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

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Bartow Service Office
170 Century Boulevard
Bartow, Florida 33830-7700
(863) 534-1448 or
1-800-492-7862 (FL only)

Sarasota Service Office
6750 Fruitville Road
Sarasota, Florida 34240-9711
(941) 377-3722 or
1-800-320-3503 (FL only)

Tampa Service Office
7601 U.S. 301 North (Fort King Highway)
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)

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TO: Interested Parties

THROUGH: Jay Hoecker, Manager, Water Supply Section, Water Resources Bureau

FROM: R. Thomas Kiger, P.E., Senior Professional Engineer
Kevin Wills, Senior Economist, Water Resources Bureau
Ryan Pearson, Economist, Water Resources Bureau
Cortney Cameron, Staff Hydrogeologist, Water Resources Bureau

SUBJECT: 2020 Regional Water Supply Plan: Agricultural Water Use Demand Projections

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Introduction

Every five years, the District develops a Regional Water Supply Plan (RWSP) in accordance with statutory requirements. A key component of this Plan is a quantification of the water supply needs for all existing and future reasonable-beneficial uses within the 20-year planning horizon. Agricultural water use is the second largest water use sector in the District and developing agricultural water use projections is an important step in assessing regional water supply needs. This memo summarizes the methods used to develop the agricultural water use projections for the 2020 Regional Water Supply Plan, and the results of the current 2020 agricultural water use projections.

The Southwest Florida Water Management District (District) also participated in the development of the RWSP for the Central Florida Water Initiative (CFWI) in conjunction with representatives from the Florida Department of Environmental Protection (FDEP), major public supply stakeholders and the South Florida and St. John's River water management districts. The CFWI region includes portions of Lake and Polk Counties which are under District jurisdiction. Consequently, the projected agricultural water use projections for Lake and Polk County were developed on a different basis than the rest of the planning area and are detailed in the Draft Central Florida Water Initiative Demand Projections as of October 2018.

Purpose

This memo explains the assumptions, methodologies, and sources used to develop the agricultural water use projections for the 2020 SWFWMD RWSP. This information includes:

- Projected irrigated agricultural acreages by crop type.
- Projected water demands for irrigated agriculture
- Projected water demands for livestock and aquaculture.
- The spatial distribution of agricultural water use projections within the District

Statutory Guidance
Section 373.709, Florida Statutes (F.S.) sets forth the requirement for regional water supply planning. Under these provisions, the Governing Board of each water management district shall develop a Regional Water Supply Plan (RWSP) for regions within the district where existing sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the 20-year planning period. This must include a water supply development component which includes a quantification of the water supply needs for all existing and future reasonable-beneficial uses within the planning horizon.

Section 373.709(2)(a)1.b F.S. further states that:

Agricultural demand projections used for determining the needs of agricultural self-suppliers must be based upon the best available data. In determining the best available data for agricultural self-supplied water needs, the district shall consider the data indicative of future water supply demands provided by the Department of Agriculture and Consumer Services pursuant to s. 570.93 and agricultural demand projection data and analysis submitted by a local government pursuant to the public workshop described in subsection (1), if the data and analysis support the local government's comprehensive plan. Any adjustment of or deviation from the data provided by the Department of Agriculture and Consumer Services must be fully described, and the original data must be presented along with the adjusted data.

Data and Information Sources
The two primary sources of data used to develop the agricultural water use projections were the District's Estimated Water Use Reports (2015-2017) the Florida Department of Agriculture and Consumer Services' Florida Statewide Irrigation Demand Report version 5 (FSAID V), published June 29, 2018. This included the use of the FSAID V agricultural water use geodatabases associated with the FDACS report. The District also utilized permit level data from both the Water Well Construction permitting program and the Water Use Permitting program.

Methodology
The process of developing the 2020 agricultural water use projections was generally divided into two parts: 1) a review of the FSAID V in comparison to existing historical water use data, and 2) the development of an adjusted FSAID V which more closely reflects historical water use patterns in the District. This adjustment was made for each of the three general categories of water use in the FSAID V: Irrigated crops, livestock demands, and aquaculture. The review of the FSAID V and the subsequent adjustments to each category are discussed in this section.

<u>FSAID V Review:</u>

The process of developing the FSAID water use projections is fully described in FDACS' technical report. A high-level summary of FSAID development can be generally be described in 5 key steps:

1) **Water Use Data Collection:** FDACS collects annual water use data at the permit level from each water management district. This is water use data collected for metered agricultural water use permits by each district's water use permitting program.

2) **Baseline Irrigated Acreage Map:** FDACS creates a baseline map (2016 in this case) of actively irrigated areas within each district.
3) **Develop an econometric water use model, and model 2016 water demands:** After mapping 2016 baseline irrigated areas, FDACS joins the District's water use data to this coverage for individual permitted operations. Using FDACS irrigated acreages and District water use data, FDACS develops a database of irrigation application rates, and uses this data to calibrate an econometric model to predict per acre water use for various crop categories. This model is then run to create a modeled 2016 estimated water demand coverage for the FSAID V.
4) **Project future irrigated acreages:** To assess the projected change in irrigated acreage, FDACS uses a statistical regression based on the historical trends in irrigated acreage in each county. Using this trend, FDACS projects future total irrigated acreage for each county. FDACS then uses a GIS model to produce a map of projected irrigated acreage and crop types in each county for 2040.
5) **Project future irrigation demands:** After the 2040 projected irrigated acreage coverage is complete, FDACS uses the econometric model to simulate future irrigation demands for 2040 at the parcel level based on project crop type. The econometric model assigns a per acre water use to each irrigated parcel based on crop type and projected crop price. Crop price is one of the key changing variables in the econometric model between the 2016 baseline and 2040 projected water use simulations.

Once the projected 2040 acreages, crop mix, and application rates are modeled at the parcel level, FDACS compiles this data into a geodatabase for publication and summarizes the results in the final FSAID report.

District staff reviewed the published report, and particularly examined the 2016 baseline water use estimates, the 2016 irrigated acreage coverage, the 2040 acreage projections and crop mix, and the 2040 projected water use. In general, although the District found the acreage data to be satisfactory for planning, the District identified several items relating to the water use baseline and projections that required modification of the projections for inclusion in the RWSP. These items are as follows:

1) The baseline year (2016) FSAID V ILG water demand estimates for the District and for whole counties were significantly higher than District historic water use estimates, even where there is an extremely high percentage of metered data. Overall, the 2016 modeled water use in the FSAID V ILG for SWFWMD was 430 mgd, and published 2016 estimated water use (for FSAID crops) was 315 mgd. This inflated baseline compared to recent historical water use data created the potential for significant over-projection of future demands. The high baseline demand would also be challenging for use in groundwater modeling for regional water supply planning, as use of these values would create sudden large increase in pumpage in the regions of the District's groundwater models, as compared to historical water use estimates based on metered data. The over-estimation trend for baseline 2016 water demands was particularly apparent in counties in the SWUCA (Charlotte, Desoto, Hardee, and Manatee), posing a challenge for future MFL assessment.

2) The use of the FSAID econometric model to synthesize typical 2016 water demands for permits where historical, user-reported metered data is available was also problematic from a planning perspective. Using the FSAID econometric model to predict baseline 2016 water demands, rather than metered data, not only created potential for under- and over-estimation of demands at the permit level, but also altered the spatial distribution of water use within counties, even where the FSAID predicted county totals may align with District estimates. Altering the spatial distribution of baseline water use can be particularly problematic in MFL assessments. Using modeled water demands where metered data is available can also have the effect of obscuring the benefits of individual grower's water conservation practices, or the conservation benefits of growers who have participated in District FARMS cost share programs. Similarly, the District also found cases where FSAID5 estimated water use under-reported historical baseline demands for individual permittees, effectively flattening out high volume water users. For these reasons, the District required baseline water demand data to be more reflective of historical metered water use at the permit level.

3) It appeared that some of the large discrepancies in FSAID modeled water use compared to historical, metered data were a result of over-estimation of irrigated acreages within permits. This was observed particularly for crops where agricultural land use or irrigated parcels can rapidly change, such as rotational vegetable operations in Manatee county, strawberry operations in Hillsborough county which can rotate with other agricultural land uses each year, and citrus, where citrus greening disease has caused rapid changes in acreages due to grove abandonments and replantings.

4) District staff also found that when comparing final FSAID values to multi-year averages of water use at the permit scale, that the FSAID model appeared to systematically over-estimate water use for the permit population of SWFWMD. Staff compared metered data to FSAID estimates and conducted a preliminary assessment of residuals and found evidence of over-estimation trends. Part of this trend seems to stem from the use of asymmetrical screening thresholds in the calibration of the econometric model. When applying District-supplied metered data to the estimated 2016 acreage of FSAID parcels, FDACS screened out the lower 25% of per acre water use rates, but only screened out the upper 10% of per acre water use rates. This dataset was then used for calibration of the econometric water use model. Screening out 15% more low water use values than high water use values prior to calibrating the econometric model creates a condition where statistical bias is introduced to the model. Models calibrated to an asymmetrical subset of an original population will be unable to predict the characteristics of the overall observed population. Although it is necessary to screen and QCQA data for model calibration, it seems unlikely that water use data for the lowest 25% of water users in the District should be thrown out as outliers while only the top 10% of data should be removed. Additionally, since the data screening process is based on application rates (metered data divided by FSAID-estimated acreage), over-estimation of irrigated acreage (observed in other analysis) would increase the likelihood of "outliers." In summary, this method of asymmetrical screening of water use data appeared to have

introduced bias into the econometric model, resulting in overestimation of agricultural water use in the District.

In summary, the 2016 baseline water demands and the 2040 projected agricultural water demands presented in the FSAID V report deviated significantly from historical metered water use in the District at the regional, county, and permit levels, and required adjustment to incorporate into the RWSP. It was particularly important to ensure that groundwater modeling exercises for the RWSP were reflective of existing metered water use.

FSAID V Agricultural Water Demand Adjustments:

To ensure that the FSAID V ILG irrigation demands were consistent with permittee-reported historical water use data, District staff used metered water use data where available to adjust the FSAID V application rates. This allowed the District to incorporate the best available data into the projections.

Acreage:

As the District does not directly track total irrigated acreage on an annual basis, and NRCS had not published acreages for the baseline interval at time the projections were developed, the FSAD V ILG irrigated acreage coverage was considered the best available acreage data for this RWSP. The use of the FSAID V acreage projections also included the added benefits of consistent statewide crop categories, and the recent incorporation of irrigated areas field verification efforts by FDACS in some District counties. A summary of FSAID V irrigated acreage projections for the SWFWMD by crop type are provided below.

FSAID V Irrigated Acreage Projections for SWFWMD

Crop Type	2016 Acreage	2040 Acreage
Citrus	278,503	259,524
Field Crops	11,440	14,998
Fruit (Non-citrus)	18,397	17,557
Greenhouse/Nursery	9,581	8,841
Hay	8,215	10,242
Potatoes	1,849	2,510
Sod	8,151	7,534
Vegetables (Fresh Market)	65,681	73,988
Grand Total	401,817	395,195

Typical Year Water Use Projections:

District staff used the FSAID V ILG, Aquaculture, and Livestock coverage to develop an adjusted average year FSAID V water use projection. The methods differed for each category based on data availability. All adjustments were done at the permit level for known District permits, and at the FSAID polygon level for non-permitted water uses. The adjustments described below were conducted for all counties in the District for consistency. After the adjustments to the FSAID V projections were complete, the agricultural projections for SWFWMD's portion of Polk county was replaced by the unadjusted FDACS FSAID IV

projections, as Polk County is in the CFWI Planning Area, and FSAID IV was used for the agricultural projections in the CFWI region.

1) Metered Irrigation Permits:

Staff compiled Estimated Water Use Report Data for all metered agricultural permits for 2014-2016. Staff then merged acreage and crop data in a spreadsheet for all FSAID ILG polygons by permit number. Once the FSAID was summarized at the permit level, staff joined the 2014-2016 estimated water use data to each permit by permit number in the same spreadsheet. An average 2014-16 water use for each metered permit was developed (years with no data were excluded). The 2014-16 average water use for each permit was divided by the 2016 acreage to produce a per acreage application rate for each permit. This permit-level per acre water use rate was multiplied by the 2016-2040 FDACS projected acreages for each permit. This created a new projected water use projection (in MGD) for each permit based on future acreage and current application rates. In no case did FDACS forecast a change in crop type for an individual permit, so existing application rates remained reasonable for the project future crop type.

2) Unmetered ILG Irrigated Areas:

Staff developed county by county per acre water use rates for each crop type to estimate demands from unmetered permits or FSAID polygons. Staff developed a summary table of metered FSAID acreage and (2014-2016 average) metered water use by county based on the previous analysis of metered permits. This data was used to develop average per acre water use by crop type for each county. Per acre water use by crop was then joined to each unmetered permit or parcel in the FSAID ILG. This per acre water use value was then multiplied by the projected 2016-2040 acreages to develop 2016-2040 projected water use in mgd for each unmetered permit. In no case did FDACS forecast a change in crop type for an individual permit, so per acre application rates remained constant for each permit over the 2016-2040 planning horizon.

3) Aquaculture:

FDACS held aquaculture water use constant over the 2016-2040 planning horizon. District staff examined the FSAID V aquaculture coverage to identify where metered data was available. Staff identified 11 permits where metered data was available. The 2016 water use baseline for each of these permits was set at the average water use of each permit from 2014-2016. The other aquaculture parcels identified in the FSAID V were left unchanged. The corporation of metered data where available resulted in an increase of 3.15 mgd compared to the FSAID V aquaculture projections. District staff followed FDACS forecasted trends and held aquaculture use constant from 2016 to 2040.

4) Livestock:

FDACS held aquaculture water use constant over the 2016-2040 planning horizon. District staff examined the FSAID V aquaculture coverage to identify where metered data was available. The overall FSAID livestock GIS coverage identified 9.13 mgd of livestock demands District wide. These had been developed using statewide livestock inventory and typical water

use per animal demands. As many District agricultural permits include multiple water use types (such as livestock and an irrigated crop), staff identified permits that were also included in the ILG. These water demands were removed from the livestock projections as the SWFWMD metered data for the adjusted ILG demands were based on total metered water use for the whole permit and would have included smaller secondary water uses for livestock in the adjusted ILG demands. This left 4.80 mgd of total demands not included in larger irrigated permits/parcels.

The remaining livestock demands were then reclassified to be more closely aligned with historical District water use data, which is focused on water use as withdrawals from a water resource. In many cases, although cattle or other livestock may require water for drinking, water may be readily available in local surface water features and no withdrawal will be present. For this reason, projected livestock demands were limited to likely demands for withdrawals of groundwater. Staff investigated the spatial livestock demands, and found that based on landcover data, 57% of livestock parcels in the FSAID had a surface water feature present. Additionally, 62% of the livestock parcels did not have a water well permit onsite, indicating a likely lack of withdrawals. Thus, final livestock demands were further limited to those livestock polygons which had a permitted water well onsite AND were not included in a larger irrigated permit as described above. Total adjusted FSAID V livestock water demand for the 2016 baseline and 2040 projection was thus 1.82 mgd Districtwide (including Polk county).

1-in-10 Dry Year Projections:

Upon completion of all FSAID adjustments for typical year ILG demands, staff scaled the adjusted ILG average year demands to 1-in-10 demands. This was done using the scaling factors developed by FDACS in the FSAID. 2015 to 2040 projected ILG demands were scaled up at the permit level using the crop-specific scaling factors used in FSAID V. Aquaculture and livestock demands were identified to be the same for a typical year in and a 1-in-10 event in the FSAID V report. Thus, adjusted aquaculture and livestock demands were also not scaled, are reported as the same value.

Spatial Distribution for Modeling:

Upon completion of all FSAID adjustments for typical year ILG demands, staff developed an updated well file for use in groundwater modeling exercises. In the majority of the District, the distribution was handled in a two-step process described here. In Polk county, the distribution was developed in the CFWI planning effort and documented in the CFWI technical memorandums.

In the first step, all projections associated with an existing permit in the District's annual water use GIS coverage were joined to their existing permitted withdrawals. Projected water use was distributed within each permit such that each withdrawal made up the same percentage of total water use within that permit as had occurred in 2015. For example, if a well in a permit accounted for 50% of total water use in historical pumpage data for that permit, it would be scaled up such that it would account for 50% of that permit's projected water use.

In the second step, projections for FSAID parcels that were not associated with existing withdrawals were distributed. In this case, a new projected well was added to the water use

geodatabase, located at the centroid of the polygon. The well was assigned to the typical groundwater source for that region, in most cases the Upper Floridan Aquifer. This process included the implicit assumption that most future growth in demand would be met by groundwater sources, as is currently the case.

This when distributing water to known permits in step one, the distribution exercise for each permit included both ground and surface water withdraw points. As such, the creation of this geodatabase also generated a projected groundwater vs surface water split. Although not a formal part of the agricultural water use projections, this data is needed for groundwater modeling exercises and other technical work. The projected groundwater and surface water split is included in summary tables below.

Benefits of Adjustments to FSAID V Demands:

There are several benefits to the use of the FSAID V projections with the SWFWMD modifications. Firstly, using FSAID V acreages allows the District to use an updated statewide dataset for agricultural acreage with common statewide crop categories. These active acreages ae updated annually, in in many cases include field verification. The use of grower-provided, metered water use data for water use application greatly increased the utility of the FSAID V acreage projections. Using permit-level water use data allows the District to maintain grower-level water use patterns while scaling up water use based on projected acreage growth. The grower provided water use data represents the best available data for local agricultural water use patterns and is reflective of regional efforts to improve water use efficiency through the SWUCA Recovery Strategy and the investments of the FARMS program. Using metered data as a projection baseline also ensures that water use is not redistributed for future modeling efforts and maintains local high and low water use centers in each county, providing for more accurate assessment of water resources and MFLs.

Stakeholder Input on Projection Methods:

In addition to the outreach efforts that are ongoing as part of the overall development of the Regional Water Supply Plan, the District conducted additional outreach with key stakeholders early in the development of the agricultural water use projections.

District staff held numerous meetings in summer and fall of 2018 with the FDACS Office of Agricultural Water Policy, the publisher of the FSAID. District staff provided updates on the technical challenges of incorporating of the unadjusted FSAID V into the RWSP. FDACS staff provided significant feedback, which led to a very helpful QAQC exercise of District metered datasets, resulting in an increase in data quality. District staff also provided FDACS with summary data and potential methods for how the FSAID V could best be incorporated into the RWSP and be reflective of historical District metered data. FDACS staff accented to the proposed modifications, the District proceeded with the methods described in this paper. The District believes that the use of FSAID V acreage projections and District metered water use data utilizes the best available data for this regional effort.

Additionally, in September 2018 the District provided a presentation on the FSAID V and potential agricultural water use projections to the members of the District's Agricultural and Green Industry Advisory Committee. The District provided a technical summary of the FSAID V methods and results, and also provided potential options for an alternate adjusted projection

method. District staff requested that the Committee take a vote on the preferred method based on their industry expertise. The Committee wished to take time to consider the proposed methods and adjourned to solicit feedback from industry groups and other stakeholders. In October 2018, the Committee reconvened, and District staff provided an additional presentation on the potential agricultural projections methods and draft results. Stakeholders present included representatives from the Florida Turfgrass Association, Florida Citrus Mutual, the Florida Strawberry Growers Association, the Florida Nursery Growers and Landscape Association, and the University of Florida IFAS, among others. After discussion, the Agricultural and Green Industry Advisory Committee voted to support the District's updated Agricultural Water Demands Projections Methodology based on the FSAID V projected acreages and adjustments to incorporated District metered water use data. The vote was passed unanimously.

In summary, District staff conducted significant outreach efforts to determine the best way to incorporate the FSAID V into the 2020 RWSP. The proposed method was developed by District water supply staff, and incorporated stakeholder comments. The final method was approved by the stakeholders of the Agricultural and Green Industry Advisory Committee and was accented to by the FDACS Office of Agricultural Water Policy.

SWFWMD 2020 Agricultural Water Use Projections:

Total Agricultural Water Use Projections (5-in-10 Water Demands, MGD)

County	ADJUSTED 2015 MGD	ADJUSTED 2020 MGD	ADJUSTED 2025 MGD	ADJUSTED 2030 MGD	ADJUSTED 2035 MGD	ADJUSTED 2040 MGD
Charlotte	8.12	8.31	8.75	9.20	9.89	10.30
Citrus	1.62	1.74	1.77	1.80	1.83	1.88
DeSoto	44.09	44.29	44.45	44.63	44.70	45.09
Hardee	32.27	31.58	30.98	30.34	29.74	29.17
Hernando	1.87	2.07	2.25	2.53	2.78	3.04
Highlands	41.64	39.95	38.01	35.92	35.46	33.01
Hillsborough	43.20	41.32	39.44	37.64	35.79	33.55
Lake	0.66	0.59	0.51	0.31	0.31	0.28
Levy	7.27	7.82	8.27	8.92	9.87	10.62
Manatee	48.87	49.28	49.68	50.45	50.93	51.34
Marion	1.70	2.99	4.13	5.31	6.27	7.40
Pasco	4.89	4.78	4.72	4.69	4.64	4.59
Pinellas	0.02	0.02	0.02	0.02	0.02	0.02
Polk*	81.83	80.83	80.36	80.67	81.36	81.61
Sarasota	3.97	3.70	3.60	3.24	3.03	2.92
Sumter	5.32	4.96	4.72	4.31	3.89	3.49
Grand Total	327.34	324.22	321.68	319.96	320.53	318.30

*Polk totals are unadjusted FSAID IV values from the 2020 CFWI Projections.

Irrigated Crop Water Use Projections (5-in-10 Water Demands, MGD)

County	2015 Baseline	Projected 2020	Projected 2025	Projected 2030	Projected 2035	Projected 2040
Charlotte	8.03	8.21	8.65	9.10	9.80	10.20
Citrus	1.57	1.69	1.72	1.74	1.78	1.83
DeSoto	43.16	43.36	43.53	43.70	43.77	44.16
Hardee	31.88	31.18	30.59	29.95	29.35	28.77
Hernando	1.84	2.04	2.23	2.50	2.75	3.01
Highlands	41.58	39.89	37.95	35.86	35.40	32.95
Hillsborough	41.07	39.18	37.31	35.50	33.65	31.41
Lake	0.65	0.58	0.50	0.29	0.29	0.27
Levy	7.26	7.81	8.26	8.92	9.87	10.61
Manatee	48.64	49.06	49.46	50.23	50.71	51.11
Marion	1.65	2.94	4.08	5.25	6.22	7.34
Pasco	4.72	4.61	4.55	4.52	4.47	4.42
Pinellas	0.02	0.02	0.02	0.02	0.02	0.02
Polk*	80.82	79.82	79.36	79.66	80.36	80.61
Sarasota	3.49	3.21	3.12	2.76	2.55	2.44
Sumter	3.53	3.17	2.93	2.52	2.10	1.70
Grand Total	319.90	316.78	314.25	312.52	313.10	310.87

*Polk totals are unadjusted FSAID IV values from the 2020 CFWI Projections.

Irrigated Crop Acreage Projections by Crop Type

Year	2016**	2020	2025	2030	2035	2040
Citrus	277,631	273,816	269,610	265,683	262,557	258,659
Field Crops	11,381	12,091	13,233	13,834	14,154	14,923
Fruit (Non-citrus)	18,213	17,756	17,446	17,015	17,086	17,400
Greenhouse/Nursery	11,045	10,887	10,775	10,620	10,496	10,384
Hay	8,200	8,326	8,502	9,247	9,836	10,101
Potatoes	1,849	1,849	1,858	2,108	2,108	2,471
Sod	8,070	8,512	8,037	7,872	7,781	7,432
Vegetables (Fresh Market)	65,428	67,112	69,494	70,680	72,727	73,826
Grand Total	401,817	400,349	398,954	397,058	396,745	395,195

**Acreage values provided are 2016 FSAID V values. The 2016 acreages were used with 2014-2016 water use data to develop an estimated 2015 water demand baseline. Acreages provided in the 2020 CFWI Projections for Polk county are from the FSAID IV and will differ slightly from the values in this table.

Livestock Water Use Projections (5-in-10 Water Demands, MGD)

County	2015 Baseline	Projected 2020	Projected 2025	Projected 2030	Projected 2035	Projected 2040
Charlotte	0.02	0.02	0.02	0.02	0.02	0.02
Citrus	0.03	0.03	0.03	0.03	0.03	0.03
DeSoto	0.27	0.27	0.27	0.27	0.27	0.27
Hardee	0.35	0.35	0.35	0.35	0.35	0.35
Hernando	0.03	0.03	0.03	0.03	0.03	0.03
Highlands	0.06	0.06	0.06	0.06	0.06	0.06
Hillsborough	0.19	0.19	0.19	0.19	0.19	0.19
Lake	0.00	0.00	0.00	0.00	0.00	0.00
Levy	0.01	0.01	0.01	0.01	0.01	0.01
Manatee	0.15	0.15	0.15	0.15	0.15	0.15
Marion	0.02	0.02	0.02	0.02	0.02	0.02
Pasco	0.17	0.17	0.17	0.17	0.17	0.17
Pinellas	-	-	-	-	-	-
Polk*	0.79	0.79	0.79	0.79	0.79	0.79
Sarasota	0.27	0.27	0.27	0.27	0.27	0.27
Sumter	0.17	0.17	0.17	0.17	0.17	0.17
Grand Total	2.52	2.52	2.52	2.52	2.52	2.52

*Polk totals are unadjusted FSAID IV values from the 2020 CFWI Projections.

Aquaculture Water Use Projections (5-in-10 Water Demands, MGD)

County	2015 Baseline	Projected 2020	Projected 2025	Projected 2030	Projected 2035	Projected 2040
Charlotte	0.08	0.08	0.08	0.08	0.08	0.08
Citrus	0.02	0.02	0.02	0.02	0.02	0.02
DeSoto	0.66	0.66	0.66	0.66	0.66	0.66
Hardee	0.04	0.04	0.04	0.04	0.04	0.04
Hernando	-	-	-	-	-	-
Highlands	-	-	-	-	-	-
Hillsborough	1.95	1.95	1.95	1.95	1.95	1.95
Lake	0.01	0.01	0.01	0.01	0.01	0.01
Levy	-	-	-	-	-	-
Manatee	0.07	0.07	0.07	0.07	0.07	0.07
Marion	0.04	0.04	0.04	0.04	0.04	0.04
Pasco	-	-	-	-	-	-
Pinellas	-	-	-	-	-	-
Polk*	0.19	0.19	0.19	0.19	0.19	0.19
Sarasota	0.22	0.22	0.22	0.22	0.22	0.22
Sumter	1.62	1.62	1.62	1.62	1.62	1.62
Grand Total	4.89	4.89	4.89	4.89	4.89	4.89

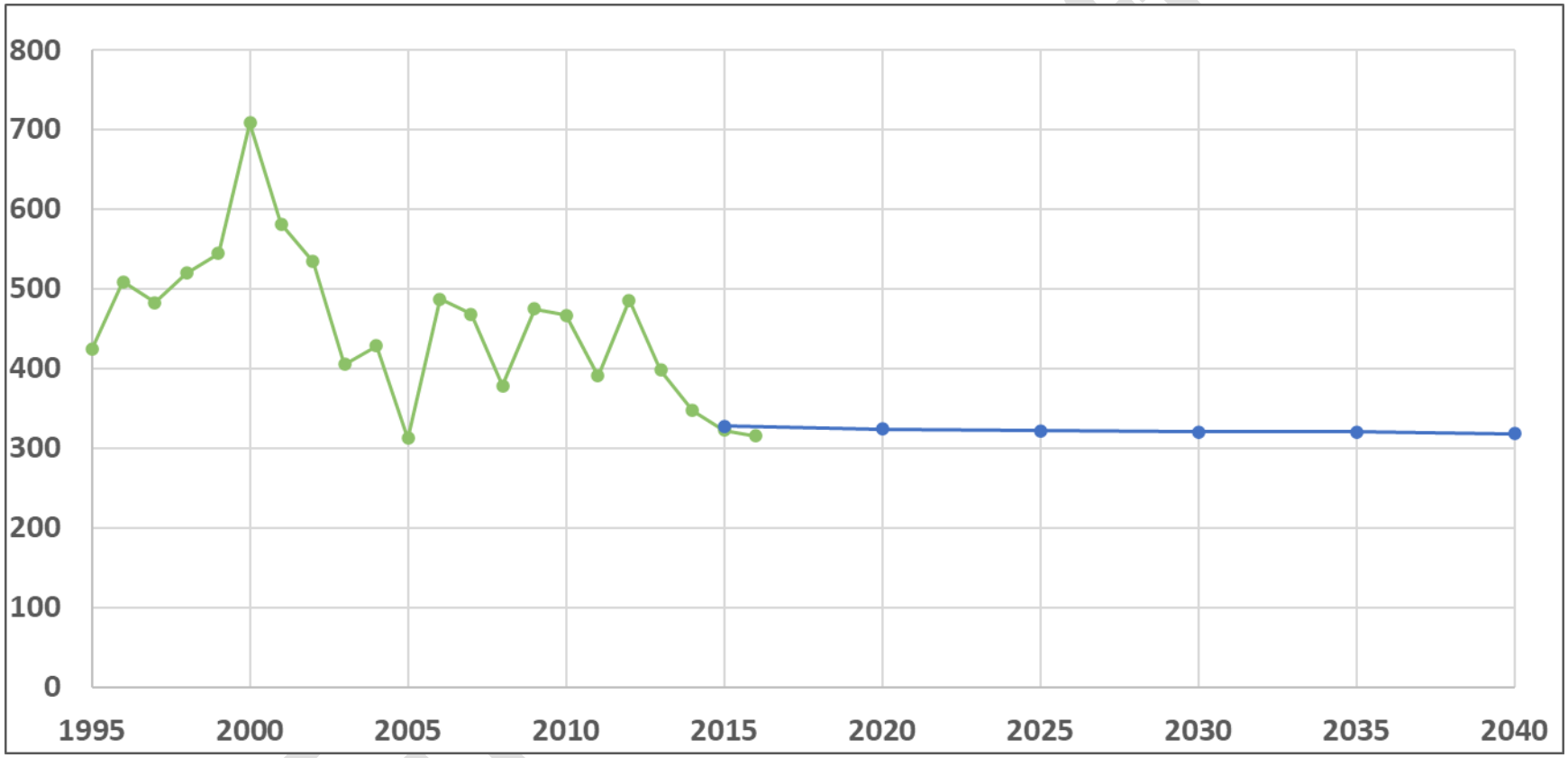
*Polk totals are unadjusted FSAID IV values from the 2020 CFWI Projections.

Total Agriculture Water Use Projections (1-in-10 Dry Year Water Demands, MGD)

County	2015 Baseline	Projected 2020	Projected 2025	Projected 2030	Projected 2035	Projected 2040
Charlotte	11.39	11.65	12.26	12.86	13.76	14.29
Citrus	2.12	2.28	2.31	2.35	2.39	2.46
DeSoto	64.75	65.03	65.24	65.50	65.61	66.15
Hardee	47.04	46.03	45.18	44.26	43.37	42.51
Hernando	2.36	2.62	2.87	3.21	3.52	3.85
Highlands	61.96	59.44	56.57	53.45	52.76	49.10
Hillsborough	55.49	52.99	50.54	48.18	45.80	42.94
Lake	0.96	0.86	0.74	0.43	0.43	0.39
Levy	9.07	9.78	10.36	11.20	12.43	13.39
Manatee	64.43	64.97	65.48	66.49	67.12	67.68
Marion	2.11	3.74	5.22	6.77	8.04	9.51
Pasco	6.76	6.61	6.53	6.47	6.41	6.34
Pinellas	0.02	0.02	0.02	0.02	0.02	0.02
Polk*	119.94	118.48	117.79	118.24	119.25	119.62
Sarasota	4.99	4.64	4.51	4.05	3.75	3.62
Sumter	6.06	5.64	5.35	4.85	4.35	3.87
Grand Total	459.45	454.78	450.99	448.34	449.02	445.74

*Polk totals are unadjusted FSAID IV values from the 2020 CFWI Projections.

Total Agricultural Water Use Projections (5-in-10 Water Demands, MGD) and Historical Water Use



Districtwide Irrigated Acreage Projections by Crop Category