

**CE 394K  
GIS in Water Resources**

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**Assessment of Damage Due to Hurricane Florence in Wilmington, NC**

**Data Collection**

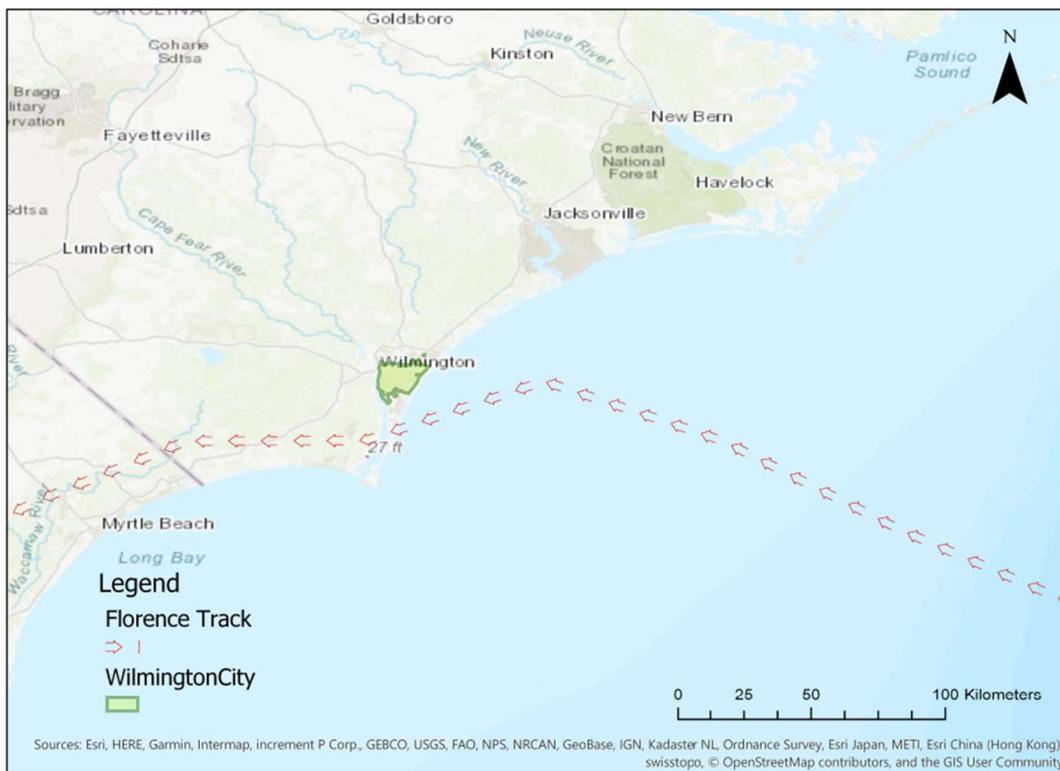
I have collected some of the data required for the damage assessment. These are enlisted below:

1. Hurricane Florence Track - Unisys
2. 30 m DEM – ArcGIS Living Atlas
3. Wilmington City Shape File – United States Census Bureau
4. Streams within Wilmington City – NHDPlus
5. Crowd Source Images of Flooding - National Alliance for Public Safety GIS Foundation
6. FEMA Reporter Images – FEMA
7. PNNL RIFT Flood Inundation – FEMA

**Methodology**

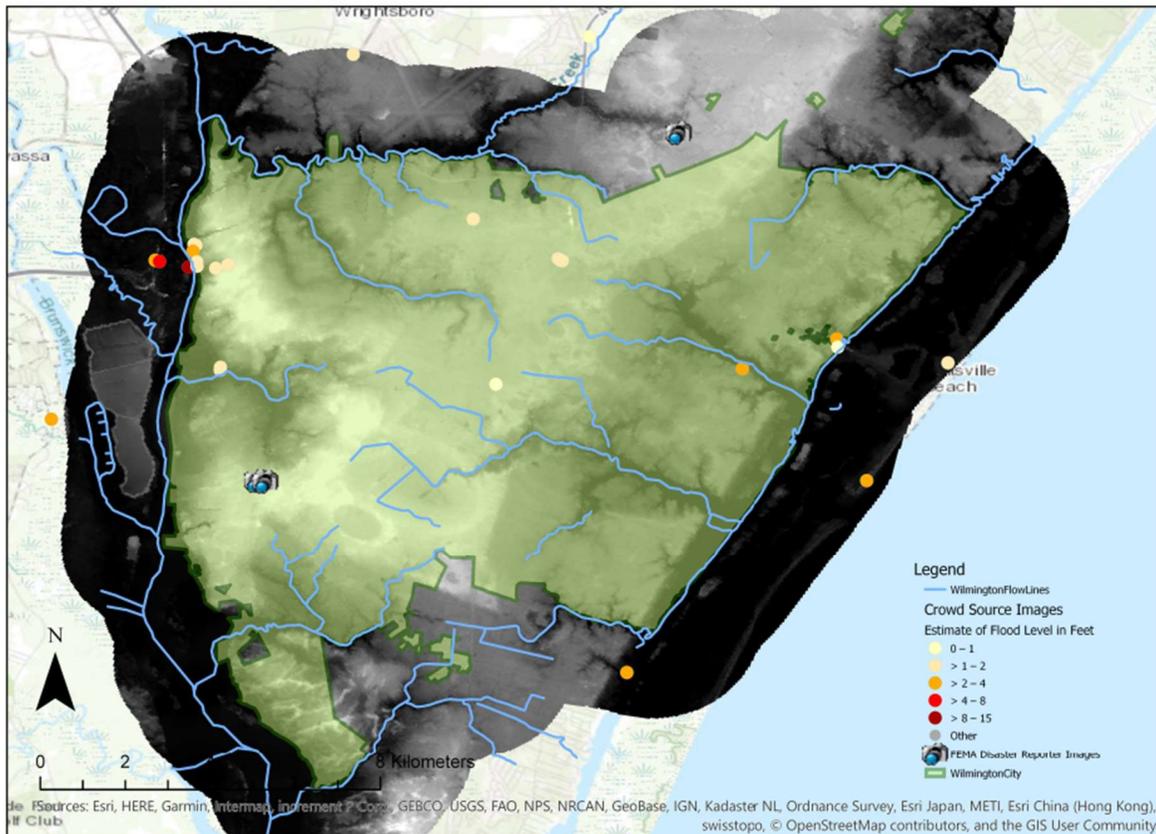
I started with adding the downloaded data to ArcGIS Pro. But the Hurricane Florence track data was not in a format supported by the software. So, I made an excel and created shape file from that. I also used Google Earth Pro in this process. I prepared a map layout to show the location of Wilmington city with respect to the track of the hurricane Florence.

## The Track of Hurricane Florence



I extracted the 30 m DEM data using a mask of 2 km buffer of the Wilmington city. Using the same extent, I extracted the NHDPlus flowlines. The location of crowd source images and FEMA reporter images are shown in the Wilmington city. The crowd source image locations were further classified according to flooding depths. Those are also shown in the map layout.

## Flooding Image Locations in Wilmington City



### Next Steps

I plan to use the Height Above Nearest Drainage (HAND) to approximate the flood extent and depth. I will use the crowd source data as a reference. I have FEMA developed flood inundation maps which can be used to judge my result obtained using HAND. This inundation map can then be used to approximate the damage.

### Challenges

I did not find any stream gage or tidal gage station within the city. So, justifying the data from the crowd source images will be tough. HAND method calculates the inundation based on the stream discharge. As the city is in the vicinity of the Atlantic Ocean, coastal storm surge is also associated with it. In this case, the inundation pattern may not be quite close to the reality.