

The Fundamentals of GIS and Real World Applications



The World at Your Fingertips

Presenter: Katrina Patton

*“The application of GIS is limited only by the
imagination of those who use it”.*

Jack Dangermond, Esri



What is GIS?

- A geographic information system (GIS) lets us visualize, question, analyze, and interpret data to understand relationships, patterns, and trends.
- GIS benefits organizations of all sizes and in almost every industry.
- Let's break it down.



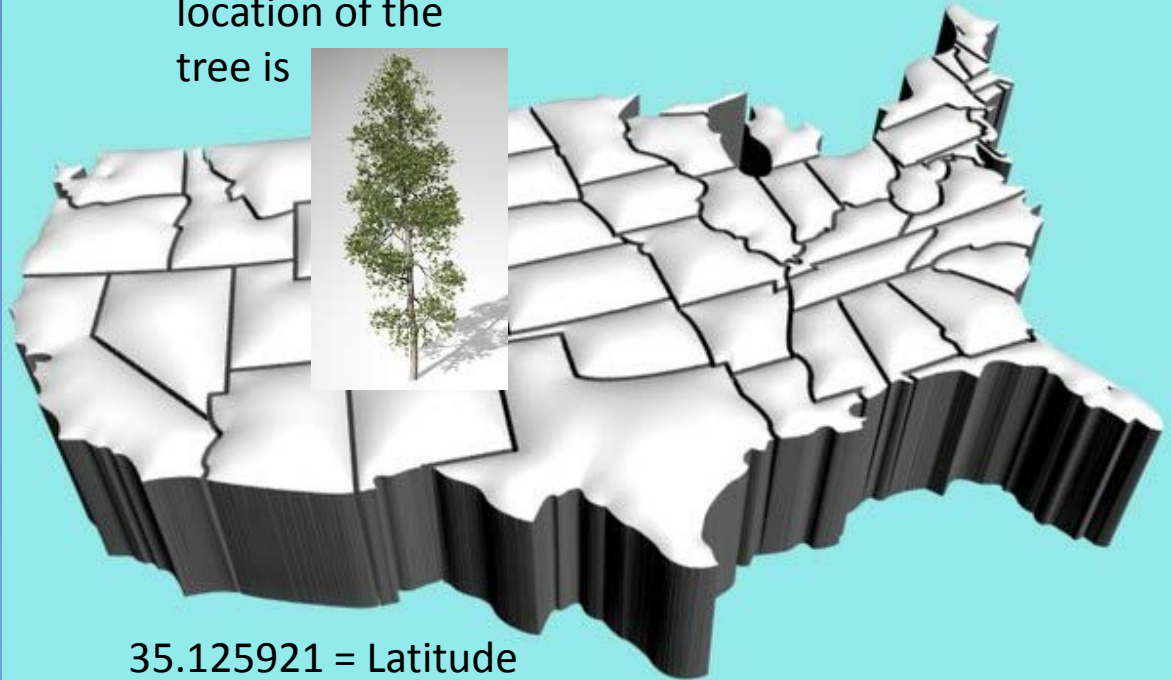
G - Geographic

- Geographic location - It is a spatial location that describes where something is physically located, using the geographic coordinate system. GCS consists of a latitude (y) coordinate and longitude (x) coordinate.
- All objects have an x and y location on earth. You have a geographic location though your position is constantly changing as you move around.



Example

The geographic location of the tree is



Tree

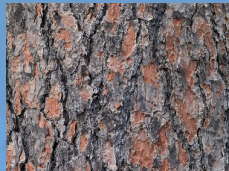
35.125921 = Latitude
-106.434002 = Longitude

Latitude is the Y axis, longitude is the X axis



I - Information

- Information about the object, the tree.





Example

- Species – Ponderosa Pine
- Description – An evergreen, open-branched tree native to western North America, adapted to well drained soils in Arizona and New Mexico
- Cones – Reddish to yellow-brown elliptic cones
- Seeds – Winged brown-purple
- Height – 75'
- Condition of tree – poor, fair, good, excellent
- And any other information you might want to collect about the tree





S – System(s)

- All the information about the tree is contained in a database which is attached to the geographic location.
- Put geographic and information together and they encompass a system.
- They work together to create the whole.



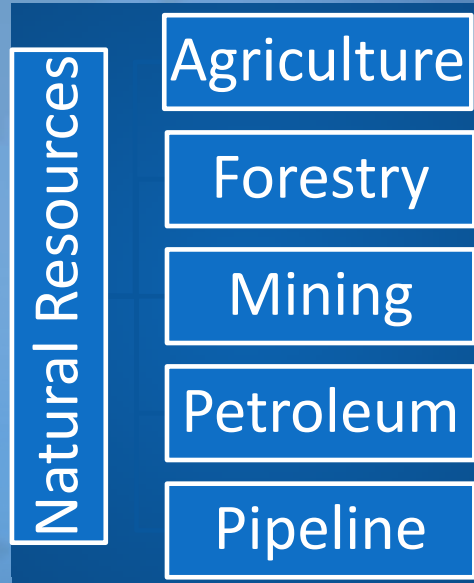
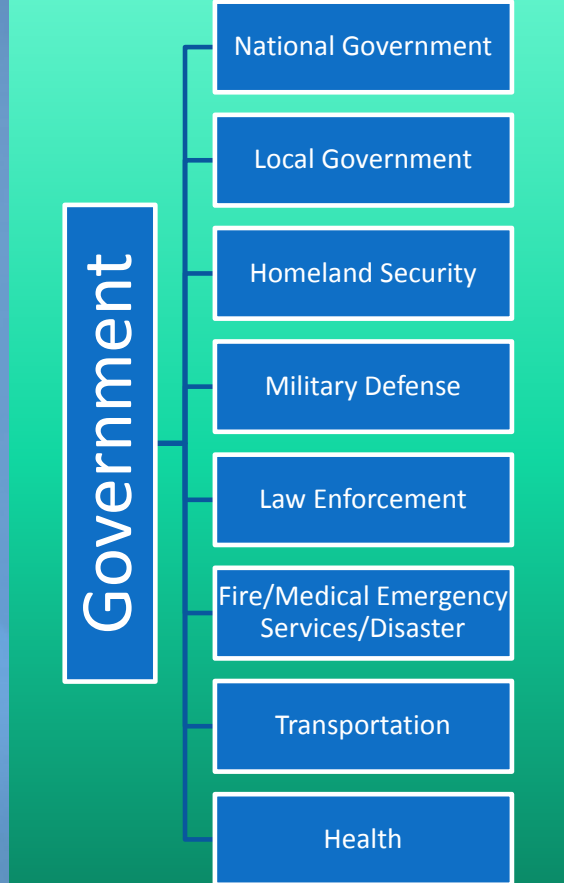
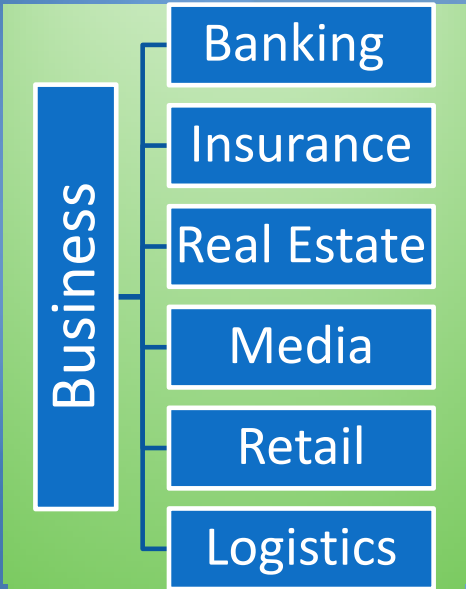


GIS Technical Definition

- An integrated collection of computer software and data used to view and manage information about geographic places, analyze spatial relationships, and model spatial processes. A GIS provides a framework for gathering and organizing spatial data and related information so that it can be displayed and analyzed.
- GIS in its simplest form is "computerized mapping".

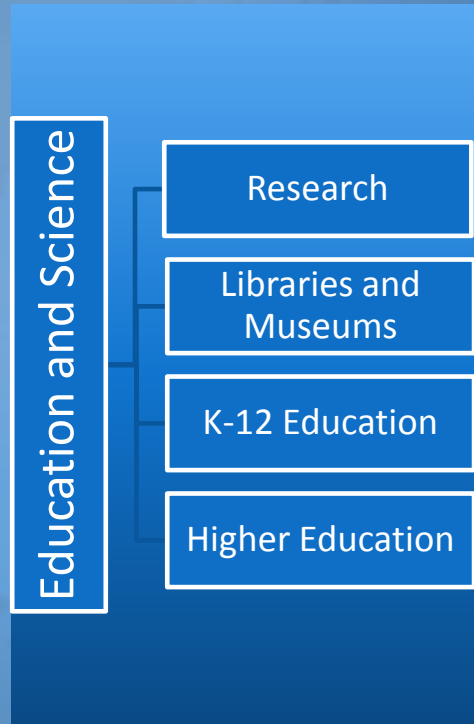
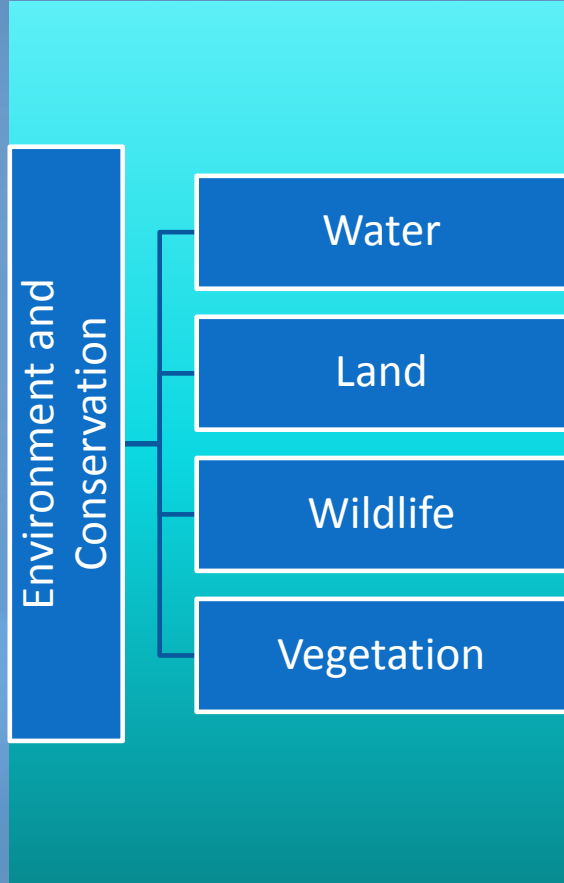
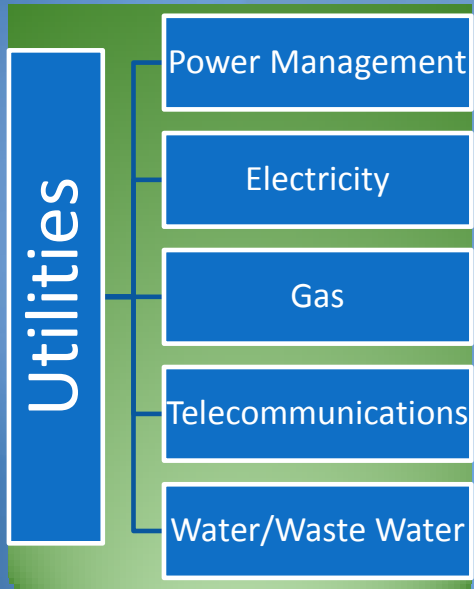


Where is GIS Used?





Where is GIS Used?





A Look At Some Applications

- **National Park Service**



The National Park Service GIS applications include mapping natural and cultural resources such as endangered species, archeological sites, historic sites, inventorying facilities and assets for management and emergency response, exotic plant management, and tracking wildlife.

- **Yellowstone National Park Thermal Inventory**

Map each feature using GPS

Conduct water testing such as PH and electrical conductivity

Obtain the temperature of the feature

Photograph and describe the feature



Police – Crime Mapping

- Keeping track of crimes in your neighborhood.



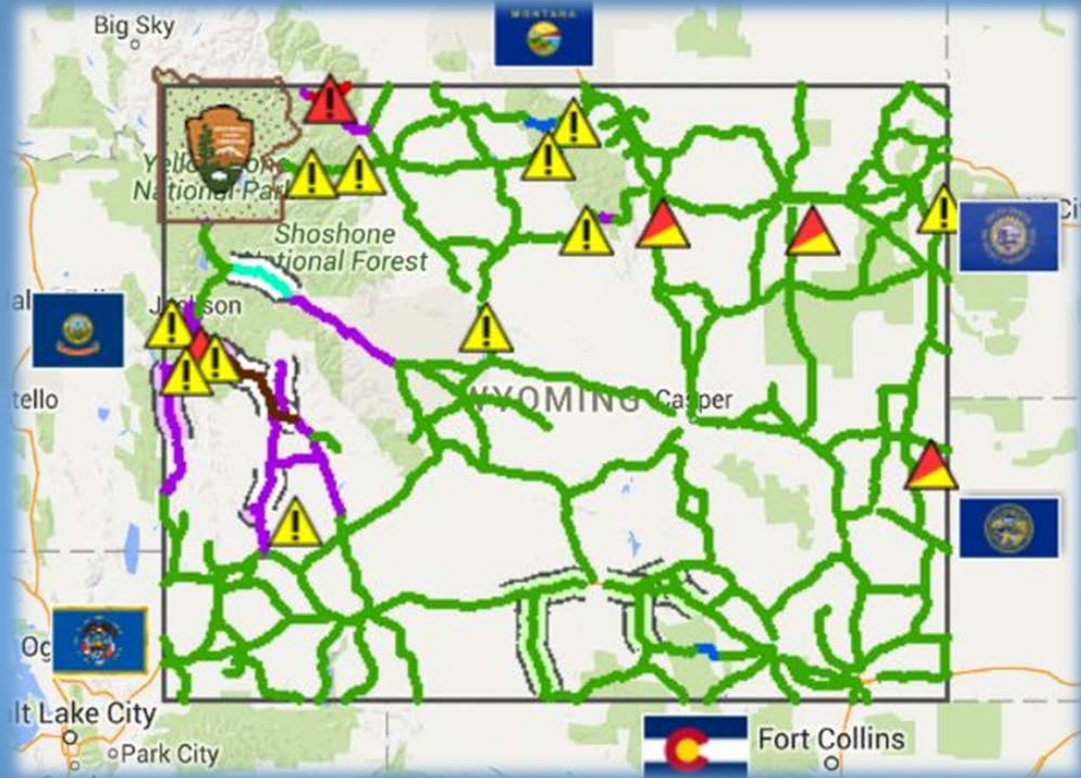
Click on image





Transportation

Road Conditions



Click on image



Do You Use GIS?

- Most likely the answer is yes. GIS is everywhere.
- If you have every used Google Maps/Bing for directions or to look up dining or shopping, you have used a GIS-based application.

