

Supporting Information

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Table S1. Radiocarbon dates (^{14}C) on exhumed vegetation from the Teardrop Glacier, Sverdrup Pass (SV), Ellesmere Island, Nunavut

Taxon/sample no.	Lab no. (UCIAMS)	^{14}C date \pm error (y BP)	Calibrated age 2σ range [median] (cal y BP)	Year (AD)	Collection date
<i>Aulacomnium turgidum</i> CLF-SV-C-2a-44.970	45000	330 \pm 20	346–463 [404.5]	1602.5	2007
<i>Bartramia ithyphylla</i> CLF-SV-E-13008	45001	360 \pm 20	426–495 [460.5]	1536.5	2007
<i>Salix arctica</i> CLF-SV-W-13149	45002	570 \pm 20	592–637 [614.5]	1382.5	2007

Taxa analyzed and field sample numbers are listed. W. M. Keck Carbon Cycle Accelerator Mass Spectrometry (AMS) Laboratory sample numbers given as University of California at Irvine AMS (UCIAMS). Both AMS radiocarbon dates (y BP) and calibrated ages (cal y BP) obtained on the subglacial specimens are given. Range of calibrated ages with a 2σ error estimate is presented with the median value in brackets []. Year AD means calendar years AD. Collection date means year the field sample was collected.

Table S2. Cultures of subglacial specimens indicating regenerated taxa

Field specimen	Subglacial taxa	Culture D/J	Cultured taxa	Distance (cm)	Start date	End date					
SBG 2	<i>Aulacomnium turgidum</i> <i>Hylocomium splendens</i> <i>Sanionia uncinata</i> <i>Pohlia nutans</i> <i>Pohlia cruda</i> <i>Ptychostomum</i> sp. 2	D4	<i>Aulacomnium turgidum</i> <i>Ptychostomum</i> sp.-A <i>Ptychostomum</i> sp.-B <i>Distichium capillaceum</i> <i>Pohlia cf filum</i>	180	15-Jul-11	26-Jul-12					
		D5	<i>Aulacomnium turgidum</i> <i>Distichium capillaceum</i>								
		D20	<i>Aulacomnium turgidum</i> <i>Ptychostomum</i> sp.- A				20-Aug-11				
		D23	Black algae				15-Sep-11				
		D24	<i>Pohlia cruda</i> <i>Distichium capillaceum</i>								
		J8*	<i>Ptychostomum</i> sp.- A <i>Distichium capillaceum</i>				15-Jul-11				
		J9*	<i>Aulacomnium turgidum</i>								
		SBG 8	<i>Distichium capillaceum</i> <i>Myurella julacea</i> <i>Orthothecium chryseum</i> <i>Encalypta rhaptocarpa</i> <i>Timmia austriaca</i> <i>Mnium marginatum</i> <i>Didymodon rigidulus</i> var. <i>Icmadophila</i> <i>Ptychostomum</i> sp. 2				D27	Green algae	0	16-Sep-11	26-Jul-12
							D28	Green algae			
							D29	<i>Tortula leucostoma</i>			
D30	<i>Distichium capillaceum</i>										
SBG 27	<i>Aulacomnium turgidum</i> <i>Pohlia nutans</i> <i>Polytrichastrum alpinum</i> <i>Philonotis fontana</i> var. <i>pumila</i>			D6	<i>Pohlia cruda</i> <i>Ptychostomum</i> sp.- A <i>Aulacomnium turgidum</i> <i>Ptychostomum</i> sp.- C <i>Distichium capillaceum</i>	570	31-Jul-11	26-Jul-12			
				D7	<i>Aulacomnium turgidum</i> <i>Ptychostomum</i> sp.- C <i>Distichium capillaceum</i>						
				D11	Nothing						
SBG 36	<i>Niphotrichum panschi</i> <i>Pohlia cruda</i>	J2*	Moss rhizoids	420	30-Dec-11	03-Mar-12					
		J3*	Moss rhizoids			07-Feb-12					
		D46*	<i>Pohlia cruda</i> <i>Pogonatum cf urnigerum</i> <i>Psilopilum cavifolium</i>			26-Jul-12					
		D47*	<i>Pohlia cruda</i> <i>Psilopilum cavifolium</i>								
SBG 37	<i>Nipotrichum panschii</i> <i>Polytrichastrum alpinum</i> <i>Psilopilum cavifolium</i> <i>Hypnum revolutum</i> <i>Pohlia cruda</i> <i>Pohlia nutans</i> <i>Aulacomnium turgidum</i> <i>Ptychostomum rutilans</i> <i>Syntrichia ruralis</i>	D51*	<i>Encalypta cf rhaptocarpa</i>	420	12-Dec-11	02-May-12					
		D40*	<i>Ptychostomum</i> sp. A <i>Pohlia cruda</i> <i>Leptobryum pyriforme</i>								
		D41*	<i>Ptychostomum</i> sp. A <i>Pohlia cruda</i> <i>Leptobryum pyriforme</i> <i>Psilopilum cavifolium</i>								
		D42*	<i>Ptychostomum</i> sp. A <i>Pohlia cruda</i> <i>Leptobryum pyriforme</i> <i>Psilopilum cavifolium</i> <i>Distichium capillaceum</i> <i>Syntrichia ruralis</i>								
		D43*	<i>Ptychostomum</i> sp. A <i>Pohlia cruda</i> <i>Psilopilum cavifolium</i> <i>Syntrichia ruralis</i>								
		J7*	Fungal hyphae				07-Feb-12				
		SBG 44	<i>Psilopilum cavifolium</i> <i>Aulacomnium turgidum</i> <i>Pogonatum cf urnigerum</i> <i>Ditrichum flexicaule</i> <i>Bartramia ithyphylla</i> <i>Polytrichastrum alpinum</i>				D10	<i>Aulacomnium turgidum</i>	< 200	06-Jul-11	26-Jul-12
							D12	<i>Aulacomnium turgidum</i>			
							D13	Green algae			02-May-12
							Jar 1*	Fungal hyphae			07-Feb-12

Table S2. Cont.

Field specimen	Subglacial taxa	Culture D/J	Cultured taxa	Distance (cm)	Start date	End date
<i>SBG CLF 13145</i>	<i>Encalypta procera</i>	D65*	Nothing	152	09-Mar-12	26-Jul-12
		D67*	Nothing			
		D68*	Nothing			
		D69*	<i>Encalypta procera</i>			
Controls (17)	Unautoclaved potting soil (seven dishes)	N/A	<i>Leptobryum pyriforme</i> (4/7 dishes)	NA	14-Jul-11 and 07-Jan-12	26-Jul-12
	autoclaved soil (three dishes)		Black and green algae fungal hyphae (2/3 dishes)			
	Autoclaved 1/2 sand and 1/2 potting soil (six dishes)		Black and green algae fungal hyphae (2/6 dishes)			
	White's nutrient medium (one sealed jar)		Nothing			

Culture: dish (D) or jar (J) with sample number given; cultured taxa: taxa determined from the culture with those regenerated from parent material in the original subglacial specimen indicated in boldface; distance: distance (cm) from the glacier margin at time of collection; culture start and end dates are given; field specimen: subglacial specimen; subglacial taxa: taxa determined in the original sample.

*Substrate autoclaved.

Table S3. List of subglacial plant species from Sverdrup Pass, Ellesmere Island, Nunavut collected within 10 m of the glacial margin during field seasons 2007 and 2009

Plant type (n)	Taxon
Bryophytes (60)	
Mosses (52)	<p><i>Aulacomnium turgidum</i> (Wahlenberg) Schwägrichen <i>Bartramia ithyphylla</i> Bridel <i>Bryoerythrophyllum recurvirostrum</i> (Hedwig) P.C. Chen <i>Campylium arcticum</i> (R.S. Williams) Brotherus <i>Catocopium nigratum</i> (Hedwig) Bridel <i>Cinclidium arcticum</i> W.P. Schimper <i>Conostomum tetragonum</i> (Hedwig) Lindberg <i>Cratoneuron arcticum</i> (Steere) Brassard <i>Cyrtomnium hymenophylloides</i> (Hübener) T. Koponen <i>Dicranum elongatum</i> Schleicher ex Schwägrichen <i>Didymodon rigidulus</i> var. <i>icmadophila</i> (W.P. Schimper ex C. Müller) R.H. Zander <i>Distichium capillaceum</i> (Hedwig) Bruch & W.P. Schimper <i>Distichium hagenii</i> Ryan ex Philibert <i>Ditrichum flexicaule</i> (Schwägrichen) Hampe <i>Encalypta alpina</i> Smith <i>Encalypta procera</i> Bruch <i>Encalypta raptocarpa</i> Schwägrichen <i>Hypohypnum polare</i> (Lindberg) Loeske <i>Hylocomium splendens</i> (Hedwig) W.P. Schimper <i>Hymenostylium recurvirostre</i> (Hedwig) Dixon <i>Hypnum revolutum</i> (Mitten) Lindberg <i>Hypnum vaucheri</i> Lesquereux <i>Isopterygiopsis pulchella</i> (Hedwig) Iwatsuki <i>Mnium marginatum</i> (Dickson ex Withering) P. Beauvois <i>Mnium thomsonii</i> W.P. Schimper <i>Myurella julacea</i> (Schwägrichen) W.P. Schimper <i>Myurella tenerrima</i> (Bridel) Lindberg <i>Niphotrichum canescens</i> subsp. <i>latifolium</i> (C.E.O. Jensen) Frisvoll <i>Niphotrichum panschii</i> (C. Müller) Bednarek-Ochyra <i>Orthothecium chryseum</i> (Schwägrichen) W.P. Schimper <i>Orthothecium strictum</i> Lorentz <i>Orthotrichum speciosum</i> Nees <i>Platydictya jungermannioides</i> (Bridel) H. Crum <i>Pogonatum dentatum</i> (Menzies ex Bridel) Bridel <i>Pogonatum cf. urnigerum</i> (Hedwig) P. Beauvois <i>Pohlia cruda</i> (Hedwig) Lindberg <i>Pohlia cf. filum</i> (W.P. Schimper) Mårtensson <i>Pohlia nutans</i> (Hedwig) Lindberg <i>Polytrichastrum alpinum</i> (Hedwig) G.L. Smith <i>Polytrichum juniperium</i> Hedwig <i>Psilopilum cavifolium</i> (Wilson) I. Hagen <i>Ptychostomum rutilans</i> (Bridel) J.R. Spence <i>Ptychostomum</i> spp. <i>Sanionia uncinata</i> (Hedwig) Loeske <i>Schistidium papillosum</i> Culmann <i>Schistidium rivulare</i> (Bridel) Podpěra <i>Syntrichia ruralis</i> (Hedwig) Weber & D. Mohr <i>Timmia austriaca</i> Hedwig <i>Tomentypnum nitens</i> (Hedwig) Loeske <i>Tortella tortuosa</i> var. <i>arctica</i> (Arnell) Brotherus <i>Warnstorfia sarmentosa</i> (Wahlenberg) Hedenäs <i>Orthothecium strictum</i> Lorentz <i>Orthotrichum speciosum</i> Nees</p>
Liverworts (8)	<p><i>Arnellia fennica</i> (Gottsche & Rabenhorst) Lindberg <i>Blepharostoma trichophyllum</i> (L.) Dumort <i>Cephaloziella arctica</i> Bryhn & Douin <i>Lophozia cf. excisa</i> (Dickson) Dumort <i>Lophozia cf. kunzeana</i> (Huebener) A. Evans <i>Lophozia</i> sp. <i>Tritomaria quinquedentata</i> (Hudson) H. Buch <i>Tritomaria scitula</i> (Taylor) Jörgensen</p>

Table S3. Cont.

Plant type (n)	Taxon
Vascular plants (6)	<i>Cassiope tetragona</i> (L.) D. Don
	<i>Dryas integrifolia</i> Vahl
	<i>Luzula cf confusa</i> Lindeberg
	<i>Luzula nivalis</i> (Laestadius) Sprengel
	<i>Salix arctica</i> R. Brown ter ex Richardson
Lichens (2)	<i>Peligeria aphthosa</i> (L.) Willdenow
	<i>Stereocaulon</i> sp.