

SEISMIC EXPECTANCY MODELING OF NORTHWESTERN SAUDI ARABIA

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ABSTRACT

Seismic expectancy modeling of northwestern Saudi Arabia utilized the spatial distributions of the seismicity parameters of the magnitude-frequency relation. The spatial distributions are at every degree latitude and longitude comprising the 4X3 degree compartment. Contour maps of iso-a and b values and expected magnitude at 10% probability of exceedance in 50 years were drawn. The map of expected magnitude agrees to some extent to the recent seismic activities and probabilistic estimates of seismic hazards in the region particularly in the gulf of Aqaba. Likewise, the a and b-value distributions were also in conformity with the oceanic and continental tectonics of the region, which show that the continental areas are highly active with small scale events and the oceanic areas are prone to strong and major earthquake events.

Basically, the applied methodology has some level of appropriateness and provides an adaptive approach to physically reliable estimates. Significantly, the study provides a preliminary basis for future occurrences of earthquakes of concern for northwestern Saudi Arabia and the probable identification and delineation of its seismic source areas.