Geologic Mapping

Making geologic maps is both a science and an art. Geologists must make precise and accurate measurements and observations from outcrops and imagery, integrate observations over a variety of spatial scales, and interpret 3D structures from scattered surface clues. A geologic map is very data-rich, conveying information on rock types, contacts, and outcrop and map-scale structures, each requiring attributes and special symbology. With its seamless integration of GIS, image processing, and 3D visualization, TNTmips is up to the challenge of geologic mapping and geologic map presentation.

Flexible Map Creation and Editing

The Spatial Data Editor in TNTmips and TNTedit provide a flexible environment for creating and editing your geologic map layers.


Draw and edit directly on a pen display.

- **Unlimited reference layers:** Map over composites of aerial or satellite images, scanned field map, contour lines, ...

- **Multiple editable layers:** simultaneously edit contact, fault, structure point, and other layers with automatic backups and multiple undos

- **Pen display support:** draw and edit naturally with a stylus directly on an LCD pen display or separate tablet

- **Relational database:** save attributes for editable layers in relational database structure or link to existing external database

- **Templates:** save templates to reuse relational database structure, database picklists, and styles

- **GPS input:** read GPS coordinates and use to add elements to map layers

Mapping Structures in Stereo and 3D

Mapping geologic structures over an image base requires that you understand the 3D configuration of the surface. The TNTmips Editor provides support for stereo and 3D viewing of your map and reference layers.

- **Edit in stereo:** map over a stereo view of any reference image using a digital elevation model

- **3D views:** open oblique perspective 3D views with full control over viewing geometry

- **Create cross-sections:** automatically generate cross-section prototype along designated section line with topographic profile and marked surface contacts

- **Add custom tools:** add your own custom tool to the map view, e.g. to measure and record the strike and dip of bedding from an image and a digital elevation model

- **DEMs available:** regional and global elevation models are included in the TNT products or use your own for more local detail
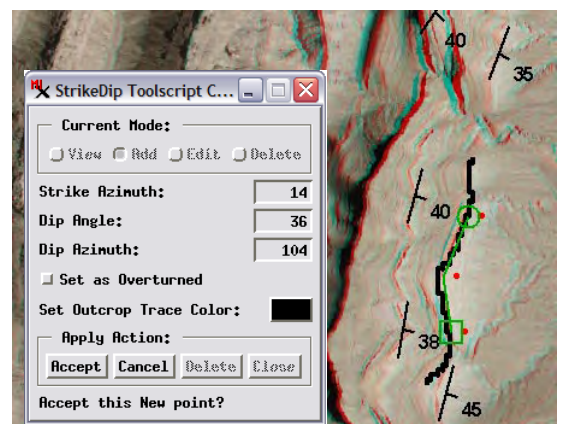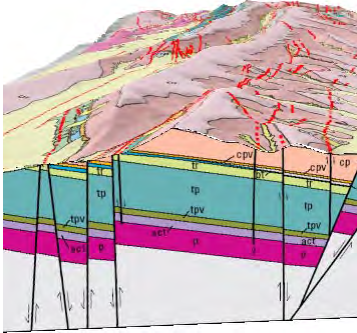

Custom tool to measure and record strike and dip in use with anaglyph stereo view of orthoimage.

2D and 3D Visualization

TNTmips provides a wide range of 2D and 3D visualization options to enhance interpretation and presentation.


3D perspective view of geologic map and cross-section.

- **3D views:** open oblique perspective 3D views with full control over viewing geometry
- **Visual data fusion:** use transparency effects in 2D and 3D displays to visually fuse geologic map data with other layers to produce shaded relief geologic maps and other custom products
- **Cross-sections:** geocode cross-sections or seismic profiles to display vertically in 3D display
- **Fence diagrams:** display multiple intersecting cross-sections in 3D or combine with surface map layers to create 3D block diagrams

Image Enhancement

TNTmips includes a full range of tools for enhancing images to use for recognizing and mapping rock types and structures.

- **Integrated enhancements:** contrast enhancement and spatial filtering integrated into the display and edit processes for maximum convenience
- **Image rectification:** rectify and reproject base images to any map reference system, orthorectify satellite images using rational polynomials
- **Multispectral image tools:** pan-sharpening for added resolution, band ratios to highlight critical lithologies, decorrelation stretch, classification
- **Hyperspectral image tools:** specialized tools for defining, extracting, and mapping target spectra
- **Custom processing:** powerful geospatial scripting environment for developing and applying custom processing and enhancement tools
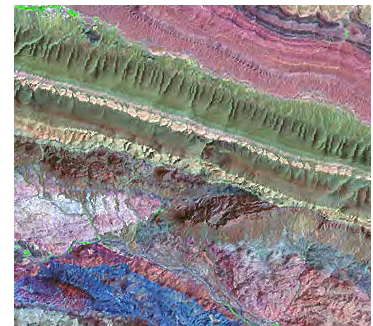
Pan-sharpened Landsat 7 bands in false-color display

Publish Hard-Copy and Electronic Versions

Use TNTmips to lay out geologic map data for printing, distribution as PDF files, or as electronic atlases.
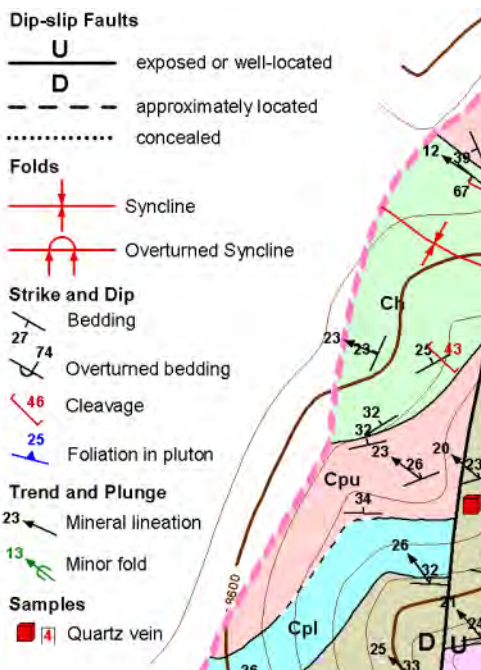
Portion of a geologic map legend created with TNTmips graphical legend-design interface.

- **Complete map layouts:** make hard-copy map layouts with map grids, legends, and scale bars and include 3D views to present fence and block diagrams
- **Legends:** graphical legend-design interface for easy layout of complex map legends
- **Auto-orient attitude symbols:** bedding, foliation, mineral lineation, and others can be automatically rendered, labeled, and oriented using cartographic scripts
- **Fold / fault symbols:** line symbols for map-scale anticlines and synclines (including overturned), normal, thrust, and strike-slip faults are rendered by cartographic scripts
- **Publish to PDF:** publish complete hard-copy layouts as PDF files for easy electronic distribution
- **Publish as Electronic Atlas:** create electronic atlases for viewing in FREE TNTatlas product with layer control, pop-in attributes keyed to cursor location, and access to complete attribute tables
- **Data Export:** export maps and map data to wide range of geospatial and relational database formats such as shape, geodatabase, KML