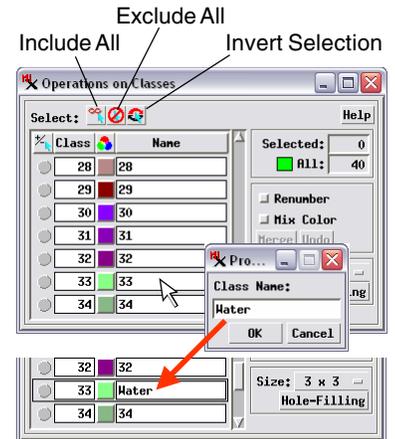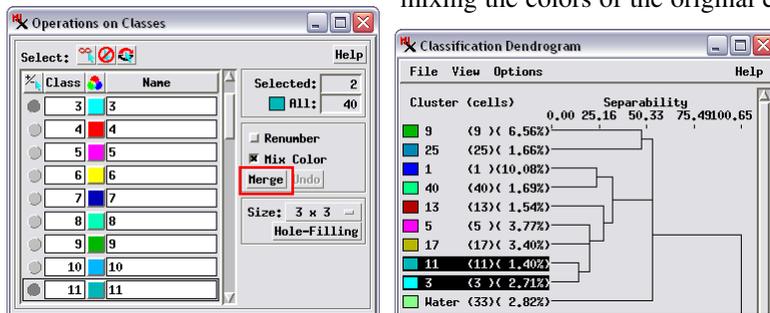# Merge and Simplify Classes

The Operations on Classes window is the control center for working with results of unsupervised classification of multiband images in the Automatic Classification process. This window presents a scrolled list of all classes with the class number (the cell value of the class in the class raster), the color automatically assigned to the class, and a class name field (which defaults to the class number). As you identify the surface materials corresponding to the classes, you can enter more meaningful names for individual classes. One or more classes can be selected in the Operations on Classes window by turning on the buttons to the left of the list entries. Icon buttons at the top of the window allow you to select or deselect all classes or invert the current selection. Classes selected in the Operations on Classes window or in any analysis window (such as the Classification Dendrogram and Co-occurrence Analysis windows) are automatically shown as selected in all open analysis windows.

Left-click in the Name field to open a prompt window to rename a class.

Your analysis of the classification results using the provided tools (see the Technical Guide entitled *Image Classification: Analysis Tools for Automatic Classification*) may lead you to identify classes that represent the same category of surface materials within the conceptual framework of your project. These are classes that have similar spectral properties (and thus low separability values in the Classification Dendrogram and Co-occurrence Analysis windows) and which may also tend to occur together (high co-occurrence values). You can use the Merge button on the Operations on Classes window to merge two or more classes. The merged class is assigned the number of the first selected class. The Class raster and all open analysis windows are automatically updated. The Mix Color option creates a color for the merged class by mixing the colors of the original classes; this works best when the starting classes have similar colors. You can turn on the renumber option to have the classes renumbered to remove gaps in the set of class numbers. You can perform a number of merge operations, and if you are dissatisfied with the result at any time, you can press the Undo button repeatedly to step backward through the previous results. You can use the Save As option on the Automatic Classification window's File menu to save any intermediate class results.
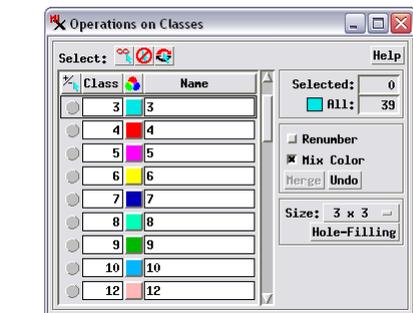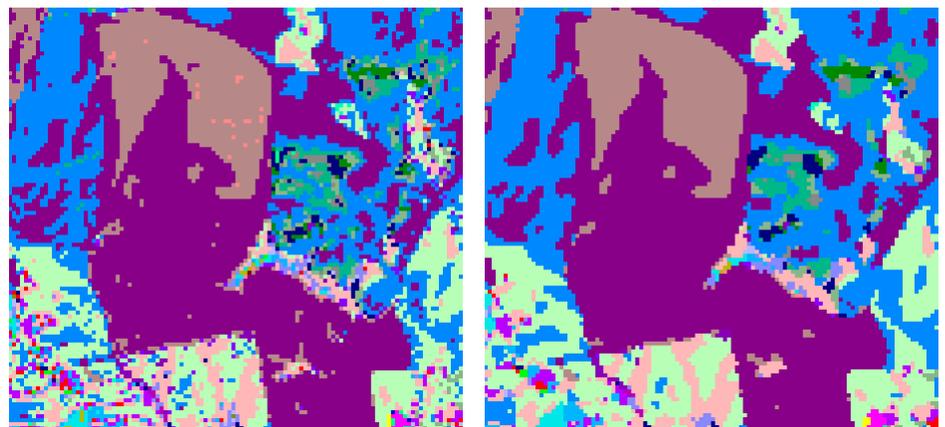

In the Operations on Classes window above, classes 3 and 11 have been selected by clicking on the circular buttons to the left of the class (darker gray when selected). Any selected classes are highlighted in the analysis windows such as the Classification Dendrogram window above. In this example the two classes have low separability, indicating they represent similar surface materials and are candidates for merging. The Mix Color option has been turned on to produce a new intermediate class color for the merged class from the similar original class colors.

Large areas consisting mostly of a single class may include many smaller "islands" or "holes" assigned to a different class. You can press the Hole-Filling button to simplify the class raster by applying a modal filter with your choice of filter window size. The filter replaces the class of each cell with the class of the majority of cells in the filter window, which reduces or eliminates small islands of class cells, as illustrated below. The "Undo" operation does not apply to Hole-Filling.

Operations on Classes window after pressing the Merge button to merge classes 3 and 11; all cells have been assigned to class 3 with the new intermediate color. Because the Renumber option was not used, the higher class numbers remain the same, and there is no class 11.

Small portion of a class raster with examples of small "class islands" within larger class areas.

The same area has been simplified by applying a 3 x 3 Hole-Filling filter.