

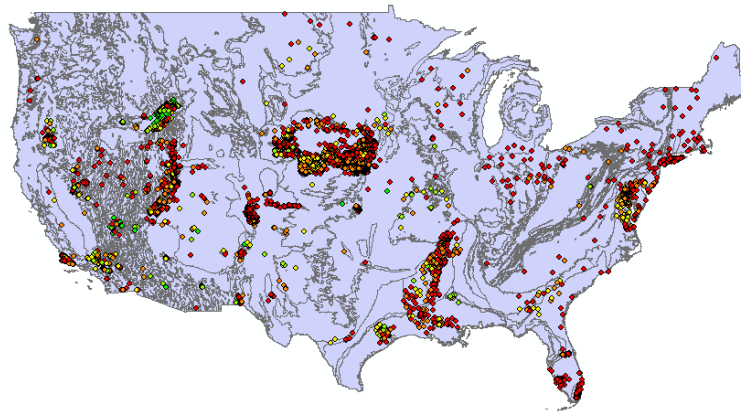
Progress Report – CE394K.3 Project

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As outlined in my initial proposal, my project will frame the booming hydraulic fracturing industry in the US in the context of shallow aquifers that intersect the major shale plays. The overall goal would be to give a sense that in certain regions of high fracturing activity, groundwater is fairly scarce. I plan to show both groundwater and fracturing activity as multiple shape files: groundwater as polygonal aquifers and color-graduated points representing wells of below-normal storage, and fracturing as polygons of active shale plays as well as points representing each active gas well.

I will be using ArcGIS tools to only show intersecting shale plays and aquifers to reduce clutter and be able to see the underlying topographic base map. If possible, I would like to also color code each aquifer with a “health index” obtained from well data. For example, the more severe an aquifer is stressed based on well data and usage rates, the more intense the color will be (for example, darker red for more stressed aquifers). The same could be done with the shale plays, since each one produces a different amount of natural gas or has a different well count per area.

As for data collection, I have first focused on the hydrologic part. The USGS website carries quite a few shape files of aquifers and well levels, which I have uploaded into ArcMAP as pictured below.



The data collection for the gas industry part will be a bit more difficult, since I will need to access the FracFocus database. However, I have a connection that can enable me to get this data, which will include water usage per well, gas production rates, locations of wells, and other helpful information. Once I have obtained this data, I will be able to start combining the fracturing and groundwater parts to start making a clearer picture of the water usage issue in the hydraulic fracturing industry.

The end goal of this project is to hopefully highlight the need to reuse flowback/produced water and reduce fresh water draws for fracturing, which frames the problem statement for my research (which involves how to best optimize this reused water).