



Engaging your community to help address stormwater pollution issues

Presentation for the APWA Tampa Expo

April 20, 2022

Special Thanks



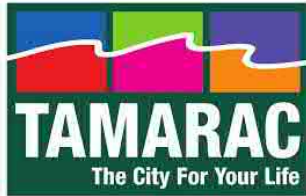
Michael E. McCabe, P.E.
District Engineer



Arnesa Zunic



Daniel Lucin, Manager
Road & Infrastructure



Troy Gies, Acting Assistant Director
Public Services Department



DiAnna Rawleigh, CFM, CPWP-M
Public Works Director



Matt Anderson, LEED AP O+M, ENV SP
Resiliency and Sustainability Manager
Public Works Department

Presentations and Q&A



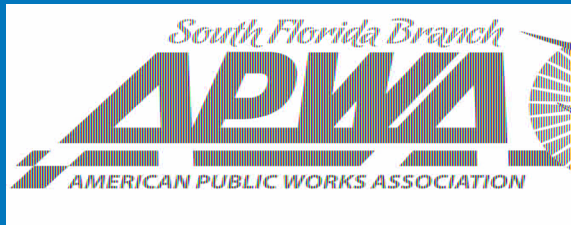
- ❖ **Emilio Lopez:** SOP Technologies
- ❖ **Evan Orellana:** Surfrider Foundation
- ❖ **Karen Beber Futernick:** Surfrider Foundation, Miami Chapter
- ❖ **Aliza Karim:** Miami Waterkeeper
- ❖ **Justin Bloom:** Suncoast Waterkeeper / Tampa Bay Waterkeeper

Emilio Lopez

SOP Technologies, CEO



Engineering & Manufacturing
Community Collaboration
Stormwater Focus



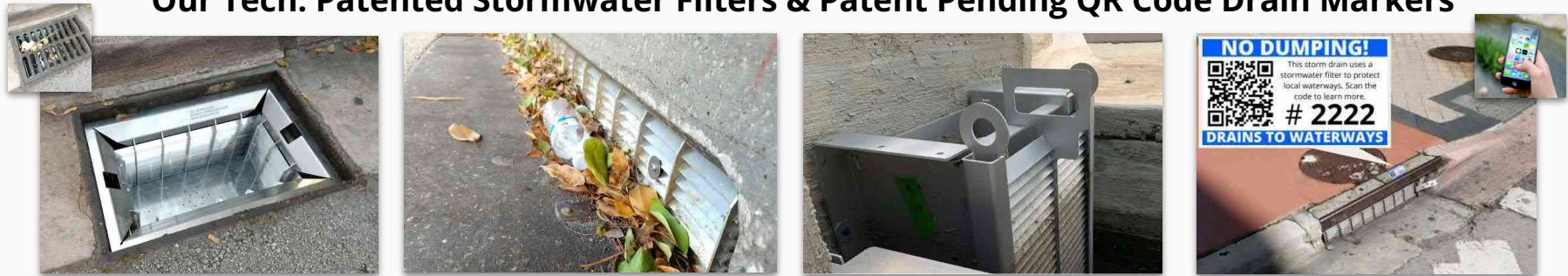
SOP Technologies

Our company's mission is to Stop Ocean Pollution



We are based in Miami, FL and provide technologies to prevent ocean pollution, prevent floods, and provide cost savings to communities and businesses globally.

Our Tech: Patented Stormwater Filters & Patent Pending QR Code Drain Markers



Our Customers Include



Why should we address stormwater pollution?



Images Source: [SFAPMS - The Hydrophyte Magazine](#)

Economic Benefits of Waterways

Biscayne Bay, FL

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/>

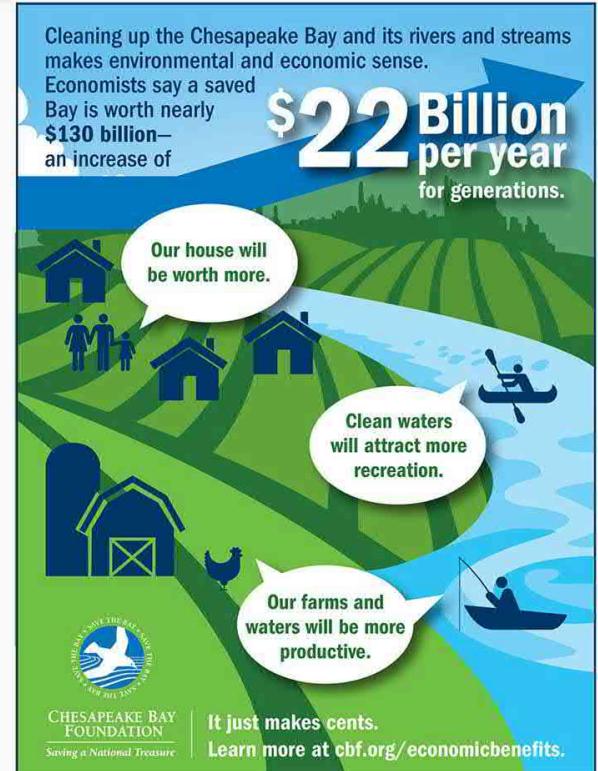
Chesapeake Bay, MD

“The value of these same benefits will increase by \$22.5 billion annually if the Chesapeake Bay Clean Water Blueprint is implemented.

[...]

If the Blueprint is not fully implemented pollution loads will increase and the value of the natural benefits will decline by \$5.6 billion”

Source:
[https://www.cbf.org/news-media/features-publications/reports/economic-benefits-of-cleaning-up-the-chesapeake-bay/index.html#:~:text=In%202009%20\(before%20the%20Blueprint,protection%20from%20floods%20and%20hurricanes.](https://www.cbf.org/news-media/features-publications/reports/economic-benefits-of-cleaning-up-the-chesapeake-bay/index.html#:~:text=In%202009%20(before%20the%20Blueprint,protection%20from%20floods%20and%20hurricanes.)



What pollutants get into storm drains?



Nonpoint Source (NPS) Pollution: Urban Areas

- Sediment
- Oil, grease and toxic chemicals from motor vehicles
- Pesticides and nutrients from lawns and gardens
- Viruses, bacteria and nutrients from pet waste and failing septic systems
- Road salts
- Heavy metals from roof shingles, motor vehicles and other sources
- Thermal pollution from impervious surfaces such as streets and rooftops

Source: <https://www.epa.gov/nps/nonpoint-source-urban-areas>

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

“over 80 percent of ocean plastic comes from land-based sources”¹

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

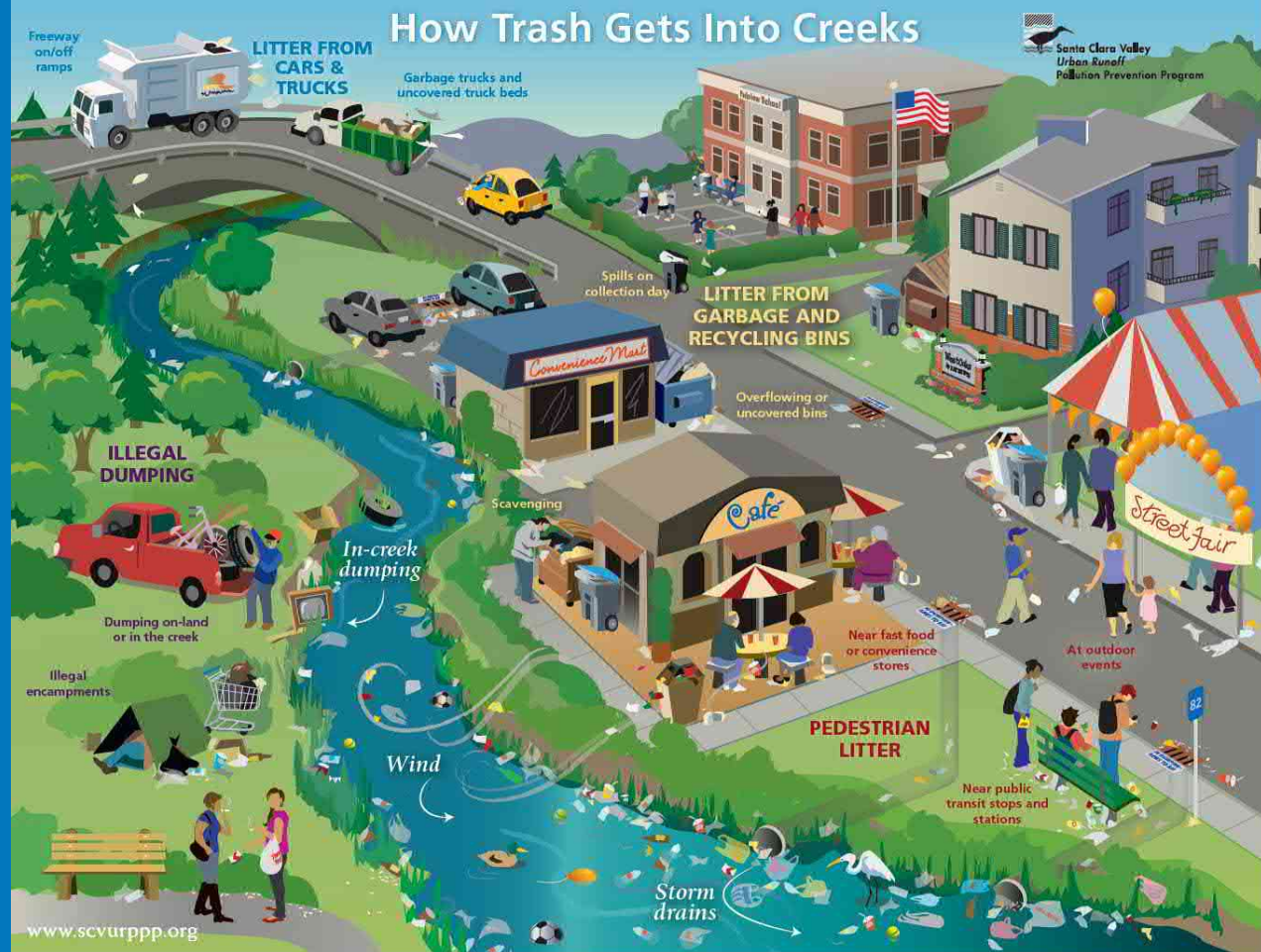


1. Ocean Conservancy <https://act.oceanconservancy.org/wp-content/uploads/2017/04/full-report-stemming-the.pdf>
2. Scientific American <https://www.scientificamerican.com/article/from-fish-to-humans-a-microplastic-invasion-may-be-taking-a-toll/>
3. Science: <https://science.sciencemag.org/content/369/6510/1515>
4. ABC News <https://www.abc.net.au/news/2018-09-14/eating-14-pieces-of-plastic-enough-to-kill-turtles/10243618>
5. NPR <https://www.npr.org/2014/06/17/322959714/plastics-dont-disappear-but-they-do-end-up-in-sea-birds-bellies>



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.**



Pollution Also Causes Flooding

“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.**¹

Inside a local stormwater basin ([video](#))



1. City of North Miami: <https://www.northmiamifl.gov/757/Flooding>

Stormwater Flooding in the News

Tampa, FL *Heavy Rains Test Tampa Stormwater Drainage Improvements* [link](#)

“We’ve actually had dive teams go out and do major cleaning of barnacles and trash in some of our big pipes that outfall into the bay that have completely been blocked,” said Jean Duncan, director of the city’s stormwater services.”

Wellington, FL *What caused Wellington roads to flood? Rapid rainfall plus clogged drains* [link](#)

“Not only did the sluggish storm system dump 4.25 inches of rain on Wellington in less than an hour and a half, it also came with wild winds that knocked loose branches, leaves and pine needles and clogged drains, Assistant Village Manager Jim Barnes said.”

San Diego, CA *Rain floods buildings on the campus of UC San Diego* [link](#)

“Campus police told 10News that clogged drains may have been the cause for most of the flooding.”

Denver, CO *Denver clearing debris-clogged storm drains to avert flooding* [link](#)

“The wrath of Mother Nature is not the only culprit behind the flooding. Trash tossed in the streets is as much to blame, said Public Works spokeswoman Emily Williams. “A lot of times, it’s trash, yard debris and pet waste that is being removed from the drains,” she said.”

Sacramento, CA *With More Rain On The Way, County Officials Say Months Of Planning Goes Into*

Preventing Flooding [link](#)

“The county said it’s also reminding people to simply pick up any trash or leaves in their neighborhood to prevent possible drain clogging.”

New York, NY *Storm Drains Fail Again in Brooklyn* [link](#)

“The flooding occurred because to the catch basins, which collect rain water, were full of garbage, said a city Department of Environmental Protection spokeswoman.”

Malaysia *Maintain drainage system to avoid floods - Malacca exco* [link](#)

“We hope all parties would adhere to the standards and regulations (on drainage system maintenance) according to schedule as we know floods occur when drains and rivers are not properly maintained. “The rain may be heavy but with the drainage system clogged with grass and mud, the situation is worsened and as such all parties should not take lightly frequent cleaning up of drains,” he told *Bernama*.”



How much trash and debris enter storm drains?

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*

Leaves
(nutrient pollution)

Various plastics, paper and litter



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

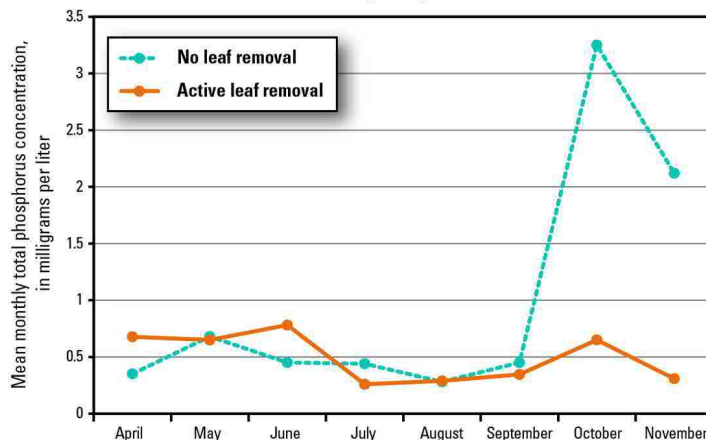


Mostly Leaves/organics

Contributing to nutrient pollution



Total phosphorus



This graph shows a significant reduction in total phosphorus in a residential neighborhood in Madison, Wis., after the implementation of a timely leaf collection and street cleaning program (Selbig, 2016).

While the **sources of nutrients to urban stormwater** are many, a **primary contributor is often decaying organic materials like leaves.** [...]

The leaves continue to decay, releasing excess phosphorus and nitrogen into local streams and lakes.

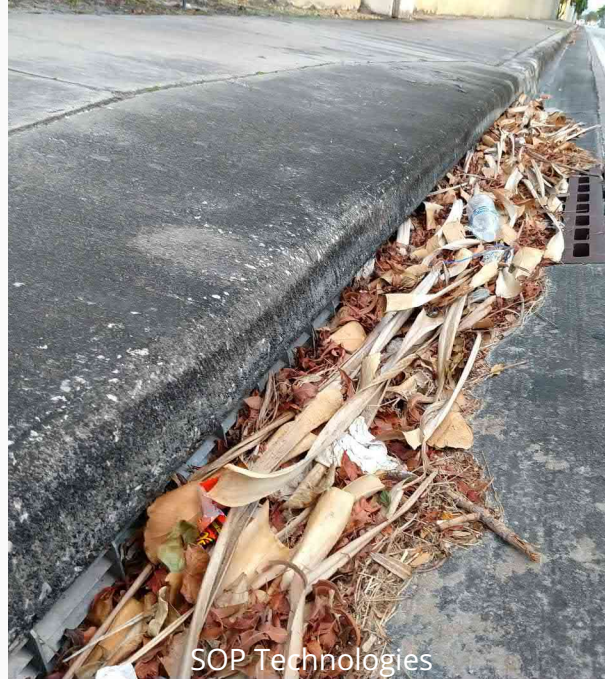
[...]

Loads of total and dissolved phosphorus were reduced by 84 and 83% ($p < 0.05$), and total and dissolved nitrogen by 74 and 71% ($p < 0.05$) with an active leaf removal program.¹

1. USGS [Using leaf collection and street cleaning to reduce nutrients in urban stormwater](#)

Mostly Leaves/organics

Contributing to nutrient pollution



“Decomposition of leaf litter has been reported to be one of the main contributors to [Dissolved Organic N] DON in urban runoff suggesting that in order to reduce DON input in stormwater runoff, a control measure (e.g., street cleaning) prior to storm events could be used to eliminate the potential of PON decomposition to DON.”²

“Today, a major concern is that leaf litter (i.e., organic debris) spikes stormwater systems and watersheds with nutrients during and after rainfall, especially when it gathers along street curbs.

Excess phosphorus and nitrogen often lead to major water quality problems for municipalities, a process called eutrophication, and harmful algal blooms (HABs).”³

2. Jani J, Yang Y-Y, Lusk MG, Toor GS (2020) Composition of nitrogen in urban residential stormwater runoff: Concentrations, loads, and source characterization of nitrate and organic nitrogen. PLoS ONE 15(2): e0229715. <https://doi.org/10.1371/journal.pone.0229715>

3. Water Quality and Health Council <https://waterandhealth.org/disinfect/autumn-leaves-fall-can-water-quality/>

Many options for maintenance and removal



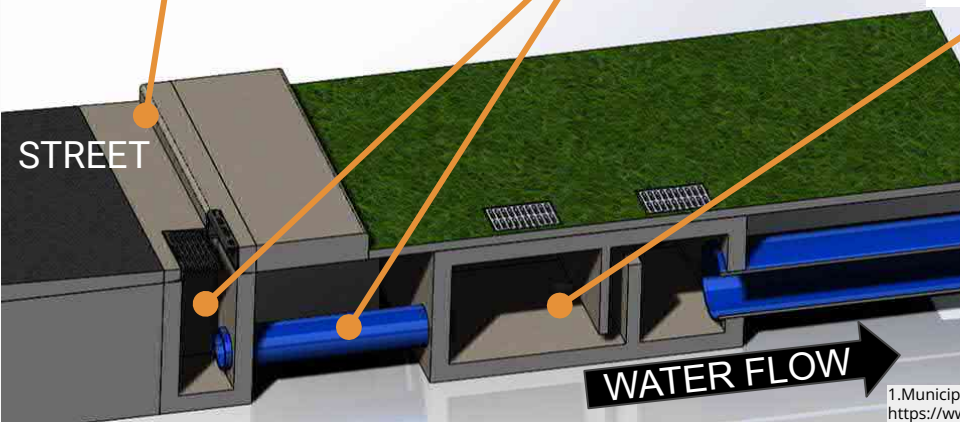
Street Sweeping



Catch Basin Cleaning



2



Cost \$/Pound: PM, TP, TN Separation or Recovery

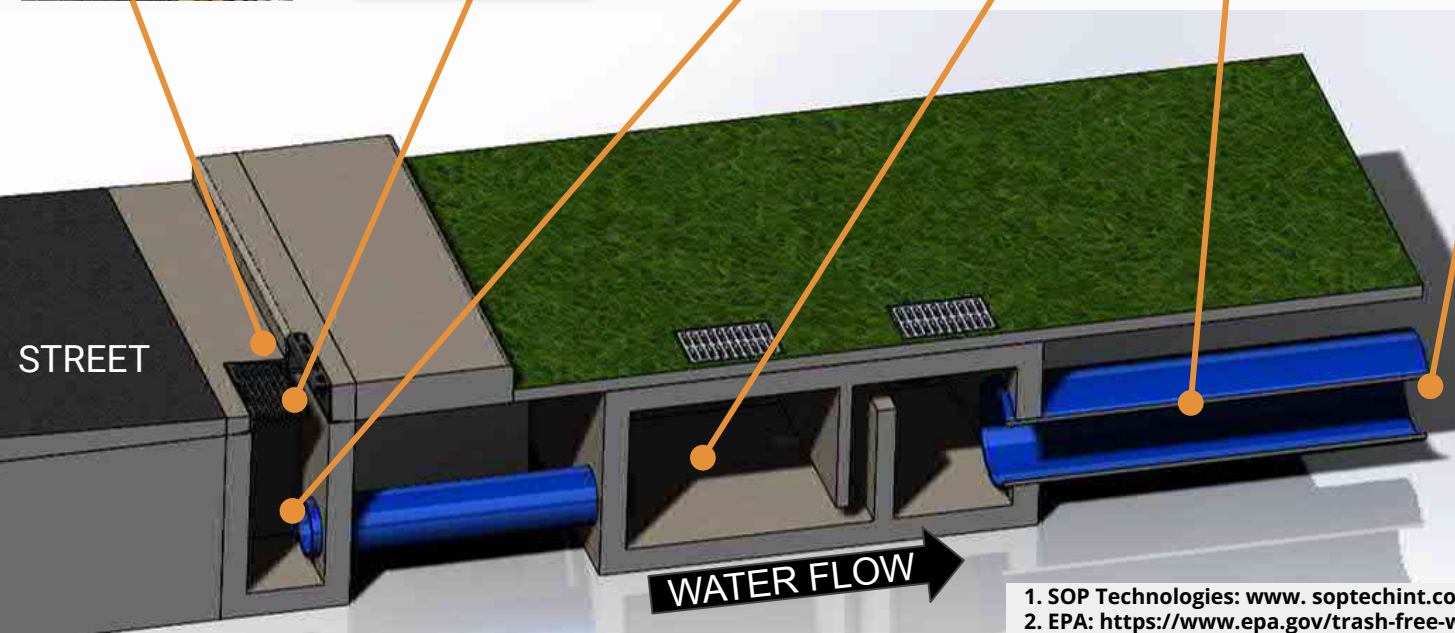
Separation or Recovery Method	Cost (\$/lb) (excluding SW landfill costs)		
	TN	TP	PM
BMP Treatment Train ^a	935	32,600	26
FL Database for BMPs ^b	1,900	10,500	41
Screened Hydrodynamic Separator ^c	3,730	9,210	4
	(1,280 - 14,860)	(3,170 - 36,680)	(1 - 13)
Baffled Hydrodynamic Separator ^c	3,020	7,450	3
	(1,280 - 14,860)	(3,170 - 36,680)	(1 - 13)
Street Cleaning (lowest cost)	165	257	0.10
Catch Basin Cleaning^d (2nd lowest)	1,016	1,656	0.70

^a Wet basin sedimentation followed by granular media filtration, UF, 2010.
^b TMDL database for FL Best Management Practices, 2009
^c Based on 2000 m² urban catchment draining to a screened hydrodynamic separator (HS) with 50% PM annual removal efficiency based on clean sump conditions
^d Based on 100 dry pounds of PM recovery with an annual cleaning frequency



elastec.com

Many solutions to capture trash and debris



Public Works Survey (2020)



Responses included Public Works employees from



Public Works Survey

Comments 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 efficient 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.**

Engaging your Community

Community Engagement Survey

Recurring Themes



1. **Partnerships:** Establish long term multi-stakeholder engagement: NGOs, businesses, local leaders, influencers, etc.
2. **Education:** Educate kids and adults about stormwater pollution and how it happens (including data and science).
3. **Resources:** Provide resources so individuals and organizations know what they can do.
4. **Messaging:** Have consistent and frequent messaging.
5. **Connect with nature:** Take people to physically see the problem (at the street level, streams, canals, etc.).
6. **Enforcement:** Increase enforcement of litter laws.
7. **Community Data:** Provide a way for community members to gather and report data about stormwater pollution.
8. **Action:** Take action on projects and obtain commitments from others.
9. **Incentives:** Provide incentives for best practices.
10. **Funding:** Increase funding to address the problem.
11. **Several Solutions:** Use several solutions to tackle the problem (there's no silver bullet).
12. **Fun:** Make it fun and entertaining.

City of Coral Gables Public Works Community Engagement



Website, social media, e-mails and mailers



“Over the last two years, we have hosted over 38 events that have had over 8,000 participants and have collected over 346,000 pounds of debris, hazardous waste, etc.”

- Community Education Workshops *Example: Virtual in Nov 2020 with over 50 attendees ([video here](#))*
- Stormwater pollution educational video ([video link](#))
- Presentations to City advisory boards (*e.g. waterways advisory board and sustainability advisory board*)
- Creating educational materials with local environmental orgs ([download here](#))
- Hosting community cleanups, recycling and hazardous waste drive thru events, community educational workshops, and other events ([Keep Coral Gables Beautiful](#))

<https://www.coralgables.com/departments/PublicWorks> | <https://www.coralgables.com/waterways> | <https://www.coralgables.com/stormwater> | <http://www.coralgables.com/kcgb>



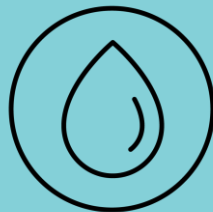
SURFRIDER
FOUNDATION®

The Surfrider Foundation is dedicated to the protection and enjoyment of the world's ocean, waves and beaches, for all people, through a powerful activist network.

What We Fight For



Ocean Protection



Clean Water



Coastal Preservation



Plastic Pollution

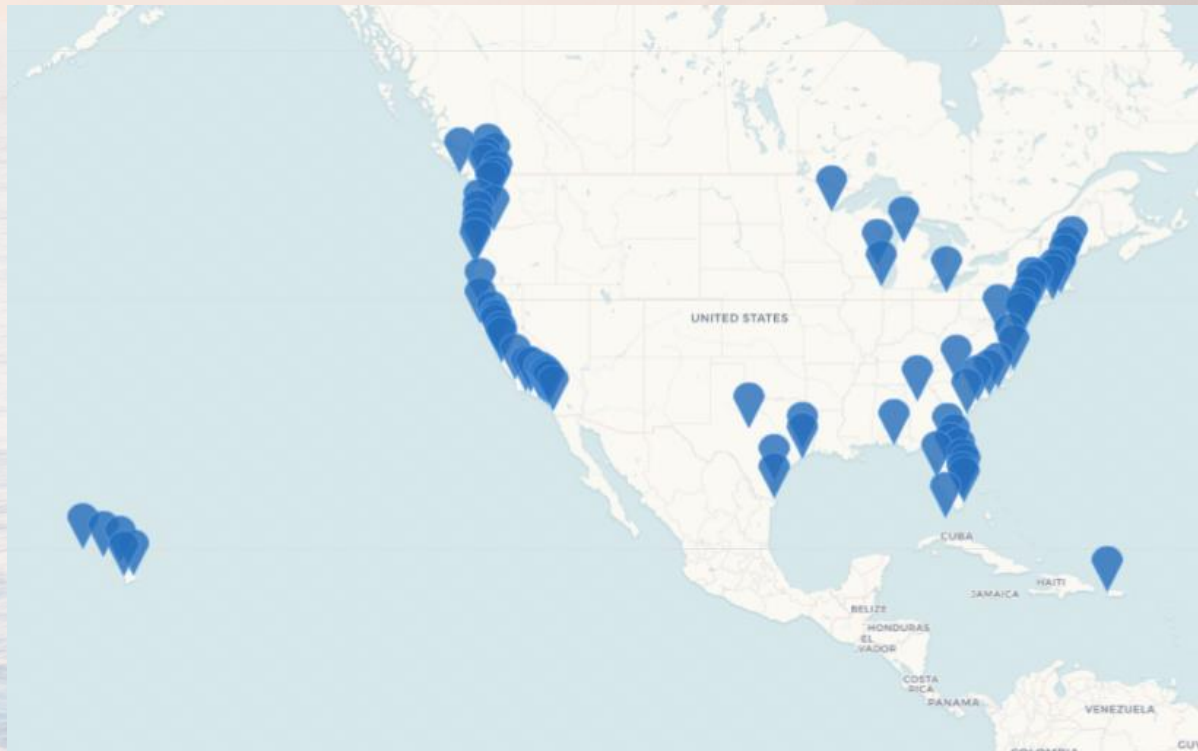


Beach Access

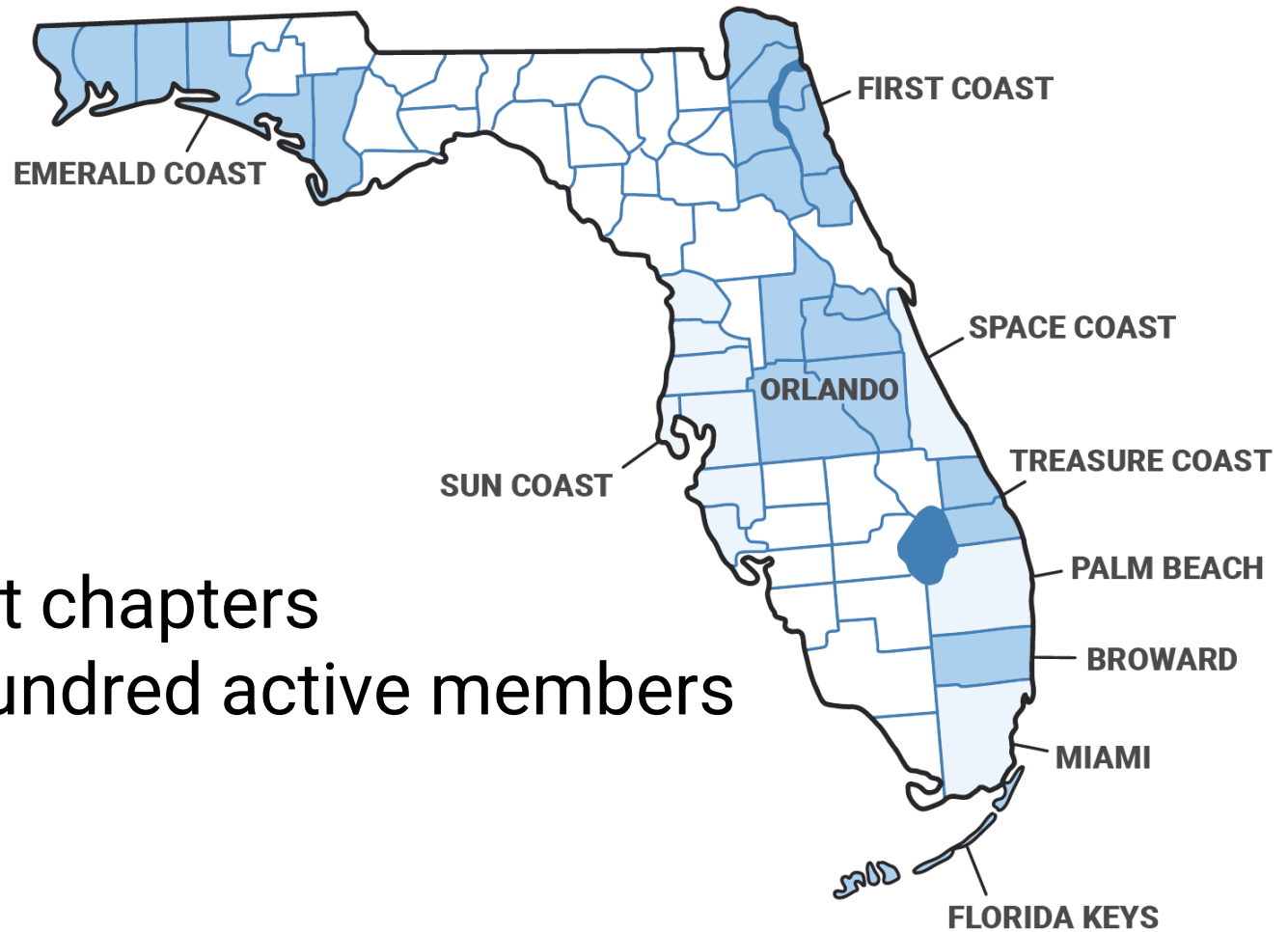
Our Network

Volunteer run – 81 chapters and 85 student clubs in the country
+ 7 international affiliates

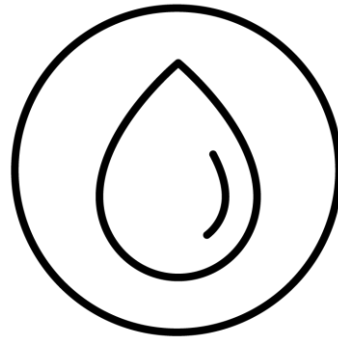
50+ staff members that support chapters w/ scientific, policy,
and legal expertise.



Our Florida Network



10 Current chapters
Several hundred active members

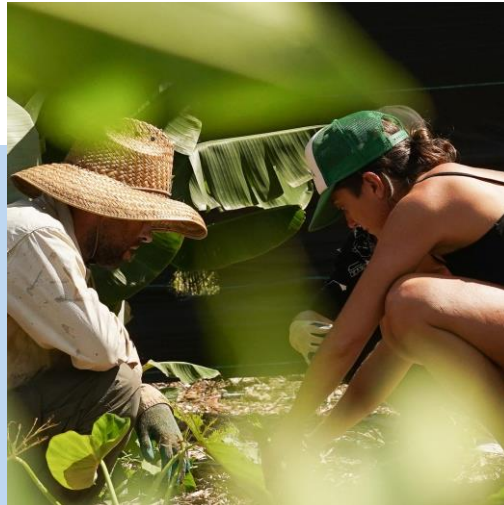


Clean Water

Blue Water Task Force



Ocean Friendly Gardens



Stop Sewage Pollution





**BLUE WATER
TASK FORCE**

Surfrider's volunteer water testing program.

Operating through a national network of 45+ labs, BWTF citizen scientists are providing critical water quality information to protect public health at the beach, raise awareness of local pollution problems and to bring together communities to implement solutions.



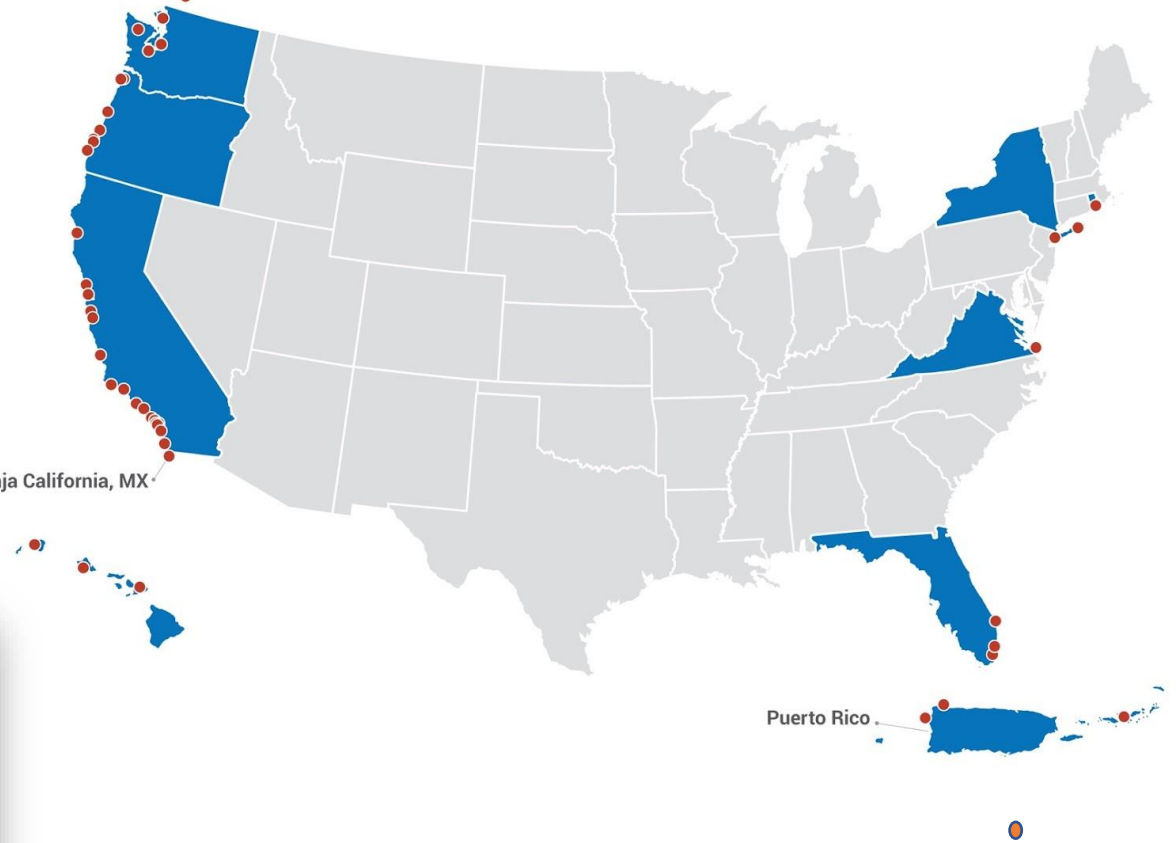
BLUE WATER TASK FORCE



Vancouver Island, BC

Baja California, MX

Puerto Rico





BLUE WATER TASK FORCE

Browser address bar: bwtf.surfrider.org/report/47?fbclid=IwAR3jKlwa2CfmZF7ITt_ywTyupUOV4oWnlGJbfYzy_KeBLc9_2zoKZMTE6fc

Page Title: Palm Beach County
URL: <https://palmbeachcounty.surfrider.org/>

Local Partners:

- SURFRIDER FOUNDATION PALM BEACH COUNTY
- Jupiter
- FH
- BOCA SAVE OUR BEACHES

Key:

Enterococcus (MPN/100mL)
Based on water quality standards set by Florida Department of Health

- Low Bacteria (0 - 35)
- Medium Bacteria (36 - 70)
- High Bacteria (> 70)

Map Labels: Lake Okeechobee, Belle Glade, Loghatchee Groves, WEST PALM BEACH, Boynton Beach, CORAL SPRINGS, Pompano Beach, West End, FREE

Date	Enterococcus	Indication Of
------	--------------	---------------

surfridermiami
Miami Beach, Florida

WATER QUALITY REPORT MIAMI

Enterococcus (0 - 35) Low Bacteria (36 - 69)

22 likes
surfridermiami BW

Full results in our Story

surfridermiami

NO SWIM ADVISORY

Liked by marilucflores and 173 others

surfridermiami NO SWIM ALERT

A no swim advisory has been issued after a sewer force main break on 81st Street and Hawthorne in #MiamiBeach



OCEAN FRIENDLY GARDENS

- Surfrider's sustainable landscaping & education program
- Providing natural and beautiful solutions to problems caused by stormwater & urban runoff
- Making the connection between how we care for our yards & public spaces and the health of our local waterways



OCEAN FRIENDLY GARDENS



- **Conservation.** Reduce outdoor water demand & provide wildlife habitat
- **Permeability.** Build healthy, living soil to sponge up water and filter out pollutants
- **Retention.** Store rainwater in the landscape to rehydrate watersheds and local water supplies

Let's make this easier!

- Building Community Across Network & Chapter Mentoring
- Partner, Partner, Partner
- Promote personal responsibility for protecting clean water at home in yard
 - Customizable handout for chapter outreach
 - Ways to engage public easier
 - Provide steps to make yards more Ocean Friendly without the responsibility of installing a big garden or total yard transformation

YOU CAN HELP PROTECT CLEAN WATER IN YOUR YARD TOO.



Go Organic!
Stop using chemical fertilizers and pesticides.



Apply mulch and compost to build healthy living soil.



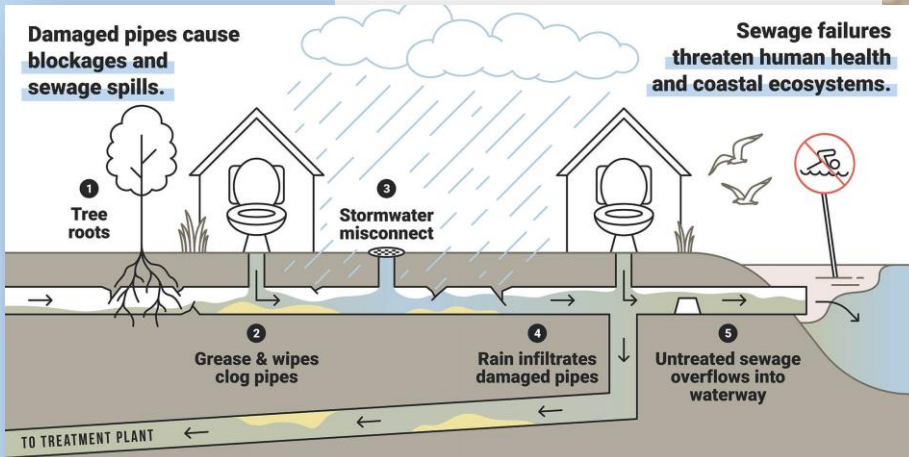
Plant native plants and climate-appropriate grasses.



Shape your garden to slow down and soak up rainwater.

Stop Sewage Pollution

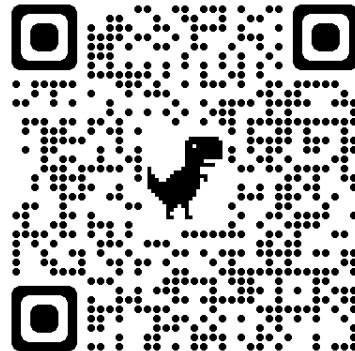
- Education
- Initiatives/Campaigns (City, State & Federal)
- Input for Public Works





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www.surfrider.org/initiatives/clean-water



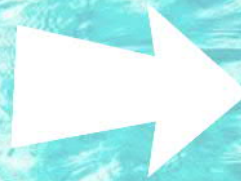
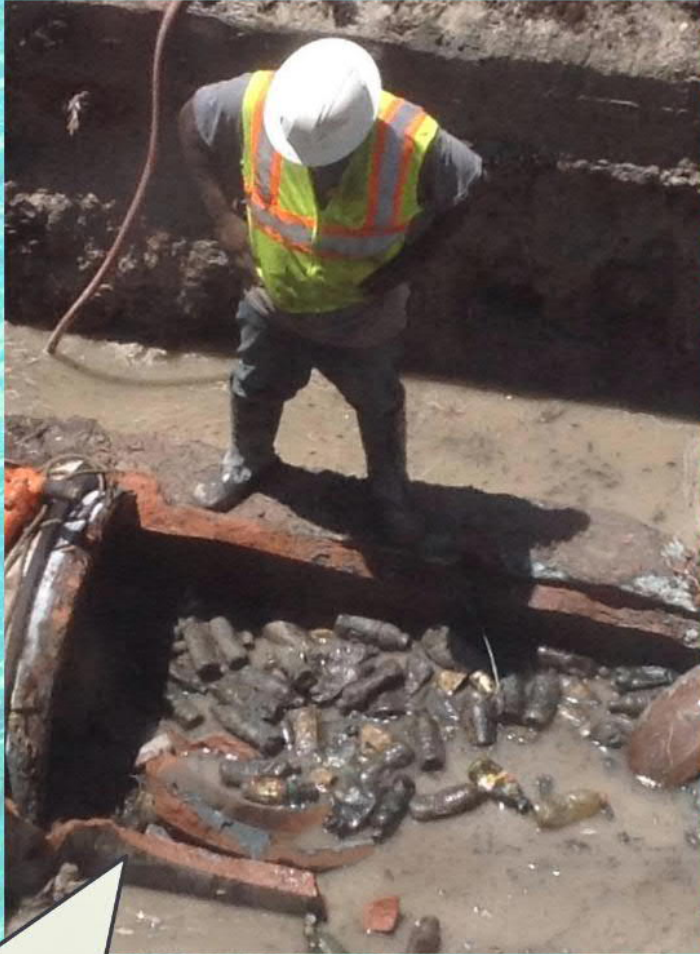
A Guide To Becoming a Public Works Superhero!

Together, we can prevent ocean pollution.



**Consider:
80% of ocean plastic
originates on land.
Stormwater pipes are
the primary conduit
between the land and
the sea.**





Problem

PHOTO BY JULIA JOPPIEN



**VOLUNTEER
CLEANUP
.ORG**

Why we care...

Plastic is having a devastating impact on sea turtles.

Research suggests that 52% of the world's turtles have eaten plastic waste. The reasons are simple: a floating plastic bag can look like a lot of jellyfish, algae, or other species that make up a large component of the sea turtles' diets.



It's not just ingesting plastic that causes problems for turtles. Entanglement in abandoned fishing nets can easily kill them through drowning or preventing individuals from escaping predators or hunting.



PHOTO BY TIM MOSSHOLDER

Drain pollution is more than plastic.

Leaves and landscape debris clog drains and, in the pipes, decompose. Rains then cause the resulting phosphorous and nitrogen to enter our waters.
Result: Algae blooms, killing fish and seagrass.



Photo by Liz Harrell

Algae blooms and bacteria cause beach closures.



And kill manatees.



NUTRIENT RUNOFF (AFOREMENTIONED NITROGEN AND PHOSPHOROUS) IS KILLING-OFF SEAGRASS, MANATEES' PRIMARY FOOD SOURCE. BY THE END OF FEBRUARY OF THIS YEAR, OVER 330 MANATEES HAD PERISHED, MOST STARVING TO DEATH.



In the Indian River Lagoon a series of human-induced harmful algal blooms have caused the loss of more than 90% of the area's seagrass biomass.

PLASTIC AND NUTRIENT OCEAN POLLUTION IS A GLOBAL PROBLEM THAT NEEDS TO BE ADDRESSED LOCALLY - ON THE MUNICIPAL/CITY + COUNTY LEVEL.



The easy truth is that it is immoral to allow pollutants to enter our oceans and waterways. We must do better.



THE NEWS IS GOOD, THOUGH!

YOU ARE THE SUPERHEROES WHO WILL LEAD THE WAY!



What you can do:

Look at your cleaning schedule. And your design criteria.

Are they sufficient? Or do they need a re-think? Devise a strategy to improve your entire storm drain system. Think about street sweeping, about gardening and landscape policies. Consider new technologies and solutions, such as drain vents, vortexes and outfall filters. And...



***Ask for what you need.**



We know you can't do this alone!

Local organizations and people are here to support you.

Please engage with us!

We are "on the ground" so we know, firsthand, the results of allowing plastics and nutrients to flow through the stormwater system and into our oceans and waterways.

And we have people! We work with constituents, voters, and concerned residents who can help message your needs to the elected officials.

There are many groups and organizations working hard to keep our beaches and oceans clean, healthy, and pollution free.



SURFRIDER
FOUNDATION.

MIAMI

The Surfrider Foundation is dedicated to the protection and enjoyment of the world's ocean, waves and beaches, for all people, through a *powerful activist network*. Surfrider is built on inclusion and vibrant, progressive problem-solving.





@fillabag



www.fillabag.co



Wooden posts with reusable bags and buckets at beach paths, inviting everyone to turn an ordinary stroll into a meaningful clean up. FillABag works with the K-12 school system, hosts small group activities, produces corporate team building engagements, spearheads community activism, and collaborates with thought-leaders and organizations regionally, nationally and globally.

Currently, there are over 48 FillABag stations in five (5) states.



MIAMI WATERKEEPER®

Miami Waterkeeper is a local nonprofit that uses community outreach, scientific research and advocacy to address water quality concerns in Biscayne Bay and the surrounding watershed.

Can we count on you?

Secretary@surfrider.miami.org

[@SurfriderMiami](https://www.instagram.com/SurfriderMiami)

Manny@FillABag.co

[@FillABag](https://www.instagram.com/FillABag)

Aliza@miamiwaterkeeper.org

[@MiamiWaterKeeper](https://www.instagram.com/MiamiWaterKeeper)



**Send us your info - we'll
contact you!**

Thank you for being a Stormwater Superhero!

Karen Beber Futernick

Surfrider Foundation, Miami Chapter

Secretary@surfrider.miami.org





**MIAMI
WATERKEEPER®**

How to Increase Awareness About Stormwater



Aliza Karim

Water Quality Specialist

4/20/2022



WHAT IS MIAMI WATERKEEPER?

MEMBER OF THE WATERKEEPER ALLIANCE

- Ignited in 1966 when industrial pollution risked community livelihoods
- Inspired environmental activism and sparked over 350 Waterkeeper groups around the world

WORKS TO ENSURE CLEAN WATER

- Swimmable
- Drinkable
- Fishable

FOCUSES ON MIAMI'S CHALLENGES

- Clean water
- Habitat Protection
- Sea Level Rise

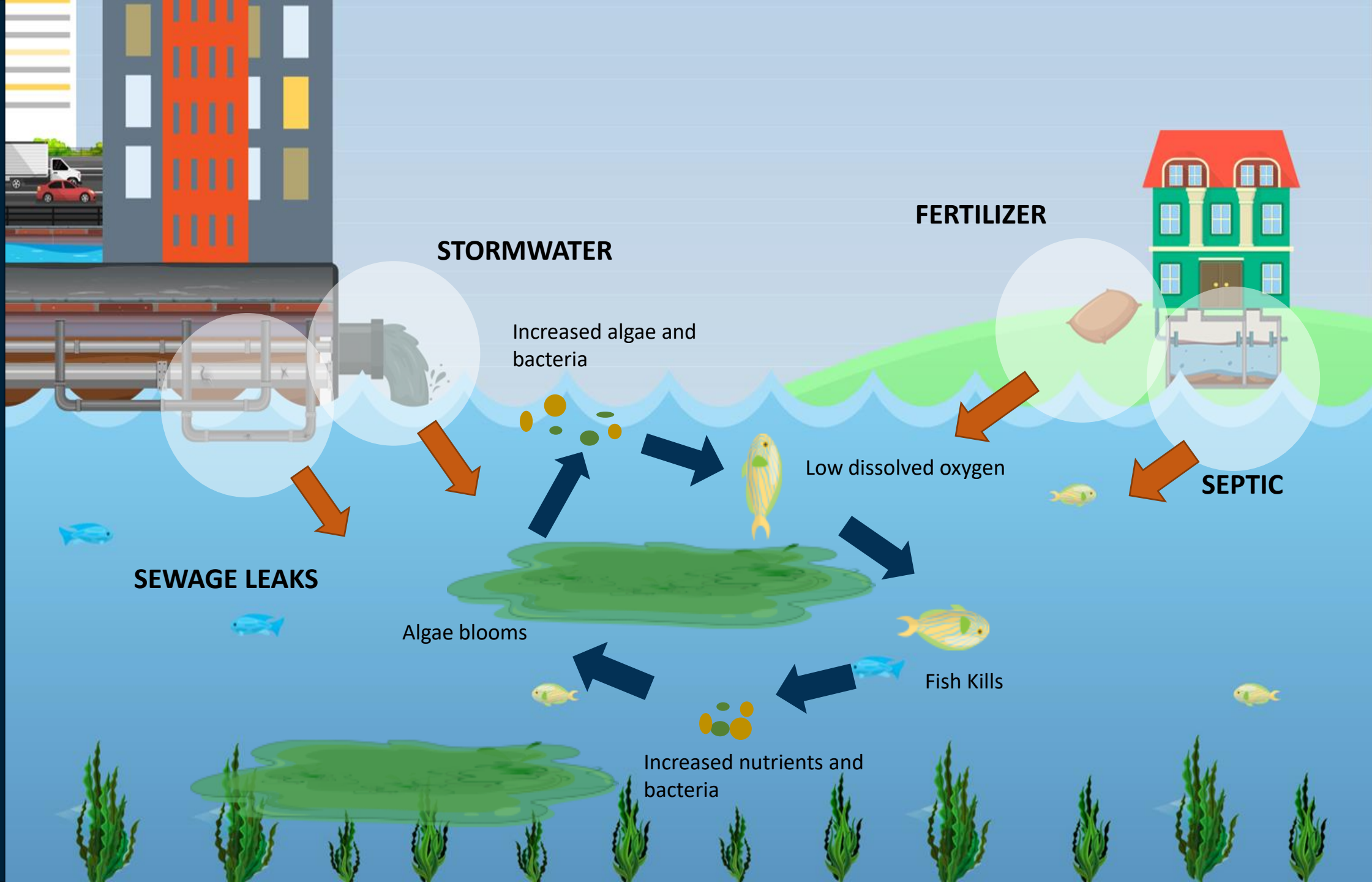


Scan with your
phone camera for
Website Link and
Contact Info!





Scan with your phone camera for Website Link and Contact Info!





COMMUNITY OUTREACH & EDUCATION

What we do:

- Junior Ambassadors Program
- County-wide beach clean ups
- Beach restoration projects
- Boat tours for community leaders
- Community empowerment
- Youth education
- Digital toolkit development

*Scan with your
phone camera for
Website Link and
Contact Info!*





How You Can Engage Your Community:

- Partner with your local Non-Profits!
- Community engagement through community clean-ups and youth events
- Widespread advertising campaigns by:
 - Reaching out to local businesses and HOA's
 - Creating a digital presence to reach a broader audience
 - Developing informational material



Scan with your
phone camera for
Website Link and
Contact Info!





Increase Awareness About How to Help:

Initiate outreach campaigns to inform about:

Homeowners and HOAs:

- Reducing fertilizer, pesticide and herbicide use, especially during wet season
 - Only using slow release nitrogen fertilizer and organic pesticides, when needed
 - Use mulch instead of herbicide for weeds
- Disposing of landscaping waste (leaves, tree clippings, cut grass)
- Picking up litter and pet waste
- Checking car for engine fluid leaks
- Having septic tanks inspected every 3 years

Local Businesses:

- Acquiring and complying with MS4 permits!
- Preventing chemical spills (detergents, automotive fluids, sediment)

What is Nutrient Pollution?

Nutrients, like **nitrogen** and **phosphorus**, are naturally occurring – but can be too much of a good thing when found in high concentrations in our waterways.

Nutrient pollution can contribute to algae blooms. **Algae blooms** turn the water **green** and smell terrible, smothering seagrass and killing fish – they can even be harmful to humans.

These nutrients are very high in sewage, septic tanks, stormwater runoff, and fertilizers.

Fertilizer
Fertilizer is often over-used in residential landscaping.
Biscayne Bay and our canals are extremely sensitive to excess nutrients, so we have to be sure to keep these nutrients out of the water to avoid algae blooms.

Septic Tank Pollution
When not properly cared for, **septic tanks can leak or flood** – creating a land-based source of pollution that drains into our waterways.
This pollution can also contaminate the aquifer, our drinking water stored underground. Always maintain your septic tank and have it regularly inspected.

Stormwater Runoff
Stormwater Runoff is any type of water that doesn't soak into the ground, but instead "runs off" down a drain or grate and into a waterway. Sometimes this water flows over polluted areas such as parking lots, roads, industrial sites, or yards, bringing contamination into waterways.

How Can YOU Help Keep Our Waterways Clean?

- Minimize or eliminate fertilizer, herbicide and pesticide use—or switch to organic varieties that are not harmful
- Plant native plants – they are naturally adapted to our climate and don't require a lot of water and fertilizer
- Avoid overwatering your lawn
- Use mulch instead of herbicides to help control weeds
- Sweep up debris – don't hose down your driveway
- Don't fertilize near waterways or during the summer rainy season
- Have septic systems inspected and pumped out every 3 years
- Routinely check your car for leaks and dispose of engine fluids properly
- When washing your car at home, use detergents sparingly or bring your vehicle to a commercial car wash
- Pick up trash, pet waste and litter around your yard and home

Other Ways to Protect Our Waterways

- Become a Member
- Attend an Event
- Volunteer

About Miami Waterkeeper

MIAMI WATERKEEPER

Miami Waterkeeper defends, protects, and preserves Biscayne Bay and surrounding waters through citizen involvement and community action. MWK works to ensure swimmable, drinkable, fishable water in South Florida.

Contact Us

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CORAL GABLES
THE CITY BEAUTIFUL

MIAMI WATERKEEPER

A CLEAN BAY BEGINS IN YOUR BACKYARD

Scan with your phone camera for Website Link and Contact Info!



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