# What is a GIS?

A GIS (Geographic Information System) can be seen
as a system of hardware, software and procedures
designed to support the capture, management,
manipulation, analysis, modeling & display
of spatially-referenced data for solving
complex planning and management problems.

NGCGIA Core Curriculum

Key: **spatially-referenced data**
Combine information by co-location.

GIS as a data presentation tool
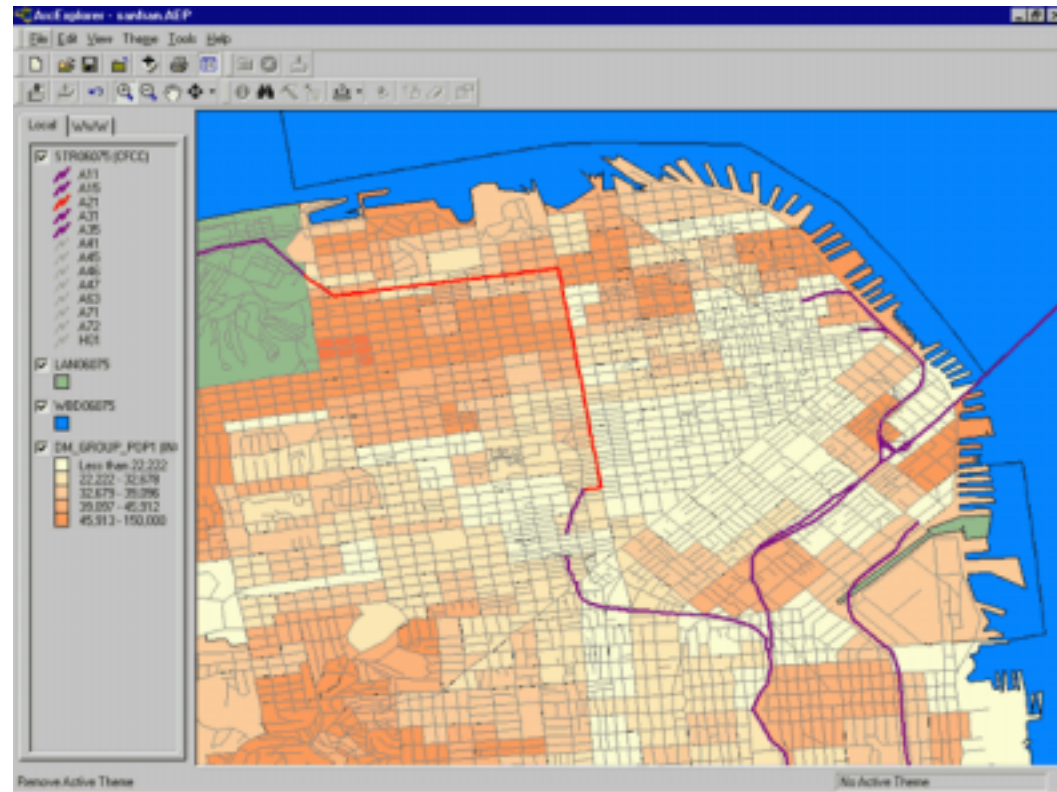
A GIS is basically a tool that mines data and displays it.
It doesn't clean it up, or maintain it,
and seldom even looks to see if it's reasonable. [Iles]

Four ways to view GIS [Goodchild]

as **Automated Mapping:** facilitating the production of standard maps

as **Map Analysis:** providing measurement and overlay tools that are
cheaper than traditional methods,

as **Inventory:** giving geographic access capabilities to
existing governmental and corporate databases,

as **Spatial Analysis and Spatial Decision Support:**
enabling new uses for old data by giving users query and analysis
tools.

Our views of a Map

What types of questions do we seek to answer with maps?
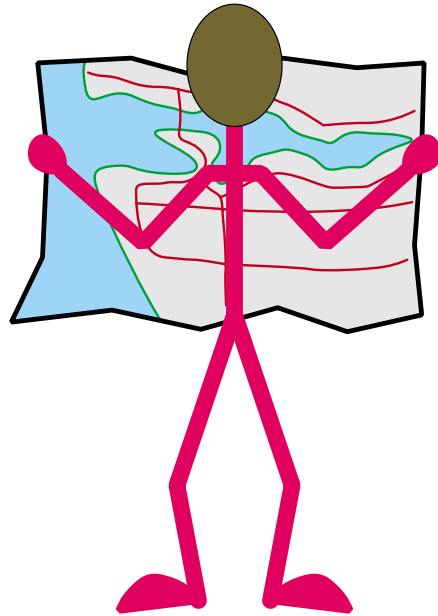
Where is the Queen Mary? (lat/long)
Where am I? (relative to known landmarks)
Where's the nearest gas station? (proximity)
How should I get from Duke to UNC by car? (net-work)
What percentage of Chapel Hill is the UNC campus? (area)

Specialists views of Maps

What is the probability of this spatial pattern?
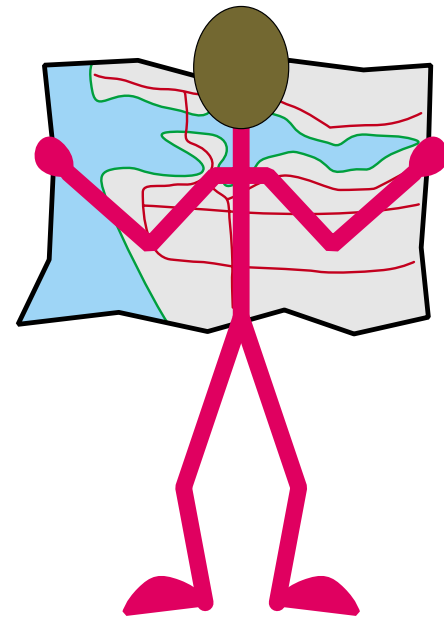How much timber is within 50m of a stream?
Who owns the land with these legal descriptions?
What is the GNP of Africa compared to France?
In what areas should I target my advertising?
What impact of the forest code on my timber license?
How do we redistrict to win the next election?

Computers' View of Maps

508493,70468,5 509844,69681,5 509696,69428,5 505337,65199,5 506639,66571,5
485494,76908,1548 486289,77978,1510 505567,75760,1495 502589,75927,187 504029,71185,1449
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492222,76786,270 493336,73022,1505 490980,74170,206 509360,69001,5 504141,64320,5
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509567,69254,5 508763,67571,5 503696,64043,5 504846,64603,5 491973,77989,303
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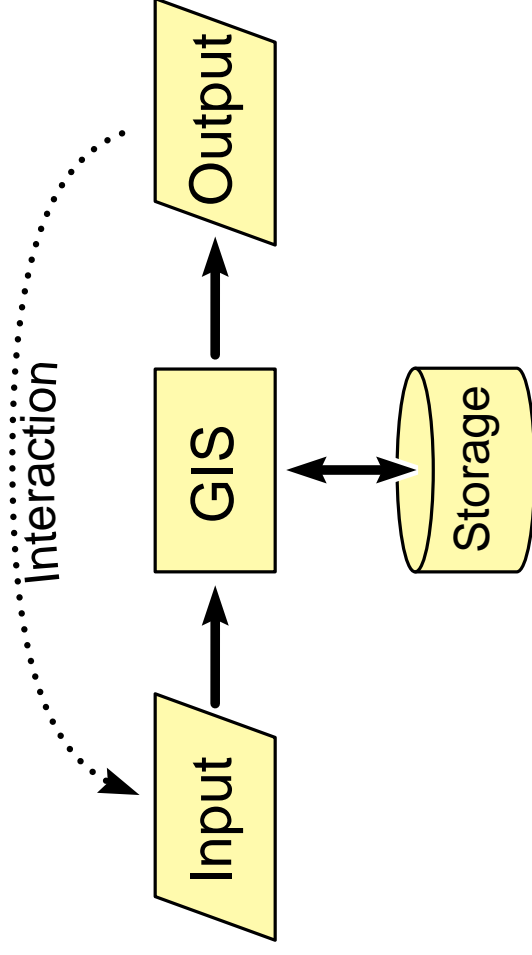
Aspects of a GIS

We will consider:

Input technologies

Output technologies

Map data

Map data structures

Analysis operations

A Closing Quote

*Where is the wisdom we have
lost in knowledge?
Where is the knowledge we have
lost in information?*

—T.S. Eliot

Where is the information we have lost in data?