

Late Holocene marine terraces at Bakkai and Noshappu, Hokkaido: Evidence for coseismic uplift along the northeastern Japan Sea

Tatsuya Ishiyama[1]; Toshimichi Nakanishi[2]; Nobuto Morishita[3]; Masanobu Shishikura[4]; Tomoo Echigo[5]

[1] Active Fault Research Center, AIST; [2] GSJ, AIST; [3] Geography Sci., Tohoku Univ.; [4] Active Fault Research Center, AIST, GSJ; [5] GRI

We present distribution, structures and ages of Holocene marine terraces constrained by tectonic geomorphology and shallow borehole transects to define periods of paleoseismic events in the northeastern Japan Sea region, where the relative North America - Eurasia plate convergence is partly consumed by a 150-km-long array of west-verging, active thin skinned fold and thrust belt that is expressed as middle Pleistocene to Holocene folded and/or uplifted shallow marine sediments. Stereopair interpretation indicates that two levels of late Holocene paleo-shorelines elevated up to 2.4 to 3.5 m and 6.8-7.2 m, and 2.1-2.3 m and 3.7-4.6 m above the active shorelines at Bakkai and Noshappu sites, respectively, are located above the crest or forelimb of the frontal fold that underlies beneath the coastal plains. Drilling investigations by use of percussion sampler, hand auger and handy Geoslicer across these elevated former shorelines indicates that two flights of late Holocene marine terraces are underlain by foreshore deposits and erosion surfaces above the underlying Pliocene-Pleistocene units, suggesting that repeated relative sea level falls occurred during the late Holocene. We thus emphasize the importance of late Holocene marine terraces as geomorphic evidence of coseismic growth of active fold beneath coastal plains, and additional radiocarbon dating of foreshore deposits will provide more insights into future seismic potential of this large actively forming but elusive compressive structure.