

The affects of potential sea level rise in Annapolis, MD

My goal for this project is to analyze potential sea level rise specifically for the city of Annapolis. With this data, I plan to overlay sea level rise upon the cities outline and buildings to see which areas are most vulnerable to this potential rise in sea level. Initially, I was aiming to analyze Annapolis' recent addition of the floodwall incorporated at city dock. With that, I was going to compare data years prior to its construction to get an idea of how successful the project was. With that being said, I was only able to find building data from 2013, prior to the construction of the floodwall so I decided to focus on the city as a whole for now.

I obtained data of sea level rise and subwater shed data of Anne Arundel Co. from Annapolis.gov's website as well as NOAA government website. The links are provided below.

<https://www.anapolis.gov/DocumentCenter/View/3307/Subwatersheds-Boundaries> , <https://www.anapolis.gov/DocumentCenter/View/3309/City-Buildings-Outlines-2011> , https://www.anapolis.gov/DocumentCenter/View/3306/Centerline_2013
https://coast.noaa.gov/htdata/lnundation/SLR/SLRdata/MD/MD_West_slr_data_dist.zip

First step is bringing in the sea level rise data and subwater shed data. Since I got the data from different organizations, I had to adjust the geometry. To do this, I used the fixed geometry tool to get both separate shape files on the same geometry. After that, I was able to use the intersection tool with the subwater shed layer as an input, and the overlay layer as both 2-foot sea level rise and 5 foot.

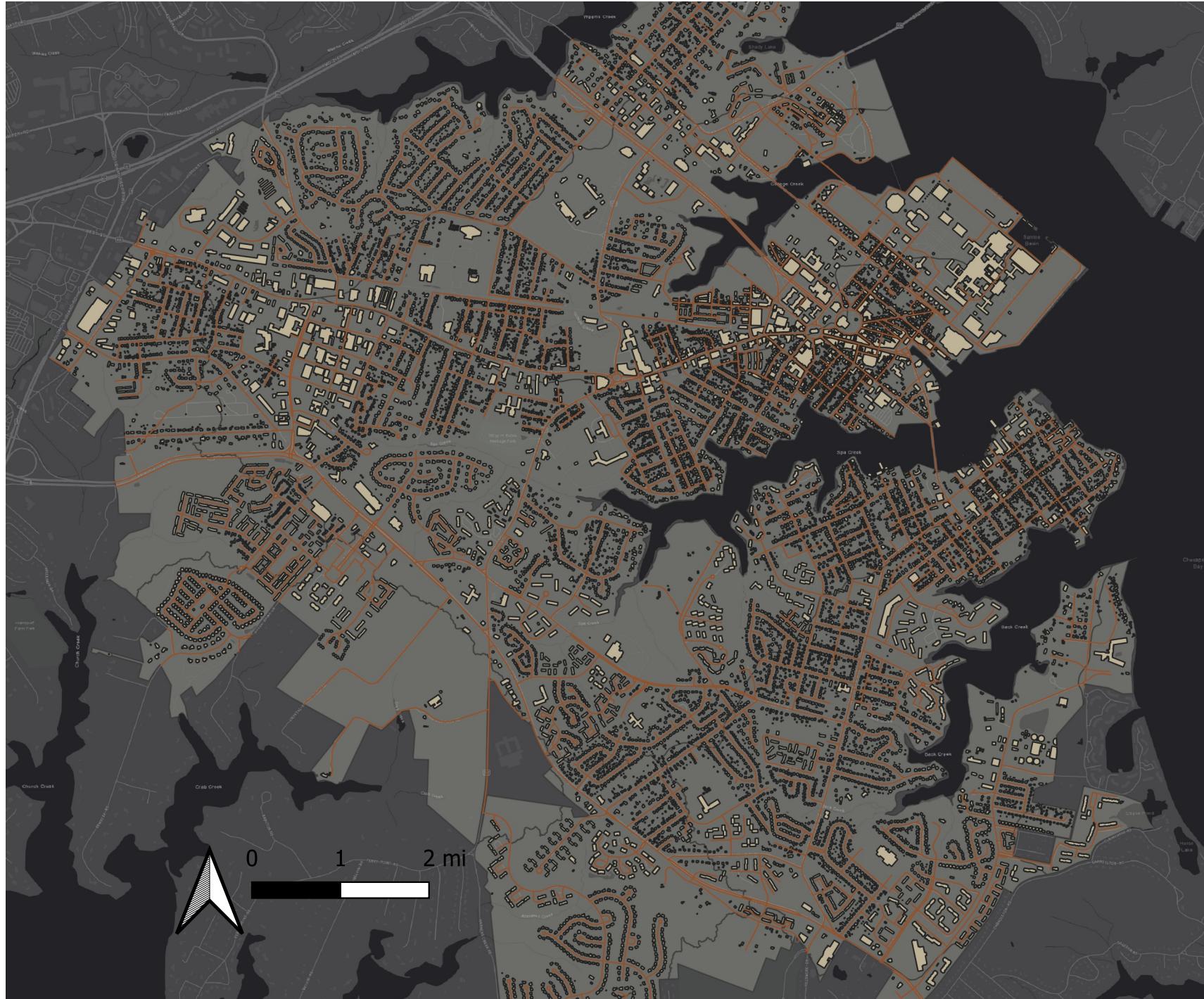
On the first map, I wanted to give context of the city's layout including the outline as well as the buildings and surrounding average watershed of the city at normal sea levels.

For my second map, highlighted in blue are areas where 2-foot sea level rise intersected with the boundaries of the city. On the left side of the map, I gave a general view of the whole city and on the right side of the map I zoomed into a few notable areas that seemed to have been impacted the most. In the top right, we have west Annapolis which shows areas along the coast of Weems creek as well as Shady lake where water is expected to breach. On the lower right section of the map we have town Annapolis, Eastport, and the Naval Academy. In this you can see residential areas surrounding the Eastport bridge and Ego Alley and in central downtown are the most affected.

Moving on, the third map analyzes the 5-foot sea level rise estimate of the city. Same as the last map the left side displays a broad view of the city in its entirety and the right side of the map depicts a few similar points we saw earlier in this paper. In the top right, West Annapolis, we notice much higher levels of water breaching into the residential areas north of Weems creek as well as a sudden breach on the west side of College creek leading into Sherman field just under the Naval Academy's bridge (450/Baltimore Annapolis Blvd). Moving on to the bottom right, this is where we see the most drastic impact of sea level rise in Annapolis. When comparing to the 2-foot sea level rise map where we saw almost no affect other than some residential areas on the coast of Eastport and Ego alley's surrounding city docks. We can now see there is a major breach which seems to encompass the naval academy entirely, which is a major concern. On a side note, I notice a larger breach on the northern tip of Eastport around Horn Point which is my current residence and is particularly concerning for this reason.

Moving forward with this, I would like to use Census track data as well as block data in order to analyze these specific neighborhoods which are most vulnerable to this sea level rise and in this, we could have a better understanding of who's affected (demographically) and why it matters, and what changes could be made to combat it.

Annapolis at Normal Sea Levels



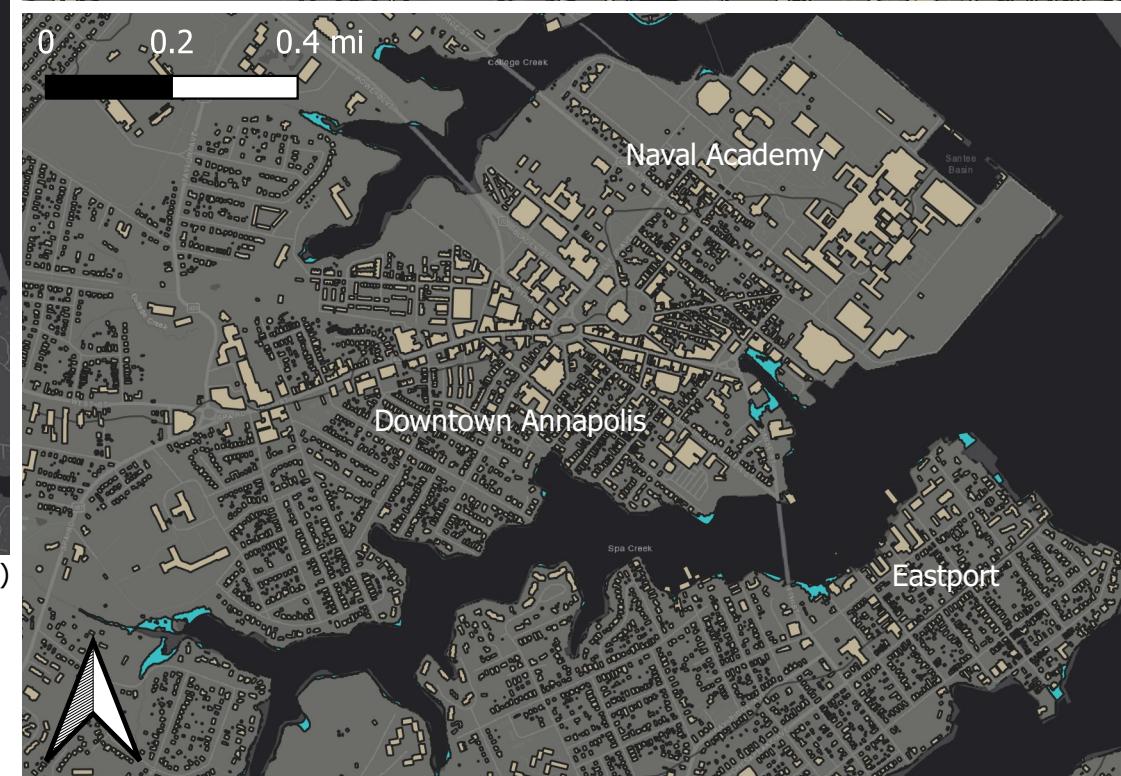
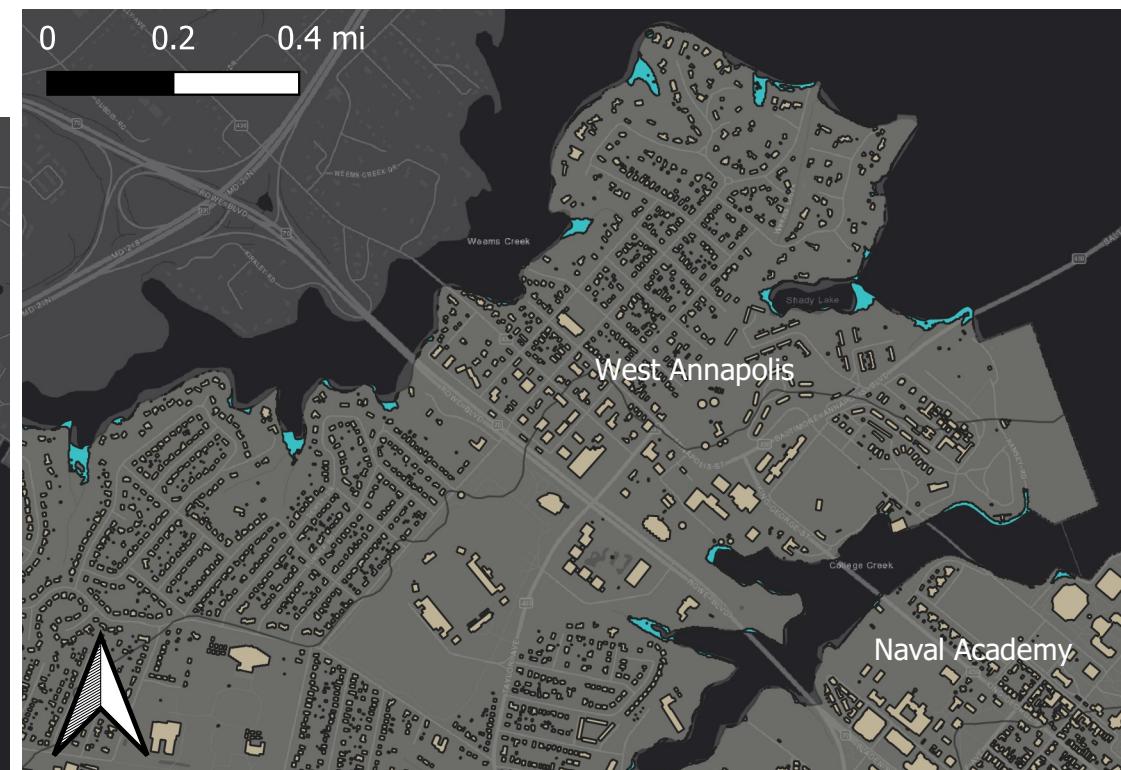
Legend

- City Outline
- City Buildings (2011)
- Roads (2013)
- Watershed

Author: Tim Patterson

Source:
<https://www.anapolis.gov/DocumentCenter/View/3307/Subwatersheds-Boundaries> <https://www.anapolis.gov/DocumentCenter/View/3309/City-Buildings-Outline-2011>
https://www.anapolis.gov/DocumentCenter/View/3306/Centerline_2013 [https://coast.noaa.gov/htdata/Inundation/SLR/SLRdata/MD/MD_West_slr_data_dist.zip]

Estimated 2ft Sea Level Rise in Annapolis



Author: Tim Patterson

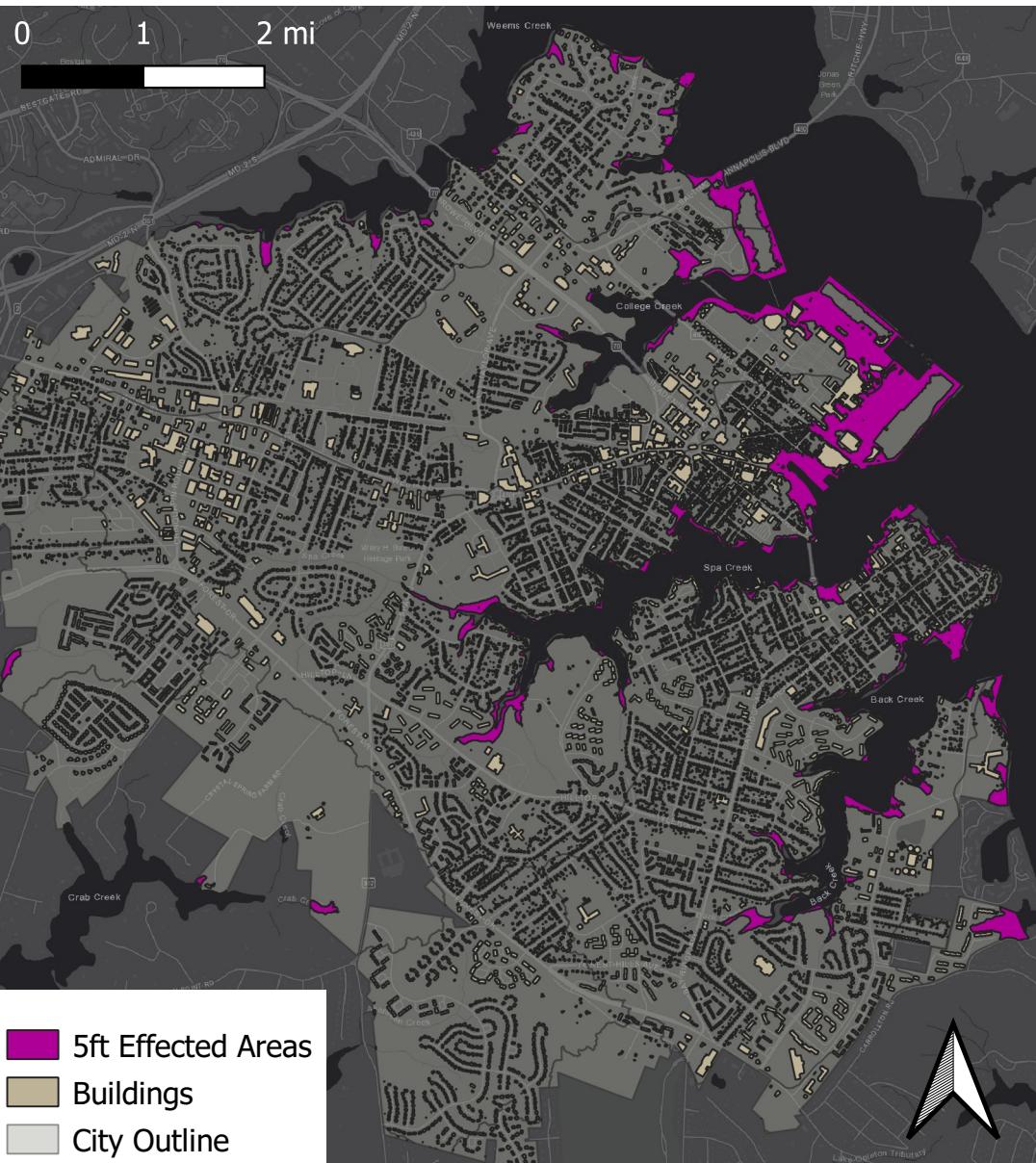
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Estimated 5ft Sea Level Rise in Annapolis



Author: Tim Patterson

Source:

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