

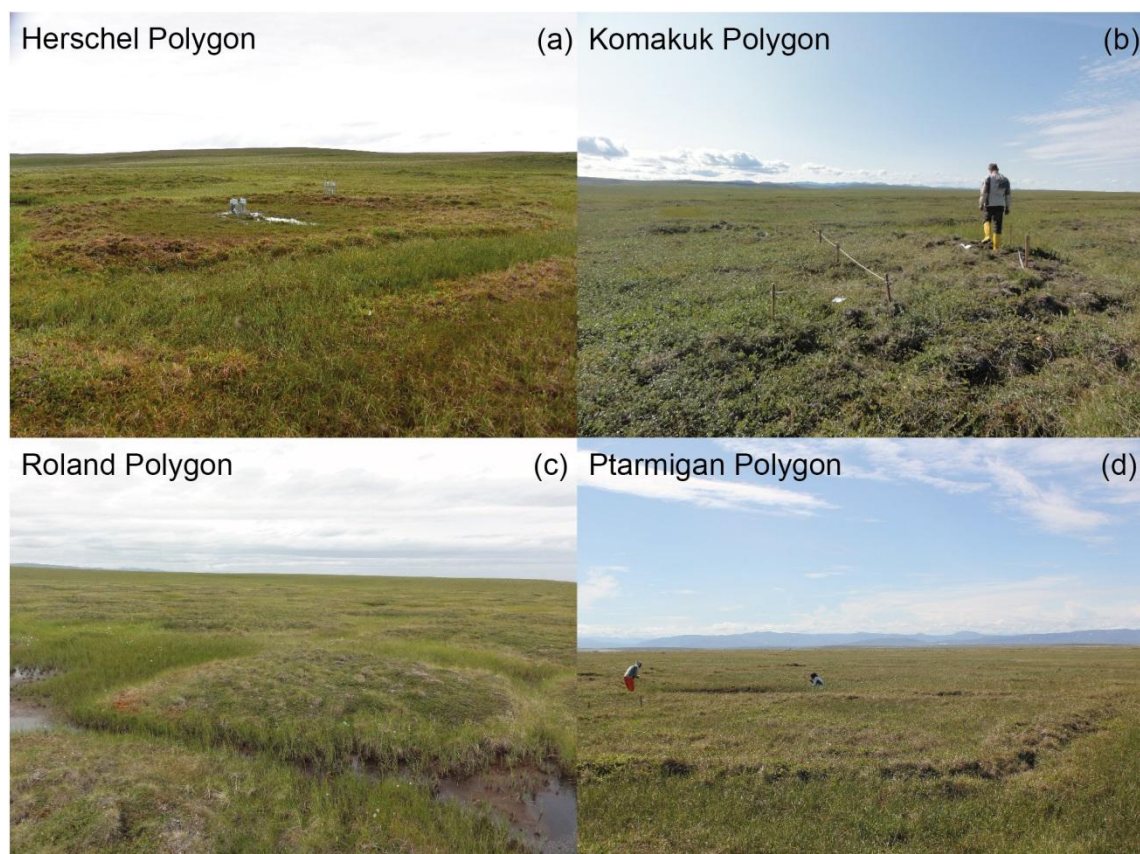
Supplementary file for: Wolter J., Lantuit H., Fritz M., Macias-Fauria M., Myers-Smith I. & Herzschuh U. 2016. Vegetation composition and shrub extent on the Yukon coast, Canada, are strongly linked to ice-wedge polygon degradation. *Polar Research* 35. Correspondence: Juliane Wolter, Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Telegrafenberg A43, 14473 Potsdam, Germany. E-mail: juliane.wolter@awi.de

Abbreviations in this document:

TC: total carbon

TN: total nitrogen content

TOC: total organic carbon content



**Supplementary Fig. S1.** We investigated different ice-wedge polygon types on the flat coastal plain and on Herschel Island: (a) Herschel Polygon, low-centred; (b) Komakuk Polygon, intermediate-centred; (c) Roland Polygon, low-centred; (d) Ptarmigan Polygon, high-centred.

**Supplementary Table S1.** Spearman's rank correlation coefficients of paired environmental parameters. Numbers in boldface show significant correlations ( $P < 0.01$ ).

	Surface height	Permafrost table	Active layer depth	Soil temperature	pH	Electrical conductivity	TOC	TN	TOC/TN
Relative surface height		<b>0.91</b>	-0.1	-0.14	<b>-0.58</b>	-0.28	<b>0.42</b>	-0.49	0.48
Permafrost table	<b>0.91</b>		-0.41	<b>-0.35</b>	<b>-0.40</b>	-0.09	<b>0.4</b>	<b>-0.34</b>	<b>0.38</b>
Active layer depth	-0.1	-0.41		<b>0.52</b>	-0.01	-0.2	-0.21	0.06	-0.15
Soil temperature	-0.14	<b>-0.35</b>	<b>0.52</b>		-0.04	0.01	-0.25	0.01	-0.15
pH	<b>-0.58</b>	<b>-0.40</b>	-0.01	-0.04		<b>0.36</b>	<b>-0.64</b>	<b>0.72</b>	<b>-0.75</b>
Electrical conductivity	-0.28	-0.09	-0.2	0.01	<b>0.36</b>		-0.34	0.25	<b>-0.35</b>
TOC	<b>0.42</b>	<b>0.4</b>	-0.21	-0.25	<b>-0.64</b>	-0.34		-0.52	<b>0.85</b>
TN	-0.49	<b>-0.34</b>	0.06	0.01	<b>0.72</b>	0.25	-0.52		<b>-0.83</b>
TOC/TN	0.48	<b>0.38</b>	-0.15	-0.15	<b>-0.75</b>	<b>-0.35</b>	<b>0.85</b>	<b>-0.83</b>	

**Supplementary Table S2.** Vascular plant species percent cover for all recorded taxa.

	Herschel Polygon															
	HP00	HP01	HP02	HP03	HP04	HP05	HP06	HP07	HP08	HP09	HP10	HP11	HP12	HP13	HP14	HP15
Cyperaceae sum	0.526	1.15	0.446	0.531	0.415	0.44	0.535	0.556	0.508	0.383	0.436	0.44	0.305	0.525	1	0.63
Cyperaceae undifferentiated	0.375	0.625	0.265	0.375	0.375	0.375	0.375	0.375	0.5	0.375	0.375	0.375	0.15	0.15	0.375	0
<i>Carex aquatilis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Carex chordorrhiza</i>	0	0	0	0	0	0	0	0.001	0.001	0.001	0.03	0.03	0	0	0	0
<i>Carex rariflora</i>	0.001	0.15	0.001	0.001	0.005	0.005	0.005	0.03	0.001	0.001	0.001	0.005	0.005	0	0	0.005
<i>Carex williamsii</i>	0	0	0.15	0.15	0.03	0.03	0.005	0	0.001	0.001	0	0	0	0	0	0
<i>Eriophorum angustifolium</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Eriophorum vaginatum</i>	0.15	0.375	0.03	0.005	0.005	0.03	0.15	0.15	0.005	0.005	0.03	0.03	0.15	0.375	0.625	0.625
<i>Juncus biglumis</i>	0	0	0	0	0.005	0	0	0	0	0	0	0	0	0	0	0
<i>Luzula confusa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Luzula wahlenbergii</i>	0	0	0	0.005	0.001	0.001	0.005	0.005	0.001	0.005	0.005	0.001	0.005	0.005	0	0
<i>Hierochloë alpina</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Hierochloë pauciflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. <i>Dupontia fisheri</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Poa arctica</i>	0	0.005	0.005	0	0	0	0	0	0	0	0	0	0	0	0.001	0.001
<i>Betula glandulosa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Salix arctica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Salix fuscescens</i>	0	0	0.001	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.03	0.03	0	0	0
<i>Salix pulchra</i>	0.15	0.03	0.03	0	0	0	0	0	0	0	0	0	0.001	0.03	0.15	0.03
<i>Salix reticulata</i>	0.001	0.03	0.15	0.005	0	0	0	0	0	0	0	0.001	0	0	0	0
<i>Dryas integrifolia</i>	0	0	0.001	0.005	0	0	0	0	0	0	0	0	0	0	0	0
<i>Rubus chamaemorus</i>	0.005	0.001	0.005	0.005	0	0	0	0	0	0	0	0.001	0.15	0.15	0.15	0.15
<i>Cassiope tetragona</i>	0	0.03	0	0.005	0	0	0	0	0	0	0	0	0	0	0.005	0.15
<i>Empetrum nigrum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Ledum decumbens</i>	0	0	0.03	0.005	0	0	0	0	0.005	0	0.005	0	0	0	0	0
<i>Pyrola grandiflora</i>	0.001	0.15	0.001	0	0	0	0	0	0	0	0	0.005	0.03	0.03	0.03	0.03
<i>Vaccinium uliginosum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0.15	0	0	0
<i>Vaccinium vitis-idaea</i>	0.03	0.15	0.03	0	0	0	0	0	0	0	0	0.001	0.03	0.15	0.03	0.15
<i>Polygonum bistorta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Polygonum viviparum</i>	0.005	0	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0	0	0	0
<i>Pedicularis</i> sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis capitata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis lapponica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis oederi</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis sudetica</i>	0	0.005	0.005	0.005	0.005	0.005	0	0.005	0.001	0.005	0	0	0	0	0	0
<i>Pedicularis lanata</i>	0	0	0.001	0.005	0	0	0.005	0	0	0	0	0	0	0	0	0
<i>Saxifraga nelsoniana</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Stellaria longipes</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Tofieldia</i> sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Supplementary Table S2. Continued.

	Komakuk Polygon										Roland Polygon							
	KP00	KP01	KP02	KP03	KP04	KP05	KP06	KP07	KP08	KP09	RP01	RP02	RP03	RP04	RP05	RP06	RP07	RP08
Cyperaceae sum	0.375	1.25	0.3	0.625	0.15	0.03	0	0.75	0.525	0.65	0.15	0.375	0.375	0.375	0.03	0.375	0.15	0.375
Cyperaceae undifferentiated	0	0.625	0.15	0.625	0.15	0.03	0	0.75	0.375	0.5	0	0	0	0	0	0	0	0
<i>Carex aquatilis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Carex chordorrhiza</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Carex rariflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Carex williamsii</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Eriophorum angustifolium</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Eriophorum vaginatum</i>	0.375	0.625	0.15	0	0	0	0	0	0.15	0.15	0.15	0.375	0.375	0.375	0.03	0.375	0.15	0.375
<i>Juncus biglumis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Luzula confusa</i>	0	0	0	0	0	0	0	0	0	0	0.005	0	0.005	0.005	0.005	0	0	0
<i>Luzula wahlenbergii</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Hierochloë alpina</i>	0	0	0	0	0	0	0	0	0	0	0.005	0	0	0	0.005	0.03	0	0
<i>Hierochloë pauciflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. <i>Dupontia fisheri</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Poa arctica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Betula glandulosa</i>	0.03	0.15	0.375	0.625	0.625	0.625	0.375	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.03	0.15	0.15	0.005
<i>Salix arctica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Salix fuscescens</i>	0	0	0.15	0.03	0.03	0.03	0.03	0.15	0	0.005	0	0	0	0	0	0	0	0
<i>Salix pulchra</i>	0.03	0.15	0	0.03	0	0	0	0	0.15	0.15	0.03	0	0.03	0.03	0	0	0.03	0
<i>Salix reticulata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Dryas integrifolia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Rubus chamaemorus</i>	0.005	0.03	0.03	0.03	0.005	0	0	0.005	0.03	0.03	0.15	0.03	0.005	0.03	0.005	0	0.005	0.03
<i>Cassiope tetragona</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Empetrum nigrum</i>	0.03	0.15	0.03	0.375	0.03	0	0.03	0.03	0	0	0	0	0	0	0	0	0	0
<i>Ledum decumbens</i>	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.03	0.375	0.15	0.15	0.15	0.15	0.15	0.375	0.15	0.15	0.03
<i>Pyrola grandiflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Vaccinium uliginosum</i>	0	0	0	0	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Vaccinium vitis-idaea</i>	0.375	0.15	0.03	0.15	0.15	0.375	0.15	0.03	0.15	0.15	0.15	0.03	0.15	0.15	0.15	0.03	0.03	0
<i>Polygonum bistorta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03	0	0
<i>Polygonum viviparum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis</i> sp.	0	0	0	0	0	0	0	0	0	0	0.005	0	0	0	0	0	0	0
<i>Pedicularis capitata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis lapponica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.005
<i>Pedicularis oederi</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.005	0	0
<i>Pedicularis sudetica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis lanata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Saxifraga nelsoniana</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Stellaria longipes</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Tofieldia</i> sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Supplementary Table S2. Continued.

	Ptarmigan Polygon transect I																						
	PPI02	PPI03	PPI04	PPI05	PPI06	PPI07	PPI08	PPI09	PPI10	PPI11	PPI12	PPI13	PPI14	PPI15	PPI16	PPI17	PPI18	PPI19	PPI20	PPI21	PPI22	PPI23	PPI24
Cyperaceae sum	0.881	0.6905	0.121	0.96	0.74	0.7	0	0.425	0.35	0.42	0.67	0.335	0.18	0.225	0.3	0.405	0.935	1.01	0.59	0.62	0.35	0.29	0.18
Cyperaceae undifferentiated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Carex aquatilis</i>	0.09	0.16	0.12	0.575	0.74	0.625	0	0.15	0.225	0.28	0.65	0.16	0.06	0.125	0.105	0.31	0.75	0.25	0.275	0	0	0.095	0.05
<i>Carex chordorrhiza</i>	0.79	0.0055	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0	0
<i>Carex rariflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03	0.05	0	0
<i>Carex williamsii</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Eriophorum angustifolium</i>	0.001	0	0	0	0	0	0	0.275	0.125	0.14	0.02	0.08	0.12	0.1	0.17	0.095	0.125	0.65	0.15	0.5	0.3	0.185	0.13
<i>Eriophorum vaginatum</i>	0	0.525	0	0.385	0	0.075	0	0	0	0	0	0.095	0	0	0.025	0	0.06	0.06	0.165	0.09	0	0.01	0
<i>Juncus biglumis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Luzula confusa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Luzula wahlenbergii</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Hierochloë alpina</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Hierochloë pauciflora</i>	0	0	0	0	0	0	0	0	0	0	0	0.001	0	0	0	0	0	0	0	0	0	0	0
cf. <i>Dupontia fisheri</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0
<i>Poa arctica</i>	0	0	0	0	0	0	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Betula glandulosa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Salix arctica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.285	0.05	0
<i>Salix fuscescens</i>	0	0	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.045	0	0	0
<i>Salix pulchra</i>	0.105	0.09	0.11	0	0	0.01	0.21	0.055	0.08	0.055	0.12	0.305	0.03	0.71	0.26	0.145	0.005	0.002	0.02	0.02	0	0.05	0.105
<i>Salix reticulata</i>	0	0	0.0275	0	0	0.001	0.05	0.02	0.05	0.065	0.0175	0	0	0	0	0	0	0	0	0	0.015	0.07	0.075
<i>Dryas integrifolia</i>	0	0	0.145	0	0	0.005	0.025	0.025	0.08	0.05	0.01	0	0	0	0	0	0	0	0	0	0.275	0.0125	0.03
<i>Rubus chamaemorus</i>	0	0	0	0	0	0.045	0.085	0.04	0.03	0.0325	0.04	0	0	0	0	0	0	0	0	0	0	0.11	0.12
<i>Cassiope tetragona</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Empetrum nigrum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Ledum decumbens</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pyrola grandiflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Vaccinium uliginosum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Vaccinium vitis-idaea</i>	0	0	0	0	0	0	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Polygonum bistorta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Polygonum viviparum</i>	0	0	0	0	0	0	0	0.001	0	0	0	0	0	0.0015	0	0.001	0	0	0	0	0	0	0.001
<i>Pedicularis</i> sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis capitata</i>	0	0	0	0	0	0	0	0	0.001	0	0	0	0	0.0005	0	0	0	0	0	0	0	0	0
<i>Pedicularis lapponica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis oederi</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis sudetica</i>	0.001	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.005	0.003	0	0	0
<i>Pedicularis lanata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Saxifraga nelsoniana</i>	0	0	0.001	0	0	0	0	0	0	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Stellaria longipes</i>	0	0	0	0	0	0	0	0	0	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Tofieldia</i> sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Supplementary Table S2. Continued.

	Ptarmigan Polygon transect 17																	
	A17	B17	C17	D17	E17	F17	G17	H17	I17	J17	K17	L17	M17	N17	O17	P17	Q17	R17
Cyperaceae sum	0.38	0.4	0.55	0.38	0.62	0.28	0.63	0.5	0.405	0.7	0.74	0.46	0.83	0.6	0.22	0.55	0.9	0.91
Cyperaceae undifferentiated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Carex aquatilis</i>	0.2	0.25	0.35	0.3	0.5	0.2	0.5	0.2	0.31	0.6	0.6	0.4	0.7	0.45	0.1	0.4	0.6	0.7
<i>Carex chordorrhiza</i>	0	0	0	0	0	0	0	0	0	0	0.02	0	0	0	0	0	0	0
<i>Carex rariflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Carex williamsii</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Eriophorum angustifolium</i>	0.15	0.13	0.2	0.08	0.07	0	0.1	0.2	0.095	0.05	0.08	0.03	0.08	0.15	0.12	0.15	0.3	0.2
<i>Eriophorum vaginatum</i>	0.03	0.02	0	0	0.05	0.08	0.03	0.1	0	0.05	0.04	0.03	0.05	0	0	0	0	0.01
<i>Juncus biglumis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Luzula confusa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Luzula wahlenbergii</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Hierochloë alpina</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Hierochloë pauciflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. <i>Dupontia fisheri</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Poa arctica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.005	0	0	0
<i>Betula glandulosa</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Salix arctica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Salix fuscescens</i>	0.05	0	0	0	0.13	0.05	0	0	0	0	0	0	0	0	0	0	0	0
<i>Salix pulchra</i>	0.13	0.22	0.16	0.25	0.05	0.35	0.25	0.14	0.145	0.18	0.22	0.35	0.17	0.2	0.08	0.2	0.09	0.08
<i>Salix reticulata</i>	0	0.03	0.005	0.1	0.03	0.02	0	0	0	0	0	0	0	0.05	0.3	0.12	0	0
<i>Dryas integrifolia</i>	0.001	0.003	0.0005	0.08	0.07	0.01	0	0	0	0	0	0.05	0.01	0.15	0.08	0.04	0	0
<i>Rubus chamaemorus</i>	0	0	0	0	0	0	0	0	0	0	0	0.02	0	0.03	0.25	0.15	0	0
<i>Cassiope tetragona</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Empetrum nigrum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Ledum decumbens</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pyrola grandiflora</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Vaccinium uliginosum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Vaccinium vitis-idaea</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0.06	0	0.03	0	0
<i>Polygonum bistorta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Polygonum viviparum</i>	0.002	0.001	0.001	0.001	0.002	0	0	0.001	0.001	0	0	0.01	0.005	0	0	0	0	0
<i>Pedicularis</i> sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis capitata</i>	0.002	0	0	0.001	0	0.01	0	0	0	0	0	0	0	0	0.05	0.04	0	0
<i>Pedicularis lapponica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis oederi</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis sudetica</i>	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pedicularis lanata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Saxifraga nelsoniana</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0	0
<i>Stellaria longipes</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Tofieldia</i> sp.	0	0	0	0	0.005	0	0	0	0	0	0	0	0	0	0	0	0	0

**Supplementary Table S3.** Results of univariate tree analysis. Relation between shrub species cover and surface height on the left and between shrub species cover and active layer depths on the right. The numbers indicate relative surface height (cm) below (or above) which the given species is found.

	Surface height (cm below reference)					Active layer depth (cm)				
	1st split					1st split				
	Herschel Polygon	Ptarmigan Polygon	Komakuk Polygon	Roland Polygon	All polygons	Herschel Polygon	Ptarmigan Polygon	Komakuk Polygon	Roland Polygon	All polygons
<i>Betula glandulosa</i>	-	-	≥ -9.5	≥ -10.5	≥ -9.5	-	-	≥ 28.5	≥ 24.5	≥ 28.5
<i>Salix fuscescens</i>	< -14	< -25	< -17	-	< -14	≥ 30.5	< 26.5	≥ 29.5	-	≥ 33.5
<i>Salix pulchra</i>	≥ -6.5	≥ -23.5	< -9.5	≥ -5	< -17.5	< 25.5	< 21.5	< 28.5	≥ 26.5	< 21.25
<i>Salix reticulata</i>	≥ -12.5	≥ -17	-	-	≥ -16.5	< 32.5	< 22.5	-	-	< 32.5
<i>Dryas integrifolia</i>	≥ -16	≥ -17	-	-	≥ -16.5	≥ 34.5	≥ 30.5	-	-	< 31.5
<i>Rubus chamaemorus</i>	≥ -6.5	≥ -2.5	≥ -13	< -10.5	≥ -3.5	< 28	< 21.5	< 32	≥ 30.5	< 26.5
<i>Empetrum nigrum</i>	-	-	≥ -9.5	-	≥ -9.5	-	-	≥ 29.5	-	≥ 29.5
<i>Ledum decumbens</i>	≥ -12.5	-	≥ -17	≥ -2.5	≥ -11	≥ 30.5	-	< 28.5	< 24.5	≥ 21.75
<i>Vaccinium vitis-idaea</i>	≥ -11	≥ -2.5	≥ -4.5	≥ -3.5	≥ -11	< 30.5	≥ 30.5	< 29.5	< 24.5	≥ 28.5
All shrub species	≥ -14	≥ -19.5	≥ -13	≥ -3.5	≥ -11	< 28	< 21.5	< 30.5	< 24.5	≥ 28.5

**Supplementary Table S4.** Measured environmental parameters for all studied ice-wedge polygons.

		Relative surface height (cm below reference)	Relative height of permafrost table (cm below reference)	Soil temperature (°C)	Active layer depth (cm)	pH	Electrical conductivity (µS/cm)	TOC (wt.%)	TN (wt %)	TOC/TN
Herschel Polygon	HP00	NA	NA	5	25	4.49	210.5	42.97	0.70	61.16
	HP01	-10	-40	5	30	4.27	NA	41.14	0.52	78.65
	HP02	-12	-44	8	32	5.64	168.6	26.93	1.82	14.77
	HP03	-15	-51	9	36	5.58	279.8	37.80	2.12	17.81
	HP04	-19	-54	8	35	5.21	193.6	28.63	1.82	15.77
	HP05	-18	-52	8	34	5.57	316	38.15	1.61	23.68
	HP06	-20	-53	7	33	5.27	332	30.58	1.80	16.97
	HP07	-25	-58	4	33	6.19	271.5	40.33	1.40	28.72
	HP08	-17	-52	7	35	5.64	623	34.67	1.83	18.94
	HP09	-25	-60	8	35	5.07	352	31.10	2.00	15.57
	HP10	-25	-56	6	31	5.65	470	36.37	1.90	19.15
	HP11	-20	-53	6	33	5.15	443	28.86	1.74	16.61
	HP12	-13	-37.5	4	24.5	4.63	280.1	40.80	1.47	27.75
	HP13	0	-26	9	26	4.16	328	41.53	0.70	59.62
	HP14	-3	-28	3	25	4.08	299	43.58	0.62	70.36
	HP15	NA	NA	4	21.5	4.62	231.6	41.98	0.67	62.31
Komakuk Polygon	KP00	-7	-42	6.5	35	4.65	75.1	38.29	1.89	20.28
	KP01	0	-31	6.7	31	4.56	164.6	42.41	1.41	30.14
	KP02	-6	-36	5.1	30	4.18	190.1	44.01	1.27	34.63
	KP03	-9	-39	4.8	30	4.4	111.1	39.77	2.17	18.36
	KP04	-5	-38	5.4	33	4.25	173.8	41.39	2.15	19.29
	KP05	-4	-33	5.1	29	3.88	212.7	39.77	1.74	22.80
	KP06	-16	-47	4.7	31	4.1	174	40.82	1.76	23.14
	KP07	-18	-51	4.1	33	4.8	135.1	41.63	1.87	22.31
	KP08	-10	-36	4	26	4.24	171.7	42.96	1.29	33.25
	KP09	-29	-57	5.1	28	5.73	106.1	41.29	2.02	20.43
Roland Polygon	RP01	-15	-48	6	33	3.63	464	43.40	1.04	41.89
	RP02	-6	-39	NA	33	3.71	255.1	44.20	1.25	35.44
	RP03	-2	-35	4.8	33	3.96	221.4	41.50	1.23	33.83
	RP04	-3	-25	3.6	22	NA	NA	42.39	0.67	62.86
	RP05	0	-24	6.2	24	4.55	90.3	35.92	1.59	22.63
	RP06	-6	-31	3.3	25	4.04	412	42.76	1.58	26.99
	RP07	-4	-32	4.5	28	3.71	240.1	44.63	1.06	42.10
	RP08	-20	-53	3.9	33	4.2	95.6	39.18	0.76	51.79
Ptarmigan Polygon transect east-west	PPI02	-27	-51	NA	24	6.281	534	35.93	2.12	16.96
	PPI03	-21	-44	5.3	23	6.63	462	33.35	2.03	16.41
	PPI04	-12	-36	4.3	24	6.604	212	33.35	2.09	15.94
	PPI05	-27	-52	4.7	25	7.08	461	38.91	2.21	17.59



**Supplementary Table S4.** Continued.

	Relative surface height (cm below reference)	Relative height of permafrost table (cm below reference)	Soil temperature (°C)	Active layer depth (cm)	pH	Electrical conductivity (µS/cm)	TOC (wt.%)	TN (wt %)	TOC/TN
PPI06	-33	-61	6.1	28	6.425	681	43.29	1.68	25.80
PPI07	-33	-61	9.1	28	6.555	204	41.47	1.87	22.22
PPI08	-1	-32	6.5	31	4.068	428	41.98	0.94	44.70
PPI09	-4	-31	3.1	27	6.489	423	32.35	1.98	16.32
PPI10	-16	-44	4.2	28	6.515	320	34.19	2.07	16.51
PPI11	-12	-34	4.4	22	7.232	518	30.19	2.11	14.33
PPI12	-13	-32	3.8	19	5.727	419	40.81	2.30	17.78
PPI13	-23	-47	3.6	24	5.768	335	38.92	2.42	16.10
PPI14	-23	-50	5.6	27	5.455	533	31.62	2.08	15.21
PPI15	-18	-39	3.3	21	6.535	379	35.50	1.81	19.58
PPI16	-18	-42	5.2	24	5.129	644	36.26	2.04	17.82
PPI17	-27	-54	4.4	27	5.993	198.4	37.25	2.15	17.31
PPI18	-27	-54	5.1	27	NA	NA	38.83	2.27	17.11
PPI19	-28	-58	5.4	30	6.802	542	33.98	2.18	15.56
PPI20	-24	-52	4.3	28	6.463	366	37.09	2.34	15.85
PPI21	-26	-52	8.8	26	6.901	563	35.18	2.30	15.26
PPI22	-8	-39	4.3	31	7.329	292	35.23	2.33	15.13
PPI23	-23	-44	4.1	21	7.222	479	36.54	2.22	16.44
PPI24	0	-25	3.4	25	4.981	323	43.06	1.00	43.22
Ptarmigan Polygon transect south– north	A17	-30	-45	4.3	15	NA	NA	NA	NA
	B17	-18	-46	4.5	28	NA	NA	NA	NA
	C17	-9	-37	4.6	28	NA	NA	NA	NA
	D17	-15	-38	4	23	NA	NA	NA	NA
	E17	-10	-40	5.1	30	NA	NA	NA	NA
	F17	-22	-44	5.6	22	NA	NA	NA	NA
	G17	-30	-53	4.3	23	NA	NA	NA	NA
	H17	-19	-44	4.2	25	NA	NA	NA	NA
	I17	-26	-53	5.1	27	NA	NA	NA	NA
	J17	-23	-50	5.1	27	NA	NA	NA	NA
	K17	-21	-48	3.4	27	NA	NA	NA	NA
	L17	-21	-49	2.9	28	NA	NA	NA	NA
	M17	-19	-43	4.6	24	NA	NA	NA	NA
	N17	-20	-43	2.3	23	NA	NA	NA	NA
	O17	0	-25	2.4	25	NA	NA	NA	NA
	P17	-17	-41	NA	24	NA	NA	NA	NA
	Q17	-24	-50	NA	26	NA	NA	NA	NA
	R17	-26	-55	NA	29	NA	NA	NA	NA