Watching Our Water: Predicting Water Quality from Satellite Images

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Water is one of our earth's greatest and most abundant resources. Since the 1800s scientists have been taking water samples and analyzing them to learn about the health of the water. More recently, satellites have become useful tools in viewing our world from a wider remote perspective. Last year, a massive database of these two forms of data was created, called AquaSat. It is organized by "matchups", which are defined by a local test taken within one day of a LandSat satellite passing overhead. I wanted to see what test results, like secchi disk depth or total suspended sediment, could be predicted using data from the satellites. I first gained access to the AquaSat paper and database. I then tried to run a neural network in a python colab notebook on my laptop, but the runtime took too long due to the massive amounts of data I was using, ~600,000 rows and 14 columns. I then moved to a desktop computer and transferred my code to run locally. I experimented with using python code to split and filter the data in lots of different ways but I couldn't get my neural network to consistently predict accurate values, despite having a very low "loss" (error) value. This could be due to many reasons: not enough correlation between data or neural network structure isn't optimal or wasn't run for long enough. I hope to work through these issues in the future.

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