

SHADED, PERSPECTIVE VISUALIZATION OF MORPHOSTRUCTURAL AND GEOLOGICAL DATA OF SE-BRAZIL USING THE GEO3VIEW SYSTEM

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The Mantiqueira and Mar mountains in SE-Brazil are impressive landscapes in terms of amplitude and lateral continuity. To enhance the integration and interpretation capabilities of morphostructural and geological data, three dimensional geometric models were developed. Topographic and drainage data, digitized from 1:250,000 sheets, were interpolated and triangulated. Due to the large amount of points the triangle density have been reduced while maintaining the curvature. Perspective visualization was done within the computer graphics program Geo3View, where meshes of topographic and structural data are displayed as shaded surfaces. Lightsources can be moved around the model to produce distinct shading in accordance to the orientation of the analyzed structures. The viewpoint can be changed interactively by rotating a camera around the model. The geometric pattern and the first order tectonic landforms are represented by the digital terrain models. The dynamic visualization of fundamental features like lateral continuity of scarpments, triangular and trapezoidal facets, spur ridges and their substitution by gravity flows improves the analysis of morphostructural and morphotectonic landscape. Morphological relationships of cronology, orientation, patterns and cut-off, as well as secondary tectonic landforms and morphostructures are easily recognized for the genetic relief visualization and interpretation in structural geomorphology. The superposition on these 3D-models, using texture mapping, of raster images representing drainage net, Cenozoic basins and tectonic structures improves the identification of Quaternary basins and highs, captures and warping of drainage setting, active or inactive lineaments, criteria of tilting and block rotations. These parameters contribute to the establishment of geological hazard and seismotectonic maps.