Spatial Display

Raster Layer Caching

The TNT products are already known for fast display and now some aspects of 2D display are even faster—in fact almost instantaneous, even with hundreds of layers in the view. Some redraw operations, such as hiding a layer that is shown or showing a layer that is hidden, apply to only one layer in the view. When all layers in the view are drawn to a single, shared memory buffer, all layers must be redrawn into the buffer when only a single layer is toggled on or off. In the TNT products, each layer in the view is cached at the scale of the view and buffered independently. Thus, any hide/show event can be nearly instantaneous rather than requiring a redraw of all layers.

Using layer caching to toggle raster and/or geometric layers on and off quickly is very useful when many large layers are involved in a composite view. The effect of toggling geometric layers on and off for a composite view is illustrated on another color plate entitled *Spatial Display: Geometric Layer Caching*. The raster layer caching example below is a composite on-the-fly mosaic of 256 layers, each of which is a 24-bit composite 2003 Digital Ortho Quarter Quad (3.75' by 3.75' DOQQ of approximately 140 MB). It takes about 12 seconds to read, cache at the requested scale, and expose this initial view of all these DOQQs. To illustrate the use of view caching, one of these raster layers has been deselected to hide it (using either the LegendView check box or the layer controls dialog). It takes about 0.25 seconds to expose this new composite view minus the hidden raster or to add it back into the view. Note that the LegendView image is not shown if an object is hidden. The single DOQQ raster object (below, middle) that is being hidden and restored and a full resolution piece of the same raster object (below, right) are illustrated to emphasize the size (140 MB) and detail (1-meter) of the raster object involved in this 0.25 second operation.

You may be concerned about the memory requirements for individual layer caching if you have an older computer. The memory requirement for this form of caching is minimal. Each of these separate layer buffers is only the size required for the part of the individual object that is shown in the view and only at the scale of the view. The original raster and geometric data are not contained in these layer buffers, just their representations in pixels as required for the area they occupy in the current view. Some redraw operations, such as panning or zooming, apply to all layers in the view and require new data be read for these layers from the corresponding original objects. For these operations, a complete redraw of all the layers into their associated buffers is required because a change in scale, or pixel resolution, or relocation of the layer in the view is required.

full view of one DOQQ

255 of 256 DOQQs