

**Long Island Sound Eelgrass Collaborative Meeting-Virtual
December 12th, 2023 (1:00-3:00)**

Participants: Hisham Abdelrahman – Roger Williams University; James Ammerman – LISS/NEIWPCC; Mike Bradley – URI; Taylor Breton – CT Audubon; Della Campbell – NYSDEC; David Carey – CT Department of Agriculture; Jill Carr – MassBays NEP; Giancarlo Cicchetti – US EPA; Phil Colarusso – US EPA; Sarah Crosby – The Maritime Aquarium; Ashley Hamilton – CT NERR; Torrie Hanley – Sacred Heart University; Stephen Heck – Stony Brook University; Gavin Jackson – CT DEEP; Shauna Kamath – NYSDEC; DeAva Lambert – CT DEEP; Matthew Leason – UCONN/CT NERR; Jon Lefcheck – UMCES; Bill Lucey – Save the Sound; Katie Lund – CT NERR; Jon Morrison – USGS; Kevin O'Brien – CT NERR; Donald Parizek – USDA; Suzanne Paton – USFWS; Maria Rosa – Connecticut College; Courtney Schmidt – NBEP; Eric Schneider – RI DEM DMF; Steve Schott – Cornell Cooperative Extension of Suffolk County; Meg Shah – UCONN/CT NERR; Evelyn Spencer – US EPA; Adam Starke – The Nature Conservancy; Kelly Streich – CT DEEP; Cayla Sullivan – US EPA; Hannah Vagts – FISM; Jamie Vaudrey – UCONN/CT NERR; Emily Watling – UCONN/CT NERR; Abbie Winter – CT DEEP; Harry Yamalis – CT DEEP; Darcy Young – Narragansett Bay NEP

- I. **Welcome and Presentation:** [Regulatory Barriers Project Update](#) - Katie Lund
- II. **Presentation:** [Comparative SAV Mapping Methods & Associated Errors](#) – Jill Carr
- III. **Presentation:** [Overview of 2017 LIS Eelgrass Aerial Survey Results – Discussion of Methods, Trends, and Variability](#) – Mike Bradley
- IV. **Survey and Break**

Q&A/Discussion after Carr and Bradley Presentations:

Has on-bottom cultured seagrass loss due to turbidity from harvesting with toe dredges come up as an issue, for example in Duxbury Bay?

- It is a concern. On-bottom culture and dredging is permitted in many sites, which do end up in or near eelgrass. Though it is not addressed yet, it is a major priority.

How do you go about geo-rectifying putting your drone images into GIS? This is often challenging without certain expensive software and processing programs.

- Compared and tried different drone software – ended up with Drone Deploy – though there is still a paywall for the year. It does a great job at stitching imagery over water and creating an accurate gofile that goes into ArcGIS pro. All the work it does is still compared with ground-controlled imagery to confirm data.
- Pix4D and Drone Deploy are both often used, though there are issues with Pix4D – if there are no features that are common to overlapping images it will simply drop them from the mosaic completely. The NY team is looking to implement Drone Deploy in their projects and experimenting with other ways to identify the X/Y of the image to stitch together the mosaic. They currently own a Matrice 300 RTK drone with better x/y accuracy and precision that has yet to be employed.

Were any sites in Jill Carr's research a mixed macroalgae/eelgrass meadow bed that could complicate mapping of edges?

- These types of areas can negatively impact the accuracy, even with good drone imagery.
- It is hard to differentiate algae from eelgrass in the imagery unless you have glaring differences in colors.

- Ulva and other greens are very hard to tell from eelgrass.
- There is a high degree of error in the methods.

As a follow-up to Jill Carr's Presentation: In relation to the idea of these demonstration sites where you heard from both farmers and researchers, how did the Massachusetts regulatory framework allow for the collaboration between farmers and researchers? Are there barriers to implementing projects like this in MA?

- It will not be easy as towns in MA have the final say through their local "home rule", although they do need state sign-off for new lease areas.
 - The towns oversee regulating new leased areas and there is not consistency between the state and town regulations.
- The state has rules about aquaculture and eelgrass placement:
 - DMF will not certify sites that have eelgrass within 25 ft.
 - It is challenging to push the science forward and do the co-location studies with these state rules in place.
 - Even if eelgrass is restored into a working farm, the farm may not be allowed to continue – who must suffer for the other to thrive?
- Will start with the towns who are most supportive since their approval is needed first before approaching the state.

Would it be useful to create a document like the RI Taskforce SOP with the Eelgrass Collaborative?

- That is one of the goals and outcomes of the Collaborative and these discussions.

Would shallow water embayment edge areas, where we see more variability and loss, be more important to monitor and map rather than a stable bed? What locations should be prioritized (e.g. deeper or shallower)?

- Bradley: If setting up a Tier 2 site, be sure to include a coastal pond since we want to know what is happening with the eelgrass in these areas. If possible, it would be good to choose two coastal pond sites and two in Narragansett Bay.
 - It all gets back to what methods are being used and who is deploying them.
 - E.g. Drone imagery is quick and easy to capture.
 - In RI we could do four or five sites easily on a yearly basis using drone imagery.
- Carr: For MA – seagrass net sites that are already present could also use a tiered monitoring program. A third tier could be used to get a sense of what is happening biomass-wise and quadrat-wise to tell the differences between open ocean and coastal pond sites.

Two resources were mentioned as part of the group discussion:

- Mass Bays eelgrass mapping report and a story map: <https://massbays.org/eelgrass-2/>
- Leigh Howarth – review paper on eelgrass/aquaculture interactions- <https://www.int-res.com/articles/aei2022/14/q014p015.pdf>

V. Speaker Q&A and Group Discussion – Jamie Vaudrey

- A Jamboard activity was launched to collect research and funding ideas with the goal to identify priorities and feasibility of projects. Participants were asked to put "sticky notes" on the mural board with research ideas and prioritize their need/feasibility using a graded quadrat approach (see end of this document for a summary).

VI. Agency/Partner Updates

FISMC (Hannah Vagts)

- Reviewed recent updates to the website, as well as public outreach materials.
 - Seagrass safe boater encouragements
 - Seagrass safe checklist
 - Nitrogen pollution impacts infographic
 - Identified two potential projects that the FISMC has been discussing including eco-mooring usage and eelgrass mapping.
 - Visit website to access product: <https://www.fiseagrass.org/fishers-island-seagrass-gallery>

CT DEEP (Kelly Streich)

- Explained CT DEEP's developing eelgrass assessment approaches using drone technology.
 - True color and multispectral cameras
 - GIS analysis of images
 - Comparison of ground-truthing data
 - Consultant support and training
 - Report of pilot results and future needs
- Working in the Niantic River Estuary in Southeastern CT. Site selection was due to the knowledge of eelgrass habitat in the area, coinciding field surveys and drone flyovers, the presence of FAA airspace that allows UAS operation, and an existing accessible staging area.
- The first surveys used PIX4D and PIX4Dreact Orthomosaic, though it had a 60% image failure, so they tried again in Bebee cove, collecting and analyzing ground-truthing data and processing using true color and multispectral PIX4D fields.
 - Currently working with a contractor to analyze the work and putting together a training exercise sometime in January. Conclusions identified that object-based methods aligned best with the known eelgrass area, and future work will compare between IEsri vs eCognition vs Envi for data analysis.

Questions:

What audiences were you looking to work with regarding the training exercises?

- Putting together an exercise for people in the agency. After bugs are worked out, it should be available for anyone to use and learn from.

What was the cost per acre for the entire project?

- Looking to put together an idea of the research time, equipment, needs, etc.
 - Hybrid/Bicoastal Workshop

US EPA (Cayla Sullivan)

- Aerial Survey and Intercomparison Study
 - LISS receives funding from Congress through the Clean Water Act Section 320, (National Estuary Program), and Section 119, (Geographic Program).
 - An intercomparison study is planned between aerial flights, though the 2023 survey was delayed. There will now be flights in 2024 by NYS DEC and 2025 by LISS (both contracting USGS). The study will be implemented in the future to understand where and when to use different mapping styles

- FY 2024
 - Annual workshop feedback for 2024 highlighted the need to initiate a long-term seed dispersal program. This feedback also included restoring eelgrass in a changing climate, flowering studies, and genetic resiliency work. An RFP will be issued in the spring for this work and further update will be given at the March 2024 Eelgrass Collaborative Meeting.

Torrie Hanley (Sacred Heart University)

- Working with Jamie Vaudrey on a NERRS Science Collaborative Project focused on seed-based restoration of eelgrass. This project aims to systematically assess and summarize eelgrass seed-based restoration efforts to create a common database and platform for the communication of shared knowledge to inform eelgrass restoration globally.
- Main components include:
 - Online Survey
 - Follow-up Interviews
 - StoryMap

VII. Next Steps and Adjourn – Katie Lund

- Calendar holds will be sent out for the next two meetings in March and June.
- The [Eelgrass Collaborative](#) website will have links to the meeting materials.

Mural Board Input:



Develop a decision tree for Eelgrass and aquaculture mixed usage of shellfish beds.

numeric nitrogen criteria

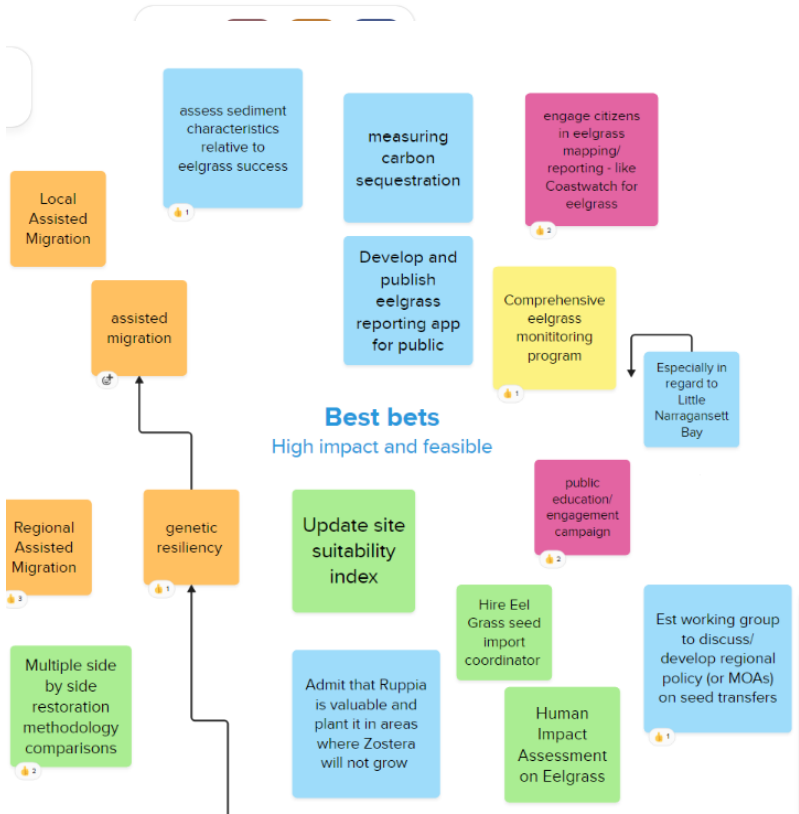
measuring greenhouse gas exchange

Moonshots

High impact, but not as feasible

E-DNA survey to identify previously cryptic eelgrass meadows

Create blue carbon credits for eel grass farming



Tax-incentive programs of aquaculture farms to foster eelgrass restoration on lease sites.

Citizen drone mapping program to contribute data

Low priority

Low impact and low feasibility

Provide preferred anchorage areas to GPS companies for inclusion into vessel GPS units (Garmin, Google, OpenStreetmap)

