

Longitudinal river profiles crossing marine terraces at northern part of western Osado coast, Sado Island, central Japan

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Marine-terrace development of the Middle to Late Pleistocene and Holocene at coast of Osado, northern part of Sado Island, central Japan, indicating tectonic uplift has been described (Ota, 1964; Tamura, 1979). At northern area of the western Osado coast, series of Pleistocene marine terraces are identified (MIS 13, 11, 9 and 5e) and Holocene marine terrace is also recognized. Here, based on drainage analysis using high-resolution DEM, river knickpoints are identified on detailed longitudinal river profiles crossing the marine terraces. At 9 out of 10 rivers, major river knickpoints develop within 500 m upstream of river mouths, those likely formed together with sea cliffs eroded during post-glacial sea-level rise and following high stands.

Retreat of sea cliffs and river knickpoints associated with coastal erosion would have finished when the Holocene marine terraces emerged. After the emergent, the river knickpoints retreated by fluvial incision. Distances between sea cliffs and river knickpoints could be distance of knickpoint retreat. The distances are detected as 100-150 m based on 1:25,000 topographic maps and DEM analysis. Assuming that the emergent occurred during 7-8 ka, the rates of knickpoint retreat range 12-21 m/ky. These rates could be high enough to dissolve old river knickpoints, formed on or before the Last Interglacial period (MIS 5e).

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