Supplementary Materials

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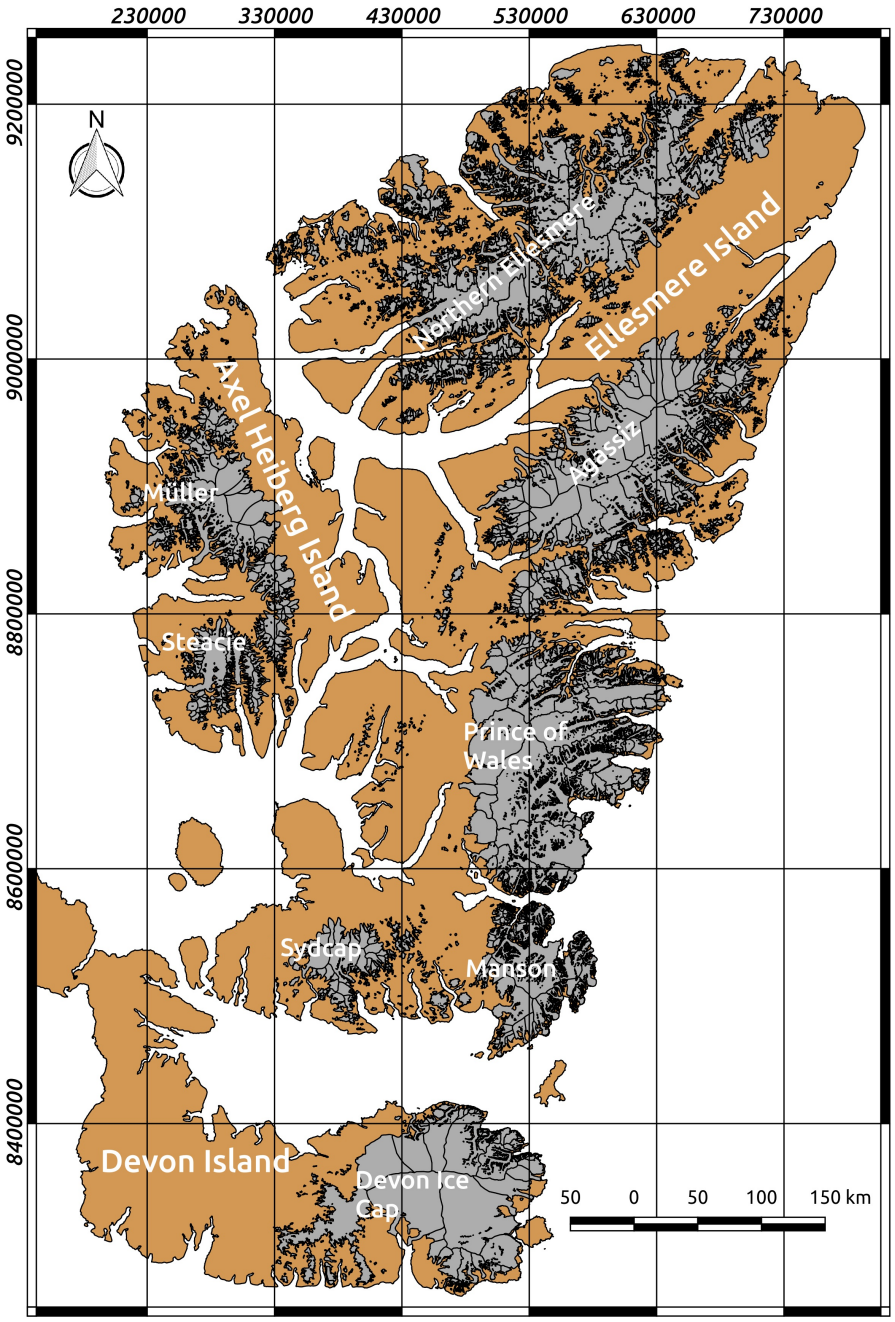

Fig. S1: Ellesmere, Axel Heiberg and Devon islands, Nunavut, Canadian Arctic (Wessel and Smith, 1996). The glacier outlines are from the Randolph Glacier Inventory (RGI) version 5.0 (Pfeffer and others, 2014).

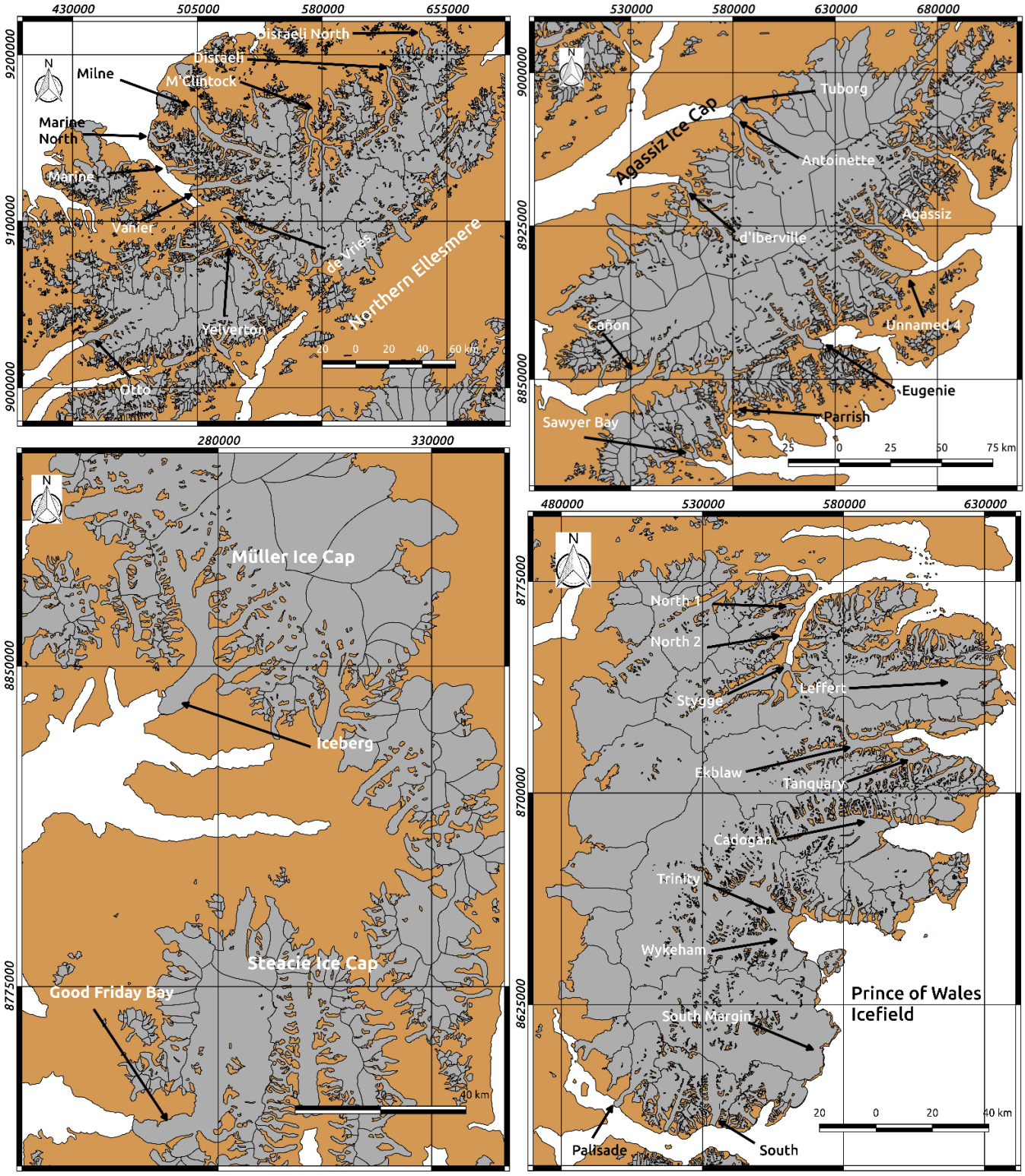

Fig. S2: Agassiz Ice Cap and Northern Ellesmere and Prince of Wales Icefields (Ellesmere Island), and Müller and Steacie Ice Caps (Axel Heiberg Island), Nunavut, Canadian Arctic.

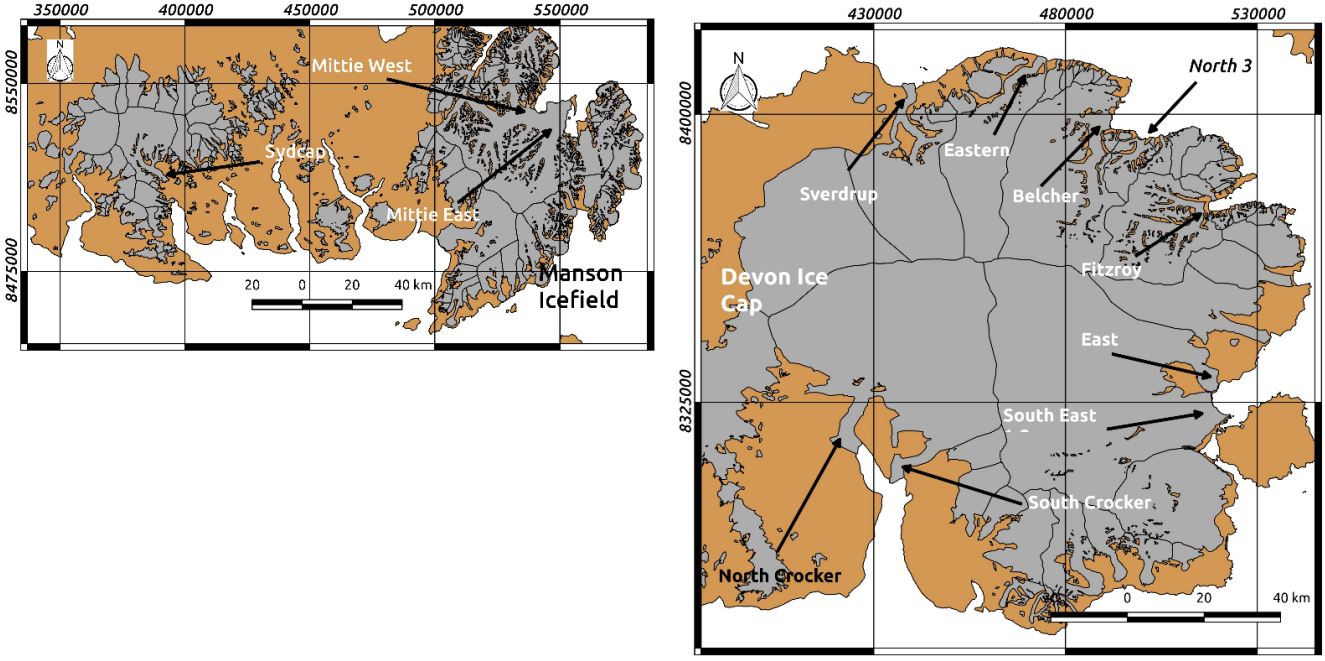

Fig. S3: Sydcap Ice Cap and Manson Icefield (Ellesmere Island) and Devon Ice Cap (Devon Island), Nunavut, Canadian Arctic.

Table S1: Characteristics of the main glaciers of Ellesmere, Axel Heiberg and Devon islands, Nunavut, Canadian Arctic.

Glacier	Latitude	Longitude	Area (m^2)	Profile length (m)	Mean thickness (m)	Mean surface velocity (m a^{-1})
			Prince of Wales Icefield			
North 1	78.94	-78.05	714000	2594	275	25
North 2	78.85	-78.24	900500	3216	280	36
Stygge	78.77	-78.24	330000	3445	96	28
Leffert	78.69	-74.92	340000	3371	101	59
Ekblaw	78.51	-76.71	1056000	4047	261	134
Tanquary	78.46	-76.08	850000	3316	256	21
Cadogan	78.23	-76.94	890000	4995	178	53
Trinity	77.97	-78.57	1638000	7150	229	771
Wykeham	77.89	-78.61	1104500	5909	187	486
South Margin	77.71	-77.88	7544400	58178	130	11
South	77.33	-79.59	350000	2147	163	107
Palisade	77.39	-80.99	180000	2153	84	42
			Devon Ice Cap			
Sverdrup	75.72	-83.18	587000	2506	234	25
Eastern	75.79	-82.00	338000	2307	147	94
Belcher	75.67	-81.39	730000	4701	155	284
Fitzroy	75.45	-80.46	535000	3256	164	189
East	75.07	-80.41	550000	5070	108	36
South East 1-2	74.98	-80.44	978000	10420	94	41
South Crocker	74.85	-83.20	626000	3369	186	75
North Crocker	74.91	-83.62	700000	4326	162	12
			Northern Ellesmere Icefield			
Disraeli North	82.84	-70.79	504000	2779	181	14
Disraeli	82.67	-72.50	314000	2020	155	38
M'Clintock	82.43	-76.15	108000	1920	56	33
Milne	82.44	-80.22	1230000	3823	322	44
Vanier	82.14	-80.75	290000	2440	119	33
DeVries	82.01	-79.60	565000	2890	196	2
Yelverton	81.84	-79.43	658000	4393	150	141
Otto	81.30	-84.70	445000	4200	106	2
Marine	82.24	-81.74	385000	2503	154	7
Marine North	82.41	-82.56	703000	4610	152	11
			Agassiz Ice Cap			
Tuborg	80.89	-76.14	780000	3367	232	49
Antoinette	80.81	-76.30	550000	2400	229	42
d'Iberville	80.56	-77.92	426000	3650	117	14
Cañon	79.68	-79.64	656000	4290	153	144
Sawyer Bay	79.36	-78.05	462000	3200	144	7
Parrish	79.57	-77.18	347000	2457	141	7
Eugenie	79.82	-74.93	402000	4747	85	61
Unnamed 4	80.07	-72.39	505000	3200	158	24
			Manson Icefield			
Mittie West Arm	76.90	-79.53	1747000	6382	274	4
Mittie East Arm	76.87	-79.12	1990000	10247	194	4
			Müller and Steacie Ice Caps			
Iceberg	79.43	-92.37	330000	4628	71	32
Good Friday Bay	78.55	-91.76	566000	5378	105	22
			Sydkap Ice Cap			
Sydkap	76.62	-85.11	414000	2520	164	82

Table S2: Sentinel-1 images used in this study.

Platform	Acquisition date	Polarisation	Orbit number	Pass direction	Slice number
Sentinel-1A	2016-02-09	HH	9875	Ascending	3-6
Sentinel-1A	2016-02-10	HH	9890	Ascending	4-9
Sentinel-1A	2016-02-11	HH	9905	Ascending	5-7
Sentinel-1A	2016-02-14	HH	9935	Ascending	3-4
Sentinel-1A	2016-02-16	HH	9972	Descending	1-4
Sentinel-1A	2016-02-17	HH	9986	Descending	1-5
Sentinel-1A	2016-02-20	HH	10030	Descending	1-3
Sentinel-1A	2016-02-22	HH	10065	Ascending	4-9
Sentinel-1A	2016-02-23	HH	10080	Ascending	5-7
Sentinel-1A	2016-02-25	HH	10109	Ascending	3-4
Sentinel-1A	2016-02-28	HH	10147	Descending	1-4
Sentinel-1A	2016-02-29	HH	10161	Descending	1-5
Sentinel-1A	2016-03-03	HH	10205	Descending	1-3
Sentinel-1A	2016-03-04	HH	10225	Ascending	3-6
Sentinel-1A	2016-03-05	HH	10240	Ascending	4-9
Sentinel-1A	2016-03-06	HH	10255	Ascending	5-7
Sentinel-1A	2016-03-08	HH	10284	Ascending	3-4
Sentinel-1A	2016-03-11	HH	10322	Descending	1-4
Sentinel-1A	2016-03-12	HH	10336	Descending	1-5
Sentinel-1A	2016-03-16	HH	10400	Ascending	3-6
Sentinel-1A	2016-03-17	HH	10415	Ascending	4-9
Sentinel-1A	2016-03-18	HH	10430	Ascending	5-7
Sentinel-1A	2016-03-23	HH	10497	Descending	1-4
Sentinel-1A	2016-03-24	HH	10511	Descending	1-5
Sentinel-1A	2016-03-27	HH	10555	Descending	1-3
Sentinel-1B	2017-01-28	HH	4054	Ascending	3-6
Sentinel-1B	2017-01-29	HH	4084	Ascending	5-7
Sentinel-1A	2017-01-29	HH	15047	Descending	1-4
Sentinel-1B	2017-01-30	HH	4069	Ascending	4-9
Sentinel-1A	2017-01-30	HH	15061	Descending	1-5
Sentinel-1B	2017-02-01	HH	4112	Ascending	7-9
Sentinel-1B	2017-02-01	HH	4113	Ascending	3-4
Sentinel-1A	2017-02-02	HH	15105	Descending	1-4
Sentinel-1A	2017-02-03	HH	15125	Ascending	3-6
Sentinel-1B	2017-02-04	HH	4151	Descending	1-4
Sentinel-1A	2017-02-04	HH	15140	Ascending	4-9
Sentinel-1B	2017-02-05	HH	4165	Descending	1-5
Sentinel-1A	2017-02-05	HH	15155	Ascending	5-7
Sentinel-1A	2017-02-07	HH	15183	Ascending	7-9
Sentinel-1A	2017-02-07	HH	15184	Ascending	3-4
Sentinel-1B	2017-02-08	HH	4209	Descending	1-4
Sentinel-1B	2017-02-09	HH	4229	Ascending	3-6
Sentinel-1A	2017-02-10	HH	15222	Descending	1-4
Sentinel-1B	2017-02-10	HH	4244	Ascending	4-9
Sentinel-1A	2017-02-11	HH	15236	Descending	5-9
Sentinel-1B	2017-02-11	HH	4259	Ascending	5-7
Sentinel-1B	2017-02-13	HH	4287	Ascending	7-9
Sentinel-1B	2017-02-13	HH	4288	Ascending	3-4
Sentinel-1A	2017-02-14	HH	15280	Descending	1-3
Sentinel-1A	2017-02-15	HH	15300	Ascending	3-6
Sentinel-1B	2017-02-16	HH	4326	Descending	1-4
Sentinel-1A	2017-02-16	HH	15315	Ascending	4-9
Sentinel-1B	2017-02-17	HH	4340	Descending	1-5
Sentinel-1A	2017-02-19	HH	15358	Ascending	7-9
Sentinel-1B	2017-02-20	HH	4384	Descending	1-4
Sentinel-1A	2017-02-22	HH	15397	Descending	1-3
Sentinel-1A	2017-02-23	HH	15411	Descending	1-5
Sentinel-1A	2017-02-26	HH	15455	Descending	1-4

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