

Holocene tectonic landform of the eastern marginal fault of the Nara basin

*Hiroyuki Tsutsumi¹, Nobuhiko Sugito², Noriyoshi Yoshida¹, Haruo Kimura³

1. Department of Environmental Systems Science, Faculty of Science and Engineering, Doshisha University, 2. Faculty of Sustainability Studies, Hosei University, 3. Central Research Institute of Electric Power Industry

The north-trending eastern marginal fault of the Nara basin consists of a series of east-dipping reverse faults at the topographic boundaries between mountains and hills on the east and basins and lowlands on the west. The fault zone poses high seismic hazards to the central Kinki area as it passes nearly Kyoto and Nara metropolitan areas. However, the probability of earthquake occurrence from this fault zone in the next 30 years is very loosely constrained due to considerable uncertainty on the timing of the latest faulting event. The Disaster Prevention Research Institute, Kyoto University, has started a 3-year research project called "Comprehensive Research Project for the Nara-bonchi-toen Fault Zone" that is funded by the Headquarters for Earthquake Research Promotion, MEXT. Doshisha University is responsible for theme 1 of the project that focuses on active fault mapping, slip rate estimation, and obtaining data on the past activity of the fault zone. As part of investigations under theme 1, we acquired 0.5-m-mesh digital elevation data from airborne laser scanning over the fault zone in the northeastern margin of the Nara basin. Besides, we interpreted 1:10,000-scale aerial photographs taken immediately after World War II by the US military. We identified a few localities with tectonic scarp less than a few meters high that are probably related to the most recent movement of the fault. Also, geologic cross-sections using the "Database for Boreholes in the Kansai Area" clearly illuminate the deformation of the Osaka Group and the overlying terrace deposits by the fault strands, which enables us to estimate the vertical offsets of strata and to estimate dip-slip rates.

Keywords: the eastern marginal fault of the Nara basin, airborne laser scanning, tectonic landform, borehole data