

The Collaboratory for the Study of Earthquake Predictability: Perspectives on Evaluation and Testing for Seismic Hazard

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The Collaboratory for the Study of Earthquake Predictability (CSEP) established 4 earthquake forecast testing centers around the world. These centers are rigorously testing more than 100 earthquake forecast models in a truly prospective manner. Centers are operating in Los Angeles (US), Wellington (NZ), Tokyo (JP), and Zurich (CH), covering many different regions and tectonic environments: California, New Zealand, Western Pacific, Japan, and Italy. In addition to regional earthquake forecast testing, CSEP has started a global testing program which is targeting the magnitude range of destructive earthquakes that are relevant for seismic hazard and risk. This program is the first link in the chain of facilities that aim to test seismic hazard and risk models and their underlying hypotheses. To complement the current activities, CSEP is developing methods for assessing the reliability of earthquake early warning algorithms, for understanding the uncertainties and limits of earthquake source inversions, and for the prospective testing of ground motion prediction models. CSEP researchers are also working on creating testable models for many seismological hypotheses, e.g. characteristic earthquakes, maximum magnitude to fault length relation. CSEP is collaborating with large modeling efforts like the Uniform California Earthquake Rupture Forecast (UCERF3) and the Global Earthquake Model (GEM). We present the ongoing activities and give perspectives for the future development of CSEP and its global collaboration.

Keywords: Earthquake prediction, Seismic hazard, Earthquake forecast testing