

Marine Debris in Biscayne Bay: Moving the Needle



OUR PANEL



Dave Doebler (Moderator) – VolunteerCleanup.Org

- Co-Founder
- Dave@VolunteerCleanup.Org



Ocean Conservancy®

Jon Paul Brooker - Ocean Conservancy

- Senior Manager & Policy Counsel for Florida Conservation
- JBrooker@OceanConservancy.org



Thomas Sprehe, PE – KCI Technologies, Inc.

- Sr. Vice President, Director of Innovation and Technology
- Thomas.Sprehe@KCI.com

FLORIDA NEEDS YOUR HELP

Jon Paul Brooker

- Sr Manager & Policy Counsel for Florida Conservation
- JBrooker@OceanConservancy.org



Ocean Conservancy®





PROTECTING FLORIDA

We are reinvesting in advocacy
and conservation in Florida

What we've accomplished

- We've released our Currents and Crossroads report, highlighting the Florida environmental issues as we see them and raising a call to action for Floridians
- Announced a partnership with the 2020 Miami Superbowl, naming Ocean Conservancy as the official Ocean partner
- Rolling out an ocean friendly city designation to promote municipal engagement in Florida's ocean and coastal conservation issues.
- We are focusing on clean and abundant water; the interconnectedness of Florida's freshwater and marine ecosystems; abundant wildlife and fisheries; and thriving habitats

SANIBEL



ST. LUCIE RIVER



ST. PETERSBURG



BLOUNTSTOWN



LOOE KEY

Jan 5, 2017
~5% dead



Jan 19, 2017
~20% dead



Feb 1, 2017
~60% dead



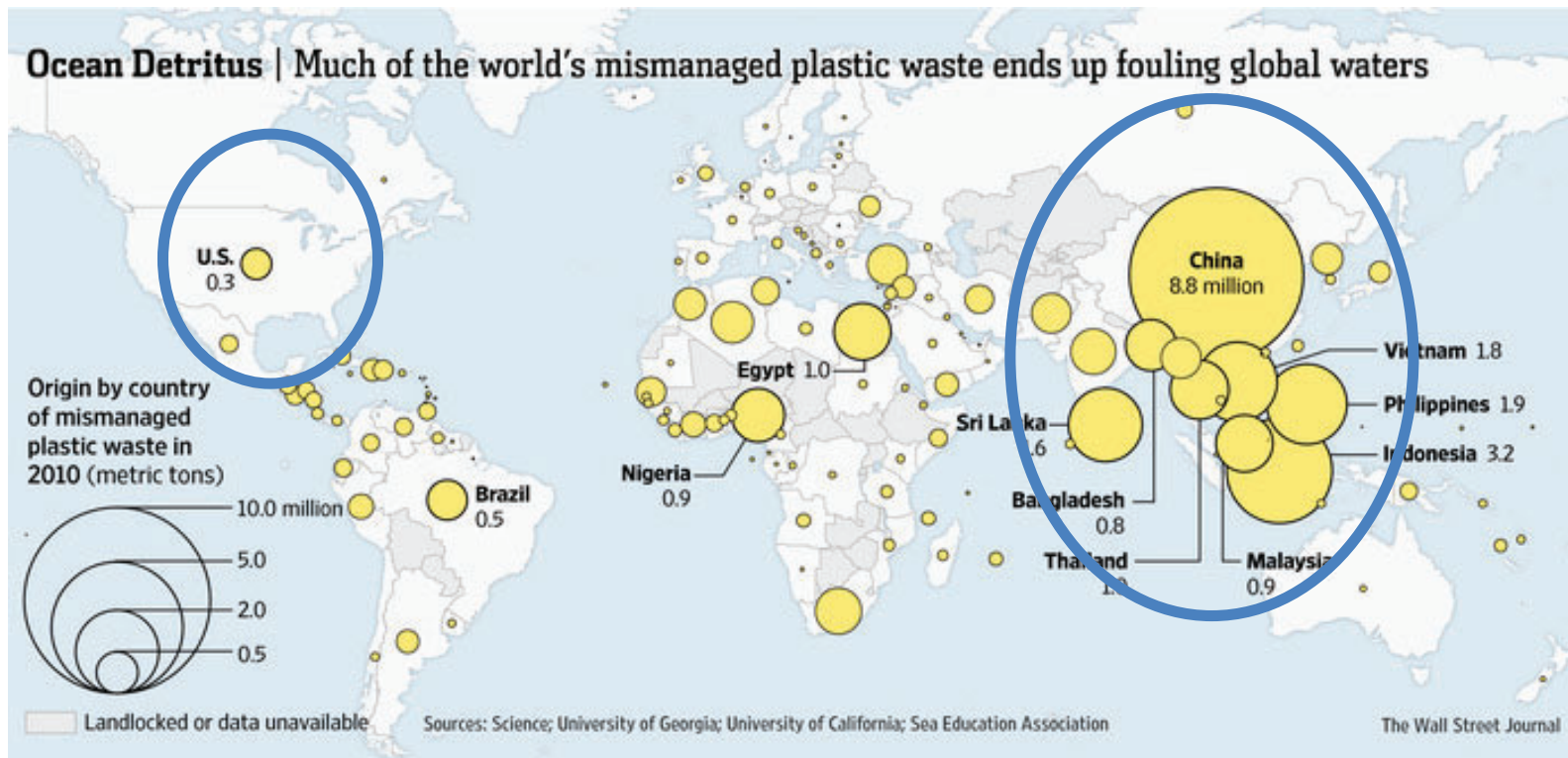
Photo: Brian Reckenbeil, FWC

ALL HANDS ON DECK:

These are the five areas where Florida's beaches, waterways, and ocean environments need action



OCEAN TRASH: 8 MILLION METRIC TONS OF PLASTIC



SOURCE: Jambeck et al. 2015 via Wall Street Journal

ICC Data Result in Marine Debris Science

DEADLIEST OCEAN TRASH

TO: 

-  1 Fishing gear 
- 2 Plastic bags & utensils
- 3 Balloons 
- 4 Cigarette butts 
- 5 Bottle caps 

 Ocean Conservancy



MOST DEADLY

Mistaken for food



KILLS: 

 Ocean Conservancy

For the first time, in our
30+ year history of
organizing the cleanup,
all the top 10 items are
made of plastic



KCI TECHNOLOGIES, INC.

Thomas Sprehe, PE – Sr. Vice President, Director of Innovation and Technology

- North-American consulting engineers
- *Engineering News-Record* #68
- 31 offices in 16 states
- 100% employee owned, 1400 + owners
- Recently acquired Keith & Schnars in S. Florida
- Multidisciplinary – engineering, science, CM
- Public and private sector clients
- Innovative and forward thinking



We are committed to Marine Debris Engineering and Management !

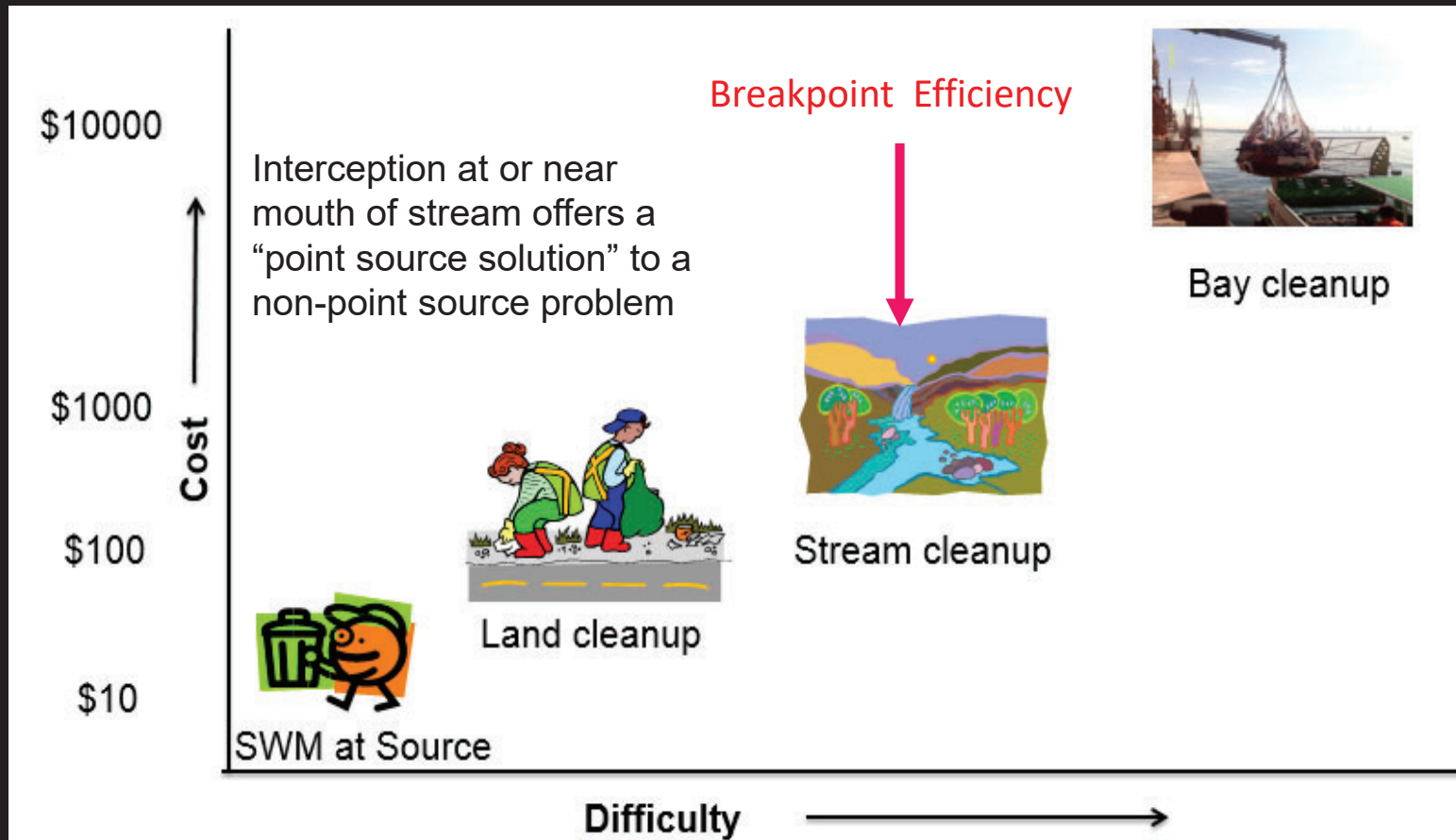
Marine Debris Management Options

- Changing human behavior through education
- Policy and Regulation (and enforcement)
- Controlling/ banning materials (e.g., polystyrene and plastic bag bans, bottle bills, taxes, etc.)

- Restoration, e.g., beach clean-ups
- Design stormwater and SWM infrastructure
- Effective Interception without high flow bypass

Engineering Involvement is Critical

INCREASING COSTS OF COLLECTION AND MANAGEMENT



Albert Pallot Park



\$8.2 Million home

Typical Cleanups of Albert Pallot Park net ~300-400 pounds of plastic trash





Iconic MacArthur Causeway



- Scarface
- Miami Vice
- Bad Boys 2
- There's something about Mary
- Marley and Me

MacArthur Causeway / Port of Miami



MacArthur Causeway / Port of Miami



MacArthur Causeway / Star Island



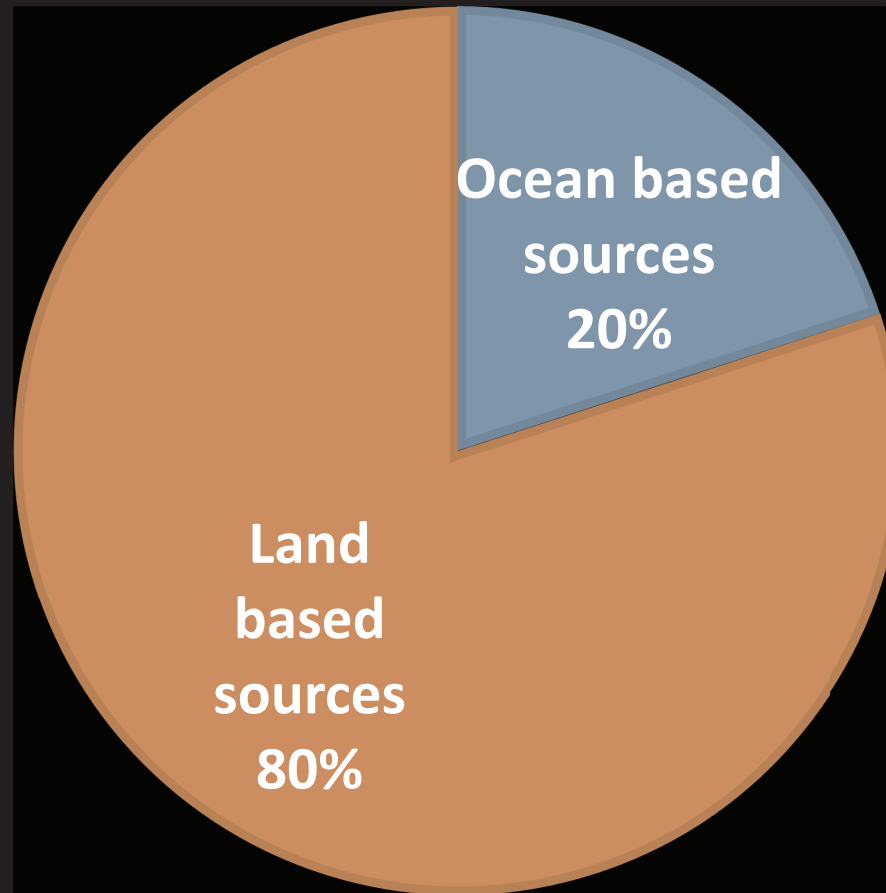
45 Star Island
\$17 Million

MacArthur Causeway – Across from Star Island 1,100 pounds





How is this trash getting into the bay?



Street Trash enters into the storm drains and exits to the bay



Trash from the street is allowed to go into the drains...



Pollution controls are only effective if cleaned frequently

Trash that makes it past overflowing pollution controls discharge to the waterway and sometimes clog the outfalls (contributing to flooding)



SOLUTIONS MUST FOCUS ON 5 KEY AREAS



PEOPLE

- Education that all trash in the waters comes from humans. Litter on the ground becomes litter in our oceans.
- Reduce consumption of non-biodegradable single use plastics



PROPER DISPOSAL

- Proper placement of trash cans - *“can on every corner”*
- Trash cans lids that prevent wind blowing trash out
- Make Recycling easy, effective and mandatory – cultural shift
- Pick up trash before mowing grass



CAPTURE

- Effective street maintenance
- Gratings that keep objects from flowing into storm drains



TRAPPING

- Effective filtration system and proper cleaning of storm drains



CLEANUP

- Clean the canals / waterways as we do the streets (govt and volunteers)

Less Expensive
Less Difficult



More Expensive
More Difficult

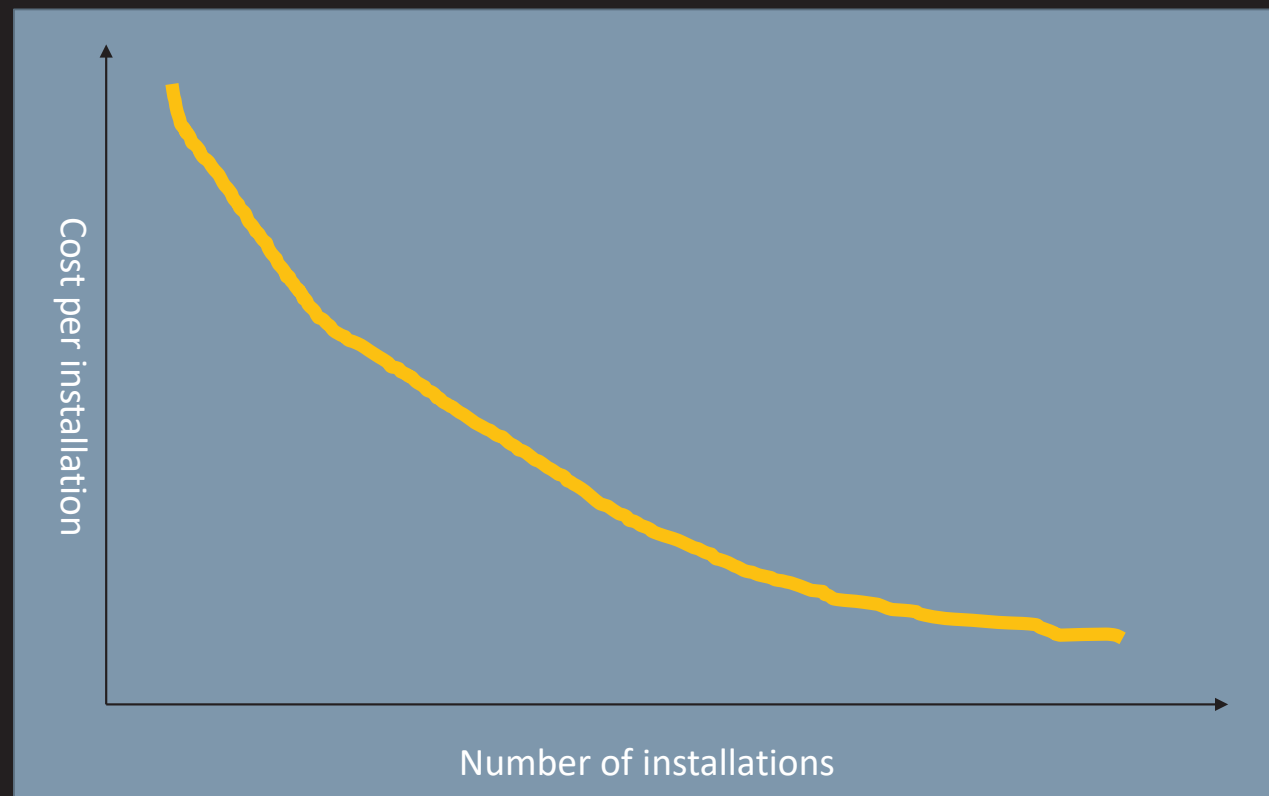
**13th and Washington
Miami Beach**



McArthur Causeway

TOM'S SOLUTIONS FOR FRONT OF PIPE STORM DRAINS

- Gratings / Filters
- Catch Basins



STORM DRAIN FILTERS / GRATINGS



Patented stormwater filter. Visit www.stopoceanpollution.com

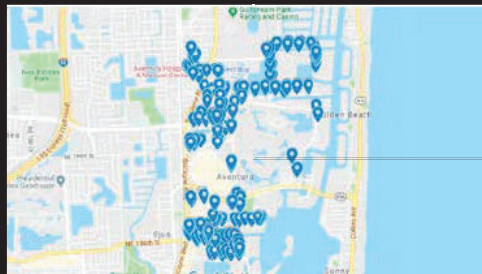
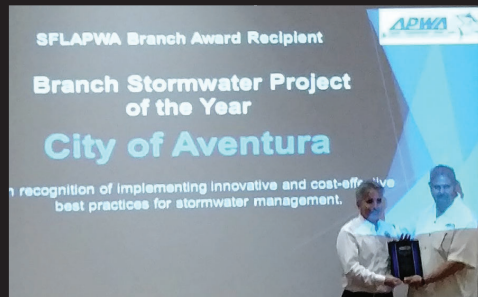
STORM DRAIN FILTERS / GRATINGS

INDUSTRY RECOGNITION: AVENTURA, FL

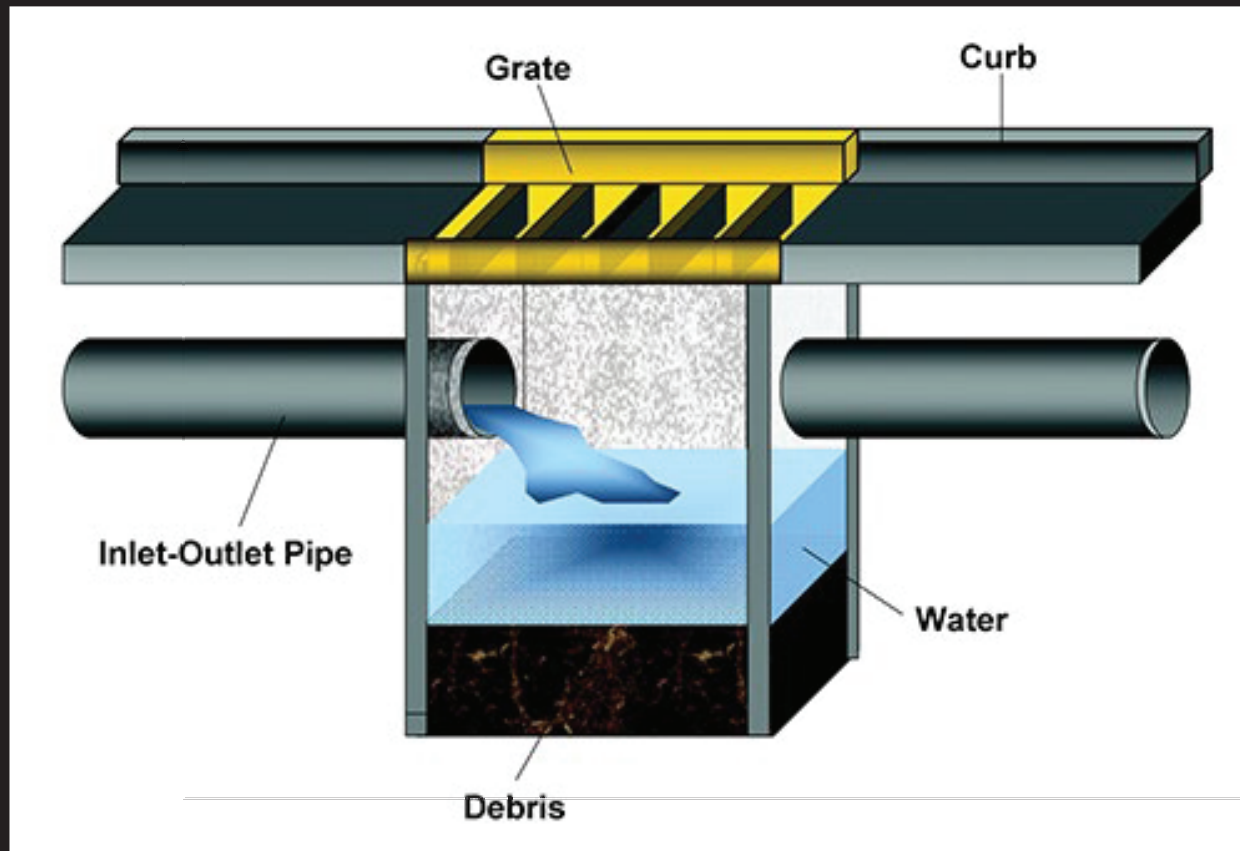


STORMWATER PROJECT OF THE YEAR

“IMPLEMENTING INNOVATIVE AND COST-EFFECTIVE BEST PRACTICES FOR STORMWATER MANAGEMENT”



TRADITIONAL CATCH BASIN



CATCH BASIN AND UNDERGROUND FILTRATION

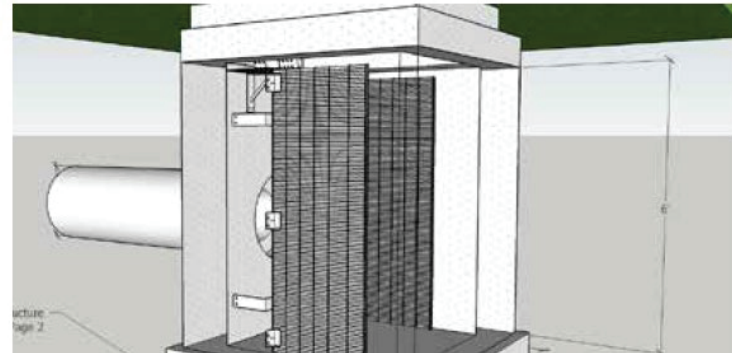
Under-grate Basket Filters

Use under storm grates to capture debris. Easily lift out and remove contents when baskets are full.

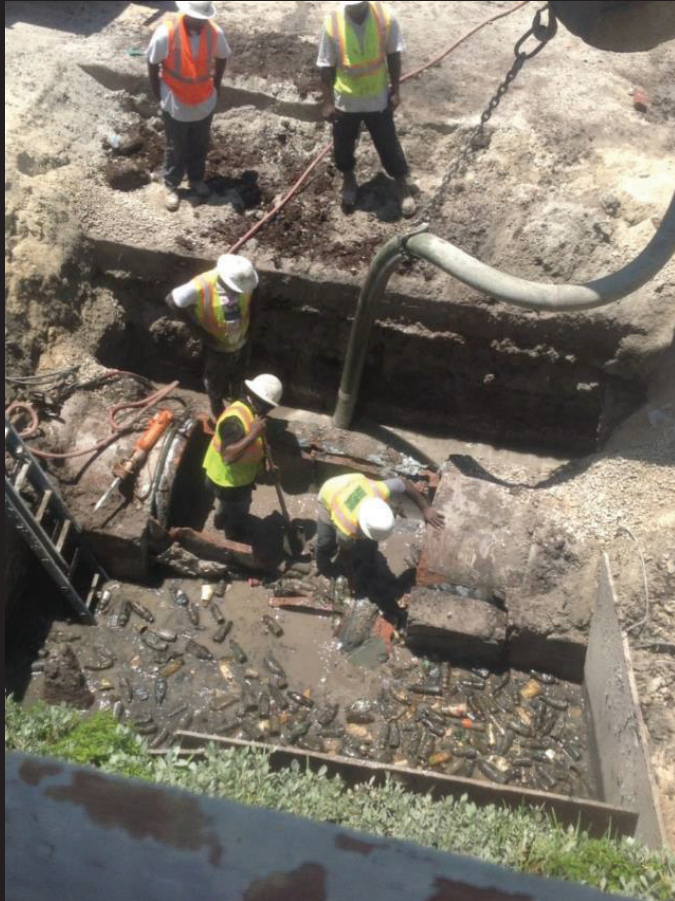


Catch Basin Filters

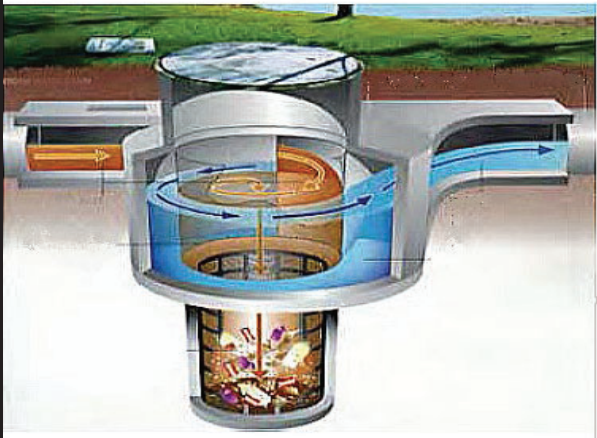
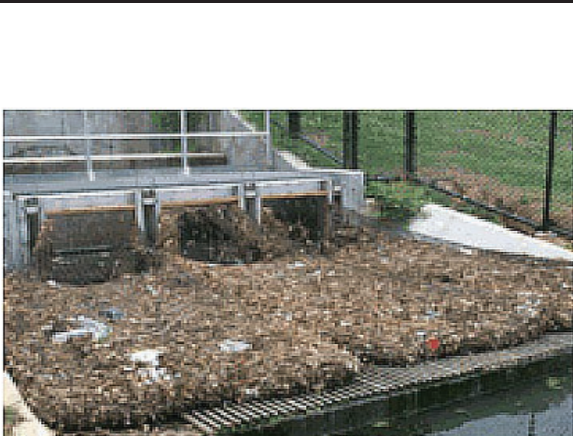
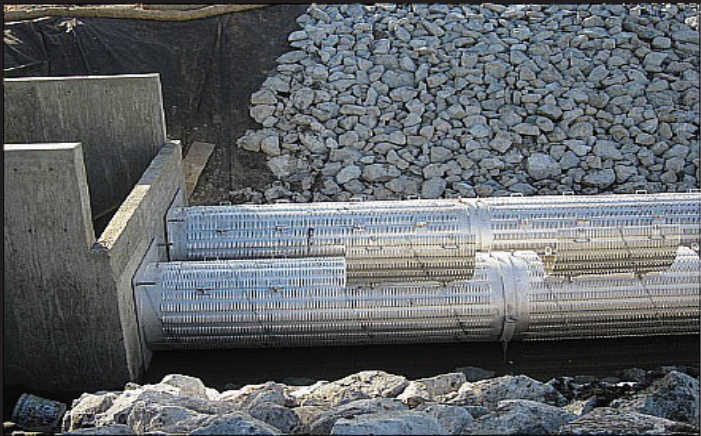
Place adjacent to pipes, inside stormwater catch basins. Remove pollutants using vacuum trucks.



Trash that gets past inlets goes into Stormwater pipes



A NUMBER OF DEBRIS INTERCEPTION SOLUTIONS



Source: EPA

STORMWATER OUTFALL SOLUTIONS

Open Channel Systems

- Open Channel netting systems
- Floating system (Alluvion)
- Fixed mounted system (Gwynn's Run)
- Removable netting capture/containment system
- Maintained by a truck mounted crane from street level



Newly installed...

Following a major spring storm...

STORMX NETTING TRASH TRAP™



Source: Stormwater Systems

There is so much trash in the canals, you can see it from space.!





Garbage collects on one of the South Florida Water Management District's booms. / [Google Maps](#)

There's So Much Trash in Miami Canals, You Can See It From Space

BRITTANY SHAMMAS | OCTOBER 20, 2017 | 9:05AM

Biscayne Park, FL 33161 - Biscayne Canal Number C8 - GPS 25.874045, -80.181442

Storm Drains and Highways lead to Canal Systems – which lead to the bay



El Portal



Pinecrest

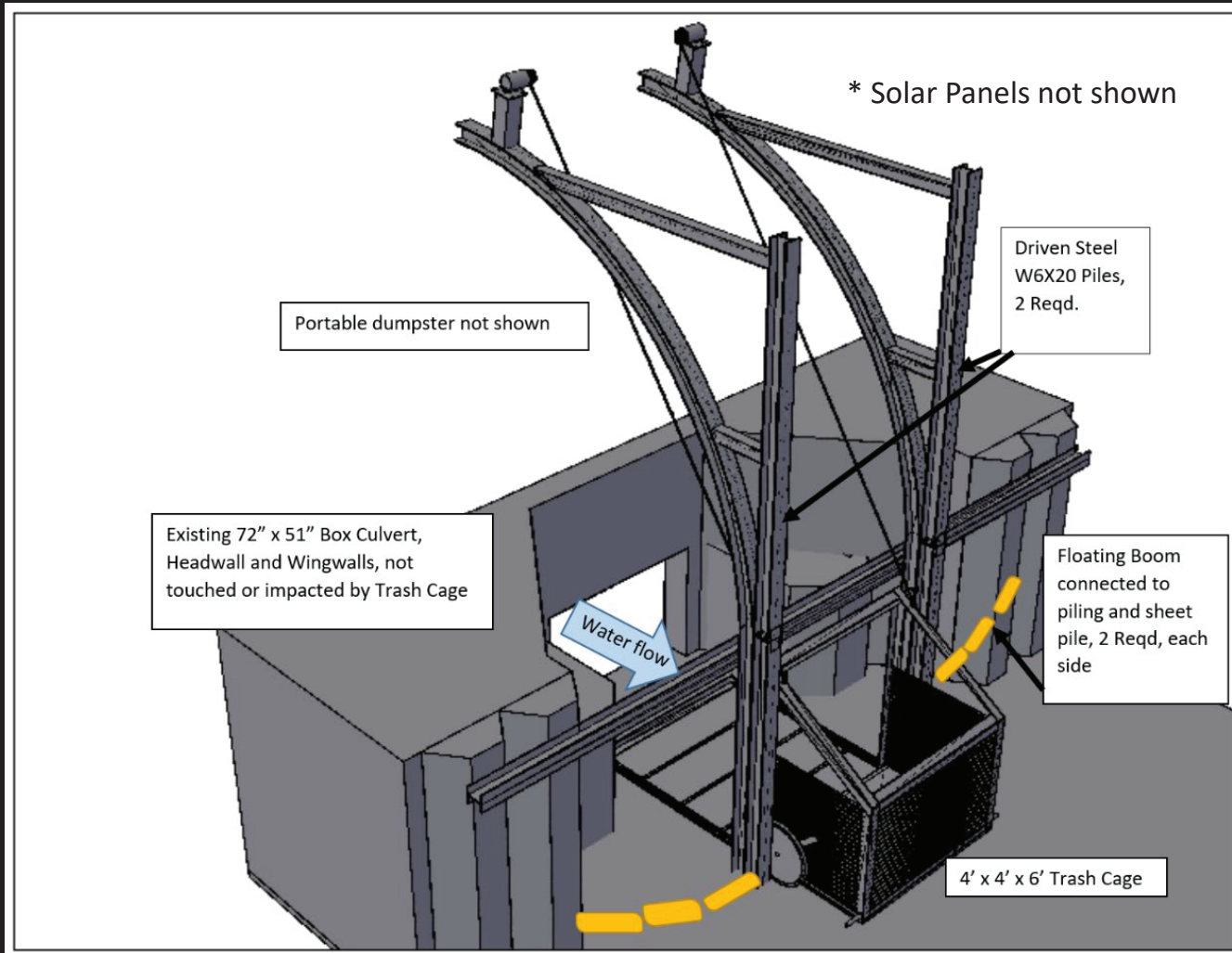
SCREENING AT A STORMWATER PUMPING STATION



BANDALONG™ IN-STREAM LITTER TRAP



ARTICULATING CAGE - TRASH ELIMINATION DEVICE (TED)



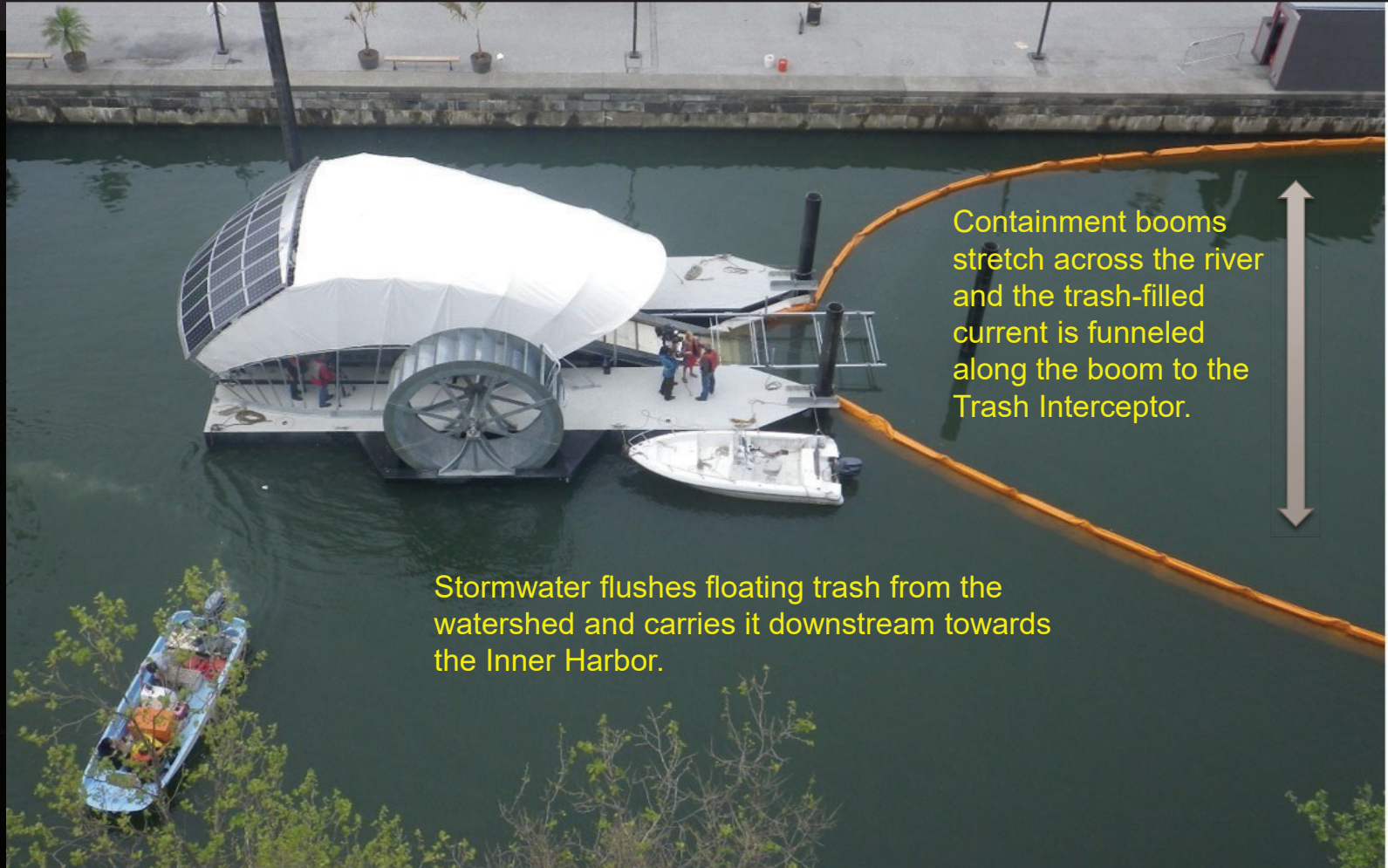
TED (TRASH ELIMINATION DEVICE) – INSTALLED



WATERWHEEL POWERED TRASH INTERCEPTOR (“TRASH WHEEL”)



THE TRASH WHEEL - HOW IT WORKS:



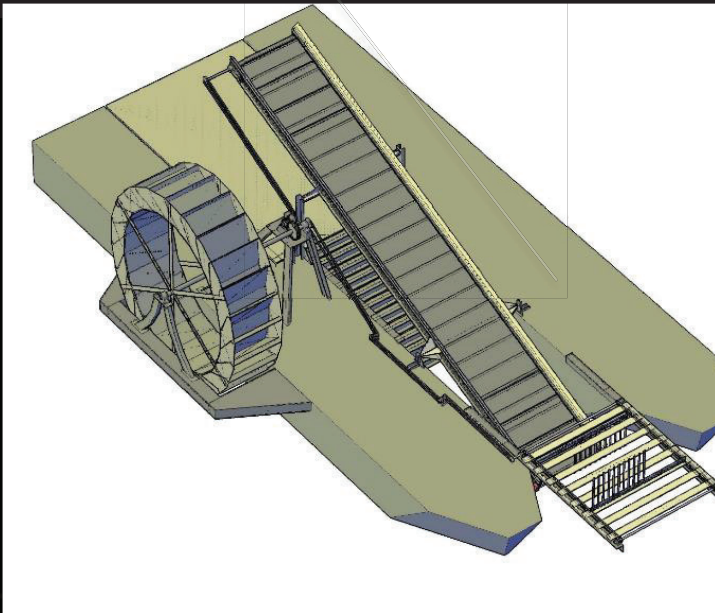
Containment booms stretch across the river and the trash-filled current is funneled along the boom to the Trash Interceptor.

Stormwater flushes floating trash from the watershed and carries it downstream towards the Inner Harbor.

HOW IT WORKS:

Conveyor Belt

- The conveyor lifts the trash out of the water and drops it into a dumpster.

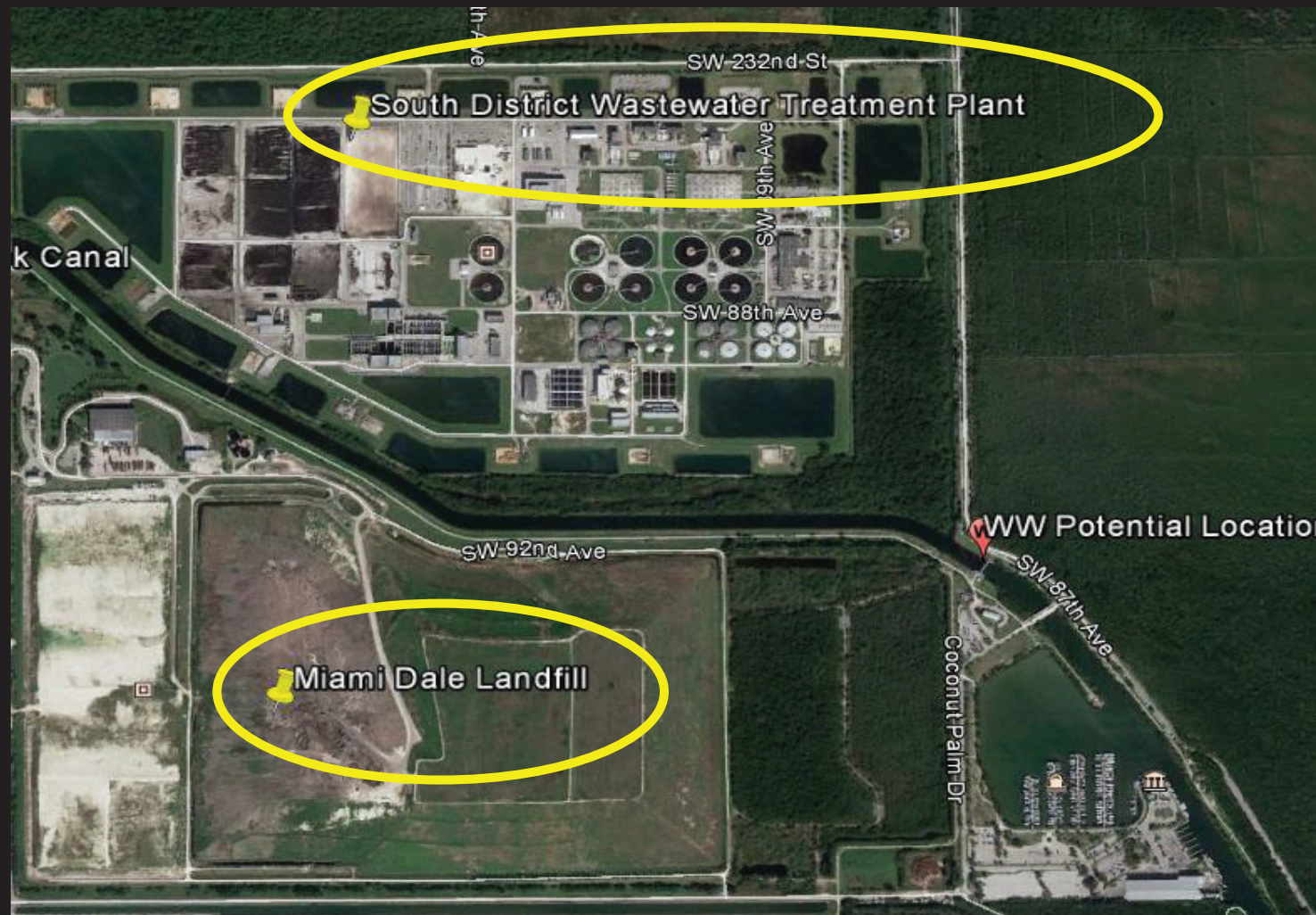


Solar Panels

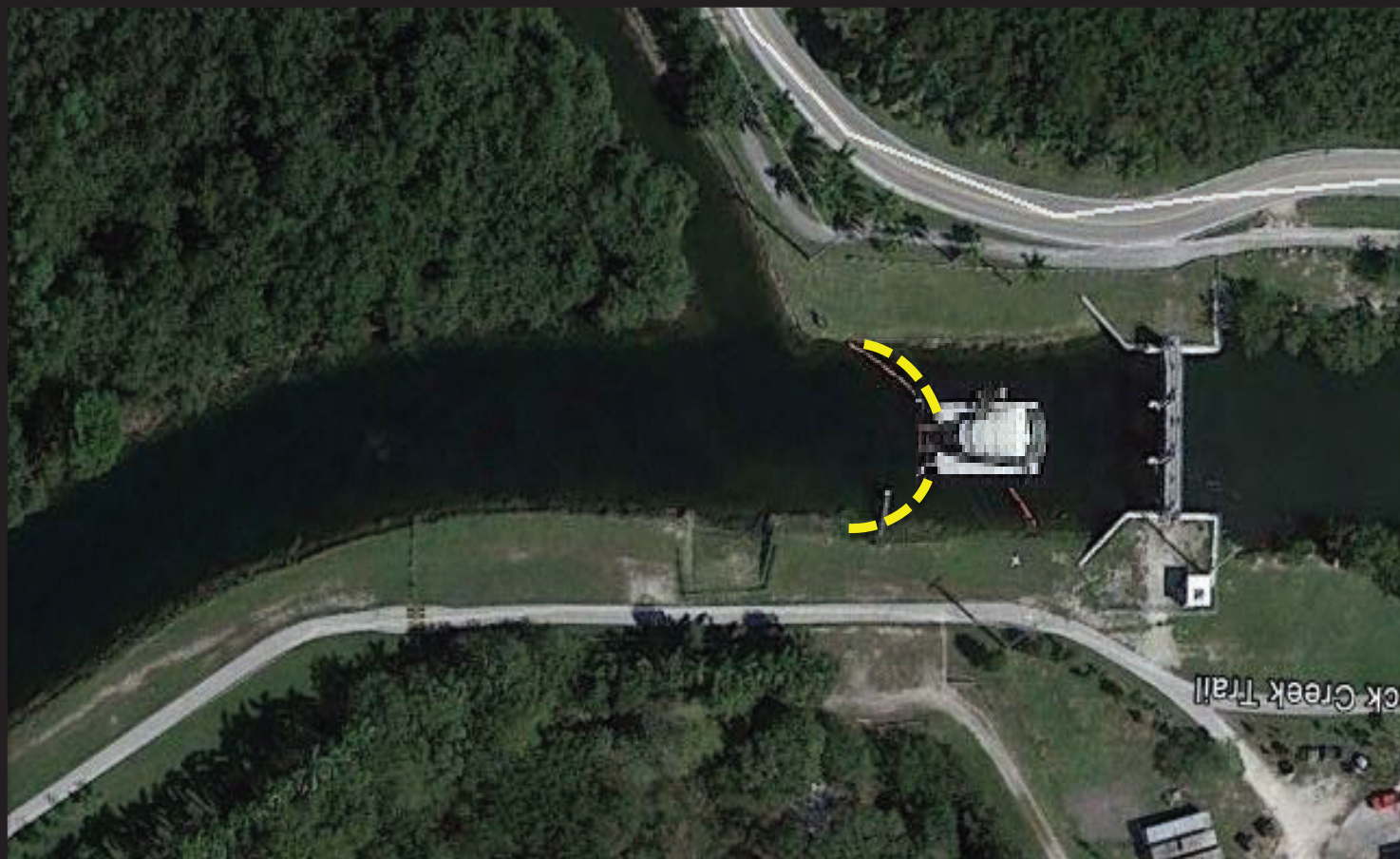
- Solar panels provide power which is stored in the batteries to power pumps.



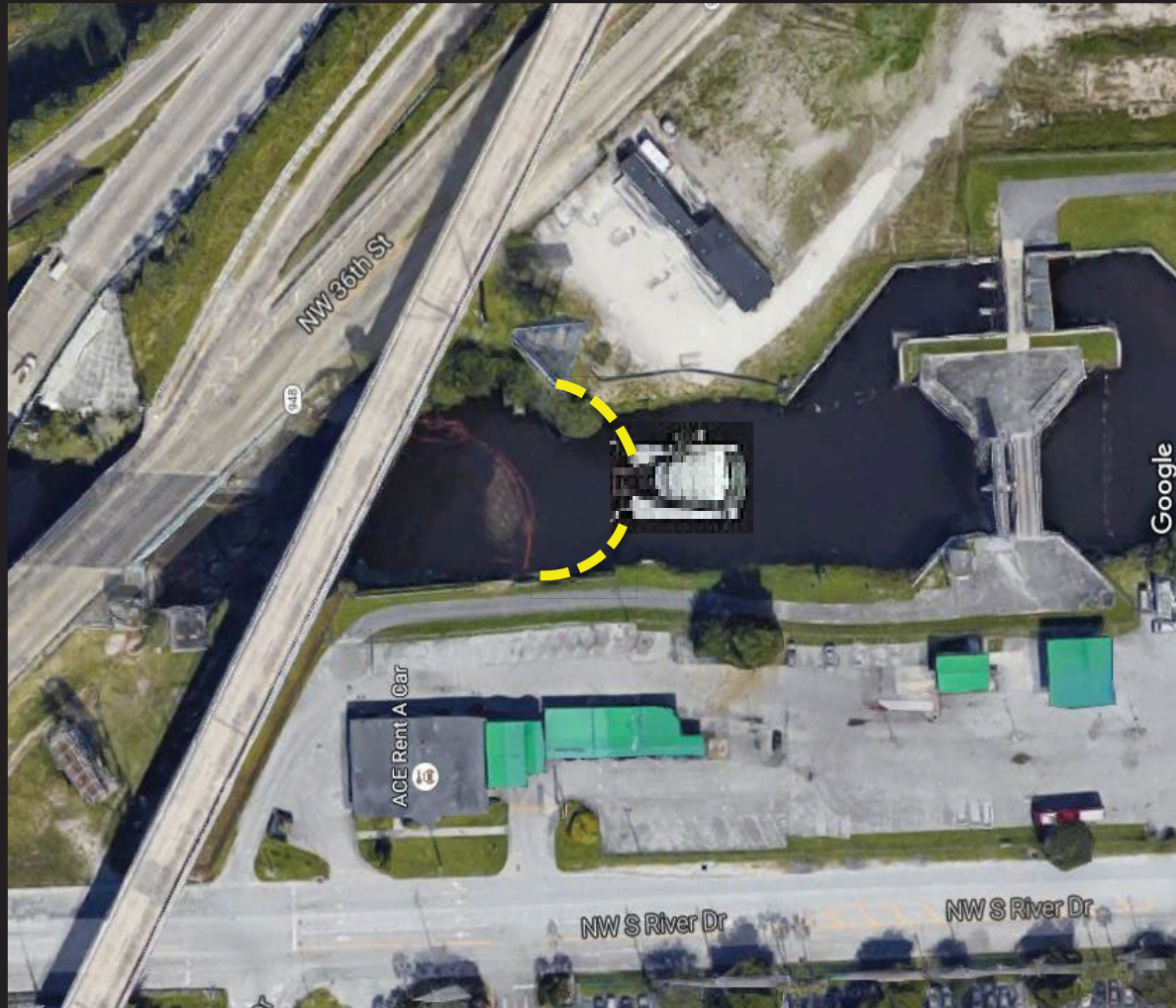
POTENTIAL TRASH WHEEL LOCATION – BLACK CREEK CANAL



POTENTIAL TRASH WHEEL LOCATION – BLACK CREEK CANAL



POTENTIAL TRASH WHEEL LOCATION – MIAMI RIVER



HOT SPOT CLEANUPS

MARINA TRASH SKIMMER™



Courtesy: Marina Accessories, Inc.



SEABIN™

- Fixed location
- Circulation and aeration
- Manually cleaned
- Shore-side power required

WASTESHARK™ - MARINA "ROOMBA"

RECOMMENDATION #1 – TASK FORCE

PROBLEM

We've taken our eye off Biscayne Bay, and the response hasn't been fast enough or effective enough.

SOLUTION

The Biscayne Bay Task Force should create a 10 year action plan addressing all pollutants. Miami-Dade County and all surrounding entities should allocate funding and implement the recommendations.

IN PROGRESS

RECOMMENDATION #2 – CREATE A TMDL FOR TRASH

PROBLEM

The law (Clean Water Act) doesn't see trash as a pollutant, only as an obstacle to stormwater flows.

SOLUTION

Florida DEP and/or Miami-Dade County should commit to reducing trash coming into Biscayne Bay by 2021 by establishing a Total Maximum Daily Load (TMDL) for all MS4 / NPDES permittees and develop a plan to implement. We can model the California or Baltimore example.

RECOMMENDATION #3 - OVERSIGHT

PROBLEM

31 cities/entities ride along Miami-Dade County's MS4 permit as 'co-permitees', yet everyone does their own thing. Annual reports are submitted directly to DEP with no oversight or enforcement authority by DERM.

SOLUTION

If cities want to ride on Miami Dade County's permit efforts, then they must submit their annual report for review by DERM. DERM should establish Best Practices and have oversight into the effectiveness of their programs.

RECOMMENDATION #4 – INVEST IN INFRASTRUCTURE

- 1) Keep trash out of the storm drain system using Storm Drain Filters and other pollution controls. Entities need to evaluate their existing infrastructure for improvement opportunities.
- 2) SFWMD needs to design better trash capture devices for the canals to keep trash from entering the bay.

RECOMMENDATION #5 - PROPER MAINTENANCE

PROBLEM

Many entities are cleaning their storm drain system once every 5+ years, which is not frequent enough – especially in urban environments. There is a lack proper focus, guidance and funding.

SOLUTION

- a) Florida DEP and Miami-Dade County should develop Best Management Practice (BMP) guidelines for pollution controls and maintenance.
- b) Florida DEP and Miami-Dade County should dictate cleaning pollution control systems in MS4 permits at least twice a year unless they can demonstrate it is not needed (compensating control).

RECOMMENDATION #6 – WE NEED TALLAHASSEE

- a) DEP needs to provide better oversight of permit holders.
- b) STOP PREEMPTIONS: Legislators have systematically blocked cities trying to solve their ocean plastic problem through Preemption laws. They have banned local legislation of plastic bags and polystyrene and recently attempted to preempt plastic straws – and refuse to address the problem at the state level. They need to understand the problem we are trying to solve, and we need their help. Repeal preemptions.
- c) BOTTLE DEPOSITS : These programs reduce litter by 70%, increase recycling by 80%,and create thousands of jobs at no cost to those who actively participate. We need a statewide \$.10+ bottle and can deposit system.

RECOMMENDATION #7 – OTHER IDEAS

- a) Provide free access to drinking water in public spaces, including water bottle refill stations, to reduce consumption of single-use plastics.
- b) Decrease litter on highways (education, enforcement and maintenance). Litter blows right into the canals.
- c) Greenspace maintenance (Staff and Contractor) must improve litter cleanup before mowing grass (become chopped plastics)
- d) Enhance waterway cleanup activities
- e) Recycling is broken because no one wants our trash. We need to have domestic recycling processing plants, the question is how do we make that investment?

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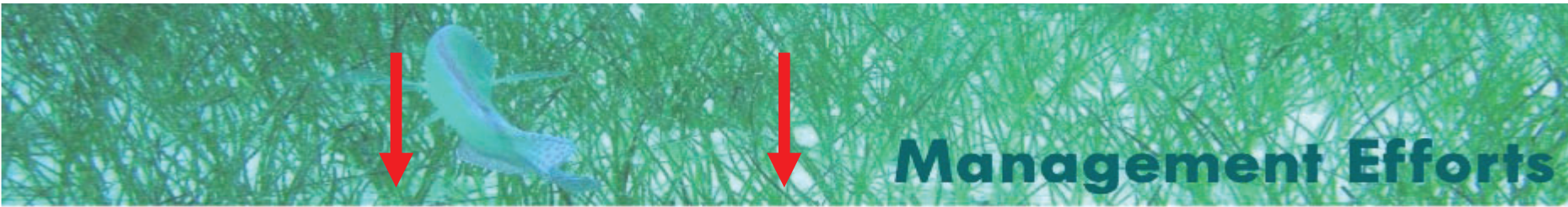


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2019 BISCAYNE BAY MARINE HEALTH SUMMIT: THE ACTION SUMMIT





Management Efforts

