

サンゴ礁と造礁サンゴを用いた完新世の 高精度海面変動復元にむけて

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High-resolution Holocene Sea-level Change Based on Coral Reefs and Hermatypic Corals

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Abstract

The importance of Holocene sea-level change has long been a central theme of Quaternary Science. Holocene sea-level records provide direct evidence of the progress of the melting of the ice sheet during the Holocene. Although the correlation between ice and ocean volumes is incontrovertible, casual links are commonly obscured. Some regional studies of coral-reef sites based on analyses of boring cores have been carried out from reef flat to reef slope at present-day reefs, demonstrating a long-term (1000-10000 years) and large-amplitude (10-100 m) melt-water history. However, short-term (< 100 years) and small-scale (< 1 m) sea-level changes that detail past sea-level records and play a major role in predicting sea-level fluctuations in the near future are not observed from reef cores. This paper is based principally on a re-examination of sea-level records from the literature and presents the following suggestions to reconstruct high-resolution Holocene sea-level records: (1) Identifying species from boring core samples is effective to reconstruct sea-level changes more precisely during the Holocene. (2) Relative abundance of data for each species is essential to determine position and course of sea-level curve within the envelope of their living depths. (3) The accuracy of reconstructing the sea-level record depends on the distribution pattern of corals; the vertical distribution in a present-day reef obtained from a site close to a given boring site is all that is required. The sea-level curve based on agreement with the above requirement is characterized by smaller fluctuations (± 0.5 - ± 2.5 m) during the Holocene, thus studies on the high-resolution sea-level record will provide predictions for research on the spatial and temporal histories of sea-level change to Holocene sciences and management of conservation of land in the near future.

Key words : coral reef, hermatypic coral, sea-level change, Holocene, boring core

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