

Changes in tides and tidal current in the Tsushima Strait estimated from a numerical model

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Tidal changes in the Tsushima Strait connecting the Sea of Japan and the East China Sea since the Last Glacial Maximum has been investigated by conducting a series of 2-d paleotidal simulation. The numerical runs were undertaken by including both the East China Sea and the South China Sea as a model domain to implement the effect of tidal changes in the Taiwan Strait on the current study region in more realistic manner, and by raising the sea level uniformly by 10 m from -120 m to 0 m. These experiments predicted tides and tidal currents of four major constituents.

The model results indicated that semi-diurnal tides were developed within the strait west of the Tsushima Island when the relative sea level was -30 m or lower. For example, the estimated M2 tidal amplitude off Hirado, the NW Kyushu Island, was about 2.1 m, more than twice as large as the present value when the sea level was 90 m lower than present. This tidal-amplitude maximum region was bounded on both eastern and western sides by two zones where strong semi-diurnal tidal currents were observed: eastern zone along the eastern and western coast of the Tsushima Island and western zone off the NE coast of the Goto Islands.

These developed tides and tidal currents in the Tsushima Strait during the latest Pleistocene to the early Holocene might have influenced the marine ecological and sedimentary environments in this region.

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