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The coupling between hydrology, the development of the active layer and the chemical signature of surface water in a periglacial catchment in West Greenland

Johan Rydberg et al.

Correspondence to: Johan Rydberg (johan.rydberg@umu.se)

Table S1. Summary table of the datasets use in this study, the time period they cover, how the data was used within this study and where the raw data can be accessed

Type of data	Time period	Use in present study	Reference	Link to data	Comment
Meteorological data	2010-present	Boundary conditions for hydrological modelling	-	www.promice.org	Two-Boat Lake is referred to as KAN_B
Hydrological data, soil moisture, regolith temperatures, precipitation, lake-water level	2010-2013	Hydrological modelling, Validation of hydrological modelling,	Johansson et al. (2015)	http://doi.pangaea.de/10.1594/PANGAEA.836178	
Soil moisture, regolith temperature, precipitation, lake-water level	2014-2019	Hydrological modelling, Particle tracking simulation	-	Available in an extension to Pangaea.836178	
Thaw depths in the active layer	May 2017	Calculations of thaw rates and the release of water from melting ground ice	-	Available in an extension to Pangaea.836178	
Stable hydrogen and oxygen isotopes	2010-2014	Isotopic data for precipitation and lake water used for mixing model	Lindborg et al. (2016)	http://doi.pangaea.de/10.1594/PANGAEA.860961	
Stable hydrogen and oxygen isotopes	2015-2019	Isotopic data intense monitoring period	-	Available in an extension to Pangaea.860961	
Stable hydrogen and oxygen isotopes	May 2017	Isotopic data intense monitoring period	-	Available in an extension to Pangaea.860961	
Water chemistry data	2010-2014	Chemical data from all water types	Lindborg et al. (2016)	http://doi.pangaea.de/10.1594/PANGAEA.860961	
Water chemistry data	2015-2019	Chemical data from all water types	-	Available in an extension to Pangaea.860961	

Table S2. Average concentrations and standard deviations for chlorine, calcium and lanthanum in rain and surface-water samples from the studied sub-catchment in the Two-Boat Lake catchment. Note that there is a considerble variability with surface waters, with higher concentrations in surface water later in the season. Because no flow weighting has been done when calculating the averages, the average values might be biased towards the later part of the unfrozen season when the runoff is lower. For access to the full datasets for water chemistry we refer to Lindborg et al. (2016) and its associated Pangaea datasets.

	Chlorine		Calcium		Lanthanum	
	(mg L^{-1})	(1*StDev)	(mg L^{-1})	(1*StDev)	(μg L^{-1})	(1*StDev)
Rain	1.2	0.79	0.94	1.0	0.086	0.056
Surface water	4.0	1.2	9.7	5.9	0.67	0.64
Enrichment	3.3		10		7.8	

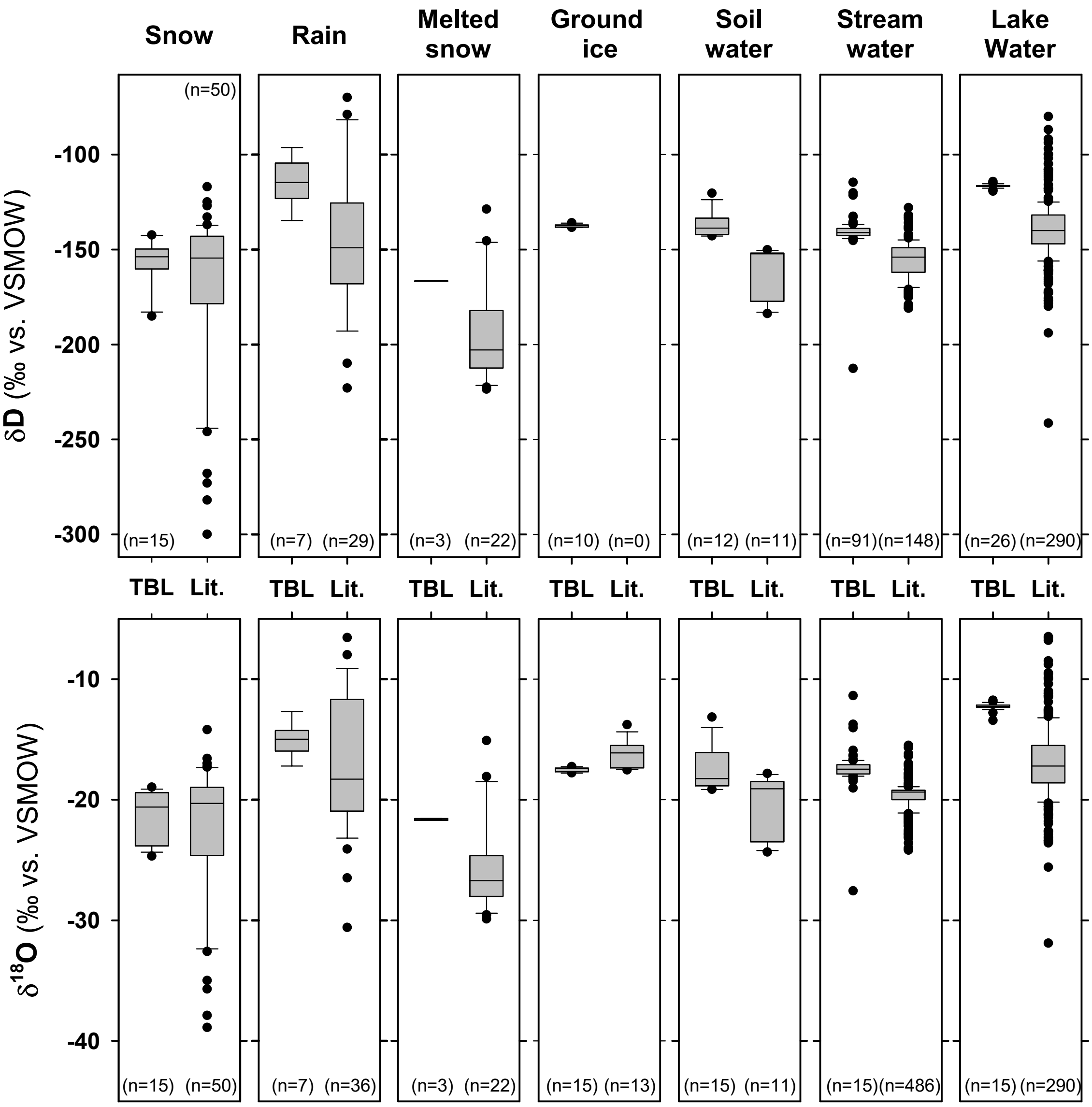

Figure S1. Boxplot showing the range of stable water isotopic composition in different sample types collected in the Two-Boat Lake (TBL) catchment (left side), and corresponding literature values from other studies conducted in Greenland (right side, Lit.). The horisontal line represent the median, the upper and lower edges of boxes represent the 25th and 75th percentiles, respectivly. Values that fall outside the 10th and 90th percentlies (represented by the whiskers) are shown as black dots. All data on stable water isotopes from the Two-Boat Lake catchment can be found in Lindborg et al. (2016) and its associated Pangaea datasets. Literature data are complied from (Akers et al., 2024), (Bowen et al., 2018), (Henkemans et al., 2018), (Jessen et al., 2014) and (Yde et al., 2016).

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