Climate Change Impacts on Septic Systems: Are New England States Prepared?

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Conservation Law Foundation

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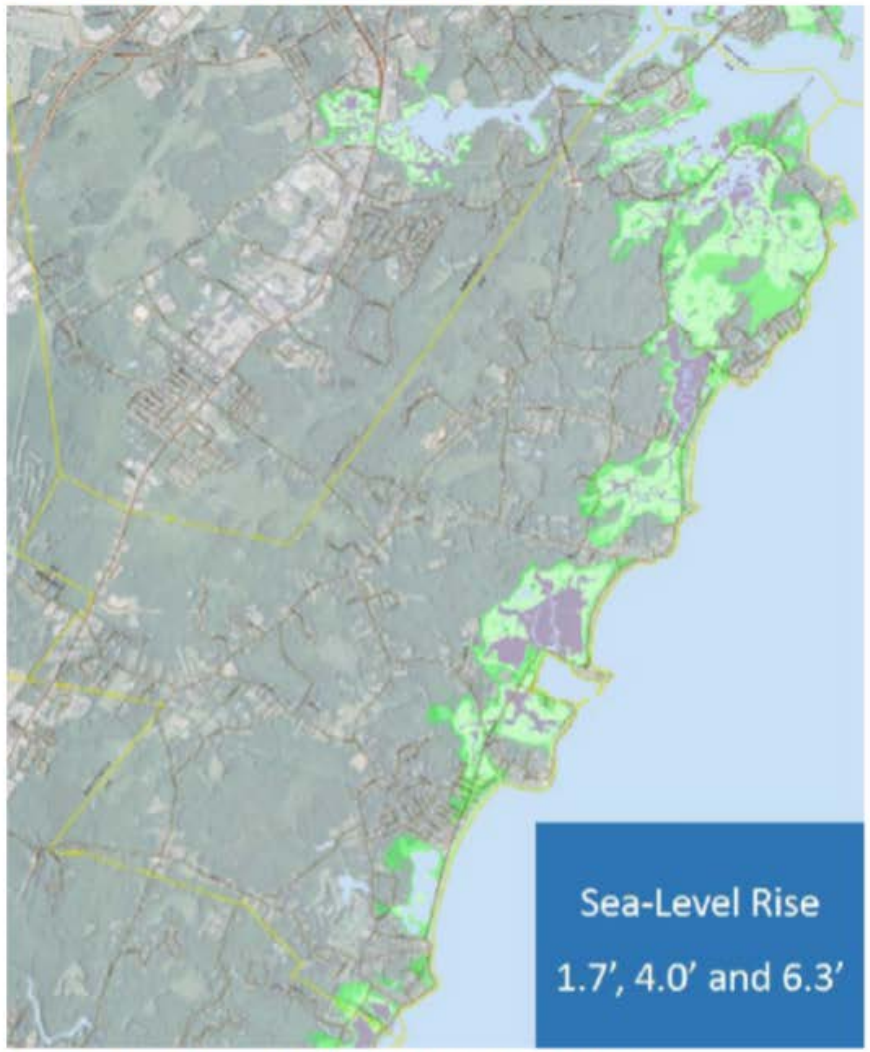
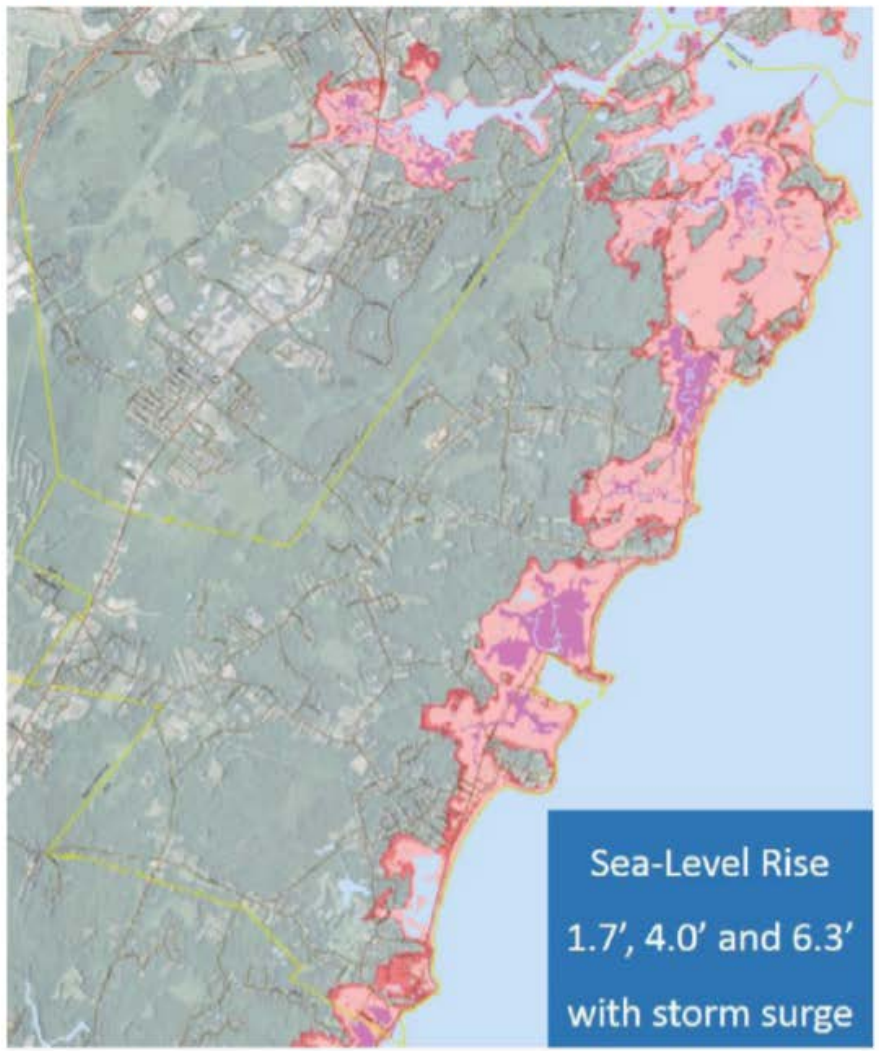
NH Sea-Level Rise Situational Awareness

Sea-Level Rise 1.7 feet, 4.0 feet and 6.3 feet



Sea-Level Rise 1.7 feet, 4.0 feet and 6.3 feet with storm surge

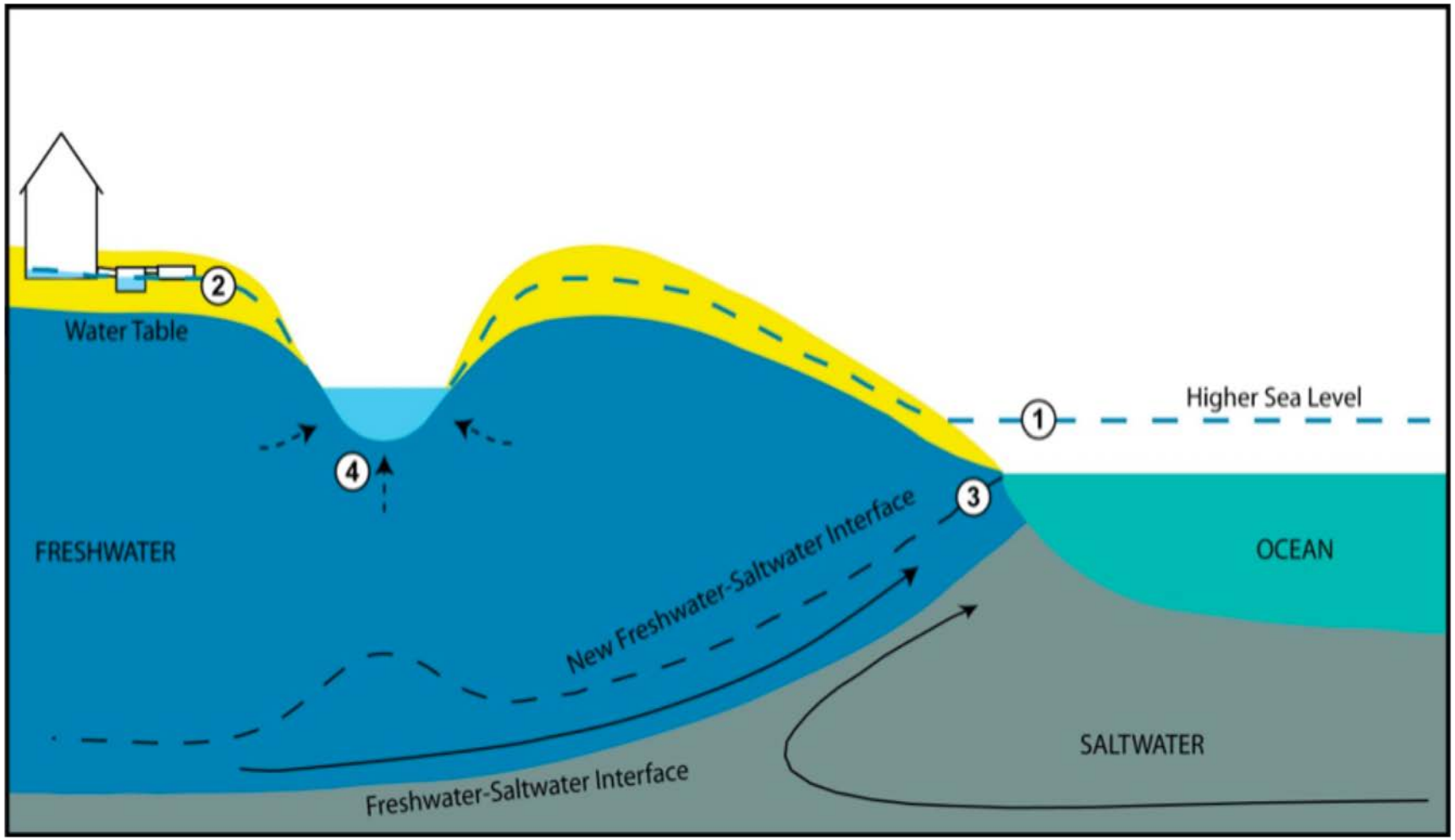


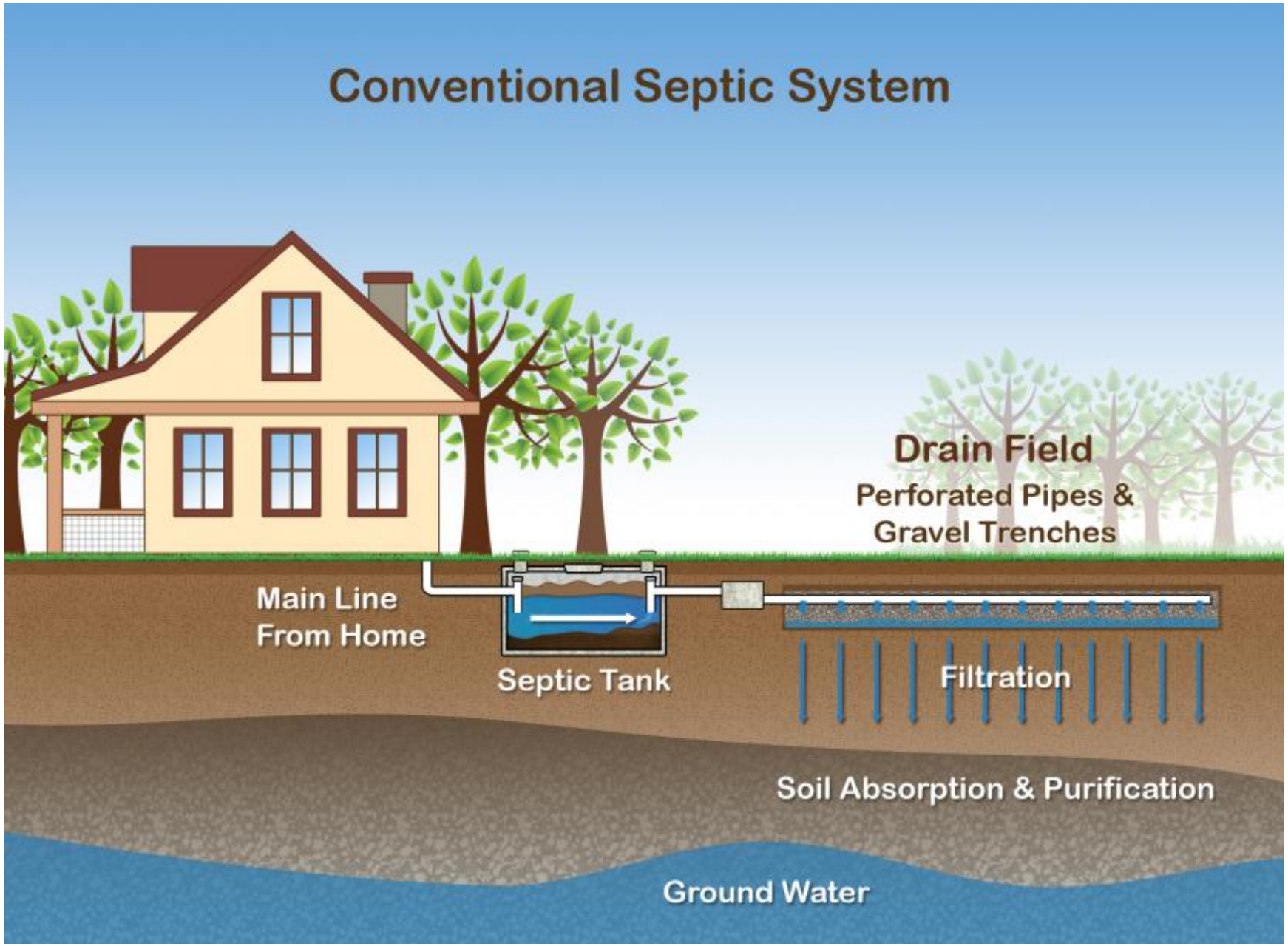
Note: Storm surge = 100-year /1% chance flood.

Map credit: Tides to Storms, Rockingham Planning Commission (2015)

How does sea level rise impact groundwater?

Source: US Geological Survey




Conventional Septic System
Drain Field
Perforated Pipes &
Gravel Trenches
Main Line
From Home
Septic Tank
Filtration
Soil Absorption & Purification
Ground Water

Avoiding Septic Shock

FEB, 2017 | ELENA MIHALY

Climate change poses a number of difficult challenges to New England's infrastructure. The most commonly discussed impacts include flooding of roads, bridges, and culverts, or water damage to buildings and electric utilities. A less discussed, but equally alarming challenge to infrastructure is how climate change is impacting onsite wastewater treatment systems, more commonly known as septic systems. Almost half of homes in New England depend on septic systems to dispose of wastewater. When functioning properly, these systems filter out harmful bacteria and pathogens to ensure nearby groundwater and surface waters are safe for human health and the environment. But rising sea levels, increased precipitation, and warmer temperatures due to climate change are all adversely impacting these systems. This white paper addresses whether states in New England are adequately addressing the issues presented by climate change in septic system regulation.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Avoiding Septic Shock

How Climate Change Can Cause Septic System Failure and Whether New England States are Prepared

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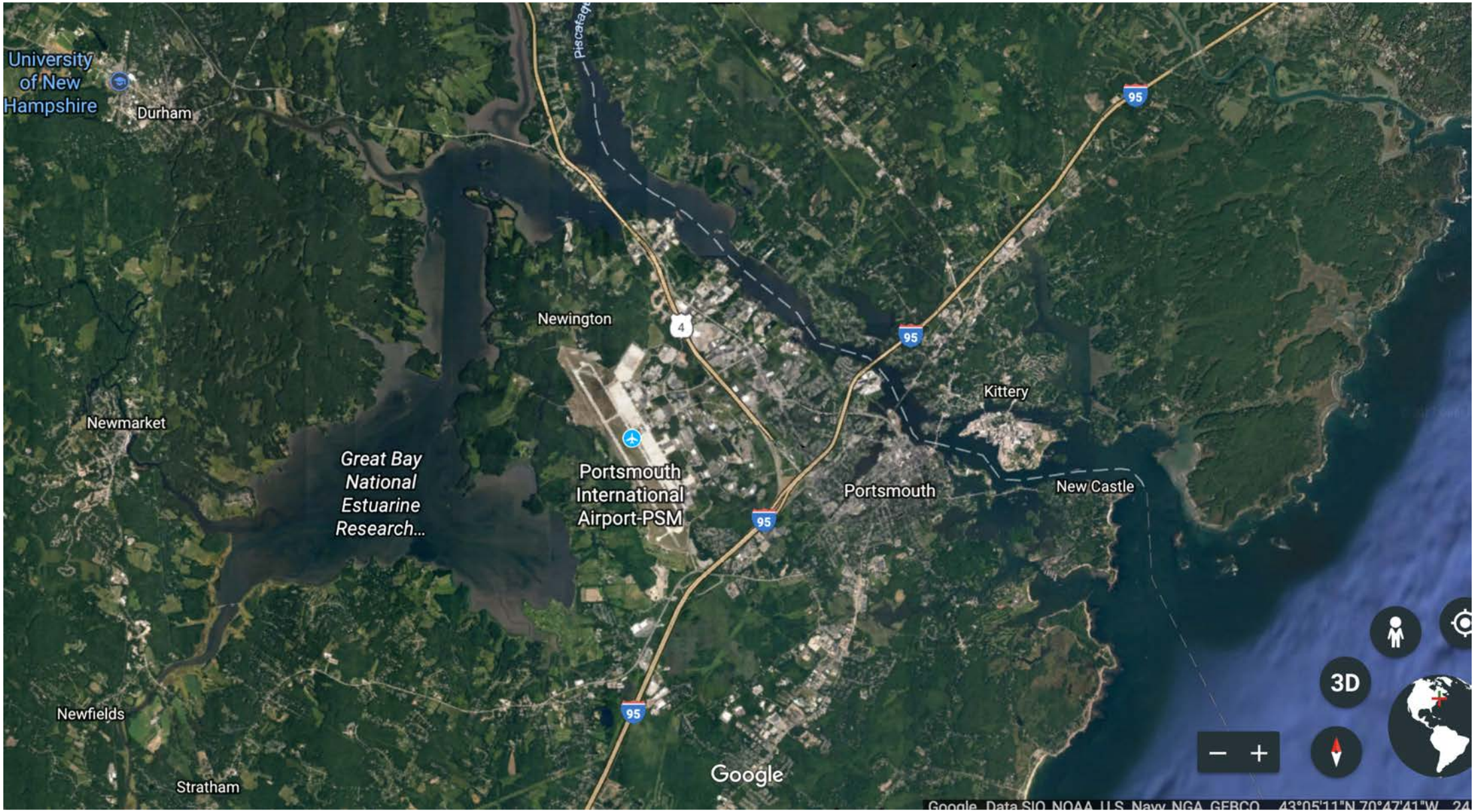
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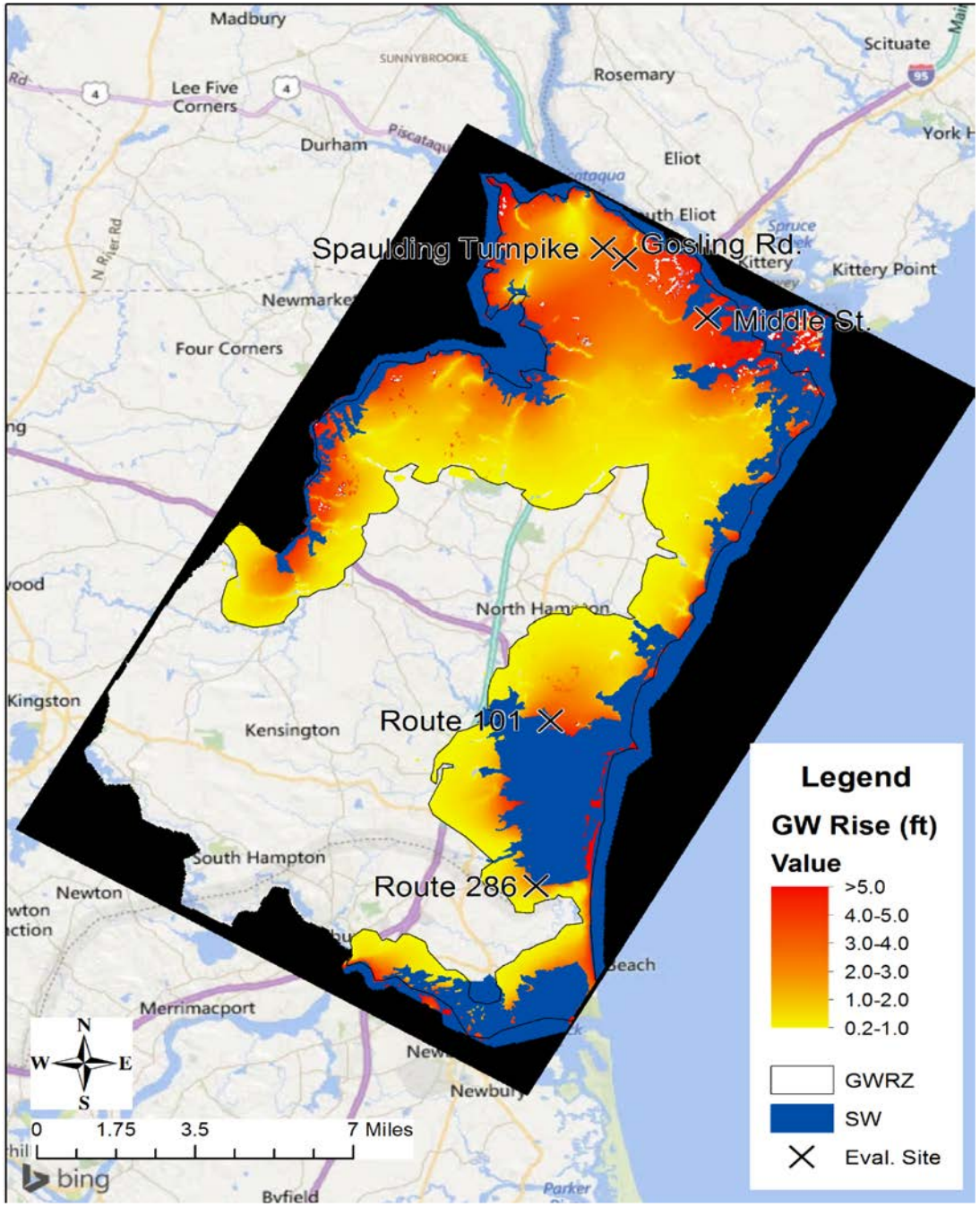
Groundwater rise with 6.6 ft of SLR in the NH Seacoast Region

Dr. Jennifer Jacobs

- Impacts of GWR will be felt more 3-4 km from the coast
- With 2 m GWR, 85% of land within 1 km of the coast will experience 0.5 m GWR, and 50% will experience +1.5 m.
- GWR will increase surface area of coastal and freshwater wetlands

Source: Modeling Groundwater Rise Caused by Sea-Level Rise in Coastal New Hampshire, 2018
Jayne F. Knott†*, Jennifer M. Jacobs†, Jo S. Daniel†, and Paul Kirshen‡



NEWMARKET, NH

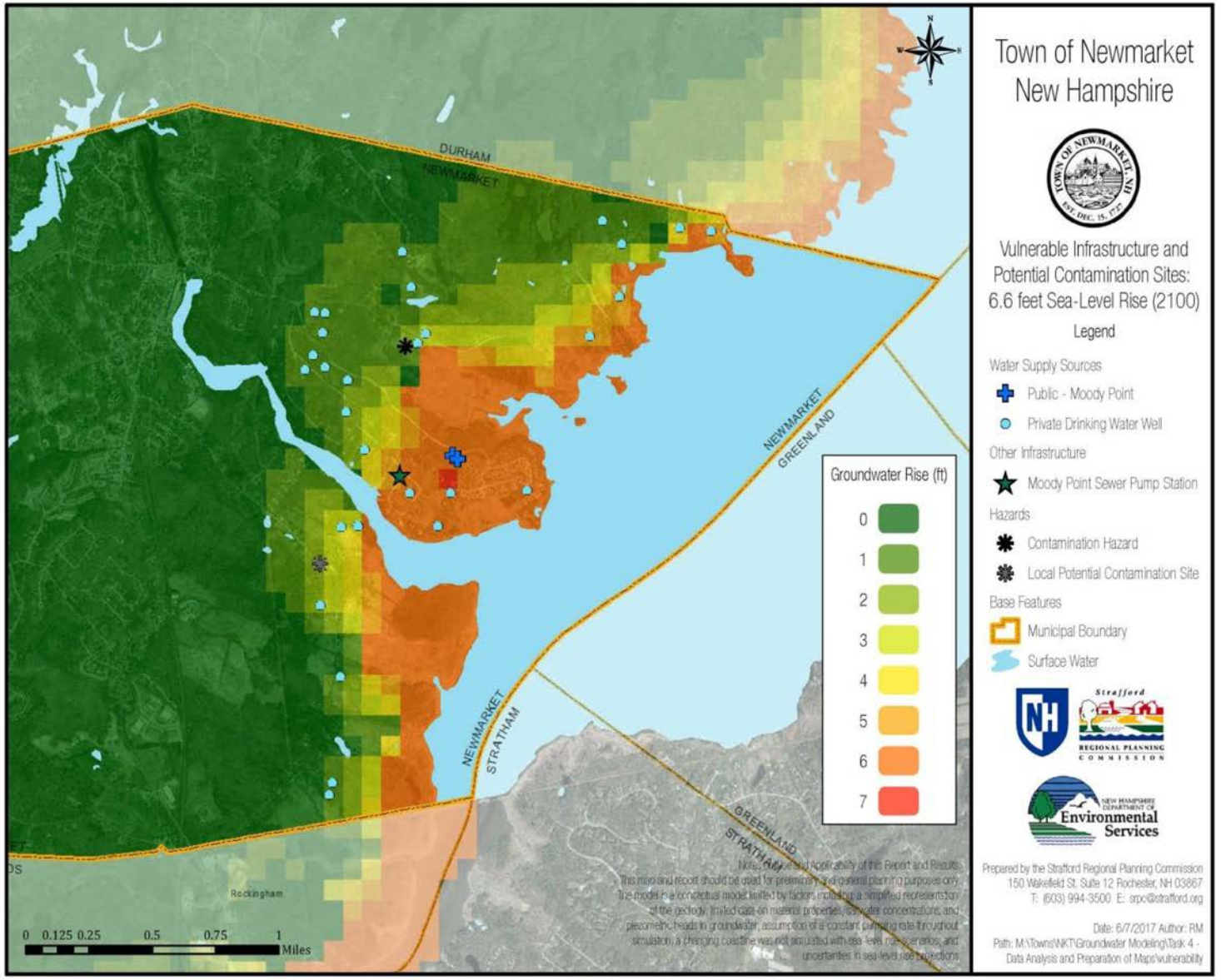
Sea-Level Rise Impacts on Drinking Water – A Groundwater Modeling Study

SRPC and UNH

April 2017

- GWR ranging from 1-7 feet with 6.6 ft of SLR is predicted within 0.8 miles of the coast.

- GWR may impact 3 public water supply wells, 30 private wells, 2 potential contamination hazards, 1 sewer pump station



RYE, NH

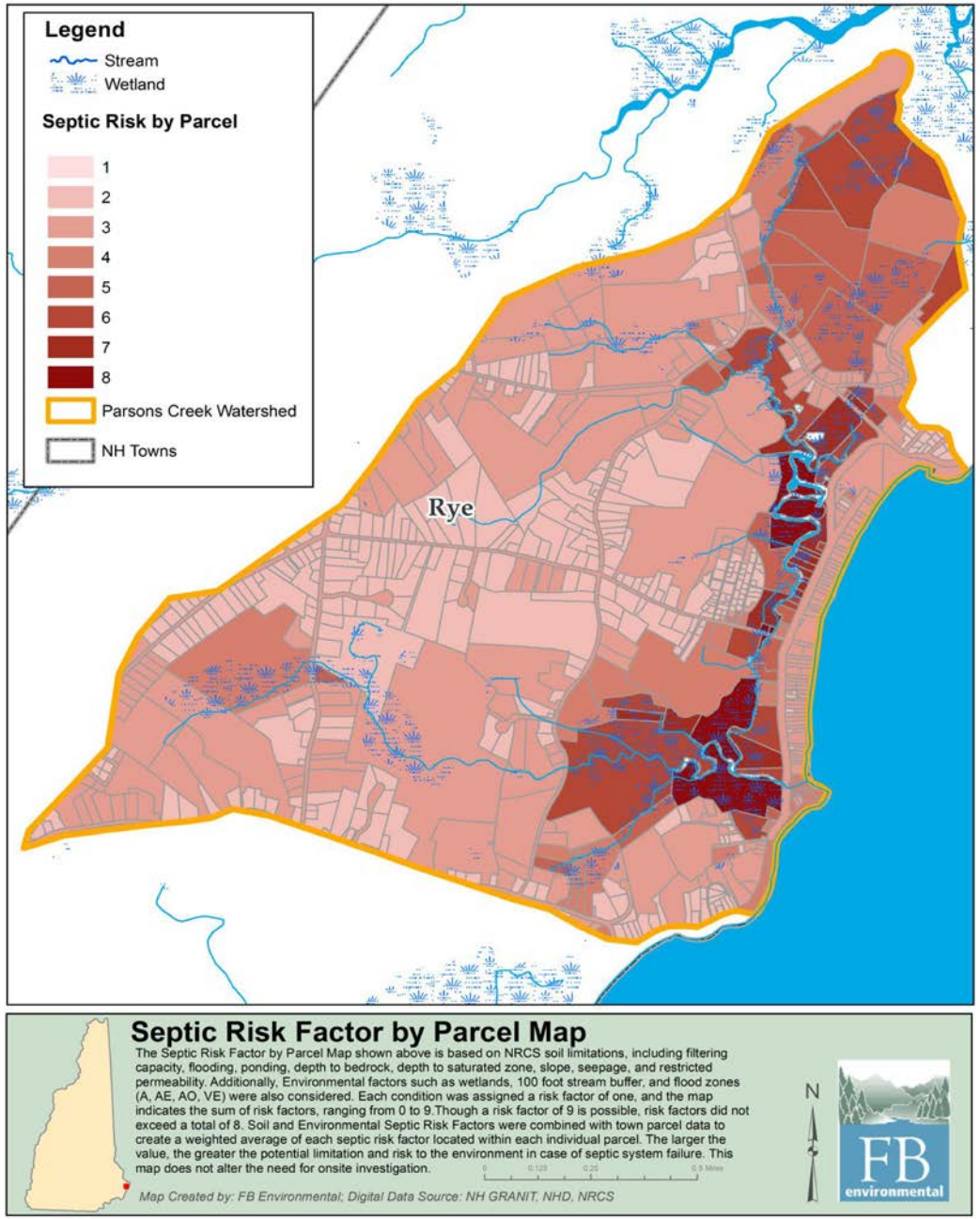
Septic System Database for the Town of Rye

January 2014

FB Environmental

- Assessed vulnerability of septic systems on 843 lots in the Parsons Creek watershed
- Considered system age, proximity to water, wetlands, flood zone, soil and environmental risk factors.

What happens if you add groundwater rise data to this analysis?



DURHAM, NH
Septic System Database for Sunnyside Drive, Woodridge Road, and Foss Farm Road Neighborhoods

Strafford Region Planning Commission
August 2016

- Reviewed 368 parcels

- Identified septic system vulnerability based on age (built in 1970s-1980s), location, soil and environmental risk factors (depth to bedrock, water table, soil type, proximity to wetlands & flood zone, etc…)

- 55% of parcels have medium ranking

What happens if you add groundwater rise data to this analysis?