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 (δ18Osw) coupled with Mg/Ca ratios of the planktic foraminifera Globigerinoides ruber. Variability in the δ18Osw over the last 400 kyr show very similar changes to δ18O from Chinese speleothems on millennial to orbital scales. Comparison with the global δ18Osw records show the δ18O at Site U1429 show very similar changes to δ18O from Chinese speleothems on millenial to orbital scales. These results suggest that the 23 kyr amplitude of the EASM precipitation has probably been modulated by the eccentricity.