

Climate Change and Sentinel Monitoring Workgroup Meeting Summary

Monday, January 29, 10-12PM

Teams Meeting (Link in Meeting Invite)



Attendees

Samarra Scantlebury, NYSDEC (Co-Chair), Kathleen Knight, CTDEEP (Co-Chair), Casey Abel, Stephanie R Arsenault, Robert Burg, Antoinette Olivia Clemetson, Sarah Crosby, Anya Grondalski, Samantha E Apgar, Yong Chen, Jason X Bochat, Claire Ober, Caitlin A Craig, Richard Friesner, Justin Davis, M Donato, Sandra A Dumais, Melissa Duvall, Christopher A Eagler, Syma Ebbin, Catherine Fede, Nathan R Fuentes, Colleen Giannini, Kurt Gottschall, Amanda L Higgs, Jesse Hornstein, Jie Yin, Allison J Joers, Kasey Burn, Rupika Ketu, Kim McKown, Alison R Kocek, Krystina A Braid, Kristen Laccetti, DeAva Lambert, Jennifer N Lander, Yunzhou Li, Robyn M Linner, Susan I Maresca, Marisa, MaryEllen Mateleska, Matthew James, Meaghan McCormack, Renee Mercaldo-Allen, Shannon Meseck, Francis OMcParland, Alexandre Meirhaeghe, Esther Nelson, Nikki Spiller, Paul M Nunnenkamp, Katie O'Brien-Clayton, James O'Donnell, Casey Personius, Owen Placido, Matthew John Pruden, Stephanie N Reifschneider, Nicole Rosenfeld, Angela E Schimizzi, , Rebecca L Shuford, Christopher R Scott, Oliver Shipley, Evelyn Spencer, Kelly Streich, Cayla Sullivan, Rachel H Sysak, Elizabeth Tanzi, Mark Tedesco, Penny Vlahos, Jackie R Wu and Harry Yamalis

Introduction

Samarra Scantlebury called the meeting to order at approximately 10:00 AM. Samarra provided an overview of the Climate Change and Sentinel Monitoring Work Group's (CCSM) purpose and, the agenda and goals for the meeting.

This January 29, 2024 meeting was a special meeting focused on convening fish experts of Long Island Sound to:

1. Establish a shared understanding of what Long Island Sound Study (LISS) Indicators Team has noted relative to fish in the Long Island Sound.
2. Establish shared understanding of LIS research funded projects related to fish of Long Island Sound.
3. Share 2024 proposal ideas that will enhance understanding of fish communities in Long Island Sound.

Samarra also shared how the information shared today will be incorporated into the CCSM planning with the workflow diagram & the bins of priority sentinels (as written in the 2018 strategy*).

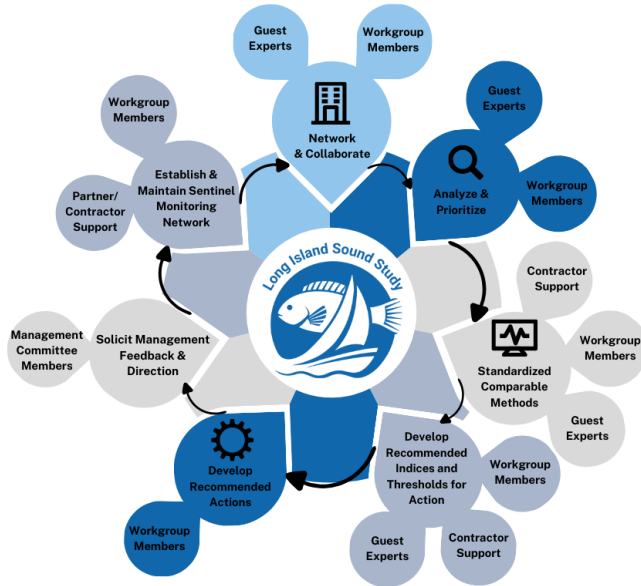


Figure 2. CCSM Workflow diagram

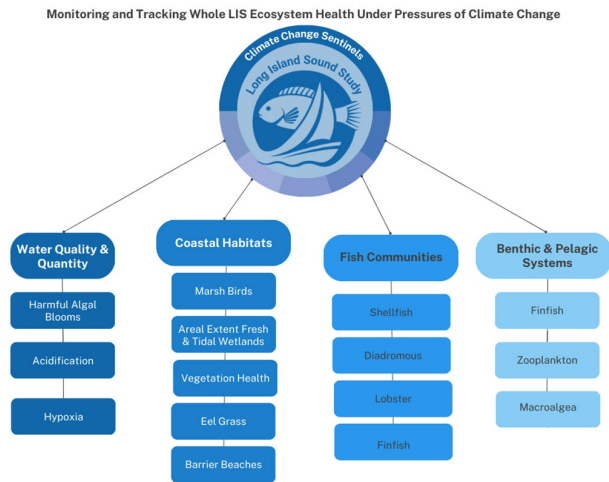


Figure 1. Priority Sentinels of 2018 Sentinel Strategy

*Note 2018 Strategy is due for an update, coming soon.

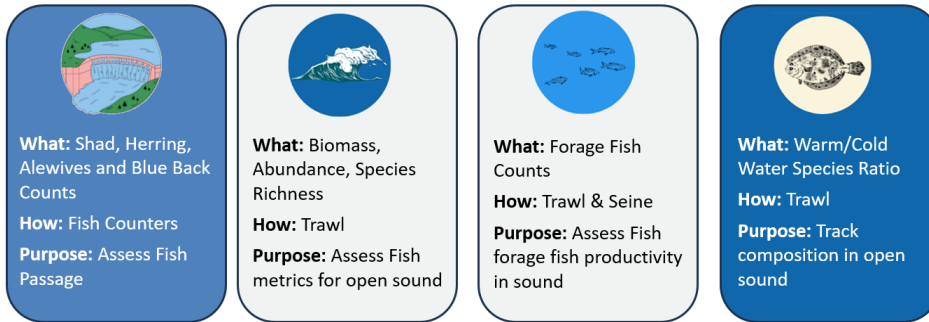
Fish Based Indicators, Kathleen (Kate) Knight

The presentation began with an introduction to the Long Island Sound Study’s Indicator Review Team. A team of Long Island Sound Study Staff that assess and track where LISS team is relative to our goals (the Ecosystem Targets of the Comprehensive Conservation Management Plan). There are two types of data that the indicators review team tracks direct data (Indicators) that relate directly to an Ecosystem Target and those that are indirectly related and provide secondary information to the general health of a system we are tracking (Supporting Indicators). The later category is where our fish related data falls into.

The nexus of this data being tracked by Indicators Review Team and the information that CCSM is utilizing from those data sets was provided. The CCSM team is evaluating climate change with respect to the whole system, for example with respect to fish communities of LISS climate change may be adding pressures to a particular species/system that enhance predation and/or weaken the ability to adapt to pressures from development or water quality issues etc. It may not be the scenario that climate change is THE factor causing the decline or otherwise detrimental scenario but it may be a factor in a compilation of pressures. This may result in CCSM making recommended actions to the LISS management committee or it may result in additional questions that need further research.

A summary of the supporting indicators relative to fish that the LISS is currently tracking was presented. This presentation was less about the details of this data, but rather more of the overarching observations and share what data types LISS is currently tracking. This is specifically for the awareness of the expertise of this meetings audience how data is being used by this program.

The major types of data include:



The major observations of each of these included:

- [Decreasing trends](#) despite increased connectivity ([river miles](#)) and decent spawning years (for alewives), indicate species are still facing other pressures.
- Relatively [static biomass and richness indices](#).
- [Game Fish](#) Observations:
 - Tautog has increased since 2010.
 - Observed declines in flounder and bluefish.
 - Observed increase in black sea bass.
 - Scup, striped bass appear to have increased since 1980s and remained steady since.
 - Other game fish trends are not as discernable or less pronounced from this data review.
- Trends for [forage fish](#) are not very discernable; abundance appears to possibly be more important in estuaries. From other trends land cover etc we know estuaries/coastal areas are at risk and important trends to be confident in. Note we have been told we are not confident our siene network is sufficient to assess this (proposal discussed later in this meeting addresses this).
- [Warm/Cold Water species](#). Clear trends of increasing warm water species and decreasing cold water species.

An overview of what information CCSM needs but is not represented in the indicators data (much of this was covered by the following presenters). This included:

- Understanding that shifts in species abundance and composition are occurring in sound in general but not good understanding of micro habitat shifts within the sound.
- Need better understanding of coastal/embayment habitats and what we are capturing/not capturing.
- Seeking better understanding of degree of climatic pressures so that we can support recommended actions at appropriate times to protect species/habitats.
- Seeking to better understand impact specifically on movement/habitat of listed species (such as sturgeon) that the Long Island Sound Study isn't tracking in this way.
- These "indicators" were what we agreed upon in the past. Is it time to relook at those? Yes CCMP revision is appropriate timing.

Evaluating Changes in Suitable Habitat & Biogeography of Cold and Warm Water Adapted Fish Species in a Changing Long Island Sound to Inform Ecosystem-Based Management, by Robyn Linner and Claire Ober, Stony Brook University.

The background information that led to this study to better understand the changes within the sound was presented. Information such as:

- Observed trends in warming LIS water temperatures,
- Warm water species are increasing in LIS.

The objectives of the study and which species the team is evaluating included:

- The **overarching objective** is to evaluate distributional changes of **warm-adapted and cold-adapted species** in the climatically-altered Long Island Sound ecosystem to inform their monitoring and management.

- **Five objectives to be addressed:**

- | | |
|---|---|
| 1 | • Understanding changes in abundance and distribution (and thus biogeography) over time; |
| 2 | • Identifying key environmental variables influencing habitat use and distribution; |
| 3 | • Developing models to hind-, now-, and forecast changes in suitable habitat; |
| 4 | • Evaluating impacts of the changes on the monitoring and management of the LIS fish community; |
| 5 | • Engaging stakeholders for outreach and feedback to inform ecosystem-based management. |



Warm-adapted

- Scup
- Butterfish
- Summer flounder
- Black sea bass
- Striped searobin
- Northern searobin
- Blue crab



Cold-adapted

- Windowpane flounder
- Little skate
- Fourspot flounder
- Winter flounder
- Spotted hake
- Silver hake
- Red hake
- American lobster

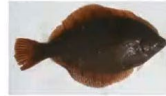


Figure 3. Slide 3, January 29, 2024, Evaluating Changes in Suitable Habitat & Biogeography of Cold and Warm Water Adapted Fish Species in a Changing Long Island Sound to Inform Ecosystem-Based Management, by Robyn Linner and Claire Ober, Stony Brook University

Data Sources include survey data from CT DEEP Trawl and NYSDEC.

Methods for each objective above were shared:

Objective 1: To evaluate changes in abundance and distribution the team is evaluating the following metrics: center of gravity, inertia, positive area and evenness.

Objective 2 & 3: Identify key parameters that influence habitat use through lit review and understanding model applications. Then using those project team is developing a Habitat Suitability Index Model to determine relationships and model the hind, now and forecast.

Objective 4: The Model will then in turn inform us to be able to identify species most (positively or negatively) impacted by climate change, species that could be changing in such a way that our current monitoring methods may not capture them, identify areas of thermal refuge (for conservation planning) and asses potential impact of LIS cable.

Objective 5: Engagement of this effort is multi-faceted: Press opportunities, workgroup meetings like this one, special workshop to be hosted at Stony Brook University and still taking suggestions.

Questions & Answers:

James O'Donnell – Currently leading LIS habitat mapping initiative and planning a meeting a meeting April 4th at Avery Point gathering information from stakeholders, sharing opportunity for Stony Brook to participate.

Penny Vlahos- How many variables are you considering for the HSI?

Robyn-- Depth, Bottom & Surface temperature, Sediment and Salinity. We did consider adding dissolved oxygen, but they aren't terrible extreme DO values during the survey sampling time so it wasn't considered a driver.

Penny Vlahos- I recommend instead of DO use AOU.

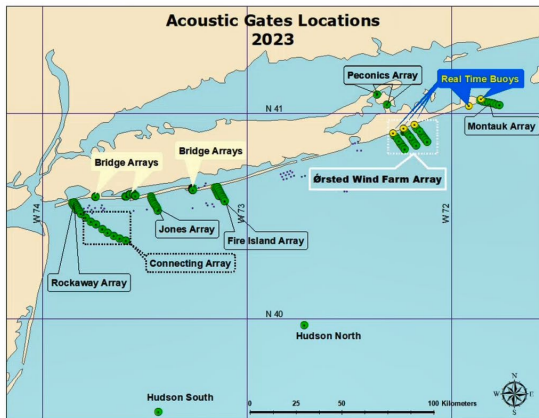
James O'Donnell- Disagreed with AOU recommendation as managers use DO. And noted the DO volume tool that may be helpful for Stony Brook team to use. Jim asked what the maps are based on.

Robyn- The temperature and salinity are based on the FVCOM model (of Chen's lab). Compared this to the survey and temperature matched really well.

New York Acoustic Monitoring, by Oliver Shipley Stony Brook University

This effort has been ongoing since 2010 and plan to expand (if approved) to North Shore of LIS. As of 2023 array now has 100 active receivers monitoring more than 25 species (including sturgeon)

Frisk, Shipley, Peterson, Dunton Arrays



- 100 active receivers.
- Monitoring coastwide movements of finfish, sharks, invertebrates.
- Monitoring movements in and out of major embayments.

Figure 4 January 29, 2024 New York Acoustic Monitoring, by Oliver Shipley Stony Brook University

Oliver emphasized the importance of continuing array data collection for more than one year especially when working with highly migratory species and for evaluating impacts of climate change on migratory patterns.

In previous work they have been able to couple temperature data with shark migration patterns.

Tracking Temperature Preference by Latitude

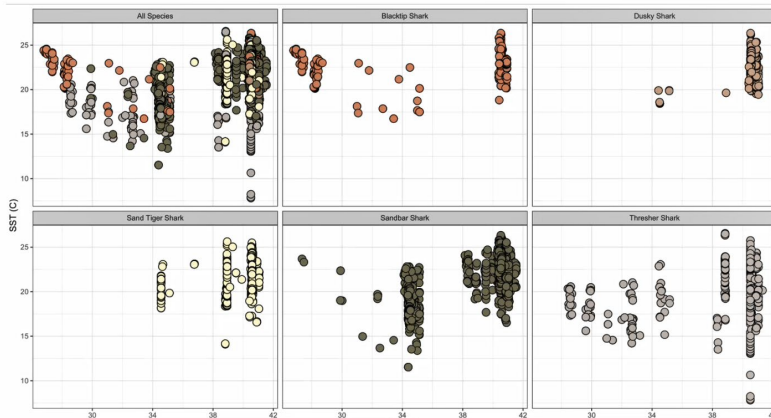


Figure 5 January 29, 2024 New York Acoustic Monitoring, by Oliver Shipley Stony Brook University

Oliver shared map regarding a previous study focused on Sturgeon in and south of LIS. One of the most interesting takeaways is the importance of eastern sound for sturgeon. Though we lack an understanding of rest of sound due to lack of receivers in that area.

Oliver also shared another study coordinated with renewable energy on fine scale positioning. This was illuminating on fine scale behaviors.

The proposed study will enhance receivers in western sound and set up in such a way that will provide directionality. These receivers will be able to leverage the animals previously tagged through coordinating with the [MATOS](#) data sharing.

Question & Answers

Syma Ebbin, UCONN- Seeing the spike in sturgeon is I imagine that might be related to the fact that there is increased tagging of that type and there is significant benefit from other programs tagging efforts, do you have an idea what overall population by species? Are you able to use the naval arrays as well?

Oliver- Noted that there is an observed spike in tagged sturgeon (close to 1000 have been tagged over last 15 yrs), when that particular study occurred there were approximately 600. Currently we have just over 380 sturgeon tagged that number will increase again. And this is varying based on management needs. Different groups have different ethical concerns, so we don't necessarily get the data beyond a tag ID unless agreements with other PIs can be made. There are data coordination efforts Ocean Tracking Network (OTN) works to coordinate the regional coordination. Another benefit of these arrays is combating miscommunication with press. Oliver noted an issue in 2018 about a shark entering the sound that with the current array we could have easily refuted the misinformation that resulted.

Esther Nelson- How do you address biofouling of the arrays?

Oliver-When we first deploy a receiver we check them far more often to be sure it will work effectively before leaving longer. In areas in NY you have barnacles and mussels, we have gone through several iterations of strategies currently there is a type of duct tape with antifouling agent. We have learned if you protect what is called the nipple at the top you will still gather good data. But this combined with removing and cleaning receivers really helps.

Ecosystem Evaluation of Fish Communities in Embayments, Samarra Scantlebury: Samarra shared the workgroups proposal for FY24 that will evaluate existing sampling and indices, create recommended sampling plan supports recommended indices. We found that there is significant data in open sound, but found a potential data gap within the embayments. This first phase is review the existing data available and compare what we have to other estuaries, get a recommended sampling plan (potentially a gold star plan and a minimal needed plan) and what indices those plans could support. Then armed with that information we could take it back to our CCSM team and our respective fish experts (CT DEEP, NYSDEC, Stony Brook etc) to make some recommendations to the management committee.

Samarra opened the floor for comments and input.

Comments included:

Justin Davis, CT DEEP- Important to think about what sort of survey is needed to fill in the information gaps and get a sense of gear and objectives of survey. A comprehensive survey of what other states and universities are doing is necessary step.

Kim McGown- Recommended we talk to the Atlantic States Marine Fisheries, they have an assessment group to find out what other states are using.

Kate also mentioned that as this project progresses, and we collect this meta data we hope to coordinate with USGs efforts regarding the meta-data database. Additionally we believe that the timing is essential as we coordinate a whole marsh health study that we could leverage the physical parameter monitoring and find efficiencies between the projects.

Becky Shufford- Suggested we coordinate with PEP and Hudson. Is there something we can get from Peugeot sound and Chesapeake Bay.

Robyn Linner- Noted there is good connection in Stony Brook Chen lab to the Hudson data and would love to continue to collaborate on this if it is funded.

Esther Nelson provided a specific contact at Hudson who would be helpful.

Meeting Close Out\Next Steps

2024 Calendar was shared.

2024 Meeting Schedule

Winter: February 28th

Spring: May 21st

Summer: August 20th

Fall: November 12th

All meetings are virtual and are from 10am-12pm.

Stay tuned for agendas meeting updates and materials for feedback.

Meeting Adjourned at 12:00