Continuous Monitoring Subcommittee

IEC Shared Waters Workgroup and HEP Water Quality Work Group

March 25, 2022

Location: Remote Meeting

# Minutes

**Attendees:** Jessica Bonamusa (IEC), Rosana Da Silva (HEP), Siddhartha Hayes (Hudson River Park River Project), Kay Howard-Strobel (UConn), Tom Laustsen (PVSC/NJHDG), Matt Lyman (CT DEEP), Katie O'Brien-Clayton (CT DEEP), Nicole Petersen (BBP), Evelyn Powers (IEC), Beau Ranheim (NYCDEP), Dan Rearick (NEIWPCC-NYSDEC), Grace Saba (Rutgers University), Chris Schubert (USGS), Melissa Sinisgalli (PVSC), Cayla Sullivan (EPA R2 LIS), and Jackie Wu (Randall's Island)

**Next Meeting:** Friday, October 14 from 1:30-3pm

**Introductions and Agenda Overview**

Evelyn Powers opened the meeting and reviewed the agenda.

**Recommendations for Developing a Statewide New Jersey Ocean Acidification Monitoring Network**

Grace Saba shared that New Jersey is predicted to be at high risk of economic harm from ocean acidification conditions and coastal ecosystem will be affected by local amplifiers. Executive Order 89 signed by Governor Murphy in 2019 included Ocean Acidification and is driving the effort through a collaborative between NJDEP and Rutgers. Beginning with the development of an OA Action Plan and a comprehensive, statewide monitoring network is essential for an OA initiative. To do this, Grace said the network is seeking to identify and engage potential partners which led to a virtual November workshop in 2021, and the third task is proposing a monitoring network. This includes receiving feedback from stakeholders on willingness to modify existing programs and logistical considerations for adding carbonate chemistry sensors or measurements into operations. Grace noted that there was interest in enhancing existing efforts for discrete sample analysis but a need for financial support is required. Grace also noted that there is a gap in data where most of the available data is surface and depth monitoring is lacking (important for seasonal variation). There is also a need for a co-located biological and chemical response monitoring to really understand how organisms are responding in the field. Opportunities to fill the gap would be to leverage existing programs, for example: utilizing NJDEP's glider used primarily for DO but could include a pH sensor; buoys or moorings that could add sensors to optimize those platforms; or working with hatchery industries to set up monitoring efforts. There is also a need for discussions around equipment, platform types, placement, link carbonate chemistry with respective drivers, and engage on regional networks. It is clear that financial support to add pH, TA/DIC to water sampling efforts, training (to ensure proper sample collection/preservation), an acceptable quality control protocol, and making data available/visualization will be needed. Katie O'Brien-Clayton share she had listened to a MACAN SeaGrant Fellows webinar yesterday that highlighted a NJ glider project. Chris Schubert and the subcommittee thanked Grace for a great presentation.

Evelyn Powers asked if there were any identification of biological indicators? Grace indicated for discrete water samples, pH, total alkalinity, and dissolved inorganic carbon (usually off a vessel) while for

a buoy, mooring or guilder its pH and pCO2. There is a need for two carbonate chemistry and with temperature and salinity you can back calculate. Most programs are using YSIs, but adding bottle samples would really help resolve the existing data gap. Beau Ranheim indicated that pH is difficult to measure if you leave sensors in the water for too long and second, total alkalinity is hard to do on the boat. Grace agreed, for those collecting total alkalinity have preserved them so that you can run the sample in the lab. Beau added moorings would be great, but out in the Harbor pH sensors are gone after 30 days. If you want to keep continuous monitoring, you need a few replacements to swap out between calibrations. Grace noted that BBP and other partners are looking to use more expensive sensors, but there are considerations for more durable sensors and identification of sites could be a good compromise. Katie O'Brien-Clayton indicated that the SeaFets and Durafets are supposed to be better for SW pH than YSI.

Chris Schubert added that the flipside is a lot of coastal/inshore waters have wider swings in signal. So the somewhat lower resolution of some sensors may be less of an issue. Grace agreed, the daily swings and seasonal swings are huge. Nicole Petersen shared that BBP has had a lot of issues with the SeaFet instruments and instead are seeing better results with the EXOs. The problem, however, is validating data using discrete sampling. Grace is hopeful that the state of New Jersey would provide funding to ground truth the sensor accuracy. There are some papers that have used YSI for ocean acidification that talked about the accuracy between discrete and found the accuracy to be a lot higher than the manufacture manual. Another issues is a lack of certified labs for carbonate chemistry, but partners have been using the Dickson standards to compare one another for QA/QC discrete measurements. Beau Ranheim shared that state certification for carbonate chemistry would be just another loop to make measuring more complicated. Grace understood and noted having a list of where to send samples and the cost would be ideal to help facilitate sampling.

In thinking about continuous monitoring and discrete sampling, Evelyn Powers asked if Grace and the team is strategizing where to place continuous monitoring to expand near hatcheries and/or just using existing networks, and is it habitat or gap based? Grace noted that it will depend on where these industries sit and where sites need to be – for a specific process for freshwater input, you need to monitor it more frequently vs. more offshore that doesn't have a driver to be able to see the cycle/event-base decreases of pH. Grace indicated more discrete sampling via vessel-based programs would be ideal in addition to a glider to grab the spatial extend of known fishing areas/habitat/species target. Beau Ranheim added, you'll want to build your discrete monitoring first to then identify the continuous station to be able to make the service call and discrete sampling at the same time. Chris Schubert added it's also valuable to be able to document (continuously) the eutrophication component of acidification (e.g., via fluorescence & DO monitoring of PP & hypoxia). Grace added for the hatchery, it's good for them to know water quality, but adding the carbon chemistry would also be helpful. No die offs due to carbonate have been witnessed in New Jersey, but there were two die offs last year that was expected, but without monitoring could not link it. In the west coast, they were able to connect die offs directly to OA.

> **Next Steps:** Grace Saba and the Rutgers-NJDEP collaboration will be drafting a Recommendations Document specific for Ocean Acidification. This document will be shared with the Subcommittee for comments.

**How Well Are We Answering Questions Regarding the Estuary?**

Rosana Da Silva launched a poll asking committee members on which topic is of greatest interest as we consider the impacts of climate change? Results showed 36% identified dissolved oxygen and ocean acidification as the clear areas of interest while 9% chose pathogens, HABs, and eDNA as areas of interest. Rosana provided a brief overview of key indicators that had sufficient data for short term and long term trend analysis as published in the State of the Estuary Report and the State of the Hudson Report.

Indicators included dissolved oxygen, nitrogen, nitrate, total phosphorus, and water temperature. Sea-level rise and flooding are likely to affect the estuary's tidal marshes and shallows. It remains to be seen whether they might survive in place or migrate into newly flooded shallows. In addition, sea-level rise and frequent flooding will include a variety of challenges from damaged infrastructure to increased erosion that estuarine managers will need to address. Rosana asked the committee, when considering climate change, what are your greatest concerns or challenges?

Matt Lyman indicated the greatest challenge is man power. While there is an increase of researchers wanting more sampling at a station or at a time, it is difficult to have enough experienced staff to be able to take the samples and also the lab personnel in running the samples. When looking at the data, we have the spatial coverage, but not great temporal coverage. Evelyn Powers added in convening an ad hoc working group for the ocean acidification monitoring, having an open dialogue has been most helpful to coordinate methodologies. Beau Ranheim indicated that ocean acidification is not on his radar. His program is focus to response to wastewater resource recovery facilities and indicate their lab is also at capacity and adding carbonate chemistry would be complicated. Grace Saba indicated ocean acidification is within NY state's ocean action plan and will be working on recommendations. Perhaps after recommendations are released will Beau and his team hear about ocean acidification initiatives. Rosana asked Matt to expand on man power, and whether it is having the personal or the funding to hold them. Matt shared they have seasonal employees for the summer, but would need more staff for the winter months to keep up with demand. Beau added that it takes a year to replace those who retire from the agency which is another challenge. Kay Howard-Strobel that not only do they sample via vessel or diving, but weather can also limit your ability to check systems. Remote sensors are great until you have to get to them. Chris Schubert suggested that there are existing stations that could be enhanced with additional sensors or discrete sampling to address many of the questions discussed in the face of climate change.