Geophysical Research Abstracts
Vol. 15, EGU2013-7146, 2013
EGU General Assembly 2013

Coral isotopic records during the medieval period from Ishigaki Island, northwestern Pacific

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Proxy-based paleoclimate reconstructions in high time-resolution and modeling studies have been greatly advanced in recent years to understand global temperature history over the past 1000 years. However, most proxy data for these reconstructions are from terrestrial sources such as tree-rings, speleothems, etc., and very few marine records in annual resolution have been obtained over 500 years. This is considered to be one of reasons for large uncertainties of global scale climatic reconstructions. Marine sediments can provide long consecutive records from several thousands of years to several million years. However, their time-resolutions of several tens to several thousands of years are insufficient for reconstructing decadal to centennial climate variabilities. Coral skeletal proxies, such as oxygen isotope ratios (δ^{18}O) and Sr/Ca, have been used to reconstruct tropical and subtropical sea surface paleoenvironment in much higher time-resolution of weeks to months, which could provide comparable results with tree-ring records.

The Northwestern Pacific is one of regions with sparse long paleoclimate records in high time-resolution for the last 1000 years. We collected a medieval fossil coral (*Porites* sp.) with a height of more than 5 m from a fringing reef of the southern coast of the Ishigaki Island, southern Japan, where the East Asian monsoon is predominant. Using combined annual age determination by annual band analysis and high resolution isotope measurements, yearly δ^{18}O was obtained spanning 300 years of about 1000 years ago (1535+-35 $\sim$ 1260+-80 ^{14}C age (ca. cal AD 850 $\sim$ 1150)). This period corresponds to the beginning of the Medieval Warm Period, recently more commonly referred to as the Medieval Climate Anomaly (Stine, 1994), and it also is marked by a tendency for La Niña-like conditions in the tropical Pacific (Mann *et al*., 2009). Here we discuss about the transition to the warm period of the northwestern Pacific and its degree by comparing with other regions' and large-scale reconstructed temperature variations.