USGS Monitoring Capabilities for the Mid-Peconic Estuary

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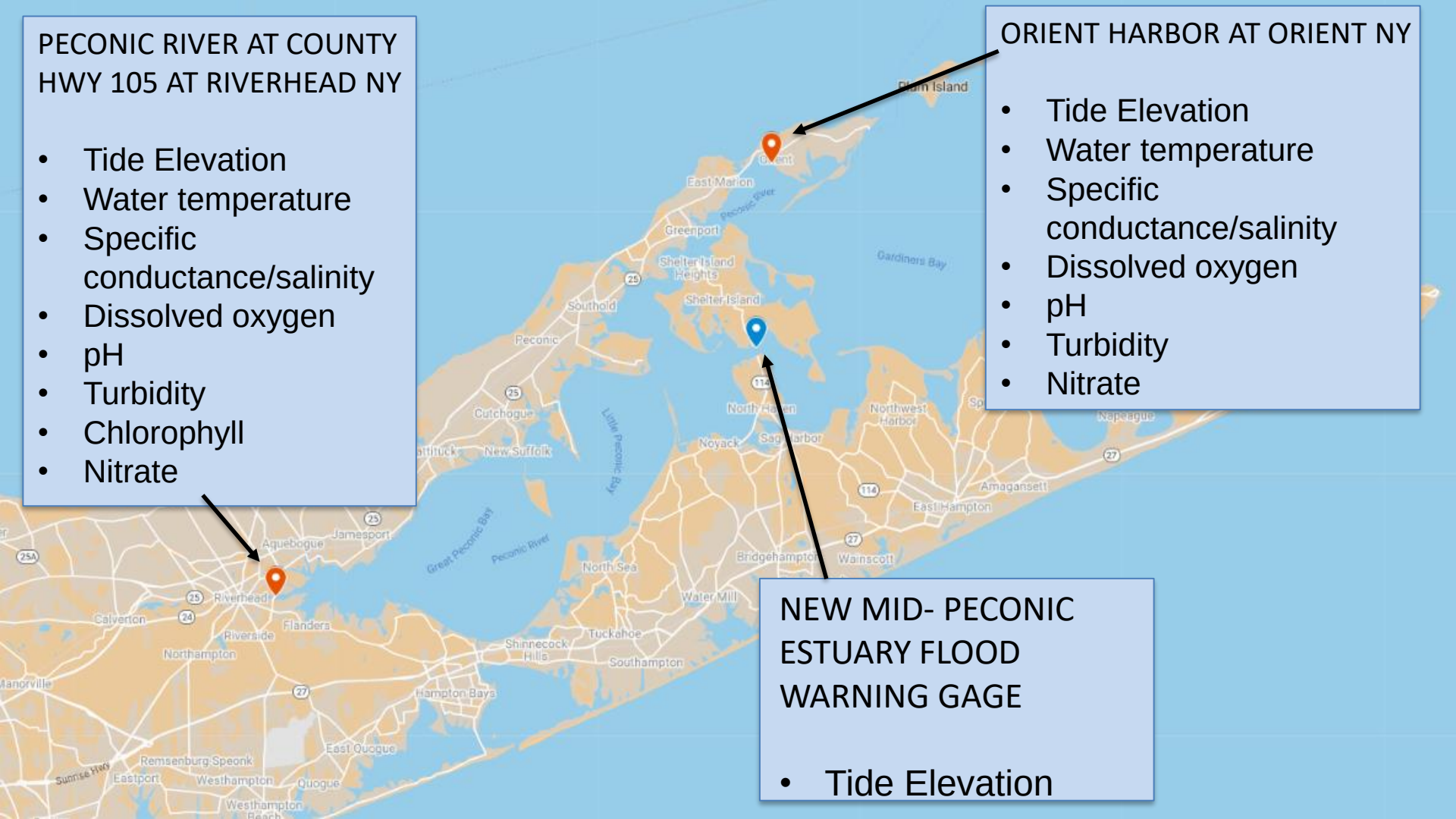
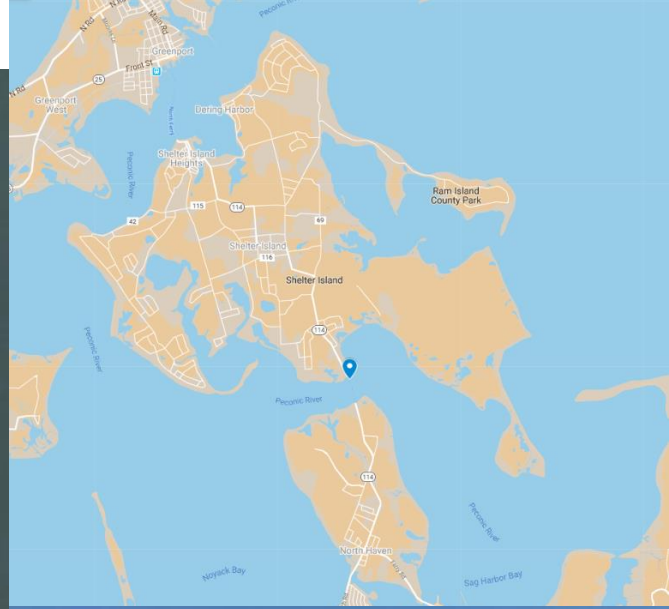

PECONIC RIVER AT COUNTY HWY 105 AT RIVERHEAD NY
• Tide Elevation
• Water temperature
• Specific conductance/salinity
• Dissolved oxygen
• pH
• Turbidity
• Chlorophyll
• Nitrate
ORIENT HARBOR AT ORIENT NY
• Tide Elevation
• Water temperature
• Specific conductance/salinity
• Dissolved oxygen
• pH
• Turbidity
• Nitrate
NEW MID- PECONIC ESTUARY FLOOD WARNING GAGE
• Tide Elevation
Plum Island
Orient
East Marion
Greenport
Shelter Island Heights
Shelter Island
Gardiners Bay
Southold
Peconic
Cutchogue
New Suffolk
Little Peconic Bay
North Haven
Noyack
Sag Harbor
Northwest Harbor
Napeague
Amagansett
East Hampton
Aquebogue
Jamesport
Great Peconic Bay
Peconic River
Riverhead
Calverton
Flanders
Riverside
Northampton
North Sea
Bridgehampton
Wainscott
Water Mill
Tuckahoe
Shinnecock Hills
Southampton
Hampton Bays
Manorville
Remsenburg-Speonk
Eastport
Westhampton
Quogue
East Quogue
Westhampton Beach


114
South Ferry
114
South Ferry C
SLAVE STATION
Slave SDI Module Mounted on Pole Collecting Data from CONSTANT FLOW BUBBLER & Transmitting to Master Station
Multiple Sensors per Slave Station
Multiple Slave Stations per Master Station
Up to 1 Mile
MASTER SDI MODULE STATION
SatLink2 Water Level Station Connected to Radar Level Recorder, Receiving Data from 2 Slaves & Transmitting Data to Headquarters & Internet via GOES.
SLAVE STATION
Slave SDI Module Collecting Data from RAIN GAGE & PRESSURE SENSOR then Transmitting to Master Station
F1S
Polarization Ridges (facing vertical surfaces)
>200 m m (7.87")
>0.5m (1.6ft) Unobstructed View
90°


Greenport
Greenport West
Front St
Boring Harbor
Shelter Island Heights
Ram Island County Park
Shelter Island
Peconic River
North Haven
Noyack Bay
Sag Harbor Bay


STAND BACK 4 FEET
DANGER ZONE

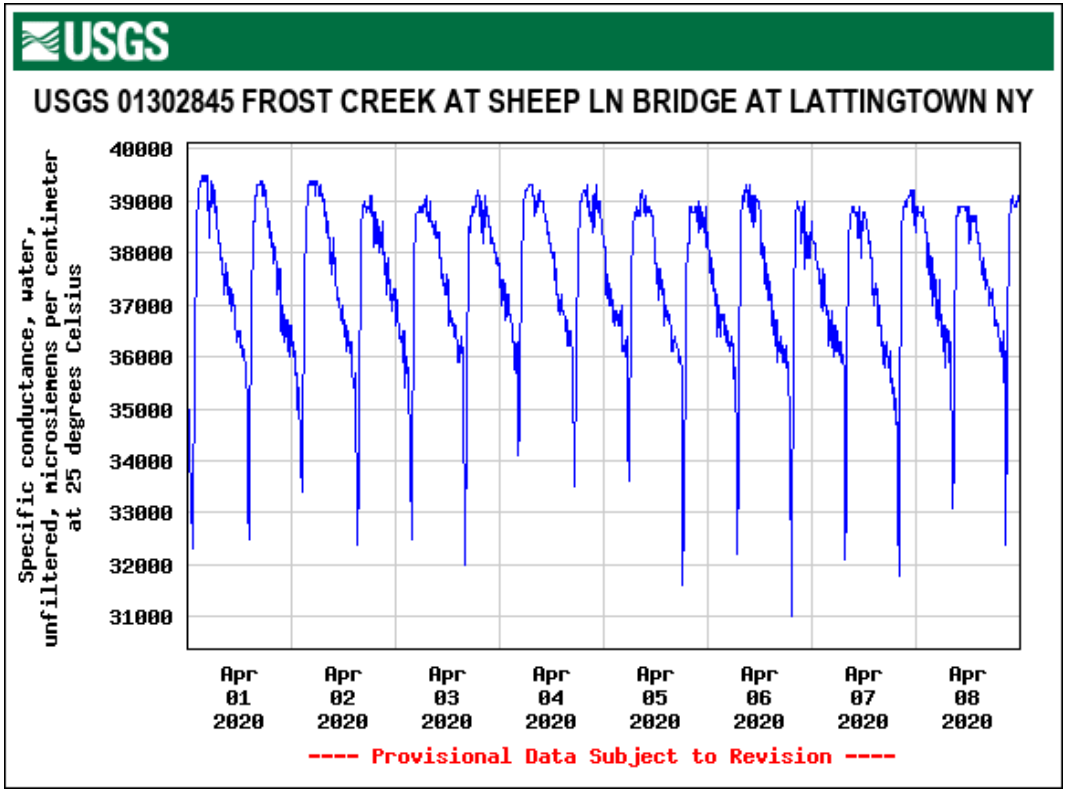
Why we monitor

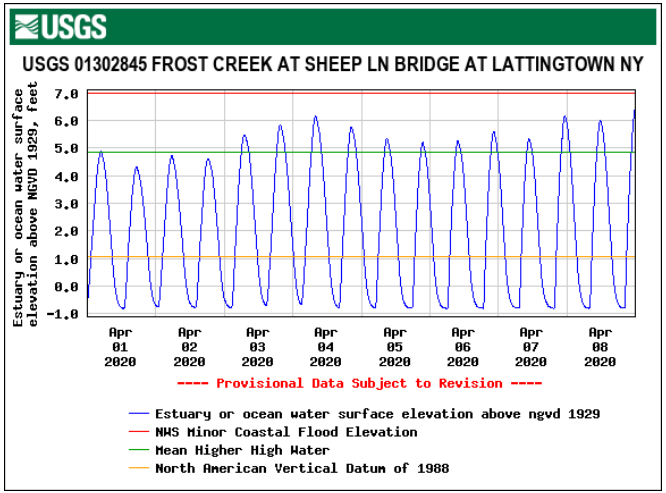
- Flood warning
- Coastal resilience and wetland health
- To understand short-term (storm) and long-term (climate change) effects.
- Coastal resource management- habitat and living resources
- Harmful Algal Blooms- warning and mitigation
- To understand hydrodynamics and flux (sediment, nutrients)
- To inform regulatory standards and TMDL development
- To establish baselines from which to ascertain change

SUNA V2

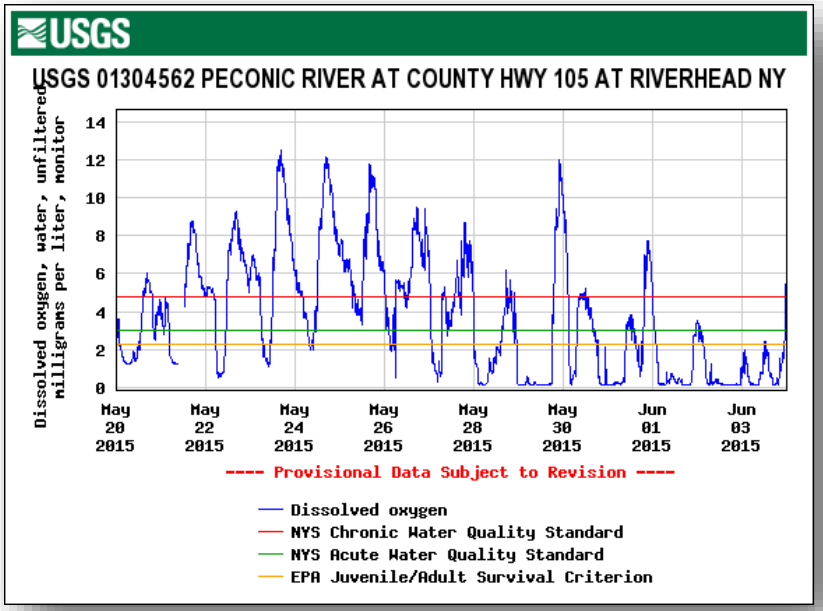
Continuous Water Quality Parameters

1. **Water temperature**
2. **Specific conductance/salinity**
3. **Dissolved oxygen**
4. **pH**
5. **Turbidity**
6. **Chlorophyll**
7. **Phycoerythrin** → A pigment in cyanobacteria (HABs)
8. **fDOM** → Flourescent dissolved organic matter
9. **Nitrate**


USGS
USGS 01302845 FROST CREEK AT SHEEP LN BRIDGE AT LATTINGTOWN NY
Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius
40000
39000
38000
37000
36000
35000
34000
33000
32000
31000
Apr 01 2020
Apr 02 2020
Apr 03 2020
Apr 04 2020
Apr 05 2020
Apr 06 2020
Apr 07 2020
Apr 08 2020
---- Provisional Data Subject to Revision ----


USGS
USGS 01302845 FROST CREEK AT SHEEP LN BRIDGE AT LATTINGTOWN NY
Estuary or ocean water surface elevation above NGVD 1929, feet
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
Apr 01 2020
Apr 02 2020
Apr 03 2020
Apr 04 2020
Apr 05 2020
Apr 06 2020
Apr 07 2020
Apr 08 2020
---- Provisional Data Subject to Revision ----
Estuary or ocean water surface elevation above ngvd 1929
NWS Minor Coastal Flood Elevation
Mean Higher High Water
North American Vertical Datum of 1988

USGS


USGS
USGS 01304562 PECONIC RIVER AT COUNTY HWY 105 AT RIVERHEAD NY
Dissolved oxygen, water, unfiltered milligrams per liter, monitor
14
12
10
8
6
4
2
0
May 20 2015
May 22 2015
May 24 2015
May 26 2015
May 28 2015
May 30 2015
Jun 01 2015
Jun 03 2015
---- Provisional Data Subject to Revision ----
Dissolved oxygen
NYS Chronic Water Quality Standard
NYS Acute Water Quality Standard
EPA Juvenile/Adult Survival Criterion

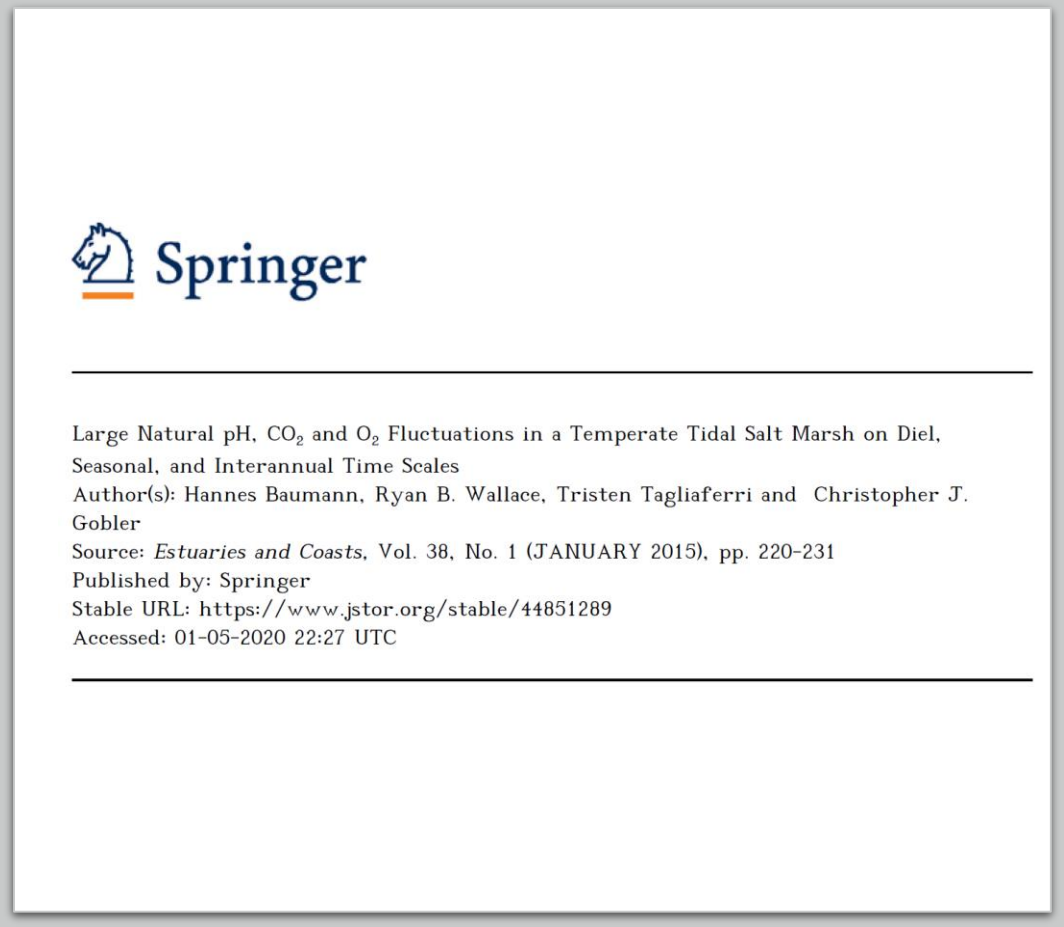
USGS

pH

Study at Flax Pond that analyzed trends in pH and DO paired with concurrent CO_2 measurements.

Used to understand the range of conditions organisms experience now to better understand potential impacts of ocean acidification and effects of climate change

USGS



Springer

Large Natural pH, CO_2 and O_2 Fluctuations in a Temperate Tidal Salt Marsh on Diel, Seasonal, and Interannual Time Scales

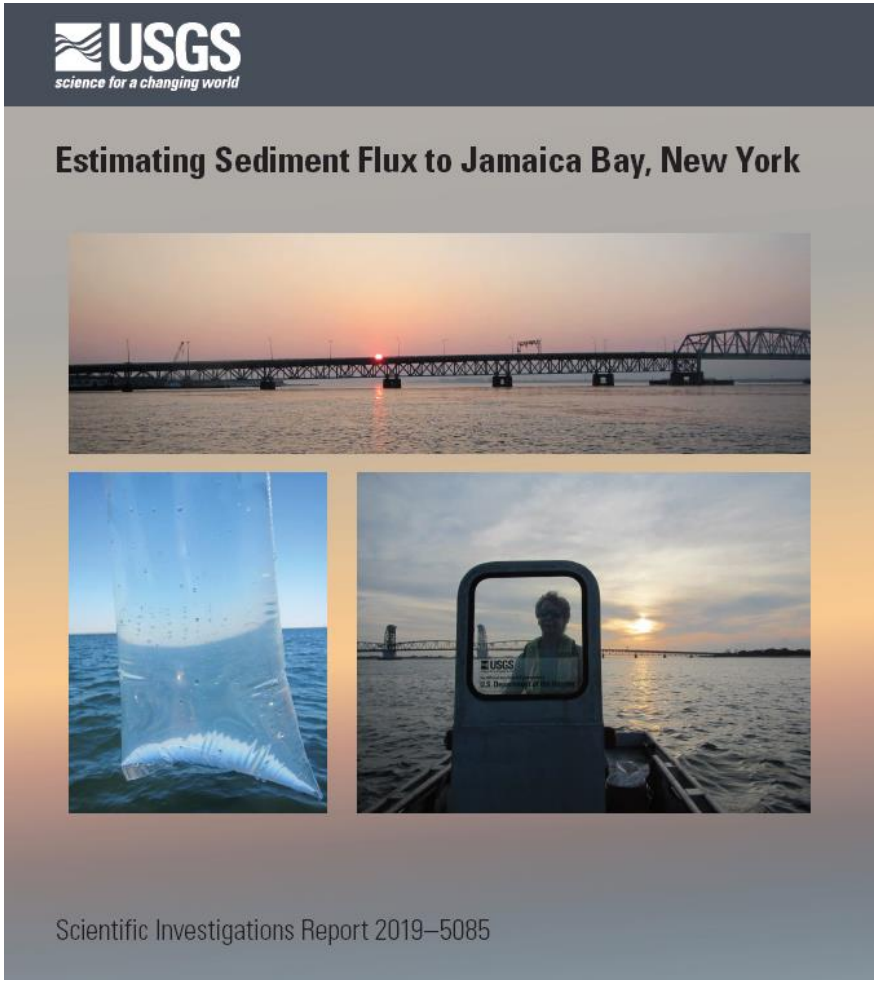
Author(s): Hannes Baumann, Ryan B. Wallace, Tristen Tagliaferri and Christopher J. Gobler

Source: *Estuaries and Coasts*, Vol. 38, No. 1 (JANUARY 2015), pp. 220-231
Published by: Springer
Stable URL: https://www.jstor.org/stable/44851289

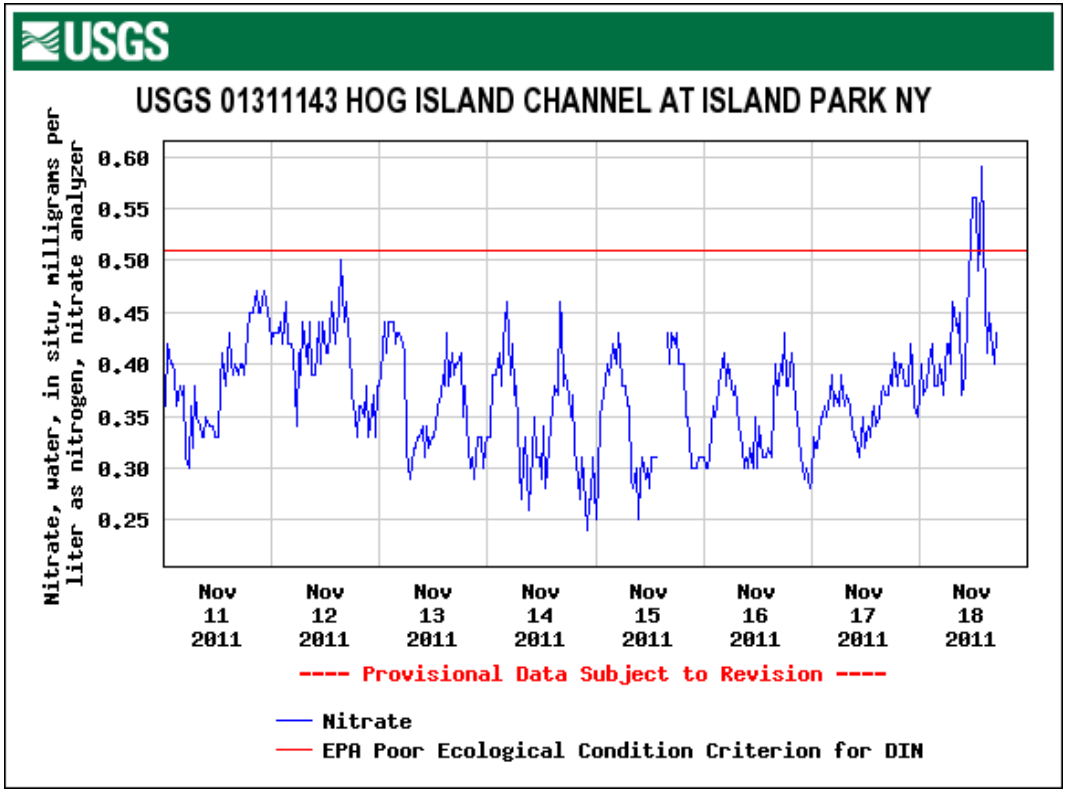
Turbidity

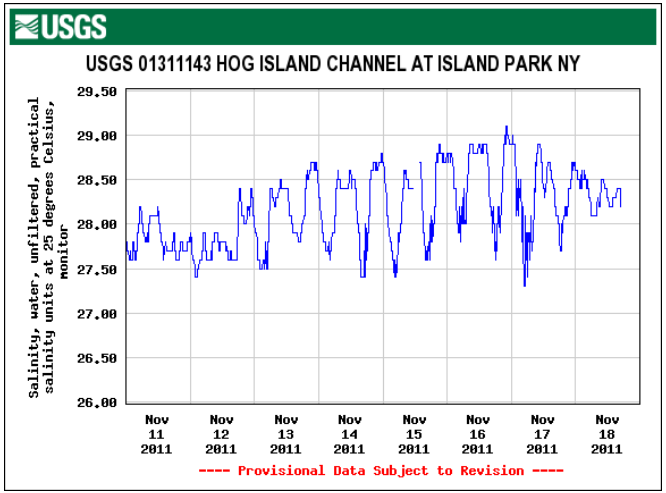
- Turbidity is important for ecosystem health (clarity of water affects sunlight penetration and productivity)
- Influenced by abundance of algae--useful paired with Chlorophyll and dissolved oxygen to understand algal blooms
- Surrogate for suspended sediment
  - Sediment Flux
  - Sediment resuspension (source of bacteria and metals)

USGS



Inverse relationship between nitrate and salinity at Hog Island Channel.





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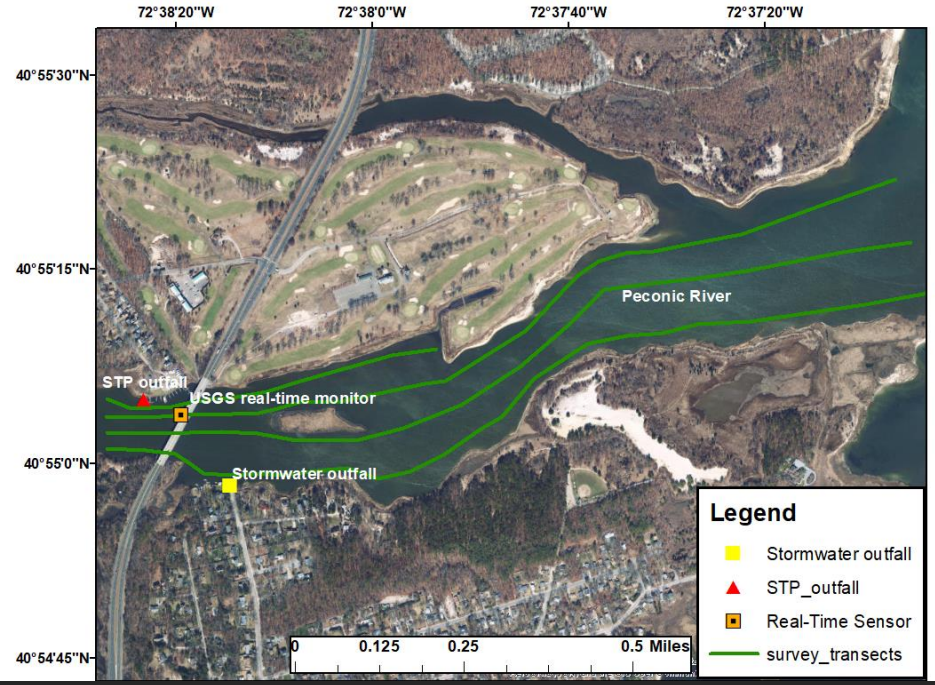
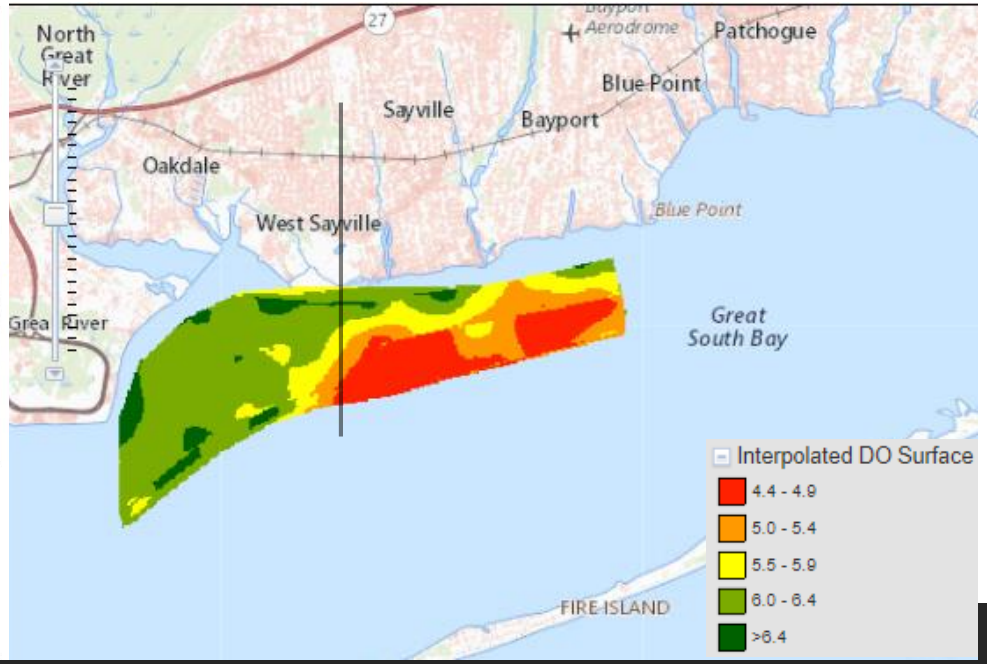
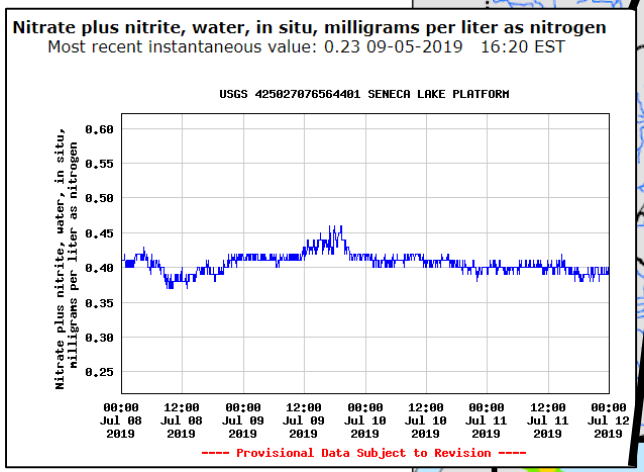
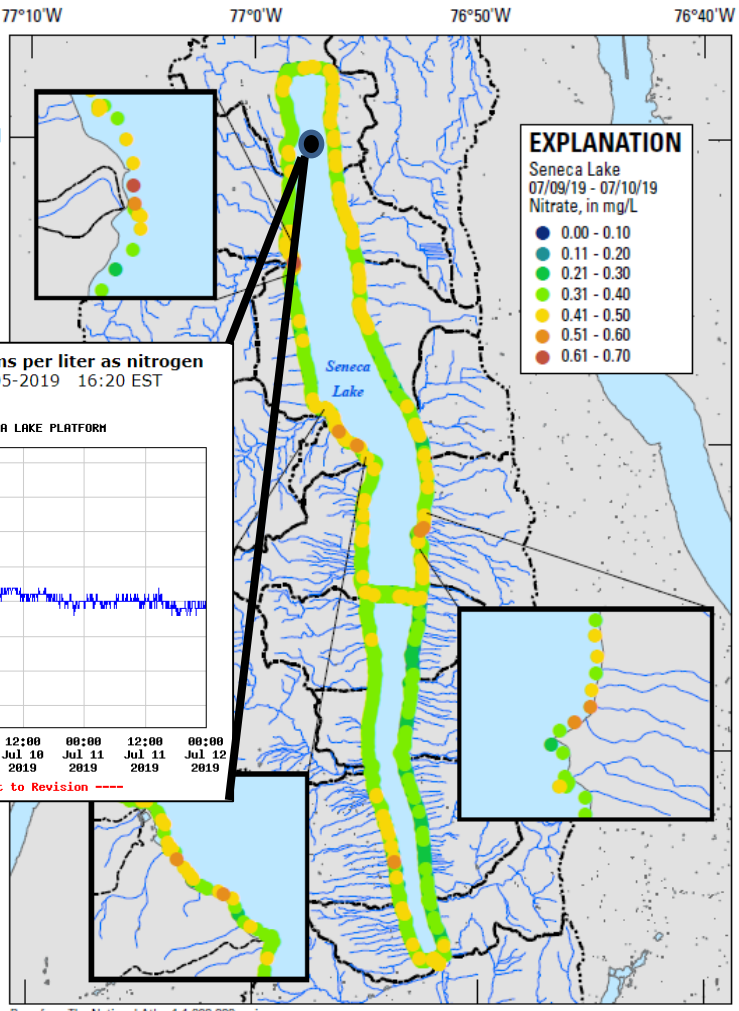


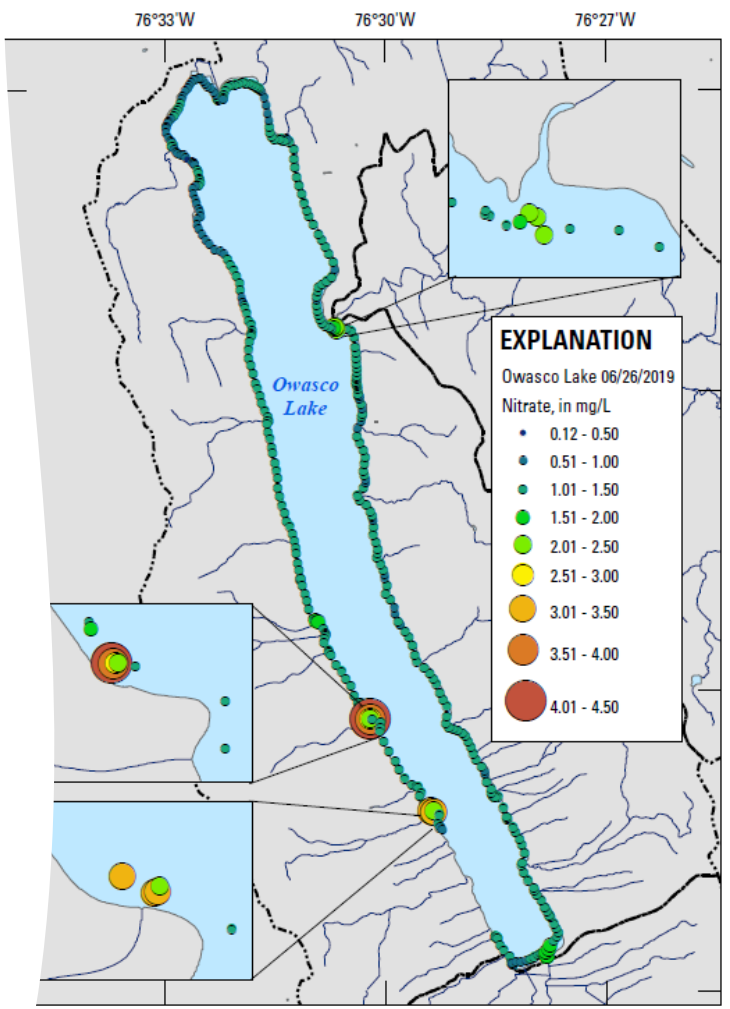


Spatial Surveys

Integrate Continuous and Spatial Data







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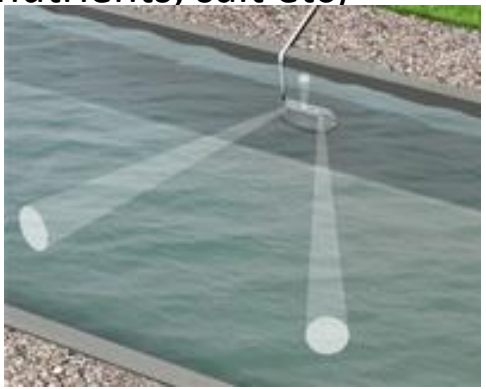
Index Velocity

- Acoustic Velocity Meter (AVM)
- Can use stage and velocity to compute discharge (need channel bathymetry to calculate cross sectional area- also required for models)
- Enables calculation of flux (sediment, nutrients, salt etc)



Argonaut SL500 Side-Looker Acoustic Doppler Current Meter

HIF Stk. No. 1113005

SonTek's Argonaut SL500 is a side-looker acoustic Doppler current meter. The unit is designed for horizontal operation — making velocity measurements in a volume of water located at some distance away from where the sensor is mounted to an underwater structure. The SL500 measures two-dimensional currents in an adjustable measurement volume located at a range of 1.5 to 120 m (5 to 400'). This unit's new molded plastic housing adds ergonomic features and drastically reduces the weight. A vertical beam for depth and the inclusion of SonTek's TrueCompass/Tilt sensor are nice improvements to the original SL500.

The unit comes with a 10 m (33') cable for power and serial communications. SonTek's ViewArgonaut and FlowPack software programs are provided to support deployment of the SL500 as well as data collection, processing, and analysis. A mounting plate bolts to the unit and allows it to be mounted directly to a flat surface. The SL500's SDI-12 interface allows very easy connections to a user's data logger or DCP.

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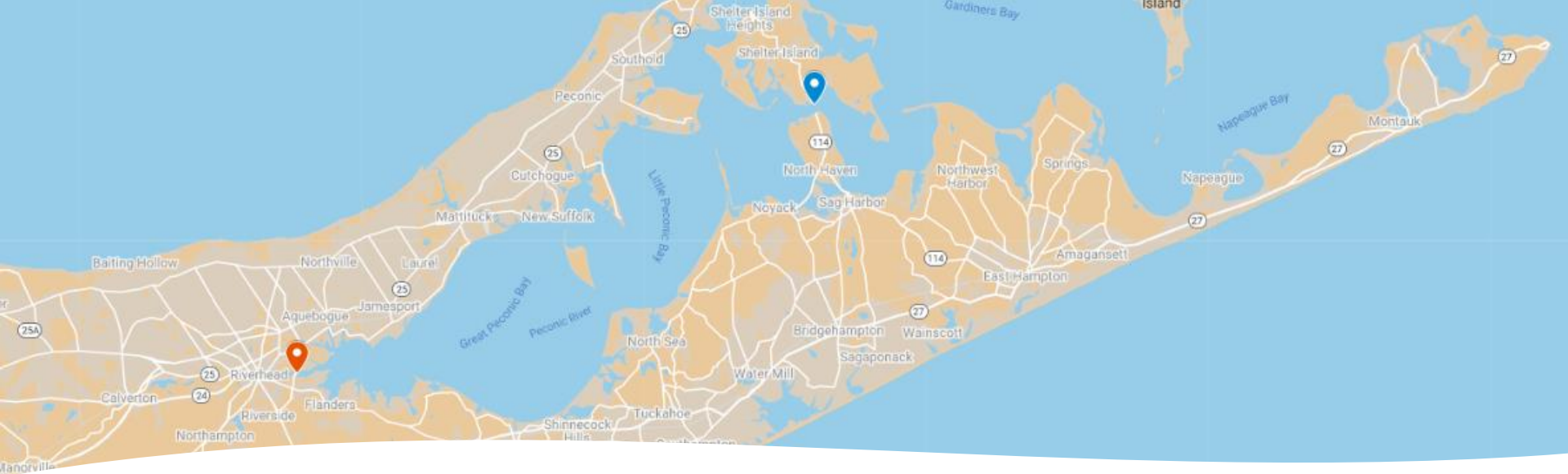

Summary

- Full suite of water-quality parameters address a variety of concerns.
- Spatial surveys complement continuous datasets (show inputs, hotspots)
- Mid-Peconic Estuary site at South Ferry is an ideal location for an index velocity station.
- Potential flow data from the mid-Peconic Estuary site offers an important calibration point for hydrodynamic models.

USGS

For more information

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