TITLE: Evaluating water moisture by spatial variations of vegetation and soil type in Texas.

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Soils are a natural section of layers, called horizons, that are composed of chemically, biologically, physically weathered bedrock that is mixed with organic matter. Soils are divided into groups called orders to separate soils based on soil properties and characteristics. Soils are important for numerous reasons. First, soils are the first thing precipitation comes in contact with before infiltrating to groundwater reservoirs. Depending on the soil type, the soil may be impermeable causing a long time for the water to reach underground water sources. Also the recharge chemistry will change based on the minerals within the different soil type. This is important because knowing the soil type will help understand and monitor the chemistry of groundwater systems used for different operation within cities. Soils are also important because they are the layer that supplies water to plants. Soils have pores spaces that stores water that plants can use for photosynthesis. But based on soil properties and characteristics, do different plants prefer to grow within certain soils types? If so, ideally this comparison could also be observed in the soil moisture, since different plant types have different water requirements. My goal for my project is to use ArcGIS to see if there is a trend between soil type and vegetation cover. If trends are discovered, the next goal is to evaluate soil moisture variation throughout these trends. I want to construct a map that illustrates the various soil types, vegetation cover, and soil moisture in Texas. Based on my progress with this part of the proposal, I would like to observe precipitation amounts throughout Texas to see if there is a trend between precipitation amount and the three objectives, specifically vegetation cover. Potentially, there could be a trend between vegetation cover with precipitation amount in different soil type. Ideally, if there is an area that were precipitation amount is low, certain plants were not want to grow there due water stress.

For this project, currently I have been looking for land cover, soil moisture, and soil type data. I was able to find and download soil type from the State Soil Geographic Database-STASGO, and the Soil Survey Geographic Database- SURGO websites. But I was unsuccessful finding soil moisture data. I had to join the soil type shapefile with the attributes table located in another folder. But the attributes were in the wrong format and I had to fix it on excel. Land cover is a large file and is taking a long time to download. So I will continue to look for a land cover shape file for the state of Texas to make things easier. I am still trying to learn different tools and how I could perform correlations between the three data points. I think I will perform a spatial analysis on the different vegetation types to see where the mostly are growing. This will give me a better understand spatial where things are spatially with the land cover data. Once I have that, then could do the same on soil type and see what vegetation type grows in what soil types. Then once I find a correlation between vegetation cover and soil type, I will compare that

with soil moisture. Below is what I have so far on my project, which is not much, but things are still coming together.