

# **SOUTH FLORIDA ECOSYSTEM RESTORATION (SFER) COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP)**

## **2020 REPORT TO CONGRESS**

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22 October 2020



**US Army Corps  
of Engineers®**

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.



# BUILDING ON HISTORIC MOMENTUM

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

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.



## SOUTH FLORIDA ECOSYSTEM RESTORATION WATER RESOURCES DEVELOPMENT ACTS 2016 - 2020

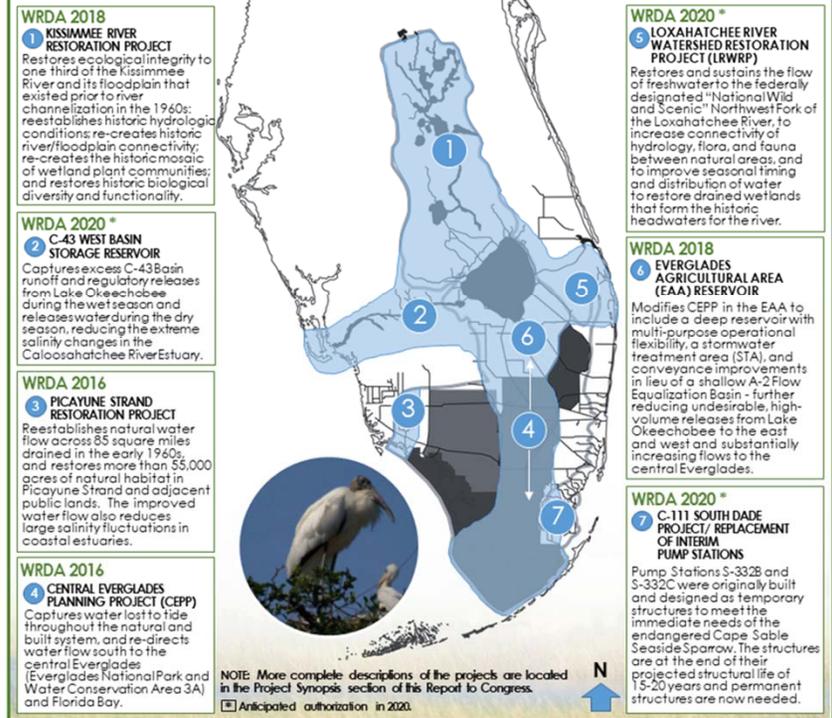
PLAN | DESIGN | BUILD | OPERATE | MONITOR | ADAPT

The process leading to a CERP project is an integrated team effort of many, based on science – that sometimes loops back in the process to ensure the right project is built. The process starts with a study called a Project Implementation Report (PIR), that ultimately recommends a plan to Congress for project authorization and eligibility for funding.

### WATER RESOURCES DEVELOPMENT ACT (WRDA): A SIGNIFICANT MILESTONE ADVANCING CERP

After a study is completed with a Recommended Plan, it awaits a U.S. Army Corps of Engineers, Chief of Engineer's Report and signature to endorse the plan, and subsequently transmit the plan to the Office of the Assistant Secretary of the Army for Civil Works [OASA (CW)], and chairpersons of the Senate Committee on Environment and Public Works and the House of Representatives Committee on Transportation and Infrastructure for consideration in a WRDA bill. WRDA 2020 marks four consecutive WRDAs since 2014 by Congress - significantly and positively impacting a large area of the original Everglades ecosystem, and furthering progress on 7 projects.

Map: Loosely depicts WRDA 2016 - 2020 projects' overlapping areas of influence.



The potential ecological benefits from improved hydrology and habitat as a result of south Florida ecosystem restoration projects are great, and many benefits are already seen for near completed projects, such as the return of the threatened wood stork and endangered Florida panther to the Picayune Strand area, and wading bird colonies along the Kissimmee River floodplain.





# 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 (USDO), 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.

2015 AND 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><b>C-111 SOUTH DADE (C-111 SD)</b></p> <ul style="list-style-type: none"> <li>All construction contracts completed</li> <li>Post-Authorization Change Report to replace the existing temporary S-332B and S-332C pump stations with permanent pumps stations and concrete outlets completed</li> <li>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</li> </ul> <p><b>HERBERT HOOVER DIKE (HHD) MAJOR REHABILITATION PROJECT AND DAM SAFETY MODIFICATION STUDY</b></p> <ul style="list-style-type: none"> <li>Replacement of 17 water control structures (culverts)</li> <li>Construction contracts for the remaining 11 culvert replacements awarded</li> <li>Construction contracts for the remaining 35.2 miles of cutoff wall installation awarded</li> <li>Initiation, scoping and plan formulation of Lake Okeechobee System Operations Manual (LOSOM), a new Lake schedule/ revised water control plan</li> </ul> <p><b>KISSIMEE RIVER RESTORATION PROJECT</b></p> <ul style="list-style-type: none"> <li>Construction completed for:               <ul style="list-style-type: none"> <li>S-456X1 Structure</li> <li>River Acres Canal</li> <li>MacArthur Ditch Backfill</li> <li>Reach 3 Backfill</li> <li>Reach 3 North Backfill Repairs</li> </ul> </li> <li>Construction of Reach 2 Backfill awarded</li> <li>Construction of S-69 Weir and Reach 3 Backfill Repairs awarded</li> </ul> <p><b>LAKESIDE RANCH STORMWATER TREATMENT AREA (STA)</b></p> <ul style="list-style-type: none"> <li>Operation of Phase II, southern Stormwater Treatment Area (STA)</li> <li>Construction of Phase III, S-191 A pump station, initiated</li> </ul> <p><b>MODIFIED WATER DELIVERIES TO EVERGLADES NATIONAL PARK (MWD)</b></p> <ul style="list-style-type: none"> <li>All construction contracts completed</li> <li>Operational field testing of S-356 and G-3273 relaxation while incrementally raising the L-29 Canal stage initiated under Increment 1</li> <li>Operational Increment 1.1/1.2 implemented</li> <li>Operational Increment 2 implemented</li> <li>Combined Operations Plan (COP) for C-111 SD and MWD recommended plan and water control plan update completed</li> </ul> <p><b>RESTORATION STRATEGIES</b></p> <ul style="list-style-type: none"> <li>Construction and the Operational, Testing, and Monitoring Phase (OTMP) of A-1 Flow Equalization Basin (FEB) completed</li> <li>Construction and OTMP of L-8 FEB completed</li> <li>Modification/ construction of three primary conveyance features (S-5A5, L-8 divide structure, and S-375) completed</li> </ul> <p><b>TAMIAMI TRAIL NEXT STEPS PROJECT</b></p> <ul style="list-style-type: none"> <li>Construction of 2.6-mile bridge completed</li> </ul> <p><b>TEN MILE CREEK WATER PRESERVE AREA</b></p> <ul style="list-style-type: none"> <li>Rehabilitation of reservoir to allow a 4-foot fill</li> <li>Operations of water preserve area and STA</li> </ul> <p><b>WEST PALM BEACH CANAL STA-1 EAST/C-51 WEST</b></p> <ul style="list-style-type: none"> <li>Culvert repairs completed</li> </ul>	<p><b>BISCAYNE BAY COASTAL WETLANDS, PHASE 1</b></p> <ul style="list-style-type: none"> <li>Operation of L-31E Interim Pump for early benefits in coastal wetlands and Biscayne Bay</li> <li>Installation of all L-31E Flow-way culverts completed</li> <li>L-31E Contract 4 awarded for L-31E flow-way</li> </ul> <p><b>BROWARD COUNTY WATER PRESERVE AREA</b></p> <ul style="list-style-type: none"> <li>Construction of Mitigation Area A Berm completed</li> </ul> <p><b>C-111 SPREADER CANAL WESTERN PROJECT</b></p> <ul style="list-style-type: none"> <li>Installation and operation of additional pump capacity at S-199 and S-200 completed</li> <li>Connection of the C-222 Header Channel to the L-31W Canal (via the G-737 culvert) completed</li> </ul> <p><b>CALOOSAHATCHEE RIVER (C 43) WESTERN BASIN STORAGE RESERVOIR PROJECT</b></p> <ul style="list-style-type: none"> <li>Award for S-470 Intake Pump Station Contract</li> <li>Award for final contract for Embankment and Civil Works</li> <li>Construction of the S-476 Irrigation Pumping Station completed</li> </ul> <p><b>CERP EVERGLADES AGRICULTURAL AREA PROJECT</b></p> <ul style="list-style-type: none"> <li>Design and early construction of the A2 STA initiated</li> <li>Design of the EAA A-2 Reservoir</li> </ul> <p><b>CENTRAL EVERGLADES PLANNING PROJECT</b></p> <ul style="list-style-type: none"> <li>Construction of S-333N spillway (1,150 cfs ) completed</li> <li>Removal of Old Tamiami Trail Road and S-346 initiated</li> <li>Construction of Contract 1 (S-631, S-633 water control structures, L-67A Spoil Removal, and L-67C Levee Gap) initiated</li> </ul> <p><b>DECOMPARTMENTALIZATION PHYSICAL MODEL (DPM)</b></p> <ul style="list-style-type: none"> <li>Years 3 and 4 of Phase I Testing during dry seasons (flow testing) completed</li> <li>Approval for Phase II year round testing</li> <li>Years 5, 6, and 7 of Phase II testing completed</li> </ul> <p><b>INDIAN RIVER LAGOON SOUTH, PHASE 1</b></p> <ul style="list-style-type: none"> <li>Construction of C-44 STA discharge spillway completed</li> <li>C-44 STA initial fill initiated</li> <li>Construction of C-44 Reservoir Pump Station completed</li> <li>Design for C-23/24 North Reservoir, South Reservoir, and STA</li> </ul> <p><b>PICAYUNE STRAND RESTORATION PROJECT</b></p> <ul style="list-style-type: none"> <li>Construction of Faka Union Pump Station completed</li> <li>Removal of 100 miles of roadways completed</li> <li>Construction of Miller Pump Station completed</li> <li>Removal of 65 miles of road and 28 miles of logging trams between Merritt and Faka Union Canals completed</li> <li>Construction of Manatee Mitigation Feature completed</li> <li>Construction of East-west canal plugging</li> </ul>




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





# EVENTS OF ECOLOGICAL SIGNIFICANCE

Over the past five years, several discrete events profoundly impacted 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.

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.

## 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



Central/Western Florida Bay HOWSEAD 20% Seagrass Meadow Loss

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

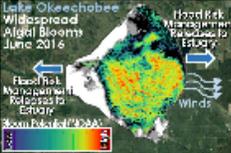
Increased nutrients and turbidity resulting from decaying seagrass meadow and destabilized sediments fueled algal outbreaks in Central and Western Florida Bay nine months after the die-off began. The secondary impacts increased seagrass vulnerability further. High nutrient/chlorophyll conditions continued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

**2015 - 2020 LAKE OKEECHOBEE | NORTHERN ESTUARIES  
HARMFUL ALGAL BLOOMS**



**Algal Blooms in Coloahatchee 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



Lake Okeechobee Watershed Algal Blooms June 2016

Flood Risk Management Releases to Estuary

Winds

\* Image courtesy of the Cain Brothers.

- 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.

**2017 SYSTEM-WIDE IMPACTS  
HURRICANE IRMA**



**Tree Islands Severely Inundated**

PRECEDING CONDITIONS
Extreme Dry Season
Extreme Wet Season



September 2017 Hurricane Irma Extreme Rainfall

**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, declining oyster populations in the St. Lucie and Coloahatchee estuaries. 2017 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.





# EVENTS OF ECOLOGICAL SIGNIFICANCE

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.

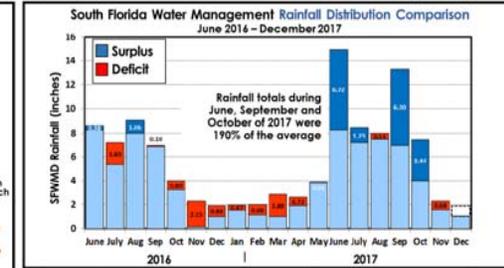
Interagency teams meet and report on-the-ground ecological conditions of Lake Okeechobee, considered the heart of the Central and Southern Florida system, on a weekly and monthly basis through calls and online reporting



## 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&S) system.



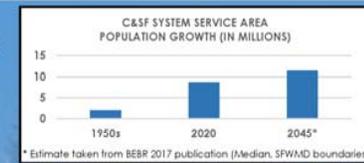
Conditions are significantly different since the C&S multi-purpose system was designed more than 70 years ago. Potential impacts related to climate change, sea level change, the burgeoning population, and the intensely developed urban landscape across south Florida were not anticipated at the time – yet, flooding within the C&S 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&S Resiliency Study to reevaluate the resiliency of the C&S system with newly observed and projected information and data available since the C&S 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.





# EVENTS OF ECOLOGICAL SIGNIFICANCE

In water year 2018, the above average wet season rainfall amounts and elevated stages throughout most of the wet and dry seasons had notable impacts on the ecology of the Everglades.

This opportunity offered us a glimpse of the ecological response we are hoping for once the water from the CERP is delivered.

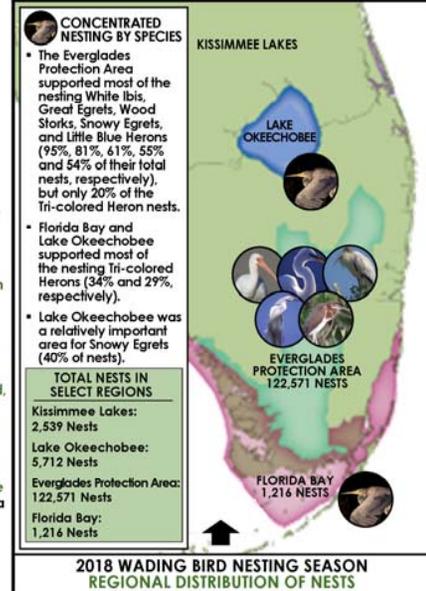
## 2018 WADING BIRD NESTING SEASON

Sustainability of healthy wading bird populations is a primary goal of the Comprehensive Everglades Restoration Plan (CERP) and other Everglades restoration programs. A central prediction of CERP is that a return to natural flows and hydropatterns will result in the recovery of large, sustainable breeding wading bird populations, a return to natural timing of nesting, and restoration of large nesting colonies in the coastal zone (Frederick et al. 2009).

An estimated 138,834 wading bird nests, excluding Cattle Egrets, which do not rely on wetlands, were initiated in South Florida during the 2018 nesting season (December 2017 to July 2018). This period reflects the largest annual nesting effort observed since comprehensive system-wide surveys began in South Florida in 1995 and is comparable with reports of large nesting events from the 1940s.

**What we learned.** This nesting event was not predicted, as the hydrological system is not yet restored as anticipated in the CERP. However, while water depths during Water Year 2018 began and ended near the historical average, the above average wet season rainfall amounts and elevated stages throughout most of the wet and dry seasons had notable impacts on the ecology of the Everglades. This opportunity offered us a glimpse of the ecological response we are hoping for once the water from CERP is delivered.

Reference: South Florida Wading Bird Report, South Florida Water Management District, Volume 24, May 2019.



- CONCENTRATED NESTING BY SPECIES**
- The Everglades Protection Area supported most of the nesting White Ibis, Great Egrets, Wood Storks, Snowy Egrets, and Little Blue Herons (95%, 81%, 61%, 55% and 54% of their total nests, respectively), but only 20% of the Tri-colored Heron nests.
  - Florida Bay and Lake Okeechobee supported most of the nesting Tri-colored Herons (34% and 29%, respectively).
  - Lake Okeechobee was a relatively important area for Snowy Egrets (40% of nests).

### KEY RESTORATION INDICATOR SPECIES | 2018 NESTING SEASON RELATIVE TO LONG-TERM TRENDS

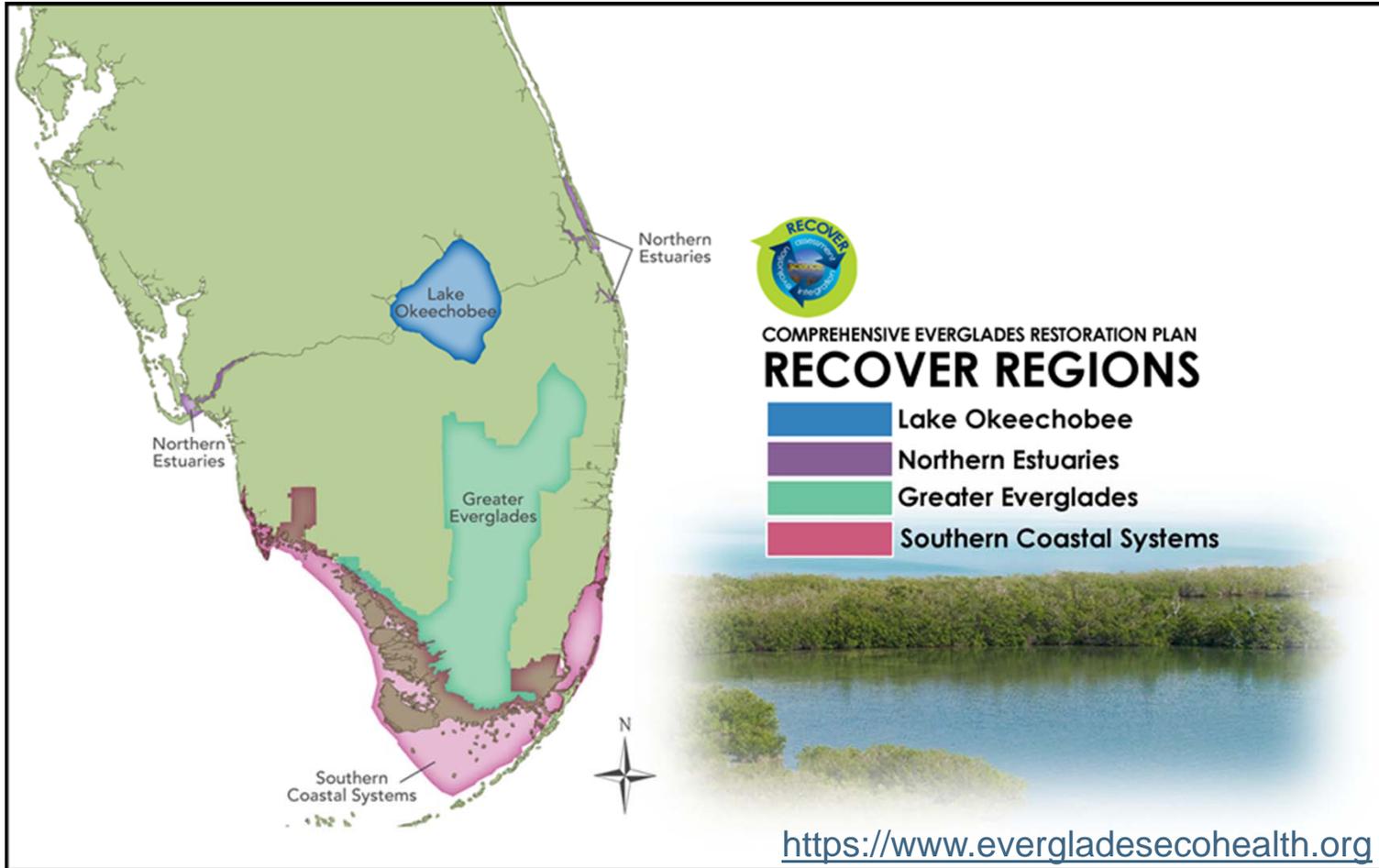


Broad River Colony with Primarily Wood Stork Nests (photo credits: Mark Cook, SFWMD)





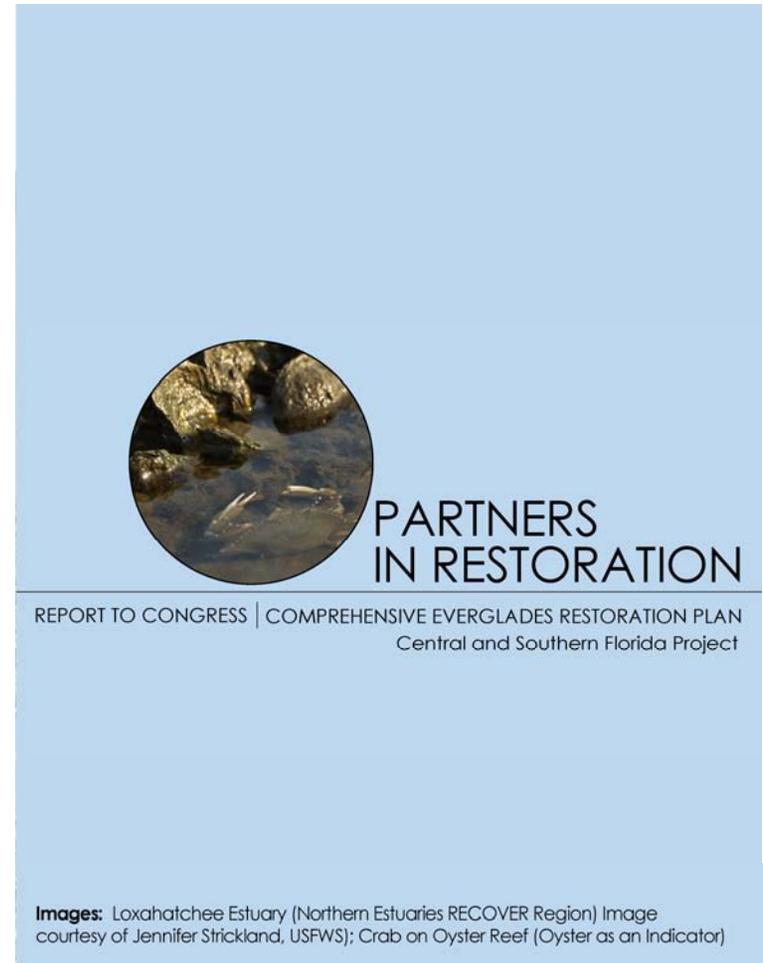
# RESTORATION SCIENCE





# PARTNERS IN RESTORATION

- The South Florida Ecosystem Restoration Task Force
- Coordination and Consultation with Tribal Governments
- Public Participation and Stakeholder Engagement
- CERP Project Delivery Team (PDT) Meetings
- Task Force Meetings and Stakeholder Workshops
- SFWMD Governing Board and Water Resources Accountability and Collaboration





# 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
- The Seminole Nation of Oklahoma
- Seminole Tribe of Florida
- Thlopthlocco Tribal Town



The USACE is honored to present the positions of the tribes in this report, they are included verbatim as provided by the tribal staff.



**MICCOSUKEE**  
TRIBE OF INDIANS OF FLORIDA





# PARTNERS IN RESTORATION, CONTINUED



- Regional Environmental Monitoring and Assessment Program (US EPA)
- C-43 West Basin Storage Reservoir Water Quality Feasibility Study (State of Florida)
- Blue-Green Algae Task Force and Innovative Technology (State of Florida)
- Basin Management Action Plans (State of Florida)





# WITH CONTINUED SUPPORT FROM CONGRESS, WE WILL ACCOMPLISH MORE



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.
- 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.



## THE NEXT FIVE YEARS

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

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



# FINANCIAL PROGRAM



## Expenditures through Fiscal Year 2019:

	USACE	SFWMD <sup>(2)</sup>	TOTAL
<b>Projects<sup>(3)</sup></b>	\$ 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 <sup>(4)</sup>	n/a	\$ 157,802,429	\$ 157,802,429
<b>Total</b>	<b>\$ 1,409,261,060</b>	<b>\$ 1,824,602,974</b>	<b>\$ 3,233,864,034</b>
<b>Cost Sharing Percentage</b>	<b>44%</b>	<b>56%</b>	<b>100%</b>

## Cost Estimate Update:

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



# SCHEDULE & NEXT STEPS



- Coordination and Consultation with Tribes - ongoing
- Consultation with SFER Task Force - today
- Public Engagement – starts today for 30 days
- Agency Letters
  - Environmental Protection Agency - complete
  - Department of Interior – complete
  - Department of the Army – in progress
  - State of Florida – in progress
- Final report to congress in December 2020

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