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GIS in Water Resources (CE 394K.3)
Term Project Progress Report
10/25/3028

Title

A comparison study of streamflow data from the National Water Model to real-world data from local storm events

Objective

        The National Water Model is a recently developed hydrologic model that "simulates observed and forecast streamflow over the entire continental United States" (http://water.noaa.gov/about/nwm). The NWM is a widely used tool throughout the hydrologic community and uses an advanced system of inputs to create forecasts in three time ranges: short-range (18-hour forecast), medium-range (10 day forecast), and long-range (30 day forecast). The short-range flow is forced with data from two meteorological models to improve the accuracy of the water flow. For my study, I will be focusing on the short-range flow model of current conditions.

        In order to study the accuracy of the National Water Model, I require observational data from waterways within the NWM flow network. For this, I have selected water gages located under Texas Department of Transportation bridges across the Austin area. There are 44 water level gauges, and 32 of those are within the NWM network. This data is housed by a water resources management company, KISTERS.

        For this project, I plan to compare these two types of data with respect to the parameter of percent difference. In GIS I will create a visual color-coded system modeling common ranges of percent differences such as 0-2%, 2-5%, 5-10% and so on.

Data

- National Water Model streamflow data at the locations of the 32 water gages
- Texas Department of Transportation waterflow gages from the KISTERS database

Steps

1) Get access to and compile KISTERS data (completed)
2) Create and use Python scripts to retrieve streamflow data from the National Water Model
   a. Use HAND methodology to estimate water level depth given flow rates
3) Run the two sets of data at identical locations through a mathematical formula for percent difference (and possibly other mathematical parameters)
4) Create a visualization of this data in arcGIS

Basemap

        For this visual representation of my data, I plan on using a topographic basemap. The topographic basemap will show the shape of the land surrounding the gage locations, which will help characterize the water channels pertinent to the project.