

DEM-derived stereo contour maps for visual analysis of tectonic geomorphology

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I developed a set of stereo contour maps generated from high quality DEMs to visually analyze geomorphological features in detail. The stereo contour maps together with a stereo slope map are more intuitive and efficient for interpretation of tectonic geomorphology than any existing thematic maps.

A DEM visualization software, SimpleDEMViewer is used to generate 2D thematic map and 3D anaglyph map. The 2D contour map is superposed by elevation tints, slope gradation and hillshading to emphasize pseudo-3D effect and micro topography. The image size of raster contour map must be adjusted according the mesh size of DEMs, contour interval and slope, and therefore multiple 2D maps are recommended to depict the variety of topography. 3D stereoscopic image in anaglyph makes a substantial visual effect to interpretation of contour maps.

Stereo contour maps are superior to depict geomorphic surface features, such as alluvial plain, fan, terrace surface, and mountain and volcano slopes. Stereo slope map is superior to highlight geomorphic line features, such as lines of ridge, valley and small scarp, and micro topography smaller than a contour interval.

Figure A stereo contour map showing the tectonic geomorphology of the Nagamachi-Rifu fault zone, Sendai, Japan, generated from 5-m-DEM. Arrows indicate the base line of the flexure scarp on terrace surfaces. Contour interval is 1 m.

Keywords: stereo contour map, stereo slope map, DEM, geomorphological analysis, tectonic geomorphology

