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# Mosaic to Google Maps Tile Overlay

The TNTmips Auto Mosaic process can convert a large set of your maps and images into a standard web tileset in various structures, including the native Google Maps Tile Overlay structure. This Google Maps tile overlay can be viewed by anyone from your web site in a web browser or locally from a hard drive, DVD, or other media. In addition to creating the strictly-defined Google Maps Tile Overlay structure, the process creates a sample HTML file that references your tileset and allows you to display it in a browser with various combinations of the native Google Maps tile layers and labels (i.e., Google Maps mashups). You can use this HTML file directly as a web page or copy and paste the relevant portions to embed the Google Maps mashup in an existing web page. Posting a mashup that references native Google Maps layers may require that you obtain a Google Maps API key authorizing this use. You can use controls on the Mosaic window to obtain and enter your API key so that it is written to the sample HTML file created by the process.

The numbered paragraphs below (keyed to numbers on the illustration) explain the various settings and options for creating a Google Maps tileset.

**1 Reference System**

Choosing *Google Maps* as the mosaic target on the Output tabbed panel automatically sets the Reference System option on the Extents tabbed panel to the Spherical / Web Mercator coordinate reference system required by Google Maps.

**2 Image Format**

A Google Maps tile overlay can include tiles in JPEG and / or PNG format. The default format option automatically uses PNG format for any tile that crosses the border of the valid image area (to provide transparency for null areas) and JPEG User Defined format for all other tiles (to provide maximum compression). More information about choosing tile formats can be found in the Technical Guide entitled *Tilesets: Tile Image Formats*.

**3 Tile Size**

All tiles in a standard Google Maps tile overlay are 256 by 256 pixels in size. This tile size is automatically set when you select Google Maps as the mosaic target. An option for a 128-pixel tile size is also provided to create a tile overlay for display on a cell phone.

**Google Maps Zoom Levels**

A Google Maps tile overlay includes a set of precomputed reduced-resolution tilesets for viewing at different **fixed** zoom levels. Zoom levels are numbered beginning with level 0, which represents the entire globe with a single tile centered at 0 degrees longitude and 0 degrees latitude. Each integer increase in zoom level doubles the number of tiles in both the x and y directions. Level 1 covers the globe with a 2 x 2 grid of tiles, level 2 with a 4 x 4 grid, and so forth. This structure also means that each tile row and column number corresponds to a **specific geographic location** on the Earth. Because the tile size is fixed, each increase in zoom level also increases the spatial resolution (reduces the pixel size in map coordinates) of the tiles at that level. Nominal pixel sizes (at the equator) are shown in the table to the right for the higher zoom levels. See the
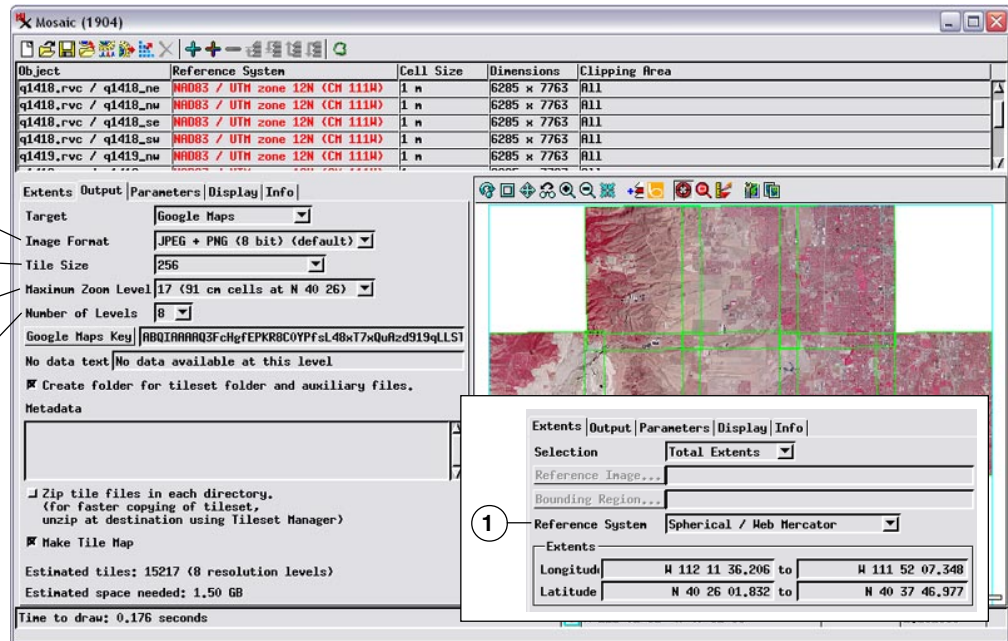
*Tilesets* TechGuides entitled *Google Maps Structure* and *Setting Zoom Levels* for more information.

**4 Maximum Zoom Level**

The Mosaic process automatically sets a default value for the Maximum Zoom Level setting so that the highest-resolution level in the Google Maps tile overlay has a cell size equal to or smaller than the input raster with the highest resolution. For example, in the mosaic layout in the illustration above, all input rasters have a cell size of 1 meter, so the Maximum Zoom Level value has defaulted to Level 17, or 91 centimeter cell size at the center latitude of the input images.

| Fixed Google Maps Zoom Level | Nominal Pixel Size at Equator |
|---|---|
| 12 | 39 m |
| 13 | 19 m |
| 14 | 10 m |
| 15 | 5 m |
| 16 | 2.4 m |
| 17 | 1.2 m |
| 18 | 60 cm |
| 19 | 30 cm |
| 20 | 15 cm |
| 21 | 8 cm |

**5 Number of Levels**

The Number of Levels setting defaults to a value such that at the minimum zoom level the image area in your tile overlay covers no more than 256 by 256 pixels. The geographic extents of your image may cause it to cross the fixed Google Maps tile grid boundaries, resulting in up to 4 tiles in this level. You can change the Number of Levels setting to reduce the number of zoom levels created in your Google Maps tileset.
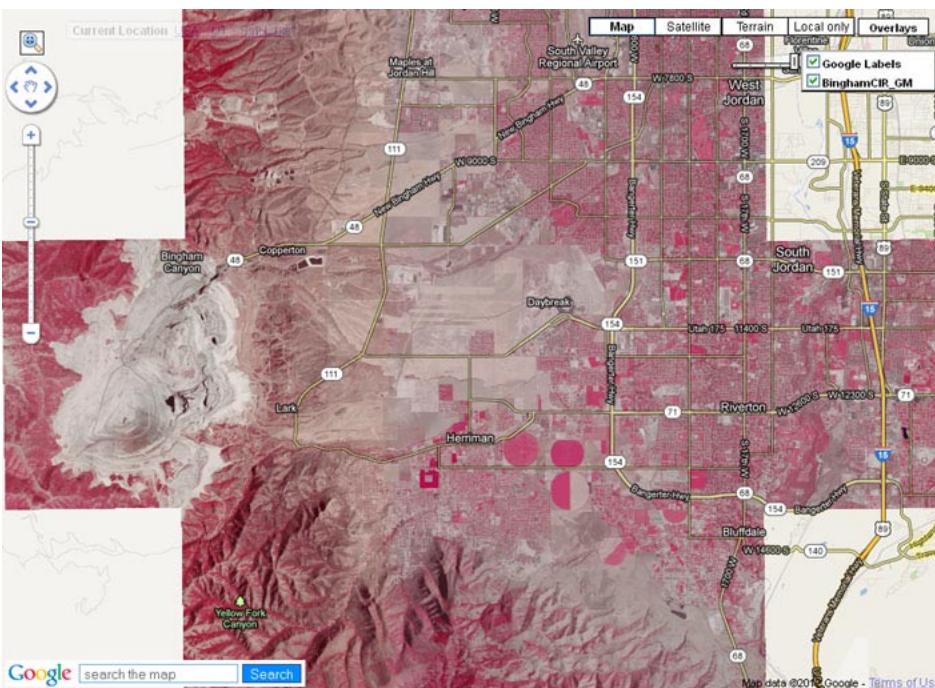
(over)

**6) Google Maps Key**

If you have already obtained a Google Maps API key, enter your key value in the field. If you don't yet have an API key, press the *Google Maps Key* pushbutton. Your web browser then opens and shows the web page where you can sign up for the Google Maps API and obtain a key.

**7) No data text**

If you pan beyond the extents or zoom beyond the available zoom levels for your Google Maps tile overlay (and no Google tiles are available), a special transparent PNG tile showing a "no data" message is automatically shown in your browser for all blank areas. You can edit the *No data text* field to change the text to be shown in these no data areas.



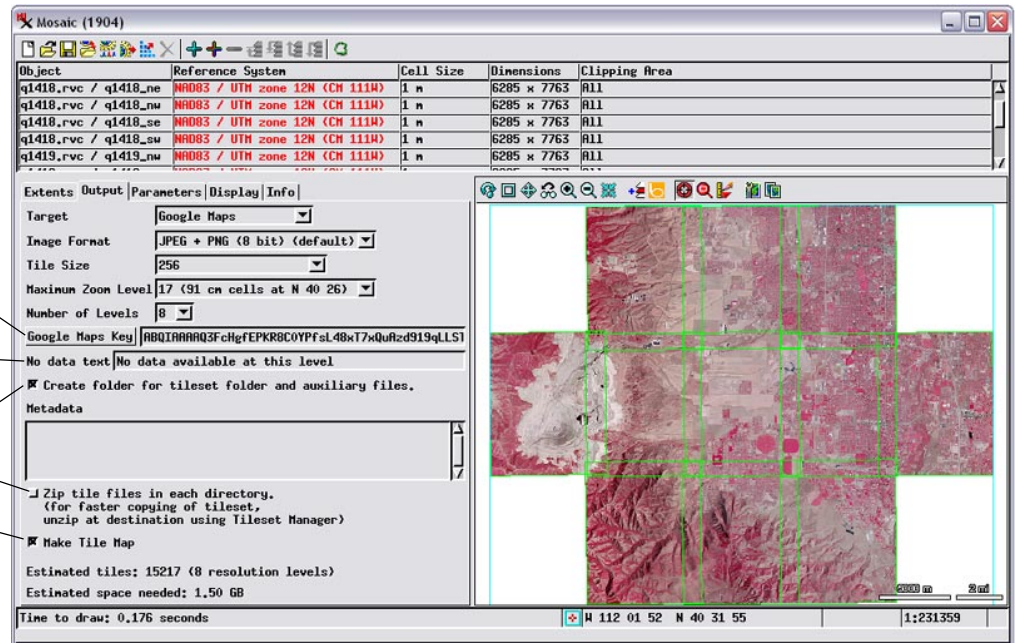**8) Create folder for tileset**

The Google Maps tileset you create consists of a folder containing all of the zoom level tiles as well as a number of auxiliary files that enable the tileset to be used in the TNT products and viewed in web geobrowsers. Turning on this toggle creates a folder that encloses all of the files and folders produced. This folder is automatically given the tileset name.

**9) Zip output**

A Google Maps tile overlay can consist of hundreds of thousands of small individual tile files organized in a series of subdirectories. Copying the raw tileset to another drive location or medium can be time-consuming because of the large number of directories and files involved. Copying the tileset is much faster if it has been archived in a single Zip file.

If you plan on moving or redistributing your Google Maps tile overlay, turn on the *Zip output* toggle to copy the tile overlay and the sample HTML file that references it to a single Zip file. Turn on the accompanying toggle if you want the raw tile overlay files to be deleted after the Zip file is created. The Tileset Manager can be used to automatically unzip a directory-zipped tileset (see the TechGuide entitled *Tilesets: Managing Structures*). As an alternative, you can use a third-party compression application to archive the entire tileset into a single Zip or RAR archive for copying.



**10) Make Tile Map**

The Make Tile Map toggle enables creation of a tile map that records the spatial distribution of tiles along with their image formats and sizes. You can use tile maps to check the integrity of your tilesets and identify and correct problems (see the TechGuide entitled *Tilesets: Checking Spatial Properties Using Tile Maps*).



Windows directory listing for the sample Google Maps tile overlay created from the mosaic layout in the illustration above. The *filename* you provide when you start the Auto Mosaic process is used to name a *filename*_Tiles directory that contains all of the tile files and the sample *filename*.html file that references the tileset.

The sample HTML file created with your Google Maps web tileset displays it as an overlay in Google Maps. Floating buttons along the top of the browser view enable the user to switch the basemap beneath the custom overlay to any of the native Google Maps basemaps (Map, Satellite, or Terrain).

The sample HTML file also provides the Google toolbar for address searches, restricts the selection of Google Maps zoom levels to the range of levels in your Tile Overlay, and restricts panning the view center beyond the bounds of the Tile Overlay.