

Demand Projections for Landscape/Recreation

Introduction

Chapter 373, Florida Statutes (F.S.) sets forth the requirement for regional water supply planning. Under the provisions of this chapter, a Regional Water Supply Plan (RWSP) must be developed for those areas where available water supplies are not expected to meet projected demands over a 20-year planning horizon. Guidance for developing projections is contained in the publication, Format and Guidelines for Regional Water Supply Planning (Florida Department of Environmental Protection (FDEP) et al., 2019). This guidance document was produced by representatives from the FDEP and each of the five water management districts. Following a Districtwide water supply assessment that identified water demands and existing sources, the Governing Board of the Southwest Florida Water Management District (SWFWMD or District) determined the need for a RWSP in the southern ten counties of the District, and the District produced its first RWSP in 2001. The statute requires that the determination of the need for a RWSP be made every five years. Accordingly, in 2003, the Governing Board determined that the need for a RWSP existed in the same ten-county area. Starting with the 2010 edition of the RWSP, the Governing Board has directed District staff to include demand projections for all sixteen counties within the District.

In support of this effort, the District participated in the development of the RWSP for the Central Florida Water Initiative (CFWI) in conjunction with representatives from the FDEP, major stakeholders, and the South Florida and St. John's River water management districts. The CFWI Planning Area includes portions of Lake and Polk counties which are under District jurisdiction. Consequently, the population and water demands for Lake and Polk counties are from the CFWI RWSP demand projections.

Purpose

This appendix details the methodology used to develop water demand projections for the landscape/recreation (L/R) water use sector within the District. The L/R sector includes water use for parks, large lawns and landscaped areas, cemeteries, medians, public rights-of-way, athletic fields, golf courses, playgrounds, and other ornamental or decorative purposes such as fountains and waterfalls.

Background

The District is divided into four planning regions: Heartland, Northern, Southern, and Tampa Bay. The Heartland Planning Region includes Hardee, Highlands, and Polk counties; the Northern Planning Region includes Citrus, Hernando, Lake, Levy, Marion, and Sumter counties; the Southern Planning Region includes Charlotte, DeSoto, Manatee, and Sarasota counties; and the Tampa Bay Planning Region includes Hillsborough, Pasco, and Pinellas counties. For the 2025 RWSP, 2020 is the baseline year for the purpose of developing and reporting water demand projections. This is consistent with the methodology in the Format and Guidelines for Regional Water Supply Planning (FDEP et al., 2019). The data for the baseline year consists of reported and estimated usage for a 2020 baseline, whereas data for the years 2025 through 2045 are projected demands (estimated needs).

Data Sources

The methodology to develop L/R water demand projections uses many data sources. The District's Estimated Water Use Reports (2016-2020) were used to gather metered plus estimated L/R water use for each county (SWFWMD, 2016-2020). The University of Florida's Bureau of Economic and Business Research (UF/BEBR) publication (2022) was used to gather base year (2020) population and county population projections for the planning period (2025-2045). In the case of Lake and Polk counties, to ensure consistency, the demand projections were taken from the 2025 CFWI RWSP demand projections (St. Johns River Water Management District (SJRWMD), South Florida Water Management District (SFWMMD), SWFWMD, and FDEP, 2023).

Methodology

Water demand from the L/R sector is positively correlated with population growth. However, further research into golf course water demands indicated that future demand is also tied to facility closures, conservation, and reclaimed water use, as well as changing future demographic characteristics. To address these findings, it was decided to forecast golf and other L/R separately. As the CFWI estimates and projections for the overall L/R sector were not divided into golf and other L/R subsector demands, the total L/R demands for the District's portions of CFWI counties (Lake and Polk) were divided into golf and other L/R based upon each county's average historic percent of the total L/R demand within the District.

Golf

The District reviewed historic (2000-2021) metered and estimated golf course water use to identify trends. District golf course water use followed a decreasing trend over the 22-year period, from approximately 50 million gallons per day (mgd) in 2000 to 28 mgd in 2021. County-level golf course water use was analyzed further to identify if each county followed a similar downward trend. In all but one county, golf course water use was found to be following a decreasing trend. Sumter County was identified to have an increasing trend in golf course water use. For this county, the projected future demands were developed by increasing the baseline water use by the BEBR county-level population growth rate. For the remaining 15 District counties, the projected future golf course demands were developed by holding the baseline water use constant. For all counties excluding Polk and Lake, the baseline water use was developed as a 5-year average of metered and estimated golf course water use from 2016 to 2020. Baseline water use for Polk and Lake counties is based on 2020 water use (consistent with the 2025 CFWI RWSP).

As noted in the section titled, "Drought (1-in-10) Demands," drought year projections are estimated to be 30 percent higher than average year quantities. The average and drought year golf demand projections by county are displayed in Tables A-1 and A-2.

Other Landscape/Recreation

The projected water demands for non-golf course L/R water use were developed using a combination of historic metered and estimated water use data and county-level projections of population growth during the planning period. For all counties excluding Polk and Lake, the baseline water use was developed as a 5-year average of metered and estimated water use from 2016 to 2020. Baseline water use for Polk and Lake counties is based on 2020 water use (consistent with the 2025 CFWI RWSP). The projected future demands were developed by increasing the baseline water use by the BEBR county-level population growth rate.

For example, the baseline 2020 Other L/R demand for Charlotte County was estimated to be 0.836 mgd. According to BEBR, the 2025 population for Charlotte County should be 7.71 percent higher than in 2020.

The 2025 Other L/R forecast is therefore calculated as follows:

$$2025 \text{ Other L/R use} = 0.836 \text{ mgd increased by } 7.71 \text{ percent} = 0.901 \text{ mgd}$$

As noted in the section titled, “Drought (1-in-10) Demands,” drought year projections are estimated to be 26 percent higher than average year quantities. Tables A-3 and A-4 display the projected average and drought year demands for the Other L/R sector.

Drought (1-in-10) Demands

“The 1-in-10 year drought event is an event that results in an increase in water demand of a magnitude that would have a 10 percent probability of occurring during any given year” 1-in-10 year Drought Subcommittee of the Water Planning Coordination Group, 1998). The Format and Guidelines for Regional Water Supply Planning (FDEP et al., 2019) indicate that methodologies for estimating the 1-in-10 year demand for recreational self-supply are similar to methodologies used to estimate agricultural demand. The optimum irrigation requirements for the 1-in-10 year event, as opposed to the average year event, were 30 percent higher for golf courses and 26 percent higher for landscape irrigation. The projected water use for an average year was multiplied by this percentage value to produce a projected water use for a 1-in-10 drought year.

Summary

The total L/R water use sector (both Golf and Other L/R) is expected to use an additional 20.06 mgd. Average water demand is projected to increase from 58.06 mgd in 2020 to 78.12 mgd in 2045.

Total average and drought year L/R projections are displayed in Tables A-5 and A-6 below. Golf and Other L/R demand projections are also presented for the four planning regions in Tables A-7 through A-10.

References

- Central Florida Water Initiative (CFWI), 2025. *2025 Central Florida Water Initiative Regional Water Supply Plan*.
- Florida Department of Environmental Protection (FDEP) et al., 2019. *Format and Guidelines for Regional Water Supply Planning*. FDEP, Tallahassee, FL.
- Southwest Florida Water Management District, 2000-2021. *Estimated Water Use Reports (for the years 2000-2021)*. Brooksville, FL.
- University of Florida, 2022. *Projections of Florida Population by County, 2025-2045, with estimates for 2021*. Bureau of Economic and Business Research, Volume 55, Bulletin 192, Gainesville, FL.

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Table 1. 2020-2045 average (5-in-10) projected golf course demand (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Charlotte	1.002	1.002	1.002	1.002	1.002	1.002	0.000	0%
Citrus	2.973	2.973	2.973	2.973	2.973	2.973	0.000	0%
Desoto	0.095	0.095	0.095	0.095	0.095	0.095	0.000	0%
Hardee	0.100	0.100	0.100	0.100	0.100	0.100	0.000	0%
Hernando	2.593	2.593	2.593	2.593	2.593	2.593	0.000	0%
Highlands	1.674	1.674	1.674	1.674	1.674	1.674	0.000	0%
Hillsborough	2.897	2.897	2.897	2.897	2.897	2.897	0.000	0%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.134	0.134	0.134	0.134	0.134	0.134	0.000	0%
Manatee	1.921	1.921	1.921	1.921	1.921	1.921	0.000	0%
Marion	2.167	2.167	2.167	2.167	2.167	2.167	0.000	0%
Pasco	2.006	2.006	2.006	2.006	2.006	2.006	0.000	0%
Pinellas	2.214	2.214	2.214	2.214	2.214	2.214	0.000	0%
Polk ¹	4.008	4.008	4.008	4.008	4.008	4.008	0.000	0%
Sarasota	3.450	3.450	3.450	3.450	3.450	3.450	0.000	0%
Sumter	2.339	2.790	4.388	6.065	7.131	7.887	5.548	237%
District Total	29.574	30.025	31.623	33.299	34.365	35.122	5.548	19%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP

Table 2. 2020-2045 drought (1-in-10) projected golf course demand (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Charlotte	1.303	1.303	1.303	1.303	1.303	1.303	0.000	0%
Citrus	3.865	3.865	3.865	3.865	3.865	3.865	0.000	0%
Desoto	0.124	0.124	0.124	0.124	0.124	0.124	0.000	0%
Hardee	0.129	0.129	0.129	0.129	0.129	0.129	0.000	0%
Hernando	3.371	3.371	3.371	3.371	3.371	3.371	0.000	0%
Highlands	2.176	2.176	2.176	2.176	2.176	2.176	0.000	0%
Hillsborough	3.766	3.766	3.766	3.766	3.766	3.766	0.000	0%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.174	0.174	0.174	0.174	0.174	0.174	0.000	0%
Manatee	2.498	2.498	2.498	2.498	2.498	2.498	0.000	0%
Marion	2.818	2.818	2.818	2.818	2.818	2.818	0.000	0%
Pasco	2.608	2.608	2.608	2.608	2.608	2.608	0.000	0%
Pinellas	2.879	2.879	2.879	2.879	2.879	2.879	0.000	0%
Polk ¹	5.210	5.210	5.210	5.210	5.210	5.210	0.000	0%
Sarasota	4.485	4.485	4.485	4.485	4.485	4.485	0.000	0%
Sumter	3.040	3.627	5.705	7.884	9.270	10.253	7.213	237%
District Total	38.446	39.032	41.110	43.289	44.675	45.658	7.213	19%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP

Table 3. Projected average (5-in-10) other landscape/recreation demand (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Charlotte	0.836	0.901	0.957	1.002	1.040	1.075	0.238	28%
Citrus	0.270	0.284	0.296	0.306	0.314	0.321	0.052	19%
Desoto	0.083	0.084	0.085	0.085	0.086	0.086	0.003	4%
Hardee	0.028	0.028	0.028	0.028	0.028	0.028	0.000	-2%
Hernando	0.812	0.870	0.918	0.958	0.991	1.018	0.206	25%
Highlands	0.344	0.352	0.360	0.366	0.370	0.374	0.031	9%
Hillsborough	6.399	6.933	7.375	7.723	8.016	8.268	1.870	29%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.037	0.039	0.040	0.041	0.043	0.043	0.006	17%
Manatee	7.940	8.758	9.444	10.005	10.499	10.934	2.994	38%
Marion	0.565	0.620	0.667	0.706	0.739	0.768	0.204	36%
Pasco	1.962	2.166	2.335	2.475	2.593	2.697	0.735	37%
Pinellas	1.027	1.043	1.059	1.072	1.083	1.092	0.065	6%
Polk ¹	3.152	4.182	4.612	4.962	5.262	5.522	2.370	75%
Sarasota	4.550	4.848	5.101	5.307	5.486	5.640	1.091	24%
Sumter	0.484	0.639	2.494	4.398	4.860	5.127	4.643	958%
District Total	28.489	31.749	35.772	39.435	41.409	42.995	14.506	51%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP

Table 4. Projected drought (1-in-10) other landscape/recreation demand (mgd)

County							Change	% Change
	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Charlotte	1.054	1.135	1.206	1.263	1.311	1.354	0.300	28%
Citrus	0.340	0.358	0.373	0.386	0.396	0.405	0.065	19%
Desoto	0.105	0.106	0.107	0.108	0.108	0.109	0.004	4%
Hardee	0.036	0.036	0.036	0.035	0.035	0.035	-0.001	-2%
Hernando	1.023	1.096	1.157	1.207	1.248	1.283	0.260	25%
Highlands	0.433	0.444	0.453	0.461	0.467	0.472	0.039	9%
Hillsborough	8.062	8.736	9.293	9.731	10.100	10.418	2.356	29%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.047	0.049	0.051	0.052	0.054	0.055	0.008	17%
Manatee	10.005	11.036	11.899	12.607	13.228	13.777	3.772	38%
Marion	0.711	0.782	0.840	0.889	0.931	0.968	0.257	36%
Pasco	2.473	2.729	2.943	3.119	3.268	3.398	0.926	37%
Pinellas	1.294	1.314	1.335	1.351	1.364	1.375	0.082	6%
Polk ¹	3.972	5.269	5.811	6.252	6.630	6.958	2.986	75%
Sarasota	5.732	6.108	6.427	6.687	6.913	7.107	1.374	24%
Sumter	0.610	0.805	3.143	5.542	6.123	6.460	5.850	958%
District Total	35.896	40.004	45.072	49.688	52.176	54.174	18.278	51%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP

Table 5. 2020-2045 average (5-in-10) projected total landscape/recreation demand (mgd)

County	2020	2025	2030	2035	2040	2045	Change	% Change
							2020-2045	2020-2045
Charlotte	1.838	1.903	1.959	2.004	2.042	2.077	0.238	13%
Citrus	3.243	3.258	3.269	3.279	3.287	3.294	0.052	2%
Desoto	0.178	0.180	0.180	0.181	0.181	0.181	0.003	2%
Hardee	0.128	0.128	0.128	0.128	0.128	0.127	0.000	0%
Hernando	3.406	3.463	3.511	3.551	3.584	3.612	0.206	6%
Highlands	2.018	2.026	2.034	2.039	2.044	2.048	0.031	2%
Hillsborough	9.296	9.830	10.272	10.620	10.913	11.165	1.870	20%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.171	0.172	0.174	0.175	0.176	0.177	0.006	4%
Manatee	9.861	10.680	11.365	11.926	12.420	12.855	2.994	30%
Marion	2.732	2.788	2.834	2.873	2.906	2.936	0.204	7%
Pasco	3.969	4.172	4.342	4.482	4.600	4.703	0.735	19%
Pinellas	3.241	3.257	3.274	3.286	3.297	3.306	0.065	2%
Polk ¹	7.160	8.190	8.620	8.970	9.270	9.530	2.370	33%
Sarasota	8.000	8.298	8.551	8.757	8.936	9.090	1.091	14%
Sumter	2.823	3.429	6.883	10.463	11.990	13.014	10.191	361%
District Total	58.063	61.774	67.395	72.735	75.775	78.117	20.055	35%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP

Table 6. 2020-2045 drought (1-in-10) projected total landscape/recreation demand (mgd)

County	2020	2025	2030	2035	2040	2045	Change	% Change
							2020-2045	2020-2045
Charlotte	2.356	2.438	2.509	2.565	2.613	2.657	0.300	13%
Citrus	4.205	4.224	4.238	4.251	4.261	4.270	0.065	2%
Desoto	0.228	0.230	0.231	0.231	0.232	0.232	0.004	2%
Hardee	0.165	0.165	0.165	0.165	0.165	0.164	-0.001	0%
Hernando	4.395	4.467	4.528	4.578	4.619	4.655	0.260	6%
Highlands	2.609	2.620	2.629	2.637	2.643	2.648	0.039	1%
Hillsborough	11.828	12.502	13.059	13.497	13.866	14.184	2.356	20%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.220	0.223	0.224	0.226	0.227	0.228	0.008	4%
Manatee	12.502	13.533	14.397	15.104	15.726	16.274	3.772	30%
Marion	3.529	3.599	3.658	3.707	3.748	3.786	0.257	7%
Pasco	5.081	5.337	5.551	5.727	5.876	6.006	0.926	18%
Pinellas	4.172	4.193	4.213	4.229	4.243	4.254	0.082	2%
Polk ¹	9.182	10.480	11.022	11.463	11.841	12.168	2.986	33%
Sarasota	10.217	10.593	10.912	11.172	11.398	11.592	1.374	13%
Sumter	3.651	4.432	8.848	13.426	15.393	16.713	13.062	358%
District Total	74.342	79.036	86.183	92.978	96.851	99.832	25.491	34%

¹Projections for the SWFWMD portion from the 2025 CFWI

Table 7. Projected landscape/recreation demand in the Heartland Planning Region (5-in-10) and (1-in-10) (mgd)

County	2020		2025		2030		2035		2040		2045		Change 2020-2045		% Change 2020-2045	
	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10
Hardee	0.128	0.165	0.128	0.165	0.128	0.165	0.128	0.165	0.128	0.165	0.127	0.164	0.000	-0.001	0%	0%
Highlands	2.018	2.609	2.026	2.620	2.034	2.629	2.039	2.637	2.044	2.643	2.048	2.648	0.031	0.039	2%	1%
Polk ¹	7.160	9.182	8.190	10.480	8.620	11.022	8.970	11.463	9.270	11.841	9.530	12.168	2.370	2.986	33%	33%
Total	9.305	11.956	10.344	13.265	10.781	13.816	11.137	14.264	11.442	14.648	11.706	14.980	2.400	3.024	26%	25%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP

Table 8. Projected landscape/recreation demand in the Northern Planning Region (5-in-10) and (1-in-10) (mgd)

County	2020		2025		2030		2035		2040		2045		Change 2020-2045		% Change 2020-2045	
	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10
Citrus	3.243	4.205	3.258	4.224	3.269	4.238	3.279	4.251	3.287	4.261	3.294	4.270	0.05	0.06	2%	2%
Hernando	3.406	4.395	3.463	4.467	3.511	4.528	3.551	4.578	3.584	4.619	3.612	4.655	0.21	0.26	6%	6%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0%	0%
Levy	0.171	0.220	0.172	0.223	0.174	0.224	0.175	0.226	0.176	0.227	0.177	0.228	0.01	0.01	4%	4%
Marion	2.732	3.529	2.788	3.599	2.834	3.658	2.873	3.707	2.906	3.748	2.936	3.786	0.20	0.26	7%	7%
Sumter	2.823	3.651	3.429	4.432	6.883	8.848	10.463	13.426	11.990	15.393	13.014	16.713	10.19	13.06	361%	358%
Total	12.374	16.000	13.110	16.945	16.672	21.496	20.342	26.188	21.944	28.249	23.033	29.652	10.659	13.652	86%	85%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP

Table 9. Projected landscape/recreation demand in the Southern Planning Region (5-in-10) and (1-in-10) (mgd)

County	2020		2025		2030		2035		2040		2045		Change 2020-2045		% Change 2020-2045	
	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10
Charlotte	1.838	2.356	1.903	2.438	1.959	2.509	2.004	2.565	2.042	2.613	2.077	2.657	0.238	0.300	13%	13%
Desoto	0.178	0.228	0.180	0.230	0.180	0.231	0.181	0.231	0.181	0.232	0.181	0.232	0.003	0.004	2%	2%
Manatee	9.861	12.502	10.680	13.533	11.365	14.397	11.926	15.104	12.420	15.726	12.855	16.274	2.994	3.772	30%	30%
Sarasota	8.000	10.217	8.298	10.593	8.551	10.912	8.757	11.172	8.936	11.398	9.090	11.592	1.091	1.374	14%	13%
Total	19.878	25.305	21.060	26.794	22.055	28.048	22.868	29.073	23.580	29.969	24.204	30.755	4.326	5.451	22%	22%

Table 10. Projected landscape/recreation demand in the Tampa Bay Planning Region (5-in-10) and (1-in-10) (mgd)

County	2020		2025		2030		2035		2040		2045		Change 2020-2045		% Change 2020-2045	
	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10
Hillsborough	9.296	11.828	9.830	12.502	10.272	13.059	10.620	13.497	10.913	13.866	11.165	14.184	1.870	2.356	20%	20%
Pasco	3.969	5.081	4.172	5.337	4.342	5.551	4.482	5.727	4.600	5.876	4.703	6.006	0.735	0.926	19%	18%
Pinellas	3.241	4.172	3.257	4.193	3.274	4.213	3.286	4.229	3.297	4.243	3.306	4.254	0.065	0.082	2%	2%
Total	16.505	21.082	17.259	22.032	17.887	22.823	18.388	23.453	18.810	23.985	19.175	24.445	2.669	3.363	16%	16%