Is it possible to forecast occurrence of a lager earthquake in clustered activities? (A study based on the new JMA catalogue)

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Two years ago, we examined probability of observing a larger earthquake in clustered activities, using a data set of inland shallow earthquakes in the Japanese islands during the period from 1995 through 2000. We especially focused on evaluating probability gains to observe M5 earthquakes in a clustered activity in which two or more earthquakes that exceed a certain threshold magnitude occur succeedingly within some specified distance and period. We got the maximum probability gain 3908.4 when condition of selecting clustered activities and the upper limit of targeted space-time volume are both set to be 5km and 5days.

After the analysis was performed, JMA has revised the hypocenter determination program as well as the method of calculating earthquake magnitude. By the revision accuracy of hypocenters and magnitude scale are considerably improved, and the JMA catalogue is updated back to October 1997.

In this paper we carried out the same analysis using the new JMA catalogue during the period from October 1997 to September 2003. We got a similar result that the maximum probability gain is as large as 2413.5, when the upper limit of distance and period and the selection condition for clustered activities are both set to be 5km and 5days.