Hydrography and nutrient concentrations in years of contrasting sea ice conditions in the Atlantic inflow region north of Svalbard

Angelika Renner$^1$, Allison Bailey$^2$, Marit Reigstad$^3$, Arild Sundfjord$^2$, and Sigrid Øygarden$^3$

$^1$Institute of Marine Research, Oceanography and Climate, Tromsø, Norway (angelika.renner@hi.no)
$^2$Norwegian Polar Institute, Tromsø, Norway
$^3$UiT The Arctic University of Norway, Tromsø, Norway

The shelf break north of Svalbard represents a major gateway for the inflow of nutrient-rich Atlantic Water (AW) to the Arctic Ocean. In this region, AW leaves the surface and subducts below Polar Surface Water (PSW). The supply of nutrients to the euphotic layer therefore varies strongly by season but also interannually, depending on e.g. rates of advection of sea ice and PSW over the AW boundary current. Additionally, the presence of sea ice can limit light availability in spring and early summer. Here, we present results from repeat sampling of hydrography, macronutrients (nitrate/nitrite, phosphate and silicic acid), and chlorophyll a along a transect at 31 E, 81.5 N in the period 2012-2017. Such time series are scarce but invaluable for investigating the range of variability in hydrography and nutrient concentrations. Measurements were done in late summer/early autumn, giving an indication of the nutrient consumption by primary producers over summer. The different years were characterised by very distinct sea ice conditions, both during the productive season and during the field campaigns. This impacted hydrography and primary production and thus nutrient concentrations in the surface and AW layers at the end of summer.