Section 24: “Tidy Up” a Classified Image

Section Objective

Students will use a Focal Majority matrix to “tidy up” a landcover image before overlaying the streets.

Class Notes

“Tidy Up” a Classified Image

Objective: Students will use a Focal Majority matrix to “tidy up” a landcover image before overlaying the streets.

Task 1: Add Inputs and Define the Matrix Kernel

Because most classification methods operate on a purely spectral level, ignoring pixels proximity to each other, we are presented with a curious problem: spatially isolated pixels, also known as “speckling”. This phenomenon comes about as a result of a few pixels being classified differently from the rest of the surrounding pixels.

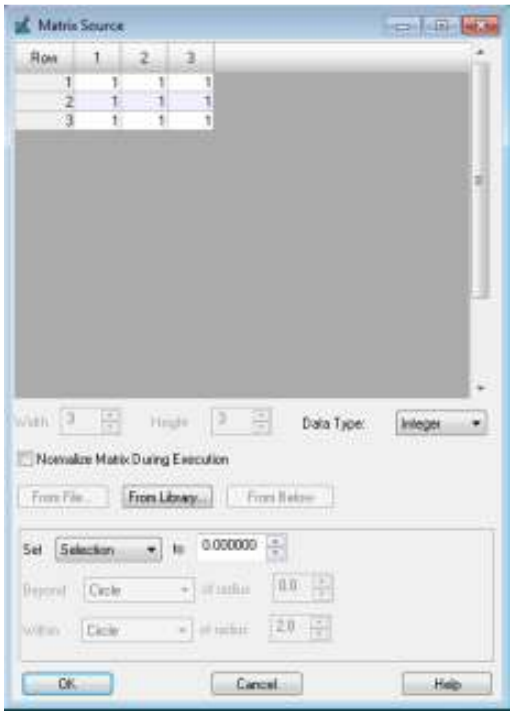
This could be the result of a lawn mower (which spectrally different from the grass surrounding it) being left in the middle of a yard, or a tree in the middle of a clear- ing. This exercise will teach you how to generalize the results of the classification and give a more homogenous landcover.

1. In ERDAS IMAGINE open a new Spatial Model Editor by selecting **File > New: Spatial Model Editor**
2. From the Favorites category in the Operators, add a **Raster Input** to the model.
3. **Double-click** the operator and load ***supervised_cherokee.img*** landcover image
4. Accept all defaults and click **OK**

We will be doing the cleanup on the supervised classification input image because we do not want to generalize our roads class, but rather the landcover classes beneath the roads

5. In the Input category, expand Matrix and drag **Kernel Matrix** Input into the Editor beneath the **Raster Input**

6. Double-click the **Kernel Matrix Input** operator to open the Matrix Source dialog



7. Click the **From Library** button in the middle of the dialog. The Kernel Selection dialog is opened
8. Select **3x3 Low Pass** from the Kernel list and click **OK** on the Kernel Selection dialog

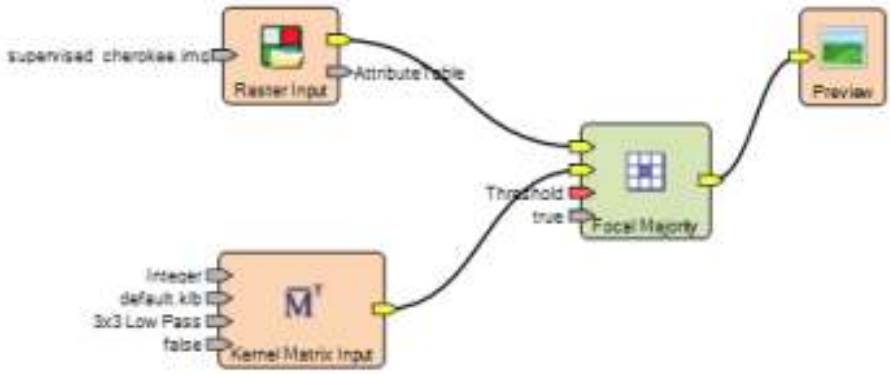
   The 3x3 Low Pass kernel will only consider the values of the pixels which are immediate neighbors of the focal pixel (pixel in the center of the matrix). This will result in an image that has minimal generalizing.

   To increase the amount of generalization, increase the size of the matrix. A 5x5 matrix will give greater generalization and a 9x9 matrix will greatly simplify the landcover image.
9. Click **OK** on the Matrix Source dialog
10. Select **File > Save > Spatial Model**. Name the model ***tidyup.gmdx*** and click **OK**

Task 2: Add the Focal Majority Function and Preview the Model

Now we are ready to add in the function we want to use. The Focal Majority operator will look at the raster and matrix inputs and write out the pixel value from the majority of pixels under the matrix.

1. Drag the **Focal Majority** operator into the Editor
2. **Connect** the **Raster Input** to the **Raster port**
3. **Connect** the **Matrix** to the **Focus** port



4. **Double-click** on the **Focal Majority** operator to open the Focal dialog

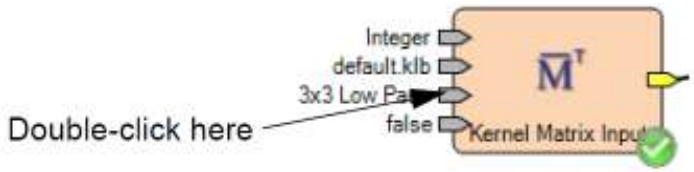
5. Change the Fill Ignored Results With: to **Original Value**. Click **OK** on the Focal dialog
6. Add a **Preview** operator (from Favorites group) and **connect** it to the **Focal Majority** Output

7. 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

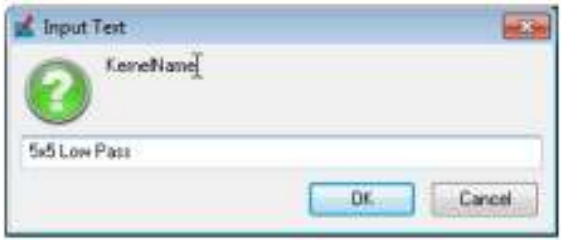
   The Focal Majority function creates a Continuous image, which means that the color table will not be applied to the output image. When we write out a new output raster, we can change the file type to Thematic and see our output colors and class names

8. **Double-click** on the **3x3 Low Pass** port on the **Kernel Matrix Input** operator. The Kernel Name input is opened

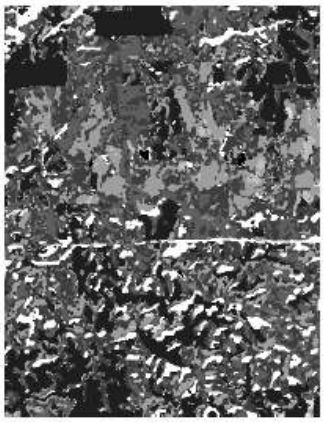
9. **Double-click** here

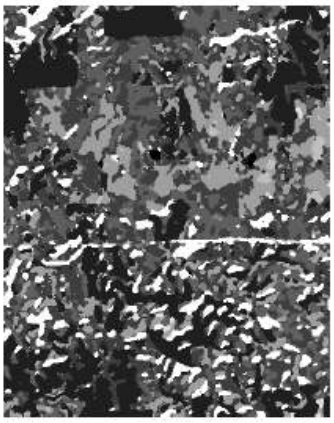


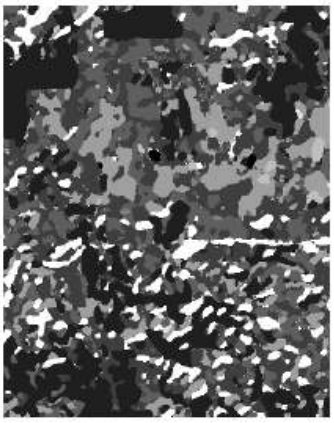
10. Change the KernelName by typing **5x5 Low Pass** in the Input Text dialog



11. Click **OK** and see the results update in the Preview


3x3 Low Pass


5x5 Low Pass


7x7 Low Pass

12. **Repeat** the previous steps and change the kernel **to 7x7 Low Pass** and then to **9x9 Low Pass**. Watch the changes in the Preview

13. Choose the matrix size you think generates the best balance between generalization and accuracy and **Save** the model

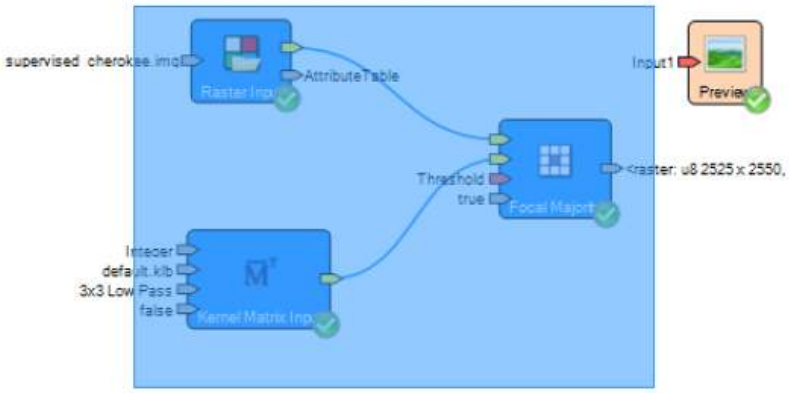
Task 3: Add the Tidy Up Model to the Combine Vector Class Model

Now we want to take this model and add it to the Roads Overlay model we made in the previous exercise. Remember that this cleanup operation needs to be done prior to overlaying the roads on the image.

If you have not yet completed the Roads Overlay model – please use the example spatial model available in the example outputs folder

1. Select **File > New > Spatial Model Editor**
2. With the new Editor pane selected, click **File > Open > Open Spatial Model**
3. Click the Recent button and select ***Roads_Overlay.gmdx*** from the List of Recent Filenames. Click **OK**
4. Click **OK** on the Select Spatial Model dialog to load the model in the new Editor
5. Select **File > Save As > Spatial Model As** and save the file as ***tidyup_overlay.gmdx***

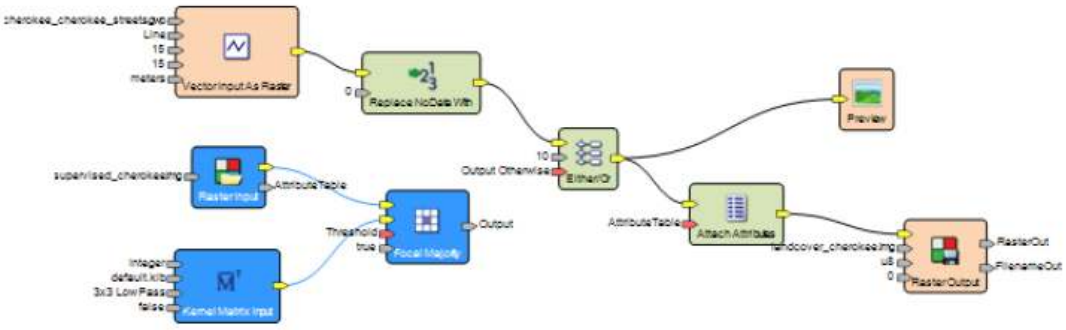
   We are going to use the tidyup model to replace the Raster Input variable in the Roads Overlay model
6. In the **Tidyup Overlay** model, click on the **Raster Input** operator to select it. **Right-click** on the **Raster Input** and select **Delete** from the context menu that is displayed
7. In the **Tidyup** model, **drag** a box around the operators (omitting the Preview operator) to **select** them



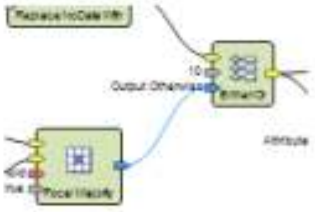
The operators turn blue when they are selected

8. In the Edit group of the Spatial Modeler tab, click  **Copy** to copy the selected operators
9. Click in the **Tidyup Overlay** model to make that Editor window active
10. Click  **Paste** to paste the operators into the **Tidyup Overlay** model

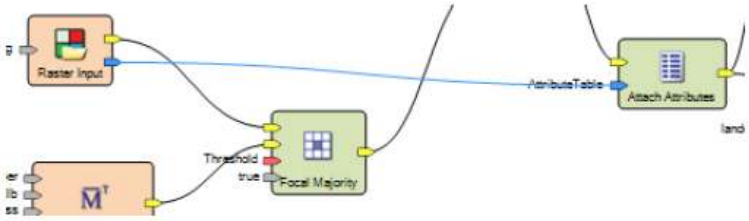
11. With all three operators still selected, **click** and drag them **beneath** the **Vector Input as Raster** operator



12. **Connect** the **Focal Majority *Output*** to the Output Otherwise port on the **Either/Or** operator



13. Connect the **AttributeTable** output port on the Raster Input operator to the **Attribute Table** port on the Attach Attributes operator



14. Preview the model and check the outputs

    Remember that the colors will not be displayed in the Pre- view, even though we attached the Attributes. The file needs to be a Thematic image in order to display the Color table. When we run the model in the next step, we will change the output file type to Thematic, ensuring that the model will display the correct colors

15. **Double-click** on the Raster Output operator

16. If you see an Attention dialog, click **No**. We do not want to delete the previous output file. The Raster Output dialog is displayed

17. Name the output image ***super_tidy_overlay.img***
18. Ensure the Data Type is **Unsigned 8 Bit**
19. Ensure he File Type is **Thematic**
20. Click **OK** on the Raster Output dialog
21. **Save** the Tidyup Overlay model
22. On the Spatial Modeler tab, click the  **Run** button.

    The model runs, creating an output file
23. **Close** the Preview pane. **Click File > New > 2D View** to open a new 2D View
24. **Display** both **landcover_cherokee.img** and **super_tidy_overlay.img** in the View. Use the checkboxes in the Contents pane to view the changes by toggling the top layer on and off.

25. **Close** the Spatial Model Editor and close the 2D View, saving changes as necessary

Class Notes