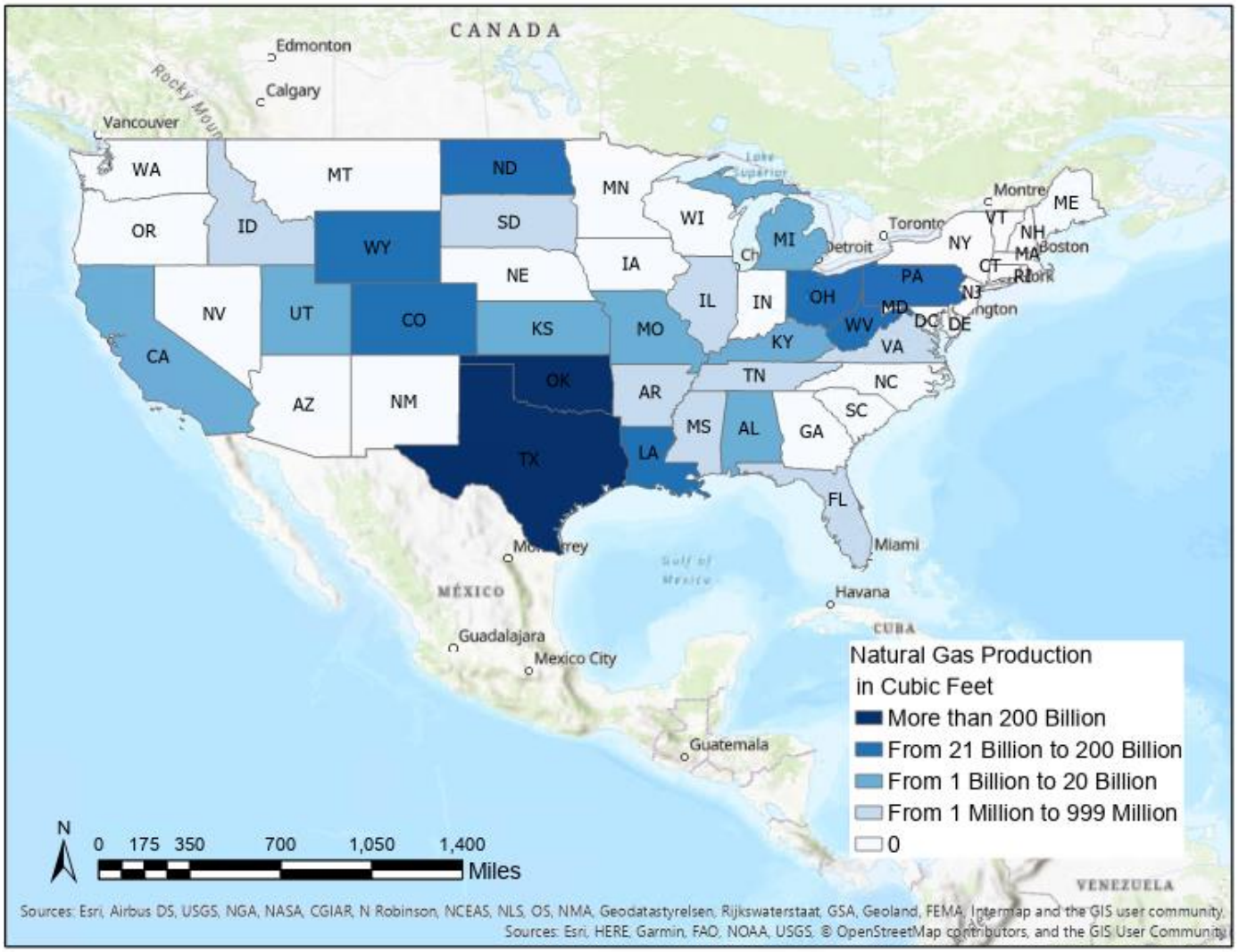
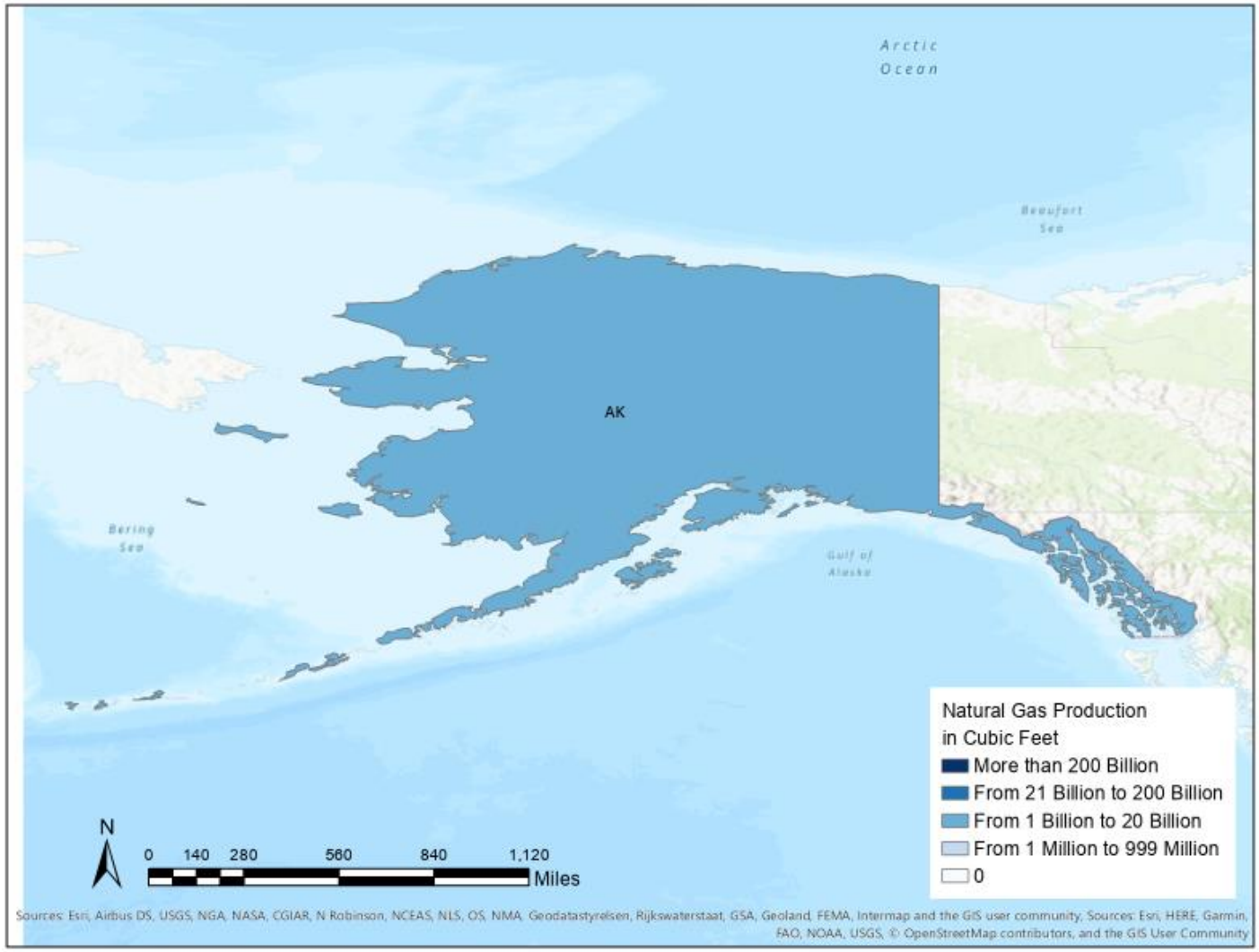
Story Telling - Visualizing Amounts

Figure 1. Natural Gas Production by State, 2019



Source: *Author's elaboration with data from the Energy Information Administration*

Figure 2. Natural Gas Production by State (AK), 2019



Source: *Author's elaboration with data from the Energy Information Administration*

The relevant points of this data visualization are:

- The main purpose of Figure 1 is to visualize amounts comparing the natural gas production by State in 2019 by creating 5 groups among the states.
- As indicated in this map, only Texas and Oklahoma produced more than 200 billion cubic feet (bcf) of natural gas in 2019.
- Wyoming, Colorado, North Dakota, Ohio, Pennsylvania, and West Virginia comprise the second group of largest producers; the states in this group produced from 21 bcf to 200 bcf.
- California, Utah, Kansas, Missouri, Alabama, Kentucky, and Michigan comprise the third group of states by natural gas production; these states produced between 1 bcf and 20 bcf.
- The rest of the states produced less than 1 bcf.
- Market power is the capacity of a State to affect the natural gas price if a shock in any of its determinants is presented.
- An analysis of this map can provide a first insight in identifying states that could potentially have market power.

I used natural gas production data by state in 2019 from the Energy Information Administration (EIA) at the website (https://www.eia.gov/dnav/ng/hist/n9050tx2M.htm).

I displayed the amounts of natural gas production using a Geographical Information Systems (GIS) approach.

I presented in Table 1 the six Tufte's principles recommended for a data visualization along with a description of each principle. Additionally, I indicated which of these principles I used when creating Figure 1 and explained their applications.

Table1. Tufte's Principles applied in Figure 1

Tufte's Principles	Figure1	Detailed description	Application
Show comparisons	✓	Making comparisons is helpful in identifying magnitude visually	This map is comparing the natural gas production by state in 2019 by grouping the states according to their production.
Show causality	✓	The data visualization could have as major goal to show causality. How a variable cause another visually could provide a first insight in identifying causation.	With this map it can be observed a first insight on the impact of contiguity of two of the largest producer states of natural gas. Therefore, location and contiguity can be a factor causing the natural gas production of Texas and Oklahoma. A further analysis must be taken into account to test this statement.
Use multivariate data	✓	Use multiple variables to accomplish the goal of the data visualization	This data visualization uses state as categorical variable and natural gas production in cubic feet as continuous variable.
Completely integrate text, images, and numbers.	✓	Integrate relevant notes, remarks, and images to better inform your audience about the information you want to communicate	This map integrates labels, to denote the natural gas production by state. I also added a north arrow, the scale, and the legend indicating the natural gas production groups.
Establish credibility	✓	One form to establish credibility is to include the data source and also start from the origin or allow the reader to identify the scale you are using	The source is included at the end of the map and it is mentioned at the description of the data visualization
Focus content	✓	Use space efficiently and avoid *chartjunk* by including relevant data to communicate your idea and stress on your main goal of your data visualization.	For visualization purposes, I separated Alaska and plotted it in a separate map as recommended by Wilke. I needed to include the legend, north arrow and scale to be consistent with the other map.