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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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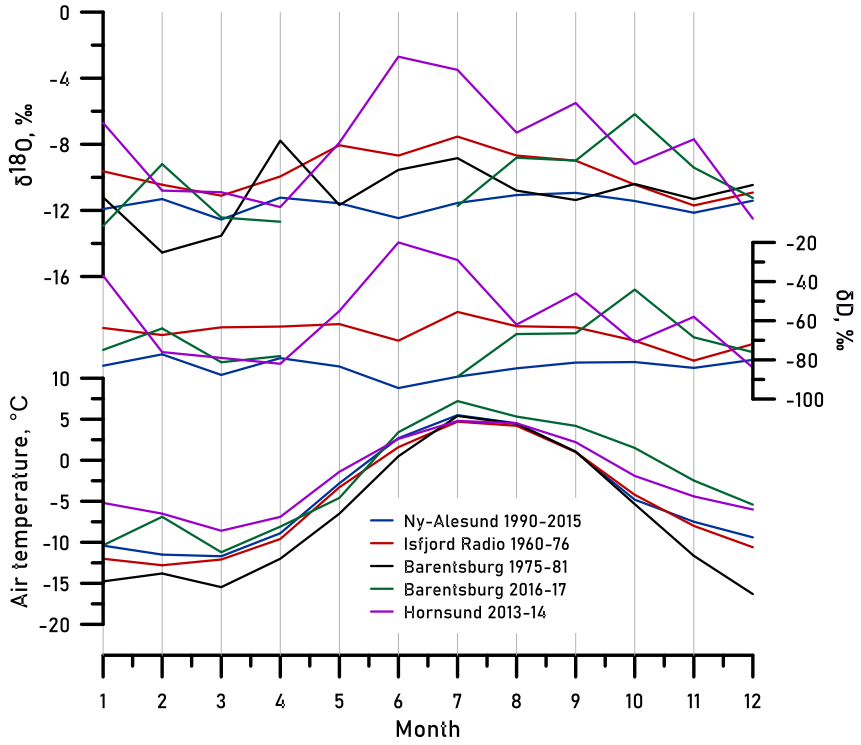
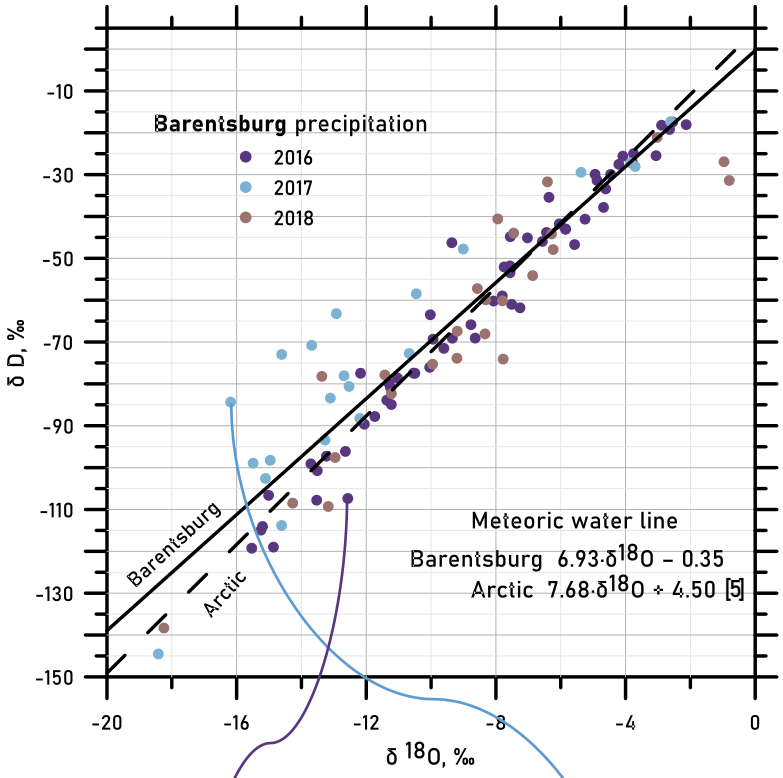
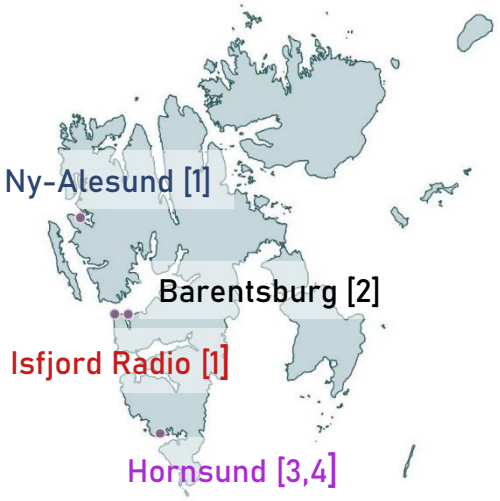
Precipitation



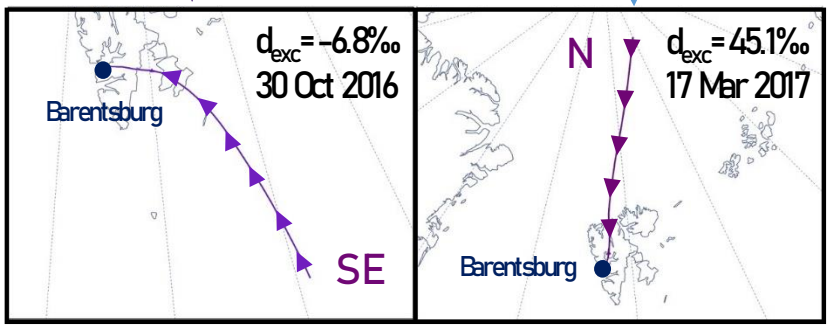




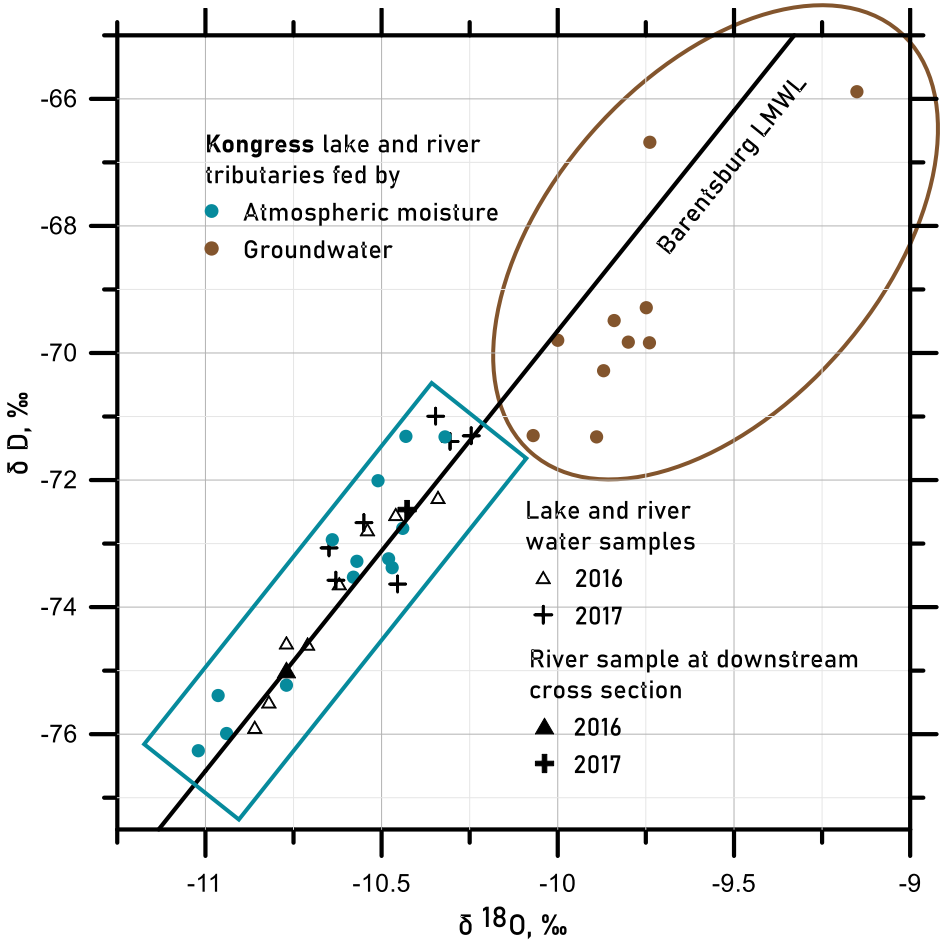
Precipitation collecting device, Barentsburg, 2016-18

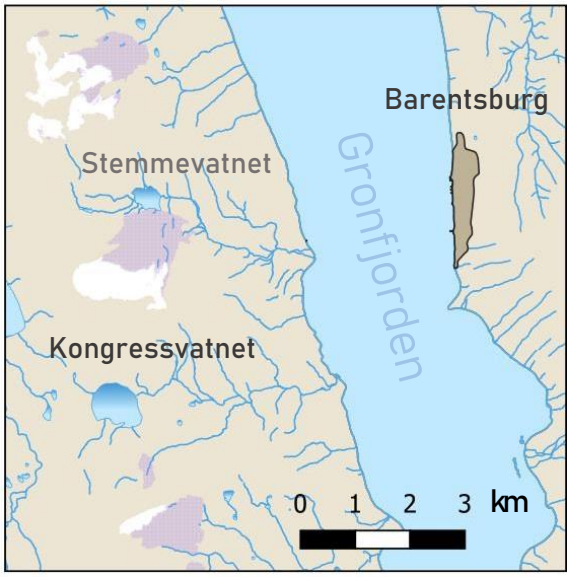
NOAA HYSPLIT Backward trajectory [6]

d_{exc} = δD – 8·δ18O indicates location of the moisture source
Here: High d_{exc} means moisture from the North,
low d_{exc} – South.



Kongressvatnet (Kongress lake)





Lake and valley tributaries

Can be separated into 2 feeding groups

Atmospheric moisture or Groundwater

Groundwater:

Lower d_{exc} and higher δD, $\delta^{18}O$ than for Atmosp.

Atmospheric:

Located along LMWL

Conclusions:

1) Relation between air temperature and isotope composition of precipitation depends on the station.
2) d_{exc} can be used as a marker of precipitation source.
3) We can check feeding type of tributaries using isotope composition.
4) Kongress shows small variability of isotope composition (2016\2017).

More info: Skakun A.A. et al., 2020 (accepted), Demidov et al., 2019

This work:

1) Skakun A.A., Chikhachev K.B., A.A. Ekaykin, Kozachek A.V., Vladimirova D.O., Veres A.N., Verkulich S.R., Sidorova O.R., Demidov N.E.. Stable isotopic content of atmospheric precipitation and natural waters in the vicinity of Barentsburg (Svalbard). Led i Sneg. Ice and Snow. 2020. 60 (3): xxx–xxx. [In Russian] (Accepted)

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[6] HYSPLIT https://www.arl.noaa.gov/hysplit/hysplit/.

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