

**Variations in the East Asian
summer monsoon during the
last 400 kyr reconstructed using
oxygen isotope and Mg/Ca-
derived sea surface
temperatures at IODP Site
U1429**

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The East Asian summer monsoon (EASM) system is a fundamental component of the Asian hydrological cycle, and therefore plays a crucial role in the regional and global climate system. Modern summer sea surface salinity in the northern part of the East China Sea (ECS) is tightly controlled by the freshwater discharge of the Yangtze River, which reflects the intensity of EASM precipitation in southern China. Site U1429 was drilled during Integrated Ocean Drilling Program Expedition 346 in the northern ECS to reconstruct Yangtze River discharge at a high temporal resolution (~100 years). A ~200 m long sediment sequence was recovered and spans the last 400 kyr based on the benthic foraminiferal oxygen isotope record. A record of sea surface salinity was reconstructed using oxygen isotope measurements of seawater ($\delta^{18}\text{O}_{\text{sw}}$) coupled with Mg/Ca ratios of the planktic foraminifera *Globigerinoides ruber*. Variability in the $\delta^{18}\text{O}_{\text{sw}}$ over the last 400 kyr show very similar changes to $\delta^{18}\text{O}$ from Chinese speleothems on millennial to orbital scales. Comparison with the global $\delta^{18}\text{O}_{\text{sw}}$ records show the $\delta^{18}\text{O}$ at Site U1429 follows the global mean signal except during MIS 7.3 to MIS 6.4 and from MIS 5.4 to MIS 4, when the $\delta^{18}\text{O}_{\text{sw}}$ at Site U1429 is higher during MIS 7.2, 6.4, 5.4, 5.2, 4 and lower during MIS 7.3, 7.1, 6.5, 5.3, 5.1. These intervals correspond to higher eccentricity periods during the last 400 kyr, where the amplitude of variation in regional $\delta^{18}\text{O}_{\text{sw}}$ is increased, suggesting the 23 kyr amplitude of the EASM precipitation is also enhanced. These results suggest that the 23 kyr amplitude of the EASM precipitation has probably been modulated by the eccentricity.