water

MDPI

SUPPLEMENTARY MATERIAL

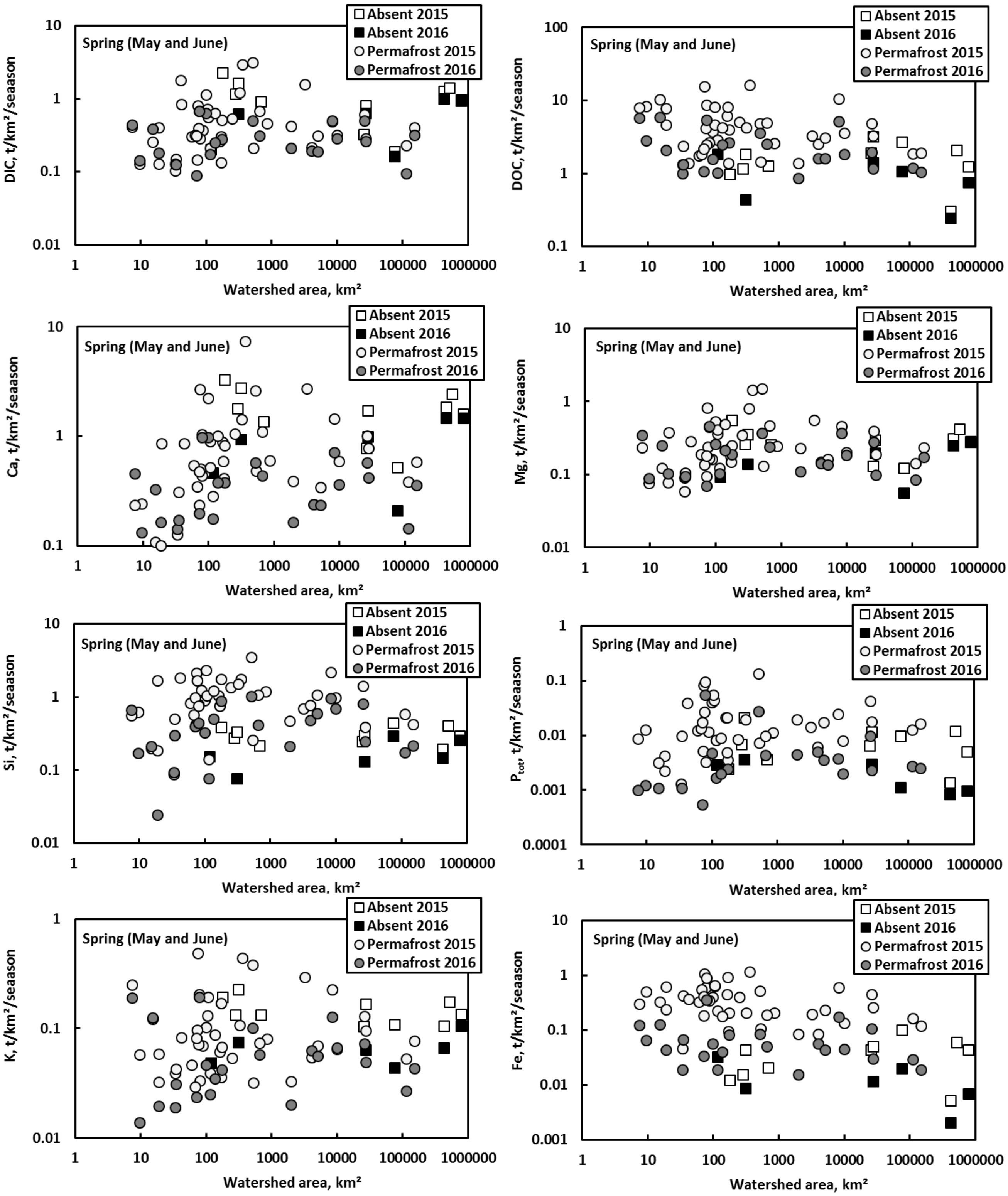

Fig. S1. Correlation between elementary yields and watershed area for permafrost-free (Absent, squares) and permafrost-affected (Permafrost, circles) regions. Open symbols represent the year of 2015 and closed symbols represent the year of 2016.

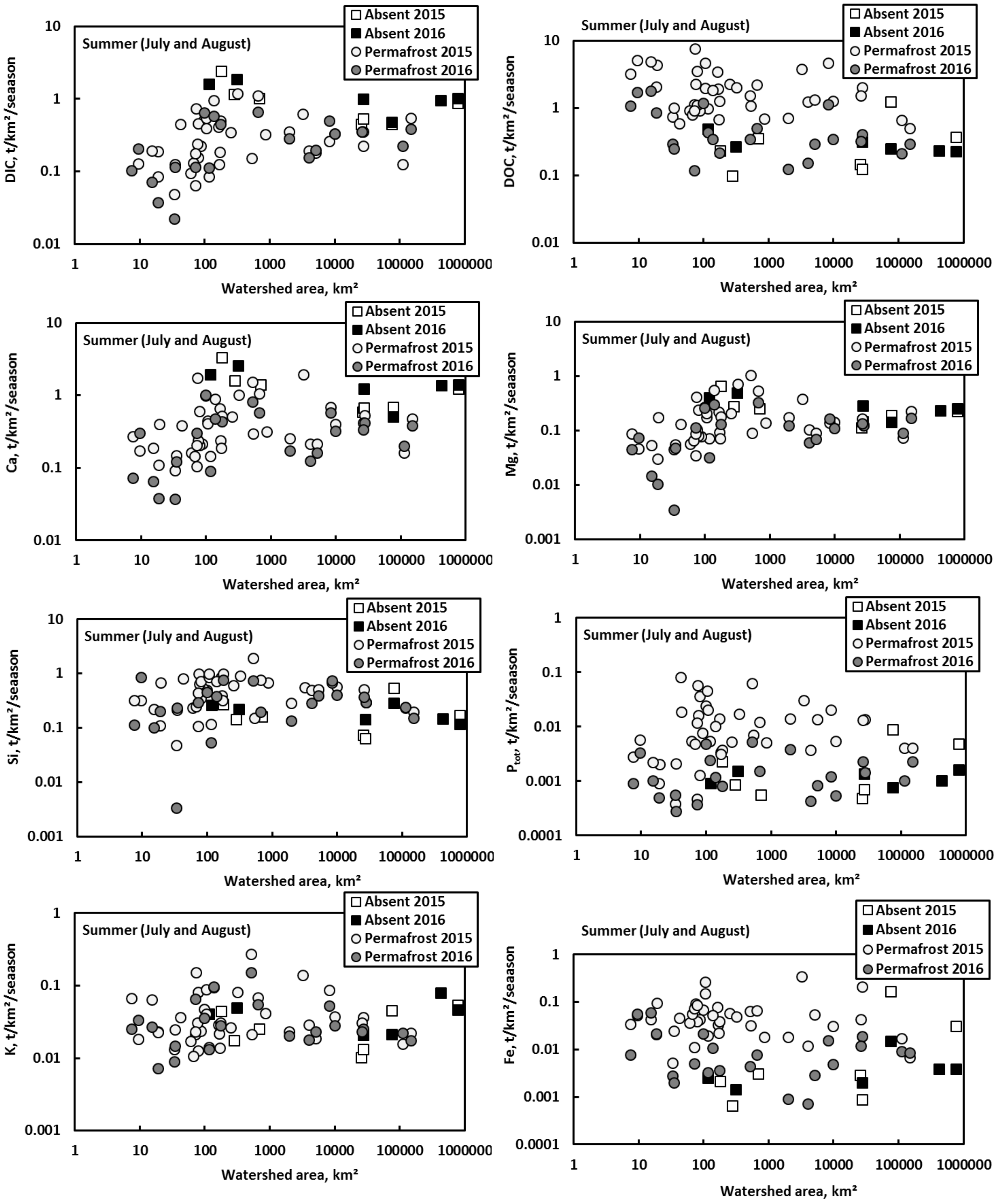

Fig. S1, continued.

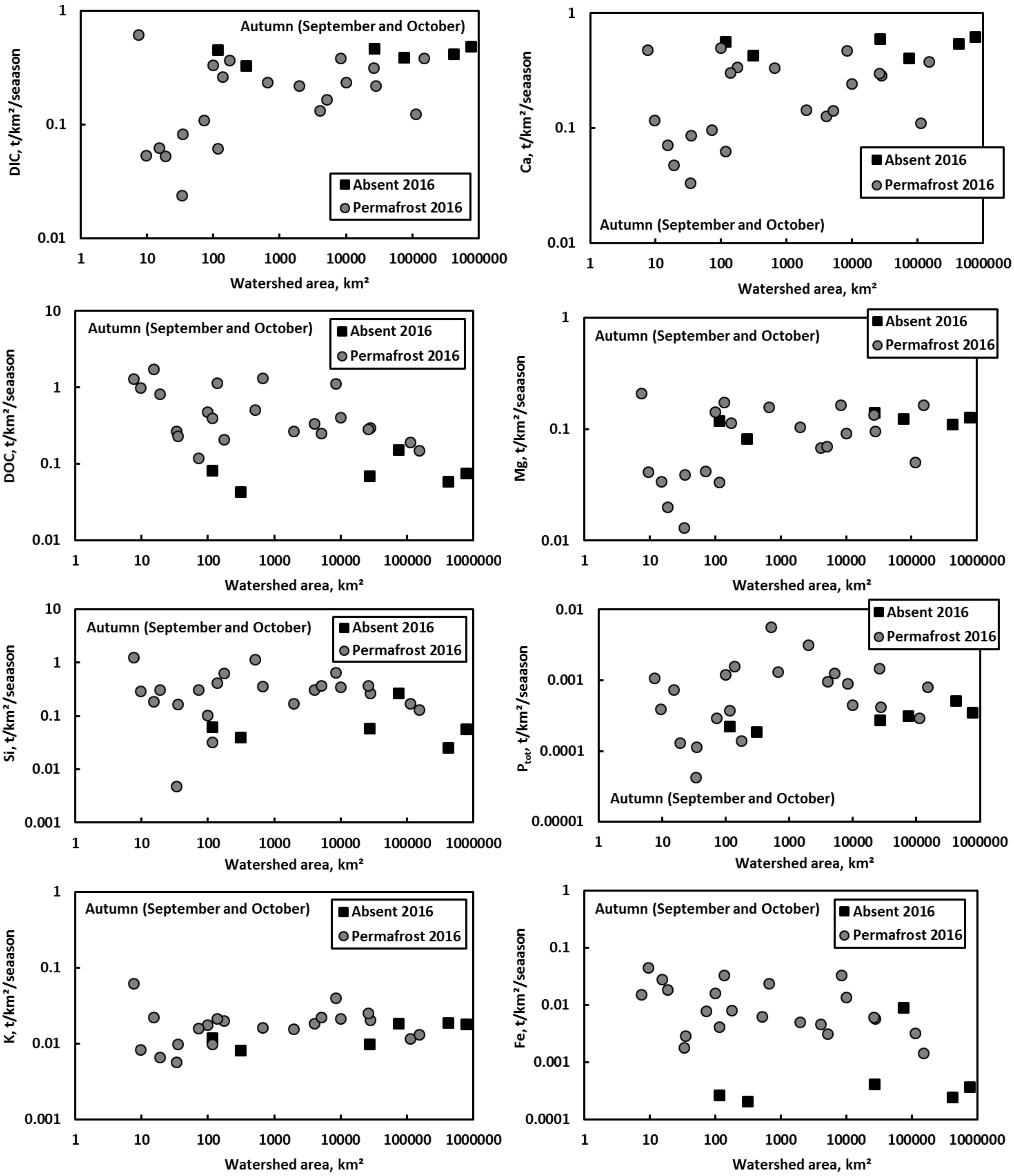

Fig. S1, continued.

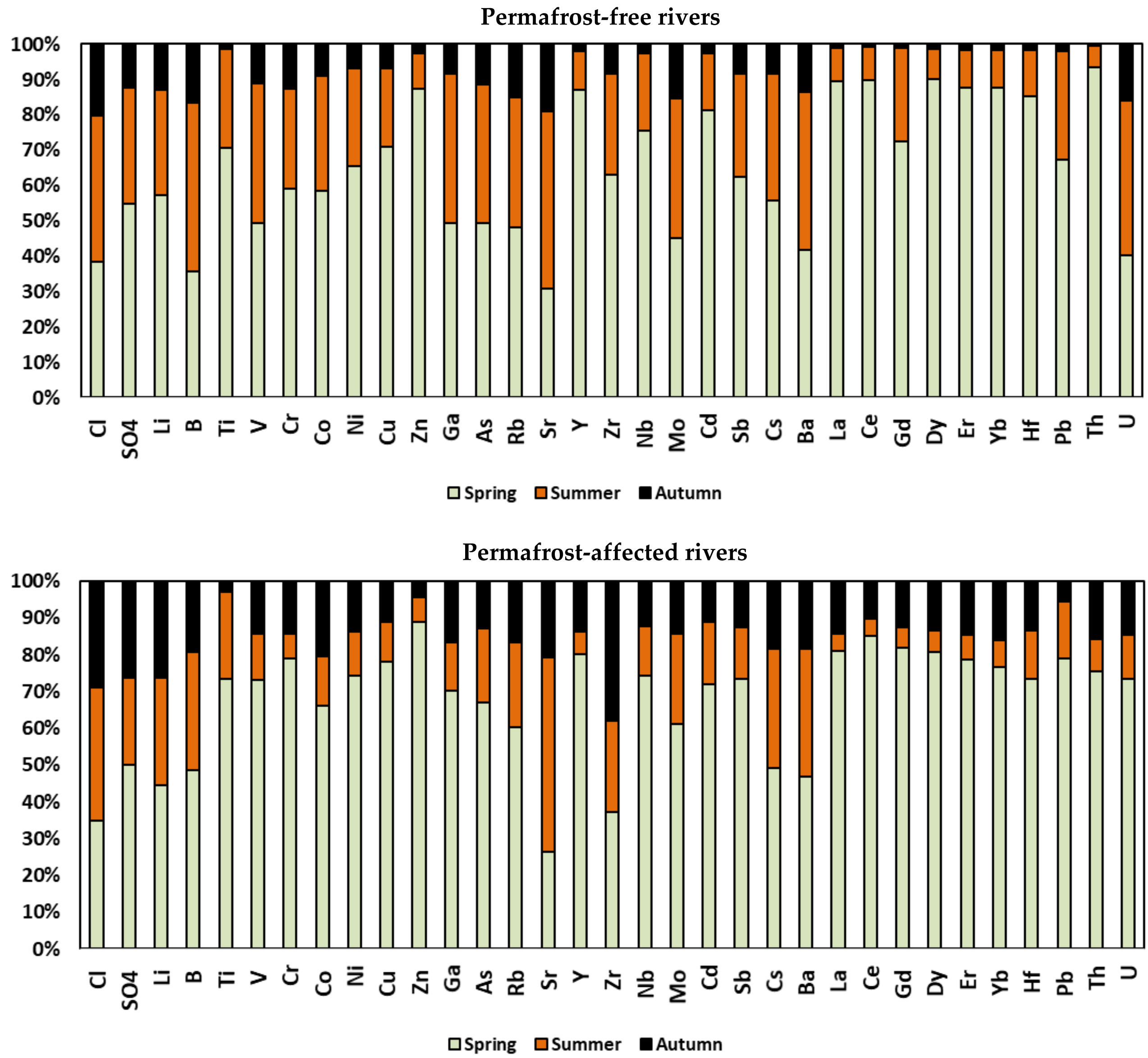

Fig. S2. Partial contribution of spring, summer and autumn 2016 to overall open-water period yields of anions and trace elements by WSL rivers, located in the permafrost-free (upper panel) and permafrost-affected (bottom panel) regions.

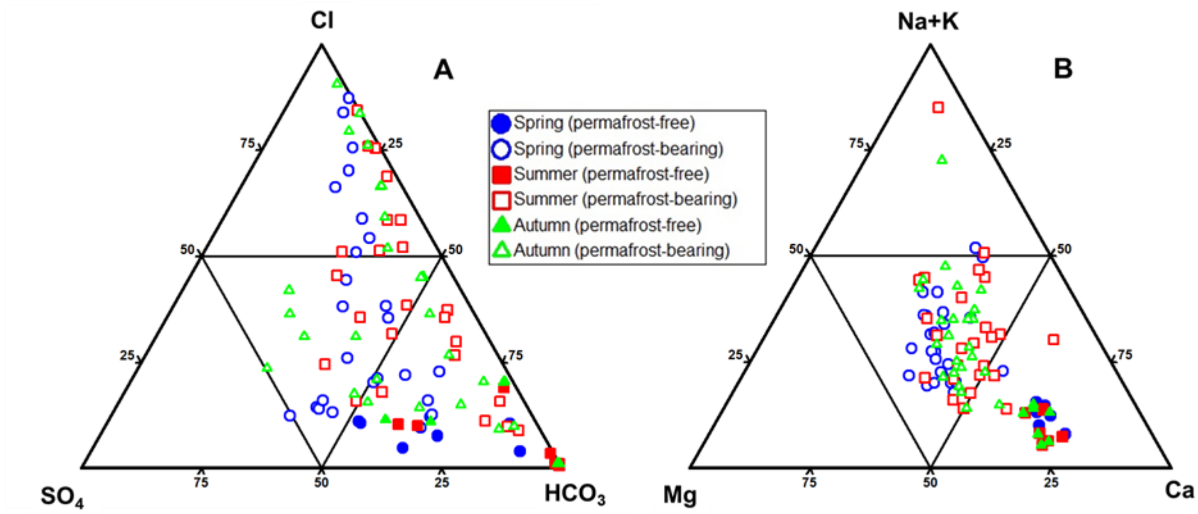

Fig. S3. Ternary molar diagrams of cations (A) and anions (B) in the southern, permafrost-free (closed symbols) and northern, permafrost-affected (open symbols) WSL rivers, sampled during spring (circles), summer (squares) and autumn (triangles). A lack of season and river size control on major chemical composition allows to use the latitude (permafrost zones) as a main governing factor of river hydrochemistry and export fluxes.

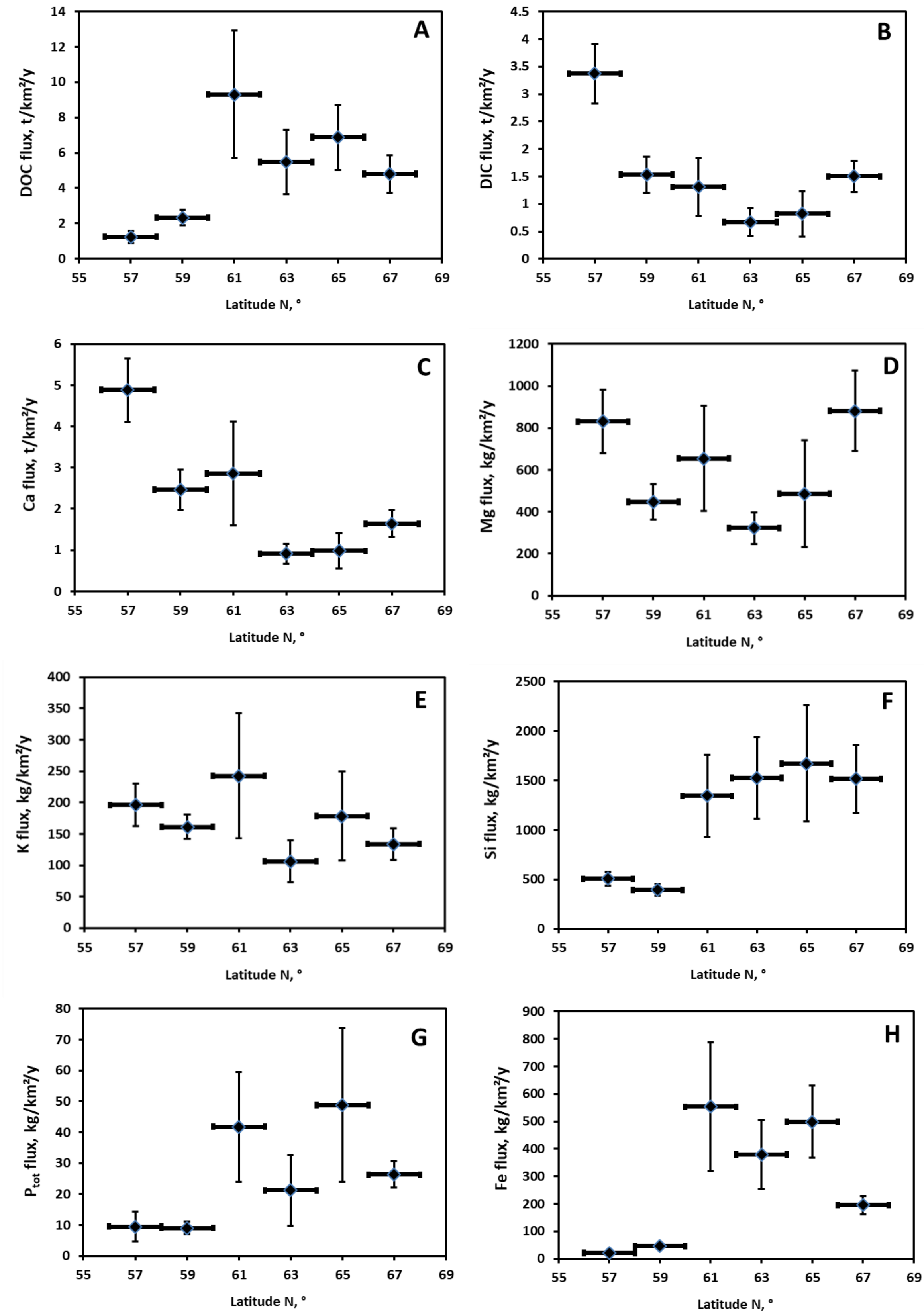

Fig. S4. Yields (watershed-area normalized export fluxes) of DOC (A), DIC (B), Ca (C), Mg (D), K (E), Si (F), P_{tot} (G) and Fe (H) during May-August 2015 in 33 WSL rivers across the latitudinal gradient. The vertical uncertainties represent the 2 s.d. of several rivers belonging to the same latitudinal belt. The year is represented by open-water period (May to October), neglecting winter (November to April).

Table S1. Spearman correlation coefficients ($p < 0.05$) between element export flux (yield) and the watershed area in the permafrost-free (PF-free) and permafrost-affected (PF-affected) rivers. Significant correlations are in bold.

	May-June 2015+2016		July-August 2015+2016		September-October 2016		May-August 2015+2016	
	PF-free	PF-affected	PF-free	PF-affected	PF-free	PF-affected	PF-free	PF-affected
Cl	0.483	0.146	**0.728**	0.172	0.543	0.033	**0.583**	0.159
SO4	0.372	0.224	**0.908**	0.119	**0.943**	0.113	**0.515**	0.124
DOC	-0.13	-0.201	0.028	**-0.28**	0.029	-0.401	-0.031	**-0.205**
DIC	0.04	0.173	**-0.579**	**0.449**	0.371	0.431	-0.244	**0.298**
Li	0.034	0.065	0.223	-0.099	0.771	-0.159	0.081	-0.028
B	-0.087	-0.034	-0.541	-0.153	0.6	0.135	-0.188	-0.114
Na	0.472	0.126	0.353	0.187	**0.886**	0.104	**0.443**	0.148
Mg	0.139	0.193	**-0.599**	**0.45**	0.314	0.365	-0.165	**0.28**
Al	-0.353	-0.233	0.243	-0.38	0.657	**-0.563**	0.012	**-0.25**
Si	0.14	0.156	-0.132	0.142	-0.314	0.038	0.038	0.147
P	-0.182	0.167	0.298	0.166	**0.886**	0.277	0.034	0.168
K	-0.03	0.082	0.392	0.099	0.657	0.234	0.141	0.081
Ca	0.04	**0.283**	-0.541	**0.395**	0.257	0.338	-0.193	**0.317**
Ti	-0.266	-0.09	0.121	0.013	-0.143	-0.231	-0.053	-0.046
Cr	-0.041	**-0.297**	0.185	-0.184	0.657	-0.31	0.049	**-0.195**
Mn	-0.242	-0.125	-0.499	**-0.381**	-0.543	**-0.453**	**-0.408**	**-0.219**
Fe	0.004	**-0.25**	**0.67**	-0.214	0.257	-0.387	0.239	-0.16
Co	-0.143	**-0.26**	-0.287	**-0.421**	-0.314	**-0.448**	-0.169	**-0.294**
Ni	-0.038	-0.031	0.199	0.133	0.143	0.128	0.05	0.032
Cu	0.45	0.186	**0.58**	0.085	**0.886**	-0.034	0.34	0.09
Zn	-0.196	-0.218	-0.003	**-0.407**	0.6	**-0.467**	-0.089	**-0.32**
Ga	-0.342	**-0.387**	0.305	**-0.418**	**0.943**	**-0.544**	0.02	**-0.34**
As	0.297	-0.173	0.461	-0.206	**0.886**	-0.222	0.349	-0.166
Rb	0.061	0.174	0.05	0.172	0.086	0.155	0.071	0.145
Sr	0.207	0.17	-0.513	**0.248**	0.314	0.286	-0.091	**0.185**
Y	0.096	0.199	**0.679**	-0.106	0.657	-0.289	0.297	0.063
Zr	**-0.503**	0.211	0.265	0.017	-0.657	-0.141	-0.125	0.038
Nb	-0.179	-0.214	0.392	-0.236	-0.543	-0.326	0.062	**-0.186**
Mo	0.413	0.149	**0.665**	0.143	**0.886**	0.26	**0.514**	0.148
Cd	-0.049	**-0.292**	0.301	**-0.371**	0.771	**-0.488**	0.122	**-0.267**
Sb	0.424	**-0.244**	**0.577**	**-0.25**	**0.886**	**-0.45**	**0.416**	**-0.186**
Cs	-0.235	**-0.476**	0.171	-0.23	-0.314	**-0.466**	0.047	**-0.329**
Ba	-0.084	-0.125	-0.273	**-0.314**	0.543	-0.118	-0.123	**-0.227**
La	-0.19	0.157	**0.64**	-0.118	0.657	-0.351	0.201	0.035
Ce	-0.227	0.093	**0.62**	-0.16	0.429	-0.333	0.178	-0.009
Pr	-0.05	0.176	**0.70**	-0.142	0.657	-0.304	0.26	0.033
Nd	0.006	0.183	**0.77**	-0.142	0.657	-0.263	0.29	0.037
Gd	0.04	0.087	**0.554**	-0.099	0.771	-0.295	0.265	-0.009
Dy	0.055	0.201	**0.69**	-0.127	0.771	-0.285	0.289	0.05
Yb	–	0.178	**0.59**	-0.128	0.314	-0.266	0.237	0.036
Hf	0.08	-0.109	0.323	**-0.308**	0.257	-0.32	0.122	-0.159
Pb	0.151	**-0.392**	0.157	-0.239	0.657	**-0.431**	0.15	**-0.283**
Th	-0.201	0.032	**0.681**	-0.213	0.429	-0.312	0.146	-0.049
U	0.32	**0.276**	0.331	0.055	0.6	0.025	**0.37**	0.156