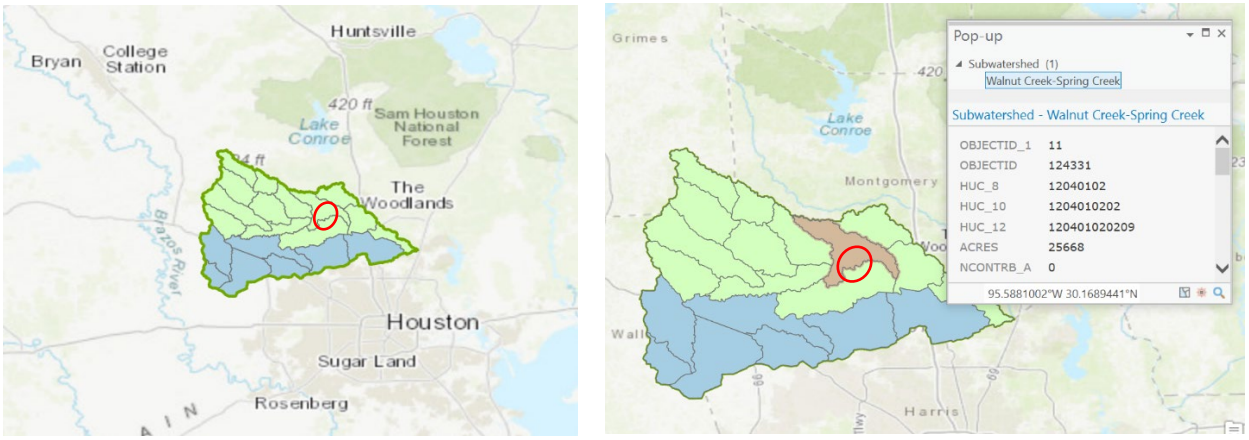
Kylee Ward
CE 394K – Term Project Progress
Due: 10/25/18

Title: Historic Flooding in Timarron Lakes of Creekside Park Neighborhood

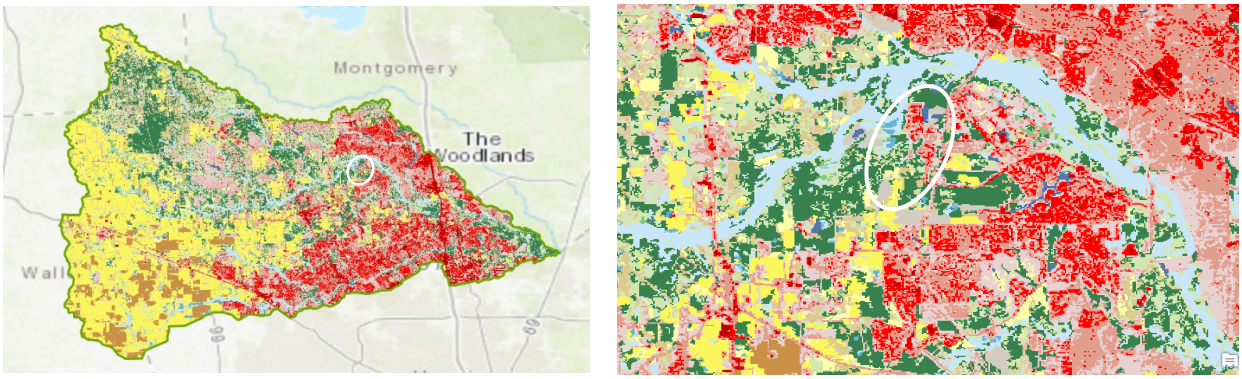
Objective: Timarron Lakes is an upscale neighborhood located in The Woodlands township north of Houston, Texas. After Hurricane Harvey hit in August 2017, around 350 homes flooded in this residential area. Now nearly 500 homeowners are being represented in a lawsuit against The Woodlands Development Company L.P., the Howard Hughes Corporation, and LJA Engineering Inc. The lawsuit presents claims against these developers of gross negligence for constructing a neighborhood in a 500-year floodplain without taking proper measures to reduce the effects of flooding, even with the knowledge of major flooding in recent decades. This project would compare the 100-year and 500-year floodplains in the area before and after the development of the Timarron Lakes neighborhood. Additionally, this analysis would map and compare the most severe flooding events in the past few decades.

Base Maps of Study Area:



Figures 1 & 2: Basin and subwatershed of interest.

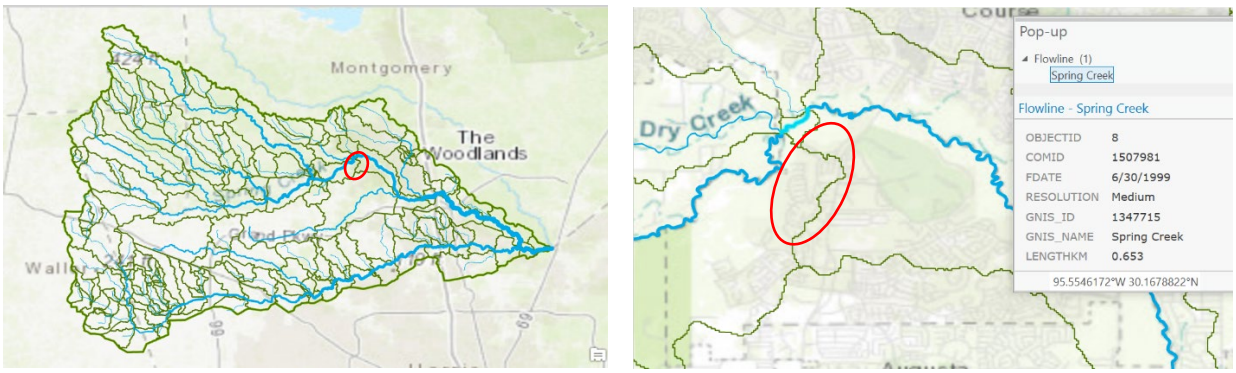
The maps in Figures 1 and 2 above show the basin and subwatershed of interest, which is the Walnut Creek – Spring Creek subwatershed. The red circles highlights the area of the Timarron Lakes neighborhood, which is surrounded by Spring Creek in the north and west directions.



Figures 3 & 4: 2011 Landcover use and closer view of area of interest.

The maps in Figures 3 and 4 above show the landcover use as reported in 2011 for the basin and study area. The Timarron Lakes neighborhood had begun construction in early 2011, so it's probable that an

updated landcover use map would display even more red area within the white circle of interest. If it becomes necessary, I will try to locate and use a more recent landcover use data source for this map.



Figures 5 & 6: Flowlines and subcatchments including closer view of Spring Creek near neighborhood.

The maps in Figures 5 and 6 above display the subcatchments and flowlines for the basin of interest. Figure 6 also shows a closer view of the area of interest with a red circle highlighting the neighborhood development. Figure 6 clearly illustrates the proximity of Spring Creek to Timarron Lakes.

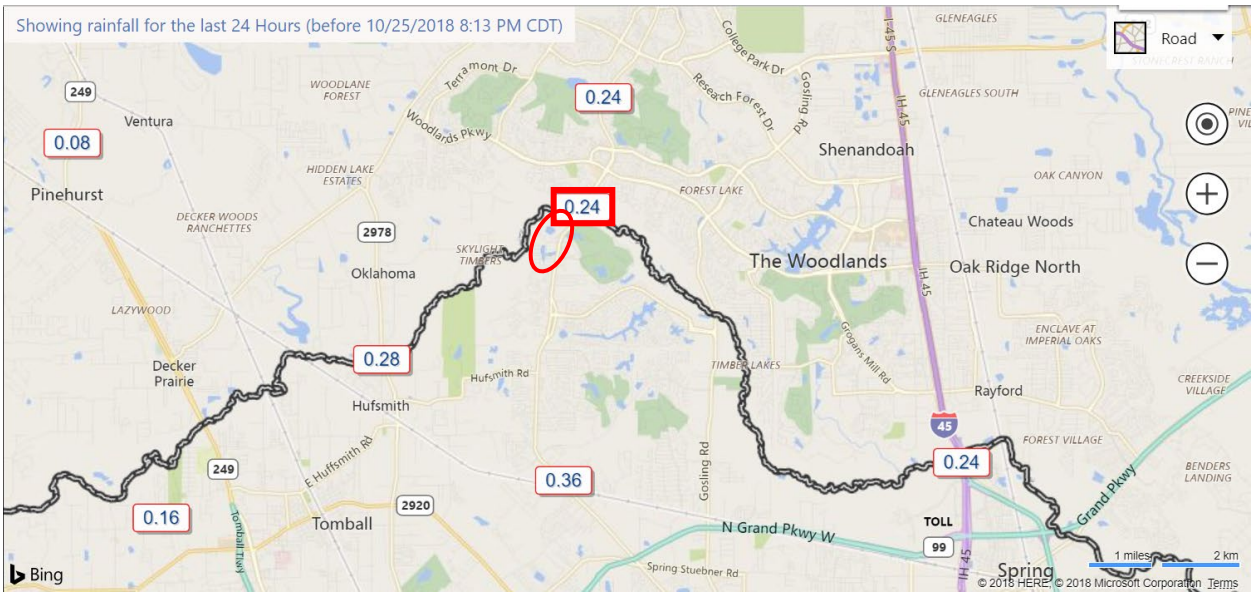


Figure 7: Locations of nearby stream gauges provided by the HCFCD

Figure 7 above displays the locations on stream gauges that are relatively close in proximity to the Timarron Lakes neighborhood (located in the red circle above). These stream gauge locations and data are provided by the Harris County Flood Control District (HCFCD). The stream gauge closest to the neighborhood is identified as “Stream Elevation Sensor 1063 J100_1060 Spring Creek @ Kuykendahl Road”, and it is located within the bold red box in Figure 7 above. I am currently unsure how to obtain the geographic coordinates for these stream gauge locations.

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Outline of Procedure:

- Identify stream gauges coordinates near neighborhood and include these gauges in base maps
- Complete class exercise 5 about HAND flood inundation map and apply to own maps
- Determine flow rates related to recent historic storms in area of interest
- Investigate details of drainage system in neighborhood
- Determine where elevation data can come from
- Write paper explaining findings that includes figures and maps
- Create presentation of results, figures, and maps
- Inquire about opportunities for expanding project and furthering research for my departmental report

Data / Sources:

- 100 yr & 500 yr floodplain maps before and after development
    - FEMA National Flood Hazard Layer (NFHL) - https://www.fema.gov/national-flood-hazard-layer-nfhl
- Spring Creek Stream Elevation data and rainfall data for major flooding events in recent years
    - Harris County Flood Warning System (FWS) - https://www.harriscountyfws.org/?View=full / https://www.harriscountyfws.org/GageDetail/Index/1060?span=24%20Hours&v=rainfall
- Harris County flood plain data (floodplain zones, conveyance zones, flood WSEL, cross sections, etc.) and stormwater infrastructure data
    - City of Houston Public Works GIS - http://www.gims.houstontx.gov/gims/default.aspx?app_id=gims&app=GIMS&AppID=-1&app=GIMS
- LIDAR elevation data from before and after the development of the neighborhood (around 2012)
    - Texas Natural Resources Information System (TNRIS) for Harris County