

HIGH-RESOLUTION ANALYSES OF PALEOEARTHQUAKE SIGNALS IN JAPAN

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Japanese fields of paleoseismology are characterized by high human activity and high watertable, while seismic activity is relatively low compared with plate boundary areas. This paper summarizes our techniques for better paleoseismological records in the circumstances. Long and intense human activity tends to erase evidence of faulting, but man-made features offer excellent time-markers and ideal piercing points for fault displacement. As to chronology, the accuracy of historical-archaeological time-scale in these two millennia is often better than unrefined radiocarbon dates. In paleoseismological analyses of past human activities, geologists always collaborate with archaeologists to bring such valuable information as the time-series of Nankai megathrust earthquakes employing archaeological sites as seismometers. Watertable has been high in most areas in Japan for Late Quaternary. Water-laid fine sediments and peat are the best recorders of paleoearthquakes when we solve engineering difficulties. Furthermore, several tectonic lakes have continuously accumulated fine sediments over tens of thousands years. Intensive analyses of 30 m long Postglacial sedimentary cores were conducted in Lake Suwa in Central Japan. A number of physical and chemical parameters were acquired every 5 cm to extract signals of coseismic change in lake-depth in addition to shaking effects. Sudden change from shallower and oxidizing condition to deeper and reducing condition clearly indicates coseismic drop of the lake basin. The analyses revealed eight previously unknown faulting events by the lake. This record together with 15 trenches along a 150 km long tectonic line is making realistic forecast possible.