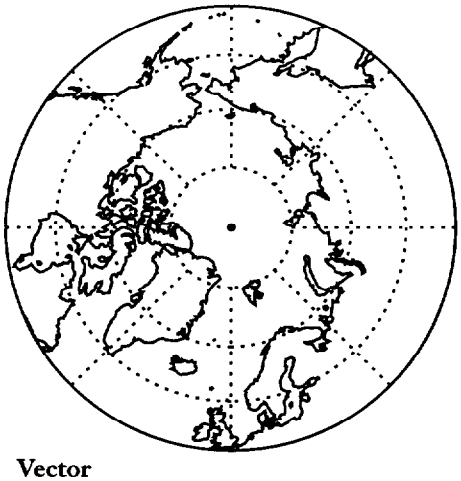
Image Formats: Vector & Raster



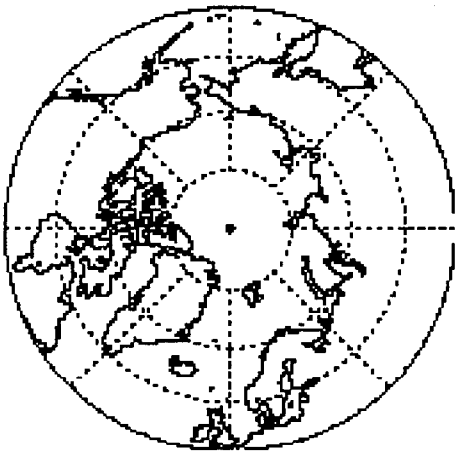
Vector

Vector graphics are described by mathematical equations of lines, circles, and so forth. They are resolution independent, meaning they can be reproduced at a variety of sizes without loss of quality, and at the maximum resolution of the display device.

applications: text & labels, maps, contours

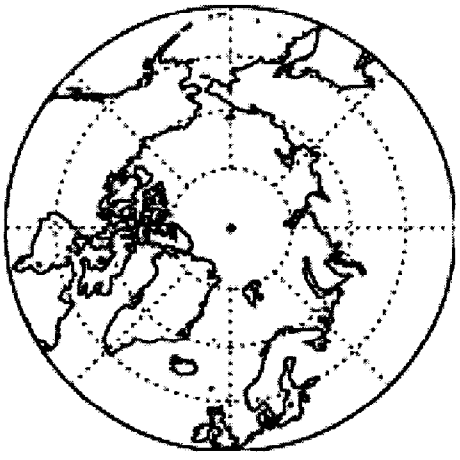
file types: encapsulated postscript (.eps), postscript (.ps)

software: Illustrator, Freehand, CorelDraw, Canvas



Raster

Raster graphics, also referred to as bitmaps, store picture information as an array of individual pixels, like most data formats. Therefore they are the most common method for creating images from satellite data. (an exception is contour lines.) The bit depth of a raster graphic determines the maximum number of colors it can contain: 1 bit (2 colors), 8 bit (256 colors), 24 bit (true color), 32 bit (true color + transparency). Data are most often displayed in 8 bit color, while photographs are typically displayed in 24 bit color. If the dimensions of a raster graphic are changed, information is either lost or interpolated. Some algorithms scale bitmap images much better than others, but it is important to do it as few times as possible.



Raster (anti-aliased)

Aliasing–jagged edges that appear at display resolutions on diagonal lines and curves–often occurs when vector images are converted to raster images for on-screen display. Some methods of converting the file formats blend sharp edges with the surrounding colors (anti-aliasing), reducing the jagginess.

applications: data, photographs

file types: TIFF (.tiff), GIF (.gif) (8-bit only), BMP (.bmp), JPEG (.jpg) (24-bit only, lossy compression), HDF raster (.hdf)

software: data analysis tools, Photoshop, XV

Ideally, images for the Earth Observatory would be a combination of vector and raster: annotations and continental outlines in a vector format (EPS) and data in a raster format (TIFF). Each covering the same area and with identical aspect ratios. If you have any quations, feel free to contact these members of the EOS-AM visualization team:

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