect to time. You are correct in that the Halls River gage measures the tidal movement of water which travels up past the gage, is stored upstream of the gage, and then moves down past the gage when tides lower. The driving force behind this movement of water is differences in elevation, and this is captured in equation three above. When gage height is increasing, tidal flow is negative, and is equal to the product of the upstream area and the rate of change in water elevation at that site. When gage height is decreasing, tidal flow is positive (downstream), and likewise equal to product of area upstream and rate of change in water elevation.

Flows at the Halls River gage and the SE Fork gage are correlated once tidal flow is corrected for and averaged over half a lunar cycle.

> flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving average using a time window of one half of the lunar cycle. The regression equation takes the following form
>
> $$\overline{Q_{HR}} = 2.0483\overline{Q_{SE}} - 89.875 \qquad (5)$$

where $\overline{Q_{HR}}$ and $\overline{Q_{SE}}$ moving averages of measured flows at the Halls River at Homosassa Springs and SE Fork Homosassa Spring stations, respectively. The above linear regression equation has a coefficient of determination of 0.704.

While the Halls River gage measures flows at a point with a larger upstream area for water to pool than does the SE Fork gage, they are both corrected by equation 3 above, which accounts for differences in upstream area.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 10:36 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Thanks for sharing.

Pleased to see this is being reconsidered.

My apology for having to used the word ridiculous when expressing concern about using SE Fork to hindcast Halls River, but I could not find a better word some weeks ago and still cannot.

This will not be solved by sitting in front of a computer screen.

Whoever is charged with the correction of this should take a trip to personally observe Halls River Springs and compare what they see there with any of the spring vents in the SE Fork, which are 5 to 10 cfs in round numbers (Pumphouse being visually the stronger).

A close look at the data output from USGS 02310689 the 'new' gage site on Halls River will help understand my assessment that Halls River in both directions from the gage is like a huge sponge (particularly upstream), resulting in flows which are not so directly related gage height at the gage site. The figures tend to show there maybe significant delays/accumulation of water, most likely in the shallow marshy areas.

It is the delta of gage height that is the driving force, but unfortunately I am not aware of any data on GH above the gage site eg at the main spring. The old gage does provide ssome input before it was decommission due to bridge construction.
Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Monday, April 15, 2019 9:28 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,

Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork
   -summed Homosassa Springs and -15 SEF
   -Halls River USGS (new site)
   -Halls River generated by regression from SE Fork, and lets not forget
   -Hidden River USGS, but I do not see this is used.

   Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

   To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
   QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report (2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted.
  For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to

heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).

- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River
There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

"Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?"

> Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

"IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?"

> This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

"As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River."

> The results you are looking for are in chapter 3 "Presentation of Results" section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

"Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?"

> The "model" in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as "linear models". The percentage of total variability ("less

than 50%”) in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The “models” are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found “The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge.”

“The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall’s River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
”

Answer:
The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system’s minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
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7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote
We reevaluated relationships between flow and all forms of available nitrogen for completeness and found that while some statistically significant relationships with flow were established, the ***results were <u>inconsistent</u> and not directly useful*** *for supporting reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results* ***were <u>conflicting</u>*** *with respect to the response as a function of flow*.
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River. Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.
The nitrate/nitrite data for Shell Island and Mud River is noted.

IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly, Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.
This is sad. The writer does not know Pumphouse Spring is in the SE Fork

----

****Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).**

But, not for this.
Quote from 3-1
The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).
There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage.
Therefore, spring flows in the Homosassa Springs Complex were
assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012 using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.
(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River
has only been gaged since 2012.
The District has estimated flows using regression based on
the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.
The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: MFLComments
Sent: Friday, April 26, 2019 3:28 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa South East Fork Specific Conductance Spikes

Martyn,

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 24, 2019 10:32 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: Homosassa South East Fork Specific Conductance Spikes

If the spikes are result of high tide why is the discharge always positive and strong.

When will someone find the fortitude (gonads) to get a portable conductivity recorder and run it for a few days with a sensor at the same location as the velocity meter. That is, and out of the eddy current which occurs along the concrete 'seawall' under higher rising tides. You are welcome to come and watch the kids bath tub dyes and string flow monitors prove this is the cause. The eddy current draws Homosassa Springs water along the seawall , mostly near the bottom out to less than a foot.
Sampling location/error is the only explanation for the spikes.

Good someone-else notice the data issue.
Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Tuesday, April 23, 2019 9:09 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa South East Fork Specific Conductance Spikes

Martyn,

Questions repeated (indented) with answers:

What causes these 'spikes'?

Are these data representative of water discharging the springs in the SEF?

See page 12 of hydrodynamic model report (appendix 6 to MFL, Chen 2019). “Firstly, although the SE Fork Homosassa Spring station is only about

130 meters to the confluence with the Homosassa River, which is roughly the same distance to the Homosassa Springs at Homosassa Springs, salinity measured at the SE Fork is mostly fresh (< 0.5 psu), while salinity measured at the Homosassa Spring at Homosassa Springs is barely below 1 psu. This suggests that SGDs from SE Fork springs, including Belcher Spring, Trotter Springs, McClain Spring, and Pumphouse Spring are fresh and the occasional peaks up to less than 2 psu are likely caused by high tides.”

To repeat: “SGDs (discharges) from SE Fork springs…are fresh” and “the occasional peaks…are likely caused by high tides.”

But, where does the daily average 1.7 to 2.5 (3000 to 4500 Spec C in round numbers) come from??

This was an editing error. It was pointed out by peer review panel and will be corrected in updated drafts of report. You are correct this is the average at the Homosassa Springs gage (no. 02310678).

- SE FORK AND HOMOSASSA SPRINGS ARE DIFFERENT ENOUGH TO BE TREATED AS TWO DIFFERENT FEEDS, BUT AS COMMENTED EARLIER I HAVE GROWING CONCERNS THAT LAMFE IS BUILT FOR A SINGLE FED SURFACE RIVER INTO A TIDAL ESTUARY. Note: I did ask earlier what discharge data does LAMFE use for Halls River.,

Yes, you are correct, the SE Fork discharge and Homosassa Springs discharge are different in magnitude and salinity. They are treated as separate inputs to the system in the LAMFE modeling application to this system. This will be further explained in updated hydrodynamic modeling reports.

- THE SPIKES ARE NOT REPRESENTATIVE OF THE WATER FROM SEF SPRINGS......UNLESS YOU CAN EXPLAIN THEM AS A NATURAL PHENOMENA OF THE DISCHARGE FROM THE SPRINGS, SAMPLING (SENSOR LOCATION MUST BE CONSIDERED.

Yes, you are correct. The spikes are not representative of the water from Southeast Fork springs.

Thank you for your comments.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 9:41 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa South East Fork Specific Conductance Spikes

Ladies and Gentlemen (those who put your names on the January 2019 Draft Peer Review Report for Homosassa),

What causes these 'spikes'?
Are these data representative of water discharging the springs in the SEF?

Following on to my last e-mail on the specific conductance 'spikes' I thought it reasonable to share with you some other notes I made on this matter from the January 2019 Peer Review Report.

See 2.3.2 Page 43

Quote
Salinity drops to lows under 0.5 and reaches highs typically around 1 to 1.5, with higher salinities typical in May and June when flows are at their lowest (Figure 2-28). Average daily salinity range is from 1.7 to 2.5.
Unquote

Somehow this does not make sense, or at least is unclear.
Certainly lows are under 0.5 (under 1000 Spec C). 'Spikes' when they occur are typically 1 to 1.5 (2000-3000 Spec C in round numbers).

But, where does the daily average 1.7 to 2.5 (3000 to 4500 Spec C in round numbers) come from??

These numbers look to be more representative of Homosassa Spring (USGS 02310678) and may be a reflection of the data fed into the LAMFE model. As such they bolster my concern that LAMFE may not be built to handle more than one feed. Is LAMFE built for a surface river feed into an estuary?

--

Furthermore, it should be noted Figure 2-25 (page 46) is not typical (see heading in the report). The dates June 22-25, 2017 were only weeks after a tidal surges from a two storms impacted the river:

- May 24-26, 2017
  May 24 Gage Ht 3.38 ft at 18:15 hr, preceded by negative flow from 15:00 hr to 19:00 (peaking -45.7 cfs @16:45 hr.) and
  followed
  May 26 Specific Conductance of 23800 (14 psu) at 09:15.

- June 7-8, 2017
  June 7 Gage Ht 2.6 ft @16:30 and
  June 8 Specific Conductance 11800 (almost 8 psu) @ 06:00 hr

In all this data let me draw your attention to one example;
May 26, 2017
Specific Conductance 01:15 5120 (2.7 psu) then 15 minutes later 01:30 1400 (0.7 psu). Hard to explain how such a change, even at the time of a major storm, can be what is discharging from the springs.

Data around hurricane Hermine September 2016 and Irma 2017 also show some interesting data hard, if not impossible to explain under positive flow (however accurate flow is measured/calculated in 'abnormal' range of gage ht).

Overall, at minimum some editing of 2-3-2 may be appropriate.

Although data from any date is what the instruments detect/report thru calculation eg for discharge, there are inherent accuracy issues such as where the detector is placed and how accurate the calculation is outside the 'normal' range.

Possible more typical is the record over the last 28 days as depicted in the attached graph for SEF (USGS 02310688).

I have also attached the same period for Homosassa Springs (02310678) simply for completeness.

In conclusion, IMHO

- SE FORK AND HOMOSASSA SPRINGS ARE DIFFERENT ENOUGH TO BE TREATED AS TWO DIFFERENT FEEDS, BUT AS COMMENTED EARLIER I HAVE GROWING CONCERNS THAT LAMFE IS BUILT FOR A SINGLE FED SURFACE RIVER INTO A TIDAL ESTUARY. Note: I did ask earlier what discharge data does LAMFE use for Halls River.,

- THE SPIKES ARE NOT REPRESENTATIVE OF THE WATER FROM SEF SPRINGS......UNLESS YOU CAN EXPLAIN THEM AS A NATURAL PHENOMENA OF THE DISCHARGE FROM THE SPRINGS, SAMPLING (SENSOR LOCATION MUST BE CONSIDERED.

- MAJOR STORMS/HURRICANE UNDOUBTEDLY HAVE A MAJOR EFFECT ON THE SPRINGS/RIVERS AND POSSIBLY WARRANT A COMPARISON OF THE EFFECTS ACROSS ALL RIVERS FOR EACH MAJOR EVENT

Martyn
P.S. Shoreline

Gabe I. Herrick

From: MFLComments
Sent: Friday, April 26, 2019 3:27 PM
To: Alan Martyn Johnson; MFLComments
Subject: RE: Homosassa MFL Appendix 7

Martyn,

“A” in equation (3) is 216,156.6 sq m for Halls River and 15597.2 sq m for SE Fork.

Thank you for providing comments on the Homosassa River system’s minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 24, 2019 10:15 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Ladies and Gentlemen,
It is hard to find words to express my thoughts, but let me try.

1. Small point but this is Appendix 6 related.
2. It would be helpful to be specific and quantify the value of A in the equation for both SEF and Halls River.
   Please share the A values.
3. I am hopeful the correction/s resulting from the Peer Review regarding net flow are meaningful.
4. For the SEFork I think the value for A is in the range of 4 or 5 acres which makes the suggested correction for a 0.03 ft gage height change in 15 minutes (which is reasonably typical) in the order of 6 cfs. This 6 cfs is taken away from the USGS Reported discharge.
5. Recognizing that the 0.03 ft is either positive or negative and that the equation states A is negative the result is either positive (minus times minus) or negative.
6. Recognizing the USGS DISCHARGE IS ALWAYS POSITIVE this results in taking with one hand and giving with the other; the result no difference.

For the SE Fork this is a hypothetical mathematical exercise that has no basis in reality, as the result is net zero. The USGS DISCHARGE DATA IS GOOD AND SIMPLE ADDITION FOR ANY PERIOD IS THE NET.

Now, Halls Rriver is an entirely different and possibly unique situation. A clue is the USGS data attempting to Tidally Filter, some of the results make no sense.

Close examination of the discharge data and the gage height differences with the SE Fork indicate the narrow passage, just upstream of the Gage Station, acts like a choke on the flow of water. I have run the comparisons.
Add to that the strong potential for the turbulence across the cross-section to be different for inflow versus outflow and thus influencing stream velocity (this is indicated by the USGS Field Measurements compared with reported discharge at the same time...some significant differences).
Add to that the slow movement of water into and out of the shallow marshy areas (sponge effect as I referred to it recently).
RESULT DIFFICULTY IN DETERMINING THE TRUE DISCHARGE
Look at the data as you view the Halls River Springs.

I suggested that the other day...take a trip...fresh air is good.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, April 23, 2019 9:09 AM
To: Alan Martyn Johnson
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Here are relevant excerpts from the initial hydrodynamic modeling report (note report is being revised in response to peer review panel comments):

It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

$$q_t = -A\frac{\partial \eta}{\partial t} \qquad (3)$$

where q_t is the tidal flow, with the positive flow pointing toward downstream, η is measured water level, t is time, and A is the surface water area upstream of the cross section.

The tidal flow (movement of water past the gage solely due to tides including storage of water upstream of the gage in the marsh) is equal to the area of the upstream water storage times the (negative) change in gage height with respect to time. You are correct in that the Halls River gage measures the tidal movement of water which travels up past the gage, is stored upstream of the gage, and then moves down past the gage when tides lower. The driving force behind this movement of water is differences in elevation, and this is captured in equation three above. When gage height is increasing, tidal flow is negative, and is equal to the product of the upstream area and the rate of change in water elevation at that site. When gage height is decreasing, tidal flow is positive (downstream), and likewise equal to product of area upstream and rate of change in water elevation.

Flows at the Halls River gage and the SE Fork gage are correlated once tidal flow is corrected for and averaged over half a lunar cycle.

flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving average using a time window of one half of the lunar cycle. The regression equation takes the following form

$$\overline{Q_{HR}} = 2.0483\overline{Q_{SE}} - 89.875 \quad (5)$$

where $\overline{Q_{HR}}$ and $\overline{Q_{SE}}$ moving averages of measured flows at the Halls River at Homosassa Springs and SE Fork Homosassa Spring stations, respectively. The above linear regression equation has a coefficient of determination of 0.704.

While the Halls River gage measures flows at a point with a larger upstream area for water to pool than does the SE Fork gage, they are both corrected by equation 3 above, which accounts for differences in upstream area.

Thank you for your comments.

Gabe Herrick, PhD
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7601 U.S. Highway 301 North
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 10:36 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Thanks for sharing.

Pleased to see this is being reconsidered.

My apology for having to used the word ridiculous when expressing concern about using SE Fork to hindcast Halls River, but I could not find a better word some weeks ago and still cannot.

This will not be solved by sitting in front of a computer screen.

Whoever is charged with the correction of this should take a trip to personally observe Halls River Springs and compare what they see there with any of the spring vents in the SE Fork, which are 5 to 10 cfs in round numbers (Pumphouse being visually the stronger).

A close look at the data output from USGS 02310689 the 'new' gage site on Halls River will help understand my assessment that Halls River in both directions from the gage is like a huge sponge (particularly upstream), resulting in flows which are not so directly related gage height at the gage site. The figures tend to show there maybe significant delays/accumulation of water, most likely in the shallow marshy areas.

It is the delta of gage height that is the driving force, but unfortunately I am not aware of any data on GH above the gage site eg at the main spring. The old gage does provide ssome input before it was decommission due to bridge construction.
Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Monday, April 15, 2019 9:28 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,

Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork
   -summed Homosassa Springs and -15 SEF
   -Halls River USGS (new site)
   -Halls River generated by regression from SE Fork, and lets not forget
   -Hidden River USGS, but I do not see this is used.

   Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

   To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
   QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report (2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted.
  For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River
There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

"Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?"

> Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

"IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?"

> This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

"As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River."

> The results you are looking for are in chapter 3 "Presentation of Results" section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

"Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?"

The "model" in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as "linear models". The percentage of total variability ("less than 50%") in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The "models" are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found "The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge."

"The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
"

Answer:
The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote

We reevaluated relationships between flow and all forms of available

nitrogen for completeness and found that while some statistically significant relationships with flow were established, the ***results were inconsistent and not directly useful*** *for supporting*

reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls

River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results ***were conflicting*** *with respect to the response as a function*

of flow.
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River.

Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.

The nitrate/nitrite data for Shell Island and Mud River is noted.

IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly. Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.

This is sad. The writer does not know Pumphouse Spring is in the SE Fork

----

****Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).**

But, not for this.

Quote from 3-1

The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).

There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage.

Therefore, spring flows in the Homosassa Springs Complex were

assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012 using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.

(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River

has only been gaged since 2012.

The District has estimated flows using regression based on

the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.

Unquote

WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.

The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: MFLComments
Sent: Friday, April 26, 2019 3:21 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Martyn,

The application of the EFDC to the Homosassa River system in 2012 and the application of the LAMFE to the system in 2019 have different spatial domains and periods of record. These account for the differences in quantity of salinity-based habitats under baseline flow scenarios in, for example, Table 5-17 of the 2012 report and Table 9 of the initial hydrodynamic modeling report.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 23, 2019 8:49 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD

Please share/alert as appropriate.

In the 2012 Homosassa MFL Report the reported baseline area of water less than or equal to 3 psu was 164680 sq m (40.7 acres)' in the 2019 Draft the reported figure is 727974 sq m (179 acres). Water of 3 psu or less is confined to the upper reaches of the Homosassa (essentially close to and upstream of the Halls River confluence).
Big difference is an under statement. Explanation?

In the 2019 Draft Report a number of different SGD are used. Which one will be for reduced discharge in 40D-8.041 and which one is for LAMFE modeling.

Read on and I will detail my concern.

As some of you may be aware about a month ago I suggested that a comparison of Volume, Area and Shoreline presented in the 2019 Draft Homosassa MFL report and the 2012 Homosassa MFL reports should be undertaken because there are significant differences.

Attached is simple spread sheet with the key data for the well defined section of Homosassa River upstream of USGS 02310700/MacRaes/RKm 9 or however you want to define it. This section is a primary section of the river with most waters of salinity less than or equal to 5 psu and all salinities less than or equal to 3 psu.

I hope I have extracted the data accurately from the reports, my only editor/proofreader is myself. Data from the 2012 report is from the hydrodynamic modeling not the regression.

My e-mail about a month ago was essentially two part:

Quote

Model Output Volume Area Shoreline

I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

End Quote

The response was

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Not clear what this answer means regarding the first part as both efforts were/are to address what happens as discharge from the springs is reduced. How is the river different in terms of volumes, area and shoreline?

Certainly the area considered in the LAMFE Model is expanded towards the Gulf as depicted in Appendix 6 Figure 20, along with the commentary that reduction in spring discharge will have ***"very insignificant effect on salinity increase there."***

The second point (highlighted yellow) is why are all the scenarios showing decreases? Appendix 6 Tables 9, 10, 11

It appears logical that tidal forces will move seawater towards the springs (replacing the 'lost' spring discharge). At some point this must increase the salinity in some zones even though salinity segments (1 or 2 psu) are large compared to the gradual changes in the river. Presumably when simulations reach 30% reduction, the loss of 60+ cfs must allow more high salinity water past Gage Station 02310700 thus maintaining the same total volume/area/shoreline in that part of the river.

With the implied accuracy of the model (eg to predict shorelines down to 41 meters in 68 km for <15 psu from existing to 2.5% discharge reduction Table 5-11 Appendix 6) there should be the ability see the seawater 'replacement' of a 30% discharge reduction.

Sorry, but I do not buy this accuracy, or that all these modeled scenarios result in reductions. Tidal force must have an effect as hinted at in the commentary ***"very insignificant effect on salinity increase there."*** Note increase.

Additionally, spring discharge of differing quality appear to be combine/added not considered as individual feeds of different salinities.

I think we may all agree the section of the river upstream of USGS Gage Station 02310700 is:

- **The same for both reports/modeling**
- **Well defined with essentially vertical banks (other than Halls River which is primarily above 3psu). No beaches/mud flats/sand bars are exposed during normal tidal changes at present. These tidal changes represent the equivalent of over 15% discharge reduction from high to low tides and are strong factual indicators of average reductions (other than water depth) modeled in the scenarios and presented in the output Tables.**
- **The section of the river most influenced by changes (reductions) in spring discharge.**

For clarity the 2012 report qualifies the shoreline as natural shoreline as defined;
2.7 page 73 (2012 Report), ***so cannot be compared to shoreline in the 2019 Draft Report, although the 2019 report does present percentage changes to the altered and natural shoreline in Tables 15 and 16. Percent of the shoreline categorizations appear to have derived from Wang data in 2012 Report.***

2012 Quote
All surveyed shorelines were classified as natural, i.e., naturally vegetated or altered, with altered shorelines including areas of rip-rap, seawall, a combination of rip-rap and seawall and maintained or modified lands. Maintained shorelines include lawns and maintained landscaping. Modified shorelines were those with relatively natural vegetation that has been previously modified.

Natural vegetation occurs along approximately 71 percent of the combined 62,529 m shoreline mapped for the Halls River, Homosassa River and Southeast Fork of the Homosassa Rivers (Figure 2-35, Table 2-6). Most of Halls River upstream from the Halls River Road Bridge is naturally vegetated, including upstream areas that were not mapped or surveyed by PBS&J. Unaltered or natural shoreline is similarly dominant in the Homosassa

River downstream from the Homosassa Community near river kilometer 7.2.
Unquote

The next point in need of clarification is:

WHAT SPRING DISCHARGE IS THE BASIS FOR THE SIMULATED REDUCTIONS? (eg 5% of what)

I would venture to suggest the 2012 report used the USGS discharge and did not include the speculative discharge of 100 cfs from Halls River.
For the 2019 Draft Report there are numerous discharges to consider;

- USGS data from the gage stations 02310678, 02310688, 02310689 (two of which have tidally filtered data).
- Daily Mean discharges as presented in Table 2-3B of the 2019 Draft Peer Review Report
- Discharge data from the three Gage Stations above, but with the SE Fork modified to represent the supposed 15 cfs lower discharge detailed in the report (Equation 6).
- Discharge data from the three Gage Stations above modified using the net discharge calculation (Equation 3)

The last one may be the most likely as from Appendix 6 page 26 ******See also my P.S.******

Quote
It should be noted that <u>net</u> SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

End quote.

Which raises the question of which discharge was this equation/formula applied to; 15 minute data, daily data, tidally filtered data, lunar cycle data? (Note; it is unclear where Homosassa Springs 02310688 net discharge data is derived from, or how.).

Before, I get too far into the weeds let me get back to model output particularly for the section of the river upstream of Homosassa R 02310700.

The attached simple spreadsheet compares the 2012 hydrodynamic model output with LAMFE output.

As you look at the output data consider the typical specific conductance (psu) at each of the Gage Stations

Homosassa R at Homosassa 02310700 5000-9000 Spec C or 2.7 to 5 psu

Homosassa Spring at Homosassa 02310678 3000-4000 SpecC or 1.7 to 2.5 psu

South East Fork 02310688 1000 Spec C or 0.5 psu

Halls River 02310689 6000-9000 Spec C or 3 to 4.8 psu

Therefore:

1. All equal or less than 3 psu water is in the section of river from Rkm 9 to 13.
2. No equal or less than 3 psu is in Halls River
3. Some of the equal or less than 5 psu water is in the Halls River
4. Some of the equal or less than 5 psu is above RKm 9 and some is just downstream of RKM 9.

Unfortunately for some reason equal or less than 4 psu is omitted. This is a critical salinity zone in the river and possibly the one most difficult to model as the only data which could be used to section and calibrate this salinity zone is the old Halls River Gage Station 02310690 where Mean daily specific conductance is 4000 to 6000 Maximums are 6000 to 9000 and Minimums 3000 to 4000.

There is a lot to consider and explain;

Why so much difference in the data sets for the same river.
Where is all this area which LAMFE presents with no referenced bathymetry data source such as Wang in 2012 report. The only means I have of assessing the square meters (converted to acres) is by Google Earth and the Citrus County property maps which do give similar areas but are different to LAMFE's significantly larger numbers.

Put pretty simply, these differences influence the credibility of the reports, or maybe I am just confused.

Martyn

******See also my P.S.******

P.S. Somehow there appears to be a question about which flow are used in the simulations.
The Executive Summary Page X
Quote
Simulations of reduced flows were based on gaged flows at the United States Geological Survey (USGS) gaging stations Homosassa Springs at Homosassa Springs, FL (No. 02310678) and SE Fork Homosassa Spring at Homosassa Springs, FL (No. 02310688). The long-term average combined flow for all "approved" daily data from October 1, 2000 to October 12, 2017 at these gages was 146 cubic feet per second (cfs). Adjusted for withdrawal impacts of 1.9 percent, the long-term unimpacted flows would average 149 cfs, and minimum flows, corresponding to 95 percent of the unimpacted flow, would average 141 cfs over the same time period.
End Quote

Gabe I. Herrick

From: Doug Leeper
Sent: Wednesday, April 24, 2019 10:32 AM
To: Alan Martyn Johnson
Cc: MFLComments
Subject: RE: Appendix 6 page 24 equation 3

Martyn:

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

To ensure this occurs, I have forwarded your original email and copied this response to the District's MFL Comments email account/folder.

Doug Leeper
MFLs Program Lead
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Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 11:18 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Appendix 6 page 24 equation 3

Doug,
I just took time to look up the referenced page/equation from your e-mail, or should I say the e-mail with your specific name and the MFL Comments name.

Someone needs to reconsider this tidal flux.

This is the problem you have with people who have not gotten their feet wet, but have a computer.

The flow changes thru the tidal cycle for the SE Fork are due to filling and emptying of the 4 acre approx pool upstream of the gage.

As you will recall recently I accepted that 4 acres may be a little on the low side if details of Pepper Creek (running to the weir which maintains level in the State Park for the State Park boats) and the canal running to Spring Cove Road are more accurately surveyed.

From page 26

1. "Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station **contains tidal fluxes through the cross sections**, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

(3)

where is the tidal flow, with the positive flow pointing toward downstream, is measured water level, is time, and is the surface water area upstream of the cross section."

HALLS RIVER GAGE SHOWS REGULAR TIDAL FLUX= = = MAJOR POSITIVE AND NEGATIVE DISCHARGES **THROUGH** THE CROSS SECTION WHICH IS NOT THE CASE FOR SE FORK.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Monday, April 15, 2019 9:28 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,

Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork
   -summed Homosassa Springs and -15 SEF
   -Halls River USGS (new site)
   -Halls River generated by regression from SE Fork, and lets not forget
   -Hidden River USGS, but I do not see this is used.

   Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

   To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
   QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report

is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report (2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted. For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.

Gabe Herrick, PhD
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Southwest Florida Water Management District
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Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River

There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

"Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?"

> Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

"IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?"

> This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

"As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River."

The results you are looking for are in chapter 3 “Presentation of Results” section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

“Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?”

The “model” in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as “linear models”. The percentage of total variability (“less than 50%”) in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The “models” are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found “The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge.”

“The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall’s River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
”

Answer:
The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system’s minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote

We reevaluated relationships between flow and all forms of available

nitrogen for completeness and found that while some statistically significant relationships with flow were established, the ***results were <u>inconsistent</u> and not directly useful*** *for supporting*

reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls

River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results ***were <u>conflicting</u>*** *with respect to the response as a function*

of flow.
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River.

Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.

The nitrate/nitrite data for Shell Island and Mud River is noted.

IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly, Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.

This is sad. The writer does not know Pumphouse Spring is in the SE Fork

---

****Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).**

But, not for this.

Quote from 3-1

The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).

There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage.

Therefore, spring flows in the Homosassa Springs Complex were

assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012 using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.

(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River

has only been gaged since 2012.

The District has estimated flows using regression based on

the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.

Unquote

WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.

The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 24, 2019 10:32 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Re: Homosassa South East Fork Specific Conductance Spikes

Follow Up Flag: Follow up
Flag Status: Completed

If the spikes are result of high tide why is the discharge always positive and strong.

When will someone find the fortitude (gonads) to get a portable conductivity recorder and run it for a few days with a sensor at the same location as the velocity meter. That is, and out of the eddy current which occurs along the concrete 'seawall' under higher rising tides. You are welcome to come and watch the kids bath tub dyes and string flow monitors prove this is the cause. The eddy current draws Homosassa Springs water along the seawall , mostly near the bottom out to less than a foot.
Sampling location/error is the only explanation for the spikes.

Good someone-else notice the data issue.
Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Tuesday, April 23, 2019 9:09 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa South East Fork Specific Conductance Spikes

Martyn,

Questions repeated (indented) with answers:

> **What causes these 'spikes'?**
>
> **Are these data representative of water discharging the springs in the SEF?**

See page 12 of hydrodynamic model report (appendix 6 to MFL, Chen 2019). “Firstly, although the SE Fork Homosassa Spring station is only about

130 meters to the confluence with the Homosassa River, which is roughly the same distance to the Homosassa Springs at Homosassa Springs, salinity measured at the SE Fork is mostly fresh (< 0.5 psu), while salinity measured at the Homosassa Spring at Homosassa Springs is barely below 1 psu. This suggests that SGDs from SE Fork springs, including Belcher Spring, Trotter Springs, McClain Spring, and Pumphouse Spring are fresh and the occasional peaks up to less than 2 psu are likely caused by high tides."

To repeat: "SGDs (discharges) from SE Fork springs…are fresh" and "the occasional peaks…are likely caused by high tides."

But, where does the daily average 1.7 to 2.5 (3000 to 4500 Spec C in round numbers) come from??

This was an editing error. It was pointed out by peer review panel and will be corrected in updated drafts of report. You are correct this is the average at the Homosassa Springs gage (no. 02310678).

- SE FORK AND HOMOSASSA SPRINGS ARE DIFFERENT ENOUGH TO BE TREATED AS TWO DIFFERENT FEEDS, BUT AS COMMENTED EARLIER I HAVE GROWING CONCERNS THAT LAMFE IS BUILT FOR A SINGLE FED SURFACE RIVER INTO A TIDAL ESTUARY. Note: I did ask earlier what discharge data does LAMFE use for Halls River.,

Yes, you are correct, the SE Fork discharge and Homosassa Springs discharge are different in magnitude and salinity. They are treated as separate inputs to the system in the LAMFE modeling application to this system. This will be further explained in updated hydrodynamic modeling reports.

- THE SPIKES ARE NOT REPRESENTATIVE OF THE WATER FROM SEF SPRINGS......UNLESS YOU CAN EXPLAIN THEM AS A NATURAL PHENOMENA OF THE DISCHARGE FROM THE SPRINGS, SAMPLING (SENSOR LOCATION MUST BE CONSIDERED.

Yes, you are correct. The spikes are not representative of the water from Southeast Fork springs.

Thank you for your comments.

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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 9:41 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>

Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa South East Fork Specific Conductance Spikes

Ladies and Gentlemen (those who put your names on the January 2019 Draft Peer Review Report for Homosassa),

What causes these 'spikes'?
Are these data representative of water discharging the springs in the SEF?

Following on to my last e-mail on the specific conductance 'spikes' I thought it reasonable to share with you some other notes I made on this matter from the January 2019 Peer Review Report.

See 2.3.2 Page 43

Quote
Salinity drops to lows under 0.5 and reaches highs typically around 1 to 1.5, with higher salinities typical in May and June when flows are at their lowest (Figure 2-28). Average daily salinity range is from 1.7 to 2.5.
Unquote

Somehow this does not make sense, or at least is unclear.
Certainly lows are under 0.5 (under 1000 Spec C). 'Spikes' when they occur are typically 1 to 1.5 (2000-3000 Spec C in round numbers).

But, where does the daily average 1.7 to 2.5 (3000 to 4500 Spec C in round numbers) come from??

These numbers look to be more representative of Homosassa Spring (USGS 02310678) and may be a reflection of the data fed into the LAMFE model. As such they bolster my concern that LAMFE may not be built to handle more than one feed. Is LAMFE built for a surface river feed into an estuary?

Furthermore, it should be noted Figure 2-25 (page 46) is not typical (see heading in the report). The dates June 22-25, 2017 were only weeks after a tidal surges from a two storms impacted the river:

- May 24-26, 2017
  May 24 Gage Ht 3.38 ft at 18:15 hr, preceded by negative flow from 15:00 hr to 19:00 (peaking -45.7 cfs @16:45 hr.) and
  followed
  May 26 Specific Conductance of 23800 (14 psu) at 09:15.

- June 7-8, 2017
  June 7 Gage Ht 2.6 ft @16:30 and
  June 8 Specific Conductance 11800 (almost 8 psu) @ 06:00 hr

In all this data let me draw your attention to one example;
May 26, 2017
Specific Conductance 01:15 5120 (2.7 psu) then 15 minutes later 01:30 1400 (0.7 psu). Hard to explain how such a change, even at the time of a major storm, can be what is discharging from the springs.

Data around hurricane Hermine September 2016 and Irma 2017 also show some interesting data hard, if not impossible to explain under positive flow (however accurate flow is measured/calculated in 'abnormal' range of gage ht).

Overall, at minimum some editing of 2-3-2 may be appropriate.

Although data from any date is what the instruments detect/report thru calculation eg for discharge, there are inherent accuracy issues such as where the detector is placed and how accurate the calculation is outside the 'normal' range.

Possible more typical is the record over the last 28 days as depicted in the attached graph for SEF (USGS 02310688).

I have also attached the same period for Homosassa Springs (02310678) simply for completeness.

In conclusion, IMHO

- SE FORK AND HOMOSASSA SPRINGS ARE DIFFERENT ENOUGH TO BE TREATED AS TWO DIFFERENT FEEDS, BUT AS COMMENTED EARLIER I HAVE GROWING CONCERNS THAT LAMFE IS BUILT FOR A SINGLE FED SURFACE RIVER INTO A TIDAL ESTUARY. Note: I did ask earlier what discharge data does LAMFE use for Halls River.,

- THE SPIKES ARE NOT REPRESENTATIVE OF THE WATER FROM SEF SPRINGS......UNLESS YOU CAN EXPLAIN THEM AS A NATURAL PHENOMENA OF THE DISCHARGE FROM THE SPRINGS, SAMPLING (SENSOR LOCATION MUST BE CONSIDERED.

- MAJOR STORMS/HURRICANE UNDOUBTEDLY HAVE A MAJOR EFFECT ON THE SPRINGS/RIVERS AND POSSIBLY WARRANT A COMPARISON OF THE EFFECTS ACROSS ALL RIVERS FOR EACH MAJOR EVENT

Martyn
P.S. Shoreline

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 24, 2019 10:15 AM
To: MFLComments
Subject: Re: Homosassa MFL Appendix 7

Follow Up Flag: Follow up
Flag Status: Completed

Ladies and Gentlemen,
It is hard to find words to express my thoughts, but let me try.

1. Small point but this is Appendix 6 related.
2. It would be helpful to be specific and quantify the value of A in the equation for both SEF and Halls River.
   Please share the A values.
3. I am hopeful the correction/s resulting from the Peer Review regarding net flow are meaningful.
4. For the SEFork I think the value for A is in the range of 4 or 5 acres which makes the suggested correction for a 0.03 ft gage height change in 15 minutes (which is reasonably typical) in the order of 6 cfs. This 6 cfs is taken away from the USGS Reported discharge.
5. Recognizing that the 0.03 ft is either positive or negative and that the equation states A is negative the result is either positive (minus times minus) or negative.
6. Recognizing the USGS DISCHARGE IS ALWAYS POSITIVE this results in taking with one hand and giving with the other; the result no difference.

For the SE Fork this is a hypothetical mathematical exercise that has no basis in reality, as the result is net zero. The USGS DISCHARGE DATA IS GOOD AND SIMPLE ADDITION FOR ANY PERIOD IS THE NET.

Now, Halls Rriver is an entirely different and possibly unique situation. A clue is the USGS data attempting to Tidally Filter, some of the results make no sense.

Close examination of the discharge data and the gage height differences with the SE Fork indicate the narrow passage, just upstream of the Gage Station, acts like a choke on the flow of water. I have run the comparisons.
Add to that the strong potential for the turbulence across the cross-section to be different for inflow versus outflow and thus influencing stream velocity (this is indicated by the USGS Field Measurements compared with reported discharge at the same time...some significant differences).
Add to that the slow movement of water into and out of the shallow marshy areas (sponge effect as I referred to it recently).
RESULT DIFFICULTY IN DETERMINING THE TRUE DISCHARGE
Look at the data as you view the Halls River Springs.

I suggested that the other day...take a trip...fresh air is good.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Tuesday, April 23, 2019 9:09 AM
To: Alan Martyn Johnson
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Here are relevant excerpts from the initial hydrodynamic modeling report (note report is being revised in response to peer review panel comments):

> It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.
>
> $$q_t = -A\frac{\partial \eta}{\partial t} \quad (3)$$
>
> where q_t is the tidal flow, with the positive flow pointing toward downstream, η is measured water level, t is time, and A is the surface water area upstream of the cross section.

The tidal flow (movement of water past the gage solely due to tides including storage of water upstream of the gage in the marsh) is equal to the area of the upstream water storage times the (negative) change in gage height with respect to time. You are correct in that the Halls River gage measures the tidal movement of water which travels up past the gage, is stored upstream of the gage, and then moves down past the gage when tides lower. The driving force behind this movement of water is differences in elevation, and this is captured in equation three above. When gage height is increasing, tidal flow is negative, and is equal to the product of the upstream area and the rate of change in water elevation at that site. When gage height is decreasing, tidal flow is positive (downstream), and likewise equal to product of area upstream and rate of change in water elevation.

Flows at the Halls River gage and the SE Fork gage are correlated once tidal flow is corrected for and averaged over half a lunar cycle.

> flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving average using a time window of one half of the lunar cycle. The regression equation takes the following form
>
> $$\overline{Q_{HR}} = 2.0483\overline{Q_{SE}} - 89.875 \quad (5)$$

> where $\overline{Q_{HR}}$ and $\overline{Q_{SE}}$ moving averages of measured flows at the Halls River at Homosassa Springs and SE Fork Homosassa Spring stations, respectively. The above linear regression equation has a coefficient of determination of 0.704.

While the Halls River gage measures flows at a point with a larger upstream area for water to pool than does the SE Fork gage, they are both corrected by equation 3 above, which accounts for differences in upstream area.

Thank you for your comments.

Gabe Herrick, PhD
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Southwest Florida Water Management District
7601 U.S. Highway 301 North
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 10:36 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Thanks for sharing.

Pleased to see this is being reconsidered.

My apology for having to used the word ridiculous when expressing concern about using SE Fork to hindcast Halls River, but I could not find a better word some weeks ago and still cannot.

This will not be solved by sitting in front of a computer screen.

Whoever is charged with the correction of this should take a trip to personally observe Halls River Springs and compare what they see there with any of the spring vents in the SE Fork, which are 5 to 10 cfs in round numbers (Pumphouse being visually the stronger).

A close look at the data output from USGS 02310689 the 'new' gage site on Halls River will help understand my assessment that Halls River in both directions from the gage is like a huge sponge (particularly upstream), resulting in flows which are not so directly related gage height at the gage site. The figures tend to show there maybe significant delays/accumulation of water, most likely in the shallow marshy areas.

It is the delta of gage height that is the driving force, but unfortunately I am not aware of any data on GH above the gage site eg at the main spring. The old gage does provide ssome input before it was decommission due to bridge construction.
Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Monday, April 15, 2019 9:28 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,

Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork
   -summed Homosassa Springs and -15 SEF
   -Halls River USGS (new site)
   -Halls River generated by regression from SE Fork, and lets not forget
   -Hidden River USGS, but I do not see this is used.

   Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

   To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
   QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report (2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted.
  For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District

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Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River
There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

“Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?”

Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

“IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?”

This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

“As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River.”

The results you are looking for are in chapter 3 “Presentation of Results” section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

“Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?”

The “model” in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as “linear models”. The percentage of total variability (“less than 50%”) in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The “models” are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found “The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge.”

“The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall’s River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
”

Answer:
The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the

springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote
We reevaluated relationships between flow and all forms of available nitrogen for completeness and found that while some statistically significant relationships with flow were established, the ***results were inconsistent and not directly useful*** *for supporting reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results* ***were conflicting*** *with respect to the response as a function*

of flow.
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River. Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.
The nitrate/nitrite data for Shell Island and Mud River is noted.
IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly, Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.
This is sad. The writer does not know Pumphouse Spring is in the SE Fork

----

****Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).**

But, not for this.
Quote from 3-1
The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).
There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage. Therefore, spring flows in the Homosassa Springs Complex were
assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012

using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.
(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River
has only been gaged since 2012.
The District has estimated flows using regression based on
the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.
The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, April 23, 2019 9:10 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa South East Fork Specific Conductance Spikes

Martyn,

Questions repeated (indented) with answers:

> **What causes these 'spikes'?**
> **Are these data representative of water discharging the springs in the SEF?**

See page 12 of hydrodynamic model report (appendix 6 to MFL, Chen 2019). "Firstly, although the SE Fork Homosassa Spring station is only about
130 meters to the confluence with the Homosassa River, which is roughly the same distance to the Homosassa Springs at Homosassa Springs, salinity measured at the SE Fork is mostly fresh (< 0.5 psu), while salinity measured at the Homosassa Spring at Homosassa Springs is barely below 1 psu. This suggests that SGDs from SE Fork springs, including Belcher Spring, Trotter Springs, McClain Spring, and Pumphouse Spring are fresh and the occasional peaks up to less than 2 psu are likely caused by high tides."

To repeat: "SGDs (discharges) from SE Fork springs…are fresh" and "the occasional peaks…are likely caused by high tides."

> **But, where does the daily average 1.7 to 2.5 (3000 to 4500 Spec C in round numbers) come from??**

This was an editing error. It was pointed out by peer review panel and will be corrected in updated drafts of report. You are correct this is the average at the Homosassa Springs gage (no. 02310678).

- SE FORK AND HOMOSASSA SPRINGS ARE DIFFERENT ENOUGH TO BE TREATED AS TWO DIFFERENT FEEDS, BUT AS COMMENTED EARLIER I HAVE GROWING CONCERNS THAT LAMFE IS BUILT FOR A SINGLE FED SURFACE RIVER INTO A TIDAL ESTUARY. Note: I did ask earlier what discharge data does LAMFE use for Halls River.,

Yes, you are correct, the SE Fork discharge and Homosassa Springs discharge are different in magnitude and salinity. They are treated as separate inputs to the system in the LAMFE modeling application to this system. This will be further explained in updated hydrodynamic modeling reports.

- THE SPIKES ARE NOT REPRESENTATIVE OF THE WATER FROM SEF SPRINGS......UNLESS YOU CAN EXPLAIN THEM AS A NATURAL PHENOMENA OF THE DISCHARGE FROM THE SPRINGS, SAMPLING (SENSOR LOCATION MUST BE CONSIDERED.

Yes, you are correct. The spikes are not representative of the water from Southeast Fork springs.

Thank you for your comments.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 9:41 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa South East Fork Specific Conductance Spikes

Ladies and Gentlemen (those who put your names on the January 2019 Draft Peer Review Report for Homosassa),

What causes these 'spikes'?
Are these data representative of water discharging the springs in the SEF?

Following on to my last e-mail on the specific conductance 'spikes' I thought it reasonable to share with you some other notes I made on this matter from the January 2019 Peer Review Report.

See 2.3.2 Page 43

Quote
Salinity drops to lows under 0.5 and reaches highs typically around 1 to 1.5, with higher salinities typical in May and June when flows are at their lowest (Figure 2-28). Average daily salinity range is from 1.7 to 2.5.
Unquote

Somehow this does not make sense, or at least is unclear.
Certainly lows are under 0.5 (under 1000 Spec C). 'Spikes' when they occur are typically 1 to 1.5 (2000-3000 Spec C in round numbers).

But, where does the daily average 1.7 to 2.5 (3000 to 4500 Spec C in round numbers) come from??

These numbers look to be more representative of Homosassa Spring (USGS 02310678) and may be a reflection of the data fed into the LAMFE model. As such they bolster my concern that LAMFE may not be built to handle more than one feed. Is LAMFE built for a surface river feed into an estuary?

Furthermore, it should be noted Figure 2-25 (page 46) is not typical (see heading in the report). The dates June 22-25, 2017 were only weeks after a tidal surges from a two storms impacted the river:

- May 24-26, 2017
  May 24 Gage Ht 3.38 ft at 18:15 hr, preceded by negative flow from 15:00 hr to 19:00 (peaking -45.7 cfs @16:45 hr.) and
  followed
  May 26 Specific Conductance of 23800 (14 psu) at 09:15.

- June 7-8, 2017
  June 7 Gage Ht 2.6 ft @16:30 and
  June 8 Specific Conductance 11800 (almost 8 psu) @ 06:00 hr

In all this data let me draw your attention to one example;
May 26, 2017
Specific Conductance 01:15 5120 (2.7 psu) then 15 minutes later 01:30 1400 (0.7 psu). Hard to explain how such a change, even at the time of a major storm, can be what is discharging from the springs.

Data around hurricane Hermine September 2016 and Irma 2017 also show some interesting data hard, if not impossible to explain under positive flow (however accurate flow is measured/calculated in 'abnormal' range of gage ht).

Overall, at minimum some editing of 2-3-2 may be appropriate.

Although data from any date is what the instruments detect/report thru calculation eg for discharge, there are inherent accuracy issues such as where the detector is placed and how accurate the calculation is outside the 'normal' range.

Possible more typical is the record over the last 28 days as depicted in the attached graph for SEF (USGS 02310688).

I have also attached the same period for Homosassa Springs (02310678) simply for completeness.

In conclusion, IMHO

- SE FORK AND HOMOSASSA SPRINGS ARE DIFFERENT ENOUGH TO BE TREATED AS TWO DIFFERENT FEEDS, BUT AS COMMENTED EARLIER I HAVE GROWING CONCERNS THAT LAMFE IS BUILT FOR A SINGLE FED SURFACE RIVER INTO A TIDAL ESTUARY. Note: I did ask earlier what discharge data does LAMFE use for Halls River.,

- THE SPIKES ARE NOT REPRESENTATIVE OF THE WATER FROM SEF SPRINGS......UNLESS YOU CAN EXPLAIN THEM AS A NATURAL PHENOMENA OF THE DISCHARGE FROM THE SPRINGS, SAMPLING (SENSOR LOCATION MUST BE CONSIDERED.

- MAJOR STORMS/HURRICANE UNDOUBTEDLY HAVE A MAJOR EFFECT ON THE SPRINGS/RIVERS AND POSSIBLY WARRANT A COMPARISON OF THE EFFECTS ACROSS ALL RIVERS FOR EACH MAJOR EVENT

Martyn
P.S. Shoreline

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 23, 2019 8:49 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Homosassa MFL Volume, Area, Shoreline and Reductions of which SGD
Attachments: Homosassa River MFL Output Data Comparison 2012 and Draft 2019.xlsx

Follow Up Flag: Follow up
Flag Status: Completed

Please share/alert as appropriate.

In the 2012 Homosassa MFL Report the reported baseline area of water less than or equal to 3 psu was 164680 sq m (40.7 acres)' in the 2019 Draft the reported figure is 727974 sq m (179 acres). Water of 3 psu or less is confined to the upper reaches of the Homosassa (essentially close to and upstream of the Halls River confluence).
Big difference is an under statement. Explanation?

In the 2019 Draft Report a number of different SGD are used. Which one will be for reduced discharge in 40D-8.041 and which one is for LAMFE modeling.

Read on and I will detail my concern.

As some of you may be aware about a month ago I suggested that a comparison of Volume, Area and Shoreline presented in the 2019 Draft Homosassa MFL report and the 2012 Homosassa MFL reports should be undertaken because there are significant differences.
Attached is simple spread sheet with the key data for the well defined section of Homosassa River upstream of USGS 02310700/MacRaes/RKm 9 or however you want to define it. This section is a primary section of the river with most waters of salinity less than or equal to 5 psu and all salinities less than or equal to 3 psu.
I hope I have extracted the data accurately from the reports, my only editor/proofreader is myself. Data from the 2012 report is from the hydrodynamic modeling not the regression.

My e-mail about a month ago was essentially two part:
Quote
Model Output Volume Area Shoreline
I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

End Quote

The response was

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Not clear what this answer means regarding the first part as both efforts were/are to address what happens as discharge from the springs is reduced. How is the river different in terms of volumes, area and shoreline?

Certainly the area considered in the LAMFE Model is expanded towards the Gulf as depicted in Appendix 6 Figure 20, along with the commentary that reduction in spring discharge will have ***"very insignificant effect on salinity increase there."***

The second point (highlighted yellow) is why are all the scenarios showing decreases? Appendix 6 Tables 9, 10, 11

It appears logical that tidal forces will move seawater towards the springs (replacing the 'lost' spring discharge). At some point this must increase the salinity in some zones even though salinity segments (1 or 2 psu) are large compared to the gradual changes in the river. Presumably when simulations reach 30% reduction, the loss of 60+ cfs must allow more high salinity water past Gage Station 02310700 thus maintaining the same total volume/area/shoreline in that part of the river.

With the implied accuracy of the model (eg to predict shorelines down to 41 meters in 68 km for <15 psu from existing to 2.5% discharge reduction Table 5-11 Appendix 6) there should be the ability see the seawater 'replacement' of a 30% discharge reduction.

Sorry, but I do not buy this accuracy, or that all these modeled scenarios result in reductions. Tidal force must have an effect as hinted at in the commentary ***"very insignificant effect on salinity increase there."*** Note increase.

Additionally, spring discharge of differing quality appear to be combine/added not considered as individual feeds of different salinities.

I think we may all agree the section of the river upstream of USGS Gage Station 02310700 is:

- **The same for both reports/modeling**
- **Well defined with essentially vertical banks (other than Halls River which is primarily above 3psu). No beaches/mud flats/sand bars are exposed during normal tidal changes at present. These tidal changes represent the equivalent of over 15% discharge reduction from high to low tides and are strong factual indicators of average reductions (other than water depth) modeled in the scenarios and presented in the output Tables.**
- **The section of the river most influenced by changes (reductions) in spring discharge.**

For clarity the 2012 report qualifies the shoreline as natural shoreline as defined;

2.7 page 73 (2012 Report), ***so cannot be compared to shoreline in the 2019 Draft Report, although the 2019***

report does present percentage changes to the altered and natural shoreline in Tables 15 and 16. Percent of the shoreline categorizations appear to have derived from Wang data in 2012 Report.

2012 Quote
All surveyed shorelines were classified as natural, i.e., naturally vegetated or altered, with altered shorelines including areas of rip-rap, seawall, a combination of rip-rap and seawall and maintained or modified lands. Maintained shorelines include lawns and maintained landscaping. Modified shorelines were those with relatively natural vegetation that has been previously modified.

Natural vegetation occurs along approximately 71 percent of the combined 62,529 m shoreline mapped for the Halls River, Homosassa River and Southeast Fork of the Homosassa Rivers (Figure 2-35, Table 2-6). Most of Halls River upstream from the Halls River Road Bridge is naturally vegetated, including upstream areas that were not mapped or surveyed by PBS&J. Unaltered or natural shoreline is similarly dominant in the Homosassa River downstream from the Homosassa Community near river kilometer 7.2.
Unquote

The next point in need of clarification is:

WHAT SPRING DISCHARGE IS THE BASIS FOR THE SIMULATED REDUCTIONS? (eg 5% of what)

I would venture to suggest the 2012 report used the USGS discharge and did not include the speculative discharge of 100 cfs from Halls River.
For the 2019 Draft Report there are numerous discharges to consider;

- USGS data from the gage stations 02310678, 02310688, 02310689 (two of which have tidally filtered data).
- Daily Mean discharges as presented in Table 2-3B of the 2019 Draft Peer Review Report
- Discharge data from the three Gage Stations above, but with the SE Fork modified to represent the supposed 15 cfs lower discharge detailed in the report (Equation 6).
- Discharge data from the three Gage Stations above modified using the net discharge calculation (Equation 3)

The last one may be the most likely as from Appendix 6 page 26 ******See also my P.S.******
Quote
It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.
End quote.

Which raises the question of which discharge was this equation/formula applied to; 15 minute data, daily data, tidally filtered data, lunar cycle data? (Note; it is unclear where Homosassa Springs 02310688 net discharge data is derived from, or how.).

Before, I get too far into the weeds let me get back to model output particularly for the section of the river upstream of Homosassa R 02310700.

The attached simple spreadsheet compares the 2012 hydrodynamic model output with LAMFE output.

As you look at the output data consider the typical specific conductance (psu) at each of the Gage Stations

Homosassa R at Homosassa 02310700   5000-9000 Spec C or 2.7 to 5 psu

Homosassa Spring at Homosassa 02310678 3000-4000 SpecC or 1.7 to 2.5 psu

South East Fork 02310688   1000 Spec C or 0.5 psu

Halls River 02310689   6000-9000 Spec C   or 3 to 4.8 psu

Therefore:

1. All equal or less than 3 psu water is in the section of river from Rkm 9 to 13.
2. No equal or less than 3 psu is in Halls River
3. Some of the equal or less than 5 psu water is in the Halls River
4. Some of the equal or less than 5 psu is above RKm 9 and some is just downstream of RKM 9.

Unfortunately for some reason equal or less than 4 psu is omitted. This is a critical salinity zone in the river and possibly the one most difficult to model as the only data which could be used to section and calibrate this salinity zone is the old Halls River Gage Station 02310690 where Mean daily specific conductance is 4000 to 6000 Maximums are 6000 to 9000 and Minimums 3000 to 4000.

There is a lot to consider and explain;

Why so much difference in the data sets for the same river.
Where is all this area which LAMFE presents with no referenced bathymetry data source such as Wang in 2012 report. The only means I have of assessing the square meters (converted to acres) is by Google Earth and the Citrus County property maps which do give similar areas but are different to LAMFE's significantly larger numbers.

Put pretty simply, these differences influence the credibility of the reports, or maybe I am just confused.

Martyn

******See also my P.S.******

P.S. Somehow there appears to be a question about which flow are used in the simulations.
The Executive Summary Page X
Quote
Simulations of reduced flows were based on gaged flows at the United States Geological Survey (USGS) gaging stations Homosassa Springs at Homosassa Springs, FL (No. 02310678) and SE Fork Homosassa Spring at Homosassa Springs, FL

(No. 02310688). The long-term average combined flow for all “approved” daily data from October 1, 2000 to October 12, 2017 at these gages was 146 cubic feet per second (cfs). Adjusted for withdrawal impacts of 1.9 percent, the long-term unimpacted flows would average 149 cfs, and minimum flows, corresponding to 95 percent of the unimpacted flow, would average 141 cfs over the same time period.
End Quote

Gabe I. Herrick

From: Doug Leeper
Sent: Wednesday, April 17, 2019 7:37 AM
To: MFLComments
Subject: FW: Homosassa River System MFL 2019 reevaluation
Attachments: Homosassa River System MFL 2019_38109_032619.pdf

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From: Hoehn, Ted <ted.hoehn@MyFWC.com>
Sent: Friday, March 29, 2019 8:41 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: Wright, Shannon <shannon.wright@MyFWC.com>; Goff, Jennifer <jennifer.goff@MyFWC.com>
Subject: Homosassa River System MFL 2019 reevaluation

Please find attached FWC's comments on the above-referenced project. You will **not** receive a hard-copy version of this letter unless requested.

If you wish to reply to our comments, please send your reply to:

FWCConservationPlanningServices@myFWC.com

Ted Hoehn
Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Office of Conservation Planning Services
620 S. Meridian Street, MS 5B5
Tallahassee, FL 32399-1600
(850) 488-8792; Cell 850-519-3106
Fax (850) 922-5679
"Many men go fishing all their lives without knowing that it is not the fish they are after."- Henry David Thoreau

Gabe I. Herrick

From: Doug Leeper
Sent: Wednesday, April 17, 2019 7:35 AM
To: MFLComments
Subject: FW: Chassahowitzka River System MFL 2019 reevaluation
Attachments: Chassahowitzka River System MFL 2019_38108_032919.pdf

---

From: Hoehn, Ted <ted.hoehn@MyFWC.com>
Sent: Monday, April 01, 2019 3:38 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: Wright, Shannon <shannon.wright@MyFWC.com>; Goff, Jennifer <jennifer.goff@MyFWC.com>
Subject: Chassahowitzka River System MFL 2019 reevaluation

Please find attached FWC's comments on the above-referenced project. You will **not** receive a hard-copy version of this letter unless requested.

If you wish to reply to our comments, please send your reply to:

FWCConservationPlanningServices@myFWC.com

Ted Hoehn
Florida Fish and Wildlife Conservation Commission
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(850) 488-8792; Cell 850-519-3106
Fax (850) 922-5679
"Many men go fishing all their lives without knowing that it is not the fish they are after."- Henry David Thoreau

Gabe I. Herrick

From: Doug Leeper
Sent: Tuesday, April 16, 2019 3:51 PM
To: MFLComments
Subject: Fw: Appendix 6 page 24 equation 3

Follow Up Flag: Follow up
Flag Status: Completed

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 11:17 AM
To: Doug Leeper
Subject: Appendix 6 page 24 equation 3

Doug,
I just took time to look up the referenced page/equation from your e-mail, or should I say the e-mail with your specific name and the MFL Comments name.

Someone needs to reconsider this tidal flux.

This is the problem you have with people who have not gotten their feet wet, but have a computer.

The flow changes thru the tidal cycle for the SE Fork are due to filling and emptying of the 4 acre approx pool upstream of the gage.

As you will recall recently I accepted that 4 acres may be a little on the low side if details of Pepper Creek (running to the weir which maintains level in the State Park for the State Park boats) and the canal running to Spring Cove Road are more accurately surveyed.

From page 26

1. "Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at Homosassa Springs station **contains tidal fluxes <u>through</u> the cross sections**, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data.

(3)
where is the tidal flow, with the positive flow pointing toward downstream, is measured water level, is time, and is the surface water area upstream of the cross section."

HALLS RIVER GAGE SHOWS REGULAR TIDAL FLUX= = = MAJOR POSITIVE AND NEGATIVE DISCHARGES **THROUGH** THE CROSS SECTION WHICH IS NOT THE CASE FOR SE FORK.

Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Monday, April 15, 2019 9:28 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,

Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork
   -summed Homosassa Springs and -15 SEF
   -Halls River USGS (new site)
   -Halls River generated by regression from SE Fork, and lets not forget
   -Hidden River USGS, but I do not see this is used.

   Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

   To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
   QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report (2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted. For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River
There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

"Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?"

> Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

"IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?"

> This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

"As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River."

> The results you are looking for are in chapter 3 "Presentation of Results" section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

"Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?"

> The "model" in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as "linear models". The percentage of total variability ("less

than 50%") in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The "models" are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found "The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge."

"The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
"

Answer:
The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote
*We reevaluated relationships between flow and all forms of available nitrogen for completeness and found that while some statistically significant relationships with flow were established, the **results were inconsistent and not directly useful** for supporting reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results **were conflicting** with respect to the response as a function of flow.*
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River.
Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.
The nitrate/nitrite data for Shell Island and Mud River is noted.
IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly. Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.
This is sad. The writer does not know Pumphouse Spring is in the SE Fork

----

****Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).**

But, not for this.
Quote from 3-1
The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).
There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage.
Therefore, spring flows in the Homosassa Springs Complex were
assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012 using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.
(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River
has only been gaged since 2012.
The District has estimated flows using regression based on
the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote

WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.
The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 10:36 AM
To: MFLComments
Cc: Doug Leeper
Subject: Re: Homosassa MFL Appendix 7

Follow Up Flag: Follow up
Flag Status: Completed

Thanks for sharing.

Pleased to see this is being reconsidered.

My apology for having to used the word ridiculous when expressing concern about using SE Fork to hindcast Halls River, but I could not find a better word some weeks ago and still cannot.

This will not be solved by sitting in front of a computer screen.

Whoever is charged with the correction of this should take a trip to personally observe Halls River Springs and compare what they see there with any of the spring vents in the SE Fork, which are 5 to 10 cfs in round numbers (Pumphouse being visually the stronger).

A close look at the data output from USGS 02310689 the 'new' gage site on Halls River will help understand my assessment that Halls River in both directions from the gage is like a huge sponge (particularly upstream), resulting in flows which are not so directly related gage height at the gage site. The figures tend to show there maybe significant delays/accumulation of water, most likely in the shallow marshy areas.

It is the delta of gage height that is the driving force, but unfortunately I am not aware of any data on GH above the gage site eg at the main spring. The old gage does provide ssome input before it was decommission due to bridge construction.
Martyn

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Monday, April 15, 2019 9:28 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,

Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork
   -summed Homosassa Springs and -15 SEF
   -Halls River USGS (new site)
   -Halls River generated by regression from SE Fork, and lets not forget
   -Hidden River USGS, but I do not see this is used.

   Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

   To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
   QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report (2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted.
  For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

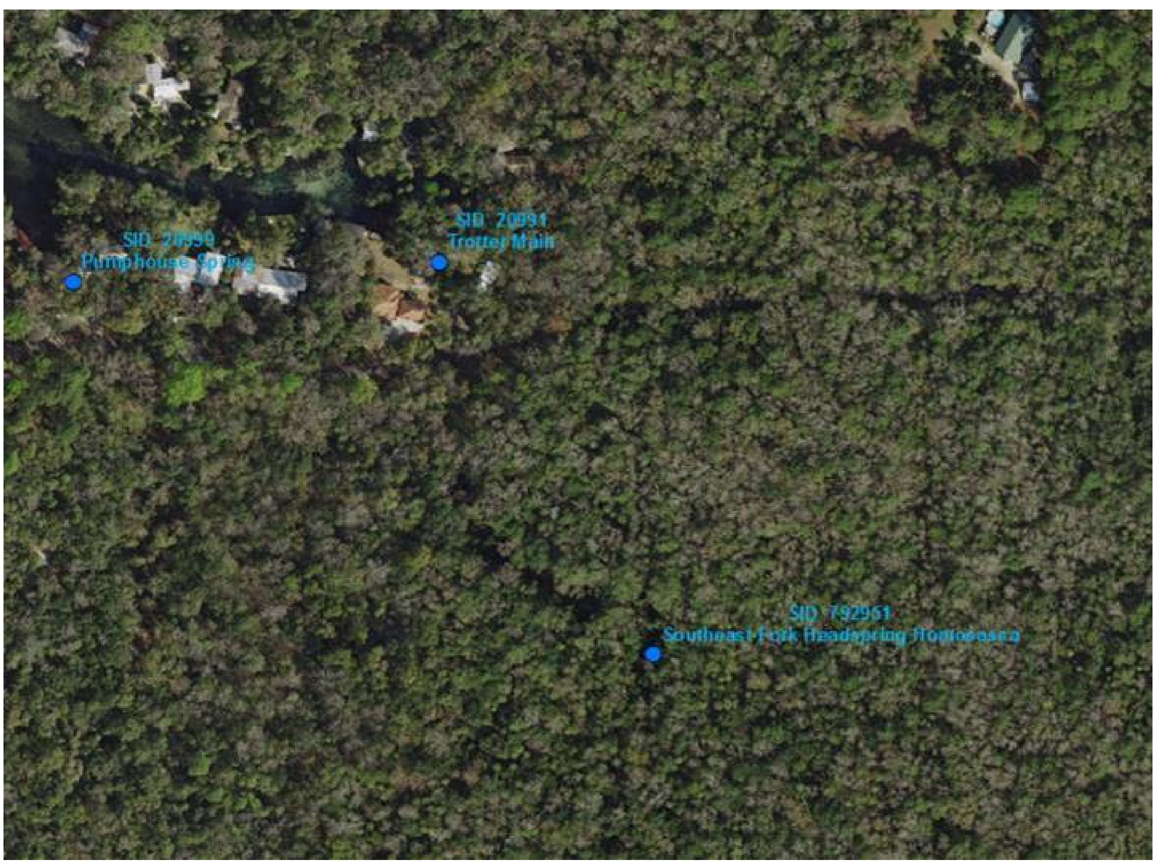
Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.



Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River
There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

“Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?”

Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

“IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?”

This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

“As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River.”

The results you are looking for are in chapter 3 “Presentation of Results” section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

“Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?”

The “model” in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as “linear models”. The percentage of total variability (“less than 50%”) in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The “models” are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found “The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge.”

“The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall’s River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
”

Answer:
The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the

springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote
We reevaluated relationships between flow and all forms of available nitrogen for completeness and found that while some statistically significant relationships with flow were established, the ***results were <u>inconsistent</u> and not directly useful*** *for supporting reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results* ***were <u>conflicting</u>*** *with respect to the response as a function*

of flow.
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River. Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.
The nitrate/nitrite data for Shell Island and Mud River is noted.
IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly, Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.
This is sad. The writer does not know Pumphouse Spring is in the SE Fork

---

****Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).**

But, not for this.
Quote from 3-1
The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).
There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage.
Therefore, spring flows in the Homosassa Springs Complex were
assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012

using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.
(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River
has only been gaged since 2012.
The District has estimated flows using regression based on
the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.
The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, April 15, 2019 9:41 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Homosassa South East Fork Specific Conductance Spikes
Attachments: SEF Specific Conductance 28 Days as of April 13 2019.html; Homosassa Springs Specific Conductance 28 Days as of April 13 2019.html

Follow Up Flag: Follow up
Flag Status: Completed

Ladies and Gentlemen (those who put your names on the January 2019 Draft Peer Review Report for Homosassa),

What causes these 'spikes'?
Are these data representative of water discharging the springs in the SEF?

Following on to my last e-mail on the specific conductance 'spikes' I thought it reasonable to share with you some other notes I made on this matter from the January 2019 Peer Review Report.

See 2.3.2 Page 43

Quote
Salinity drops to lows under 0.5 and reaches highs typically around 1 to 1.5, with higher salinities typical in May and June when flows are at their lowest (Figure 2-28). Average daily salinity range is from 1.7 to 2.5.
Unquote

Somehow this does not make sense, or at least is unclear.
Certainly lows are under 0.5 (under 1000 Spec C). 'Spikes' when they occur are typically 1 to 1.5 (2000-3000 Spec C in round numbers).

But, where does the daily average 1.7 to 2.5 (3000 to 4500 Spec C in round numbers) come from??

These numbers look to be more representative of Homosassa Spring (USGS 02310678) and may be a reflection of the data fed into the LAMFE model. As such they bolster my concern that LAMFE may not be built to handle more than one feed. Is LAMFE built for a surface river feed into an estuary?

--

Furthermore, it should be noted Figure 2-25 (page 46) is not typical (see heading in the report). The dates June 22-25, 2017 were only weeks after a tidal surges from a two storms impacted the river:

- May 24-26, 2017
  May 24 Gage Ht 3.38 ft at 18:15 hr, preceded by negative flow from 15:00 hr to 19:00 (peaking -45.7 cfs @16:45 hr.) and
  followed
  May 26 Specific Conductance of 23800 (14 psu) at 09:15.

- June 7-8, 2017
  June 7 Gage Ht 2.6 ft @16:30 and
  June 8 Specific Conductance 11800 (almost 8 psu) @ 06:00 hr

In all this data let me draw your attention to one example;
May 26, 2017
Specific Conductance 01:15 5120 (2.7 psu) then 15 minutes later 01:30 1400 (0.7 psu). Hard to explain how such a change, even at the time of a major storm, can be what is discharging from the springs.

Data around hurricane Hermine September 2016 and Irma 2017 also show some interesting data hard, if not impossible to explain under positive flow (however accurate flow is measured/calculated in 'abnormal' range of gage ht).

Overall, at minimum some editing of 2-3-2 may be appropriate.

Although data from any date is what the instruments detect/report thru calculation eg for discharge, there are inherent accuracy issues such as where the detector is placed and how accurate the calculation is outside the 'normal' range.

Possible more typical is the record over the last 28 days as depicted in the attached graph for SEF (USGS 02310688).

I have also attached the same period for Homosassa Springs (02310678) simply for completeness.

In conclusion, IMHO

- SE FORK AND HOMOSASSA SPRINGS ARE DIFFERENT ENOUGH TO BE TREATED AS TWO DIFFERENT FEEDS, BUT AS COMMENTED EARLIER I HAVE GROWING CONCERNS THAT LAMFE IS BUILT FOR A SINGLE FED SURFACE RIVER INTO A TIDAL ESTUARY. Note: I did ask earlier what discharge data does LAMFE use for Halls River.,

- THE SPIKES ARE NOT REPRESENTATIVE OF THE WATER FROM SEF SPRINGS......UNLESS YOU CAN EXPLAIN THEM AS A NATURAL PHENOMENA OF THE DISCHARGE FROM THE SPRINGS, SAMPLING (SENSOR LOCATION MUST BE CONSIDERED.

- MAJOR STORMS/HURRICANE UNDOUBTEDLY HAVE A MAJOR EFFECT ON THE SPRINGS/RIVERS AND POSSIBLY WARRANT A COMPARISON OF THE EFFECTS ACROSS ALL RIVERS FOR EACH MAJOR EVENT

Martyn
P.S. Shoreline

Gabe I. Herrick

From: MFLComments
Sent: Monday, April 15, 2019 9:31 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: SE Fork High Specific Conductance LAMFE Model feed data

Martyn,

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, April 11, 2019 8:47 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Re: SE Fork High Specific Conductance LAMFE Model feed data

Ladies and Gentlemen readers of the MFL Comments,

Some of you may have read Gabe Herrick's April 1 reply to my request for an explanation of the spikes in the SE Fork specific conductance data. I could have replied earlier and briefly, that the explanation was disappointing to say the least. However, I thought it worth finding the time to respond in a little more detail and suggest that Gabe may need some help explaining these Spec C spikes in the SEF data.

The graphs that Gabe shared are no news to me and fail in the fact they do not show the spikes in context of data for other parameters at the same time. The xl spreadsheets I attached to my original e-mail do show the data directly extracted from USGS record (sorry I did not label the columns on two of the sheets, but they followed the same order as the one that did contain the column headings).

Gabe in his answer compared SEF to Homosassa R at Homosassa 02310700. There is no comparison, as can be seen on the attached xl spreadsheet, the key parameter being DISCHARGE. The specific conductance changes are logically evident as progressive changes thru the tidal cycle (I have added some highlights to help in your quick review.

As for the attempt to explain the appearance of severity when viewed as micro or milli siemens or psu, let me just say that was unnecessary.

The comment “…**what you have identified is a small change (<1psu) in salinity in a tidal, estuarine system.**” , demonstrates a lack of understanding of what the purpose of this MFL is all about; namely how changes in the spring water feeding the river influence conditions in the river. The South East Fork is one of the two major feeds, not some small part of the estuarine system. As such the data associated with this feed is critical.

We need *spring-ographers* not oceanographers.

I know why these spikes occur, but in the absence of your accepting and acting on the explanation you continue to feed the model with inaccurate data and should have an explanation. Not grossly inaccurate but significant.

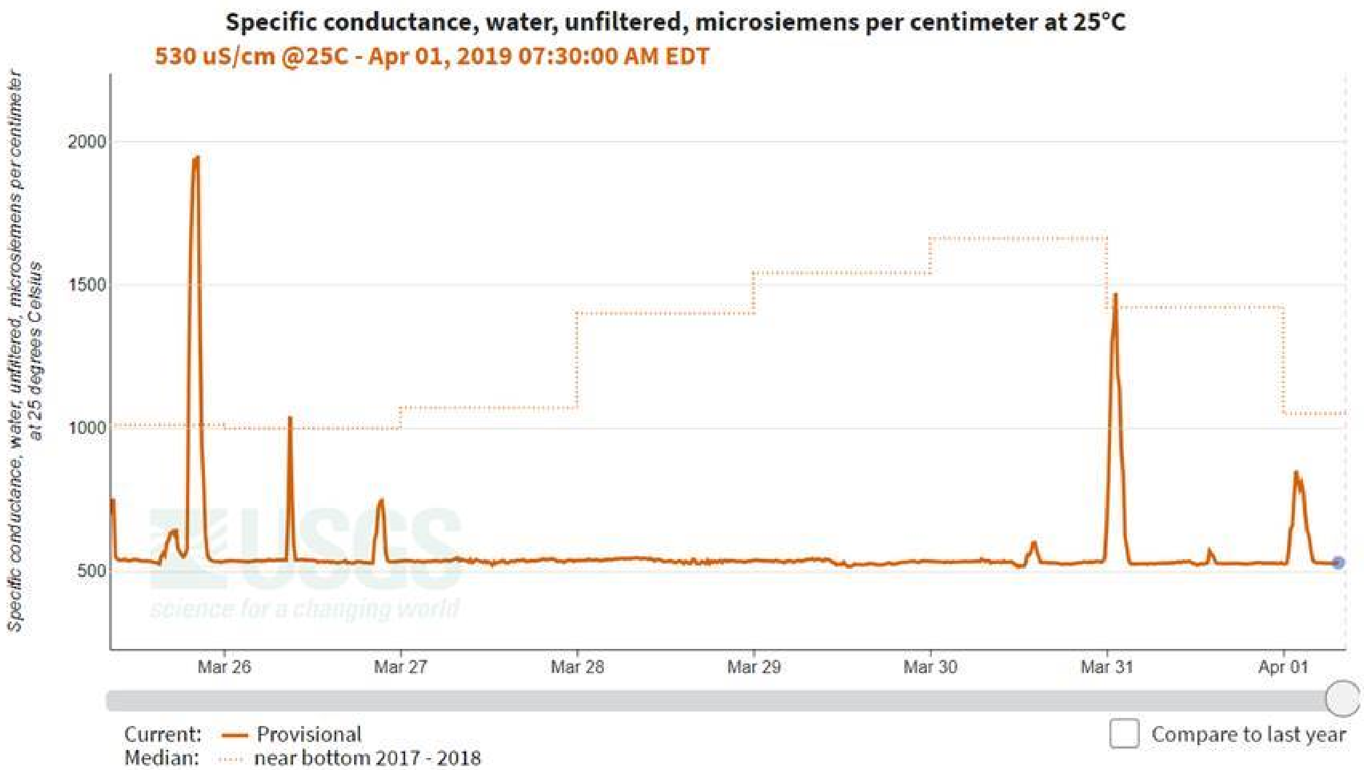
IF YOU THINK THIS IS STILL NO BIG DEAL, START TAKING A LOOK AT SHORELINE TABLE 11 PAGE 43 IN APPENDIX 6, but get past the six decimal places.

Martyn

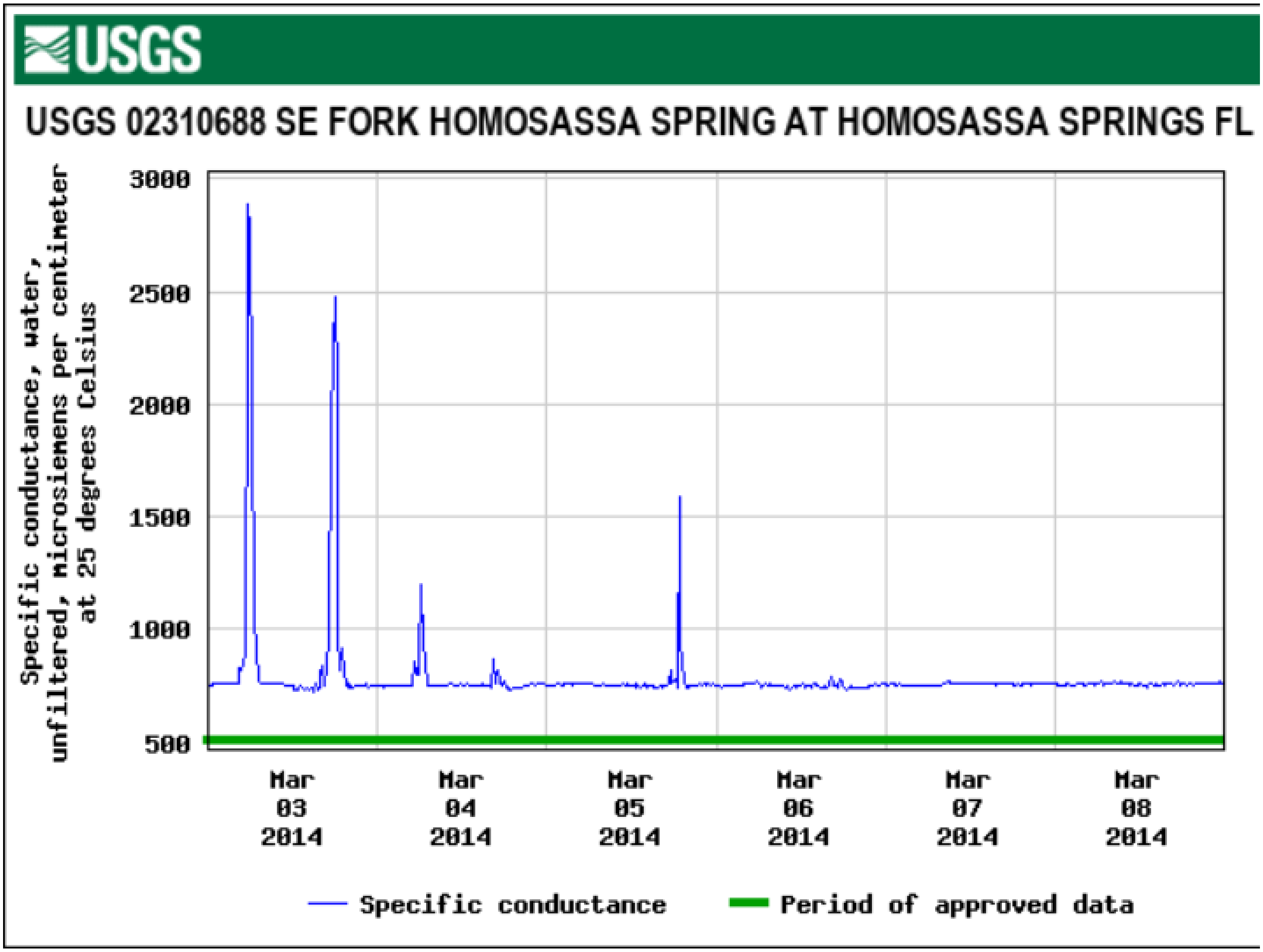
From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 9:12 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: SE Fork High Specific Conductance LAMFE Model feed data

Martyn,
I have reviewed your attached spreadsheet. It shows data that is typical of the specific conductance measurements at the SE Fork gage (No. 02310688).

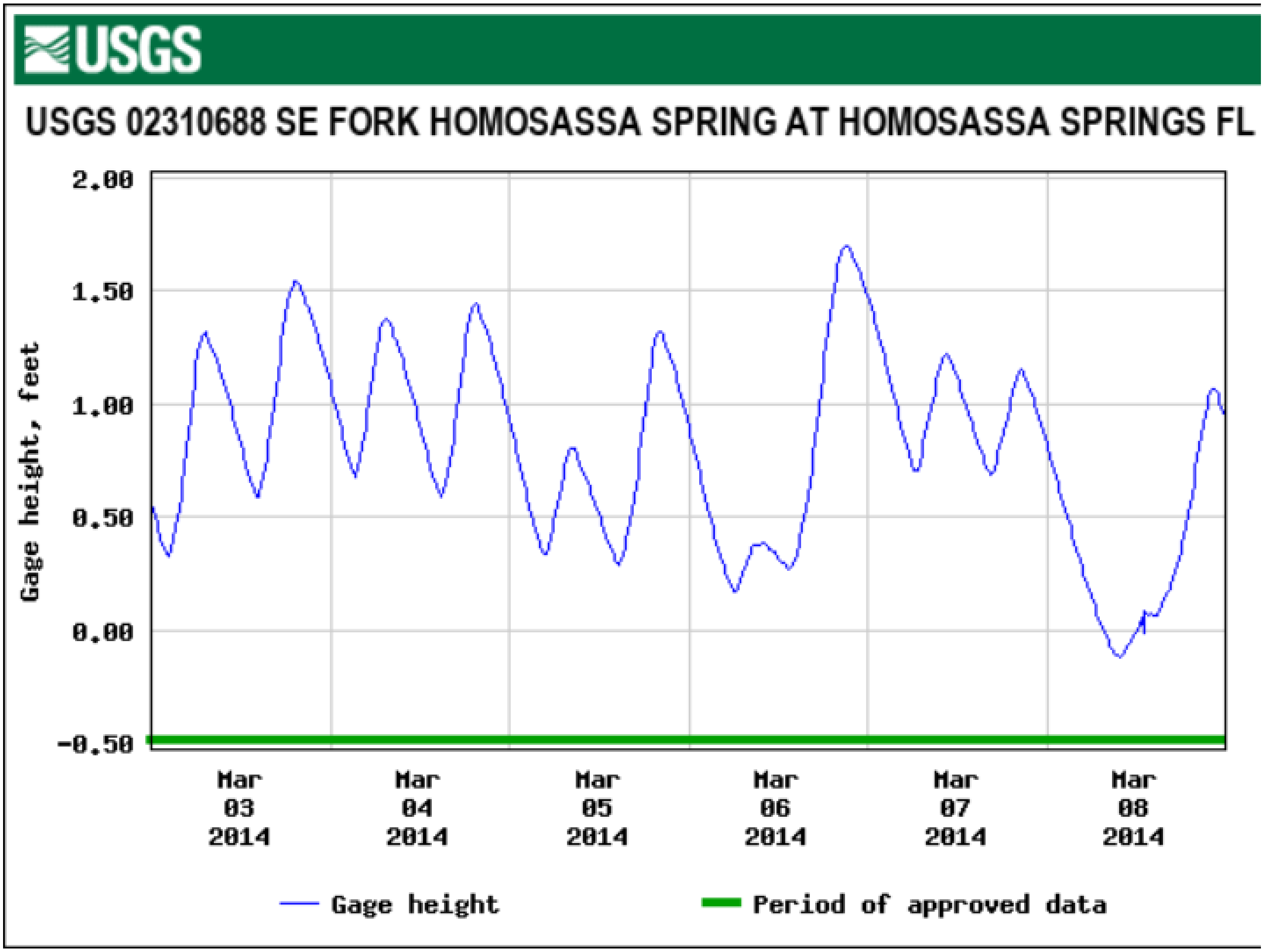
Here is provisional data in plot provided by USGS NWIS from this morning, showing similar spikes in specific conductance:



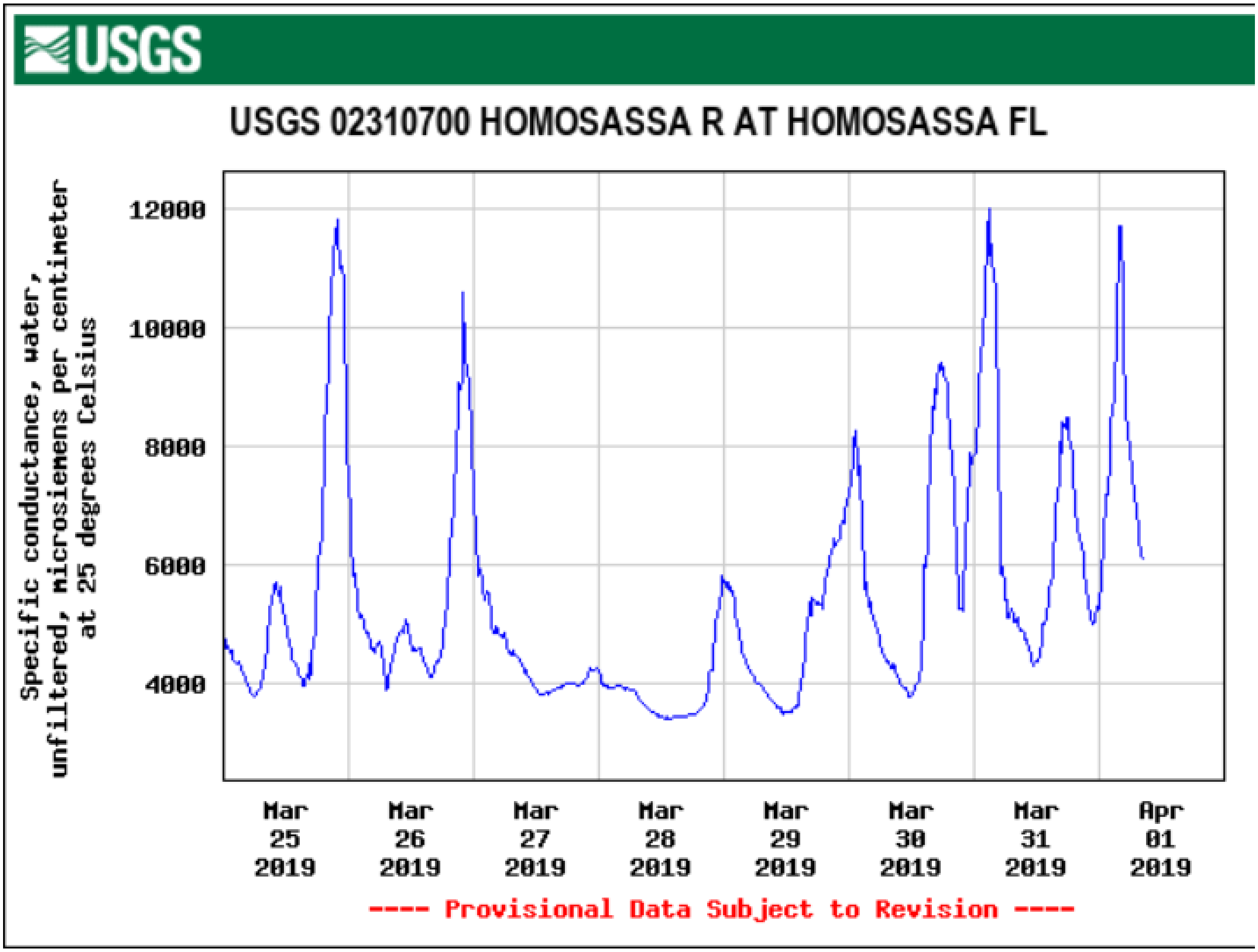
Here is data from your first selected date of 2014-03-03



Here is gage height on the same dates:



You can see spikes in specific conductance correspond to rising tides. The scale of the specific conductance spikes, when one looks at this data in isolation, is hard to get a sense for. However, changes in salinity or specific conductance of this magnitude are not unusual. Here, for example is what happens further downstream at the Homosassa River gage (No. 02310700):



Specific conductance regularly spikes from 4,000 to over 10,000 microsiemens per cm in an equally short amount of time.

Recall that the scale of specific conductance measurements as measured in microsiemens per cm can make small differences seem rather large. Some authors report millisiemens for this reason. In millisiemens, the measurements you noticed on 3/3/2014 go from 2.07 to 0.98 in 15 min. Somehow a change of 1.09 seems less severe than a change of 1090, which is why keeping scale in perspective matters. If you convert this change to psu, you get a decrease from 1.05 psu to 0.48 psu. Likewise downstream you regularly see changes from 4,000 to 10,000 microsiemens/cm, which is a change of 0.49 to 5.62 psu. In other words, what you have identified is a small change (<1psu) in salinity in a tidal, estuarine system. At high tide, when flows reach their minima, salinity often briefly increases at the SE Fork gage from around 0.5 psu to 1 psu. This is apparent in the approved record of data for the gage, readily accessible from the USGS NWIS website.

Thank you for your comments. Your comments have been received, and will be considered during the reevaluation process.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, March 27, 2019 2:18 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: SE Fork High Specific Conductance LAMFE Model feed data

In my e-mail of a couple of days ago I indicated I would share some observations regarding Appendix 7.

I will later today or tomorrow.

For now I would like to direct your thoughts to the higher Specific Conductance 'blips' in the SE Fork USGS data that are so often dismissed, BUT are aggregated in the input data used in the modeling.

Attached is an Excel Spread sheet with three 5 day examples of the data from USGS Gage Site 02310688.

Would anyone like to try and suggest how these ‘blips’ occur. What phenomena causes the Specific Conductance to increase and decrease so quickly. Examples;

03/03/2014 2070 to980 in 15 minutes
11/05/2017 722 to 2650 in 15 minutes
07/02/2018 2080 to 878 in 15 minutes

There are many others examples in these 15 days. In each of the sheets I have used color to highlight the specific conductance of concern and have identified High Tides. You are welcome to pull any timeframe from the USGS record, but do not send files with hundreds of data points unless you can explain the point you are attempting to make. The explanation of this ‘phenomena’ is likely explained in a few sentences.

In my opinion it is wrong to leave this data in the aggregated salinity input for one of the major spring inflows to the Homosassa River LAMFE model.

This needs correcting or explaining.

Martyn

Gabe I. Herrick

From: MFLComments
Sent: Monday, April 15, 2019 9:29 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
Thank you for your comments. An answer to your question is below:

QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER.

The District, in response to peer review panel comments, will be modifying the hydrodynamic model reports to clarify the methods used and results for calculations of spring flow into the Homosassa River System. These revisions are not complete, but following peer review, updated versions will be available on the website. The Halls River input to the LAMFE model for simulation runs was calculated using the Halls River at Homosassa Springs gage (No. 02310689), accounting for the tidal volume upstream of that gage (equation 3, p. 24 of hydrodynamic model report). Because simulations predated installation of the gage, correlation between gaged flows at this Halls River gage and the SE Fork gage (02310688) were used to hindcast Halls River spring inputs for time periods prior to the 2012 installation of the Halls River (No. 02310689) gage (see page 32 of the hydrodynamic model report).

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, April 09, 2019 10:42 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Thanks for the response. I had over the weekend looked at your last e-mail in detail and your response yesterday gets to the meat of the matter.

1. There are a number of different flow records used at various points in the report and appendices:
   -USGS flow records Homosassa Springs and SE Fork
   -modified USGS flow (-15 cfs for SE Fork)
   -summed flow records Homosassa Spring and SE Fork

-summed Homosassa Springs and -15 SEF
-Halls River USGS (new site)
-Halls River generated by regression from SE Fork, and lets not forget
-Hidden River USGS, but I do not see this is used.

Appears the summed SEF and Homosassa Spring flow record is used in the regressions for the flow relation of all the S889 data.

To me it is not surprising that there is inconsistency when using this flow record on data from low flow vents such as Halls and Hidden (both relatively higher salinity).
QUESTION WHAT FLOW IS USED IN LAMFE FOR HALLS RIVER. Completely agree that the 2012 report is way off the mark and I commented before. For now I have to say the data from USGS 02310689 is very questionable accuracy.

2. There is an element of the report which causes confusion; I touched on it in my last e-mail...springs in the SEF. The confusion is a result of using SE Fork and Southeast Fork Headspring. The best example I can give is the use of SE Fork in Table 3.5. AS BEST I CAN FIGURE THIS IS REFERRING TO Southeast Fork Headspring. I can list others, but I thing that one makes the point.

Just as a note of interest from one who has watched with growing despair the major deterioration of the Homosassa River over the last 20 years Southeast Fork Headspring was not mentioned in the original report (2012). I even question the thought this very small flow reemerges in Trotter. The more likely connection, if any, is the 'pool' less than 100 feet on the south side of Spring Cove (Rd). Never 'officially sampled as far as I am aware.

My final comment, for now, on App 7 is someone needs to explain the cost/benefit of this major (robotic) data analysis; particularly as it does not mention key aspects such as;

- the continued and consistent increase in nitrate/nitrite and how almost irrespective of 'which vent' is analysed the underlying concentration is indicative of the aquifer water being consistently polluted. For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
- the continued pattern of increasing seawater ingress into the springs. I looked at calcium, chloride and sodium as the major indicators. And the specific conductance for Homosassa 1, 2, 3 which all combine in the same vent and clearly show the ratios change with tidal stage (seen in the USGS continuous monitoring).

As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,
You are correct that the only long term continuous flow record in the Halls River comes from the new USGS gage (no. 02310689). The previous MFL report calculated Halls River flow by subtracting SE Fork and Main spring flows from downstream flows and attributing the difference to the Halls River. The P889 Springs WQ data includes sampling at Pumphouse spring, at Trotter Main spring, and at the SE Fork Headspring, which is across Spring Cove Rd. See page 20 of MFLs report for description of SE Fork mainspring and its run and figure 3-4 from MFLs report (also figure below). All three of these sites in the SE Fork are active and have nitrate and nitrite values. There are other springs in the SE fork, yes, but they are not sites for active water quality monitoring.

I think this answers all your questions. If not, let me know.

Thank you for your comments.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, April 03, 2019 6:59 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Homosassa MFL Appendix 7

Gabe,
Just a quick response as I am travelling.

Thanks for your answers, on quick read they are easy enough to follow.
Few comments/questions..in brief.

Halls River
There was indication that Halls River discharge has been hindcast based on correlation with SEF. AS far as I am aware the Halls discharge is at the new USGS Gage. No other flow record is available to correlate with. CORRECT ?
Nitrate nitrite from the springs program/project is at a discontinued location and the head spring.

SEF there appears to be some lack of clarity about what constitutes this. Analyses in the P889 (?may not be exactly right number) is for Trotter and Pumphouse. There are other springs which make the flow at USGS Gage eg Abdoney, Belcher, McClain.

Hidden River
Agreed one could use the USGS discharge data and the P889 data, but it must be recognized that the USGS Data Field Measurements and regression based discharge using the Homossassa Well, provide ''approx'' discharge with most data 5 to 15 cfs.

What is clear in all these analyses is Nitrate nitrite at all locations shows continuous increase despite all agency efforts.

I will respond with details in due course.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

"Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?"

Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

"IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?"

This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

"As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River."

The results you are looking for are in chapter 3 "Presentation of Results" section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

"Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?"

The "model" in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as "linear models". The percentage of total variability ("less than 50%") in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The "models" are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found "The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge."

"The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
Unquote
WHAT IS THIS HIGHLIGHTED YELLOW?
"

Answer:

The flow record used for water quality analysis is the combined flow from the SE Fork and the Main Springs gages. This flow record was provided to the consultant by district staff. The flow record was developed as described in section 3.5.1 of the MFLs document (not the appendix). The author of this appendix, in section 3-1 as quoted above, is stating that there is also a flow record from the Halls river, but these Halls River flows were not used to develop regressions or look for other relationships with water quality parameters measured at the springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

The Executive Summary initially sounded very encouraging suggesting all the mass of chemical analyses or "water quality constituents" would be organized/analyzed and presented with "explanatory examination".

Something like fitting together the gig saw of reality as opposed to modeling.

Within a few sentences I was further encouraged by an important specific;
Quote
Nitrogen enrichment in the Homosassa Springs Group is an ongoing concern…"
End Quote

And then Quote

We reevaluated relationships between flow and all forms of available *nitrogen for completeness and found that while some statistically significant relationships with flow were established, the* ***results were inconsistent and not directly useful*** *for supporting*

reevaluation of minimum flows for the Homosassa River System. Significant nitrogen relationships were found in the Southeast Fork for nitrate-nitrate (total) and total nitrogen both of which were inversely related to flow. The relationship between total nitrogen and flows in Halls

River was significant and positive, as was the relationship between nitrite (total) and flow in Hidden River. However, the number of samples was generally less than 40, the R square was less than 50 percent and the results ***were conflicting*** *with respect to the response as a function*

of flow.
End quote

Not exactly a strong points to make in the Executive Summary. Normally an Executive Summary paraphrases the major findings, not hinting the money may not have been well spent.

Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River? The USGS gages at these sites monitor flow, but do not monitor nitrate/nitrite so how were grab samples (presumably where the data originate) matched to flow, and how did the data segregate inflow sampling and outflow sampling for Halls River?

Then quote
No significant relationships between flows and other water quality constituents that could be used to support the reevaluation of minimum flows established for the Homosassa River System were identified for the Estuary data.
End quote

Scorecard is not looking good for the whole report if these words are in the Executive Summary.

Determined not to give up and intrigued by the quotes in red above reading/study continued. >Control Find< somehow arrived at Figure 3-27 (which shows Homosassa Spring 02310678). As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River.

Page 3-13 repeats the same conclusion but does not associate flow as far as I can find.

The nitrate/nitrite data for Shell Island and Mud River is noted.

IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;

What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

Briefly, Pumphouse Spring Figure 3-11 Regression relationships between the Homosassa flow gage of record and concentrations of water quality constituents of interest at Pumphouse Spring.

This is sad. The writer does not know Pumphouse Spring is in the SE Fork

----

****Having read through much of Appendix 7, there is a lot of good information that is lost in the repeated standard pattern of tables and chart (read data dump).**

But, not for this.

Quote from 3-1

The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).

There are no index velocity or tidally filtered data for discharge at 02310678. The USGS SE Fork gage (02310688) was first reported in October 2000 using a similar regression with groundwater and stage.

Therefore, spring flows in the Homosassa Springs Complex were

assumed to be directly correlated with the Weeki Wachee well and generally inversely correlated with surface water stage (Knochenmus and Yobbi 2001). The USGS began measuring spring flows for the SE Fork in 2012 using the index velocity method which resulted in tidally filtered daily values. To hindcast flows prior to in situ measurements, Leeper et al.

(2012) used a regression equation method between Weeki Wachee well for both the Main Springs and the SE Fork. Once the long term flow record was generated for both the Main Springs and the Southeast Fork, the two stations were summed to represent a long term flow record for the headwaters of the Homosassa River for reevalution of minimum flows. The Halls River is a tributary to the Homosassa River that flows into the mainstem of the river approximately 1.5 kilometers downstream of the Springs complex (Figure 3-1). The Hall's River

has only been gaged since 2012.

The District has estimated flows using regression based on

the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.

Unquote

WHAT IS THIS HIGHLIGHTED YELLOW?

Did someone forget the USGS conduct many Field Measurements to validate/support the use of the equations (including the velocity index)???.

Hindcasting/manufacturing of data does not appear to be the intent of legislative direction to use the best data available. Further, inclusion of this discussion in Appendix 7 leaves the impression that Janick Environmental are the source of this hindcasting.

The Appendix could have focused more on issues such as useful analyses which could be considered in time series of constituents which give insight into seawater ingress into the springs..

To conclude, I realize there is a lot in this e-mail for you to contemplate, but someone agreed to spend good money on the work in Appendix7 and they need to address these serious faults or correct my misinterpretations.

I have yet to find the flow related nitrite/nitrate for SE Fork, Halls River and Hidden River as presented in the Executive Summary, see my earlier comment (yellow highlighted).

Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, April 11, 2019 8:47 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Re: SE Fork High Specific Conductance LAMFE Model feed data
Attachments: Homosassa R for Time March 29 April 2, 2019.xlsx

Follow Up Flag: Follow up
Flag Status: Completed

Ladies and Gentlemen readers of the MFL Comments,

Some of you may have read Gabe Herrick's April 1 reply to my request for an explanation of the spikes in the SE Fork specific conductance data. I could have replied earlier and briefly, that the explanation was disappointing to say the least. However, I thought it worth finding the time to respond in a little more detail and suggest that Gabe may need some help explaining these Spec C spikes in the SEF data.

The graphs that Gabe shared are no news to me and fail in the fact they do not show the spikes in context of data for other parameters at the same time. The xl spreadsheets I attached to my original e-mail do show the data directly extracted from USGS record (sorry I did not label the columns on two of the sheets, but they followed the same order as the one that did contain the column headings).

Gabe in his answer compared SEF to Homosassa R at Homosassa 02310700. There is no comparison, as can be seen on the attached xl spreadsheet, the key parameter being DISCHARGE. The specific conductance changes are logically evident as progressive changes thru the tidal cycle (I have added some highlights to help in your quick review.

As for the attempt to explain the appearance of severity when viewed as micro or milli siemens or psu, let me just say that was unnecessary.

The comment "…**what you have identified is a small change (<1psu) in salinity in a tidal, estuarine system.**" , demonstrates a lack of understanding of what the purpose of this MFL is all about; namely how changes in the spring water feeding the river influence conditions in the river. The South East Fork is one of the two major feeds, not some small part of the estuarine system. As such the data associated with this feed is critical.

We need *spring-ographers* not oceanographers.

I know why these spikes occur, but in the absence of your accepting and acting on the explanation you continue to feed the model with inaccurate data and should have an explanation. Not grossly inaccurate but significant.

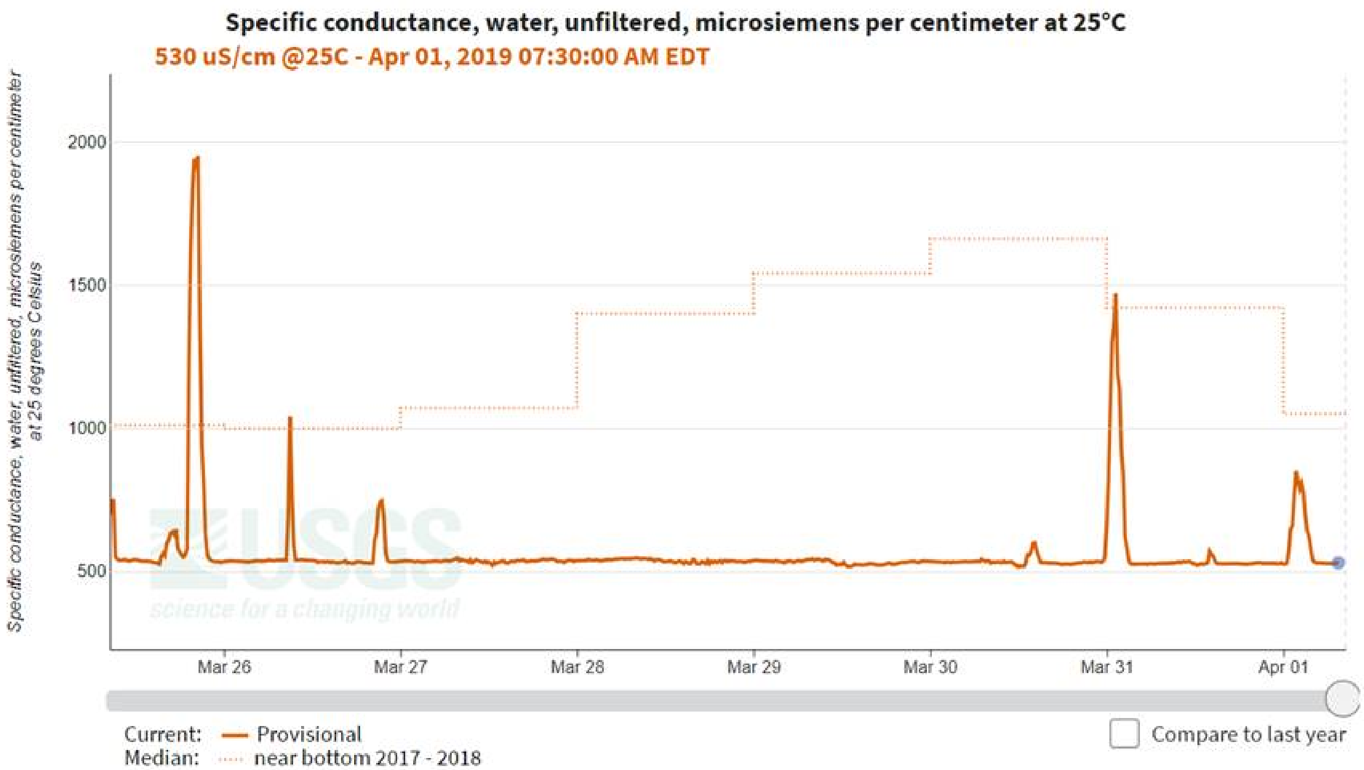
IF YOU THINK THIS IS STILL NO BIG DEAL, START TAKING A LOOK AT SHORELINE TABLE 11 PAGE 43 IN APPENDIX 6, but get past the six decimal places.

Martyn

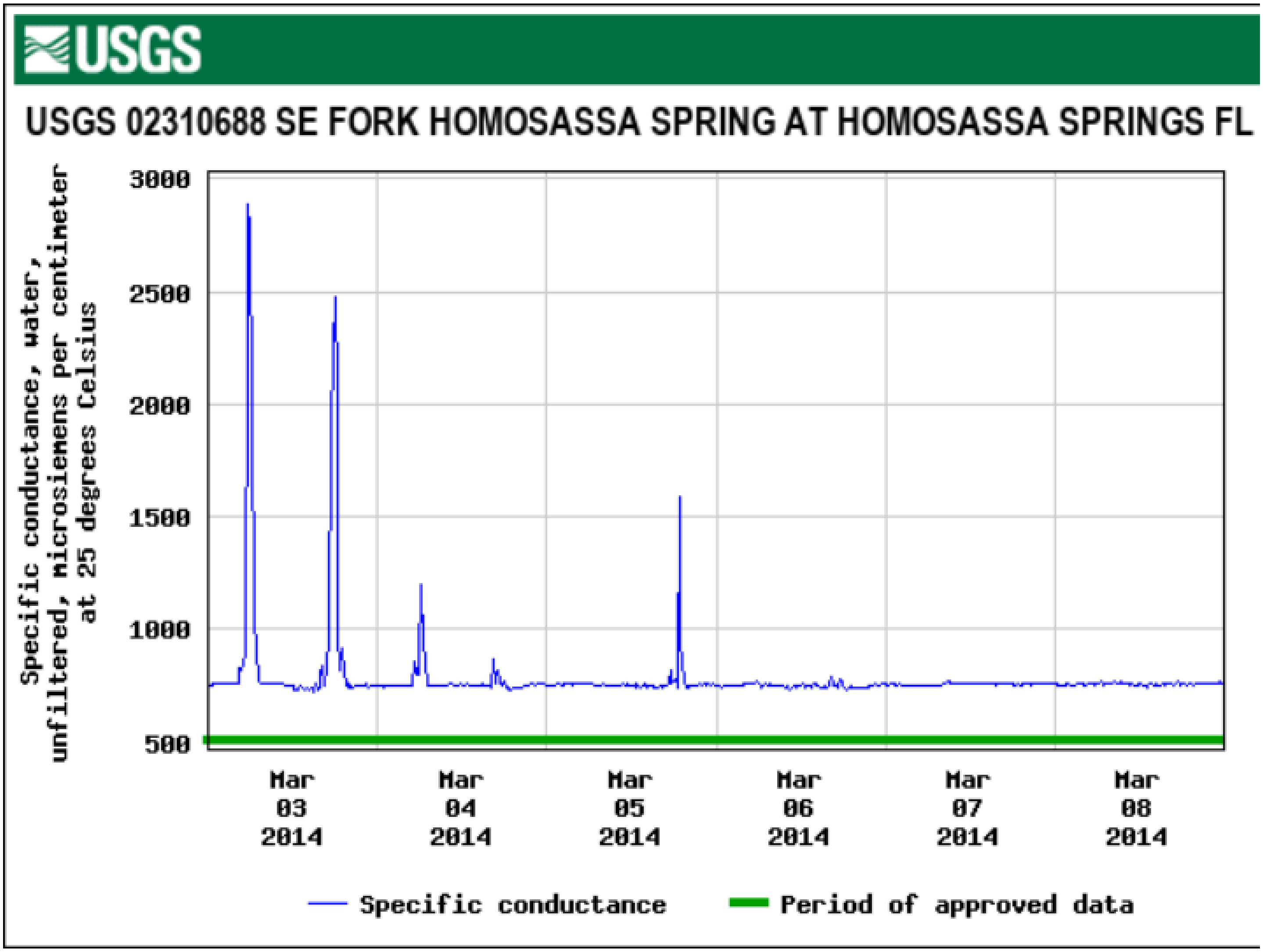
From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Monday, April 1, 2019 9:12 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: SE Fork High Specific Conductance LAMFE Model feed data

Martyn,
I have reviewed your attached spreadsheet. It shows data that is typical of the specific conductance measurements at the SE Fork gage (No. 02310688).

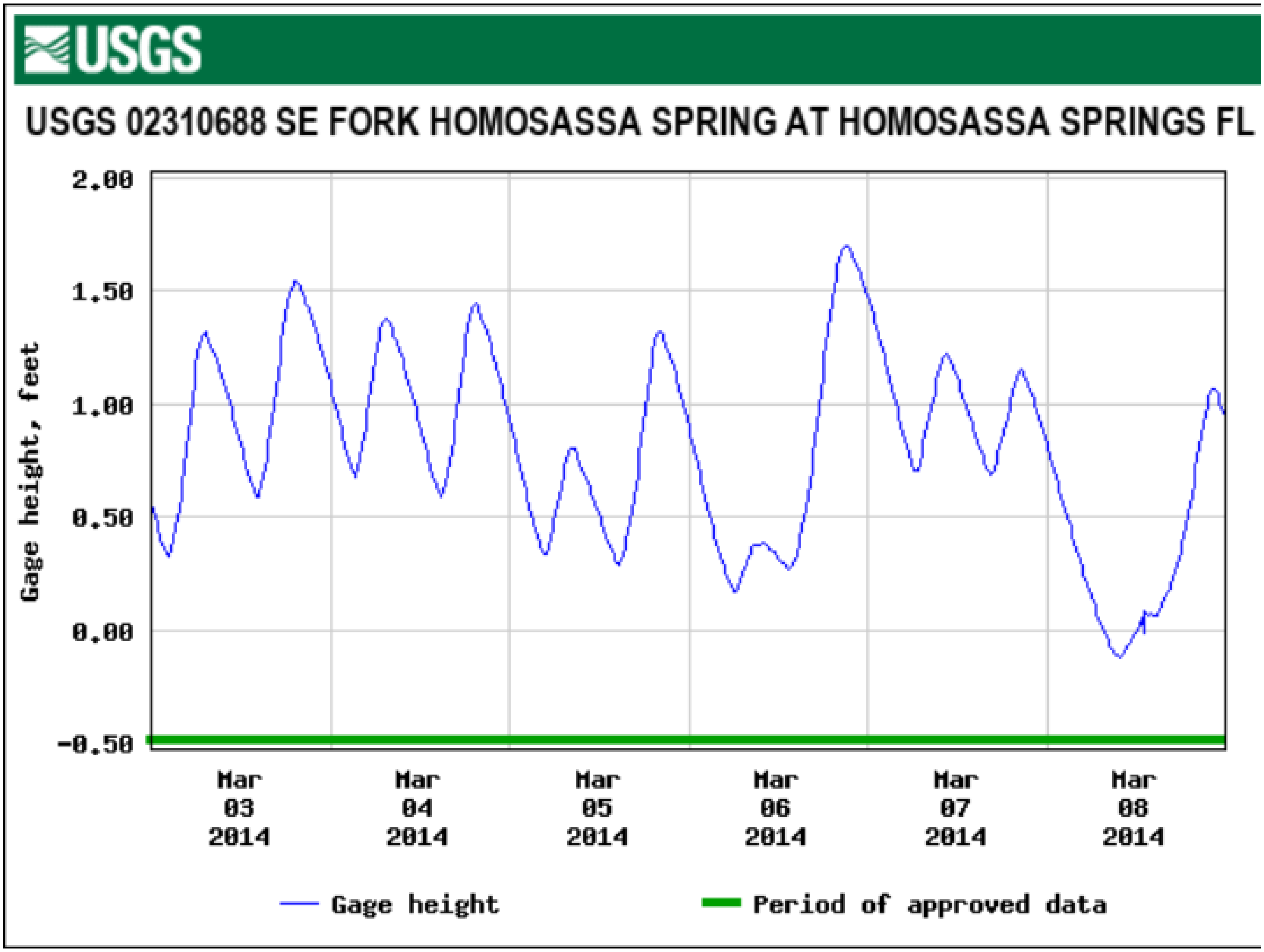
Here is provisional data in plot provided by USGS NWIS from this morning, showing similar spikes in specific conductance:



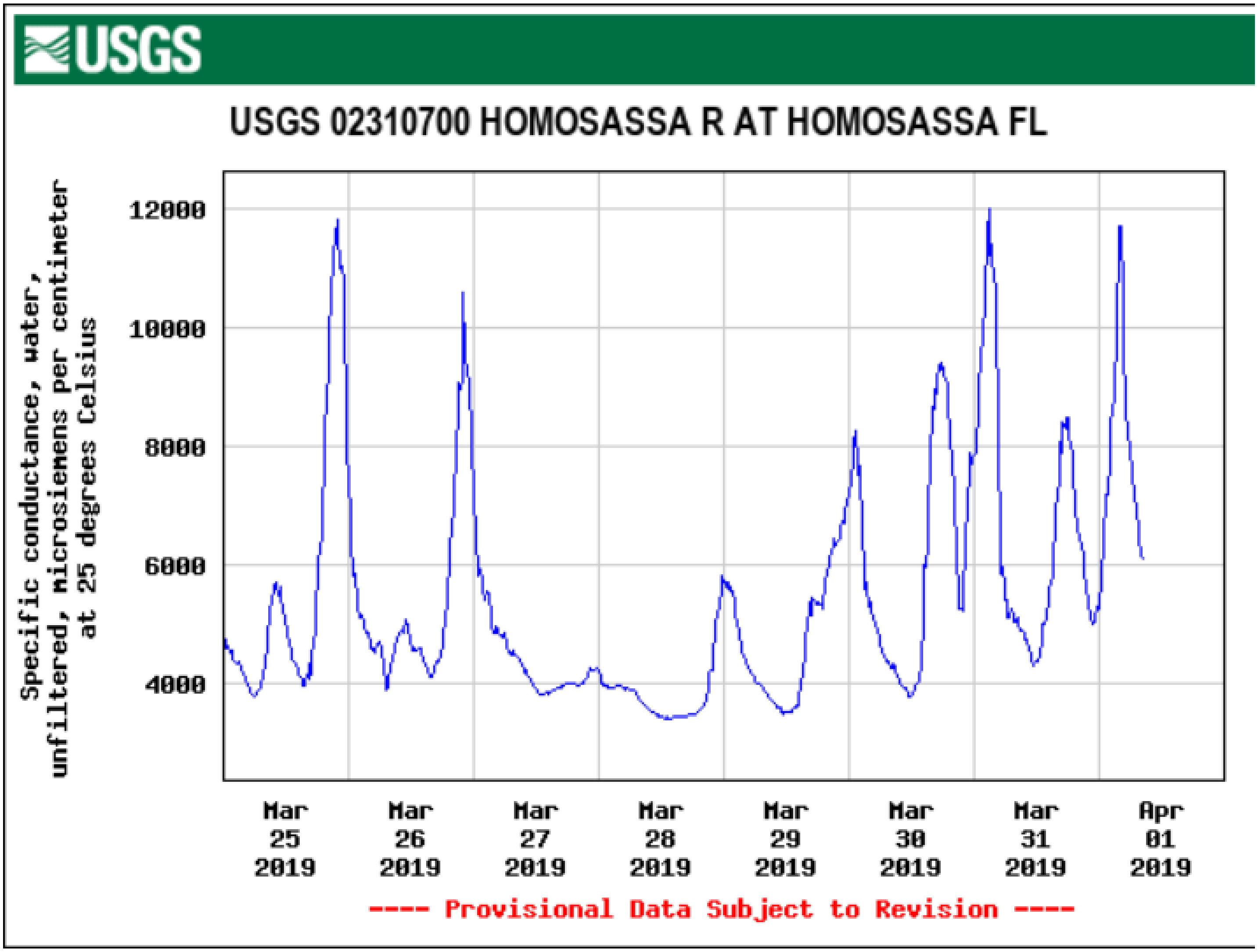
Here is data from your first selected date of 2014-03-03



Here is gage height on the same dates:



You can see spikes in specific conductance correspond to rising tides. The scale of the specific conductance spikes, when one looks at this data in isolation, is hard to get a sense for. However, changes in salinity or specific conductance of this magnitude are not unusual. Here, for example is what happens further downstream at the Homosassa River gage (No. 02310700):



Specific conductance regularly spikes from 4,000 to over 10,000 microsiemens per cm in an equally short amount of time.

Recall that the scale of specific conductance measurements as measured in microsiemens per cm can make small differences seem rather large. Some authors report millisiemens for this reason. In millisiemens, the measurements you noticed on 3/3/2014 go from 2.07 to 0.98 in 15 min. Somehow a change of 1.09 seems less severe than a change of 1090, which is why keeping scale in perspective matters. If you convert this change to psu, you get a decrease from 1.05 psu to 0.48 psu. Likewise downstream you regularly see changes from 4,000 to 10,000 microsiemens/cm, which is a change of 0.49 to 5.62 psu. In other words, what you have identified is a small change (<1psu) in salinity in a tidal, estuarine system. At high tide, when flows reach their minima, salinity often briefly increases at the SE Fork gage from around 0.5 psu to 1 psu. This is apparent in the approved record of data for the gage, readily accessible from the USGS NWIS website.

Thank you for your comments. Your comments have been received, and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637

352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, March 27, 2019 2:18 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
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This needs correcting or explaining.

Martyn

Gabe I. Herrick

From:	Alan Martyn Johnson <martynellijay@hotmail.com>
Sent:	Tuesday, April 09, 2019 10:42 AM
To:	Gabe I. Herrick; MFLComments
Cc:	Doug Leeper
Subject:	Re: Homosassa MFL Appendix 7
Follow Up Flag:	Follow up
Flag Status:	Completed

Gabe,
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  For ""which ven""t, read all the spring coast rivers
  Key exceptions are samples collected after hurricanes where lower concentrations are found due to heavy rainfall (see as examples data from samples September 2016 Hurricane Hermine and July 2012 (name escapes me).
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As I enjoy retirement expect the next comments to be about the snook manatee thermal refuge data as regards logic and result differences to the 2012 report...these are not small differences.

Martyn

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Sent: Monday, April 8, 2019 3:26 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

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springs. However, just for clarification, the appendix author notes that Halls river flows were used in other aspects of the MFLs evaluation, including hydrodynamic modeling.

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL Appendix 7

As promised.

Appendix 7

Appendix 7 can best be summarized as a mass statistical presentation of every chemical analyses of eveyr water sample taken from the Homosassa River system ,but lacking in the most part any coordination of this information. An Appendix produced in large part by a robot is how I summarized it to a friend.

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And then Quote
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IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?

Question;
What/which **model** is being referenced in this sentence from page 3-13 ""The observed statistically significant relationships with any form of nitrogen were tenuous with low numbers of observations and less than 50% of the total variability explained by the **model**.""? Should this read data analysis?

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The USGS began estimating daily discharge at the Homosassa Springs gage (02310678) in October 1995 using a regression with the Weeki Wachee Well (Knochenmus and Yobbi 2001).
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Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, April 01, 2019 10:48 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL Appendix 7

Martyn,

I have attempted to answer your questions below. My answers are indented. Some horizontal lines have been automatically added by Microsoft Outlook. It has something to do with signature formatting. I have spent 5 minutes trying to figure out how to get rid of them, and deemed further effort to be not worth the payoff. I apologize for this formatting inconvenience, and assure you it bothers me more than it likely bothers you.

"Question: Where is this nitrogen relationships data from/reported for the above in red findings for Southeast Fork, Halls River and Hidden River?"

> Answer: As seen in 2.1.1 Active Water Quality Sampling, P889 data is quarterly spring water quality data that was used for ordinary least square regression methods described in 2.2.1, with results given in 3.2.1, Table 3-5.

"IS THE EXECUTIVE SUMMARY INCORRECT RE SE FORK, HALLS AND HIDDEN?"

> This is a little hard to answer, as the question is not very clear (correct in what way, with respect to what, exactly?). With regard to the statements about nitrogen relationships with spring flow, the executive summary is correct, as explained below.

"As far as I have found there is no data as mentioned in the Executive Summary (red above) for the SE Fork, Halls River and Hidden River."

> The results you are looking for are in chapter 3 "Presentation of Results" section 3.2.1, Table 3-5, which shows statistically significant regressions between flow and water quality parameters in these springs.

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> The "model" in this case means the linear regression equations developed through ordinary least squares regression methods. These are often referred to as "linear models". The percentage of total variability ("less than 50%") in the water quality parameter expliained by the model is represented by the R Square values shown in Table 3-5. The "models" are linear equations relating each Parameter to flow with slopes and intercepts given in table 3-5. P values indicate the probability that the theoretical underlying popluation of data from which samples were taken could have a slope of zero and still produce the sample data collected.

The take-home message from your blue and red quote is this: In some springs, there are no relationships between flow and nitrogen, for example none in the main springs complex. In other springs (some locations in SE fork but Not pumphouse), there are weak relationships between flow and various types of nitrogen, but in some of these (e.g. Halls river) nitrogen concentrations actually increase with flow (at SE fork and main springs gages…see below), while in other springs nitrogen concentrations decrease with flow (again, weakly). Across the board, then, increasing flow (or managing to limit flow reductions) will not work to decrease nitrogen concentrations coming out of these springs and entering the system. These results confirm the findings of Upchurch et al. (2008) who found "The clear conclusion from this analysis is that minimum flows and levels (MFLs) cannot be utilized to control nitrate discharging from the springs by promoting high discharge."

"The District has estimated flows using regression based on the SE Fork flows to create a long term flow record for the Hall's River flows to the system, but this record is not used as part of the long term flow for evaluating the minimum flows except as part of a separate hydrodynamic modeling effort conducted in support of reevaluation.
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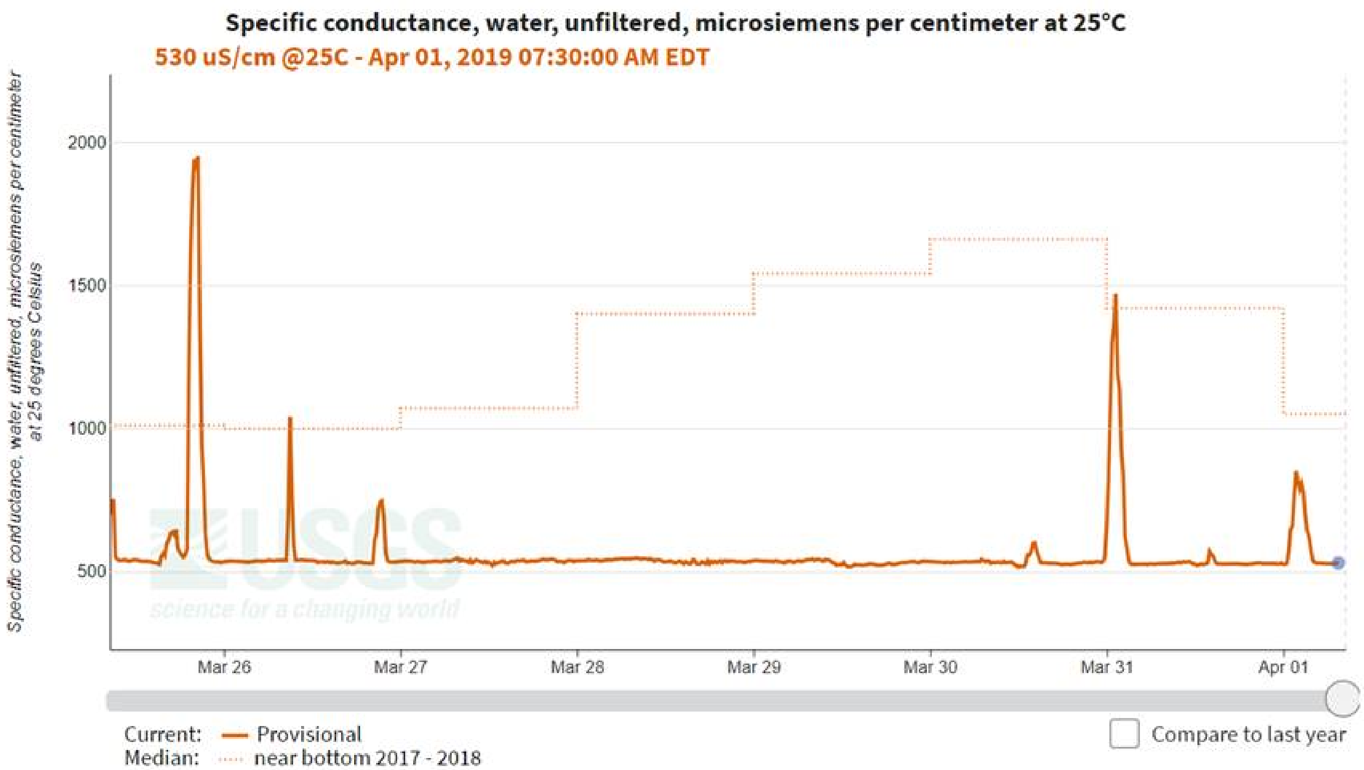
Gabe I. Herrick

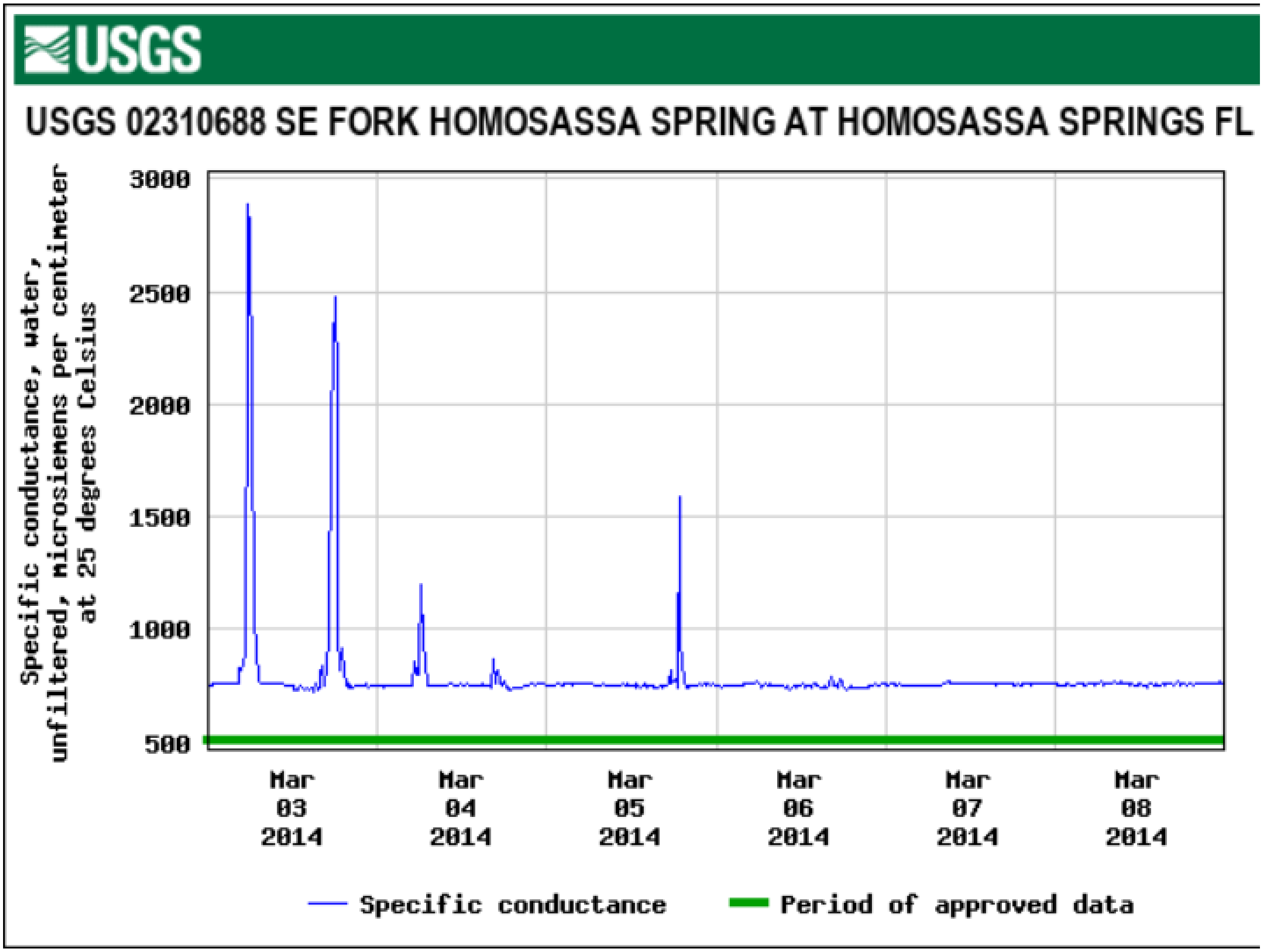
From: Gabe I. Herrick
Sent: Monday, April 01, 2019 9:12 AM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: SE Fork High Specific Conductance LAMFE Model feed data

Martyn,
I have reviewed your attached spreadsheet. It shows data that is typical of the specific conductance measurements at the SE Fork gage (No. 02310688).

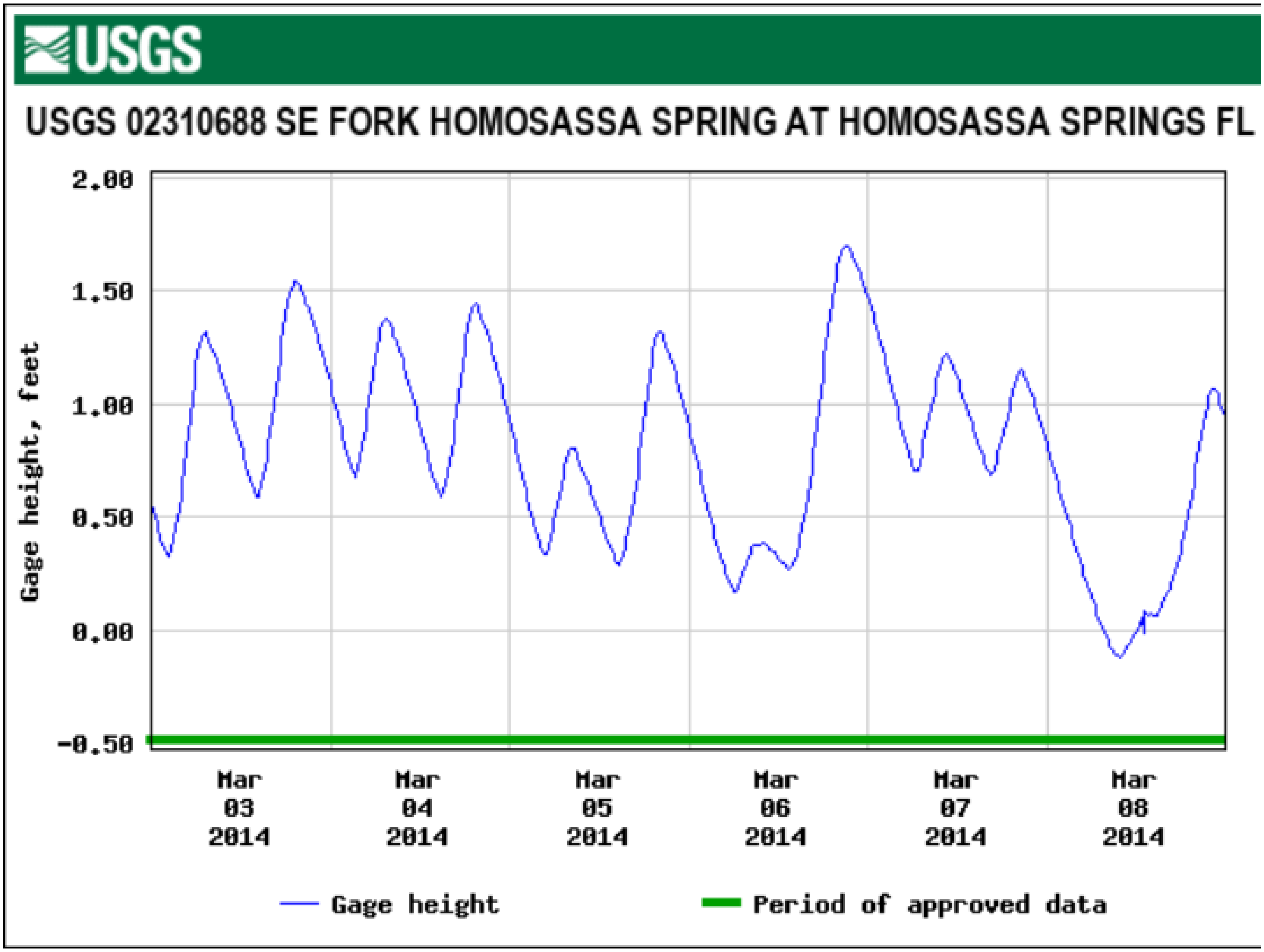
Here is provisional data in plot provided by USGS NWIS from this morning, showing similar spikes in specific conductance:



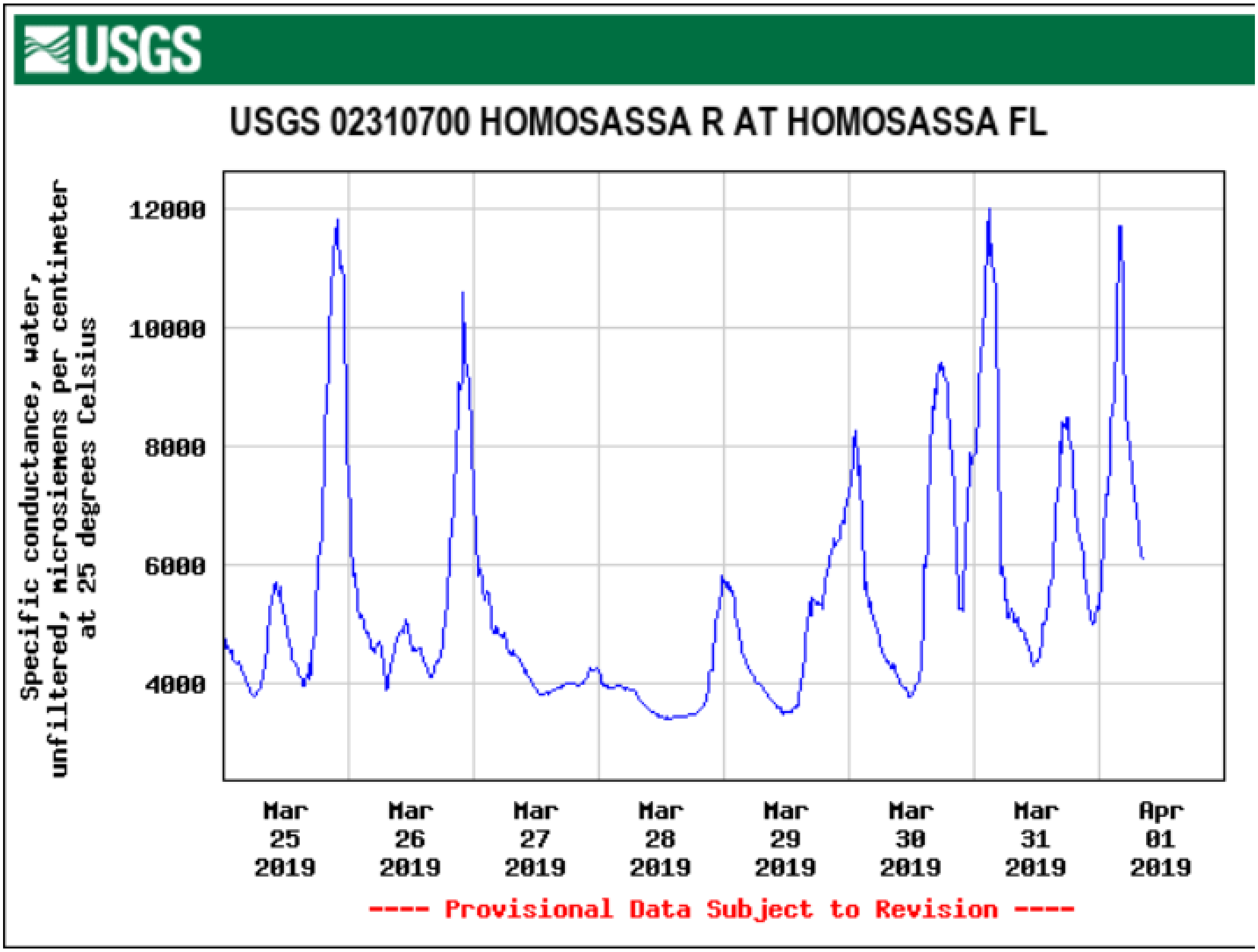
Here is data from your first selected date of 2014-03-03



Here is gage height on the same dates:



You can see spikes in specific conductance correspond to rising tides. The scale of the specific conductance spikes, when one looks at this data in isolation, is hard to get a sense for. However, changes in salinity or specific conductance of this magnitude are not unusual. Here, for example is what happens further downstream at the Homosassa River gage (No. 02310700):



Specific conductance regularly spikes from 4,000 to over 10,000 microsiemens per cm in an equally short amount of time.

Recall that the scale of specific conductance measurements as measured in microsiemens per cm can make small differences seem rather large. Some authors report millisiemens for this reason. In millisiemens, the measurements you noticed on 3/3/2014 go from 2.07 to 0.98 in 15 min. Somehow a change of 1.09 seems less severe than a change of 1090, which is why keeping scale in perspective matters. If you convert this change to psu, you get a decrease from 1.05 psu to 0.48 psu. Likewise downstream you regularly see changes from 4,000 to 10,000 microsiemens/cm, which is a change of 0.49 to 5.62 psu. In other words, what you have identified is a small change (<1psu) in salinity in a tidal, estuarine system. At high tide, when flows reach their minima, salinity often briefly increases at the SE Fork gage from around 0.5 psu to 1 psu. This is apparent in the approved record of data for the gage, readily accessible from the USGS NWIS website.

Thank you for your comments. Your comments have been received, and will be considered during the reevaluation process.

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7601 U.S. Highway 301 North
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, March 27, 2019 2:18 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: SE Fork High Specific Conductance LAMFE Model feed data

In my e-mail of a couple of days ago I indicated I would share some observations regarding Appendix 7.

I will later today or tomorrow.

For now I would like to direct your thoughts to the higher Specific Conductance 'blips' in the SE Fork USGS data that are so often dismissed, BUT are aggregated in the input data used in the modeling.

Attached is an Excel Spread sheet with three 5 day examples of the data from USGS Gage Site 02310688.

Would anyone like to try and suggest how these 'blips' occur. What phenomena causes the Specific Conductance to increase and decrease so quickly. Examples;

03/03/2014 2070 to980 in 15 minutes
11/05/2017 722 to 2650 in 15 minutes
07/02/2018 2080 to 878 in 15 minutes

There are many others examples in these 15 days. In each of the sheets I have used color to highlight the specific conductance of concern and have identified High Tides. You are welcome to pull any timeframe from the USGS record, but do not send files with hundreds of data points unless you can explain the point you are attempting to make. The explanation of this 'phenomena' is likely explained in a few sentences.

In my opinion it is wrong to leave this data in the aggregated salinity input for one of the major spring inflows to the Homosassa River LAMFE model.

This needs correcting or explaining.

Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, March 29, 2019 4:05 PM
To: Alan Martyn Johnson; MFLComments
Cc: Doug Leeper
Subject: RE: Homosassa MFL

Martyn,
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Gabe Herrick, PhD
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7601 U.S. Highway 301 North
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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, March 26, 2019 7:30 AM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL

CORRECTION TO MY e-mail OF YESTERDAY. In editing I removed part of the Volume data.

The figure for VOLUME in the ORIGINAL REPORT (reference page 68) is
Homosassa 3.68 million cubic meters 972 million gallons. Halls River 269,000 cubic meters or 71 million gallons.

My apology for this error.

Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 28, 2019 9:14 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Homosassa MFL Appendix 7

Follow Up Flag: Follow up
Flag Status: Completed

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To: MFLComments <MFLComments@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: Homosassa MFL

Gabe Herrick informed me that if I post e-mails to this address they will reach all MFL Team Members. He did not say how you decide who replies, but I am willing to give this ago.

In recent e-mails regarding the Homosassa MFL reevaluation I have briefly mentioned a concern about some specific changes which are not readily apparent in the January 2019 Report cf the original.

****However, let me start by taking an Executive analysis.

In the 2012 Report the Executive Summary reports the combined flow as **152 cfs.**

In the 2019 Report the Executive Summary reports combined flow of**146 cfs.**

Surely a diligent Executive should ask-What caused the 4% decrease since the original report?, and

Given this change how does the new report suggest even more decrease in spring flow can be tolerated before the HARM criterion are met?

******

Getting to specifics.

TOTAL Area Volume and Shoreline

The difference of physically what is the Homosassa River.

ORIGINAL REPORT primary reference page 68

AREA 766 acres Comprising of 682 Homosassa and 84 acres Halls River

VOLUME 269000 cubic meters or 71 million gallons

SHORELINE

62.5 km

JANUARY 2019 REPORT?APPENDIX 6

AREA Total area of model so far not found'

Table 10 (less than/equal to 15 psu) Existing 4097350 square meters 1012 acres

Note. No qualification of Halls River included, but assume so. Shell Island presumably not included as 20 psu.

VOLUME Total Volume not so far found.

Table 9 (equal orless than 15 psu) Existing 5286259 cubic meters or 1396 million gallons

SHORELINE

68.5 km

WHY OVER 30% MORE WATER SURFACE AREA IN THE LAMFE STUDY ?

Comment

AREA

Figure 11 in Appendix 6 shows inclusion of more areas where high salinity water from the Gulf is the primary influence AND little or no data is available to calibrate this part of the LAMFE Model. Water in these additional areas are likely well above 10,000 Specific Conductivity (5 psu)

VOLUME

That is a very significant difference.!

SHORELINE

The additional length of shoreline is 6 km, for equal or less than 15 psu. It is possible that shoreline for the additional 200+ acres which is also related to 15 psu are very difficult to define (large marshy areas).

Now lets take a look at some more detailed model output.

AREA In the model output 'bottom area'.

ORIGINAL REPORT

Using Table 5-11 Hydrodynamic model

Baseline less than 2psu 14470 square meters 5% flow reduction NA

Baseline less than 5 psu 508851 square meters 5% flow reduction 488602 square meters

or Table 5-15 (longer benchmark period)

Baseline less than 5 psu 566623 square meters 5% flow reduction 507,782 square meters

2019 REPORT

Using Table 10

Baseline less than 2 psu 319397 square meters 5% flow reduction 298305 square meters

Baseline less than 5 psu 1522543 square meters 5% flow reduction 1,451,241 square meters

THINK YOU HAVE TO AGREE THOSE ARE SIGNIFICANT DIFFERENCES Nevertheless I hold open the possibility I am not reading the data correctly.

Comment: As spring flow reduces surely there comes a point where areas of lower salinity (due to dilution) become more saline due to more high salinity water in the mix. How does a 30% reduction in spring flow result in less than 15 pus area to decreasing from 4,097,350 (existing) to 3,935,134 a 4% reduction? When modeling out to 15 psu (25000 specific conductance) the prediction should match the reality that 50 cfs reduction of spring flow is minuscule compared to tidal flux. Yes gage height all the way back to the SEF and Homosassa springs must be considered.

VOLUME

ORIGINAL

Table 5-17

Baseline less than 2 psu 49013 cubic meters 5% flow reduction 27034 (or 55%). Where physically was this large reduction predicted to occur?.

Baseline less than 5 psu 687505 cubic meters 5% flow reduction 661379 (or 96%)

2019 REPORT

Baseline less than 2 psu 471965 cubic meters 5% flow reduction 441180 (or 93%) Where physically is this reduction predicted to occur?

Baseline less than 5 psu 1947998 cubic meters 5% flow reduction 1857378 (or 95%)

Overall the LAMFE model has three times the area and volume in the less than 5 psu (9000 specific conductance) range than the original model. This is major.

The major problem with both models, apart from the differences exampled above, is they appear not to recognize that stage height in the river will not change with reduction of spring flow; the volume will be maintained by additional 'seawater' entering the river. Particularly in the critical area, upstream of USGS 02310700 (MacReas) where outflow water is about 5000 specific conductance.

If the bathymetry of this section of the river (where spring flow has the greatest effect) is not clearly defined and agreed any modeling is thwart with problems/meaningful output.

In conclusion, food for some thoughts, or the opportunity to point out where I have read/interpreted the data incorrectly.

Martyn

Tomorrow a few specific opportunities to provide your interpretation of what some USGS data means. And the real value of Appendix 7.

Gabe I. Herrick

From: MFLComments
Sent: Wednesday, March 27, 2019 3:13 PM
To: Alan Martyn Johnson; Doug Leeper
Cc: MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

Thank you for providing comments on the Homosassa River system's minimum flow reevaluation. Your comments have been received and will be considered during the reevaluation process.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 21, 2019 7:41 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Gabe,

Thanks for your e-mail response of March 15. The conversion table (Table 15) for Specific Conductance to psu is much appreciated and finds a prominent place for quick reference on my MFL file. It also serves to remind that salinity zones based on integer psu have limited ability to understand where, the effects of spring water reductions are in the critical areas upstream of the Homosassa gage site 02310700. I note at one point in the report the Homosassa Spring and SE Fork flows are added together.

For now let me focus on the first part of your e-mail; your response to my questions about the attachments to your March 8 e-mail.

One attachment shows **Estimate** discharge from 50628 to 116796 Hours. As far as I see these data are all related to the SEFork.

- What dates are these in format most people understand (mo-day-year)?
- What source and method generated these **estimates**?

The second attachment **Final** discharge. On closer examination this shows data on SEFork , Homosassa Spring, Halls River and Hidden River. My quick review before asking for an explanation did not identify these sections in the continuum of data, nor did you mention it covered more than SEF.

The data shows:
SEFork from 103079 to 155614
Homosassa Springs 68112 to155614
Halls River 106848 to155614
Hidden River 67920 to 155695

- What dates are these that most people understand.
- Not sure which of these have relevance to the 15 cfs difference, I assume only the SEFork, if not, please confirm.
- How did USGS officially report 15 minute discharge for SEFork in the 'overlap' If they reported both I do not see where other than daily and monthly which do not reveal any significant shift before/after the change. The official record changed to Velocity index October 5, 2011. Maybe I am wrong but it appears someone took it upon themselves to calculate the regression discharge after the USGS official conversion to Index Velocity base. WHY? The approved record does not show a change.
  Text on page 33 of Appendix 6 indicates an overlap period of 600 days; as far as I read on Table 19 shows an overlap more like a month. Maybe I get totally confused using ''hours after 2000/01/01

- What overlap timeframe are you SWFWMD reporting on. mm/dd/year format and hours since.

As you were not sure which figures I refer to as over 100 cfs and negative maybe you did not personally know what was in the attachments**.**
Sorry, but when you sent the data dump I assumed it was all related to the 15 cfs

Regarding Hidden River the question about how it fits in was two fold.
First as part of the 15 cfs difference. I do not think it does, But you sent the data.
Second where it fits in to LAMFE Model particularly as it is not accompanied by either temperature or salinity. **So where if at all is this 10 cfs added. As far as I can tell it rejoins the aquifer below ground level and no one really knows where it reemerges.**

Regarding the introduction of Tidally Filtered versus 15 minute data into the discussion. Tidally filtered is not a factor in SE Fork (no reverse flow), the daily mean difference is only an issue of 24 hours versus 24.84 hour tidal cycle.

I have a number of comments about other parts of your e-mail, particularly What is understood to be the Homosassa River. Thank you for drawing my attention to the difference as studied by HSW Engineering (original MFL) and the LAMFE (reevaluation MFL). As I commented it is like we are looking at a different river in the re-evaluation.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Friday, March 15, 2019 9:48 AM
To: Alan Martyn Johnson; Doug Leeper
Cc: MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,
Responses to your questions are in red below. FYI, if you respond to MFLComments@watermatters.og, your emails will be directed to my inbox as well as to Doug, Sky and others. We have been copying all correspondence to this address so that appropriate District staff can respond and be aware of ongoing issues.

Thanks,
Gabe

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Sunday, March 10, 2019 1:34 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Gabe,
Thanks for your Friday e-mail, but could you explain the attachments.

One shows discharge from hours 103079 to 155695 the other from 50628 to116796. Please explain.
Discharge reported at this gage was originally calculated based on regression. Now it is calculated based on index velocity. These two methods of calculation have different periods of record. Where they overlap, there is a 15 cfs difference. This was adjusted by subtracting 15 cfs from the regression-based record. You have two files, one with regression minus 15 cfs and its earlier period of record, the other with index velocity and its slightly overlapping and later period of record. From appendix 6: "Figure 18 shows time series plots of the discharges using the above modified USGS regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork cross section. There are about 600 days of overlap of the red and blue lines in the figure."

Some figures show well over 100 cfs and negative flows are also evident!!!!
I'm not sure which figures or data you are referring to.

Not clear where Hidden River discharge fits in.
Hidden river discharge enters Otter Creek. See section 2.1.5 and 6.3.

Regarding the conversion of specific conductance to psu
I saw the reference to Lewis, but have not yet found the equation. If it is used often it should be easy to find on the internet.
Please provide the equation SWFWMD use.

See Schemel (2001) cited in MFLs report (attached). This is the report I cited in Figure 2-22 and others. Another citation I could have used (with the same equation) is Wagner et al. (2006) “Guidelines and Standard Procedures for Continuous Water-Quality Monitors: Station Operation, Record Computation, and Data Reporting”, which cites Schemel (2001) and Lewis (1980). The equation provided in these publications is:

$$S = K_1 + \left(K_2 \times R^{1/2}\right) + (K_3 \times R) + \left(K_4 \times R^{3/2}\right) + \left(K_5 \times R^2\right) + \left(K_6 \times R^{5/2}\right)$$

where,

$K_1 = 0.0120$ $K_2 = -0.2174$ $K_3 = 25.3283$ $K_4 = 13.7714$ $K_5 = -6.4788$

“The variable R is the ratio of specific conductance at 25 °C to standard seawater (salinity equals 35) at 25 °C (53.087 millisiemens per centimeter). Salinity expressed by PSS is a dimensionless value, although it is commonly reported as practical salinity units and is nearly equivalent to parts per thousand.” Wagner et al. (2006).

Here is the R code I wrote to convert reported gage values to psu:

```
fxn.CtoS <- function(cond){
 R <- cond/53087
 Sal <- 0.012 + -0.2174*R^0.5 + 25.3283*R + 13.7714*R^(3/2) + -6.4788*R^2 + 2.5842*R^(5/2)
 return(Sal)
}
```

Where “cond” is the reported conductance from USGS gages.

Wagner et al. (2006) also has a table for easy lookup:

Table 15. Rating table for conversion of specific conductance, in microsiemens per centimeter, to salinity, in pra

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; psu, practical salinity units; (90860), ADAPS parameter code for salinity

Specific conductance, in µS/cm	Salinity, in psu (90860)	Specific conductance, in µS/cm	Salinity, in psu (90860)	Specific conductance, in µS/cm
100	0.046	11,000	6.233	38,000
300	0.142	13,000	7.464	41,000
500	0.240	15,000	8.714	44,000
700	0.340	17,000	9.981	47,000
1,000	0.492	20,000	11.911	50,000
2,000	1.016	23,000	13.873	53,000
3,800	2.001	26,000	15.865	56,000
5,000	2.679	29,000	17.885	59,000
7,000	3.836	32,000	19.931	62,000
9,000	5.022	35,000	22.003	65,000

Comment: oceanographers may like psu (smaller numbers to make large comparisons) but spring water is a whole different matter with regard the dissolved solids as regards quantity and nature.

There is no separate methodology for conversion of conductance to salinity for spring water in estuarine systems.

Agreed we should spend more time looking at the ingress of seawater into the springs eg compare the water from the SE Fork with Homosassa main spring, Chass Seven Sisters with main spring and Crab Creek. Also, for Crystal River and the springs of Saragassa Canal and Hunters Cove with some of the other springs. Clearly there is seawater ingress, **but the models assume all flows are spring water equivalent quality to what most of the pumps are sucking out of the aquifer.**

Regarding the 15 cfs adjustment.
How come this difference is not reflected in the discharge used in the previous MFL report where the average/mean discharge shown in Table 2-3 as 60 cfs is the same as USGS current discharge using velocity (there was no velocity meter at that time (so those data should be 15 cfs higher...YES?)

The discrepancy of 15 cfs was found with 15-minute data which is not tidally filtered. The 2019 report showing a mean of 60 cfs and median of 59 cfs is tidally filtered daily data. The 2012 report's Table 2-3 also shows daily data. These are different data sets.

Is it possible the difference results from the Weeki Wachee Well Levels from the old well 28320108315601 and the replacement well 283154082313701 (hope I have not transposed any numbers reading from one screen typing to this message) being used incorrectly in determining the difference.
The USGS is responsible for development of regression equations used to report flow at this gage. See USGS publication WRIR 01-4230 (Knochenmus and Yobbi 2001) for computation techniques. That regression is no longer used.

Model Output Volume Area Shoreline
I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Current model domain (from 2019 report):

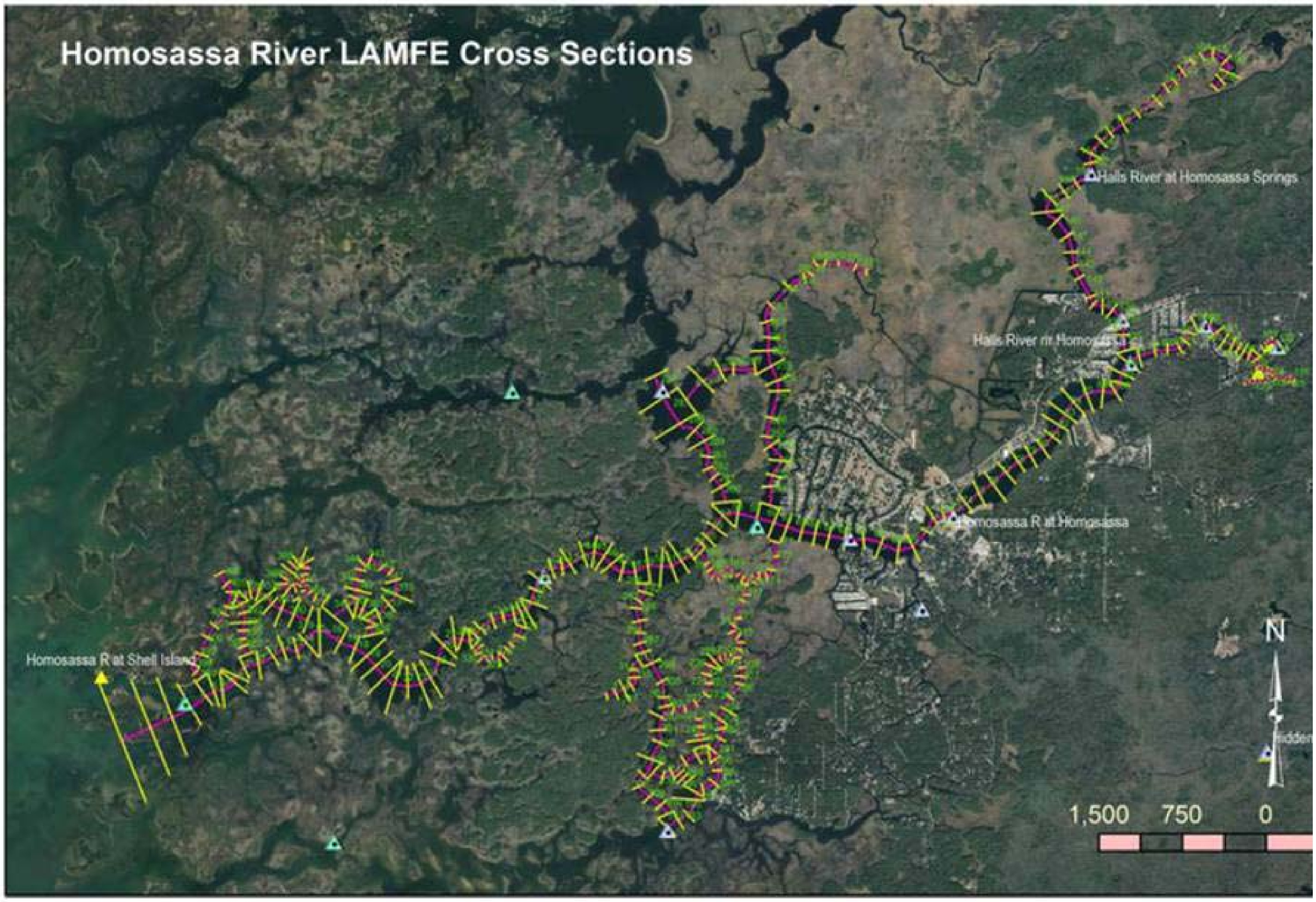

Figure 11. Cross sections (yellow segments) that form the LAMFE grids for the and its branches. Numbers in green are grid numbers in the longitudinal directio

Previous model domain (from 2012 report):

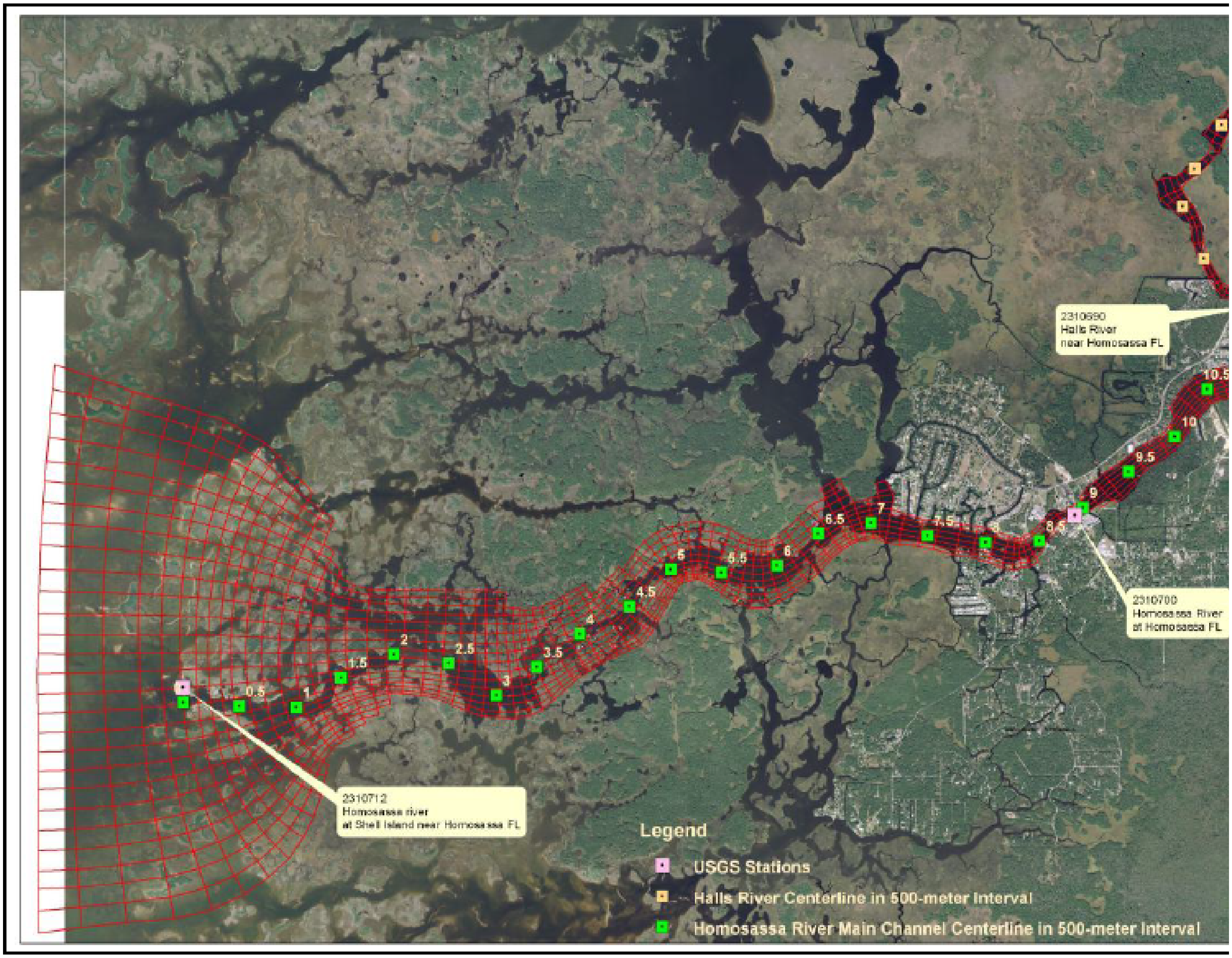

Figure 2-45. Curvilinear-orthogonal grid system for the Homosassa River E Fluid Dynamics Code model (map reproduced from HSW Engineering, Inc.

What triggered my attention is Figure 6-2 in the recent Jan 17 Peer Review Report. How (on average) does the water in Halls River warm from the upper reaches to the confluence? Unfortunately there is no Halls River gage data around this time; however there are some years when low temperatures have been recorded when both Halls River gages provide additional insight.

That figure can visually exaggerate small differences if temperatures fall on either side of a breakpoint. Monthly temperatures at these gages show that winter temps at the 02310690 gage near the confluence are slightly warmer than at the 02310689 gage upstream in the Halls River:

AT (689) (upstream Halls River)

YEAR	00010, Temperature, water, degrees Celsius, Monthly mean in deg C (Calculation Period: 2016-07-01 -> 2018-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016							31.01	28.97	27.72	24.56	21.02	20.92
2017	19.74	21.38	22.41		27.86	29.12	29.58	29.81	27.66	24.69	21.58	19.88
2018	16.73	23.09	20.81	24.71	27.26	29.63	28.69	28.23	27.77			
Mean of monthly Temperature, water	18.2	22.2	21.6	24.7	27.6	29.4	29.8	29.0	27.7	24.6	21.3	20.4

** No Incomplete data have been used for statistical calculation

NEAR (690) (near confluence)

YEAR	00010, Temperature, water, degrees Celsius,bottom Monthly mean in deg C (Calculation Period: 2016-07-01 -> 2018-06-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016							29.03	28.14	27.25	24.59	21.44	21.20
2017	20.22	21.57	22.35	24.81	26.77	27.92	28.13	28.56	26.80	24.60	21.75	20.23
2018	17.24	22.86	21.00	24.10	25.97	28.13						
Mean of monthly Temperature, water	18.7	22.2	21.7	24.5	26.4	28.0	28.6	28.4	27.0	24.6	21.6	20.7

** No Incomplete data have been used for statistical calculation

Page 13 of appendix 6 (Chen 2019): “although the Halls River at Homosassa Springs station is located upstream of
the Halls River near Homosassa station, salinity measured at upstream station is generally higher than that measured at the downstream station. Obviously, SGDs entering the upstream of the Halls River is brackish, and relatively flat salinity peaks suggests that salinity in these SGDs is in the range of 5 – 6 psu. The relatively lower salinity at the downstream station is caused by the relatively fresher SGDs from SE Fork and Homosassa headwaters, because the Halls River near Homosassa station is close to the confluence of the Halls River with the Homosassa River. The tidal currents transport relatively fresher water upstream to dilute the brackish SGDs in the upstream portion of the Halls River." The same mechanism could account for warmer water exiting the main spring and SE fork vents and eventually being transported up the Halls River in the winter. This would result in warmer temperatures downstream in the Halls River.

Do not get me wrong; I am not saying that either model is better than the other, but what I am saying is critical assessment is needed and I hope my questions help this to some extent.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Friday, March 8, 2019 4:34 PM
To: Doug Leeper; martynellijay@hotmail.com
Cc: MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

See files attached.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Gabe I. Herrick
Sent: Friday, March 08, 2019 4:32 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; martynellijay@hotmail.com
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

Thank you for your comments. Your questions have been answered in boxes within your quoted below.

Thanks,

Gabe

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, March 1, 2019 8:50 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Homosassa Re-evaluation

Doug,

I continue to read the 2019 Homosassa report and Appendices. For me, and I suspect others, the task is made more difficult by;

- The use of psu instead of Specific Conductance.
  Why is it that all the data collected as Specific Conductance then someone finds it necessary to convert this to psu?
  And by what formula is this conversion made?
  There is no handy dandy conversion site on the internet that I have yet found appropriate for spring water SpecC.

Response:
It is standard practice in marine science and oceanography for measurement equipment to report specific conductance and for this to be converted to practical salinity units. Salinity values at gaging stations were calculated as noted in Figure 2-22: Specific Conductance at 25°C converted to salinity using equation by Lewis (1980) as reported in Schemel (2001).

Schemel, Larry. 2001. Simplified Conversions Between Specific Conductance and Salinity Units for Use with Data from Monitoring Stations. IEP Newsletter. Interagency Ecological Program for the San Francisco Estuary. Vo. 14, No. 1.

- The use of Hours after 2000.
  Again, all the data collected is reference by '*normal*' date and time.
  Similarly to the psu conversion there is no conversion site on the internet. Why is hours after 2000 necessary? In my opinion it only make the data more difficult to digest.

Response:
Thank you for your comment. Initial peer review panel comments have been made to this effect as well. This time format is a simple method for mathematical convenience.

Possibly the most telling point of this mass of pages is summarized on pages 136/137.
Quote
River-wide, the 2015 mean total SAV percent cover was almost 50 percent less than the mean total SAV percent cover for all of the
previous sampling events. Eelgrass (V. americana) was not observed at any locations in the Homosassa River System in 2015. Between 1998-2011 and 2015, total SAV biomass decreased by over 90%, SAV percent cover decreased by 50%, angiosperm biomass decreased 81%, and macroalgae biomass decreased 99%. The majority of the biomass was upstream of Rkm 11, consequently changes to biomass and coverage in this portion of the river drove overall river changes (Figure 4-9). Therefore, critical SAV habitat appears to be upstream of the confluence of the Halls and Homosassa rivers.
Unquote
As in my previous e-mail THE RIVER IS DEAD.
I have personally observed this transformation over the last 18 years, neighbors have seen the changes over their almost 80 years.

For right now I would like to focus on three issues regarding the USGS data for the SE Fork which appear in Appendix 6.

1. On page 33 there is discussion of a difference of 15 cfs in the two methods of measuring discharge:

Quote
It is reasonable to assume that discharge data based on index-velocity are better estimate of the true discharge through the cross section at the SE Fork Homosassa Spring station than those
calculated from tidal data and groundwater level data at a Weeki Wachee well using the USGS regression relationship (Equation 2). It is thus meaningful to examine how good the USGS
regression relationship for the SE Fork discharge is. It was found that Equation (2) roughly overestimates 15 cfs of discharge at the SE Fork station. As such, Equation (2) was modified by adding -15 cfs to it and became as follows
3.6293 10.3114 418.139Δ 3.31029 (6)
Figure 18 shows time series plots of the discharges using the above modified USGS
regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork
cross section. There are about 600 days of overlap of the red and blue lines in the figure. It can be seen from the figure that both lines have roughly the same long-term trend and variability, and the
two matches well in a time scale that is a few days or longer.
End Quote
I acknowledge there have been changes to the formula over the years.
At the time we were pursuing installation of a velocity meter I made comparisons of the USGS calculated/reported discharge and Field Measurements. My spreadsheet shows good agreement on an average basis, but some major differences on individual results. I know I shared this with you.

WHERE IS THE DATA SHOWING THIS 15 cfs DIFFERENCE (page 33) AND ANY DISCUSSION OF THIS DIFFERENCE WITH USGS?

Response:
The USGS SE Fork Homosassa Spring at Homosassa Springs gage (no. 02310688) reports discharge starting Oct. 1, 2000. This discharge was regression based prior to October 1, 2011, when discharge began to be reported based on index velocity. Verifying the USGS regression equation for the SE Fork station against available index-velocity based flow (assuming that index-velocity based flow is more reliable), District staff found that the regression based flow is about 15 cfs higher than index-velocity based flow at the SE Fork. As such, staff calculated USGS SE Fork flow, with an interval of 15 minutes, prior to October 5, 2011 from measured 15-minute tides and daily Weeki Wachee well levels (linearly interpolated to every 15 minutes) using a modified USGS regression equation, which is simply the regression equation provided by the USGS (equation 2 in appendix 6) minus 15 cfs. You can do this yourself with data from USGS website. Files attached include this data from index velocity and regression equation.

I could request the archived discharge data from USGS to verify/corroborate my spreadsheet, but assume you/others have the data.
Comment: No mention of this adjustment of USGS data is made in the main report (as far as I can see).

2. In your e-mail of Feb 7 you state;
   Quote
   Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.
   Unquote
   This is disappointing as Specific Conductance data is assumed to represent the total discharge in any time period the eddie current draws water along the concrete wall to the sensor location. There is no reversal of the main flow. Close examination of the data shows higher Specific Conductance occurs when there is relatively rapid stage increase and examination of temperature reflects the sudden changes.
   As you may recall I have used 'kids bathtub dye' and pink twine with weighted fishing bobbers to witness this.
   Comment:
   I suspect there are PORTABLE Specific Conductance Monitors that could be placed close to the Velocity Meter to confirm SE Fork spring discharge does not have Specific Conductance spikes. A few days deployment is all that is needed.

In the meantime the LAMFE Model is being fueled with inaccurate SpecC data.

On page 13 the 'authors' half recognize the issue but simply dismiss any attempt to explain this frequent issue in the data.

Quote

This suggests that SGDs from SE Fork springs, including Belcher Spring, Trotter Springs, McClain Spring, and Pumphouse Spring are fresh and the occasional peaks up to less than 2 psu are likely caused by high tides.

End Quote

3. On page 24 it states;

   Quote

   It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at

Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data..

End Quote

and page 32

Quote

....provided that flows at the Halls River at Homosassa Springs station can be hindcasted back to October 2007. To do so, correlations of the Halls River at Homosassa Spring flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving average using a time window of one half of the lunar cycle. The regression equation takes the following form

2.0483 89.875

Unquote

Comment

There is no 'negative flow' at the SE Fork. To suggest there is correlation with Halls River is, sorry to have to say it, ridiculous.

The SEF discharge variations are due to the filling and emptying of the 3-4 acre well defined pool upstream of the gage site by spring water. Halls River upstream of the Gage Site is a very large pool that is difficult to define, but comprises of shallow marshes that act more like a sponge; taking time to both fill and empty. Clearly there is strong upstream flow each tidal cycle. Additionally, the reported Halls River discharge data (calculated from velocity) appear to be more accurate/in agreement with Field Measurements when there is upstream flow compared with downstream flow. This is supported by the experience of kayaking thru the channel immediately upstream of the sensors. It is my opinion this accuracy difference is due to higher turbulence in the water stream past the velocity meter in discharge than in-flow, resulting from the sharp turn (upstream) of the flow thru a complex channel, unlike the SE Fork channel which is well defined by 'concrete banks on both sides.

In my opinion any hind-casting creates a minefield for assessment of the model.

By the way: NDM 5 still has Halls River Flow as 102 cfs. I think we both know how that was derived ...mathematical manipulation.

Doug,

I have other questions for another time regarding the apparent major differences in model output regarding volume and area of habitats.

You are welcome to share my questions/comments with the peer review panel, but I have no intention of interfering with the process.

I look forward to their detailed review in due course.

Martyn

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Thursday, February 07, 2019 1:31 PM
To: martynellijay@hotmail.com
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn:

Good to hear from you again, also. Here are some brief responses to the questions included in your recent email.

Your question: *How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?"*
Response: The currently proposed minimum flows for the Chassahowitzka and Homosassa river systems were recently developed based on the best information currently available. Their development is ongoing, and as you know, we are currently subjecting the recommendations to independent, scientific peer review.

Your question (in reference to the Homosassa River system): *Common Snook took over from manatee on what basis?*
Response: The currently proposed minimum flows for the Homosassa River system were recently developed based on the best information currently available. Flow-related change in Common Snook habitat was the most sensitive criterion assessed, and was used to develop the current minimum flow recommendation.

Your questions: *What does all the Day of the Year data tell us?*
Some of the graphs are for different timeframes eg
Chass
Stage is for 2010-10-01 to 2017-12-05 ***Figure 2-10***
Flow is for 2012-11-18 to 2017-12-05 ***Figure 2-11***
I can see that this is available data from USGS, but what is it telling us?
It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.
Response: As noted on page 27 of the draft Chassahowitzka River system minimum flow report, Figures 2-10, 2-11 and 2-16 are provided to illustrate interaction between tide and groundwater levels on discharge in the river system.

Your questions: *What progress is being made with USGS*
A. To get velocity based discharge for Homosassa man springs?
B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to

the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.

Response to question (A): Analyses of the data collected through approximately the middle of last year at the Homosassa Springs at Homosassa Springs, FL gage were not sufficient for implementation of an index-velocity approach for discharge measurement. Data collection at the site continues and the USGS will continue to review these data to determine whether the index-velocity approach can be implemented.

Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Saturday, February 02, 2019 10:30 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,
Thank you for sharing the schedule for Peer Review of these draft reports.

I have already reviewed the reports although I must say in depth reading has yet to be done. My tardiness in this task is derived from the following key points:

1. How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?
   Code reads "

   (16) Minimum Flow for the Chassahowitzka River System.

   (a) For purposes of this rule, the Chassahowitzka River System includes the watercourse from the Chassahowitzka Main Springs Complex to the Gulf of Mexico, including contributing tributaries, Blind Springs and all named and unnamed springs that discharge to the river.

   (b) The Minimum Flow for the Chassahowitzka River System is 97% of the natural flow as measured at the United States Geological Survey (USGS) Gage Chassahowitzka River near Homosassa (Gage No. 02310650). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from this Gage is measured as the previous day's natural flow at that point minus 3%.

   (c) The District will reevaluate the Minimum Flow within six years of adoption of this rule.

   (17) Minimum Flow for the Homosassa River System.

   (a) For purposes of this rule, the Homosassa River System includes the watercourse from the Homosassa Main Springs Complex to the Gulf of Mexico, including the southeast fork of the Homosassa River, Halls River, Hidden River and all named and unnamed springs that discharge to these rivers.

(b) The Minimum Flow for the Homosassa River System is 97% of the combined natural flow as measured at the United States Geological Survey (USGS) Homosassa Springs at Homosassa Springs, FL Gage (No. 02310678), and the USGS SE Fork Homosassa Spring at Homosassa Springs, FL Gage (No. 02310688). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from these Gages are measured as the previous day's natural flow at that point minus 3%.

(c) The District will reevaluate the Minimum Flow within six years of adoption of this rule."

Executive Reports read

" The recommended minimum flows for the Chassahowitzka River system are 92 percent of flows that would occur in the absence of withdrawal impacts; allowing up to an 8 percent reduction from unimpacted flows. This recommendation is made on the basis of three criteria which are all equally sensitive to simulated reductions in flow: area and volume of salinity-based habitats less than or equal to 1 practical salinity unit and temperature-based habitat for Common Snook."

Ppage viii

and

" The recommended minimum flows for the Homosassa River system are 95 percent of flows that would occur in the absence of withdrawal impacts; allowing up to a 5 percent reduction from unimpacted flows. This recommendation is made on the basis of temperature-based habitat for Common Snook."

Page ix

Sideline: Common Snook took over from manatee on what basis?

2. What does all the Day of the Year data tell us?

Some of the graphs are for different timeframes eg

Chass

Stage is for 2010-10-01 to 2017-12-05 **Figure 2-10**

Flow is for 2012-11-18 to 2017-12-05 **Figure 2-11**

I can see that this is available data from USGS, but what is it telling us?

It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.

3. What progress is being made with USGS

A. To get velocity based discharge for Homosassa man springs?

B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.

Doug,

The Homosassa River is (as Mark Hammond commented some years ago) 'DEAD'. This year we have seen manatee trying to 'climb' the banks to get green food!!! It is so bad last week I e-mailed Chris Anastasious to ask about the final report on the Hunter Cove Revegetation Project as I had noticed the fencing has been removed.

Martyn

Good to hear from you, trust life is treating you and Ron well with regard to health and happiness.

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 1:11 PM
To: martynellijay@hotmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Martyn:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
- January-June 2019: Stakeholder outreach and meetings
- June 2019: Public workshop date and location have not yet been determined
- Fall 2019: District Governing Board meeting – Request to approve staff minimum flow recommendations and initiate rulemaking
- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

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Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Tuesday, March 26, 2019 7:30 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Homosassa MFL

Follow Up Flag: Follow up
Flag Status: Completed

CORRECTION TO MY e-mail OF YESTERDAY. In editing I removed part of the Volume data.

The figure for VOLUME in the ORIGINAL REPORT (reference page 68) is
Homosassa 3.68 million cubic meters 972 million gallons. Halls River 269,000 cubic meters or 71 million gallons.

My apology for this error.

Martyn

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, March 25, 2019 11:37 AM
To: MFLComments
Cc: Doug Leeper; Gabe I. Herrick
Subject: Homosassa MFL

Follow Up Flag: Follow up
Flag Status: Completed

Gabe Herrick informed me that if I post e-mails to this address they will reach all MFL Team Members. He did not say how you decide who replies, but I am willing to give this ago.

In recent e-mails regarding the Homosassa MFL reevaluation I have briefly mentioned a concern about some specific changes which are not readily apparent in the January 2019 Report cf the original.

****However, let me start by taking an Executive analysis.

In the 2012 Report the Executive Summary reports the combined flow as **152 cfs.**

In the 2019 Report the Executive Summary reports combined flow of**146 cfs.**

Surely a diligent Executive should ask-What caused the 4% decrease since the original report?, and

Given this change how does the new report suggest even more decrease in spring flow can be tolerated before the HARM criterion are met?

******

Getting to specifics.

<u>TOTAL Area Volume and Shoreline</u>
The difference of physically what is the Homosassa River.

ORIGINAL REPORT primary reference page 68
AREA 766 acres Comprising of 682 Homosassa and 84 acres Halls River

VOLUME 269000 cubic meters or 71 million gallons

SHORELINE
62.5 km

JANUARY 2019 REPORT?APPENDIX 6
AREA Total area of model so far not found'
Table 10 (less than/equal to 15 psu) Existing 4097350 square meters 1012 acres

Note. No qualification of Halls River included, but assume so. Shell Island presumably not included as 20 psu.

VOLUME Total Volume not so far found.
Table 9 (equal orless than 15 psu) Existing 5286259 cubic meters or 1396 million gallons

SHORELINE
68.5 km

WHY OVER 30% MORE WATER SURFACE AREA IN THE LAMFE STUDY ?
Comment
AREA
Figure 11 in Appendix 6 shows inclusion of more areas where high salinity water from the Gulf is the primary influence AND little or no data is available to calibrate this part of the LAMFE Model. Water in these additional areas are likely well above 10,000 Specific Conductivity (5 psu)

VOLUME
That is a very significant difference.!

SHORELINE
The additional length of shoreline is 6 km, for equal or less than 15 psu. It is possible that shoreline for the additional 200+ acres which is also related to 15 psu are very difficult to define (large marshy areas).

Now lets take a look at some more detailed model output.

AREA In the model output 'bottom area'.
ORIGINAL REPORT
Using Table 5-11 Hydrodynamic model
Baseline less than 2psu 14470 square meters 5% flow reduction NA
Baseline less than 5 psu 508851 square meters 5% flow reduction 488602 square meters
or Table 5-15 (longer benchmark period)
Baseline less than 5 psu 566623 square meters 5% flow reduction 507,782 square meters

2019 REPORT
Using Table 10
Baseline less than 2 psu 319397 square meters 5% flow reduction 298305 square meters
Baseline less than 5 psu 1522543 square meters 5% flow reduction 1,451,241 square meters

THINK YOU HAVE TO AGREE THOSE ARE SIGNIFICANT DIFFERENCES Nevertheless I hold open the possibility I am not reading the data correctly.

Comment: As spring flow reduces surely there comes a point where areas of lower salinity (due to dilution) become more saline due to more high salinity water in the mix. How does a 30% reduction in spring flow result in less than 15 pus area to decreasing from 4,097,350 (existing) to 3,935,134 a 4% reduction? When modeling out to 15 psu (25000 specific conductance) the prediction should match the reality that 50 cfs reduction of spring flow is minuscule compared to tidal flux. Yes gage height all the way back to the SEF and Homosassa springs must be considered.

VOLUME

ORIGINAL

Table 5-17

Baseline less than 2 psu 49013 cubic meters 5% flow reduction 27034 (or 55%). Where physically was this large reduction predicted to occur?.

Baseline less than 5 psu 687505 cubic meters 5% flow reduction 661379 (or 96%)

2019 REPORT

Baseline less than 2 psu 471965 cubic meters 5% flow reduction 441180 (or 93%) Where physically is this reduction predicted to occur?

Baseline less than 5 psu 1947998 cubic meters 5% flow reduction 1857378 (or 95%)

Overall the LAMFE model has three times the area and volume in the less than 5 psu (9000 specific conductance) range than the original model. This is major.

The major problem with both models, apart from the differences exampled above, is they appear not to recognize that stage height in the river will not change with reduction of spring flow; the volume will be maintained by additional 'seawater' entering the river. Particularly in the critical area, upstream of USGS 02310700 (MacReas) where outflow water is about 5000 specific conductance.

If the bathymetry of this section of the river (where spring flow has the greatest effect) is not clearly defined and agreed any modeling is thwart with problems/meaningful output.

In conclusion, food for some thoughts, or the opportunity to point out where I have read/interpreted the data incorrectly.

Martyn

Tomorrow a few specific opportunities to provide your interpretation of what some USGS data means. And the real value of Appendix 7.

Gabe I. Herrick

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, March 21, 2019 7:41 AM
To: Gabe I. Herrick; Doug Leeper
Cc: MFLComments
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Follow Up Flag: Follow up
Flag Status: Completed

Gabe,

Thanks for your e-mail response of March 15. The conversion table (Table 15) for Specific Conductance to psu is much appreciated and finds a prominent place for quick reference on my MFL file. It also serves to remind that salinity zones based on integer psu have limited ability to understand where, the effects of spring water reductions are in the critical areas upstream of the Homosassa gage site 02310700. I note at one point in the report the Homosassa Spring and SE Fork flows are added together.

For now let me focus on the first part of your e-mail; your response to my questions about the attachments to your March 8 e-mail.

One attachment shows **Estimate** discharge from 50628 to 116796 Hours. As far as I see these data are all related to the SEFork.

- What dates are these in format most people understand (mo-day-year)?
- What source and method generated these **estimates**?

The second attachment **Final** discharge. On closer examination this shows data on SEFork , Homosassa Spring, Halls River and Hidden River. My quick review before asking for an explanation did not identify these sections in the continuum of data, nor did you mention it covered more than SEF.

The data shows:
SEFork from 103079 to 155614
Homosassa Springs 68112 to155614
Halls River 106848 to155614
Hidden River 67920 to 155695

- What dates are these that most people understand.
- Not sure which of these have relevance to the 15 cfs difference, I assume only the SEFork, if not, please confirm.
- How did USGS officially report 15 minute discharge for SEFork in the 'overlap' If they reported both I do not see where other than daily and monthly which do not reveal any significant shift before/after the change. The official record changed to Velocity index October 5, 2011. Maybe I am wrong but it appears someone took it upon themselves to calculate the regression discharge after the USGS official conversion to Index Velocity base. WHY? The approved record does not show a change.

Text on page 33 of Appendix 6 indicates an overlap period of 600 days; as far as I read on Table 19 shows an overlap more like a month. Maybe I get totally confused using ''hours after 2000/01/01

- What overlap timeframe are you SWFWMD reporting on. mm/dd/year format and hours since.

As you were not sure which figures I refer to as over 100 cfs and negative maybe you did not personally know what was in the attachments**.**
Sorry, but when you sent the data dump I assumed it was all related to the 15 cfs

Regarding Hidden River the question about how it fits in was two fold.
First as part of the 15 cfs difference. I do not think it does, But you sent the data.
Second where it fits in to LAMFE Model particularly as it is not accompanied by either temperature or salinity. **So where if at all is this 10 cfs added. As far as I can tell it rejoins the aquifer below ground level and no one really knows where it reemerges.**

Regarding the introduction of Tidally Filtered versus 15 minute data into the discussion. Tidally filtered is not a factor in SE Fork (no reverse flow), the daily mean difference is only an issue of 24 hours versus 24.84 hour tidal cycle.

I have a number of comments about other parts of your e-mail, particularly What is understood to be the Homosassa River. Thank you for drawing my attention to the difference as studied by HSW Engineering (original MFL) and the LAMFE (reevaluation MFL). As I commented it is like we are looking at a different river in the re-evaluation.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Friday, March 15, 2019 9:48 AM
To: Alan Martyn Johnson; Doug Leeper
Cc: MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,
Responses to your questions are in red below. FYI, if you respond to MFLComments@watermatters.og, your emails will be directed to my inbox as well as to Doug, Sky and others. We have been copying all correspondence to this address so that appropriate District staff can respond and be aware of ongoing issues.

Thanks,
Gabe

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Sunday, March 10, 2019 1:34 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Gabe,
Thanks for your Friday e-mail, but could you explain the attachments.

One shows discharge from hours 103079 to 155695 the other from 50628 to116796. Please explain.
Discharge reported at this gage was originally calculated based on regression. Now it is calculated based on index velocity. These two methods of calculation have different periods of record. Where they overlap, there is a 15 cfs difference. This was adjusted by subtracting 15 cfs from the regression-based record. You have two files, one with regression minus 15 cfs and its earlier period of record, the other with index velocity and its slightly overlapping and later period of record. From appendix 6: "Figure 18 shows time series plots of the discharges using the above modified USGS regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork cross section. There are about 600 days of overlap of the red and blue lines in the figure."

Some figures show well over 100 cfs and negative flows are also evident!!!!
I'm not sure which figures or data you are referring to.

Not clear where Hidden River discharge fits in.
Hidden river discharge enters Otter Creek. See section 2.1.5 and 6.3.

Regarding the conversion of specific conductance to psu
I saw the reference to Lewis, but have not yet found the equation. If it is used often it should be easy to find on the internet.
Please provide the equation SWFWMD use.
See Schemel (2001) cited in MFLs report (attached). This is the report I cited in Figure 2-22 and others. Another citation I could have used (with the same equation) is Wagner et al. (2006) "Guidelines and Standard Procedures for Continuous Water-Quality Monitors: Station Operation, Record Computation, and Data Reporting", which cites Schemel (2001) and Lewis (1980). The equation provided in these publications is:

$$S = K_1 + \left(K_2 \times R^{1/2}\right) + (K_3 \times R) + \left(K_4 \times R^{3/2}\right) + \left(K_5 \times R^2\right) + \left(K_6 \times R^{5/2}\right)$$

where,

$K_1 = 0.0120$ $K_2 = -0.2174$ $K_3 = 25.3283$ $K_4 = 13.7714$ $K_5 = -6.4788$

"The variable R is the ratio of specific conductance at 25 °C to standard seawater (salinity equals 35) at 25 °C (53.087 millisiemens per centimeter). Salinity expressed by PSS is a dimensionless value, although it is commonly reported as practical salinity units and is nearly equivalent to parts per thousand." Wagner et al. (2006).

Here is the R code I wrote to convert reported gage values to psu:

```
fxn.CtoS <- function(cond){
  R <- cond/53087
```

```
 Sal <- 0.012 + -0.2174*R^0.5 + 25.3283*R + 13.7714*R^(3/2) + -6.4788*R^2 + 2.5842*R^(5/2)
 return(Sal)
}
```

Where “cond” is the reported conductance from USGS gages.

Wagner et al. (2006) also has a table for easy lookup:

Table 15. Rating table for conversion of specific conductance, in microsiemens per centimeter, to salinity, in pra

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; psu, practical salinity units; (90860), ADAPS parameter code for salinity

Specific conductance, in µS/cm	Salinity, in psu (90860)	Specific conductance, in µS/cm	Salinity, in psu (90860)	Specific conductance, in µS/cm
100	0.046	11,000	6.233	38,000
300	0.142	13,000	7.464	41,000
500	0.240	15,000	8.714	44,000
700	0.340	17,000	9.981	47,000
1,000	0.492	20,000	11.911	50,000
2,000	1.016	23,000	13.873	53,000
3,800	2.001	26,000	15.865	56,000
5,000	2.679	29,000	17.885	59,000
7,000	3.836	32,000	19.931	62,000
9,000	5.022	35,000	22.003	65,000

Comment: oceanographers may like psu (smaller numbers to make large comparisons) but spring water is a whole different matter with regard the dissolved solids as regards quantity and nature.

There is no separate methodology for conversion of conductance to salinity for spring water in estuarine systems.

Agreed we should spend more time looking at the ingress of seawater into the springs eg compare the water from the SE Fork with Homosassa main spring, Chass Seven Sisters with main spring and Crab Creek. Also, for Crystal River and the springs of Saragassa Canal and Hunters Cove with some of the other springs. Clearly there is seawater ingress, **but the models assume all flows are spring water equivalent quality to what most of the pumps are sucking out of the aquifer.**

Regarding the 15 cfs adjustment.
How come this difference is not reflected in the discharge used in the previous MFL report where the average/mean discharge shown in Table 2-3 as 60 cfs is the same as USGS current discharge using velocity (there was no velocity meter at that time (so those data should be 15 cfs higher...YES?)

The discrepancy of 15 cfs was found with 15-minute data which is not tidally filtered. The 2019 report showing a mean of 60 cfs and median of 59 cfs is tidally filtered daily data. The 2012 report’s Table 2-3 also shows daily data. These are different data sets.

Is it possible the difference results from the Weeki Wachee Well Levels from the old well 28320108315601 and the replacement well 283154082313701 (hope I have not transposed any numbers reading from one screen typing to this message) being used incorrectly in determining the difference.

The USGS is responsible for development of regression equations used to report flow at this gage. See USGS publication WRIR 01-4230 (Knochenmus and Yobbi 2001) for computation techniques. That regression is no longer used.

Model Output Volume Area Shoreline

I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Current model domain (from 2019 report):

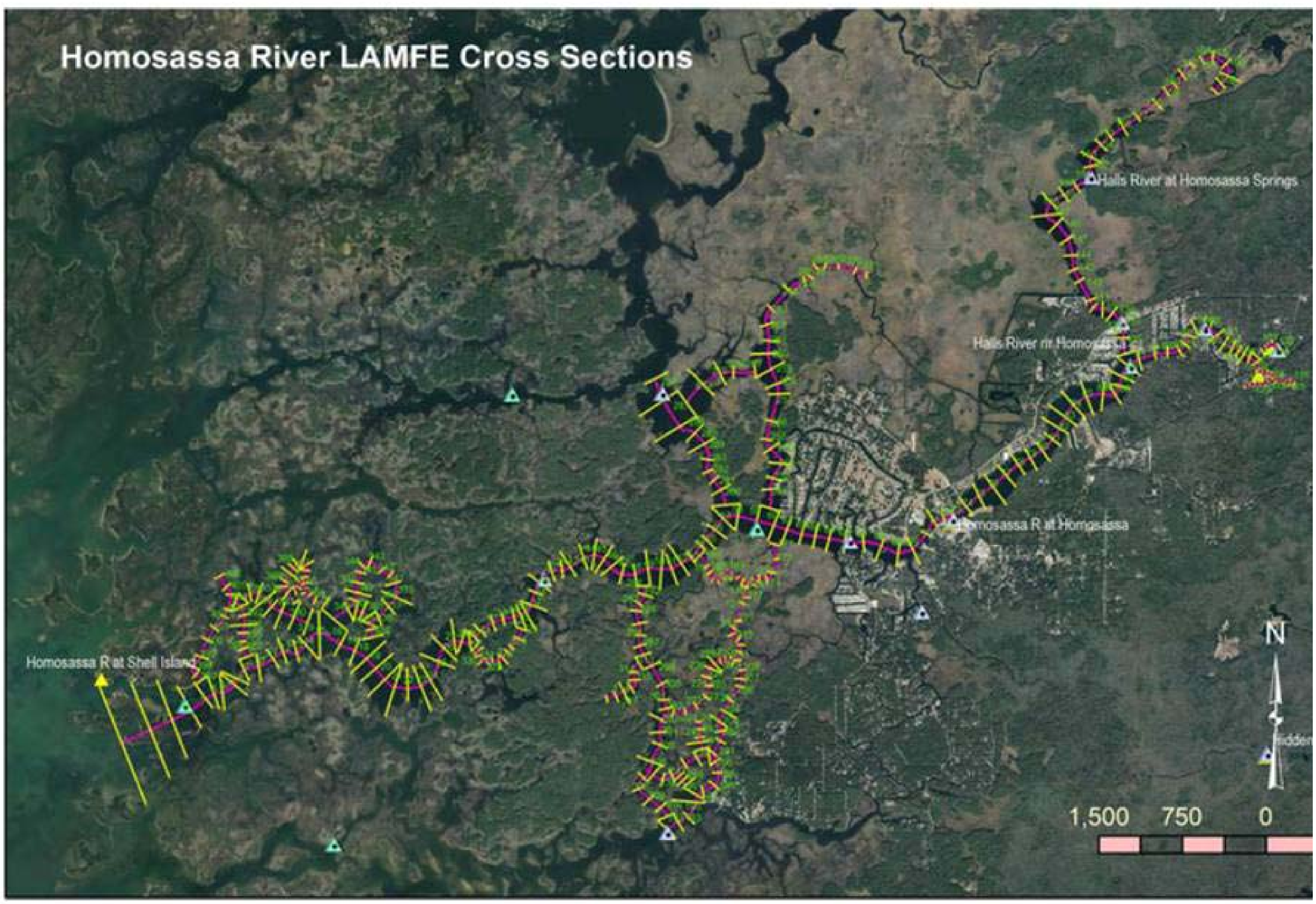

Figure 11. Cross sections (yellow segments) that form the LAMFE grids for the and its branches. Numbers in green are grid numbers in the longitudinal directio

Previous model domain (from 2012 report):

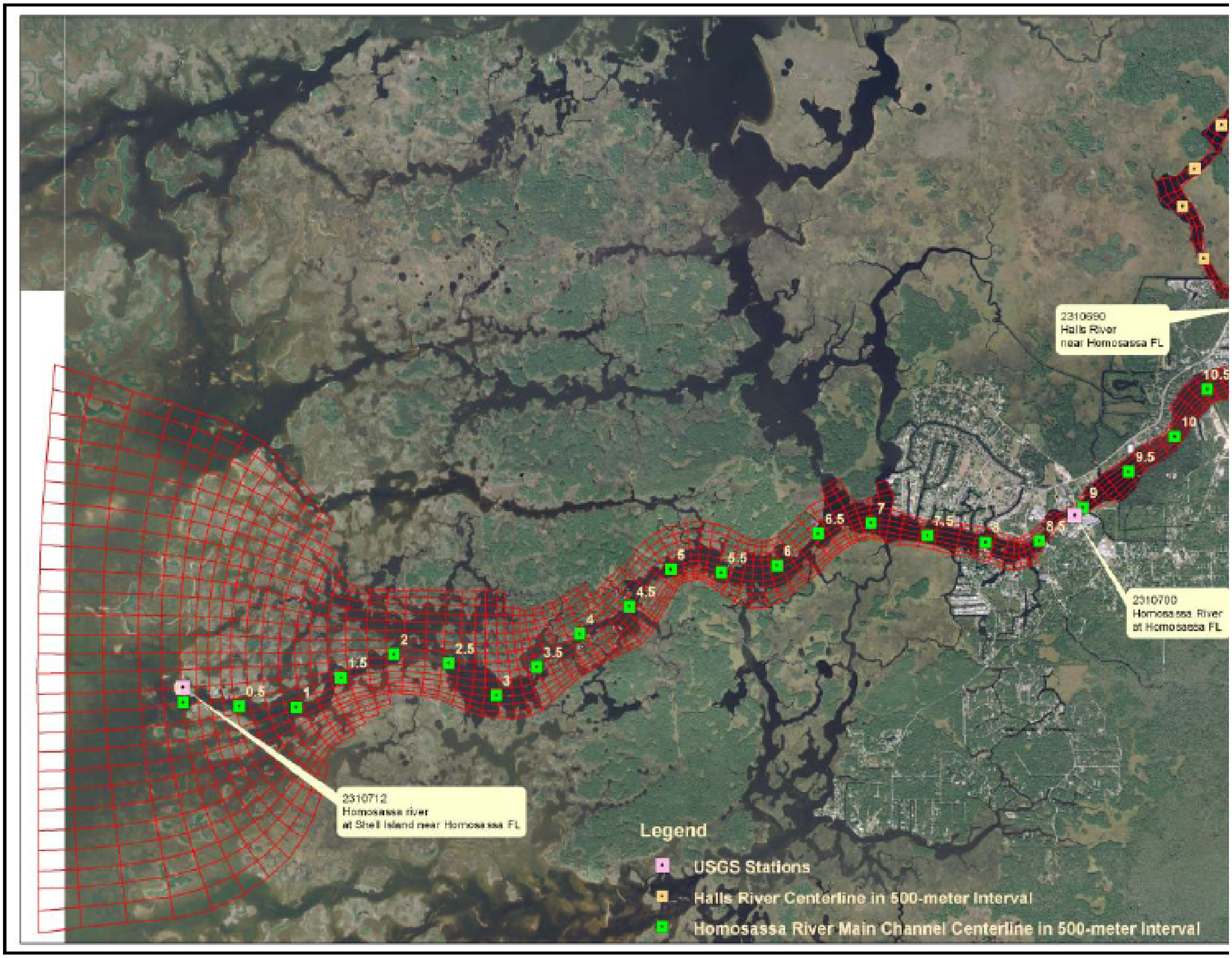

Figure 2-45. Curvilinear-orthogonal grid system for the Homosassa River E
Fluid Dynamics Code model (map reproduced from HSW Engineering, Inc.

What triggered my attention is Figure 6-2 in the recent Jan 17 Peer Review Report.
How (on average) does the water in Halls River warm from the upper reaches to the confluence? Unfortunately there is no Halls River gage data around this time; however there are some years when low temperatures have been recorded when both Halls River gages provide additional insight.
That figure can visually exaggerate small differences if temperatures fall on either side of a breakpoint. Monthly temperatures at these gages show that winter temps at the 02310690 gage near the confluence are slightly warmer than at the 02310689 gage upstream in the Halls River:

AT (689) (upstream Halls River)

00010, Temperature, water, degrees Celsius,												
YEAR	Monthly mean in deg C (Calculation Period: 2016-07-01 -> 2018-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016							31.01	28.97	27.72	24.56	21.02	20.92
2017	19.74	21.38	22.41		27.86	29.12	29.58	29.81	27.66	24.69	21.58	19.88
2018	16.73	23.09	20.81	24.71	27.26	29.63	28.69	28.23	27.77			
Mean of monthly Temperature, water	18.2	22.2	21.6	24.7	27.6	29.4	29.8	29.0	27.7	24.6	21.3	20.4
** No Incomplete data have been used for statistical calculation												

NEAR (690) (near confluence)

00010, Temperature, water, degrees Celsius,bottom												
YEAR	Monthly mean in deg C (Calculation Period: 2016-07-01 -> 2018-06-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016							29.03	28.14	27.25	24.59	21.44	21.20
2017	20.22	21.57	22.35	24.81	26.77	27.92	28.13	28.56	26.80	24.60	21.75	20.23
2018	17.24	22.86	21.00	24.10	25.97	28.13						
Mean of monthly Temperature, water	18.7	22.2	21.7	24.5	26.4	28.0	28.6	28.4	27.0	24.6	21.6	20.7
** No Incomplete data have been used for statistical calculation												

Page 13 of appendix 6 (Chen 2019): "although the Halls River at Homosassa Springs station is located upstream of
the Halls River near Homosassa station, salinity measured at upstream station is generally higher than that measured at the downstream station. Obviously, SGDs entering the upstream of the Halls River is brackish, and relatively flat salinity peaks suggests that salinity in these SGDs is in the range of 5 – 6 psu. The relatively lower salinity at the downstream station is caused by the relatively fresher SGDs from SE Fork and Homosassa headwaters, because the Halls River near Homosassa station is close to the confluence of the Halls River with the Homosassa River. The tidal currents transport relatively fresher water upstream to dilute the brackish SGDs in the upstream portion of the Halls River." The same mechanism could account for warmer water exiting the main spring and SE fork vents and eventually being transported up the Halls River in the winter. This would result in warmer temperatures downstream in the Halls River.

Do not get me wrong; I am not saying that either model is better than the other, but what I am saying is critical assessment is needed and I hope my questions help this to some extent.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Friday, March 8, 2019 4:34 PM
To: Doug Leeper; martynellijay@hotmail.com
Cc: MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

See files attached.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Gabe I. Herrick
Sent: Friday, March 08, 2019 4:32 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; martynellijay@hotmail.com
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

Thank you for your comments. Your questions have been answered in boxes within your quoted below.

Thanks,

Gabe

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, March 1, 2019 8:50 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Homosassa Re-evaluation

Doug,

I continue to read the 2019 Homosassa report and Appendices. For me, and I suspect others, the task is made more difficult by;

- The use of psu instead of Specific Conductance.
  Why is it that all the data collected as Specific Conductance then someone finds it necessary to convert this to psu?
  And by what formula is this conversion made?
  There is no handy dandy conversion site on the internet that I have yet found appropriate for spring water SpecC.

Response:
It is standard practice in marine science and oceanography for measurement equipment to report specific conductance and for this to be converted to practical salinity units. Salinity values at gaging stations were calculated as noted in Figure 2-22: Specific Conductance at 25°C converted to salinity using equation by Lewis (1980) as reported in Schemel (2001).

Schemel, Larry. 2001. Simplified Conversions Between Specific Conductance and Salinity Units for Use with Data from Monitoring Stations. IEP Newsletter. Interagency Ecological Program for the San Francisco Estuary. Vo. 14, No. 1.

- The use of Hours after 2000.
  Again, all the data collected is reference by '*normal*' date and time.
  Similarly to the psu conversion there is no conversion site on the internet. Why is hours after 2000 necessary?
  In my opinion it only make the data more difficult to digest.

Response:
Thank you for your comment. Initial peer review panel comments have been made to this effect as well. This time format is a simple method for mathematical convenience.

Possibly the most telling point of this mass of pages is summarized on pages 136/137.
Quote
River-wide, the 2015 mean total SAV percent cover was almost 50 percent less than the mean total SAV percent cover for all of the
previous sampling events. Eelgrass (V. americana) was not observed at any locations in the Homosassa River System in 2015. Between 1998-2011 and 2015, total SAV biomass decreased by over 90%, SAV percent cover decreased by 50%, angiosperm biomass decreased 81%, and macroalgae biomass decreased 99%. The majority of the biomass was upstream of Rkm 11, consequently changes to biomass and coverage in this portion of the river drove overall river changes (Figure 4-9). Therefore, critical SAV habitat appears to be upstream of the confluence of the Halls and Homosassa rivers.
Unquote
As in my previous e-mail THE RIVER IS DEAD.
I have personally observed this transformation over the last 18 years, neighbors have seen the changes over their almost 80 years.

For right now I would like to focus on three issues regarding the USGS data for the SE Fork which appear in Appendix 6.

1. On page 33 there is discussion of a difference of 15 cfs in the two methods of measuring discharge:

Quote

It is reasonable to assume that discharge data based on index-velocity are better estimate of the true discharge through the cross section at the SE Fork Homosassa Spring station than those calculated from tidal data and groundwater level data at a Weeki Wachee well using the USGS regression relationship (Equation 2). It is thus meaningful to examine how good the USGS regression relationship for the SE Fork discharge is. It was found that Equation (2) roughly overestimates 15 cfs of discharge at the SE Fork station. As such, Equation (2) was modified by adding -15 cfs to it and became as follows

3.6293 10.3114 418.139Δ 3.31029 (6)

Figure 18 shows time series plots of the discharges using the above modified USGS regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork cross section. There are about 600 days of overlap of the red and blue lines in the figure. It can be seen from the figure that both lines have roughly the same long-term trend and variability, and the two matches well in a time scale that is a few days or longer.

End Quote

I acknowledge there have been changes to the formula over the years.

At the time we were pursuing installation of a velocity meter I made comparisons of the USGS calculated/reported discharge and Field Measurements. My spreadsheet shows good agreement on an average basis, but some major differences on individual results. I know I shared this with you.

WHERE IS THE DATA SHOWING THIS 15 cfs DIFFERENCE (page 33) AND ANY DISCUSSION OF THIS DIFFERENCE WITH USGS?

Response:

The USGS SE Fork Homosassa Spring at Homosassa Springs gage (no. 02310688) reports discharge starting Oct. 1, 2000. This discharge was regression based prior to October 1, 2011, when discharge began to be reported based on index velocity. Verifying the USGS regression equation for the SE Fork station against available index-velocity based flow (assuming that index-velocity based flow is more reliable), District staff found that the regression based flow is about 15 cfs higher than index-velocity based flow at the SE Fork. As such, staff calculated USGS SE Fork flow, with an interval of 15 minutes, prior to October 5, 2011 from measured 15-minute tides and daily Weeki Wachee well levels (linearly interpolated to every 15 minutes) using a modified USGS regression equation, which is simply the regression equation provided by the USGS (equation 2 in appendix 6) minus 15 cfs. You can do this yourself with data from USGS website. Files attached include this data from index velocity and regression equation.

I could request the archived discharge data from USGS to verify/corroborate my spreadsheet, but assume you/others have the data.

Comment: No mention of this adjustment of USGS data is made in the main report (as far as I can see).

2. In your e-mail of Feb 7 you state;

   Quote

   Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

   Unquote

   This is disappointing as Specific Conductance data is assumed to represent the total discharge in any time period the eddie current draws water along the concrete wall to the sensor location. There is no reversal of the main flow. Close examination of the data shows higher Specific Conductance occurs when there is relatively rapid stage increase and examination of temperature reflects the sudden changes.

   As you may recall I have used 'kids bathtub dye' and pink twine with weighted fishing bobbers to witness this.

   Comment:

   I suspect there are PORTABLE Specific Conductance Monitors that could be placed close to the Velocity Meter to confirm SE Fork spring discharge does not have Specific Conductance spikes. A few days deployment is all that is needed.

In the meantime the LAMFE Model is being fueled with inaccurate SpecC data.

On page 13 the 'authors' half recognize the issue but simply dismiss any attempt to explain this frequent issue in the data.

Quote

This suggests that SGDs from SE Fork springs, including Belcher Spring, Trotter Springs, McClain Spring, and Pumphouse Spring are fresh and the occasional peaks up to less than 2 psu are likely caused by high tides.

End Quote

3. On page 24 it states;

   Quote

   It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at

Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data..

End Quote

and page 32

Quote

....provided that flows at the Halls River at Homosassa Springs station can be hindcasted back to October 2007. To do so, correlations of the Halls River at Homosassa Spring flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving average using a time window of one half of the lunar cycle. The regression equation takes the following form

2.0483 89.875

Unquote

Comment

There is no 'negative flow' at the SE Fork. To suggest there is correlation with Halls River is, sorry to have to say it, ridiculous.

The SEF discharge variations are due to the filling and emptying of the 3-4 acre well defined pool upstream of the gage site by spring water. Halls River upstream of the Gage Site is a very large pool that is difficult to define, but comprises of shallow marshes that act more like a sponge; taking time to both fill and empty. Clearly there is strong upstream flow each tidal cycle. Additionally, the reported Halls River discharge data (calculated from velocity) appear to be more accurate/in agreement with Field Measurements when there is upstream flow compared with downstream flow. This is supported by the experience of kayaking thru the channel immediately upstream of the sensors. It is my opinion this accuracy difference is due to higher turbulence in the water stream past the velocity meter in discharge than in-flow, resulting from the sharp turn (upstream) of the flow thru a complex channel, unlike the SE Fork channel which is well defined by 'concrete banks on both sides.

In my opinion any hind-casting creates a minefield for assessment of the model.

By the way: NDM 5 still has Halls River Flow as 102 cfs. I think we both know how that was derived ...mathematical manipulation.

Doug,

I have other questions for another time regarding the apparent major differences in model output regarding volume and area of habitats.

You are welcome to share my questions/comments with the peer review panel, but I have no intention of interfering with the process.

I look forward to their detailed review in due course.

Martyn

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
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352-796-0515 ext. 4275

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Thursday, February 07, 2019 1:31 PM
To: martynellijay@hotmail.com
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn:

Good to hear from you again, also. Here are some brief responses to the questions included in your recent email.

Your question: *How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?"*
Response: The currently proposed minimum flows for the Chassahowitzka and Homosassa river systems were recently developed based on the best information currently available. Their development is ongoing, and as you know, we are currently subjecting the recommendations to independent, scientific peer review.

Your question (in reference to the Homosassa River system): *Common Snook took over from manatee on what basis?*
Response: The currently proposed minimum flows for the Homosassa River system were recently developed based on the best information currently available. Flow-related change in Common Snook habitat was the most sensitive criterion assessed, and was used to develop the current minimum flow recommendation.

Your questions: *What does all the Day of the Year data tell us?*
Some of the graphs are for different timeframes eg
Chass
Stage is for 2010-10-01 to 2017-12-05 ***Figure 2-10***
Flow is for 2012-11-18 to 2017-12-05 ***Figure 2-11***
I can see that this is available data from USGS, but what is it telling us?
It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.
Response: As noted on page 27 of the draft Chassahowitzka River system minimum flow report, Figures 2-10, 2-11 and 2-16 are provided to illustrate interaction between tide and groundwater levels on discharge in the river system.

Your questions: *What progress is being made with USGS*
A. To get velocity based discharge for Homosassa man springs?
B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to

the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.

Response to question (A): Analyses of the data collected through approximately the middle of last year at the Homosassa Springs at Homosassa Springs, FL gage were not sufficient for implementation of an index-velocity approach for discharge measurement. Data collection at the site continues and the USGS will continue to review these data to determine whether the index-velocity approach can be implemented.

Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

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From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Saturday, February 02, 2019 10:30 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,
Thank you for sharing the schedule for Peer Review of these draft reports.

I have already reviewed the reports although I must say in depth reading has yet to be done. My tardiness in this task is derived from the following key points:

1. How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?
   Code reads "
   (16) Minimum Flow for the Chassahowitzka River System.
   (a) For purposes of this rule, the Chassahowitzka River System includes the watercourse from the Chassahowitzka Main Springs Complex to the Gulf of Mexico, including contributing tributaries, Blind Springs and all named and unnamed springs that discharge to the river.
   (b) The Minimum Flow for the Chassahowitzka River System is 97% of the natural flow as measured at the United States Geological Survey (USGS) Gage Chassahowitzka River near Homosassa (Gage No. 02310650). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from this Gage is measured as the previous day's natural flow at that point minus 3%.
   (c) The District will reevaluate the Minimum Flow within six years of adoption of this rule.
   (17) Minimum Flow for the Homosassa River System.
   (a) For purposes of this rule, the Homosassa River System includes the watercourse from the Homosassa Main Springs Complex to the Gulf of Mexico, including the southeast fork of the Homosassa River, Halls River, Hidden River and all named and unnamed springs that discharge to these rivers.
   (b) The Minimum Flow for the Homosassa River System is 97% of the combined natural flow as measured at the United States Geological Survey (USGS) Homosassa Springs at Homosassa Springs, FL Gage (No. 02310678), and the USGS SE Fork Homosassa Spring at Homosassa Springs, FL Gage (No. 02310688). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from these Gages are measured as the previous day's natural flow at that point minus 3%.
   (c) The District will reevaluate the Minimum Flow within six years of adoption of this rule."
   Executive Reports read
   " The recommended minimum flows for the Chassahowitzka River system are 92 percent of flows that would occur in the

absence of withdrawal impacts; allowing up to an 8 percent reduction from unimpacted flows. This recommendation is made on the basis of three criteria which are all equally sensitive to simulated reductions in flow: area and volume of salinity-based habitats less than or equal to 1 practical salinity unit and temperature-based habitat for Common Snook."
Ppage viii
and
" The recommended minimum flows for the Homosassa River system are 95 percent of flows that would occur in the absence of withdrawal impacts; allowing up to a 5 percent reduction from unimpacted flows. This recommendation is made on the basis of temperature-based habitat for Common Snook."
Page ix

Sideline: Common Snook took over from manatee on what basis?

2. What does all the Day of the Year data tell us?

Some of the graphs are for different timeframes eg
Chass
Stage is for 2010-10-01 to 2017-12-05 **Figure 2-10**
Flow is for 2012-11-18 to 2017-12-05 **Figure 2-11**
I can see that this is available data from USGS, but what is it telling us?
It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.

3. What progress is being made with USGS
   A. To get velocity based discharge for Homosassa man springs?
   B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.

Doug,
The Homosassa River is (as Mark Hammond commented some years ago) 'DEAD'. This year we have seen manatee trying to 'climb' the banks to get green food!!! It is so bad last week I e-mailed Chris Anastasious to ask about the final report on the Hunter Cove Revegetation Project as I had noticed the fencing has been removed.

Martyn
Good to hear from you, trust life is treating you and Ron well with regard to health and happiness.

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 1:11 PM
To: martynellijay@hotmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Martyn:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
- January-June 2019: Stakeholder outreach and meetings
- June 2019: Public workshop date and location have not yet been determined
- Fall 2019: District Governing Board meeting – Request to approve staff minimum flow recommendations and initiate rulemaking
- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

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Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, March 15, 2019 9:48 AM
To: Alan Martyn Johnson; Doug Leeper
Cc: MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations
Attachments: Schemel 2001 Conversions between Specific Conductance and Salinity.pdf

Martyn,
Responses to your questions are in red below. FYI, if you respond to MFLComments@watermatters.og, your emails will be directed to my inbox as well as to Doug, Sky and others. We have been copying all correspondence to this address so that appropriate District staff can respond and be aware of ongoing issues.

Thanks,
Gabe

Gabe Herrick, PhD
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352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Sunday, March 10, 2019 1:34 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Gabe,
Thanks for your Friday e-mail, but could you explain the attachments.

One shows discharge from hours 103079 to 155695 the other from 50628 to116796. Please explain.
Discharge reported at this gage was originally calculated based on regression. Now it is calculated based on index velocity. These two methods of calculation have different periods of record. Where they overlap, there is a 15 cfs difference. This was adjusted by subtracting 15 cfs from the regression-based record. You have two files, one with regression minus 15 cfs and its earlier period of record, the other with index velocity and its slightly overlapping and later period of record. From appendix 6: "Figure 18 shows time series plots of the discharges using the above modified USGS regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork cross section. There are about 600 days of overlap of the red and blue lines in the figure."

Some figures show well over 100 cfs and negative flows are also evident!!!!
I'm not sure which figures or data you are referring to.

Not clear where Hidden River discharge fits in.
Hidden river discharge enters Otter Creek. See section 2.1.5 and 6.3.

Regarding the conversion of specific conductance to psu

I saw the reference to Lewis, but have not yet found the equation. If it is used often it should be easy to find on the internet.
Please provide the equation SWFWMD use.
See Schemel (2001) cited in MFLs report (attached). This is the report I cited in Figure 2-22 and others. Another citation I could have used (with the same equation) is Wagner et al. (2006) "Guidelines and Standard Procedures for Continuous Water-Quality Monitors: Station Operation, Record Computation, and Data Reporting", which cites Schemel (2001) and Lewis (1980). The equation provided in these publications is:

$$S = K_1 + \left(K_2 \times R^{1/2}\right) + (K_3 \times R) + \left(K_4 \times R^{3/2}\right) + \left(K_5 \times R^2\right) + \left(K_6 \times R^{5/2}\right)$$

where,

$K_1 = 0.0120$ $K_2 = -0.2174$ $K_3 = 25.3283$ $K_4 = 13.7714$ $K_5 = -6.4788$

"The variable R is the ratio of specific conductance at 25 °C to standard seawater (salinity equals 35) at 25 °C (53.087 millisiemens per centimeter). Salinity expressed by PSS is a dimensionless value, although it is commonly reported as practical salinity units and is nearly equivalent to parts per thousand." Wagner et al. (2006).

Here is the R code I wrote to convert reported gage values to psu:

```
fxn.CtoS <- function(cond){
 R <- cond/53087
 Sal <- 0.012 + -0.2174*R^0.5 + 25.3283*R + 13.7714*R^(3/2) + -6.4788*R^2 + 2.5842*R^(5/2)
 return(Sal)
}
```

Where "cond" is the reported conductance from USGS gages.

Wagner et al. (2006) also has a table for easy lookup:

Table 15. Rating table for conversion of specific conductance, in microsiemens per centimeter, to salinity, in pra

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; psu, practical salinity units; (90860), ADAPS parameter code for salinity

Specific conductance, in µS/cm	Salinity, in psu (90860)	Specific conductance, in µS/cm	Salinity, in psu (90860)	Specific conductance, in µS/cm
100	0.046	11,000	6.233	38,000
300	0.142	13,000	7.464	41,000
500	0.240	15,000	8.714	44,000
700	0.340	17,000	9.981	47,000
1,000	0.492	20,000	11.911	50,000
2,000	1.016	23,000	13.873	53,000
3,800	2.001	26,000	15.865	56,000
5,000	2.679	29,000	17.885	59,000
7,000	3.836	32,000	19.931	62,000
9,000	5.022	35,000	22.003	65,000

Comment: oceanographers may like psu (smaller numbers to make large comparisons) but spring water is a whole different matter with regard the dissolved solids as regards quantity and nature.

There is no separate methodology for conversion of conductance to salinity for spring water in estuarine systems.

Agreed we should spend more time looking at the ingress of seawater into the springs eg compare the water from the SE Fork with Homosassa main spring, Chass Seven Sisters with main spring and Crab Creek. Also, for Crystal River and the springs of Saragassa Canal and Hunters Cove with some of the other springs. Clearly there is seawater ingress, **but the models assume all flows are spring water equivalent quality to what most of the pumps are sucking out of the aquifer.**

Regarding the 15 cfs adjustment.
How come this difference is not reflected in the discharge used in the previous MFL report where the average/mean discharge shown in Table 2-3 as 60 cfs is the same as USGS current discharge using velocity (there was no velocity meter at that time (so those data should be 15 cfs higher...YES?)

The discrepancy of 15 cfs was found with 15-minute data which is not tidally filtered. The 2019 report showing a mean of 60 cfs and median of 59 cfs is tidally filtered daily data. The 2012 report's Table 2-3 also shows daily data. These are different data sets.

Is it possible the difference results from the Weeki Wachee Well Levels from the old well 28320108315601 and the replacement well 283154082313701 (hope I have not transposed any numbers reading from one screen typing to this message) being used incorrectly in determining the difference.
The USGS is responsible for development of regression equations used to report flow at this gage. See USGS publication WRIR 01-4230 (Knochenmus and Yobbi 2001) for computation techniques. That regression is no longer used.

Model Output Volume Area Shoreline
I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.

I think what you are asking here is this: why are total shoreline lengths different between these two modeling efforts. The answer is pretty simple: the spatial domains of these models is different. The spatial areas (volumes, linear shorelines) included in previous modeling effort and current modeling effort are different.

Current model domain (from 2019 report):

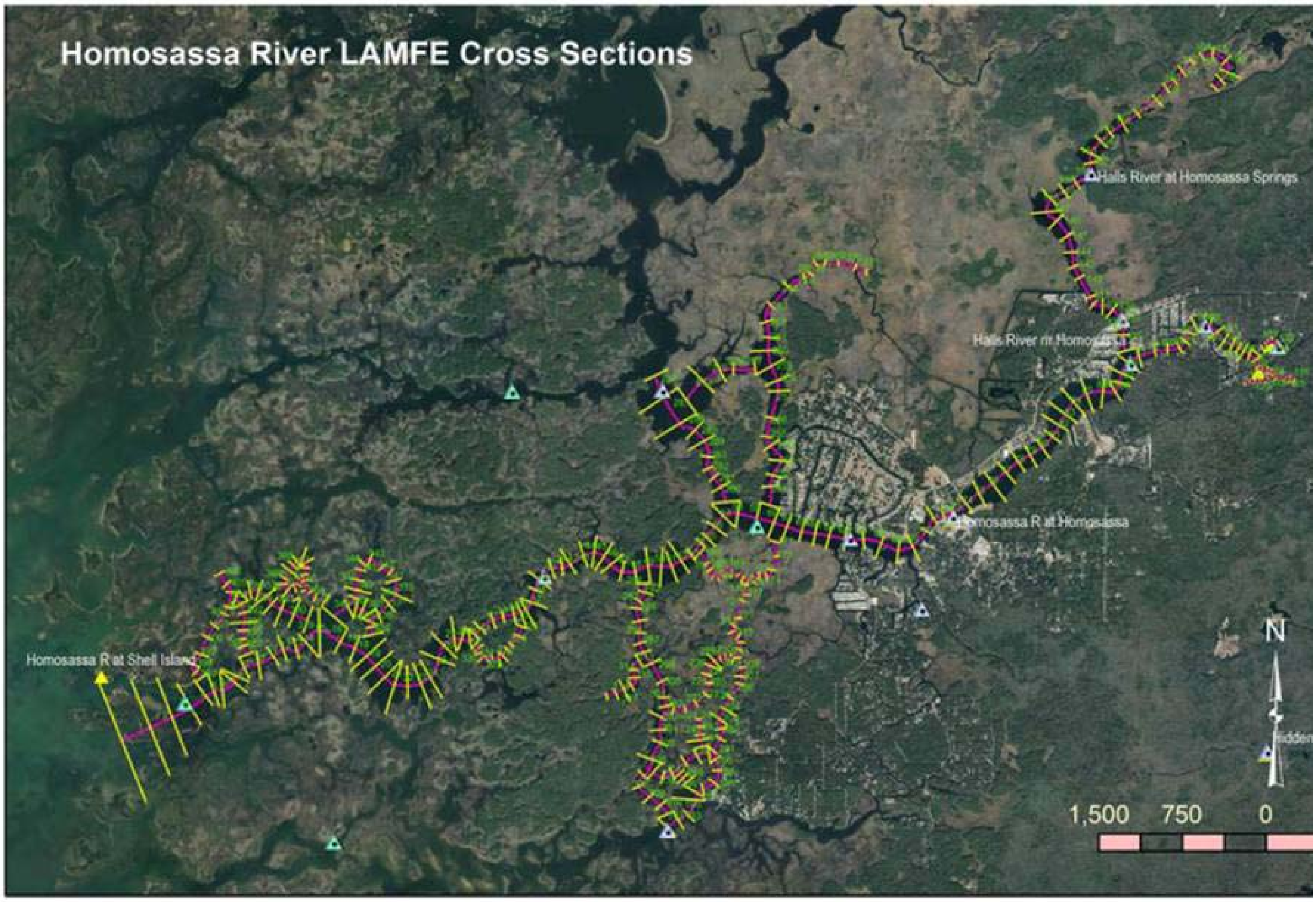

Figure 11. Cross sections (yellow segments) that form the LAMFE grids for the
and its branches. Numbers in green are grid numbers in the longitudinal directio

Previous model domain (from 2012 report):

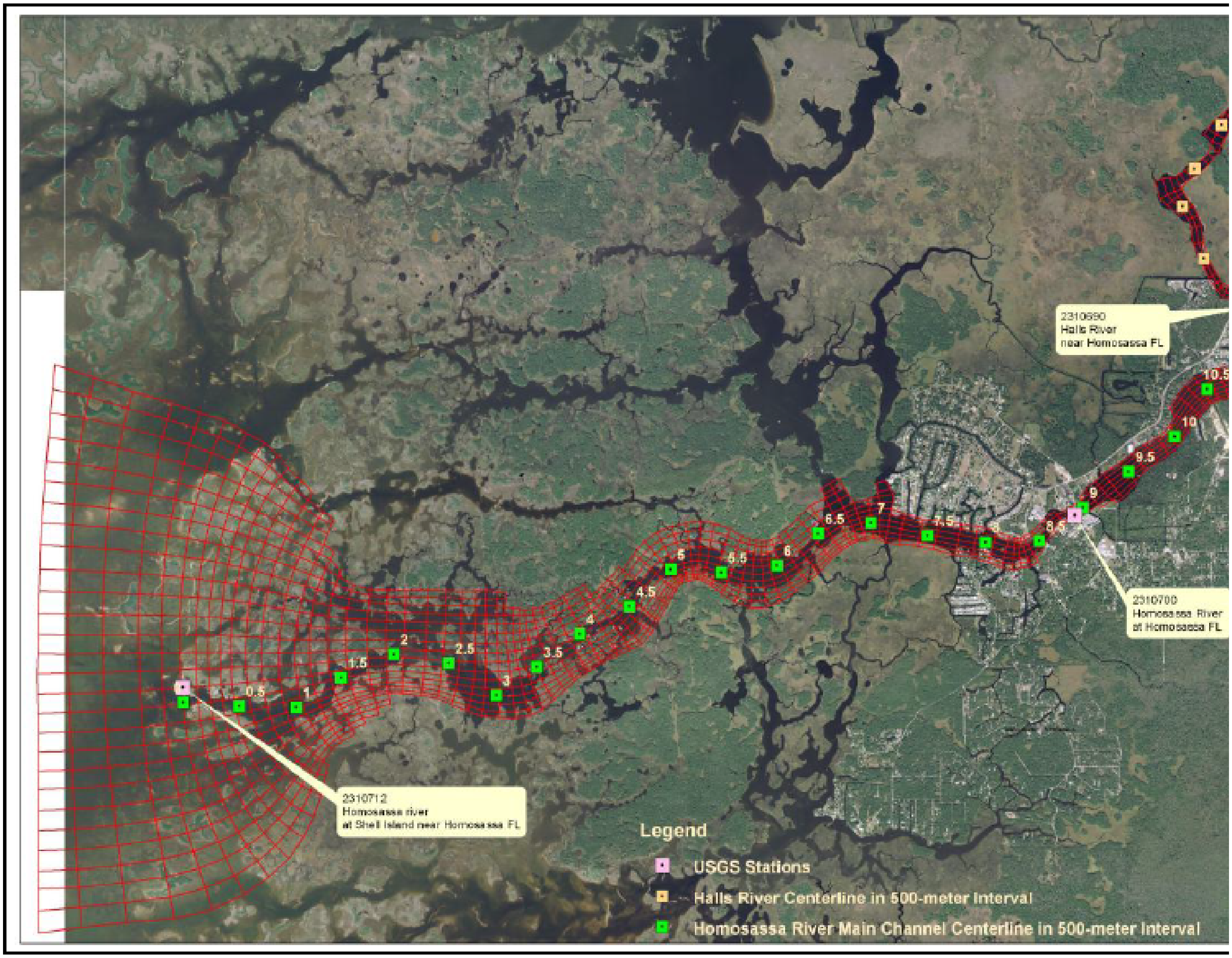

Figure 2-45. Curvilinear-orthogonal grid system for the Homosassa River E Fluid Dynamics Code model (map reproduced from HSW Engineering, Inc.

What triggered my attention is Figure 6-2 in the recent Jan 17 Peer Review Report.
How (on average) does the water in Halls River warm from the upper reaches to the confluence? Unfortunately there is no Halls River gage data around this time; however there are some years when low temperatures have been recorded when both Halls River gages provide additional insight.
That figure can visually exaggerate small differences if temperatures fall on either side of a breakpoint. Monthly temperatures at these gages show that winter temps at the 02310690 gage near the confluence are slightly warmer than at the 02310689 gage upstream in the Halls River:

AT (689) (upstream Halls River)

YEAR	00010, Temperature, water, degrees Celsius, Monthly mean in deg C (Calculation Period: 2016-07-01 -> 2018-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016							31.01	28.97	27.72	24.56	21.02	20.92
2017	19.74	21.38	22.41		27.86	29.12	29.58	29.81	27.66	24.69	21.58	19.88
2018	16.73	23.09	20.81	24.71	27.26	29.63	28.69	28.23	27.77			
Mean of monthly Temperature, water	18.2	22.2	21.6	24.7	27.6	29.4	29.8	29.0	27.7	24.6	21.3	20.4

** No Incomplete data have been used for statistical calculation

NEAR (690) (near confluence)

YEAR	00010, Temperature, water, degrees Celsius,bottom Monthly mean in deg C (Calculation Period: 2016-07-01 -> 2018-06-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016							29.03	28.14	27.25	24.59	21.44	21.20
2017	20.22	21.57	22.35	24.81	26.77	27.92	28.13	28.56	26.80	24.60	21.75	20.23
2018	17.24	22.86	21.00	24.10	25.97	28.13						
Mean of monthly Temperature, water	18.7	22.2	21.7	24.5	26.4	28.0	28.6	28.4	27.0	24.6	21.6	20.7

** No Incomplete data have been used for statistical calculation

Page 13 of appendix 6 (Chen 2019): “although the Halls River at Homosassa Springs station is located upstream of
the Halls River near Homosassa station, salinity measured at upstream station is generally higher than that measured at the downstream station. Obviously, SGDs entering the upstream of the Halls River is brackish, and relatively flat salinity peaks suggests that salinity in these SGDs is in the range of 5 – 6 psu. The relatively lower salinity at the downstream station is caused by the relatively fresher SGDs from SE Fork and Homosassa headwaters, because the Halls River near Homosassa station is close to the confluence of the Halls River with the Homosassa River. The tidal currents transport relatively fresher water upstream to dilute the brackish SGDs in the upstream portion of the Halls River." The same mechanism could account for warmer water exiting the main spring and SE fork vents and eventually being transported up the Halls River in the winter. This would result in warmer temperatures downstream in the Halls River.

Do not get me wrong; I am not saying that either model is better than the other, but what I am saying is critical assessment is needed and I hope my questions help this to some extent.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Friday, March 8, 2019 4:34 PM
To: Doug Leeper; martynellijay@hotmail.com
Cc: MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

See files attached.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Gabe I. Herrick
Sent: Friday, March 08, 2019 4:32 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; martynellijay@hotmail.com
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

Thank you for your comments. Your questions have been answered in boxes within your quoted below.

Thanks,

Gabe

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, March 1, 2019 8:50 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Homosassa Re-evaluation

Doug,

I continue to read the 2019 Homosassa report and Appendices. For me, and I suspect others, the task is made more difficult by;

- The use of psu instead of Specific Conductance.
  Why is it that all the data collected as Specific Conductance then someone finds it necessary to convert this to psu?
  And by what formula is this conversion made?
  There is no handy dandy conversion site on the internet that I have yet found appropriate for spring water SpecC.

Response:
It is standard practice in marine science and oceanography for measurement equipment to report specific conductance and for this to be converted to practical salinity units. Salinity values at gaging stations were calculated as noted in Figure 2-22: Specific Conductance at 25°C converted to salinity using equation by Lewis (1980) as reported in Schemel (2001).

Schemel, Larry. 2001. Simplified Conversions Between Specific Conductance and Salinity Units for Use with Data from Monitoring Stations. IEP Newsletter. Interagency Ecological Program for the San Francisco Estuary. Vo. 14, No. 1.

- The use of Hours after 2000.
  Again, all the data collected is reference by '*normal*' date and time.
  Similarly to the psu conversion there is no conversion site on the internet. Why is hours after 2000 necessary? In my opinion it only make the data more difficult to digest.

Response:
Thank you for your comment. Initial peer review panel comments have been made to this effect as well. This time format is a simple method for mathematical convenience.

Possibly the most telling point of this mass of pages is summarized on pages 136/137.
Quote
River-wide, the 2015 mean total SAV percent cover was almost 50 percent less than the mean total SAV percent cover for all of the
previous sampling events. Eelgrass (V. americana) was not observed at any locations in the Homosassa River System in 2015. Between 1998-2011 and 2015, total SAV biomass decreased by over 90%, SAV percent cover decreased by 50%, angiosperm biomass decreased 81%, and macroalgae biomass decreased 99%. The majority of the biomass was upstream of Rkm 11, consequently changes to biomass and coverage in this portion of the river drove overall river changes (Figure 4-9). Therefore, critical SAV habitat appears to be upstream of the confluence of the Halls and Homosassa rivers.
Unquote
As in my previous e-mail THE RIVER IS DEAD.
I have personally observed this transformation over the last 18 years, neighbors have seen the changes over their almost 80 years.

For right now I would like to focus on three issues regarding the USGS data for the SE Fork which appear in Appendix 6.

1. On page 33 there is discussion of a difference of 15 cfs in the two methods of measuring discharge:

Quote
It is reasonable to assume that discharge data based on index-velocity are better estimate of the true discharge through the cross section at the SE Fork Homosassa Spring station than those
calculated from tidal data and groundwater level data at a Weeki Wachee well using the USGS regression relationship (Equation 2). It is thus meaningful to examine how good the USGS
regression relationship for the SE Fork discharge is. It was found that Equation (2) roughly overestimates 15 cfs of discharge at the SE Fork station. As such, Equation (2) was modified by adding -15 cfs to it and became as follows

3.6293 10.3114 418.139Δ 3.31029 (6)

Figure 18 shows time series plots of the discharges using the above modified USGS
regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork
cross section. There are about 600 days of overlap of the red and blue lines in the figure. It can be seen from the figure that both lines have roughly the same long-term trend and variability, and the
two matches well in a time scale that is a few days or longer.
End Quote
I acknowledge there have been changes to the formula over the years.
At the time we were pursuing installation of a velocity meter I made comparisons of the USGS calculated/reported discharge and Field Measurements. My spreadsheet shows good agreement on an average basis, but some major differences on individual results. I know I shared this with you.

WHERE IS THE DATA SHOWING THIS 15 cfs DIFFERENCE (page 33) AND ANY DISCUSSION OF THIS DIFFERENCE WITH USGS?

Response:
The USGS SE Fork Homosassa Spring at Homosassa Springs gage (no. 02310688) reports discharge starting Oct. 1, 2000. This discharge was regression based prior to October 1, 2011, when discharge began to be reported based on index velocity. Verifying the USGS regression equation for the SE Fork station against available index-velocity based flow (assuming that index-velocity based flow is more reliable), District staff found that the regression based flow is about 15 cfs higher than index-velocity based flow at the SE Fork. As such, staff calculated USGS SE Fork flow, with an interval of 15 minutes, prior to October 5, 2011 from measured 15-minute tides and daily Weeki Wachee well levels (linearly interpolated to every 15 minutes) using a modified USGS regression equation, which is simply the regression equation provided by the USGS (equation 2 in appendix 6) minus 15 cfs. You can do this yourself with data from USGS website. Files attached include this data from index velocity and regression equation.

I could request the archived discharge data from USGS to verify/corroborate my spreadsheet, but assume you/others have the data.
Comment: No mention of this adjustment of USGS data is made in the main report (as far as I can see).

2. In your e-mail of Feb 7 you state;

   Quote

   Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

   Unquote

   This is disappointing as Specific Conductance data is assumed to represent the total discharge in any time period the eddie current draws water along the concrete wall to the sensor location. There is no reversal of the main flow. Close examination of the data shows higher Specific Conductance occurs when there is relatively rapid stage increase and examination of temperature reflects the sudden changes.

   As you may recall I have used 'kids bathtub dye' and pink twine with weighted fishing bobbers to witness this.

   Comment:

   I suspect there are PORTABLE Specific Conductance Monitors that could be placed close to the Velocity Meter to confirm SE Fork spring discharge does not have Specific Conductance spikes. A few days deployment is all that is needed.

In the meantime the LAMFE Model is being fueled with inaccurate SpecC data.

On page 13 the 'authors' half recognize the issue but simply dismiss any attempt to explain this frequent issue in the data.

Quote

This suggests that SGDs from SE Fork springs, including Belcher Spring, Trotter Springs, McClain Spring, and Pumphouse Spring are fresh and the occasional peaks up to less than 2 psu are likely caused by high tides.

End Quote

3. On page 24 it states;

   Quote

   It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at

Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches of the cross sections, tidal fluxes were estimated through the following formula and taken away from the reported discharge data..

End Quote

and page 32

Quote

....provided that flows at the Halls River at Homosassa Springs station can be hindcasted back to October 2007. To do so, correlations of the Halls River at Homosassa Spring flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving average using a time window of one half of the lunar cycle. The regression equation takes the following form

2.0483 89.875

Unquote

Comment

There is no 'negative flow' at the SE Fork. To suggest there is correlation with Halls River is, sorry to have to say it, ridiculous.

The SEF discharge variations are due to the filling and emptying of the 3-4 acre well defined pool upstream of the gage site by spring water. Halls River upstream of the Gage Site is a very large pool that is difficult to define, but comprises of shallow marshes that act more like a sponge; taking time to both fill and empty. Clearly there is strong upstream flow each tidal cycle. Additionally, the reported Halls River discharge data (calculated from velocity) appear to be more accurate/in agreement with Field Measurements when there is upstream flow compared with downstream flow. This is supported by the experience of kayaking thru the channel immediately upstream of the sensors. It is my opinion this accuracy difference is due to higher turbulence in the water stream past the velocity meter in discharge than in-flow, resulting from the sharp turn (upstream) of the flow thru a complex channel, unlike the SE Fork channel which is well defined by 'concrete banks on both sides.

In my opinion any hind-casting creates a minefield for assessment of the model.

By the way: NDM 5 still has Halls River Flow as 102 cfs. I think we both know how that was derived ...mathematical manipulation.

Doug,

I have other questions for another time regarding the apparent major differences in model output regarding volume and area of habitats.

You are welcome to share my questions/comments with the peer review panel, but I have no intention of interfering with the process.

I look forward to their detailed review in due course.

Martyn

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Thursday, February 07, 2019 1:31 PM
To: martynellijay@hotmail.com
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn:

Good to hear from you again, also. Here are some brief responses to the questions included in your recent email.

Your question: *How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?"*
Response: The currently proposed minimum flows for the Chassahowitzka and Homosassa river systems were recently developed based on the best information currently available. Their development is ongoing, and as you know, we are currently subjecting the recommendations to independent, scientific peer review.

Your question (in reference to the Homosassa River system): *Common Snook took over from manatee on what basis?*
Response: The currently proposed minimum flows for the Homosassa River system were recently developed based on the best information currently available. Flow-related change in Common Snook habitat was the most sensitive criterion assessed, and was used to develop the current minimum flow recommendation.

Your questions: *What does all the Day of the Year data tell us?*
Some of the graphs are for different timeframes eg
Chass
Stage is for 2010-10-01 to 2017-12-05 ***Figure 2-10***
Flow is for 2012-11-18 to 2017-12-05 ***Figure 2-11***
I can see that this is available data from USGS, but what is it telling us?
It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.
Response: As noted on page 27 of the draft Chassahowitzka River system minimum flow report, Figures 2-10, 2-11 and 2-16 are provided to illustrate interaction between tide and groundwater levels on discharge in the river system.

Your questions: *What progress is being made with USGS*
A. To get velocity based discharge for Homosassa man springs?
B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to

the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.

Response to question (A): Analyses of the data collected through approximately the middle of last year at the Homosassa Springs at Homosassa Springs, FL gage were not sufficient for implementation of an index-velocity approach for discharge measurement. Data collection at the site continues and the USGS will continue to review these data to determine whether the index-velocity approach can be implemented.

Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Saturday, February 02, 2019 10:30 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,
Thank you for sharing the schedule for Peer Review of these draft reports.

I have already reviewed the reports although I must say in depth reading has yet to be done. My tardiness in this task is derived from the following key points:

1. How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?
   Code reads "

   (16) Minimum Flow for the Chassahowitzka River System.

   (a) For purposes of this rule, the Chassahowitzka River System includes the watercourse from the Chassahowitzka Main Springs Complex to the Gulf of Mexico, including contributing tributaries, Blind Springs and all named and unnamed springs that discharge to the river.

   (b) The Minimum Flow for the Chassahowitzka River System is 97% of the natural flow as measured at the United States Geological Survey (USGS) Gage Chassahowitzka River near Homosassa (Gage No. 02310650). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from this Gage is measured as the previous day's natural flow at that point minus 3%.

   (c) The District will reevaluate the Minimum Flow within six years of adoption of this rule.

   (17) Minimum Flow for the Homosassa River System.

   (a) For purposes of this rule, the Homosassa River System includes the watercourse from the Homosassa Main Springs Complex to the Gulf of Mexico, including the southeast fork of the Homosassa River, Halls River, Hidden River and all named and unnamed springs that discharge to these rivers.

(b) The Minimum Flow for the Homosassa River System is 97% of the combined natural flow as measured at the United States Geological Survey (USGS) Homosassa Springs at Homosassa Springs, FL Gage (No. 02310678), and the USGS SE Fork Homosassa Spring at Homosassa Springs, FL Gage (No. 02310688). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from these Gages are measured as the previous day's natural flow at that point minus 3%.

(c) The District will reevaluate the Minimum Flow within six years of adoption of this rule."
Executive Reports read
" The recommended minimum flows for the Chassahowitzka River system are 92 percent of flows that would occur in the absence of withdrawal impacts; allowing up to an 8 percent reduction from unimpacted flows. This recommendation is made on the basis of three criteria which are all equally sensitive to simulated reductions in flow: area and volume of salinity-based habitats less than or equal to 1 practical salinity unit and temperature-based habitat for Common Snook."
Ppage viii
and
" The recommended minimum flows for the Homosassa River system are 95 percent of flows that would occur in the absence of withdrawal impacts; allowing up to a 5 percent reduction from unimpacted flows. This recommendation is made on the basis of temperature-based habitat for Common Snook."
Page ix

Sideline: Common Snook took over from manatee on what basis?

2. What does all the Day of the Year data tell us?

Some of the graphs are for different timeframes eg
Chass
Stage is for 2010-10-01 to 2017-12-05 **Figure 2-10**
Flow is for 2012-11-18 to 2017-12-05 **Figure 2-11**
I can see that this is available data from USGS, but what is it telling us?
It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.

3. What progress is being made with USGS
   A. To get velocity based discharge for Homosassa man springs?
   B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.

Doug,
The Homosassa River is (as Mark Hammond commented some years ago) 'DEAD'. This year we have seen manatee trying to 'climb' the banks to get green food!!! It is so bad last week I e-mailed Chris Anastasious to ask about the final report on the Hunter Cove Revegetation Project as I had noticed the fencing has been removed.

Martyn
Good to hear from you, trust life is treating you and Ron well with regard to health and happiness.

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 1:11 PM
To: martynellijay@hotmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Martyn:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
- January-June 2019: Stakeholder outreach and meetings
- June 2019: Public workshop date and location have not yet been determined
- Fall 2019: District Governing Board meeting – Request to approve staff minimum flow recommendations and initiate rulemaking
- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, March 15, 2019 8:05 AM
To: Ben Berauer
Cc: Doug Leeper; Kym Holzwart; Melissa Gulvin; Sky Notestein; Frank Gargano; MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluation

Ben,
Thanks for the heads up. I see the notice in the Citrus County Chronicle this morning. We are looking forward to being there.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Ben Berauer <bfberauer@aol.com>
Sent: Tuesday, March 12, 2019 10:25 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Kym Holzwart <Kym.Holzwart@swfwmd.state.fl.us>; Melissa Gulvin <Melissa.Gulvin@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluation

Gabe,

Just confirming that the meeting, and your attendance and participation is being publicized. You may be getting another notice as we distribute the information to those on our distribution, but wanted to make sure you received an early notification.

Thank you,
Ben Berauer, President, Friends of the Chassahowitzka River
(h)352-610-6704, (c)727-217-5971, bfberauer@aol.com, president@FriendsofChassahowitzka.org

The Friends of the Chassahowitzka River, formerly the Chassahowitzka River Keepers, invites all to join us for the following event! Our first public meeting in 2019 is coming up this month on the third Tuesday, March 19th at 7 PM at the Chassahowitzka Community Center, 10300 S Riviera Dr, Homosassa FL 34448. The Southwest Florida Water Management District (SWFWMD) back in 2014 set a maximum permitted water “taking” limit, set by a “Minimum Flows and Levels” (MFL) number of 3%, after initially recommending a 9% limit. That reduced limit was considered by many a significant victory for the Chassahowitzka River watershed. But it is expected that the re-evaluation this year may not be as low. The Homosassa River MFL is also up for re-evaluation. SWFWMD will be our speaker on this subject at our March meeting.

You can now find us in the following ways:

Call or text 352-897-0479.

Email us at info@FriendsofChassahowitzka.org

Visit our webpage at www.FriendsofChassahowitzka.org

Visit our Facebook page at Friends of the Chassahowitzka River.

On Feb 27, 2019, at 18:28, Ben Berauer <bfberauer@aol.com> wrote:

Great news, Gabe. We will be preparing a meeting and program announcement for early March, and will plan on your attendance for the meeting.

With great appreciation,
Ben Berauer, Chassahowitzka River Keepers President
(h)352-610-6704, (c)727-217-5971, bfberauer@aol.com

> On Feb 27, 2019, at 16:01, Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us> wrote:
>
> Ben,
>
> Yes, I would be happy to meet with you and the Chassahowitzka River Keepers to present District efforts and discuss the reevaluation for the Chassahowitzka River minimum flows and levels. My manager Sky Notestein and possibly other district staff will attend as well. March 19th at 7 PM works for us.
>
> Thank you for the invitation,
> Gabe
>
> ---
>
> Gabe Herrick, PhD
> Senior Environmental Scientist
> Southwest Florida Water Management District
> 7601 U.S. Highway 301 North
> Tampa, Florida 33637
> 352-796-0515 ext. 4275
>
> ---
>
> **From:** Ben Berauer <bfberauer@aol.com>
> **Sent:** Friday, February 22, 2019 10:04 AM
> **To:** Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
> **Cc:** Kym Holzwart <Kym.Holzwart@swfwmd.state.fl.us>; CRK <crk@chazriverkeepers.org>; Melissa Gulvin <Melissa.Gulvin@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
> **Subject:** Re: Chassahowitzka and Homosassa MFLs Reevaluation
>
> Doug, Gabe,
>
> Thank you for keeping us informed on the time table for the reevaluation of the Chassahowitzka River MFL. Since we are now in the stakeholder outreach and meetings

period I would like to invite SWFWMD to come to our Chassahowitzka community to present the status and any preliminary analysis regarding the reevaluation of the MFL. The Chassahowitzka River Keepers, a 501(c)(3) advocacy group for the protection and restoration of the river and it's springs, springshed, and adjacent surrounding coastal habitats would like to invite SWFWMD to attend and present at an upcoming monthly public meeting we conduct. These are typically the third Tuesday of the month. We would like to invite you to attend our March meeting, March 19th, at 7 pm, Chassahowitzka Community Center, 8300 S. Riviera Dr., Homosassa, Fl. 34448, if possible.

We appreciate all the past support and involvement SWFWMD has had with our organization, and look forward to having you as a guest again.

Ben Berauer, President, Chassahowitzka River Keepers
(h)352-610-6704, (c)727-217-5971, bfberauer@aol.com

> On Feb 1, 2019, at 13:36, Doug Leeper <Doug.Leeper@swfwmd.state.fl.us> wrote:
>
> Hi Ben:
>
> I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you.
>
> As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.
>
> Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.
>
> Tentative schedule for both systems:
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Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, March 15, 2019 8:02 AM
To: MFLComments
Subject: FW: Friends of Chassahowitzka Newsletter - March Events

---

From: Friends of Chassahowitzka (aka Chaz River Keepers) <info@friendsofchassahowitzka.org>
Sent: Thursday, March 14, 2019 5:50 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Friends of Chassahowitzka Newsletter - March Events

Greetings from Friends of Chassahowitzka

Friends of Chassahowitzka River, formerly known as the Chassahowitzka River Keepers, is kicking off its activities for 2019 after a rest and restructuring.

Yes, we have changed our name to the Friends of the Chassahowitzka River. A number of things have changed along with our name change, but it is only at first glance. We are basically the same organization, a grassroots group dedicated to the restoration and preservation of the Chassahowitzka River and Springs. Our web site, Facebook page, email address, and some other mechanics have changed, but you should be able to get to us just like before.

We are hitting the ground running, and hope you will join us! **Our first public meeting in 2019 is coming up this month on the third** Tuesday**, March 19th at 7:00pm**. Meetings are at the Chassahowitzka Community Center, 10300 S Riviera Dr, Homosassa FL 34448. The Southwest Florida Water Management District (SWFWMD) back in 2013 set a maximum permitted water “taking” limit, set by a “Minimum Flows and Levels” number of 3%, after initially recommending a 9% limit. That reduced limit was considered by many a significant victory for the Chassahowitzka River watershed. But it is expected that the re-evaluation this year may be significantly higher at 8%. SWFWMD will be our speaker on this subject at our March meeting.

March is also when we do our **bi-annual Chassahowitzka cleanup**. Our last cleanup was in September. Put Saturday March 30th on your calendar, and come out to help us once again! We will be doing a river and village cleanup starting at 8 am until about noon.

We plan on having regular monthly public meetings with informative educational programs every third Tuesday of each month. We have some programs lined up, but need help in program development, so if you can help in this please let us know. Join us at our monthly public meetings on the third Tuesday of each month at the Chassahowitzka Community Center.

You can now find us in the following ways:

- Call or text 352-897-0479.
- Email us at info@friendsofchassahowitzka.org
- Visit our Website - https://www.friendsofchassahowitzka.org
- Visit our Facebook page - https://www.facebook.com/friendsofchassahowitzka/

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, March 15, 2019 7:10 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluation

From: Ben Berauer <bfberauer@aol.com>
Sent: Tuesday, March 12, 2019 10:25 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Kym Holzwart <Kym.Holzwart@swfwmd.state.fl.us>; Melissa Gulvin <Melissa.Gulvin@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluation

Gabe,

Just confirming that the meeting, and your attendance and participation is being publicized. You may be getting another notice as we distribute the information to those on our distribution, but wanted to make sure you received an early notification.

Thank you,
Ben Berauer, President, Friends of the Chassahowitzka River
(h)352-610-6704, (c)727-217-5971, bfberauer@aol.com, president@FriendsofChassahowitzka.org

The Friends of the Chassahowitzka River, formerly the Chassahowitzka River Keepers, invites all to join us for the following event! Our first public meeting in 2019 is coming up this month on the third Tuesday, March 19th at 7 PM at the Chassahowitzka Community Center, 10300 S Riviera Dr, Homosassa FL 34448. The Southwest Florida Water Management District (SWFWMD) back in 2014 set a maximum permitted water "taking" limit, set by a "Minimum Flows and Levels" (MFL) number of 3%, after initially recommending a 9% limit. That reduced limit was considered by many a significant victory for the Chassahowitzka River watershed. But it is expected that the re-evaluation this year may not be as low. The Homosassa River MFL is also up for re-evaluation. SWFWMD will be our speaker on this subject at our March meeting.

You can now find us in the following ways:

Call or text 352-897-0479.

Email us at info@FriendsofChassahowitzka.org

Visit our webpage at www.FriendsofChassahowitzka.org

Visit our Facebook page at Friends of the Chassahowitzka River.

On Feb 27, 2019, at 18:28, Ben Berauer <bfberauer@aol.com> wrote:

Great news, Gabe. We will be preparing a meeting and program announcement for early March, and will plan on your attendance for the meeting.

With great appreciation,
Ben Berauer, Chassahowitzka River Keepers President
(h)352-610-6704, (c)727-217-5971, bfberauer@aol.com

On Feb 27, 2019, at 16:01, Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us> wrote:

Ben,

Yes, I would be happy to meet with you and the Chassahowitzka River Keepers to present District efforts and discuss the reevaluation for the Chassahowitzka River minimum flows and levels. My manager Sky Notestein and possibly other district staff will attend as well. March 19th at 7 PM works for us.

Thank you for the invitation,
Gabe

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Ben Berauer <bfberauer@aol.com>
Sent: Friday, February 22, 2019 10:04 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Kym Holzwart <Kym.Holzwart@swfwmd.state.fl.us>; CRK <crk@chazriverkeepers.org>; Melissa Gulvin <Melissa.Gulvin@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluation

Doug, Gabe,

Thank you for keeping us informed on the time table for the reevaluation of the Chassahowitzka River MFL. Since we are now in the stakeholder outreach and meetings period I would like to invite SWFWMD to come to our Chassahowitzka community to present the status and any preliminary analysis regarding the reevaluation of the MFL. The Chassahowitzka River Keepers, a 501(c)(3) advocacy group for the protection and restoration of the river and it's springs, springshed, and adjacent surrounding coastal habitats would like to invite SWFWMD to attend and present at an upcoming monthly public meeting we conduct. These are typically the third Tuesday of the month. We would like to invite you to attend our March meeting, March 19th, at 7 pm, Chassahowitzka Community Center, 8300 S. Riviera Dr., Homosassa, Fl. 34448, if possible.

We appreciate all the past support and involvement SWFWMD has had with our organization, and look forward to having you as a guest again.

Ben Berauer, President, Chassahowitzka River Keepers
(h)352-610-6704, (c)727-217-5971, bfberauer@aol.com

On Feb 1, 2019, at 13:36, Doug Leeper
<Doug.Leeper@swfwmd.state.fl.us> wrote:

Hi Ben:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you.

As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
- January-June 2019: Stakeholder outreach and meetings
- June 2019: Public workshop date and location have not yet been determined
- Fall 2019: District Governing Board meeting – Request to approve staff minimum flow recommendations and initiate rulemaking
- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for theChassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section

2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Thursday, March 14, 2019 8:25 AM
To: MFLComments
Subject: FW: Differences LAMFE output in reevaluation of Homosassa MFL

Follow Up Flag: Follow up
Flag Status: Flagged

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Wednesday, March 13, 2019 10:10 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Differences LAMFE output in reevaluation of Homosassa MFL

Doug,
Thank you. Very efficient as usual.

Sorry to have to troubled you on the WMIS issue, I think I would have got there, but I was guess I was being lazy...thanks again.

I had read the section in the report regarding differences but I had not seen any specific (numeric) comparisons. I will read what is in the links this evening.
Couple of examples of what triggered my thoughts;

- The LAMFE Model uses Halls River Discharge of 39 cfs (range on tidally adjusted from 4 to 73 cfs) and apparently some hindcast discharge by comparison with SE Fork (which I have commented before seems rediculous).
- At a point in the report the 15 cfs (supposed) over assessment of the SE Fork discharge by USGS Regression equation, which I assume let LAMFE calculate on approx 45 cfs a 25% reduction (I still have yet to see where USGS regression was so far in error).

Combined this is 75 cfs LESS in round numbers. When using 'existing' pumping as in NDM it appears logical that LAMFE calculations this should make the system more sensitive to spring flow reductions...or should I say more pumping...which is the premise of this whole study/exercise/effort,

I could go on and point out the the model output differences presented in Table 5.11 of the original report and Table 10 in Appendix 6 of the re-evaluation e.g

- less than psu 3 (Spec C 5400) original baseline 162199 m2 (40 acres) versus 727974 m2 (180 acres) in the re-evaluation. Maybe I am the only one who is misunderstanding these number.
- for area <1 psu (less than 1800 Specific Conductance) of around 5.5 acres is essentially the SE Fork which I had estimated at 3.5 to 4 acres. I would not argue that careful mapping of the canal leading to Spring Cove Road and Pepper Creek to the park entrance could yield 5.5 acres, but Table 5.11 has the less than 2 psu as3.5 acres (14470 m2). I do recall a comment about excluding low salinity areas in the original report but right now can not find it quickly.

Hence my comments about comparisons.
Add in the less than 5 psu old report baseline 126 acres LAMFE 376 acres

The part that should be easier to get agreement on is from the head springs down to MacReas. Past MacReas there are large areas of open marsh with shoreline extremely difficult to map.

Martyn

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Tuesday, March 12, 2019 7:08 AM
To: Alan Martyn Johnson
Subject: RE: Differences LAMFE output in reevaluation of Homosassa MFL

Martyn: Here are responses to the requests in your 3/11/2019 email.

- The Chassahowitzka-Homosassa peer review panel discussed differences between hydrodynamic modeling results for analyses supporting the existing, established minimum flows and those supporting the currently proposed minimum flows during their 2/25/2019 teleconference. A summary of the teleconference was posted to the review webforum on 3/5/2019, and is attached to this email.
- Page 77 of the draft reevaluation report on the Homosassa River System notes that Homosassa 1, 2 and 3 springs are sampled as part of the District's Spring Vents Project (P889). Water quality data for this project is available from the District's Water Management Information System (WMIS), which is described on the Water Quality Data page of the District's web site. Here's a link to that page:

  https://www.swfwmd.state.fl.us/resources/data-maps/water-quality-data

  The "WMIS Resource Data Search" link on the Water Quality Data page can be used to search for data associated with Homosassa 1 Spring (Site ID 20990); Homosassa 2 Spring (Site ID 20994) and Homosassa 3 Spring (Site ID 20998). For other, potentially relevant sites, enter a generic search term in the "District Site Name:" box on the WMIS search page, and click the "Search" button at the bottom of the page.

Hope this information is helpful.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, March 11, 2019 10:17 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Differences LAMFE output in reevaluation of Homosassa MFL

Just would like to clarify your comment on the telecon re differences in the output of original model (sorry do not recall the name at this moment) and the LAMFE model. You indicated there was discussion of this. The only reference I recall reading was an e-mail from yourself and Dann early February.
Would appreciate your sharing the additional detailed documents, e-mails etc . I will certainly look again this evening.

Yesterday I was looking for the grab sample analyses that are done on a regular basis specifically the three vents Homosassa Main Spring. Somehow I could not find the right file/web site. Would very much appreciate if you could point me in the right direction.

Thanks,
Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, March 12, 2019 9:27 AM
To: eric.johnson@myFWC.com
Cc: MFLComments
Subject: Salinity
Attachments: 3YearSalinityHom.PNG; 3YearSalinityChass.PNG

Eric,
Regarding your questions in our phone call:

We are working on a response to peer review comments about changing salinity in spring vent discharge in Chass and Homosassa, and I will get back to you on that account.

We have maps of 3-year average surface salinities in these systems that I forgot about when talking with you. They are in the Oyster and Barnacle appendices, and I've attached them here. There is a color-coded distinction here between 5 and 6 psu, although it is admittedly a bit hard to see without really focusing. You can see in Homosassa, the 6 ppt halocline (between 5-6 and 6-7) is between Rkm 6 and 7, and in the Chassahowitzka between Rkm 4 and 5. These are 3-year average surface salinities under existing conditions with impacts of 1.4% in Chass and 1.9% in Homosassa. These are the only maps we have lying around, but there are many permutations of such maps would could make by varying time frame (average salinities over 1 year, 2 years, etc.); depth (surface salinity, bottom salinity, average column salinity); simulation (existing, unimpacted, MFL (5% reduction in Homosassa, 8% reduction in Chassahowitzka), other flow reductions). If there's any of these combos that have particular biological relevance to freshwater fish, we can make the corresponding map, just let me know. Otherwise, these maps give a good general picture of where the freshwater fish habitat of < 6 psu is, on average, under current conditions.

I hope this helps, let me know if there's anything else I can do, or if you need particular maps, and I will let you know when we have a response to the peer review question about salinities in groundwater.

Thanks,
Gabe

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

Gabe I. Herrick

From: Doug Leeper
Sent: Tuesday, March 12, 2019 7:08 AM
To: Alan Martyn Johnson
Subject: RE: Differences LAMFE output in reevaluation of Homosassa MFL
Attachments: Chass_Homo MFLs Peer Rev Telcon Summ 2019-02-25 Final.pdf

Martyn: Here are responses to the requests in your 3/11/2019 email.

- The Chassahowitzka-Homosassa peer review panel discussed differences between hydrodynamic modeling results for analyses supporting the existing, established minimum flows and those supporting the currently proposed minimum flows during their 2/25/2019 teleconference. A summary of the teleconference was posted to the review webforum on 3/5/2019, and is attached to this email.
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Hope this information is helpful.

Doug Leeper
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doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, March 11, 2019 10:17 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Differences LAMFE output in reevaluation of Homosassa MFL

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Thanks,
Martyn

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, March 11, 2019 10:54 AM
To: MFLComments
Subject: FW: Differences LAMFE output in reevaluation of Homosassa MFL

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, March 11, 2019 10:17 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Differences LAMFE output in reevaluation of Homosassa MFL

Just would like to clarify your comment on the telecon re differences in the output of original model (sorry do not recall the name at this moment) and the LAMFE model. You indicated there was discussion of this. The only reference I recall reading was an e-mail from yourself and Dann early February.
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Yesterday I was looking for the grab sample analyses that are done on a regular basis specifically the three vents Homosassa Main Spring. Somehow I could not find the right file/web site. Would very much appreciate if you could point me in the right direction.

Thanks,
Martyn

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Monday, March 11, 2019 8:16 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Sunday, March 10, 2019 1:34 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Gabe,
Thanks for your Friday e-mail, but could you explain the attachments.

One shows discharge from hours 103079 to 155695 the other from 50628 to116796. Please explain.
Some figures show well over 100 cfs and negative flows are also evident!!!!
Not clear where Hidden River discharge fits in.

Regarding the conversion of specific conductance to psu
I saw the reference to Lewis, but have not yet found the equation. If it is used often it should be easy to find on the internet.
Please provide the equation SWFWMD use.
Comment: oceanographers may like psu (smaller numbers to make large comparisons) but spring water is a whole different matter with regard the dissolved solids as regards quantity and nature.
Agreed we should spend more time looking at the ingress of seawater into the springs eg compare the water from the SE Fork with Homosassa main spring, Chass Seven Sisters with main spring and Crab Creek. Also, for Crystal River and the springs of Saragassa Canal and Hunters Cove with some of the other springs. Clearly there is seawater ingress, **but the models assume all flows are spring water equivalent quality to what most of the pumps are sucking out of the aquifer.**

Regarding the 15 cfs adjustment.
How come this difference is not reflected in the discharge used in the previous MFL report where the average/mean discharge shown in Table 2-3 as 60 cfs is the same as USGS current discharge using velocity (there was no velocity meter at that time (so those data should be 15 cfs higher...YES?)

Is it possible the difference results from the Weeki Wachee Well Levels from the old well 28320108315601 and the replacement well 283154082313701 (hope I have not transposed any numbers reading from one screen typing to this message) being used incorrectly in determining the difference.

Model Output Volume Area Shoreline
I trust someone is looking at the model outputs in the original MFL report and the tables of volume, area shoreline in current Appendix 6. There are some significant differences. Be interesting to know how shoreline changes with reduced spring discharge; surly tidal movements would compensate leaving shorelines essentially the same.
What triggered my attention is Figure 6-2 in the recent Jan 17 Peer Review Report.
How (on average) does the water in Halls River warm from the upper reaches to the confluence? Unfortunately there is no Halls River gage data around this time; however there are some years when low temperatures have been recorded when both Halls River gages provide additional insight.

Do not get me wrong; I am not saying that either model is better than the other, but what I am saying is critical assessment is needed and I hope my questions help this to some extent.

Martyn

From: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Sent: Friday, March 8, 2019 4:34 PM
To: Doug Leeper; martynellijay@hotmail.com
Cc: MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

See files attached.

Gabe Herrick, PhD

Senior Environmental Scientist

Southwest Florida Water Management District

7601 U.S. Highway 301 North

Tampa, Florida 33637

352-796-0515 ext. 4275

From: Gabe I. Herrick
Sent: Friday, March 08, 2019 4:32 PM

To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; martynellijay@hotmail.com
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

Thank you for your comments. Your questions have been answered in boxes within your quoted below.

Thanks,

Gabe

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, March 1, 2019 8:50 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Homosassa Re-evaluation

Doug,

I continue to read the 2019 Homosassa report and Appendices. For me, and I suspect others, the task is made more difficult by;

- The use of psu instead of Specific Conductance.
  Why is it that all the data collected as Specific Conductance then someone finds it necessary to convert this to psu?
  And by what formula is this conversion made?
  There is no handy dandy conversion site on the internet that I have yet found appropriate for spring water SpecC.

Response:
It is standard practice in marine science and oceanography for measurement equipment to report specific conductance and for this to be converted to practical salinity units. Salinity values at gaging stations were calculated as noted in Figure 2-22: Specific Conductance at 25°C converted to salinity using equation by Lewis (1980) as reported in Schemel (2001).

Schemel, Larry. 2001. Simplified Conversions Between Specific Conductance and Salinity Units for Use with Data from Monitoring Stations. IEP Newsletter. Interagency Ecological Program for the San Francisco Estuary. Vo. 14, No. 1.

- The use of Hours after 2000.
  Again, all the data collected is reference by '*normal*' date and time.
  Similarly to the psu conversion there is no conversion site on the internet. Why is hours after 2000 necessary?
  In my opinion it only make the data more difficult to digest.

Response: Thank you for your comment. Initial peer review panel comments have been made to this effect as well. This time format is a simple method for mathematical convenience.

Possibly the most telling point of this mass of pages is summarized on pages 136/137.
Quote
River-wide, the 2015 mean total SAV percent cover was almost 50 percent less than the mean total SAV percent cover for all of the
previous sampling events. Eelgrass (V. americana) was not observed at any locations in the Homosassa River System in 2015. Between 1998-2011 and 2015, total SAV biomass decreased by over 90%, SAV percent cover decreased by 50%, angiosperm biomass decreased 81%, and macroalgae biomass decreased 99%. The majority of the biomass was upstream of Rkm 11, consequently changes to biomass and coverage in this portion of the river drove overall river changes (Figure 4-9). Therefore, critical SAV habitat appears to be upstream of the confluence of the Halls and Homosassa rivers.
Unquote
As in my previous e-mail THE RIVER IS DEAD.
I have personally observed this transformation over the last 18 years, neighbors have seen the changes over their almost 80 years.

For right now I would like to focus on three issues regarding the USGS data for the SE Fork which appear in Appendix 6.

1. On page 33 there is discussion of a difference of 15 cfs in the two methods of measuring discharge:

Quote
It is reasonable to assume that discharge data based on index-velocity are better estimate of the true discharge through the cross section at the SE Fork Homosassa Spring station than those
calculated from tidal data and groundwater level data at a Weeki Wachee well using the USGS regression relationship (Equation 2). It is thus meaningful to examine how good the USGS
regression relationship for the SE Fork discharge is. It was found that Equation (2) roughly overestimates 15 cfs of discharge at the SE Fork station. As such, Equation (2) was modified by adding -15 cfs to it and became as follows
3.6293 10.3114 418.139Δ 3.31029 (6)
Figure 18 shows time series plots of the discharges using the above modified USGS
regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork
cross section. There are about 600 days of overlap of the red and blue lines in the figure. It can be seen from the figure that both lines have roughly the same long-term trend and variability, and the
two matches well in a time scale that is a few days or longer.
End Quote
I acknowledge there have been changes to the formula over the years.
At the time we were pursuing installation of a velocity meter I made comparisons of the USGS calculated/reported discharge and Field Measurements. My spreadsheet shows good agreement on an average basis, but some major differences on individual results. I know I shared this with you.

WHERE IS THE DATA SHOWING THIS 15 cfs DIFFERENCE (page 33) AND ANY DISCUSSION OF THIS DIFFERENCE WITH USGS?

Response:
The USGS SE Fork Homosassa Spring at Homosassa Springs gage (no. 02310688) reports discharge starting Oct. 1, 2000. This discharge was regression based prior to October 1, 2011, when discharge began to be reported based on index velocity. Verifying the USGS regression equation for the SE Fork station against available index-velocity based flow (assuming that index-velocity based flow is more reliable), District staff found that the regression based flow is about 15 cfs higher than index-velocity based flow at the SE Fork. As such, staff calculated USGS SE Fork flow, with an interval of 15 minutes, prior to October 5, 2011 from measured 15-minute tides and daily Weeki Wachee well levels (linearly interpolated to every 15 minutes) using a modified USGS regression equation, which is simply the regression equation provided by the USGS (equation 2 in appendix 6) minus 15 cfs. You can do this yourself with data from USGS website. Files attached include this data from index velocity and regression equation.

I could request the archived discharge data from USGS to verify/corroborate my spreadsheet, but assume you/others have the data.
Comment: No mention of this adjustment of USGS data is made in the main report (as far as I can see).

2. In your e-mail of Feb 7 you state;

   Quote

   Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

   Unquote

   This is disappointing as Specific Conductance data is assumed to represent the total discharge in any time period the eddie current draws water along the concrete wall to the sensor location. There is no reversal of the main flow. Close examination of the data shows higher Specific Conductance occurs when there is relatively rapid stage increase and examination of temperature reflects the sudden changes.

   As you may recall I have used 'kids bathtub dye' and pink twine with weighted fishing bobbers to witness this.

   Comment:

   I suspect there are PORTABLE Specific Conductance Monitors that could be placed close to the Velocity Meter to confirm SE Fork spring discharge does not have Specific Conductance spikes. A few days deployment is all that is needed.

In the meantime the LAMFE Model is being fueled with inaccurate SpecC data.
On page 13 the 'authors' half recognize the issue but simply dismiss any attempt to explain this frequent issue in the data.
Quote
This suggests that SGDs from SE Fork springs, including Belcher Spring, Trotter Springs,
McClain Spring, and Pumphouse Spring are fresh and the occasional peaks up to less than 2 psu
are likely caused by high tides.
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I look forward to their detailed review in due course.

Martyn

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Thursday, February 07, 2019 1:31 PM

To: martynellijay@hotmail.com
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn:

Good to hear from you again, also. Here are some brief responses to the questions included in your recent email.

Your question: *How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?"*
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doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Saturday, February 02, 2019 10:30 AM

To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

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   (b) The Minimum Flow for the Chassahowitzka River System is 97% of the natural flow as measured at the United States Geological Survey (USGS) Gage Chassahowitzka River near Homosassa (Gage No. 02310650). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from this Gage is measured as the previous day's natural flow at that point minus 3%.

   (c) The District will reevaluate the Minimum Flow within six years of adoption of this rule.

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   Ppage viii
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Martyn
Good to hear from you, trust life is treating you and Ron well with regard to health and happiness.

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 1:11 PM
To: martynellijay@hotmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Martyn:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
- January-June 2019: Stakeholder outreach and meetings
- June 2019: Public workshop date and location have not yet been determined
- Fall 2019: District Governing Board meeting – Request to approve staff minimum flow recommendations and initiate rulemaking
- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

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Gabe I. Herrick

From:	Gabe I. Herrick
Sent:	Friday, March 08, 2019 4:34 PM
To:	Doug Leeper; martynellijay@hotmail.com
Cc:	MFLComments
Subject:	RE: Chassahowitzka and Homosassa MFLs Reevaluations
Attachments:	Estimated Homo SE Fork Flow with USGS Regression Equation - 15cfs.txt; HomosassaR Spring Flows_Final.txt

Martyn,
See files attached.

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Senior Environmental Scientist
Southwest Florida Water Management District
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From: Gabe I. Herrick
Sent: Friday, March 08, 2019 4:32 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; martynellijay@hotmail.com
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

Thank you for your comments. Your questions have been answered in boxes within your quoted below.

Thanks,
Gabe

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, March 1, 2019 8:50 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Homosassa Re-evaluation

Doug,
I continue to read the 2019 Homosassa report and Appendices. For me, and I suspect others, the task is made more difficult by;

- The use of psu instead of Specific Conductance.
  Why is it that all the data collected as Specific Conductance then someone finds it necessary to convert this to psu?
  And by what formula is this conversion made?
  There is no handy dandy conversion site on the internet that I have yet found appropriate for spring water SpecC.

Response:

It is standard practice in marine science and oceanography for measurement equipment to report specific conductance and for this to be converted to practical salinity units. Salinity values at gaging stations were calculated as noted in Figure 2-22: Specific Conductance at 25°C converted to salinity using equation by Lewis (1980) as reported in Schemel (2001).

Schemel, Larry. 2001. Simplified Conversions Between Specific Conductance and Salinity Units for Use with Data from Monitoring Stations. IEP Newsletter. Interagency Ecological Program for the San Francisco Estuary. Vo. 14, No. 1.

- The use of Hours after 2000.
  Again, all the data collected is reference by '*normal*' date and time.
  Similarly to the psu conversion there is no conversion site on the internet. Why is hours after 2000 necessary?
  In my opinion it only make the data more difficult to digest.

Response:
Thank you for your comment. Initial peer review panel comments have been made to this effect as well. This time format is a simple method for mathematical convenience.

Possibly the most telling point of this mass of pages is summarized on pages 136/137.
Quote
River-wide, the 2015 mean total SAV percent cover was almost 50 percent less than the mean total SAV percent cover for all of the
previous sampling events. Eelgrass (V. americana) was not observed at any locations in the Homosassa River System in 2015. Between 1998-2011 and 2015, total SAV biomass decreased by over 90%, SAV percent cover decreased by 50%, angiosperm biomass decreased 81%, and macroalgae biomass decreased 99%. The majority of the biomass was upstream of Rkm 11, consequently changes to biomass and coverage in this portion of the river drove overall river changes (Figure 4-9). Therefore, critical SAV habitat appears to be upstream of the confluence of the Halls and Homosassa rivers.
Unquote
As in my previous e-mail THE RIVER IS DEAD.
I have personally observed this transformation over the last 18 years, neighbors have seen the changes over their almost 80 years.

For right now I would like to focus on three issues regarding the USGS data for the SE Fork which appear in Appendix 6.

1. On page 33 there is discussion of a difference of 15 cfs in the two methods of measuring discharge:

Quote
It is reasonable to assume that discharge data based on index-velocity are better estimate of the true discharge through the cross section at the SE Fork Homosassa Spring station than those
calculated from tidal data and groundwater level data at a Weeki Wachee well using the USGS regression relationship (Equation 2). It is thus meaningful to examine how good the USGS
regression relationship for the SE Fork discharge is. It was found that Equation (2) roughly overestimates 15 cfs of discharge at the SE Fork station. As such, Equation (2) was modified by adding -15 cfs to it and became as follows
3.6293 10.3114 418.139Δ 3.31029 (6)
Figure 18 shows time series plots of the discharges using the above modified USGS

regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork cross section. There are about 600 days of overlap of the red and blue lines in the figure. It can be seen from the figure that both lines have roughly the same long-term trend and variability, and the two matches well in a time scale that is a few days or longer.

End Quote

I acknowledge there have been changes to the formula over the years.

At the time we were pursuing installation of a velocity meter I made comparisons of the USGS calculated/reported discharge and Field Measurements. My spreadsheet shows good agreement on an average basis, but some major differences on individual results. I know I shared this with you.

WHERE IS THE DATA SHOWING THIS 15 cfs DIFFERENCE (page 33) AND ANY DISCUSSION OF THIS DIFFERENCE WITH USGS?

Response:
The USGS SE Fork Homosassa Spring at Homosassa Springs gage (no. 02310688) reports discharge starting Oct. 1, 2000. This discharge was regression based prior to October 1, 2011, when discharge began to be reported based on index velocity. Verifying the USGS regression equation for the SE Fork station against available index-velocity based flow (assuming that index-velocity based flow is more reliable), District staff found that the regression based flow is about 15 cfs higher than index-velocity based flow at the SE Fork. As such, staff calculated USGS SE Fork flow, with an interval of 15 minutes, prior to October 5, 2011 from measured 15-minute tides and daily Weeki Wachee well levels (linearly interpolated to every 15 minutes) using a modified USGS regression equation, which is simply the regression equation provided by the USGS (equation 2 in appendix 6) minus 15 cfs. You can do this yourself with data from USGS website. Files attached include this data from index velocity and regression equation.

I could request the archived discharge data from USGS to verify/corroborate my spreadsheet, but assume you/others have the data.

Comment: No mention of this adjustment of USGS data is made in the main report (as far as I can see).

2. In your e-mail of Feb 7 you state;

   Quote

   Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

   Unquote

   This is disappointing as Specific Conductance data is assumed to represent the total discharge in any time period the eddie current draws water along the concrete wall to the sensor location. There is no reversal of the main flow. Close examination of the data shows higher Specific Conductance occurs when there is relatively rapid stage increase and examination of temperature reflects the sudden changes.

   As you may recall I have used 'kids bathtub dye' and pink twine with weighted fishing bobbers to witness this.

   Comment:

   I suspect there are PORTABLE Specific Conductance Monitors that could be placed close to the Velocity Meter to confirm SE Fork spring discharge does not have Specific Conductance spikes. A few days deployment is all that is needed.

In the meantime the LAMFE Model is being fueled with inaccurate SpecC data.

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Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
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- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, March 08, 2019 4:32 PM
To: Doug Leeper; martynellijay@hotmail.com
Cc: MFLComments
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn,

Thank you for your comments. Your questions have been answered in boxes within your quoted below.

Thanks,
Gabe

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, March 1, 2019 8:50 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Homosassa Re-evaluation

Doug,
I continue to read the 2019 Homosassa report and Appendices. For me, and I suspect others, the task is made more difficult by;

- The use of psu instead of Specific Conductance.
  Why is it that all the data collected as Specific Conductance then someone finds it necessary to convert this to psu?
  And by what formula is this conversion made?
  There is no handy dandy conversion site on the internet that I have yet found appropriate for spring water SpecC.

Response:
It is standard practice in marine science and oceanography for measurement equipment to report specific conductance and for this to be converted to practical salinity units. Salinity values at gaging stations were calculated as noted in Figure 2-22: Specific Conductance at 25°C converted to salinity using equation by Lewis (1980) as reported in Schemel (2001).

Schemel, Larry. 2001. Simplified Conversions Between Specific Conductance and Salinity Units for Use with Data from Monitoring Stations. IEP Newsletter. Interagency Ecological Program for the San Francisco Estuary. Vo. 14, No. 1.

- The use of Hours after 2000.
  Again, all the data collected is reference by '*normal*' date and time.
  Similarly to the psu conversion there is no conversion site on the internet. Why is hours after 2000 necessary? In my opinion it only make the data more difficult to digest.

Response:

Thank you for your comment. Initial peer review panel comments have been made to this effect as well. This time format is a simple method for mathematical convenience.

Possibly the most telling point of this mass of pages is summarized on pages 136/137.
Quote
River-wide, the 2015 mean total SAV percent cover was almost 50 percent less than the mean total SAV percent cover for all of the
previous sampling events. Eelgrass (V. americana) was not observed at any locations in the Homosassa River System in 2015. Between 1998-2011 and 2015, total SAV biomass decreased by over 90%, SAV percent cover decreased by 50%, angiosperm biomass decreased 81%, and macroalgae biomass decreased 99%. The majority of the biomass was upstream of Rkm 11, consequently changes to biomass and coverage in this portion of the river drove overall river changes (Figure 4-9). Therefore, critical SAV habitat appears to be upstream of the confluence of the Halls and Homosassa rivers.
Unquote
As in my previous e-mail THE RIVER IS DEAD.
I have personally observed this transformation over the last 18 years, neighbors have seen the changes over their almost 80 years.

For right now I would like to focus on three issues regarding the USGS data for the SE Fork which appear in Appendix 6.

1. On page 33 there is discussion of a difference of 15 cfs in the two methods of measuring discharge:

Quote
It is reasonable to assume that discharge data based on index-velocity are better estimate of the true discharge through the cross section at the SE Fork Homosassa Spring station than those
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regression relationship for the SE Fork discharge is. It was found that Equation (2) roughly overestimates 15 cfs of discharge at the SE Fork station. As such, Equation (2) was modified by adding -15 cfs to it and became as follows
3.6293 10.3114 418.139Δ 3.31029 (6)
Figure 18 shows time series plots of the discharges using the above modified USGS
regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork
cross section. There are about 600 days of overlap of the red and blue lines in the figure. It can be seen from the figure that both lines have roughly the same long-term trend and variability, and the
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I acknowledge there have been changes to the formula over the years.
At the time we were pursuing installation of a velocity meter I made comparisons of the USGS calculated/reported discharge and Field Measurements. My spreadsheet shows good agreement on an average basis, but some major differences on individual results. I know I shared this with you.

WHERE IS THE DATA SHOWING THIS 15 cfs DIFFERENCE (page 33) AND ANY DISCUSSION OF THIS DIFFERENCE WITH USGS?

Response:
The USGS SE Fork Homosassa Spring at Homosassa Springs gage (no. 02310688) reports discharge starting Oct. 1, 2000. This discharge was regression based prior to October 1, 2011, when discharge began to be reported based on index velocity. Verifying the USGS regression equation for the SE Fork station against available index-velocity based flow (assuming that index-velocity based flow is more reliable), District staff found that the regression based flow is about 15 cfs higher than index-velocity based flow at the SE Fork. As such, staff calculated USGS SE Fork flow, with an interval of 15 minutes,

prior to October 5, 2011 from measured 15-minute tides and daily Weeki Wachee well levels (linearly interpolated to every 15 minutes) using a modified USGS regression equation, which is simply the regression equation provided by the USGS (equation 2 in appendix 6) minus 15 cfs. You can do this yourself with data from USGS website. Files attached include this data from index velocity and regression equation.

I could request the archived discharge data from USGS to verify/corroborate my spreadsheet, but assume you/others have the data.
Comment: No mention of this adjustment of USGS data is made in the main report (as far as I can see).

2. In your e-mail of Feb 7 you state;
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   Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.
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   It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at

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....provided that flows at the Halls River at Homosassa Springs station can be hindcasted back to October 2007. To do so, correlations of the Halls River at Homosassa Spring flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving

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There is no 'negative flow' at the SE Fork. To suggest there is correlation with Halls River is, sorry to have to say it, ridiculous.

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In my opinion any hind-casting creates a minefield for assessment of the model.

By the way: NDM 5 still has Halls River Flow as 102 cfs. I think we both know how that was derived ...mathematical manipulation.

Doug,

I have other questions for another time regarding the apparent major differences in model output regarding volume and area of habitats.

You are welcome to share my questions/comments with the peer review panel, but I have no intention of interfering with the process.

I look forward to their detailed review in due course.

Martyn

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Thursday, February 07, 2019 1:31 PM
To: martynellijay@hotmail.com
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn:

Good to hear from you again, also. Here are some brief responses to the questions included in your recent email.

Your question: *How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?"*
Response: The currently proposed minimum flows for the Chassahowitzka and Homosassa river systems were recently developed based on the best information currently available. Their development is ongoing, and as you know, we are currently subjecting the recommendations to independent, scientific peer review.

Your question (in reference to the Homosassa River system): *Common Snook took over from manatee on what basis?*
Response: The currently proposed minimum flows for the Homosassa River system were recently developed based on the best information currently available. Flow-related change in Common Snook habitat was the most sensitive criterion assessed, and was used to develop the current minimum flow recommendation.

Your questions: *What does all the Day of the Year data tell us?*
Some of the graphs are for different timeframes eg
Chass
Stage is for 2010-10-01 to 2017-12-05 ***Figure 2-10***
Flow is for 2012-11-18 to 2017-12-05 ***Figure 2-11***
I can see that this is available data from USGS, but what is it telling us?
It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.
Response: As noted on page 27 of the draft Chassahowitzka River system minimum flow report, Figures 2-10, 2-11 and 2-16 are provided to illustrate interaction between tide and groundwater levels on discharge in the river system.

Your questions: *What progress is being made with USGS*
A. To get velocity based discharge for Homosassa man springs?
B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.
Response to question (A): Analyses of the data collected through approximately the middle of last year at the Homosassa Springs at Homosassa Springs, FL gage were not sufficient for implementation of an index-velocity approach for discharge measurement. Data collection at the site continues and the USGS will continue to review these data to determine whether the index-velocity approach can be implemented.
Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
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352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Saturday, February 02, 2019 10:30 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,
Thank you for sharing the schedule for Peer Review of these draft reports.

I have already reviewed the reports although I must say in depth reading has yet to be done. My tardiness in this task is derived from the following key points:

1. How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?
   Code reads "

(16) Minimum Flow for the Chassahowitzka River System.

(a) For purposes of this rule, the Chassahowitzka River System includes the watercourse from the Chassahowitzka Main Springs Complex to the Gulf of Mexico, including contributing tributaries, Blind Springs and all named and unnamed springs that discharge to the river.

(b) The Minimum Flow for the Chassahowitzka River System is 97% of the natural flow as measured at the United States Geological Survey (USGS) Gage Chassahowitzka River near Homosassa (Gage No. 02310650). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from this Gage is measured as the previous day's natural flow at that point minus 3%.

(c) The District will reevaluate the Minimum Flow within six years of adoption of this rule.

(17) Minimum Flow for the Homosassa River System.

(a) For purposes of this rule, the Homosassa River System includes the watercourse from the Homosassa Main Springs Complex to the Gulf of Mexico, including the southeast fork of the Homosassa River, Halls River, Hidden River and all named and unnamed springs that discharge to these rivers.

(b) The Minimum Flow for the Homosassa River System is 97% of the combined natural flow as measured at the United States Geological Survey (USGS) Homosassa Springs at Homosassa Springs, FL Gage (No. 02310678), and the USGS SE Fork Homosassa Spring at Homosassa Springs, FL Gage (No. 02310688). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from these Gages are measured as the previous day's natural flow at that point minus 3%.

(c) The District will reevaluate the Minimum Flow within six years of adoption of this rule."

Executive Reports read

" The recommended minimum flows for the Chassahowitzka River system are 92 percent of flows that would occur in the absence of withdrawal impacts; allowing up to an 8 percent reduction from unimpacted flows. This recommendation is made on the basis of three criteria which are all equally sensitive to simulated reductions in flow: area and volume of salinity-based habitats less than or equal to 1 practical salinity unit and temperature-based habitat for Common Snook."

Ppage viii

and

" The recommended minimum flows for the Homosassa River system are 95 percent of flows that would occur in the absence of withdrawal impacts; allowing up to a 5 percent reduction from unimpacted flows. This recommendation is made on the basis of temperature-based habitat for Common Snook."

Page ix

Sideline: Common Snook took over from manatee on what basis?

2. What does all the Day of the Year data tell us?

Some of the graphs are for different timeframes eg

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Stage is for 2010-10-01 to 2017-12-05 **Figure 2-10**

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3. What progress is being made with USGS
   A. To get velocity based discharge for Homosassa man springs?
   B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.

Doug,
The Homosassa River is (as Mark Hammond commented some years ago) 'DEAD'. This year we have seen manatee trying to 'climb' the banks to get green food!!! It is so bad last week I e-mailed Chris Anastasious to ask about the final report on the Hunter Cove Revegetation Project as I had noticed the fencing has been removed.

Martyn
Good to hear from you, trust life is treating you and Ron well with regard to health and happiness.

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 1:11 PM
To: martynellijay@hotmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Martyn:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Tuesday, March 05, 2019 11:49 AM
To: MFLComments
Subject: FW: Homosassa Re-evaluation

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Monday, March 04, 2019 9:08 AM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Subject: RE: Homosassa Re-evaluation

From: Ross Morton <Ross.Morton@swfwmd.state.fl.us>
Sent: Friday, March 01, 2019 11:55 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: Shellie Ferreira-Lee <Shellie.Ferreira@swfwmd.state.fl.us>
Subject: FW: Homosassa Re-evaluation

Doug, if the District possesses this information review of the document indicated the following public record request:

"WHERE IS THE DATA SHOWING THIS 15 cfs DIFFERENCE (page 33) AND ANY DISCUSSION OF THIS DIFFERENCE WITH USGS?
I could request the archived discharge data from USGS to verify/corroborate my spreadsheet, but assume you/others have the data.
Comment: No mention of this adjustment of USGS data is made in the main report (as far as I can see)."

Anything else is at your discretion. If you have any questions feel free to give me a call.

Ross T. Morton, P.W.S., CO-OP®, F.S.C.C.M.
2379 Broad Street
Brooksville, FL 34604-6899
Mobile/Office Phone (352)796-7211, (863)534-1448, (813)985-7481, & (941)377-3722
Ext. 6500
Email: ross.morton@watermatters.org
About The Ombudsman: http://www.swfwmd.state.fl.us/about/staff/ombudsman.php

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, March 1, 2019 8:50 AM
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Martyn

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, March 01, 2019 9:53 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluation

From: Ben Berauer <bfberauer@aol.com>
Sent: Friday, February 22, 2019 10:04 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Kym Holzwart <Kym.Holzwart@swfwmd.state.fl.us>; CRK <crk@chazriverkeepers.org>; Melissa Gulvin <Melissa.Gulvin@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluation

Doug, Gabe,

Thank you for keeping us informed on the time table for the reevaluation of the Chassahowitzka River MFL. Since we are now in the stakeholder outreach and meetings period I would like to invite SWFWMD to come to our Chassahowitzka community to present the status and any preliminary analysis regarding the reevaluation of the MFL. The Chassahowitzka River Keepers, a 501(c)(3) advocacy group for the protection and restoration of the river and it's springs, springshed, and adjacent surrounding coastal habitats would like to invite SWFWMD to attend and present at an upcoming monthly public meeting we conduct. These are typically the third Tuesday of the month. We would like to invite you to attend our March meeting, March 19th, at 7 pm, Chassahowitzka Community Center, 8300 S. Riviera Dr., Homosassa, Fl. 34448, if possible.

We appreciate all the past support and involvement SWFWMD has had with our organization, and look forward to having you as a guest again.

Ben Berauer, President, Chassahowitzka River Keepers
(h)352-610-6704, (c)727-217-5971, bfberauer@aol.com

> On Feb 1, 2019, at 13:36, Doug Leeper <Doug.Leeper@swfwmd.state.fl.us> wrote:
>
> Hi Ben:
>
> I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you.
>
> As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.
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Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, March 01, 2019 9:25 AM
To: MFLComments
Subject: FW: Homosassa Re-evaluation

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Friday, March 01, 2019 8:50 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Homosassa Re-evaluation

Doug,
I continue to read the 2019 Homosassa report and Appendices. For me, and I suspect others, the task is made more difficult by;

- The use of psu instead of Specific Conductance.
  Why is it that all the data collected as Specific Conductance then someone finds it necessary to convert this to psu?
  And by what formula is this conversion made?
  There is no handy dandy conversion site on the internet that I have yet found appropriate for spring water SpecC.
- The use of Hours after 2000.
  Again, all the data collected is reference by '*normal*' date and time.
  Similarly to the psu conversion there is no conversion site on the internet. Why is hours after 2000 necessary?
  In my opinion it only make the data more difficult to digest.

Possibly the most telling point of this mass of pages is summarized on pages 136/137.
Quote
River-wide, the 2015 mean total SAV percent cover was almost 50 percent less than the mean total SAV percent cover for all of the
previous sampling events. Eelgrass (V. americana) was not observed at any locations in the Homosassa River System in 2015. Between 1998-2011 and 2015, total SAV biomass decreased by over 90%, SAV percent cover decreased by 50%, angiosperm biomass decreased 81%, and macroalgae biomass decreased 99%. The majority of the biomass was upstream of Rkm 11, consequently changes to biomass and coverage in this portion of the river drove overall river changes (Figure 4-9). Therefore, critical SAV habitat appears to be upstream of the confluence of the Halls and Homosassa rivers.
Unquote
As in my previous e-mail THE RIVER IS DEAD.
I have personally observed this transformation over the last 18 years, neighbors have seen the changes over their almost 80 years.

For right now I would like to focus on three issues regarding the USGS data for the SE Fork which appear in Appendix 6.

1. On page 33 there is discussion of a difference of 15 cfs in the two methods of measuring discharge:
   Quote
   It is reasonable to assume that discharge data based on index-velocity are better estimate of the true discharge through the cross section at the SE Fork Homosassa Spring station than those

   calculated from tidal data and groundwater level data at a Weeki Wachee well using the USGS regression relationship (Equation 2). It is thus meaningful to examine how good the USGS

   regression relationship for the SE Fork discharge is. It was found that Equation (2) roughly overestimates 15 cfs of discharge at the SE Fork station. As such, Equation (2) was modified by adding -15 cfs to it and became as follows

   3.6293 10.3114 418.139Δ 3.31029 (6)

   Figure 18 shows time series plots of the discharges using the above modified USGS

   regression equation (red line) and index-velocity based discharges (blue line) through the SE Fork

   cross section. There are about 600 days of overlap of the red and blue lines in the figure. It can be seen from the figure that both lines have roughly the same long-term trend and variability, and the

   two matches well in a time scale that is a few days or longer.
   End Quote
   I acknowledge there have been changes to the formula over the years.
   At the time we were pursuing installation of a velocity meter I made comparisons of the USGS calculated/reported discharge and Field Measurements. My spreadsheet shows good agreement on an average basis, but some major differences on individual results. I know I shared this with you.

   WHERE IS THE DATA SHOWING THIS 15 cfs DIFFERENCE (page 33) AND ANY DISCUSSION OF THIS DIFFERENCE WITH USGS?
   I could request the archived discharge data from USGS to verify/corroborate my spreadsheet, but assume you/others have the data.
   Comment: No mention of this adjustment of USGS data is made in the main report (as far as I can see).

2. In your e-mail of Feb 7 you state;
   Quote
   Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.
   Unquote
   This is disappointing as Specific Conductance data is assumed to represent the total discharge in any time period the eddie current draws water along the concrete wall to the sensor location. There is no reversal of the main flow. Close examination of the data shows higher Specific Conductance occurs when there is relatively rapid stage increase and examination of temperature reflects the sudden changes.
   As you may recall I have used 'kids bathtub dye' and pink twine with weighted fishing bobbers to witness this.
   Comment:
   I suspect there are PORTABLE Specific Conductance Monitors that could be placed close to the Velocity Meter to confirm SE Fork spring discharge does not have Specific Conductance spikes. A few days deployment is all

that is needed.
In the meantime the LAMFE Model is being fueled with inaccurate SpecC data.
On page 13 the 'authors' half recognize the issue but simply dismiss any attempt to explain this frequent issue in the data.
Quote
This suggests that SGDs from SE Fork springs, including Belcher Spring, Trotter Springs,

McClain Spring, and Pumphouse Spring are fresh and the occasional peaks up to less than 2 psu

are likely caused by high tides.
End Quote

3. On page 24 it states;
Quote
It should be noted that net SGDs were used as input data for the model. Because the discharge measurements at the SE Fork Homosassa Spring station and the Halls River at

Homosassa Springs station contains tidal fluxes through the cross sections, they normally have higher tidal variabilities than the net SGDs do. To obtain net SGDs entering the upstream reaches

of the cross sections, tidal fluxes were estimated through the following formula and taken away

from the reported discharge data..
End Quote
and page 32
Quote
....provided that flows at the Halls River at Homosassa Springs station can be hindcasted back to October 2007. To do so, correlations of the Halls River at Homosassa Spring

flow with those of SE Fork and Homosassa Springs were studied. It was found that there is no correlation for flows between the Halls River at Homosassa Springs station and the Homosassa Spring at Homosassa Springs station. However, there is a decent correlation between the Halls

River at Homosassa Spring station and the SE Fork station if both flows filtered with a moving

average using a time window of one half of the lunar cycle. The regression equation takes the

following form

2.0483 89.875
Unquote
Comment
There is no 'negative flow' at the SE Fork. To suggest there is correlation with Halls River is, sorry to have to say it, ridiculous.
The SEF discharge variations are due to the filling and emptying of the 3-4 acre well defined pool upstream of the gage site by spring water. Halls River upstream of the Gage Site is a very large pool that is difficult to define, but comprises of shallow marshes that act more like a sponge; taking time to both fill and empty. Clearly there is strong upstream flow each tidal cycle. Additionally, the reported Halls River discharge data (calculated from velocity) appear to be more accurate/in agreement with Field Measurements when there is upstream flow compared with downstream flow. This is supported by the experience of kayaking thru the channel immediately upstream of the sensors. It is my opinion this accuracy difference is due to higher turbulence in the water

stream past the velocity meter in discharge than in-flow, resulting from the sharp turn (upstream) of the flow thru a complex channel, unlike the SE Fork channel which is well defined by 'concrete banks on both sides.

In my opinion any hind-casting creates a minefield for assessment of the model.
By the way: NDM 5 still has Halls River Flow as 102 cfs. I think we both know how that was derived ...mathematical manipulation.

Doug,
I have other questions for another time regarding the apparent major differences in model output regarding volume and area of habitats.

You are welcome to share my questions/comments with the peer review panel, but I have no intention of interfering with the process.

I look forward to their detailed review in due course.

Martyn

Gabe I. Herrick

From: Frank Gargano
Sent: Monday, February 25, 2019 1:39 PM
To: john.pricher@visitcitrus.com; miles@visitcitrus.com; don@citrusedc.com
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Gentlemen,

I hope this email finds you well. I wanted to take this opportunity to introduce myself as the new Government Affairs Regional Manager for the District's Northern Region, as well as share some information with you and your respective organizations. It's likely you may have already heard from other staff, but I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Peer review panel meeting dates and details are available on the District's online calendar.

Please feel free to contact me if you have any questions.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Monday, February 25, 2019 1:21 PM
To: jehovajirehpt@gmail.com
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Hartman,

I hope this email finds you well. I wanted to take this opportunity to introduce myself as the new Government Affairs Regional Manager for the District's Northern Region, as well as share some information with you and the TOO FAR Foundation. It's likely you may have already heard from other staff, but I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Please feel free to contact me if you have any questions or concerns. I plan on attending upcoming TOOFAR meetings along with Mark Fulkerson and Patrick Casey. I look forward to meeting you.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Monday, February 25, 2019 9:58 AM
To: MFLComments
Subject: FW: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Thursday, February 07, 2019 10:33 AM
To: 'richardowen@wrwsa.org' <richardowen@wrwsa.org>
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Owen,

I hope this email finds you well. It's likely you may have already heard from other staff, but I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Thank you,

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2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Monday, February 25, 2019 9:57 AM
To: MFLComments
Subject: FW: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Thursday, February 07, 2019 10:26 AM
To: 'bjjarvis@ufl.edu' <bjjarvis@ufl.edu>
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

BJ,
Good morning. It's likely you may have already heard from other staff, but I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Let me know if you have any questions. I will see you at the next AG Alliance meeting.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Monday, February 25, 2019 9:57 AM
To: MFLComments
Subject: FW: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Thank you,

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Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Thursday, February 07, 2019 10:23 AM
To: 'bknight@floridaspringsinstitute.org' <bknight@floridaspringsinstitute.org>; 'hobara@floridaspringsinstitute.org' <hobara@floridaspringsinstitute.org>
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Knight and Ms. Obara,

I hope this email finds you well. It’s likely you may have already heard from other staff, but I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Thank you,

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352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Monday, February 25, 2019 9:57 AM
To: MFLComments
Subject: FW: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

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Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
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352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Thursday, February 07, 2019 10:19 AM
To: 'Dan' <bansheewun2@gmail.com>
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Hilliard,

I hope this email finds you well. It's likely you may have already heard from other staff, but I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

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Sent: Monday, February 25, 2019 9:57 AM
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Subject: FW: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

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frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Thursday, February 07, 2019 10:15 AM
To: 'floridaspringscouncil@gmail.com' <floridaspringscouncil@gmail.com>
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Smart,

I hope this email finds you well. It's likely you may have already heard from other staff, but I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Monday, February 25, 2019 9:57 AM
To: MFLComments
Subject: FW: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

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Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Thursday, February 07, 2019 10:09 AM
To: 'jbrooks375@yahoo.com' <jbrooks375@yahoo.com>; 'Curt.Williams@ffbf.org' <Curt.Williams@ffbf.org>
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

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Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Monday, February 25, 2019 9:56 AM
To: MFLComments
Subject: FW: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Thursday, February 07, 2019 10:06 AM
To: 'josh@citruscountychamber.com' <josh@citruscountychamber.com>
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Wooten,

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Thursday, February 07, 2019 10:01 AM
To: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Dear Commissioner,

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2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, February 22, 2019 10:09 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluation

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Ben Berauer <bfberauer@aol.com>
Sent: Friday, February 22, 2019 10:04 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>; Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Kym Holzwart <Kym.Holzwart@swfwmd.state.fl.us>; CRK <crk@chazriverkeepers.org>; Melissa Gulvin <Melissa.Gulvin@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluation

Doug, Gabe,

Thank you for keeping us informed on the time table for the reevaluation of the Chassahowitzka River MFL. Since we are now in the stakeholder outreach and meetings period I would like to invite SWFWMD to come to our Chassahowitzka community to present the status and any preliminary analysis regarding the reevaluation of the MFL. The Chassahowitzka River Keepers, a 501(c)(3) advocacy group for the protection and restoration of the river and it's springs, springshed, and adjacent surrounding coastal habitats would like to invite SWFWMD to attend and present at an upcoming monthly public meeting we conduct. These are typically the third Tuesday of the month. We would like to invite you to attend our March meeting, March 19th, at 7 pm, Chassahowitzka Community Center, 8300 S. Riviera Dr., Homosassa, Fl. 34448, if possible.

We appreciate all the past support and involvement SWFWMD has had with our organization, and look forward to having you as a guest again.

Ben Berauer, President, Chassahowitzka River Keepers
(h)352-610-6704, (c)727-217-5971, bfberauer@aol.com

> On Feb 1, 2019, at 13:36, Doug Leeper <Doug.Leeper@swfwmd.state.fl.us> wrote:
>
> Hi Ben:
>
> I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you.

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Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Frank Gargano
Sent: Friday, February 22, 2019 8:48 AM
To: richardowen wrwsa.org
Cc: Gabe I. Herrick; Sky Notestein; Randy Smith
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Richard,
Thank you for the update. We will be available on April 17.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: richardowen wrwsa.org <richardowen@wrwsa.org>
Sent: Thursday, February 21, 2019 11:15 AM
To: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Cc: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; Randy Smith <Randy.Smith@swfwmd.state.fl.us>
Subject: Re: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Frank, Gabe - at yesterday's WRWSA Board meeting the Board approved changing the March meeting to April 17. Are you available on April 17th?

Richard S. Owen, AICP

Executive Director

Withlacoochee Regional Water Supply Authority

3600 W. Sovereign Path, Suite 228

Lecanto, FL 34461

richardowen@wrwsa.org

352-293-5955

From: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Sent: Thursday, February 14, 2019 11:45:59 AM
To: richardowen wrwsa.org
Cc: Gabe I. Herrick; Sky Notestein; Randy Smith
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Owen,
The District would like to schedule Gabe Herrick, Ph.D., senior environmental scientist, to present on the topic of MFLs for the Chassahowitzka and Homosassa River Systems at the March 20, 2019 WRWSA Board Meeting. We appreciate the opportunity.

Thank you,

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Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Friday, February 08, 2019 1:13 PM
To: richardowen wrwsa.org <richardowen@wrwsa.org>
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Richard,
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From: richardowen wrwsa.org <richardowen@wrwsa.org>
Sent: Friday, February 08, 2019 11:11 AM
To: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Subject: Re: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

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Lecanto, FL 34461

richardowen@wrwsa.org

352-293-5955

From: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Sent: Thursday, February 7, 2019 10:33:01 AM
To: richardowen wrwsa.org
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

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352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Friday, February 22, 2019 8:43 AM
To: Gabe I. Herrick
Cc: MFLComments
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Thanks, Gabe. I will confirm with WRWSA.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: MFLComments <MFLComments@swfwmd.state.fl.us>
Sent: Friday, February 22, 2019 8:42 AM
To: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>; MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Yes, I can make the April 17 meeting.

Gabe Herrick, PhD
Senior Environmental Scientist
Southwest Florida Water Management District
7601 U.S. Highway 301 North
Tampa, Florida 33637
352-796-0515 ext. 4275

From: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Sent: Thursday, February 21, 2019 3:49 PM
To: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: FW: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

---

From: Frank Gargano
Sent: Thursday, February 21, 2019 3:21 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; Randy Smith <Randy.Smith@swfwmd.state.fl.us>
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Gabe,
Let me know if you can make this change. I can accept on your behalf.

Thank you,

Frank Gargano
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Sent: Thursday, February 21, 2019 11:15 AM
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Lecanto, FL 34461

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To: richardowen wrwsa.org <richardowen@wrwsa.org>
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

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Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Thursday, February 21, 2019 3:49 PM
To: MFLComments
Subject: FW: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

---

From: Frank Gargano
Sent: Thursday, February 21, 2019 3:21 PM
To: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>
Cc: Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; Randy Smith <Randy.Smith@swfwmd.state.fl.us>
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Gabe,
Let me know if you can make this change. I can accept on your behalf.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: richardowen wrwsa.org <richardowen@wrwsa.org>
Sent: Thursday, February 21, 2019 11:15 AM
To: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Cc: Gabe I. Herrick <Gabe.Herrick@swfwmd.state.fl.us>; Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>; Randy Smith <Randy.Smith@swfwmd.state.fl.us>
Subject: Re: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Frank, Gabe - at yesterday's WRWSA Board meeting the Board approved changing the March meeting to April 17. Are you available on April 17th?

Richard S. Owen, AICP

Executive Director

Withlacoochee Regional Water Supply Authority

3600 W. Sovereign Path, Suite 228

Lecanto, FL 34461

richardowen@wrwsa.org

352-293-5955

From: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Sent: Thursday, February 14, 2019 11:45:59 AM
To: richardowen wrwsa.org
Cc: Gabe I. Herrick; Sky Notestein; Randy Smith
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Owen,
The District would like to schedule Gabe Herrick, Ph.D., senior environmental scientist, to present on the topic of MFLs for the Chassahowitzka and Homosassa River Systems at the March 20, 2019 WRWSA Board Meeting. We appreciate the opportunity.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Frank Gargano
Sent: Friday, February 08, 2019 1:13 PM
To: richardowen wrwsa.org <richardowen@wrwsa.org>
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Richard,
Thank you. I will coordinate your request with the appropriate staff and get back to you.

Thank you,

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frank.gargano@swfwmd.state.fl.us

From: richardowen wrwsa.org <richardowen@wrwsa.org>
Sent: Friday, February 08, 2019 11:11 AM
To: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Subject: Re: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Frank, thanks very much for this information. I would like to request a presentation of these at an upcoming WRWSA Board meeting. Our future meetings during the January - June 2019 stakeholder outreach schedule you have identified include March 20 and May 15. Meetings start at 3:30 pm and are held at the Government Center 3600 W Sovereign Path, Lecanto. Please let me know if appropriate SWFWMD staff would be available at either of these meetings.

Richard S. Owen, AICP

Executive Director

Withlacoochee Regional Water Supply Authority

3600 W. Sovereign Path, Suite 228

Lecanto, FL 34461

richardowen@wrwsa.org

352-293-5955

From: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Sent: Thursday, February 7, 2019 10:33:01 AM
To: richardowen wrwsa.org
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Owen,

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Thank you,

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2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Wednesday, February 20, 2019 5:02 PM
To: KEN K. CHEEK
Subject: FW: Update: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Ken,

I wanted to provide an update, as I likely will over the course of this process, on the status of our reevaluation of the Minimum Flows and Levels for both Chassahowitzka and Homosassa River Systems. We have begun the Peer Review Panel discussion meetings. The next scheduled meeting is Monday, February 25, 2019 at 1:00 pm (online calendar). Interested stakeholders may attend the meetings by way of Skype or teleconference. An agenda that includes the teleconference number and skype link is made available and linked on the District online calendar.

We are near to finalizing the date, time and location for the public meeting on this topic. I will provide that information to you when it becomes available.

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Please feel free to contact me with any questions or concerns. I am happy to assist.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Wednesday, February 20, 2019 4:59 PM
To: randy.oliver@citrusbocc.com; james.mallon@citrusbocc.com; randall.olney@citrusbocc.com; larry.brock@citrusbocc.com
Subject: Update: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Gentlemen,

I wanted to provide an update, as I likely will over the course of this process, on the status of our reevaluation of the Minimum Flows and Levels for both Chassahowitzka and Homosassa River Systems. We have begun the Peer Review Panel discussion meetings. The next scheduled meeting is Monday, February 25, 2019 at 1:00 pm (online calendar). Interested stakeholders may attend the meetings by way of Skype or teleconference. An agenda that includes the teleconference number and skype link is made available and linked on the District online calendar.

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Thank you,

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352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Wednesday, February 20, 2019 4:56 PM
To: Frank Gargano
Subject: Update: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Dear Commissioner,

I wanted to provide an update, as I likely will over the course of this process, on the status of our reevaluation of the Minimum Flows and Levels for both Chassahowitzka and Homosassa River Systems. We have begun the Peer Review Panel discussion meetings. The next scheduled meeting is Monday, February 25, 2019 at 1:00 pm (online calendar). Interested stakeholders may attend the meetings by way of Skype or teleconference. An agenda that includes the teleconference number and skype link is made available and linked on the District online calendar.

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Please feel free to contact me with any questions or concerns. I am happy to assist.

Thank you,

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frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 15, 2019 7:29 AM
To: MFLComments
Subject: FW: Requested report

From: Gary Ellis <gari.arch@gmail.com>
Sent: Thursday, February 14, 2019 4:54 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Requested report

Thanks Doug! Get back to you when I've digested this.

Ken Nash
Director, Physical Sciences and Climatology
Gulf Archaeology Research Institute
352-44-4373

On Thu, Feb 14, 2019 at 2:52 PM Doug Leeper <Doug.Leeper@swfwmd.state.fl.us> wrote:

> Hi Ken:
>
> Here's the rainfall data report by Cameron and others that you requested, and which is cited in the District's draft minimum flow reevaluation reports for the Chassahowitzka and Homosassa river systems.
>
> Doug Leeper
> MFLs Program Lead
> Southwest Florida Water Management District
> Springs and Environmental Flows Section
> 2379 Broad Street, Brookville, FL 34604
> 1-800-423-1476, extension 4272 (FL only)
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> doug.leeper@watermatters.org<mailto:doug.leeper@watermatters.org>

Gabe I. Herrick

From: Doug Leeper
Sent: Thursday, February 14, 2019 2:52 PM
To: 'Nash, Ken'
Subject: Requested report
Attachments: Cameron et al. 2018-Summary Stats...Rainfall Data...West-Central FL.pdf

Hi Ken:

Here's the rainfall data report by Cameron and others that you requested, and which is cited in the District's draft minimum flow reevaluation reports for the Chassahowitzka and Homosassa river systems.

Doug Leeper
MFLs Program Lead
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Gabe I. Herrick

From: Frank Gargano
Sent: Thursday, February 14, 2019 11:46 AM
To: richardowen wrwsa.org
Cc: Gabe I. Herrick; Sky Notestein; Randy Smith
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

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From: Frank Gargano
Sent: Friday, February 08, 2019 1:13 PM
To: richardowen wrwsa.org <richardowen@wrwsa.org>
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Richard,
Thank you. I will coordinate your request with the appropriate staff and get back to you.

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From: richardowen wrwsa.org <richardowen@wrwsa.org>
Sent: Friday, February 08, 2019 11:11 AM
To: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Subject: Re: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

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Executive Director

Withlacoochee Regional Water Supply Authority

3600 W. Sovereign Path, Suite 228

Lecanto, FL 34461

richardowen@wrwsa.org

352-293-5955

From: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Sent: Thursday, February 7, 2019 10:33:01 AM
To: richardowen wrwsa.org
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Owen,

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frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 11, 2019 11:11 AM
To: MFLComments
Subject: FW: MFL for Chaz

-----Original Message-----
From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
Sent: Monday, February 11, 2019 11:00 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: MFL for Chaz

Doug,

Considering Kym was supposed to be the author of the Chaz MFL report until the last minute change to Gabe, I think she should be acknowledged (or at least given thanks) as a contributer. I know Kym was out with FWC on a cold morning doing fish sampling behind my house. A woman from FWC that was with Kym on that trip was at Friday's peer review panel field trip in Chaz. I don't recall her name. I'm pretty sure the fish sampling was related to the MFL.

Brad

On 2/11/2019 9:00 AM, Doug Leeper wrote:
> Brad:
>
> Staffing priorities led to Kym shifting focus from the Chass minimum flow reevaluation to other District projects. Authorship on the draft minimum flow reevaluation report reflects staff contributions to the document. I'm thinking we should probably add an acknowledgement section to the documents to account for contributions made by "non-authors."
>
> Doug Leeper
> MFLs Program Lead
> Southwest Florida Water Management District Springs and Environmental
> Flows Section
> 2379 Broad Street, Brookville, FL 34604 1-800-423-1476, extension 4272
> (FL only) 352-796-7211, extension 4272 doug.leeper@watermatters.org
>
> -----Original Message-----
> From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
> Sent: Friday, February 08, 2019 11:41 AM
> To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
> Subject: MFL for Chaz
>
> Doug,
>
> I'm curious why Kym's name was not listed in the draft Chaz MFL report in appreciation for her time and efforts toward the draft. Any thoughts on this?
>
> Brad
>

>
> ---

>

Gabe I. Herrick

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Sent: Monday, February 11, 2019 9:01 AM
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Subject: FW: MFL for Chaz

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Sent: Friday, February 08, 2019 11:41 AM
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To: Brad Rimbey
Subject: RE: MFL for Chaz

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Brad

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 11, 2019 8:53 AM
To: Brad Rimbey
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Yes. Frank Kapocsi and Gordon Colvin, both with the Homosassa River Alliance, participated in the state park portion of the field trip.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
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2379 Broad Street, Brookville, FL 34604
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doug.leeper@watermatters.org

From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
Sent: Monday, February 11, 2019 8:50 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

No problem Doug. Did anyone from the Homosassa River Alliance guys in Homosassa?

Brad

On 2/11/2019 8:38 AM, Doug Leeper wrote:

> Thanks, Brad. I'll post to the peer-review webforum as soon as I can…likely under a kick-off meeting topic.
>
> Doug Leeper
> MFLs Program Lead
> Southwest Florida Water Management District
> Springs and Environmental Flows Section
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> doug.leeper@watermatters.org
>
> ---
>
> **From:** Brad Rimbey <bwr.crrc@tampabay.rr.com>
> **Sent:** Friday, February 08, 2019 3:19 PM
> **To:** Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
> **Subject:** Re: Chassahowitzka and Homosassa MFLs Reevaluations
>
> Doug,

Attached are the two documents that I gave to Chaz MFL peer review panel today. Let me know if you need anything else.

Brad

On 1/30/2019 9:57 AM, Doug Leeper wrote:

> Brad:
>
> I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Chassahowitzka River Conservation Coalition, Homosassa River Alliance, Withlacoochee Aquatic Restoration and the FL Springs Council.
> As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.
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> Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.
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> doug.leeper@watermatters.org

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Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 11, 2019 8:51 AM
To: Patricia Kapocsi
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Frank: Was nice to meet you this past Friday, and thanks for contributing to the peer-review field trip. I and others at the District look forward to continued discussions with you and other Homosassa River Alliance members regarding the ongoing minimum flow reevaluation for the Homosassa River System.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Patricia Kapocsi <fnpkap@aol.com>
Sent: Sunday, February 10, 2019 7:16 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug. Thank for allowing the Homosassa River Alliance to tag along with you and the peer group during your visit to the wildlife park. I look forward to working with you and the staff of SWIFTMUD . The protection and future health of the Homosassa is a goal, I believe we both share. Thanks again .Frank Kapocsi H.R.A.

-----Original Message-----
From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
To: fnpkap@aol.com <fnpkap@aol.com>
Sent: Fri, Feb 1, 2019 1:07 pm
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Ms. Kopocsi:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Homosassa River Alliance. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 11, 2019 8:44 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

From: Patricia Kapocsi <fnpkap@aol.com>
Sent: Sunday, February 10, 2019 7:16 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug. Thank for allowing the Homosassa River Alliance to tag along with you and the peer group during your visit to the wildlife park. I look forward to working with you and the staff of SWIFTMUD . The protection and future health of the Homosassa is a goal, I believe we both share. Thanks again .Frank Kapocsi H.R.A.

-----Original Message-----
From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
To: fnpkap@aol.com <fnpkap@aol.com>
Sent: Fri, Feb 1, 2019 1:07 pm
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Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 11, 2019 8:38 AM
To: Brad Rimbey
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations
Attachments: Chass Main 1970 to 2012.jpg; Chaz MFL Springs - Flow Records.pdf

Thanks, Brad. I'll post to the peer-review webforum as soon as I can...likely under a kick-off meeting topic.

Doug Leeper
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doug.leeper@watermatters.org

From: Brad Rimbey <bwr.crrc@tampabay.rr.com>
Sent: Friday, February 08, 2019 3:19 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,

Attached are the two documents that I gave to Chaz MFL peer review panel today. Let me know if you need anything else.

Brad

On 1/30/2019 9:57 AM, Doug Leeper wrote:

> Brad:
>
> I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Chassahowitzka River Conservation Coalition, Homosassa River Alliance, Withlacoochee Aquatic Restoration and the FL Springs Council.
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Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 11, 2019 8:39 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations
Attachments: Chass Main 1970 to 2012.jpg; Chaz MFL Springs - Flow Records.pdf

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Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 11, 2019 7:48 AM
To: MFLComments
Subject: FW: Re-vegetation Hunters Cove Project
Attachments: WAR 2017 - Final Summary Report for Kings Bay Revegetation Monitoring Project.pdf

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From: Chris Anastasiou <Chris.Anastasiou@swfwmd.state.fl.us>
Sent: Thursday, February 07, 2019 12:17 PM
To: Alan Martyn Johnson <martynellijay@hotmail.com>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: Re-vegetation Hunters Cove Project

Mr. Johnson,
Attached is the final report for the Kings Bay Revegetation Project.

Chris J. Anastasiou, PhD
Chief Scientist
Natural Systems & Restoration
Southwest Florida Water Management District

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Thursday, February 7, 2019 9:08 AM
To: Chris Anastasiou <Chris.Anastasiou@swfwmd.state.fl.us>
Cc: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Re-vegetation Hunters Cove Project

Chris,
Thanks for the response. I know what you mean about how to decide what to do with the available time we have.

Are the key research questions and answers in any formal report along with the cost/benefit/budget of that project?

As you will recall there was an idea to attempt re-vegetation in Mitten Cove of Homosassa, as best I recall, it was considered Hunter was a better site for the research project (and I agree).

In a recent e-mail to Doug I reiterated Mark Hammonds comment from some years ago that the Homosassa River is "dead" (I think the reference was more specific to the section upstream of Macrea's boat ramp). Recent observations have seen manatee 'attempting to climb' the banks to get some greens to eat while making use of the thermal refuge.
I believe the food source for manatee seeking thermal refuge is an important factor as regards HARM to the river and trust the MFL re-evaluation will consider this along with the many other factors.

SAV is very important.

No doubt snook need a food source while seeking thermal refuge offered in the Homosassa and other warm water spring fed rivers: but, I doubt they rely on SAV as I understand they dine on fish/shrimp/crab.

Need to study those electro fishing surveys and the like a little more as time allows.

Martyn

From: Chris Anastasiou <Chris.Anastasiou@swfwmd.state.fl.us>
Sent: Monday, February 4, 2019 2:06 PM
To: Alan Martyn Johnson
Subject: RE: Re-vegetation Hunters Cove

Hello Mr. Johnson.

Things are going well though always busy balancing work, the Navy, and family. My girls are ever getting bigger (7 and 9) while the rest of us keep getting older!

In regards to our SAV revegetation project in Hunters Cove. We installed the fence plots in October 2015 and removed them in June 2017. The experiment concluded in October 2017. Our original intent was to run the experiment for 2 years but once the manatees figured out how to break into our fences, we decided to end it a few months early.

There were 5 basic research questions we asked and answered from this effort:

1. Will SAV abundance increase if manatee herbivory is excluded?
    - SAV abundance increased and displaced filamentous algae in the absence of herbivory
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2. What planting methods are most effective?
    - Coconut coir mats were very effective at providing 'instant' beds of eelgrass, but they were relatively difficult to grow and transport
    - Peat pots were also effective, although they initially covered less area and provided more open areas for hydrilla colonization
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3. Is removal of unconsolidated material required prior to planting?
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    - However, removing unconsolidated material may have been beneficial by helping young SAV roots better anchor into the underlying consolidated material
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    - Unexpectedly, filamentous algae was not a major issue, and actually declined with increasing SAV coverage
5. Will established SAV persist when manatee herbivory is re-introduced?

- SAV abundance decreased dramatically within a week of herbivory re-introduction

A sixth unplanned research question that was tested was the effect of storm surge on the plots. Hurricane Hermine sent a surge of seawater up into Hunters Cove in September 2016 decimating most of the plants in our plots. However, after a couple of months, we started to see regrowth in some locations.

Thanks for your interest in this project. We definitely learned a great deal from this effort.

Take care,
Chris

Chris J. Anastasiou, PhD
Chief Scientist
Natural Systems & Restoration
Southwest Florida Water Management District

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Monday, January 28, 2019 9:37 AM
To: Chris Anastasiou <Chris.Anastasiou@swfwmd.state.fl.us>
Subject: Re-vegetation Hunters Cove

Chris,
Trust life is treating you well, and assume you are still with SWFWMD.

I noticed some time ago that the project to re-vegetate Hunters Cove concluded in 2017, but I never found a final report on the project.
I recently observed the fencing has been removed, and the satellite imagery (most recent one I found that has the fence) shows that the 'bed' closest to Kings Bay had what appear to be bare sandy areas i.e. no eel grass/SAV.

Would appreciate a brief update or direction to a final report on the project.

Thanks,
Martyn Johnson
P.S. If this request should be directed to someone other than yourself please forward or let me know.

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 11, 2019 7:43 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

From: Doug Leeper
Sent: Thursday, February 07, 2019 6:49 AM
To: Mike Heyl (heylmg@allmail.net) <heylmg@allmail.net>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Mike: I forgot to send you our peer-review kick-off email for the reevaluation of minimum flows for the Chassahowitzka and Homosassa systems. Better late than never, I guess. On another note, I'm still planning to conduct a recon on the upper Braden gage sites when I can find the time – will coordinate with you.

<><><><><>
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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.
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Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

From: Doug Leeper
Sent: Thursday, February 07, 2019 6:53 AM
To: 'Kelly, Marty' <martykellyvrod@yahoo.com>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hey Marty: I forgot to send you our peer-review kick-off email for the reevaluation of minimum flows for the Chassahowitzka and Homosassa systems. Better late than never, I guess. Hope everything is going well for you. See you sometime soon, I hope.

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Gabe I. Herrick

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Gabe I. Herrick

From: Frank Gargano
Sent: Friday, February 08, 2019 3:20 PM
To: marina@riversideresorts.com; info@riversideresorts.com; mark@homosassaspringsmarina.com
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Dear Stakeholder,

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you, your business and customers. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Thank you,

Frank Gargano

Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Caroline A. McKnight
Sent: Friday, February 08, 2019 2:09 PM
Cc: MFLComments
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Good afternoon Advisory Committee members,

I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System. Peer review panel teleconference dates and details are available on the District's online calendar.

If you have any questions, comments, or would like to schedule a meeting to discuss with staff, please email MFLcomments@WaterMatters.org. Please provide any feedback by March 31, 2019 to allow ample time for staff to review and consider feedback.

Caroline McKnight
Board and Executive Services Manager
Southwest Florida Water Management District
2379 Broad Street, Brooksville, FL 34604
(352) 796-7211, ext. 4662
Caroline.McKnight@WaterMatters.org

Gabe I. Herrick

From: Frank Gargano
Sent: Friday, February 08, 2019 1:13 PM
To: richardowen wrwsa.org
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Richard,
Thank you. I will coordinate your request with the appropriate staff and get back to you.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: richardowen wrwsa.org <richardowen@wrwsa.org>
Sent: Friday, February 08, 2019 11:11 AM
To: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Subject: Re: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Frank, thanks very much for this information. I would like to request a presentation of these at an upcoming WRWSA Board meeting. Our future meetings during the January - June 2019 stakeholder outreach schedule you have identified include March 20 and May 15. Meetings start at 3:30 pm and are held at the Government Center 3600 W Sovereign Path, Lecanto. Please let me know if appropriate SWFWMD staff would be available at either of these meetings.

Richard S. Owen, AICP

Executive Director

Withlacoochee Regional Water Supply Authority

3600 W. Sovereign Path, Suite 228

Lecanto, FL 34461

richardowen@wrwsa.org

352-293-5955

From: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Sent: Thursday, February 7, 2019 10:33:01 AM
To: richardowen wrwsa.org
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Owen,

I hope this email finds you well. It's likely you may have already heard from other staff, but I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel meeting dates and details are available on the District's online calendar. Please feel free to contact me if you would like to schedule a meeting with the District's technical staff to discuss the draft reports.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Frank Gargano
Sent: Friday, February 08, 2019 1:07 PM
To: Robert Knight
Cc: Heather Obara
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Knight,
Thank you for your comment regarding the accessibility of the reports for the re-evaluation of both Chassahowitzka and Homosassa River Systems. I can have the appropriate staff look into your request. In the meantime, the reports on the webpage can be downloaded by choosing the File, Save As option in your browser.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

From: Robert Knight <bknight@floridaspringsinstitute.org>
Sent: Thursday, February 07, 2019 8:47 PM
To: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Cc: Heather Obara <hobara@floridaspringsinstitute.org>
Subject: RE: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Frank

Thank you for alerting us to this process. Please do the public the favor of assembling these new reports and all of their appendices into one or two downloadable files for each spring system. Please let me know when you have updated your website so we can alert the concerned public.

Best wishes,

Bob

From: Frank Gargano <Frank.Gargano@swfwmd.state.fl.us>
Sent: Thursday, February 7, 2019 10:23 AM
To: Robert Knight <bknight@floridaspringsinstitute.org>; Heather Obara <hobara@floridaspringsinstitute.org>
Subject: Minimum Flows and Levels - Chassahowitzka and Homosassa River Systems

Mr. Knight and Ms. Obara,

I hope this email finds you well. It's likely you may have already heard from other staff, but I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and your organization. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel meeting dates and details are available on the District's online calendar. Please feel free to contact me if you would like to schedule a meeting with the District's technical staff to discuss the draft reports.

Thank you,

Frank Gargano
Government Affairs Regional Manager
Government and Community Affairs Office
Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
352-796-7211, ext. 4759
frank.gargano@swfwmd.state.fl.us

Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, February 08, 2019 9:50 AM
To: MFLComments
Subject: Automatic reply: Chassahowitzka and Homosassa MFLs Reevaluation

Thank you for your email. I am out of the office and will be back February 11, 2019. During this period I will have limited access to my email. If you have questions or concerns about the Chassahowitzka or Homosassa minimum flows, please email MFLcomments@WaterMatters.org. Otherwise I will respond to your emails as soon as possible upon my return.

Thank you,
Gabe

Gabe I. Herrick

From: MFLComments
Sent: Friday, February 08, 2019 9:50 AM
To: Arias, Mauricio
Cc: MFLComments; Gabe I. Herrick; Doug Leeper
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluation

Hello Mauricio,

Glad to hear your are interested and I think this will be the start of a productive long-term discussion related to environmental flows. I propose that following your examination of the two MFL reports, we make a plan to discuss. Of course, don't hesitate to request any additional information or clarification as needed. I'd like Gabe to be our mutual point of contact, since he is the lead author on both reports and works in our Tampa office. Also we have created a WebForum as a discussion space.

Looking forward to our future discussions. Best regards, Sky

From: Arias, Mauricio <mearias@usf.edu>
Sent: Friday, February 8, 2019 7:20 AM
To: Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Cc: MFLComments <MFLComments@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluation

Hi Sky,

Thank you very much for sharing this information with me. As you may know, environmental/minimum flows is at the core of my research interests and expertise, so I think that I could provide some input on the reevaluation. I'm happy to discuss how this could happen.

Best,

Mauricio

Mauricio E. Arias, PhD

Assistant Professor

Department of Civil and Environmental Engineering

University of South Florida

+1 (813) 974-5593

http://cee.eng.usf.edu/faculty/mearias/

From: Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Sent: Thursday, February 7, 2019 4:47:38 PM
Cc: MFLComments
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hello Springs Coast Management Committee Members,

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

Sky Notestein
Manager, Springs and Environmental Flows Section
Southwest Florida Water Management District
(352) 796-0515 ext. 4286

Sky.Notestein@swfwmd.state.fl.us

Gabe I. Herrick

From: Arias, Mauricio <mearias@usf.edu>
Sent: Friday, February 08, 2019 7:20 AM
To: Sky Notestein
Cc: MFLComments
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluation

Hi Sky,

Thank you very much for sharing this information with me. As you may know, environmental/minimum flows is at the core of my research interests and expertise, so I think that I could provide some input on the reevaluation. I'm happy to discuss how this could happen.

Best,

Mauricio

____

Mauricio E. Arias, PhD
Assistant Professor
Department of Civil and Environmental Engineering
University of South Florida

+1 (813) 974-5593
http://cee.eng.usf.edu/faculty/mearias/

From: Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Sent: Thursday, February 7, 2019 4:47:38 PM
Cc: MFLComments
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

Sky Notestein
Manager, Springs and Environmental Flows Section
Southwest Florida Water Management District
(352) 796-0515 ext. 4286
Sky.Notestein@swfwmd.state.fl.us

Gabe I. Herrick

From: Sky Notestein
Sent: Thursday, February 07, 2019 4:50 PM
Cc: MFLComments
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hello Springs Coast Steering Committee Members,

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

Sky Notestein
Manager, Springs and Environmental Flows Section
Southwest Florida Water Management District
(352) 796-0515 ext. 4286
Sky.Notestein@swfwmd.state.fl.us

Gabe I. Herrick

From: Sky Notestein
Sent: Thursday, February 07, 2019 4:48 PM
Cc: MFLComments
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hello Springs Coast Management Committee Members,

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

Sky Notestein
Manager, Springs and Environmental Flows Section
Southwest Florida Water Management District
(352) 796-0515 ext. 4286
Sky.Notestein@swfwmd.state.fl.us

Gabe I. Herrick

From: Doug Leeper
Sent: Thursday, February 07, 2019 1:34 PM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Saturday, February 02, 2019 10:30 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,
Thank you for sharing the schedule for Peer Review of these draft reports.

I have already reviewed the reports although I must say in depth reading has yet to be done. My tardiness in this task is derived from the following key points:

1. How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?
   Code reads "

   (16) Minimum Flow for the Chassahowitzka River System.

   (a) For purposes of this rule, the Chassahowitzka River System includes the watercourse from the Chassahowitzka Main Springs Complex to the Gulf of Mexico, including contributing tributaries, Blind Springs and all named and unnamed springs that discharge to the river.

   (b) The Minimum Flow for the Chassahowitzka River System is 97% of the natural flow as measured at the United States Geological Survey (USGS) Gage Chassahowitzka River near Homosassa (Gage No. 02310650). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from this Gage is measured as the previous day's natural flow at that point minus 3%.

   (c) The District will reevaluate the Minimum Flow within six years of adoption of this rule.

   (17) Minimum Flow for the Homosassa River System.

   (a) For purposes of this rule, the Homosassa River System includes the watercourse from the Homosassa Main Springs Complex to the Gulf of Mexico, including the southeast fork of the Homosassa River, Halls River, Hidden River and all named and unnamed springs that discharge to these rivers.

   (b) The Minimum Flow for the Homosassa River System is 97% of the combined natural flow as measured at the United States Geological Survey (USGS) Homosassa Springs at Homosassa Springs, FL Gage (No. 02310678), and the USGS SE Fork Homosassa Spring at Homosassa Springs, FL Gage (No. 02310688). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from these Gages are measured as the previous day's natural flow at that point minus 3%.

(c) The District will reevaluate the Minimum Flow within six years of adoption of this rule."

Executive Reports read

" The recommended minimum flows for the Chassahowitzka River system are 92 percent of flows that would occur in the absence of withdrawal impacts; allowing up to an 8 percent reduction from unimpacted flows. This recommendation is made on the basis of three criteria which are all equally sensitive to simulated reductions in flow: area and volume of salinity-based habitats less than or equal to 1 practical salinity unit and temperature-based habitat for Common Snook."

Ppage viii

and

" The recommended minimum flows for the Homosassa River system are 95 percent of flows that would occur in the absence of withdrawal impacts; allowing up to a 5 percent reduction from unimpacted flows. This recommendation is made on the basis of temperature-based habitat for Common Snook."

Page ix

Sideline: Common Snook took over from manatee on what basis?

2. What does all the Day of the Year data tell us?

Some of the graphs are for different timeframes eg

Chass

Stage is for 2010-10-01 to 2017-12-05 **Figure 2-10**

Flow is for 2012-11-18 to 2017-12-05 **Figure 2-11**

I can see that this is available data from USGS, but what is it telling us?

It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.

3. What progress is being made with USGS
   A. To get velocity based discharge for Homosassa man springs?
   B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.

Doug,

The Homosassa River is (as Mark Hammond commented some years ago) 'DEAD'. This year we have seen manatee trying to 'climb' the banks to get green food!!! It is so bad last week I e-mailed Chris Anastasious to ask about the final report on the Hunter Cove Revegetation Project as I had noticed the fencing has been removed.

Martyn

Good to hear from you, trust life is treating you and Ron well with regard to health and happiness.

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 1:11 PM
To: martynellijay@hotmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Martyn:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Thursday, February 07, 2019 1:31 PM
To: martynellijay@hotmail.com
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn:

Good to hear from you again, also. Here are some brief responses to the questions included in your recent email.

Your question: *How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?"*
Response: The currently proposed minimum flows for the Chassahowitzka and Homosassa river systems were recently developed based on the best information currently available. Their development is ongoing, and as you know, we are currently subjecting the recommendations to independent, scientific peer review.

Your question (in reference to the Homosassa River system): *Common Snook took over from manatee on what basis?*
Response: The currently proposed minimum flows for the Homosassa River system were recently developed based on the best information currently available. Flow-related change in Common Snook habitat was the most sensitive criterion assessed, and was used to develop the current minimum flow recommendation.

Your questions: *What does all the Day of the Year data tell us?*
Some of the graphs are for different timeframes eg
Chass
Stage is for 2010-10-01 to 2017-12-05 ***Figure 2-10***
Flow is for 2012-11-18 to 2017-12-05 ***Figure 2-11***
I can see that this is available data from USGS, but what is it telling us?
It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.
Response: As noted on page 27 of the draft Chassahowitzka River system minimum flow report, Figures 2-10, 2-11 and 2-16 are provided to illustrate interaction between tide and groundwater levels on discharge in the river system.

Your questions: *What progress is being made with USGS*
A. To get velocity based discharge for Homosassa man springs?
B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.
Response to question (A): Analyses of the data collected through approximately the middle of last year at the Homosassa Springs at Homosassa Springs, FL gage were not sufficient for implementation of an index-velocity approach for discharge measurement. Data collection at the site continues and the USGS will continue to review these data to determine whether the index-velocity approach can be implemented.
Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604

1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Saturday, February 02, 2019 10:30 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,
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I have already reviewed the reports although I must say in depth reading has yet to be done. My tardiness in this task is derived from the following key points:

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   (a) For purposes of this rule, the Chassahowitzka River System includes the watercourse from the Chassahowitzka Main Springs Complex to the Gulf of Mexico, including contributing tributaries, Blind Springs and all named and unnamed springs that discharge to the river.

   (b) The Minimum Flow for the Chassahowitzka River System is 97% of the natural flow as measured at the United States Geological Survey (USGS) Gage Chassahowitzka River near Homosassa (Gage No. 02310650). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from this Gage is measured as the previous day's natural flow at that point minus 3%.

   (c) The District will reevaluate the Minimum Flow within six years of adoption of this rule.

   (17) Minimum Flow for the Homosassa River System.

   (a) For purposes of this rule, the Homosassa River System includes the watercourse from the Homosassa Main Springs Complex to the Gulf of Mexico, including the southeast fork of the Homosassa River, Halls River, Hidden River and all named and unnamed springs that discharge to these rivers.

   (b) The Minimum Flow for the Homosassa River System is 97% of the combined natural flow as measured at the United States Geological Survey (USGS) Homosassa Springs at Homosassa Springs, FL Gage (No. 02310678), and the USGS SE Fork Homosassa Spring at Homosassa Springs, FL Gage (No. 02310688). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from these Gages are measured as the previous day's natural flow at that point minus 3%.

   (c) The District will reevaluate the Minimum Flow within six years of adoption of this rule."
   Executive Reports read
   " The recommended minimum flows for the Chassahowitzka River system are 92 percent of flows that would occur in the absence of withdrawal impacts; allowing up to an 8 percent reduction from unimpacted flows. This recommendation is made on the basis of three criteria which are all equally sensitive to simulated reductions in flow: area and volume of salinity-based habitats less than or equal to 1 practical salinity unit and temperature-based habitat for Common Snook."
   Ppage viii
   and

" The recommended minimum flows for the Homosassa River system are 95 percent of flows that would occur in the absence of withdrawal impacts; allowing up to a 5 percent reduction from unimpacted flows. This recommendation is made on the basis of temperature-based habitat for Common Snook."
Page ix

Sideline: Common Snook took over from manatee on what basis?

2. What does all the Day of the Year data tell us?

Some of the graphs are for different timeframes eg
Chass
Stage is for 2010-10-01 to 2017-12-05 **Figure 2-10**
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I can see that this is available data from USGS, but what is it telling us?
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   A. To get velocity based discharge for Homosassa man springs?
   B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.

Doug,
The Homosassa River is (as Mark Hammond commented some years ago) 'DEAD'. This year we have seen manatee trying to 'climb' the banks to get green food!!! It is so bad last week I e-mailed Chris Anastasious to ask about the final report on the Hunter Cove Revegetation Project as I had noticed the fencing has been removed.

Martyn
Good to hear from you, trust life is treating you and Ron well with regard to health and happiness.

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 1:11 PM
To: martynellijay@hotmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Martyn:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Thursday, February 07, 2019 1:31 PM
To: martynellijay@hotmail.com
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Martyn:

Good to hear from you again, also. Here are some brief responses to the questions included in your recent email.

Your question: *How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?"*
Response: The currently proposed minimum flows for the Chassahowitzka and Homosassa river systems were recently developed based on the best information currently available. Their development is ongoing, and as you know, we are currently subjecting the recommendations to independent, scientific peer review.

Your question (in reference to the Homosassa River system): *Common Snook took over from manatee on what basis?*
Response: The currently proposed minimum flows for the Homosassa River system were recently developed based on the best information currently available. Flow-related change in Common Snook habitat was the most sensitive criterion assessed, and was used to develop the current minimum flow recommendation.

Your questions: *What does all the Day of the Year data tell us?*
Some of the graphs are for different timeframes eg
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Stage is for 2010-10-01 to 2017-12-05 ***Figure 2-10***
Flow is for 2012-11-18 to 2017-12-05 ***Figure 2-11***
I can see that this is available data from USGS, but what is it telling us?
It would be useful to look at well levels on a day of the year basis, as the levels in the aquifer are a better indicator of the driving force for spring flow than tidal stage in my opinion.
Response: As noted on page 27 of the draft Chassahowitzka River system minimum flow report, Figures 2-10, 2-11 and 2-16 are provided to illustrate interaction between tide and groundwater levels on discharge in the river system.

Your questions: *What progress is being made with USGS*
A. To get velocity based discharge for Homosassa man springs?
B. To get Specific Conductance and Temperature sensors for SE Fork moved out of the eddie current area i.e. to the same location as the velocity meter. Thereby eliminating the 'thought' that springs in the SE Fork are tidally influenced with respect to specific conductance.
Response to question (A): Analyses of the data collected through approximately the middle of last year at the Homosassa Springs at Homosassa Springs, FL gage were not sufficient for implementation of an index-velocity approach for discharge measurement. Data collection at the site continues and the USGS will continue to review these data to determine whether the index-velocity approach can be implemented.
Response to question (B): The USGS and the District currently have no plans to move the specific conductance and temperature sensors deployed at the SE Fork Homosassa Spring at Homosassa Spring, FL site.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
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352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Alan Martyn Johnson <martynellijay@hotmail.com>
Sent: Saturday, February 02, 2019 10:30 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,
Thank you for sharing the schedule for Peer Review of these draft reports.

I have already reviewed the reports although I must say in depth reading has yet to be done. My tardiness in this task is derived from the following key points:

1. How is it that MFL's recommended in these reports are higher than in the rule in the current Florida Administrative Code?
   Code reads "

   (16) Minimum Flow for the Chassahowitzka River System.

   (a) For purposes of this rule, the Chassahowitzka River System includes the watercourse from the Chassahowitzka Main Springs Complex to the Gulf of Mexico, including contributing tributaries, Blind Springs and all named and unnamed springs that discharge to the river.

   (b) The Minimum Flow for the Chassahowitzka River System is 97% of the natural flow as measured at the United States Geological Survey (USGS) Gage Chassahowitzka River near Homosassa (Gage No. 02310650). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from this Gage is measured as the previous day's natural flow at that point minus 3%.

   (c) The District will reevaluate the Minimum Flow within six years of adoption of this rule.

   (17) Minimum Flow for the Homosassa River System.

   (a) For purposes of this rule, the Homosassa River System includes the watercourse from the Homosassa Main Springs Complex to the Gulf of Mexico, including the southeast fork of the Homosassa River, Halls River, Hidden River and all named and unnamed springs that discharge to these rivers.

   (b) The Minimum Flow for the Homosassa River System is 97% of the combined natural flow as measured at the United States Geological Survey (USGS) Homosassa Springs at Homosassa Springs, FL Gage (No. 02310678), and the USGS SE Fork Homosassa Spring at Homosassa Springs, FL Gage (No. 02310688). Natural flow is defined for the purpose of this rule as the flow that would exist in the absence of water withdrawal impacts. The Minimum Flow at any point downstream from these Gages are measured as the previous day's natural flow at that point minus 3%.

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Doug,
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Martyn
Good to hear from you, trust life is treating you and Ron well with regard to health and happiness.

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 1:11 PM
To: martynellijay@hotmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Martyn:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Sky Notestein
Sent: Thursday, February 07, 2019 12:42 PM
To: Patricia Kapocsi
Cc: MFLComments; Doug Leeper
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluation

Frank,

Yes, Doug and I will be there and look forward to talking with you.

Thank you,

Sky Notestein
Manager, Springs and Environmental Flows Section
Southwest Florida Water Management District
(352) 796-0515 ext. 4286
Sky.Notestein@swfwmd.state.fl.us

From: Patricia Kapocsi <fnpkap@aol.com>
Sent: Thursday, February 7, 2019 12:07 PM
To: Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluation

Sky, I hope to meet Mr. Leeper and staff when they arrive at the wildlife park on Friday. Frank

-----Original Message-----
From: Sky Notestein <Sky.Notestein@swfwmd.state.fl.us>
To: Frank and Patricia Kapocsi (fnpkap@aol.com) <fnpkap@aol.com>
Sent: Thu, Feb 7, 2019 10:21 am
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hello Mr. Kapocsi,

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Homosassa River Alliance. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Southwest Florida Water Management District
(352) 796-0515 ext. 4286
Sky.Notestein@swfwmd.state.fl.us

Gabe I. Herrick

From: Sky Notestein
Sent: Thursday, February 07, 2019 10:26 AM
To: Steve Minguy (sminguy@aol.com)
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hello Mr. Minguy,

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Homosassa River Restoration Project Inc. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Manager, Springs and Environmental Flows Section
Southwest Florida Water Management District
(352) 796-0515 ext. 4286
Sky.Notestein@swfwmd.state.fl.us

Gabe I. Herrick

From: Sky Notestein
Sent: Thursday, February 07, 2019 10:21 AM
To: Frank and Patricia Kapocsi (fnpkap@aol.com)
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hello Mr. Kapocsi,

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Southwest Florida Water Management District
(352) 796-0515 ext. 4286
Sky.Notestein@swfwmd.state.fl.us

Gabe I. Herrick

From: Sky Notestein
Sent: Thursday, February 07, 2019 10:12 AM
To: 'Andy & Terri Auner'
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hello Andy and Terri,

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

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Sky.Notestein@swfwmd.state.fl.us

Gabe I. Herrick

From: Doug Leeper
Sent: Thursday, February 07, 2019 6:53 AM
To: 'Kelly, Marty'
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hey Marty: I forgot to send you our peer-review kick-off email for the reevaluation of minimum flows for the Chassahowitzka and Homosassa systems. Better late than never, I guess. Hope everything is going well for you. See you sometime soon, I hope.

<><><><><>
I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you.

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<><><><><>

Doug Leeper
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doug.leeper@watermatters.org

From: Doug Leeper
Sent: Thursday, February 07, 2019 6:49 AM
To: Mike Heyl (heylmg@allmail.net)
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Mike: I forgot to send you our peer-review kick-off email for the reevaluation of minimum flows for the Chassahowitzka and Homosassa systems. Better late than never, I guess. On another note, I'm still planning to conduct a recon on the upper Braden gage sites when I can find the time – will coordinate with you.

<><><><><>
I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you.

As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 3:51 PM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
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doug.leeper@watermatters.org

From: Wright, Shannon <shannon.wright@MyFWC.com>
Sent: Monday, February 04, 2019 3:47 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Thank you Doug! I will be passing your information along to our staff for their review and will ask that they respond directly to you.
Shannon

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 12:36 PM
To: Wright, Shannon <shannon.wright@MyFWC.com>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Shannon:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 3:48 PM
To: MFLComments
Subject: FW: Thanks; peer review panelists list request

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
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doug.leeper@watermatters.org

From: Patrick Rose <prose@savethemanatee.org>
Sent: Monday, February 04, 2019 11:13 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: Katie Tripp <ktripp@savethemanatee.org>; Anne Harvey Holbrook <aholbrook@savethemanatee.org>
Subject: RE: Thanks; peer review panelists list request

Thanks so much!

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Monday, February 4, 2019 7:58 AM
To: Patrick Rose <prose@savethemanatee.org>
Subject: Thanks; peer review panelists list request

Thanks, Patrick. FYI, I also sent the announcement email to Katie and Anne.

The peer-review panelists for the Chassahowitzka and Homosassa minimum flows reevaluations are: Dr. Steve Peene (Applied Technology and Management, Inc.), Dr. Adam Munson (AMFL, Inc.) and Mr. Dann Yobbi.

Doug Leeper
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doug.leeper@watermatters.org

From: Patrick Rose <prose@savethemanatee.org>
Sent: Friday, February 01, 2019 2:33 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: Katie Tripp <ktripp@savethemanatee.org>; Anne Harvey Holbrook <aholbrook@savethemanatee.org>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,

Thank you for the informative email and future schedule for MFL development and review for Chassahowitzka and Homosassa Rivers.

I have copied our Director of Science and Conservation, Dr. Katie Tripp, and ask that you please include her in future email distributions.

Also, do you have a listing of members of the independent scientific peer review panel.

Regards,

Pat

Patrick M. Rose, CPM, Aquatic Biologist
Executive Director
Save the Manatee Club

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 12:48 PM
To: Patrick Rose <prose@savethemanatee.org>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Dr. Rose:

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Save the Manatee Club. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 10:23 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Spratt, Katherine <Katherine.Spratt@dep.state.fl.us>
Sent: Friday, February 01, 2019 1:59 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Thanks for all of the info. I've communicated with the toll collectors that your review group will be in the park next Friday, February 8th and that their admission into the park will be waived. If anyone from the general public wishes to join your group, they will be required to pay the regular admission rate of $13 per person for adults. Thanks again for reaching out and best of luck with your MFLs Reevaluations.

Best,

Kate Spratt
Florida Department of Environmental Protection
Ellie Schiller Homosassa Springs
Wildlife State Park
Park Services Specialist
Katherine.Spratt@dep.state.fl.us
Office: 352-628-5445
Cell: 352-400-9747

From: Doug Leeper [mailto:Doug.Leeper@swfwmd.state.fl.us]
Sent: Friday, February 1, 2019 1:04 PM
To: Spratt, Katherine <Katherine.Spratt@dep.state.fl.us>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Katherine:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Ellie Schiller Homosassa Springs

Wildlife State Park. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar. Please feel free to contact me if you would like to schedule a meeting with the District's technical staff to discuss the draft reports.

Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

Finally, thanks for working with me regarding the planned February 8th site visit to the park that will be included as part of the peer review kick-off meeting.

Doug Leeper
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1-800-423-1476, extension 4272 (FL only)
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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 8:31 AM
To: Escribano, Yesenia
Subject: RE: Chassahowitzka and Homosassa Minimum Flow Reevaluations

Yesenia:

You are certainly welcome to participate in the review kick-off meeting and field trip scheduled for 2/18/2019 as well as the subsequent planned panel meetings. Our plans for the subsequent panel meeting are for me to facilitate them as teleconferences, using a call-in number and Skype. Call-in and Skype log-in information for the planned 2/18. 2/25, 3/4, 3/11, 5/6, 5/20 and 5/29 will be provided as agendas are developed.

Doug Leeper
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doug.leeper@watermatters.org

From: Escribano, Yesenia <Yesenia.Escribano@freshfromflorida.com>
Sent: Monday, February 04, 2019 8:19 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa Minimum Flow Reevaluations

Hi Doug,

I had seen some of these events listed in the district calendar last week and was actually going to reach out to you about it. In addition to attending some of the meetings, could we may participate in the field trips?

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 12:09 PM
To: Escribano, Yesenia <Yesenia.Escribano@freshfromflorida.com>
Subject: Chassahowitzka and Homosassa Minimum Flow Reevaluations

Yesenia:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Department of Agriculture and Consumer Services. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar. Please feel free to contact me if you would like to schedule a meeting with the District's technical staff to discuss the draft reports.

Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 8:25 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Mezich, Ron <ron.mezich@MyFWC.com>
Sent: Monday, February 04, 2019 8:10 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: Merrill, Maria <Maria.Merrill@MyFWC.com>; Smith, Kent <kent.smith@myfwc.com>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Thanks Doug, we will review the documents and provide comments.

Ron

Ron Mezich
Florida Fish and Wildlife Conservation Commission
Biological Administrator
Imperiled Species Management Section
620 S. Meridian Street - 6A
Tallahassee, FL 32399-1600

Phone # (850)-922-4330

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 12:32 PM
To: Mezich, Ron <ron.mezich@MyFWC.com>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Ron:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 8:10 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Sutton, Eric <Eric.Sutton@MyFWC.com>
Sent: Sunday, February 03, 2019 8:58 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: Eason, Thomas <Thomas.Eason@MyFWC.com>; Goff, Jennifer <jennifer.goff@MyFWC.com>; Fitzwater, Jennifer <Jennifer.Fitzwater@MyFWC.com>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Thanks Doug, we will get this into the right hands

Eric Sutton
Executive Director
Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, FL 32399
850.921.5786

On Feb 1, 2019, at 12:24 PM, Doug Leeper <Doug.Leeper@swfwmd.state.fl.us> wrote:

> **CAUTION:**This email originated from outside of FWC. Whether you know the sender or not, do not click links or open attachments you were not expecting.
>
> Eric:
>
> I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.
>
> Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 8:06 AM
To: MFLComments
Subject: FW: Homoasassa mfls

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only) 352-796-7211, extension 4272 doug.leeper@watermatters.org

-----Original Message-----
From: Frank And Pat <fnpkap@aol.com>
Sent: Friday, February 01, 2019 3:50 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Homoasassa mfls

Hello Mr . Leeper, Yes the Alliance is very interested in the future of the Homoasassa River and its mfls. I cannot make the Brooksville meeting, but I am looking forward to meeting you at the Wildlife Park . Frank Kapocsi President Homoasassa River Alliance

Sent from my iPhone

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 8:05 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
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doug.leeper@watermatters.org

From: Stevens, Philip <Philip.Stevens@MyFWC.com>
Sent: Friday, February 01, 2019 3:38 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Thank you Doug. I am interesting in reviewing the document and will pass my comments along to Tim MacDonald and Eric Johnson who are a part of an FWC river flow team.

Philip Stevens, PhD
Research Scientist – Fish Biology
FWC - Fish and Wildlife Research Institute
100 8th Ave Southeast
St Petersburg, FL 33701
Phone: 727-896-8626

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 01, 2019 12:34 PM
To: Stevens, Philip <Philip.Stevens@MyFWC.com>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Phillip:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 8:02 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
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352-796-7211, extension 4272
doug.leeper@watermatters.org

From: Smith, Kent <kent.smith@myfwc.com>
Sent: Friday, February 01, 2019 3:26 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Hey Doug!

I'll pass this along to our environmental commenting lead dealing with MFLs. Thanks for sending this notice along.

Sent from my Kent's iPhone.

On Feb 1, 2019, at 12:31 PM, Doug Leeper <Doug.Leeper@swfwmd.state.fl.us> wrote:

> **CAUTION:**This email originated from outside of FWC. Whether you know the sender or not, do not click links or open attachments you were not expecting.
>
> Hi Kent:
>
> I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.
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Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 7:58 AM
To: Patrick Rose
Subject: Thanks; peer review panelists list request

Thanks, Patrick. FYI, I also sent the announcement email to Katie and Anne.

The peer-review panelists for the Chassahowitzka and Homosassa minimum flows reevaluations are: Dr. Steve Peene (Applied Technology and Management, Inc.), Dr. Adam Munson (AMFL, Inc.) and Mr. Dann Yobbi.

Doug Leeper
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From: Patrick Rose <prose@savethemanatee.org>
Sent: Friday, February 01, 2019 2:33 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: Katie Tripp <ktripp@savethemanatee.org>; Anne Harvey Holbrook <aholbrook@savethemanatee.org>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Doug,

Thank you for the informative email and future schedule for MFL development and review for Chassahowitzka and Homosassa Rivers.

I have copied our Director of Science and Conservation, Dr. Katie Tripp, and ask that you please include her in future email distributions.

Also, do you have a listing of members of the independent scientific peer review panel.

Regards,

Pat

Patrick M. Rose, CPM, Aquatic Biologist
Executive Director
Save the Manatee Club

From: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Sent: Friday, February 1, 2019 12:48 PM

To: Patrick Rose <prose@savethemanatee.org>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Dr. Rose:

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Save the Manatee Club. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 7:52 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
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doug.leeper@watermatters.org

From: Spratt, Katherine <Katherine.Spratt@dep.state.fl.us>
Sent: Friday, February 01, 2019 1:59 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Thanks for all of the info. I've communicated with the toll collectors that your review group will be in the park next Friday, February 8th and that their admission into the park will be waived. If anyone from the general public wishes to join your group, they will be required to pay the regular admission rate of $13 per person for adults. Thanks again for reaching out and best of luck with your MFLs Reevaluations.

Best,

Kate Spratt
Florida Department of Environmental Protection
Ellie Schiller Homosassa Springs
Wildlife State Park
Park Services Specialist
Katherine.Spratt@dep.state.fl.us
Office: 352-628-5445
Cell: 352-400-9747

From: Doug Leeper [mailto:Doug.Leeper@swfwmd.state.fl.us]
Sent: Friday, February 1, 2019 1:04 PM
To: Spratt, Katherine <Katherine.Spratt@dep.state.fl.us>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Katherine:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Ellie Schiller Homosassa Springs Wildlife State Park. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Finally, thanks for working with me regarding the planned February 8th site visit to the park that will be included as part of the peer review kick-off meeting.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 7:51 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
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doug.leeper@watermatters.org

From: Tennille, Kimberlee <Kimberly.Tennille@dep.state.fl.us>
Sent: Friday, February 01, 2019 1:46 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: RE: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Doug…got it, thanks.

Kimberlee L. Tennille
Park Manager
Ellie Schiller Homosassa Springs
Wildlife State Park
4150 South Suncoast Blvd.
Homosassa, FL 34446-1168
Kimberlee.Tennille@dep.state.fl.us
O: (352) 628-5343
F: (352) 628-4243

From: Doug Leeper [mailto:Doug.Leeper@swfwmd.state.fl.us]
Sent: Friday, February 01, 2019 1:45 PM
To: Tennille, Kimberlee <Kimberly.Tennille@dep.state.fl.us>
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

-Trying another email address.

Doug Leeper
MFLs Program Lead
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doug.leeper@watermatters.org

From: Doug Leeper
Sent: Friday, February 01, 2019 1:01 PM
To: Kim.Tennille@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Ms. Tennille:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Ellie Schiller Homosassa Springs Wildlife State Park. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 7:46 AM
To: Keith Ramos
Cc: MFLComments
Subject: RE: [EXTERNAL] Chassahowitzka and Homosassa MFLs Reevaluations

Thanks, Keith.

FYI, I sent the announcement email to both Joyces.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
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doug.leeper@watermatters.org

From: Keith Ramos <keith_ramos@fws.gov>
Sent: Friday, February 01, 2019 1:14 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Cc: joyce_palmer@fws.gov; Kleen Joyce <Joyce_Kleen@fws.gov>
Subject: Re: [EXTERNAL] Chassahowitzka and Homosassa MFLs Reevaluations

Hello Doug,

Thanks for the message. I have been gone from Chassahowitzka for a number of years now, but I'm copying Joyce Palmer (Refuge Manager) and Joyce Kleen (Refuge Biologist) with this email.

Sincerely,

Keith Ramos
Refuge Manager
U.S. Fish and Wildlife Service
Northern Maine NWR Complex
103 Headquarters Road, Baring, ME 04694
Office 207-454-1705
Mobile 207-436-0000
https://www.fws.gov/refuge/moosehorn/

Sent from my iPhone

On Feb 1, 2019, at 12:55, Doug Leeper <Doug.Leeper@swfwmd.state.fl.us> wrote:

> Mr. Ramos:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Monday, February 04, 2019 7:42 AM
To: MFLComments
Subject: FW: [EXTERNAL] Chassahowitzka and Homosassa MFLs Reevaluations

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
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doug.leeper@watermatters.org

From: Adimey, Nicole <nicole_adimey@fws.gov>
Sent: Friday, February 01, 2019 1:07 PM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: [EXTERNAL] Chassahowitzka and Homosassa MFLs Reevaluations

Thanks for passing this along!

Cheers!

Nicole Adimey
Division of Restoration and Recovery
Partners for Fish and Wildlife, Southeast Region Coordinator
U.S. Fish and Wildlife Service
1875 Century Boulevard
Atlanta, Georgia 30345
404.679.7138
nicole_adimey@fws.gov

On Fri, Feb 1, 2019 at 12:55 PM Doug Leeper <Doug.Leeper@swfwmd.state.fl.us> wrote:

> Hi Nicole:
>
> I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Doug Leeper

MFLs Program Lead

Southwest Florida Water Management District

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352-796-7211, extension 4272

doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:45 PM
To: Kimberly.Tennille@dep.state.fl.us
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

-Trying another email address.

Doug Leeper
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doug.leeper@watermatters.org

From: Doug Leeper
Sent: Friday, February 01, 2019 1:01 PM
To: Kim.Tennille@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Ms. Tennille:

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:40 PM
To: jbitter@tampabay.rr.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hi Jim:

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:38 PM
To: norman@amyhrf.org
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hi Norman:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:37 PM
To: hopecorona@tampabay.rr.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hi Hope:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:36 PM
To: bfberauer@aol.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Hi Ben:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:34 PM
To: president@citruscountyaudubon.org
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Mr. Hileman:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Citrus County Audubon Society.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:33 PM
To: hernandoaudubonpresident@gmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Ms. Clutter:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Hernando Audubon Society.

As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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- June 2019: Public workshop date and location have not yet been determined
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- By end of December 2019: Rulemaking to adopt minimum flows

Click here to view the reports on the District's website. You can also view these webpages to learn a little more about the minimum flows for the Chassahowitzka River System and the Homosassa River System.

An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District
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1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:31 PM
To: apaul@audobon.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluation

Ms. Paul:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Audubon Society.

As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:30 PM
To: ahodgson@audubon.org; ahodgson@gmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Ms. Hodgson:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Audubon Society.

As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:28 PM
To: homosassagirl@gmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Ms. Ellen:

Friend of the Chassahowitzka Wildlife Refuge Complex

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you, the Friends of the Chassahowitzka Wildlife Refuge Complex.

As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:25 PM
To: homosassacso@gmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Ms. Iozzia:
I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Friends of the Homosassa Springs Wildlife Park.

As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
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An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:24 PM
To: tomgo74@yahoo.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Mr. Gotterup:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you, the Friends of the Chassahowitzka Wildlife Refuge Complex and the Friends of the Crystal River National Wildlife Refuge.

As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:20 PM
To: Caroline A. McKnight
Cc: Sky Notestein; Randy Smith; Eric DeHaven; Adrienne E. Vining; Melissa Gulvin
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Caroline:

I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to members of the various District advisory committees. I'm assuming you may want to pass this information along to the committees.

As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

As appropriate, please feel free to let advisory panel members know they can contact me if they would like to schedule a meeting with the District's technical staff to discuss the draft reports.

Also, it would be helpful if you could let panel members know that staff would appreciate feedback on the proposed minimum flows before March 31 to allow staff ample time to review and consider feedback.

Finally, please let me know if you or others at the District think it would be appropriate for staff to discuss the proposed minimum flows at any advisory committee meetings.

Doug Leeper
MFLs Program Lead
Southwest Florida Water Management District

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:12 PM
To: martynellijay@hotmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Martyn:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:10 PM
To: sidflannery22@gmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Sid:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:08 PM
To: fnpkap@aol.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Ms. Kopocsi:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Homosassa River Alliance. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:04 PM
To: Katherine.Spratt@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Katherine:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Ellie Schiller Homosassa Springs Wildlife State Park. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar. Please feel free to contact me if you would like to schedule a meeting with the District's technical staff to discuss the draft reports.

Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

Finally, thanks for working with me regarding the planned February 8th site visit to the park that will be included as part of the peer review kick-off meeting.

Doug Leeper
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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 1:01 PM
To: Kim.Tennille@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Ms. Tennille:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Ellie Schiller Homosassa Springs Wildlife State Park. As a refresher, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

Finally, thanks to you and Kate Spratt for working with me regarding the planned February 8th site visit that will be included in the peer review kick-off meeting.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:58 PM
To: chazcamp.db@gmail.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Mr. Blauer:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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An initial peer review panel meeting will occur Feb. 8 at 8:30 a.m. and will include a meeting at the District's Brooksville Headquarters and a field trip to selected sites on the river systems. Additional peer review panel teleconference dates and details are available on the District's online calendar.

Finally, thanks for working with me regarding parking issues for the planned February 8 site visit to the boat ramp on the Chassahowitzka River.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:56 PM
To: Keith_Ramos@fws.gov
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Mr. Ramos:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:55 PM
To: Nicole_Adimey@fws.gov
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Nicole:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:55 PM
To: Jim_Valade@fws.gov
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Jim:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:54 PM
To: Teresa_Calleson@fws.gov
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Terri:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:53 PM
To: Jay_Herrington@fws.gov
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Mr. Herrington:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:52 PM
To: Joyce_Kleen@fws.gov
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Joyce:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:51 PM
To: Joyce_Palmer@fws.gov
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Joyce:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the U.S. Fish and Wildlife Service. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:49 PM
To: aholbrook@savethemanatee.org
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Ms. Holbrook:

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Save the Manatee Club. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:48 PM
To: prose@savethemanatee.org
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Dr. Rose:

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Save the Manatee Club. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:43 PM
To: ktripp@savethemanatee.org
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Dr. Tripp:

I hope this email finds you well. I wanted to share that the Southwest Florida Water Management District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Save the Manatee Club. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:37 PM
To: Maria.Merrill@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Maria:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:36 PM
To: Shannon.Wright@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Shannon:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:35 PM
To: Traci.Wallace@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Traci:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:34 PM
To: Tim.MacDonald@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Tim:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:34 PM
To: Philip.Stevens@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Phillip:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:33 PM
To: Eric.Johnson@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Eric:

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doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:32 PM
To: Ron.Mezich@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Ron:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:31 PM
To: Kent.Smith2@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Kent:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:30 PM
To: Stasey.Whichel@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Stasey:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:29 PM
To: Dale.Jones@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Dale:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:28 PM
To: Eric.Nagid@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Eric:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:27 PM
To: Tom.Champeau@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Tom:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Fish and Wildlife Conservation Commission. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:26 PM
To: Ted.Hoehn@MyFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Ted:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:24 PM
To: Eric.Sutton@myFWC.com
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Eric:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:22 PM
To: Jennifer.Adams@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Jennifer:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:20 PM
To: Morgan.Westberry@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Morgan:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:19 PM
To: Jack.Furney@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Mr. Furney:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Department of Environmental Protection. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:18 PM
To: Stephen.m.James@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Mr. James:

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:17 PM
To: Pamela.Flores@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Pam:

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Southwest Florida Water Management District
Springs and Environmental Flows Section
2379 Broad Street, Brookville, FL 34604
1-800-423-1476, extension 4272 (FL only)
352-796-7211, extension 4272
doug.leeper@watermatters.org

Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:15 PM
To: Kristine.p.Morris@dep.state.fl.us
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Hi Kristine:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Department of Environmental Protection. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

Staff are ready for their reevaluations to be thoroughly assessed by an independent scientific peer review panel and made available to the public as well as local, state and federal agencies for review and comment. Peer review is a transparent process and conducted in the Sunshine. Panel meetings will be publicly noticed and include opportunities for public comment. Although each system was reevaluated separately resulting in two draft reports, both reports will be evaluated by a single panel.

Tentative schedule for both systems:

- January-May 2019: Independent scientific peer review
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Your feedback would be appreciated before March 31 to allow staff ample time to review and consider feedback. Thank you in advance for your input.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:13 PM
To: Angela.Chelette@FreshFromFlorida.com
Subject: Chassahowitzka and Homosassa Minimum Flow Reevaluations

Angela:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Department of Agriculture and Consumer Services. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:12 PM
To: Kathleen.Greenwood@FreshFromFlorida.com
Subject: Chassahowitzka and Homosassa Minimum Flow Reevaluations

Hi Kathleen:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Department of Agriculture and Consumer Services. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Oh, and sorry about "volunteering" you during our CFWI teleconference this morning.

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Gabe I. Herrick

From: Doug Leeper
Sent: Friday, February 01, 2019 12:09 PM
To: Yesenia.Escribano@freshfromflorida.com
Subject: Chassahowitzka and Homosassa Minimum Flow Reevaluations

Yesenia:

I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Florida Department of Agriculture and Consumer Services. As you know, a minimum flow sets a limit on how much water can be withdrawn from various water resources to prevent significant harm occurring to those resources or the ecology of the area.

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Gabe I. Herrick

From: Doug Leeper
Sent: Wednesday, January 30, 2019 11:21 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

From: Brad Rimbey <brimbey3@tampabay.rr.com>
Sent: Wednesday, January 30, 2019 11:05 AM
To: Doug Leeper <Doug.Leeper@swfwmd.state.fl.us>
Subject: Re: Chassahowitzka and Homosassa MFLs Reevaluations

Thanks Doug. Nice talking with you yesterday. I have already downloaded the peer review drafts for the Chaz and Homosassa MFLs and I am still reviewing them.

I'll skip the Feb 8, 8:30 a.m. meeting in Brooksville but I plan to meet the peer review panel at the Chaz boat ramp on Feb 8. I emailed the agenda to a few folks at the Homosassa River Alliance in case they want to be involved in a meet and greet there. I'll skip that one. The snook population in the Homosassa main spring is typically impressive this time of year.

I'm puzzled by the District's interpretation of the adopted F.A.C. requirement for reevaluation of the Chaz & Homosassa MFLs to be completed within six years of March 2013 but I don't intend to make a big deal of it.

Brad Rimbey

On 1/30/2019 9:57 AM, Doug Leeper wrote:

> Brad:
>
> I hope this email finds you well. I wanted to share that the District is reevaluating the minimum flows for the Chassahowitzka and Homosassa river systems, which may be of interest to you and the Chassahowitzka River Conservation Coalition, Homosassa River Alliance, Withlacoochee Aquatic Restoration and the FL Springs Council.
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Gabe I. Herrick

From: Doug Leeper
Sent: Wednesday, January 30, 2019 10:47 AM
To: MFLComments
Subject: FW: Chassahowitzka and Homosassa MFLs Reevaluations

From: Doug Leeper
Sent: Wednesday, January 30, 2019 9:58 AM
To: 'Brad Rimbey' <brimbey3@tampabay.rr.com>
Subject: Chassahowitzka and Homosassa MFLs Reevaluations

Brad:

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Gabe I. Herrick

From: Gabe I. Herrick
Sent: Friday, January 18, 2019 12:31 PM
To: MFLComments
Subject: Forwarding correspondence with Brad Rimbey prior to January 18, 2019
Attachments: Re: [SWFWMD] Chassahowitzka/Homosassa MFLs; RE: [SWFWMD] Chassahowitzka/Homosassa MFLs; Re: [SWFWMD] Chassahowitzka/Homosassa MFLs; Re: [SWFWMD] Chassahowitzka/Homosassa MFLs; RE: [SWFWMD] Chassahowitzka/Homosassa MFLs; Re: [SWFWMD] Chassahowitzka/Homosassa MFLs; RE: [SWFWMD] Chassahowitzka/Homosassa MFLs; Re: [SWFWMD] Chassahowitzka/Homosassa MFLs; RE: [SWFWMD] Chassahowitzka/Homosassa MFLs; Re: [SWFWMD] Chassahowitzka/Homosassa MFLs; RE: [SWFWMD] Chassahowitzka/Homosassa MFLs; Re: [SWFWMD] Chassahowitzka/Homosassa MFLs; Re: [SWFWMD] Chassahowitzka/Homosassa MFLs; RE: [SWFWMD] Chassahowitzka/Homosassa MFLs; [SWFWMD] Chassahowitzka/Homosassa MFLs

6.13-19

Dear Dr. Herrick,

I Am 78 years old and live on The main canal of The chassahowitzka River (since 1984). My grandfather & father have been coming here from Tampa since the 1920's & I have been coming here since The 40's. NaTura I expected changes in my river.

What I didn'T expecT was To see springs drieing up, or Trees dieing from salT wat- inTrusion. Fishing is so bad some of The guides aren'T Taking charTers. Birds are declining rapidly - Butterflies also. Some of This is climate change, some from The MFl already imposed on our water. Also There is The matter of giving our water in Citrus Co To Westlies! We can't call it The Natur Coast Anymore —

It is a sad day when people sitting on a board thi They have The right To do a "Balancing act" with our environment! The main Balance is Toward Real estate + Support of The Sugar cane industries — both of which are roapidly Killing our once lovely, Beautiful state.

Please consider The lives of my children + grandchild Please do NOT Take further wate from our rivers —

Sincerely
Lynda Gourlie-Case
(A U. of F. graduat
10090 S. Riviera P
Homosassa, Fl. 3444