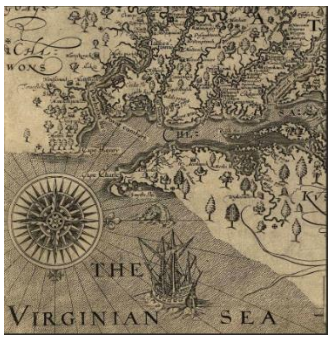
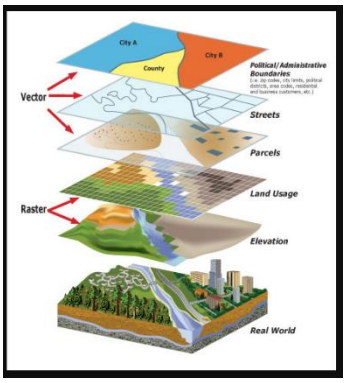
Handout 1.7 GIS Mapping



When Captain Smith created his historic map, it was an effort to tell a geographic story on the face of a map. Although we do some of this with present day paper maps, modern mapping systems "layer" information so that a more complete story can be told and graphic analysis can be more easily carried out.

Maps tell a story: They can summarize a situation, trace a route, and show change over time. They can examine causes and effects and reveal interrelationships. They can show patterns of movement and compare and contrast places. They can help people make plans, predict or model the future, and support decisions. They can explain, reveal, and propagandize. A Watershed map tells us about the movement of water from the land through small streams to a larger body of water that define the watershed and then to the next watershed and eventually to either a closed basin or the ocean. Watershed maps can also tell us about the condition of the land that makes up the watershed and the quality of the water that flows through the streams and eventually the main water resource within the watershed. The story that maps tell is mainly through spatially associated layers of data.



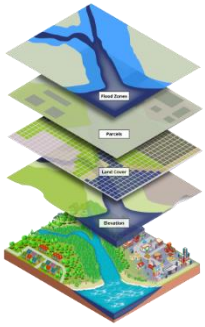
Geographic Information Systems (GIS) store, analyze, and visualize data for geographic positions on Earth's surface. GIS stands for **Geographic Information Systems** and is a computer-based tool that examines spatial relationships, patterns, and trends in geography. It was used back in 1854 (without computers of course!) to **<u>map a disease outbreak</u>** in the City of London. Fundamentally, we still use this type of spatial analysis today but in a more sophisticated way.

GIS mapping produces visualizations of geospatial information.
The 3 main ideas of Geographic Information Systems (GIS) are:

- ✓ Create geographic data.
- ✓ Manage it in a database.
- ✓ Analyze and find patterns.

Because viewing and analyzing data on maps impacts our understanding of data, we can make better decisions using GIS. It helps us understand **what** is **where**. The analysis becomes simple. Answers become clear.
Because you don't fully understand your data until you see how it relates to other things in a geographic

Data without spatial reference doesn't provide geographic context. And without geographic context, you can't fully understand the world that we live in today. That's why we need Geographic Information Systems (GIS) and how come it's making a substantial impact in our daily lives (that you may not even notice).



A Geographic Information System (GIS) is a computer system that analyzes and displays geographically referenced information. It uses data that is attached to a unique location. Most of the information we have about our world contains a location reference: Where are USGS stream gages located? Where was a rock sample collected? Exactly where are all of a city's fire hydrants? If, for example, a rare plant is observed in three different places, GIS analysis might show that the plants are all on north-facing slopes that are above an elevation of 1,000 feet and that get more than ten inches of rain per year. GIS maps can then display all locations in the area that have similar conditions, so researchers know where to look for more of the rare plants. By knowing the geographic location of farms using a specific fertilizer, GIS analysis of farm locations, stream locations, elevations, and rainfall will show which streams are likely to carry that fertilizer downstream. These are just a few examples of the many uses of GIS in earth sciences, biology, resource management, and many other fields.