

Grand Challenge in Agriculture: Hurricane Analysis

Project on Hurricane Analysis

This project focuses on exploring hurricane tracks in Texas, finding out who has been affected, and investigating cities, population and shoreline.

APPENDIX A

Report

Hurricane Analysis in Texas

By

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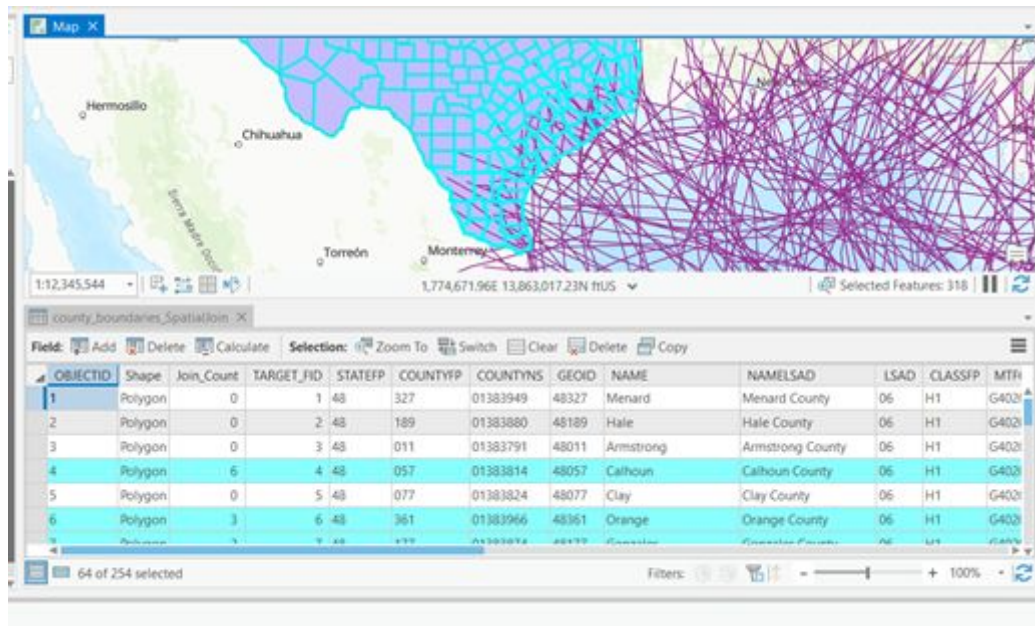
Radhika Khandelwal

November 4, 2019

Part 1 – Explore hurricane tracks in Texas

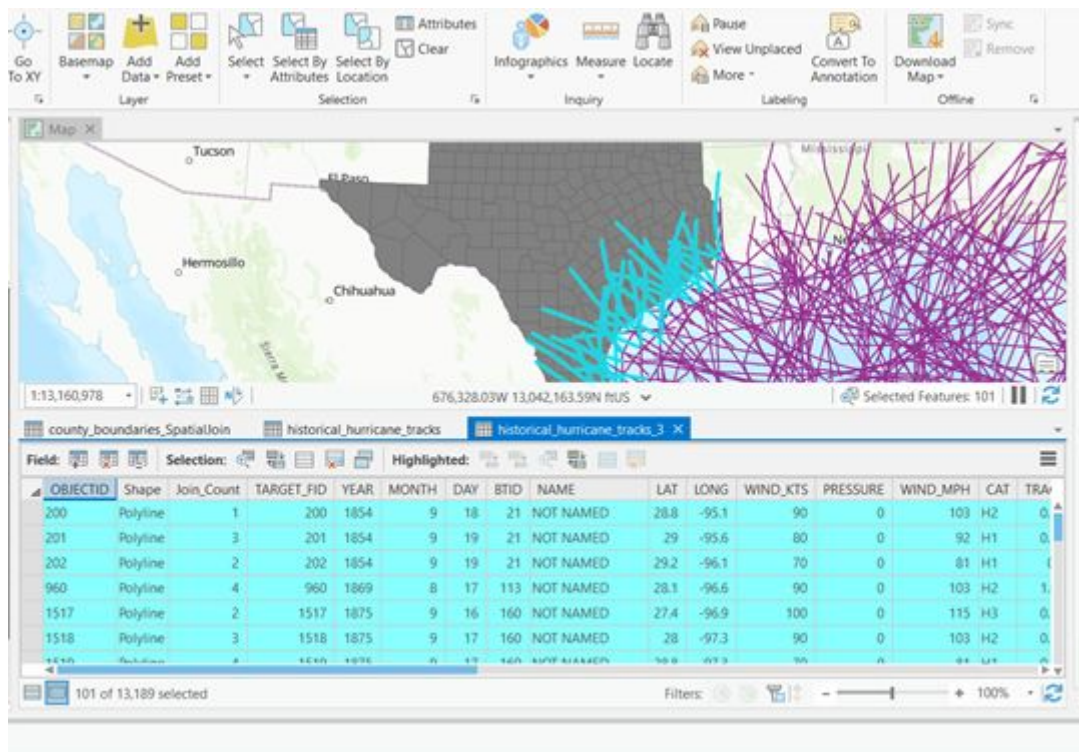
How many Texas counties were touched by at least one hurricane track?

By using spatial join for hurricane tracks and county boundaries we mapped them and with select layer using attribute join count not equal to 0 we were able to select Texas counties touched by at least one hurricane.



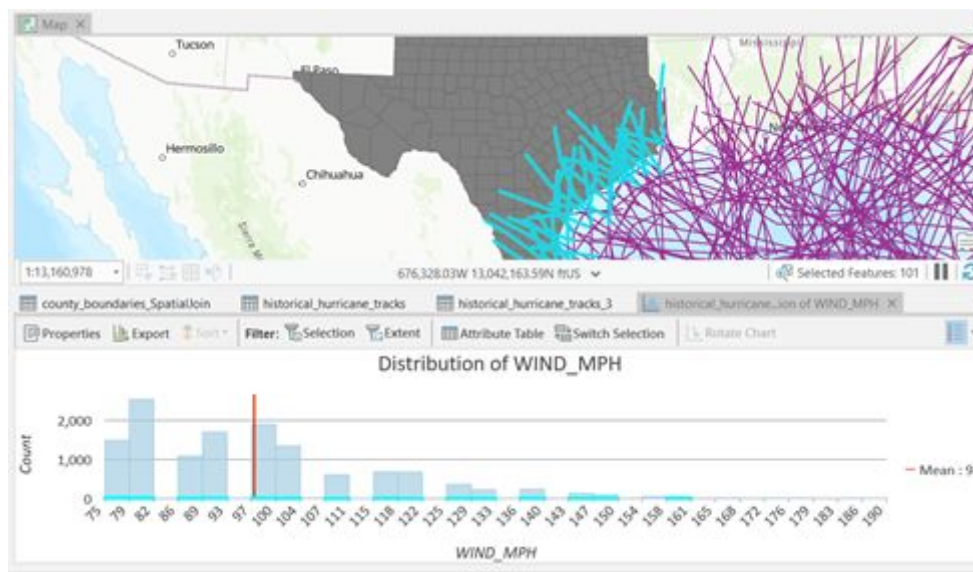
How many hurricane tracks overlay Texas?

By using the inverse spatial join with hurricane tracks and county boundaries and selecting hurricane tracks as select attribute layer, we got the number to be 101 in number



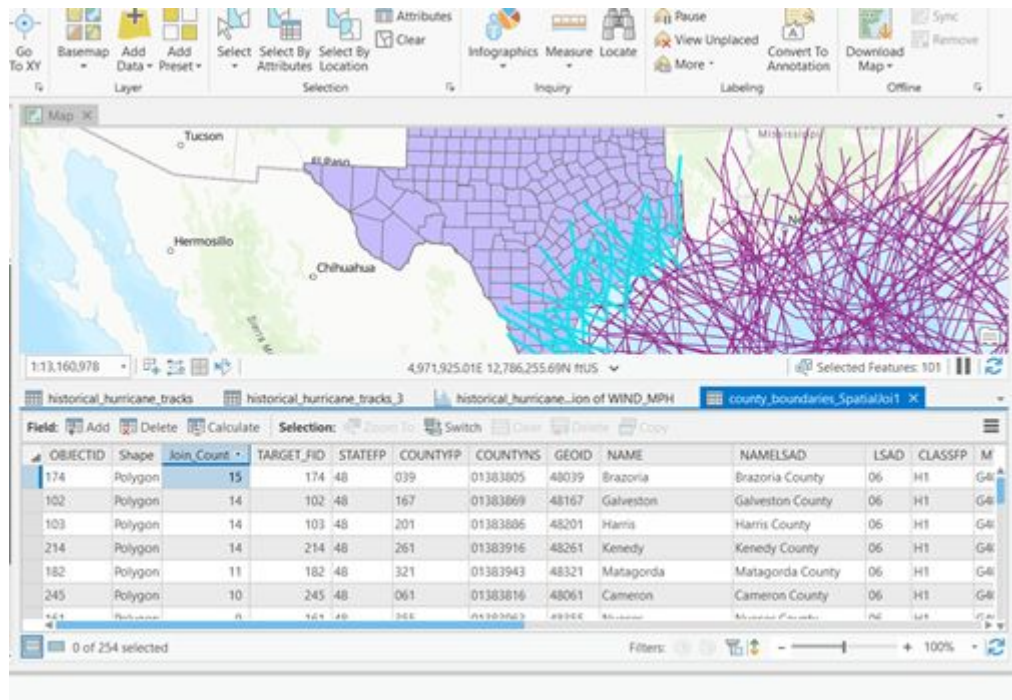
What was the average wind speed (mph) for the tracks overlaying Texas?

By forming a histogram of the header Wind_mph , we found the average wind speed overlaying Texas.



Name the county with the most hurricane tracks.

The county with maximum join count is the one with most hurricane tracks, i.e. Brazoria



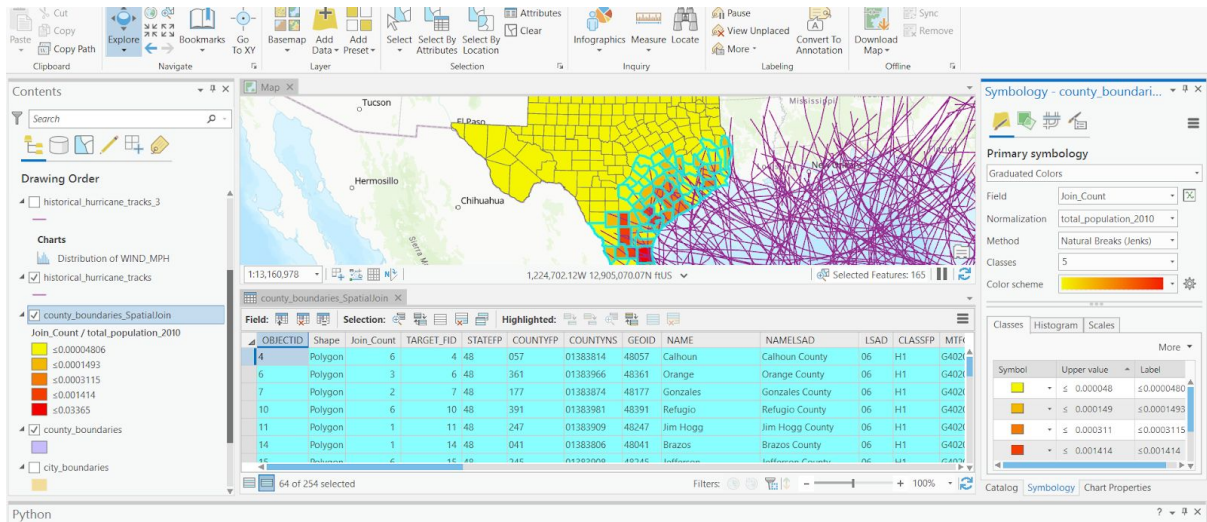
Part 2 – Finding out who has been affected

Create a new county boundary layer that only features the counties intersected by hurricane tracks. Use this new county boundary subset to create a choropleth map that highlights the counties' hurricane track counts normalized for the 2010 population. Overlay the hurricane tracks that intersect with Texas on top of the counties.

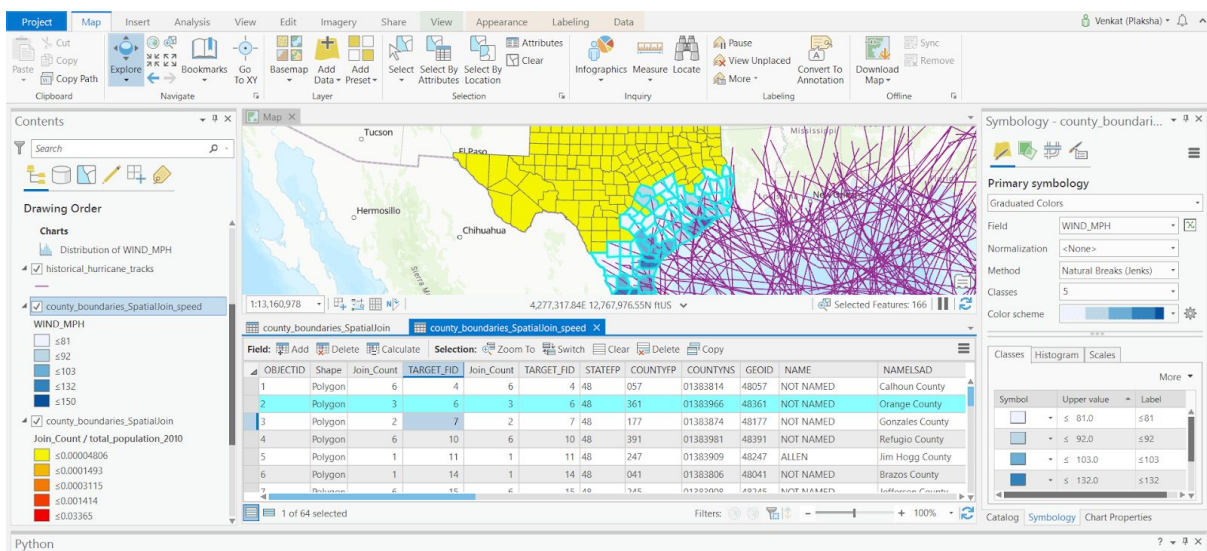
We first installed a driver to make the import of excel file compatible. Post installation, we were able to import the excel sheet on our map.

We used 'clear' to clear all previous selections for clarity. We then performed a Join from county boundary with the excel file on the common ID. Doing this, we were able to create a join with populated columns for the population.

We then moved on to open the Symbology pane and select the below seen graduated colours. We used the field as Join_Count and normalized the population. We left the method and class to their default values.



Create another map of the same counties, but this time highlighting the max wind speed.



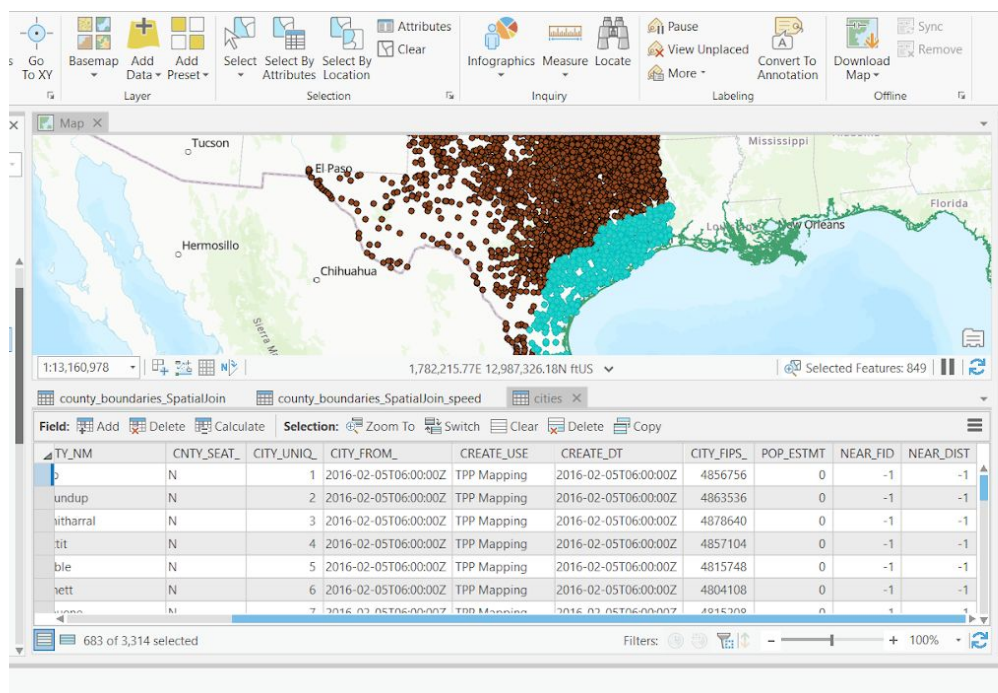
We performed another spatial join to get the 64 rows for which we open the Symbology pane again. This time we selected the field as wind and changed the graduated colours while

leaving the other parameters as they were. This created a graduated fill on our map where the dark blue areas have maximum wind speed.

Part 3 – Further investigating cities, populations, and shoreline

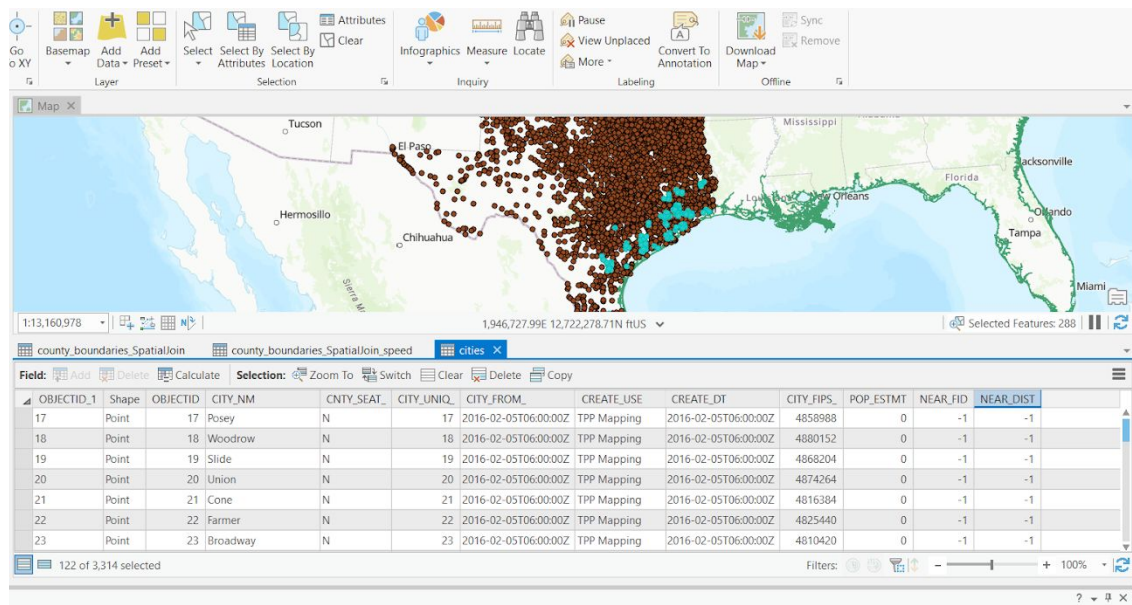
How many cities are within 100 kilometers of the coastline?

We used the geoprocessing tool named as near to find the cities within 100 km of the coastline. We selected the rows having near_dist not equal to -1 because we need to discard those rows and select others.

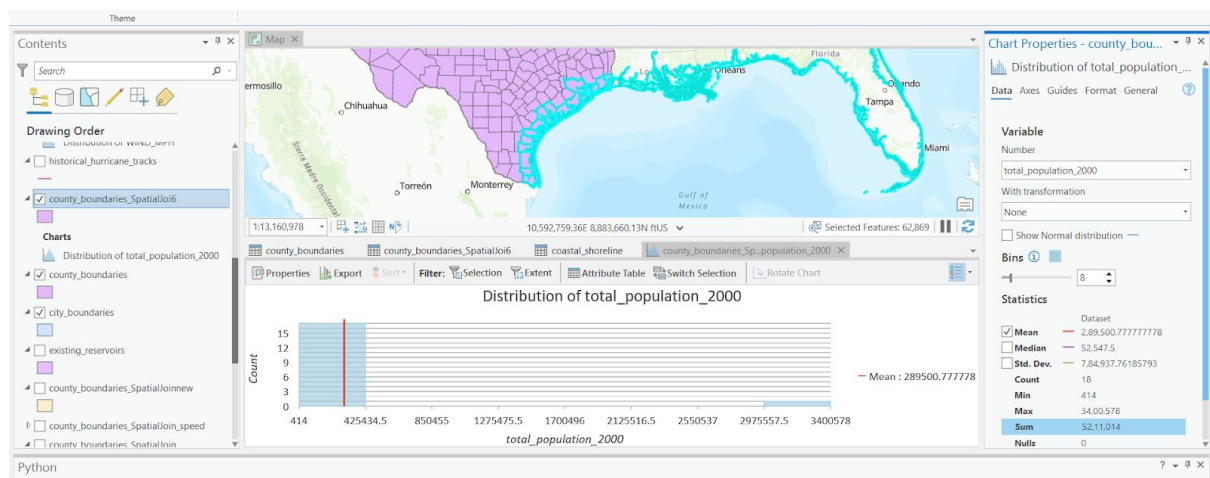


How many cities are within 100 kilometers of the coastline and are also within 10 kilometers of reservoirs?

With the selected 683 rows from above, we applied near tool and found cities within 10 km of reservoirs. We selected select layers by attribute from map and applied the selection on rows where near_dist is not equal to -1 to get the required answer.

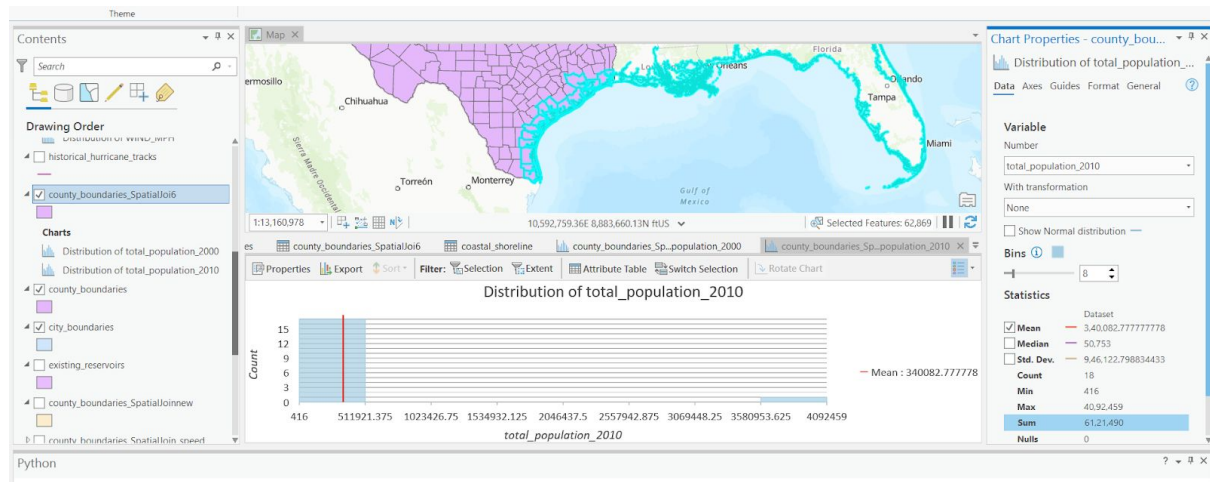


What was the total population in 2000 of the twelve counties that have a coastline on the Gulf?



We performed an intersection between the shoreline and county boundaries. We then used Select by Attribute layer tool to filter out the Gulf region. Lastly we right clicked on the Population column to 2000 to view the statistics. This enabled us to get the required sum.

What was the total population in 2010 of the twelve counties that have a coastline on the Gulf?



We then right clicked on the Population tab for 2010 to view the Statistics like we did for 2000 in the previous step. The sum displayed above is our final answer.

Data Sources

Data sources were provided by the professor.

Tasks performed

Part 1 and Part 3 second half was performed by Radhika

Part 2 and Part 3 first half was performed by Nikita