TopoToImage 4.0.0-beta.1

> Modern recreation of the 1990s Macintosh terrain visualization software

■■ BETA SOFTWARE: This is pre-release software under active development. Please report bugs and provide feedback!

■ Download

macOS Users: [Download TopoToImage v4.0.0-beta.1 (DMG)](https://github.com/jlert/TopoToImage/releases/latest) - 386 MB

See [Installation Guide](docs/INSTALLATION.md) for setup instructions including how to bypass macOS Gatekeeper.

Windows/Linux Users: The application is built with cross-platform libraries (PyQt6, NumPy, GDAL) but has not been tested on these systems. You can try running from source (see Quick Start below). Testers wanted! If you successfully run TopoToImage on Windows or Linux, please open an issue to let us know.

■ Report Issues

Found a bug? [Report it here](https://github.com/jlert/TopoToImage/issues/new) or browse [existing issues](https://github.com/jlert/TopoToImage/issues).

TopoToImage recreates the classic cartographic software from the 1990s and used by professional cartographers and Time Magazine.

■ Key Features

- Advanced Color Gradients - Support for 2-64 color gradients

- Realistic Hillshading - Configurable light direction

- Cast Shadows - Soft-edge shadows

- Interactive Gradient Editor - Drag-and-drop color ramp editing with real-time preview

- Global Coordinate System - Support for worldwide elevation data including prime meridian crossing

- Multi-Format Export - Professional output to GeoTIFF images, Geocart Image databases, PNG, JPG, and layered PNG images.

- PDF Key Files - Automated legend generation with Adobe Illustrator compatibility provides the metadata for the images the program creates

- Elevation data export - Export cropped and scaled versions of elevation databases

■■ Professional Cartographic Output

TopoToImage produces publication-quality terrain visualizations suitable for:

- Scientific Publications - High-resolution academic mapping
- Commercial Cartography - Professional map production
- GIS Workflows - QGIS-compatible GeoTIFF files
- Design Projects - Export a series of PNG files to be loaded as layers in photo editing software

■ Quick Start

Installation

```
# Clone the repository
git clone https://github.com/josephlertola/TopoToImage.git
cd TopoToImage

# Install dependencies
pip install -r requirements.txt

# Launch the application
python topotoimage.py
```

Basic Usage

1. Load Elevation Data - Support for BIL, GeoTIFF, GTOPO30, and SRTM formats
2. Select Geographic Area - Interactive map selection with coordinate input including selection across the prime meridian
3. Choose Color Gradient - Professional gradients or create custom schemes
4. Configure Rendering - Adjust hillshading, shadows, and lighting
5. Export Results - Multiple professional formats with georeferencing

Try the included sample: The project includes `Gtopo30_reduced_2160x1080.tif` - a global elevation dataset perfect for testing all features.

■ Supported Data Formats

Input Formats

- GeoTIFF - Standard georeferenced TIFF format
- BIL - Band Interleaved by Line format
- DEM - Same as BIL
- Single and multi file databases supported

Output Formats

Image formats:

- GeoTIFF Image file - Georeferenced images for GIS applications
- Geocart Image database - Specialized cartographic format
- PNG image - Image file
- JPG image - Image file
- Multiple PNG files - Export Gradient, Hill shading, Shadows, and Elevation as separate PNG files to load as layers in photo editing software
- PDF Key Files - Save the metadata for the exported image

Elevation database export:

- GeoTIFF Elevation database - Georeferenced images for GIS applications
- DEM - Band Interleaved by Line format

■ Gradient System

The gradient system supports five visualization modes:

- Shaded Relief - Pure hillshading without color
- Gradient - Color-coded elevation without shading
- Posterized - Stepped color bands for contour-like appearance
- Shading + Gradient - Combined elevation colors with hillshading
- Shading + Posterized - Stepped colors with realistic shading

■ Global Coverage

TopoToImage handles worldwide elevation data including:

- Prime Meridian Crossing - Seamless Pacific Ocean selections
- Coordinate Systems - Decimal degrees and DMS formats

- Large Area Assembly - Multi-tile stitching across boundaries

■■ Development

TopoToImage is built with:

- Python 3.8+ - Modern Python with type hints
- PyQt6 - Cross-platform GUI framework
- NumPy/SciPy - High-performance numerical computing
- Rasterio - Geospatial data I/O
- Pillow - Image processing and export

■ Historical Context

TopoToImage 4.0 recreates the terrain visualization capabilities of the original 1990s Macintosh software. The original TopoToImage was:

- Commercially successful in the professional cartography market
- Used by Time Magazine for geographic illustrations
- Provided a source for Geocart Image databases created striking color maps that could be used by Geocart the sophisticated map projection software. No problem.

This modern recreation preserves the original's algorithms.

■ License

■ Contributing

We welcome contributions! Please see [CONTRIBUTING.md](docs/CONTRIBUTING.md) for guidelines.