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Stable water isotopes of atmosphere, ocean, ice and snow north of Svalbard 2018

Water isotopes in vapour, ice and precipitation reflect the condensation and transport history of water vapour. Our in-situ measurements provide a reference dataset for atmosphere and ocean model development validation

The photos show the instruments used during the 2018 cruise: a laser instrument (1) measured $\delta^{18}\text{O}$ and δD in water vapor through an air inlet (2). Sea water was collected at the surface (3) and down to a depth of 1000 m (4), (5). Rain, snow (6) and sea-ice (7) were sampled on several occasions. Meteorological data were included in the datasets. All data are listed in the INTAROS catalogue and are made publicly available.

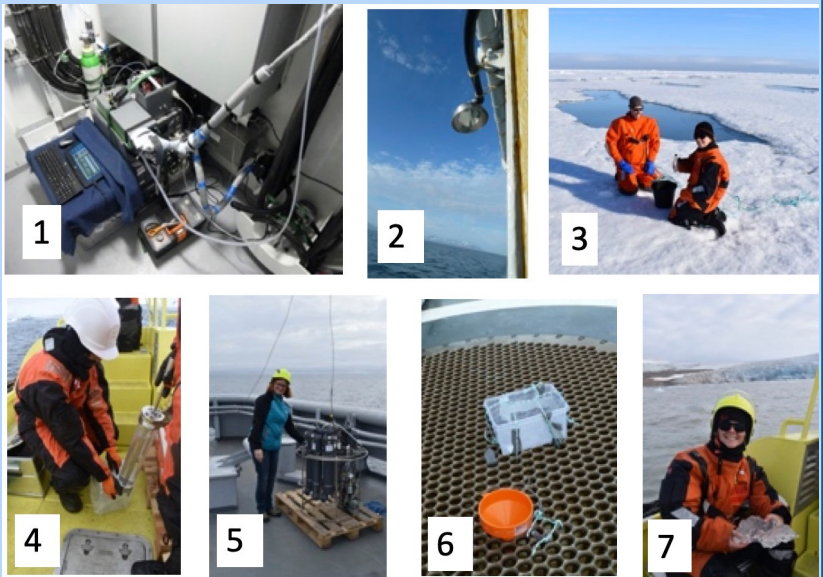


Figure 1. Instruments used for data collection

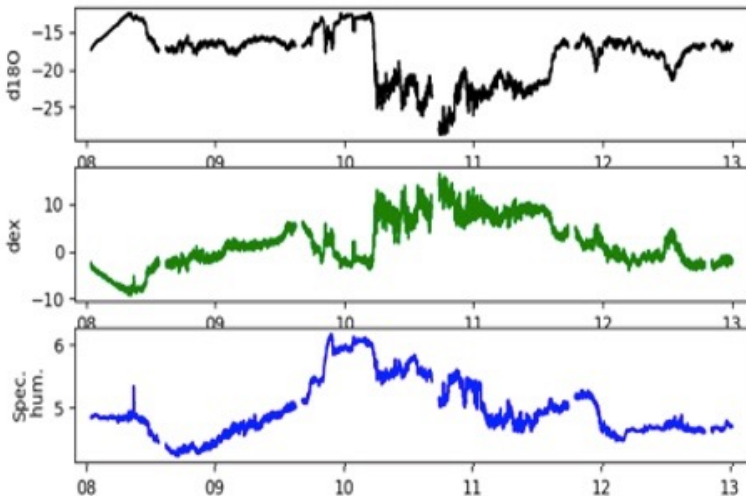


Figure 2. The water vapour isotope time series (black, green) reflect the origin of cold, dry and moist, warm air (blue).

Our water isotope reference dataset will be used by researchers to investigate air-sea interaction, and by model developers to improve processes representing the water cycle in Arctic regions. On a longer perspective, including the water isotope composition in models will contribute to more reliable weather forecasts and future climate predictions in the Arctic.



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