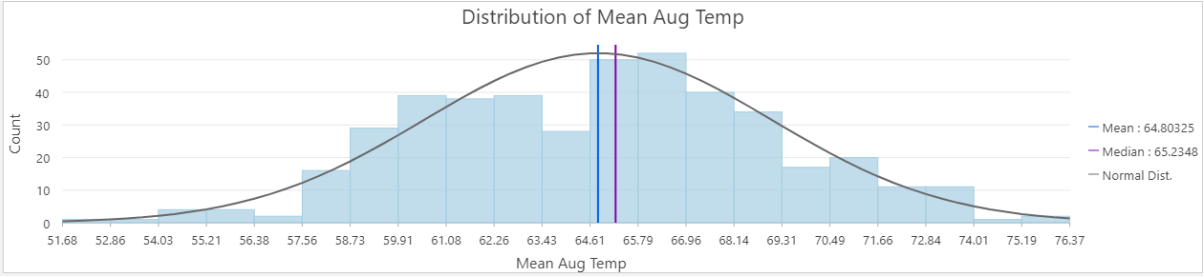
Laboratory 5 (Case Study 5)

Name: Jason Gates
Date: 06/18/2022
Engr 180 Summer 2022

OPEN the attribute table and answer: What types of data are in the attribute table (based off the column headers)? How many sites are there (what is the number of assets in the table/number of rows)?

- The data in the attribute table are object id, shape, NCDC_ID, GHCND_ID, StnName, Lat_DD, Lon_DD, Elev_Gnd_m, means/averages for each month and a global id. In other words, they have latitude and longitudes along with elevation, ids and names to classify data and means for each month in a year. There are 439 sites.

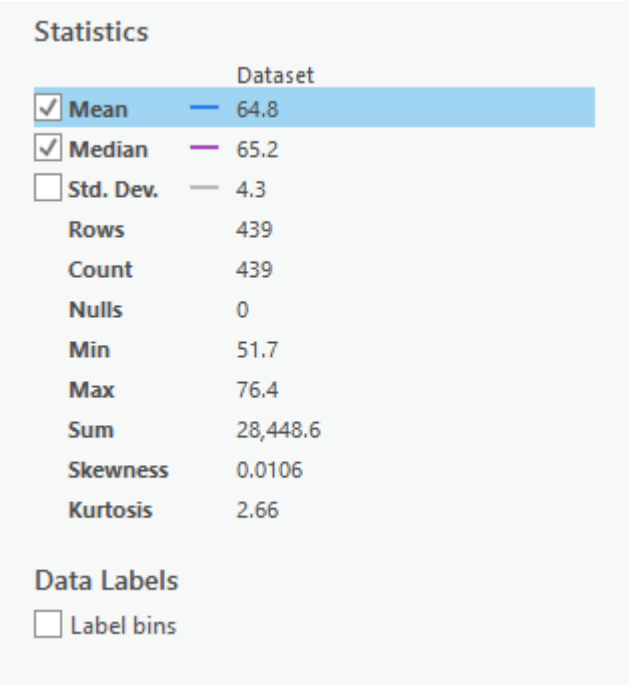
Submit a screenshot of the chart created for Mean Aug Temp with the mean, median, and normal distribution reference line. Based on a visual interpretation of the chart, are the values for Mean Aug Temp normally distributed?



- The data doesn't have a nice bell-curve shape with 95% of data fitting it. The mean and median values have to be the same for the dataset to be normally distributed and the mean and median are different in this case. However, the mean and median are only a value off so it is close to being normally distributed. The mean and median are almost same, but are slightly off which is why it isn't fully normally distributed and is just close to being normally distributed. Additionally, if the bars of data fit better into the normal distribution line and weren't poking out of it, I would say the data is normally distributed.

Part 4.3 Answer: Submit a screenshot of your statistical/numerical results. Explain in written format if the data are normally distributed based on your statistical/numerical results.

- The mean and median values have to be the same for the dataset to be normally distributed and the mean and median are different in this case. A standard normal distribution also has kurtosis of 3 and the kurtosis is slightly under 3 in this case. In this case, they are also close to normal distribution, but aren't fully normal distribution. If the kurtosis value was closer to 3 like 2.90, I would consider it to be a better candidate for being normally distributed. Additionally, if the mean and median values were very similar and were slightly different, I would also think it represents normal distribution. For example, if the mean was 64.3 and the median was 64.7, I would think it definitely represents normal distribution.



-

Part 5a Answer: Based on a visual interpretation of the chart, are the values for Mean Aug Temp normally distributed? Will the Mean Aug Temp values need to be transformed?

- Overall it follows the normal distribution line but is slightly off in some points. I think the values are close to normally distributed because of how close they are to be exactly the same as the normal distribution line. However, when you zoom into the graph, all the points align with the normal distribution line. This makes me think Mean Aug Temp is normally distributed, since all the points align with the normal distribution line. Even with it looking slightly off with the points when zoomed out, it still looks normally distributed or really close to be normally distributed. It doesn't necessarily need to be transformed since most of it fits the normal distribution. If there are any scattered or points away from the distribution line, then I would say it needs to be transformed.

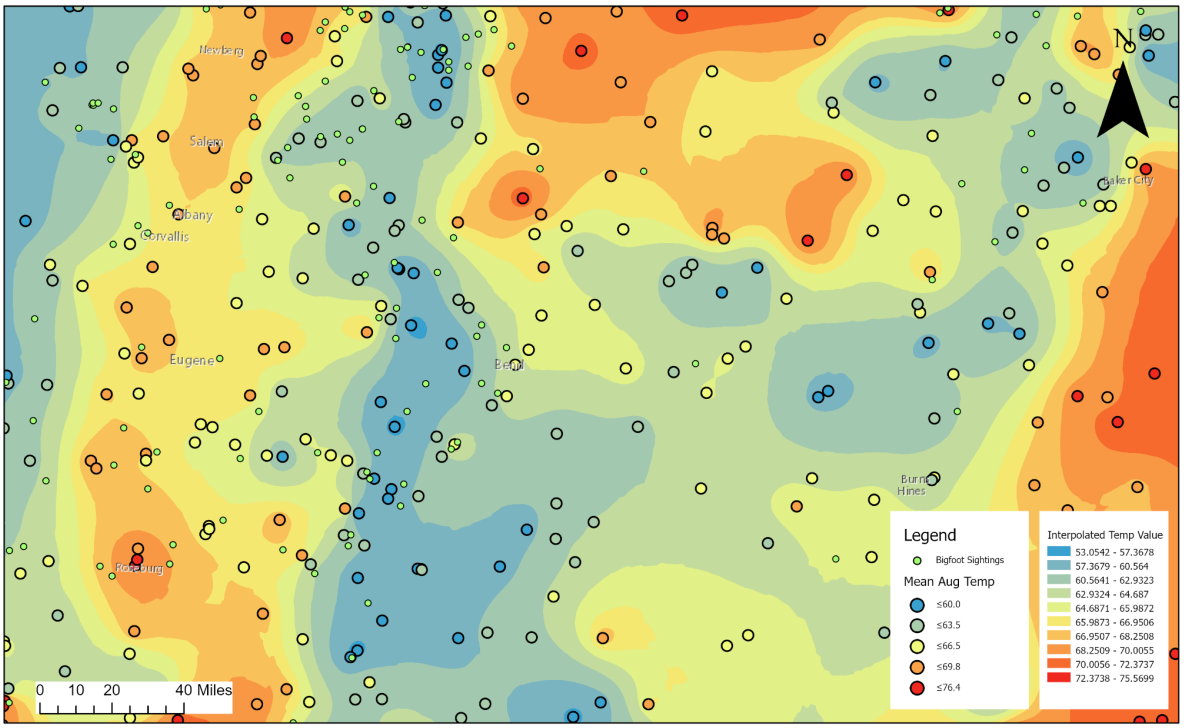
Part 5b: Submit a screenshot showing the spatial reference for this layer and Highlight or Circle the Units

Spatial Reference

Projected Coordinate System	NAD 1983 (2011) Oregon Statewide Lambert (Meters)
Projection	Lambert Conformal Conic
WKID	6556
Previous WKID	102969
Authority	EPSG
Linear Unit	Meters (1.0)
False Easting	400000.0
False Northing	0.0
Central Meridian	-120.5
Standard Parallel 1	43.0
Standard Parallel 2	45.5
Latitude Of Origin	41.75

Geographic Coordinate System	NAD 1983 (2011)
WKID	6318
Previous WKID	104145
Authority	EPSG
Angular Unit	Degree (0.0174532925199433)
Prime Meridian	Greenwich (0.0)
Datum	D NAD 1983 2011
Spheroid	GRS 1980
Semimajor Axis	6378137.0
Semiminor Axis	6356752.314140356
Inverse Flattening	298.257222101

Part 6: One production quality map using your interpolated data with added text box.



Map Description: The climate trends in this map show that Bigfoot will most likely appear in colder areas. This is because in the colder areas there are a significant amount of Bigfoot sightings than in hotter areas. The range of temperatures where Bigfoot was sighted the most are in between 53.0542 and 60.564. Bigfoot also appears in warmer areas, but less often than the colder areas. Additionally, Bigfoot tends to avoid hot areas.

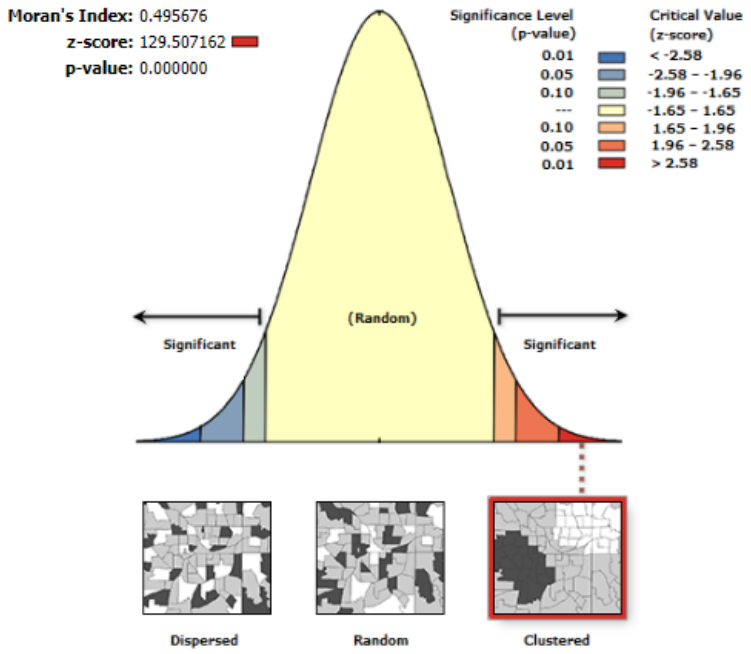
Best Temperatures and Areas to Find Bigfoot in Oregon

Created by Jason Gates
(6/19/2022)

Esri, HERE, NPS, Esri, HERE, Garmin, USGS, EPA, NPS

Part 7.4: A screenshot of your Spatial Autocorrelation Report for submission.

Spatial Autocorrelation Report



Given the z-score of 129.507162, there is a less than 1% likelihood that this clustered pattern could be the result of random chance.

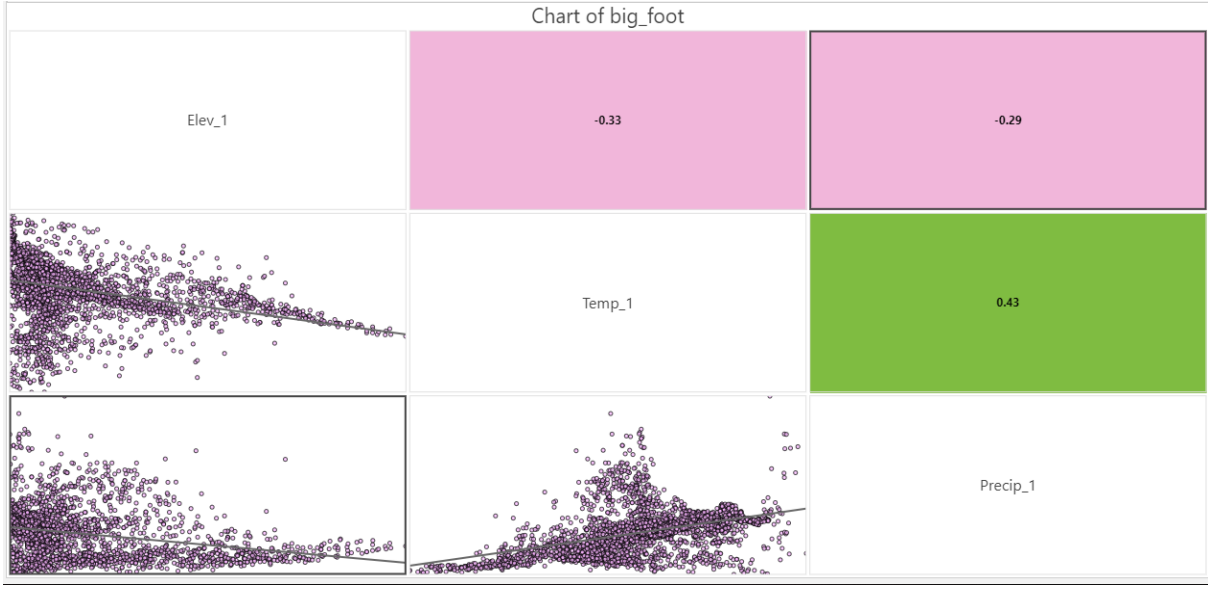
Global Moran's I Summary

Moran's Index:	0.495676
Expected Index:	-0.000291
Variance:	0.000015
z-score:	129.507162
p-value:	0.000000

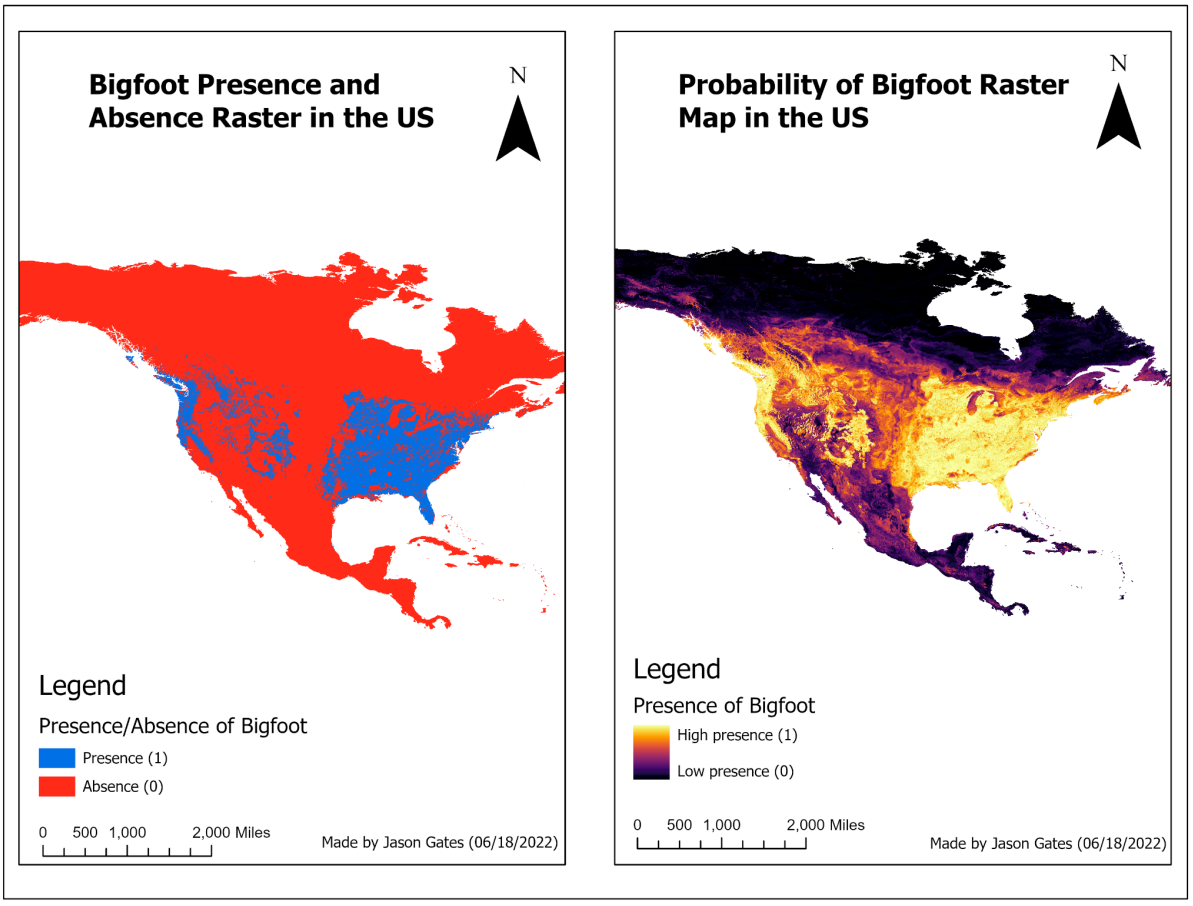
Dataset Information

Input Feature Class:	big_foot
Input Field:	PRESENCE
Conceptualization:	INVERSE_DISTANCE
Distance Method:	EUCLIDEAN
Row Standardization:	True
Distance Threshold:	771853.6975 Meters
Weights Matrix File:	None
Selection Set:	False

Part 7.5: A screenshot of your Plot Matrix



Part 12: Production quality map with TWO frames on ONE page and accompanying responses?



Answer the following [short 1-2 sentences answers are fine!]:

a. Where would you recommend BFRO take tourist for the best chance of spotting Big Foot?

- I would recommend any area that is blue on the BigFoot Presence and Absence Raster Map (Upper California, Oregon, Eastern section of United States etc). However, I would recommend colder areas in the United States like Oregon, since Bigfoot seems to be attracted to coldness rather than warmth.

b. How do you feel about the performance of your model- and why?

- The model looks questionable because the model shows Bigfoot possibly appearing in hot or warm places. This contradicts the theory that Bigfoot is attracted to cold areas and makes me question the validity of the dataset. This is shown when Bigfoot's presence is somewhat shown in the warmer parts of North America like California or parts of Mexico.

c. Considering that BigFoot is a cryptozoological creature (unknown, legendary, or extinct animals whose present existence is disputed or unsubstantiated), do you feel the model/map you created actually presents the potential distribution of Big Foot?

- Using the data provided I think the model and map shows the potential distribution of BigFoot, but is possibly very inaccurate. The data is most likely composed of false sightings, so it could possibly make the potential distribution inaccurate. However, I think this is the fault of the data and the data having inconsistencies like Bigfoot being in warmer environments causes me to question the potential distribution and the data.

i. What do you think the reported sightings of Big Foot may be (think of another large hairy animal in forests). Check out this journal article if nothing comes to mind (https://onlinelibrary.wiley.com/doi/10.1111/j.1365-2699.2009.02152.x)

- The reported sightings of BigFoot could have been sightings of an upright bear or wild upright dog/wolf. More specifically, these animals live in very similar conditions as Bigfoot. They both live in the cold and are present at low elevation. This means that any large or upright animal that lives in the cold and at low elevation could be mistaken as Bigfoot.

d. Beyond inaccurate species identification of Big Foot sighting data, what other types or errors or inaccuracies may exist in the BFRO sightings dataset (not your modeled distribution)? (think about GPS, bias, hoax, etc.)?

- In eastern areas of the United States, there is a large amount of people who believe in superstitious things like BigFoot, the Lochness Monster and Mothman. Additionally, these superstitions have history in the eastern United States. There is possible bias for BigFoot in those areas because the superstitions originated in those areas and there is a large amount of people who believe in it. Since there is a history of superstitions in that area, the large number of believers are more likely to be inclined to think that any random animal they see in the forest can be BigFoot.
- Another error involves the GPS and how the GPS has a harder time tracking forest areas. Bigfoot is known to reside in these forest areas and the trees block the signals from the GPS and makes it very difficult to track positioning. This means the GPS satellites could've taken poor images/poor data representing the environment since the signal was very weak and being blocked by the trees.

e. Lastly, what is your biggest takeaway from this assignment?

- My biggest takeaway from this assignment is how to use a model to exactly predict the distributions of an animal using data. I always wanted to know how map makers were able to make distributions and find areas where an animal

or in this case Bigfoot were possibly active in. I also enjoyed seeing and testing my model’s predictive power and was very informative.