

Use and Export BigTIFF Files

Image files in the standard TIFF file format are limited in size to 4 GB (compressed or uncompressed). Due to advances in imaging and image-processing technology in many fields, detailed images and image mosaics now routinely exceed that 4 GB limit. BigTIFF is a proposed extension to the TIFF format that enables this open, multi-purpose file format to support image files that greatly exceed 4 GB in size (see the box to the right for technical details). All bitdepths, datatypes, compression modes, and standard tags (including georeference information) in the regular TIFF/GeoTIFF format are also supported in BigTIFF.

The TNT products provide complete support for image files in BigTIFF or regular TIFF formats:

- direct use in any process
- import from TIFF / BigTIFF
- export to TIFF / BigTIFF
- use as source or target in pipeline scripts.

BigTIFF files have a “.tif” or “.tiff” file extension just like ordinary TIFF files. The TIFF library used in the TNT products deals seamlessly with reading TIFF and BigTIFF files on Windows and Mac OS X platforms. As with ordinary TIFF and GeoTIFF files, you can directly select and use an image file in BigTIFF format in any TNT process. If you want to import a BigTIFF file to the MicroImages Project File format, you can choose BigTIFF, GeoTIFF, or TIFF from the format list in the Import process. On import or direct use, BigTIFF files are recognized automatically from infor-

A Tale of Two Offsets

In both TIFF and BigTIFF files, the starting positions of internal image directories and image data segments in the file are identified by their *offset*: the total number of bytes from the beginning of the file. In the standard TIFF format, offset is specified by a 32-bit integer (4 bytes). The largest offset that can be specified is thus 2^{32} bytes, or 4 GB. The major change in the BigTIFF extension to the TIFF format is to store the offset value as a 64-bit integer (8 bytes). That change extends the theoretical maximum file size to 2^{64} bytes, or 16 exabytes (2^{20} terabytes)!

mation in the file header and file reading adjusts accordingly.

The Export process, on the other hand, requires that you explicitly choose to export to BigTIFF rather than standard TIFF format. Choosing BigTIFF from the format list automatically turns on the *Export as BigTIFF* toggle on the Export Parameters window that is common to all varieties of the TIFF format. (You can also turn this toggle on manually if you have started the export from the TIFF or GeoTIFF format selections). Only images that would produce files larger than 4 GB (after compression) need to be written as BigTIFF (standard TIFF export will fail if the output file exceeds that size). Smaller images can be exported as either TIFF or BigTIFF. If you plan to use a BigTIFF file outside of your TNT product, you should determine whether other software to be used with the image can read files in this relatively new format.



NASA Blue Marble global image (43,200 lines by 86,400 columns, 460-meter cell size) exported to BigTIFF. File size is 10.4 GB uncompressed or 4.08 GB with lossless LZW compression.