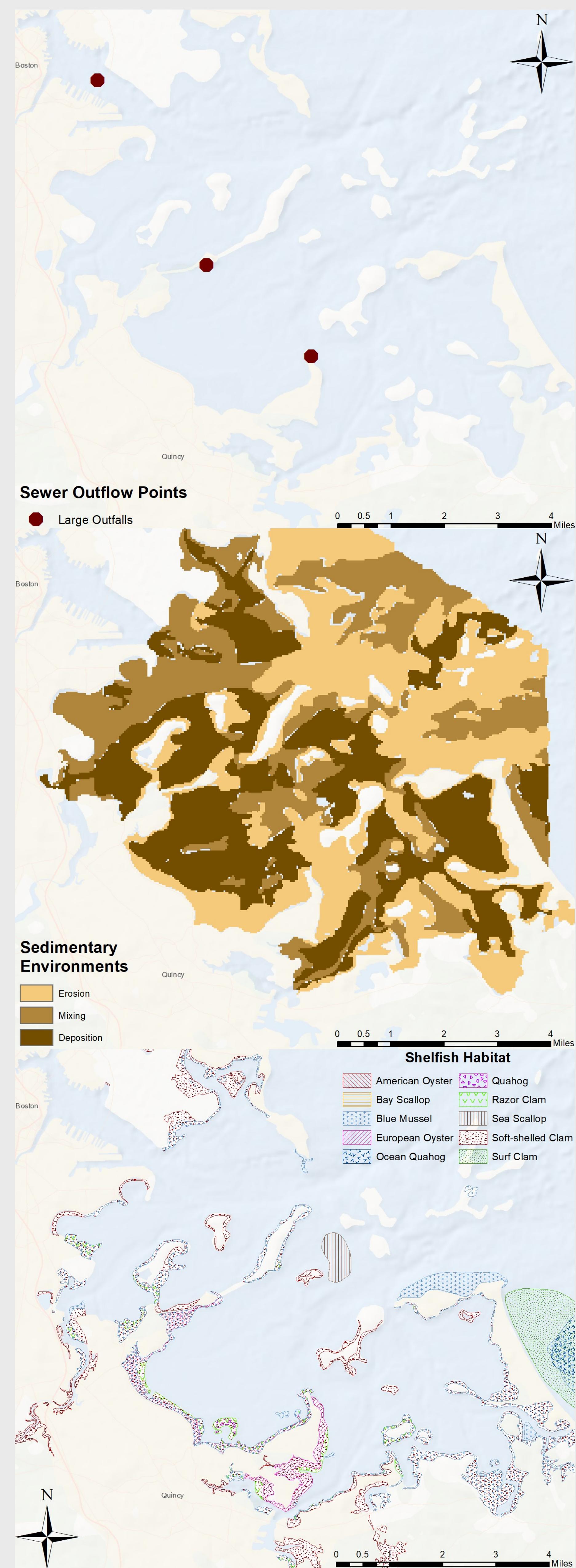


# "Harbor of Shame"

## A Sewage Contamination Risk Analysis of Boston Harbor Shellfish Populations

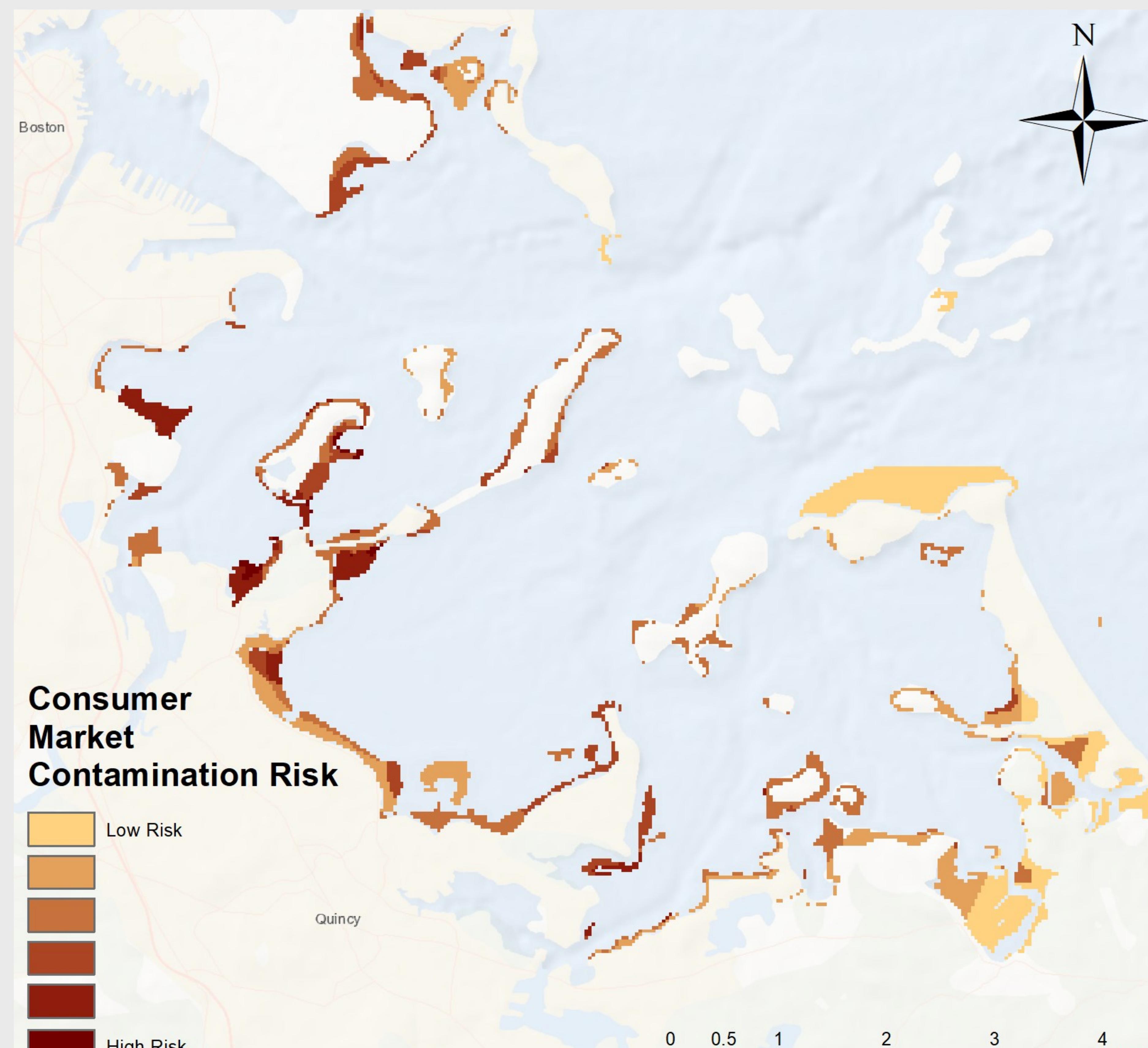


### The Problem

In his 1988 presidential campaign, then-Vice President George H.W. Bush toured Boston Harbor and witnessed the results of decades of dumping barely treated sewage into the harbor. Raw sewage has been discharged into Boston Harbor by Combined Sewer Outflows (CSOs) since the late 1800s leading Bush to coin the Boston Harbor the "Harbor of Shame." A thirty-year cleanup effort has made the present waters in and around the harbor the cleanest they have been in the past century, but dangerous sewage contaminants still linger in the sediment underneath.

### The Process

CSOs are the product of Boston's antiquated combined sewer and stormwater system. Both stormwater from surface street drains and the city's sewage flow into the same pipe system, meaning they are processed and managed together. During periods of heavy rainfall the system may be overwhelmed causing raw sewage to be dumped directly into the harbor. Three primary CSOs were identified and displayed in *Sewer Outflow Points*: Nut Island, Moon Island, and the mouth of the Inner Harbor. A series of five two-thousand meter buffers were created to rank proximity to these outflows; each was assigned a risk score of between two and thirty-two based on proximity. Raster multiplication was then used to scale each unit's risk based on sedimentary environment shown in *Sedimentary Environments*. Depositional environments are more likely to lock in contaminants, so they were weighted the highest with a factor of four. The new risk map was then filtered by *Shellfish Habitat* to create the map *Habitat Contamination Risk*. Not all shellfish species are recreationally and commercially collected, so the species were filtered by collection status and weighted by popularity to develop the *Consumer Market Contamination Risk* profile.



### Results

The final consumer market contamination risk profile found that the highest risk populations comprised of Soft Shelled Clams, Razor Clams, and Blue Mussels surrounding Houghs Neck and Squantum in Quincy, Columbia Point and Logan Airport in Boston, and Thomson Island. The European Oyster and Quahog populations are included. However, they are not emphasized due to their low harvest rate compared to the aforementioned species. Though harbor water quality has improved greatly in the past three decades, there is still work left to be done. Consumers still risk contamination while eating local shellfish, and local beaches continue to close after storms stir contaminated sediments and overwhelm the city's combined sewer outflow system.

### Limitations

Large sewer outflows are not the only points of contamination dissemination; the Dorchester and Quincy shorelines are both lined with smaller CSO outfalls not included in this analysis. Future iterations may include these outfalls in the model to increase the accuracy of the contamination risk calculations.

### Sources

Data Sources: MassGIS, Journal of Sedimentary Research, New England Journal of Public Policy, Massachusetts Water Resources Authority

Projection: NAD 1983 Massachusetts Mainland State Plane 2001

Andrew Kraunelis  
Geographical Information Systems  
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Civil & Environmental Engineering