

# Hydrologic Conditions

for the month of

## November 2017

Prepared by the  
**Hydrologic Data Section**  
**Data Collection Bureau**



December 12, 2017

<http://www.watermatters.org>

## **ACKNOWLEDGMENTS**

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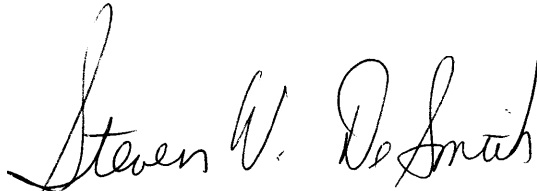
## INTRODUCTION

The Hydrologic Conditions Report is generated monthly by the Hydrologic Data Section, Data Collection Bureau, of the Southwest Florida Water Management District. This report provides an end-of-month analytical summary of regional and temporal variations in the hydrologic conditions across the District's 16-county area for planning and regulatory purposes. In addition, it provides an excellent historical record for long-term local and regional hydrologic analysis.

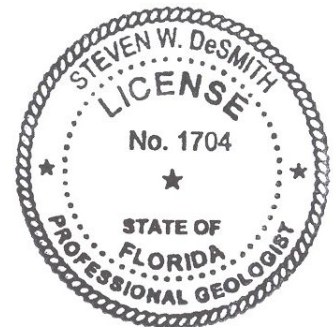
The Hydrologic Data Section is responsible for the implementation and maintenance of a network of observation and monitoring stations used to track changes in various hydrologic parameters over time. Data collected are used by the regulatory, technical, and analytical sections of the District. Data recently collected and maintained by the section include: station and basin rainfall totals, stream and spring discharge measurements, and surface and ground water levels. Frequency of data collection ranges from hourly to monthly readings. All data collected are processed and analyzed, then uploaded into the Water Management Data Base for general access by the District. The Water Management Data Base is also periodically augmented from the United States Geological Survey's hydrologic data network.

The data presented in this report are monthly rainfall totals, streamflow, springflow, surface and ground water levels, reservoir levels and the Aquifer Resource Index. Associated maps of station locations are at the end of the report in the Appendices. Also reported herein are levels of public supply surface water reservoirs supplemented by various regional utilities. The data contained in this report was collected and analyzed in accordance with generally accepted procedures consistent with applicable scientific and technical standards of practice. The data presented are considered to be the best available at the time of publication and are subject to revision. Any questions about the significance, accuracy, or interpretation of these data should be referred to Granville Kinsman, Manager of the Hydrologic Data Section at (352) 796-7211 or (800) 423-1476, extension 4284.

The data evaluation, analyses and interpretation contained within this report have been prepared or approved by a certified Professional Geologist in accordance with Chapter 492, Florida Statutes.



Registration #PG-1704



### Americans with Disabilities Act (ADA)

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## **EXECUTIVE SUMMARY**

### **Provisional Hydrologic Conditions as of December 7, 2017**

Provisional rainfall totals are provided for the period of December 1, 2017 through December 6, 2017. The northern region has received “no measurable” rainfall, while the historic mean for the northern region for the month of December is 2.55 inches. The central region has received “no measurable” rainfall, while the historic mean for the central region for December is 2.27 inches. The southern region has received “no measurable” rainfall, while the historic mean for the southern region for December is 1.82 inches. District-wide, “no measurable” rainfall has been received, while the historic mean for the District for December is 2.21 inches.

Provisional lake level data indicate that during the first 6 days of December, regional water levels have decreased in all four regions of the District. Average lake levels in the Northern region decreased an average of 0.08 foot and were 0.43 foot below the base of the normal range. Average lake levels in the Tampa Bay region decreased 0.08 foot and were 1.04 feet above the base of the normal range. Lake levels in the Polk Uplands region decreased 0.03 foot and were 1.96 feet above the base of the normal range. The Lake Wales Ridge region posted an average decrease of 0.06 foot and were 0.91 foot above the base of the normal range.

As of December 4, 2016, provisional streamflow data indicates, based on regional index rivers, that average streamflow decreased in all three regions of the District, compared to last month's data. Normal streamflow is flow that falls on or between the 25<sup>th</sup> and 75<sup>th</sup> percentiles. The average streamflow for the Withlacoochee River near Holder in the northern region was slightly above-normal at the 77<sup>th</sup> percentile. The average streamflow for the Hillsborough River near Zephyrhills in the central region was within the normal range at the 61<sup>st</sup> percentile, while flow in the Peace River at Arcadia in the southern region was within the normal range at the 59<sup>th</sup> percentile.

Provisional groundwater data, as of December 4, 2016, indicate that levels in the intermediate and Floridan aquifers have decreased in all three regions of the District, compared to last month's data. Normal aquifer levels are levels that fall on or between the 25<sup>th</sup> and 75<sup>th</sup> percentiles. Aquifer levels for the northern region were at the 68<sup>th</sup> percentile, while levels in the central region were also at the 68<sup>th</sup> percentile and levels in the southern region were at the 65<sup>th</sup> percentile.

## **EXECUTIVE SUMMARY**

### **Hydrologic Conditions for November 2017**

In November, average rainfall totals were above-normal in the northern region of the District, while they were below-normal in the central and southern regions. The normal range for rainfall is defined by totals that fall on or between the 25<sup>th</sup> to 75<sup>th</sup> percentiles of the historical monthly accumulation for each region and where the 50<sup>th</sup> percentile represents the historical mean. The northern region received an average of 3.02 inches of rainfall, equivalent to the 78<sup>th</sup> percentile of the historical November record. The central region received an average of 0.46 inch of rainfall, equivalent to the 22<sup>nd</sup> percentile, while the southern region received an average of 0.63 inch of rainfall, equivalent to the 24<sup>th</sup> percentile of the historical November record. The District-wide rainfall average of 1.23 inches was equivalent to the 43<sup>rd</sup> percentile of the historical November record.

During the 12-month period from December 1, 2016 through November 30, 2017, the average rainfall totals in the northern, central and southern regions were classified as “normal.” The northern region received an average of 51.80 inches of rainfall, equivalent to the 40<sup>th</sup> percentile of the historical annual record. The central region received an average of 51.32 inches of rainfall, equivalent to the 47<sup>th</sup> percentile, while the southern region received an average of 56.98 inches of rainfall, equivalent to the 73<sup>rd</sup> percentile. The District-wide rainfall average of 53.41 inches was equivalent to the 55<sup>th</sup> percentile of the historical annual record.

Average lake levels in November were below the annual normal range in the northern region of the District, while levels were within the annual normal range in the Tampa Bay, Polk Uplands and Lake Wales Ridge regions. Normal lake levels are defined as levels that fall between the minimum low management level and the minimum flood level. Lake levels in the Northern region decreased by an average of 0.20 foot and were 0.35 foot below the base of the annual normal range. Lake levels in the Tampa Bay region decreased an average of 0.36 foot and were 1.12 feet above the base of the annual normal range. Lake levels in the Polk Uplands region decreased 0.26 foot and were 1.99 feet above the base of the annual normal range. Average lake levels in the Lake Wales Ridge region decreased by 0.32 foot and ended the month 0.97 foot above the base of the annual normal range.

Total streamflow in November, based on three regional index streams, was at the upper-end of the normal range in all three regions of the District. Normal streamflow is defined as the flow that falls on or between the 25<sup>th</sup> and 75<sup>th</sup> percentiles. Streamflow measured at the Withlacoochee River near Holder station in the northern region was in the 71<sup>st</sup> percentile. Streamflow in the Hillsborough River near Zephyrhills station in the central region was in the 70<sup>th</sup> percentile, while total streamflow measured at the Peace River at Arcadia station in the southern region was in the 67<sup>th</sup> percentile during November.

In November, groundwater data showed that levels in the intermediate and Floridan aquifers were at the upper-end of the normal range in all three regions of the District. The normal range is defined as the level that falls on or between the 25<sup>th</sup> and 75<sup>th</sup> percentiles. The groundwater level in the northern, central and southern regions were in the 70<sup>th</sup>, 73<sup>rd</sup> and 69<sup>th</sup> percentiles, respectively.

## REGIONAL OVERVIEW OF HYDROLOGIC CONDITIONS

### NOVEMBER 2017

#### **Northern Region**

In November, the northern region received an average of 3.02 inches of rainfall, equivalent to the 78<sup>th</sup> percentile of the historical November readings, which is considered "wetter than normal." Average lake levels decreased in the northern region and ended the month an average of 0.35 foot below the base of the annual normal range. Total streamflow measured in the Withlacoochee River near Holder station decreased and was in the 71<sup>st</sup> percentile. Regional groundwater levels indicated average surficial aquifer water levels decreased and were in the 60<sup>th</sup> percentile, while levels in the intermediate and Floridan aquifer decreased and were in the 70<sup>th</sup> percentile.

#### **Central Region**

In November, the central region received an average of 0.46 inch of rainfall, equivalent to the 22<sup>nd</sup> percentile of historical November readings, which is considered "drier than normal." Average lake levels decreased in the Tampa Bay and Polk Uplands regions, ending the month 1.12 and 1.99 feet, respectively, above the base of the annual normal range. Total streamflow measured at the Hillsborough River near Zephyrhills station decreased and was in the 70<sup>th</sup> percentile. Regional groundwater levels indicated average surficial aquifer water levels decreased and were in the 72<sup>nd</sup> percentile, while levels in the intermediate and Floridan aquifer decreased and were in the 73<sup>rd</sup> percentile.

#### **Southern Region**

In November, the southern region received an average of 0.63 inch of rainfall, equivalent to the 24<sup>th</sup> percentile of historical November readings, which is considered "drier than normal." Average lake levels decreased in the Lake Wales Ridge region and ended the month 0.97 foot above the base of the annual normal range. Total streamflow measured at the Peace River at Arcadia station decreased and was in the 67<sup>th</sup> percentile. Regional groundwater levels indicated average surficial aquifer water levels decreased and were in the 69<sup>th</sup> percentile, while levels in the intermediate and Floridan aquifer decreased and were in the 69<sup>th</sup> percentile.

## RAINFALL

The rainfall data used for all tabulations in this report are provided to the District under contract with an external vendor. These data are created by enhancing contractor-developed NEXRAD radar rainfall imagery with hourly rainfall data collected from the District's network of real-time gauges. This process results in highly accurate cell-based rainfall data representative of conditions over the entire District, including those portions where rainfall data collection would otherwise be limited due to gaps in the gauging network.

As defined by the United States Geological Survey (USGS), a percentile is a value on a scale of one hundred that indicates the percent of a distribution that is equal to or below it. For example, a rainfall total equivalent to the 90<sup>th</sup> percentile is equal to or greater than 90 percent of the rainfall totals recorded for this month during all years that totals have been recorded.

Percentiles for rainfall were calculated from the historical record by region, and by specific interval. The "wet season" total is the sum of the rainfall from June through September. The "dry season" total is the sum of the rainfall from October through May. The annual total characterization was calculated from a dataset of moving 12-month rainfall sum for the same period (1915 through the most recent completed year). The moving 12-month rainfall sum was used for annual statistics because it provided a much larger dataset, and therefore a better estimate of the true percentiles. The historical 12-month cumulative average is updated monthly.

Characterization ranges were established for each region, and for the whole District, with breaks at the 10<sup>th</sup> (P10), the 25<sup>th</sup> (P25), the 75<sup>th</sup> (P75) and the 90<sup>th</sup> (P90) percentiles. The rainfall in inches for each percentile break, by rainfall interval and by region and the characterization ranges are summarized in the Appendix.

In November, rainfall totals were above-normal in the northern region of the District, while they were below-normal in the central and southern regions. The normal range for rainfall is defined by totals that fall on or between the 25<sup>th</sup> to 75<sup>th</sup> percentiles of the historical monthly average for each region and where the 50<sup>th</sup> percentile represents the historical mean. The northern region received an average of 3.02 inches of rainfall, equivalent to the 78<sup>th</sup> percentile of the historical November record. The central region received an average of 0.46 inch, equivalent to the 22<sup>nd</sup> percentile, while the southern region received an average of 0.63 inch, equivalent to the 24<sup>th</sup> percentile. District-wide, rainfall averaged 1.23 inches, which is equivalent to the 43<sup>rd</sup> percentile of the historical November record.

During the 12-month period from December 1, 2016 through November 30, 2017, the average rainfall totals in the northern, central and southern regions of the District were classified as "normal." The northern region received an average of 51.80 inches of rainfall, equivalent to the 40<sup>th</sup> percentile of the historical record. The central region received an average of 51.32 inches of rainfall, equivalent to the 47<sup>th</sup> percentile. The southern region received an average of 56.98 inches of rainfall, equivalent to the 73<sup>rd</sup> percentile. The District-wide rainfall average was 53.41 inches, which is equivalent to the 55<sup>th</sup> percentile of the historical annual record.

## **Tampa Monthly Climate Summary for November 2017**

According to the National Weather Service, the monthly average temperature (°F) for Tampa was 72.1 degrees, which was 3.0 degrees above normal. The highest temperature recorded during the month was 86.0 degrees, while the lowest temperature recorded during the month was 51.0 degrees. The November 2017 monthly average temperature of 72.1 degrees ranks as the 9<sup>th</sup> warmest November since records began in 1890. The warmest November had an average temperature of 76.3 degrees, which occurred in 1986.

## **Temperature and Precipitation Outlook**

The Climate Prediction Center's (CPC) three-month weather forecast, as of November 16, 2017, indicates below-normal rainfall throughout the District during the composite 3-month period from December 2017 through February 2018. The temperature forecast for this same time-period indicates above-normal temperatures in all three regions of the District.

[Note: Due to the early publication date for this report of December 12, 2017, the CPC's December 21, 2017 forecast report was unavailable].

For more information log on to the CPC's website at:

[http://www.cpc.ncep.noaa.gov/products/OUTLOOKS\\_index.html](http://www.cpc.ncep.noaa.gov/products/OUTLOOKS_index.html)

## RELATIONSHIP OF NOVEMBER 2017 RAINFALL TO HISTORICAL RAINFALL AVERAGES

### Regional Summary:

<i>Region</i>	<i>NOV 2017 Average Rainfall</i>	<i>Historical Average for NOV</i>	<i>Departure from Historical Average</i>	<i>Calendar Year 2017 Cumulative Rainfall JAN-NOV</i>	<i>Calendar Year Historical Cumulative Rainfall JAN-NOV</i>	<i>Departure from Historical Cumulative NOV 2017</i>	<i>Cumulative 12-month Rainfall DEC 2016- NOV 2017</i>	<i>Historical 12-month Cumulative Rainfall</i>	<i>Departure from Historical 12-month Cumulative</i>
Northern Counties	3.02	1.97	1.05	51.11	50.94	0.17	51.80	53.47	-1.67
Central Counties	0.46	1.82	-1.36	50.58	50.03	0.55	51.32	52.34	-1.02
Southern Counties	0.63	1.76	-1.13	56.42	50.54	5.88	56.98	52.37	4.61
District All Counties	1.23	1.84	-0.61	52.75	50.46	2.29	53.41	52.66	0.75

### Regional Counties Summary:

<i>NORTHERN COUNTIES</i>	<i>NOV 2017 Average Rainfall</i>	<i>Historical Average for NOV</i>	<i>Departure from Historical Average</i>	<i>Calendar Year 2017 Cumulative Rainfall JAN-NOV</i>	<i>Calendar Year Historical Cumulative Rainfall JAN-NOV</i>	<i>Departure from Historical Cumulative NOV 2017</i>	<i>Cumulative 12-month Rainfall DEC 2016- NOV 2017</i>	<i>Historical 12-month Cumulative Rainfall</i>	<i>Departure from Historical 12-month Cumulative</i>
Levy County	2.78	2.09	0.69	47.37	50.86	-3.49	48.13	53.79	-5.66
Marion County	4.28	2.08	2.20	53.50	51.47	2.03	54.34	54.17	0.17
Citrus County	3.73	1.93	1.80	49.81	51.39	-1.58	50.43	53.97	-3.54
Sumter County	2.18	1.91	0.27	51.78	49.45	2.33	52.54	51.86	0.68
Hernando County	2.37	1.96	0.41	51.57	52.46	-0.89	52.02	54.94	-2.92
<i>CENTRAL COUNTIES</i>									
Pasco County	0.93	1.92	-0.99	51.19	51.62	-0.43	51.62	54.00	-2.38
Pinellas County	0.65	1.85	-1.20	44.07	49.33	-5.26	44.55	51.70	-7.15
Hillsborough County	0.24	1.79	-1.55	51.21	50.39	0.82	51.77	52.58	-0.81
Polk County	0.36	1.76	-1.40	51.06	49.95	1.11	52.12	51.96	0.16
<i>SOUTHERN COUNTIES</i>									
Manatee County	0.35	1.82	-1.47	50.28	51.46	-1.18	50.94	53.43	-2.49
Hardee County	0.96	1.69	-0.73	55.48	50.35	5.13	56.20	52.08	4.12
Highlands County	1.10	1.72	-0.62	57.97	50.48	7.49	58.98	52.01	6.97
Sarasota County	0.51	1.82	-1.31	57.54	50.78	6.76	57.88	52.64	5.24
DeSoto County	0.57	1.70	-1.13	58.43	50.15	8.28	58.81	51.82	6.99
Charlotte County	0.52	1.68	-1.16	62.99	50.83	12.16	63.37	52.50	10.87

## NOVEMBER 2017 RAINFALL CHARACTERIZATION

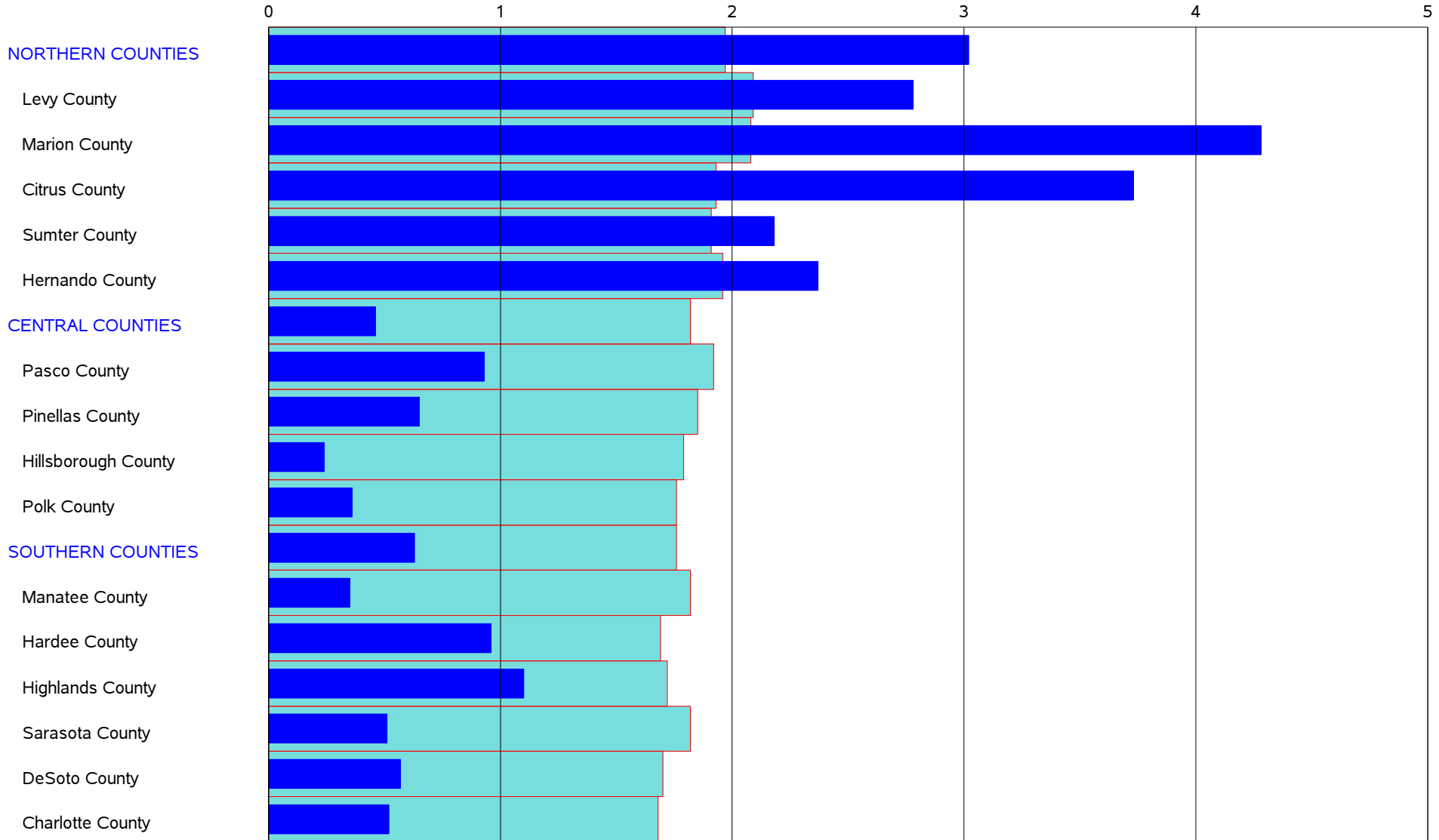
### Regional Characterization:

<i>Region</i>	<i>NOV 2017 Average Rainfall</i>	<i>Historical NOV Percentile</i>	<i>NOV Rainfall Characterization</i>	<i>Cumulative 12-month Rainfall DEC 2016- NOV 2017</i>	<i>Historical 12-month Cumulative Percentile</i>	<i>12-month Cumulative Rainfall Characterization</i>
Northern Counties	3.02	78	Wetter than normal	51.80	40	Normal
Central Counties	0.46	22	Drier than normal	51.32	47	Normal
Southern Counties	0.63	24	Drier than normal	56.98	73	Normal
District Counties	1.23	43	Normal	53.41	55	Normal

### Regional Counties Characterization:

<i>NORTHERN COUNTIES</i>	<i>NOV 2017 Average Rainfall</i>	<i>Historical NOV Percentile</i>	<i>NOV Rainfall Characterization</i>	<i>Cumulative 12-month Rainfall DEC 2016- NOV 2017</i>	<i>Historical 12-month Cumulative Percentile</i>	<i>12-month Cumulative Rainfall Characterization</i>
Levy County	2.78	69	Normal	48.13	29	Normal
Marion County	4.28	89	Wetter than normal	54.34	51	Normal
Citrus County	3.73	84	Wetter than normal	50.43	35	Normal
Sumter County	2.18	66	Normal	52.54	51	Normal
Hernando County	2.37	71	Normal	52.02	39	Normal
<i>CENTRAL COUNTIES</i>						
Pasco County	0.93	34	Normal	51.62	41	Normal
Pinellas County	0.65	31	Normal	44.55	25	Normal
Hillsborough County	0.24	10	Drier than normal	51.77	49	Normal
Polk County	0.36	17	Drier than normal	52.12	53	Normal
<i>SOUTHERN COUNTIES</i>						
Manatee County	0.35	12	Drier than normal	50.94	42	Normal
Hardee County	0.96	44	Normal	56.20	70	Normal
Highlands County	1.10	46	Normal	58.98	81	Wetter than normal
Sarasota County	0.51	21	Drier than normal	57.88	73	Normal
DeSoto County	0.57	26	Normal	58.81	77	Wetter than normal
Charlotte County	0.52	30	Normal	63.37	88	Wetter than normal

## NOVEMBER 2017 RAINFALL HISTORIC AVERAGE VS HISTORICAL NOVEMBER AVERAGE (INCHES)



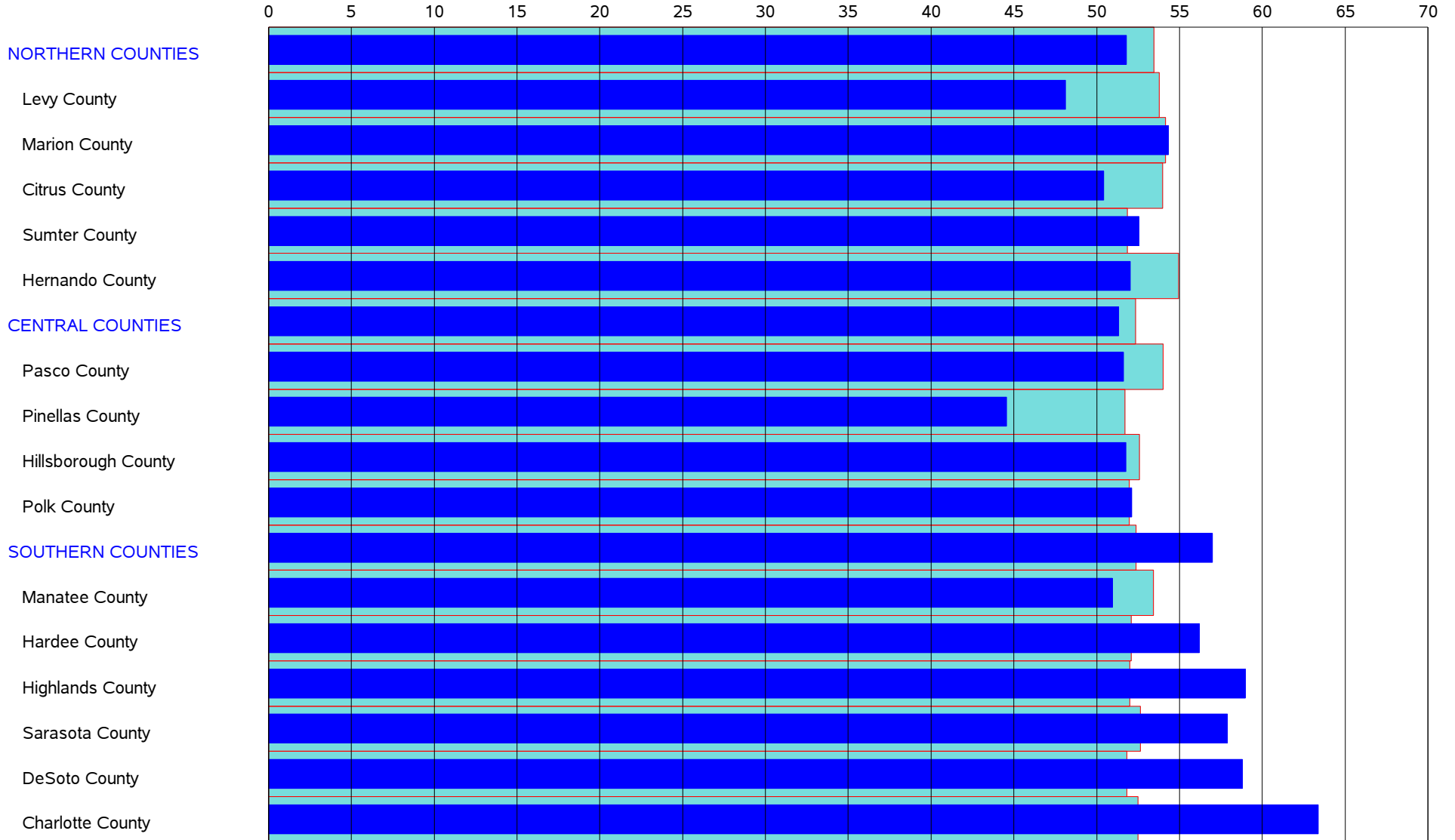
November 2017 Rainfall



Historical November Average Rainfall



## NOVEMBER 2017 12-MONTH CUMULATIVE RAINFALL VS AVERAGE ANNUAL CUMULATIVE (INCHES)



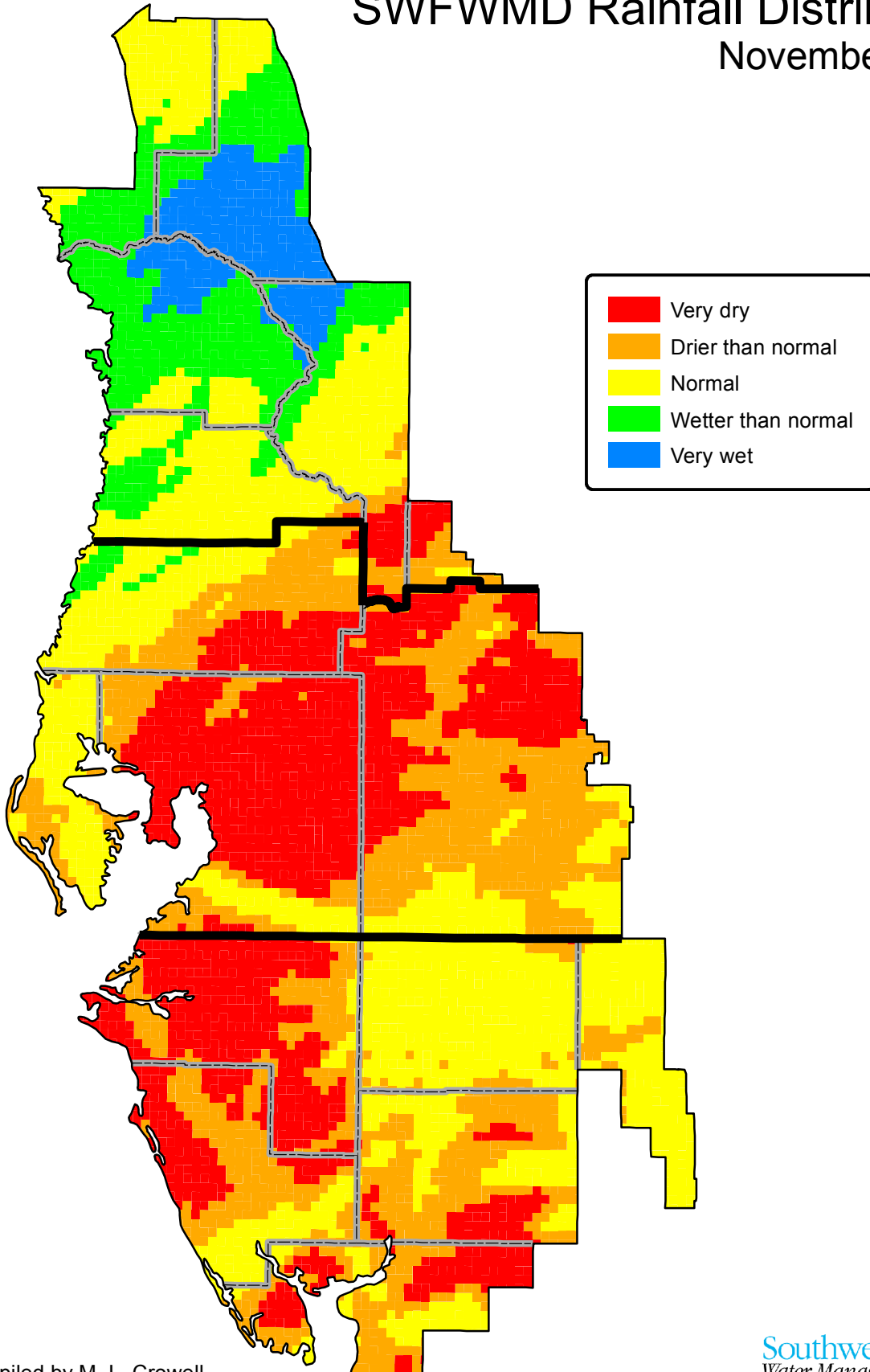
12-month Cumulative Rainfall



Average 12-month Cumulative

# SWFWMD Rainfall Distribution

## November 2017

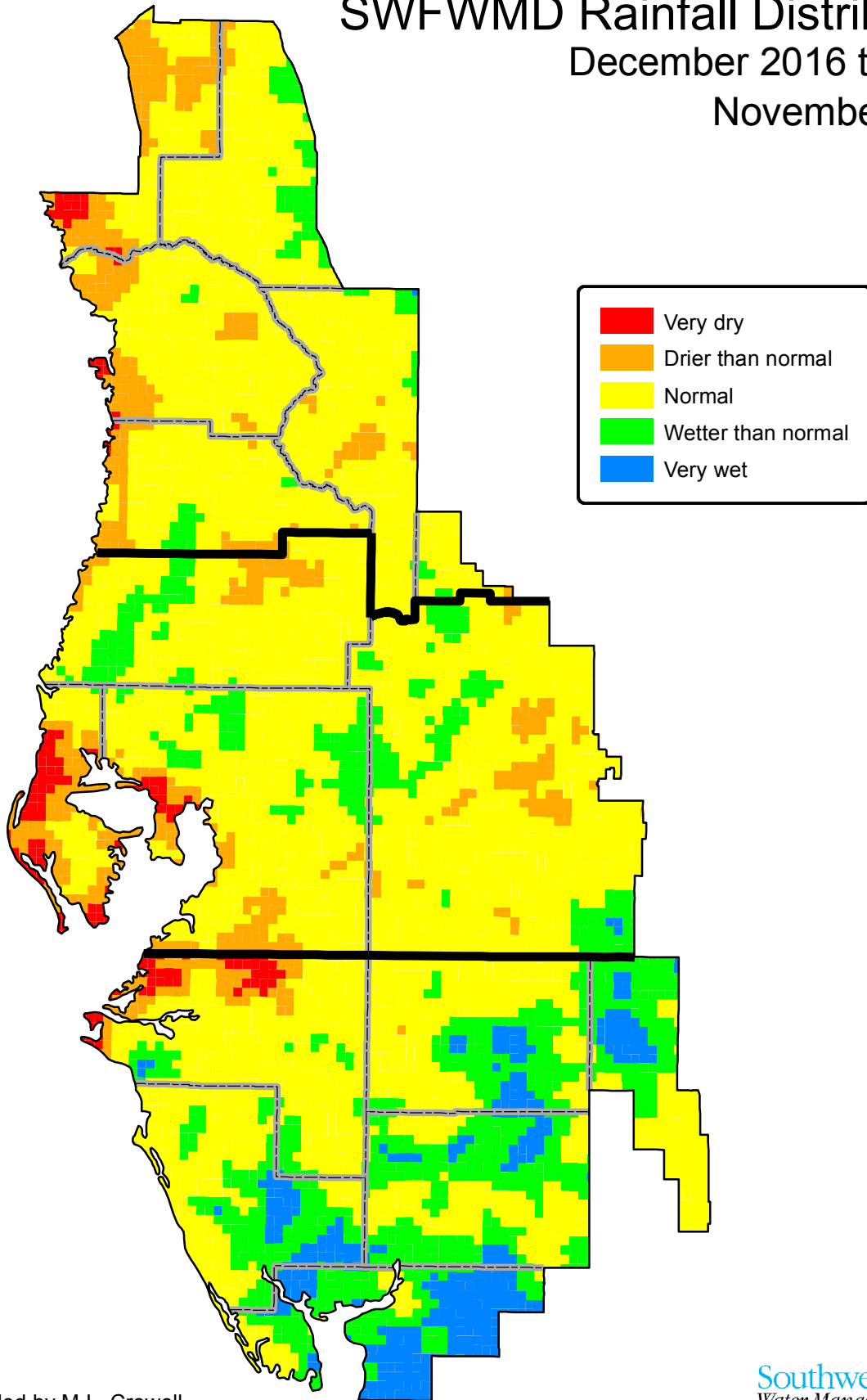


Compiled by M. L. Crowell  
Data source: Vieux, Inc.

Southwest Florida  
Water Management District

# SWFWMD Rainfall Distribution

December 2016 through  
November 2017



Compiled by M.L. Crowell  
Data source: Vieux, Inc.

Southwest Florida  
Water Management District

## SURFACE WATER

### Lakes

Across the District, 76 lakes have been selected as excellent indicators of current surface water conditions (see index map in Appendix). Water levels of these lakes are read monthly. In general, these lakes are concentrated in four regions, the northern region of Citrus, Hernando, and Sumter Counties, the Tampa Bay region of Hillsborough and Pasco Counties, the Polk Uplands region of northern Polk County, and the Lake Wales Ridge region of Polk and Highlands Counties. In this report, current monthly lake levels are tabulated and compared with previous records as well as District-established management levels. In addition, lake-level data representative of the four regions are presented in hydrographs showing a 15-year history of water levels, as a general indicator of surface-water conditions in that region.

The District's Governing Board (the Board) has established lake management levels for approximately 410 lakes within District boundaries, which are specified in Chapter 40D-8, Florida Administrative Code (F.A.C.). Management levels help protect the water resources of the District and the ecology of the lake or water-body for which it was established. In this report, the following three management levels are used to indicate normal and low lake levels: the Minimum Flood (MF) level, the Minimum Low Management (MLM) level, and the Minimum Extreme Low Management (MELM) level. In general, the MF level corresponds to the normal high level, the MLM to the normal low level, and the MELM to a drought-year low. These levels were derived from various sources, including technical publications, topographic maps, Water Resource Data Reports of the USGS, and other studies. Field investigations are also used to determine past surface levels from water marks, wetland vegetation, dry land vegetation, and to establish the elevation of septic tanks, docks, sea walls, roads and floor slabs.

During a normal year, each of the indicator lakes should reach both the designated normal high (MF) and the normal low (MLM) levels. In addition, it is generally beneficial for lakes to reach the adopted drought year low (MELM) level every four to six years for a short period of time for the biological health of the lake. In this report, hydrographs of representative lakes compare current and recent water levels against “**normal ranges**” defined by the adopted MF and MLM levels.

Of the 76 lakes presented in this report, 17 have water-control structures. These structures are used for water conservation and do not generally influence the water levels with regard to meteorologically wet or dry conditions. During periods of extreme high water, the structures may be operated to minimize flooding.

During November, 72 of the 76 lakes monitored for this report recorded water level decreases, while 4 recorded increases, compared to last month. Water levels decreased in the Northern, Tampa Bay, Polk Uplands and Lake Wales Ridge regions by 0.20, 0.36, 0.26 and 0.32 foot, respectively. District-wide, average water levels decreased by 0.30 foot, compared to last month.

In November, 59 of the 76 lakes monitored for this report recorded water level increases, 15 recorded decreases, while one was unchanged, compared to last year's levels. Water level data for last year was missing for Lake Alice. In the Northern, Tampa Bay, Polk Uplands and Lake Wales Ridge regions, average lake levels were higher by 0.15, 0.19, 0.39 and 0.34 foot, respectively. District-wide, average lake levels were higher by 0.25 foot, compared to last year's levels.

Water levels in 61 of the 76 lakes were above the base of the annual normal range, 14 were below, while one had a level equal to the "base level." Lake levels in the Northern region averaged 0.35 foot below the base of the annual normal range, while levels in the Tampa Bay, Polk Uplands and Lake Wales Ridge regions averaged 1.12, 1.99 and 0.97 feet, respectively, above the base of the normal range. District-wide, lake levels averaged 1.03 feet above the base of the annual normal range. Water levels in 72 of the 76 lakes were above the drought-year levels.

## SUMMARY OF LAKE ELEVATIONS OF REGIONAL LAKES (feet)

NORTHERN LAKES						Change	Change	Diff	(MELM)	(MLM)	(MF)	Period		Period	
Lake Name	County	Beginning of Record	OCT 2017	NOV 2017	NOV 2016	from OCT 2017	from NOV 2016	from MELM	Drought Year Low	Normal Year Low	Normal Year High	of Record Low	Record Low Date	of Record High	Record High Date
Big Fish Lake	Pasco	1980	73.55	73.05	73.73	-0.50	-0.68	1.30	71.75	73.05	76.05	65.45	JUN 1997	77.40	SEP 2004
Crews Lake	Pasco	1986	53.08	52.48	51.80	-0.60	0.68	2.48	50.00	52.00	55.00	42.63	APR 2001	54.92	MAR 1998
Hancock Lake	Pasco	1978	99.36	98.98	101.09	-0.38	-2.11	-3.02	102.00	104.00	106.50	90.00	MAR 2009	108.90	MAR 1998
Hunters Lake	Hernando	1965	16.71	17.05	17.37	0.34	-0.32	1.05	16.00	17.50	20.50	11.70	JUN 2001	20.50	MAR 1970
Lake Iola	Pasco	1965	139.29	138.91	140.11	-0.38	-1.20	-3.59	142.50	145.00	147.50	128.96	MAY 2012	148.70	JAN 1989
Lake Lindsey	Hernando	1982	65.35	65.25	64.30	-0.10	0.95	0.75	64.50	66.00	69.00	59.38	MAY 2012	69.47	MAR 1998
Little Lake (Consu	Citrus	1985	41.20	40.99	39.88	-0.21	1.11	3.74	37.25	39.00	41.50	31.10	MAY 2001	42.84	SEP 2004
Lake Miona	Sumter	1978	52.37	52.62	50.51	0.25	2.11	1.62	51.00	53.00	55.00	47.88	AUG 1992	56.60	OCT 1982
Moon Lake	Pasco	1990	40.01	39.75	39.32	-0.26	0.43	4.25	35.50	37.50	40.50	32.98	APR 2009	41.26	SEP 2004
Lake Panasoffkee	Sumter	1955	40.24	39.72	38.42	-0.52	1.30	1.22	38.50	39.50	42.50	36.92	JUN 2007	44.28	APR 1960
Lake Pasadena	Pasco	1984	91.42	91.07	92.03	-0.35	-0.96	1.07	90.00	91.50	94.50	81.56	MAY 2001	94.86	OCT 2004
Spring Lake	Hernando	1965	180.25	180.15	180.67	-0.10	-0.52	1.90	178.25	181.25	184.25	174.85	JUN 1965	183.57	OCT 1984
Floral City Pool	Citrus	1957	41.49	41.36	40.38	-0.13	0.98	3.11	38.25	40.25	42.50	30.35	JUN 2001	44.22	MAR 1960
Inverness Pool	Citrus	1958	39.65	39.68	39.32	0.03	0.36	3.43	36.25	38.25	40.50	31.46	MAY 2001	42.94	APR 1960
Hernando Pool	Citrus	1958	38.27	38.25	38.17	-0.02	0.08	3.50	34.75	36.75	39.00	31.09	JUL 2001	41.74	APR 1960

TAMPA BAY LAKES															
Lake Name	County	Beginning of Record	OCT 2017	NOV 2017	NOV 2016	Change from OCT 2017	Change from NOV 2016	Diff from MELM	(MELM) Drought Year Low	(MLM) Normal Year Low	(MF) Normal Year High	Period of Record Low	Record Low Date	Period of Record High	Record High Date
Lake Alice	Hillsborough	1971	40.95	40.56	M	-0.39	M	3.06	37.50	40.25	42.25	33.24	MAY 2002	42.42	SEP 2004
Lake Ann-Parker	Pasco	1969	47.23	46.95	46.97	-0.28	-0.02	1.95	45.00	45.75	48.75	43.28	JUN 2002	49.29	SEP 1979
Bay Lake	Hillsborough	1982	45.66	45.43	45.02	-0.23	0.41	2.93	42.50	44.00	46.75	41.86	APR 1985	46.46	DEC 1997
Lake Brant	Hillsborough	1971	58.19	57.71	57.50	-0.48	0.21	3.21	54.50	56.50	58.75	51.65	JUN 1994	60.04	AUG 1979
Brooker Lake	Hillsborough	1977	62.83	62.48	62.27	-0.35	0.21	3.48	59.00	61.00	64.25	56.49	MAY 2002	64.08	DEC 1997
Calm Lake	Hillsborough	1965	50.15	49.81	49.84	-0.34	-0.03	4.81	45.00	47.50	50.50	41.88	JUN 2002	51.04	JUL 2015
Camp Lake	Pasco	1968	62.54	62.00	61.72	-0.54	0.28	3.00	59.00	61.75	64.00	50.82	MAY 2002	64.05	JUL 2015
Carlton Lake	Hillsborough	1976	92.73	92.19	93.19	-0.54	-1.00	4.19	88.00	90.50	93.50	86.82	MAY 2001	94.60	FEB 1998
Lake Carroll	Hillsborough	1985	36.73	36.39	35.99	-0.34	0.40	3.89	32.50	34.50	37.00	30.87	MAY 2002	38.06	DEC 1997
Church Lake	Hillsborough	1931	35.47	35.26	35.01	-0.21	0.25	3.76	31.50	34.00	36.25	27.94	MAY 2002	38.60	FEB 1936
Lake Cooper	Hillsborough	1946	60.35	59.68	59.42	-0.67	0.26	2.68	57.00	59.75	61.75	55.60	JUN 2001	62.54	SEP 1947
Crescent Lake	Hillsborough	1981	42.13	41.97	41.76	-0.16	0.21	3.47	38.50	40.00	42.50	35.34	JUN 2001	42.89	SEP 2017
Deer Lake	Hillsborough	1977	66.65	66.19	65.80	-0.46	0.39	3.69	62.50	64.50	67.25	60.72	MAY 2002	67.42	DEC 1997
Egypt Lake	Hillsborough	1978	36.64	37.16	35.97	0.52	1.19	4.66	32.50	35.00	37.50	33.06	MAY 2000	38.15	SEP 1985
Gornto Lake	Hillsborough	1979	37.20	36.87	36.82	-0.33	0.05	2.87	34.00	36.00	38.50	29.86	MAR 1979	39.48	FEB 1998
Lake Harvey	Hillsborough	1970	61.21	60.57	60.57	-0.64	0.00	2.57	58.00	60.25	62.50	53.94	MAY 2002	63.90	DEC 1997
Lake Hiawatha	Hillsborough	1981	49.95	49.63	49.55	-0.32	0.08	4.63	45.00	48.00	50.50	46.14	JUN 2000	51.12	APR 2010
Horse Lake	Hillsborough	1930	46.84	46.42	46.24	-0.42	0.18	4.42	42.00	44.00	46.50	36.33	JUN 2002	50.00	AUG 1959
Lake Keene	Hillsborough	1948	62.40	62.38	61.87	-0.02	0.51	3.38	59.00	60.50	63.00	56.92	MAY 1994	63.69	SEP 2017
Keystone Lake	Hillsborough	1984	41.62	41.38	41.13	-0.24	0.25	2.38	39.00	39.75	42.00	37.89	JUN 1994	43.64	AUG 2015
King Lake	Pasco	1983	102.90	102.44	102.14	-0.46	0.30	2.44	100.00	102.50	105.25	94.20	APR 2009	104.80	MAR 1987
Lake Leclare	Hillsborough	1977	51.66	51.17	51.09	-0.49	0.08	4.17	47.00	49.50	52.00	44.95	JUN 2001	52.99	JUL 2015
Lake Linda	Pasco	1969	66.07	65.52	65.00	-0.55	0.52	3.52	62.00	64.00	66.75	60.07	MAY 2001	67.17	SEP 2017
Little Lake	Hillsborough	1931	45.44	45.20	45.04	-0.24	0.16	3.20	42.00	43.50	46.50	38.06	JUN 1994	48.65	AUG 1960
Long Pond	Hillsborough	1978	45.83	45.48	45.29	-0.35	0.19	3.48	42.00	44.00	46.50	36.33	MAY 1979	48.27	SEP 1998
Mud (Walden) Lake	Hillsborough	1978	112.96	112.83	112.75	-0.13	0.08	2.33	110.50	112.50	115.00	111.45	MAY 2017	114.42	MAR 1978
Lake Padgett	Pasco	1965	69.61	69.04	68.84	-0.57	0.20	1.54	67.50	69.00	71.25	66.27	JUN 2001	71.90	SEP 1988
Platt Lake	Hillsborough	1946	49.86	49.40	48.92	-0.46	0.48	3.40	46.00	47.75	50.50	42.53	JUN 2001	51.88	SEP 1979
Rainbow Lake	Hillsborough	1971	39.77	39.31	39.08	-0.46	0.23	4.31	35.00	37.50	40.50	29.82	JUN 2002	40.95	JUL 2015
Lake Stemper	Hillsborough	1946	60.97	60.89	60.37	-0.08	0.52	2.89	58.00	59.50	62.00	53.36	JUN 2001	62.30	MAR 1960
Lake Thomas	Hillsborough	1971	63.05	62.55	62.19	-0.50	0.36	3.30	59.25	61.25	63.50	56.48	JUN 2002	64.48	SEP 1979
Turkey Ford Lake	Hillsborough	1970	51.21	50.35	49.96	-0.86	0.39	0.35	50.00	51.50	54.00	48.07	JUN 1985	55.28	SEP 1988
Lake Wimauma	Hillsborough	1985	81.15	80.70	81.90	-0.45	-1.20	-0.30	81.00	83.00	86.75	70.12	MAY 2001	84.38	MAR 1998

NOTE: M='no data' or 'not determined'

All elevations are referenced to NGVD 1929 datum. Report compiled by Patrick Casey

## SUMMARY OF LAKE ELEVATIONS OF REGIONAL LAKES (feet)

POLK UPLANDS LAKES															
Lake Name	County	Beginning of Record	OCT 2017	NOV 2017	NOV 2016	Change from OCT 2017	Change from NOV 2016	Diff from MELM	(MELM) Drought Year Low	(MLM) Normal Year Low	(MF) Normal Year High	Period of Record Low	Record Low Date	Period of Record High	Record High Date
Lake Alfred	Polk	1961	130.30	130.03	130.22	-0.27	-0.19	3.78	126.25	128.25	130.75	122.40	MAY 1977	132.76	MAR 1998
Lake Ariana	Polk	1945	136.76	136.62	136.38	-0.14	0.24	4.12	132.50	134.50	137.00	131.28	MAY 1976	137.90	AUG 1946
Lake Arietta	Polk	1970	142.66	142.46	141.49	-0.20	0.97	4.46	138.00	141.00	144.00	136.50	MAY 1977	144.12	SEP 2004
Blue Lake South	Polk	1986	115.25	115.11	115.60	-0.14	-0.49	2.61	112.50	114.00	117.00	103.38	FEB 1991	119.19	DEC 2005
Lake Bonny	Polk	1954	131.42	130.89	130.35	-0.53	0.54	4.89	126.00	128.00	130.50	122.34	MAY 2009	133.08	SEP 2004
Lake Buffum	Polk	1972	132.11	131.72	131.20	-0.39	0.52	4.97	126.75	129.25	132.25	123.90	JUN 1991	133.00	JUN 2005
Clearwater Lake	Polk	1979	144.08	143.80	143.78	-0.28	0.02	4.80	139.00	141.00	143.50	137.93	MAY 2001	146.06	AUG 1984
Lake Conine	Polk	1989	128.62	128.56	128.28	-0.06	0.28	4.06	124.50	126.50	128.75	123.83	NOV 2009	129.95	SEP 2004
Eagle Lake	Polk	1965	129.38	129.24	128.96	-0.14	0.28	2.74	126.50	128.50	130.75	118.76	MAY 1976	131.50	SEP 1996
Lake Fannie	Polk	1967	125.45	125.28	124.94	-0.17	0.34	5.28	120.00	123.50	125.75	118.67	MAY 1977	127.51	SEP 2004
Lake Garfield	Polk	1969	103.05	102.18	101.09	-0.87	1.09	2.18	100.00	101.00	104.75	97.38	JUN 2001	105.91	SEP 1979
Lake Hamilton	Polk	1945	121.16	120.92	120.58	-0.24	0.34	3.67	117.25	119.00	121.50	116.61	JUN 2001	124.34	OCT 1948
Lake Helene	Polk	1961	146.70	146.45	143.89	-0.25	2.56	7.45	139.00	141.00	144.00	134.06	JUN 2008	146.71	OCT 2017
Lake Howard	Polk	1987	131.86	131.67	131.20	-0.19	0.47	4.67	127.00	129.50	132.00	127.69	MAY 2001	133.08	SEP 2004
Lake Juliana	Polk	1961	133.16	132.79	132.68	-0.37	0.11	5.29	127.50	130.00	132.50	126.20	MAY 1976	134.10	MAR 1998
Lake Mcleod	Polk	1965	129.71	129.49	129.66	-0.22	-0.17	1.49	128.00	129.50	132.00	115.11	MAY 1976	131.98	SEP 1998
Lake Otis	Polk	1954	127.29	127.14	126.90	-0.15	0.24	4.14	123.00	125.00	128.00	119.58	MAY 1976	129.12	SEP 1960
Lake Ruby	Polk	1971	124.84	124.62	124.61	-0.22	0.01	3.62	121.00	123.00	125.25	117.41	MAY 1976	125.98	SEP 2004
Lake Gibson	Polk	1969	142.91	142.80	142.62	-0.11	0.18	1.30	141.50	141.50	143.50	140.21	MAY 2009	145.40	SEP 1988

LK WALES RIDGE LAKES															
Lake Name	County	Beginning of Record	OCT 2017	NOV 2017	NOV 2016	Change from OCT 2017	Change from NOV 2016	Diff from MELM	(MELM) Drought Year Low	(MLM) Normal Year Low	(MF) Normal Year High	Period of Record Low	Record Low Date	Period of Record High	Record High Date
Lake Annie	Polk	1970	115.45	115.33	115.52	-0.12	-0.19	1.33	114.00	116.00	119.00	108.36	JUN 1990	117.56	OCT 2005
Lake Clay	Highlands	1983	78.59	78.33	77.68	-0.26	0.65	3.33	75.00	76.00	78.75	74.34	MAY 2001	78.82	JUN 2013
Crooked Lake	Polk	1945	119.34	119.02	118.23	-0.32	0.79	2.02	117.00	118.50	122.00	106.10	MAY 1991	123.98	OCT 1948
Lake Jackson	Highlands	1945	102.99	102.74	102.27	-0.25	0.47	4.74	98.00	100.00	103.00	96.47	JUN 2008	103.76	SEP 1947
Lake Letta	Highlands	1951	100.43	99.49	98.97	-0.94	0.52	4.49	95.00	97.00	100.00	90.27	JUN 2008	101.38	OCT 1953
Lake Lotela	Highlands	1950	108.81	108.18	106.96	-0.63	1.22	4.18	104.00	105.00	108.50	96.63	JUN 2008	109.38	JUL 1954
Lake Placid	Highlands	1984	93.38	93.26	92.90	-0.12	0.36	3.26	90.00	91.50	94.50	88.08	JUN 2008	94.24	SEP 2003
Starr Lake	Polk	1983	105.60	105.59	106.46	-0.01	-0.87	-2.41	108.00	110.00	113.00	96.23	JUL 2001	109.80	DEC 2005
Trout Lake	Highlands	1981	99.05	98.80	98.67	-0.25	0.13	3.80	95.00	98.00	101.00	87.15	MAY 2001	99.89	SEP 2016

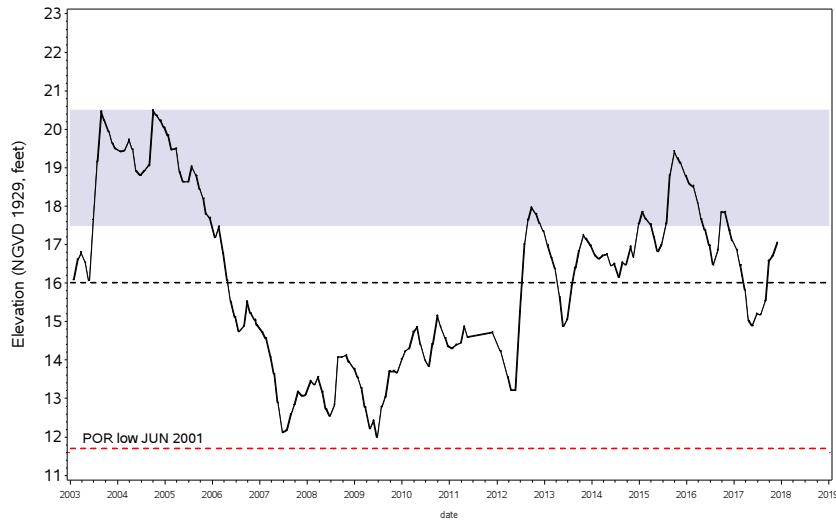
NOTE: M='no data' or 'not determined'

All elevations are referenced to NGVD 1929 datum. Report compiled by Patrick Casey

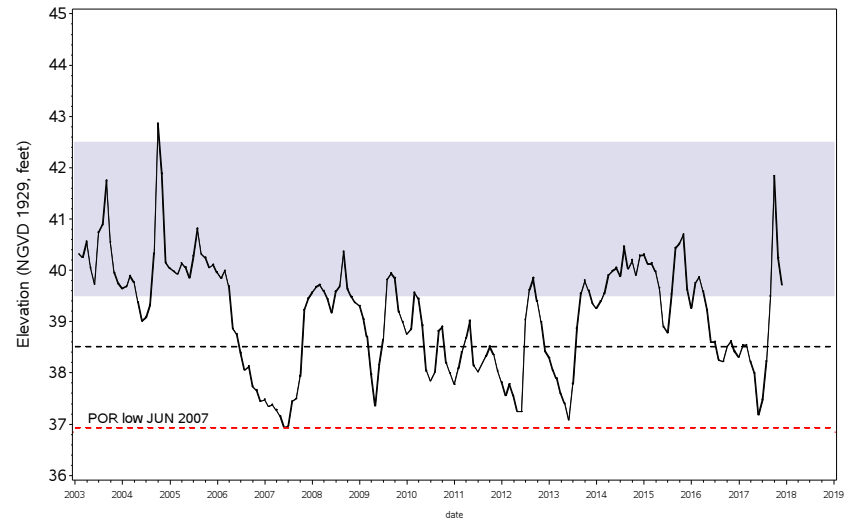
# HYDROGRAPHS OF REGIONAL LAKES

## 15-yr Period of Record

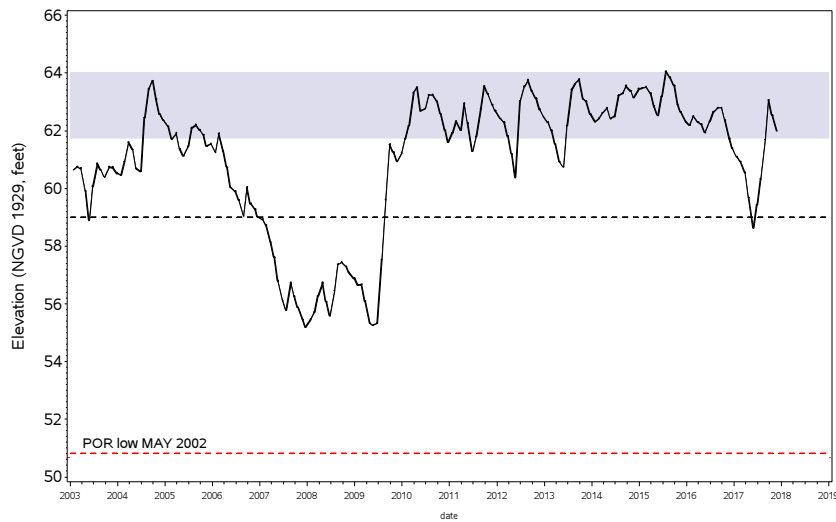
Hunters Lake  
Northern Lakes



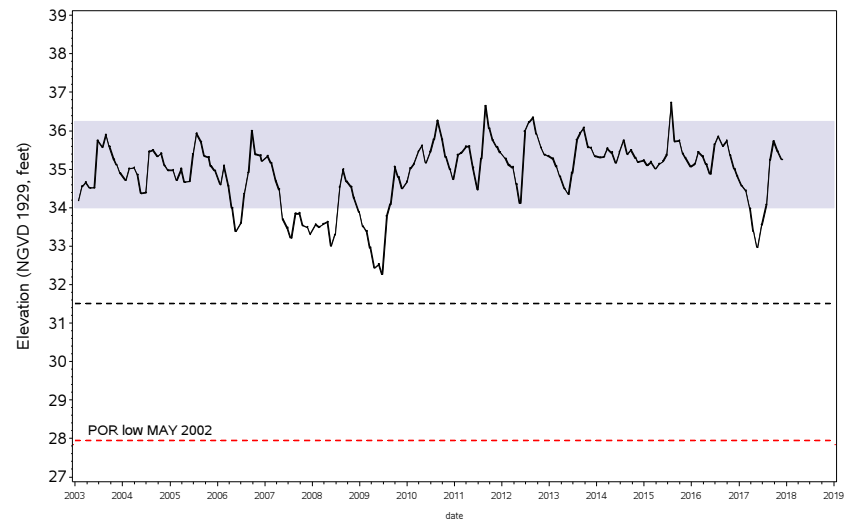
Lake Panasoffkee  
Northern Lakes



Camp Lake  
Tampa Bay Lakes



Church Lake  
Tampa Bay Lakes



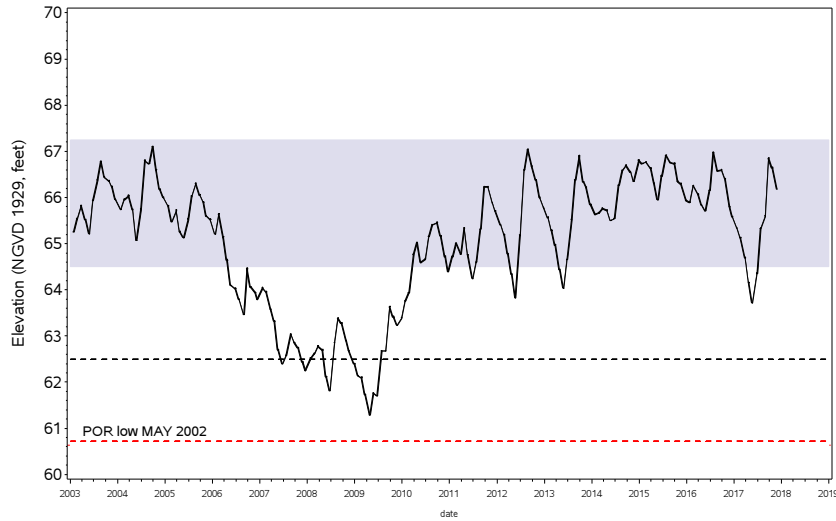
— Monthly Mean Elevation    - - - Drought Year Low    Normal Range



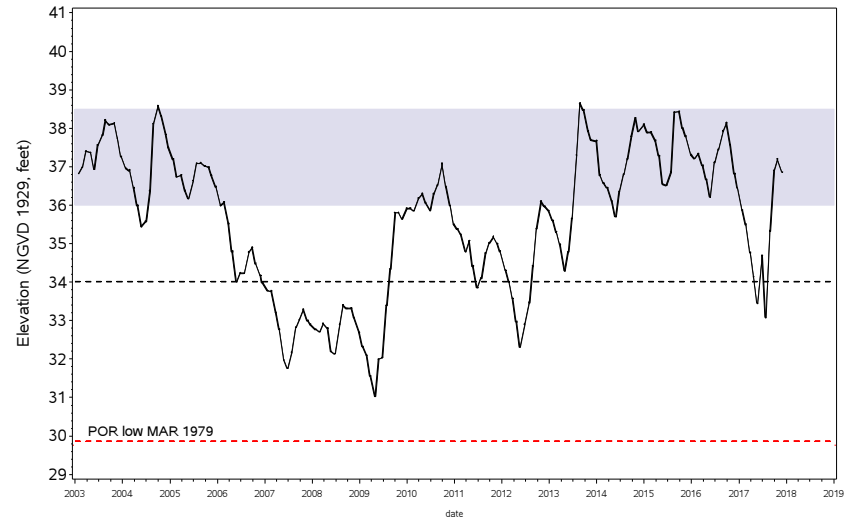
# HYDROGRAPHS OF REGIONAL LAKES

## 15-yr Period of Record

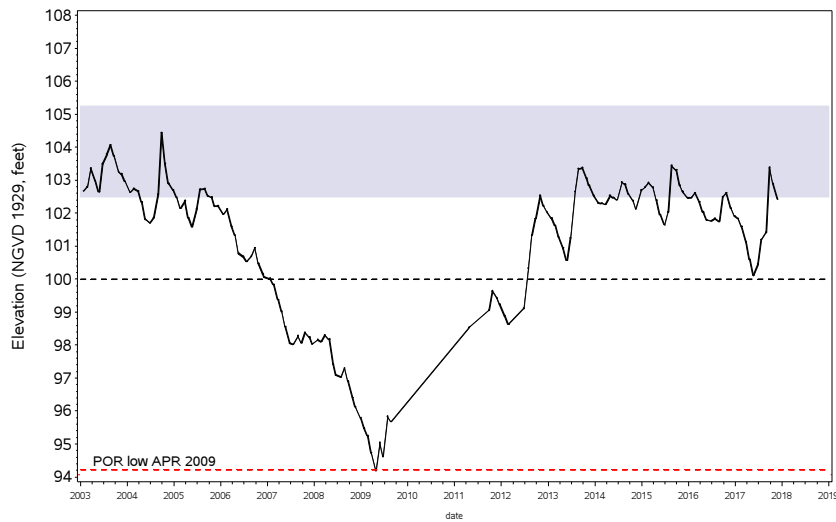
Deer Lake  
Tampa Bay Lakes



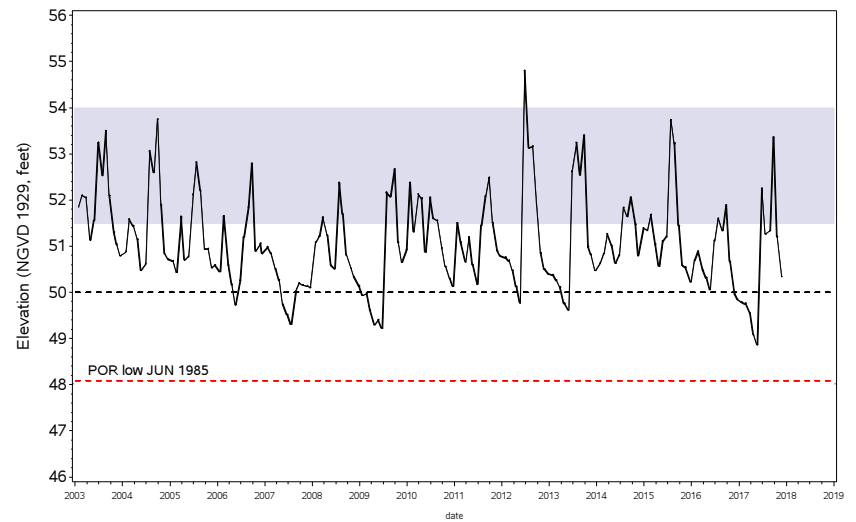
Gornto Lake  
Tampa Bay Lakes



King Lake  
Tampa Bay Lakes



Turkey Ford Lake  
Tampa Bay Lakes

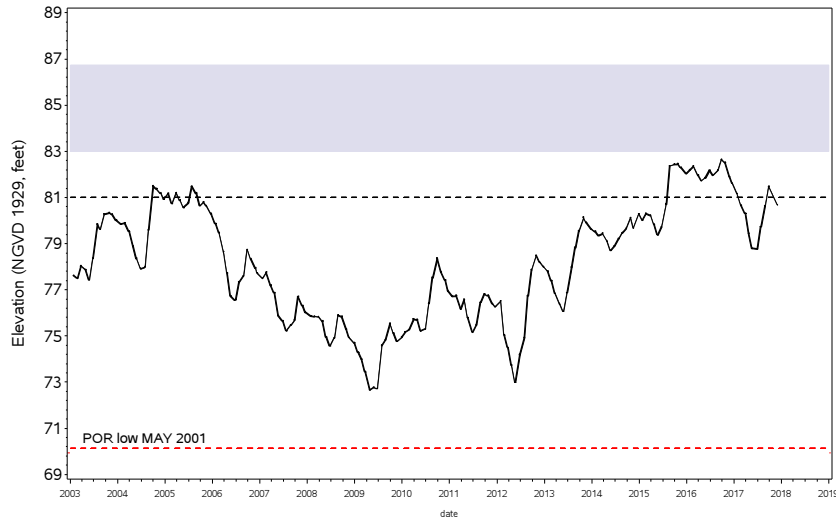


— Monthly Mean Elevation    - - - Drought Year Low    Normal Range

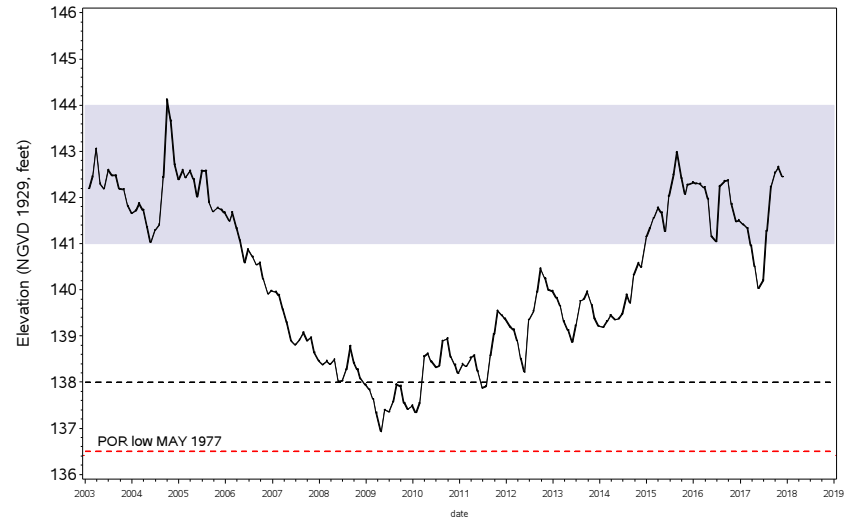
# HYDROGRAPHS OF REGIONAL LAKES

## 15-yr Period of Record

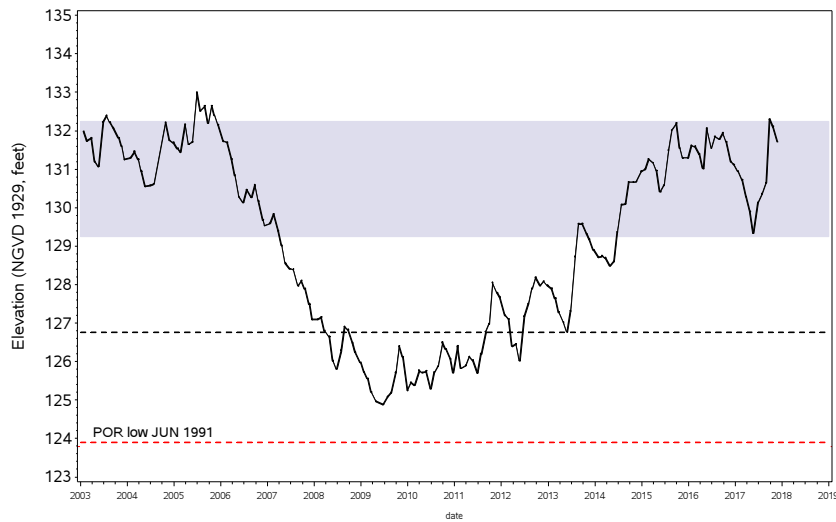
Lake Wimauma  
Tampa Bay Lakes



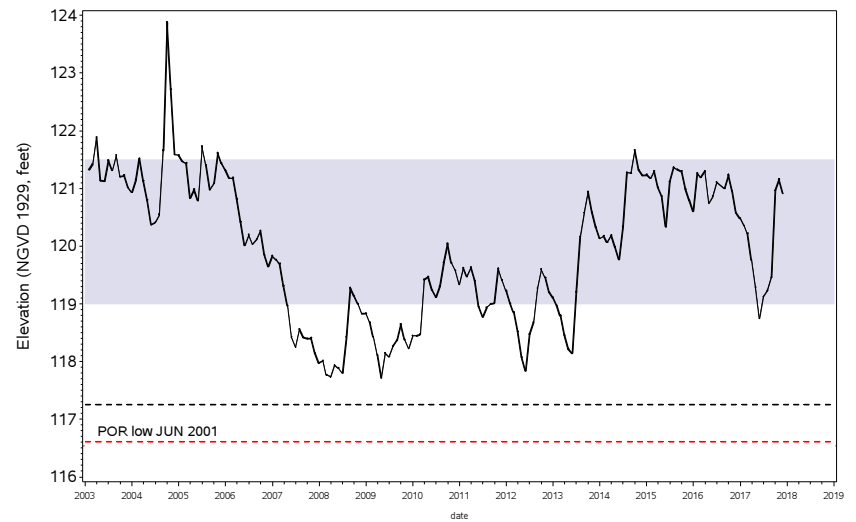
Lake Arietta  
Polk Uplands Lakes



Lake Buffum  
Polk Uplands Lakes



Lake Hamilton  
Polk Uplands Lakes

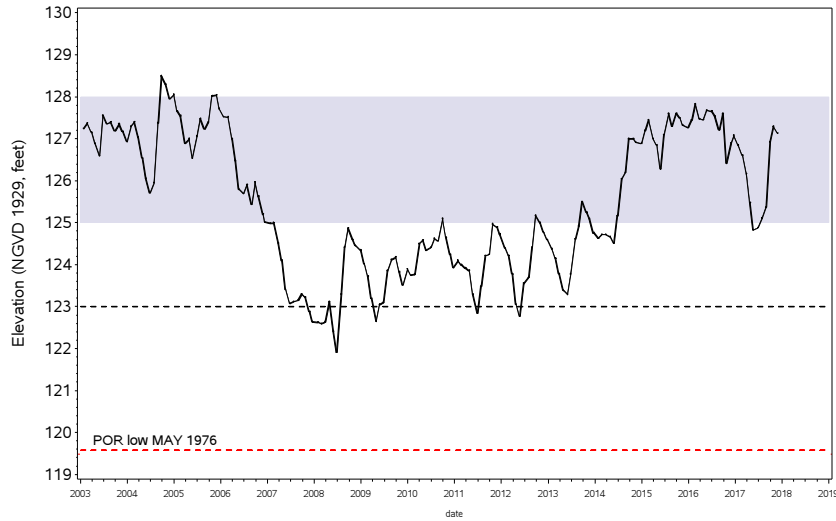


Monthly Mean Elevation
  Drought Year Low
  Normal Range

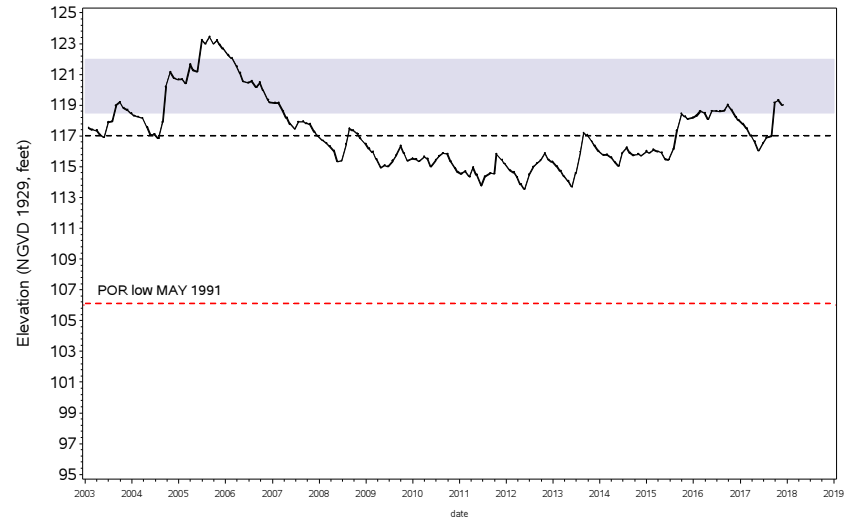
# HYDROGRAPHS OF REGIONAL LAKES

15-yr Period of Record

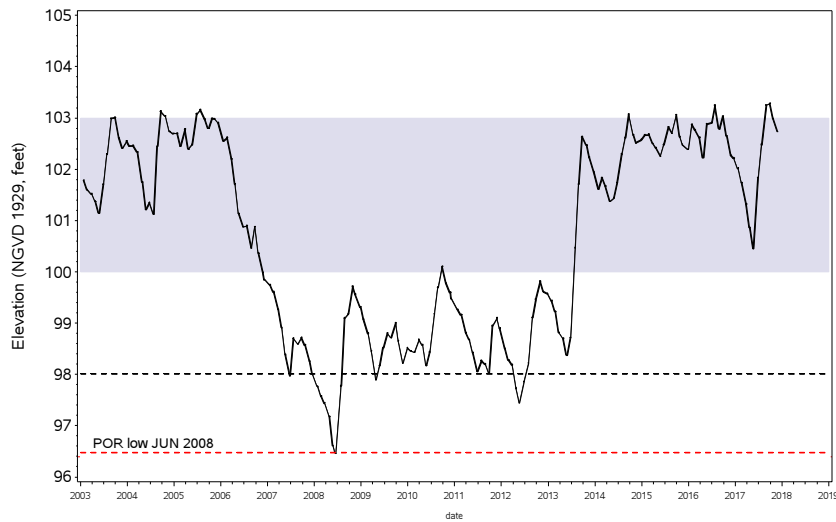
Lake Otis  
Polk Uplands Lakes



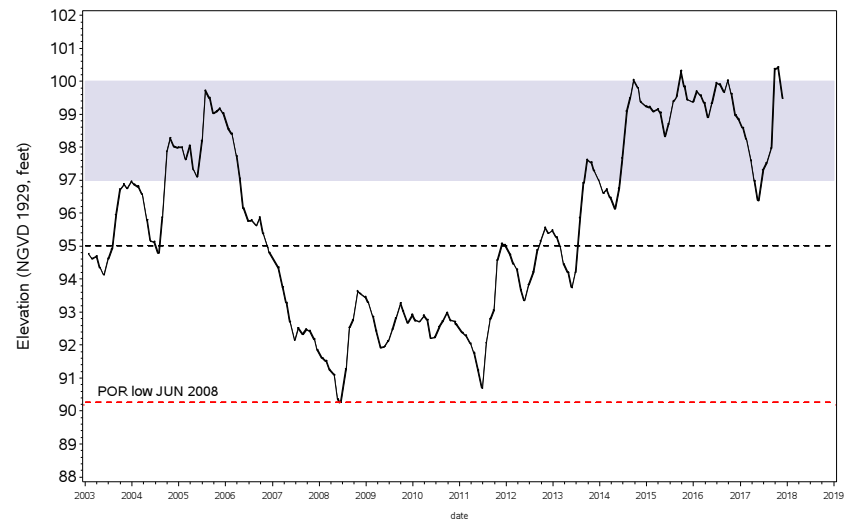
Crooked Lake  
Lake Wales Ridge Lakes



Lake Jackson  
Lake Wales Ridge Lakes



Lake Letta  
Lake Wales Ridge Lakes



— Monthly Mean Elevation    - - - Drought Year Low    Normal Range

## **Streams**

The District processes streamflow data collected by the U.S. Geological Survey (USGS) under a cooperatively funded program between the District and the USGS. Streamflow is recorded daily as water elevations at 12 gauging stations in three regions of the District (see index map in the Appendix). The USGS uses rating curves developed from water level elevations to calculate streamflow discharge in units of cubic feet per second (cfs). For this report, the reported streamflow values are the means of the daily discharge volumes for the current month. The period-of-record high and low values correspond to monthly means and not to peak events. Percentile values are calculated from the monthly means for the period of record, for each station. The percentile is the monthly mean statistically ranked on a scale of zero to 100 that indicates the percent of the period-of-record monthly means that are at or above the present monthly mean. The current year's data are provisional, and are subject to revision. Revised data are used for all calculations, as they become available.

Hydrographs are produced for each of the stream stations. Current monthly means for each station are compared to respective 25<sup>th</sup> and 75<sup>th</sup> percentiles of the period-of-record monthly means.

During November, all 12 stations monitored for this report had decreased streamflow, compared to last month. Total streamflow decreased in the northern, central and southern regions of the District by 1711.4 cfs (1105.6 mgd), 949.8 cfs (613.6 mgd) and 1849.4 cfs (1194.7 mgd). District-wide, total streamflow decreased by an average of 4510.6 cfs (2913.8 mgd).

In November, eleven of the 12 stations recorded higher streamflow than in November 2016. Streamflow was higher in the northern, central and southern regions by 517.5 cfs (334.3 mgd), 147.3 cfs (95.2 mgd) and 419.6 cfs (271.1 mgd), respectively. District-wide, total streamflow was higher, on average, by 1084.4 cfs (700.5 mgd), than the November 2016 average.

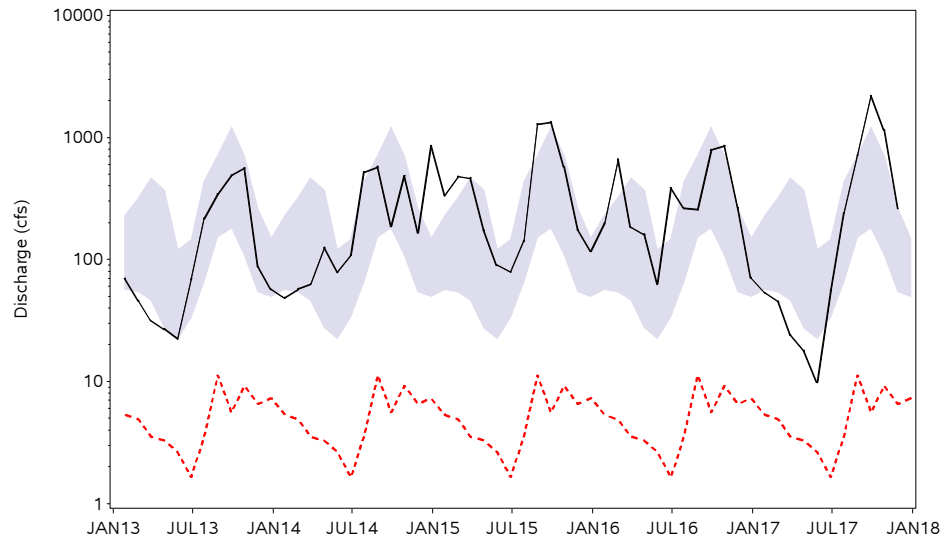
Compared to historical November discharge values, Withlacoochee River streamflow, measured at the Trilby station and the Holder station averaged in the 75<sup>th</sup> and 71<sup>st</sup> percentiles, respectively. Streamflow measured at the stations on the Anclote, Pithlachascotee and Hillsborough Rivers averaged in the 61<sup>st</sup>, 43<sup>rd</sup> and 70<sup>th</sup> percentiles of respective historical November readings. Streamflow measured at the Alafia River, Little Manatee River and Peace River at Bartow stations averaged in the 44<sup>th</sup>, 47<sup>th</sup> and 55<sup>th</sup> percentiles of respective historical November readings. Additionally, streamflow measured at the Josephine Creek, Manatee River, Myakka River and Peace River at Arcadia stations averaged in the 91<sup>st</sup>, 66<sup>th</sup>, 33<sup>rd</sup> and 67<sup>th</sup> percentiles of respective historical November readings.

## SUMMARY OF STREAM DISCHARGE FROM MAJOR STREAMS (CFS), NOVEMBER 2017

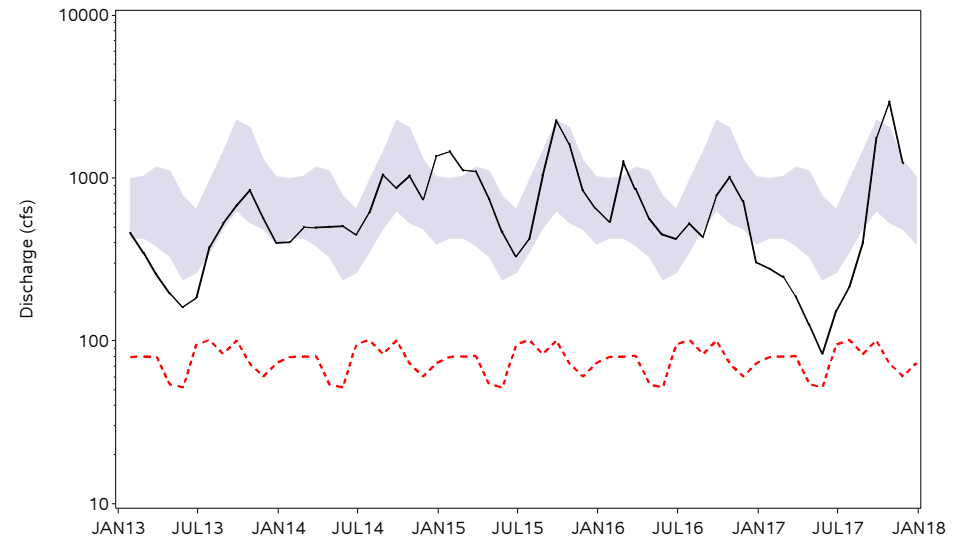
	<i>Beginning Year of Record</i>	<i>Mean Discharge NOV 2017</i>	<i>Mean Discharge OCT 2017</i>	<i>Mean Discharge NOV 2016</i>	<i>Change from OCT 2017</i>	<i>Change from NOV 2016</i>	<i>NOV 2017 Percentile Rank</i>	<i>Period of Record Low</i>	<i>Record Low Date</i>	<i>Period of Record High</i>	<i>Record High Date</i>
<i>NORTHERN COUNTIES</i>											
Withlacoochee R at Trilby	1930	262.7	1150.1	263.4	-887.4	-0.7	75%	0.1	JUN2000	8840	JUN1934
Withlacoochee R near Holder	1931	1237.3	2948.7	719.8	-1711.4	517.5	71%	33.0	MAR2001	8660	APR1960
<i>CENTRAL COUNTIES</i>											
Anclote River near Elfers	1946	12.3	53.8	4.4	-41.5	7.9	61%	0.8	MAY1962	3710	JUL1960
Pithlachascotte R near New Port Richey	1963	3.4	27.5	1.6	-24.1	1.8	43%	0.0	MAY2013	2180	JUN2012
Hillsborough R near Zephyrhills	1939	129.6	299.7	95.1	-170.1	34.5	70%	27.0	MAY2001	9700	MAR1960
Alafia River at Lithia	1932	132.1	472.0	121.2	-339.9	10.9	44%	4.1	JUN2000	9820	SEP2004
Little Manatee R near Wimauma	1939	43.9	81.7	32.6	-37.8	11.3	47%	0.9	DEC1976	9720	SEP1988
Peace River at Bartow	1939	109.1	445.5	28.2	-336.4	80.9	55%	0.0	MAY2009	4100	SEP1947
<i>SOUTHERN COUNTIES</i>											
Josephine Cr near DeSoto City	1946	141.9	366.0	35.6	-224.1	106.3	91%	0.5	MAY1956	1680	SEP1948
Manatee River near Myakka Head	1966	17.6	30.1	14.0	-12.5	3.6	66%	0.1	MAY1975	6440	JUN2003
Myakka River near Sarasota	1936	35.4	170.9	33.7	-135.5	1.7	33%	0.0	JUN2012	9540	JUN2003
Peace River at Arcadia	1931	535.5	2012.8	227.5	-1477.3	308.0	67%	0.0	SEP2017	9990	OCT1953

# HYDROGRAPHS OF MAJOR STREAMS JANUARY 2013 TO NOVEMBER 2017

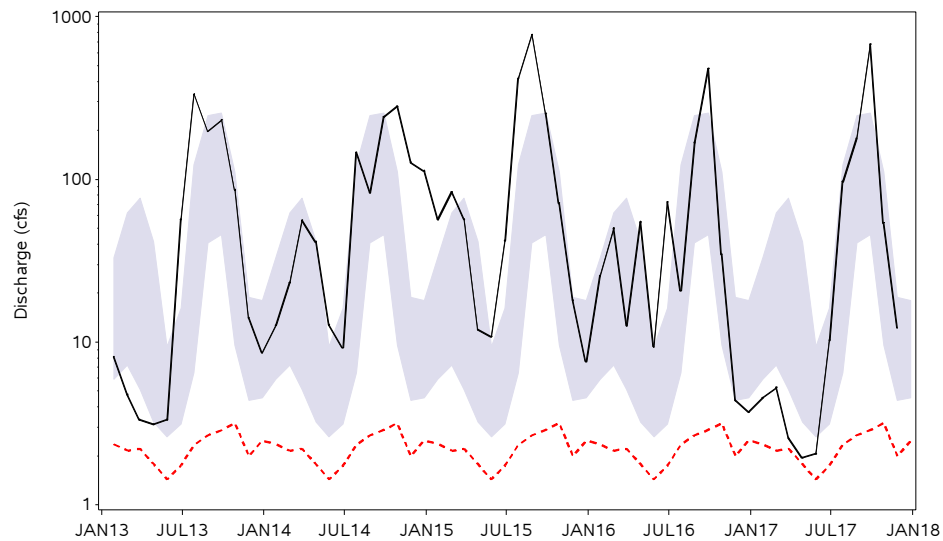
Withlacoochee R at Trilby  
Northern Counties



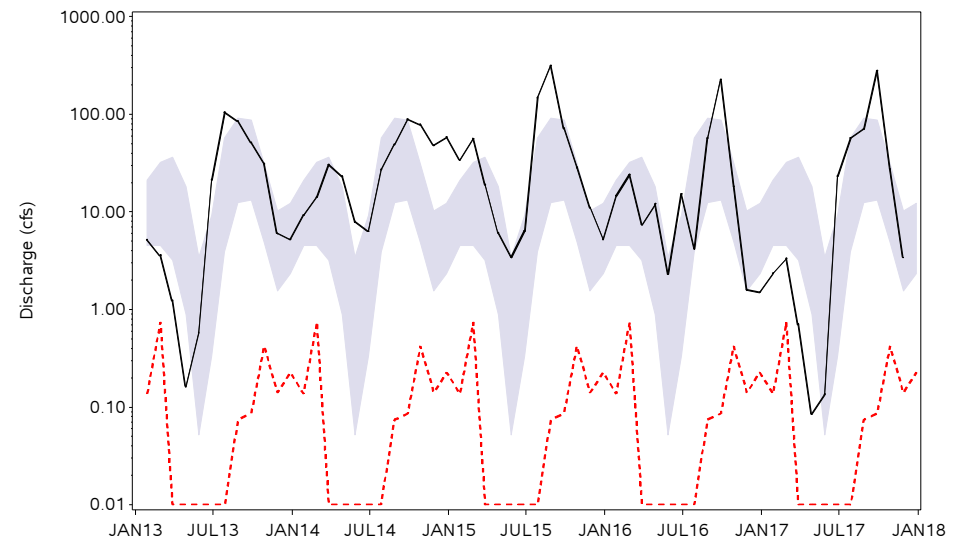
Withlacoochee R near Holder  
Northern Counties



Anclote River near Elfers  
Central Counties



Pithlachascotee R near New Port Richey  
Central Counties



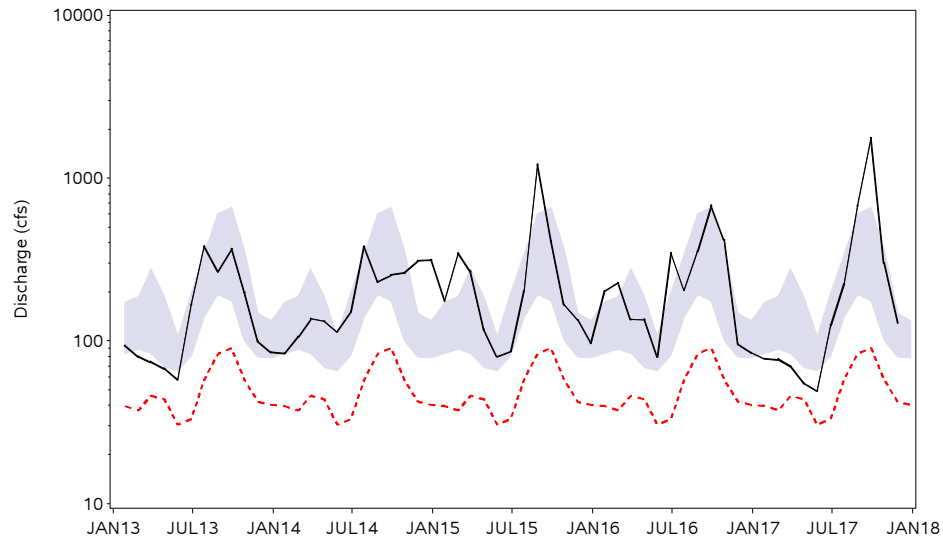
— Monthly Mean Discharge

- - - POR Monthly Low

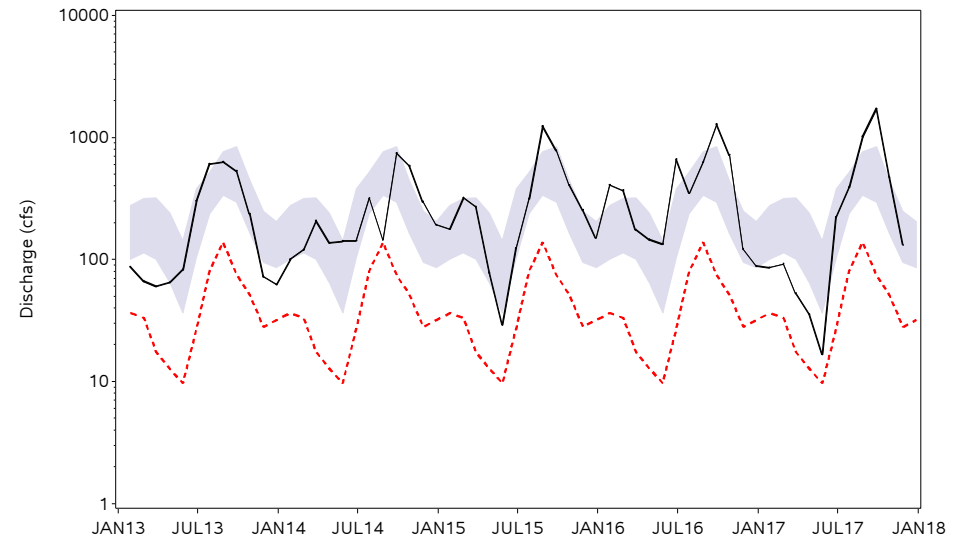
Normal Range

# HYDROGRAPHS OF MAJOR STREAMS JANUARY 2013 TO NOVEMBER 2017

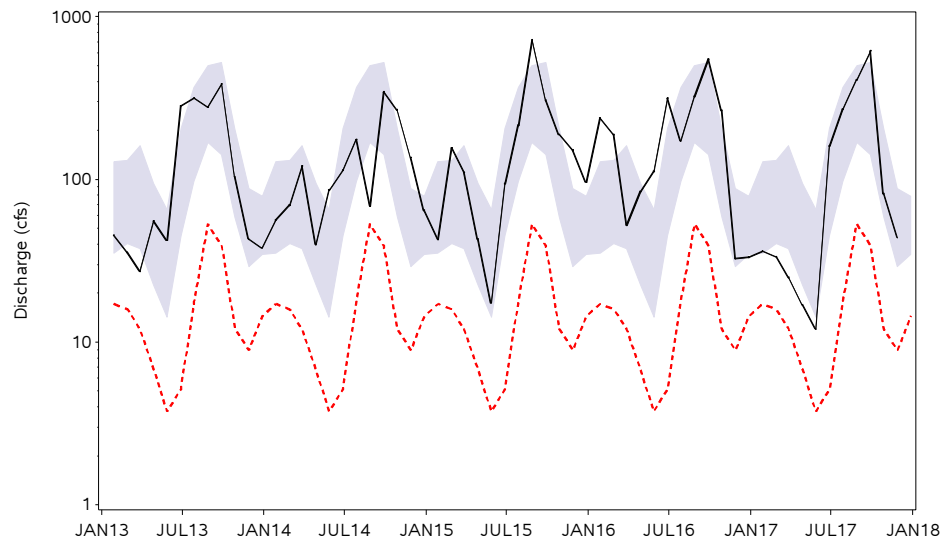
Hillsborough R near Zephyrhills  
Central Counties



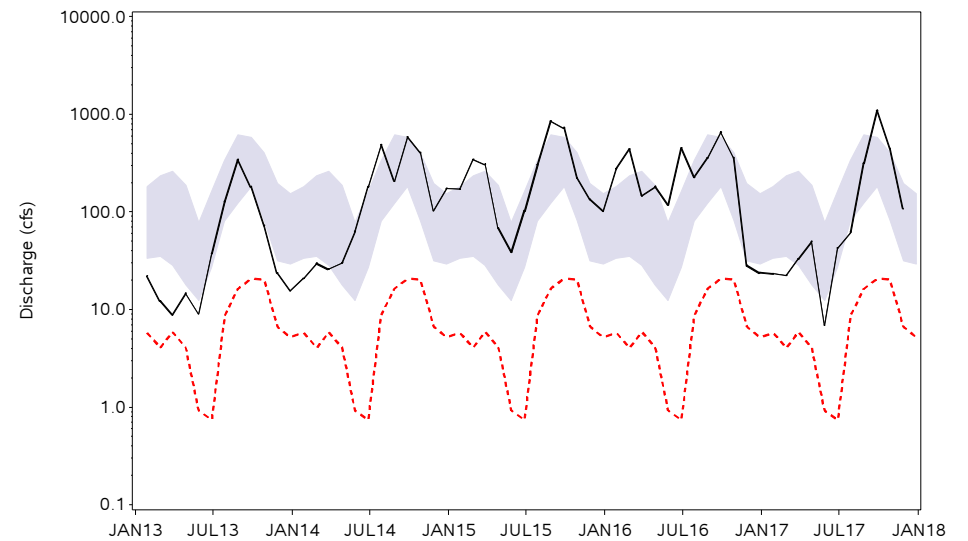
Alafia River at Lithia  
Central Counties



Little Manatee R near Wimauma  
Central Counties



Peace River at Bartow  
Central Counties



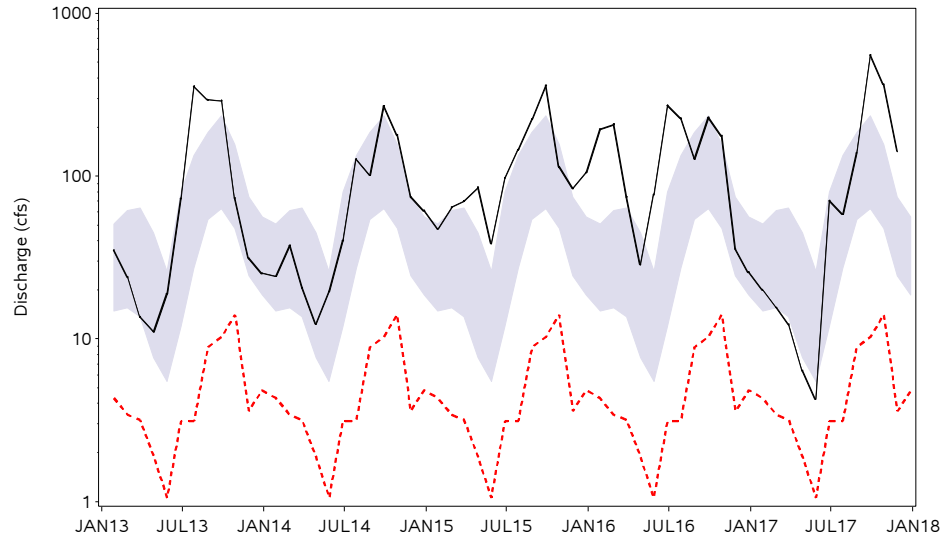
— Monthly Mean Discharge

- - - POR Monthly Low

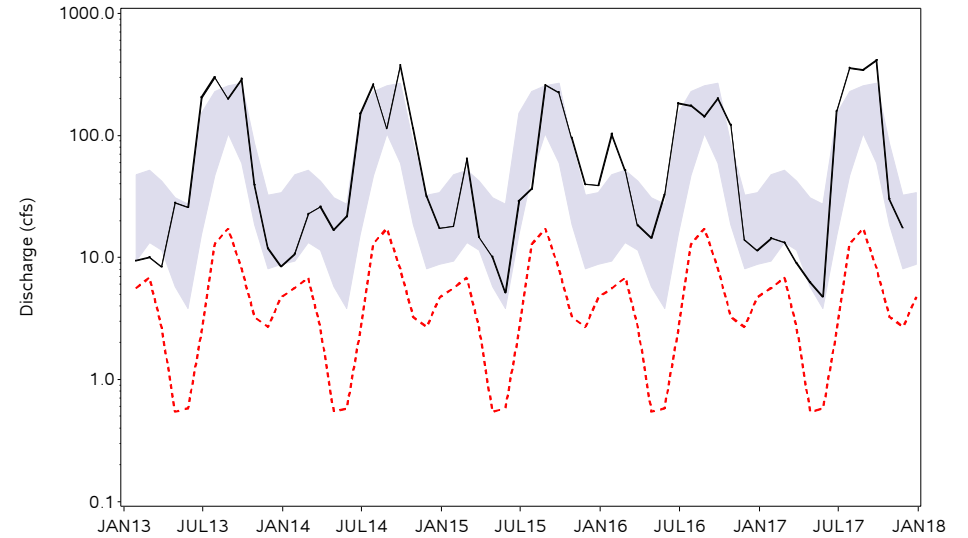
Normal Range

# HYDROGRAPHS OF MAJOR STREAMS JANUARY 2013 TO NOVEMBER 2017

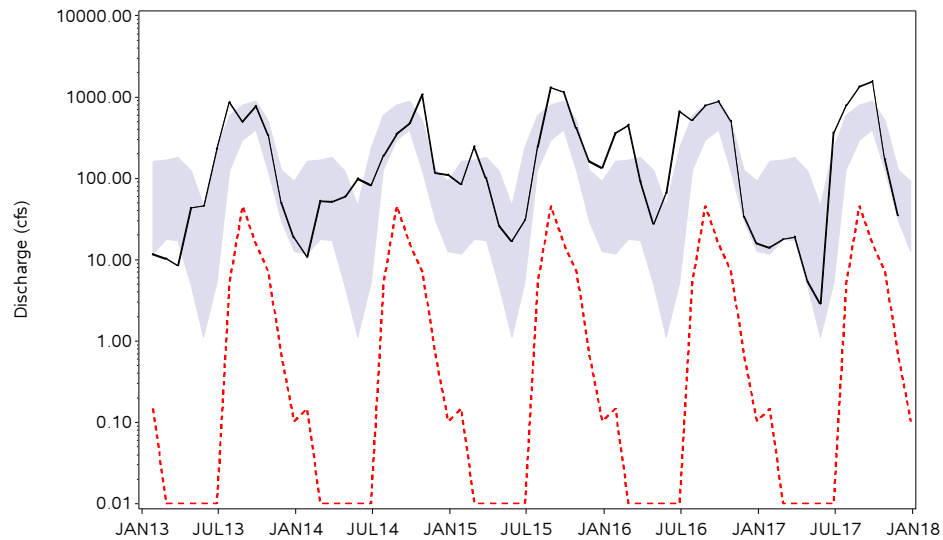
Josephine Cr near DeSoto City  
Southern Counties



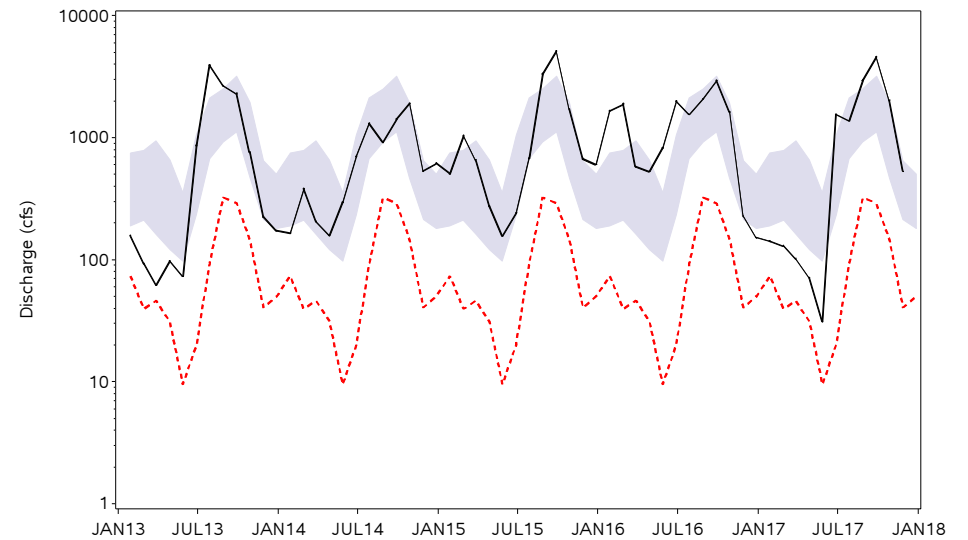
Manatee River near Myakka Head  
Southern Counties



Myakka River near Sarasota  
Southern Counties



Peace River at Arcadia  
Southern Counties



— Monthly Mean Discharge

- - - POR Monthly Low

Normal Range



## **Springs**

The District processes springflow data collected by Tampa Bay Water through a mutual agreement and by the U.S. Geological Survey (USGS) under a cooperatively funded program between the District and the USGS. Springflow is monitored at seven gauging stations in two regions of the District (see index map in the Appendix). Springflow data for Rainbow, Silver and Sulphur Springs are recorded as daily water levels. The USGS uses rating curves developed for these springs from historical water level elevations to calculate springflow discharge in units of cubic feet per second (cfs). Crystal and Weeki Wachee Springs discharge (cfs) is provided as an instantaneous reading calculated by the USGS. Buckhorn and Lithia Springs discharge is obtained from Tampa Bay Water biweekly and weekly, respectively. Period-of-record high and low values correspond to monthly theoretical means and not to peak events. Values are reported as percentiles calculated from an analysis of historical monthly means recorded during a given month. The percentile is the monthly mean ranked on a scale of zero to 100 that indicates the percent of period-of-record values that are above, equal to or below the median (50<sup>th</sup> percentile) for the current month. The values reported are provisional, and are subject to revision at the end of the water year. Revised USGS springflow data are loaded into the District's WMIS when they become available.

Hydrographs are produced for the seven-springflow stations, and current values are compared to respective 25<sup>th</sup> and 75<sup>th</sup> percentiles that are calculated from historical data. The 25<sup>th</sup> and 75<sup>th</sup> percentiles are calculated using the SAS<sup>TM</sup> software system for data analysis using period-of-record monthly theoretical means for each springflow station analyzed.

During November, six of the seven stations reported decreased springflow, while one reported increased flow, compared to the previous month. Total springflow decreased in the northern and central regions by 77.9 cfs (50.3 mgd) and 5.3 cfs (3.4 mgd), respectively. District-wide, springflow decreased by 83.2 cfs (53.7 mgd).

In November, total springflow recorded at all seven stations was above last year's levels. Total springflow for the northern and central regions were higher by 194.1 cfs (125.5 mgd) and 42.8 cfs (27.7 mgd), respectively. District-wide, springflow was higher by 236.9 cfs (153.2 mgd), compared to November 2016 rates.

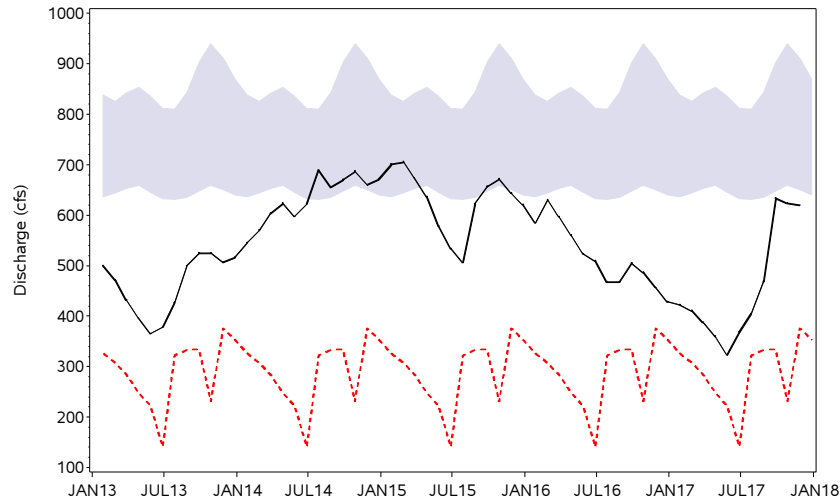
Compared to historical period-of-record values for November, total springflow measured in Rainbow, Silver and Weeki Wachee Springs, in the northern region, was in the 43<sup>rd</sup>, 17<sup>th</sup> and 81<sup>st</sup> percentiles of respective historical readings. Springflow measured in Crystal, Sulphur, Buckhorn and Lithia Springs in the central region was in the 82<sup>nd</sup>, 40<sup>th</sup>, 80<sup>th</sup> and 94<sup>th</sup> percentiles, respectively, of historical November readings.

## SUMMARY OF SPRINGS DISCHARGE FROM MAJOR SPRINGS (CFS), NOVEMBER 2017

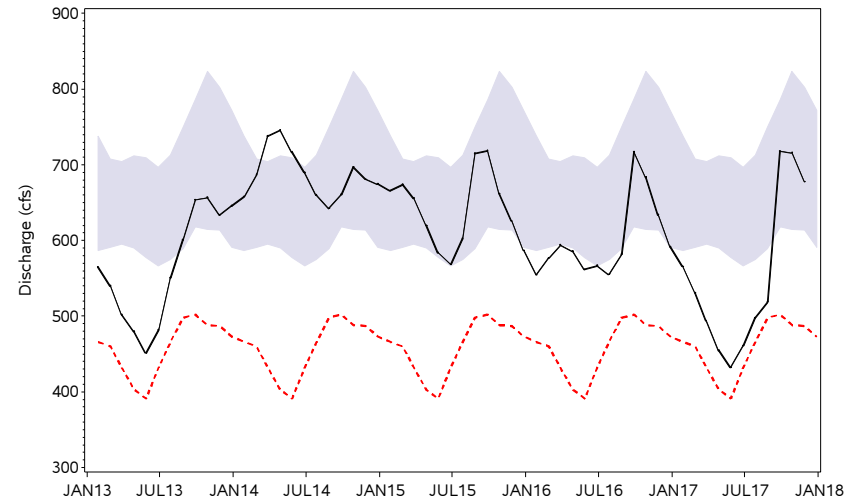
<i>NORTHERN COUNTIES</i>	<i>NOV 2017 Discharge</i>	<i>OCT 2017 Discharge</i>	<i>NOV 2016 Discharge</i>	<i>Change From OCT 2017</i>	<i>Change From NOV 2016</i>	<i>NOV 2017 Percentile Rank</i>	<i>Period of Record Low</i>	<i>Record Low Date</i>	<i>Period of Record High</i>	<i>Record High Date</i>
Rainbow Springs	687.1	735.9	658.5	-48.8	28.6	43%	391.0	MAY2012	1060.0	SEP1988
Silver Springs	616.4	632.8	468.5	-16.4	147.9	17%	141.0	JUN2012	1290.0	OCT1960
Weeki Wachee Springs	190.6	203.3	173.0	-12.7	17.6	81%	101.0	JUN1994	257.0	OCT2004
<i>CENTRAL COUNTIES</i>										
Crystal Springs	65.9	59.4	50.7	6.5	15.2	82%	25.7	JUN2001	113.6	AUG1941
Sulphur Springs	31.2	37.0	15.7	-5.8	15.5	40%	0.0	FEB1976	145.0	MAR1960
Buckhorn Springs	13.7	14.9	13.0	-1.2	0.7	80%	2.2	MAY2006	32.7	AUG2004
Lithia Springs	63.0	67.8	51.6	-4.8	11.4	94%	9.1	MAY2000	91.5	NOV2004

# HYDROGRAPHS OF REGIONAL SPRINGS JANUARY 2013 TO NOVEMBER 2017

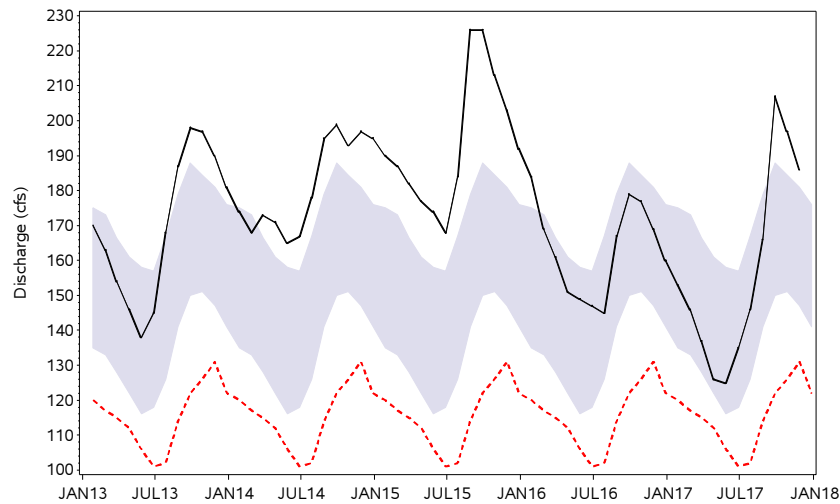
Silver Springs  
Northern Counties



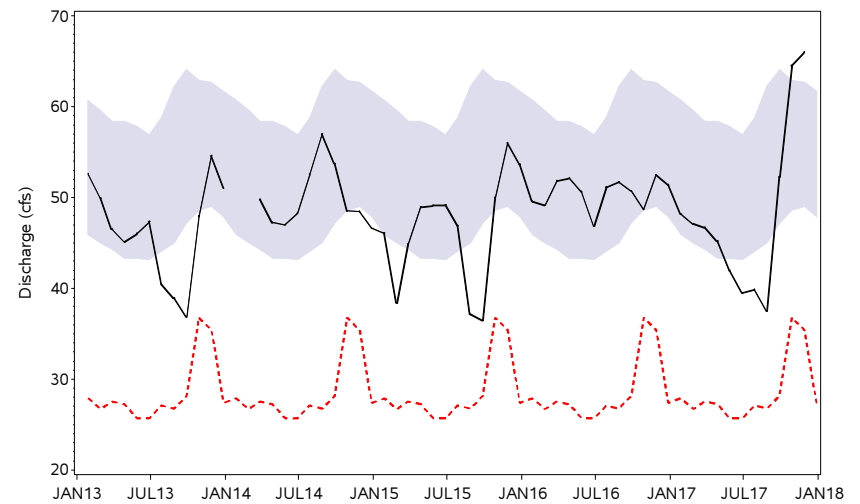
Rainbow Springs  
Northern Counties



Weeki Wachee Springs  
Northern Counties



Crystal Springs  
Central Counties



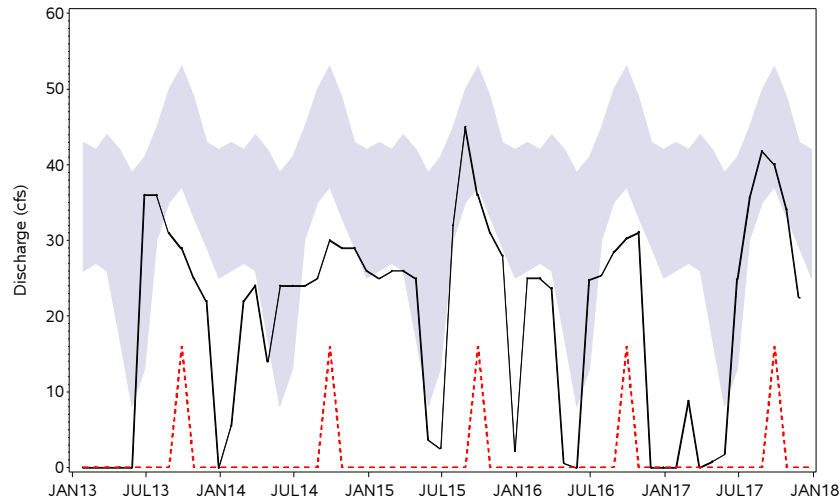
— Monthly Discharge

- - - POR Monthly Low

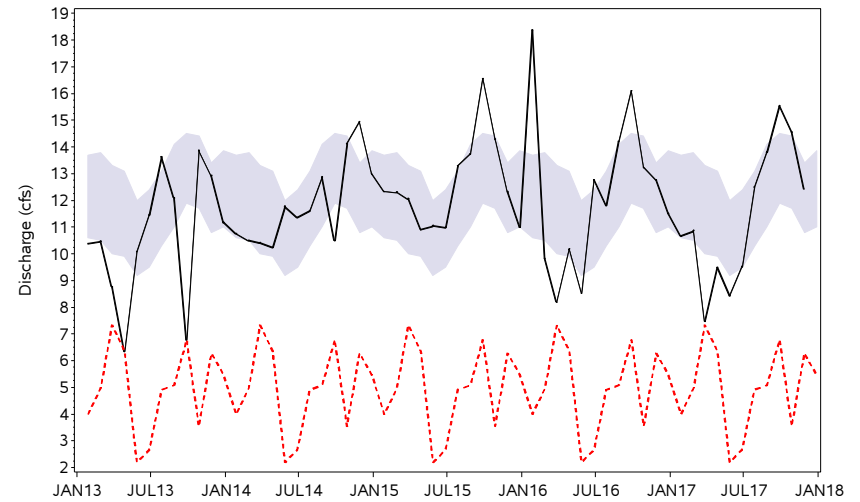
Normal Range

# HYDROGRAPHS OF REGIONAL SPRINGS JANUARY 2013 TO NOVEMBER 2017

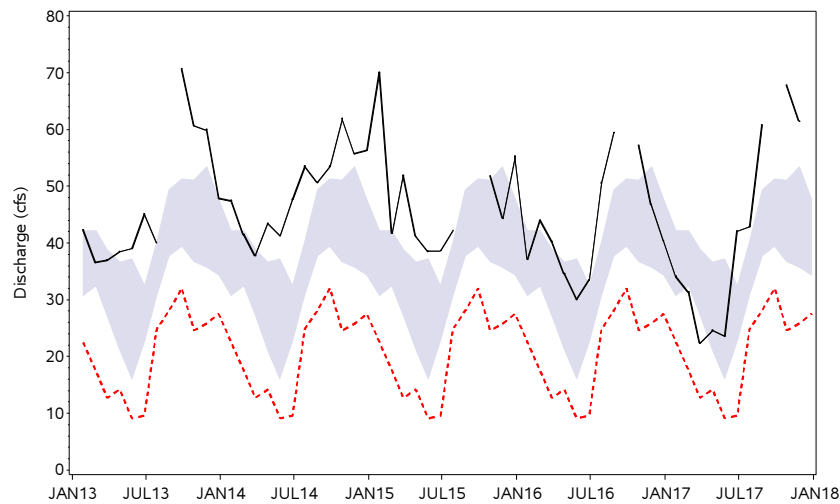
Sulphur Springs  
Central Counties



Buckhorn Spring  
Central Counties



Lithia Springs  
Central Counties



— Monthly Discharge

- - - POR Monthly Low

■ Normal Range

## GROUND WATER

The ground-water section of this report provides ground-water level information within the District based on geographically delineated areas (regions) within the District. For this report, the District has been divided into three geographical regions that are defined by county boundaries (see index maps in the Appendix). Each regional area includes all or part of each county that is located within that region and that is also within the District's jurisdictional boundaries. The northern region includes the counties of Citrus, Hernando, Lake, Levy, Marion and Sumter, where the Floridan aquifer is generally unconfined and at or near land surface, allowing rainfall to easily recharge (replenish) the aquifer system. The central region includes the counties of Hillsborough, Pasco, Pinellas and Polk, where the Floridan aquifer can be unconfined, semi-confined or confined (overlain by thick clays). Where the Floridan aquifer is confined, recharge to the aquifer from rainfall is low. The southern region includes the counties of Charlotte, DeSoto, Hardee, Highlands, Manatee and Sarasota, where the Floridan aquifer is confined.

Twelve surficial aquifer (shallow, non-artesian) monitor wells and 82 intermediate and Floridan aquifer (deep) monitor wells are measured for this report to determine the relative health of ground-water levels District-wide. Only monitor wells with an adequate and reliable period-of-record water level measurements were selected for the network. For each well, the 25<sup>th</sup> and 75<sup>th</sup> percentiles ("low normal" and "high normal," respectively) were calculated for each week of the year using the period-of-record data. The 25<sup>th</sup> and 75<sup>th</sup> percentiles are used to represent the lower and upper limits of the normal range, as they are considered a reliable and robust measure of the normal range, and are less affected by extremes in the data record. The end-of-month water-level readings measured for this report are compared to their corresponding normal ranges. Trend data from 16 intermediate and Floridan aquifer wells are shown in hydrographs to compare current water levels to the low normal and high normal levels.

Data from these wells are further compiled into regional statistics for the three regions of the District. Wells in the northern counties are unconfined and non-artesian, while those in the southern counties are confined and artesian. Wells included in the central counties vary between confined and unconfined conditions due to the transitional nature of geology in this area. The potentiometric levels of representative Floridan aquifer wells are used to produce the potentiometric surface maps presented in this report.

## **Surficial Aquifer**

In November, monthly analysis indicates that all 12 surficial aquifer wells recorded water level decreases, compared to last month. Regionally, average surficial aquifer water levels decreased in the northern, central and southern regions of the District by 0.67, 0.88 and 0.58 foot, respectively. District-wide, average surficial aquifer water levels decreased by 0.77 foot.

During November, annual analysis indicates average water levels in 11 of the 12 surficial aquifer wells were higher than November 2016 levels. Average surficial aquifer water levels were higher in the northern, central and southern regions by 0.48, 0.87 and 0.07 foot, respectively. District-wide, average water levels in surficial wells were 0.61 foot higher than November 2016 levels.

For November, water levels were above the low normal level in all 12 surficial wells. Average surficial aquifer water levels in the northern, central and southern regions were 1.41, 1.79 and 1.09 feet, respectively, above the low normal level. District-wide, the average water level in surficial wells was 1.55 feet above the low normal level.

## SUMMARY OF SURFICIAL AQUIFER LEVELS IN REPRESENTATIVE WELLS, NOVEMBER 2017

	NOV 2017 Elev	OCT 2017 Elev	NOV 2016 Elev	Change From OCT 2017	Change From NOV 2016	NOV Historical Low Normal	NOV Historical High Normal	Departure From Low Normal	Period of Record Low	Record Low Date	Period of Record High	Record High Date
<i>NORTHERN COUNTIES</i>												
Green Swamp	90.75	91.45	90.28	-0.70	0.47	89.55	91.30	1.20	82.95	MAY2000	93.07	SEP1985
Lecanto 2	9.33	9.97	8.83	-0.64	0.50	7.72	9.88	1.61	5.76	MAY2001	13.92	SEP1974
<i>CENTRAL COUNTIES</i>												
Loughman	92.88	93.84	92.03	-0.96	0.85	91.24	92.53	1.64	88.40	JUN2001	96.31	SEP2017
Lutz-Lake Fern	56.91	57.43	56.62	-0.52	0.29	56.28	57.15	0.63	52.64	NOV2009	61.10	SEP1986
ROMP 50 Shallow	41.51	41.84	41.20	-0.32	0.31	41.25	41.69	0.26	38.01	OCT2010	44.05	SEP2001
SR 33 & Combee Road	133.23	134.28	133.11	-1.05	0.12	132.71	134.04	0.52	129.16	FEB2001	136.97	OCT1995
SR 577 Shallow	123.23	124.13	121.63	-0.89	1.60	121.03	123.84	2.20	109.99	JAN2000	129.26	SEP2013
Tarpon Road Shallow	13.12	14.28	12.15	-1.16	0.96	11.08	12.70	2.04	9.22	MAY2017	17.25	AUG2015
USGS P-48	103.88	105.10	101.94	-1.22	1.94	98.64	101.06	5.24	96.07	JUN2001	105.84	SEP2017
<i>SOUTHERN COUNTIES</i>												
Edgeville 4 Shallow	66.99	67.13	68.38	-0.14	-1.39	66.67	67.80	0.32	63.76	MAY2012	69.87	SEP1994
ROMP 26 Shallow	70.76	71.62	69.60	-0.86	1.16	68.76	70.52	2.00	64.32	JUN1999	75.30	SEP2017
SR 74	15.89	16.64	15.44	-0.75	0.45	14.94	15.93	0.95	12.66	MAY2000	18.78	AUG2013

### **Intermediate and Floridan Aquifers**

In November, monthly analysis indicates that 75 of the 82 intermediate and Floridan aquifer wells monitored for this report recorded water level decreases, compared to last month. Regionally, average water levels decreased in the northern, central and southern regions by 0.45 foot, 1.03 and 1.51 feet, respectively. District-wide, the average water level in the intermediate and Floridan aquifer decreased by 1.06 feet.

During November, annual analysis indicates that 78 of the 82 intermediate and Floridan aquifer wells monitored for this report recorded water level increases, compared to levels measured in November 2016. Regionally, the mean water level in the northern, central and southern regions was higher by 1.33, 1.29 and 3.42 feet, respectively, compared to last year's levels. District-wide, average water levels in intermediate and Floridan aquifer wells were 2.08 feet higher than November 2016 levels.

For November, 79 of the 82 intermediate and Floridan aquifer wells had levels above the low normal level, compared to historical monthly levels. Average water levels in the northern, central and southern regions were 2.37, 5.21 and 4.04 feet, respectively, above the low normal level. District-wide, the average water level in intermediate and Floridan aquifer wells was 4.09 feet above the low normal level.



## SUMMARY OF INTERMEDIATE AND FLORIDAN AQUIFER LEVELS IN REPRESENTATIVE WELLS, NOVEMBER 2017

### Regional Summary:

<i>Region</i>	<i>NOV 2017 Mean Elevation</i>	<i>NOV 2017 Relation to POR Median</i>	<i>NOV 2017 Relation to 25th Percentile</i>	<i>NOV 2017 Mean Percentile Rank</i>	<i>OCT 2017 Mean Percentile Rank</i>	<i>NOV 2016 Mean Percentile Rank</i>
Northern Counties	39.24	0.92	2.37	70%	71%	42%
Central Counties	60.71	2.52	5.21	73%	81%	57%
Southern Counties	34.19	1.64	4.04	69%	74%	34%

### Regional Wells Summary:

<i>NORTHERN COUNTIES</i>	<i>NOV 2017 Elev</i>	<i>OCT 2017 Elev</i>	<i>NOV 2016 Elev</i>	<i>Change From OCT 2017</i>	<i>Change From NOV 2016</i>	<i>NOV Historical Low Normal</i>	<i>NOV Historical High Normal</i>	<i>Departure From Low Normal</i>	<i>NOV 2017 Percentile Rank</i>	<i>Period of Record Low</i>	<i>Record Low Date</i>	<i>Period of Record High</i>	<i>Record High Date</i>
CE 14 Dunnellon Deep	37.69	38.16	37.60	-0.47	0.09	37.76	43.21	-0.07	23%	31.94	MAY2012	60.24	MAR1966
Chassahowitzka 1 Deep	7.30	7.57	6.72	-0.27	0.58	6.27	7.32	1.03	74%	4.80	JUN2001	9.75	SEP2004
Inverness Dot Fldn	29.22	29.35	30.20	-0.13	-0.98	28.01	32.17	1.21	43%	21.70	JUN2001	37.80	OCT1982
Mascotte Deep	100.19	100.60	98.96	-0.41	1.23	98.92	100.50	1.27	70%	93.94	JUN2000	102.66	SEP1988
North Locanto Deep	5.10	5.30	4.42	-0.20	0.68	4.36	5.55	0.74	53%	2.94	MAY2001	8.10	OCT1982
ROMP 103 Suwannee/Ocala	42.92	43.99	42.21	-1.07	0.71	38.37	43.80	4.55	73%	33.75	MAY2009	51.03	OCT2004
ROMP 107 Ocala/Avon Park	14.14	14.98	13.86	-0.84	0.28	11.28	14.53	2.86	67%	8.08	AUG2007	19.78	NOV1982
ROMP 111 Ocala/Avon Park	50.47	50.78	47.73	-0.31	2.74	48.12	49.61	2.35	97%	44.23	JUL1992	53.36	SEP2004
ROMP 116 Avon Park	34.77	35.69	32.94	-0.92	1.83	31.75	33.76	3.02	95%	29.24	MAY2012	39.28	OCT2004
ROMP 119 Avon Park	46.19	46.86	43.03	-0.67	3.16	43.26	45.81	2.93	84%	39.86	MAY2012	52.20	MAR1998
ROMP 120 Avon Park	45.73	46.27	42.75	-0.54	2.98	42.20	45.51	3.53	80%	38.71	MAY2012	52.24	MAR1998
ROMP 134 Ocala/Avon Park	47.97	48.23	47.66	-0.26	0.31	43.69	48.31	4.28	72%	37.80	JUN2012	57.35	APR1998
ROMP 89 Ocala	91.05	91.77	91.02	-0.72	0.03	89.02	91.83	2.03	54%	82.44	JUN2000	94.93	DEC1997
ROMP 97 Avon Park	19.83	20.38	18.79	-0.55	1.04	16.10	21.16	3.73	66%	11.84	MAY2009	26.24	SEP2004
ROMP TR 124 Avon Park	3.38	3.52	2.65	-0.14	0.73	2.42	3.23	0.96	81%	0.77	SEP2004	8.06	SEP2016
ROMP TR 21-2 Ocala/Avpk	3.54	3.34	3.14	0.20	0.40	2.25	3.27	1.29	86%	-0.06	DEC1990	6.12	OCT1995
Sumter 13 JC 59 Up Fldn	44.05	43.46	39.40	0.59	4.65	39.98	42.77	4.07	96%	36.52	MAY2012	47.01	JUN2003
Tidewater 1 FLDN	55.55	55.92	53.36	-0.37	2.19	53.15	56.65	2.40	67%	47.94	JUN2012	61.81	SEP1982
Webster City Fldn	81.99	83.01	79.44	-1.02	2.55	79.49	83.57	2.50	55%	74.16	MAY2012	88.77	SEP2005
Weeki Wachee Deep Repl	18.00	18.88	16.58	-0.88	1.42	15.29	19.36	2.71	60%	10.37	MAY2009	23.61	AUG1984

# Regional Wells Summary (continued):

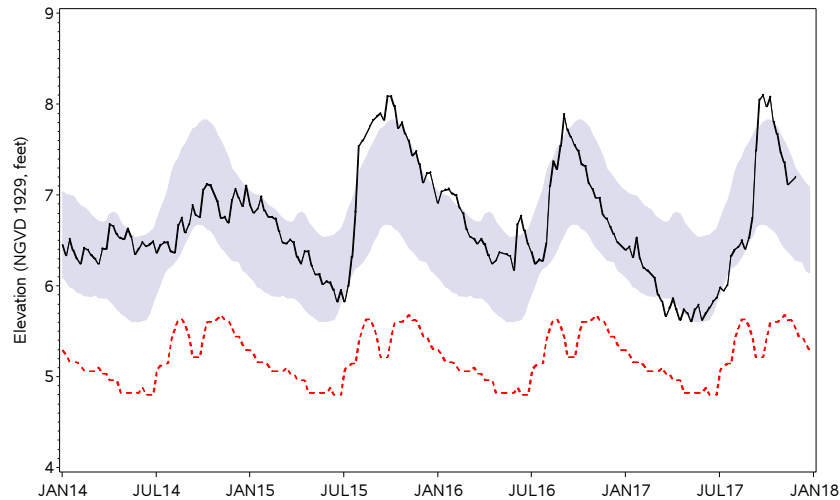
	NOV 2017 Elev	OCT 2017 Elev	NOV 2016 Elev	Change From OCT 2017	Change From NOV 2016	NOV Historical Low Normal	NOV Historical High Normal	Departure From Low Normal	NOV 2017 Percentile Rank	Period of Record Low	Record Low Date	Period of Record High	Record High Date
<b>CENTRAL COUNTIES</b>													
Bexley 2 Fldn	61.30	62.18	60.76	-0.88	0.54	60.21	61.82	1.09	54%	56.08	JUN2000	64.50	SEP2017
Coley Deep	87.24	88.35	83.01	-1.11	4.23	80.82	89.00	6.42	71%	60.77	JAN2010	94.17	SEP1949
Debuel Road Deep	56.23	57.48	55.33	-1.25	0.90	53.35	56.12	2.88	81%	46.48	JUN2002	60.13	SEP1979
Hills State Pk Parking Deep	39.54	41.31	38.85	-1.77	0.69	37.38	39.33	2.16	84%	35.35	JUN2000	47.42	DEC1997
Lk Alftred Deep nr Lake Alfr	128.96	129.71	128.54	-0.75	0.42	126.25	128.61	2.71	88%	119.85	MAY1974	131.62	OCT1960
Loughman Deep	90.62	91.12	89.53	-0.50	1.09	89.58	91.35	1.04	53%	85.90	MAY2001	93.23	OCT1979
Lykes Pasco Fldn	68.89	70.27	68.04	-1.38	0.85	63.71	68.09	5.18	82%	56.94	JUN2000	75.78	OCT2004
Masaryktown Deep	38.00	39.01	36.19	-1.01	1.81	29.51	40.83	8.49	62%	21.89	AUG1994	50.32	SEP1984
Moon Lake Deep	31.63	32.08	31.22	-0.45	0.41	29.61	31.20	2.02	90%	26.10	JUN2000	38.78	DEC1997
Pasco 13 nr Drexel Fldn	71.96	72.81	71.42	-0.85	0.54	71.78	73.27	0.18	30%	68.00	JUN2001	77.14	JUL1960
Pinellas 665 Fldn	9.42	9.93	9.18	-0.51	0.24	9.06	10.97	0.36	47%	6.70	MAY2006	14.79	SEP1959
ROMP 123 Hawthorn/Ocala	8.66	10.39	4.48	-1.73	4.18	4.73	14.72	3.93	48%	-29.47	MAY2000	33.56	FEB1998
ROMP 40 Swnn/AvPk	40.82	44.87	38.12	-4.05	2.70	33.29	42.93	7.53	62%	-4.15	JUN2000	57.37	FEB1998
ROMP 45 Avon Park	77.22	78.95	73.67	-1.73	3.55	63.44	71.76	13.78	95%	31.75	MAY1981	84.44	OCT2004
ROMP 48 Tampa/Suwannee	34.96	38.20	31.79	-3.24	3.17	28.13	36.64	6.83	64%	-9.39	JUN2000	52.64	AUG1982
ROMP 50 Avon Park	6.29	7.68	6.86	-1.39	-0.57	3.10	7.02	3.19	63%	-32.77	FEB2004	14.95	AUG1982
ROMP 58 Ocala	106.02	106.50	104.83	-0.48	1.19	96.89	102.09	9.13	92%	84.03	JUN2000	111.01	DEC2005
ROMP 59 Swnn/AvPk	78.27	79.96	75.19	-1.69	3.08	60.84	72.44	17.43	92%	33.33	MAY1981	85.92	OCT2004
ROMP 60 Ocala/Avon Park	77.71	79.23	74.48	-1.52	3.23	57.61	71.93	20.10	89%	51.29	MAY2012	82.61	SEP2015
ROMP 66 Tampa	19.77	21.43	18.46	-1.66	1.31	16.79	18.96	2.98	90%	12.04	JUN1977	25.47	AUG2015
ROMP 76 U Fldn	130.33	131.48	129.60	-1.15	0.73	126.65	129.69	3.68	91%	119.37	MAY1981	132.92	SEP2004
ROMP 87 Avon Park	102.41	103.56	102.20	-1.15	0.21	101.14	102.96	1.27	59%	94.88	JUN2000	106.30	FEB1998
ROMP 88 Avon Park	104.09	105.00	103.66	-0.91	0.43	102.53	104.16	1.56	71%	97.42	JUN2000	107.21	SEP2017
ROMP 93 Swnn/AvPk	73.07	73.64	72.74	-0.57	0.33	66.46	73.03	6.61	77%	59.03	JUN2001	76.60	SEP1982
ROMP DV-1 Suwannee	55.59	50.76	53.83	4.83	1.76	50.59	55.98	5.00	71%	12.06	JAN2010	65.72	FEB1998
ROMP TR 10-2 Tampa	10.50	11.50	9.65	-1.00	0.85	8.29	10.25	2.21	81%	0.22	MAY1981	14.90	SEP2004
ROMP TR 13-3 Avon Park	17.01	17.22	15.66	-0.21	1.35	15.13	16.32	1.88	92%	10.95	JUL1987	18.79	AUG2015
SR 52 And CR581 Deep	73.39	74.61	73.53	-1.22	-0.14	67.81	74.80	5.58	58%	56.96	JUN2001	79.44	AUG1965
SR 52 Deep W nr Fivay Jct	53.10	53.32	52.52	-0.22	0.58	51.67	52.88	1.43	90%	48.08	JUN2000	59.53	AUG2010
SR 577 Deep	91.23	93.09	91.70	-1.86	-0.47	85.06	92.40	6.17	64%	72.76	JUN2000	98.51	MAR1998
Sanlon Ranch Fldn	99.80	100.72	98.61	-0.92	1.19	86.35	95.83	13.45	90%	66.38	MAY1975	105.27	OCT2004
Tarpon Rd Deep	10.23	10.75	9.33	-0.52	0.90	9.83	10.78	0.40	52%	7.50	JUN2006	13.48	AUG2015

# Regional Wells Summary (continued):

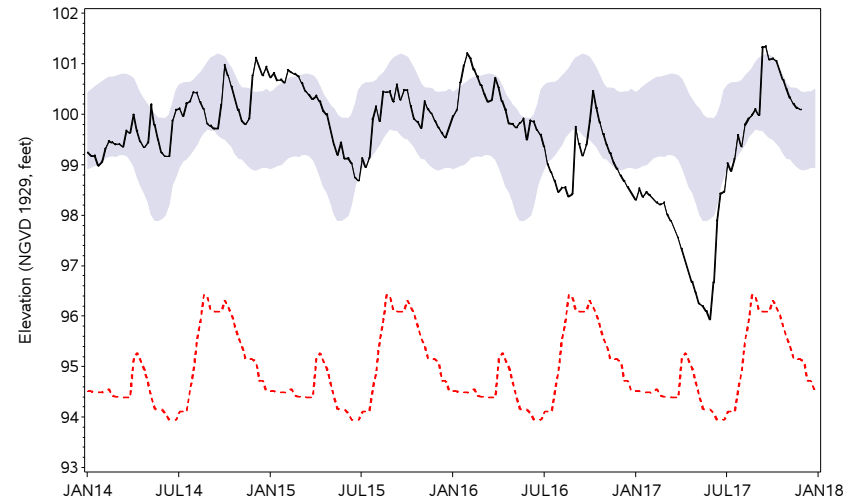
	NOV 2017 Elev	OCT 2017 Elev	NOV 2016 Elev	Change From OCT 2017	Change From NOV 2016	NOV Historical Low Normal	NOV Historical High Normal	Departure From Low Normal	NOV 2017 Percentile Rank	Period of Record Low	Record Low Date	Period of Record High	Record High Date
<b>SOUTHERN COUNTIES</b>													
Big Slough Deep	33.99	34.83	32.97	-0.84	1.02	32.42	33.67	1.57	83%	26.85	MAY2006	36.59	JAN1983
Cargill FA-1 Fldn	75.32	77.19	71.66	-1.87	3.66	62.09	71.67	13.23	93%	30.50	MAY1981	82.95	OCT2004
Edgeville 3 Deep	28.11	30.65	21.88	-2.54	6.23	25.02	35.21	3.09	43%	1.13	MAY2000	46.40	OCT1965
Englewood 14 Deep	6.53	5.82	5.68	0.71	0.85	3.66	6.19	2.87	84%	-0.97	FEB2001	11.37	SEP1974
Florida Pwr @ Piney Point	16.05	17.42	13.34	-1.37	2.71	11.09	15.00	4.96	88%	-4.84	MAY1989	21.52	SEP2017
Kibler Deep	7.40	10.71	2.74	-3.31	4.66	4.16	14.40	3.24	45%	-29.95	MAY2000	29.30	AUG1978
Manasota 14 Deep	18.36	18.95	17.20	-0.59	1.16	18.57	21.18	-0.21	21%	15.46	MAY2017	22.70	NOV1971
Marshall Deep	45.47	48.84	39.40	-3.37	6.07	39.63	47.77	5.84	63%	8.96	JUN2000	55.24	MAR1964
ROMP 16 Ocala	48.16	49.73	44.99	-1.57	3.17	45.76	48.41	2.40	68%	28.94	JAN2001	51.21	SEP1995
ROMP 17 Up Fldn	47.90	49.52	43.83	-1.62	4.07	43.69	46.68	4.21	95%	31.89	JUN2000	51.64	OCT1994
ROMP 19 West UFA Swnn	29.14	30.75	27.68	-1.61	1.46	23.24	29.36	5.90	72%	10.99	JUN2000	33.80	SEP2017
ROMP 19X UFA (SWNN) Monitor	34.78	36.25	32.94	-1.47	1.84	31.54	35.84	3.24	70%	19.28	JUN2000	40.19	JAN1984
ROMP 20 UFA (SWNN) Monitor	22.67	23.68	20.12	-1.01	2.55	19.87	21.85	2.80	87%	11.99	MAY2007	26.66	SEP2017
ROMP 22 UFA (SWNN) Monitor	19.25	21.67	16.08	-2.42	3.17	14.68	20.15	4.57	70%	-3.88	MAY2000	30.18	FEB1998
ROMP 26 Suwannee/Tampa	46.34	48.97	40.88	-2.63	5.46	42.07	46.56	4.27	72%	19.48	JAN2010	53.18	OCT1979
ROMP 28X Swnn/AvPk	72.52	71.87	69.56	0.65	2.96	67.87	70.36	4.65	96%	57.24	JAN2010	74.68	OCT1995
ROMP 30 Swnn/AvPk	55.97	55.38	42.73	0.59	13.24	41.62	50.10	14.35	90%	-0.20	JUN2000	60.52	MAR1998
ROMP 31 Swnn/AvPk	46.48	50.24	39.18	-3.76	7.30	36.47	45.65	10.01	80%	-8.20	JUN2000	57.92	MAR1998
ROMP 32 Low Ocala/Avpk	28.21	31.92	21.50	-3.71	6.71	20.45	31.64	7.76	65%	-17.74	JUN2000	51.65	OCT1987
ROMP 43XX Avon Park	92.04	92.09	89.27	-0.05	2.77	85.69	89.66	6.35	93%	70.93	JAN2010	94.60	MAR1998
ROMP 9 UFA (SWNN) Monitor	43.05	43.96	41.47	-0.91	1.58	41.37	42.91	1.68	85%	36.20	MAY2000	46.35	SEP2006
ROMP TR 1-2 Up Fldn	45.50	46.19	44.74	-0.69	0.76	44.67	45.46	0.83	76%	40.72	JUN2000	47.22	SEP2015
ROMP TR 3-1 Up Fldn	34.43	35.15	33.59	-0.72	0.84	33.35	34.13	1.08	88%	29.04	JUN2000	35.98	SEP2017
ROMP TR 5-1 Suwannee	19.81	20.80	18.59	-0.99	1.22	18.62	20.14	1.19	62%	13.26	JUN2000	23.00	SEP1983
ROMP TR 5-2 UFA (SWNN) Monitor	25.88	25.84	23.86	0.04	2.02	23.82	26.61	2.06	59%	13.75	MAY2006	31.26	OCT1994
ROMP TR 7-1 Tampa	19.14	20.51	16.98	-1.37	2.16	17.47	19.36	1.67	69%	10.01	JUN2000	24.23	SEP2017
ROMP TR 7-4 Swnn/Ocala	14.82	16.96	11.54	-2.14	3.28	10.93	15.32	3.89	72%	-3.55	MAY2000	24.20	SEP2017
Romp TR SA-1 UFS (SWNN) Monitor	10.64	12.35	8.70	-1.71	1.94	11.08	15.35	-0.44	16%	2.89	MAY2017	24.52	SEP1979
Sarasota Office Up Floridan	16.04	18.38	12.35	-2.34	3.69	14.75	25.74	1.29	32%	-3.24	JUN2000	35.21	MAR1931
Verna T 0-1	14.72	17.35	10.67	-2.63	4.05	11.95	19.91	2.77	46%	-15.73	MAY2000	33.32	JAN1984

# HYDROGRAPHS OF REPRESENTATIVE INTERMEDIATE AND FLORIDAN AQUIFER WELLS JANUARY 2014 TO NOVEMBER 2017

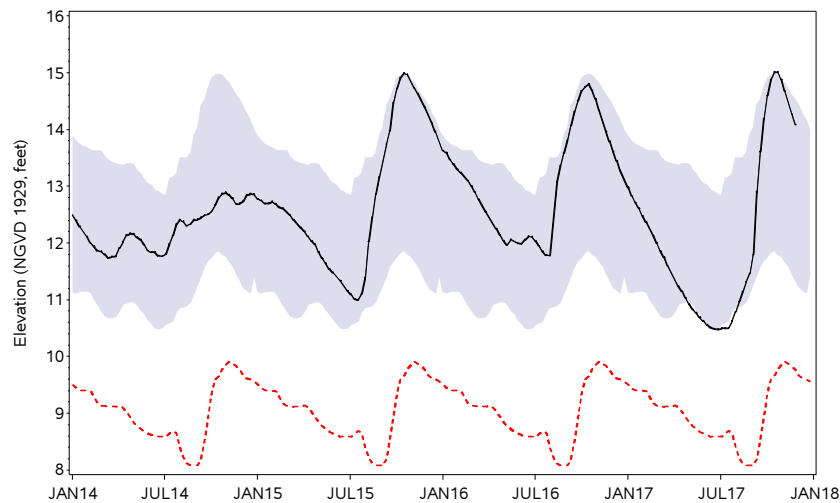
Chassahowitzka #1  
Northern Region



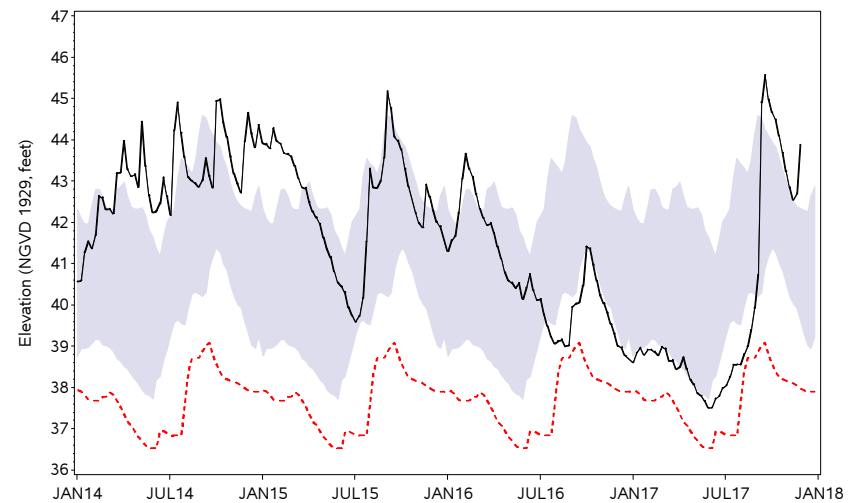
Mascotte Deep  
Northern Region



ROMP 107 Ocala/Avon Park  
Northern Region



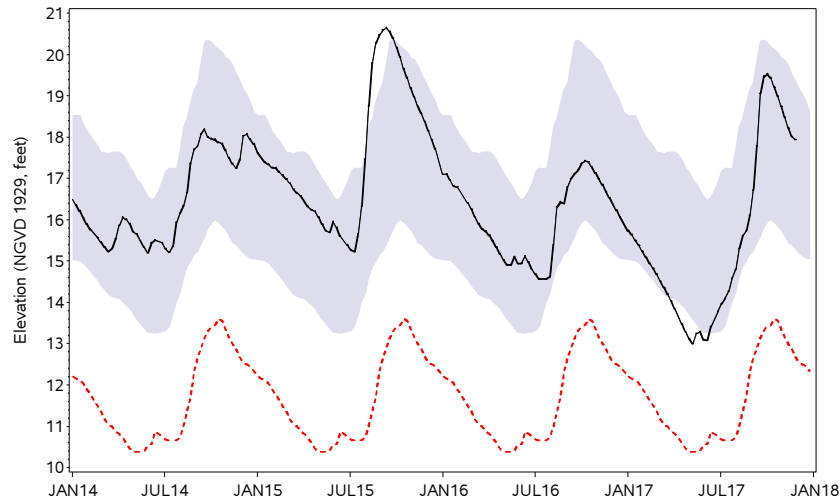
Sumter 13 Upper Fldn  
Northern Region



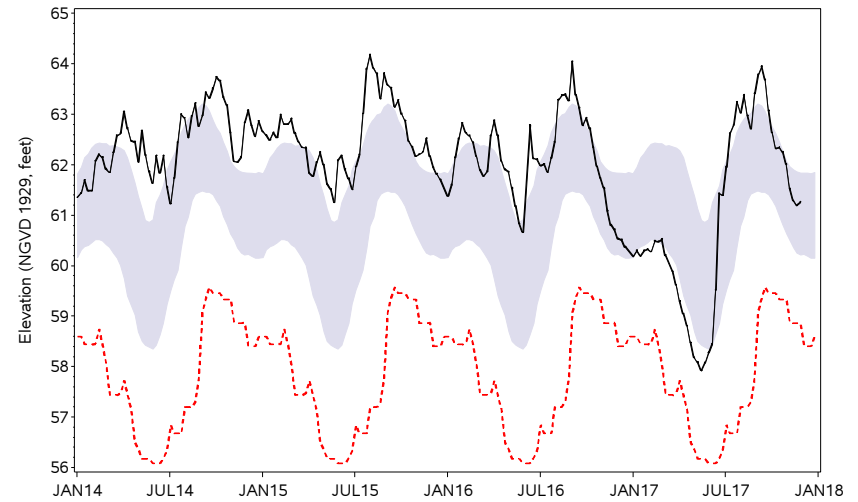
— Average Weekly Elevation      - - - - - POR Weekly Low      Normal Range

# HYDROGRAPHS OF REPRESENTATIVE INTERMEDIATE AND FLORIDAN AQUIFER WELLS JANUARY 2014 TO NOVEMBER 2017

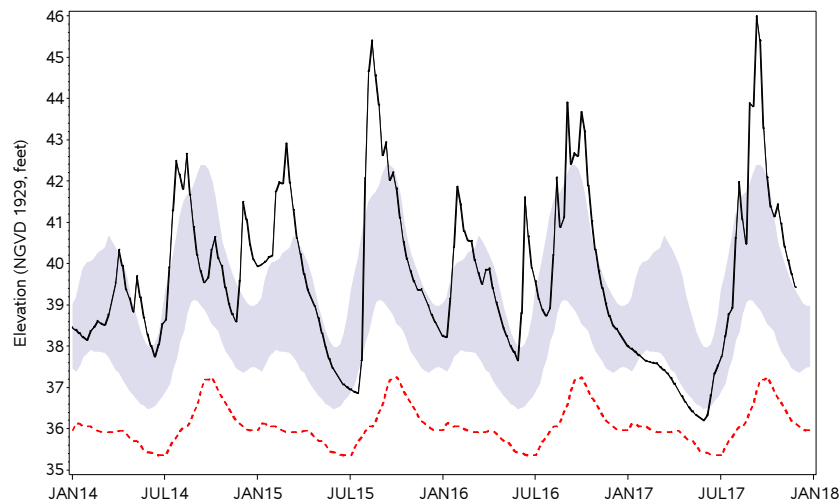
Weeki Wachee Deep  
Northern Region



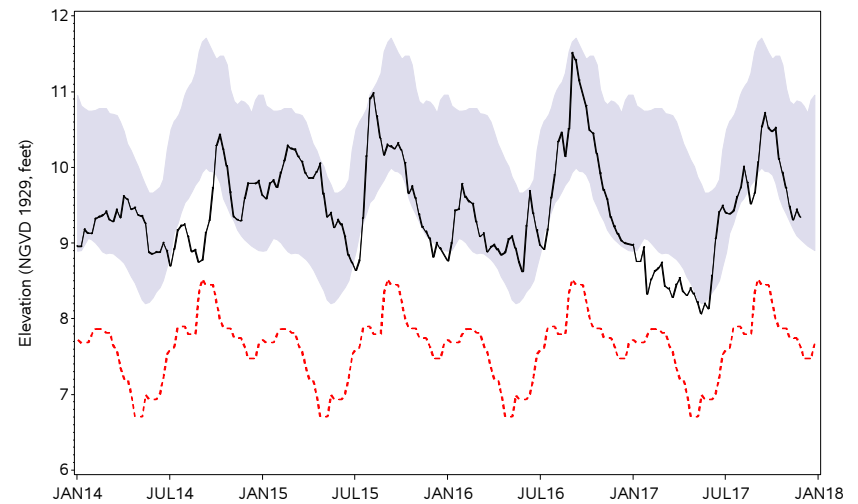
Bexley Well 2  
Central Region



Hillsborough St Park Deep  
Central Region



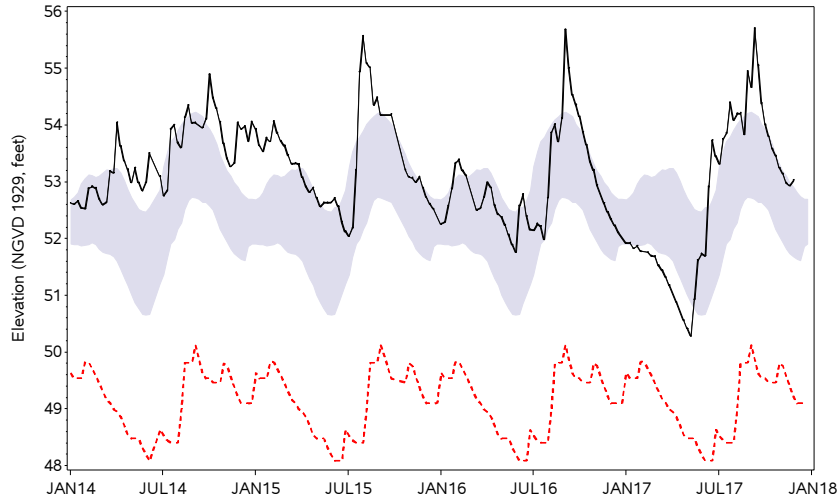
Pinellas 665  
Central Region



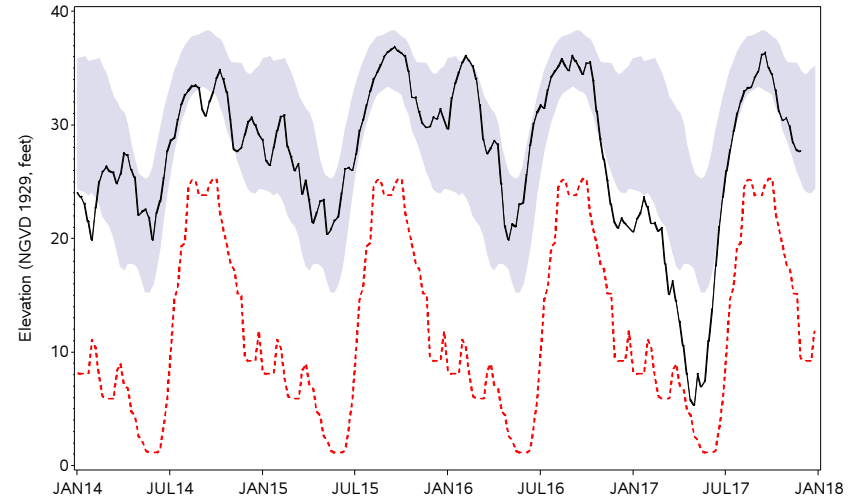
— Average Weekly Elevation      - - - - - POR Weekly Low      Normal Range

# HYDROGRAPHS OF REPRESENTATIVE INTERMEDIATE AND FLORIDAN AQUIFER WELLS JANUARY 2014 TO NOVEMBER 2017

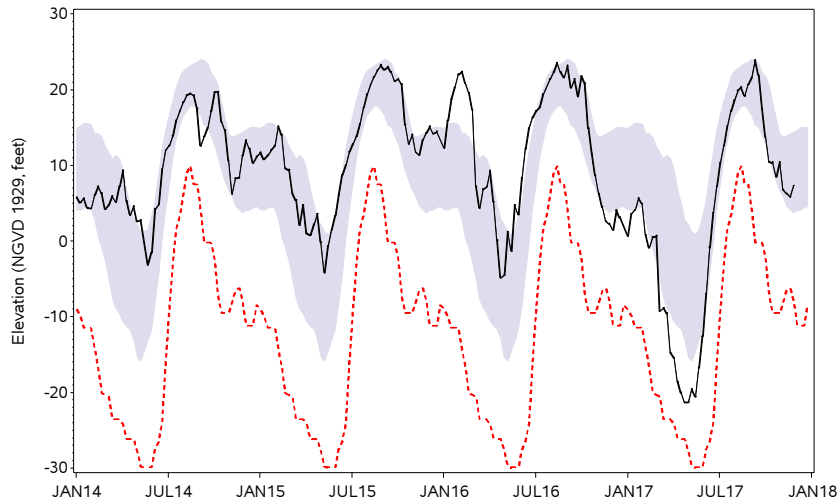
SR 52 Deep (West) near Fivay  
Central Region



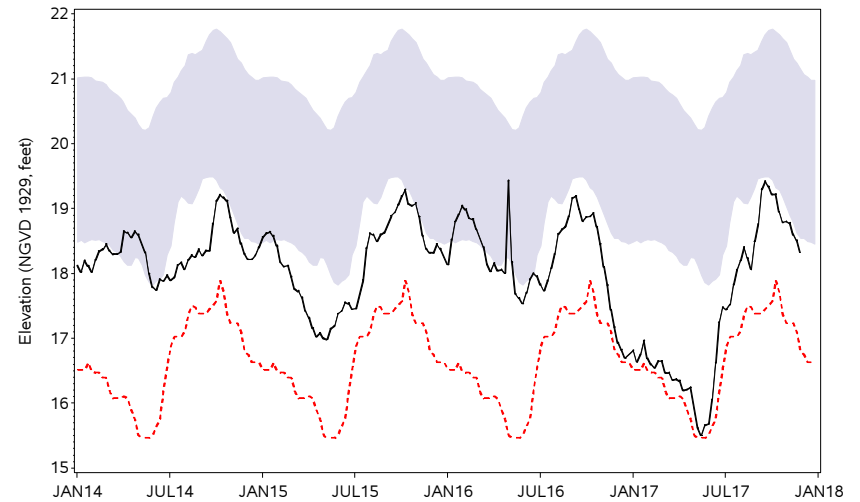
Edgeville 3 Deep  
Southern Region



Kibler Deep  
Southern Region



Manasota 14 Deep  
Southern Region



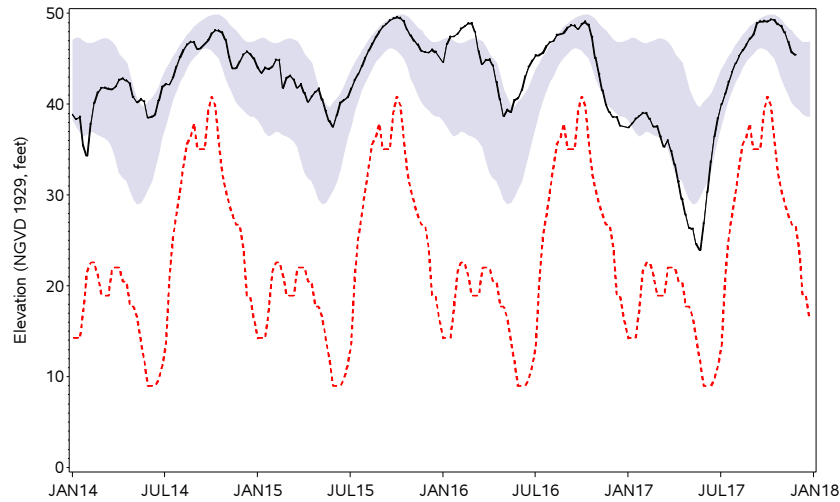
— Average Weekly Elevation

- - - POR Weekly Low

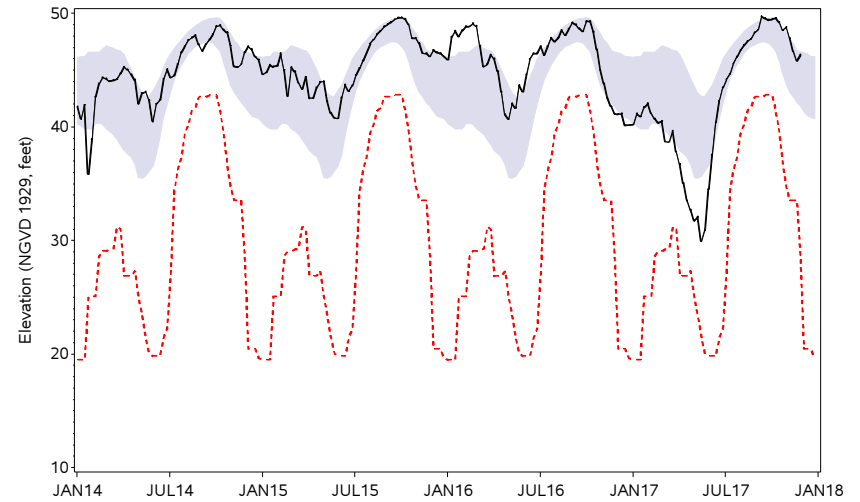
Normal Range

# HYDROGRAPHS OF REPRESENTATIVE INTERMEDIATE AND FLORIDAN AQUIFER WELLS JANUARY 2014 TO NOVEMBER 2017

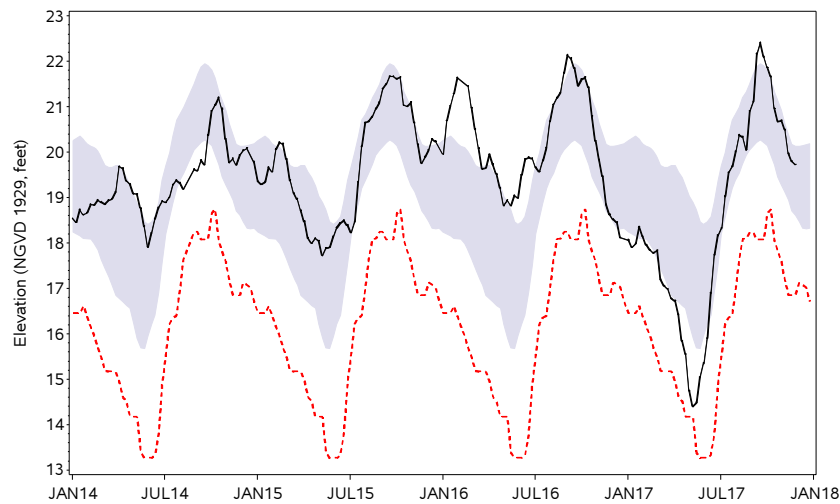
Marshall Deep  
Southern Region



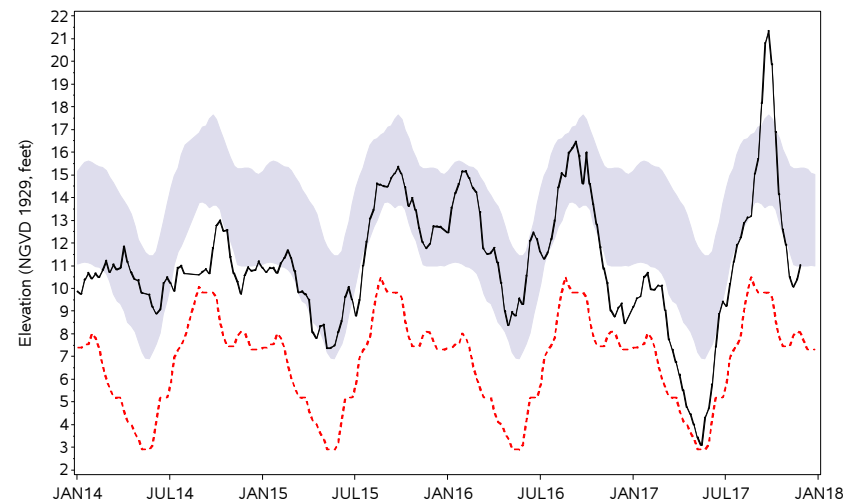
ROMP 26 Suwannee/Avon Park  
Southern Region



ROMP TR 5-1 Suwannee  
Southern Region



Romp TR SA-1  
Southern Region

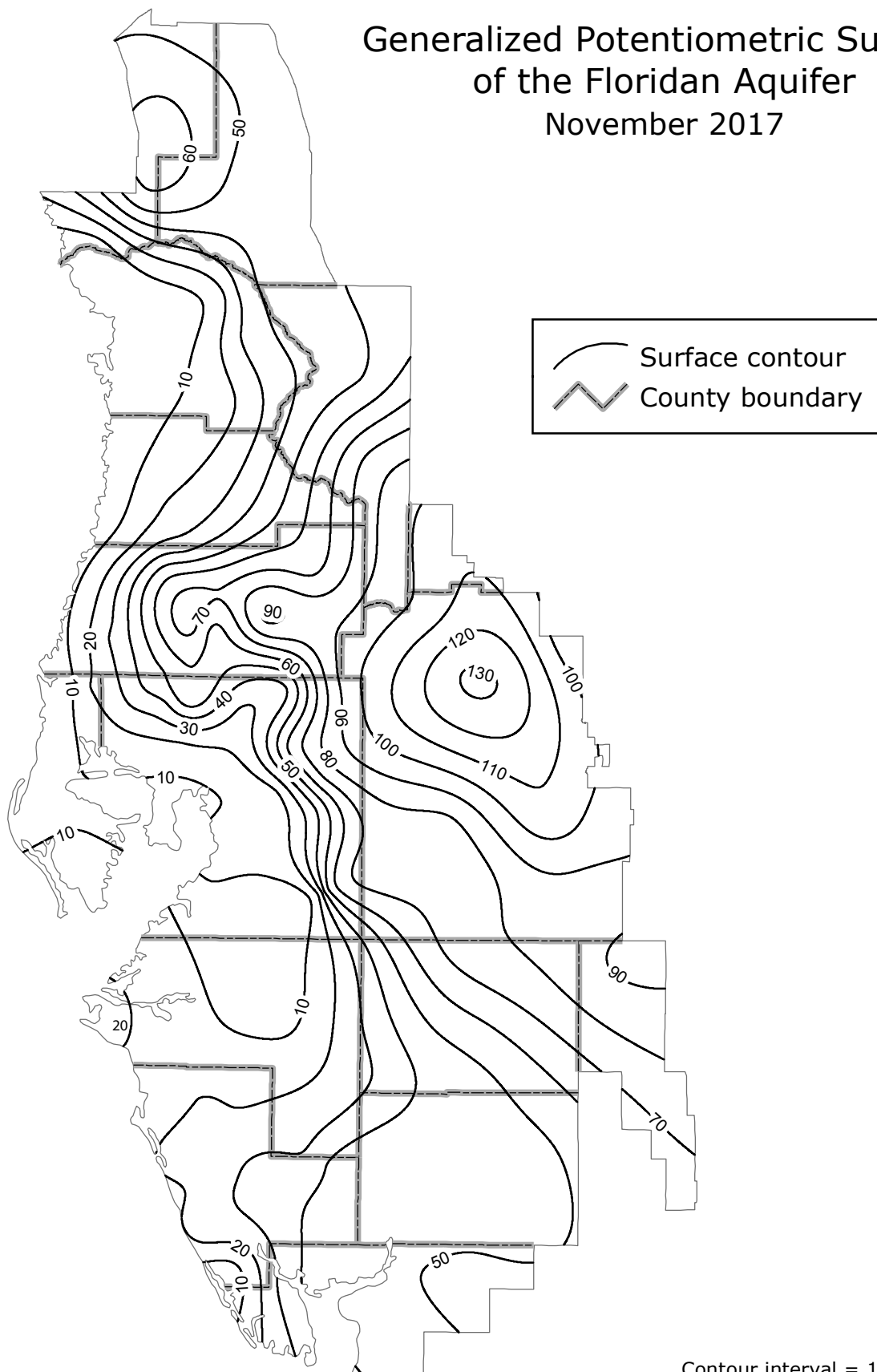


— Average Weekly Elevation

- - - POR Weekly Low

Normal Range

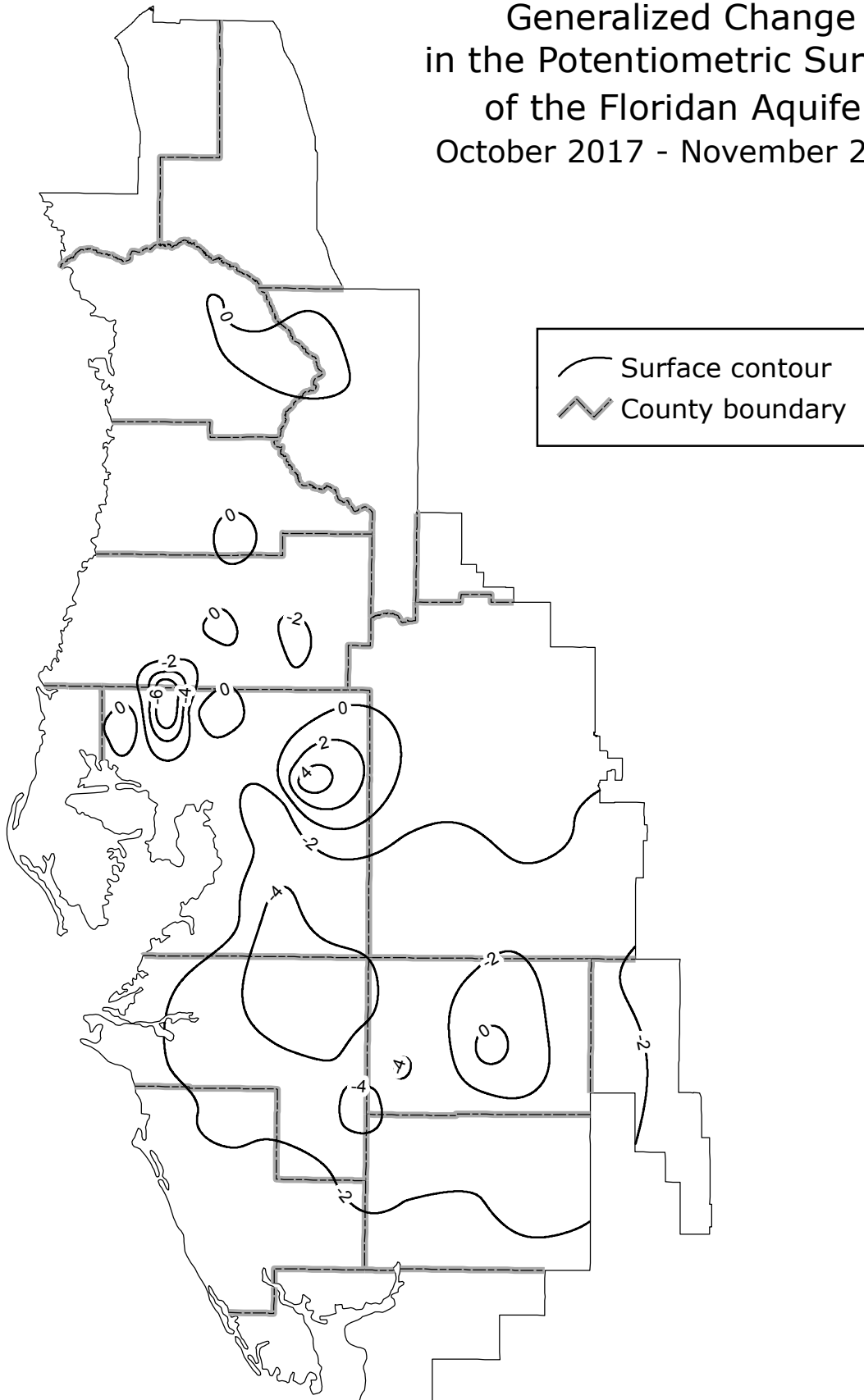
# Generalized Potentiometric Surface of the Floridan Aquifer November 2017



Compiled by M.L. Crowell



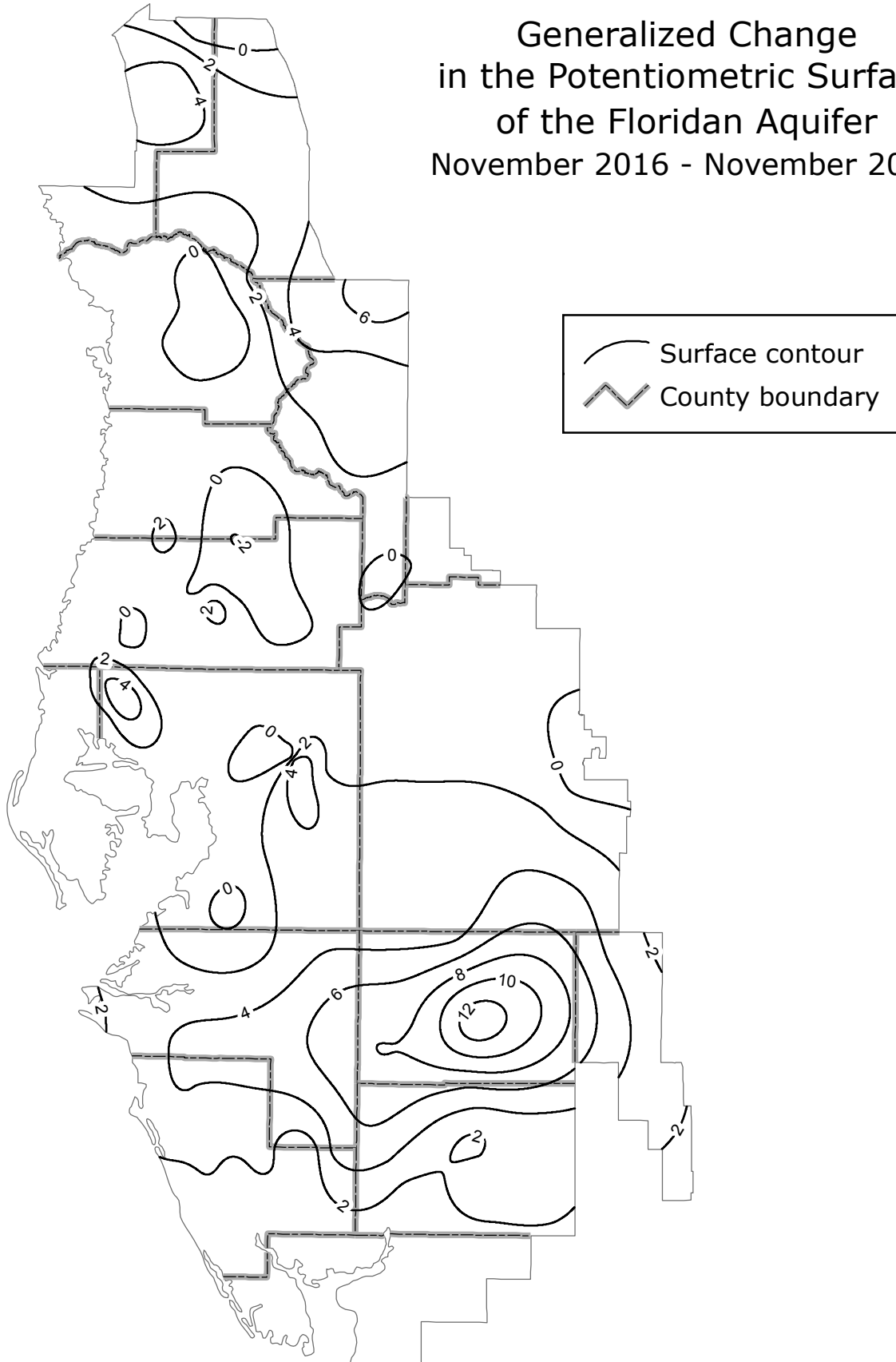
# Generalized Change in the Potentiometric Surface of the Floridan Aquifer October 2017 - November 2017



Compiled by M.L. Crowell

Contour interval = 2 feet

Generalized Change  
in the Potentiometric Surface  
of the Floridan Aquifer  
November 2016 - November 2017



Compiled by M.L. Crowell

Contour interval = 2 feet

## **Public Supply Wellfields**

Water levels are measured in 21 monitor wells (9 surficial, 12 intermediate and Floridan aquifer wells) located at nine public supply wellfields in the District. Thirteen of the 21 monitor wells have water levels measured monthly, two biweekly, and six weekly. Monthly data are tabulated to compare recent water levels to historical means.

In November, monthly analysis indicates that average water levels decreased in 10 of the 12 intermediate and Floridan wells and all nine surficial wells. Average water levels measured in the intermediate and Floridan wells decreased 2.12 feet, while levels measured in surficial wells decreased 0.85 foot.

During November, annual analysis indicates average water levels in 7 of the 12 intermediate and Floridan wells and 7 of the 9 surficial wells were above last year's levels. Water levels measured in the intermediate and Floridan wells averaged 0.97 foot above last year's levels, while surficial water levels averaged 0.74 foot above November 2016 levels.

For November, average water levels in all 12 intermediate and Floridan wells and all 9 surficial wells were above the low normal level, compared to historical monthly levels. Water levels measured in the intermediate and Floridan wells averaged 7.19 feet above the low normal level, while levels in the surficial wells averaged 5.48 feet above the low normal level.

# SUMMARY OF GROUNDWATER LEVELS IN REPRESENTATIVE WELLFIELD WELLS, NOVEMBER 2017

	NOV 2017 Elev	OCT 2017 Elev	NOV 2016 Elev	Change From OCT 2017	Change From NOV 2016	NOV Historical Low Normal	NOV Historical High Normal	Departure From Low Normal	Period of Record Low	Record Low Date	Period of Record High	Record High Date
<i>INT/FLORIDAN WELLS</i>												
Cosme-Odesa Cosme No. 3	26.58	26.31	26.21	0.27	0.38	23.05	26.81	3.53	11.58	JUN2000	33.84	AUG2012
Cross Bar WRW	52.41	52.96	51.11	-0.55	1.30	41.24	53.78	11.17	33.94	JAN1994	61.65	AUG1984
Cypress Crk TMR-1 Deep	63.74	64.11	61.08	-0.36	2.67	53.44	61.52	10.30	36.93	FEB2001	70.87	JUN1976
Cypress Crk TMR-3 Deep	62.61	61.90	60.16	0.71	2.45	51.49	59.68	11.12	34.22	FEB2001	68.74	JUL1976
Eldridge-Wilde 11 Deep	22.28	23.99	18.89	-1.71	3.39	11.76	19.00	10.52	0.31	SEP1990	64.70	NOV2009
Eldridge-Wilde 2S	20.81	22.00	19.37	-1.19	1.44	11.16	18.76	9.65	-1.05	JUN2000	25.44	SEP2013
Morris Bridge 3A Deep	30.79	31.63	31.29	-0.84	-0.50	27.36	31.65	3.43	17.02	MAY2009	42.53	AUG2013
Section 21 Hills 13 Deep	39.66	46.86	39.76	-7.19	-0.10	35.60	44.92	4.06	21.54	JUN2002	52.08	JUL1944
South Pasco 42	49.32	56.07	50.77	-6.75	-1.45	42.36	49.35	6.96	27.98	MAY2002	58.65	SEP2017
South Pasco SR 54 Deep	52.27	56.99	52.91	-4.71	-0.64	46.21	54.08	6.06	33.49	MAY2002	59.26	AUG2012
Starkey Regional	34.57	35.52	34.68	-0.95	-0.11	31.68	34.48	2.89	25.03	JUN2000	38.37	AUG2015
Verna 08	12.64	14.75	9.82	-2.11	2.82	6.08	13.70	6.56	-24.32	MAY1989	26.68	FEB1998
<i>SURFICIAL WELLS</i>												
Cosme-Odesa IC-6	37.50	38.45	37.19	-0.96	0.31	36.07	37.61	1.43	31.91	JUL1973	42.95	AUG2015
Cross Bar SERW	69.36	69.80	68.47	-0.44	0.89	59.52	68.32	9.84	53.08	JUL1994	72.53	JUL1984
Cypress Crk TMR-1 Shallow	63.98	64.83	61.36	-0.84	2.62	57.09	63.87	6.89	39.89	DEC2000	69.22	SEP2004
Cypress Crk TMR-3 Shallow	60.34	62.13	58.58	-1.79	1.76	53.83	59.40	6.51	53.55	MAY1997	64.80	JUN2003
Eldridge-Wilde 11 Shallow	27.24	27.86	26.59	-0.62	0.65	18.08	23.01	9.16	10.28	MAY1991	31.72	JUL2015
Morris Bridge 3A Shallow	33.07	34.03	33.40	-0.96	-0.33	32.43	34.63	0.64	24.86	MAY2009	39.20	DEC1997
Section 21 Hills 13 Shallow	51.16	52.12	51.22	-0.96	-0.06	41.06	50.52	10.10	33.81	MAY2001	53.82	AUG2012
South Pasco SR 54 Shallow	58.43	58.58	58.28	-0.15	0.15	56.93	58.69	1.50	54.43	OCT1980	60.49	SEP1998
Starkey 707	30.86	31.76	30.19	-0.90	0.67	27.59	30.07	3.27	22.70	JUN2000	34.18	AUG2015

### **Aquifer Resource Index**

Aquifers are underground layers of rock and sand that hold water. In southwest Florida, more than 80 percent of the water supply comes from aquifers. The Aquifer Resource Index (ARI) was created to provide information to the media, residents, local governments and other interested parties about current ground-water conditions and how they compare to historical records. The underlying purpose of this index is to provide the public with a gauge of ground-water conditions in their area, so they can develop an understanding of the severity and cycles of drought and recovery

This ARI report has been modified to now reflect percentile values to compare current aquifer levels to historical levels during the same time of year on a scale of 0-100. For example, if the regional groundwater level is at the 50th percentile, it means that half of the historical levels for this time of year were higher and half were lower than the current level.

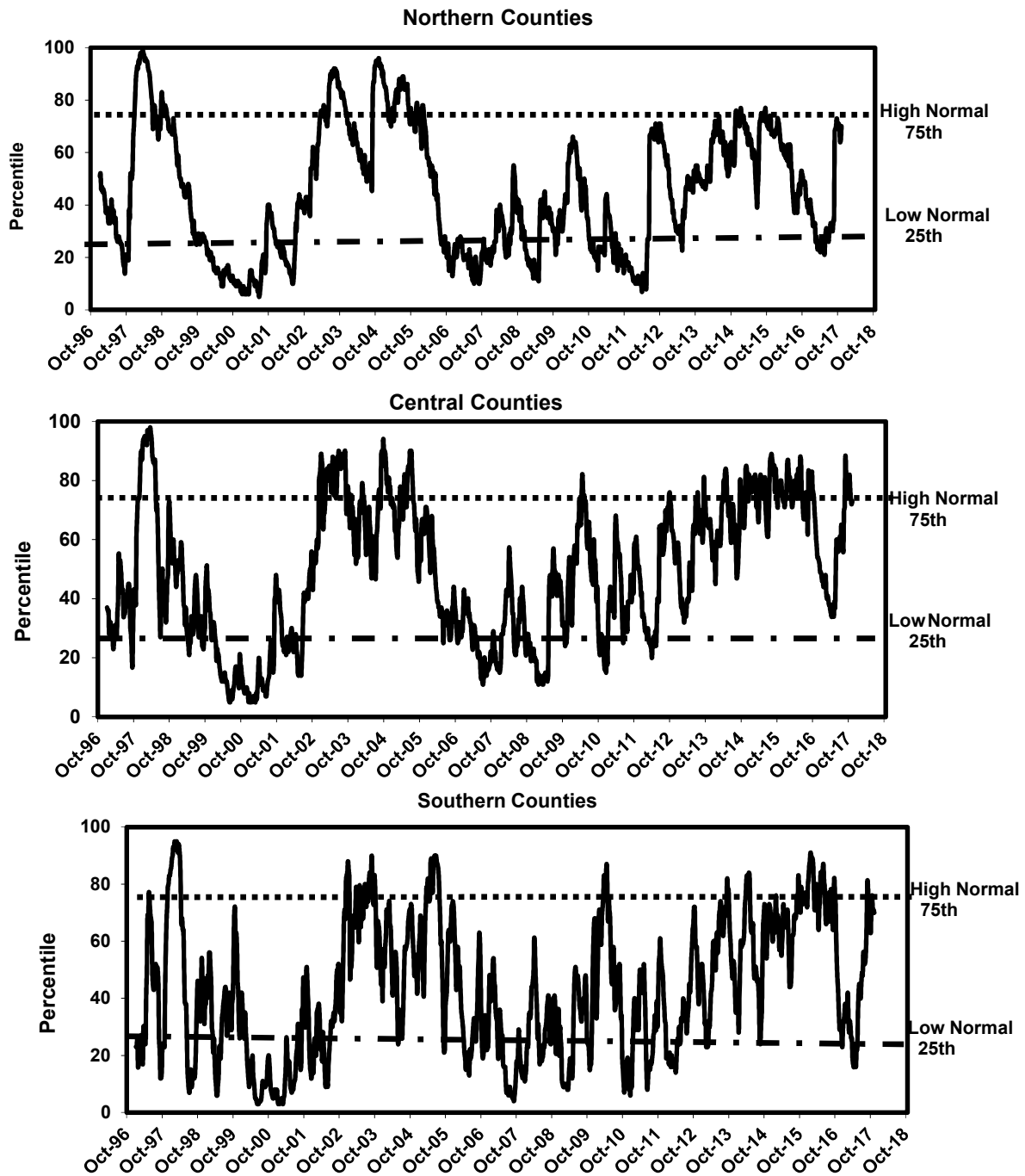
To determine the ARI percentile value for each geographic region (indicated below), the percentile values of the monitor wells located within that region are averaged. Monitor wells with an adequate and reliable period-of-record to calculate weekly percentiles were selected for the network. There are 20 wells located in the northern region, 32 wells located in the central region and 30 wells located in the southern region, that are currently used for determining the regional percentiles. A total of 82 wells District-wide are used for the ARI Network (see index map in Appendix).

**Weekly Aquifer Resource Index Level (Percentile)**

<b>Report Date</b>	<b>Northern Region</b>	<b>Central Region</b>	<b>Southern Region</b>
11/06/2017	69	76	75
11/13/2017	63	73	70
11/20/2017	64	72	71
11/27/2017	70	73	69

Note: Any regional percentile value that falls on or between the 25<sup>th</sup> and 75<sup>th</sup> percentile is considered “normal.” Less than the 25<sup>th</sup> would be considered “below-normal,” while above the 75<sup>th</sup> would be considered “above-normal.”

**AQUIFER RESOURCE INDEX\***  
November 2017



\*Average Groundwater Level Relative to Low Normal, NGVD 29  
Compiled By Steven DeSmith, P.G.

# **PUBLIC SUPPLY SURFACE WATER RESERVOIRS**

**CITY OF TAMPA RESERVOIR (Hillsborough River Basin):** Constructed in 1924, it is located on the Hillsborough River in Hillsborough County. It is the fourth largest public supply surface water facility in the District. It is the main water supply for the City of Tampa and has a total storage capacity of 1.7 billion gallons (bg). The total usable volume is 1.4 bg, when the reservoir elevation is 22.5 feet NGVD. It is an in-stream reservoir with a depth that ranges between nine and 22 feet. Given this amount of water, it is estimated that a 15-day supply of water is available from this facility over an extended dry period. During periods of low water due to drought conditions, the facility is permitted to pump water from two alternate sources. The first of these two sources is the Tampa Bypass Canal. Water is pumped over the water control structure at S-161 into the Hillsborough River above the dam. The second source is Sulphur Springs, just downstream from the dam, where water is captured at the spring and pumped back behind the dam. Withdrawals from both sources are in strict accordance with pumpage schedules as outlined in the facility's water use permit. When water levels fall below 12 feet NGVD, water cannot be withdrawn because the reservoir level is below the intake pipes. The permitted average daily withdrawal for this facility is 82 mgd, with a permitted maximum daily withdrawal of 104 mgd. Currently, ground water wells are not used to augment this facility. The minimum producible level is 9.00 feet.

## **PEACE RIVER RESERVOIRS - PEACE RIVER/MANASOTA REGIONAL WATER**

**SUPPLY AUTHORITY (Peace River Basin):** The Peace River reservoirs are located in southwestern DeSoto County. They are an off-stream reservoir system consisting of two reservoirs that store surface water captured from the Peace River during wet periods. The first reservoir, Reservoir 1, was built in 1980 and encompasses approximately 85 acres, has a water depth of approximately 31 feet, and has a total storage capacity of approximately 625 million gallons. The second reservoir, Reservoir 2, was built in 2009, covers about 616 acres, has a water depth of approximately 35 feet, and has a total storage capacity of about 6.0 billion gallons. The PRMRWSA facility ranks as the third largest in the District for total volume storage and supplies water to Charlotte, DeSoto, Manatee and Sarasota counties and to the City of North Port. The facility also uses an aquifer storage recovery (ASR) system for storing treated water pumped from the river. The minimum producible level at Reservoir 1 is Elevation 8.0 feet, while Reservoir 2 is Elevation 27.0 feet.

**MANATEE RESERVOIR (Manasota Basin):** Completed in 1967 by the damming of the Manatee River, the Manatee Reservoir is the second largest of the six surface-water public supply facilities within the District. Located in Manatee County, this in-stream facility has a storage capacity of 7.5 bg. The service area of the Manatee reservoir is the unincorporated portions of Manatee County, the City of Palmetto and Anna Maria Island, and also the Sarasota SUD#1. This reservoir provides essentially all public supply for Manatee County, with the exception of the City of Bradenton. The total size of this reservoir is 1800 acres with an average depth of 15 feet. With the reservoir full, the facility has approximately 220 days of available water supply. When the surface-water elevation drops below 21.0 feet, water cannot be withdrawn because levels are below the facility's intakes. The permitted average daily withdrawal for this facility is 34.9 mgd, with a permitted peak monthly quantity of 41.9 mgd. The minimum producible level is 21.00 feet.

**EVERS RESERVOIR (Manasota Basin):** Constructed in 1935 and expanded in 1985, it is located on the Braden River in Manatee County. This is the fifth largest public supply reservoir in the District. Its main service area is the City of Bradenton and approximately 500 customers outside the city. It has a total storage capacity of 1.5 bg. The total size of the facility is 300 acres with an average depth of 12 feet. Water ceases to flow over the dam when the level falls below 3.84 feet NGVD. During the 1985 drought, while expansion of the facility was taking place, the water level dropped to one foot below sea level and demand was still met. Given a completely full reservoir, with no water going over the spillway, it is estimated the facility could supply water for approximately 260 days, with no input from rainfall. The permitted average daily withdrawal for this facility is 6.95 mgd, with a permitted peak monthly quantity of 8.13 mgd. Currently, ground-water wells are not used to augment this facility.

**SHELL CREEK RESERVOIR (Peace River Basin):** Shell Creek Reservoir, located in Charlotte County, is the sixth largest surface water system within the District. This system was built in 1964 and services the City of Punta Gorda as well as unincorporated areas surrounding the city limits. The Shell Creek Reservoir is fed by two primary tributaries, Shell Creek from the east and Prairie Creek from the northwest. The total drainage area at Hendrickson Dam is 373 square miles. It has a surface area of 800 acres and depths of 10 to 12 feet. Total storage capacity is 765 mg. Even with this low volume of water, personnel at this facility estimate they have approximately 125 days of available supply with no input from rainfall. Water ceases to flow across the weir when surface elevations drop below 5.0 feet NGVD, and at 3.7 feet NGVD water quality becomes a major concern. When surface elevations drop below 1.75 feet NGVD, the water is below the intakes and withdrawal of water is not possible. The permitted average daily withdrawal by this facility is 5.358 mgd, with a permitted peak monthly quantity of 6.901 mgd. The minimum producible level is 1.70 feet.

**C.W. BILL YOUNG REGIONAL RESERVOIR - TAMPA BAY WATER (Alafia River Basin):** Constructed in early 2005, it is the largest public supply surface water facility in the District. Located in southern Hillsborough County, it is an off-stream reservoir that stores surface water skimmed from the Tampa Bypass Canal and Alafia and Hillsborough Rivers. It services the Tampa Bay region through the Tampa Bay Water regional public supply water distribution system. The reservoir has an estimated storage capacity of 15.0 bg when the water level elevation is 136.5 feet NGVD. The reservoir is approximately 45 feet deep, two miles long and one mile wide, and encompasses a land area of approximately 1,100 acres. It reportedly has the capacity to provide 25 percent of the Tampa Bay region's public supply needs for six months and can supply the Tampa Bay regional surface water treatment plant at full capacity for 227 days.



## **Reservoirs**

Water-level data for the seven reservoirs are obtained weekly from the USGS, Manatee County Utilities Department, Peace River/Manasota Regional Water Supply Authority, or Tampa Bay Water. The last weekly water-level value of the month is indicated in this report. The values reported are provisional and subject to revision.

In November, five of the seven reservoirs monitored for this report recorded water-level decreases, compared to last month. The Evers, Hillsborough River, Lake Manatee, Peace River No. 2 and Shell Creek reservoirs posted water level decreases of 0.11, 0.07, 0.01, 0.10 and 0.32 foot, respectively. The Bill Young and Peace River No. 1 reservoirs posted water level increases of 0.02 and 0.10 foot, respectively, compared to last month.

# SUMMARY OF WATER LEVELS IN WATER SUPPLY RESERVOIRS (ELEVATION IN FEET, NGVD 29)

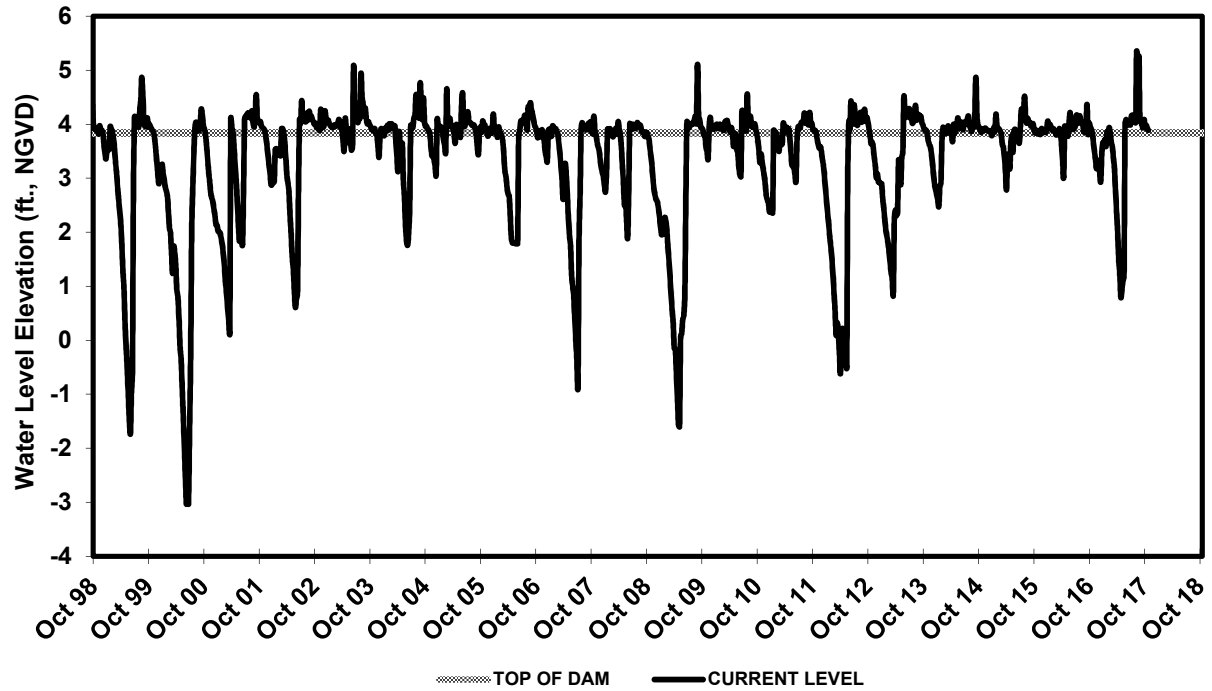
RESERVOIR	2017 October	2017 November	2016 November	Change from Prior Month	Change from Prior Year
<b>Evers</b>					
City of Bradenton	3.98	3.87	3.36	-0.11	0.51
<b>Hillsborough</b>					
City of Tampa	22.70	22.63	22.12	-0.07	0.51
<b>Lake Manatee</b>					
Manatee County	39.15	39.14	39.61	-0.01	-0.47
<b>C.W. Bill Young Regional</b>					
Tampa Bay Water	135.68	135.70	133.96	0.02	1.74
<b>Peace River</b>					
PRMRWSA Reservoir #1	25.20	25.30	23.70	0.10	1.60
PRMRWSA Reservoir #2	62.80	62.70	62.10	-0.10	0.60
<b>Shell Creek</b>					
City of Punta Gorda	5.54	5.22	5.09	-0.32	0.13

NGVD - National Geodetic Vertical Datum

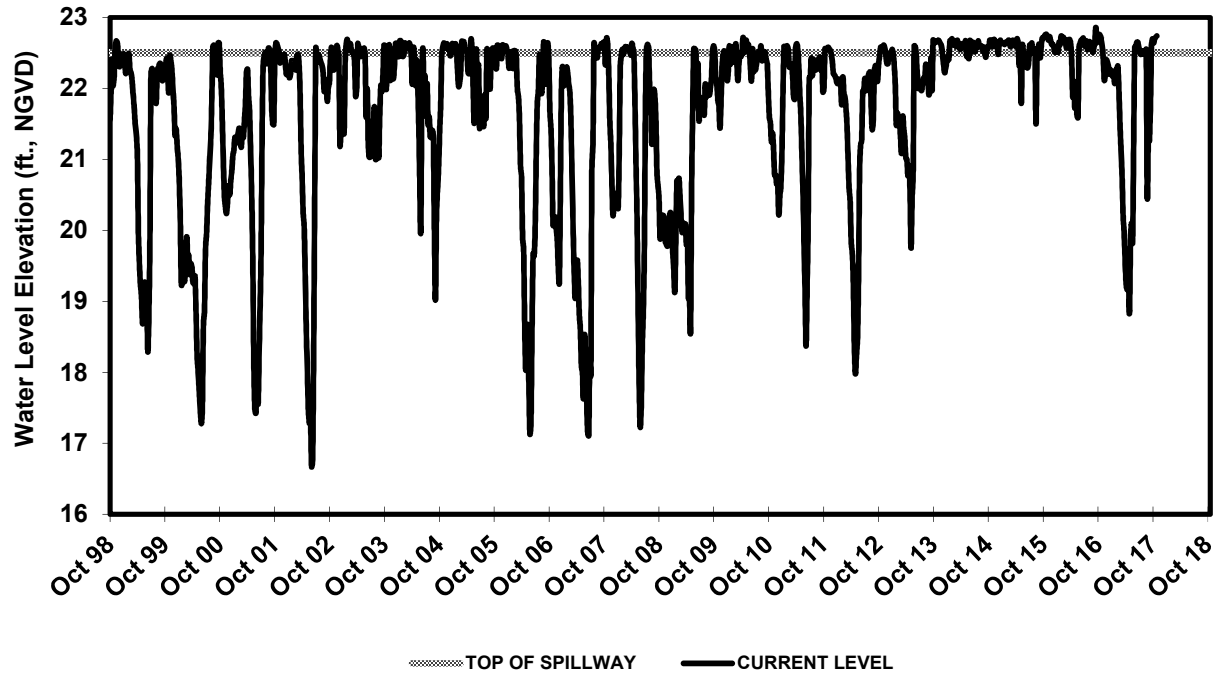
Reported data are provisional and subject to revision.

Compiled by Steven W. DeSmith, P.G.

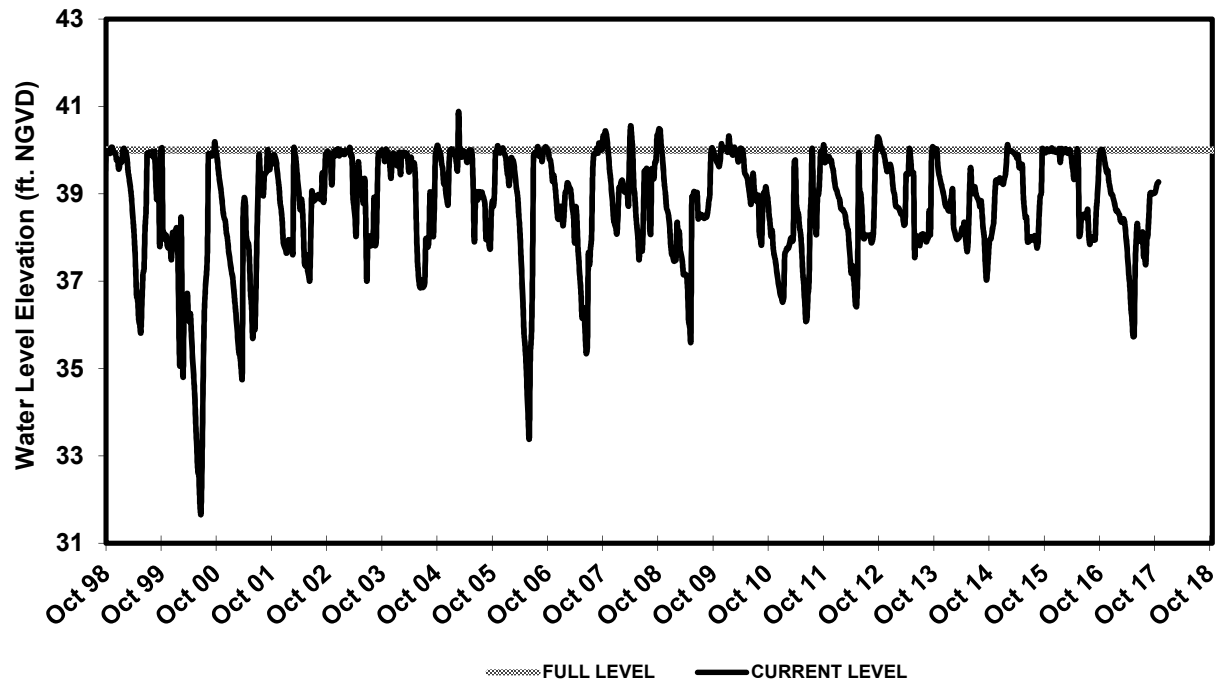
### EVERS RESERVOIR City of Bradenton



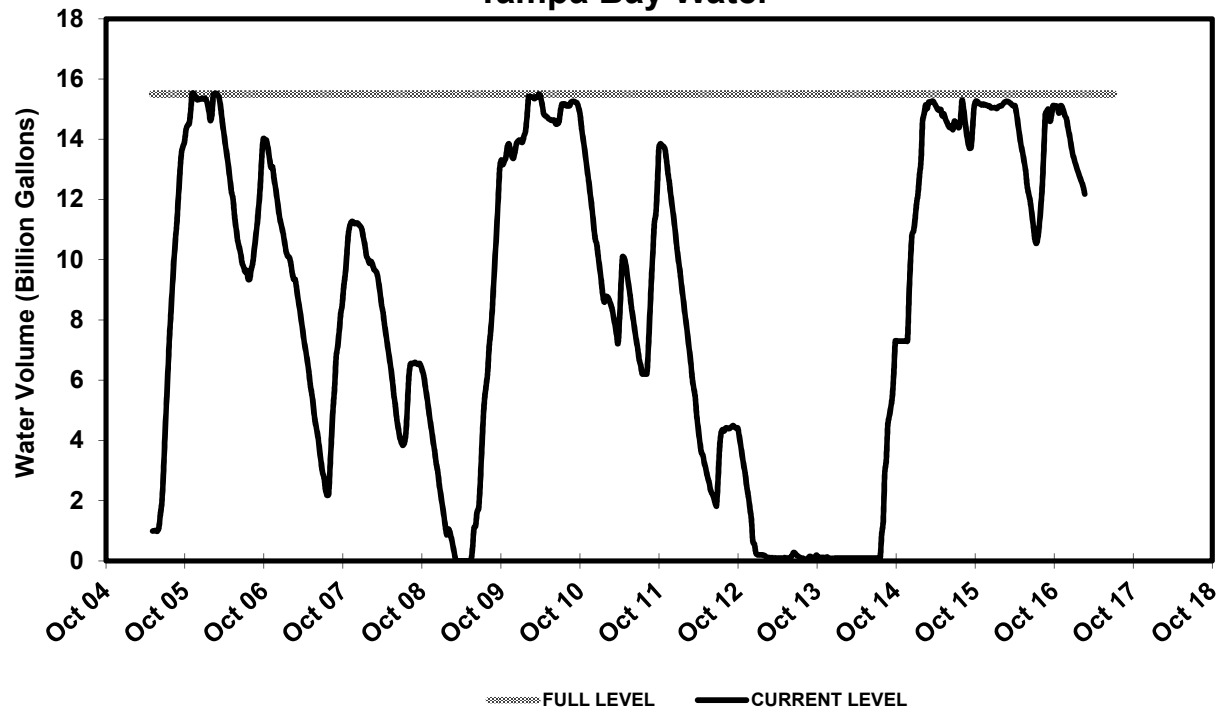
### HILLSBOROUGH RESERVOIR City of Tampa



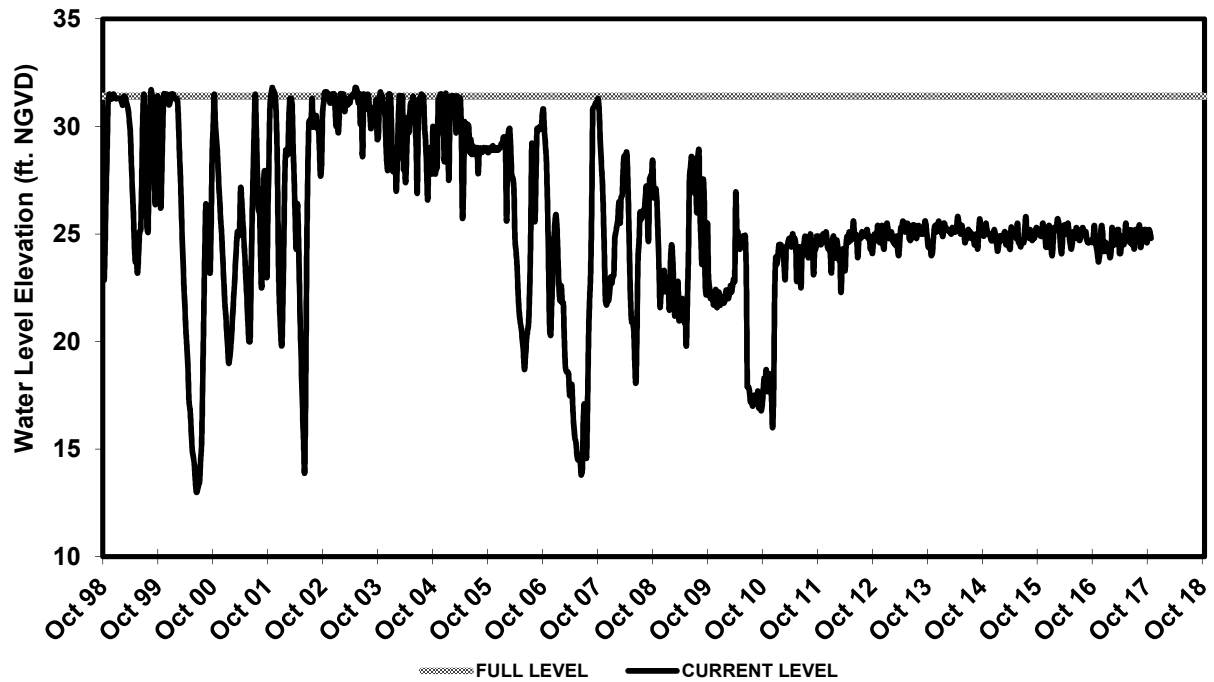
# LAKE MANATEE RESERVOIR Manatee County



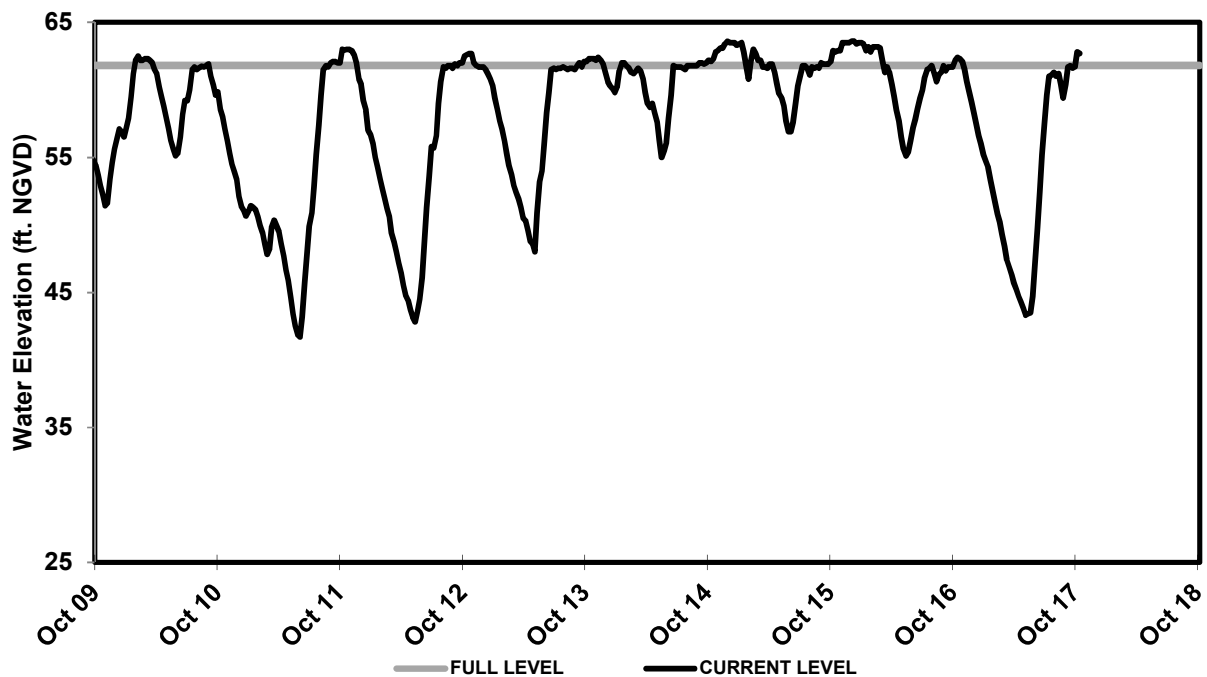
# C.W. BILL YOUNG REGIONAL RESERVOIR Tampa Bay Water



**PEACE RIVER RESERVOIR No. 1**  
**Peace/Manasota Reg. Water Supply**

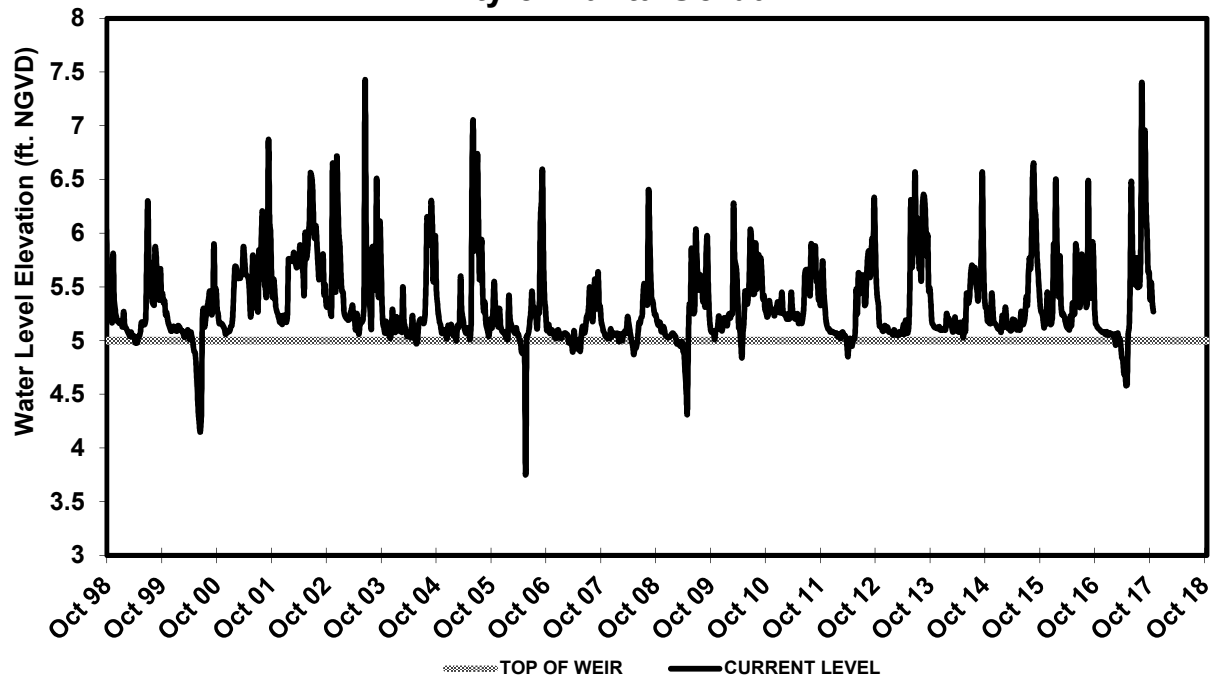


**PEACE RIVER RESERVOIR No. 2**  
**Peace/Manasota Reg. Water Supply**



# SHELL CREEK RESERVOIR

## City of Punta Gorda



# **APPENDICES**

Rainfall percentiles by interval and region, inches.

<b>Rainfall Interval</b>	<b>Region</b>	<b>10<sup>TH</sup> Percentile (P10)</b>	<b>25<sup>th</sup> Percentile (P25)</b>	<b>50<sup>th</sup> Percentile (P50)</b>	<b>75<sup>th</sup> Percentile (P75)</b>	<b>90<sup>th</sup> Percentile (P90)</b>
Annual total	<i>Northern</i>	43.19	48.35	54.01	58.86	63.46
Annual total	<i>Central</i>	41.45	46.10	52.16	57.28	63.82
Annual total	<i>Southern</i>	42.05	46.25	52.19	57.82	63.43
Annual total	<i>District</i>	43.12	47.22	52.99	57.46	62.83
Dry season total	<i>Northern</i>	15.27	18.42	23.79	28.72	32.10
Dry season total	<i>Central</i>	13.32	16.48	21.59	26.86	30.83
Dry season total	<i>Southern</i>	12.35	15.68	21.24	26.23	30.01
Dry season total	<i>District</i>	13.71	16.79	22.02	27.22	29.70
Wet season total	<i>Northern</i>	22.79	25.44	29.45	33.43	38.16
Wet season total	<i>Central</i>	23.22	25.79	29.71	34.86	39.22
Wet season total	<i>Southern</i>	24.37	27.37	30.58	35.88	41.68
Wet season total	<i>District</i>	23.92	27.16	29.97	34.71	38.93
January total	<i>Northern</i>	0.73	1.50	2.45	4.00	5.30
January total	<i>Central</i>	0.72	1.21	2.23	3.72	4.60
January total	<i>Southern</i>	0.39	0.93	1.88	3.31	4.93
January total	<i>District</i>	0.65	1.17	2.10	3.55	4.90
February total	<i>Northern</i>	0.82	1.42	2.82	4.08	5.76
February total	<i>Central</i>	0.60	1.12	2.38	4.17	5.50
February total	<i>Southern</i>	0.36	1.26	2.21	3.63	4.93
February total	<i>District</i>	0.73	1.32	2.38	3.94	5.12
March total	<i>Northern</i>	1.00	2.06	3.15	5.43	7.21
March total	<i>Central</i>	0.97	1.66	2.96	4.95	6.44
March total	<i>Southern</i>	0.81	1.28	2.56	4.29	6.68
March total	<i>District</i>	1.09	1.64	3.04	4.86	6.92
April total	<i>Northern</i>	0.65	1.33	2.38	3.95	5.52
April total	<i>Central</i>	0.51	0.96	1.87	3.44	5.59
April total	<i>Southern</i>	0.48	1.19	2.04	3.75	4.66
April total	<i>District</i>	0.65	1.20	2.24	3.72	5.12
May total	<i>Northern</i>	1.18	1.95	3.21	4.67	6.92
May total	<i>Central</i>	0.87	1.64	2.73	4.58	5.75
May total	<i>Southern</i>	1.17	1.91	3.36	5.22	6.75
May total	<i>District</i>	1.23	2.04	3.24	4.87	6.29
June total	<i>Northern</i>	4.60	5.47	7.27	8.63	10.16
June total	<i>Central</i>	3.65	4.79	6.46	8.27	9.48
June total	<i>Southern</i>	4.22	5.63	7.44	9.06	12.06
June total	<i>District</i>	4.55	5.46	7.24	8.60	10.99
July total	<i>Northern</i>	5.36	6.75	8.29	9.16	11.52
July total	<i>Central</i>	4.89	5.98	8.35	10.05	11.44
July total	<i>Southern</i>	5.68	6.94	8.11	9.50	10.99
July total	<i>District</i>	5.60	6.83	8.19	9.57	10.58
August total	<i>Northern</i>	5.44	6.30	7.31	9.72	11.33
August total	<i>Central</i>	5.52	6.55	7.90	9.62	12.03
August total	<i>Southern</i>	5.55	6.22	7.70	8.97	10.49
August total	<i>District</i>	5.65	6.52	7.70	9.37	10.67
September total	<i>Northern</i>	2.79	4.18	5.84	8.04	11.35
September total	<i>Central</i>	3.19	5.11	6.46	8.50	11.69
September total	<i>Southern</i>	4.30	5.46	6.94	9.33	11.85
September total	<i>District</i>	3.85	5.21	6.53	8.62	11.65
October total	<i>Northern</i>	0.63	1.27	2.46	4.40	6.15
October total	<i>Central</i>	0.69	1.39	2.61	4.03	6.13
October total	<i>Southern</i>	0.92	1.78	2.73	4.27	6.04
October total	<i>District</i>	1.06	1.57	2.80	4.15	5.79



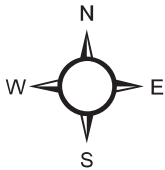
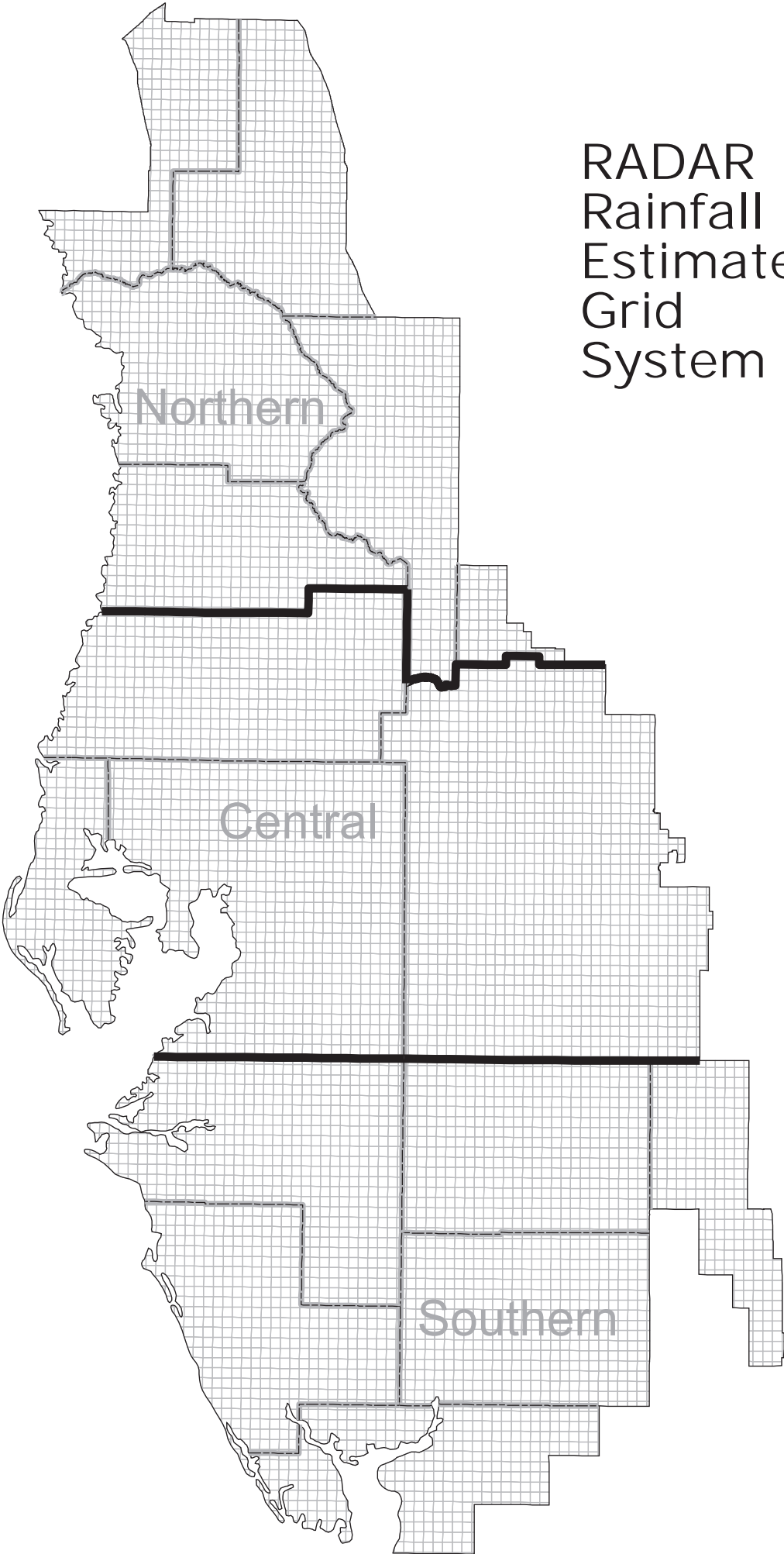
Rainfall percentiles by interval and region, inches (continued).

<b>Rainfall Interval</b>	<b>Region</b>	<b>10<sup>TH</sup> Percentile (P10)</b>	<b>25<sup>th</sup> Percentile (P25)</b>	<b>50<sup>th</sup> Percentile (P50)</b>	<b>75<sup>th</sup> Percentile (P75)</b>	<b>90<sup>th</sup> Percentile (P90)</b>
November total	<i>Northern</i>	0.38	0.71	1.63	2.88	4.56
November total	<i>Central</i>	0.25	0.47	1.42	2.82	4.33
November total	<i>Southern</i>	0.40	0.64	1.46	2.56	3.82
November total	<i>District</i>	0.37	0.63	1.53	2.73	4.39
December total	<i>Northern</i>	0.54	1.06	2.06	3.71	5.19
December total	<i>Central</i>	0.48	0.84	1.89	3.03	4.87
December total	<i>Southern</i>	0.45	0.77	1.56	2.63	4.18
December total	<i>District</i>	0.54	0.89	1.86	2.92	4.34

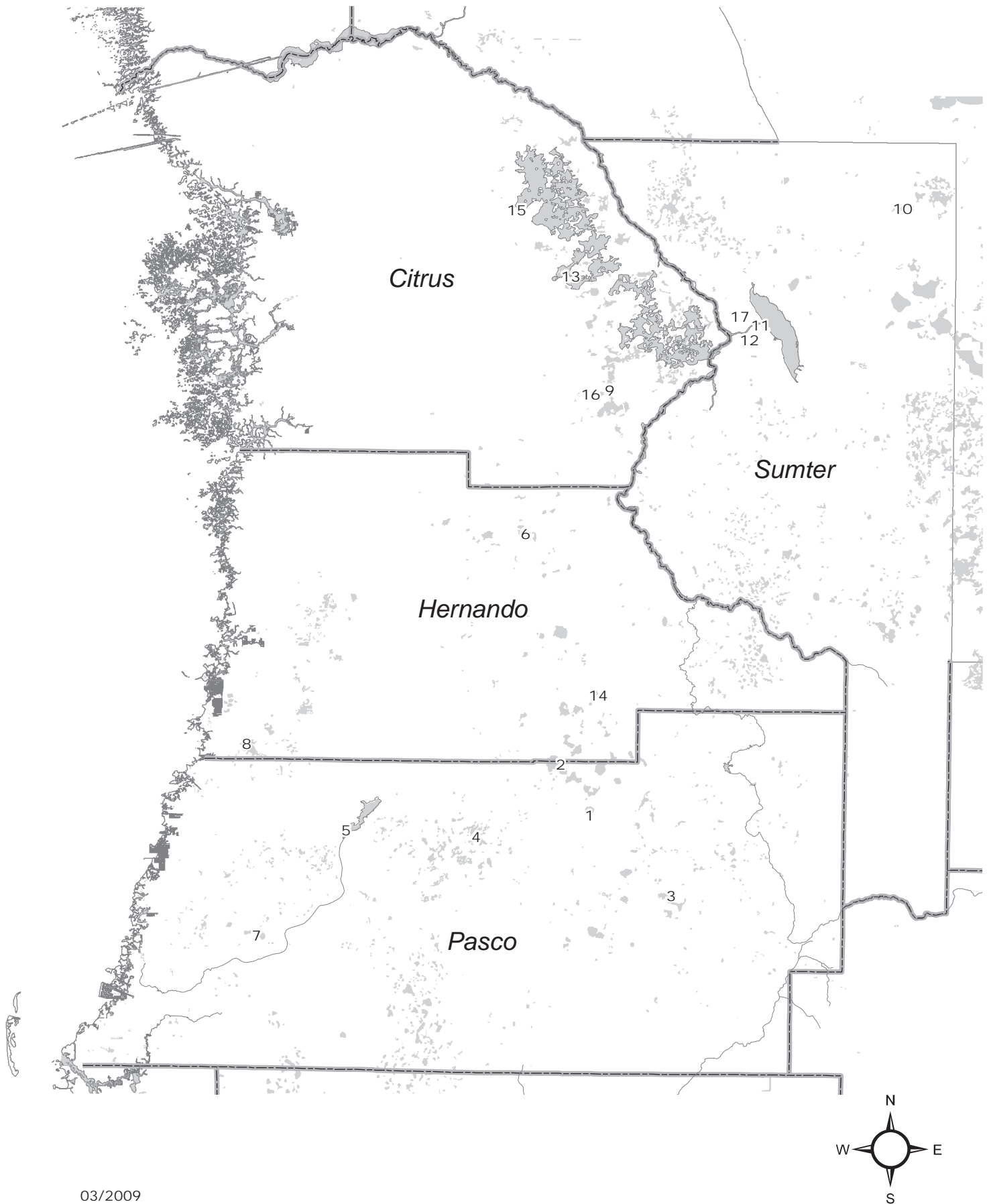
Rainfall characterization ranges

<b>Characterization</b>	<b>Range</b>	<b>Corresponding Rainfall Percent of Normal (approximate)</b>
Very dry	Less than the P10 rainfall	Less than 80 percent of normal
Drier than normal	P10 to P24 rainfall	80 to 90 percent of normal
Normal	P25 to P75 rainfall	90 to 110 percent of normal
Wetter than normal	P76 to P90 rainfall	110 to 120 percent of normal
Very Wet	Greater than the P90 rainfall	Greater than 120 percent of normal

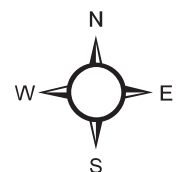
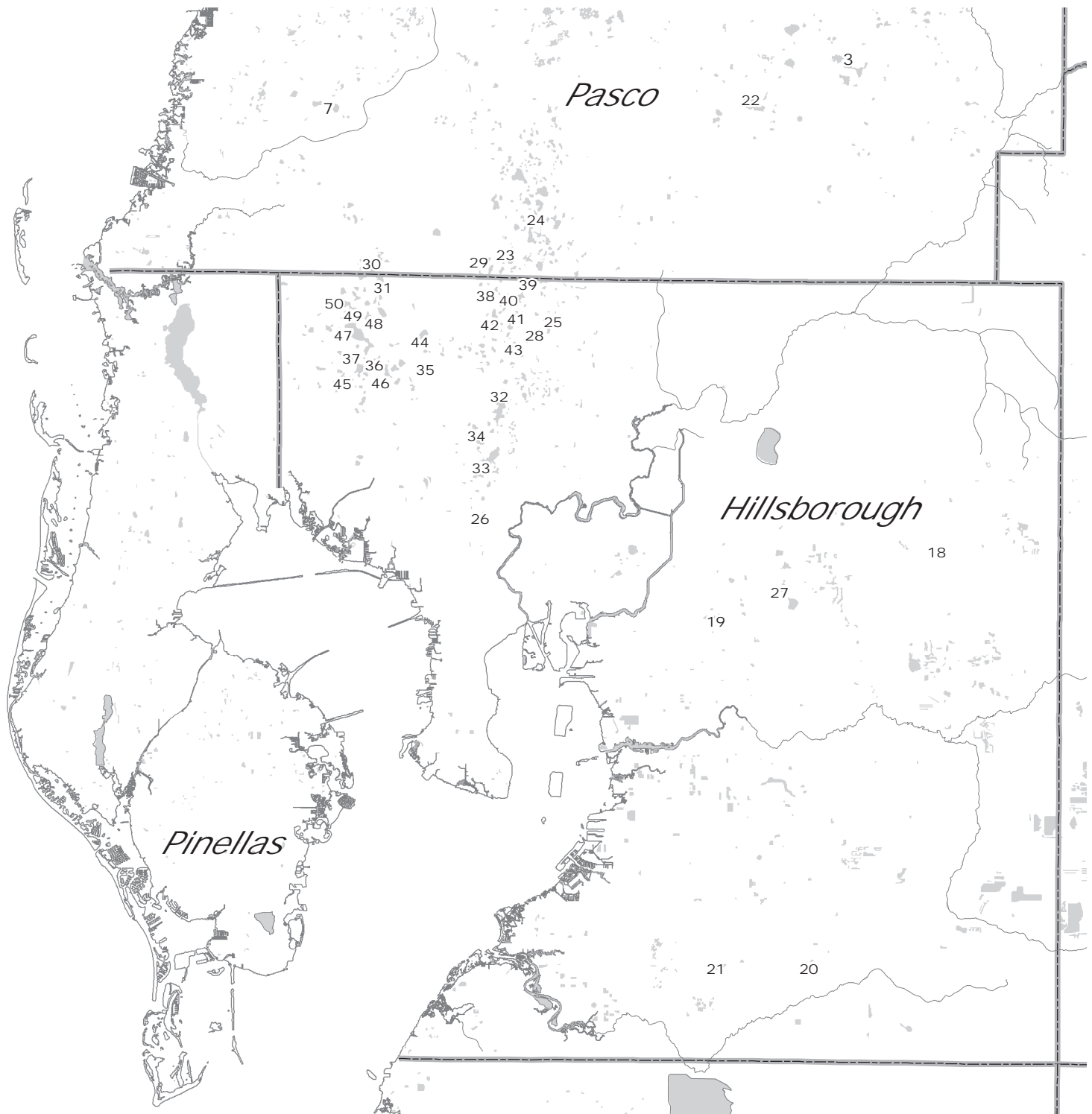
RADAR  
Rainfall  
Estimate  
Grid  
System



# Selected Lake Monitoring Stations Northern Region

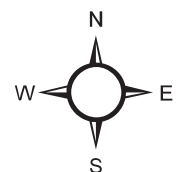
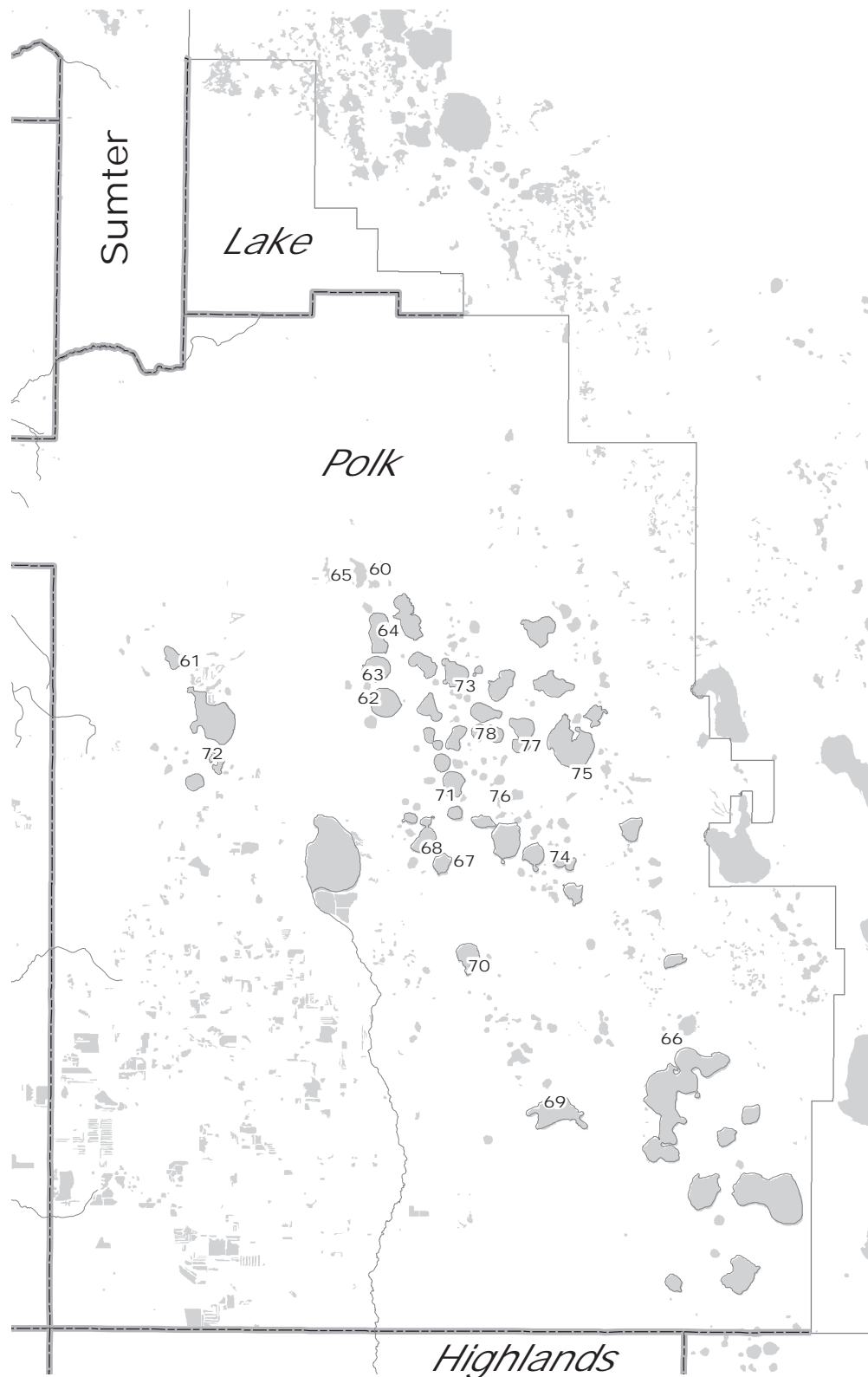


# Selected Lake Monitoring Stations Tampa Bay Region



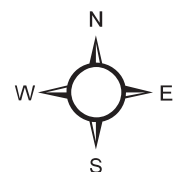
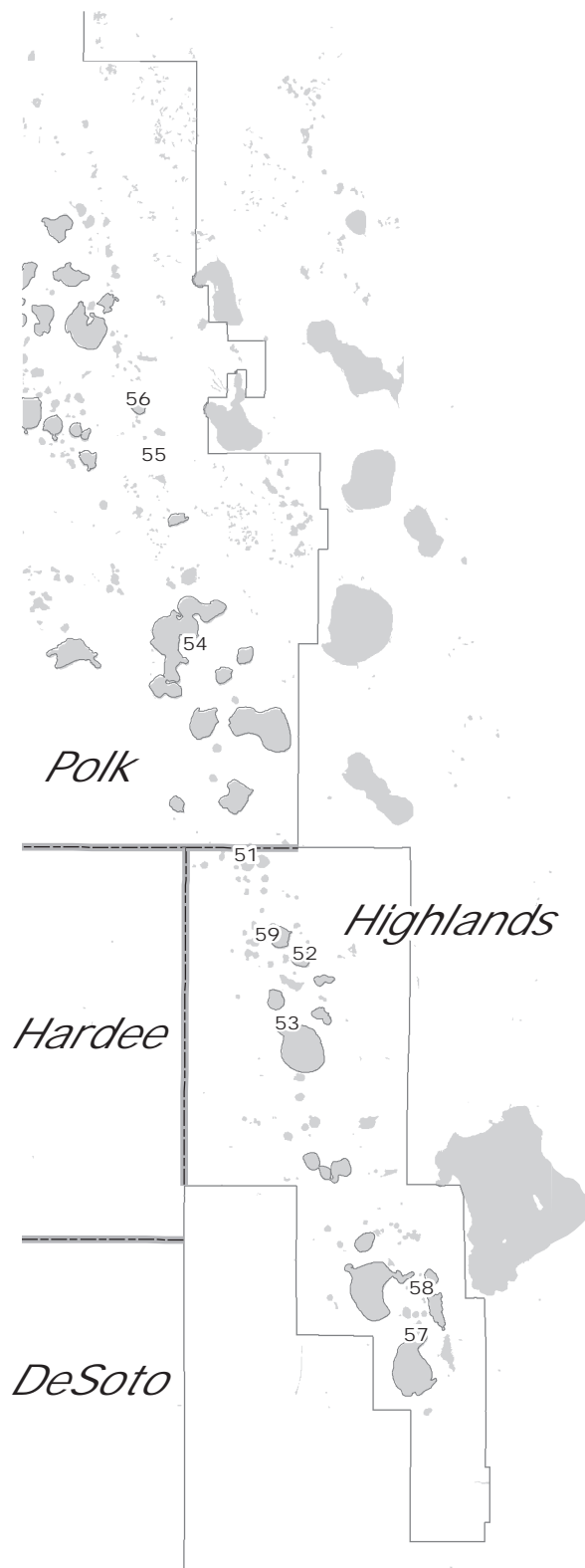
# Selected Lake Monitoring Stations

## Polk Uplands Region



# Selected Lake Monitoring Stations

## Lake Wales Ridge Region



## Selected Lake Monitoring Stations

### Northern Region

<u>Map ID</u>	<u>Site Name</u>
1	Lake Iola
2	Hancock Lake
3	Lake Pasadena
4	Big Fish Lake
5	Crews Lake
6	Lake Lindsey
7	Moon Lake
8	Hunters Lake
9	Tsala Apopka at Floral City
10	Lake Miona
11	Pana Vista Outlet River
12	Outlet River at Panacoochee
13	Tsala Apopka at Inverness
14	Spring Lake
15	Tsala Apopka at Hernando
16	Little Lake (Consuella)
17	Lake Panasoffkee

### Tampa Bay Region

<u>Map ID</u>	<u>Site Name</u>	<u>Map ID</u>	<u>Site Name</u>
18	Mud (Walden) Lake	40	Lake Brooker
19	Gornto Lake	41	Cooper Lake
20	Carlton Lake	42	Lake Thomas
21	Lake Wimauma	43	Brant Lake
22	King Lake near San Antonio	44	Turkey Ford Lake
23	Lake Linda	45	Church Lake
24	Lake Padgett	46	Horse Lake
25	Keene Lake	47	Lake Alice
26	Egypt Lake	48	Lake Calm
27	Long Pond	49	Keystone Lake
28	Lake Stemper	50	Crescent Lake
29	Camp Lake		
30	Lake Ann (Parker)		
31	Lake Hiawatha		
32	Platt Lake		
33	Lake Carroll		
34	Bay Lake		
35	Lake LeClare		
36	Little Lake		
37	Rainbow Lake		
38	Lake Harvey		
39	Deer Lake		

## Selected Lake Monitoring Stations

### Lake Wales Ridge Region

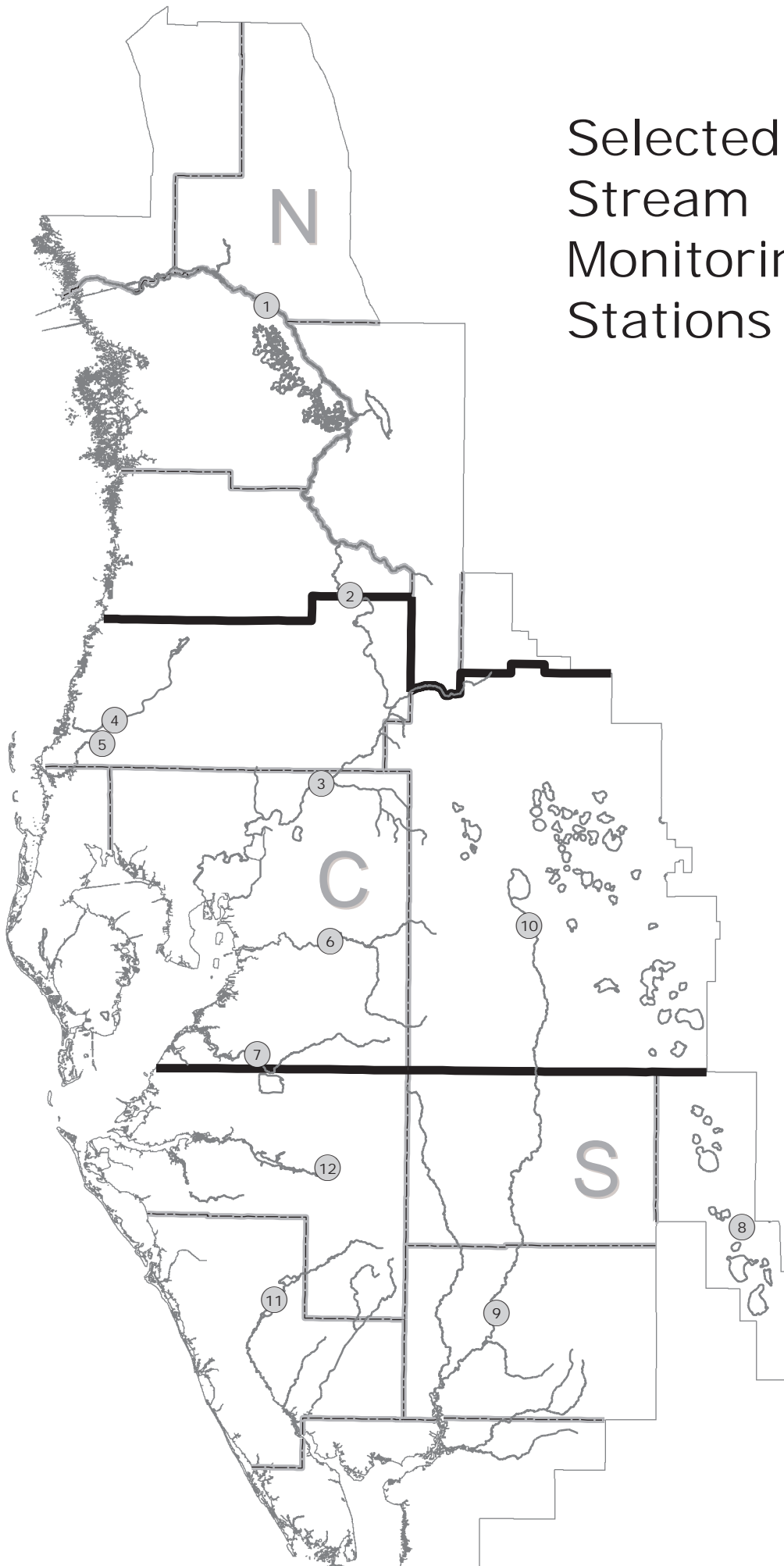
<u>Map ID</u>	<u>Site Name</u>
51	Trout Lake
52	Lake Letta
53	Lake Jackson at Sebring
54	Crooked Lake near Babson Park
55	Lake Starr
56	Lake Annie
57	Lake Placid
58	Lake Clay
59	Lake Lotela

### Polk Uplands Region

<u>Map ID</u>	<u>Site Name</u>
60	Lake Helene
61	Lake Gibson
62	Lake Ariana
63	Lake Arietta
64	Lake Juliana
65	Clearwater Lake
66	Blue Lake South
67	Lake McLeod
68	Eagle Lake
69	Lake Buffum
70	Lake Garfield
71	Lake Howard
72	Lake Bonny
73	Lake Alfred
74	Lake Ruby
75	Lake Hamilton
76	Lake Otis
77	Lake Fannie
78	Lake Conine



# Selected Stream Monitoring Stations



## Selected Stream Monitoring Stations

<u>Map ID</u>	<u>Site Name</u>
1	Withlacoochee River near Holder
2	Withlacoochee River at Trilby
3	Hillsborough River near Zephyrhills
4	Pithlachascotee River near New Port Richey
5	Anclote River near Elfers
6	Alafia River at Lithia
7	Little Manatee River near Wimauma
8	Josephine Creek near DeSoto City
9	Peace River at Arcadia
10	Peace River at Bartow
11	Myakka River near Sarasota
12	Manatee River near Myakka Head

## **STREAM MONITORING STATIONS**

### **WITHLACOOCHEE RIVER (Northern Region)**

Total length: 157 miles  
Headwaters: NW Polk and southern Sumter Counties  
Elevation: 135 feet  
Tributaries: Little Withlacoochee, Big Gant Canal, Jumper Creek, Shady Brook, Outlet River of Lake Panasoffkee, Leslie Heifner Canal, Orange State Canal, Tsala Apopka Outfall Canal and Rainbow Springs.  
Mouth: Gulf of Mexico, Citrus County  
Average fall: 0.9 feet/mile  
Drainage area: 2000 square miles

#### **Holder Station**

County: Marion  
Period-of-record: 1928  
Location: 38 miles upstream from mouth  
Avg daily discharge: 1036.3 cfs  
Runoff per year: 10.36 inches  
Max of monthly avg discharge: 7096.3 cfs in 04/1960  
Min of monthly avg discharge: 111.8 cfs in 07/1992  
Drainage area: 1825 square miles

#### **Trilby Station**

County: Hernando  
Period-of-record: 1928  
Location: 93 miles upstream from mouth  
Avg daily discharge: 336.3 cfs  
Runoff per year: 6.73 inches  
Max of monthly avg discharge: 4254.7 cfs in 09/1933  
Min of monthly avg discharge: 6.1 cfs in 07/1992  
Drainage area: 570 square miles

### **ANCLOTE RIVER (Central Region)**

Total length: 27.5 miles  
Headwaters: South-central Pasco County, west of Land O Lakes  
Elevation: 65 feet  
Tributaries: South Branch and Hollin Creek  
Mouth: Gulf of Mexico, Pasco County  
Average fall: 2.4 feet/mile  
Drainage area: 113 square miles

#### **Elfers Station**

County: Pasco  
Period-of-record: 1946  
Location: 16 miles upstream from mouth  
Avg daily discharge: 65.1 cfs  
Runoff per year: 12.20 inches  
Max of monthly avg discharge: 633.8 cfs in 09/1988  
Min of monthly avg discharge: 1.4 cfs in 05/1981  
Drainage area: 72.5 square miles

**HILLSBOROUGH RIVER (Central Region)**

Total length: 55 miles  
Headwaters: Southeast Pasco County  
Elevation: 77 feet  
Tributaries: Crystal Springs, Blackwater Creek, Flint Creek, Trout Creek, Cypress Creek, Curiosity Creek and Sulphur Springs  
Mouth: Hillsborough Bay  
Average fall: 1.4 feet/mile  
Drainage area: 690 square miles

**Zephyrhills Station**

County: Hillsborough  
Period-of-record: 1939  
Location: 40 miles upstream from mouth  
Avg daily discharge: 244.2 cfs  
Runoff per year: 15.05 inches  
Max of monthly avg discharge: 2284.5 cfs in 12/1997  
Min of monthly avg discharge: 47.1 cfs in 05/1994  
Drainage area: 200 square miles

**PITHLACHASCOTEE RIVER (Central Region)**

Total length: 41 miles  
Headwaters: Crews Lake and Masaryktown area in central Pasco and southern Hernando Counties  
Elevation: 120 feet  
Mouth: Gulf of Mexico  
Average fall: 2.9 feet/mile  
Drainage area: 191 square miles

**New Port Richey Station:**

County: Pasco  
Period-of-record: 1963  
Location: 10.5 miles upstream from mouth  
Avg daily discharge: 27.9 cfs  
Runoff per year: 2.11 inches  
Max of monthly avg discharge: 329.4 cfs in 09/1988  
Min of monthly avg discharge: 0.0 cfs  
Drainage area: 180 square miles

**ALAFIA RIVER (Central Region)**

Total length: 24 miles  
Headwaters: Western Polk and eastern Hillsborough Counties  
Tributaries: North and South Prongs, Lithia Springs, and Buckhorn Creek.  
Elevation: 30 feet  
Mouth: Tampa Bay  
Average fall: 1.5 feet/mile  
Drainage area: 420 square miles

**Lithia Station:**

County: Hillsborough  
Period-of-record: 1932  
Location: 16 miles upstream from mouth  
Avg daily discharge: 339.7 cfs  
Runoff per year: 13.59 inches  
Max of monthly avg discharge: 4185.4 cfs in 09/1933  
Min of monthly avg discharge: 13.0 cfs in 05/1945  
Drainage area: 335 square miles

**LITTLE MANATEE RIVER (Central Region)**

Total length: 39 miles  
Headwaters: Southeast Hillsborough County  
Tributaries: Carlton Branch, the South Fork, Dug Creek and Cypress Creek.  
Elevation: 130 feet  
Mouth: Tampa Bay  
Average fall: 3.4 feet/mile  
Drainage area: 225 square miles

**Wimauma Station:**

County: Hillsborough  
Period-of-record: 1939  
Location: 15 miles upstream from mouth  
Avg daily discharge: 171.4 cfs  
Runoff per year: 15.68 inches  
Max of monthly avg discharge: 1443.7 cfs in 07/1945  
Min of monthly avg discharge: 3.8 cfs in 05/45  
Drainage area: 149 square miles

**JOSEPHINE CREEK (Southern Region)**

Total length: 12 miles  
Headwaters: Lake Josephine in central Highlands County  
Elevation: 80 feet  
Mouth: Lake Istokpoga in Highlands County  
Average fall: 3.5 feet/mile  
Drainage area: 143 square miles

**DeSoto City Station:**

County: Highlands  
Period-of-record: 1946  
Location: 4.9 miles upstream of mouth  
Avg daily discharge: 74.2 cfs  
Runoff per year: 8.90 inches  
Max of monthly avg discharge: 769.9 cfs in 09/1960  
Min of monthly avg discharge: 1.1 cfs in 05/56  
Drainage area: 109 square miles

**MANATEE RIVER (Southern Region)**

Total length: 45 miles  
Headwaters: Four corners area Hillsborough, Polk, Hardee and manatee Counties.  
Elevation: 130 feet  
Mouth: Tampa Bay  
Average fall: 2.9 feet/mile  
Drainage area: 330 square miles

**Myakka Head Station:**

County: Manatee  
Period-of-record: 1966  
Location: 36 miles upstream from mouth  
Avg daily discharge: 69.6 cfs  
Runoff per year: 14.62 inches  
Max of monthly avg discharge: 529.7 cfs in 09/1994  
Min of monthly avg discharge: 0.5 cfs in 04/75  
Drainage area: 65.3 square miles

**MYAKKA RIVER (Southern Region)**

Total length: 54.1 miles  
Headwaters: Western Hardee and Eastern Manatee Counties  
Tributaries: Howard Creek, Deer Prairie, and Big Slough Canal  
Elevation: 105 feet  
Mouth: Charlotte Harbor  
Average fall: 1.9 feet/mile  
Drainage area: 540 square miles

**Sarasota Station:**

County: Sarasota  
Period-of-record: 1936  
Location: 36 miles upstream from mouth  
Avg daily discharge: 250.5 cfs  
Runoff per year: 15.03 inches  
Max of monthly avg discharge: 2467.2 cfs in 09/1947  
Min of monthly avg discharge: 0.0 cfs numerous times  
Drainage area: 229 square miles

**PEACE RIVER (Central and Southern Region)**

Total length: 120 miles  
Headwaters: Green Swamp in northern Polk County through Lake Hancock, Winter Haven chain of lakes, and Lake Hamilton.  
Tributaries: Peace Creek Canal, Saddle Creek, Charlie Creek, Prairie Creek, Horse Creek, Joshua Creek and Shell Creek. Elevation: 110 feet  
Mouth: Charlotte Harbor  
Average fall: 1 feet/mile  
Drainage area: 2300 square miles

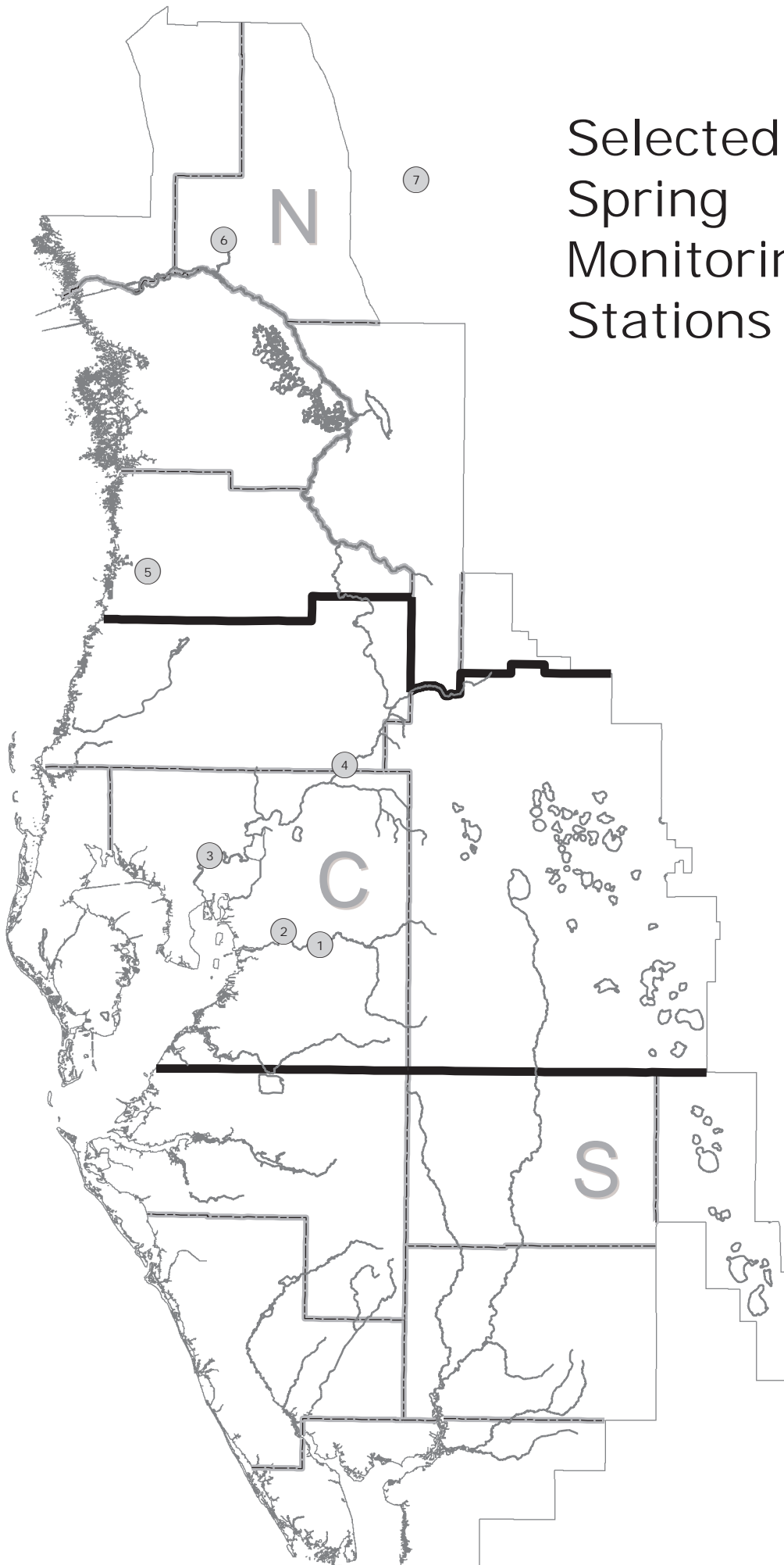
**Arcadia Station (Southern Region):**

County: Desoto  
Period-of-record: 1931  
Location: 36 miles upstream from mouth  
Avg daily discharge: 1078.9 cfs  
Runoff per year: 10.79 inches  
Max of monthly avg discharge: 9876.0 cfs in 09/1933  
Min of monthly avg discharge: 51.6 cfs 05/85  
Drainage area: 1367 square miles

**Bartow Station (Central Region):**

County: Polk  
Period-of-record: 1939  
Location: 105 miles upstream from mouth  
Avg daily discharge: 224.1 cfs  
Runoff per year: 6.72 inches  
Max of monthly avg discharge: 2261.5 cfs in 09/1960  
Min of monthly avg discharge: 6.4 cfs 05/90  
Drainage area: 390 square miles

# Selected Spring Monitoring Stations



## Selected Spring Monitoring Stations

<u>Map ID</u>	<u>Site Name</u>
1	Lithia Main Spring
2	Buckhorn Main Spring
3	Sulphur Springs at Sulphur Springs
4	Crystal Springs near Zephyrhills
5	Weeki Wachee River near Brooksville
6	Rainbow Springs near Dunnellon
7	Silver Springs near Ocala



## **SPRINGS MONITORING STATIONS**

### **RAINBOW SPRINGS (Northern Region)**

County:	Marion
Basin:	Withlacoochee River
Magnitude:	1 <sup>st</sup>
Discharge measurement location:	5 mi downstream from head of springs
Discharge contributes to:	Rainbow River, Withlacoochee River
Public Access:	Yes
Period-of-record:	1965
Gage:	Non-recording gage
Maximum daily mean:	1061 cfs in 09/1988
Minimum daily mean:	489 cfs in 06/2000

### **SILVER SPRINGS (Northern Region)**

County:	Marion
Basin:	Ocklawaha River
Magnitude:	1 <sup>st</sup>
Discharge measurement location:	4 to 5 mi downstream from head of springs
Discharge contributes to:	Silver Springs River, Ocklawaha River, St. Johns River
Public Access:	Yes
Period-of-record:	1932
Gage:	Water-stage recorder
Maximum daily mean:	1290 cfs in 10/1960
Minimum daily mean:	432 cfs in 07/2000

### **WEEKI WACHEE SPRINGS (Northern Region)**

County:	Hernando
Basin:	Coastal Rivers
Magnitude:	1 <sup>st</sup>
Discharge measurement location:	1 mi downstream from head of springs
Discharge contributes to:	Weeki Wachee River
Public Access:	Yes
Period-of-record:	1993
Gage:	Water-stage
Maximum daily mean:	229 cfs in 03/1998
Minimum daily mean:	101 cfs in 06/1994

### **CRYSTAL SPRINGS (Central Region)**

County:	Pasco
Basin:	Hillsborough River
Magnitude:	2 <sup>nd</sup>
Discharge measurement location:	Difference between discharge measurements of Hillsborough River made upstream from and downstream from Crystal Springs
Discharge contributes to:	Hillsborough River
Public Access:	No
Period-of-record:	1923
Gage:	Non-recording gage
Maximum daily mean:	147 cfs in 07/1941
Minimum daily mean:	22 cfs in 08/1986

**SULPHUR SPRINGS (Central Region)**

County:	Hillsborough
Basin:	Hillsborough River
Magnitude:	2 <sup>nd</sup>
Discharge measurement location:	300 ft downstream from gage
Discharge contributes to:	Hillsborough River
Public Access:	Yes
Period-of-record:	1956
Gage:	Water-stage recorder
Maximum daily mean:	145 cfs in 03/1960
Minimum daily mean:	0 cfs for various days throughout the period-of-record

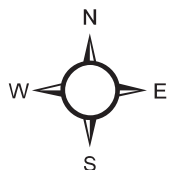
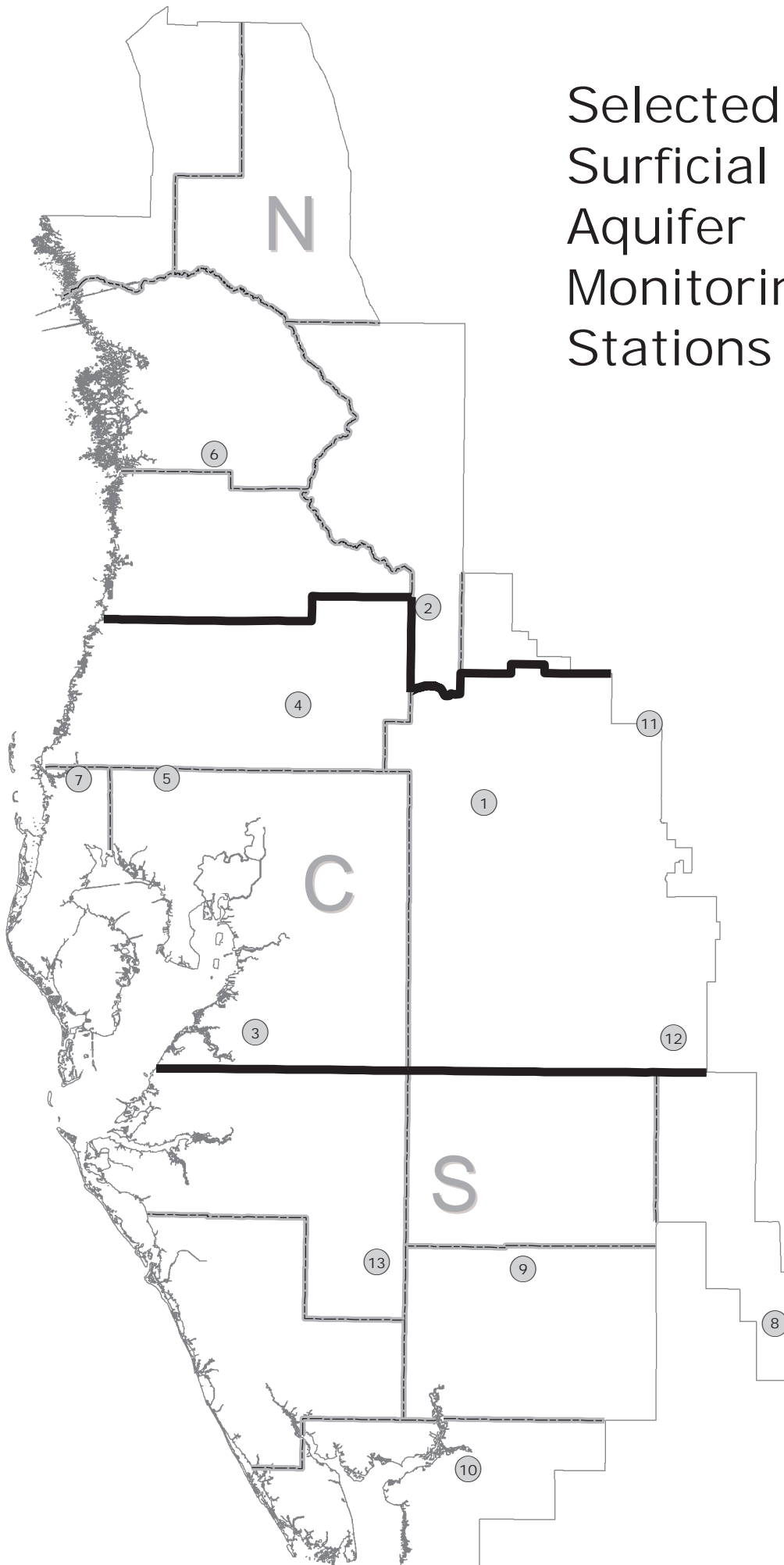
**BUCKHORN SPRINGS (Central Region)**

County:	Hillsborough
Basin:	Alafia River
Magnitude:	2 <sup>nd</sup>
Discharge measurement location:	Difference between discharge measurements of Buckhorn Creek made 25 ft upstream from and 100 ft downstream from Buckhorn Springs
Discharge contributes to:	Buckhorn Creek, Alafia River
Public Access:	No
Period-of-record:	1987
Gage:	Water-stage recorder
Maximum daily mean:	21.9 cfs in 02/1989
Minimum daily mean:	2.7 cfs in 06/1987

**LITHIA SPRINGS: (Central Region)**

County:	Hillsborough
Basin:	Alafia River
Magnitude:	2 <sup>nd</sup>
Discharge measurement location:	50 feet downstream from main pool
Discharge contributes to:	Alafia River
Public Access:	Yes
Period-of-record:	1934
Gage:	Water-stage recorder
Maximum daily mean:	83.4 cfs in 10/1967
Minimum daily mean:	6.3 cfs in 02/1989

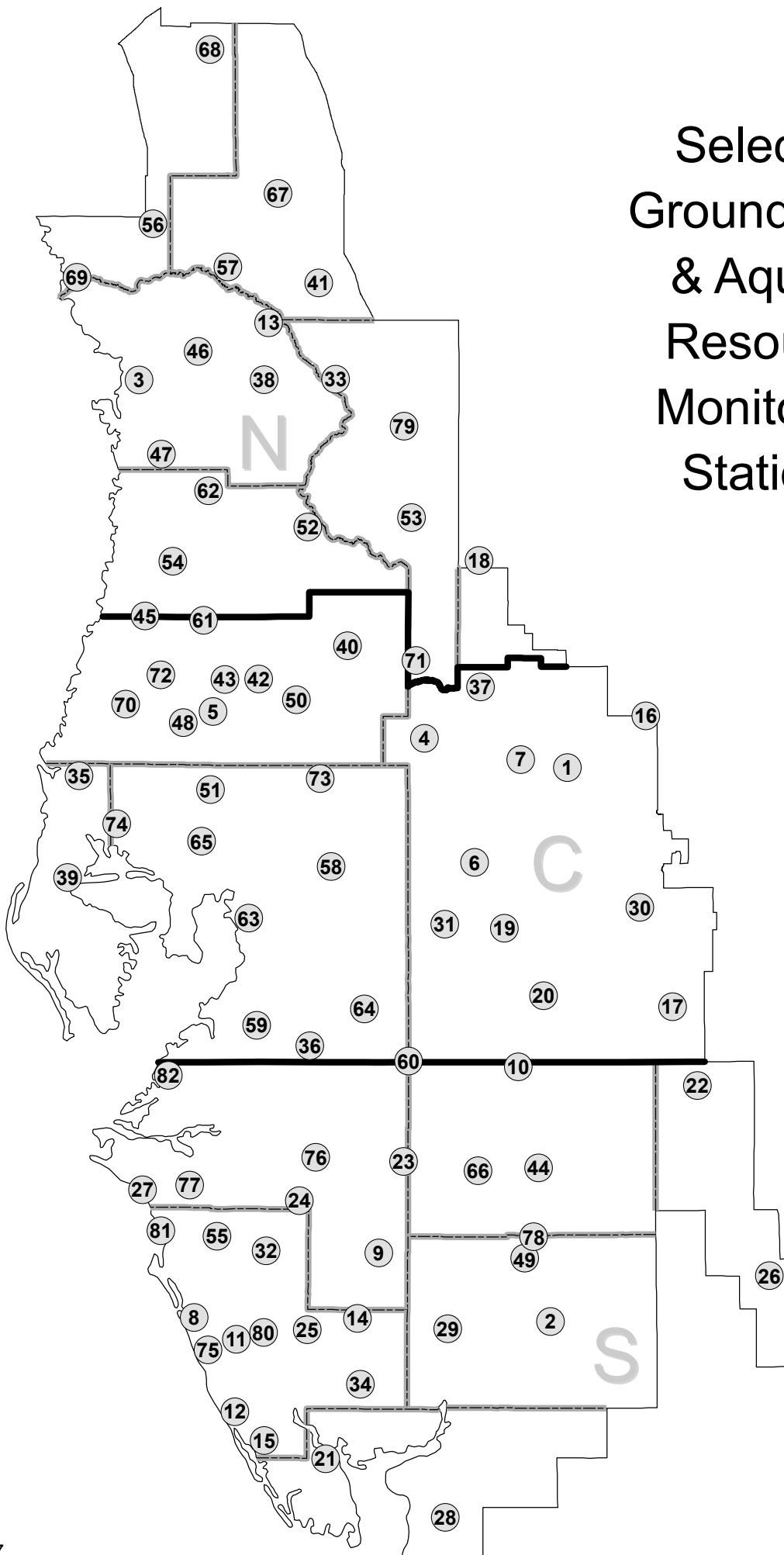
# Selected Surficial Aquifer Monitoring Stations



## Selected Surficial Aquifer Monitoring Stations

<u>Map ID</u>	<u>Site Name</u>
1	State Road 33/Combee Road Shallow
2	Green Swamp L12B Shallow
3	ROMP 50 Surficial
4	State Road 577 Shallow
5	Lutz-Lake Fern Shallow
6	Lecanto 2 Shallow
7	Tarpon Road Shallow
<del>8</del>	<del>Bairs Den Surficial</del>
9	ROMP 26 Surficial
10	State Road 74 (77-Foot) Shallow
11	Loughman Shallow
12	USGS P-48 Shallow
13	Edgeville 4 Shallow

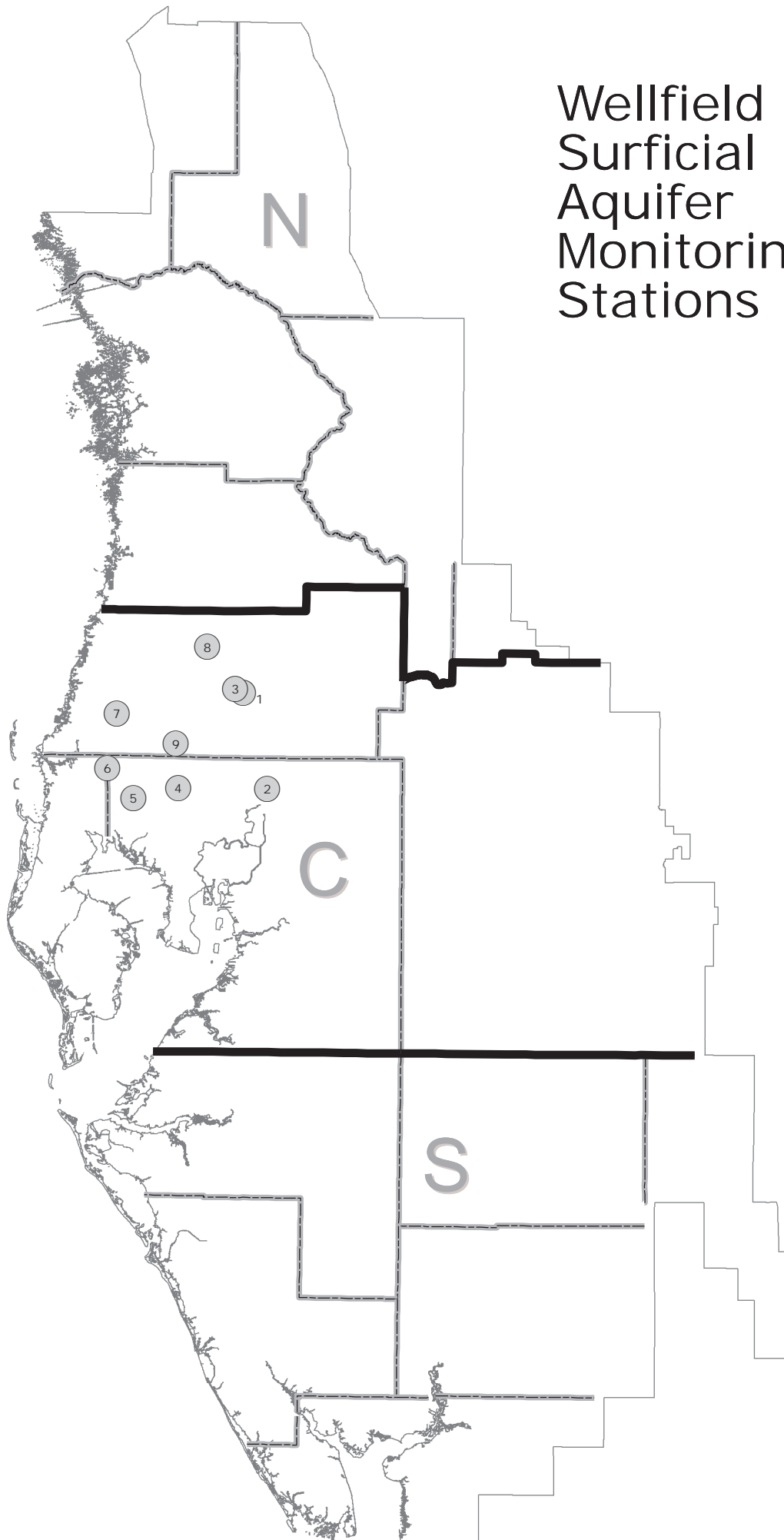
# Selected Groundwater & Aquifer Resource Monitoring Stations



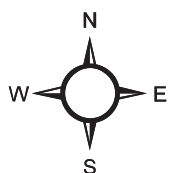
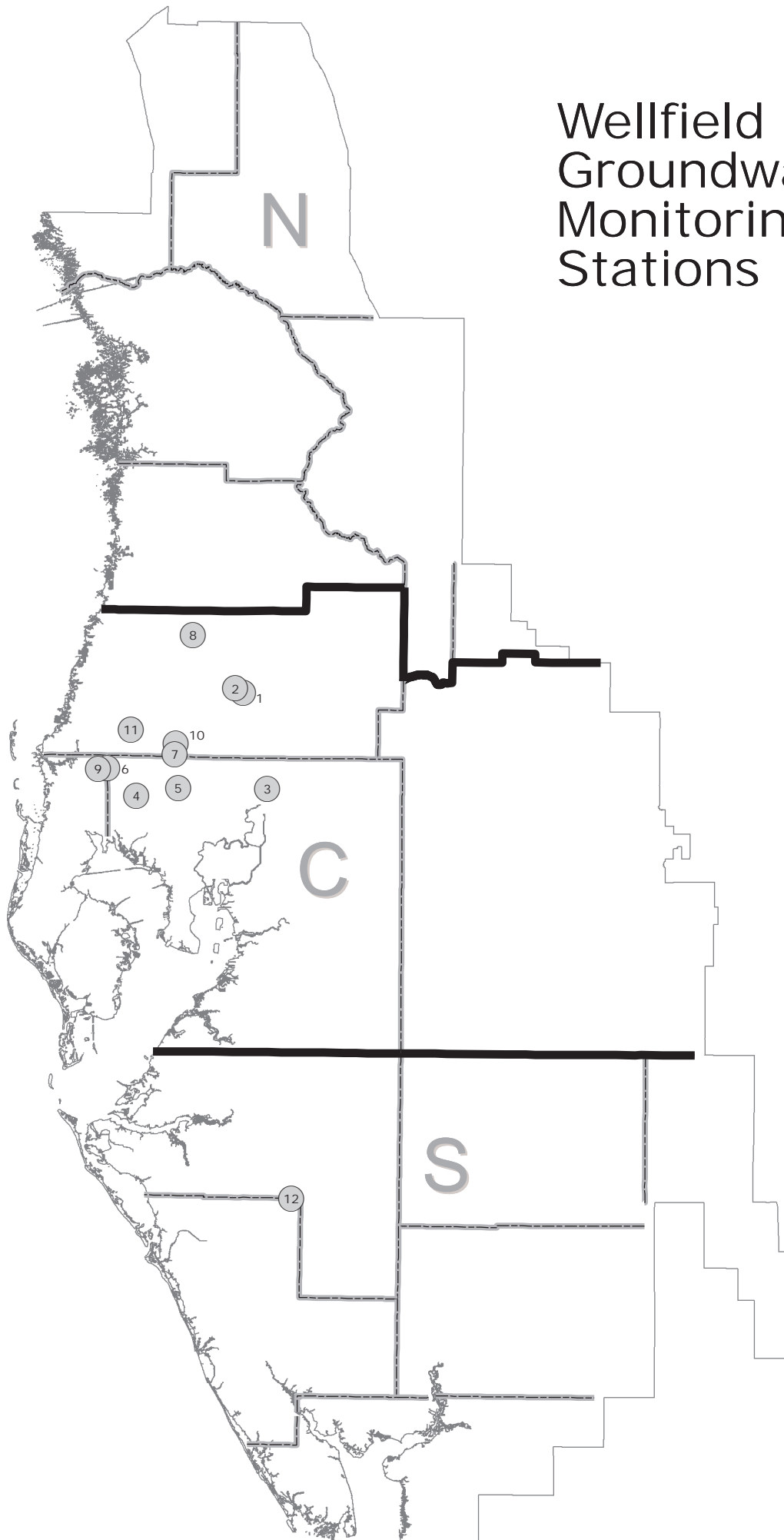
## Select Groundwater & Aquifer Resource Monitoring Stations

Map ID	Site Name	Map ID	Site Name
1	Lake Alfred Deep nr Lake Alfred	49	ROMP 26 U Fldn Aq Monitor
2	ROMP 16 U Fldn Aq Monitor	50	SR 577 Deep
3	ROMP TR 21-2 U Fldn Aq Chloride Monitor	51	Debuel Road Deep
4	ROMP 87 U Fldn Aq (Avpk) Monitor	52	ROMP 103 U Fldn Aq Monitor
5	Pasco 13 nr Drexel Fldn	53	Webster City Fldn
6	Sanlon Ranch Fldn	54	Weeki Wachee Fldn Repl
7	ROMP 76 U Fldn Aq Monitor	55	Sarasota Service Office U Fldn Aq Monitor
8	ROMP 20 U Fldn Aq (Swann) Monitor	56	Tidewater 1 Fldn
9	Edgeville 3 Deep	57	CE 14 Dunnellon Deep
10	Cargill FA-1 Fldn	58	DV-1 U Fldn Aq (Swann) Monitor
11	ROMP TR 5-2 U Fldn Aq (Swann) Monitor	59	ROMP 50 U Fldn Aq (Avpk) Chloride Monitor
12	Manasota 14 Deep	60	ROMP 40 U Fldn Aq Monitor
13	ROMP 116 U Fldn Aq Monitor	61	Masaryktown Deep
14	Big Slough Deep	62	ROMP 107 U Fldn Aq Monitor
15	Englewood 14 Deep	63	ROMP TR 10-2 U Fldn Aq Monitor
16	Loughman Deep	64	ROMP 48 U Fldn Aq (Tmpra/Swann) Monitor
17	Coley Deep	65	ROMP 66 U Fldn Aq Monitor
18	Mascotte Deep (L-0062)	66	ROMP 31 U Fldn Aq Monitor
19	ROMP 59 U Fldn Aq Interface Monitor	67	ROMP 120 U Fldn Aq Monitor
20	ROMP 45 U Fldn Aq (Avpk) Monitor	68	ROMP 134 U Fldn Aq (Ocal-Avpk-Oldm) Monitor
21	ROMP TR 3-1 U Fldn Aq Monitor	69	ROMP TR 124 U Fldn Aq Monitor (Avpk) 2
22	ROMP 43XX U Fldn Aq Monitor	70	Moon Lake Deep
23	ROMP 32 U Fldn Aq (Avpk) Monitor	71	ROMP 89 U Fldn Aq Monitor
24	Verna Test 0-1	72	SR 52 Deep West nr Fivay Junction
25	ROMP 19X U Fldn Aq (Swann) Monitor	73	Hillsborough River State Park Parking Lot Deep
26	ROMP 28X U Fldn Aq Monitor	74	ROMP TR 13-3 U Fldn Aq Monitor
27	ROMP TR 7-1 L Arca Aq Interface Monitor	75	ROMP TR 5-1 U Fldn Aq Sulfate Monitor
28	ROMP TR 1-2 U Fldn Aq Monitor	76	Kibler Deep
29	ROMP 17 U Fldn Aq (Swann) Monitor	77	ROMP TR 7-4 U Fldn Aq (Swann) Monitor
30	ROMP 58 U Fldn Aq Monitor	78	Marshall Deep (USGS)
31	ROMP 60 U Fldn Aq (Avpk) Monitor Repl	79	ROMP 111 U Fldn Aq Monitor
32	ROMP 22 U Fldn Aq (Swann) Monitor	80	ROMP 19 U Fldn Aq (Swann) Monitor
33	Sumter 13 JC 59 Up Fldn Repl	81	ROMP TR SA-1 U Fldn Aq (Swann) Monitor
34	ROMP 9 U Fldn Aq (Swann) Monitor	82	Florida Power Fldn at Piney Point
35	Tarpon Road Deep		
36	ROMP 123 Htrn As/U Fldn Aq Monitor		
37	ROMP 88 U Fldn Aq Monitor		
38	Inverness DOT Fldn		
39	Pinellas 665 Fldn		
40	Lykes Pasco Fldn		
41	ROMP 119 U Fldn Aq Sulfate Monitor		
42	SR 52 And CR 581 Deep		
43	ROMP 93 U Fldn Aq Monitor		
44	ROMP 30 U Fldn Aq Monitor		
45	ROMP 97 U Fldn Aq Monitor		
46	North Lecanto Deep		
47	Chassahowitzka 1 Deep		
48	Bexley 2 Fldn		

# Wellfield Surficial Aquifer Monitoring Stations



# Wellfield Groundwater Monitoring Stations





## Wellfield Groundwater Monitoring Stations

<u>Map ID</u>	<u>Site Name</u>
1	Cypress Creek TMR-1 Deep
2	Cypress Creek TMR-3 Deep
3	Morris Bridge 3A Floridan
4	Cosme 3 Floridan
5	St. Pete Hillsboro 13 Deep
6	Eldridge-Wilde 11 Floridan
7	St. Pete 42 Deep
8	Cross Bar WRW Floridan
9	Eldridge-Wilde 2S Deep
10	State Road 54 Deep
11	Starkey Regional Floridan
12	Verna 08 Deep

## Wellfield Surficial Aquifer Monitoring Stations

<u>Map ID</u>	<u>Site Name</u>
1	Cypress Creek TMR-1 Shallow
2	Morris Bridge 3A Surficial
3	Cypress Creek TMR-3 Shallow
4	St. Pete Hillsboro 13 Shallow
5	St. Pete IC-6 Shallow
6	Eldridge-Wilde 11 Surficial
7	Starkey 707 Shallow
8	Cross Bar SERW Shallow
9	State Road 54 Shallow

# Reservoir Locations

