

Monthly-resolved coral barium isotopic records in the South China Sea and its paleoceanographic implication

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Marine barium (Ba) is an important proxy for the nutrient cycle, productivity and the mixing of water masses. However, the factors affected Ba cycle are complicated and not fully understood. Here, we present monthly resolution *Porites* coral records of barium isotope ($\delta^{137}\text{Ba}$) at site of Nanwan, and yearly resolution *Porites* coral records at sites of Xiaoliuqiu, Weizhou Island, Longwan, Xiaodonghai and Yongshu Reef in the South China Sea (Fig. 1). Monthly coral $\delta^{137}\text{Ba}$ records from the coastal site of Nanwan express a seasonal cycle from 0.30‰ in dry season to 0.25‰ in rainy season, negative correlating with Ba concentration ([Ba]). Annual mean records vary from 0.08‰ to 0.25‰, also exhibiting an anti-phasing relationship with [Ba]. High [Ba] and low $\delta^{137}\text{Ba}$ recorded in coastal corals could be attributed to input of terrestrial sediment flux in rainy season by a binary mixture with fresh water and surface seawater. However, the coral records at open-ocean sites, with a less terrestrial influence, are characterized with high $\delta^{137}\text{Ba}$ and high [Ba]. Ba isotopes in shallow-water corals show great potential as a proxy for land-sea interactions and water mass mixing.

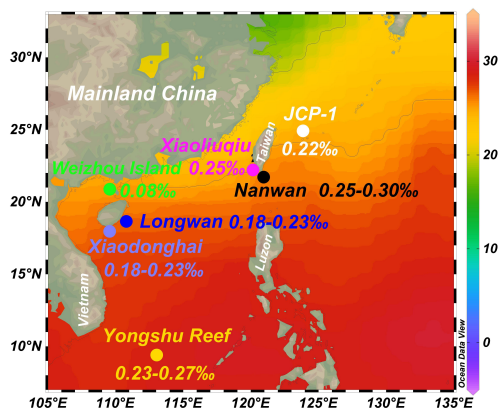


Figure 1. A sea surface temperature map with locations of the coral samples and $\delta^{137}\text{Ba}$ are indicated.