

LECTURE 6: CREATING AND EDITING DATA



*CEEN 4800/6965 - Special Topics
Geographic Information Systems and Hydrologic & Hydraulic Modeling
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OUTLINE

- ◆ **Section 6: Creating and Editing Data**
 - ◆ **Chapter 14: Building Geodatabases**
 - ◆ **Exercise 14a: Creating a personal geodatabase (Lab Exercise)**
 - ◆ **Exercise 14b: Creating feature classes (Homework)**
 - ◆ **Chapter 15: Creating Features**
 - ◆ **Exercise 15a: Drawing features (Lab Exercise)**
 - ◆ **Exercise 15b: Using feature construction tools (Homework)**
 - ◆ **Chapter 16: Editing Features and Attributes**
 - ◆ **Exercise 16a: Deleting and modifying features (Lab Exercise)**
 - ◆ **Exercise 16b: Splitting and merging features (Homework)**
 - ◆ **Exercise 16c: Editing feature attribute values (Homework)**

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ARCGIS GEODATABASE

- ◆ Geodatabase = geographic database
- ◆ Stores both geographic and attribute data in the same RDBMS
- ◆ The term geodatabase refers to a storage format
 - ◆ File-based formats like shapefiles: store feature coordinate and attribute information in separate files
 - ◆ Geodatabase: Stores spatial features and their attributes in the same RDBMS file

FIVE GEODATABASE TYPES

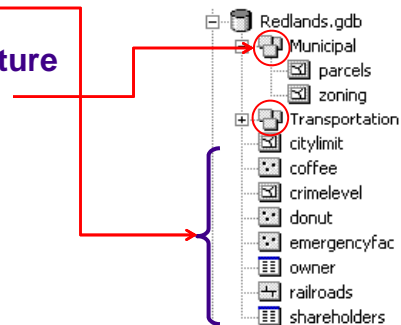
- ◆ **Personal (first three)**
 - ◆ For small projects
 - ◆ Only one user can edit at a given time
- ◆ **Multiusers (last two)**
 - ◆ For larger enterprise GIS applications and databases
 - ◆ Supports concurrent editing by multiple users; supports versioning
 - ◆ Requires ArcEditor or ArcInfo license
 - ◆ Requires a RDBMS software (e.g., Oracle or SQL Server)
 - ◆ Also requires ArcGIS Server software

Geodatabase Type	Available Through	DBMS Technology	Differentiating Characteristics
Personal geodatabase for MS Access	ArcView, ArcEditor, ArcInfo	Microsoft Access	1 editor 2 GB mdb file size limit
File geodatabase	ArcView, ArcEditor, ArcInfo	File structure	1 editor 1 TB per table size limit (default) No versions
Personal geodatabase	ArcEditor, ArcInfo	Microsoft SQL Server 2005 Express	1 editor 4 GB size limit per GDB 3 concurrent connections Support for versions
Workgroup geodatabase	Workgroup level of ArcGIS Server	Microsoft SQL Server 2005 Express	Multi-user editing 4 GB size limit per GDB Support for versions
Geodatabase	Enterprise level of ArcGIS Server	IMS DB2, IBM Informix, Microsoft SQL Server 2000 or 2005, Oracle	Multi-user editing Support for versions

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Geodatabase data format

- ◆ **Stand-alone feature classes**
- ◆ **Feature datasets (group of feature classes)**

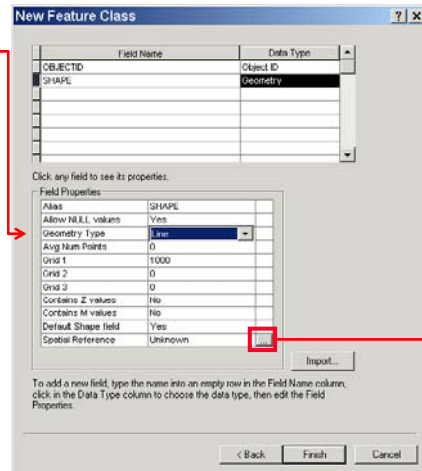


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CREATE NEW FEATURE CLASS IN A GDB

- ◆ Select GDB in ArcCatalog → right click → New → Feature Class

- ◆ Define Geometry Type
- ◆ Define Spatial Reference



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LAB EXERCISE

- ◆ **Exercise 14a:**
Creating a personal geodatabase



- ◆ **Note:** Before starting the exercise, copy exercise data folder (Chapter14) from the C:\GTKArcGIS folder to your personal drive, i.e., N: drive (YSU's student account server) or memory stick.

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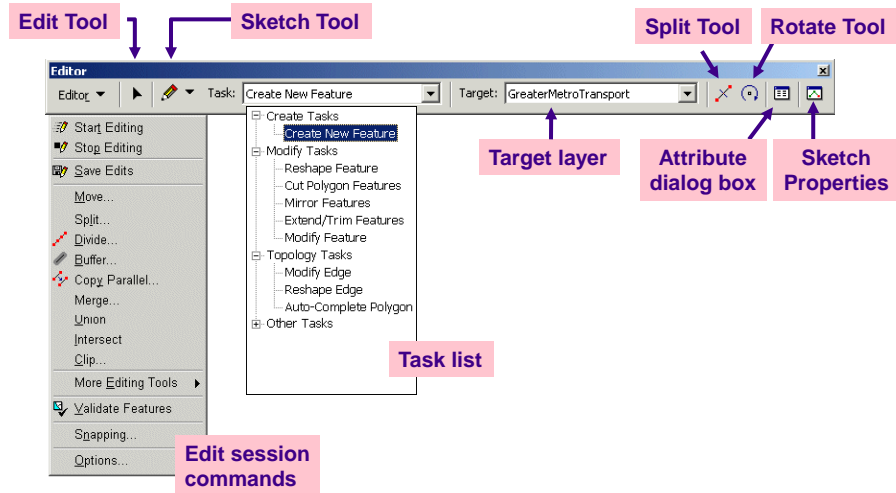
CREATING & EDITING FEATURES

EDITING OVERVIEW

- ◆ Editing spatial data
 - ◆ Navigating the Editor toolbar
 - ◆ Editing tools
 - ◆ Simple editing functions
 - ◆ Working with sketches
- ◆ Editing attribute data
 - ◆ Using the Attribute dialog on selected features
 - ◆ Editing attribute values

THE EDITOR TOOLBAR

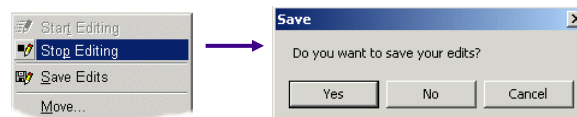
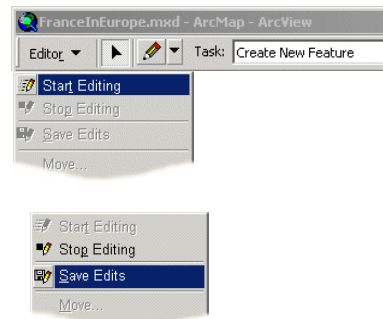
- ◆ All editing functions are controlled through the toolbar



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MANAGING EDIT SESSIONS

- ◆ Starting a session
- ◆ Saving edits
 - ◆ During the edit session
 - ◆ At the end of the edit session
- ◆ Ending a session



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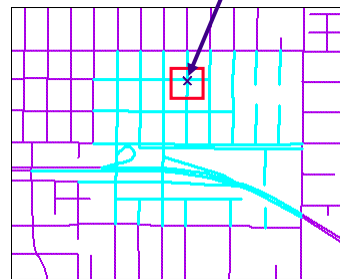
SELECTING FEATURES

- ◆ Interactive method
 - ◆ Manual: Select features by clicking them with Edit tool
 - ◆ Graphic Method: Select features by drawing a shape (box, line, or area) (Lecture 5A)
- ◆ Query method
 - ◆ Selection menu: By Attribute, By Location (Lecture 5A)
- ◆ Choice of selectable layers from Selection menu (Lecture 5A)

Edit Tool



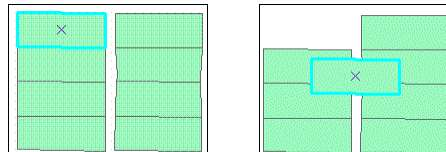
Selection anchor



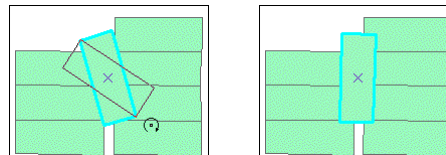
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SIMPLE EDITING FUNCTIONS

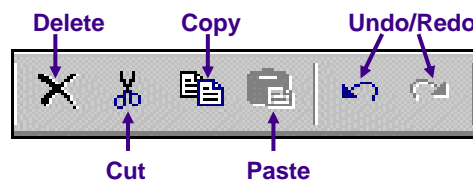
- ◆ Moving
 - ◆ Click and drag



- ◆ Rotating



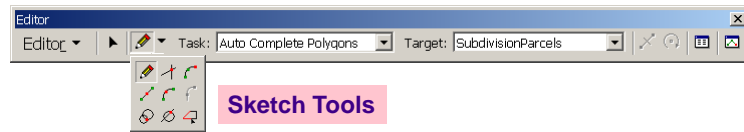
- ◆ Others



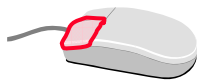
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SKETCH TOOL

- ◆ Use to create, modify, reshape features



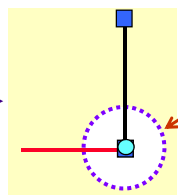
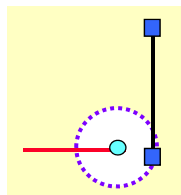
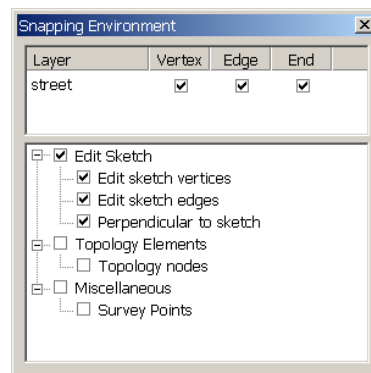
- ◆ Temporary graphic represents feature geometry
- ◆ Left mouse button adds vertices or points
 - ◆ Double-click or F2 key to finish sketch
 - ◆ Right-click to access context menu



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USING SNAPPING

- ◆ Snapping automatically moves your pointer to the location of a feature.
- ◆ Editor tool bar → Editor → Snapping
 - ◆ Snaps pointer to existing feature's edge, vertex, or endpoint



Snapping Tolerance: the distance the pointer must be to a feature before it snaps to that location.
Set through Options from the Editor menu.

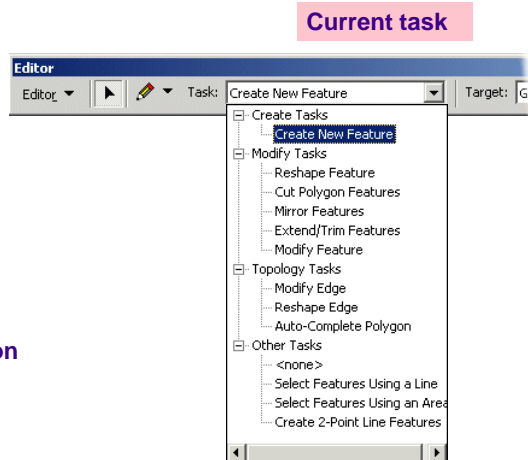
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EDIT TASKS

- ◆ Sketch tool works with the current task

- ◆ Task examples:

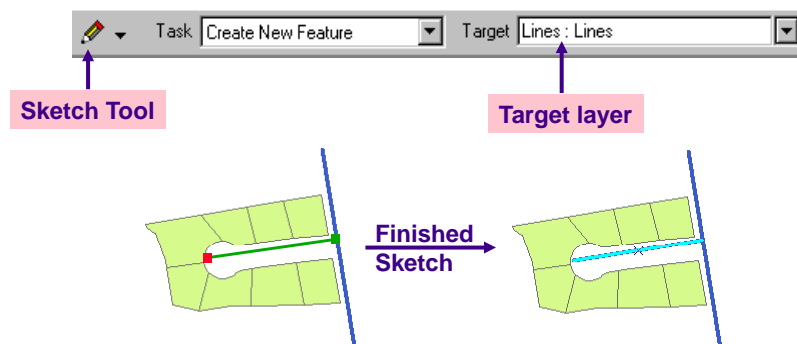
- ◆ Create New Feature
- ◆ Modify Feature
 - ◆ Reshape Feature
 - ◆ Extend/Trim Features
 - ◆ Cut Polygon Features
- ◆ Maintain topology
 - ◆ Auto-Complete Polygon



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CREATE NEW FEATURE TASK

- ◆ Sketch tool is used to add new features to the Target layer

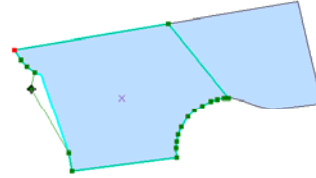


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MODIFY FEATURE AND RESHAPE FEATURE

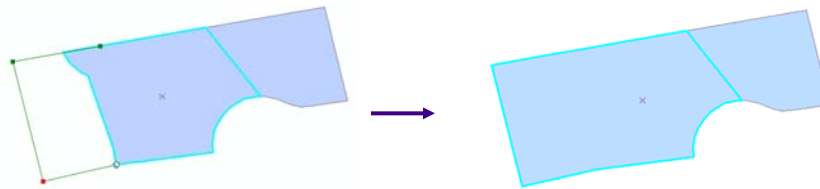
◆ Modify Feature Task

- ◆ Edit the vertices of an existing feature
- ◆ Modify one feature at a time
- ◆ Shortcut: Double-click with the Edit Tool



◆ Reshape Feature Task

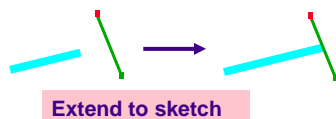
- ◆ Feature takes the shape of the intersecting sketch



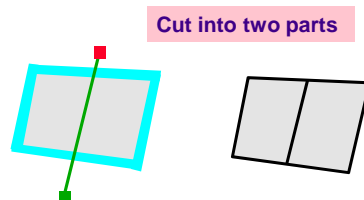
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EXTEND/TRIM FEATURES AND CUT POLYGON

◆ Extend/Trim Features



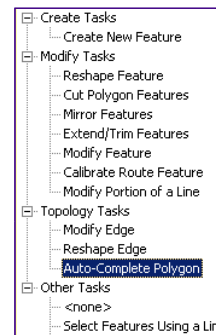
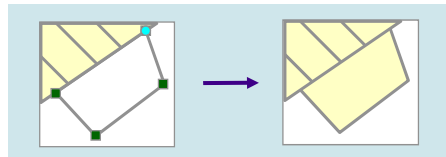
◆ Cut Polygon Features



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AUTO-COMPLETE POLYGON

- ◆ Automatically maintain coincidence (topology)
 - ◆ Align new polygon with existing features
 - ◆ Avoid gaps or overlaps

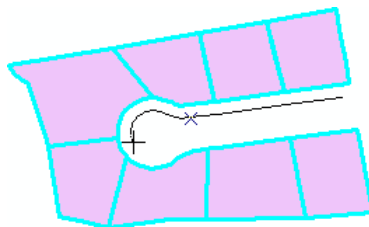


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TRACE TOOL



- ◆ Trace along selected features
- ◆ Select features
- ◆ Click to start and stop the trace
- ◆ Press O to specify an offset



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SKETCH CONTEXT MENU

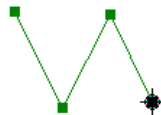
- ◆ Pops up with Right-click
- ◆ Context menu type depends on click location



Sketch Tool
context menu

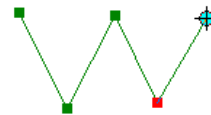
Snap To Feature ▾	
Direction...	Ctrl+A
Deflection...	Ctrl+F
Length...	Ctrl+L
Change Length	
Absolute X, Y...	F6
Delta X, Y...	Ctrl+D
Direction/Length...	Ctrl+G
Parallel	Ctrl+P
Perpendicular	Ctrl+E
Segment Deflection...	F7
Replace Sketch	
Tangent Curve...	Ctrl+T
Streaming F8	
Delete Sketch	Ctrl+Delete
Finish Sketch	F2
Square and Finish	
Finish Part	

Sketch Tool
context menu



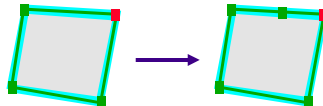
When cursor
is directly
over last
vertex

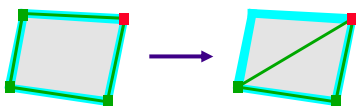
When
cursor is
away from
last vertex



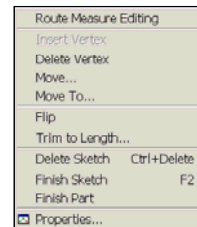
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MODIFYING EXISTING FEATURES

- ◆ Double-click feature to expose sketch elements
- ◆ Right click to show context menu
- ◆ Insert Vertex
 

A diagram showing a square with a red vertex. An arrow points to the same square with an additional green vertex inserted at the top center.
- ◆ Delete Vertex
 

A diagram showing a square with a red vertex. An arrow points to the same square with one vertex removed, resulting in a triangle.
- ◆ Move vertices delta x,y (Move) or exact x,y (Move To)

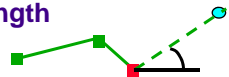


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CONTROL SKETCH ELEMENTS

◆ Next sketch segment

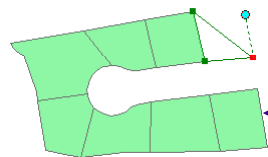
◆ Direction/Length



Direction = 30°
Length = 25 m

◆ Directions based on existing features

◆ Parallel



Parallel to

Snap To Feature	
Direction...	Ctrl+A
Deflection...	Ctrl+F
Length...	Ctrl+L
Change Length	
Absolute X, Y...	F6
Delta X, Y...	Ctrl+D
Direction/Length...	Ctrl+G
Parallel	Ctrl+P
Perpendicular	Ctrl+E
Segment Deflection...	F7
Replace Sketch	
Tangent Curve...	Ctrl+T
Streaming	F8
Delete Sketch	Ctrl+Delete
Finish Sketch	F2
Square and Finish	
Finish Part	

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EDITING
ATTRIBUTES & TABLES

ADDING TABLE FIELDS IN ARCMAP

- ◆ Add fields (Change schema)
 - ◆ Must be outside edit session

FID*	Shape*	LU_CODE	ZONE_CODE	Shape_Length	Shape_Area
1	Polygon	OS		2503.564427	62794.259024
2	Polygon	VAC	VAC	2477.448939	224072.047107
3	Polygon	OS	VAC	765.381119	21593.398608
4	Polygon	OS	VAC	665.456436	
5	Polygon	OS	FC	342.545742	
6	Polygon	OS	VAC	3102.095436	
7	Polygon	OS	VAC	2094.729970	
8	Polygon	CDM		2954.015306	
9	Polygon	OS	VAC	3186.282822	
10	Polygon	VAC	VAC	1694.462480	
11	Polygon	SDP	FC	1618.621886	
12	Polygon	VAC	VAC	3189.010253	
13	Polygon	VAC	VAC	843.661888	
14	Polygon	VAC	VAC	2310.052686	
15	Polygon	VAC	VAC	1058.072825	
16	Polygon	VAC	VAC	1621.989122	
17	Polygon	VAC	VAC	4756.227582	
18	Polygon	VAC	VAC	1603.267616	
19	Polygon	VAC	VAC	2387.181309	
20	Polygon	OS	VAC	184.759379	

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ADDING TABLE FIELDS IN ARCCATALOG

1 Type in new field name

2 Choose the field type

3 Set the field properties

Field Name	Data Type
OBJECTID	Object ID
NewField	Text
	Short Integer
	Long Integer
	Float
	Double
	Text
	Date
	Blob
	Guid

Click any field to see its properties.

Field Properties	
Alias	
Allow NULL values	Yes
Default Value	
Domain	
Length	50

Import...

To add a new field, type the name into an empty row in the Field Name column, click in the Data Type column to choose the data type, then edit the Field Properties.

< Back Finish Cancel

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LAB EXERCISES



- ◆ **Exercise 15a: Drawing features**
- ◆ **Exercise 16a: Deleting and modifying features**
- ◆ **Note:** *Before starting the exercises, copy exercise data folders (Chapter15 and Chapter16) from the C:\GTKArcGIS folder to your N: drive (YSU's student account server) or memory stick.*

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HOMEWORK 4



- ◆ **Exercise 14b: Creating feature classes**
 - ◆ Q1. Complete Exercise 14b and submit a screenshot of "New Feature Class" window from Step 10 (shown on page 386).
- ◆ **Exercise 15b: Using feature construction tools**
 - ◆ Q2. Complete Exercise 15b . After completing Step 27, zoom to display the extents of both the newly added parcels. Submit a screenshot of the updated map.
 - ◆ Extra Credit (10 extra points): Instead of submitting a screenshot, print and submit the above map in landscape mode. Add the following elements to this map:
 - ◆ Your name
 - ◆ A map title
 - ◆ North arrow
 - ◆ Scale bar, and
 - ◆ YSU logo.

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HOMEWORK 4



♦ Exercise 16b: Splitting and merging features

- ♦ Q3. Complete Exercise 16b. After completing Step 21, zoom to display the extents of the three edited parcels (2707, 2855, 2861). Submit a screenshot of the updated map.

♦ Exercise 16c: Editing feature attribute values

- ♦ Q4. Complete Exercise 16c. After completing Step 13, repeat Steps 10 to 13 to accomplish the following:
 - ♦ Add a new field to the table called Hectares
 - ♦ Use Field Calculator to populate the Hectares field with parcel area in Hectares (Hint: 1 Hectare = 2.471 acres)
 - ♦ Submit a screenshot of the updated “Attributes of Parcels” table. The screenshot should show all the columns (including the Hectares column) and at least the first 10 rows of the table.