TopoToImage 4.0.0-beta.2

> 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!

■ Two Ways to Use TopoToImage

Option 1: Download the macOS App Bundle (Easiest for Mac Users)

[Download TopoToImage v4.0.0-beta.2 (DMG)](https://github.com/jlert/TopoToImage/releases/latest) - 388 MB

• Simple installation - drag and drop
• No Python or dependencies required
• See [Installation Guide](docs/INSTALLATION.md) for Gatekeeper bypass instructions

Option 2: Run from Source (All Platforms - Bypasses Gatekeeper!)

Recommended for:

• Windows/Linux users
• Developers
• Anyone wanting to avoid macOS Gatekeeper issues

See Quick Start below for instructions.

■ 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 (Running from Source)

Prerequisites

• Python 3.8 or later
• pip (Python package installer)

Installation

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

# Install dependencies
pip install -r requirements.txt

# Launch the application
python topotoimage.py
```

Note: Running from source completely bypasses macOS Gatekeeper restrictions - no security warnings!

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

Platform Status:

- macOS: ■ Fully tested and supported
- Windows: ■■ Not tested - contributors needed!
- Linux: ■■ Not tested - contributors needed!

The codebase uses cross-platform libraries, so Windows/Linux support should work but needs testing and documentation. See [CONTRIBUTING.md](docs/CONTRIBUTING.md) if you'd like to help!

■ 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.