



2015 - 2020 MOMENTUM

REPORT TO CONGRESS | COMPREHENSIVE EVERGLADES RESTORATION PLAN
Central and Southern Florida Project

THE 2015 – 2020 REPORT TO CONGRESS

details the momentum that has sprung from previous years of Everglades restoration efforts – that will in turn, set the initial pace for further restoration progress in 2020 and beyond. The report is structured to mirror the multi-faceted aspects of the restoration program, and to highlight the collaboration of the many partners, team members, and stakeholders so vital to restoration success and its current and future momentum.

Cover Images:

Front: Tricolored Heron

Back: Record Bird Colonies at the Broad River

Photo Credits: Mark Cook,
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, 2015, and June 30, 2020.

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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**Determination letter by
U.S. Department of the Army**

**Determination letter by
U.S. Department of the Interior**

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**Determination letter by
U.S. Environmental Protection Agency**

Letter of Support by
Florida Department of Environmental Protection
and
South Florida Water Management District
For the
State of Florida

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EXECUTIVE SUMMARY

The South Florida ecosystem, known as America’s Everglades, is both nationally significant and unique in the world. The Comprehensive Everglades Restoration Plan will restore, protect, and preserve a natural resource treasure – the South Florida ecosystem.

The *2020 Report to Congress* on the Comprehensive Everglades Restoration Plan (CERP) is the fourth 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, 2015 - June 30, 2020).

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 Miccosukee Tribe of Indians of Florida; the Seminole Tribe of Florida; the State of Florida, including the Florida Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD); other federal, state, and local agencies; and the South Florida Ecosystem Restoration (SFER) Task Force.

Building on Historic Momentum

The one word that characterizes Everglades restoration during the July 1, 2015 to June 30, 2020 time-period covered by this report is ***momentum***. 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, illustrated in **Figure ES-1** and **Figure ES-2**.

Successful Partnership

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

Approximately \$1.3 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.

CERP cumulative expenditures through fiscal year 2019 total \$3.23 billion.

The updated cost estimate for CERP is \$23.158 billion.

With Support from Congress We Have Accomplished Big Things for America's Everglades and Our Economy

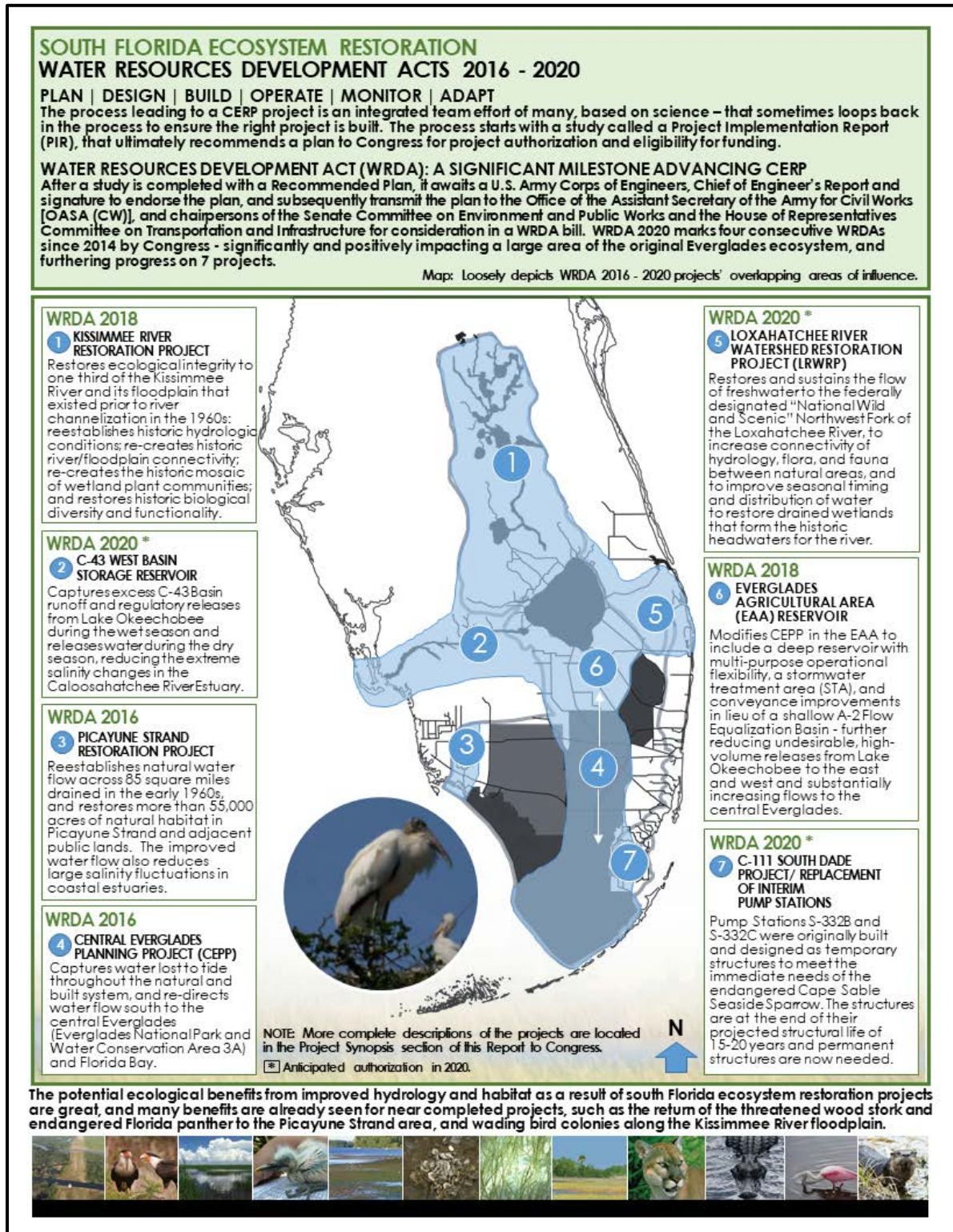




Figure ES-1: Water Resources Development Acts 2016–2020.




MOMENTUM AND THE MILESTONES



The array of efforts and coordination between federal, state and local partners and stakeholders to move Everglades restoration forward is immense – as is the range of expertise required across all phases of the project delivery process. Although “Plan – Design – Build – Operate – Monitor – Adapt” is a simple way to refer to a very integrated and complex process, these milestones do allow us to take a brief pause, whether informally in a status report or formally with a ceremony, to recognize those that have contributed to the current milestone and those who will contribute to the next. Records of these milestones are yet another way to tell a story of restoration coordination and dedication that is making the vision of a healthy Everglades a reality.

NON-CERP MILESTONES	CERP MILESTONES
<p>C-111 SOUTH DADE (C-111 SD)</p> <ul style="list-style-type: none"> ▪ All construction contracts completed ▪ Post-Authorization Change Report to replace the existing temporary S-332B and S-332C pump stations with permanent pumps stations and concrete outlets completed ▪ Combined Operations Plan (COP) for C-111 SD and Modified Water Deliveries to Everglades National Park (MWD) recommended plan and water control plan update completed <p>HERBERT HOOVER DIKE (HHD) MAJOR REHABILITATION PROJECT AND DAM SAFETY MODIFICATION STUDY</p> <ul style="list-style-type: none"> ▪ Replacement of 17 water control structures (culverts) ▪ Construction contracts for the remaining 11 culvert replacements awarded ▪ Construction contracts for the remaining 35.2 miles of cutoff wall installation awarded ▪ Initiation, scoping and plan formulation of Lake Okeechobee System Operations Manual (LOSOM), a new Lake schedule/revised water control plan <p>KISSIMMEE RIVER RESTORATION PROJECT</p> <ul style="list-style-type: none"> ▪ Construction completed for: <ul style="list-style-type: none"> - S-65EX1 Structure - River Acres Canal - MacArthur Ditch Backfill - Reach 3 Backfill - Reach 3 North Backfill Repairs ▪ Construction of Reach 2 Backfill awarded ▪ Construction of S-69 Weir and Reach 3 Backfill Repairs awarded <p>LAKESIDE RANCH STORMWATER TREATMENT AREA (STA)</p> <ul style="list-style-type: none"> ▪ Operation of Phase II, southern Stormwater Treatment Area (STA) ▪ Construction of Phase III, S-191A pump station, initiated <p>MODIFIED WATER DELIVERIES TO EVERGLADES NATIONAL PARK (MWD)</p> <ul style="list-style-type: none"> ▪ All construction contracts completed ▪ Operational field testing of S-356 and G-3273 relaxation while incrementally raising the L-29 Canal stage initiated under Increment 1 ▪ Operational Increment 1.1/1.2 implemented ▪ Operational Increment 2 implemented ▪ Combined Operations Plan (COP) for C-111 SD and MWD recommended plan and water control plan update completed <p>RESTORATION STRATEGIES</p> <ul style="list-style-type: none"> ▪ Construction and the Operational, Testing, and Monitoring Phase (OTMP) of A-1 Flow Equalization Basin (FEB) completed ▪ Construction and OTMP of L-8 FEB completed ▪ Modification/construction of three primary conveyance features (S-5AS, L-8 divide structure, and S-375) completed <p>TAMIAMI TRAIL NEXT STEPS PROJECT</p> <ul style="list-style-type: none"> ▪ Construction of 2.6-mile bridge completed <p>TEN MILE CREEK WATER PRESERVE AREA</p> <ul style="list-style-type: none"> ▪ Rehabilitation of reservoir to allow a 4-foot fill ▪ Operations of water preserve area and STA <p>WEST PALM BEACH CANAL STA-1 EAST/C-51 WEST</p> <ul style="list-style-type: none"> ▪ Culvert repairs completed 	<p>BISCAYNE BAY COASTAL WETLANDS, PHASE 1</p> <ul style="list-style-type: none"> ▪ Operation of L-31E Interim Pump for early benefits in coastal wetlands and Biscayne Bay ▪ Installation of all L-31E Flow-way culverts completed ▪ L-31E Contract 4 awarded for L-31E flow-way <p>BROWARD COUNTY WATER PRESERVE AREA</p> <ul style="list-style-type: none"> ▪ Construction of Mitigation Area A Berm completed <p>C-111 SPREADER CANAL WESTERN PROJECT</p> <ul style="list-style-type: none"> ▪ Installation and operation of additional pump capacity at S-199 and S-200 completed ▪ Connection of the C-222 Header Channel to the L-31W Canal (via the G-737 culvert) completed <p>CALOOSAHATCHEE RIVER (C 43) WESTERN BASIN STORAGE RESERVOIR PROJECT</p> <ul style="list-style-type: none"> ▪ Award for S-470 Intake Pump Station Contract ▪ Award for final contract for Embankment and Civil Works ▪ Construction of the S-476 Irrigation Pumping Station completed <p>CERP EVERGLADES AGRICULTURAL AREA PROJECT</p> <ul style="list-style-type: none"> ▪ Design and early construction of the A2 STA initiated ▪ Design of the EAA A-2 Reservoir <p>CENTRAL EVERGLADES PLANNING PROJECT</p> <ul style="list-style-type: none"> ▪ Construction of S-333N spillway (1,150 cfs) completed ▪ Removal of Old Tamiami Trail Road and S-346 initiated ▪ Construction of Contract 1 (S-631, S-633 water control structures, L-67A Spoil Removal, and L-67C Levee Gap) initiated <p>DECOMPARTMENTALIZATION PHYSICAL MODEL (DPM)</p> <ul style="list-style-type: none"> ▪ Years 3 and 4 of Phase I Testing during dry seasons (flow testing) completed ▪ Approval for Phase II year round testing ▪ Years 5, 6, and 7 of Phase II testing completed <p>INDIAN RIVER LAGOON SOUTH, PHASE 1</p> <ul style="list-style-type: none"> ▪ Construction of C-44 STA discharge spillway completed ▪ C-44 STA initial fill initiated ▪ Construction of C-44 Reservoir Pump Station completed ▪ Design for C-23/24 North Reservoir, South Reservoir, and STA <p>PICAYUNE STRAND RESTORATION PROJECT</p> <ul style="list-style-type: none"> ▪ Construction of Faka Union Pump Station completed ▪ Removal of 100 miles of roadways completed ▪ Construction of Miller Pump Station completed ▪ Removal of 65 miles of road and 26 miles of logging trams between Merritt and Faka Union Canals completed ▪ Construction of Manatee Mitigation Feature completed ▪ Construction of East-west canal plugging



Images: Indian River Lagoon, South, Phase 1 Ribbon Cutting Event (activating the pumps at the C-44 Storm Water Treatment Area)

Figure ES-2: Non-CERP and CERP Project Milestones Accomplished in 2015–2020.

Events of Ecological Significance

Over the past five years, several discrete events profoundly impacted the Everglades system. Depicted in **Figure ES-3**, these include the seagrass die-off in Florida Bay, harmful algal blooms in the St. Lucie River and Estuary, and Hurricane Irma’s impact to the whole system.

These are challenges that a healthy and restored ecosystem will be better able to weather in the future and they underscore the need for continued support for current and future CERP projects. In addition, investments in the South Florida Ecosystem Restoration program provide direct and improved flexibility in the operations of the Central and Southern Florida (C&SF) system.

CERP identified 68 components that can contribute significantly to “getting the water right” and restoring the health of the ecosystem. Through a rigorous planning process, the components described in the CERP “Yellow Book” are combined into 50+ implementable projects that become part of the Integrated Delivery Schedule. The components include, among others, storage reservoirs, wetland restoration, stormwater treatment areas (STAs), seepage management, aquifer storage and recover (ASR), waste-water reuse, removing barriers to sheetflow and operational changes.

Restoration activities, including operational components recommended in the CERP, occur within the context of the larger, actively operated C&SF system. The current C&SF project includes 1,000 miles of canals, 720 miles of levees, and several hundred water control structures providing services to south Florida such as water supply, flood protection, water management, preservation of fish and wildlife, navigation, recreation, and prevention of salt water intrusion.

Water managers and scientists at USACE, working in concert with those from partner agencies and tribes, continue to assimilate the latest scientific data from across the South Florida Ecosystem to inform deliberate and transparent decisions. Interagency teams meet and report on-the-ground ecological conditions of Lake Okeechobee, considered the heart of the Central and Southern Florida system, on a weekly and monthly basis through calls and online reporting (<http://w3.saj.usace.army.mil/h2o/reports/StatusDaily.htm> and <https://www.sfwmd.gov/science-data/operational-planning>). Annual summaries of conditions are published by the SFWMD in a scientific, peer reviewed report called the South Florida Environmental Report (<https://www.sfwmd.gov/science-data/scientific-publications-sfer>).

Integrated-system water management operations are the critical last step in getting water right and achieving maximum systemwide benefits. Recent successes in the Kissimmee River Restoration allow additional freshwater to be held within the river floodplain benefiting the historic river habitats and improving the inflows to Lake Okeechobee. Additional operational flexibility in the Lake Okeechobee Regulation Schedule facilitated a 4-fold (4X) increase in acres of submerged aquatic vegetation in Lake Okeechobee during the summer growing season in 2019. Massive storage reservoirs east and west of Lake Okeechobee are under construction and will be ready to be pressed into service in 2021 and 2023, respectively, directly benefiting conditions in the St. Lucie River and Estuary and improving freshwater deliveries to the Caloosahatchee River and Estuary.

VISIBLE IMPACTS

Ecosystem impacts are not always readily observable – one of many reasons why thoughtfully planned monitoring is critical to restoration and the lives of those dependent on restoration success. At times, there are conditions that set off a chain of events that very visibly alter the ecosystem and the pace of restoration, reinforcing the need for South Florida Ecosystem Restoration projects and the flexibility they provide water management. Some of the events that had a profound impact on the Everglades system and habitat over the past five years are summarized below. (Images courtesy of the Audubon Society and South Florida Water Management District)

2015 SOUTHERN COASTAL SYSTEM FLORIDA BAY SEAGRASS DIE-OFF



Dead Seagrass in Florida Bay

PRECEDING CONDITIONS

Severe Precipitation Deficit WY2015/Early WY2016
Lack of Freshwater Flow into Bay
High Salinity Concentrations in Bay
Higher Bay Water Temperatures
Low Oxygen Concentration in Bay
Minimal Mixing in Bay Water Column



● Large die-offs observed (August 2015)
○ Additional die-offs observed (October 2015)

Increased nutrients and turbidity resulting from decaying seagrass meadow and destabilized sediments fueled algal outbreaks in Central and Western Florida Bay nine months after the die-off began. The secondary impacts increased seagrass vulnerability further. High nutrient/chlorophyll conditions continued from April through December 2016.

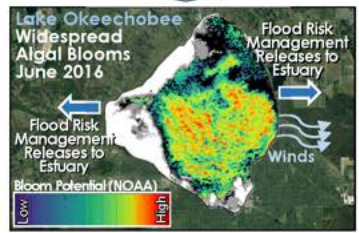
2015 - 2020 LAKE OKEECHOBEE | NORTHERN ESTUARIES HARMFUL ALGAL BLOOMS



Algal Blooms in Caloosahatchee Estuary*

PRECEDING CONDITIONS

High Rainfall
Nutrient Run-off from Watersheds Surrounding Lake and Estuary
Warm Temperatures
Long Hours of Daylight
Stagnant Conditions
Lake Releases to Estuaries for Flood Risk Management



- Although algal blooms occurred during each year of this reporting period, the summer of 2016 provides an example of the conditions that can spawn these events. June 2016 data indicated high levels of chlorophyll and detection of cyanobacteria in the Lake (June 14, 2016 NOAA cyanobacteria imagery overlaid on the map above).
- Prevailing winds and releases from Lake Okeechobee for Flood Risk Management sent algal blooms and nutrients into the estuaries. Coupled with nutrients from their watersheds, extensive algal blooms formed in the estuaries.

* Image courtesy of the Cavin Brothers.

2017 SYSTEM-WIDE IMPACTS HURRICANE IRMA



Tree Islands Severely Inundated

PRECEDING CONDITIONS

Extreme Dry Season
Extreme Wet Season



Lake Okeechobee
Water quality impacts (nutrients and turbidity) for several months following the storm may limit improvements in indicator status in near term.

Northern Estuaries
Inflows of freshwater suppressed salinity values, decimating oyster populations in the St. Lucie and Caloosahatchee estuaries. 2019 mapping indicates an oyster rebound.

Greater Everglades
Tree islands were excessively stressed by extreme 2017 dry and wet seasons, and hurricane-related inundation. Future stress is likely to adversely impact tree island vegetation.

Southern Coastal System
Storm surge and high winds damaged mangroves in the southwest coast, coral reefs in Biscayne Bay, and seagrass beds in Florida Bay. Examples of other impacts included severe declines in snook and bull shark populations in the southwest estuaries from increased freshwater flow, degraded water quality, and erosion.

Figure ES-3: Events of Ecological Significance – Visible Impacts.

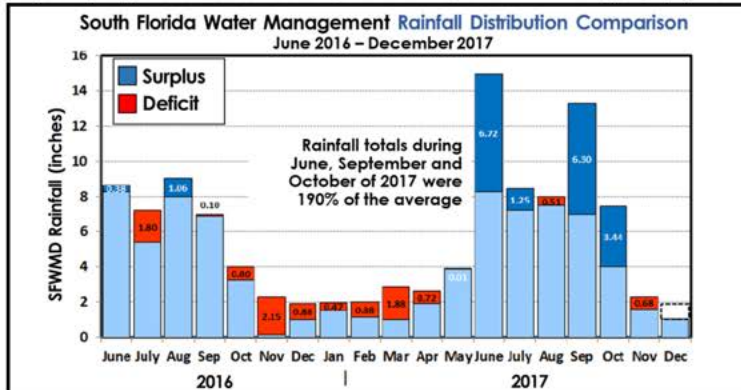
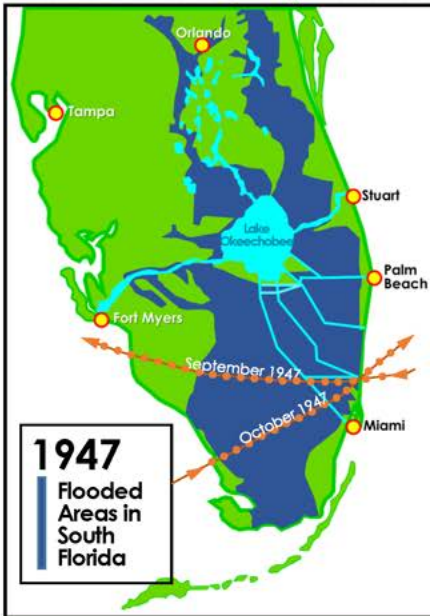
The Lake Okeechobee System Operating Manual (LOSOM) study is underway with the goal of incorporating flexibility in Lake Okeechobee operations while balancing congressionally authorized purposes. As part of the evaluation, the LOSOM will test the timing and volume of water that can be sent south and ensure compliance and compatibility with the State’s Restoration Strategies, which clean the water before it reaches the Greater Everglades. The LOSOM will leverage the progress made by the new water control plan for Water Conservation Area 3, Everglades National Park and the South Dade Conveyance System, known as the Combined Operational Plan, which moves more water south across the Tamiami Trail. When the Central Everglades and the EAA Reservoir Projects are complete, they will further connect from north to south and improve the resilience of the natural system.

Figure ES-4 briefly describes 2017, a challenging year for water management. It also provided a glimpse of the resiliency of the south Florida Ecosystem, which would occur more often with the consistent implementation of the CERP, as illustrated by the following year’s historic wading bird nesting season, see **Figure ES-5**.

2017 A CHALLENGING WET SEASON ACROSS SOUTH FLORIDA

BACKGROUND

Rainfall within the South Florida Water Management District service area during the 2017 Wet Season was, overall, 151% of average – with the wettest June through October on record. As indicated in the chart below, rainfall totals during June, September and October were 190% of average. In fact, the 2017 rainfall surplus exceeded that of 1947, the catastrophic year of storms and rainfall impacting south Florida and prompting authorization of the Central and Southern Florida (C&SF) system.



Conditions are significantly different since the C&SF multi-purpose system was designed more than 70 years ago. Potential impacts related to climate change, sea level change, the burgeoning population, and the intensely developed urban landscape across south Florida were not anticipated at the time – yet, flooding within the C&SF service area during 2017 was minimized, and the ecology in parts of the natural system flourished the following year. Although a challenging year for water resources management, we might cautiously infer that 2017 signaled progress – and that the collaborative South Florida Ecosystem Restoration efforts, including the Comprehensive Everglades Restoration Plan (CERP), are working to help increase resiliency across south Florida.

MOVING FORWARD

Climate change challenges are not likely to go away. Current projections and observed trends indicate a continuous increase in Earth's temperature beyond year 2100, resulting in altered rainfall patterns, increased sea levels, modified groundwater levels and soil moisture, and other significant impacts that affect water resources management.

The U.S. Army Corps of Engineers (USACE) climate change adaptation policy and guidance is currently applied at the project level across South Florida Ecosystem Restoration (SFER) implementation, as well as all mission areas. On a system-wide basis, additional change adaptation strategy for SFER might include:

- Incorporating climate change into how we currently measure restoration success on a system-wide basis to better understand how restoration activities and projects benefit overall resilience across south Florida.
- Implementing a C&SF Resiliency Study to reevaluate the resiliency of the C&SF system with newly observed and projected information and data available since the C&SF and CERP were authorized.
- Continuing to broaden our holistic perspective to fully understand, amidst change, the context in which restoration activities operate and to seek increasingly innovative and sustainable restoration solutions.

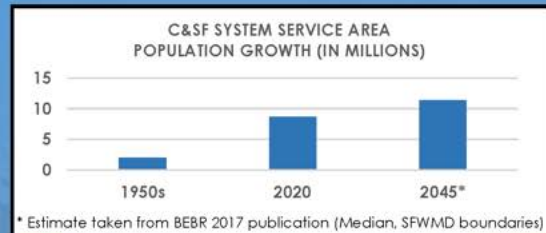


Figure ES-4: Events of Ecological Significance – Storms and Climate Change.

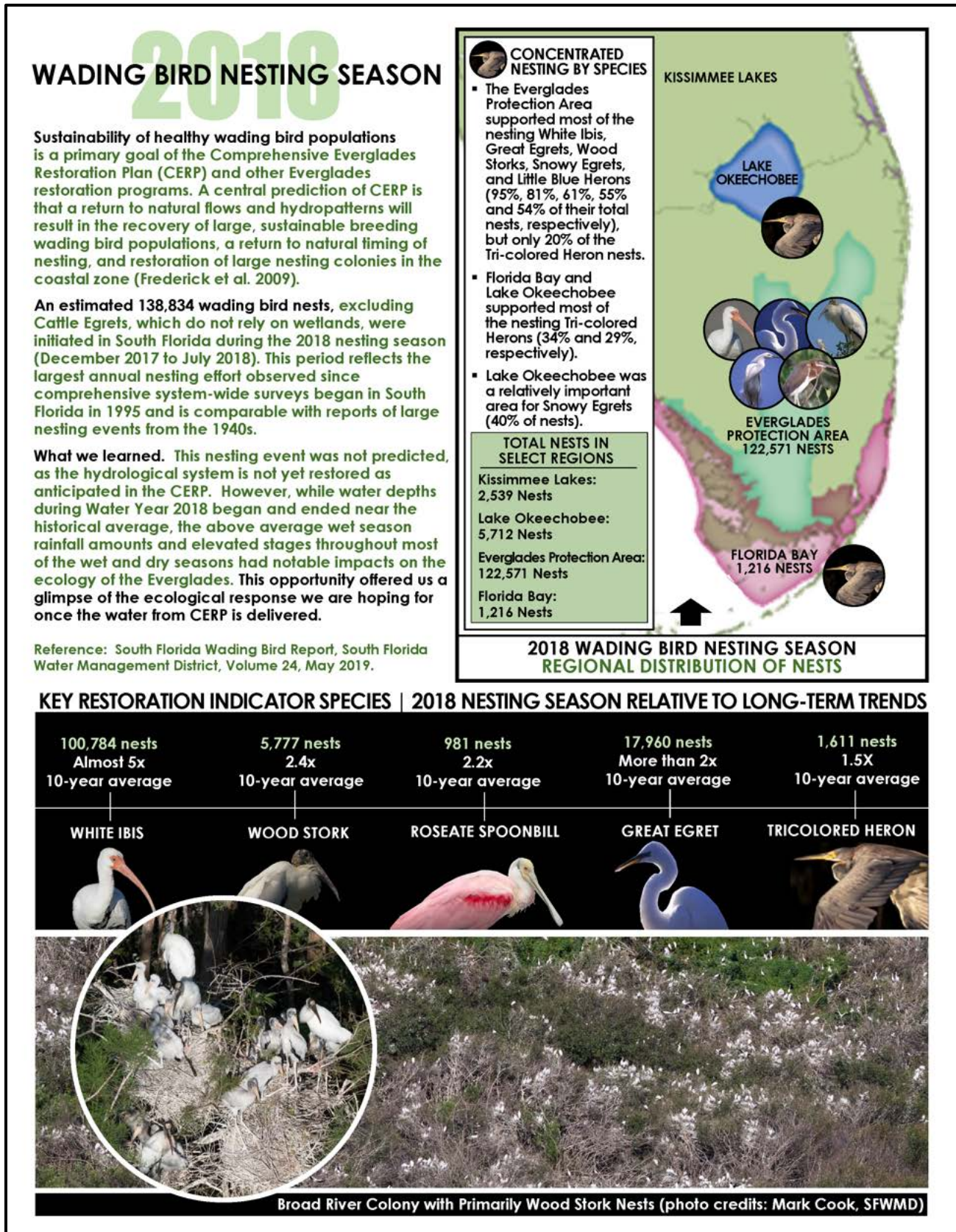


Figure ES-5: Events of Ecological Significance – Historic Wading Bird Nesting Season.

Restoration Science

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 monitoring and research 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 are tools to link planning, construction, and adaptive management to ensure that intended results are achieved. The **RE**storation, **CO**ordination, and **VER**ification (**RECOVER**) program, the scientific arm of CERP, ensures that science remains a fundamental and overarching element throughout the planning, project implementation, and adaptive management of Everglades restoration. RECOVER coordinates the monitoring of ecological indicator species and physical conditions across the system, develops performance measures, and employs modeling and other tools to evaluate project alternatives, assess restoration progress and adapt as necessary to meet project goals. RECOVER regions are depicted in **Figure ES-6**.

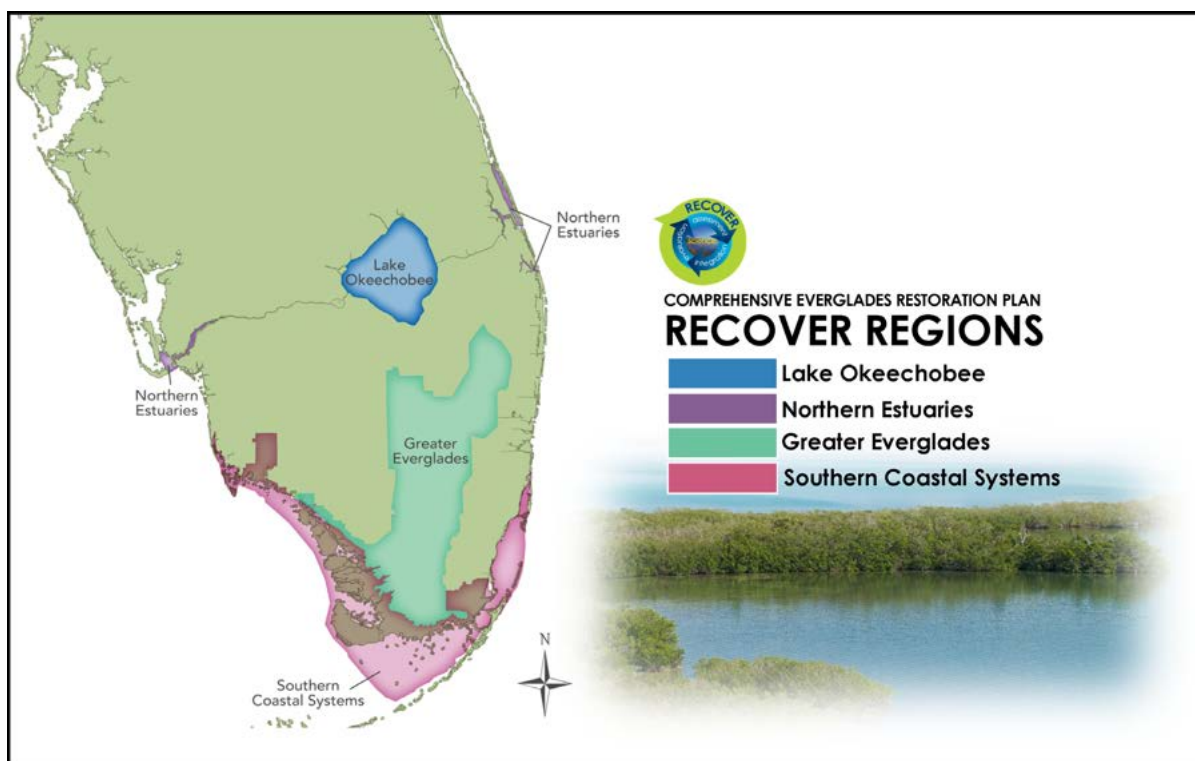


Figure ES-6: RECOVER Regions.

During the reporting period, RECOVER produced the *2012-2017 Everglades Report Card* and the *2019 System Status Report (SSR)*, documenting updates from the CERP Monitoring and Assessment Plan (MAP) program. The key finding of the 2012–2017 Everglades Report Card is that ecosystem health is in fair condition. Everglades ecosystems are vulnerable to further ecological degradation and are providing minimal ecosystem functions. Essential ecological functions are currently degraded and unsustainable, leading to inadequate habitats for plants and animals. These results are discussed in detail in the report card and on the website at <https://www.evergladesecohealth.org>.

CERP aims to restore the characteristics of a hydrologically integrated Everglades, which will provide the best habitat for plants and animals while protecting the region’s water resources, leading to a healthy South Florida Ecosystem. The results achieved by individual projects such as the Kissimmee River, Picayune Strand, Biscayne Bay Coastal Wetlands, Phase 1, and the bridging of Tamiami Trail are encouraging. As hydrology is restored and habitats rebound, native species are returning, such as the threatened wood stork and endangered Florida panther to the Picayune Strand area and wading bird colonies along the Kissimmee River floodplain. These projects provide insight into what can be achieved at larger scales through continued restoration.

RECOVER is using science to forecast what a recovering Everglades will look like. WRDA 2000 introduced the concept of Interim Goals, further developed into the Programmatic Regulations of 2003 and defined as **“a means by which the restoration success of the Plan may be evaluated throughout the implementation process.”** The regulations also required the development of Interim Targets for **“evaluating the progress towards other water-related needs of the region provided for in the Plan...”** These goals and targets are based on selected native habitats and species called indicators that, through monitoring and forecasting, can tell us how the Everglades is expected to respond to restoration. For the current effort, which began in 2017 and concluded with a report in 2020, RECOVER generated forecasts for changes in the indicators by 2026 and 2032 due to the scheduled implementation of CERP projects.

- Overall, model forecasts show unisubstantial progress toward ecosystem goals while also meeting needs for water supply and flood protection.
- The hydrologic and ecologic needs of the Greater Everglades portion of the ecosystem (see map above) are still not fully achieved by 2032.
- Water management operations (e.g. Lake Okeechobee; Combined Operational Plan) will play key roles in achieving CERP goals for ecosystem restoration, water supply, and flood protection.
- Agencies must continue to monitor the ecosystem and use adaptive management to respond to changing real world conditions.

With Continued Support from Congress, We Will Accomplish More

- ❖ A healthy and resilient Everglades directly supports the economy and sustainability of the State of Florida, home to over 22 million people in the state and 9 million people in South Florida.
- ❖ The next five years provide an opportunity to build upon the restoration program’s current momentum and substantial recent progress:
 - The success of CERP will stand on the shoulders of completed Foundation Projects that have bridged the Tamiami Trail and will continue to send more, clean, freshwater to the Greater Everglades and Everglades National Park (see Non-CERP milestones, **Figure ES-2**).
 - Great strides toward “getting the water right” will be made during the next reporting period: four Foundation Projects will have been completed, six CERP projects will have been constructed, and seven more CERP projects will be simultaneously under design and construction.
 - Planning will also be underway for the next group of CERP projects including the Biscayne Bay Southeastern Everglades Ecosystem Restoration (BBSEER) study and the Southern Everglades study.
- ❖ Continued success depends upon three pillars of support:
 - **Everglades science** holds the key to achieving CERP goals. We have a lot more to do and we continue learning as we go. Science has illustrated that America’s Everglades are resilient. Recent events of ecological significance have shown us an early glimpse at the positive ecological response that can be achieved through a healthier, restored Everglades.
 - **Timely authorizations and funding** are critical to capitalizing on the momentum in restoration of America’s Everglades.
 - Successful **partnerships, collaboration, and leadership** are fostering the real-time delivery of the program.



Figure ES-8: American Flag at Everglades National Park

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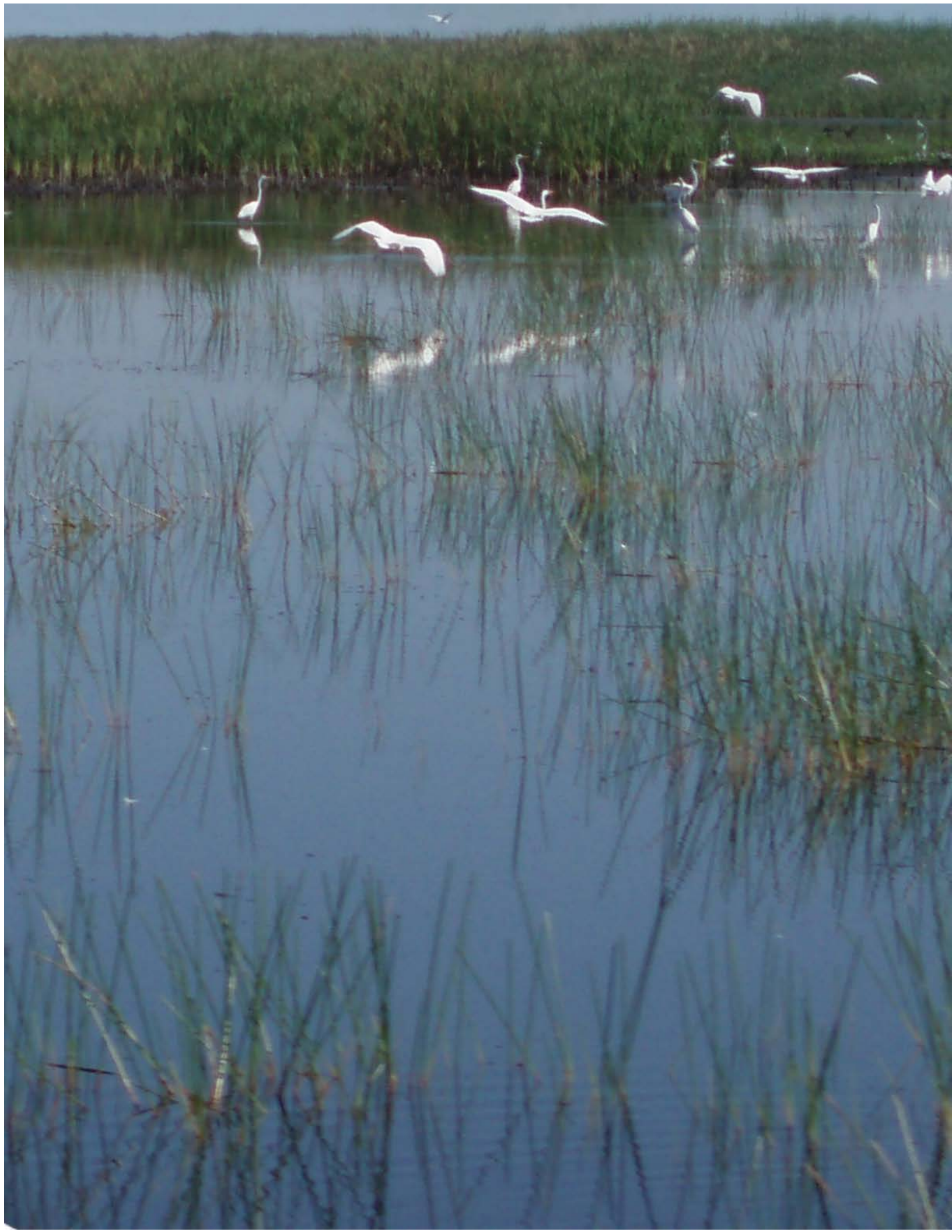
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INTRODUCTION

REPORT TO CONGRESS | COMPREHENSIVE EVERGLADES RESTORATION PLAN
Central and Southern Florida Project

Images: Lake Okeechobee Wading Birds (Lake Okeechobee RECOVER Region;
Submerged Aquatic Vegetation (Indicator)



1 INTRODUCTION

The *2020 Report to Congress* on the Comprehensive Everglades Restoration Plan (CERP) is the fourth 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, 2015 - June 30, 2020) 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 Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, the State of Florida including the Florida Department of Environmental Protection (FDEP) and the South Florida Water Management District (SFWMD), other federal, state, and local agencies, and the South Florida Ecosystem Restoration Task Force.

1.1 Federal and Non-federal Sponsors of CERP

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

1.2 South Florida Ecosystem Task Force

The South Florida Ecosystem Restoration Task Force (Task Force) was established by section 528(f) of the Water Resources Development Act of 1996. There are seven federal, two tribal, and five state and local government representatives. The duties of the Task Force are to: exchange information regarding programs, projects and activities of the agencies and entities represented on the Task Force to promote ecosystem restoration and maintenance; 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.

The members of the Task Force in 2020 include:

- Chair - Assistant Secretary for Water and Science, U.S. Department of the Interior
- Vice-Chair – Secretary, Florida Department of Environmental Protection
- Federal - Assistant Secretary of the Army for Civil Works, U.S. Department of the Army
- Federal - Assistant Attorney General, Environment and Natural Resources Division, U.S. Department of Justice
- Federal - Deputy Administrator, U.S. Environmental Protection Agency
- Federal - Under Secretary for Farm Production and Conservation, U.S. Department of Agriculture
- Federal - Under Secretary for Policy, U.S. Department of Transportation

- Federal - Assistant Administrator for NOAA’s National Ocean Service, U.S. Department of Commerce
- Tribal - Water Resources Director, Miccosukee Tribe of Indians of Florida
- Tribal - General Counsel, Seminole Tribe of Florida
- Non-federal - Governing Board Member, South Florida Water Management District
- Non-federal - County Commissioner, Miami Dade County
- Non-federal - Mayor, City of Sanibel
- Non-federal - Director, Office of Water Policy and Ecosystems Restoration, Florida Department of Environmental Protection
- Special Advisor - Executive Director, Florida Fish and Wildlife Conservation Commission
- Special Advisor – Director, US DOI, Office of Everglades Restoration Initiatives
- Special Advisor – Sandy Soto, Program Manager, US DOI, Office of Everglades Restoration Initiatives

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 <https://www.evergladesrestoration.gov>.

1.3 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 addresses 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 1-1**). 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.

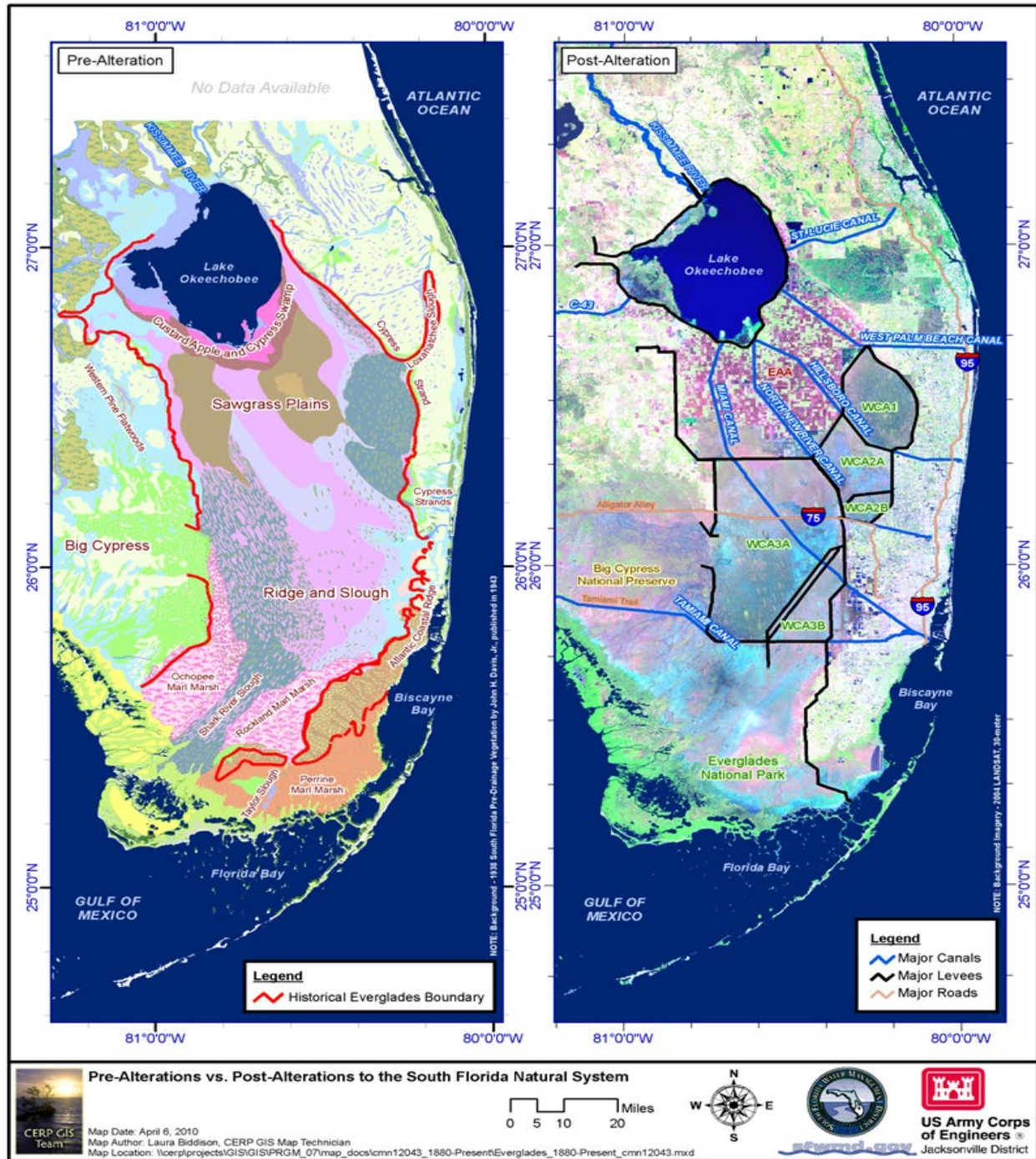


Figure 1-1. Pre-Alterations vs. Post-Alterations to the South Florida Natural System

1.4 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. For a number of reasons, south Florida has during this same time experienced significant reduction of natural water storage capacity,

redirection of water to northern coastal estuaries, changed water quality, and channelization of water flow over time, and resulting reduction of natural sheetflow in the regional system have led to substantial ecological damage to natural habitats. The human environment also experienced 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).

1.5 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 and store water that currently flows unused to the Atlantic Ocean and Gulf of Mexico. This captured water will then be able to be redirected to where it is needed within the ecosystem.

With CERP’s approval, the U.S. Congress requested adaptive management (AM) principles during Everglades restoration by stating “that the agencies responsible for project implementation...will seek continuous improvement of the Plan based upon new information, improved modeling, new technology, and changed circumstances” (U.S. Senate, 2000). Congress directed the U.S. Secretary of the Army to develop Programmatic Regulations for CERP to ensure that the Plan’s goals and purposes are achieved.

1.6 Implementing the Plan

The components that make up the Comprehensive Everglades Restoration Plan are known as “Yellow Book” (YB) components. A map and table depicting the status of all CERP components is provided below (**Figure 1-2**).



Figure 1-2. CERP Components Status Map.

1.7 Integrated Delivery Schedule

The components that are authorized and are in the design and/or construction phases are described in the Integrated Delivery Schedule (IDS) (<https://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/Integrated-Delivery-Schedule/>). The initial IDS was developed in response to advice provided in the 2007 General Accountability Office (GAO) report and the 2006 National Academy of Science (NAS) Report to Congress. Subsequently, the IDS was integrated with the progress of Foundation and other key Non-CERP projects and serves the purpose of the Master Implementation Sequencing Plan (MISP) originally described in the CERP Yellow Book authorized by Congress in 2000. The working draft of the 2020 update of the IDS, released by the USACE at the September 17, 2020 public engagement workshop sponsored by the SFER Task Force, includes a total construction cost of SFER from 2020 to 2030 of \$7.4 billion.

The IDS allows implementing agencies to inform decision-makers for scheduling, staffing, and budgeting South Florida Ecosystem restoration program efforts. The IDS is not an agency action or decision document. The IDS is a living document and is updated as necessary to reflect any major changes in program authority, funding, or other pertinent decisions.

Regular updates to the IDS require consultation with the South Florida Ecosystem Restoration Task and stakeholder input in accordance with the Programmatic Regulations for the CERP (33 CFR Part 385). The latest information on consultation with the Task Force on the IDS is available on the website - evergladesrestoration.gov/content/ids/idsw/. The IDS synchronizes program and project priorities with the State of Florida and achieves the CERP restoration objectives at the earliest practicable time, consistent with funding and the interdependencies between project components. ***The IDS reflects the sequencing strategy for planning, design, and construction and does not include costs for completed work or land acquisition.***

The IDS includes those federal projects cost shared with the local sponsors; Central and Southern Florida Projects (C&SF) which includes the Comprehensive Everglades Restoration Plan (CERP), Kissimmee River Restoration, and Foundation Projects. ***Foundation*** projects include non-CERP projects that the CERP implementation depends upon such as the Herbert Hoover Dike Rehabilitation, Kissimmee River Restoration, Modified Water Deliveries to Everglades National Park, C-111 South Dade, South Florida Water Management District's Restoration Strategies project, and the Tamiami Trail Next Steps project (shown in the blue band). These major projects have been merged into an IDS that provides an overall strategy and sequence for their planning, design, and construction based on ecosystem needs, benefits, costs, and available funding.

CERP projects authorized under WRDA 2007 are referred to as ***Generation 1*** projects (shown in the green band in the IDS); ***Generation 2*** projects were authorized under the *Water Resources Reform and Development Act (WRRDA) of 2014* and are shown in the purple band on the IDS. The Central Everglades Planning Project (CEPP), a suite of CERP components focused on the heart of the Everglades, was authorized in the Water Infrastructure Improvements for the Nation (WIIN) Act of 2016 and amended in the America's Water Infrastructure Act of 2018 with the addition of the CERP Everglades Agricultural Area Reservoir (shown in the orange band in the IDS);. Additional planning efforts underway or upcoming are listed in the white band of the IDS. Detailed project updates are provided in **Section 2** of this report.

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 the CERP with the goal of addressing prior environmental issues 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 regarding 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.

1.8 Tribal Interests – Native People of the South Florida Ecosystem

The following federally recognized Tribes have been consulted during the planning and preparation of the Project Implementation Reports and the subsequent design and construction efforts associated with the CERP implementation: Miccosukee Tribe of Indians of Florida, Seminole Nation of Oklahoma, Seminole Tribe of Florida and Thlopthlocco Tribal Town.

1.9 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 1-3**). 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.



Figure 1-3. Kissimmee River Restoration. Photo: USACE.

In this reporting period, a strong focus has been placed on storage of water within the system by constructing reservoirs to the east and west of Lake Okeechobee. On the east coast, the C-44 Reservoir and Stormwater Treatment Area (STA) (depicted in **Figure 1-4**) will capture and treat local runoff from the C-44 basin, reduce average annual total nutrient loads and improve salinity in the St. Lucie Estuary and the southern portion of the Indian River Lagoon. Reservoir construction is expected to be complete in 2021 and will allow storage of 50,600 acre-feet of water. Cells 1-3 of the STA were completed and flooded in 2019 and the remaining cells will be completed in 2020. On the west coast, construction of the C-43 West Basin Storage Reservoir has been accelerated by the SFWMD. When complete, the C-43 Reservoir will store approximately 170,000 acre-ft of local basin runoff and releases from Lake Okeechobee. It will reduce the volume of discharges from Lake Okeechobee to the Caloosahatchee Estuary during the wet season and provide a source of freshwater flow to the estuary during the dry season to help balance salinity levels to protect plants and wildlife. The reservoir is expected to be completed by December 2023.

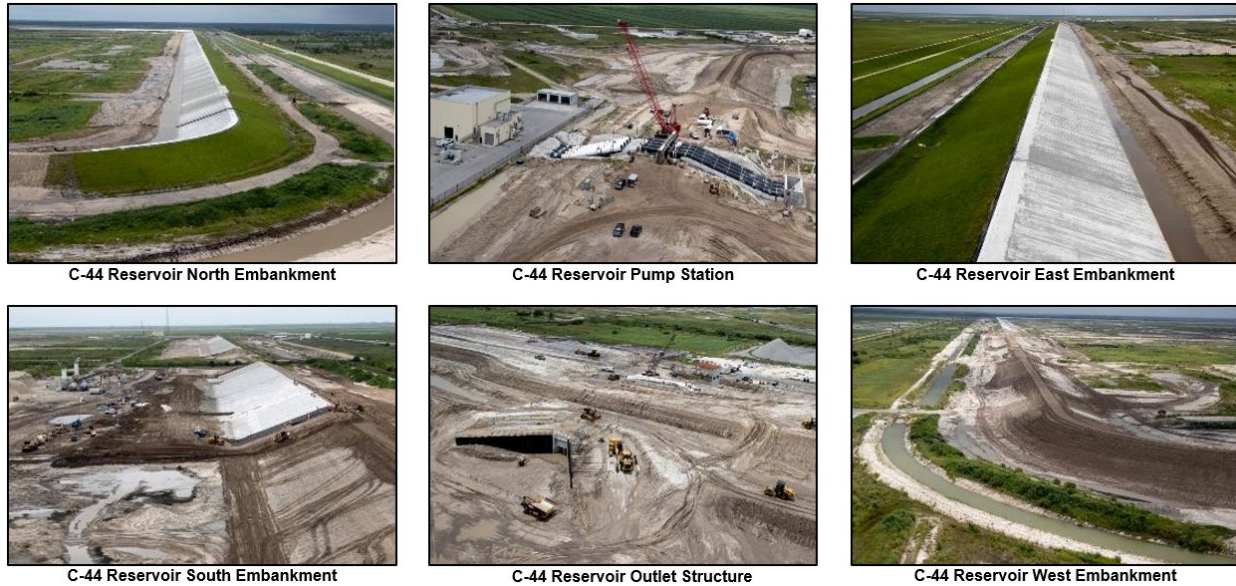


Figure 1-4. Indian River Lagoon South Project, C-44 Reservoir Construction Progress. Photos: USACE.

A spotlight has also been put on the implementation of the CEPP. In 2018, the SFWMD produced a Section 203 study recommending additional storage and treatment in the Everglades Agricultural Area as well as improving conveyance capacity within the system. In section 1308(a) of the Water Resources Development Act of 2018, Congress authorized the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida in accordance with section 601 of the Water Resources Development Act of 2000, as recommended in the addendum to the South Florida Water Management District (SFWMD) Section 203 Study, Feasibility Study and Draft Environmental Impact Statement prepared by the SFWMD and dated May 2018, with such modifications as the Secretary of the Army considers appropriate. In section 1308(b) of this statute, Congress further specified that the project “may be constructed only after the Secretary prepares a report that addresses the concerns, recommendations, and conditions identified by the Secretary in the review assessment titled “Review Assessment of South Florida Water Management District’s Central Everglades Planning Project, Section 203 Post Authorization Change Report, Integrated Feasibility Study and DRAFT Environmental Impact Statement (March 2018, Amended May 2018) and dated May 2018.” Work is moving forward under these provisions and in conjunction with the Central Everglades Planning Project. The USACE and SFWMD are working together to accelerate design and construction of the EAA Reservoir (**Figure 1-5**) and STA. Additionally, advanced work is being completed on the CEPP South with several features, such as Old Tamiami Trail Removal and the S-333N (**Figure 1-6**), under construction already. Construction of water control structures S-631, S-632 and S-633 in the CEPP South, which will add significant conveyance between Water Conservation Area 3A and Northeast Shark River Slough in Everglades National Park, is anticipated to start in September of-2020.



Figure 1-5. EAA Reservoir, Site Investigations. Photo: USACE.



Figure 1-6. CEPP South, Structure S-333N Construction in Water Conservation Areas. Photo: SFWMD.

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.

Over the past five years several discrete events occurred that had a profound impact on the Everglades system. These include the seagrass die-off in Florida Bay, harmful algal blooms in the St. Lucie River and Estuary and Hurricane Irma’s impact to the whole system. Please refer to the “Visible Impacts” figure in Section 2 of this report.

Working with the University of Maryland Center of Environmental Science’s (UMCES) Integration and Application Network (IAN) team and many south Florida scientists, RECOVER produced an ecosystem health report card for the Everglades to assess and synthesize environmental data to evaluate overall ecosystem condition, and with the purpose of delivering a concise communication tool for a more general audience. Report cards integrate large, complex datasets into an overarching score that’s easily understood by the public. The Florida Everglades report card reports on the status of the Everglades ecosystem from May 1, 2012–April 30, 2017 (dates which correspond to water years 2013–2017). The report card provides a transparent, timely, and geographically detailed assessment of the Everglades status measured by the defined ecosystem indicators and performance measures of the CERP.

The key finding of the 2012–2017 Everglades Report Card is that ecosystem health is in fair condition. Everglades ecosystems are vulnerable to further ecological degradation and are providing minimal ecosystem functions. Essential ecological functions are degraded and unsustainable, leading to inadequate habitats for plants and animals. The overall condition is an area-weighted average of the four sub-region scores. The Southern Coastal Systems scored poorly while Lake Okeechobee, Northern Estuaries, and Greater Everglades scored fair. Each region has a different set of indicators that reflect the health of that region (RECOVER 2019A). For example, the Lake Okeechobee region has lake stage as an indicator, which is relevant for the lake, but not for the other regions. The indicators and results are discussed in detail in the report card and on the website at <https://www.evergladesecohealth.org>.

As described in the 2019 System Status Report, management and restoration of all regions of the Everglades is underway to help mitigate these impacts. CERP aims to restore the characteristics of a hydrologically integrated Everglades, which will provide the best habitat for plants and animals, leading

to a healthy Everglades system. The results achieved by individual projects such as Picayune Strand, Biscayne Bay Coastal Wetlands Part 1, and the bridging of Tamiami Trail are encouraging. Taken together, these regional activities are critical to managing the trans-boundary conditions that are essential to system-wide health. These projects provide insight into what can be achieved at larger scales but are currently limited in their scale and influence. Restoring the historical hydrologic characteristics of the Everglades awaits further progress on larger-scale projects now underway or in the planning stages. Within the regions of the Everglades, research and restoration projects have improved the management of hydrologic flows and increased water storage, which are key to achieving the restoration goals of improving wetland hydroperiods and flows of freshwater into coastal areas.

1.10 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 2016, 2018, 2020), 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.



ACCOMPLISHMENTS

REPORT TO CONGRESS | COMPREHENSIVE EVERGLADES RESTORATION PLAN
Central and Southern Florida Project

Images: Florida Bay (Southern Coastal Systems RECOVER Region);
Crocodile (Indicator)



2 ACCOMPLISHMENTS 2015-2020

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 2-1 through TABLE 2-5 include CERP projects with activity during the reporting period. TABLE 2-6 and TABLE 2-7 include 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 2-1: CERP Progress 2015-2020 (Completed; local sponsor is the SFWMD unless otherwise noted.)

CERP PROJECT	PROGRESS 2015-2020	NEXT STEPS
CERP Aquifer Storage and Recovery (ASR) Regional Study	<ul style="list-style-type: none"> Incorporated ASR Pilot Project test results and technical data report findings Peer review of draft study conducted by the NRC in April 2015 Final report completed June 2015 (USACE and SFWMD 2015) 	<ul style="list-style-type: none"> Utilized in planning and future implementation of ASR systems associated with the Loxahatchee River and Lake Okeechobee Watershed Restoration projects “Incremental adaptive restoration” - the National Research Council’s recommended phased implementation of future ASR systems
CERP Melaleuca Eradication and Other Exotic Plants <ul style="list-style-type: none"> Generation 1 	<ul style="list-style-type: none"> Utilization of the facility for development and implementation of biological controls 	<ul style="list-style-type: none"> Continued implementation of biological controls in the Everglades

Table 2-2: CERP Progress 2015–2020 (Under construction/in progress; local sponsor is the SFWMD unless otherwise noted.)

CERP PROJECT	PROGRESS 2015-2020	NEXT STEPS
<p>CERP Biscayne Bay Coastal Wetlands Project – Phase 1</p> <ul style="list-style-type: none"> • Generation 2 • State Expedited Construction 	<ul style="list-style-type: none"> • PPA executed August 2016, amended March 2018 • L-31E Pump ran from 2016 through March 2019, providing early benefits to coastal wetlands and Biscayne Bay (SFWMD) • All L-31E Flow-way culverts installed as of May 2019 (USACE and SFWMD) • Cutler Wetlands component design update began in November 2019 (SFWMD) • L-31E Contract 4 awarded April 2020 (USACE) • L31E Contract 5 in design. (USACE) • The USACE approved the SFWMD’s deviation request to increase the operating range of structure to improve hydroperiods in Model Lands. 	<ul style="list-style-type: none"> • Construction of the L-31E Flow-way, Contracts 4 and 5 (USACE) • Complete design update and construction of the Cutler Wetlands component (SFWMD)
<p>CERP Broward County Water Preserves Area Project</p> <ul style="list-style-type: none"> • Generation 2 	<ul style="list-style-type: none"> • PPA Executed in August 2016 • Construction of the Mitigation Area A Berm Completed in 2019 • Initiation of design for remaining features of the C-11 Impoundment 	<ul style="list-style-type: none"> • Construction of remaining features of the C-11 Impoundment • Initiation of design and construction for the Seepage Management Area

CERP PROJECT	PROGRESS 2015-2020	NEXT STEPS
<p>CERP Caloosahatchee River (C-43) Western Basin Storage Reservoir Project</p> <ul style="list-style-type: none"> • Generation 2 • State Expedited Construction 	<ul style="list-style-type: none"> • Pre-Partnership Credit Agreement No. 2 Executed in June 2015 • Project Partnership Agreement Executed in June 2016 • Award of S-470 Intake Pump Station Contract in January 2018 • Award of final contract for the Embankment and Civil Works in March 2019 • Construction of the S-476 Irrigation Pumping Station Completed April 2019 • Validation Report to increase the Authorized Project Cost completed 2020 	<ul style="list-style-type: none"> • Completion of Construction of S-470 Intake Pump Station • Completion of Embankment and Civil Works Construction
<p>CERP C-111 Spreader Canal: Western Project</p> <ul style="list-style-type: none"> • Generation 2 • State Expedited Construction 	<ul style="list-style-type: none"> • Operations and maintenance of completed construction (Frog Pond detention area, Aerojet Canal extension, earthen plugs in several canals, and associated structures) 	
<p>CERP Central Everglades Planning Project</p> <ul style="list-style-type: none"> • State Expedited Construction 	<ul style="list-style-type: none"> • Authorized in WRDA 2016 (U.S. Congress 2014) • Pre-Partnership Credit Agreements #1, #2, and #3 • Completed a Validation Report for CEPP South • Project Partnership Agreement, South Phase (July 2020) • SFWMD completed construction on a 1,150 cfs S-333N spillway structure • SFWMD initiated removal of Old Tamiami Trail Road Removal including removal of S-346 	<ul style="list-style-type: none"> • Design and Construction of S-356 Pump Station and S-355W Gated Spillway • Design and Construction of earthwork features to include removal of L-67C, construction of L-67D (Blue Shanty), Removal of L-29 and Removal of L-67 ext levee and Backfill of the L-67 extension canal • Initiation of a Validation Report and design for 2nd phase (CEPP North)

CERP PROJECT	PROGRESS 2015-2020	NEXT STEPS
	<ul style="list-style-type: none"> USACE initiated construction of Contract #1 (S-631, S-633, L-67A Spoil Removal, & L-67C Levee Gap) 	<ul style="list-style-type: none"> Initiation of design for 3rd phase (CEPP NewWater)
<p>CERP Indian River Lagoon South, Phase 1</p> <ul style="list-style-type: none"> Generation 1 State Expedited Construction 	<ul style="list-style-type: none"> C-44 STA Discharge spillway construction completed November 2015 C-44 Reservoir Pump Station completed November 2018 C-44 STA Initial Fill initiated in 2019 C-23/24 North Reservoir, South Reservoir, and STA designs ongoing 	<ul style="list-style-type: none"> Complete construction of the C-44 STA in December 2020 Complete construction of the C-44 Reservoir in April 2021 Award construction contract of the C-23 to C-44 Interconnect Canal in Summer 2021 Award construction contract of the C-23/24 STA in Fall 2021 Award construction contract of the C-24 North Reservoir in Fall 2022 Award construction contract of the C-23 South Reservoir in Fall 2024 Award construction contract of the C-25 Reservoir in Summer 2024 Award construction contract of the C-25 STA in Summer 2026

CERP PROJECT	PROGRESS 2015-2020	NEXT STEPS
CERP Picayune Strand Restoration Project <ul style="list-style-type: none"> • Generation 1 	<ul style="list-style-type: none"> • Limited reevaluation report completed in 2016 • Removed 65 miles of road and 26 miles of logging trams between Merritt and Faka Union Canals. • Manatee Mitigation Feature completed in 2016 • East-west canal plugging • Faka Union Pump Station completed in 2018 and removal of 100 miles of roadways • PPA Amendment 1 executed June 2019 • Miller Pump Station construction completed in 2020 	<ul style="list-style-type: none"> • Design work and construction of flood protection features, road removal, and canal backfill
CERP Site 1 Impoundment Project <ul style="list-style-type: none"> • Generation 1 	<ul style="list-style-type: none"> • PPA executed June 2010 • Phase 1 construction completed in 2015 	<ul style="list-style-type: none"> • Operations and maintenance of the Phase 1 completed work.
CERP WCA-3 Decompartmentalization and Sheetflow Enhancement (DECOMP) Physical Model <ul style="list-style-type: none"> • Generation 1 	<ul style="list-style-type: none"> • Completed years 3 and 4 of Phase I Testing during dry seasons in 2015 - 2016 and 2016 - 2017 • Phase II year round testing approved November 2017 • Completed years 5, 6, and 7 of Phase II testing in 2017–2018, 2018–2019, and 2019–2020. 	<ul style="list-style-type: none"> • Testing planned for May 2020 – April 2021 • After completion of operational testing, DECOMP structures will be incorporated into a Federal project, providing operational flexibility

TABLE 2-3: CERP Progress 2015–2020 (Design phase activities; local sponsor is the SFWMD unless otherwise noted.)

CERP PROJECT	PROGRESS 2015-2020	NEXT STEPS
<p>CERP Everglades Agricultural Area Project</p> <ul style="list-style-type: none"> • State Expedited Construction • Requires New Start Designation 	<ul style="list-style-type: none"> • Authorization received in WRDA 2018. See project description below for details on authorization. • Pre-Partnership Credit Agreement executed May 2020 • Completed a Follow-Up Report • SFWMD initiated design and early construction of the A2 Stormwater Treatment Area (STA) • USACE initiated design of the A2 Reservoir and Pump Station 	<ul style="list-style-type: none"> • Execute a Project Partnership Agreement • Design of conveyance features in the Miami and North New River Canals • Anticipated construction of conveyance features in the Miami and North New River Canals • Design of the A2 Reservoir and Pump Station • Anticipated construction of the A2 Reservoir and Pump Station
<p>CERP Lake Okeechobee ASR</p> <ul style="list-style-type: none"> • State Expedited Design (LOWRP still in planning – see below) 	<ul style="list-style-type: none"> • Mechanical assessment of L-63N ASR well completed • Phase 1 site evaluation completed 	<ul style="list-style-type: none"> • Progress from state expedited design to construction phase • Begin construction of continuous cores to investigate hydrogeological conditions in proposed ASR cluster locations (S-191 basin) • Begin construction of exploratory wells at C-38N and C-38S • Evaluate water treatment technologies to meet ASR requirements during recharge, storage, and recovery • Complete condition assessment of Kissimmee Pilot ASR well

Table 2-4: CERP Progress 2015–2020 (Planning phase; local sponsor is the SFWMD unless otherwise noted.)

CERP PROJECT	PROGRESS 2015–2020	NEXT STEPS
CERP Lake Okeechobee Watershed Restoration Project	<ul style="list-style-type: none"> • Project Implementation Report (PIR) initiated July 2016 • Supplemental Draft PIR/EIS Released for Public, Agency, and Tribal Review July 2019 • Final PIR/EIS published August 2020 	<ul style="list-style-type: none"> • Anticipated release of Report of the Chief of Engineers for State, Agency, and Tribal Review in Fall 2020 • Anticipated execution of Pre-Partnership Credit Agreement in 2020 • Potential consideration by Congress in the 2020 or 2022 WRDA
CERP Loxahatchee River Watershed Restoration Project	<ul style="list-style-type: none"> • Completed the PIR-EIS March 2020 • Chief of Engineers Report signed April 8, 2020 	<ul style="list-style-type: none"> • Execute a PPA once project is authorized by Congress • Initiate design of project components • Complete exploratory borehole to test site hydrogeology for ASR well construction • Initiation C-18W Impoundment Design • Initiate FW 2 and FW 3 Design
CERP Western Everglades Restoration Project	<ul style="list-style-type: none"> • Project Implementation Report (PIR) initiated 2016 • Approval of Waiver #1 • Plan formulation, modeling and selection of tentatively selected plan • Consultation with the SFER Task Force in October 2019 • Partnering meetings and letters of support in January 2020 • Request for Waiver #2 	<ul style="list-style-type: none"> • Draft Environmental Impact Statement/Project Implementation Report • Release of Report of the Chief of Engineers for State, Agency, and Tribal Review • Report of the Chief of Engineers transmittal to the Secretary of the Army and the Congress for authorization consideration – estimated 2022

TABLE 2-5: CERP Progress 2015–2020 (New effort in next reporting cycle; local sponsor is the SFWMD unless otherwise noted.)

CERP PROJECT	PROGRESS 2015–2020	NEXT STEPS
CERP Biscayne Bay and Southeastern Everglades Ecosystem Restoration (BBSEER)	<ul style="list-style-type: none"> • Initiation, Development and Completion of Project Management Plan (PMP) for Yellow Book components BBB, FFF, HHH, WW, XX and OPE 2019 through May 2020 • Stakeholder engagements at SFER Task Force and Biscayne Bay Regional Restoration Coordination Team (BBRRCT) in April 2020 • Initiation of new planning study in 2020 	<ul style="list-style-type: none"> • Public scoping • Plan formulation • Tentatively Selected Plan (TSP) Milestone • Draft Environmental Impact Statement/Project Implementation Report • Release of Report of the Chief of Engineers for State, Agency, and Tribal Review • Report of the Chief of Engineers transmittal to the Secretary of the Army and the Congress for authorization consideration
CERP Southern Everglades	<ul style="list-style-type: none"> • Interagency review and planning meetings Spring 2020 	<ul style="list-style-type: none"> • Project Management Plan for Yellow Book components BB, CC, EEE, GG, QQ, S, U, YY, ZZ

TABLE 2-6: Additional Non-CERP Progress, 2015-2020 (completed)

NON-CERP PROJECT	PROGRESS 2015-2020	NEXT STEPS
Lake Trafford Restoration	<ul style="list-style-type: none"> • Completed and operational 	<ul style="list-style-type: none"> • Operations and Maintenance
<ul style="list-style-type: none"> • State project 		
Taylor Creek and Nubbin Slough: Lake Okeechobee Water Retention and Phosphorous Removal	<ul style="list-style-type: none"> • Completed and operational 	<ul style="list-style-type: none"> • Operations and Maintenance
<ul style="list-style-type: none"> • Critical Project • Joint Federal and State project 		

<p>West Palm Beach Canal STA-1 East/C-51 West</p> <ul style="list-style-type: none"> • Foundation Project • Joint Federal and State project 	<ul style="list-style-type: none"> • Completed and operational • Completion of culvert repairs in 2016 	<ul style="list-style-type: none"> • Operations and maintenance • Initiation of construction of the STA-1E Cells 5 and 7 repair under State of Florida’s Restoration Strategies (see below)
<p>C-111 South Dade Project</p> <ul style="list-style-type: none"> • Foundation Project • Joint Federal and State project 	<ul style="list-style-type: none"> • Construction contracts complete in 2020 • Completed Northern Detention Area and modifications to South Detention Area (Contract 8) • Construction of, plugging of L-31W Canal, rebuilding L-31W Levee and integrated weir, and monitoring stations (Contract 9) • Completed a Post Authorization Change Report to replace the existing temporary S-332B and S-332C pump stations with permanent pumps stations and concrete outlets and recommend cost-share of OMRR&R 	<ul style="list-style-type: none"> • Operations and maintenance. Operations defined in Combined Operations Plan (COP) in conjunction with Modified Waters features • Execute a PCA Amendment once PACR is authorized and funds appropriated by Congress • Initiate design and construction of permanent S-332B and S-332C pump stations and concrete outlets
<p>Modified Water Deliveries to Everglades National Park (MWD)</p> <ul style="list-style-type: none"> • Foundation Project • Joint Federal and State project • Operations defined in Combined Operational Plan (COP) 	<ul style="list-style-type: none"> • Increment 1 operational field testing of S-356 and G-3273 relaxation while incrementally raising the L-29 Canal stage was initiated in October 2015. • Increment 1.1/1.2 was implemented in February 2017. • Construction of 8.5 SMA was completed February 2018. • Increment 2 was implemented in March 2018. • Increment 3, COP, was implemented in August 2020. 	<ul style="list-style-type: none"> • Operations and Maintenance

<p>Seminole Big Cypress Reservation Water Conservation Plan</p> <ul style="list-style-type: none"> • Joint Federal and Tribal project 	<ul style="list-style-type: none"> • Completed and operational • Construction contract for Basin 2 was completed in 2017. • Basin 3 lands and associated construction features were removed from the plan for the authorized project in August 2018. 	<ul style="list-style-type: none"> • Operations and Maintenance
<p>Southern Corkscrew Regional Ecosystem Watershed</p> <ul style="list-style-type: none"> • Critical Project • Joint Federal and State project 	<ul style="list-style-type: none"> • Completed and Operational 	<ul style="list-style-type: none"> • Operations and Maintenance
<p>Ten Mile Creek Water Preserve Area</p> <ul style="list-style-type: none"> • State project 	<ul style="list-style-type: none"> • Completed and Operational • SFWMD completed rehabilitation of reservoir in June 2017 to allow a 4-foot fill in the reservoir to elevation +22.0 ft. NGVD29 	<ul style="list-style-type: none"> • Operations and Maintenance

TABLE 2-7: Additional Non-CERP Progress, 2015-2020 (under construction/in progress)

NON-CERP PROJECT	PROGRESS 2015–2020	NEXT STEPS
<p>Herbert Hoover Dike Major Rehabilitation Project and Dam Safety Modification Study</p> <ul style="list-style-type: none"> • Federal Project • Lake Okeechobee operations study, Lake Okeechobee System Operations Manual (LOSOM), ongoing 	<ul style="list-style-type: none"> • Dam Safety Modification Study approved 2016 • Since 2015, completed the replacement of 17 water control structures (culverts) • Awarded construction contracts for the remaining 11 scheduled culvert replacements • Awarded construction contracts for the remaining 35.2 miles of scheduled cutoff wall installation • Initiation (2019) and plan formulation (2020) of LOSOM 	<ul style="list-style-type: none"> • Completion of all culvert replacements by 2022 • Completion of all cutoff wall construction by 2022 • Completion of Herbert Hoover Dike Rehabilitation by 2022 • LOSOM - Evaluation of alternative lake schedules (2020-2021) with the anticipated completion of study in late 2022

<p>Kissimmee River Restoration</p>	<ul style="list-style-type: none"> Federal Project 	<ul style="list-style-type: none"> Completed construction of contract (CNT) 18A S-65EX1 Structure in 2015 Completed construction of CNT 15B River Acres Canal in 2015 Completed construction CNT 10B MacArthur Ditch Backfill in 2016 Completed construction CNT 12 Reach 3 Backfill in 2017 Awarded construction CNT 10 Reach 2 Backfill in 2016 Awarded construction CNT 12A S-69 Weir and Reach 3 Backfill Repairs Awarded and completed construction CNT12B Reach 3 North Backfill Repairs 	<ul style="list-style-type: none"> Complete final construction contracts - CNT 10 Reach 2 Backfill and CNT 12A S-69 Weir construction in late 2020/spring 2021 Complete Kissimmee Headwaters Schedule Environmental Assessment and Record of Decision Initiate System Five-year Monitoring Program and operational transition plan in 2021
<p>Lakeside Ranch STA</p>	<ul style="list-style-type: none"> State of Florida 	<ul style="list-style-type: none"> Components completed outside of CERP by the SFWMD Phase I (northern STA and S-650 pump station) operational since 2013 Phase II (southern STA) operational since 2019 Phase III (S-191A pump station) under construction 	<ul style="list-style-type: none"> Continue O&M for completed STA portions, with some restrictions, as structure automation and telemetry is currently in process Under Phase III, construction of the S-191A pump station to be completed by April 2021
<p>Restoration Strategies</p>	<ul style="list-style-type: none"> State of Florida 	<ul style="list-style-type: none"> Construction of L-8 FEB completed Modification/construction of three primary conveyance features (S-5AS, L-8 divide structure, and S-375) completed Land acquisition for the STA-1W Expansions completed STA-1W Expansion #1 construction completed Construction of the STA-1E Cells 5 and 7 repairs initiated 	<ul style="list-style-type: none"> Initiation of construction for the G-341 conveyance improvements Initiation of construction of STA-1W Expansion #2 Design completion of the C-139 FEB (11,000 acre-feet of storage) Initial flooding and optimization period for STA-5/6 internal improvements

	<ul style="list-style-type: none"> • A1 FEB operational monitoring and testing period completed • Design for C-139 FEB initiated • Construction of the STA-5/6 Internal Improvements completed • Restoration Strategies Science Plan updated 	
<p>Tamiami Trail Next Steps Project</p> <ul style="list-style-type: none"> • National Park Service • State of Florida 	<ul style="list-style-type: none"> • Authorized in the Consolidated Appropriations Act of 2012 (Public Law 112-74) • Construction of 2.6-mile bridge completed June 2019. • Design underway for raising roadbed, installing 6 small bridges and adding stormwater treatment swales 	<ul style="list-style-type: none"> • Operations of 2.6-mile bridge included in the Combined Operations Plan (COP) • Design- build contract to raise of 6.5 miles of roadway initiated • Construction of roadway raising to be complete January 2024, construction closeout expected April 2025.

Please see the summary of accomplishments in **Figure 2-1**.



2015 2020 MOMENTUM AND THE MILESTONES

The array of efforts and coordination between federal, state and local partners and stakeholders to move Everglades restoration forward is immense – as is the range of expertise required across all phases of the project delivery process. Although “Plan – Design – Build – Operate – Monitor – Adapt” is a simple way to refer to a very integrated and complex process, these milestones do allow us to take a brief pause, whether informally in a status report or formally with a ceremony, to recognize those that have contributed to the current milestone and those who will contribute to the next. Records of these milestones are yet another way to tell a story of restoration coordination and dedication that is making the vision of a healthy Everglades a reality.

NON-CERP MILESTONES

CERP MILESTONES

C-111 SOUTH DADE (C-111 SD)

- All construction contracts completed
- Post-Authorization Change Report to replace the existing temporary S-332B and S-332C pump stations with permanent pumps stations and concrete outlets completed
- Combined Operations Plan (COP) for C-111 SD and Modified Water Deliveries to Everglades National Park (MWD) recommended plan and water control plan update completed

HERBERT HOOVER DIKE (HHD) MAJOR REHABILITATION PROJECT AND DAM SAFETY MODIFICATION STUDY

- Replacement of 17 water control structures (culverts)
- Construction contracts for the remaining 11 culvert replacements awarded
- Construction contracts for the remaining 35.2 miles of cutoff wall installation awarded
- Initiation, scoping and plan formulation of Lake Okeechobee System Operations Manual (LOSOM), a new Lake schedule/revised water control plan

KISSIMMEE RIVER RESTORATION PROJECT

- Construction completed for:
 - S-65EX1 Structure
 - River Acres Canal
 - MacArthur Ditch Backfill
 - Reach 3 Backfill
 - Reach 3 North Backfill Repairs
- Construction of Reach 2 Backfill awarded
- Construction of S-69 Weir and Reach 3 Backfill Repairs awarded

LAKESIDE RANCH STORMWATER TREATMENT AREA (STA)

- Operation of Phase II, southern Stormwater Treatment Area (STA)
- Construction of Phase III, S-191A pump station, initiated

MODIFIED WATER DELIVERIES TO EVERGLADES NATIONAL PARK (MWD)

- All construction contracts completed
- Operational field testing of S-356 and G-3273 relaxation while incrementally raising the L-29 Canal stage initiated under Increment 1
- Operational Increment 1.1/1.2 implemented
- Operational Increment 2 implemented
- Combined Operations Plan (COP) for C-111 SD and MWD recommended plan and water control plan update completed

RESTORATION STRATEGIES

- Construction and the Operational, Testing, and Monitoring Phase (OTMP) of A-1 Flow Equalization Basin (FEB) completed
- Construction and OTMP of L-8 FEB completed
- Modification/construction of three primary conveyance features (S-5AS, L-8 divide structure, and S-375) completed

TAMIAMI TRAIL NEXT STEPS PROJECT

- Construction of 2.6-mile bridge completed

TEN MILE CREEK WATER PRESERVE AREA

- Rehabilitation of reservoir to allow a 4-foot fill
- Operations of water preserve area and STA

WEST PALM BEACH CANAL STA-1 EAST/C-51 WEST

- Culvert repairs completed

BISCAYNE BAY COASTAL WETLANDS, PHASE 1

- Operation of L-31E Interim Pump for early benefits in coastal wetlands and Biscayne Bay
- Installation of all L-31E Flow-way culverts completed
- L-31E Contract 4 awarded for L-31E flow-way

BROWARD COUNTY WATER PRESERVE AREA

- Construction of Mitigation Area A Berm completed

C-111 SPREADER CANAL WESTERN PROJECT

- Installation and operation of additional pump capacity at S-199 and S-200 completed
- Connection of the C-222 Header Channel to the L-31W Canal (via the G-737 culvert) completed

CALOOSAHATCHEE RIVER (C 43) WESTERN BASIN STORAGE RESERVOIR PROJECT

- Award for S-470 Intake Pump Station Contract
- Award for final contract for Embankment and Civil Works
- Construction of the S-476 Irrigation Pumping Station completed

CERP EVERGLADES AGRICULTURAL AREA PROJECT

- Design and early construction of the A2 STA initiated
- Design of the EAA A-2 Reservoir

CENTRAL EVERGLADES PLANNING PROJECT

- Construction of S-333N spillway (1,150 cfs) completed
- Removal of Old Tamiami Trail Road and S-346 initiated
- Construction of Contract 1 (S-631, S-633 water control structures, L-67A Spoil Removal, and L-67C Levee Gap) initiated

DECOMPARTMENTALIZATION PHYSICAL MODEL (DPM)

- Years 3 and 4 of Phase I Testing during dry seasons (flow testing) completed
- Approval for Phase II year round testing
- Years 5, 6, and 7 of Phase II testing completed

INDIAN RIVER LAGOON SOUTH, PHASE 1

- Construction of C-44 STA discharge spillway completed
- C-44 STA initial fill initiated
- Construction of C-44 Reservoir Pump Station completed
- Design for C-23/24 North Reservoir, South Reservoir, and STA

PICAYUNE STRAND RESTORATION PROJECT

- Construction of Faka Union Pump Station completed
- Removal of 100 miles of roadways completed
- Construction of Miller Pump Station completed
- Removal of 65 miles of road and 26 miles of logging trams between Merritt and Faka Union Canals completed
- Construction of Manatee Mitigation Feature completed
- Construction of East-west canal plugging



Images: Indian River Lagoon, South, Phase 1 Ribbon Cutting Event (activating the pumps at the C-44 Storm Water Treatment Area)

Figure 2-1: Accomplishments during the reporting period 2016–2020.

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2.1 Project Synopses

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

2.1.1 Aquifer Storage and Recovery (ASR) Pilot Projects/Regional Study – CERP

The CERP envisioned use of ASR wells to store volumes of water in the 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 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 USACE and along the Hillsboro Canal in central Palm Beach County by the SFWMD. Results obtained from these ASR pilot projects demonstrated 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). ASR has been included as a component in planning projects for the Loxahatchee River Watershed Restoration and the Lake Okeechobee Watershed Restoration.

2.1.2 Biscayne Bay Coastal Wetlands (BBCW) Project, Phase 1 – CERP

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 three components (Deering Estate, Cutler Wetlands and the L-31E Flow-way) to redistribute surface water into Biscayne Bay. The SFWMD has completed construction of the Deering Estate features and the L-31E culverts and is currently updating the design for the Cutler Wetlands component. The USACE is nearly complete with design of the remaining L-31E features, which will be constructed by the USACE during the next reporting period.

2.1.3 Biscayne Bay and Eastern Everglades Restoration (BBSEER) — CERP

This CERP planning study will include components of C-111 Spreader Canal West and Biscayne Bay Coastal Wetlands phase II. The purpose of the project is to improve the quantity, quality, timing, and distribution of freshwater to Biscayne Bay, including Card Sound and Barnes Sound and Biscayne National Park; to improve of natural glades habitat in the Model Lands and Southern Glades; and to improve resiliency of these coastal habitats in light of sea level change. An explicit objective of this project is lowering the coastal salinity to the extent possible in the Bay and providing functional natural estuarine habitat. The yellow book components in the study will include Biscayne Bay Coastal Wetlands (OPE), Biscayne Bay Coastal Canals (FFF), C-111N Canal Project (WW), South Miami Dade County Reuse (BBB), West Miami Dade Reuse (HHH), and North Lake Belt (XX). The study began in late 2020. The final product will be an Integrated Project Implementation Report and Environmental Impact Statement, which will require authorization by Congress.

2.1.4 Broward County Water Preserve Areas (BCWPA) Project – CERP

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 was initiated by the USACE in Fiscal Year 2016. Most of the land needed for the project has already been acquired. Construction on the Mitigation Area A Berm of the C-11 Impoundment feature was completed in 2018. Construction of the remaining C-11 Impoundment features is scheduled to begin in 2022.

2.1.5 C-111 South Dade (C-111 SD) Project – Non-CERP

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 portions of the bay's health by reducing nearshore salinity. 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 was designed and constructed by the USACE. Lands needed for construction of the project have been provided by SFWMD. In addition to the incremental field tests that have been ongoing for the last several years, the final operating plan for this project was developed as part of the public process for the operational study called the "Combined Operational Plan" (COP) for the Mod Waters and C-111 projects, which was adopted by the USACE in late 2020. All construction contracts have been completed. A Post Authorization Change Report for the replacement of Pump Stations S-332B and S-332 C is anticipated to be completed in 2020. The replacement of the Pump stations is pending authorization.

2.1.6 C-111 Spreader Canal Western (C-111 SCW) Project – CERP

This CERP project reduces seepage losses from Everglades National Park and provides increased flows towards Florida Bay through Taylor Slough. The project provides for ecosystem restoration of freshwater wetlands, tidal wetlands, and coastal habitat by restoring more natural hydrology to the 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 constructed features are already showing positive ecological benefits to the Taylor Slough area, including the Cape Sable Seaside Sparrow habitat, by restoring more natural water conditions and flows.

2.1.7 Caloosahatchee River (C-43) Western Basin Storage Reservoir Project – CERP

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 provide incidental benefits 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 started on the dam embankment and associated water control structures in 2019. Construction of the intake pump station, embankment, and other civil works features is ongoing. It is scheduled to be complete in 2024.

2.1.8 Central Everglades Planning Project (CEPP) and CERP Everglades Agricultural Area (CERP EAA) Project – CERP

These two projects work together and are known as “CEPP” and “CERP EAA”. The goals of the CEPP and CERP EAA 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 and CERP EAA combine several CERP components extending from Lake Okeechobee down to Everglades National Park into two comprehensive projects that include water storage, water quality treatment, conveyance, and decompartmentalization (the removal of levees and canals) in the heart of the Everglades. The primary features of CERP EAA include the A-2 Reservoir (known as the EAA Reservoir) and A-2 Stormwater Treatment Area to divert, store, and treat Lake Okeechobee and watershed regulatory releases. These are paired with CEPP's conveyance features to deliver and distribute existing flows and the redirected Lake Okeechobee and watershed 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. The CEPP has many components which are grouped into CEPP South, CEPP North and CEPP New Water. Together, CEPP and CERP EAA will increase fresh water to the northern extents of the Greater Everglades by an average annual estimate of 370,000 acre-feet per year.

In section 1308(a) of the WRDA of 2018, Congress authorized the project for ecosystem restoration, Central and Southern Florida, Everglades Agricultural Area, Florida in accordance with section 601 of the Water Resources Development Act of 2000, as recommended in the addendum to the SFWMD Section 203 Study, Feasibility Study and Draft Environmental Impact Statement prepared by the SFWMD and dated May 2018, with such modifications as the Secretary of the Army considers appropriate. The final recommendation is contained in the Section 1308(b) of Water Resources Development Act of 2018 Report to Address Concerns, Recommendations, and Conditions Identified in the Assistant Secretary of the Army for Civil Works (ASA(CW)) Review Assessment, completed with the Record of Decision in May of 2020.

2.1.9 Herbert Hoover Dike Major Rehabilitation Project and Dam Safety Modification Study – Non-CERP

Lake Okeechobee is a 730-square mile lake that is surrounded by the 143-mile long Herbert Hoover Dike (HHD). The dike is currently being rehabilitated due to safety concerns. During the reporting period the USACE continued work on 32 federal water control structures, also known as culverts, which are considered to be the greatest threat to the dike due to loss of material into and around them. Replacing these structures is the current priority. To date, the USACE has taken action on all 32 of the culverts: one

was removed, three abandoned, seventeen were replaced, and eleven are under contract for replacement. Work on all culverts is scheduled to be complete by 2022.

In August 2016, the Dam Safety Modification Report (DSMR) was approved and includes the final risk reduction feature needed to bring HHD within tolerable risk guidelines. The work includes 28.5 miles of cutoff wall construction between Lake Harbor and Moore Haven and around Lakeport. Additional remediation includes embankment armoring at the State Road 78 Bridge crossing the Harney Pond Canal along with embankment armoring adjacent to the S-71 and S-72 water control structures.

Construction was completed to close the gaps in the 21.4 miles of the Reach 1 cutoff wall from Port Mayaca to Belle Glade. Construction on the 6.6-mile extension of the cutoff wall from Belle Glade to Lake Harbor is ongoing. The Dam Modification Cutoff Wall Multiple Award Task Order Contract (MATOC) was awarded to three contractors in January 2019. Four task order contracts including 24.4 miles of cutoff wall construction have been awarded through January 2020 with the final 4.1-mile task order awarded in May 2020. The three embankment armoring contracts are all scheduled to be awarded in 2020 with completion of all HHD construction contracts by 2022.

State of Florida contributed \$100M to help accelerate the completion of Herbert Hoover Dike from 2025 to 2022. Also, supplemental Long-Term Disaster Recovery Investment Plan (LDRIP) funds provided a total \$514M for HHD to fully fund construction to completion in 2022. The operational criteria for Lake Okeechobee are being updated to coincide with the completion of the HHD rehabilitation project, described below in the **Lake Okeechobee System Operations Manual – Non-CERP** section.

2.1.10 Indian River Lagoon South (IRL-S) Project – CERP

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. Current efforts are focused on completing the construction of the C-44 Reservoir and STA and the design effort for the C-23/24 reservoirs and STA component. The USACE completed construction of the C-44 Intake Canal (C-400) and is expected to complete the reservoir construction in 2021. The SFWMD has completed construction of the S-401 pump station that will serve the C-44 Reservoir and the S-404 STA Discharge structure. SFWMD has initiated hydration of 4 of the 6 planned STA cells, and expects to complete construction on the facility in late 2020. The USACE has initiated design of the C-23/24 components and expects to issue the construction contract for the C-23/C-24 STA in late 2021, and for the north reservoir in 2022. The overall project will reduce 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.

2.1.11 Kissimmee River Restoration (KRR) Project – Non-CERP

When completed, this project will have restored more than 40 square miles of river-floodplain ecosystem, including almost 29,000 acres of wetlands and 43 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 floodplain habitat; 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 USACE 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 70 percent complete with approximately 30 miles of river and 20,000 acres of floodplain physically 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 provide incidental improvements to water quality in the basin through the natural uptake of nutrients in the water. The remaining 9 miles of canal backfilling will be completed in 2021, achieving the restoration of the physical integrity of the system. The implementation of the Headwaters Revitalization Schedule for Lake Kissimmee after completion of construction will restore functional integrity of the system, setting the hydrologic conditions for habitat restoration. The final step, in the path to full restoration, is implementation of post restoration monitoring activities to measure the changes in biological integrity of the system and progress towards meeting the full project benefits.

2.1.12 Lake Okeechobee Watershed Restoration Project (LOWRP) – CERP

This CERP project covers approximately 1,450,000 acres, primarily located north of Lake Okeechobee, and includes Lake Okeechobee and the Caloosahatchee and St. Lucie estuaries. Through addition of shallow above ground storage, Aquifer Storage and Recovery (ASR) wells, and wetland restoration features, the Recommended Plan would improve operational flexibility in Lake Okeechobee to address variability in wet and dry environmental conditions. The infrastructure and operational flexibility provided will result in improved water levels in Lake Okeechobee; improved quantity and timing of discharges to the St. Lucie and Caloosahatchee estuaries; improved water supply for existing legal users of the Lake Okeechobee Service Area (LOSA); and increased spatial extent and functionality of terrestrial and littoral wetlands. The PIR for LOWRP was initiated in 2016 and the Final EIS/PIR was published by the USACE in August of 2020. Depending on timing and the result of the State and Agency Review and Chief of Engineers Report, the LOWRP may be considered by Congress in the 2020 or 2022 WRDA.

2.1.13 Lake Okeechobee ASR Wells – CERP

The Lake Okeechobee Watershed Restoration Project (LOWRP) Aquifer Storage and Recovery (ASR) Wells are a component of the LOWRP parent project advanced by the SFWMD after the Tentatively Selected Plan milestone. The LOWRP is described in Section 2.1.12 above. The state expedited the design of ASR wells located in clusters in various locations throughout the Lake Okeechobee watershed. The LOWRP ASR wells are anticipated to be constructed by SFWMD in incremental phases following the recommendations of an Independent External Peer Review panel and the National Academies of Science report.

2.1.14 Lake Okeechobee System Operations Manual – Non-CERP

The LOSOM effort is re-evaluating Lake Okeechobee operations to coincide with the completion of Herbert Hoover Dike (HHD) rehabilitation in 2022. The goal of the LOSOM effort is to incorporate flexibility in Lake Okeechobee operations, while balancing the congressionally authorized project purposes for flood control, water supply, recreation, navigation, environmental effects to fish and wildlife, and cultural and recreational resources. The LOSOM effort will also consider the future

Comprehensive Everglades Restoration Plan (CERP) infrastructure that will provide additional flexibility in the C&SF system. The LOSOM objectives are to manage risk to public health and safety, life and property; Continue to meet authorized purposes for navigation, recreation and flood control; Improve water supply performance; and Enhance ecology in Lake Okeechobee, northern estuaries and across the south Florida system. The result of the LOSOM effort will be a new water control plan (operating criteria) for Lake Okeechobee and the accompanying National Environmental Policy Act (NEPA) documentation in late 2022 to coincide with the rehabilitated Herbert Hoover Dike.

2.1.15 Lake Trafford Restoration Project – Non-CERP

Lake Trafford, the largest natural lake south of Lake Okeechobee, serves as an important ecotourism resource for recreational boating and fishing. This completed, State, project removed muck and exotic aquatic vegetation and restored native submerged aquatic vegetation. The results have been successful with improvement in the overall health and condition of the lake that has led to increased fish and wildlife productivity. The project is in the operations and maintenance phase.

2.1.16 Lakeside Ranch Stormwater Treatment Area Project – Non-CERP

Led by the State of Florida and SFWMD, 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. Additional work to circulate water from Lake Okeechobee via the construction of a new pump station is ongoing.

2.1.17 Loxahatchee River Watershed Restoration Project (LRWRP) – CERP

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. The PIR-EIS was completed in 2020 with a Chief of Engineers report signed in April 2020. The Recommended Plan would deliver 98% of the wet season restoration flow target and 91% of the dry season restoration flow target for the Northwest Fork of the Loxahatchee River. The Recommended Plan also improves wetland hydrology in the Pal-Mar natural area complex and restores 17,000 acres of various types of agricultural land that are part of the historical Greater Everglades. An additional 10,000 acres of natural areas are improved in the J.W. Corbett Wildlife Management Area, Loxahatchee Slough, and Kitching Creek. These habitats collectively include a unique mix of ridge and slough, mesic and wet flatwoods, wet prairie, cypress floodplain, cypress strand, dome swamps, depression marsh, mesic and hydric hammock plant communities. The restoration actions also improve connectivity for over 78,000 acres of natural areas and restored wetlands that benefit many species of flora and fauna both endangered and important recreational species.

2.1.18 Melaleuca Eradication and Other Exotic Plants Project – CERP, System wide

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 USACE 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, it is providing system wide benefits.

2.1.19 Modified Water Deliveries to Everglades National Park Project (MWD) – Non-CERP

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; and 4) 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 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.

Since 2015, the USACE has implemented a series of deviations to test different operating plans' performance. At the same time, they initiated planning for the **Combined Operational Plan (COP)** to replace ERTP. A multi-year planning process was completed, and implementation of the Combined Operational Plan began in August 2020. The COP water control plan incorporates constructed features of the Mod Waters and C-111 South Dade projects and will increase water levels and flows into Northeast Shark River Slough by 28% while maintaining flood protection to eastern developed areas through pumping of underground water lost through seepage back into the park. Flows to ENP will follow the newly developed Tamiami Trail Flow Formula, which is based on stages in WCA 3 and ENP, forecasted rainfall, evapotranspiration, and the prior week's flows from WCA 3A to ENP. The COP's Tamiami Trail Flow Formula achieves the long-term restoration goal and improves upon the 1980s Rainfall Plan, achieving the hydrologic objectives of: 1) delivering surface water flow that resembles more natural processes; 2) delivering surface water flows in a more gradual rate change; and 3) spatially distributing surface water flow across Shark River Slough. It also eliminates bypasses of NESRS during routine operations but may be implemented during Extreme High-Water Events.

2.1.20 Picayune Strand Restoration Project (PSRP or Picayune) – CERP

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, Collier Seminole State 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 by the SFWMD. Since then, the USACE has been leading much of the construction of the major pump stations, road removal, and canal plugging. The SFWMD has constructed the manatee mitigation features in the lower part of the project and the USACE has finished the pump station construction. The remaining work includes the Southwest Protection Features; road removal; and Miller and Faka Union Canal plugging will be completed by the USACE. An LRR is was completed in 2016 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. 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 in FY2024.

2.1.21 Restoration Strategies (RS) – Non-CERP

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 implemented an \$880 million technical plan to complete several projects that will create more than 6,500 acres of new STAs and 110,000 acre-feet of additional water storage through construction of Flow Equalization Basins (SFWMD 2012). The Restoration Strategies projects are a state responsibility and work in conjunction with existing STAs to achieve compliance with State of Florida water quality standards. Work is well underway with six of thirteen projects complete as of 2020. All projects are scheduled to be completed by December 2025, with water quality compliance monitoring once the projects come online.

2.1.22 Seminole Tribe Big Cypress Reservation Water Conservation Plan – Non-CERP

The intent of this project is to rehydrate wetlands, improve water quality on an incidental basis, 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 incidental water quality benefits from the settling of nutrients. Construction was completed on Basins 1, 2, and 4; Basin 3 features will not be constructed and were removed from the project. 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 the project.

2.1.23 Site 1 Impoundment Project – CERP

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. The Phase 2 features include the 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 was completed in 2016. Phase 2 work has not been scheduled at this point.

2.1.24 Southern Corkscrew Regional Ecosystem Watershed Project (CREW) – Non-CERP

This project will restore historical sheetflow in the project area and reduce 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.

2.1.25 Southern Everglades – CERP

This study will improve water deliveries to Everglades National Park including nearshore areas of Florida Bay through comprehensive seepage management along the eastern border of the Water Conservation Areas, further improvements in marsh, overland flow within the Greater Everglades, and storage features to provide carryover capacity to supplement dry season flows into Everglades National Park at the eastern border with Tamiami Trail. The study will include yellow book components BB - Dade Broward Levee/Pennsuco Wetlands; CC - Broward County Secondary Canal System; EEE - Flows to eastern Water Conservation Area; GG - Lake Okeechobee Aquifer Storage and Recovery (additional phase); QQ - Decentralization of Water Conservation Area 3 (additional phase); S - Central Lakebelt Storage Area; U - Bird Drive Recharge Basin; YY - Divert WCA2 flows to Central Lake Belt Storage; and ZZ - Divert WCA3 flows to Central Lake Belt Storage Area.

2.1.26 Tamiami Trail Next Steps Project – Non-CERP

The Phase 1 project provides an additional 2.3 miles of bridging west of the one-mile bridge already completed under the Mod Waters project. The Phase 2 project will raise the remaining roadway, and add six smaller bridges to allow higher water levels and improve flow distributions in adjacent canals and increase flows southward into the Northeast Shark River Slough basin of 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 signed an agreement for construction of the project with the Florida Department of Transportation (FDOT) and Federal Highway Administration (FHWA) in 2015. The FDOT completed construction on Phase 1 in 2019 and will oversee the Phase 2 construction. The

Governor of Florida initially committed \$90 million over three years to construct the 2.3-mile long bridges along the western section of the Tamiami Trail and raising 6.7 miles of roadway. The Phase 1 project had a total cost of \$97 million with \$20 million provided through a Transportation Investment Generating Economic Recovery (TIGER) grant from the FHWA. The Phase 2 project has an expected cost of \$100 million, with \$60 million coming from the Nationally Significant Federal Lands and Tribal Projects (NSFLTP) program grant from the FHWA. Initial design was completed in March 2020, and the FDOT advertise the project in April 2020. Construction is expected to begin in October 2020 and be substantially complete by November 2024.

2.1.27 Taylor Creek and Nubbin Slough: Lake Okeechobee Water Retention and Phosphorus Removal Project – Non-CERP

This project was constructed by the USACE 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 is in the operations and maintenance phase by SFWMD.

2.1.28 Ten Mile Creek Water Preserve Area Project – Non-CERP

This project includes an aboveground 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 turned over to the SFWMD as a state project in May 2016. In June 2017, rehabilitation of the Ten Mile Creek Reservoir was completed and repurposed as a state water preserve area. The project is in the operations and maintenance phase by SFWMD and providing benefits to the North Fork of the St. Lucie River.

2.1.29 Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement Physical Model (DPM) – CERP

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, a phase of which was authorized in the Central Everglades Planning Project. Construction of the design test features was completed in 2012 and operational testing has been underway from 2013 through 2020 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.

2.1.30 West Palm Beach Canal STA 1 East/C-51 West Project – Non-CERP

This project captures and treats stormwater runoff from urban and agricultural areas prior to release 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 USACE and has been transferred to the SFWMD for operations. Meanwhile, the USACE continues to repair numerous culverts throughout the project area that connect the various cells of the STA. These repairs were completed in 2016.

2.1.31 Western Everglades Restoration Project (WERP) – CERP

This study includes: the CERP Big Cypress/L-28 Interceptor Modifications component CCC; portions of the WCA-3A Decompartmentalization component QQ and RR; Seminole Tribe Big Cypress Water Conservation Plan OPE; and the Miccosukee Tribe Water Management Plan OPE. The study is aimed at re-establishing ecological connectivity of wetland and upland habitats in the western Everglades with restored freshwater flow paths, flow volumes and timing, seasonal hydroperiods, and historic distributions of sheetflow. The project would result in restoration of and sustainability of native flora and fauna, reduction in wildfires and promote system-wide resilience in light of future change, such as sea level rise and climate change. The study began in 2016, and working with stakeholders and state and federal agencies, the project team has identified a plan that will meet the objectives. The study was suspended from late 2019 to March 2020 due to concerns related to potential impacts on private properties, acceptability, and cost effectiveness. Because there is support for continuing the effort from The Seminole Tribe of Florida, The Miccosukee Tribe of Indians of Florida, DOI, BCNP, the USACE, and SFWMD will request a second waiver of the schedule and budget to complete the study by 2022. The project delivery team will be working with the National Park Service, the Tribes, landowners and the SFWMD to evaluate options to obtain the minimum real estate needed for the project.

2.2 Projects Currently Listed for De-authorization

The following projects that were conditionally authorized in WRDA 2000 have been previously listed for de-authorization due to lack of funding and activity. 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, de-authorization of these projects does not pose a problem at this time.

- Lake Belt In-ground Reservoir Technology (Pilot) - The BBSEER and Southern Everglades studies will evaluate how to achieve the intent of the benefits of this storage volume while acknowledging prior work to understand feasibility of the specific feature as described in the Yellow Book. See **TABLE 2-5**.
- North New River Improvements – capacity improvements needed to support flows south from Lake Okeechobee authorized in the EAA Reservoir project. See **TABLE 2-3**.
- Raise and Bridge East Portion of Tamiami Trail and Fill Miami Canal within WCA-3 – will be completed under the Next Steps projects with the National Park Service and Department of Transportation. See **TABLE 2-7**.
- Taylor Creek/Nubbin Slough Storage and Treatment Area – See **TABLE 2-6**.
- Wastewater Reuse Technology (Pilot) - The BBSEER study will evaluate how to achieve the intent of the benefits of this source water volume while acknowledging prior work to understand feasibility of the specific feature as described in the Yellow Book. See **TABLE 2-5**.

2.3 LAND ACQUISITION

In the last five years, the South Florida Water Management District (SFWMD), as an agency of the State of Florida and the Non-Federal sponsor for the U.S. Army Corps of Engineers has acquired lands needed for CERP. Since the inception of CERP, the SFWMD and the State of Florida have partnered with USDOJ, USDA, and local governments including St. Lucie, Martin, Palm Beach, Broward, Miami-Dade, and Lee counties, to acquire the lands needed for the CERP project – examples including the lands for the EAA

and C-43 Reservoirs. Final footprints needed for some projects have not yet been determined. In some cases, and to ensure the availability of lands needed for potential CERP project implementation, the SFWMD has moved forward acquiring potentially needed lands well in advance of project planning and design (i.e., the Lake Okeechobee watershed). 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% (250,956 acres) have been acquired as of December 31, 2019, leaving approximately 134,044 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.

TABLE 2-8 depicts land acquired between December 1, 2014, and December 31, 2019 by the SFWMD for Everglades restoration and other District projects. CERP project lands acquired totaled approximately 2,060 acres and are designated in the table below.

TABLE 2-8: Land Acquisition by Project (2015 – 2020)

PROJECT NAME	ACREAGE
Arch Creek	0.05
Biscayne Bay Coastal Wetlands – Phase 1 (CERP)	495.88
Broward County Water Preserve Areas (CERP)	275.40
C-4 Flood Mitigation	0.94
C-18	0.32
C-24	0.75
C-43 Basin Storage Reservoir – Part 1 (CERP)	0.69
C-51	21.36
C-111 South Dade	186.59
Critical CREW	0.74
East Coast Buffer	693.72
Central Everglades Planning Project – A-2 FEB (CERP)	498.97
Kissimmee River Restoration	1,071.00
L-8	2.51
L-16 (Bolles Canal Improvements)	24.80
Lake Hicpochee Hydrologic Enhancement, NEEPP	2,509.96
Lake Okeechobee & Estuary Recovery (LOER)	0.74
Palmar	1.00
Picayune Strand Restoration – Belle Meade (CERP)	772.09
Picayune Strand Restoration – Fakahatchee Strand State Park (CERP)	16.25

PROJECT NAME	ACREAGE
Shingle Creek	24.98
Southern Glades	4.33
Stormwater Treatment Areas	1,336.39
Water Conservation Areas	1.34
Zipper Canal	3.41
TOTAL	7,944.21

2.4 SCIENTIFIC INVESTIGATIONS

2.4.1 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 monitoring and research 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. The **REstoration, COordination, and VERification (RECOVER)** program, the scientific arm of CERP, ensures science remains a fundamental and overarching element throughout the planning, project implementation, and adaptive management of Everglades restoration. RECOVER coordinates the monitoring of ecological indicator species and physical conditions across the system, develops Performance Measures, and employs modeling and other tools to evaluate project alternatives and assess restoration progress. The RECOVER regions are depicted in **Figure 2-2**.

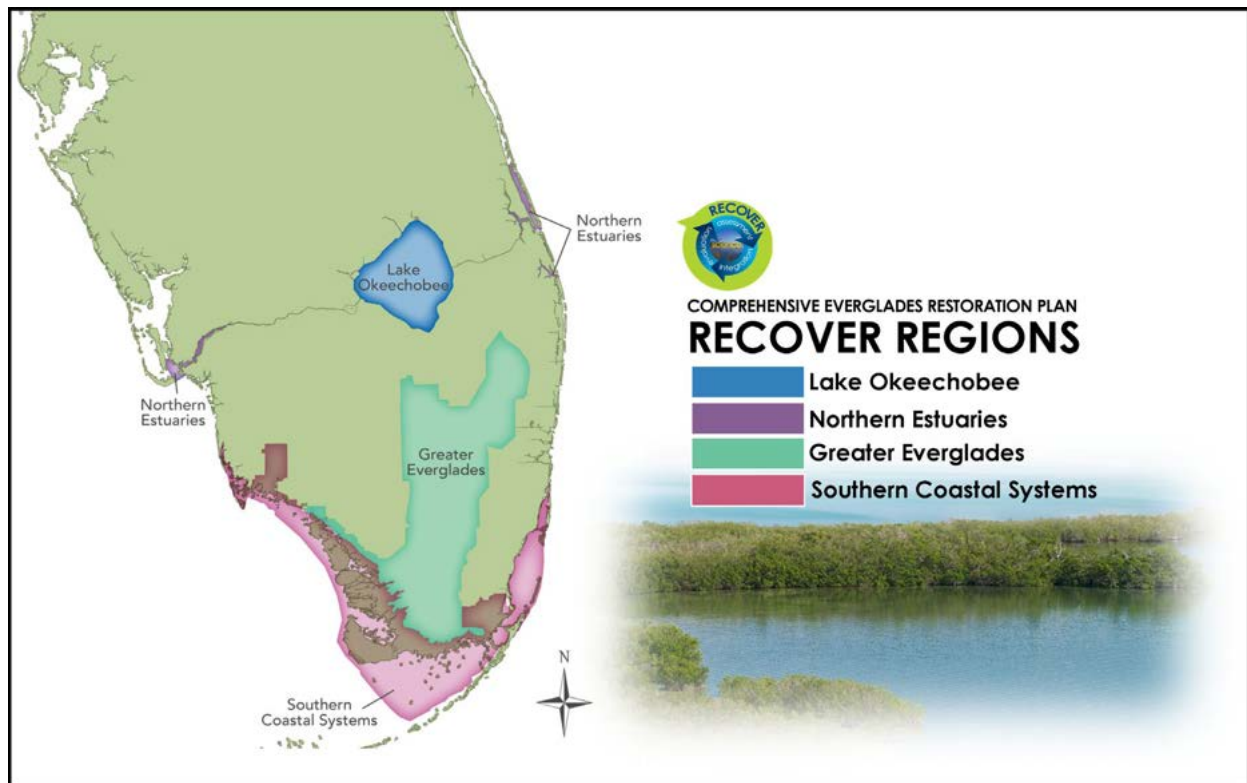


Figure 2-2: Map of RECOVER Regions.

2.4.2 Responding to Changing Ecosystem Needs: The Adaptive Management Program

WRDA 2000 authorized adaptive management as an important tool of CERP implementation. Adaptive management is a structured management approach that is rooted in science and helps achieve goals and objectives by addressing risks and uncertainties inherent to ecosystem restoration (RECOVER 2010). This is especially important 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 uses adaptive management at all project phases – planning, design, construction, and operations.

Project adaptive management and monitoring plans have been implemented for Biscayne Bay Coastal Wetlands Project, Phase 1 which modified project operations to gain the benefits predicted by the project. Field tests such as the DECOMP Physical Model use RECOVER information to establish monitoring that is being used to inform the design and implementation of CEPP South project features.

2.4.3 Monitoring to Determine the Health of the Everglades: The RECOVER System Status Report

During the reporting period, RECOVER produced the *2019 System Status Report (SSR)*, documenting updates from 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. As part of the 2019 SSR RECOVER, working with the University of Maryland Center of Environmental Science’s (UMCES) Integration and Application Network (IAN) team and many south Florida scientists, produced an ecosystem health report card for the Everglades to assess and synthesize environmental data to evaluate overall ecosystem condition, and with the purpose of delivering a concise communication tool for a more general audience. Report cards integrate large, complex datasets into an overarching score that’s easily understood by the public. The Florida Everglades report card reports on the status of the Everglades ecosystem from May 1, 2012–April 30, 2017 (dates which correspond to water years 2013– 2017). The report card provides a transparent and geographically detailed assessment of the Everglades status measured by the defined ecosystem indicators and performance measures of the CERP. The Everglades Report Card can be found at <https://evergladesecohealth.org/>

2.4.3.1 Events of Ecological Significance

Over the past five years several discrete events occurred that had a profound impact on the Everglades system. These include the seagrass die-off in Florida Bay, harmful algal blooms in the St. Lucie River and Estuary and Hurricane Irma’s impact to the whole system. Please see **Figure 2-3** below.

VISIBLE IMPACTS

Ecosystem impacts are not always readily observable – one of many reasons why thoughtfully planned monitoring is critical to restoration and the lives of those dependent on restoration success. At times, there are conditions that set off a chain of events that very visibly alter the ecosystem and the pace of restoration, reinforcing the need for South Florida Ecosystem Restoration projects and the flexibility they provide water management. Some of the events that had a profound impact on the Everglades system and habitat over the past five years are summarized below. (Images courtesy of the Audubon Society and South Florida Water Management District)

2015 SOUTHERN COASTAL SYSTEM FLORIDA BAY SEAGRASS DIE-OFF



Dead Seagrass in Florida Bay

PRECEDING CONDITIONS

Severe Precipitation Deficit WY2015/Early WY2016
Lack of Freshwater Flow into Bay
High Salinity Concentrations in Bay
Higher Bay Water Temperatures
Low Oxygen Concentration in Bay
Minimal Mixing in Bay Water Column



- Large die-offs observed (August 2015)
- Additional die-offs observed (October 2015)

Increased nutrients and turbidity resulting from decaying seagrass meadow and destabilized sediments fueled algal outbreaks in Central and Western Florida Bay nine months after the die-off began. The secondary impacts increased seagrass vulnerability further. High nutrient/chlorophyll conditions continued from April through December 2016.

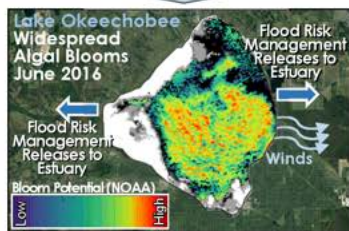
2015 - 2020 LAKE OKEECHOBEE | NORTHERN ESTUARIES HARMFUL ALGAL BLOOMS



Algal Blooms in Caloosahatchee Estuary*

PRECEDING CONDITIONS

High Rainfall
Nutrient Run-off from Watersheds Surrounding Lake and Estuary
Warm Temperatures
Long Hours of Daylight
Stagnant Conditions
Lake Releases to Estuaries for Flood Risk Management



- Although algal blooms occurred during each year of this reporting period, the summer of 2016 provides an example of the conditions that can spawn these events. June 2016 data indicated high levels of chlorophyll and detection of cyanobacteria in the Lake (June 14, 2016 NOAA cyanobacteria imagery overlaid on the map above).
- Prevailing winds and releases from Lake Okeechobee for Flood Risk Management sent algal blooms and nutrients into the estuaries. Coupled with nutrients from their watersheds, extensive algal blooms formed in the estuaries.

* Image courtesy of the Cavin Brothers.

2017 SYSTEM-WIDE IMPACTS HURRICANE IRMA



Tree Islands Severely Inundated

PRECEDING CONDITIONS

Extreme Dry Season
Extreme Wet Season



Lake Okeechobee

Water quality impacts (nutrients and turbidity) for several months following the storm may limit improvements in indicator status in near term.

Northern Estuaries

Inflows of freshwater suppressed salinity values, decimating oyster populations in the St. Lucie and Caloosahatchee estuaries. 2019 mapping indicates an oyster rebound.

Greater Everglades

Tree islands were excessively stressed by extreme 2017 dry and wet seasons, and hurricane-related inundation. Future stress is likely to adversely impact tree island vegetation.

Southern Coastal System

Storm surge and high winds damaged mangroves in the southwest coast, coral reefs in Biscayne Bay, and seagrass beds in Florida Bay. Examples of other impacts included severe declines in snook and bull shark populations in the southwest estuaries from increased freshwater flow, degraded water quality, and erosion.

Figure 2-3. Events of Ecological Significance, Visible Impacts, 2015–2020.

2.4.3.1.1 Seagrass Die-off in Florida Bay

In 2015, Florida Bay experienced a crisis where up to 20% of the seagrass meadow was lost. Thousands of acres of *Thalassia testudinum* died, leaving entire basins denuded and carpeted by decaying biomass. Florida Bay has one of the largest seagrass meadows in the world, which contributes to the diversity and productivity of its unique ecosystem. Seagrasses stabilize the shallow sea floor thereby preventing erosion along the coastline, act as nurseries for commercially important species, provide food and habitat for many endangered species, take up dissolved nutrients and serve many other important ecological and economic functions.

Submerged aquatic vegetation (SAV), composed of seagrass and benthic macroalgae, provides critical habitat, structure, food, and nutrient sequestration throughout Florida Bay. It is important to understand the causes and extent of the 2015 seagrass die-off, the rate of habitat recovery, and the potential of SFWMD's Florida Bay Initiative in the C-111 Basin to reduce the probability of future die-offs. When the 2015 die-off occurred, bay waters were clear and nutrient concentrations low. SAV densities had been increasing for many years (Hall et al. 2016; Cole et al. 2018). The cause of this die-off was the combination of high salinity, high temperatures, and low oxygen concentrations in the sediment. A severe precipitation deficit and lack of freshwater inflow during WY2015 and early in WY2016 led to unusually high salinities in June 2015 relative to long-term averages. Within central and western Florida Bay, salinities exceeded 70 PPT and water temperatures were 2–3 degrees Fahrenheit above average (Madden et al. 2017; Koch et al. 2007; Hall et al. 2016). Low oxygen concentrations, especially at night (Borum et al. 2005), a result of the lack of water column mixing and dense vegetation, created a further barrier to complete mixing and created a high nighttime respiratory demand. These factors pushed the system beyond a tipping point, resulting in rapid die-off. By August 2015, visual observations found large areas of dead seagrass within Garfield Bight and Rankin Lake. Mapping in October 2015 found additional die-off in parts of Whipray Basin, Rabbit Key Basin, and Johnson Key Basin.

An algal bloom developed in Florida Bay following the seagrass die-off. The bloom was concentrated in the Central and Western bays in WY2017, fed by nutrients released from decaying seagrass. The nutrient monitoring program shows Total Phosphorus (TP) concentrations below long-term averages prior to, during, and following the die-off, only increasing above average concentrations in April the following year, nine months after the die-off began. Chlorophyll a, (chl a) used by scientists as a proxy for estimating phytoplankton abundance and biomass in the water, increased almost immediately, concurrent with increasing TP. The high-nutrient high-chlorophyll condition lasted five months before returning to low background levels in December.

2.4.3.1.2 Harmful Algal Blooms

As shown in the Visible Impacts figure (**Figure 2-3**), algal blooms occurred in either Lake Okeechobee and/or the Northern Estuaries during each year of the reporting period. Algal blooms are naturally occurring, common in summer, and can appear in any body of water in the right environmental conditions. Blooms with cyanobacteria can produce harmful toxins and the blooms that occurred in the spring of 2016 and 2018 caused problems. Several factors combined to magnify the size and intensity of the blooms including elevated nutrient levels, warm temperatures, long hours of daylight, and stagnant conditions.

Wetter than normal conditions from November 2015 to May 2016 created a plankton bloom in Lake Okeechobee beginning in May 2016. June chlorophyll data, used by scientists to understand the abundance of phytoplankton biomass, indicated the presence of bloom level concentrations at widespread locations in the lake. As an example, concentrations of chlorophyll greater than 40 micrograms per liter are generally representative of a moderate bloom condition and normally visible to the unaided human eye. Most elevated chlorophyll levels (greater than 40) were found in the southern end of the lake and detection of microcystins in water samples confirmed a cyanobacteria bloom of the species *Microcystis aeruginosa*.

Runoff from the unusually high winter and spring rainfall in 2016 increased the water level of Lake Okeechobee. This prompted the release of water into the St. Lucie and Caloosahatchee estuaries to prevent flooding. Meanwhile, prevailing winds pushed the bloom east toward the entrance to the St. Lucie Canal, where it was carried into the St. Lucie Estuary. In the estuary, the nutrient- and bloom-laden releases from the lake combined with additional nutrients in runoff from the rest of the watershed, and algal blooms were observed throughout the estuary and several miles into the Atlantic Ocean. The first detection of microcystin toxin in the estuary occurred on June 20, 2016, and the last sample with toxin detected was on July 26, 2016.

As reported by many citizens and scientists in South Florida, the 2018 bloom in Lake Okeechobee had effects to the St Lucie and Caloosahatchee Rivers and Estuaries. Data is reported on Lake Okeechobee conditions by the Florida Department of Environmental Protection and shared with the public on their website: <https://floridadep.gov/AlgalBloom>.

2.4.3.1.3 Hurricane Irma

Hurricane Irma made landfall on the lower Florida Keys (Cudjoe Key) on September 10, 2017 (WY2018) as a Category 4 storm with 130 mph winds. The path of the eye crossed Florida Bay, and the storm made final landfall in Marco Island, FL, as a category 3 storm with 115 mph sustained winds. Peak storm surges of 3–6 ft above high tide levels occurred along the west coast 6–12 hours following the passage of the eye. Then Irma turned inland, weakened in strength, and was a tropical storm when it crossed into Georgia on September 11, 2017. Rainfall totals from the storm were 8”–10” across the peninsula.

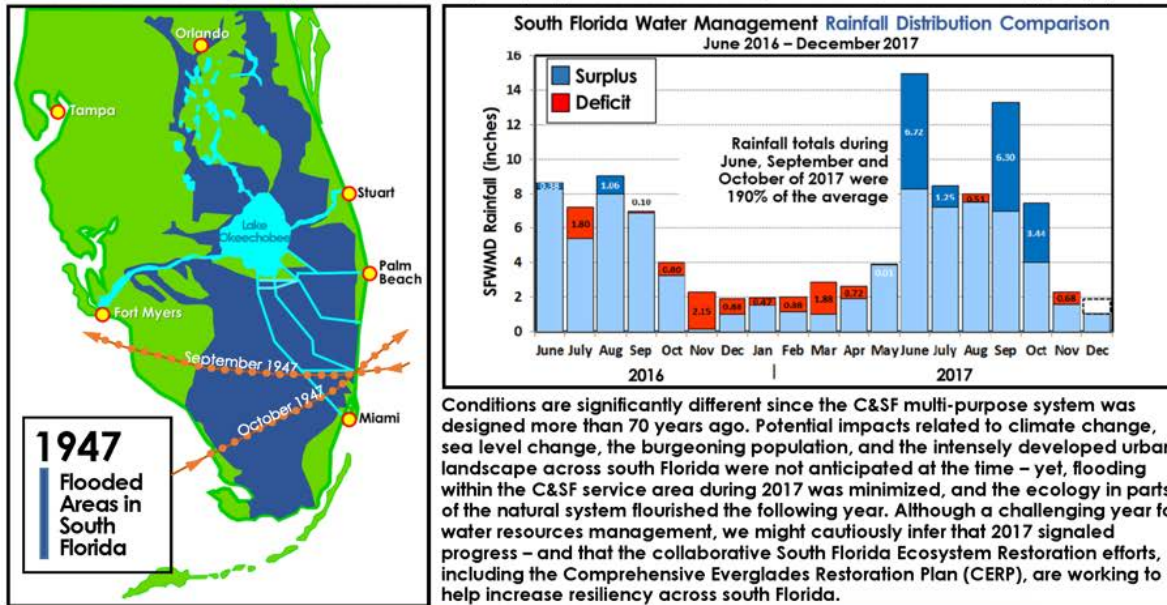
Hurricanes are part of the natural cycle in south Florida. The Everglades’ ecosystems are typically resilient to their effects, and past hurricanes provide insight into what to expect following Irma. Signs of ecological recovery appeared in the first months following the storm. However, Irma’s full impact will play out over an extended period.

Please see **Figure 2-4** and **Figure 2-5** below.

2017 A CHALLENGING WET SEASON ACROSS SOUTH FLORIDA

BACKGROUND

Rainfall within the South Florida Water Management District service area during the 2017 Wet Season was, overall, 151% of average – with the wettest June through October on record. As indicated in the chart below, rainfall totals during June, September and October of 2017 were 190% of average. In fact, the 2017 rainfall surplus exceeded that of 1947, the catastrophic year of storms and rainfall impacting south Florida and prompting authorization of the Central and Southern Florida (C&SF) system.



MOVING FORWARD

Climate change challenges are not likely to go away. Current projections and observed trends indicate a continuous increase in Earth's temperature beyond year 2100, resulting in altered rainfall patterns, increased sea levels, modified groundwater levels and soil moisture, and other significant impacts that affect water resources management.

The U.S. Army Corps of Engineers (USACE) climate change adaptation policy and guidance is currently applied at the project level across South Florida Ecosystem Restoration (SFER) implementation, as well as all mission areas. On a system-wide basis, additional change adaptation strategy for SFER might include:

- Incorporating climate change into how we currently measure restoration success on a system-wide basis to better understand how restoration activities and projects benefit overall resilience across south Florida.
- Implementing a C&SF Resiliency Study to reevaluate the resiliency of the C&SF system with newly observed and projected information and data available since the C&SF and CERP were authorized.
- Continuing to broaden our holistic perspective to fully understand, amidst change, the context in which restoration activities operate and to seek increasingly innovative and sustainable restoration solutions.

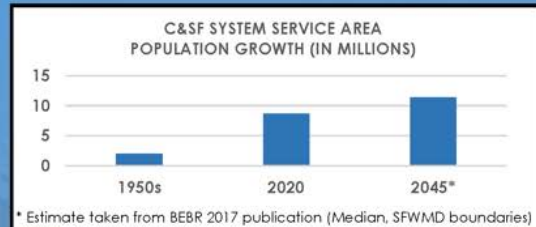


Figure 2-4: Events of Ecological Significance, Storms, 2015–2020.

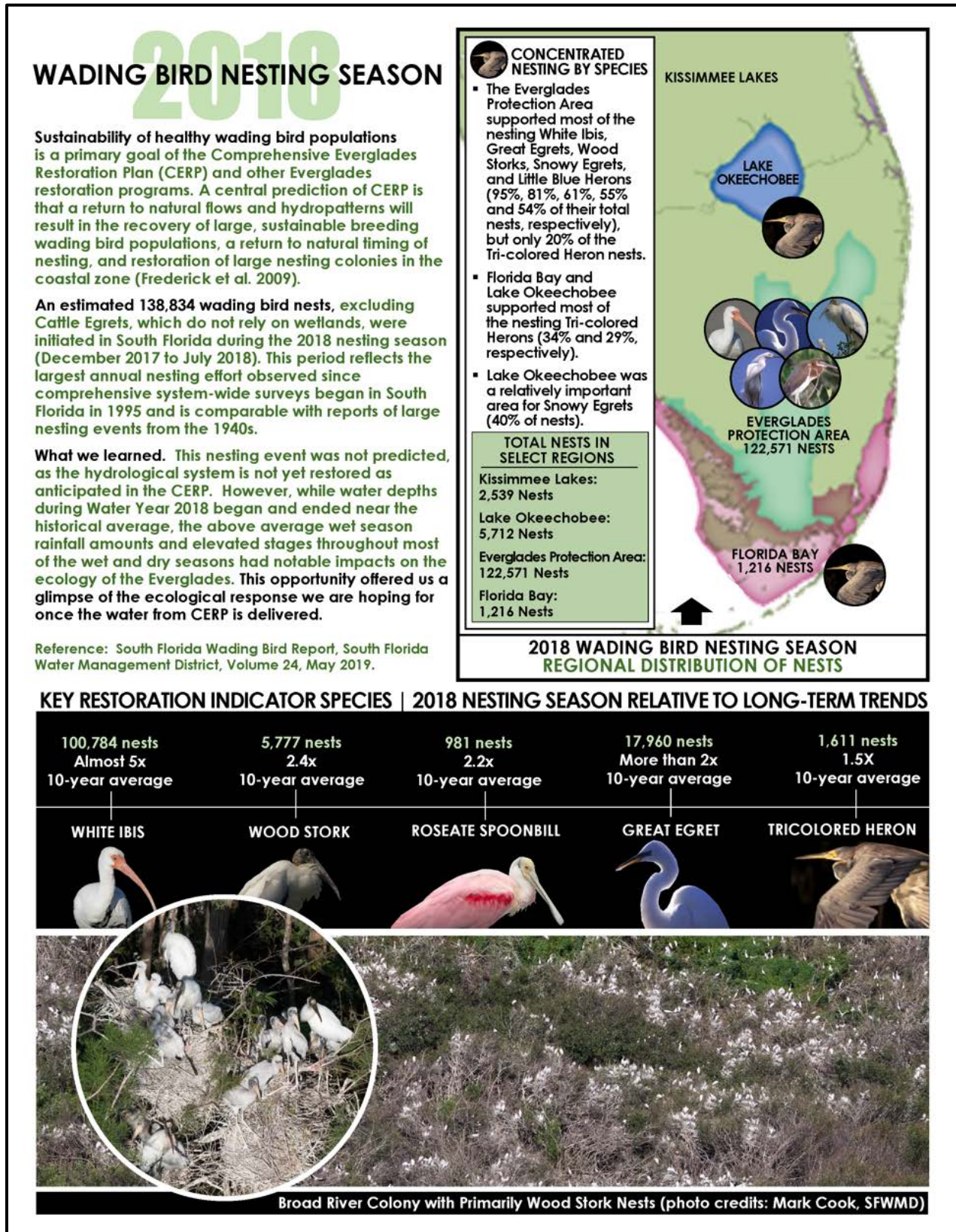


Figure 2-5: Events of Ecological Significance, Historic Wading Bird Nesting Season, 2017.

2.4.3.1.3.1 Lake Okeechobee

Hurricane Irma passed about 60 miles west of the lake with sustained winds in the central portion of the lake between 50 and 60 mph. These winds caused lake stages to increase over 6 feet in the north and west sides of the lake, while dropping stages more than 4 feet in the south and east sides of the lake; causing a wind seiche (a standing wave in an enclosed or partially enclosed body of water) of more than 10 feet from east to west at its peak. The enormous rainfall associated with the storm added nutrients to the water column. Total phosphorus inflows and resuspension from the sediments resulted in significant one-week increase in concentrations of Total Phosphorus in the nearshore zone and in the pelagic zone. Turbidity rose by orders of magnitude in the nearshore areas and the pelagic areas. Strong winds associated with cold fronts in January 2018 caused even further sediment resuspension, causing the highest turbidity levels since devastating hurricanes in 2004 and 2005. The combined physical effects of wave action and deep water, combined with poor water quality for months following the storm, reduce the likelihood that the indicator status of Lake Okeechobee will improve in the near term. Please refer to indicator status descriptions in the System Status Report sections of this report.

2.4.3.1.3.2 Northern Estuaries

Hurricane Irma brought heavy rainfall over the watersheds north of Lake Okeechobee and the watersheds of the Northern Estuaries. Runoff from the hurricane resulted in high inflows of freshwater from local basin runoff and Lake Okeechobee regulatory releases, as well as nutrients to the Northern Estuaries. The inflow of freshwater suppressed salinity values, decimating oyster populations in the St. Lucie and Caloosahatchee Estuaries. An extended wet dry season following Hurricane Irma kept salinities depressed in the system, and the usual spat fall that typically peaks in October/November was impacted, thus resulting in a delay in oyster recovery after this event. Since then, however, oyster have returned to the system, with adult oysters and spat present in monitoring samples, and with updated oyster mapping which took place in both estuaries in 2019.

2.4.3.1.3.3 Greater Everglades

Hurricane Irma created conditions in which more than 90% of the tree islands with data available were inundated. Water levels were already high in September 2017 due to the accumulated rainfall through the wet season. High rainfall from Irma pushed water depths in the freshwater wetlands of the Greater Everglades to record levels. 2017 was an extreme year, with a very dry season when more than 90% of tree islands remained dry. During the wet season 80% of the tree islands were inundated with a monthly average of 20 days of inundation. Several tree islands were hit hard by Hurricane Irma. A preliminary analysis of tree data collected at eight islands in Everglades National Park suggests high tree damage. When trees stressed by the hurricane experience drought or high-water conditions in the next few years, tree island vegetation is likely to be adversely affected.

2.4.3.1.3.4 Southern Coastal Systems

Storm surge and high winds were the predominant stressors that caused direct impacts in the Southern Coastal Systems (SCS) region. Along the southeast coast of Florida, north of Biscayne Bay, storm surge ranged from 2–4 feet; in Biscayne Bay, 4–6 feet of storm surge; in Florida Bay, 4–6 feet while some places measured 5–8 feet. The southwest coast of Florida from Whitewater Bay to Marco Island

received the strongest storm surge at 6–10 feet. Rainfall north and within the SCS Region was substantial ranging from 8.19–14.48 total inches of rainfall. High winds extensively damaged the mangroves along Florida’s southwest coast. Large trees across more than 51,200 hectares had leaves stripped from branches, broken canopies, and snapped stems, or were uprooted by wind. This exceeds the extent of damage caused by previous hurricanes to hit this area, notably Hurricane Andrew in 1992. An aerial survey of coastal conditions six months after Hurricane Irma indicates that there may be more patches of coastal mangrove forest where high rates of mortality occurred compared to previous storms.

Observations after Hurricane Irma revealed damage to the coral reefs near Biscayne Bay. Overall, impacts to benthic macrophyte communities from Hurricane Irma were limited in spatial extent. While the storm scoured some seagrass beds, a decline in seagrass density was only observed in some parts of northern Florida Bay. Acute indirect impacts associated with low salinity and dissolved oxygen from stormwater drainage occurred in the northern coastal basins of Florida Bay, particularly in Manatee Bay. Algal blooms with suspended solids-related turbidity subsequently formed and remained an issue in parts of western Florida Bay for at least a year following the storm. Snook and bull shark populations decreased or dropped to zero in the Lower Southwest Coast estuaries following Hurricane Irma due to the increase in freshwater inflow. Other impacts due to the amount of rainfall include erosion, increased nutrient loading throughout the water column, short-term increase in turbidity, short-term water temperature changes, and extended natural and structural freshwater discharges throughout the SCS region. Current drainage conditions throughout south Florida drained the system relatively quickly. For example, the Picayune Strand Restoration Project Area, where regional rainfall totals were highest, was back at normal water levels within two weeks.

2.4.3.2 2019 System Status Report

The Everglades is struggling to maintain ecosystem functions that support south Florida’s tourism, recreation, and economy due to multiple pressures such as land use and development, agricultural practices, flood control and water supply, other water management constraints, and tropical storm and other climate events which impact all aspects of the system. Essential ecological functions are degraded, leading to often-unsuitable habitats for plants and animals. In the past five years, plants such as submerged aquatic vegetation, and animals including oysters, fish, and birds, have all been negatively impacted by fluctuating weather patterns and human disturbances. One hundred years ago, the Everglades’ ecosystems existed within a fully integrated hydrologic system. Construction of the canals and dikes of the Central and Southern Florida System served congressionally authorized project purposes, and also by virtue of their functions reduced the connectivity of the hydrologic system, leaving the component ecosystems more vulnerable. Management and restoration of all RECOVER regions of the Everglades is underway to help mitigate these impacts. CERP aims to restore the characteristics of a hydrologically integrated Everglades, which will provide the best habitat for plants and animals, leading to a healthy Everglades system. The results achieved by individual projects such as Picayune Strand, Biscayne Bay Coastal Wetlands Part 1, and the bridging of Tamiami Trail are encouraging. Taken together, these regional activities are critical to managing the trans-boundary conditions that are essential to system-wide health. These projects provide insight into what can be achieved at larger scales but are currently limited in their scale and influence. Restoring the historical hydrologic characteristics of the Everglades awaits further progress on larger-scale projects now

underway or in the planning stages. Within the regions of the Everglades, research and restoration projects have improved the management of hydrologic flows and increased water storage, which are key to achieving the restoration goals of improving wetland hydroperiods and flows of freshwater into coastal areas.

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 (WY) 2013 through 2017 (May 1, 2012 – April 30, 2017) are used in this report.

For more information, please refer to the 2019 System Status Report - <https://evergladesecohealth.org/publications/>.

2.4.3.2.1 Lake Okeechobee

Water managers and scientists at USACE, working in concert with those from partner agencies and tribes, continue to assimilate the latest scientific data from across the South Florida ecosystem to inform decisions. Interagency teams meet and report on-the-ground ecological conditions of Lake Okeechobee on a weekly and monthly basis through calls and online reporting (<http://w3.saj.usace.army.mil/h2o/reports/StatusDaily.htm> and <https://www.sfwmd.gov/science-data/operational-planning>). Annual summaries of lake conditions are published by the SFWMD in a scientific, peer reviewed report called the South Florida Environmental Report (<https://www.sfwmd.gov/science-data/scientific-publications-sfer>).

As published in the 2020 South Florida Environmental Report, surface water inflow to Lake Okeechobee was 1.99 million acre-feet in WY2019, nearly a 42% decrease from WY2018 inflows of 3.42 million acre-feet. Total Phosphorus loads to the lake from atmospheric deposition and tributaries totaled 442 tons in WY2019, less than half the WY2018 TP load (1,081 tons). This year's load reduction can generally be attributed to drier conditions and decreased flow volumes. In-lake Total Phosphorus concentration was 156 parts per billion, 23% lower than the WY2018 value of 203 parts per billion. Total Nitrogen load to the lake was estimated to be 5,188 tons, a 41% decrease from the previous water year Total Nitrogen load of 8,745 tons. In-lake Total Nitrogen concentration decreased by 20% from the previous water year to 1.35 milligrams per liter (mg/L). Overall, water quality conditions improved in Lake Okeechobee from WY2018, when it was impacted by Hurricane Irma, which passed over Lake Okeechobee in early September 2017.

Low lake stages had mixed effects in WY2019. Beds of newly sprouted eelgrass sprouted across areas wiped clean by Hurricane Irma in 2017. Lower lake stages promoted reduced nutrient levels and clearer water in nearshore zones towards the end of the water year, aiding in vegetation recovery. Wading birds and Everglade snail kites had the lowest nest totals since WY2009 (1,575 nests and 0, respectively) while wading bird foraging numbers were the highest recorded (15,954 birds in late April 2019) since surveys began in WY2010.

Hurricane Irma caused dramatic increases in suspended solids and uprooted emergent vegetation. Despite the time elapsed since Hurricane Irma, lake water quality and aquatic habitat continued degrading into WY2019. Submerged aquatic vegetation (SAV) recovery was not observed until spring

2019. In WY2019, the total areal coverage of SAV reached approximately 5,200 acres, the lowest in 12 years.

The 2019 System Status Report describes Lake Okeechobee in Fair condition. The five-year period from WY2013–WY2017 was considerably wetter, with water levels going above the stage envelope in all five water years and failing to reach the seasonal low of the stage envelope in two water years than the previous five years. Evaluation of the indicators during this period suggest such water levels, despite comprising one of the more stable periods in decades, have not been favorable for overall ecological conditions on Lake Okeechobee. This may be due to events where lake stages were higher during critical growing season periods, which may have had an outsized effect on vegetation and other indicators.

2.4.3.2.2 Northern Estuaries

The Northern Estuaries include the Caloosahatchee River Estuary, the St. Lucie Estuary and Southern Indian River Lagoon, and the Loxahatchee River Estuary. In general, the indicators in the 2019 System Status Report for the Northern Estuaries are in fair to good condition. SAV declined or remained stable at low densities in all regions of the Northern Estuaries. Oyster scores ranged from poor to good throughout the five years, with mostly fair scores (Error! Reference source not found.). A cycle of salinity perturbations negatively affects oysters and causes increased disease and reduced survivorship. When salinity conditions are favorable, oysters typically recover. Oysters can be resilient to stress, however with increasing variability they could decline overall. Benthic infauna was in good condition, while salinity and chlorophyll a were in good to fair condition. The Northern Estuaries are impacted by human control of flows that alter volume, distribution, circulation, and temporal patterns of freshwater inflows and natural events like hurricanes, El Niño, and drought. These cause sub-optimal salinities that have negative impacts on submerged aquatic vegetation (SAV), oysters, and benthic infauna.

2.4.3.2.3 Greater Everglades

The central and southern Everglades primarily include areas south and east of the EAA, including the WCAs and Everglades National Park. In the Greater Everglades region conditions varied throughout the five-year reporting period, with indicator scores in the 2019 System Status Report ranging from good to poor. Conditions for periphyton were good despite a shift in periphyton community structure.

Periphyton is a complex mixture of algae, cyanobacteria, heterotrophic microbes, and detritus that is attached to submerged surfaces in most aquatic ecosystems. Periphyton serves as an important food source for invertebrates, tadpoles, and some fish. It can also absorb contaminants, removing them from the water column and limiting their movement through the environment. Another advantage is that periphyton communities are located throughout the Everglades, which allows scientists to monitor large areas for alterations and anthropogenic effects. Scientists use this information to help manage water movement to ensure the health of the Everglades ecosystem

Tree islands were also in the good range due to resilience of the islands in conservation areas. Although nonnative fish had a good score overall, the score ranged from good to fair, with more nonnatives in recent years. Invasive reptiles also continue to increase in number and expand their range, scoring poor overall. Multiple years of wet conditions impacted prey availability, and as a result, most wading bird targets were not met. Prey abundance and alligator indicators remain impaired. Marl prairie and ridge

and slough habitat remain degraded; however, some areas of marl prairie habitat have shown improvement.

Large areas of freshwater marl prairie border the deeper sloughs of the Everglades. Marl prairie occurs on thin, calcitic soil that has accumulated over limestone bedrock. Historically the peat-based ridge and slough landscape was the predominant feature of the central Everglades, encompassing what are now Water Conservation Areas 1 (Loxahatchee National Wildlife Refuge), 2, and 3, and extending into Shark River Slough. This landscape is composed of a parallel arrangement of rather evenly spaced sawgrass ridges and open water sloughs characterized by aquatic vegetation and generally the year-round presence of water above the soil surface.

2.4.3.2.4 Southern Coastal Systems

The 2019 System Status Report describes the condition of the Southern Coastal Systems as Poor. The Southern Coastal Systems (SCS) region is a contiguous network of coastal wetlands and estuaries that wraps around the southern end of the Florida peninsula from Biscayne Bay on the southeastern coast to the Ten Thousand Islands area on the Upper Southwest Coast, and includes Florida Bay and the Lower Southwest Coast. The SCS is one of the most ecologically and economically important regions in the state of Florida. Over the past century, water management practices and agriculture/urban development have changed the availability, timing, and distribution of fresh water to the SCS. This altered the structure and function of these ecosystems. During the reporting period in the 2019 System Status Report (2012–2017), the inconsistent delivery of freshwater combined with periods of significant drought, hurricanes and sea level rise, have continued to impact the ecological indicators of the SCS. Overall, the Southern Coastal Systems regions are in poor to fair condition. Reduced freshwater flow combined with sea level rise has resulted in increased salinity throughout the region. Elevated salinity, due to a local drought in 2014 and 2015, negatively impacted crocodiles, gulf pipefish, and submerged aquatic vegetation (SAV) in Biscayne Bay and Florida Bay. Spoonbill nesting, prey community, and spotted seatrout are in poor to very poor condition, due to a prey base shift from high salinities. Gold spotted killifish, gulf pipefish, and fish in the Southwest Coast region were in fair to good condition because of the channelization of water flow and pulsed volumes. To improve the ecological processes and overall health of the Southern Coastal Systems region, restoration of freshwater flow will need to continue in the years to come.

2.4.4 INTERIM GOALS AND TARGETS

The Comprehensive Everglades Restoration Plan was authorized by Congress in the Water Resources Development Act (WRDA) of 2000. This act introduced the concept of Interim Goals, which was further developed into the Programmatic Regulations of 2003 (found in the Code of Federal Regulations at 33 C.F.R. Part 385) and defined as “a means by which the restoration success of the Plan may be evaluated throughout the implementation process.” 33 C.F.R. § 385.3. The regulations also required the development of Interim Targets for “evaluating the progress towards other water-related needs of the region provided for in the Plan....” 33 C.F.R. § 385.39.

In 2005, RECOVER provided the first Interim Goals and Targets recommendations. During this process, RECOVER selected indicators – aspects of the natural, agricultural, and urbanized systems related to the goals and purposes of the CERP. Interim Goals and Targets were defined as predictions of how the indicators would change as the numerous planned projects of CERP were implemented incrementally through time and as the CERP made progress towards meeting desired restoration conditions. Since few predictive tools were available at the time, the 2005 Interim Goals and Targets predictions were largely qualitative and based on the best available science. Since the 2005 effort, many of the indicators have been refined to include more predictive measures using scientifically defensible computer models. Some indicators have been removed due to their inability to accurately inform Interim Goals or excluded because modeling tools were not yet available (table below). Other new indicators have been included using updated scientific information and models developed during the past decade (Figure 2-6).

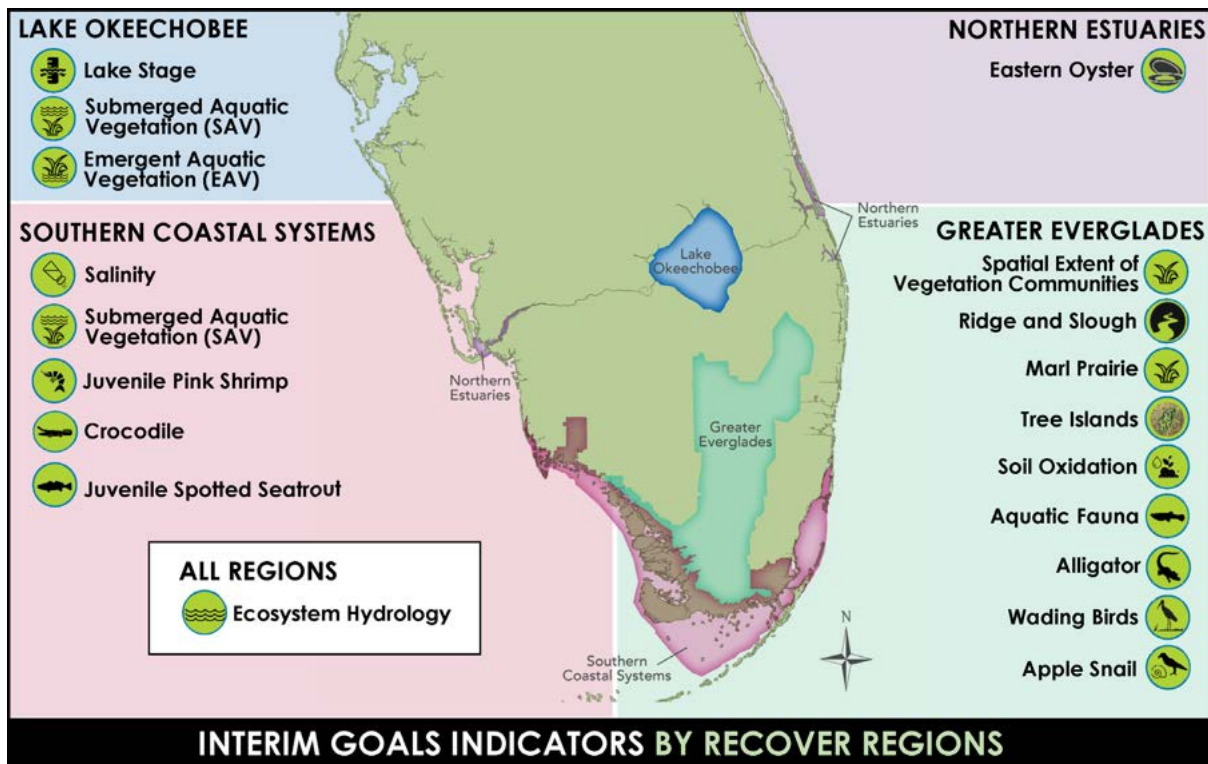


Figure 2-6. Ecosystem Indicators and RECOVER Regions.

The Programmatic Regulations require that Interim Goals and Targets be developed for five-year increments beginning with the existing conditions baseline and ending in full implementation. For the current effort which began in 2017 and completed with a report in 2020, RECOVER developed four simulations: existing baseline conditions (ECBIGIT), 2026, 2032CEPP, and 2032PACR.

- The ECBIGIT model run represents the state of the structures and system circa 2017 and includes the Everglades Restoration Transition Plan (ERTP). Certain pre-CERP projects such as Modified Water Deliveries and C-111 South Dade Projects are assumed to be complete in the baseline.
- The other simulations contain assumptions based on the July 2018 Integrated Delivery Schedule (IDS) for what structures and operations would be implemented in 2026 and 2032. Two 2032 runs (2032CEPP and 2032PACR) were included due to uncertainty regarding the authorization of the Everglades Agricultural Area (EAA) reservoir. The 2032CEPP simulation includes the shallow A1/A2 Flow Equalization Basin (FEB) as originally authorized in the Central Everglades Planning Project (CEPP) whereas the 2032PACR includes the now authorized A2 EAA reservoir and Stormwater Treatment Area (STA) per the CEPP PACR (Post Authorization Change Report).

These model runs used historical hydrology from 1965-2005 to generate forecasts for changes in the indicators by 2026 and 2032 due to the scheduled implementation of CERP projects. A map of the Interim Goals and Interim Targets regions is depicted below (**Figure 2-7**). Please refer to the 2020 Interim Goals and Interim Targets Report published on the USACE website – <https://www.saj.usace.army.mil/IGIT/>.

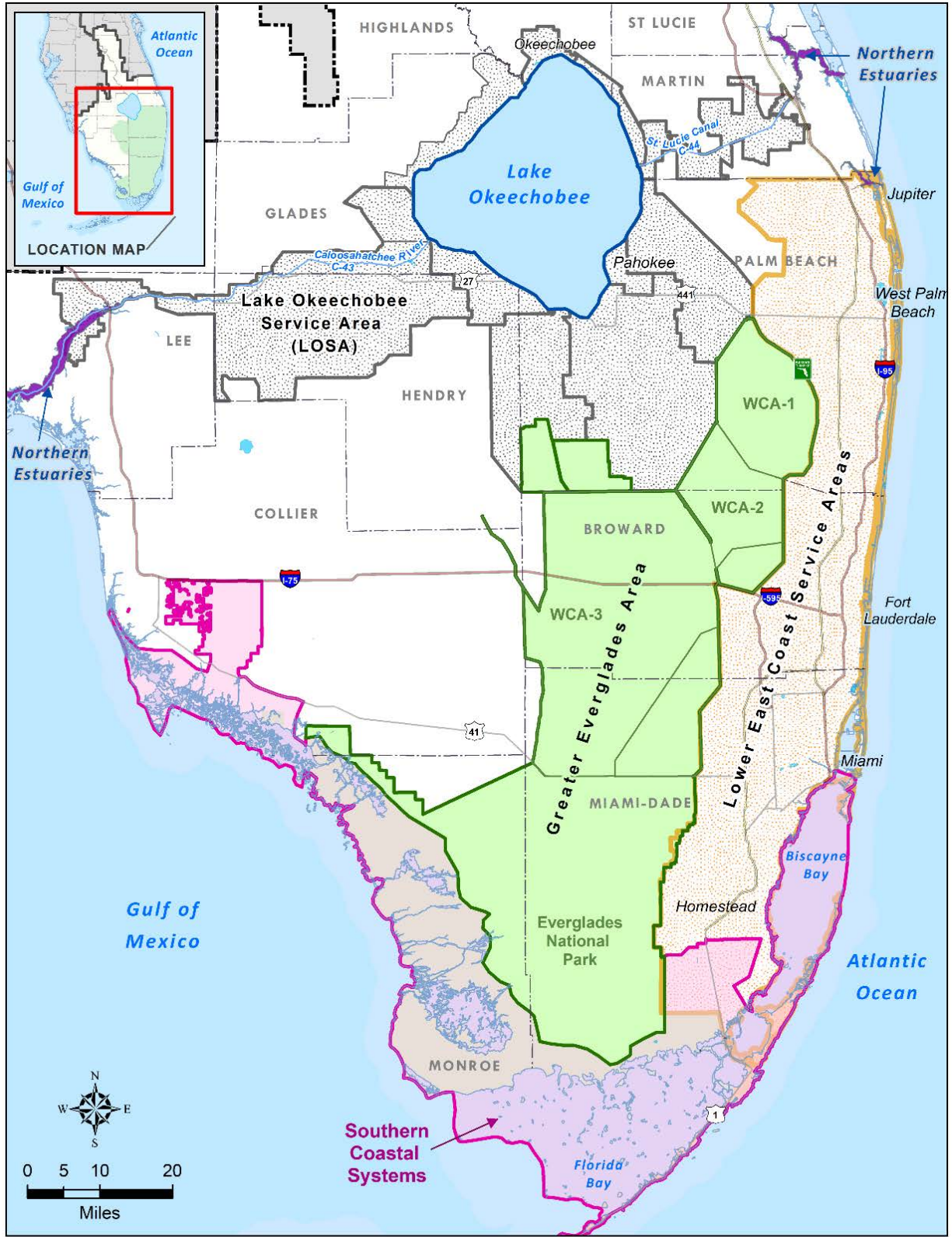


Figure 2-7. Map of Interim Goals and Interim Targets Regions.

2.4.4.1 Interim Goals

The CERP’s focus is on “getting the water right” in the South Florida ecosystem—getting the right amount of water to the right places at the right time. Overall, this Interim Goals modeling incremental exercise demonstrates the importance of the CERP and that we can make significant incremental environmental progress. Small, beneficial changes are observed in the expected responses of the Interim Goals indicators in 2026. However, these responses vary spatially and temporally because of which projects, features, and operations are used in the modeling (<https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/14710>).

During the 2026 scenario, the greatest improvements are in the Northern Estuaries and Lake Okeechobee due to increased storage with the C-43 and C-44 reservoirs. However, improvements in the Greater Everglades and Southern Coastal Systems regions are minimal due to the lack of increased flows south by 2026. This demonstrates the importance of implementing projects that will increase the volume of water delivered south and restore the hydrologic connectivity between the Water Conservation Areas and southern portions of the system. The impact of these projects (i.e., CEPP) was observed in the 2032 scenarios, which incorporate new water and increased flows across the “Red Line” (i.e., boundary between Everglades Protection Area and EAA). Whereas improvements were observed in many Lake Okeechobee, Northern Estuaries, and Greater Everglades ecological indicators during the 2032 scenarios, improvements in the Southern Coastal Systems were minimal. The Southern Coastal Systems region relies on freshwater delivery to maintain optimal salinity conditions for SAV and other estuarine species. Unfortunately, CERP does not recommend an infrastructure or an operational change that can make substantial freshwater deliveries to the Southern Coastal Systems. Future Interim Goals and Targets Reports may need to evaluate non-CERP modifications to the Southern Coastal Systems to improve Florida Bay, especially considering sea level rise.

Overall, the 2020 Interim Goals and Interim Targets exercise indicated that by implementing all elements of the 2032PACR scenario, the system will capture, store, and redistribute water to restore more natural flow, improve water retention, enhance and protect habitats, and support a more productive fish and wildlife community structure. Detailed result summaries for each region (Northern Estuaries, Lake Okeechobee, Greater Everglades, and Southern Coastal Systems) and Interim Targets (Water Supply and Flood Protection) are provided in the following paragraphs.

2.4.4.1.1 Northern Estuaries

The Northern Estuaries region, composed of the St. Lucie Estuary, Loxahatchee River Estuary, and the Caloosahatchee Estuary has been impacted by alterations in the timing, volume, distribution, and quality of water flowing into each system. These alterations in the hydrology result in the estuaries frequently receiving freshwater delivered in a strong pulsing of flows or conversely periods of water; this has altered the natural salinity regime. CERP projects will moderate these stressors to the benefit of the natural attributes of this region. The Eastern oyster (*Crassostrea virginica*) habitat suitability serves as the Northern Estuaries Interim Goal, as oysters are a U.S. Environmental Protection Agency valued ecosystem component (VEC), and performs a key function in the ecosystem through the provision of habitat as living spaces, refugia, and foraging ground for other species; oysters have other known benefits to estuarine ecosystems including but not limited to water filtration and nutrient cycling. The Interim Goal for submerged aquatic vegetation (SAV) is not included in this report as the SAV habitat

suitability index model is still under development. Oyster habitat suitability increased in each estuary across all Interim Goals model increments. There was an improvement in suitable habitat ranked in the “Good” and “Very Good” range with each future increment simulation, with a total of 53 and 70 acres cumulative improvement in these categories in the St. Lucie and Caloosahatchee, respectively, between the ECBIGIT and 2032PACR. The response of oysters to the 2032PACR simulation indicates that increased storage south of Lake Okeechobee along with reduced extreme freshwater releases will provide the expected benefits to the Northern Estuaries (see **Figure 2-8**).

Key findings for Northern Estuaries:

- Oyster habitat suitability increased in both the St. Lucie and Caloosahatchee estuaries across all Interim Goals model increments
- Greatest improvements observed with the 2032PACR scenario
- Increased storage south of Lake Okeechobee and reduced extreme freshwater releases will provide the expected benefits to the Northern Estuaries region

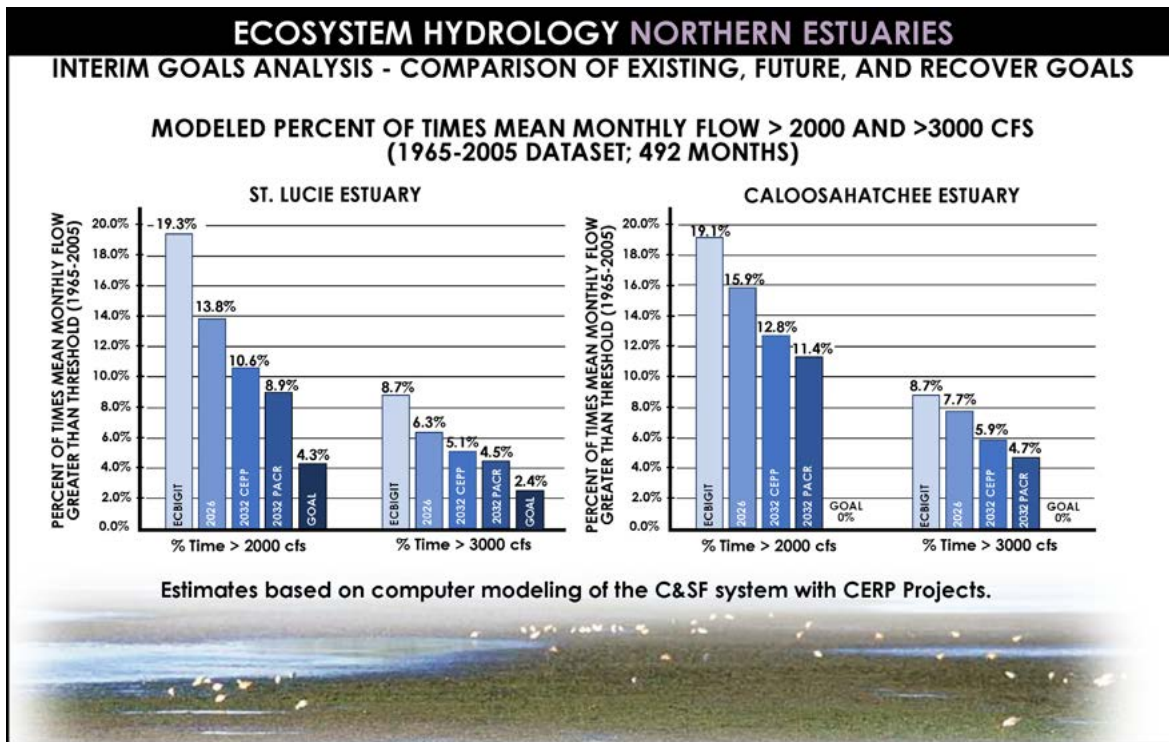


Figure 2-8. Interim Goals Analysis of Northern Estuaries Hydrology

2.4.4.1.2 Lake Okeechobee

Over the decades, the draining of wetlands for agricultural and residential development, increasing water supply demands and the channelization of runoff have resulted in changed water levels, increased nutrients, and invasive exotic plants in Lake Okeechobee. As a result of these stressors, there has been an increased frequency of harmful algal blooms, changes in marsh vegetation composition, and a loss of littoral and nearshore SAV which provide critical habitat for fish and wildlife. CERP projects through 2032 are expected to improve Lake Okeechobee primarily through increasing the flexibility of operations (see

Figure 2-9). Lake stage, SAV and emergent aquatic vegetation (EAV) were used as Interim Goals indicators for Lake Okeechobee. The amount of time lake stage was projected to be within the ecologically beneficial envelope increased from 28% for existing conditions up to 32% for the 2032PACR simulation, with a decrease in low stage occurrences but a small increase in high stage occurrences. The more time that lake stage is within the ecological envelope, the more favorable conditions are for the other Interim Goals indicators, SAV and EAV. Improvements are expected to increase in magnitude as more CERP and non-CERP projects come online especially those that provide new water storage upstream.

Key findings for Lake Okeechobee:

- Amount of time lake stage was within the ecologically beneficial envelope increased with the 2032PACR scenario.
- In the 2032PACR scenario, low stage occurrences decreased, however, high stage occurrences increased.
- Lake stage improvements expected to increase in magnitude as more projects come online that provide new water storage upstream.

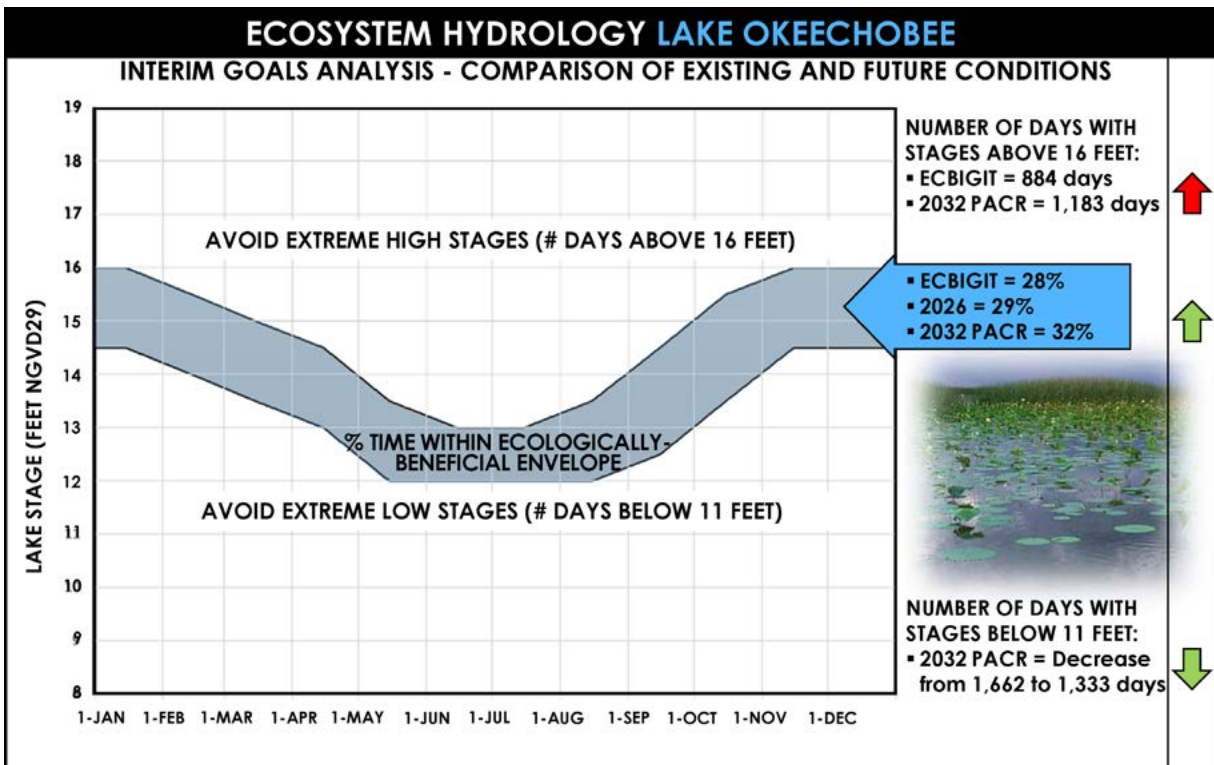


Figure 2-9. Interim Goals Analysis – Comparison of Existing and Future Stage Conditions Modeled for Lake Okeechobee.

2.4.4.1.3 Greater Everglades

The Greater Everglades has experienced a change in ecosystem health due to anthropogenic activities. These activities have resulted in the Everglades receiving less water volume overall with additional

alterations in the location of inflows; compartmentalization of the system into Water Conservation Areas 1, 2, 3A, 3B, and Everglades National Park using levees and canals which changes the sheetflow, creating areas that are deep while other areas have less water; and changes in the depth and duration of flows. The volume of flows into the overall Greater Everglades, and specifically into the Shark River Slough and Taylor Slough, has been reduced compared with historical estimates. More water was directed into western Shark River Slough affecting the marl prairies. Levees at the southern end of the Water Conservation Areas 3A have resulted in ponding whereas northern WCA 3A and WCA 3B have become dry and experienced fires. These changes have resulted in a loss of tree islands, an alteration of the ridge and slough pattern on the landscape, loss of soils due to soil oxidation, alterations of hydroperiods in marl prairies and in the sloughs, all with impacts on alligators, fish, wading birds, and endangered species. CERP is expected to improve conditions in the region by creating storage reservoirs to provide dry season flows, improving seepage management, and removing barriers to sheet flow. Several indicators were used to assess Interim Goals in the Greater Everglades region, these include: spatial extent of key vegetation types, ridge and slough, marl prairie, tree islands, soil oxidation, small fish, alligators, wading birds, and apple snails (prey item for Everglade snail kites).

This incremental modeling analysis found that the full impact of CERP will not be felt in the Greater Everglades region until the 2032CEPP and 2032PACR infrastructures and operational protocols are implemented. The 2032PACR scenario resulted in an average annual increase in flows of 350,000 acre-feet across the “Red Line” (i.e., boundary between Everglades Protection Area and EAA) into the Water Conservation Areas to benefit the ecosystem and met the CERP target for additional flows across the “Red Line” (see **Figure 2-10**). However, the modeled flows across the “Red Line” totaling 1.9 million-acre feet in the 2032PACR scenario still fall short of the historical flows of 2.5 to 3 million acre-feet estimated by the original Natural System Model (NSM) when CERP was first approved.

The distribution of these additional flows varies spatially across the landscape and through time within the region and across indicators. For example, during the 2032 scenarios, many Interim Goals indicators improved in northern WCA 3A due to rehydration from increased flows from the L-4 canal into the NW section of WCA 3A. Soil oxidation, slough stability, wading bird foraging, small fish densities, apple snail populations, and alligator habitat suitability improved in this area. In addition to the improvements in northern WCA 3A, there is a transition from long hydroperiod, ponded areas to sawgrass along the L-67 in southern WCA 3A. The landscape vegetation changes occurring in southern WCA 3A are consistent with expected consequences of implementing large-scale restoration actions.

Current conditions in WCA 3A have resulted in new ponding. As hydrologic connectivity is restored between WCA 3A, WCA 3B, and ENP the new ponding will decrease and promote the development of a sawgrass dominated ridge, slough, and tree island landscape. A consequence of this transition is the local decrease in small fish densities and wading bird foraging conditions; however, these indicators improve in other areas of the system, such as northern WCA 3A, Shark River Slough and Taylor Slough.

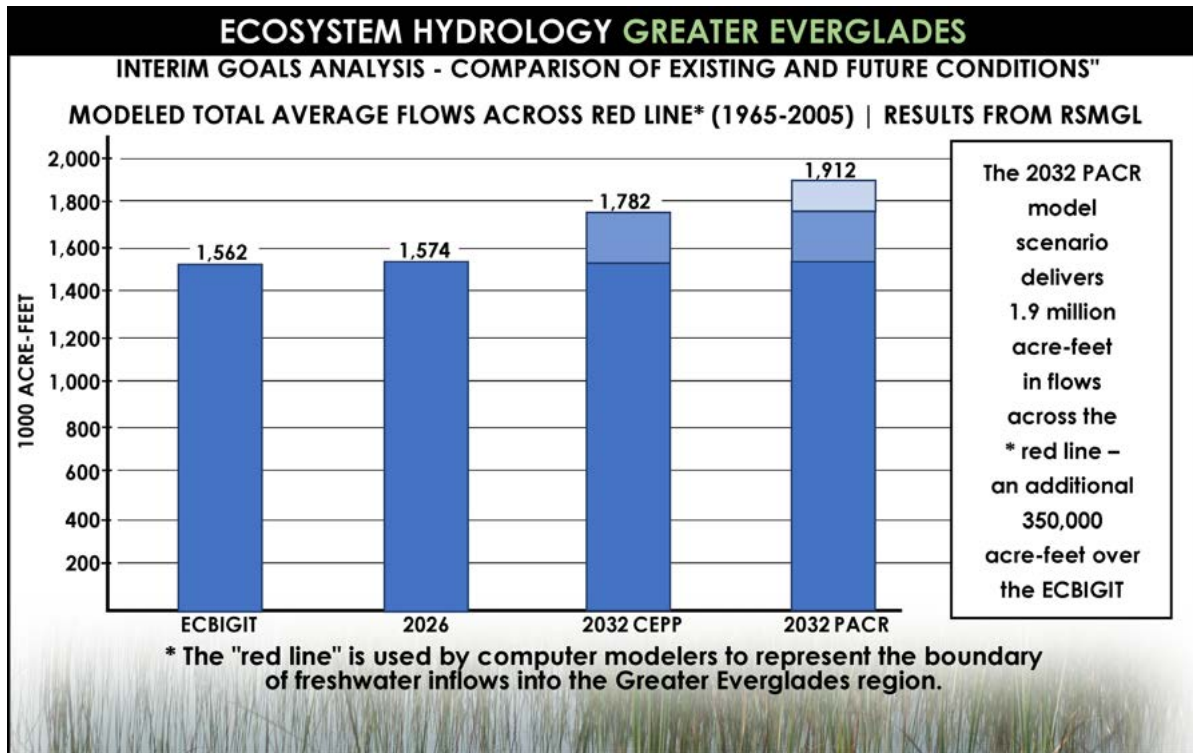


Figure 2-10. Interim Goals Analysis of Greater Everglades Region Hydrology

Indicator responses also vary depending on wet (1995), dry (1989), or average (1978) years. If conditions are wetter, most indicators improve whereas when conditions are drier, most indicators deteriorate across the region. Some indicators predict the greatest incremental improvement due to CERP projects under drier years, whereas a few show improvement in wetter years. These results are important as they help us to understand the potential responses to changes in climate and also illustrate that the region will benefit from management that provides more water south. The varying responses of the region’s ecological indicators to the hydrologic conditions produced during the Interim Goals increments signifies the complexity of biological succession towards a healthier ecosystem and solidifies the importance of multiyear hydroperiods and more natural fluctuations in water depths.

Key Findings for Greater Everglades:

- Lack of progress with 2026 scenario is not unexpected as it does not provide additional water across the “Red Line.”
- 2032PACR scenario results in an average annual increase of 350,000 ac-feet across the “Red Line” (northern boundary of the Greater Everglades region)
- Greatest impacts of CERP are when the 2032 infrastructures and operational protocols are implemented.

2.4.4.1.4 Southern Coastal Systems

The Southern Coastal Systems region includes Biscayne Bay, Florida Bay, and the Southwest Coast. This region relies on freshwater entering the southern estuaries to maintain ideal salinity conditions for SAV and associated estuarine species. Anthropogenic activities have changed the availability, timing, and distribution of freshwater to the region, which has changed the structure and function of the ecosystem. CERP was designed to eliminate or substantially moderate hydrologic stressors that have degraded this region. Salinity patterns, seagrass, juvenile pink shrimp production, American crocodile growth and survival index, and juvenile spotted seatrout habitat quality were all used as indicators of CERP progress.

Overall, ecological indicators did not improve substantially in this region, as there was only a modest increase in freshwater flows to the Southern Coastal Systems region resulting in moderate improvements in salinity with the greatest improvement occurring during the 2032PACR model run (**Figure 2-11**). The majority of the ecological indicators—including, SAV, American crocodile, and juvenile spotted seatrout—mirrored the salinity response with the greatest improvement occurring during the 2032PACR model run. Importantly, the current Interim Goal effort solidified the importance of full implementation of CERP to increase freshwater flows into the region.

Key Findings for Southern Coastal Systems:

- Ecological indicators did not improve substantially in this region as there was a modest increase in freshwater flows.
- Full implementation of CERP will be needed to increase freshwater flows into this region, especially during the dry season.

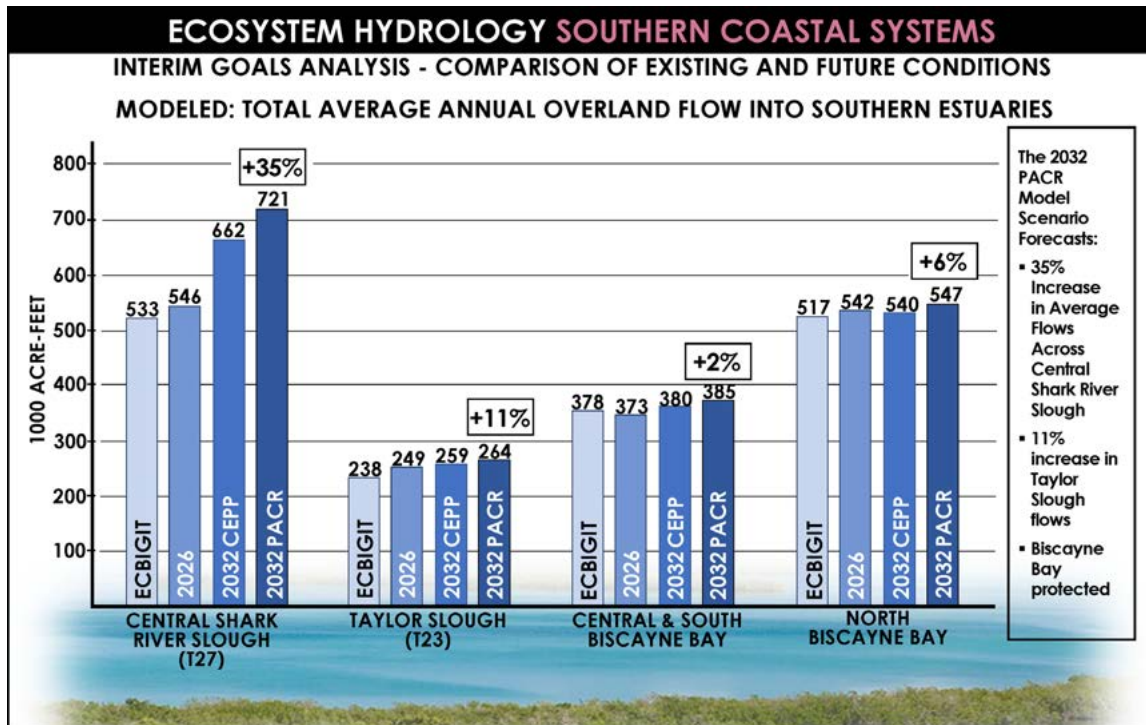


Figure 2-11. Interim Goals Analysis of Southern Coastal Systems Hydrology.

2.4.4.2 Interim Targets

RECOVER issued its technical report with recommendations for Interim Goals and Interim Targets in 2005 to facilitate creating the intergovernmental agreements for both Interim Goals and Interim Targets in 2007. This section provides an update on progress toward Interim Targets with a focus on the tools and model evaluations RECOVER will need to develop in anticipation of project progress that will be reported on in the next five year reporting cycle including predictions and assessments of the Interim Target indicators. As stated in **Figure 2-12**, Interim Targets are a means to evaluate the success of CERP in providing for other water-related needs of the region, including water supply and flood protection.

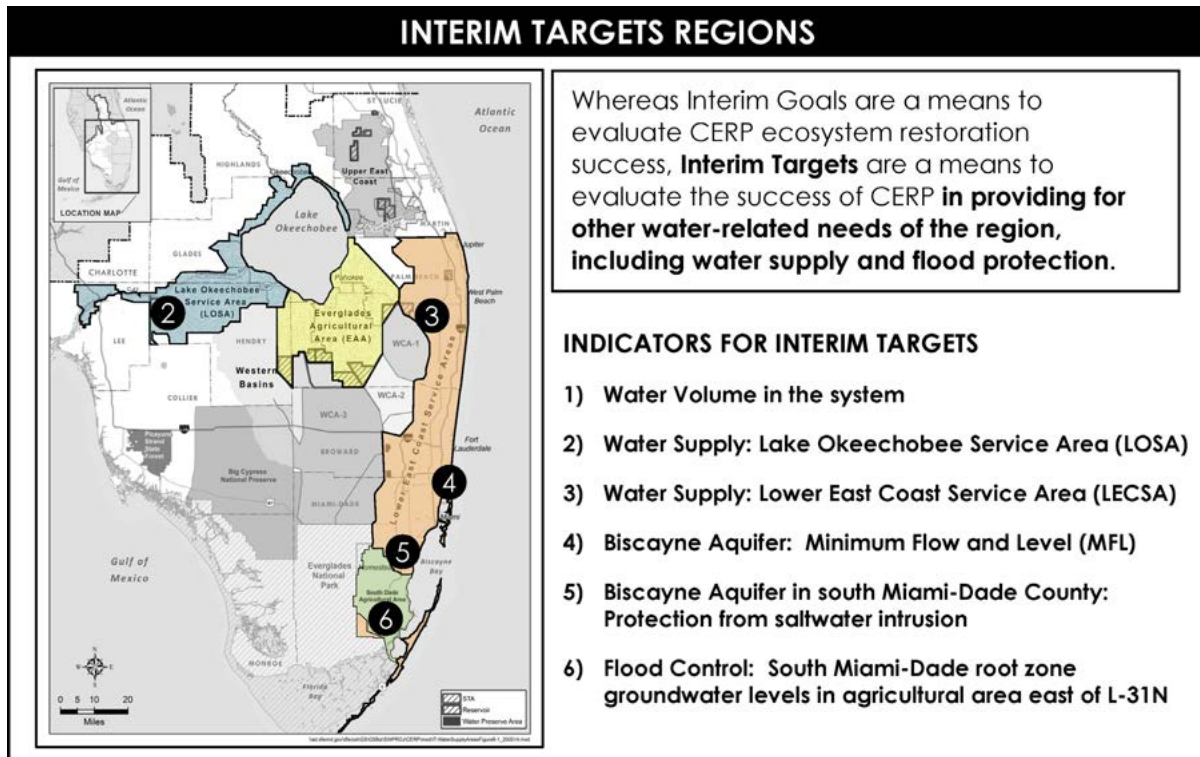


Figure 2-12 Map of Interim Targets Regions and Interim Targets Indicators

The increase in regional storage capacity provided by the CERP is also expected to increase the sources of water available for other water-related needs of the region. While substantial progress is now being made on implementation of the various projects of CERP, progress towards achieving the Interim Targets has yet to be realized. Increases in developed area water supply for the Lower East Coast and maintenance or improvements in flood protection are the result of other efforts. CERP performance in these areas depends on the future completion and operation of CERP projects (see **Figure 2-13**). Progress toward achieving the Interim Targets depends largely on projects the Integrated Delivery Schedule predicts to be constructed and operational by 2030, including CEPP and the CERP EAA Reservoir Project. Water supply predictions for performance improvements are primarily for existing legal uses in the Lake Okeechobee Service Area (LOSA) and Lower East Coast Service Areas.

RECOVER will focus on the highest priority Interim Target Indicators over the next five years. The SFWMD tracks and reports on several of the indicators as part of their flood control and water supply missions and they are reported in the South Florida Environmental Report on a yearly basis.

Interim Targets Key Findings:

- Greatest improvements observed with the 2032PACR scenario, which includes the CEPP EAA A-2 Reservoir/STA.
- Lake Okeechobee Service Area experiences fewer water shortage events once the CEPP EAA A-2 Reservoir/STA is operational.

- Lower East Coast Service Area predicted to have slight improvements in water supply performance.
- Biscayne Aquifer model predictions indicate minimal change in protection from saltwater intrusion. Groundwater levels in the Miami-Dade Agricultural Area root zone area are predicted to slightly increase; however, these negative changes are expected to be resolved through implementation of COP.

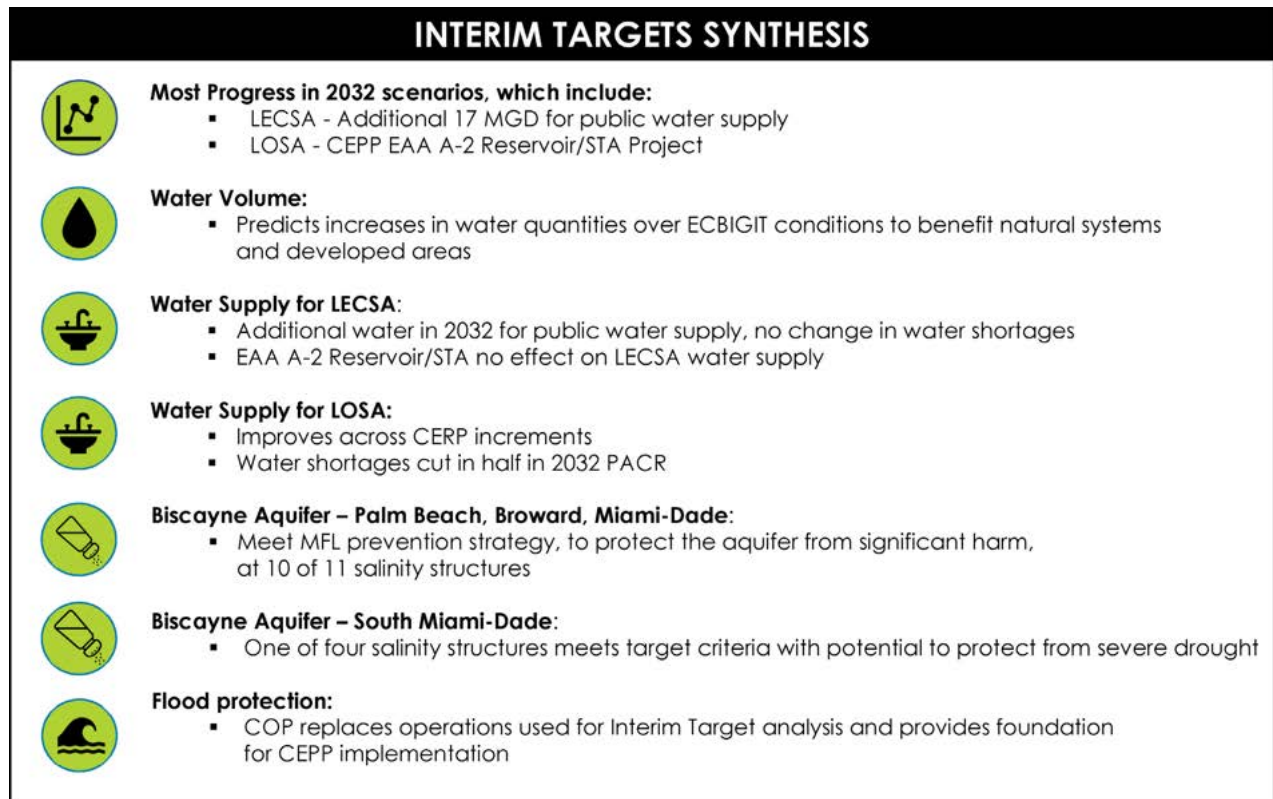


Figure 2-13. Interim Targets – Summary of Findings

2.4.4.3 RECOVER Assessment and Reporting

Reports on the progress towards Interim Goals and Interim Targets may be produced by RECOVER every five years, likely in combination with the RECOVER System Status Report. Assessment of progress towards the Interim Goals will allow RECOVER to feedback learning to managers and identify where progress is occurring as planned; where early indications of problems may require increased focus or adjustment of projects; and where opportunities for increased benefit occur both within CERP and in collaboration with non-CERP projects. Such feedback allows managers to adaptively implement and manage the progress of CERP to the ultimate benefit of the ecosystem and the people of Florida. Generally, Interim Goals and Targets:

- Tell us where we are going: Planning tools that estimate likely success of the CERP as projects are constructed and operated.
- Tell us if we are getting there: A basis for reporting progress to policy makers and public.

- Help us figure out ways to get better: Assist adaptive management.

Interim goals are used for two major purposes in the CERP:

- First, the interim goals are used in CERP planning as a guide for project design, as a criterion for development of CERP project scheduling within the IDS, and to assist in the evaluations in support of a Periodic CERP Update.
- Second, they are used as benchmarks for the comparison of field information collected during the implementation and operation of CERP projects in order to assess whether the Everglades ecosystem that is modified by CERP project implementation is achieving its expected restoration goals. In this context, interim goals are expected to play a significant role in driving the adaptive management program for CERP and are used to report to the United States Congress on restoration progress.

Interim targets are used to measure and anticipate incremental improvements in water supply (agriculture and municipal/industry) and other socio-economic indicators over the course of CERP implementation. Measurement of progress and anticipated CERP progress as reflected by interim target evaluations assists managers in project implementation sequencing and in adaptively managing the system to achieve the optimum quantity, quality, timing, and distribution. Interim targets provide a means for evaluating progress toward meeting other water-related needs of the region provided by the Plan throughout the overall planning and implementation. Interim targets were established for the Comprehensive Everglades Restoration Plan (CERP or the Plan) to evaluate progress towards providing for other water related needs of the region, including water supply and flood protection, throughout the implementation process (DOD 2003, 33 C.F.R. § 385.39 (a)(1) and (2)).

Revised Interim Goals and Interim Targets, and the corresponding updated restoration indicators, hydrologic and ecologic models, analytical tools, scientific information, adaptive management, and program monitoring, and the assessment of the progress towards the achievement of the Interim Goals and Interim Targets will help inform the next Periodic CERP Update.

Big Picture Messages from 2020 Interim Goals and Interim Targets Report

- Overall model forecasts show substantial progress towards ecosystem goals while also meeting needs for water supply and flood protection.
- Hydrologic and ecologic needs of Greater Everglades ecosystem are still not fully achieved by 2032.
- Lake Okeechobee management and Combined Operational Plan will play key roles in achieving CERP goals for ecosystem restoration, water supply, and flood protection.
- Must continue to monitor system and use adaptive management to respond to changing real world conditions.
- Implementing agencies need to decide whether to adopt these revised Interim Goals and Targets recommendations.

Next Steps after 2020 Interim Goals and Interim Targets Report

The next step after the 2020 Interim Goals and Interim Targets report is to conduct a technical evaluation called a Periodic CERP update, as defined in the Programmatic Regulations. In addition, following the RECOVER review and approval of this report, South Florida Water Management District,

the U.S. Army Corps of Engineers, and the Department of the Interior may amend the 2007 Interim Goals Agreement to reflect the revisions provided in this report. The Programmatic Regulations state, “[t]he Secretary of the Army, the Secretary of the Interior, and the Governor shall revise the interim goals and execute a new agreement as appropriate.” 33 C.F.R. § 385.38. The 2007 Interim Targets Agreement may also be amended and is executed by the Secretary of the Army and the Governor.

The Corps of Engineers and the South Florida Water Management District will, in consultation with the Department of the Interior, the Environmental Protection Agency, the Department of Commerce, the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, the Florida Department of Environmental Protection, and other Federal, State, and local agencies, conduct an evaluation of the Plan using new or updated modeling that includes the latest scientific, technical, and planning information. 33 CFR, Part 385, Section §385.31(c), Adaptive Management Program, Periodic CERP Updates provides more detailed information on Periodic CERP Updates.

As part of the evaluation, the Corps of Engineers and the South Florida Water Management District shall determine the total quantity of water that is expected to be generated by implementation of the Plan, including the quantity expected to be generated for the natural system to attain restoration goals as well as the quantity expected to be generated for use in the human environment. The Corps of Engineers and the South Florida Water Management District shall also consult with the South Florida Ecosystem Restoration Task Force in conducting the evaluation of the Plan.

This evaluation is to help understand restoration progress and is not reformulation or a modification of the authorized CERP plan. The authorized projects reflected in the Integrated Delivery Schedule can and must continue to be designed and implemented as this evaluation is conducted.

2.4.5 ADDITIONAL RESTORATION SCIENCE PROGRAMS

2.4.5.1 Invasive Exotic Species

The Everglades is being invaded by numerous nonnative species, including invasive exotic plants, fish, amphibians, reptiles, birds, and macroinvertebrates. In addition to threatening the natural environment, these invasive species can also impact the region's economy (e.g., invasive fruit flies and other agricultural pests), culture (e.g., Ambrosia beetle impacts on tree islands), and human health (e.g., iguanas and Giant African land snails). In order to effectively address invasive species, the *2011 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 (IES) Strategic Action Framework (SFERTF 2015). The IES 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. Priorities identified in the 2015 Framework focused upon the establishment of an early detection and rapid response (EDRR) system for the south Florida ecosystem.

Progress to date includes increased capacity with multiple agencies establishing or enhancing formal exotic programs and teams, increased coordination efforts through formal Cooperative Invasive Species Management Areas (CISMA) partnerships and the establishment of a Python Coordinator, and expanded outreach and public participation through the FWC's 888-I've-Got1 hotline. In 2019, the Task Force embarked upon an update of the IES Framework. The 2020 Framework will reflect progress made, including the development of risk screening tools to support rapid response, and will describe additional priorities moving forward such as tool development (e.g., horizon scanning) and capacity building (e.g., detector dog program expansion in south Florida ports). Since 2015, the overall detector dog program was initially expanded to 3 dogs/handlers in South Florida between the USFWS and the FWC. Recently, the USFWS K-9 retired, leaving only the two FWC dogs/handlers at South Florida ports (one each at Port Everglades and the Port of Miami). The 2020 Framework update highlighted expanding the detector dog program for south Florida ports as a priority in order to better screen incoming cargo for invasive exotic species. When finalized, the 2020 IES Framework will be available at <https://www.evergladesrestoration.gov/>.

2.4.5.2 Climate Change

Climate Change projections and observed trends indicate continuous increase in Earth's temperature, resulting in altered rainfall patterns, increased sea levels, modified groundwater levels and soil moisture, and other significant impacts that affect water resources management. Warmer global conditions are likely to persist beyond 2100. Accordingly, it is important to assess how the impacts of climate change, especially sea level rise, affects everglades restoration projects in CERP. Additionally, adaptation strategies that can be integrated with CERP goals of restoring a healthy Everglades ecosystem and sustaining its unique plant and wildlife diversity must be explored. Measuring restoration success needs to incorporate climate change considerations and the associated benefits of the results being achieved through restoration. Among such benefits, increased stage and hydroperiod associated with CERP serve to deter or slow down saltwater intrusion and promote more sustainable aquifer recharge rates. Improved timing and quantity of flows from CERP results in healthier estuaries and bays, and reduced marsh dry outs. Restoration efforts also contribute to the establishment of a more stable coastline, through enhancing soil build up, combating peat soil collapse, and reducing nutrient releases. In addition, CERP water storage projects increase the ability to better manage extreme weather events, while protecting communities and the environment.

Obeysekera et al. (2014) predicted the responses of the Everglades to climate change impacts and evaluated the resilience and robustness of greater Everglades restoration plans under future climate change and sea level rise. Assuming a future scenario with 18 inches of sea level rise, 1.5° Celsius temperature increase, and plus and minus 10% change in average rainfall, the results indicate significant changes in water budgets, ecosystem performance, wetlands habitats and coastal marshes, water supply demands and availability, groundwater levels and flood protection. In order to define more

accurate future scenarios, the study recommends the continuous analysis of climate model data, and regional and local downscaling products, with focus on seasonality and extremes, given the uncertainties still resulting from predicting extreme magnitudes and frequencies, and the associated impacts to water resources and the ecosystems in the region.

Parallel to restoration efforts, USACE has been collaborating with local sponsors to advance a series of coastal studies in South Florida. The South Atlantic Coastal Study is conducting the analyses of coastal risk and identifying initial measures that can address vulnerabilities to sustainably maintain or enhance current levels of coastal storm risk reduction. The Miami-Dade Back Bay Coastal Storm Risk Management Study also aims to promote resiliency and reduce the risk of coastal storm damage, exacerbated by combinations of sea level rise, saltwater intrusion, and climate change, through the implementation of structural, nonstructural, and natural and nature-based feature measures.

In March 2019, the South Florida Water Management District, the local sponsor to the Central and Southern Florida Project, has signed an endorsement letter requesting USACE seek federal funding to initiate the C&SF Flood Resiliency Study, with the goal to address increasing flooding and other related risks due to changed conditions, including sea level rise, climate change, land development and population growth. Through coordinated efforts, USACE and partner agencies are ready to address sea level rise and other climate impacts in the region.

There is strong local and stakeholder support for climate adaptation and preparation, demonstrated by the coordination among Broward, Miami-Dade, Monroe, and Palm Beach Counties, and several municipalities, united to form the Southeast Florida Regional Climate Change Compact. It represents a new form of regional climate governance designed to allow local governments to set the agenda for adaptation, while providing state and federal agencies with access to technical assistance and support.

It should be noted that USACE overarching climate adaptation policy requires consideration of climate change, for both sea level change and inland hydrology, in all studies to reduce vulnerabilities and enhance the resilience of water resources infrastructure. The assessments are performed, in accordance with published USACE climate guidance, at an appropriate, scalable level based on the complexity, size and level of risk associated with the study.

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.

2.4.5.3 Regional Environmental Monitoring and Assessment Program (US EPA)

The USEPA has been assessing the environmental conditions in the Everglades since the 1990s. The Everglades Regional Environmental Monitoring and Assessment Program (REMAP) measures current and changing conditions for water quality and ecological resources. Program data address key questions related to water conditions and soil loss, and track the effectiveness of efforts to control or manage phosphorus and mercury.

During each sampling event, about 120 marsh locations are sampled in a two-week window in order to provide a snapshot of conditions throughout the Everglades. Over 1,300 locations have been sampled during 15 sampling events in three decades. Program data and project reports are available to the public at USEPA's Everglades REMAP website. REMAP has been coordinated with state and federal partners, with funding support and collaborative helicopter operations provided by Everglades National Park.

2.4.5.4 C-43 West Basin Storage Reservoir Water Quality Feasibility Study (State of Florida)

On January 10, 2019, Governor Ron DeSantis signed Executive Order 19-12 which called for greater protection of Florida's environment and water quality, particularly in relation to the harmful blue-green algal blooms in south Florida. Specifically, the Executive Order directed the Florida Department of Environmental Protection (FDEP) to work with the SFWMD to add a stormwater treatment component to the C-43 West Basin Storage Reservoir (WBSR), with the intent of providing additional treatment and improving the quality of water leaving this important storage component of the CERP. This initiative is being implemented by the state through the C-43 WBSR Water Quality Feasibility Study.

2.4.5.5 Blue-Green Algae Task Force and Innovative Technology (State of Florida)

The Blue-green Algae Task Force is an advisory body, appointed by Governor Ron DeSantis, to aid the Department of Environmental Protection in fulfilling its mission to protect, conserve and manage the state's natural resources and enforce its environmental laws. The task force, through its discussion and deliberations, provides guidance and specific, science-based recommendations with the goal of expediting improvements and restoration of Florida's water bodies that have been adversely affected by blue-green algae blooms.

In October 2019, the task force provided a draft consensus document and recommendations. Focus has been placed on source identification, nutrient reduction, and remediation efforts with additional guidance provided on innovative technologies as they relate to the prevention, clean-up, and mitigation of harmful algal blooms. Most recently, the task force has considered the issue of algal toxins and human health impacts to identify knowledge gaps and research priorities.

In response to Governor DeSantis' Executive Order 19-12, FDEP is identifying methods to prevent, combat, or clean-up harmful algal blooms (HABs) through a grant solicitation process. In 2019, the Florida Legislature appropriated \$10 million for grants to local governments and water management districts. The projects being funded include a range of technologies that can prevent, combat or clean-up HABs in freshwater or estuary systems that are consistent with the guidance provided by the Blue-Green Algae Task Force.

2.4.5.6 Basin Management Action Plans (State of Florida)

A variety of basin-specific planning efforts identifies water quality standards and detail mechanisms to achieve and maintain those standards. Total Maximum Daily Loads (TMDLs) are scientifically determined maximum amounts of a pollutant that a surface water body can absorb and still meet water quality standards that protect human health and aquatic life. Basin Management Action Plans (BMAPs) and Watershed Protection Plans (WPPs) promote a comprehensive, interconnected watershed approach to identify upstream measures to improve water quality in, and hydrology to, downstream water bodies.

BMAPs are the framework for water quality restoration, containing local and state commitments to reduce pollutant loading through current and future projects and strategies.

The BMAPs for the Caloosahatchee Estuary Basin, St. Lucie River and Estuary Basin, and Lake Okeechobee were adopted in 2012, 2013, and 2014, respectively. Per Northern Everglades and Estuaries Protection Plan (NEEPP) requirements in State law, the first 5-Year Review for the Caloosahatchee Estuary BMAP was completed by FDEP in November 2017 and the first 5-Year Review for the St. Lucie River and Estuary BMAP was completed in June 2018. The first 5-year review for the Lake Okeechobee BMAP was completed by FDEP in December 2019, in coordination with the update of the Lake Okeechobee BMAP.

In January 2019, Governor DeSantis' Executive Order 19-12 included a requirement to update and secure all restoration plans, within one year, for waterbodies impacting south Florida communities, including the Lake Okeechobee, Caloosahatchee River and Estuary, and St. Lucie River and Estuary BMAPs. FDEP updated all three BMAPs which were adopted by Secretarial Order on February 3, 2020.

2.5 FINANCIAL PROGRAM

2.5.1 Project/Program Funding

Approximately **\$1.3 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 2-9**).

TABLE 2-9: CERP federal and state enacted funding⁽¹⁾, OCT 1, 2014, through SEP 30, 2019 (rounded in thousands)

FEDERAL	FY15	FY16	FY17	FY18	FY19	5-YR TOTAL
USACE	\$ 61,001	\$71,925	\$78,435	\$ 92,054	\$97,253	\$ 400,668
U.S. National Park Service	\$ 5,162	\$ 5,216	\$ 5,236	\$ 5,236	\$ 5,236	\$ 26,086
U.S. FWS	\$ 2,746	\$2,718	\$ 2,718	\$ 2,718	\$ 2,718	\$ 13,618
Federal Subtotal	\$ 68,909	\$ 79,859	\$ 86,389	\$100,008	\$ 105,207	\$440,372

STATE	FY15	FY16	FY17	FY18	FY19	5-YR TOTAL
SFWMD(1)	\$ 52,836	\$54,436	\$ 35,914	\$ 30,212	\$ 26,638	\$ 200,036
FL Department of Environmental Protection	\$ 61,337	\$ 49,371	\$ 163,461	\$ 173,784	\$ 176,042	\$ 623,995
FL Fish and Wildlife	\$ 1,732	\$ 2,152	\$ 3,005	\$ 4,617	\$ 4,954	\$ 16,460

STATE	FY15	FY16	FY17	FY18	FY19	5-YR TOTAL
Conservation Commission						
State Subtotal	\$ 115,905	\$ 105,959	\$202,380	\$ 208,613	\$ 207,634	\$ 840,491
TOTAL FUNDING	\$ 184,814	\$ 185,818	\$ 288,769	\$ 308,621	\$ 312,841	\$ 1,280,863

Notes:

Amounts are from the FY2020 Cross-Cut Budget.

USACE amount does not include CERP O&M.

(1) Reflects SFWMD adopted budget appropriations less any state and federal funds.

2.5.2 Expenditures through Fiscal Year 2019

Federal sponsor (USACE) and local sponsor creditable expenditures and open obligations (USACE) for CERP implementation through the end of Fiscal Year 2019, as shown in **TABLE 2-10**, total approximately \$1.4 billion for the USACE and \$1.8 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 2-10: CERP cumulative expenditures through fiscal year 2019⁽¹⁾(in thousands)

	USACE	SFWMD ⁽²⁾	TOTAL
Projects⁽³⁾	\$ 1,062,565,973	\$1,427,253,821	\$ 2,489,819,794
Adaptive Assessment & Monitoring	\$ 78,320,014	\$ 48,425,360	\$ 126,745,374
Program Coordination	\$ 268,375,074	\$ 191,121,363	\$ 459,496,437
Estimated Work-in-Kind, not yet submitted ⁽⁴⁾	n/a	\$ 157,802,429	\$ 157,802,429
Total	\$ 1,409,261,060	\$ 1,824,602,974	\$ 3,233,864,034
Cost Sharing Percentage	44%	56%	100%

Source: USACE Monthly Report - SFWMDRpt CERP Annual Expend thru 30SEP2019

Notes:

(1) Actual expenditures and open obligations (USACE) which is not the same as funds allocated.

(2) Includes cumulative and creditable (approved) SFWMD submissions through FY2019.

(3) Project totals also includes CERP Feasibility Studies and Pilots.

(4) An estimate of the Credit for submissions from SFWMD for FY2017 & FY2018.

As noted above in **TABLE 2-10**, 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.

2.5.3 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, is generic rather than site specific. The cost for the CERP components will be updated and modified as individual Project Implementation Reports are developed and completed, providing a more defined and detailed scope for each project.

The current cost estimates reported in the Report to Congress are estimates based on present day value (First Cost) and not inflated through 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 **\$6.78 billion (TABLE 2-11)** is due to price level (inflation) adjustment from October 2014 to October 2019, changes in project scope and schedule, and new project authorizations. Updated cost estimates are also available by project in **TABLE 2-12**. The increased cost estimate includes costs associated with the CERP: Central Everglades Planning Project authorization in WRDA 2016, as well as the CERP: Everglades Agricultural Area authorization in WRDA 2018. Due to the authorizing language for these two projects, some project features are included under both the CEPP New Water Project Component, as well as the EAA Project, which causes a duplication in cost.

TABLE 2-11: CERP cost estimate update (summary in millions)*

	OCT 14 PRICE LEVEL	OCT 19 PRICE LEVEL
Projects	\$15,514	22,234
AA&M	\$157	\$162
Program Coordination	\$737	\$762
TOTAL	\$16,408	\$23,158

*In current dollars.

TABLE 2-12: Updated Cost Estimates by CERP Project (1,2)

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

WBS PROJ #	CERP COMPONENT	PROJECT NAME	2015 REPORT TO CONGRESS (1 OCT 14 PRICE LEVELS)	CURRENT COST ESTIMATE (1 OCT 19 PRICE LEVELS)	DIFFERENCE	DIFFERENCE DUE TO INFLATION	DIFFERENCE DUE TO SCOPE/SCHEDULE CHANGES, AUTHORIZATION, MOVEMENT OF COMPONENTS
1	A, W, OPE	Lake Okeechobee Watershed Restoration (LOWRP)	759,216	1,818,659	1,059,443	509,439	550,004
3	GG	Lake Okeechobee Aquifer Storage & Recovery	1,556,247	1,858,446	302,199	233,269	68,930
4a	D_P1	Caloosahatchee River (C-43) West Basin Storage Reservoir	591,902	999,113	407,211	85,024	322,187
4 b		Caloosahatchee Watershed	287	287	0	0	0
5	D_P2	C-43 Basin Aquifer Storage and Recovery	330,259	393,447	63,188	48,863	14,325
6	DDD	Caloosahatchee Back-pumping with Stormwater Treatment	124,871	150,253	25,382	19,486	5,896
7	B, UU	Indian River Lagoon - South	2,999,962	3,032,889	32,927	284,741	(215,814)
8	G_P1	Everglades Agricultural Area Storage Reservoir	57,670	57,670	0	0	0
9	G_P2						
10	CCC	Big Cypress - L-28 Interceptor Modifications	64,370	81,616	17,246	9,974	7,272

WBS PROJ #	CERP COMPONENT	PROJECT NAME	2015 REPORT TO CONGRESS (1 OCT 14 PRICE LEVELS)	CURRENT COST ESTIMATE (1 OCT 19 PRICE LEVELS)	DIFFERENCE	DIFFERENCE DUE TO INFLATION	DIFFERENCE DUE TO SCOPE/SCHEDULE CHANGES, AUTHORIZATION, MOVEMENT OF COMPONENTS
11	RR	Flows To NW & Central WCA 3A	32,844	39,265	6,421	5,136	1,285
12 a	SS	WCA 3 Decentralization and Sheetflow Enhancement - Part 1	129,162	152,138	22,976	14,613	8,363
12 b	QQ_P2, AA	WCA 3 Decentralization and Sheetflow Enhancement -- Part 2	0	0	0	0	0
12 c	QQ_P3 (prev. QP2)	WCA 3 Decentralization and Sheetflow Enhancement -- Part 3	0	0	0	0	0
	ZZ		1,219	10,219	9,000	2,140	6,860
14	KK	Loxahatchee National Wildlife Refuge Internal Canal Structures	11,209	13,366	2,157	1,666	491
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
17	K_P1, GGG, X, Y, OPE	Loxahatchee River Watershed Restoration Project (LRWRP)	682,472	808,682	126,210	84,405	41,805

WBS PROJ #	CERP COMPONENT	PROJECT NAME	2015 REPORT TO CONGRESS (1 OCT 14 PRICE LEVELS)	CURRENT COST ESTIMATE (1 OCT 19 PRICE LEVELS)	DIFFERENCE	DIFFERENCE DUE TO INFLATION	DIFFERENCE DUE TO SCOPE/SCHEDULE CHANGES, AUTHORIZATION, MOVEMENT OF COMPONENTS
18	LL, K_P2	Loxahatchee River Watershed Restoration Aquifer Storage and Recovery	253,237	302,632	49,395	38,108	11,287
20	V V_P1	PBC Agriculture Reserve Reservoir	137,437	171,020	33,583	25,275	8,308
21	V V_P2	PBC Agriculture Reserve Aquifer Storage & Recovery	61,413	71,519	10,106	9,060	1,046
22	M_P2	Hillsboro Aquifer Storage and Recovery	129,185	153,482	24,297	18,830	5,467
23	EEE	Flows to Eastern Water Conservation Area	9,906	11,787	1,881	1,456	425
24	CC	Broward Co. Secondary Canal System	19,352	23,251	3,899	2,995	904
25	XX_P2	North Lake Belt Storage Area	390,443	460,651	70,208	63,008	7,200
27 43	BB U	Everglades National Park Seepage Management	242,229	534,579	292,350	78,387	213,963
28	FFF / OPE	Biscayne Bay Coastal Wetlands	206,253	201,563	(4,690)	17,894	(22,584)
29	WW	C-111 Spreader Canal	203,190	184,068	(19,122)	20,505	(39,627)
30	OPE	Picayune Strand Restoration	617,762	623,110	5,348	18,431	(13,083)

WBS PROJ #	CERP COMPONENT	PROJECT NAME	2015 REPORT TO CONGRESS (1 OCT 14 PRICE LEVELS)	CURRENT COST ESTIMATE (1 OCT 19 PRICE LEVELS)	DIFFERENCE	DIFFERENCE DUE TO INFLATION	DIFFERENCE DUE TO SCOPE/SCHEDULE CHANGES, AUTHORIZATION, MOVEMENT OF COMPONENTS
31	OPE	Florida Keys Tidal Restoration*	2,410	18,838	16,428	2,122	14,306
32	PILOT	Lake Okeechobee ASR PILOT	31,205	31,205	0	0	0
33	PILOT	C-43 Aquifer Storage and Recovery PILOT	3,256	3256	0	0	0
34	PILOT	Hillsboro ASR PILOT					
35	PILOT	Lake Belt In-Ground Reservoir Technology PILOT	32,005	36,769	4,764	4,163	601
36	PILOT	L-31 N (L-30) Seepage Management PILOT	16,336	18,211	1,875	1,574	301
37	PILOT	Wastewater Reuse Technology PILOT	40,052	46,430	6,378	5,536	842
38	OPE	Acme Basin B Discharge*	0	42,256	42,256	5,278	36,978
39	OPE	Strazzulla Wetlands	0	113,925	113,925	17,505	96,420
40	M_P1	Site 1 Impoundment	274,930	319,626	44,696	28,947	15,749
44		Aquifer Storage and Recovery Regional Study	25,141	25,269	128	0	128
45	R, Q, O	Broward County Water Preserve Areas (WPAs)	880,958	1,134,347	253,389	95,155	158,234
46	T	C-4 Control Structures	3,467	4,074	607	522	85
48	YY	WCA 2B Flows to Everglades National Park	119,307	140,532	21,225	18,282	2,943

WBS PROJ #	CERP COMPONENT	PROJECT NAME	2015 REPORT TO CONGRESS (1 OCT 14 PRICE LEVELS)	CURRENT COST ESTIMATE (1 OCT 19 PRICE LEVELS)	DIFFERENCE	DIFFERENCE DUE TO INFLATION	DIFFERENCE DUE TO SCOPE/SCHEDULE CHANGES, AUTHORIZATION, MOVEMENT OF COMPONENTS
49	XX_P1	WPA Conveyance	390,726	463,846	73,120	62,638	10,482
51	QQ, II, G, V, AA, FF	Central Everglades Planning Project (CEPP)	1,874,972	2,092,686	217,714	275,124	(57,410)
52	G	Everglades Agricultural Area (EAA)	0	3,310,284	3,310,284	3,310,284	0
90	OPE	Miccosukee Tribe Water Management Plan	36,099	42,308	6,209	5,370	839
91	OPE	Winsberg Farm Wetlands Restoration*	0	30,465	30,465	3,716	26,749
92	OPE	Restoration Of Pineland & Hardwood Hammocks in C-111 Basin	871	1,016	145	125	20
93	OPE	Henderson Creek - Belle Meade Restoration*	7,265	8,556	1,291	1,111	180
94	OPE	Lakes Park Restoration*	0	8,138	8,138	901	7,237
95	OPE	Melaleuca Eradication and Other Exotic Plants	4,817	4,662	(155)	6	(161)
96	OPE	Seminole Tribe Big Cypress Reservation Water Conservation Plan	111,272	125,283	14,011	16,093	(2,082)
97	HHH	West Miami-Dade Reuse	643,420	0	(643,420)	0	(643,420)
98	BBB	South Miami-Dade Reuse	534,965	0	(534,965)	0	(534,965)

WBS PROJ #	CERP COMPONENT	PROJECT NAME	2015 REPORT TO CONGRESS (1 OCT 14 PRICE LEVELS)	CURRENT COST ESTIMATE (1 OCT 19 PRICE LEVELS)	DIFFERENCE	DIFFERENCE DUE TO INFLATION	DIFFERENCE DUE TO SCOPE/SCHEDULE CHANGES, AUTHORIZATION, MOVEMENT OF COMPONENTS
	OPE	Southern CREW	59,138	68,627	9,489	10,659	(1,170)
	OPE	Lake Trafford Restoration*	22,623	25,440	2,817	3,239	(422)
	FEAS	Southwest Florida Feasibility Studies	18,000	17,000	(1,000)	0	(1,000)
	FEAS	Florida Bay Florida Keys Feasibility Study	6,500	6,500	0	0	0
	FEAS	Comprehensive Integrated Water Quality Plan	8,100	8,100	0	0	0
TOTALS			15,451,373	22,233,586	6,782,213	2,270,127	4,512,086

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

(2) The Western Everglades Restoration Project Implementation Report is not final at the time of this report; therefore, it is not referenced in the table.

* indicates projects being implemented by others outside of CERP



PARTNERS IN RESTORATION

REPORT TO CONGRESS | COMPREHENSIVE EVERGLADES RESTORATION PLAN
Central and Southern Florida Project

Images: Loxahatchee Estuary (Northern Estuaries RECOVER Region) Image courtesy of Jennifer Strickland, USFWS); Crab on Oyster Reef (Oyster as an Indicator)



3 PARTNERS IN RESTORATION AND PUBLIC ENGAGEMENT

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.
- Assist and support agencies and entities represented on the Task Force in their restoration activities.

There are seven federal, two tribal, and five state and local government representatives on the Task Force. The Florida-based Working Group and the Science Coordination Group 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.

The Department of the Interior’s Office of Everglades Restoration Initiatives (OERI) provides staff support for the Task Force and its subgroups. OERI maintains the EvergladesRestoration.gov website that is a primary information source for Everglades restoration activities including Task Force meeting and event notifications. The OERI website also serves as a comprehensive library and archive of Everglades restoration reports and other important documents and records. Task Force reports include the Biennial Report to Congress, the annual Integrated Financial Plan, and the annual Cross-cut Budget on the overall Everglades restoration effort.

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 Science Coordination Group at these meetings as well as hear important updates and consultation presentations from the Corps and CERP local sponsors (see Section 3.4 for more details on Task Force meetings).

During this reporting period, the Task Force continued sponsoring stakeholder workshops related to CERP projects and programs. The Task Force sponsored workshop format provides the public with additional, interactive opportunities to provide meaningful input into the planning process. The National Research Council called the stakeholder workshop process “exemplary” and recommended that it “serve

as a model for future planning processes” (NRC 2014). During the reporting period, six stakeholder workshops were conducted (see Section 3.4 for more details on Task Force sponsored workshops).

The Task Force has prioritized the critically important need to have a coordinated and consistent effort to combat invasive exotic species. OERI is presently updating the Task Force’s *Invasive Exotic Species Strategic Action Framework*. The framework was developed by an extensive and diverse set of partners including members of the Task Force, Working Group, Science Coordination Group, Everglades Cooperative Invasive Species Management Area (ECISMA), and other federal, state, and local partners. The 2015 Framework identified a need to focus on and coordinate efforts in the Early Detection and Rapid Response (EDRR) phase of the invasion curve. Since 2015, many successful improvements have been made in the EDRR approach so the 2020 Framework will build upon those improvements, identify additional EDRR priorities and address needs in the Prevention and Long-term Management of invasive exotic species (See subsection 2.4.5.1 for further details on the 2020 IES Framework).

3.2 Public Participation and Stakeholder Engagement

Public outreach remains a vital part of the CERP and is used as a tool 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.

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 website addresses are the following:

- OERI – www.evergladesrestoration.gov
- USACE - www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/
- SFWMD – www.sfwmd.gov/our-work/restoration

The websites, along with distributed materials, have 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.

3.3 CERP Project Delivery Team (PDT) Meetings

PDT meeting enable federal and tribal governments, state and local agencies 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 Project Implementation

Report (PIR) for each project. The PDT meetings 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.

3.4 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 formally consulted and afforded an opportunity to provide recommendations on CERP projects and plans. Accordingly, status reports are provided to the Task Force, Working Group, and Science Coordination Group, and consultation is sought on CERP plans, reports, and other programmatic efforts. In addition to regular meetings, stakeholder workshops sponsored by the Working Group and Science Coordination Group provide the public with many opportunities to provide meaningful input.

During the reporting period, the Task Force met 7 times and the Working Group and Science Coordination Group met jointly 10 times. The SCG also met separately 2 times during the reporting period to focus on research coordination following Hurricane Irma and RECOVER's Conceptual Ecological Models (CEMs). The Biscayne Bay Regional Restoration Coordination Team meets bimonthly, with the option to schedule additional meetings based on need, to provide information to stakeholders and report stakeholder issues back to the Working Group. In addition to these regular meetings, two stakeholder workshops were held on the IDS (2015 and 2019 updates), two workshops were held on the WERP, and two workshops were conducted on the LOWRP. Task Force, Working Group, and SCG meetings and stakeholder workshops are open to the public and live webcasts are provided whenever possible. All meeting and workshop materials are available for public viewing at any time on OERI's website, <https://www.evergladesrestoration.gov>.

3.5 SFWMD Governing Board and Water Resources Accountability and Collaboration

As a regional governmental agency that manages the water resources in the southern half of the state, the SFWMD is committed to soliciting public and stakeholder feedback on Everglades restoration and related water issues in South Florida. The agency is directed by nine Governing Board members, appointed by the Governor, who set policy for the agency. The Governing Board meets monthly on a variety of issues including the CERP and other Everglades restoration projects. These meetings are publicly noticed, live streamed and provide the opportunity for public and stakeholder input on any agenda item. <https://www.sfwmd.gov/who-we-are/governing-board>

The SFWMD is committed to facilitating communication and collaboration to ensure diverse perspectives and viewpoints are represented on all water resource issues. To meet this goal, the Governing Board created two Water Resources Accountability and Collaboration (WRAC) groups in July 2019 to address both routine and ad hoc issues. To encourage public participation, all WRAC meetings are live streamed online and the public is encouraged to provide comment at the meetings. <https://www.sfwmd.gov/who-we-are/water-resources-accountability-and-collaboration>

In addition to these meetings, the SFWMD hosts a WRAC Recreational Forum which meets quarterly and provides the opportunity for the public and stakeholders to engage on projects that include or impact recreation within the region. <https://www.sfwmd.gov/who-we-are/governing-board/wrac>

3.6 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 the scoping phase, and availability of the draft and final NEPA documents and integrated feasibility reports. 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 notices for Environmental Impact Statements are published in the Federal Register. Materials are provided online for public access.

3.7 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.

3.8 Coordination and Consultation with Tribal Governments

USACE recognizes the sovereign status of Tribal governments and our obligation for pre-decisional government-to-government consultation. Consultation is an open, timely, meaningful, collaborative and effective deliberative communication process that emphasizes trust, respect and shared responsibility. The interaction between the federal government and federally recognized Indian Tribes has its origins in the U.S. Constitution. The federal government has a unique legal and political relationship with Tribal governments that recognizes self-government and self-determination. USACE recognizes the unique role Tribes play as partners in water resources projects. Consultation is an integral, invaluable process of USACE planning and implementation. Consultation is done to ensure open lines of communication with Tribes during the decision-making process for those matters that have the potential to significantly affect protected tribal resources, tribal rights (including treaty rights) and Indian lands. Tribal Consultation occurs under the following policies: Executive Order 13175 and USACE Tribal Consultation Policy.

The USACE has formally requested government-to-government consultation with the Miccosukee Tribe of Indians of Florida, Seminole Nation of Oklahoma, Seminole Tribe of Florida, and Thlopthlocco Tribal Town on CERP projects. This is in accordance with the National Historic Preservation Act and implementing regulations and the National Environmental Policy Act. The USACE consulted with these tribes on a number of CERP projects during this reporting period:: Central Everglades Planning Project (CEPP); CERP EAA Reservoir and STA; Picayune Strand Restoration Project; Broward County Water Preserve Area; Indian River Lagoon South; Loxahatchee River Watershed Restoration Project, Lake Okeechobee Watershed Restoration Project; and the Western Everglades Restoration Project.

As a result of tribal consultation efforts undertaken by the Jacksonville District, the Seminole Tribe of Florida requested an ethnographic synthesis of the Everglades in order to develop a better

understanding of the historic tribal use of tree islands and other resources and features within the region. As the Corps consults on future water management activities, the specialized expertise and perspectives contained in such an ethnographic synthesis will aid in the identification of historic properties and further refine the assessment of potential effects of future projects on resources of importance to the tribes.

In order to develop the ethnographic study requirements, the USACE Jacksonville District reached out to the USACE Tribal Nations Technical Center of Expertise (TNTCX) to facilitate and participate in consultation meetings with the Seminole Tribe of Florida to discuss the potential ethnographic study which would gather information from a tribal perspective to assist the USACE in future Tribal consultation efforts for projects and undertakings associated with the CERP. The TNTCX took the information gathered at consultation meetings between the Jacksonville District and the Seminole Tribe and developed a scope of work for the CERP Seminole Ethnographic study. The contract was awarded by the TNTCX to North Wind Resource Consulting on 24 September 2019. North Wind subcontracted the ethnography to the Seminole Tribe's Tribal Historic Preservation Office to conduct the work. The work includes oral histories, ethnographic interviews, a Seminole Tribe cultural history, GIS and maps of traditional place names, and other biological, environmental, geographical, and cultural features of significance to the Tribe. This study is scheduled to be complete in September 2021. This information will aid the USACE in considering traditional cultural properties, places, and sites of significance to the Tribe when determining effects of CERP projects.

The following two sections were provided by the Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida. They are included verbatim as provided by the Tribal staff (via email from Stacy Myers for the Seminole Tribe of Florida on April 24, 2020 and email from Gene Duncan for the Miccosukee Tribe of Indians of Florida on May 18, 2020). The USACE is honored to present the positions of the Tribes in this report.

3.8.1 Position of the Miccosukee Tribe of Indians of Florida



The Miccosukee Tribe continues to participate in meaningful government-to-government consultation in every aspect of Everglades Restoration to ensure that the Tribe's culture and way of life will continue for future generations. The Tribe continues to engage in consultation on the projects affecting the greater Everglades and the Tribe. Those projects include but are not limited to those listed below

Cultural Resources: The Miccosukee Tribe's policy is avoidance and non-disturbance of cultural resources. Miccosukee culture does not allow inundation or removal of cultural resources in any circumstance.

ASR: While the Tribe advocates for more storage north of Lake Okeechobee, the Tribe does not advocate for the usage of ASR technology in Everglades Restoration projects.

Western Everglades Restoration: The Miccosukee Tribe of Indians endorses and supports the restoration of the Western Everglades Restoration Plan, aka the WERP Hybrid Plan. The Tribe supports the construction of the Windgate Mill Stormwater Treatment Area (STA) and the North Feeder STA. The

two STAs are anticipated to meet the water quality standards of the Miccosukee Tribe, Seminole Tribe, BCNP, and the State of Florida. The removal of the levees and filling of the L-28 Interceptor Canal and L-28 Canals south of I-75 will benefit Tribal lands by eliminating the discharge of polluted water at the “tip of the triangle”, improve ecosystem connectivity benefiting wildlife, and reintegrate 9,000 acres of the Triangle back into the Everglades, while protecting existing levels of flood protection for Sherrod Ranch and the Miccosukee Alligator Alley Cattle Pastures. The complete removal of the L-28 Tie-Back Levee and partial removal of the L-28 South Levee will reconnect WCA 3-A with the BCNP, reduce flooding of Tribal tree islands and avoids flooding of Tribal camps along Tamiami Trail. Vegetation management actions are expected to restore areas previously damaged by excessive nutrients.

Lake Okeechobee Operations: The Miccosukee Tribe remains concerned with water levels in Lake Okeechobee. The Regulation Schedule is supposed to govern the management of water in the Everglades Ecosystem to prevent serious harm to the sensitive Everglades environment. Conservation of water in Lake Okeechobee during the wet season allows supply of water during the dry season to prevent water shortages during the dry season. WRDA 2000 contained a “savings clause” that provided protection for water supply for both nature and people. The Miccosukee advocate for the management of Lake Okeechobee to be consistent with the Comprehensive Everglades Restoration Plan (CERP). Application of the savings clause to Lake Okeechobee levels will assure that water will be available for the natural downstream users including the religious and cultural uses of the Miccosukee people, the continued access to the Miccosukee Federal Reservation and animal life throughout the Everglades.

Combined Operations Plan: The Combined Operations Plan (COP) is the proposed management of water levels in the Everglades until the CEPP project comes online, which should be in about 10 years. COP will increase water deliveries from WCA-3A to ENP through Northeast Shark River Slough and is expected to improve hydrologic conditions in Taylor Slough and the Rocky Glades of Everglades National Park. The Tribe advocates for COP to be implemented in manner that will not adversely impact federally protected Tribal lands in WCA-3A. The Tribe advocates to limit such impacts as (1) lower water levels in WCA-3A which will prevent the Tribal members from accessing tree islands for cultural and religious practices, (2) permanent loss of muck substrate due to soil oxidation in northern WCA-3A, (3) increased risk of wildfires in a dryer WCA-3A, (4) lack of access for Tribal members to enter their lands for hunting, fishing, frogging, gathering of traditional medicine, (5) disproportionate impacts to tribal commercial airboat operations and (6) increased phosphorous loading in WCA-3A.

EAA Reservoir: The Florida legislature passed the Chapter 2017-10 which requires that the EAA Reservoir compartment A-2 be converted to 240,000 acre-feet of storage and/or the A-1 and A-2 Reservoirs be converted to 360,000 acre-feet of storage. Because of the potential for increased pollution into Tribal lands, the Tribe continues to advocate for shallow water “Flow Equalization Basins” (FEBs) as a better option to provide an important water quality benefit that a 23-foot deep-water reservoir cannot provide. The Tribe continues to work with the US Army Corps of Engineers and all stakeholders to ensure that Miccosukee cultural resources within the EAA footprint will remain undisturbed.

Wildlife: The Tribe continues to promote the protection of wildlife in restoration of the greater Everglades. Advocating for the requirements of the animals, both large and small and their habitat, in the water Operation Plans.

3.8.2 Position of the Seminole Tribe of Florida



The USACE technical teams consult regularly with the Seminole Tribe of Florida technical staff. The Seminole Tribe has supported many of the activities surrounding Everglades Restoration involving decompartmentalization and restoration of natural hydroperiods in the southern region of the Everglades ecosystem and with the Kissimmee River Restoration. The Tribe understands and generally supports the need for implementing additional water storage on a massive scale to replace storage lost to drainage and flood control; however, initiatives to build large, above ground water storage facilities north of Lake Okeechobee are unnatural and inconsistent with restoration and have caused the Tribe to object to these projects. The Tribe does support the EAA Reservoir because it will store water where water was historically stored before the EAA was drained for agricultural uses. The Seminole Tribe has an issue with the consistency of communication and coordination from the USACE during certain aspects of Everglades restoration, particularly situations that may impact the Tribe and its natural resources. When the Seminole Tribe's interests align with the Corps' goals, from the Seminole Tribe's perspective, the USACE coordinates closely with the Tribe and information is easy for the Tribe to obtain. When restoration planning may impact Tribal resources in a negative way or the restoration effort presents a difficult issue to resolve (i.e., one where the Tribe may oppose aspects of the planning effort) Tribal staff has experienced difficulty in receiving timely information and coordinating meaningful consultation with USACE technical teams.

For example, during Western Everglades Restoration Project (WERP) planning, a serious issue arose regarding the economic feasibility of the project. The technical team had concerns that a number of features, including some the Seminole Tribe had requested, were too expensive relative to the restoration benefits the project would produce. This was an issue that ultimately threatened WERP's viability, yet, from the perspective of Tribal staff, this information was communicated to the Tribe very late in the planning process, not long before the TSP milestone deadline. This left Tribal staff (as well as USACE technical staff) with little time to respond and try to find an acceptable solution to the issue.

In another example, Tribal staff had difficulties during the Lake Okeechobee Watershed Restoration Project planning study. Early in the study, coordination with the Tribe proceeded in a normal and open manner. As planning progressed, however, after the Tribe raised serious objections to aspects of the project, from the Tribe's perspective, coordination became increasingly difficult to the point that meaningful communication essentially ceased.

In the Seminole Tribe's view, it is not clear what reasons caused this incongruity in coordination and communication with the USACE technical teams. It could very well be, as is sometimes the case in these types of situation, that the perception of this incongruity may be affected by its perspective as a stakeholder that was not privy to the entire planning process. The incongruity could very well be the

result of a few simple misunderstandings of key communications or it could be just a set of unfortunate circumstances that are an unavoidable byproduct of the rushed 3 by 3 by 3 planning process. Regardless, the Seminole Tribe's concern in raising this issue is that close communication and coordination are most important when there is a difficult, but important, issue to work through. WERP was nearly derailed and the Seminole Tribe still has serious, unresolved issues with the LOWRP TSP in large part because, for whatever reason, the consultation process broke down and serious issues could not be discussed and understood early enough in the planning process for Tribal technical staff and USACE technical staff to effectively resolve or mitigate them.

In addition to threatening the successful planning and implementation of important aspects of Everglades restoration, this issue can damage the relationship between the USACE, the Seminole Tribe, and the South Florida Water Management District. This is an outcome that does not benefit any party involved. The Seminole Tribe and its technical staff want to encourage and help facilitate frank conversations earlier in the planning process in order to work through difficult planning issues that affect important Tribal resources, natural and historic, in order to avoid unnecessary fights later down the road that threaten to cause long-term damage to these important working relationships.

Another example of this limited coordination, although not a CERP project, but in the footprint of CERP is the Dispersed Water Management Projects (all versions). Early in the study processes, these projects again proceeded in a normal and open manner. However, when the Tribe began to object to aspects of these projects, coordination decreased to the point that dialog essentially ceased.

The USACE cultural resources team also consults annually with the Seminole Tribe of Florida on upcoming projects and expected issues and meets with the Tribe 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, minimization, 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 of Florida, through its Tribal Historic Preservation Office, continues to express its concerns with the impacts of water levels on Tree Islands and other locations within the Everglades system that frequently contain cultural resources of importance to the Tribe. This Tribal concern with human-induced (anthropogenic) changes to hydroperiods is acknowledged in the Burial Resources Agreement. The Tribe continues to seek a path for constructive cooperation with the USACE cultural staff to address these concerns and gather the data necessary to allow informed NHPA Section 106 determination of effects.

3.9 Independent Scientific Review

The National Academies' Committee on Independent Scientific Review of Everglades Restoration Progress (CISRERP) has provided biennial reviews of restoration progress and advice on scientific and engineering issues that may impact progress since 2004. These studies were congressionally mandated under the Water Resources Development Act of 2000, which launched the Comprehensive Everglades Restoration Plan. In the last five years, the CISRERP has published two reports (2016, 2018) and a third is underway (2020). A brief summary of each report is provided on their website and is reflected below.

The sixth biennial review, issued in 2016, assesses progress made in the various separate project components and discusses specific scientific and engineering issues that may impact further progress. The 2016 report states that a dedicated source of funding could provide the ongoing long-term system-wide monitoring and assessment that is critical to meeting restoration objectives. The report also examines the implications of knowledge gained and changes in widely accepted scientific understanding regarding pre-drainage hydrology, climate change, and the feasibility of water storage since the CERP was developed.

The 2018 report notes that impressive progress was made during 2016-2018 in planning new CERP projects, and that the vision for CERP water storage was becoming clearer. The report indicates that construction and completion of authorized CERP projects will likely take several decades, and at this pace of restoration, it is even more imperative that agencies anticipate and design for the Everglades of the future. This seventh biennial review assesses the progress made in meeting the goals of the CERP and provides an in-depth review of CERP monitoring, with particular emphasis on project-level monitoring and assessment. It reviews developments in research and assessment that inform restoration decision making and identifies issues for in-depth evaluation considering new CERP program developments, policy initiatives, or improvements in scientific knowledge that have implications for restoration progress.

At the time of issuance of this draft report, the CISRERP was in its final stages of the eighth biennial review report to be released and published in 2020.

Each of their biannual reports are published online and can be read by the public at <https://www.nationalacademies.org/our-work/independent-scientific-review-of-everglades-restoration-progress-viii>.

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THE NEXT FIVE YEARS

REPORT TO CONGRESS | COMPREHENSIVE EVERGLADES RESTORATION PLAN
Central and Southern Florida Project

Images: Greater Everglades RECOVER Region; Wading Bird (Indicator)



4 THE NEXT FIVE YEARS

TABLE 4-1 summarizes the progress anticipated during the next reporting period. Further details are available in the 2020 update of the Integrated Delivery Schedule, which is available at <https://www.evergladesrestoration.gov>.

TABLE 4-1: Anticipated Progress, 2020-2025

ANTICIPATED CONSTRUCTION COMPLETIONS
C&SF: Herbert Hoover Dike Rehabilitation
C&SF: Kissimmee River Restoration and Headwaters Schedule
C&SF: Modified Water Deliveries to Everglades National Park: Final Water Control Plan for Modified Water Deliveries and C-111 South Dade projects – Final Combined Operational Plan
Restoration Strategies
Tamiami Trail Next Steps, Phase 2 Road Raising and Culvert Installation
C&SF: CERP: Biscayne Bay Coastal Wetlands Phase 1, L-31 East Flow-way and Cutler Wetlands
C&SF: CERP: Caloosahatchee River (C-43) West Basin Storage, Pump Station, and Embankment
C&SF: CERP: Central Everglades Planning Project, South, Structures S-333N, S-355W, S-631, S-632, S-633, L-67 C levee gaps and L-67A Spoil Mound Removal, Removal of Old Tamiami Trail
C&SF: CERP: Everglades Agricultural Project, A-2 STA Inflow/Outflow Canal, and A-2 STA, Reservoir Inflow/Outflow Canal & Bridge
C&SF: CERP: Indian River Lagoon-South, C-44 Reservoir, C-44 STA, and Pump Station, and C-23/24 STA
C&SF: CERP: Picayune Strand Flood Protection Features, Road Removal and Canal Plugging
ANTICIPATED DESIGN AND CONSTRUCTION UNDERWAY
C&SF: CERP: Broward County Water Preserve Areas, C-11 Impoundment and WCA-3A/3B Seepage Management Area
C&SF: C-111 South Dade Project, S-332B and S-332C Pump Stations Replacement (pending 2020 WRDA)
C&SF: CERP Central Everglades Planning Project, North, L-4-Levee Degrade & New Pump Station S-630, S-8 Pump Station Modifications, Miami Canal Backfill/Tree Islands, L-5 Canal Improvements, L-6 Diversion
C&SF: CERP: Central Everglades Planning Project, New Water, L-31N Seepage Barrier
C&SF: CERP: Central Everglades Planning Project, South, S-356 Pump Station, Removal L-67 C & L-67 Extension and Construction of L-67D Levee (Blue Shanty Flow-way)
C&SF: CERP: Everglades Agricultural Project, Reservoir Inflow Pump Station and Embankment (pending new start and/or 2020 WRDA)
C&SF: CERP: Indian River Lagoon-South, C-23/24 Reservoir North, C-23/C24 Reservoir South, C-23/C44 Interconnect, and C-25 Reservoir and C-25 STA

ANTICIPATED PLANNING EFFORT COMPLETIONS
C&SF: CERP: Biscayne Bay Southeastern Everglades Ecosystem Restoration
C&SF: CERP: C-43 Western Basin Reservoir Post Authorization Change Report (WRDA 2020)
C&SF: C-111 South Dade Project, Post Authorization Change for S-332B and S-332C Pump Stations Replacement (WRDA 2020)
C&SF: CERP: Lake Okeechobee Watershed Restoration Project
C&SF: Lake Okeechobee System Operations Manual (WRDA 2018 initiation, 2022 completion)
C&SF: CERP: Loxahatchee River Watershed Restoration Project (WRDA 2020)
C&SF: CERP: Southern Everglades Study
C&SF: CERP: Western Everglades Restoration Project [Big Cypress/L-28 Interceptor]
ANTICIPATED PROJECT PARTNERSHIP AGREEMENTS
C&SF: CERP: C-111 Spreader Canal, Western
C&SF: CERP: Central Everglades Planning Project (anticipated July 2020)
C&SF: CERP: Everglades Agricultural Area Project (anticipated Spring 2021)
C&SF: CERP: Indian River Lagoon South, Phase 2
C&SF: CERP: Loxahatchee River Watershed Restoration Project
C&SF: CERP: Lake Okeechobee Watershed Restoration Project (Pre-Project Partnership Agreement)
C&SF: CERP: Western Everglades Restoration Project

4.1 Anticipated Science Program Efforts

TABLE 4-2 summarizes the progress anticipated during the next reporting period in the area of Everglades science. Further details about RECOVER are available at <https://www.saj.usace.army.mil/Missions/Environmental/Ecosystem-Restoration/RECOVER/> and <https://www.evergladesrestoration.gov>.

TABLE 4-2: RECOVER'S Anticipated Efforts, 2020-2025

RECOVER MISSION AREA/PROGRAM	ANTICIPATED EFFORTS
ADAPTIVE MANAGEMENT PROGRAM	<ul style="list-style-type: none"> • Update the 2015 CERP Programmatic Adaptive Management Plan (RECOVER 2015) every 5 years to incorporate new findings and inform project implementation schedules, and operations. • Update program- and project-level uncertainties and potential adaptive management strategies. • Assist with the development of project-specific Adaptive Management (AM) plans as required by the USACE. • Develop passive and active AM strategy scopes of work. • Schedule, design, and recommend AM strategies for implementation.
ADAPTIVE ASSESSMENT AND MONITORING PROGRAM	<ul style="list-style-type: none"> • Provide system-wide monitoring and produce System Status Reports in 2024 to report CERP’s performance. • Adjust monitoring programs and protocol to meet CERP project implementation and scientific needs particularly in light of climate change and exotic species issues. • Coordinate project-specific monitoring plans with existing system-wide monitoring • Improve information-exchange between scientists and managers and coordination among all south Florida scientific and restoration efforts.
EVALUATION AND PLANNING	<ul style="list-style-type: none"> • Complete ecological models, hypotheses, performance measures. • Provide scientific input for project sequencing contained in the IDS. • Next Steps after 2020 Interim Goals and Interim Targets – Periodic CERP Update • Incorporate new guidance related to climate change into ecological planning tools and integrate applicable information into short- and long-term plans.

4.2 Looking Forward

In early 2020, the Task Force developed a set of hypothetical funding scenarios as a comparison to the annual estimated funding requirements for the projects included in the October 2019 Integrated Delivery Schedule (IDS). This analysis did not look at the intricate project sequencing and scheduling decisions that would need to be made for these hypothetical scenarios. It also did not anticipate future construction timelines or costs for projects currently in the planning phase. It does provide a generalized review of the impact of three different funding scenarios on the overall timelines and cumulative costs for the slate of activities depicted on the October 2019 IDS.

Three alternative scenarios were developed: 1) annual costs and project timelines as depicted on the October 2019 IDS, 2) funding levels at the \$400M/year as envisioned in CERP's "Yellow Book," and 3) a five-year average funding level that was developed from the past five years (this equated to approximately \$310M/year). The analysis included 3% annual increases in construction costs for the latter two scenarios.

On the October 2019 IDS, projects currently under construction are anticipated to be completed by 2030, if annual funding matches the planning estimates. If funding is received at the levels anticipated in the Yellow Book, that timeline roughly extends to 2034. If the five-year average of funding continues, the timeline extends to approximately 2039. The total dollars represented in the latter two scenarios also increase as the timelines are extended. The October 2019 IDS indicated an overall cost of \$6.8 billion. The Yellow Book scenario increased that estimate to \$8.7 billion and the five-year average increased it to \$9.5 billion.

For more information on this analysis performed by the Task Force, refer to the 2020 Biennial Report on <https://evergladesrestoration.gov>.

4.3 Big Picture Message of the 2020 Report to Congress

The next five years provide an opportunity to build upon substantial recent progress. These are the big picture messages of the 2020 Report to Congress:

- ❖ The success of CERP in the next five years will stand on the shoulders of the Foundation projects that will continue to send more, clean, freshwater to the Greater Everglades, bridged the Tamiami Trail and listen to the signals of Everglades National Park.
- ❖ America’s Everglades are resilient - events of ecological significance show us an early glimpse at ecological response.
- ❖ Timely authorizations and funding are critical to capitalizing on the momentum in restoration of the historic River of Grass, known as America’s Everglades.
- ❖ Great strides toward “getting the water right” can be made during the next reporting period with continued support from Congress and the State of Florida: four Foundation Projects will have been completed; six CERP projects will have been constructed and seven more projects will be simultaneously under design and construction. Planning will be underway for the next group of CERP projects included in both the Biscayne Bay Southeastern Everglades Ecosystem Restoration (BBSEER) study and the Southern Everglades studies.
- ❖ Everglades science holds the key to achieving CERP goals. We have a lot more to do and we are learning as we go.
- ❖ Successful collaboration and leadership are fostering the real-time delivery of the program.
- ❖ A healthy and resilient Everglades directly supports our economy and sustainability.

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TAB A: LIST OF ACRONYMS

ACRONYM	DEFINITION
AA&M	Adaptive assessment and monitoring
ASR	Aquifer Storage and Recovery
BBSEER	Biscayne Bay Southeastern Everglades Ecosystem Restoration
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

ACRONYM	DEFINITION
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
PPCA	Pre-Partnership Credit Agreement
RECOVER	REstoration COordination & VERification
REMAP	Regional Environmental Monitoring and Assessment Program
RSM	Regional Simulation Model
SAV	Submerged Aquatic Vegetation
SCG	Science Coordination Group
SEACOM	Florida Bay Seagrass Community Model
SFER	South Florida Ecosystem Restoration

ACRONYM	DEFINITION
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
USDOI	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 Accountability and Collaboration
WY	Water Year

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*****THIS SECTION IS PENDING UPDATE*******TAB B: REFERENCES**

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