Savin Hill Cove, MA Salt Marsh and Mudflat Restoration Project

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Savin Hill Cove, MA

(Photo taken by Alyssa Hardiman)

Location:

- Savin Hill Cove is nestled in between the University of Massachusetts Campus and the Vietnam War Memorial off of the Morrissey Blvd. (Image below is from the University of Massachusetts-Boston website)

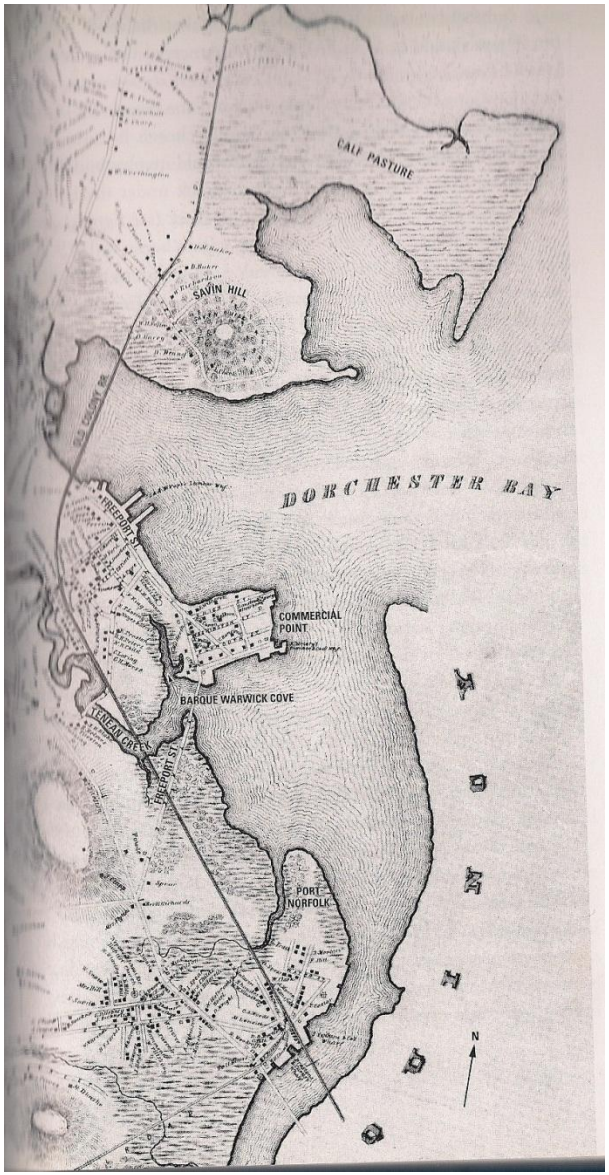
History & Background

- The Boston Shoreline is composed entirely of made land and Columbia Point (Where Umass Boston lies) and Savin Hill Cove are no exception.
- Columbia Point, previously known as Calf Pasture, used to be a place to pasture calves and was a very marshy area.
- **Interesting Point:** The historic building from the Calf Pasture was acquired by UMB and is designated for a Marine Environmental Center.

Boston Shoreline, 1850

- Image 12.2 (1850)

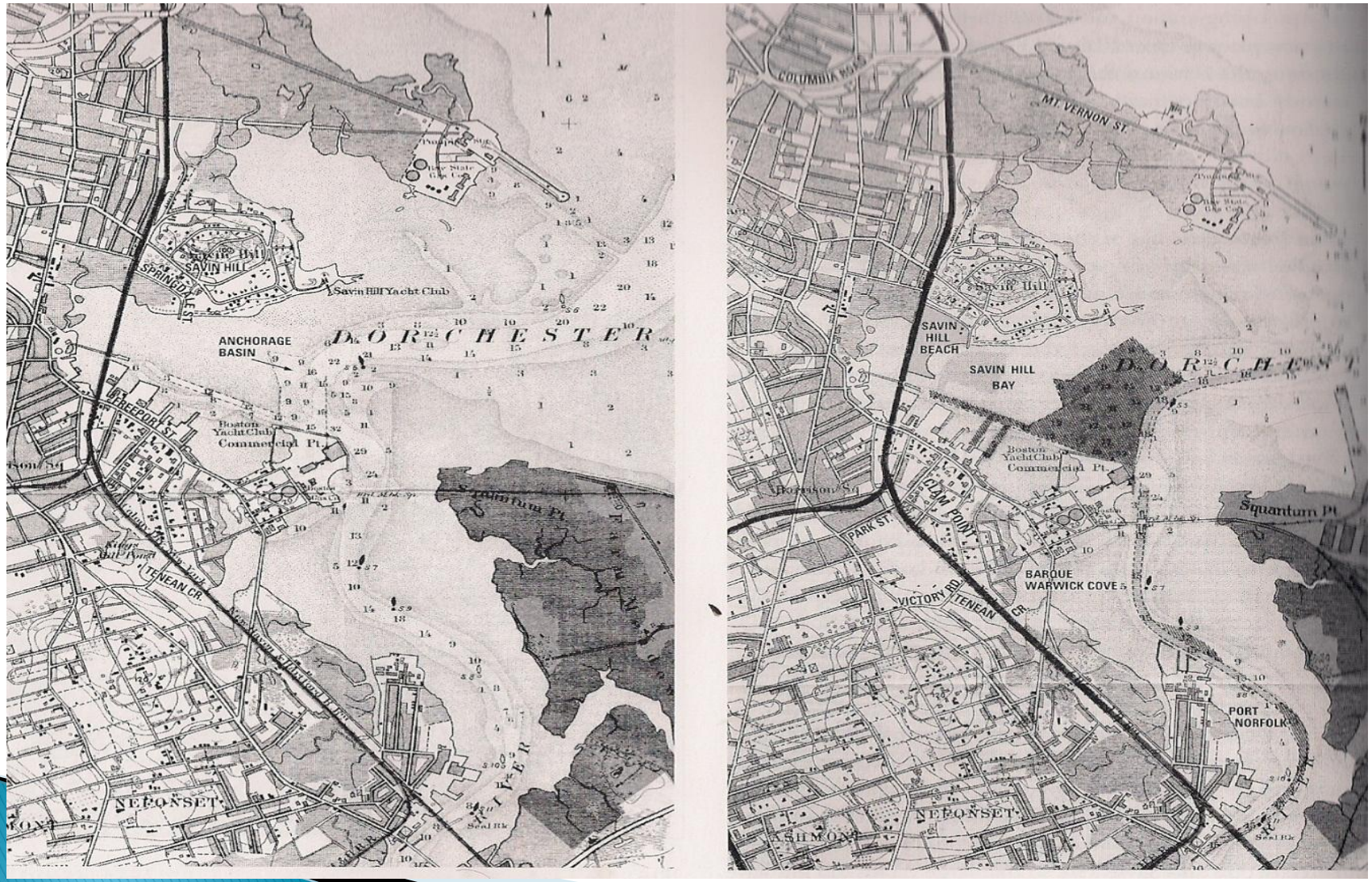
From Gaining Ground by Nancy S. Seaholes.



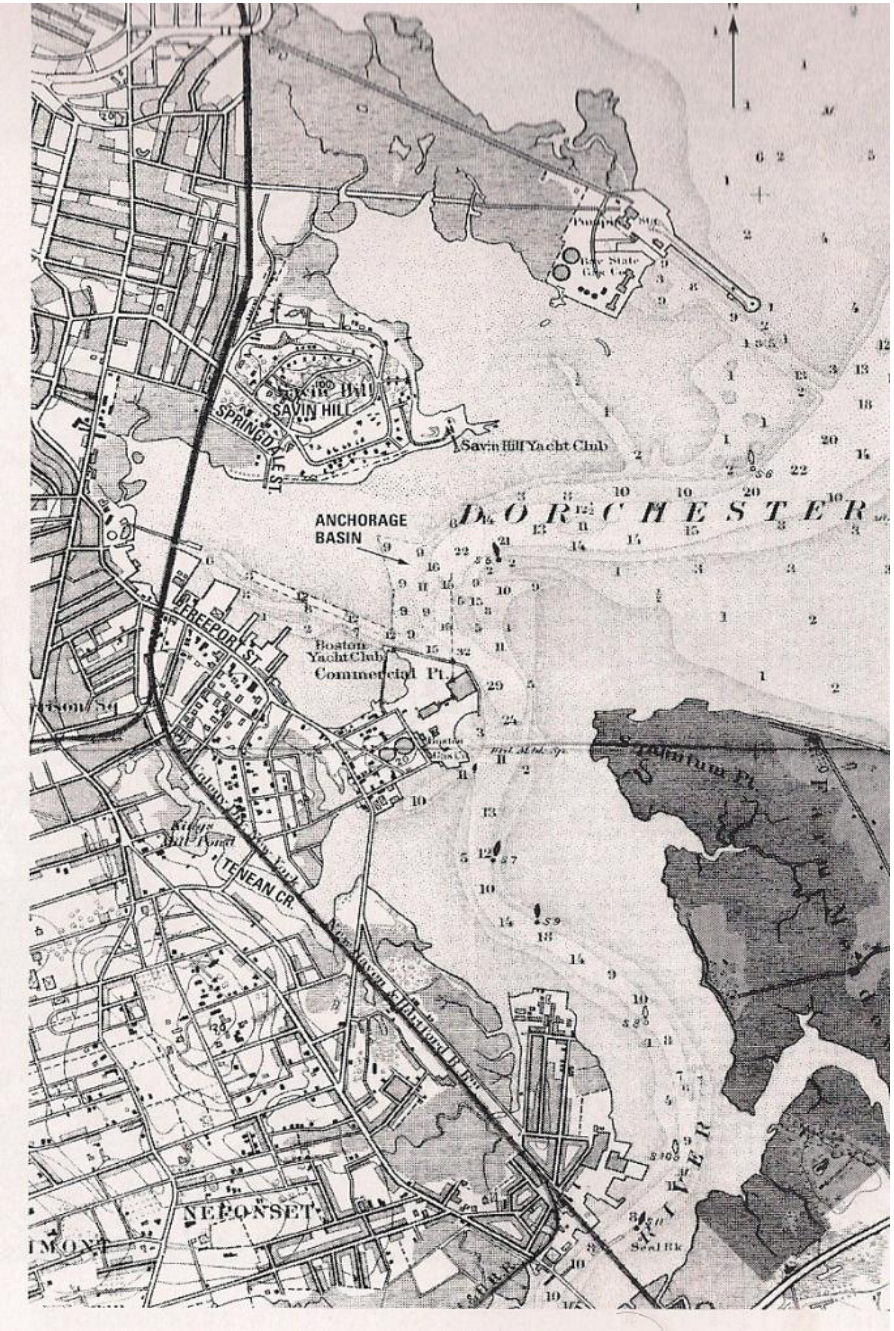
Savin Hill Beach

- The Savin Hill (originally Rock Hill) was renamed in 1822 for the Savin Trees (Red Cedar) that grew on it.
- The Savin Hill Beach was previously a salt marsh and was filled in with dredged material (from Dorchester Bay) in 1908 to make way for a park and beach.
- Today the Dorchester Yacht Club now occupies the shore & the South East Expressway crosses the filled area between the train tracks and Savin Hill Beach (McConnell Park).
- **Significance:** Previously natural Salt Marsh areas were located all along the Boston/Dorchester coast and were capable of survival.

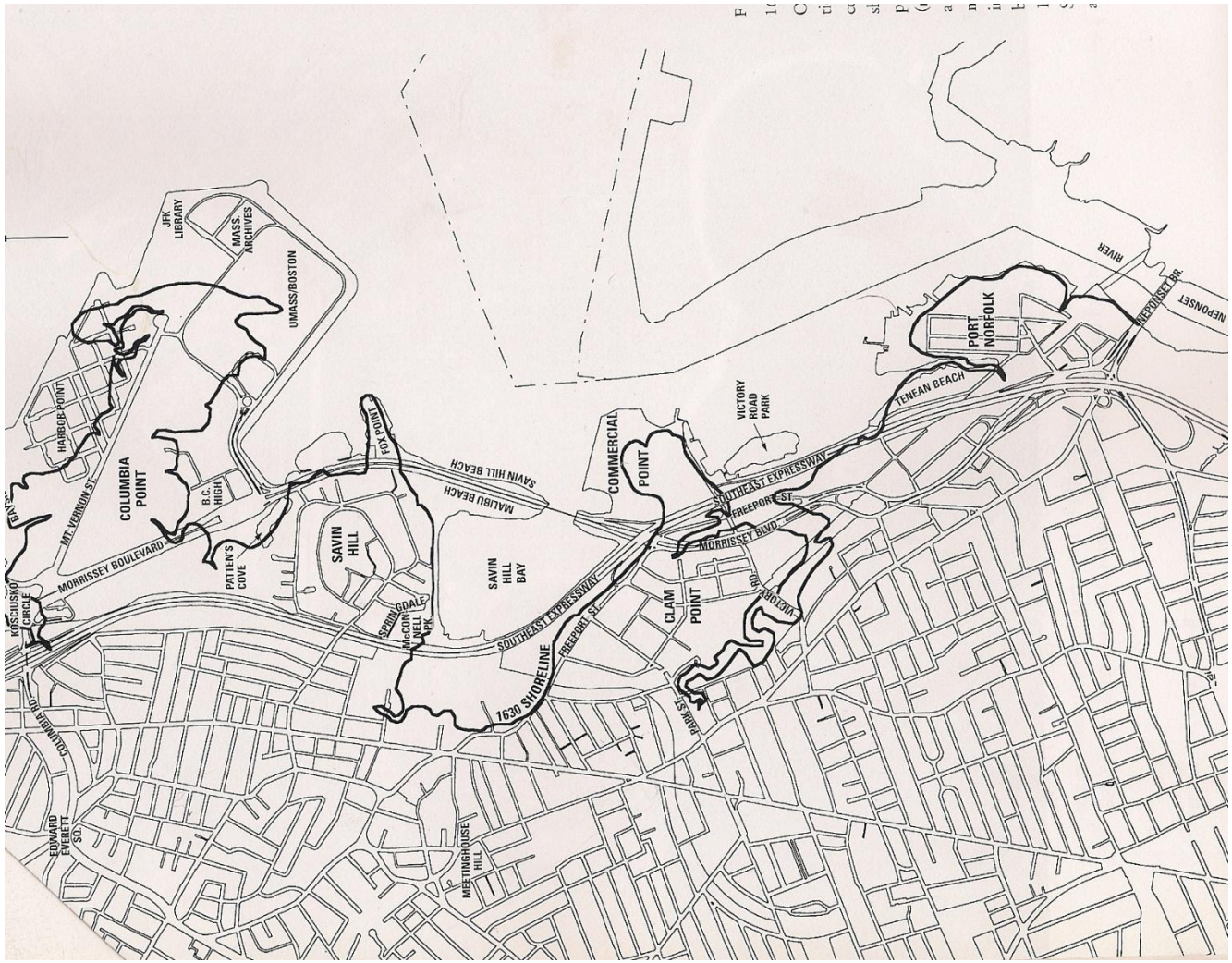
Dorchester, 1907 and Dorchester 1917 (Making of Savin Hill Beach)- Image 12.5-12.6 Gaining Ground



Dorchester, 1934- Image 12.7 Gaining Ground by Nancy S. Seasholes



Before & After- Image 12.1 Gaining Ground by Nancy S. Seasholes



Pictures of conditions at the Site (Pictures taken by Alyssa Hardiman and Nicole Proia)

Problems Savin Hill Cove Faces:

- Sediment Build Up (Dredging)
- Water Quality
- Pollutants (Location)
- Storm Water Outfall
- Loss of Habitat
- Social Impacts on Local Community (Activities, Research Boat)

Factors to Look At

- Current organism populations
- Current Water Quality
- Sedimentation
- Current/Past Dredging Operations
- Current habitat conditions for marine wildlife

Savin Hill Cove Salt Marsh= The Solution !

- **OUR GOAL:**
- We are proposing a Salt Marsh as the main solution to almost all of the problems we have addressed in Savin Hill Cove. The basic Dynamics of salt marshes will be now be discussed to make it understood why it is the best solution.
- **VISION:**
- We envision a luch, thriving, beautiful marsh environment right aslongside of the highly anthropogenic environment of Morrissey Boulevard. The balance between artifical and natural would be a highly dynamic and interesting environment that would draw people to it.

Methodology

- We planned to meet at Savin Hill Cove at both high tide and low tide. This will enable us to get the full experience of the environment in both its regular states.
- Learn the dynamics of a salt marsh in depth to know how the restoration would work and grow.
- Learn about the problems of Savin Hill Cove in depth to ensure a Salt Marsh was a good solution and for which problems.

Salt Marshes- The Basics

- Salt Marshes are one of the most dynamic and thriving environments of our world today, rivaling tropical rain forests and coral reefs.
- They are home to many marine organisms, flora and fauna, coastal shore birds, coastal wildlife, and can serve as an alternative, natural recreational setting for environmentally conscious people to enjoy.

How they are formed:

Mudflats, 1st stage of salt marsh formation: http://www.geography-site.co.uk/pages/physical/coastal/images/mudflat02.jpg

Salt Marsh with clearly visible zones: http://www.learnnc.org/lp/media/collections/cede/cedebwr08.jpg

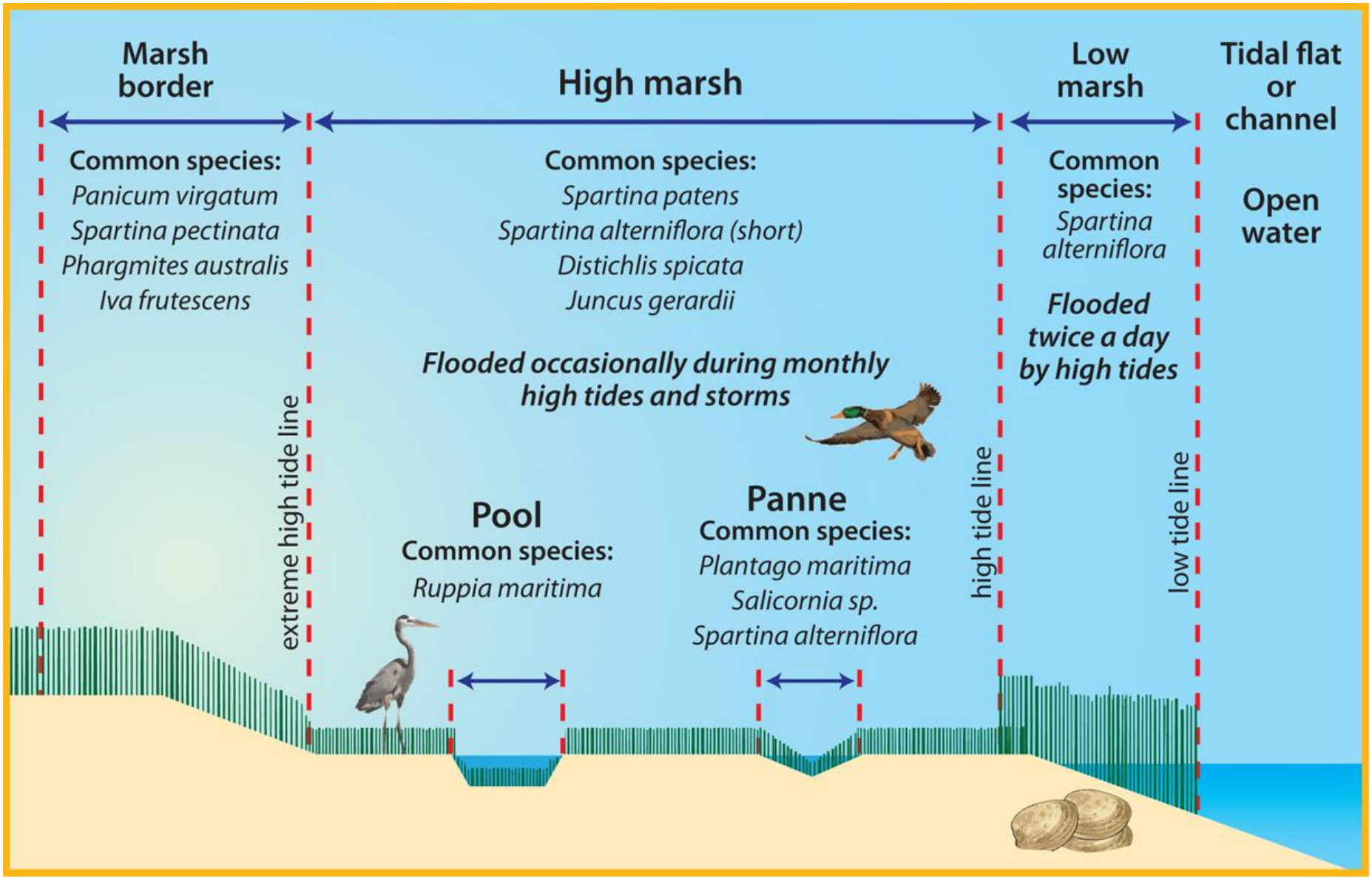
Man-Made Salt Marshes

- A study from researchers at University of New Hampshire and University of England focused on New Hampshires Great Bay. They compared the progress of the 6 Man Made Salt Marshes (1-14 years old) to 11 natural reference marshes. The results showed differences in both, but none that would deter from a man-made option.

Man Made Salt Marshes: http://www2.2space.net/images/upl_newsImage/1276837831.jpg

Salt Marsh Zonation

- Salt Marshes Contain different zones which can be considered different ecosystems in and of themselves.
- Tidal Flat, Mudflats, Low Marsh, High Marsh, Uplands and Marsh Borders.


Marsh border
High marsh
Low marsh
Tidal flat or channel
Common species:
Panicum virgatum
Spartina pectinata
Phargmites australis
Iva frutescens
Common species:
Spartina patens
Spartina alterniflora (short)
Distichlis spicata
Juncus gerardii
Common species:
Spartina alterniflora
Open water
Flooded twice a day by high tides
Flooded occasionally during monthly high tides and storms
extreme high tide line
high tide line
low tide line
Pool
Common species:
Ruppia maritima
Panne
Common species:
Plantago maritima
Salicornia sp.
Spartina alterniflora

Benefits of a Salt Marsh:

- Salt Marshes produce detritus which can serve as a food source for many organisms.
- They are known as excellent nursery grounds for young fish, shellfish, crustaceans and various marine species because of their rich waters and relatively low energy environments.
- Salt Marshes are low energy environments because the grasses here can serve as an environmental buffer from coastal storms and waves and reducing erosion.
- They are also known as natural filters. The Marsh plants uptake and break down pollutants in the waters and sediments and cleanse the areas.
- Salt Marshes can also prevent sediments from washing offshore creating more land for growth and lessening the contribution to the Savin Hill Cove dredging problems.

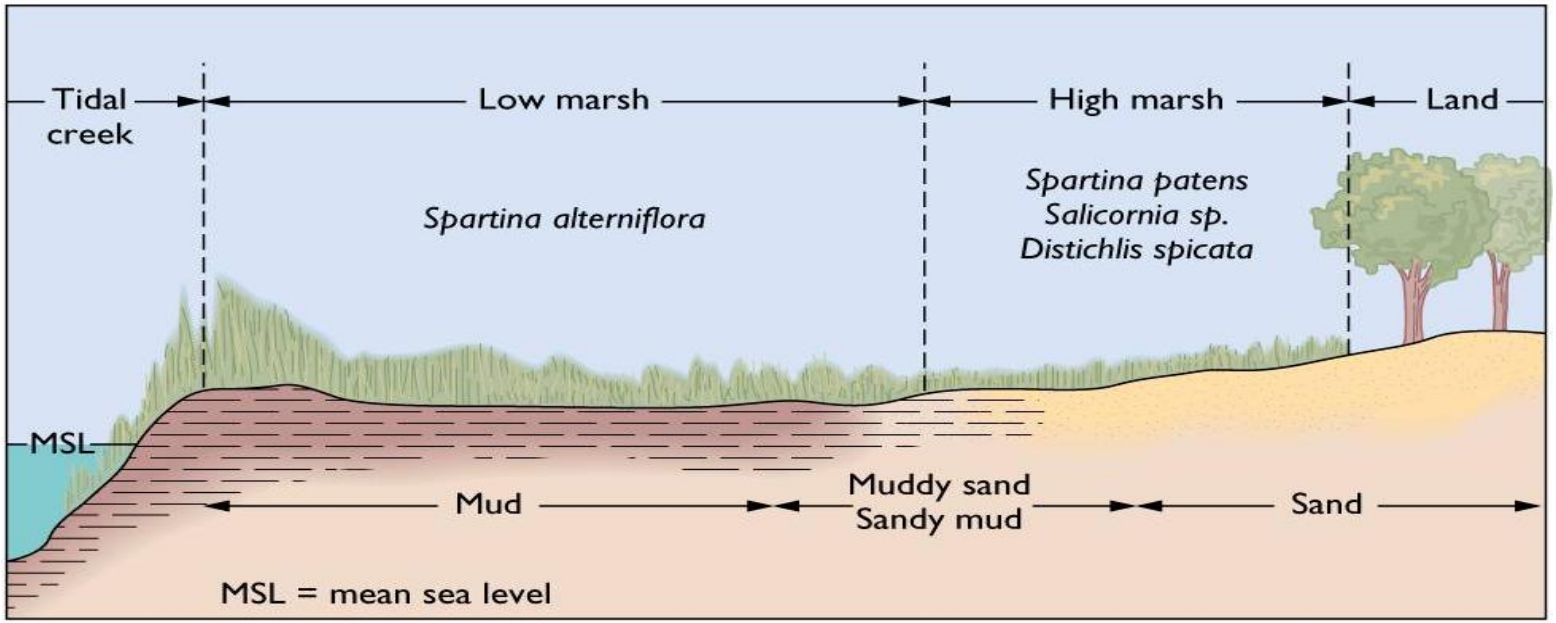
(www.dep.state.fl.us/coastal/habitats/saltmarshes.htm)

Salt Marsh Benefits

Slat marshes are a transitional area between land and water. They provide a natural buffer system which will help with the constant flooding of Morrissey Blvd.

DORCHESTER -- A major road flooded and forced police to close it off to drivers on Sunday afternoon. http://www1.whdh.com/news/articles/local/BO101077/

Salt marsh progression and sea level rise



Salt Marsh Zonation

Low Marsh:
Spartina alterniflora
High Marsh (often brackish):
Spartina patens, Distichlis spicata

MHHS - Spring High Water
MHW - Mean High High Water
MSL - Mean Tide Level
MLW - Mean Low Water

Dredged Material Removal

Many salt marshes have been impacted by the deposition of fill, either dredged mud and sand derived from historic navigation projects, or various types of structural fill derived from various industrial activities. This was the case in Savin Hill Cove. To restore marshes which have been impacted by fill, the historic intertidal elevations must be reestablished with earth-moving equipment.

Picture of Construction and Dredging at Savin Hill Cove: Photographer Uknown

Dredging Savin Hill Cove

Picture of Construction and Dredging at Savin Hill Cove: Photographer Uknown

Picture of Construction and Dredging at Savin Hill Cove: Photographer Uknown

Now to Apply all of this to the promising Savin Hill Cove…

GoogleEarth Image: Edited by Alyssa Hardiman

Extension of the Boston Harbor Walk

The Boston Harbor Walk provides a safe pathway for bikers and joggers to enjoy what the Boston area has to offer and learn the history behind it along the way. The new extension will do just that and add the safety aspect for the residents who jog along the busy Morrissey Blvd.

Figure 1-Top: Example of possible railings:http://nycedges.blogspot.com/2010/10/salt-marsh-nature-center-brooklyn.html
Figure 2- Bottom- Harborwalk: along Dorchester Bay: http://www.gonomad.com/destinations/0908/massachusetts-boston-waterfront.html

Interpretive Walkway

The Savin Hill Salt Marsh interpretive walkway includes pathways along the outside of the salt marsh for bikers and walkers, as well as walkways through the salt march with interpretive stations that provide information and history about the salt marsh and this unique ecosystems.

Marsh Walkway: http://fineartamerica.com/featured/plum-island-walkway-linda-makiej.html
Marsh Walkway Deck: http://www.ci.edmonds.wa.us/Discovery_programs_website/Edmonds_Marsh.html

Savin Hill Cove pathway Signs explaining what a salt marsh is and why they are important:

Smooth Cordgrass(*Spartina alterniflora*)

- This type of marsh grass dominates the regularly flooded low marsh. It is responsible for much of the marsh's productivity. *Spartina*'s successful adaptations enable it to live where few other plants could survive.

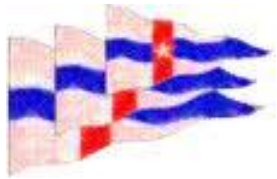
Salt Marsh Grass: http://www.saltmarshlife.com/salt-marsh/plants.html

Education First

The information that will be found along the extended Boston Harbor walk and Savin Hill Cove area will provide useful information to the public and residents in the area. The information will include the history of the area and its community, such as the Savin Hill Yacht Club. It will inform visitors of the involvement of the yacht club and how they were able to integrate with the restoration of the salt marsh. It will also help spark people's interest in their community and hopefully want them to get involved in projects such as these.

View of Boston:
http://www.examiner.com/geocaching-in-boston/geocaching-massachusetts-boston-harborwalk

Old Boston Map: Savin Hill:
http://mashpedia.com/Savin_Hill



Community Outreach

Reaching out to the community, helps provide education and inform them on what is going on in their community. It helps the residents get involved and have a say in what is being done in their own backyards. Lucky for us, we are extremely close to Umass Boston. We can have environmental professors and students get involved by helping in outreach programs for the local community and the understanding and restoration of the Savin Hill Salt Marsh.

Kids learning about Salt Marshes: http://www.seacoastonline.com/articles/20100603-NEWS-6030433

Researchers in a Salt Marsh: http://sls.uwe.ac.uk/fieldtrips/

How can we as students get involved and get possible credits?

With agreement of the Umass Boston Eeos department, we can offer credits and research studies for students who want to get involved. the health and progress of the salt marsh can be monitered by having students go out and collect samples of the water and over all health and quality of the marsh. We can also include the local community my inviting them to educational events and touring of the marsh.

Umass Boston from Savin Hill Cove: UMB.edu

Water Sample Boston Harbor: http://www.flickr.com/photos/umass_boston/page63/

Conclusion & Discussion

- Savin Hill Cove is an ideal spot for a Salt Marsh Restoration Project.
- It will solve or alleviate the major problems of The Morrissey Boulevard such as pollution, flooding, ecosystem degradation, dredging and also create a recreational area for the local community.

- Questions?

A very special thanks to..

- Professor Anamarija Francic
- Classmates of EEOS 476
- Mr. Neil Price
- Mr. Chris Sweeney
- Dr. Allen Gontz
- Mr. John O'Donnell
- Savin Hill Yacht Club
- The Boston Harbor Association
- Boston Redevelopment Association

References

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- Gaining Ground, Chapter 12-Dorchester, by Nancy S. Seasholes
- Dynamics of a Salt Marsh by Dr. Elizabeth Wenner, Marine Resources Research Institute
- Department of Environmental Protection, Florida Marine Research Institute Brochure-Section Habitats-Salt Marshes
- Anthropogenic Modification of New England Salt Marsh Landscapes by Mark D. Bertness, Patrick J. Ewanchuck, and Brian Reed Silliman.
- www.oceaninn.com/the-nature-preserve/248/
- Salt Marsh Restoration: What Scientists are Discovering by Peter H. Taylor