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Estimation of causative faults producing crustal upwarping in the Nishi-tsugaru Coast, Northeast Japan

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The Nishi-tsugaru Coast, Northeast Japan, has experienced co-seismic shoreline uplifts associated with two historic earthquakes (either M6.9) which occurred in 1704 AD and 1793 AD (Imamura, 1920; Usami, 2003). Although each offshore causative fault model was proposed to explain the height distribution of co-seismically emerged abrasion platforms by Nakata et al. (1976) and the small tsunami generation (Sato, 1980), neither models did not coincide with active tectonic structures and topography. Re-recognizing Holocene emerged tidal topography and their dating, we aim to estimate actual causative faults of which movements match the upwarping of paleoshoreline features and active geologic structure in the surrounding submarine areas. Based on the concordance among the deformation modes indicated by co-seismic records and late Quaternary marine terrace records, the causative fault of 1793 earthquake is assigned to the Kita-kanegasawa fault developing the Odoose anticline described in the geological map by Hirayama and Kamimura (1985), and similarly that of 1704 earthquake is likely the Omagoshi fault in Osawa (1963). In addition, the most northeast area of this coast has been probably up-warped by the active movement of Ajigasawa fault, and the Henashi peninsula in the central part of the coast by that of a submarine active fault which is estimated below the steep tectonic scarp several kilometer offshore

Keywords: emerged shoreline topography, upwarping, coseismic uplift, causative fault, Nishi-tsugaru Coast