

2018 SOUTH FLORIDA Environmental Report

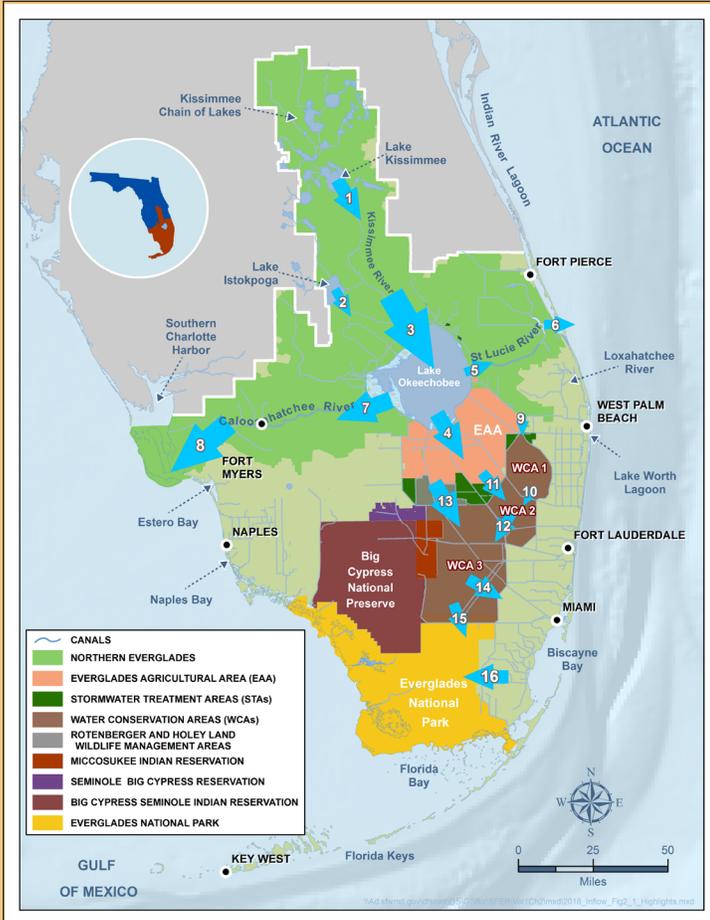


Roseate spoonbill and chicks

HIGHLIGHTS

The 2018 South Florida Environmental Report (SFER) documents a year of restoration, scientific and engineering accomplishments in the Kissimmee Basin, Lake Okeechobee, Everglades and South Florida coastal areas. The report also provides extensive peer reviewed research summaries, data analyses, financial updates and a searchable database of environmental projects.

The full report covers environmental information of Water Year 2017 (May 1, 2016–April 30, 2017) and project/budgetary information for the South Florida Water Management District (SFWMD or District) Fiscal Year 2016-2017 (October 1, 2016–September 30, 2017). The full 2,834-page report is available online at www.sfwmd.gov/sfer.



Map ID	Water Body	Notes	WY2017 Flows Subtotals (acre-feet)	WY2017 Flows (acre-feet)
1	Lake Kissimmee Outflows			856,145
2	Lake Istokpoga Outflows			429,180
3	Lake Okeechobee Total Inflows			2,460,826
4,5,7	Lake Okeechobee Total Outflows			2,672,499
4	Flows to the South from Lake Okeechobee		1,039,925	
5	Flows into the St. Lucie Canal from Lake Okeechobee		394,728	
7	Flows into the Caloosahatchee Canal from Lake Okeechobee		1,231,755	
6	Flows into the St. Lucie Estuary through St. Lucie Canal			417,032
	Lake Okeechobee Releases to St. Lucie Estuary	a, b, c	338,207	
	C-44 Basin Runoff into St. Lucie Estuary	a, b	78,825	
8	Flows into the Caloosahatchee Estuary through Caloosahatchee Canal			1,940,819
	Lake Okeechobee Releases to Caloosahatchee Estuary	a, b, d	1,010,066	
	Basin Runoff into Caloosahatchee Estuary	a, b	930,753	
9	Water Conservation Area 1 Inflows			236,245
10	Water Conservation Area 1 Outflows			164,088
11	Water Conservation Area 2 Inflows			545,550
12	Water Conservation Area 2 Outflows			499,918
13	Water Conservation Area 3 Inflows			990,095
14,1	Water Conservation Area 3 Outflows			1,169,431
5				
15,1	Everglades National Park Inflows			1,340,883
6				

- a. Calculated value.
- b. This item is not shown on the map.
- c. This is Map ID 5 less agriculture and public water supply withdrawals.
- d. This is Map ID 7 less agriculture and public water supply withdrawals.

Inflow/outflow map depicts flow numbers for acre-feet of water for Water Year 2017 (May 1, 2016- April 30, 2017) moved through the water management system.*

**An acre-foot of water is the volume needed to cover 1 acre of land with 1 foot of water.*

Inflows/Outflows Water Year 2017

During most of the Water Year 2017 dry season (October 2016 – April 2017), most of the District regions were drier than average and drought concern progressively increased. Rainfall deficits continued month after month and water levels consistently declined in lakes and Everglades Water Conservation Areas (WCAs). The District’s Governing Board issued a drought warning on April 13, 2017, to bring awareness of the dry conditions and encourage water conservation. A hydrologic drought never developed due to sufficient storage in lakes and water conservation areas. Groundwater conditions were normal with no immediate concern for agricultural or urban water supply.

Even though Water Year 2017 was drier than average, there were four tropical systems that contributed rainfall to the District area directly or by influence: Tropical Storm Colin (June 5–7, 2016), Hurricane Hermine (August 27–September 2, 2016), Tropical Storm Julia (September 12–13, 2016) and Hurricane Matthew (October 4–7, 2016).

Everglades Water Quality

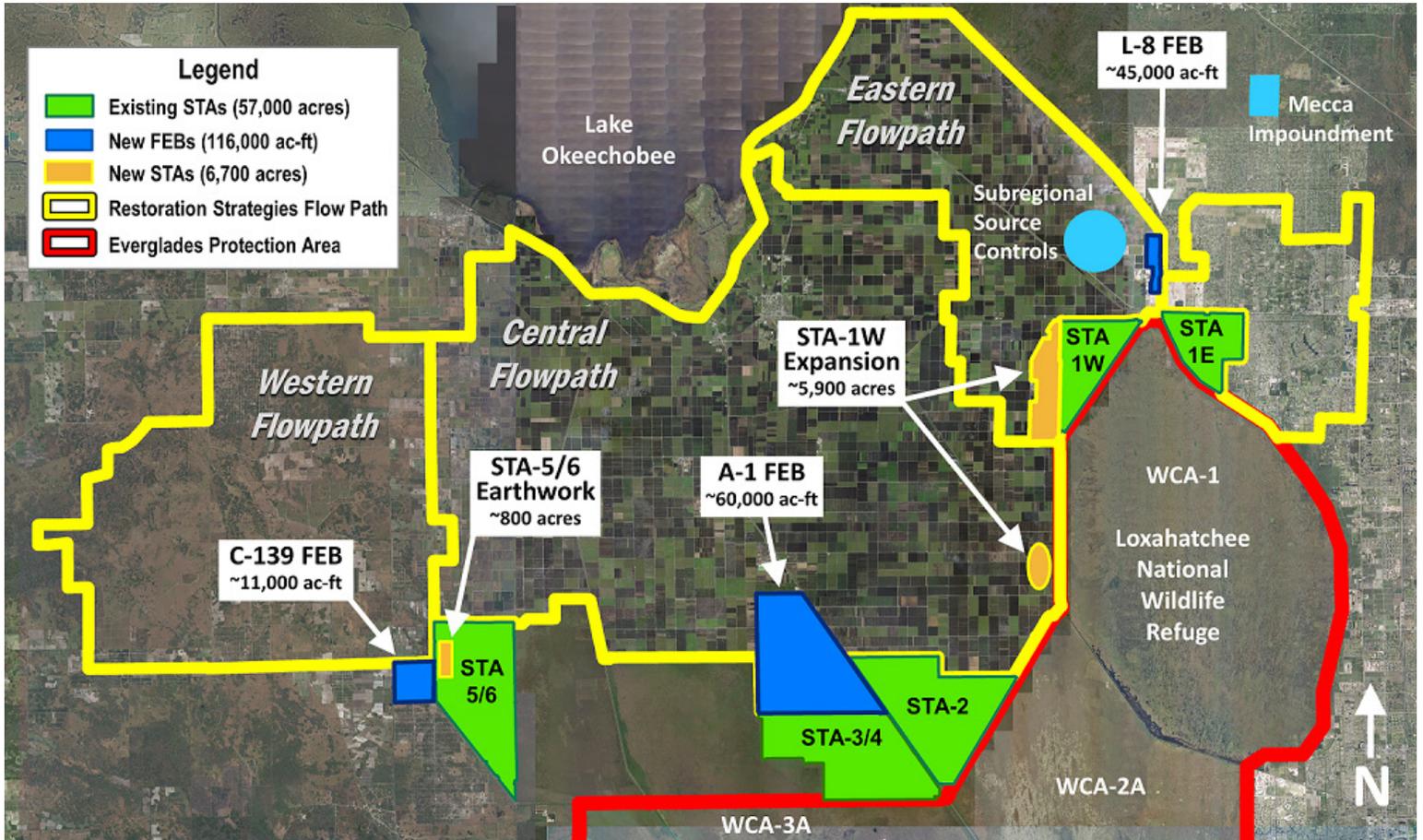
Everglades water quality continues to show improvement.

Unimpacted portions of the Everglades WCAs passed all four parts of the state’s total phosphorus (TP) rule as indicated in the most recent five-year TP criterion assessment. In Water Year 2017, a

monitoring station in the Arthur R. Marshall Loxahatchee National Wildlife Refuge was transitioned from impacted to unimpacted reflecting the ongoing trend of continued improvement in water quality throughout the Everglades WCAs. The investments made over the last two decades are making a difference improving Everglades water quality with now more than 90% of the Everglades Protection Area at or below 10 parts per billion phosphorus.

Everglades Stormwater Treatment Areas

The Everglades Stormwater Treatment Areas (STAs) reduced TP outflow concentrations to an average of 15 micrograms per liter (or parts per billion) in Water Year 2017. This is the lowest overall annual outflow concentration achieved by the STAs to date. Over a 23-year operational history, the Everglades STAs have treated approximately 18.6 million acre-feet of water and have retained 2,329 metric tons of TP. In Water Year 2017, with 57,000 acres of treatment area, the STAs treated 1.1 million acre-feet of water—more than 851,000 acre-feet from agricultural and urban runoff and 239,000 acre-feet from Lake Okeechobee. STAs reduced both inflow TP load and concentration by 84%, keeping 108 metric tons of TP from entering the Everglades Protection Area during Water Year 2017.



Restoration Strategies include 6,500 acres of new STAs and 116,000 acre-feet of additional water storage utilizing flow equalization basins.



The STA 1-West Expansion project is ongoing and construction of the first phase is expected to be completed December 31, 2018.



L-8 Divide Structure allows for efficient L-8 FEB outflow operations and enables L-8 FEB water to flow south to STA-1 East and STA-1 West.

- Construction of the L-8 Divide Structure (G-541) was completed in July 2016 and the structure is operational. G-541 enables the efficient transfer of water into and out of the L-8 FEB.
- Construction of the S-375 Expansion (G-716), located in STA-1 East, was completed in April 2017. During high flow events in the C-51 West basin or when STA-1 East is receiving optimal flows, G-716 in combination with S-375, enables stormwater runoff to be directed to the L-8 FEB for storage prior to being redirected to STA-1 East and/or STA-1 West for treatment.
- The first phase (4,300 acres of effective treatment area out of a total of 5,900 acres) of the STA-1 West Expansion project is ongoing and construction is expected to be completed by the consent order deadline of December 31, 2018. A construction status report was completed in February 2017 ahead of the consent order deadline.

Ongoing conveyance improvements

- G-341 Related Conveyance Improvements project is a multi-phase multi-year project intended to improve conveyance within the EAA, specifically in the Bolles East, Ocean and Hillsboro canals.
 - Bolles East Canal Segment 1 (~1.2 miles) construction started in August 2015 and was completed in September 2016.
 - Bolles East Canal Segment 2 (~1 mile) construction started in July 2016 and was completed in March 2017.
 - Bolles East Canal Segment 3 (~3.2 miles) construction started in May 2017 and is expected to be complete by February 2019.
 - Construction of a new Duda Road bridge started in June 2016 and was completed in November 2016. Coordination with landowners on the remaining bridges started in June 2017.

Progress has been made in implementing the Restoration Strategies Science Plan, which began implementation in 2013.

The primary objective of the scientific studies under this plan is to investigate ways for improving operation and management of the STAs to optimize treatment performance and help achieve the water quality-based effluent limit for TP. Of the nine initial studies, two have been completed and another two are nearing completion. As of Water Year 2017, the studies have accomplished the following:

- Produced data that improves representation of hydraulics within the Everglades STAs. This information is being used to update the Water Depth Assessment Tool for more accurate estimation of water depth in the STAs and FEBs.

What is phosphorus?

Although phosphorus is a vital nutrient in all natural systems, it is also a fertilizer component. It flows across the landscape in stormwater runoff (urban and agriculture), harming natural areas by promoting algae growth and an overabundance of non-native plants, crowding out natural vegetation and disrupting food sources and habitats used by native wildlife. The Everglades is naturally a low-nutrient system. Even small amounts of additional nutrients can upset the ecological balance needed by the native plants and animals in the historic “River of Grass.” Phosphorus is normally recorded in micrograms per liter ($\mu\text{g}/\text{L}$) or parts per billion (ppb). In this document, total phosphorus (TP) is used to denote measurement when monitoring phosphorus found in water bodies or as it relates to inflows and outflows of water. Phosphorus is used when referencing all other aspects of the nutrient in general terms.

What is an STA?

Stormwater treatment areas (STAs) are large, constructed wetlands with inflow and outflow structures for controlling water movement. Aquatic plants in the STAs remove and store excess nutrients (phosphorus) found in the stormwater runoff through growth and the accumulation of dead plant material in the layers of sediment. This natural process cleanses the water before it is moved out of the STA and into the Everglades or other water bodies.

What is an FEB?

Flow equalization basins (FEBs) are constructed impoundments designed to capture stormwater runoff and provide a steadier flow of water to the STAs, helping to maintain desired water levels needed to achieve optimal water quality improvement performance.

How much is an acre-foot?

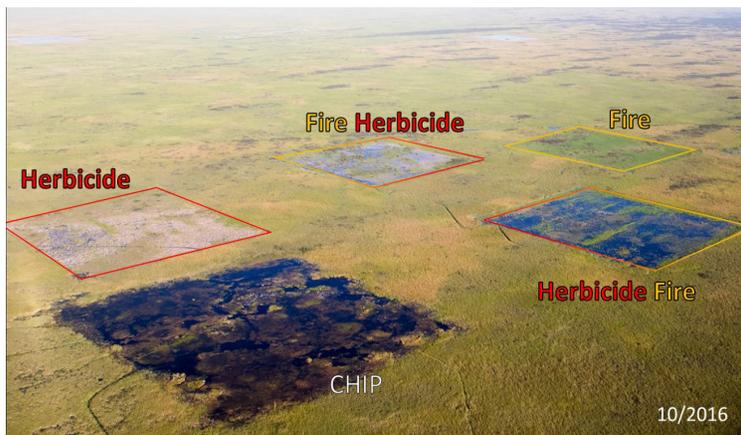
An acre-foot is the volume needed to cover 1 acre of land with 1 foot, or 325,851 gallons, of water.



One of the multiple monitoring platforms inside STA-2, as part of the Restoration Strategies Science Plan implementation.

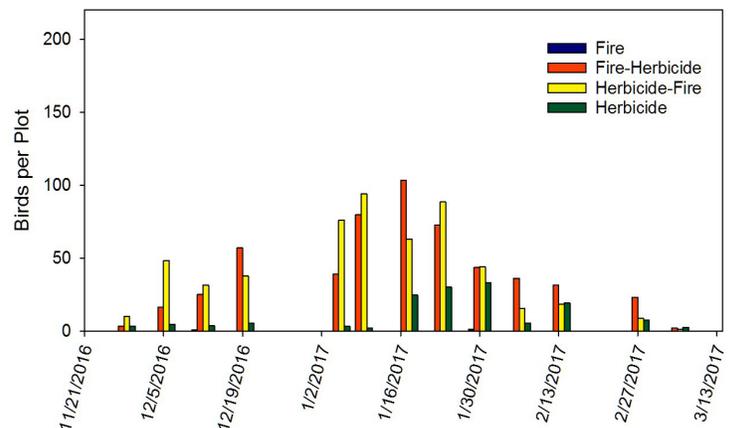
An optimization tool that approximates potential outflow TP concentration under operational flow routing regimes was also developed.

- Determined that there are several technologies and soil amendments with potential to lower phosphorus concentrations. Due to uncertainties in treatment efficacy, impacts to STA operations and downstream marsh and high costs, no further evaluation on amendments is planned at this time.
- Collected sufficient information to better understand the performance of the STA-3/4 periphyton-based STA and the conditions influencing that performance. This treatment area, where muck was removed during construction, achieved an outflow TP concentration of 8 micrograms per liter ($\mu\text{g/L}$) in Water Year 2017 and consistently achieved 13 $\mu\text{g/L}$ or less in the ten years of its operation. Ultra-low outflow concentrations were maintained despite short-duration high pulsed flows, sustained moderate flows and water depths up to 2.2 feet. Limerock cap was also found to be a promising alternative to muck removal in areas where it is not feasible.

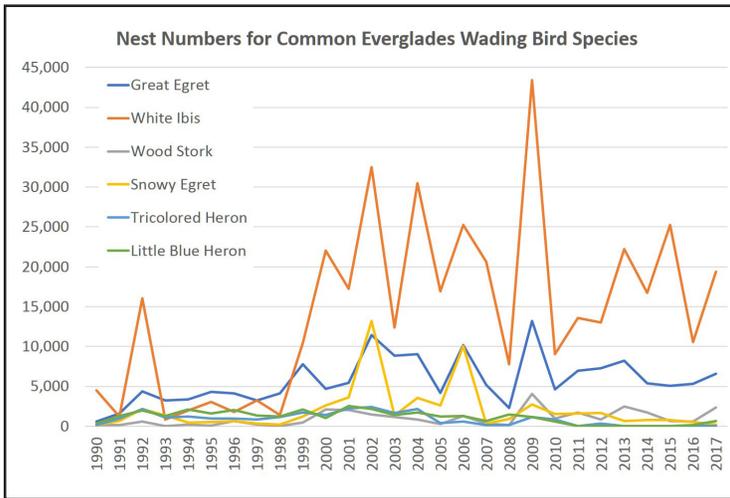


Aerial photo of four of the Active Marsh Improvement plots taken in October 2016, two months after burn treatment and nine months after herbicide treatment. The tan color within the Herbicide plot is dead cattail; the bright green in the Fire plot is newly invaded cattail. In the Fire Herbicide and Herbicide Fire plots, there is considerable open water area. In the foreground is a more mature plot (labeled CHIP for the Cattail Habitat Improvement Project). This plot, created in 2006, is a wet prairie of spikerush, chara, algae, duck potato and open water.

- New data are helping us understand the uptake and release of phosphorus in the STAs and determine the factors that influence outflow TP concentrations. A clear gradient in TP concentration was observed from inflow to outflow in well performing flow-ways. Soluble reactive phosphorus, which is the form available to algae, microorganisms and plants, is generally removed within the first half of the treatment flow-way. When the system is not flowing, TP concentration increases, which has been attributed to generation of particulate phosphorus within the cell but not to flux with soil porewater.
- Determined that there is a positive relationship between high flows velocities and increase in TP in inflow canals, primarily in the form of particulate phosphorus, which further supports the importance of FEBs.
- Monitoring of cattail communities continued in selected cells that have shown cattail decline in the past. A significant decline in cattail root biomass has been observed in the first year of monitoring; there was a complete decline in cattail community in one of the study cells. Daily water depths exceeded targets a majority of the time, with more frequent deeper water levels in STA-3/4.
- Initial information from these ongoing studies is being used to refine STA operations, including use of the A-1 FEB, to do the following:
 - moderate loading and avoid stagnant conditions.
 - better estimate nutrient budgets for individual STA cells
 - identify new management techniques such as soil inversion or limerock capping.
 - better understand which vegetation provides the best phosphorus uptake and resiliency under a variety of flow, load and depth conditions.



Wading bird counts per week in all Active Marsh Improvement plots from November 2016 to March 2017. The plots consistently attracting the largest number of wading birds were those treated with a combination of herbicide and fire. (Fire-Herbicide plots were first treated with fire then herbicide. Herbicide-Fire plots were first treated with herbicide then fire.)



Historical nesting numbers in the Everglades for six wading bird species. Other wading bird species observed nesting in the Everglades in 2017 include roseate spoonbill, great blue heron, black-crowned night heron and yellow-crowned night heron.

Everglades Ecology and Invasive Species

Restoration efforts and operational needs have benefited from monitoring, modeling and assessment of Everglades hydrology, ecosystem function and landscape change.

Programs and mandates which benefited include the Comprehensive Everglades Restoration Plan (CERP), Everglades Forever Act (EFA), Long-term Plan for Achieving Water Quality Goals in the Everglades Protection Area, minimum flows and minimum water levels (MFLs), regulation and operational schedules and Restoration Strategies. Some key findings follow:

- The largest and most cutting-edge landscape science in the Everglades continues to be the Decomp Physical Model (DPM), which is a landscape-level field experiment aimed at quantifying the restoration benefits of increased flow and alternate canal backfilling methods to the Everglades ridge and slough landscape. The fourth DPM flow event provided information on hydrologic connectivity of the landscape, fish movement and changing community structure, slough vegetation shifting and generation of hot spots of water and nutrient movement.
- The Active Marsh Improvement project in Water Conservation Area 2 found further evidence that burning, combined with herbicide application, provides immediate open water habitat for submerged aquatic vegetation and foraging habitat for wading birds.
- An estimated 34,672 wading bird nests were started in the Everglades. This is 12.9 percent higher than the decadal average. The federally threatened wood stork produced 2,359 nests, which is an 87.4 percent increase over the average for the past five years. This was the third highest nesting effort for wood storks during the last 54 years. Storks tend to nest at the same location from year to year, but in 2017 they

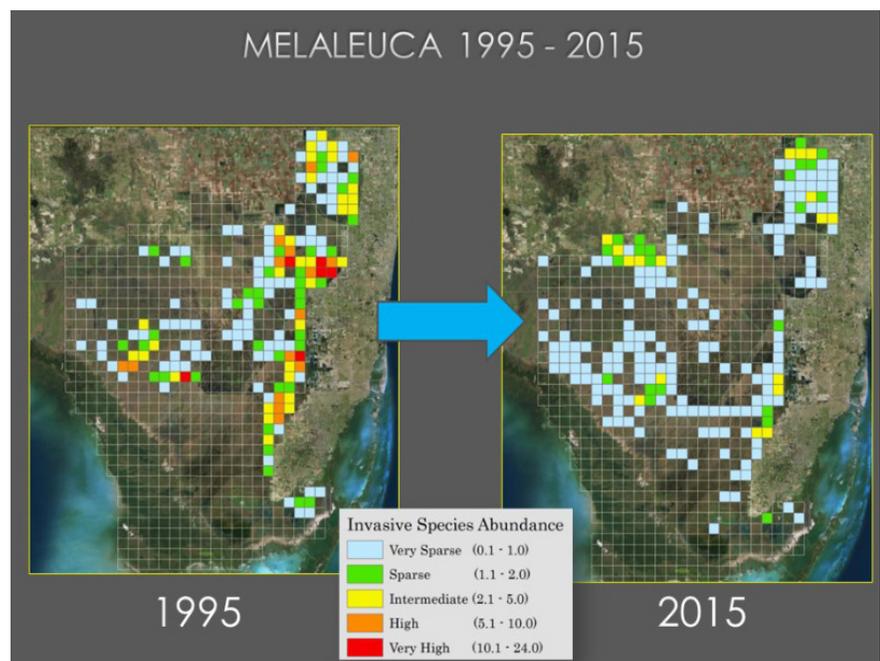
established two additional colony sites. Improved nesting was a result of the previously wet conditions, which produced large amounts of fish prey, followed by a long drydown during the nesting season, which concentrated the prey at high densities and made it available to the birds.

- The presence of grey snapper and black drum in the McCormick Creek system, which drains into Florida Bay, suggests the potential that the system serves as an important nursery habitat for recreational species.
- Shoal grass (*Halodule wrightii*) may be expanding into areas in which turtlegrass (*Thalassia testudinum*) has died off within Florida Bay suggesting that recovery of submerged aquatic vegetation has begun.
- Large, productive meadows of widgeon grass (*Ruppia* spp.) provide critical habitat in Florida Bay and maintenance of a viable seed bank of this plant is critical to maintain populations of this species at the transition zone between the freshwater marsh and Florida Bay.

Efforts at Controlling Exotic Vegetation Demonstrate Successes and Challenges

The SFWMD has one of the country's largest invasive plant management programs, controlling aquatic and terrestrial vegetation systemwide. The interagency melaleuca management program is a national model for regional, interagency invasive plant control programs. Melaleuca has been systematically controlled from Water Conservation Areas 2 and 3 and Lake Okeechobee and is now under maintenance control in these regions. Efforts are underway by the National Park Service to reach maintenance control of melaleuca in Everglades National Park and Big Cypress National Preserve.

The United States Department of Agriculture's Agricultural Research Service biological control laboratory in Davie, Florida,



Melaleuca coverage within the Everglades in 1995 and 2015.

District python hunter, Donna Kalil (right) with assistant Ann Vega, after capturing a 3.1-meter (10-foot) python on the L-28 levee in Miami-Dade County.



was funded and built as a component of CERP. It now supports biological control agent rearing and field release for melaleuca, Old World climbing fern, water hyacinth, air potato and other invasive nonindigenous plant species, but significant challenges to systemwide invasive plant management remain.

The continued expansion of Old World climbing fern in the Kissimmee River Floodplain and the Arthur R. Marshall Loxahatchee National Wildlife Refuge is among the most formidable wetland invasive plant problems in the state. Both of these ecosystems are the focus of intensified invasive plant control efforts by the District, Florida Fish and Wildlife Conservation Commission and other cooperating agencies.

Efforts to Control Exotic Animals Continue and Expand

Existing programs continue such as the University of Florida Everglades Invasive Reptile and Amphibian Monitoring Program, which is carried out in cooperation with support from the District and other state and federal agencies. Also, federal, state, local and tribal partners continued efforts to control expanding populations of several invasive animal species including Burmese pythons, Argentine black and white tegus and spectacled caiman. New in Fiscal Year 2016-2017 are independent python hunter incentive programs managed by the District and Florida Fish and Wildlife Conservation Commission. To date, the two programs have resulted in the removal of more than 800 Burmese pythons.

Northern Everglades and Estuaries Protection Program

Projects and initiatives targeting improvements in water quality and water storage in the Northern Everglades are progressing. Water Year 2017 highlights follow:

- **Florida Department of Environmental Protection (FDEP) Basin Management Action Plan Update:** Projects designed to implement nutrient reductions toward achieving the total maximum daily loads (TMDLs) for the Northern Everglades basins continued. Annual progress reports for the St. Lucie Estuary, Caloosahatchee Estuary and Lake Okeechobee basins are available at <https://floridadep.gov/dear/water-quality-restoration/content/basin-management-action-plans-bmaps>.
- **Lake Okeechobee Watershed Construction Projects:** Construction of the Rolling Meadows Wetland Restoration – Phase I Project was completed. Construction activities for the southern section of the Lakeside Ranch STA – Phase II Project

and the Kissimmee River Restoration Project, in partnership with the U.S. Army Corps of Engineers (USACE), continued. Operations also continued for the Lakeside Ranch STA (Phase I), Taylor Creek STA and Nubbin Slough STA projects. Planning is also underway for potential deep injection wells.

- **Lake Okeechobee Watershed Restoration Project (LOWRP):**

LOWRP is a joint planning effort between SFWMD and the USACE, called for in CERP, to identify opportunities to increase water storage capacity in the lake's watershed that will improve the lake's water levels, reduce the frequency and severity of harmful discharges to the northern estuaries, restore wetlands and improve existing and future water supplies. A plan including above and belowground storage and wetland restoration components is under development. Planning will be complete in 2019.

- **St. Lucie and Caloosahatchee River Watersheds Construction Projects:**

Construction of the CERP Caloosahatchee River (C-43) West Basin Storage Reservoir and Indian River Lagoon-South — C-44 Reservoir and STA projects continued. Combined, they will provide more than 220,000 acre-feet of additional water storage. Watershed construction project-related work that began this year included operations and monitoring of Phase I mesocosms of the C-43 Water Quality Treatment and Testing Facility Project, construction of the Lake Hicpochee Hydrologic Enhancement – North Project, and a remediation project for water storage at Ten Mile Creek.

- **Dispersed Water Management Program:** The average annual storage benefit provided by the completed projects within the program through Water Year 2017 is estimated to be approximately 86,000 acre-feet per year. The first of six Northern Everglades Public-Private Partnership (NE-PPP) projects, Caulkins Water Farm Expansion is completed and began operation in 2017. It is anticipated to divert more than 60,000 acre-feet per year of water from the C-44 canal that would otherwise be discharged to the St. Lucie Estuary.

- **Florida Department of Agriculture and Consumer Services (FDACS) Agricultural Non-Point Best Management Practices:**

A poultry manual was adopted and development began on a small farms manual. Revisions to the cow/calf, sod and specialty fruit and nut manuals began. As of March 31, 2017, FDACS has enrolled 1,837,247 acres in the Lake Okeechobee Watershed; 300,106 acres in the St. Lucie River Watershed; and 431,124 acres in the Caloosahatchee River Watershed. Further details are available at www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy.

Lake Okeechobee Conditions for Water Year 2017

TP loads to the lake were 59 metric tons less than the previous water year, mostly due to an extremely dry November to April period. Vegetation improvements were seen in managed portions of the interior marsh, but cattail expansion was significant. Fish populations continue to be in good condition and stable with the black crappie population showing signs of growth.



Treated and burned cattail sites in Moonshine Bay, 18 months post burn (April 2017). Thousands of wading birds were commonly observed during spring 2017 foraging in open habitat created by the 2015 cattail treatments.

The combination of long, steady water level recessions; a lack of stage reversals; drying conditions in the surrounding watersheds; and recently managed areas that created open marsh habitat at lower elevations likely all contributed to the high numbers of foraging wading birds and increase in nesting in 2016 relative to recent years. Large-scale management of cattail and torpedograss highlighted in last year's SFER resulted in dramatic habitat improvements for the Everglades snail kite and wading birds within Moonshine Bay. Numbers of wading birds found foraging in the lake in the spring were the highest since surveys began in 2010 and nesting efforts on the lake were the highest since 2013.

Oyster Densities in St. Lucie and Caloosahatchee Estuaries

Oyster densities within the St. Lucie Estuary were stable in Water Year 2017. This stability period follows declines that occurred over the past two years after maximum levels were recorded during the Water Year 2015 dry season. In the Caloosahatchee River, oyster densities increased slightly compared to the last two water years. For both estuaries, this water year's inflow conditions were conducive to oyster larval recruitment and served to maintain the parasite Dermo at low levels. Dermo can infect blood cells of oysters, affecting their health and reproduction. Dermo is more prevalent at higher salinities.

Kissimmee River Restoration

Construction for the Kissimmee River Restoration Project nears completion. Construction (backfilling of the C-38 canal) for Reach 3 (Phase III) was completed in September 2016. Reach 2 (Phase II) construction is in progress and scheduled for completion in August 2018. When all work is complete in 2019, the Kissimmee River Restoration project will restore approximately 40 miles of the historic Kissimmee River and inundation of approximately 25,000 acres of floodplain wetlands. Over 320 species of fish and wildlife are expected to benefit.

Status of Restoration Projects

Volume III of the 2018 SFER provides an annual update on environmental restoration projects to comply with permits issued by the Florida Department of Environmental Protection under the Comprehensive Everglades Restoration Plan Regulation Act (CERPRA), Everglades Forever Act (EFA), Northern Everglades and Estuaries Protection Program (NEEPP), and Environmental Resource Permit (ERP) state statutes. Currently, annual updates are provided for 29 projects: 1 project in pre-construction, 7 projects under construction, 18 projects operating and 3 with a phase under construction while at least one other phase is operating. See



In Water Year 2017, construction was completed for Kissimmee River Restoration Project Phase I MacArthur Ditch Backfill Project.

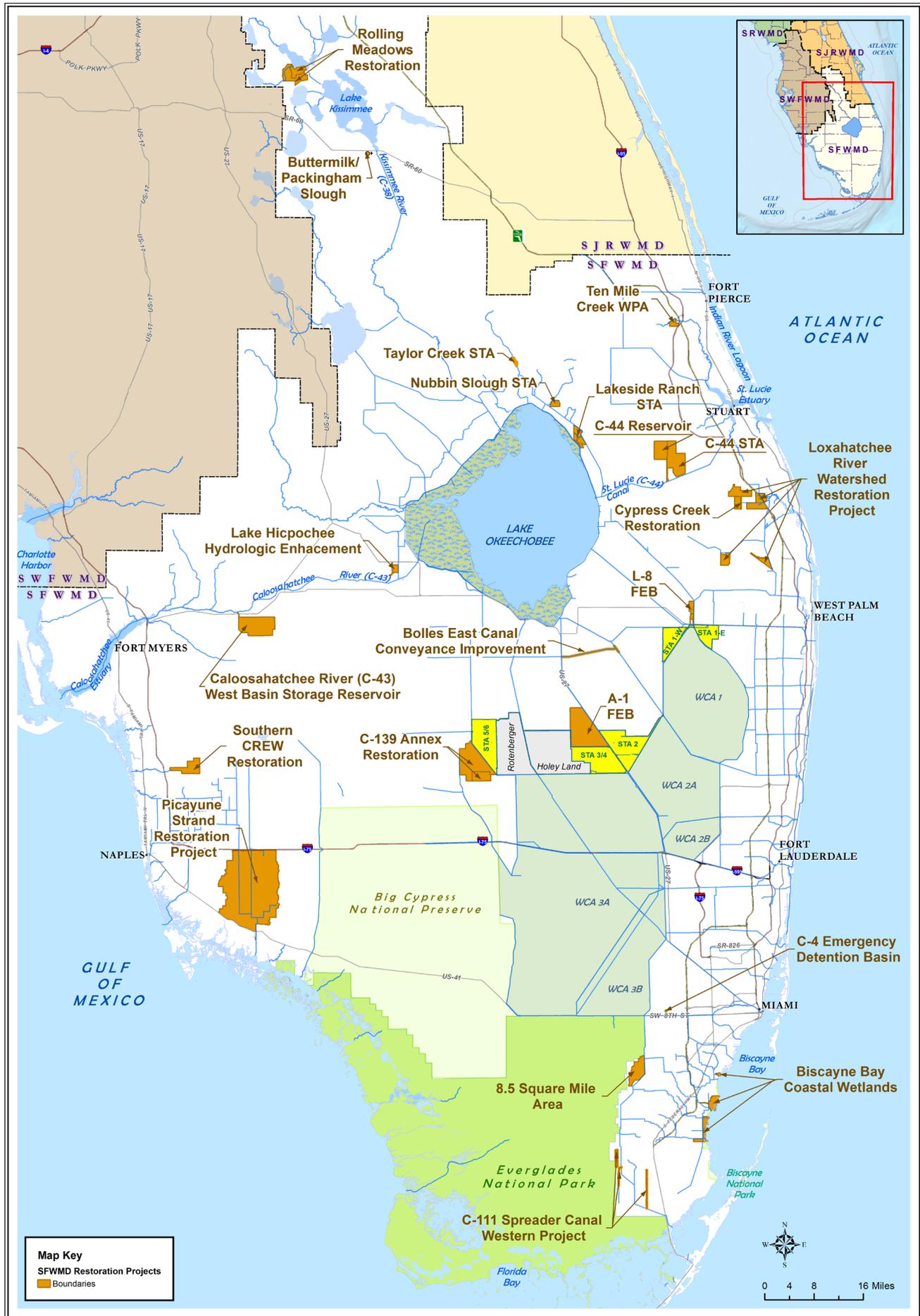
project map on page 10 for those restoration projects discussed in the Volume III.

Comprehensive Everglades Restoration Plan (CERP) Progress Picayune Strand Restoration Project:

- Progress to date on this project, which will restore the hydrology and ecology of the Picayune Strand area by establishing predevelopment sheet flows and hydroperiods, includes completed construction of two pump stations and active construction on a third, the plugging of the Prairie and Merritt canals, road removal east of Merritt canal and construction of the Manatee Mitigation Feature.
- Backfilling and plugging of the Prairie Canal, located near Naples, has substantially restored the hydrology and reduced the severity of fires for lands east of the canal, which is facilitating recovery of natural vegetation. Similar results are expected in the other areas once construction is completed.
- The Manatee Mitigation Feature operated for the first time in Water Year 2017.
- All construction will be complete in 2022.

Biscayne Bay Coastal Wetlands:

- This project, the first CERP project constructed with direct benefits to Biscayne National Park and Biscayne Bay, was designed to address issues with nearshore hypersalinity and coastal degradation by restoring more natural patterns of freshwater delivery into Biscayne Bay.
- Short-term hydrologic and water quality improvements continued to be realized for the CERP water quality component within the Deering Estate and in water entering Biscayne Bay.
- Timing of flows to wetlands along the flow-way also improved.
- Wetland stage and inundation have increased in Cutler Creek/ Slough.
- The District completed installation of a temporary electric pump in March 2016 to help promote redistribution of water flow through the L-31E culverts into remnant tidal creeks, which should improve nearshore salinity regimes within Biscayne Bay.



Restoration Project Map

CERP Construction in Progress**Caloosahatchee River (C-43) West Basin Storage Reservoir:**

- An additional \$37 million was appropriated to expedite the project in Fiscal Year 2016-2017 and \$106.6 million in Fiscal Year 2017-2018.
- Once complete, the 10,700-acre reservoir with an average water depth of 17 feet (deepest 25 feet) will have the capacity to store 170,000 acre-feet of water from Lake Okeechobee and runoff from the basin that is currently discharged to the river. The water will then be released when needed so the Caloosahatchee River and Estuary will have a more stable salinity regime.
- Total project cost is approximately \$548 million.
- Planned project completion date is 2022.

C-44 Reservoir and STA:

- This project, which is part of the Indian River Lagoon-South project, will capture, store and treat runoff from the C-44/S-153 basin prior to discharge to the St. Lucie Estuary, reducing damaging freshwater discharges, decreasing nutrient load and maintaining desirable salinity regimes.
- Once complete, the 3,400-acre reservoir with an average water depth of 15 feet will have the capacity to store 50,600 acre-feet of water. The STA will be approximately 6,300 acres.
- Total project cost is approximately \$575 million.
- Planned project completion date is 2021.

Southern Corkscrew Regional Ecosystem Watershed (CREW):

- Nearing completion, this project will provide significant benefits to the ecosystem including restoring wetlands and the natural sheet flow of water, improving regional flood protection drainage, increasing water storage and aquifer recharge capability and reducing the amount of nutrient-rich stormwater reaching the Imperial River and Estero Bay.
- Phase II of the project consists of ditch backfilling, ditch plugging, road degradation and construction of low water crossings to allow for reestablishment of hydrologic conditions similar to those present prior to development attempts.

Ten Mile Creek Water Preserve Area (WPA):

- This remediation project for water storage to help moderate the salinity levels and reduce sediment loads in the St. Lucie River and Estuary was substantially completed in June 2017.

Everglades Forever Act (EFA) Progress**L-8 Flow Equalization Basin (FEB):**

- Once a component of CERP as the L-8 Reservoir, this project was repurposed for use as an FEB as part of Restoration Strategies.
- Located in western Palm Beach County, project construction is complete and Governor Scott presided over a ribbon cutting event in November 2017.
- This deep belowground reservoir is capable of storing 45,000 acre-feet of water.

A-1 Flow Equalization Basin (FEB):

- The A-1 FEB, a critical component of Restoration Strategies, is an approximately 15,000-acre aboveground impoundment capable of storing approximately 60,000 acre-feet of water.

- The main purpose of the FEB is to attenuate peak stormwater runoff flows, temporarily store stormwater runoff and improve delivery rates to STA-2 and STA-3/4, which will enhance the operation and phosphorus treatment performance of the STAs.
- Though not designed to be a water quality treatment facility, the A-1 FEB reduced TP loads by 85% (27.8 metric tons) and the flow-weighted mean TP concentrations from 84 to 15 micrograms per liter.

Bolles East (L-16) Canal Conveyance Improvement:

- Nearing completion, construction will increase the conveyance of water between the Hillsboro and North New River canals to improve the efficiency of the Everglades STAs and help reduce flooding and improve irrigation water supply for adjacent farmlands.

Non-Everglades Construction Projects:

- In January 2017, construction of two additional Non-ECP structures, S-34 and S-151 began. These activities are expected to be completed in October 2018 and May 2018, respectively.

Northern Everglades and Estuaries Protection Program (NEEPP) Progress**Lake Hicpochee Hydrologic Enhancement:**

- Located in the East Caloosahatchee Basin, Phase I of the project will provide shallow water storage, rehydrate a portion of the lake bed to promote habitat restoration, provide storage and increase capacity for ancillary water quality enhancements.
- Construction began in March 2017 and is expected to be complete in September 2018.

Rolling Meadows Restoration Project:

- Construction is completed on the Parcel B Wetland Restoration Phase.
- This project will restore the natural habitat by establishing connectivity to Lake Hatchineha and by the diversion of some of the flows from Catfish Creek into the parcel.

Taylor Creek STA

- This STA, one of two pilot-scale STAs being implemented north of Lake Okeechobee, has an effective treatment area of 118 acres and is predicted to remove up to 2 metric tons of TP from the Taylor Creek drainage basin per year.
- This STA demonstrated a net reduction of 16% in TP loads and concentrations in Water Year 2017.

Nubbin Slough STA

- The second pilot-scale STA located north of Lake Okeechobee, which will treat runoff from Nubbin Slough, is designed for an annual average TP load reduction of 3 to 5 metric tons per year.
- This STA became operational in September 2016; outflow was discharged for only 63 days during the water year and during the short period of discharge, the TP flow-weighted mean concentration at the outflow stations was lower than at the inflow station.

Lakeside Ranch STA

- Located in western Martin County on lands adjacent to Lake Okeechobee, this STA currently has an effective treatment area of 919 acres. Phase II, nearing completion, will add 788 acres of effective treatment area.
- The STA achieved a TP load reduction of 55% in WY2017.

Environmental Resource Permit (ERP) Progress**Loxahatchee River Watershed Restoration Project**

- G-160 and G-161 components of the Loxahatchee River Watershed Restoration Project are designed to restore a more natural hydroperiod to the Loxahatchee Slough while increasing flows to the Northwest Fork of the Loxahatchee River.
- Operation of the structures was successful in maintaining the required water level range in the Loxahatchee Slough during WY2017.

C-4 Emergency Detention Basin

- This project, which provides 3,264 acre-feet of water storage, was constructed to reduce the magnitude, duration and frequency of flooding of low-lying areas within Sweetwater and West Miami.
- During WY2017, the project operated as designed.

Buttermilk/Packingham Slough, G-700 Pump Station Bypass Removal

- This project implements an engineering solution as opposed to acquiring real estate to provide flood protection related to the Kissimmee River Restoration Project.
- During WY2017, the project operated as designed.

Cypress Creek Restoration Project

- The project will restore hydroperiods and improve natural storage to 4,572 acres of wetlands, thus improving the timing of flows to the Northwest Fork of the Loxahatchee River.
- The portions of the project completed to date operated as designed during WY2017.

C-139 Annex Restoration

- This project will restore hydrologic conditions to 7,813 acres of former citrus grove, contribute to improved water quality in the Everglades and restore historic habitats while maintaining flood protection for surrounding properties
- Construction of Phase I is substantially complete and vegetation establishment is under way.

Funding of Restoration Projects

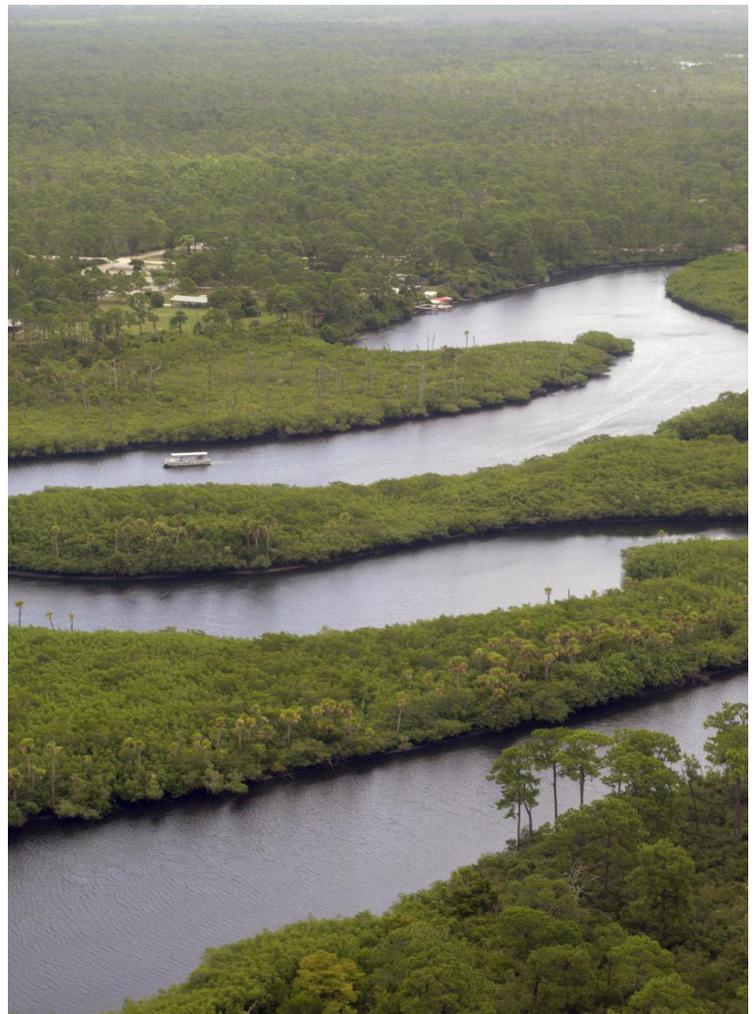
Governor Scott signed the Legacy Florida bill in April 2016. This bill provides up to \$200 million annually in dedicated funding for Everglades restoration beginning in Fiscal Year 2017-2018. The Fiscal Year 2016-2017 Florida First budget signed by Governor Scott provides more than \$100 million for CERP projects and \$56.8 million for NEEPP projects. Approximately \$32 million was also provided in Fiscal Year 2016-2017 for Restoration Strategies projects.

Senate Bill 2017-10: Submittal of Progress Report on Implementation

In 2017, Senate Bill 10 was approved by the Florida Legislature and signed into law by Governor Rick Scott, providing funding to the District to expedite planning, design and construction of the EAA Storage Reservoir, an original component of CERP. The project goals are to significantly reduce the volume of damaging discharges from Lake Okeechobee to the northern estuaries and provide additional water storage, treatment and conveyance south to the Everglades.



The District is dedicated to planning, designing and constructing the project. Alternatives were developed that will reduce the number of discharge events from Lake Okeechobee to the northern estuaries, in conjunction with authorized projects, by almost 63% while accomplishing the goals and objectives for flow south identified by CERP, achieving state water quality standards and complying with state and federal laws. In January 2018, a comprehensive progress report was submitted to the Legislature and was received favorably.



The Loxahatchee River Watershed Restoration Project will restore a more natural hydroperiod to the Loxahatchee Slough and increase flows to the Northwest Fork of the Loxahatchee River.

Florida Bay

SFWMD initiated implementation of an innovative plan to deliver needed fresh water to Florida Bay, an immediate action to help reduce salinity levels in the bay and promote recovery of seagrasses. Operational improvements increase flow of fresh water directly into Taylor Slough in Everglades National Park, a major source of fresh water for the bay. Additional water reaching the bay during both dry and wet seasons meets stringent water quality standards.

Florida Bay project features completed and underway include installing 10 plugs in the L-31W Canal; connecting canals; sealing the S-332D Discharge Basin; rebuilding, installing and modifying levees and weirs and increasing pump capacity at two pump stations. A comprehensive ecological and water quality monitoring plan was initiated to evaluate the Florida Bay project and the effects of increased flow.

Five-Year Capital Improvement Plan

Over the next five years, SFWMD estimates spending \$1.9 billion on projects contained in its Five-Year Capital Improvements Plan. The plan reflects ongoing commitments to District Governing Board priorities for Fiscal Year 2017-2018 through Fiscal Year 2021-2022, including an estimated \$1.6 billion for restoration projects. The remaining funds address agency priorities related to flood control and water supply throughout the water management system.

The Fiscal Year 2017-2018 adopted budget included a planned capital improvements project budget of \$375 million. Based on the revised estimated project schedules, the District's Five-Year Capital Improvement Plan was adjusted to a total of \$321 million for Fiscal Year 2017-2018. The difference of \$54 million is largely attributed to the rebudget in the Fiscal Year 2018-2019 preliminary budget from prior year state appropriations for the Caloosahatchee River (C-43) West Basin Storage Reservoir for upcoming contracts and the redirect within the current year of cooperative funding to cover Hurricane Irma recovery costs.

Consolidated Project Database

The online SFER Consolidated Project Database at www.sfwmd.gov/sfer provides rapid data sorting, searches and retrieval for comprehensive updates on many projects referenced in the 2018 SFER.

The complete 2018 South Florida Environmental Report is available online at www.sfwmd.gov/sfer.



Florida Bay Project - In 2017, the District constructed project features and implemented operational measures to get more fresh water to flow into Taylor Slough to help reduce salinity levels and promote the recovery of seagrasses. In today's managed system, the largest single source of fresh water into Florida Bay is direct rainfall over the bay itself, which accounts for more than 45% of its freshwater input. The other major source for freshwater flows into the bay is Taylor Slough in the southeastern part of Everglades National Park.



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