

Characteristics of size and activity of the 290 major behavioral segments of active fault in Japan

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<http://unit.aist.go.jp/actfault/activef.html>

The Active Fault Research Center, GSJ/AIST has been constructing an active fault database to make a probabilistic evaluation of the future faulting event and earthquake occurrence on major active faults in Japan. The database consists of three sub-databases, 1: sub-database on individual site, which including long-term slip and paleo-faulting data with error range and reliability, 2: sub-database on details of paleo-faulting, which includes the excavated geological units and faulting event horizons with age-control, and 3: sub-database on characteristics of behavioral segments, which includes the fault length, long-term slip-rate, recurrence interval, most-recent event, slip-per-event and vest estimated segment for cascade earthquake. 290 segments are evaluated in detail.

Active fault strands in Japan are segmented into behavioral segments based on fault discontinuity of 2-3 km and larger, and paleoseismicity. The segments are also grouped into 'seismogenic faults', the best estimation of the earthquake segments, based on the geometric discontinuity of 5 km and smaller. 290 behavioral segments are involved in 150 major those are 20 km and over in length and 0.1 m/ky and over in long-term slip-rate. The Number of behavioral segments in a single seismogenic faults varies between 1 and 14, averaged at approximately 2. The length of the segments is averaged about 20-25 km and only several segments are longer than 45 km. The longest seismogenic faults, named the Median Tectonic Line Active Fault System of 390 km-long was probably ruptured during the 16th century, in a series of large earthquakes, and the second longest Itoigawa-Shizuoka Tectonic Line Active Fault System of 140 km- long was also ruptured between the 8th and 9th centuries. These average number and length of most of the segments are almost the same as the behavioral segments of surface ruptures that occurred in Japan since 1891.

Displacement per event of the segments varies between 1 and several meters and dose not show significant regional variation all over Japan. The amount of displacement is not a function of the length of seismogenic fault, but that of behavioral segment. On the other hand, recurrence interval of faulting event of those segments varies very much from 1 ky to 30 ky and over. The interval has a tendency of increasing from outer arc side to the inner arc side on land, according to the gradient of crustal strain in both geological and geodetic times.