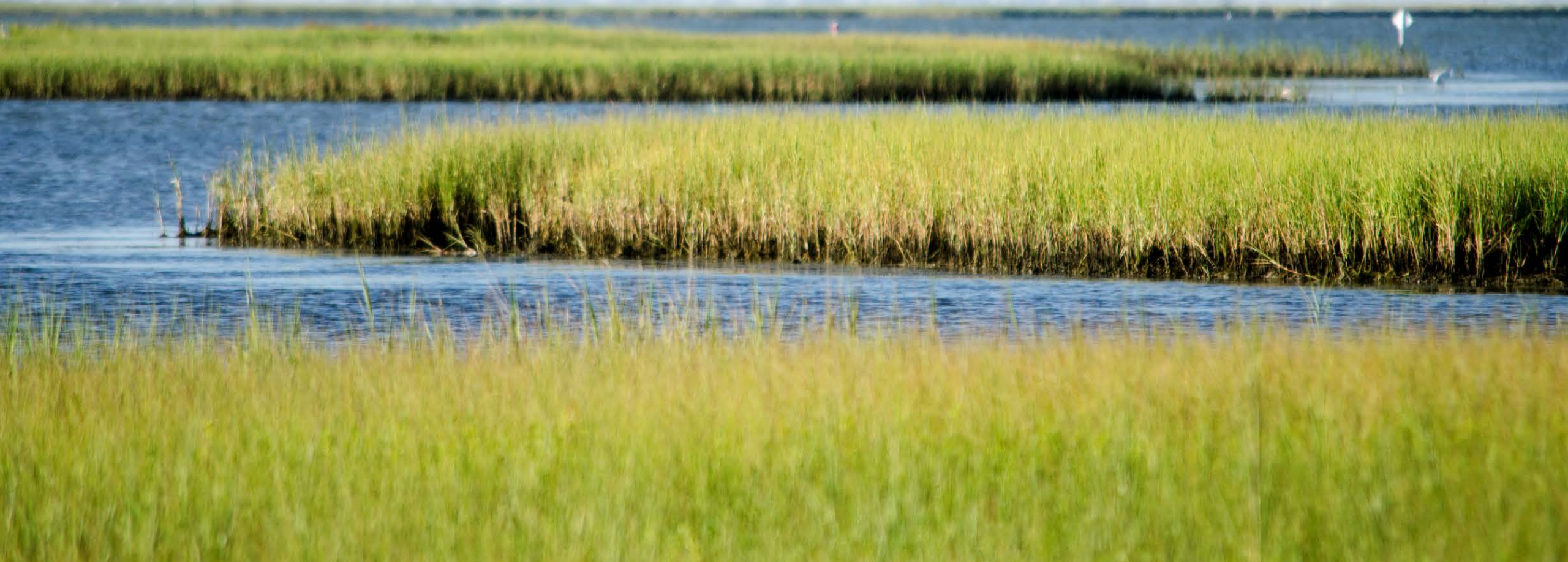




GALVESTON BAY FOUNDATION

Preserving and Protecting Galveston Bay for 30 years.





GALVESTON BAY
FOUNDATION

Guardian of Galveston
Bay since 1987



PROTECT



ADVOCATE



CONSERVE



EDUCATE



RESTORE

Working together for a better Galveston Bay.

GALVESTON BAY: STARTS IN OUR BACKYARD.



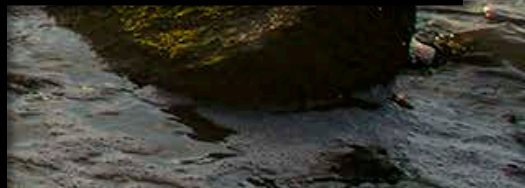
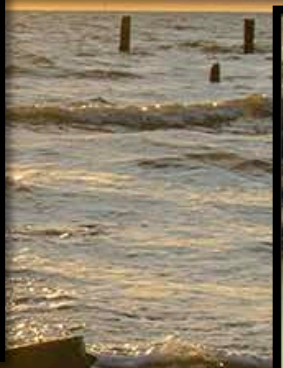
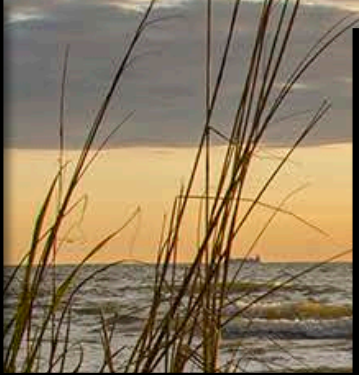
GALVESTON BAY: STARTS IN OUR BACKYARD.



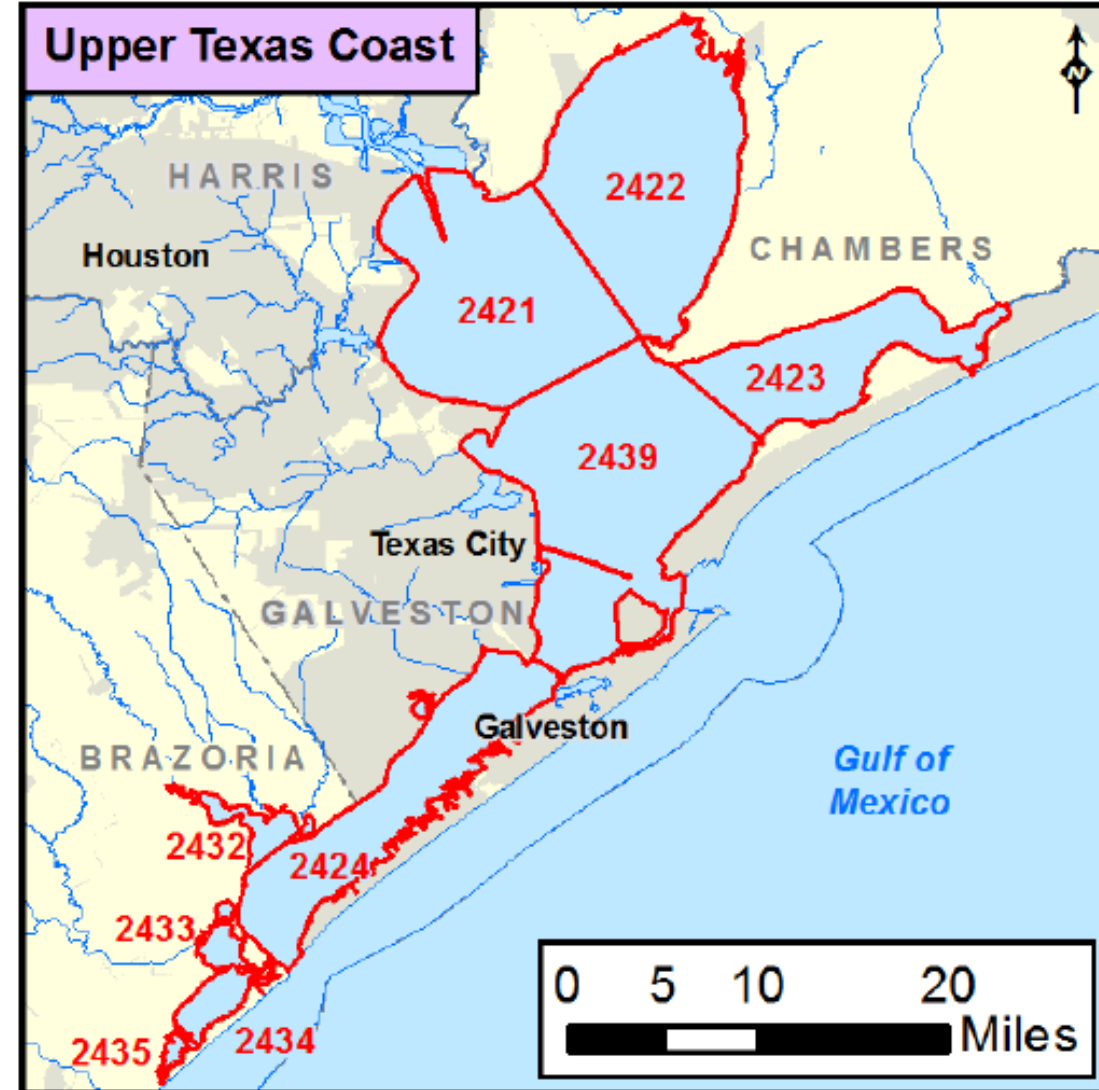
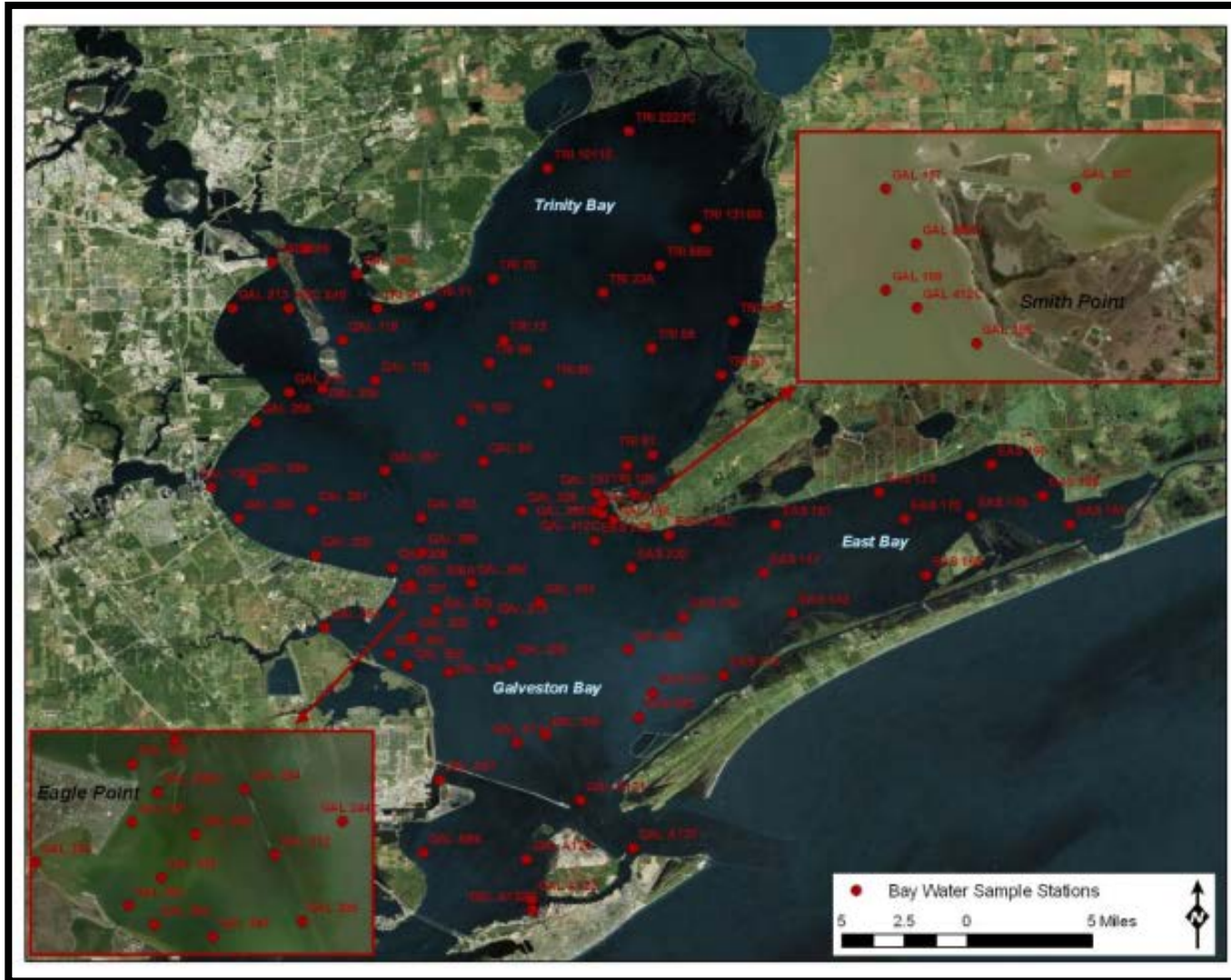
GALVESTON BAY: STARTS IN OUR BACKYARD.



GALVESTON BAY: STARTS IN OUR BACKYARD.



Monitoring Impact on Water Quality



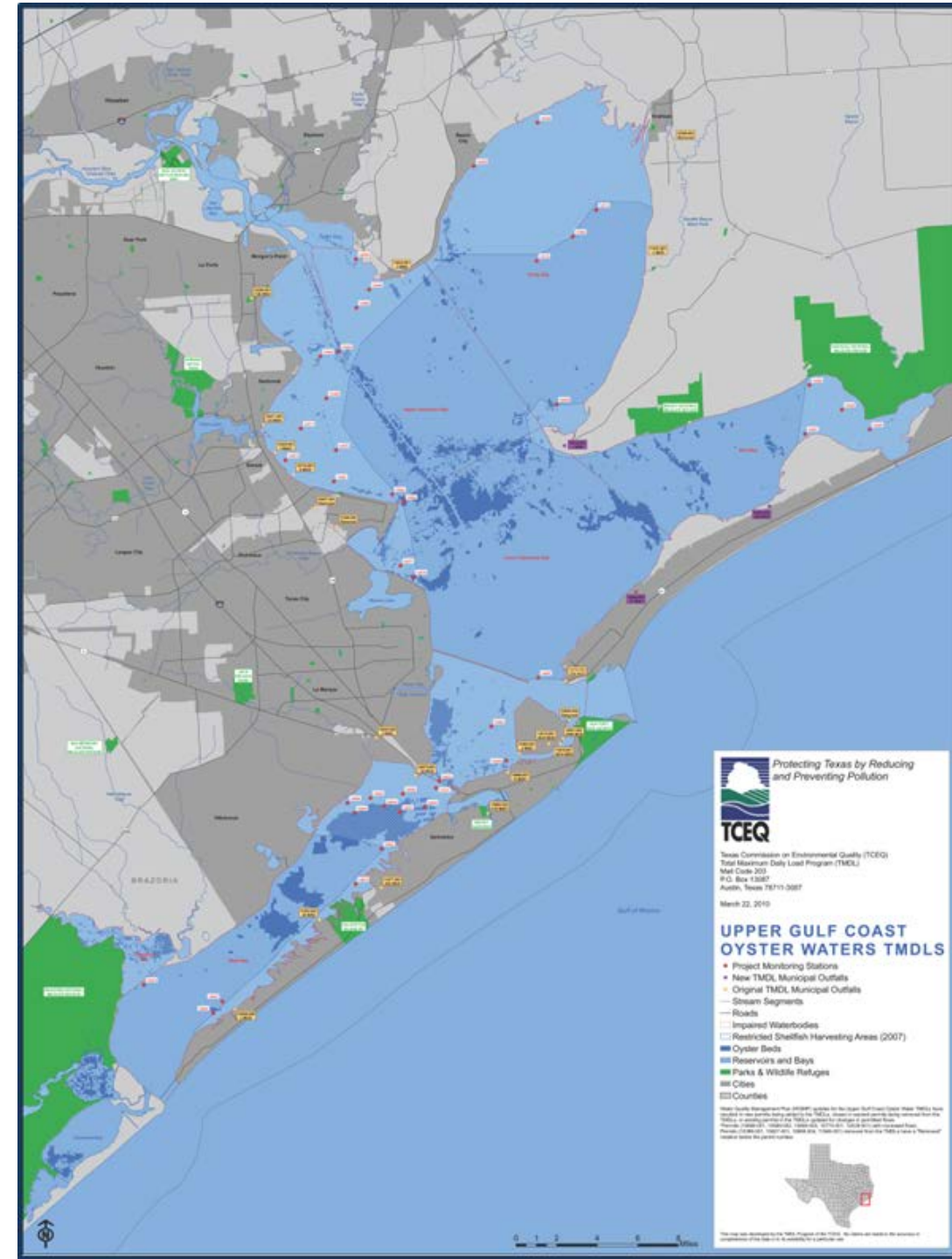
Galveston Bay: Impaired for Bacteria (*oyster waters use*)

→ *Total Maximum Daily Load*

- “Budget” for pollution
- Focus only on constituent of concern
- Can lead to mandatory and voluntary change

TMDL = Wasteload Allocation + Load Allocation + MOS

→ *Implementation Plan*



What is an Implementation Plan?

- Determines HOW reductions will be made
- Based on stakeholder recommendations
- Voluntary measures to reduce contaminant loading into waterway

Address Four Sources of Bacterial Pollution

- I. Wastewater Treatment Facilities (WWTFs)
 - Sanitary Sewer Overflows
 - Facility malfunction or flooding
- II. On-Site Sewage Facilities (OSSFs)
- III. Boater Waste
- IV. Stormwater Runoff
 - Nonpoint source pollution
 - Behavior from residents
 - Wildlife & Pets

1. Wastewater Treatment Facilities (WWTF)

- Bacteria contamination from WWTFs can occur through:
 - Collection pipe malfunction
 - Overflows and flooding at treatment facilities
 - Leaking sludge and sewage debris

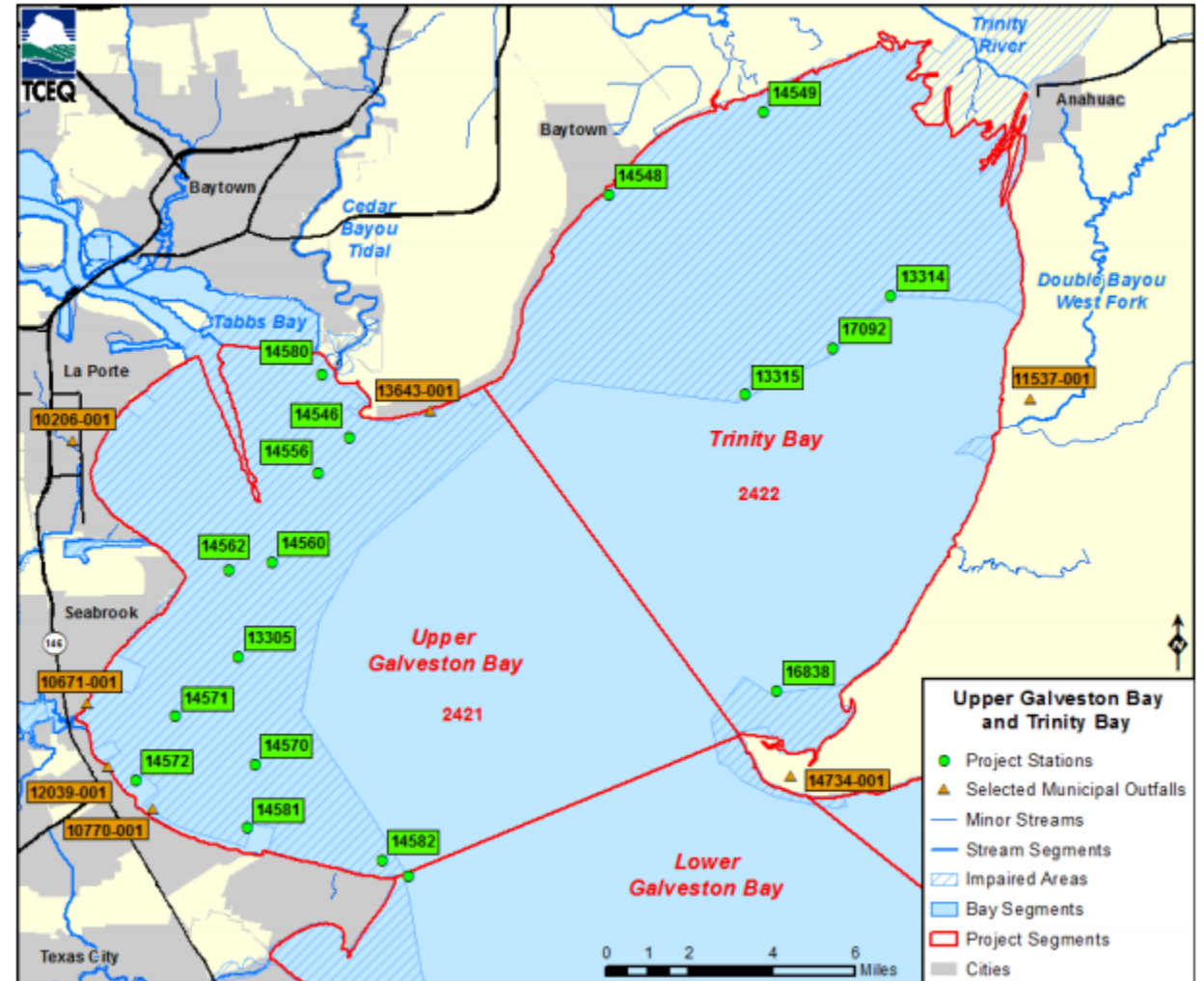


Figure 3. Upper Galveston and Trinity Bays - Wastewater Treatment Facilities and Sampling Stations

1. Wastewater Treatment Facilities (WWTF)

Recommended Management Measures	Status
Improve guidance and training to owners and operators for sampling bacteria	In progress
Encourage plants to conduct bacteria sampling prior to being issued a permit limit	Completed
Recommend that TCEQ conduct unannounced and focused investigations at WWTFs	Future: TCEQ negotiating with EPA
Reduce Sanitary Sewer Overflows (SSOs)	In progress

Provide supporting resources on website and support TCEQ & other partners

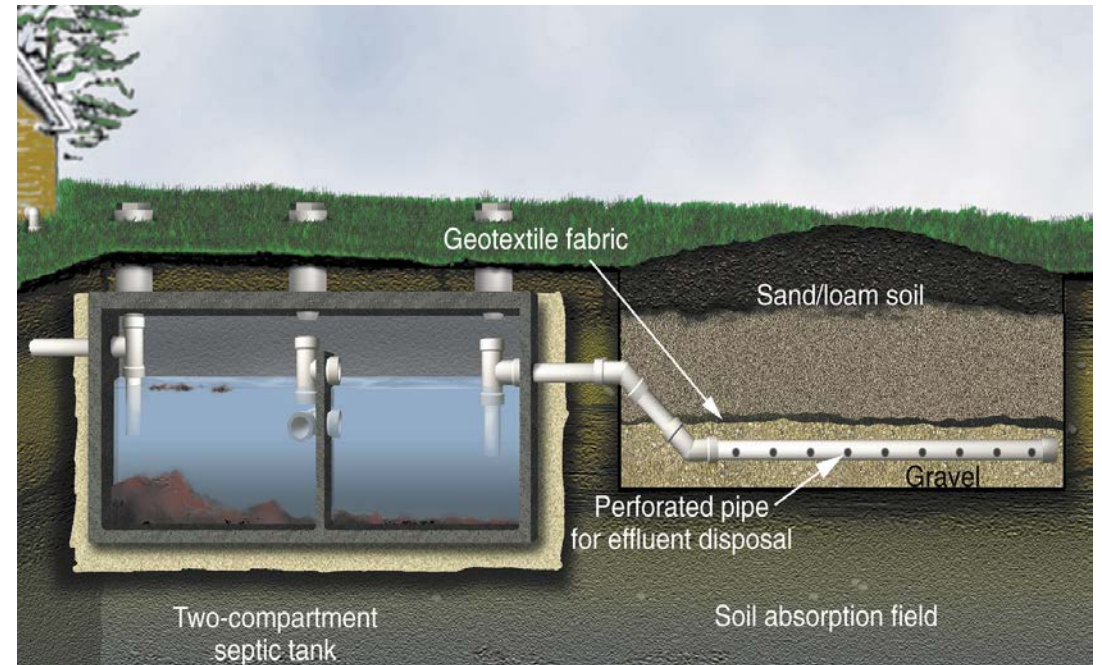
1. Wastewater Treatment Facilities (WWTF)

	Domestic Outfalls	WWTP Outfalls	Stormwater Outfalls	Marinas & Boat Ramps
<i>Enterococcus</i>	3.45 MPN	1.35 MPN		
DO		0.08 mg/L	-0.11 mg/L	0.01 mg/L
Transparency				
pH	-0.06		0.19	0.02

(2km radius)

2. On Site Sewage Facilities (OSSF)

- Bacteria contamination from OSSFs can occur through:
 - Improperly installed or managed systems
 - Old systems
- Lead to bacteria entering the Bay through storm water runoff or groundwater infiltration

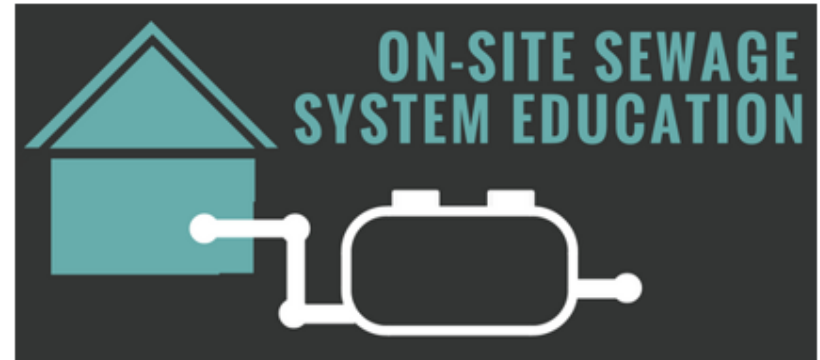
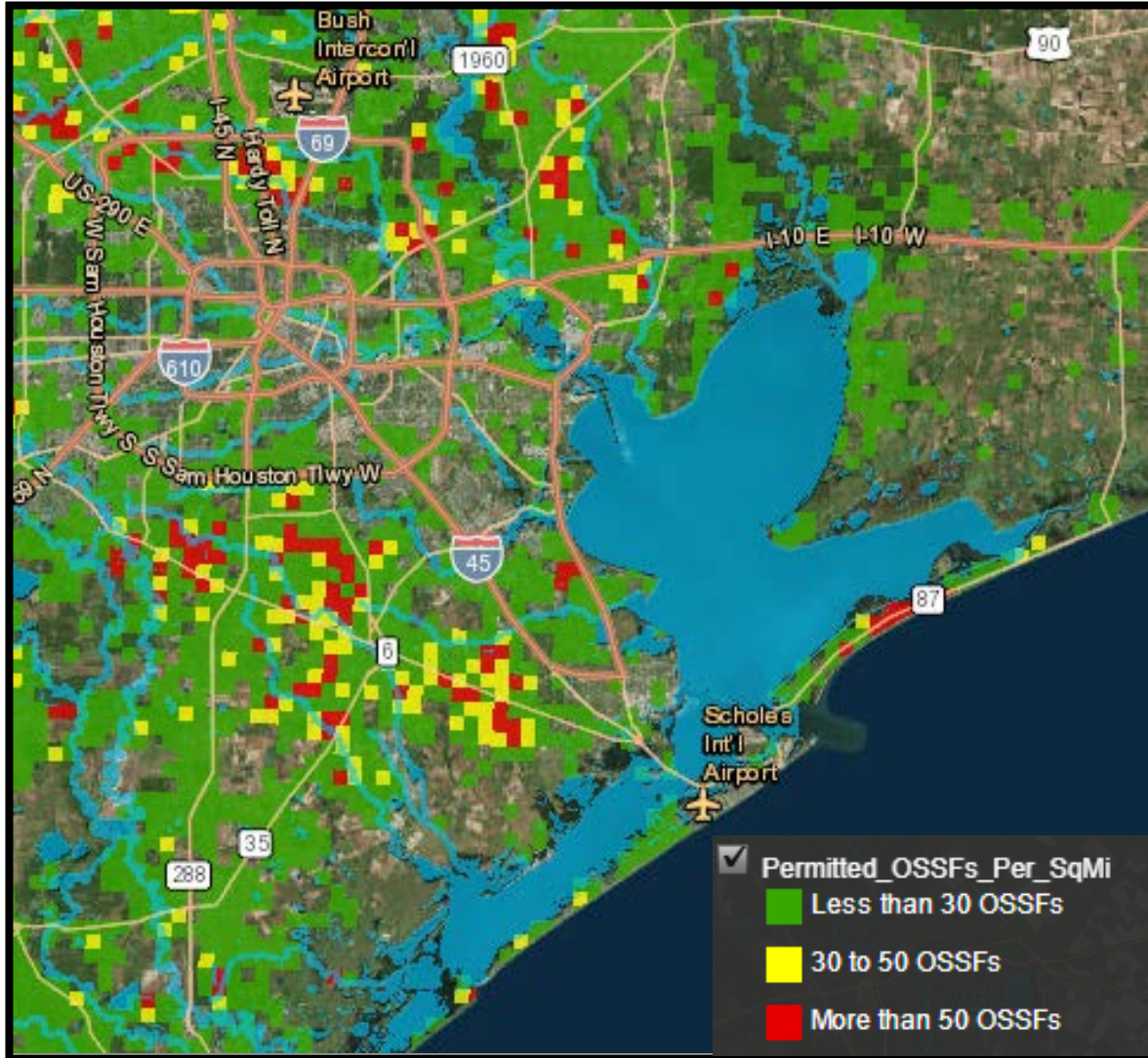


2. On Site Sewage Facilities (OSSF)

Recommended Management Measure	Status
Map unidentified OSSFs within the project area, prioritize inspection needs based on highest potential impact	In progress
Collaborate with Authorized Agents to inspect OSSFs in priority areas identified by the workgroup, identify funding sources to assist low income communities	Future
Partner with regional watershed groups to conduct focused studies of OSSF impacts on the local watershed	In progress
Offer workshops and outreach materials to homeowners, real estate agents, installers, inspectors, and homebuyers	In progress

Biggest obstacle: lack of resources

2. On Site Sewage Facilities (OSSF)



Learn about managing your own septic system at one of these FREE workshops!

Saturday, May 5, 2018
9:00 AM to 12:00 PM
at **Sam and Carmena Goss Memorial Branch Library**
1 John Hall Drive
Mont Belvieu, TX 77523

Saturday May 19, 2018
9:00 AM to 12:00 PM
at **Bayou Vista MUD 12 Building**
2929 Highway 6, Suite 300
Bayou Vista, TX 77563

Workshop covers:

- How to protect your property and health through regular inspection and maintenance.
- Available resources, including possible financial support to repair and replace failing systems.

For More Info
Visit www.galvbay.org or
email waterquality@galvbay.org



Event partially funded by a grant from the Texas Commission on Environmental Quality, Galveston Bay Estuary Program, and the US Environmental Protection Agency.



3. Boater Waste

Recommended Management Measure	Status
Increase # of pump-out stations on Galveston Bay	In progress
Increase enforcement of existing marine sanitation device regulations	In progress
Promotion of available pumpout facilities & proper boater behavior	In progress
Explore possibility of submitting an application to the U.S. EPA to designate Galveston Bay as a federal No Discharge Zone	In progress
Collect water quality data, as well as focused sampling in marinas	In progress

Biggest obstacle: lack of resources

3. Boater Waste

	Domestic Outfalls	WWTP Outfalls	Stormwater Outfalls	Marinas & Boat Ramps
<i>Enterococcus</i>	✓	✓	✗	✗
DO	✗	✓	✓	✓
Transparency	✗	✗	✗	✗
pH	✓	✗	✓	✓

(2km radius)

3. Boater Waste

	Domestic Outfalls	WWTP Outfalls	Stormwater Outfalls	Marinas & Boat Ramps
<i>Enterococcus</i>	NA	✘	NA	✓
DO	NA	✘	NA	✘
Transparency	NA	✘	NA	✘
pH	NA	✘	NA	✘

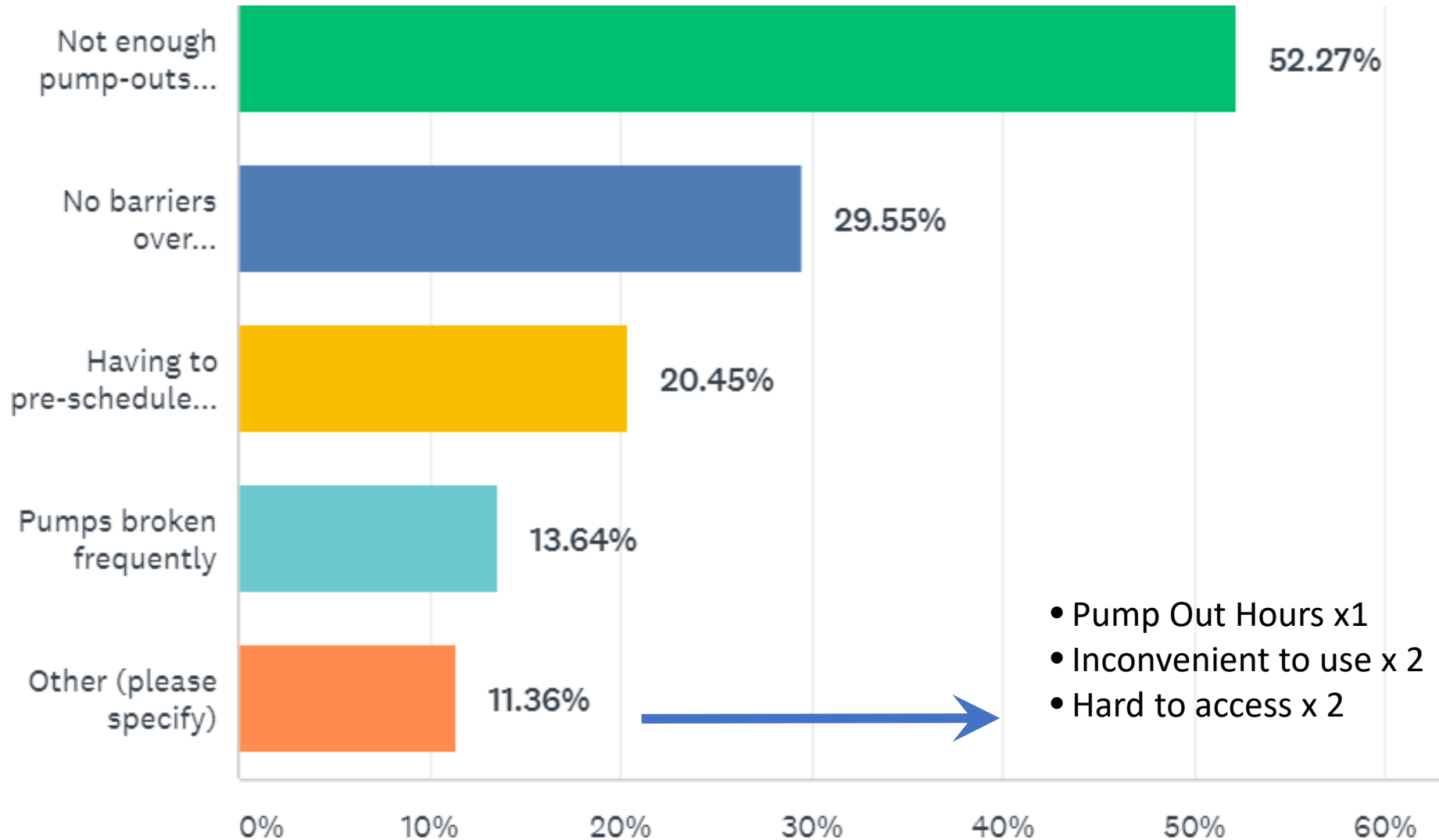
(Zooming in: 0.5km radius)

3. Boater Waste

	Domestic Outfalls	WWTP Outfalls	Stormwater Outfalls	Marinas & Boat Ramps
<i>Enterococcus</i>				-0.48 MPN

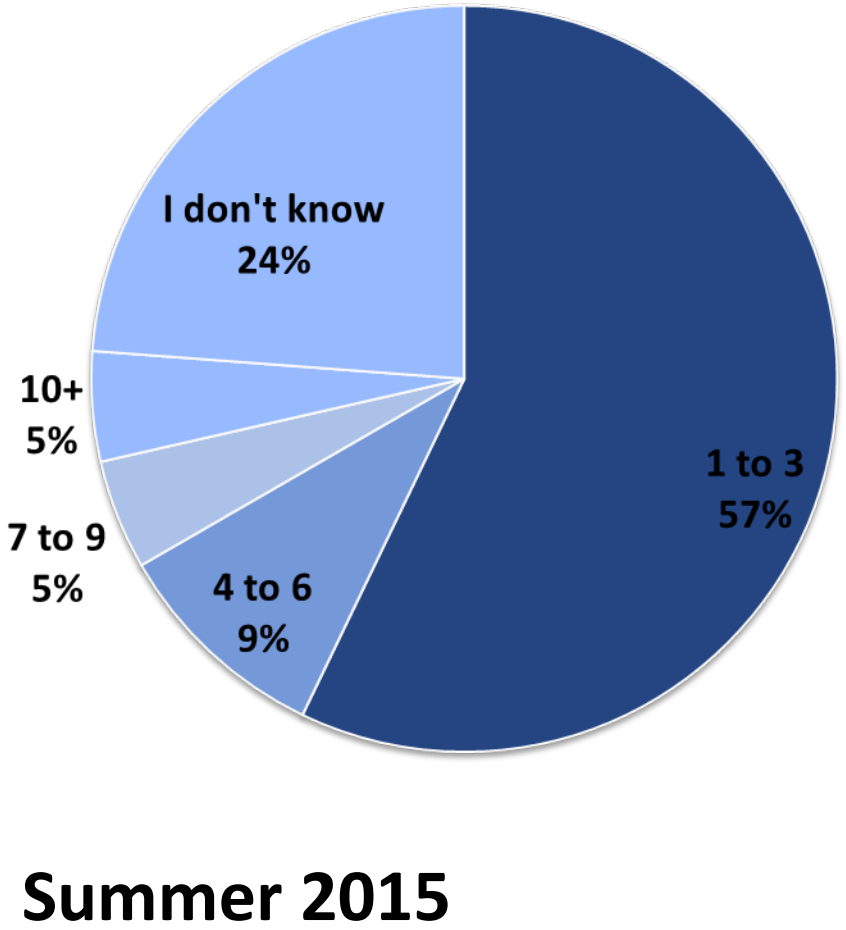
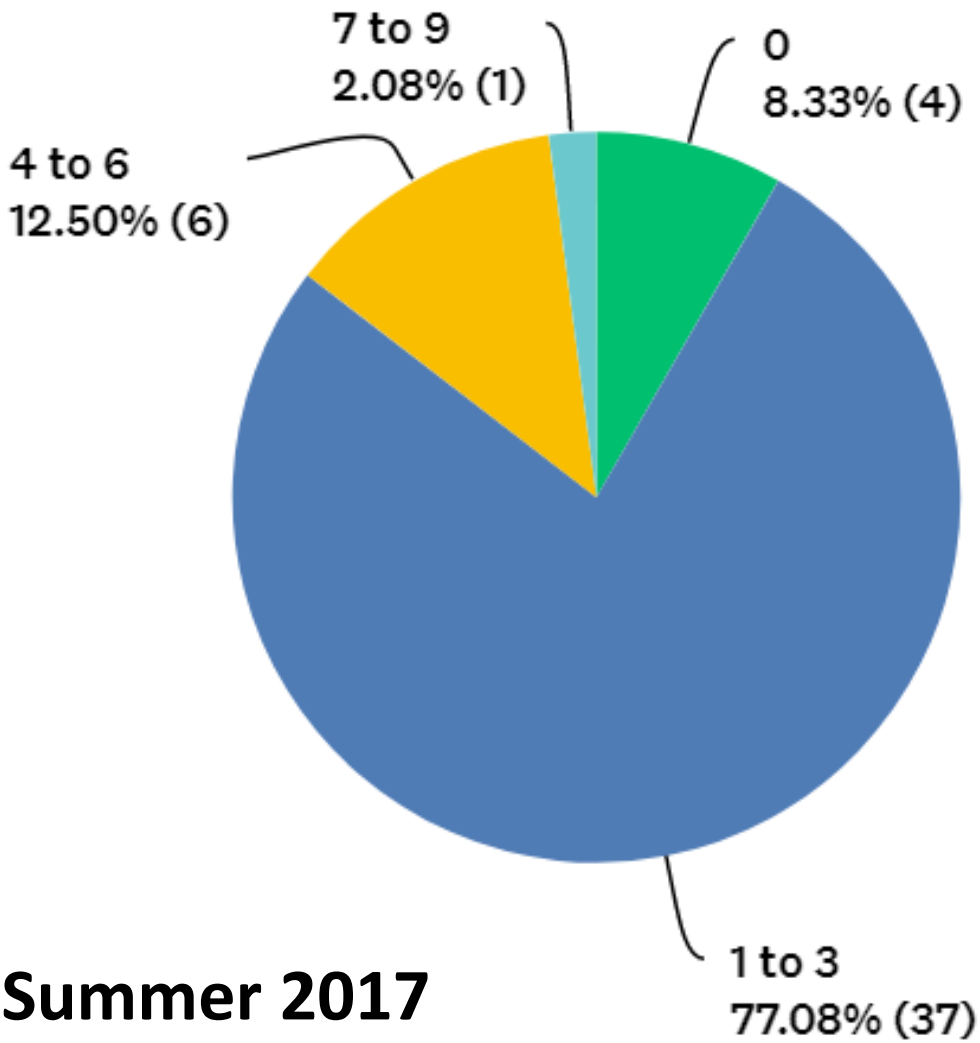
(Zooming in: 0.5km radius)

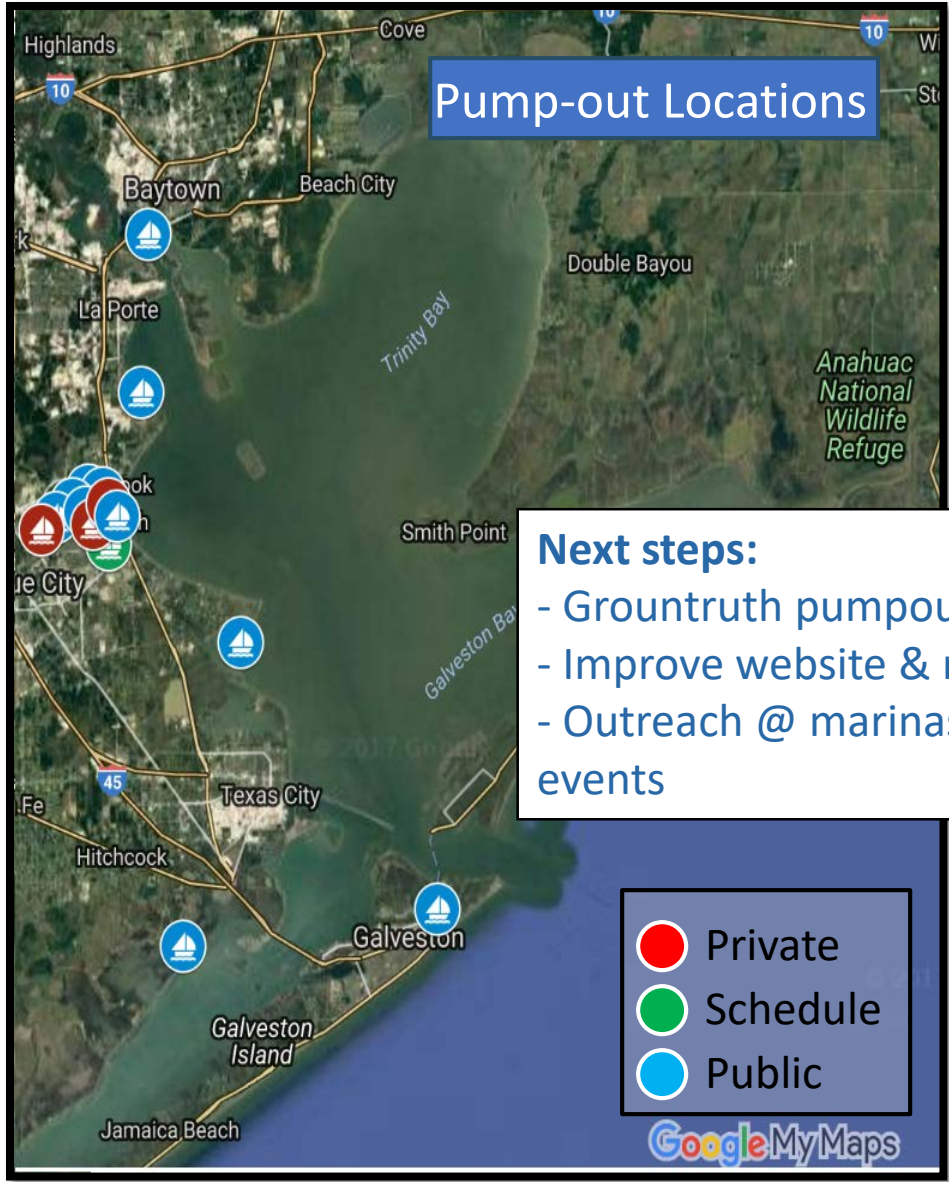
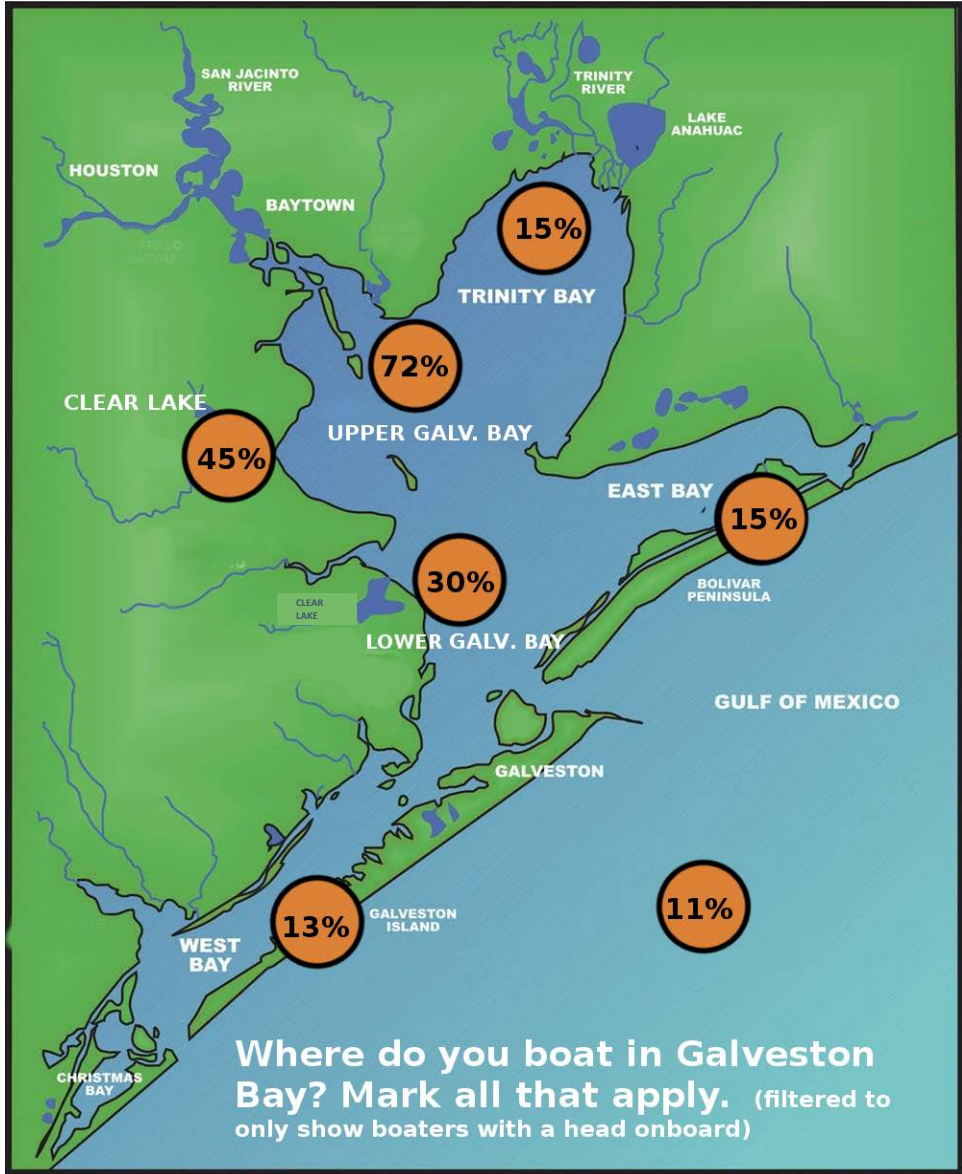
What are some barriers you perceive to using pump-out stations over discharging waste in the Bay?



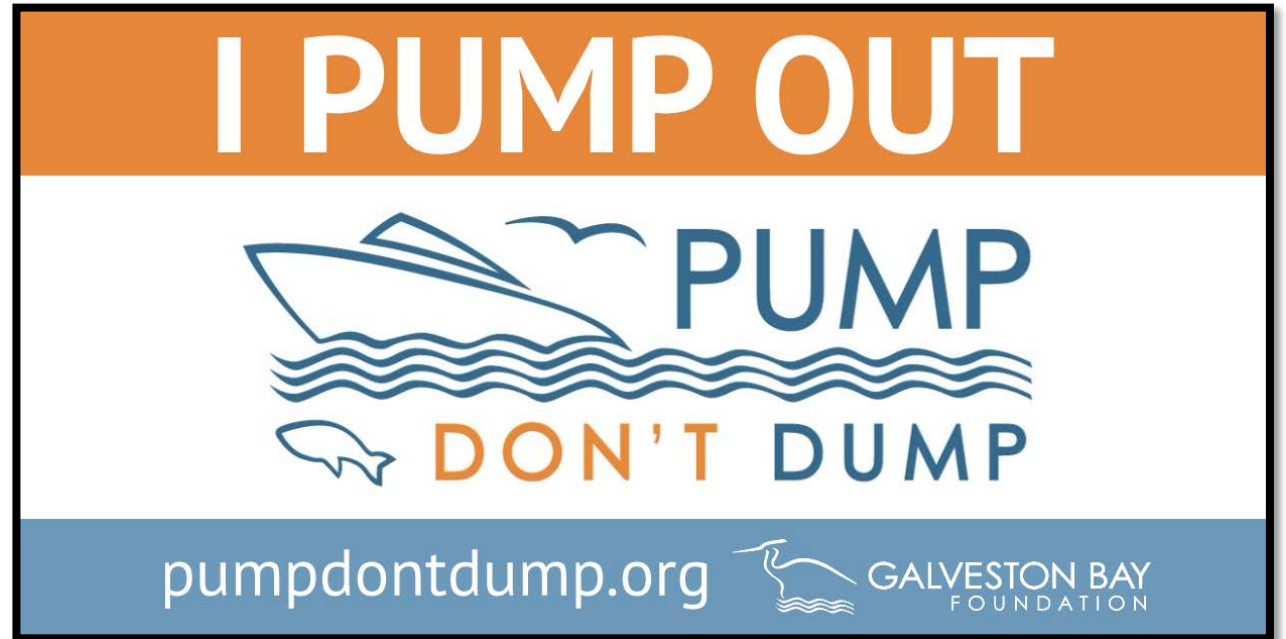
More surveys needed!

How many dockside stations and mobile pump-out services do you know of in the Clear Lake or Galveston Bay area? (filtered by boaters with a head only)





Boater Waste Education Campaign



pumpdontdump.org

4. Stormwater Runoff



“Reduction of non-point source pollution (urban runoff) comes from changing behaviors through education”

5 WAYS YOU CAN HELP PROTECT WATER QUALITY IN GALVESTON BAY



USE A RAIN BARREL

Rain barrels reduce stormwater runoff, which carries bacteria into our waterways. One rain barrel can save 1,050 gallons per year. That's enough water to run your dishwasher 175 times!



BAG IT FOR YOUR BAY

There are enough dogs in the Houston-Galveston region to fill 52 dump trucks of poop every day. Pet waste is a major source of stormwater bacteria pollution. Pick up after your pooch!



CEASE THE GREASE

Over half of the sanitary sewer overflows in our region are caused by grease blockages. Throw kitchen grease in the trash and recycle your used cooking oil at an approved location.



REPORT POLLUTION

Download the Galveston Bay Action Network mobile app to instantly report any land or water pollution you see. Reports are automatically sent to the appropriate authority who can investigate and clean it up!

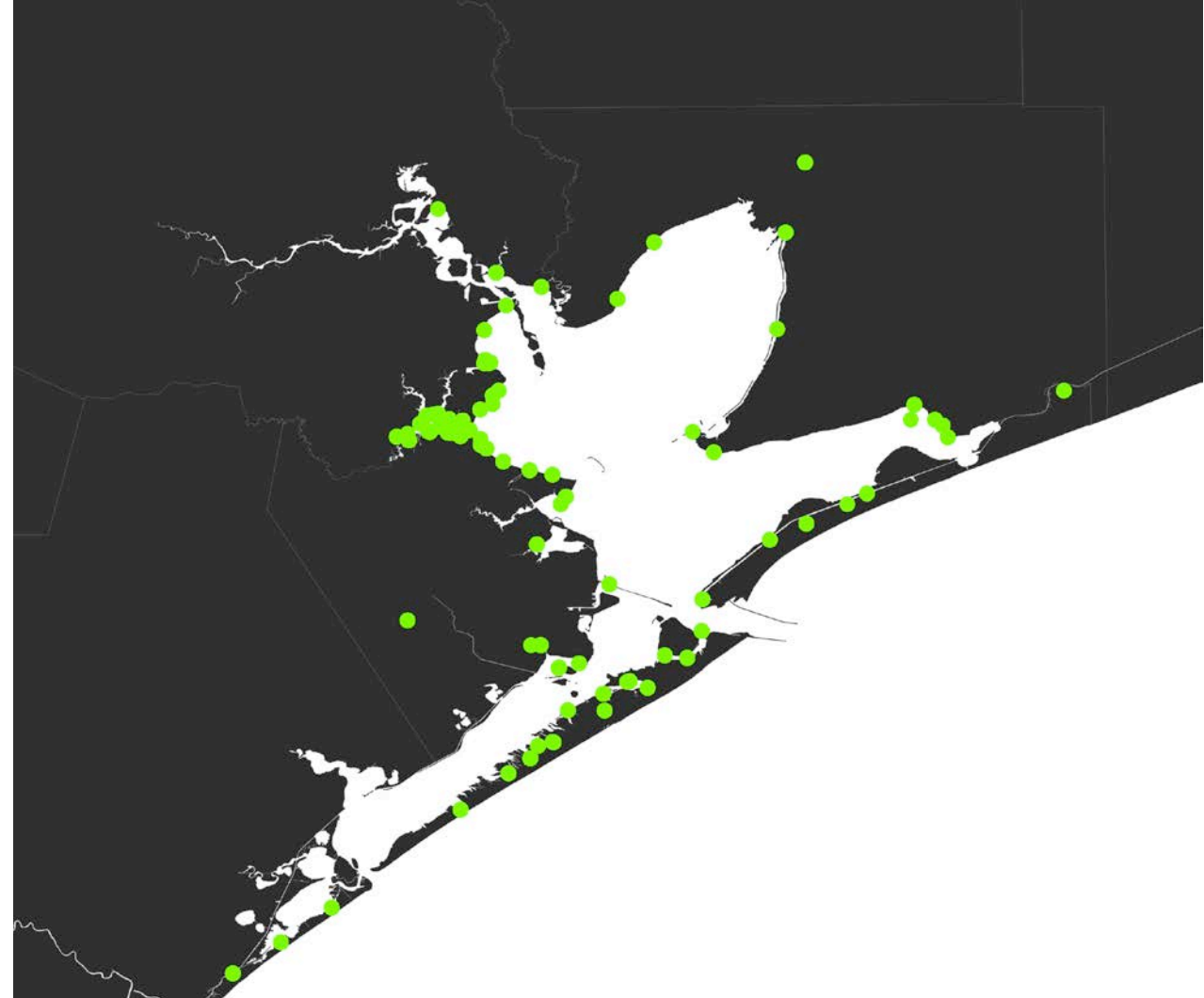
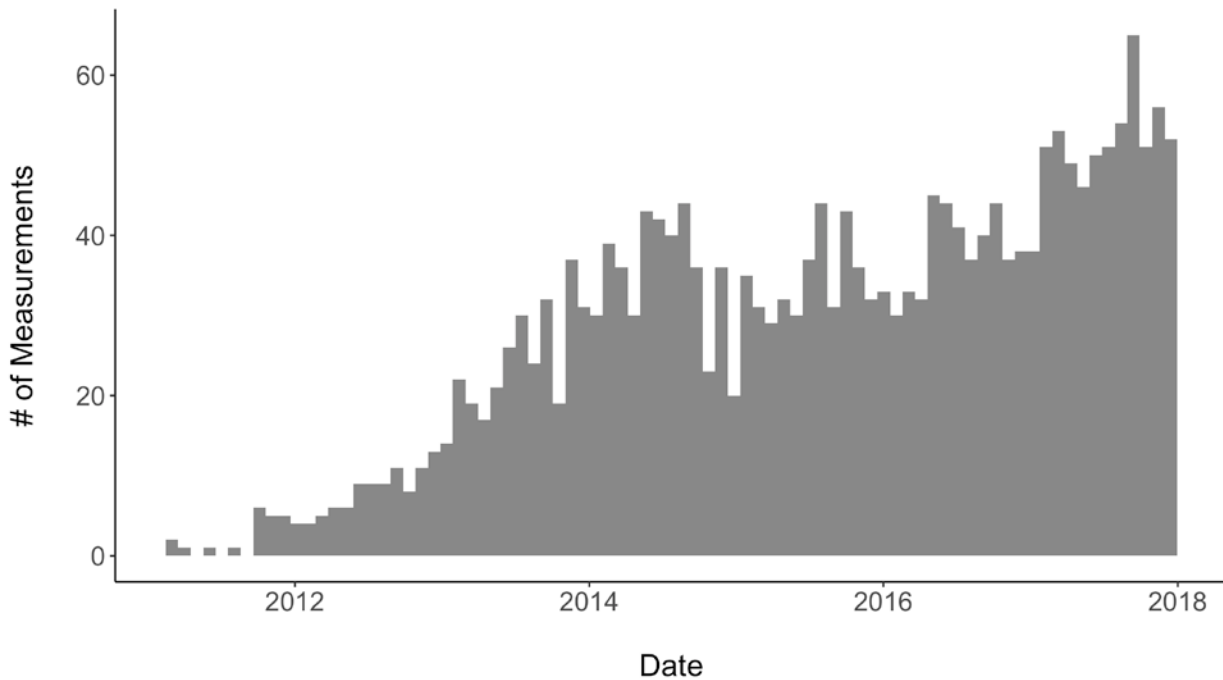


CONSERVE WATER

Every time we conserve water, our rivers maintain the flow levels to support a healthy Bay with the right salinity ranges for wildlife to thrive. Save water, save the Bay! Take the pledge to conserve today!

Water Monitoring Team Data Summary

- 78 sampling locations
- 7 years (2011 – 2017)



Why collect this data?

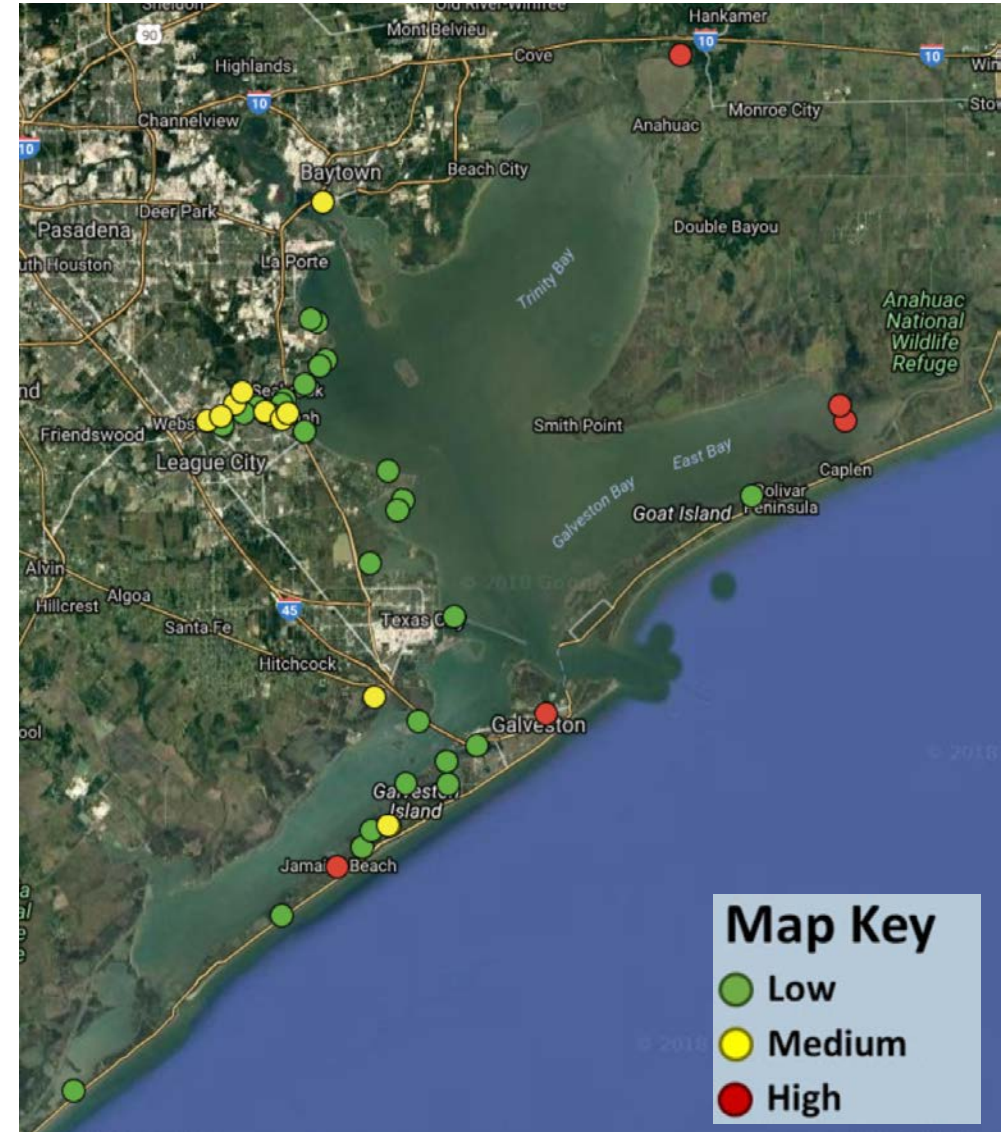
- We all interact with the Bay in one way or another
- Obtain a complete picture of the health of Galveston Bay
- Create baseline understanding of water quality patterns and trends
- Screen for potential problems
- Educate both local decision makers and the public on water quality concerns
- Inform community behavior and management practices around our region



Enterococcus vs Water Quality

- *Enterococcus* are a useful indicator bacteria of fecal contamination, particularly in brackish water
 - Source of infection for humans and wildlife
- Of the 78 sampling locations, 45 sampled for *Enterococcus*
 - Low: < 15 MPN (29 sites; 64.4%)
 - Medium: ≥ 15 and < 35 MPN (11 sites; 24.4%)
 - High: ≥ 35 MPN (5 sites; 11.1%)

*Sites classified as “High” are considered unsafe by the US EPA and TCEQ



Enterococcus vs Water Quality



Biggest Impact on
Enterococci:
RAINFALL

Dissolved Oxygen and Temperature also have minor
impact on Enterococci levels

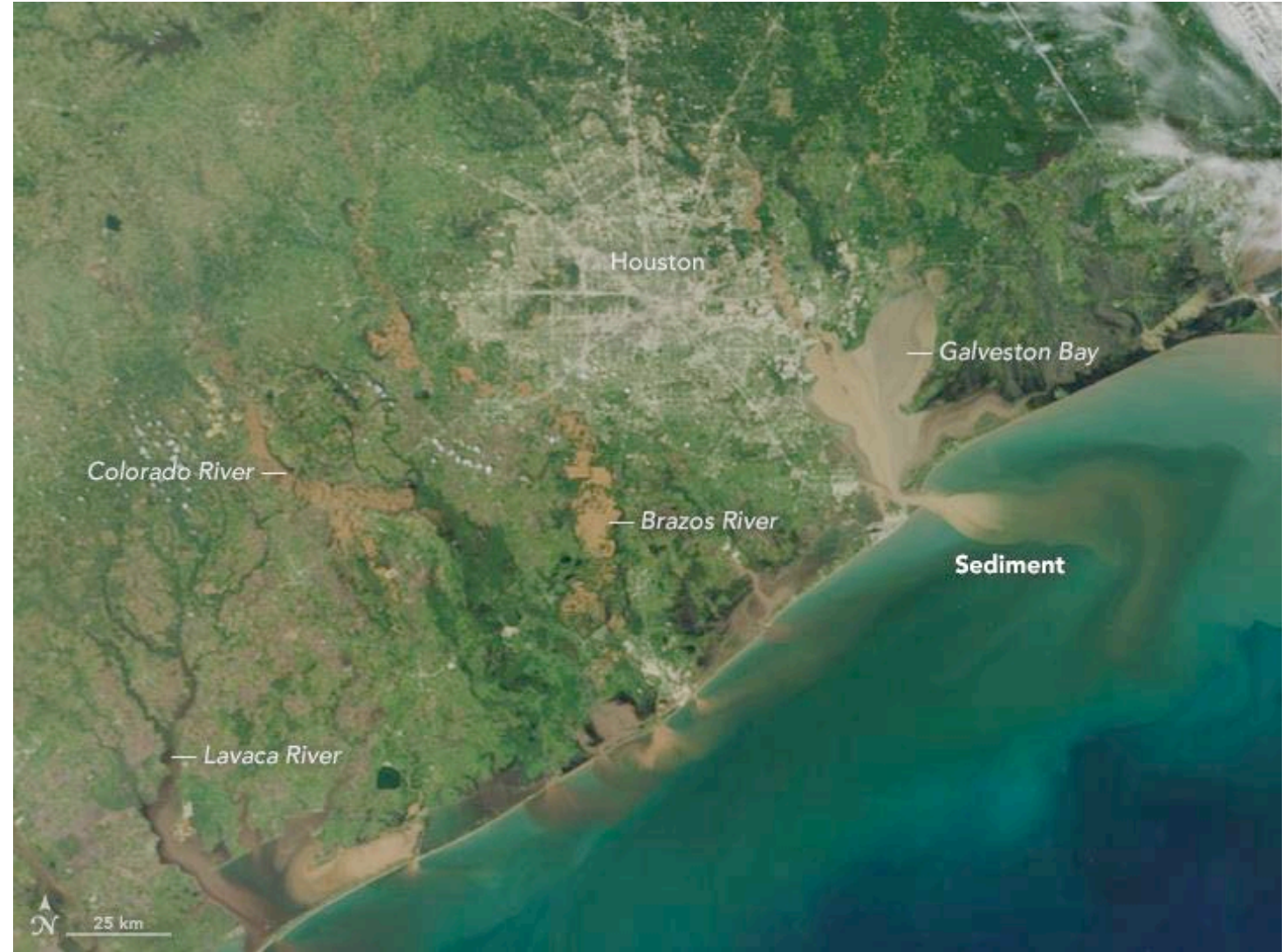
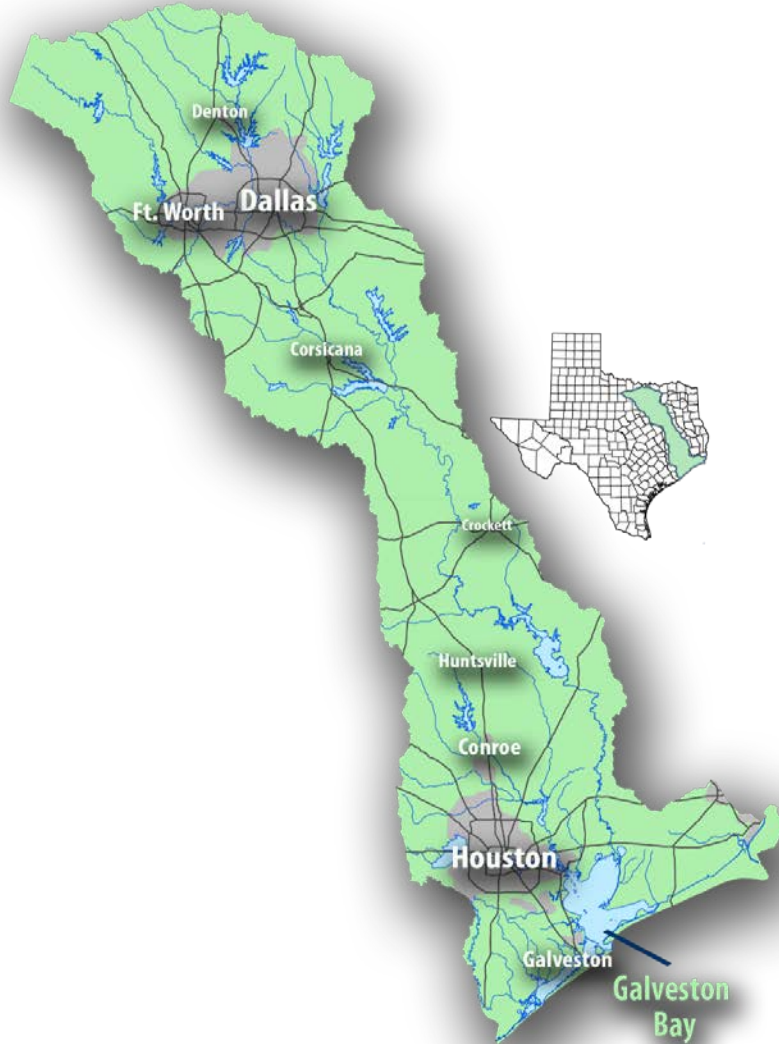
Higher bacteria concentrations
after heavy rainfall

Bacteria concentrations slightly
lower in summer

Lower bacteria concentrations
when DO levels decrease

What else can and should we learn from our data?

Watersheds and Runoff



How you can help!

5 WAYS YOU CAN HELP PROTECT WATER QUALITY IN GALVESTON BAY



USE A RAIN BARREL

Rain barrels reduce stormwater runoff, which carries bacteria into our waterways. One rain barrel can save 1,050 gallons per year. That's enough water to run your dishwasher 175 times!



BAG IT FOR YOUR BAY

There are enough dogs in the Houston-Galveston region to fill 52 dump trucks of poop every day. Pet waste is a major source of stormwater bacteria pollution. Pick up after your pooch!



CEASE THE GREASE

Over half of the sanitary sewer overflows in our region are caused by grease blockages. Throw kitchen grease in the trash and recycle your used cooking oil at an approved location.



REPORT POLLUTION

Download the Galveston Bay Action Network mobile app to instantly report any land or water pollution you see. Reports are automatically sent to the appropriate authority who can investigate and clean it up!



CONSERVE WATER

Every time we conserve water, our rivers maintain the flow levels to support a healthy Bay with the right salinity ranges for wildlife to thrive. Save water, save the Bay! Take the pledge to conserve today!

Use a Rain Barrel

\$35 for a barrel and connector kit

Upcoming workshops:

- June 3: Saint Arnold Rain Barrel Workshop
- July 14: Baytown Rain Barrel Workshop
- August 11: Galveston Rain Barrel

Register online at galvbay.org/rainbarrel



Bag It For Your Bay

TAKE THE PLEDGE

**I pledge to throw my dog's
waste away,
not to leave it for another day.**

**I will not leave it in the rain,
I will not put it down the drain.**

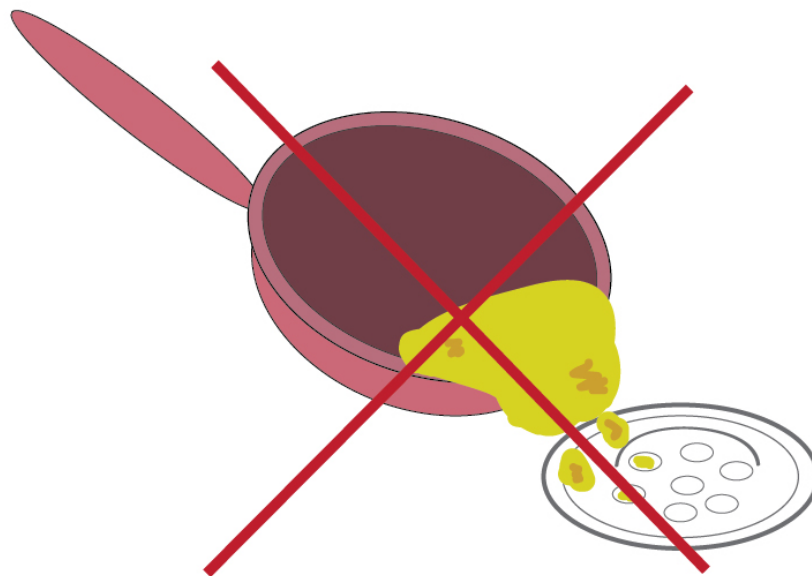
**To the can I'll make a dash,
to put it with the other trash!**



**GALVESTON BAY
FOUNDATION**

Cease the Grease

MYTH: Pouring a little bit of grease down the drain won't hurt.



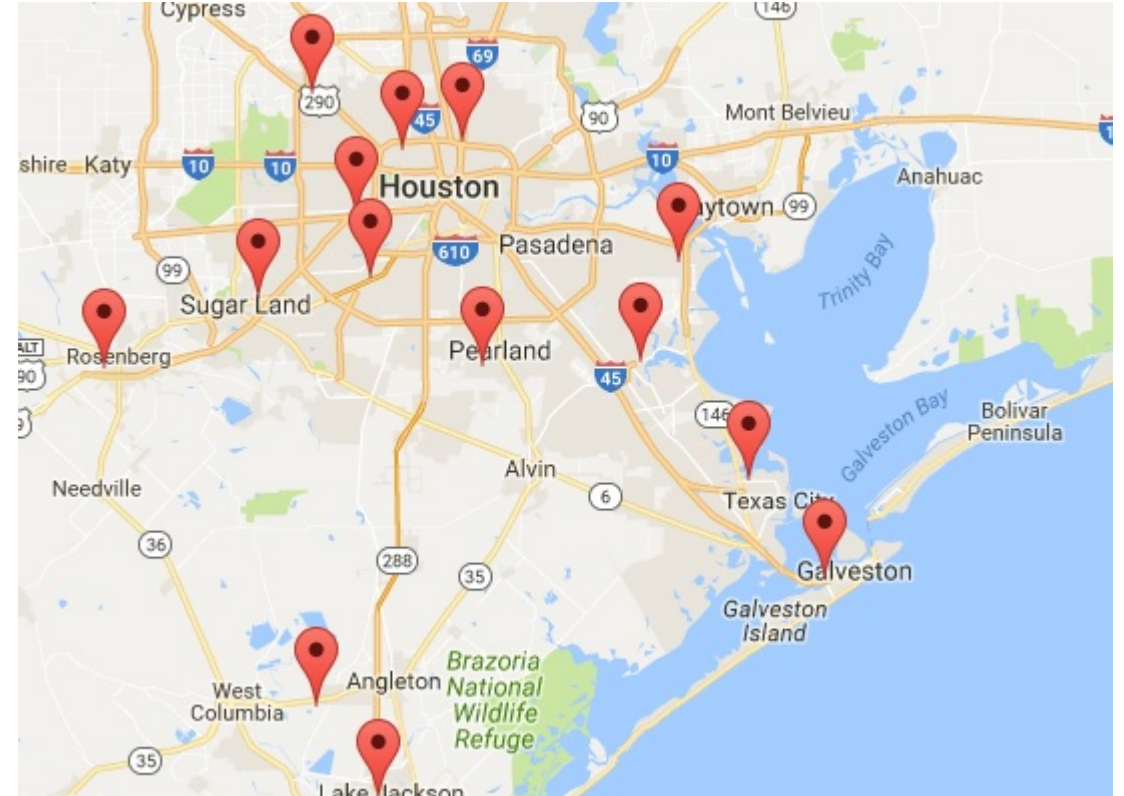
FACT: Little amounts of grease add up and cause a BIG problem in our pipes.



Cease the Grease

Always throw your cooking waste, such as fats, oils, and grease, in the trash – never down the drain!

Use a scraper to clean your pans or plates off into your garbage can. Use a funnel to pour your oil back into a container to be recycled, or your grease into a jar to save for later (or to throw out).

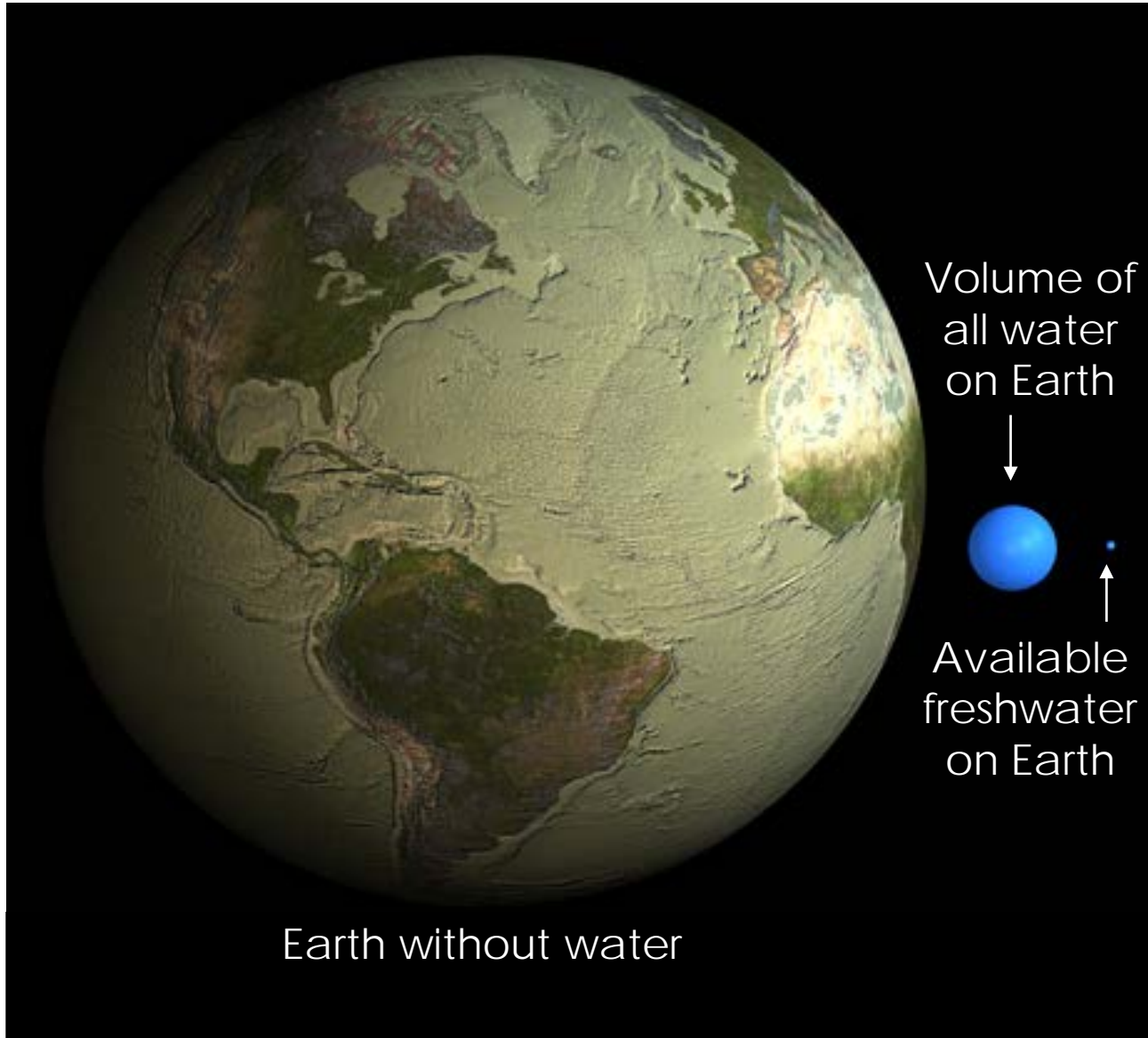


Visit ceasethegrease.net to find a cooking oil recycling station near you!

Report Pollution



Conserve Water



Only **3%** of Earth's water is **freshwater**.

Less than **1%** of the world's freshwater is **accessible for all life on Earth**.

Conserve Water



Our Bay and its wildlife need water too!

Conserve Water



SAVE WATER.
SAVE THE BAY.

**GALVESTON BAY
WATER BRIGADE**



TAKE THE PLEDGE

For resources, ideas, tips, and to take the pledge, visit gbwb.org

Questions?



GALVESTON BAY
FOUNDATION

waterquality@galvbay.org

Thank you!



GALVESTON BAY
FOUNDATION

waterquality@galvbay.org