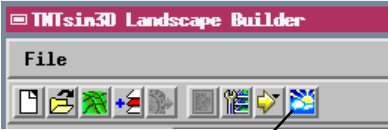


Adding Sky Domes to Landscapes



Use the Add Sky icon button on the Landscape Builder window to add a sky image to a Landscape File.

Any raster image that depicts a full sphere or upper hemisphere in an equirectangular projection (see below) can be used to create a sky dome for use in TNTsim3D. The Add Sky utility resamples the input image to the proper dimensions and format and stores it in a Sky folder within the designated Landscape File. In TNTsim3D you can then se-

You can add sky dome images of your own to any of your TNTsim3D Landscape Files using the Add Sky utility in the Landscape Builder process in TNTmips.

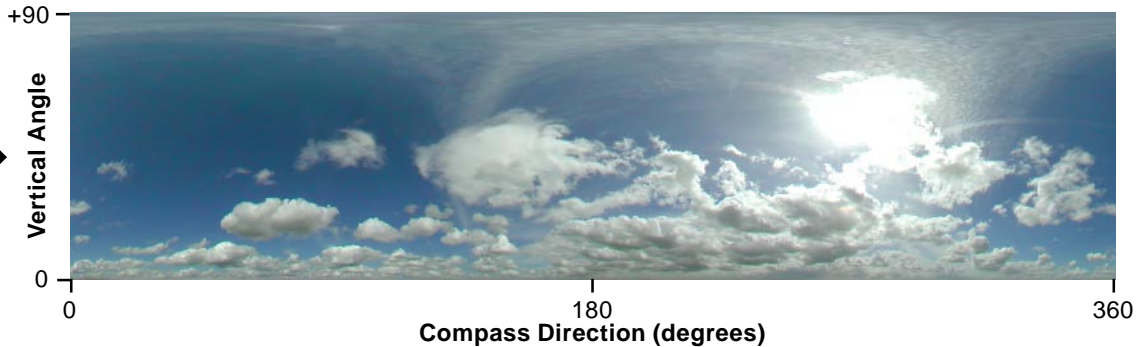
lect for view any sky dome within the Landscape File (or any one of the standard sky domes in the library distributed with TNTsim3D).

If your input image has a ratio of columns to lines close to 4:1, the Add Sky utility resamples it to an upper hemisphere sky dome 512 lines by 2048 columns in size. If the ratio is closer to 2:1, a full-sphere image with dimensions of 1024 lines by 2048 columns is created. Best results are achieved with input images close to one of these sizes. You can directly use an external file in TIFF, JPEG, JPEG2000, or MrSID formats in this procedure; images in other formats must be imported to a TNT Project File before conversion.

About Sky Dome Images



Hemispherical sky photo taken with 180-degree fish-eye lens.



Equirectangular projection of the hemispherical sky photo.

Sky dome images in TNTsim3D are spherical panoramic images represented in an equirectangular projection. This projection “unwraps” a complete sphere or upper hemisphere to a flat image in which the horizontal dimension represents the compass direction (0 to 360 degrees) and the vertical dimension represents the vertical angle to the image cell (-90 to +90 for a full sphere or 0 to +90 for an upper hemisphere image). TNTsim3D reverses the equirectangular projection to render the sky dome image onto the spherical sky-viewing surface, restoring its original spherical geometry.

TNTsim3D initially renders the upper half of a full-sphere image to the sky hemisphere and the lower half to the part of the sphere that is below the horizon; you could therefore use a distinct color or texture in the lower half of the sky dome image to indicate its subterrain-position. When TNTsim3D renders an upper-hemisphere sky dome, the entire image is rendered to the sky hemisphere and the lowest line of cells is replicated downward to fill the lower half of the sky sphere. In either case, controls in TNTsim3D allow you to rotate the sky dome about vertical or horizontal axes if desired.

Obtaining or Creating Sky Dome Images

Additional sky panoramas in equirectangular format are available for free download from:

www.philohome.com/skycollec/skycollec.htm

Web sites providing sky panoramas for sale at varying costs include www.1000skies.com and www.turbosquid.com.

Many commercial sites offer sky images with only the upper (sky) hemisphere or full-sphere images in which the lower hemisphere is blank. To save space in your Landscape Files you should crop the blank lower hemisphere from the latter images before converting them to sky domes.

You can also create your own realistic sky images using one of a number of specialized software packages that can stitch together a series of sky photographs into a spherical panorama. A good source of information about panoramic photography and stitching software (much of it low-cost) is:

www.panoguide.com

Of course, you do not need to start with real sky photographs. A host of graphics packages are available that you can use to create virtual sky images, with results limited only by your imagination.