



THE HEALTH OF OUR ESTUARIES

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October 21, 2021



WHO WE ARE

- Formed in 1995 on Charlotte Harbor and one of only 28 Congressionally designated “estuaries of national significance” in the United States.
- Receive special funding and support from USEPA under the Clean Water Act to protect and restore water resources in the CHNEP area.



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THE POWER OF PARTNERSHIP

- **CHNEP is:**
 - **Public-private partnership**
 - **Consensus-based**
 - **Non-regulatory**
 - **Science-based**
 - **Citizen-supported**
 - **Regional Approach**
- **\$19 of restoration for every \$1 of federal funding!**



WHERE WE WORK

- CHNEP area 5,416 sq. miles
- Lemon Bay, Dona & Roberts Bays, Charlotte Harbor, Pine Island Sound, Caloosahatchee, San Carlos Bay and Estero Bay
- Rivers including Myakka, Peace, Caloosahatchee, and Estero
- Inland and coastal Communities 10 counties and 25 cities
 - Including Charlotte County and City of Punta Gorda



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WHAT WE DO

Work together to implement our
'Strategic Plan' for the region or the
Comprehensive Conservation
Management Plan (CCMP)



Water Quality
Improvement



Hydrological
Restoration



Fish, Wildlife &
Habitat Protection



Public
Engagement



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ECONOMIC VALUE OF CLEAN WATER



**Charlotte County Economic Impact:
\$1.49 billion (annually)**

Primary economic driver: TOURISM

Quality of Life: Priceless

NATURAL RESOURCES IN THE CHNEP AREA GENERATE:



\$13.6 Billion in Total Output



\$3.8 Billion in Regional Income



\$146 Million in Local & Tax Revenue



**and Support Over 148,000 Jobs
Annually**



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A SYSTEM UNDER STRESS?

Effects of Excess nutrients and bacteria:

- Increased algae growth since 2012
- Longer, more frequent algae blooms
- Multiple blooms of drift macroalgae in Florida estuaries cause damage to seagrass habitats and water quality implications
- Harmful Algae Blooms (HABs)
Adverse health effects in humans and other animal populations



NUTRIENT POLLUTION & SOURCES

- Human-generated sources of Nitrogen and Phosphorus
- Sources include:
 - Agricultural, Industrial, Mining runoff
 - Urban Stormwater runoff
 - Wastewater discharges / failing septs
 - Development and loss of wetlands
 - Atmospheric emissions
 - Excess flow is considered a form of pollution- Ex: water coming from Lake Okeechobee into the Caloosahatchee at high volumes

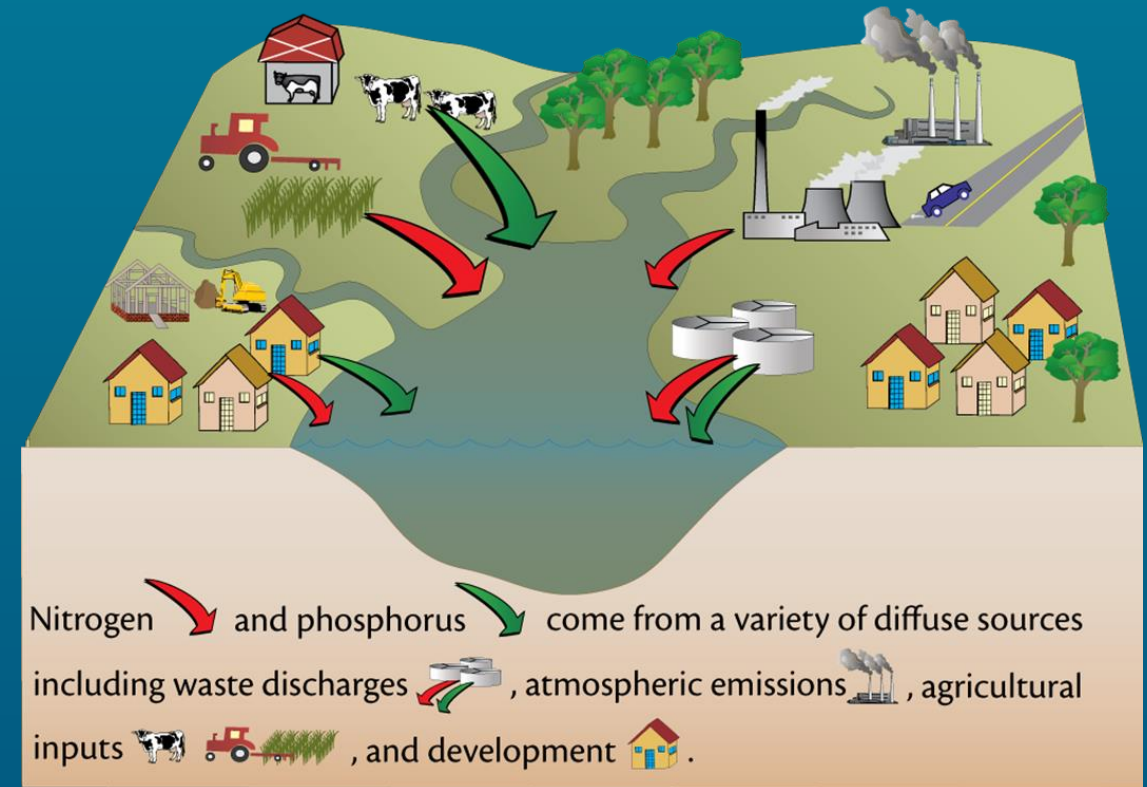


Diagram courtesy of the Integration and Application Network (ian.umces.edu), University of Maryland Center for Environmental Science. Source: Lane, H., J.L. Woerner, W.C. Dennison, C. Neill, C. Wilson, M. Elliott, M. Shively, J. Graine, and R. Jeavons. 2007. Defending our National Treasure: Department of Defense Chesapeake Bay Restoration Partnership 1998-2004. Integration and Application Network, University of Maryland Center for Environmental Science, Cambridge: MD.



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NUTRIENT POLLUTION IN FL

- Waters not attaining standards set by the FDEP
- Nutrient pollution is a common widespread problem in FL, accounting for 73% of all waterway 'impairments'
- Approx. 75% of assessed waterbodies in FL are impaired
- 363 waterbodies are impaired by Total Nitrogen
- 354 water bodies are impaired by Total Phosphorus

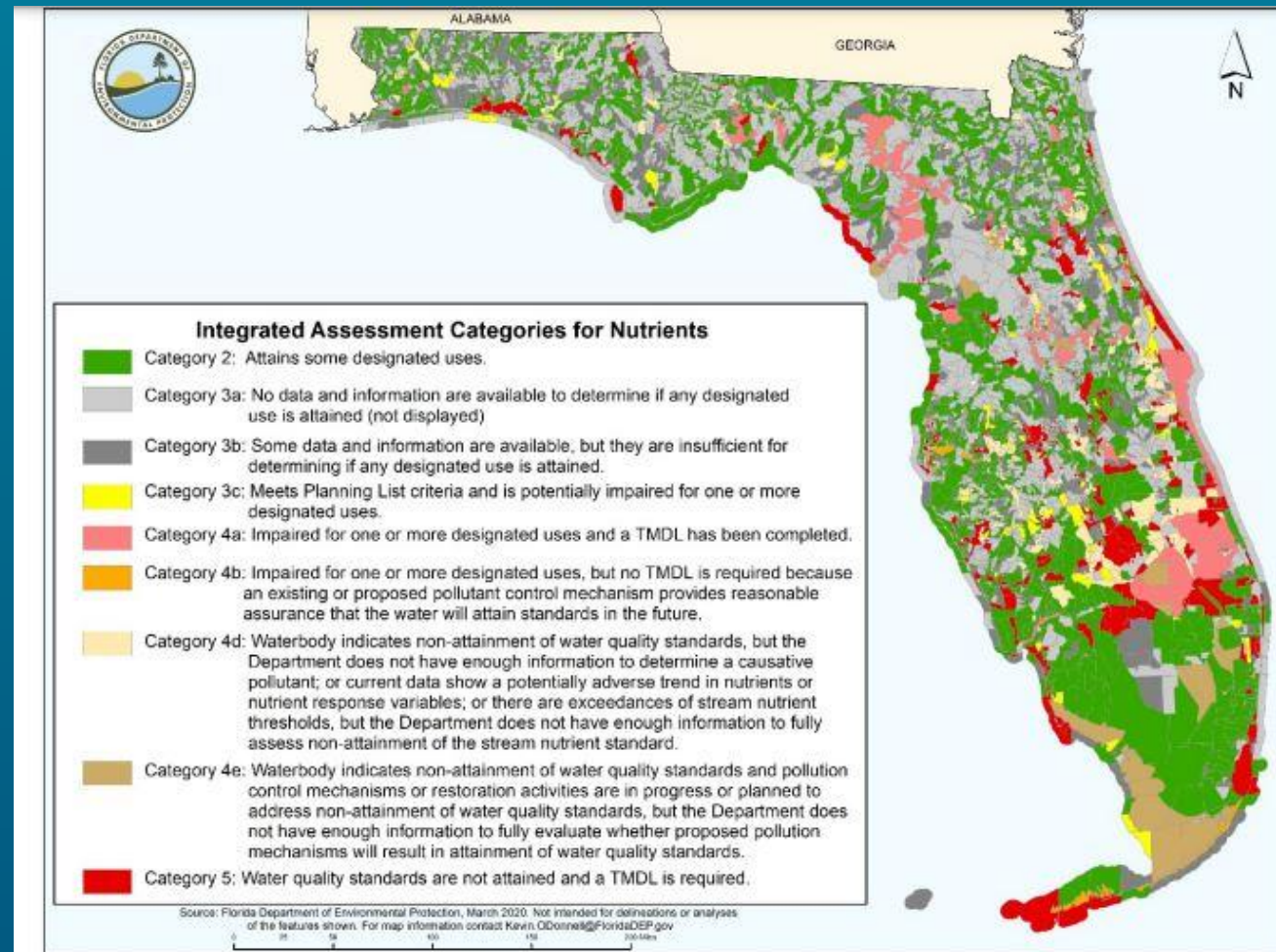
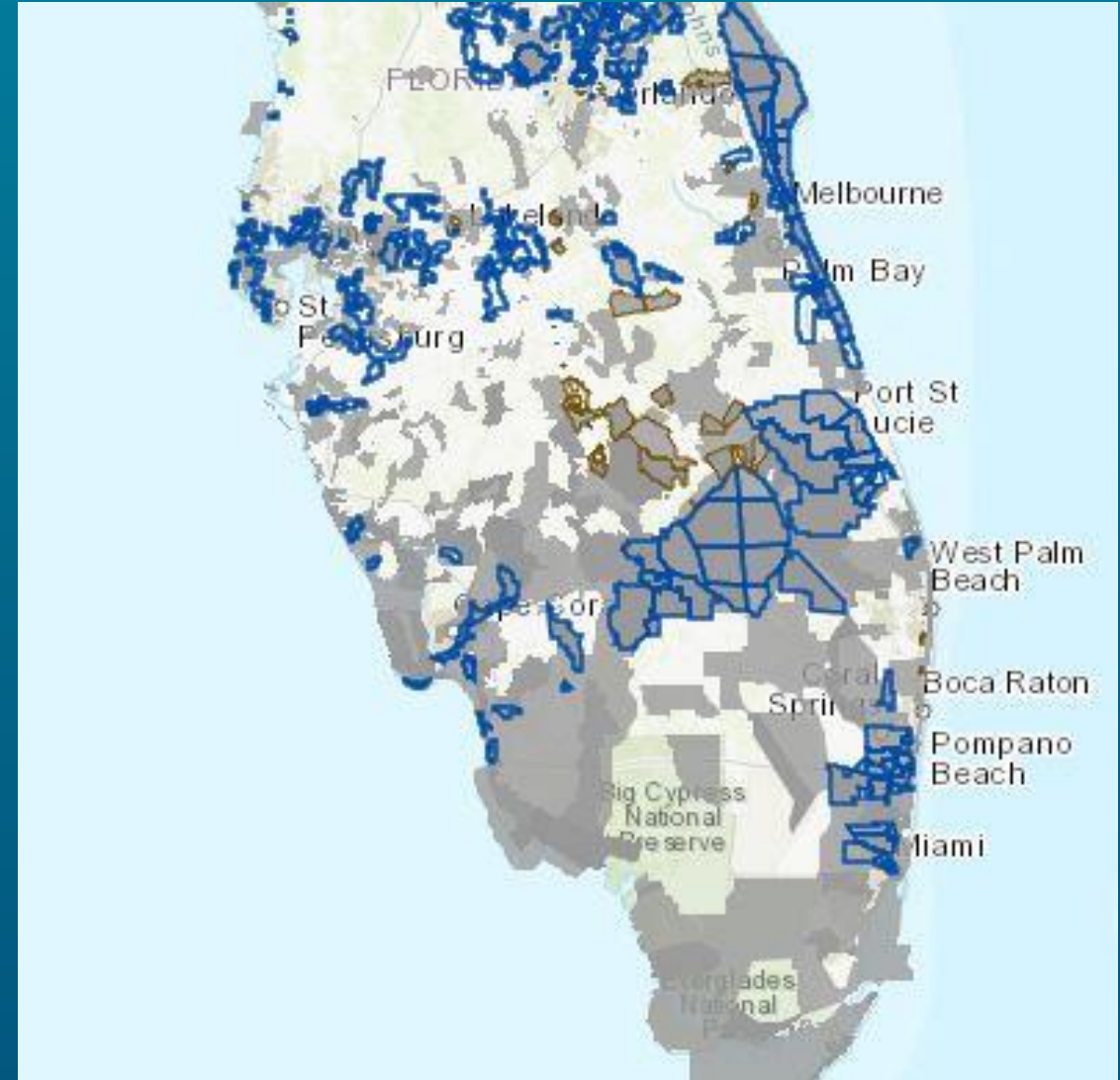


Figure 3.1b. Results of Florida's surface water quality assessment: EPA assessment categories for nutrients



NUTRIENT POLLUTION IN OUR AREA

- Gray areas are waters not attaining standards set by the FDEP.
- Current areas that are impaired for nutrients:
 - Dona Bay (TN)
 - Roberts Bay (TN)
 - Lemon Bay (TN)
 - Matlacha Pass (TN)
 - Peace River (TN)
 - Caloosahatchee River (TN, TP)
 - Myakka River (TN)



NUTRIENT POLLUTION IS PERVASIVE

- Six metrics that define or contribute to water quality impairment to determine their overall rank on recent trends and worsening water quality.

1 rapid impairment - 9 less concerning impairment

County	Avg. Total Impairments ¹ 2018, 2019, 2020	% of Total ² WBIDs Impaired	% Net Change ³ Impairment	% Change ⁴ Developed	% Change ⁵ Impervious	% Area ⁶ Agriculture	Avg. Rank	Rank
Collier	7	7	2	2	2	8	4.67	4
Lee	5	3	1	4	3	7	3.83	2
Charlotte	4	5	4	7	6	4	5.00	5
Sarasota	3	6	6	5	5	6	5.17	6
Manatee	6	5	3	1	1	3	3.17	1
Hillsborough	1	4	9	3	4	5	4.33	3
Pinellas	2	6	5	9	9	9	6.67	9
Hendry	9	2	8	6	7	1	5.50	7
Glades	8	1	7	8	8	2	5.67	8

Source: Calusa Waterkeeper



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WHY WE MEASURE WATER QUALITY & SEAGRASS

- We need to collect water samples in our regions long-term to help us see if nutrient pollution is increasing or decreasing and how that changes our water.
- Seagrass need light to grow and thrive so is an indicator of clean water- so we measure seagrass as well.
- Seagrass uptake nutrients to fuel growth and thrive in systems with balanced nutrients, algae grows faster and will thrive in areas with excessive nutrients.
- In Charlotte Harbor and surrounding estuaries anecdotal data points to a shift from seagrass to algae, indicating a high nutrient load

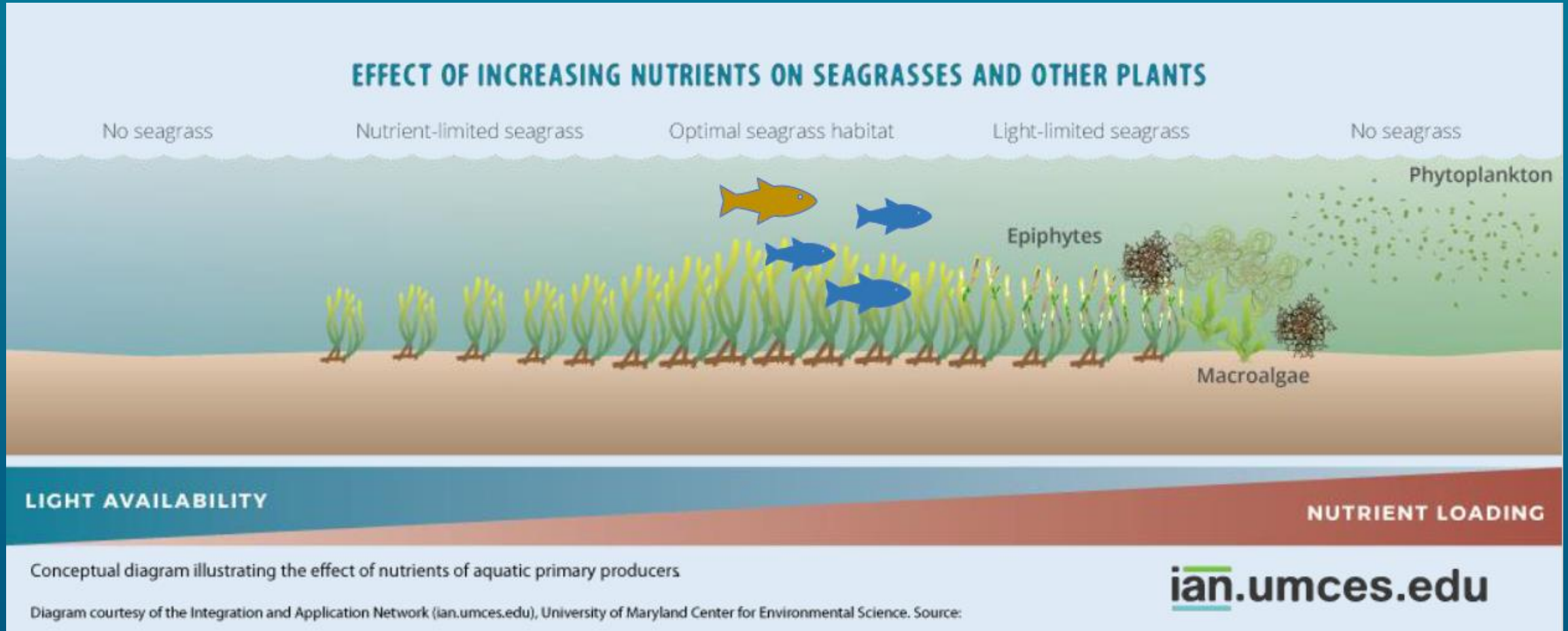


*Losing
Seagrass is a
WQ Double
Whammy!*



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WHY WE MEASURE WATER QUALITY & SEAGRASS

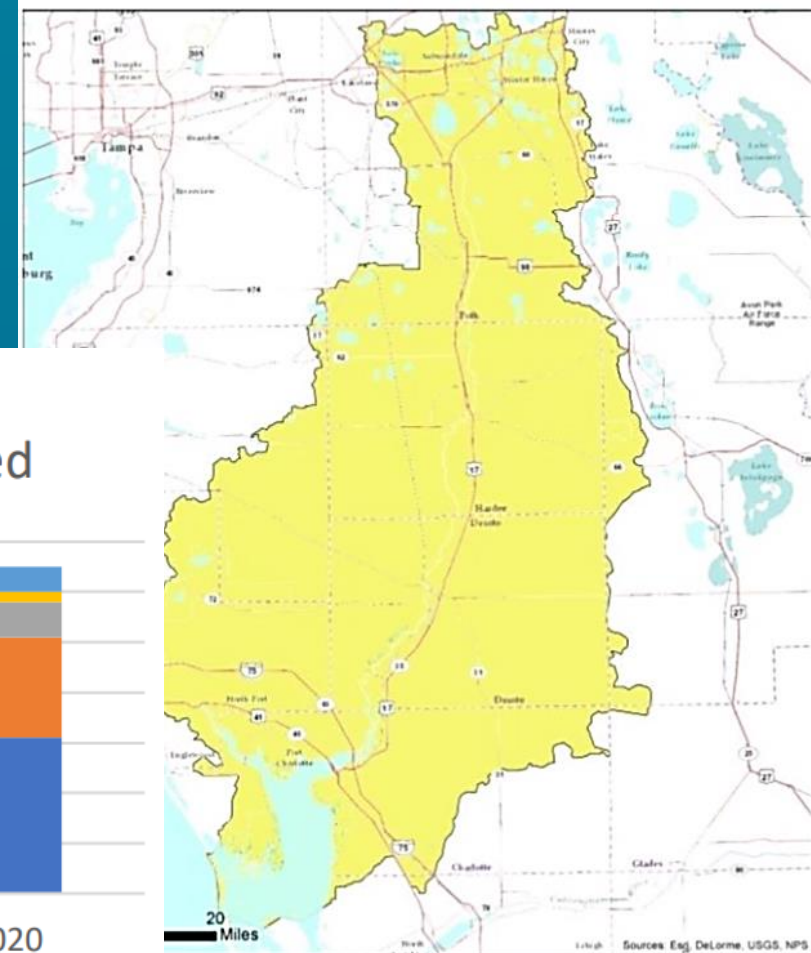
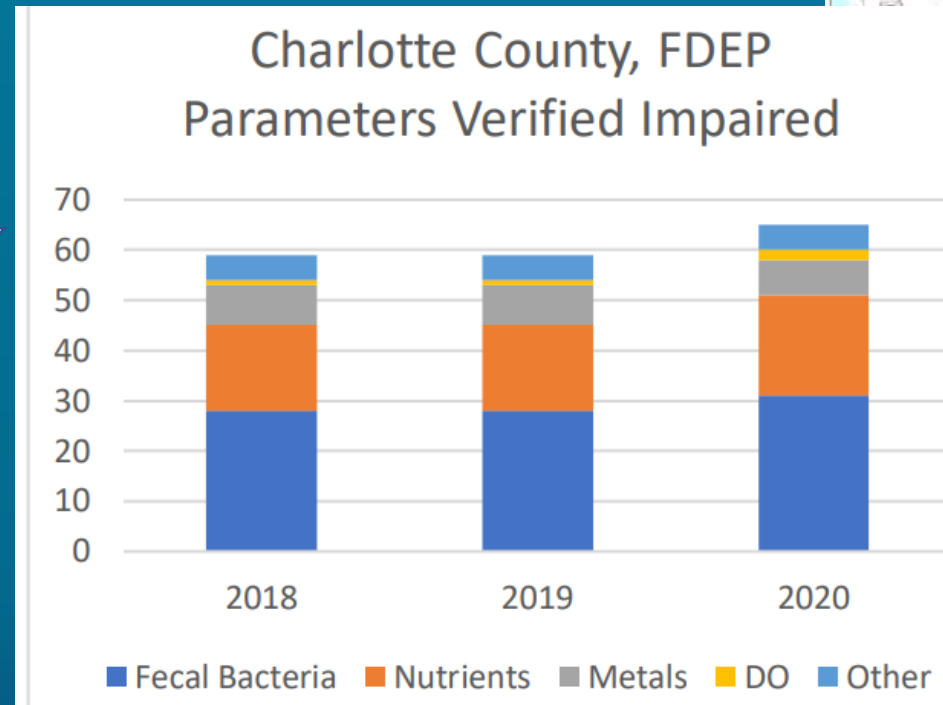


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CHARLOTTE HARBOR ESTUARY

- Peace River, Myakka River, and Charlotte Harbor Proper.
- Impaired (FDEP IWR)
 - Nutrients, Fecal Coliform, Iron, Mercury
- Water Quality Report Card Grade: C+
- Seagrass: Decreasing
- Algae: Increasing

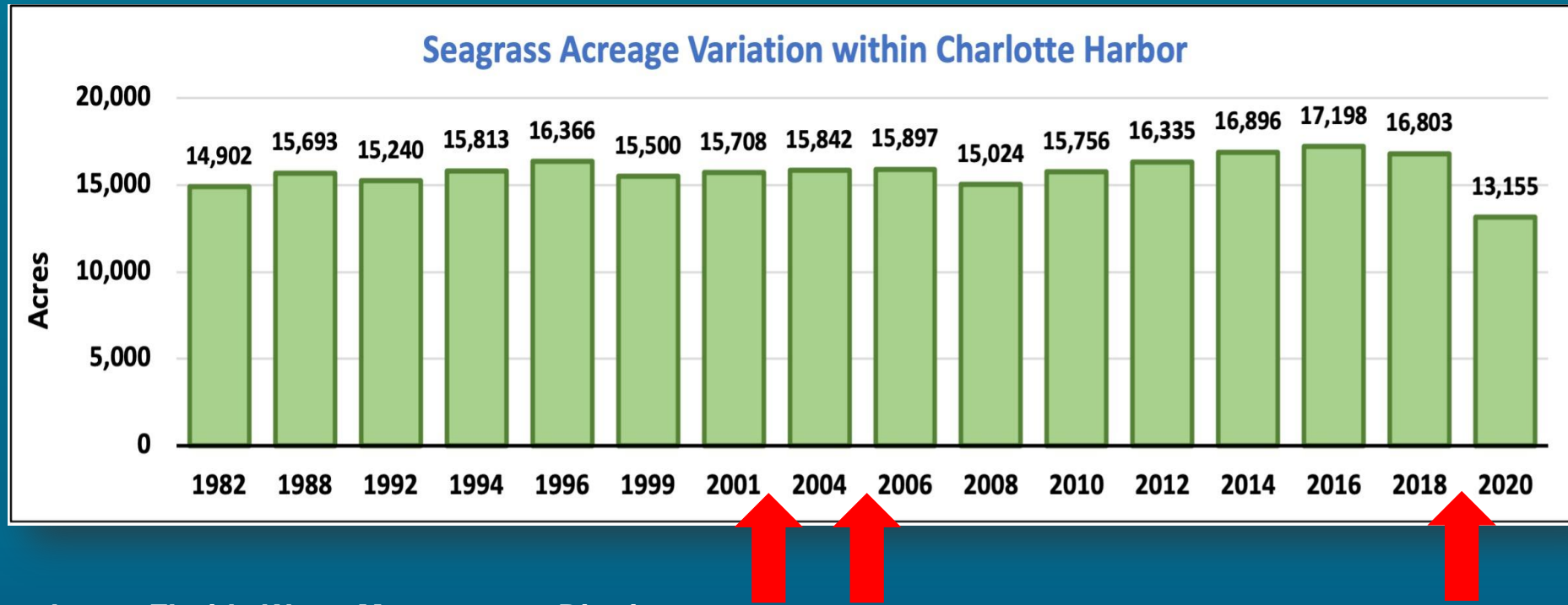
Source: Conservancy of Southwest Florida and Calusa Waterkeeper



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CHARLOTTE HARBOR SEAGRASS

- Seagrass acreage has been relatively stable in the past, indicating good water quality
- Are we less resilient than in the past? Following Hurricane Irma, prolonged red tide event, and algae bloom- 23% loss of seagrass between 2018-2020

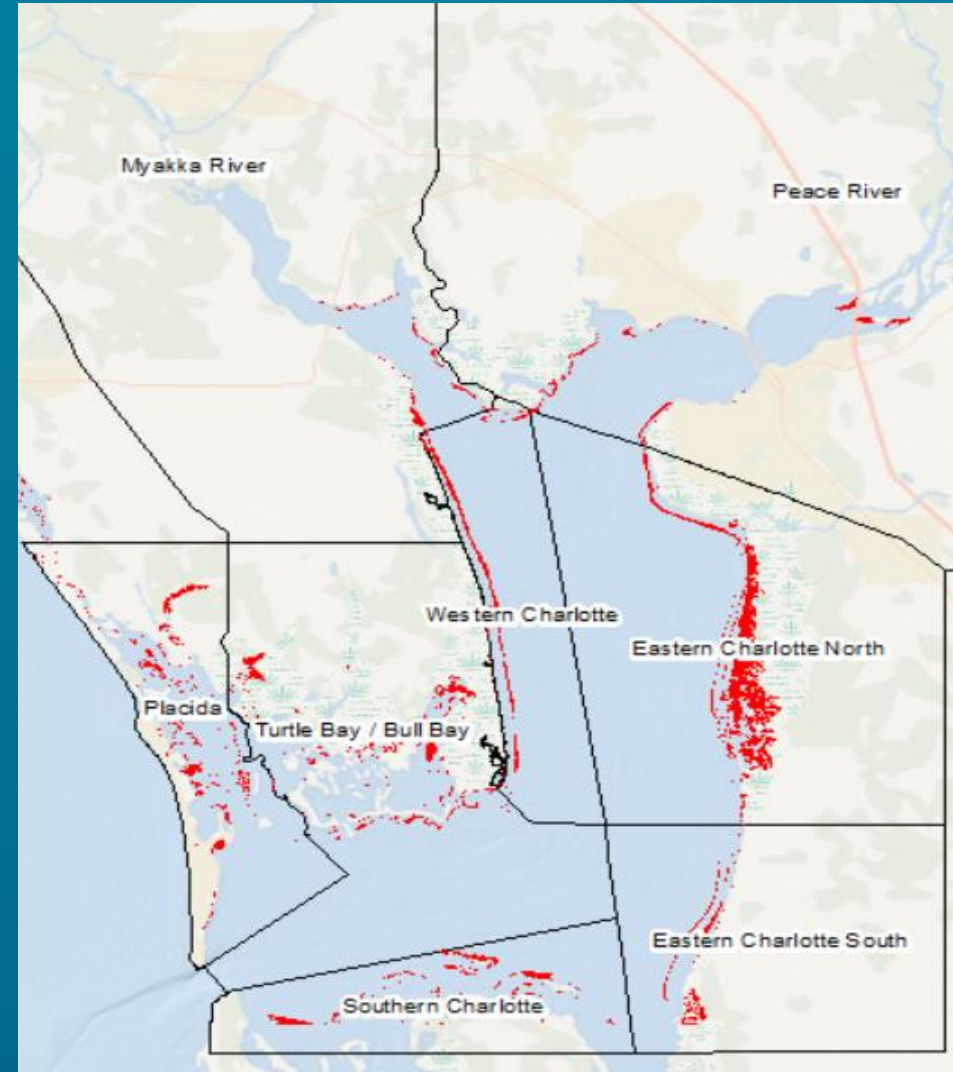
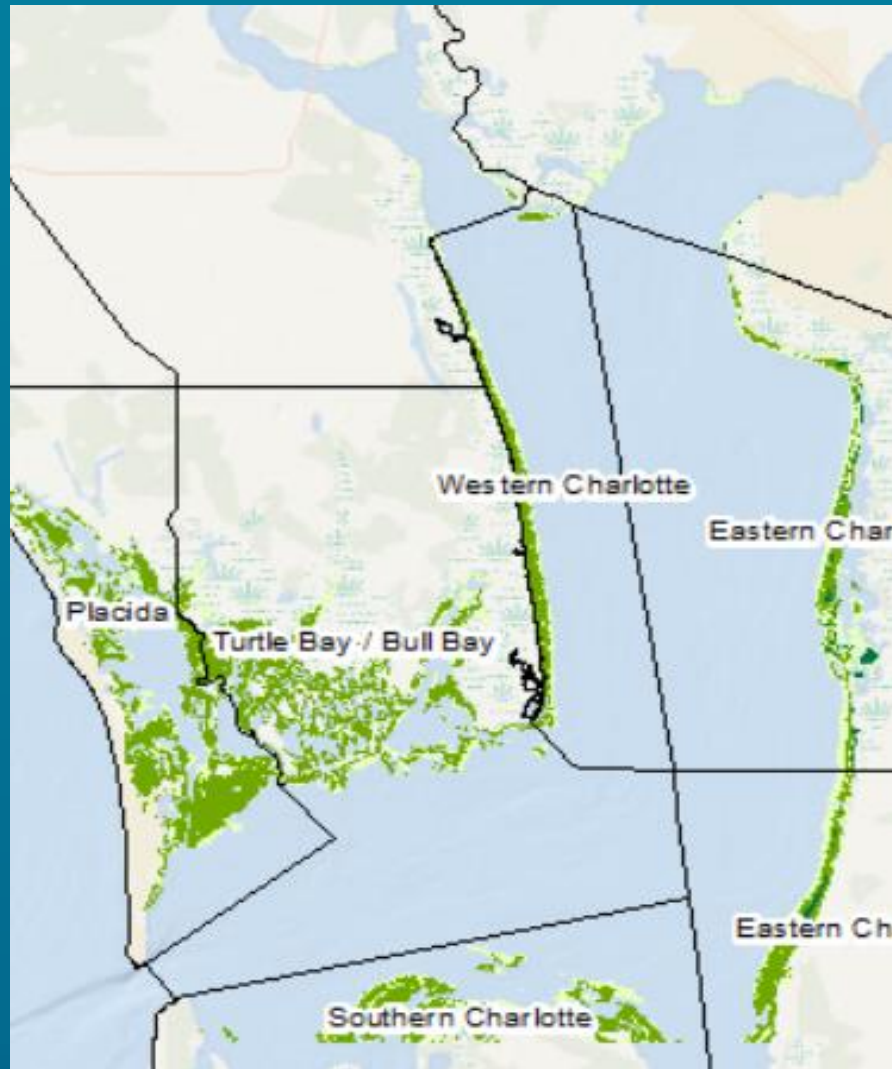


Source: Southwest Florida Water Management District



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CHARLOTTE HARBOR SEAGRASS LOSS

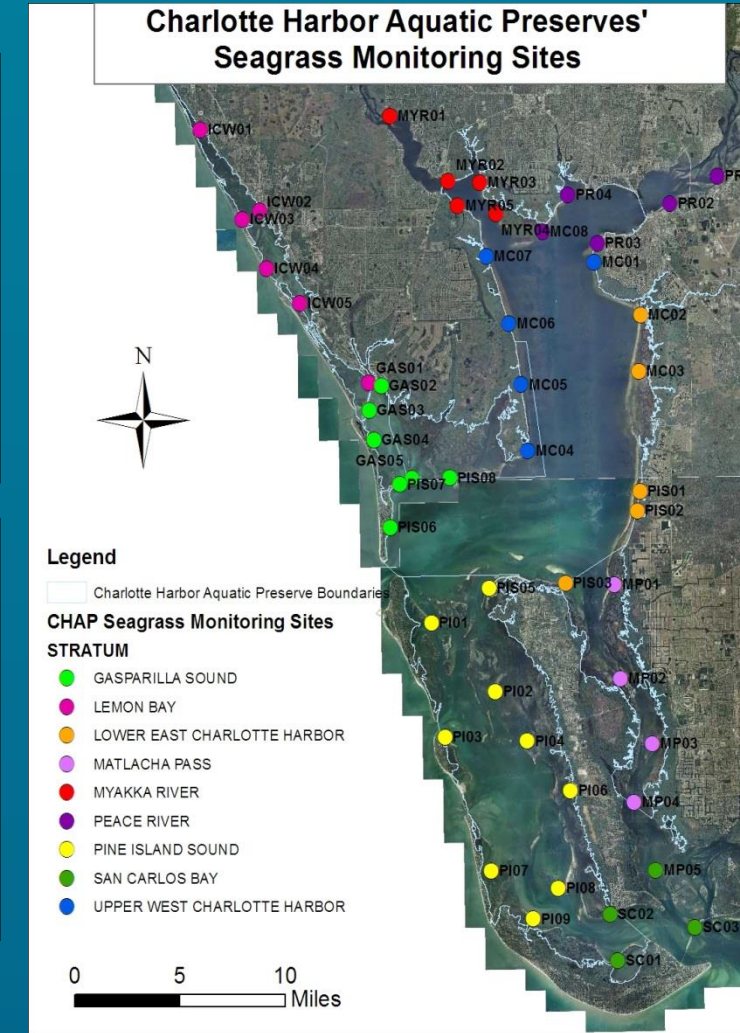
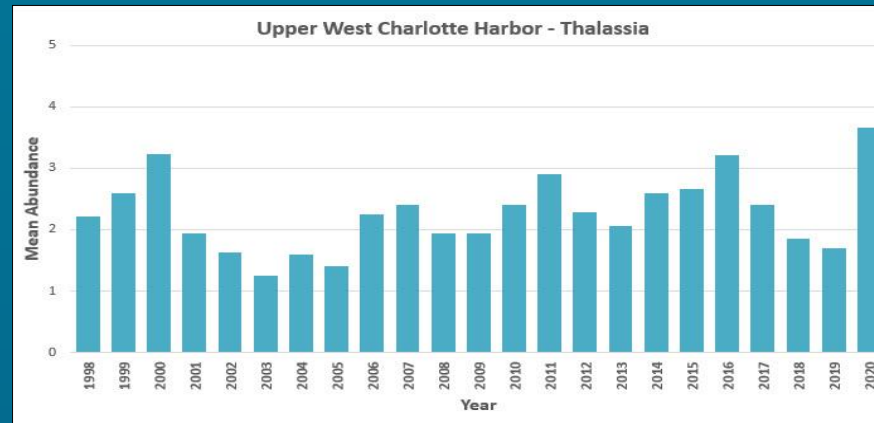
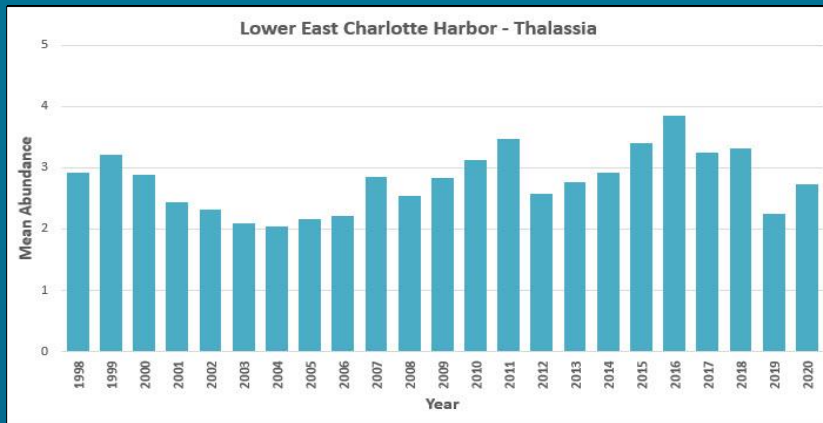
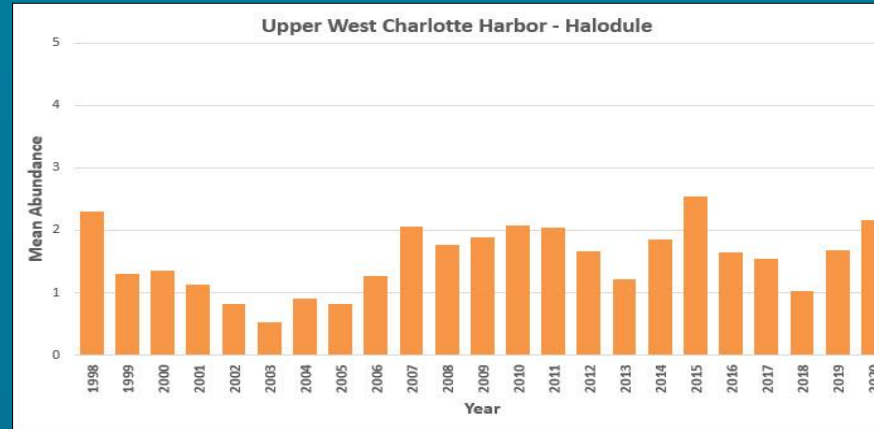
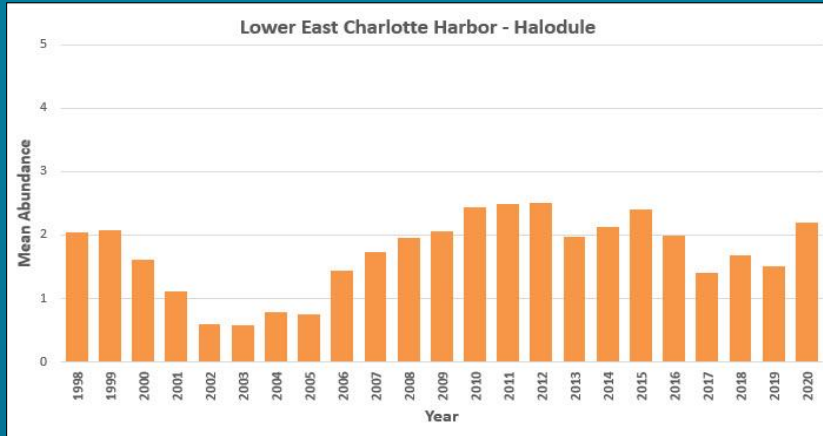


Source: Southwest Florida Water Management District



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SEAGRASS DIVERSITY & HEALTH



Source: Charlotte Harbor Aquatic Preserves, Florida Department of Environmental Protection.

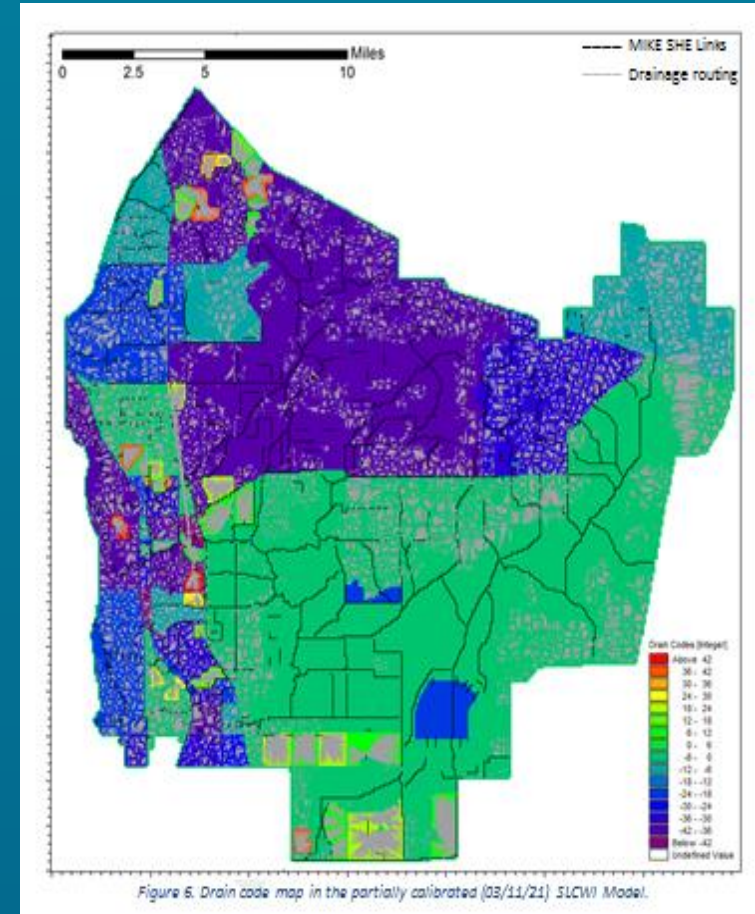
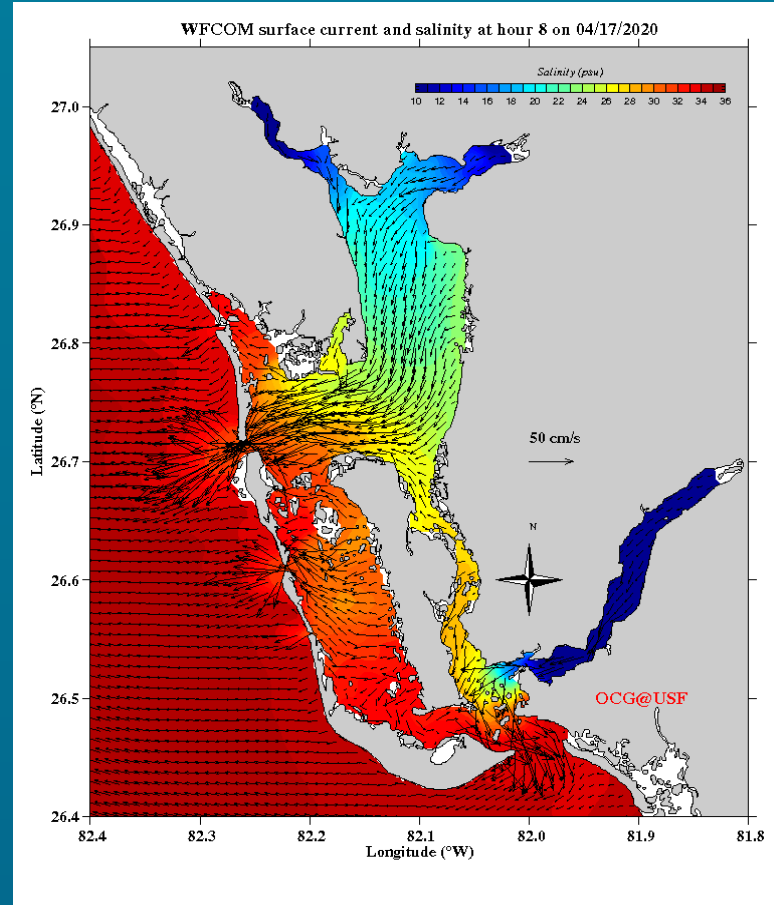


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FUTURE REGIONAL RESEARCH

Additional data considerations for holistic approach. Data for the region includes:

- Predictive Modeling of circulation: West Florida Coastal Ocean Model for Charlotte Harbor
- Hydrological modeling in the Charlotte Harbor watershed



Sources: University of South Florida, College of Marine Science – Ocean Circulation Group



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Reducing Nutrient Pollution

- **Improved wastewater, stormwater and ag/industrial runoff retention and treatment**
- **Increased nutrient sampling for more assessment, TMDLs and BMAPs**
- **Improved stormwater treatment regulation**



Restoring Hydrological Flow

- **Flow volume affects pollution concentrations and loads - so restoring appropriate flows with hydrological restoration and better flow management is important**



Restoring Aquatic Habitat

- **Seagrass and shellfish restoration, wetlands, and living shorelines provide natural systems approaches to nutrient uptake, as well as assist natural systems being more resilient to the impacts of algae blooms**



Outreach and Public Engagement

- **Environmental education and citizen engagement spread community support and involvement in nutrient pollution reducing behaviors Providing resources to Policymakers for decision-making**



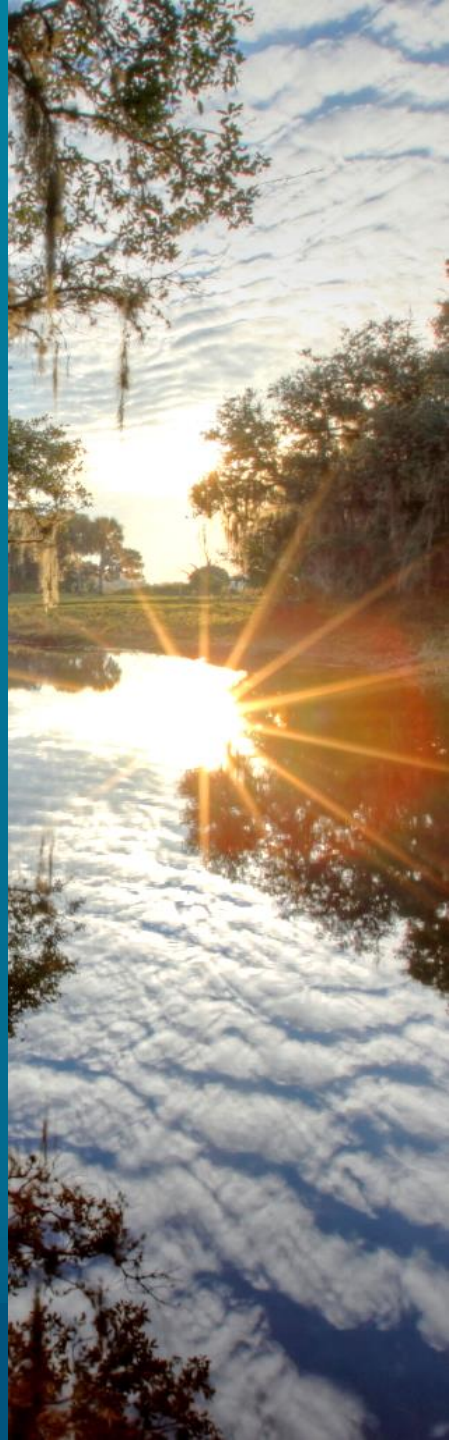
THE POWER OF PARTNERSHIP

Current Partnership projects and resources:

- Coastal Charlotte Harbor Water Monitoring Network and Volunteer Water Quality Program. Continued seagrass, algae, and fisheries monitoring (FWC, Sea Grant, FDEP, CHNEP, SWFWMD and Municipalities)
- CHNEP Water Atlas public website with analytical tools. NEW Seagrass pages and fact sheets and analytical tools such as heat maps and circulation models chnep.wateratlas.usf.edu/
- Large-scale watershed hydrological modeling and restoration planning projects for improving flows to natural systems
- University and NGO studies on nutrient cycling, seagrass data and water quality analysis
- Actions taken by counties and municipalities (storm/wastewater)



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COASTAL CHARLOTTE HARBOR MONITORING NETWORK (CCHMN)



The CCHMN is a regional partnership of agencies (managed under CHNEP) that collect and analyze water samples from 60 randomly selected field sites in 10 water bodies monthly. 15 parameters are measured/analyzed.

- Partners: CHNEP, FWC, FDEP, SWFWMD, Charlotte County, City of Cape Coral, and Lee County
- Implemented: 2001-
Present Status: Ongoing



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CHNEP WATER ATLAS

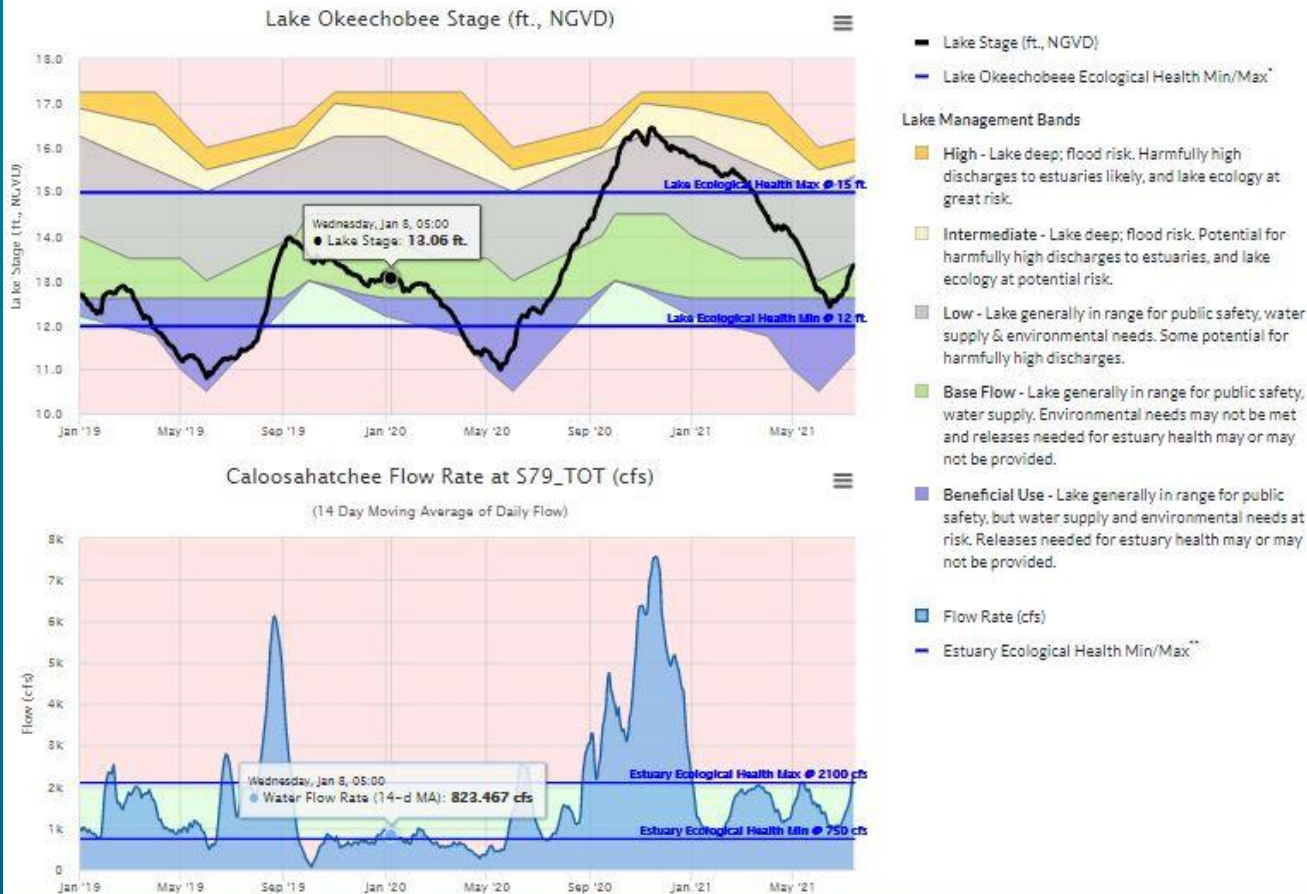


Lake Okeechobee & Caloosahatchee Estuary Tracker

The graphs below show recent elevation levels¹ of Lake Okeechobee, and the corresponding rate of discharge (flow)² of water into the Caloosahatchee River. "Lake Management Bands" comprise the background of the graphs; these bands are defined in the LOSDM. The health minimum and maximum define the optimum ranges for lake level and river flow.

¹ As measured by SFWMD station LAKEOKEE, which is a composite "pseudo-station" that reports the daily mean of eight elevation gages operated by the Army Corps of Engineers (ACOE).

² Mean daily flow of water from Lake Okeechobee into the Caloosahatchee River, as measured at the WP Franklin Lock, in cubic feet per second (cfs).



- User-friendly maps and charts.
- Lake Okeechobee and Caloosahatchee Release Levels
- Seagrass Health, Diversity, and Acreage
- Water Quality Status and Trends
- Habitat Restoration Needs Plan Pages



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CHARLOTTE HARBOR FLATWOODS HYDROLOGICAL RESTORATION INITIATIVE



The Charlotte Harbor Flatwoods Hydrologic Restoration Initiative (CHFI) encompasses 80,000 acres of land and has the goals of:

- Flood reduction
- Improved water quality
- Enhance fish and wildlife habitat



- **Location:** Charlotte and Lee Counties, FL
- **Partners:** Charlotte County, Southwest Florida Water Management District, South Florida Water Management District, and Florida Fish and Wildlife Conservation Commission
- **Implemented:** 2020
- **Status:** Upcoming
- **CHNEP Cost:** \$573,060



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HABITAT RESTORATION NEEDS

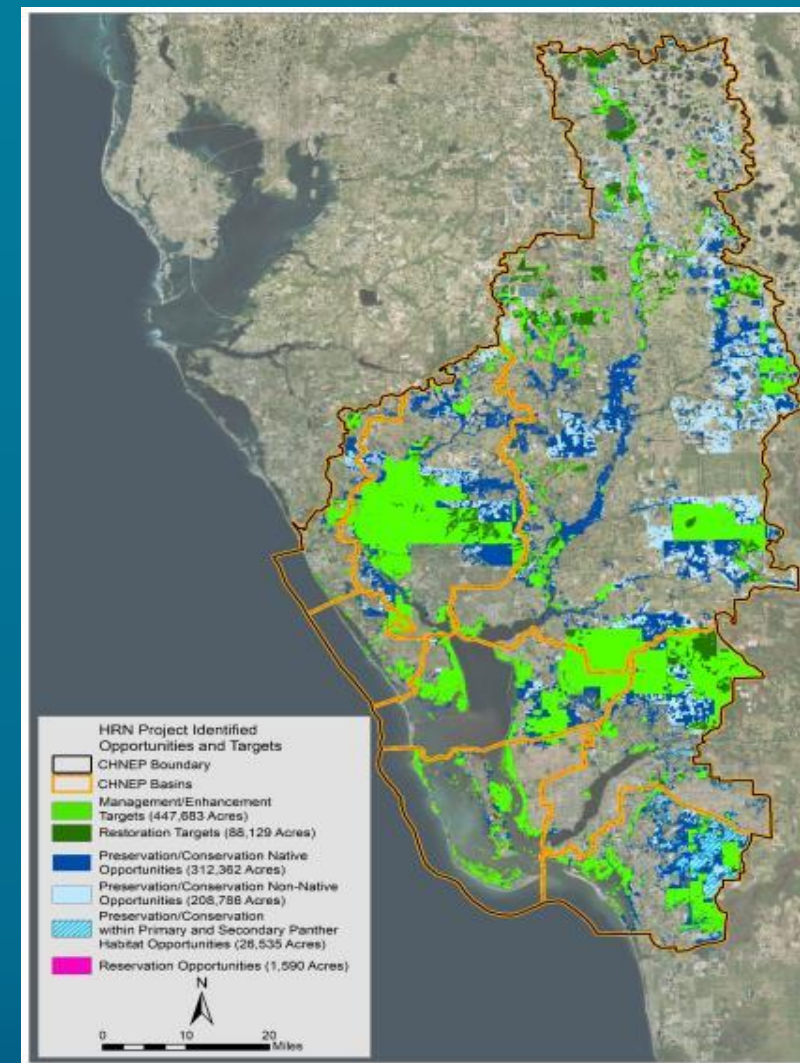


CHNEP funded data gathering, mapping and analysis of all identified important habitat areas to create a master plan for landscape-level habitat protection.

Helps agencies and organizations identify:

1. Preservation/Conservation Opportunities
2. Reservation Opportunities
3. Management/Enhancement Targets
4. Restoration Targets

When combined, the private habitat area opportunities (blues), fit together with public habitat area targets (greens), to create landscape-level habitat corridors and contiguous habitat areas



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GATEWAY TO MYAKKA MARSH RESTORATION



The Myakka is designated a “Florida Wild and Scenic River” with a wide variety of habitats found along its shores.

- **Enhanced habitat**
- **Recreational and Educational benefits**
- **Economic benefits**



- **Location:** Sarasota and Manatee Counties, FL
- **Partners:** Conservation Foundation of the Gulf Coast, Beautiful Ponds, Inc., Myakka River State Park, National Fish and Wildlife Foundation, USDA Natural Resources Conservation Service, Southwest Florida Water Management District, Disney Conservation Fund, and Selby Foundation
- **Implemented:** 2019
- **Status:** Ongoing
- **Funding Source:** Environmental Protection Agency



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CHNEP PUBLIC ENGAGEMENT



- Harbor Happenings Magazine
- Annual Nature Calendar
- Monthly Volunteer Events
- Attend outreach festivals in each county
- Conservation Grants



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CITIZEN ACTION



Contact local, county, state and federal legislators to voice support for issues you care about.

- **Support funding for upgrades to stormwater and wastewater systems and nutrient reduction policies.**
- **Support funding for environmentally sensitive lands protection programs at local and state level.**
- **Support of local government investments in water quality monitoring and analysis and increased state support for programs.**
- **CHNEP State and Federal Legislative Priorities at chnep.org**



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CHNEP RESOURCES

- Sign up to get involved: chnep.org
or chnep.org/monthly-volunteer-events
- CHNEP Water Atlas available at: chnep.wateratlas.usf.edu/
- Mark your calendar for the 2022 Southwest Florida Climate Summit in April



Improve Water
Quality



Restore
Hydrological Flow



Protect Fish, Wildlife
and their Habitat



Educate and
Engage the Public



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THANK YOU

Many partners continuing to research to find better ways to manage our waterways and habitats!

- Concerned community members and citizen-scientists collecting data
- Florida Department of Environmental Protection (FDEP)
- Southwest and South Florida Water Management District (SWFWMD) (SFWMD)
- The National Estuary Program and Florida NEP's
- Florida Fish and Wildlife Conservation Commission (FWC)
- Florida Sea Grant (UF)
- Counties and Local Municipalities
- Universities and NGO's



Courtesy of: FDEP CHAP



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