

Tilesets

Creating a Structure

TNTmips can prepare tilesets whose structure conforms to those described by Google, Microsoft, and NASA for their popular viewers. These include:

- Tile Overlays for Google Maps
- Super-Overlays for Google Earth
- Custom Tile Layers for Microsoft Bing Maps
- Tile Layers for NASA's World Wind

and also TNT raster object tilesets for use in MicroImages' commercial products. Each of these standard tilesets must conform to its vendor's specific file naming and directory structure. Each directory level contains tile files of specified size, image file format, and zoom level. These tileset structures are designed to ensure rapid retrieval and display of the required tiles at any zoom level.

The Export to Tilesets process is designed to efficiently produce tilesets from your input orthoimages. Each input image is converted into a separate output tileset in the designated tileset structure. Export to Tilesets allows you to set up these tileset operations to run concurrently as jobs in the TNT Job Processing System to take advantage of your computer's multiple processing cores for maximum process efficiency.

Input Images

The input orthoimages for Export to Tilesets can be color composites, RGB combinations from multiband images, or

The pane in the upper part of the Export to Tilesets window lists the images selected for creating tilesets along with the reference system, cell size, input and output dimensions, and other information for each. The reference system and cell size values are shown in red if the selected tileset target requires that the image be reprojected and/or resampled.

Export to Tilesets window set to convert a set of 877 Landsat composites (JP2 files) to Google Maps tilesets. Each JP2 file is a compressed color composite of Landsat bands 7, 4, and 2 with 15 meter cell size. These composites provide global coverage of land areas excluding

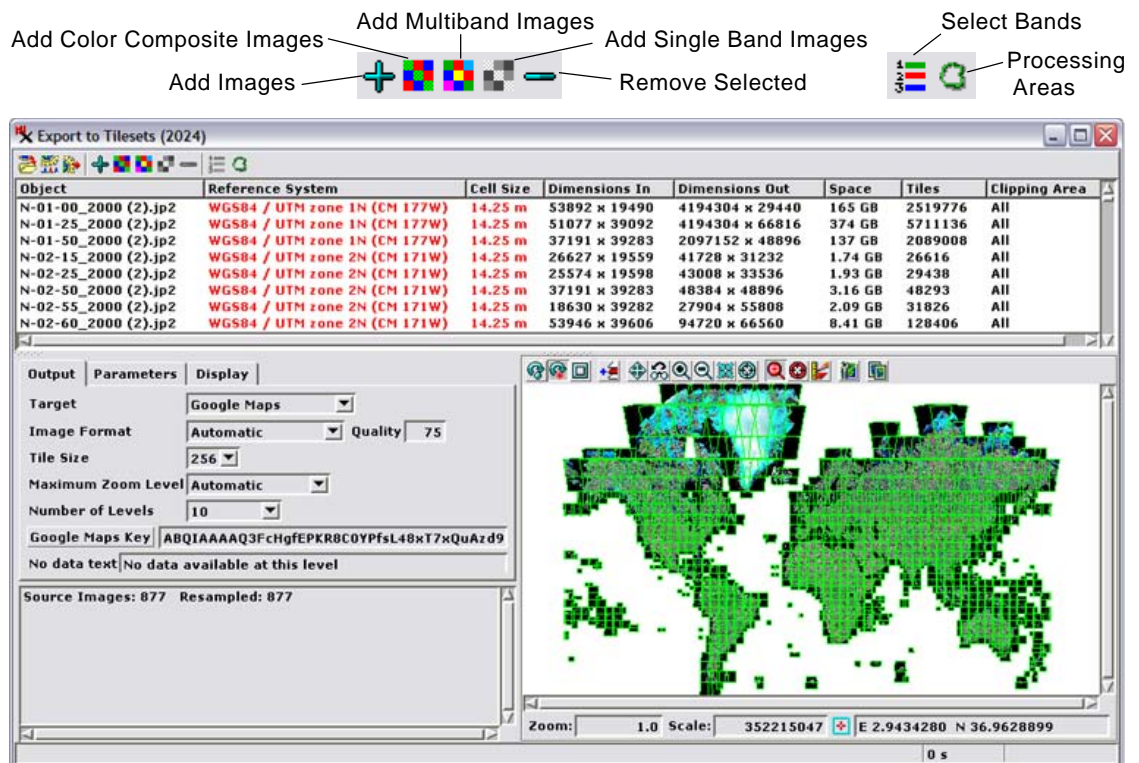
Antarctica but including many islands. The total compressed size of the 877 composites (with about 30:1 lossy JPEG2000 compression) is 151 GB. The uncompressed size would be about 4.5 TB.

The Export to Tilesets and Merge Tilesets processes are designed to work together to efficiently assemble very large tilesets. You can first prepare multiple smaller tilesets in the Export to Tilesets process, where TNT Job Processing allows you to run concurrent tileset operations to exploit your system's multiple processor cores. You then use the Merge Tileset process to assemble these individual tilesets into a single larger tileset. See the Technical Guide entitled *Tilesets: Assembling Very Large Structures*.

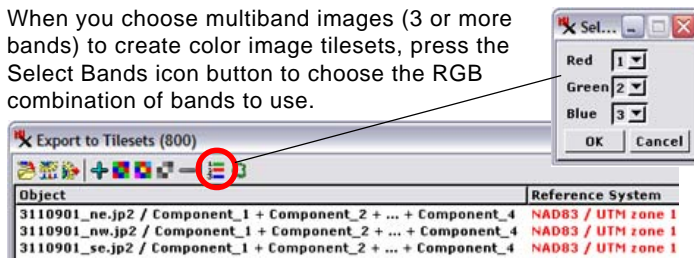
single-band grayscale rasters. These images can be in TNT Project Files or other image formats supported for direct use in the TNT products (GeoJP2, GeoTIFF, MrSID, ...). Export to Tilesets can process these input images concurrently in the background, reading the various image formats, decompressing them as needed, converting from the input Coordinate Reference System to that required for the tileset, resampling to build each fixed-scale tile layer, and compressing each tile to the required format.

The Export to Tilesets window provides separate icon buttons for adding color composite, multiband, and single-band images to the input list. There is also a general Add Images icon button that automatically determines the image or raster type from the images you select. When you choose a multiband image (3 or more bands), use the Select Bands icon button to assign bands to the red, green, and blue color components.

(over)

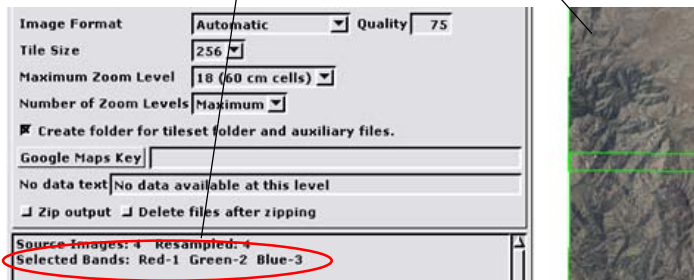


When you choose multiband images (3 or more bands) to create color image tilesets, press the Select Bands icon button to choose the RGB combination of bands to use.



The band number you choose for each display color is listed in the text field in the lower left portion of the Export to Tilesets window.

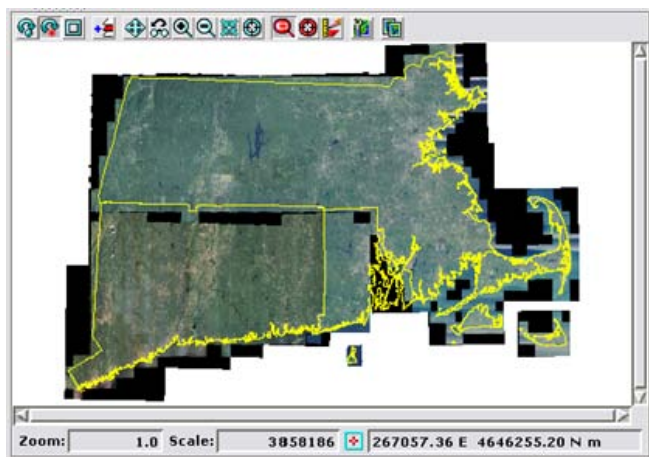
The bands you assign to Red, Green, and Blue are used for the color display in the view pane



Each image you choose is shown in the list in the upper part of the Export to Tilesets window. This list shows the input and estimated output raster dimensions of each, the number of tiles to be produced, and the estimated disk space required. The list also shows the input CRS and cell size, which are shown in red if the target tileset type requires that the image be reprojected and/or resampled to a different cell size.

Clipping Areas and Bounding Region

The Export to Tilesets process allows you to select existing geospatial objects to control the image areas and overall extent of the output tilesets. You can designate a *clipping area* individually for each input image to define the portion of that image to be used in creating the output tileset. You can also set a limit on the overall extents of the entire set of output tilesets. For both clipping areas and the bounding area, you can set a buffer



The view pane in the Export to Tilesets window shows each input image as well as the outline of the Clipping Area object (if any) that you have chosen for that input image (yellow outlines in this illustration). These outlines are used to define the image areas to be written to the tileset created from individual input images.

distance to automatically enlarge the designated region to provide additional image context. Procedures for setting up clipping areas and a bounding region are detailed in the Technical Guides entitled *Tilesets: Clipping Input Images* and *Tilesets: Clipping to a Project Boundary*, respectively.

Image Format and Tile Size

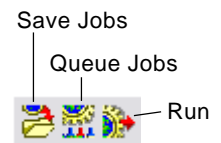
The Image Format menu provides a selection of the image file formats that are available for the particular tileset structure you have selected. For Google Maps, Google Earth, Bing Maps, and World Wind tilesets the default Automatic format option automatically uses PNG format for any tile that crosses the border of the valid image area (to provide transparency for non-image areas) and JPEG format for all other tiles (to provide maximum compression). The TechGuide entitled *Tilesets: Tile Image Formats* provides more information about the various image formats used for tile files in tilesets.

Zoom Levels

A Google Maps, Google Earth, Bing Maps, or World Wind tileset comprises many levels pre-rendered at different spatial resolution to provide quick retrieval and display of the required tiles at any zoom level. In the Export to Tilesets process you can set the maximum zoom level (highest resolution) to be created in your tileset as well as the total number of zoom levels to be created. Procedures for setting zoom levels along with details of the zoom level nomenclature for different tileset structures can be found in the TechGuide entitled *Tilesets: Setting Zoom Levels*.

Job Processing

The Export to Tilesets process allows you to take advantage of the concurrent processing capabilities of your computer's multiple processor cores using the TNTmips Job Processing System. You can set up many tileset creation operations at one time and use the Queue Jobs icon button to immediately queue each of the tileset conversions as a separate job or the Save Jobs icon button to hold these jobs for later release.



Creating Tilesets for Merging

As outlined in the TechGuide entitled *Tilesets: Assembling Very Large Structures*, you can use the Export to Tilesets process to create a number of adjoining tilesets that subsequently will be assembled into a larger tileset using the Merge Tilesets process. When you create these component tilesets, you do not necessarily need to produce all of the lower resolution-levels, as many of these tiles will need to be recomputed during the merge operation. Tilesets that you will merge do not have to match in maximum zoom level and number of levels (see the TechGuide entitled *Tilesets: Merging Structures*). However, for maximum efficiency in the merge process you should create at least several resolution levels in addition to the maximum resolution level. Many of the tiles in these higher resolution levels can be reused (merely copied, not recomputed) in Merge Tileset, and creating them in the Create Tilesets process allows you to take advantage of concurrent processing via Job Processing, as discussed above.