



## **Environmental changes in Fjords of Svalbard Archipelago in the Arctic**

Seung-II Nam (1), Young Ji Joo (1), Kwangchul Jang (1), Jung-Hyun Kim (1), Yeong Ju Son (1), Dahae Kim Kim (1), Young Jin Joe (1), Kwangkyu Park (1), and Matthias Forwick (2)

(1) Korea Polar Research Institute, Division of Polar Paleoenvironment, Incheon, Korea, Republic Of (sinam@kopri.re.kr), (2) UiT The Arctic University of Norway in Tromsø, 9037 Norway

Up to 62% of the Svalbard archipelago is covered by glaciers and ice caps, which are highly sensitive to the global climate changes occurred during the Holocene. Being at the relatively warmer part of the Arctic, the melting rate of the glaciers in Svalbard have recently begun accelerating, due to the combination of increasing oceanic heat inflow of the warm North Atlantic current and rising summer temperatures in the Arctic. Regarding their environmental vulnerability, the Svalbard fjords provide an excellent setting for mapping and investigating geologic and environmental consequences of the past and future climate changes.

Starting in 2015, KOPRI launched a research project titled "Research on environmental changes in fjords and coastal geomorphology: toward better understanding of the erosion and redeposition processes of the Svalbard archipelago in the Arctic". The main objectives of this project are 1) evaluating and mapping geology and coastal geomorphology, 2) reconstructing environmental changes prompted by the Holocene climate changes in the fjord systems in Svalbard, and 3) developing paleoenvironmental proxies applicable to the Arctic research. The first Korea-Norway joint expedition in 2016 yielded invaluable data and sediment cores preserving records of the Holocene and recent environmental changes in Dicksonfjorden, Isfjorden, Van Mijenfjorden, and Hornsund.

In 2017, our effort to unravel the geologic and environmental histories of Svalbard stretched to the fjords in northern Svalbard (Wijdefjorden, Woodfjorden, Lifdefjorden) and beyond the edge of summer sea-ice cover in further north, during the second Korea-Norway International Expedition on the R/V Helmer Hanssen (July 26 – August 1, 2017). The new sediment cores collected during the expeditions allowed us to successfully interpret the Holocene history of fjord environmental changes driven by climate variations, such as changing sediment provenance led by the retreating tidewater glacier as well as varying influences of the warm Atlantic water in the surface productivity and sea-ice distributions. We will continue to parse the mechanisms of environmental changes, such as sediment delivery, sea-ice formation, and glacial retreat, in the Svalbard archipelago in order to probe the impacts of the future climate changes in polar region.