

Health Impacts of Sea Level Rise in Southeast Florida

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Introduction

Health is an issue that is not often considered in sea level rise assessments, policies, and adaptation projects. It is critical to assess the short and long term impacts of both direct and indirect effects of sea level on health. The first step to understanding and integrating sea level rise health impacts into resiliency and adaptation planning is to understand what these impacts are. Increased flooding will lead to water contamination, increased vectors for disease, and mold. A higher storm surge has similar impacts that also include increased injuries and infrastructure damage. Salinization of the groundwater will impact the water supply and limit agriculture and landscaping. Saturated soils can cause seepage from landfills, brownfields, and sewage treatment areas such as septic tanks. Indirect influences will be food insecurity and mental health impacts. It is crucial to assimilate health into existing adaptation efforts and policy, from transportation to economic development, and to use an integrative approach to increase resilience.

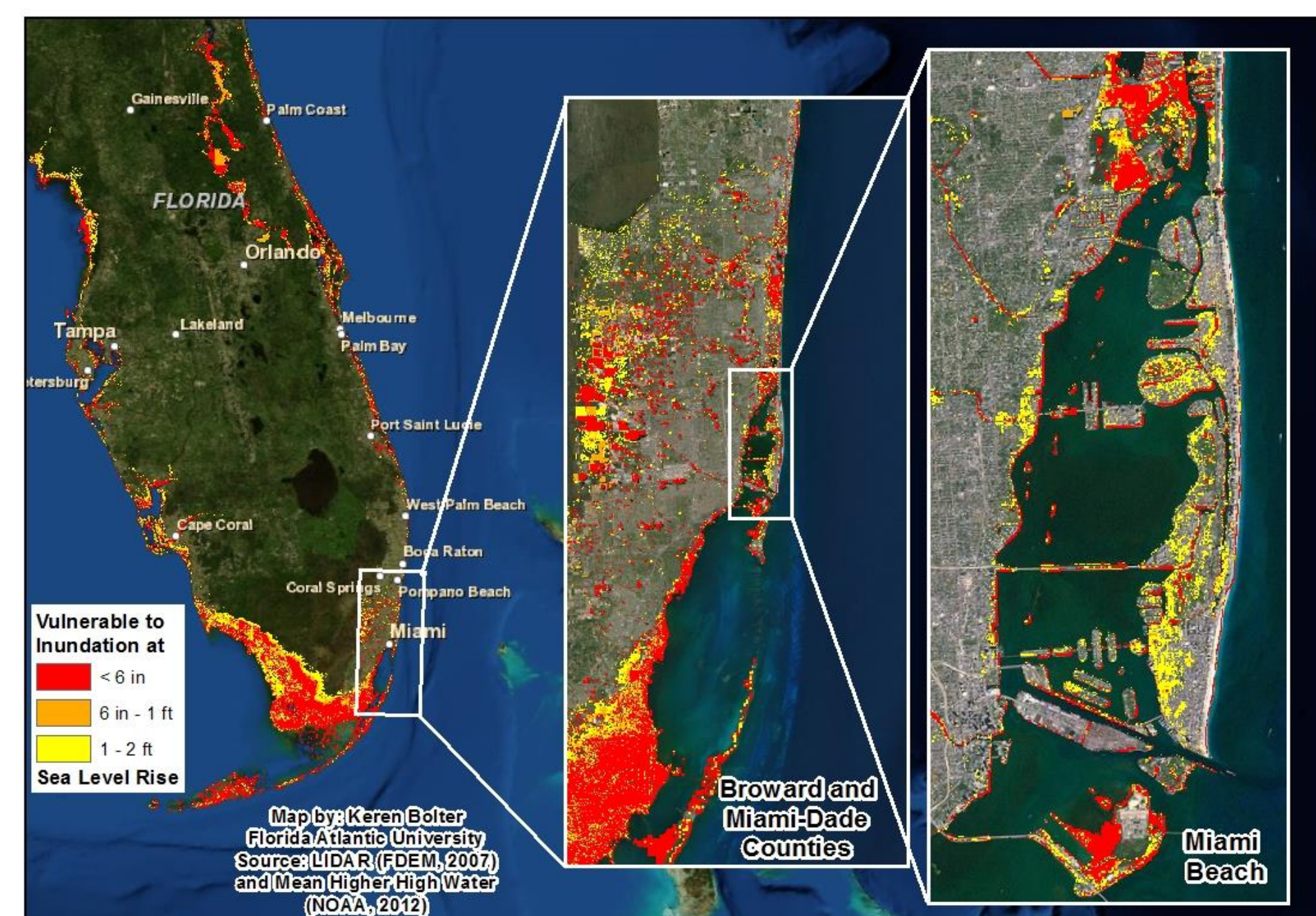


Figure 1: Sea level rise inundation mapping of Southeast Florida

Impacts

It is anticipated that with the continued compromising of water infrastructure as a result of climate change induced sea level rise, the rates of flooding will increase and the quantity and quality of potable water will decrease (). The CDC provides a analysis of potential impacts of climate change to public health(). The researchers pulled sea level rise relevant impacts from this and have vetted them with public health practitioners working in Southeast Florida.

Physical Risk	Health Exposure	Vulnerable Populations
Higher Storm Surge	<ul style="list-style-type: none"> Mental health issues from <ul style="list-style-type: none"> property damage displacement Injury and accidents 	<ul style="list-style-type: none"> Coastal populations <ul style="list-style-type: none"> Elderly, handicapped, of children living in high rises Remote from emergency services mobile home residents
Increased Flooding	<ul style="list-style-type: none"> Waterborne disease vectors housing dislocation limited health care access Nutrition/ food supply Exposure to mold Drowning Mold 	<ul style="list-style-type: none"> Low socioeconomic status Handicapped, elderly, children Residents of mobile homes People living in areas with outdated drainage Respiratory Disease
Raised Water Table	<ul style="list-style-type: none"> Contaminated water supply <ul style="list-style-type: none"> Landfill/Brownfield seepage Sewage and toxic pollutants release Saltwater Intrusion Unstable foundation from saturated soil 	<ul style="list-style-type: none"> Low socioeconomic status Handicapped, elderly, children People living near impaired waters, septic tanks, People who get water from wells near contaminated areas Those susceptible to diarrheal diseases

Table 1: Potential health impacts of sea level rise

Data

On going data collection from literature review and in-person interviews with both sea level rise and public health experts is resulting in a robust catalogue of data sources. These data points are being layered with sea level rise inundation maps.

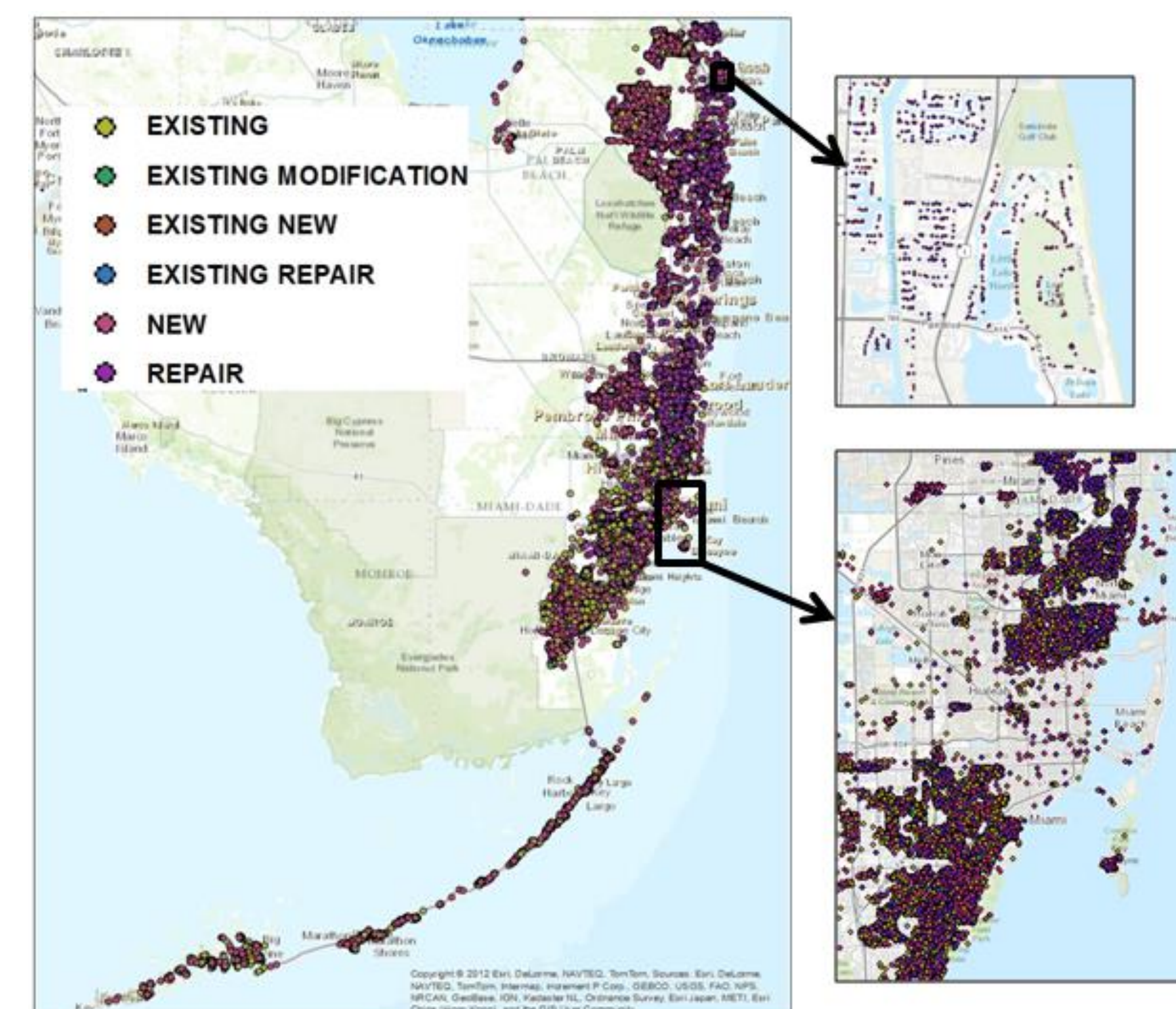
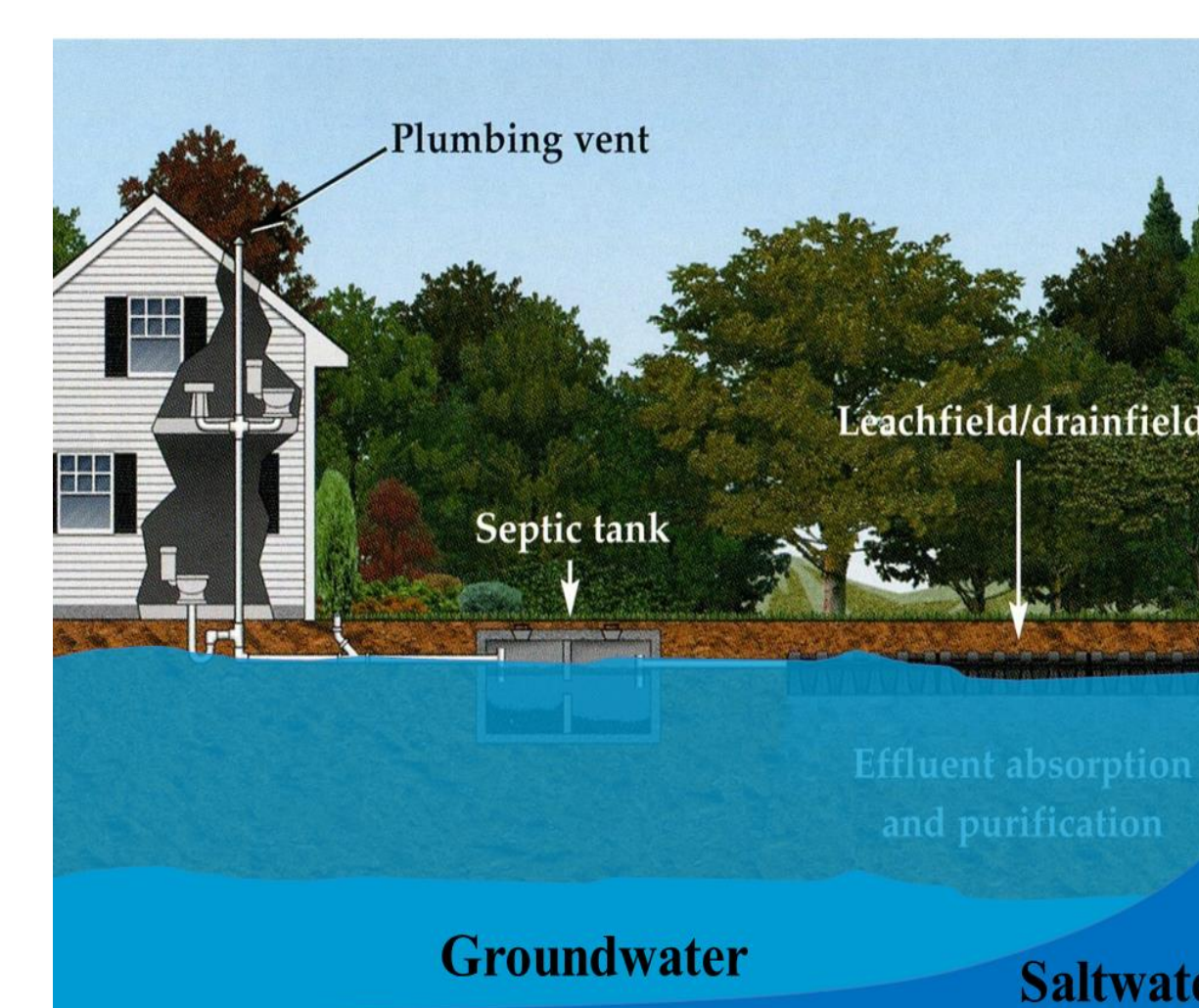


Figure 2: Spatial distribution of on site sewage treatment and disposal systems in Southeast Florida



Figure 3: Standard configuration of septic system, above coastal aquifer

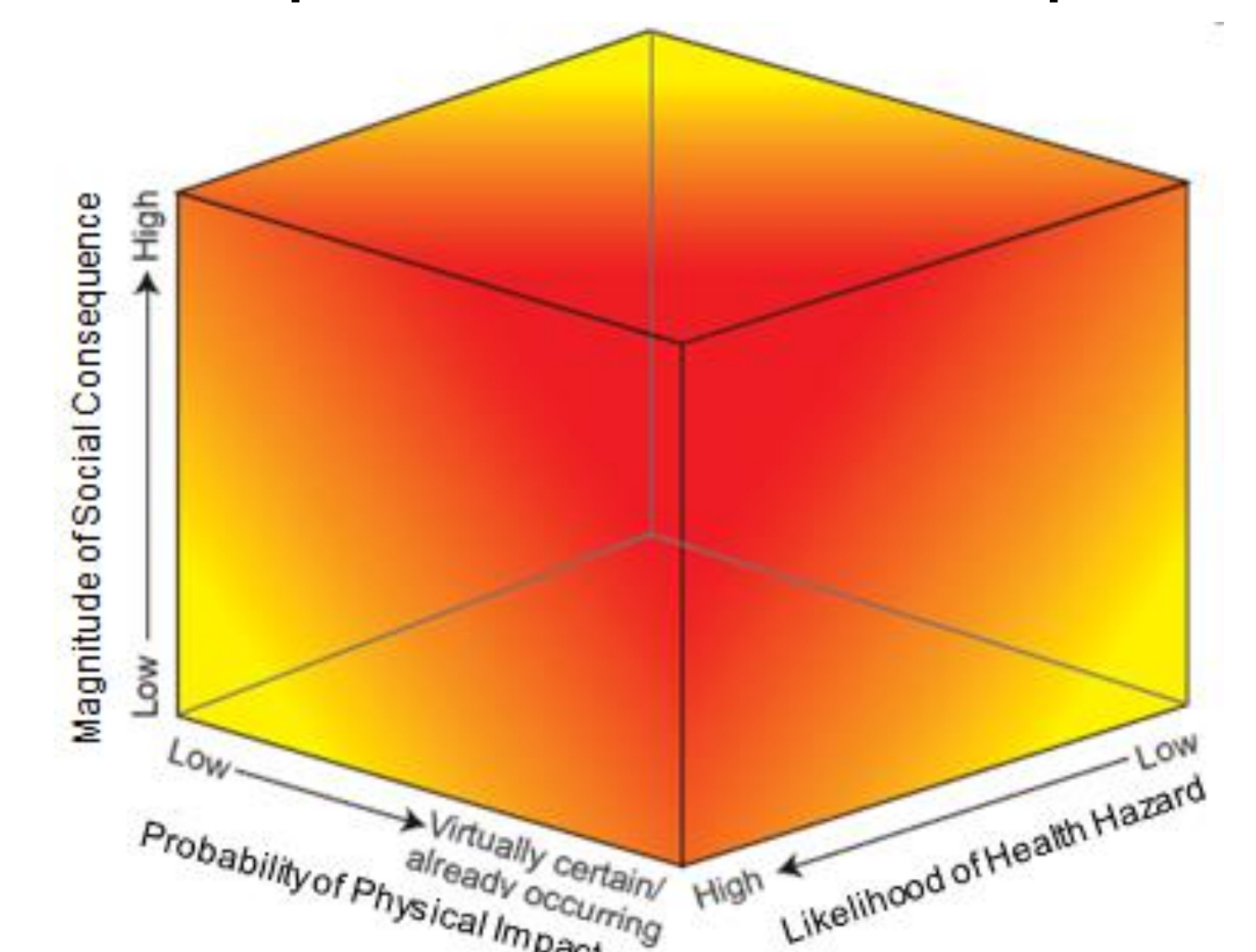
Figure 4: Models show the lifting of the water table with sea level rise along the coast at a one-to-one ratio



Adaptation Options

How Can We Prepare for the Health Implications of Sea Level Rise in South Florida?

The climate change adaptation approach used for water utilities planning for NYCDEP is applied here in the context of human health and sea level rise adaptation. This involves an eight step process the guides the prioritization of adaptation.



Red: Risks for which adaptation strategies should be developed
Orange: Risks for which adaptation strategies may need to be developed or for which further information is needed
Yellow: Risks for which impacts should be monitored but which may not need actions at this time

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