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Supplement of

A revised pan-Arctic permafrost soil Hg pool based on Western Siberian peat Hg and carbon observations

Artem G. Lim et al.

Correspondence to: Oleg S. Pokrovsky (oleg.pokrovsky@get.omp.eu)

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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 ⁻³	C, %	N, %	Hg, ng g ⁻¹	RHgC, μg g ⁻¹
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 ⁻³	C, %	N, %	Hg, ng g ⁻¹	RHgC, µg g ⁻¹
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 ⁻³	C, %	N, %	Hg, ng g ⁻¹	RHgC, μg g ⁻¹
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.

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

Table S4. Overview of R_{HgC} data used for estimating the northern circumpolar permafrost region soil Hg pool.

country	location	region	n	Dataset Reference	Reference
Russia	Western Siberian Lowland	Eurasia	208		this study
Russia	Northern European Russia	Eurasia	11		1
Russia	Northern Siberia	Eurasia	10	Olson et al. (2018)	2
Russia	West Siberia	Eurasia	18	Olson et al. (2018)	3
Russia	Belyi Island	Eurasia	4	Olson et al. (2018)	4
Sweden		Eurasia	3	Olson et al. (2018)	5
Sweden		Eurasia	34	Schuster et al. (2018)	6
Norway	Svalbard	Eurasia	4	Olson et al. (2018)	7
Norway	Svalbard, Ny-Alesund	Eurasia	38	Schuster et al. (2018)	8
Norway	Svalbard	Eurasia	10	Olson et al. (2018)	9
Denmark	Greenland	Eurasia	8	Olson et al. (2018)	10
Canada	Nunavut, Cornwallis Island	North America	18	Olson et al. (2018)	11
Canada	Inuvik, Northwest Territories	North America	80	Olson et al. (2018)	12
Canada	Bathurst and Devon Island	North America	24	Olson et al. (2018)	13
USA	Alaska	North America	589	Schuster et al. (2018)	14
USA	Alaska	North America	114	Olson et al. (2018)	15

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