

Salem Massachusetts



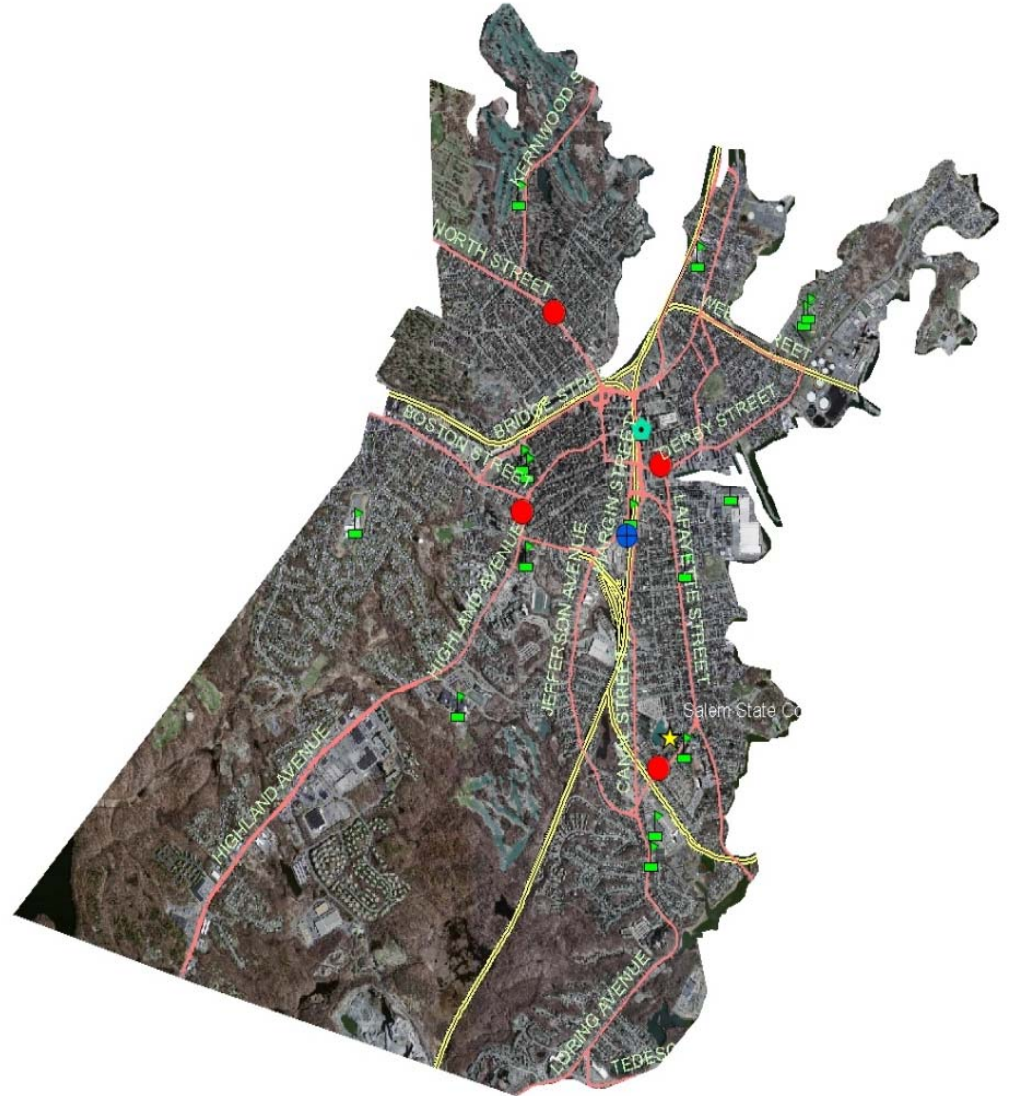
GPH340

Risa Yaginuma

Dr. Luna

The Goal of this project

- The goal of this project
 - analyze about impact of series of sea level rise in Salem.



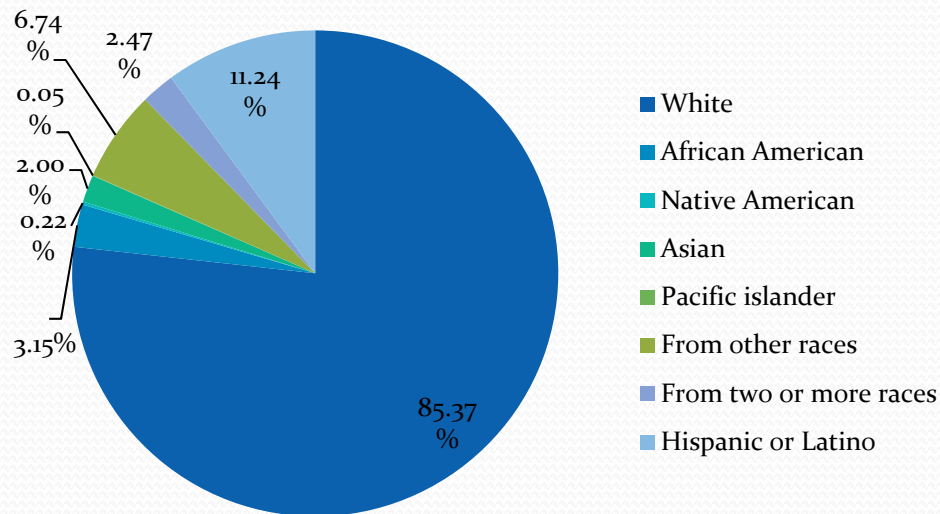


Salem

- Area - Total : 18.1 sq mi (46.8 km²)
 - Land : 8.1 sq mi (21.0 km²)
 - Water : 10.0 sq mi (25.8 km²)
- Elevation - 9 ft (3 m)
- Population (2007)
 - Total : 40,922
 - Density : 5,052.1/sq mi (1,948.7/km²)

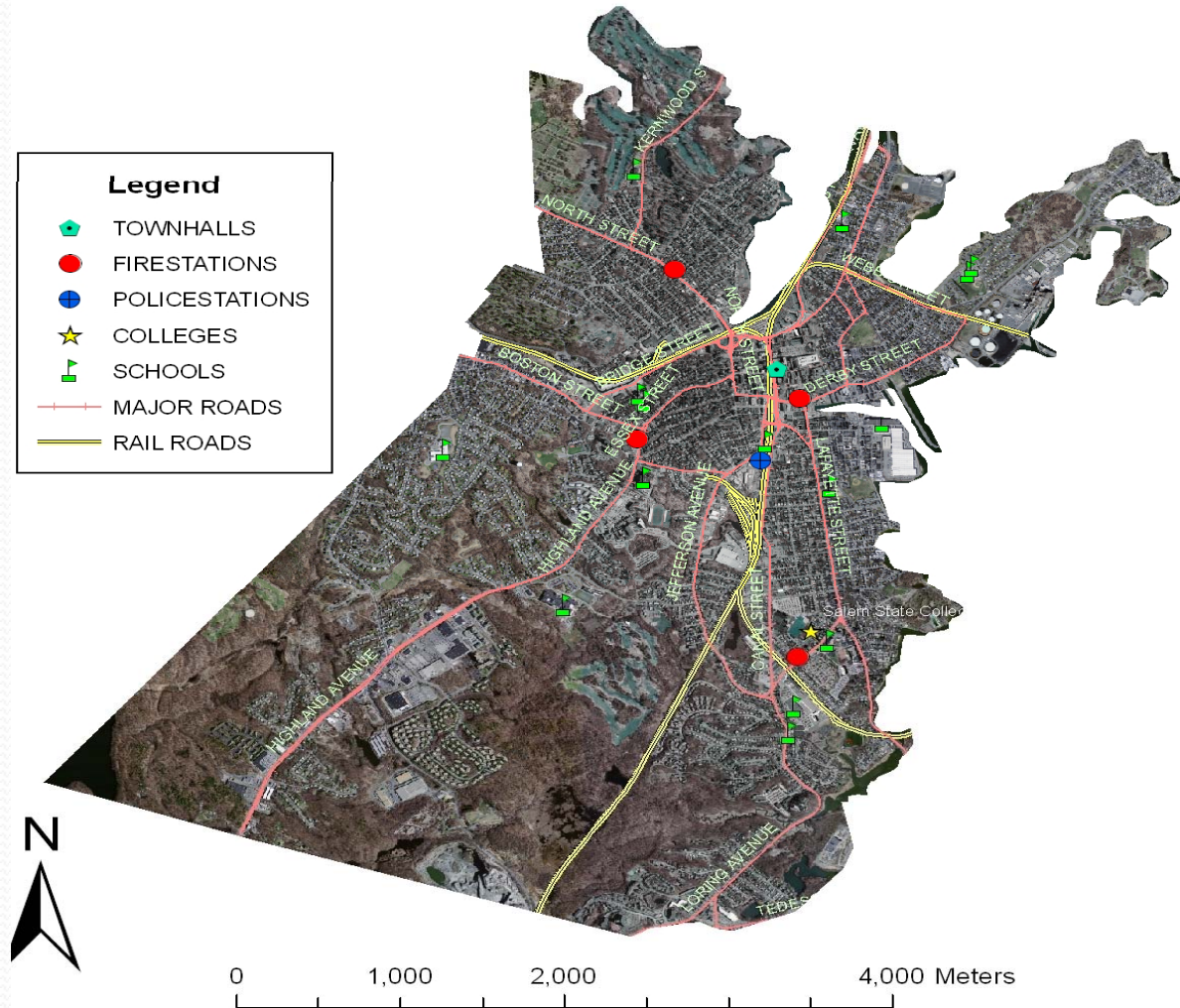
Demographics

Demographics



- There were 17,492 households out of which 24.2% had children under the age of 18 living with them, 38.8% were married couples living together, 13.3% had a female householder with no husband present, and 44.5% were non-families. 34.9% of all households were made up of individuals and 11.5% had someone living alone who was 65 years of age or older.
- In the city the population was spread out with 20.2% under the age of 18, 10.4% from 18 to 24, 33.4% from 25 to 44, 21.9% from 45 to 64, and 14.1% who were 65 years of age or older.
- The median income for a household in the city was \$44,033, and the median income for a family was \$55,635.
- The median age was 36 years.

Salem



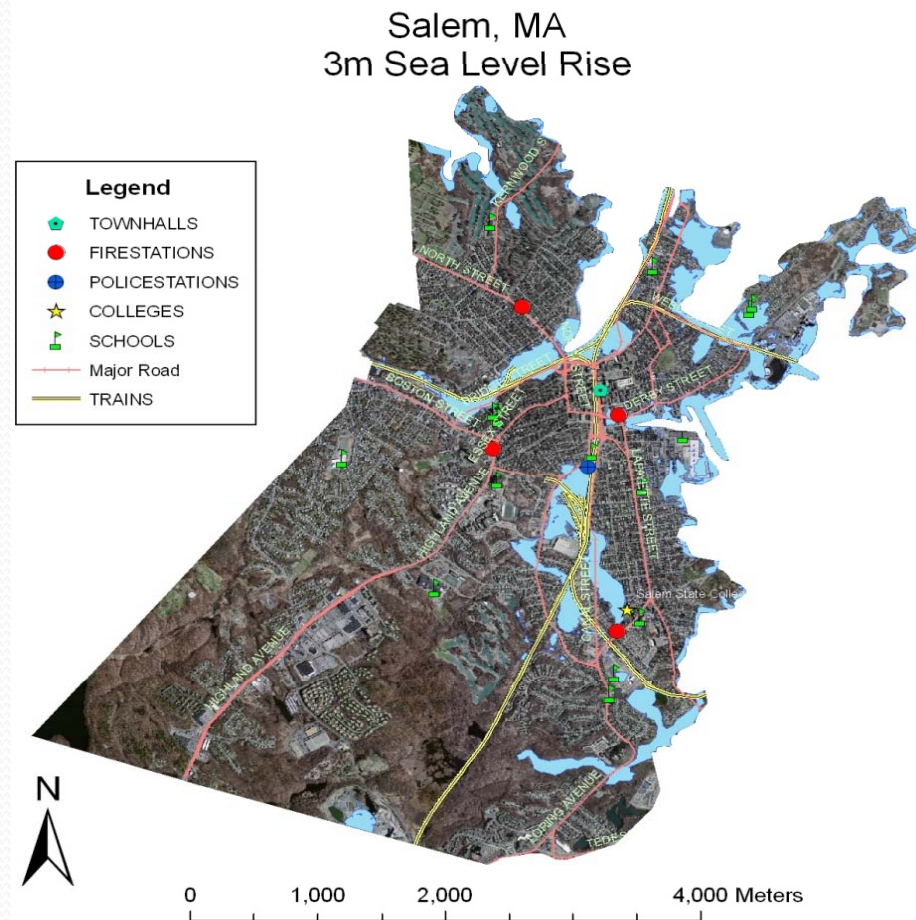
GPH340
Risa Yaginuma
Data from MassGIS
Fall 2009
12/11/09



Important Infrastructure

- 1 Salem Town halls
- 4 Salem Fire stations
- 1 Police station
- 1 Salem State College
- 15 Schools
- Major Roads
- Rail Roads

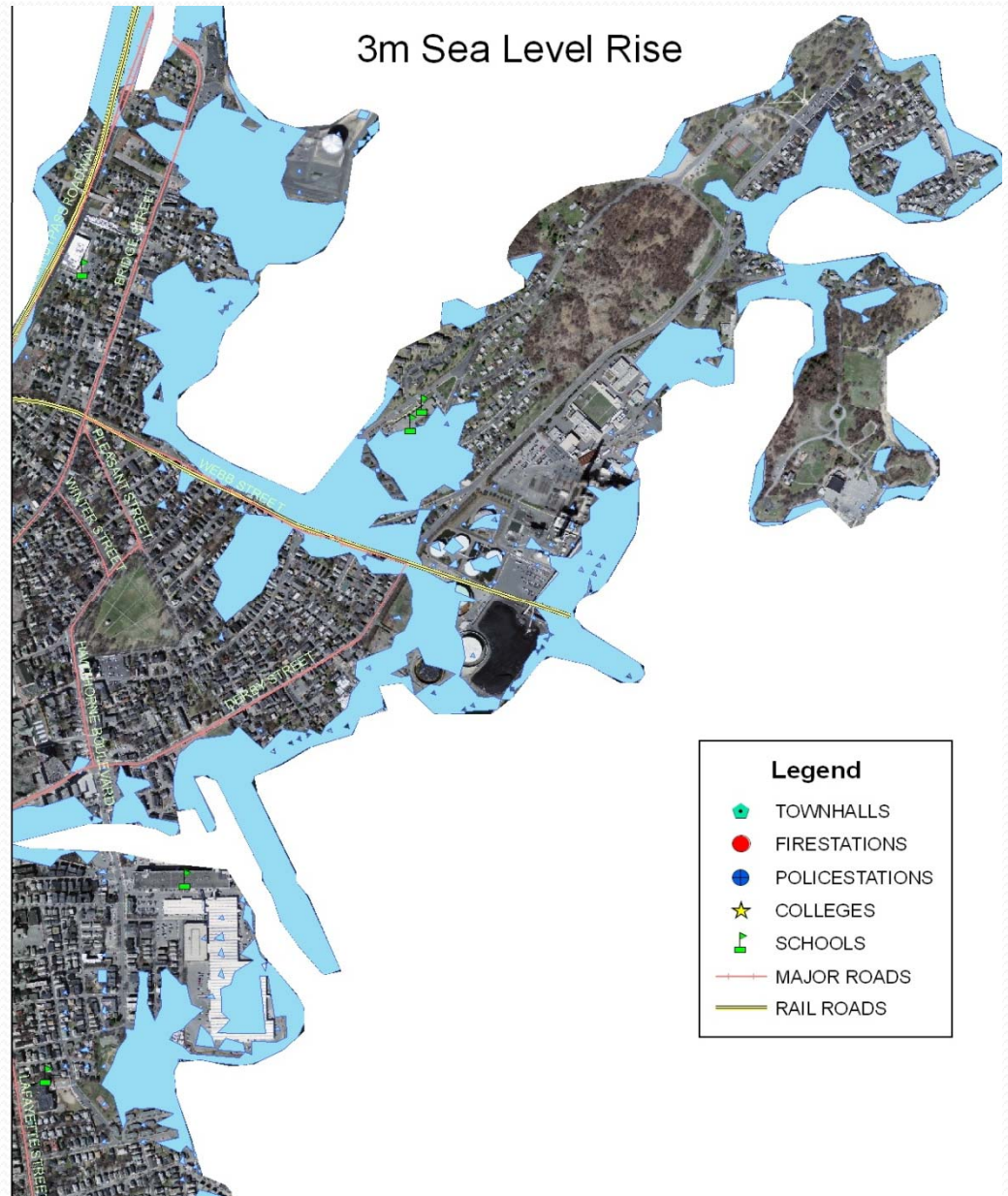
At 3m Sea Level Rise, 9% will be flooded in Salem.



GPH340
Risa Yaginuma
Data from MassGIS
Fall 2009
12/11/09

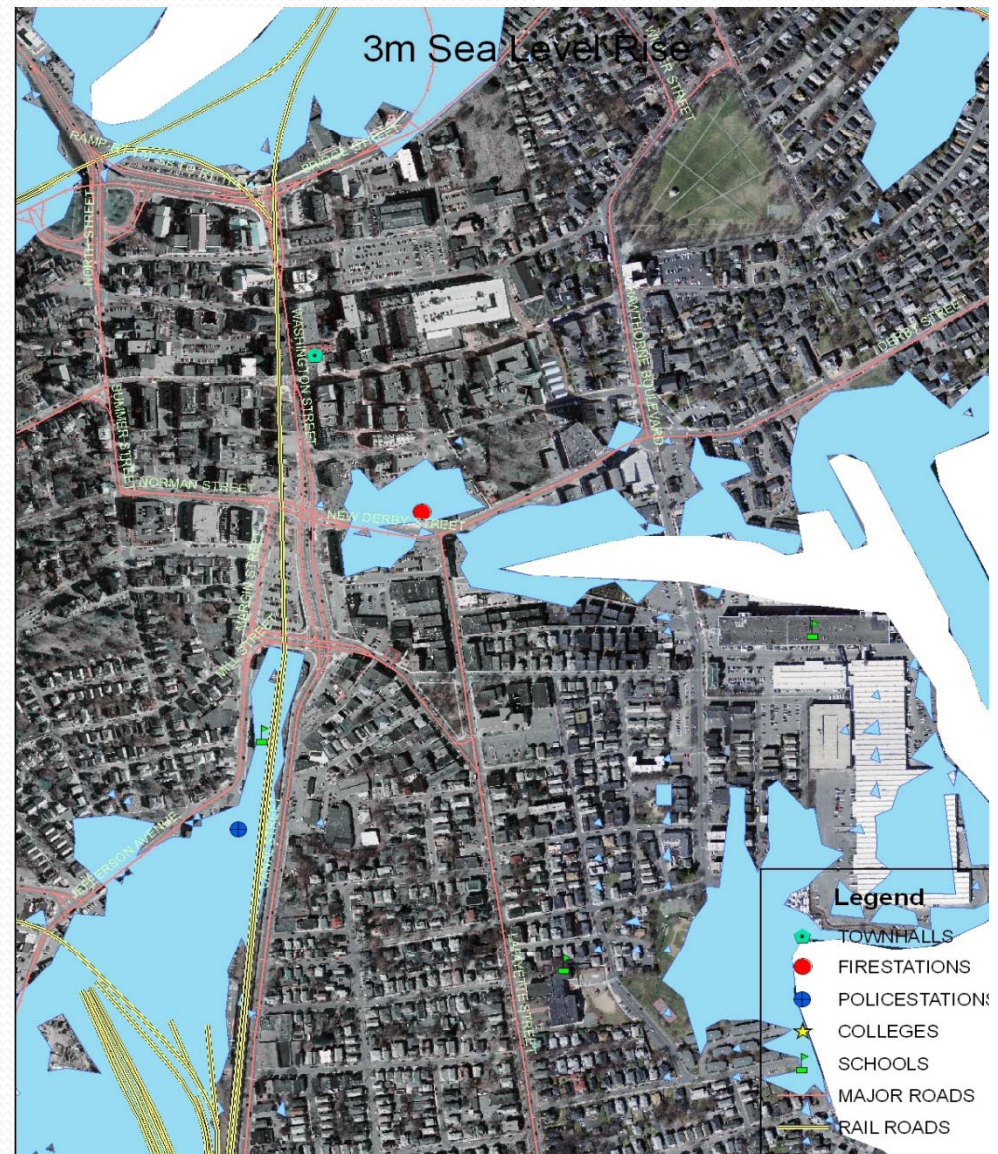
Singing Coastline at 3m of sea level rise

- Some roads and upper east side of coastline would be affected.
- Coast lines, areas along Bridge Street, and some areas in between Lafayette Street and Highland Avenue will be affected when the sea level rises by 3m in Salem, MA.



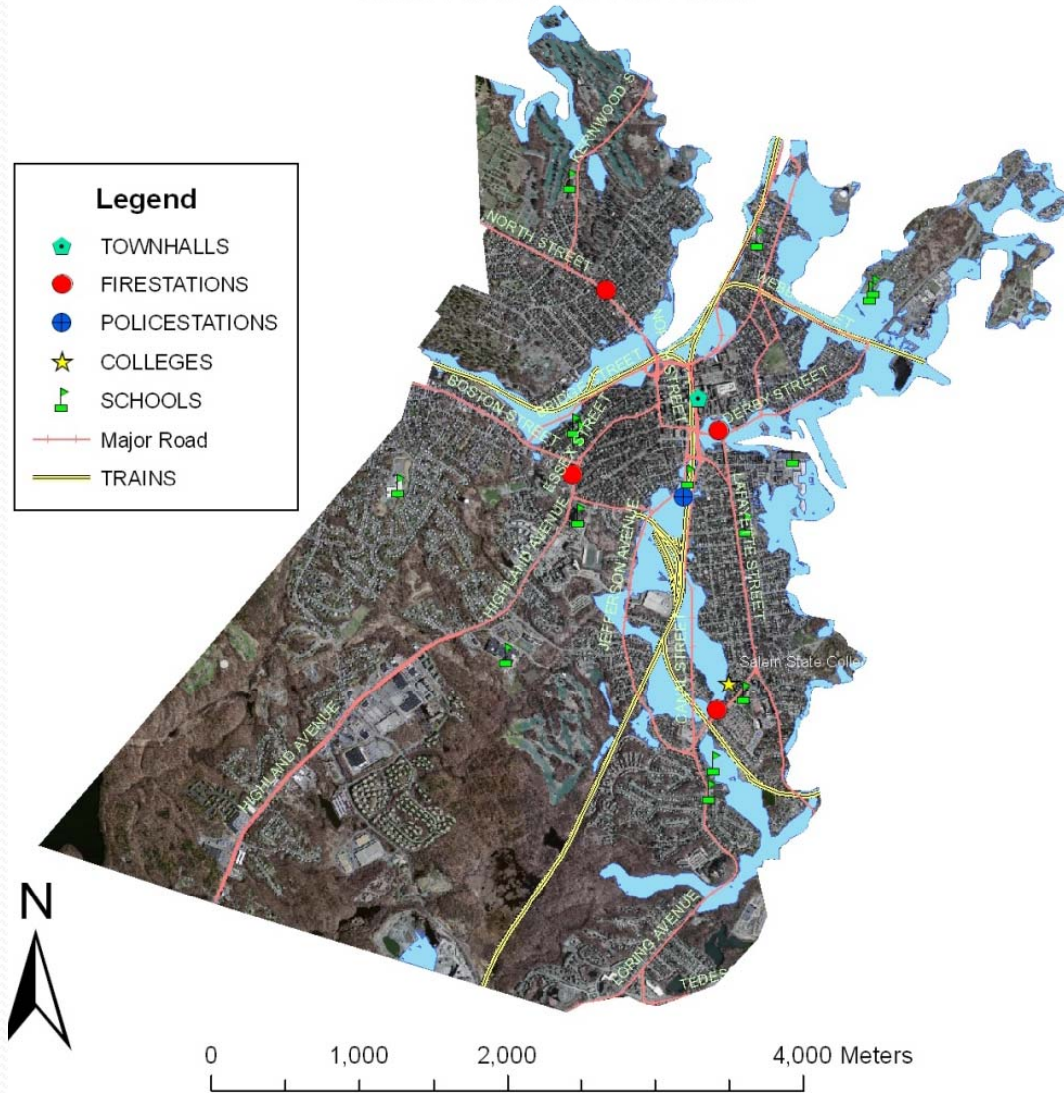
Salem Townhalls, Firestations, Policestations and Schools at 3m of Sea level Rise

- The worst affected area will be northern east part of Salem.
- In that area there are roads, rail tracks, fire station, police station and schools, include Phoenix which will be flooded due to rise of the sea level.



At 3.5m Sea Level Rise, 13% will be flooded in Salem.

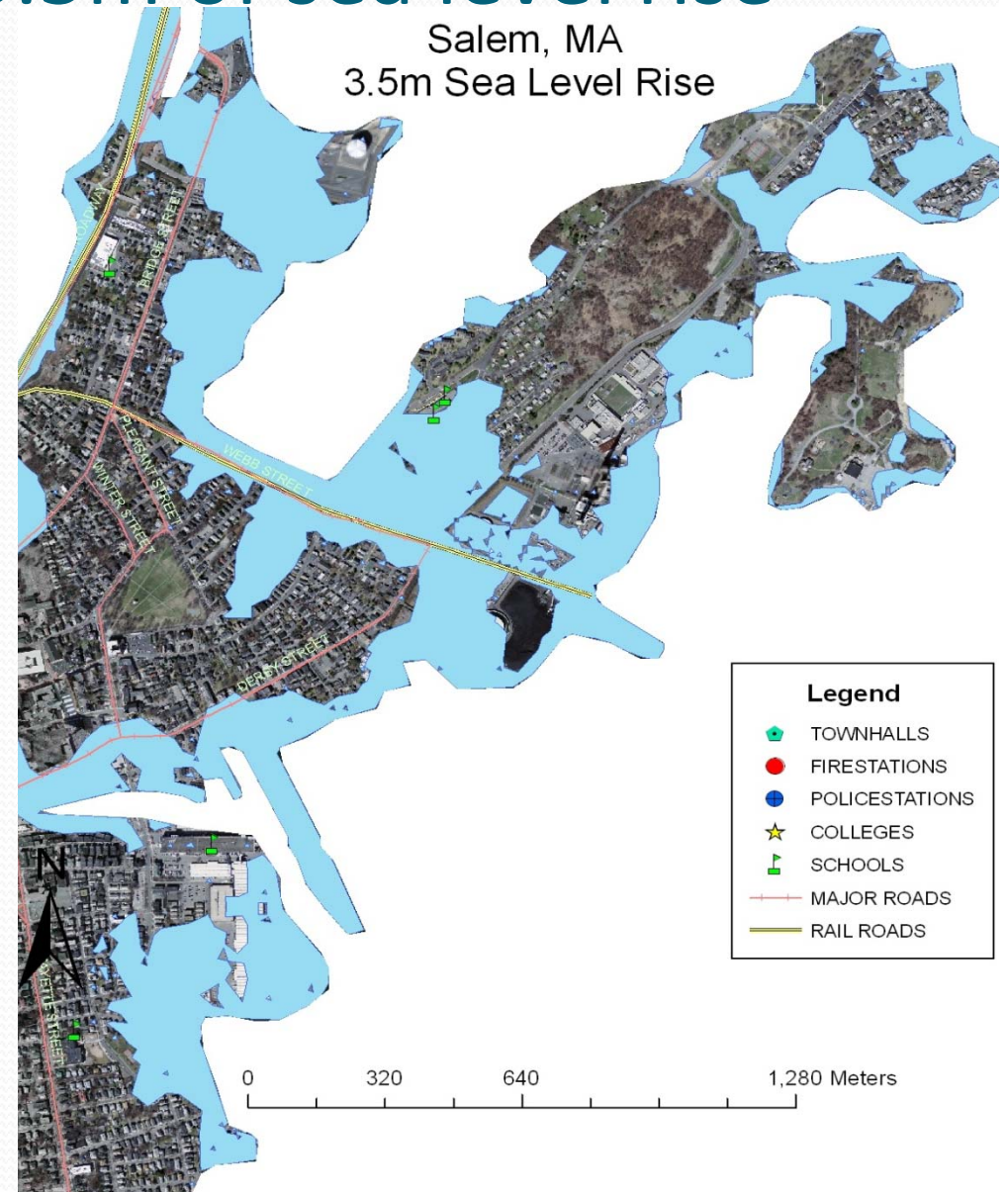
3.5m Sea Level Rise



Singing Coastline at 3.5m of sea level rise

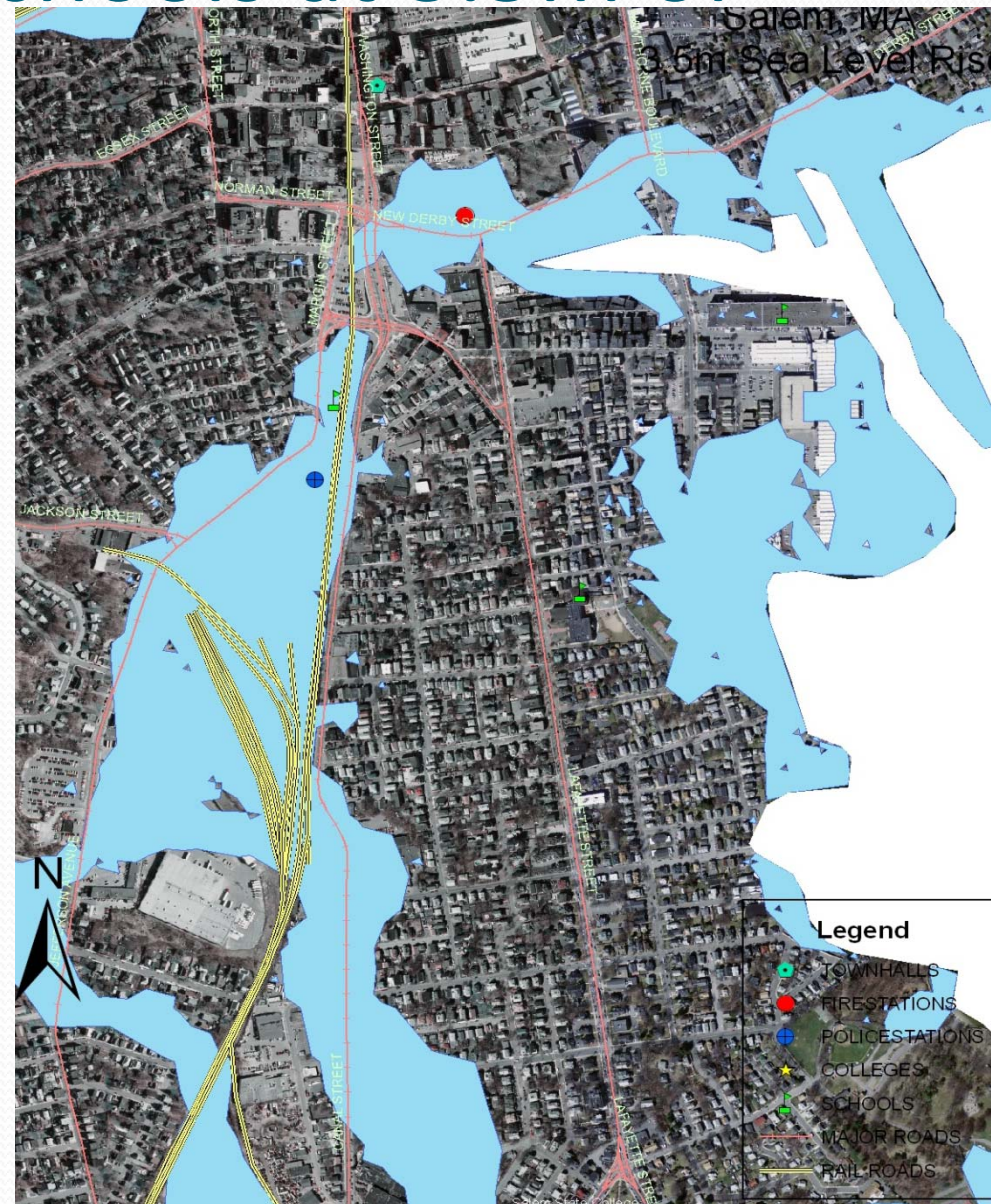
Salem, MA
3.5m Sea Level Rise

- This is moderately case of storm surge.
- More roads and upper east side of coastline would be affected.
- Bridge Street will be under water which makes northern west part of Salem will be isolated.
- Most of the areas between Jefferson Avenue and Canal Street will be flooded.
- The worst affected area is the northern east of part of Salem especially Pickering Wharf and Salem Willows.



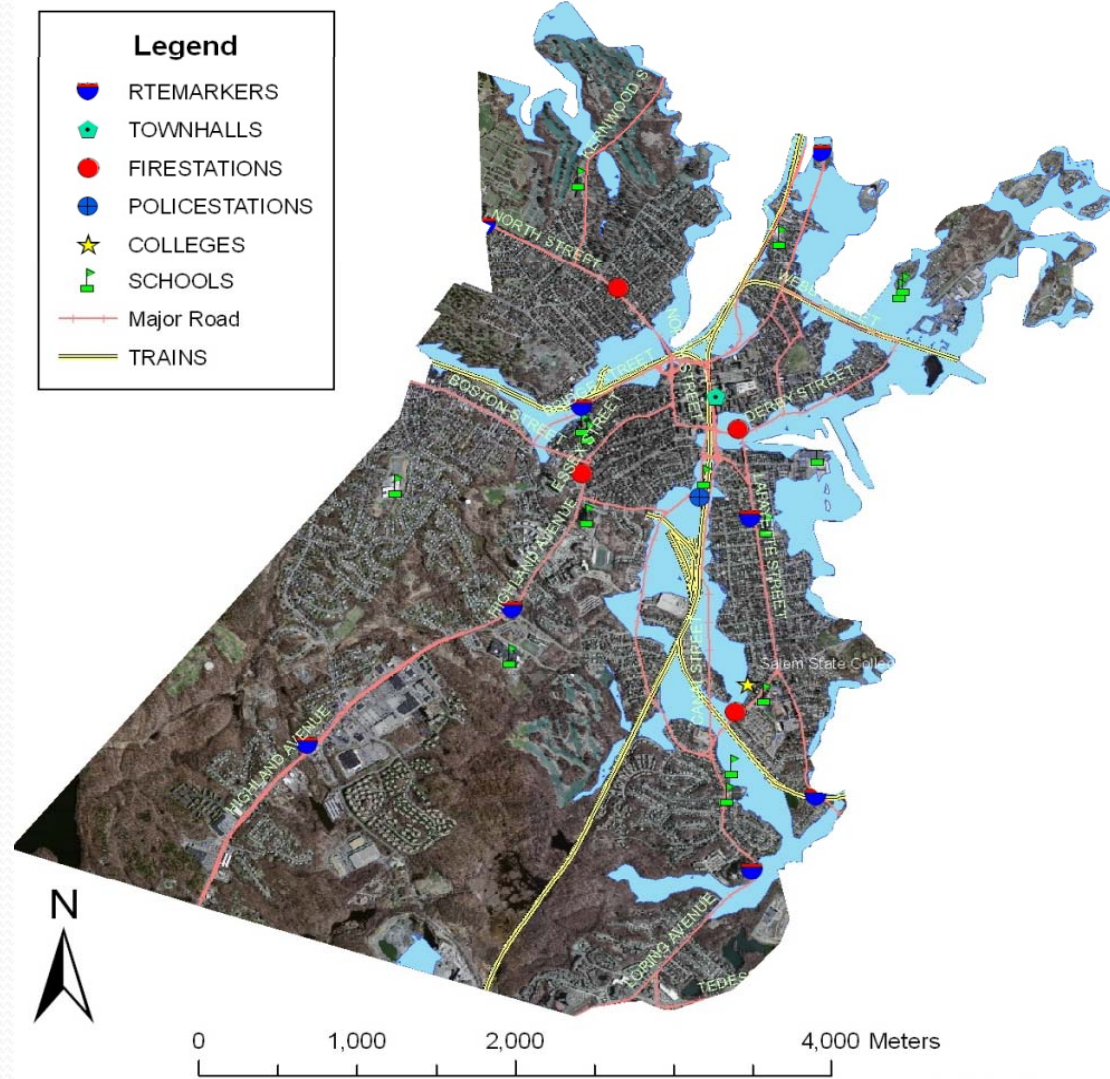
Salem Townhalls, firestations, Policestations and Schools at 3.5m of Sea level Rise

- More schools include North sore Education Consorter Embark, Bentley and Salem Early Childhood are completely submerged.
- Some damaged to the residential area of Webb Street, commercial area of Canal Street and New derby Street.



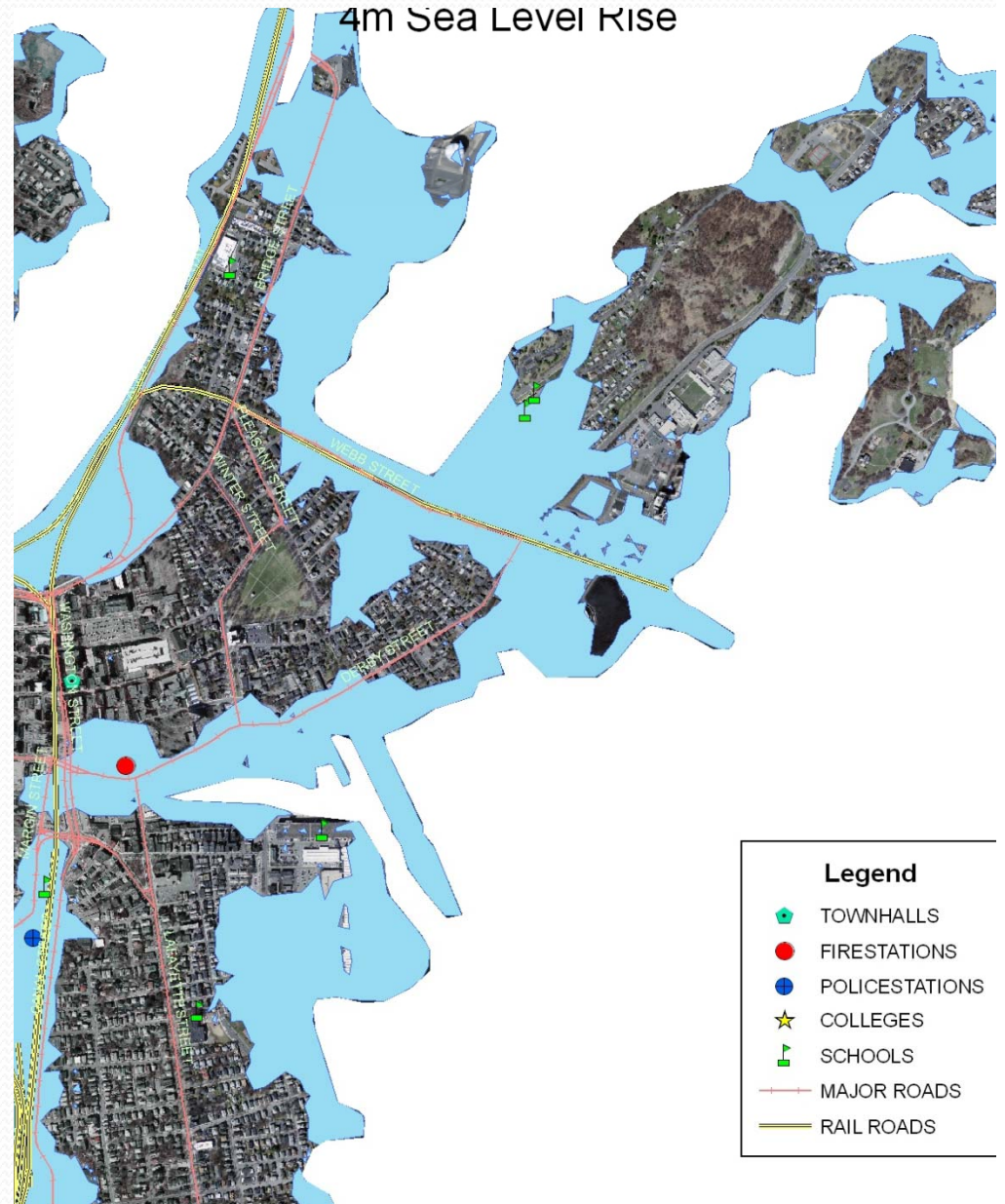
At 4m Sea Level Rise, 16% will be flooded in Salem.

4m Sea Level Rise



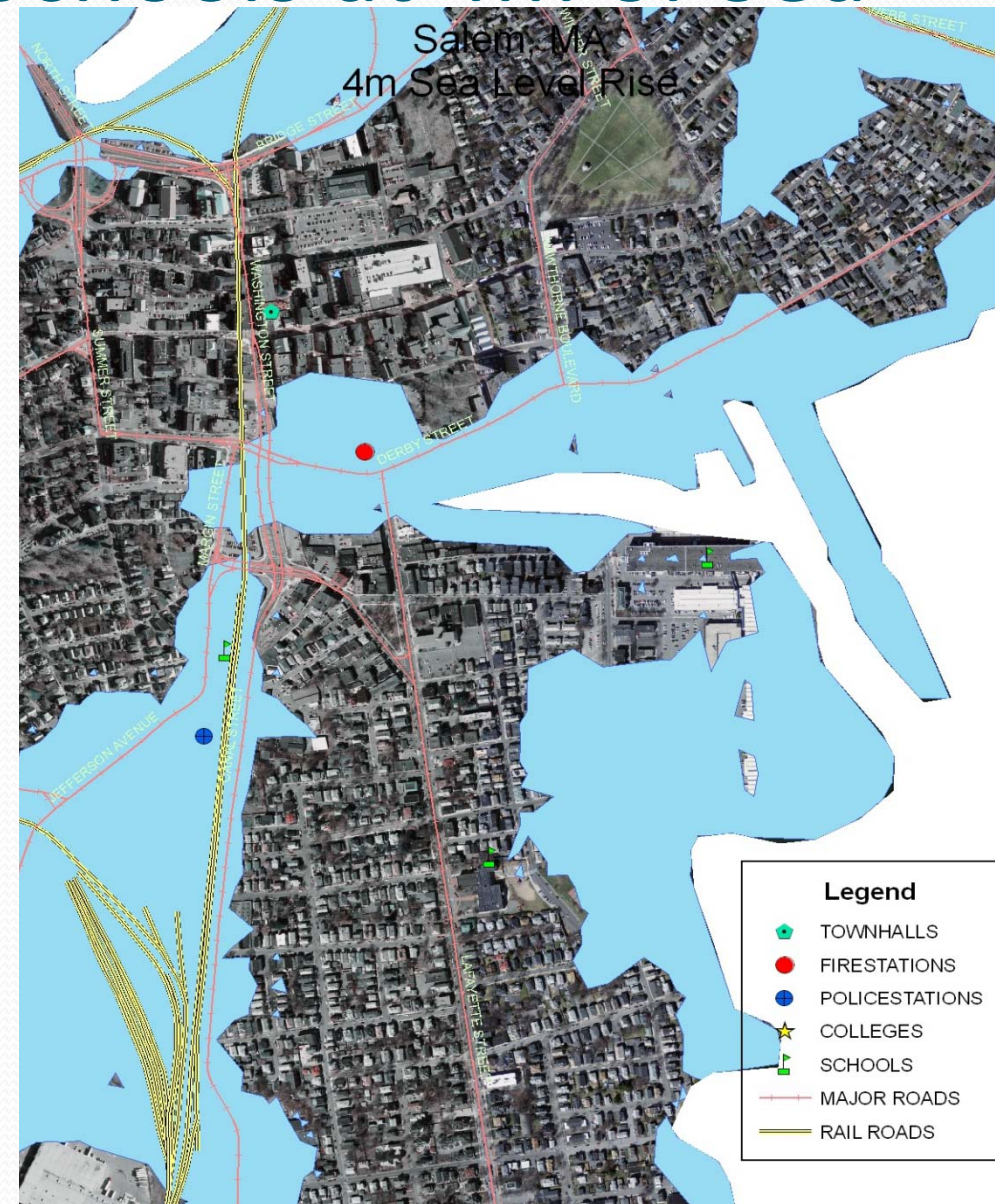
Singing Coastline at 4m of sea level rise

- This is worst case of storm surge.
- Most half of east side of coastline would be affected.



Salem Townhalls, firestations, Policestations and Schools at 4m of Sea level Rise

- Most half of rail road and major road would be inundated include Bridge Street and Salem Bypass Roadway.
- Some industrial area of Derby Street would be damaged, also part of Power plant.





Points of interest submerged

- Salem Willows
- Pickering wharf
- Some part of Power Plant
- Salem Police department
- Salem Fire department
- Schools include school of Phoenix, Bentley and Salem State College



Conclusion

- Most half of rail road and major road affected the sea level rise such as Cannel Street , Webb Street, Derby Street and Bridge Street are most severe affected.
- Also most residential area of Webb Street, Industrial area of Derby Street, and commercial area of cannel Canal Street are in flooded.
- Power plants, fire stations, police station, schools, and even Salem State College will be under influence.
- Some industrial area well prepared for sea level rise, but many infrastructure would damaged such as fire and police station and major road and train.
- The town may consider raising and reinforcing those access roads will be flooded under these scenarios.
- Salem should be aware of possible for flooding in the future.



References

- Mass GIS
- <http://www.mass.gov/mgis/laylist.htm>
- Town of Salem official website
- <http://salemma.areaconnect.com/statistics.htm>
- <http://www.salem.com/Pages/index>