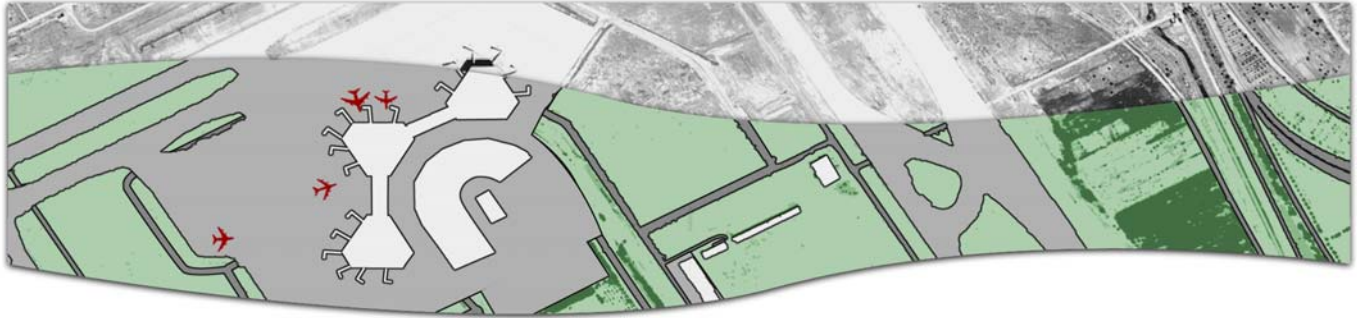




Feature Analyst® QuickStart GUIDE



MULTI-CLASS EXTRACTIONS *4.2 for ArcGIS*

Multi-class extractions can speed up processing when your problem calls for you to classify an image into two or more classes. To use a multi-class approach, you must group the individual feature classes into a single, multi-class layer. By combining classes into a single feature layer, Feature Analyst can learn and extract multiple feature classes in one pass. Review the following information to determine if the multi-class approach is best for your problem.

APPROACH		USAGE
Multi-Class		Allows you to determine how to set the background class. Use when you can visually separate the image into two classes, such as land and water, or when the target feature class comprises more than 40 percent of the image.
	Wall-to-wall option enabled	Allows you to set the number and types of classes, and pick the background class. Classifies every pixel into one of the classes in the multi-class training set. Use when extracting two distinct classes, such as land-water or pervious-impervious.
	Without wall-to-wall option	Allows you to pick all classes except the background class. Feature Analyst analyzes the image, determines a background class, and then classifies every pixel as belonging to one of the classes in the multi-class layer or to the background class. It is useful not to use the wall-to wall option when digitizing numerous classes.
Single-Class		Use when the target feature class comprises less than 40 percent of the image. Feature Analyst picks the background class.

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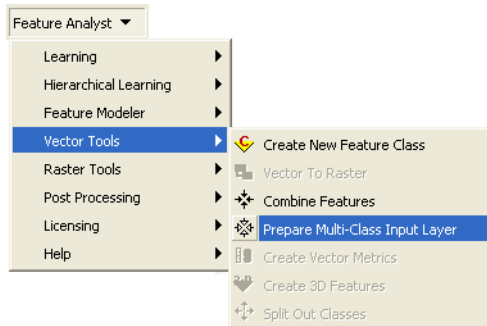
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Prepare the Multi-Class Input Layer

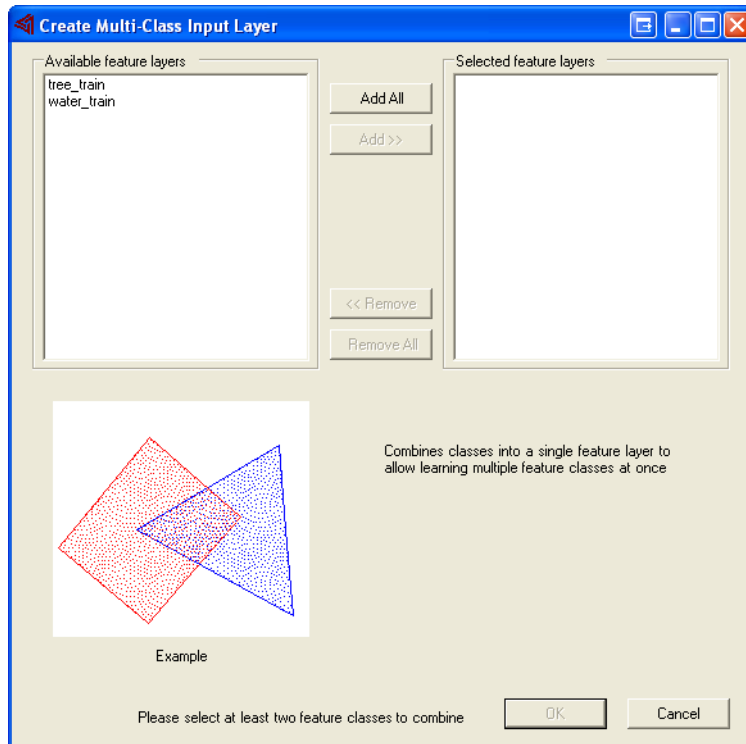
Note: The first step in a multi-class extraction is creating a feature class and drawing a training set for each feature you want to extract.

To use a multi-class approach, you must group the individual feature classes into a single, multi-class layer.

- 1 Choose **Feature Analyst** on the toolbar, choose **Vector Tools** on the drop-down menu, and then choose **Prepare Multi-class Input Layer**.



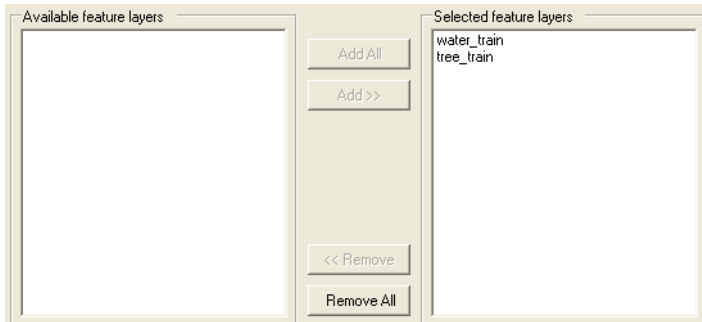
The Create Multi-Class Input Layer dialog box opens.



Tip: You can also double-click on a feature layer in the Available feature layers list box to add it to the Selected feature layers list box.

- 2 Select **each feature-class layer** in the Available feature layers list box and choose **Add**.
- 3 Repeat for each layer in your multi-class extraction. You must select at least two feature class layers.

The selected layers display in the Selected feature layers list box.



- 4 Choose **OK**.

The Save Feature As dialog box opens.

By default, Feature Analyst names the file in the Name field.

- 5 Accept the **default file name** and **file location**.

-or-

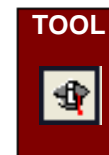
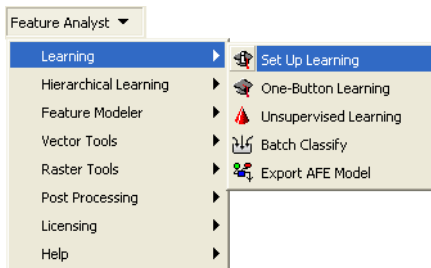
Provide a **new name** and **location** for the file and choose **Save**.

The Feature Analyst process box appears.

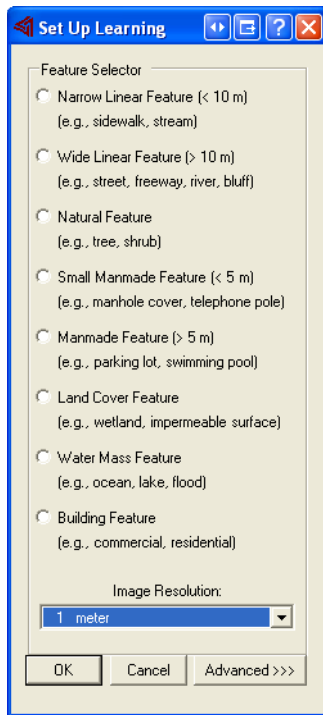
The new multi-class file, comprising the selected layers, displays in the table of contents.

Set the Learning Parameters

- 1 Highlight the **multi-class layer** in the table of contents.
- 2 Choose **Feature Analyst** on the toolbar, choose **Learning** on the drop-down menu, and then choose **Set Up Learning**.

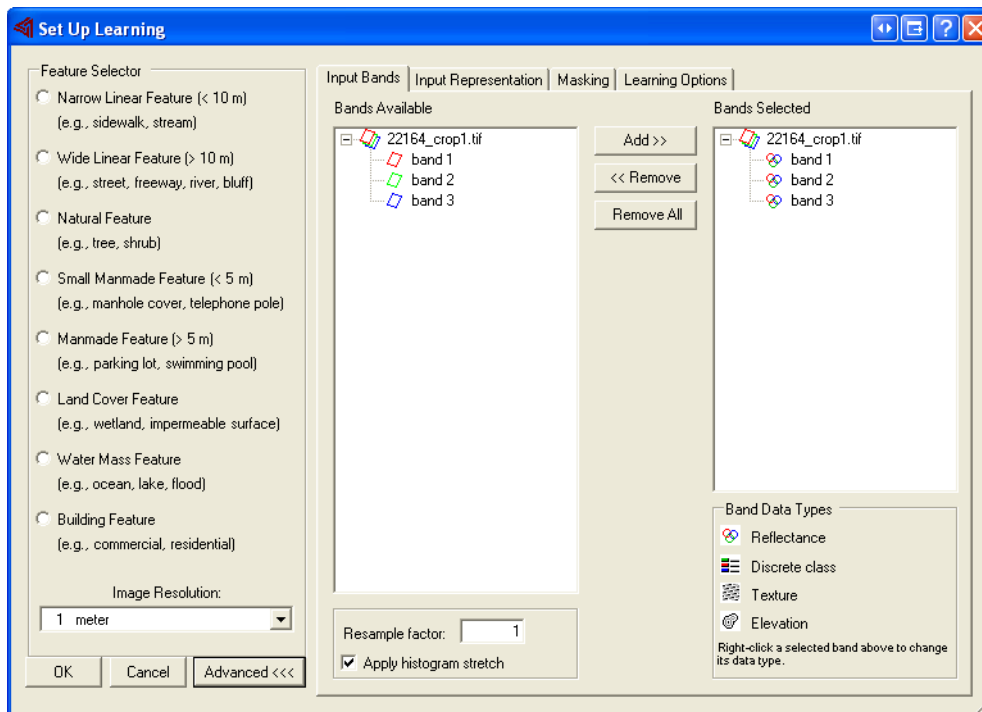


The Set Up Learning dialog box opens.



3 Choose **Advanced**.

The dialog box expands and displays the Input Bands tab.



- 4** In the Bands Selected list box, verify that the change detection raster appears in the Bands Selected list, and that all of the appropriate bands are selected with the correct reflectance data type.
- 5** If you added a third band to a panchromatic image, highlight that band in the Bands Selected box and choose **Remove**.

- 6 Select the **Input Representation tab** and select an **Input Representation pattern** that will give you the best search pattern for *all* of the target features in your extraction problem.

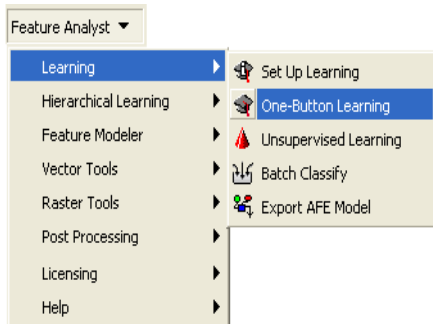
Note: The Manhattan pattern is often a good choice for extracting multi-class features of different types, such as buildings, trees, and water bodies.

- 7 Select the **Masking tab** and add a masking option, if necessary.
- 8 Select the **Learning Options tab** and set learning options and associated parameter values, as necessary.
- 9 Verify that **Wall-to-wall classification** is selected.
- 10 Customize the other learning parameters, as necessary.
- 11 Choose **OK** when you are done.

The Set Up Learning dialog box closes.

Run the Multi-Class Extraction

- 1 Choose **Feature Analyst** on the toolbar, choose **Learning** on the drop-down menu, and then choose **One-Button Learning**.



The Save Feature As dialog box opens.

By default, Feature Analyst names the file in the Name field.

- 2 Accept the **default file name** and **file location**.

-or-

Provide a **new name** and **location** for the file and choose **Save**.

The Feature Analyst Process box opens, displaying the progress of the multi-class extraction.

The results layer appears in the table of contents and displays in the workspace.

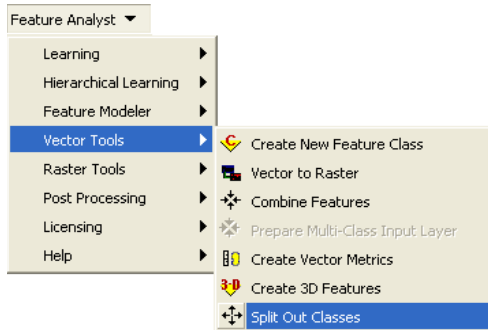
- 3 Examine your extraction results layer.

Split Out Classes

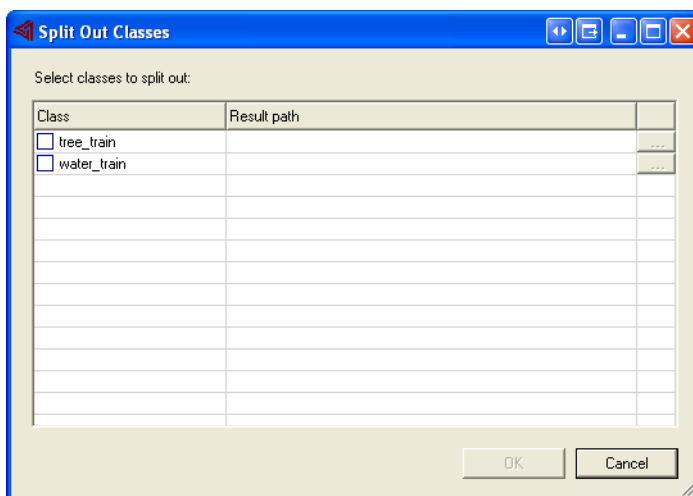
You must split out any feature class result layers you want to run cleanup on.

- 1 Highlight the **multi-class feature layer** in the table of contents.

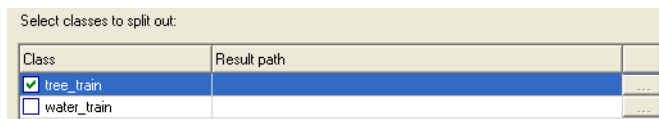
- Choose **Feature Analyst** on the toolbar, choose **Vector Tools** from the drop-down menu and then choose **Split Out Classes**.



The *Split Out Classes* dialog box opens, allowing you to select the feature classes to split from the result layer.



- In the Class column, select **a class** to split out.



The *Save Feature As* dialog box opens.

By default, Feature Analyst names the file in the Name field.

- Accept the **default file name** and **file location**.

-or-

Provide a **new name** and **location** for the file and choose **Save**.

- Repeat, as necessary, for each layer in the multi-class extraction that you want to cleanup.

- Choose **OK** on the Split Out Classes dialog box.

The *Feature Analyst* process box appears, displaying the progress of splitting out the layers.

The resulting split-out feature classes appear in the table of contents and display in the workspace.

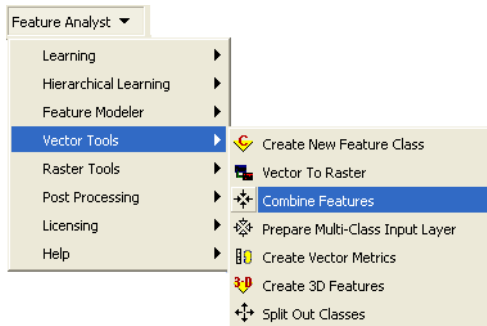
Clean Up Results

- Run Hierarchical Learning and/or Post Processing on the split-out layers, as necessary.

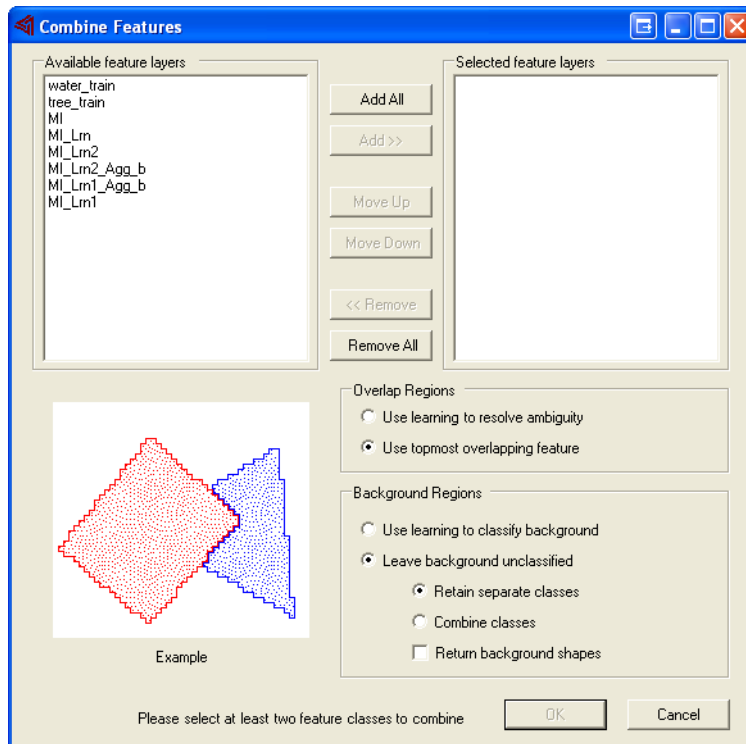
Combine Feature Layers

To get a wall-to-wall classification of your image, you need to combine the split-out layers.

- 1 Highlight a **split-out class** in the table of contents.
- 2 Choose **Feature Analyst** on the toolbar, choose **Vector Tools** on the drop-down menu, and then choose **Combine Features**.



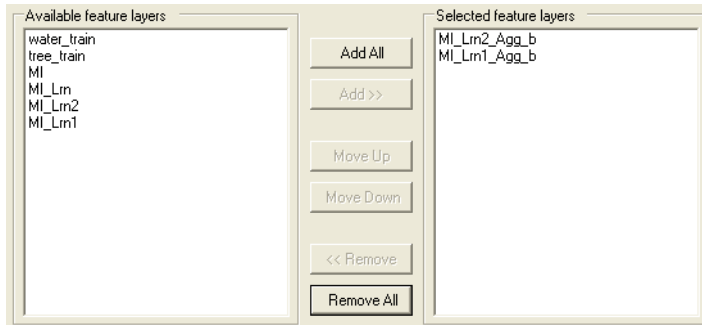
The Combine Features dialog box opens.



Tip: You can also double-click on a feature layer in the Available feature layers list box to add it to the Selected feature layers list box.

- In the Available feature layers list box, select **each layer** you want to combine and choose **Add**.

The selected feature classes move to the Selected feature layers list box.



- In the Selected feature layers list box, arrange your selected feature layers by order of importance for preserving feature boundaries by selecting the layer(s) and choosing **Move Up** or **Move Down**.
- Under Overlap Regions, select **an overlap option** to resolve any overlapping of features.
- Under Background Regions, select **a background option** for classifying areas of the image (called background) that are not included in any of the result classes.
- Choose **OK**.

The Save Feature As dialog box opens.

By default, Feature Analyst names the file in the Name field.

- Accept **the default file name** and **file location**.

-or-

Provide **a new name** and **location** for the file and choose **Save**.

The Feature Analyst Process box opens, displaying the progress of combining the feature classes.

The resulting combined feature class appears in the table of contents and displays in the workspace.