Science & Technical Advisory Committee Meeting
Stony Brook University
July 8, 2011

Welcome and Introductions

Larry Swanson began the meeting and asked all attendees to introduce themselves.

Synthesis Book Update

Jim Latimer provided an update on the Synthesis Book. He noted that he received a completed draft biogeochemistry chapter from Carmela Cuomo that morning and thanked her for efforts. He presented a timeline for completing the book and noted that the Pollutant chapter and the Biology/Ecology chapter are the two for which drafts are still needed. He emphasized that he will be working with those chapter leads to complete drafts and would modify the outlines if needed. The Management chapter is also still being written but is partly dependant on the technical chapters from which it will draw material. Jim ended on an optimistic note that he believes that significant progress has been made and that the book will be completed.

Management Committee Update

Mark Tedesco gave an update on the Citizen Advisory Committee's Sound Vision Action Plan and related it to the Long Island Sound Study (LISS) Action Agenda that was circulated to the STAC. **Action: The STAC requested that it be asked in a follow up survey to rank priority actions.** To support the review, a survey has been created at http://www.surveymonkey.com/s/QKXTSCY

The survey asks requests a ranking of the importance of proposed actions within the Science and Management and the Habitats and Wildlife sections on a scale of 1-5. It also asks for recommendations on additional actions and why. Finally, it asks for suggestions for new recommended actions within the Waters and Watersheds and People and the Sound sections. Survey responses are requested by July 18. This way, STAC input can be provided at the July 21 Management Committee meeting.

Tedesco also reviewed the LISS FY 2011 work plan and budget, which is available at http://longislandsoundstudy.net/2011/07/2011-work-plan/

Lastly, it was noted that the 2012 LISS meeting schedule will be proposed soon and that the STAC will be asked if the proposed meeting dates are appropriate to support STAC attendance and participation.

Eutrophication Water Quality Monitoring Review

A. Understanding hypoxia trends and drivers

Jim O'Donnell began the discussion by presenting the results of his team's review of the systemwide eutrophication model (SWEM), noting three points: 1) SWEM is insensitive to discharge magnitude, 2) has reduced vertical turbulent flux in hypoxic zone, 3) has estimates of respiration/production that are too low.

In his review of the physical model component of SWEM, his team found that the M_6 tide/M_2 tide ratio that is higher in western Long Island Sound (WLIS) than eastern Long Island Sound (ELIS) was picked up well by SWEM. This shows that the model does a complicated thing right for which there were no measurements at the time. The M_6 tide is important in determining vertical mixing. But there is little lateral resolution in SWEM due to limited segmentation.

O'Donnell also concluded that the oxygen data lacked enough statistical power to discern model performance and that it would be better to consider estimates of the duration of hypoxia than to make seasonal concentration comparisons.

Major conclusions are that 1) we can improve SWEM through quantitative skill assessment and comparison to observations; 2) we should measure carbon biomass and rates of production/respiration to constrain SWEM.

B. Current water quality measurements

Matt Lyman, CTDEP, gave a presentation on the CTDEP water quality monitoring program, highlighting the stations, frequency, and parameters, and ways that the DO data has been presented. Bob Wilson noted that Kamazima Lwiza of Stony Brook University has been calculating DO Area and volume days. Connecticut Department of Environmental Protection (CTDEP) should compare methods.

Caitlyn Nichols, Interstate Environmental Commission, highlighted that IEC is continuing it WLIS and embayments summer monitoring program. **Action: IEC should provide data to the Long Island Sound Integrated Coastal Observing System (LISICOS) so that it can be incorporated and made available along with other water quality data.**

Jim O'Donnell then gave a presentation on the LISICOS program. He noted it has plotted DO contour maps using CTDEP data set and objective analysis (statistical analysis) to improve presentation. He is also concerned with determining the uncertainties in the duration/area measurements. Buoys determine the short-term variation in DO that occurs between the ship sampling every two weeks. Using buoy data he has estimated that the error in single ship board sample as an estimate of the 14-day mean is 2 mg/L. Using this figure, the calculated uncertainty in the survey duration of hypoxia estimates is 45 sq. miles. This suggests that area/duration estimates have large enough variability to make trend determination difficult without large changes. He noted that the buoy locations were selected primarily to understand hypoxia, not to detect long-term changes. Their current location makes it unlikely that they will be able to detect early changes in hypoxia dynamics that may be occurring in the western Sound. He then made

recommendations to improve the power of the sampling program: 1) Add a buoy ($150,000/year estimated cost) in the area most likely to change (in more central LIS location); 2) double up instruments on buoys to avoid data loss when one probe goes off-line.

Bob Wilson gave a presentation on the Port Jefferson-Bridgeport Ferry monitoring project, which supports calculation of the residual circulation patterns through the water column. He first showed the clear fresh water signal of the Harlem River into WLIS. He noted the correlation between wind stress and the western flux of water. In response to a question, he noted that since they have data from 2004 they can begin to look at annual and seasonal variations in circulations and flux patterns to the variability in hypoxia.

C. Discussion

Regarding buoy locations, Jim O'Donnell noted that one option is to move an existing buoy to central LIS, but he noted it is more likely that funding pressures would move the buoy out of LIS. Carmela Cuomo stated that she thought it would be valuable to get near bottom ammonia and sulfide measurements. Milan Keser emphasized the importance of pH measurements and that their value went beyond acidification. Bob Wilson stated that it would be valuable to evaluate the Chesapeake Bay monitoring initiatives, including looking at trends in multiple dimensions and data assimilation. Penny Howell mentioned that local fishers, with funding, could provide assistance in maintaining and deploying buoys and sensors. Sylvain DeGuise asked whether the monitoring program objectives are being met. O'Donnell responded that the monitoring is helping to understand hypoxia, but is less able to discern trends. Penny Howell noted that the temperature data was pivotal in influencing lobster management policies. Mark Tedesco noted that there are three desired outcomes: 1) improved understanding of hypoxia, 2) identification of status and trends, and 3) support for diagnostic analyses for management, including modeling. Charles Yarish asked if the monitoring program is under funding threat. Matt Lyman responded that cutting some stations won't lower costs much and that cutting some analyses could lower lab costs. He also noted that moving to a probabilistic design should be considered.

In summary, the following recommendations were discussed and agreed to by the STAC:

1. **The monitoring programs should be maintained to support**
    a. **improved understanding of hypoxia,**
    b. **identification of status and trends, and**
    c. **support diagnostic analyses for management, including modeling.**
2. **Aggregate data in a centralized location to facilitate analyses and distribution to other users (IEC, NYCDEP, and local embayment monitoring, as appropriate).**
3. **Measure water column carbon biomass and rates of production/respiration (secondarily consider benthic respiration) to constrain SWEM.**
4. **Add redundancy in buoy instrumentation to minimize the chance of data gaps.**

5. **To discern trends, focus on duration estimates in areas where change will first occur (central LIS). This could be accomplished by expanding buoy deployments eastwards to allow earlier detection of change.**
6. **Employ data assimilation to improve descriptions of the state of the Sound.**

Next STAC Meeting

The next STAC meeting is November 18 in Connecticut. The agenda will consider presentations on restoration projects and the effectiveness of the techniques employed in meeting restoration objectives. Descriptions of Future Fund projects, including restoration projects, can be found at http://longislandsoundstudy.net/about/grants/lis-futures-fund/

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Name	Institution
Larry Swanson	SoMAS/SBU
Julie Rose	NOAA
Gillian Stewart	Queens College, CUNY
John Mullaney	USGS
Suzanne Paton	USFWS - SNEP - Coastal Program
Jim Latimer	EPA - ORD
Sylvain DeGuise	CT Sea Grant
Art Glowka	LISoundStakeholders
Micah Kieser	UConn
Caitlyn Nichols.	Interstate Environmental Commission.
Jim O'Donnell	UConn
Anne McElroy	SBU
Cornelia Schlenk	NY SeaGrant
Charlie de Quillfeldt	NYS DEC
Kelly Streich	CT DEEP
Mickey Weiss	Project Oceanology
Carmela Cuomo	UNH
Penny Howell	DE(E)P Marine Fisheries
Matt Lyman	DEEP LISWQMP
Mark Tedesco	EPA/LISO
Bob Wilson	SoMAS/SBU