APCC Chase Garden Creek Meeting

5/16/23

Present: Jordan Mora (Restoration Ecologist, APCC), Amanda Lima (Town of Yarmouth, Town Engineer), Rick Sawyer (President, ARC), Gabby Sakolsky (Superintendent, Cape Cod Mosquito Control), Eliza Fitzgerald (Restoration Technician, APCC), Bill Bonnetti (DNR, Town of Yarmouth), Chloe Starr (Operations Coordinator, ARC), Greg Berman (WHOI SeaGrant, Cape Cod Cooperative Extension) Tara Lewis (Water Quality Analyst, Cape Cod Commission), Karen Johnson (DNR, Town of Dennis), Brittany DiRienzo (Town of Yarmouth), David Fryxell (President, Dennis Conservation Land Trust), Tom Andrade (Town Engineer, Town of Dennis)

Agenda:

Introductions
Project Overview- Timeline and Scope
Completed work
Discussion

Follow up and considerations from discussion

- ➔ LiDAR available via CCC, CCS
- ➔ Vegetation imagery for NDVI from 2012-2014 if anyone knows of a source
- ➔ Where are the best locations for parking and access?
- ➔ Water Quality Monitoring?

Project/Funding Background

Lavori Sterling Foundation Donation- Funding project

- Lavori family interested in looking at the salt marsh
- Have property on pheasant cove circle—interested in partnering with APCC to take a closer look at the marsh—vague and flexible framework

Overall changes noticed

- Chase Garden Creek has filled in, related to the erosion at Chapin Beach

Curious about ongoing monitoring/ past monitoring

Planning in the past to look at Thin-Layer Placement (TLP) —where did towns get with this? Is there any data or designing and planning? Next steps?

Initial concerns at CGC:

- Rising sea levels
- Erosion along Chapin Beach and Dr. Bottero Road—if a breach would occur, what would happen to the marsh?
- Disturbance to wildlife near conservation land at Windswept and Pheasant Cove Circle
- Spread of invasive *Phragmites*
- Increased boat traffic and foot traffic in river and on marsh
- Goal:
    - Design study to assess conditions
    - Work with partners to address issues we see
    - Improve integrity and stability of the marsh

Scope and timeline:

- Year 1: assess marsh integrity and human impacts (landscape scale eval) and coordinate with stakeholders
- Year 2- targeted monitoring effort
    - Tidesheds
    - Vulnerable areas to SLR
    - Transects, plots, look at vegetation, monitoring over time
- Year 3
    - Plan and design for restoration, seek funding for projects
        - Runneling, ditch remediation, TLP
        - How would we fund this?
- Year 4 and 5
    - Permitting and implementation if we get there
    - Ramp up the monitoring
    - Post restoration (ambitious goal)

Year 1:

- Task 1
    - Establish an understanding about what is going on with stakeholders and potential partners
- Task 2
    - GIS analysis, Plant health (UVVR) analysis
    - Assess marsh health and how that varies across the system
- Task 3
    - Rapid field assessment
    - Plant species presence and extent
    - Elevation in lower or subsided areas
- Task 4
    - Disseminate results within this group and with the broader community
- Task 5
    - Annual report—due Feb 2024

Marsh Assessment?

How do we want to phase different scales of assessment?

Phase 1

- Looked to Barnstable Great Marsh where they are proposing restoration through runneling and remediating ditches. A similar salt marsh site, both tidally and historically. What methods did that research team start with?
- Based on discussions with Great Marsh research team, decided first phase to employ UVVR (unvegetated to vegetated ratio, Neil Ganju et al. 2017) method to determine healthy growing plants vs bare areas.
    - Ratio = 0.13-0.14: balance between sediment transport and deposition flips. Lower ratio= healthier, vegetated. Higher ratio= degrading, eroding, vegetation cannot keep up with increased flooding from SLR. The higher ratio indicates there is an unbalanced relationship between sediment supply, elevation of marsh platform, marsh drainage, and vegetation cover. This unbalanced relationship results in plant dieback and further subsidence of the marsh platform.
- Tideshed polygons created from UVVR- looking at high UVVR ratio
    - In these areas, pooling/ponding, short form Spartina alterniflora
    - The marsh as a whole is large and a large area of the marsh near the mouth of the channel has a higher UVVR

Next steps in phase 1/things to consider

- Comparing 2016 and 2021 imagery – look for variation in rates of decline
- NAIP imagery (USDA)— accessed via NOAA website
    - *NAIP imagery (clarification) used for this method because of the timing. USDA obtains this imagery during peak growing season—important for comparisons and UVVR. Other aerial imagery available on MassGIS appears to be mainly from March or April.
    - If members of group know of additional leaf-on satellite or aerial imagery from 2012-2014, please let us know. Could apply the NDVI/UVVR method to earlier years for longer-term comparison (would be nice to see accelerated SLR years, 2005-2015)
        - 2005- 2015- metonic cycle, coming off of this. Over the next several years SLR will be less severe compared to last metonic cycle
- NDVI- normalized difference vegetation index
    - We need to classify vegetated and non-vegetated areas and calculate ratios, compare those over time

Discussion

Should we focus on the areas of the marsh that are at risk? Should we focus on healthy marsh/stable areas?

- Is the high UVVR marsh worth restoration efforts, or should efforts be focused on protecting and restoring the already healthy marsh
- Using transects we can perform rapid assessments in at risk and healthier marsh to compare, and return to monitor in 2024 to compare transects over time as well

- TLP is likely the best strategy for restoring/ rebuilding the more degraded marsh, but open to other methods and suggestions

Tara: Saltmarsh migration?

- Nothing is off the table. Likely outcomes, looking at potential of marsh restoration and migration. Would like to coordinate these efforts- can we combine low-lying efforts with tidal restoration?
- salt marsh migration may be tricky because of extent of development around the edges of the marsh

Greg:

- For migration, consider referring to SLAMM models
- TLP- CZM funded grant for TLP somewhere within this area—tying in to this? How did this CZM project wind up? Bring in someone from CZM
- GIS work: planning on doing any LiDAR or stereomapping, can get in touch with CCS or Carol Ridley

Tara: CCC has recent liDAR- Anne Reynolds at CCC has access to recent LiDAR from 2020

Rick: ARC has black and white aerial photos going back to the 60s! we probably want that

- Anecdotally, since 2018, have not seen any increase in boat or human traffic, sometimes fishers,
- 2016- 2021: 2017 storm, sand moved in from Chapin Beach, which has changed boat access
    - sandbars are new from the past 5 years
- Looking at vulnerable areas, growth in ponded areas?
- Ruppia maritima—does this pick up with UVVR method? One caveat and need for survey. We saw this species at the Barnstable Great Marsh

Jordan: Property ownership discussion

- Who owns property? Where can we park cars and gain access?
- Path from Black Flats Road, but no parking.
- Land trust, town owned (Dennis and Yarmouth)
- State owned land
- General call for more information
    - Karen: black flats access, old dike that went across marsh. No parking. A lot of these pieces are not owned outright by conservation groups, no solid records of marsh ownership. Parking lot for chapin beach- beach sticker required
    - Parking/ access out of ARC, have availability and boat ramp—can coordinate with Rick
    - Parking on south side near Pheasant Cove as part of agreement with Lavori
    - No knowledge about contact for state-owned property in Yarmouth
    - Who manages the boardwalk near pheasant cove circle?—follow up with Bill

Low lying roads discussion

- 3 areas under planning for impacts over time of sea level rise: New Boston Road and Dr. Bottero (Dennis), 6A main street in Yarmouth (ma DOT)

- Salt marsh and Tom Matthews pond—this is a manmade pond and a herring run, does this flood at all high tides or just higher tides? follow up with Bill about Tom Matthews pond
- Tara: low lying road maps: includes all roads from CCC, can follow up with Tara to take a closer look at these

Dennis New Boston road updates?

- In low lying road priority list—commission has some ideas, building a wall, replacing culvert, preliminary phases- it is a priority location for remediation/ raising road
- Timeline?
    - Prelim stages now. No estimates yet. But in planning phases. Need final rec, cost, then looking for funding source
    - Is there benefit for monitoring here or for help to secure that funding/ project manage?
    - Already underwater with existing storm surge and high tides
    - It is definitely a priority—culvert?

Dr Bottero road has a whole history

- Spent 5 years getting grants from CZM, the town decided to stop, no consensus from agencies, wildlife agencies could not agree. Studies posted on website, under Beach Management Advisory Committee. One study looked at flushing in CGC, parameters now different because of sand shifting. Concentrated on beach and erosion access, not a lot of info in studies relating to salt marsh and creek management
- Decided to take emergency measures only, no bridge

Greg- sediment transport studies?

- 2011 first report, WHG
- 2012 WHG erosion management
- CZM efforts looked at sediment transport
- Sediment budget from CCS looks at longshore transport and nodes of sediment transport- Eliza can look into this

Post-meeting follow-up questions:

- Water quality monitoring? Who/where?
- What about CCMC? Where do they access/manage?
- Get group to together again in the fall for next phases/ long term planning options and will share report
- Dredging? Dredge spoils for TLP. Has previous Yarmouth town director of natural resource looked at dredge spoils? Find CZM studies
    - Getting CZM involved in these conversations useful—have been involved in CGC area already
- Who to talk to at the state about access/management?