On the real-time earthquake prediction in Kamchatka region by the 1998-2018 data of Kamchatka Branch of Russian Expert Council

Danila Chebrov, Vadim Saltykov, and Yulia Serafimova
Kamchatka Branch of Geophysical Survey of RAS, Russia

Kamchatka Expert Council was established in 1998 as subdivision of the Russian Expert Council for Earthquake Forecasting, Assessment of Seismic Hazards and Risk. Kamchatka is one of the most seismoactive region of the world. More than 30 earthquakes with M>6.0 occurred in 1998–2018. So problem of earthquake and volcano eruption forecasting is important here. Analysis of large earthquake precursors is one of the main functions of the Council. The authors of various methods of earthquake prediction submit their forecasts to the Council. All predictive messages are documentarily recorded. Conclusions about the seismic situation in Kamchatka are delivered to the Government and EMERCOM.

Precursors of large Kamchatka earthquakes 1998–2018 with M>6.0 detected by various kinds of observations and by different methods are shown. Among them there are seismological, geodetic, seismoacoustic, hydrodynamic, hydro- and geochemical, electromagnetic and meteo precursors. Total amount of used methods is more than 20. Most of the applied prediction methods give earthquake waiting periods of about 1 month. All forecasts are divided into successful (time, area and magnitude of expected earthquake correspond to real ones), partially successful (2 from 3 expected value of the parameters are true) and false alarms. Significance evaluations are given for some procedures of monitoring.

The presented data about precursors were received by Kamchatka Branch of Geophysical Survey RAS, Institute of Volcanology and Seismology FEB RAS, Institute of Cosmophysical Research and Radio Wave Propagation FEB RAS, Institute of Physics of the Earth RAS (Moscow), and others. The experience of the documentarily recorded medium-term earthquake predictions made within 20 years using a set of methods is unique.