

# ER Mapper Professional

## Version 7.1

7/14/2008  
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## Why the Need for Raster Compression

- Make large raster files available for download onto small mobile GPS devices
- Compressed raster files work faster in GIS applications
  - Faster load times
  - Faster refresh rates
- Smaller storage space
- Makes raster files easier to transport from one device to another
  - Burn to CD or DVD more easily
  - Internet access faster
  - Other mobile storage devices

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# What is a Compressed Image

A compressed image is one that has been reduced in size, but still maintains an almost perfect version of the original. There are various compression techniques, but it is wavelet compression that is used by ER Mapper's software. This technique enables very high compression rates where a typical colour image can be compressed to less than 2% to 5% of its original size (50:1 to 20:1 compression ratios). This means that, at 20:1 compression, it is possible for 10GB (10,000MB) of color imagery to be compressed down to 500MB, small enough to fit on a single CD-ROM disk.

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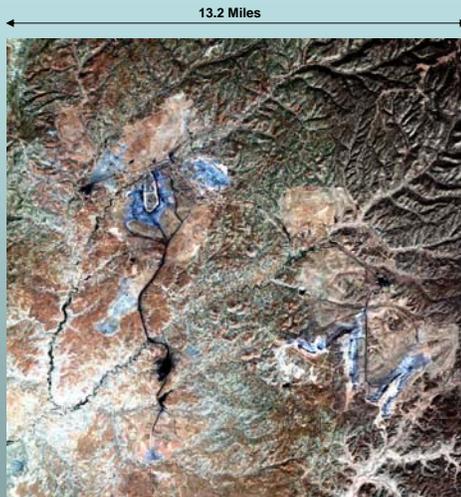


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# Compression Example



## Before Compression Color Image Statistics

- QuickBird Satellite Image – 4 Bands
- 8882 x 9851 pixels
- Cell size = 7.874 feet
- Image format - TIFF
- Uncompressed Size – 363.69 MB

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## Compression Example cont.



### After Compression Color Image Statistics

- Compression Ratio 20:1
- 8882 x 9851 pixels
- Cell size = 7.874 feet
- Image format - .ecw
- Compressed Size – 18.9 MB

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**363.69 MB**



**18.9 MB**

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## Two Compression Formats Available in ER Mapper

The Enhanced Compression Wavelet (**ECW**) file format has become a de facto geospatial industry standard for high end imagery, enabling, for the first time, interactive roaming and zooming of terabyte-sized images. After more than five years of commercial use, it is a mature, stable technology with a strong user base worldwide.

The ISO **JPEG 2000** standard (ISO/IEC 15444) is fully supported by ER Mapper 7.1. It allows precisely defined control of all aspects of compression, and includes a lossless mode that allows perfect reconstruction of compressed data while still providing significant file size reduction..

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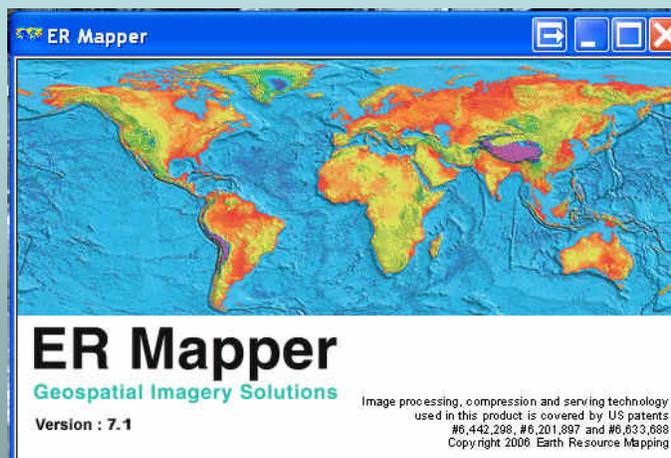


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## Compressing Raster Images in ER Mapper 7.1



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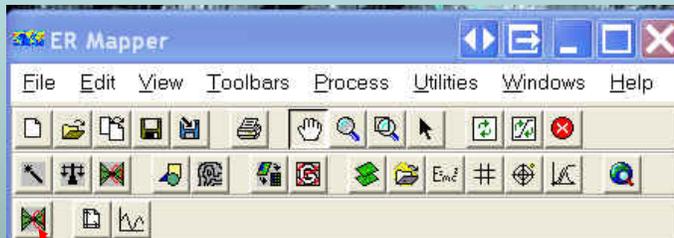


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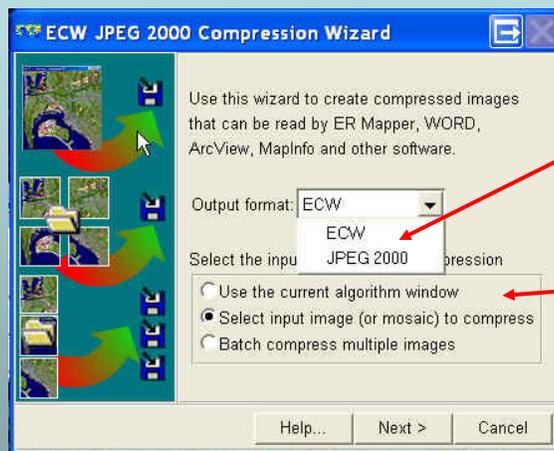
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## ER Mapper Main Menu Area



ECW JPEG 2000 Compression Wizard icon

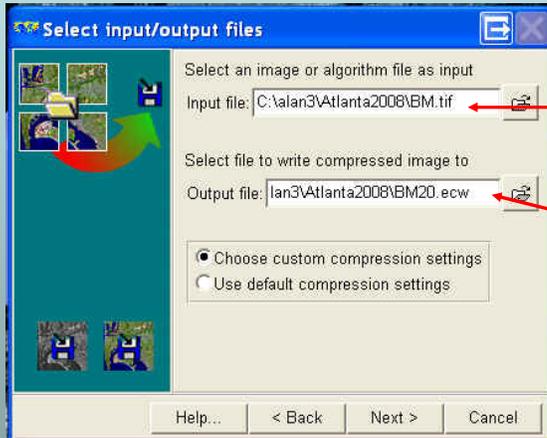
## The Compression Wizard



Set Compression Format

Set mode of image input

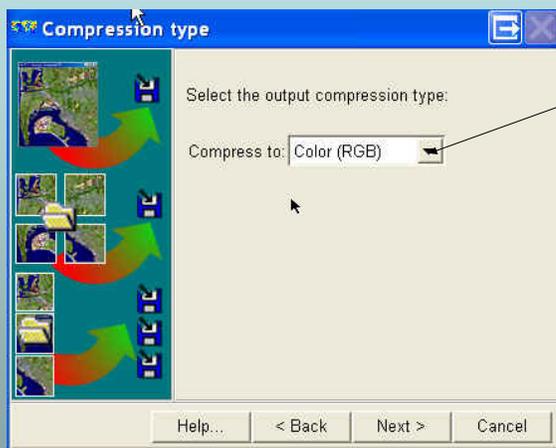
## Input/Output Designation



Input Image – a few of the raster formats that can be used are: bmp, tif, jpeg, doq, img

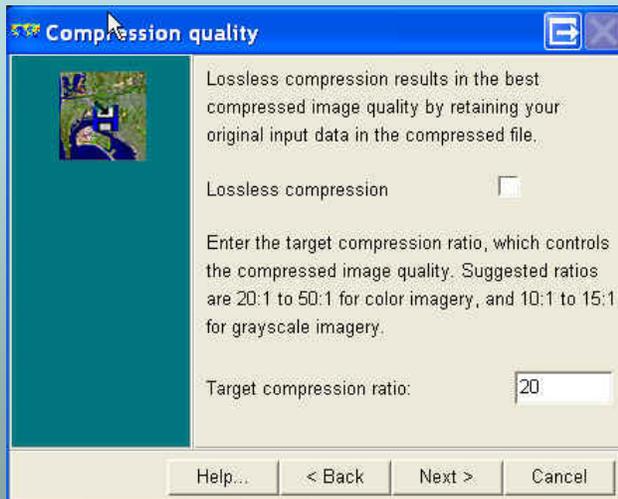
Output either ecw or jp2

## Compression Type



Grayscale  
Color (RGB)  
Multiband

## Compression Quality



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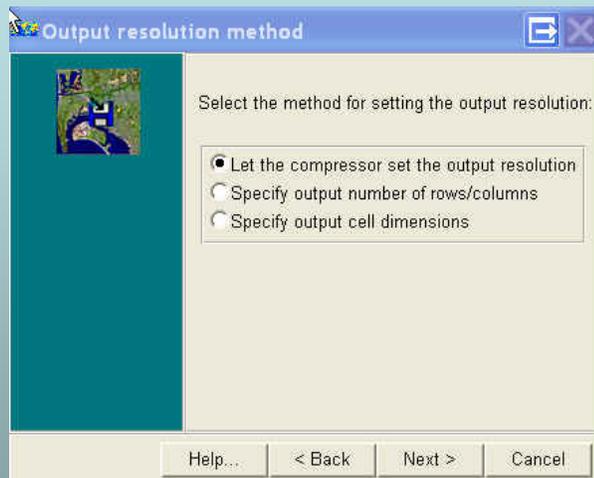


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## Output Resolution Method



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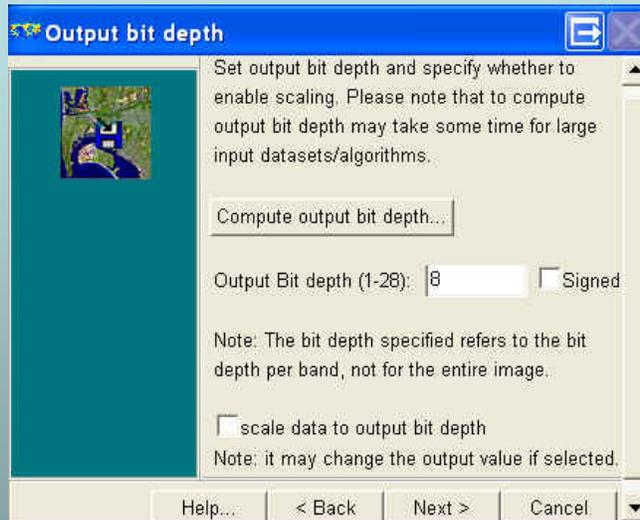


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## Output Bit Depth



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## Compression Summary



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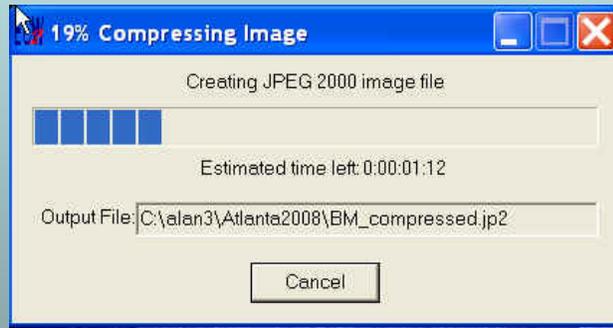


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## Running the Compression Job



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## Zoomed in Comparison

Original IMG – 343.7MB



Compressed 50:1 ECW – 8.9MB



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## Other Capabilities Available in ERMapper 7.1

- Orthorectification
- Data Fusion and Mosaicing
- Digital Elevation Models
- Map Production
- Change Detection
- Image Enhancement
- Image Display
- Multispectral Classification
- Image Statistics
- Supplied Algorithms and Filters

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## Compatibility with other TIPS Core Software

- ArcGIS – Works very well within ArcMap, ArcCatalog, ArcGlobe & Explorer
- AutoCAD – CAD supports the ECW format
- ArcPad 7.1 – does not support ECW format – was supported in version 6.x via a plug-in - There may be a plug-in developed for version 7.x at a later date
- Did not get a chance to test ECW format in TerraSync

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The limitations of compressed images are:

- **Display only** - Compressed images may be viewed but not manipulated. They are read-only.
- **No selection** - Compressed images cannot be altered and their pixels may not be selected.
- **Limited on-the-fly re-projection** - A compressed image may be viewed only within a map the coordinate system of which is more or less similar to that of the image. If the re-projection between the coordinate system of a compressed image and the coordinate system of a map containing the image is curvilinear, the compressed image layer will not be displayed in the map.
- **Reduced information content** - The compression process eliminates the original pixel information in the image. Although compressed images when reconstituted for display may appear visually identical to an original uncompressed image, the reconstituted pixels are a synthetic approximation of the originals.
- **No transparent pixels** - ECW and JPEG2000 compression do not support four channel (**RGBa**) data so there is no channel available to save transparent pixel information. Note that when working with other types of images and "deleting" pixels the pixels are not really deleted - they are simply made transparent. The only way to delete pixels in an image is to crop the image, in which case the cropped pixels are genuinely deleted. If images containing transparent pixels are converted to a compressed image the transparent pixels will be restored as black regions.

Compressed images nonetheless provide significant benefits:

- **Fast display** - The reconstitution process provides for very rapid display of an image view at any desired zoom or pan.
- **Fast loads and saves** - Projects containing compressed images load and save much faster than projects using uncompressed images.
- **Linked images** - Compressed images may be left in their original **.ecw** files or in their JPEG2000 files instead of being imported into the Manifold **.map** project file.
- **Reduced disk space** - Compressed images require much less room than uncompressed images. Using linked images to utilize a single image file in many different projects will also save much disk space as compared to duplicating that image within many projects as an imported image.
- **Streaming links** - Compressed images in ECW format may be linked into a Manifold project from an ECWP server URL, loading from a data stream served by an ER Mapper Image Web Server.
- **Dynamic channel combinations** - The **Image - Display Options** command allows selection of which channels from a multi-channel image will be used for **R, G, B** and alpha channels.

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## Questions ????



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