

SOUTH FLORIDA

Environmental Report 2015

EXECUTIVE SUMMARY



MARCH 1, 2015



From the Kissimmee headwaters to Florida Bay, the Florida Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD) continue to implement, monitor and document progress on science-based initiatives and partnerships designed to improve and sustain the region's valuable resources.

This reporting period reflects an above average rainfall year, marked by an aggressive start to the rainy season. In response, Lake Okeechobee rose more than two and a half feet during May, June and July 2013. Water managers, scientists and engineers from the U.S. Army Corps of Engineers, SFWMD, FDEP and other agencies met weekly to discuss the state of the regional system and to develop operational recommendations to the Corps. Although inflows into Lake Okeechobee were above the historical average, outflows were also significantly higher. And while the east and west coast estuaries received the brunt of the freshwater discharges, extra efforts were made to move more water to the south.

On the water quality front, implementation is well underway on Governor Scott's Restoration Strategies for achieving the phosphorus limits established for the Everglades. Massive flow equalization basins and associated features are beginning to take shape, and design plans are in development to expand stormwater treatment area capacity. The 57,000 acres of existing Everglades STAs treated more than 1.3 million acre-feet of water, reducing phosphorus loads by 81 percent. Improved farming practices produced a 63-percent phosphorus reduction in the Everglades Agricultural Area when compared to baseline data, and farmers in the C-139 basin maintained nutrient discharges within allowable historic levels. To date, these combined actions have prevented more than 4,582 metric tons of phosphorus from entering the Everglades.

The positive results of those ongoing efforts are starting to be realized even sooner than anticipated. Within the extensive Everglades water quality monitoring network, this was the first year in which some of the stations previously identified as "impacted" transitioned to "unimpacted" status. A total of six stations successfully met the stringent phosphorus criterion for the change in designation based on both 5-year and annual compliance consistency.

Also of note, this year's report incorporates the legislatively required 3-year update to both the St. Lucie and Caloosahatchee River Watershed Protection Plans, including project construction progress, research and monitoring results and strategies for moving forward. Increased storage is a key initiative for the northern Everglades, and three water farming pilot projects were initiated to test the feasibility of retaining water on fallow citrus fields.

The State's commitment to protect, preserve and improve the South Florida ecosystem remains focused on implementing plans and completing projects that will provide long-term environmental benefits and help restore more natural water flows.

Jonathan P. Stevenson
Secretary
Department of
Environmental Protection

Blake C. Guillory, P.E.
Executive Director
South Florida Water
Management District



sfwmd.gov

Foreword

The 2015 *South Florida Environmental Report* (SFER) provides efficient, consolidated reporting by the South Florida Water Management District and the Florida Department of Environmental Protection pursuant to Chapter 2005-36, Laws of Florida, and Subsection 373.036(7), Florida Statutes. The complete SFER is a comprehensive three-volume publication. This Executive Summary focuses on major updates and accomplishments over the reporting year. The report distinctly serves the public and decision makers with thorough, up-to-date information on the many advances toward South Florida's environmental restoration and other key activities.

Volume I, The South Florida Environment, documents relevant scientific and engineering efforts throughout Florida, spanning diverse areas of the interconnected Northern and Southern Everglades systems. This volume satisfies the annual reporting mandates required by dozens of federal and state regulations and permits.

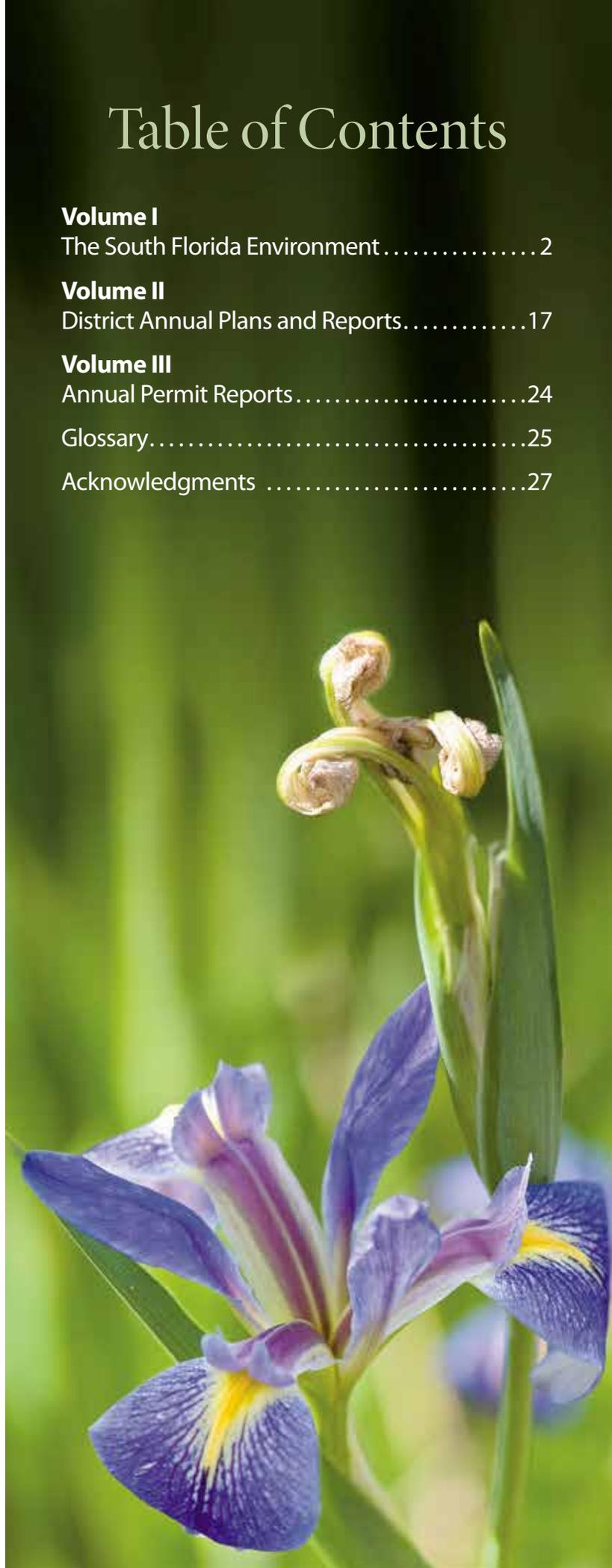
Volume II, District Annual Plans and Reports, comprises annual plans and reports required of all of Florida's water management districts. This volume captures the milestones in implementing the agency's strategic priorities and projects. A web-accessible consolidated database is also included to efficiently provide additional project-related information.

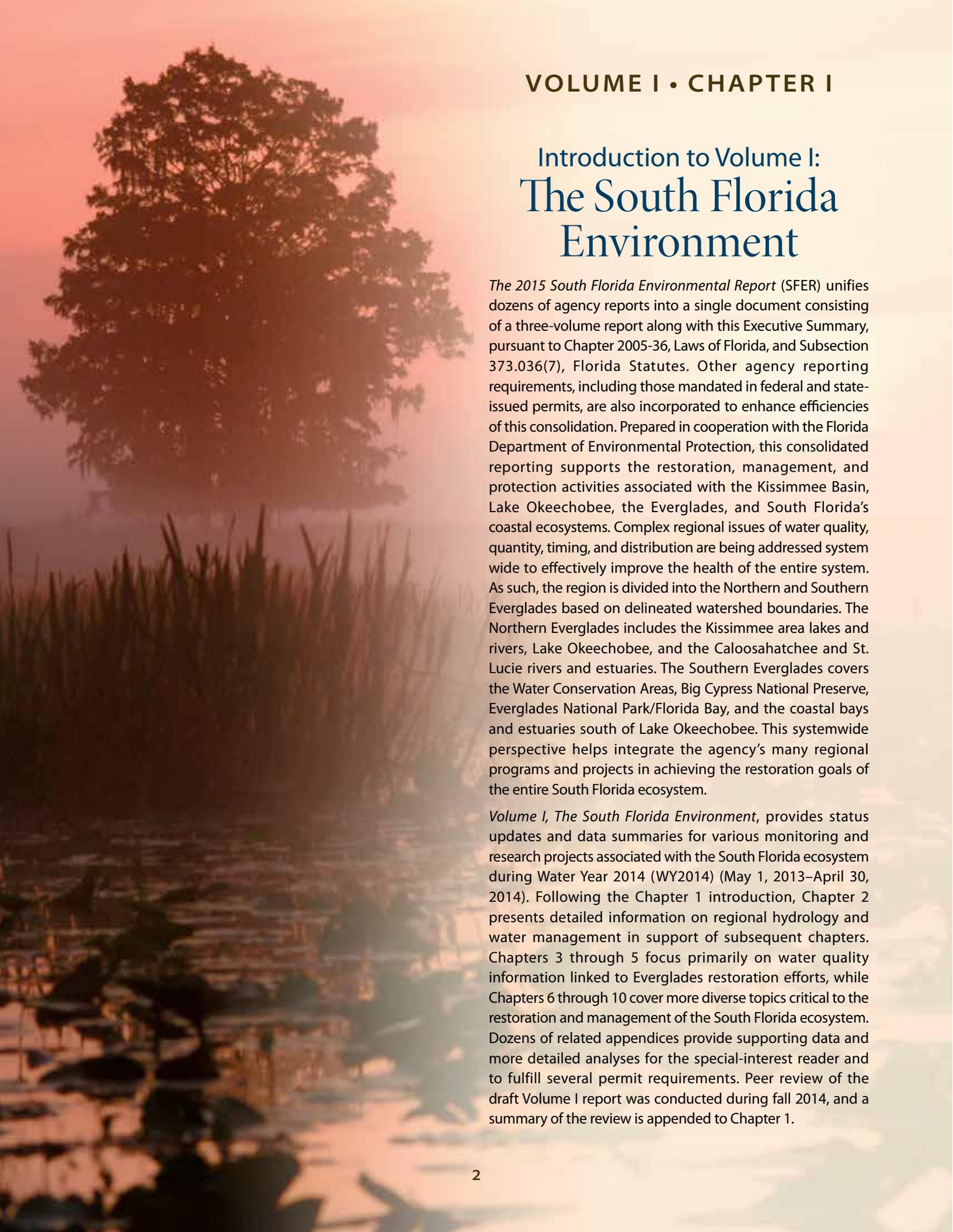
Volume III, Annual Permit Reports, expands on Volume I to further streamline unified reporting and comply with various permit-related reporting requirements. This volume supports the Comprehensive Everglades Restoration Plan Regulation Act, Everglades Forever Act, Northern Everglades and Estuaries Protection Program, Environmental Permitting projects, and Emergency Orders.

The entire 2015 report is available on the District's website www.sfwmd.gov/sfer. Overall, the far-reaching efforts featured in the SFER provide the scientific foundation of agency programs and projects that ultimately support prudent environmental decision making. With the ongoing support of stakeholders and the public, the 2015 SFER showcases sound management and progress toward restoration of the entire South Florida region.

Table of Contents

Volume I	
The South Florida Environment	2
Volume II	
District Annual Plans and Reports.....	17
Volume III	
Annual Permit Reports.....	24
Glossary.....	25
Acknowledgments	27





VOLUME I • CHAPTER I

Introduction to Volume I: The South Florida Environment

The 2015 South Florida Environmental Report (SFER) unifies dozens of agency reports into a single document consisting of a three-volume report along with this Executive Summary, pursuant to Chapter 2005-36, Laws of Florida, and Subsection 373.036(7), Florida Statutes. Other agency reporting requirements, including those mandated in federal and state-issued permits, are also incorporated to enhance efficiencies of this consolidation. Prepared in cooperation with the Florida Department of Environmental Protection, this consolidated reporting supports the restoration, management, and protection activities associated with the Kissimmee Basin, Lake Okeechobee, the Everglades, and South Florida's coastal ecosystems. Complex regional issues of water quality, quantity, timing, and distribution are being addressed system wide to effectively improve the health of the entire system. As such, the region is divided into the Northern and Southern Everglades based on delineated watershed boundaries. The Northern Everglades includes the Kissimmee area lakes and rivers, Lake Okeechobee, and the Caloosahatchee and St. Lucie rivers and estuaries. The Southern Everglades covers the Water Conservation Areas, Big Cypress National Preserve, Everglades National Park/Florida Bay, and the coastal bays and estuaries south of Lake Okeechobee. This systemwide perspective helps integrate the agency's many regional programs and projects in achieving the restoration goals of the entire South Florida ecosystem.

Volume I, The South Florida Environment, provides status updates and data summaries for various monitoring and research projects associated with the South Florida ecosystem during Water Year 2014 (WY2014) (May 1, 2013–April 30, 2014). Following the Chapter 1 introduction, Chapter 2 presents detailed information on regional hydrology and water management in support of subsequent chapters. Chapters 3 through 5 focus primarily on water quality information linked to Everglades restoration efforts, while Chapters 6 through 10 cover more diverse topics critical to the restoration and management of the South Florida ecosystem. Dozens of related appendices provide supporting data and more detailed analyses for the special-interest reader and to fulfill several permit requirements. Peer review of the draft Volume I report was conducted during fall 2014, and a summary of the review is appended to Chapter 1.

South Florida Hydrology and Water Management

The ecological and physical characteristics of South Florida have been shaped by years of hydrologic variation with extreme droughts and floods, sometimes within a relatively short time period. South Florida hydrology is driven by rainfall, runoff, groundwater recharge, surface water discharge, and evapotranspiration. Region-wide water management is accomplished by approximately 4,800 miles of canals and levees, roughly 1,350 water control structures, and nearly 70 pump stations. Information on regional hydrology and water management in this chapter is essential to environmental science and the interpretation of results in most of the other Volume I chapters. WY2014 hydrology reflected in rainfall, water levels, inflows, and outflows for the regional water management system is compared with the previous water year (WY2013) and historical conditions. The chapter also examines the hydrologic impact of the high rainfall events associated with the WY2014 hurricane season.

Region Experiences Another Year of Rainfall Swings

The El Niño-Southern Oscillation, a natural phenomenon that involves fluctuating ocean temperatures in the equatorial Pacific, is closely linked to variation in South Florida hydrology. The 2013 neutral condition of El Niño continued in the beginning of 2014 but, by spring 2014, the tropical Pacific west of Peru started warming and the chance of El Niño increased. WY2014 was driven by above-average rainfall (55.14 inches compared to the region's historical annual average of 52.75 inches), with only two rainfall areas (East and West Agricultural Areas) and Everglades National Park experiencing below-average rainfall. In most rainfall areas, the wet season months of August, September and October were much drier than average. However, June and July in the wet season and May and January in the dry season were wet

enough to make up the deficit and drive the overall water year rainfall to above-average levels. Also of note in early January, coastal St. Lucie, Martin, and Palm Beach counties experienced a rare event, with a frequency higher than 100-year one-day maximum rainfall at several sites. During this event, maximum rainfall ranged from 8 inches in the northern extent up to as much as 23 inches in Boynton Beach, which was the hardest hit area. This high intensity rainfall created localized flash floods, affecting streets and several homes.

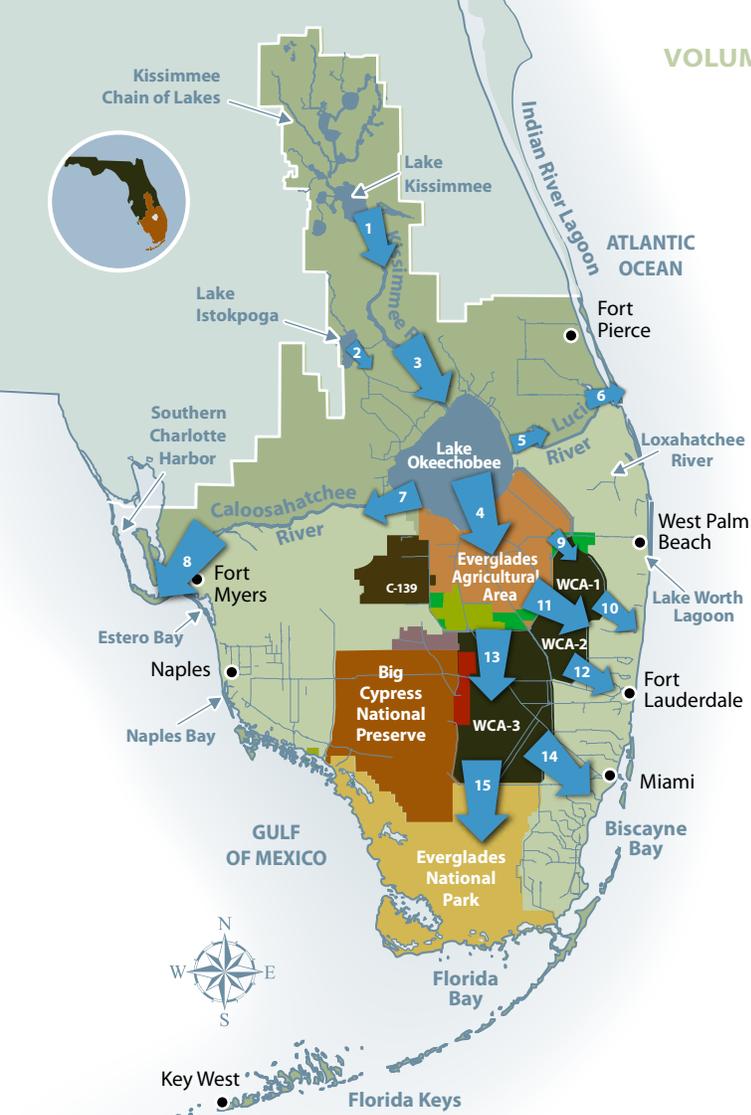
WY2014 Marked as an Inactive Hurricane Season

Lake Okeechobee, the main storage of the regional water management system, was at a stage of 13.44 feet National Geodetic Vertical Datum (ft NGVD) on May 1, 2013. The lake stage increased dramatically to 16.05 ft NGVD by August 10, 2013, following three consecutive months (May, June, and July) of very wet conditions across the Kissimmee Basin and the rest of the lake watershed, resulting in discharges to manage lake levels. The lake stage followed a gradual decline through the dry season, reaching 13.07 ft NGVD by the end of WY2014. Overall, Lake Okeechobee's average stage was 14.48 ft NGVD for WY2014, roughly 0.5 feet higher than both the historical average and previous water year, respectively.

During the 2013 hurricane season, Atlantic, Gulf of Mexico, and Caribbean tropical weather events were below prediction, with just 11 tropical storms and 2 hurricanes. According to the National Oceanic and Atmospheric Administration, 2013 had the fewest hurricanes since 1982 and this low-level of activity was also mirrored in terms of number, strength, and duration of storms—it was the sixth least-active since 1950. The season started early with Tropical Storm Andrea forming in the southern Gulf of Mexico in June as a low pressure system—notably, the only storm that made landfall on the U.S. during the 2013 hurricane



Regional Inflows and Outflows



LEGEND

- CANALS
- NORTHERN EVERGLADES
- WATER CONSERVATION AREAS
- STORMWATER TREATMENT AREAS
- MICCOSUKEE INDIAN RESERVATION
- BIG CYPRESS SEMINOLE INDIAN RESERVATION
- ROTENBERGER AND HOLEY LAND
- WILDLIFE MANAGEMENT AREAS

WATER FLOW (ACRE-FEET IN THOUSANDS)

Water Year 2014* 2013

	2014*	2013
1. Lake Kissimmee Outflows	766	440
2. Lake Istokpoga Outflows	319	281
3. Lake Okeechobee Inflows	2,695	2,100
4. Lake Okeechobee Outflows	2,528	1,042
5. Flows into the St. Lucie Canal from Lake Okeechobee	445	104
6. Flows into the St. Lucie Estuary through the St. Lucie Canal	676	153
7. Flows into the Caloosahatchee Canal from Lake Okeechobee	1,226	501
8. Flows into the Caloosahatchee Estuary through the Caloosahatchee Canal	2,522	1,138
9. Water Conservation Area 1 Inflows	380	364
10. Water Conservation Area 1 Outflows	471	484
11. Water Conservation Area 2 Inflows	1,078	1,074
12. Water Conservation Area 2 Outflows	965	938
13. Water Conservation Area 3 Inflows	1,248	1,322
14. Water Conservation Area 3 Outflows	1,453	1,225
15. Everglades National Park Inflows	1,591	1,497

* Water Year 2014 flows are reflected on map

season. Although the storm passed through North Florida, its associated rainfall over the District area was approximately 4.1 inches, with quite heavy rainfall (8 to 15 inches) and severe flooding in southeastern Broward and northeastern Miami-Dade counties. In addition, Tropical Storm Andrea followed a wet May and occurred in a wet June. This created water management challenges especially in the operation of STA-1W, STA-1E, and STA-3/4, where flooding conditions forced diversion of stormwater into the Water Conservation Areas.

Water Flows Rise Following Rainfall Spikes

WY2014 inflows and outflows to major water bodies and canals in the northern half of the District were far higher than

the average volumes experienced last water year (WY2013). These flows reflect the above-average rainfall for the year. During WY2014, Lake Okeechobee inflows were 130 percent and the outflows were 170 percent of the historical average. During the wet season (June to October), surface water inflows into the lake were 2.3 million ac-ft higher than what the lake normally receives in a typical year. At the same time, 1.6 million ac-ft were discharged from the lake to control the rise in stage. Except for inflows into Water Conservation Area 1, inflows and outflows to the Water Conservation Areas were higher than the average. With cascading effects, inflows into Everglades National Park (161 percent of the historical average) were also much higher than usual.

Water Quality in the Everglades Protection Area

Volume I, Chapter 3A fulfills the reporting requirements of the Everglades Forever Act by providing an update on the status of water quality in the Everglades Protection Area (EPA). During WY2014, as in recent years, Everglades water quality generally met the state Class III water quality criteria specified in Chapter 62-302, Florida Administrative Code, with a few excursions being limited to specific areas within the EPA, as discussed below. This chapter also presents an update on nutrients in surface waters in the EPA, including a comparison of total phosphorus (TP) levels to the phosphorus criterion (five-year geometric mean of 10 micrograms per liter, or $\mu\text{g/L}$), and evaluates potential factors affecting water quality in this region.

Water Quality Monitoring Results

With more than 140 active stations and in excess of 2,500 sampling events, the majority of analytical results indicate general compliance with state water quality standards. Similar to monitoring results from recent water years, water quality excursions were identified in WY2014 for dissolved oxygen (DO), alkalinity, pH, and specific conductance; however, these excursions were limited to specific areas of the EPA. With some excursions below the site-specific alternative criterion, DO is classified as a concern for several areas within the EPA. These excursions are attributed to phosphorus concentrations within impacted areas (i.e., those areas with ambient soil TP levels greater than 500 milligrams per kilogram). Excursions for alkalinity and pH in the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge) reflect a natural condition resulting from the dominance of soft water in the Refuge and are not considered violations of state water quality standards. Specific conductance was categorized as a concern for some areas of the EPA but these sites were generally associated with intrusion of mineral-rich groundwater into the canals and marsh areas highly influenced by these canal inflows. Additionally, seven pesticides or pesticide breakdown products were detected above their method detection limit, but none exceeded toxicity guideline concentrations or state water quality standards. All other measured parameters complied with their respective state water quality standards.

Nutrient Trends in Everglades Surface Water

Each year, the EPA receives variable amounts of surface water inflows based on the hydrologic variability within the upstream basins. Over the last five years, approximately 169 metric tons (mt) of TP was received from upstream sources (Lake Okeechobee, Everglades Agricultural Area Basin, C-139 Basin, L-8 Basin, C-51W Basin, and other water

control districts) for treatment, with a portion (roughly 32 mt, or 19 percent) delivered to the EPA after treatment by the Everglades STAs and a relatively small portion (roughly 6 mt, or 4 percent) delivered to the EPA through diversion. In WY2014, TP loads from all surface sources to the EPA totaled approximately 87.1 mt, with a flow-weighted mean concentration of $18 \mu\text{g/L}$. Another 193 mt of TP are estimated to have entered the EPA through atmospheric deposition. The 87.1 mt TP load in the surface inflows to the EPA represents a decrease of approximately 1 percent compared to the previous water year (88.4 mt in WY2013), primarily resulting from increased flow volumes this year.

TP concentrations were lowest within the Everglades National Park and highest in periphery of the Refuge, with annual geometric mean inflow concentrations ranging from 5.6 to $22.1 \mu\text{g/L}$, respectively. Annual geometric mean TP concentrations at interior sites range from $3.6 \mu\text{g/L}$ in the Park to $7.9 \mu\text{g/L}$ in the Refuge. Annual geometric mean TP concentrations for individual interior marsh monitoring stations ranged from less than $2.0 \mu\text{g/L}$ in some unimpacted portions (i.e., those areas with ambient soil TP levels less than 500 milligrams per kilogram) of the marsh to $20.0 \mu\text{g/L}$ at a Refuge site that is highly influenced by canal inputs. Of the interior marsh sites, 81 percent exhibited annual geometric mean TP concentrations of $10.0 \mu\text{g/L}$ or less, with 93.7 percent of the marsh sites having annual geometric mean TP concentrations of $15.0 \mu\text{g/L}$ or less, which is the annual TP criterion for individual monitoring sites.

Five-Year TP Criterion Assessment in the Everglades Protection Area

The TP criterion rule specifies that each component of the four-part test be achieved for a water body to be considered in compliance with the criterion. Similar to previous years' reporting, the five-year (WY2010–WY2014) TP criterion assessment results indicate that unimpacted portions of each Water Conservation Area passed all four parts of the compliance test. In contrast, impacted portions of each water body failed one or more parts of the test as expected with enriched soil conditions. The impacted portions of the Water Conservation Areas consistently exceeded the annual and five-year network TP concentration limits of $11 \mu\text{g/L}$ and $10 \mu\text{g/L}$, respectively. This water year marks the first year that stations identified as impacted have transitioned to an unimpacted status. A total of six stations, two in each portion of the EPA, achieved a long-term geometric mean concentration of $10 \mu\text{g/L}$ or less and the annual concentrations of $15 \mu\text{g/L}$ or less.

Mercury and Sulfur Environmental Assessment for the Everglades

The biological accumulation of mercury (Hg) through the Everglades food web requires that mercury be transformed into methyl mercury (MeHg) and released into the marsh water where it begins the journey to problematic levels in fish and wildlife. Mechanisms that drive mercury methylation and accumulation are very complex and variable. Best available science documents that biological, chemical, and hydrologic factors all influence these processes and their endpoint of elevated mercury levels in fish and wildlife.

Volume I, Chapter 3B fulfills the reporting requirements of the Everglades Forever Act by summarizing water conditions within the Everglades Protection Area (EPA) with respect to concerns regarding mercury concentrations and loads; results of sulfur monitoring are also reported due to its role in mercury cycling. This update includes current status of Hg and sulfur monitoring in the EPA and provides a summary of biota Hg concentrations and mercury atmospheric deposition. Supportive information is provided including sulfate concentrations and loads from surface waters and atmospheric sources (i.e., wet deposition), along with key aspects from research on mercury cycling.

Research and Evaluation Highlights

- Largemouth bass (*Micropterus salmoides*) total mercury (THg) concentrations have declined spatially throughout the EPA, with levels decreasing by 45 percent since WY2001. However, additional reduction is needed, as the annual THg median concentration in bass still exceeded the U.S. Environmental Protection Agency human health MeHg criteria at various monitoring sites.

- At a lower trophic level, sunfish (*Lepomis* spp.) THg concentrations averaged 0.17 mg/kg, which is nearly 2.25 times the federal criterion (0.077 mg/kg MeHg) for wildlife protection. However unlike bass, no significant temporal trend was apparent throughout the period of record for these species. Mosquitofish (*Gambusia* spp.) THg concentrations decreased by 36 percent from last year, but still exceeded the federal criterion for protection of wildlife at a few monitoring sites.

- For the last water year (WY2013), annual wet deposition of THg accounted for 127.8 kilograms of Hg to the EPA, representing 97 to 99 percent of the Hg delivered to the EPA. Wet deposition of sulfate accounted for 7,375 metric tons (mt) to the EPA, ranging from 4.8 to 31.6 percent of the total sulfate load to the EPA.

- In WY2014, sulfate loads from surface sources, including internal transfers to the EPA, totaled approximately 141,289 mt, while atmospheric sulfate deposition (wet + dry deposition) was estimated to be 9,231 mt. Overall, this load represents an increase of roughly 38 percent compared to the previous year (102,337 mt in WY2013), driven primarily by several years of consistently high flow volumes. Annual mean inflow sulfate concentrations ranged from 7.2 milligrams per liter (mg/L) for Everglades National Park to 55.1 mg/L for the Refuge. Sulfate concentrations were generally lower at interior marsh regions (1.8 mg/L for the Park to 44.5 mg/L for WCA-2), indicating that plant uptake and conversion to other sulfur species are occurring within the marsh.



Nutrient Source Control Programs

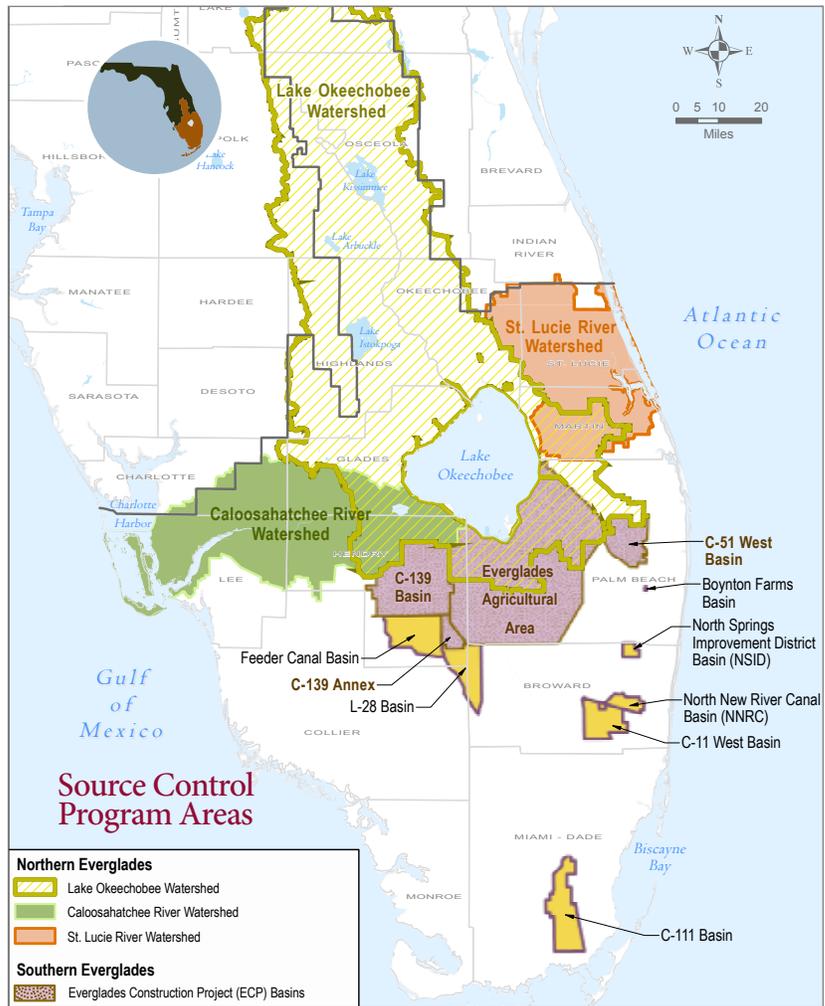
Volume I, Chapter 4 provides the WY2014 update on the South Florida Water Management District's regulatory source control programs to reduce nutrients in runoff within the Southern and Northern Everglades areas in support of restoration efforts. These programs rely primarily on mandatory Best Management Practices (BMPs) for agricultural and non-agricultural sources. BMPs range from infrastructure improvements to optimized operations, and include outreach and educational components.

Program success in the Southern Everglades is determined using quantitative water quality-based measures that gauge nutrient reductions in runoff compared to pre-BMP baseline periods. The mandatory BMP program in the Southern Everglades has shown a long-standing record of success. The Northern Everglades program relies on a combination of the District's and Florida Department of Environmental Protection's regulatory programs and the Florida Department of Agriculture and Consumer Services' incentive-based programs.

Southern Everglades

The Everglades Agricultural Area (EAA) and C-139 basins met their respective total phosphorus (TP) performance measures in WY2014. The EAA Basin achieved a 63 percent reduction in TP load, marking its 19th consecutive year of basin compliance and a long-term reduction of 55 percent relative to the baseline period. This was the third year of full implementation of comprehensive BMP plans in the C-139 Basin. Discharges from the basin carried 28 metric tons (mt) of TP in WY2014; this is the first year since WY2012 that the basin was above the target load and the limit was not exceeded. The rule-established confidence level defining current loads as greater than historical loads is based on exceedance of the target in three consecutive years or the limit in a single year.

The total TP load of 17.3 mt discharged to the Everglades Protection Area from the non-Everglades Construction Project basins during WY2014 represents continued decreasing TP loads since the implementation of basin diversions and water quality improvement efforts.



Northern Everglades

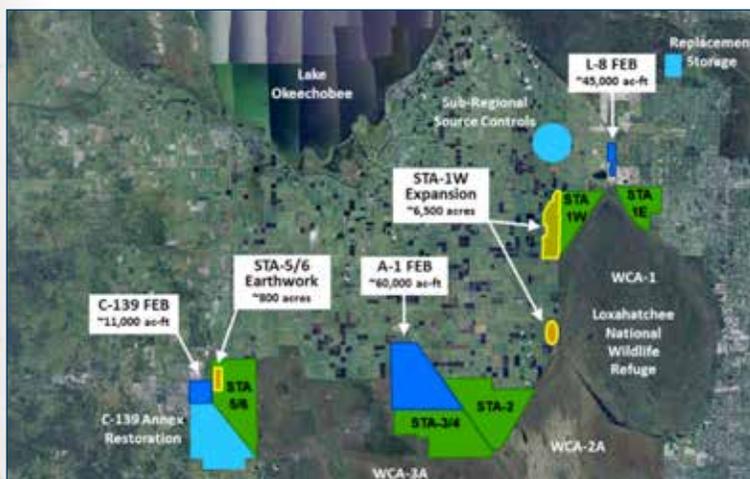
Over the past year, the District optimized its water quality monitoring network within the Northern Everglades watersheds and prepared for initiating the process for amending Chapter 40E-61, Florida Administrative Code, in accordance with the mandates of the Northern Everglades and Estuaries Protection Program. Proposed amendments are anticipated to consider updates to permit requirements and timelines for implementation, and modify program boundaries to include the Upper Kissimmee and Lake Istokpoga basins and the St. Lucie and Caloosahatchee river watersheds. The proposed amendments may include nitrogen in addition to phosphorus for the river and estuary watersheds. Any amendments are expected to take into account applicable Basin Management Action Plans and other coordinating agency programs.

Restoration Strategies – Design and Construction Status of Water Quality Improvement Projects

In June 2012, the State of Florida and the U.S. Environmental Protection Agency reached consensus on new restoration strategies for further improving water quality in the Everglades. These strategies will expand water quality improvement projects to achieve the total phosphorus (TP) water quality criterion established for the Everglades Protection Area, which includes Everglades National Park. Fully funded by South Florida Water Management District (SFWMD) and the State of Florida, the SFWMD is implementing a regional water quality plan utilizing state funds to complete 10 water treatment and storage projects in three flow paths—Eastern, Central and Western—between Lake Okeechobee and the Greater Everglades. The Restoration Strategies Regional Water Quality Plan projects include more than 6,500 acres of new Stormwater Treatment Areas (STAs). The technical plan also calls for 116,000 acre-feet of additional water storage through the construction of Flow Equalization Basins (FEB). These impoundments will capture runoff during storm events and provide a more steady flow of water to the Everglades STAs, helping to maintain desired water levels needed to achieve optimal performance.

Under the Restoration Strategies Program, planned efforts also involve implementing additional source controls in areas of the eastern Everglades Agricultural Area where TP levels in stormwater runoff have been historically higher. Additionally, a robust Science Plan is being implemented to ensure continued research and monitoring to improve and optimize the performance of the STAs (see Chapter 5C of this volume). Overall, the technical plan is part of a revised National Pollutant Discharge Elimination System watershed permit for operating the five Everglades STA complexes south of Lake Okeechobee (see map). This permit along with a new state-issued Everglades Forever Act watershed permit establishes stringent TP limits (known as the Water Quality Based Effluent Limit) for water discharged from the Everglades STAs into the Everglades Protection Area.

Pursuant to the watershed permits and their associated Consent Orders, the design and construction of the treatment and storage projects are planned to occur in three phases over a 12-year timeframe, with completion of all projects set for 2025. During WY2014, eight Consent Order milestones were completed on five projects (A-1 FEB, L-8 FEB, L-8 Divide Structure, S-5AS Modifications, and STA-1W Expansion #1) in two flow paths. The L-8 and A-1 FEBs are currently under construction in the Eastern and Central flow paths, respectively. In the Eastern Flow Path, two primary conveyance features (L-8 Divide and S-5AS Divide Structures) are also in the construction phase according to the Consent Order milestones and the STA-1W Expansion #1 is in design.



*Restoration Strategies
Regional Water Quality
Plan Projects*

Performance of the Everglades Stormwater Treatment Areas

The Everglades Stormwater Treatment Areas (STAs)—STA-1 East (STA-1E), STA-1 West (STA-1W), STA-2, STA-3/4, and STA-5/6—were designed and constructed to reduce total phosphorus (TP) in runoff water before it enters the Everglades Protection Area (EPA). The STAs are shallow, freshwater marshes currently providing approximately 57,000 acres of effective treatment area. Volume I, Chapter 5B, presents information on STA treatment performance, operations, enhancements, and related scientific studies during WY2014. The chapter fulfills various reporting mandates and addresses components identified in the Everglades Forever Act and Long-Term Plan for Achieving Water Quality Goals in the EPA.

Everglades STA Overview

- Over their combined operational periods, the STAs have treated more than 14.8 million acre-feet (ac-ft) of inflow and retained 1,874 metric tons (mt) of TP that would have otherwise entered the EPA. In WY2014, the STAs collectively treated 1.34 million acre-feet of water, reducing TP loads by 81 percent and produced an outflow flow-weighted mean (FWM) TP concentration of 21 micrograms per liter ($\mu\text{g/L}$). For a second consecutive year, this was one of the lowest combined annual outflow FWM TP concentrations.
- The outflow FWM TP concentrations for individual STAs in WY2014 ranged from 14 (STA-3/4) to 41 $\mu\text{g/L}$ (STA-1E), while the percent TP load retained ranged from 76 (both STA-1E and STA-2) to 88 percent (STA-5/6). Notably, STA-3/4 over its 11-year operational history has treated the most runoff (~4.7 million ac-ft), retained the second largest TP load (526 mt), achieved the highest percent TP load retained (84 percent), and discharged water at the lowest outflow FWM TP concentration (17 $\mu\text{g/L}$) of all the STAs.
- Early in the wet season, runoff from Tropical Storm Andrea and rainfall events immediately following the storm increased water depths in STA-1E, STA-1W, and STA-3/4 to their maximum operating levels. In response to these high-

water conditions, runoff was diverted around these STAs for approximately one week in June 2013.

- With the exception of STA-5/6, all the other STAs were kept fully hydrated this year and did not dry out. High hydraulic and TP loads associated with runoff from Tropical Storm Isaac in August 2012 affected all STAs, except STA-5/6, to some degree; STA-1E was the most impacted facility. The record volume of runoff exceeded the treatment capacity of STA-1E and STA-1W, necessitating the partial diversion of stormwater directly into the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Water Conservation Area 1).
- In response to continuing rise in Lake Okeechobee's water level during months of above-average rainfall and to help reduce regulatory releases to the St. Lucie and Caloosahatchee estuaries, enhanced operations were implemented during WY2014 to send more lake water south to the Everglades via the STAs and to tide. This was accomplished by maximizing flows through key areas of existing canal infrastructure and pump stations. Approximately 175,000 ac-ft of Lake Okeechobee regulatory releases were treated in the STAs prior to delivery to the EPA in WY2014, which is substantially higher compared to previous water years.
- During periods of drier conditions experienced in WY2014, supplemental water from Lake Okeechobee was delivered to certain areas in STA-1E, STA-2, and STA-5/6 to maintain water levels at target stages and keep their plant communities hydrated. The Eastern Flow-way of STA-1E was kept dry throughout WY2014 due to construction activities associated with the removal of the PSTA Demonstration Project in Cell 2.
- Federally protected Everglade snail kite (*Rostrhamus sociabilis*) nests were observed at STA-1E and STA-5/6 during both the 2013 and 2014 nesting seasons. Operational adjustments were implemented in these two STAs to minimize impacts to nests during these periods.



Update for the Restoration Strategies Science Plan

In accordance with the 2012 Everglades Water Quality Restoration Framework Agreement between the U.S. Environmental Protection Agency (USEPA) and Florida Department of Environmental Protection (FDEP) as well as the South Florida Water Management District's Restoration Strategies Regional Water Quality Plan, the Science Plan for the Everglades Stormwater Treatment Areas (STAs) has been established to investigate the critical factors that collectively influence the total phosphorus reduction and treatment performance in the Everglades STAs. It is expected that the results from the Science Plan will be used to enhance the design and operations of projects under the Restoration Strategies Program, which will ultimately improve capabilities of the STAs to achieve compliance with the state's water quality criteria for total phosphorus. The Science Plan is also intended to fulfill the requirements of the requirements of the September 2012 Consent Orders between the District and FDEP associated with the National Pollutant Discharge Elimination System and Everglades Forever Act watershed permits for the Everglades STAs.

Pursuant to the Consent Orders, the Science Plan was developed by the District in consultation with federal and state technical representatives designated by the USEPA and FDEP. The complete version of the Science Plan, dated June

2013, is available on the District's website at www.sfwmd.gov/rs_scienceplan. During the past year, Detailed Study Plans for eight individual studies were developed and published on the Science Plan website in September 2014. Technical workshops were also held with the technical representatives to provide an open, collaborative forum for further discussion and refinement of the proposed work of the individual study plans. It is expected that additional workshops with technical representatives and public meetings with stakeholders will continue to be held as the Science Plan studies are further refined and implemented.

In Volume I, Chapter 5C provides an update on the Science Plan, with key highlights of the plan as well as ongoing planning and implementation efforts. As the proposed study plans of the Science Plan are further detailed and implemented, it is anticipated that this chapter in future SFERs will communicate plan findings. The findings will be used to gauge progress toward optimizing phosphorus treatment performance and achieving the Water Quality Based Effluent Limit for total phosphorus. This information will then be used to identify needed policy and management actions, key areas of uncertainty, and essential information gaps to direct future Science Plan efforts.



Everglades Research and Evaluation

The South Florida Water Management District and collaborating agencies continue to sponsor monitoring, modeling, and assessment of Everglades hydrology, wildlife, plant ecology, ecosystem function, and landscape change. These studies support both short-term operational needs and long-term restoration goals and are focused on the need for information on regional hydrology for decision making on Everglades projects. In Volume I, Chapter 6 highlights major research findings, as highlighted below.

- **Hydrologic Drivers:** Above-average rainfall for WY2014 and a quick rise in water levels at the start of the water year created some physiological stress for hardwoods on tree islands, especially in Water Conservation Area 3A. Dry season recession rates, conducive to wading bird foraging, got an early start and might have led to a large nesting period were it not for a significant hydrological reversal in February.

- **2014 Wading Bird Report:** An estimated 34,714 wading bird nests were initiated in South Florida, including portions of the SWFWMD, during the 2014 nesting season (December to July). This is 28 percent fewer nests than last year's estimate (48,291 nests), representing below-average nesting compared to the decadal average (42,782 nests). The only species that did not experience reduced nesting in 2014 was the wood stork (*Mycteria americana*), which produced 2,799 nests—a 26 percent improvement relative to the decadal average. Large-scale water-level reversals from February to early April allowed concentrated prey to disperse and limited the amount of area with suitable foraging depths. Such conditions likely account for the large proportion of nests abandoned in 2014.

- **Loxahatchee Impoundment Landscape Assessment:** Innovative tracking devices and enclosures are being used to observe small fish movement across habitats. Related field data showed that reflooding events (i.e., reversals) can cause important distributional changes in prey fishes, reducing densities in alligator holes, as well as in sloughs where wading birds typically forage. Reflooding events caused prey to move to ridges, where wading bird foraging is less successful.

- **Tree Islands:** Small artificial floating islands using commercially available peat bags are being tested as a mechanism to reestablish ghost tree island seed banks and restore elevations. A study is being conducted to compare forest structure, growth rate, species contribution to leaf fall, and litterfall between a pristine and a degraded tree island. To date, study results indicate that high soil saturation and poor soil nutrient conditions have a negative effect on forest structure and litterfall production.

- **The Decomp Physical Model:** As part of the Comprehensive Everglades Restoration Plan's Adaptive Management Study, this field-scale model is being used to evaluate flow velocities needed to restore the ridge and slough patterns in the Everglades and assess the ecological impacts of canal backfilling. During WY2014 flow events, water velocities were high enough to erode sediments and increase sediment transport up to twentyfold higher than baseline, pre-flow estimates. Importantly, particulates and water total phosphorus did not increase, suggesting particle recapture is sufficient to maintain low nutrient conditions even while flowing.

- **Florida Bay Update:** Hydrologic patterns, water quality, and macrophyte coverage showed little long-term change from the previous two years. The results of synoptic, high resolution water quality measurements linked discharge with the water quality of the bay. In addition, a submerged aquatic vegetation model results indicate improved conditions with increased freshwater flows expected from the Central Everglades Planning Project.

- **Landscape Change:** Automatic classification of two very similar vegetative communities in Landsat imagery using ecological theory, texture, and spectral characteristics was successful and compared very favorably to the more expensive and time-consuming high-resolution, hand-delineated maps. The District is also participating in regional and national efforts to begin planning for sea level rise in South Florida, as climatic and sea level change are expected to pose challenges to regional water supply, flood control, and environmental restoration over the next century.



Status of Nonindigenous Species

With its mild climate, diverse environments and expanding urbanization, South Florida is particularly vulnerable to invasion by nonnative species. In Volume I, Chapter 7 reviews broad issues of established nonindigenous plants and animals in South Florida and their relationship to restoration, management, planning, organization, and funding. The chapter provides updates on priority species, highlights emerging threats to native plants and animals, and summarizes new research findings. It also discusses control or management activities for species capable of impacting District resources.

Nonindigenous Plants

- Regionwide efforts to control invasive plants continue on District-managed lands. The District has the country's largest aquatic plant management program, managing floating and submerged aquatic vegetation systemwide. The successful melaleuca (*Melaleuca quinquenervia*) management program also continues to be a national model for regional, interagency invasive plant control programs.
- Biological control of several invasive plants continues to show promise. Notably, the new mass rearing facility at the United States Department of Agriculture's Agricultural Research Service biological control laboratory in Davie now supports biological control agent rearing and field release for melaleuca, Old world climbing fern (*Lygodium microphyllum*), water hyacinth (*Eichhornia crassipes*), and other invasive nonindigenous plants.
- A total of 75 plant species are District priorities for control. Although control programs for some aggressive plants have been positive, challenges keep mounting as other harmful invasives are introduced and their ranges expand. Those species with a high potential to become widespread invaders are the focus of interagency rapid response efforts aimed at containment and possible eradication.

Nonindigenous Animals

- Nonindigenous animal species are numerous in South Florida—ranging from roughly 62 species in the Kissimmee Basin to over 130 in the Greater Everglades. While prioritizing these species for control is challenging across regulatory agencies, this issue is complicated further by a deficiency of practical control measures.
- Targeted efforts by the Florida Fish and Wildlife Conservation Commission are ongoing to build its invasive animal management program, while working closely with the District and other partners to manage nonnative animals in South Florida. During 2014, federal, state, and tribal partners progressed with rapid response efforts to control animal invaders such as the northern African python (*Python sebae*) and Argentine black and white tegu (*Tupinambis merianae*) in the Greater Everglades.
- Burmese pythons (*Python molurus bivittatus*) continue to be removed in the Everglades and surrounding rural areas, while their numbers appear to be rising again after cold-induced reductions observed in 2010–2011. The District remains an active partner in regional efforts to halt the spread of this invasive reptile by conducting regional search and removal operations.

During Fiscal Year 2014, the District spent roughly \$19 million for overall invasive species prevention, control, and management in South Florida. Looking ahead, nonnative invasions will remain to exert pressure on native species and ecosystem functions and require long-term, multiagency management. To address the persistent influx of new invasions, collaborating agencies are providing information to policy makers for developing strategies and regulations toward prevention.



Lake Okeechobee Watershed Protection Program Annual Update

The Northern Everglades and Estuaries Protection Program (NEEPP) coordinating agencies [South Florida Water Management District, Florida Department of Environmental Protection (FDEP), and Florida Department of Agriculture and Consumer Services (FDACS)] and other federal, state and local agencies are working to restore Lake Okeechobee. NEEPP is focused on improving water quality and hydrology of the system, and evaluating progress toward achieving restoration goals and learning more about the system. Volume I, Chapter 8 presents the annual status during WY2014 for Lake Okeechobee and its watershed under these coordinated interagency efforts.

Watershed Update

- WY2014 inflow to Lake Okeechobee was 2.83 million acre-feet (ac-ft), which is 31 percent higher than flows observed in WY2013. The lake began the water year at an elevation of 13.4 feet National Geodetic Vertical Datum of 1929 (ft NGVD)—roughly 1.7 ft higher than the same time last year—placing water levels in the Low Lake Management Sub-Band. Lake stage increased to its maximum level by August (16.1 ft NGVD) and remained high until October. During this period, a combination of base flow and regulatory releases were made to the estuaries and Water Conservation Areas (via the Everglades Stormwater Treatment Areas). Subsequently, lake stage began to decline due to drier-than-average conditions, with levels at about 13.1 ft NGVD at the close of WY2014.
- In WY2014, total phosphorus (TP) loading to the lake was 609 metric tons (mt) including 35 mt from atmospheric deposition. The current five-year average (WY2010–WY2014) TP load was 442 mt, which is nearly three times greater than the 140 mt/yr Total Maximum Daily Load (TMDL) for the lake. Over the past year, in-lake TP concentrations declined slightly from 124 micrograms per liter (µg/L) in WY2013 to 118 µg/L in WY2014, which is in line with the most recent five-year average as well as pre-hurricane (pre-2004) levels.
- WY2014 total nitrogen (TN) loading to the lake was 6,750 mt (including 1,233 mt from atmospheric deposition), an increase of 353 mt compared to the WY2013 load of 6,397 mt. The current five-year average (WY2010–WY2014) TN load was 5,401 mt.
- Fixing the complex and varying problems in the Lake Okeechobee Watershed requires a multifaceted restoration approach. The coordinating agencies are committed to restoring Lake Okeechobee and its watershed, continuing existing efforts, and identifying new opportunities to improve the ecosystem, such as expanding the Dispersed Water Management Program including implementing

additional Northern Everglades–Payments for Environmental Services projects and constructing the Nicodemus Slough Project; continuing the Kissimmee River Restoration Project; expanding alternative technologies hybrid wetland treatment technology; and initiating Floating Aquatic Vegetative Tilling. Fifteen research, modeling, and assessment projects were also initiated, continued, or completed in WY2014.

- Development of FDEP’s Lake Okeechobee Basin Management Action Plan (BMAP), the overarching water quality restoration plan, continued in 2014. The BMAP is the blueprint for restoring impaired waters by reducing pollutant loadings to meet a TMDL. Developed collaboratively with existing and new stakeholders, it builds upon the efforts and strategies identified in the Lake Okeechobee Watershed Protection Plan and provides an enforceable framework necessary to achieve the established TMDL. Notably, the first Lake Okeechobee BMAP document, focused on the six sub-watersheds north of the lake, was completed and adopted in December 2014.

In-Lake Ecological Update

- Total areal coverage of submerged aquatic vegetation decreased by 29 percent in WY2014 (33,854 acres) from the previous year (47,692 acres). Emergent vegetation such as spike rush (*Eleocharis* spp.) continues to replace historical, nearshore SAV habitat. It is unclear what these shifts in macrophyte communities have on lake ecology, although conditions are substantially better than the higher lake stages in the mid to late 1990s and following the 2004–2005 hurricanes. Several exotic invasive species also appear to be gaining ground, especially during periods of lower lake levels, and as control efforts have been scaled back.
- Wading bird foraging, a key metric for evaluating the lake’s health, declined somewhat this year due to an early and rapid recession in lake stage followed by a large and prolonged reversal in stage from late January through most of February. Together, these conditions reduced available foraging acreage and prey availability during the peak of the nesting season.
- The lake’s fishery continues to be in good condition. Overall, values for most species were not as high as they were in 2010 when the fishery appeared to peak, but remain comparable to historical pre-hurricane levels. The black crappie (*Pomoxis nigromaculatus*) population, whose recovery has lagged relative to other important lake species, appears to be stable, with continued good population values and size class distribution.

Kissimmee River Restoration and Basin Initiatives

In Volume I, Chapter 9 highlights the major WY2014 activities associated with the Kissimmee Basin. The Kissimmee Basin forms the headwaters of the historic Kissimmee-Okeechobee-Everglades system and is characterized by diverse wetland, river, and lake ecosystems. The Upper Basin includes the Kissimmee Chain of Lakes, and the Lower Basin includes the Kissimmee River. Channelized for flood control in the 1960s by construction of canal C-38, the Kissimmee River and its floodplain experienced pervasive ecological changes because the canal prevented flow in the original river channel and seasonal inundation of the floodplain. These changes included drastic declines in wetlands, diminished fish and wildlife populations, and loss of ecosystem functions.

In partnership with the U.S. Army Corps of Engineers, construction for the Kissimmee River Restoration Project began in 1999. Three restoration phases have been completed to date. The last major phases of construction are scheduled to begin in 2015 and be completed by 2019. Numerous ecological benefits of the project have been documented by the District's Kissimmee River Restoration Evaluation Program. In recent years, the District has worked to integrate the restoration project with various management strategies for the Kissimmee Basin and Northern Everglades region, including the Kissimmee Chain of Lakes and Kissimmee Upper Basin Monitoring and Assessment Project, the Kissimmee Basin Modeling and Operations Study, and the Lake Okeechobee Watershed Protection Program.

Kissimmee Basin Highlights

- The first three phases of the Kissimmee River Restoration Project have reestablished flow to 24 miles of river channel and allowed intermittent inundation of 7,710 acres of floodplain. Construction activities advanced in WY2014 in the headwaters and lower part of the river.
- Continuous inflow to the Kissimmee River restoration area was maintained during WY2014. Under the interim regulation schedule, this key restoration goal has been achieved in 10 of the last 13 years. In WY2014, Kissimmee Basin rainfall was near average, with above-average rainfall in June and August inundating the entire river floodplain. A slow, prolonged decline in water levels at the end of the wet season did not occur, so the floodplain recession target was not met.
- WY2014 dissolved oxygen concentrations in restored portions of the river channel remained higher than pre-



restoration levels, meeting one of three restoration targets. The mean daytime dissolved oxygen concentration in the river channel surpassed the restoration expectation during the dry season but not in the wet season. The third metric, frequency of concentrations greater than 2.0 milligrams per liter, fell just short of its 90 percent target due to declining concentrations associated with high rainfall.

- Kissimmee River nutrient loads in WY2014 were comparable to post-Phase I construction averages. However, average total phosphorus (TP) loads and concentrations at four river structures were significantly greater than pre-construction averages. Agricultural runoff into the south end of Lake Kissimmee appears to be responsible for higher TP levels at the river's headwater (S-65) and structures downstream.
- Total wetland plant coverage has remained relatively steady in the Phase I floodplain area from 2008–2011 and continues to achieve the restoration target of greater than 80 percent coverage. However, the target of long-hydroperiod broadleaf marsh covering at least 50 percent of the restored floodplain is still not being met.
- The number of wading bird nesting colonies and total number of nests increased from last year. Although numbers of foraging wading birds and waterfowl using the river floodplain declined from the previous year, the three-year average remained above the restoration target.

St. Lucie and Caloosahatchee River Watershed Protection Plan Annual and Three-Year Updates

In Volume I, Chapter 10 presents the annual (WY2014) status and three-year evaluation for the Caloosahatchee River and St. Lucie River Watershed Protection Plans (RWPPs) under the Northern Everglades and Estuaries Protection Program (NEEPP; Section 373.4595, Florida Statutes) by the three coordinating agencies—South Florida Water Management District, Florida Department of Environmental Protection (FDEP), and the Florida Department of Agricultural Consumer Services (FDACS). NEEPP is focused on improving water quality and hydrology of the Northern Everglades Watersheds, including Lake Okeechobee, St. Lucie River, and Caloosahatchee River (see map), as well as evaluating progress toward achieving regional restoration goals.

Watershed Efforts

- In fall 2014, the District kicked off a planned two-year effort to reevaluate storage needs north of Lake Okeechobee, considering varying storage south of the lake to minimize damaging estuarine discharges, maintain the lake's ecology, and send water south for restoration needs. For both RWPPs, source control programs also continued to progress. Related efforts include increasing enrollment of local growers by FDACS in their Best Management Practices (BMP) program.
- The Basin Management Action Plan (BMAP) for the Caloosahatchee Estuary was adopted in November 2012. Stakeholders identified projects that are estimated to reach 40 percent of the nutrient reductions to meet the estuarine portion of the adopted Total Maximum Daily Load (TMDL) for total nitrogen (TN). The St. Lucie River and Estuary BMAP was adopted in June 2013. Stakeholders identified projects to reach 30 percent of the nutrient reductions to meet adopted TMDLs for TN and total phosphorus (TP).
- In the regional Comprehensive Everglades Restoration Plan (CERP) Indian River Lagoon South – C-44 Reservoir/Stormwater Treatment Area (STA) Project, the District and U.S. Army Corps of Engineers amended an agreement allowing the SFWMD to expedite STA construction. The State of Florida also appropriated more than \$60 million over the last two years for STA construction, which began in October 2014.
- The CERP Caloosahatchee River (C-43) West Basin Storage Reservoir Project received federal authorization in the 2014 Water Resources Reform and Development Act. In 2014, the State of Florida appropriated \$18 million to design and construct a C-43 Early Start Project, which would have provided interim water storage on-site until the full reservoir could be completed. The state is now planning to move forward to complete Phase I by 2019.
- In the St. Lucie Watershed, the District's Dispersed Water Management (DWM) Program started three Water Farming Payment for Environmental Services pilot projects in 2013–2014 with the assistance of a Section 319 Clean Water Act Grant, administered by the FDEP. As of 2014, other DWM projects on public and private lands became operational in the Caloosahatchee Watershed. Overall, the storage, retention, and detention created by projects within the DWM Program since 2005 will be approximately 93,202 acre-feet.

Research and Monitoring

- In the St. Lucie Watershed, annual rainfall increased from WY2012–WY2014 due to the wettest April through July in 2014 since 1932. Total annual freshwater inflow and TP and TN loading into the St. Lucie Estuary (SLE) also increased from WY2012–WY2014.

- In the SLE, salinity generally exhibited an inverse pattern to freshwater inflows. The presence of submerged aquatic vegetation occurrence fluctuated with salinity within the lower estuary from WY2007–WY2014. Relatively low densities in live oysters were observed in mid-WY2014 following extreme freshwater inflow, but larval oyster supply appeared sufficient to support a natural recovery.

- During WY2014, annual TN concentrations within the SLE were lower than the long-term average but still exceeded the TMDL target of 0.72 milligrams per liter (mg/L). Annual TP concentrations were equal to or lower than long-term averages and also exceeded the TMDL target (0.081 mg/L). Upper estuarine chlorophyll-a concentrations were comparable to or greater than the long term-average from WY2012–WY2014 but were less in the lower estuary.

- Similar to the SLE, the highest rainfall and freshwater inflows for the Caloosahatchee Watershed over the last three water years occurred in WY2014 and salinity inversely tracked freshwater inflows. TN and TP loading also followed fluctuations in freshwater inflow, with the highest loads observed in WY2014.

- The highest Caloosahatchee River Estuary (CRE) TN concentrations were observed in the upper estuary and lowest downstream near the CRE’s mouth, which is expected due to tidal influences. In general, long-term, annual, and seasonal average TP concentrations were slightly higher in the upper estuary. Average chlorophyll-a values were reduced compared to the long-term averages throughout the CRE in the wet seasons of WY2013 and WY2014.

- In the CRE, some observable patterns for the submerged aquatic vegetation community appeared coincidental with freshwater inflow but other factors appear important. In general, more submerged aquatic vegetation species were found at the distinct freshwater and marine regions, and fewer species were in between those regions. No obvious relationships between oyster density and the average salinity of the lower CRE were observed at Bird Island but, further upstream at Iona Cove, oysters were virtually eliminated during the wet season of WY2014.

Strategies Moving Forward

- The first five-year phases of the Caloosahatchee Estuary Basin BMAP and the St. Lucie River and Estuary BMAP will continue and planning has begun for the second five-year phases slated to begin in 2017 and 2018, respectively. The FDEP is enhancing the water quality science in both watersheds and working together with stakeholders on developing new projects for water quality improvements.

- Per NEEPP, the District will initiate rule development amending the existing program under Chapter 40E-61, Florida Administrative Code, to cover the St. Lucie and Caloosahatchee watersheds. Rulemaking workshops are expected in 2015 to solicit public input on draft rule text so that an amended rule, consistent with other water quality improvement strategies in NEEPP, including the BMAPs, may be adopted and implemented.



Northern Everglades Watersheds

- The FDACS continues to enroll agricultural lands, enhance their BMP program, and work with regional landowners to identify opportunities to implement cost-shared BMPs. In 2014, the State of Florida appropriated \$10 million to expedite cost-share BMPs. The FDACS anticipates making legislative requests of \$10 million in subsequent years to continue finding these types of projects.

- The District’s DWM Program has several key activities planned to help guide the program’s future direction. These will include conducting a suitability analysis, investigating water storage models, analyzing water retention of publicly owned lands, evaluating cost effectiveness, exploring funding opportunities, and developing an integrated database. Also, additional DWM projects are being brought on line and opportunities for expansion (e.g., Water Farming Payment for Environmental Services) are being explored.

- Looking ahead, the coordinating agencies will continue working collaboratively to identify funding opportunities to build off the approximate \$232 million in 2014 state appropriations for projects. Most of these projects were outlined in the important work of the Florida Senate’s Indian River Lagoon Lake Okeechobee Select Committee accomplished in the past year and include projects within the NEEPP watersheds (e.g., Kissimmee River Restoration) and further south. Future progress on regional projects south of the Northern Everglades but within the District’s regional system (such as CERP’s Central Everglades Planning Project) will also bring important restoration benefits to the Caloosahatchee and St. Lucie estuaries.

VOLUME II • CHAPTER 1

Introduction to Volume II

Chapter 2005-36, Laws of Florida, and Subsection 373.036(7), Florida Statutes, directs each of the state's water management districts to consolidate its annual plans and reports that are submitted to Florida's governor and legislature. Since 2005, the South Florida Water Management District has fulfilled this mandate by presenting the applicable plans and reports in Volume II of the South Florida Environmental Report. Incorporation of these reports into a single document has improved reporting efficiency and quality while also making the information more accessible to policy makers, stakeholders, and the public.

The project-related information described in this volume parallels the District's performance management cycle throughout Fiscal Year 2014 (October 1, 2013 through September 30, 2014). Strategic priorities and projects drive the annual budget, and performance metrics provide the framework for measuring and reporting agency progress. Consistent with chapter topics and content in corresponding reports of the other water management districts, Volume II chapters cover the following:

- Fiscal and Performance Accountability Report
- Priority Water Bodies List and Schedule
- Five-Year Capital Improvements Plan
- Five-Year Water Resource Development Work Program
- Alternative Water Supply Annual Report
- Florida Forever Work Plan, Annual Update
- Land Stewardship Annual Report
- Mitigation Donation Annual Report

The SFER Consolidated Project Report Database provides a comprehensive update on many District projects (activities with start and end dates) and processes (ongoing activities) that are referenced in the *2015 South Florida Environmental Report* (available at www.sfwmd.gov/sfer). The database is designed to uniformly describe projects and processes linked to report-related planning efforts and provide these details in one accessible location rather than repeating them in several reports. It also enables rapid data sorting, searches, and retrieval for efficient information and project management.

Fiscal Year 2014 Fiscal and Performance Accountability Report

The South Florida Water Management District tracks and manages agency performance by linking long-term strategic priorities, annual budgets and performance metrics reporting. Fiscal and Performance Accountability Reports (also known as Annual Work Plan Reports) are prepared quarterly with the fourth quarter report presenting end of fiscal year status. In Volume II, Chapter 2 presents the year-end report of the FY2014 Performance Accountability Report, the final step of the annual reporting cycle. The chapter highlights the FY2014 status of key projects/processes, financial summaries, accomplishments, and performance metrics.

Fiscal and Performance Accountability Report Remains Strong

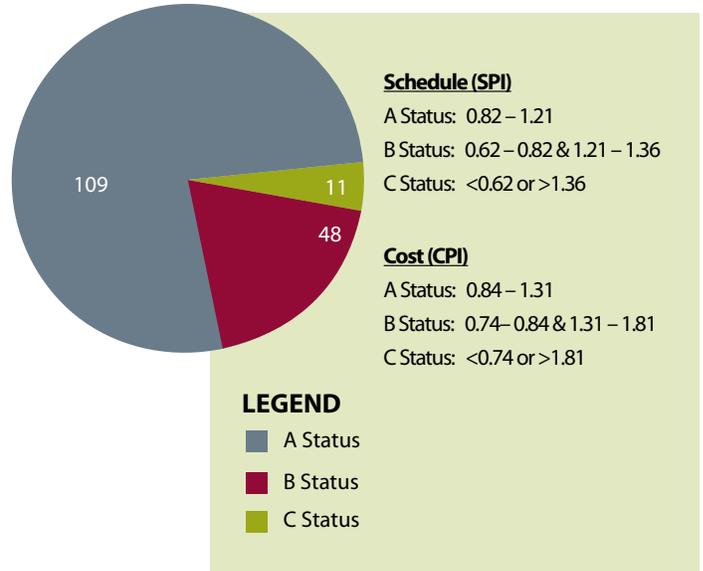
Earned Value is a project management tool in which planned and actual completed work is compared to confirm if agency projects are on track. This report presents the FY2014 Annual Work Plan project milestone achievement based on Earned Value indices (schedule and cost) and performance level achieved: A (on plan), B, or C status. Performance indices were calculated for each project and measured against the defined ranges (see chart). A project with a Schedule Performance Index of 1.00 is exactly on schedule, and a project with a Cost Performance Index (CPI) of 1.00 is exactly on budget, which represents the ideal situation where project execution matches project planning. Overall in FY2014, 109 (65 percent) of the total (168) portfolio projects were categorized in A status, 48 (29 percent) in B status, and 11 (6 percent) in C status.

Process metrics quantitatively detail the performance patterns of the SFWMD's processes, products, and services necessary to perform core missions at minimum cost and time. They are the daily tools driven by enterprise SAP® financial data that helps the agency understand, manage, and improve what the organizational divisions produce in their portion of the Annual Work Plan. The metrics provide the information necessary to make effective and productive business decisions.

Fiscal Year 2014 Gross Revenues and Expenditures

As of September 30, 2014, with the fiscal year transactions substantially complete, 99.6 percent of the District's budgeted operating revenue (excluding fund balance) has been collected. The primary source of operating revenue received to date is taxes. Ad valorem taxes comprise 64 percent of the budgeted operating revenues and drive collections based on the annual cycle of the property tax bill. The remaining

Fiscal Year 2014 Status of Major District Projects and Processes (October 1, 2013 – September 30, 2014)



revenue source is fund balance, which represents the amount of prior year residual revenue that is budgeted in the current year and has already been received. Total FY2014 sources collected were 99.8 percent of the budget, or \$719.5 million. For FY2014, 100.5 percent of budgeted ad valorem tax revenue and 101.2 percent of budgeted agricultural privilege tax revenue were collected. Historical ad valorem trends for the past five years through September support an average collection rate of 99.2 percent.

Funded by state appropriations, a total of \$93.0 million was budgeted, largely represented by \$74.8 million in Save Our Everglades Trust Fund reimbursements, \$5.0 million in reimbursements from the Florida Fish and Wildlife Conservation Commission for aquatic/invasive plant control, \$6.9 million in Water Management Lands Trust Fund reimbursements for debt service expenses related to bonds, and \$4.0 million for the J.W. Corbett Levee System improvements.

Expenditure rates are used as general indicators of progress in program implementation. At the end of FY2014, the District expended 81 percent of its budget, increasing from the 69 percent expended in FY2013.

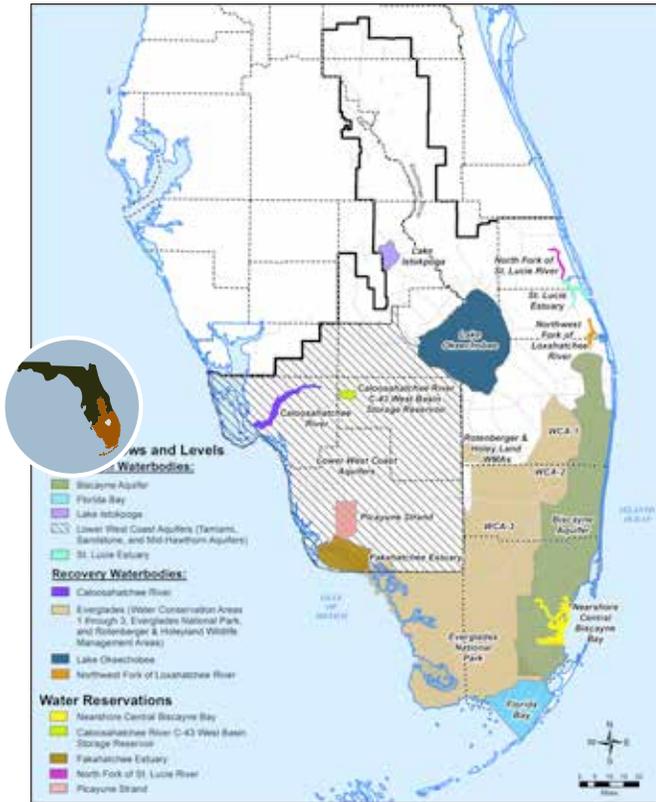
2015 Priority List and Schedule

To protect water supplies for natural systems, the South Florida Water Management District adopts minimum flows and levels (MFLs), water reservations, and restricted allocation areas (RAAs) by rule. Chapter 3 of Volume II summarizes such District rulemaking completed through 2014 and outlines priorities for developing new rules during the 2015–2017 timeframe.

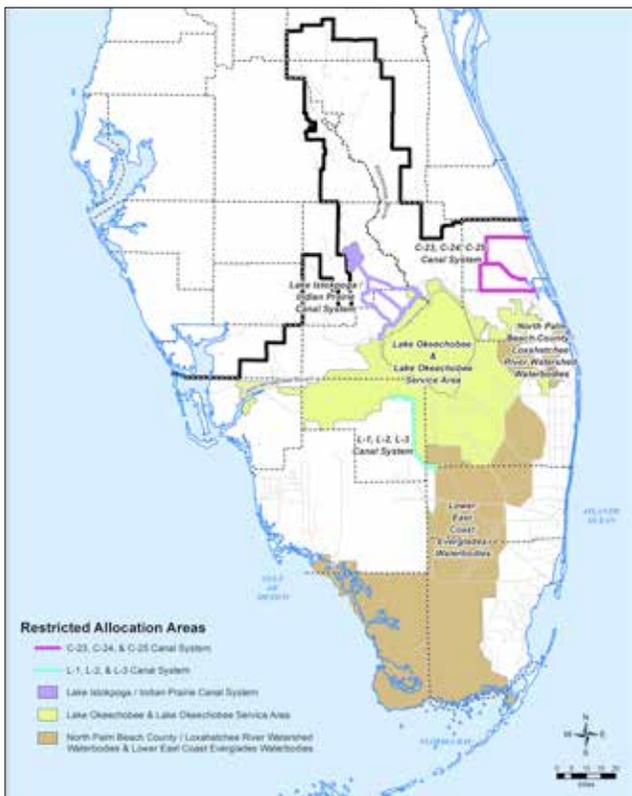
Pursuant to Florida law, the District develops annually a Priority List and Schedule that identifies water resources for which MFLs and water reservations need to be established. In November 2014, the District’s Governing Board adopted the 2015 Priority List and Schedule and, subsequently, it was submitted to the Florida Department of Environmental Protection for their review and approval. To date, the District has adopted nine MFLs and five water reservations (top map), and five restricted allocation areas (bottom map), covering approximately 12.6 million acres.

New in 2014, the water reservation for the Caloosahatchee River (C-43) West Basin Storage Reservoir was adopted. Specifically, this will reserve from allocation all water contained within and released from the reservoir to the Caloosahatchee River for the protection of fish and wildlife. The reservoir is a component of the Comprehensive Everglades Restoration Plan, and it also serves as a recovery strategy for the Caloosahatchee River.

During 2014, the District continued collecting technical data and refining hydrodynamic and ecological models as part of the reevaluation of MFL criteria established for the Caloosahatchee River. The agency also continued developing water reservations for water bodies in the Kissimmee Basin, including portions of the Kissimmee River and floodplain and the Kissimmee Chain of Lakes. These initiatives are planned to be completed by December 2015. Further details on these plans are available at www.sfwmd.gov/reservations.



Regional Priority Water Bodies



Five-Year Capital Improvements Plan

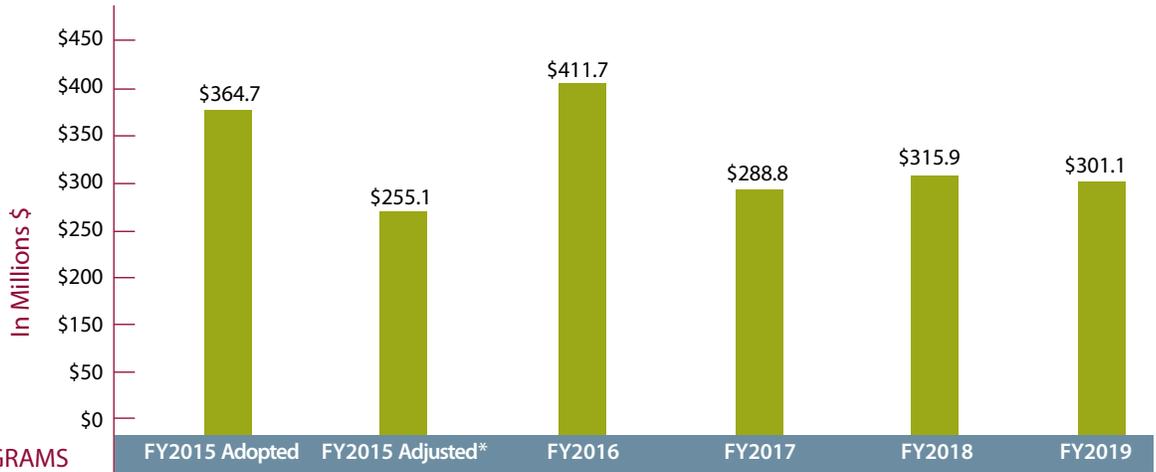
In accordance with Section 373.536, Florida Statutes, each year the South Florida Water Management District reports on the agency’s Five-Year Capital Improvements Plan (CIP). The plan includes estimated capital project expenditures and anticipated revenues over a five-year period. Volume II, Chapter 4, includes projected revenues and expenditures for capital improvements for FY2015–FY2019.

The FY2015 adopted budget included a planned capital improvements project budget of \$364.7 million. Based on the revised estimated project schedules, the District’s Five-Year CIP has been adjusted to a total of \$255.1 million for FY2015. The difference of \$109.6 million has been re-budgeted and included in the FY2016 amount in the plan, reflecting the preliminary budget submitted to the Florida legislature on January 15, 2015. Over the next five years, FY2015 (adjusted) through FY2019, the District estimates spending \$1.6 billion

on projects contained in the Five-Year CIP. Currently, the plan reflects ongoing commitments to District Governing Board priorities including \$324.4 million dedicated for Restoration Strategies projects, with the balance allocated for the refurbishment, replacement, and improvement of South Florida’s flood control infrastructure; and other agency water supply and restoration priorities.

A summary of the expenditures in the District’s Five-Year CIP are shown in the figure below. These expenditures are for (1) basic construction costs including design, engineering, permits, inspections, and site development; and (2) other project costs including land acquisition and associated costs, surveys, and facility acquisition and improvements. More detailed descriptions of these capital projects are provided in the SFER Consolidated Project Report Database at www.sfwmd.gov/sfer.

Five-Year Annual Capital Budget Estimates
(Fiscal Years 2015–2019)



DISTRICT PROGRAMS	FY2015 Adopted	FY2015 Adjusted*	FY2016	FY2017	FY2018	FY2019
Restoration	\$273.5	\$186.1	\$311.4	\$230.2	\$257.1	\$242.1
Operations & Maintenance	\$63.8	\$62.8	\$59.5	\$52.6	\$52.0	\$50.0
Land Stewardship	\$23.8	\$2.6	\$25.5	\$4.0	\$4.8	\$7.0
Water Supply	\$2.1	\$2.1	\$12.0	\$2.0	\$2.0	\$2.0
Mission Support	\$1.5	\$1.5	\$3.3	\$0.0	\$0.0	\$0.0
Total	\$364.7	\$255.1	\$411.7	\$288.8	\$315.9	\$301.1

*FY2015 adjusted budget reflects re-budgeted amounts from the FY2015 adopted budget to FY2016 based on updated project timing/schedule.

Five-Year Water Resource Development Work Plan

The State law requires that all water management districts prepare an annual Five-Year Water Resource Development Work Program to update the agency's implementation strategy for the water resource development component of each approved regional water supply plan. The Work Program is included in Volume II, Chapter 5A, to fulfill various reporting requirements on planning, projects and funding related to water supply. Further information on the District's role in managing the region's water resources is available at www.sfwmd.gov/watersupply.

Water Supply Planning Updates

The purpose of water supply planning is to develop strategies to meet existing and future water demands for urban and agricultural users while meeting the needs of the environment. The District has prepared regional water supply plans for a 20-year planning horizon that are updated every five years for each of the agency's planning regions. Plan updates identify water resource and water supply development projects expected to meet the needs of all reasonable-beneficial water demands and to protect natural

systems from harm up to and during a 1-in-10-year drought event. The most recent Upper East Coast, Lower West Coast, Lower East Coast, and Lower Kissimmee Basin water supply plans or updates were approved by the District's Governing Board in 2011, 2012, 2013, and 2014 respectively. The Central Florida Water Initiative Regional Water Supply Plan, which includes coverage of the Upper Kissimmee Basin, is expected to be approved jointly by the South Florida, Southwest Florida, and St. Johns River water management districts in 2015 (www.cfwewater.com).

Allocations for Water Resource Development Projects

The District has allocated over \$7.6 million in FY2015 for water resource development projects. In addition, 50 percent of the FY2015 operations and maintenance budget (\$107.5 million) has been allocated to providing water supply to the region. The agency anticipates spending \$573.3 million on both regional and District-wide projects over the next five years (FY2015–FY2019).

Alternative Water Supply Annual Report

Due to the limitations that exist on development of traditional freshwater sources, future regional water demands will be met primarily through developing Alternative Water Supply (AWS) sources. Alternatives include nontraditional water supplies such as brackish groundwater, surface water captured during wet weather, and reclaimed water as identified in the applicable regional water supply plan. The South Florida Water Management District's program to support the development of AWS projects has been in place for more than a decade. This program, in cooperation with the state, has approved \$193.5 million since 1997 for the construction of 488 AWS projects. In Volume II, Chapter 5B provides an annual update on the agency's AWS funding efforts during FY2014.

In 2005, the Florida legislature created the Water Protection and Sustainability Program (WPSP), which established annually recurring state funding, when available, to the District for the construction of AWS projects. From FY2006–FY2014, the District approved more than \$172 million in funding (including WPSP and carry forward amounts) for more than 300 projects that created over 434 million gallons per day of additional alternative water capacity. At this time, no AWS projects have been approved for funding in FY2015. Further information on the District's AWS program is available at www.sfwmd.gov/AWS.

Florida Forever Work Plan, 2015 Annual Update

In Volume II, Chapter 6A presents the 2015 annual update of the Florida Forever Work Plan. This chapter identifies projects eligible for funding under the Florida Forever Act (Section 259.105, Florida Statutes) as well as projects eligible for land acquisition funding from state-appropriated accounts or trust funds under Section 373.139(3)(c), Florida Statutes. Land acquisition activity during FY2014 is also provided in this chapter, while the land acquisition status of Florida Forever/Save Our Rivers (FF/SOR) projects is presented in Chapter 6B of this volume.

The 2015 Florida Forever Work Plan update identifies a total of 42 eligible projects under the Florida Forever Program, Northern Everglades and Estuaries Protection Program, Comprehensive Everglades Restoration Plan, and other water resource projects. In this update, the Sam Jones/Abiaka Prairie has been added as a FF/SOR project, using approximately 15,000 acres of previously acquired District-owned lands, to provide hydrologic benefits to groundwater, surface water and water supply, once the lands are restored as part of the C-139 Annex Restoration Project.

Project modifications were also made to two projects to reflect boundary revisions made through the project planning and implementation processes. The Indian River Lagoon – South, Palmar Complex – Natural Storage and Treatment Area feature was updated in accordance with the December 11, 2014 adopted amendment to 2014 Florida Forever Work Plan modifying the project boundary. The C-111 South Dade Project boundary was updated to incorporate approximately 6,020 acres associated the Southern Glades,

FF/SOR project land and approximately 5,274 acres associated within the Frog Pond, FF/SOR project lands for the purpose of Everglades restoration and flood protection.

Progress under Florida Forever

In FY2014, the SFWMD obtained 3,441 acres of land interests through donations, mitigation, and expenditures, totaling \$5.21 million. The acquisitions were made with District, state, and local government funds.

Over the past six decades, the South Florida Water Management District has acquired nearly 1.5 million acres of land within its 16-county jurisdiction to support flood control infrastructure, protect water resources, and restore impaired ecosystems. As part of a broad effort to maximize its resources to meet mission-critical responsibilities, the District is conducting a comprehensive land assessment to ensure that each parcel is being put to its most effective use. A similar assessment process was conducted by the Florida Department of Environmental Protection and the state's four other water management districts.

Notably, in September 2013, the first phase of the SFWMD land assessment was completed—a review of approximately 750,000 acres of fee-owned lands in which the District has full or shared ownership rights. A total of 21,357 acres of land were recommended and approved for further evaluation as potential surplus or exchange. The second phase of the assessment is currently under way, during which due diligence actions will be conducted on the lands proposed for possible disposition.



Land Stewardship Annual Report

Through land stewardship, the South Florida Water Management District is responsible for managing agency-owned lands, including Save Our Rivers and other natural conservation lands, as well as those areas being maintained for future water resource projects. The program also administers mitigation banks and regional off-site mitigation areas and oversees the development of recreational uses on these public lands. As of FY2014, program funds come primarily from ad valorem tax revenues, supplemented by other funding sources including off-site mitigation, mitigation revenue, lease revenue, and grants for wetland restoration and exotic control projects.

In Volume II, Chapter 6B highlights Save Our Rivers and Florida Forever natural lands projects for the District's five land management regions (Upper Lakes, Kissimmee/Okeechobee, East Coast, Everglades, and West Coast) and FY2013–FY2014 land management activities and acquisition

status for each region. The chapter also provides project descriptions for major program components: hydrologic and habitat restoration, vegetation management, invasive species control, prescribed burning, wildlife management, public use, water resource education, law enforcement, mitigation, infrastructure management, and management of project lands for future Comprehensive Everglades Restoration Plan and other water resource projects.

The District and its partners manage more than 1.45 million acres of public land while providing recreational opportunities to the public. In FY2014, the District invested \$8.5 million in land management (including \$1 million in Lake Belt mitigation funds dedicated to the C-139 Annex Restoration Project), while \$7.9 million in revenue was generated from agricultural leases and mitigation banks. Land management costs in FY2015 are anticipated to be \$7.7 million.

VOLUME II • CHAPTER 7

Mitigation Donation Annual Report

Wetland Mitigation Funds Benefit Regional Restoration

Mitigation is the acquisition, creation, restoration, or enhancement of wetlands to compensate for permitted wetland impacts. Each year, Florida's water management districts report on the status of funds received and expended as mitigation within certain legislatively qualifying projects. Mitigation funding enables the South Florida Water Management District to direct funds toward priority restoration in a cost-effective manner that benefits the South Florida ecosystem.

In Volume II, Chapter 7 presents mitigation fund expenditures for FY2014 for the agency's two regional mitigation projects: Corkscrew Regional Ecosystem Watershed and Pennsuco Regional Mitigation Area. The chapter describes the restoration and management efforts for these projects. Spanning more than 60,000 acres in Lee and Collier counties,

the Corkscrew Regional Ecosystem Watershed contains some of the largest remaining pristine cypress wetlands in the United States, providing habitat to numerous protected species. Covering about 13,000 acres in Miami-Dade County, Pennsuco is an impaired wetland ecosystem that likely will continue to degrade and further impact adjacent natural areas unless invasive exotics are controlled. Importantly, continued enhancements to these vital wetlands offer regional ecological benefits and contribute to overall Everglades restoration goals.

Although neither project still accepts cash payments from developers with impacts to wetlands, existing dedicated funds are used to support ongoing restoration and management activities. In FY2014, the District expended over \$740,000 on supporting the enhancement of 3,013 acres in the two areas. It is anticipated that FY2015 combined expenditures will be just over \$800,000.

VOLUME III

Annual Permit Reports

Volume III efficiently builds on the South Florida Water Management District's consolidated reporting and simplifies the process for submitting annual permit reports and complying with specific reporting conditions required by permits issued by the Florida Department of Environmental Protection. This volume is also intended to assist in efforts to streamline the permit reporting process, so that meaningful comparisons of yearly progress can more easily be made and to assure the regulatory agencies that the District is documenting all permit-required information.

Specifically, Volume III summarizes the status of projects and environmental monitoring results collected during Water Year 2014 (WY2014) (May 1, 2013–April 30, 2014). The volume contains five chapters and 13 supporting appendices. These include federal permit reporting under the Clean Water Act, and state permit reporting for the Comprehensive Everglades Restoration Plan Regulation Act, Everglades Forever Act, Northern Everglades and Estuaries Protection Program, Environmental Resource Permitting projects, and Emergency Orders in place during the reporting period. Further details about the permit reports are available on the District's website at www.sfwmd.gov/sfer.

Glossary

Acre-feet (ac-ft): The volume required to cover 1 acre to a depth of 1 foot, commonly used to express large amounts of water (1 acre-foot = 325,900 gallons).

Ad valorem tax: A tax imposed on the value of real and personal property, as certified by the property appraiser in each county.

Alternative Water Supply (AWS): A supply of water that has been reclaimed after municipal, commercial, or agricultural uses; or a supply of storm water, or brackish or salt water, that has been treated in accordance with applicable rules and standards sufficient to supply an intended use.

Best Management Practices (BMPs): Land, agricultural, industrial, and waste management techniques that reduce pollutant export from a specified area.

Compliance monitoring: In a water quality management program, compliance is associated with meeting permit conditions as well as ambient standards. Periodic monitoring provides water quality data that are used to assess compliance.

Comprehensive Everglades Restoration Plan (CERP): The 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.

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

Drought: An extended period of low rainfall, below-normal streamflow, and depleted surface and subsurface storage.

Estuary: The part of the wide lower course of a river where its current is met by ocean tides or an arm of the sea at the lower end of a river where fresh and salt water meet.

Everglades Agricultural Area (EAA): An area extending south from Lake Okeechobee to the northern levee of Water Conservation Area 3A, from its eastern boundary at the L-8 canal to the western boundary along the L-1, L-2, and L-3 levees. The EAA incorporates almost 3,000 square kilometers (1,158 square miles) of highly productive agricultural land.

Everglades Construction Project (ECP): The foundation of a large ecosystem restoration program, composed of various interrelated construction projects between Lake Okeechobee and the Everglades. This includes the Everglades Stormwater Treatment Areas, which have a total area with infrastructure components of approximately 68,000 acres, with roughly 57,000 acres of effective treatment area currently operational.

Everglades Forever Act (EFA): A 1994 Florida law (Section 373.4592, Florida Statutes), amended in 2003, to promote Everglades restoration and protection. This will be achieved through comprehensive and innovative solutions to issues of water quality, water quantity, hydroperiod, and invasion of nonindigenous species to the Everglades ecosystem.

Everglades Protection Area (EPA): As defined in the Everglades Forever Act, the EPA comprises Water Conservation Areas 1, 2A, 2B, 3A, and 3B, the Arthur R. Marshall Loxahatchee National Wildlife Refuge, and Everglades National Park.



Expenditure: The disbursement of appropriated funds to purchase goods or services.

Fiscal Year (FY): The 12-month period for which the annual budget is developed and implemented. The fiscal year for the District begins on October 1 and ends on September 30.

Florida Forever Act: A 1999 Florida law (Section 259.105, Florida Statutes) authorizing the issuance of bonds to fund land acquisition, water resource development, stormwater management projects, water body restoration activities, recreational facilities, public access improvements, and invasive plant removal.

Florida Statutes (F.S.): 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.

Flow-weighted mean concentration: The average concentration of a substance in water, corrected for the volume of water flow at the time of sampling. Samples taken when flow is high are given greater weight in the average.

Geometric mean: A statistical average of a set of transformed numbers, often used to represent a central tendency in highly variable data, such as water quality. It is calculated from data transformed using powers or logarithms and then transformed back to original scale after averaging.

Loading (or mass loading): The amount of material carried by water into a specified area, expressed as mass per unit of time. One example is phosphorus loading into WCA-2A, measured in metric tons per year. Note that 1 metric ton (mt) is equivalent to 1,000 kilograms, or 2,205 pounds.

Minimum Flows and Levels (MFLs): Florida law (Chapter 373, Florida Statutes) requires the state's water management districts to set water levels for each major body of water "...at which further withdrawals would be significantly harmful to the water resources or ecology of the area."

Northern Everglades and Estuaries Protection Program (NEEPP): As defined by Florida law (Section 373.4595, Florida Statutes), an initiative to holistically restore the Everglades through increased focus and integration of regional projects in the Northern Everglades, including the Lake Okeechobee watershed, and the Caloosahatchee and St. Lucie River watersheds and estuaries.

Parts per billion (ppb): A unit of measure, equivalent to micrograms per liter (1 ppb = 1 µg/L).

Revenue: Monies received from all sources, with the exception of fund balances, that will be used to fund expenditures in a fiscal year.

Stage: The height of a water surface above an established reference point. This vertical control measurement is usually expressed as feet National Geodetic Vertical Datum of 1929 or feet North American Vertical Datum of 1988.

Stormwater Treatment Area (STA): A large, constructed wetland designed to remove pollutants, particularly nutrients, from stormwater runoff using natural processes.

Submerged aquatic vegetation (SAV): Wetland plants that exist completely below the water surface.

Total Maximum Daily Load (TMDL): The maximum allowed level of pollutant loading for a water body, while still protecting its uses and maintaining compliance with water quality standards, as defined in the Clean Water Act.

Total phosphorus (TP): An estimate of the concentration of phosphorus in both organic and inorganic forms in a water sample. In freshwater environments, increased levels of this nutrient can promote the growth of algae and other plants.

Water Conservation Areas (WCAs): Diked areas of the remnant Everglades that are hydrologically controlled for flood control and water supply purposes. These are the primary targets of Everglades restoration and major components of the Everglades Protection Area.

Water quality: The physical, chemical, and biological condition of water as applied to a specific use, typically propagation of fish and wildlife, public water supply, industry, or recreation.

Water quality criteria: Constituent concentrations based on scientific data and judgments on the relationship between pollutant concentrations and environmental and human health effects.

Water Reservations: As defined by Florida law (Subsection 373.223(4), Florida Statutes), water set aside or designated for use, in a certain location, time, or quantity, as may be required for protecting fish and wildlife or public health and safety.

Water Year (WY): The period from May 1 through April 30, during which water quality and other data are collected and reported in the South Florida Environmental Report.



Acknowledgments

The South Florida Water Management District gratefully acknowledges the many professionals who have contributed to the *2015 South Florida Environmental Report*. Along with this Executive Summary, the three-volume main report was developed collaboratively by more than 200 authors and contributors from the District, the Florida Department of Environmental Protection, and other supporting agencies and organizations with expertise in the various reporting topics. The professionalism and dedication of the entire 2015 SFER team that helped prepare this large, complex document are gratefully recognized.

For further information, please contact:

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Garth Redfield
Water Quality Bureau
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406
561-682-6611
gredfiel@sfwmd.gov

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Edward C. Smith
Director, Office of Ecosystem Projects
Florida Department of Environmental Protection
3900 Commonwealth Blvd., MS 24
Tallahassee, Florida 32399-3000
850-245-3169
edward.c.smith@dep.state.fl.us

The complete 2015 SFER is available online at www.sfwmd.gov/sfer.



ON THE COVER

Kissimmee Basin Restoration

(Water Reservations)

Extending from Orlando to Lake Okeechobee, the Kissimmee Basin is known as the headwaters of the Everglades. Freshwater flows are essential to achieve—and sustain—environmental restoration of about 44 meandering miles of the historic Kissimmee River and floodplain plus more than two dozen interconnected lakes that together support a vast array of fish and wildlife such as the American green tree frog, *Hyla cinerea* (back cover).

To provide water essential for the protection of fish and wildlife in the Kissimmee River, its vast floodplain and the Upper Chain of Lakes, in June 2014 the South Florida Water Management District authorized the next step in a public process to reserve water for the ecosystem. Rule development for the Water Reservation will bring together stakeholders to continue an ongoing public review of Kissimmee science and technical data, with the goal of adopting a final rule in 2015.

To date, Florida has invested close to \$400 million in Kissimmee Basin restoration projects encompassing lakes, the river and floodplain. This accounts for almost 25,000 acres of wetland habitat critical to the protection of fish and wildlife, including endangered or threatened species. When implemented, the Water Reservation will guarantee that water needed to keep these ecosystems thriving will not be allocated for consumptive use.

For more information on regional Water Reservations, visit www.sfwmd.gov/watersupply



South Florida Water Management District
3301 Gun Club Road • West Palm Beach, Florida 33406
561-686-8800 • 1-800-432-2045 • www.sfwmd.gov

MAILING ADDRESS: P.O. Box 24680 • West Palm Beach, FL 33416-4680

sfwmd.gov