

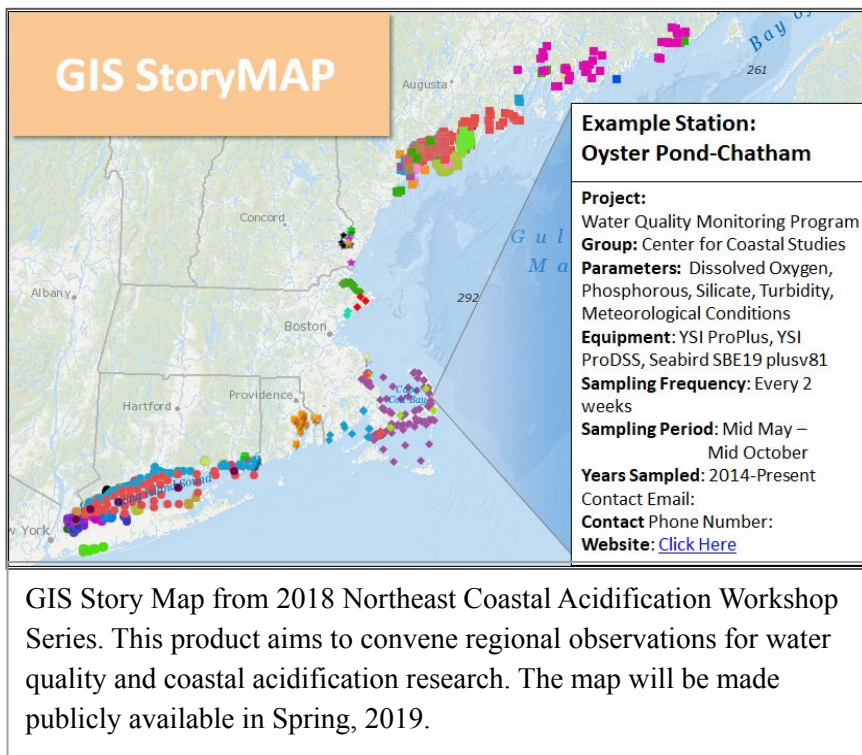


Monitoring Blitz for Coastal Acidification

Greetings all,

In 2018, a workshop series for coastal acidification highlighted the role of water quality monitoring in understanding regional patterns of acidification and local levels of risk. Many participating organizations expressed interest in becoming more involved with coastal acidification research and regional approaches toward monitoring climate change. This letter proposes an initiative for a single day coastal acidification monitoring blitz, Shell Day, on August 22, 2019.

Because coastal acidification is influenced by local factors, monitoring can, over time, provide actionable information for watershed management, and strategic habitat protection and restoration aimed to improve local resilience to acidification.



Coastal Acidification Research Considers:

- ⇒ the role of eutrophication in causing short term coastal acidification events linked with hypoxia;
- ⇒ the influence of low alkalinity river and groundwater and of precipitation events that reduce the buffering capacity of a marine environment to resist acidification;
- ⇒ the influence of tidal chemistry and the balance of photosynthesis and respiration on pH and alkalinity in estuaries and embayments.

Stewardship and research organizations support hundreds of coastal monitoring stations throughout the Northeast. Therefore, water quality measurements can help to reveal how certain coastal locations are most vulnerable to acidification, the extent to which local drivers exacerbate acidification, and the degree to which local management and stewardship can protect our ecosystems from those stressors.

Join us in planning **SHELL DAY**, a coastal acidification monitoring blitz event, for **August 22, 2019**





Monitoring Blitz for Coastal Acidification

Why SHELL DAY?

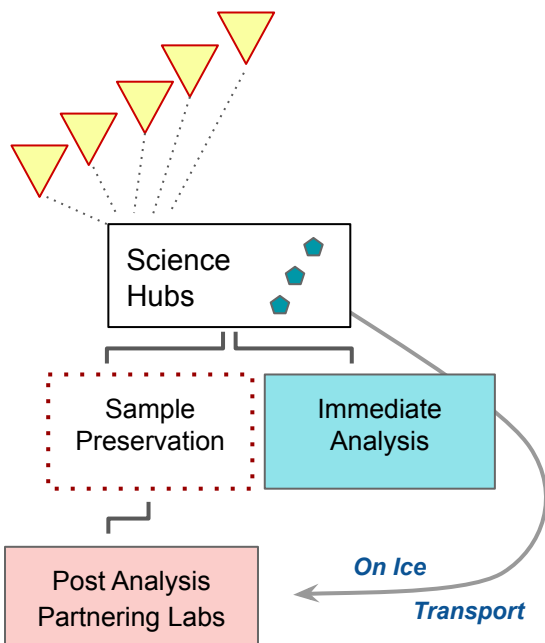
Distinct from long term ocean and coastal acidification (OCA) studies, vast networks of community water quality monitors offer a critical and unique opportunity to make simultaneous observations at a regional scale. Of the various ways to study coastal acidification, it is presently important to capture the relationship in individual estuaries and embayments between **salinity** and **total alkalinity (TA)** which is the capacity of a marine environment to resist or *buffer* acidification. Therefore, ***if salinity and total alkalinity correlate enough for salinity to be used as a proxy for alkalinity***, salinity measurements, which are affordable and widely available, can be used to help estimate carbonate saturation state and local vulnerability to acidification.

Experts believe that water quality monitoring groups are well positioned to participate in this research. During the proposed sampling blitz, monitoring organization can measure your routine series of water quality parameters, while also collecting Total Alkalinity bottle samples supplied at no cost and later analyzed by NECAN and partnering EPA and University laboratories. The Shell Day Steering Committee is now working to procure all of the resources you would need to collect bottle samples for Total Alkalinity; for you to transport those samples on ice to partnering laboratories, for you to join laboratories in processing samples the day after Shell Day collection, and for the results of the monitoring blitz to be analyzed and shared back with participating organizations.

Why are Salinity and Total Alkalinity (TA) Related to Acidification?

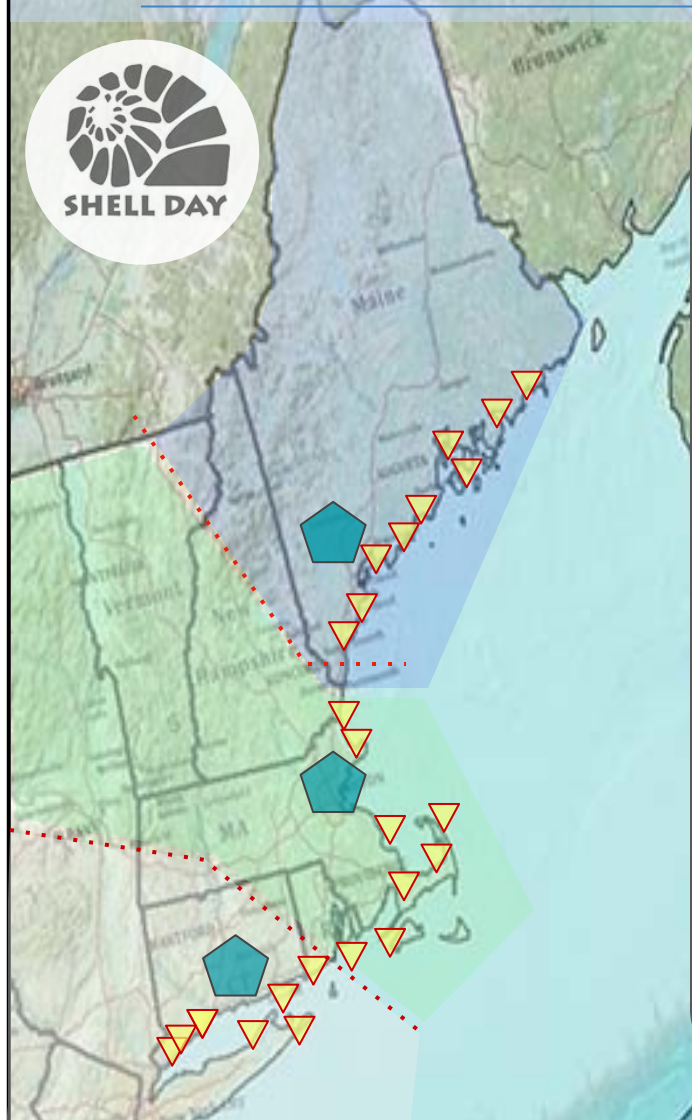
| | | |
|------------------|--------------------------------------|--|
| pH | Total Alkalinity (Salinity Proxy) | Marine organisms are affected by the availability of carbonate ions dissolved in the marine environment. Acidification regards the reduction of those ions. At least 2 of the 4 carbonate measurements along with temperature are needed to evaluate the risk of acidification. Total alkalinity is especially informative but few monitoring organizations have access to the equipment for measuring TA. |
| pCO ₂ | Dissolved Inorganic Carbon | |

Proposed Sequence for Shell Day:



- **Join discussion webinars** for the project and methodology
- **TA sampling kits** arrive free of charge to monitoring organizations (TA sample bottles, data labels, waterproof bag for on-ice transport)
- Monitoring groups select sampling sites with science advisors
- Sampling regimes focus on greatest “*salinity gradient*”; i.e. maximums of **low and high tide**
- You’ll need your own thermometers, salinity meters, a cooler and ice
- Educational materials for coastal acidification will be provided for you to share with volunteers
- **Aug 22, Collect samples at low, mid and high tide** for each site. Bottle samples kept on ice. While you do this, other groups from Long Island Sound to Downeast Maine will also be sampling for TA, Salinity and Temperature
- **Aug 23, Transport or ship samples** to Science Hubs at partnering laboratories
- **Join Science Advisors** and other Shell Day participants to continue conversation about coastal acidification and to operate on-site TA measurement
- **Data synthesis** led by NECAN research partners and participating organizations
- **Results** formulated into usable figures/products
- **Webinars** to discuss and share result in Fall, 2019

Monitoring Blitz for Coastal Acidification



The Value of this Project:

- Single day, blitz sampling events may be an effective way to involve monitoring programs in assessments for coastal acidification.
- This crowdsourced and event-based research technique for coastal acidification may prove to be a useful tool in engaging new audiences through authentic science outreach.
- As your organizations are the communicators and educators to broad public audiences, Shell Day can also serve as an opportunity for outreach about coastal acidification. We aim to work with you to create **education materials** that support discussion among your volunteers and constituencies.

Special Thanks to the Partners Involved in this Project:

