Water Quality Monitoring Work Group
TEAMS Online Meeting
Nov. 17, 2020 – Meeting Summary

Attendance

Jim Ammerman (Chair)—Long Island Sound Study (LISS)/New England Interstate Water Pollution Control Commission (NEIWPCC)
Carol DiPaolo and Michelle McAllister—Coalition to Save Hempstead Harbor
Richard Friesner—NEIWPCC
Michele Golden--New York State Depart of Environmental Conservation (NYSDEC)
Peter Linderoth—Save the Sound (STS)
David Lipsky—New York City Department of Environmental Protection (NYCDEP)
Matt Lyman—Connecticut Department of Energy and Environmental Protection (CTDEEP)
Jon Morrison—United States Geological Survey (USGS)
Katie O'Brien-Clayton—CTDEEP
Leah O'Neill—EPA, Region 1
Evelyn Powers—Interstate Environmental Commission (IEC)
Beau Ranheim—NYCDEP
Nikki Tachiki—EPA, LIS Office
Koon Tang—NYSDEC
Mark Tedesco—EPA, LIS Office
Jamie Vaudrey—University of Connecticut

Agenda

Special meeting to review Tetra Tech Draft Retrospective Analysis, hereafter called the "Analysis".

Discussion

1. Jim Ammerman asked about the total nitrogen NPDES permit loads, whether they were the permitted or actual loads. Mark Tedesco replied that they were the actual loads.
2. Jim Ammerman mentioned that the Analysis said that Secchi depths were available only for the Western Narrows. Matt Lyman said that was true before 2002, but not since.
3. Jim Ammerman also asked about the meaning of "zero response values" on page 3, it was not clear whether that meant a value of zero or no data. A related issue is "non-detects" or below detection measurements, particularly surface nitrogen in the summer, how are they treated.
4. There was also a discussion of whether to use a generalized linear mixed-effect model (GLM) or a generalized additive model (GAM) as described in the methods on page 1. Tetra Tech went with the GLM because they said initial analysis of the modeled results

were linear. Jamie Vaudrey said the resulting analysis was hard to assess and could have been more sophisticated. There was no seasonal analysis and annual averages tend to remove sensitivity.

5. Jon Morrison and Matt Lyman noted that all years with no seasonal analysis would "smear" any seasonal effects. It was also noted that Tetra Tech filtered the data for the growing season (April-September).
6. Jamie Vaudrey wondered if there was any accounting for river flow and climate impacts other than the temperature and salinity terms in the model equation.
7. Several people wondered about trends in the five different regions, Jamie sees trends in total nitrogen in the Western Narrows. However, Tetra Tech has so far not investigated regional trends except for chlorophyll *a*, though they suggest that is a future option.
8. In terms of temporal trends, there were few in the average analysis, though the ones that appeared were trends in PAR, Kd, and Secchi depth, all consistent with an increase in water clarity. The largest number of temporal trends were found in the analyses of the 10th percentile of annual value and the observed daily data. The trend of increasing water clarity continued, but in some cases nutrients and chlorophyll *a* also increased, which might seem contradictory.
9. When Mark Tedesco asked Katie O'Brien-Clayton, Matt Lyman, and Evelyn Powers what trends they had found, Matt mentioned that he saw a trend of decreasing nitrogen over time when the data was de-seasonalized. To do this the mean of all data for a given station over the duration of sampling is subtracted from the observed result for particular survey. When these results are plotted they show a consistent decline in most forms of nitrogen in the western, central, and eastern Sound over time. This is particularly true since 2010. Mark also asked them for suggestions of analyses they would like do but had not yet done.
10. Mark Tedesco also mentioned that dissolved oxygen was missing from these analyses, though that may be because CTDEEP and U Conn. are funded to determine both hypoxic area and volume, a project still in progress. He mentioned an interest in the older tool combining hypoxic area and duration and relating it to biomass. It is hoped that the new calculations of hypoxic volume will have more biological relevance than area alone, as found in some other ecosystems.
11. Carol DiPaolo and Michelle McAllister asked for confirmation that the triangles in the map in Figure 1 corresponded to the individual sampling stations. They were somewhat surprised by the opposing trends in water clarity vs. nutrients and chlorophyll mentioned above. They also wondered about the opposing trends of DIN (increasing) and TN (decreasing) in Table 8, suggesting a decline in organic nitrogen. Finally, they were interested in regional analysis reflecting population and development patterns in the Long Island Sound watershed. They also wondered about related increasing risks (both pollution and others) from climate change and sea level rise and were interested

in recommendations for effective BMPs. These latter topics have not yet been investigated by Tetra Tech but were listed in their potential additional analyses.

12. In general, many participants had an interest in both regional and seasonal analyses. Except for chlorophyll *a*, as previously mentioned, Tetra Tech has not yet conducted regional analyses, though they have mentioned them as a future possibility. The same is true for seasonal analyses.