



Unified Water Study: Sound-Wide Embayment Monitoring

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Save the Sound[®]

Action for our region's environment.

Save the Sound is a leader in environmental action in the Long Island Sound region. We fight climate change, save endangered lands, protect the Sound and its rivers, and work with nature to restore ecosystems



Discussion Overview

1. Unified Water Study

2. Data to Action

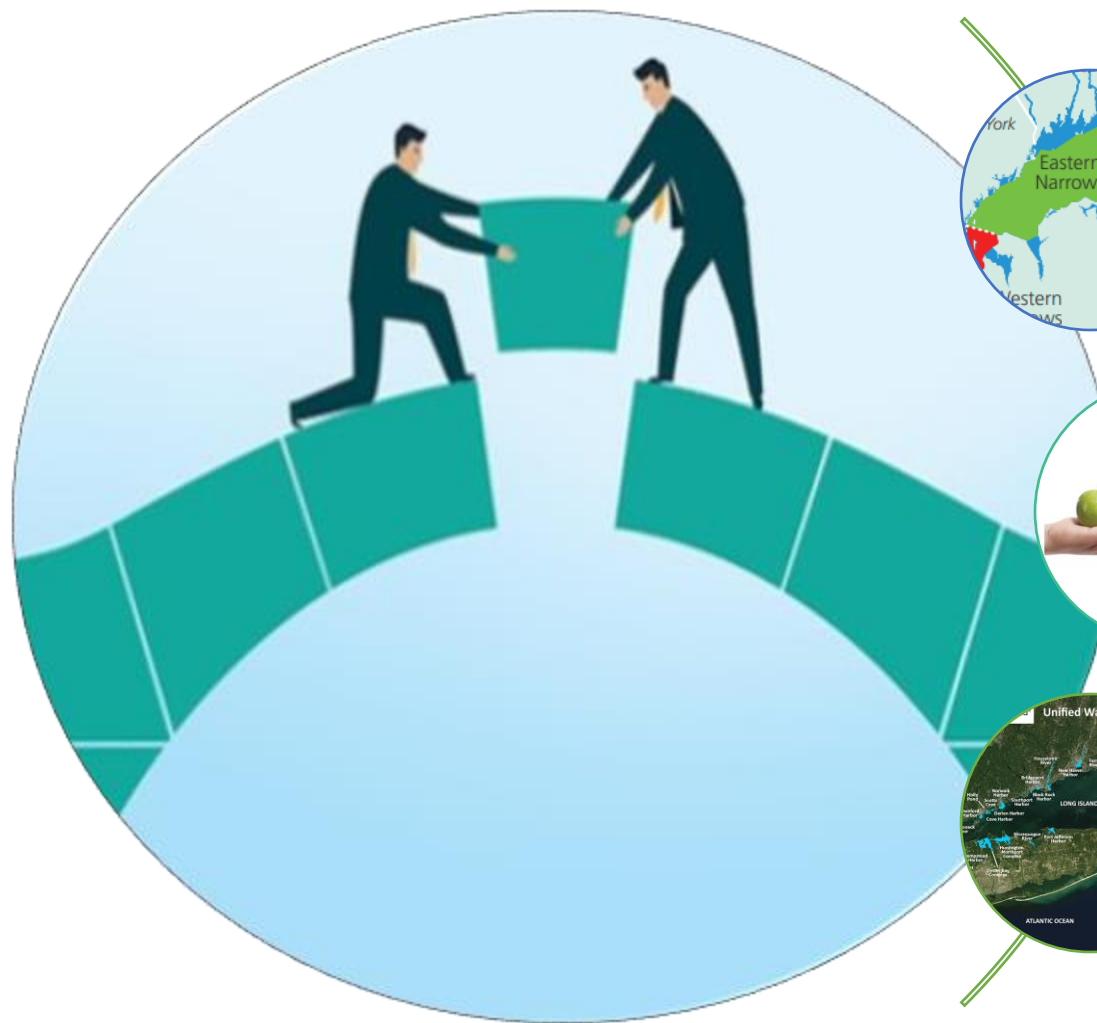
3. Discussion



STS staff conducting water quality sampling at sunrise in New Rochelle Harbor, NY



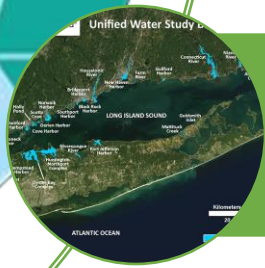
Unified Water Study (UWS) – Filling in the Gaps



Abundance of data existed for LIS open waters, but not bays & harbors



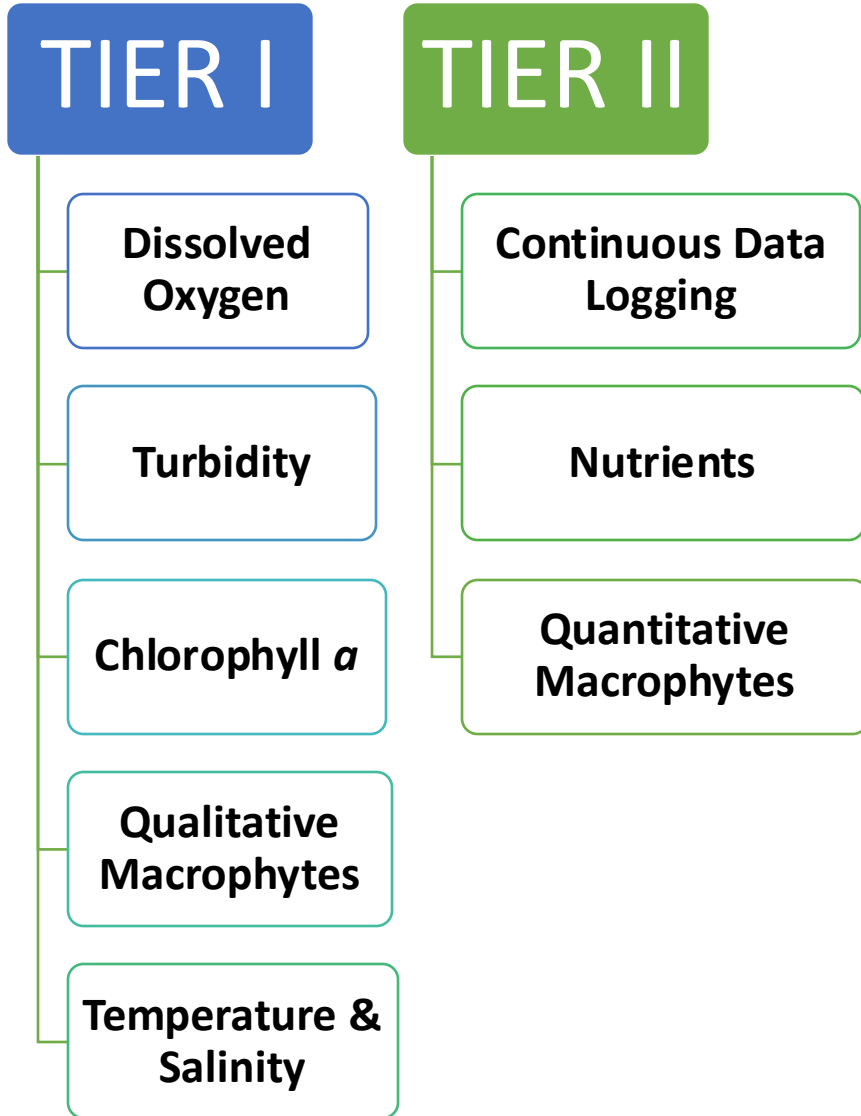
UWS provides comparable environmental health data around the margins of LIS



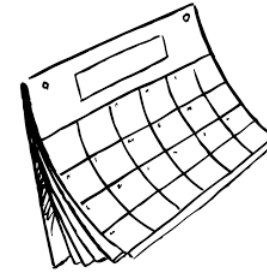
27 groups monitoring in 2024



Unified Water Study



**6 Month Monitoring Season:
May – October**



**Conducted in compliance with an EPA-
Approved Quality Assurance Project Plan**





Unified Water Study



46

Tier I Embayments

14

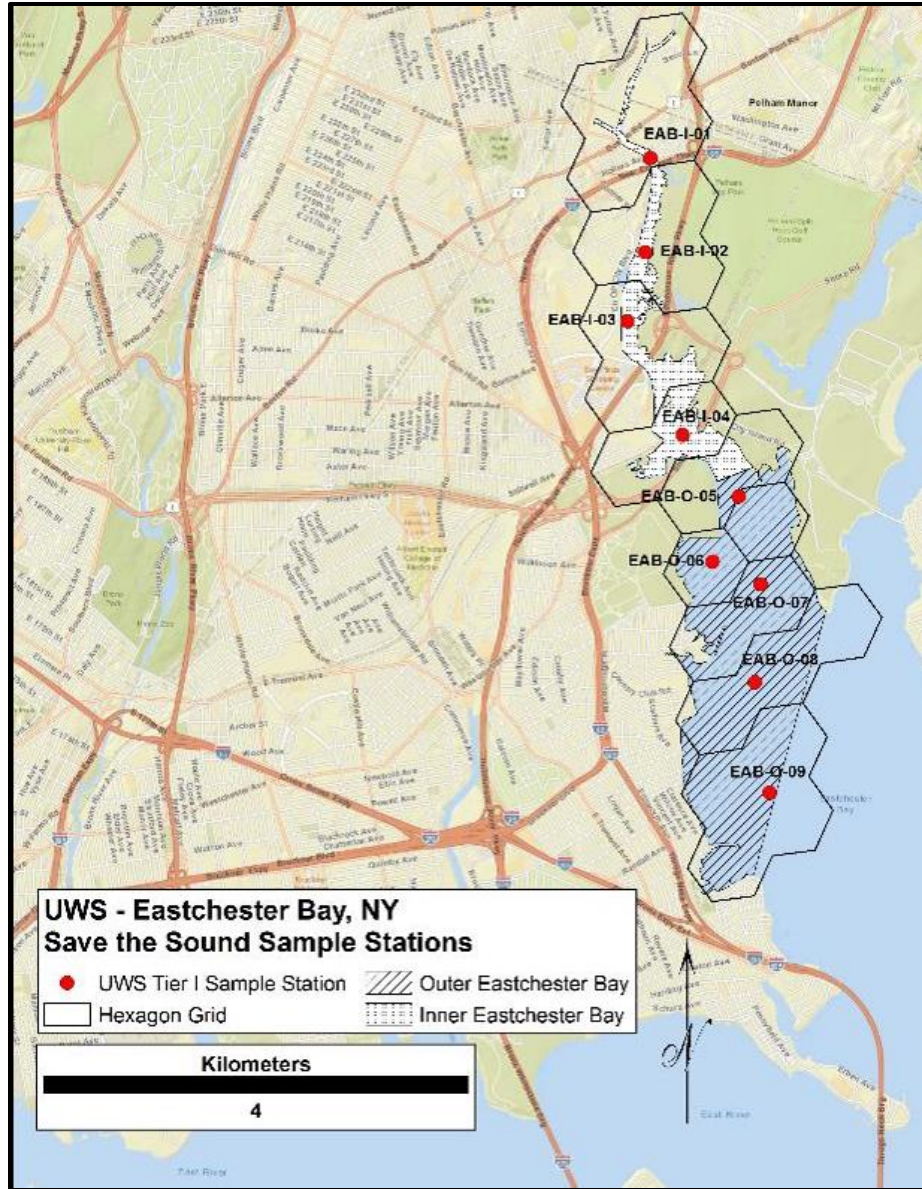
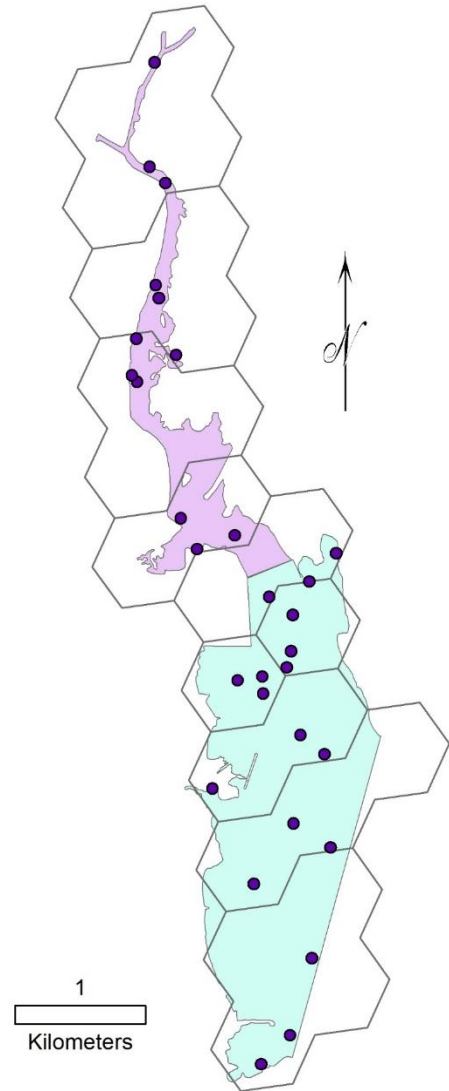
Tier II Embayments

273

Tier I Stations



Unified Water Study



- ❖ 0.42 km² hexagon grid
- ❖ Random stations
- ❖ 4 Tier I WQ stations minimum
- ❖ 3 stations per segment



Unified Water Study

❖ Trainings & Online Module Refreshers

❖ Field Audits during First Two Months of Season; Technical Support



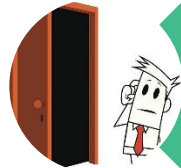


Unified Water Study

Includes all necessary Equipment,
Supplies, and Expendables



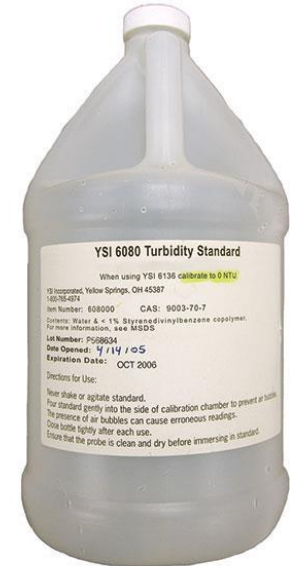
Lowers Study Expenses



Eases Group Entry
Process

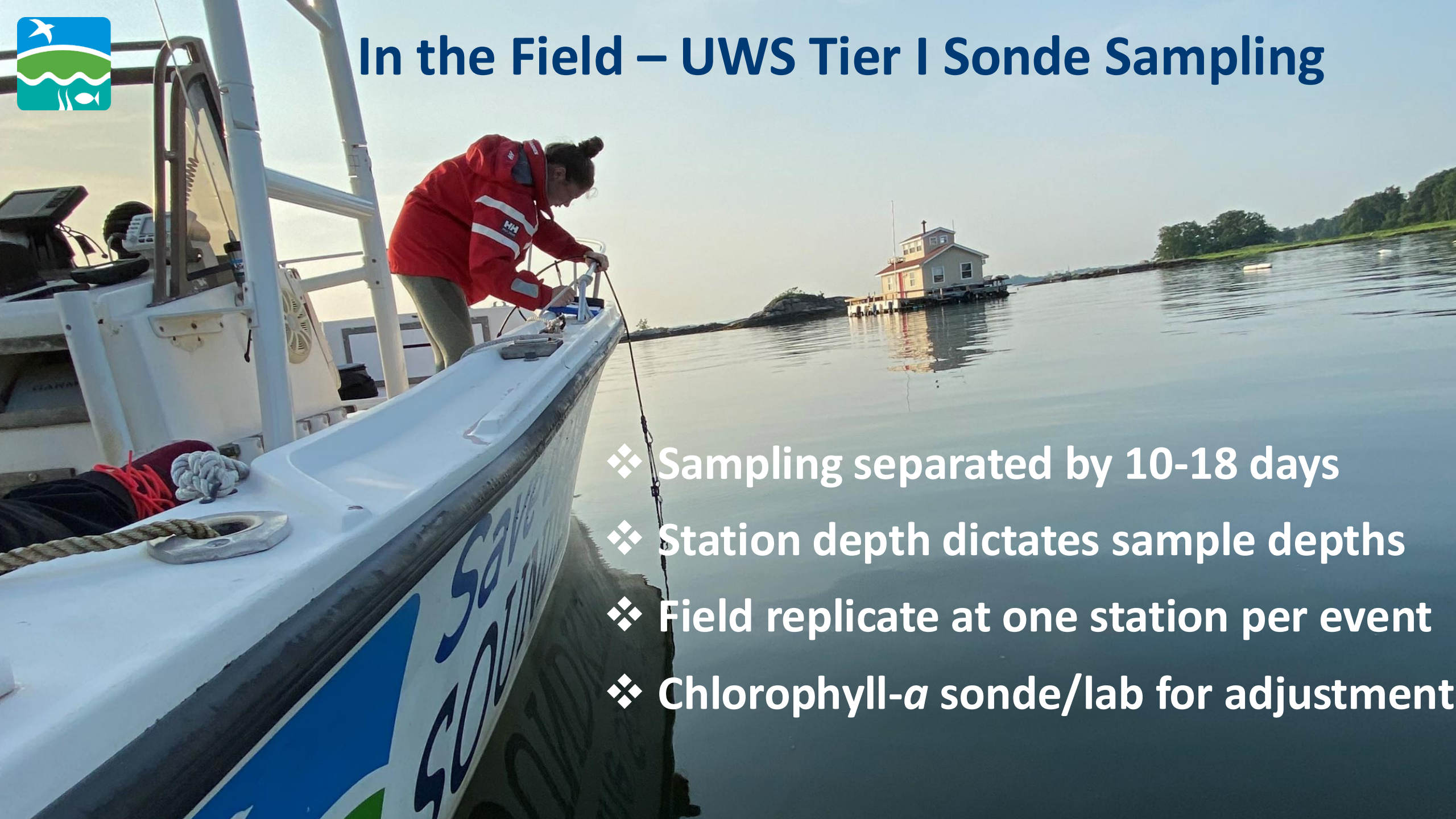


Enhances Data
Comparability





In the Field – UWS Tier I Sonde Sampling

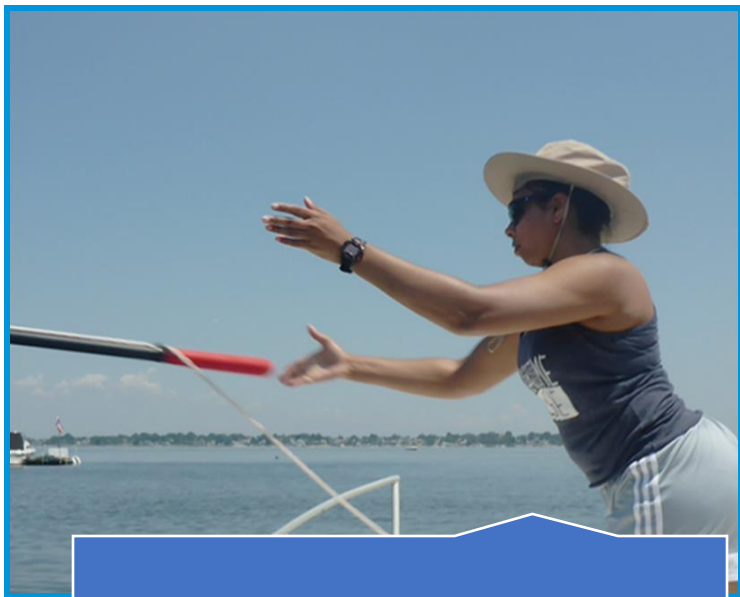


- ❖ Sampling separated by 10-18 days
- ❖ Station depth dictates sample depths
- ❖ Field replicate at one station per event
- ❖ Chlorophyll-*a* sonde/lab for adjustment

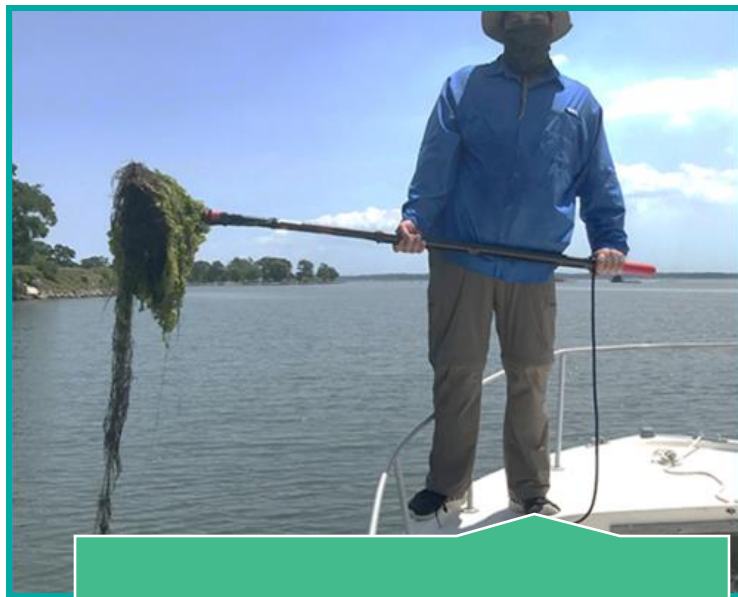


In the Field – UWS Tier I

Qualitative Macrophytes (None, Some, Lots)



3 Sampling Events



July 15 – August 7



3-7 stations per embayment



In the Field – UWS Tier II

Surface
Nutrients

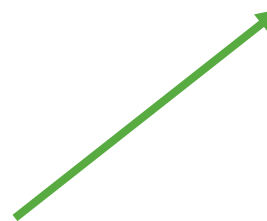


Subset of
Tier I WQ
stations

Twice a
month,
May-Oct



+ tributary station(s)





John & Daria Barry Foundation Laboratory

- Est. Dec 2021
- Laboratory Manager: Elena Colón
- Laboratory Technician: Lindsay Potts

- Pathogen Indicator Bacteria
- Chlorophyll-*a*
- Total Suspended Solids (TSS)
- Harmful Algal Blooms (HABs)
- Nutrients





UWS Nutrients

- ❖ 2400+ samples
- ❖ SEAL AQ400
Discrete Analyzer
- ❖ NYSDOH ELAP
Audit completed

Ammonia

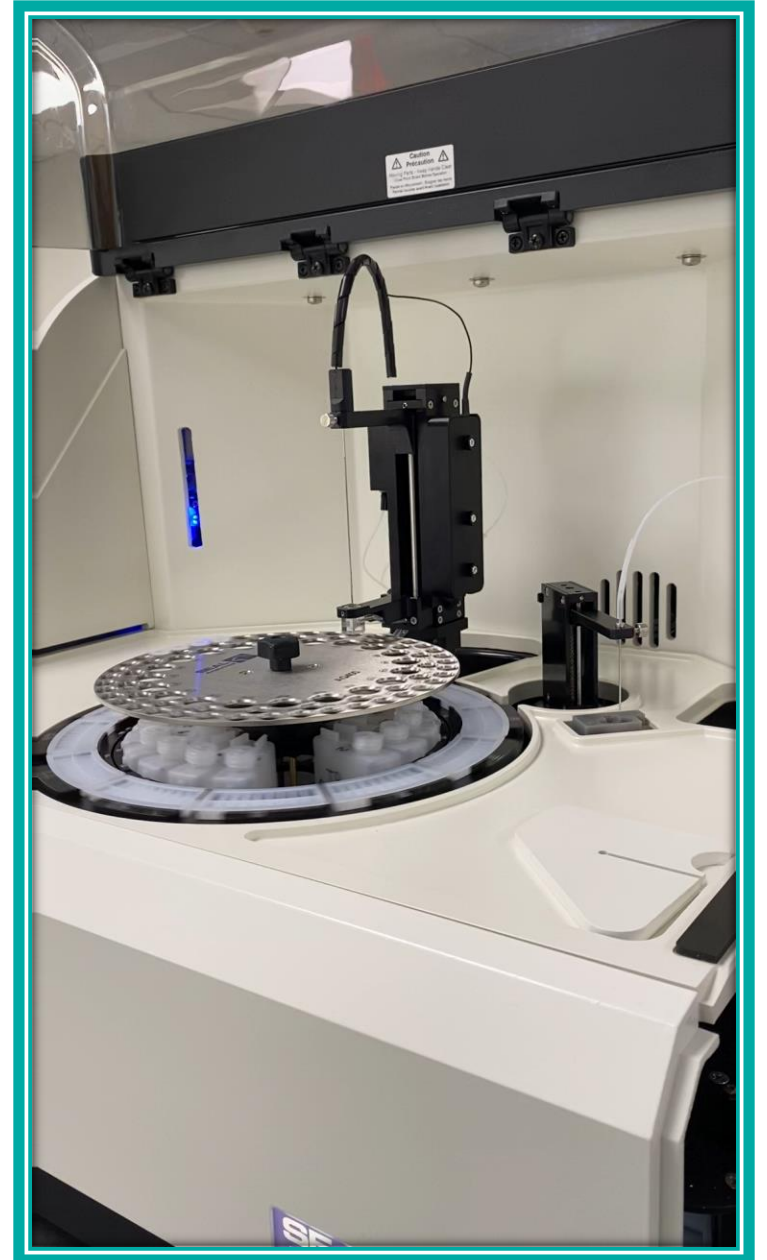
Nitrite

Nitrate-Nitrite

ortho-Phosphate

Total Nitrogen

Total Phosphorous





In the Field – UWS Tier II

Continuous Data Loggers

- Dissolved Oxygen
- Salinity
- Temperature
- Barometric Pressure
- Light



May-Oct.
One station per segment
0.5 meters off bottom





In the Field – UWS Tier II



Quantitative Macrophytes

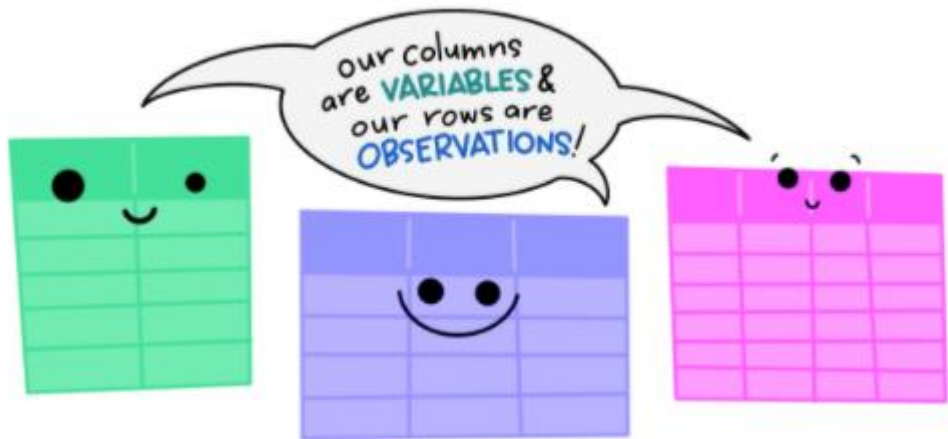
Completed once per season, per embayment

Water quality and rake toss stations

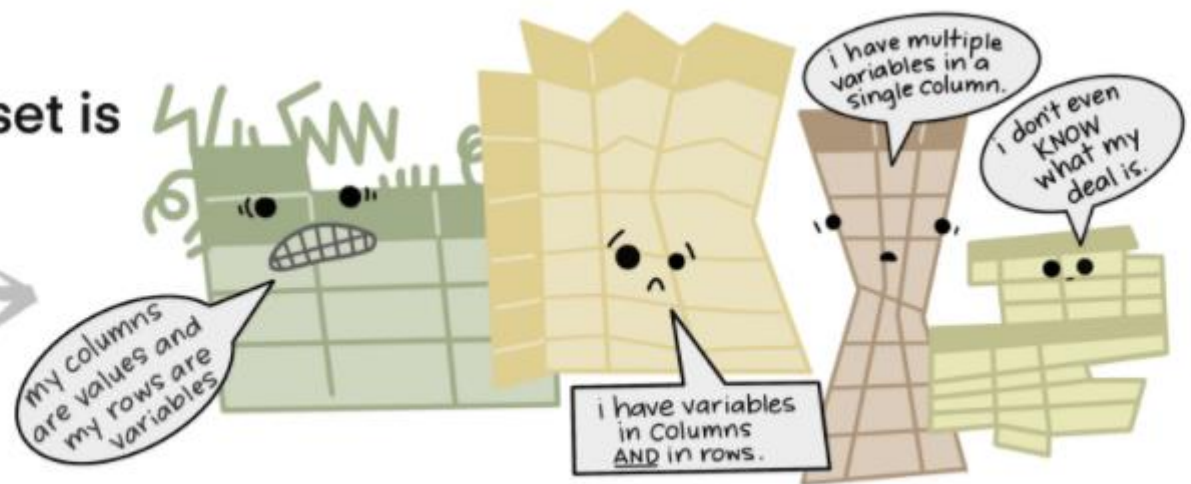


Field to the Screen

The standard structure of tidy data means that "tidy datasets are all alike..."



"...but every messy dataset is messy in its own way."
-HADLEY WICKHAM





Data to Action: Submissions



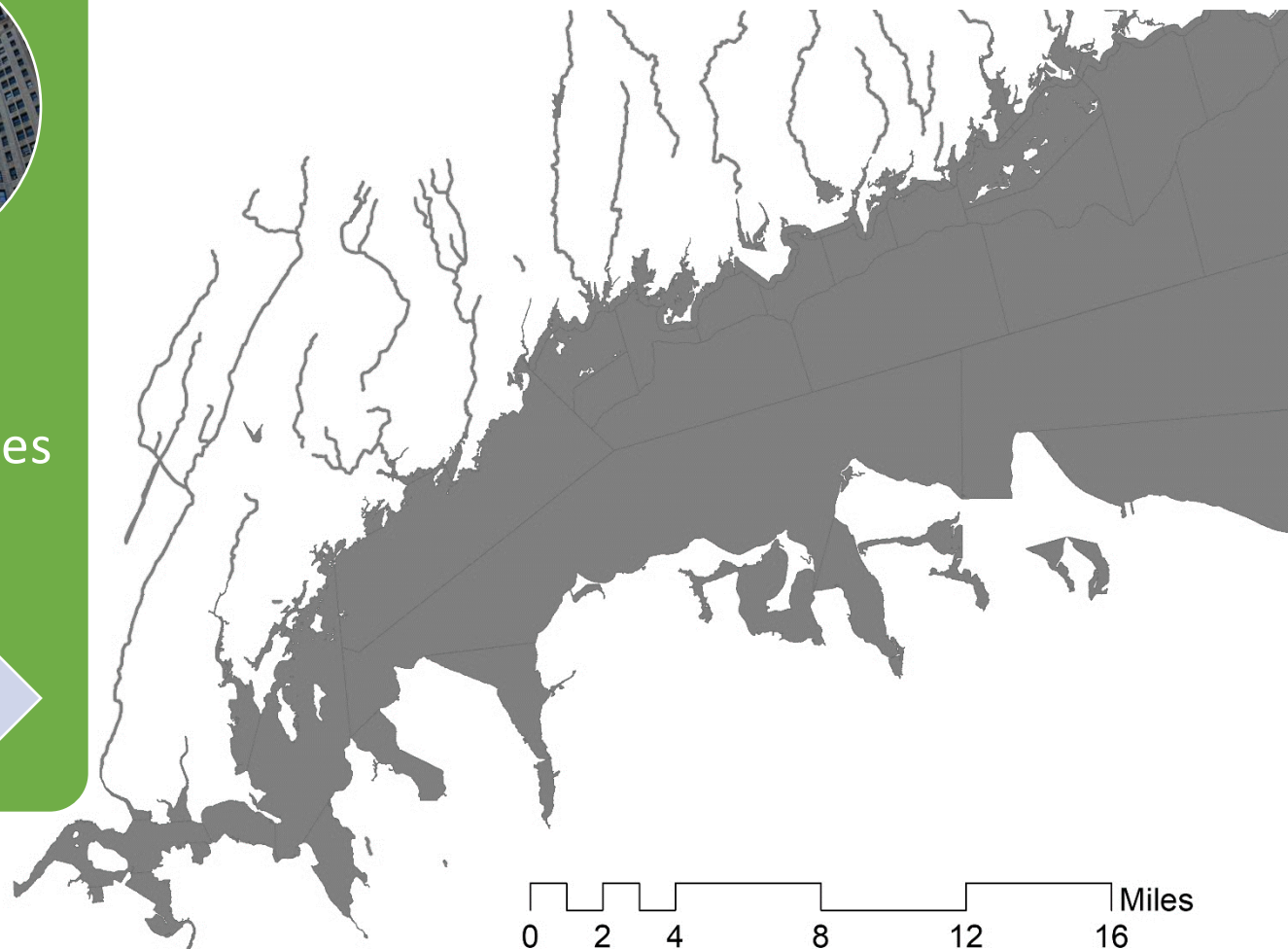
EPA



CTDEEP,
NYCDEP,
NYSDEC

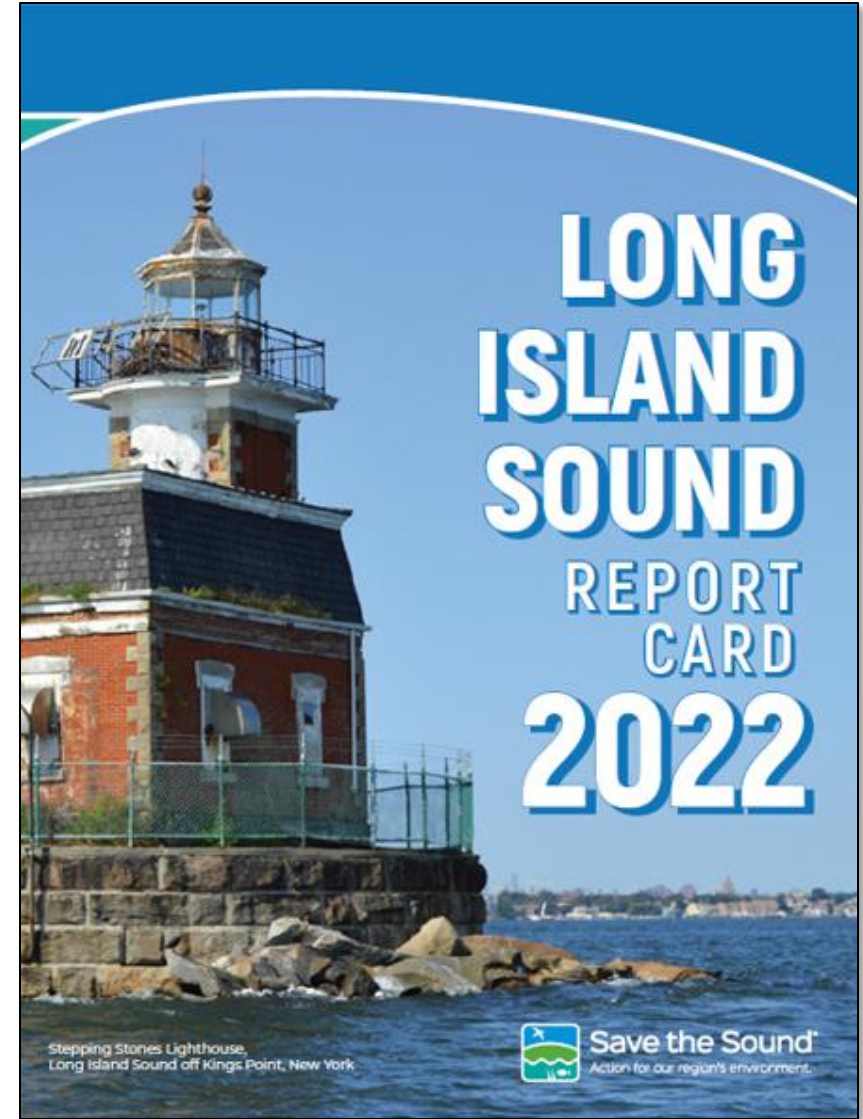
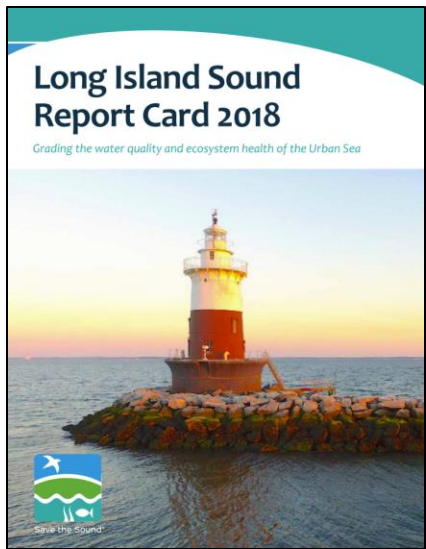
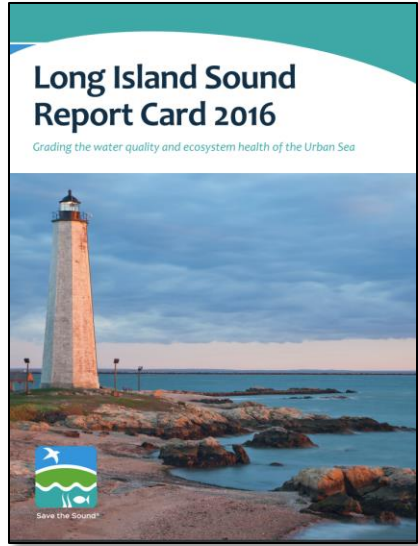


Municipalities





Long Island Sound Report Card

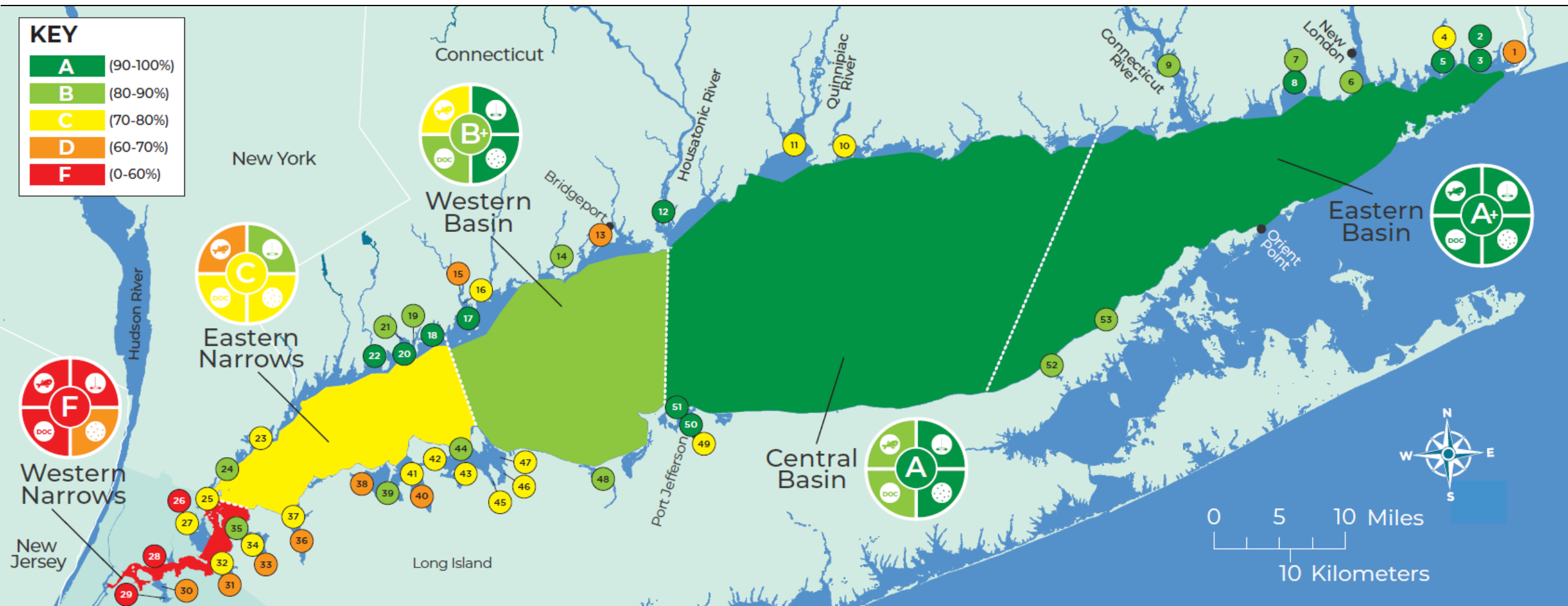




2022 Long Island Sound Report Card

KEY

A	(90-100%)
B	(80-90%)
C	(70-80%)
D	(60-70%)
F	(0-60%)





Data to Action: Submissions

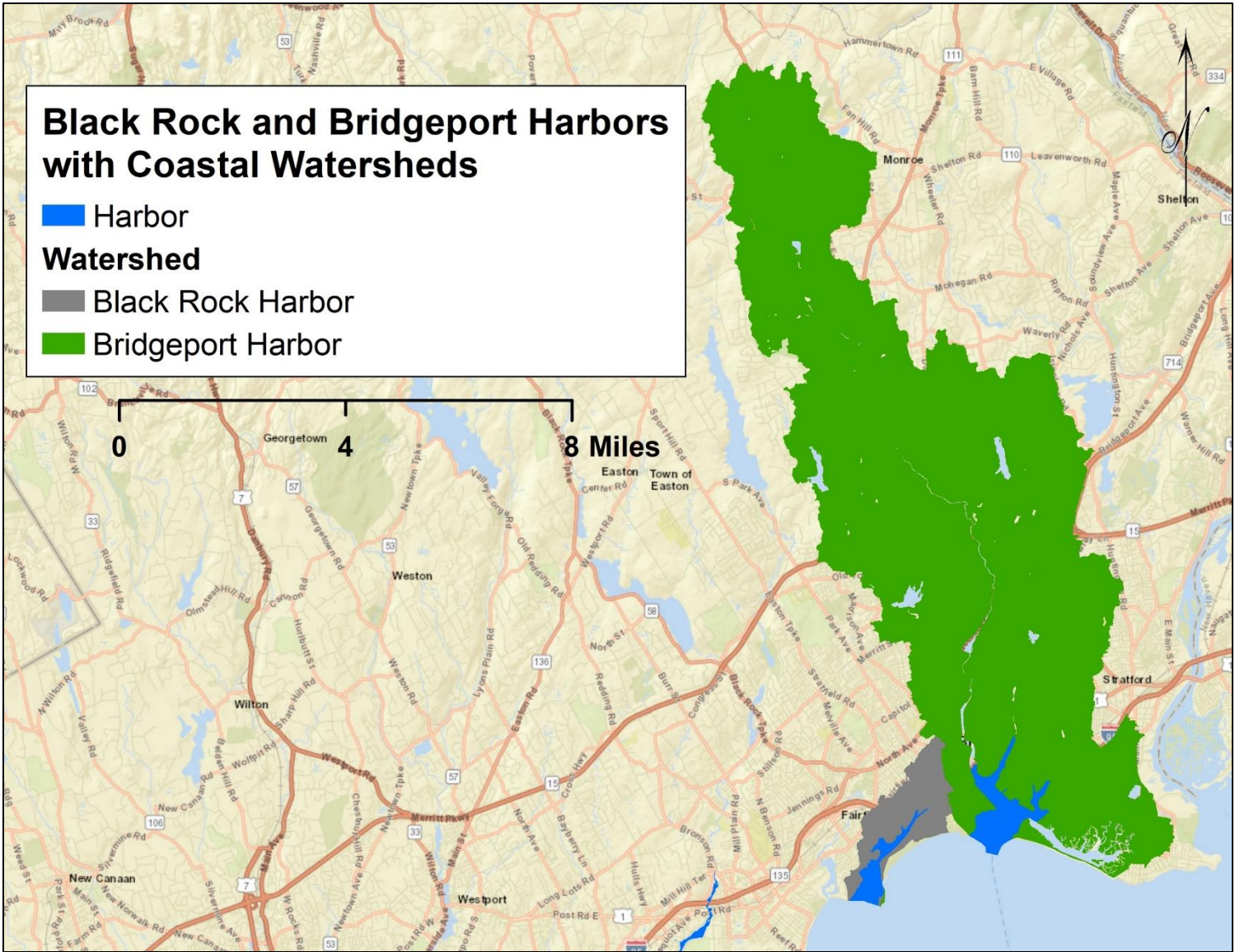


<https://www.britannica.com/topic/Senate-United-States-government>

**Report Card referenced
by CT Senators in
support of increasing
federal funding for LIS**



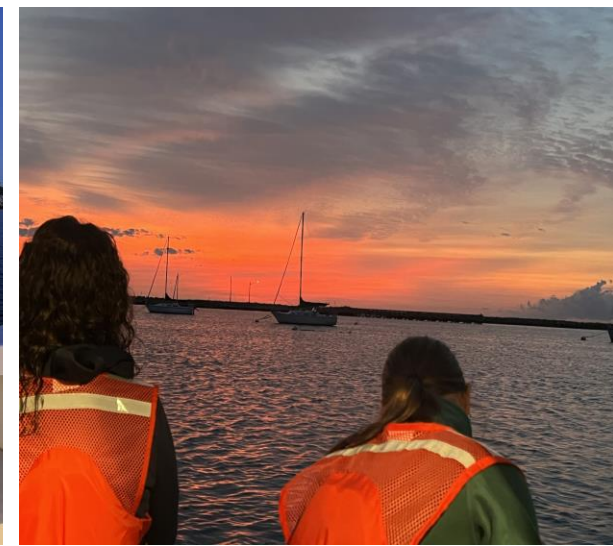
Data to Action: Local Discussions



**Excess nitrogen
in many LIS bays
and harbors**

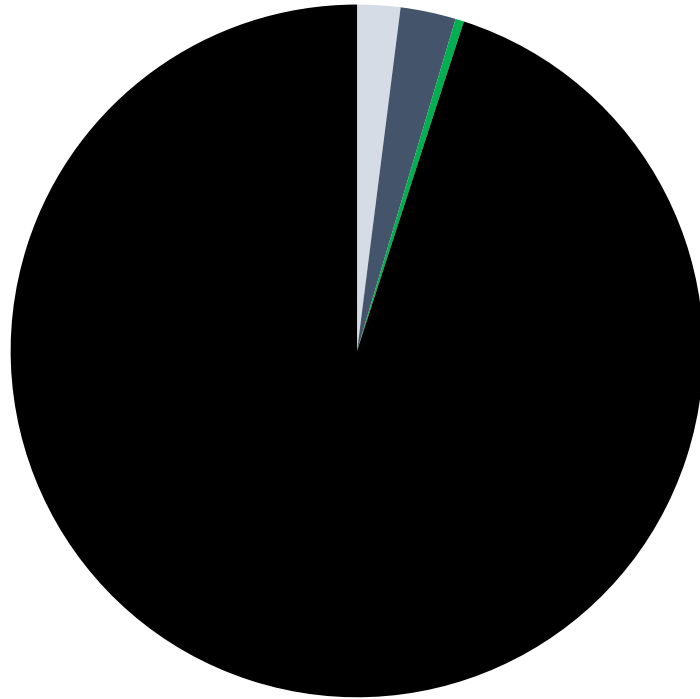


BRASTEC and Ash Creek Conservation Association



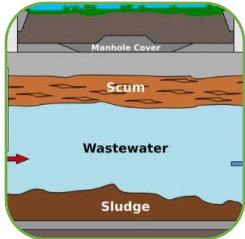


Data to Action: Local Discussions



- Atmospheric Deposition to Embayment
- Atmospheric Deposition to Watershed
- Fertilizer
- Sewer
- Septic

Black Rock Harbor Nitrogen Load Modeling



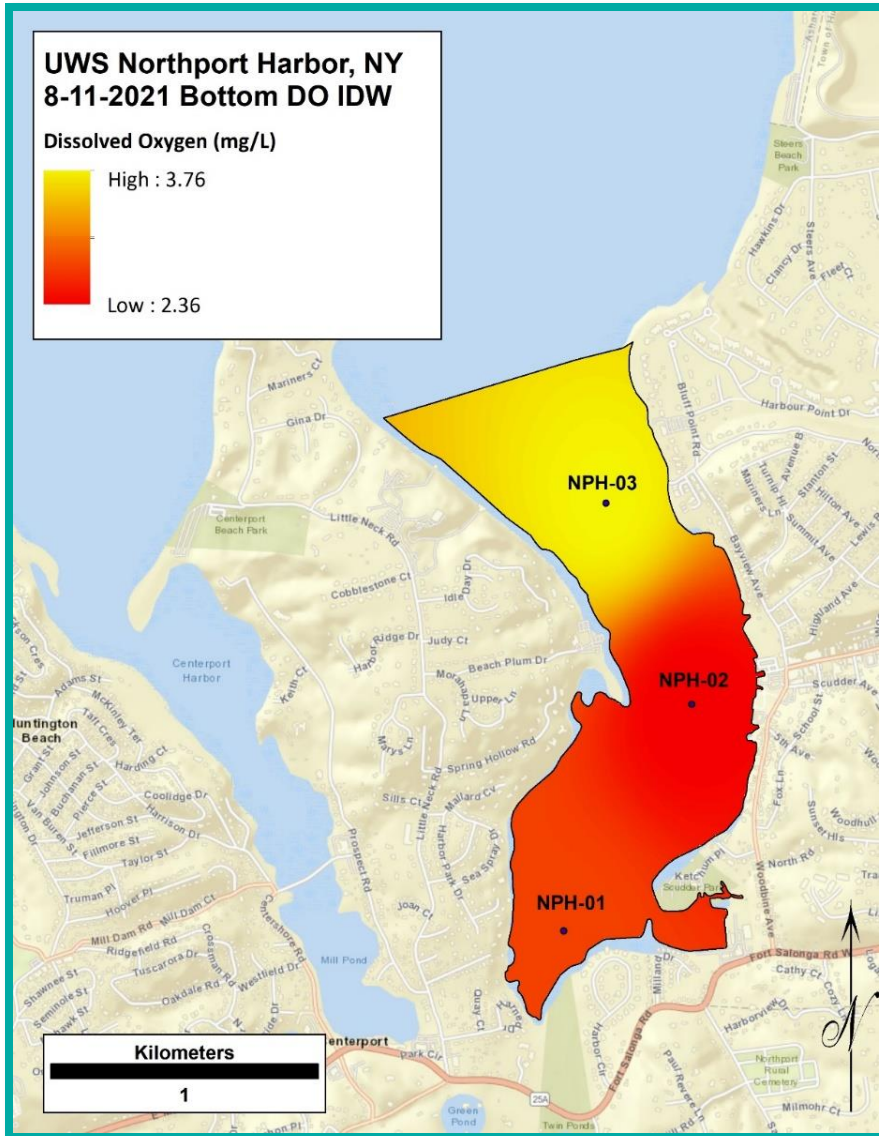
>90% from Sewer Input



Reduce sources to improve water quality



Data to Action: Local Discussions



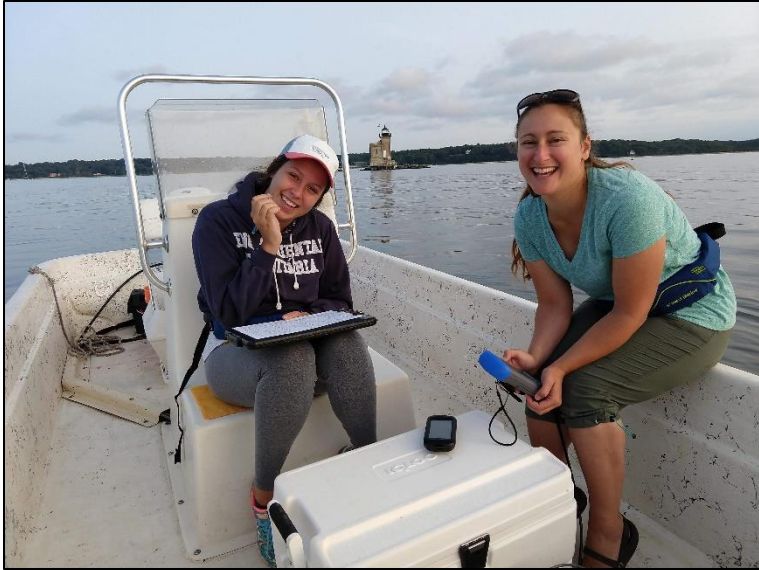
Hypoxia up to and around station NPH-02

Low Dissolved Oxygen up to boundary



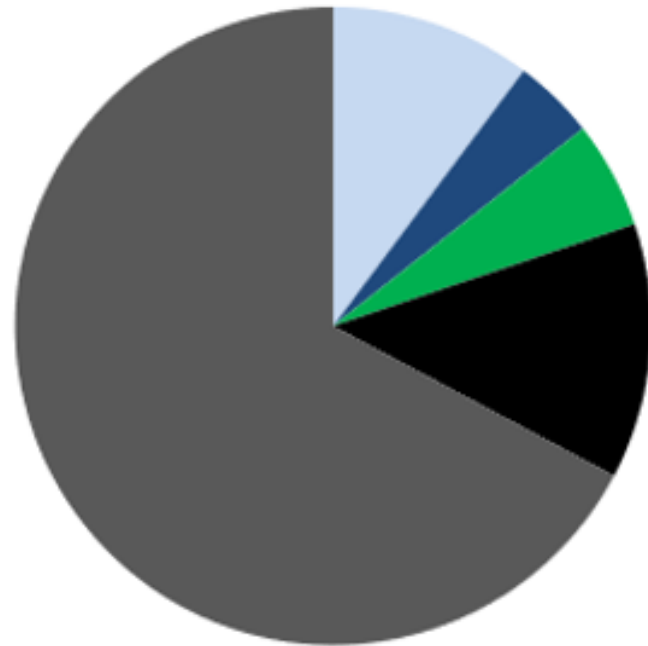
Cornell Cooperative Extension
Marine Program

Thank You Cornell Cooperative Extension!



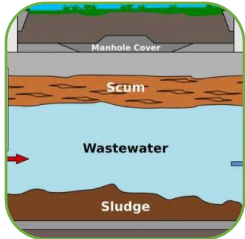


Data to Action: Local Discussions



- Atmospheric Deposition to Embayment
- Atmospheric Deposition to Watershed
- Fertilizer
- Sewer
- Septic

Northport Harbor Nitrogen Load Modeling



67% from septic systems



Reduce source to improve water quality



Thank you!
plinderoth@savethesound.org

