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Controls on spatial and temporal variability in streamflow and hydrochemistry in a glacierized catchment

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Table S1. Statistics of element concentration (in µg l^{-1}) from selected stream, tributary and active rock glacier springs in the Sulden catchment sampled from March to October 2015. CV: coefficient of variation. VC: variability coefficient (see Eq. 1) with $SD_{baseflow}$ (based on samples from March, April, and October 2015) and $SD_{melting}$ (based on samples from May to September 2015). Note that CV was not calculated for SSPR2 – 4 as water samples were available only during summer.

Location	Statistic	Na	Mg	Al	K	Ca	V	Cr	Mn	Fe	Ni	Cu
S1	min	1881.3	12169.1	6.9	1051.2	41497.2	0.2	0.2	1.1	21.1	0.5	1.5
	max	7246.9	19547.1	541.4	2456.0	56508.3	1.8	1.4	62.4	1038.9	3.8	9.1
	mean	3253.5	14625.4	148.7	1657.3	48423.7	0.6	0.6	15.0	292.5	1.3	4.9
	SD	1782.0	2265.3	157.3	487.1	4538.1	0.5	0.3	18.7	300.2	1.0	3.0
	CV	0.5	0.2	1.1	0.3	0.1	0.9	0.5	1.2	1.0	0.8	0.6
	VC	0.6	0.3	0.3	1.6	0.5	0.2	0.2	0.1	0.3	0.2	0.8
S2	min	1968.4	9793.3	6.1	1546.3	43167.9	0.1	0.2	1.1	12.0	0.3	1.3
	max	3334.6	16453.8	743.1	2476.3	73177.3	1.9	1.7	71.0	1513.5	3.8	9.1
	mean	2431.6	12437.2	211.2	1900.9	52361.7	0.6	0.6	18.5	410.7	1.2	3.3
	SD	409.4	2292.5	236.4	299.3	8738.1	0.6	0.5	22.4	467.9	1.1	2.4
	CV	0.2	0.2	1.1	0.2	0.2	1.0	0.8	1.2	1.1	0.9	0.7
	VC	2.0	0.2	0.2	0.7	0.2	0.1	0.2	0.1	0.2	0.2	0.2
S6	min	1262.6	17458.6	9.0	1042.6	67588.1	0.1	0.1	1.5	21.6	0.5	1.5
	max	2277.0	34928.5	799.4	1748.4	166731.5	3.4	1.9	104.6	1587.1	6.2	17.0
	mean	1805.6	22862.4	278.4	1362.7	129896.0	1.1	0.8	43.1	596.1	2.1	6.5

	SD	339.4	5512.9	321.0	259.4	28165.0	1.2	0.7	47.4	670.0	1.9	4.9
	CV	0.2	0.2	1.2	0.2	0.2	1.2	0.8	1.1	1.1	0.9	0.8
	VC	0.6	0.2	0.0	1.4	0.5	0.0	0.1	0.0	0.1	0.1	0.2
SSPR2-4	min	1768.3	10051.4	9.0	1236.1	76848.5	0.0	0.1	1.5	16.7	0.2	0.5
	max	2818.6	29509.5	321.2	2402.5	131149.7	2.5	0.6	71.7	492.2	1.5	38.3
	mean	2199.9	17254.4	68.9	2009.0	94611.4	0.4	0.3	13.1	127.5	0.7	8.2
	SD	343.3	6935.8	97.8	294.4	21508.4	0.8	0.2	22.5	148.5	0.5	11.7
	CV	0.2	0.4	1.4	0.1	0.2	2.2	0.5	1.7	1.2	0.7	1.4
T1	min	1125.7	13481.8	6.3	536.9	33044.0	0.2	0.1	0.9	13.3	0.3	0.4
	max	3312.9	42197.2	914.7	1470.6	88033.8	4.5	1.8	121.8	1178.5	3.5	22.0
	mean	2078.3	19230.5	139.8	985.9	48369.3	0.8	0.5	19.1	190.2	1.1	5.1
	SD	600.5	8846.6	293.5	302.7	16108.6	1.4	0.5	38.9	374.8	1.0	6.6
	CV	0.3	0.5	2.1	0.3	0.3	1.8	1.0	2.0	2.0	0.9	1.3
	VC	1.3	0.1	0.0	0.8	0.3	0.0	0.3	0.0	0.0	0.2	0.2
TT2	min	321.0	12048.8	4.7	272.8	23873.4	0.1	0.2	0.8	10.4	0.3	0.7
	max	2524.5	20756.5	568.0	1017.1	39335.1	2.0	1.3	57.1	1116.2	2.7	22.2
	mean	1148.1	16898.0	97.0	551.6	32228.7	0.4	0.4	10.2	173.2	0.9	8.0
	SD	727.9	2945.5	179.7	244.1	4615.5	0.6	0.4	17.9	357.5	0.7	7.7
	CV	0.6	0.2	1.9	0.4	0.1	1.5	0.9	1.8	2.1	0.8	1.0

	VC	0.9	0.8	0.1	0.6	0.5	0.1	0.3	0.1	0.1	0.3	0.2

Table S2. Statistics of element concentration (in µg l^{-1}) from selected stream, tributary and active rock glacier springs in the Sulden catchment sampled from March to October 2015. CV: coefficient of variation. VC: variability coefficient (see Eq. 1) with $SD_{baseflow}$ (based on samples from March, April, and October 2015) and $SD_{melting}$ (based on samples from May to September 2015). Note that CV was not calculated for SSPR2 – 4 as water samples were available only during summer.

location	statistics	Zn	As	Se	Rb	Sr	Ag	Cd	Sb	Hg	Pb	U
S1	min	4.1	12.1	0.5	0.0	307.9	0.0	0.0	0.2	0.0	0.4	0.0
	max	23.2	61.1	1.1	2.6	390.5	0.1	0.1	0.5	0.2	7.6	11.3
	mean	9.7	27.0	0.8	1.1	349.8	0.0	0.1	0.3	0.1	2.1	5.1
	SD	5.8	15.5	0.2	1.1	27.2	0.0	0.1	0.1	0.1	2.3	5.2
	CV	0.6	0.6	0.2	1.0	0.1	2.6	1.0	0.4	1.1	1.1	1.0
	VC	0.2	2.6	1.0	0.0	0.7	-	1.0	2.0	0.0	0.1	0.0
S2	min	3.7	15.1	0.4	0.0	334.0	0.0	0.0	0.1	0.0	0.3	0.0
	max	23.8	40.9	0.7	3.4	609.9	0.0	0.1	0.2	0.2	9.4	11.3
	mean	8.5	23.3	0.5	1.6	410.7	0.0	0.0	0.2	0.1	2.7	4.9
	SD	6.4	8.0	0.1	1.6	81.0	0.0	0.0	0.0	0.1	3.4	5.1
	CV	0.7	0.3	0.2	1.0	0.2	-	1.3	0.3	1.1	1.3	1.0
	VC	0.2	2.0	0.5	0.0	0.3	-	1.0	1.0	0.0	0.1	0.0
S6	min	5.6	6.3	0.5	0.0	524.0	0.0	0.0	0.3	0.0	0.4	0.0
	max	40.9	17.0	1.2	1.9	2024.0	0.0	0.2	0.5	0.1	18.1	11.3
	mean	19.1	10.1	0.9	0.7	1380.5	0.0	0.1	0.3	0.0	6.7	4.0
	SD	12.9	4.0	0.2	0.8	463.1	0.0	0.1	0.1	0.0	7.3	4.9
	CV	0.7	0.4	0.2	1.2	0.3	-	0.9	0.2	1.2	1.1	1.2
	VC	0.2	0.1	0.5	0.0	0.5	-	0.5	2.2	0.0	0.0	0.0
SSPR2-4	min	1.5	6.3	0.4	0.0	341.2	0.0	0.0	0.1	0.0	0.2	0.0
	max	49.4	38.0	0.6	2.7	1355.7	0.1	0.4	0.4	0.1	19.8	27.2
	mean	10.7	31.1	0.5	0.9	770.9	0.0	0.1	0.2	0.0	3.1	6.9
	SD	14.8	4.4	0.1	1.0	435.7	0.0	0.1	0.1	0.0	6.3	9.4

	CV	1.4	0.1	0.2	1.1	0.6	2.6	1.4	0.6	1.3	2.0	1.4
T1	min	2.3	7.2	0.6	0.0	220.9	0.0	0.0	0.2	0.0	0.3	0.0
	max	46.5	64.2	1.4	1.9	478.1	0.0	0.2	0.7	0.2	18.0	12.5
	mean	10.9	24.5	1.1	0.7	340.1	0.0	0.1	0.4	0.1	2.9	5.6
	SD	13.6	18.4	0.3	0.7	75.8	0.0	0.1	0.1	0.1	5.7	5.7
	CV	1.2	0.8	0.2	1.1	0.2	-	1.4	0.4	1.1	2.0	1.0
	VC	0.1	2.9	0.6	0.0	0.9	-	0.6	2.0	0.0	0.0	0.0
TT2	min	2.8	0.3	0.5	0.0	149.4	0.0	0.0	0.2	0.0	0.3	0.0
	max	39.4	1.2	1.5	1.7	384.5	0.5	0.1	0.5	0.7	9.1	10.6
	mean	9.9	0.7	1.0	0.4	247.5	0.1	0.0	0.3	0.1	1.8	4.8
	SD	11.4	0.3	0.3	0.5	67.5	0.2	0.0	0.1	0.2	2.8	4.9
	CV	1.2	0.4	0.3	1.5	0.3	2.6	1.3	0.4	1.8	1.5	1.0
	VC	0.1	0.3	1.3	0.0	1.2	0.0	1.0	-	0.0	0.1	0.0