

VALIDITY OF THE METHODOLOGY FOR RECOGNITION OF EARTHQUAKE-PRONE AREAS

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Accurate definition of the potential earthquake sources plays a main role in development of seismic hazard assessment. This work presents the history of the development and the results of long-term implementation of an original methodology dedicated to pattern recognition of earthquake prone areas that was initiated in 1972 by I. Gelfand, V. Keilis-Borok, E. Rantsman. The methodology is based on the idea, derived from the observations, that large earthquakes are associated with nodes, specific structures forming around the intersections of the fault zones. Since 1972 seismogenic nodes for different target magnitudes have been recognized in numerous seismic regions worldwide including most part of the Alpine belt from Pyrenees to Himalaya, South America Andes, California, Kamchatka, Iberian Peninsula and some others. Totally, 91 earthquakes of target magnitudes occurred in the regions studied with pattern recognition approach since 1972 up to 01.08.2012. 79 of them (87%) took place within the nodes that were recognized in advance as capable of large earthquakes. Note that 27 out of 79 post-publication earthquakes occurred at nodes, where, at the moment of the recognition, events of target magnitude have been unknown yet. Long-term implementation provided strong evidences in favor of reliability of the methodology.