VISUALIZING DATA

GIS data is the foundation of today's digitally created maps. But how can the numerical data contained within a .SHP file be transformed into a visually appealing map?

Follow along in this tutorial and learn how CANVAS 11 GIS+ can quickly transform the appearance of map objects, coordinates and other GIS property values into an eye-catching graphic.

Map objects containing population density data, land use descriptions, elevation or mineral deposit information can be enhanced with custom or preset color, gradient or texture inks to produce a "topic-targeted" thematic map.

CANVAS 11 GIS+ contains an easy-to-use Visualize Data interface that lets you custom-select and modify the symbology or appearance of map objects according to property value or other classification options. Bear in mind that the appearance of a thematic map depends on the data, topics and the message that you wish to deliver. This tutorial shows only one of several options that are available to create thematic maps so we encourage you to experiment.

The goal of this tutorial is to provide you with an understanding of symbology and learn something about the capabilities of Canvas 11 GIS+.
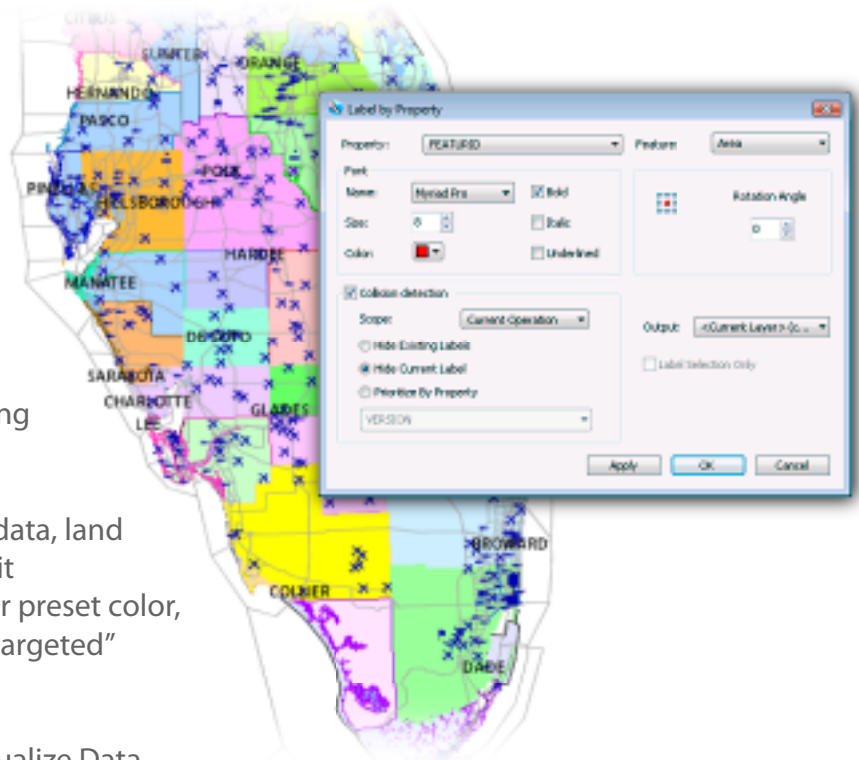
Objectives
After this exercise you will be able to:
> » Colorize shape files
> » Apply symbols
> » Open and visualiz data
> » Label data

Required knowledge to perform this exercise:
> » Open shape files and palettes
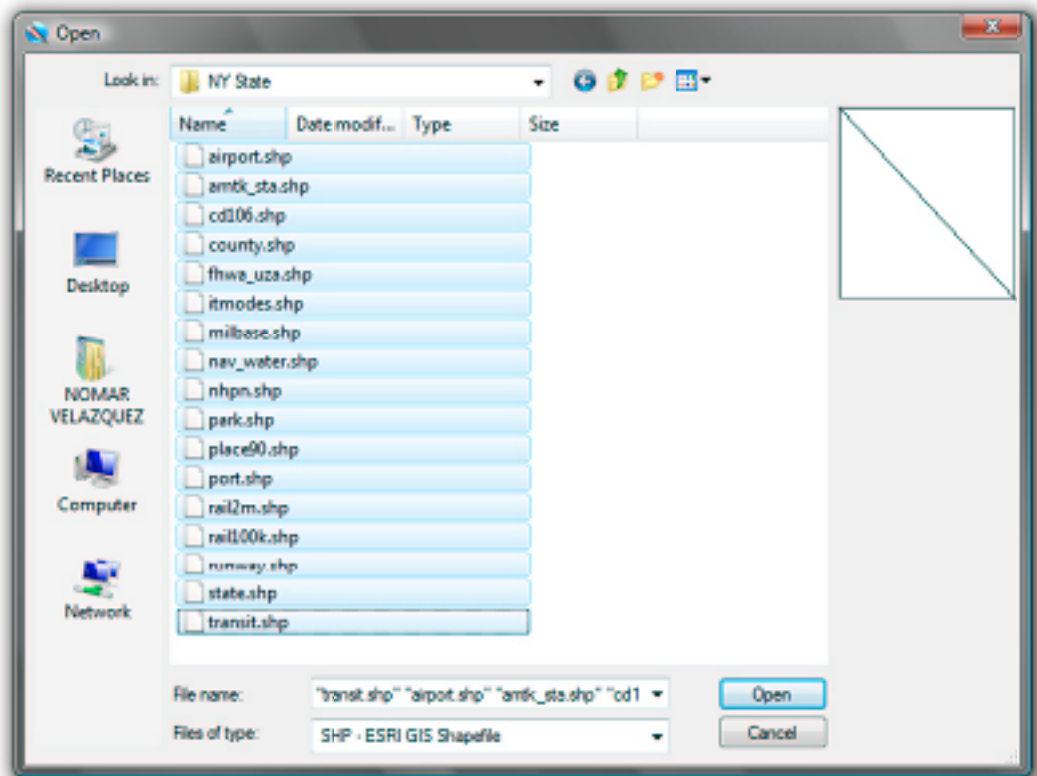> » Move an object
> » Draw or place an object

STEP 1: OPENING FILES

We will start this exercise with four Shapefiles containing Florida GIS data. These files consist of area, line, and point objects.

To open the file choose GIS > Import. Navigate to the folder and Shift-click all the .SHP files and click Open.

✔ Tip: Rather than Shift-clicking the files and opening them at once, you can also open one file and then click the Add button in the Files / Layers List dialog box to open the remaining Shapefiles.

The Files/Layers List dialog box will now open. If you wish to change an object's color, select the layer in the list and click the Properties button to open the Layer Properties dialog box. For this tutorial, we will not modify the projection information; so leave the projection information as is. However, you should know that the projection settings for the file can be modified at any time. Click OK to load the files.
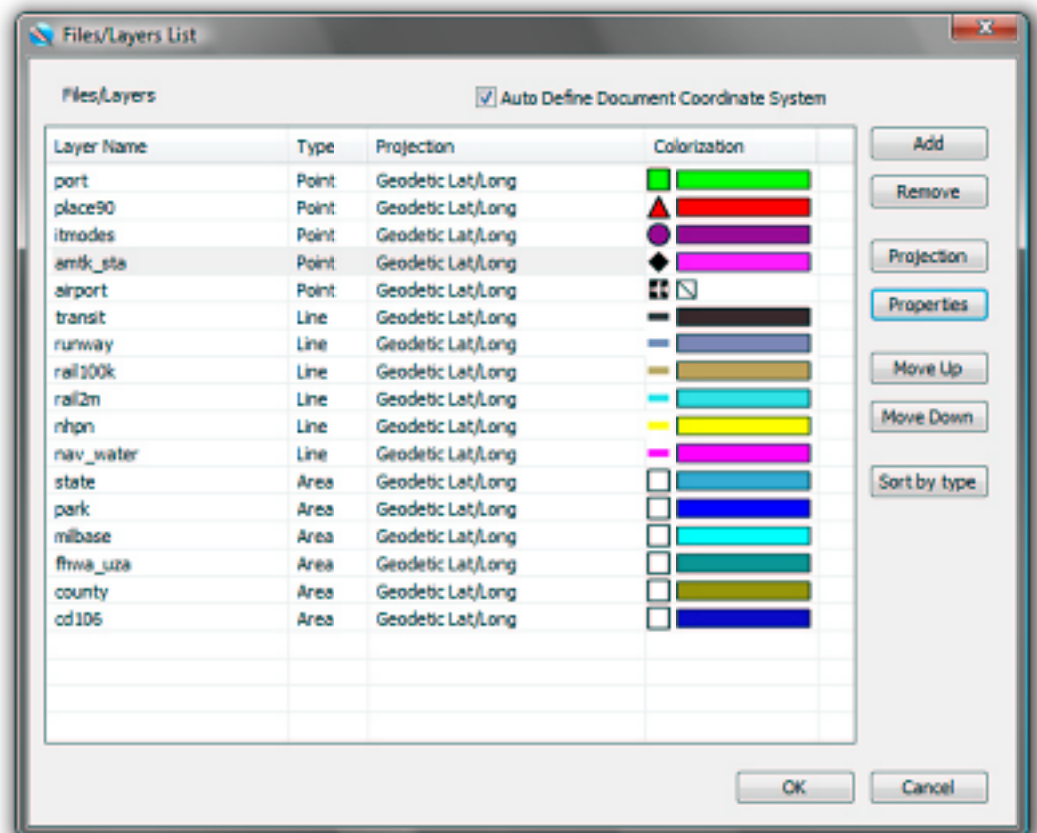
The loaded Shapefiles should look like the image on the right.
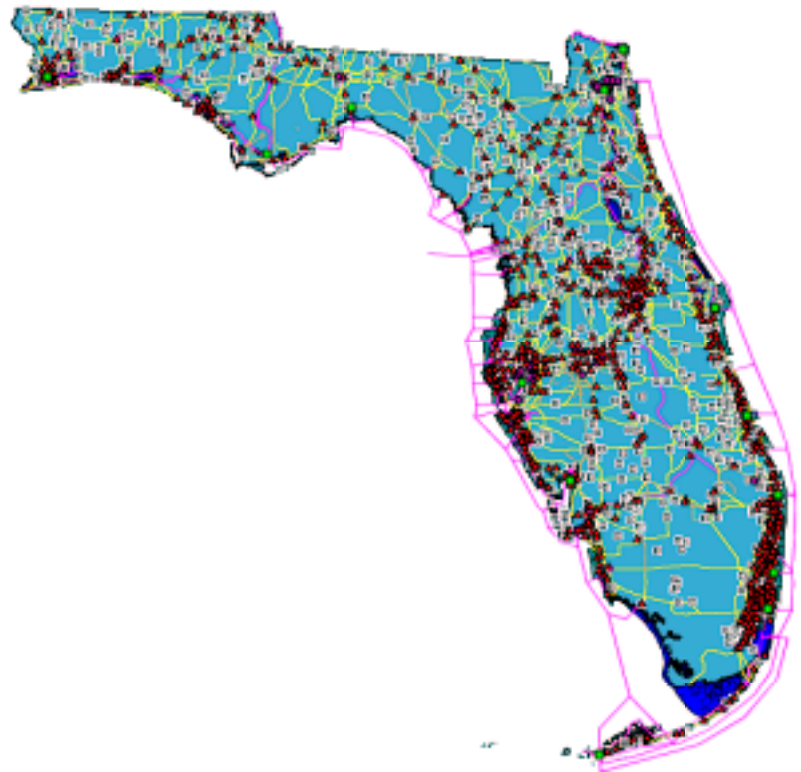
STEP 2: REMOVING FILL INK

Now let's start using the Visualize data command to change the appearance of various map objects.

First, let's remove the fill ink from all objects on the state and county layers by doing the following:

- At the bottom of the document window, select the state layer and select all (Ctrl+A).
- Click the fill ink icon in the Toolbox and select no ink from the Presets palette.
- Select the county layer and perform the same steps.
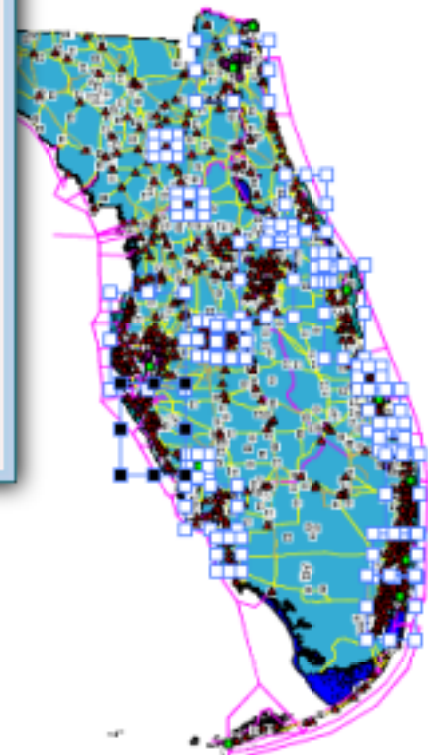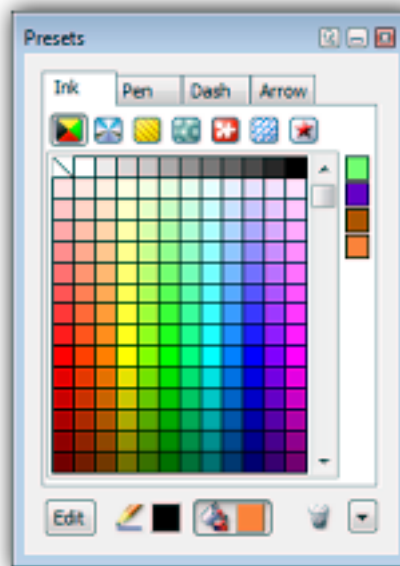
Now select the airport layer and choose GIS > Visualize data. With this command, you can change map objects' appearances by using the Symbol, Stroke, or Fill categories. For the first example, we will select Symbol and the Single option. Since there is no selection, only Layer should be available from the Scope menu.

For this exercise, we will change the size to 3.0 pt and select the "Preserve symbol frame ink" and "Preserve symbol fill ink" checkboxes.

Tip: For these exercises, deselect the Create Legend checkbox in the Visualize data dialog box.

Continue to next step before clicking OK.
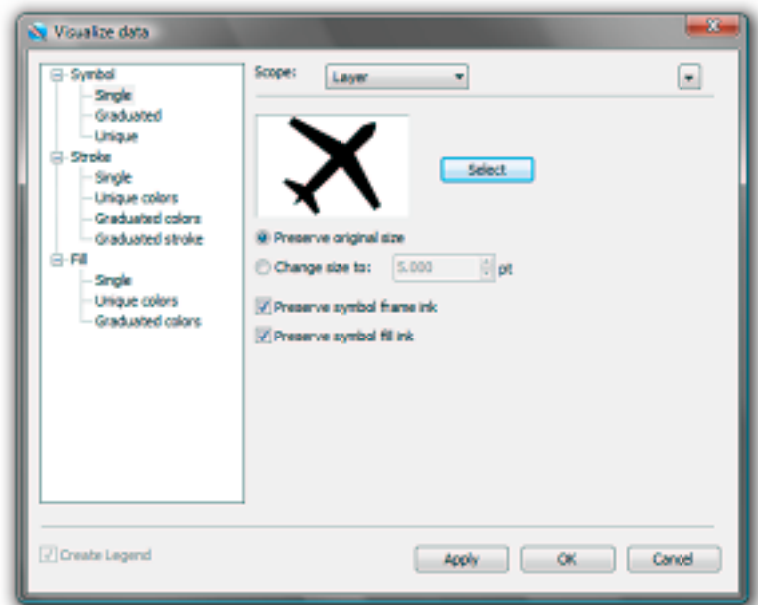
- Preserve original size - Select this radio button to keep the size of the object being replaced by a dynamic object.
- Change size to - Select this radio button and then enter a size in the text field. The selected dynamic object will be the chosen size.
- Preserve symbol frame ink - Select this checkbox to use the object's original outline color.
- Preserve symbol fill ink - Select this checkbox to use the object's original fill color.

Next we will replace all the airport icons (triangles). Click the Select button to open the Select Library Item dialog box. A list of categories should appear in the left pane with the available dynamic library items appearing in the right pane. Select the Transportation category beneath GIS Symbols. Select the Airport symbol in the top row in the right pane. Click OK to replace. The result should look like the below image.

Now we will differentiate between the various airport facilities. With the airport layer still selected, open the Visualize data dialog box again. We will use the Symbol category and the Unique option.

    1) Open the Property menu and select FAC_TYPE. The related values should appear below.
    2) Click to the left of each value to open the Select Library Item dialog box.
    3) Select a dynamic library object from the various categories that represents that value.
   4) Click OK to replace the current objects.
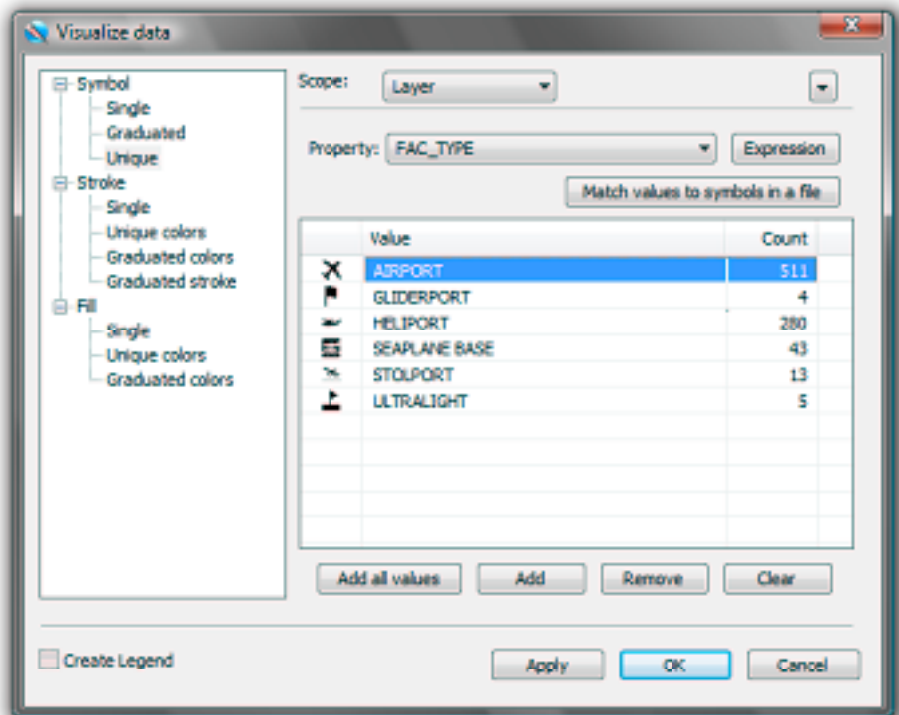
Tip: If you work with files that have identical values, you can use the Match values to symbols in a file option. You must first create dynamic library objects and save the files via the Symbol Library palette. The names of the dynamic library objects must be the same as the values in the files.

STEP 3:
Next, select the runway layer and open the Visualize data dialog box once again. We will use the Stroke category and the Unique colors option to modify the stroke of the runways.

    1) Select City from the Property menu.
    2) Click Add all values to load the values for the selected property.
    3) Click the Options button and select Generate Random Color palette.
    4) As shown in the image on the right, each value is assigned a different color.
    5) Click OK to apply the colors to the line objects.
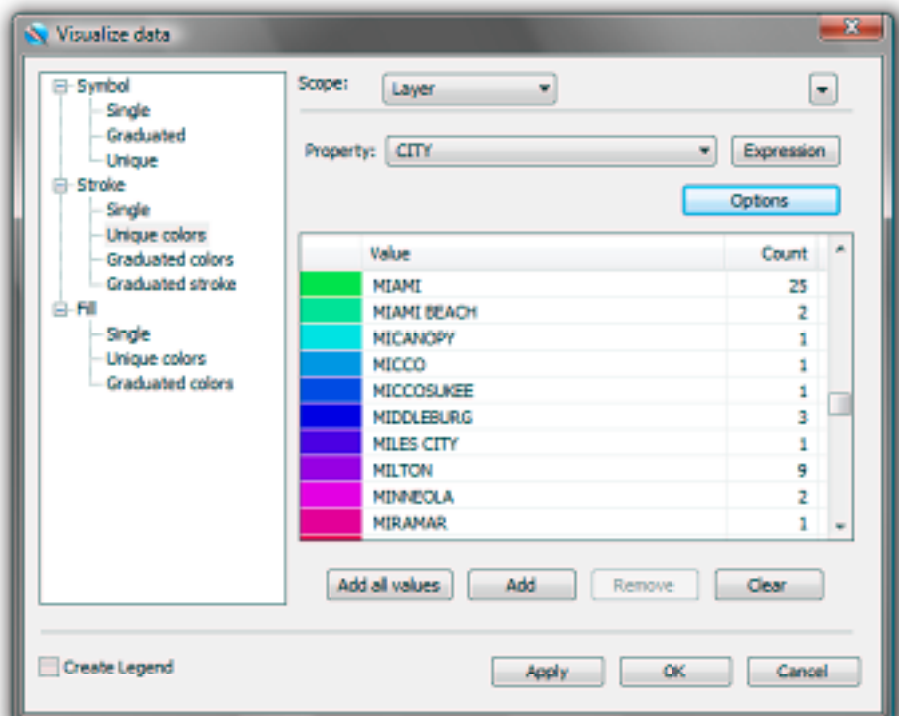
Now, let's change the stroke width of the runways so they are more visible.

1) Open the Visualize data dialog box and select the Stroke category and Single option.
2) Click the Select button to open the pen stroke options of the Presets palette.
3) Choose a Standard pen stroke with a 2 pt width.
4) Click OK to apply the pen stroke to the runways.
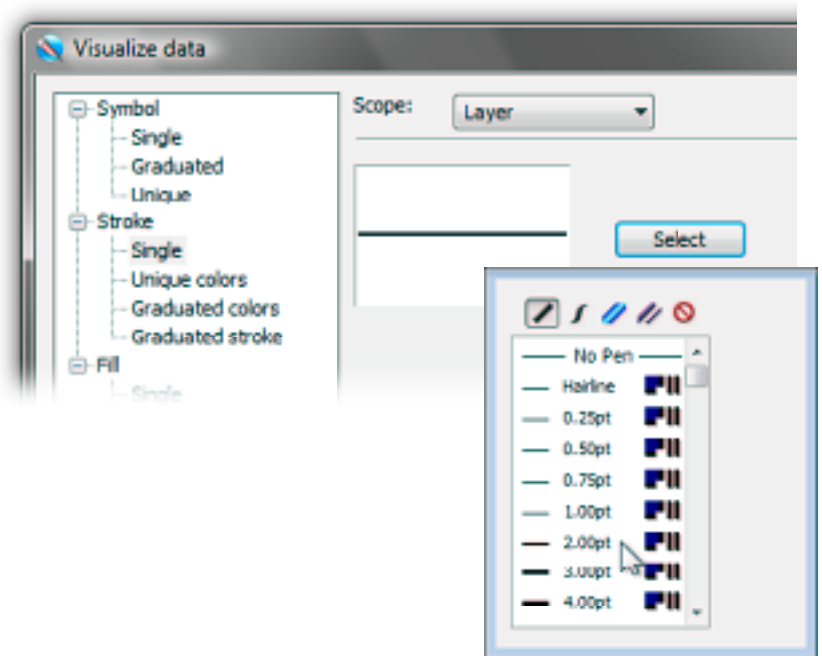
Next, we will differentiate between the various runways by using the Stroke category and Graduated stroke option.

1) Select ELEV from the Property menu. The range of values loads automatically.
2) Use the From and To fields to determine the size range for the pen stroke. From refers to the thinnest width, and To is the widest width. For this exercise, we will use 3 pt and 8 pt.
3) Click OK to apply the changes.

✓ Tip: When using a Graduated option, only properties that have a numeric data type appear in the Property menu.
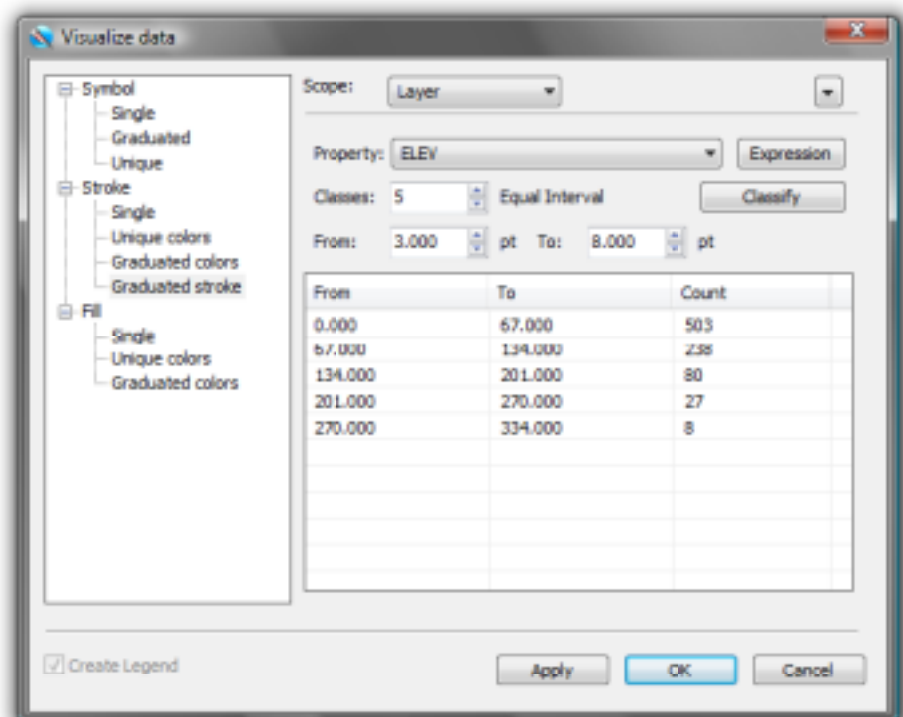
STEP 4: APPLYING FILL INK

Now, select the county layer and open the Visualize data dialog box. We will apply a fill ink to various counties by using Fill category and the Unique colors option.

1) Select COUNTY from the Property menu.
2) Click the Add all values button.
3) Click the Options button and select Generate Random Color palette. Each value is assigned a different color.
4) Click OK to apply the inks to the area objects.
5) Select all the objects on this layer (Ctrl+A).
6) Lower the opacity to 25% by using the Opacity slider in the Properties bar.
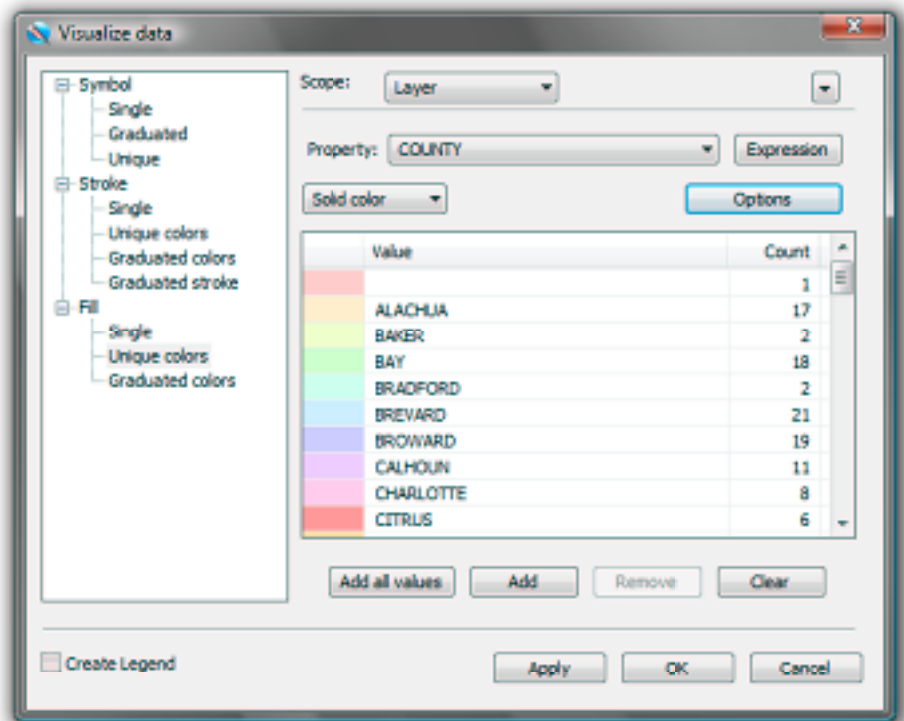

STEP 5: COLORING THE STATES

Now, select the state layer and open the Visualize data dialog box. We will apply a fill ink to the state by using the Fill category and the Single option.

1) Select the Fill category and then Single.
2) Click the Select button to open the pop-up Presets palette.
3) Select an ink type and then choose an ink.
4) Click OK to apply the ink to the area objects.

In the example on the right, we used a very light color ink.
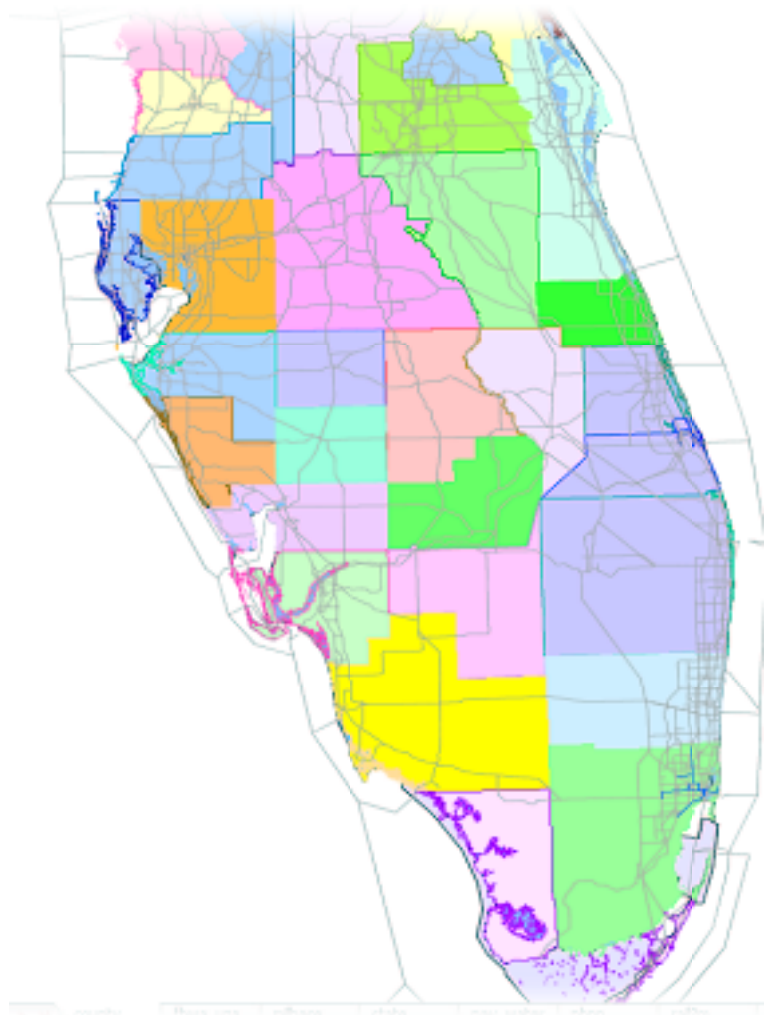
STEP 6: LABELING MAP OBJECTS

We can also further enhance a mapping project by adding labels to objects. In this case, we will label the counties.

1) Select the county layer.
2) Choose GIS > Label by property to open the Label By Property interface.
3) Select COUNTY from the Property menu.
4) Choose the Font options. We will use a small font and a red color so the labels are easily seen.
5) Select Hide Current Label for Collision detection.
6) Enter a value in the Rotation Angle field and select a reference point, if necessary.
7) Select Current Layer in the Output menu.
8) Click OK to create the labels.
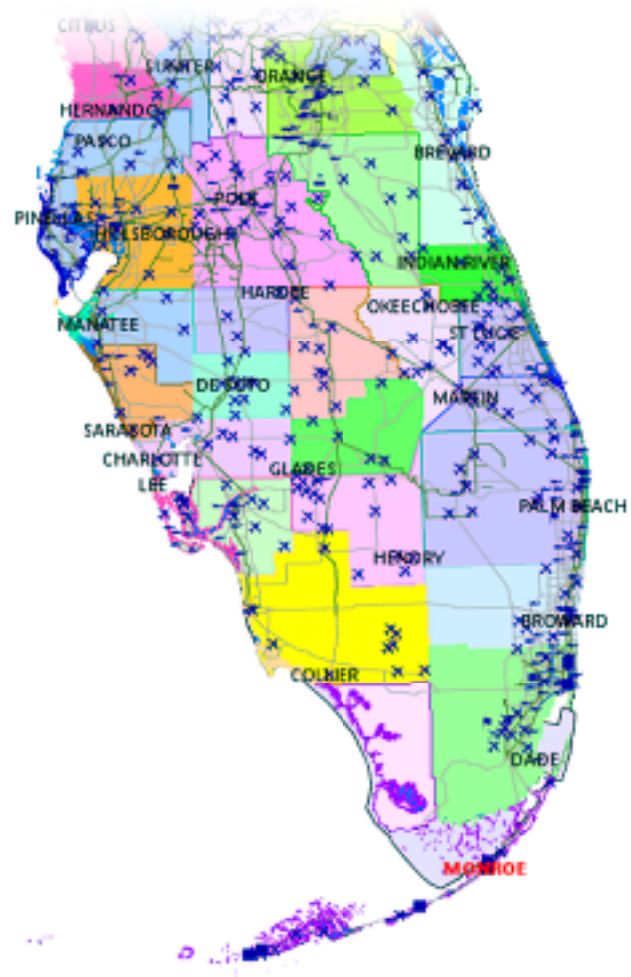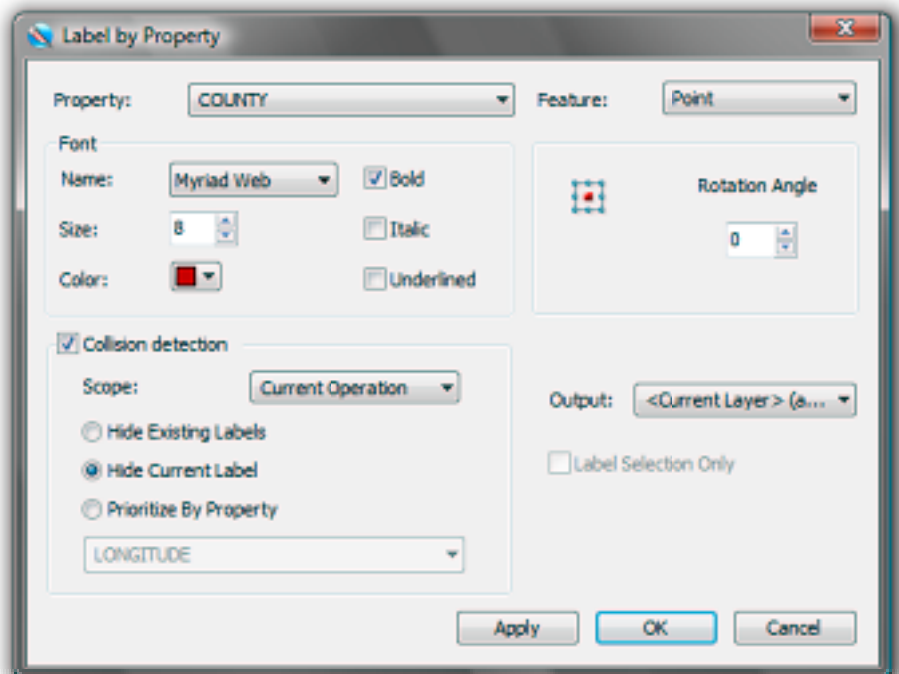
The final map project would appear like the image on the right side.