Holocene base and geologic history in Miho Bay, southwest Japan, since the Late Pleistocene based on seismic profiles

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Miho Bay is located off Yumigahama Peninsula in the western Tottori Prefecture, southwest Japan. Yumigahama Peninsula is one of the biggest sand bars in Japan. Hino River flows into Miho Bay, and clastic materials supplied through this river affect the sediment types in Miho Bay and those of Yumigahama Peninsula. Yumigahama Peninsula expanded its body by the material supplied from upper stream of Hino River, which was accelerated by human activity (e.g. iron manufacture) that started 300 years ago. Today, coastal retrogradation (erosion) is in progress at this coast because supplied materials through rivers are decreased by the construction of dams and cessation of iron manufacture. The coastline of Yumigahama Peninsula has been controlled by the environment of upper stream of Hino River and hydrography in Miho Bay. In order to preserve the coastal to topography, it is necessary to clarify the history in Miho Bay. In this study, acoustic stratigraphy in the Miho Bay is clarified, and geologic history in this area is also discussed.

Seismic survey using 'Bubble Pulser' was carried out in Miho Bay. Seismic profiles and drilling data were compared, and geologic history since the Late Pleistocene was reconstructed.

Two distinctive reflectors are recognized in seismic profiles. Because upper distinctive reflector is rugged, this reflector was formed during the lower sea level period. As result of the comparison with the drilling data, upper distinctive reflector was formed before the Hypsithermal period (warm period about 6 ka BP) and this reflector can be correlated with Holocene basement. Lower distinctive reflector was formed during the Late Pleistocene. Because upper reflector is continuous, depth distribution of Holocene basement is clarified. In Miho Bay, two big valleys as paleo- river systems exist. Based on sea level change, geologic history since the Late Pleistocene in Miho Bay and surrounding area can be divided into the following four stages. In stage 1 (early Late Pleistocene), the sea level was the same as that of present, and the old Yumigahama Peninsula was formed at the similar position as in the present. At stage 2 (after stage 1), topographic feature similar to the present basin was formed. With the fall of sea level, old sandbar system grew up to the seaward area, and the erosional scour hole at the northern end of Yumigahama Peninsula was formed by the tidal current erosion. At stage 3 (Last Glacial Maximum), valley system incising the Pleistocene sediments was formed. At stage 4 (Holocene), present topographic features were formed after Hypsithermal period.