



Palm Beach County Lake Worth Lagoon Update

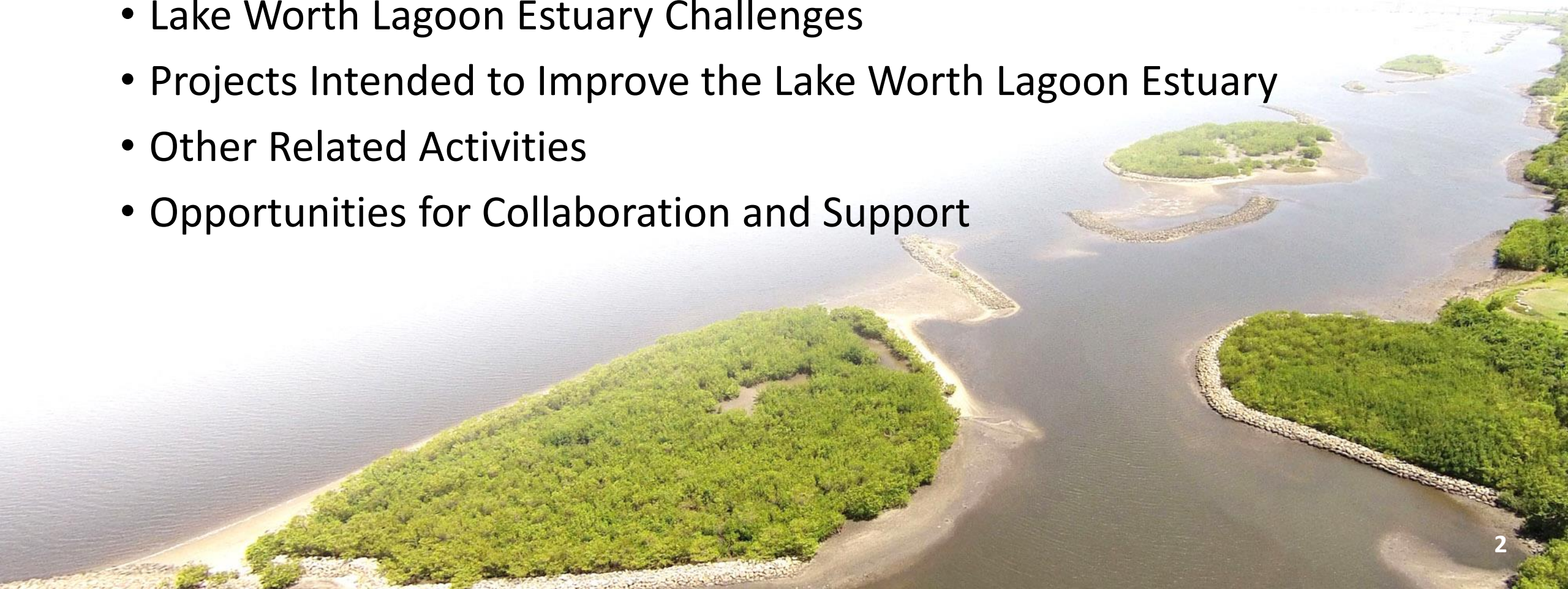


County Coalition for Responsible Management of Lake Okeechobee,
St. Lucie and Caloosahatchee Estuaries, and Lake Worth Lagoon

February 26, 2021

Agenda

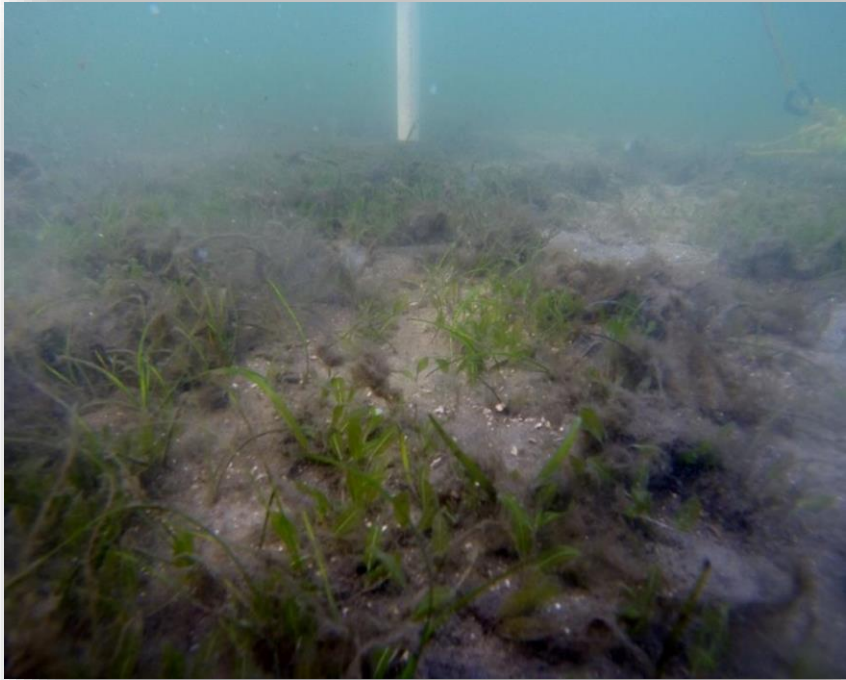
- Background, Significance and Economic Value
- Estuary and Watershed Characteristics and Infrastructure
- Lake Worth Lagoon Estuary Challenges
- Projects Intended to Improve the Lake Worth Lagoon Estuary
- Other Related Activities
- Opportunities for Collaboration and Support







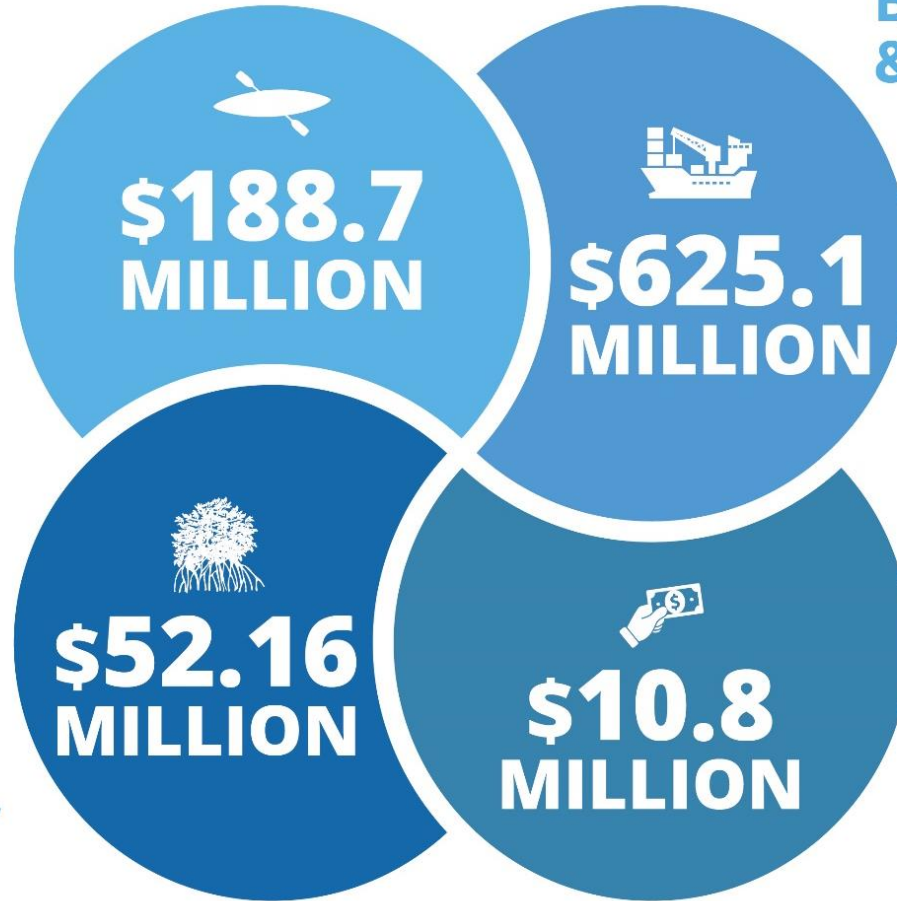




Economic Value of Lake Worth Lagoon Estuary

RECREATION

FISHING: \$3.4M
DIVING: \$5.2M
BOATING: \$7.3M
BIRDBWATCHING: \$2M



BUSINESS & COMMERCE

4,726 FULL TIME JOBS
\$375 MILLION (60%) OF ECONOMIC ACTIVITY IS FROM THE PORT OF PALM BEACH

VALUE OF LAGOON HABITATS

FOR FISH AND WILDLIFE, WATER QUALITY PROTECTION, CLIMATE MITIGATION

INCREASED SPENDING IN THE LOCAL ECONOMY

DUE TO INCREASED RESIDENTIAL PROPERTY VALUE

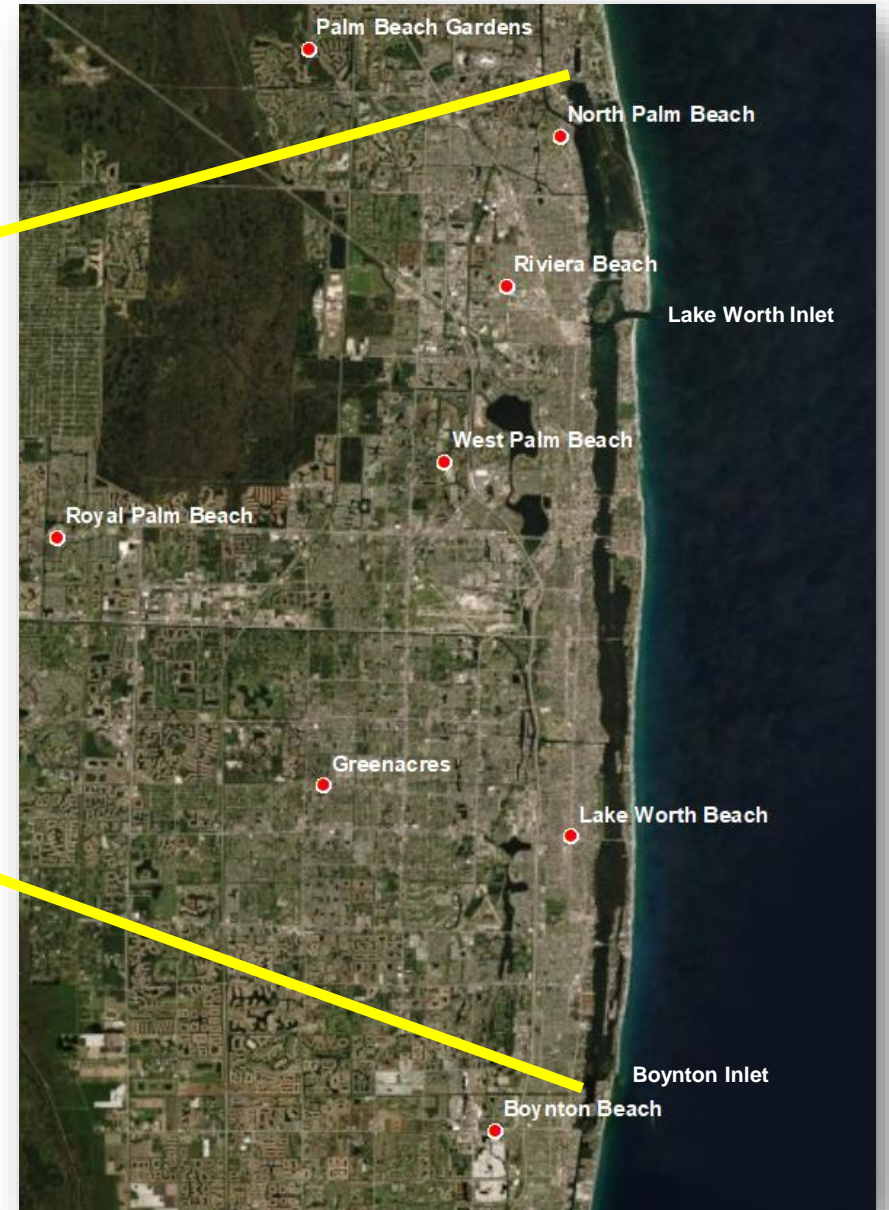
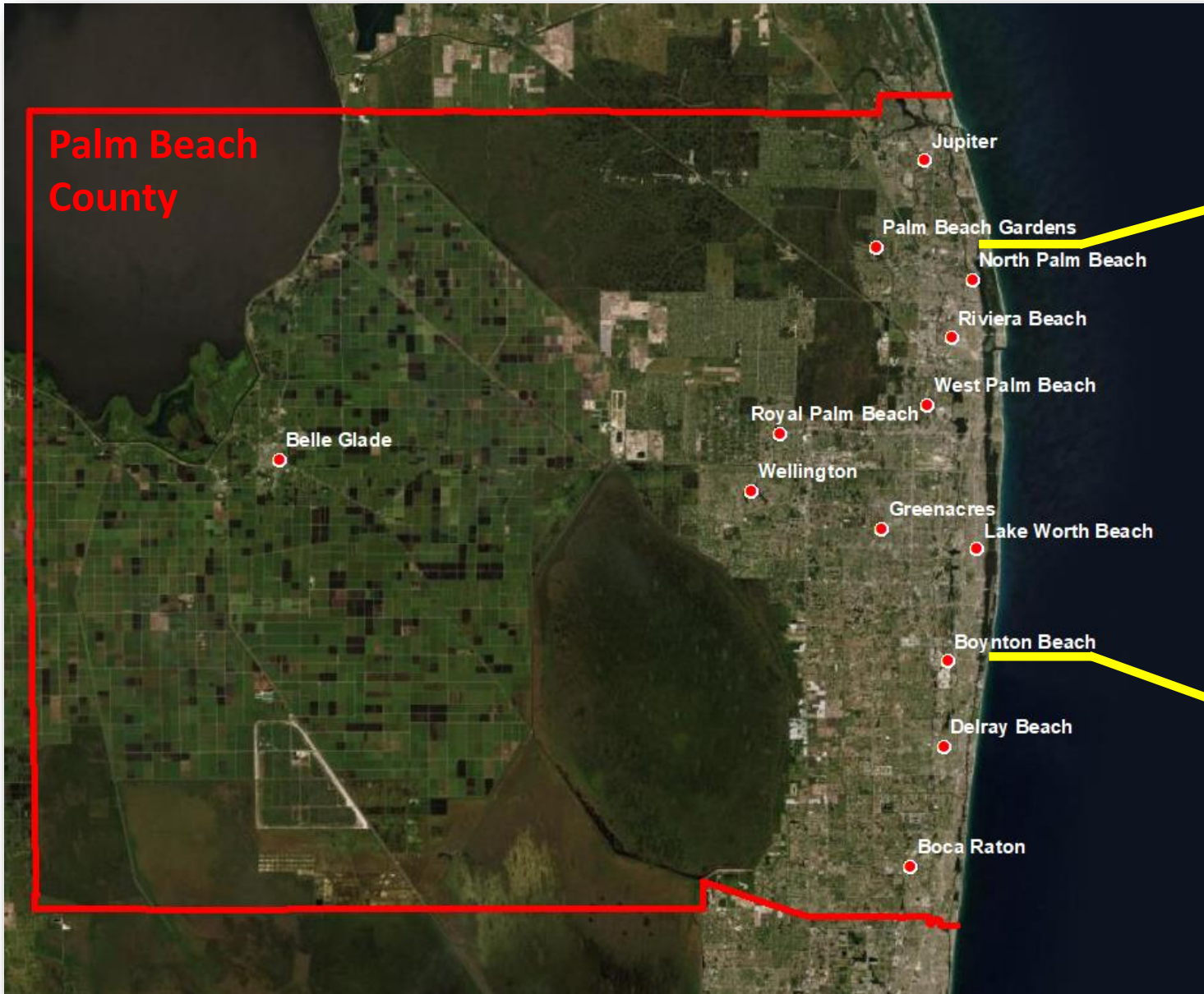
ADDITIONAL REAL ESTATE VALUE ON LAGOON WATERFRONT:

SINGLE-FAMILY HOME: \$73,761 CONDOMINIUM UNIT: \$11,292

NOTE: Annual Figures
DRAFT; Subject to Revision

SOURCE: Everglades Law Center & PFM Group Consulting LLC

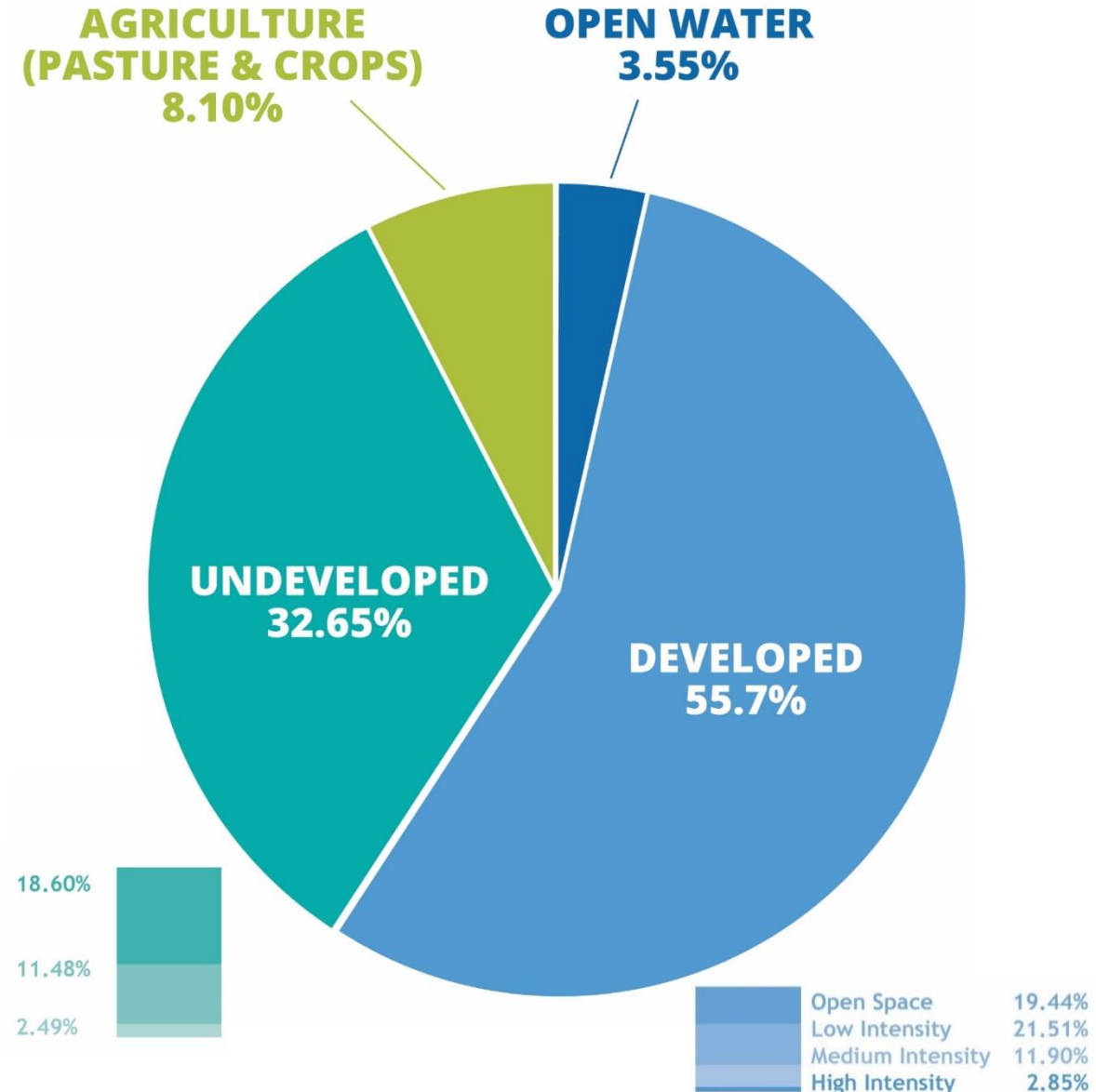
Lake Worth Lagoon Estuary



LAKE WORTH LAGOON BY THE NUMBERS

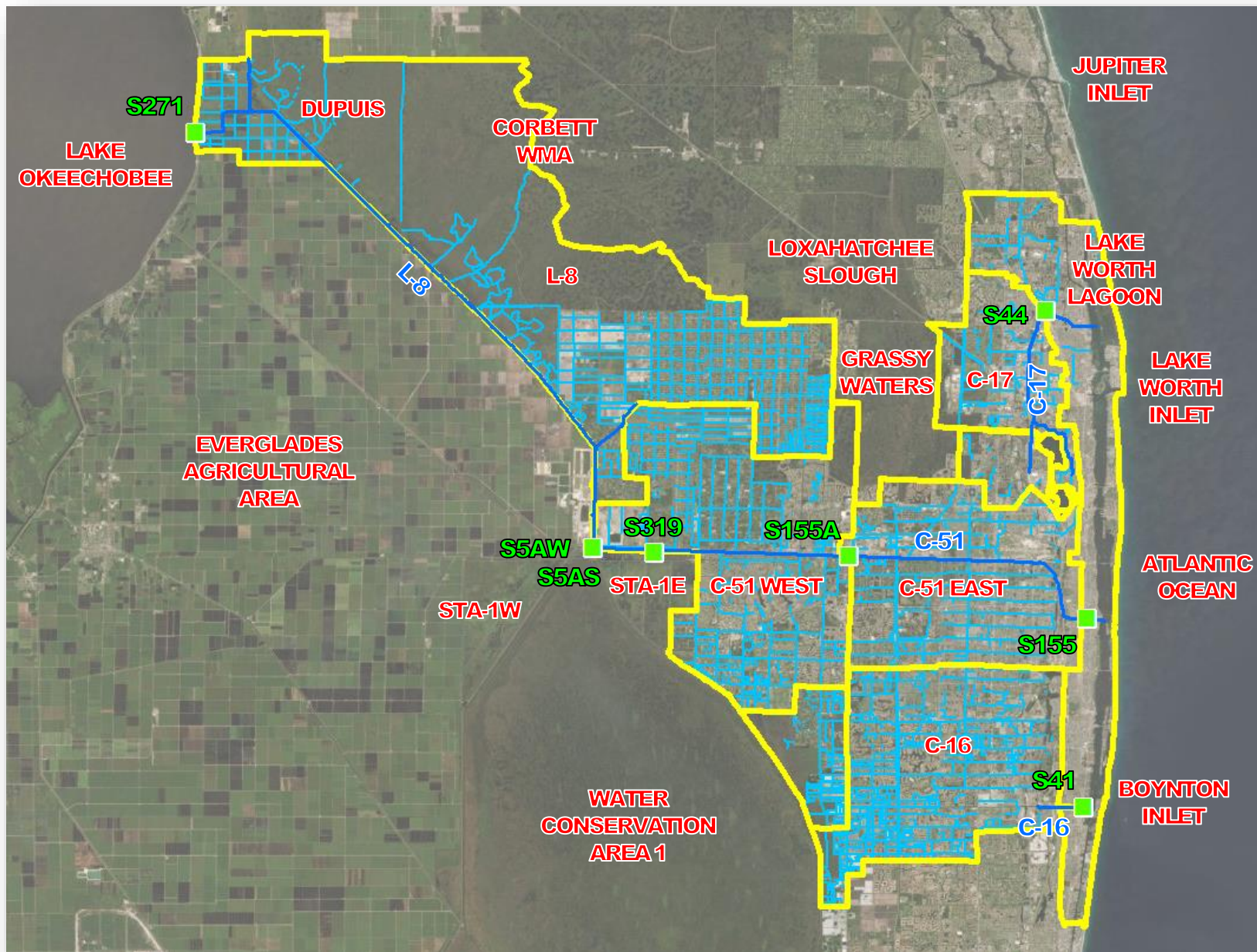


LAND USE IN THE WATERSHED



DRAFT; Subject to Revision

Watershed Characteristics and Infrastructure



Challenges

Shoreline Hardening



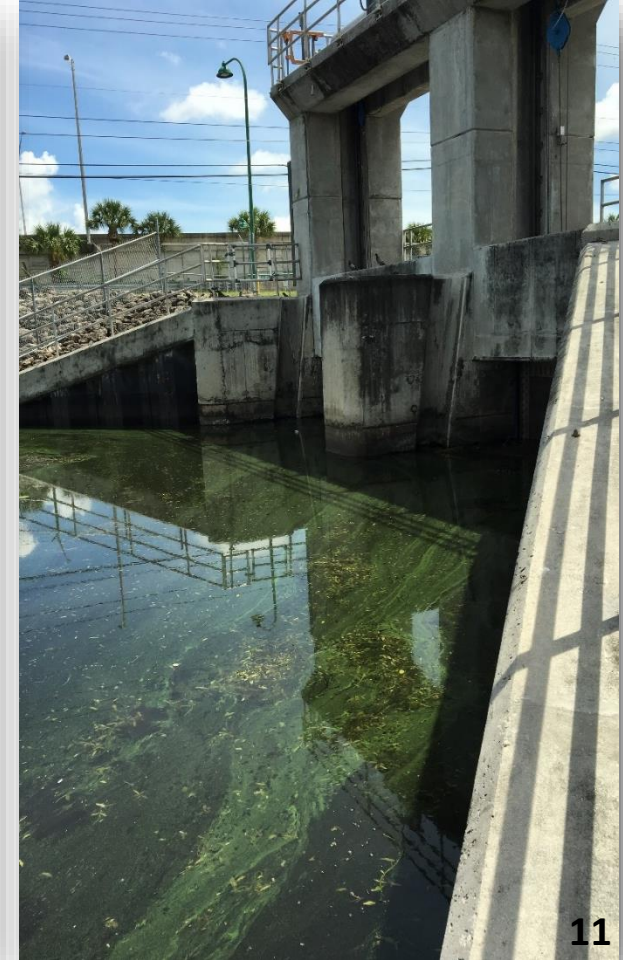
Stormwater Discharges



Limited Flushing in Central Lagoon



Algae



Shoreline Hardening (aka Seawalls)



Shoreline Hardening (Seawalls)





2020 Lake Worth Lagoon Shoreline Characterization

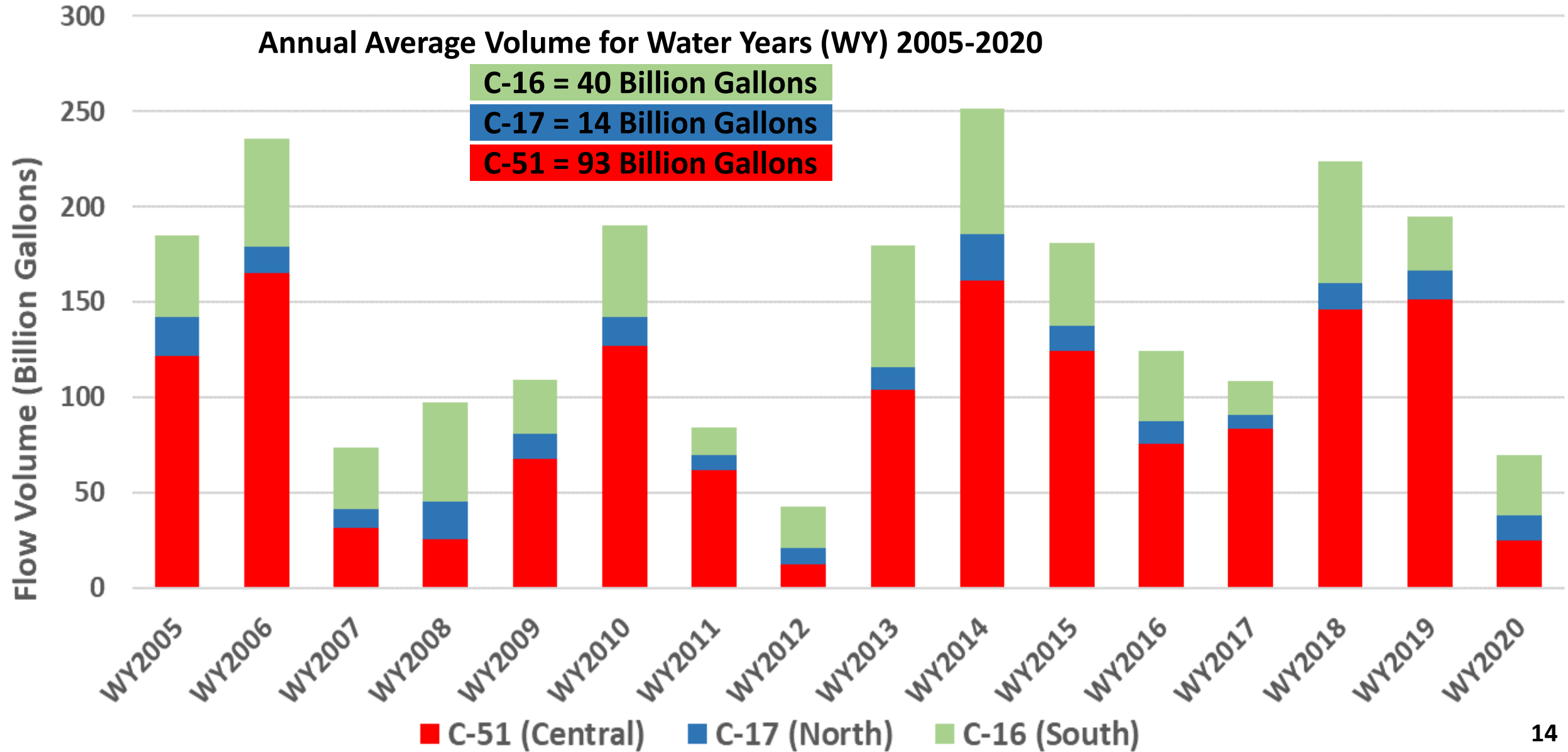
Shoreline

- Armored 70%
- Natural 30%

0 0.5 1 2 3 Miles

Stormwater Discharges to the Lake Worth Lagoon



Stormwater Discharges: Structure S-155



Purpose:

Maintain the C-51 Canal at 8 – 8.5 feet NGVD29; Prevent saline intrusion

Description:

3-bay concrete spillway with 25-foot wide automatically-controlled vertical lift gates

Flow Capacity:

4,800 cubic feet per second (cfs) with a downstream tide elevation of 1.0 feet NGVD29

Year Constructed:

~1983

Stormwater Discharges: Muck



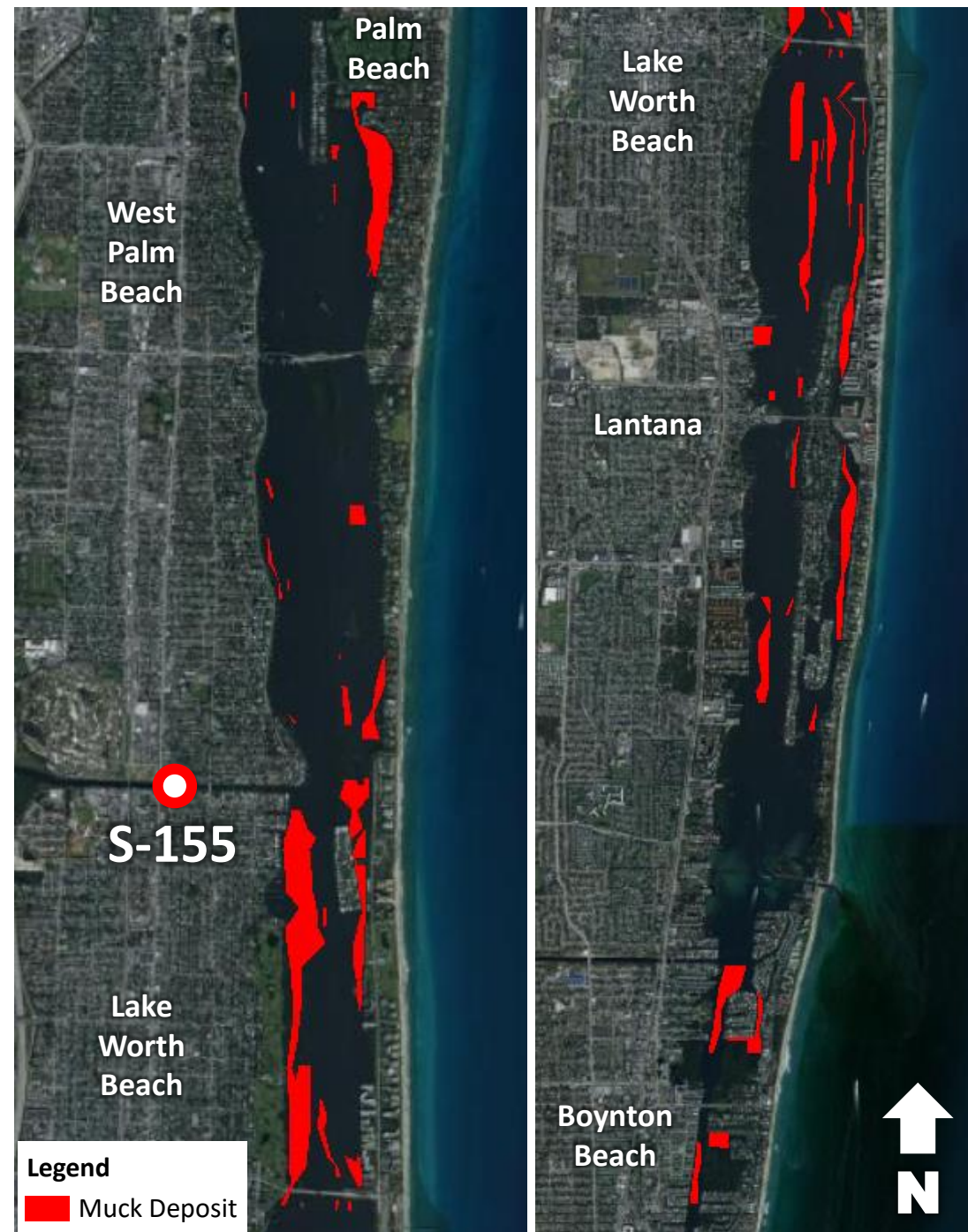
What's the Problem with Muck?

- Blankets the natural sand substrate
- Reduces available benthic and oyster habitat
- Decreases biodiversity
- Easily re-suspended
 - Increased turbidity
 - Decreased light penetration
 - Reduced photic zone
- Prevents colonization/expansion of Submerged Aquatic Vegetation (SAV)



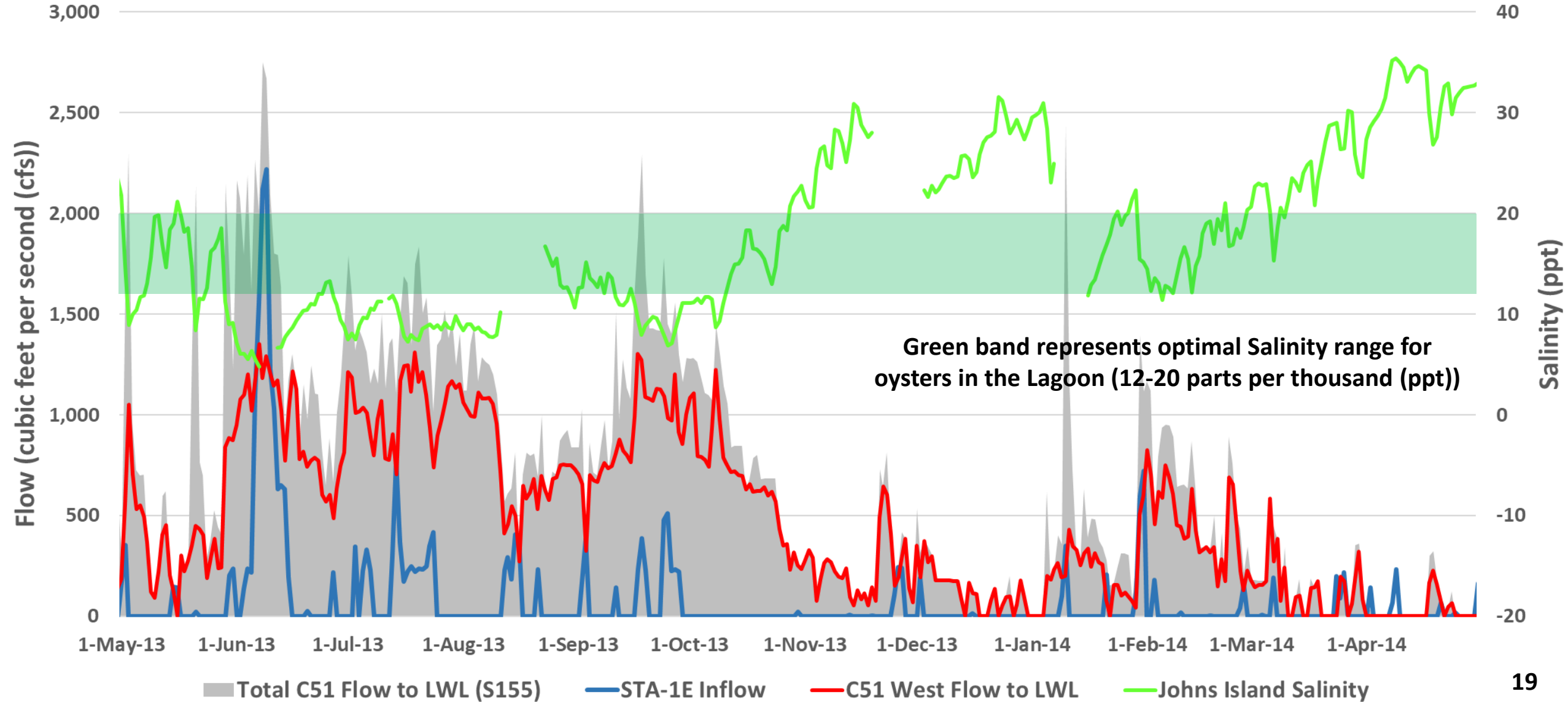
Muck Distribution (2003)

- 425 acres of Muck >1 foot deep in a 12 mile long area
- \pm 42% of muck deposits are found within a 2 mile radius of C-51 Canal discharge location
- \pm 1.2 million cubic yards of muck near C-51 Canal discharge location
- Accumulation rate \sim 0.9 centimeters per year



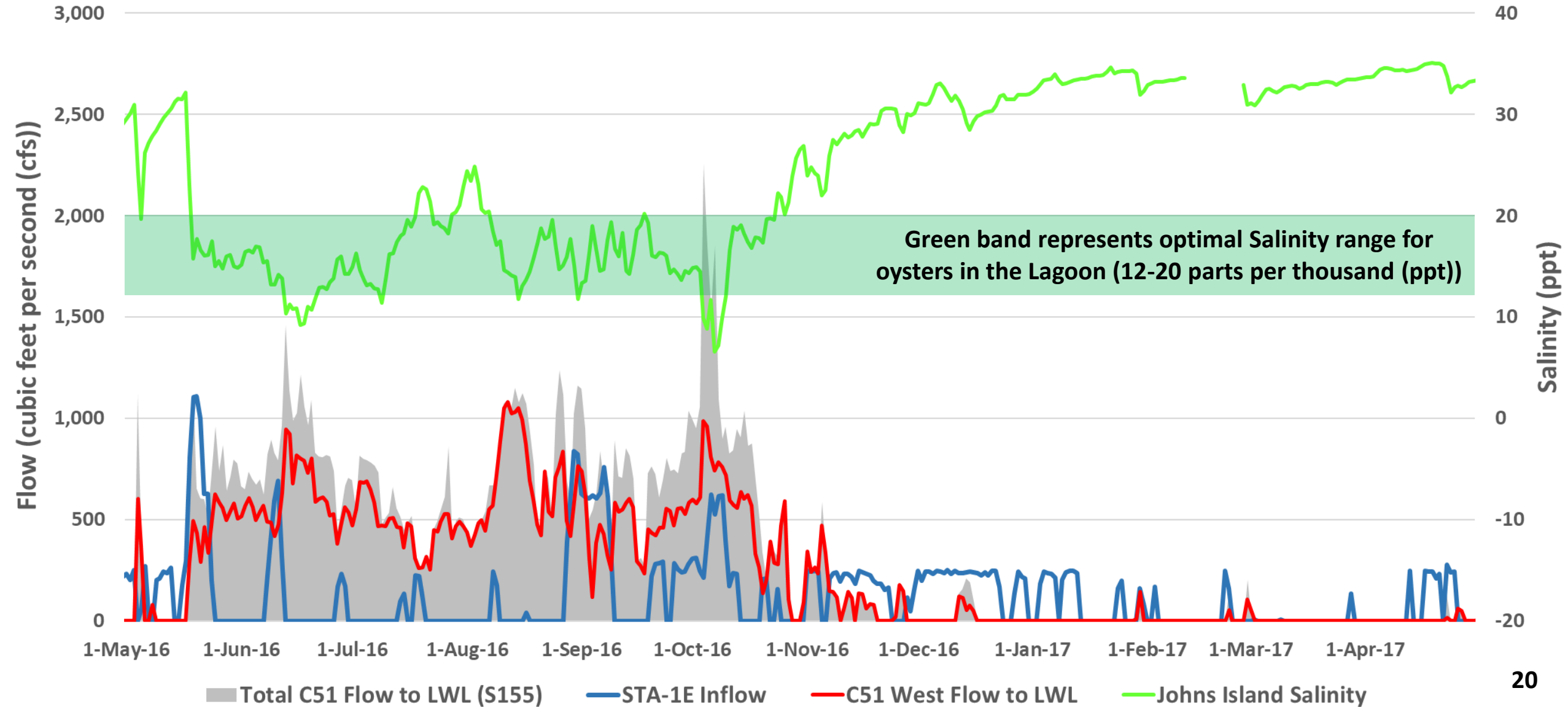
Stormwater Discharges: Salinity near S-155

Water Year 2014 (May 2013 – April 2014)



Stormwater Discharges: Salinity near S-155

Water Year 2017 (May 2016 – April 2017)



Limited Flushing in Central Lake Worth Lagoon

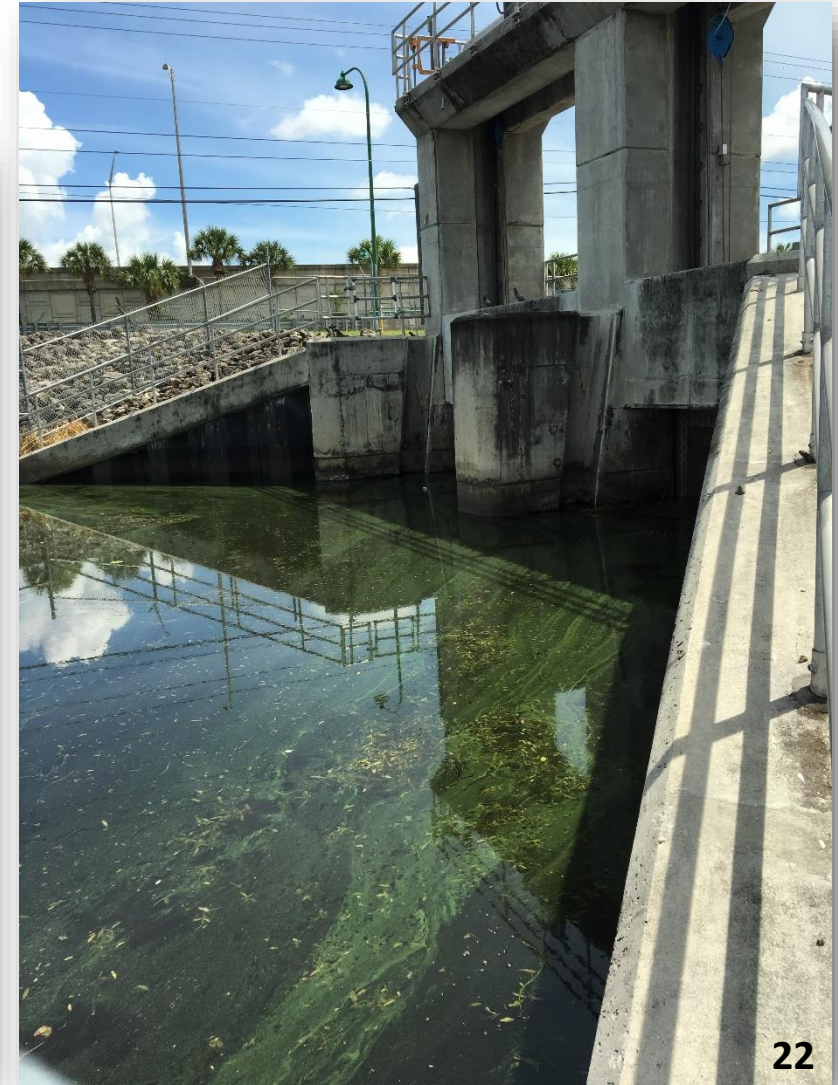
**Boynton
Inlet**

S-155

**Palm Beach
Inlet**



Blue-Green Algae Blooms



Summa Beach Park – West Palm Beach – June 2016



HEALTH ALERT

**TOXIC ALGAE CONCERNS
WEST PALM BEACH**

Source:
WPEC/CBS12

Summa Beach Park – West Palm Beach – June 2016



HEALTH ALERT

**TOXIC ALGAE CONCERNS
WEST PALM BEACH**

Source:
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Projects Intended to Improve the Lake Worth Lagoon Estuary

Restoring Tidal Flats



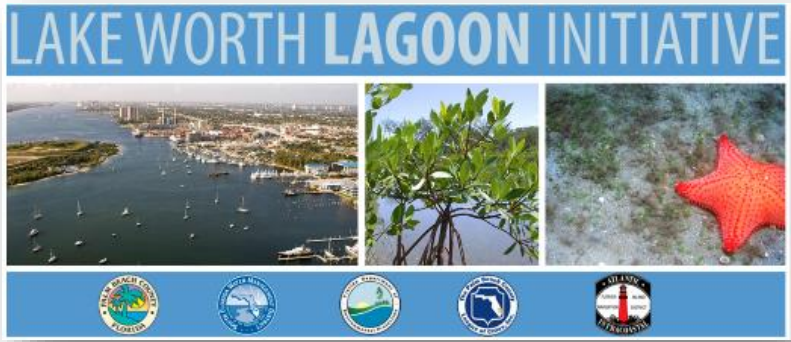
Creating Living Shorelines



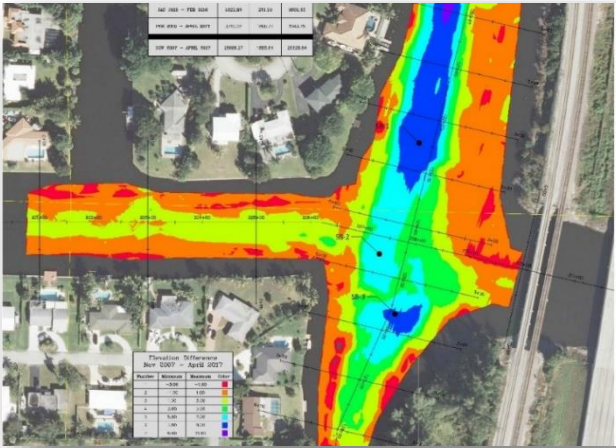
Constructing Islands



Lake Worth Lagoon Initiative



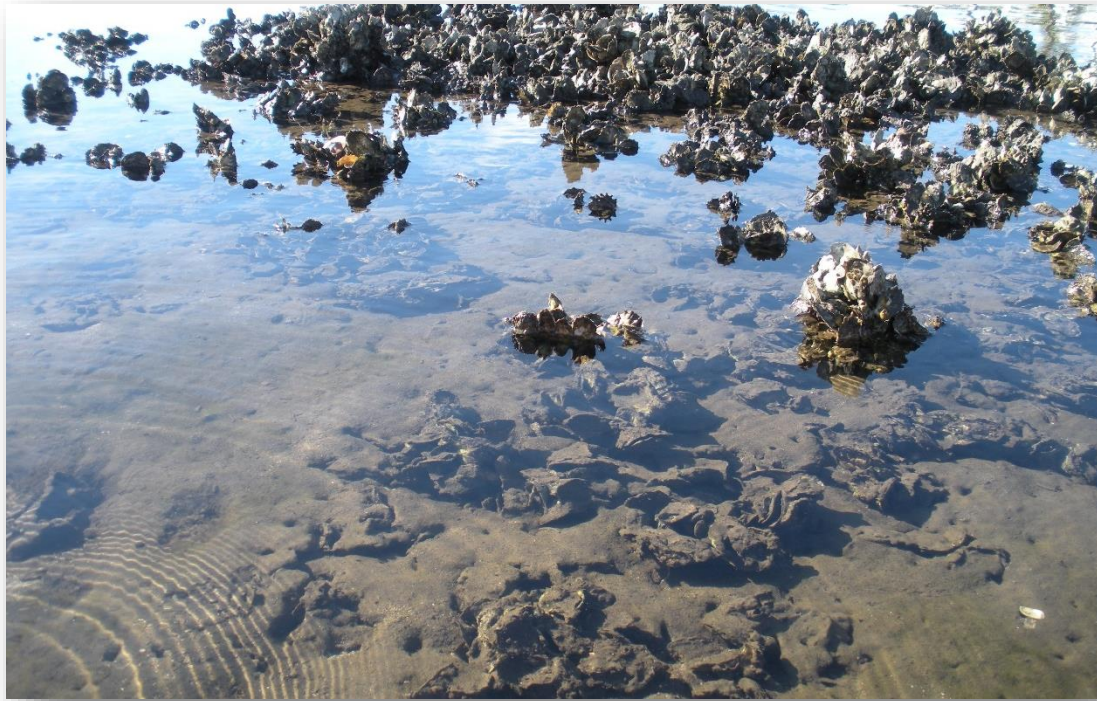
C-51 Sediment Trap



Comprehensive Everglades Restoration Plan (CERP)



Restoring Tidal Flats



Creating Living Shorelines



Before



After

Creating Living Shorelines (cont'd)

2005



2006



2009



Constructing Islands



Snook Islands (east of Lake Worth Beach Golf Course)



Constructing Islands (cont'd)

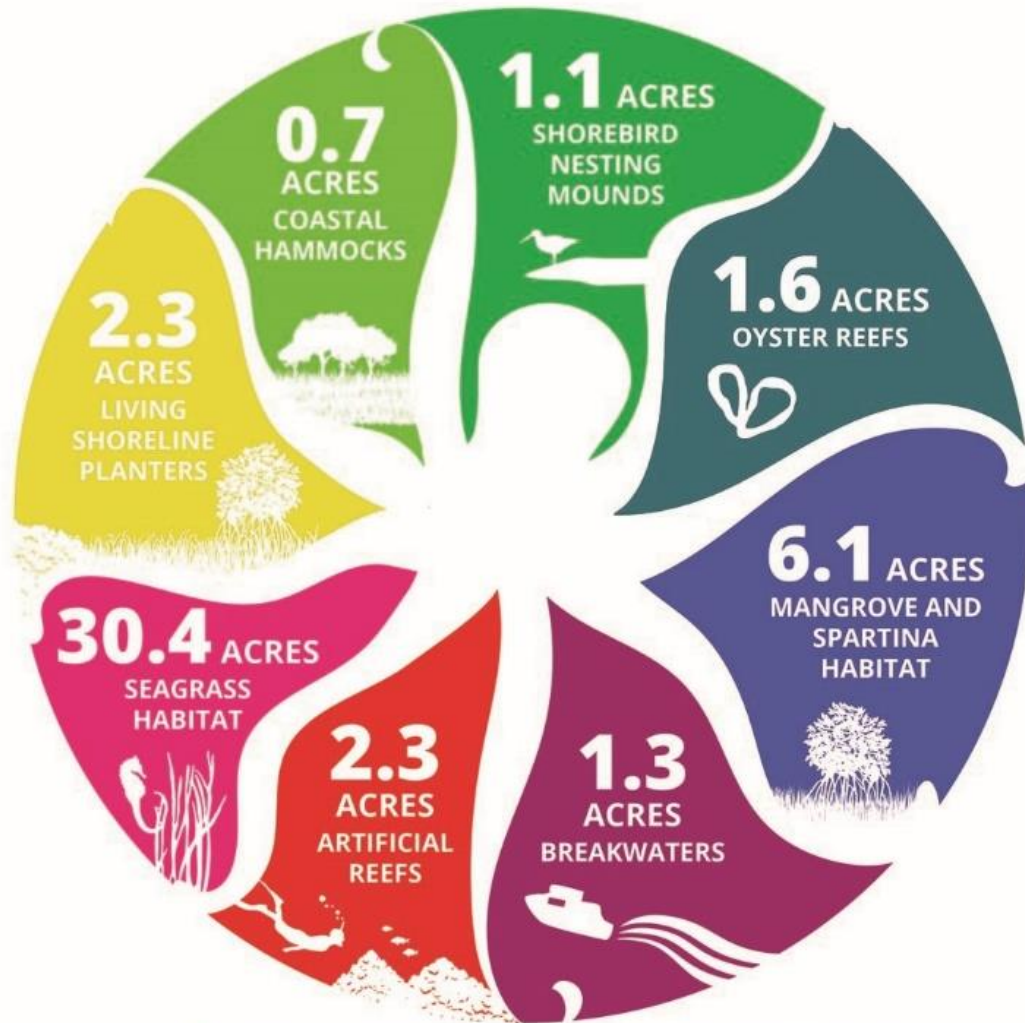


Lake Worth Lagoon Initiative



LIVING SHORELINE AND HABITAT RESTORATION PROJECTS

FROM 2014-2019



+6 ADDITIONAL RESTORATION PROJECTS planned or underway in the next 3 years

FINANCING LAGOON IMPROVEMENTS

FLORIDA LEGISLATURE

\$22M

\$88M

LOCAL AND FEDERAL MATCH

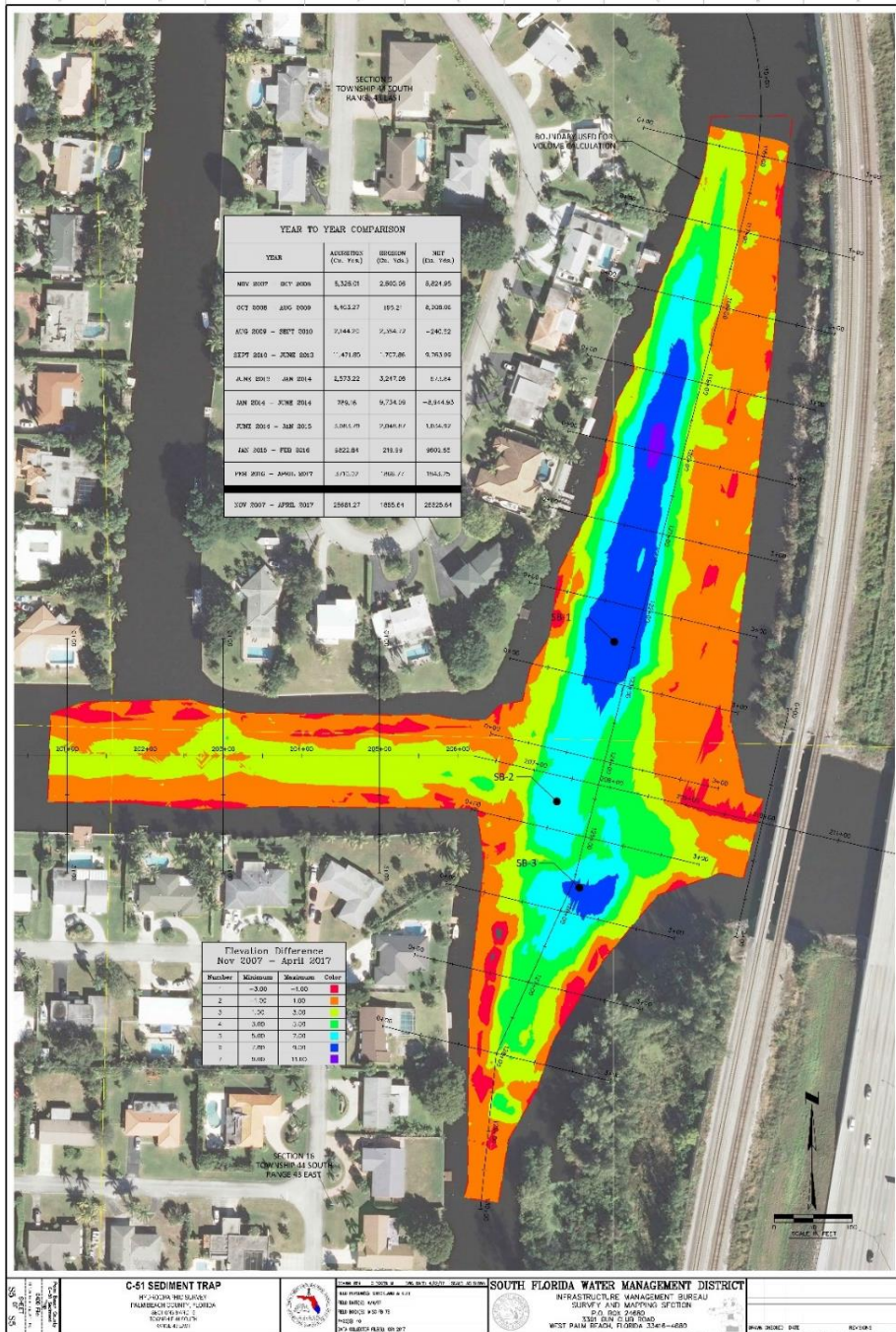


\$110M TOTAL

USED FOR **65** PROJECTS RESULTING IN

>250 ACRES OF HABITAT RESTORED

C-51 Canal Sediment Trap



- Pilot Project identified in 1999 Restudy (CERP)
- Constructed in 2007 by Palm Beach County
- Located just west of I-95 south of Forest Hill Blvd. between West Palm Beach and Lake Clarke Shores
- ~100,000 cubic yards of muck removed
- Total Cost = \$2.7 million (SFWMD = \$1.5 M, PBC = \$1.2 M)
 - Dredging = \$1.7 million
 - Trucking and Material Handling = \$600,000
 - Site Preparation = \$200,000
 - Project Management = \$200,000
- 50-year Agreement with SFWMD, Palm Beach County and the City of West Palm Beach signed in 2006
- SFWMD is responsible for operation, management and maintenance

An aerial photograph showing a wide canal on the left, a set of railroad tracks in the center, and a multi-lane highway on the right. The canal is bordered by residential houses and palm trees on the left. The highway is filled with cars and trucks. In the background, a city skyline is visible under a clear sky. The text 'C-51 Canal Sediment Trap' is overlaid in white on the canal area.

C-51 Canal Sediment Trap

Comprehensive Everglades Restoration Plan (CERP)

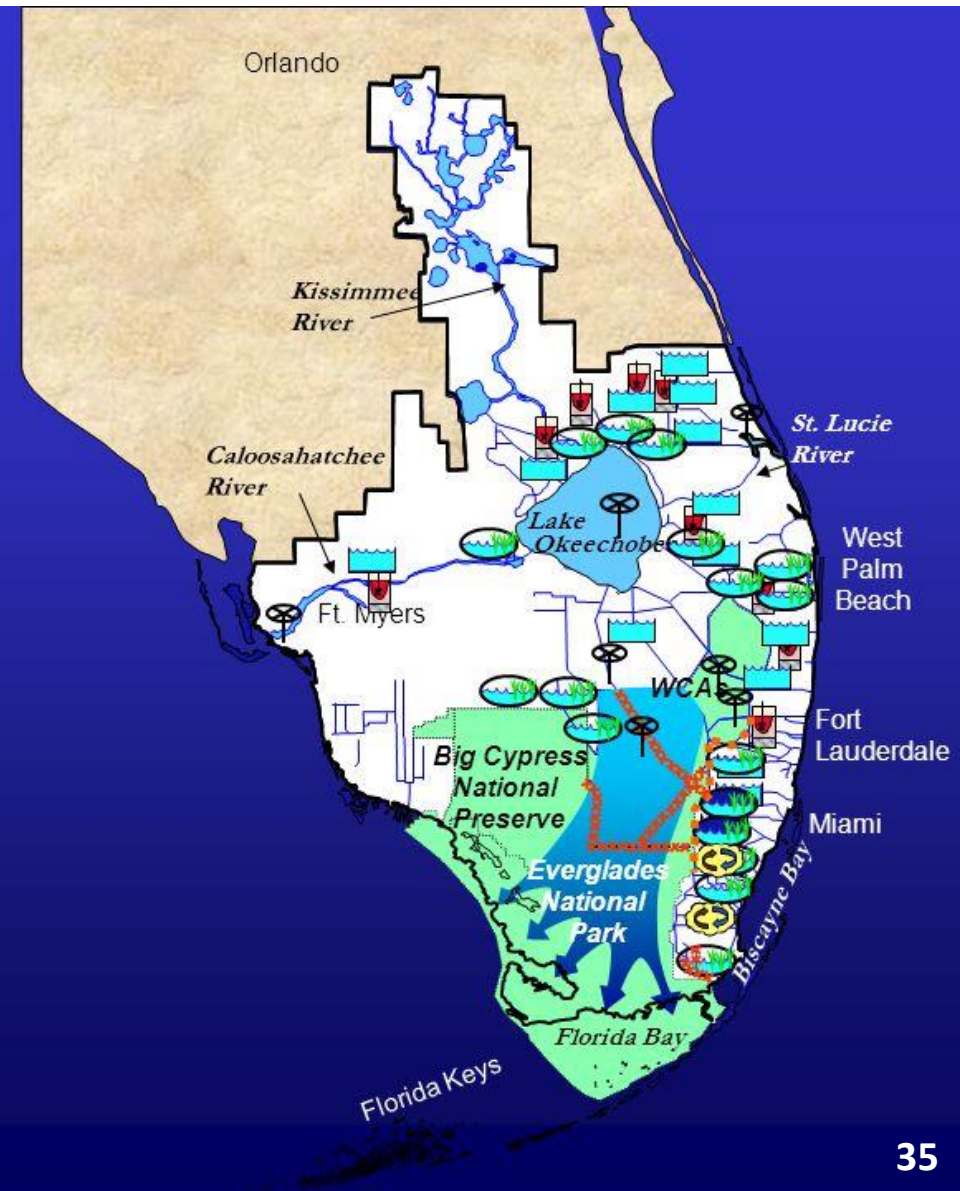
*Rescuing an Endangered Ecosystem:
The Plan to Restore America's Everglades*



*The Central and Southern Florida Project
Comprehensive Review Study
(The Restudy)*

68 CERP Components

-  **Aquifer Storage & Recovery – 330 Wells**
-  **Surface Water Storage Reservoir – 170,000 acres**
-  **Stormwater Treatment Areas (STAs) – 36,000 acres**
-  **Reuse Wastewater at 2 Regional Plants**
-  **Seepage Management**
-  **Removing 240 miles of Barriers to Sheetflow**
-  **Operational Changes**



Comprehensive Everglades Restoration Plan (CERP)

ID	CERP Component Name	Storage (acre-feet)	Aquifer Storage and Recovery (ASR)	Water Quality Treatment	Purpose
K and GGG	Water Preserve Areas / L-8 Basin	48,000	50 million gallons per day (mgd)	Yes	reduce high discharges to Lake Worth Lagoon (LWL); restore Loxahatchee Slough and River; augment regional water supply
X	C-17 Backpumping and Treatment			2,200 acre-feet STA	capture and store excess water discharged to LWL; restore Loxahatchee Slough; augment regional water supply
Y	C-51 Backpumping and Treatment			2,400 acre-feet STA	
LL	C-51 Regional Groundwater ASR		170 mgd	Yes	capture and store excess water discharged to LWL; augment regional water supply
VV	Palm Beach County Agricultural Reserve Reservoir and ASR	20,000	75 mgd	Yes	
N/A	Lake Worth Lagoon Restoration			Yes	sediment removal / trapping in C-51 Canal or LWL; improve water quality; enable success for additional County habitat restoration and enhancement projects

CERP Project Re-Scoping in 2015 Removes Lake Worth Lagoon Estuary

North Palm Beach County Part 1 Project (2010)

Planning Objectives

- Reduce or reverse saltwater intrusion and related impacts to northwest fork of the Loxahatchee River
- Improve environmental and public water supply by utilizing freshwater sources lost to tide
- Restore wetland hydroperiods
- Restore hydrologic and spatial connectivity of natural areas
- Reduce adverse impacts of accumulated sediment and reduce sediment loading to Lake Worth Lagoon from C-51 Canal
- Maintain current level of flood protection in the L-8 Basin

Source: SFWMD presentation to Palm Beach County Water Resources Task Force, January 2010 (Presenter: Beth Kacvinsky)

Loxahatchee River Watershed Restoration Project (2020)

Project Purpose

- Restore and sustain the overall quantity, quality, timing and distribution of freshwaters to the federally-designated National Wild and Scenic Northwest Fork of the Loxahatchee River
- Restore, sustain and reconnect the area's wetlands and watersheds that form the historic headwaters for the river

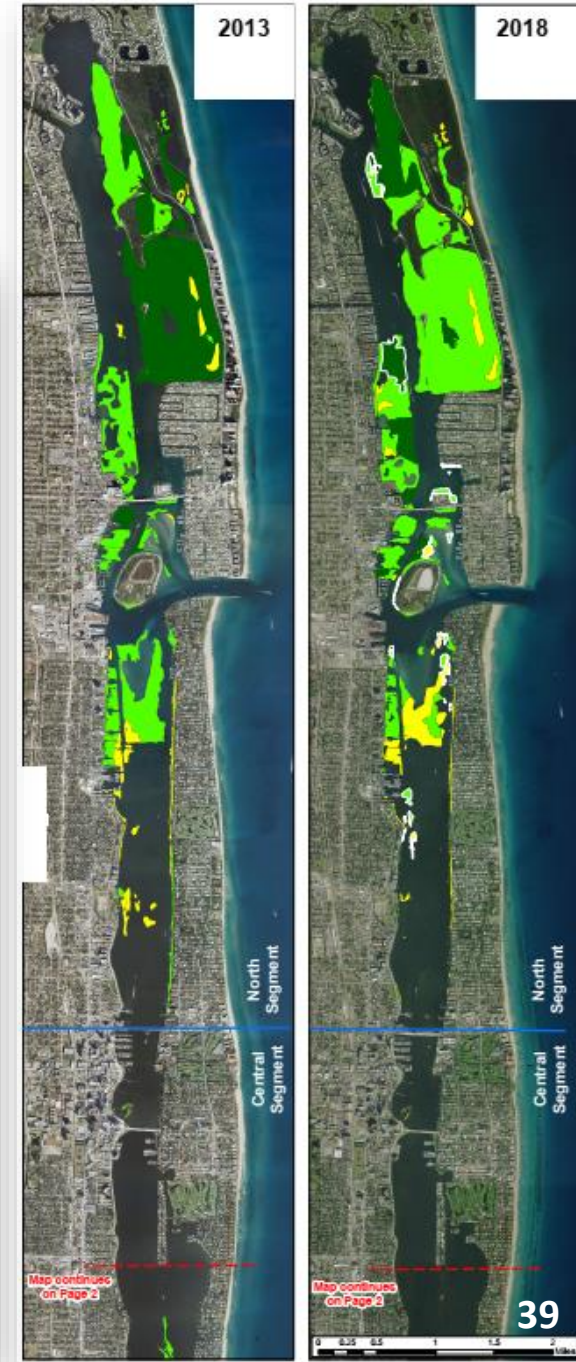
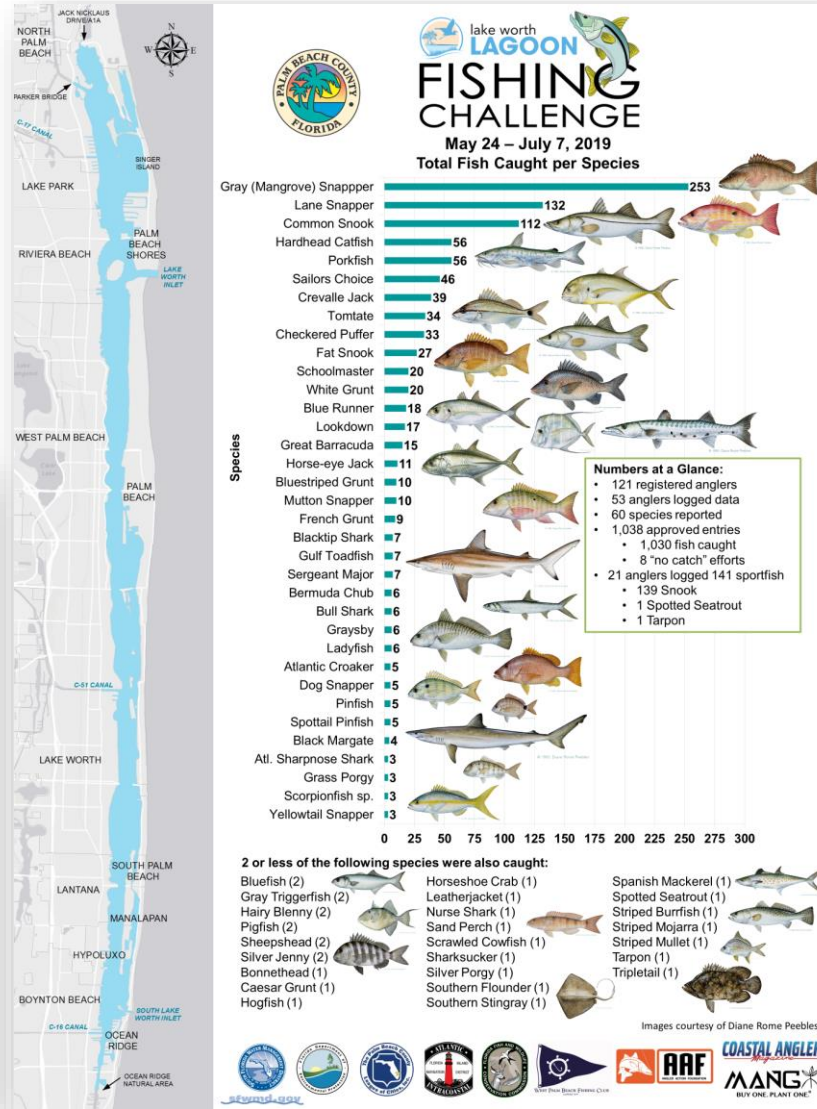
Source: Final Integrated Project Implementation Report and Environmental Impact Statement, January 2020 (Section 1.3)

Lake Okeechobee System Operating Manual (LOSOM) Potential Impacts to Lake Worth Lagoon



Water Quality and Habitat Monitoring

- Water Quality
- Oysters
- Salinity
- Seagrass
- Fish
- Sea Turtles
- Shorebirds





lake worth
LAGOON



LAKE WORTH LAGOON **MANAGEMENT PLAN**

Opportunities for Collaboration and Support

- Request that the County Coalition continue to recognize the value and needs of the Lake Worth Lagoon Estuary
- Support future state appropriations requests to implement Lake Worth Lagoon Initiative projects
- In LOSOM process, advocate for recognizing Lake Worth Lagoon Estuary with meaningful performance measures as requested by Palm Beach County





Palm Beach County Lake Worth Lagoon Update



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