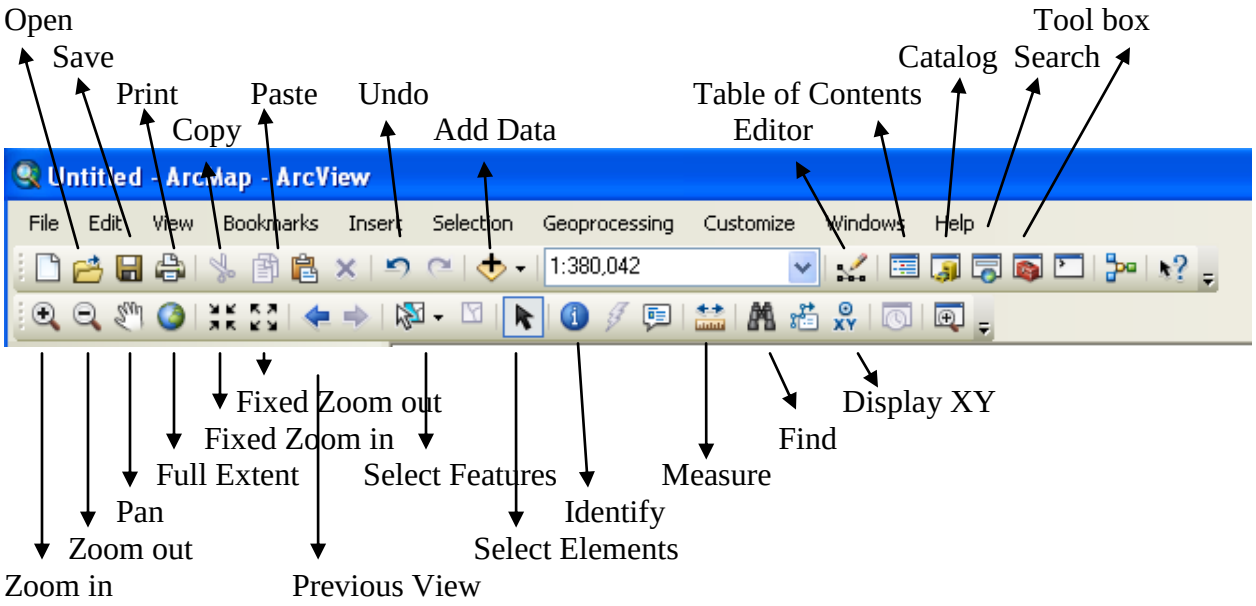
Introduction to ArcGIS 10

1. Download data from NCDOT GIS site

- Rd_Char_Mlpst
- Countyboundaries
- Bridge locations
- Topo map

2. Launch ArcMap

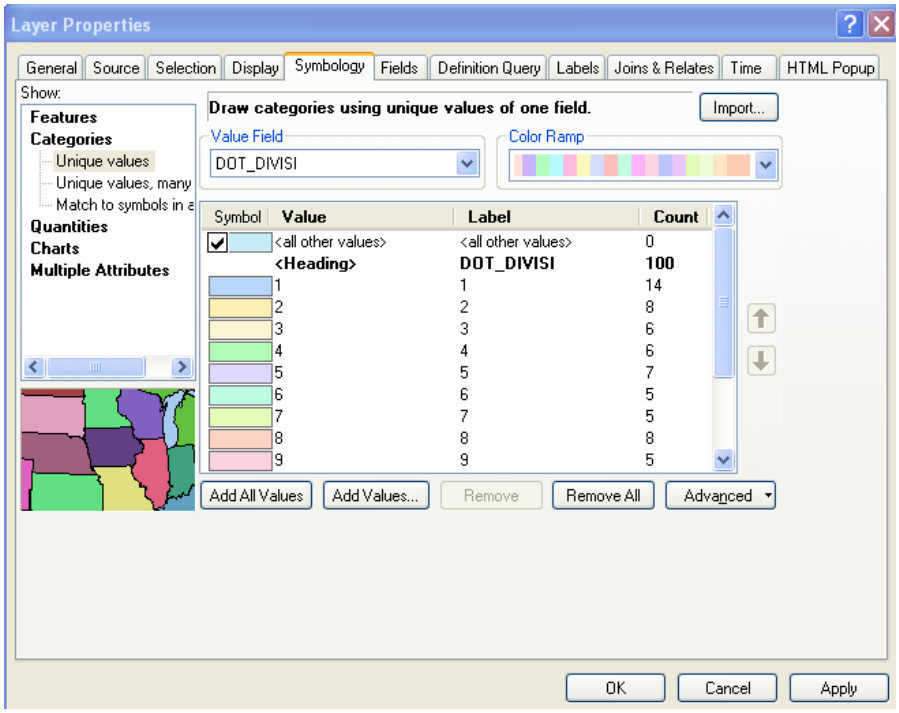
- Introduce interface



3. Symbolization

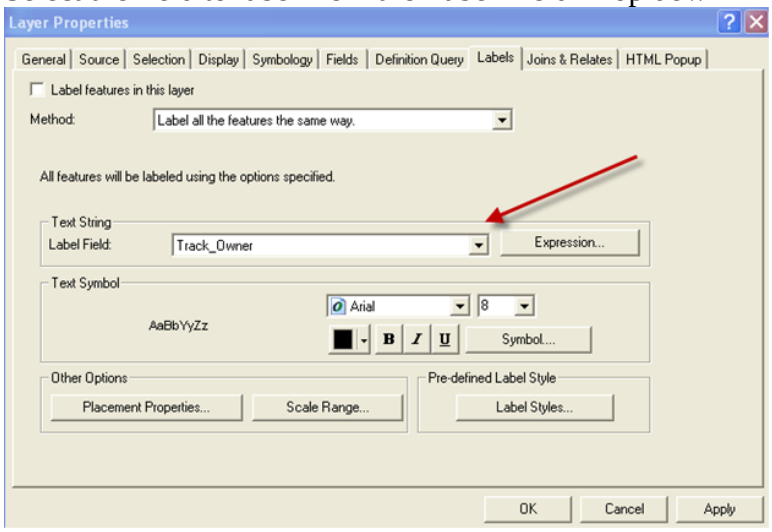
- Add NCDOT Divisions of County Boundary
- Right click CountyBoundary in Table of Contents (TOC)
- From Layer Properties select Symbology tab
- Select Categories from Show list
- Unique Values is the default
- Select Dot_Divisi from Value Field drop down list

- Click Add All Values
- Click OK



4. Labels

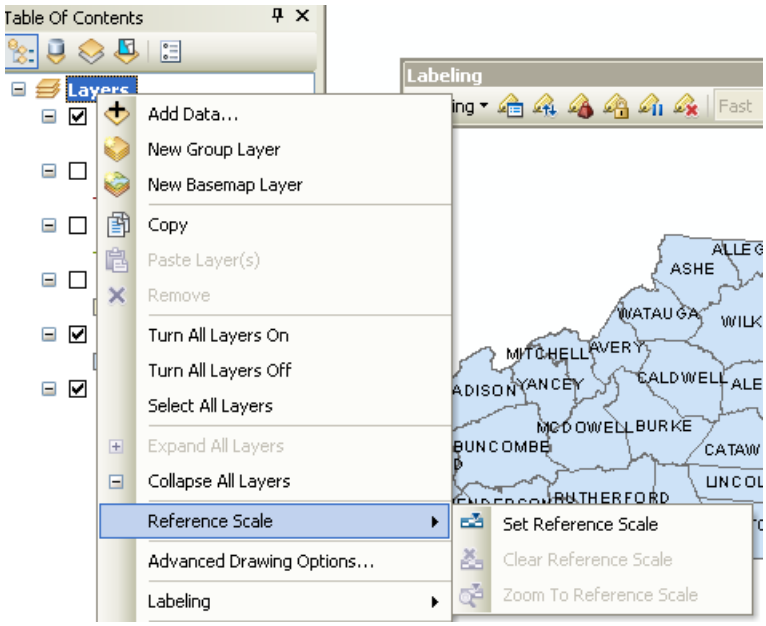
- To turn on labels for county names,
- Right click on layer, check beside Labels
- To change the field displaying Labels, right click on layer you want to label > select Properties > Labels
- Select the field to label from the Label Field Drop down



- Label Rd_Char_Mlpst by Street Name field, and by type

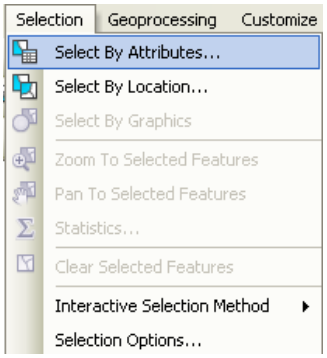
5. Converting Labels to Annotation

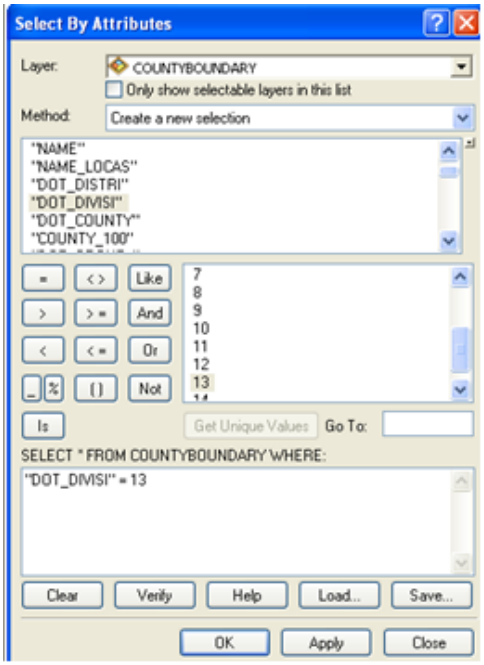
- Right click the Countyboundary layer, click labels
- Click Customize, point to toolbars, click Labeling
- Click the View Unplaced Labels button
- Unplaced labels appear in red. Click View Unplaced Labels button again to hide unplaced label
- Type 3,000,000 in Map Scale box & press Enter
- Right click Layers, point to Reference Scale, then click Set Reference Scale
- In the Table of Contents, right click Layers and click Convert Labels to Annotation
- Uncheck the Feature Linked column
- Navigate to GDB under Annotation Feature class
- Check the box for Convert unplaced labels to unplaced annotation
- Click Convert



6. Select by Attribute

- Division
- Click Selection, Select by Attributes
- Add the Layer to Select from
- Double click the field to select from as the first part of your expression
- Select Operator
- Get Unique Values
- Verify equation
- Click OK

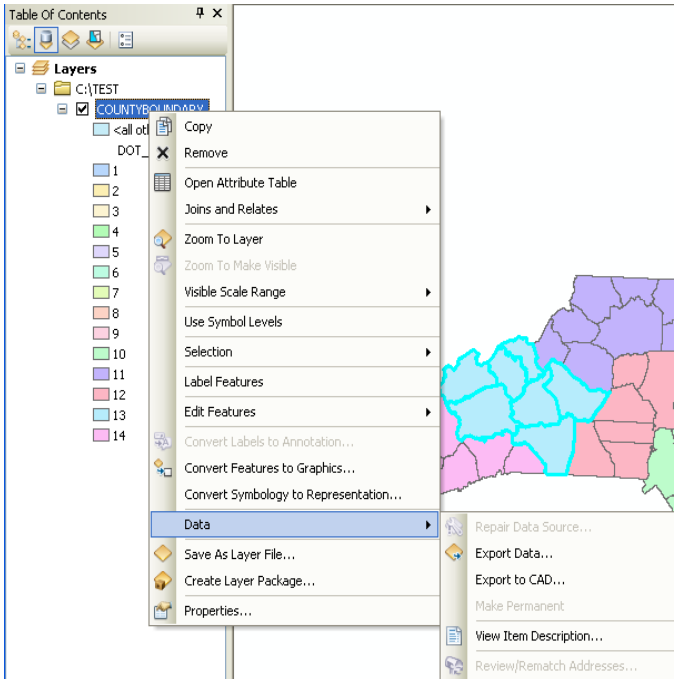




7. Export data, create new layer

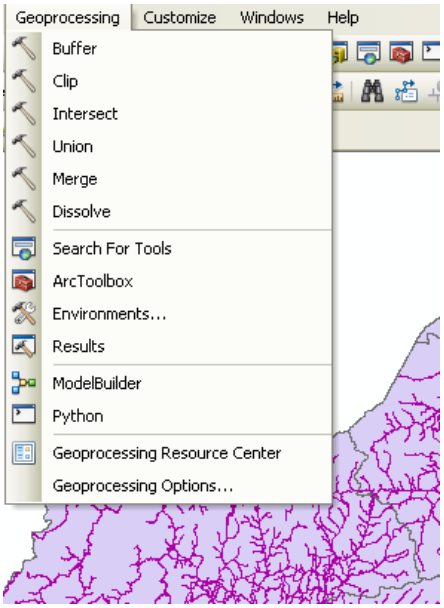
- Right Click layer with selected attributes
- Slide down to Data
- Click Export Data
- Select Selected Features
- Select this layer's source data
- Navigate to path where data is stored
- Click OK
- Add feature class to map as a layer

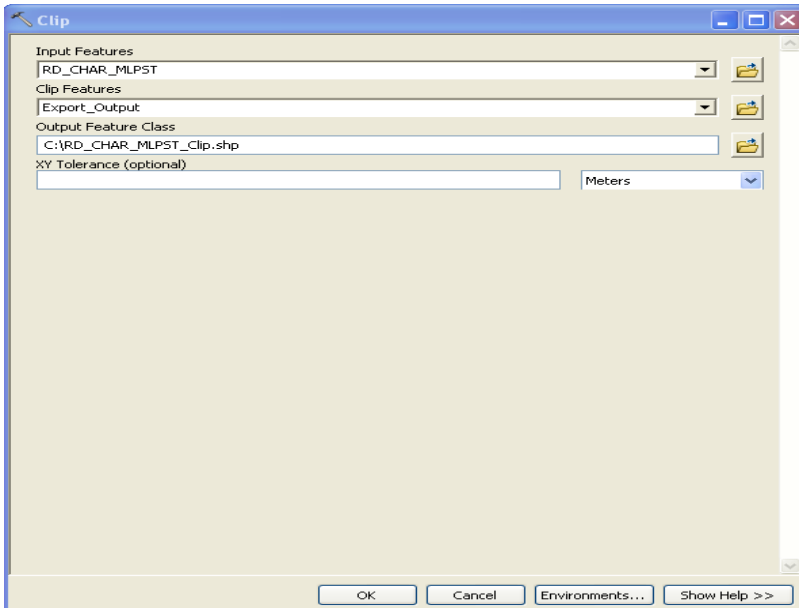
TIP – Be aware if you are using shapefiles vs geodatabase here. The process for saving is slightly different.



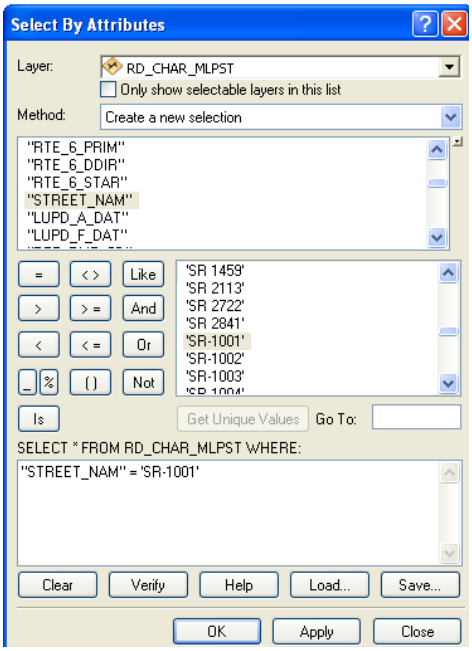
8. Overlay Rd_Char file on new Division layer

- Select by location to see results
- Click Geoprocessing
- Click Clip
- Select Input Feature (or drag and drop layer from Table of Contents)
- Select Clip Feature
- Navigate to path to save layer and name layer
- Click OK





9. Create a Route by Selection



- Use ID tool to locate 2 routes
- Right click layer and make it the only selectable layer
- Click Selection tab
- Select by Attributes
- Add Layer to choose selection from
- Method , Create a new selection
- Select field, operator and value to write expression
- Click OK
- Click Selection
- Click Select by Attributes
- Verify Layer
- Change Method to Add to current selection
- Add new route number to expression
- Click OK
- Export data as new layer with meaningful name, ie Route 1

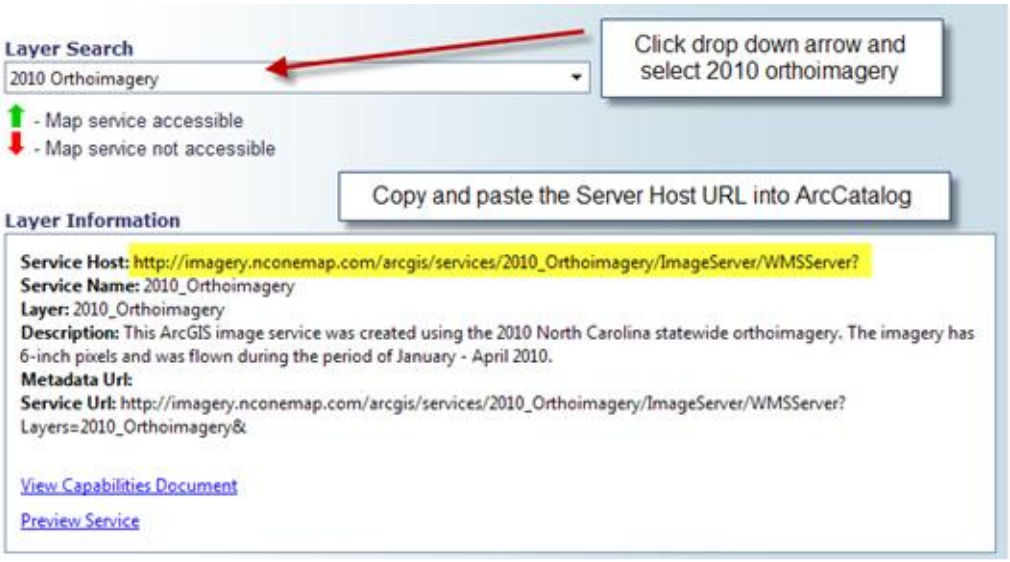
10. Add a buffer

- Buffer Route 1
- Right click layer and make it the only selectable layer
- Click Geoprocessing tab
- Input feature to buffer
- Input linear measurement and units
- Select Dissolve type
- Click OK
- Clear selection 
- Symbolize buffer

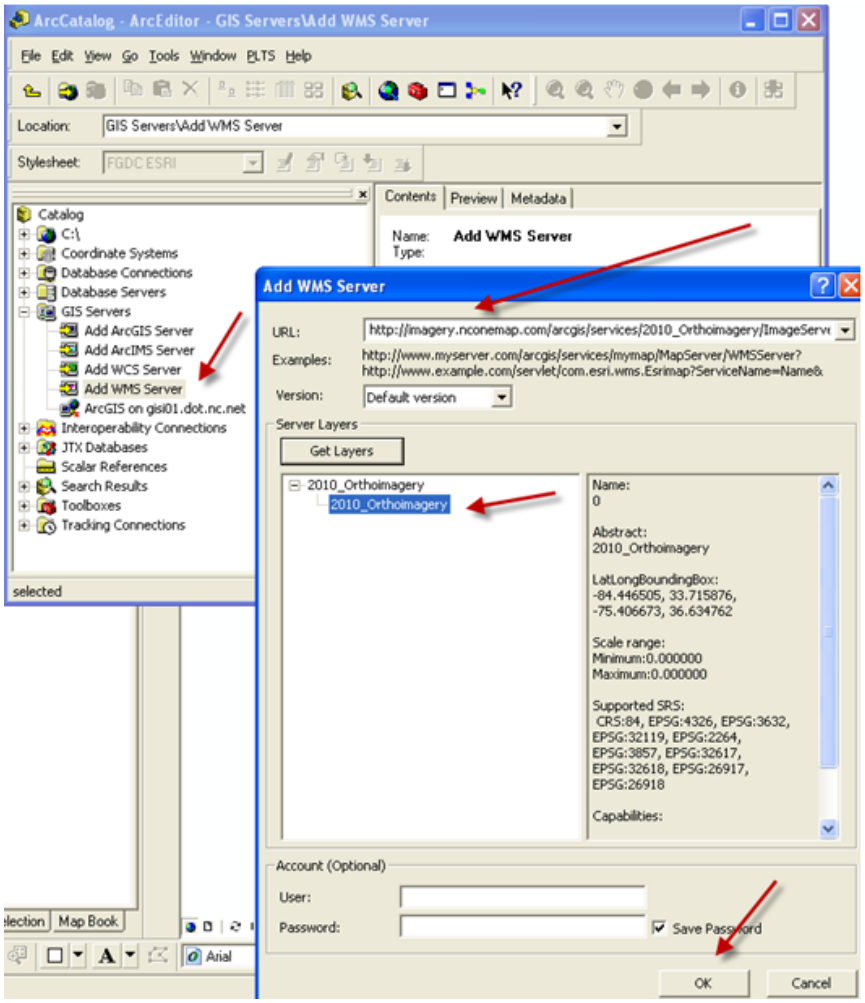
11. Launch ArcCatalog to add WMS

- Click on Tools, Options, and check the box beside GIS Servers
- To add the 2010 orthoimagery Web Map Service open Internet Explorer
- In the google search window, type “NCOne Map wms”
- Click the following option from Internet search:

- Click NC OneMap web service catalog

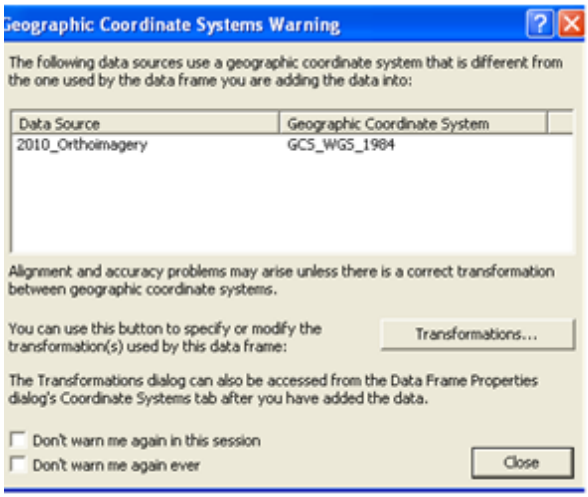


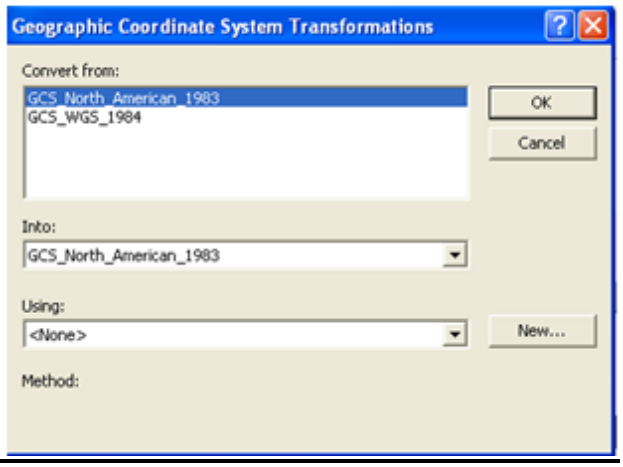
- Open ArcCatalog
- Click GIS Servers
- Click Add WMS Server
- Paste URL of WMS into URL box
- Select Get Layers
- Select 2010_Orthimagery under the 2010_Orthoimgery directory
- Click OK
- To check connection, right click on ArcGIS service in ArcCatalog and refresh



To add the imagery and data to the Table of Contents in ArcMap,

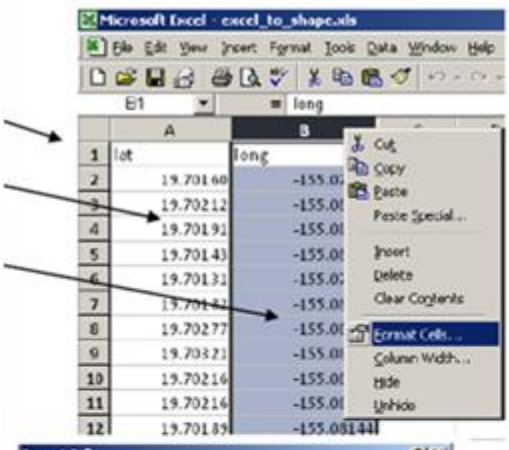
- Click Add Data icon and navigate to ArcCatalog
- Select GIS Servers
- Select 2010 orthoimagery on imagery.nconemap.com
- Select 2010_orthoimagery
- If the Geographic Coordinate Systems Warning Dialog opens, read it, select GCS _North_American_1983 option, then close the dialog window

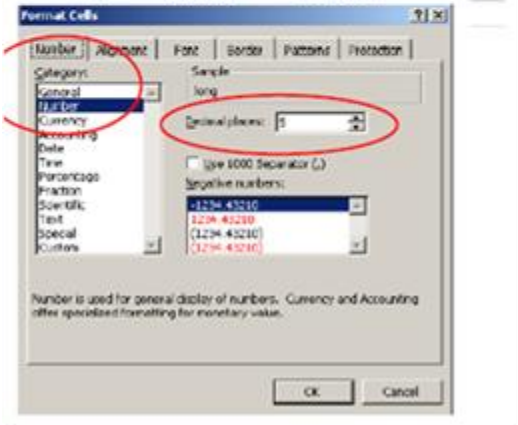




12. Add Bing Maps

To add the Bing Maps services into your current ArcMap map document, click **File** > **Add Data** > **Add Basemap** and double-click the service you want to add. The service will be added to your map inside a basemap layer to provide you with the best performance. Bing Maps services are free for ArcGIS Desktop users.



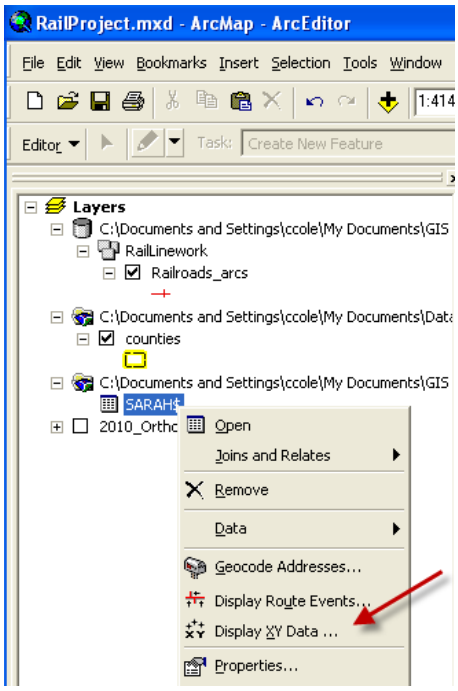


13. Bring in Excel Spreadsheet

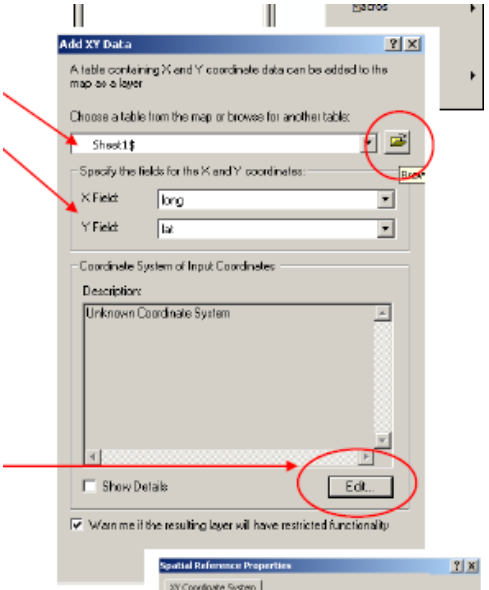
- Examine fields for Lat/Long fields
- Import coordinate system
- Display XY Data

Add Excel worksheet from Add icon  to convert to shapefile or geodatabase feature class

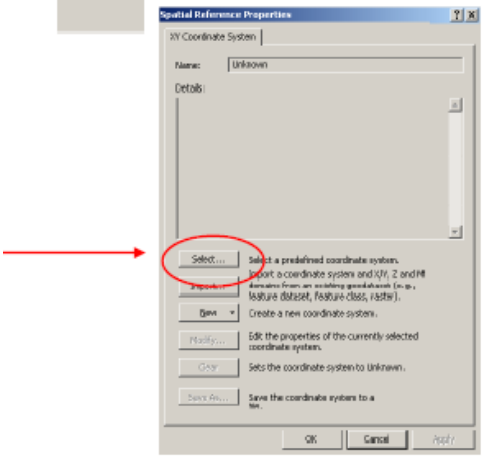
- Open Spread sheet in Excel
- Examine data for longitude and latitude fields
- Add Lat/Long columns (if necessary) – Be sure to use a negative sign in Longitude column
- Format Cells as Number with as many decimal places as needed
- Save file and close it



- To convert the file, launch ArcMap
- Select Add Data icon and navigate to work folder
- Select Crossing excel data file, add
- Right Click Excel$ click Display XY Data
- Display XY Data Dialogue Box opens



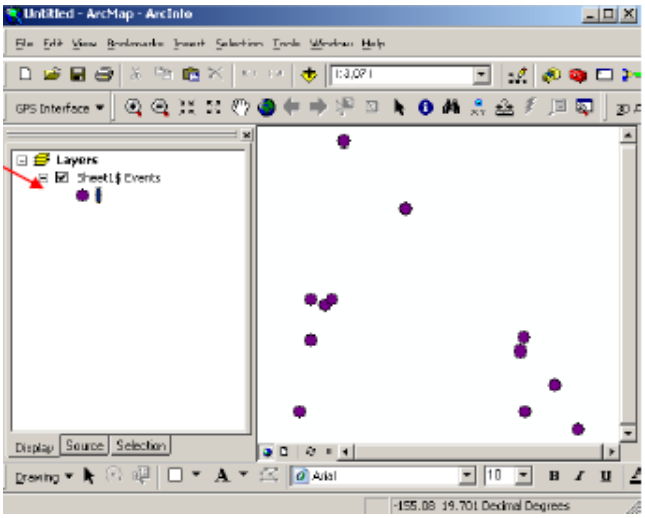
- The file should be in the dialog box
- Specify the fields for x, y coordinates
- X field should be longitude, and Y field should be latitude
- To change the coordinate system from Unknown, click Edit



- When the Spatial Reference Properties dialog box opens, click select
- Browse for the Geographic Coordinate System, select World folder, then browse for WGS 1984 projection from the list and click Add.

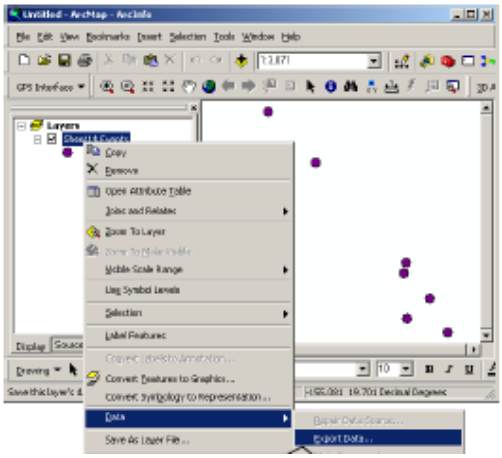
TIPS – Check the layer properties of data in your .mxd. Click the Source tab and look at the Projected Coordinate System and the Geographic Coordinate System. This will provide you with the coordinate system information you need to use.

- You will receive message that **Table Does Not Have Object-ID Field message.**
- Click OK – this lets you know you need to export the file to create a Shapefile.
- The temporary file should be visible as a layer in ArcMap.



Create the Final Shapefile

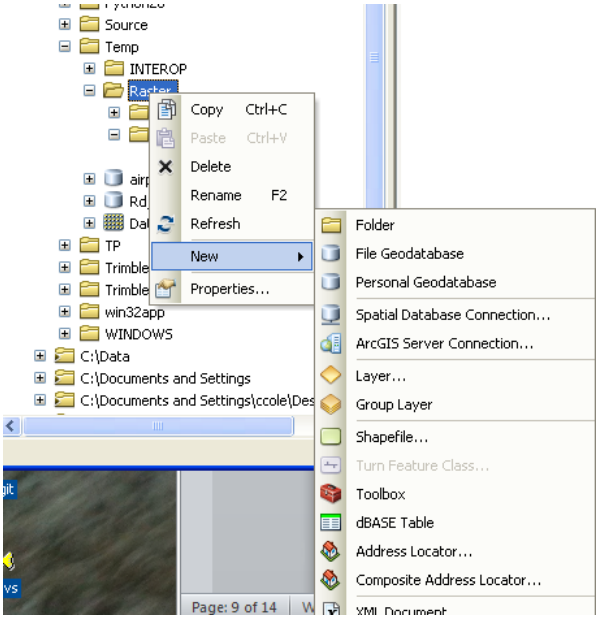
- Right click the event layer and navigate down the pop-up menu to Data > Export Data
- In the Export Data dialog, this layer's source data and browse to the directory where you want to store this layer.
- Click Ok, and Add exported data to map as a layer

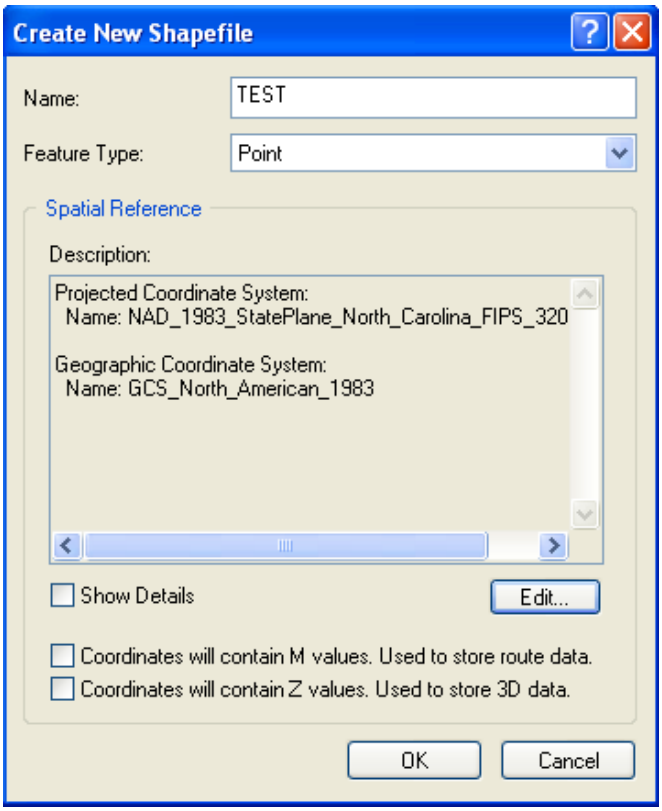


14. Editing

- METHODS

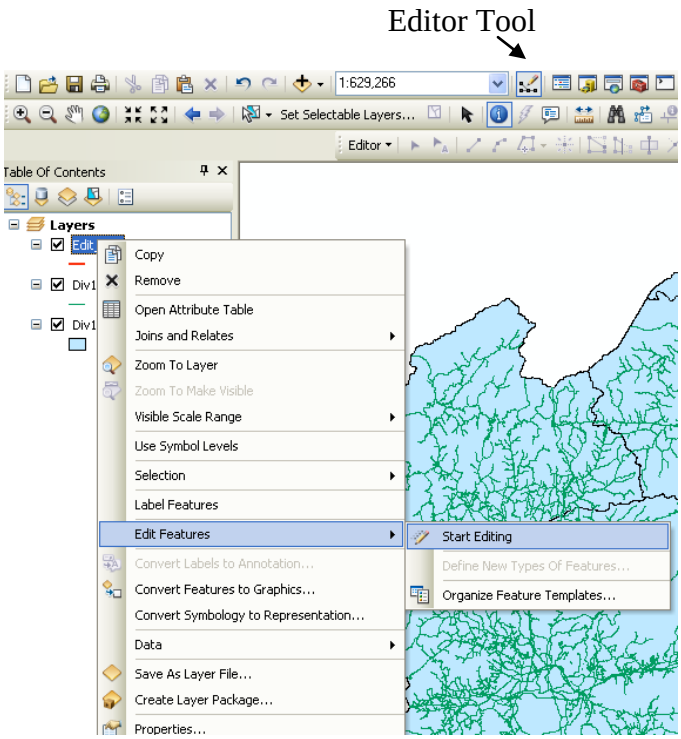
  CREATE SHAPEFILE
- Right on file location in ArcCatalog
- Slide to New
- Click Shapefile
- Name new shapefile and select geometry
- Select or import coordinate system
- Click OK



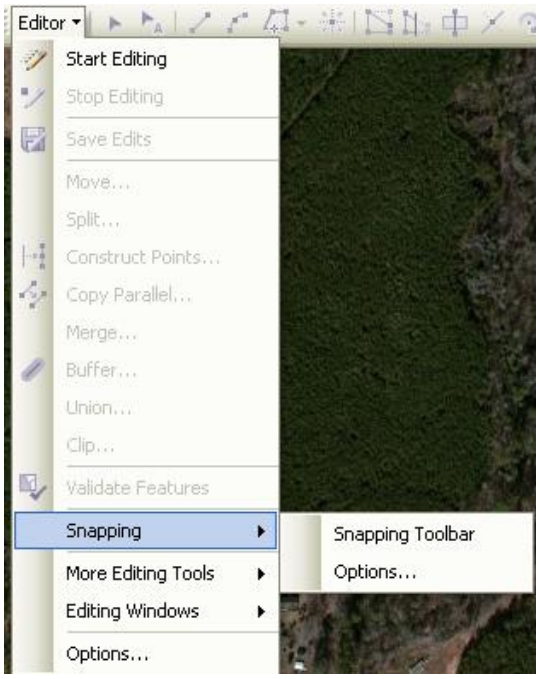


CREATE NEW POINT

- Turn Editor ON click Editor icon or right click the layer, slide to Edit Features, click Start editing
- Click Editor drop down menu and make sure Start Editing is selected
- If error menu pops up, read the message and check your data. Perform necessary edits, transformation
- Click the POINT tool on the Create Features window
- Place a point in a new location in the display
- Click the Attributes button on the Editor toolbar
- Click inside the ID box and add a number
- Press Enter
- Close Attributes window



DIGITIZING LINES and SNAPPING



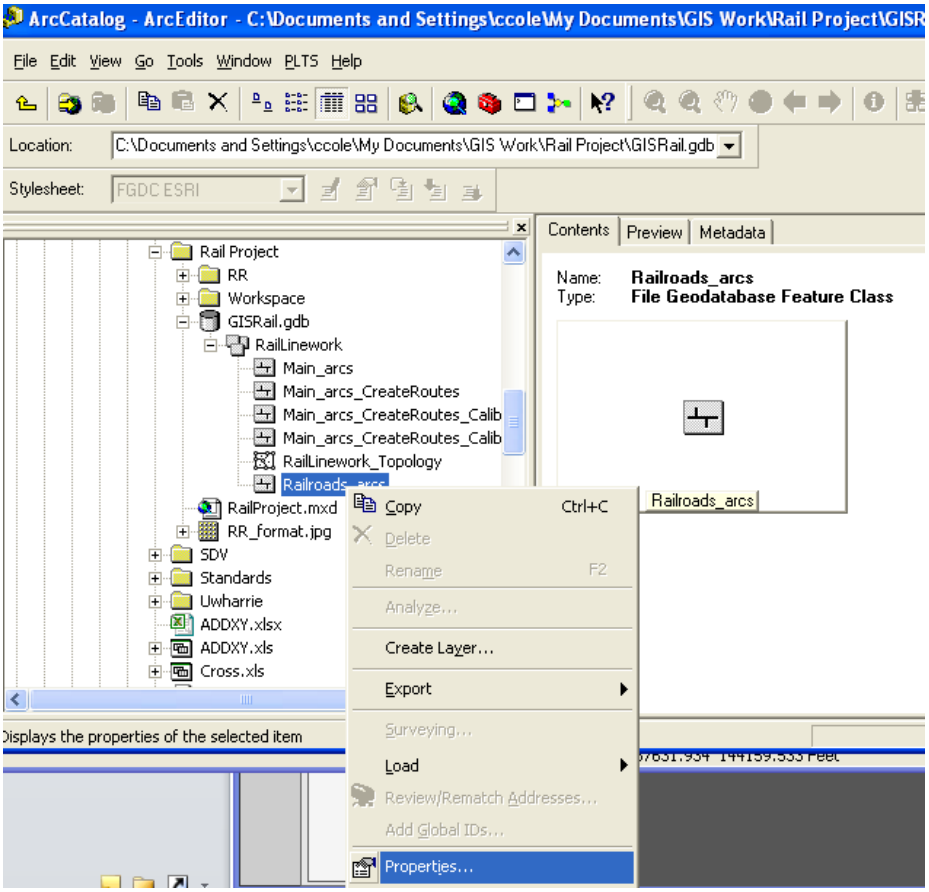
- Navigate to neighborhood without digital roads
- Add the SNAPPING toolbar to ArcMap. Click the Editor, slide to Snapping, click Snapping Toolbar
- Confirm Snapping toolbar has END, Vertex, and Edge types active
- Click the Snapping menu and click options. Set snap tolerance to at least 10 pixels
- In the Create Features window, click Wake Roads line template and the Line tool
- Rest pointer over existing road line but do not click.
- Click once.
- Using the aerial as a guide, digitize the new line by clicking the map each place you want to add a vertex
- Press F2 key which finishes the sketch
- Add Attributes for new line feature

TO RESHAPE A LINE OR POLYGON FEATURE

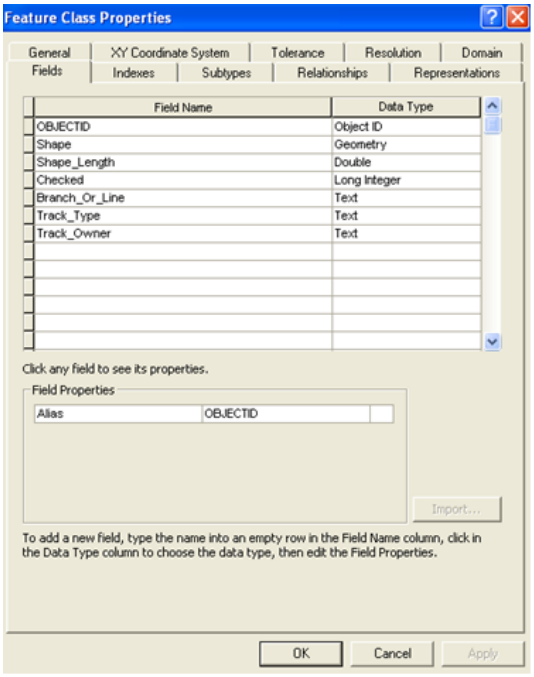
- To edit lines and vertices, turn on Snapping – Select Edit Vertices tool icon and add, delete and move vertices as needed.
- Save Edits
- Stop Editing
- Turn off Editor toolbar

15. Adding a Field to an Existing Layer

- Open ArcCatalog and navigate to the layer or table you want to modify
- Click the Contents tab in the ArcCatalog window
- Click the layer you are adding the field to in the Catalog tree
- Right-click the feature class in the Contents list and click properties



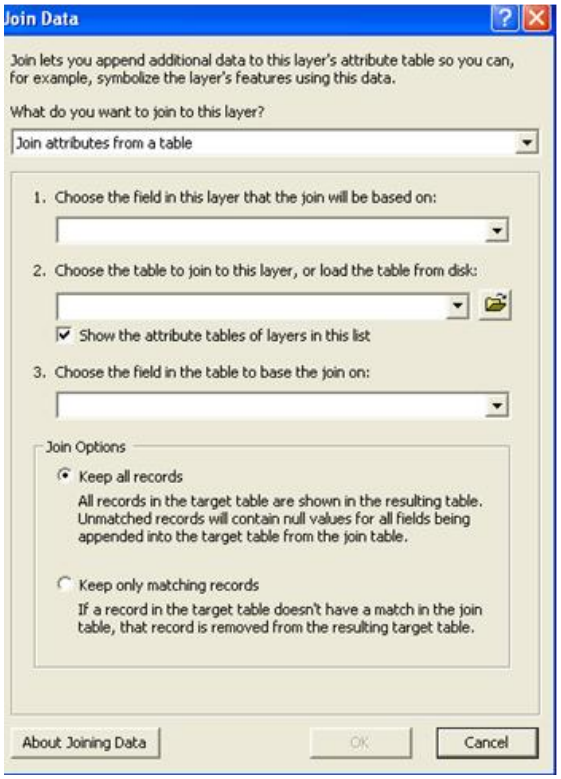
- Click the Fields tab. The columns in the feature class's attribute table are listed. Check the field name, data, and data type for both the table and the geographic layer
- Scroll to the bottom of the list of column names. Click in the 1st empty row under Field Name of the last attribute and enter your new field
- Click under the Data Type to the right of the new column's name, click the drop down that appears, and click the appropriate data type
- Click OK

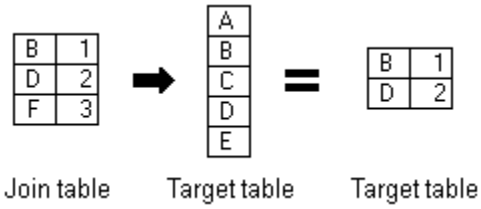


16. How to Join a Table to a Geographic Layer

There are two requirements to join a table to a geographic layer – the field must be the same data type and they both must have a field with the same values.

- Right click on the layer you want to add the table to
- Slide to Joins and Relates, then click on Joins
- Make sure you select "Join attributes from a table" in the first box
- For number 1, choose the field from the geographic layer the join will be based on
- For number 2, choose the table you are joining to the geography
- For number 3, choose the field from the table to join to the geographic layer
- For this join you will want to Keep All Records, so click that button





Steps:

1. In the table of contents, right-click the layer or table you want to join, point to **Joins and Relates**, then click **Join**.

You can also click the **Table Options** button on an open table window to access the ***Join Data*** dialog box.

Tip:

If you do not want your fields to be prefixed with the table name after a join, open the attribute table, click the **Table Options** menu, then uncheck **Show Field Aliases**.

2. Click the **What do you want to join to this layer?** arrow and click **Join attributes from a table**.
3. Click the field on which the join will be based.
4. Choose the table to join to the layer or table. If it is not currently part of the map, click the browse button to search for it on disk.
5. Click the field in that table on which the join will be based.
6. Choose whether to keep all records or only matching records.
7. Click **OK.**

Tip:
If you want to permanently save joined data with your geographic features, export the data to a new feature class, right-click the layer in the table of contents, point to **Data**, then click **Export data**.

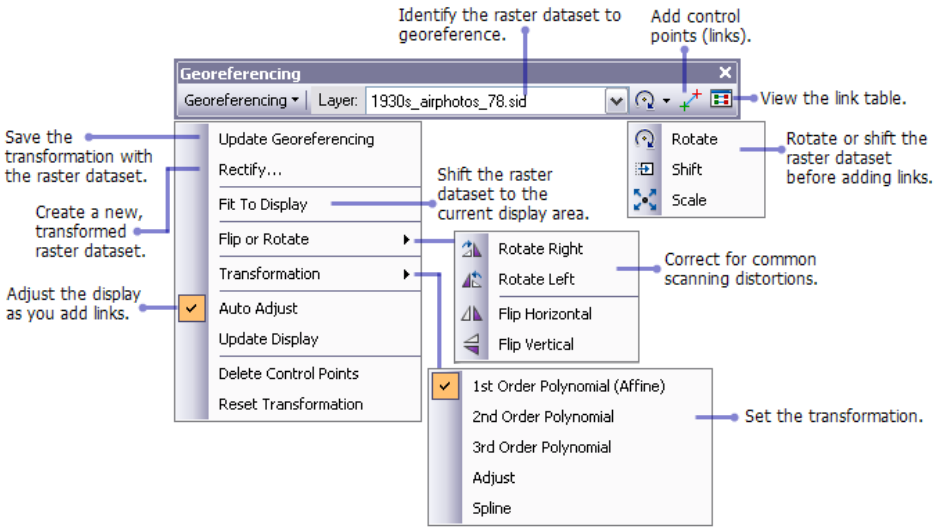
Tip:
When editing joined data, you cannot directly edit the joined columns. To edit the joined data, you must first add the joined tables or layers to ArcMap. You can then perform edits on this data separately. These changes are reflected in the joined columns.

17. Georeferencing

The link below explains georeferencing:
http://help.arcgis.com/en/arcgisdesktop/10.0/help/index.html#//009t000000mn000000

The images below show the Georeferencing toolbar and functions.

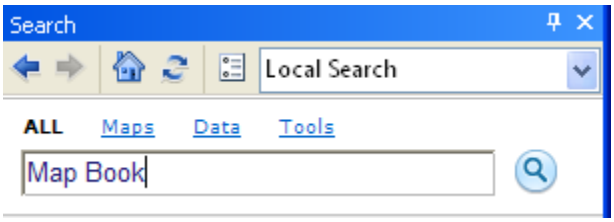
Button	Name	Function
	Rotate	Rotates the source layer
	Shift	Shifts the source layer
	Scale	Rescales the source layer
	Add Control Points	Allows you to select control points from a layer and add them to the map
	View Link Table	Shows links and errors in tabular form



- Click Customize tab, slide to Toolbars, and click beside Georeferencing.

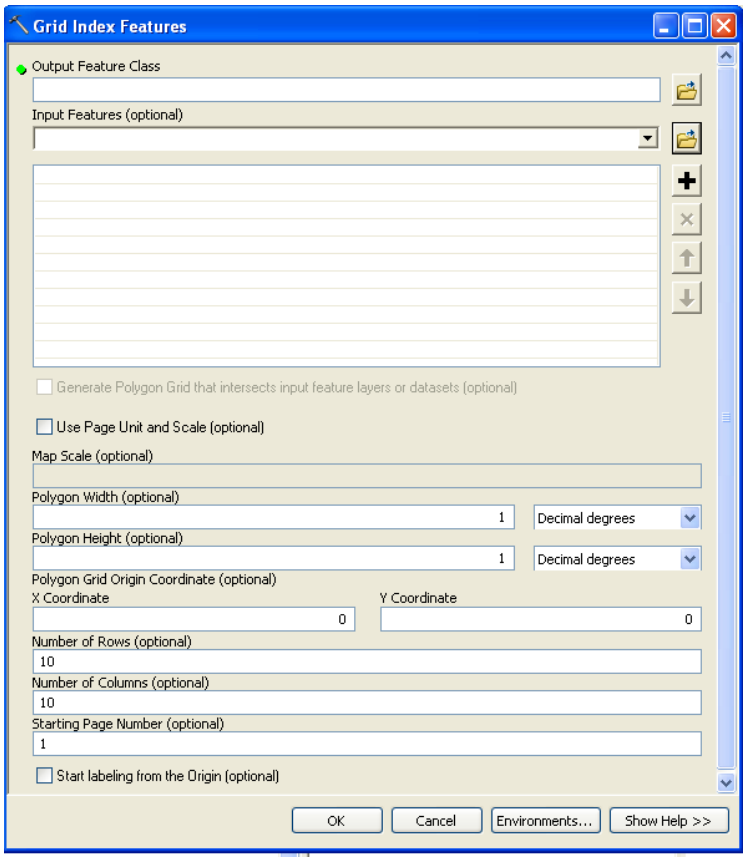
- Add image to georeference (fit to map)
- Locate at least 4 points that both map and image have in common (similar roads or objects)
- Add Control Points by clicking control point on image then toggling to map and clicking on same point.
- Repeat for all control points
- Click Georeferencing tool and select Update Display
- Check Link Table for Residual Root Mean Square
- Replace/correct Control Points to reduce RMS

18. Creating a Map Book Using Data Driven Pages



- Open the Search window
- Type Map Book for search

- Select Grid Index Features
- The Output feature class is the object being mapped – this can be dragged and dropped from the Table of Contents



- You can accept the defaults or make modifications to the Polygon Width & Height and Number of Rows options

- Click OK to create grid