

Match and Apply Contrast

The Mosaic process in TNTmips (Image / Mosaic) provides several options for adjusting the contrast of individual source images or setting the contrast of the assembled output mosaic. The contrast currently set (via a contrast table or auto-contrast method) for displaying a source image can be applied to the image before it is added to the mosaic. The contrast of source images can also be matched to that of a reference image, which can be one of the source images or an independent image. Alternatively, the contrast of the assembled mosaic can be adjusted using an auto-contrast method or by matching to an independent reference image.

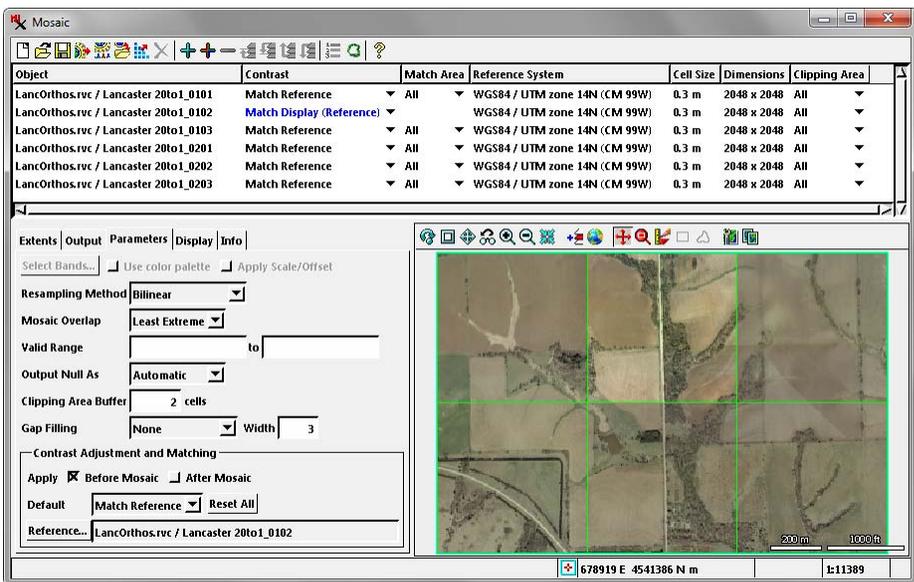
Controls for these procedures are found in the Contrast Adjustment and Matching section of the Parameters tabbed panel on the Mosaic window. Turn on the Before Mosaic checkbox to apply or match contrast for a source image or images. Turn on the After Mosaic checkbox to adjust the contrast of the output mosaic (these are mutually exclusive selections). If no contrast adjustment or matching is needed, leave both checkboxes unchecked.

Adjust Contrast of Source Images

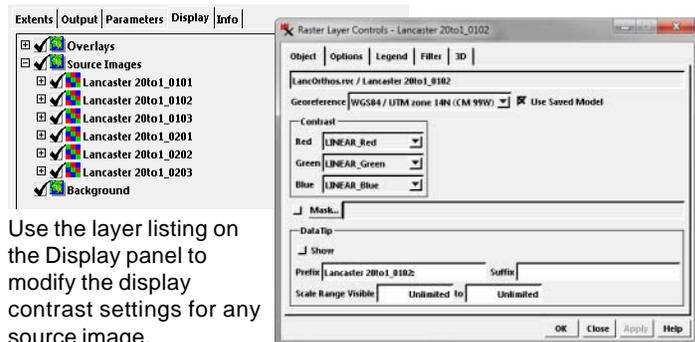
When you turn on the Before Mosaic checkbox, a Contrast column is added to the Mosaic window's Object list to show the contrast setting for each of the source images. The initial contrast setting for all images is set by the option on the Default menu; the options on this menu are Match Display and Match Reference. You can change the contrast setting for all source images by selecting a different option on the Default menu and pressing the Reset All pushbutton next to the menu. You can change the contrast setting for an individual source image by left-clicking on its entry in the Contrast column and choosing an option from the pop-up Contrast menu; the options are None, Match Display, and Match Reference.

Match Display

The Match Display contrast option uses the display contrast currently set for a source image to adjust the image values before adding the image to the mosaic. You can change the display contrast settings for any source image in the Mosaic process. The Display tabbed panel incorporates the same functionality as the Display Manager window. Expand the Source Images group on the Display panel to see the layer listings for the source images (see illustration above right). You can click on the layer icon for any source image to open the Raster Layer Controls window; use the Contrast menu or menus on the Object tabbed panel to choose a saved contrast table or an auto-



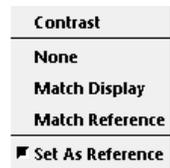
Mosaic layout with six orthoimage color-composites as source images. The Contrast Adjustment and Matching controls and the Contrast column in the Object list have been used to set the middle image in the top row of the View as the reference image for contrast matching the other source images before assembling the mosaic. The contrast for this reference image has also been set to match its contrast shown in the View.



Use the layer listing on the Display panel to modify the display contrast settings for any source image. You can also open the right mouse-button menu for a source layer listing and choose Enhance Contrast to adjust the contrast and save new contrast tables. You can adjust the contrast independently for any or all of the source images.

Match Reference

You can also choose to match the contrast of any of the source images to a reference image. The reference image can be one of the source images or an independent image. To designate a source image as the reference for contrast matching, open the Contrast menu for the image using the Contrast column in the Object list and turn on the Set as Reference toggle option. In the example illustrated at the top of this page, the reference image also has its contrast set to Match Display; the Set as Reference option can be used in combination with either the Match Display or None contrast settings for the source image. When Match Display



(over)

is set for the reference source image, contrast-adjusted histograms are computed automatically for contrast matching. For composite, RGB separate, or multiband source images, contrast is matched independently for each image component.

To use an independent image as the contrast reference, press the Reference pushbutton in the Contrast Adjustment and Matching section of the Parameters panel. The independent contrast reference image is not added to the View pane in the Mosaic window. The raw image histograms for the reference image are used for contrast matching; they are not adjusted for any display contrast settings. You can use the Apply Contrast process (Image / Filter / Apply Contrast) if necessary to create a reference image with contrast-enhanced raw image values.

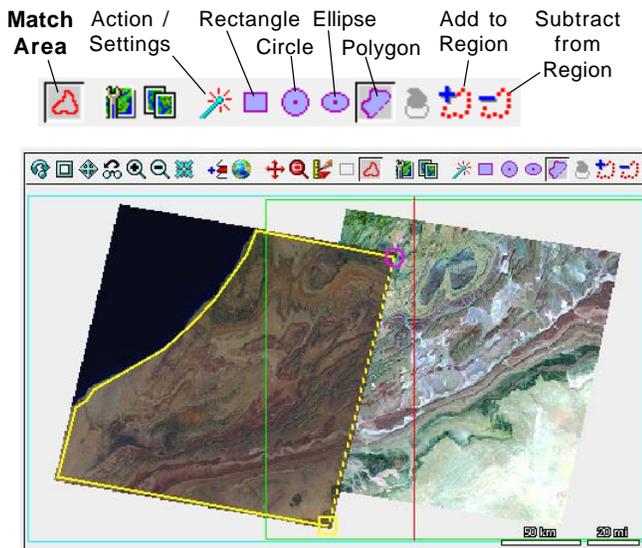
Matching Area

When source images are being matched to a reference image, a Match Area column is added to the Object list. For the source images being matched, this column provides a menu to choose whether all or a portion of the image is used to set the histograms for contrast matching. The default setting is All. The Choose option on the Match Area menu opens the Object Selection dialog so you can select a region object or a vector object with polygons to define the matching area. The Edit option activates the Match Area tool in the View pane (see illustration below). This tool provides a set of standard drawing tools (Rectangle, Circle, Ellipse, and Polygon) that you can use

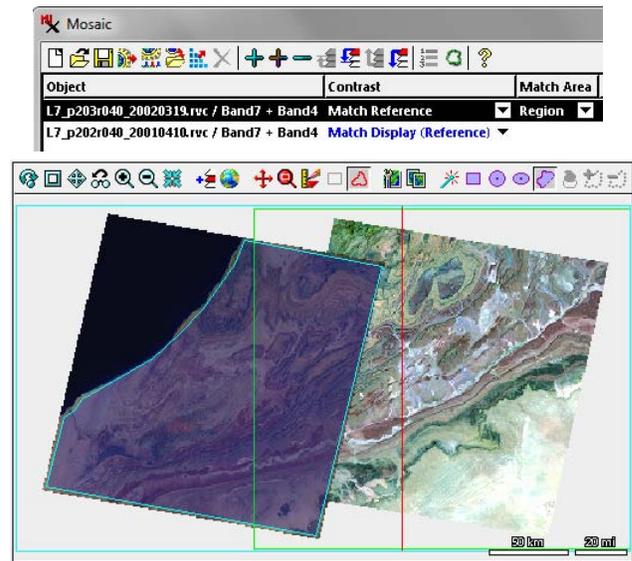
to draw shapes in the view over the designated image. After drawing a shape, press either the Add to Region or Subtract from Region icon button on the View toolbar (or right-click to Add to Region). You can also use the Match Area tool to modify a region you have selected using the Choose option by adding or subtracting additional shapes. When you have selected or created a partial matching area, the Match Area column shows the entry "Region" for the relevant source image. A Match Area region is shown in the View whenever its parent image is selected in the Object List and the Match Area tool is turned on.

Adjust Contrast of Assembled Mosaic

To apply contrast to the mosaic after assembly (rather than adjusting the source images), turn on the After Mosaic checkbox. The Method menu below the checkbox allows you to choose an auto-contrast method (Auto Linear, Auto Normalize, Auto Equalize, Auto Logarithmic, or Hyperbolic Tangent) to adjust the image values. You can also choose Match Reference from the menu, then press the Reference pushbutton to select an image to which to match the mosaic. The raw image histograms for the reference image are used for contrast matching; they are not adjusted for any display contrast settings.



When you match source image contrast to a reference image, you may wish to exclude a non-representative part of the image (such as the dark ocean area in the left-hand image in the illustration above) when determining the histograms for matching. Here the Match Area toolset is being used (via its Polygon tool) to outline a region (yellow outline) to use for contrast matching. Press Add to Region (or right-click) to add the active shape to the region. (Press the Action / Settings button to show a menu with options to Clear the Drawing Tool and Clear Region.)



Match Area region created from the polygon shown to the left.



Final contrast-matched mosaic.