

BPT014-05

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Climate reconstruction based on a 120-year coral record In order to understand climate system in the Western Pacific

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Hermatypic corals in the tropics are recognized as the excellent archives of past climate and environmental conditions based upon the stable isotopic composition and the contents of trace elements of their skeleton provide quantitative and reliable information about them. In this study, Sr/Ca ratio and $d^{18}O_{\text{coral}}$ analysis of a coral from the eastern coast of Philippines were conducted. Our environmental reconstruction based on a 120-year coral record has revealed that this area is influenced by EAWM (East Asian Winter Monsoon) as well as ENSO (El Nino Southern Oscillation) in spite of tropical region.

<ENSO>

High (low) correlation between $d^{18}O_{\text{coral}}$ and $d^{18}O_{\text{seawater}}$ during El Nino (La Nina) events and high (low) correlation between $d^{18}O_{\text{coral}}$ and SST during La Nina (El Nino) events were detected. This seems to indicate the asymmetry of ENSO in this region. ((1) Negative rainfall anomaly during El Nino event has more influence on $d^{18}O_{\text{seawater}}$. (2) Westward migration of the WPWP during La Nina event has more effects on SST.)

<EAWM>

Reconstructed winter SSTA and Winter Monsoon Index (WMI) shows good correlation in some regimes and the timing of the phase shift is similar. The spectral analysis of WMI shows inter-decadal periodicity as well as inter-annual periodicity. And t-statistic displays the magnitude of EAWM has changed on the decadal scale. This transition has occurred around regime shift years. It is suggested that winter SST variability in this region reflects the change of the wind stress related to the decadal variability.

Based on these perspectives, we further consider climate system in the Western Pacific.