

2015

Central & Southern Florida Project

REPORT TO CONGRESS | COMPREHENSIVE EVERGLADES RESTORATION PLAN



Building a future with each generation

# 2015

## Central & Southern Florida Project

### REPORT TO CONGRESS | COMPREHENSIVE EVERGLADES RESTORATION PLAN



**PROGRESS: FOUNDATION, GENERATION 1 AND GENERATION 2 PROJECTS**

Images, left to right: Kissimmee River Restoration; C-51/STA-1E; C-111 South Dade Culverts; Modified Water Deliveries to Everglades National Park Tamiami Trail 1-Mile Bridge; Melaleuca Eradication Facility; Indian River Lagoon – South C-44 Reservoir/STA Intake Canal; Site 1 Impoundment; Picayune Strand Faka Union Pump Station; Site for C-43 Reservoir; Broward County Water Preserve Areas; Biscayne Bay Coastal Wetlands Deering Estates Flow-way; C-111 Spreader Canal

Front cover images courtesy of Angie Dunn, U.S. Army Corps of Engineers; Conservancy of Southwest Florida; National Oceanic and Atmospheric Administration; and the South Florida Water Management District.

## AGENCY LETTERS

Section 601 of the *Water Resources Development Act (WRDA)* of 2000 approved the Comprehensive Everglades Restoration Plan (CERP), which is the framework for modifications and operational changes to the Central and Southern Florida Project needed to restore, preserve, and protect the south Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection.

Section 601(l) of *WRDA 2000* requires that the Secretaries of the Army and the Interior jointly submit a Report to Congress not less than every five years on the implementation of the plan. This report covers progress made between July 1, 2010 and June 30, 2015.

In accordance with Section 601(l)(1) of *WRDA 2000*, this report includes:

*“...the determination of each Secretary, and the Administrator of the Environmental Protection Agency, concerning the benefits to the natural system and the human environment achieved as of the date of the report and whether the completed projects of the Plan are being operated in a manner that is consistent with the requirements of subsection (h)...”*

Following are these determinations and a letter of support signed by the Florida Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD).

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DEPARTMENT OF THE ARMY  
OFFICE OF THE ASSISTANT SECRETARY  
CIVIL WORKS  
108 ARMY PENTAGON  
WASHINGTON DC 20310-0108  
FEB 23 2016

**Determination of the Secretary of the Army for the  
Five-Year Report to Congress Pursuant to Section 601(I) of the WRDA 2000**

I am providing the 2015 Five-Year Report to Congress as per the Water Resources Development Act (WRDA) of 2000, Section 601(1) and as required by the Programmatic Regulations for the Comprehensive Everglades Restoration Plan (33 C.F.R. § 385.40(d)(1)). I have determined that satisfactory progress is being made towards achieving the benefits for the natural system and the human environment envisioned in the Comprehensive Everglades Restoration Plan (CERP).

The Army Corps of Engineers, in partnership with its primary partner, the South Florida Water Management District, continues to develop and implement the CERP. The successful implementation of the CERP is a result of consultation with the Department of Interior, Environmental Protection Agency, Department of Commerce, tribal governments, State of Florida, and other Federal partners, all of which have actively participated in the development and progress of this program.

In the past five years, four projects were authorized in the Water Resources Reform & Development Act of 2014 (WRRDA): the C-111 Spreader Canal Western Project; the Biscayne Bay Coastal Wetlands Phase I Project; the Broward County Water Preserve Areas Project; and Caloosahatchee River (C-43) West Basin Storage Reservoir Project. In addition, the Central Everglades Planning Project, a suite of CERP projects focused on the heart of the Everglades, has a signed Chief's Report and was provided to Congress in August 2015 for consideration in future legislation.

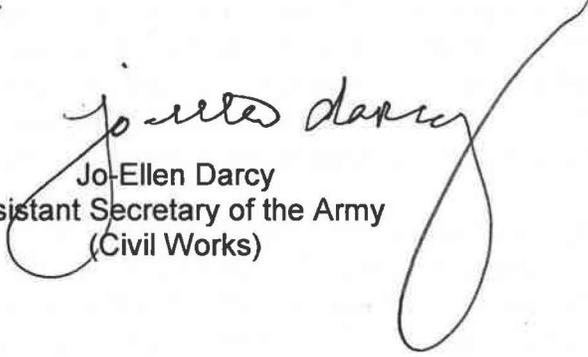
The Water Resources Development Act of 2000 conveyed the expectation that adaptive management principles would be applied during CERP implementation. The CERP Monitoring and Assessment Plan, a scientifically rigorous system-wide/regional monitoring program, has laid the foundation by generating information to support understanding of ecosystem responses to CERP implementation. Extensive new data has been collected over the last five years from applied research, field monitoring, and computer analysis that informs the understanding of the complex Everglades environment. The value of new scientific information is its ability to improve decision making within CERP, thereby improving restoration success.

The Master Implementation Sequencing Plan has been updated via development of the the Integrated Delivery Schedule (IDS) which encompasses not only CERP projects, but also other major south Florida restoration efforts and their interdependencies. The IDS provides the comprehensive schedule for planning, design, and construction for projects in the South Florida ecosystem restoration program. The IDS identifies the optimum sequencing of key restoration projects to

deliver meaningful restoration benefits as early as possible, consistent with law and available funding. The IDS incorporates both Federal and State initiatives.

The State of Florida has made significant advances in regards to land acquisition, project construction and water storage and management. The State began implementation on several projects or portions of projects, some of which are identified in CERP, with the goal of advancing the delivery of benefits to the natural and human environments. Additionally, in 2012, the State of Florida, including the Florida Department of Environmental Protection, the South Florida Water Management District, and the U.S. Environmental Protection Agency reached consensus on new strategies that will work in conjunction with existing water treatment areas to improve water quality in America's Everglades.

The next five years hold the promise of even more tangible, beneficial change in the south Florida ecosystem. We look forward to continuing progress with the Department of Interior, the State of Florida, and our other partners in achieving the benefits for the natural system and the human environment envisioned by CERP to ensure the Everglades are Forever.



Jo-Ellen Darcy  
Assistant Secretary of the Army  
(Civil Works)



THE SECRETARY OF THE INTERIOR  
WASHINGTON

**Determination of the Secretary of the Interior for the Five-Year Report to Congress Pursuant to Section 601(L) of the Water Resources Development Act of 2000**

The restoration of America's Everglades continues to make significant progress as reflected in this *Five-Year Report to Congress*. Progress includes: (1) major restoration benefits for the environment as a result of the implementation of the Comprehensive Everglades Restoration Plan (CERP); (2) additional work to restore the quantity, quality, timing, and distribution of fresh water; (3) restoration of habitat and recovery of threatened and endangered species; and (4) efforts to ensure compatibility between the built and natural environments throughout the South Florida Ecosystem. The success of the restoration program would not be possible without effective collaboration between the Department of the Interior (Department), State of Florida (State), and their Federal, tribal, and local government partners, as well as a diverse set of non-governmental interests.

Increasing the spatial extent of wetlands and providing increased water supplies for the environment provides numerous observed benefits for the Everglades natural system. Examples include:

- Restoring more than 400,000 additional acre-feet per year of clean fresh water to 2 million acres of natural system throughout the greater Everglades ecosystem.
- Removing excess phosphorus from water delivered to the Everglades through Florida's "Restoration Strategies" program so as to achieve the necessary level of water quality for restoration.
- Completing the planning for the Central Everglades Planning Project, currently pending before Congress for authorization, that will further increase water supplies by another 210,000 acre-feet thereby benefitting coastal estuaries and lessening damaging regulatory discharges.
- Restoring more than 15,000 acres of wetlands in the historic of the Kissimmee River Basin floodplain.
- Restoring 13,000 acres in the Picayune Strand with beneficial impacts to native species including the endangered Florida panther.

Restoring the Flow of Clean Fresh Water

The Department is especially pleased with the progress toward restoring flows in the southern end of the ecosystem, which is home to Everglades National Park, Biscayne National Park, and other Federal, State, tribal, and local conservation areas. In 2013, a one-mile bridge was completed that will allow water to move freely under a portion of the Tamiami Trail, thereby

restoring habitat and increasing water flow through the Everglades National Park and into Florida Bay. Other progress in the southern end of the system includes the C-111 Spreader Canal Western Project which was completed in 2012. This project prevents the loss of groundwater thereby restoring wetlands and coastal habitat within Everglades National Park. In addition, the State completed phase 1 of the Biscayne Bay Coastal Wetlands Project benefiting Biscayne National Park and its coastal and estuarine habitat. This project will restore native habitats, improve water quality in Florida Bay, and enable the restoration partners to better combat rising sea levels. As the Modified Water Deliveries and C-111 South Dade projects near completion, redirection of existing flows are now beginning into Northeast Shark River Slough and Taylor Slough restoring natural flow patterns and habitat in the 109,000-acre Everglades National Park expansion area as well as redistributing inflows to Florida Bay.

Efforts to move water south from Lake Okeechobee depend on significant replumbing of the central Everglades. During the reporting period, the expedited planning process for the Central Everglades Planning Project (CEPP) and innovative stakeholder engagement led by the South Florida Ecosystem Restoration Task Force resulted in a plan to bring more clean fresh water to the Everglades from Lake Okeechobee. As noted above, the CEPP plan is ready for authorization in the next Water Resources Development Act. Once constructed, the CEPP will further increase flow into Everglades National Park under the Tamiami Trail Next Steps Project, which was authorized by Congress in 2012, that is currently being implemented by the National Park Service and the State of Florida's Department of Transportation.

#### Restoring Natural Habitat

The Kissimmee River Restoration Project, which began prior to the CERP, restored more than 20,000 acres of wetlands and 44 miles of historic river channel with clear results in the resurgence of native plants and avian species. Likewise, the CERP is restoring natural habitats, thereby building on the progress the partners are making and improving overall ecosystem health. During this past reporting period, the Picayune Strand Restoration Project broke ground and will, when complete, restore 55,000 acres of habitat by restoring natural water flows and reconnecting wetlands. Initial investigations document the resurgence of native vegetation, wading birds, and increased numbers of the highly endangered Florida panthers utilizing this area.

#### Recovery of Threatened and Endangered Species

Everglades restoration efforts continue to make important contributions to enhance the survival and recovery of imperiled species. During the past 5 years, the status of the wood stork was down listed from endangered to threatened. The West Indian manatee population has increased significantly; the U.S. Fish and Wildlife Service recently announced a proposal to down list this species from endangered to threatened. The Florida panther population is continuing to increase, with the potential for creating additional populations outside of its present range in south Florida. The Everglade snail kite, although still endangered, has increased in population over the past 5 years; it is highly dependent on healthy wetlands in south Florida.



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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

DEC - 2 2015

OFFICE OF WATER

**Determination of the Administrator of the U.S. Environmental Protection Agency for the 2015 Five-Year Report to Congress Pursuant to Section 601(1) of the WRDA 2000**

On behalf of the Administrator of the U.S. Environmental Protection Agency (EPA), I have determined that substantial progress is being made to achieve significant environmental restoration as well as benefits to the South Florida human environment as a result of implementation of the Comprehensive Everglades Restoration Plan (CERP). The actions to date are consistent with the required assurances of project benefits contained in Subsection 601(h) of the Water Resources Development Act (WRDA) of 2000. This determination is in accordance with Section 601(1) of the Act and as required by the Programmatic Regulations for the CERP (33C.F.R. § 385.40 (d)(1)).

The 2015 CERP Report to Congress, jointly submitted by the Secretaries of the Army and Interior, is the third CERP report to Congress since the enactment of WRDA 2000. The report details the substantial and meaningful programmatic and project related efforts of the U.S. Army Corps of Engineers (COE), the South Florida Water Management District, the associated cooperating federal and state agencies, the Tribal Nations, and local governments responsible for implementing CERP. Currently, numerous CERP implementation activities are underway.

During the past 5 years, significant environmental results have been achieved through implementation of CERP and the pre-CERP foundation restoration projects, such as the Kissimmee River Restoration Project, the Modified Water Deliveries to Everglades National Park Project, and the C-111 South Dade Project. In addition, in 2012, the EPA and the State of Florida reached a historic agreement on new strategies for improving water quality in America's Everglades. The State's Restoration Strategies Program projects, estimated at \$880 million, will work in conjunction with the existing Everglades stormwater treatment areas (STA) and CERP projects to achieve compliance with Everglades water quality standards. The design and construction of these features will be completed by 2025, with some key project features operational by 2016. Once all projects are complete in each flow path (east, central and west), the stringent STA outflow total phosphorus concentration limit is expected to be achieved.

During the past five years, construction of CERP generation one projects authorized by WRDA 2007 have begun. These projects include the Picayune Strand Restoration Project, the Indian River Lagoon South C-44 Reservoir/STA, and the Site 1 Impoundment. Florida has begun expedited construction of several CERP generation two restoration projects which were authorized by Congress in WRDA 2014. These projects include the C-111 Spreader Canal, the Biscayne Bay Coastal Wetlands Phase 1 Project, and the Caloosahatchee River Western Basin Storage Reservoir.

The Central Everglades Planning Project (CEPP), whose goal is to substantially increase freshwater flows south from Lake Okeechobee to Everglades National Park and Florida Bay, was completed in an expedited three-year period. It has been approved by the Assistant Secretary of the Army for Civil Works and will be submitted to Congress to be authorized in the next WRDA.

Additionally, the Tamiami Trail 1-Mile Bridge Project has been completed and construction of the Tamiami Trail Next Steps Project is expected to begin in the near future. Ongoing construction activities associated with these many major CERP projects and Restoration Strategies Projects have resulted in real on-the-ground progress demonstrating this Administration's commitment to ecosystem restoration in South Florida.

Another indicator of substantial progress is EPA's implementation in 2014 of another round of the Everglades Ecosystem Assessment Program (also referred to as Regional Environmental Monitoring and Assessment Program, or REMAP). EPA began this assessment program in 1995 to provide a baseline of ecological health that could serve as a benchmark for assessing future conditions and restoration progress. The 2014 sampling of 119 locations in the Everglades represents the tenth sampling event over the last 20 years. The Program documents current and changing water quality and ecological conditions in the Everglades in order to provide quantitative statements about ecosystem health, and to assess the progress of restoration. The findings of the assessment will be available in 2016 and will address key questions related to water management and soil loss, and track the effectiveness of restoration efforts such as the Restoration Strategies Program to control phosphorus, efforts to restore Everglades habitat, and efforts to control mercury.

Over the next five years, numerous CERP projects are scheduled for construction and completion. These projects will result in improved water quality and ecological conditions in the wetland and aquatic ecosystems of South Florida. I anticipate that the next CERP Report to Congress will document continued substantial ecological restoration success across the South Florida landscape.

EPA is, and will continue to be, an active partner working with the COE, the other federal agencies, the State of Florida, the Tribal Nations, and local governments in the development and implementation of CERP. EPA views CERP as a vital opportunity to restore the nationally and internationally valuable and unique Everglades ecosystem. EPA remains committed to supporting the adaptive management approach to CERP implementation in order to achieve the natural system and human environment results for South Florida.



Joel Beauvais  
Acting Deputy Assistant Administrator  
Office of Water



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South Florida Water Management District  
3301 Gun Club Road  
West Palm Beach, Florida 33406



December 14, 2015

The Honorable Jo-Ellen Darcy  
Assistant Secretary of the Army  
Civil Works  
104 Army Pentagon  
Room 3E446  
Washington, DC 20310

Dear Secretary Darcy:

The 2015 Report to Congress on the Comprehensive Everglades Restoration Plan (CERP) documents the many significant achievements of the partnering agencies. The report captures both the successes and challenges of implementing these projects to ensure that America's Everglades is a vibrant and living legacy for future generations. Considerable progress has been made over the last five years on both CERP and other foundation projects. While recognizing that restoring the Everglades is a long-term commitment, we are pleased to report that several of Florida's efforts are already yielding significant water quality and storage enhancements to benefit the Everglades.

In 2012, the State of Florida authorized the South Florida Water Management District (District) to construct a suite of civil works projects to accelerate water quality improvements to water flowing into the Everglades. Known as Restoration Strategies, these water quality projects represent an investment totaling \$880 million and are being funded through District and State appropriations. As of November 2015, the District is meeting construction milestones to ensure overall completion by December 31, 2025.

Considerable improvements have already been documented in water quality entering America's Everglades. Notably, all inflow regions to the larger Everglades Protection Area now have decreasing total phosphorus concentrations. Further, six sampling locations within the Everglades Protection Area have transitioned from impacted to unimpacted as a result of decreasing phosphorus levels. Total phosphorus load has been reduced by an average of 65 percent over the last five years from Everglades Agricultural Area basins through an intensive best management practices program with farmers and ranchers in the region. The Stormwater Treatment Areas treated approximately 1.7 trillion gallons of water during the same period and together these efforts reduced the total phosphorus loads in water entering the Everglades by approximately 82 percent.

Florida remains committed to the ecological health of its estuaries through restoration of more natural coastal flows and protection of estuarine habitats. Efforts to achieve this include expediting projects

ahead of the federal process in order to achieve ecosystem benefits as early as possible. Specific projects include the Caloosahatchee River C-43 West Basin Reservoir, Biscayne Bay Coastal Wetlands Phase 1 and, near Everglades National Park, the C-111 West Spreader Canal. In addition, Florida continues to support projects with federal Project Partnership Agreements using State funding for the construction of the stormwater treatment area and pump station portion of the C-44 Reservoir and Stormwater Treatment Area Project as well as components for the Picayune Strand Restoration Project.

Increasing natural flows through the heart of the Everglades system is essential to the restoration effort. The Central Everglades Planning Project (CEPP) is focused on this goal, and when implemented, CEPP projects will increase storage, treatment and conveyance of water south from Lake Okeechobee, through the Everglades and on to Florida Bay. To advance this effort, in 2013 Governor Scott partnered with the U.S. Department of the Interior to commit \$90 million in funding to help complete the Tamiami Trail 2.6 Mile Bridge, a project that is critical to the success of the CEPP. Earlier this year, the CEPP received a signed Record of Decision and is ready to be authorized in the next Water Resources and Development Act. To sustain restoration progress, Florida urges Congress to proceed with immediate authorization of the CEPP to benefit the heart of America's Everglades.

Florida also recognizes that invasive exotic species are an obstacle to restoration progress because these nuisance species threaten the very ecosystems that we are working to restore. State and Federal partners are collaborating to identify solutions to eradicate and control invasive exotic species. There has been some success to control invasive exotics in the Everglades, notably the completion in 2013 of the CERP project known as the Melaleuca Eradication and Other Exotic Plants Research Annex. With dedicated State and Federal funding, this facility serves to develop and implement biological controls that supplement existing efforts against the most aggressive, widespread and problematic invasive exotic plants in south Florida.

Florida asserts that exotic species management is a critical part of Everglades restoration, but there is much more that must be done to overcome these invasives. Dedicated Federal funding is needed for invasive exotic species control to protect and enhance vital portions of the Everglades managed by the U.S. Fish and Wildlife Service (USFWS), particularly in the Loxahatchee National Wildlife Refuge (Refuge). Invasive exotic control in the Refuge, particularly for eradication and control of Old World Climbing Fern and Melaleuca, has been under-funded and as a result, the USFWS has lost momentum in its invasive exotic control efforts. We urge Congress to provide additional sustained funding to enable the Refuge to regain control of the invasive exotic species that now threaten Everglades restoration efforts.

During the past five years, a noteworthy contributor to success in implementing State/Federal cost shared projects has been a significant improvement in the timely, effective communication between the State and Federal partners. Communication improvements have achieved better understanding, coordination and collaboration between partners and regional stakeholders, ultimately reducing delays in getting projects underway.

The Honorable Jo-Ellen Darcy

Page Two

December 14, 2015

Overall restoration planning continues, and in November 2015, the CERP Integrated Delivery Schedule (IDS) was updated with input from the State and a broad range of stakeholders. The IDS now identifies a path forward for efficient and timely implementation of the authorized CERP projects as well as future planning for restoration projects. Dedicated and steady funding from Congress remains critical to maintaining the momentum that the State and Federal governments are now achieving.

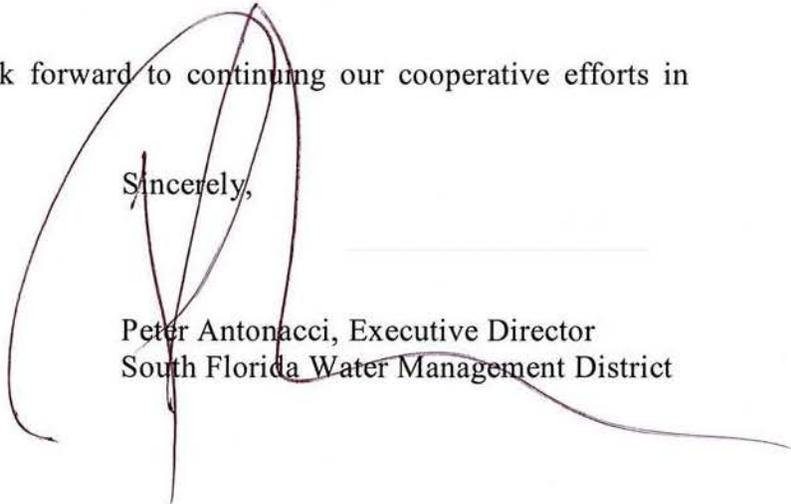
We remain committed to this process and look forward to continuing our cooperative efforts in protecting and restoring America's Everglades.

Sincerely,



Jonathan P. Steverson, Secretary  
Department of Environmental Protection

Sincerely,



Peter Antonacci, Executive Director  
South Florida Water Management District

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## EXECUTIVE SUMMARY

America's Everglades: an area twice the size of New Jersey; a multifaceted mixture of dense forests and open prairies, sunny croplands and shady swamps, rural expanses and dynamic cities; and the source of water for 8.1 million residents. Unique and threatened, the Everglades is the focus of a restoration partnership between the federal government and the State of Florida.

Just a century ago, massive quantities of water flowed through the Kissimmee River floodplain into Lake Okeechobee. Then, spreading into a wide shallow sheet of water, it flowed south through vast marshes to Florida Bay. Coined the "River of Grass" for the sawgrass that flourished in its center, the Everglades is actually a mosaic of freshwater ponds, prairies, and forested uplands that supports rich plant and wildlife communities. Renowned for its wading birds and diverse wildlife, the Everglades is home to dozens of federally threatened and endangered species. Over time, the Everglades has diminished in size by about half; but it remains, even in its diminished state, one of the largest intact wetland ecosystems in the world. Its restoration is arguably the largest and most complex environmental restoration endeavor in history. Everglades restoration is a partnership between the federal government and the State of Florida, and that partnership has produced unprecedented success over the past five years.<sup>1</sup>

### FIVE YEARS OF UNPRECEDENTED PROGRESS

The one word that characterizes Everglades restoration during the July 1, 2010 to June 30, 2015 time-period covered by this report is **Progress**. Federal, state, local, and tribal governments, the United States Congress, the Florida Legislature, stakeholder groups, and members of the public have taken concrete, collaborative steps over the past five years to move key restoration programs and plans forward. This reporting period has been busy with new construction starts, project completions, accelerated planning efforts, and record-breaking new investments in water quality. The hope for America's Everglades is that this success will breed even more progress in the years to come.

Progress is indeed continuing beyond the end-date of this reporting period, with planning currently moving ahead (Loxahatchee River Watershed Restoration Project), recommended plans have been provided to Congress for authorization (Central Everglades Planning Project), construction contracts being awarded (C-111 South Dade Project Contract 8), ground breakings (Indian River Lagoon South Project's C-44 Reservoir), and construction completions (Site 1 Impoundment - Phase 1, and Restoration Strategies' A-1 Flow Equalization Basin) all before the end of 2015.

Even in the wake of so much restoration progress, there is still much more to accomplish and a great sense of urgency to move restoration farther down the road. There is no greater reminder of the importance and urgency of Everglades restoration than the threats faced by the ecosystem during the past five years. Heavy rains in 2013 devastated northern coastal estuaries and threatened tree island habitats, while a lack of rain and freshwater flows in 2015 are contributing to declining ecological conditions in Florida Bay and Biscayne Bay. Despite gains and efforts, invasive plants and animals gained

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<sup>1</sup> Section 601 of the Water Resources Development Act (WRDA) of 2000 approved the Comprehensive Everglades Restoration Plan and requires that the Secretaries of the Army and the Interior jointly submit a Report to Congress regarding implementation progress. This report is submitted pursuant to WRDA 2000 and the Programmatic Regulations (33 CFR 385.40) and covers progress made between July 1, 2010 through June 30, 2015.

**CERP Projects**

- 1 - Acme Basin B Discharge
- 2 - Big Cypress - L-28 Interceptor Modifications
- 3 - Biscayne Bay Coastal Wetlands
- 4 - Broward County Secondary Canal System
- 5 - Broward County Water Preserve Areas
- 6 - C-4 Control Structures
- 7 - C-43 Basin Aquifer Storage and Recovery
- 8 - C-111 Spreader Canal
- 9 - Caloosahatchee Back-pumping with Stormwater Treatment
- 10 - Caloosahatchee River (C-43) West Basin Storage Reservoir
- 11 - Central Lake Belt Storage Area
- 12 - Everglades Agricultural Area Storage Reservoirs
- 13 - ENP Seepage Management
- 14 - Florida Keys Tidal Restoration
- 15 - Flows to NW and Central WCA 3A
- 16 - Henderson Creek-Belle Meade Restoration
- 17 - Hillsboro Aquifer Storage and Recovery
- 18 - Indian River Lagoon - South
- 19 - Lake Okeechobee Aquifer Storage and Recovery
- 20 - Lake Okeechobee Watershed
- 21 - Lake Trafford Restoration
- 22 - Lakes Park Restoration
- 23 - Loxahatchee NWR Internal Canal Structures
- 24 - Loxahatchee River Watershed Restoration
- 25 - Loxahatchee River Watershed Restoration - ASR
- 26 - Melaleuca Eradication and Other Exotic Plants
- 27 - Miccosukee Tribe Water Management Plan
- 28 - North Lake Belt Storage Area
- 29 - PBC Agriculture Reserve Aquifer Storage and Recovery & PBC Agriculture Reserve Reservoir
- 30 - Picayune Strand Restoration
- 31 - Restoration of Pineland and Hardwood Hammocks in C-111 Basin
- 32 - Seminole Big Cypress Reservation Water Conservation Plan
- 33 - Site 1 Impoundment
- 34 - South Miami-Dade Reuse
- 35 - Southern CREW
- 36 - Strazzulla Wetlands
- 37 - WCA2B Flows to ENP
- 38 - WCA3 Decompartmentalization & Sheetflow Enhancement
- 39 - West Miami-Dade Reuse
- 40 - Winsberg Farm Wetlands Restoration
- 41 - WPA Conveyance

**CERP Pilots**

- 10 - C-43 Aquifer Storage and Recovery Pilot
- 17 - Hillsboro Aquifer Storage and Recovery Pilot
- 42 - L-31N (L-30) Seepage Management Pilot
- 43 - Lake Belt In-Ground Reservoir Technology Pilot
- 19 - Lake Okeechobee Aquifer Storage and Recovery Pilot
- 44 - Wastewater Reuse Technology Pilot

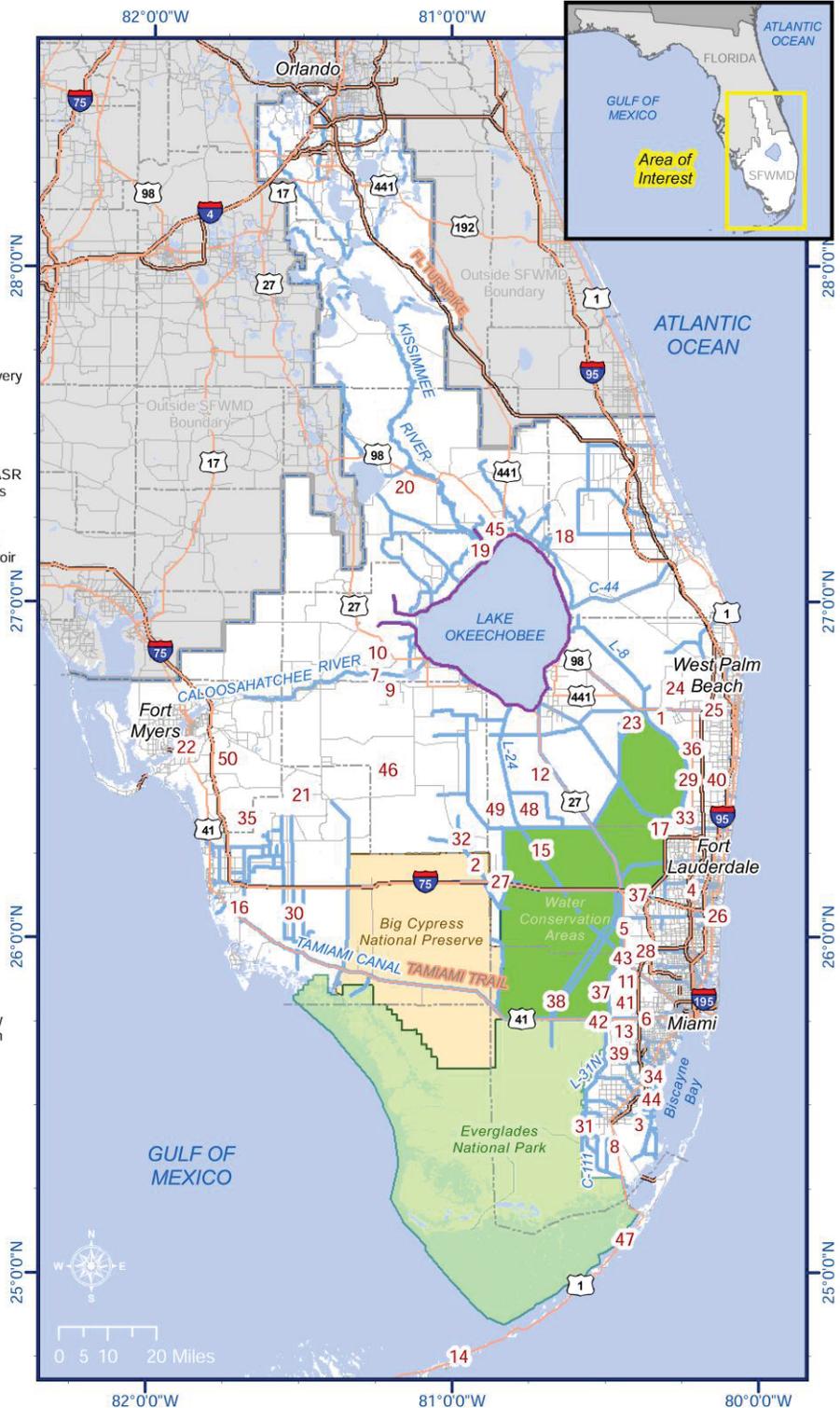
**CERP Plans and Studies**

- 45 - Aquifer Storage and Recovery Regional Study
- 46 - Comprehensive Integrated Water Quality Plan
- 47 - Florida Bay Florida Keys Feasibility Study
- 48 - Modify Holey Land WMA Operation Plan
- 49 - Modify Rotenberger WMA Operation Plan
- 50 - Southwest Florida Feasibility Study

**Legend**

-  Herbert Hoover Dike
-  Existing Canals

**IMPORTANT DISCLAIMER:**  
 This map is a conceptual or planning tool only. CERP does not guarantee or make any representation regarding the information contained herein. It is not self-executing or binding, and does not affect the interests of any persons or properties, including any present or future right or use of real property.



Map Updated: July 15, 2011 Map Author: Laura Biddison, CERP GIS Map Technician  
 Map Location: \\cERP\projects\GIS\PRGM\_07\map\_docs\cmn11856\_CongressReport\CERP\_Projects\_cm11856.mxd

Figure 1: Map of the Comprehensive Everglades Restoration Plan Projects

a greater foothold throughout the system in the last five years. Everglades restoration will address these and other threats, making the region healthier and more sustainable.

## TO RESTORE THE EVERGLADES, WE HAVE TO GET THE WATER RIGHT

The Comprehensive Everglades Restoration Plan (CERP) focuses on “getting the water right” in the south Florida ecosystem—getting the right amount of water of the right quality to the right places at the right time (Figure 1). Implementing projects that capture, store, clean, and redistribute water will restore natural water flow, enhance and protect habitats, and improve our ability to retain and utilize much-needed fresh water within the ecosystem, instead of having to drain this precious resource to the Atlantic Ocean and Gulf of Mexico. How are we accomplishing these goals? By reconfiguring the water management infrastructure of an 18,000 square mile region. We plan, design, construct, and operate CERP and other restoration projects to reverse the damage the current water management system has inadvertently caused the Everglades, while continuing to serve the millions of people who reside within and visit the region.

### Restoring and Protecting Estuaries and Coastal Areas

- *Challenge: Our estuaries and coastal areas currently receive too little or too much water, impacting the delicate salinity balance needed for these rich ecosystems to flourish.*
- *Solution: Storing, cleaning, and distributing excess water in ways that benefit coastal ecosystems.*

The *Biscayne Bay Coastal Wetlands Project* improves the ecology of Biscayne National Park by rehydrating coastal wetlands and increasingly flowing fresh water to the estuary over a broad area, instead of through individual drainage canals. The State of Florida expedited construction of the *Deering Estate Flow-way* has already produced ecological and hydrological improvements in the area, which in turn have produced improvements in Biscayne Bay’s habitat quality (Figure 2).



Figure 2: Deering Estate Flow-way

The *Caloosahatchee River (C-43) Western Basin Storage Reservoir Project* will capture runoff from the surrounding basin and some excess water from Lake Okeechobee. When completed it will reduce the frequency of harmful discharges to the estuary during wet periods and provide a source of water during dry periods. In addition, this project will improve water quality by reducing salinity and nutrient impacts to the estuary. The State has expedited the project, planning for completion of Cell 1 by 2018 and Cell 2 by 2020. The total storage capacity upon completion will be 55 billion gallons of water, enough to cover the city of Miami with 7.5 feet of water.

The Herbert Hoover Dike is a 143-mile earthen dam that surrounds Lake Okeechobee, the heart of the Kissimmee-Okeechobee-Everglades system. The *Herbert Hoover Dike Major Rehabilitation Project* and *Dam Safety Modification Study* are addressing seepage and stability problems through a combination of construction features and operations to prevent a potential failure during extreme high water events.

Once completed, this project will provide greater water management flexibility, thus improving the amount and timing of water released to the northern coastal estuaries.

The Indian River Lagoon-South Project addresses water flows into the estuary and lagoon and will restore native habitats and improve water quality. This project includes multiple water storage and treatment features. The U.S. Army Corps of Engineers (USACE) completed the first construction contract for the project in July 2014 (construction of the intake canal, access roads, and other preparatory work for the C-44 reservoir) (Figure 3). The USACE also awarded the construction contract for the first of four planned water reservoirs (the C-44 reservoir) in September 2015. The South Florida Water Management District (SFWMD) is constructing associated water management features, including a large pump station to move the water (the C-44 pump station) and a stormwater treatment area (STA) to improve water quality (the C-44 STA).



Figure 3: Groundbreaking for the Indian River Lagoon-South C-44 Reservoir and Stormwater Treatment Area on Oct. 28, 2011, in Indiantown, Florida. Photo: USACE.

#### **Restoring Water Flow to Everglades National Park and Florida Bay**

- *Challenge: Not enough water is currently flowing to Everglades National Park and Florida Bay.*
- *Solution: Delivering larger quantities of water to these areas and preventing this water from seeping out of the system before it gets there.*

The C-111 Spreader Canal Western Project helps keep underground water in Everglades National Park, provides increased fresh water to Florida Bay through Taylor Slough, and restores freshwater wetlands, tidal wetlands, and coastal habitat. Completed by the SFWMD in 2012, this project enhances the habitat conditions that produced the massive colonies of wading birds that once inhabited this area.

The Modified Water Deliveries to Everglades National Park Project (Mod Waters) is 95% complete. This project will improve natural water flows to Shark River Slough and Everglades National Park. Flood mitigation work to protect a residential area near the project (the 8.5 Square Mile Area) will be complete in 2016. A field test of the project's features will begin in late 2015. This is the first increment of a three increment process to develop a final operational plan for Mod Waters. The first increment uses the S-356 Pump Station and is designed to return water lost through underground seepage back to the park and to increase water stages and flows in Northeast Shark Slough.

One of the more important accomplishments during the reporting period was completion of a new one-mile bridge on the Tamiami Trail to improve water flow under the roadway and into Everglades National

Park (Figure 4). Built in the 1920s, U.S. Highway 41, commonly known as Tamiami Trail, functions as a dam between the central Everglades and Everglades National Park. Replacing sections of this roadway with bridges is important for restoration.

In 2014, the Committee on Independent Scientific Review of Everglades Restoration Progress (CISRERP) commended the restoration program on the one-mile bridge, referring to it as “a major step” in restoring the hydrology and ecology of Shark River Slough in Everglades National Park (NRC 2014). It also recognized the important congressional leadership necessary to move the project forward (NRC 2010).



Figure 4: Ribbon cutting for the one-mile bridge on Tamiami Trail in 2013, a major milestone in restoring flows to Everglades National Park. Photo: USACE

Under a separate congressional action, the National Park Service (NPS) received authorization to construct 5.5 additional miles of bridging on Tamiami Trail. As a part of this project, Florida Governor Rick Scott announced in 2012 the state’s intention to collaborate with the NPS on the construction of a new 2.6-mile bridge. This additional bridging will provide even more water flow into Everglades National Park and will distribute that flow across a wider area to hydrate important deeper water habitats in the park. A contract award for this bridge is expected by January 2016 and a construction groundbreaking is anticipated in April 2016.

In its 2012 report, the CISRERP noted that although the pace of ecosystem restoration had improved, the focus had been on the periphery of the remnant Everglades. Completed in 2014 and transmitted to Congress for authorization in 2015, the *Central Everglades Planning Project (CEPP)* addresses this concern by removing barriers to flow in the central Everglades to begin putting the “river” back into the “River of Grass.” The CEPP will bring an average of 200,000 acre-feet (enough to cover Manhattan with more than 9 feet of water) of additional water from Lake Okeechobee into the central Everglades each year. This will reduce damaging discharges to the northern estuaries while returning more flow to the Everglades. The new water will eventually flow into Everglades National Park under the 2.6-mile bridge scheduled for completion in 2019. The final administrative review (*Record of Decision*) was signed August 31, 2015, just after the end of this reporting period (Darcy 2015).

#### **Restoring Water Quality: *The Restoration Strategies Project***

- *Challenge: Poor water quality negatively impacts native habitats and species.*
- *Solution: Cleaning water before it enters sensitive ecosystems.*

In 2012, the State of Florida, including the Florida Department of Environmental Protection (FDEP) and the SFWMD, and the U.S. Environmental Protection Agency (USEPA) reached consensus on new strategies for improving water quality in America's Everglades dubbed *Restoration Strategies* (SFWMD 2012). Under this project, the SFWMD will create more than 6,500 acres of new water treatment wetlands (STAs) and 116,000 acre-feet of additional water storage (flow equalization basins or FEBs). In

2013, the Florida Legislature unanimously voted to include the state’s plan into law and committed an unprecedented recurring funding source for the duration of the program.

The *Restoration Strategies* program managed by the FDEP and the SFWMD, estimated at \$880 million, will work in conjunction with existing water treatment areas to achieve compliance with stringent water

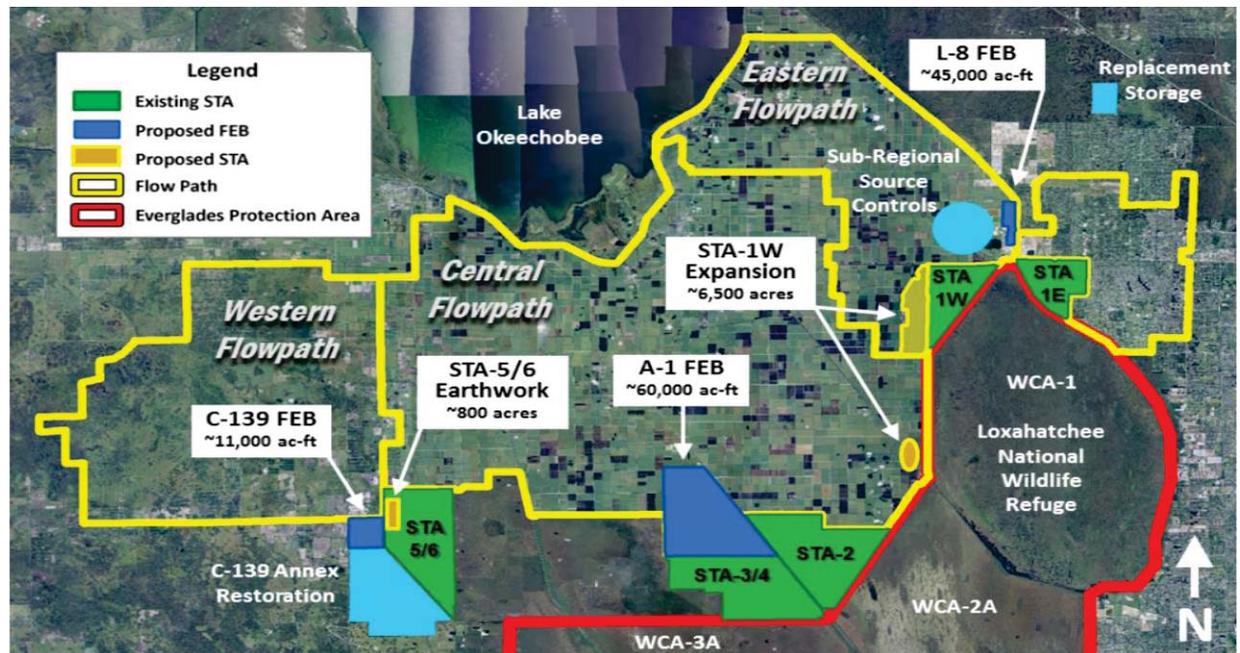


Figure 5: Project features of the Restoration Strategies program.

quality standards for the nutrient phosphorus within America’s Everglades (Figure 5). This program will be completed by 2025, with many features already nearing completion (the L-8 FEB and the A-1 FEB) and others about to begin construction (STA-1W Expansion #1). Project implementation milestones and their associated deadlines are mandated by legal agreements (consent orders) and are closely monitored by the USEPA and other federal and state agencies. Once all projects are complete and operating, the expected outcome is cleaner water that meets the established standards for total phosphorus. The CISRERP described *Restoration Strategies* as a “significant development with important implications for restoration of both water quality and flow in the central Everglades” (NRC 2014).

## TO RESTORE THE EVERGLADES, WE HAVE TO RESTORE AND PROTECT HABITATS

- *Challenge: Alternations to the landscape negatively impacted native habitats and species.*
- *Solution: Restore and reconnect wetlands and other native habitats.*

The *Picayune Strand Restoration Project* involves the restoration of natural water flow across 55,000 acres of habitat in western Collier County, an area nearly the size of the District of Columbia. This area, drained in the early 1960s for residential development, was purchased for restoration by the State of Florida with assistance from federal Farm Bill funding. The project, under lead agency USACE, includes the construction of three huge pump stations (one pump station is completed; two are currently under construction), the removal of 260 miles of roadways, the plugging of 48 miles of canals, and the

construction of additional features that will facilitate the flow of water over a larger area, thus restoring native habitats (Figure 6). During this reporting period, Picayune Strand showed beneficially higher water levels (1 to 2 feet higher) in the constructed areas of the project. Florida panthers are increasing in numbers, wading birds are once again foraging in the area, and native vegetation is re-emerging.



*Figure 6: The Merritt Pump Station is the first of three pump stations to be completed for restoring Picayune wetlands and wildlife habitat and also to improve the health of downstream estuaries in the Ten Thousand Islands National Wildlife Refuge. Photo: USACE.*

The 1,660-acre Site 1 Impoundment captures and stores excess water and allows some of that water to soak into Florida’s underground aquifers. Phase 1 will be completed by the end of 2015 and will increase the amount of water that remains in the Everglades, especially during dry periods, improving natural habitat in the Arthur R. Marshall Loxahatchee National Wildlife Refuge.

The Kissimmee River Restoration Project is restoring more than 40 square miles of river-floodplain ecosystem, including almost 20,000 acres of wetlands and 44 miles of historic river channel. Scheduled for completion in 2019, this project is currently over halfway done. Native plants, fish, wading birds, shorebirds, and ducks are once again thriving in the restored areas. Largemouth bass and sunfish, desired native species that had not been prevalent prior to restoration, now comprise 63 percent of fish found in the restored portions of the river. Long-legged wading bird populations, including white ibis, great egret, snowy egret, and little blue heron, have increased significantly, in some years increasing at greater than double the restoration expectation. Eight shorebird species, absent before restoration, have returned to the river and floodplain, illustrating the immediate impacts of this project.

## **TO RESTORE THE EVERGLADES, WE HAVE TO BE SMART, FAST, AND FOCUSED**

### **Being Smart and Fast: Re-energizing and Refocusing the Restoration Program through Expedited Planning and Innovative Stakeholder Engagement**

In October 2011, the Assistant Secretary of the Army (Civil Works), the Secretary of the Interior, the Governor of Florida, and the Executive Director of the SFWMD agreed to initiate the CEPP planning effort as part of the National Pilot Program for Feasibility Studies. This USACE program aims to expedite planning and to make the process more predictable and efficient. The size, scope, and accelerated pace of the CEPP ensured that it quickly became the dominant element of restoration planning between 2012 and 2014. The CEPP introduced an innovative public participation effort sponsored by the South Florida Ecosystem Restoration Task Force (Task Force). This allowed the public to provide more meaningful input into the planning process than ever before. As a result, the CEPP earned unprecedented levels of public and stakeholder support. The CISRERP called the CEPP public process “exemplary” and recommended that it “serve as a model for future planning processes (NRC 2014).”

## Being Focused: Forging a Path Forward through the Integrated Delivery Schedule

The Integrated Delivery Schedule (IDS) provides an overall strategy and sequence for project planning, design, and construction based on ecosystem needs, benefits, costs, and available funding. This schedule helps restoration planners, stakeholders, and the public focus on priorities, opportunities, and challenges and provides a path forward, completing construction of projects underway and outlining the next projects to undergo planning, design, and construction. In its 2014 report, the CISRERP suggested the 2011 IDS be revisited to advance projects with the greatest potential to avert ongoing ecosystem degradation and promise the largest restoration benefits. The updated IDS will be completed by the end of 2015. The update process is utilizing the Task Force’s successful workshop model to engage the public and stakeholders.

## TO RESTORE THE EVERGLADES, WE HAVE TO ADDRESS NEW THREATS

### Combating Invasive Exotic Species

Florida is second only to Hawaii in the severity of the threats posed by invasive exotic species on U.S. native habitats and species due to its subtropical climate, the existence of several high volume ports of entry, and the large scale of its pet, aquarium, and ornamental plant industries. The longer we wait to address a particular invasion, and the more widespread that invasion becomes, the more expensive it is to control. In its 2014 report, the CISRERP noted excellent progress in *operational* coordination of the management of invasive exotic species, but suggested that *strategic* coordination is necessary as well as an early detection and rapid response (EDRR) system. The Task Force has since developed an *Invasive Exotic Species Strategic Action Framework* and is working with federal and state agencies, tribal and local governments, academia, and the private sector to establish an EDRR system for the south Florida ecosystem.

*The Melaleuca Eradication and Other Exotic Plants Project* is a joint effort between the USACE, the U.S. Department of Agriculture, the U.S. Department of the Interior, the SFWMD, and the University of Florida. This facility is part of a long-term plan to supplement existing efforts to control and reduce the most aggressive, widespread, and problematic invasive exotic plants in south Florida (Figure 7). Construction of the \$1.7 million Research Annex (provided through the American Recovery and Reinvestment Act of 2009) was completed on August 30, 2013, making it the first completed CERP project.



Figure 7: An Everglades marsh overtaken by melaleuca, an invasive exotic plant that displaces native vegetation and alters natural habitats. Photo: SFWMD.

## **TO RESTORE THE EVERGLADES, WE MUST EVALUATE ECOSYSTEM RESPONSE AND ADAPT AS NEEDED**

### **Ecological and Hydrological Monitoring Indicates Evidence of Early Restoration Success!**

A robust system-wide monitoring and assessment program is a critical component of the CERP Adaptive Management Program and of determining the success of our restoration efforts. The challenge has been to establish and maintain an effective and efficient monitoring network over the 18,000 square mile area. To accomplish this, the REstoration, COordination, and VERification (or RECOVER) Group tracks key attributes that indicate system health (“indicators”). The Task Force assists in these efforts by providing a forum to coordinate the monitoring efforts of the various agencies. To understand ecological health of the ecosystem and track our restoration progress, a *System Status Report* on the key indicators, an ecological report card on our restoration success, is prepared every two years. Adaptive management restoration leaders take these findings and, linking science to decision-making, work to improve the probability of restoration success.

Project monitoring indicates that implementation of restoration projects and adjustments in operations are having positive impacts on the ecosystem. For example, the Roseate Spoonbill, a threatened and endangered wading bird species, achieved improved nesting success due to favorable climatic conditions and timely and effective coordination with water management operational decisions. The combination of the C-111 Spreader Canal Western Project and extended rainfall produced longer, and more ecologically beneficial, wet periods along the eastern edge of Everglades National Park. Crocodile nesting and population trends over the past two decades increased along the southwestern Florida coast due to canal plugging in that region.

## **TO RESTORE THE EVERGLADES, WE MUST KEEP MOVING FORWARD**

Congressional authorization is a critical step in CERP implementation. Although *WRDA 2000* (U.S. Congress 2000) approved the overall CERP plan, individual CERP projects require congressional authorization before they can receive federal appropriations for construction. Authorization and appropriations are also necessary before the USACE can provide credit to its state partners for completed work. Authorization normally occurs through periodic WRDAs. During the reporting period, the *2014 Water Resources Reform and Development Act (WRRDA)* authorized four CERP projects for construction: the Caloosahatchee River (C-43) West Basin Storage Reservoir Project; the C-111 Spreader Canal Western Project; Phase 1 of the Biscayne Bay Coastal Wetlands Project; and the Broward County Water Preserve Areas Project. The Central Everglades Planning Project is awaiting authorization in 2016.

In addition to working on the projects authorized in *WRRDA 2014* (U.S. Congress 2014), key steps in maintaining forward progress include completion of projects to the north (Kissimmee River Restoration), south (Modified Water Deliveries to Everglades National Park, Picayune Strand, C-111 South Dade, and C-111 Spreader Canal projects), east (C-44 Reservoir and STA on the St. Lucie River), and west (the first cell of the C-43 Reservoir on the Caloosahatchee River). The focus in the future will move toward the center of the Everglades as we begin the restoration of the River of Grass through the Central Everglades Planning Project. Water quality will continue being addressed through projects such as Restoration Strategies. Partner agencies will continue to focus on building CERP projects, monitoring and

adaptively managing the implementation of completed projects, and planning and designing the next generation of projects.

The Committee on Independent Scientific Review of Everglades Restoration Progress indicated in their Fourth Biennial Review report that declines of hydrology-dependent features characteristic of the historic Everglades system, such as tree islands, peat, and ridge and slough habitat, take long timeframes to recover and that these declines will continue until the hydrology and water quality improvements can be addressed (CISRERP 2012). Sustained funding at both the state and federal levels, along with timely and continuing authorizations of CERP projects in upcoming WRDA legislation, is essential to maintaining the benefits and progress documented here and in reversing the trend of declining ecosystem conditions that has characterized the last 60 years.

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## 1. INTRODUCTION

The *2015 Report to Congress* on the Comprehensive Everglades Restoration Plan (CERP) is the third in a series of periodic reports to fulfill the requirements of the *Water Resources Development Act (WRDA) of 2000* (U.S. Congress 2000) and the *CERP Programmatic Regulations* (33 CFR 385.40; DOD 2003). This report provides members of the U.S. Congress and other interested parties with an update on the progress of CERP over the five year reporting period (July 1, 2010 - June 30, 2015) and the accomplishments expected over the next five years. Cumulative expenditures for this cost shared program are included in this document. This report is submitted by the Secretary of the Army and the Secretary of the Interior after consultation with the U.S. Environmental Protection Agency (USEPA), the Department of Commerce, the Seminole Tribe of Florida, the Florida Department of Environmental Protection (FDEP), the South Florida Water Management District (SFWMD), other federal, state, and local agencies, and the South Florida Ecosystem Restoration Task Force (Task Force). The Task Force is charged with coordinating the development of consistent policies, strategies, plans, programs, project activities, and priorities for addressing restoration, preservation, and protection of the south Florida ecosystem. The Task Force currently includes representatives of the above agencies as well as the U.S. Department of Agriculture (USDA), the U.S. Department of Justice, the U.S. Department of Transportation, Miami-Dade County, and the City of Sanibel. Additional federal, state, and local agencies are represented on the Task Force's Working Group and Science Coordination Group (SCG). Prior reports (USACE and USDOJ 2005, 2010), the *Programmatic Regulations* (DOD 2003), and pertinent WRDA legislation are located on the official CERP website [www.evergladesrestoration.gov](http://www.evergladesrestoration.gov). As this report went to print, consultation with the Miccosukee Tribe of Indians of Florida had been requested, but not completed.

### Early Alterations to the Ecosystem

The Central and Southern Florida (C&SF) Project was authorized by the U.S. Congress in 1948 in response to significant flooding in south Florida. The C&SF Project addressed issues related to flood and water level control, water conservation, prevention of saltwater intrusion, preservation of fish and wildlife, and recreation. Earlier drainage projects were expanded in the C&SF Project by the U.S. Army Corps of Engineers (USACE) in partnership with the SFWMD. Together, these agencies constructed and managed a water management system consisting of more than 1,000 miles of canals, 720 miles of levees, and more than 150 water control structures – it was the largest Civil Works project of its time.

The C&SF Project altered significant portions of the natural system (Figure 8). The Kissimmee River was channelized for flood control and navigation and Lake Okeechobee was diked to prevent uncontrolled overflows from the lake. The region of the Everglades immediately south of Lake Okeechobee, now called the Everglades Agricultural Area (EAA), was drained to accommodate agricultural production. A drainage system was constructed in the lower east coast to support and enhance urban, suburban, and agricultural development. An elaborate dike system was constructed in the central portions of the historic Everglades to create the Water Conservation Areas (WCAs), vast tracts of remnant Everglades sawgrass that serve multiple water resource and environmental purposes including flood control, water supply, and deliveries of water to Everglades National Park.

## Recognition of Unintended Consequences

With its complex, regional water management infrastructure, the C&SF Project has worked well to fulfill its intended purposes for over a half century. However, these infrastructure alterations have had unintended consequences for much of the south Florida ecosystem. The significant reduction of natural water storage capacity, redirection of water to northern coastal estuaries, declining water quality, channelization of water flow, and resulting reduction of natural sheetflow in the regional system have

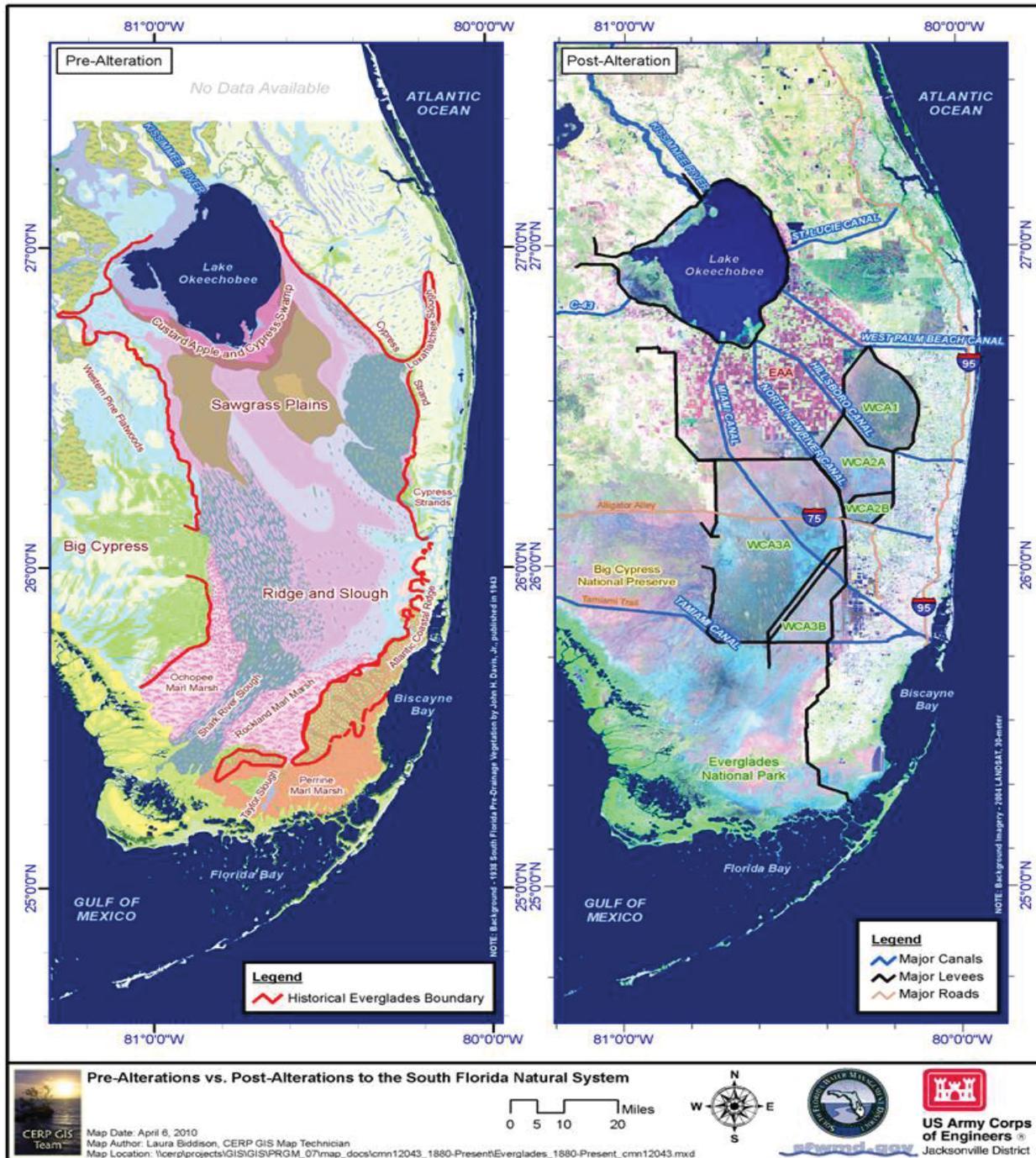


Figure 8: Pre-Alterations vs. Post-Alterations to the South Florida Natural System

led to substantial ecological damage to natural habitats. The human environment also suffered negative impacts in terms of drinking water supply, water quality, recreational opportunities, and tribal interests. Congress authorized a reexamination of the C&SF Project in order to develop a plan to restore the south Florida ecosystem, enhance water supplies, and maintain flood control (U.S. Congress 1992 and 1996).

### **The Restoration Plan**

The *WRDA 2000* approved the CERP as “a framework for modifications and operational changes” to the C&SF Project “needed to restore, preserve and protect the south Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection” (USACE and SFWMD 1999).

The CERP is the largest environmental restoration program in history. It builds upon and complements other state and federal initiatives to revitalize south Florida’s ecosystem. The plan is composed of a series of projects designed to address four major characteristics of water flow: quantity, quality, timing, and distribution. Because of their size and complexity, several projects have multiple components. In total, 68 individual components comprise more than 50 projects in the plan. Together, these projects aim to get the right amount of water, of the right quality, delivered to the right places, at the right times. This will be achieved by constructing and utilizing water infrastructure features that capture, store, and treat water that currently flows unused to the Atlantic Ocean and Gulf of Mexico. This clean, captured water will then be able to be redirected to where it is needed within the ecosystem.

### **Implementing the Plan**

The USACE is the lead federal agency responsible for undertaking implementation of the CERP in partnership with the U.S. Department of the Interior (USDOI), the SFWMD (lead non-federal sponsor), the State of Florida, and other local sponsors (U.S. Congress 2000).

CERP projects authorized under *WRDA 2007* and currently under construction are referred to as **Generation 1** projects. **Generation 2** projects were authorized under the *Water Resources Reform and Development Act (WRRDA) of 2014* and are currently being designed, with some project features undergoing expedited construction by the SFWMD. The Central Everglades Planning Project (CEPP), a suite of CERP projects focused on the heart of the Everglades, has a signed Chiefs Report and was provided to Congress in August 2015 for consideration in future *WRDA* legislation.

The full suite of benefits from CERP implementation assumes the successful completion of other restoration projects: Foundation Projects, Critical Projects, and Restoration Strategies. The **Foundation Projects** were authorized separately before CERP with the goal of correcting prior environmental damage while also enhancing water supply and flood mitigation. The **Critical Projects** were authorized in *WRDA 1996* and are smaller restoration projects that will produce “independent, immediate, and substantial restoration, preservation, and protection benefits.” **Restoration Strategies** is the Everglades water quality program being implemented by the State of Florida to achieve compliance with Everglades water quality standards (SFWMD 2012).

The C&SF Project also included authority with regard to recreation. While the original authority has been modified several times since 1948, recreation remains a major component of the benefits to be achieved through ecosystem restoration. The many thousands of acres managed by state and federal agencies support abundant recreational opportunities, including fishing, hunting, boating, and wildlife

viewing. These recreational activities enhance the cultural and economic value of the Everglades ecosystem. As CERP projects are implemented, the impact to recreation opportunities will be addressed along with the additional recreation opportunities that may be made available by the CERP.

All Everglades restoration efforts will follow the principles set forth in the Water Rights Compact which are intended to prescribe and protect the rights of the Seminole Tribe of Florida regarding the management and use of water (Seminole Tribe of Florida 1987).

### Restoration Results

Successful restoration of the natural system of south Florida will be achieved by restoring the hydrological and biological characteristics that both defined the original pre-drainage Everglades and made it unique among the world's wetlands. The defining characteristics of the original Everglades include sheetflow, low levels of nutrients in freshwater wetlands, healthy and productive estuaries, resilient plant communities, and an abundance of native wildlife. Monitoring results show that changes are already being seen following restoration efforts that reflect these defining characteristics of the historic Everglades.

The ongoing recovery of the Kissimmee River stands as a shining example of a large-scale restoration effort producing quantifiable and readily identifiable ecological benefits (Figure 9). Throughout the 24 miles of river restored thus far, historical wetland and floodplain defining vegetation has staged a significant comeback.

The numbers and diversity of returning waterfowl are far beyond restoration expectations. Fish and other aquatic wildlife have flourished with increased diversity and numbers. The sheetflow of water across more than 15,000 acres of restored floodplain has improved water quality in the river and Lake Okeechobee.

Early stages of the Picayune Strand Restoration Project are showing similar results. The advance work completed by the SFWMD on the Prairie Canal has demonstrated positive impacts to vegetation and wildlife. The Picayune Strand Restoration Project provides key wildlife corridors for Florida panthers and other species between the region's many conservation areas: Big Cypress National Preserve, Fakahatchee Strand Preserve State Park, Collier-Seminole State Park, South Belle Meade State Conservation and Recreation Lands, Rookery Bay National Estuarine Research Reserve, Ten Thousand Islands National Wildlife Refuge, Everglades National Park, and Florida Panther National Wildlife Refuge.

Additionally, completed portions of the Biscayne Bay Coastal Wetlands Project Phase 1 and the C-111 Spreader Canal Western Project, both of which had early construction work completed in 2012 by the SFWMD, have restored more natural flows. Monitoring is showing the resulting positive impacts on native vegetation and wildlife. Other smaller projects, such as the Taylor Creek/Nubbin Slough STA and Lake Trafford restoration, as well as projects completed by the SFWMD outside of CERP [Acme Basin B,



Figure 9: Kissimmee River Restoration. Photo: USACE.

Lakeside Ranch Stormwater Treatment Area (STA), and Lakes Park Restoration Project] are also demonstrating the beneficial effects of restoration efforts on water quantity, quality, timing, and distribution and the resulting benefits for wildlife in both species diversity and sheer numbers of individuals.

The Restoration Coordination and Verification (RECOVER) team is tracking the ecosystem’s response to project implementation. These efforts complement the regional hydrological, meteorological, and water quality monitoring overseen by the SFWMD. RECOVER’s monitoring program has documented improvements in the following areas as a result of operational changes and restoration projects being constructed and becoming operational over the past five years:

- Florida Bay/Southern Coastal Systems: Roseate spoonbill nesting improved, most likely due to improvements in coordination with water management operational decisions and favorable climatic conditions.
- Everglades National Park: Hydroperiods were 50 days longer (on an annual average basis) along the eastern edge of Everglades National Park as a result of the C-111 Spreader Canal Western Project and extended rainfall.
- Cape Sable: Crocodile nesting and population trends increased along the southwestern Florida coast due to the installation/repair of canal plugs for the National Park Service’s Cape Sable Canals Dam Restoration Project.
- Biscayne National Park: Biscayne Bay has responded positively to increased water flow in restoration areas when fresh water is available.

### **Independent Scientific Reviews and Response**

In accordance with *WRDA 2000*, the National Research Council (NRC) Committee on Independent Scientific Review of Everglades Restoration Progress (CISRERP) was convened to conduct biennial reviews of the CERP. The CISRERP is composed of a diverse team of internationally recognized experts in ecosystem restoration science. During the reporting period, the committee completed three reports (NRC 2010, 2012, 2014), which are summarized later in this document. Everglades restoration accomplishments noted by the CISRERP and agency activities conducted in response to recommendations by the CISRERP are noted throughout this report.

*“The proposed plan offers significant benefits that should make important strides toward reversing ongoing declines in the remnant Everglades ecosystem and enhancing the condition of Everglades landscapes and species. The project is one of the first CERP efforts to have successfully integrated water flow restoration with water quality restoration. Overall, the plan is an impressive response to the need to accelerate the pace of restoration of the central Everglades.”*  
CISRERP, 2014 Report.

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## 2. ACCOMPLISHMENTS 2010-2015

This report provides a synopsis of all current CERP projects and other federal and state restoration activities that support or complement the CERP. Progress made during the reporting period and anticipated next steps are highlighted in the tables below. Table 1 includes CERP projects with activity during the reporting period. Table 2 includes Foundation Projects, Critical Projects, and other federal and state non-CERP initiatives. Brief descriptions of each project are available in the section following the tables.

TABLE 1: CERP PROGRESS, 2010-2015

CERP PROJECT*	PROGRESS 2010-2015	NEXT STEPS
<b>COMPLETED</b>		
<b>Aquifer Storage and Recovery (ASR) Pilot Projects</b>	<ul style="list-style-type: none"> <li>Completed testing at Hillsboro ASR Pilot in 2012</li> <li>Conducted testing at Kissimmee River Pilot in 2013</li> <li>Results of testing incorporated into a Technical Data Report finalized in 2013 (USACE and SFWMD 2013)</li> </ul>	<ul style="list-style-type: none"> <li>The Kissimmee and Hillsboro ASR pilot systems are now functional and available for operation</li> </ul>
<b>ASR Regional Study</b>	<ul style="list-style-type: none"> <li>Incorporated ASR Pilot Project test results and technical data report findings</li> <li>Hydrogeological modeling of well sites completed 2013</li> <li>Peer review of draft study conducted by the NRC in April 2015</li> <li>Final report completed June 2015 (USACE and SFWMD 2015)</li> </ul>	<ul style="list-style-type: none"> <li>Will be utilized in the future planning and implementation of ASR systems</li> <li>The NRC recommended phased implementation of future ASR systems, with a focus on multi-well ASR clusters</li> </ul>
<b>Lakes Park Restoration Project</b> Local Sponsor: Lee County	<ul style="list-style-type: none"> <li>Completed by Lee County and SFWMD February 2013</li> </ul>	
<b>Melaleuca Eradication and Other Exotic Plants</b> Generation 1	<ul style="list-style-type: none"> <li>Project Partnership Agreement (PPA) executed July 2010</li> <li>Mass Rearing Annex completed August 2013</li> <li>Transferred to SFWMD January 2014</li> </ul>	<ul style="list-style-type: none"> <li>Utilization of the facility for development and implementation of biological controls</li> </ul>
<b>UNDER CONSTRUCTION/IN PROGRESS</b>		
<b>Biscayne Bay Coastal Wetlands Project – Phase 1</b>	<ul style="list-style-type: none"> <li>Final Project Implementation Report (PIR) March 2012 (USACE and SFWMD 2012)</li> </ul>	<ul style="list-style-type: none"> <li>Design and construction of the L-31E Flow-way</li> </ul>

CERP PROJECT*	PROGRESS 2010-2015	NEXT STEPS
<ul style="list-style-type: none"> <li>• Generation 2</li> <li>• State Expedited Construction</li> </ul>	<ul style="list-style-type: none"> <li>• Chief of Engineers Report May 2012 (Temple 2012a)</li> <li>• Record of Decision September 2012 (Darcy 2012a)</li> <li>• Authorized in WRRDA 2014 (U.S. Congress 2014)</li> <li>• SFWMD completed construction on four L-31E culverts (2010) and Deering Estates Flow-way (2012)</li> <li>• L-31E Pilot Pump Test conducted October 2014 - April 2015</li> </ul>	<ul style="list-style-type: none"> <li>• Initiate design and construction of the Cutler Wetlands component</li> <li>• PPA anticipated in 2017</li> </ul>
<p><b>C-111 Spreader Canal: Western Project</b></p> <ul style="list-style-type: none"> <li>• Generation 2</li> <li>• State Expedited Construction</li> </ul>	<ul style="list-style-type: none"> <li>• Final PIR January 2011 (USACE and SFWMD 2011)</li> <li>• Chief of Engineers Report January 2012 (Temple 2012b)</li> <li>• Record of Decision July 2012 (Darcy 2012b)</li> <li>• Authorized in WRRDA 2014 (U.S. Congress 2014)</li> <li>• SFWMD completed construction (Frog Pond detention area, Aerojet Canal extension, earthen plugs in several canals, and associated structures) in 2012</li> </ul>	<ul style="list-style-type: none"> <li>• Design of an additional structure in the lower C-111 may begin during the next reporting period, if needed</li> <li>• PPA anticipated in 2017</li> </ul>
<p><b>Picayune Strand Restoration Project</b></p> <ul style="list-style-type: none"> <li>• Generation 1</li> </ul>	<ul style="list-style-type: none"> <li>• Merritt Pump Station completed 2014, included plugging 13.5 miles of canal and removal of 95 miles of roadways</li> <li>• Faka Union Pump Station is nearing completion and includes plugging 12 miles of canal and removal of 100 miles of roadways</li> <li>• Miller Pump Station construction initiated January 2014 with plugging of 13 miles of canal and removal of 65 miles of roadway</li> </ul>	<ul style="list-style-type: none"> <li>• Completion of the Faka Union Pump Station</li> <li>• Design work and construction of flood protection features, road removal, and canal backfill</li> <li>• Completion of the Miller Pump Station in fall 2017</li> <li>• Limited reevaluation report under preparation with completion in 2015</li> </ul>
<p><b>Site 1 Impoundment Project</b></p> <ul style="list-style-type: none"> <li>• Generation 1</li> </ul>	<ul style="list-style-type: none"> <li>• PPA executed June 2010</li> <li>• Phase 1 construction initiated 2010 to be completed in 2015</li> </ul>	<ul style="list-style-type: none"> <li>• Completion of Phase 1</li> </ul>

CERP PROJECT*	PROGRESS 2010-2015	NEXT STEPS
<b>Indian River Lagoon South, Phase 1: C-44 Reservoir and STA Project</b> <ul style="list-style-type: none"> <li>• Generation 1</li> <li>• State Expedited Construction</li> </ul>	<ul style="list-style-type: none"> <li>• PPA executed September 2010 and amended in August 2014</li> <li>• Contract 1 (bridge, intake canal, access roads, and C-133 Canal) completed July 2014</li> <li>• Design of C-44 pump station, STA, and reservoir completed in 2014</li> <li>• Construction of C-44 pump station, STA, and reservoir initiated in 2014 and 2015</li> </ul>	<ul style="list-style-type: none"> <li>• Reservoir construction contract to be awarded in September 2015</li> <li>• Construction completion of the C-44 reservoir (USACE) and the pump station and STA (SFWMD) in 2020</li> <li>• Design work on the C-23/24 reservoirs and the C-23/24 STA</li> </ul>
<b>Lakeside Ranch STA</b> <ul style="list-style-type: none"> <li>• State Expedited Construction</li> </ul>	<ul style="list-style-type: none"> <li>• Components completed outside of CERP by the SFWMD</li> <li>• Phase 1 (STA North and S-650 Pump Station) completed 2012</li> <li>• Design for Phase 2 (STA South and S-191A Pump Station) completed 2012</li> <li>• Design for STA South updated May 2015</li> </ul>	<ul style="list-style-type: none"> <li>• Construction of STA South scheduled to begin 2016</li> </ul>
<b>WCA-3 Decompartmentalization and Sheetflow Enhancement (DECOMP) Physical Model</b> <ul style="list-style-type: none"> <li>• Generation 1</li> </ul>	<ul style="list-style-type: none"> <li>• Construction completed October 2013</li> <li>• Testing conducted November - December 2013 and November 2014 - January 2015</li> </ul>	<ul style="list-style-type: none"> <li>• Testing planned for October 2015 - January 2016</li> <li>• Removal of DECOMP structures will occur at the end of the testing</li> </ul>
<b>DESIGN PHASE ACTIVITIES</b>		
<b>Broward County Water Preserves Area Project</b> <ul style="list-style-type: none"> <li>• Generation 2</li> </ul>	<ul style="list-style-type: none"> <li>• Final PIR February 2012 (USACE and SFWMD 2012)</li> <li>• Chief of Engineers Report May 2012 (Temple 2012)</li> <li>• Record of Decision October 2012 (Darcy 2012)</li> <li>• Authorized in WRRDA 2014 (U.S. Congress 2014)</li> </ul>	<ul style="list-style-type: none"> <li>• Initiation of design and construction for the C-11 Impoundment</li> <li>• Initiation of design and construction for the Seepage Management Area</li> <li>• PPA execution</li> </ul>
<b>Caloosahatchee River (C-43) Western Basin Storage Reservoir Project</b> <ul style="list-style-type: none"> <li>• Generation 2</li> <li>• State Expedited Construction</li> </ul>	<ul style="list-style-type: none"> <li>• Final PIR November 2010 (USACE and SFWMD 2010)</li> <li>• Chief of Engineers Report January 2011 (Van Antwerp 2011)</li> <li>• Authorized in WRRDA 2014 (U.S. Congress 2014)</li> </ul>	<ul style="list-style-type: none"> <li>• Construction of the pump station and Cell 1 with completion in 2018 and completion of cell 2 of the reservoir in the next reporting period</li> </ul>

CERP PROJECT*	PROGRESS 2010-2015	NEXT STEPS
	<ul style="list-style-type: none"> <li>• Pre-Partnership Credit Agreement #2 June 2015</li> <li>• Design and construction specifications for the pump station and Cell 1 of the reservoir are underway by the SFWMD with award of first contract</li> </ul>	<ul style="list-style-type: none"> <li>• The PPA is currently being pursued and should be finalized during the next reporting period</li> </ul>
<b>PLANNING PHASE</b>		
<b>Loxahatchee River Watershed Restoration Project</b>	<ul style="list-style-type: none"> <li>• PIR reinitiated October 2014</li> </ul>	<ul style="list-style-type: none"> <li>• Approval of SMART (Specific, Measurable, Attainable, Risk-Informed, and Timely) planning PIR scope/schedule anticipated late 2015</li> <li>• Completion of PIR and initiation of design</li> <li>• Completion anticipated for authorization in a future WRDA cycle</li> </ul>
<b>Central Everglades Planning Project</b>	<ul style="list-style-type: none"> <li>• Final PIR July 2014 (USACE and SFWMD 2014)</li> <li>• Chief of Engineers Report December 2014</li> <li>• Record of Decision signed and PIR transmitted to Congress August 2015 (after the reporting period)(Darcy 2015)</li> </ul>	<ul style="list-style-type: none"> <li>• The project is ready for authorization in the next WRDA</li> <li>• Complete a Limited Reevaluation Report (LRR) and execute a PPA for the 1<sup>st</sup> Phase (anticipated to be CEPP South)</li> <li>• Initiation of Old Tamiami Trail removal</li> <li>• Initiation of design for several water control features in the south, S-333 and S-356 enlargement, and WCA-3A to WCA-3B connections to move more water into eastern Shark River Slough</li> <li>• Initiation of an LRR and design for 2<sup>nd</sup> phase (CEPP North)</li> </ul>
<b>NEW EFFORT ANTICIPATED IN THE NEXT REPORTING CYCLE</b>		
<b>Big Cypress/L-28 Interceptor [Western Everglades]</b>		<ul style="list-style-type: none"> <li>• Initiation of planning and design</li> <li>• Finalization of PIR</li> </ul>
<b>Lake Okeechobee Watershed</b>		<ul style="list-style-type: none"> <li>• Initiation of planning and design</li> <li>• Finalization of PIR</li> <li>• Completion for authorization during next reporting period</li> </ul>

\*Local sponsor is the SFWMD unless otherwise noted.

TABLE 2: ADDITIONAL NON-CERP PROGRESS, 2010-2015

Non-CERP Project	Progress 2010-2015	Next Steps
<b>COMPLETED</b>		
<b>Lake Trafford Restoration</b>	<ul style="list-style-type: none"> <li>Completed November 2010</li> </ul>	
<b>Taylor Creek and Nubbin Slough: Lake Okeechobee Water Retention and Phosphorous Removal</b> <ul style="list-style-type: none"> <li>Critical Project</li> </ul>	<ul style="list-style-type: none"> <li>Taylor Creek portion completed April 2011</li> <li>Nubbin Slough STA transferred to SFWMD for Operation and Maintenance, Repair, Replacement and Rehabilitation (OMRR&amp;R) in March 2015</li> </ul>	
<b>West Palm Beach Canal STA-1 East/C-51 West</b> <ul style="list-style-type: none"> <li>Foundation Project</li> </ul>	<ul style="list-style-type: none"> <li>STA-1 East operational; repairs on culverts underway</li> <li>Completion of trash rake system</li> <li>Periphyton STA demonstration project completed December 2010; deconstruction completed June 2014</li> </ul>	<ul style="list-style-type: none"> <li>Completion of culvert repairs anticipated in 2016</li> </ul>
<b>UNDER CONSTRUCTION/IN PROGRESS</b>		
<b>C-111 South Dade Project</b> <ul style="list-style-type: none"> <li>Foundation Project</li> </ul>	<ul style="list-style-type: none"> <li>PCA amendment finalized August 2014, allowing construction to begin on final two components</li> <li>Contract 8 plans and specifications completed</li> </ul>	<ul style="list-style-type: none"> <li>Construction Contract 8 to be awarded October 2015</li> <li>Completion of Northern Detention Area (Contract 8)</li> <li>Construction of Contract 9, plugging of L-31W Canal</li> <li>Completion of a Post Authorization Change Report to assess provision of permanent pumps stations and outlet for the existing interim S-332B and S-332C pump stations</li> </ul>
<b>Herbert Hoover Dike Major Rehabilitation Project and Dam Safety Modification Study</b> <ul style="list-style-type: none"> <li>Federal Project</li> <li>CERP assumed this to be in place and fully functional</li> </ul>	<ul style="list-style-type: none"> <li>Dam Safety Modification Study initiated 2011</li> <li>Since 2010, 3.4 miles of toe ditch have been filled, 21.4 miles of cutoff wall installed, and 3 culverts have been removed or replaced; 14 of the 32 culverts are currently under construction or will be under construction by the end of 2015</li> </ul>	<ul style="list-style-type: none"> <li>Finalization of Dam Safety Modification Study in 2016</li> <li>Replacement of the remaining culverts around the lake</li> <li>Construction of an additional 6 miles of cutoff wall in the southeast corner of lake</li> </ul>

Non-CERP Project	Progress 2010-2015	Next Steps
<b>Kissimmee River Restoration</b> <ul style="list-style-type: none"> <li>Federal Project</li> </ul>	<ul style="list-style-type: none"> <li>Reach 4B completed 2010</li> <li>Completed modifications to CSX Railroad bridge</li> <li>Completed contract to restore oxbows in Reaches 2 and 3</li> <li>Completed River Acres flood protection</li> <li>Initiated construction for backfilling MacArthur's Ditch</li> <li>Design for backfilling Reach 2 underway, which will restore flow to 9 additional miles of river</li> <li>Contract for Reach 2 backfill awarded</li> </ul>	<ul style="list-style-type: none"> <li>Completion of all remaining construction contracts</li> <li>Installation of a concrete weir in the C-38 Canal to facilitate flow moving through the restored river channel and to maintain higher stages in the backfilled C-38 Canal during low flow periods</li> <li>Finalization of efforts in the headwaters and implementation of the Headwaters Regulation Schedule</li> </ul>
<b>Modified Water Deliveries to Everglades National Park</b> <ul style="list-style-type: none"> <li>Foundation Project</li> </ul>	<ul style="list-style-type: none"> <li>Construction of 1-mile bridge completed March 2013</li> <li>Construction of Tamiami Trail Modifications Project completed December 2013</li> <li>Operational field testing of S-356 and G-3273 relaxation initiated in 2015</li> </ul>	<ul style="list-style-type: none"> <li>Final construction contract to be awarded to complete flood mitigation work in late 2015</li> <li>Completion anticipated and expected to be fully operational during the next reporting period</li> <li>Land acquisition to support incremental operational testing program to be completed in 2016</li> <li>Completion of the incremental operational field testing</li> <li>Development of final Combined Operations Plan, which is scheduled for completion in 2019</li> </ul>
<b>Restoration Strategies</b> <ul style="list-style-type: none"> <li>State of Florida</li> </ul>	<ul style="list-style-type: none"> <li>Consensus between SFWMD and USEPA reached in 2012 on actions necessary to meet water quality standards (new features working in conjunction with existing STAs)</li> <li>Construction of Compartment B of STA-2 and Compartment C of STA-5/6 completed in 2014</li> <li>Initial Flooding and Optimization Compartment B of STA-2 and Compartment C of STA-5/6 completed in 2014</li> </ul>	<ul style="list-style-type: none"> <li>Construction completion of the A-1 FEB (late 2015)</li> <li>Construction completion of the L-8 FEB (early 2016)</li> <li>Construction of the S-375 water conveyance feature to begin by January 2016</li> <li>Construction of STA-1 West Expansion #1 to begin in 2016</li> <li>Construction completion of the S-5AS, L-8 Divide, and S-375 (G-716)</li> <li>Design of the C-139 FEB (11,000 acre-feet of storage) will be initiated by November 2018</li> </ul>

Non-CERP Project	Progress 2010-2015	Next Steps
	<ul style="list-style-type: none"> <li>• Construction of two flow equalization basins (FEBs)(A-1 FEB and L-8 FEB) initiated</li> <li>• Modification/construction of two primary conveyance features (S-5AS and L-8 divide structure) initiated</li> <li>• Design completed for the S-375 Expansion (G-716)</li> <li>• Land acquisition completed for the STA-1W Expansions</li> <li>• Land acquisition completed for the CERP L-8 Reservoir replacement feature</li> <li>• STA-1W Expansion #1 design completed in June 2015</li> <li>• Restoration Strategies Science Plan developed and implemented</li> </ul>	<ul style="list-style-type: none"> <li>• Completion of the research projects described in the Restoration Strategies Science Plan</li> <li>• Initiation of construction for the G-341 conveyance improvements</li> </ul>
<b>Seminole Big Cypress Reservation Water Conservation Plan</b>	<ul style="list-style-type: none"> <li>• Construction of Basin 1 completed July 2008; transferred to the Seminole Tribe of Florida in 2010</li> <li>• Construction of Basin 4 completed January 2013; transferred to the Seminole Tribe of Florida July 2013</li> <li>• Construction contract for Basin 2 awarded September 2013</li> </ul>	<ul style="list-style-type: none"> <li>• Completion of Basin 2 estimated Fall 2016</li> </ul>
<b>Southern Corkscrew Regional Ecosystem Watershed</b> <ul style="list-style-type: none"> <li>• Critical Project</li> </ul>	<ul style="list-style-type: none"> <li>• Design completed 2013 (SFWMD)</li> <li>• Installation of two monitoring wells 2015 (SFWMD)</li> </ul>	<ul style="list-style-type: none"> <li>• Completion of construction anticipated in 2017</li> </ul>
<b>DESIGN PHASE</b>		
<b>Tamiami Trail Next Steps Project</b> <ul style="list-style-type: none"> <li>• National Park Service</li> <li>• State of Florida</li> </ul>	<ul style="list-style-type: none"> <li>• Authorized in the Consolidated Appropriations Act of 2012 (U.S. Congress 2012)</li> <li>• Design for 2.6-mile bridge underway</li> </ul>	<ul style="list-style-type: none"> <li>• Construction of 2.6-mile bridge to be complete by 2020</li> </ul>
<b>Ten Mile Creek Water Preserve Area</b>	<ul style="list-style-type: none"> <li>• SFWMD started limited operations in 2015</li> </ul>	<ul style="list-style-type: none"> <li>• Construction of modifications by SFWMD as a non-federal project to create a functional water storage and treatment facility</li> </ul>

## 2.1 PROJECT SYNOPSES

The following CERP and non-CERP projects are summarized alphabetically.

**Aquifer Storage and Recovery Pilot Projects/Regional Study** – The CERP envisioned extensive use of ASR wells to store large volumes of water in the deep Floridan aquifer. The intent was to ensure water for the Everglades and other water resource needs in south Florida, while improving conditions in Lake Okeechobee and reducing damaging releases of fresh water to the northern coastal estuaries. Due to uncertainties identified with ASR technology at this scale, a pilot project was constructed and tested in the Kissimmee River area of Lake Okeechobee by the Corps and along the Hillsboro Canal in central Palm Beach County by the SFWMD. Results obtained from these ASR pilot projects demonstrated successful operations and provided field data to augment eleven years of scientific and engineering studies. The NRC peer-reviewed the resulting *Final Technical Data Report, Aquifer Storage and Recovery Regional Study* (USACE and SFWMD 2015), which will serve as a guide for future Everglades restoration projects considering ASR. The NRC recommended a phased implementation of future ASR systems, with a focus on multi-well ASR clusters (NRC 2015).

**Big Cypress/L-28 Interceptor Project [Western Everglades]** – This CERP project will re-establish sheetflow across the Big Cypress Reservation and into the Big Cypress National Preserve, maintain flood protection and groundwater levels on Seminole tribal lands, and ensure inflows meet applicable water quality standards. While this project has not yet been initiated, data collection and problem identification has been underway through a multi-agency effort facilitated by the Task Force. Detailed planning and development of a PIR is expected to start in the next reporting period. The Western Everglades Restoration Project has been identified in the Draft Integrated Delivery Schedule (IDS) as one of the next planning efforts to be undertaken as part of the CERP. The project will address considerations from the original Big Cypress L-28 Interceptor Project.

**Biscayne Bay Coastal Wetlands Project, Phase 1** – The goal of this CERP project is to improve the ecology of Biscayne National Park and Biscayne Bay by rehydrating coastal wetlands, reducing freshwater point source discharges, and redistributing surface water through a spreader canal system. Phase 1 includes construction of two new flow-ways (Deering Estate and L-31E Culverts), restoration of an existing flow-way (Cutler Flow-way), and construction of associated features to redistribute surface water into Biscayne Bay. The SFWMD has completed construction of the Deering Estates features and a portion of the L-31E culverts features. The remaining features will be constructed by the Corps and SFWMD during the next reporting period.

**Broward County Water Preserve Areas Project** – This CERP project will reduce seepage from WCA-3, reduce phosphorus loading to WCA-3, capture water normally lost to tide, and provide conveyance features for urban and natural system water deliveries. These functions will be achieved by diverting stormwater into two above ground impoundments. A seepage management area will connect the two impoundments. This project was authorized in WRRDA 2014 and design work will be initiated by the Corps in Fiscal Year 2016. Most of the land needed for the project has already been acquired and construction should be initiated during the next reporting period.

**C-111 South Dade Project** – Located in south Miami-Dade County, this project is the southern end of the C&SF project and borders the eastern edge of Everglades National Park. This project is intended to restore the wetland sloughs and prairies along the eastern boundary of Everglades National Park

improve hydrologic conditions in Taylor Slough and other adjoining areas of the park. The project will send more fresh water through Taylor Slough into Florida Bay, thus improving the bay's overall health by reducing hypersaline events. At the same time, project features will maintain flood protection for development and agricultural interests located east of the project. The project includes aboveground detention areas, associated water control features, canal plugging, and operational changes and is being designed and constructed by the Corps. All of the lands needed for the project have been provided by the SFWMD. The first of three remaining construction contracts will be initiated in late 2015 with the rest expected during the next reporting period. The final operating plan for this project will be developed as part of the combined operational plan for the Mod Waters and C-111 project.

**C-111 Spreader Canal Western Project** – This CERP project will reduce seepage losses from Everglades National Park and provide increased flows to Florida Bay through Taylor Slough. The project will provide for ecosystem restoration of freshwater wetlands, tidal wetlands, and coastal habitat by restoring more natural hydrology to the area. This will enhance the restoration of conditions that produced the legendary massive flocks and colonies of wading birds that once inhabited this area. The project was authorized in WRRDA 2014 and includes an aboveground detention area, two pump stations, canal plugging, culverts, and operational changes in south Miami-Dade County. Most of the project features have been constructed by the SFWMD in advance of authorization to jump start the recovery of the Taylor Slough area. The two remaining features will be constructed by the Corps during the next reporting period. The constructed features are already showing positive environmental benefits to the Taylor Slough area by restoring more natural water conditions and flows.

**Caloosahatchee River (C-43) Western Basin Storage Reservoir Project** – This CERP project will improve the quantity, quality, and timing of water releases to the Caloosahatchee River and estuary on Florida's west coast. The project includes a 170,000-acre-foot reservoir that will capture excess regional runoff and releases from Lake Okeechobee. This captured water will then be supplied to the Caloosahatchee River and Estuary when needed during the dry season. The reservoir will also help to improve water quality by reducing the salinity and nutrient impacts of the region's runoff and improving environmental water supply deliveries to the Caloosahatchee Estuary. The project was authorized in WRRDA 2014 and is being implemented at an accelerated pace by the SFWMD. Construction is starting on the first cell of the reservoir in 2015.

**Central Everglades Planning Project** – The goals of the CEPP are to improve the quantity, quality, timing, and distribution of water in the Northern Estuaries, WCAs, and Everglades National Park in order to restore habitats and ecological function in the natural system. The CEPP combines several CERP components extending from Lake Okeechobee down to Everglades National Park into a comprehensive project that includes water storage, water quality treatment, conveyance, and decompartmentalization (the removal of levees and canals) in the heart of the Everglades. The primary features include storage and treatment areas to divert, store, and treat Lake Okeechobee regulatory releases, conveyance features to deliver and distribute existing flows and the redirected Lake Okeechobee water through WCA-3A, back filling portions of the Miami Canal, conveyance features to deliver and distribute water from WCA-3A to WCA-3B and Everglades National Park, and seepage management features.

**Herbert Hoover Dike Major Rehabilitation Project and Dam Safety Modification Study** – Since 2007, the USACE has been conducting major rehabilitation of the Herbert Hoover Dike to address seepage and stability problems. The USACE is utilizing a combination of construction features and operations to prevent a potential failure during extreme high water events. The project includes cut-off walls, culvert replacement and repairs, and associated features along the 143-mile levee surrounding Lake Okeechobee. Thus far, 21.5 miles of cutoff walls have been constructed along the southeastern levee and several major culverts through the levee have been replaced. Work is continuing on an additional 6.5 miles of cutoff wall this year along with the continued replacement and/or repair of over 32 culverts in the levee. A *Dam Safety Modification Study* is being prepared by the Corps and should be completed in 2016. This study will identify remaining problems and appropriate solutions.



Figure 10: C-44 Intake Canal muck removal. Photo: USACE.

**Indian River Lagoon South Project** –

This CERP project includes the C-44 Reservoir and STA, the C-23/24 and C-25 reservoirs and STAs, the acquisition and implementation of 90,000 acres of natural storage areas, the removal of more than 7 million cubic yards of muck from the Indian River Lagoon, and the restoration of certain portions of the lower St. Lucie Estuary (Figure 10). Current efforts are focused on the construction of the C-44 Reservoir and STA. The Corps has completed the first contract for the intake and discharge canals. The Corps will award the contract for construction of the reservoir in late 2015 while the SFWMD will award the contract for the construction of the STA and pump station. The overall project will reduce harmful freshwater inflows and generate habitat and water quality improvements in the St. Lucie Estuary and the southern Indian River Lagoon. This estuary and lagoon are one of the most diverse estuaries in the United States and improved conditions will maintain and enhance its diversity and ability to support an abundance of estuarine life and the economy that depends on it.

**Kissimmee River Restoration Project** – When completed, this project will have restored more than 40 square miles of river-floodplain ecosystem, including almost 20,000 acres of wetlands and 44 miles of historic river channel. Efforts include oxbow restoration, degradation of spoil mounds created when the river was channelized in the 1960s, acquisition and restoration of more than 100,000 acres of floodplain wetlands, removal of two water control structures, backfilling of 22 miles of the C-38 Canal, and improvement of water conveyance and storage in the headwater lakes. Much of the construction effort is being accomplished by the Corps with the SFWMD acquiring lands needed for the project (over 99% of lands needed have been acquired) as well as constructing certain flood mitigation features. Thus far, the project is over 60 percent complete with more than 14 miles of river and 15,000 acres of floodplain restored. The recovery success has been phenomenal with native plants, fish, wading birds, shorebirds, and ducks once again thriving in the restored areas. In addition, the project is reducing flows into Lake Okeechobee during storm events and helping to improve water quality in the basin through the natural uptake of nutrients in the water. The remaining 8 miles of canal backfilling and the headwaters features

will be completed in the next reporting period along with the development and implementation of a new water control plan to maximize restoration benefits.

**Lake Okeechobee Watershed Project** – This CERP project covers approximately 1,800 square miles and incorporates the four major tributary systems that naturally drain the lower portion of the watershed into the northern portion of Lake Okeechobee. The purpose of this project is to create water storage and treatment facilities to help regulate extreme highs and low water levels in the lake, reduce phosphorus loading to the lake, and reduce damaging releases to the east and west coast estuaries. In addition, this project will focus on rehydrating wetlands in and around the areas north of the lake and improving the ecological health of Lake Istokpoga. The PIR for this project should be initiated in the next reporting period.

**Lake Trafford Restoration Project** – Lake Trafford, the largest natural lake south of Lake Okeechobee, serves as an important ecotourism resource for recreational boating and fishing. This completed project removed muck and exotic aquatic vegetation and restored native submerged aquatic vegetation. Even though this project was identified for restoration under the Critical Projects program, insufficient funding authority was available under that program to complete the project. The SFWMD went ahead and completed the muck removal and restoration of the lake. The results have been very successful with significant improvement in the overall health and condition of the lake that has led to increased fish and wildlife productivity.

**Lakes Park Restoration Project** – The purpose of this project is to enhance surface water runoff quality by creating a flow-way with shallow littoral zones to enhance pollution removal. The restoration provides habitat and water quality benefits at Lakes Park and improves conditions downstream. The project included the construction of a 40-acre marsh/flow-way in an abandoned rock mine, removal of exotic vegetation, and planting of native vegetation. While the project was identified in the Critical Projects program and CERP, the SFWMD partnered with Lee County to accelerate implementation outside of CERP. Construction has been completed and the project is providing positive benefits to the lake and downstream natural areas.

**Lakeside Ranch Stormwater Treatment Area Project** – This project was identified as a component of the Lake Okeechobee Watershed Project but was constructed by the SFWMD outside of CERP. The project consists of a 2,700-acre STA adjacent to Lake Okeechobee in the Taylor Creek/Nubbin Slough Basin that will provide up to 19 metric tons of phosphorus reduction annually, improving the quality of the water flowing into Lake Okeechobee. It is providing positive benefits to the health of Lake Okeechobee through the removal of nutrients from the water.

**Loxahatchee River Watershed Restoration Project** – This CERP project will restore and sustain the overall quantity, quality, timing, and distribution of fresh water to the federally designated “National Wild and Scenic” Northwest Fork of the Loxahatchee River. This project also seeks to restore, sustain, and reconnect the area’s wetlands that form the historic headwaters for the river and northeastern Everglades. This project was originally identified as the North Palm Beach County Project in CERP but later renamed to recognize the main focus area of the Loxahatchee River. The PIR is being reinitiated by the Corps and SFWMD to address recent changes and modifications needed to the project. Project features being considered during the planning process include reservoirs, canal improvements, pump station, backfilling ditches, removing berms, and gated structures. Water storage will allow excess water

to be captured and used to increase freshwater deliveries to the Northwest Fork of the Loxahatchee River during dry periods.

**Melaleuca Eradication and Other Exotic Plants Project** – This CERP project included construction of a facility for mass rearing and dissemination of U.S. Department of Agriculture (USDA) approved biological controls for the control of invasive exotic plants. The initial focus of work conducted in this facility will be the rearing and distribution of biological controls to combat melaleuca, Brazilian pepper, Australian pine, and Old World climbing fern. Construction of this project was approved by the Assistant Secretary of the Army (Civil Works) under the programmatic authority provided in WRDA 2000. Construction of this facility has been completed by the Corps and the facility has been transferred to the SFWMD and Florida Department of Agriculture and Consumer Services for use. This was the first CERP project to be completed and transferred to operational status.

**Modified Water Deliveries to Everglades National Park Project** – The purpose of this project, commonly referred to as Mod Waters, is to improve natural water flows to Shark River Slough and Everglades National Park. The project consists of four major components: 1) flood mitigation for the residential 8.5 Square Mile Area; 2) conveyance and seepage control features to reconnect freshwater flows and control seepage out of Everglades National Park; 3) modifications to Tamiami Trail, including construction of a 1-mile bridge, to allow increased freshwater flows south into Everglades National Park (Figure 11); and 4) project implementation support that focuses on monitoring and operations.

The project also includes the development of a Water Control Manual to prescribe operations. Operations in the Mod Waters and C-111 South Dade area have been in a transitional phase since the early 1980s in attempts to improve water flow into the park and protect endangered species that occupy the area. The latest operational changes were implemented in 2012 and labeled the Everglades Restoration Transition Plan (ERTP) to recognize the transitional nature of operations until all project features are in place. The ERTP



Figure 11: Tamiami Trail one-mile bridge, completed in 2013. Photo: USACE.

included the continuation of bypassing flows from WCA-3A and moving more water to the east during the Cape Sable seaside sparrow nesting season to help protect that endangered species along with incorporating better water management practices for WCA-3A to benefit the also endangered snail kite. This plan will ultimately be replaced by a final operating plan that incorporates the features of the Mod Waters and C-111 South Dade projects. The final operating plan will be implemented in three increments with the first increment beginning in fall 2015. Each increment will increase water levels and flows in Northeast Shark River Slough while maintaining flood protection to eastern developed areas through pumping of underground water lost through seepage back into the park.

The E RTP provides for continued operation of the current water control plan for WCA-3 as it enables compliance with Section 106 of the National Historic Preservation Act [under 36 CFR § 800.14(b)] before an “effect determination” has concluded. Previous consultation with the Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida determined both tribes are concerned that higher water levels in the WCAs or Everglades National Park will adversely affect cultural resources of significance (Figure 12). The Corps is using a Programmatic Agreement (PA) as a tool to investigate the question and make a determination. The PA outlines stipulations for investigation to understand the effects of water operations on cultural resources within the WCA. The PA is designed to provide information on historic water levels across the area and test 12-15 archaeological sites to determine if current water operations are adversely affecting significant cultural resources. Previous Corps studies at lakes and dams have shown that fluctuation of water can cause adverse effects on cultural resources. However given the natural fluctuation of water within the Everglades system, and historic (pre-drainage) levels, it is not clear if there is an effect or not. No previous studies have addressed this issue.



Figure 12: Tribal members replacing a traditional chickee roof on a tree island in WCA-3A. Photo: USACE.

The Corps consulted with the various parties for over 18 months and entered into this agreement with parties that include the Seminole Tribe of Florida, Everglades National Park, the Florida State Historic Preservation Officer, and the Advisory Council on Historic Preservation.

**Picayune Strand Restoration Project** – This CERP project covers more than 55,000 acres and will restore natural habitats and the region’s historic sheetflow while maintaining flood protection for neighboring communities. The project serves as an important link connecting Everglades National Park and the Ten Thousand Island National Wildlife Refuge to the south with the Fakahatchee Strand State Preserve to the east, the South Belle Meade State Conservation and Recreation Lands project to the west, and the Florida Panther National Wildlife Preserve to the north. By connecting this large mosaic of natural areas, historic wildlife paths and trails will be restored, especially for the Florida panther. The project includes three pump stations, three spreader basins, 260 miles of road removal, 48 miles of canal plugging along four canals, manatee mitigation features, and flood protection features. The first component of this project, plugging of the Prairie Canal, was completed as advance work by the SFWMD during the previous reporting period. Since then the Corps has been leading much of the construction of the major pump stations, road removal, and canal plugging. The SFWMD will be constructing the manatee mitigation features in the lower part of the project while the Corps finishes the pump station construction and remaining work. Currently, one pump station has been completed and the remaining two are under construction. Also, an LRR is under preparation and nearing completion to address an overall increase in project costs. Even though the project features are just coming online, the area is already showing signs of recovery, particularly along the Prairie Canal where wading birds are flourishing and plant life is recovering. Thanks to the State’s accelerated land acquisition, which is nearly complete, the Florida panther has shown positive signs of recovery through a notable increase in the number of animals inhabiting the area. The project should be completed during the next reporting period.

**Restoration Strategies** – In 2012, the State of Florida and the USEPA reached a consensus on new strategies for improving water quality in America's Everglades. Under these Restoration Strategies, the SFWMD is implementing an \$880 million technical plan to complete several projects that will create more than 6,500 acres of new STAs and 116,000 acre-feet of additional water storage through construction of FEBs (SFWMD 2012). The Restoration Strategies projects will work in conjunction with existing STAs to achieve compliance with State of Florida water quality standards. Work is already well underway with the completion of the first FEB, the A-1 FEB, scheduled for late 2015. This will be quickly followed by the completion of the L-8 FEB and other features.

**Seminole Tribe Big Cypress Reservation Water Conservation Plan** – The intent of this project is to rehydrate wetlands, improve water quality, and provide water storage on the Seminole Tribe's Big Cypress Basin Reservation. The project's original design included irrigation cells to provide stormwater protection and water storage for agricultural irrigation; water resource areas that receive stormwater discharges to facilitate nutrient settling and nutrient uptake by vegetation to improve water quality and to improve the hydroperiod of wetlands adversely affected by the close proximity of major drainage/irrigation canals; and pump stations, canals, and culverts for local irrigation and drainage. The initial design called for six irrigation cells in Basin 1, two irrigation cells in Basin 2, two irrigation cells in Basin 3, and one irrigation cell in Basin 4. Because of high soil porosity and seepage rates from the irrigation cells noted after completion of Basin 1, these features were eliminated from the design for Basins 2, 3, and 4. The irrigation cells in Basin 1 currently provide stormwater attenuation and some water quality benefits from the settling of nutrients. Federal expenditures on the project have reached the per project federal funding cap set by Congress for the Critical Projects Program under which this project was authorized. As a result, the Seminole Tribe of Florida has been responsible for 100% of the costs to complete Basin 2 and Basin 3 is being eliminated from the project.

**Site 1 Impoundment Project** – This CERP project has been divided into two phases. The Phase 1 features include the rehabilitation and improvements to the common levee bordering WCA-1 (also known as the Arthur R. Marshall Loxahatchee National Wildlife Refuge), the creation of a 6-acre wildlife protection area, and other features (Figure 13). Phase 2 will focus on construction of the reservoir and remaining project works. The Phase 1 work will reduce the amount of seepage loss from the adjacent refuge thus helping to increase the amount of water that remains in that natural system, especially during dry periods. Maintaining the additional water will allow for ecological habitat improvements in the refuge. The Phase 1 work will be completed in 2015. Phase 2 work has not been scheduled at this point.



*Figure 13: Site 1 Impoundment, improvements to the L-40 Canal and Levee. Photo: USACE.*

**Southern Corkscrew Regional Ecosystem Watershed Project** – This project will restore historical sheetflow in the project area and reduce excessive freshwater discharges (which include nutrients and pollutants) to Estero Bay during the rainy season. This will have a significant benefit to the wetland areas in the watershed as well as improve conditions in Estero Bay. The project was identified under the Critical Projects Program but could not be implemented due to the federal funding cap. The SFWMD has

proceeded with implementation of this project outside of the Critical Projects Program. The SFWMD has been acquiring the necessary lands and will begin construction in the next reporting period.

**Tamiami Trail Next Steps Project** – This project will provide an additional 5.5 miles of bridging west of the one-mile bridge already completed under the Mod Waters project. The project will also raise the roadway to allow higher water levels in adjacent canals and to increase flows south into Everglades National Park. The project was authorized in 2012 as a separate project outside of Mod Waters or CERP for implementation by the USDO. The USDO has signed an agreement for construction of the project with the Florida Department of Transportation (FDOT) who will handle the construction. The Governor of Florida has committed \$90 million over the next 3 years to construct the first 2.6-mile long bridge along the western section of the Tamiami Trail that is just south of WCA-3B. An additional \$20 million has been provided through a Transportation Investment Generating Economic Recovery (TIGER) grant from the U.S. Department of Transportation. Initial design has been underway by the USDO and FDOT with project construction scheduled to be underway in 2016.

**Taylor Creek and Nubbin Slough: Lake Okeechobee Water Retention and Phosphorus Removal Project** – This project was constructed by the Corps in partnership with the SFWMD under the Critical Projects Program. This completed project consists of two STAs and associated water management features that capture and treat inflows and subsequently discharge cleaner water back into Taylor Creek, Nubbin Slough, and Lake Okeechobee. The project has been transferred to the SFWMD for operations.

**Ten Mile Creek Water Preserve Area Project** – This project includes an above-ground reservoir, an STA, and associated water management features to improve the health of the St. Lucie Estuary. The project is intended to provide seasonal and temporary storage of peak stormwater flows and to use that stored water to augment flows in the dry season to help moderate salinity levels and reduce sediment loads downstream. The project was constructed by the Corps as a part of the Critical Projects Program. The project has been under evaluation since construction completion due to concerns about the embankment design and construction. The SFWMD is initiating a limited startup of the project at lower water levels to begin obtaining benefits from the project in the basin. The SFWMD has also requested that the project be removed from the federal program thus allowing them to modify the project sufficiently to achieve a fully functional project.

**Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement Physical Model** – This CERP project is a design effort that provides for the temporary installation and testing of water management features to address scientific, water flow, and water management uncertainties prior to the decompartmentalization of WCA-3. Construction of the test features was completed in 2012 and operational testing has been underway to determine the effects of alternative levels of canal plugging to reconnect WCA-3A with WCA-3B. Results of the testing are currently being evaluated.

**West Palm Beach Canal STA 1 East/C-51 West Project** – This project captures and treats stormwater runoff from urban and agricultural areas prior to discharge into the Arthur R. Marshall Loxahatchee National Wildlife Refuge. The STA includes treatment cells, distribution cells, and associated pumps, culverts, and other water management features. The project is designed to provide water quality benefits to the refuge while maintaining flood protection for developed areas. The project was constructed by the Corps and has been transferred to the SFWMD for operations. Meanwhile, the Corps continues to repair numerous culverts throughout the project area that connect the various cells of the STA. These repairs should be completed in 2016.

### Projects Currently Listed for Deauthorization

The following projects that were conditionally authorized in WRDA 2000 have recently been listed for deauthorization due to lack of funding and activity over the past six years. In general, since a new PIR would be required prior to further work on these projects and since that new PIR would require congressional authorization as well, deauthorization of these projects does not pose a problem at this time. Also, with the authorization of the Tamiami Trail Next Steps project, the CERP project for raising and bridging the east portion of the Tamiami Trail will no longer be needed.

- North New River Improvements
- Raise and Bridge East Portion of Tamiami Trail and Fill Miami Canal within WCA-3
- Taylor Creek/Nubbin Slough Storage and Treatment Area
- Wastewater Reuse Technology

## **2.2 LAND ACQUISITION**

The State of Florida, with financial assistance from the USDOJ, USDA, and local governments including St. Lucie, Martin, Palm Beach, Broward, Miami-Dade, and Lee counties, is acquiring lands needed for the CERP. Final footprints needed for each project have not yet been determined. However, to ensure the availability of lands needed for potential CERP project implementation, the state has moved forward aggressively acquiring potentially needed lands well in advance of project planning and design, and at their own risk. Acquiring this land now, rather than waiting, preserves land that otherwise might be developed or become unavailable. The actual lands needed for a project, and any potential credits toward the non-federal sponsor's cost share, are described in final PIRs and associated plans and specifications.

Of the approximately 385,000 acres of land needed for potential CERP projects, approximately 65% (249,000 acres) have been acquired as of December 31, 2014, leaving approximately 136,000 acres that still need to be acquired. For projects with an executed PPA, non-federal funds spent on land acquisition are included in the total expenditures described in the funding section of this report.

Between October 1, 2010 and September 30, 2015, the State's fiscal years closest to this document's reporting period, nearly 55,000 acres have been acquired for Everglades projects.

TABLE 3: LAND ACQUISITION BY PROJECT

PROJECT NAME	ACREAGE
8.5 Square Mile Area	2,283.32
Acme Basin B Discharge	1.56
Big Cypress Basin	6.56
Big Cypress Basin Field Station	7.98
Biscayne Bay Coastal Wetlands	1,689.91
C-111 South Dade	9.74
C-111 Spreader Canal	72.68
C-18	0.63
C-2	0.01
C-4	0.75
C-4 Flood Mitigation	0.03
C-44 STA	2.76
CREW	2,237.94
Cypress Creek/Loxahatchee	1,227.85
Deer Fence	269.29
East Coast Buffer	70.00
Herbert Hoover Dike	733.39
Hillsboro Canal	3.36
Indian River Lagoon - South	1,911.82
Kissimmee Chain of Lakes	407.32
Kissimmee River	553.79
L-2W	1.03
L-31N	6.07
L-40	24.85
L-63N	1.39
Lake Hicpochee Hydrologic Enhancement, NEEPP	807.29
Lake Okeechobee & Estuary Recovery (LOER)	174.26
Lake Okeechobee Isolated Wetlands Creation & Restoration (SWAP)	428.35
Lake Okeechobee Water Retention Phosphorus Removal Project	287.17
Loxahatchee River	371.00
Loxahatchee River Watershed Restoration Project	4,253.53
Palm Beach County - Natural Lands	766.57
Picayune Strand Restoration - Fakahatchee Outside Boundary	87.18
Picayune Strand Restoration (SGGE)	11,057.34
Regulatory Mitigation Lands	1,232.08
River of Grass	18,549.65
Shingle Creek	1.20
Southern Glades	541.23
Stormwater Treatment Areas	4,756.04
<b>TOTAL</b>	<b>54,836.91</b>

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## **2.3 SCIENTIFIC INVESTIGATIONS**

### **2.3.1 RECOVER and CERP's Science Program**

The restoration program depends on sound science to evaluate ecological health and assess ecosystem response to restoration activities. Science informs decision-making and allows for the adaptation of our restoration efforts. Long-term data that describe the ecological conditions, variability, trends, and patterns in the Everglades are fundamental to understanding how projects, once implemented, change the ecology of the Everglades. Long-term data is a tool to link planning, construction, and adaptive management to ensure that intended results are achieved. RECOVER, the scientific arm of CERP, ensures science remains a fundamental and overarching element throughout the ongoing planning, implementation, and adaptive management of Everglades restoration. RECOVER coordinates the monitoring of ecological indicator species and physical conditions across the system and then uses modeling and other tools to assess restoration progress.

### **2.3.2 Responding To Changing Ecosystem Needs: The Adaptive Management Program**

Adaptive management is a structured management approach that allows for learning while doing, especially for projects where risks from delays in implementation outweigh risks from project uncertainties. Adaptive management addresses uncertainties by testing hypotheses, linking science to decision making, incorporating flexible design, and adjusting project implementation, as necessary, to improve the probability of restoration success. The CERP is being planned, implemented, assessed, and refined using the principles of adaptive management. During this reporting period, project adaptive management and monitoring plans have been incorporated, as required by WRDA 2007, into the CEPP, C-111 Spreader Canal Western Project, and Biscayne Bay Coastal Wetlands Project, Phase 1. Field tests, such as the DECOMP Physical Model, use RECOVER information to establish monitoring that will be used to inform future related work.

### **2.3.3 Monitoring To Determine The Health Of The Everglades: The System Status Report**

During the reporting period, RECOVER produced the *2012 Interim Systems Status Report (SSR)* and the *2014 SSR*, documenting the CERP Monitoring and Assessment Plan (MAP) program. The goal of the MAP is to document status and trends of the defining attributes and key indicator species of the south Florida ecosystem, as well as to address key questions (uncertainties) about achieving ecosystem restoration goals. A comprehensive understanding of the system enables the successful use of adaptive management principles to track and guide restoration activities to ultimately achieve restoration success.

Aside from 2013, the past five years have been dry, which has benefited the Northern Estuaries and Lake Okeechobee but continued to negatively impact the central Everglades and southern coastal areas. In the north, we have seen improvements that likely indicate how the ecosystem will respond in the future once CERP restoration projects are in place to maintain ecosystem resilience in all climatic periods (sequence of wet years or dry years). In the south, the drought has continued to impact the central Everglades wetlands hydrology, ecosystem characteristics, flora, fauna, and landscape types, as well as salinity trends and ecology in the southern coastal areas. The few restoration projects constructed to date—Biscayne Bay Coastal Wetlands Project - Phase 1, C-111 Spreader Canal Western Project, and Picayune Strand Restoration Project—have begun to yield benefits in their project areas.

Some of the challenges affecting the Everglades ecosystem include:

- Hydrology remains altered across the system (too dry in the northern WCAs and in Everglades National Park, and too wet in the southern WCAs).
- The number of large tree islands, an important habitat and feature of the historic Everglades, decreased by 50% between 1954 and 2004 in Shark River Slough.
- Florida Bay salinity conditions moved farther from restoration targets over the past four years.

Certain ecosystem indicators illustrate improvements due to restoration projects being constructed and operational:

- Wetland hydrology improved due to the operational part of the Deering Estate Biscayne Bay Coastal Wetlands expedited project.
- Picayune Strand showed higher water levels near the filled Prairie Canal (1 to 2 feet higher) and vegetation is starting to show signs of improvement and moving closer to reference conditions.
- Desirable wet conditions (longer hydroperiods) were 50 days longer (on an annual average basis) along the central-eastern edge of Everglades National Park as a result of the C-111 South Dade Project.
- Roseate spoonbill nesting improved, most likely due to favorable climatic conditions and better real-time environmental coordination with water management operational decisions.
- Crocodile nesting and population trends increased over the past two decades along the southwestern Florida coast due to the Cape Sable plug restoration projects.

Following is a summary of ecosystem conditions during the reporting period by region. Conditions are provided by the most recent water years that are available and best match the reporting period for this document. A water year begins on May 1 and ends the subsequent year on April 30. Water years 2009 through 2013 (May 1, 2009 – April 30, 2013) are used in this report. For more information, please refer to the 2014 SSR.

### **Lake Okeechobee**

Lake Okeechobee ecology improved during the reporting period (Water Years 2009 to 2013) due in part to operational changes and favorable climatic conditions.

Phosphorus and other nutrient concentrations decreased during the reporting period. Submerged aquatic vegetation (SAV) habitat found near the shore during the summer increased by 12,200 acres and periphyton were more abundant, while algal bloom frequency slightly increased by 2.6 percent. These results suggest that Lake Okeechobee ecology will improve once more storage outside of Lake Okeechobee is available to reduce the frequency of above-average inflows during wet years and once ecologically desired water levels are incorporated as part of Lake Okeechobee operations.

### **Northern Estuaries**

The Northern Estuaries include the Caloosahatchee River Estuary, the St. Lucie Estuary and Southern Indian River Lagoon, the Loxahatchee River Estuary, and Lake Worth Lagoon.

### St. Lucie Estuary

New data indicate supplemental freshwater inflows to the St. Lucie Estuary during extremely dry years, especially when they occur back to back, may be needed to maintain healthy oyster populations in the middle estuary. Climate (temperature and rainfall) patterns during the reporting period (Water Years 2009 to 2013) led to new findings about the distribution of flow requirements for oysters in the St. Lucie Estuary. The data also suggest that rapid drops in salinity (1 to 2 practical salinity units per day) may be detrimental to seagrass even if these decreases are within their normal tolerance ranges and that recovery can take months to years. Salinity and sediment composition are the major determinants of the species diversity of invertebrates found at the bottom of the southern Indian River Lagoon and St. Lucie Estuary.

### Caloosahatchee Estuary

Data from the Caloosahatchee River Estuary indicate management activities that decrease high flow events and allow a more gradual release of water into the estuary are beneficial. Oysters typically spawn in the Caloosahatchee River Estuary from May through November, with a peak in July to August. The majority of spawning occurs during the rainy season when flows are usually the highest and salinities the lowest. New evidence also demonstrates high temperatures result in additional stress to oysters by increasing predation rates and lowering salinity tolerance.

### **Central and Southern Everglades**

The central and southern Everglades primarily includes areas south and east of the EAA, including the WCAs and Everglades National Park. Monitoring over the past 10 years has documented *periodic* dry years that may have had a positive role in shaping ecosystem structure, providing habitat and concentrating prey for key restoration indicators such as alligators and wading birds. However, *successive* dry years (droughts) can negatively impact the system. These impacts are exacerbated by the C&SF Project, which compartmentalized the central and southern Everglades and created upstream regions that are too dry and downstream areas that are too wet. The C&SF Project also has disrupted the flow of clean water through the Everglades that defined and sustained the characteristics that make these wetlands unique in the world. Continued monitoring has revealed new information on the following.

### Wading Birds and Prey Fish

- Drying events help concentrate prey fish for wading birds; however, long-term analysis shows an increased frequency of drying events leads to decreased fish biomass.
- Droughts decrease the density of larger fishes that are the preferred prey for great egrets and wood storks, but they increase the density of crayfish, the primary food for white ibis.
- Monitoring from 1986 to 2013 shows white ibises were more sensitive to hydrologic reversals than great egrets.
- The optimal water level recession rate for several wading bird species is from 5 to 7 millimeters per day.
- Linking prey performance to wading bird performance can help improve predictive tools for restoration and operational planning.
- Wading bird data were used in weekly water management operational decisions by the SFWMD and the USACE to incorporate real-time foraging conditions.

### Alligators

- Areas that experience dry downs that last longer than two months or repeated dry downs at intervals shorter than once every three to five years are not likely to support restoration population goals for alligators.

### Ridge and Slough Vegetation

Hydrology is a determining factor with respect to changes in both marshes and tree islands at the population, community, and ecosystem levels, and these responses are rapid (decadal).

- Fluctuations in the hydrologic regime from 1999 to 2012:
  - resulted in below average water levels and shorter hydroperiods in Shark River Slough,
  - promoted an increase in spikerush and sawgrass cover at the expense of open water sloughs and slough vegetation in the marshes, and
  - resulted in the expansion of woody plants across the full suite of communities comprising the tree island gradient, i.e., bayhead forest, bayhead swamp, and sawgrass tail.
- Good ridge and slough vegetation and landscapes were found at mean annual slough water depths of 20 to 50 centimeters, although a large proportion of sites near the drier end of this range are conspicuously degraded.
- Healthy tree islands:
  - exhibit spatial and temporal variability in plant water uptake focused in the shallow soil profile,
  - exhibit evapotranspiration that increases from wetter communities to drier communities within the tree island, and
  - actively accumulate ions in soil water of the drier, “high head” plant community.

### Water Quality

The strong relationship between periphyton metrics downstream of inflow structures and total phosphorus concentrations in inflows from Water Years 2007 to 2011 points to the continuing relevance of nutrient inputs to Everglades ecology. However, the multi-metric periphyton assessment is sometimes inconsistent with flows and loads across basins, with very low and stable ambient levels in WCA-3A and WCA-3B, and with declining concentrations being seen widely in Everglades National Park. Full interpretation of the periphyton metric for marsh impairment must consider inflow volumes and legacy marsh total phosphorus, local biogeochemical processes, marsh water levels, hydrology, and other factors influencing periphyton ecology.

### **Southern Coastal Systems**

The Southern Coastal Systems include Biscayne Bay, Florida Bay, the Lower Southwest Coast, the Upper Southwest Coast, and the Ten Thousand Islands. These regions have been impacted by changes in the availability, timing, and distribution of freshwater inflows. Restoration of the southern coastal systems will depend on the reestablishment of additional freshwater and more natural flow distribution. These important estuaries rely on appropriate water levels and salinity regimes to support seagrass habitat and native species. Studies conducted during the reporting period provided information on these factors.

### Seagrass

- The frequency of occurrence and abundance of juvenile sportfish are directly related to the amount of seagrass habitat cover.
- Seagrass species diversity is declining, with some species showing marked gains and others decreasing in spatial extent.

### Salinity

- Moderate estuarine salinity is preferred by some sportfish.
- The plugging of canals near Cape Sable likely moved salinity regimes toward restoration targets, resulting in improvements in American crocodile nesting.
- Obtaining pre-drainage salinities in Florida Bay would require water levels in Shark River Slough to be 0.5 to 0.8 foot higher than the current observed levels.
- Salinity increased in Florida Bay, moving farther away from restoration targets likely due to reduced rainfall and resulting reduced inflows from the water management system.
- Fish and invertebrate surveys indicate that pink shrimp and sea trout are declining as hypersalinity increases in Biscayne Bay.
- Test freshwater deliveries in 2011-2012 showed that even a small amount of additional freshwater delivered to Biscayne Bay during the dry season improved salinity.

### Hydrology

- Successful nesting of Florida Bay roseate spoonbills in seven of the last eight years is due to favorable climate conditions and better coordination with water managers.
- Operation of the expedited component of the Biscayne Bay Coastal Wetlands Project yielded hydrologic and vegetation improvements in the project area wetlands.

### Water Quality

- Although there has not been a significant trend in overall water quality since the 2009 SSR, there has been a marked increase in Chlorophyll A in southern Florida Bay and the southeastern Everglades (northeastern Florida Bay and Barnes Sound/Manatee Bay/Blackwater Sound) in Water Year 2011 through Water Year 2013. These changes may be related to climatic patterns, with unusually high rainfall in recent dry seasons.

## **2.3.4 INTERIM GOALS AND TARGETS**

Interim Goals provide a means to evaluate the restoration success of the CERP by tracking restoration performance and progress, providing a basis for reporting that progress at specified intervals of time, and for periodically evaluating the accuracy of predictions of system responses to the effects of CERP. The Interim Goals can be expressed as either predictions of ecosystem response to CERP implementation, or as desired levels of performance and reflect incremental accomplishments towards achieving CERP goals. Interim Targets are defined as anticipated incremental improvements in water supply (agriculture, municipal/industry) and other socio-economic indicators over the course of CERP implementation.

### **Interim Goals**

Interim Goals were established in 2007 to evaluate restoration success by tracking restoration performance after projects or series of projects become operational. The past ten years of planning,

design, and construction set the pace for unprecedented restoration progress that if maintained, will see the achievement of its interim goals and targets increasing with each reporting interval.

In a long-term restoration program such as CERP, it is important that goals are set with a means of tracking the goals over time as restoration projects are implemented. RECOVER issued its technical report in 2005 to facilitate creating the intergovernmental agreement in 2007 and also developed and began implementation of MAP monitoring to track restoration progress. This section provides an update on progress toward interim goals with a focus on new ecological modeling tools RECOVER has been developing in anticipation of project progress that will be reported on in the next five year reporting cycle and the MAP monitoring will be used to assess the indicators in the field.

Ecological models are tools that link ecological effects to mainly hydrology in restoration planning. The NRC, which conducts biennial independent scientific reviews of CERP, concluded in their 2010 report that “Improved species models... are urgently needed to provide more rigorous scientific support for water management decisions” (NRC 2010). Ten of the 29 interim goal indicators are primarily hydrological, and use either hydrologic field data or hydrological models for assessing restoration progress; the rest are biologically focused and need special models to analyze impacts and predict performance. All of these models are discussed below. Substantial progress has been made on development of ecological predictive tools and the MAP monitoring required for these indicators is summarized in the table below.

Worthy of note is that the entire suite of models summarized below (with the exception of Lake Okeechobee) was used extensively in the planning for CEPP. RECOVER and project delivery team members used the models to shape and refine project alternatives and perform system-wide evaluations of the alternatives.

Progress toward achieving the Interim Goals depends largely on having completed and operational projects. While substantial progress is now being made on implementation of the various projects of CERP, there are currently no fully completed CERP projects aside from the melaleuca research annex that was completed late in the reporting period. Therefore, progress by CERP towards achieving the Interim Goals has been minimal. However, the ongoing work and completion of the Foundation Projects is having a very positive and beneficial impact on the system and is setting the stage for CERP to achieve the Interim Goals as individual projects are completed. Great restoration success has been witnessed in the Kissimmee River Basin as that project nears completion. This demonstrated impact, combined with the positive effects of the other Foundation Projects and the initial beneficial effects of the advance work done by the SFWMD on the Picayune Strand Restoration Project, the C-111 Spreader Canal Western Project, and Biscayne Bay Coastal Wetlands – Phase 1 has already affirmed the expectations for CERP restoration success and achievement of the Interim Goals set for the overall program. As CERP’s Generation 1 projects are completed in the next reporting period, we expect to see even more positive benefits to the ecosystem and incremental achievement of the Interim Goals for those areas.

TABLE 4: ECOLOGICAL MODELING TOOLS AND ASSESSMENT MONITORING

INTERIM GOAL INDICATOR	PREDICTIVE TOOLS COMPLETE	MONITORING AVAILABLE FOR ASSESSMENT	PLANS FOR PREDICTIONS AND ASSESSMENTS OF INTERIM GOALS
<b>REGION: Northern Estuaries</b>			
<b>Oysters</b>	Oyster mechanistic model and Habitat Suitability Index.	Mapping of the extent of live oyster beds performed every 5 years, latest 2012.	Modeled predictions based on the IDS and continued mapping every 5 years after flow and salinity regimes restored through Indian River Lagoon - South, CEPP, and Lake Okeechobee Watershed projects.
<b>Submerged Aquatic Vegetation (SAV)</b>	SAV simulations for 3 important species, Manatee grass, wild celery, and shoal grass.	Mapping performed at least every 5 years, latest maps 2014 (Caloosahatchee River Estuary) and 2015 (Indian River Lagoon).	Same as above.
<b>REGION: Lake Okeechobee</b>			
<b>Submerged Aquatic Vegetation</b>	Areal SAV coverage predictions based on lake stages and the amount of potentially colonizable nearshore area.	Yearly monitoring produce vegetation maps. For SAV, the July–August annual nearshore SAV mapping coverage data are used since they have the most significant correlation with lake stage. A subset of nearshore sites are also monitored during the spring, fall, and winter.	Ongoing comparison of annual summer areas coverage data as it correlates to average monthly May (vascular) and July (Chara) lake stages. An annual vascular score is also based on the average May lake stage.
<b>Algal Blooms</b>	Algal bloom frequency is predicted, as described above. The model also predicts the ratio of diatoms to blue-green algae.	Quarterly monitoring and assessment of algal biomass and annual mean cyanobacteria, diatoms, and chlorophyll A are used to assess conditions in relationship to nutrients.	Ongoing assessment and future use in determining planning and storage options.
<b>REGION: Greater Everglades</b>			
<b>Aquatic Fauna Regional Populations</b>	Logistic model parameterized to	Dry season and wet season trophic prey	Evaluate the effect of restoration by continued

INTERIM GOAL INDICATOR	PREDICTIVE TOOLS COMPLETE	MONITORING AVAILABLE FOR ASSESSMENT	PLANS FOR PREDICTIONS AND ASSESSMENTS OF INTERIM GOALS
<b>in Everglades Wetlands</b>	predict small fish densities based on the time between drying events.	concentrations are monitored in the MAP and are used to build the model and provide field level assessment.	monitoring to assess the predicted effects on the ecosystem of the following projects based on the IDS: Mod Waters,, Decomp Physical Model, C-111 South Dade, C-111 Spreader Canal, Restoration Strategies, Tamiami Trail Next Steps, and CEPP.
<b>Large Fish</b>	A generalized logistic model predicts largemouth bass catch-per-unit-effort based on the average length of drying events in days for each study site.	Catch per unit effort for largemouth bass is monitored in the wet season in Everglades marshes.	Same as above.
<b>American Alligator</b>	An American alligator production index has been developed as an update of the 2004 Spatially Explicit Species Index Model. The model integrates five probability functions: (1) habitat availability, (2) breeding potential, (3) courtship and mating, (4) nest building, and (5) nest flooding.	No MAP data were collected 2013-2015 due to cutbacks in funding. Temporary funding sources were found outside of the MAP for those years and it is anticipated that MAP will resume alligator data collection in FY 2016. Alligator abundance surveys are conducted in both the wet and dry seasons yearly in Everglades marshes.	Same as above.
<b>System-wide Wading Bird Nesting Pattern</b>	#1 - A wood stork foraging potential model has been developed to predict the relative suitability of foraging conditions for wood storks within Everglades freshwater marshes during the breeding season.	Wading bird nesting and prey availability are monitored at multiple locations throughout the Everglades. This data has been used to develop and calibrate the models and assess current conditions in	Predict the effect of restoration progress by modeling the progress of the following projects and continued monitoring activities: Mod Waters, Decomp Physical Model, C-111 South Dade,

INTERIM GOAL INDICATOR	PREDICTIVE TOOLS COMPLETE	MONITORING AVAILABLE FOR ASSESSMENT	PLANS FOR PREDICTIONS AND ASSESSMENTS OF INTERIM GOALS
	<p>#2 - A wading bird nesting model developed in the Gawlik lab at Florida Atlantic University predicts the number of nests for the great egret, white ibis, and wood stork.</p> <p>#3 - The spatial foraging condition model was used to evaluate wading birds in the technical evaluation of CEPP for great egret, white ibis, and wood storks. This model focuses on hydrologic characteristics.</p>	<p>the field of several key wading bird species such as wood stork, great egret, and white ibis.</p>	<p>C-111 Spreader Canal, Restoration Strategies, Tamiami Trail Next Steps, and CEPP.</p>
<p><b>Snail Kite</b></p>	<p>A Florida apple snail population model has recently been used as a proxy for the snail kite and includes the Everglades Depth Estimation Network (EDEN) water level model information.</p>	<p>University of Florida conducts range-wide surveys from Everglades National Park north to the Kissimmee Chain of Lakes, and most major wetlands in between. Overall population and as many nest locations as possible (~400) are monitored until the nestlings are ready to fledge, at which point they are banded. Nest location monitoring and banding activity runs from about Jan-Oct, and the actual resight surveys run from Mar- Jul.</p>	<p>Predictions based on system-wide restoration progress and continued monitoring of the species.</p>

INTERIM GOAL INDICATOR	PREDICTIVE TOOLS COMPLETE	MONITORING AVAILABLE FOR ASSESSMENT	PLANS FOR PREDICTIONS AND ASSESSMENTS OF INTERIM GOALS
<b>REGION: Southern Coastal Systems</b>			
<b>Submerged Aquatic Vegetation in Southern Estuaries</b>	The Florida Bay Seagrass Community Model (SEACOM) is a seagrass community ecological simulation model that assesses the impact of management strategies on the Florida Bay SAV community. The model predicts biomass and species composition of <i>Thalassia</i> , <i>Halodule</i> , and <i>Ruppia</i> .	Annual SAV monitoring is performed in much of Florida and Biscayne Bays. This long-term data set of monitoring has been used to develop and calibrate the model and is used to track the actual annual changes to these communities in relationship to water quality changes.	Predictions based on the IDS and subsequent evaluation of the effects of C-111 Spreader Canal Western Project, Biscayne Bay Coastal Wetlands (Portions), and Mod Waters.
<b>Juvenile Shrimp Densities in Florida Bay and Biscayne Bay</b>	A shrimp production index simulates growth, survival, and potential harvests from a specified monthly cohort as a function of salinity and temperature.	MAP shrimp density monitoring in Florida Bay was eliminated due to lack of funding in 2012. Limited nearshore monitoring remains in Biscayne Bay.	Same as above.
<b>American Crocodile</b>	An American crocodile hatchling growth and survival salinity index is calculated for August through December, the period following hatching when hatchlings are most vulnerable to high salinities.	MAP monitoring data was collected until 2012. Monitoring has continued in Everglades National Park and by Florida Power and Light on their properties and Turkey Point Nuclear Power Plant.	Same as above.

### Interim Targets

Multiple CERP projects are currently under construction, therefore no significant progress has been made toward the Interim Targets that rely on project completion. However, as noted above for the Interim Goals, the Foundation Projects are setting the stage for CERP projects to achieve their planned targets when completed. As the first generation of CERP projects will be coming on line this next reporting period, along with portions of the Generation 2 projects, we expect to begin to see incremental achievements towards the Interim Targets in those areas affected by these projects, mainly in the St. Lucie Canal Basin and the Picayune Strand Basin. When the CEPP is authorized and

implemented, we expect to see a significant jump in the achievement of Interim Targets due to the increased water made available by that project. To prepare for this, RECOVER will need to focus on the highest priority Interim Target indicators over the next five years. This effort will need additional resources and coordination with the agencies who regularly track these indicators in south Florida. The SFWMD tracks and reports on several of these indicators as part of their flood control and water supply missions, and they are reported in the South Florida Ecosystem Report on a yearly basis.

### **2.3.5 ADDITIONAL RESTORATION SCIENCE PROGRAMS**

#### **Invasive Exotic Species**

The Everglades is being invaded by numerous nonnative species, including invasive exotic plants, fish, amphibians, reptiles, birds, and macroinvertebrates. These invaders threaten our environment, economy, culture, and human health. In order to effectively address invasive species, the *2010 CERP Memorandum – Requirements for Project Implementation Plans and Other Implementation Documents*, the *CERP Guidance Memorandum 062.00: Invasive and Native Nuisance Species Management* (USACE and SFWMD 2012b) was developed and implemented. Subsequent CERP projects, such as the CEPP (USACE and SFWMD 2014), have incorporated invasive species considerations into their PIRs.

In 2013, the Melaleuca Eradication and Other Exotic Plants Project became the first completed CERP project. A joint effort between the USACE, USDA, USDO, SFWMD, and University of Florida, this facility is part of a long-term plan to use biological controls to supplement existing efforts to control and reduce the most aggressive, widespread, and problematic invasive exotic plants in south Florida, such as melaleuca, Brazilian pepper, Australian pine, and Old World climbing fern.

In its 2014 report, the CISRERP noted excellent progress in *operational* coordination of the management of invasive exotic species but suggested that *strategic* coordination was needed to develop a comprehensive view of all nonnative species along with an early detection and rapid response (EDRR) system for the Everglades (NRC 2014). In response, the Task Force initiated development of an *Invasive Exotic Species Strategic Action Framework* (SFERTF 2014). The Framework recognizes the longer the delay in addressing a particular invasion and the more widespread that invasion becomes, the more expensive it is to address. Current efforts are focused upon establishment of an EDRR system for the south Florida ecosystem.

#### **Climate Change**

Recognition is growing that Earth's global climate is warming, the rate of warming is likely to accelerate, and warmer global conditions are likely to persist well beyond 2100. The CERP goals of restoring a healthy Everglades ecosystem and sustaining its unique plant and wildlife diversity must address how climate change will impact these Everglades goals. Measuring restoration success needs to incorporate climate change considerations that can then be developed into a framework for long-term climate adaptation strategies.

The Climate Change in South Florida Technical Workshop (February 14–15, 2013) discussed the model outputs for the year 2060 scenarios using the South Florida Water Management Model (SFWMM). The output from these scenarios was compared to CERP performance indicators. To illustrate, one future scenario considered 18 inches of sea level rise, 1.5° Celsius temperature increase, and 10% decreased

rainfall (with water management infrastructure and operations based on a 2010 baseline). The conclusions from this scenario workshop indicate:

- Lake Okeechobee – A two-meter decrease in average high and low water levels over multiple years would make the 100,000 acres of the lake’s marsh dry out and be prone to fires, cause vegetation die off, and would dramatically alter lake ecology.
- Freshwater Wetlands throughout the Everglades – Major impacts to soils and native vegetation, fish, and wildlife, reduced peat production, increased rate of peat loss, and increased fire risk would be experienced. Aquatic fish production would likely decrease, affecting wading birds and alligators. There would be increased stress on individual plant species and the vegetation community, which will make the habitat more suitable for invasive exotic species. Water level fluctuations over a wet-dry cycle would alter soil biogeochemical processes resulting in more soil oxidation, release of mercury and sulfate, and an increase of methyl mercury.
- Coastal and Marine Ecosystems – A rise of 1.5 feet in sea level would cause the salinity of Florida Bay to become more like the ocean and would also cause erosion of the coastal marshes. Higher summer temperatures may negatively affect seagrass habitat and fish, coral will continue to be impacted, and peat loss in freshwater wetlands due to saltwater intrusion may also result in additional nutrient impairments to Florida Bay.

Despite the challenges that may lay ahead to deal with the potential effects of climate change on the human and natural environment of south Florida, the overwhelming consensus by scientific experts is that restoration of the Everglades, as envisioned in the CERP, is the best defense against adverse effects of climate change. The preservation of the water resources of south Florida, the restoration of the natural flows and functions of the south Florida ecosystem, and the increase in spatial extent of wetland and natural areas offer the best hope for a resilient Everglades ecosystem that can better adapt to future changes.

### **Regional Environmental Monitoring and Assessment Program**

The USEPA has been conducting an assessment of the health of the Everglades over the last 20 years. The Everglades Ecosystem Assessment Program (also referred to as Regional Environmental Monitoring and Assessment Program, or REMAP) measures current and changing conditions for water quality and ecological resources. Program data addresses key questions related to water management and soil loss and tracks the effectiveness of efforts to control phosphorus and mercury.

During each sampling phase, about 125 locations are sampled in a two-week window in order to assess the entire Everglades at a single point in time. In September 2014, Phase IV sampling was conducted at 119 locations throughout the marsh. Funding support from and collaborative helicopter operations with Everglades National Park have made this effort possible. Data interpretation is ongoing, and the USEPA project report should be available in 2016.

## 2.4 FINANCIAL PROGRAM

### 2.4.1 Project/Program Funding

Over \$1.2 billion in funding, in combined contributions from the federal and state partners, has been provided in support of the CERP and prospective CERP projects over the past five fiscal years (FY) (**Table 5**).

**TABLE 5: CERP FEDERAL AND STATE ENACTED FUNDING <sup>(1)</sup>,  
OCT 1, 2010 THROUGH SEP 30, 2014 (ROUNDED IN THOUSANDS)**

<b>FEDERAL</b>	<b>FY10</b>	<b>FY11</b>	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>	<b>5-Yr Total</b>
USACE <sup>(2)</sup>	\$ 119,966	\$ 117,525	\$ 57,886	\$ 75,902	\$ 35,217	\$ 406,496
USACE - ARRA <sup>(3)</sup>	\$ 86,796					\$ 86,796
US - National Park Service	\$ 5,198	\$ 5,150	\$ 5,101	\$ 4,854	\$ 5,130	\$ 25,433
US - FWS	\$ 3,251	\$ 3,251	\$ 3,246	\$ 3,029	\$ 3,246	\$ 16,023
<b>Federal Sub Total</b>	<b>\$ 215,211</b>	<b>\$ 125,926</b>	<b>\$ 66,233</b>	<b>\$ 83,785</b>	<b>\$ 43,593</b>	<b>\$ 534,748</b>
<b>STATE</b>	<b>FY10</b>	<b>FY11</b>	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>	<b>5-Yr Total</b>
SFWMD	\$ 106,296	\$ 227,063	\$ 52,664	\$ 66,537	\$ 56,117	\$ 508,678
FL Department of Environmental Protection	\$ 48,590	\$ 51,809	\$ 31,006	\$ 28,528	\$ 73,165	\$ 233,098
FL Fish and Wildlife Conservation Commission	\$ 2,723	\$ 1,497	\$ 1,640	\$ 1,188	\$ 2,002	\$ 9,050
<b>State Sub Total</b>	<b>\$ 157,609</b>	<b>\$ 280,369</b>	<b>\$ 85,311</b>	<b>\$ 96,253</b>	<b>\$ 131,284</b>	<b>\$ 750,825</b>
<b>TOTAL FUNDING</b>	<b>\$ 372,820</b>	<b>\$ 406,295</b>	<b>\$ 151,544</b>	<b>\$ 180,038</b>	<b>\$ 174,877</b>	<b>\$ 1,285,573</b>

Notes: (1) Actual funds allocated to date, but not necessarily expended.

(2) USACE CERP activities are funded under the overall Central and Southern Florida Project.

(3) USACE Everglades projects funded through the American Recovery and Reinvestment Act of 2009.

## 2.4.2 Expenditures through Fiscal Year 2014

Federal sponsor (USACE) and local sponsor creditable expenditures for CERP implementation through the end of Fiscal Year 2014, as shown in **Table 6**, total approximately \$937.7 million for the USACE and \$1.054 billion for the SFWMD. The inclusion of work-in-kind credit from the primary non-federal sponsor normally lags in the reporting process as the SFWMD must compile the data and submit it to the USACE who then must verify and validate the information submitted.

**TABLE 6: CERP CUMULATIVE EXPENDITURES THROUGH FISCAL YEAR 2014** <sup>(1)</sup>  
(in thousands)

	USACE	SFWMD <sup>(2)</sup>	TOTAL
<b>Projects<sup>(3)</sup></b>	\$ 631,880	\$ 816,051	\$ 1,447,931
Adaptive Assessment & Monitoring	\$ 64,105	\$ 44,941	\$ 109,046
Program Coordination	\$ 241,704	\$ 183,580	\$ 425,284
Estimated Work-in-Kind, not yet submitted <sup>(4)</sup>	-	\$ 9,037	\$ 9,037
<b>Total</b>	\$ 937,688	\$ 1,053,609	\$ 1,991,297
<b>Cost Sharing Percentage (%)</b>	<b>47%</b>	<b>53%</b>	<b>100%</b>
Note: (1) Actual expenditures, which is not the same as funds allocated. (2) Includes cumulative and creditable (approved) SFWMD submissions through FY12. (3) Projects total also includes Feasibility Studies and Pilots. (4) An estimate of the submissions expected from the SFWMD for FY13 and FY14.			

As noted above in **Table 6**, the costs include program coordination and adaptive assessment and monitoring. Program coordination includes providing strategic direction for the sequence of project implementation, resource allocation, and goals against which progress of the restoration is measured, and the feedback processes to identify and address any shortfalls in progress. In addition, program coordination also includes CERP projects, which are managed at the programmatic level due to their interface with all of the projects: Master Recreation Plan, Public Outreach, Interagency Modeling Center, Information and Data Management, Quality Assurance Oversight Team, and Environmental and Economic Equity.

### 2.4.3 Cost Estimate Update

The original estimated cost of CERP was based on the best available information at the time. Appropriate contingency factors were used to reflect the uncertainties inherent at that stage of the program. The cost risk associated with each feature was appraised separately and, due to the lack of design information, was generic rather than site specific. It was anticipated that the cost of the CERP would be modified as pilot projects and individual PIRs were completed.

The current cost estimates reported in the Report to Congress are estimates based on present day value and not inflated thru the mid-point of construction (Fully Funded Cost). The Report to Congress cost estimates have consistently been reported at present day value and will continue to be reported as such in order to appropriately compare the updated cost estimates over time.

The cost estimate increase of \$3 billion (**Table 7**) is due to price level (inflation) adjustment from October 2009 to October 2014, changes in project scope and schedule, and new project authorizations. Updated cost estimates are also available by project in **Table 8**.

TABLE 7: CERP COST ESTIMATE UPDATE

	Summary (in millions) *	
	Oct 10 Price Level	Oct 14 Price Level
<b>Projects</b>	\$ 12,303	\$ 15,514
<b>AA&amp;M</b>	\$ 579	\$ 157
<b>Program Coordination</b>	\$ 578	\$ 737
<b>TOTAL</b>	\$ 13,460	\$ 16,408

\*In current dollars.

TABLE 8: UPDATED COST ESTIMATES BY CERP PROJECT

*Changes in Cost Estimates*

*(Costs in \$1,000 and Project Component Alignment per CERP Guidance Memorandum 002.03)*

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
1	A, W, OPE	Lake Okeechobee Watershed	661,524	759,216	97,692	97,692	0	
4a	D_P1	Caloosahatche River (C-43) West Basin Storage Reservoir	570,484	591,902	21,418	57,525	(36,107)	Updated with actual authorized cost per WRRDA 2014.
4 b		Caloosahatche Watershed	262	287	25	25	0	
5	D_P2	C-43 Basin Aquifer Storage and Recovery	304,185	330,259	26,074	26,074	0	
33	PILOT	C-43 Aquifer Storage and Recovery PILOT	8,723	3,256	(5,467)	0	(5,467)	Project complete. Actual cost to complete less than estimated cost.
6	DDD	Caloosahatche Back-pumping with Stormwater Treatment	114,640	124,871	10,231	10,231	0	

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
7	B, UU	Indian River Lagoon - South	1,694,302	2,999,962	1,305,660	107,500	1,198,160	Increase in cost based upon current certified cost and scope.
8	G_P1	Everglades Agricultural Area Storage Reservoir	596,439	57,670	(538,769)	39,978	(578,747)	Current cost estimate reflects project sunk cost. Components G_P1 and G_P2 have been incorporated into CEPP. The current CEPP cost includes these components.
9	G_P2							
10	CCC	Big Cypress - L-28 Interceptor Modifications	59,098	64,370	5,272	5,272	0	
11	RR	Flows To NW & Central WCA 3A	41,259	32,844	(8,415)	78	(8,493)	Component II formally a component in the project has been moved to CEPP. The current CEPP

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
								cost includes component II.
23	EEE	Flows to Eastern Water Conservation Area	9,127	9,906	779	779	0	
48	YY	WCA 2B Flows to Everglades National Park	109,554	119,307	9,753	9,753	0	
12 a	SS	WCA 3 Decompartmen talization and Sheetflow Enhancement - Part 1	145,803	129,162	(16,641)	9,488	(26,129)	Component QQ_P1 formally a component in the project has been moved to CEPP. The current CEPP cost includes component QQ_P1.
12 b	QQ_P2, AA	WCA 3 Decompartmen talization and Sheetflow Enhancement - Part 2	107,811	0	(107,811)	7,735	(115,546)	Component QQ_P2 and AA formally components in the project has been moved to CEPP. The current CEPP cost includes

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
								components AA and QQ_P2.
12 c	QQ_P3 (prev. QP2)	WCA 3 Decompartmentalization and Sheetflow Enhancement - Part 3	39,824	0	(39,824)	2,915	(42,739)	Component QQ_P3 formally a component in the project has been moved to CEPP. The current CEPP cost includes component QQ_P3.
	ZZ		1,112	1,219	107	107	0	
14	KK	Loxahatchee National Wildlife Refuge Internal Canal Structures	10,323	11,209	886	886	0	
15	DD	Modify Holey Land Wildlife Mgt. Area Operation Plan	0	0	0	0	0	
16	EE	Modify Rotenberger Wildlife Mgt. Area Operation Plan	0	0	0	0	0	

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
17	K_P1, GGG, X, Y, OPE	Loxahatchee River Watershed Restoration Project	615,714	682,472	66,758	66,758	0	
18	LL, K_P2	Loxahatchee River Watershed Restoration Aquifer Storage and Recovery	233,009	253,237	20,228	20,228	0	
20	V V_P1	PBC Agriculture Reserve Reservoir	124,765	137,437	12,672	12,672	0	
21	V V_P2	PBC Agriculture Reserve Aquifer Storage & Recovery	56,542	61,413	4,871	4,871	0	
3	GG	Lake Okeechobee Aquifer Storage & Recovery	1,432,270	1,556,247	123,977	123,977	0	
32	PILOT	Lake Okeechobee ASR PILOT	44,657	31,205	(13,452)	541	(13,993)	Project complete. Actual cost less than estimated cost.
34	PILOT	Hillsboro ASR PILOT						

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
40	M_P1	Site 1 Impoundment	128,350	274,930	146,580	8,288	138,292	Increase in cost based upon current certified cost and scope.
22	M_P2	Hillsboro Aquifer Storage and Recovery	119,091	129,185	10,094	10,094	0	
24	CC	Broward Co. Secondary Canal System	17,777	19,352	1,575	1,575	0	
43	U	Everglades National Park Seepage Management	485,662	242,229	(243,433)	34,701	(278,134)	Component FF and V formally components in the project has been moved to CEPP. The current CEPP cost includes components FF and V.
27	BB							
49	XX_P1	WPA Conveyance	357,714	390,726	33,012	33,012	0	
25	XX_P2	North Lake Belt Storage Area	357,436	390,443	33,007	33,007	0	
35	PILOT	Lake Belt In-Ground	29,715	32,005	2,290	2,290	0	

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
		Reservoir Technology PILOT						
36	PILOT	L-31 N (L-30) Seepage Management PILOT	17,146	16,336	(810)	412	(1,222)	Decrease in scope.
28	FFF / OPE	Biscayne Bay Coastal Wetlands	457,627	206,253	(251,374)	17,253	(268,627)	Updated with actual authorized cost per WRRDA 2014.
29	WW	C-111 Spreader Canal	137,234	203,190	65,956	15,313	50,643	Updated with actual authorized cost per WRRDA 2014.
30	OPE	Picayune Strand Restoration	458,525	617,762	159,237	5,824	153,413	Cost increases due to post-Katrina lessons learned and other design changes.
31	OPE	Florida Keys Tidal Restoration	1,427	2,410	983	983	0	

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
38	OPE	Acme Basin B Discharge	24,241	0	(24,241)	0	(24,241)	State completed project in March of 2010, outside of CERP.
39	OPE	Strazzulla Wetlands	67,390	0	(67,390)	0	(67,390)	This project is no longer being pursued under CERP.
45	R, Q, O	Broward County Water Preserve Areas (WPAs)	485,543	880,958	395,415	68,923	326,492	Updated with actual authorized cost per WRRDA 2014.
46	T	C-4 Control Structures	3,190	3,467	277	277	0	
90	OPE	Miccosukee Tribe Water Management Plan	33,207	36,099	2,892	2,892	0	
91	OPE	Winsberg Farm Wetlands Restoration	16,736	0	(16,736)	0	(16,736)	Project closed out in 2009 at request of sponsor.
92	OPE	Restoration Of Pineland &	802	871	69	69	0	

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
		Hardwood Hammocks in C-111 Basin						
93	OPE	Henderson Creek - Belle Meade Restoration	5,622	7,265	1,643	1,643	0	
94	OPE	Lakes Park Restoration	6,567	0	(6,567)	0	(6,567)	Sponsor requested to close out this project and not pursue under CERP.
95	OPE	Melaleuca Eradication And Other Exotic Plants	3,718	4,817	1,099	9	1,090	Project completed in 2014.
96	OPE	Seminole Tribe Big Cypress Reservation Water Conservation Plan	102,344	111,272	8,928	8,928	0	
97	HHH	West Miami-Dade Reuse	592,046	643,420	51,374	51,374	0	
98	BBB	South Miami-Dade Reuse	492,183	534,965	42,782	42,782	0	
37	PILOT	Wastewater Reuse	37,049	40,052	3,003	3,003	0	

WBS Project #	CERP Component	Project Name	2010 Report to Congress (1 Oct 09 Price Levels)	Current Cost Estimate (1 Oct 14 Price Levels)	Difference	Difference Due to Inflation	Difference Due to Scope Changes, Authorization, Movement of Components	Comment
		Technology PILOT						
	OPE	Southern CREW	53,533	59,138	5,605	5,605	0	
	OPE	Lake Trafford Restoration	20,821	22,623	1,802	1,802	0	
	FEAS	Southwest Florida Feasibility Studies	18,000	18,000	0			
	FEAS	Florida Bay Florida Keys Feasibility Study	6,500	6,500	0			
	FEAS	Comprehensive Integrated Water Quality Plan	8,100	8,100	0			
44		Aquifer Storage and Recovery Regional Study	85,806	25,141	(60,665)	2,153	(62,818)	
51	QQ, II, G, V, AA, FF	Central Everglades Planning Project (CEPP)	0	1,874,972	1,874,972	0	1,874,972	Project combines components QQ, II, G, V AA, FF.
		<b>TOTALS</b>	<b>12,303,970</b>	<b>15,513,772</b>	<b>3,209,802</b>	<b>1,019,696</b>	<b>2,190,106</b>	

(1) Adaptive Assessment and Monitoring (AA&M) and Program Level Activities (PLA) costs are not reflected in this table.

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### 3. PARTNERS IN RESTORATION

#### 3.1 THE SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE

The intergovernmental Task Force is the only forum that provides strategic coordination and a system-wide perspective to coordinate the separate restoration efforts being planned and implemented in south Florida. The duties of the Task Force, as prescribed in WRDA 1996 (U.S. Congress 1996), include the following:

- Coordinate the development of consistent policies, strategies, plans, programs, projects, activities, and priorities addressing the restoration, preservation, and protection of the South Florida Ecosystem;
- Exchange information regarding programs, projects and activities of the agencies and entities represented on the Task Force to promote ecosystem restoration and preservation;
- Facilitate the resolution of interagency and intergovernmental conflicts associated with the restoration of the South Florida Ecosystem among the agencies and entities represented on the Task Force;
- Coordinate scientific and other research associated with the restoration of the South Florida Ecosystem; and
- Provide assistance and support to agencies and entities represented on the Task Force in their restoration activities.

Four sovereign entities (federal, state, and two tribes) are represented on the Task Force. Fourteen members sit on the Task Force itself, representing seven federal departments, three state agencies/offices, two American Indian tribes, and two local governments. The Florida-based Working Group and the SCG have been established to assist the Task Force with its responsibilities. Their members include additional federal, state, and local agencies. The Task Force and Working Group establish regional and issue-based teams as needed to address pressing or area-based restoration concerns. Currently, the SFWMD's Water Resources Advisory Commission (WRAC) also serves as an advisory body to the Task Force.

This reporting period witnessed the development and utilization of an innovative stakeholder engagement approach. The Task Force kicked off an intensive public involvement process for the expedited planning process of the CEPP at the end of 2011 and it quickly became the dominant element of restoration planning between 2012 and 2014. The public was afforded more opportunities to provide meaningful input into the planning process than ever before and as a result, the CEPP earned unprecedented levels of public and stakeholder support. The National Research Council called the CEPP public process "exemplary" and recommended that it "serve as a model for future planning processes (NRC 2014). The stakeholder workshop model is also being utilized for the 2015 update of IDS.

On July 9, 2013, the Task Force directed its Working Group and SCG to develop the *Invasive Exotic Species Strategic Action Framework* for addressing the serious threats to the Everglades posed by invasive exotic plant and animal species (SFERTF 2014). The framework was developed by an extensive and diverse set of partners including members of the Task Force, Working Group, SCG, Everglades Cooperative Invasive Species Management Area (ECISMA), and the USDO's Office of Everglades Restoration Initiatives. The Framework seeks to help decision-makers understand the connections between goals, strategies, and tactics; maximize the extent to which the current capacity for partnership

is leveraged to meet common goals; help decision-makers make wise and timely investment decisions in the battle against invasive exotics; and define success and provide for accountability. Currently, efforts are focused on the establishment of an EDRR system for the Everglades ecosystem.

The Task Force meets at least semi-annually to review the overall progress of the restoration effort and perform the duties noted above. They also provide direction to the Working Group and SCG at these meetings as well as hear important updates and consultation presentations from the Corps and CERP local sponsors.

### **3.2 PUBLIC PARTICIPATION AND STAKEHOLDER ENGAGEMENT**

Public outreach is a vital part of CERP used to educate and inform stakeholders on restoration progress, while also providing a mechanism for meaningful public participation during the restoration process. The CERP planning process requires robust public participation to ensure stakeholder involvement, understanding, and support. For the CEPP alone, 74 public engagements were conducted within 29 months during this reporting period.

All public meetings and corresponding materials are widely distributed. In addition to announcing meetings through paid advertisement, news releases to numerous media outlets, social media posts, and CERP e-notices, this information is also provided to local counties and Chambers of Commerce to ensure residents in each meeting area are afforded the opportunity to attend.

All project and program information is posted online and accessible to any and all interested parties. The Web page, along with distributed materials, has points of contact listed for accessing additional information by either phone or e-mail. Additionally, in the scoping notices and paid advertisements for public meetings, a phone number is provided for anyone requiring special assistance to attend the meetings.

The USACE, SFWMD, and Task Force have developed and implemented a wide array of creative and effective outreach programs and products, at both the program and the individual project level, for a variety of audiences. The following is a description of the major restoration forums.

#### **CERP Project Delivery Team (PDT) Meetings**

PDT meetings enable federal, state, and local agencies, and tribal governments to provide input into CERP planning efforts. Specifically, the PDT develops a project management plan (PMP) to outline the scope, activities, schedule, cost estimates, and agency responsibilities for each project. After the completion and approval of the PMP by the USACE and SFWMD, the team prepares the planning document (PIR) for each project. These forums are open to the public and advertised through CERP e-notice distribution lists, web page updates, and social media. Meeting materials are also provided online for public access.

#### **Task Force Meetings and Stakeholder Workshops**

One of the primary duties of the Task Force is to consult with, and provide recommendations to, the Secretary of the Army and the non-federal sponsor of CERP projects. CERP's Programmatic Regulations (33 CFR Part 385) stipulate the Task Force be afforded an opportunity to provide recommendations on CERP projects and plans. Accordingly, status reports are provided to the Task Force, Working Group, and SCG, and consultation is sought on CERP plans, reports, and other efforts. In addition to regular

meetings, stakeholder workshops sponsored by the Working Group and SCG provide the public more opportunities to provide meaningful input. During the reporting period, 3 stakeholder workshops were held on the 2015 update of the IDS and 16 were conducted during the expedited planning process for the CEPP. Task Force, Working Group, and SCG meetings and stakeholder workshops are open to the public and live webcasts are provided whenever possible. During the reporting period, the Task Force met 11 times and the Working Group and SCG met jointly 16 times. Additionally, the Biscayne Bay Regional Restoration Coordination Team meets monthly to provide information to stakeholders and report stakeholder issues back to the Working Group. During this period, there were minimal to no direct engagements with socially and economically disadvantaged individuals and/or individuals with limited English proficiency. Decreases in public outreach funding has impacted efforts to engage socially and economically disadvantaged individuals and/or individuals with limited English proficiency. All public engagements were open to all members of the public, and publications were available in English in electronically and hardcopies forms.

### **SFWMD Governing Board and Water Resources Advisory Commission**

The SFWMD is directed by nine Governing Board members, appointed by the Governor and confirmed by the Florida Senate, who set policy for the agency. The SFWMD's WRAC is an advisory body to the SFWMD Governing Board and the Task Force. It is a forum for improving public participation and decision-making about water resource issues in the south Florida ecosystem. Members are appointed to the WRAC by the SFWMD Governing Board and represent a broad range of business, agricultural, environmental, tribal, governmental, and public interests. Governing Board and WRAC meetings and workshops are open to the public.

### **National Environmental Policy Act**

In accordance with the National Environmental Policy Act (NEPA), public comment periods and public meetings are also conducted as part of USACE's planning efforts for scoping, presenting the final array of alternatives, and draft report. In addition to standard notification through e-notice distribution lists, web page updates, and social media, public meetings and public comment periods are also announced through news release and published in the Federal Register. Materials are provided online for public access.

### **RECOVER**

RECOVER provides essential support to the CERP in meeting its goals and purposes by applying a system-wide perspective to CERP planning and implementation. Led by the RECOVER Leadership Group consisting of ten agencies and two tribes, this multi-agency team of scientists, modelers, planners, and resource specialists organize and apply scientific and technical information in ways that are most effective in supporting the objectives of CERP. The RECOVER team conducts scientific and technical evaluations and assessments for improving CERP's ability to restore, preserve, and protect the south Florida ecosystem while providing for the region's other water-related needs. RECOVER communicates and coordinates the results of these evaluations and assessments to managers, decision makers, and the public

### **3.3 COORDINATION WITH TRIBAL GOVERNMENTS**

The USACE cultural resources team consults annually with the Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida on upcoming projects and expected issues, and meets with both tribes frequently throughout the year to coordinate on cultural resource issues.

The USACE and the Seminole Tribe of Florida have signed a Burial Resources Agreement which is a mutually agreed upon framework that will serve as the basis for consultation regarding the presence of burial resources within the Jacksonville District's area of action and jurisdiction for the Civil Works and Regulatory Programs. In this Agreement, the USACE, in consultation with the Seminole Tribe, will develop adaptive management plans to address uncertainty in the event of a proposed action on burial resources. It also establishes procedures that will ensure culturally sensitive treatment of burial resources pursuant to the USACE's Trust Responsibility. These procedures involve the early identification of burial resources and the processes for treatment of burial resources. The USACE will, in a timely manner, implement a concise and transparent Three-Step Process for each activity that it determines, through consultation with the Seminole Tribe, may impact burial resources. As part of the Three-Step Process, the USACE will develop by memoranda for the record (MFR), in coordination with the Seminole Tribe and other appropriate consulting parties, methods for locating burial resources, the treatment alternatives for man-induced impacts (avoidance, relocation, or mitigation), and a proposed consultation schedule. Each incident will be treated on a case-by-case basis. This Burial Resources Agreement is a benchmark of a growing, positive relationship with the Seminole Tribe of Florida. By recognizing the unique Government-to-Government relationship between the U.S. Government and American Indian Tribes, the USACE will continue to give special consideration to the Tribes' environmental and cultural resources. Pursuant to the Trust Responsibility, the USACE will work collaboratively with the Seminole Tribe of Florida through open and timely communication regarding the location and treatment of burial resources within the USACE's area of action and jurisdiction for the Civil Works and Regulatory Programs.

The Seminole Tribe expressed concerns regarding water resources for the Big Cypress Reservation and surrounding natural and conservation lands. In response, the Task Force convened an inter-agency working group in 2013. The group conducted a review of existing information on water resources in the Western Basins and identified data gaps. During the reporting period, the Seminole Tribe completed a groundwater/surface water interaction study, began LIDAR and potentiometric mapping on the Big Cypress Reservation, and began developing ecological indicator targets. In addition, in compliance with the National Environmental Policy Act, the Corps, in coordination with the Seminole Tribe, the SFWMD, and the Bureau of Indian Affairs, are in the process of developing an Environmental Assessment to consider modifications to S-190 operations. This assessment was undertaken in response to the Tribe's request that the S-190 regulation schedule provide for the original, authorized purpose of prevention of over-drainage of the Big Cypress Reservation.

### **3.4 INDEPENDENT SCIENTIFIC REVIEW**

In its 2010 report, the CISRERP noted improvements since their 2008 report in restoration pace, federal and state partner relationships, and research efforts. Four CERP projects were under construction and pilot projects were addressing design and construction concerns. They noted the pace of federal funding

had increased and praised the federal government for initiating construction of the 1-Mile Tamiami Trail Bridge Project, a linchpin in the larger restoration effort. Despite the advances, the committee noted only sparse natural system restoration benefits had resulted to date. Thus, the committee suggested increasing the pace of the CERP, if possible. The committee stated that if restoration progress continues, substantial ecological benefits to the ecosystem will increase. They noted the daunting water quality and quantity challenges facing Everglades restoration and supported the SFWMD's initiative to purchase 26,800 acres of land for additional water storage and treatment. The committee also recognized that "getting the water right" is a formidable task that requires coordinated partnering and improved research on tradeoffs throughout the ecosystem.

In the 2012 report, CISRERP noted that the pace of ecosystem restoration had improved but the focus had been on the periphery of the remnant Everglades. They acknowledged although substantial progress had been made to reduce phosphorus, minimal progress had been made to restore hydrology. They acknowledged the declines of hydrology-dependent features (e.g., tree islands, peat, ridge and slough, and snail kites) will take long timeframes to recover. They stated declines will continue until both hydrology and water quality improvements can be addressed. In particular, production of restoration benefits within the WCAs and Everglades National Park continue to lag behind, but the committee noted that the CEPP is a step in the right direction. The committee reported notable progress had been made in the construction of Everglades restoration projects since their 2010 report. Significant accomplishments included Restoration Strategies to improve water quality and the CEPP as a means to expedite restoration benefits to the remnant Everglades. Regarding funding and authorization issues, the report noted declines in state funding had shifted responsibility for implementation progress to the federal government. The state has vastly outspent the federal government, so an increased level of federal funding will be necessary to maintain the pace of restoration progress. They noted the last WRDA was passed in 2007 and the lack of project authorizations could soon become a major impediment to restoration progress. In regards to science, the committee stated effective assessment of restoration progress will depend on monitoring to establish pre-project trends, followed by similar data to determine the ecological changes that can be ascribed to the project, and a comprehensive assessment of monitoring efforts is needed.

In the 2014 report, CISRERP recognized the CEPP efforts were responsive to prior recommendations to expedite restoration in the central Everglades. It was noted that CERP progress has been impeded by limited funding and infrequency of WRDA authorizations. The committee suggested CERP planners revisit the IDS to advance projects with the greatest potential to avert ongoing ecosystem degradation and those that promise the largest restoration benefits. While restoration progress by CERP projects to date remains modest, it was noted that STA performance shows signs of improvement and climate change provides a strong incentive for accelerating restoration. It was recommended CERP planners consider implications of sea-level rise and potential hydrologic change in system-wide planning and project prioritization by designing for flexibility in anticipation of future changes in temperature, precipitation, and sea-level rise. It was also recommended high priority be given to research needs related to climate change and Everglades restoration. Regarding invasive nonnative species, the committee noted excellent progress in operational coordination of the management of invasive species but suggested strategic coordination is needed to develop a comprehensive view of all nonnative species along with an EDRR system that addresses all parts of the greater Everglades. A system-wide mechanism for prioritizing research on and management of invasive species was recommended along

with long-term monitoring and research needed to understand the potential impacts of climate change on Everglades nonnative species management. On the topic of science and decision making, the committee stated that stable funding is needed for useful long-term system-wide monitoring, a comprehensive reevaluation of restoration-related monitoring is needed to determine its adequacy, and renewed attention to science coordination is warranted.

#### 4. THE NEXT FIVE YEARS

The next CERP Five Year Report will reflect implementation of the planning achievements and construction authorizations realized during this reporting cycle. Completion of Generation 1 and Generation 2 projects currently underway will be complemented by the work beginning on additional projects, including the CEPP. Completion of Foundation Projects, such as the Modified Water Deliveries to Everglades National Park, C-111 South Dade, and Kissimmee River Restoration projects, will provide significant hydrological and ecological benefits to the south Florida ecosystem. Table 9 summarizes the progress anticipated during the next reporting period. Further details are available in the 2015 update of the Integrated Delivery Schedule, which is available at [www.evergladesrestoration.gov](http://www.evergladesrestoration.gov).

TABLE 9: ANTICIPATED PROGRESS, 2015-2020

ANTICIPATED CONSTRUCTION COMPLETIONS
C&SF: C-111 South Dade, Contracts 8 and 9
C&SF: West Palm Beach Canal STA-1 East/C-51 West
C&SF: CERP: Biscayne Bay Coastal Wetlands Phase 1, L-31 East Flow-way
C&SF: CERP: Caloosahatchee River (C-43) West Basin Storage, Pump Station, and Cell 1
C&SF: CERP: Indian River Lagoon-South, C-44 Reservoir and C-44 STA and Pump Station
C&SF: CERP: Picayune Strand
C&SF: CERP: Site 1 Impoundment, Phase 1
E&SF: Seminole Tribe Big Cypress Reservation Water Conservation Plan
Kissimmee River Restoration
Modified Water Deliveries to Everglades National Park: Final Water Control Plan for Modified Water Deliveries and C-111 South Dade projects
Restoration Strategies: L-8 FEB, S-375 Structure Expansion, S-5AS Divide Structure, L-8 Divide Structure
Tamiami Trail Next Steps, Phase 1 (2.6 mile bridge)
ANTICIPATED CONSTRUCTION UNDERWAY
C&SF: CERP: Biscayne Bay Coastal Wetlands Phase 1, Cutler Wetlands
C&SF: CERP: Broward County Water Preserve Areas, C-11 Impoundment and WCA-3A/3B Seepage Management Area
C&SF: CERP: Caloosahatchee River (C-43) West Basin, Cell 2
C&SF: CERP: Central Everglades Planning Project, South
C&SF: CERP: Indian River Lagoon-South, C-23/24 Reservoir and Pump Station
Herbert Hoover Dike
Restoration Strategies: STA-1W Expansion #1
ANTICIPATED PLANNING EFFORT COMPLETIONS
C&SF: CERP: Lake Okeechobee Watershed Project
C&SF: CERP: Loxahatchee River Watershed Restoration Project
C&SF: CERP: Western Everglades Restoration Project [Big Cypress/L-28 Interceptor]
ANTICIPATED PPAs
C&SF: CERP: Biscayne Bay Coastal Wetlands – Phase 1
C&SF: CERP: Broward County Water Preserve Areas
C&SF: CERP: C-111 Spreader Canal, Western
C&SF: CERP: Caloosahatchee River (C-43) West Basin Storage Reservoir
C&SF: CERP: Central Everglades Planning Project

## Anticipated Science Program Efforts

TABLE 10: RECOVER'S ANTICIPATED EFFORTS, 2015-2020

RECOVER MISSION AREA/PROGRAM	ANTICIPATED EFFORTS
<p><b>Adaptive Management Program</b></p>	<ul style="list-style-type: none"> <li>▪ Update the <i>2015 CERP Programmatic Adaptive Management Plan</i> (RECOVER 2015) every 3 to 5 years to incorporate new findings and inform project implementation schedules, and operations.</li> <li>▪ Assist with the development of project-specific Adaptive Management (AM) plans as required by the USACE.</li> </ul>
<p><b>Adaptive Assessment and Monitoring Program</b></p>	<ul style="list-style-type: none"> <li>▪ Provide system-wide monitoring and produce System Status Reports in 2019 to report CERP's performance.</li> <li>▪ Adjust monitoring programs and protocol to meet CERP project implementation and scientific needs particularly in light of climate change and exotic species issues.</li> <li>▪ Coordinate project-specific monitoring plans with existing system-wide monitoring</li> <li>▪ Improve information-exchange between scientists and managers and coordination among all south Florida scientific and restoration efforts.</li> </ul>
<p><b>Evaluation and Planning</b></p>	<ul style="list-style-type: none"> <li>▪ Complete ecological models, hypotheses, performance measures, and interim and long-term goals currently underway.</li> <li>▪ Provide scientific input for project sequencing contained in the IDS.</li> <li>▪ Incorporate new guidance related to climate change into ecological planning tools and integrate applicable information into short- and long-term plans.</li> </ul>

## Looking Forward

In summary, the next five years provide an opportunity to build upon substantial recent progress. Great strides toward “getting the water right” will be made during the next reporting period: five Foundation Projects will be completed; half a dozen CERP projects will be simultaneously under construction, and planning and design will be underway for the next generation of CERP projects. Timely authorizations and funding are critical to continuing progress toward restoration of the historic River of Grass, known as America’s Everglades.

**TAB A: LIST OF ACRONYMS**

AA&M	Adaptive assessment and monitoring
ASR	Aquifer Storage and Recovery
C&SF	Central and Southern Florida
CEPP	Central Everglades Planning Project
CERP	Comprehensive Everglades Restoration Plan
CISRERP	Committee on Independent Scientific Review of Everglades Restoration Progress
DECOMP	Decomartmentalization and Sheetflow Enhancement
E&SF	Eastern and Southern Florida
EAA	Everglades Agricultural Area
ECISMA	Everglades Cooperative Invasive Species Management Area
EDEN	Everglades Depth Estimation Network
EDRR	Early detection and rapid response
ENP	Everglades National Park
ERTP	Everglades Restoration Transition Plan
FDEP	Florida Department of Environmental Protection
FEB	Flow equalization basin
FDOT	Florida Department of Environmental Protection
Framework	Invasive Exotic Species Strategic Action Framework
FY	Fiscal Year
IDS	Integrated Delivery Schedule
LRR	Limited Reevaluation Report
MAP	Monitoring and Assessment Plan
MFR	Memoranda for the record
Mod Waters	Modified Water Deliveries to Everglades National Park
NEPA	National Environmental Policy Act
NPS	National Park Service
NRC	National Research Council

OMRR&R	Operations, Maintenance, Repair, Replacement & Rehabilitation
PA	Programmatic Agreement
PDT	Project Delivery Team
PIR	Project Implementation Report
PLA	Project level activities
PMP	Program management plan
PPA	Project Partnership Agreement
RECOVER	REstoration COordination & VERification
REMAP	Regional Environmental Monitoring and Assessment Program
SAV	Submerged Aquatic Vegetation
SCG	Science Coordination Group
SEACOM	Florida Bay Seagrass Community Model
SFWMD	South Florida Water Management District
SFWMM	South Florida Water Management Model
SSR	System Status Report
STA	Stormwater treatment area
Task Force	South Florida Ecosystem Restoration Task Force
TIGER	Transportation Investment Generating Economic Recovery
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOJ	U.S. Department of the Interior
USEPA	U.S. Environmental Protection Agency
WCA	Water Conservation Area
WRDA	Water Resources Development Act
WRRDA	Water Resources Reform and Development Act
WRAC	Water Resources Advisory Commission

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Central and Southern Florida Project  
Comprehensive Everglades Restoration Plan  
2015 Report to Congress

Government Entities Involved in Everglades Restoration

Federal

Executive Office of the President  
Executive Office of the President, Council on Environmental Quality  
U.S. Department of Agriculture, Natural Resources Conservation Service  
U.S. Department of Army, Corps of Engineers  
U.S. Department of Commerce, National Oceanic and Atmospheric Administration  
U.S. Department of Interior: Bureau of Indian Affairs;  
Fish and Wildlife Service; Geological Survey; National Park Service; and  
Office of the South Florida Ecosystem Restoration Task Force  
U.S. Department of Justice  
U.S. Department of Transportation, Office of Safety, Energy and Environment  
U.S. Environmental Protection Agency

Tribal

Miccosukee Tribe of Indians of Florida  
Seminole Tribe of Florida

State

Executive Office of the Governor  
Florida Department of Agriculture: Division of Forestry; and Institute for Agricultural Studies  
Florida Department of Community Affairs  
Florida Department of Environmental Protection  
Florida Department of Health  
Florida Department of Transportation  
Florida Fish and Wildlife Conservation Commission  
South Florida Water Management District  
South Florida Water Management District, Water Resources Advisor Commission  
Southwest Florida Water Management District  
St. Johns River Water Management District

Local Counties

Broward, Charlotte, Collier, Glades, Hendry, Highland,  
Lee, Martin, Miami-Dade, Monroe, Okeechobee, Orange,  
Osceola, Palm Beach, Polk, St. Lucie



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