

Tidal flood delta and buried oyster reef in Akkeshi -Bay and Lake eastern Hokkaido, revealed by sonic survey

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The coastal area of Kushiro-Nemuro region, eastern Hokkaido is tectonically controlled by sudden uplift when giant earthquakes occurred at intervals of a few hundreds years and subsequent long and slow prevailed subsidence during late Holocene. Therefore, an active barrier system generally characterizing a transgressive stage and system is developed around the Recent Akkeshi Bay - Akkeshi Lake area (e.g. Shigeno others, 2011). Akkeshi Bay located between Kushiro City and Nemuro City, approximately 9km wide and 30m deep at maximum is connected with Akkeshi Lake by a tidal inlet about 500m wide and 10m deep. Akkeshi lake is a lagoon with the mean depth of about 2m, and a wide flood tidal delta is distributed in the western part of the lake. Until thirty years ago, modern oyster reefs had been developed in the wide area of tidal flat on the flood tidal delta, though already all extinct.

We carried out the single-channel sonic survey by using Sono-probe for the purpose of elucidating the inner structure of the flood and ebb tidal deltas and the distribution of modern oyster reefs around the Akkeshi Bay - Akkeshi Lake area. Inside of the lake, because of the shallowness and gregarious eelgrass, sonic survey lines were restricted to the east-westward trending fairways. In contrast, we arranged the most of sonic survey lines in N-S direction across tidal inlet within the Akkeshi Bay area except for the lines located along the east-westward sand-spit.

As a result of sonic survey, some distinct reflections gently dipping outside in coarse- grained deposits were recognized on sonic profiles across the tidal inlet. It shows the ebb tidal delta formed by ebb tidal currents. Furthermore, several strong reflections were observed on the profile along the sand-spit. These reflections are nearly consistent with the borehole lithostratigraphic data from coastal lowland areas.

In the flood tidal delta along the lake mouth area, we found some upheaval topography (mound-like structure) traced with strong reflections, even though the inner structure of the flood tidal delta is not clearly observed. The depth of these surfaces ranges 2 - 4m, and it is thought to be submerged oyster reefs judging from their shape and reflection patterns.

Keywords: tidal flood delta, buried oyster reef, Akkeshi Bay and Lake, sonic survey, late Holocene, Hokkaido