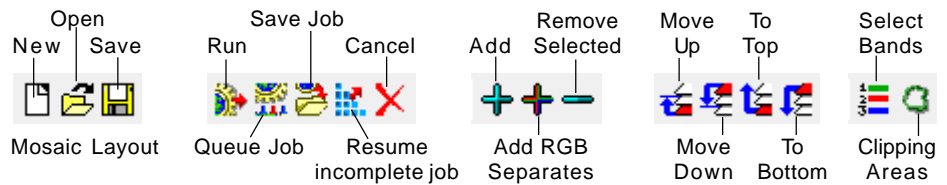


Mosaic Overview

The Mosaic process in TNTmips (Image / Mosaic) provides a convenient and flexible interface for mosaicking all types of raster images: grayscale, color composites, RGB raster sets, and multiband images. The process lets you control the overall extents of the output mosaic, set clipping areas for individual input images, control how overlap areas are processed, and apply and/or match contrast. The process uses the TNT image processing pipeline for very rapid throughput of even very large datasets, and you can use the TNT Job Processing system to defer execution to convenient times.

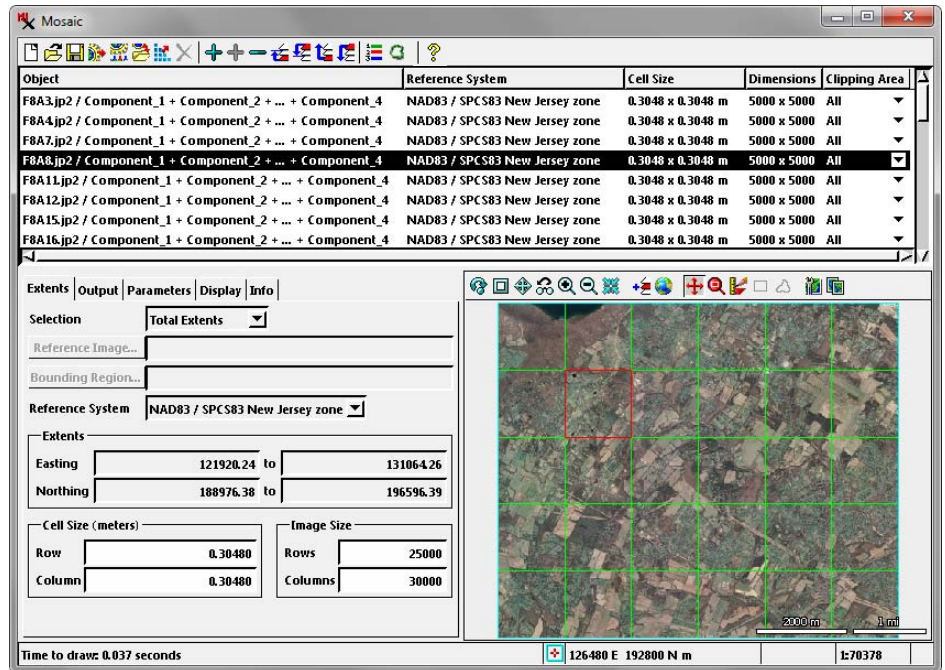


Adding and Managing Input Images

You add input images to the mosaic using two icon buttons on the Mosaic window toolbar. Use the Add RGB Separates icon button to add a set of three coincident rasters as an RGB color image. Use the Add button to add grayscale, color composite, or multiband images (see the Technical Guide entitled *Mosaic: Grayscale, Multiband, and Color*). The selected images are listed in the Object list in the upper part of the window and displayed in the View pane integrated into the window. If you need to remove an input image, select it in the Object list and press the Remove Selected icon button. A left click selects a single image, <ctrl>-click toggles the selection state of the respective image without affecting other selections, and <shift>-click can be used to select a contiguous set of images in the list.

The Object list shows the coordinate reference system, cell size, and image dimensions for each input image. If input images have differing cell sizes or reference systems, the minimum cell size and the predominant reference system are set as the defaults for the mosaic. These default settings can be changed on the Extents tabbed panel, as discussed below. Reference system and cell size entries in the list are shown in red if they differ from those set for the output mosaic. If an object falls completely outside of the designated extents of the mosaic, its name is shown in blue. If an image is not upright relative to its reference system and will be resampled during processing, its reference system is shown in blue in the list. Pausing the mouse cursor over colored text in the list triggers a DataTip that explains the reason for the highlighting.

The input images are initially listed in the order in which they were selected (from top to bottom). This listing also determines the order of display of the images; images higher in the list overlap images lower in the list. You can reorder the list by selecting particular image entries and using the Move Up, Move Down, To Top, and To Bottom icon buttons.



Extents Panel

The Extents tabbed panel (shown in the illustration above) provides controls for setting the overall extents of the mosaic as well as its reference system and cell size. The Selection menu at the top of this panel lets you control the overall spatial extents of the mosaic. The default option on this menu is Total Extents, which sets the mosaic extents automatically from the overall extents of the set of input images. You can also choose User Defined to set the extents manually, and Limiting Region or Match Reference to use an existing geometric object or image (respectively) to set the output extents (see the TechGuide entitled *Limit Mosaic Extents*).

When you choose Total Extents, User Defined, or Limiting Region as the Selection option, you can choose the coordinate reference system and cell size for the output mosaic. The Reference System menu lists all of the reference systems used by the input images, and a Specify option that automatically opens the Coordinate Reference System window so that you can choose from any reference system supported by TNTmips. The mosaic View automatically shows the input objects projected to the designated output reference system. You can set the mosaic cell size by editing the values in the Cell Size or Image Size fields. When you choose Match Reference from the Selection menu, the reference raster determines the extents, reference system, and cell size of the mosaic.

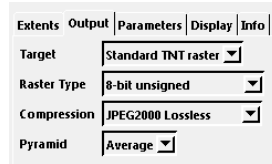
(over)

Clipping Input Images

You can use all or a designated portion of each input image to form the image in the output mosaic. You can specify clipping areas for one or more input images using previously created objects (region, vector, or coincident binary raster mask) to define the area to use from each designated input image. Clipping areas are designated using the Clipping Area column in the Object list or the Clipping Areas icon button in the toolbar (see the TechGuide entitled *Mosaic Selected Areas* for details).

Output Panel

The controls on the Output tabbed panel let you set the characteristics of the output mosaic raster or rasters. The Target menu provides the options to mosaic to a *Standard TNT raster* or to a *Tiled TNT raster*. A tiled TNT raster is a tiled multiframe structure designed for very efficient display of large raster images. Further discussion of mosaicking to tiled TNT rasters and related settings can be found in the TechGuide entitled *Mosaic to Tiled TNT Raster*.

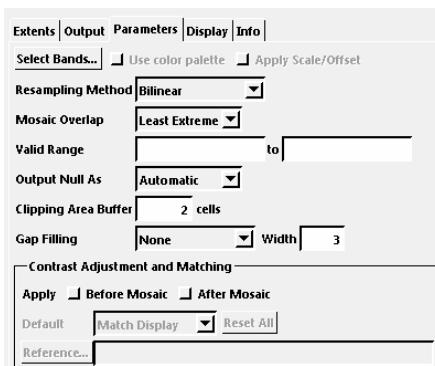


NOTE: You can mosaic images to standard web tilesets (Google Maps, Google Earth, Bing Maps, or NASA WorldWind) using the Mosaic to Image Tileset process (Tileset / Image / Mosaic).

When you choose to mosaic to a standard TNT raster, additional menus on the Output panel let you choose the Raster Type and Compression and Pyramid methods. The Raster Type menu is used to choose the data type and bit-depth for grayscale, RGB-separates, and multiband mosaics. You can also choose to mosaic RGB separate and multiband input images to a color composite (see the TechGuide entitled *Mosaic: Grayscale, Multiband, and Color*).

Parameters Panel

The Parameters panel provides controls for a number of varied mosaic options. The Resampling Method menu selection determines how a raster cell value in the output mosaic is computed from the cell values at the corresponding location in the input image. This menu provides standard raster resampling options: Nearest Neighbor, Bilinear, Bicubic, Bicubic Smoother, Bicubic Sharper, and Lanczos 4x4 (see the TechGuide entitled *Image Processing: Resampling Methods*). The Mosaic Overlap menu setting governs how mosaic values are computed in areas where input images overlap. The default setting, Least Extreme, uses the value from the overlapping source images that is the least numerically extreme; this choice is a



simple way of ensuring that marginal non-image areas (typically with value 0 or 255) that have not been set to null are eliminated from the overlap areas in the output mosaic. Other choices are First (value from first image in the overlap area), Last (last overlapping image), and Minimum and Maximum.

The Valid Range fields allow you to enter inclusive minimum and maximum values defining the range of valid input values to transfer to the mosaic. Cells with input values outside the specified range are set as null in the mosaic. The Output Null As menu specifies how the value for output null cells is determined. The Automatic option sets a null cell value appropriate for the output raster data type. You can also choose Zero, Most Extreme, Minimum (minimum allowed value for the data type), or Maximum (maximum allowed value for the data type).

When you set clipping areas for input images, the Clipping Area Buffer setting on the Parameters panel lets you automatically enlarge each clipping area by setting an outside buffer width (in cells).

If some adjacent source images do not overlap or abut, leaving gaps along the seams, you can choose to have these gaps automatically filled by interpolation from the valid cell values along the edges. The Gap Filling menu offers the choices None, Inverse Distance, and Inverse Square. The latter two choices specify how weighting factors assigned to the values of the valid cells vary with their distance from the current gap cell position. In the Inverse Distance method the weighting factor decreases linearly with distance, whereas in the Inverse Square method it decreases with the square of the distance.

The Contrast Adjustment and Matching controls at the bottom of the Parameters panel allow you to apply contrast to individual source images before mosaicking, to apply contrast to the output mosaic, and to match the contrast of a reference image that may or may not be one of the source images. See the TechGuide entitled *Mosaic: Match and Apply Contrast* for details.

Additional controls at the top of the Parameters panel may be individually active depending on the characteristics of the source images. The Select Bands pushbutton is active when you have selected multiband source images, which are automatically displayed in color in the Mosaic view pane. Pressing the Select Bands pushbutton (or the Select Bands icon button in the Mosaic window toolbar) opens a Select Bands window that you can use to choose the band assignments for the color display and optionally for output to a color composite mosaic.

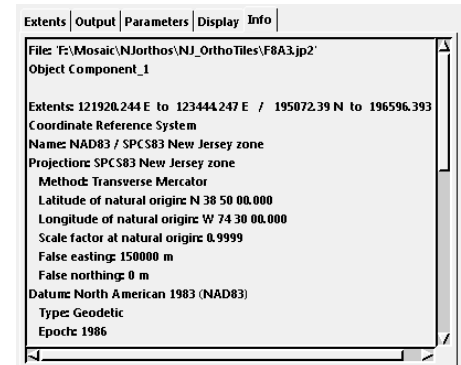
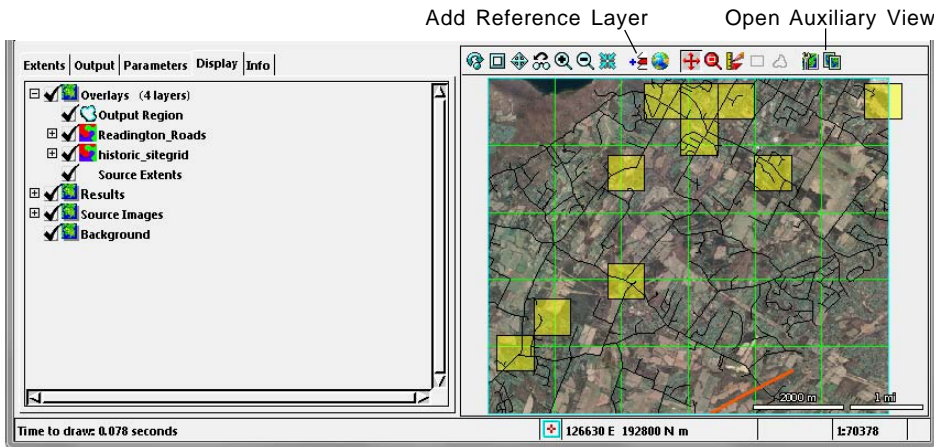
The *Use color palette* toggle is active when all of the source images are unsigned 8-bit or 16-bit raster objects with color palettes. When this toggle is turned on, the colors are transferred to the output mosaic. If all of the input color palettes are identical, the unsigned raster type can be preserved and the color palette merely transferred to the mosaic. If some source images have different color palettes, the output mosaic is automatically created as a 24-bit color composite; a message with that information is automatically shown when you turn on the toggle.

(continued)

The *Apply Scale/Offset* toggle is active when a Value Scale other than 1.0 and/or a Value Offset other than 0 has been set for any of the source grayscale rasters. Turn the toggle on to apply the scale and offset values to the input cell values when they are transferred to the mosaic.

Info Panel

When a single source image is selected in the Object list, the Info panel (illustrated below) shows the filename, object name, object description, extents, and details of the image's coordinate reference system. If no source image is selected, the panel shows the total number of source images.



Select the Overlays or Background group entry in the Display panel and press the Add Reference Layer icon button above the View to add layers for visual reference above (Overlays) or below (Background) the Source Images group. In the illustration above, several reference layers have been added to Overlays group.



Display Panel and View Pane

The Mosaic window includes an integrated View pane that automatically displays the source images. You also have the option to open a resizable Auxiliary View window using an icon button above the View pane (see illustration above).

The Display panel provides layer controls and several predefined groups for the view(s). The input images are placed in the Source Images group. You can add objects to two additional groups for visual reference while assembling your mosaic: the Background group below the Source Images group and the Overlays group above it. You can use the checkboxes in the Display panel layer controls to toggle any group or layer on and off as needed.

The Overlays group automatically includes a Source Extents layer, which shows the rectangular extents of each of the source images, and an Output Region layer, which shows the currently-specified output region. If the Extents Selection option is set to Total Extents, the Output Region layer outlines the total rectangular extents of the set of source images. If you choose Limit to Region, User Defined, or Match Reference to set smaller output extents, the Output Region layer automatically updates to show the designated mosaic boundary. If you choose to match a reference image, an Extents Reference group is also automatically added to the views to contain the displayed reference image.

After mosaic processing is complete, the mosaic is automatically added to the views in the Results group.

Mosaic Layouts

You can save and reopen mosaic layouts that reference the source images you have selected and all of the current process settings. This option is especially useful when you are creating multiple mosaics from the same set of input images (for example, mosaicking multiband source images to color outputs using several different band combinations, such as natural color and color-infrared). The three icon buttons on the left end of the Mosaic window's toolbar relate to mosaic layouts. Use the Save icon button to save the current settings to a mosaic layout in a Project File and the Open icon button to reload a previously-saved mosaic layout. Use the New icon button to clear the list of source images and start a new mosaic project.

Running the Mosaic

When you have set all of the desired mosaic options, press the Run icon button on the Mosaic window toolbar to run the process immediately. A progress bar in the bottom right corner of the window shows the mosaic progress graphically and with a label showing the percent completed.

Standard Queue Job and Save Job icon buttons are also provided to process the mosaic using TNT Job Processing: see the TechGuide entitled *System: TNTmips Job Processing System* for more information. When you mosaic to a tiled TNT raster, the mosaic is run as a specialized form of job that can be resumed if interrupted by using the Resume Incomplete Job icon button; see the TechGuide entitled *Mosaic to Tiled TNT Raster* for more information.

