

CE 394K Geoinformation System in Water Resources

Term Project

Flooding in the City of Houston during Hurricane Harvey

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1. Background

Hurricane Harvey of 2017 is tied with 2005's Hurricane Katrina as the costliest tropical cyclone on record, inflicting \$125 billion in damage, primarily from catastrophic rainfall-triggered flooding in the Houston metropolitan area and Southeast Texas. In a four-day period, many areas received more than 40 inches (1,000 mm) of rain as the system slowly meandered over eastern Texas and adjacent waters, causing unprecedented flooding. The resulting floods inundated hundreds of thousands of homes, which displaced more than 30,000 people and prompted more than 17,000 rescues.



Figure 1 Houston during Hurricane Harvey. CNN

2. Objective

The object of this project is to create an hourly-interval flood map series of Houston during Hurricane Harvey in August 2017 using HAND method we've learnt in class. Then compare that with real-time flood map and discuss any differences. In this project, I will try to use everything we have learnt in class during the semester and see if I can use them to solve some real problems.

3. Data Source

3.1 DEM Data

I used the DEM data I downloaded from USGS with 1/3 arcsec resolution for n30w095, n30w096, n31w095, n31w096, n31w097. I used *Mosaic to New Raster* tool to combine the DEMs I downloaded. Then I used a boundary of Houston I found from H-GAC database, created a 10km buffer, and used *Extract by Mask (Spatial Analyst)* tool to create the map I need. The map displaying the elevations in the City of Houston and the surrounding area is displayed in Figure 2.

1/3 arc second DEM for Houston City

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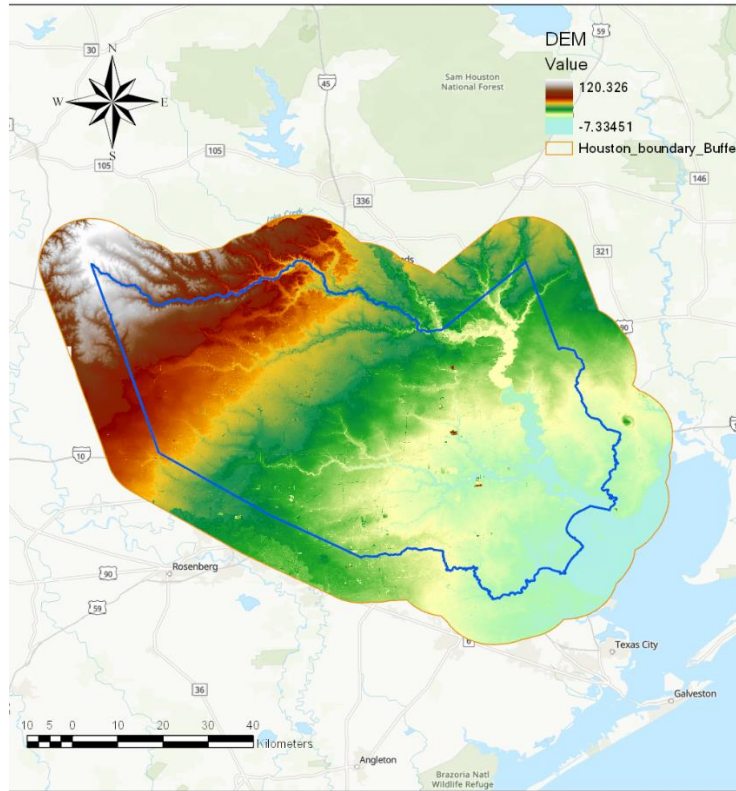


Figure 2 DEM for Houston City

3.2 Water Level Data

There are several different sources to get the water-level data, including the USGS stream gage data, and the NOAA coastal tide gage data.

3.3 Flowlines and hydrological data

Flowline and other hydrology data are downloaded from National Hydrography Dataset.