AOGS 2006

Past 900-Year Vertical Crustal Movements Reconstructed from the Stratigraphic Record Along the Pacific Coast of Central Japan

OSAMU FUJIWARA[1], JUNKO KOMATSUBARA[1], KEITA TAKADA[2]

[1]*Active Fault Research Center, AIST*

[2]*Fukken Co., Ltd.*

Accumulation of coseismic subsidence and uplift related to the subduction-zone earthquakes occurred around the Nankai Trough during the last 900 years was reconstructed from the stacking pattern of a strand plain system in the western coast of Shizuoka Prefecture, Pacific coast of central Japan. Stratigraphic succession of the plain, excavated by orientation-controlled 30 cm- wide geoslicer, is composed of upper shoreface sand (US), foreshore sand (FS), backshore sand (BS) and back marsh mud, in ascending order. Upper boundary of FS, now 0.45-0.65 m in height, approximately indicates the former tide level. This height value is settled into the range of present high tide level around the study area, +7 cm to +74 cm in height. Then, vertical crustal movement has been scarcely accumulated since the deposition of the FS. Estimated age of FS, based on 14C dating, is 12th Century or a little older. About 0.6 m subsidence was observed around the study area at the AD 1854 Ansei Earthquake (Hatori, 1985), though the area shows an uplifting trend with rate of about 3 mm/y during the last 100 years (Xia and Fujii, 1992; Kunimi et al., 2001). If the 3 mm/y uplift has been accumulated without interruption by coseismic subsidence since the 12th Century, the FS in the study area ought to reach around the height of 2.7 m. This 2.7 m gap between the estimated and observed heights of the FS probably indicates the accumulated value of coseismic subsidence. Since the 12th Century, seven subduction-zone earthquakes occurred around the Nankai Trough (Sangawa, 2004). The last AD1944 Earthquake was not accompanied with coseismic subsidence (Fujii, 1980). Average value of coseismic subsidence by remaining six earthquakes is calculated to be about 45 cm and close to the value at the AD 1854 Earthquake. Coseismic uplift possibly occurred before the 12th Century. The succession of US, FS and BS shows a emergence process of the beach system. Emerged beach is now covered by a coastal dune with 100 m wide. Emergence of the beach system is probably attributed to the rapid sea-level fall triggered by a coseismic uplift. References: Fujii, Y. (1980). Jishin, Tokai Publication. Hatori, T. (1985) Gekkan Chikyu, 7, 182-191. Kunimi, T. et al. (2001) Jour. Geogr. Surv. Inst., no.96, 23-37. Sangawa, A. (2004) Mem. Geol. Soc. Japan, no.58, 11-18. Xia, S. and Fujii, Y. (1992) J. Phys. Earth , 40, 657-676.