

Volume estimation of clastic materials transported from coastal zone and marine geology in Miho Bay, western Tottori Prefecture

takahiko inoue[1]; Atsuko Amano[2]; Naoya Iwamoto[2]; Yoshio Inouchi[3]

[1] Graduate School of Sci. and Eng., Ehime Univ.; [2] Earth Sci., Ehime Univ; [3] CMES, Ehime Univ.

Coastal erosion is one of the most important environmental issues in Japanese coast. In order to preserve the coastal area, it is necessary to clarify a mass balance of particles that compose coastal sediment. For the preservation of coastal area, up to now, only the mass balance of sand in beach and shallow sea area was paid to attention, and the volume of sand transported from coastal zone to offshore had not been clarified. In this study, the volume of sand transported from coast to offshore which is an important element of mass balance is estimated.

Study area is Miho Bay located on the northeast of Kaike coast of Yumigahama Peninsula, Tottori Prefecture. Kaike coast can be regarded as a model area of protection against coastal erosion where various protection methods have been tested. In order to clarify the volume of transportation from the coastal zone to offshore, a seismic survey and a sampling of bottom sediment were carried out in the Miho Bay. After classification of bottom sediment and distribution of Holocene were clarified, short coring by gravity corer was carried out. Sediment volume in Miho Bay in the last 100 years was clarified by using the sand flux that was estimated from the sedimentation rate (Pb-210 method) and the content of grains coarser than fine sand (125 micro-meter in diameter), because these grains compose the beach and barrier sediment of Yumigahama Peninsula.

Consequently, the volume of the sand grains transported and deposited offshore in one year is estimated to be 66,000 cubic-meters per year. Currently, the eroded volume is estimated to be about 100,000 to 150,000 cubic-meters per year by topographic changes (e.g. Uda, 1997) or other methods (e.g. Inoue et al., 2004) in coastal zone. The volume transported to offshore is estimated to the half or third of the eroded volume. On the other hand, deposited volume estimated at beach near Sakaiminato City is about 125000 cubic meters (Inoue et al., 2004). Volume of sandy material supplied from the river was estimated to be 67,000 cubic-meters per year (Sato et al., 1998).

The mass balance of grains coarser than fine sand in this system is clarified, based on transported and deposited volume. In Hino River- Yumigahama Peninsula- Miho Bay system, total volume eroded in coastal zone and supplied from the river to the coast is balanced with total volume deposited in sedimentary area and offshore.