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ENGR-180-01

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LAB4-1

<u>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)?</u>
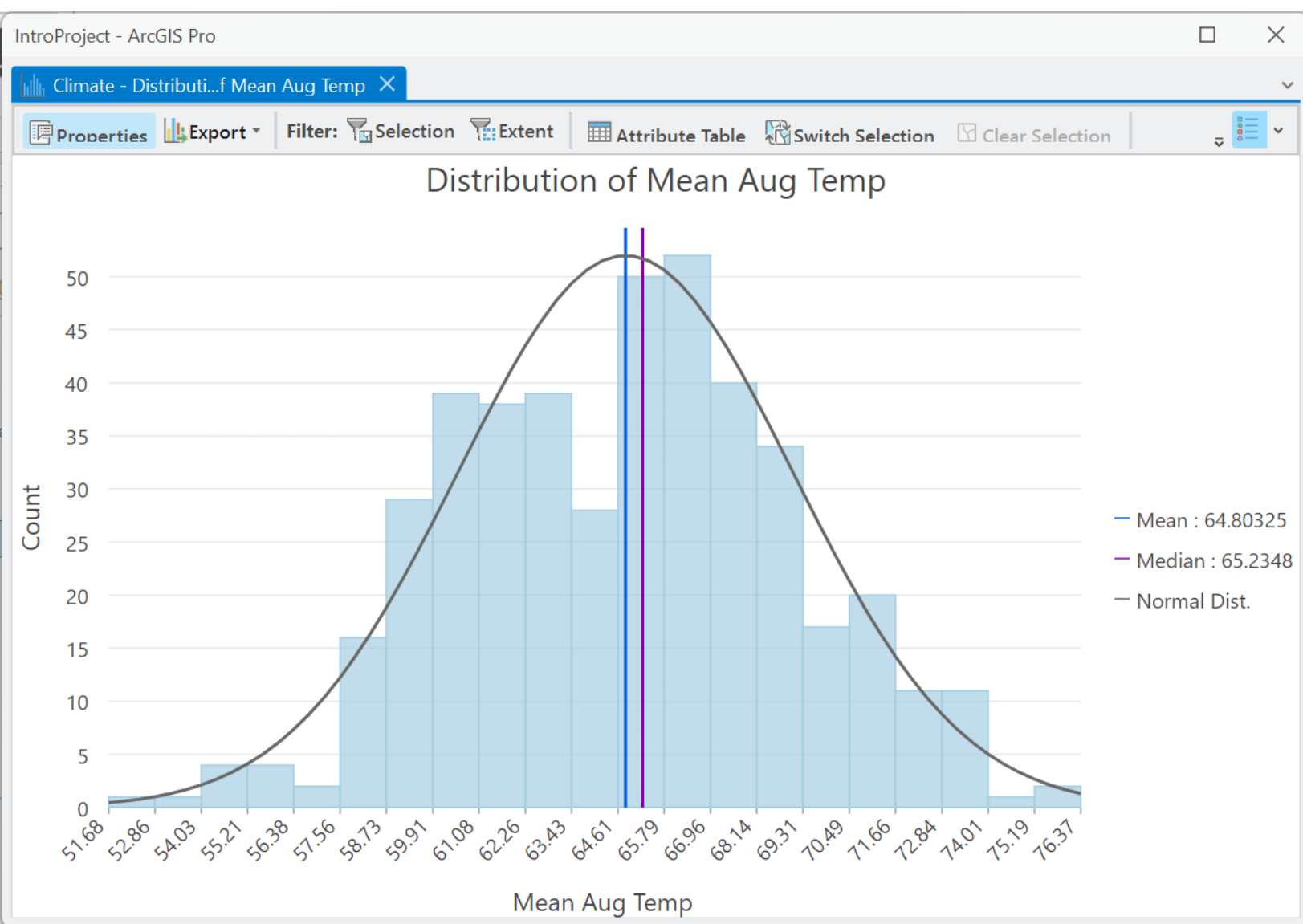
There are all kinds of data in the attribute table, relating to latitude, longitude, terrain data and even street name. There are roughly 439 sites (rows) in the table.
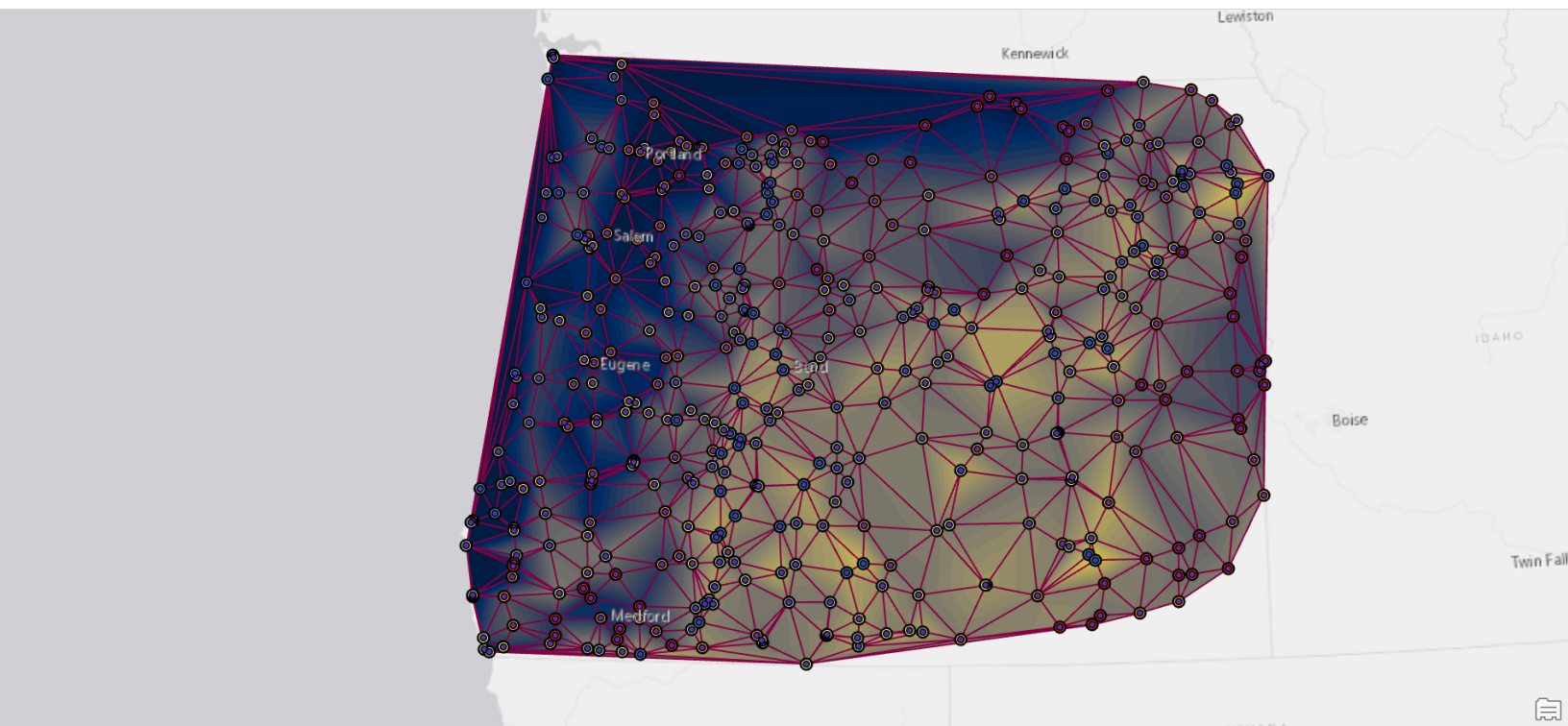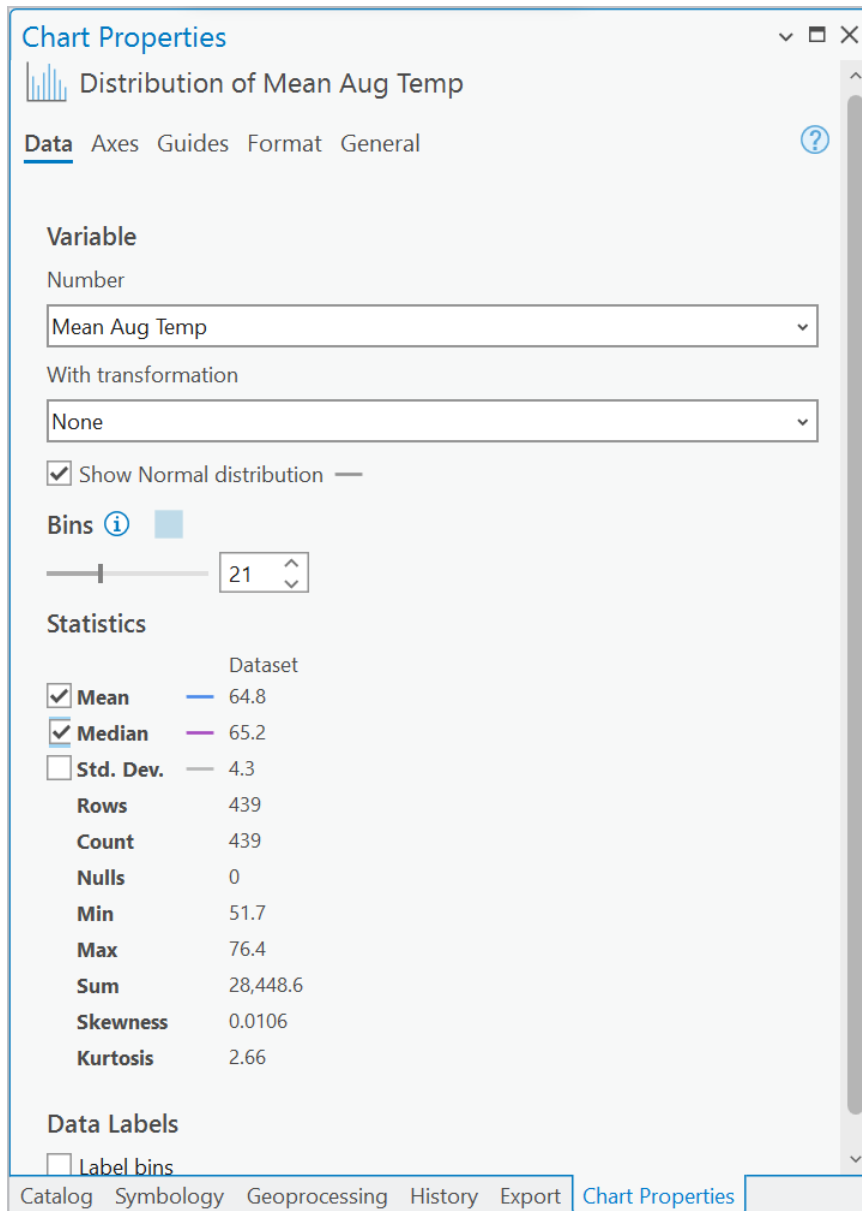


Above is a screenshot of my TIN surface with Edges on.

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 values for Mean Aug Temp are somewhat normally distributed although there are some

values that fall outside of the conventional normal distribution curve, like 61.08 on the Mean

Aug Temp chart falls outside of the normal distribution reference line. I have included the chart I

created for the Mean Aug Temp below.

**Chart Properties** ⌄ ▢ ✕

Distribution of Mean Aug Temp

**Data** Axes Guides Format General ⑦

**Variable**

Number

| Mean Aug Temp | ⌄ |

With transformation

| None | ⌄ |

☑ Show Normal distribution —

**Bins** ⓘ ▪

———|——— 21 ⌃⌄

**Statistics**

Dataset

| | | |
|---|---|---|
| ☑ **Mean** | — | 64.8 |
| ☑ **Median** | — | 65.2 |
| ☐ **Std. Dev.** | — | 4.3 |
| **Rows** | | 439 |
| **Count** | | 439 |
| **Nulls** | | 0 |
| **Min** | | 51.7 |
| **Max** | | 76.4 |
| **Sum** | | 28,448.6 |
| **Skewness** | | 0.0106 |
| **Kurtosis** | | 2.66 |

**Data Labels**

☐ Label bins

Catalog   Symbology   Geoprocessing   History   Export   Chart Properties

Based on the results, I can say that the data is normally distributed because the skewness for a normal distribution is always zero, and the skewness for this data falls in that category as well, since it is a positive value, we can tell it is skewed to the right, we can also tell that the data is

normally distributed because the Kurtosis for a standard normal distribution is three, but since the Kurtosis for this data is 2.66 which is close to the expected value of three, it also falls under the category of normally distributed. *("1.3.5.11. Measures of skewness and kurtosis," n.d.)* .

<u>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?</u>
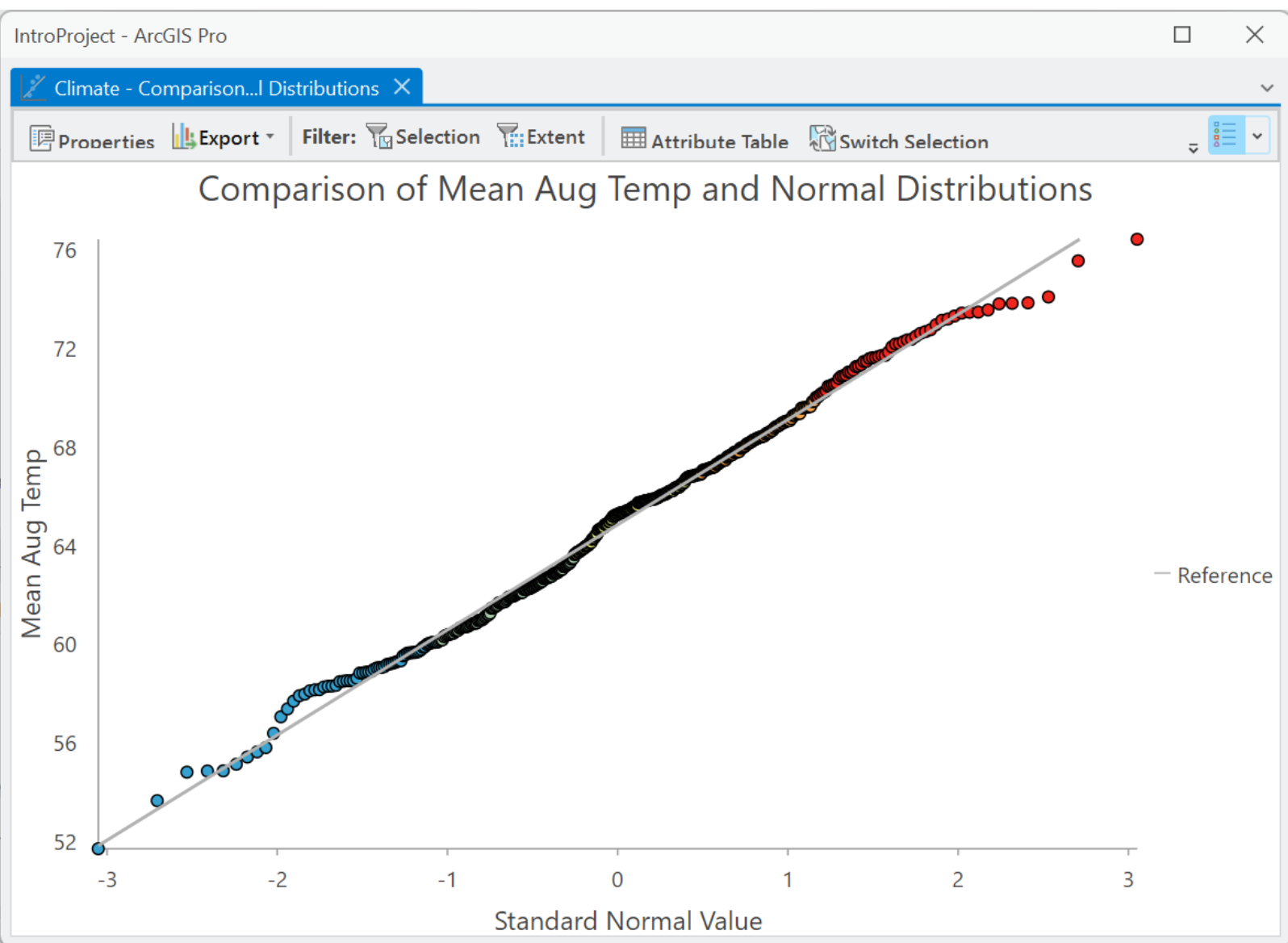
Based on a visual interpretation of the chart (QQ plot above) I believe the values for the Mean

Aug Temp are not normally distributed and they will need to be transformed, especially the

values that are on the ends of the plot, they will need to be transformed to fit a little closer to the

reference line.

Submit a screenshot showing the spatial reference for the Climate layer and highlight/circle the

units.

| Layer Properties: Climate | | | |
|---|---|---|---|
| General | **Spatial Reference** | | |
| Metadata | | | |
| **Source** | Projected Coordinate System | NAD 1983 (2011) Oregon Statewide Lambert (Meters) | |
| Elevation | Projection | Lambert Conformal Conic | |
| Selection | WKID | 6556 | |
| Display | Previous WKID | 102969 | |
| Cache | Authority | EPSG | |
| Definition Query | Linear Unit | Meters (1.0) | |
| Time | False Easting | 400000.0 | |
| Range | False Northing | 0.0 | |
| Indexes | Central Meridian | -120.5 | |
| Joins | Standard Parallel 1 | 43.0 | |
| Relates | Standard Parallel 2 | 45.5 | |
| Page Query | 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 | |

OK     Cancel

1 . Explain why there are differences in the two climate layers you interpolated. How/why does the method influence the visual result? Be specific to this dataset.
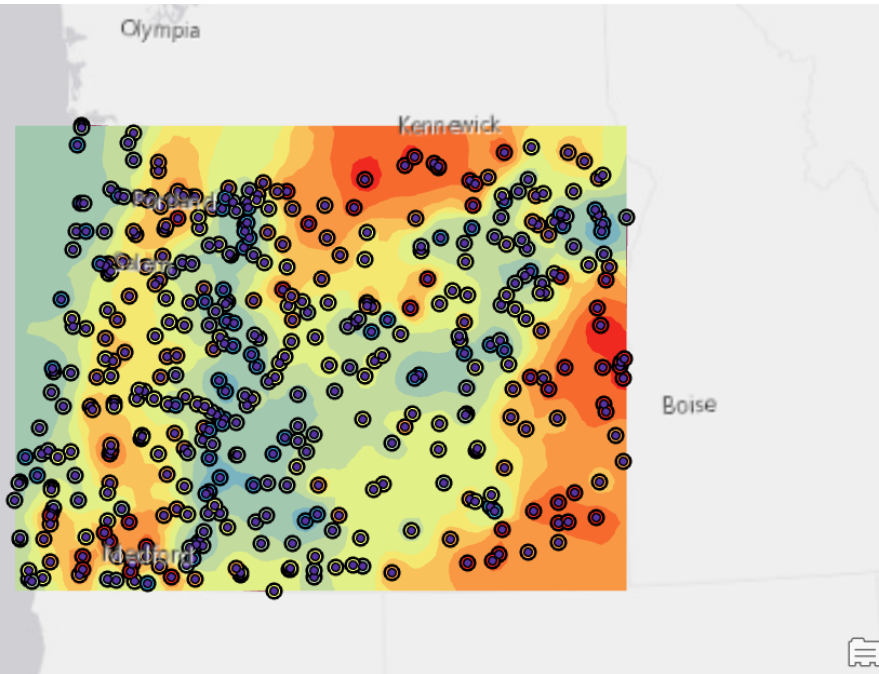


Climate-IDW
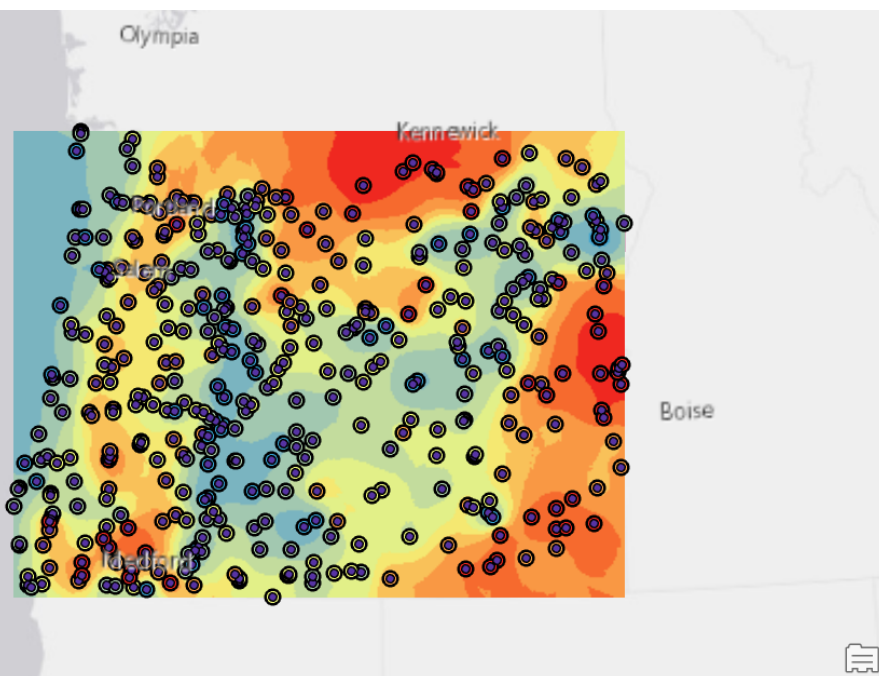


Climate-Kriging
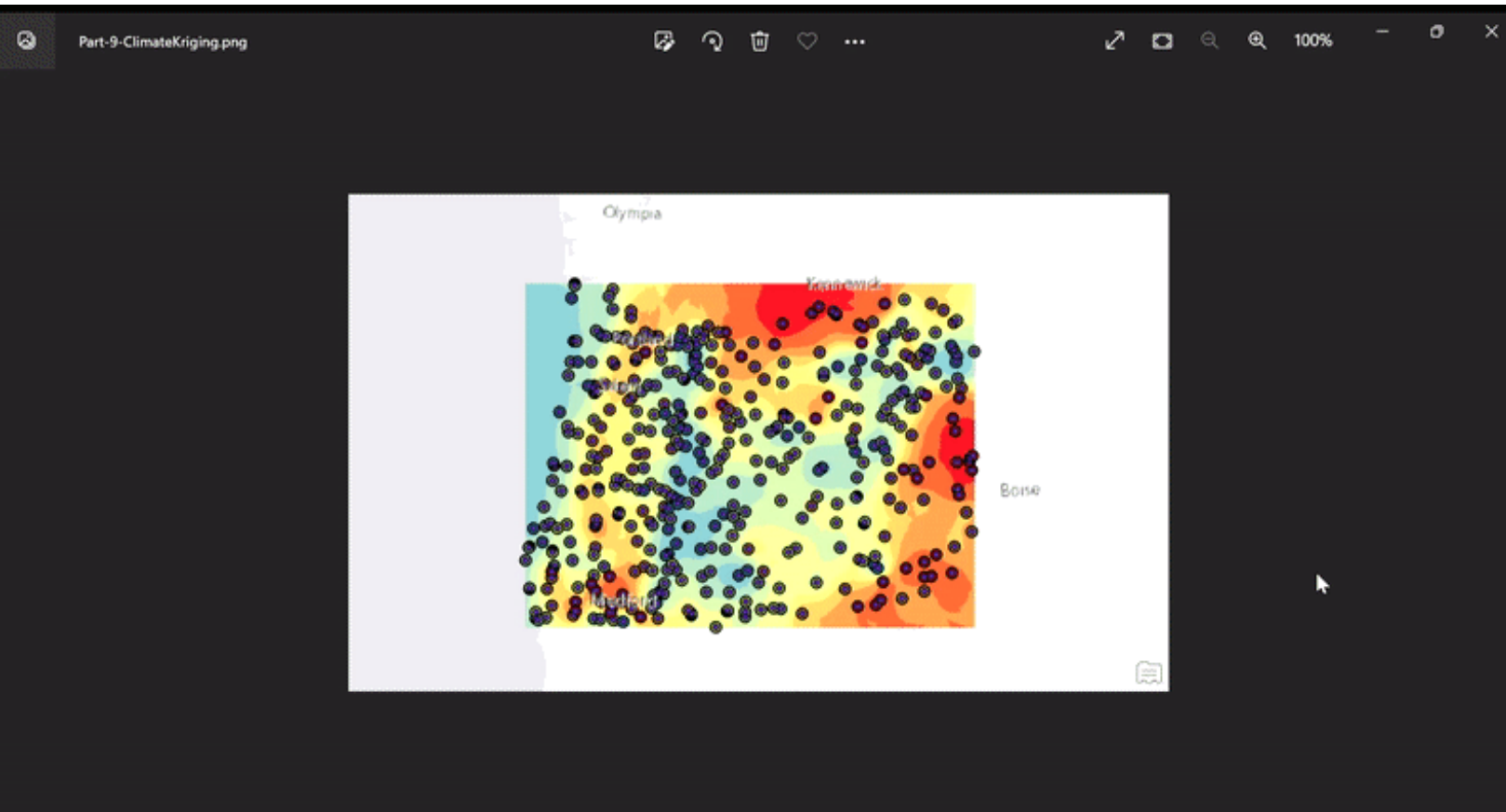
The difference between the IDW and Kriging climate layers from a visual perspective in this dataset is that, the Kriging climate layer seems to be able to find and highlight similar areas better than than IDW climate layer can, this is due to the fact that the Kriging layer highlights are darker and cover a lot more areas than the IDW layer informed us with. The method influences the result because IDW calculates the unknown values (for interpolation) based on taking averages of the nearest values, so it makes sense that the areas it informed us with are lighter in comparison to the areas that the Kriging layer highlighted, Kriging which is much advanced than IDW, creates a weighted average of the data that, with increasing distance between the point at which the surface is estimated and the locations of the data points, returns an estimate of the

underlying surface. ("Kriging," 2013) So it also makes sense as to why the Kriging layer is so detailed.

2. Describe how the two climate layers correspond to the interpolated Elevation TIN we made, particularly change in temperature correlating/corresponding to elevation.

The two climate layers correspond to the interpolated elevated TIN model from earlier in that the two layers both show the parts of the map that are hot and cold with the heat being represented with red hue blobs and the cold with blue hue blobs. In the TIN model this is demonstrated with the triangles and in those triangles it shows the areas with heat as deep blue as this is where the lower elevation on the coast meets the ridge, and areas with cold climate with brown colour triangles as these are the higher elevation areas.

3. Do ClimateKriging and ClimateIDW communicate the same message to your map reader? Explain your reasoning.

I believe ClimateIDW and ClimateKriging communicate the same message to the map reader in that the two are both highlighting the same areas and with a union of both there would be very little difference, because the message they're trying to get across is the climate zones in Oregon and any reader can infer the zones that have been highlighted as cold/hot.

4. Can we use TIN interpolation on the climate data, in addition to kriging and IDW? Why or why not?

Yes we can use TIN interpolation on the climate data, in addition to Kriging and IDW, as these are all interpolation methods used to predict values at specific locations, the real question comes when deciding on which has the best prediction, for this climate dataset I believe Kriging was the best method because it returned results that were more accurate and it was better suited for this dataset, whereas TIN interpolation is best for terrain or elevation estimation.

Works Cited

1.3.5.11. Measures of skewness and kurtosis. (n.d.).

https://www.itl.nist.gov/div898/handbook/eda/section3/eda35b.htm

Kriging. (2013, January 11). Geographic Information Systems (GIS) in Public Health Research.

https://www.hsph.harvard.edu/gis/arcgis-tips/kriging/