Sediment Management in Savin Hill Cove

Image source: Google Maps

Environmental, Earth, & Ocean Sciences Capstone Project
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Our Project Site

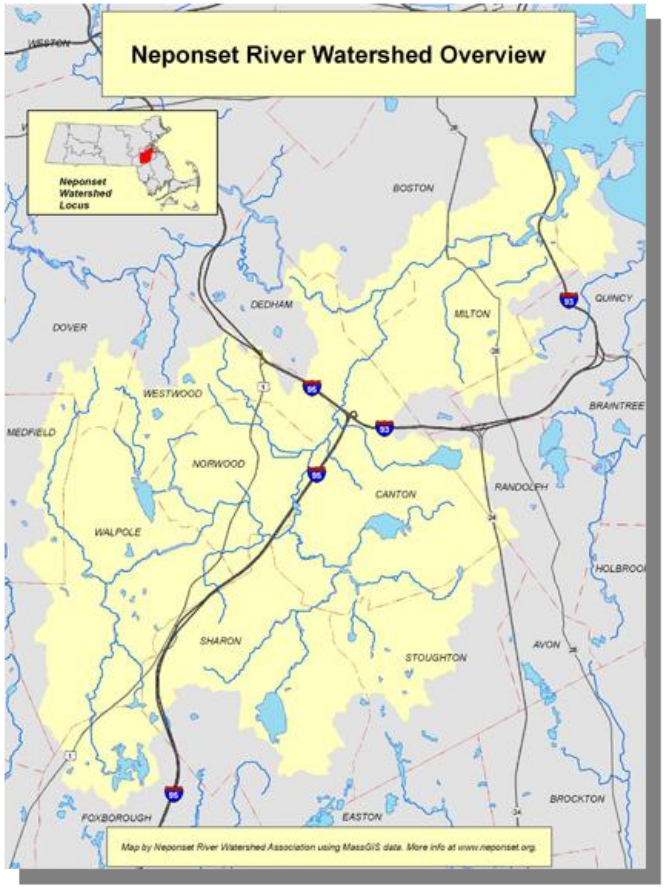


Image source: www.neponset.org

Image source: www.mass.gov/czm/coastguide/online/descriptions/dorchester_bay_quincy.htm

Issues

- Sediment accumulation

  High tide:

Image source: http://kevishere.files.wordpress.com/2010/10/umass-boston1.jpg

  Low tide:

Photo taken by Michiey (http://www.flickr.com/photos/michiey/)

- Degraded environment
- Debris accumulation
- Restricted boat access
- Inundation of sediment/biology in Umass Boston's heating/cooling system

Issues (cont.)

- Storm water drainage & runoff

Image Source: http://www.mwra.state.ma.us/annual/csoar/2004mwracsoar.pdf

Our Mission

To minimize the impact of sedimentation in navigation channels, and to restore the degraded ecosystem.

Project Objectives

- Investigate history
- Identify information gaps
- Identify causes of issues
- Present multiple scenarios/solutions
- Ensure student involvement now and in the future

Methodology

- Dredging Assessment

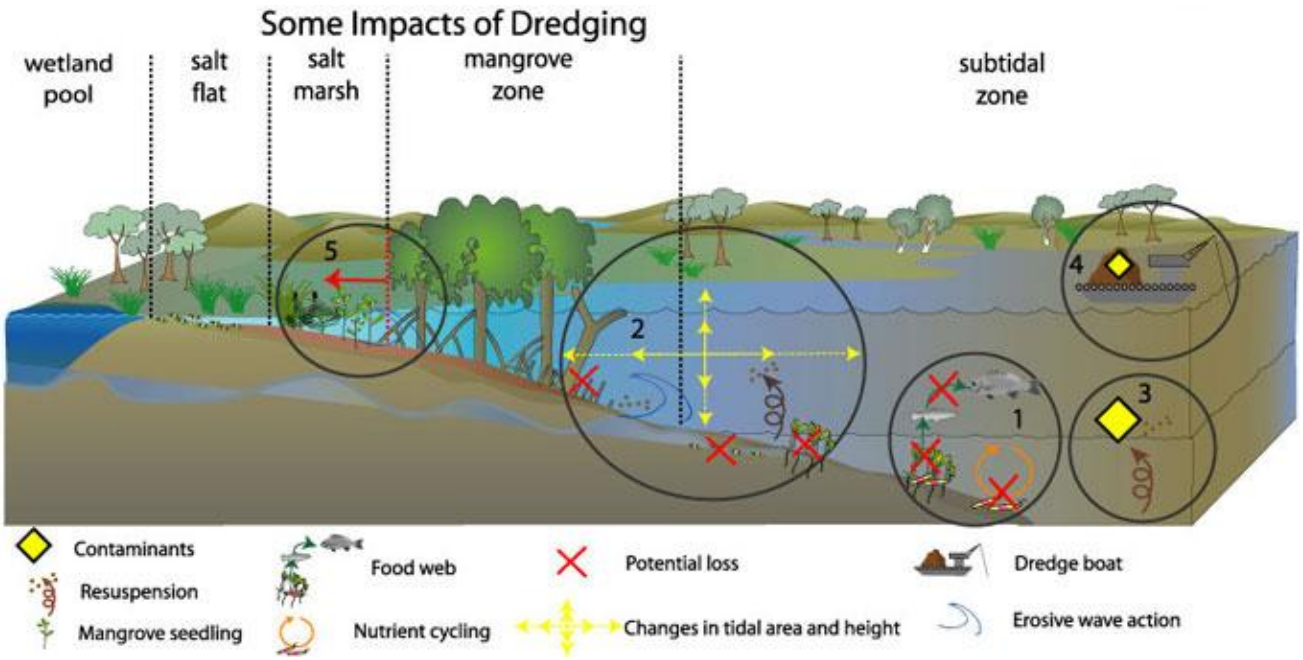


Image Source: http://www.ozcoasts.org.au/conceptual_mods/threats/images/dredging.jpg

Methodology(cont.)

- 2006 Environmental Assessment
  - conducted by Normandeau Associates of Falmouth, MA
  - Low turbidity, low biodiversity
- Weekly meetings outside of class
- Site visit w/ Professor Allen Gontz
- Meet with stakeholders and other contacts
  - Chris Sweeney Director of Marine Operations (UMB), Zehra Schneider Grahm Deputy Director of Environmental & Health Services Office

Methodology (cont.)

- Interpreting data and information
  - History, Past dredging, UMB Master Plan
- Look into alternative sediment management (natural & others)

Results…

- Soft structures
- Hard structures

>combination

- *Use only native vegetation*

Image source: Umass Boston Digital Archives

Image source: Umass Boston Digital Archives

Image source: Umass Boston website

Salt Marsh Restoration

Image source: Great Ecology and Environments, Inc.

- Filter pollutants
- Increase biodiversity
- Accrete sediment

Rock sill together with Salt Marsh

- Provides safety for newly seeded salt marshes

Image Source: Virginia Coastal Zone Management

Bio-retention

Bio-retention areas both large and small proposed as storm water runoff buffers along roadways and parking lots

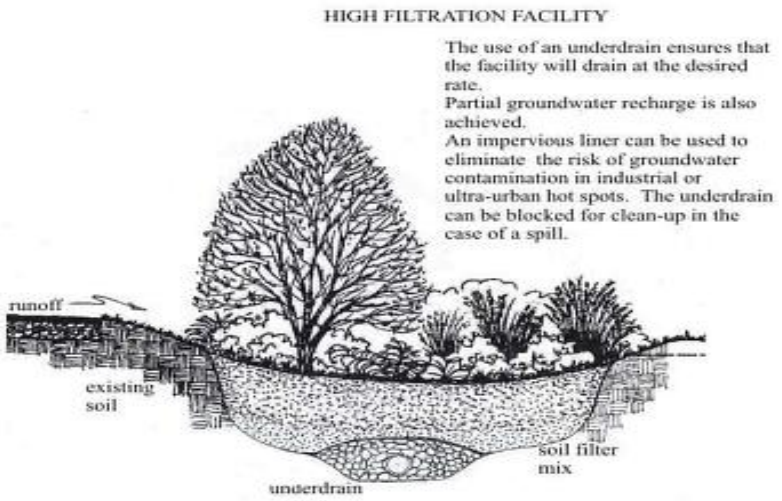


Image Source: Quality Assurance for Nonpoint Source Best Management Practices

- Reduces noise pollution
- Wind breaker
- Filters pollutants /sediment from runoff
- Intrinsic value

Image Source: National Transportation Enhancements Clearinghouse

Image source: Greenspace

Hard Structures

Image source: Granite Environmental, Inc.

Silt Screens

Prevent sediment accumulation in Savin Hill Cove

Image source: http://www.mvs.usace.army.mil/arec/basics.html

Training Dams

Control water/sediment pathways

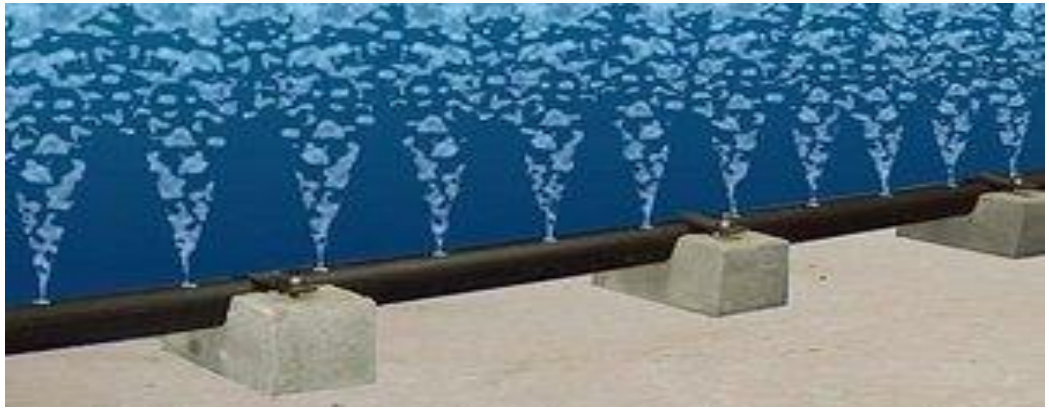
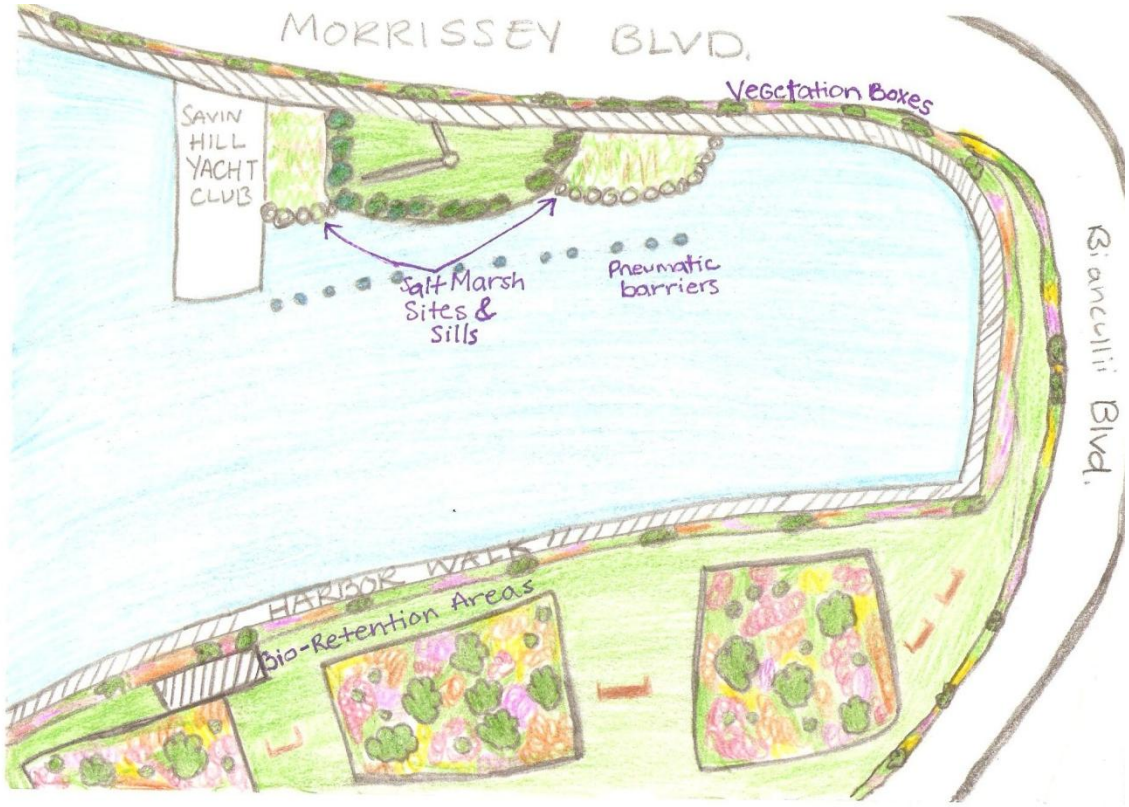


Image Source: Nautic Expo

Pneumatic Barriers

Prevent sediment from settling in navigation channels

Our Vision



Illustrated by Caitlyn Mello

- Rock sill w/salt marshes
- Pneumatic barriers
- Bio-retention areas

Future Monitoring & Looking Ahead

- Brownfield feasibility
- Dredge spoil reuse for Salt Marsh Restoration
- Patten’s Cove
- Master Plan
- Student/community Involvement
- Create baseline data

Acknowledgements

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- Professor Allen Gontz and
- Professor Anamarija Frankic

…for all their help they provided for our project.

Sources

Granite Environmental, Inc. (http://www.erosionpollution.com/)

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Photo used: (http://img.nauticexpo.com/images_ne/photo-m2/permanent-floating-oil-boom-for-harbor-compressed-air-system-199854.jpg)

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Quality Assurance for Nonpoint Source Best Management Practices (http://www.lowimpactdevelopment.org/qapp/index.htm)

Photo used: (http://www.lowimpactdevelopment.org/qapp/bio_benefits.htm)