Section 23: Combine Vector Class to a Classified Landcover Image

Section Objective

Image Classification techniques can do a good job of classifying land covers, but there are some places where they meet their limits. For example, unless you are using object-oriented classification (like IMAGINE Objective) they generally can't tell the difference between a road and a parking lot. And what about where a tree overhangs the street?

Those pixels are spectrally different from the other road pixels, and will never be correctly classified.

You cannot fix that with traditional classification techniques, but you can use vector road data to define the road pixels into the Landcover image. This process, known as overlaying, can "burn" the roads (or any other class you have data for-- building footprints, streams, etc.) into your Landcover image.

Tools Used

Spatial Model Editor	Graphical Interface used to create spatial models
Operator Panel	Used to find and utilize key Model Operators
View Attributes	Table view of the Thematic Output

Class Notes

Combine Vector Class to a Classified Landcover Image

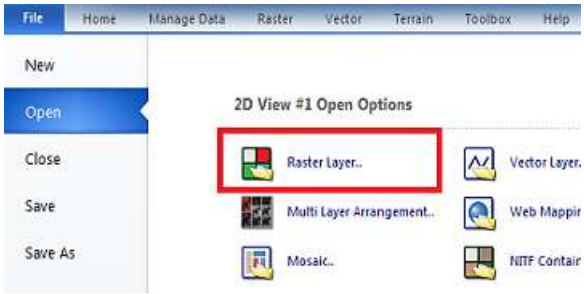
Task 1: Examining Data and Set Preferences

Image Classification techniques can do a good job of classifying land covers, but there are some places where they meet their limits. For example, unless you are using object-oriented classification (like IMAGINE Objective) they generally can't tell the difference between a road and a parking lot. And what about where a tree overhangs the street? Those pixels are spectrally different from the other road pixels, and will never be correctly classified.

You cannot fix that with traditional classification techniques, but you can use vector road data to define the road pixels into the Landcover image. This process, known as overlaying, can "burn" the roads (or any other class you have data for-- building footprints, streams, etc.) into your Landcover image.

First, let's open the data and see what we are working with.

1. Start **ERDAS IMAGINE 2015**
2. Select File | Open | **Raster Layer**



Browse to the training folder

3. In the upper right corner of the dialog, click the button to save the current directory as the default data directory in your preferences

4. Select ***supervised_cherokee.img*** Click **OK**
5. Roam and zoom through the image to get a sense of the image contents. The raster attributes display in the Contents pane showing you class names and colors

   The option to display the class names in the Table of Contents is not enabled by default. We enabled the Show Thematic Legends preference in the Table of Contents category of the Preferences

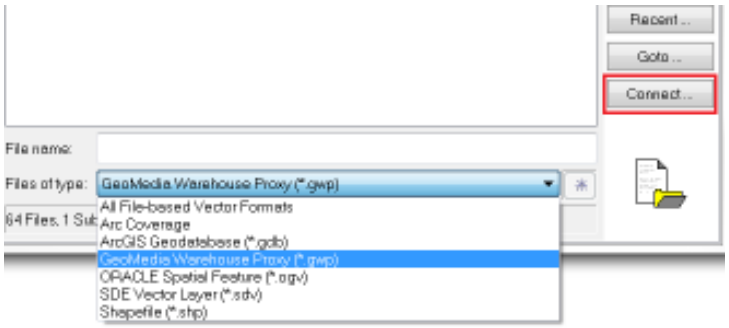
   Note how many classes are currently in the image?

Task 2: Connecting to a GeoMedia Warehouse

Now we need to connect to the vector, which is stored in a GeoMedia Warehouse

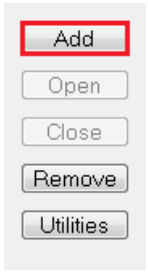
1. Select File | Open | **Vector Layer**

2. Change the Files of Type to **GeoMedia Warehouse Proxy (.gwp)**. Click **Connect**



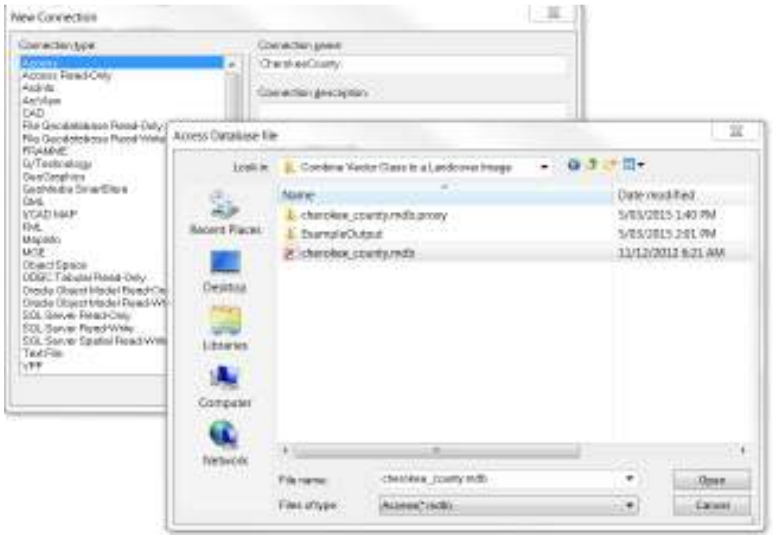
The Connection Manager dialog is displayed

3. Click **Add** to add a warehouse connection



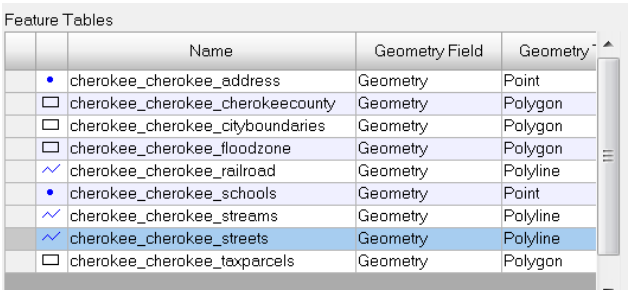
4. Enter **CherokeeCounty** for the Connection name (Connection Type: Access)
5. Click Browse... and navigate to your input directory

6. Select ***cherokee_county.mdb*** and click **Open**



7. Click **OK** on the New Connection dialog
8. Click here to select the GeoWarehouse

9. Click here to select the features you want to load in the View



10. Click on the Cherokee County database in the Warehouse Connections list to display all of the Feature Tables stored in that warehouse. Wait for the Feature Tables to load
11. Scroll down and select the ***cherokee_cherokee_streets*** geometry. Click **OK**

12. Click **OK** on the Select Layer to Add dialog

    The vector displays on top of the Landcover image. You may need to adjust the display properties of the vector to see it better

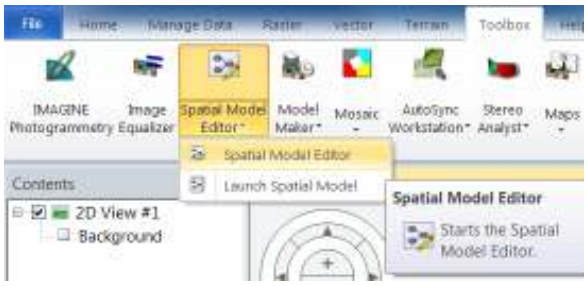
13. With the vector selected in the Contents pane, select the Style tab in the ribbon

14. To change the line color, choose a color from the Line Color menu. Use the Line Style menu to change the other line proper- ties, such as thickness, pattern, arrows, etc.

15. Examine where the roads overlay the Landcover image

Task 3: Create a New Spatial Model

1. From the Toolbox tab, click the Spatial Model Editor button, then select Spatial Model Editor



This displays an empty Spatial Model Editor, an Operators pane, a Properties pane, and a Spatial Modeler tab.

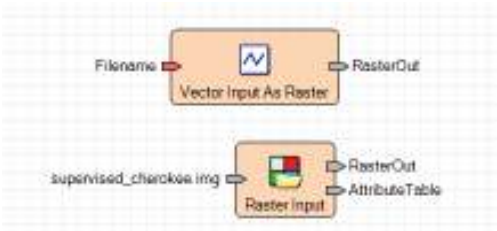
2. In the Operators pane, Key Word Search **Raster Input** and drag+drop into the Spatial Model Editor

3. Double-click on the Raster Input operator in the Editor window to open the Raster Input dialog.

4. Select ***supervised_cherokee.img*** as the input file. Accept all of the other defaults and click **OK**

Next we want to add in the roads vector we will use to locate all of the roads. To do this, we will need to convert the vector to a raster, and specify that the new raster should have the same pixel resolution as our input image.

5. In the Operators pane, drag the **Vector Input as Raster** operator into the Editor above the raster input.



The Vector Input as Raster will take the specified input vector and rasterize it as one of the first steps of the model.

6. **Double-click** on the **Vector Input as Raster** operator in the Editor to open the Input Dialog
7. Select ***cherokee_cherokee_streets.gwp*** from the recent files pull- down list. For Feature Type, ensure that **Line** is selected
8. Change the Cell Size to **Specify**, and enter **15** in both the X: and Y fields. Ensure that the units are set to Meters

9. Click **OK**

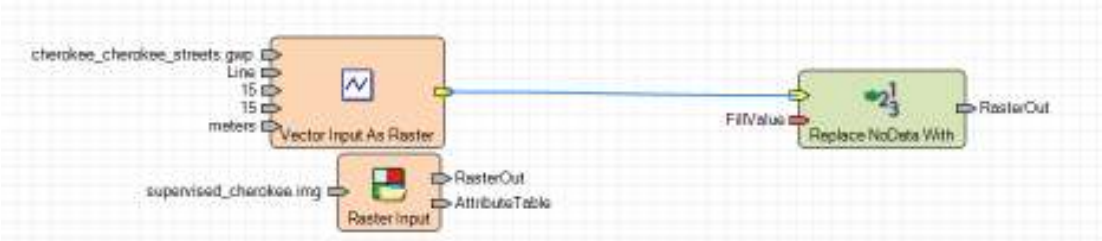
Task 4: Changing NoData values and Connecting the Flow

Now that we have our inputs defined we are ready to start adding functions. The first thing we need to do is to change all the NoData values in the rasterized vector to zeroes, just like they are in our classified raster image.

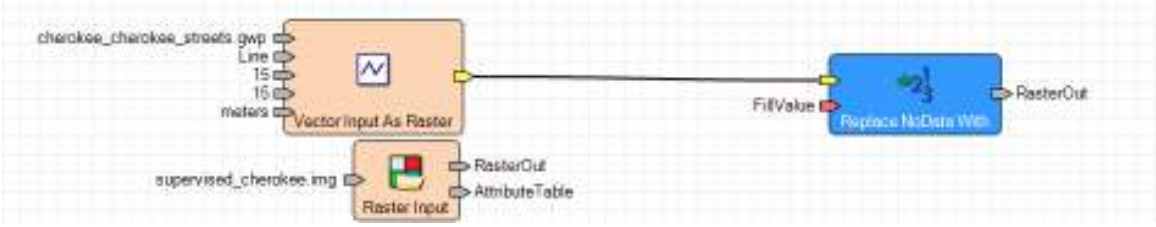
1. In the Operators pane, drag the **Replace NoData With** operator into the Editor next to the Vector Input as Raster operator we specified in the last step

The Replace NoData With operator requires two inputs: a raster and a Fill Value

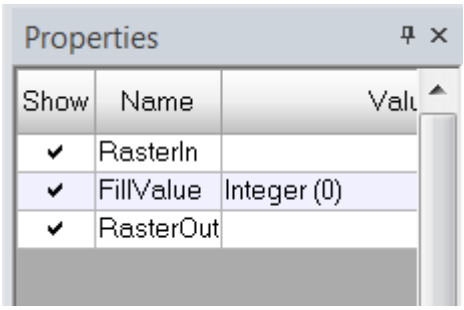
2. Click and drag a connection from the RasterOut port to the RasterIn port on the Replace NoData With Operator



3. The ports turn blue to indicate which ports are selected. When you let go of the connector, both ports turn yellow indicating that a valid connection has been made.
4. Click the Replace NoData With operator to select it (it will turn blue when selected)

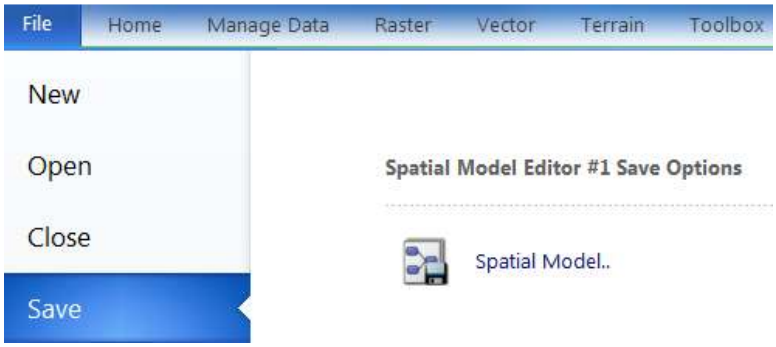


5. In the Properties pane, click in the Value field next to FillValue and type **0**



If the Properties pane is not displayed, you can open it by clicking the Properties button in the View group of the Spatial Modeler tab.

6. Select File | **Save | Spatial Model**. Name the model **roads_overlay.gmdx** and click **OK**



Task 5: Adding an Either/or Condition and Preview

We have defined both of our inputs to the model and changed all of the NoData values from the vector to zeroes. We now must define the main operation, or function, we want the model to perform on these data sets. This will be a Conditional statement telling the model to write out a new pixel value for all pixels corresponding to a road vector polyline.

1. In the Operators pane, drag+drop the **Either/Or** operator into the Editor to the *right* of and between the raster and vector inputs

   What is our Test? What is the Output if True? What is the Output Otherwise?

2. Click on the RasterOut port on the Replace NoData with operator. Drag the connection to the Test port on the Either/Or operator

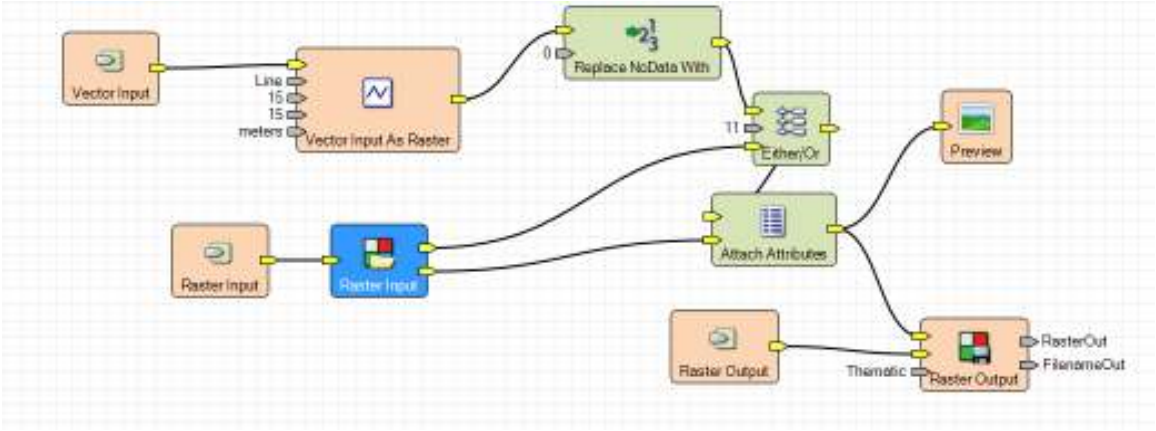
   When both ports turn yellow, the connection has been made

3. Drag the connection from the RasterOut port on the Raster Input operator to the Output Otherwise port on the Either/Or operator

   Now we need to specify the pixel value for the new Roads class

4. Click the Either/Or operator to select it

5. In the Properties pane, enter **11** in the Value field next to Output If True



   Now let's preview what we have created so far

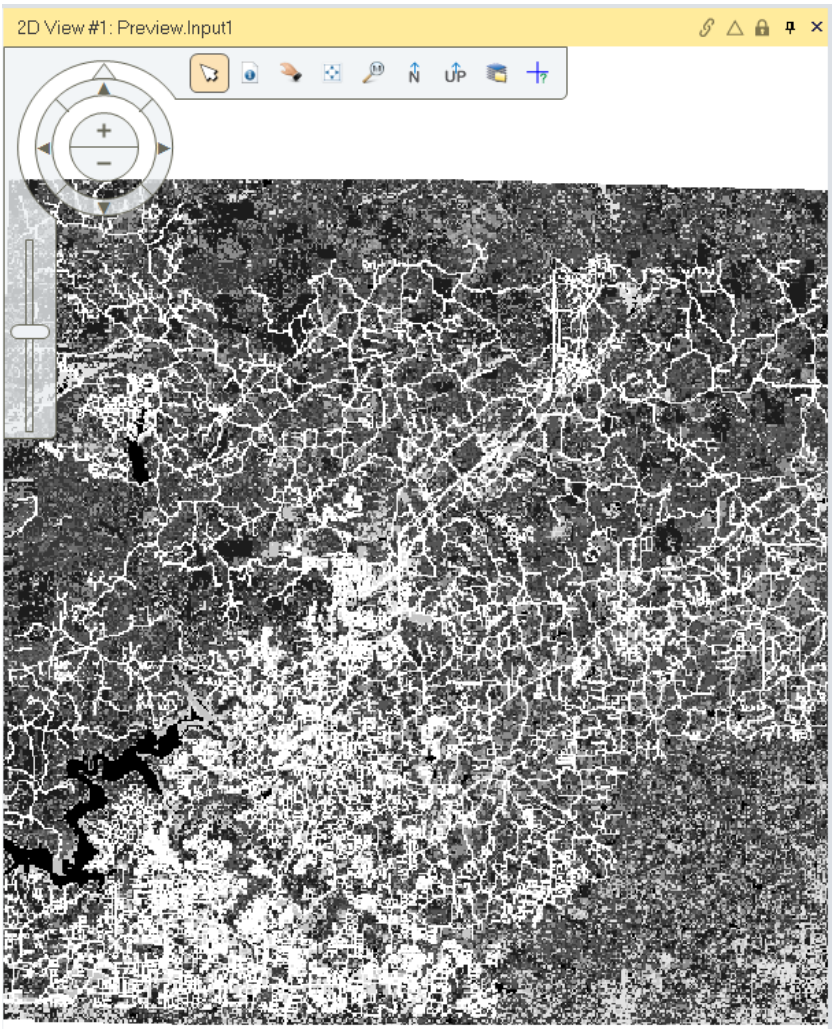
6. In the Operators list, expand the Favorites category (at the top of the list) and drag the Preview operator into the right side of the model

7. Connect the RasterOut port on the Either/Or operator to the input on the Preview port

8. In the Execute group on the Spatial Modeler tab, click the Preview button to open the Preview and see the results of the model up to this point

As the model runs, it turns green and then places a green tick to indicate success. It places a red cross to indicate where it encountered a problem

All of the pixels which corresponded to the streets polylines are white (values of 11) and all of the other pixels have been written out as shades of gray

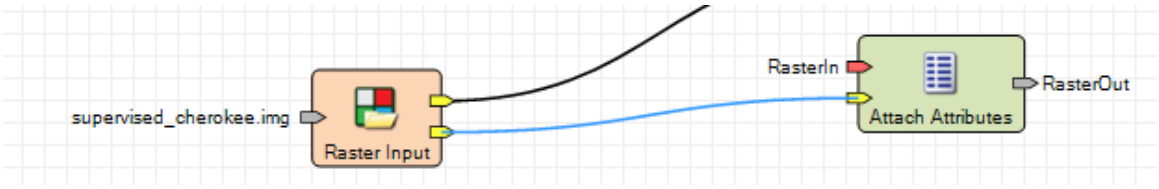


9. **Save** the model

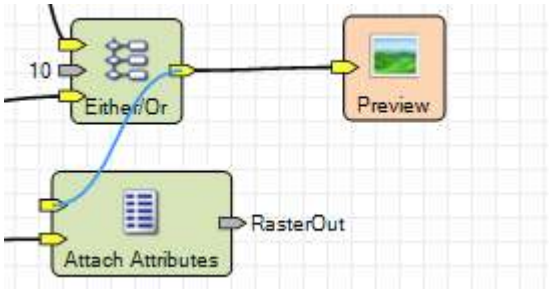
Task 6: Attach Attributes to Output File

Now we are ready to reattach the Color and Class_Names attributes back out to the image.

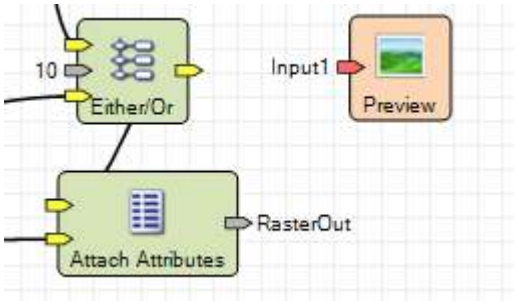
1. From the Data Generation category in the Operators, drag **Attach Attributes** to the right and below the Either/Or operator
2. Drag the **Attribute Table** *output port* on the Raster Input operator and connect it to the Attribute Table input port on the Attach Attributes operator



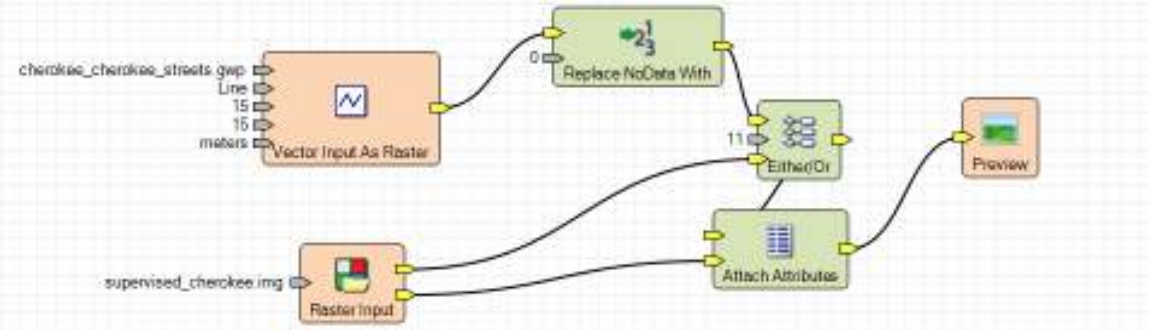
3. Connect the **RasterOut** *port* on the Either/Or operator (currently still connected to the Preview) with the RasterIn port on the Attach Attributes operator



4. Disconnect the Preview by dragging the connecter off of the input port and dropping it



5. Connect the RasterOut from Attach Attributes operator to the Preview input port

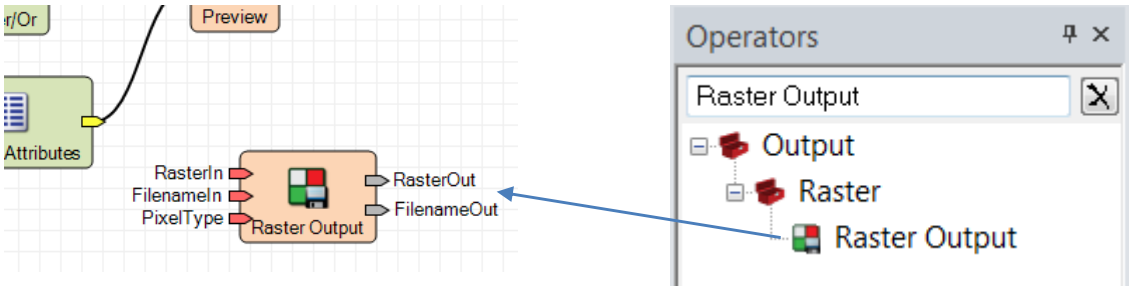


6. Click Preview on the Spatial Modeler tab to rerun the preview process and see the colors

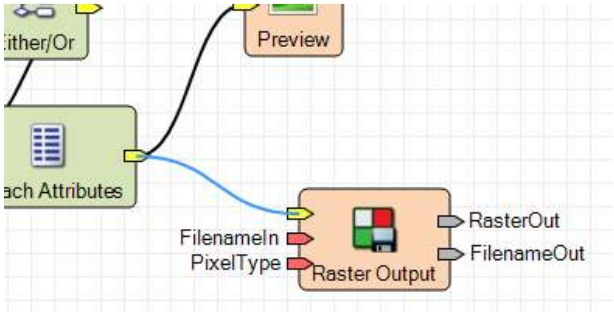
7. **Save** the model
8. **Close** preview window

Task 7: Add Input Ports and Output Model

1. From the Operators list, drag **Raster Output** into the Editor window

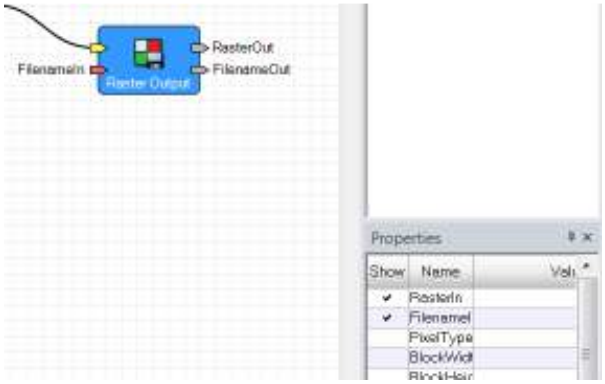


2. Connect the **Attach Attributes** *output port* to the **RasterIn** *port* on the Raster Output operator

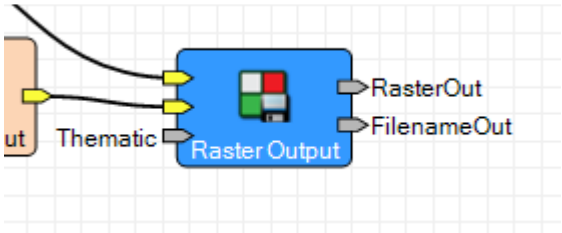


3. Select the **Raster Output** operator in the Editor and **Untick Pixel Type** from the Operators Properties

   This changes PixelType from a required input to using default input instead

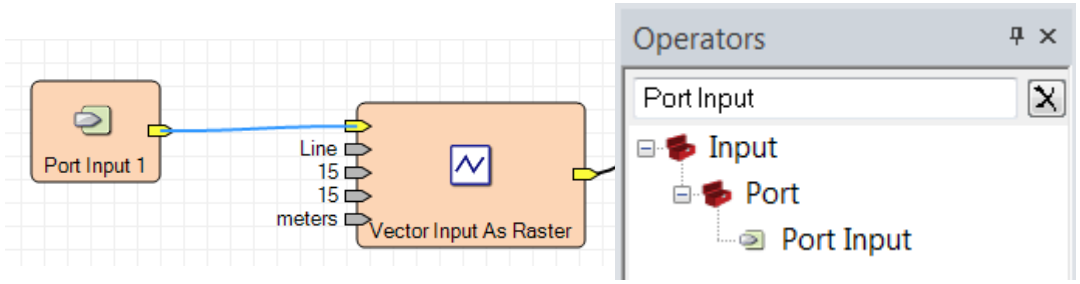


4. **Double-click** the **Raster Output** Operator to open the Raster Output dialog and specify File Type: **Thematic** close dialog

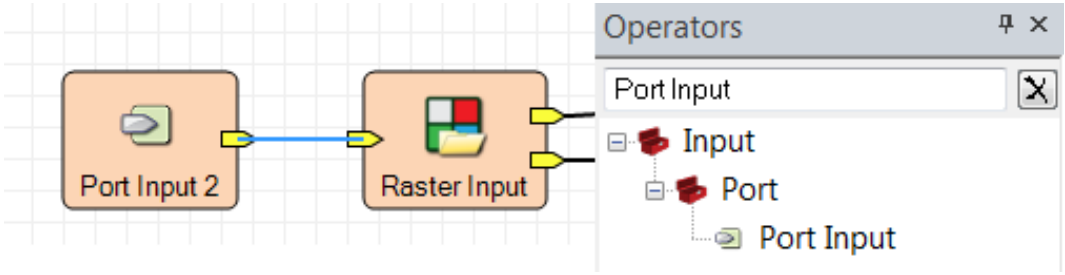


5. Drag and Drop a **Port Input** into the Model Editor and Connect to **Vector Input As Raster** Input

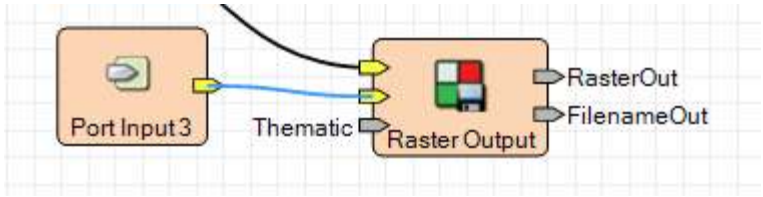
6. Drag



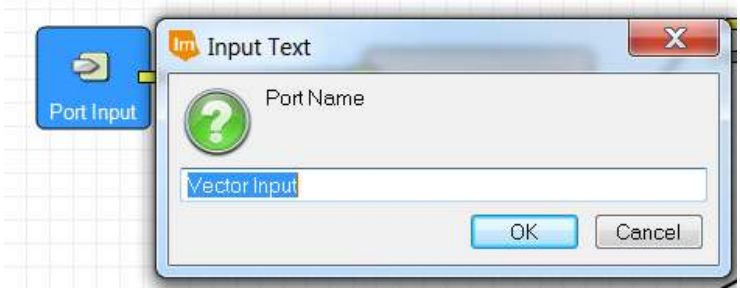
and Drop a second **Port** Input into the Model Editor and Connect to **Raster Input** Filename Input



7. Drag and Drop a third **Port Input** into the Model Editor and Connect to **Raster Output** Filename In

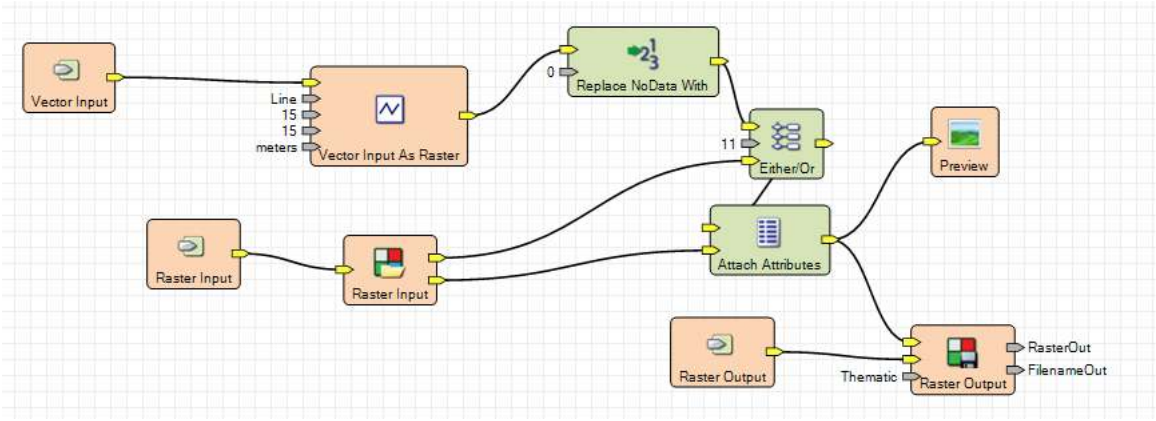


8. **Right-Click** on the first Port Input and **Rename** to **Vector Input**



9. Repeat above step to **Rename Raster Input** Port **Raster Output**

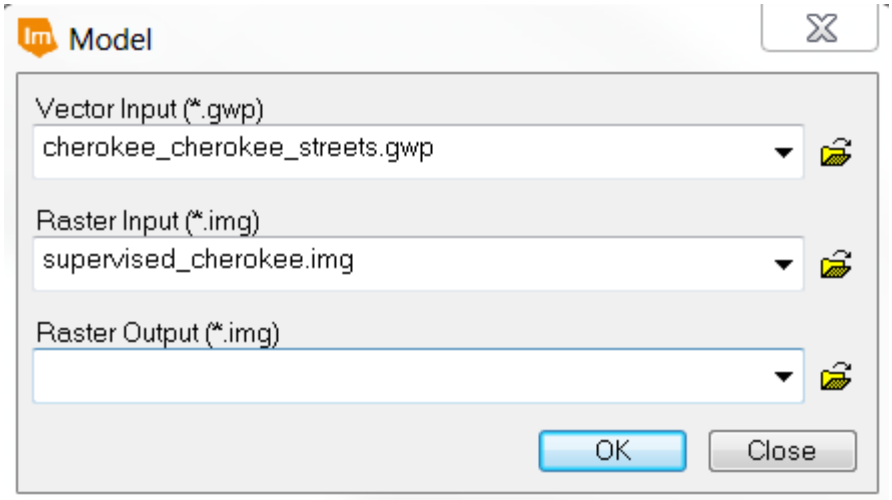
   Your model should now look like this



10. **Save** the model

11. On the Spatial Modeler tab, click the **Run** button. The model runs, this time creating an output file

    Note how your custom port inputs have defined the Model GUI



12. Run the Model by Specifying Raster Output **Landcover_cherokee.img** and clicking **OK**

13. Once model is complete. Open ***landcover_cherokee.img*** in a new 2DView.

    Note that the Streets are in the image, but not listed in the class list in the Contents pane

14. Right-click on ***landcover_cherokee.img*** in the Contents pane. Select **Display Attribute Table** from the menu. The Attribute Table is displayed

15. **Class 11** is present in the image but does not have a class name

16. Type **Roads** into the Class_Names for **class 11**

landcover_cherokee.img

Row	Value	Histogram	Color	Red	Green	Blue	Opacity	Class_Names
0	1	104436		0	0	0	0	Unclassified
1	2	907362		0	0.62	0.878	1	Water
2	3	1646403		0	0.388	0	1	Coniferous Forest
3	4	1256910		0.561	0.91	0.459	1	Mixed Forest
4	5	149350		0.38	0.659	0.149	1	Deciduous Forest
5	6	956116		0.961	0.961	0.859	1	Scrub
6	7	75870		0.91	0.941	0.58	1	Grass
7	8	341312		1	0.651	0	1	Agriculture
8	9	596757		0.82	0.71	0.549	1	Bare Soil
9	10	0		1	0.278	0.278	1	Built Up
10	11	213186		0	0	0	0	

17. Click the color block to **change the class color**

18. Set the Opacity for the Roads class to 1

19. With the image selected in the Contents pane, click Save on the Quick Access menu

20. Clear the View and then reopen ***landcover_cherokee.img***

21. Note that the Roads class name and the color you assigned are now present in the file

22. Clear the 2D View and close your Spatial Modeler Editor, saving any changes

Class Notes

Class Notes