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Tectonic tilting inferred from difference in Holocene relative sea-level changes among the sites in the Nobi Plain

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This study presents relative sea-level (RSL) curves since the middle Holocene for six core sites on the Nobi Plain, Japan, and considers the influence of vertical tectonic movements on RSL. The cores reveal a typical deltaic succession in which sedimentary facies can be divided into five units. In ascending order these are braided river (unit A), fluvial to intertidal (unit B), inner bay (unit C), delta front (unit D), and delta plain (unit E). Electrical conductivity (EC) in uppermost unit C is proportional to the thickness of unit D, and provides an indication of the water depth close to the top of unit C. We translated EC in unit C to water depth by applying the function y = 5.2x (x = EC, y = water depth). We then estimated RSL by adding the EC-derived water depth to the sea-floor elevation obtained from sediment accumulation curves derived from 115 14C ages. RSL at 6000 cal BP increased with distance from the Yoro fault system. RSL at the four core sites nearest the fault system has been rising continuously since 6000 cal yr BP, indicating subsidence in this area. This trend of continuous rise of RSL and the differences in RSL among core sites show that the Nobi Plain has been tilted down to the west in response to Holocene activity on the Yoro fault system.

Keywords: electrical conductivity, Holocene relative sea-level changes, Nobi Plain, sediment core, tectonic tilting, Yoro fault system