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Trends of Groundwater Levels Over Time

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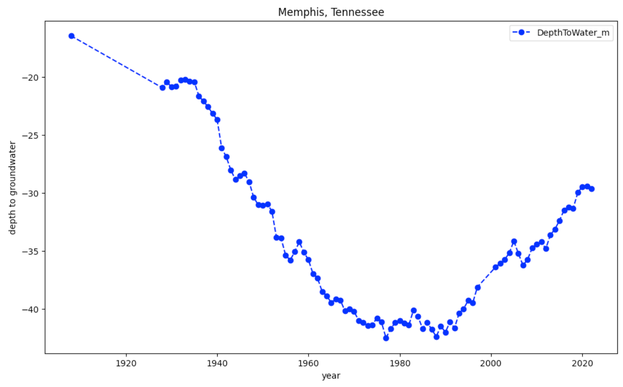

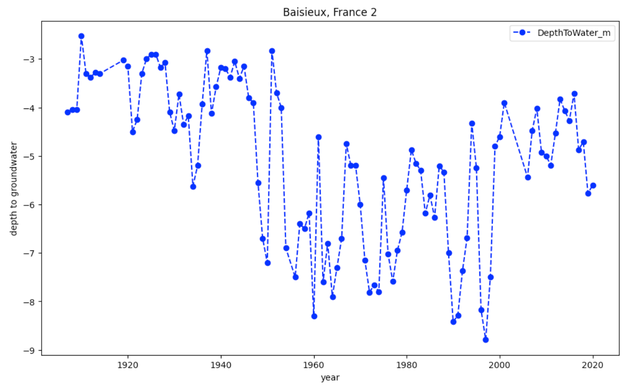

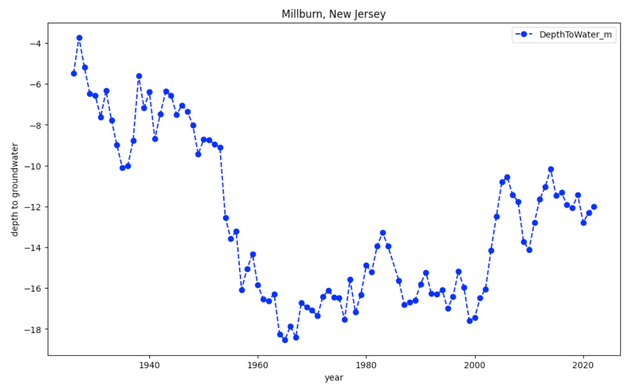

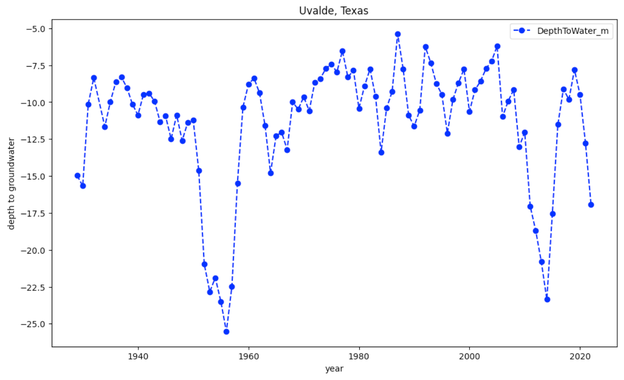

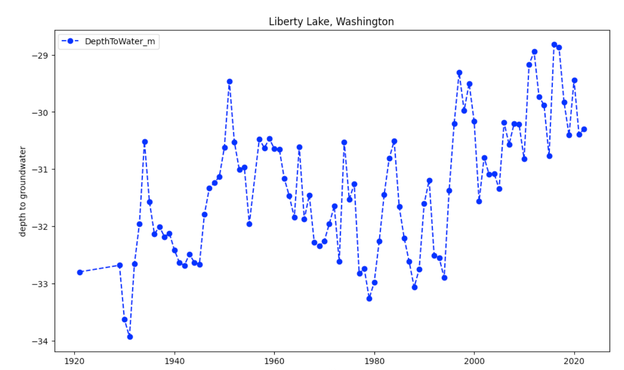

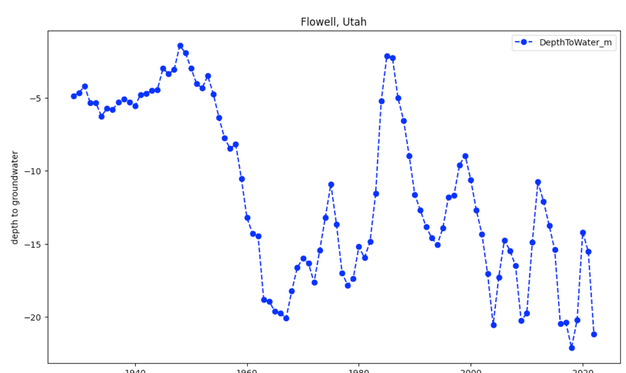

Introduction

Groundwater is water absorbed by the soil and earth beneath the surface, saturating it, and the groundwater level is the level at which the saturation zone ends near the surface. Despite groundwater's critical importance as one of the few sources of fresh water available, only a few studies have compared groundwater level changes from in-situ measurements made in different aquifers on diverse continents.

Methods

I analyzed groundwater level time series to characterize how groundwater levels have changed over time in different places. I used Python and Jupyter Notebook along with the pandas and matplotlib modules to graph groundwater level changes over time. The data analyzed here derive from a Hydroshare data repository created by Scott Jasechko (https://www.hydroshare.org). I graphed records with ninety or 90 or more measurements to identify long-term records.

Results

The main research finding from the groundwater level time series analysis is that the overall trend of groundwater levels is decreasing despite some places having a slight increase or seeming to be relatively the same. Groundwater levels fluctuate at different ranges depending on the locations.

Conclusion

Overall, the study's results show that groundwater levels have decreased over time in most locations, with a smaller number of wells showing evidence of rising groundwater levels. My findings highlight that groundwater is being used up faster than it can be recharged in most places.

Future direction

Research into groundwater levels can be further expanded by looking into the sources of groundwater recharge and what is using the groundwater, causing it to decrease. Another angle of research into groundwater could be to see areas that have subsidized and how it correlates to groundwater levels and groundwater usage.

References

The research data set is from Hydroshare and created by Scott Jasechko (https://www.hydroshare.org).

Acknowledgment

Thank you, David Percy, for teaching me Python and my mentor, Scott Jasechko, for showing me a dataset I could use for research.