



# Coastal Vulnerability of Beverly

Predictions of Sea Level Rise and Storm Surges

Colin Carney, AutumnRose Cataldo, Ari Connors, Marco Saraceno, Sarah Powers

# Background

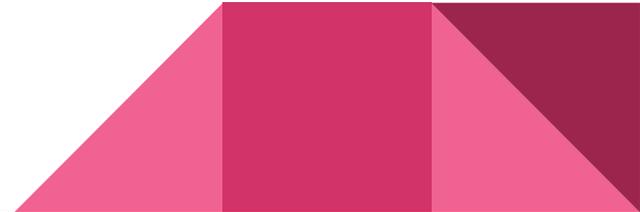
The purpose of this presentation is to explain the vulnerability to hazards the city of Beverly could experience from sea level rise in the year 2100 and storm surges.

The goal is to ensure that plans can be established for the future.

The question investigated was:

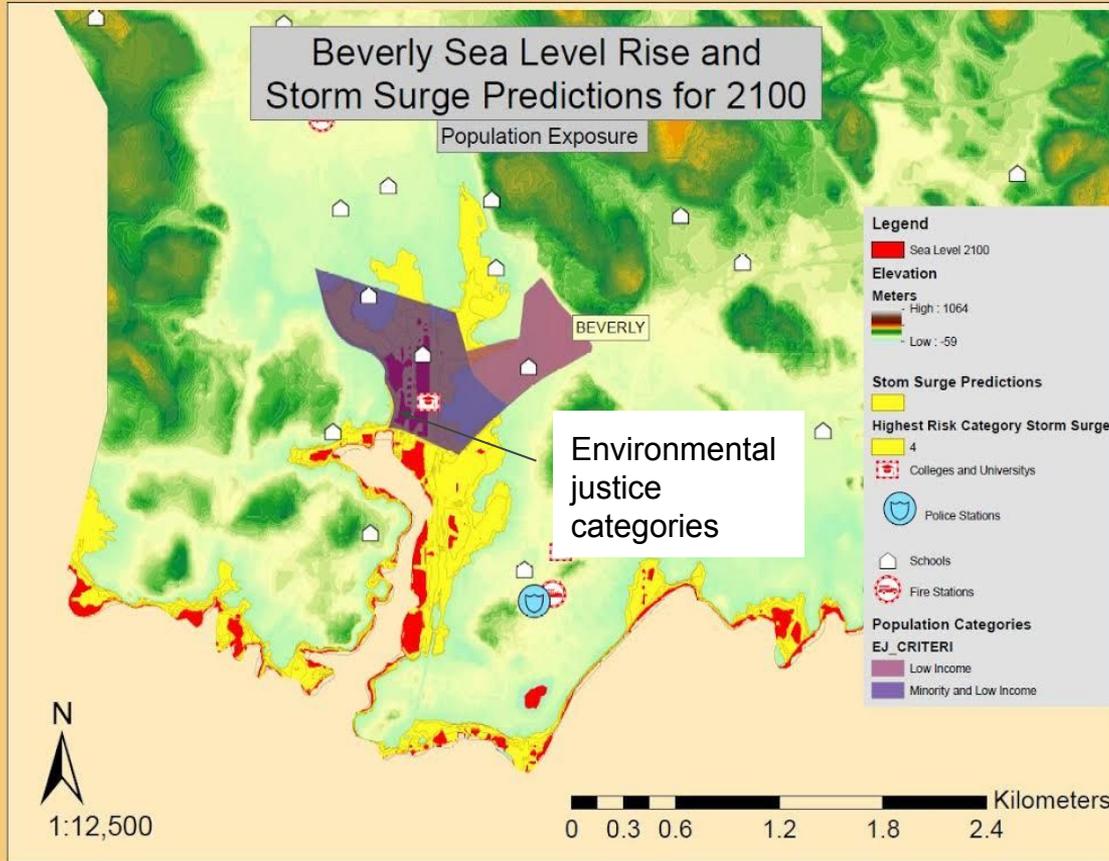
- What exposures will be most affected by sea level rise and storm surges?

Data was collected using layers from MassGIS archives.



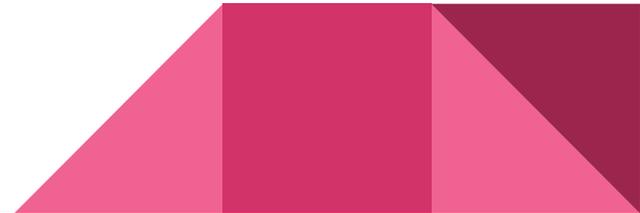
# Population Threats

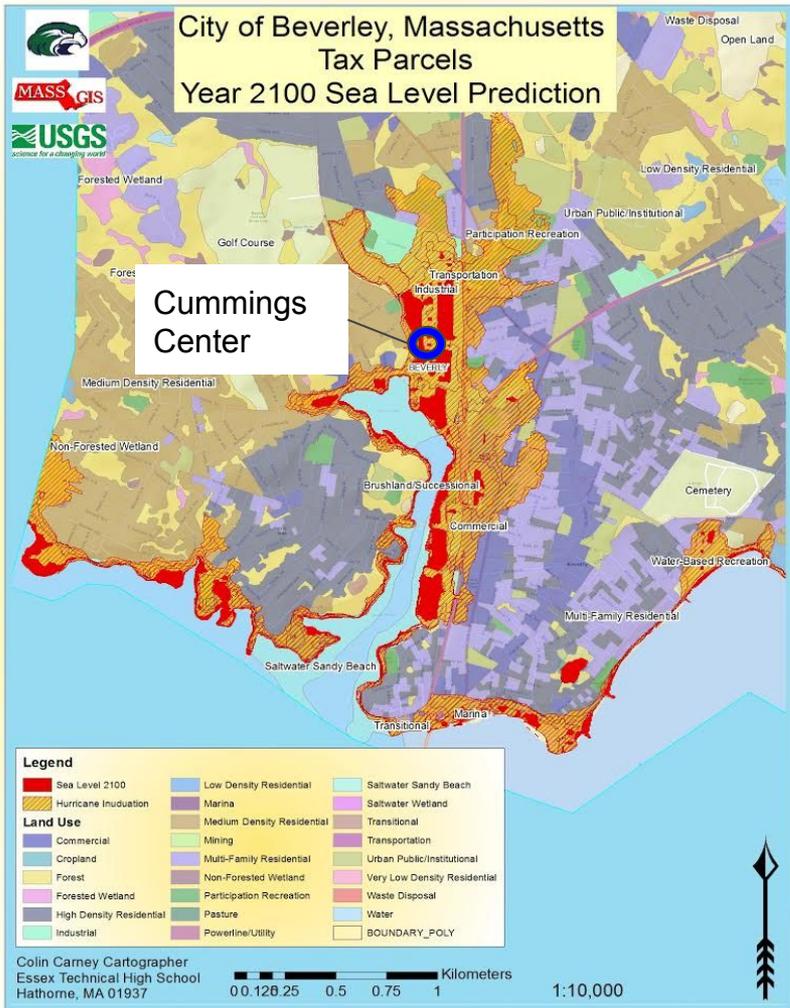
- No major emergency services affected.
  - ie. police stations, fire stations, hospitals
- In the environmental justice layer, low income and minority populations have a large portion of affected area.



# Economic Threats Based on Land Use

- Data from the tax parcels shows that billions of dollars would be at risk from damage due to sea level rise and possible storm surge.
- Residential areas are most at risk followed by industrial, participation-recreation, and commercial.
- The Cummings Center, a hub of economic productivity, will be in danger of flooding from sea level rise





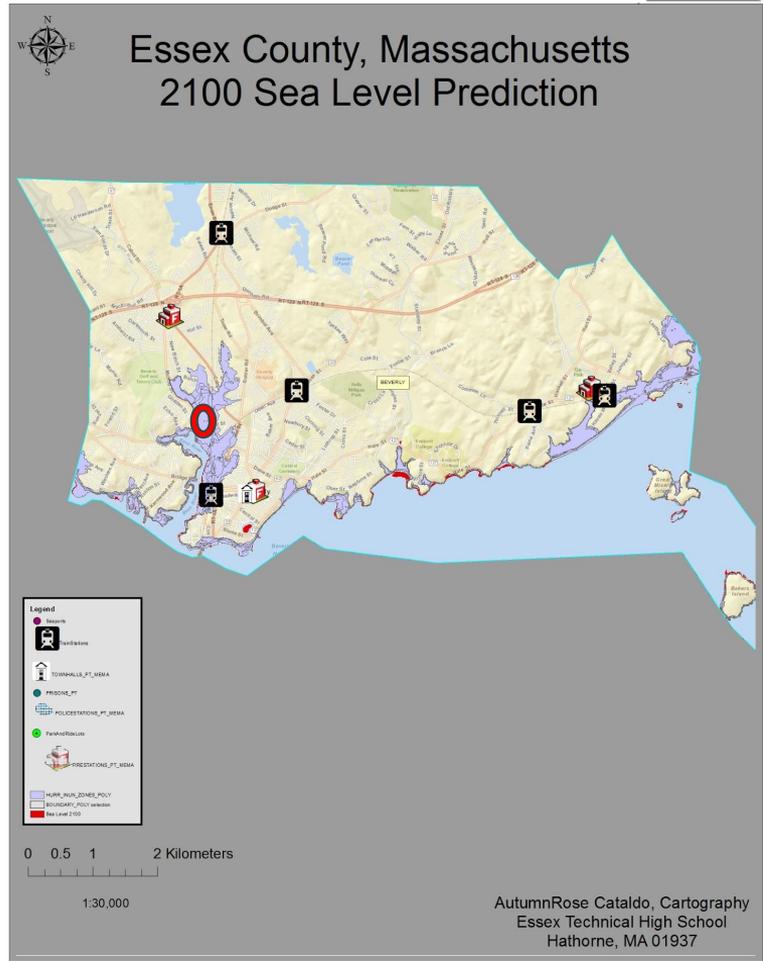
# Land Use and Economic Threats

Based off of both sea level rise and storm surge:

- Category at highest risk (sea level rise) is high density residential
  - Land value of the category is estimated to be tens of millions of dollars.
- Category at medium risk (storm surge) is commercial and low density residential
- Category at the lowest risk is industrial and participation recreation

# Lifeline Facilities and Infrastructure Threats

- Route 1A has some portions affected by the storm surge but not by the sea level rise.
- For the most part, major routes of transport will not be damaged by flooding.
- Power grids and transmission lines are not affected on a large scale and would not be an immediate threat from the sea level rise or the storm surge.



# Solutions to Threats

- Determine exact evacuation routes with roads that are not affected by the storm surge.
    - Major transportation routes are not affected by flooding.
    - Find specific evacuation via public transportation for low income areas
  - Protect existing unthreatened critical areas such as wetlands to decrease non-permeable surfaces and provide a buffer against storms.
  - Find new emergency centers away from flood zones.
  - Designate emergency service crews from unaffected areas to affected areas, since fire stations are not directly at risk.
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