

Project Update:

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Class: GIS in Water Resources (16035)

Title: ***Geospatial Analysis of the Big Spring, TX Area – Why Direct Potable Reuse Makes Sense***

It will attempt to justify the Big Spring Raw Water Processing Facility which is the first direct potable reuse facility in the nation. I will lay out the troubles that the region has had and why this last resort for water conservation was a good option. The boundaries will consist of the Colorado River Basin HUC (from USGS) and the planning region F (from TWDB). The decision factors for the project included the following:

- The high evaporation rate in west Texas – I will show through pan evaporation data how this specific region (Region F) compares to the rest of Texas (probably the average over Texas) with respect to water evaporation. This will focus mainly on the reservoirs since that is where the majority of surface water is stored.
- The low annual precipitation – I will compare the precipitation in this area to other parts of Texas. The low amount of precipitation and the high evaporation rates make it fairly obvious that this region is not ideal for storing water in reservoirs.
- The varying elevations in the region – I will point out the varying elevations in the area around Big Spring and the adjacent reservoirs which make it costly to pump water back and forth in this area.
- Groundwater data – I will look into the groundwater sources in this area in order to map out the salinity and water quality (essentially the brackishness of the water). This is another deciding factor in using groundwater as a water source. This region has a lot of brackish water which would make it pretty costly to treat as opposed to cleaner surface water sources.

The data I have collected so far:

- Texas Water Database:
 - Hillshade shapefiles
 - Precipitation Shapefiles
 - Terrain Color Ramp Shapefile
 - HUC Shapefile
 - Existing Reservoir Shapefile
 - Pan Evaporation Data (annual) for the grids in Region F
- USGS Data:
 - Stream Gage data for the Midland, Big Spring, Odessa, Snyder, and San Angelo areas. This shows the streamflows for the rivers in that area.
 - Historical Water levels (and volumes) of the E.V. Spence, J.B. Thomas, O.H. Ivie, and Lake Colorado City Reservoirs. These reservoirs are where the area gets the majority of its water.
- NOAA Data:
 - Precipitation index overlay
 - Drought severity index overlay

- The following map is the overlaid shapefiles I've collected. I intend to only look at the 1208 basin (Colorado River) that is inside the TWDB planning Region F. I still need to collect evaporation data and join some of those layers together so I only have my region of interest highlighted. I also need to add the elevation layer and find the distances between the reservoirs and the Big Spring RWPF.

