

## Geological and geomorphological evidence for the mid-Holocene environmental changes and East Antarctic ice sheet fluctuation

# Hideki Miura[1]; Shogo Iwasaki[2]; Jun'ichi Okuno[1]; Hideaki Maemoku[3]

[1] NIPR; [2] none; [3] Geography, Edu., Hiroshima Univ.

A comparison is made of some Holocene paleoenvironmental records; (1) the relative sea-level changes, (2) the relict penguin remains, and (3) the local glacial histories, obtained from raised beach deposits, abandoned penguin rookery and glacial geology/geomorphology in the East Antarctic coastal region respectively.

Radiocarbon dating ages of in situ fossil shells from deltaic raised beach with well-marked stepped topography at Skarvsnes allow us to define Holocene relative sea-level variations. Stable sea-levels are identified at 16-12 m asl during 7,500-5,000 calib. yrBP, and at 0-5 m after 3,500 calib. yrBP. The rapid regression at 12-5 m occurring between 5,000 calib. yrBP and 3,500 calib. yrBP suggests that some glacial loading had removed around this period.

Relict penguin remains near Mt. Riiser-Larsen indicate the occupation history of Adelie penguins. Radiocarbon dating ages of remains concentrate between 5,000 and 1,500 calib. yrBP, suggesting that a warming period with the absence of sea-ice and high marine productivity for breeding. This is because that the sea-ice extent probably has been the most important factor in controlling distributions of Antarctic penguins.

Sedimentary process and depositional timing of glacial till including shell fragments indicate the glacial fluctuation of East Antarctic ice sheet during Holocene. At Skallen, we can observe many types of geomorphological and geological features suggesting direct evidence for glacial advance between 5,000-4,000 calib. yrBP and ~1,500 calib. yrBP, and retreat ~6,000 calib. yrBP and between 4,000-2,000 calib. yrBP just in front of present margin of East Antarctic ice sheet.

These facts lead us to the following ideas: (1) the rapid sea-level falling event is attributed to the rapid removal of a regional ice load between 6,000 and 3,000 calib. yrBP, (2) the long term trends possibly reflect local ice sheet fluctuations superimposed on common climatic fluctuations, (3) the EAIS margin had slightly retreated and sea-ice had reduced during almost same period, which has been reported as Antarctic mid-Holocene climatic optimum for advantage of penguin's breedings.