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GIS of Water Resources

Term Paper Proposal

Barnett Shale Hydraulic Fracturing in Texas

I propose an analysis of the Barnett Shale formation in Texas in regards to the risks due to hydraulic fracturing. I will analyze the size of the formation, the number of current gas wells, the watersheds surrounding these wells, and the land cover and demographic information over the shale gas play to determine the potential impacts of contamination to the population.

First, I will plot geographical information about the shale formation over Texas to demonstrate the size and scope. This will use the NHDPlus dataset. I will map current gas wells on the shale and describe the current amounts of natural gas produced per well. I will use the Texas Railroad Commission GIS viewer and data. I will then compare the gas well position with watershed data and drinking water wells to see how many areas are currently pulling water from watersheds within a certain range of drilling. This will allow me to determine risk levels of contamination from fracking fluids based upon downstream distance. I will use the USGS website on water resources for watershed boundaries and the Texas Water Development Board's groundwater database for water well information.

To determine the risk to the population, I will plot land cover information and demographic information from the National Land Cover Dataset to view how much of the shale is currently covered by suburban and urban living centers, like Dallas-Fort Worth. These cities limit the placements of vertical drilling but do not prevent horizontal wells from being drilled to reach areas beneath the cities. I will also to relate the water well positions with where people in their city get their water from to determine possible contamination risks.

Comprehensively, I will analyze the Barnett Shale formation in Texas with its gas wells compared to water well information and human placement to determine the current and potential future impact of hydraulic fracturing