

Seafloor environmental variations effected by topographic changes during the last 100 years in Kojima Bay, Okayama

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Kojima bay is an estuary located at the southern coastal area in Okayama Prefecture. Its topographic has been widely varied by the effect of deposition processes in natural and reclamations. In addition, artificial lake called Kojima Lake was formed by dikes construction at the eastern part of the bay in 1959. In order to examine the impacts of topographic changes by natural and human activities to the seafloor environment during the last 100 years, we collected 27 surface and 2 core samples in September, 2009, and analyzed sedimentary structures by radiographics, grain size and ²¹⁰Pb and ¹³⁷Cs dating.

Spatial distribution pattern of grain size from surface sediments showed that silt-mud sediments were mainly deposited in the bay and the mouth of Yoshii River and the tidal flat in the central part were composed of sandy sediments. In Kojima Lake, grain size decreased toward the central part of the lake from the coastal part. Compared with the distribution pattern of grain size in 1988 by Okayama (1989), grain size at the mouth of Yoshii River and tidal flat increased toward the present. This result suggests the delta progradation in the river mouth and/or increases in wave influences accompanying with a decrease in water depth.

Core samples were composed of silt-mud sediments and divided three sections with obvious variations in color and sedimentary structure; poorly-defined lamina or sharply-defined bioturbation section, sharply-defined lamina and color variation section, and poorly-defined bioturbation section from the bottom. Results of ²¹⁰Pb and ¹³⁷Cs dating show boundaries between these sections are 1950s and 1970-1980s, respectively. These core results imply the seafloor environmental variations accompanied with dike constructed in 1959 as the following. Before constructed dike and Kojima Lake, benthic activities were very active. After that, seafloor condition of the bay and lake became a stagnant and suboxic and benthic activities were very little. After 1970-1980s, it is probably that water quality improvements by human activities slightly restored benthic activities.

Keywords: Sedimentary structure, grain size, ²¹⁰Pb dating, estuary, reclamation