

Introduction to ArcView Lab – Basic ArcView Skills

This lab will introduce the user to several basic ArcView skills such as loading themes, navigating within a view, identifying elements, and performing simple queries. This lab assumes that GISHydro2000 has been installed on the computer being used.

Task

Locate the USGS gage nearest the intersection of “Watts Branch” (in Montgomery County) and “STATE HWY 28” (alternate name: “DARNESTOWN RD or W MONTGOMERY AVE”). Determine this gage’s number and period of record.

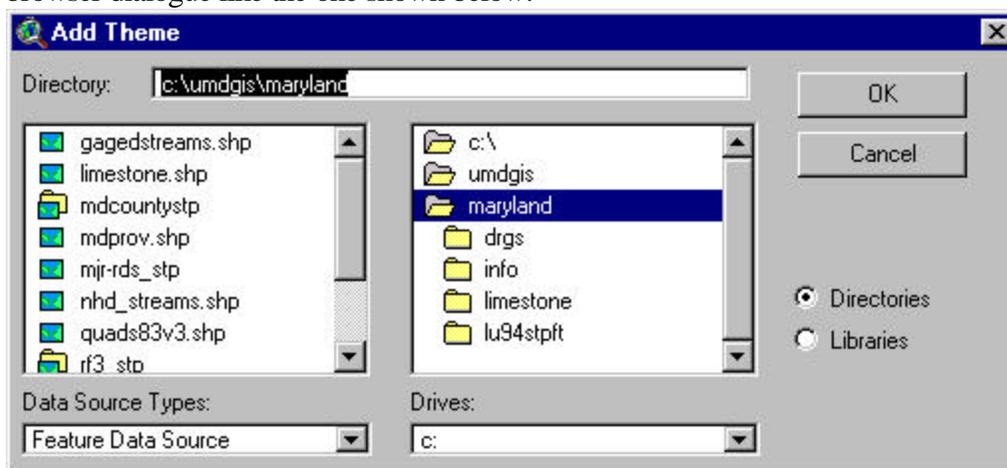
Step One – Create a View Window

When ArcView first starts up the user is presented with a blank project. Depending on the particular settings of the machine you are working on, you may be given the opportunity to open a new view and even add themes to it, or you may just be presented with a blank project. If the latter is the case, double click on the “View” icon and a new view, “View1” should appear. Click inside the “View1” window to make it the active window.

Step Two – Load in Relevant Themes

ArcView makes the distinction between three types of themes: Feature Data (vector), Image Data (dumb raster), and Grid Data (raster). Let’s load examples of each of these data types and have a look at them.

Load the following vector themes located in the “\umdgis\Maryland\” sub-directory: “usgsgages.shp”, “mdcountystp”, “quads83v3.shp”, “nhd_streams.shp”, and “mjr-rds_stp”. To do this, select the “View: Add Theme...” menu choice to obtain a file browser dialogue like the one shown below:



Navigate to the “\umdgis\Maryland” sub-directory and select the indicated themes by clicking on them in the left column of the browser. (Note that you can select multiple themes by holding down the shift key as you click with the mouse.). When you have selected all the desired themes, click on the “OK” button.

The added items will appear in the left margin of the view window. You must click in the small box to the left of each theme name in order for that theme to be visible. Notice that there are three types of feature (vector) data: points (gages), lines (roads or streams) and polygons (quadrangle outlines, counties).

Now add two image themes by again selecting “View: Add theme...” Notice that the “Data Source Type” defaults to “Feature Data Source”. Click on the down arrow at the left of this source type to obtain the “Image Data Source” selection. Select “kensington.tif” and “lu94stpft” and click on the “OK” button.

Finally, add one grid them by selecting “View: Add theme...” and choosing “Grid Data Source”. Load in “lu94stpft” again.

Last note: see if you can find the button that has the same functionality as “View: Add theme...”. This button is a quicker way to load new themes into the view.

Step Three – Basic Navigation

Before proceeding further, take some time to navigate around the view using the buttons and tools shown at right. For instance, make the “kensington.tif” the active theme and click on the “Zoom to active theme(s)” button. Notice how this zooms you to the extent of only the Kensington quadrangle. Now use the “magnifying glass tool(+)” and the “hand tool” to move around. Try making other themes active, or selecting items in any of the vector themes and using the other buttons shown above. Play around a little bit just to get the feel of how each of these icons works. You will become more fluent in using these icons as you use ArcView more.



Step Four – Using the Identify Tool



Click on any of the feature themes to make theme active and use the identify tool to learn more about the feature you have just clicked on. Play with this item for a little while. The information housed in the gage, road, and stream themes is probably the most interesting information to try to sample. You can also use the identify tool to sample from grid themes, in this case “lu94stpft”.

Step Five – Compare Image to Grid Data

Let’s now investigate how image and grid data are different. Recall that we loaded “lu94stpft” as both an image and grid theme so it should appear twice in legend in the left hand margin. Notice that when this theme was loaded as an image no color legend appeared. When it was loaded as a grid, a legend with the numbers: 11, 12, 13, ... appeared. Image data is just an image with no “intelligence” associated with it. For instance, if you make just the “lu94stpft” theme loaded as an image active, the identify tool will be grayed out, indicating that nothing more can be learned about this image – it

cannot be sampled by the identify tool. In comparison, the “lu94stpft” theme loaded as a grid can be sampled with the identify tool. This step is just to show you the difference between the two data types and also to point out that if you wish to use raster data to perform calculations, do not accidentally perform the common error of loading the data as an image.

Step Five – Labeling a Stream/Road/Gage



Somewhat similar to the identify tool, is the “label tool”. By making a particular feature theme active, you can click on individual features within that theme and use this tool to label them. This is generally a convenient way to label roads and streams.

Step Six – Getting and Using a Table

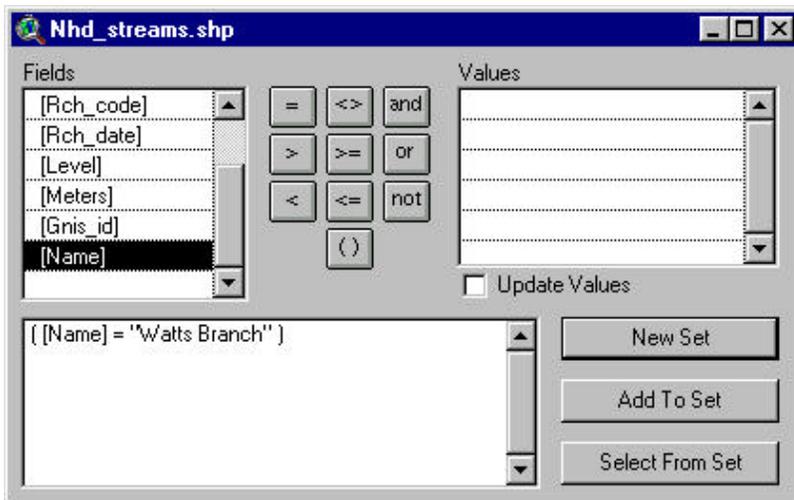
The power of any GIS is the linkage between what is seen visually and the associated table with these visual elements. Make any feature theme or the “lu94stpft” grid theme active and you will find that you can obtain the table associated with this theme by selecting “Theme: Table...”. Notice that you can select records (rows) of this table by clicking with the mouse. You can then use the “Zoom to selected” button to zoom to selected features. This can be a powerful way to visualize information presented in a table. Notice that the information in a single record is identical to the information presented when you click on that feature/pixel using the identify tool. The identify tool, in essence, presents a single record of a theme on demand.

(Extra: Locate the button that has the same effect as “Theme: Table...”). This is a faster way to obtain a theme’s table.

Step Seven – Performing a Query

Data in tabular form is easy to query (to ask simple yes/no questions). The result of these queries can then be inspected visually in the view. Let us set up the query that will help

answer the task outlined earlier. Click on the “Query Builder” button: , with the “nhd_streams.shp” theme active. You will obtain the following dialogue box:



By typing in the lower left corner the text ([Name] = "Watts Branch") and clicking on the "New Set" button all streams with the name "Watts Branch" will be selected. You can view these streams by clicking on the "Zoom to selected" button and looking for the yellow selected items. You will notice that there are two such streams, one draining westward into Northeast Washington and into the Anacostia river. The other stream drains southwards through south-central Montgomery county into the Potomac river. This latter stream is the one we are investigating. Use the label tool to mark this stream.

Now make the "mjr-rds_stp" theme active. Use the query builder with the selection string:

([Alt1_name] = "W Montgomery Ave")

Use the label tool to mark this road. Use the label tool to mark this road. Notice that the road is marked "STATE HWY 28". Why is this? Check under "Theme: Properties..." (Text labels) and see if you can change what ArcView labels this road.

Step Eight – Complete the Task

Make the "usgsgages.shp" theme visible and raise it to the top of the legend so that it overlays all other displayed information. You should notice that a gage is located just about 1000 feet (find and use the "measure tool" to confirm this) to the south of the crossing of Watts Branch by Montgomery Avenue. Use the identify tool to learn this gage's identification number and period of record.