

Ocean-glaciers interactions in fjord Hornsund

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The Arctic fjords are a link between the ocean and land, therefore they are highly vulnerable to warming and are expected to exhibit the earliest environmental changes resulting from anthropogenic impacts on climate. In the Arctic, the inshore boundary of a fjord system is usually dominated by tidewater glaciers while its offshore boundary is strongly influenced by warm oceanic waters.

Improved understanding of the fjord-ocean exchange and processes within Arctic fjords is of a highest importance because their response to atmospheric, oceanic and glacial variability provides a key to understand the past and to forecast the future of the high latitude glaciers and Arctic climate.

The results of field measurements in the Hornsund fjord (southern Spitsbergen), collected under the Polish-Norwegian projects GLAERE and AWAKE-2, will be presented. Interannual variability of warm Atlantic Water entering the fjord, seasonal changes of water properties in the glacier bay and the structure of the water column in the vicinity of the glacier termination will be addressed.

Direct contact of warm oceanic water with a glacier's wall causes submarine melting, undercutting and glacier calving. Turbulent plumes of subglacial meltwater constitute an important mechanism of heat transfer and also influence a glacier retreat. However our understanding of these processes is limited due to problems with obtaining in situ data close to the glacier wall. Therefore special attention will be paid to observations of the underwater parts of the Hornsund glaciers and new measurements of water column fine structure and mixing in the turbulent meltwater plumes.