# A Hazard Assessment of Active Faults in Japan Based on Statistical Simulations - Part 1 Probability of Earthquake Occurrences

Michiyo Sugai[1], Yasuhiro Suzuki[2], Takashi Kumamoto[3], Hirotaka Suzuki[4]

[1] UNCRD, [2] Information Sci. and Tech.,Aichi Pref. Univ., [3] Dept. Geography. TMU, [4] ADRC

The present paper evaluates the hazards of earthquake occurrences from active fault systems in the Japanese archipelago, based on statistical simulations. The following points become clear from the present study: 1) The frequency of earthquake occurrence of the statistical simulations is in fair agreement with that in historical records. 2) 30-year probabilities of one-third of all major active fault systems would be smaller than 10^{-8}. 3) 30-year probabilities of one-third of active fault systems would be larger than 0.01. 4) 30-year probabilities of very few active fault systems would be larger than 0.1. 5) It is very effective for mitigation of earthquake disasters to perform trenching investigations and to find out the most dangerous active fault systems in the Japanese archipelago.
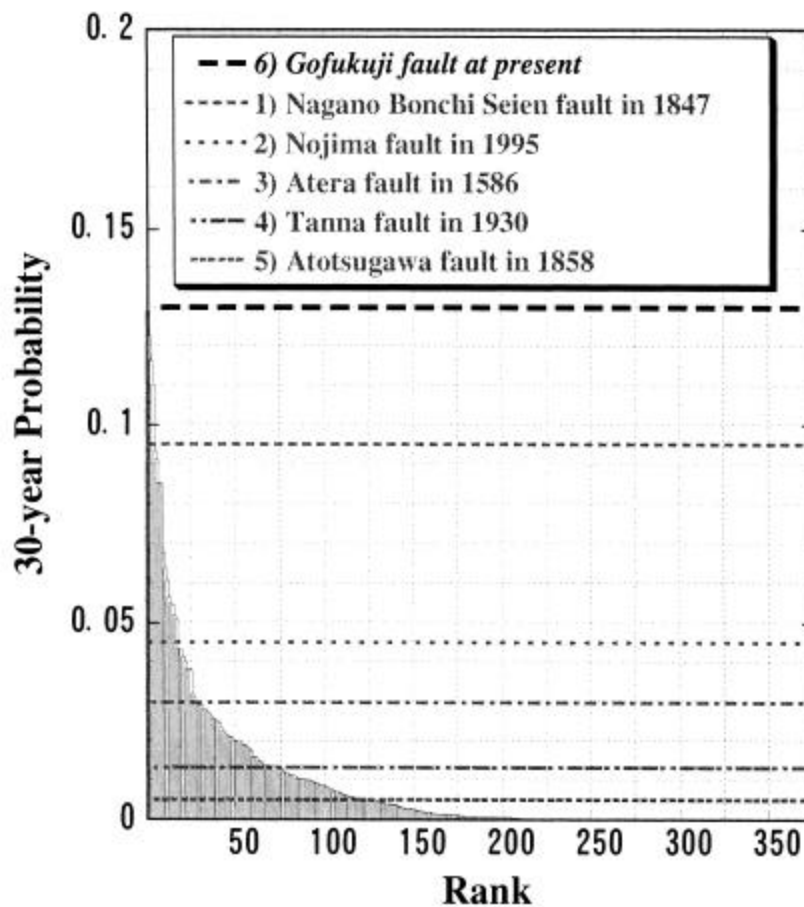
Figure 30-year Probabilities (Set No. 1)

Showing a estimated distribution of 30-year probabilities (probabilities of earthquake occurrences within a 30-year period from the present time). The probabilities are arranged in order of increasing size. The larger probability is in the higher rank. Here it should be noted that the shape of the distribution in the figure is down to the right hand side and downwardly convex. This means that a 30-year probability of one highly ranked active fault system is larger than that of many in the lowest ranked active fault systems. Namely, it is very effective to find out highly ranked (i.e. the most dangerous) active fault systems and to take countermeasures against those. Thus, trenching in-situ investigations etc. are very important as they enable us to identify such highly ranked active fault systems. Figure also shows 30-year probabilities of some active faults where great historical earthquakes occurred. All the probabilities of historical earthquakes were estimated by a subcommittee for Long-term Evaluation of Earthquake Research Committee of the Headquarters for Earthquake Research Promotion. As shown in the legend, the subcommittee estimated the 30-year probability just before the most recent event for active faults Nos. 1 to 5, and at present for No. 6. As is evident in Figure, every 30-year probability of the historical earthquakes can be ranked highly.