# Google and Bing Maps in a "Box"

MicroImages has used publicly-available imagery to create a Google Maps and Bing Maps global tileset using the tileset creation, management, and publication features available in every TNTmips. This global 10-meter coverage is a single hierarchical tileset of ~60,500,000 files in ~13,700 directories. Each file is a 256 by 256-pixel JPEG or PNG image tile. This tileset occupies 1.2 terabytes on an NTFS 2 TB hard drive that has been interfaced to the MicroImages web site using the inexpensive eSATA external drive carrier illustrated.

Zoom levels 0 to 7 are a natural color Structural Earth image assembed from the Blue Marble August 2004 natural-color Earth image (created from MODIS imagery by NASA) merged with relief-shaded topography and bathymetry using TNTmips.

Zoom levels 8 to 14 are ~10-meter resolution Landsat false-color global coverage.

This global tileset was prepared on an 8-core Power Mac using TNTmips.
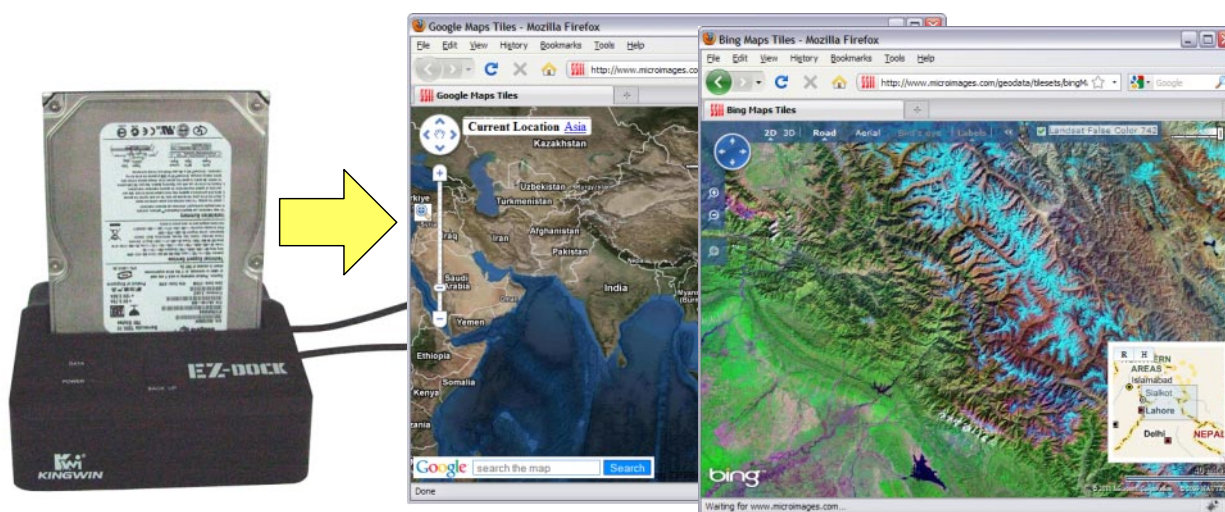
Input Imagery

- A 2 TB drive containing 879 files of false color Landsat mosaic image files downloaded from https://zulu/scc.nasa.gov/mrsid.
- Each source image file is a mosaic tile covering an area of 5 degrees of latitude by 6 degrees of longitude in *.sid format.
- Each image mosaic tile has a spatial resolution of 14.25 meters in the UTM coordinate reference system appropriate for its location.
- Most of the 100s of individual Landsat images used to create each mosaic were acquired in the year 2000.
- All of the 879 image mosaics are false-color composites of Landsat band 7, band 4, and band 2 as red, green, and blue (respectively).
- This false-color band combination was selected by NASA to provide good discrimination of various natural and man-made land cover types.

Mosaic into Tilesets [1]

- The Auto Mosaic process in TNTmips was used to assemble groups of the 879 UTM Landsat tiles into 29 Google/Bing Maps hierarchical tilesets.[2]
- Each of these intermediate tilesets is a large geographic patch converted to the required Spherical Web Mercator coordinate reference system.

(over)

Merge into Global Tileset

The Merge Tileset process in TNTmips was used to merge the 29 tilesets into a single global Google / Bing Maps standard web tileset with zoom levels 8 to 14.

Assemble Components into Geomashup

TNTmips' Geomashup process was used to layout, package, and zip up the Landsat and Structural Earth[3] global tilesets into Google Maps and Bing Maps geomashup HTML web pages with the desired tools and base layers ready to publish on any web site.

Install on Any Web Site

The geomashup web package was copied to the MicroImages web site and unzipped. The two HTML files it contains were posted as web pages so the Landsat 10-meter Global data can be viewed in a browser in Google Maps and Bing Maps:

Google Maps: www.microimages.com/geodata/tilesets/googleMaps/Landsat742.html

Bing Maps: www.microimages.com/geodata/tilesets/bingMaps/Landsat742.html

Structure and size of this global tileset:

Folders, Tiles, and File Size by Zoom Level*

Zoom Level	Number of Folders	Number of Tiles	Size	Size on Disk
0	1	1	60 KB	64 KB
1	2	4	218 KB	288 KB
2	3	12	795 KB	960 KB
3	6	44	2.9 MB	3.7 MB
4	11	153	10 MB	13 MB
5	21	495	32.1 MB	41 MB
6	42	1,724	89.1 MB	118 MB
7	83	6,319	242 MB	339.4 MB
8	166	23,878	735 MB	1,082 MB
9	331	92,457	2.5 GB	3.8 GB
10	660	364,177	9.6 GB	14.5 GB
11	1,319	1,445,437	38.5 GB	57.4 GB
12	2,453	5,542,645	137 GB	209 GB
13	3,990	17,319,271	371 GB	593 GB
14	4,600	35,789,413	652 GB	1,155 GB

*See the TechGuide entitled *Tilesets: Understanding Sizes*.

[1] All 879 Landsat source mosaics can be mosaicked directly from the downloaded *.sid files into the single global hierarchical tileset to skip the merge step. However, it is more efficient to mosaic smaller groups of these input mosaics into intermediate tilesets in parallel using TNTmips Job Processing to optimize the use of multiple cores.

[2] A single hierarchical tileset can be used as a Google Maps Tile Overlay and as a Microsoft Bing Maps Custom Overlay.

[3] The Structural Earth natural-color portion of this global tileset is used for the low-resolution global synoptic zoom levels (0 to 7). It covers both ocean and continental areas and is in natural color, making it easier to navigate to familiar local areas. These Structural Earth levels were also assembled in TNTmips using many geodata sources (see the Technical Guide entitled *GeoMedia Publishing: Publishing Your Professional Geodata Via Google*).