

# 2

## Demand Estimates and Projections

This chapter summarizes the water demand estimates and projections for the Upper East Coast (UEC) Planning Area of the South Florida Water Management District (SFWMD or District) through the planning horizon (2019 to 2045). Estimates and projections are presented by water use category and were developed in coordination with various stakeholder groups, including agriculture, utilities, industry, local governments, and other interested parties. A detailed discussion of the data collection and analysis methodology is provided in **Appendix A**.

Water demands in the UEC Planning Area are driven by agricultural irrigation, followed by potable water use provided by utilities. Due to greening disease (huanglongbing), citrus acreage and production continue to decrease. Water demand projections presented for citrus are based on the assumption that the number of active citrus groves will continue to decline through the planning horizon (2045). Acreages of all other crops are also projected to decrease. Starting in early 2020, the COVID-19 pandemic has had significant impacts to the economy, particularly to businesses and tourism. However, residential development has expanded at a robust rate in Martin and St. Lucie counties. The UEC Planning Area population continues to increase, and the average per capita use rate increased slightly between 2016 and 2019.

### TOPICS

- ◆ Water Demand
- ◆ Water Use Categories
- ◆ Population Estimates and Projections
- ◆ Public Supply
- ◆ Domestic Self-Supply
- ◆ Agriculture
- ◆ Commercial/Industrial/Institutional
- ◆ Landscape/Recreational
- ◆ Power Generation
- ◆ Summary of Demand Estimates
- ◆ Demand Projections in Perspective

## WATER DEMAND

Water demands can be described and analyzed in two ways: gross demand and net demand. Gross demand is the volume of water withdrawn or diverted from a groundwater or surface water source. This definition serves as the basis for water allocations established through water use permits issued by the SFWMD. Further information on water use permitting is provided in the *Support Document for the 2021-2024 Water Supply Plan Updates (2021-2024 Support Document; SFWMD 2021)*. Net demand refers to the volume of water delivered to end users after accounting for treatment losses and delivery system inefficiencies. For Public Supply (PS) and Domestic Self-Supply (DSS), demands commonly are referred to as raw and finished demands rather than gross and net demands, respectively. In this *2021 Upper East Coast Water Supply Plan Update (2021 UEC Plan Update)*, net demand is equal to gross demand for all water use categories except PS.

This 2021 UEC Plan Update presents demands for average rainfall and 1-in-10 year drought conditions (**Appendix A**). Section 373.709, Florida Statutes (F.S.), states the level-of-certainty planning goal associated with identifying water demands contained in water supply plans shall be based on meeting demands during 1-in-10 year drought conditions for at least a 20-year period. Although not quantified in this plan, environmental demands are addressed through resource protection criteria (**Chapter 4**).

### INFO ⓘ

#### Average Rainfall and 1-in-10 Year Drought

An **average rainfall year** is defined as a year with a rainfall amount that has a 50% probability of being exceeded in any other year.

A **1-in-10 year drought** is defined as a year in which below normal rainfall occurs, with a 90% probability of being exceeded in any other year. It has an expected return frequency of once in 10 years.

## WATER USE CATEGORIES

Water demands for this 2021 UEC Plan Update are estimated in 5-year increments for the six water use categories listed below, which were established by the Florida Department of Environmental Protection (FDEP) in coordination with the state's water management districts. The water use category names and acronyms have been updated for this plan to align with other water supply planning efforts across the state.

- ◆ **Public Supply (PS)** – Potable water supplied by water treatment plants with a current allocation of 0.10 million gallons per day (mgd) or greater.
- ◆ **Domestic Self-Supply (DSS)** – Potable water used by households served by small utilities (less than 0.10 mgd) or self-supplied by private wells.
- ◆ **Agriculture (AG)** – Self-supplied water used for commercial crop irrigation, greenhouses, nurseries, livestock watering, pasture irrigation, and aquaculture.
- ◆ **Commercial/Industrial/Institutional (CII)** – Self-supplied water associated with the production of goods or provision of services by industrial, commercial, or institutional establishments.

- ◆ **Landscape/Recreational (L/R)** – Self-supplied and reclaimed water used to irrigate golf courses, sports fields, parks, cemeteries, and large common areas such as land managed by homeowners’ associations and commercial developments.
- ◆ **Power Generation (PG)** – Self-supplied and reclaimed water used for cooling, potable, and process water by power generation facilities.

**Table 2-1** presents estimated (2019) and projected (2045) average gross water demands, by water use category, in the UEC Planning Area for this water supply plan update. AG accounts for the majority of current and projected demands, followed by PS, L/R, PG, DSS, and CII. A small decrease in total demand is projected through the planning horizon.

Table 2-1. Estimated (2019) and projected (2045) average gross water demands (in mgd) for the UEC Planning Area, by use category.

Water Use Category	2019	2045
Public Supply	56.26	81.62
Domestic Self-Supply	5.76	5.61
Agriculture	174.72	130.10
Commercial/Industrial/Institutional	4.43	5.74
Landscape/Recreational	32.03	40.64
Power Generation	17.91	17.47
<b>UEC Planning Area Total</b>	<b>291.11</b>	<b>281.18</b>

UEC = Upper East Coast; mgd = million gallons per day.

## POPULATION ESTIMATES AND PROJECTIONS

Population estimates and projections were used to develop demands for all water use categories except PG. Developing population estimates and projections required multiple sources of information, including county-level data from the Bureau of Economic and Business Research (BEBR), consistent with Section 373.709(2)(a), F.S., sub-county data from traffic analysis zones, and local data from local government Comprehensive Plans. **Appendix A** provides further details on the development of population estimates and projections. Draft results were presented to the region’s larger PS utilities to ensure accuracy and obtain agreement with final 2045 population projections in the plan update.

### NOTE

All population estimates and projections are for permanent residents, as defined by the United States Census. However, the per capita use rate, which is used to calculate water demands, reflects use by seasonal residents as well.

In 2019, the estimated population within the UEC Planning Area was 468,498 permanent residents (**Table 2-2**). BEBR projections indicate the UEC Planning Area population will grow to 686,409 permanent residents in 2045, an increase of approximately 47%. Nearly two-thirds of the UEC Planning Area population resides in St. Lucie County, while Martin County accounts for approximately one-third, and this trend is expected to continue. As explained in **Appendix A**, BEBR high projections were used for St. Lucie County and BEBR medium projections were used for Martin and northeastern Okeechobee counties. Only a small population that relies on DSS resides in the northeastern portion of Okeechobee County within the UEC Planning Area. Detailed population projections for PS utilities and county DSS areas are provided in **Appendix A**.

Table 2-2. Permanent resident population served by PS and DSS in the UEC Planning Area in 2019 and 2045.

County	2019 Population			2045 Population		
	PS	DSS	Total	PS	DSS	Total
Martin	151,506	7,092	<b>158,598</b>	183,730	9,271	<b>193,001</b>
St. Lucie	272,297	37,060	<b>309,357</b>	459,716	33,085	<b>492,801</b>
Okeechobee*	0	544	<b>544</b>	0	607	<b>607</b>
<b>UEC Planning Area Total</b>	<b>423,803</b>	<b>44,695</b>	<b>468,499</b>	<b>643,446</b>	<b>42,963</b>	<b>686,409</b>

DSS = Domestic Self-Supply; PS = Public Supply; UEC = Upper East Coast.

\* Values listed are only for the area within the UEC Planning Area boundary.

## PUBLIC SUPPLY

The PS category includes potable water supplied by water treatment plants with a current allocation of 0.10 mgd or greater. Developing PS demand projections in the UEC Planning Area was a multistep process that included determining PS utility service area and DSS populations, calculating per capita use rates (PCURs), and projecting future water needs.

### NOTE

Perceived discrepancies in table totals are due to rounding.

## Per Capita Use Rates

For each PS utility, a net (finished) water PCUR was developed using past population estimates and finished water data reported to the FDEP. The PCUR for each utility is a 5-year (2015 through 2019) average, calculated by dividing annual net (finished) water volume by the corresponding service area population for each year. For PS demand projections, PCURs were assumed to remain constant through 2045. To calculate projected gross (raw) demands, the treatment efficiency for each utility, based on treatment process type(s) expected in 2045, was applied as a raw-to-finished ratio. Any demand reductions due to historical conservation practices are implicitly factored into the projections by using the 5-year average PCUR. Future water conservation savings (**Chapter 3**) were not factored into the demand projections used in this plan update due to water savings uncertainties. PS service area and water treatment plant maps are provided in **Appendix A**. Utility profiles containing population and finished water use data and projections as well as permitted allocations are provided in **Appendix B**.

## PS Demand Estimates and Projections

**Tables 2-3 and 2-4** present PS gross (raw) and net (finished) water demands, respectively, in 5-year increments by county. The results indicate PS gross (raw) water demands will increase approximately 50%, from 56.26 mgd in 2019 to 81.62 mgd in 2045 under average rainfall conditions. Calculation of 1-in-10 year demand is increased based only on the outdoor portion of PS use, and the methodology is explained in **Appendix A**.

Table 2-3. PS gross (raw) water demands in the UEC Planning Area, by county.

County	Gross (Raw) Demand – Average Rainfall Conditions (mgd)							2045 1-in-10 Year Demand
	2019	2020	2025	2030	2035	2040	2045	
Martin	22.26	22.54	23.89	25.00	25.92	26.61	27.23	31.76
St. Lucie	34.00	35.98	40.18	43.22	47.82	51.20	54.39	59.29
Okeechobee*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>UEC Planning Area Total</b>	<b>56.26</b>	<b>58.52</b>	<b>64.07</b>	<b>68.22</b>	<b>73.74</b>	<b>77.81</b>	<b>81.62</b>	<b>91.05</b>

mgd = million gallons per day; PS = Public Supply; UEC = Upper East Coast.

\* Values listed are only for the area within the UEC Planning Area boundary. No PS utilities are located in the portion of Okeechobee County within the UEC Planning Area.

Table 2-4. PS net (finished) water demands in the UEC Planning Area, by county.

County	Net (Finished) Demand – Average Rainfall Conditions (mgd)							2045 1-in-10 Year Demand
	2019	2020	2025	2030	2035	2040	2045	
Martin	19.20	19.45	20.46	21.30	21.96	22.53	23.05	26.90
St. Lucie	28.17	29.83	33.30	35.64	39.37	42.15	44.78	48.83
Okeechobee*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>UEC Planning Area Total</b>	<b>47.37</b>	<b>49.28</b>	<b>53.76</b>	<b>56.94</b>	<b>61.33</b>	<b>64.68</b>	<b>67.83</b>	<b>75.73</b>

mgd = million gallons per day; PS = Public Supply; UEC = Upper East Coast.

\* Values listed are only for the area within the UEC Planning Area boundary. No PS utilities are located in the portion of Okeechobee County within the UEC Planning Area.

## DOMESTIC SELF-SUPPLY

The DSS category includes potable water used by households that are served by small utilities with current allocations less than 0.10 mgd or that are self-supplied by private wells. Permanent resident populations within DSS areas were developed simultaneously with the PS population estimates and projections. All permanent residents outside of PS utility service area boundaries were considered DSS population. Population projection methodology and results are further described in **Appendix A**.

**Table 2-5** contains the UEC Planning Area's DSS demand estimates and projections under average rainfall conditions. The average PCUR of PS utilities in the county were used to calculate demands. For DSS demands, the raw to finished water ratio is assumed to be 1.00. Therefore, no distinction is made between gross (raw) and net (finished) water demands. Average DSS demands in 2019 were 5.76 mgd for 44,695 permanent residents (**Table 2-2**). DSS demands are expected to decrease 3%, to 5.61 mgd for 42,963 residents in 2045. This decrease can be attributed to low anticipated growth in DSS areas and expansion of PS utility service areas over the planning horizon.

Table 2-5. DSS gross (raw) water demands in the UEC Planning Area, by county.

County	Demand – Average Rainfall Conditions (mgd)							2045 1-in-10 Year Demand
	2019	2020	2025	2030	2035	2040	2045	
Martin	1.11	1.12	1.20	1.27	1.34	1.39	1.45	1.69
St. Lucie	4.60	4.79	4.97	5.15	3.96	4.03	4.10	4.47
Okeechobee*	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07
<b>UEC Planning Area Total</b>	<b>5.76</b>	<b>5.96</b>	<b>6.23</b>	<b>6.48</b>	<b>5.36</b>	<b>5.48</b>	<b>5.61</b>	<b>6.23</b>

DSS = Domestic Self-Supply; mgd = million gallons per day; UEC = Upper East Coast.

\* Values listed are only for the area within the UEC Planning Area boundary.

## AGRICULTURE

The AG category includes self-supplied water used for commercial crop irrigation, greenhouses, nurseries, livestock watering, pasture irrigation, and aquaculture. AG is the largest water use category in the UEC Planning Area, accounting for 174.72 mgd (60%) of the region’s total estimated water demand in 2019. Agricultural production in the UEC Planning Area is of regional significance, with 107,383 acres under irrigation (**Figure 2-1**). In 2018, output from the crop, livestock, and fisheries sectors located within the UEC Planning Area contributed \$558 million to the regional economy (Court and Ferreira 2020).

Agricultural acreage data published by the Florida Department of Agriculture and Consumer Services (FDACS 2020) were used to determine water demands for this 2021 UEC Plan Update. Pursuant to Section 373.709(2)(a), F.S., water management districts are required to consider FDACS water demand projections. Any adjustments or deviations from the projections published by FDACS, “...must be fully described, and the original data must be presented along with the adjusted data.” A detailed description of the analyses and adjustments is provided in **Appendix A**.

Agricultural water demand was determined using the Agricultural Field-Scale Irrigation Requirements Simulation (AFSIRS) model (Smajstrla 1990). No distinction was made between net and gross water demands. The FDACS irrigated crop acres, soil types, growing seasons, and irrigation methods were used as input data for the AFSIRS model. AG demand estimates and projections are based on the commercially grown crop categories in **Table 2-6**, as generally developed by the FDEP and water management districts for use in water supply plans. Citrus and sugarcane are the predominant irrigated land use in the UEC Planning Area, encompassing 56,559 acres with an average demand of 87.23 mgd in 2019 (**Table 2-6**). Together, these two crop types account for approximately half of the irrigated acreage and demand under average rainfall conditions. Irrigated fresh market vegetables, hay, and greenhouse/nurseries are the next largest AG categories, with a combined 46,473 acres and 76.14 mgd of irrigation demand in 2019.





Table 2-6. Agricultural irrigated acres and gross water demands (in mgd) in the UEC Planning Area, by crop type.

Crop	2019			2045		
	Acres	Average Demand	1-in-10 Year Demand	Acres	Average Demand	1-in-10 Year Demand
Citrus	32,478	37.20	46.92	20,109	22.70	28.89
Sugarcane	24,081	50.03	58.11	20,359	42.66	49.94
Fresh Market Vegetables	20,586	31.86	38.21	16,163	23.63	28.49
Hay/Pasture	20,493	29.54	34.33	15,486	22.03	25.53
Greenhouse/Nursery	5,394	14.74	16.25	3,753	9.95	11.03
Sod	2,900	5.56	6.63	1,856	3.71	4.53
Potatoes	1,101	3.10	3.60	1,080	3.04	3.53
Fruit (Non-Citrus)	350	0.71	0.82	198	0.40	0.47
<b>Total</b>	<b>107,383</b>	<b>172.74</b>	<b>204.87</b>	<b>79,004</b>	<b>128.12</b>	<b>152.41</b>

mgd = million gallons per day; UEC = Upper East Coast.

Note: The Florida Department of Agriculture and Consumer Services reports acreages and demands for a field crops category; however, there are no field crops in the UEC Planning Area.

Total irrigated acres in the UEC Planning Area are projected to decrease 26% by 2045. All crops are projected to decrease in acreage over the planning horizon. The largest change in irrigated acreage and demand is expected to occur in the citrus industry. By 2045, citrus is expected to decrease by 12,369 acres, and average demands are projected to decrease by 14.50 mgd.

Gross AG demands under average rainfall conditions in the UEC Planning Area are projected to decrease from 174.72 mgd in 2019 to 130.10 mgd in 2045 (**Table 2-7**). These totals include demands from livestock and aquaculture in addition to the demands for crop irrigation shown in **Table 2-6**. Demands for livestock and aquaculture in the UEC Planning Area in 2019 are estimated to be 1.91 mgd and 0.07 mgd, respectively, and are projected to remain constant over the planning horizon.

**INFO** ⓘ

Examples of crop categories used in this report include the following:

**Fresh Market Vegetables:**

- ◆ Tomatoes
- ◆ Green beans
- ◆ Peppers
- ◆ Melons

**Fruits (Non-Citrus):**

- ◆ Dragon fruit
- ◆ Strawberries

Table 2-7. AG gross water demands for all agricultural acreage, livestock, and aquaculture in the UEC Planning Area, by county.

County	Demand – Average Rainfall Conditions (mgd)							2045 1-in-10 Year Demand
	2019	2020	2025	2030	2035	2040	2045	
Martin	101.67	99.56	96.54	93.46	90.58	87.08	83.72	97.46
St. Lucie	67.56	64.93	60.42	55.61	50.57	46.14	41.29	50.96
Okeechobee*	5.49	5.49	5.49	5.09	5.09	5.09	5.09	5.97
<b>UEC Planning Area Total</b>	<b>174.72</b>	<b>169.98</b>	<b>162.45</b>	<b>154.16</b>	<b>146.24</b>	<b>138.31</b>	<b>130.10</b>	<b>154.39</b>

AG = Agriculture; mgd = million gallons per day; UEC = Upper East Coast.

\* Values listed are only for the area within the UEC Planning Area boundary.



## COMMERCIAL/INDUSTRIAL/INSTITUTIONAL

The CII water use category includes water demands associated with industrial and commercial operations for processing, manufacturing, and technical needs such as concrete, citrus processing, and mining operations. CII demands only include self-supplied users and do not include industrial or commercial users that receive water from PS utilities; those users are included in the PS category. All CII demand estimates and projections are presumed to be the same for average rainfall and 1-in-10 year drought conditions, and withdrawal demand is assumed to be equal to user demand. Therefore, no distinction is made between net and gross water demands.

Estimated CII demands for 2019 were 4.43 mgd, with minimal projected growth resulting in demands of 5.74 mgd in 2045 (**Table 2-8**). Growth within the CII category is expected to be driven by regional population growth.

Table 2-8. CII gross water demands in the UEC Planning Area, by county.

County	Demand (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin	3.46	3.50	3.70	3.86	3.99	4.11	4.21
St. Lucie	0.92	0.97	1.08	1.19	1.29	1.38	1.47
Okeechobee*	0.05	0.05	0.05	0.05	0.05	0.06	0.06
<b>UEC Planning Area Total</b>	<b>4.43</b>	<b>4.52</b>	<b>4.83</b>	<b>5.10</b>	<b>5.33</b>	<b>5.55</b>	<b>5.74</b>

CII = Commercial/Industrial/Institutional; mgd = million gallons per day; UEC = Upper East Coast.

\* Values listed are only for the area within the UEC Planning Area boundary.

## LANDSCAPE/RECREATIONAL

L/R is the third largest water use category in the UEC Planning Area, encompassing irrigation of golf courses and other landscaped areas such as parks, sports fields, and common areas of residential developments. L/R demands include use of groundwater/surface water as well as reclaimed water. L/R acreages reflect only the acres under water use permits and do not include acres solely irrigated with reclaimed water that do not have backup water use permits. Details regarding development of the L/R demands are provided in **Appendix A**.

Within the L/R category, 9,881 permitted acres were attributed to landscape irrigation (**Table 2-9**). These landscaped areas are expected to grow 45%, which is approximately the same rate as the local population through 2045.

For the recreational part of the L/R category, there are 58 golf courses irrigating 5,406 acres under water use permits in the UEC Planning Area (**Table 2-9**). This does not include golf course acreage solely irrigated with reclaimed water. Under average rainfall conditions, this land use required an estimated 12.16 mgd in 2019. Golf course acres and demands are projected to remain steady through 2045.

Table 2-9. L/R permitted acreage and gross water demands (in mgd) in the UEC Planning Area.

Land Use	2019			2045		
	Acres	Average Demand	1-in-10 Year Demand	Acres	Average Demand	1-in-10 Year Demand
Landscape	9,881	19.87	25.03	14,319	28.48	35.88
Golf	5,406	12.16	15.81	5,406	12.16	15.81
<b>Total</b>	<b>15,287</b>	<b>32.03</b>	<b>40.84</b>	<b>19,725</b>	<b>40.64</b>	<b>51.69</b>

UEC = Upper East Coast; mgd = million gallons per day; L/R = Landscape/Recreational.

Gross water demands for L/R are the combination of demands from the golf sector and other landscaped areas as well as estimated and projected reclaimed water use. No distinction is made between net and gross water demands. Under average rainfall conditions, total estimated L/R gross water demands are projected to increase from 32.03 mgd in 2019 to 40.64 mgd in 2045. **Table 2-10** shows that groundwater and surface water supply sources meet approximately 76% of the 2019 L/R water demands, with reclaimed water supplementing the remaining 24%. The ratio of reclaimed water to groundwater/surface water used to meet future L/R demands is assumed to remain constant. Demands for reclaimed water in each county are assumed to grow at the same rate as that county's L/R demands.

Table 2-10. L/R gross water demands in the UEC Planning Area, by county and source.

Source	Demand – Average Rainfall Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
<b>Martin County</b>							
Groundwater/Surface Water	11.88	11.96	12.32	12.62	12.86	13.08	13.27
Reclaimed Water	3.66	3.69	3.80	3.89	3.97	4.03	4.09
<b>Martin County Total</b>	<b>15.54</b>	<b>15.65</b>	<b>16.12</b>	<b>16.51</b>	<b>16.83</b>	<b>17.11</b>	<b>17.36</b>
<b>St. Lucie County</b>							
Groundwater/Surface Water	12.51	13.02	14.06	15.11	16.02	16.87	17.67
Reclaimed Water	3.92	4.08	4.41	4.73	5.02	5.29	5.54
<b>St. Lucie County Total</b>	<b>16.43</b>	<b>17.10</b>	<b>18.47</b>	<b>19.84</b>	<b>21.04</b>	<b>22.16</b>	<b>23.21</b>
<b>Okeechobee County*</b>							
Groundwater/Surface Water	0.06	0.06	0.06	0.06	0.06	0.07	0.07
Reclaimed Water	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Okeechobee County Total</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.07</b>	<b>0.07</b>
<b>UEC Planning Area</b>							
Groundwater/Surface Water	24.45	25.04	26.44	27.79	28.94	30.01	31.01
Reclaimed Water	7.58	7.77	8.21	8.63	8.99	9.32	9.63
<b>UEC Planning Area Total</b>	<b>32.03</b>	<b>32.81</b>	<b>34.65</b>	<b>36.41</b>	<b>37.93</b>	<b>39.34</b>	<b>40.64</b>

L/R = Landscape Recreational; mgd = million gallons per day; UEC = Upper East Coast.

\* Values listed are only for the area within the UEC Planning Area boundary.

# POWER GENERATION

Demands under the PG category include use of groundwater, fresh surface water, or reclaimed water by thermoelectric power generation facilities. PG demands do not include the use of brackish surface water and cooling water returned to its withdrawal source, or seawater. Demands under average rainfall and 1-in-10 year drought conditions are assumed to be equal in the PG category; no distinction is made between net and gross water demands.

There are two power generation plants currently operating in the UEC Planning Area that are addressed in this plan update: Florida Power & Light (FPL) Martin Plant near Indiantown (Martin County) and the Treasure Coast Energy Center in Fort Pierce (St. Lucie County).

Also operating in the UEC Planning Area is the FPL St. Lucie Nuclear Plant on Hutchinson Island. However, the facility uses potable water (permitted separately) and seawater (which does not require a water use permit) for cooling; therefore, the facility is not addressed in this water supply plan update. The Indiantown Cogeneration Plant in Martin County is inactive and will be demolished by 2022.

The FPL Okeechobee Clean Energy Center, located in Okeechobee County, is within the St. Johns River Water Management District, approximately 6 miles outside the UEC Planning Area. Because the facility is beyond the planning area and SFWMD boundary, its demands are not included in this 2021 UEC Plan Update. However, the facility’s demands were simulated in the groundwater modeling analysis because the influence of the withdrawals extends into the UEC Planning Area. The facility is estimated to need an average of 9.00 mgd (11.00 mgd peak) of water from the Floridan aquifer system for operation.

The need for additional power is expected to increase as the population in the UEC Planning Area and other portions of South Florida grows. The area’s major power supplier, FPL, expects that much of the region’s future power generation capacity will use fresh or alternative (brackish or reclaimed) water sources for cooling. The FPL Martin Plant uses cooling pond and tower technology that varies by unit and substantially decreases overall water supply demands at the facility because the cooling pond is the intake and release point. PG demands are expected to remain relatively stable from 2019 to 2045 (**Table 2-11**). More information on the development of PG estimates and projections is provided in **Appendix A**.

Table 2-11. Average gross water demand for PG in the UEC Planning Area between 2019 and 2045.

County	Gross Water Demand (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin	16.46	14.13	14.13	14.13	14.13	14.13	14.13
St. Lucie	1.45	3.34	3.34	3.34	3.34	3.34	3.34
<b>UEC Planning Area Total</b>	<b>17.91</b>	<b>17.47</b>	<b>17.47</b>	<b>17.47</b>	<b>17.47</b>	<b>17.47</b>	<b>17.47</b>

mgd = million gallons per day; PG = Power Generation; UEC = Upper East Coast.

## SUMMARY OF DEMAND ESTIMATES

Total gross water demands under average rainfall conditions in the UEC Planning Area are projected to be 281.18 mgd by 2045, a 3% decrease from 2019 demands (291.11 mgd). Demands under 1-in-10 year drought conditions are approximately 16% higher than those for average rainfall conditions.

**Table 2-12** provide 5-year incremental summaries of gross demands for all water use categories in the UEC Planning Area under average rainfall and 1-in-10 year drought conditions. Gross demands under average rainfall conditions are used to demonstrate projected trends, including the following key highlights:

- ◆ PS and DSS gross demands combined are expected to increase 41%, from 62.02 mgd in 2019 to 87.23 mgd in 2045. PS will remain the second largest water use category in the UEC Planning Area.
- ◆ AG gross demands are projected to decrease from 174.72 mgd in 2019 to 130.10 mgd in 2045. AG will remain the largest water use category in the UEC Planning Area.
- ◆ CII gross demand is projected to increase 1.31 mgd over the planning period. The projected demand growth is related to regional population growth.
- ◆ L/R gross demands are projected to increase by 8.61 mgd by 2045. L/R will remain the third largest water use category in the UEC Planning Area.
- ◆ PG gross demands are projected to remain relatively constant, with 17.47 mgd expected in 2045.

Table 2-12. Summary of gross water demands under average rainfall and 1-in-10 year drought conditions in the UEC Planning Area, by water use category.

Water Use Category	2019	2020	2025	2030	2035	2040	2045
<b>Demand – Average Rainfall Conditions (mgd)</b>							
PS	56.26	58.52	64.07	68.22	73.74	77.81	81.62
DSS	5.76	5.96	6.23	6.48	5.36	5.48	5.61
AG	174.72	169.98	162.45	154.16	146.24	138.31	130.10
CII	4.43	4.52	4.83	5.10	5.33	5.55	5.74
L/R	32.03	32.81	34.65	36.41	37.93	39.34	40.64
PG	17.91	17.47	17.47	17.47	17.47	17.47	17.47
<b>Total</b>	<b>291.11</b>	<b>289.26</b>	<b>289.70</b>	<b>287.84</b>	<b>286.07</b>	<b>283.96</b>	<b>281.18</b>
<b>Demand – 1-in-10 Year Drought Conditions (mgd)</b>							
PS	63.04	65.53	70.67	76.28	82.36	86.84	91.05
DSS	6.36	6.59	6.57	7.17	5.94	6.10	6.23
AG	206.85	201.21	192.17	182.27	173.33	163.74	154.39
CII	4.43	4.52	4.83	5.10	5.33	5.55	5.74
L/R	40.84	41.83	44.16	46.37	48.28	50.04	51.69
PG	17.91	17.47	17.47	17.47	17.47	17.47	17.47
<b>Total</b>	<b>339.43</b>	<b>337.15</b>	<b>335.87</b>	<b>334.66</b>	<b>332.71</b>	<b>329.74</b>	<b>326.57</b>

AG = Agriculture; CII = Commercial/Industrial/Institutional; DSS = Domestic Self-Supply; L/R = Landscape/Recreational; mgd = million gallons per day; PG = Power Generation; PS = Public Supply; UEC = Upper East Coast.

# DEMAND PROJECTIONS IN PERSPECTIVE

Demand projections presented in this 2021 UEC Plan Update are based on the best available information. **Table 2-13** shows the 2040 average gross demands projected in the 2016 UEC Plan Update compared to the 2045 demands projected in this 2021 UEC Plan Update. The total demand projection for 2045 in this 2021 UEC Plan Update is 21% lower than the estimated 2040 demand projected in the 2016 UEC Plan Update. The projections reflect trends, economic circumstances, and industry intentions that change over time. Like any predictive tool based on past assumptions, there is uncertainty and a margin for error. The differences can be primarily attributed to:

- ◆ AG, CII, and L/R projections presented in this plan update were developed using a different methodology than was used in the 2016 UEC Plan Update in order to improve accuracy and use the best available data.
- ◆ Projected 2045 citrus acreage is significantly less than projected in the 2016 UEC Plan Update for 2040.
- ◆ Projected water needs for PG in 2045 are less than in the 2016 UEC Plan Update for 2040 because the construction of additional fossil and/or nuclear generation plants is no longer anticipated.

Table 2-13. Comparison of gross water demands under average rainfall conditions at the end of respective planning horizons in the 2016 UEC Plan Update and this 2021 UEC Plan Update.

Water Use Category	2016 UEC Plan Update 2040 Demand (mgd)	2021 UEC Plan Update 2045 Demand (mgd)	Percent Difference
Public Supply	73.15	81.62	12%
Domestic Self-Supply*	0.74	5.61	658%
Agriculture	186.65	130.10	-30%
Commercial/Industrial/Institutional	5.00	5.74	15%
Landscape/Recreational	33.94	40.64	20%
Power Generation	55.20	17.47	-68%
<b>Total</b>	<b>354.68</b>	<b>281.18</b>	<b>-21%</b>

mgd = million gallons per day; UEC = Upper East Coast.  
 \* Difference in demands is due to population projection methodology adjustments.

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