Seismic Observation and Seismicity of Malawi

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1. National Seismic Observation Network of Malawi

Instrumental seismological observation in Malawi dates back to 1962. Currently, Geological Survey Department of Malawi (GSDM) operates 12 broadband seismic stations throughout the country. Four of GSDM stations are co-located with GPS stations in northern Malawi belonging to SEGMeNT Project led by Columbia University, USA. Two stations belong to AfricaArray Project (Pennsylvania State University, USA) in Zomba and Mzuzu, co-located with GPS and weather Stations.

The rationale is to develop and maintain a national database of earthquake activity in the country and surrounding areas that can be employed in disseminating information to the general public and for use in seismic hazard assessment and decision-making.

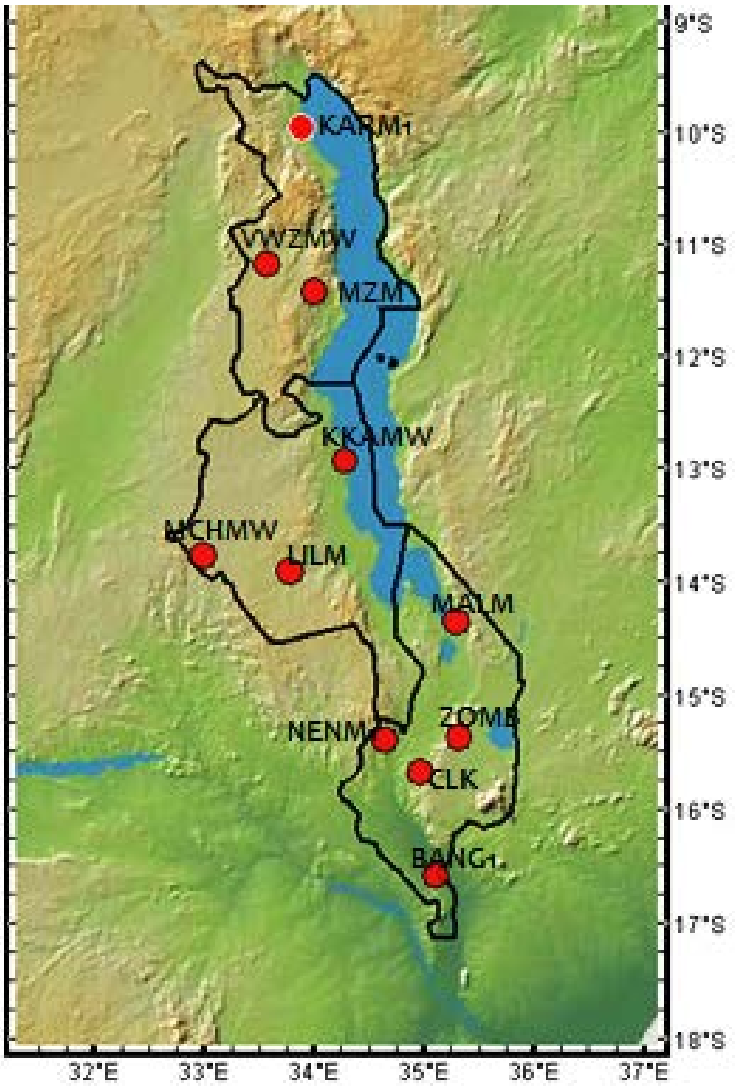

Figure 1. Seismic Stations in Malawi (Basemap: Courtesy of GeoMapApp, Ryan et. al., 2009, http://www.geomapapp.org).

2. Seismicity of Malawi

The available catalogue has events from 1901 which has records of some strong earthquakes such as the Rukwa earthquake (Ms 7.4) on December 13, 1910 south of Tanzania. The catalogue presents 144 earthquakes of between Ms 4.5 to 7.4, with the Rukwa event of 1910 being the largest during the pre-instrumental observation period (1900-1962). In the post-instrumental period, the catalogue has 686 earthquakes of magnitude 4.0 to 6.3, with the Salima event of 1989 (M6.2) and the Karonga event of 2009 (M6.0) being the largest events. The larger events fall within the northern part of the country where highest seismicity is also concentrated.

In Malawi, small-to-moderate earthquakes both from within the country and from neighbouring countries are felt which makes it vulnerable to seismic hazards. The spatial distribution shows northern Malawi as highly active followed by the centre, whereas the south is sparsely distributed. Seismicity picks up after Nsanje (beyond latitude 17.0°S) in Mozambique.

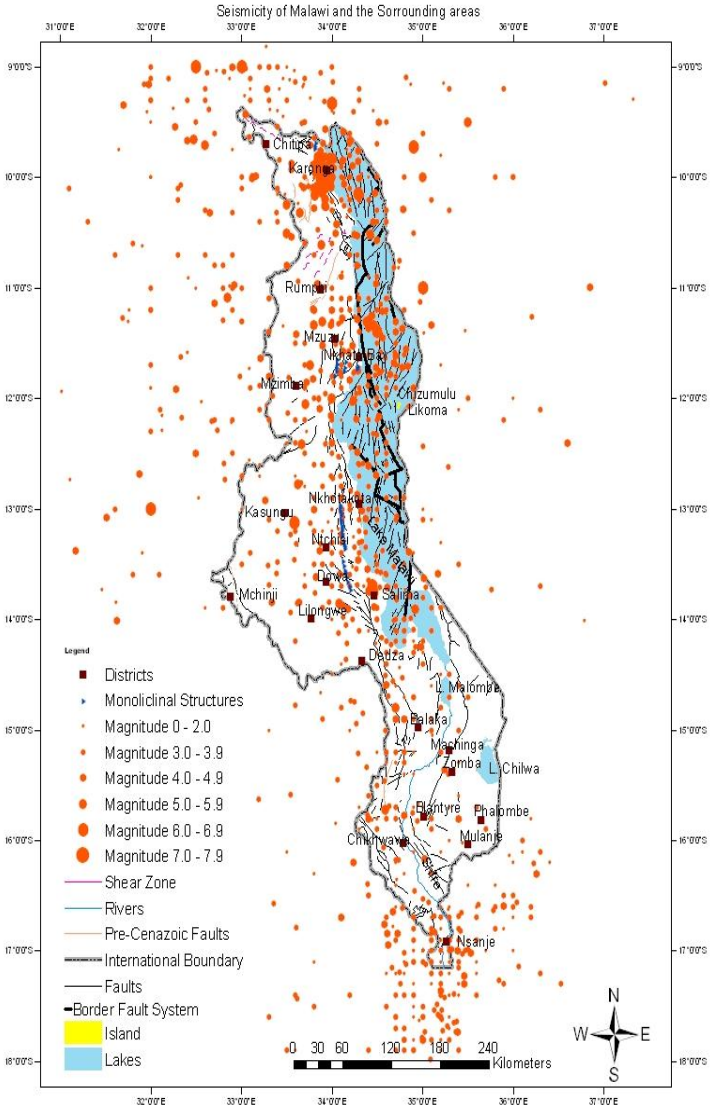

Figure 2. Seismicity of Malawi.