

Effect of Coastal Flooding on Revere Massachusetts

Kyle Favaloro

Gph 340 Maps and GIS

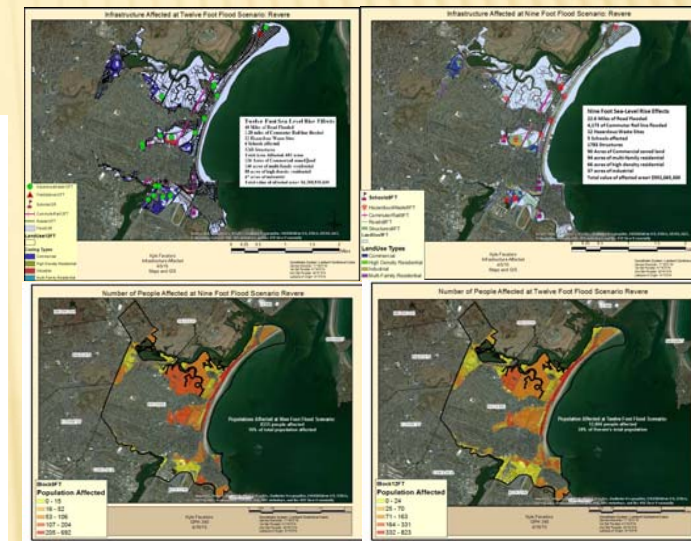
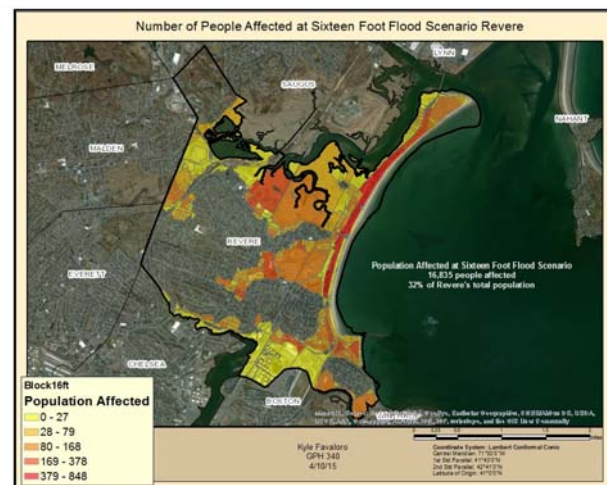
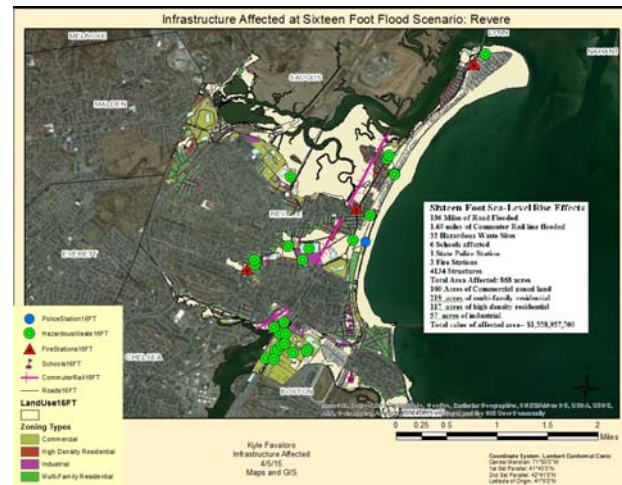
Summary

This project was completed in order to model three different flood scenarios in the city of Revere. The three major scenarios include a 9 foot flood, a 12 foot flood, and a sixteen foot flood. These levels were calculated based on NOAA predictions for future sea-level rise combined with storm surge estimates. By using ArcMap we were able to accurately model these scenarios using data layers from the MassGIS website. This project has proved that Revere is at huge risk if future sea-levels do rise, along with many other North Shore communities.

Methods

To generate an accurate model of these flood scenarios we followed 7 general steps to come up with the final maps. First we downloaded elevation data sets off the MassGIS website. Next we used this data to create an elevation raster to get a basic understanding of the elevation of the city. After this we identified the parts of the city that would fall below the water level under each flood scenario by using the elevation model we created. Next we created flood polygons for each different flood scenario. We then overlaid these flood polygons over a base map of the city to understand what features would be affected in the flood plain. After this we calculated the proportion of infrastructure and area that would be affected under each scenario. Finally we used the block group data from the U.S. census to identify the affected populations. When doing the calculations for affected population we calculated the proportion of each block that fell within the flood polygon and compared that to the population of those blocks to get a more accurate understanding of how many people in each block would be affected.

Results



Conclusions

This project was to learn what the effects of sea level rise combined with storm surge and high tide would have on the city of Revere. From this project we learned that Revere will be greatly affected by the effects of global climate change. At the sixteen foot flood scenario we found that 16,835 people would be affected which is about 32% of the entire population of Revere. Along with this we found that 136 miles of roadway would be flooded along with 3 fire stations, 1 police station and 6 schools. Accounting for a total of 868 acres flooded. This proves that climate change will affect us individually, although many seem to think it won't. This project proves the real world affects that climate change can and will have on the North Shore of Boston. This can serve as a warning to many of us and specifically for the city of Revere that we need to change our lifestyles in order to lower greenhouse gas emissions before we are faced with cleaning up a situation modeled in this project. Further modeling, with more accurate calculations is necessary to gain a much more precise model of the affects of these scenarios.

References and Contact information

"Office of Geographic Information (MassGIS), 2015. Commonwealth of Massachusetts, MassIT"