

**SUPPLEMENTARY INFORMATION**

**Table S1. Physio-geographical parameters and soil properties of six sampling sites.**

Site	Lat., ° N	Mean annual temp., ° C	Mean annual precipit., mm	Mineral substrate	Micro-landscapes	share of micro-landscape, %	Peat thickness, m	Seasonal thaw depth, cm	Soil type (WRB, 2014)
Tazovsky, (Tz)	67.4	−9.1°C	363	Clay loam and loam ; sands on marine clay deposits	polygon	65	2.0–4.0	41	Dystric Hemic Epicryic Histosols (Hyperorganic); Dystric Murshic Hemic Epicryic Histosols (Hyperorganic)
					permafrost subsidences	7		55	Dystric Epifibric Hemic Cryic Histosols (Hyperorganic)
					frost crack	13		44	Dystric Epifibric Cryic Histosols (Hyperorganic)
					hollows	16	0.2–1.5	65	Dystric Fibric Cryic Histosols; Histic Reductaquic Cryosols (Clayic)
Pangody, (Pg)	65.9	−6.4°C	484	Loam	peat mounds (palsa)	53	0.2–1.3	49	Dystric Hemic Epicryic Histosols; Histic Cryosols (Loamic); Histic Oxyaquic Turbic Cryosols (Loamic)
					permafrost subsidences	10	0.6–1.1	74	Dystric Hemic Endocryic Histosols
					hollows	37	0.3–1.0	82	Dystric Epifibric Endocryic Histosols; Histic Reductaquic Turbic Cryosols (Loamic); Dystric Fibric Histosols (Gelic)
Khanymey, (Kh)	63.8	−5.6°C	540	Sand	peat mounds (palsa)	49	0.1–1.4	90	Dystric Hemic Cryic Histosols; Spodic Histic Turbic Cryosols (Albic, Arenic); Histic Turbic Cryosols (Albic, Arenic)
					permafrost subsidences	30	0.7–1.1	165	Dystric Hemic Histosols (Gelic)
					hollows	21	0.4–1.1	215	Dystric Epifibric Histosols; Spodic Histic Turbic Cryosols (Arenic); Gleyic Histic Entic Podzols (Turbic)

Table S1, continued.

Kogalym, (Kg)	62.3	-4.0°C	594	Sand	ridge	61	1.7-2.3	-	Dystric Ombric Fibric Histosols (Hyperorganic)
Mukhrino (Mh)	60.9	-1.3	546	Sandy loam, loam	ryam, ridge	50	3.0-3.5	-	Dystric Ombric Fibric Histosols (Hyperorganic)
Plotnikovo (Pl)	56.9	-0.5	461	Carbonate -bearing clays	ryam, ridge	40	1.5-1.7	-	Dystric Ombric Fibric Histosols

**Table S2.** Primary data on C, N, and Hg concentration in peat of 6 studied sites.

Site I.D.	Active/ PF	sample	Depth, cm	Density, g cm <sup>-3</sup>	C, %	N, %	Hg, ng g <sup>-1</sup>	RHgC, μg g <sup>-1</sup>
Plotnikovo (Pl), 56.9°N	Active	peat	0-10	0.03	45	0.7	39	0.09
Plotnikovo (Pl), 56.9°N	Active	peat	10-20	0.02	42	0.6	45	0.11
Plotnikovo (Pl), 56.9°N	Active	peat	20-30	0.02	45	0.8	49	0.11
Plotnikovo (Pl), 56.9°N	Active	peat	30-40	0.02	46	0.8	50	0.11
Plotnikovo (Pl), 56.9°N	Active	peat	40-50	0.02	45	0.8	33	0.07
Plotnikovo (Pl), 56.9°N	Active	peat	50-60	0.02	46	0.8	35	0.07
Plotnikovo (Pl), 56.9°N	Active	peat	60-70	0.02	47	0.8	36	0.08
Plotnikovo (Pl), 56.9°N	Active	peat	70-80	0.02	48	0.9	31	0.06
Plotnikovo (Pl), 56.9°N	Active	peat	80-90	0.02	44	0.8	26	0.06
Plotnikovo (Pl), 56.9°N	Active	peat	90-100	0.01	43	0.7	16	0.04
Plotnikovo (Pl), 56.9°N	Active	peat	100-110	0.01	43	0.9	21	0.05
Plotnikovo (Pl), 56.9°N	Active	peat	110-120	0.01	45	1.1	26	0.06
Plotnikovo (Pl), 56.9°N	Active	peat	120-130	0.03	48	1.7	35	0.07
Plotnikovo (Pl), 56.9°N	Active	peat	130-140	0.33	39	1.7	56	0.14
Plotnikovo (Pl), 56.9°N	Active	mineral	140-150	1.62	13	0.5	53	0.40
Mukhrino (Mh), 60.9°N	Active	peat	0-10	0.02	50	0.5	21	0.04
Mukhrino (Mh), 60.9°N	Active	peat	10-20	0.03	49	0.5	31	0.06
Mukhrino (Mh), 60.9°N	Active	peat	20-30	0.04	50	0.7	35	0.07
Mukhrino (Mh), 60.9°N	Active	peat	30-40	0.06	45	0.9	69	0.15
Mukhrino (Mh), 60.9°N	Active	peat	40-50	0.03	51	0.4	48	0.09
Mukhrino (Mh), 60.9°N	Active	peat	50-60	0.03	53	0.7	19	0.04
Mukhrino (Mh), 60.9°N	Active	peat	60-70	0.04	50	0.6	16	0.03
Mukhrino (Mh), 60.9°N	Active	peat	70-80	0.03	53	0.8	25	0.05
Mukhrino (Mh), 60.9°N	Active	peat	80-90	0.03	66	0.9	15	0.02
Mukhrino (Mh), 60.9°N	Active	peat	90-100	0.06	53	1.1	46	0.09
Mukhrino (Mh), 60.9°N	Active	peat	100-110	0.09	54	1.1	79	0.15
Mukhrino (Mh), 60.9°N	Active	peat	110-120	0.07	57	1.3	66	0.12
Mukhrino (Mh), 60.9°N	Active	peat	120-130	0.05	58	1.2	49	0.09
Mukhrino (Mh), 60.9°N	Active	peat	130-140	0.02	53	0.6	14	0.03
Mukhrino (Mh), 60.9°N	Active	peat	140-150	0.02	55	0.8	19	0.03
Mukhrino (Mh), 60.9°N	Active	peat	150-160	0.02	54	0.8	23	0.04
Mukhrino (Mh), 60.9°N	Active	peat	160-170	0.02	54	0.9	20	0.04
Mukhrino (Mh), 60.9°N	Active	peat	170-180	0.02	53	0.6	18	0.03
Mukhrino (Mh), 60.9°N	Active	peat	180-190	0.06	52	0.9	49	0.09
Mukhrino (Mh), 60.9°N	Active	peat	190-200	0.02	53	0.5	13	0.02
Mukhrino (Mh), 60.9°N	Active	peat	200-210	0.02	53	0.5	19	0.04
Mukhrino (Mh), 60.9°N	Active	peat	210-220	0.02	54	0.5	15	0.03
Mukhrino (Mh), 60.9°N	Active	peat	220-230	0.02	52	0.5	11	0.02
Mukhrino (Mh), 60.9°N	Active	peat	230-240	0.02	51	0.5	9	0.02
Mukhrino (Mh), 60.9°N	Active	peat	240-250	0.02	52	0.4	8	0.02
Mukhrino (Mh), 60.9°N	Active	peat	250-260	0.02	52	0.5	12	0.02
Mukhrino (Mh), 60.9°N	Active	peat	260-270	0.02	54	0.5	10	0.02
Mukhrino (Mh), 60.9°N	Active	peat	270-280	0.02	54	1.0	7	0.01
Mukhrino (Mh), 60.9°N	Active	peat	280-290	0.02	52	0.5	12	0.02
Mukhrino (Mh), 60.9°N	Active	peat	290-300	0.03	52	0.5	10	0.02
Mukhrino (Mh), 60.9°N	Active	peat	300-310	0.02	52	0.5	9	0.02
Mukhrino (Mh), 60.9°N	Active	peat	310-320	0.02	53	0.6	14	0.03
Mukhrino (Mh), 60.9°N	Active	peat	320-330	0.03	56	1.0	23	0.04
Mukhrino (Mh), 60.9°N	Active	peat	330-340	0.04	59	1.6	32	0.06
Mukhrino (Mh), 60.9°N	Active	peat	340-350	0.06	58	1.6	45	0.08
Mukhrino (Mh), 60.9°N	Active	peat	350-360	0.09	57	0.7	35	0.06
Mukhrino (Mh), 60.9°N	Active	mineral	360-370	1.58	29	0.7	38	0.13
Mukhrino (Mh), 60.9°N	Active	mineral	370-380	1.65	1	0.1	11	0.78

**Table S2, continued.**

Site I.D.	Active/ PF	Sample type	Depth, cm	Density, g cm <sup>-3</sup>	C, %	N, %	Hg, ng g <sup>-1</sup>	RHgC, µg g <sup>-1</sup>
Kogalym (Kg), 62.3°N	Active	peat	0-5	0.02	46	0.6	40	0.09
Kogalym (Kg), 62.3°N	Active	peat	5-10	0.02	44	0.5	67	0.15
Kogalym (Kg), 62.3°N	Active	peat	10-15	0.03	45	0.4	79	0.18
Kogalym (Kg), 62.3°N	Active	peat	15-20	0.03	45	0.4	48	0.11
Kogalym (Kg), 62.3°N	Active	peat	20-25	0.03	46	0.5	69	0.15
Kogalym (Kg), 62.3°N	Active	peat	25-30	0.03	45	0.6	90	0.20
Kogalym (Kg), 62.3°N	Active	peat	30-35	0.06	45	0.5	81	0.18
Kogalym (Kg), 62.3°N	Active	peat	35-40	0.07	48	1.4	152	0.32
Kogalym (Kg), 62.3°N	Active	peat	40-45	0.07	49	1.4	68	0.14
Kogalym (Kg), 62.3°N	Active	peat	45-50	0.08	50	1.2	47	0.09
Kogalym (Kg), 62.3°N	Active	peat	50-55	0.08	49	0.9	41	0.08
Kogalym (Kg), 62.3°N	Active	peat	55-60	0.09	49	0.7	39	0.08
Kogalym (Kg), 62.3°N	Active	peat	60-65	0.10	48	0.7	19	0.04
Kogalym (Kg), 62.3°N	Active	peat	65-70	0.11	48	0.6	22	0.05
Kogalym (Kg), 62.3°N	Active	peat	70-75	0.12	50	0.8	26	0.05
Kogalym (Kg), 62.3°N	Active	peat	75-80	0.10	49	0.9	21	0.04
Kogalym (Kg), 62.3°N	Active	peat	80-85	0.12	47	0.8	38	0.08
Kogalym (Kg), 62.3°N	Active	peat	85-90	0.13	47	0.7	15	0.03
Kogalym (Kg), 62.3°N	Active	peat	90-95	0.15	46	0.5	10	0.02
Kogalym (Kg), 62.3°N	Active	peat	95-100	0.16	48	0.6	18	0.04
Kogalym (Kg), 62.3°N	Active	peat	100-105	0.11	48	0.7	20	0.04
Kogalym (Kg), 62.3°N	Active	peat	105-110	0.12	50	0.9	20	0.04
Kogalym (Kg), 62.3°N	Active	peat	110-115	0.12	51	0.8	22	0.04
Kogalym (Kg), 62.3°N	Active	peat	115-120	0.13	49	0.8	37	0.08
Kogalym (Kg), 62.3°N	Active	peat	120-125	0.12	52	1.2	30	0.06
Kogalym (Kg), 62.3°N	Active	peat	125-130	0.12	53	1.2	41	0.08
Kogalym (Kg), 62.3°N	Active	peat	130-135	0.13	48	0.8	47	0.10
Kogalym (Kg), 62.3°N	Active	peat	135-140	0.15	48	0.8	39	0.08
Kogalym (Kg), 62.3°N	Active	peat	140-145	0.13	52	1.0	34	0.07
Kogalym (Kg), 62.3°N	Active	peat	150-155	0.19	50	1.1	61	0.12
Kogalym (Kg), 62.3°N	Active	peat	155-160	0.18	59	1.3	96	0.16
Kogalym (Kg), 62.3°N	Active	peat	160-165	0.18	54	1.1	60	0.11
Kogalym (Kg), 62.3°N	Active	peat	165-170	0.25	52	1.0	77	0.15
Kogalym (Kg), 62.3°N	Active	peat	170-175	0.38	32	0.7	46	0.15
Kogalym (Kg), 62.3°N	Active	mineral	175-180	1.72	5	0.2	9	0.18
Kogalym (Kg), 62.3°N	Active	mineral	180-185	1.01	25	0.8	23	0.09
Kogalym (Kg), 62.3°N	Active	mineral	185-190	1.74	1	0.0	4	0.76
Khanymey (Kh), 63.8°	Active	peat	0-7	0.07	43	0.7	135	0.32
Khanymey (Kh), 63.8°	Active	peat	7-11	0.11	42	0.4	74	0.18
Khanymey (Kh), 63.8°	Active	peat	11-18	0.12	43	0.8	44	0.10
Khanymey (Kh), 63.8°	Active	peat	18-28	0.13	44	0.6	33	0.07
Khanymey (Kh), 63.8°	Active	peat	28-34	0.13	47	1.1	34	0.07
Khanymey (Kh), 63.8°	PF	peat	34-44	0.18	45	0.8	23	0.05
Khanymey (Kh), 63.8°	PF	peat	44-54	0.10	49	1.1	40	0.08
Khanymey (Kh), 63.8°	PF	peat	54-64	0.26	51	1.4	55	0.11
Khanymey (Kh), 63.8°	PF	peat	64-74	0.20	51	1.2	52	0.10
Khanymey (Kh), 63.8°	PF	peat	74-84	0.32	51	1.9	49	0.10
Khanymey (Kh), 63.8°	PF	peat	84-94	0.23	53	1.7	63	0.12
Khanymey (Kh), 63.8°	PF	peat	94-104	0.28	48	2.0	48	0.10
Khanymey (Kh), 63.8°	PF	peat	104-114	0.28	57	2.3	56	0.10
Khanymey (Kh), 63.8°	PF	peat	114-124	0.23	51	1.8	41	0.08
Khanymey (Kh), 63.8°	PF	peat	124-134	0.21	43	1.5	51	0.12
Khanymey (Kh), 63.8°	PF	peat	134-138	0.39	33	0.9	39	0.12
Khanymey (Kh), 63.8°	PF	mineral	138-140.5	1.63	2	0.1	4	0.21
Khanymey (Kh), 63.8°	PF	mineral	140.5-147	1.76	1	0.0	3	0.40

Table S2, continued.

Site I.D.	Active/ PF	Sample type	Depth, cm	Density, g cm <sup>-3</sup>	C, %	N, %	Hg, ng g <sup>-1</sup>	RHgC, μg g <sup>-1</sup>
Pangody (Pg), 65.9°N	Active	peat	0-5	0.07	42	0.7	133	0.32
Pangody (Pg), 65.9°N	Active	peat	5-10	0.10	52	0.7	64	0.12
Pangody (Pg), 65.9°N	Active	peat	10-15	0.10	46	1.2	76	0.16
Pangody (Pg), 65.9°N	Active	peat	15-20	0.25	51	1.4	71	0.14
Pangody (Pg), 65.9°N	Active	peat	20-25	0.25	51	1.3	87	0.17
Pangody (Pg), 65.9°N	Active	peat	25-30	0.22	56	1.1	70	0.12
Pangody (Pg), 65.9°N	Active	peat	30-35	0.22	54	1.3	70	0.13
Pangody (Pg), 65.9°N	Active	peat	35-40	0.23	51	1.1	52	0.10
Pangody (Pg), 65.9°N	PF	peat	40-45	0.23	49	0.9	50	0.10
Pangody (Pg), 65.9°N	PF	peat	45-50	0.19	55	1.1	97	0.18
Pangody (Pg), 65.9°N	PF	peat	50-55	0.20	55	1.2	93	0.17
Pangody (Pg), 65.9°N	PF	peat	55-60	0.17	56	1.2	95	0.17
Pangody (Pg), 65.9°N	PF	peat	60-65	0.24	57	1.3	72	0.13
Pangody (Pg), 65.9°N	PF	peat	65-70	0.23	59	1.3	59	0.10
Pangody (Pg), 65.9°N	PF	peat	70-75	0.19	50	1.0	46	0.09
Pangody (Pg), 65.9°N	PF	peat	75-80	0.15	54	1.1	59	0.11
Pangody (Pg), 65.9°N	PF	peat	80-85	0.13	53	1.1	66	0.13
Pangody (Pg), 65.9°N	PF	peat	85-90	0.11	53	0.8	32	0.06
Pangody (Pg), 65.9°N	PF	peat	90-95	0.09	48	0.5	23	0.05
Pangody (Pg), 65.9°N	PF	peat	95-100	0.09	49	0.6	43	0.09
Pangody (Pg), 65.9°N	PF	peat	100-105	0.07	48	0.7	74	0.15
Pangody (Pg), 65.9°N	PF	peat	105-110	0.03	49	0.7	70	0.14
Pangody (Pg), 65.9°N	PF	peat	110-115	0.08	45	0.8	73	0.16
Pangody (Pg), 65.9°N	PF	peat	115-120	0.10	54	0.6	35	0.07
Pangody (Pg), 65.9°N	PF	peat	120-125	0.06	48	0.8	95	0.20
Pangody (Pg), 65.9°N	PF	peat	125-130	0.14	55	1.1	97	0.18
Pangody (Pg), 65.9°N	PF	peat	130-135	0.10	44	0.9	93	0.21
Pangody (Pg), 65.9°N	PF	peat	135-140	0.17	17	0.4	56	0.33
Pangody (Pg), 65.9°N	PF	peat	140-145	0.25	31	0.7	63	0.20
Pangody (Pg), 65.9°N	PF	peat	150-155	0.23	38	0.9	82	0.22
Pangody (Pg), 65.9°N	PF	mineral	155-160	1.54	4	0.1	26	0.59
Pangody (Pg), 65.9°N	PF	mineral	160-165	1.47	3	0.1	23	0.84
Pangody (Pg), 65.9°N	PF	mineral	165-170	1.59	3	0.1	23	0.79
Pangody (Pg), 65.9°N	PF	mineral	170-175	1.71	3	0.1	19	0.69
Pangody (Pg), 65.9°N	PF	mineral	175-180	1.68	3	0.1	45	1.37
Pangody (Pg), 65.9°N	PF	mineral	180-185	1.78	1	0.0	12	1.03
Tazovsky (Tz), 67.4°N	Active	peat	5-10	0.08	48	1.5	262	0.54
Tazovsky (Tz), 67.4°N	Active	peat	10-15	0.08	45	1.0	210	0.46
Tazovsky (Tz), 67.4°N	Active	peat	15-20	0.09	45	2.5	173	0.38
Tazovsky (Tz), 67.4°N	Active	peat	20-25	0.09	48	2.5	126	0.26
Tazovsky (Tz), 67.4°N	Active	peat	25-30	0.02	50	2.7	70	0.14
Tazovsky (Tz), 67.4°N	Active	peat	30-35	0.15	48	2.3	106	0.22
Tazovsky (Tz), 67.4°N	Active	peat	35-40	0.12	47	2.1	127	0.27
Tazovsky (Tz), 67.4°N	PF	peat	40-45	0.12	48	2.3	178	0.37
Tazovsky (Tz), 67.4°N	PF	peat	45-50	0.11	49	2.4	131	0.27
Tazovsky (Tz), 67.4°N	PF	peat	50-55	0.12	48	2.5	114	0.24
Tazovsky (Tz), 67.4°N	PF	peat	55-60	0.07	47	2.1	92	0.20
Tazovsky (Tz), 67.4°N	PF	peat	60-65	0.07	47	2.0	108	0.23
Tazovsky (Tz), 67.4°N	PF	peat	65-70	0.10	47	2.0	92	0.19
Tazovsky (Tz), 67.4°N	PF	peat	70-75	0.10	48	2.4	85	0.18
Tazovsky (Tz), 67.4°N	PF	peat	75-80	0.11	47	2.0	129	0.27
Tazovsky (Tz), 67.4°N	PF	peat	80-85	0.11	47	2.0	93	0.20
Tazovsky (Tz), 67.4°N	PF	peat	85-90	0.10	38	1.8	98	0.26
Tazovsky (Tz), 67.4°N	PF	peat	90-95	0.10	47	2.1	71	0.15
Tazovsky (Tz), 67.4°N	PF	peat	95-100	0.09	45	1.6	113	0.25
Tazovsky (Tz), 67.4°N	PF	peat	100-105	0.08	46	1.7	76	0.16

**Table S2**, continued.

Tazovsky (Tz), 67.4°N	PF	peat	105-110	0.07	47	2.0	65	0.14
Tazovsky (Tz), 67.4°N	PF	peat	110-115	0.08	50	2.3	82	0.17
Tazovsky (Tz), 67.4°N	PF	peat	115-120	0.10	49	2.3	82	0.17
Tazovsky (Tz), 67.4°N	PF	peat	120-125	0.10	49	1.6	98	0.20
Tazovsky (Tz), 67.4°N	PF	peat	125-130	0.11	49	1.9	166	0.34
Tazovsky (Tz), 67.4°N	PF	peat	130-135	0.11	48	2.6	74	0.15
Tazovsky (Tz), 67.4°N	PF	peat	135-140	0.08	47	2.3	70	0.15
Tazovsky (Tz), 67.4°N	PF	peat	140-145	0.08	48	2.3	103	0.22
Tazovsky (Tz), 67.4°N	PF	peat	150-155	0.08	49	2.1	131	0.27
Tazovsky (Tz), 67.4°N	PF	peat	155-160	0.08	49	2.2	101	0.21
Tazovsky (Tz), 67.4°N	PF	peat	160-165	0.08	48	2.2	196	0.41
Tazovsky (Tz), 67.4°N	PF	peat	165-170	0.08	48	2.2	72	0.15
Tazovsky (Tz), 67.4°N	PF	peat	170-175	0.09	46	2.3	68	0.15
Tazovsky (Tz), 67.4°N	PF	peat	175-180	0.09	46	2.4	74	0.16
Tazovsky (Tz), 67.4°N	PF	peat	180-185	0.08	48	1.9	135	0.28
Tazovsky (Tz), 67.4°N	PF	peat	185-190	0.08	48	2.0	98	0.20
Tazovsky (Tz), 67.4°N	PF	peat	190-195	0.09	48	2.1	74	0.15
Tazovsky (Tz), 67.4°N	PF	peat	195-200	0.09	46	2.6	138	0.30
Tazovsky (Tz), 67.4°N	PF	peat	200-205	0.09	47	2.4	170	0.36
Tazovsky (Tz), 67.4°N	PF	peat	205-210	0.09	48	2.3	72	0.15
Tazovsky (Tz), 67.4°N	PF	peat	210-215	0.05	48	1.8	79	0.16
Tazovsky (Tz), 67.4°N	PF	peat	215-220	0.05	48	2.3	127	0.27
Tazovsky (Tz), 67.4°N	PF	peat	220-225	0.06	49	2.2	71	0.15
Tazovsky (Tz), 67.4°N	PF	peat	225-230	0.06	45	2.3	128	0.28
Tazovsky (Tz), 67.4°N	PF	peat	230-235	0.07	47	2.6	114	0.24
Tazovsky (Tz), 67.4°N	PF	peat	235-240	0.07	48	2.7	100	0.21
Tazovsky (Tz), 67.4°N	PF	peat	240-245	0.06	50	1.9	78	0.16
Tazovsky (Tz), 67.4°N	PF	peat	245-250	0.06	47	1.9	75	0.16
Tazovsky (Tz), 67.4°N	PF	peat	250-255	0.08	45	1.8	110	0.24
Tazovsky (Tz), 67.4°N	PF	peat	255-260	0.08	46	2.3	82	0.18
Tazovsky (Tz), 67.4°N	PF	peat	260-265	0.07	48	2.1	97	0.20
Tazovsky (Tz), 67.4°N	PF	peat	265-270	0.07	47	1.5	91	0.19
Tazovsky (Tz), 67.4°N	PF	peat	270-275	0.04	44	1.8	117	0.27
Tazovsky (Tz), 67.4°N	PF	peat	275-280	0.04	47	1.4	79	0.17
Tazovsky (Tz), 67.4°N	PF	peat	280-285	0.04	48	1.7	78	0.16
Tazovsky (Tz), 67.4°N	PF	peat	285-290	0.04	48	1.2	84	0.18
Tazovsky (Tz), 67.4°N	PF	peat	290-295	0.04	46	1.2	106	0.23
Tazovsky (Tz), 67.4°N	PF	peat	295-300	0.04	47	1.4	145	0.30
Tazovsky (Tz), 67.4°N	PF	peat	300-305	0.09	50	1.6	284	0.57
Tazovsky (Tz), 67.4°N	PF	peat	305-310	0.11	52	1.5	79	0.15
Tazovsky (Tz), 67.4°N	PF	peat	310-315	0.11	46	1.5	81	0.18
Tazovsky (Tz), 67.4°N	PF	peat	315-320	0.10	48	3.2	85	0.18
Tazovsky (Tz), 67.4°N	PF	peat	320-325	0.18	65	2.3	67	0.10
Tazovsky (Tz), 67.4°N	PF	peat	325-330	0.18	47	1.2	84	0.18
Tazovsky (Tz), 67.4°N	PF	peat	330-335	0.18	47	1.7	112	0.24
Tazovsky (Tz), 67.4°N	PF	peat	335-340	0.18	49	2.2	131	0.27
Tazovsky (Tz), 67.4°N	PF	peat	340-345	0.19	51	2.3	89	0.18
Tazovsky (Tz), 67.4°N	PF	peat	345-350	0.18	49	2.4	60	0.12
Tazovsky (Tz), 67.4°N	PF	peat	350-355	0.18	48		87	0.18
Tazovsky (Tz), 67.4°N	PF	peat	355-360	0.18	44		210	0.48
Tazovsky (Tz), 67.4°N	PF	peat	360-365	0.18	51		129	0.25
Tazovsky (Tz), 67.4°N	PF	peat	365-370	0.18	42		94	0.22
Tazovsky (Tz), 67.4°N	PF	peat	370-375	0.18	35		91	0.26
Tazovsky (Tz), 67.4°N	PF	peat	375-380	0.19	31		76	0.24
Tazovsky (Tz), 67.4°N	PF	peat	380-385	0.18	22	1.8	55	0.25
Tazovsky (Tz), 67.4°N	PF	mineral	385-390	1.72	13	1.1	177	1.32
Tazovsky (Tz), 67.4°N	PF	mineral	390-395	1.68	12	1.0	127	1.06
Tazovsky (Tz), 67.4°N	PF	mineral	395-400	1.71	11	0.9	172	1.55
Tazovsky (Tz), 67.4°N	PF	mineral	400-405	1.70	11	0.9	230	2.04

**Table S3.** Correlations matrix of Hg concentration with major and trace element concentration in peat active layer, peat permafrost horizon and underlying mineral layer across the WSL (all 6 sites together). Correlations are significant at  $p < 0.05$ . Blank cells correspond to lack of correlation.

<b>Element</b>	<b>Active layer</b>	<b>Frozen layer</b>	<b>Mineral layer</b>	<b>Element</b>	<b>Active layer</b>	<b>Frozen layer</b>	<b>Mineral layer</b>
<b>C</b>	-0.30		0.60	<b>Rb</b>	0.77		0.44
<b>N</b>	0.50	0.47	0.75	<b>Sr</b>		0.44	0.70
<b>Li</b>			0.78	<b>Zr</b>	0.52	0.34	0.66
<b>B</b>		0.32		<b>Nb</b>	0.53		0.65
<b>Na</b>	0.59		0.67	<b>Mo</b>	0.31	0.49	0.76
<b>Mg</b>	0.20	0.43	0.65	<b>Cd</b>	0.26	0.29	0.73
<b>Al</b>	0.54	0.26	0.65	<b>Sb</b>		0.40	0.67
<b>P</b>	0.75	0.41	0.75	<b>Cs</b>	0.61		0.50
<b>K</b>	0.76		0.55	<b>Ba</b>			0.61
<b>Ca</b>		0.54	0.79	<b>La</b>	0.56	0.42	
<b>Ti</b>	0.38		0.67	<b>Ce</b>	0.54	0.42	0.52
<b>V</b>	0.66	0.39	0.66	<b>Nd</b>	0.53	0.43	0.62
<b>Cr</b>	0.79	0.31	0.71	<b>Gd</b>	0.52	0.43	0.59
<b>Mn</b>		0.45	0.75	<b>Yb</b>	0.58	0.42	0.68
<b>Fe</b>		0.32	0.67	<b>Lu</b>	0.6	0.39	0.65
<b>Co</b>		0.36	0.71	<b>Hf</b>	0.31	0.34	0.66
<b>Ni</b>	0.59	0.41	0.72	<b>W</b>	0.6		0.51
<b>Cu</b>	0.64	0.40	0.66	<b>Tl</b>	0.46		0.52
<b>Zn</b>			0.76	<b>Pb</b>	0.49		0.60
<b>Ga</b>	0.6		0.61	<b>Th</b>	0.42	0.40	0.52
<b>Ge</b>	0.58			<b>U</b>	0.45	0.38	0.63
<b>As</b>	0.67	0.43	0.77				