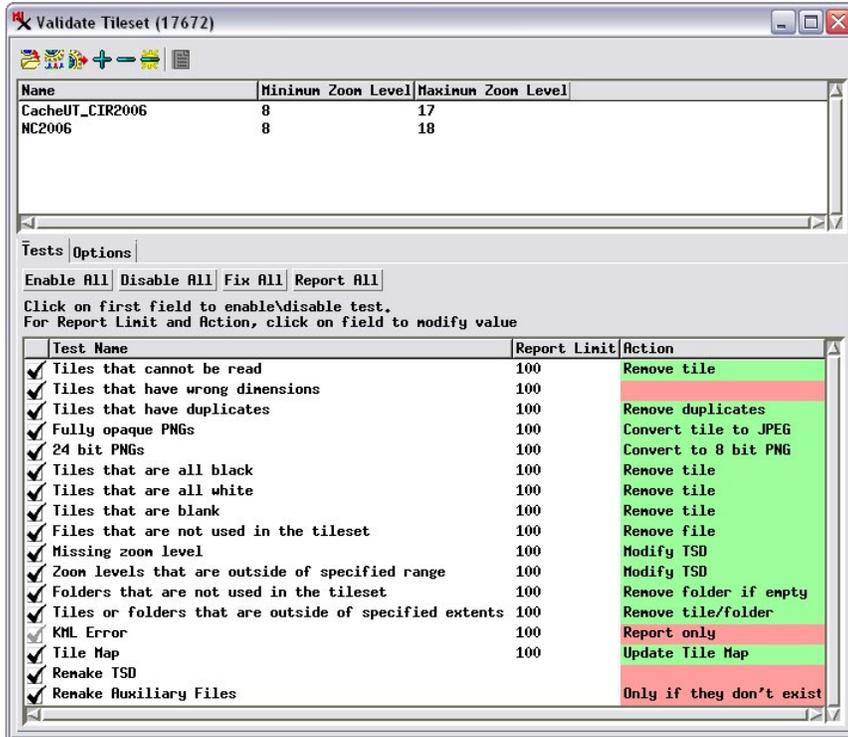# Validating Structures

Standard web tilesets (Google Maps, Bing Maps, Google Earth, and NASA World Wind) are conceptually simple hierarchical directory structures that can contain millions of small individual raster files in several very common formats. When you are using simple raster images, you can easily check them for completeness and processing artifacts by viewing at full extents, then zooming to full resolution and panning around to a few sample locations. In a web tileset, however,

els, tiles or folders that are not used or are outside the stated extents of the tileset, and various tests of the condition of individual tile files (blank, all black, all white, wrong tile dimensions, among others). Another test checks for KML errors in Google Earth tilesets.
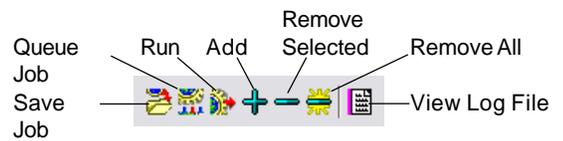
The Validate Tileset process is also useful for indentifying subtle issues that affect the stored size and display speed of a web tileset, such as fully opaque PNG tiles (which can be replaced by more highly-compressed JPEG tiles) and 24-bit edge PNG tiles (which in many cases can be replaced by 8-bit PNG tiles).

Use the checkbox controls to enable or disable individual validation tests, or set all tests using the Enable All and Disable All buttons. Most tests can be set to either report or fix the associated errors; a right mouse-click in the Action column entry for a test reveals a menu from which you can pick the desired action. You can set the action for all tests at once using the Fix All or Report All button.

it is impossible to systematically view every tile file at every zoom level. You are unlikely to visually identify a local problem in a tileset that was incorrectly designed or built, has been subsequently damaged, or undergone some other undesirable modification at some particular zoom level and geographic location.

The Validate Tileset process scans every directory and tile file in a standard web tileset to detect, report, and where possible (and requested) repair the tileset. It can be applied to any locally available web tileset that has been produced in TNTmips. It can also be applied to local web tilesets acquired from other sources. In the latter case you must first use the Link to Tileset process in TNTmips to create a small Tileset Definition (TSD) file that allows a tileset to be used in TNT processes (see the Technical Guide entitled *Tilesets: Link to a Structure*).

Using the information in the TSD link file as a starting point, Validate Tileset provides tests to check for missing zoom lev-

Standard options affecting the auxiliary files produced with each tileset are found on the Options tabbed panel. You can also choose to halt processing if any error cannot be resolved.

You can use the diagnostic tools in the Validate Tileset process in conjunction with *tilemaps*, which show the spatial distribution of tiles, their file formats, and stored sizes at each zoom level (see the TechGuide entitled *Tilesets: Checking Spatial Properties Using Tile Maps*). Validate Tileset produces a log file that tabulates errors found in the individual tests by zoom level, and tile maps can be used to pinpoint the spatial locations of those errors. Validate also updates existing tilemaps to reflect any changes it makes in the tileset structure.

Although the error fixes incorporated in the Validate Tileset process result in a tileset that conforms to its description in its TSD file, you can choose to remake the TSD file as well to update it to the current TSD format version. You can also remake all auxiliary files, which include all of the standard HTML files that enable the tileset to be immediately viewed in the associated geobrowser, to incorporate any newly added tools and features.

As part of the development of the TNTmips processes that create, render, and merge tilesets, MicroImages has created many large tilesets and published them for your use. Our extensive use of these processes made it clear that while tilesets seem simple, once created they are like black boxes: it is very hard to detect what is inside by looking in from the outside. The Validate Tileset and Tileset Manager processes evolved to support this large effort, and these processes are now available to support your own activities with tilesets. A large tileset takes a considerable amount of computer time to prepare. The problems addressed and repaired in the Validate Tilesets process can save damaged tilesets and improve the performance of apparently valid tilesets. Identifying various error conditions in large tilesets also enabled MicroImages to make adjustments in the TNTmips tileset processes to avoid creating these conditions.

```
Validate Tileset Log G:\CacheCntyUtah\CacheUT_CIR2006\CacheUT_CIR2006fix.log
Tileset: G:\CacheCntyUtah\CacheUT_CIR2006\CacheUT_CIR2006.tsd
2010-08-27 13:09:05

Errors:
10 Fully opaque PNGs

Time -
Reading of tiles: 5.3 minutes
Scanning of tile data: 47 seconds
Scanning of tileset structure: 21 seconds
Total: 6.4 minutes

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Level 17
Total Errors: 0
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Level 16
Total Errors: 2
Fully opaque PNGs
Errors: 2
G:\CacheCntyUtah\CacheUT_CIR2006\CacheUT_CIR2006_Tiles\16\24328\12456.png(136.42 KB)
G:\CacheCntyUtah\CacheUT_CIR2006\CacheUT_CIR2006_Tiles\16\24469\12402.png(109.40 KB)
```

Portion of a sample Validate Tileset log file. The sample Google Maps tileset includes both JPEG and PNG files. The latter file type should be used only for edge tiles that include at least some transparent (no data) cells. In this case 10 PNG files were found to be fully opaque, and so can be replaced with JPEG files that are more compressed and that consequently load faster in Google Maps.

As a result, all of these processes have been refined to produce high-quality tilesets that work with maximum efficiency in all geobrowsers. However, MicroImages recommends that you use the Validate Tileset process to check the integrity of any tileset you obtain from outside sources and other software before you publish the tileset on the internet. You can further test the published tileset from the end-user's viewpoint via geoviewer by using the interactive diagnostic tool described in the Technical Guide entitled *Tilesets: Remote Diagnostic Tool*.