

M8 Deep and Shallow

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Abstract: Detailed analysis of the results of applying the M8 algorithm to the New Zealand catalogue reveals a number of surprising features:

1. If the catalogue is divided into crustal and subcrustal events, (taking $d = 40$ km as the boundary), the subcrustal events are predicted more effectively than the crustal events
2. The larger ($M > 6.3$) deeper events tend to be preceded by high values of the M8 series from the deeper events, but by low values of the M8 series from the shallow events.
3. No strong or consistent changes in the M8 series appear to precede the larger shallow events, but there is a weak tendency to follow the same sort of pattern as the deeper events.

A closer examination of the series reveals that these effects may be caused by long-term fluctuations in activity among the subcrustal events, with the increase in deeper activity being accompanied by a decrease in shallow activity. Overall, the forecasting power of the M8 series remains low but still significant. The results may be as important in drawing attention to patterns of seismic activity with geophysical interest than as potential forecasts of seismic hazard.