



## Targeting the next mega-earthquake

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Our understanding of seismic process in terms of non-linear dynamics of a hierarchical system of blocks-and-faults and deterministic chaos, has already led to reproducible intermediate-term middle-range earthquake prediction technique confirmed by statistical testing in forward application from 1992 to the present. The 26 December 2004 mega-earthquake happened to be the first indication that the algorithm M8, designed for prediction of M8.0+ earthquakes and tested in applications aimed at M8.0+ and smaller target events down to M5.5+, can be rescaled for prediction of mega-earthquakes of M9.0+. The event is not a full verification although supported by case histories of the other mega-earthquakes of the 20th century (Kamchatka, 1952; Andeanoff Islands, 1957; Chile, 1960; and Alaska, 1964). The analysis of seismic sequences within space-time of long-, intermediate-, and short-term scales evidence consecutive stages of inverse cascading of seismic activity to the great shock and direct cascading of aftershocks. The first may reflect coalescence of instabilities at the approach of a catastrophe, while the second indicates a certain state of readjustments in the system after it. We compare the observed seismic dynamics prior to and after the mega-earthquakes, which demonstrate common features of predictability and diverse behavior in course second-order phase transitions in complex non-linear system of blocks-and-faults. These features allow suggesting a few locations for the next mega-earthquake expected to shake the Earth within a decade.