Shifting Shorelines of Savin Hill Cove

1777 to Present

University of Massachusetts at Boston
School For the Environment
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Photo Credit: Boston and its Environs, 1806, Philips R, Norman B. Leventhal Collection at Boston Public Library
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Vision: Through the use of technology, we aim to find the changes to the shoreline and the resulting impact of human settlement and development in and around Savin Hill Cove and Columbia Point.
Abstract:

Through the use of a geographic information system, namely ArcMap, we built an interactive map to portray the changing shoreline of Savin Hill Cove and the immediate surrounding area. We have found maps that span over two hundred years, as far back as 1777, and roughly every twenty-five years since then. Sources for maps that we used include map collections at the Boston Public Library, USGS, and other online archives.

In order to accomplish this we georeferenced the old digital maps. From there, we created a digitized shoreline for each year, enabling us to layer the maps and see the change in the shoreline. From our work this semester, we are truly able to see change to the shoreline and land use of the Savin Hill Cove area since the late 18th century.
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Approach:

- Find digital copies of historical maps
- Gain permission to use maps for our project
- Learn skills necessary to convert hand drawn paper maps into digital referenced format
- Apply skills, create ‘working maps.’
- Focus on the changes to the Savin Hill Cove’s shoreline throughout history
- Publish product
- Tell you all about it!
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Sources & Acknowledgments:

• Norman B. Levanthal Collection at the Boston Public Library
• USGS
• Mass GIS
• Texas A&M University Libraries tutorials. Link: http://www.youtube.com/watch?v=PHtxbpboDro
• GIS Tutorials. Link: http://www.youtube.com/watch?v=6dY3x-5qX6U
• Professor Helenmary Hotz
• Professor Michael Trust
Obstacles:

- Finding Boston Harbor maps that included Savin Hill Cove
- First we looked to MA Archives, spoke with community leaders, searched the internet, looked to published works, finally finding the most of our material at the NBL Collection at Boston Public Library
- Gaining permission to use maps
- Learning to georeference
- Learning to digitize
- Aligning hand drawn features to current landmarks
- Recognizing the changes in geomorphology
- Learning how to publish our work in an interactive medium
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Methodology:

- Once we got our hands on the maps we saved them as high resolution digital images, .TIFs.
- Then we uploaded them into ArcMap, which is an ESRI product. ESRI is a commercial GIS, however if you wanted to replicate our work, there are other GIS products available. A GIS, or Geographic Information System, is an integration of hardware and software that allows the user to capture, analyze, manage, and display geospatial data. In ArcMap we were able to give coordinates to our paper maps. This is called georeferencing.
- Neither one of us knew how to do this so we asked for help and watched tutorials on Youtube.
- To georeferencing we had to find control points from currently referenced maps to link to our historical maps. We used coastline, train, and road shapefiles from the Mass GIS website. Our efforts resulted in aligned historical maps within a coordinate system.
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Georeferencing in action

Photo Credit: Nicole Borgstrom
Map on Left: Map of Dorchester 1920, Dorchester Board of Trade, Norman B. Leventhal Collection at the Boston Public Library
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Methodology:

• We ran into problems here because the varying detail of the hand-drawn historic maps. It differed from year to year depending on the artists’ perspective. You will see this difference margin in our final product.

• Once we georeferenced all our maps we saved them as layers within ArcMap. This allowed us to overlay the maps to analyze change.

• We decided to focus on the changes we saw in the coastline of Savin Hill Cove and Columbia Point. In order to best present this to you, we had to digitize an outline of the shoreline in every map.

• Again, we turned to Youtube tutorials and a little professional guidance to learn how to digitize. Once we figure that out, we clicked our way to our final product. Time was spent making the maps presentable and aesthetically pleasing.
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Photo Credit: Nicole Borgstrom
Map on Left: Map of Dorchester 1920, Dorchester Board of Trade, Norman B. Leventhal Collection at the Boston Public Library
Map on Right: Plan of Dorchester 1880, Boston City Surveyor, Norman B. Leventhal Collection at the Boston Public Library
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Methodology:

• In order to present our work to you, we exported the map with all layers into ArcReader, where the user can analyze the shifting shorelines of the cove. We also published an inclusive map as a .PDF, however only one image is able to be displayed. This can be found on the class website.

• All our work and due credit has been cited in the metadata.
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Final Product:

Photo Credit: Nicole Borgstrom
Map: A Plan of Boston in New England with its Environs Henry Pelham, Norman B. Leventhal Collection at the Boston Public Library
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Lessons Learned:

- This is more of a disclaimer than a lesson, we are novice GIS users, so there is a degree of inaccuracy from our ‘learning curve.’
- Hand drawn maps have a degree of inaccuracy. Maps serve different functions so the amplitude of detail depends on artists’ motives.
- Georeferencing and digitizing are time consuming.
- .TIFFs have higher resolution, better for the scale we were working with.
- Youtube is a great resource.
- There has been great change over the years to Savin Hill Cove, Columbia Point and the entire Boston Harbor.
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The End!

Questions? Comments?

Photo Credit: www.maps.google.com