S1 Groundwater contribution to environmental flows estimation in snowfall dominated and rainfall dominated regions in British Columbia

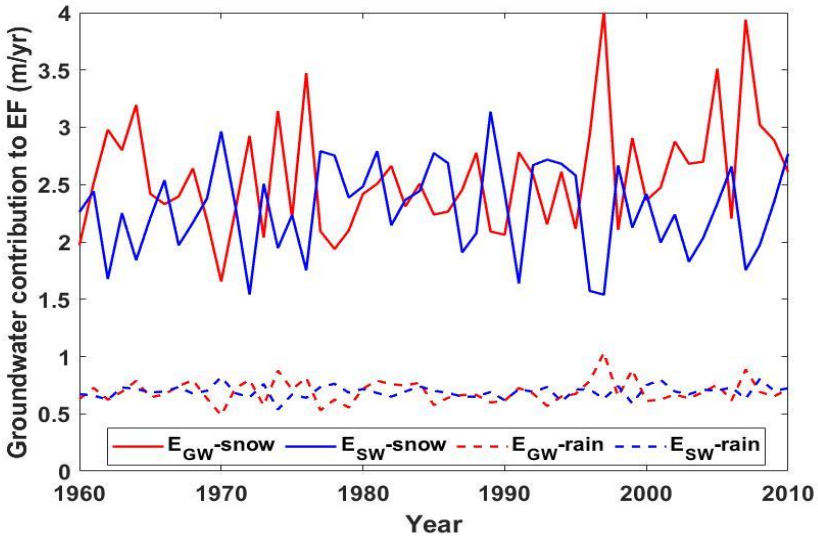

Fig. SI1 Mean annual groundwater contribution to environmental flows in snowfall dominant areas (E_{GW}-snow, E_{SW}-snow) and rainfall dominant areas (E_{GW}-rain, E_{SW}-rain) in British Columbia

S2 Groundwater contribution to environmental flows as percentage of annual precipitation

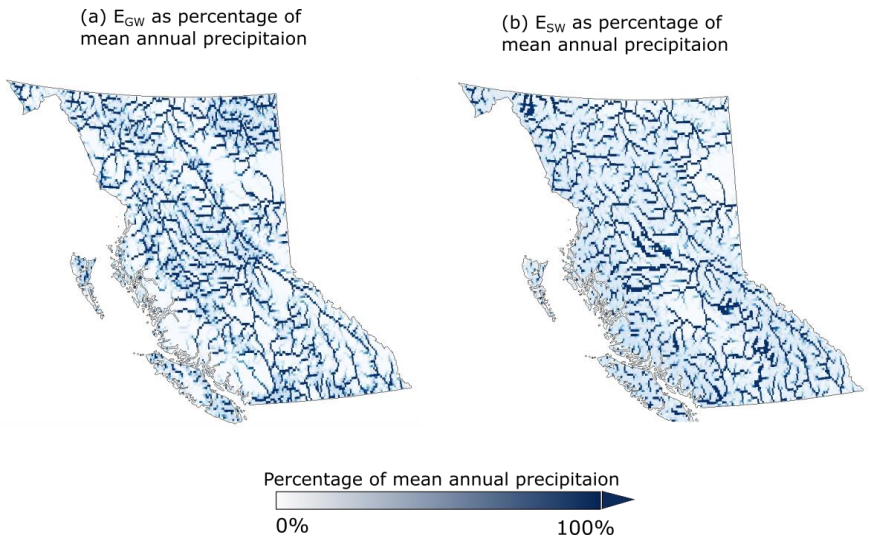

Fig. SI2 Annual groundwater contribution to environmental flow (a) groundwater centric method and (b) surface water centric method as percentage of mean annual precipitation

S3 Groundwater contribution to environmental flows estimates in different biogeoclimatic zones and hydrozones in British Columbia

Table S1. Results for derived values of EF contribution from groundwater in British Columbia using groundwater centric method and surface water centric method.

Groundwater contribution to EF (m/yr)	Mean	Median	Max	Min	Mean	Median	Max	Min
	E_{GW}				E_{SW}			
Full BC	2.27	0.09	232.11	0.00	1.99	0.13	285.62	0.00
Bio-geo climatic zones (BGCZ)								
BG	2.79	0.07	18.11	0.00	1.88	0.08	17.37	0.02
PP	4.79	0.45	39.58	0.00	2.79	1.17	17.96	0.02
ID	1.93	0.14	23.25	0.00	1.54	0.10	17.65	0.00
SBP	0.74	0.10	15.02	0.00	0.41	0.05	11.51	0.00
SBS	1.71	0.12	40.33	0.00	1.31	0.07	19.74	0.00
MS	0.59	0.10	23.57	0.00	0.47	0.06	17.63	0.00
BWBS	1.16	0.08	27.57	0.00	0.78	0.04	18.80	0.00
ICH	1.76	0.20	33.51	0.00	2.08	0.23	18.77	0.01
CD	1.37	0.43	9.54	0.20	0.68	0.33	3.92	0.13
ES	0.51	0.10	28.78	0.00	0.56	0.10	19.32	0.01

CM	0.53	0.15	20.41	0.00	0.82	0.28	14.18	0.02
CWH	0.97	0.38	19.40	0.00	1.17	0.39	15.59	0.01
Hydrozones								
Coastal Mountains	0.94	0.18	30.96	0.00	1.07	0.27	19.32	0.01
N.interior	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N.E.plains	1.15	0.09	40.33	0.00	0.87	0.06	19.74	0.00
Haida Gwaii	0.83	0.07	21.33	0.00	0.43	0.02	11.38	0.00
S.interior	1.05	0.47	13.32	0.32	0.48	0.27	4.64	0.18
S.E.mountains	0.98	0.10	39.58	0.00	0.98	0.09	17.96	0.00
Vancouver island	0.92	0.16	33.51	0.00	1.09	0.18	18.57	0.02

S4 Statistical evaluation of the difference significance between two methods of estimation

Table S2. Kolmogo- Smoirnoff test results to evaluate the statistical significance of the difference between estimates from two methods.

Zones	Kolmogorov-Smirnov test	
	p value	Difference significant
Bio-geo climatic zones (BGCZ)		
BG	0.26	False

PP	0.44	False
ID	0.10	False
SBP	0.00	True
SBS	0.00	True
MS	0.00	True
BWBS	0.00	True
ICH	0.00	True
CD	0.25	False
ES	0.00	True
CM	0.00	False
CWH	0.00	False
Hydrozones		
Coastal Mountains	0.00	True
N.interior	NaN	NaN
N.E.plains	0.00	True
Haida Gwaii	0.00	True
S.interior	0.00	True
S.E.mountains	0.00	True

Vancouver Island	0.00	True

S5 Statistical evaluation of the normality

Normality of the E_{GW} and E_{SW} was tested using 10 different statistical methods. Namely, test1 - Kolmogorov-Smirnov test; test 2-Stephens Method; test 3- Marsaglia Method; test 4-Lilliefors test; test 5- Anderson-Darling (AD) test; test 6-Cramer-Von Mises (CvM) test; test 7-Shapiro-Wilk (SW) test; test 8-Shapiro-Francia (SF) test; test 9-Jarque-Bera (JB) test; test 10-D'Agostino and Pearson (DAP) test. In Table S3 and S4, 1 indicate normal disctibution and 0 indicate not normal distribution

Tabe S3. Normality test results for E_{GW} for different biogeoclimatic zones and hydroones

Results for E_{GW}	**Test 1**	**Test 2**	**Test 3**	**Test 4**	**Test 5**	**Test 6**	**Test 7**	**Test 8**	**Test 9**	**Test 10**
Bio-geo climtaic zones (BGCZ)										
BG	0	0	0	0	0	0	0	0	0	0
PP	0	0	0	0	0	0	0	0	0	0
ID	0	0	0	0	0	**1**	0	0	0	0
SBP	0	0	0	0	0	**1**	0	0	0	0
SBS	0	0	0	0	0	**1**	0	0	0	0
MS	0	0	0	0	0	**1**	0	0	0	0
BWBS	0	0	0	0	0	**1**	0	0	0	0

ICH	0	0	0	0	0	**1**	0	0	0	0
CD	0	0	0	0	0	0	0	0	0	0
ES	0	0	0	0	0	**1**	0	0	0	0
CM	0	0	0	0	0	**1**	0	0	0	0
CWH	0	0	0	0	0	**1**	0	0	0	0
Hydrozones										
Coastal Mountains	NaN	0	0	0	0	0	0	0	0	0
N.interior	0	0	0	0	0	0	0	0	0	0
N.E.plains	0	0	0	0	0	**1**	0	0	0	0
Haida Gwaii	0	0	0	0	0	**1**	0	0	0	0
S.interior	0	0	0	0	0	**1**	0	0	0	0
S.E.mountains	0	0	0	0	0	**1**	0	0	0	0
Vancouver island	0	0	0	0	0	**1**	0	0	0	0

Tabe S4. Normality test results for E_{SW} for different biogeoclimatic zones and hydroones

Results for E_{SW}	**Test 1**	**Test 2**	**Test 3**	**Test 4**	**Test 5**	**Test 6**	**Test 7**	**Test 8**	**Test 9**	**Test 10**
Bio-geo climtaic zones (BGCZ)										

BG	0	0	0	0	0	0	0	0	0	0
PP	0	0	0	0	0	0	0	0	0	0
ID	0	0	0	0	0	**1**	0	0	0	0
SBP	0	0	0	0	0	**1**	0	0	0	0
SBS	0	0	0	0	0	**1**	0	0	0	0
MS	0	0	0	0	0	**1**	0	0	0	0
BWBS	0	0	0	0	0	**1**	0	0	0	0
ICH	0	0	0	0	0	**1**	0	0	0	0
CD	0	0	0	0	0	0	0	0	0	0
ES	0	0	0	0	0	**1**	0	0	0	0
CM	0	0	0	0	0	**1**	0	0	0	0
CWH	0	0	0	0	0	**1**	0	0	0	0
Hydrozones										
Coastal Mountains	NaN	0	0	0	0	0	0	0	0	0
N.interior	0	0	0	0	0	0	0	0	0	0
N.E.plains	0	0	0	0	0	**1**	0	0	0	0
Haida Gwaii	0	0	0	0	0	**1**	0	0	0	0

S.interior	0	0	0	0	0	**1**	0	0	0	0
S.E.mountains	0	0	0	0	0	**1**	0	0	0	0
Vancouver island	0	0	0	0	0	**1**	0	0	0	0

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