GEO 565 Options

• Option 1 - Term Paper
• Option 2 - Project (simple GIS analyses and map series)
• Option 3 - Annotated Bibliography uploaded to the web

Choose which option you want by Tuesday, January 21st

• Term Papers or uploading of web site due by 5:00, Fri., March 14th
  – NO EXTENSIONS!
GEO 565 Term Paper (1)

• 20 pages (double-spaced) INCLUDING figures and references
  – do NOT staple your paper
  – flexible on subject matter of paper
  – specify and follow a scholarly journal format
  – specify key words
  – *points will be subtracted if these specifications are omitted*
Suggested Content

- look at current uses of GIS in your area of interest
- other fields
- identify potential for furthering research
- research/management questions
- describe a study in progress (proposal?)
Previous Topics on Web Site

- **Objective** - clearly stated - not more than 2 principal objectives
- **Problem** - importance to your thesis and/or to your profession
- **Background** - previous work, unresolved problems, narrowing subject area
  (Literature Review)
• **Scientific Procedures**
  – project design
  – data collection procedures
  – methods of analysis
  – results anticipated

• **Management Procedures**
  – task breakdown
  – person-hour allocation table
  – budget
GEO 565 Project (2)

- Detailed instructions and examples course web site at dusk.geo.orst.edu/gis/projects.html
- Find your own data, do the analysis and create the maps using ArcView, Idrisi, or any other GIS
- 10 pages: writeup + maps
- Due 4:00 p.m., Mar. 19 - NO final exam
GEO 565
Annotated Bibliography (3)

- MUST be web-based
- Don’t know HTML? Don’t panic! Resources will be available - it’s easy!
- Upload your page(s) by Friday, March 14th, 5:00 p.m.
- Again see dusk.geo.orst.edu/gis/projects.html
What is GIS?

Chapter 1
“Computing is not about computers anymore. It is about living.”

“GIS is not about systems anymore. It is about geography.”

(... and geographic DATA)

-- Keith Clarke, UCSB, 2001
Defining GIS

• Different definitions of a GIS have evolved in different areas and disciplines.
• database, map coordinates, computer-based link between them.
• All GIS definitions recognize that spatial data are unique because they are linked to maps.
Some Basic GIS Concepts...

- Mapping is a key feature of a GIS but it is NOT the whole story.
- A GIS is NOT simply a computer system for MAKING maps
  - maps at different scales, projections, colors
- not simply a computer system for STORING maps or images.
  - In fact, it stores the DATA from which these are created.
An Analysis Tool...

• for every piece of data it specifies:
  – what it is
  – where it is
  – how it relates to other pieces of data
• things in common
• see spatial relationships or create NEW relationships
Major Questions for a GIS:

- *what* exists at a certain location?
- *where* are certain conditions satisfied?
- *what* has changed in a place over time?
- *what* spatial patterns exist?
- *what if* this condition occurred at this place? (modelling, hypothesis testing)
For example...

Toxic Substance Locations:
  District 24
  District 16
  14 George Boulevard

Proposed School Locations:
  124 Elm Street
  35 White Road
Toxic Substances

School Locations
Major Questions for YOU...

- what ARE my questions?
- what data do I need?
- how can I combine my data to answer my questions?
The Process of GIS

• Think about a place or a topic ...
• Ask a question about it ...
• Use data to make a map ...
• Explore the patterns that appear ...
• Enhance the data or modify the analysis ...
• Ask a new question ...
• Repeat ...
Spatial and Non-Spatial Data

Spatial Data
GEOGRAPHICALLY REFERENCED DATA, IDENTIFIED ACCORDING TO LOCATION.

Spatial

Non-Spatial

Address

Name

Value

SMITH

12 OXFORD CRT.

SMITH

5000

TALIKA

14 OXFORD CRT.

TALIKA

7000

DRANA

16 OXFORD CRT.

DRANA

6000

Geographically-referenced data

- Latitude and longitude
- Street address
- x and y coordinates
- Range and township
- Location shown on a map
The Data Model

• A conceptual description (mental model) of how data are organized for use by the GIS
  – entities ---> objects

• GISs have traditionally used either “raster” or “vector” data models
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• GISs have traditionally used either “raster” or “vector” data models
A Raster Data Model Uses a Grid.

Figure 3.1 Generic structure for a grid. (Clarke, 2000)
Rasters are Faster...

- maps directly onto computer memory structure (array).
- natural for scanned or remotely sensed data.
- continuous surfaces.
- easy to understand, read, write, draw
- Spatial analytical operations are faster.
- compression is easier