

Reconstruction of Holocene glacial paleoenvironmental changes in Svalbard fjords of Arctic

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Starting in 2015, KOPRI launched a five-year research project (July 2015 - June 2020) titled "Research on environmental changes in fjords and coastal geomorphology: Towards a better understanding of the erosion and redeposition processes of the Svalbard archipelago in the Arctic", which is supported by the National Research Foundation of Korea (NRF). The main objectives of this project are 1) the assessment and mapping of coastal geomorphology, 2) the reconstruction of environmental changes caused by the Holocene climate changes in the fjord systems in Svalbard, and 3) the development of paleoenvironmental proxies for Arctic research. The first joint expedition between Korea and Norway with R/V Helmer Hanssen in the summer of 2016 provided invaluable data and new sediment cores that preserved records of the Holocene and recent environmental changes in various Fjords of Dicksonfjorden, Isfjorden, Van Mijenfjorden, and Hornsund.

Our effort to unravel the geologic and environmental background of Svalbard extended to the fjords in the northern Svalbard (Wijdefjorden, Woodfjorden) and beyond the summer sea-ice margin in the far north during the second joint cruise between Korea and Norway on the R/V *Helmer Hanssen* (July 26 - August 1, 2017). Furthermore, the third joint cruise between Korea and Norway to the southern Svalbard fjords (Isfjorden, Bellsund, Van Mijenfjorden, Van Keulenfjorden, Hornsund, and Storfjorden) was carried out in order to collect further data on bathymetry and chirp-profiles as well as a couple of new sediment cores with the R/V *Helmer Hanssen* (August 2 -7, 2019). The overall goal of our geological research program with the R/V *Helmer Hanssen* aims to reconstruct the glacial-environmental history of the Svalbard fjords through post-deglaciation. Bathymetry and chirp data will provide further insights into the evolution of glaciogenic sedimentary depositions in the Arctic fjord complex systems since the last post-glacial period. Based on data preliminary obtained, we will continue to analyze the mechanisms of glacier-derived environmental changes such as sediment deposition, sea-ice formation, and retreat from the tidewater glaciers in the Svalbard archipelago to study the effects of future climate change in the polar region.