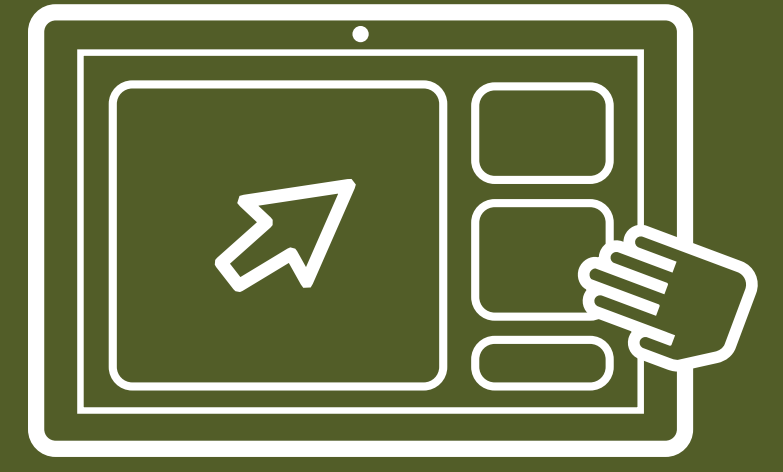
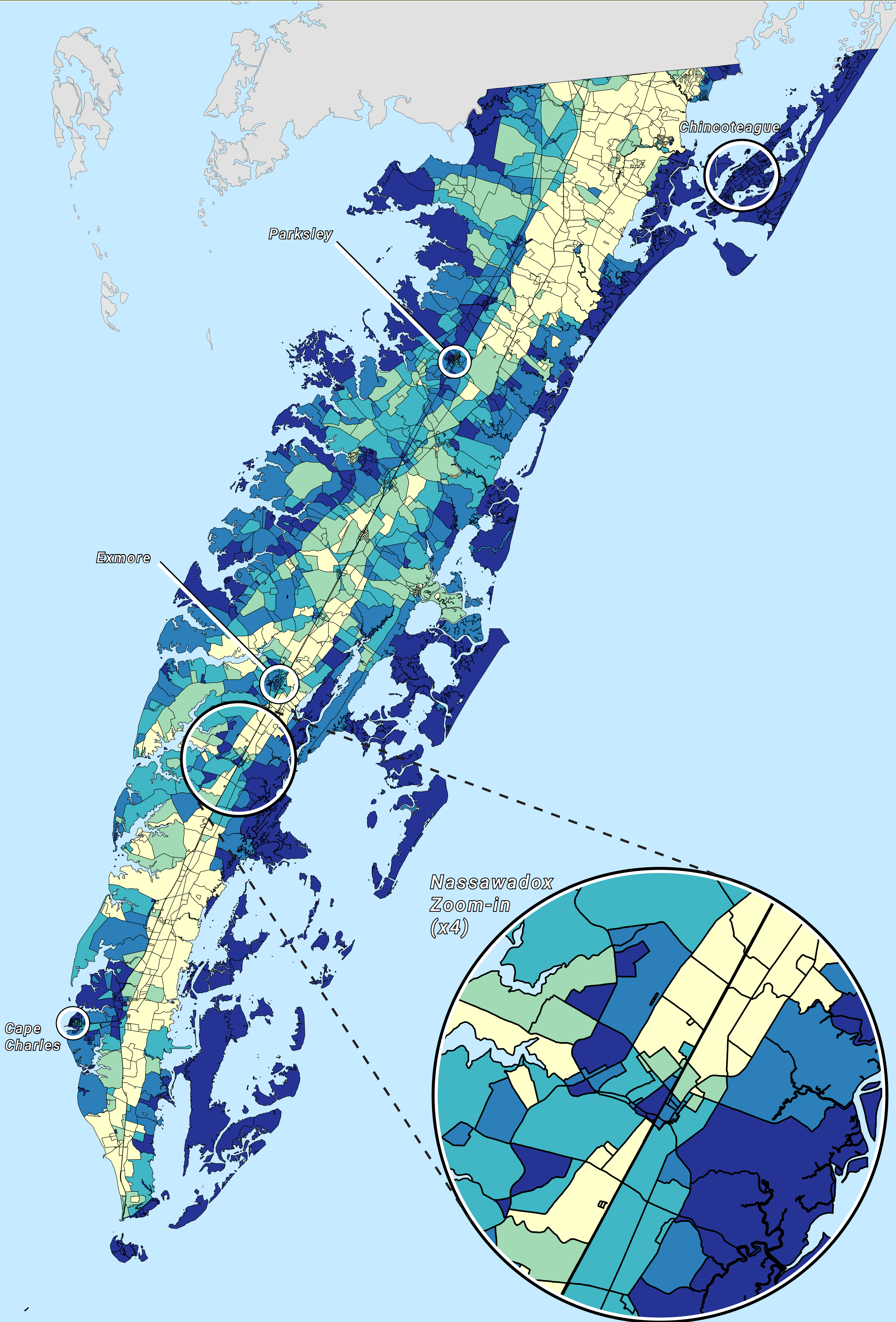


Septic System Vulnerability with Changes in Groundwater Level



Livability Tool Data Preview



Septic system functionality

For a septic system (an on-site wastewater treatment system) to function well, the groundwater level should average at least three feet below the ground surface.

A model can predict the depth of groundwater from the land surface.

The map to the left represents conditions on the Eastern Shore of Virginia in year 2040. Darker blue colors on the map may not be able to efficiently support septic systems.

A changing future

Changes in precipitation patterns may impact the expected depth of groundwater.

Drier, hotter conditions may lead to lower groundwater which would be good for the functioning of septic systems. Wetter, cooler conditions may result in higher groundwater levels that put additional stress on septic systems.

Timing of precipitation also impacts groundwater. A future with fewer, but larger rain events, will have deeper groundwater.

Time sequence

The research assesses the likely functionality of septic systems for the present year (2024) and future years 2040, 2060, 2080. 2040 data is shown.

Legend

Depth to Groundwater (feet)
Year 2040

- Less than 3 ← Unlikely that a septic system will properly function in this area
- 3 - 4
- 4 - 5
- 5 - 6
- Above 6

0 2.5 5 10 Miles

Map uses U.S. Census "block" areas, a geographic unit for population statistics.



Key takeaway

Now and into the future, septic system viability for wastewater management on the Eastern Shore is highly dependent on the specific location of the system

The original Eastern Shore SEAWAT model for coastal groundwater was developed by the U.S. Geological Survey (USGS) in collaboration with the Virginia Department of Environmental Quality. Surface elevation data came from the USGS. Researchers from the University of Virginia modified the Eastern Shore SEAWAT model to simulate future conditions given a changing climate.

Culver, Teresa, Farshad Hesamfar, Sergio A. Barbosa, and Lawrence Band. 2025. "Depth to Groundwater and Septic System Vulnerability."

