

Sea level change and its influence on the Hemudu Culture in the South Yangtze River Delta during the Holocene

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The Neolithic settings of Ningbo-Shaoxing Plain (basin) is famous for the early adoption of cereal cultivation during the Holocene, such as Hemudu Culture. Ningbo-Shaoxing basin is located in the south Yangtze River Delta near the east coast of China. As noticed by many work carried out in this region, the sea level change was one of the most important challenge for the early settlements during the early to middle Holocene. However, there still lacks a unified understanding about the sea level change history.

As Ningbo-Shaoxing basin is sheltered by the north mountain ranges from direct erosion of tidal process, we retrieved a series relative continuous sediment cores with uniform lithology, to understand the land and sea interaction in this basin. In this study, one core located away from, but close to the Tianluoshan site (a representative site of Hemudu Culture) was chose, as a natural sedimentation. Among many different proxies, diatom is a well-known biological indicator of fresh and marine environment. Nevertheless, in previous studies, there is rare systematic study about diatom at this area. Besides, X-Ray Fluorescence (XRF) scanning can provide different geochemical elements curves in the sediment in a high-resolution and semi-quantitative way.

In this study, diatom, XRF scanning and grain size analyses was carried out, based on a high resolution AMS ¹⁴C chronology frame. This study assesses the timing when sea transgression reached this area and when sea retreated, also the pattern of sea level change during the early to middle Holocene. The result shows that during the period of sea level rise, there were several short-term periods influenced by fresh water input, which was indicated by predominately fresh diatom species than marine species. Moreover, Calcium content from XRF scanning has a significant correlation with the relative abundance of marine diatom species, which may provide a high resolution sea level history. These results may make important contribution to the understanding of how early settlements adapt to sea level change in this area.

Keywords: sea level , diatom, XRF