CARTOGRAMS AND THEMATIC MAPS- Choropleth & Isopleth

A **cartogram** (also called a **value-area map** or an **anamorphic map**, the latter common among German-speakers) is a thematic map of a set of features (countries, provinces, etc.), in which their geographic size is altered to be directly proportional to a selected variable, such as travel time, population, or Gross National Product. Geographic space itself is thus warped, sometimes extremely, in order to visualize the distribution of the variable. It is one of the most abstract types of map; in fact, some forms may more properly be called diagrams. They are primarily used to display emphasis and for analysis as nomographs.[1]

Cartograms leverage the fact that size is the most intuitive visual variable for representing a total amount. In this, it is a strategy that is similar to proportional symbol maps, which scale point features, and many flow maps, which scale the weight of linear features. However, these two techniques only scale the map symbol, not space itself; a map that stretches the length of linear features is considered a linear cartogram (although additional flow map techniques may be added). Once constructed, cartograms are often used as a base for other thematic mapping techniques to visualize additional variables, such as choropleth mapping.

A **thematic map** is a type of map that portrays the geographic pattern of a particular subject matter (theme) in a geographic area. This usually involves the use of map symbols to visualize selected properties of geographic features that are not naturally visible, such as temperature, language, or population. In this, they contrast with general reference maps, which focus on the location (more than the properties) of a diverse set of physical features, such as rivers, roads, and buildings. Alternative names have been suggested for this class, such as *special-subject* or *special-purpose maps*, *statistical maps*, or *distribution maps*,

but these have generally fallen out of common usage. Thematic mapping is closely allied with the field of Geovisualization.

Thematic Maps

•Thematic maps can be tricky, there are many different kinds.
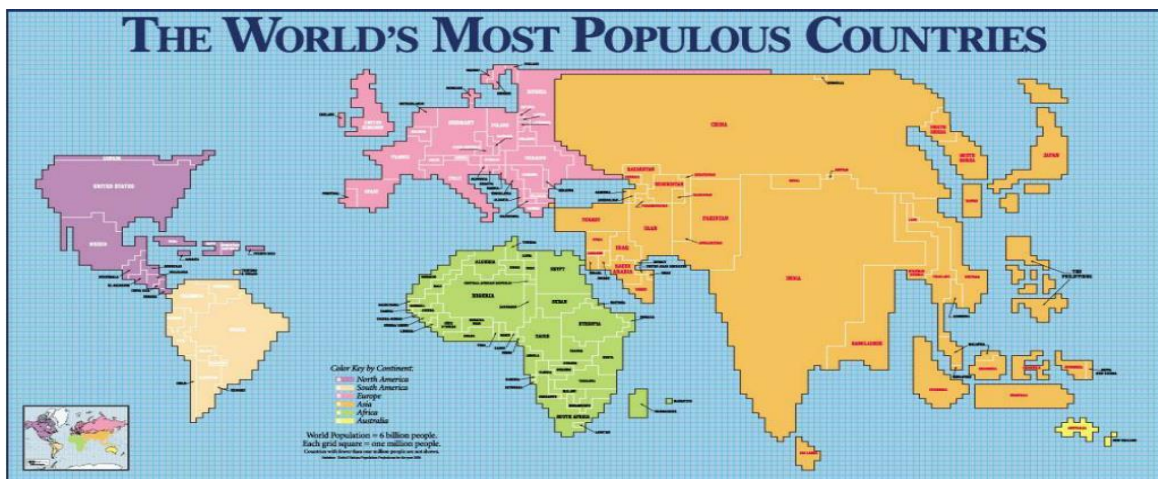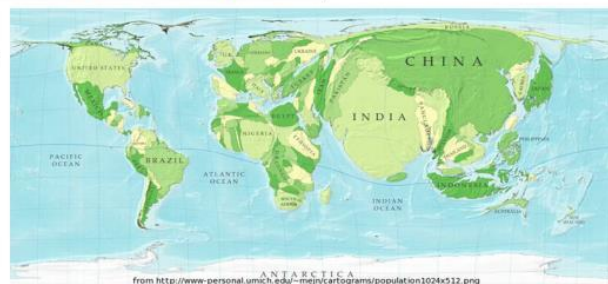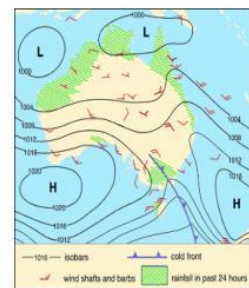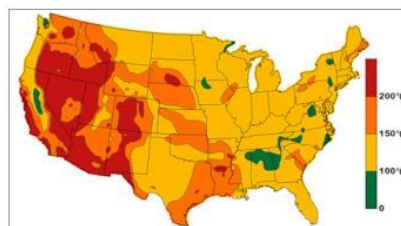•They all do the same thing... they **show information**

Some common thematic maps:
•Population maps
•Weather maps
•Resource maps
•Topographic maps

How data and values are displayed:
•**Choropleths** use differences in shading or color to show variables.

•**Cartograms** represent map feature surfaces in such a way, as to make them proportional to a given statistical variable.

For example, the above figure is a Cartogram of World Population

-notice countries are in accurate relative locations compared to other countries

-color used here to simply distinguish continental areas, however, color schemes may be used to differentiate data

Several types of thematic maps have been invented, starting in the 18th and 19th centuries, as large amounts of statistical data began to be collected and published, such as national censuses. These types, such as choropleth maps, and chorochromatic maps, use very different strategies for representing the location and attributes of geographic phenomena, such that each is preferable for different forms of phenomena and different forms of available data. A wide variety of phenomena and data can thus be visualized using thematic maps, including those from the natural world (e.g., climate, soils) and the human world (e.g., demographics, public health)

CHOROPLETH AND ISOPLETH MAPS

Choropleth maps represent data values in geographic areas with different colors and patterns. Data is categorized into classes, with each class assigned a unique color or pattern.

For example, if you're mapping sale data you could classify any sales amount under $5000, yellow, amounts between $5000 and $10,000 orange, and amounts over $15,000 red. Those colors are then used for different sales territories so users instantly know which category a territory falls into.
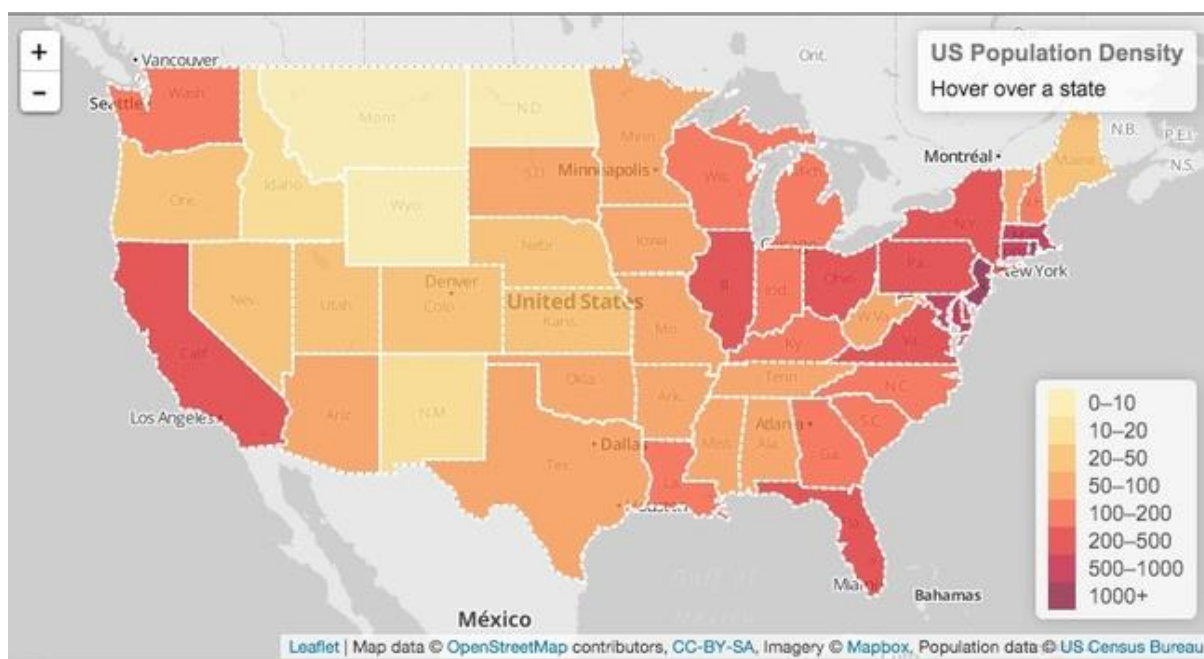
Choropleth Maps Are Best Used For:

- Measuring Population Density and Total Population
- Visualizing Sales Volume and Revenue
- Measuring Demographics (Education, Housing, Per Capita Income, Labor, etc.)

Advantages of Choropleth Maps

- Choropleth maps color-code your data into classes, making it a snap to **understand large volumes of data quickly**—even when visualizing data for multiple regions.

- Because they are so widely-used, choropleth maps mean virtually **no time wasted on explanation or specialized training**.
- Choropleth maps are **fast and simple to prepare**, especially with software like Maptive.

Disadvantages of Choropleth Maps

- Choropleth maps are better suited for generalized data and breadth than specific figures.
- Because data classes are determined by the map's creator, choropleth maps can manipulate data to mislead people in the wrong hands.

Isopleth Maps

Isopleth maps use colors and shades to represent data, similar to choropleth maps. However, they differ in that data isn't grouped within predefined boundaries such as census tracts, counties, or states.

Instead, iso lines divide the map into different areas and show where data levels change.
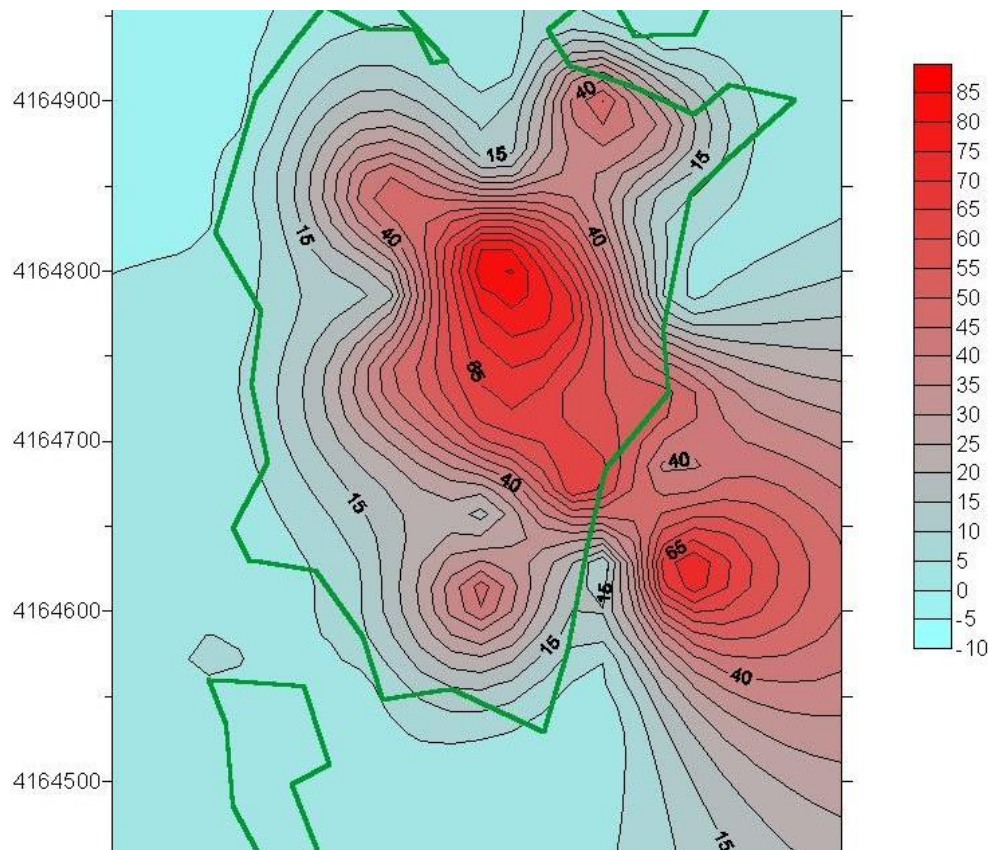
Isopleth Maps Are Best Used For:

- Mapping Weather and Climate Patterns
- Visualizing Data for Large Regions (Countries, Continents, etc.)
- Measuring Change Over Time or Distance

Advantages of Isopleth Maps

- Isopleth maps are well-suited for **large-scale analysis**, allowing you to map data without boundaries like state, county, zip code, etc.
- Isopleth maps are the **best thematic maps for natural data** like rainfall, temperature, elevation, and other climate variables.

Disadvantages of Isopleth Maps

- Since Isopleth maps visualize trends over large regions, they are prone to over-generalization and lack the ability to account for sudden or atypical results.