

Campus Wells: Visualizing data to support interpretation

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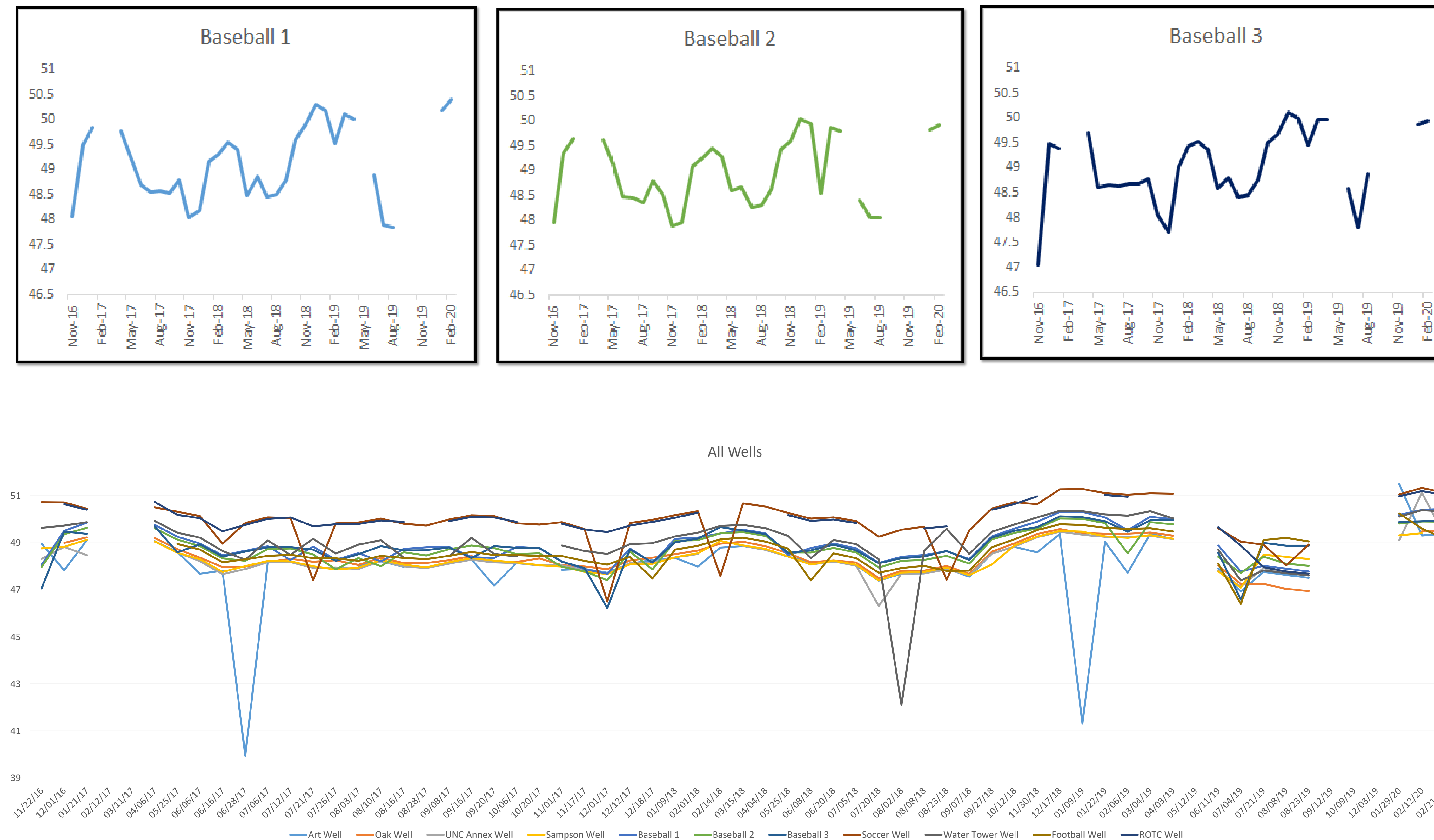
Introduction

The campus of the University of North Carolina at Pembroke has eleven wells that are being monitored for water level as part of a project that includes wells across Robeson County and data from wells in surrounding counties in North Carolina and South Carolina. Data collection began in November 2016 as part of the larger Robeson County Groundwater Project which collects data from wells to record, model, and report water levels for the county. This poster highlights the eleven wells on campus to look for localized trends in this area of dense water level sampling.

The provided graphs focus on the periodic changes in ground water level at specific wells on campus while the maps show how the spatial patterns of the modeled ground water level surfaces vary over time. The initial descriptions and interpretations of the monthly average observations and mapped data have led us to questions about the data as we explore three years of data during our of first semester working on this ongoing project.



Images of another student collecting data at county and campus wells



Well Graphs and anomalies

The Baseball 1, Baseball 2, and Baseball 3 wells (left) have very similar patterns. However, even though these three wells are in close proximity we do see differences. For instance, in December of 2017 Baseball 3 sees a significantly lower measurement than the other two wells. Another time when they diverge is March 2019 when the Baseball 2 well water level drops a foot more than the Baseball 1 well.

The Art well follows the general campus pattern for water levels as can be seen on the composite graph except for two instances; June of 2016 and January of 2019. For these two times the water level dropped significantly. Conversely, in February of 2020, the UC Annex well had a large spike in water level that no other well had during that period.

Future work

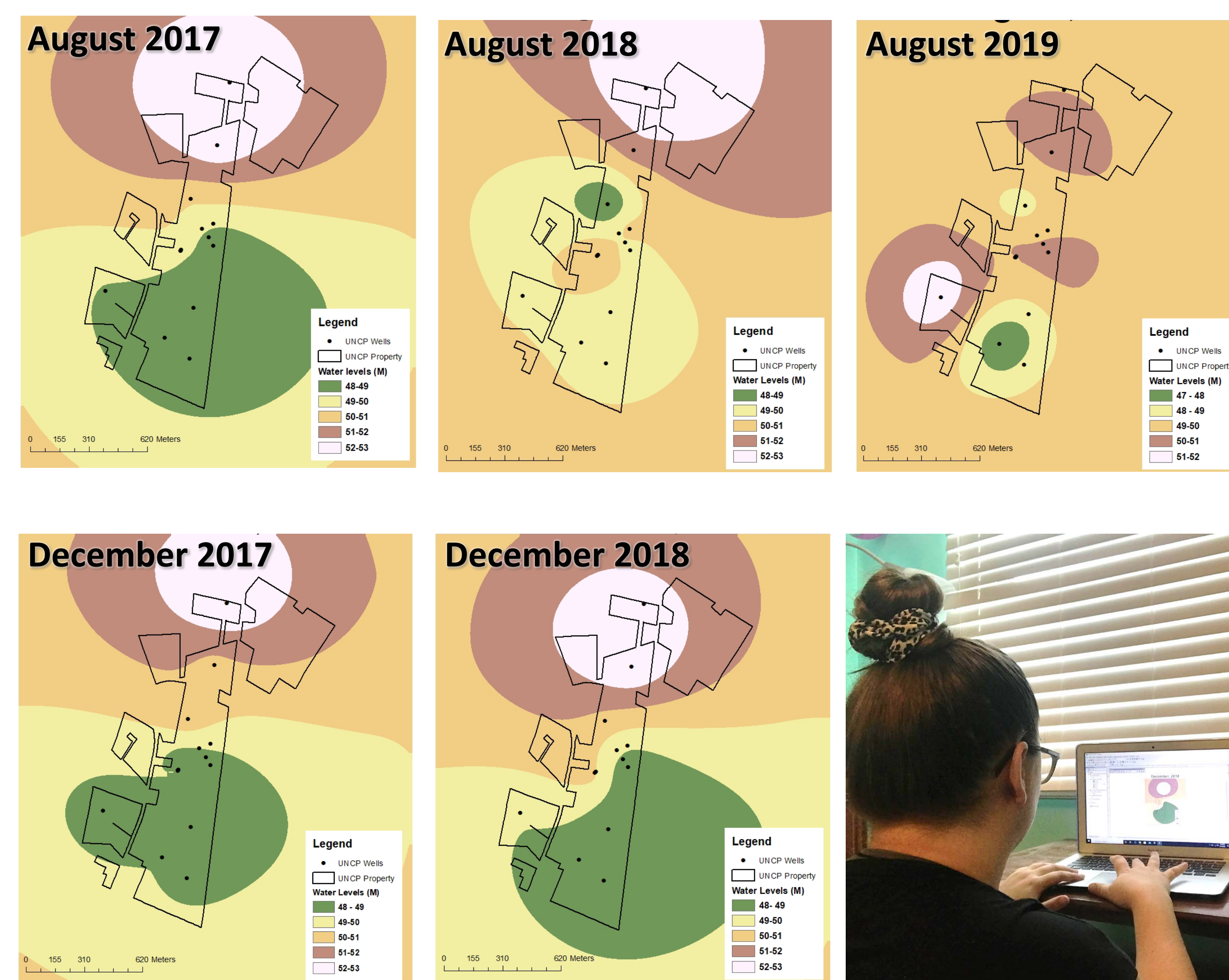
Based on the observation made from the graphs and maps, there are some question that can be used to guide future work:

- Look at seasonal changes in the campus ground water levels, either natural or tied to water pumping schedules?
- An important question for understanding the changes within individual wells over time is what wells have pumps attached and how does pumping impact the well water levels?
- How would county well water levels impact the mapped data?

With these questions and more time on the project to consider them, we are excited to see how our knowledge will grow as we better understand the data available as part of the ongoing Robeson County Groundwater Project research.

Acknowledgments

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Maps

To the left you see a selection of maps from late summer and winter months since 2017 showing the average ground water levels for each month with the surface modeled based only on the campus wells. While there is relatively little variation in the water levels across campus, the water levels tend to be higher on the northern end of campus. Generally, the ground water levels are higher in the summer months than the winter. Additionally, in August 2019 the water level pattern differs from previous months with the Football well water levels measuring higher and the ROTC well measuring lower than previous years.

