Water Quality Monitoring Work Group
TEAMS Online Meeting
June 15, 2023 – Meeting Summary

Attendance

Jim Ammerman (Chair)—Long Island Sound Study (LISS)/NEIWPCC
Denise Argue-- United States Geological Survey (USGS)
Jordan Bishop—NEIWPCC
Anthony Caniano—Suffolk County
Natalie Cheung—USGS
Melissa Duvall—Environmental Protection Agency (EPA)
Richard Friesner—NEIWPCC
Dianne Greenfield—City University of New York (CUNY)
Jim Hagy—EPA ORD
Ben Lawton—EPA ORISE
Peter Linderoth—Save The Sound (STS)
Matt Lyman—Connecticut Department of Energy and Environmental Protection (CT DEEP)
Michelle Lapinel McAllister-- Coalition to Save Hempstead Harbor
Jon Morrison—USGS
Jim O'Donnell—UConn
Evelyn Powers—Interstate Environmental Commission (IEC)
Beau Ranheim—NY City Dept. of Environmental Protection (NYCDEP)
Samarra Scantlebury –NYSDEC
Evelyn Spencer—EPA
Nikki Spiller—Harbor Watch
Paul Stacey—Footprints in the Water
Kelly Streich—CT DEEP
Cayla Sullivan-- EPA, LIS Office
Mark Tedesco—EPA
Maria Tzortziou—CUNY

Jim Ammerman started the meeting with a few announcements. He mentioned the upcoming June 30th STAC meeting including a presentation by the co-editors of a new report by the Chesapeake Bay Program STAC, see: https://www.chesapeake.org/stac/cesr/. He also announced that EPA would soon be recruiting a new ORISE Fellow with biogeochemical and data analysis expertise (see: https://www.zintellect.com/Opportunity/Details/EPA-REG2-2023-01) and that there was a new opinion article in the New York Times suggesting that the Army Corps of Engineering proposed floodwall design for NYC would limit a access to the waterfront (see: https://www.nytimes.com/interactive/2023/06/15/opinion/nyc-flood-waterfront-

plan.html?searchResultPosition=1) . Jim said that in today's meeting he just wanted brief updates from all the major monitoring groups, as well as on the data management efforts including QuickDrops, and an initial discussion of the work group budget priorities for next year. Finally, he mentioned another meeting would be needed before the September 15th budget priority deadline, probably in early September.

Unified Water Study (UWS): Peter Linderoth, Save the Sound
Peter said they were off to a good start, now with 27 monitoring groups working in 46 embayments. There were some delays in the May start due to equipment delays, YSI turbidity and chlorophyll sensors ordered in December did not arrive until May, but everyone now has the equipment that they need. A new group is Project Oceanology, located at UConn Avery point, who monitors two new embayments, Mumford Cove and the Poquonnock River, the former is of interest because of its eelgrass. Peter noted that the UWS used a combination of YSI EXO1s and Eureka Mantas in the past but had now switched to all EXO1s, which works well, along with YSI ProDSS meters. Peter added that QuickDrops was coming along well as a community data platform, though certainly it will not just be limited to NGOs, LINAP and USGS are also interested. It has a WQX import function which will help many groups get their data into EPA'S Water Quality Exchange. Peter said he could provide a full demonstration when the system is complete at the end of the summer, perhaps in a September meeting.

Questions:

1. There were no questions for Peter, but Jim Ammerman mentioned the related and important Suffolk County Legislative hearing next Wednesday, June 21st, at 6:30 PM, as announced by LINAP. The County Legislature will consider a ballot measure to develop a county-wide wastewater management district.

USGS Watershed Monitoring and Data Clearinghouse: Jon Morrison, USGS
Jon showed a slide of their current river and embayment monitoring sites on both sides of the Sound. He showed data from the Norwalk River with dissolved oxygen concentrations already falling below 4 mg/l at both the surface and bottom waters. Starting this year, USGS is monitoring the entire Connecticut River Watershed from near the Canadian border all the way down to the mouth at the Sound and is excited about that effort. USGS has also started the clearinghouse project, the metadata mapper, by reaching out to various partners and stakeholders for their information to be displayed on a common platform. USGS has also conducted regional stakeholder meetings and done data digitization and quality review, with the goal of having a draft this fall. Feedback will be solicited and acted upon to improve the mapper for ultimate release at the end of 2024.

USGS has also started their dynamic SPARROW modeling project looking at the entire LIS watershed. They are beginning to code the model and are mining the available nitrogen and phosphorus data to calibrate the model; upstream data is more sparse than downstream data. They are also working with EPA on the RBEROST part of that project to evaluate best management practices to determine which are most effective for decreasing nutrient loads. Jon

showed a map of sites where they have so far found total nitrogen measurements. They hope to produce a journal article or report on the dynamic SPARROW model in late 2024 or 2025. Related public outreach efforts will also include a website.
The USGS component of the coastal acidification project has just started, and Jon showed a map of the sites that they are monitoring. The stations include a gradient from east to west in LIS and include both the north and south shores.

Questions:

1. Maria Tzortziou asked about Dissolved Organic Matter (DOM) fluorescence measurements or fDOM as found on YSI sensors because she said that it was a very useful measurement for water quality and modeling. Jon replied that fDOM measurements were currently limited to four sites in the Connecticut River watershed and were being evaluated for effectiveness. USGS could write a proposal to expand fDOM measurements in the future if they found it valuable. Maria said she would like to work with USGS on such a proposal because she made similar measurements and found that fDOM measurements were good to compare with remote sensing information, especially at river mouths. Maria and Jon agreed to discuss this issue further.
2. Peter Linderoth asked about how long the USGS Norwalk estuary continuous monitoring would be in place and whether USGS would be interested in working with Save the Sound to provide outreach about water quality to Norwalk leaders and the local community, perhaps in the fall. Jon replied that they had lots of data in the Norwalk River, including upstream, and had funding to maintain their continuous monitoring instruments going forward and for outreach. He expressed interest in working with Peter on these issues going forward.
3. Paul Stacey asked if USGS was communicating with the Connecticut HSPF model and using it. Jon replied that they were using it alongside the SPARROW model to calibrate each other because the two models do very different things.
4. Jim O'Donnell asked if the USGS data was available online and Jon replied that it was but if Jim cannot find something he should just ask.

CT DEEP LIS Monitoring: Matt Lyman, CT DEEP
Matt mentioned that they lost their sampling rosette unit in November 2022 so their winter sampling methods limited how much they could include additional researchers. However, their rosette has now been recovered thanks to the UConn dive team and they are back at full strength. They did miss their March survey because the Dempsey had a no-sail order due to the lack of active fire suppression onboard. During the winter they started their ocean acidification sampling at all their water quality stations. He also mentioned that they do have an fDOM sensor which is not yet calibrated because they do not have the standards. However, they will add that to their YSI instrument in the future. They also recently received bids for their new research vessel and hope to let the contract in late summer or fall. An 18-month building process would then lead to its delivery in the summer of 2025. Katie O'Brien-Clayton added that they were not sampling for acidification at all their stations but at a subset of ten. She also noted that for the June survey, the bottom dissolved oxygen at Execution Rocks was 6.24 mg/l.

Questions:

1. Jon Morrison mentioned that they make their own fDOM standards, but also have access to a suite of calibration standards including fDOM from the USGS hydrologic instrumentation facility. He suggested that CT DEEP might be interested in obtaining some and Matt agreed and said that he would follow up.

Western LIS Monitoring: Evelyn Powers, IEC
Evelyn said that their winter monthly surveys had added acidification parameters starting last October and that the biweekly surveys start on June 27th. They are also continuing Unified Water Study (UWS) sampling in Little Neck Bay and Manhasset Bay. This is also the pilot year for the pathogen monitoring effort with two groups on the New York side (Friends of the Bay monitoring Frost Creek, and Coalition to Save Hempstead Harbor monitoring Dosoris Pond). Three groups are monitoring on the Connecticut side (CT National Estuarine Research Reserve [CT NERR] monitoring Lieutenant River and Duck River, Clean Up Sound & Harbors [CUSH] is monitoring Palmer Cove, and Harbor Watch is monitoring Norwalk Harbor). Most of the groups have started biweekly sampling by now except perhaps CT NERR. They are looking forward to QuickDrops to facilitate uploading data to the Water Quality Portal. Next year will have weekly samples with more groups and water bodies monitored.

Hempstead Harbor Monitoring: Michelle McAllister Coalition to Save Hempstead Harbor (CSHH)
Michelle said they started their core weekly sampling in May, though canceled the first week due to weather. Their UWS monitoring participation was delayed, but both that and pathogen monitoring start this week. Brown water was reported last week in both Hempstead Harbor and Manhasset Bay. They also distributed a horseshoe crab survey and have gotten a few results back so far if anyone is interested.

Suffolk County Long Term Monitoring for Subwatersheds Wastewater Plan: Anthony Caniano, Suffolk County
Anthony along with consultants is developing a long-term monitoring plan to measure the impacts of the Suffolk County Subwatersheds Wastewater Plan. He wants to take advantage of all current monitoring efforts but plans to supplement those where needed. Anthony mentioned that he is also interested in Save the Sound's QuickDrops as a repository and reporting platform and has been working with Peter Linderoth. Anthony expects to get an inventory of all the current monitoring activities from his consultant this month and will go from there to see what additional work is needed.

New York City Monitoring: Beau Ranheim, New York City Department of Environmental Protection (NYCDEP)
Beau reported that they had received their new boat, though it is not yet in the water because there are still some issues to work out. They are doing a lot more regulatory sampling at treatment plans for ammonia, cyanide, and bacteria so are more inward focusing. With

retirements and resignations his staff is currently short by four people, so everyone is very busy, and they are also adding management of two contracts. Their data display should improve in the next 6-8 months as there have been delays because the GIS person left. Summer monitoring is otherwise on track.

Questions:

1. In a later comment, Peter Linderoth mentioned that Dr. Caterina Panzeca at SUNY Maritime, who runs the Marine Environmental Science program, has students who might be qualified to work at NYCDEP after they graduate. Beau responded that he must increasingly hire off the Civil Service list and encouraged anyone with students who might be interested in positions to take the NYC Civil Service test and get on the list. Beau said he had had a couple of interns from SUNY Maritime.

Long Island Sound Integrated Coastal Observing System (LISICOS): Jim O'Donnell, UConn
Jim showed the latest fluorescence from the surface of the ARTG buoy, and the bottom dissolved oxygen (DO) from Execution Rocks, which is now below 5 mg/l but quite variable. ARTG bottom DO was down to about 6.5 mg/l, but much less variable. All were displayed on the UConn ERDDAP server at: merlin.dms.uconn.edu:8080/erddap/tabledap/. Jim briefly showed how to generate graphs to display data from the ERDDAP server. All the buoys are currently working and there are plans for three glider flights starting in July for two weeks, another two weeks in August, and then through the fall turnover.

Questions:

1. Peter Linderoth asked how he could get more information on Jim's glider work, like something to read. Jim suggested the following website, which includes glider tracks from US, and focusing on LIS: https://gliders.ioos.us/ He also suggested the following two papers:

a. Ilia, A., et al. (2023). "Observations of Autumnal Cooling in a Large Estuary." Journal of Geophysical Research: Oceans **128**(2).
b. Cui, J.-H. (2012). Ocean-TUNE: A Community Ocean Testbed for Underwater Wireless Networks. WUWNet'12. Los Angeles.

Acidification and Eelgrass Updates: Cayla Sullivan, EPA
Cayla mentioned that CT DEEP and UConn are being funded to conduct a total alkalinity comparison of the different methods currently in use. All the acidification monitoring partners are aware of that project. For eelgrass, the data challenge project that ORISE Fellow Ben Lawton is working on hopes to complete its story map this summer. The UWS monitoring of Mumford Cove and Fishers Island (in 2024) are great additions as well as the continuous temperature and light monitoring that will be added to some of the embayments with eelgrass. They will also be updating Jamie Vaudrey's Habitat Suitability Index Model (2013) with a lot of new data.

Potential Priorities for Next Year's Budget

Discussion:

1. Jim Ammerman asked Jon Morrison about Peter Raymond's automated alkalinity instrument. Jon said that Peter has an autonomous device called the "Alkanator" which samples water and runs an alkalinity titration. He is currently testing it at the USGS station on the lower Connecticut River at Old Lyme, CT. The deployment will last a couple of weeks to make measurements at different salinities. USGS is making related measurements and additional deployments are planned at other locations during the summer. Jon said that Peter Raymond will be looking for funding to improve the instrument in the future so Jim Ammerman asked Jon to keep track of its performance during the summer to see if it might be a priority for future work group support.
2. Paul Stacey mentioned that the revision of the CCMP was also approaching and said that there was a need for streamlining, and no need for separate Water Quality Monitoring and Sentinel Monitoring Work Groups and that they should be merged. Everyone is relying on the same data and ecosystem health and climate change are essentially the same thing. He also added that while we are getting a lot more good monitoring data, we are not getting new actionable information and are not managing LIS differently than we did 25 or 30 years ago. We don't have quantitative targets and haven't made the connection to the watershed. Data utilization for management is a weak spot and our TMDL is 20 years old. New tools like his Local Watershed Assessment Tool (LWAT) developed with UConn CLEAR are a good example of what is needed in the future. If we have healthy watersheds, we will have a healthy LIS.
3. Cayla Sullivan commented that in the last acidification group meeting two items were called out, better connecting the monitoring to habitats and their living resources, since some of the acidification monitoring sites are near shellfish beds, and more education through Shell Day and related public outreach activities. Penny Vlahos and Katie O'Brien-Clayton have already been active with other National Estuary Programs on Shell Day. Paul Stacey added that communication with the public is difficult if all the groups within the LISS don't communicate with each other, there is a definite need for streamlining. Jim O'Donnell said that the mechanism of linking observations to actions since the start of the program has been to establish targets based on models. He said that we need a strategy session to organize activities around critically assessing the new NYCDEP/EPA model that is being developed. It is time to put together a comprehensive observation program that can evaluate how well that model does in predicting things that we can manage.
4. Jim Ammerman summarized that a lot of the things discussed here will come up in the CCMP revision which is likely to be comprehensive. Jim O'Donnell mentioned that current efforts linked to CT DEEP models in Norwalk and Mystic River are a good strategy but that is not true for the main Sound. The new LIS model will be completed in a couple of years, and we need to think about what else we need to do. We need to evaluate what the model cannot do and how to extend it to things that we want to

understand. He does not see the model explaining the variability in the area of hypoxia or the distribution of submerged aquatic vegetation (SAV). If we care about those things, we should develop a program to target the controlling mechanisms and link it to things that we can manage. This work group has been about coordinating monitoring to get things done but we also need a broader strategic effort to look forward to the next five to ten years of model development. Paul Stacey reminded the group that the June 30th STAC meeting includes a presentation by the editors of a new Chesapeake Bay Program STAC report that connects monitoring to management and has important implications for the LISS. Jim Ammerman noted that the Chesapeake STAC report emphasizes living resources and nearshore environments.

5. Ben Lawton seconded the comments made by Jim O'Donnell and wanted to comment on his eastern Sound temperature model, particularly as relates to eelgrass. He said that just in the last three years the increase in sensors in the eastern Sound has greatly increased the resolution of temperature mapping in the embayments. This coupled with improved remote sensing of eelgrass distributions should help us see the actual effects of improved water quality on eelgrass distributions.
6. Jim Ammerman thanked the speakers and participants and said that he would soon be organizing another meeting for early September. He reminded everyone to be thinking about budget priorities for next year as well as important items for the upcoming CCMP revision. The issues discussed today such as applying monitoring information to management, connecting watershed health to Sound health, and testing and applying the new models, will figure prominently in the CCMP revision.