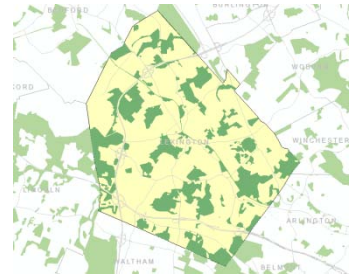


Creating a Smaller Data Set from a Larger Data Set – Vector Data



Author: Barbara Parmenter, revised September 22, 2011

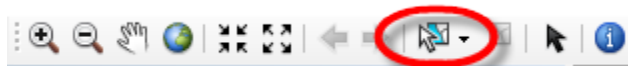
This tip sheet covers how to create a smaller subset data set of a larger data set for vector data formats (point, line, polygon). If you need to clip a raster data set, please see the tip sheet for that.

There are two methods you can use. One is to **select** a portion of an existing shape file and create a new layer file from it (or export that to a new shape file). The other is to **clip** an existing shape file by using another polygon shape file (like using a cookie cutter) to create a new clipped version of the original shape file. If you use the selection method, you will come out with entire features, e.g., entire parcels, or entire road segments, so some of these may extend beyond the area you want. If you use the clip method, all features are clipped at the border of the cookie cutter. This has the advantage of not including anything outside your area of interest but the disadvantage of chopping some features up which perhaps should not be chopped (e.g., parcels).

To create smaller subset data set of larger data set using the selection method – quick method by creating a layer file

Let's say you want to display on your map just the city boundary for Lexington and you also want to display open space but only the open space in Lexington. You don't have a separate Lexington city boundary shape file, but you DO have a TOWNS polygon layer from MassGIS with all the town boundaries in Massachusetts. You also have the MassGIS Open Space data set.

1. Add the MassGIS TOWNS layer to ArcMap (TOWNS_POLY - <http://www.mass.gov/mgis/towns.htm>)
2. Locate Lexington (e.g., by labeling the towns)
3. In the *Tools* bar, click on the **Select Features** icon

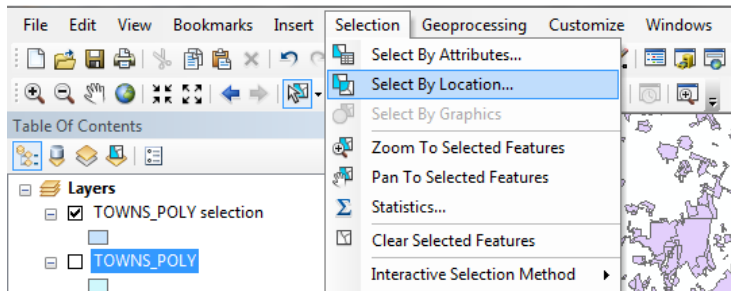


4. Click somewhere in Lexington – it will now be selected and highlighted in cyan
5. *Right-click* on the TOWNS_POLY layer in the *Table of Contents*, and choose **Selection – Create Layer from Selected Features**

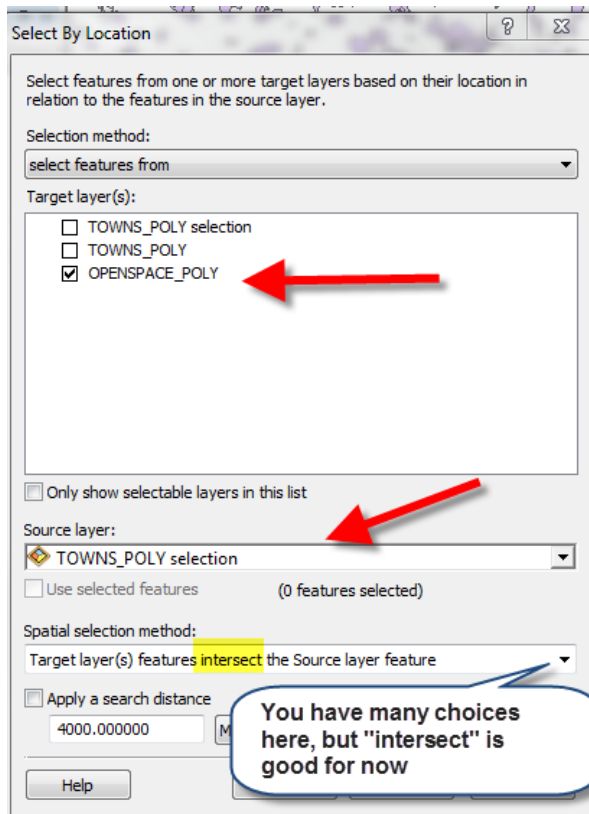
6. You'll see at the top of your *Table of Contents* a new layer called **TOWNS_POLY selection**
7. Remove the cyan selection by clicking on the *Clear Selected Features* icon –



8. Add the OPENSOURCE_POLY data set (<http://www.mass.gov/mgis/osp.htm>)
9. If you now want to select the open space in Lexington to create a layer file just of those areas, click on the *Selection* menu and choose **Select by Location**



10. Fill out the dialog box as follows and click OK when you're done:



11. Now *Right-click* on the OPENSOURCE_POLY layer in the *Table of Contents*, and choose **Selection – Create Layer from Selected Features** – you’ll see the selected features in their own layer.
12. Remove the selected features when you’re done, and turn off the original OPENSOURCE_POLY layer.

Note that some of the open space areas extend beyond Lexington. That’s because these areas don’t end at the city line. You have other choices instead of INTERSECT in the Select by Location dialog box, for example “are completely within” – try Select by Location again as you did above, but choose “are completely within” instead of “intersect” – it might be better, but you’ll also see that some open spaces are now missing.

If you really wanted to cut the open space areas off at the Lexington boundary, you could use the CLIP function in ArcGIS. See the instructions for using the CLIP method starting on page 4 below for how to do this.

Note that you can also select features using the Select tool by dragging a box around them (click and hold the mouse key in the upper left corner of the area, drag down to the lower right corner and release, just like making a zoom-in box). If you need to add or remove from the selection, choose *Selection – Interactive Selection Method*, and make the appropriate choice. Then use the *Select* tool to add or remove. There are a number of other ways to select features in a map, including *Select by Graphic*, *Select by Attribute*, and *Select by Location*.

Creating a permanent shape file of the selected features

If you want to create a permanent shape file of the selected features (instead of a temporary layer file), follow these steps:

1. Select the features you want to be in the new data set (e.g., from above, the open space polygons in Lexington)
2. *Right-click the data layer* containing selected features and choose **Data-Export Data**
3. For *Export*, make sure that *Selected Features* is the specified option.
4. Specify how you want a coordinate system defined for this new data file (note: this is a good way to put data into a target coordinate system if you want to do that – before you do the Export, set the Data Frame’s coordinate system to the one you want all your data to be in).
5. Navigate to your personal project folder and give this data set a new name (e.g., Lexington Open Space.shp. This will create a new shape file with only the selected features.
6. Click YES to add this data set to the map.

Repeat this process for every data layer for which you want a smaller subset.

When finished, make sure that all your new data sets are working and viewable in ArcMap.

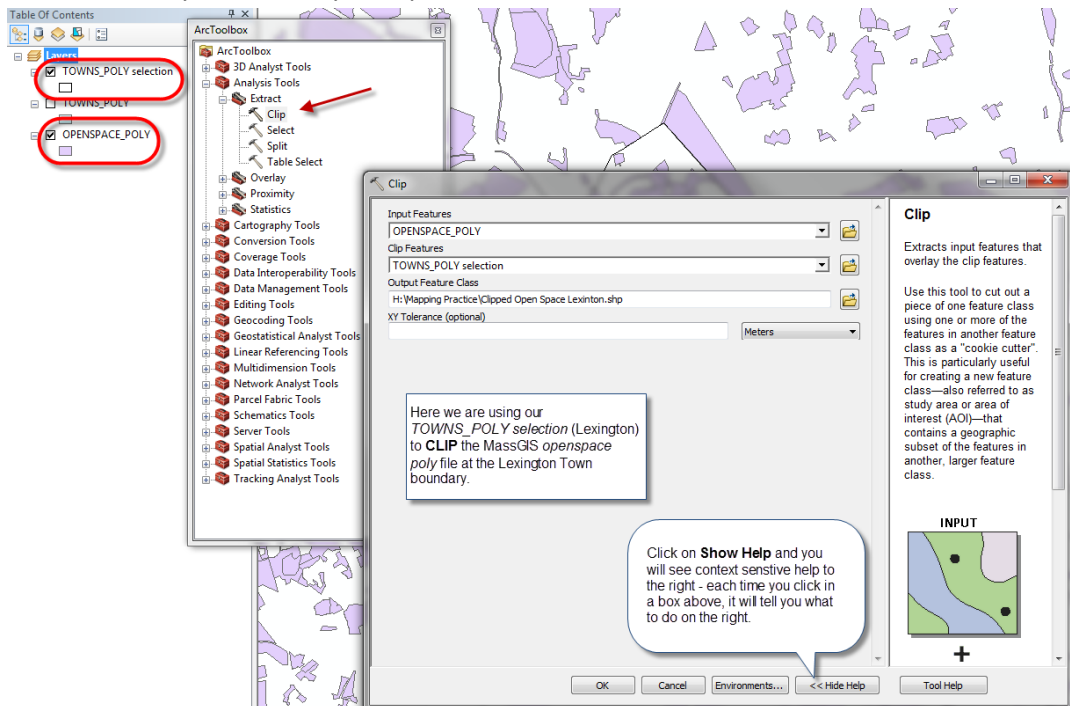
To create smaller subset data set of large data set using the clip method:

To use the clip method, you will need to have a polygon shape file which will act as the "clipper" (the cookie cutter) in addition to the "clippee" shape files. This could be an existing file like a watershed or a town boundary (including a town for which you have created a layer file (like we did above for Lexington). It needs to be a polygon layer. If you want to create your own polygon area, e.g., a study site, see *Creating a new boundary feature* starting on p. 5.

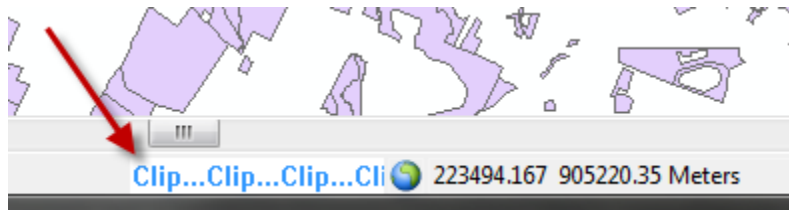
1. In ArcMap, once you have a boundary file (e.g., the Lexington town boundary from above) to use as the "clipper" file, click on **ArcToolbox** (the red toolbox icon):



2. Make sure no features are selected (highlighted in cyan on the map).
3. Go to *Analysis Tools – Extract – Clip* and double-click on *CLIP*.
4. Click on *Show Help* and read about the *CLIP* function
5. Follow the prompts carefully to select the *Input* (the data set to be clipped or the "clippee") and the *CLIP* data set (the layer that the clip will be based on or the "clipper," e.g., the single town polygon). Save it to your personal folder and give it a good name (e.g., openspace_clip)
6. Click **OK** when you are ready to clip



7. It will take some time to run – after a minute you will see the processing on the bottom left of the screen:



Once the clip is complete, you should recalculate the area, perimeter, and length fields in the clipped data if you will be using these in any analysis – clipping does not automatically recalculate these.

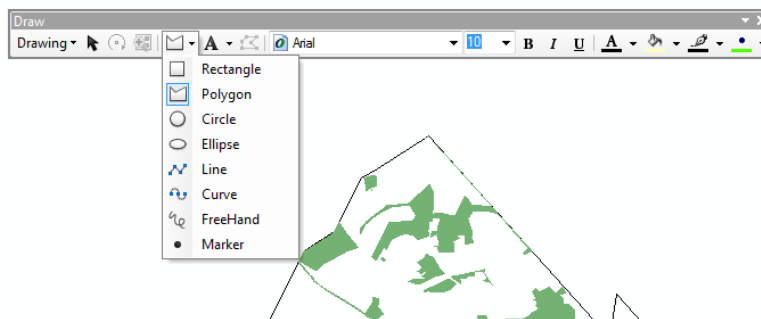
8. To recalculate any of these fields, open the layer's attribute table, right-click on the name of the attribute in question (e.g., *Area*) and choose *Calculate Geometry*
9. Ignore the warning message and press OK
10. Choose the property you want to calculate (e.g., *Area*), the coordinate system, and the units (e.g., meters), and press OK.
11. Do the same for any other fields if necessary (length, perimeter)

You now have a smaller shape file with the geometry properties correctly calculated.

Creating a new boundary feature to act as the clipper layer

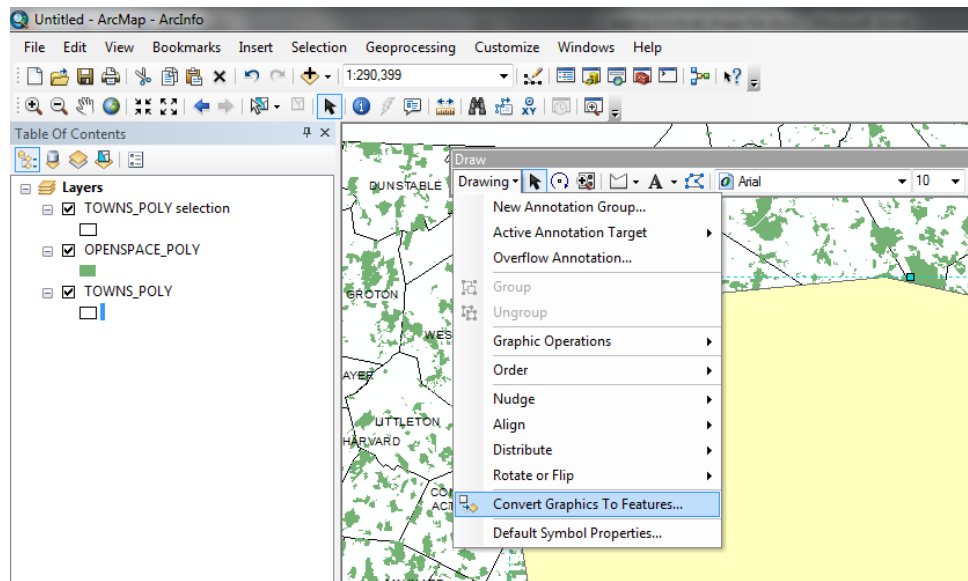
If you need to create a new “clipper” GIS file (e.g., a project area boundary file), follow these directions – you will be creating a graphic on the screen to clip your data with:

1. Open ArcMap and add the geographic data you want to clip (you must have already defined the projection for these files)
2. If you don't see the DRAW menu, add it by clicking on **Customize – Toolbars - Draw**.
3. From the *DRAWING* menu select the **new polygon tool** as shown below:

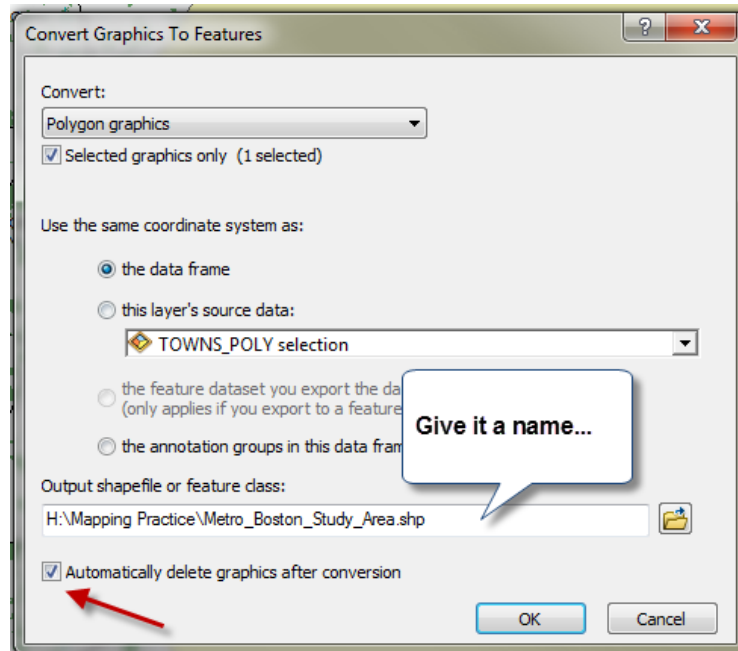


4. Use the polygon tool to draw a polygon for your project study area – if you mess up, just delete it and start again.

- When you have the area set the way you want, click on *DRAW* in the DRAW menu and choose **Convert Graphics To Features**:



- Fill out the Dialog box as you see here:



- Click on OK
- Choose YES to add it to the map

You can now use this new data layer as your “clipper” file – go back to the instructions for clipping.