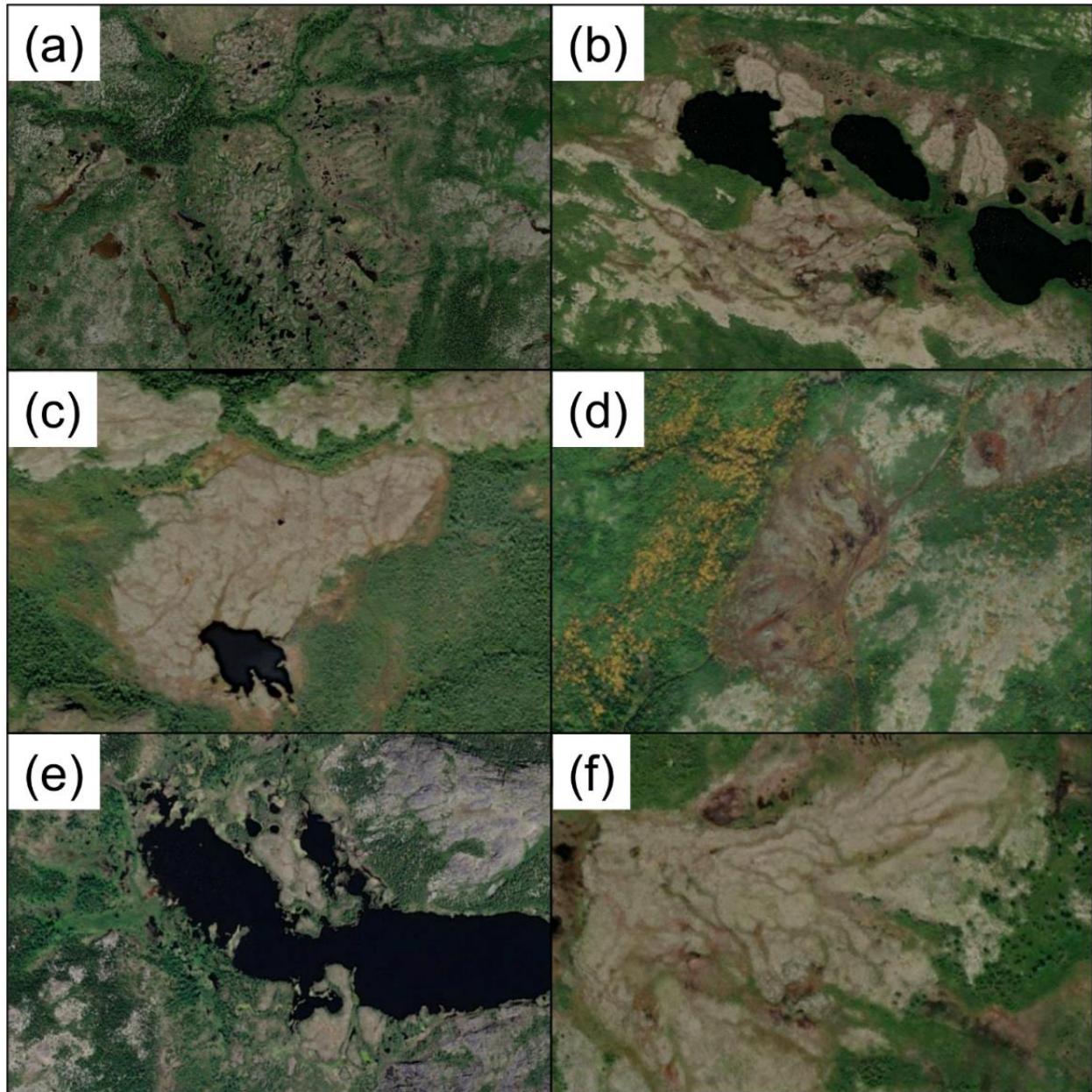
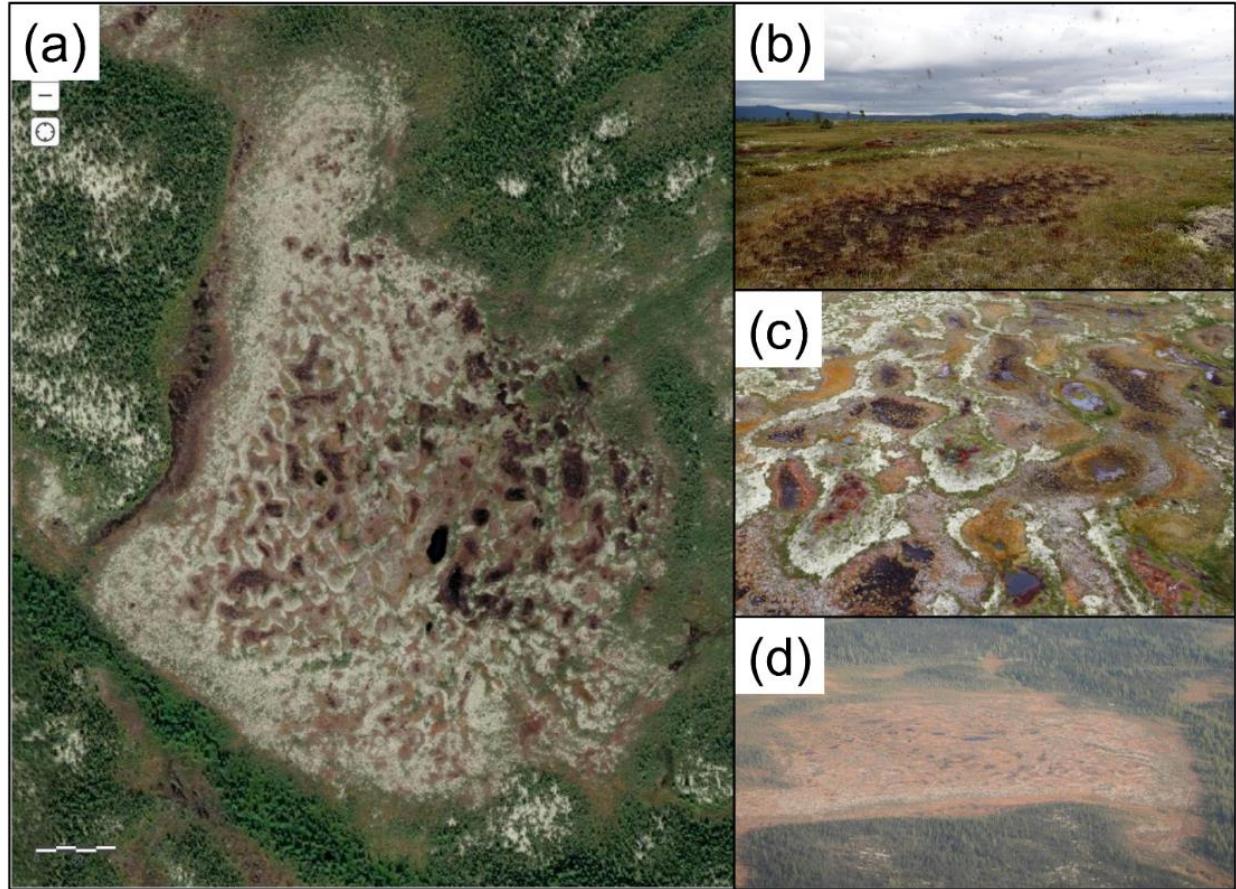


1      Section S1: Examples of wetlands of interest as identified from high-resolution satellite imagery and as  
2      validated through field visits and low-altitude aerial photographs



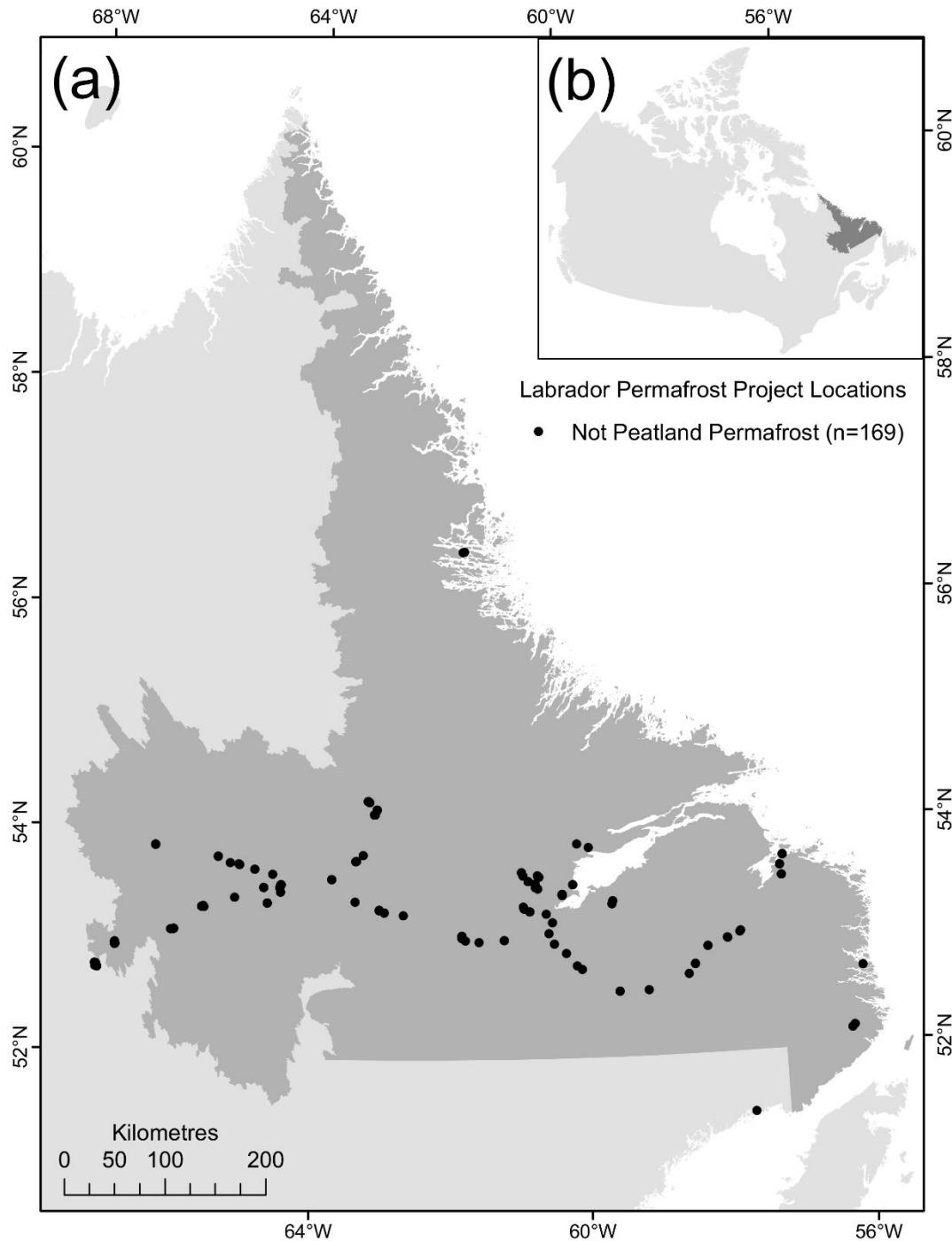
3  
4      Figure S1. Examples of wetlands of interest in Labrador that were identified by the mapping team using high-resolution  
5      satellite imagery available via Esri ArcGIS Online.



6  
7 Figure S2. (a) High-resolution satellite image from Esri ArcGIS Online,  
8 (b) site photo taken with a digital handheld camera  
9 during field visit, (c) photo taken during low-altitude RPA survey,  
10 and (d) photo taken with a digital handheld camera  
during low-altitude Twin Otter overflight for a wetland of interest with validated peatland permafrost presence near  
Rigolet.

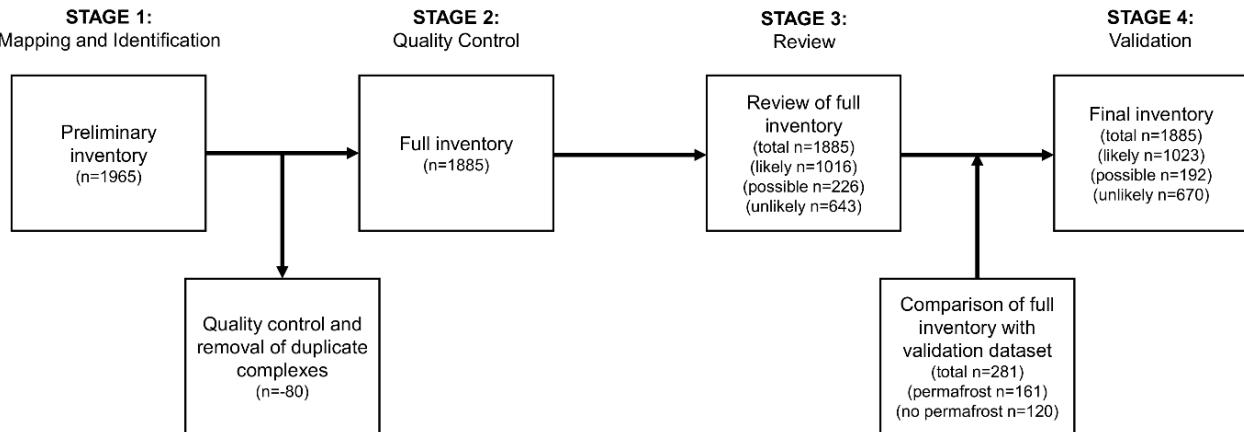
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12      Section S2: Overview of sites visited by the Labrador Permafrost Project (2013-2017) that did not contain  
13      peatland permafrost



14  
15      Figure S3. (a) Field locations visited during the Labrador Permafrost Project (2013-2017) that were classified as non-  
16      peatland permafrost locations (Way, 2017; Way & Lewkowicz, 2016, 2018). Peatland permafrost presence was evaluated  
17      through frost probing and/or the installation of iButton temperature loggers (Maxim Integrated) at the depth of probe  
18      refusal for up to two years; (b) Location of Labrador in relation to Canada.

19    **Section S3: Overview of peatland permafrost inventorying and validation process**



20

21    **Figure S4. Conceptual diagram of multi-stage inventorying and validation process for the coastal Labrador peatland**  
22    **permafrost inventory.**

23

24      **Section S4: Summary of climatic and physiographic characteristics of inventoried peatland permafrost**  
 25      **complexes**

26  
 27      **Table S1.** Summary of mean, standard deviation, minimum, and maximum latitude, distance from coastline, elevation,  
 28      mean annual air temperature, mean annual freezing degree days, and mean annual thawing degree days for WOIs classified  
 29      as likely, possibly, or unlikely to contain peatland permafrost landforms in the final coastal Labrador peatland permafrost  
 30      complex inventory.

	Likely (n=1023)		Possible (n=192)		Unlikely (n=670)	
	mean ± std	range	mean ± std	range	mean ± std	range
Latitude (°N)	54.1 ± 1.1	51.4-58.6	54.5 ± 1.9	51.4-60.2	54.0 ± 1.4	51.4-60.2
Distance from Coastline (km)	4.7 ± 15.1	0-454.5	11.7 ± 15.1	0-127.1	18.9 ± 25.5	0-434.4
Elevation (m a.s.l.)	31 ± 40	0-858	68 ± 68	0-467	79 ± 68	0-437
Mean Annual Air Temperature (°C) <sup>a</sup>	-0.9 ± 1.2	-7.5-1.2	-1.3 ± 2.1	-7.6-1.2	-0.6 ± 1.6	-6.9-1.3
Freezing Degree Days (° days) <sup>a</sup>	1595 ± 335	1126-3466	1818 ± 519	1164-3623	1701 ± 380	1076-3383
Thawing Degree Days (° days) <sup>a</sup>	1284 ± 178	736-1704	1351 ± 292	394-1784	1466 ± 233	397-1960

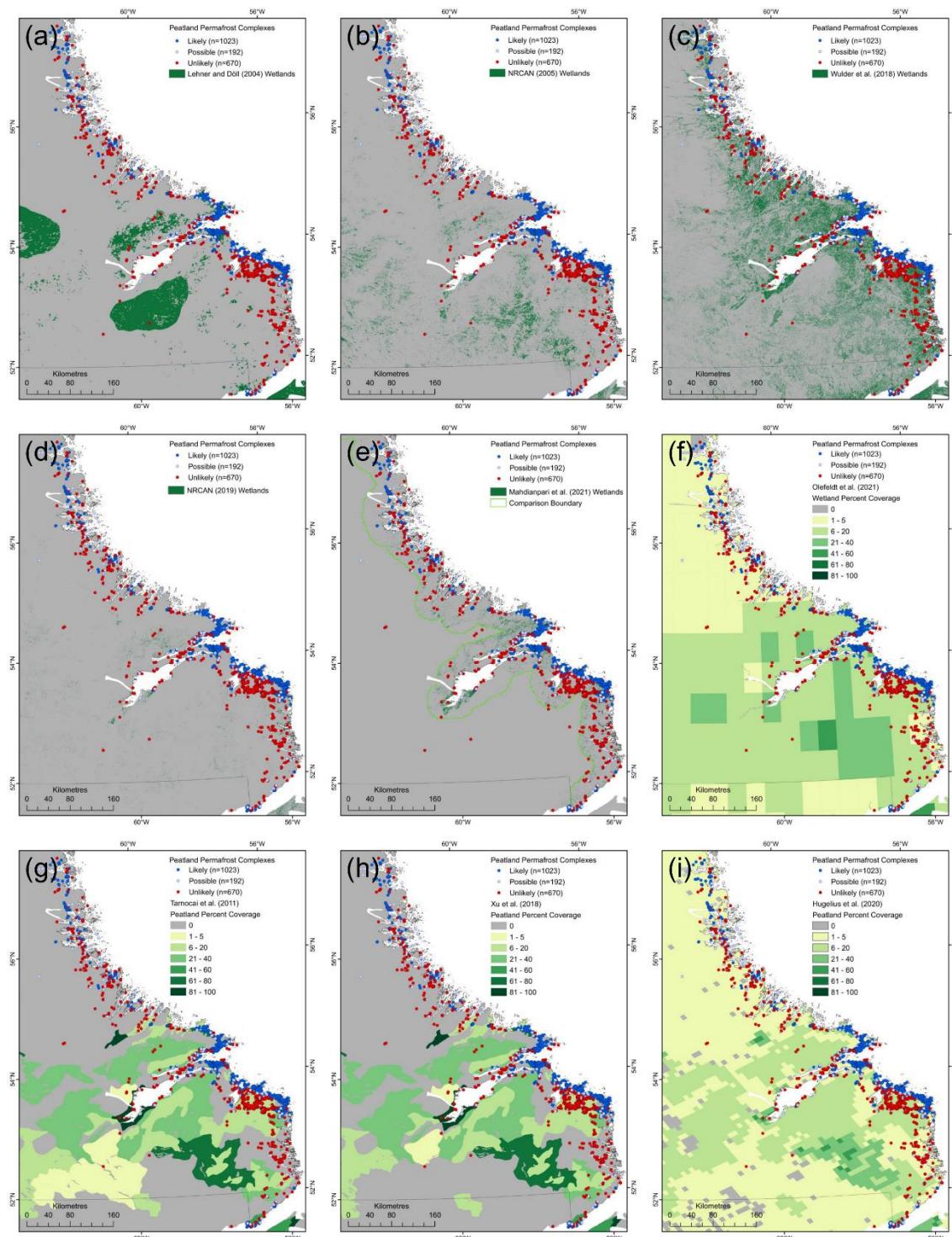
31      <sup>a</sup> Note: mean annual air temperature, freezing degree days, and thawing degree days are averaged over  
 32      the 1981 to 2010 climate normal.

33      **Section S5: Comparisons of inventoried peatland permafrost complexes with selected wetland, peatland, and**  
 34      **permafrost distribution products**

35  
 36      **Table S2. Number of inventoried likely, possibly, and unlikely peatland permafrost complexes classified as wetlands or**  
 37      **peatlands by selected products.**

Product	Reference	Number of inventoried peatland permafrost complexes classified as wetlands or peatlands			
		All (n=1885)	Likely (n=1023)	Possible (n=192)	Unlikely (n=670)
<b>Wetland Products</b>					
Global Lakes and Wetlands Database	Lehner and Döll (2004)	86	68	6	12
National Topographic Database	Natural Resources Canada (2005)	775	257	93	425
High Resolution Binary Wetland Map for Canada	Wulder et al. (2018)	726	267	86	373
Land Cover of Canada 2015	Natural Resources Canada (2019)	44	31	5	8
Boreal Arctic Wetlands and Lakes Dataset	Olefeldt et al. (2021)	1777	961	182	634
Canadian Wetland Inventory Map 3 (Coastal)	Mahdianpari et al. (2021) <sup>a</sup>	1176 (n=1860)	713 (n=1022)	108 (n=190)	356 (n=648)
<b>Peatland Products</b>					
Peatlands of Canada	Tarnocai et al. (2011)	803	355	89	359
PEATMAP	Xu et al. (2018)	807	358	89	360
Northern Peatland Extent, Depth, Carbon Storage, and Nitrogen Storage	Hugelius et al. (2020)	1793	978	178	638

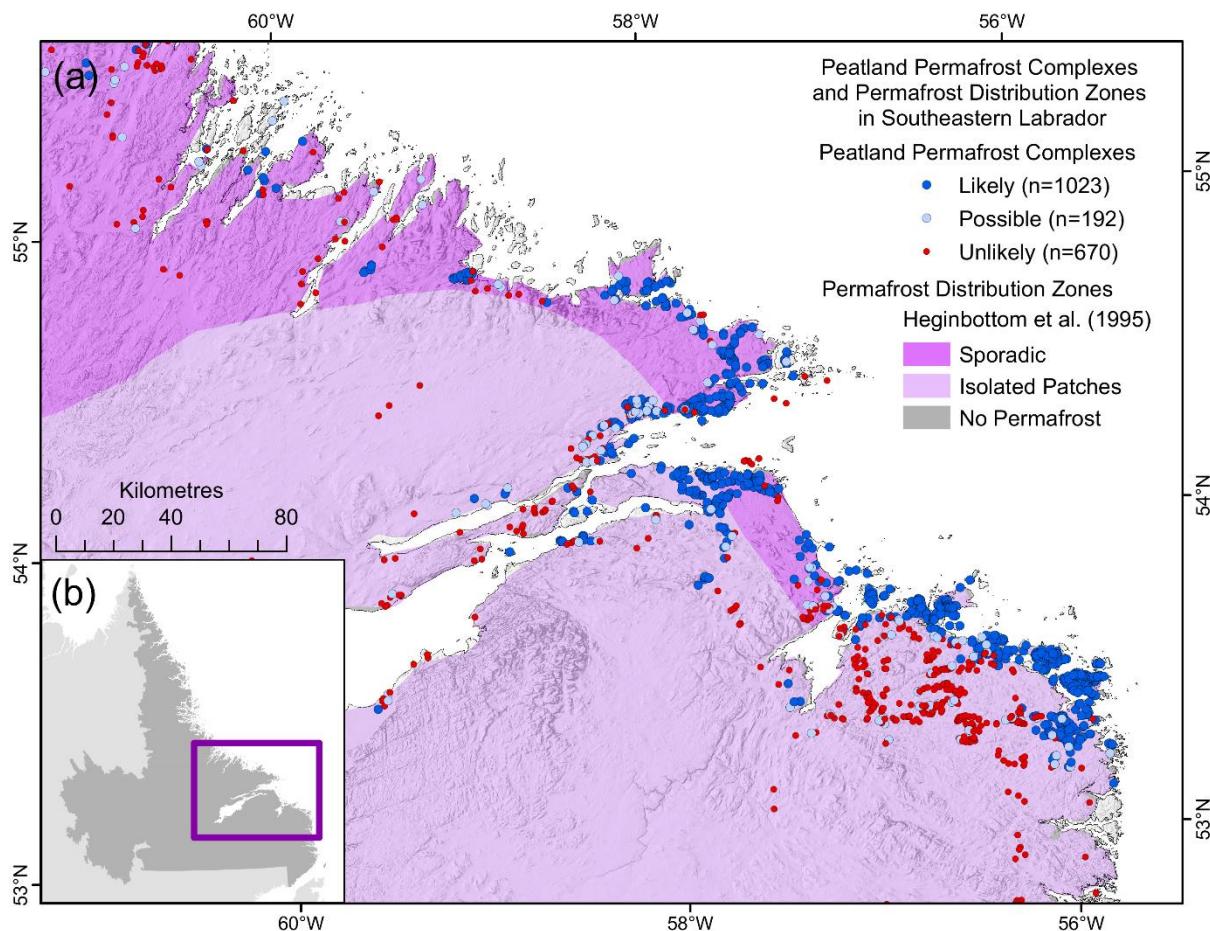
38      <sup>a</sup> Note: the comparison with the Canadian Wetland Inventory Map 3 product only included wetlands of  
 39      interest within 50 km of the Labrador Sea or Gulf of St. Lawrence coastline  
 40      (total n=1860, likely n=1022, possible n = 190, unlikely n=648).



41  
42 **Figure S5.** Comparison of inventoried peatland permafrost complexes with wetland or peatland areas from the (a) Global  
43 Lakes and Wetlands Database; (b) National Topographic Database; (c) High-Resolution Binary Wetland Map for Canada;  
44 (d) Land Cover of Canada 2015; (e) Canadian Wetland Inventory Map 3 within 50 km of the coast; (f) Boreal-Arctic  
45 Wetland and Lake Dataset; (g) Peatlands of Canada Database; (h) PEATMAP; and (i) Maps of Northern Peatland Extent,  
46 Depth, Carbon Storage and Nitrogen Storage.

47      **Section S6: Comparisons of inventoried peatland permafrost complexes with permafrost distribution zones**  
48      **from the Permafrost Map of Canada and the Northern Hemisphere Permafrost Map**

49



50  
51      **Figure S6. (a) Comparison of inventoried peatland permafrost complexes with permafrost distribution zones from the**  
52      **Permafrost Map of Canada (Heginbottom et al., 1995) for (b) southeastern Labrador near Rigolet, Cartwright, and Black**  
53      **Tickle.**

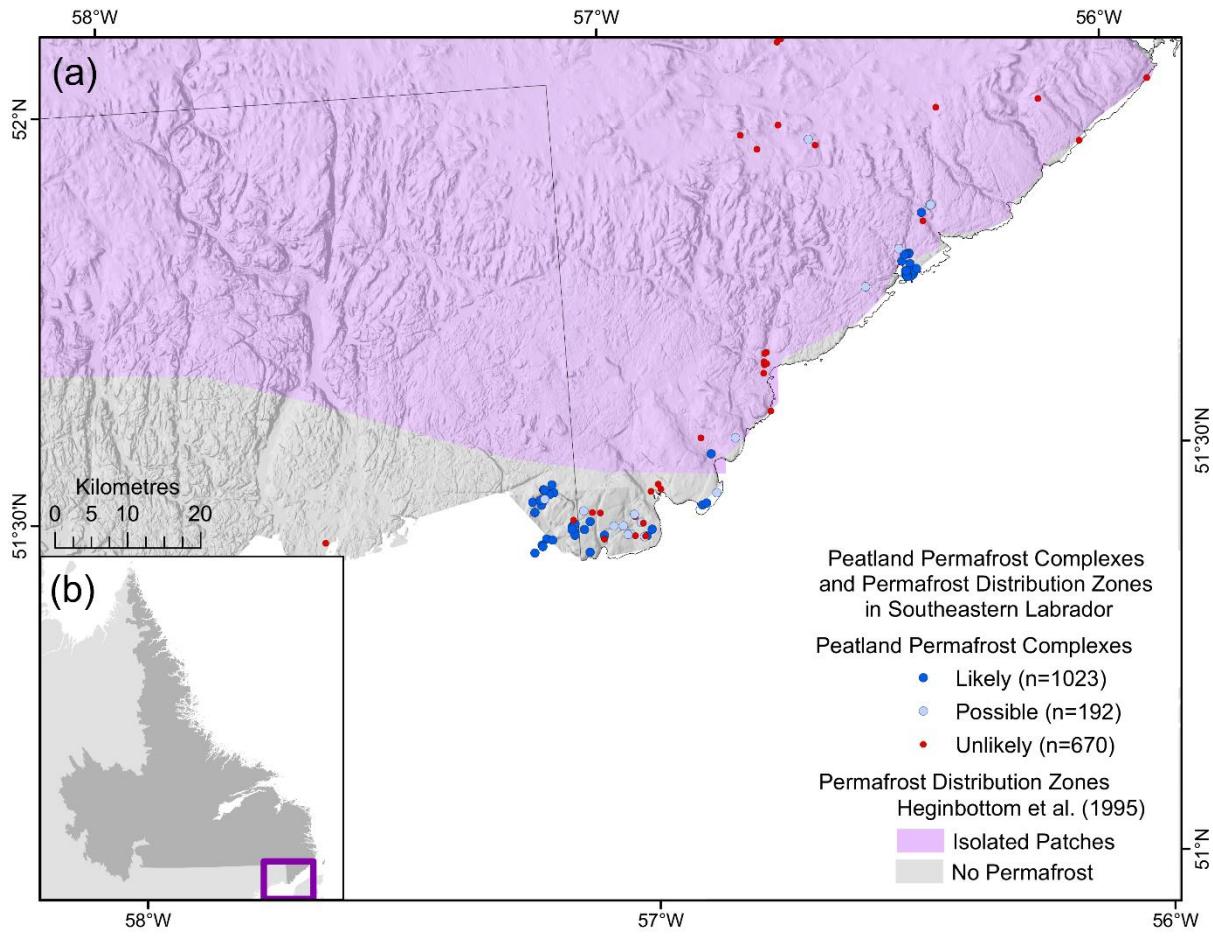
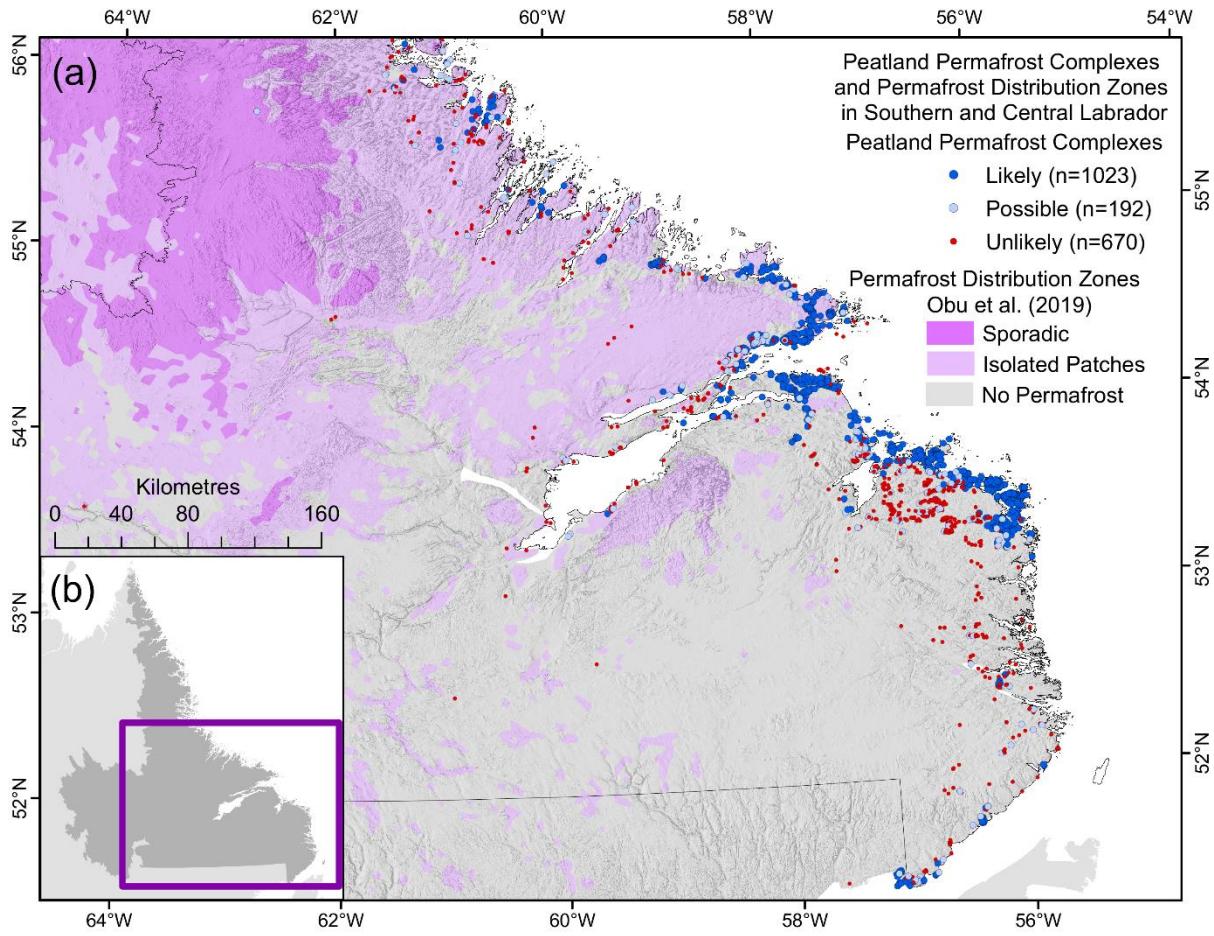


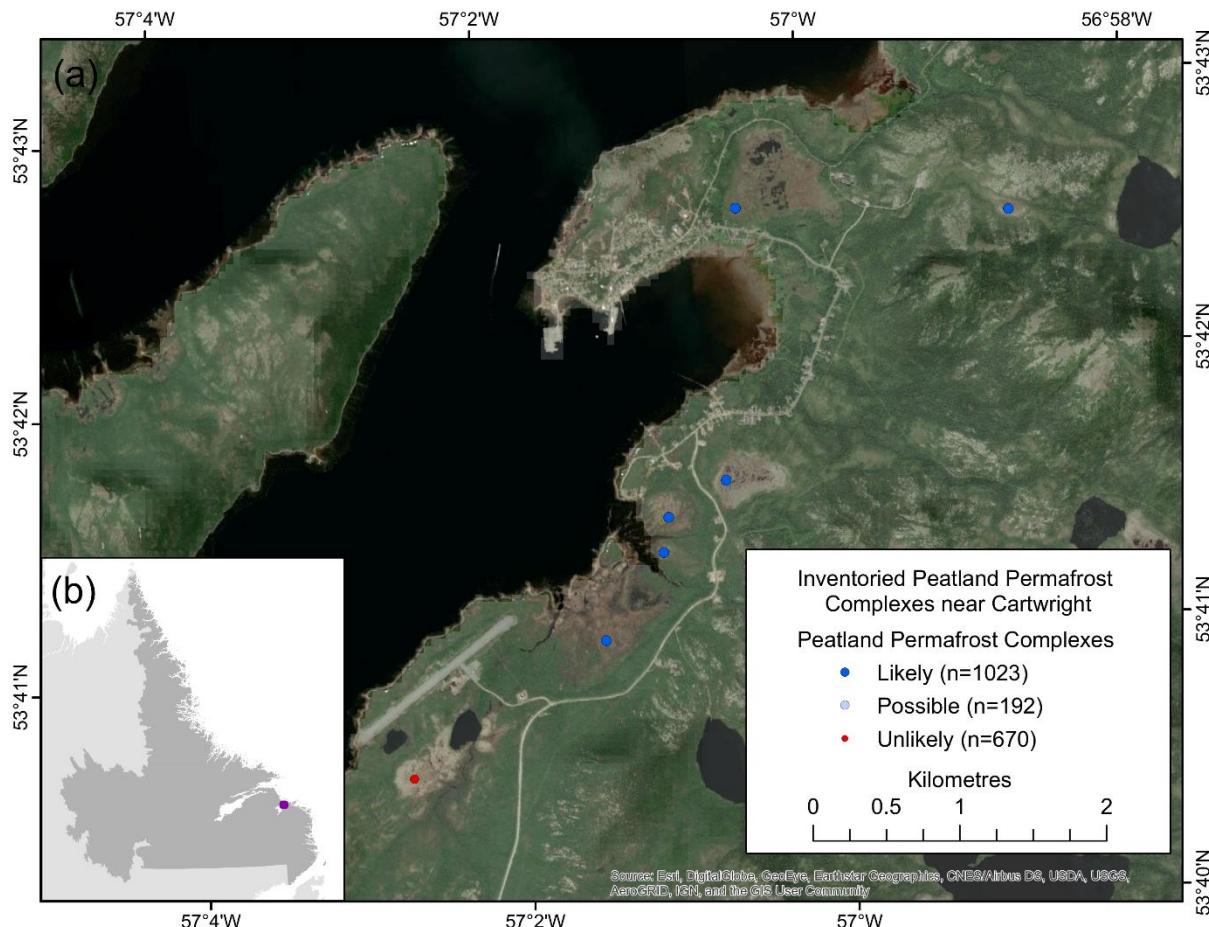
Figure S7. (a) Comparison of inventoried peatland permafrost complexes with permafrost distribution zones from the Permafrost Map of Canada (Heginbottom et al., 1995) for (b) southeastern Labrador and adjacent areas of Quebec near Red Bay and Blanc-Sablon.



58  
59  
60 **Figure S8.** (a) Comparison of inventoried peatland permafrost complexes with permafrost distribution zones from the 2000-2016 Northern Hemisphere Permafrost Map (Obu et al., 2019) for (b) southern and central coastal Labrador.

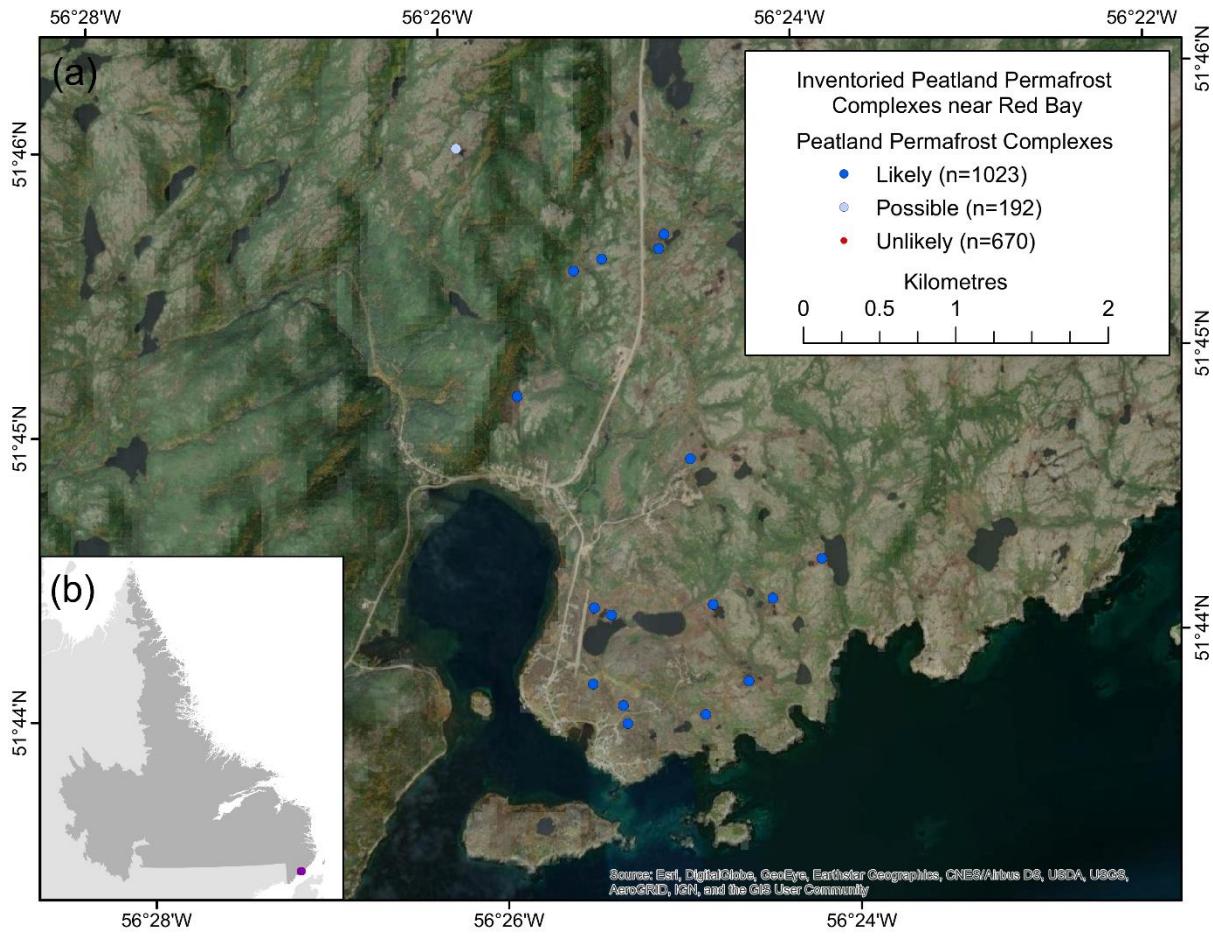
61    **Section S7: Location of inventoried peatland permafrost complexes near selected communities**

62



63  
64  
65

**Figure S9. (a) Location of likely, possible, and unlikely peatland permafrost complexes near the community of Cartwright; (b) Location of Cartwright in relation to Labrador.**



66  
67  
68 **Figure S10.** (a) Location of likely, possible, and unlikely peatland permafrost complexes near the community of Red Bay;  
68 (b) Location of Red Bay in relation to Labrador.

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