

## Reconstruction of past Kuroshio pathway using stable isotope records in coral annual bands

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Massive, hermatypic coral colonies have annual bands due to the seasonal change of the skeletal density. Since these corals have high skeletal growth rates, they are commonly used as tools for reconstructing near past ocean environmental changes with a temporal resolution from weeks to months.

Oxygen isotope ratio of the coral skeleton, which is the most common proxy, is controlled by temperature and oxygen isotope ratio of seawater when the skeleton is formed, and if the latter can be neglected, it can be used for paleothermometry.

Purpose of this study is to reconstruct ocean environmental changes for last 100 years, especially to reveal the past Kuroshio pathway based on the isotope analysis of coral skeletons collected from two remote locations in the Naisei Islands.

Coral samples were collected from Yonaguni and Takara islands in 2001 and 2005 respectively. These are optimum locations to minimize local influences because 1) both islands do not have well developed reefs, 2) there are no river inputs nearby collection sites, and 3) both coral samples have been collected at depths more than 10 m.

Carbon and oxygen isotope ratios are determined with monthly resolutions until 1911. Long-term changes of seawater temperature estimated from these oxygen isotope ratios show good agreements with ship-based seawater observations for both locations, therefore, seawater salinities, which can be estimated from seawater isotope ratios, have been unchanged for last 100 years. Coral isotope records indicate that elevation of seawater temperature in winter has been more than that in summer.

Inter-annual variation of coral-based seawater temperature and its relation to the past Kuroshio pathway will be discussed.