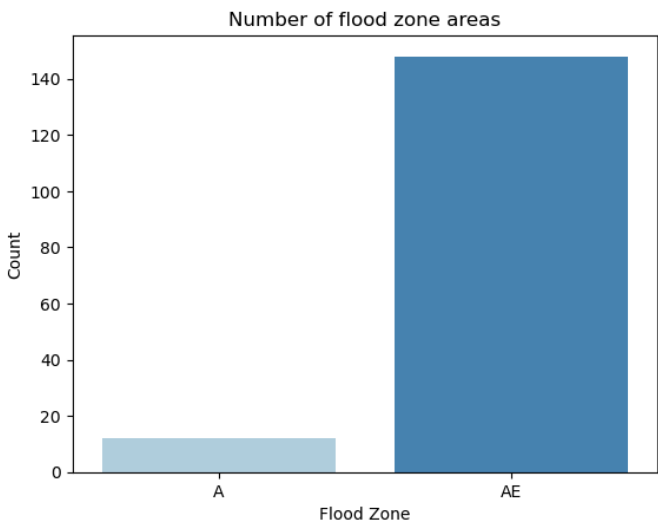
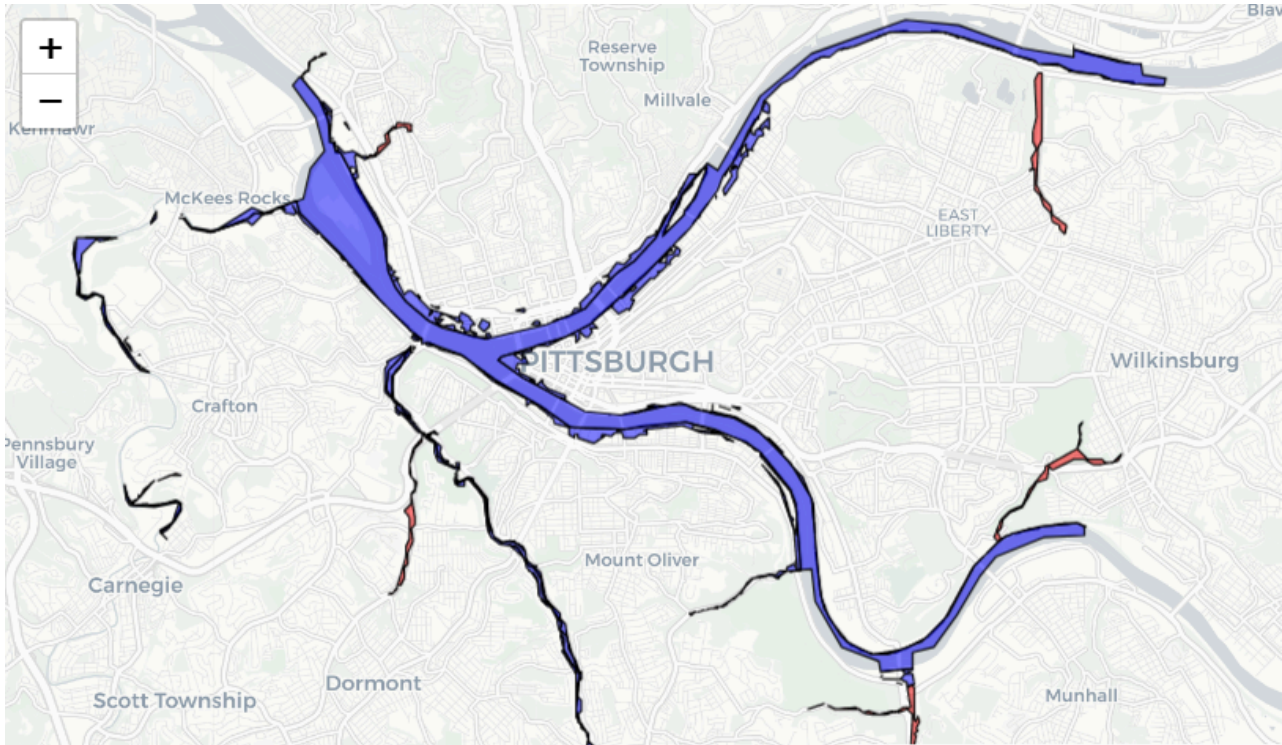




In this data story, I helped explore flood vulnerability using the 2014 FEMA flood Zones dataset which was obtained from the Western Pennsylvania Regional Data Center (WPRDC). The purpose of this project is to organize, interpret, and analyze the flood risk across the city to see how possible factors such as insurance rates would be calculated depending on the zones with low and high risk profiles. The dataset contains columns labeled as “fld_zone” for flood zone and “sfha_tf” for Special flood hazard Areas which were used to visualize the data.

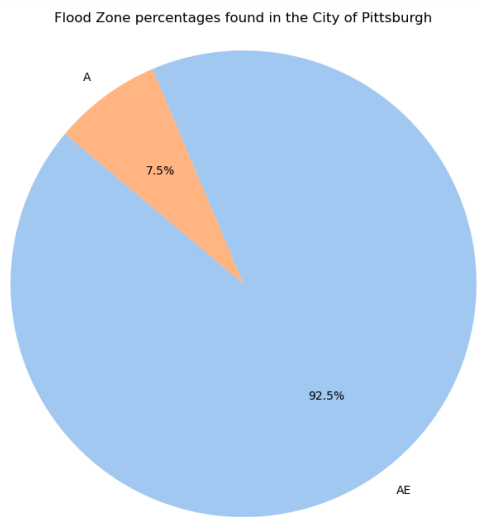
Seaborn and Geopandas were both used to visualize the data and interpret it. The zone categories stand for land based on a risk of 100 years, which is about the 1% indicated by A or low risk flooding area and AE which stands for high risk flooding areas. Using Python, we were able to explore the components of the dataset using head() and info() to break down what exactly was needed. A metric coordinate system of (EPSG:3857) was used to allow us to use accurate spatial calculations which is something new that we learned we had to do. The centroid and average center point of all the zone polygons were calculated to accurately center the Folium, another library, backed interactive capable map. I set it to static as to refrain the map from moving whenever scrolling up or down on the page or having the cursor accidentally on the map.



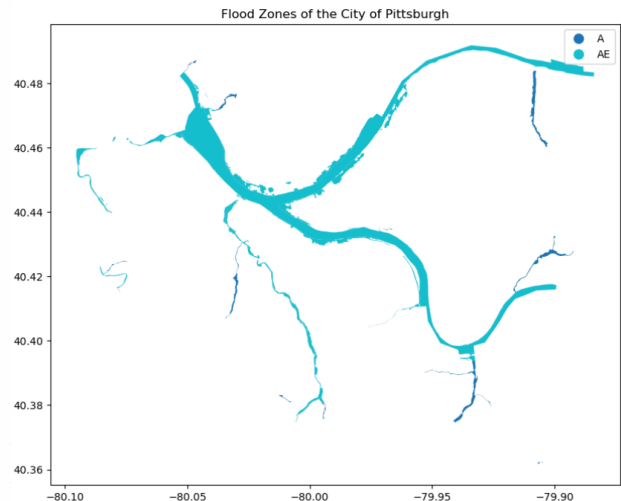
The bar chart was used to represent how the city of Pittsburgh’s number of flood zone areas compared to many more AE factors than A flood zone types, which by the quantity was less than 20 units compared to AE’s 140+ units. This was further explained as a percentage in the pie chart below it. The pie chart served to showcase the proportion of areas classified by flood zone type. The chart reveals that over 90% of the areas fall under the “AE” flood zone and that less than 10% fall on “A” flood zone. This also signifies that a large portion of Pittsburgh lies in areas with high flooding compared to low flooding areas. The city’s infrastructure would have to be able to manage worst case scenarios and insurance companies should have flood insurance set at a higher price point than none.

FLOOD ZONE RATIO

There were plenty of High-risk flood zones labeled “AE” which cover much of the map and “A” which only covered close to 7.5% of the map. These zones also represent the areas studied by detailed hydraulic models which are representative of base flood elevation requirements for infrastructure and building dwellings. The “X” zones seen also stand for low to medium risk areas which make up a small percentage of the mapped region and are highlighted in blue or red.



REFLECTION



While FEMA’s 2014 flood zone maps created are not perfect predictors of flooding behavior and may have 10 years of old data, these visualizations are widely used for determining flood insurance rates, guiding new development, and informing emergency preparedness strategies. I would definitely need an up to date dataset of a recent time frame as of 3 years or less to see if there have been significant changes in Pittsburgh’s topography. This is to also ensure that the rivers have not been shifting into extremes in any direction. This could also indicate a drought if the rivers have been seen shrinking or river growth as to see which areas could go underwater. This would also help us understand water usage behaviors or climate change if shrinking is occurring.

Final Thoughts

Ultimately, this analysis provides a compelling spatial narrative of flood risk in Pittsburgh. By using public data, geospatial tools, and visualizations we can appreciate the importance of climate change, urban development, and other factors that may need to be looked at before raising insurance rates, development of dwellings, and resource use. These are a couple of ways that we as citizens could do to find ways to better prepare for a natural disaster, flooding of a certain area, or relief fund preparation as we see which areas would be at a higher risk of flooding than others.