

Rupture history and net slip of the Western Boundary Faults of the Fukushima Basin, Northeast Japan

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The Western Boundary Fault Zone of the Fukushima Basin, northeastern Japan, is composed of several active faults. We examined the recent activities of the Shiroishi Fault (northern part of the fault zone) and the Daiyama Fault (southern part of the fault zone), on the basis of trenching and drilling surveys across the fault traces.

By these excavations, we are able to provide evidence of two faulting events of the Shiroishi Fault for the past 14 kys. Based on the radiocarbon dates, the timing of the most recent faulting and the penultimate faulting on the fault are bracketed to be between 2.4 and 2.6 ka and 9.5 to 11.8 ka, respectively. The average recurrence interval is larger than 7kys. Each reverse slip is ca. 2.5-4 m.

The trenches across the Daiyama Fault clearly exposed five to six paleoearthquake surface faults since ca. 25ka. These faulting events occurred during 1.9-2 ka, 5.6-6.3 ka, 8.5-9 ka, 13-14 ka, 14-19.5 ka and 23-24 ka, respectively. Therefore, we roughly estimate that the Daiyama Fault has been active and produced large earthquakes with an average recurrence interval of about 3-4 kys since ca. 25 ka. The average net slip associated with each event is estimated to be over 2m.

There have been no simultaneous reactivations of these active faults. Reverse faultings have occurred more frequently on the Daiyama Fault than on the Shiroishi Fault.