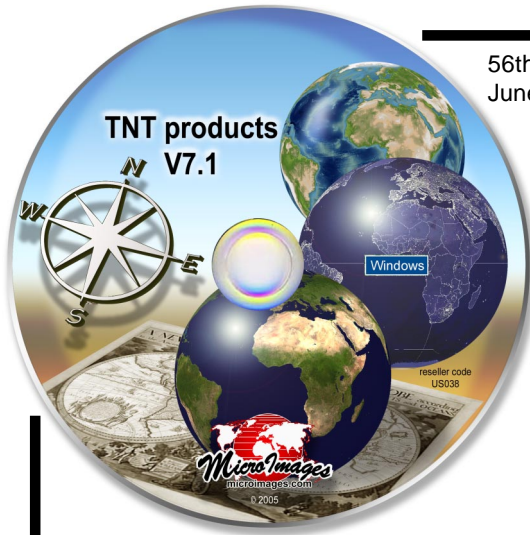


56th Release  
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# V7.1 New Features

**Highlight Features:** Project File Appears as  
Windows Folder with Icons  
3D Views Support LegendView Features  
2D Views Use Instant On/Off Layers  
Simulations Use Manifolds/Make Movies  
View/Import DWG files  
Web Map Service Supported

## ***Project File and Objects Emulate Windows XP/2000 Folder and Icons***

TNT Project Files (\*.rvc) now appear and function on your desktop as an extension of the Microsoft Windows XP/2000/2003 directory structure. Selecting a Project File opens its contents in a standard window with icons representing and providing access to its raster, vector, CAD, shape, TIN, group, layout, and RDBMS objects. Project File folders are represented as icons that can be used to open a new window to access the objects and folders they contain. Typical Microsoft Windows actions can be performed in these windows on the icons representing the contents of a Project File.

### *Project File Folder*

- Find a Project File in any directory as a folder icon.
- Open, close, resize, move Project File folder as any Microsoft folder or window.
- TNT objects appear as icons in this window.
- TNT folders appear as folders in this window.
- View folder contents in 5 Windows modes: Icons, List, Thumbnails, Tiles, and Details.

### *Object Icons*

- Select TNT object icon with left mouse button to open a TNT product and view it (i.e., if Project File's \*.rvc extension registered as application for the TNT product).
- Select TNT group or layout icon with left mouse button to view that group or layout (i.e., builds view of the entire map from all the objects defined by the group or layout).

Try the Nebraska Statewide Land Viewer TNT Atlas DVD distributed with V7.1. It uses a single natural color image of all of Nebraska. This image was mosaicked into a single uncompressed raster object of 1 terabyte from approximately 6000 orthophoto JPEG images of 1-meter resolution. It was then compressed 200:1 using JPEG2000 for use in this atlas. This huge compression retains the 1-meter resolution by blurring the highest frequency variability within cultivated fields and natural areas (i.e., primarily loses crop row structure and small shrubs).



- Use right mouse button on object's icon to open pop-up menu choices such as:  
 "Get Info" on a folder or object to view system-level details and thumbnail view,  
 "Open With" to browse to a particular TNT product to view the object,  
 Add object as a layer to any open view window,  
 Open the object in TNT display or edit mode,  
 View object properties (i.e., metadata accessed by "Info" icon in Project File Maintenance),  
 Browse into subobjects (i.e., masks, tiers, histograms, styles) and view details,  
 Delete or rename an object,  
 Drag object to another Project File folder, and so on.

#### *Integration with Existing Selection Methods*

- Use any of the other methods to open the TNT product and then select the object(s).
- Opening via an icon still opens all advanced layer control dialogs and edit tools.
- Add an object via its icon to a composite view opened by any available method.
- Use any object opened/added from the icon just as before  
 (i.e., this is just another method of viewing or editing objects).

#### ***Auto-Open other TNT Supported Geodata Formats***

Geodata in any format supported for direct use in TNT can be opened in a TNT product by selecting its icon with the left mouse button. The TNT or other application started will be the one assigned to that file extension. Use this in Mac OS X 10.3x or 10.4x and Windows XP/2000/2003. Geodata files currently supported include shapefiles, DWG, DGN, DXF, JPEG, JP2, TIFF, GeoTIFF, PNG, ECW, and MrSID.

- Select the geodata file's icon with left mouse button to open it in a TNT spatial display  
 (i.e., behaves like any other registered file type in Mac OS X and Windows).
- Use right mouse button to "Open With" TNT if file extension registered to some other product.
- Automatically uses TNT link file with pyramids, styles, ... if available.
- Automatically makes TNT link file if none is available.
- Use pop-in dialog to optionally add TNT data not automatically provided by the format  
 (e.g., add pyramids, specify CRS, ...).
- Use as new alternate, but integrated, object selection procedure to start a TNT product  
 (i.e., after selection in this fashion, this is just another TNT object in the view).

#### ***TNTAtlas***

TNTAtlas is FREE software and has no size limitations on the single layer it can directly open and use. Now auto-opening the layer from a TNT object or other geodata object as outlined above makes TNTAtlas a powerful viewer and analysis tool. It no longer requires learning the TNT advanced users' layer selection and layer control procedures to start the product and access a single layer. Now the TNT Project File structure and use of an X server effectively disappears when TNTAtlas is used for the distribution of your geodata. There are many other free viewers, but they do not satisfy important geospatial uses (i.e., large files, pyramided access, RDBMS access, etc.) and analysis (measurement, selection, ...). Use low-cost TNTview in a similar fashion with these same new features for applications using multiple layers.



- Use method familiar to Windows/Mac user to start from any supported geodata icon.
- Use method familiar to Windows user to start from any TNT object, group, or map layout.
- Fast use of all supported formats and objects regardless of size  
(e.g., huge JP2 or MrSID images, large shapefiles, ...).
- Fast subsequent viewing of other geodata formats after first use  
(i.e., poor or inefficient design of other formats resolved when TNT link file automatically built for first use of any supported file, e.g., builds and saves pyramid layers, indexes ...).
- Provides a suite of built-in interactive tools: measurement, selection, region analysis, ...
- Automatically highlights the element(s) providing the contents of the DataTip  
(e.g., show polygon in its color style using solid or transparent fill or boundary only).
- User interface can be customized to focus on a specific use.
- Add interactive analysis tools via SML: Tool Scripts, selection dialogs, web URL access, ...
- Easy installation program available for Mac OS X or autostart or install for Windows.

### ***New Direct Use Geodata Formats***

- DWG files from AutoCAD 2005 and earlier versions (\*.dwg).
- DXF files from AutoCAD 2005 and earlier versions (\*.dxf).
- DGN files from MicroStation V8 and earlier versions (\*.dgn).
- SID files from MrSID (\*.sid) with LINUX.
- Access database now has its table relationships (i.e., schema) available.

### ***2D Display***

#### *Caching Individual Layers*

- Separate memory buffer for each raster or geometric layer in 2D view.
- Each buffer is 32-bit (RGBAlpha).
- Uses 8-bit alpha component in buffer for transparency and other effects.
- Buffer covers only portion of layer in view to conserve memory.

#### *Use of Layer Caching*

- Instantly toggle on/off any layer(s) in a view even if they are part of a group or layout.
- Add new layer draws only that layer.
- Direct selection of new element in view instantly removes previous element's highlight.
- Elements used in DataTip instantly highlight (this is called a mouseover event).
- Highlight DataTip polygon elements in color as solid fill or boundary only.
- Toggles View-in-View tool instantly.

#### *Miscellaneous*

- Toggle on/off duplicate styles in LegendView and multi-object legends.
- Point symbols can now be transparent.
- Improved intersection of styled lines using multipass rendering.
- Select/deselect all styles in list at once for copying.
- Select form of label for UTM map grid to be xXX or xXXN (N = North or other direction).

## **3D Display**

### *Layer Controls*

- Use same powerful LegendView and controls as in 2D views.
- View legends for elements in each layer.
- Add, hide, and control individual layers as in 2D views.
- DataTips are shown for elements in 2D layers.
- All layers (objects) are rendered separately.
  - Geometric elements no longer rendered into the surface drape layer (i.e., resolution of elements no longer set by large foreground image cells).
  - Faster to toggle on and off.
  - Operation, features, and control closely parallel a 2D view.

### *Geometric Layers*

- Improved perspective properties of all element types.
  - Rendered as screen pixel independently of large surface cells in foreground.
  - Improved appearance at vanishing point in background areas.
  - Forced to stay on surface so portions do not disappear below surface.
- Render 2D elements draped on surface with more styles.
  - All element types conform to the surface shape.
  - Point symbol rendered with all style elements including new transparency.
  - Lines rendered as solid or transparent with all patterns.
  - Fill polygons with solid, transparent, hatch, and bitmap styles.
  - Draw polygons “partially filled” using wide border, which draws only inward from boundary (why? complete filling even with transparency can obscure surface detail).
  - CartoScripts are evaluated from attributes just as in 2D renderings.
- Render 3D elements as 3D shapes.
  - Points can be rendered as shaded color spheres and cubes.
  - Lines can be rendered as shaded color pipes.
  - Dashed lines rendered as pipes and spheres.
  - Elements can be rendered at any XYZ position in the 3D view space.
  - Elements with Z = surface elevation are intersected by surface.

### *Rendering Engine*

- Error tolerance setting in variable triangulation controls quality versus speed.
  - Lower setting provides maximum quality at average speed.
  - Higher setting provides acceptable quality at faster speed.
- Variable Triangulation computations now buffered for faster redraws:
  - When changing viewpoint parameters and
  - To add, delete, or modify overlay layers.

## **TNTsim3D**

### *Manifold Surfaces*

- Include manifold surface(s) in a landscape file using Landscape Builder.
- View manifold surface(s) in a simulation
  - (e.g., cross-sections, planar/curving profiles of any orientation, and outlines of 3D volumes).



- Smooth the path of the recording of a simulation and save it.  
Splines the recorded observer position path in 3D.  
Alters axis of Main view smoothly based upon recent, previous positions of observer.

#### *Movies*

- Create movie of the simulation in Main view from the recorded path using SML script.  
Script requests creation of, and access to, each frame of simulation.  
Script can be altered to modify the contents of each frame.  
(e.g., to insert something into each frame such as a logo, a sprite, ...)
- Choose MPEG or AVI format and set the compression level for the AVI file.

#### *Stereo*

- Choose Main view of simulation to be stereo (i.e., 2 views from 2 viewpoints are created).
- Select method from side-by-side, line interleaved, column interleaved, anaglyph, or Sharp.

#### *Help Dialogs*

- Create text objects and add them to the Landscape File.
- Select and view text objects during simulation using Help menu.  
Use for instructions in any supported language.  
Provide metadata about author, geodata sources, description of landscape, ...

### **Other System Level**

#### *Coordinate Reference Systems*

- Improved viewing and analysis of “whole earth” objects.  
Reliably use objects crossing 180 degrees of longitude or including the poles.  
Use orthographic projection from any viewpoint.
- Use shorter, individual country CRS selection lists for easier access.
- Use MODIS image ellipsoid and datum.
- Add datum transformation from Indian 1954 to WGS84 for Thailand.
- Add Macedonia datum and State coordinate reference system.
- Add Stromlo CRS for Australian Capital Territory (ACT).

#### *Miscellaneous*

- Binary null masks used in more processes replacing null value  
(why? using null value is meaningless in lossy compression as in MrSID and JPEG2000).
- Null masks are now very compressed using tile level compression.
- Improvements in speed of vector validation.
- Improved accuracy of specified cell size when rendering to a raster object.

### **New Import/Export Process**

Has new features but is incomplete prototype; process it is replacing is still available.

#### *New Import Interface*

- Select any geodata file type and permitted TNT object type(s) are automatically listed.
- Use easy selection of multiple files.
- View format information in tabular form with sortable columns.
- Search for supported format by extension.





### *New Export Interface*

- Specify format then select object(s) to export.
- Use easy setup for creating multiple files.
- View format information in tabular form with sortable columns.
- Search for supported format by extension and appropriate geodata type.

### *New Formats Imported*

- DWG (\*.dwg) files from AutoCAD 2005 can be imported.
- DXF (\*.dxf) import updated to handle AutoCAD 2005 DXF files.
- Importing an Access database will use its schema to establish its relationships in TNT tables.
- DGN (\*.dgn) import is updated to handle MicroStation V8 files.
- \* Nikon digital camera files can be imported (\*.nef), use with Nikon DX2 12.4-megapixel SLR.
- Ricoh digital Camera images can be imported (using EXIF V2.2 header for its \*.jpg files).
- Kodak Professional Digital Camera files (\*.dcr) can be imported.
- IMG (\*.img) files greater than 2 GB from ERDAS can be imported.
- netCDF (\*.cdf) network Common Data Form can be imported.
- TIGER (\*.rt\*) for 2003 and 2004 can be imported with metadata.

### *New Formats Exported*

- MrSID (\*.sid) files can be exported  
(note: using this requires purchase and use of LizardTech metering cartridge).

### *Mosaicking*

- Much faster loading and processing when using thousands of input rasters.
- Use contrast matching for 16-bit rasters.
- Select “Least Extreme” option for overlap  
(i.e., avoids using either very bright or dark values when more neutral value is available).
- Select “First Raster” option for overlap.
- Automatically name output rasters with input name and number for multiband mosaic.
- Select that null output cells written as maximum value to represent white if exported.

### *TNTedit*

- Trace of erased elements instantly disappears  
(i.e., new caching of individual layers restores view without requiring a redraw).
- Use toggle to suppress leader line for a label moved outside or away from a vector element.

### *Raster Predefined Combinations*

- Apply any available compression method and compression ratio for output raster.
- Choose new operations for computing output cell for stack of cells in input rasters:  
average, count, median, mode, minimum, standard deviation,  
sum, variance, diversity, slope, or offset.

### *Raster Extract*

Extract raster areas for polygon areas selected from CAD or shape objects  
(note: was available only for vector objects in V7.0).



### ***TNTserver***

- Releases and upgrades now concurrent with other TNT products.  
(why? they may use TNTAtlas and other features only available in current TNT products).
- Version numbering now matches other TNT products (e.g., this is V7.1 of TNTserver).
- Weekly patches are now available for download.

### ***Web Map Service (WMS)***

Open Geospatial Consortium (OGC) WMS services are now supported (proposed ISO 19128 standard). Permits the use of anyone's WMS-compliant client to access TNTserver. TNTserver supports versions 1.1.1 and 1.3 of the OGC WMS protocol. The support of this OGC protocol does not require the use of Tomcat but instead uses only a small CGI process that sends the HTTP GET request to TNTserver and sends back the reply from TNTserver. This CGI process is built for Windows, Mac OS X, Linux, and Sun (tntservercgi.exe for Windows and tntservercgi for Linux/Unix). This process permits the TNTserver, which is only available for Windows XP, 2000, and 2003, to communicate with your existing web server. The source code for the CGI process is available and can be modified and extended using the free TNTsdk.

### ***Web Coordinate Transformation Service (WCTS)***

Open Geospatial Consortium (OGC) draft specifications for WCTS services are supported. These provide for transformation of layers or elements from one Coordinate Reference System (CRS) to another. The addition of this protocol means that TNTserver will respond to OGC standard requests for its available source and target CRSs, Coordinate Transformations, and Coordinate Methods plus supported Coverage (image types) and Features. TNTserver also responds to a standard OGC request to transform and send the requested geodata in the target CRS.

### ***Manager***

- New process called "TNTserver Manager" replaces the control panel applet.
- Use a dialog for all setup and modifications with tab panels for:
  - Control: start, stop, pause, upgrade, and to check status and license;
  - Image: control available responses, properties, and permissions  
(i.e., set JPEG, JP2, SVG, and PNG availability, size, quality, number cached, ...);
  - Log: location, frequency, duration, content, ... of user statistics log and connect time;
  - Web: work directory name, address, size, and duration and CGI script address;
  - Logo: logo file and location and its use, size, placement, ...
  - Contact: form to enter administrator contact data required by a WMS;
  - Title: server name, address, keyword list;
  - Directory: add or remove drives and lock or unlock directories; and
  - System: connection port, thread queue size and duration, receive/send timeouts.

## ***TNTclient***

### *WMS Viewer Window*

- Uses open HTML approach, which can be modified as desired.
- Accesses atlases using the OGC WMS services.
- Uses layers from any other standard WMS site.
- Provides composite view in browser window of layers from all WMS sites.

### *WMS Layer Locator Window*

- Uses open HTML approach, which can be modified as desired.
- Opens layer locator/selection panel in second browser window.
  - Select from WMS sites known to your TNTserver and/or MicroImages.
  - Search for unknown WMS sites.
  - Review details for layers advertised by other sites and TNTserver.
  - Graphically review coverage and exclusion area of any site's layers.
  - Graphically review legend with styles for layers if available.
  - Select WMS layers to overlay in Viewer window.

### *HTML and JAVA Based*

- Continue using these earlier TNTclients as the TNT protocol they use is available.
- Tomcat must be installed to support their communication with TNTserver.

## ***Geospatial Scripting Language (SML)***

### *Editor*

- Check current line number shown automatically at bottom of window.
- Select text with shift-arrow or shift mouse click.

### *Expanded Classes*

- Easier to use CRS classes with expanded documentation.
- Save all of a displayed object's viewing parameters so it can be redisplayed as previously.
- Compute contrast based on a set of parameters.
- Specify encoding of imported text fields (supports language localization).
- Set transparency for raster layer.
- Access contrast settings for a raster layer.
- Choose multiple object types in a file selection dialog.

### *Selected New Classes/Functions*

- Directly draw into CAD object.
- Connect to a HTTP (web) server as a client.
- Accept message from an HTTP server.
- Connect to a SOAP (Simple Object Access Protocol) web server.
- Accept parameters from a SOAP web service.
- Define a function to use when any control device is activated during execution of script (e.g., use key to break out of an orbiting or recorded simulation and start new activity).