



## **Glacial Ocean Circulation and Property Changes in the North Pacific**

**S.-J. Kim** (1), Y.-G. Park (2)

Korea Polar Research Institute, KORDI, Incheon, Korea

The glacial property and circulation changes in the North Pacific Ocean are investigated using a coupled ocean-atmosphere-sea ice climate model. With glacial boundary conditions, an increase in potential density in upper layers of the northern North Pacific makes the water column highly unstable and eventually results in the enhancement of the North Pacific Intermediate Water (NPIW) production, in consistent with proxy evidence. The NPIW outflow reaches deeper layers than in present, but largely confined to the North Pacific. The increase in potential density is predominantly due to the increase in salinity and secondarily decreases in temperature. The increase in surface salinity is especially high in the Sea of Okhotsk and the western Bering Sea, which are the possible source areas of the glacial NPIW production. In these regions, an increase in brine release due to the marked increase in sea ice, the excessive evaporation over precipitation, and the reduction in river discharge contribute to the increase in surface salinity. In short, reduction in freshwater input to the northern North Pacific is mainly responsible for the increase in the production and outflow of glacial NPIW.