



Geographic Information Systems

What is it?

GIS is a *System* made of computer software, hardware, data and people that helps to manipulate, analyze and present information that is tied to a spatial location

- ***spatial location*** - usually a geographic location
- ***information*** - visualization of analysis of data
- ***system*** - linking software, hardware, data
- ***people*** - a thinker, user and explorer who is behind the power of GIS

In other words, GIS is...

a method to visualize, manipulate, analyze and display spatial data to study the world

a "Smart Map" linking a database to the map, creating dynamic displays

- Data is organized by layers, coverages or themes; with each theme representing a common feature.
- Layers are integrated using explicit location on the earth's surface, thus geographical location is the organizing principal.

What Can a GIS Do for You?

Perform Specific Geographic Queries and Analysis
 Are there any wetlands within a specific parcel?
 Where are all the steep slopes within a specific township?
 What is the total area of type II and III wetlands within a proposed building site?

Improve Organizational Integration
 Improved management of resources
 Interdepartmental information sharing and communication

Maps, Modeling and Analysis
 Geographic visualization
 Database

Make Better Decisions and Create Better Solutions
 Tools to query, analyze and map data in support of the decision making process

Raster Data or Grid Data

- Pixel Data
- A location and value
- Examples of Raster Data are satellite and aerial photos

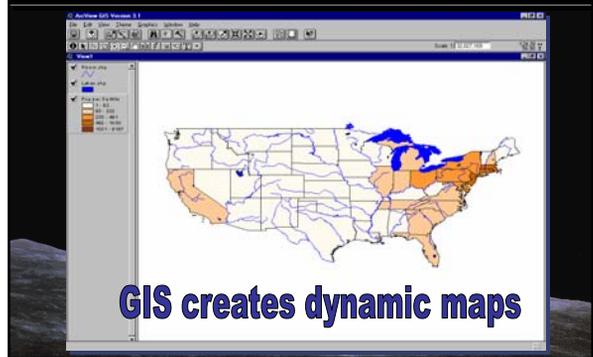
Vector Data or Linear Data

- Points, lines and polygons
- Features - (ex; house, boat, well, lake)
- Attributes - (ex; type, length, size)

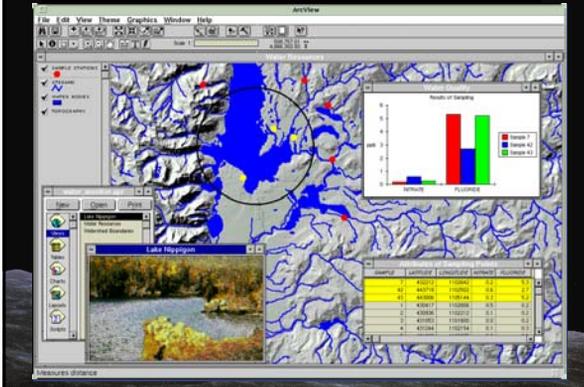
Database "Not Easy to Interpret"

State	Year	Area (sq. mi.)	Population	Per Capita Income					
Alabama	1978	52,424	2,817,741	242,740	8,093,111	15,890	1,842	1,842	1,842
Alaska	1978	587,781	242,740	242,740	11,111	2,817	2,817	2,817	2,817
Arizona	1978	113,990	1,842,000	1,842,000	1,842,000	1,842,000	1,842,000	1,842,000	1,842,000
Arkansas	1978	53,177	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
California	1978	158,333	15,833,333	15,833,333	15,833,333	15,833,333	15,833,333	15,833,333	15,833,333
Colorado	1978	104,237	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Connecticut	1978	5,543	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Delaware	1978	2,427	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Florida	1978	55,561	15,833,333	15,833,333	15,833,333	15,833,333	15,833,333	15,833,333	15,833,333
Georgia	1978	59,260	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Hawaii	1978	10,423	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Idaho	1978	82,743	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Illinois	1978	142,997	15,833,333	15,833,333	15,833,333	15,833,333	15,833,333	15,833,333	15,833,333
Indiana	1978	36,422	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Iowa	1978	72,844	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Kansas	1978	82,743	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Kentucky	1978	40,371	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Louisiana	1978	52,424	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Maine	1978	31,423	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Maryland	1978	20,242	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Massachusetts	1978	7,823	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Michigan	1978	96,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Minnesota	1978	226,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Mississippi	1978	52,424	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Missouri	1978	69,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Montana	1978	142,997	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Nebraska	1978	77,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Nevada	1978	113,990	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
New Hampshire	1978	9,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
New Jersey	1978	14,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
New Mexico	1978	121,997	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
New York	1978	54,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
North Carolina	1978	52,424	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
North Dakota	1978	77,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Ohio	1978	40,371	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Oklahoma	1978	69,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Oregon	1978	96,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Pennsylvania	1978	31,423	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Rhode Island	1978	1,423	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
South Carolina	1978	32,424	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
South Dakota	1978	77,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Tennessee	1978	40,371	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Texas	1978	692,423	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Utah	1978	82,743	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Vermont	1978	9,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Virginia	1978	40,371	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Washington	1978	72,844	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
West Virginia	1978	20,242	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Wisconsin	1978	65,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111
Wyoming	1978	97,243	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111	2,427,111

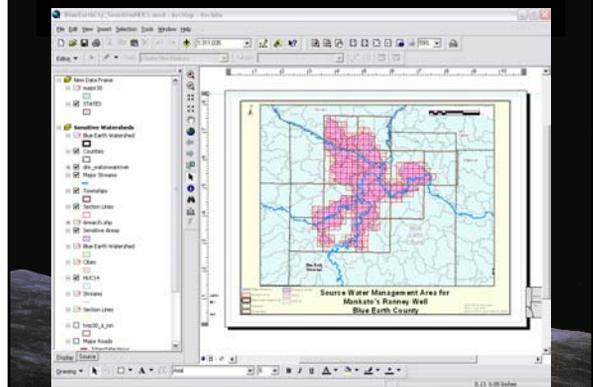
Visualization "Worth a Thousand Words"



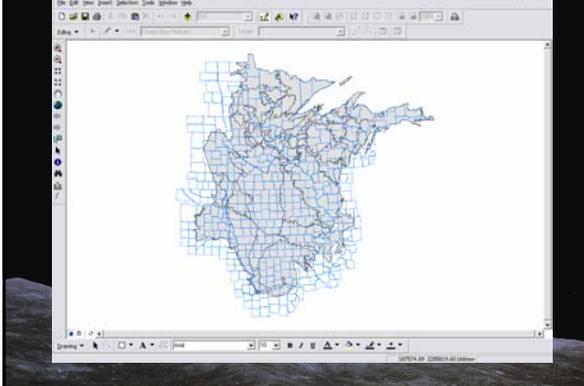
Combining Various Display Methods



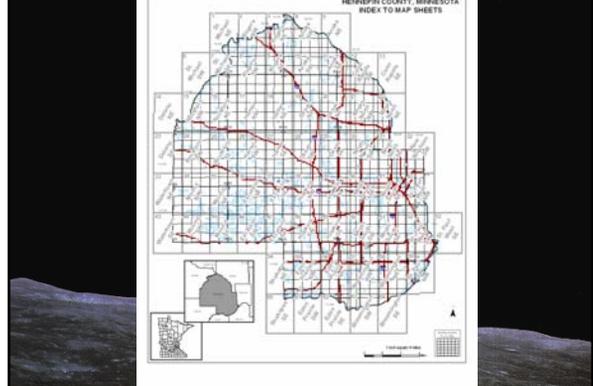
NRCS GIS Examples



Index sheets for soil surveys



Index sheets for soil surveys

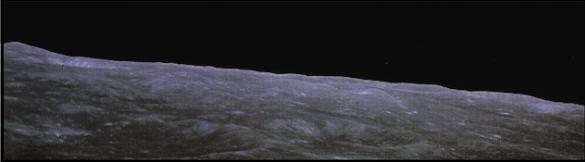


INTERESTED?

Check out the web!

A career in GIS and natural resources is rewarding

Even if your career path doesn't lead you to GIS, keep in mind that it is a tool that can support every discipline; from soils to economics to health occupations.



For more information

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