Introduction to GIS

Geographic Information Systems (GIS)
GIS Basics

- GIS uses computer programs to collect, store, analyze, and share geographic data.
- GIS allows users to view relationships and identify patterns more easily with different layers.

Source: Adapted from ESRI
GIS Layers

• Layers are different bits of data that are placed on top of each other
  – GIS uses two or more layers to identify patterns and relationships
Understanding Patterns and Relationships

• Spatial Patterns: Identifiable connections that are repeated
  – Ex. Metro areas more typically vote Democrat, while rural areas vote Republican
Understanding Patterns and Relationships

• Spatial Relationships: Connections between different data sets as connected to their physical geographic locations
  – Ex. The SW United States experiences more immigration from Latin America, while the NE has more Immigrants from Canada
Examining Scale

• Scale is the size of the area being examined
  – Large Scale: Small area, large amounts of detail
  – Small Scale: Large area, small amounts of detail

• Scale is representation between map and real world proportions
Functions of GIS: Collect Data

- Use of technology like spreadsheets or GPS programs to collect geographic data
  - In the form of Latitude and Longitude Coordinates, Addresses, or Geographic Areas (counties, states, neighborhoods, etc...)

- Specialized databases used to manage and access data
  - Many “cloud based”
Functions of GIS: Display Data

- GIS programs allow geographic data to be shown in a number of different formats
  - Web based interactive maps
  - Static web maps
  - Printable maps
- Allows the easy display of findings and geographic information
Functions of GIS: Analyze Data

• Data can be compared to other layers to find relationships and patterns
• Can change and manipulate layers to see connections better and look for relationships
• Answer geographic questions
Functions of GIS: Share Data

• Can share data publically or privately
  – With everybody, or within an organization
• Quick easy display of data
  – Share pictures, links, or on social media
Industries Using GIS

- Business
- Government
- Health and Human Services
- Natural Resources
- Public Safety
- Transportation
- Utilities and Communication
Sources

- https://uspatial.umn.edu/
- http://www.esri.com/