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GISWR - Term Project Update

My project aims to be a scaled down and simplified version of work I did over the summer at the Bureau of Economic Geology. I was assigned to help gather well production data to determine potential areas where wells may be drilled to extract water to be used for unconventional natural gas recovery from the Barnett Shale. My goal is to map out the potential available amount of water (i.e. the specific yield, storativity, or specific storage, depending on the information I can find) in Wise, Montague, Clay and Jack counties in northern Texas that could be used for gas extraction. I was responsible for going through all the well log sheets from the Texas Commission on Environmental Quality website and entering the data (e.g. depth of well, pumping data, etc.) into Excel spreadsheets. Since there are several hundred to over a thousand well logs for each county, I will be using the data I already have.

County	<u>Grid Num</u>	<u>Depth to Bottom of Trinity Aquifer</u>	Well Depth (ft)	Measurement Date	Depth to Water (ft), neg = below land surface	Pump rate (gpm)	Drawdown (ft)	Pumping Time (hr)
MONTAGUE	19-02-8	0	160	7/6/2000	-90	20	-70	1

Table 1. Example of data gathered from well logs

I have gathered maps from online to compile one map in GIS that displays the county borders, major aquifers and depths, and USGS grids that correlate to the location of wells. I was able to find these maps on the Texas Parks and Wildlife and Texas Water Development Board websites. These maps will allow me to determine the areas that contain wells that penetrate deep enough beyond the depths in

aquifers that are used for potable water. I need to work on editing the maps to display only the counties I intend to focus on

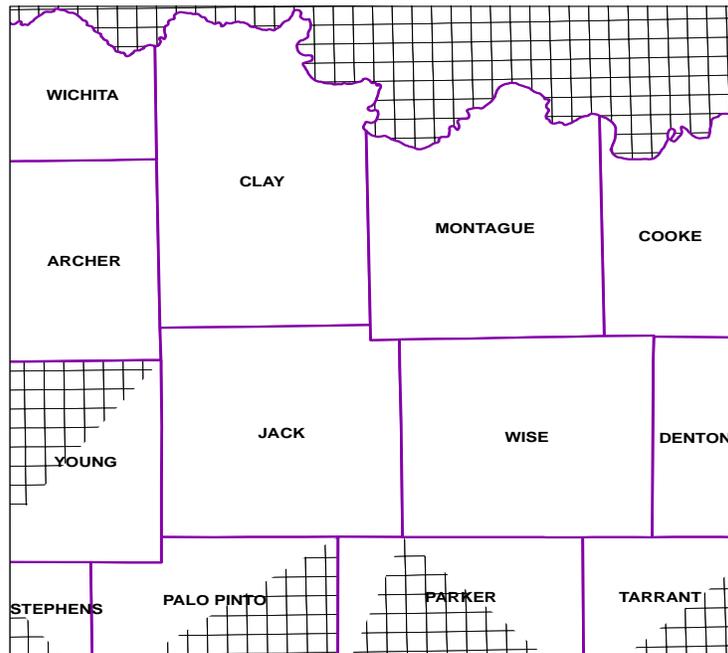


Figure 1 Map displaying Texas Counties, major aquifers (green is Trinity), and USGS grids

To finish my project, I need to calculate the potential water production capacity for each grid cell, edit my maps to display only the four counties I am focusing on, and then import the capacity data into GIS to be displayed and distinguished by a color scale. I need to research properties of the aquifers in these counties to figure out with the porosity and permeability are and then combine that with averaged pumping data from the wells in each grid cell.