

Supplementary Information

Petroleum exploration increases methane emissions from northern peatlands

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Supplementary Table 1: Comparison of peatland seismic line length between ABMI Human Footprint database and ABMI Enhanced Linear Features database^a

	Bog	Fen	Swamp	Peatland Total
Total area (km²)	711	3339	837	4887
Seismic line length from ABMI Human Footprint database¹ (km)				
Legacy + trails^b	1418	5693	1097	8207
LIS^b	441	1651	377	2469
Total	1859	7344	1474	10676
Seismic line length from ABMI Enhanced Linear Feature database² (km)				
Legacy + trails^b	2011	8190	1546	11747
LIS^b	1320	5770	1137	8227
Total	3331	13960	2683	19974
Seismic lines included in ABMI Human Footprint database (%)				
Legacy + trails^b	70	70	71	70
LIS^b	33	29	33	30
Total	56	53	55	53

- a. Numerical results from our comparison of the ABMI Human Footprint database¹ used throughout the study to a higher resolution data set under development at ABMI (ABMI Enhanced Linear Features)², using mapped seismic line data with 1 m spatial resolution air photos in a site located near the town of Conklin, Alberta, Canada (55.6314° N, 111.0839° W). Total study area for comparison is 10,475 km² containing 4,887 km² peatland.
- b. LIS = low-impact seismic lines. Description of legacy lines and trails is given in Methods

Supplementary Table 2: Length of seismic lines within wetland types for the province of Alberta

Wetland Type	Bog	Fen	Marsh	Swamp	Open Water	Total
Total Area						
Covered (km²)	30048	58580	16039	46155	20073	170895
LIS (km)	9093	17449	144	7515	22	34223
Legacy lines (km)	73437	112627	8088	92016	1408	287576
Trails (km)	6049	14508	2580	12950	696	36782

Supplementary Table 3: Area of different types of seismic Lines within wetland types for the province of Alberta

Wetland Type	Bog	Fen	Marsh	Swamp	Open Water	Total
LIS (km²)	27.3	52.3	0.4	22.5	0.1	102.6
Legacy (km²)	440.6	675.8	48.5	552.1	8.4	1725.4
Trails (km²)	24.2	58.0	10.3	51.8	2.8	147.1

Supplementary References

1. Alberta Biodiversity Monitoring Institute (ABMI), *Wall-to-Wall Human Footprint Inventory 2014*. (Alberta Biodiversity Monitoring Institute and Alberta Human Footprint Monitoring Program, Edmonton, AB, Canada, 2017).
2. Alberta Biodiversity Monitoring Institute (ABMI). *Enhanced Linear Features in the Oil Sands Region 2014* (Alberta Biodiversity Monitoring Institute, Edmonton, AB, Canada, 2017).