

WASSERQUALITÄT von BLOCKGLETSCHERBÄCHEN

Ulrike Nickus

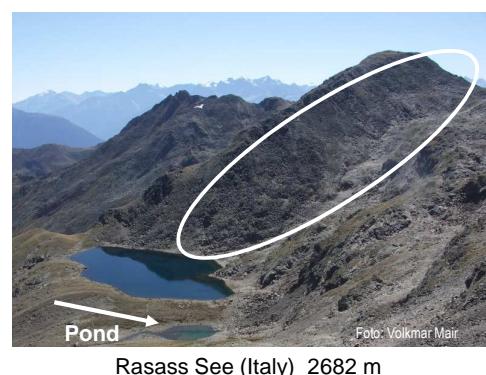
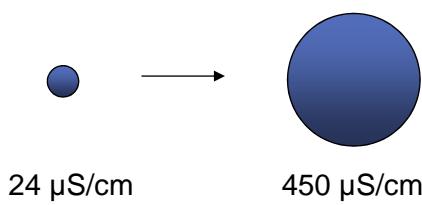
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IMPACT on HEADWATER LAKE CHEMISTRY

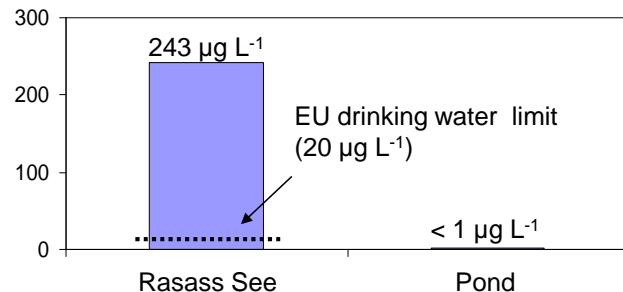
- Change in ionic composition

Rasass See (1990 to 2005)



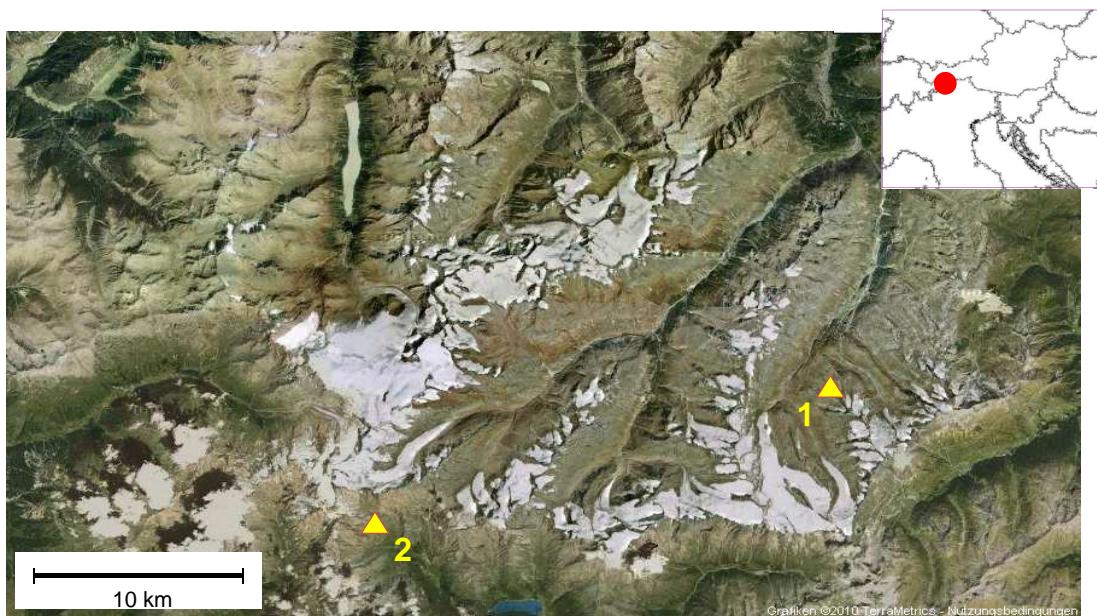
- Heavy metals in lake water
e.g. nickel

(Thies et al. 2007)



ROCK GLACIER STREAM CHEMISTRY

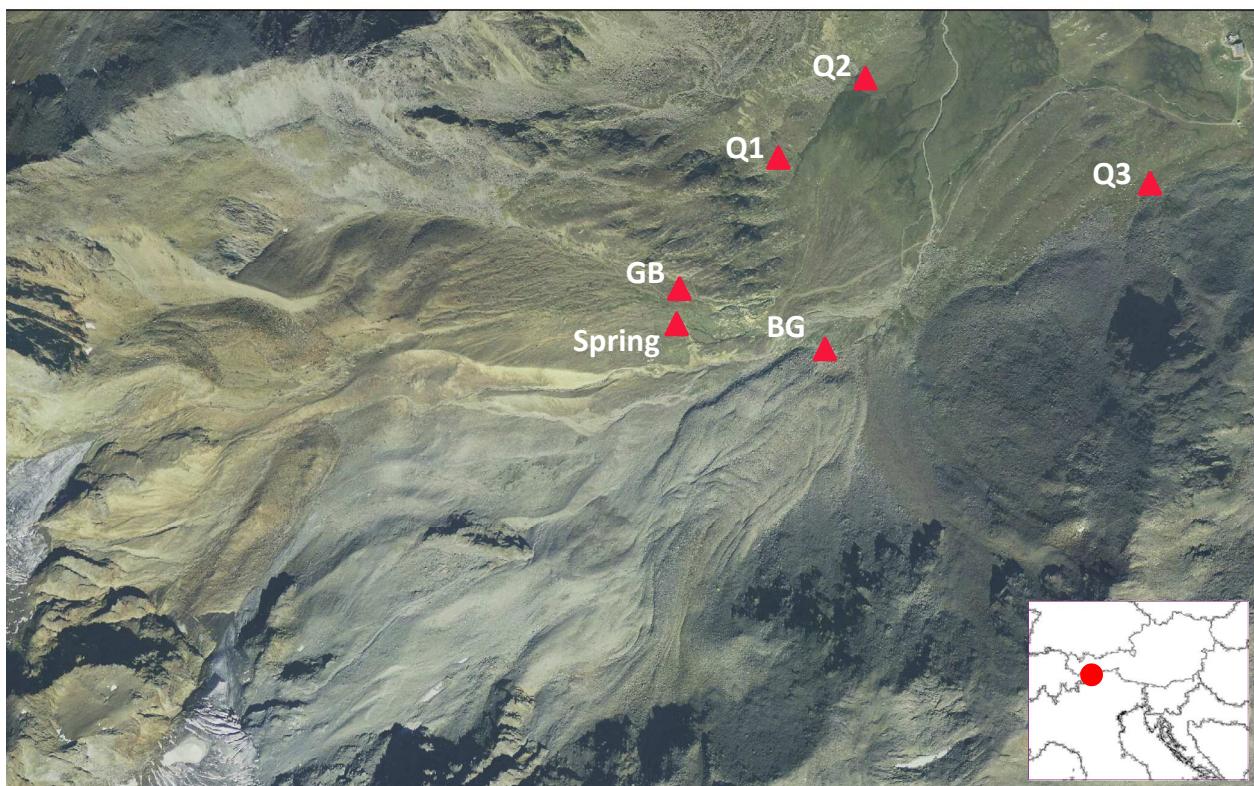
STUDY SITES



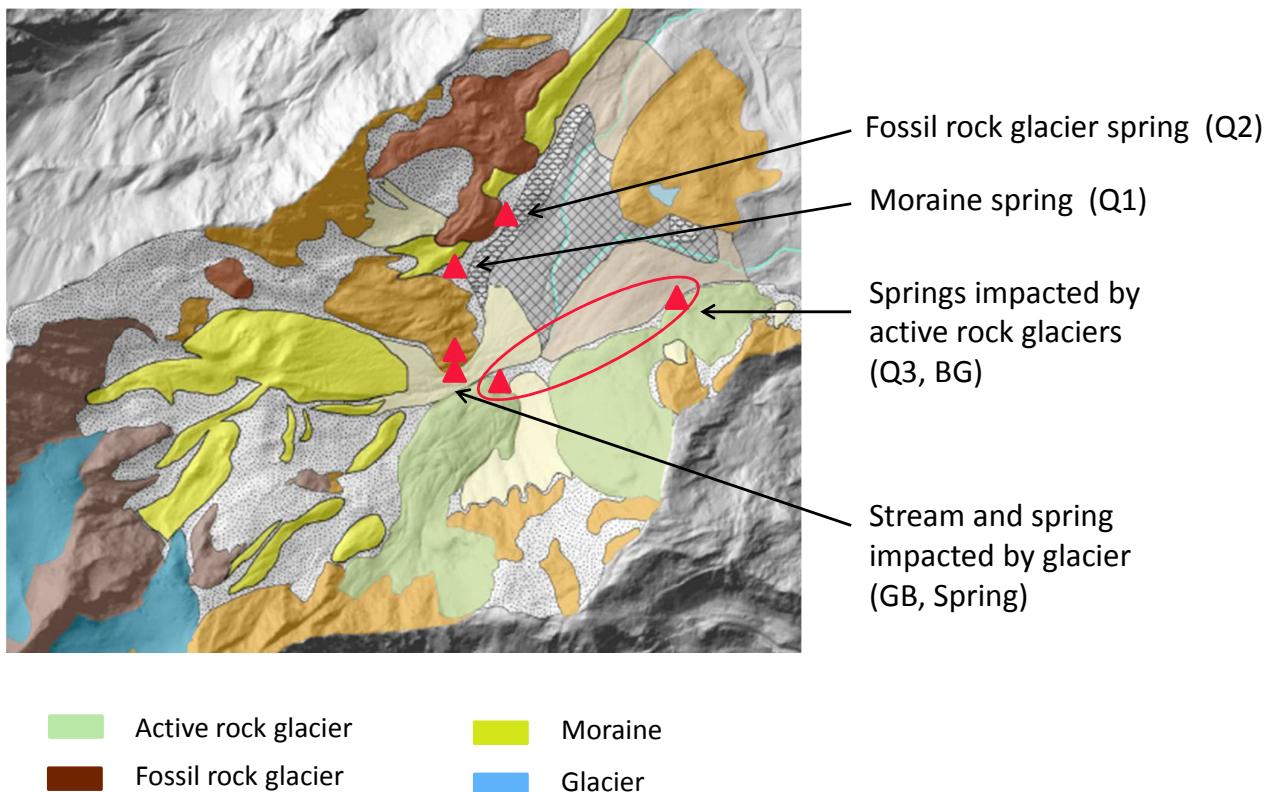
1 Hochebenkar 2 Lazaun

LAZAUN ROCK GLACIER

▲ Water sampling at Q1, Q2, Q3, GB, BG, Spring



Geological map of Lazaun cirque (Chinellato et al. 2011)



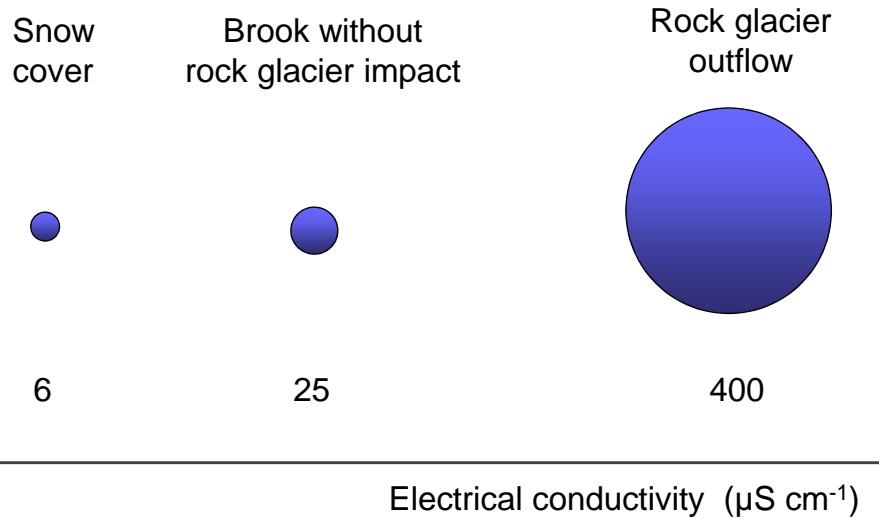
IONIC COMPOSITION

(June – October, 2007 – 2014 mean values)

	Impacted by	Conductivity μS/cm	SO_4^{2-} mg/L	Mg^{2+} mg/L	Ca^{2+} mg/L
Q1	moraine	14	3	0.4	2
Q2	fossil rock glacier	71	24	2	9
Q3 BG	active rock glacier	338	139	14	34
		200	78	5	26
GB Spring	glacier (and ?)	158	63	4	19
		177	68	4	20

IONIC LOAD

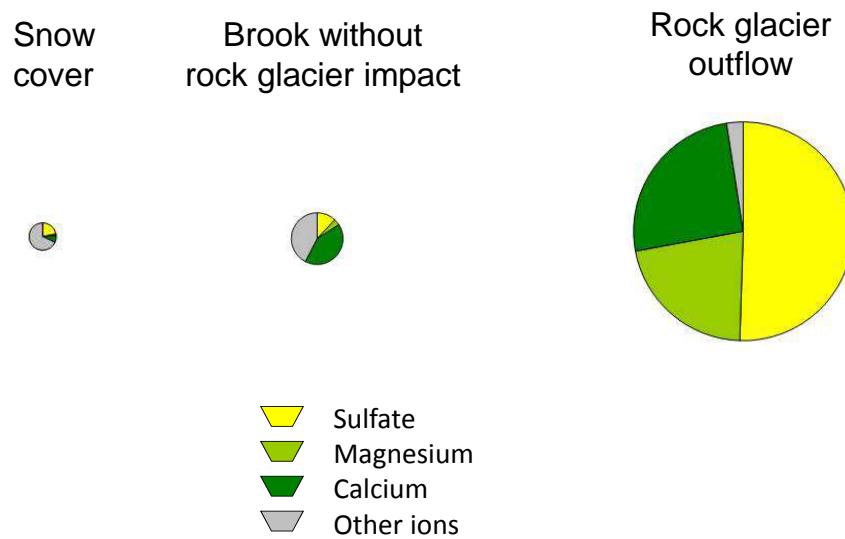
(typical values)



(Nickus et al., in prep.)

IONIC COMPOSITION

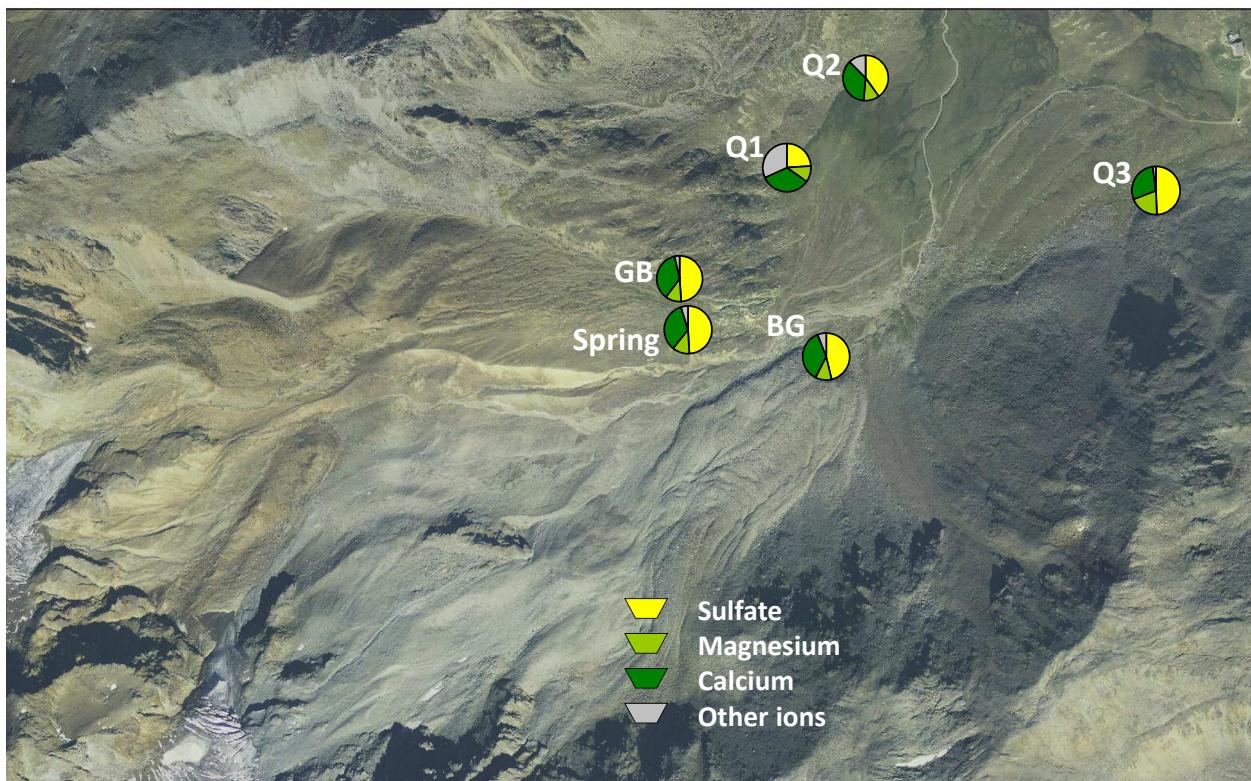
(typical values)



(Nickus et al., in prep.)

LAZAUN ROCK GLACIER

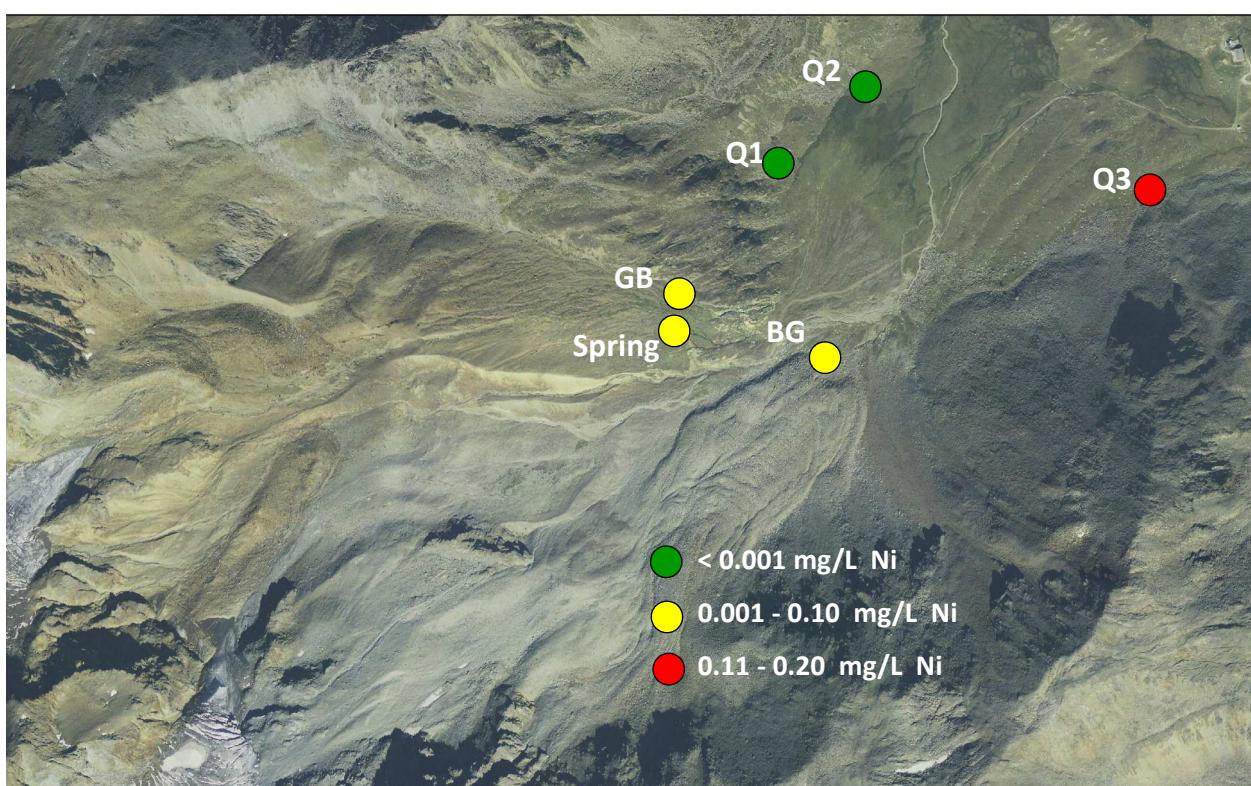
Ionic composition



(Nickus et al., in prep.)

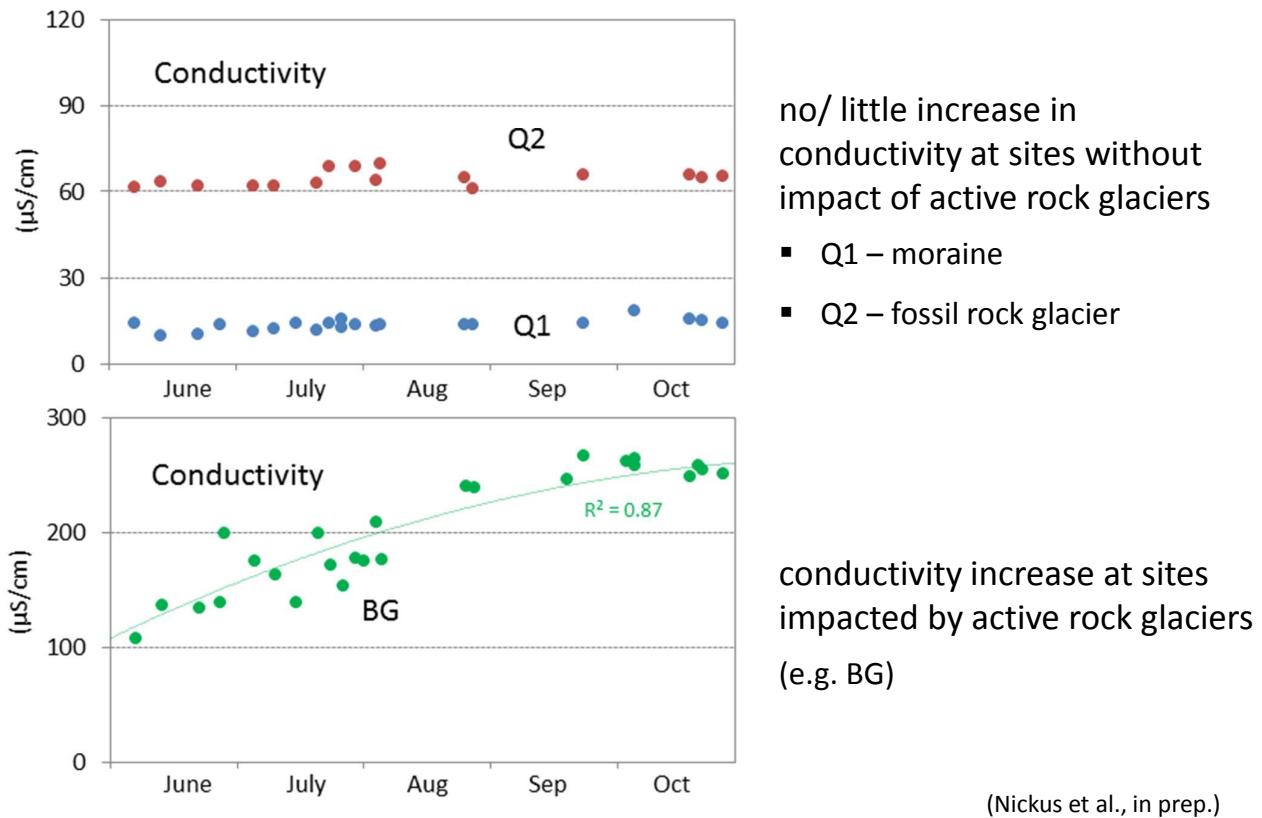
LAZAUN ROCK GLACIER

Nickel concentration

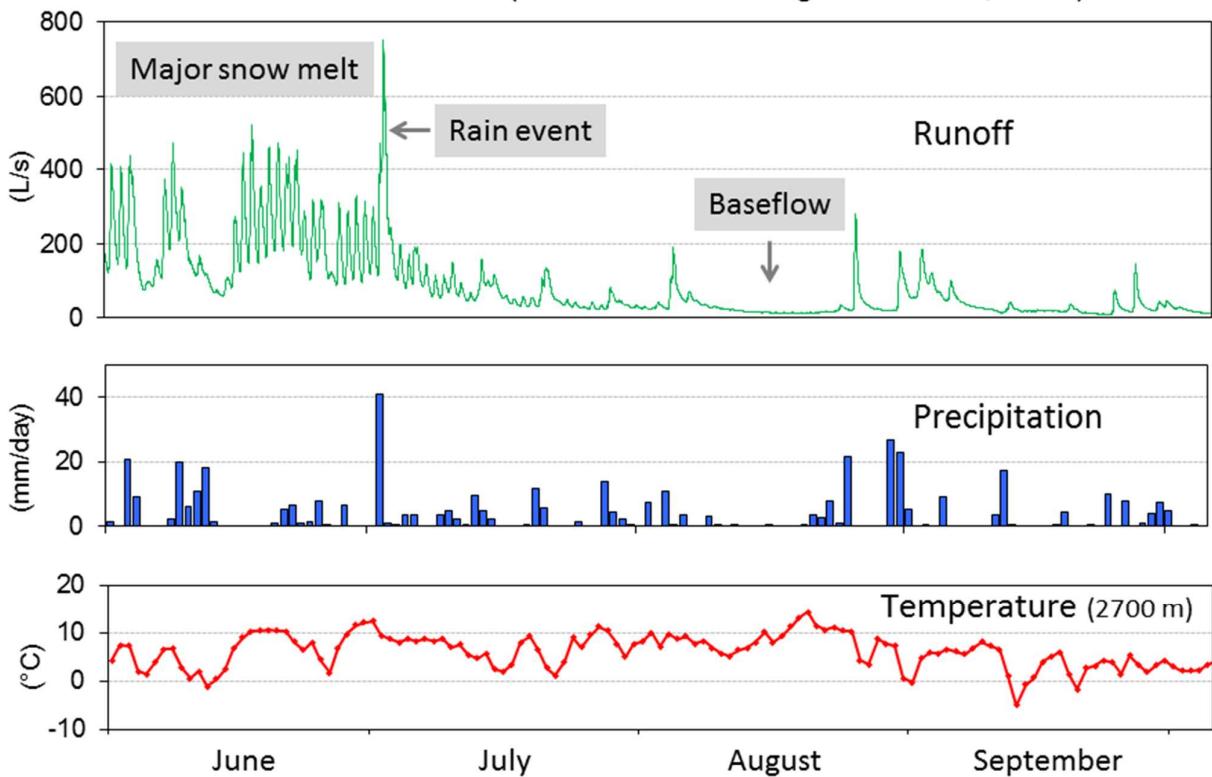


(Nickus et al., in prep.)

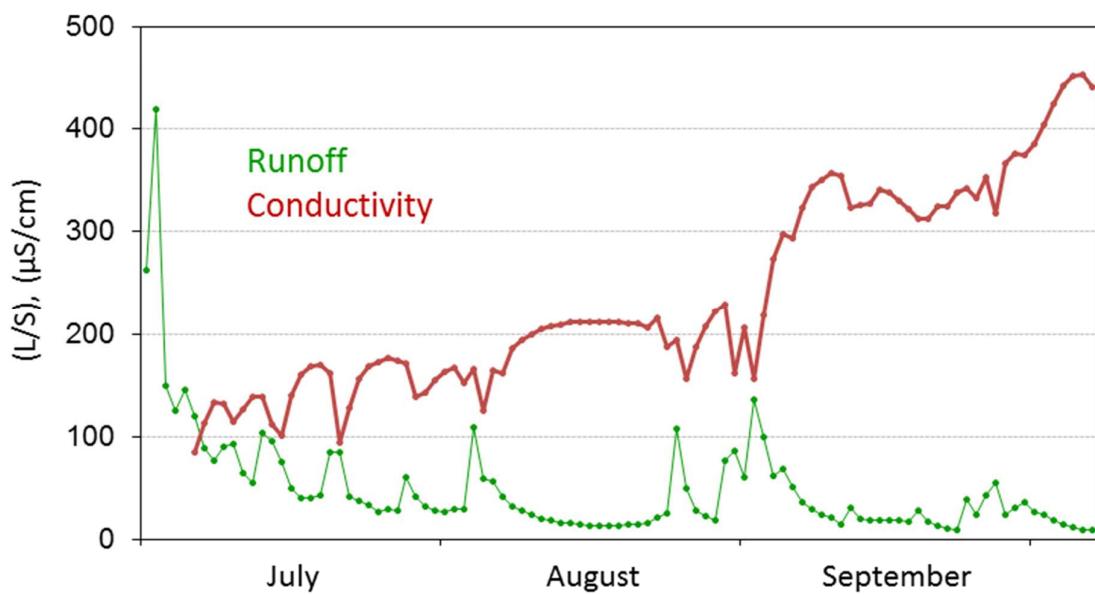
SEASONALITY (2007 - 2014)



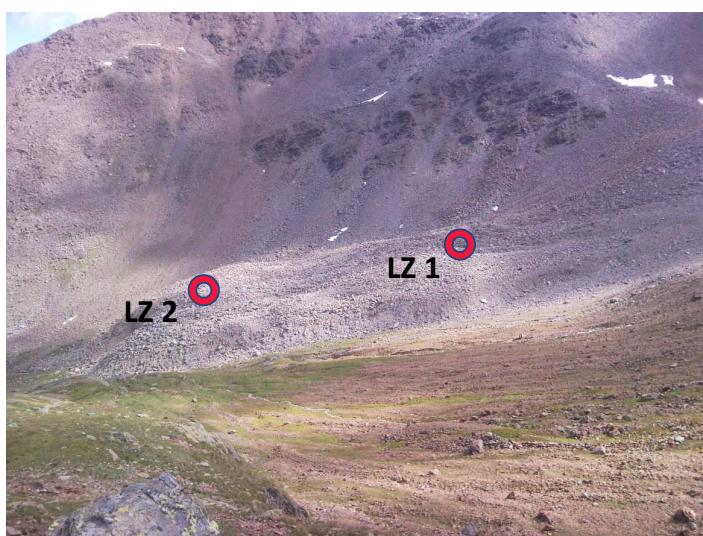
SEASONALITY (Hochebenkar rock glacier brook, 2012)



SEASONALITY (Hochebenkar rock glacier brook, 2012)



CORE DRILLING SITES

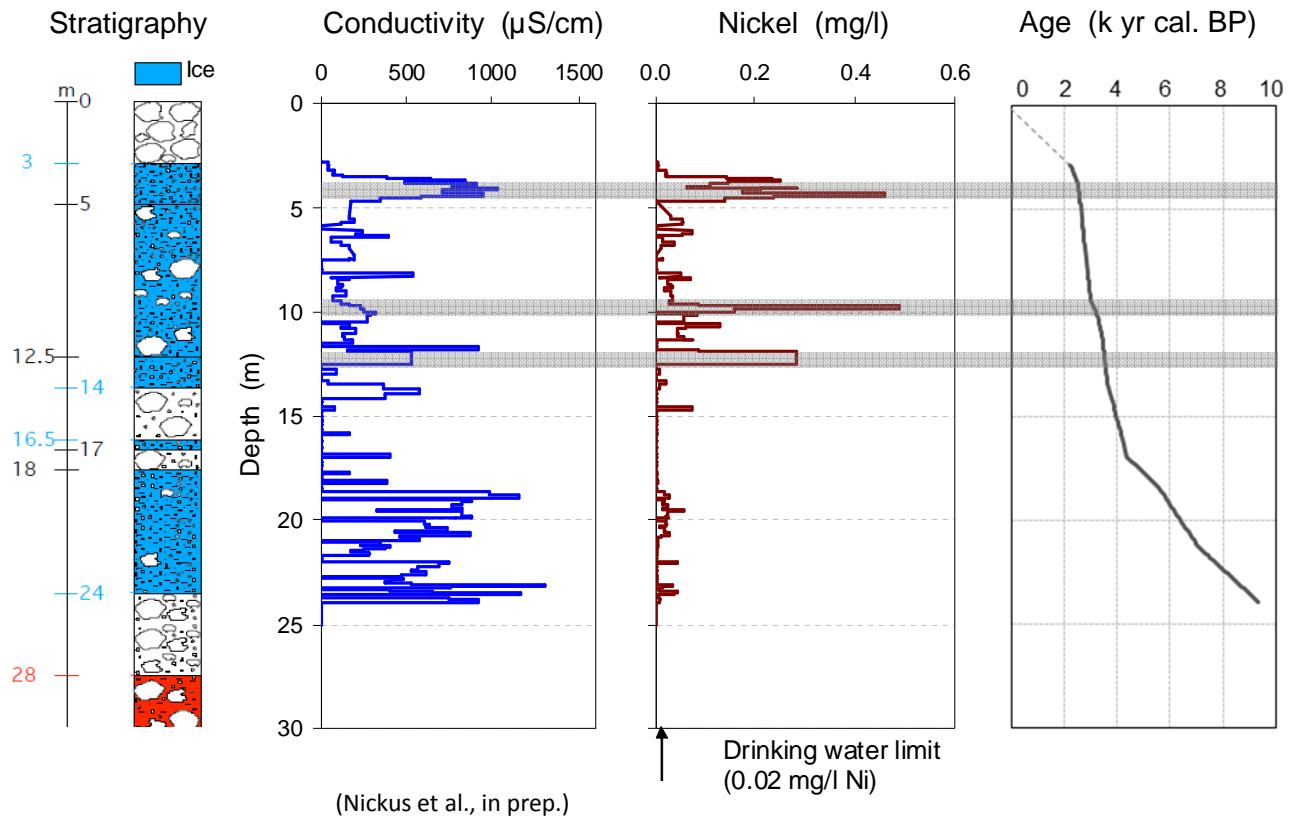


LZ 1 (2580 m) 40 m length
LZ 2 (2538 m) 32 m length

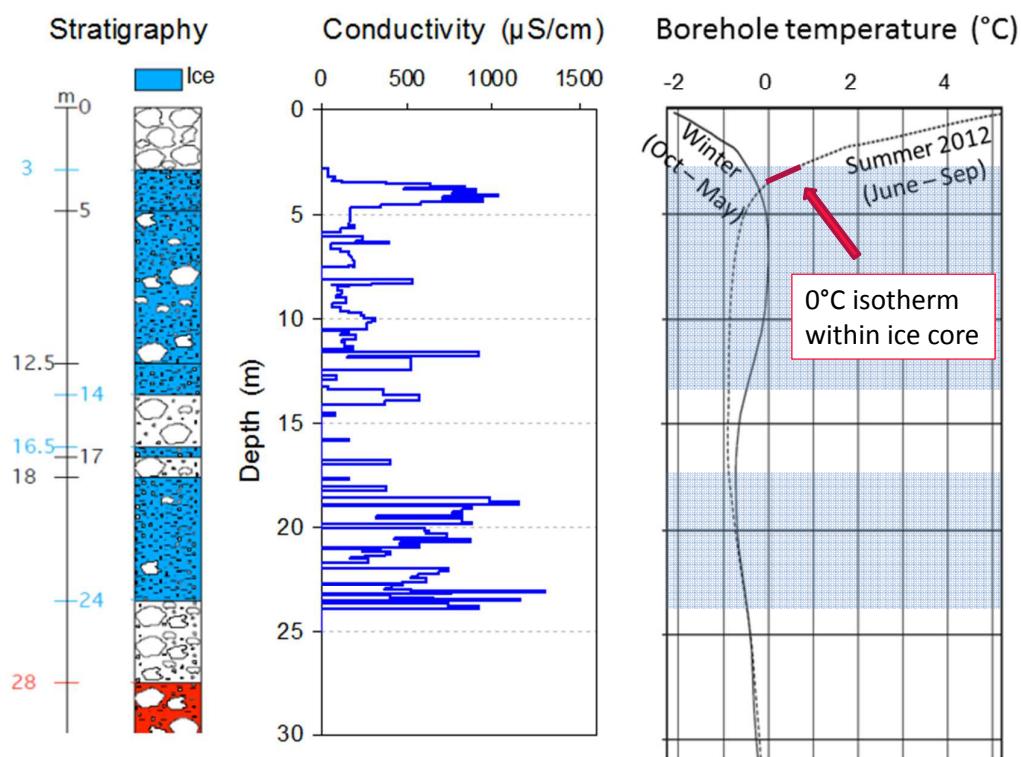


(Krainer et al. 2015)

LAZAUN ROCK GLACIER CORE 1



LAZAUN ROCK GLACIER CORE 1



SUMMARY

IONIC COMPOSITION of rock glacier outflows

- dominated by sulfate, calcium and magnesium (up to 99% of total ions)
- sulfate concentrations seem to increase with a rising impact of rock glacier

METAL CONCENTRATIONS in rock glacier outflows

- can exceed drinking water limits up to one order of magnitude (e.g. nickel)

SEASONALITY in solute concentrations of rock glacier outflows with

autumn maxima due to:

- decreasing dilution of highly mineralised baseflow between early summer and fall
- potential contribution of internal ice melt

Little to no seasonality in solute concentrations in streams without rock glacier impact

Acknowledgements

D. Bressan, B. Dietre, I. Hajdas, M. Hirnsperger, J. N. Haas, K. Krainer, K. Lang, V. Mair, D. Reidl, R. Tessadri, H. Thies, D. Tonidandel

EU Interreg IV-Permaqua, EU Alpine Space-PermaNet, EU-Eurolimpacs and Austrian Academy of Sciences for financial support

Hydrographic Service Tyrol (Austria) for data supply



Danke für Ihre Aufmerksamkeit

