



**Long Island Sound Study
Water Quality Monitoring Workgroup Conference Call
Meeting Minutes**

Monday, July 16, 2018 10:30 AM-11:30 AM

Participants:

Jim Ammerman (Chair)—Long Island Sound Study (LISS)/New England Interstate Water Pollution Control Commission (NEIWPCC)

Cassie Bauer-- New York State Dept of Environmental Conservation (NYSDEC)
Charles DeQuillfeldt— NYSDEC
Richard Friesner--NEIWPCC
Lorraine Holdridge-NYSDEC
David Lipsky—New York City Department of Environmental Protection (NYCDEP)
Matt Lyman—Connecticut Department of Energy and Environmental Protection (CT DEEP)
Audra Martin—NEIWPCC
Katie O'Brien-Clayton—CT DEEP
Jim O'Donnell—University of Connecticut (U Conn)
Leah O'Neill—United States Environmental Protection Agency (USEPA)
Evelyn Powers—Interstate Environmental Commission (IEC)/NEIWPCC
Beau Ranheim--NYCDEP
Paul Stacey—Footprints in the Water
Kelly Streich— CT DEEP
Jamie Vaudrey—U Conn

Advance Agenda and Notes

Agenda

1. Monitoring updates
2. Current methods for Chlorophyll a measurements in Long Island Sound
3. Data management strategy for Long Island Sound
4. Other items or updates, let me know if you have major items to add.

1. The meeting started with an update on current monitoring efforts. Matt Lyman and Katie O'Brien-Clayton from CT DEEP were out monitoring in Long Island Sound as we spoke. Matt noted that monitoring was proceeding successfully and that oxygen levels generally remained high. Evelyn Powers (IEC) mentioned one low oxygen station in Manhasset Bay but otherwise high concentrations. Beau Ranheim (NYCDEP) said that their monitoring program was proceeding routinely.

2. Chlorophyll a measurements were the next discussion item. Jim Ammerman (LISS/NEIWPCC) cited Jamie Vaudrey's (U Conn) methods comparison data that he distributed last week and then asked Jamie to summarize the methods and her analysis. To summarize briefly, total chlorophyll a consists of active intact chlorophyll a plus some fraction of breakdown products call "pheopigments", mostly pheophytin. (Technical note on chlorophyll a breakdown

products: Pheophytin has lost the Mg atom, chlorophyllide has lost the alcohol tail, pheophorbide has lost both. All may be referred to as “pheopigments” or pheophytin the EPA methods below.) Healthy phytoplankton have mostly active chlorophyll *a*, but the fraction of pheopigments increase as the cells age or a bloom senesces. There are two EPA-approved fluorescence methods for total chlorophyll *a* (see links below), and they use different methods to correct for pheopigments and other interfering pigments. The non-acidification (NA) method uses narrow bandpass fluorescence filters to exclude interference but does underestimate the pheopigment fraction of total chlorophyll *a* by about 40% according to Jamie. The acidification (A) method uses a broader filter range but corrects for interference with an extra acidification step after the initial fluorescence measurement and before a second measurement. (Acid addition removes the Mg atom.) Calculations then yield a measure for intact chlorophyll *a* and another for pheopigments, which can be added together (after correction of pheopigments for an “acidification factor”) to provide a measure of total chlorophyll *a*.

This total chlorophyll *a* value is probably the most useful measurement for addressing eutrophication in Long Island Sound and similar systems where the peak value is most important. The inclusion of pheopigments is also important because such pigments were probably active chlorophyll *a* in the recent past. The NA method should yield a similar total chlorophyll *a* value and did in Jamie’s comparison study with low chlorophyll *a* concentrations (<3 ug/l). More recent method comparisons conducted with higher chlorophyll *a* concentrations are not yet available, though the absolute (but not percentage) differences between methods would likely be higher than at low concentrations. The NA method is simpler but can never provide separate pheopigment measurements which may be useful for grazing or some other studies. Currently, CT DEEP uses the NA method, IEC uses the A method, and various citizens’ groups use one or the other, therefore comparisons are important.

Beau Ranheim (NYCDEP) noted that they use the A method, though have tested the NA method in the past as well. They generally found good agreement between the two, though got unusual results when dinoflagellates dominated, such as sometimes occurs in Jamaica Bay, in that case the NA method was higher. They are moving towards routine use of the HPLC method for chlorophyll *a*, which is generally considered more definitive but involves more instrumentation and expertise.

Lorraine Holdridge (NYSDEC) asked about the composition of pheopigments. Jamie mentioned that as chlorophyll *a* breakdown products they are common in the sediment from phytoplankton that have sunk out of the water column. Paul Stacey (Footprints in the Water) thanked Jamie for her studies and both noted that chlorophyll *a* is often a variable measurement, with differences seen even between identical samples and methods. Paul described the even greater uncertainty between chlorophyll *a* and phytoplankton productivity and left unmentioned was the very wide variation in phytoplankton carbon to chlorophyll *a* ratios.

3. A data management strategy for Long Island Sound was the next topic of discussion. This topic has been a concern for some time and was addressed by Jim O’Donnell (U Conn) at the recent STAC meeting. At the STAC meeting he described the current LISICOS system and listed the current LIS data contributors, the currently used LIS models, and listed some of the data sharing options for the future along with current examples (an edited version of his STAC presentation was distributed before the call). Jim recommended adopting the NOAA ERDDAP System, which facilitates data access and analysis. Concurrently the LIS data management issue was also detailed in the new report of the Technical Advisory Committee (TAC) for the Integrated Modeling Framework, the new regional modeling effort of NYCDEP and EPA. (Note: This report is not currently publicly available but selected recommendations on data

management were described. Lorraine Holdridge (NYSDEC), David Lipsky (NYCDEP), and Kelly Streich (CT DEEP), were members of the TAC or worked with it.)

The TAC recommended using the Water Quality Portal (WQP), a national database developed by the National Water Quality Monitoring Council (NWQMC), EPA, and USGS. The WQP provides access to EPA STORET, USGS NWIS, other data sources and is organized in “Characteristic Groups” including hydrodynamic parameters, water quality parameters, and sediment parameters. Data collected under EPA contracts or grants is already required to be submitted to the WQP. Jim O’Donnell was difficult to hear because of a poor phone connection but suggested that we query users of the current data system to find out about its usability and challenges. He argued that the discussion was largely focused on data-focused systems like WQP and he wanted to see a system where both data and model outputs would be available in the same place. David Lipsky said that such a system was an objective of the Integrated Modeling Framework.

Paul Stacey mentioned that he was involved with a workgroup that was working with USGS to improve WQP and its data input counterpart, the Water Quality Exchange (WQX). He provided several WQP-related links as well as others to regional databases (see below). Richard Friesner (NEIWPCC) also mentioned Dwane Young’s (EPA) recent presentation on WQX (second WQX link below). Paul Stacey asked about efforts directed at sentinel monitoring for climate change (physical, chemical, and biological changes) beyond just the water quality parameters discussed so far. Cassie Bauer (NYSDEC) noted that the Sentinel Monitoring Workgroup had been updated their previous LIS information and that a new report should be available next week.

At the end of the discussion, Evelyn Powers (IEC) raised the issue of the usefulness of the current formats for the joint CT DEEP-IEC annual hypoxia reports. She noted that the new short “highlights” report has proven useful but wondered if all the effort devoted to the full report was worth it. There might also be changes which would make the full report more useful. Jim Ammerman suggested an in-person meeting of a smaller group to consider the question in detail, prior to the next report.

Links:

Chlorophyll a methods

A Method: https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=309417

NA Method: <https://nepis.epa.gov/Exe/ZyPDF.cgi/9100PTUC.PDF?Dockkey=9100PTUC.PDF>;
<https://www.turnerdesigns.com/t2/doc/appnotes/S-0013.pdf>

Databases

WQP: <https://www.waterqualitydata.us/>

WQX: <https://www.epa.gov/waterdata/water-quality-data-wqx>; <http://neiwpc.org/wp-content/uploads/2018/06/Water-Quality-Data-Sharing.pdf>

Others (thanks to P. Stacey): https://www.waterqualitydata.us/other_portal_links/;

<https://www.northeastoceandata.org/>; <http://www.oceanhealthindex.org/>;

<http://midatlanticocean.org/data-portal/>; <http://neracoos.org/>;

<http://neracoos.org/sentinelmonitoring>; <http://www.oceandataportal.org/> (Note: My browser said this last site was not secure.)