

#1 – CLIPPING A DATASET

Purpose: From the ArcGIS Help menu: **Geoprocessing** is the processing of geographic information, one of the basic functions of a **GIS**. It provides a way to create new information by applying an operation to existing data. Any alteration or information extraction you want to perform on your data involves a **geoprocessing** task. It can be a simple task, such as converting geographic data to a different format, or it can involve multiple tasks performed in sequence, such as those that clip, select, then intersect **datasets**. Within ArcGIS, you can perform **geoprocessing** tasks in a number of ways:

GOAL: The goal of this exercise is to first create a new shapefile of our specific area of interest. In this case, it is Hennepin County. Once we have this file, we can then learn to use a new tool called “Clip” to clip a statewide landmark (gnis) dataset to just one county (Hennepin). The end result will be a new shapefile (or dataset) that contains only those landmarks that are within Hennepin County.

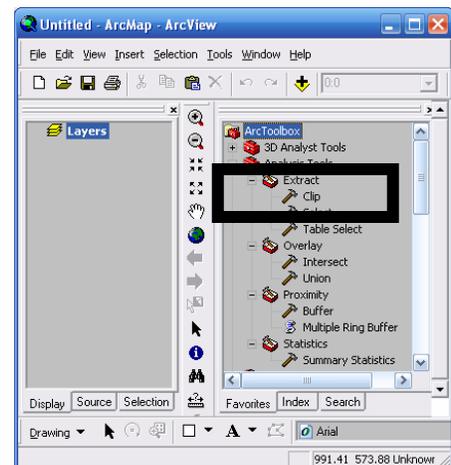
Data Sources used in this Exercise:

f:/geodata/government_units/cty24k_a_mn.shp

f:/geodata/geographic_names/gnis_p_mn.shp

Tools:

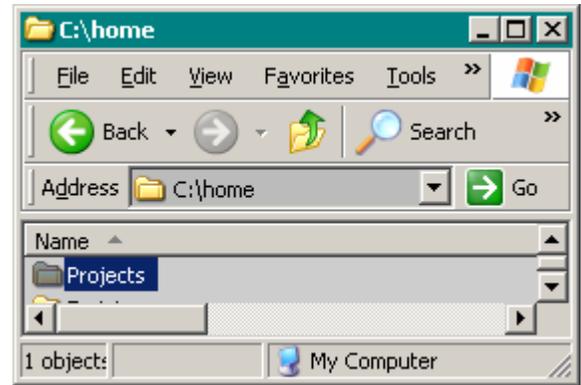
Clip Tool from ArcToolbox (see diagram at right)



Initial Project Setup: Storing of all Exercises information will be to the C:\Home folder

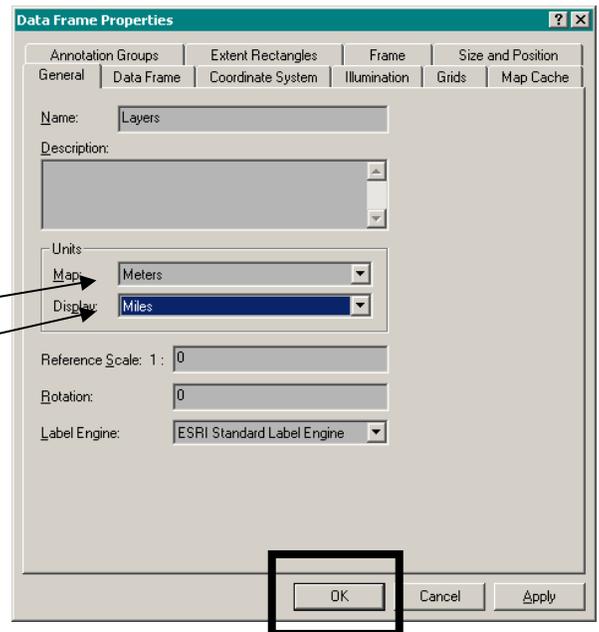
1. Open ArcCatalog.
2. In your **C:\Home** folder, Create a new folder called **Projects**. Double-click on this Projects folder to open; then create a new subfolder called **Clip**. This is the project folder you'll work from for this exercise.

C: \ Home \ Projects \ Clip



3. To Begin and Save your Project:
 - Open a new empty map in ArcMap
 - Click on **File - Save As – Clip.mxd** Make sure you navigate and save this project to your C: / **Projects / Clip** folder.

4. In the “Table of Contents”...left pane in ArcMap,
 - a. Right-Click on **Layers** (also called the Data Frame.)
 - b. Select **Properties – General**
 - c. Set the following Units (see diagram at right):
 - i. Map to Meters and
 - ii. Display to Miles
 - iii. Click OK and close.

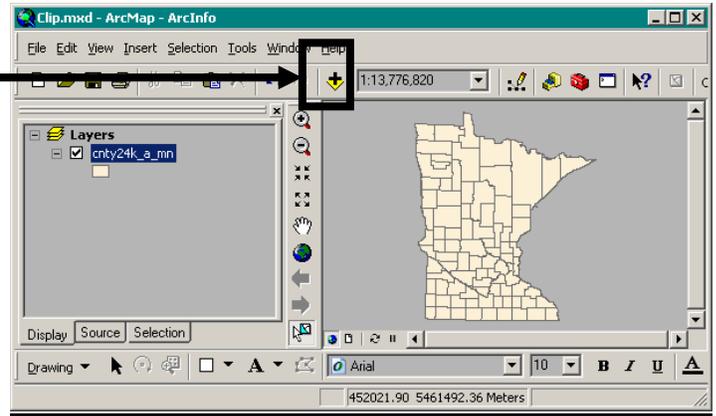


Reminder: If you had already added one of the shapefiles that we'll be using in this lab to your project before doing Step #3, ArcGIS would have automatically registered that the Map Units were Meters.

Also recall that the “Display: Miles” is what is used when you add a Scale Bar to your Layout – distance will be measured in miles (vs. feet, meters, etc.).

Begin the Clip Process

5. Next, **Add** the following dataset using the tool shown at right (yellow box with “+” sign):



Navigate to:

f:/geodata/government_units/**cnty24k_a_mn.shp**

- The shapefile will be added to your Table of Contents (TOC) in the left pane.
- Your colors may vary from what’s shown at right.

5. Next, we’ll open the Attribute Table and look at the contents. To do this:

- **Right-click** on the shapefile name
- Click on **Open Attribute Table**

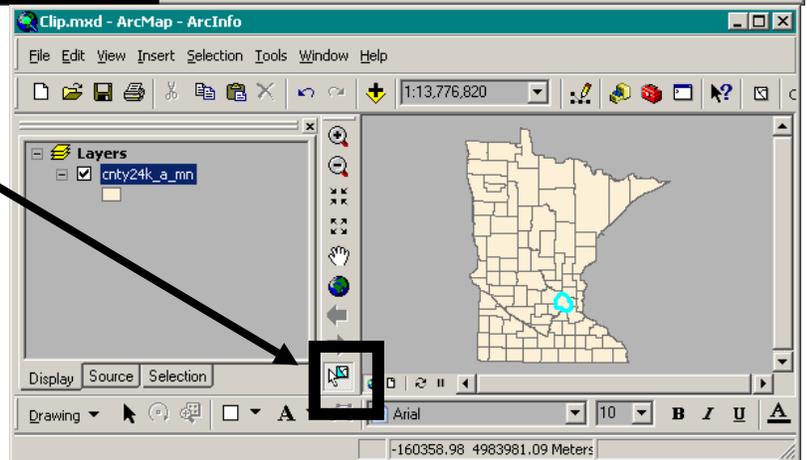
See below for example. Notice the field CTY_NAME and that there are 87 records – 1 for each county.

FID	Shape	AREA	PERIMETER	COUNTY	CTY_NAME	CTY_ABBR	CTY_FIPS	SSASY	ACRES	COUNTYFIPS
0	Polygon	46083209	388250.14572	39	Lake of the Woods	LOTW	77 MN077	1138740.89972	077	
1	Polygon	28621837	263017.48277	35	Kittson	KITT	69 MN069	707260.995569	069	
2	Polygon	43470985	302590.75293	68	Roseau	ROSE	135 MN135	1074191.43389	135	
3	Polygon	81672378	412897.43594	36	Koochiching	KOOC	71 MN071	2018168.42963	071	
4	Polygon	46987322	374207.65129	45	Marshall	MARS	89 MN089	1161082.03433	089	

6. Use the select tool and click on Hennepin County

- This highlights the county.

Be careful to only click inside Hennepin and that only 1 county highlights.



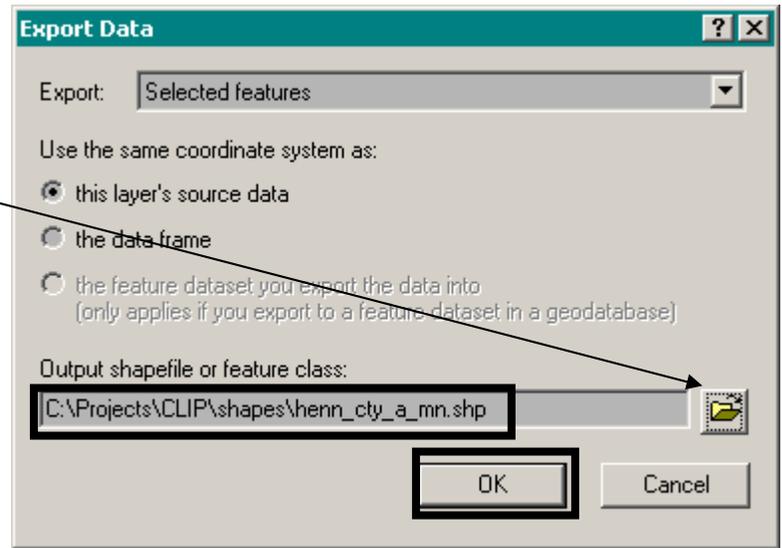
7. Right-click on the **cty24k_a_mn** dataset name
 - click on **Data – Export Data**

This will make a “copy” of just Hennepin County and “save” it to a new shapefile.

8. Click on the Browse button and navigate to your **C:\Home\Projects\Clip** folder and save the shapefile to a new name: **henn_cty_a_mn.shp** . Click **OK**.

(FYI: we’re following normal USDA naming conventions. “_a_” stands for “area” or in GIS terms, polygon shapefile.)

- “_a_” = polygon
- “_p_” = point
- “_l_” = line



9. Click **Yes** when asked if you want to add to your project.

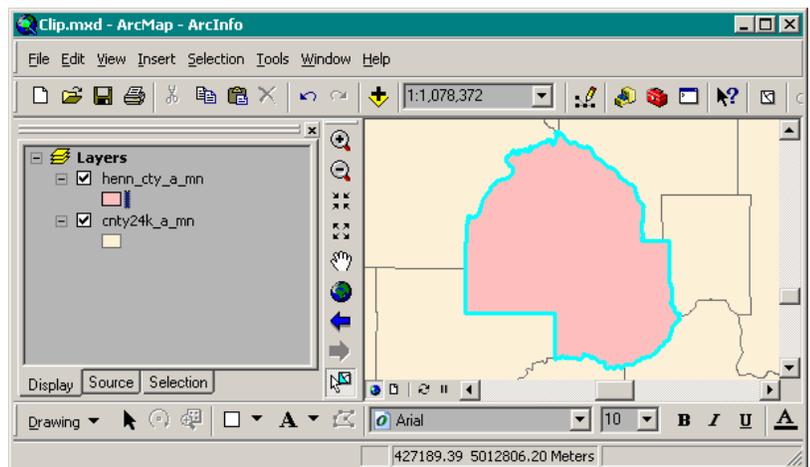
10. Notice the new shapefile has been added to your Table of Contents (TOC) – left pane.

- Right-click on **henn_cty_a_mn** dataset
- Select **Zoom to Layer**.

[again, colors may vary]

11. Remove the **cty24k_a_mn** dataset from the project.

- Right-click on **cty24k_a_mn**
- Click **Remove**



The remainder of this project will now be centered on this new county shapefile as you begin to explore the Clip tool.

12. **SAVE!!!!**

CLIP GNIS Shapefile to Hennepin County shapefile

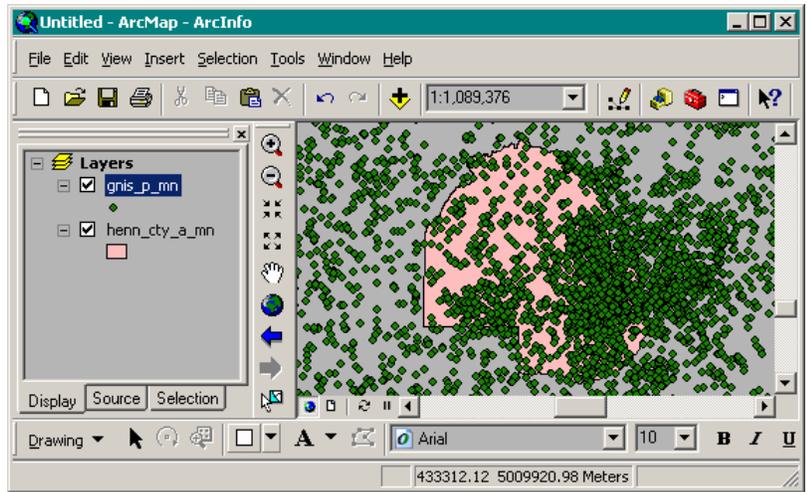
Note: Use the clip operation when you want to extract only a portion of one dataset using another dataset as a "cookie cutter." In this project, you want to use a county boundary to extract only those landmarks that are contained within that county.

13. **Add** the following dataset (remember, yellow box with "+" sign):

- f:/geodata/geographic_names/**gnis_p_mn.shp**

This dataset is just a national "landmarks" type point dataset.

14. Right-Click on the **gnis_p_mn.shp**
15. Open up the attribute table and look at the attribute fields (Rt-Click, Open Attribute Table). Notice there are 29,069 records!!!!

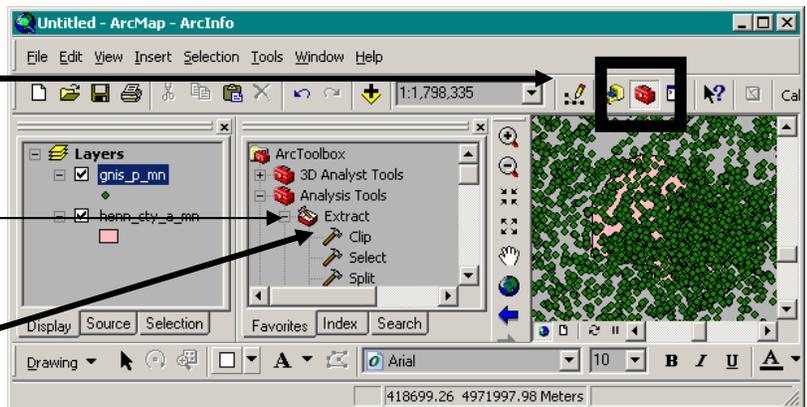


16. If ArcToolbox is not open, then open it. (Click on Red Toolbox on toolbar.)

17. Click on "+" next to Analysis Tools

- a. Click on "+" next to Extract Toolset.
- b. Now you can see all of the Extract tools, including the "CLIP" tool.

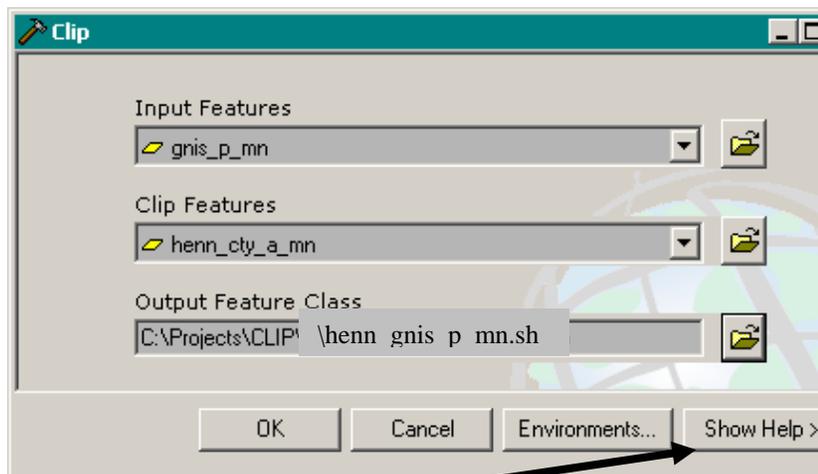
18. Double-Click on **Clip** tool (next to hammer)



What's great here is that you can "click and drag" the datasets from the TOC right into the boxes in the Clip Tool. OR....you can click on the little down triangle and all datasets that are in your TOC will show up. You can then select the appropriate dataset by clicking on it.

19. Whichever method you use, make sure that your dialog box resembles that at right. Save the new dataset as **henn_gnis_p_mn.shp** in your project Clips' shapes folder.

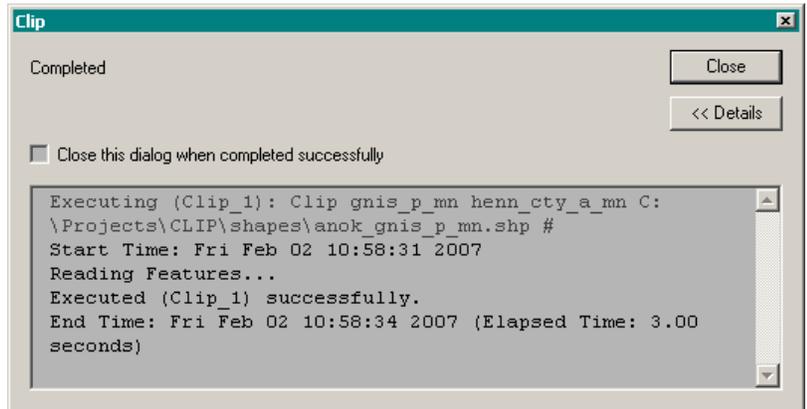
- Input = shapefile to clip (gnis_p_mn)
- Clip Features = shapefile boundary used to clip (henn_cty_a_mn)
- Output = name of NEW shapefile (henn_gnis_p_mn.shp)



Click on the **Show Help** to learn more about the Clip function. Click **OK**.

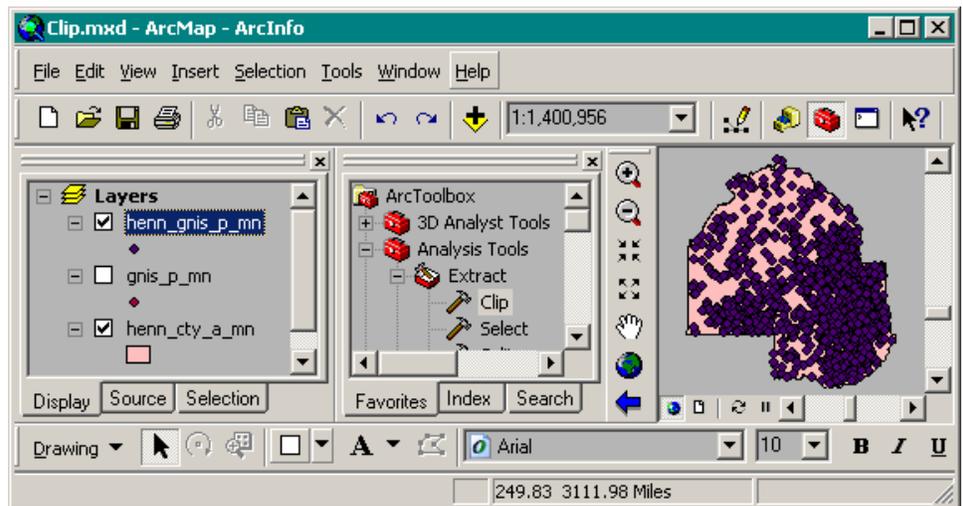
What is happening is the gnis points are being “cookie cut” at the county boundary. The end result will only show those points that fall inside the Hennepin County boundary.

The Clip dialog box (at right) shows you the processing that was done behind the scenes. When it is done, “Completed” is shown in the upper left corner. Review what it says and then **Close**. [The process only took 3 seconds to complete the full clip process!]



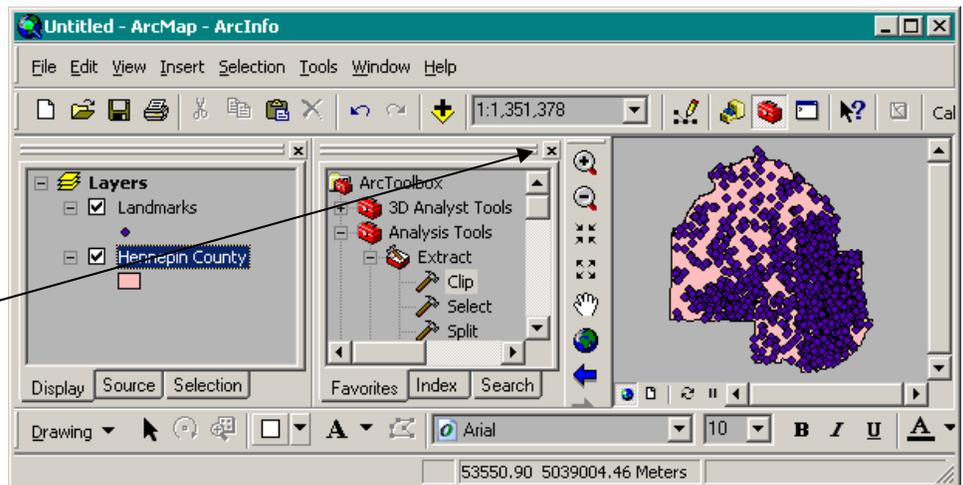
- Notice that the new dataset is automatically added to your project.
- Open the attribute table and see that all of the attribute fields are still there. BUT, notice there are now only 1,112 records!!! Quite a difference from the original +29,000 records.
- Something to remember is that the clip process maintains all of the original attribute fields; some processes do not.

20. Last, remove the original statewide “gnis_p_mn.shp” dataset from your project as you longer need it.



21. Rename your new shapefiles in the TOC to a more recognizable name. In this case, I called it “**Landmarks.**”

CLOSE ARCTOOLBOX (click on little “x” in corner).



Save your Project

