

EGU2020-13048

<https://doi.org/10.5194/egusphere-egu2020-13048>

EGU General Assembly 2020

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Stable isotopic content of atmospheric precipitation and natural waters in the vicinity of Barentsburg (Svalbard) in 2016-2018.

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In 2016–2018, during Russian Arctic Expedition on Svalbard (RAE-S) we have collected the samples of atmospheric precipitation, terrestrial waters, snow and ice on West Spitsbergen island in the vicinity of Grønfjorden. The measurements of stable water isotope content ($\delta^{18}\text{O}$ and δD) in the atmospheric precipitation collected in Barentsburg has allowed to draw the Local Meteoric Water Line and to analyze the relationship between the isotopic content and air temperature. Aside from this, the d-excess values in precipitation ($d_{\text{exc}} = \delta\text{D} - 8\delta^{18}\text{O}$) was interpreted as a marker of the moisture source. This fact was confirmed by HYSPLIT modelling of atmospheric moisture. It has been demonstrated that the isotopic content of the surface waters (lakes and rivers on mountain glacier valleys) clearly points to the dominating type of feeding (atmospheric, ground) of these hydrological objects. We have discovered the small annual variability of the isotopic composition of Lake Kongress water during 2 years and defined the sources of water in its tributaries: 13 of them have atmospheric source and 9 with ground source. In general, isotopic content of water in the vicinity of Grønfjorden (mean values are: $\delta^{18}\text{O} = -10,3 \text{ ‰}$, $\delta\text{D} = -72,5 \text{ ‰}$) is higher than in other regions of Svalbard.