Data Management in the GIS Environment

gis@umd.edu
University of Maryland, College Park
2012

Workshop Outline

1. Presentation
2. Exercises
    1. X-Y events
    2. Joining and relating tables
    3. Self-directed exercises (joining)
3. Questions and concerns?

What you need in GIS Data

- Good data (has reliable metadata)
- Data with a spatial component
- Data in spatial agreement

Projections and Coordinate Systems

- **Geographic coordinate system (GCS)**
  - Location on a sphere (latitude-longitude)
- **Datum** (goes along with the GCS)
  - An estimate of Earth's actual shape fit into a spheroid
  - GPS units use the WGS 1984 datum
- **Projected coordinate system**
  - Location on a flat map from a defined 0,0 origin
  - Has an underlying GCS

Projections ctd.

- A map projection distorts one or more of the following:
  - Distance
  - Shape
  - Area
  - Direction
- Reference website:
  http://egsc.usgs.gov/isb/pubs/MapProjections/projections.html
- Reference books:

  Flattening the earth: two thousand years of map projections / John P. Snyder

  An Album of Map Projections (USGS Professional Paper 1453) / John P. Snyder and Philip M. Voxland

  http://pubs.er.usgs.gov/#search:basic/query=album%20map%20projections%20snyder/page=1/page_size=100:0

Data Types (Layers)

- Vector
- Raster/Grid

Boundaries

Features

Geology

Hydrology

Demographic

Remote Sensing

Data Sources (for layers)

- Digital or scanned maps or photos
- GPS
- Field sampling
- Remote sensing, aerial photos
- Databases/spreadsheets (standalone tables)
- Files from other software (CAD, survey)
- Manual digitization
- Lidar

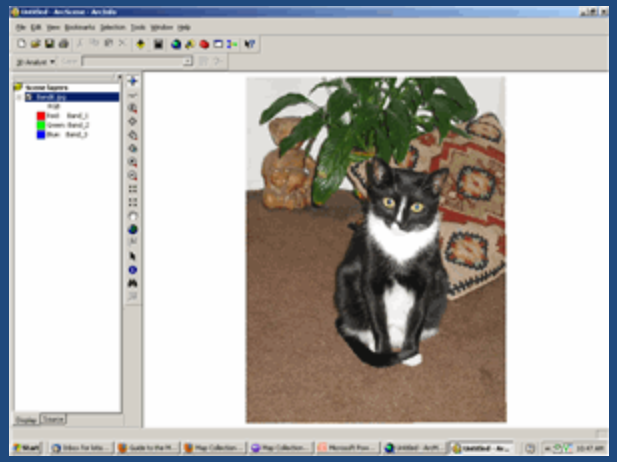
Data Providers

1. **Free**
    - government (Federal, state, local)
    - people who share
    - libraries
2. **Pay**
    - commercial data providers
    - local government
3. **Create**
    - you

Sample Websites

- Data.gov: http://www.data.gov
- UM GIS Data Repository: http://libraries.umd.edu/gis/
- Washington, D.C. GIS: http://data.dc.gov/
- Pennsylvania Spatial Data Access http://www.pasda.psu.edu/
- GeoLytics: http://www.geolytics.com/
- SimplyMap database http://researchport.umd.edu/databases&id=UMD07900
- GIS Data and Websites Guide: http://lib.guides.umd.edu/gisdata

Data needs a spatial component to be useful in a GIS



Digital photograph

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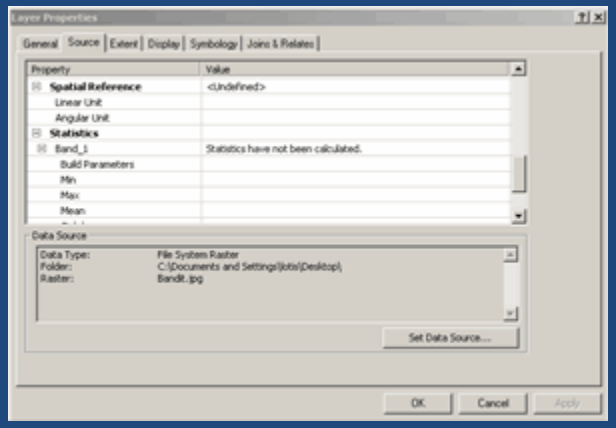
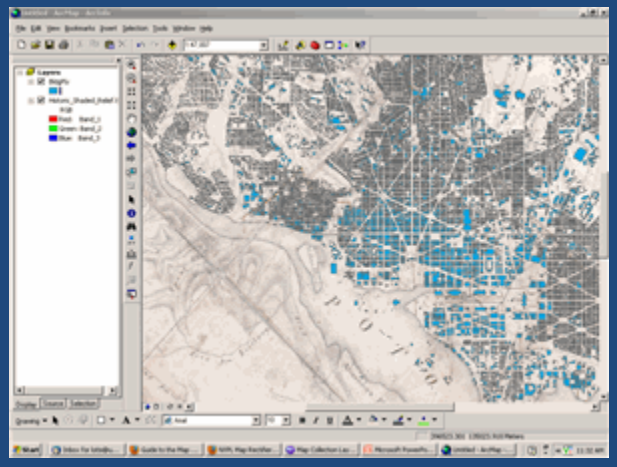


No spatial information

= NO

GIS can't use



Scanned map

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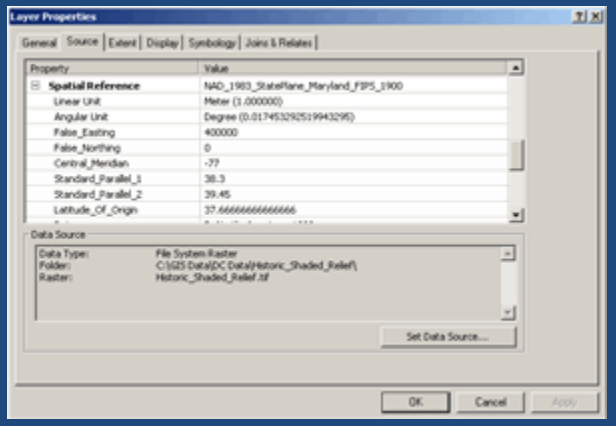

Spatial information given
(coordinate system, datum, projection)

= YES

GIS can use

	A	B	C	D	E
1	Latitude	Longitude	BirdsOct	BirdsNov	BirdsDec
2	38.98439	-76.946246	23	41	13
3	38.95534	-76.943176	18	35	10
4	38.89147	-77.088699	30	45	20
5					

YES – has latitude and longitude, in correct format

YES, but… - latitude and longitude need to be in decimal degrees

	A	B	C	D	E
1	Latitude	Longitude	BirdsOct	BirdsNov	BirdsDec
2	38.59.4	-76.56.46	23	41	13
3	38.56.19	-76.56.35	18	35	10
4	38.53.29	-77.5.19	30	45	20
5					

	A	B	C	D
1	Zip	BirdsOct	BirdsNov	BirdsDec
2	20742	23	41	13
3	20781	18	35	10
4	22207	30	45	20
5				

MAYBE – can you match the zip code to a field in your boundary file?

MAYBE – can you match the state to a field in your boundary file?

	A	B	C	D	E
1	State	Town	BirdsOct	BirdsNov	BirdsDec
2	MD	College Park	23	41	13
3	MD	Hyattsville	18	35	10
4	VA	Arlington	30	45	20

	A	B	C
1	BirdsOct	BirdsNov	BirdsDec
2	23	41	13
3	18	35	10
4	30	45	20

NO – no spatial information

Data Quality

- **Metadata**
- **Spatial aspect**
- **Matching**

  type and content

  projection/coordinate system

How do I actually do it?

Let's do some exercises.

Class Assessment

Please complete this! It's quick and helps us improve the workshops.

Complete the "Data Management Survey/Assessment" at:
http://www.lib.umd.edu/GOV/geospatial.html

Or use the direct link:

http://www.zoomerang.com/Survey/WEB22E8JPY6W2T