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quick facts on...

Restoration Strategies

for Clean Water for the Everglades

FEBRUARY 2016

BACKGROUND:
America's Everglades was once a vibrant, free-flowing River of Grass, extending from the Kissimmee Chain of Lakes near Orlando to the southern tip of the peninsula at Florida Bay. Over time, significant development allowed for population and economic growth. The construction of canals and water control structures, along with increased water needs due to urban and agricultural expansion, also contributed to unintended environmental consequences.

Recognizing that a healthy ecosystem is vital to a healthy economy, a number of initiatives are under way to improve water quality, increase storage and reestablish more historic flows.

***The South Florida Water Management District** is a regional governmental agency that manages the water resources in the southern part of the state. It is the oldest and largest of the state's five water management districts.*

***Our Mission** is to manage and protect water resources of the region by balancing and improving flood control, water supply, water quality and natural systems.*

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A Plan for Improving Water Quality

In June 2012, the State of Florida and the U.S. Environmental Protection Agency (EPA) reached consensus on new restoration strategies for further improving water quality in America's Everglades. Based on months of scientific and technical discussions, these strategies will expand water quality improvement projects to help achieve the phosphorus water quality standard established for the Everglades.

- Under these strategies, the South Florida Water Management District (SFWMD) is implementing a regional water quality plan to complete six water treatment and storage projects between Lake Okeechobee and the greater Everglades.
  - The projects in the technical plan include more than 6,500 acres of new **stormwater treatment areas** (STAs). These constructed wetlands use "green technology" to remove excess phosphorus, which can harm the Everglades ecosystem.
  - The technical plan also calls for 116,000 acre-feet of additional water storage through construction of **flow equalization basins** (FEBs). These impoundments will capture runoff during storm events and provide a more steady flow of water to the STAs, helping to maintain desired water levels needed to achieve optimal performance.
- The technical plan is part of a revised National Pollutant Discharge Elimination System (NPDES) permit issued by the Florida Department of Environmental Protection (DEP) and approved by the EPA for operation of the District's current network of five STAs south of Lake Okeechobee.The NPDES permit — along with a state-issued Everglades Forever Act permit — establishes stringent phosphorus limits for water discharged from the Everglades STAs.
- The strategies also feature implementation of additional source controls — where pollution is reduced at the source — in the eastern Everglades Agricultural Area (EAA) where phosphorus levels in stormwater runoff have been historically higher.
- In addition, a robust **science plan** will ensure continued research and monitoring to improve and optimize the performance of the STAs.

Current Restoration Strategies Projects

Design and construction of the treatment and storage projects in the Restoration Strategies Regional Water Quality Plan will take place in three phases, with completion of all projects set for 2025. Work is already under way on several components for the plan's first two phases. Projects in these two phases are scheduled to be finished by 2016 and 2018, respectively.

A-1 Flow Equalization Basin
With a capacity of 60,000 acre-feet, the A-1 FEB is the largest of three flow equalization basins in the Restoration Strategies plan. The A-1 FEB attenuates peak stormwater flows, temporarily storing water so it can be delivered at a steady rate to STA-2 and STA-3/4 to improve their performance. As a shallow FEB, the A-1 also contains emergent vegetation to help reduce

phosphorus concentrations before moving water to the STAs.

- **Project Status:**
  Operational testing and monitoring ongoing
- **Constuction Completion Date:** November 2015

L-8 Flow Equalization Basin
Building on a strategically located 950-acre former rock mine, the L-8 FEB is a deep below-ground reservoir capable of storing 45,000 acre-feet of water. Initially, this project will function as a multipurpose FEB to capture, store and deliver stormwater to STA-1 East and STA-1 West to improve their performance and to provide interim benefits for other restoration purposes. When the STA-1 West expansion is operational, the L-8 FEB will transition to primarily storing stormwater runoff and delivering flows to optimize the treatment performance of STA-1 East and STA-1 West.

- **Project Status:** Construction ongoing
- **Expected Construction Completion Date:** December 2016

L-8 Divide Structure (G-541)
The L-8 Divide Structure, also known as G-541, will be a fully automated water control structure located within the L-8 canal, just

east of the L-8 FEB. The structure will assist the movement of stormwater into the L-8 FEB for storage and, when needed, assist in directing FEB outflows south to STA-1 East and STA-1 West. G-541 is designed to function within the current operational criteria for the L-8 canal to maintain flood control for the basin.

- **Project Status:** Construction ongoing
- **Expected Construction Completion Date:** September 2018

STA-1 West Expansion
Located immediately northwest of the Arthur R. Marshall Loxahatchee National Wildlife Refuge (also known as Water Conservation Area 1), STA-1 West removes excess phosphorus and other nutrients from stormwater flowing into the Refuge and other parts of the greater Everglades. The 6,500-acre expansion of STA-1 West, which will take place in two phases, will double its effective treatment area and further reduce phosphorus concentrations.

- **Project Status:** Construction of Phase 1 ongoing
- **Expected Construction Completion Date:** December 2018 (Phase 1)

S-5AS Structure Modifications
Implementation of projects in the Restoration Strategies plan will increase the use of the existing S-5AS structure to direct stormwater runoff north to the L-8 FEB for storage. As a result, some modifications and upgrades to the structure are required to ensure more efficient operations.

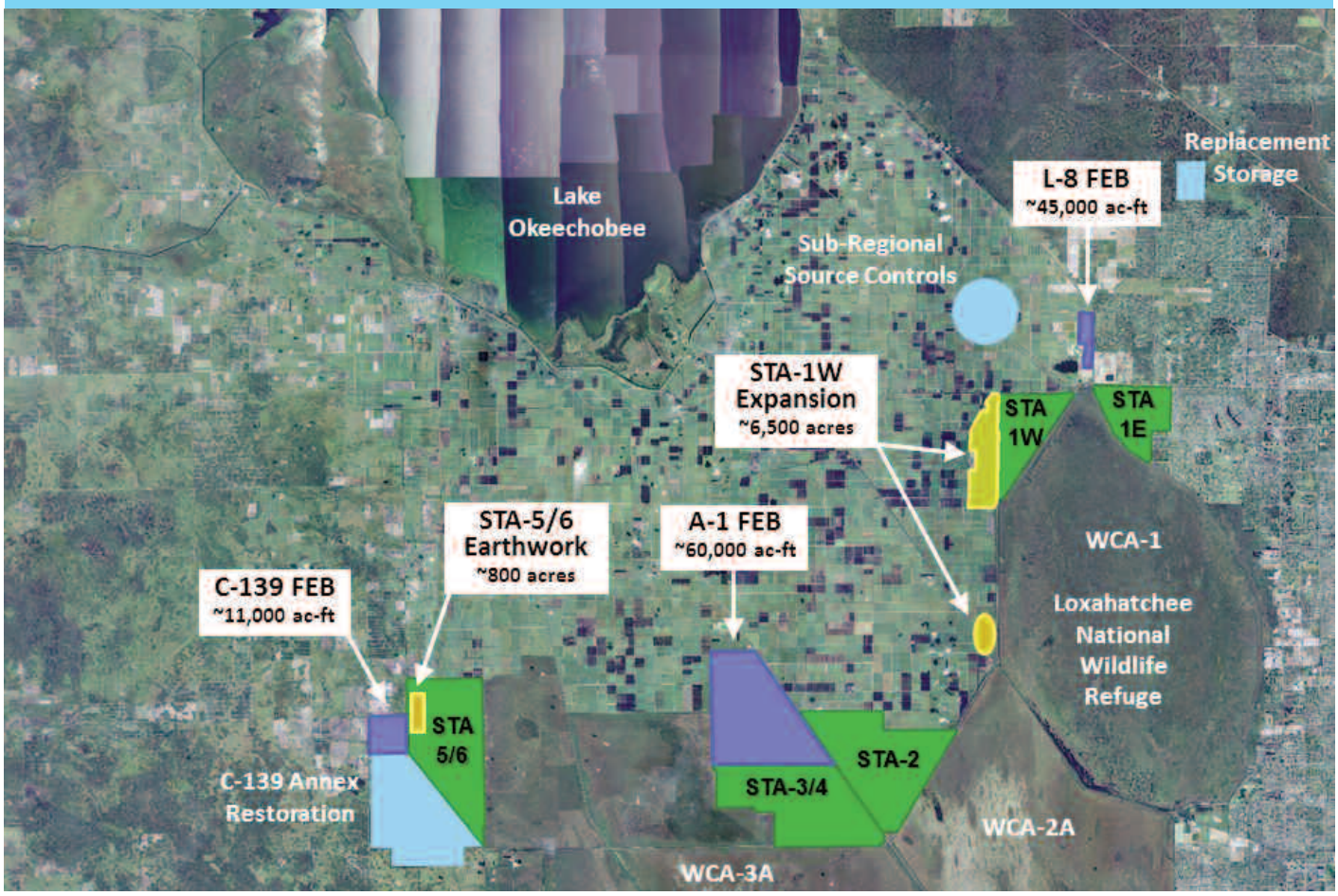
- **Project Status:** Construction ongoing
- **Expected Construction Completion Date:** September 2016

S-375 Structure Expansion (G-716)
The new G-716 structure will expand the capacity of the existing S-375 structure, located within STA-1 East. During high flow events in the C-51 West Basin or when STA-1 East is already receiving optimal flows, S-375 and G-716 will direct stormwater runoff to the L-8 FEB for storage prior to being redirected to STA-1 East and/or STA-1 West for treatment.

- **Project Status:** Construction ongoing
- **Expected Construction Completion Date:** December 2018

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Restoration Strategies – Key Projects



Science Plan Projects

As part of the Restoration Strategies Regional Water Quality Plan, the District is implementing the Science Plan for the Everglades Stormwater Treatment Areas. The Science Plan was crafted by more than 35 SFWMD scientists and engineers in coordination with technical representatives from DEP, EPA, the U.S. Army Corps of Engineers, Everglades National Park and the Arthur R. Marshall Loxahatchee National Wildlife Refuge.

- The Science Plan was developed to identify studies that investigate the critical factors that collectively influence ultra-low treatment performance and phosphorus reduction in the STAs.

- Results from Science Plan studies will be used to inform the design and operation of water quality projects in order to meet the stringent phosphorus standard for the Everglades. In addition, data and information gathered from the studies will be incorporated into the development and refinement of the District's modeling tools.

- **The Science Plan is structured around six key questions:**
  1. How can the FEBs be designed and operated to moderate and optimize phosphorus concentrations, phosphorus loading rates and hydraulic loading rates entering the STAs, possibly in combination with water treatment technologies or inflow canal management?
  2. How can internal loading of phosphorus to the water column be reduced or controlled, especially in the lower reaches of the treatment trains?
  3. What measures can be taken to enhance vegetation-based treatment in the STAs and FEBs?
  4. How can the biogeochemical or physical mechanisms be managed to further reduce soluble reactive, particulate and dissolved organic phosphorus concentrations at the outflow of the STAs?
  5. What operational or design refinements could be implemented at existing STAs and future features (i.e. STA expansions, FEBs) to improve and sustain STA treatment performance?
  6. What is the influence of wildlife and fisheries on the reduction of phosphorus in the STAs?

- The Science Plan was published in June 2013, and implementation is ongoing. It can be viewed at www.sfwmd.gov/rs_scienceplan.

As part of the Restoration Strategies Water Quality Plan, the South Florida Water Management District is implementing the Science Plan for the Everglades STAs. Developed by more than 35 District scientists and engineers in coordination with technical representatives from other state and federal agencies, the science plan identifies studies needed to increase phosphorus reduction and treatment performance in the STAs. Results from the Science Plan studies will be used to enhance design and operation of water quality projects in order to meet the stringent phosphorus standard for the Everglades.

Building on Water Quality Progress

The Restoration Strategies Regional Water Quality Plan will build on the significant progress already made by the State of Florida to protect and improve the Everglades. Since 1994, the State has invested more than $1.8 billion toward lowering phosphorus levels in Everglades-bound waters through a combination of nutrient source controls and construction projects. Farming Best Management Practices (BMPs) prevent or reduce phosphorus in discharges at the source. BMPs have worked in tandem with the Everglades STAs to contribute to documented water quality improvements.

- Five Everglades STAs are operational with an effective treatment area of 57,000 acres, including 12,000 acres completed in 2012.
- In Water Year 2015, these constructed wetlands treated more than 1.4 million acre-feet of water, reducing phosphorus loads by 83 percent. To date, the STAs have treated more than 16.1 million acre-feet of water and have retained more than 2,012 metric tons of phosphorus.
- Improved farming methods on 470,000 acres of agricultural lands south of Lake Okeechobee have resulted in annual average phosphorus reductions of 56 percent, more than twice the amount required by State law.
- To date, BMPs and STAs together have prevented approximately 4,860 metric tons of phosphorus from entering the Everglades.

For more information on Restoration Strategies for Clean Water for the Everglades, visit www.sfwmd.gov/restorationstrategies.

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