Jenna Kromann
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Project Update: Understanding the River Systems in the Recharge Zone of the San Antonio Segment of the Edwards Aquifer focusing on the Nueces River

This purpose of my project is to quantify the amount of recharge that occurs as the Nueces River Crosses the recharge zone of the San Antonio segment of the Edwards aquifer. I will do this by gathering information from the USGS, NHD, and the Edwards Aquifer Authority (EAA). The streamflow data can be gathered from the USGS in a gauge upstream of the recharge zone and a gauge downstream. Recharge will be calculated by subtracting the upstream – downstream flow. Below I will inform you of what progress I have made so far.

I have completed a number of different tasks to aid me in calculating recharge. First I downloaded the NHDPlus data to obtain flowlines, and then I separated out the Nueces River from these flowlines. After finishing I found the boundaries of the San Antonio segment of the Edwards aquifer from the Edwards Aquifer Authority, this shapefile included the designated recharge, drainage, and artesian zones. Then I found the gauges from the USGS that were located upstream and downstream of the recharge zone. The gauges that I will use are (Nueces River near Laguna and Barksdale). Next I figured out what subregion watersheds (HUC 8) contributed to the gauges, there were two different watersheds contained in this area. Now that I know the location of the gauges, I need to use excel and download the flow data from the USGS.

The next steps I need to complete finding the recharge are described below. First I need to get the flow data in a spreadsheet and calculate the amount of recharge. Then I would like to add this data to my map and show the differences in flow over the years. I would also like to add more data about precipitation, soil moisture, geology, and evapotranspiration (ET) data; if I can find this data I would be able to more accurately estimate recharge using a more complex water balance model similar to Puente, 1978 or USGS, 2011.

Some difficulties that I am facing are finding ET data that is distributed spatially. Also I am having difficulty trying to figure out how I should display my recharge data. If I could find this data then I could use: Precipitation-Change in Storage-ET-(Qin-Qout (flow))=Recharge. Once I obtain this data spatially I can used the spatial raster analyst calculator to aid me in figuring out recharge on a watershed scale. If I cannot find this data I will just use a simple model: flow in minus the flow out is equal to recharge. I may also use flow data I have obtained by stream gauging to compare this data to recharge calculated by only using the two USGS gauges. Overall there are a few more tasks I need to complete, but so far things have been going smoothly.

Nueces River Study Area

Legend

ZONE

- Artesian Zone
- Drainage Zone
- Recharge Zone
- Transition in Recharge Zone

0818999010 Nueces Rv.nr Barksdale, TX

Nueces River

08190000 Nueces Rv at Laguna, TX

N

0   5   10   20 Miles