State of Connecticut

GENERAL ASSEMBLY
ENVIRONMENT COMMITTEE
LEGISLATIVE OFFICE BUILDING, ROOM 3200
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EELGRASS WORKING GROUP MEETING AGENDA
January 9, 2024
3:00 p.m. to 4:30 p.m.
Zoom Remote Meeting

Attendance: Bill Lucey, Griffin Harris, Kelly Streich, Jamie Vaudrey (chair), David Carey, Zach Gordon, Lukas Houle (administrator), Bradford Towson (LCO), Tessa Getchis, Craig Tobias

1) (2 min) Welcoming Remarks

   a) Link to this document: https://docs.google.com/document/d/16a5ocRvraUrMlYGPFJT2xOcUzx4f1t-TCJnmLzkl8co/edit?usp=sharing

2) (1 min) Outline of document is now available - please sign up for sections by adding your name as a comment: 2024-Feb CGA Eelgrass WG Report

3) (1 min) Future Meeting Times.

   a) 3pm-4:30pm. For 2024:

      (1) Tuesday, Jan 9, 2024

      (2) Friday, Jan 19, 2024

      (3) Wednesday, Jan 24, 2024

   b) Jan 9 (Tue) - THIS MEETING

      i) *Monitoring and Change Analysis of Eelgrass in Southern New England, Long Island Sound, and Long Island* - presentation & discussion (lead person/people - Jamie, Bill

      ii) Review of Surveying Options for LIS eel grass prepared by Bill Lucey

iii) Discussion of surveying techniques, through federal agencies USFWS, EPA, USACE

iv) Recently the state DEEP has begun using UAV surveys to take drone photographs of eel grass area, methodology being developed

v) UCONN's work; US Fish/Wildlife Surveys conduct the arial shoots of eel grass but UConn focuses more on individual areas of eel grass, smaller sites

   (1) Millstone lab goes out and surveys their areas 4x / year – has the longest record of surveying since the 1980s

   (2) Would like to survey more often, even if only at indicator sites, UAV is a good tool for possibly mapping areas, installation of sea grass net sites

      (a) Eel grass monitoring as part of Eel Grass Reserve likely will not be in effect/collecting verifiable data for two years – approval from NOAA etc.

   (3) If you can't do a comprehensive survey you can do smaller, indicator sites to make inferences about the greater eel grass population

   (4) Review of surveying techniques: Scuba surveys, sidescan sonar transects, acoustic imaging, underwater drone video, UAV drone, underwater drone, Airplane imaging, Satellite imagery, Hybrid imagery (kayak, scuba combo)

      (a) Members reported back on assigned sections

         (i) Scuba - Summary - a challenge in diver surveys is locating the base point/starting point for a transect. They attempted a low-cost build of a pinger & hydrophone - the pinger worked, but the hydrophone was not sufficiently sensitive to help with navigation. This highlights the need for low-cost but reliable instrumentation for some types of monitoring. If we are interested in involving Community/Citizen Scientists in monitoring efforts, having affordable gear that is easy to use is beneficial. For example, a pinger can cost up to $2k for a long-lived, deployable pinger (as low as $400 for a shorter-lived pinger), and a hydrophone costs >$5,000. Some agencies (e.g., EPA) run competitions for development of low-cost sensors - highlighting the need for low-cost options - this could be useful for scaling up monitoring efforts across groups

         (ii) Sidescan Sonar Transects - Problem - current technologies (aerial photos and satellite imagery) challenge to accurately assess eelgrass in shallow turbid estuaries

1. Solution – Towfish underwater video camera and scaling lasers, sidescan sonar and transponder-based positioning system.
2. Tested – 3 New Brunswick estuaries
3. Mapped eelgrass cover and health, ancillary bottom features (benthic algal, oysters)
4. Findings – cost effective and useful for bay-scale assessment (to sub-meter precision) – both eelgrass cover and health

(iii) Acoustic imaging: need to understand seasonal variation for conservation purposes

1. Solution – acoustic monitoring using quantitative echo sounder
2. Sampling – surveys conducted 9 times over 3 years
3. Determined spatial distribution of eelgrass (geostatistical methods)
4. Findings – identified max & min growth period, identified spatial variations, eelgrass distribution coincided with life history, distribution differed by area and changed yearly due to the effects of bottom characteristics and wind direction. Also considered supporting services of eelgrass (carbon sink/fixation). This was useful for coastal conservation.

(iv) Underwater Drone: As effective as divers. Very protected area. Takes significant skills to control it. Entanglement in eelgrass. Current velocities had a large impact. Effective near shore and less effective in open areas. Water Clarity is a big issue.

(v) UAV/ Arial Drone: Quadcopter surveys at 15m altitude - RGB spectral bands. A short Zostera spp

1. Good flow chart for data acquisition and post processing.
2. Quadrat groundtruthing an statistical analysis of aerial vs quadrat results.
3. Uncertainty ranged between 9-32% with more accurate surveys at lower vegetation density.
4. Successful in distinguishing between macroalgae and seagrass
5. Here’s the rub - this is intertidal seagrass habitat

(vi) Airplane Imagery: Study used a low altitude balloon-mounted digital camera platform to characterize intertidal eelgrass eelgrass habitat on a 1)patch scale and 2) landscape scale. Assuming Canada based on author affiliations). Purpose was to be able to compare dataset in order to track temporal changes in seagrass patch metrics over a 26-month period. At patch scale, change in seagrass metrics was consistent with patch border expansion at the expense of patch density and integrity. Successful in that it allowed for tracking of patch metrics through time to depict landscape change. Did not examine subtidal beds; suitable for LIS?

1. Study assessed the capability of hyperspectral airborne imagery using Compact Airborne Spectrographic Imager (CASI) (carried by a solar plane) to map intertidal and subtidal eelgrass habitat in Spain. Hyperspectral imaging (HSI) is a technique that analyzes a wide spectrum of light instead of just assigning primary colors (red, green, blue) to each pixel. The light striking each pixel is broken down into many different spectral bands in order to provide more information on what is imaged. Ground sampling distance was 2m, and sensor used to acquire bands in visible/near infrared wavelengths with 10 band combination being most accurate; use limited to moderate and high density meadows. Was conducted in clear conditions at low tide.

(vii) Satellite Imagery: Study compared a new method using satellite imagery to standard field surveys of eelgrass. They did this at 3 different locations in Northwest Canada and had varying success. It came down to water quality and clarity parameters. In clearer and shallower waters the satellite algorithms were more accurate than deeper, cloudier waters.

(viii) Hybrid Method: Drone photography approach where areas in interest were photographed by the drone at altitudes lower than traditional airplane photography. A method of seagrass surveillance is described. A drone would be taken to survey areas with seagrass and if the drone operator noticed a largely vegetated patch in their water, they would land the drone and go to investigate the area themselves. The investigation would be via snorkeling or kayaking, and they would see if the areas continued seagrass was only macroalgae. If there were areas where a drone could not see, kayaks would be used to survey the area. No eelgrass beyond a single clump (~1.5 feet in diameter) was found. This total acreage illustrates how poor the status and condition of this habitat is within the Inland Bays.

vi) Discuss *Working Group Recommendations*

1. ** Please review working document prior to the meeting: [2024-Feb CGA Eelgrass WG Report]

4) Jan 19 (Fri) - FUTURE MEETING

   a) *Engaging the Community* - presentation & discussion (Zach/Tessa)

   b) Discuss *Working Group Recommendations*

      1. ** Please review working document prior to the meeting: 2024-Feb CGA Eelgrass WG Report

5) Jan 24 (Wed) - FUTURE MEETING

   a) discuss final draft of recommendations

6) (40 min) *Monitoring and Change Analysis of Eelgrass in Southern New England, Long Island Sound, and Long Island* - presentation & discussion (lead person/people - Jamie, Bill(?))

7) (40 min) Review: *Working Group Recommendations*

   a) What do we need to review? Is anything not currently in our plan?

   - Do we put money into monitoring, or do we put money towards water quality and restoration – is it more important to survey or to improve conditions (consensus was improved conditions). We have peaked in terms of reducing nitrogen - we reached those goals, and now N is increasing again - if we just monitor, we'll be monitoring future decline as N continues to increase. Need to keep this as a highlight - need to continue to focus on water quality improvements.
   - CLEAR and Save the Sound - both focusing on stormwater work force, to help continue to reduce the impact of storm water. Need to continue the focus on creating the habitat conditions that support healthy eelgrass.
   - Developing capacity for the various types of surveys may be a priority - having someone/someplace that can do the drone surveys/kayak surveys/video surveys/etc.