

Table S1. Geometric measurements of rapidly drained thermokarst lakes and associated deltas and thermo-erosion gullies.

Lake ID (Nitze et al., 2020)	Lake Location	Drained Lake Measurements		Thermo-erosion Gulley Measurements				Delta Measurements	
		Area (km ²)	Gulley ID	Length (m)	Width _{bd} (m)	Width _{ad} (m)	Width _Δ (m)	Area (m ²)	Area (m ²)
99492	66.451°, -164.761°	1404	0	196	5.15	8.57	3.41	669	10287
102499	65.749°, -167.338°	346	1	160	1.93	8.41	6.48	1036	4366
99550	66.438°, -164.223°	233	2	501	1.28	3.00	1.72	862	5910
99516	66.443°, -164.078°	99	3	187	1.97	4.02	2.05	383	4453
100470	66.245°, -164.513°	288	4	270	8.46	13.69	5.23	1412	9026
Mean	-	474	-	262	3.76	7.54	3.78	873	6808
Median	-	288	-	196	1.97	8.41	3.41	862	5910
Max	-	1404	-	501	8.46	13.69	6.48	1412	10287

Approximate lake ID, lake location, lake area following rapid drainage, gulley measurements before and after drainage, and thermokarst delta area are shown.

Burnham, B.S., et al., Rapid sediment re-deposition may limit carbon release during catastrophic thermokarst lake drainage. *GSA Today*, v. 32, <https://doi.org/10.1130/GSATG529GW.1>.

Table S2. Estimated soil organic carbon content measured in gigagram (Gg) in top 2 meters removed from thermo-erosion gullies are shown.

Gully ID	JOHNSON (Gg/m ²)	STATSGO (Gg/m ²)	MISHRA (Gg/m ²)	NCSCDv2 (Gg/m ²)	DOS-TEM (Gg/m ²)	Mean (Gg/m ²)
0	5.10	4.43	10.30	3.88	7.81	6.31
1	7.90	6.86	15.95	6.02	12.10	9.77
2	7.81	6.77	15.75	5.94	11.95	9.64
3	2.60	2.26	5.26	1.98	3.99	3.22
4	10.77	9.34	21.73	8.20	16.49	13.31
Mean	6.84	5.93	13.80	5.20	10.47	8.45
Median	7.81	6.77	15.75	5.94	11.95	9.64
Max	10.77	9.34	21.73	8.20	16.49	13.31

Estimates are derived from five process-based spatial statistical models (Zhu and McGuire, 2016). JOHNSON estimates derived from Johnson et al. (2011); 30 m resolution. STATSGO, state soil geographic database; 30 m resolution. MISHRA estimates derived from Mishra and Riley (2012); 1 km resolution. NCSCDv2, Northern Circumpolar Soil Carbon Database version 2; 1 km resolution. DOS-TEM, Dynamic Organic Soil version of the Terrestrial Ecosystem Model; 1 km resolution.

REFERENCES CITED

- Johnson, K.D., and 14 others, 2011, Soil carbon distribution in Alaska in relation to soil-forming factors: *Geoderma*, v. 167–168, p. 71–84, <https://doi.org/10.1016/j.geoderma.2011.10.006>.
- Mishra, U., and Riley, W.J., 2012, Alaskan soil carbon stocks; Spatial variability and dependence on environmental factors: *Biogeosciences*, v. 9, no. 9, p. 3637–3645, <https://doi.org/10.5194/bg-9-3637-2012>.
- Zhu, Z., and McGuire, A.D., 2016, Baseline and projected future carbon storage and greenhouse-gas fluxes in ecosystems of Alaska: U.S. Geological Survey Professional Paper 1826, 196 p, <https://doi.org/10.3133/pp1826>.