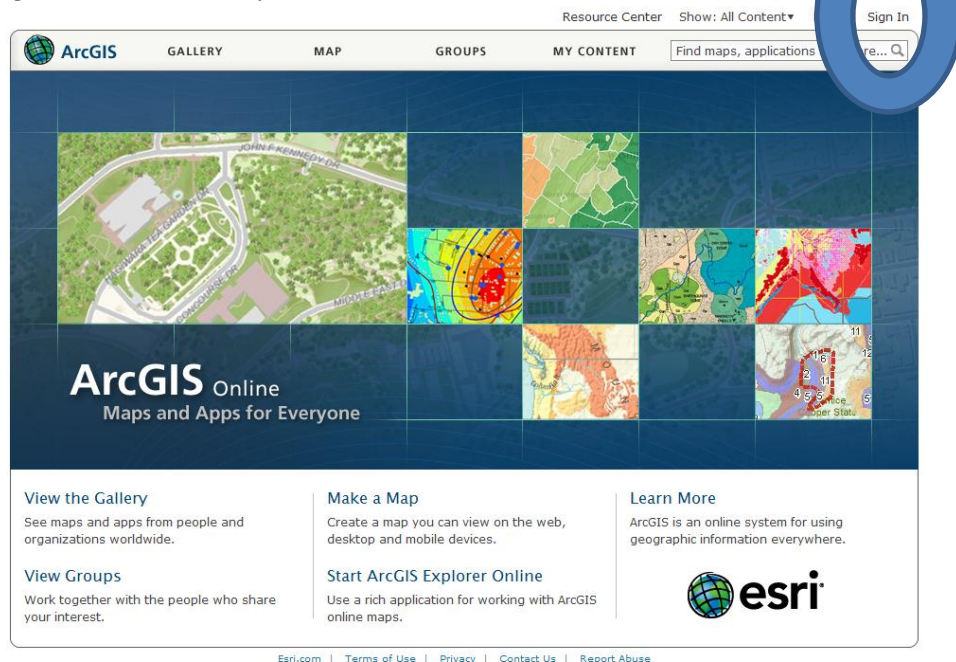# *Introduction to GIS for WV Teachers*

(1) As you enter:

1. Head to www.arcgis.com.
2. Click Sign In and login, or follow the steps to create an account.

(2) Introduction to GIS Presentation

(3) ArcGIS.com

Introduction:

1. Similar to Google Map
   a. Zoom in/out with the bar and scroll on mouse
   b. Detail is greater as you zoom in
   c. Layers can be added
   d. Basemap can be changed
2. Teacher Task: Look through the "Gallery". Choose a map that interests you. Think about how you can use that map as a class opener, closer, or "sponge" in the coming week. What lesson, simple or complex, will this help you present, teach, or reinforce? (4-5 volunteers will answer).

Notes:

(4)   Working with ArcGIS 10:

Data is Key! Let's get our data on our computers. This software is a data "**displayer**" and "**analyzer**." Without data it is useless.

1.   Teacher Task: Copy Data from jump drive to your computer's hard drive. Return jump drive.
   a.   Copy entire Data folder to My Documents.

Data forms the basis of a GIS, now that we have data, we can use our GIS.

1.   First thing to understand about our data is **how the data is stored**.
   a.   Multiple formats for GIS data.
   b.   Example: Look at \Data\West_Virginia\Schools\
      schoolsPreKThrough12thAndHigherEd_201007_utm83_shp
         i.   1 dataset, requires 7 files
   c.   When you acquire data, keep the data in the folder it comes in.
   d.   All these files are required to make the dataset work.
   e.   Data is stored in this file format, the GIS **Displays** and **Analyses** these files.

2.   **Opening GIS**:
   a.   Start > All Programs > ArcGIS > Arc Map
   b.   Options upon startup:
         i.   Open an existing map or make a new map using a template.
            1.   Select the Default "A Blank map"
   c.   At a blank slate – **an empty map**. Notice:
         i.   Coordinates on the bottom right.
         ii.   Tools along the bottom of the top toolbar.
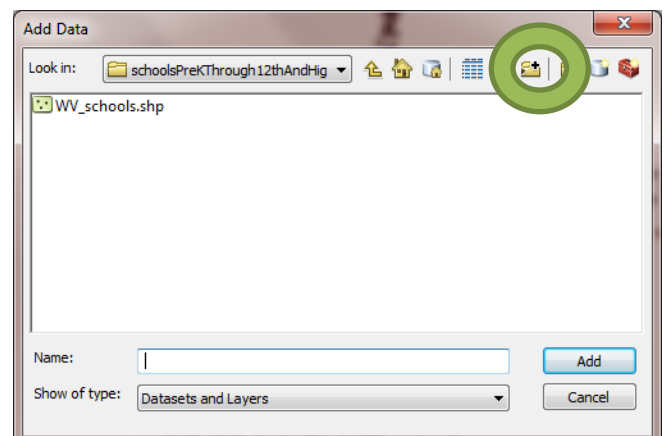   iii.   Information about specific tools appears in bottom left corner if you "hover"
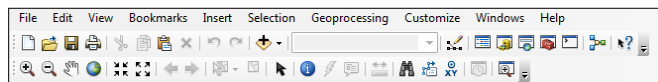
         iv.   Remember : Right – Where am I? Left – What am I about to do?

   d.   **Add Data**
         i.   The first time you use a new dataset in a new location on your computer, you have to tell ArcGIS that this location is one where you will store GIS Data.
         ii.   We do that with the "Connect to folder" button. This opens a new window.
         iii.   Navigate to the location where your "Data" folder is stored.
         iv.   Click OK.

v. This folder is now recognized as a location where data is stored.

vi. Now, in the Add Data window navigate to \Data\West_Virginia\Schools\ schoolsPreKThrough12thAndHigherEd_201007_utm83_shp

vii. And add WV_schools.shp

viii. Table of content shows the name.

ix. Units are now? (Meters)

x. Click List By Source Button – this shows file location. Click back to List By Drawing Order tab.

3. Exploring and Analyzing our data:

    a. Explore the **toolbar**:

    b. **Let's Explore the data** associated with these points.

      i. Right Click on WV_schools in the Layers window

      ii. Click Open Attribute Table

      iii. What "Shape" is this data stored in?

      iv. What other "Shapes" do you think are possible?

      v. What data is associated with each point?

      vi. Right Click on a Column (a.k.a. Field) to sort the data.

      vii. Sort County Field.

        1. How many schools are located in Pocahontas County?

c. **Basic Symbolizing** (Categorizing data).
    i. Right Click on WV_schools in the Layers window
    ii. Select Properties at the bottom.
    iii. Click on Symbology Tab.
        1. Features > Single Symbol
            a. Allows you to change all symbols, making them the same
        2. Categories > Unique Values
            a. Allows you to categorize data points based on an attribute that is text, like the type of school in "subtype"
        3. Categories > Graduated Colors
            a. Allows you to categorize data points based on a numerical attribute that covers a range of values.

d. Teacher Task – Add Data – 3 Data Sets
    i. Counties: \Data\West_Virginia\Boundaries\countyBoundary_censusAndUSGS_200503_utm83_shp\WVcounty
    ii. Cities: \Data\West_Virginia\Census\WV_cities
    iii. Other States: \Data\US_ESRI_Data\US_Canada_States

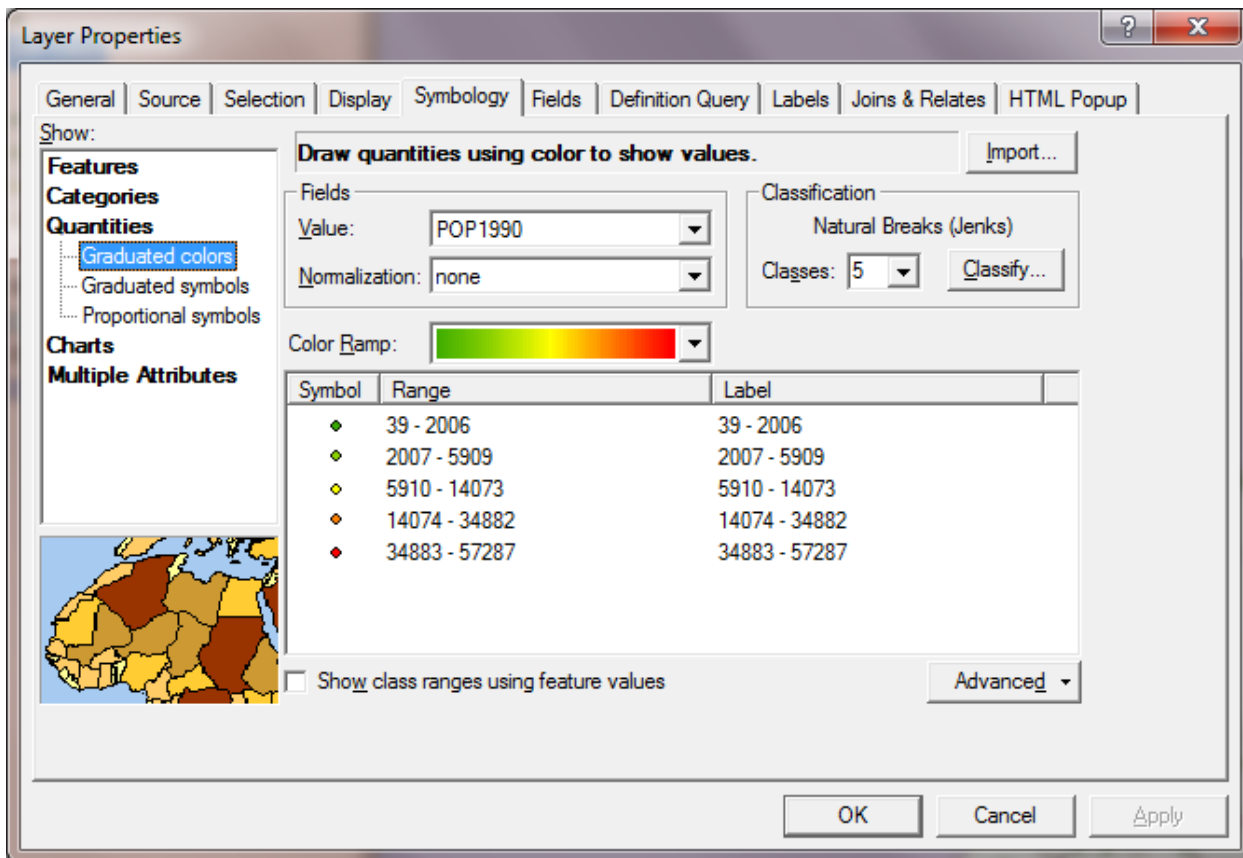# TIME TO SAVE YOUR PROJECT
File: Save:
WVschools.mxd

e. Teacher Task – Turn Off Schools – "Uncheck"

f. **Basic Symbolizing** – part 2
    i. Right Click on WV_cities in the Layers window
    ii. Select Properties at the bottom.
    iii. Click on Symbology Tab.

iv. Match your settings to those pictured below.

v. Click OK and view your results.

g. Teacher Task.
   i. Using the same settings above, classify the counties in WVcounty.
   ii. For Value, select POP2000.

h. **Labeling** – Part 1
   i. Right Click on US_Canada_States
   ii. Select Label Features
   iii. View your results

i. **Labeling** – Part 2
   i. Sometimes you don't want to label with the field that ArcGIS chooses.
   ii. Right Click on WV_Cities
   iii. Select Properties
   iv. Select Symbology
   v. Click on the Labels Tab
   vi. Match your settings to those pictured below. This will label every feature, or city, in this data file.
   vii. This will be messy, but go ahead and try it.

viii.   View your results.

ix.   Messy, isn't it?
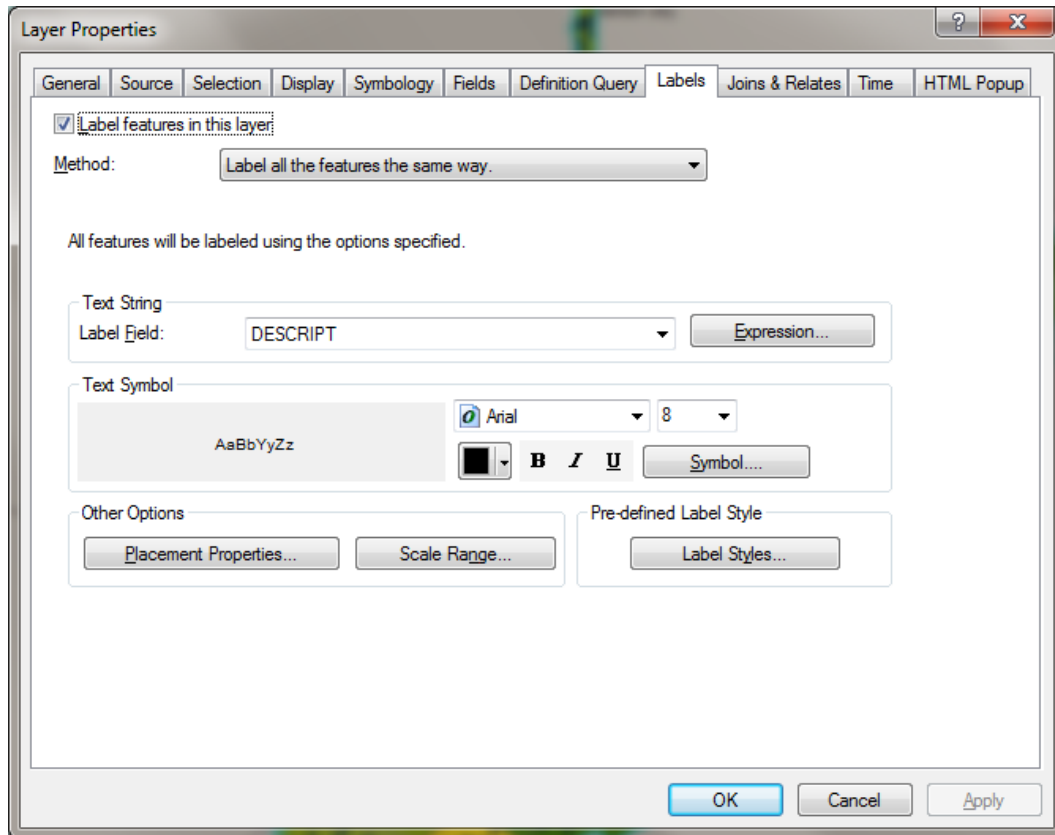
j.   **Labeling** – Part 3

    i.   Sometimes you don't want to use all the labels, only some.

    ii.   Right Click on WV_Cities

    iii.   Select Properties

    iv.   Click on the Labels Tab

    v.   Change the Method to "Define classes of features and label each class differently."

    vi.   Now, we're going to run a "query" to select the cities we are interested in.

    vii.   Click SQL. Match your settings to those pictured to the right.

    viii.   We are selecting cities in the POP1990 column that have a population greater than 14000.

    ix.   Click OK.

    x.   Your layer properties window will now look like this:

   xi.   Click OK and view your results.
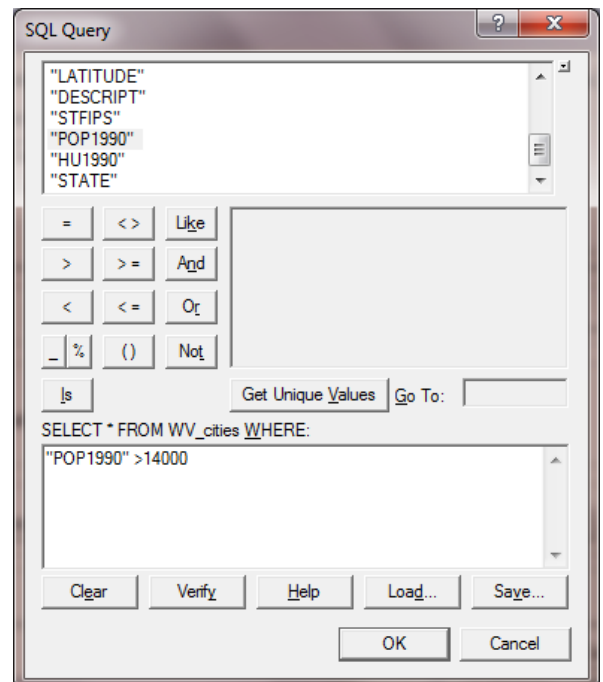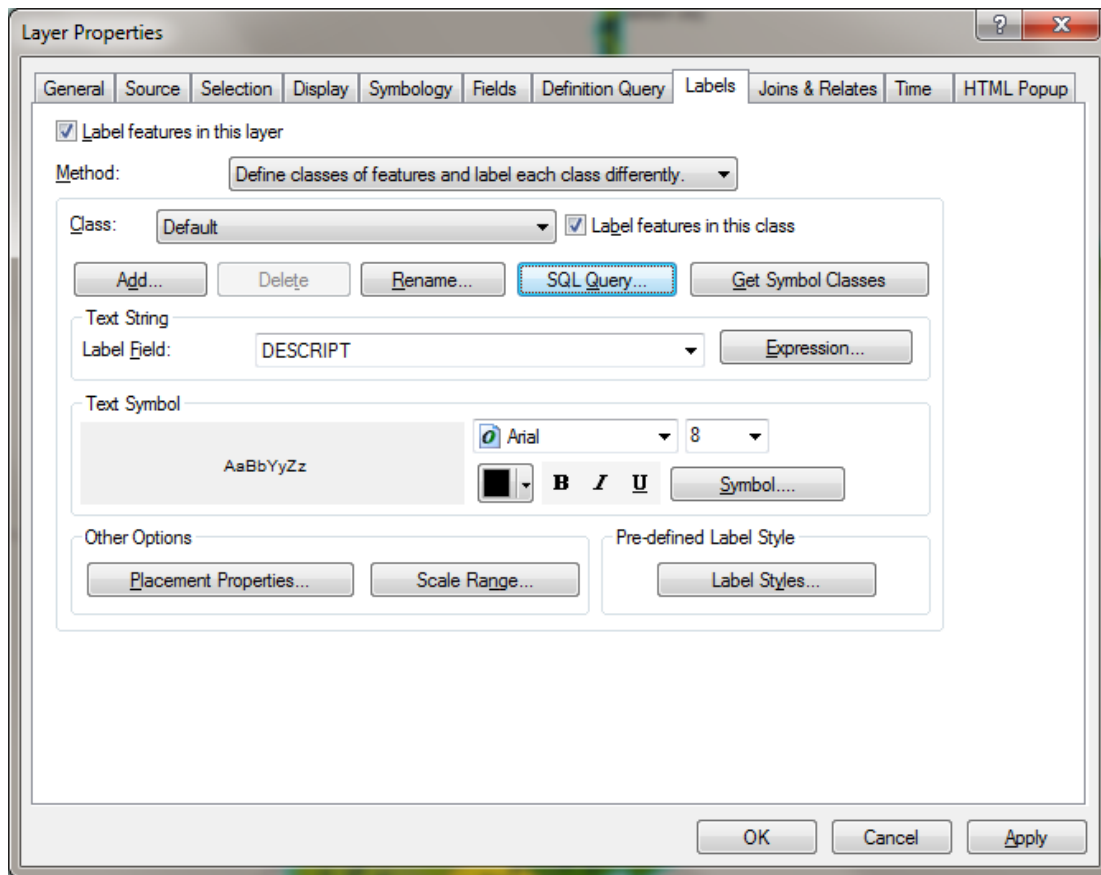
k. **Basic Querying**:
   i. A query is our method of asking questions of the data.
   ii. This query will show us the counties that grew between 1986 and 2000.
   iii. Click the Selection Menu, choose "Select by Attributes"
   iv. Match your values to those shown to the right.
   v. You are selecting counties whose percent of population change (POPCH_PCT) is greater than 1.
   vi. Click OK and view your results.
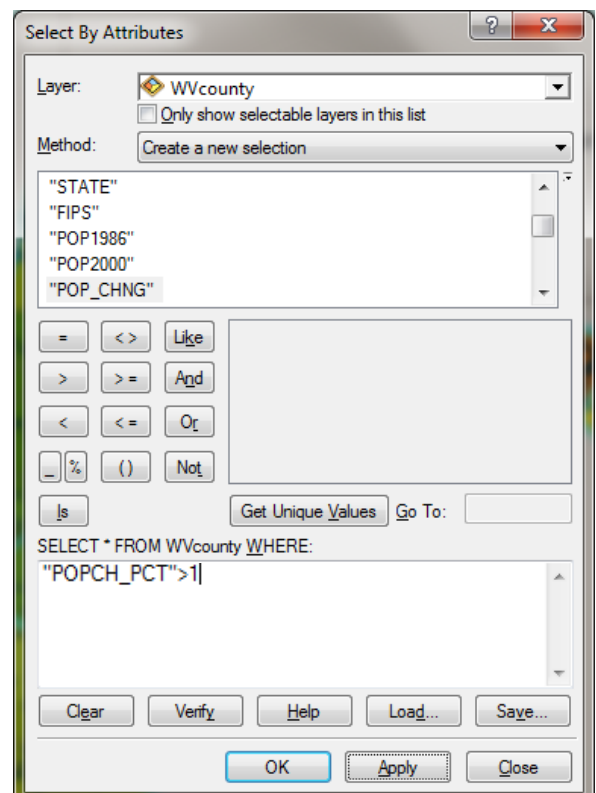
l. **Basic Querying** – Part 2

    i. With your growing counties still selected, Click the Selection Menu, choose "Select by Location"

    ii. Match your values to those shown to the right.

    iii. You are selecting schools that are within the growing counties that we already have selected.

    iv. Click OK and view your results.
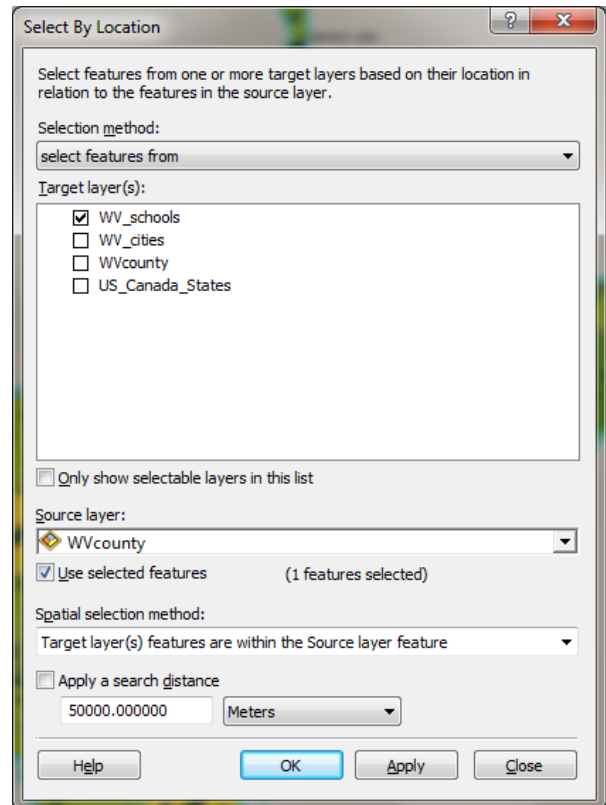
m. **Basic Querying** – Part 3

    i. You can use a query to only display certain pieces of data.

    ii. Go back to your WV_cities dataset.

    iii. Right click on WV_cities.

    iv. Select Properties.

    v. Select the Definition Query Tab.

    vi. Click Query Builder.

    vii. Match your values to those to the right. This is the same query we did earlier to label cities with populations greater than 14,000. Now we're using a query to choose what to display.

    viii. Click OK. Then OK again to close the layer properties.

    ix. View your results.
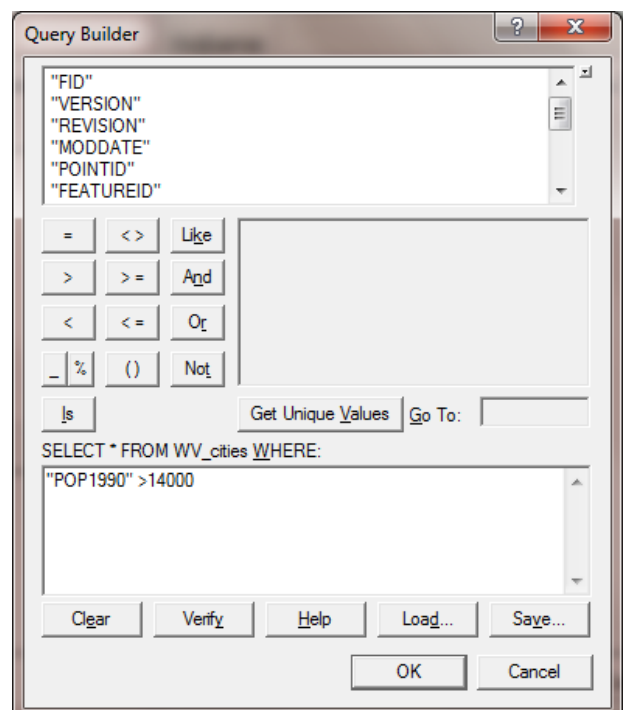
n. **Making a map**.
  i. The view we are looking at is called "Data View"
  ii. Select the View menu, select Layout View. This is where we make a real map.
  iii. Notice that you have a new set of tools, called Layout.
  iv. Notice that you still have your original set of tools.
  v. You have a very basic map here, but to add map elements to the page, click Insert.
  vi. By selecting the box around the data window, you can change its size and shape.

  vii. You can still use your tools menu to move around, zoom, etc. in the data window.
  viii. Maps can be exported (File>Export Map) as image files (.jpg, .gif) or .pdf files.
  ix. Teacher Task:
      1. Using the map handout, create an identical map in the layout view. Add a title, a text box with your name, a legend, an arrow, and a scale bar. Ask Questions!

Notes: