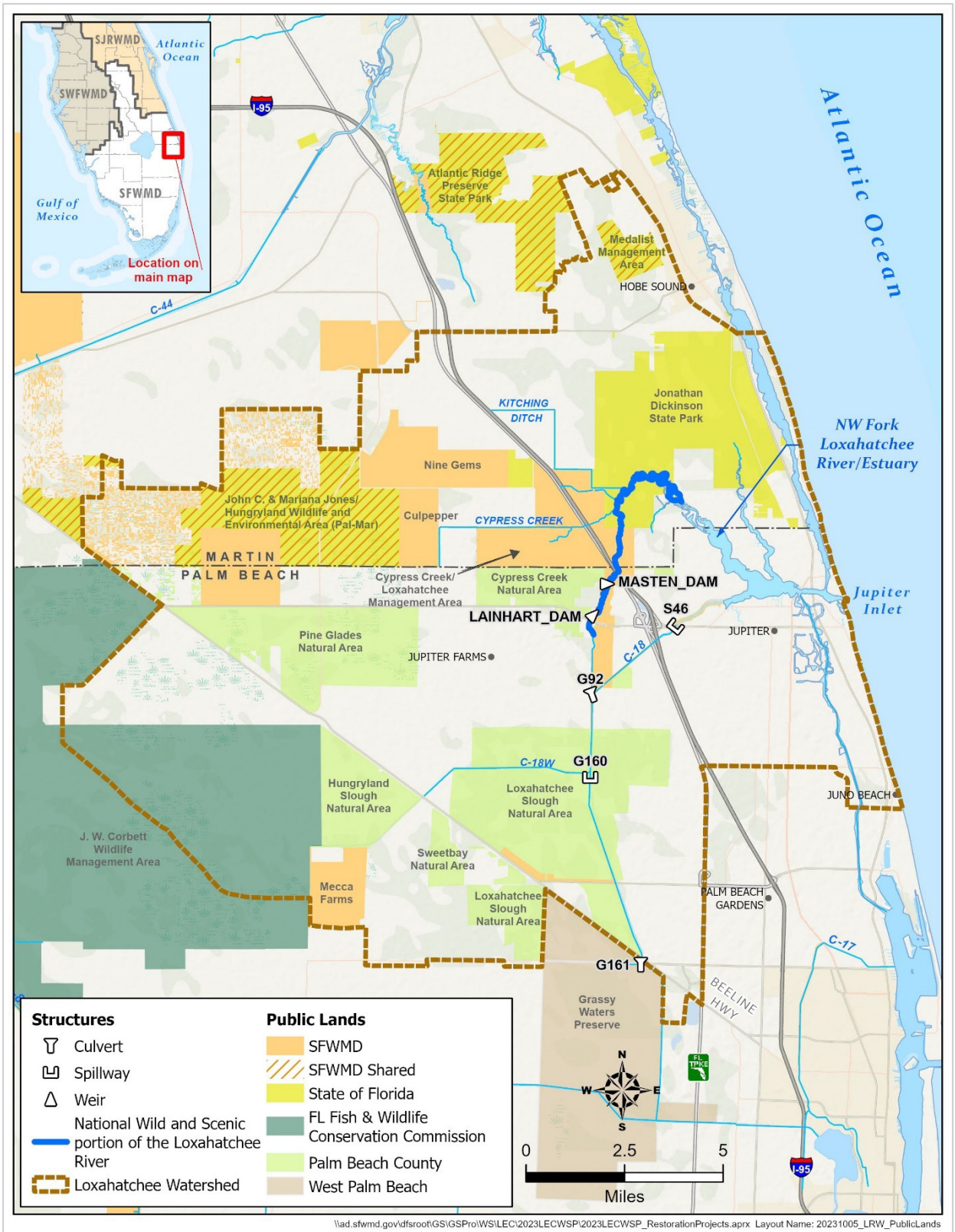

Figure 7-15. Major features of the Loxahatchee River and Estuary.

Management measures (e.g., storage impoundments, wetland restoration, reconnecting historical flow paths) to meet planning objectives were incorporated into the USACE Tentatively Selected Plan, which was identified in July 2018 (**Figure 7-16**; **Table 7-3**), and the Recommended Plan was approved in 2020.

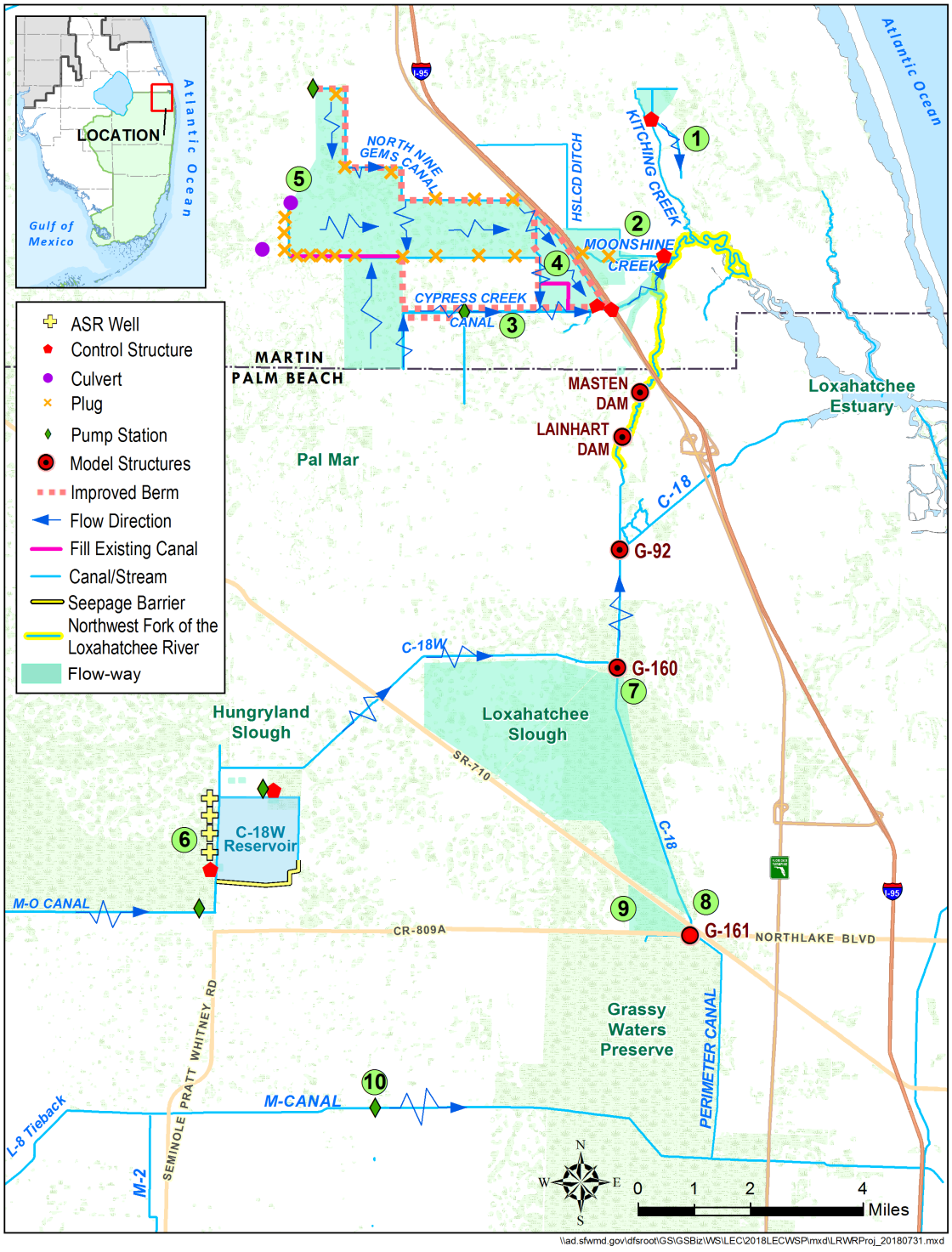

Figure 7-16. Loxahatchee River Watershed Restoration Project authorized plan components. **Table 7-3** provides details of these 10 projects.

Table 7-3. Loxahatchee River Watershed Restoration Project authorized components.

Figure 7-16 Map ID	Name	Description
1	Kitching Creek	Improve hydration with spreader canal and Jenkin's ditch weir/plug.
2	Moonshine Creek and Gulfstream East	Restore flow by connecting Hobe St. Lucie Conservancy District ditch to Moonshine Creek; install weir in Hobe Grove ditch, and regrade area to historical topography.
3	Cypress Creek Canal	Reduce overdrainage with new raised Cypress Creek Canal Weir and drainage improvements; regrade southern forks of canal.
4	Gulfstream West	Reduce overdrainage with Hobe St. Lucie Conservancy District Canal realignment. Restore flow with pump and flow-through marsh.
5	Pal Mar East	Restore flow and connection with berm improvements, pumps, and drainage redirection.
6	C-18W Reservoir/ASR Wells	Provide storage with 9,500-acre-foot aboveground reservoir and four ASR wells. Connect to M-O Canal and install pump.
7	G-160 Structure	Reduce overdrainage to improve hydroperiod in Loxahatchee Slough.
8	G-161 Structure	Connect Grassy Waters Preserve to Loxahatchee Slough and the Northwest Fork of the Loxahatchee River via the C-18 Canal.
9	Grassy Waters Preserve Triangle	Connect Grassy Waters Preserve to Loxahatchee Slough and the Northwest Fork of the Loxahatchee River via the C-18 Canal.
10	M-1 Pump Station	Convey lower M-1 basin water to M-Canal, Grassy Waters Preserve, and G-161 Structure.

ASR = aquifer storage and recovery.

Storage for the Loxahatchee River

The L-8 Reservoir originally was acquired to provide water storage as a component of the CERP North Palm Beach County Project – Part 1. In 2012, the Restoration Strategies Regional Water Quality Plan incorporated the L-8 Reservoir as one of its features, but it is now being used as an FEB to increase the water quality improvement capabilities of STA-1E and STA-1W.

In 2013, the SFWMD acquired approximately 1,850 acres in the western C-18 Basin (referred to as Mecca Farms). This property was identified under the Restoration Strategies Regional Water Quality Plan as a potential replacement facility for the L-8 Reservoir to store and deliver water to the Northwest Fork of the Loxahatchee River. The C-18W Reservoir (Mecca Farms) is included in the Loxahatchee River Watershed Restoration Project's authorized plan, along with adjacent ASR wells (**Figure 7-15**).

CERP Hillsboro Site 1 Impoundment/Fran Reich Preserve Reservoir

Located in Palm Beach County, the Fran Reich Preserve Reservoir (formerly called the Site 1 Reservoir) is a proposed 1,660-acre, 8-foot-deep, aboveground impoundment to capture and store excess surface water from the Hillsboro Basin and WCA-1 (Arthur R. Marshall Loxahatchee National Wildlife Refuge). With the reservoir in place, dry season water withdrawals from the refuge to meet water demands would be reduced, allowing more

natural and consistent water levels within the refuge. In addition, benefits to the downstream estuaries and reduced groundwater seepage from the refuge are expected. This project provides water supplies identified in the Everglades MFL recovery strategy.

In order to utilize funding from the American Recovery and Reinvestment Act of 2009, Phase 1 of the Fran Reich Preserve Reservoir, a standalone and usable portion of the project, was identified for construction. Phase 1 includes the embankment (L-40 modifications) and the S-530 Spillway, which reduce seepage loss from the adjacent wildlife refuge. Phase 1 construction was completed in December 2016.

Phase 2 includes additional site preparation, earthwork, construction of pump stations, canal improvements, embankment, placement of geocells on the embankment exterior, and placement of soil cement on the embankment interior. Phase 2 requires congressional authorization due to increased project cost.

CERP Broward County Water Preserve Areas

The objective of the CERP BCWPA project is to restore the ecological health of the Everglades. The BCWPA project addresses loss of ecosystem function within the Everglades as a result of 1) damaging discharges of runoff from developed areas in western Broward County into the Everglades (WCA-3A), 2) excessive nutrient loading to the Everglades, and 3) excessive seepage of water out of the Everglades to developed areas in western Broward County. The BCWPA project has three features: C-11 Impoundment, C-9 Impoundment, and WCA-3A/3B Seepage Management Area.

The BCWPA project, location depicted in **Figure 7-17**, is designed to perform two primary functions:

- Reduce seepage loss from WCA-3A/3B to the C-9 and C-11 basins.
- Capture, store, and distribute surface water runoff from the western C-11 Basin that has been discharged into WCA-3A/3B.

The C-11 Impoundment is the first feature of the BCWPA project to be designed and constructed. Final design is anticipated to be completed by early 2024 with a construction contract award in late 2024. The purpose of the C-11 Impoundment is to direct stormwater runoff from the western C-11 drainage basin into the impoundment instead of pumping untreated runoff into WCA-3A through the S-9 Pump Station. The impoundment pool will also assist in reducing seepage from WCA-3A and WCA-3A/3B Seepage Management Area (once built), thereby increasing groundwater recharge in the vicinity of the impoundment; providing an additional source of water for meeting the municipal and agricultural water supply demands; and preventing saltwater intrusion into drinking water aquifers. The C-11 Impoundment project is not considered flood control. Water will be released from the impoundment to the C-11 Canal to help maintain canal stages during the dry season, recharge the surficial aquifer, improve groundwater elevations in the eastern C-11 Canal Basin, and maintain water levels in the Pond Apple Slough (bordered by I-595 to the north and the C-11 Canal to the south). Water will be released from the C-11 Impoundment during the wet season to the C-9 Impoundment, once constructed, if storage is available there. Design for WCA-3A/3B Seepage Management Area and the C-9 Impoundment is anticipated to begin in 2024.

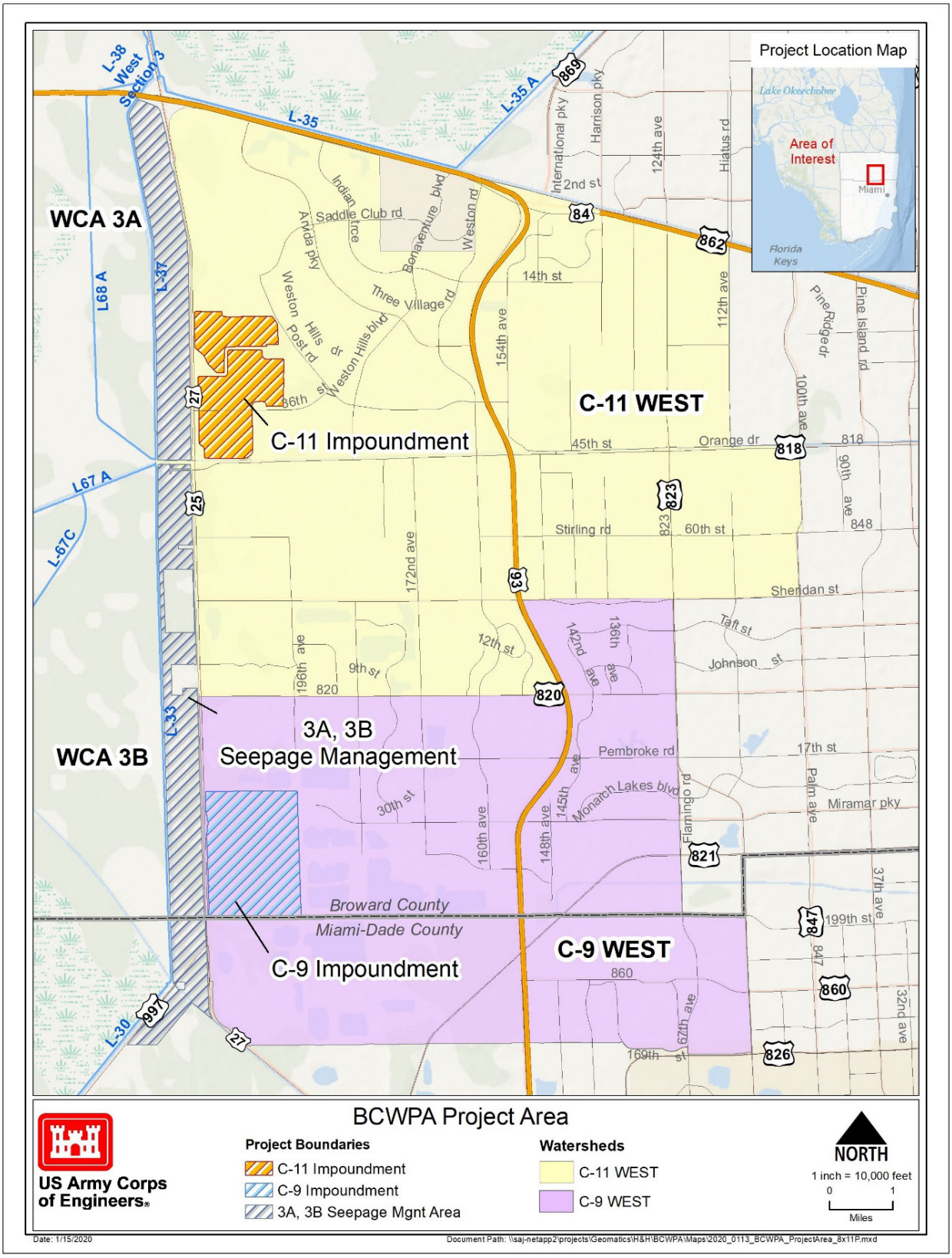

Figure 7-17. Broward County Water Preserve Areas project area and features.

Biscayne Bay

CERP Biscayne Bay Coastal Wetlands Project

Development of surface water drainage systems and groundwater withdrawals has altered the quantity, quality, timing, and distribution of freshwater flows to Biscayne Bay. Water quality in the bay has suffered due to rapid runoff from surface water drainage systems, and development has shifted the overall balance of freshwater inflows to Biscayne Bay altering the bay's salinity. The Water Quality Data Analysis (Migliaccio 2008) and Storm Event Sampling in the Biscayne Bay Watershed (Migliaccio 2009) projects were designed to further understand these impacts. The links between development, freshwater inflows, and the bay's ecology are complex. The Biscayne Bay Seepage Study (Langevin 2001) and Characterization of Nearshore Epifauna Study (Browder et al. 2011) were part of the effort to clarify these relationships.

The CERP (BBCW) Project is essential to the restoration of tidal wetlands and nearshore habitats within Biscayne Bay, including Biscayne National Park. The project will divert runoff that currently discharges directly to the bay through regional canals and redistribute the fresh water through a spreader canal system into the coastal wetlands adjoining Biscayne Bay to provide more natural overland flow. The slower, more natural delivery of fresh water over a broad area is expected to provide more stable salinity conditions and re-establish appropriate estuarine salinities for fish and shellfish nursery habitat in tidal wetlands and the nearshore bay.

Phase 1 of the CERP BBCW Project is composed of three flow-ways: Deering Estate, Cutler Wetlands, and L-31 East (**Figure 7-18**). In advance of congressional authorization and appropriations, the SFWMD constructed the Deering Estate Flow-way and a portion of the L-31E Flow-way.

- **Deering Estate Flow-way** – This flow-way redistributes excess freshwater runoff, directing it away from existing canal discharges and spreading it out as sheetflow prior to discharging into Biscayne Bay. The SFWMD completed construction of the flow-way in April 2012. The project became operational in November 2012.

Deering Estate Flow-Way
Pump Station (S-700)

- **Cutler Wetlands Flow-way** – This component includes construction of the S-701 Pump Station on the C-1 Canal, a lined conveyance canal, a spreader canal system, a box culvert, and a micro tunnel under roadways. The pump station will deliver water to the spreader canal in the saltwater wetlands via a concrete-lined conveyance canal. Construction of the pump station began in November 2022, while construction of the remaining features is expected to commence in early 2024. The SFWMD is expected to complete construction of the Cutler Wetlands Flow-way in 2025.

- **L-31 East Flow-way** – This flow-way is designed to partially re-establish historical sheetflow and wetland hydroperiods downstream of the project area by redirecting flow through a series of new culverts. The flow-way may provide the additional benefit of mitigating impacts from freshwater discharges via existing canals. By 2010, the SFWMD had constructed four of the ten culverts planned for the L-31 East Flow-way, and the USACE constructed two additional culverts in 2017. The SFWMD constructed the final four culverts in 2018. The USACE will construct the remaining features of the L-31 East Flow-way (five pump stations) with anticipated completion by 2025. In 2017, the SFWMD initiated interim pump operations at the temporary S-709 Structure. A temporary pump was installed to divert available fresh water from the C-103 Canal through project culverts and into the L-31E Canal. Interim operations provided early benefits to the coastal wetlands and nearshore Biscayne Bay prior to the USACE constructing the permanent S-709 Pump Station.

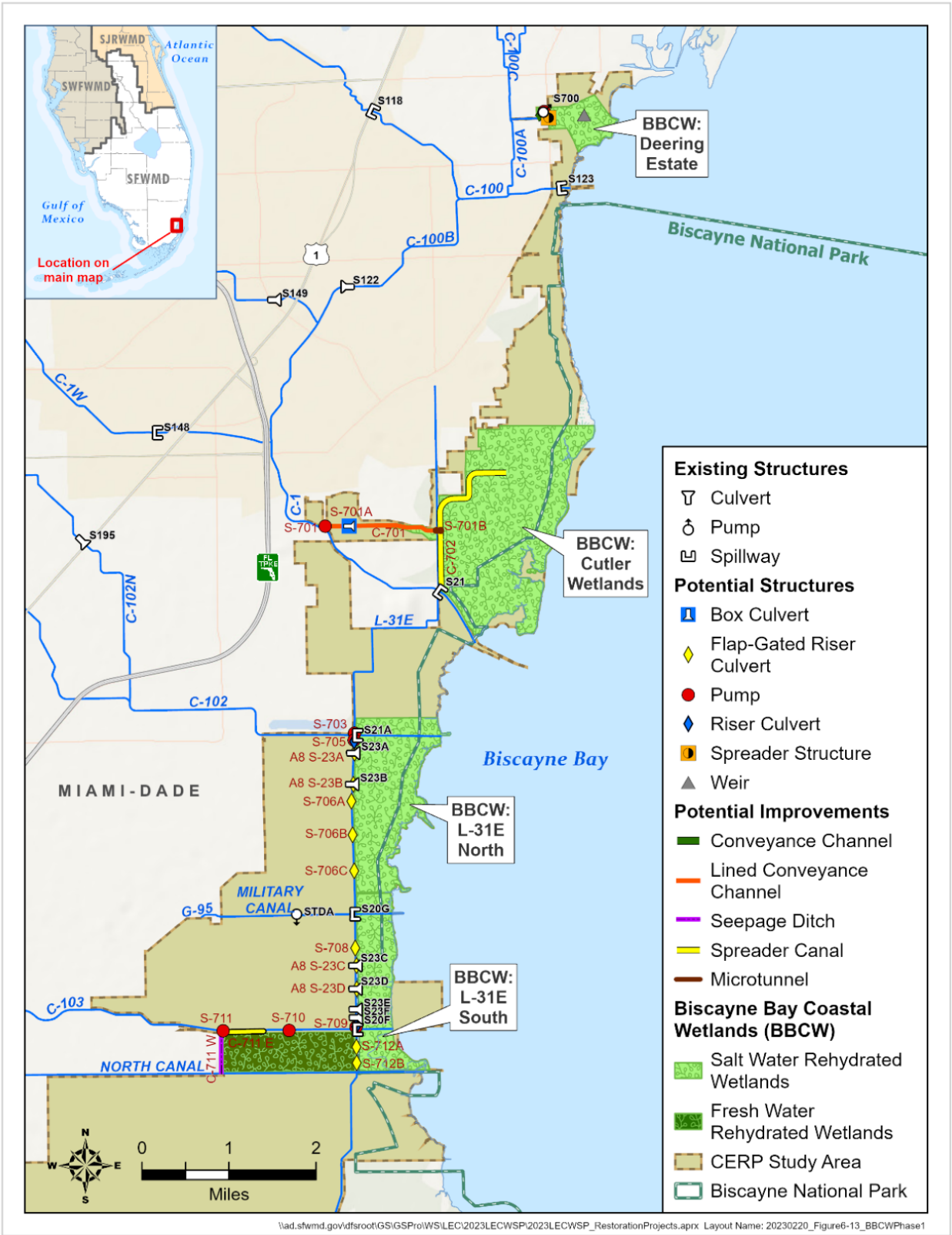

Figure 7-18. Biscayne Bay Coastal Wetlands Project – Phase 1.

In 2012, the USACE and SFWMD completed the final report for Phase 1 of the BBCW Project, which describes the project purpose and need, location, evaluation of alternatives, and Recommended Plan. The project was authorized by Congress in 2014.

Biscayne Bay

Staff from Miami-Dade County, Biscayne Bay National Park, Deering Estate Park, the National Oceanic and Atmospheric Administration, Fairchild Tropical Botanic Garden, and Florida International University contributed to project efforts. Routine compliance monitoring is conducted for water quality, including salinity, and ecological parameters for the BBCW Project. At one monitoring site, an increased abundance of bird species, amphibians, invertebrates, and fish was observed as well as a decrease in invasive exotic plant species. The SFWMD also tracks performance of the constructed components of the BBCW Project, including freshwater flow volumes to the wetlands. Updated BBCW Project monitoring data and analyses are reported annually in the *South Florida Environmental Report*.

CERP Biscayne Bay and Southeastern Everglades Ecosystem Restoration

The current drainage system and development of wetlands has altered the deliveries of fresh water to the bay. The CERP BBSEER Project is evaluating opportunities to incorporate water storage, active and passive water management features, water quality features, and alterations to existing canals and levees to improve the following:

- Quantity, timing, and distribution of fresh water to estuarine and nearshore subtidal areas, including mangrove and seagrass areas, of Biscayne National Park, Card Sound, and Barnes Sound to improve salinity regimes and reduce damaging pulse releases

- Freshwater wetland water depth, ponding duration, and flow timing within the Model Lands, Southern Glades, and eastern panhandle of Everglades National Park to maintain and improve habitat value
- Ecological and hydrological connectivity between Biscayne Bay coastal wetlands, the Model Lands, and Southern Glades
- Resiliency of coastal habitats in southeastern Miami-Dade County to sea level change

The project is in the planning stages with a USACE Tentatively Selected Plan anticipated in 2024.

SUMMARY

Water resource development projects serve various purposes in support of managing, protecting, and restoring water resources. Benefits of the water resource development projects discussed in this chapter include the following:

- Restoration of natural resources and prevention of further loss
- Support for MFL prevention or recovery strategies
- Protection of existing water supplies through better resource management and continued implementation of regional resource monitoring
- Water conservation as a demand management tool to expand current water supplies
- Improved understanding of the hydrogeologic system that provides traditional and alternative water supplies for the LEC Planning Area
- Increased future supply availability

Table 7-4 provides the status of the projects discussed in this chapter.

Table 7-4. Status of regional and Districtwide water resource projects in the LEC Planning Area by region.

Project	Completed Project Elements	Status of Ongoing/Uncompleted Elements
Lake Okeechobee Region		
CERP Lake Okeechobee Watershed Restoration Project	Planning efforts were implemented in 2016. A Tentatively Selected Plan was identified in 2018. PIR expected to be completed in 2023.	Planning is ongoing to increase storage. Drilling and testing of ASR wells and design of treatment systems.
Lake Okeechobee Component A Storage Reservoir	Planning efforts for the Section 203 Feasibility Study were initiated in February 2023. The Recommended Plan was identified in August 2023, and the Draft Environmental Impact Statement (EIS) and Feasibility Study were posted for public review in October 2023.	The Final EIS and Section 203 Feasibility Study will be completed in 2024. ASR well water quality is being evaluated and may be included in the WRDA 2026 submittal with wetland restoration components.
Northern Everglades and Estuaries Program – Taylor Creek, Nubbin Slough, and Lakeside Ranch STAs	All three STAs are complete and operational.	Monitoring and maintenance will continue.
USACE Herbert Hoover Dike Major Rehabilitation	A 56.2-mile seepage barrier was installed, 28 culverts replaced, 4 culverts abandoned, and armoring installed at the S-71, S-72, and Harney Pond Canal State Road 78 Bridge. Project is completed.	None
Everglades Region		
Everglades Forever Act Projects (including the Restoration Strategies Regional Water Quality Plan)	STA-1W Expansion #2 construction status report was completed in February 2022. G-341 Related Conveyance Improvements construction was completed in August 2023. STA-5/6 Internal Improvements construction was completed in May 2020.	STA-1W Expansion #2 construction is ongoing. The project is expected to be complete by December 2024. C-139 FEB construction is expected to be completed by December 2023. STA-5/6 Internal Improvements optimization period is expected to be complete by December 2025. Completion of all projects is expected by 2025.
Modified Water Deliveries to Everglades National Park	Taylor Slough Bridge, 8.5-Square Mile Area Flood Mitigation Project Protection Features, Tamiami Trail Modifications, and installation of S-356 Pump Station are complete.	None

Table 7-4. Continued.

Project	Completed Project Elements	Status of Ongoing/Uncompleted Elements
Everglades Region (Continued)		
C-111 South Dade Project	Two interim pump stations and one permanent pump station were constructed between 1997 and 2002. 4.75 miles of spoil mounds along the lower C-111 Canal were removed in 1997. Taylor Slough Bridge was replaced in 1999. Partial retention/detention zones were completed in 2000 and 2002. The S-331 Command and Control Center was constructed in 2009. The South Detention Area, linking previously separated pump station detention areas, was constructed in 2009. Construction of 10 plugs in the L-31W Canal as well as rebuilding of the L-31W Levee and the Taylor Slough integrated weir was completed in early 2018. Construction of the North Detention Area was completed in 2018. The L-359 and South detention areas were modified to create an eastern flow-way between the S-357 and S-332C pump stations (approximately 8 miles) in 2018.	Replace the interim pumps at the S-332B and S-332C pump stations with permanent ones, which was authorized in 2020 by Congress. Construction of both pump stations is expected to begin in 2024.
CERP WCA-3A Decompartmentalization Physical Model	The final permit for model construction and interim operations was received in 2012. A construction contract was awarded in May 2012. Model construction was completed in 2013. Operational testing was completed between November and January of 2013 to 2017 for Phase 1. The S-152 Structure and L-67C backfill treatments were authorized as permanent features for CEPP.	Phase 2 operational testing has been ongoing since 2018.
CERP Central Everglades Planning Project (CEPP)	Modifications include 1) change the A-2 FEB to be constructed as a 240,000-acre-foot reservoir and 6,500-acre STA, and 2) increase conveyance in the North New River and Miami canals. The project is divided into four phases: CEPP EAA, CEPP North, CEPP South, and CEPP New Water.	Anticipated completion of A-2 Reservoir construction is 2034. Construction of the A-2 STA is ongoing and initial hydration date is scheduled for December of 2024. North New River Canal Conveyance improvements will be completed by November 2025 and Miami Canal improvements by 2027.
S-197 Structure Replacement Project and Automation	Replacement was completed in 2013.	None

Table 7-4. Continued.

Project	Completed Project Elements	Status of Ongoing/Uncompleted Elements
Everglades Region (Continued)		
CERP C-111 Spreader Canal Western Project	All features were constructed and operational by 2012. Modifications were completed in 2018.	Monitoring is ongoing.
South Dade Study and Florida Bay Plan	Study was completed in 2015. Operational and structural projects were incorporated in C-111 projects.	None
South Florida Wading Bird Report	Most recent 2021 report was published in March 2023 (Cook and Baranski 2023).	Reports are completed annually to identify breeding colonies.
Western Basins		
CERP Western Everglades Restoration Project	Planning efforts began in 2016. Tentatively Selected Plan was identified in August 2023.	Final PIR is anticipated to be completed in 2024.
C-139 Annex Restoration Project	The Lake Belt Mitigation Committee approved the C-139 Annex for wetlands mitigation in 2012. Phase 1 construction began in 2016.	Sam Jones/Abiaki Prairie restoration (Phase 1) will progress as mitigation funds allow and is expected to be completed by 2027. Biological restoration (Phase 2) will be implemented through 2032.
Lower East Coast Service Areas		
Restoration Plan for the Northwest Fork of the Loxahatchee River	The SFWMD has acquired over 10,000 acres in support of the Northwest Fork of the Loxahatchee River restoration. Several projects were constructed from 2007 to 2017 to benefit the Loxahatchee River, including the installation of structures G-160 and G-161, widening of the M-Canal, Nine Gems restoration, C-18 Project culvert replacements, Culpepper hydrologic restoration, and Lainhart and Masten dams refurbishments.	Loxahatchee Slough Natural Area Hydrological restoration is ongoing. Additional restoration activities are expected to occur at Culpepper and Nine Gems sites.
CERP Loxahatchee River Watershed Restoration Project and Storage for the Loxahatchee River	A final PIR was approved in 2020. A new RAA was adopted in June 2022 to protect water associated with the four proposed ASR wells at the C-18W Reservoir site. Rule development was completed for the protection of water made available for the Loxahatchee River Watershed Restoration Project by amending the *Applicant's Handbook for Water Use Permit Applications within the South Florida Water Management District* (SFWMD 2022b) and the associated rule. Design of project features was started within Flow-way 3.	USACE project partnership agreement is expected to be executed by end of 2023. Commencement of design of project components is being planned.
CERP Hillsboro Site 1 Impoundment/Fran Reich Preserve Reservoir	Phase 1 L-40 modifications and S-530 Spillway construction were completed in 2016.	Additional funding authorization from Congress needed for Phase 2.

Table 7-4. Continued.

Project	Completed Project Elements	Status of Ongoing/Uncompleted Elements
Lower East Coast Service Areas (Continued)		
CERP Broward County Water Preserve Areas	The PIR and Chief of Engineers report were completed in 2012. The project received congressional approval in 2014. The C-11 Impoundment Mitigation Area A Berm was completed in November of 2018.	The C-11 Impoundment design is anticipated to be completed by early 2024 with a construction contract award in late 2024. The C-11 Impoundment will be completed in 2027. The C-9 Impoundment design is expected in 2024, and construction is expected to begin in 2030. WCA-3A/3B Seepage Management Area construction is anticipated to begin in 2027.
CERP Biscayne Bay Coastal Wetlands Project	The PIR and Chief of Engineers report were completed in 2012. Deering Estate Flow-way construction was completed in 2012, and the flow-way is operational. The project received congressional approval in 2014. Ten culverts were completed in the L-31 East Flow-way by 2018.	The Cutler Wetlands Flow-way (to be constructed by the SFWMD) is anticipated to be completed by 2025. The remaining features of L-31 East Flow-way (to be constructed by the USACE) are anticipated to be completed by 2025.
CERP Biscayne Bay and Southeastern Everglades Ecosystem Restoration	None	The project is in the planning stages with a Tentatively Selected Plan expected in 2024.
Regional Groundwater Modeling		
East Coast Surficial Model	Model preparation, code changes, and documentation were initiated in 2022. The first and second peer reviews have been completed. Water level calibrations were completed in 2023.	The East Coast Surficial Model will be undergoing a third peer review and resource analyses in early 2024. Results are expected to be available in 2024.
East Coast Floridan Model	The East Coast Floridan Model was updated in 2021.	None
Lower West Coast Surficial and Intermediate Aquifer Systems Model	The Lower West Coast Surficial and Intermediate Aquifer Systems Model was completed in 2022.	None
Districtwide Water Resource Development Projects		
MFL, Water Reservation, and Restricted Allocation Area Rule Activities	Six MFLs and four RAAs were established prior to 2013 in the LEC Planning Area. The Nearshore Central Biscayne Bay Water Reservation was adopted in June 2013. The C-18W Reservoir ASR Groundwater Buffer Zone RAA was adopted in June 2022.	The SFWMD continues implementation of MFL prevention and recovery strategies. The LOSOM record of decision was signed on August 12, 2024. Additional capital projects are being planned and constructed. A storage assessment analysis was conducted as part of this plan to support the revised Lake Okeechobee MFL recovery strategy.

Table 7-4. Continued.

Project	Completed Project Elements	Status of Ongoing/Uncompleted Elements
Districtwide Water Resource Development Projects (Continued)		
Comprehensive Water Conservation Program	The program was approved in 2008. The year-round irrigation rule was adopted in 2010. From FY2018 through FY2022, 20 water conservation projects were funded, partially through the Cooperative Funding Program.	The SFWMD continues operation of recognition and certification programs, regulatory initiatives, education, and outreach.
Cooperative Funding Program	From FY2018 through FY2022, eight AWS projects were funded, partially through the Cooperative Funding Program.	The SFWMD continues support of AWS development through the Cooperative Funding Program.
Drilling and Testing Groundwater Resources	Monitor wells were installed in southeastern and northeastern Broward County in 2021 and 2023.	The SFWMD installs monitor wells and conducts subsurface testing as needed.
Groundwater Assessment	Saltwater interface maps were updated in 2019.	Saltwater interface maps will be updated in 2024.
Groundwater, Surface Water, and Wetland Monitoring	A hydrogeologic mapping update of the Lower West Coast aquifers was completed in 2023 (Zumbro et al. 2023). Hydrogeologic data archiving of Floridan aquifer system borehole video logs was completed in 2017.	Monitoring of 760 groundwater and numerous surface water stations is ongoing Districtwide.

ASR = aquifer storage and recovery; AWS = alternative water supply; CEPP = Central Everglades Planning Project; CERP = Comprehensive Everglades Restoration Plan; EIS = Environmental Impact Statement; FEB = flow equalization basin; FY = Fiscal Year; LEC = Lower East Coast; LOSOM = Lake Okeechobee System Operating Manual; MFL = minimum flow and minimum water level; PIR = Project Implementation Report; RAA = restricted allocation area; SFWMD = South Florida Water Management District; STA = stormwater treatment area; USACE = United States Army Corps of Engineers; WCA = water conservation area; WRDA = Water Resources Development Act.

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8

Water Supply Development Projects

TOPICS

- Projects Identified for This Plan Update
- Cooperative Funding Program
- Summary of Water Supply Development Projects

This chapter summarizes the proposed water supply development projects anticipated to meet water needs in the Lower East Coast (LEC) Planning Area of the South Florida Water Management District (SFWMD or District) for the 2021 to 2045 planning period. Water supply development projects include the planning, design, construction, operation, and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale, or end use and are proposed by water users to meet existing and future demands. Water users, such as Public Supply (PS) utilities, local and tribal governments, and self-suppliers as well as Commercial/Industrial/Institutional (CII) and Agriculture (AG) users are primarily responsible for water supply development projects. For this *2023–2024 Lower East Coast Water Supply Plan Update* (2023–2024 LEC Plan Update), alternative water supply (AWS) development projects have been proposed by PS utilities that rely on nontraditional water sources.

Water use permits typically are required for most water supply development projects. Each proposed use of water must meet the conditions for permit issuance found in Section 373.223, Florida Statutes (F.S.), and the implementing criteria found in Chapter 40E-2, Florida Administrative Code (F.A.C.). Further information is provided in the *2021–2024 Support Document for Water Supply Plan Updates* (2021–2024 Support Document; SFWMD 2021). Regarding water supply development projects, local economic conditions and population growth may affect when water is needed, which projects are required, and how water use permits need to be obtained or modified to accommodate growing demand.

PROJECTS IDENTIFIED FOR THIS PLAN UPDATE

Projects proposed for inclusion in this plan update were evaluated based on factors discussed in the previous section, level of detail provided by the applicant (e.g., project scope, cost, schedule), and whether the project is expected to create new water supply, possibly increasing permit allocation(s).

Users are not required to select a project included in this 2023–2024 LEC Plan Update. In accordance with Section 373.709(6), F.S., nothing contained in the water supply component of a regional water supply plan should be construed to require local governments, public or privately owned utilities, special districts, self-suppliers, multijurisdictional entities, or other water suppliers to select the identified projects. In addition, an anticipated project may not be implemented or may be deferred if there is insufficient need.


Reverse Osmosis Water Treatment Plant

Public Supply

PS demand includes all potable uses served by public and private utilities with an allocation of 0.10 million gallons per day (mgd) or greater. In 2021, PS demand in the LEC Planning Area was met by fresh groundwater from the surficial aquifer system (SAS) (91%), brackish groundwater from the Floridan aquifer system (FAS) (6%), and surface water (3%), as shown in **Figure 5-2**. The PS average net (finished) water demand is projected to grow from 808.34 mgd in 2021 to 945.46 mgd by 2045, a 17% increase. A combination of existing and additional capacity created by water supply development projects will be used to meet the increased demand.

In addition to meeting demands, utilities may propose water supply development projects to address specific situations, such as accommodating a change in treatment process or source or optimizing distribution systems to match future demand locations. Although reuse and conservation of water do not produce potable water, they are demand management options to meet nonpotable demand or extend existing potable supplies to meet future demand. Proposed projects are listed in the utility profiles contained in **Appendix B** and summarized at the end of this chapter. In addition to proposed water supply development projects, each profile includes population and demand projections (**Chapter 2**, **Appendix A**), permitted water allocations, and permitted treatment capacities for potable water and reclaimed water. Based on planning-level screening, water supply projects are identified in this plan update to meet 2045 projected demands and generally have a likelihood of being permittable. However, each proposed use of water must meet the conditions for permit issuance found in Section 373.223, F.S., and the implementing criteria found in Chapter 40E-2, F.A.C., and will be reviewed on an application-by-application basis.

In the LEC Planning Area, 14 PS utilities have proposed 24 new potable projects to implement source diversification, changes in treatment technology, expansion of existing plants, and construction of new production wells. In total, the proposed PS projects could create 101.60 mgd of additional potable water treatment capacity (**Table 8-1**). Combined with existing capacity (1,497.65 mgd), the total treatment capacity including the proposed projects will exceed the projected 2045 PS total net (finished) demand of 945.46 mgd.

Table 8-1. Number and capacity of potable and nonpotable water supply development projects proposed by utilities for construction/implementation between 2021 and 2045.

Water Source	Number of Projects[a]	Capacity (mgd)	Cost ($ million)
Potable Projects			
Surficial Aquifer System[b]	6	8.67	$208.4
Floridan Aquifer System[b]	15	84.93	$1,359.18
Seawater	3	8.00	$134.00
Potable Total	**24**	**101.60**	**$1,701.58**
Nonpotable Projects			
Reclaimed Water[b]	11	32.35	$228.00
Surface Water[c]	11	38.00	$167.00
Nonpotable Total	**22**	**70.35**	**$395.00**
LEC Planning Area Total	**46**	**171.95**	**$2,096.58**

mgd = million gallons per day.

[a] Many of the projects are multiphased (e.g., more than one project at the same water treatment plant).

[b] Projects designed to expand distribution or storage of treated water and projects to repair or replace existing facilities are not included because they do not generate new water treatment capacity. Wellfield expansion projects are not included if they do not increase the capacity for production.

[c] The surface water projects listed here do not increase water supply treatment capacity.

In order to meet the projected 2045 demands, 11 of the 54 PS utilities in the LEC Planning Area need to modify their permitted allocations, construct projects, and/or establish bulk agreements with nearby utilities: Dania (2.07 mgd), Hallandale (3.86 mgd), Miramar (0.89 mgd), North Springs Improvement District (1.37 mgd), Pompano Beach (0.55 mgd), Florida City (1.46 mgd), Homestead (5.51 mgd), Lantana (0.28 mgd), Palm Springs (0.11 mgd), Riviera Beach (1.51 mgd), and Tequesta (0.21 mgd). The minimum amount of water needed by these utilities to meet their shortfall totals 17.83 mgd.

For the 11 utilities that need projects to meet their 2045 demands, the following projects have been proposed:

- The **City of Dania Beach** maintains a bulk water agreement to purchase up to 1.58 mgd from Broward County Water and Wastewater Services–South Regional Wellfield (BCWWS-SRW) and has also entered into a capacity allocation agreement with Palm Beach Aggregates, LLC for an additional 1.00 mgd from the C-51 Reservoir Phase 1 to be used to offset water pumped from the BCWWS-SRW, making 2.58 mgd of total raw water available from BCWWS-SRW.
- The **City of Hallandale Beach** maintains a bulk water agreement to purchase up to 3.26 mgd from BCWWS-SRW and has also entered into a capacity allocation agreement with Palm Beach Aggregates, LLC for an additional 1.00 mgd from the C-51 Reservoir Phase 1 to be used to offset water pumped from the BCWWS-SRW, making 4.26 mgd of total raw water available from BCWWS-SRW.

- The **City of Miramar** has proposed a reclaimed water distribution system expansion project to increase reclaimed water use by up to 3.50 mgd. A special condition of the city's water use permit allows an increase in the annual allocation of up to 18.87 mgd upon demonstrating an average total of 4.00 mgd of reclaimed water use for offsetting withdrawals from the SAS. However, the city will still need additional allocations from alternative sources, such as the FAS, to meet the projected 2045 raw water demands. A water use permit modification is currently under review by the SFWMD.
- **North Springs Improvement District** plans to construct a reverse osmosis (RO) water treatment plant (WTP) that will provide up to 2.00 mgd of additional water from the FAS.
- The **City of Pompano Beach** has purchased 2.00 mgd of C-51 Reservoir Phase 1 storage capacity to offset additional SAS raw water withdrawals above the base condition. Once the required volume of offset water is delivered, the city can withdraw up to 19.73 mgd from the SAS.
- **Florida City** is working to reduce unaccounted for water losses which will also reduce its per capita use rate. Additionally, the SFWMD suggests developing interconnections with the City of Homestead and the Florida Keys Aqueduct Authority and purchasing bulk water from either entity. Florida City Water and Sewer Department can implement this suggestion or determine an alternative source to meet its demands in excess of the permitted allocation.
- The **City of Homestead** plans to construct an aquifer recharge project that will use industrial cooling wastewater to recharge the SAS and offset increased withdrawals. Upon completion of this project and the reduction of the allocation for a nearby permittee, the base condition allocation can be increased from 11.00 to 16.28 mgd.
- The **Town of Lantana** will need to determine an alternative source prior to renewing its water use permit in 2028. Raw water demands are projected to exceed the permitted allocation by 2030.
- The **Village of Palm Springs** is projected to have raw water demands that exceed the permitted allocation by 0.11 mgd by 2045. The SFWMD suggests purchasing bulk water from Palm Beach County Water Utilities Department. The village can implement this suggestion or determine an alternative source to meet its demands in excess of the permitted allocation.
- The **City of Riviera Beach** is proposing to construct an FAS wellfield and a new 7.48 mgd RO WTP by 2026 and to replace the existing lime softening WTP with a new 8.52 mgd membrane softening WTP.
- The **Village of Tequesta** will need to request an increase in the permitted allocation from the FAS prior to renewing its water use permit in 2031. Demands are projected to exceed the permitted allocation by 2030.

The following projects have been proposed by utilities that can meet their 2045 demand but want to diversify their water sources or improve current treatment methods to increase capacity:

- The **Florida Keys Aqueduct Authority** plans to construct two new seawater desalination WTPs and rehabilitate the Stock Island seawater desalination WTP to create a combined increase in potable water treatment capacity of 8.00 mgd.
- The **City of Sunrise** plans to abandon their RO treatment facility at Springtree and replace it with membrane softening, increasing the treatment capacity by 1.90 mgd.
- The **Miami-Dade Water and Sewer Department** is planning several projects to expand potable water treatment capacity:
  - A 2.50 mgd expansion of the Hialeah RO WTP and FAS wellfield
  - Construction of a new South Miami Heights membrane softening WTP and SAS wellfield with a capacity of 2.55 mgd
  - A two-phased project for constructing a new FAS wellfield and RO treatment trains at the South Miami Heights WTP with a total treatment capacity of 17.45 mgd for backup to the C-51 Reservoir offset water
- The **Palm Beach County Water Utilities Department** plans to expand WTP 2 to add 12.50 mgd of membrane softening capacity for treating increased SAS withdrawals.
- The **Village of Wellington** plans to replace lime softening with a membrane softening treatment system that will increase overall treatment capacity by 0.70 mgd.
- **Broward County Water and Wastewater Services District 2A/North Regional** plans to add FAS wells and expand its WTP by adding 6.00 mgd of RO treatment as a backup to the C-51 Reservoir offset water.
- The **City of Fort Lauderdale** plans to expand its water treatment capacity by 6 mgd through the construction of additional FAS wells and RO treatment as a backup to the C-51 Reservoir offset water.
- The **City of Hollywood** plans to construct FAS wells and expand its RO treatment plant by 4.00 mgd.
- The **City of Lauderhill** plans to install FAS wells and construct an RO WTP adding 3.00 mgd of treatment capacity.
- The **City of Boynton Beach** plans to construct FAS wells and an RO WTP adding 8.00 mgd of treatment capacity.
- The **City of West Palm Beach** plans to construct FAS wells and an RO WTP adding 30.00 mgd of treatment capacity.
- In addition to the utilities listed above, several other utilities have also purchased C-51 Reservoir Phase 1 storage capacity to offset additional SAS raw water withdrawals above their base condition allocation. Please refer to **Table 8-2**, the utility profiles in **Appendix B**, and **Chapter 5** for further information.

Reclaimed Storage Pond and Pump Station

In addition, PS utilities have also proposed 22 nonpotable water supply projects using reclaimed water, surface water, and stormwater that could create up to 70.35 mgd of additional water supply for landscape and golf course irrigation as well as groundwater recharge (**Table 8-2**). The proposed nonpotable water projects include construction and expansion of reclaimed water production facilities and surface water storage projects. Although projects involving new nonpotable water distribution lines and other infrastructure may qualify for the Cooperative Funding Program (described later in this chapter), they are not included as projects generating new water supply capacity. The individual reuse inventory reports submitted to the Florida Department of Environmental Protection (FDEP) for the year 2021 (FDEP 2022) indicated 7.9% of wastewater generated in Broward, 5.9% in Miami-Dade, 3.5% in Monroe, and 49.7% in Palm Beach was reused (including supplemental flows) for irrigation, industrial applications, wetland hydration, and aquifer recharge.

Table 8-2. Proposed potable and nonpotable water supply development projects in the LEC Planning Area (2021 to 2045).

County	Potable Utility Name	Project Name[a]	Project Description	Project Capacity (mgd)	Total Capital ($M)	Estimated Completion Date
Nonpotable – Surface Water						
Broward	BCWWS D1	C-51 Reservoir Phase 1 - BCWWS D1	C-51 Reservoir offset water credits purchased	1.00	$4.60	2023
	BCWWS D2	C-51 Reservoir Phase 1 - BCWWS D2	C-51 Reservoir offset water credits purchased	2.00	$9.20	2023
	BCWWS D3	C-51 Reservoir Phase 1 - BCWWS D3	C-51 Reservoir offset water credits purchased	3.00	$13.80	2023
	Dania	C-51 Reservoir Phase 1 - Dania	C-51 Reservoir offset water credits purchased	1.00	$4.60	2023
	Fort Lauderdale	C-51 Reservoir Phase 1 - Fort Lauderdale	C-51 Reservoir offset water credits purchased	3.00	$13.80	2023
	Hallandale	C-51 Reservoir Phase 1 - Hallandale	C-51 Reservoir offset water credits purchased	1.00	$4.60	2023
	Margate	C-51 Reservoir Phase 1 - Margate	C-51 Reservoir offset water credits purchased	2.00	$9.20	2023
	Pompano	C-51 Reservoir Phase 1 - Pompano	C-51 Reservoir offset water credits purchased	2.00	$9.20	2023
	Sunrise	C-51 Reservoir Phase 1 - Sunrise	C-51 Reservoir offset water credits purchased	5.00	$23.00	2023
Miami-Dade	MDWASD	C-51 Reservoir Phase 1 - MDWASD	C-51 Reservoir offset water credits purchased	15.00	$69.00	2023
Palm Beach	West Palm Beach	Grassy Waters Preserve Storage Improvements	Construct improvements to increase the water storage capacity of the existing Grassy Waters and Apoxee preserves	3.00	$6.00	2028
Potable – SAS						
Broward	Hallandale	SAS Well 9	Construction of SAS Well 9	3.03[b]	$1.80	2023
	Sunrise	Springtree RO Conversion to Membrane Softening Phase 1	Replace RO skids with membrane softening resulting in 0.20 mgd of additional capacity	0.20	$1.00	2025
	Sunrise	Springtree RO Conversion to Membrane Softening Phase 2	Second phase of RO to membrane softening conversion project adding 1.70 mgd of capacity	1.70	$7.00	2028
Miami-Dade	Homestead	JD Redd Park 1.67 mgd SAS Recharge for Offset	Construct a distribution line and recharge trench to use industrial cooling wastewater for recharging and offsetting SAS withdrawals	1.67	$0.40	2024
	MDWASD	South Miami Heights New 2.55 mgd SAS WTP	Construct new 2.55 mgd membrane softening WTP	2.55	$25.00	2026
	MDWASD	Cluster 10 SAS Wellfield	Construct Cluster 10 SAS Wellfield	15.00	$10.00	2031
	North Miami Beach	Norwood WTP – SAS Wells and Raw Water Mains – Phase 2	Construct an SAS well, wellhead, and raw water mains	3.70	$1.75	2026

Table 8-2. Continued.

County	Potable Utility Name	Project Name	Project Description	Project Capacity (mgd)	Total Capital ($M)	Estimated Completion Date
Potable – SAS (Continued)						
Palm Beach	PBCWUD	WTP 2 12.50 mgd Expansion – Membrane Softening	Expand WTP 2 to add 12.50 mgd of membrane softening treatment capacity	12.50	$65.00	2028
	Riviera Beach	New 8.52 mgd Membrane Softening WTP	Construct a new 8.52 mgd Membrane Softening WTP	8.52	$100	2027
	Wellington	Membrane Softening Expansion and Decommissioning of Lime Softening WTP	Membrane softening treatment expansion and decommissioning of lime softening WTP resulting in 0.70 mgd capacity increase	0.70	$10.40	2028
Potable – FAS						
Broward	BCWWS D2	District 2A 6.00 mgd RO WTP Expansion	Expand existing RO WTP by 6.00 mgd	6.00	$33.34	2035
	Fort Lauderdale	New 6.00 mgd RO Facility at Dixie WTP and FAS Wellfield	Construct 6.00 mgd new RO facility and FAS wells at Dixie WTP	6.00	$49.10	2034
	Hollywood	2.00 mgd RO Facility Expansion Train E and FAS Wells F14 and F15	Construct Train E to expand RO capacity by 2.00 mgd at the Hollywood WTP and construct FAS Wells F14 and F15	2.00	$5.00	2034
	Hollywood	2.00 mgd RO Facility Expansion Train F and FAS Wells F16 and F17	Construct Train F to expand RO capacity by 2.00 mgd and construct FAS Wells F16 and F17	2.00	$5.00	2042
	Lauderhill	New 1.00 mgd RO Facility and FAS Wells – Phase 1	Construct new 1.00 mgd RO facility and FAS wells – Phase 1	1.00	$25.00	2028
	Lauderhill	2.00 mgd Expansion of RO Facility – Phase 2	Expand RO facility by 2.00 mgd – Phase 2	2.00	$30.00	2030
	Miramar	2.50 mgd RO Train No. 2 (West WTP) for Standby	Construct backup 2.50 mgd RO train at West WTP	2.50	$7.59	2025
	Miramar	2.50 mgd RO Train No. 3 (West WTP) for Standby and FAS Wells 4 and 5	Construct additional 2.50 mgd backup RO skid and FAS Wells 4 and 5	2.50	$15.00	2030
	NSID	New 2.00 mgd RO WTP	Construct new 2.00 mgd RO WTP	2.00	$2.45	2023
Miami-Dade	MDWASD	Hialeah 2.50 mgd RO WTP Expansion and four FAS Wells – Phase 1b	Expand Hialeah RO treatment capacity by 2.50 mgd and construct four FAS wells – Phase 1b	2.50	$2.45	2023
	MDWASD	South Miami Heights: New 12.45 mgd RO WTP and Wells for FAS backup to C-51 – Phase 1	Construct new 12.45 mgd RO WTP and wells for FAS backup to C-51 – Phase 1 South Miami Heights	12.45	$264.25	2026
	MDWASD	South Miami Heights: 5.00 mgd RO facility Expansion for backup to C-51 – Phase 2	Expand RO treatment capacity by 5.00 mgd for backup to C-51 – Phase 2 South Miami Heights	5.00	Included Above	2029

Table 8-2. Continued.

County	Potable Utility Name	Project Name	Project Description	Project Capacity (mgd)	Total Capital ($M)	Estimated Completion Date
Potable – FAS (Continued)						
Miami-Dade (Continued)	North Miami Beach	Norwood WTP – FAS Well, Lines, Mains – Phase 2	Construct an FAS well, wellhead, and mains	3.70	$1.75	2026
Palm Beach	Boynton Beach	New 8.0 mgd RO Facility and three FAS Wells	Construct new 8 mgd RO treatment facility and three FAS wells	8.00	$20.00	2029
	Jupiter	FAS Wells 14, 15, 16	Construct three new FAS wells	4.53	$10.56	2024
	Jupiter	FAS Wells 17, 18	Construct two new FAS wells	1.44	$4.20	2028
	Riviera Beach	New 7.48 mgd RO WTP and nine FAS Wells	Construct new 7.48 mgd RO WTP and nine FAS wells	7.48	$150.00	2027
	West Palm Beach	New 30.00 mgd RO WTP and FAS Wells	Construct new 30.00 mgd RO WTP and FAS wells	30.00	$750.00	2043
Potable – Seawater						
Monroe	FKAA	New Stock Island RO WTP	Construct new 4.00 mgd RO WTP	4.00	$50.00	2025
	FKAA	New Crawl Key RO WTP	Construct new 4.00 mgd RO WTP	4.00	$70.00	2028
	FKAA	Rehab Existing Stock Island RO WTP	Rehabilitate 2.00 mgd RO WTP	2.00	$14.00	2034
Nonpotable – Reclaimed Water						
Broward	BCWWS D2	North Regional – 16.00 mgd WRF Expansion	Expand the North Regional WRF by 16.00 mgd	16.00	$54.20	2023
	Davie	Reclaimed Water System Extension – Bamford Sports Complex and along University Drive between SW 36th Street and SW 30th Street	Construct a reclaimed water main to Bamford Sports Complex and along University Drive between SW 36th Street and SW 30th Street adding up to 0.20 mgd of reclaimed water distribution capacity	0.20	$1.40	2023
	Davie	Reclaimed Water System Extension along SW 92nd Avenue from SW 36th Avenue to Griffin Road	Construct a reclaimed water main along SW 92nd Street from 36th Avenue to Griffin Road adding up to 1.00 mgd of reclaimed water distribution capacity	1.00	$2.30	2025
	Davie	Reclaimed Water System Extension along SW 30th Street from 75th Avenue to College Avenue	Construct a reclaimed water main along SW 30th Street from 75th Avenue to College Avenue adding up to 0.30 mgd of reclaimed water distribution capacity	0.30	$0.64	2025

Table 8-2. Continued.

County	Potable Utility Name	Project Name	Project Description	Project Capacity (mgd)	Total Capital ($M)	Estimated Completion Date
Nonpotable – Reclaimed Water (Continued)						
Broward (Continued)	Deerfield	Reclaimed Water Distribution Line and Purchase Agreement with BCWWS	Construct a reclaimed water main and purchase agreement with BCWWS adding up to 1.00 mgd of reclaimed water distribution capacity	1.00	$11.00	2030
	Miramar	Reclaimed Water System Extension West of I-75	Construct a reclaimed water distribution main west of I-75 adding up to 3.50 mgd of reclaimed water distribution capacity	3.50	$8.60	2025
	Pompano	Pompano-Broward Reclaimed Water Trunk Main	Construct a reclaimed water trunk main of 10.00 mgd to replace the current diversion from Broward's ocean outfall pipeline	10.00	$50.00	2025
	Pompano	3.5 mg Reclaimed Water Storage Tank with Booster Station	Construct a 3.50 mg reclaimed water storage tank with booster station	3.50	$15.00	2027
	Pompano	3.5 mg Reclaimed Water Storage Tank	Construct a 3.50 mg reclaimed water storage tank	3.50	$5.00	2035
	Pompano	5.00 mgd WRF Expansion	Construct 5.00 mgd WRF expansion	5.00	$15.00	2035
	Pompano	Reclaimed Water System Extension Program Phase VI+	Construct multiple reclaimed water distribution projects adding a total of 6.90 mgd of distribution capacity by 2030	6.90	$7.80	2030
Miami-Dade	Homestead	4.00 mgd Reclaimed Water Treatment Expansion	Construct 4.00 mgd expansion of WRF	4.00	$45.00	2030
	Miami-Dade	South District Reclaimed Water Main Extension to FPL Turkey Point Clean Energy Center	Construct a reclaimed water main extension to FPL Turkey Point with a distribution capacity of up to 15.00 mgd	15.00	$315.00	2025
	Miami-Dade	South District Effluent Energy Recovery System	Construct distribution system to direct up to 50.00 mgd of treated effluent for industrial cooling at WWTF prior to deep well injection	50.00	$22.00	2045
	Miami-Dade	Central District Effluent Energy Recovery System	Construct distribution system to direct up to 24.00 mgd of treated effluent for industrial cooling at WWTF prior to deep well injection	24.00	$19.50	2045
	Miami-Dade	North District Effluent Energy Recovery System	Construct distribution system to direct up to 35.00 mgd of treated effluent for industrial cooling at WWTF prior to deep well injection	35.00	$15.00	2045

Table 8-2. Continued.

County	Potable Utility Name	Project Name	Project Description	Project Capacity (mgd)	Total Capital ($M)	Estimated Completion Date
Nonpotable – Reclaimed Water (Continued)						
Miami-Dade (Continued)	Zoo Miami	Zoo Miami Water Resource Recovery Facility	Construct a new wastewater treatment system at Zoo Miami to create up to 0.40 mgd of reclaimed water for onsite uses.	0.40	$24.00	2045
Monroe	FKAA	Key Largo Wastewater Treatment District and FKAA – Initial Direct Potable Reuse Demonstration Project	Key Largo Wastewater Treatment District to construct initial direct potable reuse demonstration project, expandable using RO, in conjunction with FKAA	0.50	$2.00	2026
	FKAA	Key Largo Wastewater Treatment District and FKAA – Direct Potable Reuse Demonstration Project Expansion	Expand initial direct potable reuse project to full capacity of Key Largo WWTF, FKAA participation required	3.45	$6.00	2030
	FKAA	City of Marathon – Reuse System Reactivation and Expansion	Reactivation of existing conventional reuse systems and extension of distribution mains, installation of irrigation systems on city property	1.40	$3.00	2024
	FKAA	City of Marathon and FKAA – Direct Potable Reuse RO	Install RO systems at five WWTFs to produce potable water from advanced wastewater treated reclaimed water to supplement existing FKAA water system, FKAA participation required		$16.00	2030
	FKAA	City of Marathon and FKAA – Indirect Potable Reuse with ASR and RO	Install pumping systems and conveyance force main from five WWTFs to Grassy Key ASR pumping system and wells, and construct 1.40 mgd of RO to provide advanced wastewater treatment, FKAA participation required		$14.00	2030
	FKAA	Key West Resort Utilities – Reuse Distribution Mains and Irrigation Systems	Construct extension of reclaimed water distribution mains to major users and installation of irrigation systems	0.85	$3.00	2027
	FKAA	Key West Resort Utilities and FKAA – Direct Potable Reuse Distribution Line	Extend a distribution main to the FKAA facility to convey advanced treated reclaimed water as source water for FKAA's RO facility, FKAA participation required	0.50	$1.00	2026

Table 8-2. Continued.

County	Potable Utility Name	Project Name	Project Description	Project Capacity (mgd)	Total Capital ($M)	Estimated Completion Date
Nonpotable – Reclaimed Water (Continued)						
Palm Beach	Boynton Beach	Reclaimed Water System Extension – Phases 1-4	Construct multiple reclaimed water distribution projects adding a total of 3.30 mgd of distribution capacity by 2030	3.30	$40.00	2030
	Delray Beach	Reclaimed Water System Extension – Area 9	Construct a reclaimed water distribution main with a distribution capacity of 0.20 mgd	0.20	$1.50	2026
	Delray Beach	Reclaimed Water System Extension – Area 10	Construct a reclaimed water distribution main with a distribution capacity of 0.10 mgd	0.10	$2.70	2023
	Delray Beach	Reclaimed Water System Extension – Area 15	Construct a reclaimed water distribution main with a distribution capacity of 0.16 mgd	0.16	$1.70	2028
	Delray Beach	Reclaimed Water System Extension – Areas 2, 3, 5	Construct multiple reclaimed water distribution projects adding a total of 0.42 mgd of distribution capacity by 2026	0.42	$1.00	2026
	PBCWUD	Green Cay Wetlands Phase 2: 2.00 mgd Indirect Potable Reuse Project – WTP, 2.3 Miles Purified Water Pipeline, and SAS Wells	Construct a 2.00 mgd potable reuse WRF, 2.3 miles of transmission lines, and SAS Wells	2.00	$47.50	2025
	PBCWUD	Palm Beach-Broward Interconnect Phase 1B: South Reclaimed Water Transmission and System Extension in Southern Palm Beach County	Construct reclaimed water system extension in southern Palm Beach County adding up to 10.51 mgd of distribution capacity	10.51	$58.50	2028
	Wellington	0.20 mgd WRF Expansion – Phase 2	Expand WRF by 0.20 mgd	0.20	$1.30	2030

ASR = aquifer storage and recovery; BCWWS = Broward County Water and Wastewater Services; BCWWS-SRW = Broward County Water and Wastewater Services–South Regional Wellfield; FAS = Floridan aquifer system; FKAA = Florida Keys Aqueduct Authority; FPL = Florida Power & Light; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; mg = million gallons; mgd = million gallons per day; NSID = North Springs Improvement District; PBCWUD = Palm Beach County Water Utilities Department; RO = reverse osmosis; SAS = surficial aquifer system; WRF=water reclamation facility; WTP = water treatment plant; WWTF = wastewater treatment facility.

[a] Based on planning-level screening, water supply projects are identified in this plan update to meet 2045 projected demands and have a likelihood of being permitted. However, each proposed use of water must meet the conditions for permit issuance found in Section 373.223, F.S., and the implementing criteria found in Chapter 40E-2, F.A.C., and will be reviewed on an application-by-application basis.

[b] The City of Hallandale has worked with SFWMD staff to permit a replacement well (Well 9) and modify a permit to increase its SAS allocation. The new well did not increase potable water treatment capacity.

Domestic Self-Supply

Domestic Self-Supply (DSS) includes potable water used by households served by small utilities (less than 0.10 mgd) or self-supplied by private wells. DSS average net (finished) demands in the LEC Planning Area are projected to increase from 10.56 mgd in 2021 to 14.45 mgd in 2045. All current and future needs in this use category are expected to be met from private wells using fresh groundwater from the SAS. As such, no water supply development projects have been proposed for this use category.

Agriculture

AG water use includes self-supplied water used for crop irrigation, greenhouses, nurseries, livestock watering, pasture irrigation, and aquaculture. AG is the second largest water use category in the LEC Planning Area and is projected to remain so over the planning horizon. However, AG is the only water use category projected to have a lower demand in 2045 than in 2021. Gross AG water demand is projected to decrease by 1%, from 645.20 mgd in 2021 to 637.66 mgd in 2045, and irrigated acreage is projected to decrease by 2% (11,465 acres). **Chapter 2** and **Appendix A** provide more information about AG water use and projected demands.

The majority of AG water demand in the LEC Planning Area is supplied by fresh surface water and groundwater. Water availability from most surface water and groundwater sources are limited by regulatory protections (**Chapter 4**).

Water supply opportunities for AG may be available in the future by capture and use of on-site stormwater through the use of tailwater recovery systems and reservoirs. The storage and use of reclaimed water may be possible for a limited number of crops when meeting food safety and market standards, but there are no reclaimed water sources near AG areas in the region. More efficient irrigation systems could reduce the amount of water needed to meet future crop demands; however, implementation of such systems can be economically and technically challenging. No specific water supply development projects for this category were provided or identified for this 2023–2024 LEC Plan Update.

Continued use of best management practices (BMPs) promotes water conservation (**Chapter 3**). The Florida Department of Agriculture and Consumer Services (FDACS) develops and adopts (by rule) agricultural BMPs addressing water quality. Some BMPs contain an implicit water conservation component. Growers who enroll in the FDACS BMP program and implement the BMPs demonstrate their commitment to water resource protection, have a presumption of compliance with state water quality standards, and are eligible for technical and financial assistance towards meeting water resource protection goals.

Commercial/Industrial/Institutional

The CII water use category includes self-supplied water associated with the production of goods or provision of services by commercial, industrial, and institutional establishments. Water demands for CII in the LEC Planning Area are met primarily using traditional supplies such as fresh surface water and groundwater and, to a limited extent, reclaimed water. The

projected average gross demand for this category is estimated to be 102.57 mgd by 2045, which is a slight increase from 2021 demands (87.35 mgd).

Although traditional water supplies generally are considered adequate to meet the relatively small demands projected for CII, AWS options should be considered based on local conditions. If reclaimed water is available to meet existing and/or new CII demands, the feasibility of such opportunities will be evaluated through the water use permitting process. No specific water supply development projects for this category were provided or identified for this 2023–2024 LEC Plan Update.

Landscape/Recreational

The Landscape/Recreational (L/R) category includes self-supplied water used to irrigate golf courses, sports fields, parks, cemeteries, and large common areas (e.g., land managed by homeowners' associations and commercial developments). Irrigation supplies for this category include fresh groundwater, surface water from local canals or stormwater management system ponds, and reclaimed water. In the LEC Planning Area, L/R average gross demand is projected to increase from 178.65 mgd in 2021 to 199.18 mgd in 2045.

The projected increase in growth for this category is expected to be partially met through currently proposed reclaimed water projects. In the LEC Planning Area, reclaimed water is used to irrigate large, landscaped areas, such as residential and commercial common areas. Historically, irrigation supplies for this category included local fresh groundwater and surface water from canals or stormwater management system ponds. Reclaimed water is used to meet approximately 26.3% of the irrigation demand for L/R.

Reclaimed water treatment capacity increases projected by wastewater treatment utilities indicate substantial volumes of additional reclaimed water will be made available in the future, primarily due to compliance with the Ocean Outfall Law pursuant to Section 403.086(10), F.S. More information can be found in **Chapter 5** and **Appendix E**. Reclaimed water projects proposed by PS utilities and WWTFs are expected to generate 32.35 mgd of additional reclaimed water treatment capacity by 2045. This additional volume may provide opportunities for current irrigation users to convert existing irrigation from traditional fresh water to reclaimed water. No specific water supply development projects for this category have been provided or identified for this 2023–2024 LEC Plan Update.

Power Generation

The Power Generation (PG) water demand, which includes water used for cooling, processing, and potable drinking water at power generation facilities, could increase from 42.20 mgd in 2021 up to 62.33 mgd in 2045. There are seven PG sites located in the LEC Planning Area that utilize fresh and brackish groundwater and surface water to meet a portion of their demands. Of the seven sites, one, the Florida Power & Light (FPL) West County Energy Center, utilizes close to 15 mgd of reclaimed water for its industrial cooling needs. By 2045, that facility may receive up to 20 mgd of reclaimed water for cooling, and the FPL Turkey Point Clean Energy Center may receive up to 15 mgd of reclaimed water to meet its demands for industrial cooling and process water.

As stated above, PG water demands could increase approximately 20 mgd from 2021 to 2045, primarily depending on environmental conditions at Turkey Point for its cooling canal system. **Appendix A** provides additional information. Because the availability of fresh water is limited in the LEC Planning Area, AWS sources may be the most feasible options to meet future PG demands if a new use is proposed. No specific water supply development projects for this category were provided or identified for this 2023–2024 LEC Plan Update.

COOPERATIVE FUNDING PROGRAM

Funding for water supply development and water conservation at the local level is the shared responsibility of water suppliers and users. The State of Florida and the water management districts have provided funding to local water users to develop AWS sources and to implement water conservation programs. One criterion for funding consideration is that the project must be included in, or consistent with, a regional water supply plan update. Some projects not included in this 2023–2024 LEC Plan Update, but consistent with the plan's goals, may be funded. When the SFWMD deems appropriate, a plan may specifically identify the need for multijurisdictional approaches to projects based on technical, permit, and financial feasibility.

Boca Raton Membrane Concentrate Recycling

For nearly two decades, the SFWMD has provided funding to local governments, special districts, utilities, homeowners' associations, water users, and other public and private organizations for AWS, water conservation, and stormwater projects consistent with the SFWMD's core mission. In 2016, these efforts were combined under the Cooperative Funding Program (CFP), which provides financial incentives for local projects that complement ongoing regional restoration, flood control, water quality, and water supply efforts within the District's 16-county jurisdiction.

Each fiscal year, the District Governing Board will determine the amount of funding, if any, to allocate to the CFP, the project priorities for that year, and the cost share to be allocated. SFWMD staff will review the proposed projects based on guidelines and priorities established by the District's Governing Board. Program funding is subject to approval by the District Governing Board.

Alternative Water Supply

The AWS component of the CFP provides cost-share funding for projects that increase water supply. These projects include development of saltwater or brackish water, reclaimed or recycled water, surface water captured during heavy rainfalls, sources made available through addition of new storage capacity, and stormwater (for use by a water use permittee), among others. From Fiscal Year (FY) 2018 through FY2022, the SFWMD provided more than $24.2 million in AWS funding for 20 projects located throughout the District. Eight of these projects are in the LEC Planning Area, generating 16 mgd of AWS capacity and 2.6 mgd of additional reclaimed water distribution capacity (**Table 8-3**).

Table 8-3. Alternative water supply (reclaimed water) projects in the LEC Planning Area supported by the Cooperative Funding Program (FY2018 to FY2022).

Project Name	Entity Name	Fiscal Year	Capacity (mgd)
Palm Beach County			
Reclaimed Water Main Construction along SW 4th Street	Delray Beach, City of	2020	0.21[a]
Reclaimed Water Main Extension – Area 10 Phase 2	Delray Beach, City of	2021	0.12[a]
Broward County			
Broward-Palm Beach Reclaimed Water Main Interconnect	Broward County Board of County Commissioners	2020	16.00
Reclaimed Water Distribution System Expansion: NE 16th Street to NE 24th Street and NE 23rd Avenue to Intracoastal Waterway	Pompano Beach, City of	2020	0.34[a]
T.Y. (Topeekeegee Yugnee) Park Reclaimed Water Main Expansion	Broward County Board of County Commissioners	2020	0.46[a]
Reclaimed Water System Extension – Bamford Sports Complex and along University Drive between SW 36th Street and SW 30th Street	Davie, Town of	2021	0.20[a]
Reclaimed Water System Extension along SW 92nd Avenue from SW 36th Avenue to Griffin Road	Davie, Town of	2022	1.00[a]
Reclaimed Water System Extension along SW 30th Street from 75th Avenue to College Avenue	Davie, Town of	2022	0.30[a]
		Total Capacity	**16.00**

FY = Fiscal Year; LEC = Lower East Coast; mgd = million gallons per day.
[a] Project adds to the reclaimed water distribution system but does not increase actual water treatment capacity.

Water Conservation


Rain Sensor

The water conservation component of the Cooperative Funding Program or CFP, formerly known as the Water Savings Incentive Program or WaterSIP, provides cost-share funding for projects that reduce urban and agricultural water use. The SFWMD has provided matching funds up to 50% to water providers and users (e.g., local governments, utilities, agricultural operations, industrial groups, schools, hospitals, homeowners' associations) for water-saving technologies, such as low-flow plumbing fixtures, rain sensors, fire hydrant flushing devices, and other hardware. From FY2018 to FY2022, the SFWMD provided more than $2.5 million in funding towards 43 water conservation projects, with an estimated water savings of 1,108.1 million gallons per year (mgy), or 3.04 mgd. In the LEC Planning Area, 20 of these projects received $1.04 million in funding with an estimated water savings of 413.60 mgy or 1.13 mgd (**Table 8-4**). **Chapter 3** contains additional information on water conservation efforts.

Table 8-4. Water conservation projects in the LEC Planning Area supported by the Water Savings Incentive Program and the Cooperative Funding Program (FY2018 to FY2022).

Project Name	Entity Name	Project Type	Fiscal Year	Proposed Water Savings (mgy)
Palm Beach County				
Nursery Overhead Efficiency Project 2	Palm Beach Soil and Water Conservation District	Irrigation	2020	37.90
Community Water Conservation Strategies – Phase VII – HET	West Palm Beach, City of	Indoor Plumbing	2020	4.98
Belle Glade Celery Drip Ag Irrigation Retrofit (200 acres)	Duda Farm Fresh Foods, Inc.	Irrigation	2020	82.00
Automatic Line Flushing Devices	Delray Beach, City of	ALFD	2020	3.80
Nursery Overhead Efficiency Project 3	Palm Beach Soil and Water Conservation District	Irrigation	2021	53.60
Irrigation Controller Retrofit at 32 Facilities	School District of Palm Beach County	Irrigation	2021	49.40
Urban Irrigation Efficiency Improvement Program	West Palm Beach, City of	Irrigation	2022	8.70
Community Water Conservation Strategies Phase VIII – HET	West Palm Beach, City of	Indoor Plumbing	2022	3.53
Broward County				
NatureScape Residential Irrigation Rebate Program	Broward Water Partnership[a]	Irrigation	2020	27.10
Conservation Pays HET Rebate Program	Broward Water Partnership[a]	Indoor Plumbing	2020	16.80
USEPA WaterSense HET Replacement/Credit Program	Broward County Board of County Commissioners	Indoor Plumbing	2021	5.33
Water Conservation Software Technology	Davie, Town of	Software	2022	23.40
Miami-Dade County				
Residential HET Rebate Project FY20/21	MDWASD	Indoor Plumbing	2020	27.40
Landscape Irrigation Rebate Project FY20/21	MDWASD	Irrigation	2020	29.50
Residential HET Rebate Project FY21/22	MDWASD	Indoor Plumbing	2021	5.50
Residential High-Efficiency Showerhead and Faucet Rebate Project FY21/22	MDWASD	Indoor Plumbing	2021	7.00
Landscape Irrigation Rebate Project FY21/22	MDWASD	Irrigation	2021	6.21
Landscape Irrigation Rebate Project FY22/23	MDWASD	Irrigation	2022	11.65
Residential HET and High-Efficiency Fixture Rebate Projects FY22/23	MDWASD	Indoor Plumbing	2022	5.20
Monroe County				
HET Retrofit Rebate Program	Florida Keys Aqueduct Authority	Indoor Plumbing	2020	4.60
			Estimated Total Water Savings	**413.60**

ALFD = automatic line flushing device; CFP = Cooperative Funding Program; FY = Fiscal Year; HET = high-efficiency toilet; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; mgy = million gallons per year; USEPA = United States Environmental Protection Agency.

[a] This project was completed by the Broward County Resilient Environment Department on behalf of the Broward Water Partnership.

SUMMARY OF WATER SUPPLY DEVELOPMENT PROJECTS

Total average gross water demands within the LEC Planning Area from all sources are projected to increase approximately 208.93 mgd (11%) by 2045. Meeting these demands requires continued demand reduction through water conservation and use of diverse water sources, including brackish groundwater (for most uses except AG and DSS), reclaimed water, seasonally available surface water, and ASR.

To meet projected 2045 demand, 11 of the 54 PS utilities need to construct projects to meet their projected 2045 demands. The proposed water supply development projects could generate 101.60 mgd of new water treatment capacity to meet the 2045 PS net (finished) demand of 945.46 mgd. New treatment capacity consists of 92.93 mgd of water produced by FAS and seawater projects and 8.67 mgd of water produced by SAS projects. Summaries of existing and proposed projects and capacities are provided in **Tables 8-1** and **8-5**.

Although users are not required to select a project included in this 2023–2024 LEC Plan Update, in accordance with Section 373.709(6), F.S., development and implementation of water supply projects, including AWS, is critical to ensure an adequate water supply is available for future growth while sustaining the natural systems.

Table 8-5. Existing and proposed increase in water supply treatment capacities (in mgd) for LEC Public Supply utilities.

County	Public Supply Utility	Surface Water/ Stormwater		SAS		FAS/Seawater		ASR[a]		Reclaimed Water[b]	
		Existing	Proposed[c]	Existing	Proposed[c]	Existing	Proposed[c]	Existing	Proposed[c]	Existing	Proposed[c]
Broward	BCWWS District 1		1.00	16.00							
	BCWWS District 2A		2.00	30.00			6.00[d]			6.40	16.00
	BCWWS District 3		3.00								
	Cooper City			7.00							
	Coral Springs			16.00							
	CSID			7.40							
	Dania Beach		1.00	5.00							
	Davie			4.00		6.00				1.67	
	Deerfield Beach			20.60		3.00					
	Fort Lauderdale		3.00	82.75			6.00				
	Hallandale Beach		1.00	16.00							
	Hillsboro Beach			2.25							
	Hollywood			55.50		4.00	4.00			8.00	
	Lauderhill			16.00			3.00				
	Margate		2.00	13.50							
	Miramar			15.25		2.50	5.00			7.50	
	North Lauderdale			7.50							
	NSID			6.80			2.00				
	Parkland			0.58							
	Pembroke Pines			18.00							
	Plantation			24.00						2.00	
	Pompano Beach		2.00	50.00						7.50	5.00
	Royal Utility			1.00							
	STOF – Hollywood[e]			3.53							

Table 8-5. Continued.

County	Public Supply Utility	Surface Water/ Stormwater		SAS		FAS/Seawater		ASR[a]		Reclaimed Water[b]	
		Existing	Proposed[c]	Existing	Proposed[c]	Existing	Proposed[c]	Existing	Proposed[c]	Existing	Proposed[c]
Broward (Continued)	Sunrise		5.00	50.00	1.90	1.50	-1.50			2.99	
	Tamarac			16.00							
	Tindall Hammock			1.00						0.60	-0.60
Hendry	STOF - Big Cypress[e]			2.00							
Miami-Dade	Americana Village			0.50							
	Florida City			4.00							
	Homestead			19.20						5.00	4.00
	MDWASD		15.00	451.93	2.55	7.50	19.95	25.00		124.82	0.40
	North Miami			9.30							
	North Miami Beach			32.00		9.50					
Monroe	FKAA			23.80		9.00	8.00		1.40	1.93[f]	5.35
Palm Beach	Boca Raton			70.00						17.50	
	Boynton Beach			34.40			8.00	4.00		14.00	
	Delray Beach			26.00						10.00	
	Golf			0.86							
	Highland Beach					3.00					
	Jupiter			16.30		13.70				11.50[g]	
	Lake Worth Beach			12.90		4.50					
	Lantana			3.84							
	Manalapan			0.65		1.70					
	Mangonia Park			1.08							
	Maralago Cay			0.42							
	PBCWUD			103.28	12.50					25.89	2.00

Table 8-5. Continued.

County	Public Supply Utility	Surface Water/ Stormwater		SAS		FAS/Seawater		ASR[a]		Reclaimed Water[b]	
		Existing	Proposed[c]	Existing	Proposed[c]	Existing	Proposed[c]	Existing	Proposed[c]	Existing	Proposed[c]
Palm Beach (Continued)	PBCWUD Western Region					10.00				0.68	
	Palm Springs			10.00							
	Riviera Beach			17.50	-8.98		7.48				
	Seacoast			27.50		3.00				14.67	
	Tequesta			2.73		3.60				2.50[g]	
	Wellington			12.30	0.70					6.42	0.20
	West Palm Beach	47.00	3.00				30.00	8.00		28.00	
LEC Planning Area Total		**47.00**	**38.00**	**1,368.15**	**8.67**	**82.50**	**92.93**	**37.00**	**1.40**	**299.57**	**32.35**

ASR = aquifer storage and recovery; BCWWS = Broward County Water and Wastewater Services; CSID = Coral Springs Improvement District; FAS = Floridan aquifer system; FKAA = Florida Keys Aqueduct Authority; LEC = Lower East Coast; MDWASD = Miami-Dade Water and Sewer Department; mgd = million gallons per day; NSID = North Springs Improvement District; PBCWUD = Palm Beach County Water Utilities Department; SAS = surficial aquifer system; STOF = Seminole Tribe of Florida.

[a] Estimated recoverable storage capacity, not water supply capacity.

[b] Reclaimed water is not a potable water source; however, it is an AWS used to reduce reliance on traditional water sources.

[c] Distribution lines, wells, ASR wells, stormwater reservoirs, and other infrastructure or storage projects that do not generate additional water supplies are not counted as adding increased water supply treatment capacity.

[d] The expansion of the 2A WTP is postponed pending the status of the C-51 Reservoir Phase 1 project.

[e] The Seminole Tribe of Florida is a sovereign Indian Tribe and an independent Tribal Government separate from Broward and Hendry counties. However, for discussion purposes, information relating to the Seminole Tribe of Florida Hollywood and Big Cypress Reservations are included in the calculations.

[f] The total estimated reclaimed water treatment capacity of all WWTFs located within the FKAA service area.

[g] Based on the Loxahatchee River Water Control District's total reclaimed water treatment capacity of 14.00 mgd and the estimated portion of reclaimed water distribution lines located within the Jupiter and Tequesta potable water utility service areas.

REFERENCES

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SFWMD. 2021. *2021–2024 Support Document for Water Supply Plan Updates*. South Florida Water Management District, West Palm Beach, FL. November 2021.

9

Conclusions and Future Direction

This chapter of the *2023–2024 Lower East Coast Water Supply Plan Update* (2023–2024 LEC Plan Update) provides conclusions and summarizes the future direction for water supply planning in the LEC Planning Area of the South Florida Water Management District (SFWMD or District). This plan update assesses the water demands from 2021 through 2045. Water demand is expected to increase by 208.93 million gallons per day (mgd) by 2045, primarily due to increases in the Public Supply (PS) and Landscape/Recreational (L/R) water use categories (**Chapter 2**). Water conservation is an important component of integrated water resource management and may reduce, defer, or eliminate the need to expand water supply infrastructure. Water conservation by all users reduces the amount of water needed to meet current and future demands (**Chapter 3**).

TOPICS

- Demand Summary
- Demand Management: Water Conservation
- Natural Systems and Resource Protection
- Water Source Options
- Coordination
- Climate Change and Sea Level Rise
- Conclusions

There are several activities planned or under way to meet natural systems water needs, including Comprehensive Everglades Restoration Plan (CERP) projects and changes to lake regulation schedules, that can affect (enhance or limit) future water supplies within the LEC Planning Area (**Chapter 7**). In addition, regulatory criteria designed to protect water resources, including water reservations, restricted allocation areas, and elements identified in minimum flow and minimum water level (MFL) prevention and recovery strategies, place limitations on water available for allocation (**Chapter 4**, **Appendix C**).

Guidance in this 2023–2024 LEC Plan Update should be considered when developing water supply options to meet future needs. Statutory requirements, existing conditions, resource constraints (including protection tools and criteria), and the needs of all water users are addressed. All water users are encouraged to continue being prudent with water use decisions and use water efficiently. The SFWMD's recommendations for water supply planning in the LEC Planning Area include continued coordination with agricultural stakeholders, PS utilities, and other water users; protection of natural resources; diversification of water sources; and continued monitoring of water levels and water quality in surface water and groundwater.

DEMAND SUMMARY

Total average annual demand for all water use categories for 2045 is projected to be 2,063.56 mgd (**Table 9-1**). This is an 11% increase from the estimated 2021 demands (1,854.63 mgd) and 3% more than the projected 2040 demands (2,006.54) in the *2018 Lower East Coast Water Supply Plan Update* (SFWMD 2018).

Table 9-1. Change in water use demands in the LEC Planning Area from 2021 to 2045.

Water Use Category	2021 Estimated Use (mgd)	2045 Projected Demand (mgd)	Percent Change	Percent of Projected 2045 Total Demand
PS	890.67	1,047.37	17.59%	50.76%
DSS	10.56	14.45	36.96%	0.70%
AG	645.20	637.66	-1.17%	30.90%
CII	87.35	102.57	17.41%	4.97%
L/R	178.65	199.18	11.49%	9.65%
PG	42.20	62.33	47.70%	3.02%
LEC Planning Area Total	**1,854.63**	**2,063.56**	**11.30%**	**100.00%**

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

DEMAND MANAGEMENT: WATER CONSERVATION

Water conservation measures and programs for all water use categories offer the potential to reduce the amount of water needed to meet future demands (**Chapter 3**). All water users are urged to implement water conservation measures to reduce demands and defer construction of capital-intensive projects. The following conservation-related actions are recommended:

- The SFWMD should continue to implement its Comprehensive Water Conservation Program and its Cooperative Funding Program.
- Agricultural water users are encouraged to install or upgrade to high-efficiency irrigation systems, advanced irrigation technology (controllers), and when applicable, Florida Automated Weather Network (FAWN) irrigation tools. More efficient irrigation systems could substantially reduce the amount of water needed to meet future crop demands; however, implementation of such systems may be economically and technically challenging.
- PS utilities are encouraged to develop goal-based water conservation plans and proactively implement water-saving measures and programs, such as incentives to promote replacement of older water fixtures with new high-efficiency ones.
- Local governments should evaluate whether mandated water conservation measures, such as requirements for construction of water-efficient homes and commercial properties, are appropriate for their jurisdiction.

- Local governments should adopt a year-round irrigation ordinance that fully comports with the SFWMD's Mandatory Year-Round Landscape Irrigation Conservation Measures Rule (Chapter 40E-24, Florida Administrative Code). Although 71 of the 116 local governments have adopted acceptable ordinances, 45 in the LEC Planning area have not yet adopted irrigation ordinances.
- Local governments should develop and adopt ordinances to promote and be consistent with Florida-Friendly Landscaping provisions (Section 373.185, Florida Statutes).
- Public education programs can help instill a year-round conservation ethic. Local and tribal governments and PS utilities are encouraged to provide conservation-related information, messaging, and educational programs in cooperation with the SFWMD.
- All eligible water users are encouraged to seek cost-share funding opportunities that may be available for water conservation projects.
- L/R water users are encouraged to implement advanced irrigation technology, improve landscape design and best management practices, and participate in recognition programs (e.g., Florida-Friendly Landscaping program) to further increase landscape water use efficiency.
- Commercial/Industrial/Institutional (CII) entities are encouraged to use the *Water Efficiency and Self-Conducted Water Audits at Commercial and Institutional Facilities: A Guide for Facility Managers* (SFWMD 2013) to improve water use efficiency and reduce operating costs.

NATURAL SYSTEMS AND RESOURCE PROTECTION

STA-1 West Cell 3

In addition to the protection of water resources, a wide range of activities related to natural systems can affect future water supplies within the LEC Planning Area. Such activities include construction of CERP projects; changes by the United States Army Corps of Engineers (USACE) to regulation schedules for the Everglades, Lake Okeechobee, and other water bodies; and monitoring and research projects. In addition, regulatory criteria designed to protect water resources and related natural systems place limitations on water available for allocation (**Chapter 4**, **Appendix C**).

CERP includes regional projects to improve the quality, timing, volume, distribution, and delivery of water to the natural system. Future environmental restoration and water resource protection efforts include the following:

- The SFWMD and USCAE will continue to make progress towards completion of Restoration Strategies Program and CERP projects, including construction of flow restoration and equalization basins/stormwater treatment areas, Broward County Water Preserve Areas, Central Everglades Planning Project, Western Everglades Restoration Project, C-111 Spreader Canal Western project, Biscayne Bay Coastal Wetlands project, and Biscayne Bay Southeastern Everglades Ecosystem Restoration.

- The SFWMD will continue to partner with the USACE on planning for future CERP projects in the Lake Okeechobee, Loxahatchee River, and Western Everglades watersheds; Central Everglades; Biscayne Bay; and other coastal areas and in the Broward County Water Preserve Areas.
- The SFWMD will continue to synchronize CERP priorities with the USACE using the Integrated Delivery Schedule (USACE 2023), a sequencing strategy for planning, designing, and constructing cost-shared projects as part of the South Florida Ecosystem Restoration Program, based on ecosystem needs, benefits, costs, and available funding.
- The SFWMD will continue to develop and implement new regulatory rules and criteria, such as water reservations and restricted allocation areas, to protect water created for natural systems by CERP and other restoration projects.
- The SFWMD will continue to refine operations to achieve restoration benefits, including ongoing efforts in the Combined Operational Plan, Modified Water Deliveries to Everglades National Park, and Water Conservation Area-3A Decompartmentalization Physical Model projects.
- The SFWMD will continue to monitor and research natural areas, including Biscayne Bay, Florida Bay, the Loxahatchee River, and Lake Okeechobee and provide annual updates in the *South Florida Environmental Report* (https://www.sfwmd.gov/sfer) to track the health of the areas and meet regulatory requirements.
- The SFWMD will continue to implement, review, and update MFL prevention and recovery strategies, as appropriate, in conjunction with future water supply plan updates.
- The SFWMD will continue to re-evaluate the Biscayne aquifer monitoring network data on a regular basis to ensure water levels in coastal canals that recharge the aquifer are being maintained at the operation levels needed to meet the Biscayne Aquifer MFL.

WATER SOURCE OPTIONS

PS users rely primarily on fresh groundwater from the surficial aquifer system (SAS). Withdrawals from the SAS have been maximized in many areas, especially along the coast, due to potential impacts on wetlands, potential for saltwater intrusion into freshwater sources, and proximity to contamination sources. Therefore, PS utilities are projected to continue increasing use of the Floridan aquifer system (FAS) to meet future water demands.

Agricultural users in the LEC Planning Area rely primarily on surface water from Lake Okeechobee, water conservation areas, regional canals, and groundwater where surface water is not available. Based on projected declines in agricultural demands due to the conversion of agricultural lands to residential and other land uses in Palm Beach and Miami-Dade counties, the existing surface water and groundwater sources should be able to meet future landscape irrigation demands.

Alternative water supply (AWS) sources, such as reclaimed water, can be used to meet new uses or replace freshwater sources and potable water currently used for irrigation or industrial purposes. Additionally, water storage features, such as reservoirs, aquifer storage

and recovery (ASR) wells, and impoundments, can capture excess stormwater, groundwater, and surface water during wet-weather periods and provide supplemental water supply for AG, PS, natural systems, and other needs during dry periods. Seawater is a potential AWS source as membrane technology costs continue to decline. There are two reverse osmosis seawater desalination treatment plants in the LEC Planning Area operated for emergencies by the Florida Keys Aqueduct Authority.

Climate change and sea level rise can affect water resources and water demands in the LEC Planning Area. The District, local governments, and water users need to be diligent in proactively understanding potential impacts, develop tools to predict those potential impacts, and implement resiliency strategies in a coordinated effort.

The following sections offer guidance for consideration by local governments, water users, and the SFWMD as a basis for the future availability of water supply sources in the LEC Planning Area.

Surface Water

Surface water sources in the LEC Planning Area, including Lake Okeechobee, are integrally connected as part of the Kissimmee-Okeechobee-Everglades ecosystem and regional water supply system. Several local water control districts have connections with the regional system to divert water for water supply. In addition, many regional surface water bodies are part of current and future environmental restoration projects. Water availability in most of these systems is limited due to restricted allocation area criteria or other protective measures. Additional water storage features could enhance water availability. The following actions should be implemented:

- The USACE completed the rehabilitation of the Herbert Hoover Dike and revised the Lake Okeechobee System Operating Manual (LOSOM), which was finalized in August of 2024. The USACE's water control plan for LOSOM includes operational flexibility reflecting the multiple objectives of managing Lake Okeechobee water levels. The Environmental Impact Statement (EIS) upon which LOSOM is based showed water supply performance improvements over the Lake Okeechobee Regulation Schedule 2008 (LORS08). The SFWMD will provide operational guidance to the USACE on a weekly basis and use available storage and conveyance capacity to achieve water supply performance consistent with the state's water supply authority.

Herbert Hoover Dike

- Capital projects to increase storage, such as ASR systems and aboveground storage reservoirs, will continue to be designed and constructed by the SFWMD and the USACE.
- The SFWMD and USACE will complete and implement the components identified in the Lake Okeechobee Watershed Restoration Project. Part of CERP, this project will increase the watershed's storage capacity and improve the quantity and timing of water deliveries to Lake Okeechobee.

- Local governments, agricultural operations, and utilities are encouraged to create additional storage capacity for excess surface water to use for water supply purposes, when technically and economically feasible. Entities also are encouraged to investigate the potential storage capacity in local water control district systems.

Groundwater

Fresh groundwater is the primary source of water for potable use and agricultural irrigation in the LEC Planning Area coastal region. Approximately 91% of PS demand in 2021 was met with water from the SAS. Current permit allocations are sufficient to meet most utilities' demands through 2045. Additional allocation of fresh groundwater above currently permitted levels to meet future PS demand in the LEC Planning Area depends on the location and source limitations. Use of reclaimed water and water conservation measures can extend fresh groundwater supplies. The remaining 2045 PS demand is expected to be met using the brackish FAS.

Surficial Aquifer System

Withdrawals from the SAS are limited due to MFL rules, restricted allocation area criteria, saltwater intrusion concerns, potential impacts on wetlands, pollution, interference with existing legal users, and off-site land uses. Potential use of the SAS for new or increased allocations will be evaluated on an application-by-application basis to determine if a project meets water use permitting criteria. The following actions are suggested:

- Water users are encouraged to reduce reliance on the SAS by diversifying water sources and developing AWS sources to meet future water demands.
- PS utilities should design wellfield locations, configurations, and pumping regimes to avoid saltwater intrusion, pollution, harm to natural systems, or increased dependence on the regional system (as demonstrated through modeling).
- PS utilities should consider implementing groundwater recharge systems using reclaimed or excess surface water as an impact offset or substitution credit (see *Reclaimed Water* section).
- PS utilities should continue to expand interconnections with other utilities for supply reliability and assess existing interconnections to confirm they operate as intended.
- The SFWMD, United States Geological Survey (USGS), and local governments should continue coordinating saltwater intrusion monitoring efforts to delineate the location and movement of the saltwater interface and identify areas of concern. The SFWMD will continue to update saltwater interface maps every 5 years.
- The SFWMD will periodically review existing groundwater monitoring networks and enhance them, as appropriate.
- The SFWMD will work with appropriate local governments to identify long-term sustainable water supply solutions in Domestic Self-Supply (DSS) areas that are currently or projected to experience aquifer stress.

Floridan Aquifer System

The FAS is expected to be the primary water source to meet increased PS demands. Brackish groundwater from the FAS is considered an AWS source in the LEC Planning Area. The following future actions are suggested:

Floridan Aquifer System Monitor Well

- Local water users installing FAS wells are encouraged to collaborate with the SFWMD to gather and share hydrogeologic data. Additional data will increase knowledge of aquifer properties and could support updates to future groundwater modeling efforts of the FAS.
- The monitoring networks used to assess the SAS and FAS are a hybrid of regional monitoring by agencies, such as the SFWMD and USGS, and monitoring performed by water use permittees as part of their permit requirements. Efforts should be made to identify wells considered critical to long-term monitoring and modeling to ensure they are maintained or replaced, as necessary.
- Local water users, other agencies, local governments, and PS utilities are encouraged to coordinate with the SFWMD to improve ongoing water level and water quality monitoring of the FAS.
- PS utilities should use an incremental approach when installing and testing production wells due to geologic variability within the FAS. Wellfields should be designed with adequate separation between wells and monitored to prevent overstressing production zones to minimize harmful changes in water quality.
- The SFWMD will continue to work with FAS stakeholders to further refine assumptions and data used in groundwater model simulations.
- Landowners are encouraged to plug and abandon free-flowing, inactive, or nonfunctional FAS wells in accordance with existing rules and regulations. This will prevent loss of water via free-flowing wells and contamination of the overlying SAS with more saline water from the FAS.

Reclaimed Water

In the LEC Planning Area, reclaimed water is used for L/R irrigation, groundwater recharge, power generation (PG) cooling water, and environmental enhancement. Reclaimed water can be used to meet new uses or replace freshwater sources currently used for irrigation and industrial purposes, thereby decreasing the use of traditional freshwater sources. Opportunities to expand reclaimed water use include the following:

- Local governments should consider requiring construction of reclaimed water infrastructure in new development projects. Building codes, ordinances, and land development regulations are options to promote reclaimed water use.

- Local governments should consider establishing mandatory reuse zones, where reclaimed water use is required by ordinance. The SFWMD will provide technical assistance to local governments who wish to establish mandatory reuse zones.
- Local governments and PS utilities should support development of additional reclaimed water lines for green space irrigation (e.g., residential lots, medians, common areas, golf courses) to decrease reliance on traditional freshwater sources.

Water Reuse

- PS utilities should consider using substitution credits and impact offsets (Section 373.250, Florida Statutes) to promote increased availability and distribution of reclaimed water and decreased use of traditional water sources.
- PS utilities should extend their reclaimed water supply by implementing feasible options, such as increased storage, residential customer metering, tiered rate structures, limiting landscape irrigation frequency for mature landscapes, and interconnects with other reclaimed water utilities.

New Storage Capacity for Surface Water or Groundwater

In the LEC Planning Area, water storage options include reservoirs, ASR wells, and surface water impoundments that capture excess groundwater or surface water for later use. In addition, ASR can be used to store excess potable water and reclaimed water for seasonal or longer-term drought resilience. Proposed projects that develop new storage and create additional water supply may be considered AWS sources. Opportunities for new storage capacity include the following:

West Palm Beach ASR System at Clear Lake

- Surface water storage systems (e.g., reservoirs) can help meet urban, agricultural, and environmental water supply needs.
- New or retrofitted surface water storage systems for agricultural operations could provide additional water supply for irrigation but may have limited availability during a 1-in-10-year drought.
- ASR systems can store water during periods of low demand and high-water levels (i.e., during the wet season) for subsequent recovery during dry periods, which could reduce withdrawals from the SAS wells.

Seawater

The ocean is an important source of water, but desalination is required before seawater can be used for water supply purposes. Where appropriate, utilities should consider the feasibility of desalinated seawater from the Atlantic Ocean as an additional water source option for the LEC Planning Area.

COORDINATION

Coordination and collaboration among regional and local government agencies and utility planning entities is essential to ensure the supply of water is sufficient and sustainable to meet urban, agricultural, and environmental needs. Examples of coordination activities include the following:

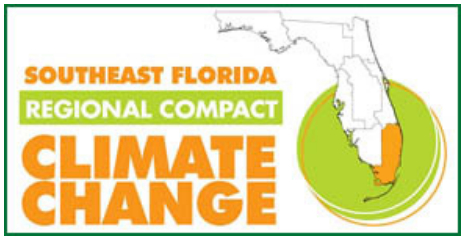
- Water Supply Facilities Work Plans are due within 18 months of approval of this 2023–2024 LEC Plan Update. Local governments must provide linkages and coordination between the SFWMD's plan update and the water supply-related components of their Comprehensive Plans.
- The SFWMD will continue to work with the Florida Department of Agriculture and Consumer Services and agricultural stakeholders to provide data for annual updates to the Florida Statewide Agricultural Irrigation Demand simulation for future crop acreage and water demand projections.
- The SFWMD will continue to coordinate with utilities, counties, and the USGS to review, recommend improvements, and provide data and analyses for saltwater intrusion monitoring networks.
- Where wellfields are at risk of saltwater intrusion, the SFWMD will work with utilities and counties to identify additional monitoring needs and potential solutions.
- The SFWMD will coordinate with stakeholders on the development and use of regional groundwater and surface water models to evaluate water resource availability.
- The SFWMD will support the development of multijurisdictional partnerships, where appropriate, to implement programs or projects that benefit a greater number of people than one entity might benefit by itself, such as the Broward Water Partnership and the C-51 Reservoir Project participants.
- The SFWMD will continue to coordinate with local governments, utilities, and private entities on resiliency efforts and development of adaptive strategies to address climate change and sea level rise.

CLIMATE CHANGE AND SEA LEVEL RISE

Climate change and sea level rise could affect hydrologic conditions, and thus water supply sources, as well as patterns of water demand. Recommendations related to climate change and sea level rise include the following:

- The SFWMD will continue to investigate climate change and sea level rise projection models for use in water supply planning and system operations.
- The SFWMD will continue to support AWS development and promote water conservation to increase the security and diversity of water sources, as withdrawing less water from aquifers helps prevent saltwater intrusion.
- The SFWMD, USACE, and coastal utilities and municipalities should identify methods to evaluate the consequences of climate change and sea level rise and use them to assess the cumulative impacts to existing structures and legal users.

- The SFWMD will continue to provide technical assistance to local governments as they develop climate change adaptation strategies.
- Local governments and utilities are encouraged to participate in the Southeast Florida Regional Climate Change Compact to support regional planning efforts and initiatives focused on adapting to rising sea levels in the LEC Planning Area.



Southeast Florida Regional Climate Change Compact

- Water users should periodically review irrigation schedules and consider installing weather-based controllers.
- PS utilities should plan for climate change and sea level rise by reducing withdrawals from the SAS and by using the FAS, employing water conservation measures to reduce overall water demands, and expanding reuse programs to reduce potable and self-supplied SAS withdrawals for irrigation.
- Local governments, utilities, and private entities should coordinate on resiliency efforts and development of adaptive strategies to address climate change and sea level rise (e.g., constructing defensive barriers, improving infrastructure, rezoning property threatened by inundation or transferring it to public ownership).

CONCLUSIONS

Building on the findings and conclusions of previous LEC water supply plan updates, this 2023–2024 LEC Plan Update assesses water supply demand and available sources through 2045. This plan update concludes that future water needs of the region during average and 1-in-10-year drought conditions can be met through the 2045 planning horizon with appropriate management, conservation, and implementation of projects identified herein.

Meeting future water needs through 2045 in the LEC Planning Area depends on the following:

- Construction of potable water supply development projects by PS utilities.
- Implementation of CERP Restoration Strategies and other water resource development projects to provide additional storage.
- Implementation of LOSOM and construction of CERP capital projects identified in MFL prevention and recovery strategies.

Successful implementation of this 2023–2024 LEC Plan Update requires close collaboration with agricultural interests, local and tribal governments, utilities, and other stakeholders. Coordination efforts should ensure that water resources in the LEC Planning Area continue to be prudently managed and available to meet future demands while also protecting natural systems.

REFERENCES

SFWMD. 2013. *Water Efficiency and Self-Conducted Water Audits at Commercial and Institutional Facilities: A Guide for Facility Managers*, *2nd Edition*. South Florida Water Management District, West Palm Beach, FL. July 2013.

SFWMD. 2018. *2018 Lower East Coast Water Supply Plan Update*. South Florida Water Management District, West Palm Beach, FL. November 2018.

USACE. 2023. *Integrated Delivery Schedule 2023 Update*. United States Army Corps of Engineers, Jacksonville, FL. November 2023.

Glossary

1-in-10-year drought 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.

1-in-10-year level of certainty (see *Level of Certainty*)

Acre-foot, acre-feet Volume of water that covers 1 acre (43,560 square feet) to a depth of 1 foot. The equivalent of 43,560 cubic feet, 1,233.5 cubic meters, or 325,872 gallons.

Agricultural best management practice (Agricultural BMP) A practice or combination of agricultural practices, based on research, field testing, and expert review, determined to be the most effective and practicable means of improving water quality or quantity while maintaining or even enhancing agricultural production.

Agricultural Field-Scale Irrigation Requirements Simulation (AFSIRS) A water budget model for calculating irrigation demands that estimates demand based on basin-specific data. The AFSIRS model calculates both net and gross irrigation requirements for average and 1-in-10-year drought irrigation requirements. A crop's net irrigation requirement is the amount of water delivered to the root zone of the crop, while the gross irrigation requirement includes both the net irrigation requirement and the losses incurred in the process of delivering irrigation to the crop's root zone.

Agriculture (AG) Self-supplied water used for commercial crop irrigation, greenhouses, nurseries, livestock watering, pasture, and aquaculture.

Alternative water supply Salt water; brackish surface water and groundwater; surface water captured predominately during wet-weather flows; sources made available through the addition of new storage capacity for surface water or groundwater; water that has been reclaimed after one or more public supply, municipal, industrial, commercial, or agricultural uses; the downstream augmentation of water bodies with reclaimed water; stormwater; and, any other water supply source that is designated as nontraditional for a water supply planning region in the applicable regional water supply plan (Section 373.019, Florida Statutes [F.S.]).

***Applicant's Handbook for Water Use Permit Applications within the South Florida Water Management District* (Applicant's Handbook)** Read in conjunction with Chapter 40E-2, Florida Administrative Code (F.A.C.), the Applicant's Handbook further specifies the general procedures and criteria used by SFWMD staff for review of water use permit applications to ensure water uses permitted by the SFWMD are reasonable-beneficial, do not interfere with existing legal users, and are in the public interest.

Aquifer A geologic formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs.

Aquifer storage and recovery (ASR) The underground storage of potable water, stormwater, surface water, fresh groundwater, or reclaimed water, which is appropriately treated to potable standards and injected into an aquifer through wells. The aquifer (typically the Floridan aquifer system in South Florida) acts as an underground reservoir for the injected water, reducing water loss to evaporation. The water is injected during the wet season or when water is readily available and stored with the intent to recover it for use during future dry periods.

Aquifer system A heterogeneous body of (interbedded or intercalated) permeable and less permeable material that functions regionally as a water-yielding hydraulic unit and may be composed of more than one aquifer separated at least locally by confining units that impede groundwater movement, but do not greatly affect the hydraulic continuity of the system.

Average rainfall year A year having rainfall with a 50% probability of being exceeded over a 12-month period.

Base condition A specified period of time during which collected data are used for comparison with subsequent data.

Basin There are two types of basins: 1) a groundwater basin is a hydrologic unit consisting of one large aquifer, or several connecting and interconnecting aquifers; and 2) a surface water basin is a tract of land drained by a surface water body or its tributaries.

Below land surface Depth below land surface regardless of land surface elevation.

Boulder Zone A highly transmissive, cavernous zone of dolomite within the Lower Floridan aquifer used to dispose of secondary-treated effluent from wastewater treatment facilities and concentrate from membrane water treatment plants via deep injection wells.

Brackish water Water with a chloride concentration greater than 250 milligrams per liter (mg/L) and less than 19,000 mg/L.

Canal A manmade waterway used for draining or irrigating land or for navigation by boat.

Capacity The ability to treat, move, or reuse water. Typically, capacity is expressed in millions of gallons per day (mgd).

Central and Southern Florida Project (C&SF Project) A complete system of canals, storage areas, and water control structures spanning the area from Lake Okeechobee to the east and west coasts and from Orlando south to the Everglades. It was designed and constructed during the 1950s by the United States Army Corps of Engineers (USACE) to provide flood control and improve navigation and recreation.

Commercial/Industrial/Institutional (CII) Self-supplied water associated with the production of goods or provision of services by industrial, commercial, or institutional establishments.

Comprehensive Everglades Restoration Plan (CERP) The federal-state partnership framework and guide for the restoration, protection, and preservation of the South Florida ecosystem. CERP also provides for water-related needs of the region, such as water supply and flood protection.

Confined aquifer An aquifer containing groundwater that is confined under pressure and bounded between substantially less permeable materials such that water will rise in a fully penetrating well above the top of the aquifer. In cases where the hydraulic head is greater than the elevation of the overlying land surface, a fully penetrating well will naturally flow at the land surface without means of pumping or lifting.

Confining unit A body of significantly less permeable material than the aquifer, or aquifers, that it stratigraphically separates. The hydraulic conductivity may range from nearly zero to some value significantly lower than that of the adjoining aquifers, and impedes the vertical movement of water.

Conservation (see *Water conservation*)

Consumptive use Any use of water that reduces the supply from which it is withdrawn or diverted**.**

Control structure An artificial structure designed to regulate the level/flow of water in a canal or other water body (e.g., weirs, dams).

Cubic feet per second (cfs) A rate of flow (e.g., in streams and rivers) equal to a volume of water 1 foot high and 1 foot wide flowing a distance of 1 foot in 1 second. One cfs is equal to 7.48 gallons of water flowing each second.

DBHYDRO The SFWMD's corporate environmental database, storing hydrologic, meteorologic, hydrogeologic, and water quality data.

Demand The quantity of water needed to fulfill a requirement.

Demand management Reducing the demand for water through activities that alter water use practices, improve efficiency in water use, reduce losses of water, reduce waste of water, alter land management practices, and/or alter land uses.

Dike An embankment to confine or control water, especially one built along the banks of a river or lake to prevent overflow of lowlands; a levee.

Discharge The rate of water movement past a reference point, measured as volume per unit of time (usually expressed as gallons per minute, cubic feet per second, or cubic meters per second).

Disinfection The process of inactivating microorganisms that cause disease. All potable water requires disinfection as part of the treatment process prior to distribution. Disinfection methods include chlorination, ultraviolet radiation, and ozonation.

Disposal Effluent disposal involves the practice of releasing treated effluent back to the environment using ocean outfalls, surface water discharges, or deep injection wells.

Domestic Self-Supply (DSS) Potable water used by households served by small utilities (less than 0.10 mgd) or self-supplied by private wells.

Domestic wastewater Wastewater derived principally from residential dwellings, commercial buildings, and institutions; sanitary wastewater; sewage.

Drainage basin The land area where precipitation ultimately drains to a particular watercourse (e.g., river, stream) or body of water (e.g., lake, reservoir). Drainage basins in South Florida are defined by rule and periodically are redefined to reflect changes in the regional drainage network.

Drawdown 1) The vertical distance between the static water level and the surface of the cone of depression. 2) A lowering of the groundwater surface caused by pumping.

Drought A long period of abnormally low rainfall, especially one that reduces water supply availability.

Ecology The study of the inter-relationships of plants and animals to one another and to their physical and biological environment.

Ecosystem Biological communities together with their environment, functioning as a unit.

Ecosystem restoration The process of reestablishing to as near its natural condition as possible, the structure, function, and composition of an ecosystem.

Elevation The height in feet above mean sea level according to National Geodetic Vertical Datum of 1929 (NGVD29) or North American Vertical Datum of 1988 (NAVD88). May also be expressed in feet above mean sea level as reference datum.

Environmental impact statement An evaluation of the positive and negative environmental effects of a proposed agency action required under United States environmental law by the National Environmental Policy Act for federal government agency actions "significantly affecting the quality of the human environment."

Estuary A body of water found where a river meets the ocean that is characterized by fresh water mixing with salt water.

Evapotranspiration (ET) The total loss of water to the atmosphere by evaporation from land and water surfaces and by transpiration from plants.

Exceedance The violation of the pollutant levels permitted by environmental protection standards.

Exceedance (MFL) As defined in Rule 40E-8.021, F.A.C., to fall below a minimum flow or level, which is established in Parts II and III of Chapter 40E-8, F.A.C, for a duration greater than specified for the MFL water body.

Finished water Water that has undergone a purification or treatment process; water that has passed through all the processes in a water treatment plant and is ready to be delivered to consumers. Contrast with *Raw water*.

Finished water demand (see *Net water demand*)

Fiscal Year (FY) The South Florida Water Management District's fiscal year begins on October 1 and ends on September 30 the following year.

Florida Administrative Code (F.A.C.) The Florida Administrative Code is the official compilation of the administrative rules and regulations of state agencies.

Florida Department of Agriculture and Consumer Services (FDACS) An executive department of the Government of Florida. FDACS supports and promotes Florida agriculture, protects the environment, safeguards consumers, ensures the safety and wholesomeness of food and implements agricultural best management practices, addressing water quality and water conservation.

Florida-Friendly Landscaping Quality landscapes that conserve water, protect the environment, are adaptable to local conditions, and are drought tolerant. The principles of such landscaping include planting the right plant in the right place, efficient watering, appropriate fertilization, mulching, attraction of wildlife, responsible management of yard pests, recycling yard waste, reduction of stormwater runoff, and waterfront protection.

Florida Statutes (F.S.) The Florida Statutes are a permanent collection of state laws organized by subject area into a code made up of titles, chapters, parts, and sections. The Florida Statutes are updated annually by laws that create, amend, or repeal statutory material.

Floridan aquifer system (FAS) A highly used, deep aquifer system composed of the Upper and Lower Floridan aquifers. It is the principal source of water supply north of Lake Okeechobee and is highly mineralized south of the lake, requiring membrane treatment prior to use.

Flow The actual amount of water flowing by a particular point over some specified time. In the context of water supply, flow represents the amount of water being treated, moved, or reused. Flow is frequently expressed in millions of gallons per day (mgd).

Fresh water An aqueous solution with a chloride concentration less than or equal to 250 mg/L.

Geologic unit A geologic unit is a volume of rock or ice of identifiable origin and age range that is defined by the distinctive and dominant, easily mapped and recognizable petrographic, lithologic, or paleontologic features that characterize it.

Gross (raw) water demand The amount of water withdrawn from a water resource to meet a particular need of a water user or customer. Gross demand is the amount of water allocated in a water use permit. Gross or raw water demands are nearly always higher than net or user/customer water demands to account for treatment and distribution losses.

Groundwater Water beneath the surface of the ground, whether or not flowing through known and definite channels. Specifically, that part of the subsurface water in the saturated zone, where the water is under pressure greater than the atmosphere.

Groundwater recharge (see *Recharge*)

Harm As defined in Chapter 40E-8, F.A.C., the temporary loss of water resource functions that results from a change in surface or groundwater hydrology and takes a period of one to two years of average rainfall conditions to recover.

Headwater(s) 1) Water that is typically of higher elevation (with respect to tailwater) or on the controlled side of a structure. 2) The waters at the highest upstream point of a natural system that are considered the major source waters of the system.

Hydrogeologic unit Any rock unit or zone that because of its hydraulic properties has a distinct influence on the storage or movement of groundwater.

Hydrogeology The geology of groundwater, with emphasis on the chemistry and movement of water.

Hydrologic condition(s) The state of an area pertaining to the amount and timing of water present.

Hydrologic model A conceptual or physically based procedure for numerically simulating a process or processes that occur in a watershed.

Hydrology The scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.

Impoundment Any lake, reservoir, or other containment of surface water occupying a depression or bed in the earth's surface and having a discernible shoreline.

Infiltration The movement of water through the soil surface into the soil under the forces of gravity and capillarity.

Inflow 1) The act or process of flowing in or into. 2) The measured quantity of water that has moved into a specific location.

Injection well Refers to a well constructed to inject treated wastewater directly into the ground. Wastewater is generally forced (pumped) into the well for dispersal or storage in a designated aquifer. Injection wells are generally drilled below freshwater levels, or into unused aquifers or aquifers that do not contain drinking water.

Irrigation The application of water to crops and other plants by artificial means to supplement rainfall.

Landscape irrigation The outside watering of shrubbery, trees, lawns, grass, ground covers, vines, gardens, and other such flora, not intended for resale, which are planted and are situated in such diverse locations as residential and recreational areas, cemeteries, public, commercial and industrial establishments, and public medians and rights-of-way.

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.

Levee An embankment to prevent flooding or a continuous dike or ridge for confining the irrigation areas of land to be flooded.

Level of certainty A water supply planning goal to assure at least a 90% probability during any given year that all the needs of reasonable-beneficial water uses will be met, while sustaining water resources and related natural systems during a 1-in-10-year drought event.

Marsh A frequently or continually inundated unforested wetland characterized by emergent herbaceous vegetation adapted to saturated soil conditions.

Miccosukee Tribe of Indians of Florida A federally recognized Native American tribe, who was part of the Seminole Nation until they organized as an independent tribe in 1962. The Miccosukee Tribe of Indians of Florida is recognized by the State of Florida pursuant to Chapter 285, Florida Statutes.

Million gallons per day (mgd) A rate of flow of water equal to 133,680.56 cubic feet per day, 1.5472 cubic feet per second, or 3.0689 acre-feet per day. A flow of one million gallons per day for one year equals 1,120 acre-feet (365 million gallons).

Minimum flow and minimum water level (MFL) A flow or level established by the SFWMD pursuant to Sections 373.042 and 373.0421, F.S., for a given water body, at which further withdrawals would be significantly harmful to the water resources or ecology of the area.

Mobile irrigation lab (MIL) A vehicle furnished with irrigation evaluation equipment that is used to carry out on-site evaluations of irrigation systems and to provide recommendations on improving irrigation efficiency.

Model A computer model is a representation of a system and its operations and provides a cost-effective way to evaluate future system changes, summarize data, and help understand interactions in complex systems. Hydrologic models are used for evaluating, planning, and simulating the implementation of operations within the SFWMD's water management system under different climatic and hydrologic conditions. Water quality and ecological models are also used to evaluate other processes vital to the health of ecosystems. Groundwater flow models are a numerical representation of water flow and water quality within an aquifer or aquifer system.

Monitor well Any human-made excavation by any method to monitor fluctuations in groundwater levels, quality of underground waters, or the concentration of contaminants in underground waters.

National Geodetic Vertical Datum of 1929 (NGVD29) A geodetic datum derived from a network of information collected in the United States and Canada. It was formerly called the "Sea Level Datum of 1929" or "mean sea level." As technology has improved and the demand for greater accuracy increased, inherent inaccuracies were uncovered in NGVD29. As a result, NGVD29 has been superseded by the North American Vertical Datum (NAVD) of 1988.

Natural system(s) A self-sustaining living system that supports an interdependent network of aquatic, wetland-dependent, and upland living resources.

Outflow The measured quantity of water that has left an area or water body (through pumping or gravity) during a certain period of time.

Per capita use 1) The average amount of water used per person during a standard time period, generally per day. 2) Total use divided by the total population served.

Permeability The capacity of a porous rock, sediment, or soil for transmitting a fluid.

Planning Area The SFWMD is divided into five areas within which planning activities are focused: Upper Kissimmee Basin (part of the Central Florida Water Initiative), Lower Kissimmee Basin, Upper East Coast, Lower West Coast, and Lower East Coast.

Potable water Water that is suitable for drinking, culinary, or domestic purposes.

Potentiometric head The level to which water will rise when a well is placed in a confined aquifer.

Power Generation (PG) The difference in the amount of water withdrawn by electric power generating facilities for cooling purposes and the water returned to the hydrologic system near the point of withdrawal.

Priority Water Bodies List and Schedule Required in Section 373.042(2), F.S. of the state's five water management districts to provide the Florida Department of Environmental Protection with an annual list and schedule of specific surface waters and groundwaters with minimum flows and levels and water reservation rules that will be adopted to protect them from the effects of consumptive use allocations.

Process water Water used for nonpotable industrial use, e.g., mixing cement.

Public Supply (PS) Water supplied by water treatment facilities for potable use (drinking quality) with projected average pumpages greater than 0.10 million gallons per day.

Public Supply (PS) demand All potable (drinking quality) water supplied by water treatment plants with projected average pumpages of 0.10 million gallons per day or greater to all types of customers, not just residential.

Rapid infiltration basin A disposal method by which treated wastewater is applied in deep and permeable deposits of highly porous soils for percolation.

Raw water 1) Water that is direct from the source—groundwater or surface water—without any treatment. 2) Untreated water, usually that entering the first unit of a water treatment plant. Contrast with *Finished Water*.

Raw water demand The amount of water that must be withdrawn from the groundwater or surface water system to meet a particular need. Withdrawal demands are almost always higher than user/customer demands because of treatment and process losses, and inefficiencies associated with delivering water from the source to the end user.

Reasonable-beneficial use Use of water in such quantity as is needed for economic and efficient use for a purpose, which is both reasonable and consistent with the public interest.

Recharge (groundwater) The natural or intentional infiltration of surface water or reclaimed water into the ground to raise groundwater levels.

Reclaimed water Water that has received at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility (Rule 62-610.200, F.A.C.).

Recovery The rate and extent of return of a natural population or community to some aspect(s) of its previous condition. Because of the dynamic nature of ecological systems, the attributes of a "recovered" system should be carefully defined.

Reservoir An artificial or natural water body used for water storage. Reservoirs can be above or below ground.

Restoration The recovery of a natural system's vitality and biological and hydrological integrity to the extent that the health and ecological functions are self-sustaining over time.

Restricted allocation area An area designated within the South Florida Water Management District boundaries for which allocation restrictions are applied regarding the use of specific sources of water. The water resources in these areas are managed in response to specific sources of water in the area for which there is a lack of water availability to meet the projected needs of the region from that specific source of water.

Retrofit 1) Indoor: The replacement of existing water fixtures, appliances, and devices with more efficient fixtures, appliances, and devices for the purpose of water conservation. 2) Outdoor: The replacement or changing out of an existing irrigation system with a more efficient irrigation system, such as a conversion from an overhead sprinkler system to a micro-irrigation system. May also include rain or soil moisture sensors to increase efficiency.

Reuse The deliberate application of reclaimed water for a beneficial purpose. Criteria used to classify projects as "reuse" or "effluent disposal" are contained in Rule 62-610.810, F.A.C. The term "reuse" is synonymous with "water reuse."

Reverse osmosis A treatment process for desalting water using applied pressure to drive the feed water (source water) through a semipermeable membrane.

Rule(s) Of or pertaining to the SFWMD's regulatory programs, which are set forth in various statutes, codes, and criteria.

Runoff That component of rainfall, which is not absorbed by soil, intercepted and stored by surface water bodies, evaporated to the atmosphere, transpired and stored by plants, or infiltrated to groundwater, but which flows to a watercourse as surface water flow.

Salinity Of or relating to chemical salts, usually measured in milligrams per liter (mg/L), or practical salinity units.

Salt water (see *Seawater or Salt water*)

Saltwater interface The hypothetical surface of chloride concentration between fresh water and seawater where the chloride concentration is 250 mg/L at each point on the surface.

Saltwater intrusion The invasion of a body of fresh water by a body of salt water due to its greater density. It can occur either in surface water or groundwater bodies. The term is applied to the flooding of freshwater marshes by seawater, the upward migration of seawater into rivers and navigation channels, and the movement of seawater into freshwater aquifers along coastal regions.

Seawater or **Salt water** Water with a chloride concentration at or above 19,000 mg/L.

Seepage The passage of water or other fluid through a porous medium, such as the passage of water through an earth embankment or masonry wall. Groundwater emerging on the face of a stream bank; the slow movement of water through small cracks, pores, interstices, etc., of a material into or out of a body of surface or subsurface water. Seepage is generally expressed as flow volume per unit of time.

Seminole Tribe of Florida A federally recognized Indian Tribe organized pursuant to Section 16 of the Indian Reorganization Act of 1934 and recognized by the State of Florida pursuant to Chapter 285, Florida Statutes.

Serious harm As defined in Chapter 40E-8, F.A.C., the long-term, irreversible, or permanent loss of water resource functions resulting from a change in surface water or groundwater hydrology.

Service area The geographical region in which a water supplier has the ability and the legal right to distribute water for use.

Significant harm As defined in Chapter 40E-8, F.A.C., the temporary loss of water resource functions that results from a change in surface water or groundwater hydrology and takes more than 2 years to recover, but which is considered less severe than serious harm.

Stormwater Water that does not infiltrate but accumulates on land as a result of storm runoff, snowmelt, irrigation, or drainage from impervious surfaces.

Stormwater discharge Precipitation runoff from roadways, parking lots, and roof drains that is collected in gutters and drains. A major source of nonpoint source pollution to water bodies and sewage treatment facilities in municipalities where stormwater is combined with the flow of domestic wastewater (sewage) before entering the wastewater treatment facility.

Stormwater treatment area (STA) A system of constructed water quality treatment wetlands that use natural biological processes to reduce levels of nutrients and pollutants from surface water runoff.

Surface water Water above the soil or substrate surface, whether contained in bounds, created naturally or artificially, or diffused. Water from natural springs is classified as surface water when it exits from the spring onto the earth's surface.

Surficial aquifer system (SAS) Often the principal source of water for urban uses. This aquifer is unconfined, consisting of varying amounts of limestone and sediments that extend from the land surface to the top of an intermediate confining unit.

Treatment facility Any facility or other works used for the purpose of treating, stabilizing, or holding water or wastewater.

Tributary A stream that flows into a larger stream or other body of water.

United States Army Corps of Engineers (USACE) As part of the Department of the Army, the USACE has responsibilities in civil and military areas. In civil works, the USACE has authority for approval of dredge and fill permits in navigable waters and tributaries thereof; the USACE enforces wetlands regulations, and constructs and operates a variety of water resource projects, mostly notably reservoirs, levee, dams, and locks.

United States Geological Survey (USGS) The federal agency chartered in 1879 by Congress to classify public lands, and to examine the geologic structure, mineral resources, and products of the national domain. As part of its mission, the USGS provides information and data on the nation's rivers and streams that are useful for mitigation of hazards associated with floods and droughts, including streamflow, groundwater, water quality, and water use and availability.

Utility Any legal entity responsible for supplying potable water for a defined service area or customer.

Violation (MFL) As defined in Rule 40E-8.021, F.A.C., to fall below an adopted minimum flow or level criterion for a duration and frequency greater than specified for the MFL water body. Unless otherwise specified herein, in determining the frequency with which water flows and levels fall below an established MFL for purposes of determining an MFL violation, a "year" means 365 days from the last day of the previous MFL exceedance.

Wastewater The combination of liquid and water-carried pollutants from residences, commercial buildings, industrial plants, and institutions together with any groundwater, surface runoff, or leachate that may be present.

Water conservation The permanent, long-term reduction of daily water use. Permanent water use reduction requires the implementation of water saving technologies and measures that reduce water use while satisfying consumer needs. Water conservation is considered a demand management measure because it reduces the need for future expansion of water supply infrastructure (see *Demand management*).

Water conservation rate structure A water rate structure designed to conserve water. Examples of conservation rate structures include increasing block rates, seasonal rates, and quantity-based surcharges.

Water management The general application of practices to obtain added benefits from precipitation, water or water flow in any of a number of areas, such as irrigation, drainage, wildlife and recreation, navigation, water supply, watershed management, and water storage in soil for crop production. Watershed management is the analysis, protection, development, operation, or maintenance of the land, vegetation, and water resources of a drainage basin for the conservation of all its resources for the benefit of its residents. Watershed management for water production is concerned with the quality, quantity and timing of the water which is produced.

Water quality 1) A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose. 2) The physical, chemical, and biological condition of water as applied to a specific use. Federal and state guidelines set water quality standards based on the water's intended use, whether it is for recreation, fishing, drinking, navigation, shellfish harvesting, or agriculture.

Water reservation A legal mechanism to set aside water for the protection of fish and wildlife or the public health and safety from consumptive water use. The reservation is composed of a quantification of the water to be protected, which includes a seasonal and a location component.

Water resource development The formulation and implementation of regional water resource management strategies, including collection and evaluation of surface water and groundwater data; structural and nonstructural programs to protect and manage the water resources; development of regional water resource implementation programs; construction, operation and maintenance of major public works facilities to provide for flood control, surface and groundwater storage, and groundwater recharge augmentation; and related technical assistance to local governments and to government-owned and privately owned water utilities (Section 373.019, F.S.).

Water reuse (see *Reuse*)

Watershed A region or area bounded peripherally by a water parting and draining ultimately to a particular watercourse or body of water. Watersheds conform to federal hydrologic unit code standards and can be divided into subwatersheds and further divided into catchments, the smallest water management unit recognized by SFWMD Operations. Unlike drainage basins, which are defined by Rule, watersheds are continuously evolving as the drainage network evolves.

Water Shortage Plan(s) This effort includes provisions in Chapters 40E-21 and 40E-22, F.A.C., and identifies how water supplies are allocated to users during declared water shortages. The plan allows for supply allotments and cutbacks to be identified on a weekly basis based on the water level within Lake Okeechobee, demands, time of year, and rainfall forecasts.

Water supply development The planning, design, construction, operation, and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale, or end use (Section 373.019, F.S.).

Water Supply Plan Detailed water supply plan developed by the water management districts under Section 373.709, F.S., providing an evaluation of available water supply and projected demands at the regional scale. The planning process projects future demand for at least 20 years and recommends projects to meet identified needs.

Water table The surface of a body of unconfined groundwater at which the pressure is equal to that of the atmosphere; defined by the level where water within an unconfined aquifer stands in a well.

Water use Any use of water that reduces the supply from which it is withdrawn or diverted.

Water use permitting The issuance of permits by the South Florida Water Management District, under the authority of Chapter 40E-2, F.A.C., allowing a specified quantity of water withdrawal for consumptive use over a specified time period.

Wellfield One or more wells producing water from a groundwater source. A tract of land that contains a number of wells for supplying a large municipality or irrigation district.

Wetland An area that is inundated or saturated by surface water or groundwater with vegetation adapted for life under those soil conditions (e.g., swamps, bogs, marshes).

Withdrawal Water removed from a groundwater or surface water source for use.

Yield The quantity of water (expressed as rate of flow or total quantity per year) that can be collected for a given use from surface or groundwater sources.

The South Florida Water Management District is committed to managing and protecting our region's water resources.

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