**Attendance**

Jim Ammerman (Chair)—Long Island Sound Study (LISS)/NEIWPCC

Robert Burg—LISS/NEIWPCC

Anthony Caniano—Suffolk County

Carriel Cataldi—Connecticut Department of Energy and Environmental Protection (CT DEEP)

Alex DuMont--NEIWPCC

Richard Friesner—NEIWPCC

Michele Golden—New York State Department of Environmental Conservation (NYS DEC)

Gina Groseclose—United States Geological Survey (USGS)

Jim Hagy—EPA ORD

Emily Krsnak--USGS

Kamazima Lwiza—Stony Brook University

Jon Morrison—USGS

Katie O'Brien-Clayton—CT DEEP

Jim O’Donnell—UConn

Samarra Scantlebury –NYSDEC

Youngmi Shin—EPA ORISE

Evelyn Spencer--EPA

Paul Stacey—Footprints in the Water

Kelly Streich—CT DEEP

Sarah Stomski—Coalition to Save Hempstead Harbor

Cayla Sullivan-- EPA

Elizabeth Tanzi—EPA

Maria Tzortziou--CUNY

Jamie Vaudrey—UConn

Penny Vlahos—UConn

Kimarie Yap--IEC

Jim Ammermanstarted the meeting by inviting the monitoring groups around LIS to provide updates. Kimarie Yap of IEC said that they were switching to UConn as the lab for total alkalinity and dissolved inorganic cardon (DIC) samples starting in June. Jamie Vaudrey of the Connecticut National Estuarine Research Reserve (CT NERR) said that they recently held a series of meetings to get feedback on the locations for the permanent monitoring stations within the reserve boundaries. The will eventually have four monitoring stations with YSI sondes taking measurements every 15 minutes, one of which will be telemetered for real-time data. They got great feedback and some suggestions that they had not considered as well as potential collaboration opportunities with USGS. If you have suggestions, please let Jamie know, they probably won’t have gear in the water before next spring. Jim Ammerman asked when they were going to decide on their monitoring locations and Jamie responded that decisions have been delayed by discussions with USGS. She hopes that decisions on locations can be made by this summer and that two permanent stations can be installed by next spring. The two remaining stations will be installed late in 2025 or early in 2026 and may be more flexible in terms of locations. Jon Morrison of USGS added that they were already collecting some of the data under discussion.

Jim Ammerman noted that Peter Linderoth is on vacation, but when asked about the status of QuickDrops, said that it had been distributed to alpha users, the first real users and not just testers. Jamie added that those alpha users were just starting to enter data. Katie O’Brien-Clayton mentioned that CT DEEP has started their 2024 monitoring season, completing all their scheduled sampling from January through March, including two chlorophyll *a* surveys. They are conducting interviews for seasonal employees next week, and Matt is on extended leave until sometime in May. Bids for the R/V Dempsey replacement have recently closed. Jon Morrison of USGS said that all their current monitoring for embayments, tributaries, and coastal acidification were under way and doing well. They are approaching the end of their monitoring for the Saugatuck and Southport embayments, so the two buoys deployed there will probably be removed in late April. Anthony Caniano of Suffolk County said that the Suffolk subwatersheds monitoring plan was entering the final stages of developing the scope of work. It will cover the entire county, including the north shore on Long Island Sound. He will be seeking out the three estuary programs to plan individual meetings with each of them. They plan to conduct intensive monitoring on select embayments as a pilot project. Jim O’Donnell showed temperature, dissolved oxygen (DO) and pCO2 data from the ARTG and WLIS buoys for 2023. Bottom DO at both buoys was less than 3 mg/l for most of August, with more ventilation events and variability at WLIS.

Jim O’Donnell added that the President’s budget has called for a 75% cut in IOOS appropriations for fiscal year 2025, though the IOOS and NERACOOS office staffs would probably be maintained. This could threaten buoy operations in 2025 and calls for reaching out to local US Congressional Representatives and Senators. Kamazima said that the National Science Foundation was also slated for a 9-10% cut. Jim Ammerman added that this work group has been invited to join the Watersheds and Embayment Work Group for their next meeting 10 AM to noon on Wednesday, May 8, when Jon Morrison from USGS and others will discuss embayment data collection. Stay tuned for additional information.

**CCMP Revision Update from the Watershed Writing Team:** Kelly Streich, CT DEEP

The goal provided by the Revision Oversight Group, “Clean Waters and Healthy Watersheds” has been retained and a goal statement “Restore and Maintain Water Quality in Long Island Sound and Its Watershed” has been added. The committee has met three times with a fourth meeting tomorrow. She said that that the committee was from a diversity of organizations, had contractor support from EPA, and thanked the members for persisting through the long meetings. By a vote of the committee members, the five objectives are ranked in the following order: 1. Nutrients, 2. Watershed Condition, 3. Pathogens, 4. Toxic Contaminants, and 5. Physical Debris. The committee is continuing its discussion of each objective, confirming the objective titles, completing the SMARTIE structure using the template, and establishing numeric targets. These will be finalized at the early April meeting ahead of the Management Committee meeting.

**Discussion**

-Kamazima Lwiza said he was unsure what a numeric target means and asked if it is a quantifiable measure. Kelly responded that it should be a measurable target according to the SMARTIE structure. These targets must be quantifiable which can be a challenge, even for water quality issues like microplastics. Kelly added that measures of marine debris removal were still under discussion and are not final. There will be public engagement sessions followed by more revisions and then a public comment period followed by additional revisions, there is still a long way to go.

-Jim O’Donnell asked what SMARTIE means and Kelly described it (Specific, Measurable, Achievable, Relevant, Time-Bound, Inclusive, and Equitable), saying that she has passed over it rather quickly. Jim seconded Kamazima’s concerns about numeric targets, noting that they would be challenging particularly for certain objectives.

-Paul Stacey said that this would be a challenge because you are trying to address complex topics with a single point outcome. He suggested using targets along a gradient, or tiers of targets. He suggested the biocondition targets from projects that he conducted with UConn CLEAR. There is not one target for every water body. He said it can be difficult to fit with the Clean Water Act which wants specific targets, but he has example studies for Norwalk Harbor and Niantic Bay that he would be willing to discuss further. Kelly added that one part of SMARTIE was “Relevant”, so the goals must be achievable by the Long Island Sound partnership.

**Brief Review of Coastal Acidification Partners’ Data (QA/QC and Upload):** Liz Tanzi, Cayla Sullivan, EPA

Liz said that she was new to this position so she was wondering if others could provide her with updates so that she could better understand it, she does not have anything specific to say. Penny Vlahos then asked to speak and said that she was working on acidification monitoring with CT DEEP and measuring three parameters, total inorganic carbon (DIC), total alkalinity (TA), and spectrophotometric pH, which is more precise than the usual pH data collected. She showed an example spreadsheet for one month with a total alkalinity (TA) measured by the Dixon method as well as a TA predicted by the DIC and pH. The measured and predicted TA are closely correlated, though the predicted TA is usually equal or slightly less as it includes only the carbonate alkalinity and not the other buffering components. They have a robust data set for 2023 and are analyzing the March 2024 data. A summary of the current data set will be presented at the upcoming Long Island Sound Research Conference.

**Discussion**

-Cayla Sullivan asked if what Penny presented was part of the intercalibration study. Penny replied that it was not, USGS uses a freshwater alkalinity protocol, and marine scientists use the Dixon protocol, and they will not agree because they use different reference standards. Since researchers are seeking high-resolution data in a system with a large salinity transition, they are working to understand the uncertainties resulting from this transition and methods differences. They should have a much better understanding by the end of this summer.

Cayla added that Liz Tanzi is now the EPA coastal acidification lead. She further said that it was important to determine where acidification investigators currently were with respect to QA/QC processing of their data and uploading it to one of the appropriate databases (WQX or others). Part of the reason for this is that EPA ORD is again compiling information on acidification from National Estuary Programs (NEPs) with the goal of developing a synthesis of full carbonate chemistry including aragonite saturation compared with system-specific thresholds of acidification-sensitive organisms and water quality standards like pH and dissolved oxygen. She added that it is unclear when this data will be needed, but we need to determine the status of LIS data availability and accessibility.

Penny Vlahos replied that their data was ready except for a slight delay in determining whether a dye correction was needed for the spectrophotometric pH measurements. Paul Stacey asked if these efforts weren’t required in a quality assurance project plan (QAPP) as they used to be. Cayla replied that nothing had changed, every project has a required QAPP. Paul also asked Penny if given the CCMP revision and the interest in pH and the many influences on it, were there some SMARTIE objectives and management actions that could be included in the new CCMP. Penny responded that the CCMP writing teams could include issues with longer targets (10-20 years) such as the hypercapnia (elevated CO2) which is a separate problem from hypoxia, is also a multi-stressor, and persists longer in bottom waters.

Gina Groseclose (USGS) said that they were monitoring acidification in the bottom waters of all major tributaries and embayments in Connecticut and two small bays on the north shore of Long Island. They are about ready to switch to alkalinity measurements that use the Dixon method. Penny asked about the standards but agreed that they would discuss it later. For the water year 2023 they collected data from April through September and all their discrete and continuous data are publicly available on USGS NWIS (National Water Information System). USGS has had only one minor QA/QC issue, and they collect DIC, DOC, acid neutralizing capacity, alkalinity, and pH. This allows them to determine aragonite saturation.

Kimarie Yap from IEC said that they had completed QA/QC for 2022 and 2023 data and uploaded it to WQX. As mentioned previously, they are moving their DIC and alkalinity sample analyses to UConn starting around June, as the previous lab they used determined only carbonate, not total alkalinity. Penny pointed out that this was an important example of removing inconsistencies in the acidification data. Michele Golden (NYS DEC) pointed out that New York State has requirements that go beyond EPA, primarily for using a laboratory with Environmental Laboratory Approval Program (ELAP) Certification. She asked if organizational QAPPs included this. Katie O’Brien-Clayton (CT DEEP) said that ELAP certification does not include total alkalinity in marine waters and NYS DEC had signed off on their QAPP. Kamazima Lwiza asked about which embayments on the north shore of Long Island were being monitored by USGS. Gina Groseclose responded that they were doing continuous and discrete monitoring in Oyster Bay and Flax Pond.

Jim O’Donnell said they were supported to add pH and pCO2 sensors to the bottom of the ARTG buoy and a pair of similar sensors at the bottom of the Central Sound Buoy. The 2023 ARTG buoy data has been recovered, processed, but not yet run through QA/QC like the 2022 data which was compared with discrete samples and CT DEEP data. He showed the ARTG pH and pCO2 time- series which showed a seasonal pattern closely corresponding to the dissolved oxygen. He will calculate aragonite saturation following the QA/QC procedures. He noted that there was a variation of 0.2 pH units within a month period which would be unresolved by water samples at monthly intervals. He was also unsure whether the increased noise in the pH time-series at the end of the year was real or instrument problem, he is looking forward to comparing it with other in situ data. Penny asked how often the instruments were cleaned and Jim responded every two weeks in the summer and every month at other times. Jon Morrison (USGS) asked if the noise could be due to colder water temperatures, noting that their pH sensors were sometimes more variable in cold conditions. Jim added that October often shows nighttime cooling which explains the rapid increase in DO and could explain the pH variability. He concluded that this is the longest continuous record they have gotten from the pCO2 sensor which has been a challenge to use. Jim added that he had committed to participating in the EPA ORD acidification synthesis and Cayla acknowledged his participation. Jim asked Penny about the stations she had sampled, and they agreed to follow up later.

**Discussion of FY 2024 Supplemental Proposals**

1. National Coastal Condition Assessment 2025 LIS Embayment Intensification, CT DEEP (EPA Contract), $500,000

Katie O’Brien-Clayton from CT DEEP provided some comments on this proposal which is intended to provide more data for the development of a benthic invertebrate index of biological integrity (IBI). This project would support sampling at an additional 60 embayment locations in 2025 in addition to the 20+ sites in the main Sound, like 2020 and 2021. They are just beginning Phase 2 of this effort to develop the IBI. They hope to use the 2020 and 2021 data for validation and the new 2025 data for assessments.

Paul Stacey noted that these types of indices have been highly successful in stream monitoring because there is a consistent character from site to site, which is not the case in Long Island Sound where there is a lot of variation. He said that sixty samples will not cover all the variation

and wondered if CT DEEP had consulted with Peg Pelletier who is an expert in this area. Katie said that Peg Pelletier is on the technical advisory group for the project and is the one in charge of the M-AMBI index for the EPA National Coastal Condition Assessment (NCCA). While it works well on a national scale there is a need to develop a localized IBI for LIS, as has been done for numerous other estuaries. Jim Hagy asked about the random statistical design and wonder if choosing specific sampling sites based on available site information would not be more useful. Katie agreed but said the NCCA offered only one sampling design. Jim said that he did not necessarily see the need for more samples, but better information from the samples collected. Katie suggested that they must accept the available NCCA sampling package. Paul suggested that fouling plates could be an alternative with a constant substrate which provides a consistent reading of the differences among sites. Jim Hagy suggested that the LISS push back on the NCCA and not just take what they are offering. He said that more papers resulted from deliberate site selection vs. random design, though the latter might work on a national scale. He suggested resampling to provide time-series information which Katie said could was part of the NCCA design. She reiterated that they were just on Phase 2 and were hoping to get more deliberate about future sampling. Jim Ammerman also noted that the 2020 and 2021 NCCA data are not yet available.

1. Long Island Sound Tributary Streamflow Monitoring, CT DEEP/USGS, $67,200

Jon Morrison spoke for USGS and noted that four important tributary stream gage monitoring sites in Connecticut were short on funding, so they need support to continue for the next year. Jim Ammerman asked if they would need additional funding after this one year and Jon replied that USGS was overhauling all their data collection programs that they run through EPA and are developing a comprehensive base request to which these sites would be added. They are discussing this with Mark Tedesco, and this proposal would continue funding in the meantime. USGS also has a program to get more funding for the stream gages but that is in the future. Penny Vlahos asked what measurements were included and Jon replied it was just streamflow, additional measurements were supported by other projects. Paul Stacey added his support and said the USGS data had been essential to the development of the LIS TMDL.

1. Messaging and Forecasting Hypoxia In Long Island Sound: Building a Communications ToolKit, NEIWPCC/Sea Grants, $60,000

Cayla Sullivan from EPA gave a brief presentation about the project, which is focused on the communications part of the Hypoxia Forecast Tool currently under development. She discussed the workshop that was held in May 2023. She mentioned the progress made in reducing hypoxia as well as the various groups involved in monitoring it. She mentioned other hypoxia forecasting tools currently available for the Gulf of Mexico, Chesapeake Bay, and Lake Erie which have been shown to be effective communication tools. This project is to work with people at the interface of science and practice to find the best way to improve public awareness about hypoxia in LIS. This communications proposal includes several components such as developing a video that imparts the issues and impacts of LIS hypoxia with an emphasis on land-use and anthropogenic influences. It also includes piloting targeted communications with one or two selected communities in the western Sound and installing signage. Finally, creating a communications kit and potentially developing a communications game like the one for Chesapeake Bay. The communities will be selected with the help of the EJ work group and the project will include the Sea Grant outreach coordinators. Robert Berg added that some of the work of Gregory Dietl relating sediment molluscan death assemblages to past water quality might also be useful to help communicate water quality improvements. Kamazima Lwiza commented that a clear communications strategy was needed because it would be easy to overload the audience, we are seeking to communicate with too much information. Paul Stacey said he thought that there was not a lot of interest in hypoxia and though we have done a good job reducing it, little has changed in the last seven years as the five-year running average of hypoxic area has been basically flat. He said that he could reasonably predict the area of hypoxia and he did not see a big audience for this information, it is not that charismatic a problem.

1. Summary Report of water-quality data collected Mystic, Norwalk, Southport, and Saugatuck Embayments 2021-2024, USGS, $140,000

Jon Morrison from USGS said that this project was to prepare a report on the discrete and continuous water quality data collected from four Connecticut embayments. In response to a question from Jim Ammerman he added that the data was originally collected to feed into models. The data set is very large and will be released but there will be no synthesis of it without this project.

1. Changes in Nitrogen Concentrations in Groundwater Following the Installation of Sewers, USGS, $171,846

Jon Morrison said that septic systems were transitioned to sewers in the Pine Grove peninsula in 2008, which drains groundwater to the Niantic River, an estuary important to eelgrass and other biota. Sampling was conducted for a couple of years after the transition but not since then and USGS now wants to re-sample the area for water flow and nutrient concentrations 15 years after it was sewered to measure the long-term changes due to the installation of sewers. Paul Stacey said that he was the project manager for the original project there and the nitrogen levels were very high. He thought it would be an interesting project to understand the current conditions, but it would not be effective in terms of convincing homeowners and politicians to replace septic systems with sewers in other areas. Kelly Streich added that she had vetted this study with several groups at CT DEEP who were enthusiastic about getting the data and using it as a communications tool.