

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 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 both TIFF and BigTIFF files on Windows and Mac OS X platforms. As with ordinary TIFF files, you can directly select and use an image file in BigTIFF format in any TNT process. For import or export, simply select the TIFF or GeoTIFF file format from the format list in the Import or Export window.

On import or direct use, BigTIFF files are recognized auto-

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)!

matically from information in the file header and file reading adjusts accordingly. On export only files larger than 4 GB need to be written as BigTIFF, but the final file size is unknown when the export begins. The output file thus is always initialized and begins writing as a standard TIFF file. If the file grows to the point where its size would exceed the 4GB limit for the standard TIFF format, the file header and internal file directories are automatically rewritten to conform to the BigTIFF format standard and writing of image data then continues. None of the previously-written image data needs to be changed or rewritten during this conversion, so the export procedure is not slowed appreciably by the change. However, upon completion the Export process provides a warning message to inform you that the exported file has been written as BigTIFF.



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.