Holocene relative sea-level change and its influence to the sedimentary environment of Bohai Bay, China

*Jianfen Li [1,2], Hong Wang[1,2], Yongsheng Chen[1,2], Fu Wang[1,2], Zhiwen Shang[1,2], Xingyu Jiang[1,2], Lizhu Tian[1,2]

1. Tianjin Center, China Geological Survey (CGS), 2. Key Laboratory of Muddy Coast Geo-Environment, China Geological Survey, CGS, Tianjin, China

The west coast of Bohai Bay, as one of the pioneer areas, was selected for Holocene sea level change study in China since the mid-1970s. Not only common elements such as the basal peat layers but also both Holocene cheniers and oyster reefs, localizing particularly in the area, were continuously used as sea level indicators for local sea level reconstruction. Based on fundamental studies, given by the others during the last four decades, and the recent finds by the autors' group of this paper, whose specific efforts were mainly focused on the development of cheniers and oyster reefs, and Holocene coastal sedimento- and chronostratigraphies, this paper thoroughly refined indicative meanings of the local sea level indicators. Based on the comprehensive study of foraminifera, diatom, pollen and oxygen-carbon isotopes of different types of sea level index points (SLIPs), a detailed discussion was given to the temporo-spatial significance of these index points and 127 effective SLIPs were chosen out from them. After residence time correction, the Holocene relative sea level curve of Bohai Bay was reconstructed. The result reveals a basic regularity of the relative sea level change turning point at 6 ka cal BP in the study area: at 10 ka cal BP, the relative sea level was recorded at -23m. Then it was followed by a period of rapid rise with a rate of ~5mm/a and at about 6 ka cal BP, the relative sea level rose to -2.5m. Then it changed little.
Under the control of regional sea level change, the present shoreline was influenced by sea water around 8 ka cal BP and developed tidal flat environment and then rapidly changed to shallow marine environment. At 6 ka cal BP, the transgression reached the maximum landwards. After that, the delta environment began to develop, which pushed the coastline moved seawards continuously until present shoreline.

Keywords: Holocene, Bohai Bay, Sea level index point, Relative sea level change, Sedimentary environment

