



NWCG Event Data Standard Editing the Incident Geotabase Editing Overview

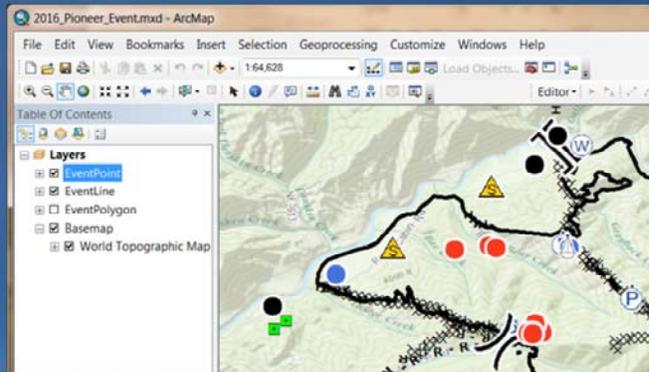
Objectives

- Highlight key ArcGIS tools for editing the Event GDB
- Demonstrate an editing workflow for the Event GDB



Event Geodatabase Editing - Overview

- Edit the GDB with **Commercial Off The Shelf (COTS)** tools – ArcMap
- Demo and IAP exercise will use COTS tools and Event GDB



Edit GDB with COTS tools

In the past GIS Specialists used special (complicated) tools to manage and edit databases. **Anyone remember ArcView 3.x? Ventura Tools! ArcMap and the Fire Incident Mapping Tool (FIMT).** Many of these tools were created to address shortcomings in the available software or to reduce the number of “button clicks” to do a job. Over the years the GIS software has matured to include most of these tools. Items like Data Driven Pages replaced the old Map Book Extension and the Cut Fireline Tool has been replaced by the split line option.

So now there is trend toward simplification and using COTS tools wherever possible. Partially to make training easier and partially because there is no \$\$ to continue to support custom extensions.

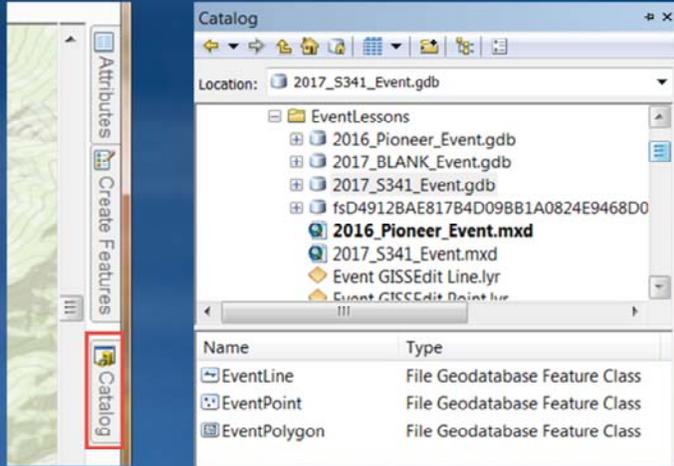
DEMO and IAP Exercise

For the purpose of the demo and the IAP map creation you will all use COTS tools to do the work and not rely on any custom tools or extensions.

The following slides contain some pointers that will be helpful when editing the data and creating the IAP map. But **use and share** any ArcGIS tricks you may have for streamlining the process.

Event Geodatabase Editing – Catalog Window

- No Locks!
- Windows > Catalog
- Dockable window



28 - NWCO Dist. Data Standard 4

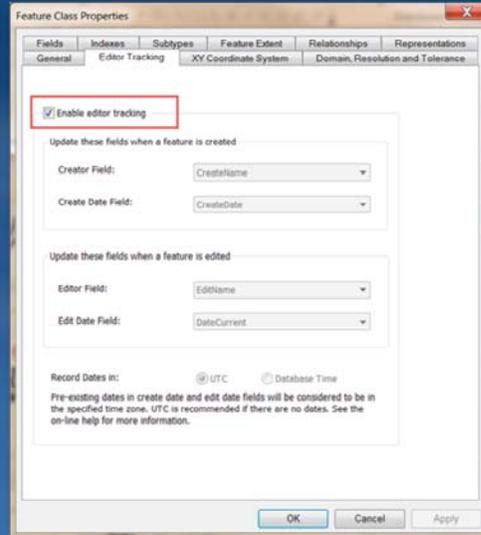
No Locks!

When using the Catalog window **WITHIN** ArcMap you will avoid many of the locking issues that occur when running both ArcCatalog and ArcMap at the same time. This issue is compounded when there are multiple GIS Specialists on a fire and they are all accessing the database.

The Catalog window can be displayed by selecting the Catalog menu item in the Windows menu or it may be already docked somewhere in ArcMap. This window can also be dragged to a second monitor.

Event Geodatabase Editing – Editor Tracking

- Feature Class Properties
- Right click on Feature Class in Catalog
- Set the Tracking Fields



Editor Tracking

It is a best practice to use Editor Tracking during an incident to track edits made by GISS and the edits made by field users if using feature services.

Creator: **CreateName**

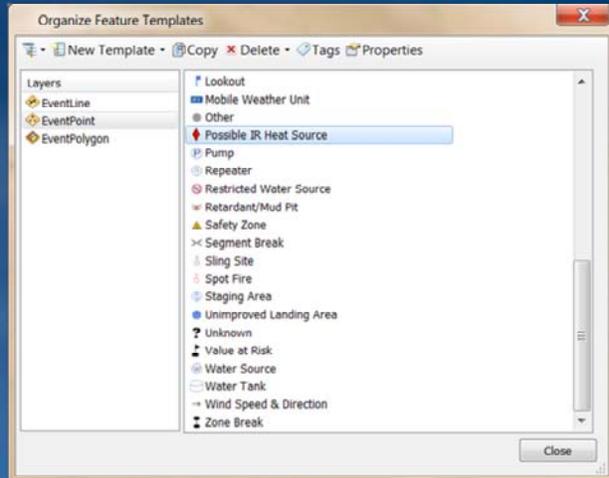
Create Date: **CreateDate**

Editor: **EditName**

Edit Date: **DateCurrent**

Event Geodatabase Editing – Feature Templates

- Define all information required to create a feature
- Set Default values
- Avoid data entry errors
- See **ESRI Help** on Feature Templates



28 - NWCCO Emer. Data Standard 8

STOP – Audience Question

A show of hands for anyone who has used or configured feature templates in the past? An example of when that was used?

Define all information required to create a feature

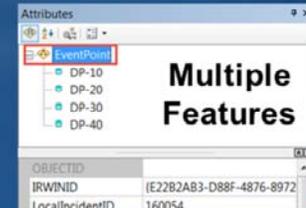
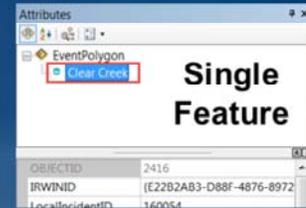
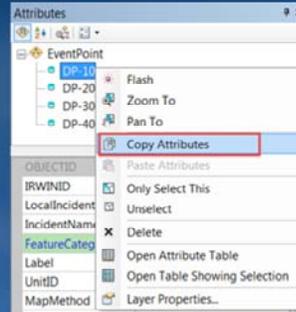
A feature template is automatically created when you start editing a feature, so many folks may not have experience configuring a custom one. The default symbology for a feature, or an attribute of a feature (Feature Category) can be defined when the data is created.

Default attributes can be configured for all elements of a feature class in the feature template. Why is this important to us? Feature templates allow us to automate some of the repetitive tasks associated with creating and/or editing wildland fire features. Feature Templates allow us to set the Incident Name for all features or the IRWIN ID. **This saves time and limits mistakes.**

ESRI Help on Feature Templates: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/creating-new-features/about-feature-templates.htm>

Event Geodatabase Editing – Attributes Window

- Speeds Data Entry
- Edit attributes for **Single** feature
- Apply same Attribute to **Multiple** features
- Copy all Attributes from a feature to other features



28 - NWCO Edit. Data Standard 7

Stop – Audience Question

How do you edit attribute data in ArcMap? Those who use the feature class table – Stand UP. Those who use the Attributes window, raise your hand.

So why use the Attributes window??

Speeds Data Entry

Using the feature class table for data entry may seem like the most intuitive way to enter and edit data in ArcMAP. But the Attributes window allows you to much more efficiently enter data for features. Sidebar Attribute window also saves you screen real estate on smaller laptop screens that you will be using on the fire. The information displaying the Attributes window is based on the current selected features.

Edit Attributes for Single feature

This is the easiest one – enter attributes for the single selected feature. Type directly in the window. The Attributes window can be set to automatically display after editing a feature if desired. This can be set from the Editor toolbar. Go to the **Editor** drop down menu select **Options**, and then the **Attributes** tab. Check the “Display” box to enable this behavior.

Apply same value to Multiple features

When multiple features are selected a common attribute can be assigned to all of the features at once. When the Feature Class is highlighted in the Attributes window any attribute entered applies to all of the selected features. For example - this is helpful when importing IR data and assigning a DateTime the feature was collected and changing the MapMethod of the feature to Infrared Image.

Copy all Attributes from a feature to other features

If you have a feature will full attribution and want to apply these values to other selected features the values can be copy and pasted between features. This could be used when entering Water Sources in the database. If there were 10 Water Sources the attributes that had the same attributes as an existing feature,

the Attributes could be copied from the existing feature and pasted into the new features saving time.

ArcGIS Help – Editing Attributes:

<http://desktop.arcgis.com/en/arcmap/10.4/manage-data/editing-attributes/about-editing-attributes.htm>

ARGIS Blog Post on Editing Attributes: <https://blogs.esri.com/esri/arcgis/2011/01/18/getting-the-most-out-of-editing-in-arcgis-10-editing-attributes/>



NWCG Event Data Standard Editing the Incident Geotabase Part 2 – Editing DEMO

DEMO

- Will walk through how COTS tools can be used to edit the incident geodatabase.
- Keep in mind this is only one option for editing the data, ArcMap provides many different options for editing data. **Pick the method that works best for you.**



28 - NWCG Edit. Data Standard 9

Demonstrate how these tools can be used to speed up the editing of incident geodatabase. Use the same incident data that the students will receive to make the map. The Clear Creek fire.

Since we are using COTS tools these editing steps can be used anywhere – daily job, etc.

DEMO - Workflow

- Polygon
- Point or Line
- Labeling

- Layout
- Print

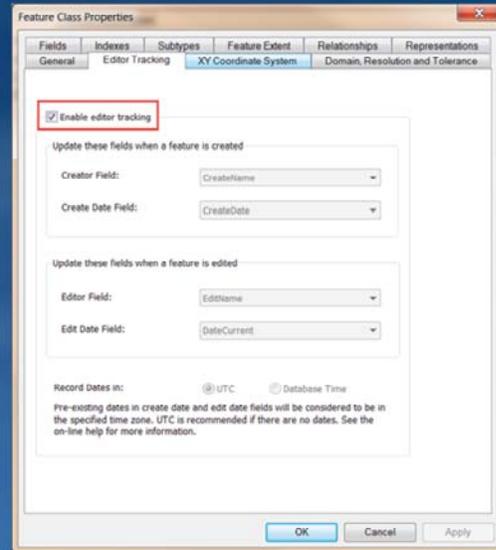


28 - NIMCO Emer. Data Standard 10

This is a very rough workflow for the creation of incident maps. We generally start with a polygon since the line features may be created based on the polygon boundary. Line and point are interchangeable and the order really does not matter. In the demo we are going to focus on creating Polygon, Points, Lines, and set basic labeling.

Editing Workflow Demo – Blank Geodatabase

- GDB – WGS84
- Set up Editor Tracking
- Apply Layer Files if necessary



28 - NWCG Edit. Data Standard 11

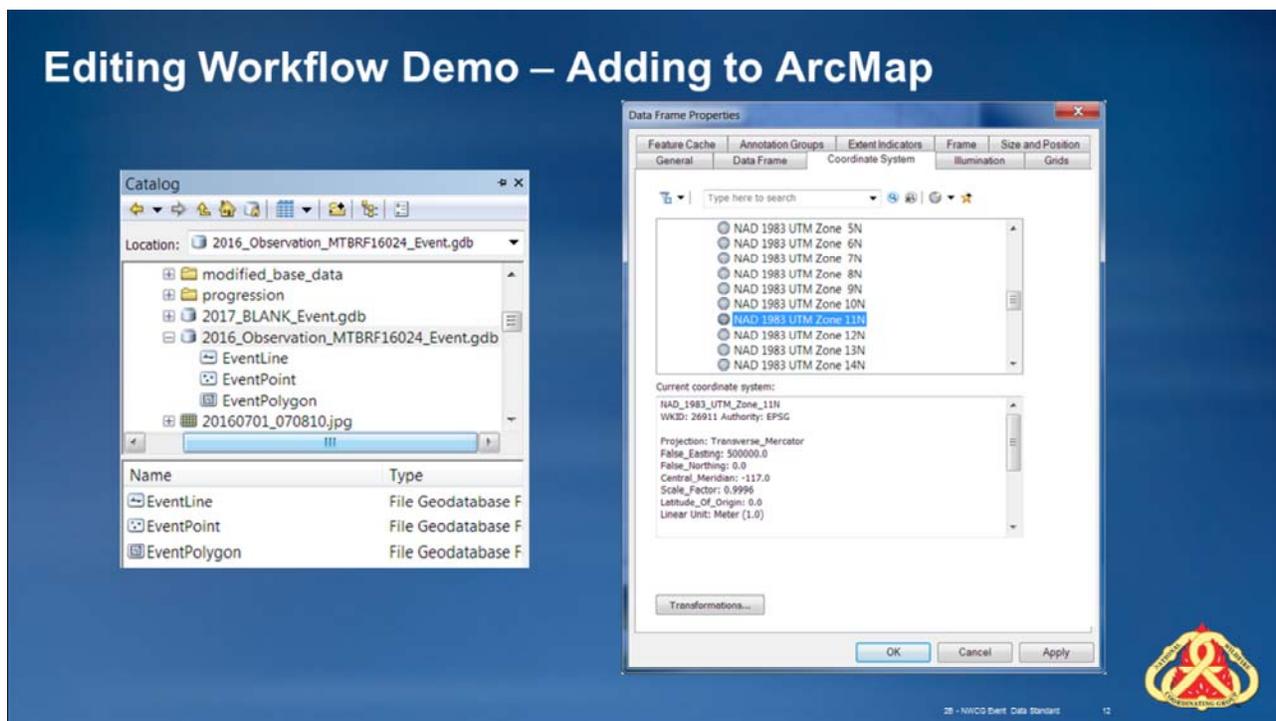
HIDE SLIDE IF DEMO IS GOING TO BE DONE LIVE. This slide includes points to highlight during demo.

1. There is a blank GDB provided for the class work.
2. Copy the GDB to an incident folder and rename using GSTOP file naming standards.
3. GDB Name = **2016_Observation_MTBRF16024_Event.gdb**
4. Keep the GDB feature classes in the same projection. This is the one used by the feature services so we are going to practice editing data and calculating Acres and Lat/Long to simulate what you would do on a fire.
5. Need to setup Editor tracking on the GDB if not already enabled. This is done for each feature class.
6. In Catalog window right click on the feature class and go to **Properties**. Then select the **Editor Tracking** tab.
7. Check the box to **Enable Editor Tracking** and select the Create and Edit field information. **CreateName, CreateDate, EditName** and **DateCurrent** are standard fields for Editor Tracking.
8. Apply layer files if symbology is not already present or if there is an issue. Layer files are included in the **2016_ObservationTools** folder.

Editor Tracking: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/editing-fundamentals/enabling-editor-tracking.htm>

Layer Files: <http://desktop.arcgis.com/en/arcmap/10.4/map/working-with-layers/importing-symbology-from-another-layer.htm>

Editing Workflow Demo – Adding to ArcMap

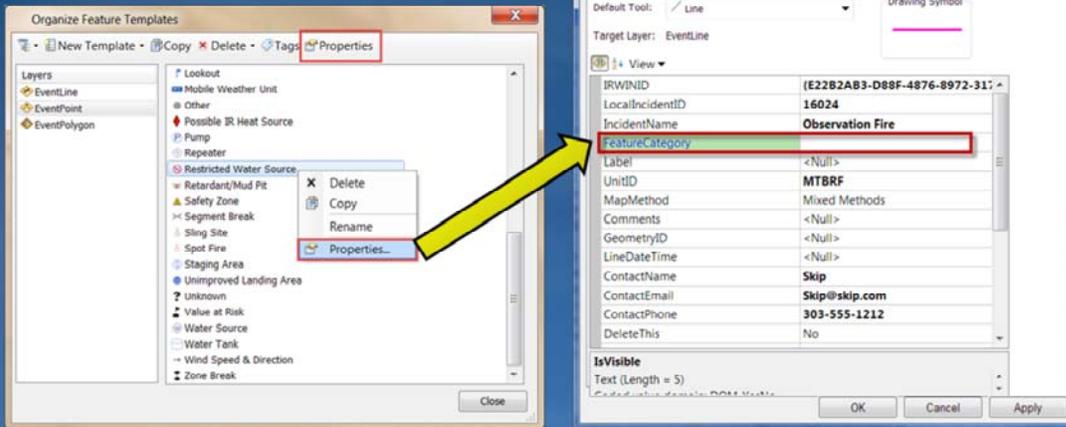


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1. Use the Catalog window sidebar. As previously discussed the Catalog window sidebar helps avoid database locking in ArcGIS.
2. Change the data frame projection to match the local projection. This will project the geodatabase on the fly.
3. Local Projection = **NAD 1983 UTM Zone 11N**
4. Right click on Layers in the Table of Contents and select **Properties**. From the **Data Frame Properties** dialog box pick the **Coordinate System** tab and select the local, projected coordinate system.
5. Add the feature classes to ArcMap.
6. Apply the layer files to symbolize the data correctly.

Editing Workflow Demo – Feature Template

- Setup Templates for Point, Line or Polygon



HIDE SLIDE IF DEMO IS GOING TO BE DONE LIVE. This slide includes points to highlight during demo.

1. Demonstrate setting up a feature template for the EventPolygon feature class.
2. Demonstrate how to set default values for all of the elements in a particular feature class.
3. In the Table of Contents right click on the EventPoint feature class. Go to **Edit Features** and select **Organize Feature Templates**. This will bring up the Organize Feature Templates dialog box.
4. If the Event feature classes do not have templates created for them select a feature class and click **New Template** from the upper menu option. Take the defaults in the dialog boxes and create the templates. Once created they will show in the right hand pane of the Organize Feature Templates dialog.
5. In the left hand Layers pane in the Organize Feature Templates window click on the **EventPolygon** feature class. The pane on the right side will display the Feature Categories. Use **Shift Click** to select all of the features on the right hand side. Click on **Properties** in the top menu to open the Template Properties.
6. Since we have selected all of the Feature Categories in the **EventPolygon** feature class, any values we enter in the **Template Properties** window will apply to all of the newly created features.

Fill in the following values:

IRWINID: {E22B2AB3-D88F-4876-8972-3179C24712BF}

Local Incident ID: 16024

Incident Name: Observation Fire

Unit ID: MTBRF

Contact Info: Yours

GACC: NRCC

IMTName: NRIMT

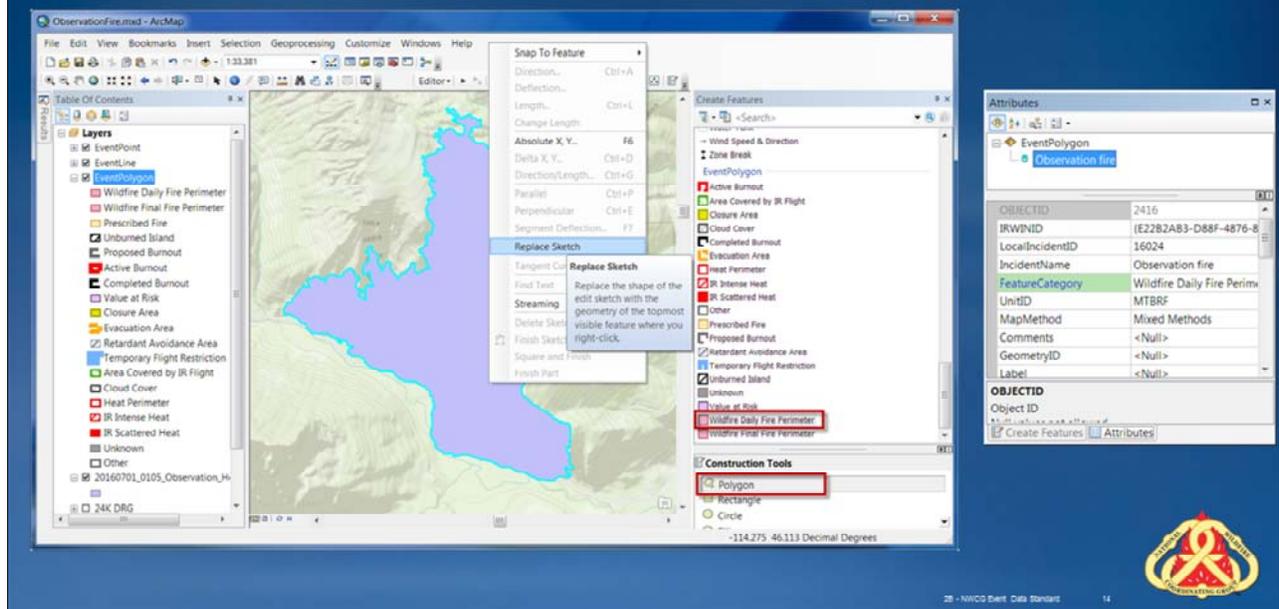
7. After setting the default values for all of the features you can check the Template Properties for a few

individual feature to show that the values are present.

8. In the interest of time, just do the Event Polygon features and explain to the students that the process is the same for the other two feature classes. Have the other two feature classes pre-populated.

Feature Templates: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/creating-new-features/about-feature-templates.htm>

Editing Workflow Demo – Copy Polygon

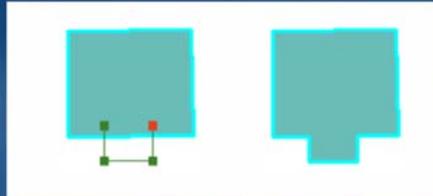


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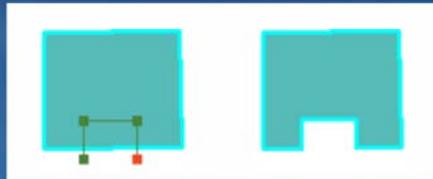
1. Add the fire polygon from the Observation Fire incident – located in the IR folder.
2. Start an edit session on the Event feature classes. Right click on the fire polygon, go to **Edit Features** and select **Start Editing**.
3. Make sure the Editor Toolbar is displayed
4. Using the **Edit Tool** select the Clear Creek fire polygon.
5. Go to the **Create Features** window, select the **Polygon** Construction Tool, right click on the selected fire polygon and choose **Replace Sketch**.
6. This will create a polygon with the same vertices as the selected polygon.
7. Right click and select **Finish Sketch** or use **F2**.
8. So why do it this way? The **Replace Sketch** option just copies the geometry and preserves the default values that you have pre-loaded in the editing template. This cuts down on data entry. Normal Copy/Paste will copy both the geometry and the values over writing the editing template.
9. Review the values in the Attributes window.
10. **Save Edits!**

Editing Workflow Demo – Edit Polygon

- If endpoints start within polygon – added to feature



- If endpoints start outside the feature – removed from feature



20 - NWCCO Edit. Data Standard

10



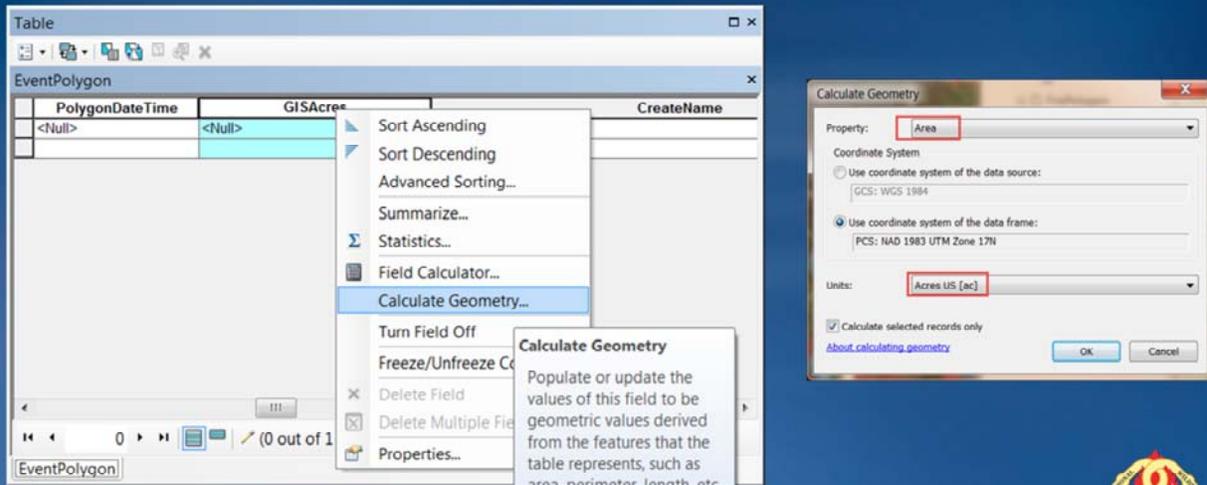
HIDE SLIDE IF DEMO IS GOING TO BE DONE LIVE. This slide includes points to highlight during demo.

1. The **Reshape Feature** editing tool can be used to modify an existing line or polygon geometry.
2. It can be used to increase or decrease a polygon based on where the user starts editing. Best used for adding daily growth to a polygon.
3. Start an edit session.
4. Select the Event Polygon (Daily Wildfire Perimeter) and add to the NW corner of the fire. This is just for a demo, so don't worry about matching up with tomorrow's data. Show the **Reshape Feature** tool at least twice in the demo.

Reshaping a line: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/editing-existing-features/reshaping-lines.htm>

Reshaping a polygon: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/editing-existing-features/reshaping-polygons.htm>

Editing Workflow Demo – Calculate Acres



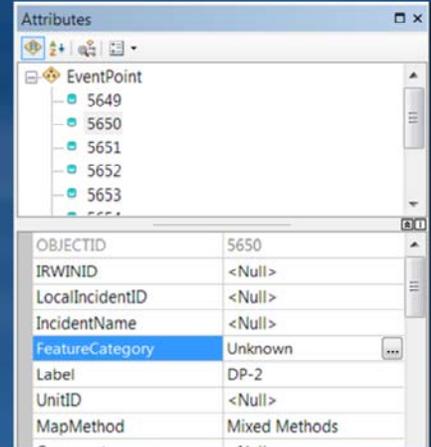
HIDE SLIDE IF DEMO IS GOING TO BE DONE LIVE. This slide includes points to highlight during demo.

1. Calculate the Acres for the newly created polygon
2. Open the table for the Event Polygon by right clicking on Event Polygon in the Table of Contents and selecting **Open Attribute Table**.
3. Values will be calculated on selected records if they exist of the entire column of information.
4. Right click on the GISAcres field and select **Calculate Geometry**.
5. Under Property select **Area**.
6. For the Coordinate System select **Use coordinate system of the data frame**. This is necessary since the feature class is in WGS84.
7. Under Units select **Acres US**.
8. Click **OK**
9. Acres should ~ 1238 acres.

Calculate Geometry: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/tables/calculating-area-length-and-other-geometric-properties.htm>

Editing Workflow Demo – Copy Points

- Copy Points
- Does not honor Feature Template default values.
- Attributes window to speed data update.



28 - NWCCO Ext. Data Standard 17

HIDE SLIDE IF DEMO IS GOING TO BE DONE LIVE. This slide includes points to highlight during demo.

Key point here is that when using Copy/Paste the feature template default values are not honored.

1. Open the FirePoints table from the Clear Creek sample data.
2. Select the records with a PointName of DP in the table.
3. Use the Copy/Paste buttons on the main toolbar to copy to the **EventPoint** feature class.
4. The new points will come over with a FeatureCategory of **Unknown**.
5. Show how the **Feature Template** default values were not passed to the new features.
6. Use the **Attributes** window to populate values for all features at once.

Fill in the following values:

IRWINID: {E22B2AB3-D88F-4876-8972-3179C24712BF}

Local Incident ID: 16024

Incident Name: Observation Fire

Unit ID: MTBRF

Comments: From Logs Chief Bryant

PointDateTime: 6/30/2016 20:30 (this will convert to PM correctly)

Contact Info: Yours

GACC: NRCC

IMTName: NRIMT

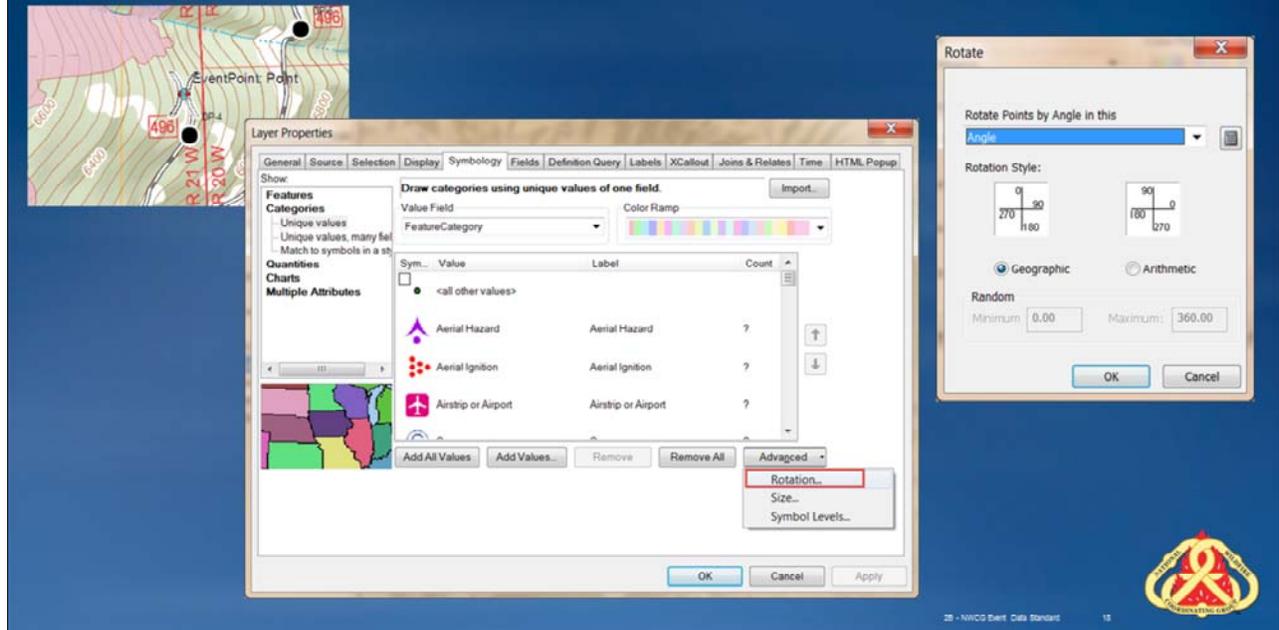
7. Change the Display Field by right clicking on **EventPoint** in the table of contents and selecting **Properties**. Then go to the **Display** tab and select Label as the display field.
8. Show how the various Drop Point label attributes can be edited by clicking on the individual ObjectID. Once the **Label** field is updated it will display in the Attributes window.

ArcGIS Help – Editing Attributes:

<http://desktop.arcgis.com/en/arcmap/10.4/manage-data/editing-attributes/about-editing-attributes.htm>

ARGIS Blog Post on Editing Attributes: <https://blogs.esri.com/esri/arcgis/2011/01/18/getting-the-most-out-of-editing-in-arcgis-10-editing-attributes/>

Editing Workflow Demo – Create Point

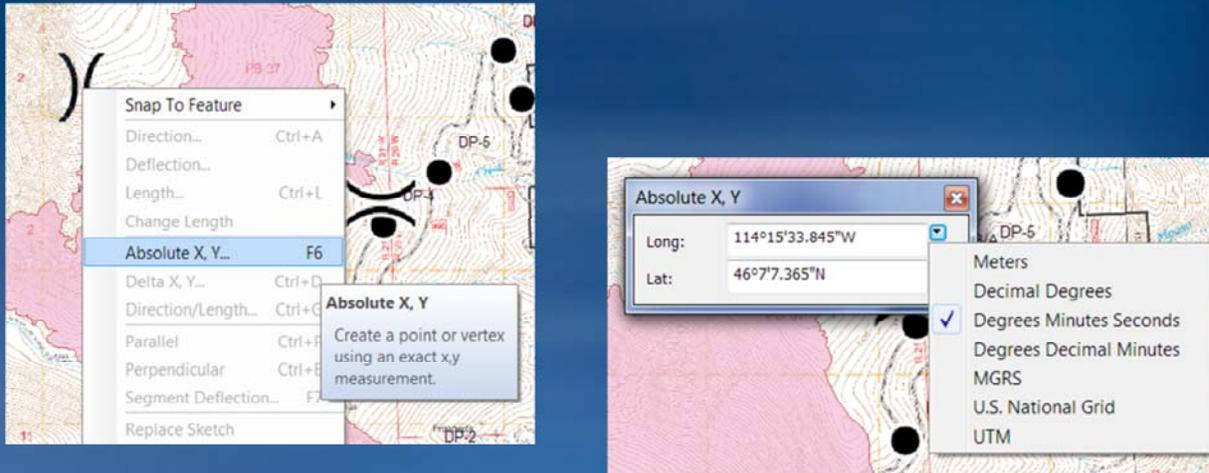


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1. Create and assign a rotation value to a Division Break.
2. Start editing.
3. In the **Create Features** window select Division Break from the EventPoint feature class.
4. Digitize the B/A Division Break at the end of the FS Road 496.
5. Switch to the **Attributes** window and show how the default values carry over from the **Feature Template**.
6. Change the **Angle** attribute to 90. This will turn the Division Break symbol to that angle.
7. The rotate by angle option is set up in the layer files. If this needs to be set by the GISS it can be done in the Event Point **Layer Properties** dialog box. Right click on Event Point, select **Properties**, then the **Symbology** tab and under **Advanced** click on **Rotation**. Set the rotation field and angle measurement.

Rotating Point Feature Symbols: <http://desktop.arcgis.com/en/arcmap/10.4/map/working-with-layers/rotating-point-feature-symbols.htm>

Editing Workflow Demo – Create Point via Lat/Long

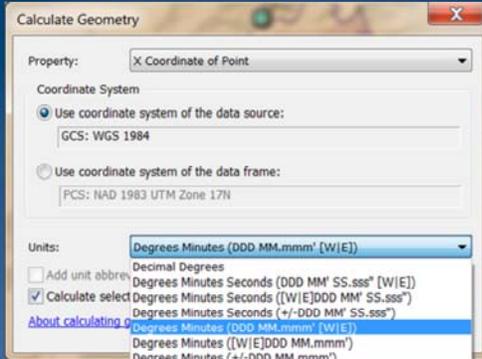


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1. Create a Division Break using the Lat/Long option in ArcMap
2. Select the Division Break symbol in the **Create Features** window.
3. Right click on the map and select **Absolute X, Y** from the context menu.
4. On the right side of the dialog box click on the triangle to set the input format. Change to **Degrees Minutes Seconds** for this example. Point out that the students should check the exercise to determine proper coordinate format – it could vary.
5. Enter the coordinates for the E/B Break location: 46° 8'10.8"N 114° 17'27.4"W
6. A division break will be created at this location.

Create Point at Absolute X, Y: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/creating-new-features/creating-a-point-at-an-exact-x-y-location.htm>

Editing Workflow Demo – Calculate Lat/Long



- Use DDD MM.mmm' [W|E] or [N|S]

ContactPhone	LatWGS84_DDM	LongWGS84_DDM	DeleteThis	ComplexName	Comj
<Null>	35° 42 363' N	82° 6.727' W	No	<Null>	<Null>
<Null>	35° 43.096' N	82° 4.833' W	No	<Null>	<Null>
<Null>	35° 43.417' N	82° 5.471' W	No	<Null>	<Null>
<Null>	35° 43.762' N	82° 6.716' W	No	<Null>	<Null>
<Null>	35° 44.006' N	82° 7.731' W	No	<Null>	<Null>



HIDE SLIDE IF DEMO IS GOING TO BE DONE LIVE. This slide includes points to highlight during demo.

1. Select the EventPoints that will have values calculated.
2. Open the EventPoint table.
3. Highlight the LatWGS84_DDM field, right click and pick **Calculate Geometry**. For the **Property** dropdown choose **Y Coordinate of the Point**, select **Degrees Minutes (DDD MM.mmm' [N|S])** and Click OK.
4. Highlight the LongWGS84_DDM field, and do the same selecting **Degrees Minutes (DDD MM.mmm' [W|E])** and Click OK.
5. The geometry calculations must be done against a string field if the degree symbol and other information is desired. Calculations against a numeric field will result in a decimal degrees output.
6. Table can be exported for use in an aviation map.

Calculate Geometry: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/tables/calculating-area-length-and-other-geometric-properties.htm>

Editing Workflow Demo – Line from Polygon

Paste
Choose a layer to create feature(s) in:
Target: EventLine
OK Cancel

Editor
Split Tool
Split a selected line feature into two features at a location you click. When you click, the pointer must be within the snapping tolerance.

Attributes
Route Measure Editing
Insert Vertex
Delete Vertex
Move...
Move To...
Change Segment
Flip
Trim To Length
Part
Delete Sketch
Finish Sketch
Finish Part
Sketch Properties

20 - WVIC Data Support 21

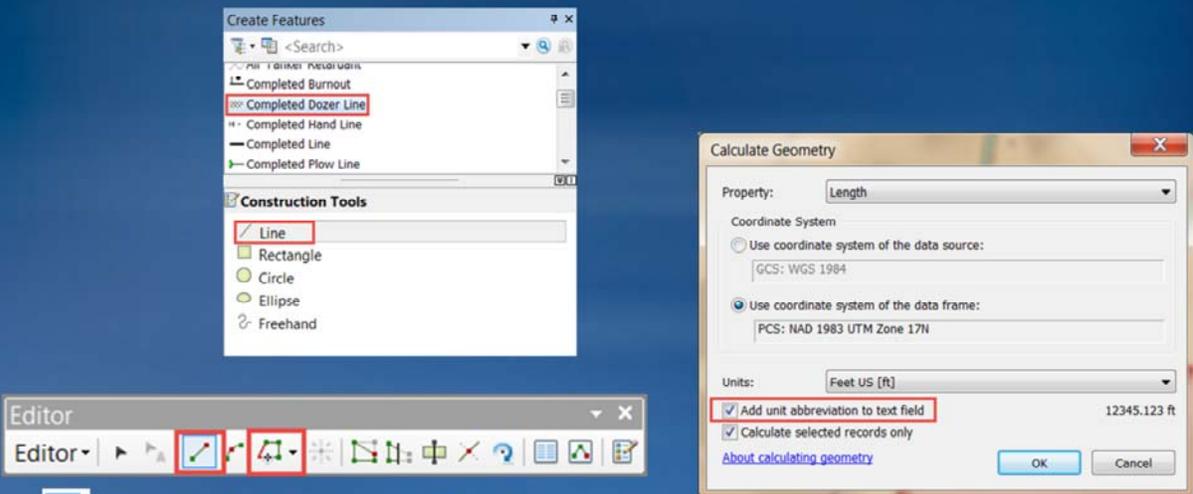
HIDE SLIDE IF DEMO IS GOING TO BE DONE LIVE. This slide includes points to highlight during demo.

- Often fire lines are created from the fire polygon itself for sections of Uncontrolled Fire Edge or other features. This process copies the Event Polygon and pastes it into the Event Line to ensure coincident lines.
- Select the fire polygon.
- From the main tool bar click **Copy** and then **Paste**.
- In the Paste dialog box pick Event Line as the **Target**.
- This will convert the polygon into a line feature. Turn off the Event Polygon feature class.
- Open the Attributes window and change the Feature Category to Uncontrolled Fire Edge. **If the line is not selected it will not display properly – the FeatureCategory will be the same as the fire polygon and that has no symbol.**
- The Event Line now needs to be split so different Feature Categories can be applied.
- Select the Line and click on the **Split** tool on the **Editor Toolbar**.
- Split the line at the Division Break and the southern Drop Point. Completed between the two. Uncontrolled for the rest.
- If the Uncontrolled Fire Edge hash marks are facing out, then the line will need to be flipped.
- Select the portion of the line to **Flip**, right click on the line and select Edit Vertices, and then right click on the start of the line which is a red vertex and click **Flip**.
- This will change the direction of the hash marks without changing the symbol.

Split Lines: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/editing-existing-features/ways-to-split-a-line-feature.htm>

Flip Line Segment: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/editing-existing-features/flipping-lines.htm>

Editing Workflow Demo – Create Line



The screenshot displays three key components of the ArcGIS editing workflow:

- Create Features Window:** Shows the 'Completed Dozer Line' feature class selected under the 'Construction Tools' category.
- Editor Toolbar:** The 'Line' and 'Trace' tools are highlighted with red boxes.
- Calculate Geometry Dialog:** The 'Property' is set to 'Length', 'Units' is 'Feet US [ft]', and the checkbox 'Add unit abbreviations to text field' is checked. The calculated length is shown as 12345.123 ft.

Straight Segment Tool
Trace Tool

HIDE SLIDE IF DEMO IS GOING TO BE DONE LIVE. This slide includes points to highlight during demo.

1. Frequently lines will need to be created that are not part of the Event Polygon. Those can be digitized freehand or traced from source data.
2. The Trace Tool is another option for creating lines or modifying sections of a polygon to match data from another source. In this example we will create a line that follows an existing line.
3. Add the line supplied by the Dozer Boss. C:\2016_Observation\incident_data\gps\20170701. Make sure to turn on the FireLine feature class.
4. Start an edit session.
5. Open the **Create Features** window and select the **Completed Dozer Line** symbol.
6. Using the Line Construction Tool start creating an Event Line that follows the GPS file.
7. Create the first point on the bottom of the GPS line. Switch to the **Trace** tool. Click on the FireLine feature class and trace along a line to trace its geometry.
8. Double click to complete.
9. Calculate Line Length using the Calculate Geometry tool.
10. Open the Event Line table, select the record for calculating, right click on the column (NAME?), and select **Calculate Geometry**.
11. In the **Property** dropdown select "Length"
12. In the **Units** dropdown select "Feet US"
13. Check the box for "Add unit abbreviations to text field".
14. Hit OK. This will create the length with an abbreviated unit.

Trace Tool: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/editing-fundamentals/creating-segments-by-tracing-features.htm>

Calculate Geometry: <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/tables/calculating-area-length-and-other-geometric-properties.htm>

Review Objectives

- Provide a background for the Event Geodatabase
- Discuss key features of the Event GDB.
- Highlight key ArcGIS tools for editing the Event GDB.
- Demonstrate an editing workflow for the Event GDB.



Did we meet the Objectives?

How To Documents and Additional Links

- Feature Templates
 - <http://desktop.arcgis.com/en/arcmap/10.4/manage-data/creating-new-features/about-feature-templates.htm>
- Attribute Window:
 - <https://blogs.esri.com/esri/arcgis/2011/01/18/getting-the-most-out-of-editing-in-arcgis-10-editing-attributes/>
- Editing Tips and Tricks 1
 - <https://blogs.esri.com/esri/arcgis/2011/08/17/getting-the-most-out-of-editing-in-arcgis-10-part-1/>
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