Geophysical Research Abstracts
Vol. 19, EGU2017-18490-1, 2017
EGU General Assembly 2017


# New data from fringing-reef cores for the mid-Holocene higher sea level in Hainan Island, northern South China Sea

Yantao Yao, Wenhuan Zhan, and Jie Sun

CAS Key Laboratory of Marginal Sea Geology, South China Sea Institute of Oceanology, Chinese Academy of Science, Guangzhou, China (yaoyt@scsio.ac.cn)

Most previous research on sea level indicators (including beachrock, abrasion platforms, notches and coral reefs) from coast of northern South China Sea suggested a higher sea level in the mid-Holocene. Microatolls, considered to be one of the most reliable indicators, led to an estimation of 2 to 3 m or even more higher sea levels in the mid-Holocene at southwest Leizhou Peninsula. Volcanic activities, however, occurred at several stages during the Quaternary at southern Leizhou Peninsula and northern Hainan Island, indicating a tectonically unstable local crust. Comprehensive comparison of microatolls between the volcanic and the non-volcanic coasts implied obvious uplift of the volcanic coast, where elevation of microatolls was higher than those on the non-volcanic coast. In addition, microatolls from the non-volcanic coast universally demonstrated a mid-Holocene higher sea level of less than 1 m. Similar studies to date at some tectonically stable locations, distant from the major glaciation centers (the far-field), provided evidence that the mid-Holocene sea level was not as high as that estimated before. On the longest and also the widest fringing reef of Hainan Island, 10 cores were drilled in a transect approximately perpendicular to coastline. Upper and lower unconformities for the layer of Holocene marine sediments witnessed the Holocene transgression and regression, respectively. U-series and AMS14C ages of in-situ surface corals and deposits from the unconformities, compiled with sedimentary characteristics, announced a highest sea level of 1.18 m in 5.30 cal ka BP. The rapid sea level rise mainly occurred in 6.25∼5.75 cal ka BP at a rate up to 11.4 mm/a. From 5.30 cal ka BP to 4.50 cal ka BP, it can be regarded as a relative sea level stand, for most surface fossil microatolls on reef flat lived in this period. Since then there might be a sudden and fast sea level fall in 4.50∼4.14 cal ka BP, resulting in fast exposure of the initial reef flat and then fast covering of sand dunes or beachrocks. As a result, fossil microtalls on the initial reef flat were well preserved, which were very important to indicating the mid-Holocene higher sea level.

Acknowledgement: This research was supported by the National Program on Key Basic Research Project of China (2013CB956104)[U+3001]National Natural Science Foundation of China (41376063) and the Chinese-Polish collaborated project ERES.