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Supplement of

**Assessing inter-annual and seasonal patterns of DOC and DOM
quality across a complex alpine watershed underlain by
discontinuous permafrost in Yukon, Canada**

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Year	Sites	DOC (mg/L)			SUVA ₂₅₄			BIX			FI		
		Spring	Summer	F/W	Spring	Summer	F/W	Spring	Summer	F/W	Spring	Summer	F/W
<i>2015</i>													
	BB	1.77±0.66(5)	1.25±0.31(11)	1.19±0.39(9)	3.30±0.58(3)	3.88±0.55(4)	2.72±0.42(2)	0.55±0.04	0.60±0.01	0.60±0.03	1.49±0.06	1.54±0.03	1.57±0.76
	CL	2.90(1)		2.60(1)									
	GC	2.89±2.29(52)	1.07±0.21(36)	1.75±0.76(17)	3.21±0.84(22)	3.81±0.75(14)	2.42±0.33(3)	0.69±0.06	0.60±0.02	0.65±0.02	1.52±0.06	1.54±0.04	1.57±0.04
	W1	15.8(1)			3.94(1)			0.47 (1)			1.46(1)		
	WCO			1.79±0.90(14)			2.21±0.17(10)			0.66±0.03			1.62±0.03
<i>2016</i>													
	BB	2.34±0.87(14)	1.42±0.27(23)	1.50±0.20(3)	3.56±0.48(10)	2.81±0.59(16)	2.45±0.28(3)	0.513±0.03	0.58±0.03	0.62±0.02	1.45±0.04	1.52±0.06	1.52±0.00
	CL		3.15±0.35(2)										
	GC	4.32±2.56(43)	1.71±0.34(32)	2.00±0.57(20)	3.86±1.40(37)	2.86±0.38(17)	3.14±0.32(11)	0.513±0.06	0.58±0.03	0.60±0.04	1.45±0.04	1.50±0.04	1.50±0.02
	W1	6.70(1)	7.37±0.64(10)	6.95±0.21(2)	4.77(1)	4.04±0.60(7)		0.58(1)	0.63±0.05		1.58(1)	1.54±0.04	
	WCO	2.69±0.80(18)	2.58±0.44(22)	2.35±0.35(3)	2.83±0.42(12)	2.70±0.28(19)	2.69±0.11(2)	0.582±0.04	0.60±0.02	0.66±0.03	1.53±0.02	1.54±0.03	1.55±0.01
<i>2017</i>													
	BB	2.70(1)	2.17±0.45(7)	1.15±0.14(6)		3.02±0.38(6)	3.15±0.17(6)		0.55±0.03	0.61±0.02		1.48±0.03	1.55±0.02
	CL		3.23±0.15(4)	2.96±0.09(5)		2.66±0.15(3)	2.82±0.08(5)		0.66±0.03	0.69±0.02		1.48±0.01	1.50±0.03
	GC	3.15±0.64(2)	2.33±0.71(7)	1.28±0.18(6)		3.14±0.23(5)			0.55±0.03			1.45±0.03	
	W1			6.10(1)			5.26(1)			0.62(1)			1.66(1)
	WCO	4.42±1.84(6)	2.72±0.37(5)	2.14±0.11(5)		2.83±0.25(3)	2.94±0.10(3)		0.61±0.03	0.64±0.01		1.51±0.02	1.57±0.02

Table S1. This table is similar to Table 1 in the manuscript but incorporates all samples used for principal component analysis (PCA). Additional sites (CL, W1) and additional years of data for sites BB, GC and WCO were used in the analysis to investigate influence of landscape type. Notation: Mean ± standard deviation (number of samples).

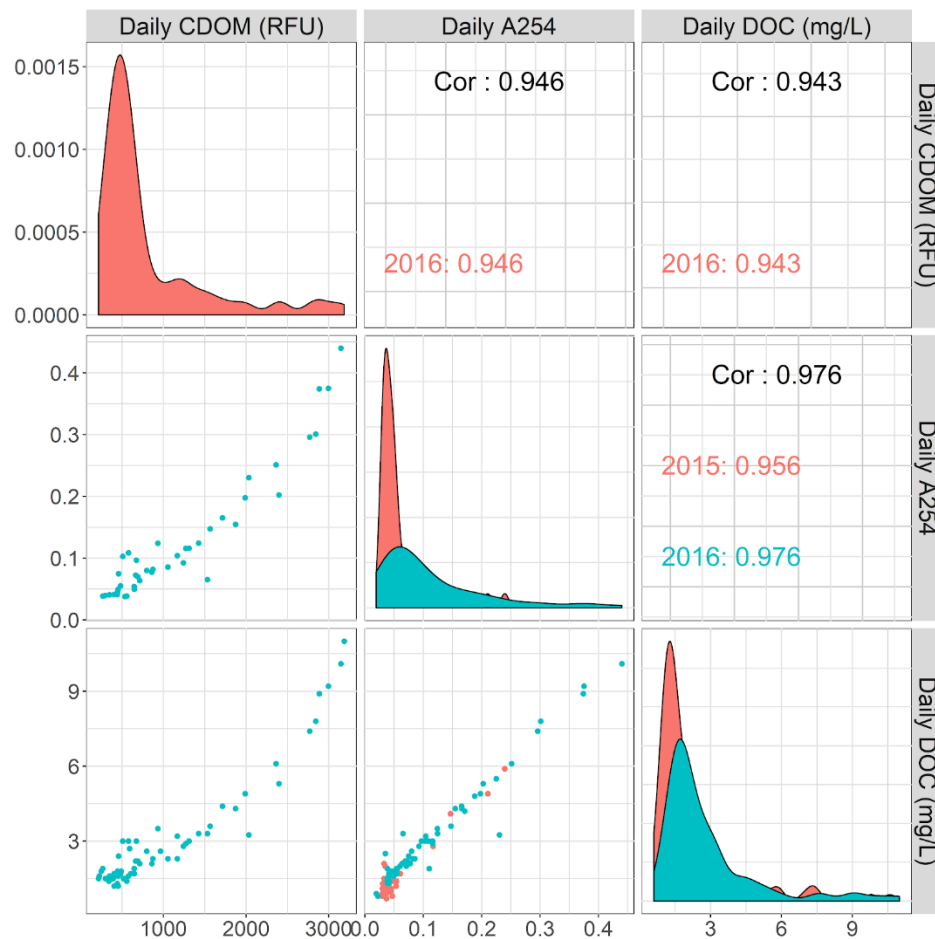


Figure S1. Correlation matrices of average daily CDOM (RFU), A254 (nm⁻¹) and DOC concentration (mg L⁻¹). No CDOM was measure in 2015 so it was not possible to separate out that year. Correlation was calculated using Pearson at 95% significance level (p<0.001 in all cases).

<i>Year Site</i>	Spring (R ²)	Summer (R ²)	Fall (R ²)	Spring & Summer (R ²)	Spring, Summer & Fall (R ²)
2002 GC	0.047	0.180		0.063	
2003 GC	0.041	0.001		0.034	
2006 GC	0.021	0.175		0.029	
2008 GC	0.024	0.215		0.005	
2015 GC	0.263	0.004	0.547	0.316	0.314
2016 GC	0.115	0.536	0.551	0.039	0.048
2016 WCO	0.066	0.783		0.010	0.011

Table S2. Regressions between discharge (Q) and DOC concentrations (C) were performed using the CQregression function in the RiverLoad package (Nava et al., 2019) for GC in 2002, 2003, 2006, 2008, 2015 and 2016. A statistically significant correlation between C and Q was necessary to perform the regression.

Kaiser-Meyer-Olkin factor
Overall MSA = 0.77

MSA for each item:

FI = 0.98

Fresh = 0.68

HIX = 0.86

BIX = 0.69

SUVA = 0.91

DOC = 0.94

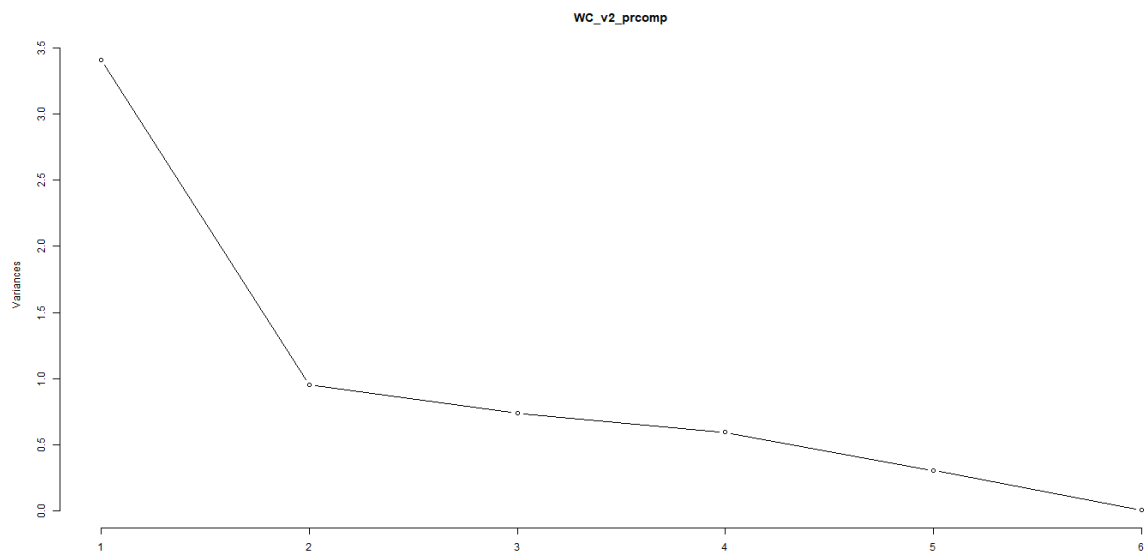


Figure S2. Scree plot for PCA.

	PC1	PC2	PC3	PC4
Standard dev	1.8472	0.9747	0.8577	0.7702
Proportion of variance	0.5687	0.1583	0.1226	0.09887
Cumulative proportion	0.5687	0.7270	0.8496	0.9485

Table S3. Standard deviation, proportion of variance explained by each PC (x100 for %) and cumulative proportion explained.

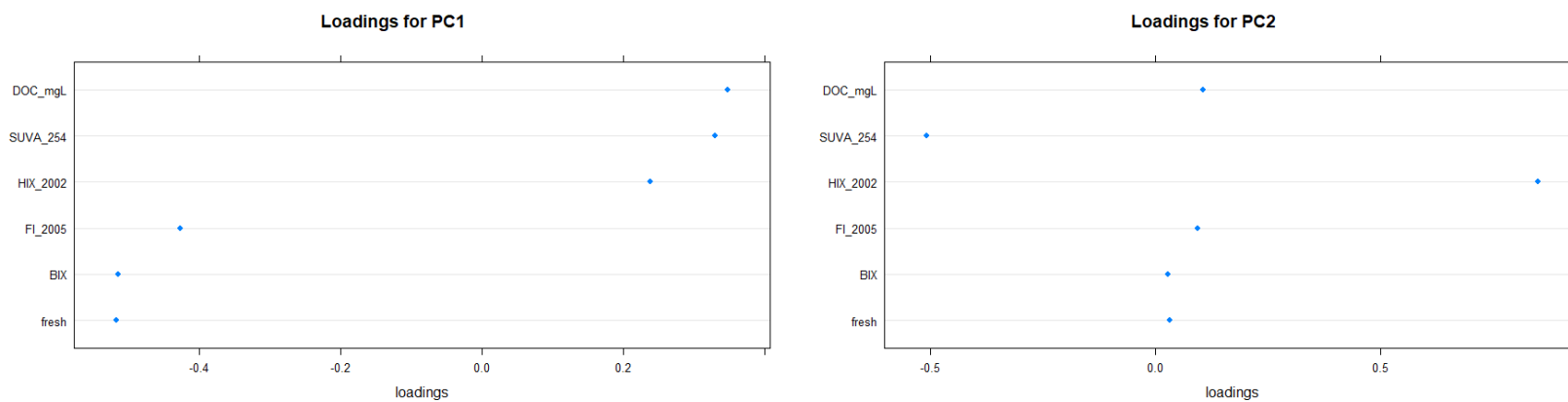


Figure S3. Dot plots of loadings per PC in PCA.