A test of the b-value model for moderate earthquakes off the east coast of Tohoku

Masajiro Imoto[1]; Naoko Yamamoto[1]

[1] NIED

The b-model used to estimate probabilities of moderate earthquakes in the Kanto region is applied to earthquakes in the eastern Tohoku region. In order to use the JMA catalogue, we attempted to calculate the magnitude parameter equivalent to the NIED scale, since our model was developed based on the NIED catalogue for seismicity in the Kanto region. In our previous study, we constructed a table to convert the JMA magnitude scale (Mjma) to the equivalent NIED scale (Mnied) for Kanto earthquakes. Since there is a difference in seismicity between the two regions, we estimate the Poisson rate for a target earthquake based on the Gutenberg-Richter magnitude-frequency relation using earthquakes in the study area during the year 2000. The b-model hazard estimate is given by the product of the Poisson rate and the probability gain calculated from a change in b-values. The study area covers 330 (east-west) x 600 (south-north) x 60 (depth) km**3 volume off the east coast of Tohoku, Japan, where 19 earthquakes with magnitude (Mnied) of 5.5 and greater occurred from 2000 to 2004. The log-likelihood ratio of the b-model compared to the Poisson model estimates a performance level of 7.5, which is lower than that obtained for the Kanto region.