

**Water Quality Monitoring Work Group
TEAMS Online Meeting
August 3, 2021 – Meeting Summary**



Attendance

Jim Ammerman (Chair)—Long Island Sound Study (LISS)/NEIWPCC
Jordan Bishop—NEIWPCC
Sarah Crosby—Harbor Watch
Kristin DeRosia-Banick— Bureau of Aquaculture, Connecticut Department of Agriculture
Holly Drinkuth—The Nature Conservancy, CAC CT Co-chair
Michele Golden—New York State Department of Environmental Conservation (NYSDEC)
Jim Hagy—EPA ORD
Alex Huddell—ORISE/EPA
Mike Jensen— Suffolk County Dept. of Health Services
Peter Linderoth—Save the Sound
Jon Morrison—United States Geological Survey (USGS)
Esther Nelson—EPA
Katie O’Brien-Clayton—CT DEEP
Leah O’Neill—EPA
Evelyn Powers—Interstate Environmental Commission (IEC)
Beau Ranheim— New York City Department of Environmental Protection (NYCDEP)
Kelly Streich—CT DEEP
Mark Tedesco—EPA, LIS Office
Jamie Vaudrey—UConn
Jordan Welnetz--EPA

Agenda

1. Presentation by Sarah Crosby “Science Need: Pathogen monitoring in the LIS watershed”
2. Presentation by Peter Linderoth “LIS Community Data Platform”
3. Discussion of “DRAFT Long Island Sound Study (LISS) Water Quality Monitoring Work Group FY22 Work Plan”

Presentation by Sarah Crosby “Science Need: Pathogen monitoring in the LIS watershed”

Sarah argued for the importance of pathogen monitoring in the LIS watershed, noting that waters “that are clean, clear, safe to swim in, and charged with life” are essential to meeting the vision of the LISS CCMP from 2015. She noted that sewage pollution is often invisible so requires testing. She listed several concerns with pathogen pollution in LIS watersheds, including public health, environmental justice, limiting access to the Sound, lack of information, and the potential for increasing impact with climate change. Sarah then listed the major monitoring programs around LIS with a focus on Connecticut, including monitoring of

watersheds, stormwater and wastewater, coastal waters, and the central Sound. She noted that many of these monitoring programs do not measure pathogens, particularly in the central Sound. There are many coastal stations monitored for pathogens by the CT Bureau of Aquaculture as shown on a map. However, a different statewide map of mostly inland waters included in the 2020 CT DEEP Waterbody Assessment showed that many CT waterbodies are not fully supportive of recreational use and a lack of data prevents assessment of many others. Sarah stated that most of the groups measuring pathogens in LIS watershed that are used in the CT state assessments are NGOs.

Sarah concluded by arguing that increased watershed pathogen monitoring is an important LISS science need, most of the LIS watershed is not monitored for pathogens and there is no coordination of current monitoring. Sarah mentioned that pathogens are an important indicator of sewage pollution that is relevant to CCMP Ecosystem Targets for shellfish, beach closures, and nitrogen and eutrophication, and she listed some relevant CCMP Strategies and Implementation Actions, including WW-35 (assess sources of pathogens). She noted that the Implementation Team identified "pathogen contamination monitoring and management" as one of three priority areas in need of strategic direction from the Management Committee in the spring of 2021. Finally, Sarah argued for a coordinated, geographically strategic, scalable pathogen monitoring throughout the LIS watershed.

Questions and Comments:

1. Jim Hagy (EPA) asked Sarah to elaborate on what she means by geographically strategic and scalable. She responded that that the Unified Water Study (UWS, organized by Save the Sound) was a good model for growing a program over time. Sarah also mentioned that current pathogen monitoring programs tend to be based where the participating organization is based and not where monitoring needs are most urgent. State agencies like CT DEEP use the available data but greater coordination would facilitate more monitoring of priority areas to increase coverage and potentially involve additional organizations. Jim Hagy followed up by saying that we can use available data to determine where to collect additional samples and cited a paper on stream biotic condition that used a machine-learning model to do that (Hill, R. A., E. W. Fox, S. G. Leibowitz, A. R. Olsen, D. J. Thornbrugh and M. H. Weber (2017). "Predictive mapping of the biotic condition of conterminous U.S. rivers and streams." *Ecol. Appl.* 27(8): 2397-2415).
2. Mark Tedesco (EPA) mentioned that this is a timely topic that the Watersheds and Embayments Work is also heavily involved in. He asked about what sort of sampling program would better define impairments as well lead to solutions. She replied that there are two main issues, the appropriate spatial and temporal scales of monitoring, as detailed in a paper last year which suggested you need to be close to the source of the problem. You also must also address the variability resulting from human use patterns, such as weekend activities. The data must also be strictly quality-controlled using standardized protocols, under a QAPP as for the UWS. Sarah noted that her laboratory is

also certified by the State Department of Health and that pathogen data can be variable so a network of partners working together to ensure data quality is important.

3. Jon Morrison agreed that a coordination monitoring program was a good idea but said that many programs have different objectives so may use different methods. Therefore, the questions to be addressed and how the data will be used should be clear from the beginning. Sarah agreed and suggested that as many interested groups as possible should be involved from the beginning to address as many needs as possible. Her lab used membrane filtration in the past and now uses IDEXX and is confident that they are comparable, at least for *Escherichia coli*, though others may disagree. End users should determine the ultimate objectives of such a program. Sampling design also depends on the questions asked and the logistics of sampling.
4. Peter Linderoth, bring in stakeholders early and a network of labs could be useful, but there is a lot of untapped interest and even data available. Sarah noted that costs for these analyses are not that high and said that the UWS is a good model as previously discussed.
5. Additional information in the chat from Mike Jensen on Suffolk County Dept. of Health Services monitoring of harbors and beaches, including pathogens: Surface water quality monitoring in North Shore harbors (tributaries to LIS):
<https://gisportal.suffolkcountyny.gov/gis/home/item.html?id=988ffe9131754a1db60b927d353c1c6c>
Beaches (includes all beaches in Long Island):
<https://gisportal.suffolkcountyny.gov/gis/home/item.html?id=025cb4dad57413980bd7e760b94da8>

Presentation by Peter Linderoth “LIS Community Data Platform”

Peter provided an update on development of the LIS Community Data Platform, a data management system under development by Save the Sound and a group of partners and intended for use by community monitoring groups. The goal of the project is to “create a standardized user-friendly data storage, visualization, and retrieval system for Long Island Sound community-generated data.” The scoping year of the project is complete, and the project is in year one of early project development focusing on detailed planning with the project partners and Kisters, a global software company focused on environment and energy data management. Other tasks for year one include technical and feature set development and Fecal Indicator Bacteria (FIB) data visualization planning. The project will be completed in year two with development of a marketing plan, piloting of database functionality, the launching of data visualization and full rollout of FIB data visualization on the Sound Health Explorer.

Prior input suggested up to 62 potential features for database deployment including types of data, geographic scope, monitoring program information, quality assurance information, data

visualization and retrieval options, other relevant data sets, etc. Features will be developed with user and stakeholder involvement with an iterative rollout throughout the LIS watershed with lots of testing and piloting. Discussion with stakeholders developing other data management systems (such as NYSDEC and LIQWIDS) is already underway. Users will need to include quality assurance information, standard operating procedures, and contact information for questions by data users. The system will incorporate both discrete and continuous quantitative data, as well as allowing for replicates. They have developed a Phase 1 list of monitored parameters for the database, but more are likely to be added later. Peter concluded with a list of some of the most common monitoring parameters, some data retrieval options, and types of information that could be included in data visualizations and mapping (see <https://gemstat.org/>). He finished with a FIB Data Visualization of LIS beaches on Sound Health Explorer and mentioned the system will push data to EPA's WQX which should be helpful to a lot of groups.

Questions and Comments:

1. Jim Ammerman asked when the first iteration would be complete, and Peter said that there had been a delay in funding, but he expected a beta version in a year and the final in a year and a half to two years.
2. Jim Hagy noted that Total Kjeldahl Nitrogen (TKN) was one of the parameters listed and said that some labs could no longer use the method because of the toxicity involved. Jamie Vaudrey mentioned that it was in the database to include historical data and Peter said some certified and regulators still used it. After further discussion Beau Ranheim said the method involved heating sulfuric acid and that's why a lot of groups no longer used it.
3. Katie O'Brien-Clayton noted in the chat the Quality Assurance information should include information on the lab, since if the lab is not state certified CT DEEP cannot use the data.

Discussion of "DRAFT Long Island Sound Study (LISS) Water Quality Monitoring Work Group FY22 Work Plan"

Jim Ammerman uploaded a draft of the Water Quality Monitoring Work Group (WG hereafter) work plan for discussion. He described the basic sections of the plan as suggested by the original memo from Mark Tedesco and noted that the WG was comprised of groups conducting monitoring in and around LIS as well as other regional water quality experts. He noted that monitoring activities had increased greatly with the recent budget increases and that monitoring coordination and data management are the current focus of the WG, though monitoring equipment and other challenges are also discussed. He then reviewed a list of Implementation Actions (IAs) which addressed monitoring coordination, data management, and other potential monitoring areas, such, as pathogens, plastics and trash, and harmful algal blooms (HABs) and toxins. He commented on recent input from Paul Stacey, suggesting a closer connection to watersheds and the Sentinel Monitoring Work Group, and Dave Lipsky, who

suggested closer ties among embayment monitoring and the integrated modeling efforts of EPA and the New York City Department of Environmental Protection.

Questions and Comments:

1. Jim Hagy asked what the Sentinel Monitoring Work Group was, and Jim Ammerman mentioned that they had engaged in two periods of activity, focused on sentinels of climate change, and described some of the past research projects which resulted from the group's efforts.
2. Jim Ammerman mentioned that greater collaboration with other work groups could be useful, as suggested in the comments by Paul Stacey, the current organization may be overly stove-piped.
3. Jim Hagy said he had written comments and would submit them, but he added that one of them was on the issue of "open science" vs. "open data" which was somewhat muddled in the draft work plan. He said that the LISS ORISE Fellow, Alex Huddell, clearly understood that Open Science was a suite of analytical methods which go well beyond just open data and the distinction needed to be strengthened in the work plan.
4. Jim Ammerman then repeated the LISS monitoring efforts had recently grown quickly and organically and that perhaps it was time for greater coordination which could improve monitoring coverage but also make it more efficient. He noted that there could be potential territorial concerns among monitoring groups and suggested the possibility on including experts in sampling design in coordination efforts. Jim Hagy suggested that when engaging survey professionals, it might be possible to have some monitoring groups add new stations while maintaining their prior ones, thus increasing the overall coverage. He noted that EPA's National Aquatic Resource Surveys had been able to nest some of their monitoring stations within established state surveys. Sarah Crosby added that the same thing had happened with the UWS, groups that joined adopted new UWS monitoring sites and protocols or added new sites under UWS protocols while maintaining many of their previous ones. This increased spatial coverage using common protocols which facilitated comparison of different embayments and overcame any initial resistance. Sarah said that watershed monitoring community is looking for exactly the types of increased efficiencies described above.
5. Jim Hagy asked about how quickly that data was available from the UWS to compare results. Sarah said that she could only speak as a participant in the UWS, Peter Linderoth had to leave this meeting for another one, but that some of the data availability issues still needed to be worked out. Jamie Vaudrey added that the UWS sampling season ran from May through the end of October and that groups had to report their data to Save the Sound (STS) by the end of November and then STS has to quality control it. This process takes some time, so STS is trying to automate the quality control as much as possible and is currently working with one of the monitoring groups that want to post their data online in almost real time, though this current posted data is limited to a few parameters.
6. Jim Ammerman then asked about other potential parameters (pathogens, plastics, HABs, etc.) that could be monitored. Kristin DeRosia-Banick had earlier advocated for

HAB monitoring as they are often a concern for shellfish. She wrote earlier in the chat that the major CT urban areas do not monitor pathogens but need to. Jim Hagy noted that from some of his local interactions with the public, HABs were a concern.

7. Jim Ammerman asked if there were any major topics missing from this work plan and noted previous comments suggesting closer connections to the watershed, though this raises the issues of partitioning tasks among this WG, the Watersheds and Embayments WG, and the Climate Change and Sentinel Monitoring WG. Jim Hagy asked if there was any monitoring of oil on the water in LIS because that issue came up in previous surveys elsewhere as an issue for the public. Jim Ammerman said he was unaware of any monitoring but said there must be oil spill response in LIS. Holly Drinkuth as if there was process for coordinating work plans between this WG and the Watersheds and Embayments WG. Jim Ammerman responded that there was not a current process but that he would be reaching out to them and other WGs. He also said that he would like additional input from this WG and would develop some sort of Google Doc or other online form to facilitate comments as well as have a final WG meeting in mid to late September to finalize the work plan. Sarah Crosby suggested that if there is interest in increased pathogen monitoring that sampling for multiple parameters should be coordinated for both central Sound and watershed monitoring since the actual water sampling is the costliest.
8. Link to the Google Doc for making comments on the draft work plan is:
https://docs.google.com/document/d/1PIC7kqVr8O AQ4I7s1aTrOFFQM1HLe_o0no5iS5uXQGw/edit?usp=sharing
Comments are encouraged!