Biscayne Bay Marine Health Summit Town Hall

October 2, 2020

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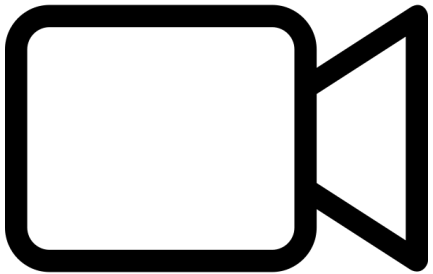
Thank you to our sponsors!

Recording and Live Stream in Progress



About the Biscayne Bay Marine Health Summit

Vision: A Sustainable and Healthy Biscayne Bay

The Biscayne Bay Marine Health Summit (BBMHS) is a group of independent volunteers (our *"Steering Committee"*) committed to promoting a healthy Biscayne Bay. We collaborate with local government agencies, academic institutions, businesses and nonprofits in order to achieve our goals.

- **Advocacy:** To work with local, state and federal stakeholders towards the implementation of the Summit's recommended strategies in order to improve Biscayne Bay water quality through preservation and restoration efforts.
- **Communication:** Keep Summit attendees informed about Biscayne Bay health-related initiatives through the creation of a monthly newsletter.
- **Education:** Share with Summit attendees post-Summit actions being proposed, considered or implemented by key Biscayne Bay stakeholders in order to restore, preserve or protect BB against human-related impacts.

Founder

Luiz Rodrigues

BBMHS Steering Committee

Albert Gomez

Camila Quaresma-Sharp

Dave Doebler

Emilio Lopez

Irela Bagué

Patrick Shearer

Scott Stripling

Steve Sauls

June 2017

Inaugural Biscayne Bay Marine Health Summit

May 2018

Action Summit Planning Meeting

September 2019 *The Action Summit*
Biscayne Bay Marine Health Summit

Some Notable Achievements of Past Summits

Catalyst for the Biscayne Bay Task Force (BBTF)

Increased collaboration between environmental groups

Recurring newsletter sharing actions to protect Biscayne Bay

Bringing new technologies and solutions to South Florida

And lots of people are on a similar mission

- Engaging the youth
- Incorporating sports
- Scientific research
- Self-managed cleanups
- Advocating for new legislation

https://www.local10.com/news/local/2020/08/29/north-bay-village-hosts-march-to-help-protect-and-preserve-biscayne-bay/

biscaynebayfl.com

Why should we protect Biscayne Bay?

Moral Responsibility

Human Health

Marine Health

Bay Health = Economic Health

Biscayne Bay-related uses generated $6.9 billion in income to southeast Florida residents in 2004

Direct, Indirect and Induced Economic Contribution to Southeast Florida
Contribution is 4% of Southeast Florida's Economy

Activity	Output (Million $)	Income (Million $)	Jobs	Tax Revenue (Million $)
Recreation	$3,992	$2,243	58,800	$272
Commercial Fishing	$30	$18	473	$2
Port of Miami Shipping	$8,895	$4,259	77,048	$368
Miami River Shipping	$805	$406	6,741	$44
Total	**$13,722**	**$6,926**	**143,062**	**$686**

Source: https://www.hazenandsawyer.com/work/projects/biscayne-bay-economic-study/

biscaynebayfl.com

Goals for Today's Town Hall

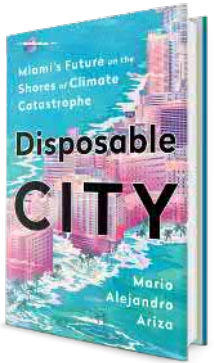
1. Share the Biscayne Bay Task Force recommendations
2. Encourage your support for the BBTF recommendations during the October 6th Miami-Dade County Board of Commissioners meeting https://miamidade.live/BCCMeeting
3. Help YOU take action

Today's Agenda

- **Biscayne Bay Task Force Summary**
  - Irela Bagué (BBMHS, BBTF, and Bagué Group)
  - Tiffany Troxler, Ph.D. (BBTF and FIU)
- **Presentations with Q&A: Moderated by Mario Ariza (Sun Sentinel)**
  - **Infrastructure**: Emilio Lopez (BBMHS and SOP Technologies)
  - **Water Quality:** Dr. Todd Crowl (FIU)
  - **Education & Outreach:** Rachel Silverstein, Ph.D. (Miami Waterkeeper)
  - **Marine Debris:** Dave Doebler (BBMHS and VolunteerCleanup.org)
  - **Watershed, Habitat Restoration and Natural Infrastructure:** Patrick Shearer (BBMHS and E Sciences)
  - **Funding:** Albert Gomez (BBMHS and IC Assemblies)
  - **Governance**: Lee Hefty (Miami-Dade County DERM)
- **Call to Action**
  - Steve Sauls
- **Closing Remarks**
  - Mario Ariza (Sun Sentinel)

Mario Alejandro Ariza: Moderator for Today

Mario Alejandro Ariza covers federal courts for the South Florida Sun-Sentinel. He is a Dominican immigrant to the United States, and the author of *Disposable City: Miami's future on the Shores of Climate Catastrophe*. Mario holds an MFA in poetry from the University of Miami and a Master's degree in Hispanic Cultural Studies from Columbia University. His poetry, journalism, and non-fiction writing can be found in places like *BOAAT*, *The Atlantic*, and *The Believer*.



https://disposable.city/

Biscayne Bay Recovery Plan

Summary of Biscayne Bay Task Force Recommendations

A Unified Approach to Recovery for a Healthy & Resilient Biscayne Bay

Biscayne Bay Task Force Report and Recommendations

June 2020

Biscayne Bay Task Force Members

Irela Bagué, Task Force Chairperson, President, Bagué Group
David Martin, Task Force Vice Chairperson, President, Terra Group
Lynette Cardoch, Ph.D., Director of Resilience & Adaptation, Moffatt & Nichol
Lee Hefty, Director, Division of Environmental Resources Management, Miami-Dade County
James Murley, Chief Resilience Officer, Office of Resilience, Miami-Dade County
John Pistorino, P.E., Principal, Pistorino and Alam
Alyce Robertson, Executive Director, Downtown Development Authority
Steve Sauls, Biscayne Bay Marine Health Summit Steering Committee Member
Tiffany Troxler, Ph.D., Director of Science, Sea Level Solutions Center, Florida International University

MIAMI-DADE COUNTY
BISCAYNE BAY TASK FORCE

- Established by Miami-Dade County Board of County Commissioners via Resolution - February 2019

- To review prior studies, relevant data, and prepare a written report with recommendations identifying problem areas, prioritizing projects, and recommendations regarding State and Federal Legislation, activities, and appropriations.

- Held 18 meetings heard 35 presentations from local and state agencies, municipalities, academia, community-based organizations, and key stakeholders.

- The final report presented to Miami- Dade County Board of County Commissioners on August 31, 2020.

Overarching Recommendations

A unified and collaborative approach to watershed restoration is urgently needed. To improve the water quality and the health of Biscayne Bay, the Task Force recommends:

Miami-Dade County's Board of County Commissioners (BCC) should create a new intergovernmental body called the **Biscayne Bay Watershed Management Board** (WMB).

The WMB should be supported by the creation of a new position called the **Chief Bay Officer** (CBO) in the Office of the Mayor. The WMB and the CBO should be supported by County staff, appropriate technical experts and community input to improve water quality in the Biscayne Bay watershed.

The WMB will be responsible to develop and, upon approval by the BCC, implement the **Biscayne Bay Watershed Restoration Plan** (WRP). The WMB, working with the CBO, should ensure that the following recommendations by the Task Force are implemented.

Recommendation Themes

- Improving Water Quality
- Government Action to Help Protect & Monitor
- Critical Infrastructure Improvements to our Water System
- Restoring the Watershed Habitat & Natural Infrastructure
- Reducing Land and Water Based Marine Debris
- Education & Outreach for Citizens & Visitors
- Creating Funding Opportunities for Recovery & Restoration

Actions Taken

- **State of Emergency Resolution** - Sponsored by Comm. Bovo
- **Urging Resolution to US Congress and Florida Legislature for Additional Funding and Making Biscayne Bay a State and Federal Legislative Priority in 2021** – Sponsored by Comm. Sosa/Co-Sponsor Comm. Bovo
- **Urging Resolution Septic to Sewer request for State & Federal Funding** – Sponsored by Comm. Sosa/Co-sponsors Comms. Bovo, Cava, Edmonson, Heyman, Higgins, Jordan
- **Resolution Directing Mayor to Review BBTF Recommendations and Provide Implementation Plan** – Sponsors Comm. Sosa/Co-sponsor Comm. Higgins (Scheduled for October 6, 2020)
- **Resolution Urging Municipalities Near Biscayne Bay to Provide Additional Funding for Biscayne Bay recovery efforts and Coordinate Interlocal Agreements** – Sponsored by Sosa, passed Committee heading to BCC (Oct. 6, 2020)
- **Chief Bay Officer Position added to FY21 Budget by Mayor Gimenez**

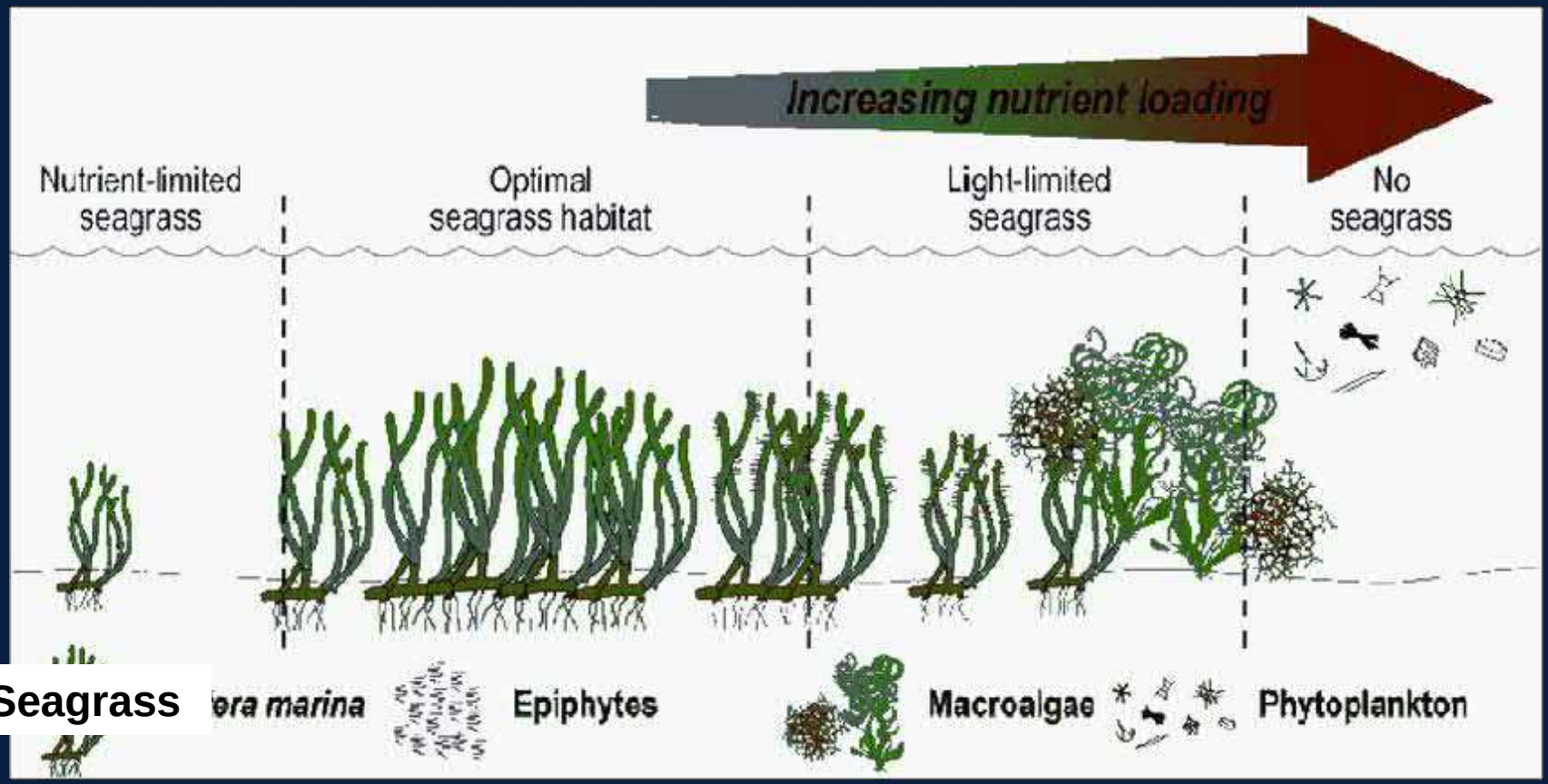
Upcoming

- **Ordinance relating to regulation of fertilizer; creating Chapter 18C of the Code; regulating fertilizer application and usage in the incorporated and unincorporated areas** (first reading Oct. 6, 2020) – Sponsored by Comm. Levine Cava/Co-Prime Comm. Higgins

Report Pending

- **Resolution Directing Mayor to Develop and Implement an Annual "Report Card" on the Health of Biscayne Bay** – Sponsored by Comm. Cava/ Co-sponsors by Comms. Heyman & Sosa

Big changes in Biscayne Bay aquatic environment -- seagrass habitat decline with **increased** nutrient loading



Conceptual diagram of seagrass habitat changes with increasing nutrient loading in a coastal lagoon system. Elevated nutrient loading results in a gradual transition from benthic-dominated to water-column-dominated primary production and the loss of seagrass habitat. Source: Catherine E. Wazniak, Maryland Department of Natural Resources.

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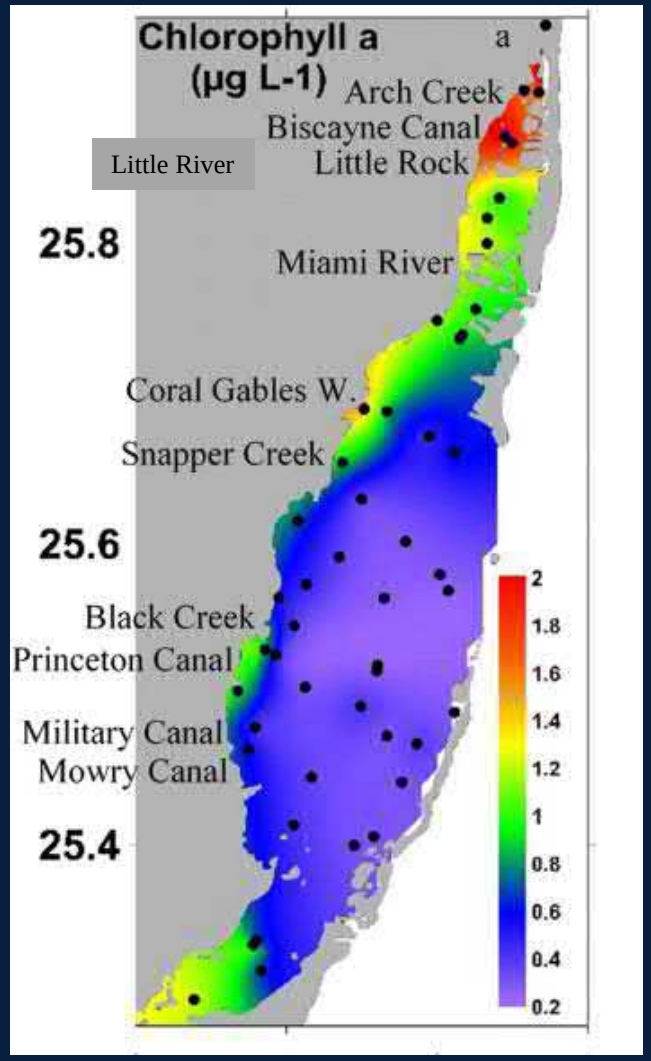
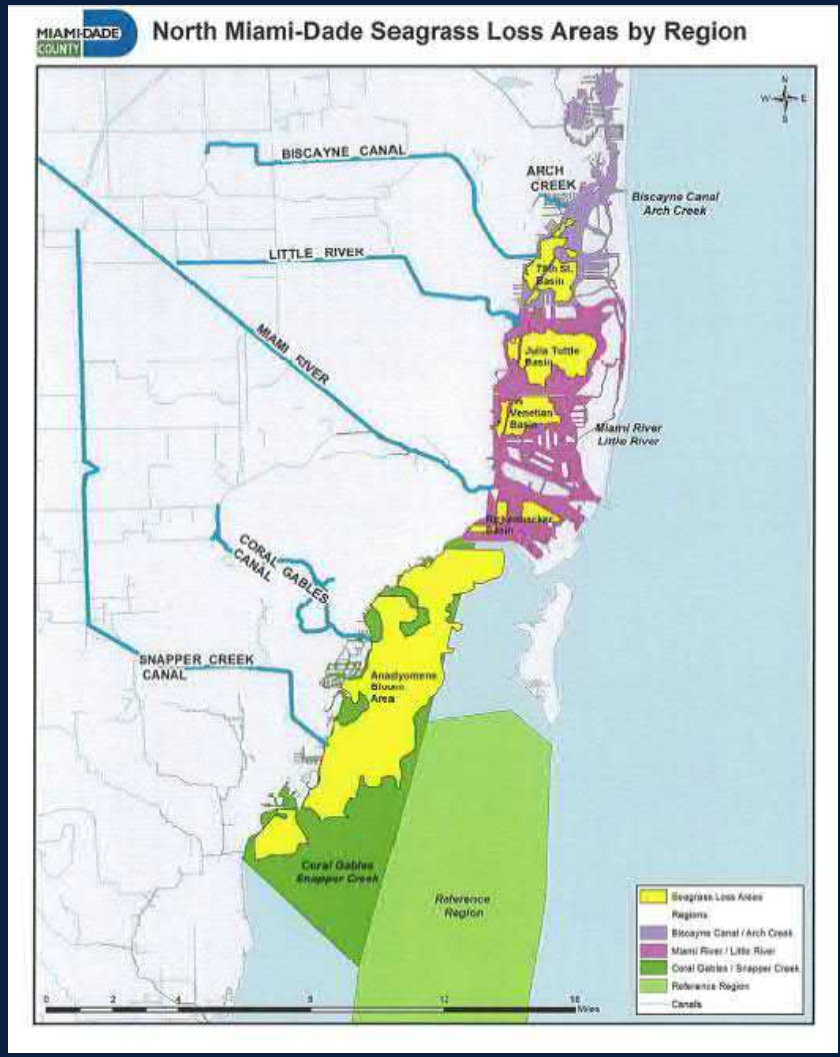
WARNING SIGNS

Poorest water quality in North North Bay and getting worse over time (1995-2014)



Millette et al. 2019

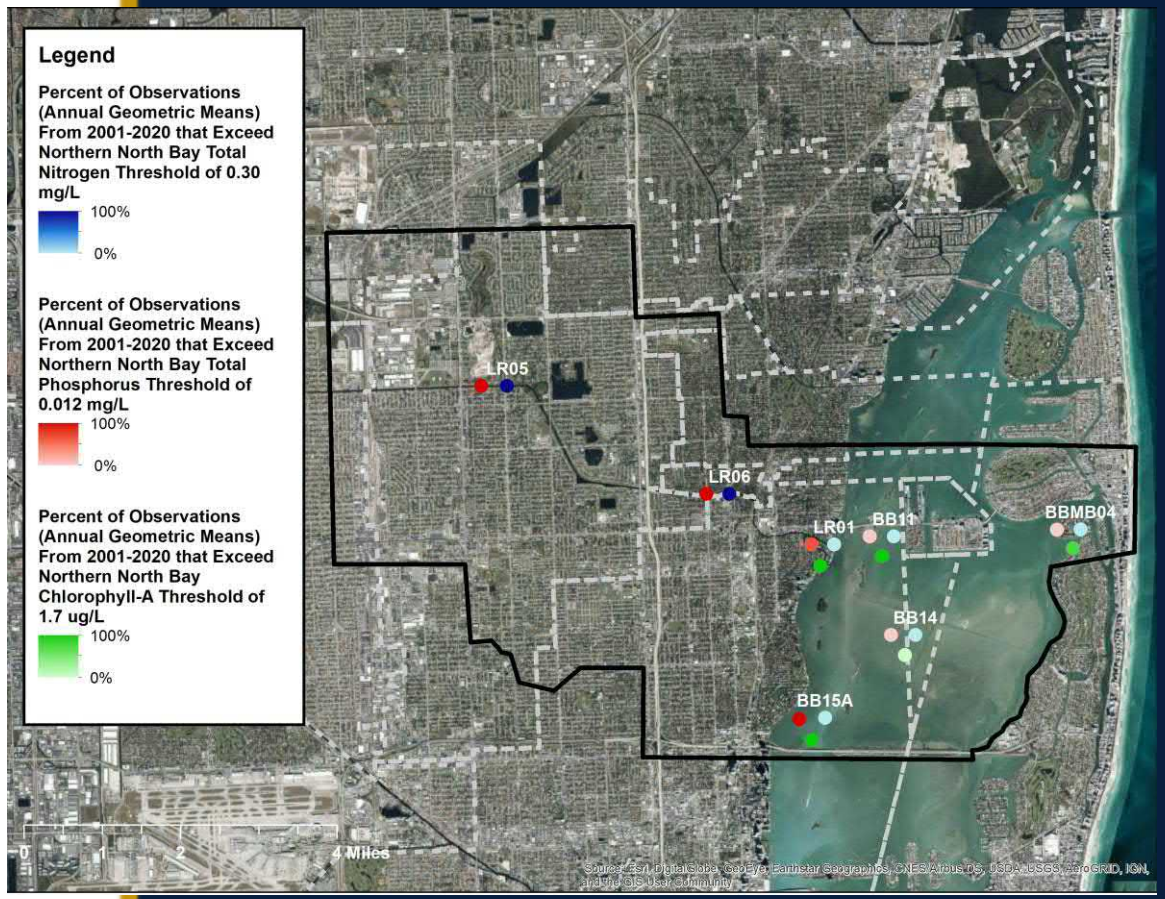
1998 Die-Off in 79th St Basin – 90% loss, more recent die-off in Julia Tuttle; also area of recent fish kill

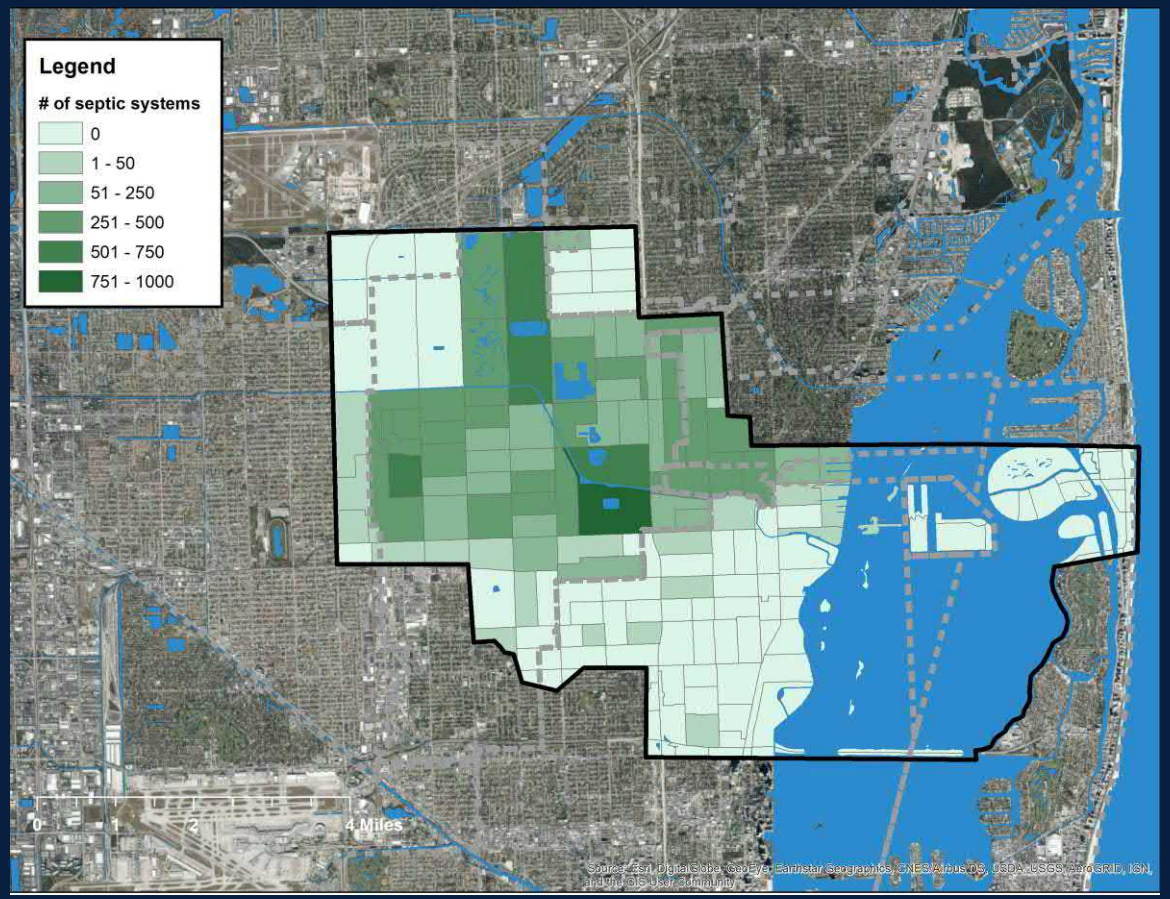


Miami Dade County 2018

FIU Institute of Environment

Northern Biscayne Bay – Little River Basin





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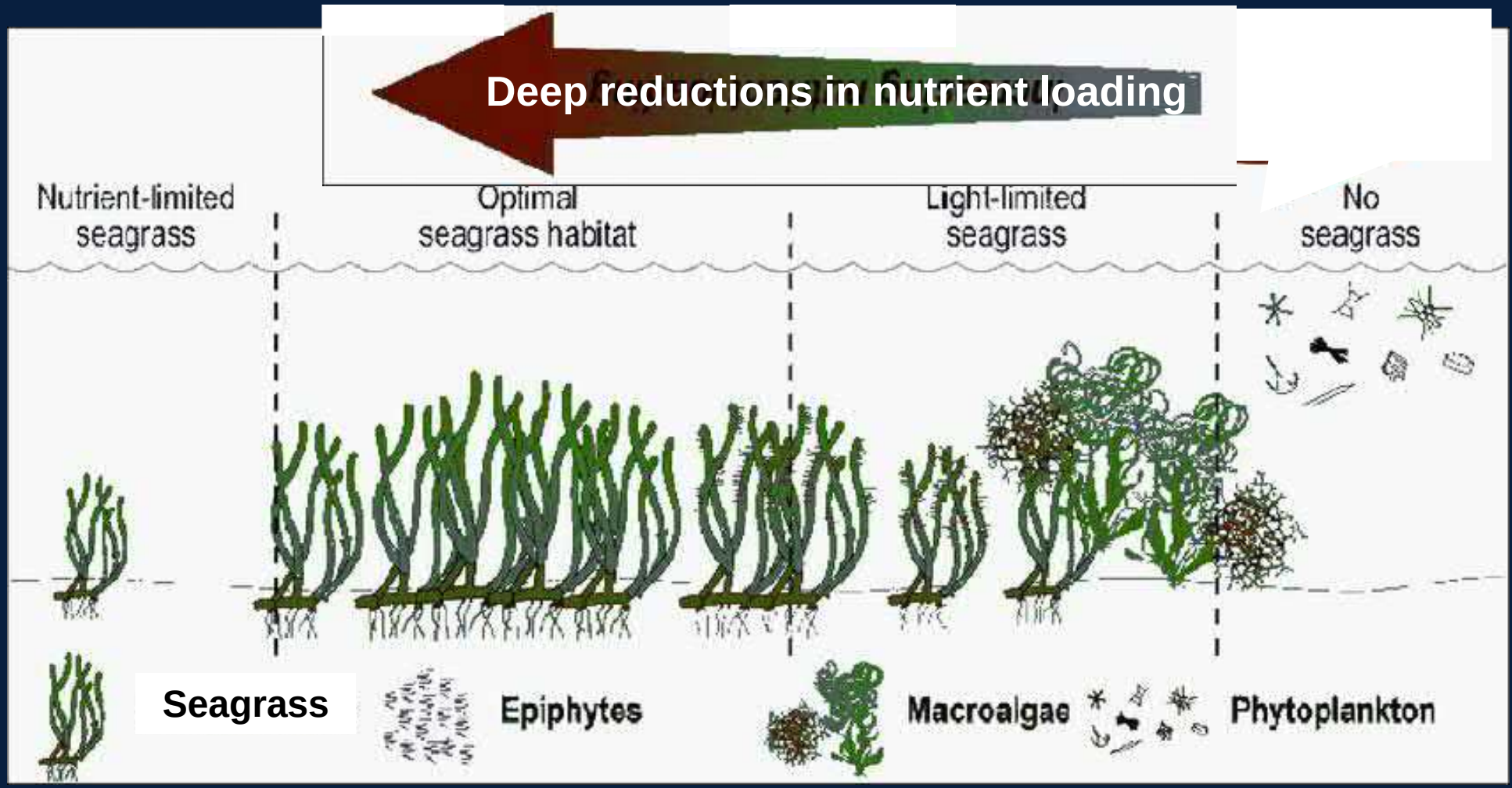
Quality of water coming out of Little River has exceeded the numeric nutrient criteria for Biscayne Bay nearly every year in the last 20

Approximately 17,000 septic tanks with ½ estimated to the compromised at some part of the year by 2020 groundwater levels

Sustained, decline in water quality, seagrass die-offs and recent fish kill indicate that urgent action is needed to decrease nutrient loading. **This will require a long-term, coordinated and deliberate effort to bring nutrient loading below the threshold that no adverse effects would be expected so we can manage Biscayne Bay for increasing pressure from climate change and future disturbances like infrastructure failures *to increase resilience of the Bay***



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Take a watershed approach to achieving deep reduction in pollutant loads for restoration of seagrass meadows to historic coverages

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	WATER QUALITY	BENCHMARK
1A	Establish science-based, pollutant load reduction goals and interim targets	Short-Term (S)
1B	Develop, implement and continuously monitor and demonstrate progress toward meeting 1A's pollutant load reduction goals and interim targets	Short-Term (S)
1C	Activate additional Department of Regulatory and Economic Resources' (RER) resource management functions	Immediate (I)
1D	County should conduct an immediate assessment of land-based hotspot areas prioritized based on existing, known impairments	Immediate (I)
1E	Review, develop (as needed), implement and enforce local ordinances and policies to attain pollution load reduction goals set forth in the Watershed Restoration Plan (WRP)	Short-Term (S)
1F	Coordinate, staff and provide an annual budget for comprehensive, centralized Biscayne Bay Watershed data and research coordination and data management infrastructure	Immediate (I)

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Benchmark

Immediate (I)	Short-Term (S)	Mid-Term (M)
Less than one year	Between one and three years	Greater than three years

Action Type

Actions that can be accomplished administratively within the County	Actions that require additional policy considerations	Actions that require further collaboration at the municipal, state, or federal level

	WATER QUALITY	BENCHMARK
1G	Undertake and secure funding for new pilot projects and research projects focused on reducing pollutant loads	Immediate (I)
1H	Elevate and further amend the Comprehensive Develop Master Plan (CDMP) to further include Biscayne Bay watershed management planning elements	Mid-Term (M)
1I	Conduct a climate change vulnerability assessment for Biscayne Bay	Short-Term (S)
1K	Pass a county-wide fertilizer ordinance	Short-Term (S)
1L	Increase compliance of all marinas and commercial operations along waterways	Immediate (I)
1M	Continue to monitor the progress of the October 7th, 2015 Consent Agreement between FP&L and Miami-Dade County	Immediate (I)

Benchmark

Immediate (I)	Short-Term (S)	Mid-Term (M)
Less than one year	Between one and three years	Greater than three years

Action Type

Actions that can be accomplished administratively within the County	Actions that require additional policy considerations	Actions that require further collaboration at the municipal, state, or federal level

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	INFRASTRUCTURE	BENCHMARK
3A	Increase compliance with existing laws to result in the immediate connection of ~12,000 properties to the sewer system	Short-Term (S)
3B	Develop and enforce septic system design criteria with design parameters	Short-Term (S)
3C	Initiate a mandatory septic system registration and inspection program	Mid-Term (M)
3D	Undertake immediate efforts to identify and eliminate all root causes of Sanitary Sewer Overflows (SSO) including inflow and infiltration. Accelerate sewer infrastructure maintenance and upgrades	Short-Term (S)
3E	Develop and expedite a Condition Assessment and Asset Management Action Plan to document the condition of the County's wastewater system assets and certify all historical "As Builts" and/or those not already certified with a focus on identifying horizontal and vertical locations of main wastewater transmission lines	Short-Term (S)
3F	Enforce the existing code and update the stormwater design criteria to improve effectiveness and include advances in stormwater treatment technologies	Short-Term (S)
3G	Develop a plan to prioritize the retrofitting of stormwater infrastructure within basins with the most substantial water quality and/or habitat degradation issues	Short-Term (S)
3H	Eliminate direct and indirect stormwater discharges to Biscayne Bay	Mid-Term (M)
3I	Set policy that all As-Builts/Record Drawings are done and certified by a Florida Professional Surveyor and Mapper qualified and registered to do work in Miami Dade County	Short-Term (S)
3J	Set policy to require during the design phase of future construction that all existing utilities are designated and located vertically and horizontally	Short-Term (S)
3K	Ensure that new infrastructure projects to address coastal flooding and storm surge that are cost-shared by the County adhere to the recommendations of this Task Force and prioritize Biscayne Bay health and resilience	Short-Term (S)

Septic Systems

Sanitary sewer system

Stormwater Systems

Governance

WATERSHED HABITAT RESTORATION AND NATURAL INFRASTRUCTURE

4A	Develop ecologically acceptable living shoreline design options that are consistent with the existing Biscayne Bay Aquatic Preserve Act	Immediate (I)
4B	Raise awareness of the value of mangroves through a homeowner education campaign	Short-Term (S)
4C	Increase enforcement of existing rules for protecting existing mangroves and mangrove shorelines	Short-Term (S)
4D	Identify vulnerable properties along the coastline and partner with municipalities to focus on public properties and private property owners to create a voluntary Mangrove Protection and Restoration Zone Program	Short-Term (S)
4E	Prioritize existing and identify new green and blue infrastructure approaches and restoration projects	Immediate (I)
4F	Continue to work with SFWMD and to have the State of Florida allocate the funds necessary to ensure the timely commencement of construction of the Cutler Flow Way in accordance with the project timeline in the Integrated Delivery Schedule	Immediate (I)
4G	Continue to advocate for funding to support the Biscayne Bay Southern Everglades Ecosystem Restoration (BBSEER) project (also known as the BBCW / C-111)	Mid-Term (M)
4H	Establish seagrass targets and maintenance requirements	Short-Term (S)
4I	Accelerate green infrastructure solutions for flooding, resiliency and water quality	Short-Term (S)

A Key Takeaway:

Efforts to adapt to climate change impacts, kick start economy, create equity, restore the watershed and recover Biscayne Bay are *complementary and mutually-beneficial, and will promote resilience across Greater Miami and the Beaches*

https://resilient305.com

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Emerging activities by stakeholders to implement BBTF recommendations

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Infrastructure

With a focus on stormwater pollution

SOP Technologies
Environmental Solutions
soptechint.com

Presentation By: Emilio Lopez

My mission is to **Stop Ocean Pollution**

Engineering & Manufacturing | Stormwater Pollution Analysis | Community Collaboration

SOP Technologies | soptechint.com | info@soptechint.com | 305-792-8778

As polluted water makes its way to the oceans, water quality can be affected, which often results in the **closing of local beaches due to unhealthy water conditions. Stormwater carries disease-causing bacteria and viruses.** Swimming in polluted waters can make you sick.

A study in Santa Monica Bay showed that **people who swim in front of flowing storm drains are 50 percent more likely to develop certain symptoms than those who swim 400 yards from the same drain.**

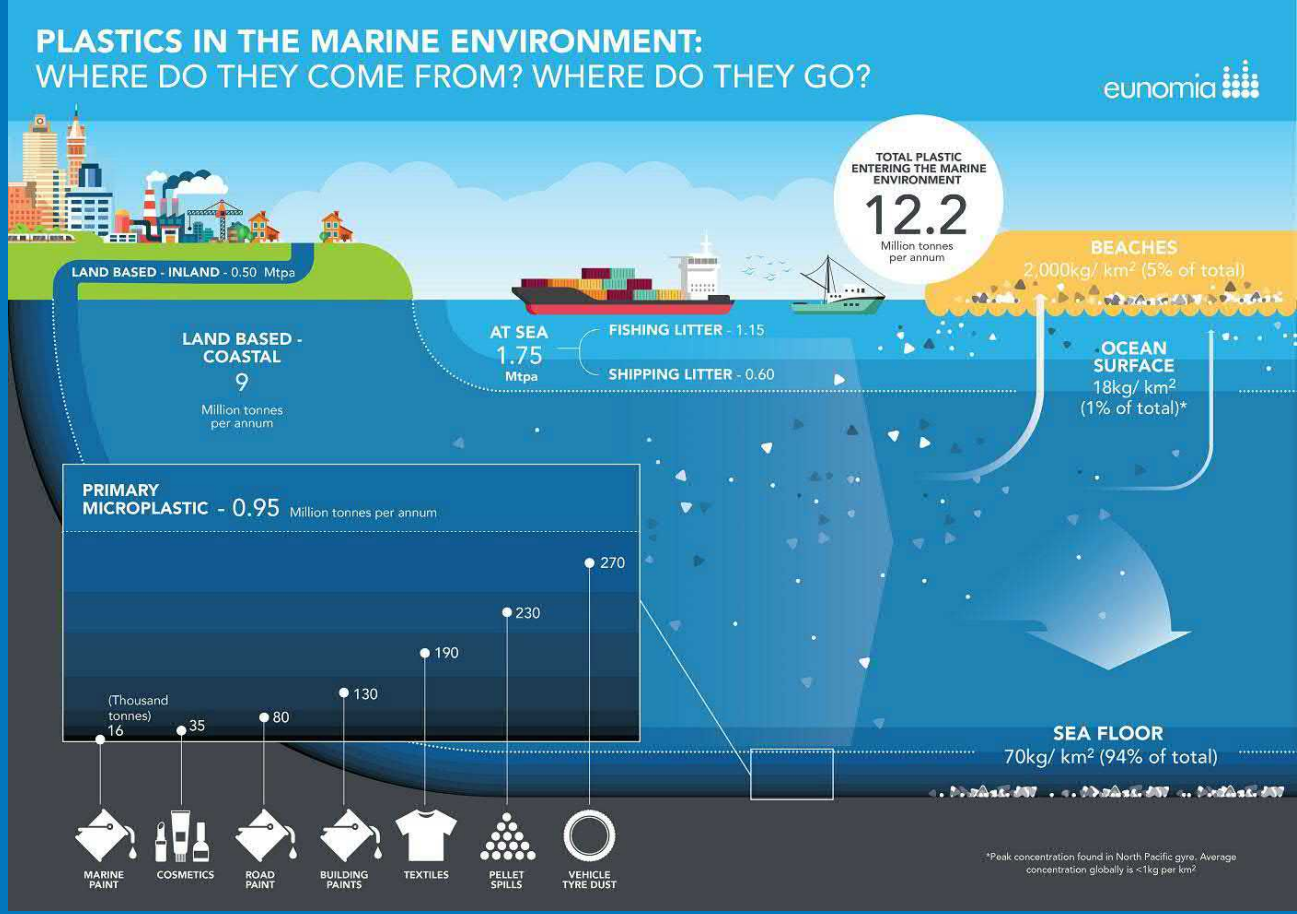
EPA: https://www3.epa.gov/region9/water/npdes/stormwater-feature.html

What are the origins of ocean plastic debris, and how does it leak into the ocean?

"**Less than 20 percent of leakage originates from ocean-based sources** like fisheries and fishing vessels.

This means **over 80 percent of ocean plastic comes from land-based sources**;
once plastic is discarded, it is not well managed, and thus leaks into the ocean."[1]

"19 to 23 million metric tons, or 11%, of plastic waste generated globally in 2016 entered aquatic ecosystems."[3]



1. Ocean Conservancy https://act.oceanconservancy.org/wp-content/uploads/2017/04/full-report-stemming-the.pdf
2. Graphic: Eunomia https://www.eunomia.co.uk/reports-tools/plastics-in-the-marine-environment/
3. Science: https://science.sciencemag.org/content/369/6510/1515

Pollution Also Causes Flooding

"When it rains, water washes down the street, pushing plastics and other trash into the stormwater drain. Those openings on the curb were designed to capture rainwater and prevent flooding, not serve as public trash cans. But **researchers say more and more trash is making its way from those drains to the ocean."**[1]

"Never dump any waste in the storm sewers or canals within the City. It is illegal for any direct or indirect entry of any solid, liquid or gaseous matter to enter the drainage system. **Even grass clippings and branches can accumulate and plug channels.** A plugged channel or storm drain cannot carry water and **when it rains, clogged storm drains will cause water to back up into the street and may cause flooding.**[2]

Inside a local stormwater basin (video)

1. NPR: https://whyy.org/segments/looking-to-cut-plastics-pollution-in-the-ocean-start-upstream/
2. City of North Miami: https://www.northmiamifl.gov/757/Flooding

How much trash and debris enters local storm drains and Biscayne Bay?

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Environmental Solutions
soptechint.com

Per inlet, per year: Approx. 175 lbs of leaves (nutrients) and trash enter stormwater basins and pipes. 0.051 lbs TP 0.106 lbs TN*

There are over 95,000 stormwater inlets/catch basins/grates in Miami-Dade County

Every year:

- **Over 16 Million pounds of leaves (nutrients) and trash entering stormwater inlets**
- Over 4,845 pounds of Total Phosphorus (TP)
- Over 10,070 pounds of Total Nitrogen (TN)

Mostly leaves (nutrient pollution)

Lots of street litter

*Based on data we collected in 2019 and 2020 at 3 cities, and with the collaboration of SENDIT4THESEA

Public Works Departments Survey

SOP Technologies
Environmental Solutions
soptechint.com

Responses included Public Works employees from

MIAMI-DADE COUNTY

Cutler Bay FLORIDA ESTABLISHED 2005

VILLAGE OF KEY BISCAYNE ISLAND PARADISE 1991 FLORIDA

WEST MIAMI FLORIDA

NORTH MIAMI FLORIDA

City of North Miami Beach NMB CITYNMB.COM

CITY OF MIAMI GARDENS 2003

City of North Bay Village Florida 1945 Harbor Island North Bay Island Treasure Island

MIAMI SPRINGS At the Heart of it All!

CITY OF DORAL

Public Works Survey: Acting Upon Task Force Recommendations

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During the next 12 months, which of the following Biscayne Bay Task Force Recommendations do you support taking action upon within your jurisdiction?

3H	Eliminate direct and indirect stormwater discharges to Biscayne Bay.	✓✓✓✓
5F	Evaluate the various existing stormwater outfall systems in your jurisdiction to determine their effectiveness at preventing debris from entering Biscayne Bay.	✓✓✓✓✓✓✓✓
1G	Undertake and secure funding for new pilot projects and research projects focused on reducing pollution loads.	✓✓✓✓✓✓
5D	Conduct an analysis of marine debris in Biscayne Bay.	✓✓✓
5G	Identify and establish dedicated and recurring funding sources to pay for marine debris prevention and removal activities.	✓✓✓✓✓✓
3G	Develop a plan to prioritize the retrofitting of stormwater infrastructure within basins with the most substantial water quality and/or habitat degradation issues.	✓✓✓✓✓✓✓✓
3F	Enforce the existing code and update the stormwater design criteria to improve effectiveness and include advances in stormwater treatment technologies.	✓✓✓✓✓
4I	Accelerate green infrastructure solutions for flooding, resiliency, and water quality.	✓✓✓✓✓

Public Works Survey: Stormwater Debris Causing Floods

How often does your jurisdiction experience flooding caused by stormwater pipes that are clogged with leaves and street litter?

Many solutions to capture, collect and remove pollution

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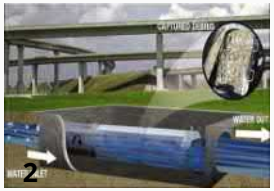
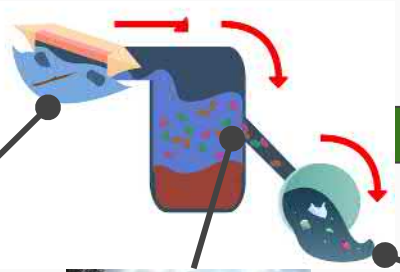


LOWER COST

HIGHER COST



Street Sweeping*
$257 / lb. of TP
$165 / lb. of TN

Catch Basin Cleaning*
$1,656 / lb. of TP
$1,016 / lb. of TN

2. EPA https://www.epa.gov/trash-free-waters/trash-capture-technologies#drain
* University of Florida: https://www.florida-stormwater.org/assets/FSAEF/Research/MS4/UF%20FDEP%20MS4%20Maintenance%20Final%20Report_edited.pdf

Taking Action to Protect Biscayne Bay

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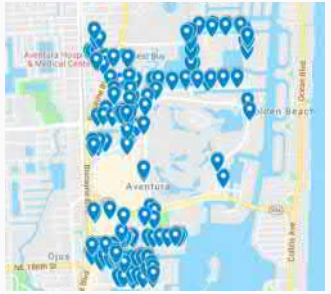
City of Aventura Analysis

It all began with the 2017 Biscayne Bay Marine Health Summit. To protect Biscayne Bay from leaves (nutrient pollution) and street litter pollution, the City of Aventura implemented SOP Technologies' patented stormwater curb inlet filters/screens at their stormwater inlets city-wide by Summer 2019.



- **Annual Pollution Prevention:**
  - **38,528 lbs. of leaves, street litter and debris** prevented from entering the stormwater system, local groundwater, and the Biscayne Bay.
  - Nutrient load reductions
    - **14.56 lbs. of Total Phosphorus (TP)**
    - **30.25 lbs. of Total Nitrogen (TN)**
- **Cost Savings**
  - **$43,000 - $97,000 net cost savings** within 10 years
- **Flood Prevention**
  - The city is keeping thousands of pounds of leaves and litter out of stormwater catch basins and pipes, thereby preventing street flooding.

Full report https://soptechint.com/blog/2020/8/17/city-of-aventura-preventing-nutrient-and-stormwater-pollution-of-biscayne-bay

Public Works Survey:
Preventing Stormwater Pollution

Do you support preventing leaves (nutrient pollution) and street litter from flowing into stormwater inlets and discharging to Biscayne Bay?

100%
Responded YES

Public Works Survey: Additional Comments

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What additional comments would you like to share about preventing pollution of Biscayne Bay?

All **Storms [drains] should be cleaned on a regular basis** to remove pollutants. Cutler Bay cleans all public storm drains on a 2 year cycle. Also when possible upgrade the storm drain infrastructure by replacing slab covered trenches to Exfiltration trenches.

Install pollution prevention structures to improve the water quality. Create regulation that enforce all private developer in the use of sustainable measures in their project and promote the sustainability process in order to **promote the implementation of better and more efficients stormwater drainage systems that discharge into the bay as well maintain free of pollutants our streets**

Labeling of Storm water Inlets that have a direct outflow to canals, rivers and bays.

Eliminate all septic tanks in areas that affect the Bay. **Educate the public** by providing frequently information on media outlets (radio, TV) and social media outlets on how the public can help. **It is an urgent matter**.

The Public at large as individuals should have common sense when it comes to contaminating water resources. Literature, videos and other means of notification only goes so far. I think there needs to be a program in place starting with **elementary schools all the way through high school teaching the citizens of tomorrow that what they do today will impact them tomorrow.**

Public Works Survey: Adopt-a-Drain Program

Do you support having an adopt-a-drain program where community members help to quantify stormwater debris and pollution in your jurisdiction?

83%
Responded YES

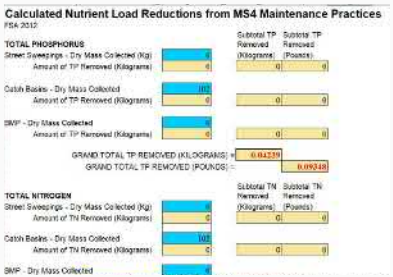
Get Involved

SOP Technologies Adopt-a-Drain Program

Help us quantify pollution entering stormwater systems and Biscayne Bay

Contact info@soptechint.com

Collect, quantify and weight Stormwater Pollution


Calculated Nutrient Load Reductions from MS4 Maintenance Practices

FSA 2012

TOTAL PHOSPHORUS

Street Sweepings - Dry Mass Collected (Kg)

Amount of TP Removed (Kilograms)

Subtotal TP Removed (Kilograms)

Subtotal TP Removed (Pounds)

Catch Basins - Dry Mass Collected

Amount of TP Removed (Kilograms)

BMP - Dry Mass Collected

Amount of TP Removed (Kilograms)

GRAND TOTAL TP REMOVED (KILOGRAMS)

GRAND TOTAL TP REMOVED (POUNDS)

TOTAL NITROGEN

Street Sweepings - Dry Mass Collected (Kg)

Amount of TN Removed (Kilograms)

Subtotal TN Removed (Kilograms)

Subtotal TN Removed (Pounds)

Catch Basins - Dry Mass Collected

Amount of TN Removed (Kilograms)

BMP - Dry Mass Collected

Biscayne Bay Town Hall

Dr. Todd A. Crowl
Executive Director, Institute of Environment
Florida International University

October, 2, 2020

FIU
Institute of Environment

	WATER QUALITY	BENCHMARK
1A	Establish science-based, pollutant load reduction goals and interim targets	Short-Term (S)
1B	Develop, implement and continuously monitor and demonstrate progress toward meeting 1A's pollutant load reduction goals and interim targets	Short-Term (S)
1C	Activate additional Department of Regulatory and Economic Resources' (RER) resource management functions	Immediate (I)
1D	County should conduct an immediate assessment of land-based hotspot areas prioritized based on existing, known impairments	Immediate (I)
1E	Review, develop (as needed), implement and enforce local ordinances and policies to attain pollution load reduction goals set forth in the Watershed Restoration Plan (WRP)	Short-Term (S)
1F	Coordinate, staff and provide an annual budget for comprehensive, centralized Biscayne Bay Watershed data and research coordination and data management infrastructure	Immediate (I)

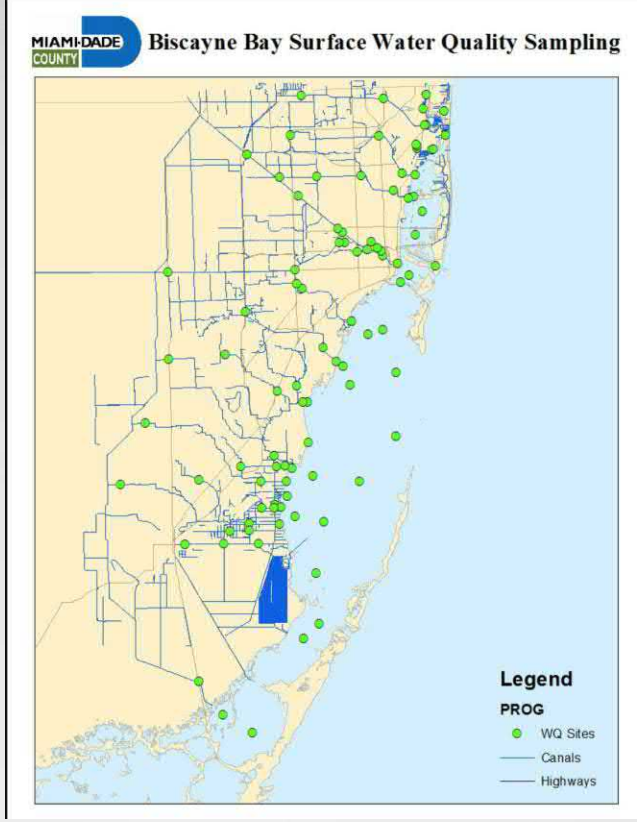
Benchmark

Immediate (I)	Short-Term (S)	Mid-Term (M)
Less than one year	Between one and three years	Greater than three years

Action Type

Actions that can be accomplished administratively within the County	Actions that require additional policy considerations	Actions that require further collaboration at the municipal, state, or federal level

FIU Institute of Environment



Florida Department of Environmental Protection, Department of Environmental Research Management, South Florida Water Management District, Miami-Dade Water and Sewer, NOAA

UM, FIU , Miami Water Keepers, other NGO's, other scientists

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We need to include more nimble sampling methodologies that allow continuous data

And over much larger spatial area with near-real time data

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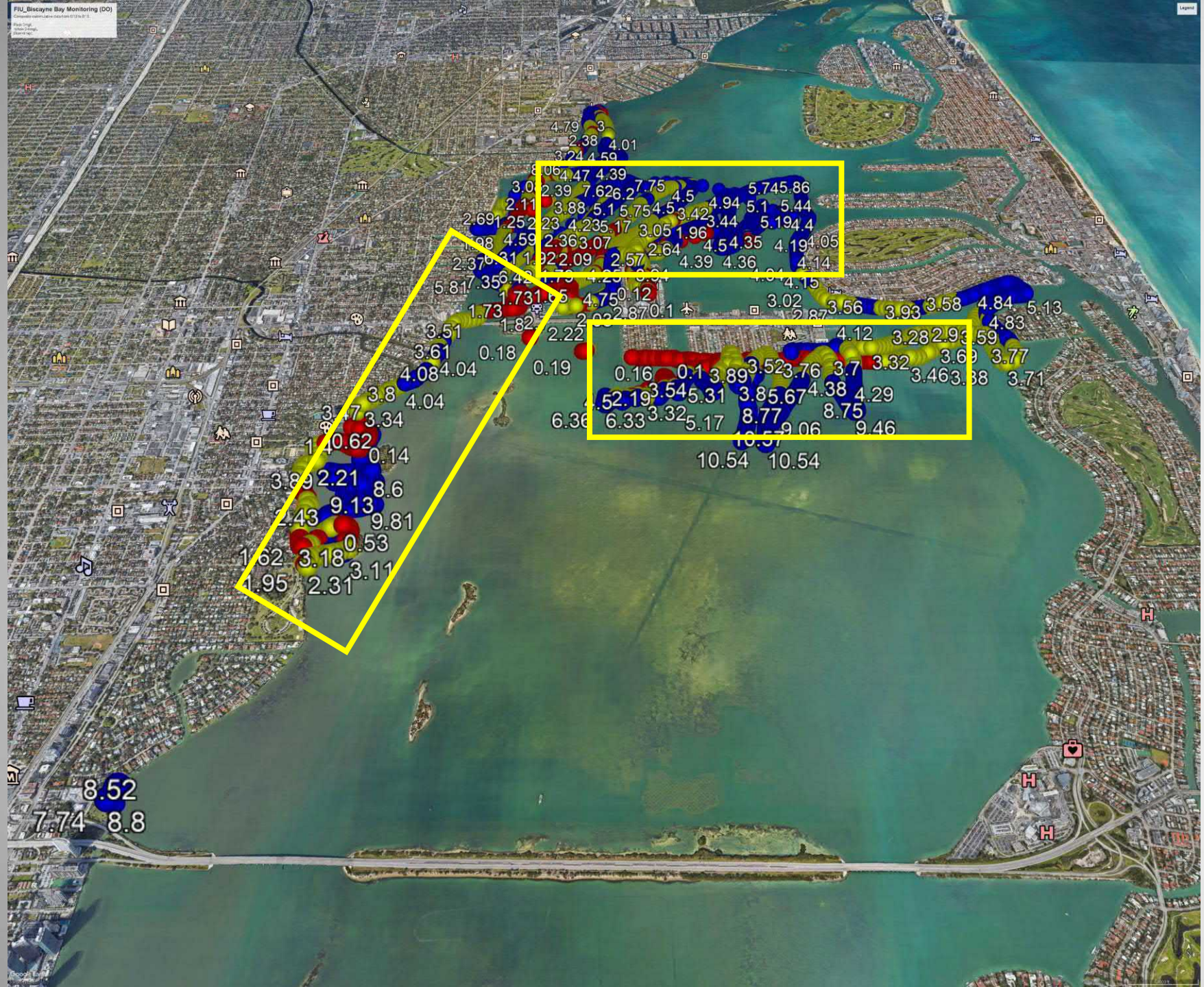

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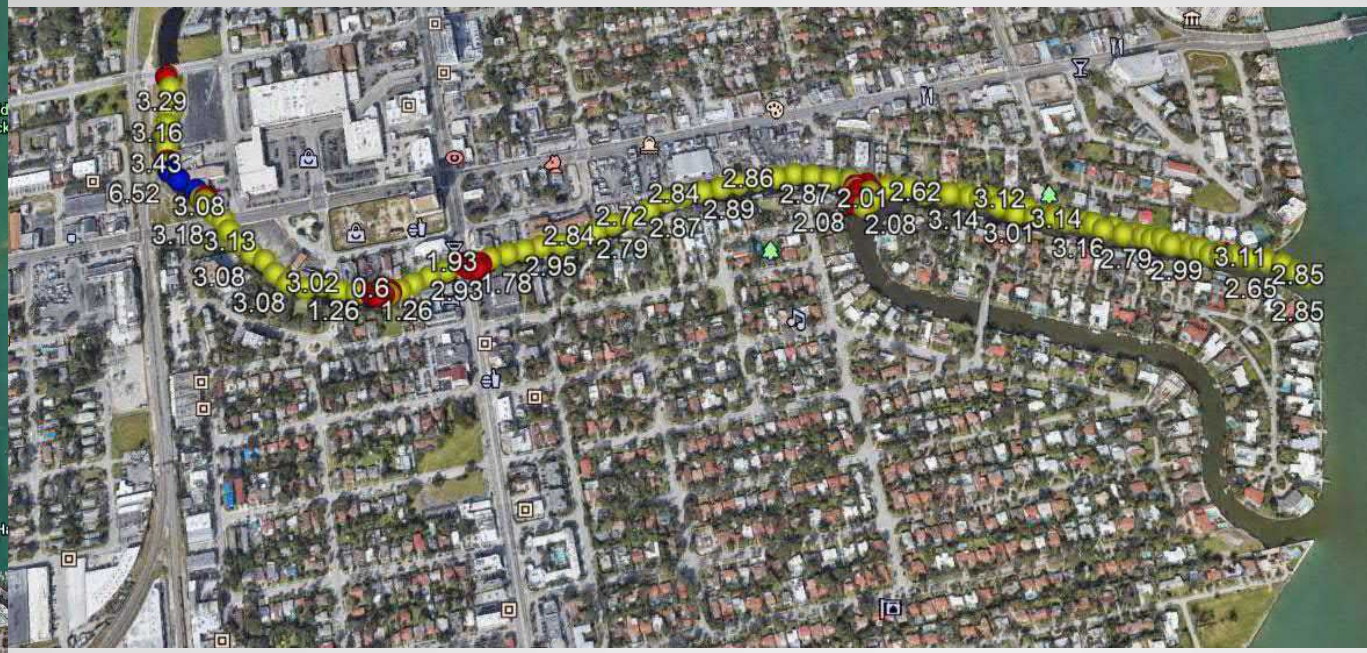
Institute of Environment



FIU
Institute of Environment

We also need continuous monitoring with real-time data

Including night-time observations

FIU Institute of Environment

FIU | Center for Aquatic Chemistry and Environment

NSF Center of Research Excellence in Science and Technology

Environment.fiu.edu

“Develop, implement and continuously monitor and demonstrate progress toward meeting pollutant load reduction goals”

We need an Interagency, Comprehensive Greater Biscayne Bay Watershed Program

Data harvesting for interoperability
Data dissemination for policy decision
Data visualization for community education

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	WATER QUALITY	BENCHMARK
1A	Establish science-based, pollutant load reduction goals and interim targets	Short-Term (S)
1B	Develop, implement and continuously monitor and demonstrate progress toward meeting 1A's pollutant load reduction goals and interim targets	Short-Term (S)
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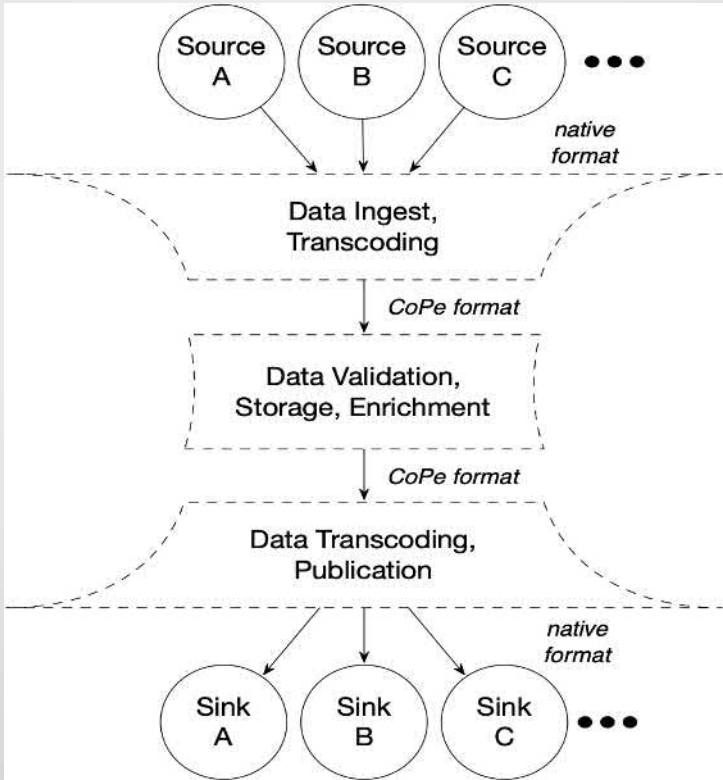
1D	County should conduct an immediate assessment of land-based hotspot areas prioritized based on existing, known impairments	Immediate (I)
1E	Review, develop (as needed), implement and enforce local ordinances and policies to attain pollution load reduction goals set forth in the Watershed Restoration Plan (WRP)	Short-Term (S)
1F	Coordinate, staff and provide an annual budget for comprehensive, centralized Biscayne Bay Watershed data and research coordination and data management infrastructure	Immediate (I)

Benchmark
Immediate (I) Less than one year | Short-Term (S) Between one and three years | Mid-Term (M) Greater than three years

Action Type
Actions that can be accomplished administratively within the County | Actions that require additional policy considerations | Actions that require further collaboration at the municipal, state, or federal level

We need an Interagency, Comprehensive Greater Biscayne Bay Watershed Program

Data harvesting for interoperability
Data dissemination for policy decision
Data visualization for community education



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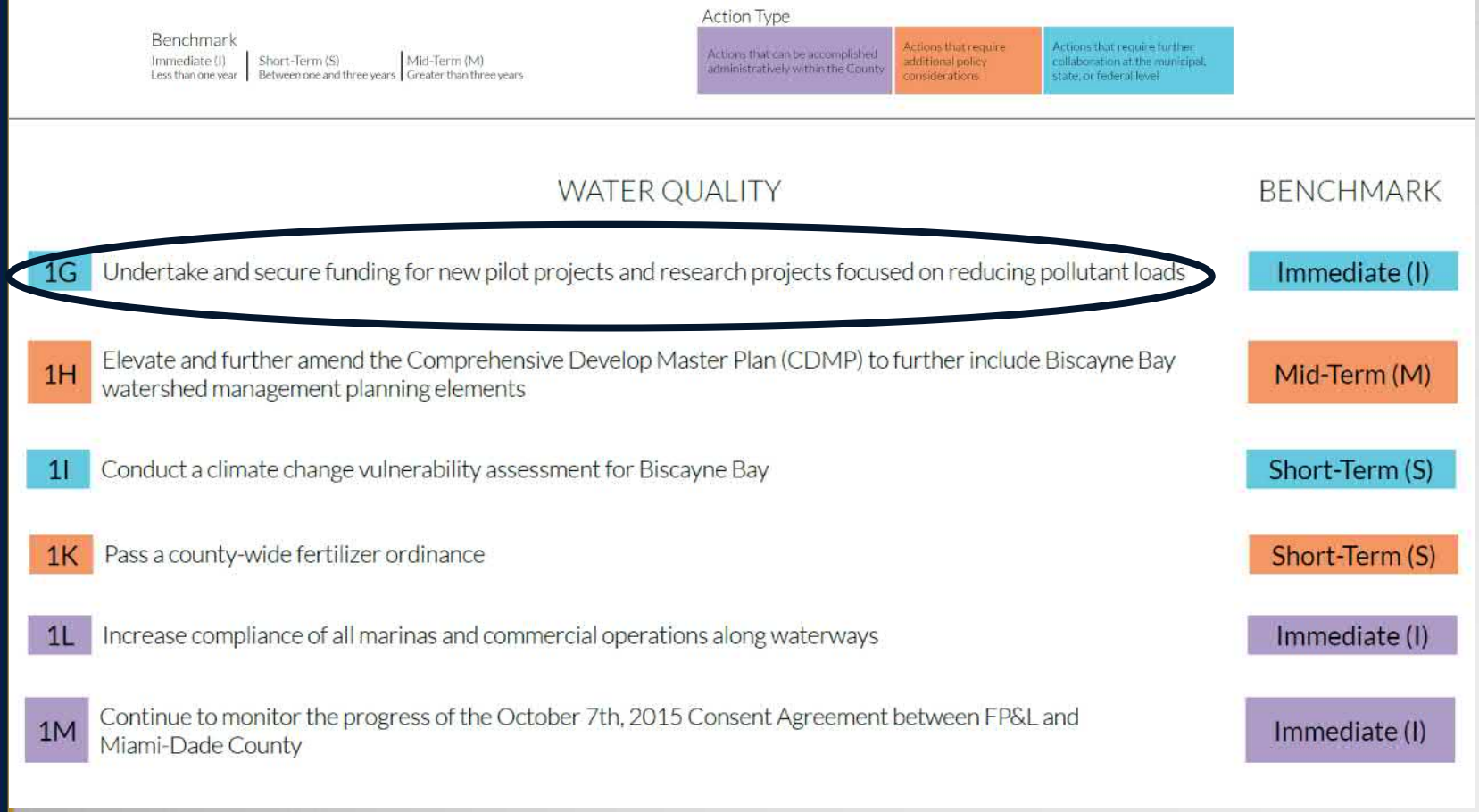

We need to secure State-Level funding like the Hudson River, Chesapeake Bay, California Bay and Tampa Bay Programs

Environmental Finance and Risk Management Program –

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“Establish funding streams to support a Coordinated staff and provide an annual budget for comprehensive monitoring and management actions”

Environmental Finance and Risk Management Program –

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➢**Train a new generation of environmental finance professionals who will develop and implement effective resilience/sustainability theories, policies, and practical applications**

➢ **Offer comprehensive training in environmental resilience finance - catastrophe bonds, weather derivatives, carbon markets, green bonds and other methods to create financing solutions to disaster preparedness and resilience/mitigation/adaptation/sustainability/reduction/conservation projects hedging the risks associated with those solutions**

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Holistic monitoring and implementation is NOT ENOUGH….we must empower all of the citizens that live the Biscayne Bay Watershed to understand the information

EDUCATION IS THE KEY

FIU
Institute of Environment

MIAMI
WATERKEEPER®

Ensuring swimmable, drinkable, fishable water for all

Rachel Silverstein, Ph.D.
Executive Director and Waterkeeper

OUR MISSION

To ensure swimmable, drinkable, fishable water for all.

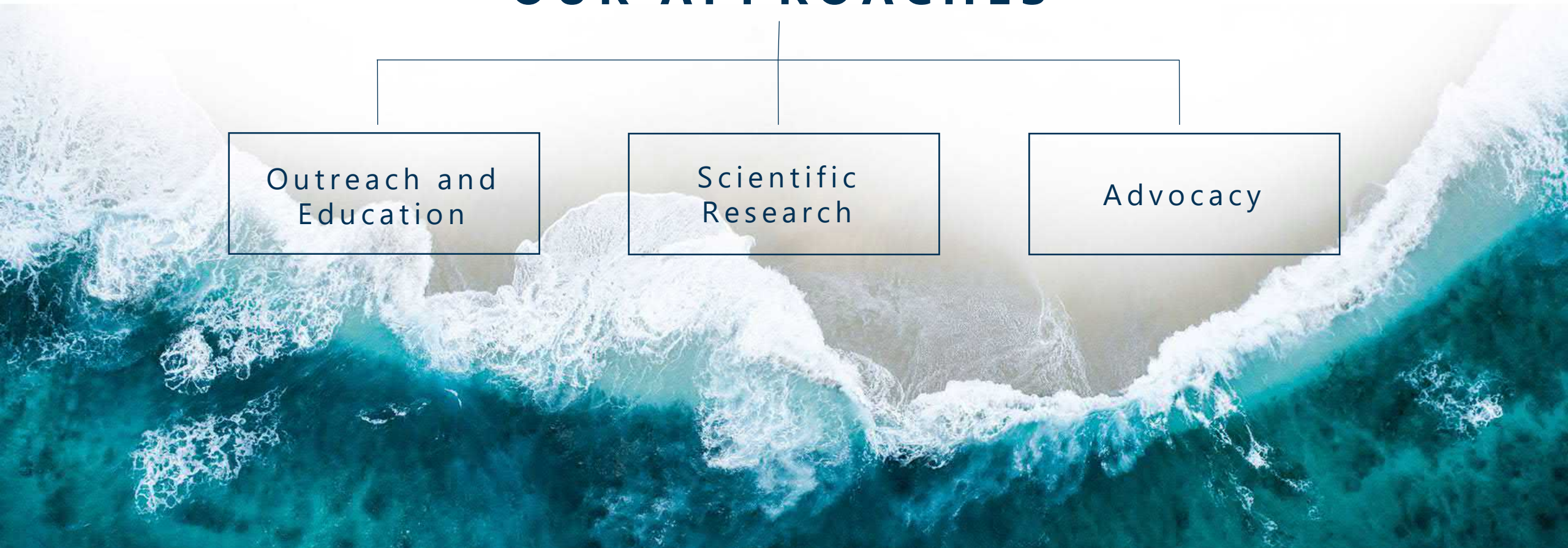
MIAMI WATERKEEPER®

FOCUS AREAS

- Clean Water
- Habitats
- Sea level rise

OUR APPROACHES

- Outreach and Education
- Scientific Research
- Advocacy



EDUCATION AND OUTREACH

		BENCHMARK
6A	Create a multi-lingual, multi-media campaign and educational outreach program	Immediate (I)
6B	Leverage the funding in the Community Based Organization grant program to create a special focus on Biscayne Bay education	Short-Term (S)
6E	Build upon and increase volunteer clean-up activities county-wide	Immediate (I)
6C	Conduct an educational campaign to inform the public on the proper and improper ways to dispose of trash and the impacts of littering and marine debris to the health and management of Biscayne Bay	Immediate (I)
6F	Develop environmental sustainability and "plastic free" best practices	Short-Term (S)
6D	Implement policies to reduce the amount of locally generated plastic marine debris	Short-Term (S)
6G	Support a "Living Laboratory for Bay Health"	Short-Term (S)
6H	Develop and implement a contractor and lawn care industry training program	Short-Term (S)
6I	Expand the scope of Baynanza to add year-round activities and collaborate on Biscayne Bay Marine Health Summit activities.	Immediate (I)

Smart Fertilizer Outreach

Benchmark

Immediate (I)	Short-Term (S)	Mid-Term (M)
Less than one year	Between one and three years	Greater than three years

Action Type

Actions that can be accomplished administratively within the County	Actions that require additional policy considerations	Actions that require further collaboration at the municipal, state, or federal level

MIAMI WATERKEEPER'S

JUNIOR AMBASSADOR PROGRAM

Miami Waterkeeper's Junior Ambassador program celebrates its fifth cohort of students. These young environmental leaders received specialized training in civic engagement and advocacy, South Florida environmental issues, and participated in unique service learning opportunities. In 2019-2020, our students achieved numerous successes!

PARTICIPATED IN 3 SERVICE LEARNING EVENTS

- International Coastal Clean Up at Marine Stadium Park
- Deering Estate Biodiversity Walk
- Water Quality Skills for Citizen Scientists aboard the Seakeepers' vessel *Julia*

GRADUATED 21 JUNIOR AMBASSADORS

COMPLETED 4 ADVOCACY TRAININGS

GUIDED BY 5 LEADERSHIP BOARD MEMBERS

REMOVED 500 POUNDS OF MARINE DEBRIS

COMPLETED AT LEAST 21 SERVICE HOURS PER STUDENT

CONTRIBUTED TO 20 ACRES OF NATIVE HABITAT RESTORATION

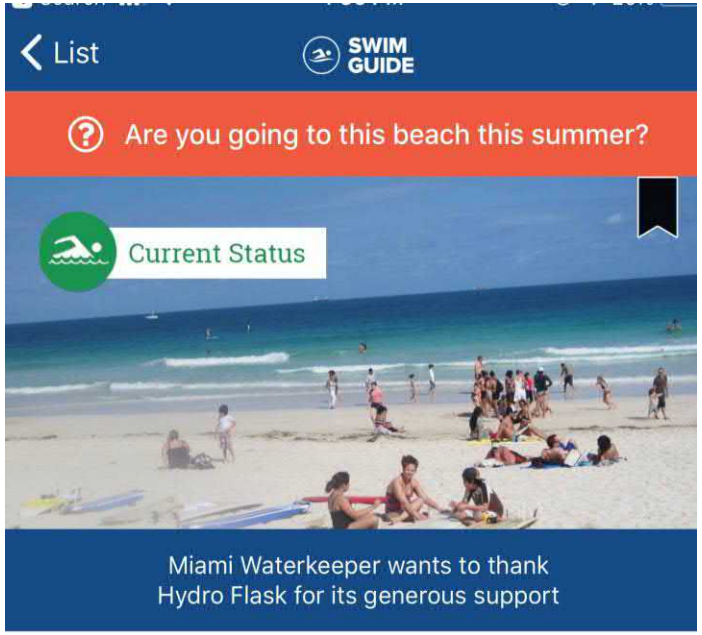

MIAMI
WATERKEEPER
1000 EYES
ON THE WATER
VIRTUAL TRAINING

1000 Eyes on the Water
#seeafishsendafish

via Scott Zeigler

Community reports of fish kill observations

WATER QUALITY MONITORING



John Lloyd Beach State Park

Dania, Florida

Updated by Miami Waterkeeper

This park provides many recreational activities as well as serving as a manatee sanctuary for Florida's beloved yet highly endangered gentle giants. Activities include boating (boat ramp access), fishing in the surf, canoeing, kayaking, hiking/nature trails and snorkeling. Rentals available include: canoes, kayaks, paddleboats, sail & pontoon boats, gazebos, BBQ grills and volleyballs. For those who prefer underwater scenes, the park offers on of the easiest and most interesting shore dives in the area. The Loggerhead Cafe offers lunch and snacks.

RANSOM EVERGLADES BOAT PATROL

Nutrient Pollution Outreach

- Causes algae blooms
- Comes from:
  - Sewage leaks
  - Pet waste
  - Fertilizers
  - Septic Tanks

Recommendations for Proposed Fertilizer Ordinance

TIME

No fertilizer from May - September

PLACE

15 ft set backs from waterways and storm drains

RATE

At least 50% slow-release nitrogen in fertilizer mix

0% phosphorus


TRASH

MIAMI WATERKEEPER®

WAVES OF CHANGE

A Docu-Series Celebrating 10 Years of Miami Waterkeeper

Launching in a virtual event: October 6-8, 2020

Miami Waterkeeper, a local non-profit organization with a mission to defend, protect, and preserve South Florida's watershed, is turning 10! We're celebrating a decade of protecting the water you love. Join Miami Waterkeeper and our host committee to celebrate our region's history as we look toward the next 10 years.


MIAMI
WATERKEEPER®
Ensuring swimmable, drinkable, fishable water for all
Facebook: /miamiwaterkeeper
Instagram: @miamiwaterkeeper
Twitter: @miamiwaterkpr
miamiwaterkeeper.org

MARINE DEBRIS

5A	Create a comprehensive marine debris prevention, reduction, and removal program within DERM and to adequately fund and staff the program	Short-Term (S)
5B	Establish a marine debris working group to promote collaboration on ways to reduce marine debris	Short-Term (S)
5C	Through the Miami-Dade County Police Department, direct the Marine Patrol Unit to prioritize its commitment to the enforcement of all applicable laws having a nexus to the environmental health of the Bay and its tributaries	Short-Term (S)
5D	Conduct an analysis of marine debris in Biscayne Bay	Short-Term (S)
5E	Adopt a target maximum input level policy for trash	Short-Term (S)
5F	Evaluate the various existing stormwater outfall systems throughout the county to determine their effectiveness at preventing debris from entering Biscayne Bay	Mid-Term (M)
5G	Identify and establish dedicated and recurring funding sources to pay for marine debris prevention and removal activities	Immediate (I)

MARINE DEBRIS

5A	Create a comprehensive marine debris prevention, reduction, and removal program within DERM and to adequately fund and staff the program	Short-Term (S)

- NOAA already leads the "Florida Marine Debris Reduction Plan", so there is already a program to jump on.
- 32 entities operate together on Miami-Dade County's MS4 Stormwater permit, but each entity reports directly to DEP (not DERM). If DERM provides oversight and collaboration, we could improve maintenance programs.

5B	Establish a marine debris working group to promote collaboration on ways to reduce marine debris	Short-Term (S)

- 32 entities have in-house Public Works Departments, so we already have the knowledge, experience and talent to share best practices via meetings, peer review, and peer mentorship. Together, we can develop and implement Best Management Practices (BMP's) for design and maintenance.

5C	Through the Miami-Dade County Police Department, direct the Marine Patrol Unit to prioritize its commitment to the enforcement of all applicable laws having a nexus to the environmental health of the Bay and its tributaries	Short-Term (S)

- Marine Patrol are the Eyes and Ears of the Bay. They can watch for including illicit discharges from construction sites, sunken boats, etc. They can also serve a valuable resource for water sampling.
- We need to focus on island maintenance. A lot of debris comes from inadequate garbage cans and lack of 'pack-it-out' behaviors. Zero recycling even though 50% of trash is aluminum.

MARINE DEBRIS

5D	Conduct an analysis of marine debris in Biscayne Bay	Short-Term (S)

- Top 2 primary sources: Stormwater Systems and Canals

5E	Adopt a target maximum input level policy for trash	Short-Term (S)

- Total Maximum Daily Load's (TMDL's) set a threshold for the amount of pollutants going into the watershed. TMDL's exist for nutrient and bacteria, but not trash. Miami-Dade County should adopt a maximum input level policy for trash.

5F	Evaluate the various existing stormwater outfall systems throughout the county to determine their effectiveness at preventing debris from entering Biscayne Bay	Mid-Term (M)

- We can start with maintenance schedules. Most entities clean their storm water systems once every 5-7 years.

5G	Identify and establish dedicated and recurring funding sources to pay for marine debris prevention and removal activities	Immediate (I)

- Government focuses on prevention
- Volunteers can support Removal Activities – www.VolunteerCleanup.Org and govt led 'Clean Your Neighborhood Day'

Single County Resolution

The county should establish a voluntary "Total Maximum Daily Load (TMDL)" for nearshore and offshore debris. This regulation should include incremental targets to reach ZERO trash entering the Bay by March 2024.

Section 1: That the County shall conduct baseline monitoring studies to determine the dominant source of trash affecting the Basin.

5D

Section 2: That the County shall evaluate existing trash pollution controls to determine the most viable solution to eliminating trash from entering the Basin from the County.

5F

Section 3: That the County shall adopt a maximum input level policy for trash, which shall direct the County to decrease the amount of trash pollution entering the Basin from trash sources within the County.

5E

Section 4: That the County shall utilize technological, educational, regulatory and enforcement measures to meet the County's total input level for trash into the Basin.

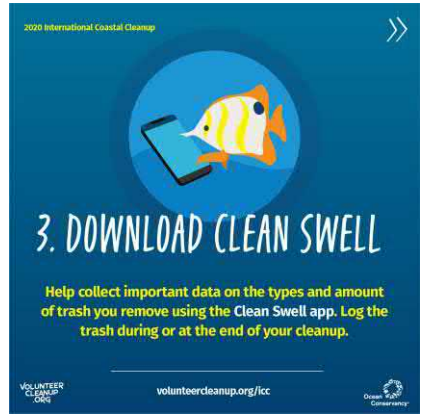
Infrastructure

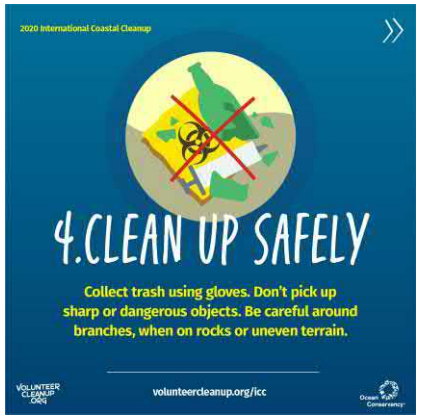
3F

International Coastal Cleanup SEASON

Sept 19 – Nov 1 www.VolunteerCleanup.Org

Find a Small Group Cleanup | Info on DIY Solo Cleanup





Contests and Prizes:

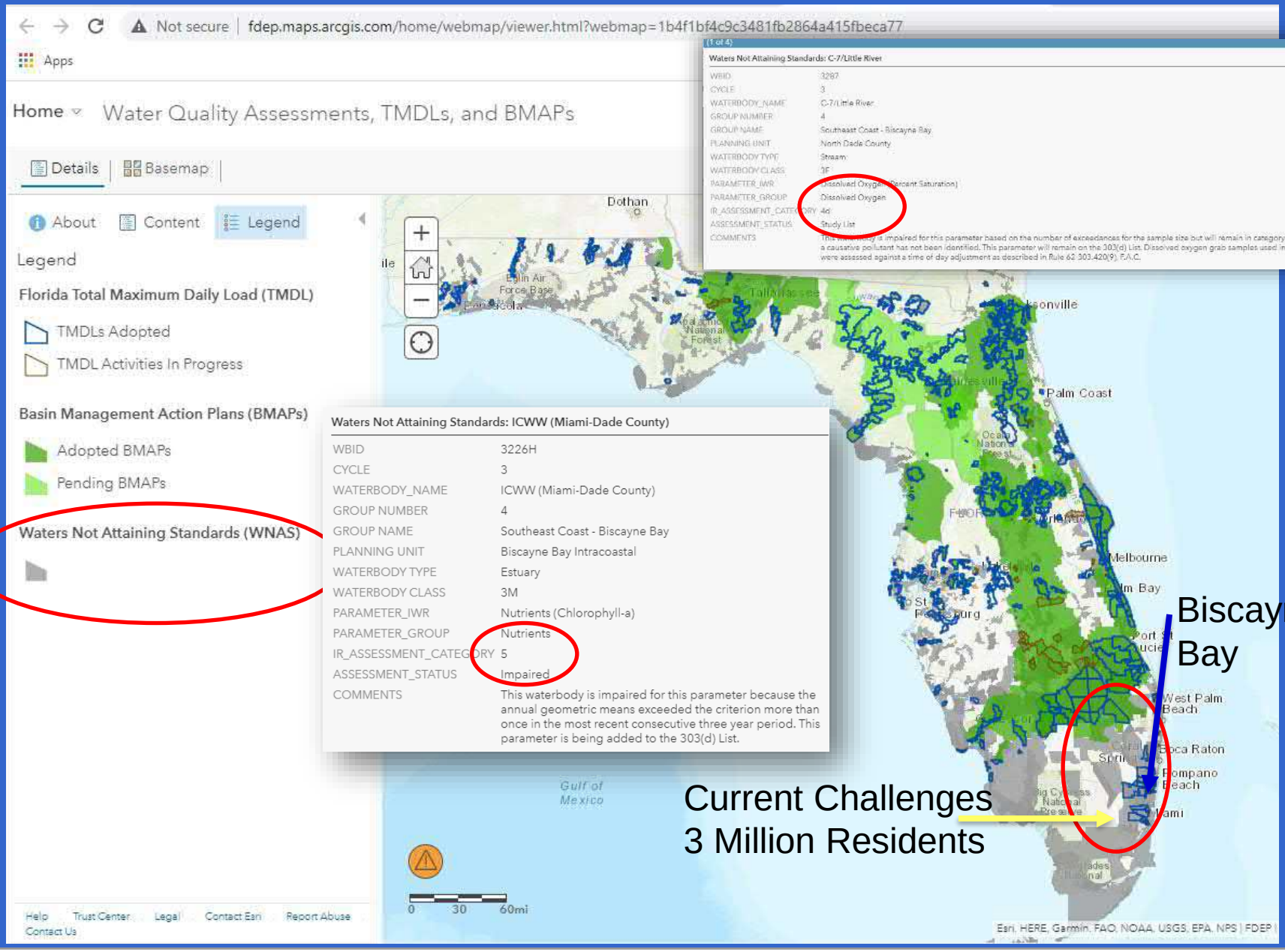
100 LB Club: Anyone who picks up more than 100 pounds (10 bags). Clean Swell Report and photos required as proof!

•**Four or More Club:** Anyone who participates in at least 4 cleanups during the season. Clean Swell Report and photos!

Infrastructure / Municipal Issues & Water Quality Retrofits

What is a TMDL and Why do they exist?

- Total Maximum Daily Loads (TMDLs) are water quality goals for waterbodies with verified impairments. They establish the maximum amount of pollutant that a waterbody can assimilate without causing exceedances of water quality standards.
- The Florida Department of Environmental Protection (DEP) identified the Lake Okeechobee, the Caloosahatchee Estuary and five tributaries, and the St. Lucie River as water bodies with excess nutrients for which TMDLs were set.
- FDEP adopted BMAPs to achieve TMDLs
  - 2012 – Caloosahatchee Estuary BMAP
  - 2013 – St. Lucie River and Estuary BMAP
  - 2014 – Lake Okeechobee BMAP
  - 2020 – FDEP updated all 3 BMAPs and expanded the Caloosahatchee BMAP boundary

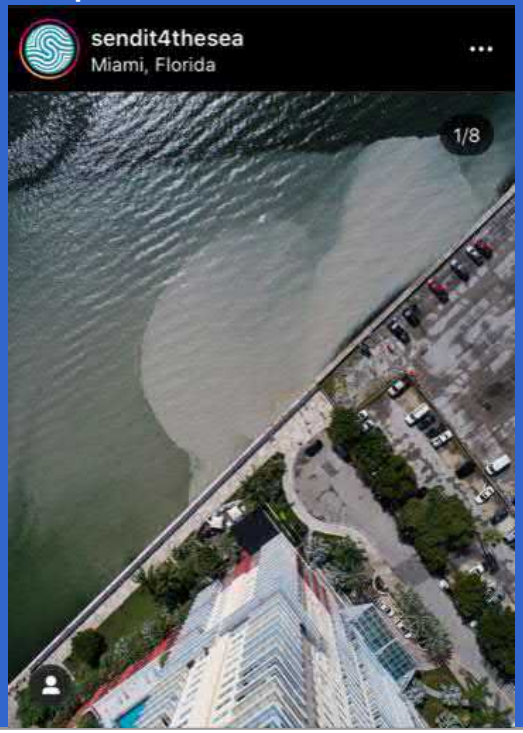

Not secure | fdep.maps.arcgis.com/home/webmap/viewer.html?webmap=1b4f1bf4c9c3481fb2864a415fbeca77
Apps
Home
Water Quality Assessments, TMDLs, and BMAPs
Details
Basemap
About
Content
Legend
Legend
Florida Total Maximum Daily Load (TMDL)
TMDLs Adopted
TMDL Activities In Progress
Basin Management Action Plans (BMAPs)
Adopted BMAPs
Pending BMAPs
Waters Not Attaining Standards (WNAS)
Waters Not Attaining Standards: ICWW (Miami-Dade County)
WBID 3226H
CYCLE 3
WATERBODY_NAME ICWW (Miami-Dade County)
GROUP NUMBER 4
GROUP NAME Southeast Coast - Biscayne Bay
PLANNING UNIT Biscayne Bay Intracoastal
WATERBODY TYPE Estuary
WATERBODY CLASS 3M
PARAMETER_IWR Nutrients (Chlorophyll-a)
PARAMETER_GROUP Nutrients
IR_ASSESSMENT_CATEGORY 5
ASSESSMENT_STATUS Impaired
COMMENTS This waterbody is impaired for this parameter because the annual geometric means exceeded the criterion more than once in the most recent consecutive three year period. This parameter is being added to the 303(d) List.
Waters Not Attaining Standards: C-7/Little River
WBID 3287
CYCLE 3
WATERBODY_NAME C-7/Little River
GROUP NUMBER 4
GROUP NAME Southeast Coast - Biscayne Bay
PLANNING UNIT North Dade County
WATERBODY TYPE Stream
WATERBODY CLASS 3F
PARAMETER_GROUP Dissolved Oxygen
ASSESSMENT_STATUS Study List
Dothan
Palm Coast
Melbourne
West Palm Beach
Boca Raton
Pompano Beach
Gulf of Mexico
Biscayne Bay
Current Challenges
3 Million Residents
0 30 60mi
Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | FDEP
Help Trust Center Legal Contact Esri Report Abuse
Contact Us

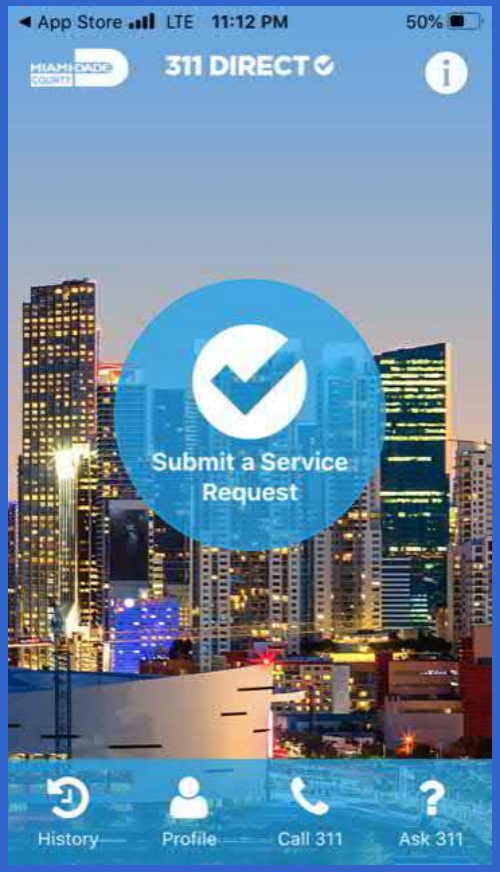
Watershed Restoration Plan

Water Quality – Report Pollution and Clogged Pipe Issues!

1C	Activate additional Department of Regulatory and Economic Resources' (RER) resource management functions	Immediate (I)

call 305-372-6955, 24 hours a day, 7 days a week.
EnvtlComplaints@miamidade.gov
https://www.miamiwaterkeeper.org/1000eyes

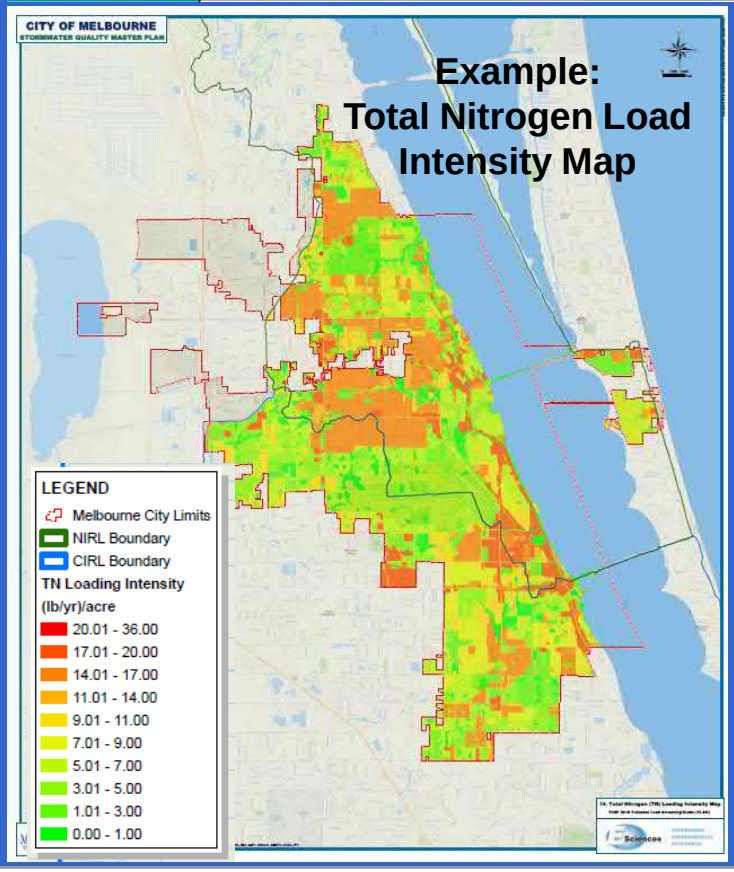


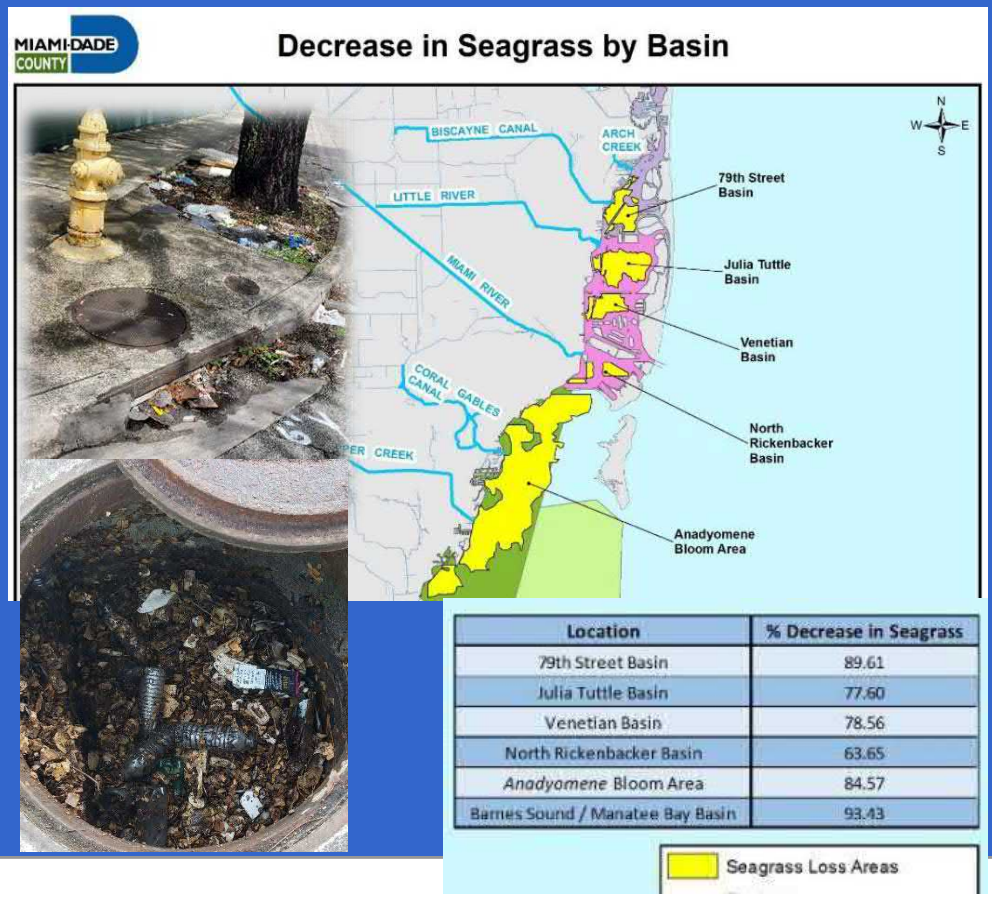


Watershed Restoration Plan

Water Quality – Map Pollution and Identify Hot Spots!

1D	County should conduct an immediate assessment of land-based hotspot areas prioritized based on existing, known impairments	Immediate (I)
1F	Coordinate, staff and provide an annual budget for comprehensive, centralized Biscayne Bay Watershed data and research coordination and data management infrastructure	Immediate (I)





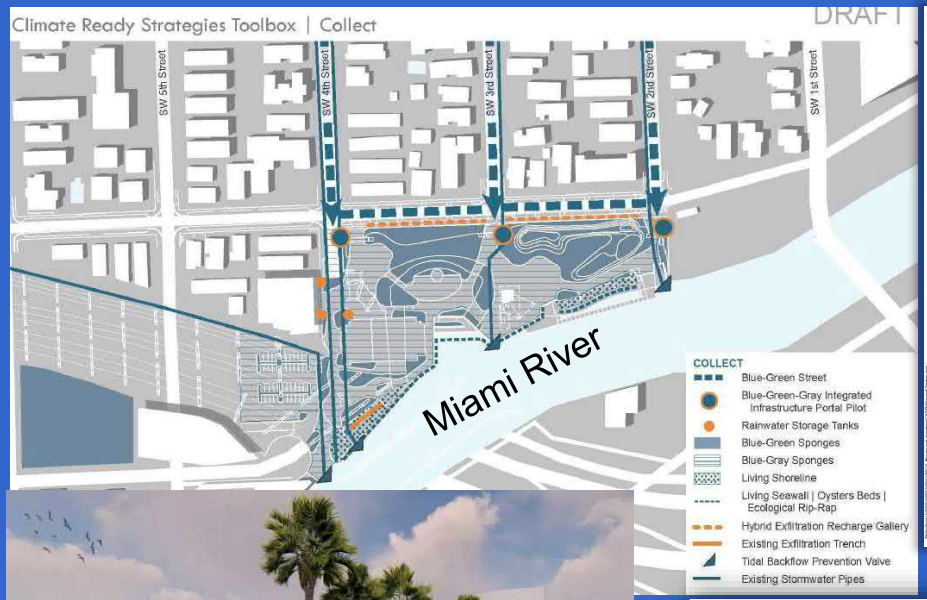
Location	% Decrease in Seagrass
79th Street Basin	89.61
Julia Tuttle Basin	77.60
Venetian Basin	78.56
North Rickenbacker Basin	63.65
Anadyomene Bloom Area	84.57
Barnes Sound / Manatee Bay Basin	93.43

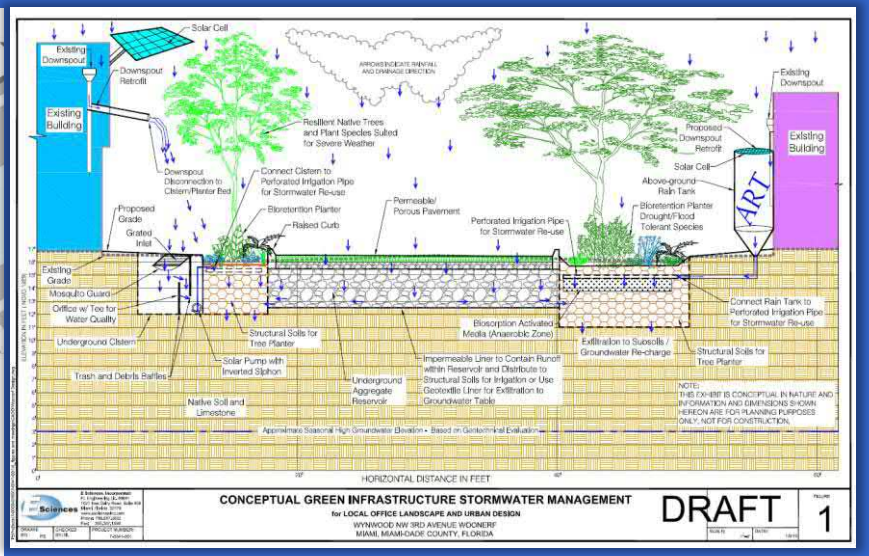
Seagrass Loss Areas

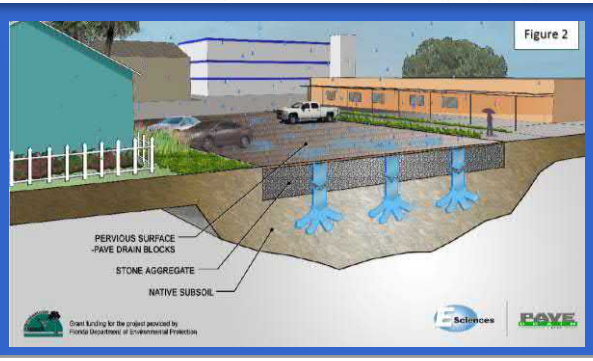
Watershed Restoration Plan

Water Quality – Support Pilot Projects / Get Involved!

1G	Undertake and secure funding for new pilot projects and research projects focused on reducing pollutant loads	Immediate (I)
4E	Prioritize existing and identify new green and blue infrastructure approaches and restoration projects	Immediate (I)







Wynwood Woonerf Concept

Woonerf As Habitat

LOCAL OFFICE LANDSCAPE AND URBAN DESIGN, LLC

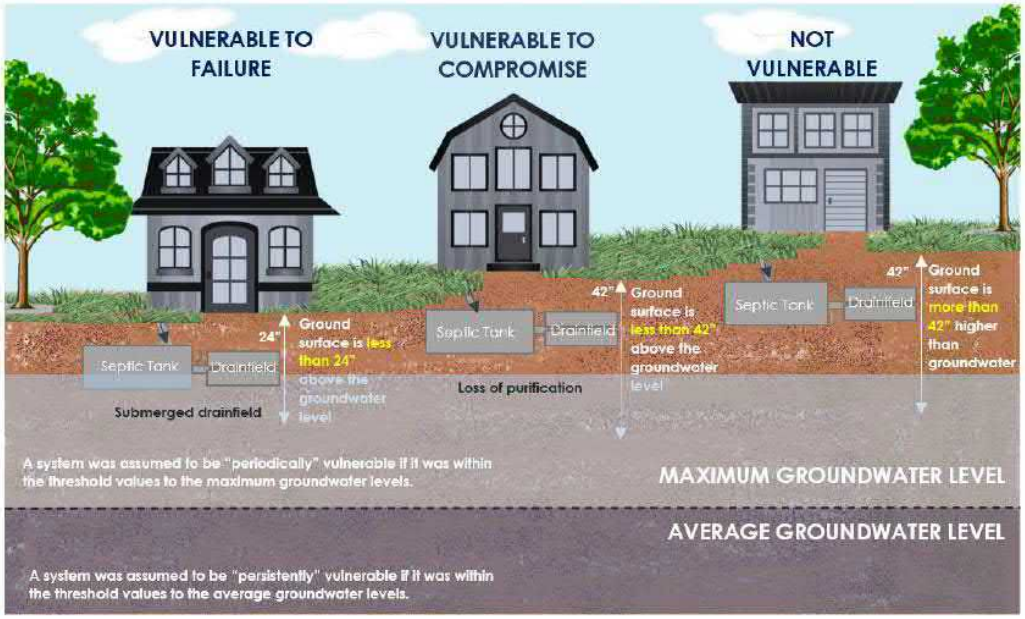
SCHEMATIC DESIGN | WYNWOOD WOONERF
20 FEBRUARY 2019

Watershed Restoration Plan

Infrastructure – Prioritize Septic Cleanout Cap Replacement + Sewer Connections

3A	Increase compliance with existing laws to result in the immediate connection of ~12,000 properties to the sewer system	Short-Term (S)
3D	Undertake immediate efforts to identify and eliminate all root causes of Sanitary Sewer Overflows (SSO) including inflow and infiltration. Accelerate sewer infrastructure maintenance and upgrades	Short-Term (S)

Figure 8: Assumptions regarding vulnerability thresholds used in this report



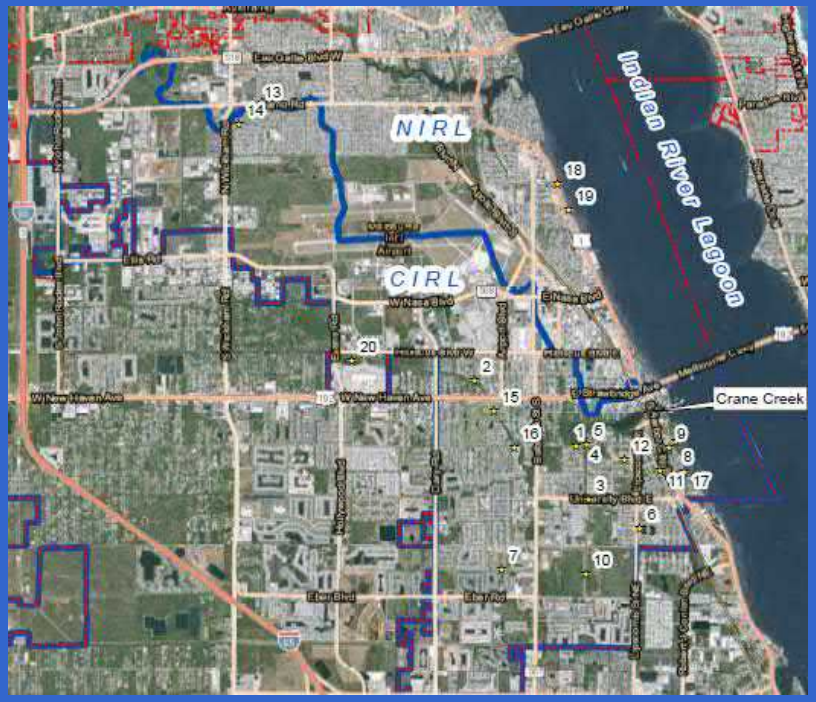
Source: Brevard County, Florida; Save Our Indian River Lagoon Projects

Watershed Restoration Plan

Infrastructure – Prioritize pollution "hot spots" and Develop Retrofit Concepts

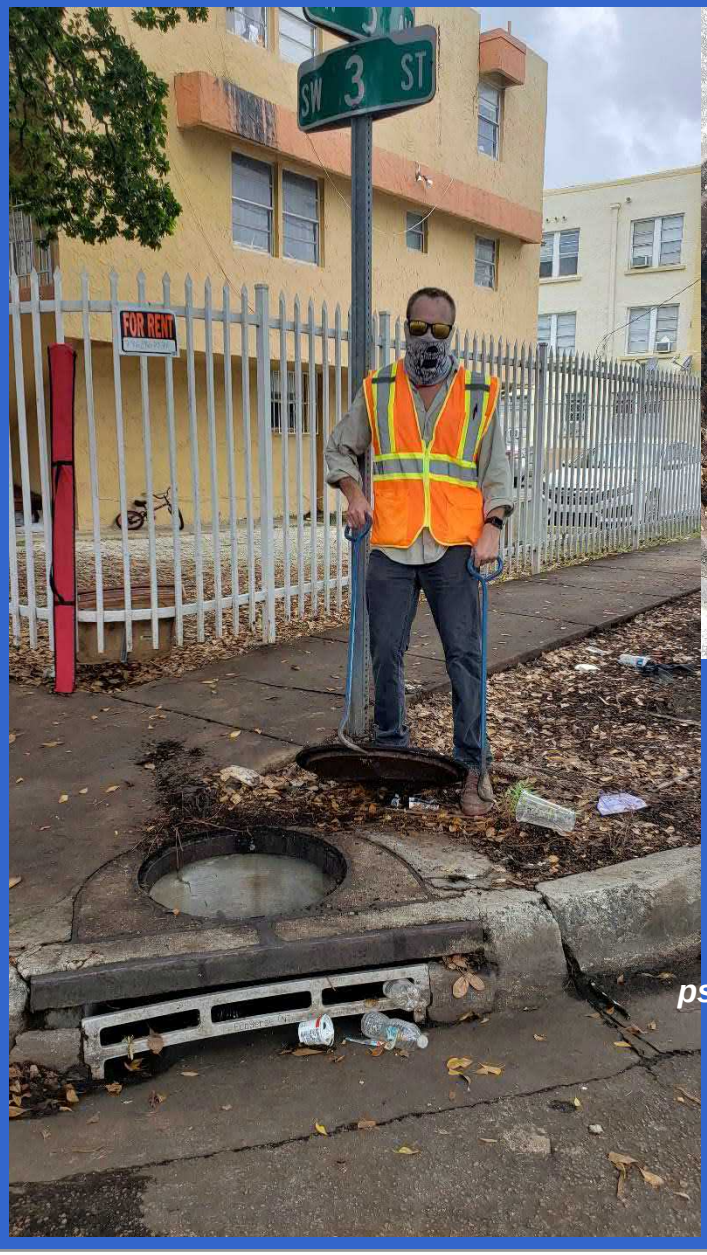
3G	Develop a plan to prioritize the retrofitting of stormwater infrastructure within basins with the most substantial water quality and/or habitat degradation issues	Short-Term (S)
3K	Ensure that new infrastructure projects to address coastal flooding and storm surge that are cost-shared by the County adhere to the recommendations of this Task Force and prioritize Biscayne Bay health and resilience	Short-Term (S)

TN load reduction (lbs/yr)	TN $/lb Removal	TP Treatment Efficiency (%)	TP load reduction (lbs/yr)	TP $/lb Removal	Total Estimated Cost	Nutrient Treatment Efficiency (TN)	Nutrient Treatment Efficiency (TP)	Construction Costs	Construction Impacts	Long Term Maintenance Costs	Community Enhancement	Property Acquisition
1988.2	$455	15.00%	327.9	$2,760	$905,000	High	Medium	High	Medium	Medium	Positive	Not Required
324.2	$565	15.50%	46.8	$3,916	$183,300	High	Medium	Low	Low	Medium	Neutral	Not Required
6100.2	$696	74.00%	1617.7	$2,626	$4,247,600	High	Medium	High	Medium	Medium*	Positive	Not Required
684.5	$1,029	41.10%	126.3	$5,579	$704,600	High	Low	High	Low	Medium	Neutral	Not Required
183.9	$1,086	15.50%	28.1	$7,107	$199,700	High	Low	Low	Medium	Medium	Neutral	Not Required
171.7	$1,135	15.50%	20.4	$9,575	$194,900	High	Low	Low	Medium	Medium	Neutral	Not Required



Algal Turf Scrubber

Source: Indian River County, Florida, and Hydromentia



Questions?

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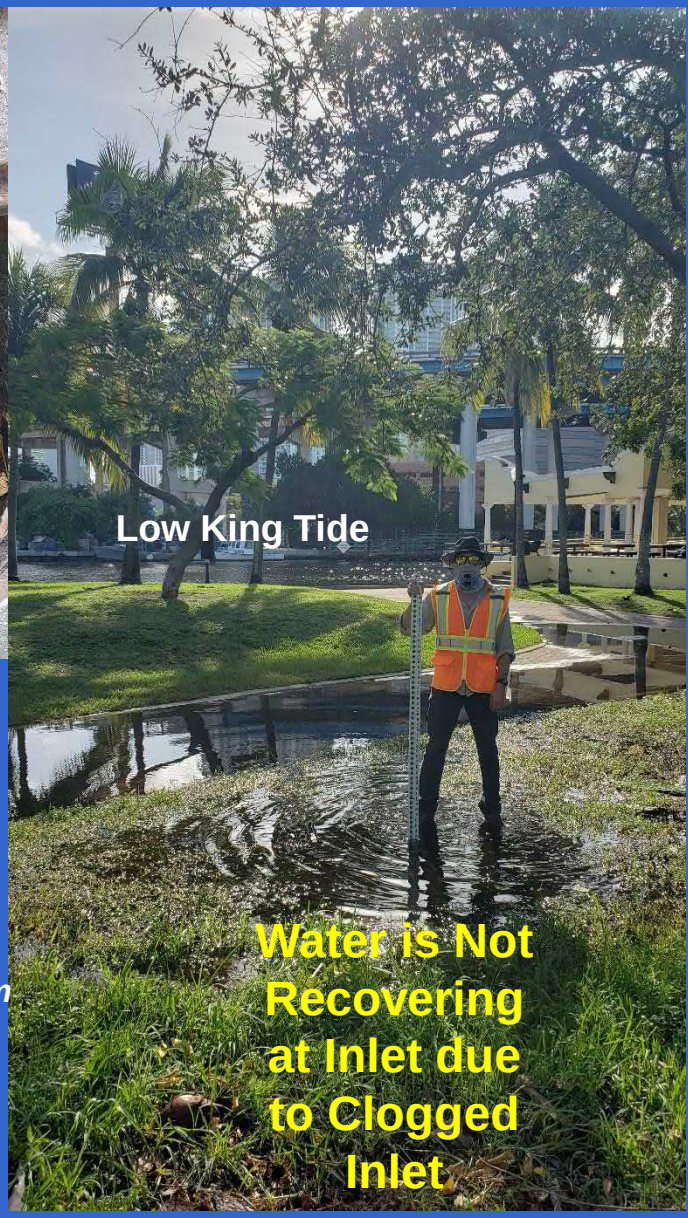

ALBERT GOMEZ - BISCAYNE BAY MARINE HEALTH SUMMIT - STEERING COMMITTEE MEMBER

FUNDING

7A	Collaborate with the Miami-Dade Legislative Delegation and the Congressional Delegation to secure annually appropriated funds to support Biscayne Bay watershed restoration	Immediate (I)
7B	Immediately engage in the legislative process to designate a Biscayne Bay License Plate	Immediate (I)
7C	Immediately enter into a cost-share partnership with SFWMD	Immediate (I)
7D	Collaborate with Florida Inland Navigational District (FIND) to immediately identify projects that will improve water quality and restoration of the Biscayne Bay watershed	Immediate (I)
7E	Leverage municipal financial resources through interlocal agreements to supplement County funds	Short-Term (S)
7F	Develop a mechanism to collaborate with municipalities and work with the development community	Short-Term (S)
7G	Direct the preparation of a report of potential funding sources by the Office of Management and Budget and the Office of Intergovernmental Affairs	Immediate (I)

7A	Activate State and Federal funding within pertinent agencies via legislative action, while harmonizing existing state and federally funded projects to align with stated BBTF recommendations. (i.e. Federal: Army Corps of Engineers, EPA, NOAA, US Parks, DOI, NSF - Florida: FL-DEP, SFLWMD, FIND)
7B	Pass ordinance to create a Biscayne Bay License Plate as a dedicated funding source towards natural system restoration in Biscayne Bay and in support of .
7C	Enter into SFWMD cost-sharing partnership with Miami-Dade County via the DERM Biscayne Bay Environmental Enhancement Trust Fund & the Miami Dade Water & Sewer Department budget based on the existing Consent Decree goals in support offsetting citizen cost for septic to sewer conversions, along with increasing maintenance frequency and standards of storm drains across the county.
7D	Develop a direct fund within FIND to support project pipeline identified in partnership with the Miami Dade Watershed Board. (i.e. Septic Tank Maintenance rebate program, Septic to Sewer conversion offset fund, updated Biscayne Bay Circulatory Model, Advanced water quality monitoring programs, hybrid-natural systems coastal restoration program)
7E	Within a Miami Dade Watershed Plan, develop specific Basin Action Plans that facilitate inter-local agreements within basin-specific municipalities based on shared cost, risks, threats, & vulnerabilities. (i.e. Little River, El Portal, Upper East Side, Morning Side, Miami Shores)
7F	Via ordinance, redirect DERM Biscayne Bay Environmental Enhancement Trust Fund to be fed by a Biscayne Bay development assessment fee, and by fines prorated based on the extent of the violation. Link monies generated by fines into mitigation project within specific basins action plans where violation occurred. Allow the Miami Dade Watershed Board to prioritize projects within the new funding pipeline based on extent of risks and vulnerabilities, supported by commissioned research.
7G	Fast track funding for the Chief Bay Officer, Staff, the Watershed Board and associate commissioned research, reports, & pilot projects.

BISCAYNE BAY MARINE HEALTH SUMMIT
Town Hall Zoom Meeting

CALL TO ACTION

By Steve Sauls

WE CAN DO THIS!

TODAY, I'D LIKE YOU TO DO FIVE THINGS:

1. Call or send a personal note to your county commissioner and tell them that Biscayne Bay is important to you. Tell them you support the recommendations of the Biscayne Bay Task Force. Tell them you support a new Biscayne Bay Watershed Board and a new fertilizer ordinance. Be brief, be respectful and use your own words. Thank them for their leadership and support. Please do it today.

   See: http://www.miamidade.gov/commission/districts.asp for contact info.

2. Reach out to two friends and ask them to do the same.
   Better yet, enlist the support of the organizations you belong to.

3. Share what we're doing through your social media network and join the Biscayne Bay Marine Health Summit Facebook group. It's a great source of information.

4. Volunteer for one of the many organizations working for a clean and sustainable bay.

5. Make a strong effort to reduce your personal consumption of single-use plastic products. It's the first step in reducing the flow of trash from our streets to our waterways.

WE CAN DO IT, IF WE WORK TOGETHER.