Watershed Sciences 4930 & 6920
GEOGRAPHIC INFORMATION SYSTEMS

WEEK Four – Lecture 7
EDITING & ATTRIBUTING DATA & METADATA

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HOUSEKEEPING - AFTER
• WATS 4931/6921 Proposals Due Feb 1st Feb 3rd!
• Thursday last official day for WATS 6915
• Effects Toolbar...

TODAY’S PLAN
I. Editing… What is it?
II. Some Editing Workflows
III. Attributes & Attributing
IV. Metadata
V. Some Comments...

WHAT DOES EDIT MEAN TO YOU?
• First not in GIS terms...
• Then in the context of GIS

EDITING IN GIS
• Why edit existing data?
  - Errors and inconsistencies from data entry such as
digitization (e.g. undershoots, overshoots, missing),
attribution errors (mislabeled)
  - Spatial data can change over time (augment it with
new data)
  - Positional data only so accurate
• Editing includes drawing in GIS
  - CAD is far more powerful at drawing
• Editing is also for editing data and attributes!
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TWO WAYS TO START EDITING

1. Use the editor toolbar
2. Right-Click on the layer you want to edit

STARTING, SAVING, STOPPING

• Because your time is valuable and you’re paranoid...
• Save as frequently as you’re willing to redraw something...
• Because you need to start somewhere...
• Because you are done with your work... don’t worry it asks if you want to save your work.

THE EDITOR TOOLBAR

• Only active when you’ve started editing a layer
• Everything relies on feature templates...
• Encourages thinking about symbology, attributing, & drawing in one step

CREATING FEATURES WITH TEMPLATES

 Templates impose symbology...
• You choose feature template
• Then choose construction tool

WHEN EDITING... JUST SKETCH!

• Whatever you are drawing is a sketch, until you complete it (F2)
• Feature construction dialog follows you
• Right-click context allows you to do a lot more...
SNAPPING MAKES EDITING MORE ACCURATE

Snap Modes:
- Auto-snapping
- Manual-snapping

Snap Methods:
- Endpoint
- Vertex
- Midpoint
- Edge
- Intersection
- Tangent

SOME POLYGON TRICKS...

EDITING EXISTING FEATURES
- Edit Vertices
- Moving
- Deleting
- Separating
- Reshaping
- Splitting
- Flipping
- Scaling
- Rotating
- Slipping
- Trimming
- Simplifying

QUERYING LEADS TO SMARTER SELECTION

DIGITIZING
- Manual types:
  1. On-Screen Digitizing
  1. Based on a scanned image
  2. Hardcopy Map Digitizing
  1. Use a tablet, digitizer

In addition:
Scanned data can sometimes be automatically digitized but always requires fixing.
DIGITIZING PROCESS

• Creation of digital vector data from either scanned images (i.e. raster data or physical hard-copy maps)

DIGITIZING ERROR

• In practice, errors are random and normally distributed about zero (this is good)
• If not, there is bias in your digitization

THE TABLET... NOT THE GIRL

= Death to:

ONE SOURCE OF BIAS: BLUNDERS

• Snapping can help!
• CAD would be better yet...
• Or Topology Rules!

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GIS AND ATTRIBUTE DATA

Geographic (spatial) data, by default, has some type of attribute (non-spatial) data that need be stored such that they are easily accessible for query and analysis purposes
WHAT IS THE KEY STEP YOU HAVE TO TAKE TO ADD ATTRIBUTES?

- Add a new field… (i.e. column in the attribute table)

SOME FUNNY RULES ABOUT ADDING FIELDS

- You cannot Add Field in an active edit session
  - Solution: Stop Editing
- You cannot (always) Add Field from ArcCatalog if the feature is a layer in the table of contents of an open ArcMap Document
  - Solution: Unload layer or close ArcMap

EDITING IN THE TABLE WINDOW

- In an active edit session...
- What does it typically mean when you try to change a value and Arc won’t let you?

THE ATTRIBUTES WINDOW...

- A powerful tool for query & editing...

SUMMARIZE...

CALCULATE GEOMETRY – SMART ATTRIBUTING

- What you can calculate depends on feature type
- You choose coordinate system
- You choose Units
FIELD CALCULATOR – SMART ATTRIBUTING

• Powerful form of spatial analysis...
• You can come up with just about anything that combines existing attributes...

ARCPAD MAKES IT EASY

• Attribute that data in the field (when collecting raw data) instead of back in the office...
• Build in error checking...

CREATE SHAPEFILE, THEN QUICKFORM

ArcPad STUDIO FOR FANCIER APPS.

ATTRIBUTING DURING DATA COLLECTION

An ArcPad extension with a suite of editing and text tools that integrate with GPS for the collection of point data.

(Mapsmith example from MIT Geosciences)

SUMMARY OF COMMON ATTRIBUTE TASKS
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WHAT IS METADATA?

WHAT? THERE’S METADATA?

• Get to it from Table of Contents and our favorite right-click...
• Or from ArcCatalog... and a right-click

METADATA FOR WHAT?

- A folder
- A file
- A geodatabase
- A map document

METADATA - OF THE MAP DOCUMENT

• How many of you have ever filled these things out?

DID YOU KNOW... GEOLOGIC UNITS

How to I cite this data?
MAKE IT SHOW MORE...

MORE FROM... GEOLOGIC UNITS

RESOURCE IDENTIFICATION... GEOLOGIC UNITS

SPATIAL REPRESENTATION... GEOLOGIC UNITS

DISTRIBUTION INFORMATION... GEOLOGIC UNITS

METADATA & ITEM PROPERTIES... GEOLOGIC UNITS
• Populating such that your metadata is effective can take some effort and time...
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**HOW FAR TO GO (POPULATING METADATA)?**

- Who is the audience you are sharing with?
  - Is it yourself (reminder)
  - Is it a colleague?
  - Is it the general public?
- What is the purpose of the data & therefore the metadata?
- When sharing a paper map or PDF what is value of metadata?
- When sharing GIS data what is value of metadata?
- How to cite? - Metadata gives an answer...

**TODAY’S PLAN**

1. Editing... What is it?
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4. Metadata
5. Some Comments... & Exercise!!!

**WHAT WILL YOU USE THE TOOL DO?**

- What is GIS?
  - Just a tool?
  - A powerful medium for making persuasive arguments!
- Make a persuasive argument
  - For the right reasons
  - For the wrong reasons

  What we don’t teach you in school...

**YOUR EXCERCISE**

- Rest of Class:
  - Break into groups of 2-4 people
  - Define your overarching question or field monitoring problem
  - What type of information you want to collect (polygons, polylines or points)
  - How you would represent that as attributes and pop-up dialogs
  - What the field types would be (e.g. text, numeric, integer, drop-down, button, radios, images, etc.)

**WHAT WERE THE STORIES THAT STUCK WITH YOU?**

- 4 of ‘em anyway...

**6 C’S & METADTA**

1. Colorful - (but not cluttered) An effective use of color to distinguish features and emphasize key aspects of your map.
2. Creative - (but not confusing) There are lots of creative ways to display your geographic data and analyses.
3. Correct - All analyses, calculations and labels are correct.
4. Context - Describe, coordinates, projections, scale, orientation, setting All maps should have enough context for the user to determine where it is, what it is about and what the scale is within the context that it is presented (e.g. zooming in map vs. within a report).
5. Convincing - (fit for purpose) All maps have a purpose, and your map should be effective at conveying the message it is intended to.
6. Consistent - There should be typographic and typographic consistency both within a single map and amongst multiple maps in the same assignment or project.
THIS WEEK’S LAB

Lab 4: Digitizing, Editing & Sharing Data

• Edit existing Vector Data
• Create new vector data layers and edit them (i.e. digitizing)
• Edit and create tabular data
• Share vector and tabular data with other GIS users