

Paper Number: 820

Active Lineament Mapping within Karonga Area; Northern Malawi: Using Automatic Lineament Extraction Methods

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The Karonga area is situated at the junction where the eastern and the western branches of the East African Rift System (EARS) cross into the Malawi Rift and the Luangwa Valley in Zambia respectively. As part of the rift system, Karonga has been the most seismically active area in the country. In order to understand the hazard resulting from such activity, we mapped the active lineaments using satellite imagery. The source data used in this study included SRTM DEM, existing geological and geophysical data in order to improve the characterization of the lineaments. Lineament extraction from SRTM DEM was achieved through Automatic Lineaments Extraction algorithm in PCI Geomatica software. All structures inherent to the structural setup trending N-S, NW-SE, NE-SW, NNW-SSE and E-W directions were extracted and buffered out for further analysis. When correlated, the source data with the mapped lineaments largely populated in the central and northern parts of Karonga area, coincided well with the current seismicity. This implies that the current seismicity is influenced by movement along some of the mapped or sub-surface structures which might have the potential of generating the seismicity experienced in the area. More geophysical methods need to be employed to identify these lineaments and associated sub-surface structures to fully understand their orientation, depth and how they interact at depth in order to qualify them as seismogenic lineaments.

Key words: Active Lineaments, Automatic lineaments extraction, Seismicity of Malawi, SRTM DEM of Malawi.

