Supplementary material to Greenland ice-sheet wide classification of glaciers based on two distinct seasonal ice velocity behaviors

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HYDROLOGIC ROUTING ALGORITHM

Model setup

We apply a simple hydrological routing algorithm to estimate the general subglacial water pathways beneath type-2 and type-3 glaciers. Our simulations of the general subglacial flow paths are due to: (1) decadal changes in ice surface elevations and (2) variations in flotation fractions. In these experiments, we assume the general water flow direction is driven by gradients in the hydraulic potential given by Shreve (1972):

$$\nabla\phi = \rho_w g \nabla z_b + f\rho_i g \nabla H \quad (1)$$

where ρ_w and ρ_i are the densities of water (1000 kg m^{-3}) and ice (917 kg m^{-3}) respectively, g is the gravitational acceleration (9.81 m s^{-2}), z_b is the bedrock elevation provided by BedMachine V3 (Morlighem and others, 2017) and H is the ice thickness obtained from the difference between ice surface elevation and bed elevation (H=z_s-z_b), and represents the flotation fraction. Formally, f is the ratio of water pressure to ice overburden pressure, where f<1 indicates water pressure is below the ice overburden, and f=1 represents water pressure is at the ice overburden pressure. We applied a $D\infty$ routing algorithm (Tarboton, 1997) to distribute water down the calculated hydrologic potential gradient surface.

For the first experiment, we compared the subglacial flow paths calculated separately using the 90 m Greenland Ice Mapping Project (GIMP) V1 surface elevation grid, covering a period of 2003-2009, and the updated 90 m GIMP V2 grid, covering the 2012-15 period. In this experiment, we assume a flotation fraction equals 1, in order to isolate and examine the changes in subglacial flow paths due to the variations in ice thickness between 2003-2009 to 2012-2015 and produce two respective scenarios of subglacial pathways. We manually compare them and create a binary database for our classified type-2 and type-3 glaciers that show either (1) rerouting of water pathways to or from neighboring catchments or (0) no rerouting (*Supplementary Figure 8*). *Supplementary Figure 7* shows the routing results for experiment 1.

For the second experiment, we vary the flotation fraction from 0.8 to 1.1 to further examine the impact of the uncertainty in the variations of subglacial water pressure on drainage flow paths. In this experiment, we use the GIMP V1 surface elevation and the BedMachine V3 for the bed elevation in Equation 1. The changes in flotation fraction is applied uniformly across Greenland, in order to examine the maximum impact of changes in subglacial water pressures could potentially have on the general pattern of water flow paths. We create a similar binary database by comparing pathways in different flotation scenarios.

Model results

The potential subglacial flow path changes for classified glaciers estimated from the hydrologic routing model are summarized in *Supplementary Table 1*. The following percentage values only include glaciers with routing data available. For the differences in hydrological routing estimated from the decadal surface elevation changes with flotation condition (f=1), we find that most type-2 (65-74%) glaciers tend to be more prone to subglacial water rerouting, while ∼40% of type-3 glaciers likely experience rerouting. The remaining 60% of type-3 glaciers show no signs of rerouting and are more likely to have persistent subglacial drainage pathways that are less sensitive to surface elevation changes. However, a large number of type-3 glaciers (70%) also showed rerouting if we included BedMachine errors in our modeling. Only 40% of type-2 glaciers showed rerouting when the flotation fraction varies from 0.8 to 1.0, while 70% of type-2 glaciers

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Table 1. Subglacial flow path changes (switch or rerouting denoted by S and no switch or no rerouting denoted by NS) of type-2 and type-3 classified glaciers with changes in topography and water pressure conditions. The first two experiments include topographic changes from GIMP V1 (2003-09) and V2 (2012-15) DEMs with or without errors in bedrock topography with flotation fraction equals to 1. Two other experiments check rerouting in case of flotation fraction varies from 0.8 to 1.0 and from 1.0 to 1.1.

		Type-2 (39)	Type-3 (61)
GIMP V1 vs V2	NS	11	40
	S	21	26
	NA	10	12
GIMP V1 vs V2 including error	NS	8	19
	S	23	43
	NA	10	16
f (0.8 vs 1.0)	NS	22	44
	S	15	23
	NA	5	11
f (1.0 vs 1.1)	NS	8	25
	S	19	27
	NA	15	26

are likely to reroute water when the condition changes from flotation (f=1.0) to overpressure scenario (f=1.1). For f=0.8 to 1, around 65% of type-3 glaciers are not likely to exchange water with adjacent catchments and nearly half of type-3 glaciers do so for f=1.0 to 1.1.

Table 2. Greenland-basin wise glacier classification in 2017, 2018 and 2019. NOG: Number of glaciers; T2: Type-2; T-3: Type-3; UC: Unclassified.

Basin	**2017**			**2018**			**2019**		
(NOG)	T2	T3	UC	T2	T3	UC	T2	T3	UC
NO (9)	7	1	1	6	0	3	6	2	1
NW (69)	16	20	33	15	15	39	9	35	25
CW (16)	2	10	4	3	6	7	3	5	8
SW (34)	8	7	19	13	10	11	12	13	9
SE (50)	1	19	30	2	9	39	0	16	34
CE (29)	1	19	9	5	7	17	3	17	9
NE (14)	7	2	5	5	1	8	5	8	1

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APPENDIX

Appendix A is a table, which shows the numbers and names of glaciers investigated in this study. It also shows their time-series distances, DIST-2 and DIST-3, from standard type-2 and type-3 velocity patterns and classified classes in 2017 (Class17), 2018 (Class18) and 2019 (Class19) based on time-series distance threshold value of 0.25.

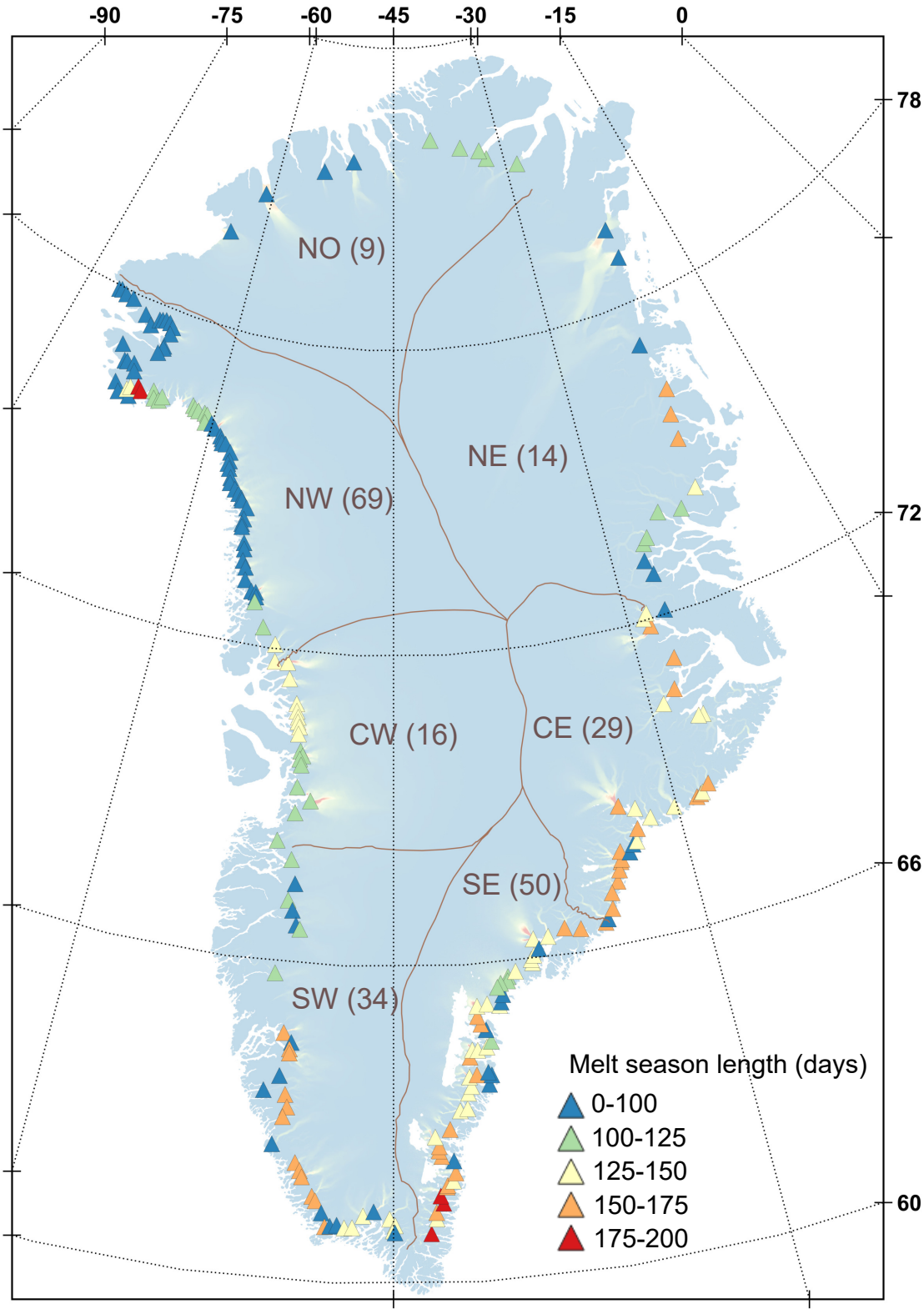

Fig. 1. Melt season lengths at study glaciers derived from RACMO2.3p2 daily meltwater runoff data in 2017 (Noël and others, 2019). The background velocity map is NASA MEaSUREs Greenland Quarterly Ice Sheet Velocity Mosaics from SAR and Landsat, Version 1 product (Joughin and others, 2018) and the basins are provided from Mouginot and others (2019). The red and blue colors indicate fast and slow moving ice, respectively.

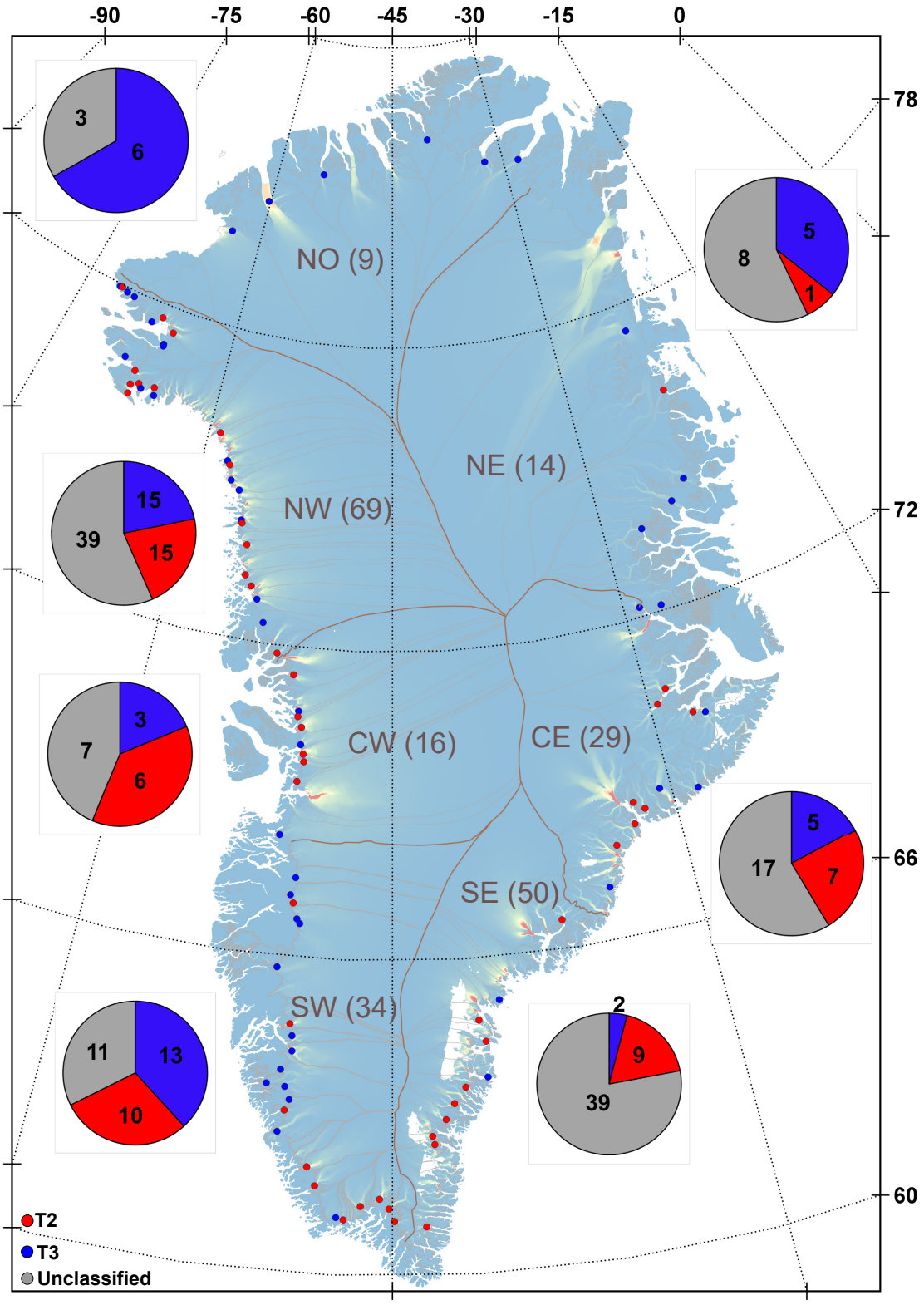

Fig. 2. Seasonal ice velocity classification map of Greenland in 2018 showing the location of type-2 (blue dots) and -3 (red dots) glaciers in different basins, namely NO: North, NE: North East, CE: Central East, SE: South East, SW: South West, CW: Central West, NW: North West. Pie charts display number of type-2 (blue), type-3 (red) and unclassified (gray) glaciers in these basins. The background velocity map is NASA MEaSUREs Greenland Quarterly Ice Sheet Velocity Mosaics from SAR and Landsat, Version 1 product (Joughin and others, 2018) and the basins are provided from Mouginot and others (2019). The red and blue colors indicate fast and slow moving ice, respectively.

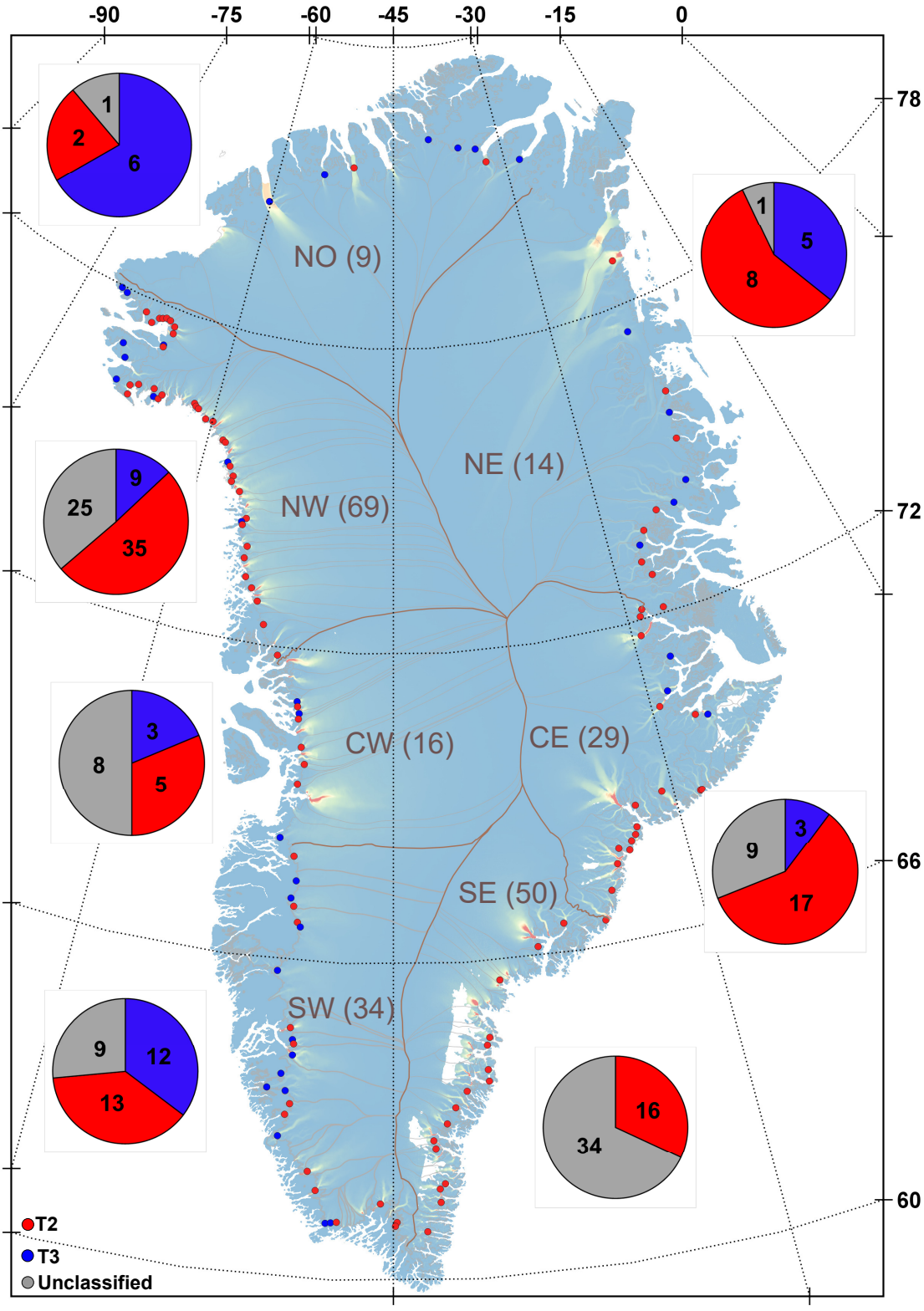

Fig. 3. Seasonal ice velocity classification map of Greenland in 2019.

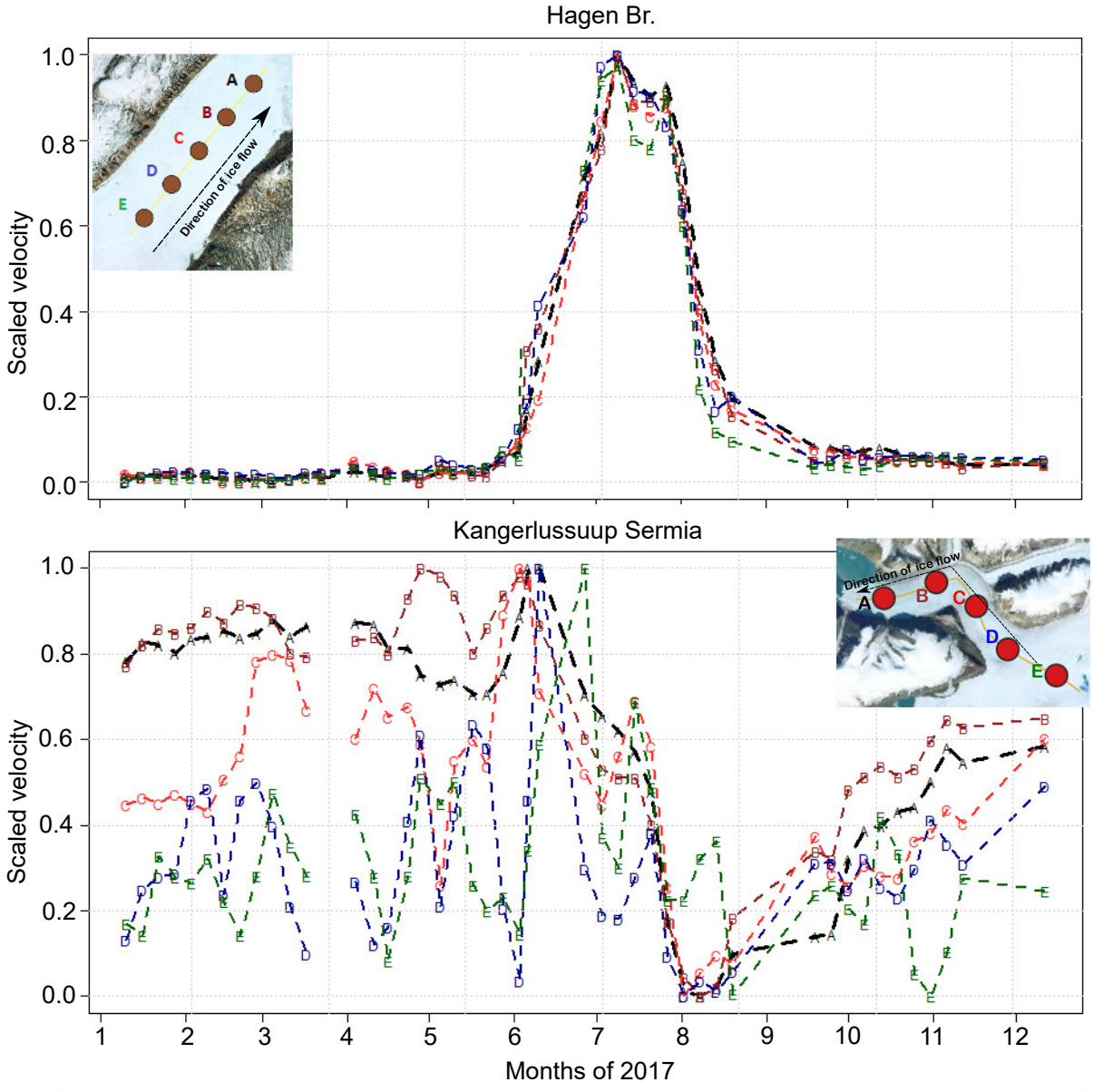

Fig. 4. Scaled velocity of 2017 at five (A-E) equidistant points at Hagen Bræ (upper panel) and Kangerlussuup Sermia (lower panel). Points "A" are located near their ice fronts and points "E" are farthest inland located at 14.4 km and 21.2 km from their ice fronts respectively. The arrow shows the direction of ice flow.

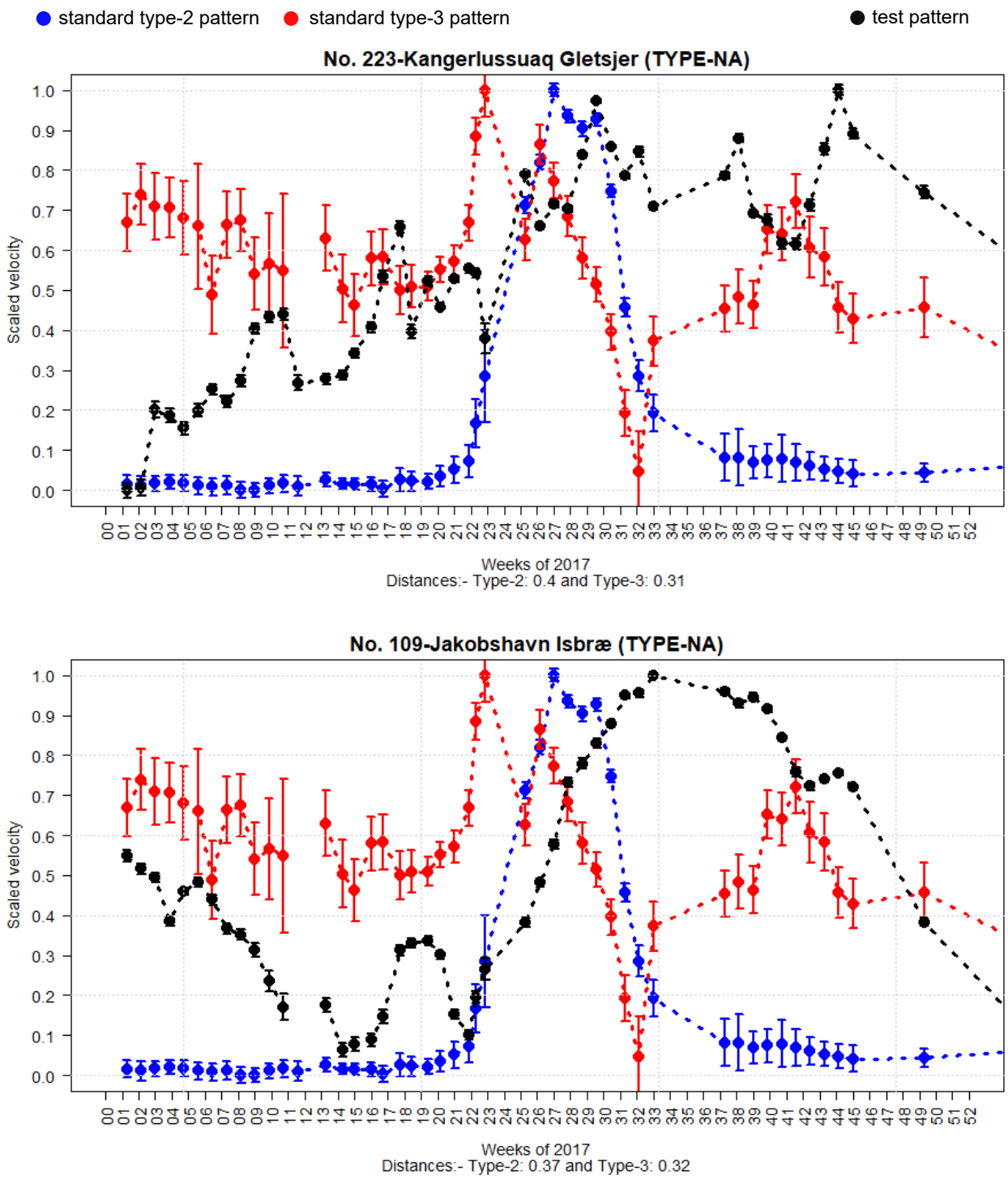

Fig. 5. Seasonal patterns of standard type-2 (Hagen Bræ), shown by blue "2", and type-3 (Upernavik Iss.-1), shown by red "3" glaciers together with test glaciers, i.e. Glacier No. 223 Kangerlussuaq Gletsjer (upper panel) and Glacier No. 109 Jakobshavn Isbræ (lower panel), shown by "T". Their corresponding time-series distances are also provided in the panels.

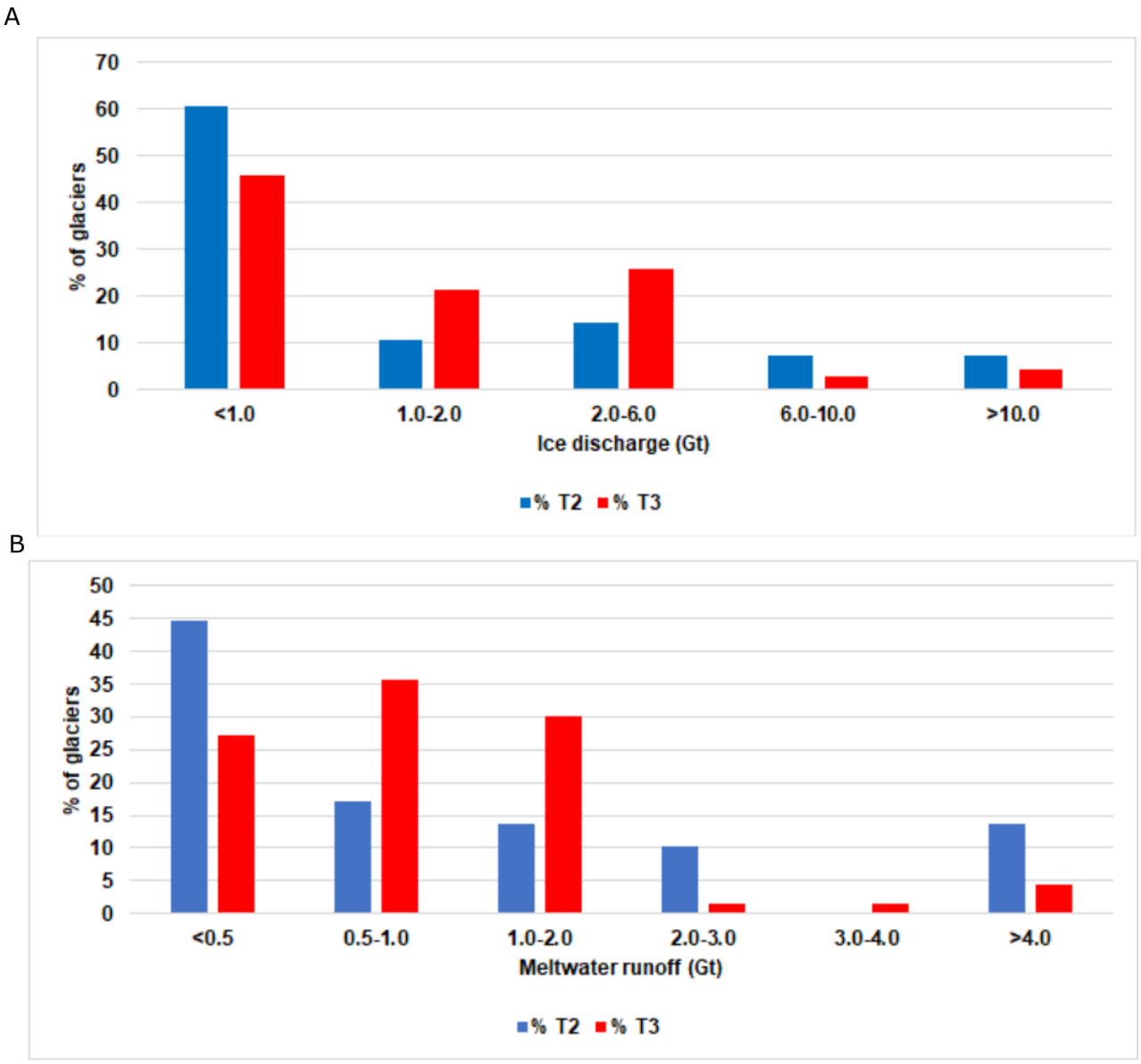

Fig. 6. Panel A and B categorically show the ice discharge and meltwater runoff for type-2 and type-3 glaciers in 2017.

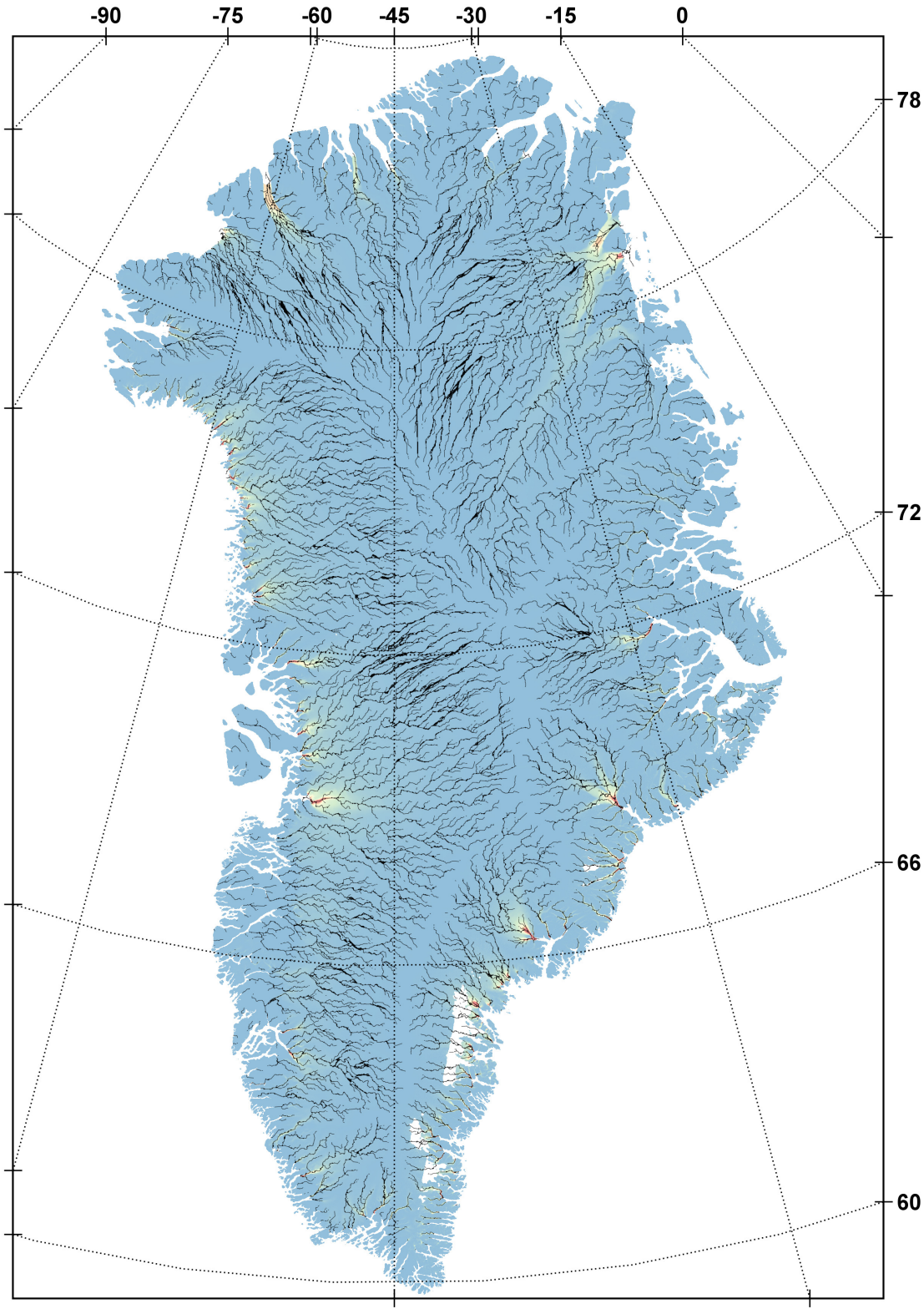

Fig. 7. Subglacial drainage pathways obtained from experiment 1. The background velocity map is NASA MEaSUREs Greenland Quarterly Ice Sheet Velocity Mosaics from SAR and Landsat, Version 1 product (Joughin and others, 2018).

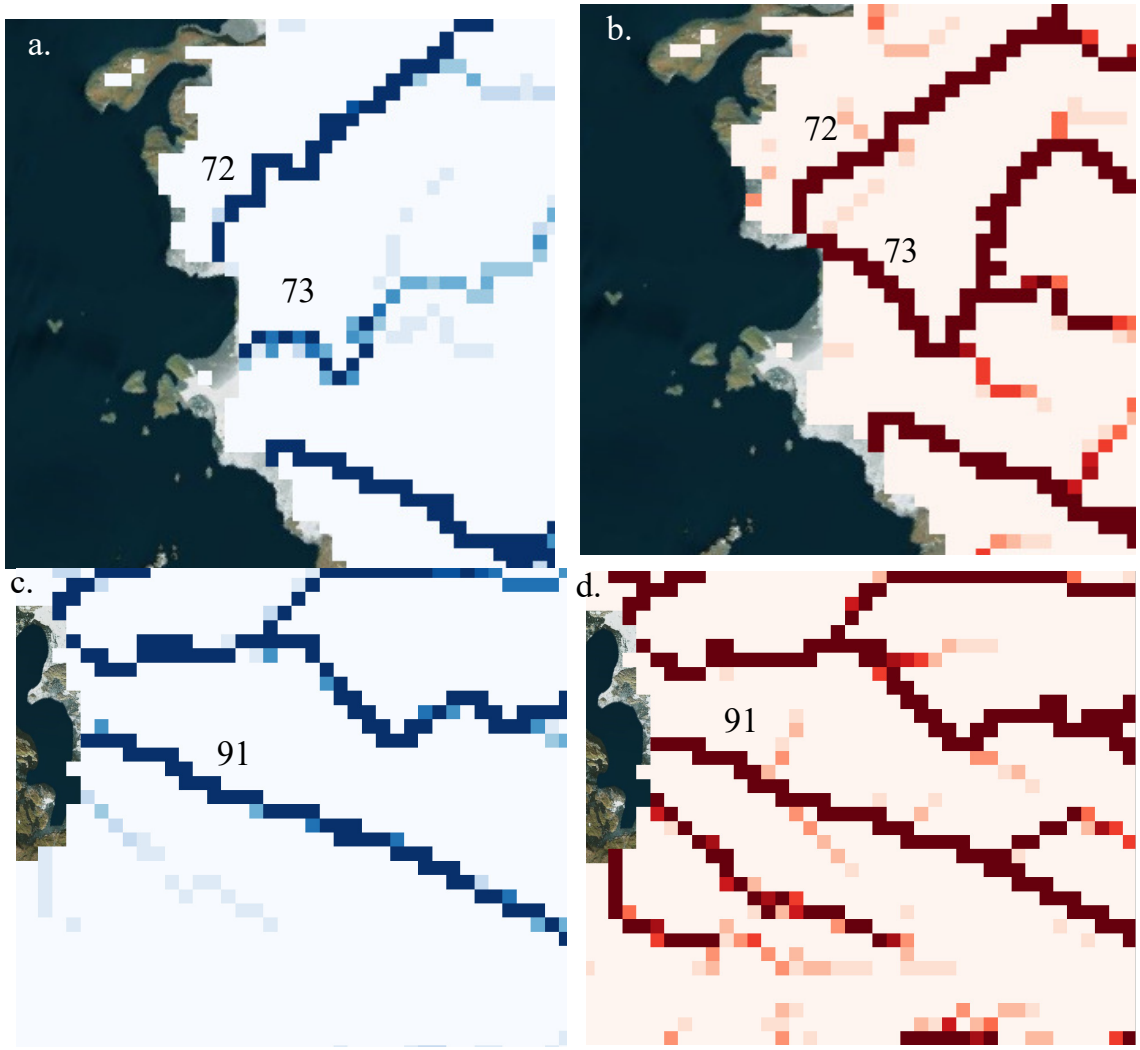

Fig. 8. Examples of glaciers showing water rerouting (switching) and no routing (no switching). Glacier No. 72 (Steenstrup Gletsjer) and Glacier No. 73 (Kjer Gletsjer) showed routing, while no routing took place in case of Glacier No. 91 (Upernavik Isstrøm-IV) in experiment 3 (f = 0.8 vs 1.0) (Table 1).

Appendix A

G.NO	Glacier Name	LAT	LONG	2017 DIST-2	2017 DIST-3	2017 Class17	2018 DIST-2	2018 DIST-3	2018 Class18	2019 DIST-2	2019 DIST-3	2019 Class19
1	Hagen Bræ	81.35	-28.49	0	0.47	2	0.22	0.38	2	0.13	0.27	2
2	Academy Gletsjer	81.61	-32.3	0.16	0.37	2	0.22	0.36	2	0.2	0.14	3
3	Marie Sophie Gletsjer	81.79	-33.07	0.3	0.31	NA	0.25	0.38	NA	0.19	0.27	2
4	Hobbs Gletsjer	81.91	-35.6	0.18	0.34	2	0.26	0.31	NA	0.15	0.34	2
5	Adams Gletsjer	82.14	-39.68	0.16	0.5	2	0.15	0.39	2	0.18	0.35	2
8	Ryder Gletsjer	81.7	-50.47	0.17	0.34	2	0.28	0.3	NA	0.26	0.13	3
9	Steensby Gletsjer	81.44	-54.21	0.11	0.46	2	0.21	0.29	2	0.23	0.3	2
10	Petermann Gletsjer	80.76	-60.89	0.39	0.2	3	0.16	0.41	2	0.18	0.4	2
11	Humboldt Gletsjer	79.84	-63.58	0.15	0.4	2	0.13	0.34	2	0.19	0.19	NA
16	Clements Markham Gletsjer	77.94	-71.87	0.23	0.33	2	0.21	0.36	2	0.33	0.29	NA
17	Diebitsch Gletsjer	77.95	-71.59	0.2	0.33	2	0.31	0.24	3	0.18	0.21	2
18	Moris Jesup Gletsjer	77.91	-71.04	0.18	0.33	2	0.24	0.29	2	0.15	0.23	2
19	Meehan Gletsjer	77.89	-70.25	0.29	0.35	NA	0.17	0.35	2	0.26	0.3	NA
22	Bowdoin Gletsjer	77.7	-68.58	0.24	0.27	2	0.33	0.27	NA	0.22	0.13	3
23	Hubbard Gletsjer	77.55	-67.79	0.24	0.29	2	0.13	0.35	2	0.27	0.18	3
24	Hart Gletsjer	77.71	-67.2	0.3	0.29	NA	0.27	0.26	NA	0.33	0.24	3
25	Sharp Gletsjer	77.73	-66.93	0.48	0.19	3	0.38	0.24	3	0.39	0.21	3
26	Melville Gletsjer	77.75	-66.61	0.36	0.21	3	0.63	0.45	NA	0.35	0.18	3
27	Farquhar Gletsjer	77.73	-66.21	0.43	0.25	NA	0.47	0.34	NA	0.35	0.15	3
28	Tracy Gletsjer	77.66	-65.83	0.22	0.33	2	0.3	0.36	NA	0.23	0.18	3
29	Heilprin Gletsjer	77.52	-65.84	0.43	0.23	3	0.26	0.16	3	0.27	0	3
30	Leidy Gletsjer	77.25	-65.99	0.13	0.39	2	0.14	0.41	2	0.21	0.31	2
31	Marie Gletsjer	77.21	-65.97	0.3	0.33	NA	0.19	0.33	2	0.25	0.23	3
32	Sermiarsupaluk	77.09	-66.27	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Unnamed-1	76.99	-69.42	0.13	0.39	2	0.25	0.41	NA	0.19	0.22	2
36	Salisbury Gletsjer	76.71	-68.69	0.14	0.39	2	0.13	0.39	2	0.17	0.34	2
37	Chamberlin Gletsjer	76.71	-68.46	NA	NA	NA	NA	NA	NA	NA	NA	NA
38	Knud Rasmussen Gletsjer	76.73	-67.84	0.28	0.28	NA	0.28	0.31	NA	0.19	0.19	NA
39	Harald Moltke Bræ	76.58	-67.59	0.14	0.37	2	0.36	0.19	3	0.32	0.26	NA
40	Pituffik Gletsjer	76.26	-68.69	0.13	0.51	2	NA	NA	NA	0.17	0.36	2
41	Appakkooriaq	76.1	-68.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
42	Nasersorfik	76.09	-67.26	0.25	0.29	NA	0.28	0.24	3	0.32	0.12	3
43	Unnamed-2	76.2	-67.58	NA	NA	NA	NA	NA	NA	NA	NA	NA
44	Unnamed-3	76.27	-67.38	0.37	0.2	3	0.33	0.12	3	0.33	0.19	3
45	Unnamed-4	76.34	-66.77	0.3	0.24	3	0.34	0.16	3	0.32	0.23	3
46	Unnamed-5	76.27	-66.45	0.21	0.4	2	0.21	0.33	2	0.25	0.26	NA
47	Unnamed-6	76.36	-65.44	0.38	0.18	3	0.39	0.17	3	0.33	0.13	3
48	Savigssuaq Gletscher	76.23	-65.23	NA	NA	NA	0.16	0.26	2	0.17	0.33	2
49	Helland Gletsjer	76.22	-64.8	0.19	0.43	2	0.28	0.33	NA	0.3	0.21	3
50	Unnamed-7	76.3	-64.61	0.39	0.19	3	0.36	0.25	NA	0.4	0.21	3
57	Unnamed-8	76.34	-61.92	0.34	0.22	3	0.56	0.34	NA	0.26	0.15	3
58	Döcker Smith Gletsjer	76.29	-61.7	0.29	0.3	NA	0.51	0.31	NA	0.31	0.22	3
59	Unnamed-9	76.26	-61.39	0.47	0.23	3	0.32	0.29	NA	0.26	0.18	3
60	Rink Gletsjer	76.25	-60.83	0.45	0.22	3	0.41	0.28	NA	0.42	0.27	NA
61	Unnamed-10	76.23	-60.59	0.39	0.32	NA	0.42	0.37	NA	0.34	0.29	NA
62	Issuusarsuit Sermiat	76.08	-60.63	0.3	0.29	NA	0.28	0.31	NA	0.34	0.19	3
63	Unnamed-11	76.1	-60.06	0.39	0.23	3	0.38	0.29	NA	0.31	0.14	3
64	Kong Oscar Gletsjer	76.02	-59.71	0.4	0.27	NA	0.55	0.41	NA	0.38	0.29	NA
65	Unnamed-12	75.9	-59.11	0.4	0.27	NA	0.36	0.23	3	0.41	0.26	NA
66	Nordenskiöld Gletsjer	75.85	-58.95	0.42	0.24	3	0.43	0.32	NA	0.38	0.26	NA
67	Nansen Gletsjer	75.78	-58.87	0.37	0.32	NA	0.35	0.27	NA	0.3	0.2	3
68	Unnamed-13	75.77	-58.55	0.4	0.26	NA	0.41	0.27	NA	0.33	0.16	3
69	Sverdrup Gletsjer	75.63	-58.03	0.21	0.39	2	0.32	0.51	NA	0.26	0.34	NA

70	Dietrichson Gletsjer	75.46	-57.94	0.46	0.19	3	0.56	0.31	NA	0.48	0.26	NA
71	Unnamed-14	75.41	-58.03	0.25	0.34	NA	0.21	0.38	2	0.22	0.35	2
72	Steenstrup Gletsjer	75.32	-57.84	0.37	0.3	NA	0.39	0.18	3	0.42	0.2	3
73	Kjer Gletsjer	75.15	-57.58	0.33	0.36	NA	0.49	0.39	NA	0.37	0.22	3
74	Unnamed-15	75.05	-57.54	0.16	0.35	2	0.24	0.29	2	0.3	0.22	3
75	Hayes Gletsjer	74.95	-57.08	0.39	0.31	NA	0.36	0.41	NA	0.45	0.36	NA
76	Unnamed-16	74.88	-56.73	0.26	0.26	NA	0.18	0.29	2	0.2	0.18	3
77	Unnamed-17	74.8	-56.46	0.44	0.27	NA	0.27	0.27	NA	0.31	0.38	NA
78	Unnamed-18	74.76	-56.39	0.34	0.28	NA	0.36	0.26	NA	0.33	0.3	NA
79	Nunatakassaap Sermia	74.63	-55.93	0.38	0.38	NA	0.4	0.41	NA	0.45	0.48	NA
80	Illullip Sermia	74.41	-55.98	0.53	0.23	3	0.46	0.29	NA	0.41	0.24	3
81	Unnamed-19	74.31	-56.07	0.28	0.27	NA	0.23	0.37	2	0.16	0.21	2
82	Cornell Gletsjer	74.25	-56.02	0.4	0.32	NA	0.26	0.24	3	0.41	0.19	3
83	Sermeq Avanarleq	73.95	-55.64	0.42	0.21	3	0.37	0.29	NA	0.44	0.33	NA
84	Sermeq Kujalleq	73.83	-55.56	0.48	0.17	3	0.39	0.17	3	0.42	0.2	3
85	Qeqertarsuup Sermia	73.6	-55.5	0.52	0.26	NA	0.52	0.32	NA	0.38	0.18	3
86	Kakiffaat Sermiat	73.48	-55.24	0.5	0.26	NA	0.39	0.33	NA	0.49	0.32	NA
87	Naajarsuit Sermiat	73.24	-55.11	0.42	0.2	3	0.33	0.12	3	0.18	0.15	3
88	Upernavik Is-I	73.05	-54.56	0.47	0	3	0.4	0.23	3	0.45	0.24	3
89	Upernavik Is-II	73.04	-54.27	0.13	0.38	2	0.31	0.27	NA	0.39	0.29	NA
90	Upernavik Is-III	72.94	-54.2	0.47	0.26	NA	0.32	0.34	NA	0.46	0.3	NA
91	Upernavik Is-IV	72.85	-54.23	0.39	0.2	3	0.18	0.27	2	0.28	0.17	3
92	Unnamed-20	72.39	-53.43	0.43	0.23	3	0.21	0.32	2	0.25	0.24	3
93	Inngia Isbræ	72.09	-52.51	0.35	0.37	NA	0.26	0.25	NA	0.34	0.32	NA
94	Umiammakku Isbræ	71.76	-52.4	0.28	0.28	NA	0.38	0.16	3	0.34	0.12	3
95	Rink Isbræ	71.77	-51.59	0.33	0.22	3	0.26	0.31	NA	0.37	0.44	NA
96	Kangerlussuup Sermia	71.45	-51.36	0.59	0.2	3	0.5	0.22	3	0.53	0.32	NA
98	Perlerfiup Sermia	70.99	-50.78	0.44	0.13	3	0.26	0.29	NA	0.19	0.28	2
99	Sermeq Silarleq	70.84	-50.72	0.42	0.37	NA	0.38	0.38	NA	0.4	0.23	3
100	Kangilleq	70.73	-50.61	0.23	0.29	2	0.16	0.29	2	0.12	0.24	2
101	Sermilik Isbræ	70.64	-50.6	0.48	0.25	NA	0.4	0.23	3	0.39	0.21	3
102	Lille Gletsjer	70.54	-50.48	0.56	0.24	3	0.59	0.34	NA	0.57	0.33	NA
103	Store Gletsjer	70.4	-50.5	0.36	0.24	3	0.42	0.16	3	0.52	0.34	NA
104	Sermeq Avannarleq	70.08	-50.29	0.33	0.2	3	0.15	0.24	2	0.37	0.23	3
105	Sermeq Kujalleq	69.99	-50.14	0.4	0.34	NA	0.31	0.39	NA	0.49	0.47	NA
106	Kangilernata Sermia	69.92	-50.29	0.47	0.2	3	0.33	0	3	0.35	0.35	NA
107	Eqip Sermia	69.81	-50.19	0.41	0.2	3	0.28	0.22	3	0.42	0.22	3
108	Sermeq Avannarleq	69.38	-50.29	0.42	0.24	3	0.35	0.13	3	0.35	0.12	3
109	Jakobshavn Isbræ	69.13	-49.51	0.37	0.36	NA	0.38	0.44	NA	0.35	0.41	NA
110	Saqqarliup Sermia	68.88	-50.28	0.41	0.24	3	0.24	0.24	NA	0.21	0.21	NA
111	Nordenskiöld Gletsjer	68.32	-51.08	0.13	0.38	2	0	0.33	2	0	0.27	2
113	Poloniagletsjer	67.97	-50.24	0.21	0.32	2	0.19	0.19	NA	0.21	0.18	3
114	Inuppaat Quuat	67.52	-49.95	0.26	0.29	NA	0.17	0.25	2	0.22	0.23	2
115	Isunnguata Sermia	67.19	-50.22	0.16	0.36	2	0.1	0.29	2	0.07	0.26	2
116	Unnamed-21	67	-49.97	0.34	0.27	NA	0.36	0.14	3	0.3	0.14	3
117	Unnamed-22	66.72	-49.74	0.27	0.34	NA	0.19	0.24	2	0.19	0.18	3
118	Unnamed-23	66.65	-49.54	0.2	0.35	2	0.11	0.26	2	0.08	0.28	2
119	Unnamed-24	65.78	-50.52	0.11	0.48	2	0.19	0.45	2	0.22	0.39	2
120	Narsap Sermia	64.66	-49.88	0.53	0.18	3	0.47	0.18	3	0.39	0.18	3
121	Qamanaarsuup Sermia	64.48	-49.52	0.26	0.33	NA	0.15	0.28	2	0.15	0.25	2
122	Akullersuup Sermia	64.36	-49.58	0.55	0.26	NA	0.55	0.27	NA	0.45	0.21	3
123	Kangiata Nunaata Sermia	64.28	-49.57	0.23	0.34	2	0.14	0.27	2	0.17	0.18	2
124	Unnamed-25	63.84	-49.91	0.26	0.27	NA	0.16	0.28	2	0.13	0.26	2
125	Sermeq	63.54	-50.54	0.28	0.31	NA	0.14	0.31	2	0.14	0.26	2
126	Unnamed-26	63.49	-49.6	0.22	0.29	2	0.2	0.27	2	0.18	0.29	2

127	Unnamed-27	63.25	-49.49	0.23	0.36	2	0.22	0.34	2	0.25	0.22	3
128	Nakkaasorsuaq	63.07	-49.64	0.39	0.23	3	0.34	0.16	3	0.24	0.19	3
129	Frederikshåb Isblink	62.54	-49.98	0.28	0.28	NA	0.15	0.27	2	0.2	0.22	2
130	Avannarleq Bræ	62.22	-48.99	0.59	0.26	NA	0.53	0.26	NA	0.46	0.25	NA
131	Nigerlikasik Bræ	62.07	-48.79	NA	NA	NA	NA	NA	NA	NA	NA	NA
132	Sermilik Bræ	61.96	-48.69	0.55	0.2	3	0.43	0.15	3	0.39	0.22	3
133	Sermiligaarsuk Bræ	61.6	-48.23	0.47	0.2	3	0.3	0.09	3	0.33	0.12	3
134	Sioralik Bræ	61.53	-48.09	0.31	0.34	NA	0.42	0.31	NA	0.6	0.39	NA
135	Arsuk Bræ	61.3	-47.83	0.39	0.33	NA	0.4	0.3	NA	0.36	0.25	NA
137	Nordre Qipisaqqu Bræ	61.05	-47.67	0.22	0.45	2	0.27	0.34	NA	0.24	0.33	2
138	Søndre Qipisaqqu Bræ	61.06	-47.47	NA	NA	NA	NA	NA	NA	0.23	0.39	2
139	Unnamed-28	61.08	-47.21	0.32	0.32	NA	0.2	0.38	2	0.25	0.19	3
140	Sermilik Bræ	61.04	-46.92	0.44	0.26	NA	0.51	0.23	3	0.5	0.3	NA
142	Qalerallit Sermiat	61.04	-46.61	0.39	0.25	NA	0.4	0.28	NA	0.34	0.3	NA
143	Eqalorutsit Killiit Sermiat	61.27	-46.19	0.35	0.26	NA	0.38	0.22	3	0.32	0.25	NA
144	Eqalorutsit Kangilliit Sermiat	61.35	-45.78	0.53	0.28	NA	0.45	0.15	3	0.39	0.2	3
145	Qooqqup Sermia	61.22	-45.15	0.4	0.26	NA	0.32	0.23	3	0.31	0.31	NA
146	Unnamed-29	61.1	-44.93	0.43	0.24	3	0.5	0.36	NA	0.36	0.23	3
147	Jespersen Bræ	61	-45.01	0.46	0.22	3	0.4	0.23	3	0.3	0.18	3
148	Sermeq Kangilleq	60.96	-44.94	0.38	0.23	3	0.42	0.29	NA	0.37	0.25	NA
149	Unnamed-30	60.93	-43.53	0.56	0.25	NA	0.46	0.18	3	0.41	0.2	3
150	Unnamed-31	61.21	-43.3	0.58	0.26	NA	0.52	0.3	NA	0.53	0.36	NA
151	Unnamed-32	61.33	-43.31	0.49	0.22	3	0.39	0.36	NA	0.38	0.36	NA
152	Unnamed-33	61.5	-43.02	0.46	0.2	3	0.47	0.32	NA	0.39	0.24	3
153	Unnamed-34	61.64	-43.13	0.37	0.25	NA	0.44	0.26	NA	0.41	0.18	3
154	Unnamed-35	61.8	-42.87	0.52	0.3	NA	0.5	0.25	NA	0.43	0.22	3
155	Unnamed-36	61.84	-42.84	0.45	0.24	3	0.57	0.39	NA	0.42	0.28	NA
156	Unnamed-37	61.91	-42.6	0.45	0.2	3	0.35	0.31	NA	0.45	0.38	NA
157	Unnamed-38	62.06	-42.5	0.47	0.21	3	0.52	0.33	NA	0.46	0.33	NA
158	Unnamed-39	62.29	-42.55	0.65	0.28	NA	0.54	0.33	NA	0.48	0.34	NA
159	Unnamed-40	62.38	-43.04	0.51	0.28	NA	0.56	0.37	NA	0.5	0.44	NA
160	Unnamed-41	62.49	-43.14	0.35	0.41	NA	0.36	0.24	3	0.33	0.22	3
161	Unnamed-42	62.57	-43.13	0.39	0.26	NA	0.33	0.2	3	0.32	0.19	3
162	Unnamed-43	62.75	-43.28	0.51	0.2	3	0.44	0.32	NA	0.43	0.29	NA
163	Heimdal Gletsjer	62.89	-42.65	0.5	0.21	3	0.52	0.22	3	0.36	0.2	3
164	Guldfaxe	63.23	-42.2	0.37	0.21	3	0.33	0.09	3	0.3	0.12	3
165	Skinfaxe	63.26	-41.88	0.58	0.21	3	0.48	0.32	NA	0.35	0.26	NA
166	Thrym Gletsjer	63.56	-41.81	0.32	0.31	NA	0.4	0.11	3	0.37	0.16	3
167	Storebjørn	63.68	-41.66	0.35	0.33	NA	0.49	0.33	NA	0.4	0.28	NA
168	A.P. Bernstorff Gletsjer	63.86	-41.73	0.5	0.17	3	0.44	0.29	NA	0.35	0.3	NA
169	Sleipner	63.89	-41.4	0.28	0.4	NA	0.35	0.41	NA	0.39	0.43	NA
171	Gerd Gletsjer	63.7	-40.89	0.36	0.29	NA	0.23	0.28	2	0.38	0.2	3
172	Gungner	63.88	-40.76	0.41	0.3	NA	NA	NA	NA	0.45	0.32	NA
173	Unnamed-44	63.93	-40.91	0.38	0.31	NA	0.33	0.27	NA	0.32	0.24	3
176	Unnamed-45	64.24	-41.66	0.53	0.22	3	NA	NA	NA	0.44	0.34	NA
177	Gråulv	64.37	-41.54	NA	NA	NA	NA	NA	NA	NA	NA	NA
178	Unnamed-46	64.36	-41.3	0.5	0.18	3	0.42	0.39	NA	0.41	0.33	NA
179	Unnamed-47	64.41	-40.89	0.43	0.2	3	0.34	0.24	3	0.31	0.19	3
180	Unnamed-48	64.51	-40.68	0.63	0.28	NA	NA	NA	NA	0.43	0.23	3
182	Unnamed-49	64.74	-40.87	0.27	0.26	NA	0.41	0.32	NA	0.26	0.25	NA
183	Unnamed-50	64.85	-41.09	0.68	0.24	3	0.31	0.24	3	0.41	0.29	NA
184	Unnamed-51	65	-41.22	0.47	0.29	NA	0.48	0.42	NA	0.39	0.37	NA
185	Unnamed-52	65.2	-41.21	0.46	0.25	NA	NA	NA	NA	0.56	0.41	NA
186	Unnamed-53	65.23	-40.74	0.37	0.23	3	0.55	0.38	NA	0.52	0.39	NA
187	Unnamed-54	65.18	-40.17	0.46	0.14	3	0.21	0.38	2	0.48	0.25	NA

188	Unnamed-55	65.24	-40.1	0.42	0.25	NA	0.37	0.34	NA	0.47	0.3	NA
189	Unnamed-56	65.38	-39.99	NA	NA	NA	NA	NA	NA	NA	NA	NA
190	Unnamed-57	65.71	-39.68	0.53	0.26	NA	NA	NA	NA	0.4	0.31	NA
191	Unnamed-58	65.64	-39.72	0.44	0.16	3	NA	NA	NA	0.49	0.34	NA
192	Unnamed-59	65.6	-40.05	0.33	0.25	NA	0.27	0.33	NA	0.35	0.24	3
193	Unnamed-60	65.53	-40.21	0.44	0.29	NA	NA	NA	NA	0.46	0.3	NA
194	Unnamed-61	65.8	-39.31	0.36	0.26	NA	NA	NA	NA	0.36	0.33	NA
195	Brückner Gletsjer	65.93	-38.47	0.55	0.22	3	0.36	0.28	NA	0.38	0.3	NA
196	Heim Gletsjer	66	-38.52	0.37	0.32	NA	0.56	0.33	NA	0.49	0.27	NA
197	Kattilertarpia	66.07	-38.37	0.24	0.38	2	0.28	0.36	NA	0.25	0.29	NA
201	Helheim Gletsjer	66.38	-38.32	0.34	0.36	NA	0.54	0.43	NA	0.36	0.41	NA
202	Apuseerajik	66.18	-38.1	NA	NA	NA	0.42	0.35	NA	0.31	0.19	3
203	Fenris Gletsjer	66.39	-37.6	0.5	0.27	NA	0.43	0.51	NA	0.39	0.44	NA
204	Franche Comté Gletsjer	66.51	-36.76	0.47	0.2	3	0.33	0.09	3	0.38	0.15	3
206	Glacier de France	66.45	-35.99	NA	NA	NA	NA	NA	NA	NA	NA	NA
209	Unnamed-62	67.22	-33.8	0.43	0.25	NA	0.55	0.34	NA	0.48	0.36	NA
210	K.J.V. Steenstrup Søndre Bræ	66.49	-34.75	0.41	0.2	3	0.42	0.31	NA	0.42	0.22	3
211	K.J.V. Steenstrup Nordre Bræ	66.55	-34.61	0.25	0.35	NA	0.33	0.42	NA	0.38	0.41	NA
213	Unnamed-63	66.73	-34.3	0.58	0.2	3	0.39	0.33	NA	0.49	0.26	NA
214	Unnamed-64	67.03	-34.2	0.41	0.17	3	0.23	0.28	2	0.31	0.19	3
215	Unnamed-65	67.58	-33.46	0.29	0.23	3	0.28	0.25	NA	0.35	0.21	3
216	Unnamed-66	67.43	-33.62	0.39	0.26	NA	0.34	0.25	NA	0.47	0.47	NA
217	Unnamed-67	67.62	-33.4	0.51	0.23	3	0.53	0.38	NA	0.47	0.39	NA
218	Unnamed-68	67.78	-33.4	0.48	0.22	3	0.5	0.24	3	0.37	0.18	3
219	Nordre Parallelgletsjer	67.72	-32.92	0.4	0.28	NA	0.33	0.26	NA	0.35	0.24	3
220	Unnamed-69	67.86	-32.68	0.38	0.3	NA	0.37	0.43	NA	0.41	0.19	3
221	Polaric Gletsjer	67.9	-32.45	0.39	0.21	3	0.45	0.32	NA	0.37	0.17	3
222	Hutchinson Gletsjer	68.14	-32.29	0.39	0.2	3	0.42	0.18	3	0.32	0.19	3
223	Kangerlussuaq Gletsjer	68.64	-33.02	0.39	0.29	NA	0.34	0.25	NA	0.36	0.26	NA
224	Courtauld Gletsjer	68.53	-32.18	0.43	0.22	3	0.38	0.19	3	0.3	0.2	3
226	Frederiksborg Gletsjer	68.29	-31.5	0.45	0.21	3	0.37	0.22	3	0.41	0.3	NA
227	Sorgenfri Gletsjer	68.38	-30.15	0.3	0.23	3	0.14	0.22	2	0.22	0.1	3
228	Rosenborg Gletsjer	68.45	-28.87	NA	NA	NA	NA	NA	NA	NA	NA	NA
229	Kronborg Gletsjer	68.48	-28.64	0.39	0.19	3	0.18	0.23	2	0.22	0.21	3
230	Unnamed-70	68.51	-28.52	0.44	0.23	3	0.42	0.27	NA	0.41	0.21	3
231	Borggraven	68.64	-28.11	0.57	0.26	NA	0.5	0.26	NA	0.56	0.32	NA
232	Magga Dan Gletsjer	69.95	-27.22	0.26	0.23	3	0.15	0.24	2	0.11	0.27	2
233	Kista Dan Gletsjer	69.95	-27.5	0.47	0.21	3	0.44	0.18	3	0.26	0.09	3
235	Vestfjord Gletsjer	70.36	-29.22	0.38	0.15	3	0.26	0.24	3	0.21	0.11	3
236	Rolige Bræ	70.58	-28.39	0.28	0.23	3	0.32	0.12	3	0.15	0.18	2
237	Eielson Gletsjer	71.16	-27.87	0.37	0.26	NA	0.25	0.36	NA	0.13	0.28	2
238	Daugaard-Jensen Gletsjer	71.88	-28.69	0.36	0.21	3	0.43	0.28	NA	0.21	0.14	3
239	Unnamed-71	72.05	-28.98	0.46	0.17	3	0.63	0.34	NA	0.34	0.11	3
240	Unnamed-72	72.14	-28.74	0.14	0.36	2	0.16	0.21	2	0.3	0.1	3
241	Jomfru Gletsjer	72.11	-27.53	0.39	0.36	NA	0.22	0.36	2	0.22	0.21	3
244	Hisinger Gletsjer	72.84	-27.53	0.32	0.27	NA	0.44	0.28	NA	0.34	0.18	3
245	Nordenskiöld Gletsjer	73.13	-27.86	0.27	0.3	NA	0.33	0.35	NA	0.26	0.16	3
246	Jættegletsjer	73.46	-27.56	0.24	0.3	2	0.29	0.38	NA	0.16	0.21	2
247	Gerard de Geer Gletsjer	73.55	-27.23	0.36	0.17	3	0.13	0.32	2	0.27	0.07	3
248	Nunatakgletsjer	73.96	-25.93	0.24	0.31	2	0.25	0.3	NA	0.2	0.15	3
249	Waltershausen Gletsjer	73.87	-24.28	0.23	0.35	2	0.17	0.28	2	0.14	0.27	2
250	Wordie Gletsjer	74.16	-22.81	0.27	0.28	NA	0.21	0.28	2	0.18	0.19	2
251	Heinkel Gletsjer	75.17	-22.61	0.29	0.33	NA	0.44	0.33	NA	0.22	0.1	3
252	Ejnar Mikkelsen Gletsjer	75.67	-22.41	0.14	0.36	2	0.28	0.28	NA	0.12	0.22	2
253	Soranerbræen	76.16	-21.93	0.38	0.2	3	0.31	0.24	3	0.29	0.21	3

254	Storstrømmen	77.15	-22.61	0.15	0.46	2	0.11	0.37	2	0.18	0.38	2
255	Zachariae Isstrøm	78.91	-21.19	0.13	0.37	2	0.29	0.31	NA	0.26	0.16	3
256	79N	79.51	-21.29	0.2	0.38	2	0.63	0.4	NA	0.26	0.34	NA