

10% of Strong Earthquakes ($M>7$) Could Be Predicted in China - New Perspective in Earthquake Prediction

Chen Yong, China Seismological Bureau, 100036 Beijing, China
Yongchen@public.bta.net.cn

Today our approach is much the same as before: we continue to study a succession of case histories of events leading to strong earthquakes. Over the past one or two decades some progress has been made in detailing the case histories of the precursory states before the large earthquakes. Foreshocks are the important precursor that no doubts are physically related to the occurrence of main shock. There exist some characteristics of seismicity pattern in foreshock sequences comparing to earthquake swarm: 1, the epicenters of foreshocks sequence were spatially densely concentrated; 2, the temporal process in foreshock sequences generally can be divided into 4 steps, low activity - very high activity(few days) - quiescence(few hours to a day) - mainshock occurrence; 3, the focal mechanisms of foreshocks were almost the same with the mainshock. In contrast, the consistency of focal mechanisms does not exist in earthquake swarm and in aftershocks. The percentages of earthquakes with foreshock sequences are about 6% and 18% for the mainshocks with Magnitude 5.5 and 7.0 respectively in mainland of China in the past 30 years. This case analysis provides us a possibility to predict earthquakes with foreshock sequences. Earthquake prediction is based not only on the foreshock pattern characteristics, but on multidisciplinary precursory observation. With the new generation of instruments, with the new observation (particularly the electric field, underground gas and so on.) and with the increased resolution in devising solutions to the inverse problem, if more research work will be done in the next 5 years, about 10% of strong earthquakes ($M>7$) could be predicted in China.