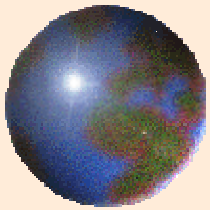

Brief Overview of Geographic Information Systems (GIS) Technology

February 20, 2007

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Presenter

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What is GIS?

Geographic Information Systems (GIS) is a technology and set of methods used to create, manage, analyze, and distribute spatial information.

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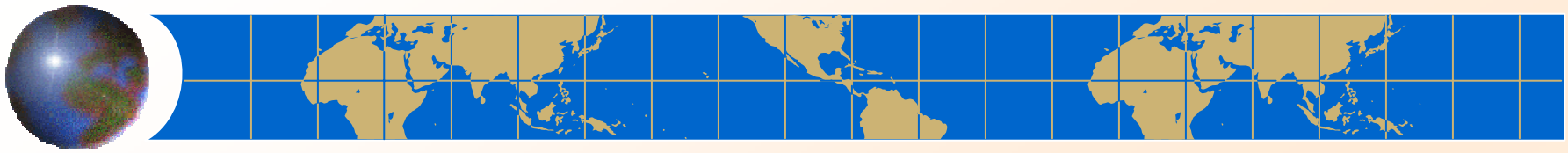


Strengths of GIS

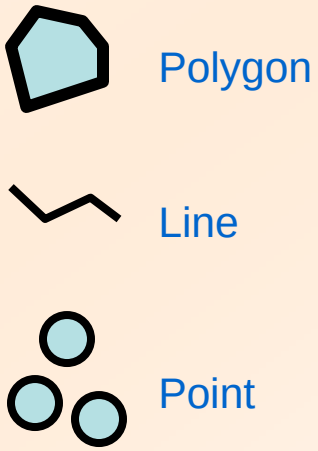
- Integrates data by location regardless of format
- Visualizes information, most often in the form of a map
- Allows analysis of spatial data and associated attributes

Spatial Data

Spatial data, stored in both raster and vector formats, identifies a location.

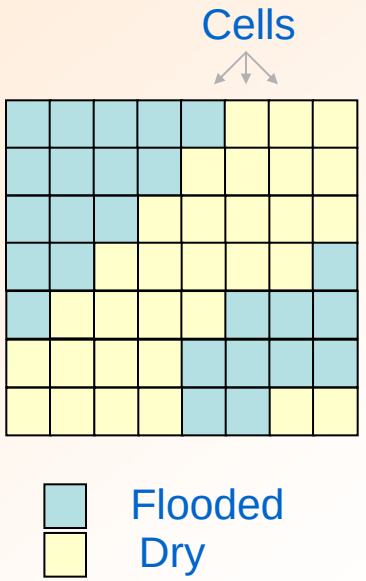
Vector Data

Stores the x,y coordinates that represent the locations / boundaries of map features.



Raster Data

Represents the dominant feature that is present in a cell.



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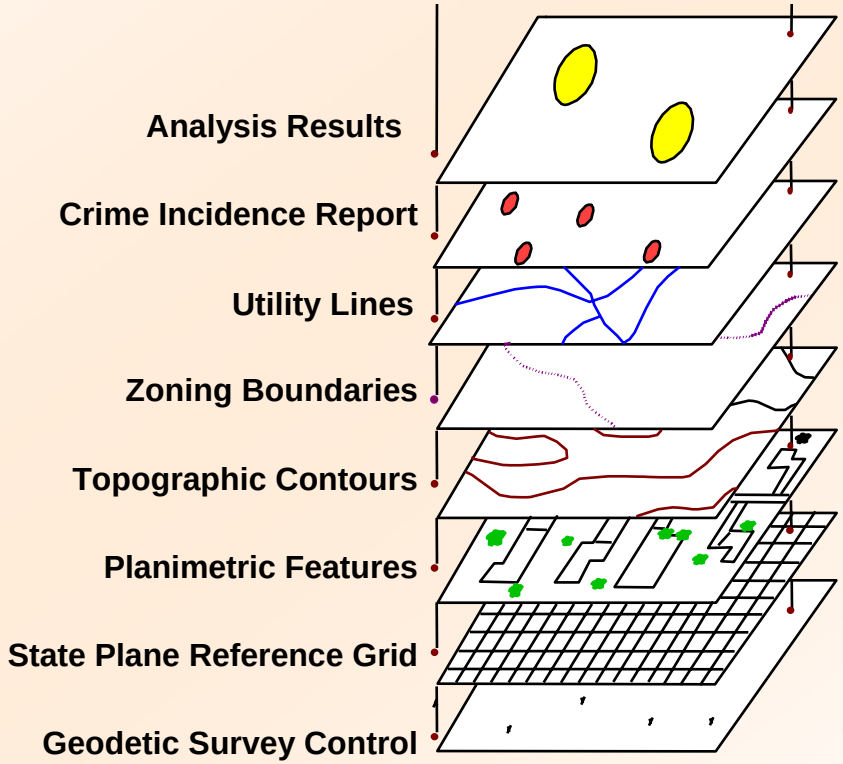
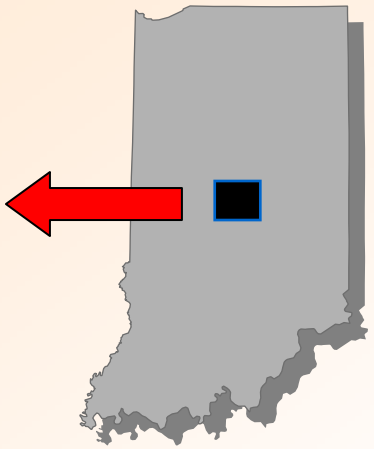
Spatial Attribute Data

- Information associated with a location
- Examples
  - Street name, type, speed limit, etc.
  - Person name, age, gender, education, etc.
  - Utility owner, use, right of way, etc.
  - Date of origin, size, access rights, etc.

Layering

Spatial data and its attributes are organized as overlying "layers" that can be viewed and analyzed in any combination.





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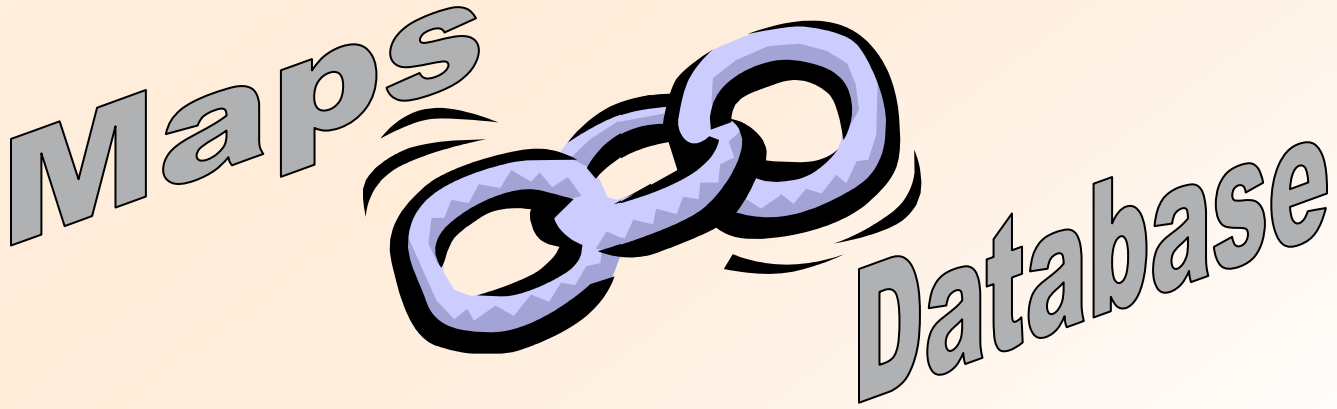
"Smart" Map

GIS links the visual map to a database of locations and attributes, thus making the map dynamic or capable of supporting queries. This association forms the analytical power of GIS.



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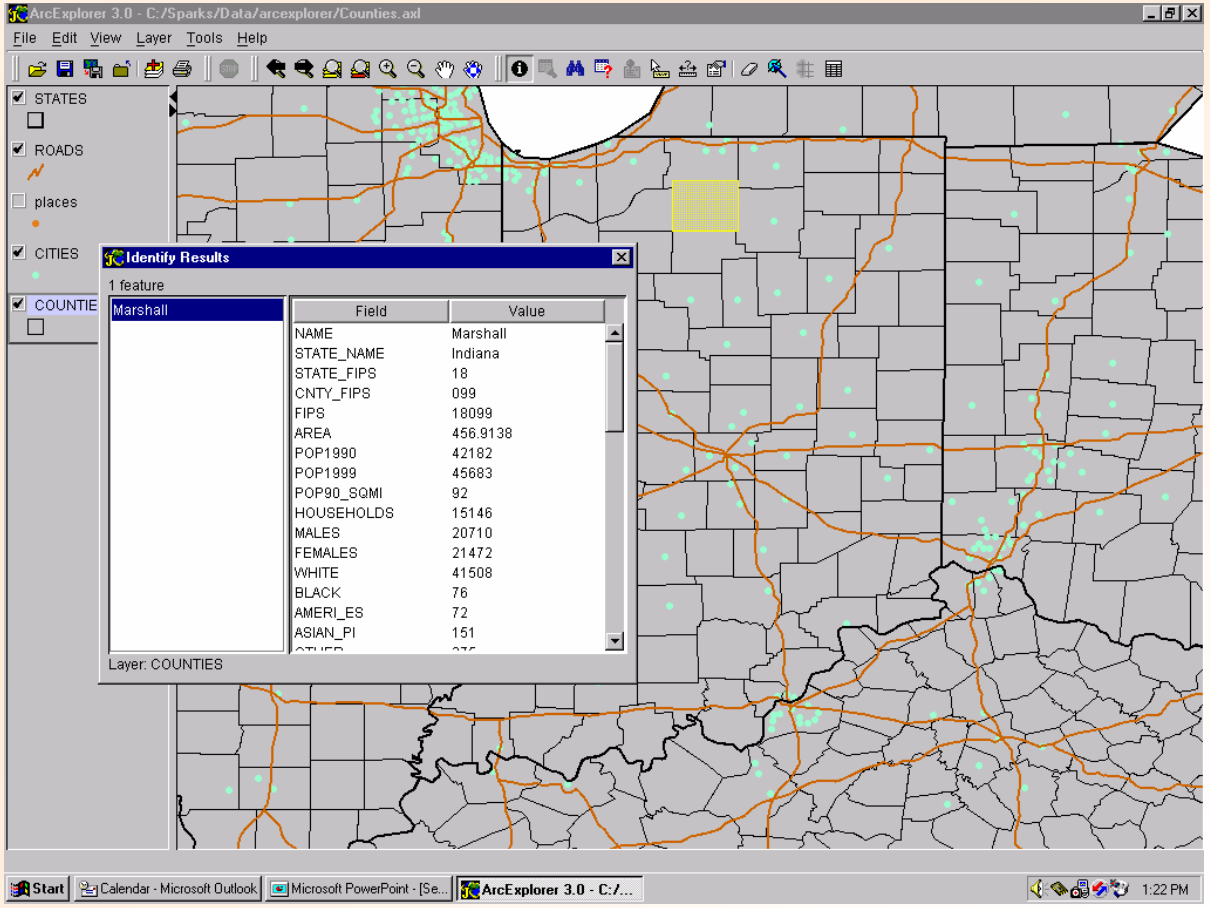
"Smart" Map

The map represents information (attributes) in the database



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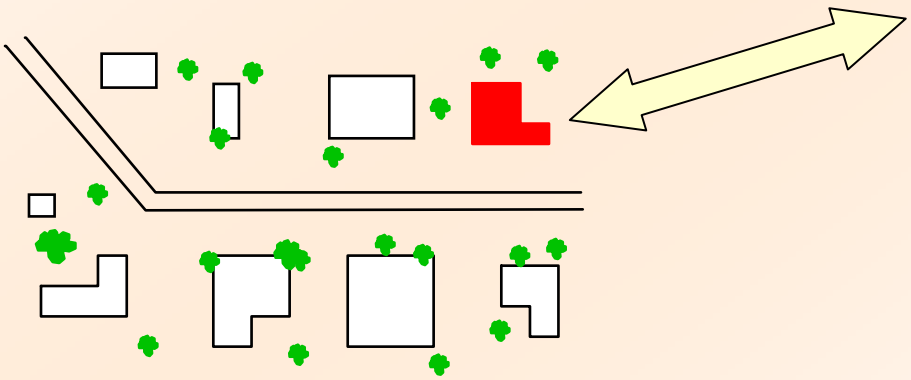
"Smart" Map

The database and map are linked by a unique value or common identifier.



Building ID	897-2874A
Owner	Jane Doe
Address	110 E Main
City	Noblesville
State	Indiana
Zip	46060
Value	$72,000

GIS handles multiple data types

- Tabular data
- Satellite or aerial Photography
- GPS coordinates
- Text
- Multimedia

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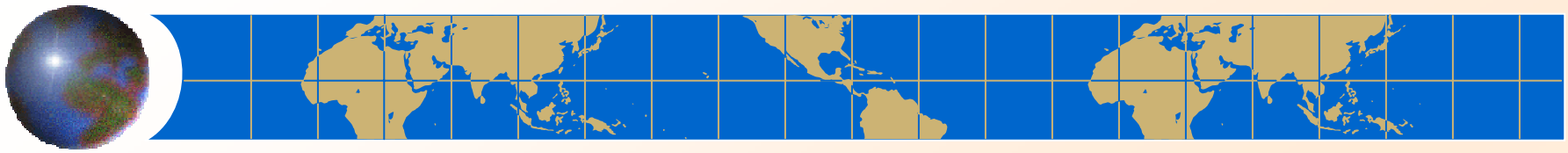


Spatial Analysis

GIS supports analysis in multiple forms and at multiple scales

- Proximity analysis
- Network analysis
- Cluster analysis
- Spatio-temporal analysis
- Agent-based modeling
- Spatial interaction modeling

Spatial Analysis

Which parcels owned by the City of Carmel are zoned for industrial development?

Parcel Layer

ID	Owner
35	City of Carmel
36	School
37	Kokomo

Zoning Layer

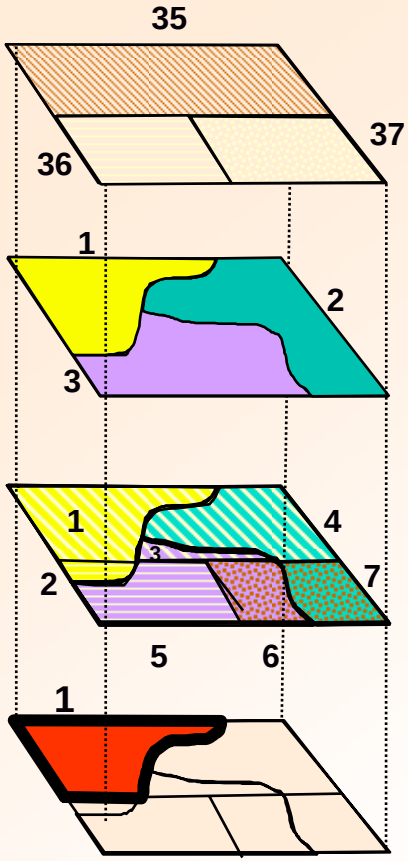
ID	Soil Type
1	Industry
2	Comm.
3	Residential

Perform Analysis

ID	Zoning	Owner
1	Industry	City of Carmel
2	Industry	Indianapolis
3	Residential	City of Carmel
4	Comm.	City of Carmel
5	Residential	Howard Smith
6	Residential	Mable Marble
7	Comm.	Mable Marble

Perform Query

ID	Zoning	Owner
1	Industrial	City of Carmel



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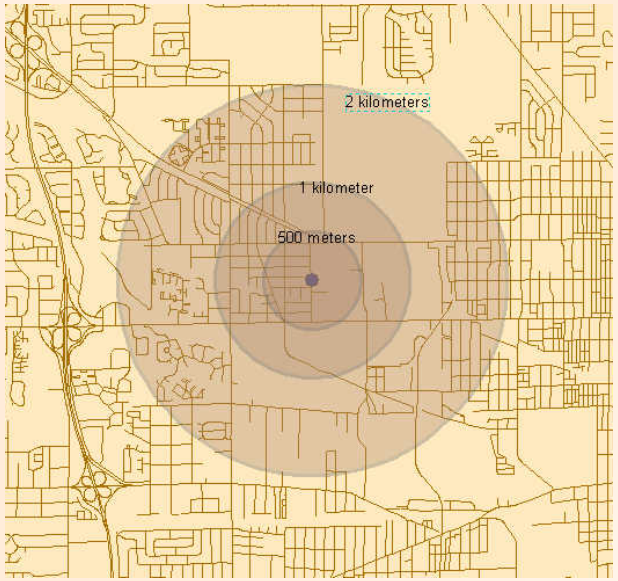
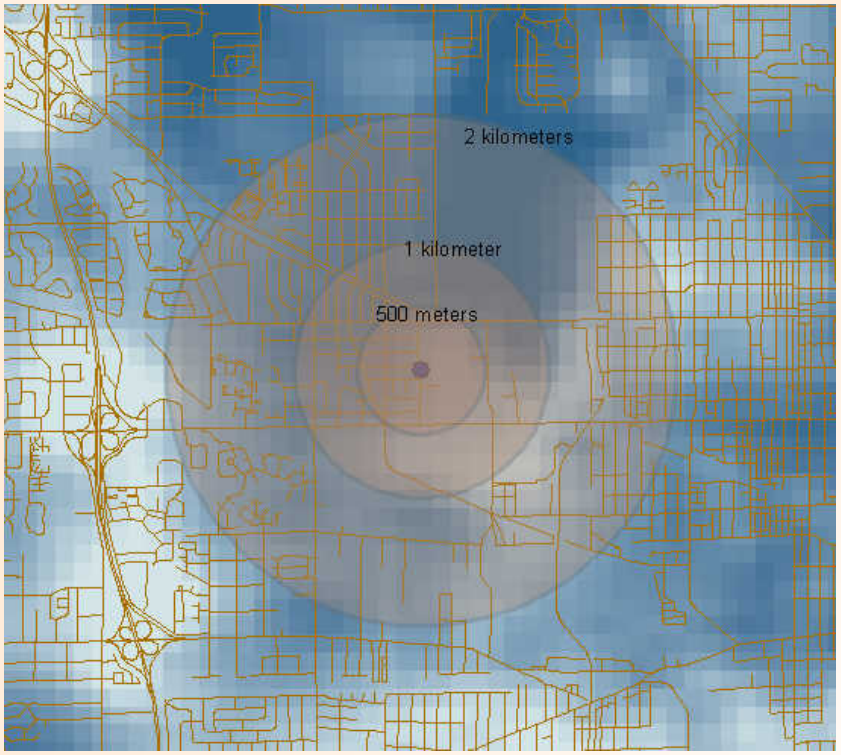
Spatial Analysis

Where are the highest density populations found within the service area of a facility?





Service area overlaid with population density

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The Power of Spatial Models

- Explore impact of change within a spatial context
- Examine different spatial scenarios
- Perform cost-benefit analysis within a defined geography

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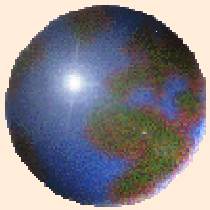

Questions

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