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Supplement of

Environmental and taxonomic controls of carbon and oxygen stable isotope composition in *Sphagnum* across broad climatic and geographic ranges

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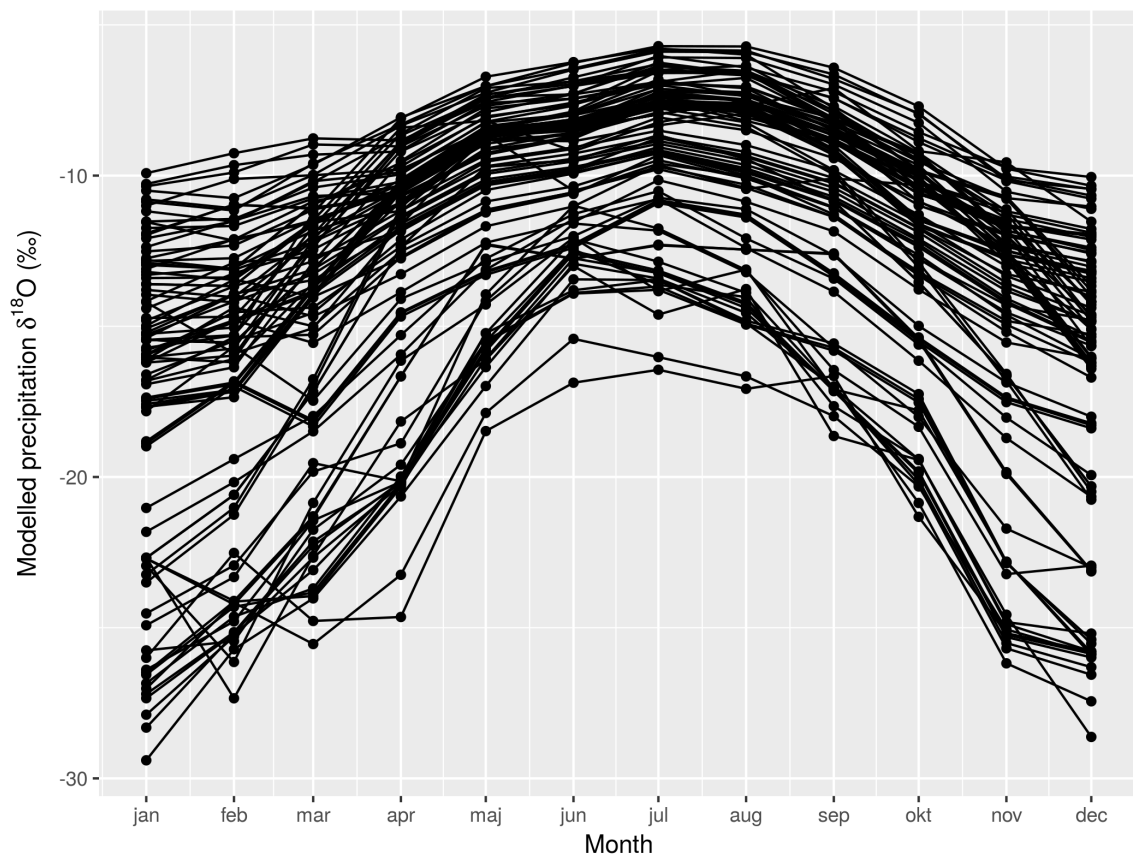


Figure S1. Annual variation in modelled $\delta^{18}\text{O}_{\text{precip}}$ at the sample sites (one line per site).

Table S1. List of sampled sites, their location, sampling year and species.

Region	Site	Latitude (wgs84)	Longitude (wgs84)	Elevation (m asl)	Year	Region
Bulgaria, Central Rhodopes Mts	Chairski lakes	41.590646	24.446419	1377	2013	<i>S.magellanicum</i>
Bulgaria, Vitosha Mts	Kapaklivets	42.593977	23.280245	1829	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Bulgaria, Western Rodopi Mts	Shiroka Polyana	41.756378	24.144839	1544	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Bulgaria, Western Stara planina Mts	Petrohan pass	43.117778	23.1225	1376	2013	<i>S.magellanicum</i>
Canada, AB	208UB	56.1157	-115.7024	660	2013	<i>S.fuscum</i>
Canada, AB	BC35	55.87	-115.1	653	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, AB	Wandering River_Control	55.353942	-112.517692	566	2014	<i>S.magellanicum</i>
Canada, NT (S)	Scotty Creek	61.308833	-121.305166	282	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, ON (E)	Mer Bleue	45.409441 66	-75.518708	68	2013	<i>S.magellanicum</i>
Canada, ON (N)	MOE BOG	52.693756	-83.945183	125.5	2014	<i>S.fuscum</i>
Canada, ON (N)	MOE MOSS	52.696969	-83.950642	88	2014	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, ON (NW)	Raith	48.85354	-89.95639	472	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, ON (NW)	Savanne	48.954	-90.23306	458	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, ON (S)	Parry_Sound	45.459776 5	-80.15097025	222.75	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, ON (S)	Puslinch_bog	43.408056 75	-80.26402575	307	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, QC	Coteau road	47.7668	-64.5940825	4.5	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, QC	Goulet	47.71879	-64.684885	2.5	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, QC	Grande-Plee Bleue	46.779877 5	-71.0570275	92.5	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, QC	Jifi (Haut- Shippagan)	47.739982 5	-64.7446675	2	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, QC	Miscou #5	48.009512 5	-64.5060325	5	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, QC	Saint-Charles	46.788247 5	-70.9727375	99	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, QC	Sainte-Catherine	46.8725	-71.585795	169.5	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, QC	Saint-Etienne	46.653442 5	-71.31894	98	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Canada, QC	Wilson	47.939865	-64.52368	4	2013	<i>S.fuscum</i> <i>S.magellanicum</i>

Canada, QC	Chute Panet	46.869367 5	-71.8403475	153.5	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
China	Hani	42.225840 28	126.5189861	851.25	2014	<i>S.fuscum</i> <i>S.magellanicum</i>
China	Mangui	52.283305 56	122.4387153	741.75	2014	<i>S.fuscum</i> <i>S.magellanicum</i>
Czech Republic	Jizerka	50.827243 06	15.32870833	864.25	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Czech Republic	Mrtvý luh	48.87025	13.87161111	739.75	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Czech Republic	Velký Močálbog	50.396215 28	12.63510417	925.75	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Estonia (central)	Männikjärve bog	58.875833 33	26.24722222	81	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Estonia (central)	Parika bog	58.475	25.77041667	52	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Estonia (NE)	Seli bog	59.170555 56	27.27388889	58	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Estonia (SW)	Tolkuse bog	58.138888 89	24.51972222	10	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Finland (N)	Kaamanen	69.140792	27.2712	165	2013	<i>S.fuscum</i>
Finland (N)	Salmisuo	62.78477	30.947475	116	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Finland (N)	Siikajoki	64.731505	24.719083	46.75	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Finland (N)	Siikaneva	61.83722	24.169767	131.5	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Finland (S)	Tervalamminsuo	60.3874	23.5844175	78	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Italy (N)	Lupicino	46.429444 44	11.41222222	1288	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Japan (NE)	East Ochiishi Mire	43.20111	145.51981	176.75	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Netherlands	Bargerveen	52.68564	7.024459	18	2014	<i>S.magellanicum</i>
Norway (central)	Bjornmyra	63.33613	10.4056925	135.25	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Norway (central)	Hemne	63.214697 5	9.0210675	60	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Norway (central)	Tydal	63.066745	11.3981125	482.25	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Poland (N)	Linkowo	52.954494 3	15.9308732	46	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Poland (N)	Tuchola (BT)	53.829601 4	17.5632897	127	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Poland (SE)	Puścizna Wielka bog	49.452937 5	19.75760417	650.75	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Poland (SE)	Tarnawa Niżna	49.111930 56	22.82725	670.5	2013	<i>S.magellanicum</i>

Poland (SE)	Zakole bog	49.215513 89	22.7415625	564	2014	<i>S.fuscum</i> <i>S.magellanicum</i>
Romania, Apuseni Mts	Molhașul Mare de la Izbuç	46.589722 22	22.76111111	1208	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Romania, Ciomatu Mts	Tinovul Mohoș bog	46.136388 89	25.90277778	1048	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Romania, Gutâi Mts	Tâul lui Dumitru bog	47.824722 22	23.69833333	1142	2014	<i>S.magellanicum</i>
Romania, Maramureș Mts	Tâul Obcioarei bog	47.684861 11	24.53666667	1043	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Romania, Obcina Mestecanisului Mts	Găina-Lucina	47.659444 44	25.18222222	1212	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, Komi Republic	Kuzobnjur	61.838269	53.297717	117	2013	<i>S.fuscum</i>
Russia, Komi Republic	Ust-pozheg	61.94259	50.273818	86	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, Middle of West Siberia	Kondinskie Lakes	60.85347	63.520245	69.5	2013	<i>S.magellanicum</i>
Russia, Middle of West Siberia	Mukhrino	60.89942	68.68825333	34	2013 & 2014	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, Middle of West Siberia	Kogalym	62.230191	74.13096	75	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, Middle of West Siberia	Nizneartovsk	60.916	76.8116	44	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, Middle of West Siberia	Pogranichnoe	62.9707	75.18102	103	2013	<i>S.magellanicum</i>
Russia, North of West Siberia	Gupkinskoe	64.55025	76.95076	40	2013	<i>S.fuscum</i>
Russia, North of West Siberia	Hanimey	63.78	75.55	66	2014	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, North of West Siberia	Pangody	65.87059	74.95099	62	2013	<i>S.fuscum</i>
Russia, North of West Siberia	Tetu-Mamontotay	63.221	75.7112	118	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, South of West Siberia	Nikolaevka	55.1316	79.0316	119	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, South of West Siberia	Plotnikovo	56.85009	82.8311	118	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, St-Petersburg region	Vsevolozsk	60.0642	30.65478	33	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, St-Petersburg region	Nizhne-Svirsky State Natural Reserve	60.6667	33.0378	6	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, St-Petersburg region	Ozernoie mire	60.3518	29.55455	55	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Russia, St-Petersburg region	Stroganovo	59.28565	30.00917	113	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Sweden (N)	Abisko mire	68.35916	18.81038	356	2013	<i>S.fuscum</i>
Sweden (N)	Stordalen	68.3528	19.03689	378	2013	<i>S.fuscum</i>
Sweden (N)	Storflaket	68.34711	18.97589	387	2013	<i>S.fuscum</i>
Sweden (S)	Kulflyten	59.90254	15.83353	137	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Sweden (S)	Store mosse	57.29919	13.94138	163	2013	<i>S.fuscum</i>

						<i>S.magellanicum</i>
Sweden (S)	Traneröds mosse	56.04455	13.18672	168	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
Switzerland, Jura	Etang de la Gruere	47.239622	7.049483	1003	2014	<i>S.fuscum</i> <i>S.magellanicum</i>
Switzerland, Jura	Le Cachot	47.005658	6.665169	1052	2014	<i>S.fuscum</i> <i>S.magellanicum</i>
UK, England	Fenns and Whixall Mosses	52.915	-2.773	90	2013	<i>S.magellanicum</i>
UK, Scotland	Flanders Moss	56.151	-4.207	19	2013	<i>S.magellanicum</i>
UK, Scotland	Forsinard Flows	58.382	-3.828	182	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
UK, Scotland	Moidach More	57.453	-3.629	274	2013	<i>S.magellanicum</i>
UK, Wales	Cors Fochno	52.502	-4.011	4	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
USA, Interior Alaska, Healy	CiPEHR	63.88202	-149.2269	671	2014	<i>S.fuscum</i> <i>S.magellanicum</i>
USA, Maine	Great Waas Island	44.472147	-67.582071	15	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
USA, Maine	Orono Bog	44.869721	-68.727243	42	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
USA, Maine	Saco Heath	43.545971	-70.47155	43	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
USA, New York	Bloomindale Bog	44.383778	-74.140796	474	2013	<i>S.fuscum</i>
USA, New York	Greenwoods Conservancy	42.71707	-75.0990505	545	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
USA, New York	Lake Desolation	43.162063	-73.977556	514	2013	<i>S.fuscum</i> <i>S.magellanicum</i>
USA, New York	Silver Lake	44.511166	-73.885986	449	2013	<i>S.magellanicum</i>

Table S2. Summary statistics of measured isotope values (*Sphagnum* tissue) and explanatory variables. $\delta^{18}\text{O}_{\text{precip}}$ = modelled annual mean value in precipitation, ET = evapotranspiration April to October, P = precipitation April to October, T = average temperature April to October, NPP = net primary productivity, HWT = height above the water table at the end of the growing season.

Variable	Species	Mean	St. Dev.	Min	Max
$\delta^{18}\text{O}$	<i>S. fuscum</i>	20.86	1.87	14.45	24.14
	<i>S. magellanicum</i>	20.32	1.94	12.57	24.63
$\delta^{13}\text{C}$	<i>S. fuscum</i>	-28.25	1.16	-31.47	-25.85
	<i>S. magellanicum</i>	-28.78	1.45	-32.19	-24.32
$\delta^{18}\text{O}_{\text{precip}}$	<i>S. fuscum</i>	-12.82	3.46	-21.31	-8.42
	<i>S. magellanicum</i>	-12.14	3.29	-21.31	-8.16
T (C°)	<i>S. fuscum</i>	13.4	3.23	5.73	18.39
	<i>S. magellanicum</i>	14.21	2.58	5.76	18.39
ET (mm)	<i>S. fuscum</i>	513.81	109.52	253.7	732.91
	<i>S. magellanicum</i>	526.5	97.91	332.66	732.91
P (mm)	<i>S. fuscum</i>	527.43	145.92	256.54	833.27
	<i>S. magellanicum</i>	515.35	147.98	218.32	833.27
ET/P	<i>S. fuscum</i>	1.03	0.27	0.32	1.54
	<i>S. magellanicum</i>	1.08	0.24	0.53	1.56
NPP (g m ⁻² year ⁻¹)	<i>S. fuscum</i>	232.13	157.3	-65.14	833.64
	<i>S. magellanicum</i>	179.6	150.65	8.94	921.15
HWT (cm)	<i>S. fuscum</i>	33.37	13.41	9.5	100
	<i>S. magellanicum</i>	24.23	14.16	0	75
Elevation (m)	<i>S. fuscum</i>	303.47	397.88	2	1829
	<i>S. magellanicum</i>	358.55	436.87	2	1829