High-Resolution Long-Term Earthquake Forecasts for California and Italy

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We present five-year and ten-year estimates of \( m > 5 \) earthquake probabilities in California and Italy. The forecasts will be tested independently and prospectively in the global Collaboratory for the Study of Earthquake Predictability (CSEP). Our long-term forecasts are calculated from smoothing declustered seismicity and assuming a tapered Gutenberg-Richter magnitude distribution. We carefully account for catalog completeness issues and optimize the amount of smoothing in retrospective tests. Confirming a previous finding, retrospective tests suggest that including small \( m > 2 \) earthquakes significantly improves the spatial forecast of \( m > 5 \) earthquakes. In contrast to other, relatively smooth models in CSEP, our forecasts have high spatial resolution - a feature apparently responsible for the model’s current lead in the 19-model, five-year RELM experiment in California. We compare the Californian and Italian forecasts and evaluate the performance of the forecasts using the likelihood score.