

Evolution of Chinese Annual Earthquake Predictions from 1990 to 1998

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China Seismological Bureau has been making official annual predictions since the 70s. The predictions are based upon observations on more than 1700 precursorial elements from 800 observational stations. Every January, an official document is reported to the State Council of China, though kept confidential during the entire predicted year to avoid unnecessary social panic. In this study, we use an R score to evaluate the Chinese annual predictions in the 90s. The entire monitored area of China is divided into 0.5X0.5 cells, and R score is defined as the success rate subtracts false alarm rate. It ranges from +1 for all correct predictions and -1 for complete failure of predictions. The average R-score of the annual prediction in China in the 90s is 0.184. If prediction is completely randomly made, the expectation of R score is 0. Since chances of earthquake occurrence is not homogeneous in space. If a cell is randomly chosen for prediction but the probability to be chosen is proportional to the background seismicity. Then, by random tests, it is found that R score of such prediction is 0.120, and the probability to get R score equal to or better than the actual Chinese prediction in an average year is 0.34. However, in 9 successive years, the chance to get equal or better R score is very low, 10^{-5} only. It is suggested that earthquake prediction in China is not by chance, though it is still in a very preliminary stage.