Beaufort County Adapts: Sea Level Impacts Beneath Our Feet

PROJECT SUMMARY
Based on concerns raised in Beaufort Country reports, the project team aims to assess rising groundwater levels and its corresponding impacts. High groundwater level can lead to problems with subsurface infrastructure, including septic tanks and pipes.

Once we understand how the groundwater level changes because of tides and rains, we will predict how often we are likely to see septic system impairment under future conditions. More impairment is expected due to rising sea levels and more intense storms due to climate change.

In the upcoming months, we will host meetings with the local communities to talk about residents’ perceptions of and experiences with changes in groundwater and our preliminary findings. We will also send out surveys to residents and will hold discussion groups to get a better understanding of residents’ awareness of and priorities in mitigating rising groundwater impacts.

PRELIMINARY RESULTS:
In May 2022, we installed 15 wells across four communities in Beaufort County (St. Helena, Mossy Oaks, All Joy, Shell Point). Based on data so far, we are seeing a few trends:

- Rains cause the groundwater level to rise substantially, and rain is the dominant reason for high groundwater levels. A period of multiple rainfall events caused groundwater levels to rise 4 – 6 feet.

- After a rainstorm, it typically takes about 12 hours for the water level to fall back to its pre-storm level.

- Compared to storms, tides have a smaller impact on groundwater level (1 - 4 inches of fluctuation), with groundwater near the coast having the most tidal-driven change.

- In some areas, groundwater levels rose high enough that they would reduce septic system functioning, if a septic system was at that location. Please see the back of this page for a graph of water level data at two wells.

The team is still working to determine how groundwater level is related to distance from the shore, and we are working on estimating the frequency of groundwater impairment in the future.

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For more information, please visit https://www.scseagrant.org/beaufort-county-adapts/
Graphs showing data from rainfall, tide level, and two groundwater wells on St. Helena Island

The top graph (Graph 1) is the measured precipitation at a nearby rain gauge, from Weather Underground. The dates for these data aligned with the dates on Graph 3.

The middle graph (Graph 2) is the tides from a nearby NOAA tide gauge at Fort Pulaski, GA. The corresponding dates are also listed on Graph 3.

The bottom graph (Graph 3) is the data for two wells on St. Helena Island, referred to as SC1 (blue line) and SC2 (orange line). The closer the lines are to the top of the graph, the closer the water is to the surface. This is called Depth to Water (DTW) and is measured in feet, as indicated on the vertical (or y) axis. The red area above the dashed line indicates the water level where a septic system would be impaired and would not function properly.

- As the groundwater at the SC1 well (blue line) rises above the dashed line and in the red area, it shows that a septic system would be impaired at that location.

- For septic tanks in a position similar to SC1 well (blue line), they would not function properly for almost a month in 2022. Poor stormwater drainage and other impacts of being flooded by water may have continued longer.

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