

Table S1. A ‘Little Ice Age glacier’ inventory for the North Atlantic sector.

The Little Ice Age glacier inventory listed below contains information on the glaciers used in Figure 2. The geographical locations of the different records are marked in Figure 1 with blue dots. The inventory contains information on region, name of site, name of glacier, latitude of the glacier, time of major advances with associated uncertainty, a short description of the dating technique used for dating the glacier position during the LIA, and reference to the corresponding study/studies.

Although the list by no means includes all published records of LIA glacier advances we still argue that they are representative for glacier activity that occurred in the North Atlantic sector. Excellent compilations of LIA glacier activity in Alaska, Canada and USA during the last millennium(1) Barclay, Wiles and Calkin 2009, 2) Briner, Thompson Davis and Miller 2009, 3) Calkin, Wiles and Barclay 2001, 4) Luckman 2000, 5) Menounos, Osborn, Clague and Luckman 2009, 6) Reyes, *et al.* 2006, 7) Wiles, Barclay, Calkin and Lowell 2008 are not shown in the table, but these records basically show results similar to those presented in Figure 2.

Region/ country	Site	Name of glacier	Latitude	Time of major advances (AD)	Sigma negative	Sigma positive	Dating technique	Reference
Arctic	Spitsbergen	Longyearbreen	78.13N	1910	1000	20	¹⁴ C	(8) Humlum, <i>et al.</i> 2005
Arctic	Spitsbergen	Linnébreen	78.03N	1920	600	20	¹⁴ C	(9) Svendsen and Mangerud 1997
Arctic	Spitsbergen	Linnébreen	78.03N	1900	500	20	¹⁴ C	(10) Snyder, Werner and Miller 2000
Arctic	Spitsbergen	Many	79.00N	1340	130	130	Lichen	(11) Werner 1990
Arctic	Spitsbergen	Many	79.00N	1800	130	130	Lichen	(11) Werner 1990
Arctic	Nova Zemlja	Sho'kalsiki glacier	76.11	1550	150	150	²¹⁰ Pb and ¹⁴ C	(12) Zeeberg, Forman and Polyak 2003
Arctic	Nova Zemlja	Sho'kalsiki glacier	76.11	1850	50	100	²¹⁰ Pb and ¹⁴ C	(12) Zeeberg, Forman and Polyak 2003

Arctic	Jan Mayen	Several glaciers	71	1850	218	60	Historical/Lichen	(13) Anda, Orheim and Mangerud 1985
Arctic Norway	Øksfjorden	Fornesbreen	70.1	1850	50	50	Historical	(14) Gellatly, Whalley, Gordon, Hansom and Twiggs 1989
Arctic Norway	Lyngen	Lenangsbreen, Fornesbreen	69.72	1910	85	20	Lichen/historical	(15) Ballantyne 1990, 16) Bakke, Dahl, Paasche, Løvlie and Nesje 2005
Eastern Greenland	I.C. Jacobsen Fjord	Sødalen and Heksetungen glacier	68.13	1649	86	86	Lichen	(17) Geirsdottir, Hardardottir and Andrews 2000
Arctic Sweden*	Kebnekaise	Storglacieren	67.55	1750	100	100	Model	(18) Linderholm, Jansson and Chen 2007
Arctic Norway	Svartisen	Vestisen	66.67	1740	62	40	Lichen	(19) Winkler 2003
Arctic Norway	Okstindan	Austre Okstindbreen	66.04	1600	200	200	Lichen/lake sediments	(20) Bakke, <i>et al.</i> 2010
Arctic Norway	Okstindan	Austre Okstindbreen	66.04	1760	60	40	Lichen	(19) Winkler 2003
Arctic Norway	Okstindan	Austre Okstindbreen	66.04	1840	30	40	Lichen	(19) Winkler 2003
Iceland	Vatnajökull	Lambatugnajökull	64.3	1790	40	10	Lichen	(21) Bradwell, Dugmore and Sugden 2006
Iceland	Langjökull	Hrutfell	64.45	1720	40	40	Lichen	(22) Kirkbride and Dugmore 2006
Iceland	Langjökull	Hrutfell	64.45	1890	30	30	Lichen	(22) Kirkbride and Dugmore 2006
Southern Norway	Joutunheimen	Several glaciers	61.3	1750	33	33	Historical (photo/observ.)	(23) Matthews 2005, 24) Liestøl 1967
Southern Norway	Jostedalsbreen	Nigardsbreen	61.4	1750	20	0	Historical (photo/observation)	(25) Matthews and Karlen 1992, 26) Fægri 1950

Southern Norway	Folgefonna	Bondhusbree	60.04	1750	60	60	Lichen	(27) Bakke, Dahl and Nesje 2005
Southern Norway	Folgefonna	Buerbreen	60.02	1890	0	0	Historical (photo/observation)	(27) Bakke, Dahl and Nesje 2005
Southern Norway	Hardangerjøkulen	Midtdalsbreen	60.34	1750	40	40	Lichen	(28) Dahl and Nesje 1994
Southern Norway	Northern Folgefonna	Jordalsbreen	60.13	1750	30	30	Lichen	(29) Bakke, Lie, Nesje, Dahl and Paasche 2005
Southern Norway	Northern Folgefonna	Jordalsbreen	60.13	1870	30	30	Lichen	(29) Bakke, Lie, Nesje, Dahl and Paasche 2005
Switzerland	Bernese Alps	Grosser Aletsch gletcher	46.27	1350	150	150	Sub fossil (¹⁴ C)	(30) Holzhauser, Magny and Zumbuhl 2005
Switzerland	Bernese Alps	Grosser Aletsch gletcher	46.27	1670	30	30	Sub fossil (¹⁴ C)	(30) Holzhauser, Magny and Zumbuhl 2005
Switzerland	Bernese Alps	Grosser Aletsch gletcher	46.27	1850	0	0	Historical	(30) Holzhauser, Magny and Zumbuhl 2005
Switzerland	Bernese Alps	Grindelwald glacier	46.34	1600	40	40	Historical	(30) Holzhauser, Magny and Zumbuhl 2005
Switzerland	Bernese Alps	Grindelwald glacier	46.34	1820	30	30	Historical	(30) Holzhauser, Magny and Zumbuhl 2005
France*	Mont Blanc	Meer de Glace	45.54	1750	105	105	Historical	(31) Reynaud and Vincent 2002

* = range of advances constitute the maximum and minimum estimate

References:

1. Barclay DJ, Wiles GC, & Calkin PE (2009) Holocene glacier fluctuations in Alaska. *Quaternary Science Reviews* 28(21-22):2034-2048.
2. Briner JP, Thompson Davis P, & Miller GH (2009) Latest Pleistocene and Holocene glaciation of Baffin Island, Arctic Canada: key patterns and chronologies. *Quaternary Science Reviews* 28(21-22):2075-2087.
3. Calkin PE, Wiles GC, & Barclay DJ (2001) Holocene coastal glaciation of Alaska. *Quaternary Science Reviews* 20(1-3):449-461.
4. Luckman BH (2000) The Little Ice Age in the Canadian Rockies. *Geomorphology* 32(3-4):357-384.
5. Menounos B, Osborn G, Clague JJ, & Luckman BH (2009) Latest Pleistocene and Holocene glacier fluctuations in western Canada. *Quaternary Science Reviews* 28(21-22):2049-2074.
6. Reyes AV, *et al.* (2006) Expansion of alpine glaciers in Pacific North America in the first millennium AD. *Geology* 34(1):57-60.
7. Wiles GC, Barclay DJ, Calkin PE, & Lowell TV (2008) Century to millennial-scale temperature variations for the last two thousand years indicated from glacial geologic records of Southern Alaska. *Global and Planetary Change* 60(1-2):115-125.
8. Humlum O, *et al.* (2005) Late-Holocene glacier growth in Svalbard, documented by subglacial relict vegetation and living soil microbes. *Holocene* 15(3):396-407.
9. Svendsen JI & Mangerud J (1997) Holocene glacial and climatic variations on Spitsbergen, Svalbard. *Holocene* 7(1):45-57.
10. Snyder JA, Werner A, & Miller GH (2000) Holocene cirque glacier activity in western Spitsbergen, Svalbard: sediment records from proglacial Linnevatnet. *Holocene* 10(5):555-563.
11. Werner A (1990) Lichen growth rates for the northwest coast of Spitsbergen, Svalbard. *Arctic and Alpine Research* 22:129-140.
12. Zeeberg J, Forman SL, & Polyak L (2003) Glacier extent in a Novaya Zemlya fjord during the "Little Ice Age" inferred from glaciomarine sediment records. *Polar Res* 22(2):385-394.
13. Anda E, Orheim O, & Mangerud J (1985) Late Holocene glacier variations and climate at Jan Mayen. *Polar Res* 3(2):129-140.
14. Gellatly AF, Whalley WB, Gordon JE, Hansom JD, & Twigg DS (1989) Recent glacial history and climatic change, Bergsfjord, Troms-Finnmark, Norway. *Norsk Geografisk Tidsskrift* 43:21-34.
15. Ballantyne CK (1990) The Holocene Glacial History of Lyngshalvoya, Northern Norway - Chronology and Climatic Implications. *Boreas* 19(2):93-117.
16. Bakke J, Dahl SO, Paasche Ø, Løvlie R, & Nesje A (2005) Glacier fluctuations, equilibrium-line altitudes and palaeoclimate in Lyngen, northern Norway, during the Lateglacial and Holocene. *The Holocene* 15(4):387-409.
17. Geirsdottir A, Hardardottir J, & Andrews JT (2000) Late-Holocene terrestrial glacial history of Miki and IC Jacobsen Fjords, East Greenland. *Holocene* 10(1):123-134.

18. Linderholm HW, Jansson P, & Chen DL (2007) A high-resolution reconstruction of Storglaciaren mass balance back to 1780/81 using tree-ring data and circulation indices. *Quaternary Research* 67(1):12-20.
19. Winkler S (2003) A new interpretation of the date of the 'Little Ice Age' glacier maximum at Svartisen and Okstindan, northern Norway. *The Holocene* 13(1):83-95.
20. Bakke J, *et al.* (2010) A complete holocene history from Austre Okstindbreen, Arctic Norway based on lacustrine and terrestrial evidence. *Quaternary Science Reviews*:DOI: 10.1016/j.quascirev.2010.1002.1012.
21. Bradwell T, Dugmore AJ, & Sugden DE (2006) The Little Ice Age glacier maximum in Iceland and the North Atlantic Oscillation: evidence from Lambatungnajökull, southeast Iceland. *Boreas* 35(1):61-80.
22. Kirkbride MP & Dugmore AJ (2006) Responses of mountain lee caps in central Iceland to Holocene climate change. *Quaternary Science Reviews* 25(13-14):1692-1707.
23. Matthews JA (2005) 'Little Ice Age' glacier variations in Jotunheimen, southern Norway: a study in regionally controlled lichenometric dating of recessional moraines with implications for climate and lichen growth rates. *Holocene* 15(1):1-19.
24. Liestøl O (1967) Storbreen glacier in Jotunheimen, Norway. *Norsk Polarinstitutt Skrifter* 141:1-63.
25. Matthews JA & Karlen W (1992) Asynchronous Neoglaciation and Holocene Climatic-Change Reconstructed from Norwegian Glaciolacustrine Sedimentary Sequences. *Geology* 20(11):991-994.
26. Fægri K (1950) On the variations of western Norwegian glaciers during the last 200 years. *Association Internationale d'Hydrologie Scientifique, Assemblée Générale d'Oslo 1948* 2:293-303.
27. Bakke J, Dahl SO, & Nesje A (2005) Lateglacial and early-Holocene palaeoclimatic implications based on reconstructed glacier fluctuations and equilibrium-line altitudes at northern Folgefonna, Hardanger, western Norway. *Journal of Quaternary Science* 20(2):179-198.
28. Dahl SO & Nesje A (1994) Holocene glacier fluctuations at Hardangerjøkulen, central-southern Norway: a high-resolution composite chronology from lacustrine and terrestrial deposits. *The Holocene* 4:269-277.
29. Bakke J, Lie Ø, Nesje A, Dahl SO, & Paasche Ø (2005) Utilizing physical sediment variability in glacier-fed lakes for continuous glacier reconstructions during the Holocene, northern Folgefonna, western Norway. *The Holocene* 15(2):161-176.
30. Holzhauser H, Magny M, & Zumbuhl HJ (2005) Glacier and lake-level variations in west-central Europe over the last 3500 years. *Holocene* 15(6):789-801.
31. Reynaud L & Vincent C (2002) The period of glacier extension named Little Ice Age. *Houille Blanche* (8):16-19.