

Tidal changes at Asian deltas in response to future sea-level rise

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A numerical model has been employed to assess the impact of sea level rise on tidal regimes in the East China Sea and the South China Sea with a special interest on tidal changes at around the deltaic region where the elevation is low and coasts are vulnerable to changes in water levels. The model covers the East and South China seas as a whole with a spatial resolution of 2 minutes (approx. 3 km). A preliminary result for the East China Sea suggests recognizable changes in the amplitude of M2 tides and M2 tidal currents at region such as Hangzhou Bay, the Changjiang Estuary and Haizhou Bay when the sea-level was raised by 1 m. Off the Changjiang Estuary, for example, tidal velocity increased for more than 10 cm/s at deep channels while decreased by about 5 cm/s on shoals. These results indicate that the sea-level rise may alter equilibrium among water currents and seafloor and modify the bottom topography of large estuaries and subaquatic deltas through the induced changes in tides and tidal currents.

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