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## CHANGE DETECTION

Feature Analyst has the ability to perform Change Detection on image data sets that show change over time. You decide whether you want to extract all changed areas between before and after images, or you can employ object-specific change detection. Object-specific change detection allows you to extract specific changes.

It is important to note that in order for change detection to function properly, the before and after images must be correctly registered to each other. Common features between the two images must overlap exactly; otherwise, results can be skewed. If your images are not correctly registered, consult the ArcGIS help on using the Georeferencing Tools.

### Change Detection Work Flow

The general workflow for performing change detection with the Feature Analyst is as follows:

- 1 Add the before (pre) and after (post) images to a layer or view. Verify that the images are correctly registered to each other.
- 2 Use the Prepare Change Detection Layer menu item to fuse the images into a single input raster.
- 3 Adjust the symbology of the change detection raster, if necessary, so you can see the areas that have changed.
- 4 Create a new training set and specify examples that reflect the change you are trying to extract.
- 5 Use the Set Up Learning button to set the input learning parameters for the change detection pass.
- 6 Perform cleanup and post processing as needed.

### Preparing Change Detection Layer

Before you extract change between before and after images you must fuse the images together use the Prepare Change Detection Layer option.

- 1 Choose Feature Analyst on the toolbar and select Image Tools on the menu.
- 2 Select Prepare Change Detection Layer on the Image Tools menu.

The Prepare Change Detection Layer dialog box opens.

- 3 Highlight the image that represents the before image and choose Set Before Image.
- 4 Highlight the image that represents the after image and choose Set After Image.

The selected images appear in the respective fields at the bottom of the dialog box.

- 5 Choose Create Image.
- 6 Enter a name and path for the new image and choose Save.

*Feature Analyst selects a band combination that highlights the changes between the two images. By default, reddish areas indicate objects or features that do not exist in the after image. The objects or features highlighted in light blue represent items added over time.*

Now, you are ready to setup your learning parameters and run the extraction pass.

## Setting Up Learning for Change Detection

- 1 Choose Set Up Learning on the toolbar and select the Input Bands tab in the Learning Settings box.
- 2 Verify that the change detection raster you created appears in the Bands Selected box.
- 3 Select the Input Representation tab and select an appropriate Input Representation Pattern.
- 4 Set the pattern width.
- 5 Select the Learning Options tab and select the appropriate learning approach.
- 6 In the Aggregate Area, set a minimum.
- 7 Depending on your target features, select Find Rotated Instances.
- 8 Choose OK and then choose One Button Learning on the Feature Analyst toolbar.

The Feature Analyst Save As dialog box opens.

- 9 Enter a name and a path for the new results layer and choose Save.

Feature Analyst returns a result layer showing the changes between the two images.

Now apply hierarchical learning or post processing to clean up your results.