What is a Geographic Information System (GIS)?

A system that displays geographically based data upon a map for interpretation and decision-making.

Not everyone agrees on what a "true" GIS is. Different functions meet different needs.

Types of Mapping Systems

- Geographic Information Systems (GIS) - Analytical
- Automated Mapping and Facilities Management Systems (AM/FM)
- Computer-Aided Design Systems (CAD) - Detailed Maps
- Resource Management Systems
What differentiates a Geographic Information System from simple mapping?

A simple mapping system integrates data and a map to produce a "statistical map", e.g. U.S. Map shading states with more than 10 million people.

The map is the final output.

What distinguishes the GIS?

A GIS will allow the map itself to be used as input for the next data or graphic request, i.e. show me the highest per capita income in those states by county.

The output map becomes the input for other data requests.
What makes up a Geographic Information System?

- Databases of information (e.g. demographic) keyed by geography.
- Maps to match your geography (i.e. county maps, zip code)
- Software to manipulate the data and the map for display (i.e. SAS* System)
- Some "intelligence" to classify data intervals.

GIS Issues

- Costs
  - map and data storage
  - technology
  - system development
  - system maintenance
- Display CRT's, Plotters, Resolution, Quality, Hardware/Software
- Functions
- What useful purpose will a GIS serve?
GIS Functions

- Ability to statistically inquire different map levels of data

- Create statistical map indexes i.e. Wealth as a function of income, education, population

- Use counties, tracts, MCD/CCDs, block/group, zip code and Bureau of Census statistical descriptions

- View Territories of Marketing Areas: i.e. SAMI, ADI, etc.

- Provide for custom user-defined boundaries

Advanced Functions

- "Cut and paste" data based graphic options i.e., population within a ten mile radius of a city.

- Mouse-drawn boundaries or cursor graphics.

- Statistical Modeling (i.e. model sales)

- Interactivity, Maintenance, Customization
GIS Features - Map Display

- Classifying or reclassifying data intervals for display; intelligent defaults
- Color, shading, scale, legend
- Label map areas, county names, etc.
- Label reference points: cities, roads, rivers, etc.

Other Features

- The ability to zoom-in or enlarge the viewing area
- Multivariate display - population, income
- User entered data
- Automation of function: Menus to drive the system
Can GIS be integrated with traditional graphics plots, pie charts, or report generators?

SAS/GRAPH* could be used as a link

What does SAS/GRAPH* give me for GIS development?

- Proc GMAP, GPROJECT, GREduce, etc.
- Annotation Capabilities and Functions-ANNOTATE
- Proc GREPLAY, template catalogs, graphic catalogs
- SAS/AF* for menu driven development
- SAS* Support - "The Best in the Industry"
How will you store/retrieve your map and annotation files?

- Projected
- Unprojected
- Reduced

Will you create maps dynamically with PROC GMAP or use PROC GREPLAY from a Graphics Catalog?

How will you combine map files and annotations?

Suggested SAS System Flow

SAS/AF* to Drive SAS/Graph*

MAPS
\ | GREPLAY -> Display /
/ | ____|_____
GMAP |__________| Review
     |__________| Plotter
Other GIS Systems are.
PC-based and may require
"black box" implementation

- Advanced Business Concepts
  - Image GEO - DSS*
- ARC/INFO*
- Atlas Graphics* from STSC
- CLARITAS Prizm* & Ware
- CONQUEST* software -
  geodemographic by
  Donnelley Marketing
- National Decision Systems -
  Infomask*
- Tydac - SPANS*

This is not a complete list of
products available nor is it
up-to-date. You are
couraged to do your own
analysis based on your own
company or industry needs.
What does TIGER have?

- Surface boundaries of U.S. and territories
- Political boundaries: states, counties, etc.
- Statistical boundaries: SMA, etc.
- Features: roads, railroad, rivers, etc.
- Names: features, class codes
- 1980 & 1990 Geographic Area Codes
- Address and Zip Code Ranges for Streets

Prototype Data Available:

- Boone County, MO.: 3.6 megabytes of data—if everything is purchased
- Enormous amount of data
- No software available from Census

Let us make the effort with SAS*. 

615
Applications of GIS?

Use your imagination. How will we be using SAS*?

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