

**Table S1.** List of included studies by region.

Region	Site # in regional compilations	Original reference(s)	Lake name	Glacier or ice cap name	Latitude	Longitude
Alaska	1	McKay and Kaufman (2009)	Greyling lake	unnamed glaciers	61.386081	-145.73755
Alaska	2	McKay and Kaufman (2009)	Hallet lake	unnamed glaciers	61.49115	-146.24142
Alaska	3	Levy et al. (2004)	Waskey lake	unnamed glaciers	59.863254	-159.20727
Alaska	4	Zander et al. (2013)	Cabin lake	Sheridan glacier	60.529421	-145.45985
Alaska	5	LaBrecque and Kaufman (2016)	Emerald lake	Grewingk glacier	59.62688	-151.06176
Alaska	6	Daigle and Kaufman (2008)	Goat lake	North Goat glacier	60.257331	-149.90773
Arctic Canada	1	Thomas et al. (2010)	Longspur lake	unnamed glaciers	69.8	-69.2
Arctic Canada	2	Moore et al. (2001); Miller et al. (2005)	Donard lake	Caribou glacier	66.666667	-61.783333
Arctic Canada	3	Thomas et al. (2010)	Big Round lake	Kuuktannaq glacier	69.865183	-68.859517
Arctic Canada	4	Thomas et al. (2010)	Yougloo lake	Kuuktannaq glacier	69.83085	-68.607267
Arctic Canada	5	Thomas et al. (2010)	Igloo Door lake	Kuuktannaq glacier	69.853	-68.691017
Greenland	1	Medford et al. (2021)	Rapids and Bunny lakes	Renland Ice Cap	71.03272	-27.466573
Greenland	2	Larsen et al. (2019)	lake T3 and T8	Flade Isblink ice cap	81.33	-17.44
Greenland	3	Larocca et al. (2020a)	Alakariqsoq lake	unnamed glaciers	60.681783	-45.295083
Greenland	4	Larocca et al. (2020a)	Uunartoq lake	unnamed glaciers	60.582117	-45.0507
Greenland	5	Schweinsberg et al. (2019)	Pauiaivik lake	Sermikassak glacier	70.338693	-51.454854
Greenland	6	Adamson et al. (2018)	Madsen lake	Slettebreen ice cap	74.58	-21.07
Greenland	7	Axford et al. (2019)	Deltasø lake	North ice cap	76.75952	-67.61005
Greenland	8	Larsen et al. (2017)	Badesø lake	RGI40-05.07196 and RGI40-05.07208 glaciers	64.13	-51.36
Greenland	9	Schweinsberg et al. (2019)	Saqqap Tasersua lake	Qangattaq ice cap	70.183333	-51.5
Greenland	10	Schweinsberg et al. (2017)	Sikuiui lake	Qangattaq ice cap	70.219751	-51.122524
Greenland	11	Larsen et al. (2017)	Langesø lake	RGI40-05.07196 glacier	64.13	-51.33
Greenland	12	Lowell et al. (2013)	Bone lake	Istorvet ice cap	70.89	-22.27
Greenland	13	Schweinsberg et al. (2018)	Crash lake	unnamed glacier	65.68131	-51.29924
Greenland	14	Larocca et al. (2020a)	Quvnerit lake	unnamed glaciers	59.970383	-43.813717
Greenland	15	Levy et al. (2014)	Two Move lake	Bregne ice cap	70.912	-25.63
Greenland	16	Larocca et al. (2020b)	Pers lake	unnamed glaciers	63.8032	-51.19869
Greenland	17	van der Bilt et al. (2018)	Ymer lake	Ymer glacier	65.62242	-37.724488
Greenland	18	Larsen et al. (2017)	lake IS21	Qasiqiannguit ice cap	64.166583	-51.338067

Greenland	19	Larsen et al. (2019)	lake T4	Ice cap 1	81.36	-19.47
Greenland	20	Larsen et al. (2019)	lake T2 and T6	Ice cap 2	81.39	-18.83
Greenland	21	Balascio et al. (2015)	Kulusuk lake	Kulusuk glaciers	65.56	-37.11
Greenland	22	Larsen et al. (2021)	Smaragd Sø lake	Mittivakkat Glacier	65.6926	-37.9058
Iceland	1	Striberger et al. (2012)	lake Lögurinn	Eyjabakkajökull glacier	65.25	-14.41667
Iceland	2	Larsen et al. (2012)	lake Hvítárvatn	Langjökull ice cap	64.616667	-19.85
Iceland	3	Harning et al. (2016a; 2016b)	Tröllkonuvatn lake	Drangajökull ice cap	66.14252	-22.05607
Iceland	4	Harning et al. (2016a; 2016b)	Efra-Eyvindarfjarðarvatn lake	Drangajökull ice cap	66.0778	-21.95312
Iceland	5	Harning et al. (2016a)	Skorarvatn lake	Drangajökull ice cap	66.25627	-22.32213
Scandinavia	1	Lie et al. (2004)	lake Bukkehåmmårtjørna	Bukkehåmmårbreen glacier	61.462911	8.711695
Scandinavia	2	Matthews et al. (2000)	Bøvertunsvatnet lake	Leirbreen glacier	61.64271	8.072605
Scandinavia	3	Matthews et al. (2000)	Dalsvatnet lake	Liabreen and Høybreane glaciers	61.694001	8.179643
Scandinavia	4	Shakesby et al. (2007)	Liavatnet lake	Sekkebreen, Tverrbytnbreen, Kuppenbreen, Kupbreen, Tverreggibreen, Greinbreen, Tverrbotnbreen, Harbardsbreen, and Fortundalsbreen glaciers	61.853766	7.756761
Scandinavia	5	Vasskog et al. (2012)	lake Nerfloen	numerous glaciers (presently 52) including five outlet glaciers of Jostedalbreen glacier	61.933333	6.866667
Scandinavia	6	Nesje et al. (2000)	Nedre Sygneskardvatnet lake	Sygneskardbreen glacier	61.872287	7.292228
Scandinavia	7	Dahl and Nesje (1994); Dahl; Nesje (1996)	lakes Hestebotnvatn and Tungevatn	N Hardangerjøkulen glacier	60.544659	7.700267
Scandinavia	8	Karlén and Matthews (1992); Matthews and Karlén (1992)	Gjuvvatnet lake	unnamed glacier	61.527391	7.839419
Scandinavia	9	Nesje et al. (1994)	lake Isdalsvatn	SW Hardangerjøkulen glacier	60.449023	7.292332
Scandinavia	10	Bakke et al. (2010)	Vestre- and Austre Kjennsvatnet	Austre Okstindbreen glacier	66.069918	14.255108
Scandinavia	11	Bakke et al. (2005b; 2005c)	Dravladalsvatn, Vassdalsvatn, Vetlavatn, and Vassdalsvatn lakes	N Folgefonna	60.200678	6.466234
Scandinavia	12	Seierstad et al. (2002)	lake Grønningstølsvatnet	Grovabreen glacier	61.4461	6.47
Scandinavia	13	Nesje et al. (2001)	lake Jarbuvatnet	Flatebreen glacier	61.66202	6.786048
Scandinavia	14	Nesje et al. (2006)	lake Vanndalsvatnet	Spørteggbreen glacier	61.591799	7.361723
Scandinavia	15	Bakke et al. (2013)	lake Nedre Sørsendalsvatn	Blåbreen glacier	61.673883	6.28737
Scandinavia	16	Snowball and Sandgren (1996)	lakes Bajimus Gorsajávri, Vuolimus Gorsajávri, and Gaskkamus Gorsajávri	Kårsa glacier	68.333333	18.5
Scandinavia	17	Bakke et al. (2005a)	lake Aspvatnet	Lenangsbreene glacier	69.750028	19.96051
Scandinavia	18	Rosqvist et al. (2004)	Vuolep Allakasjaure lake	unnamed glacier	68.168104	18.1933218

Scandinavia	19	Nesje et al. (1995)	lake Grøndalsvatn	Ålfotbreen glacier	61.68933	5.567813
Scandinavia	20	Wittmeier et al. (2015)	lake Jökulvatnet, Store Rundvatnet, and Storvatnet	Langfjordjökelen ice cap	70.133333	21.716667
Svalbard	1	Allaart et al. (2021)	lake Femmilsjøen	NW Åsgardfonna Ice Cap	79.805308	15.730763
Svalbard	2	Røth et al. (2018)	lake Vårfluesjøen	Bybreen, Uglebreen, Salomonbreen, and Grennabreen glaciers	79.7269	14.4112
Svalbard	3	Svendsen and Mangerud (1997)	lake Linnèvatnet, east basin	Linnèbreen glacier	78.05	13.833333
Svalbard	4	Røth et al. (2015)	Kløsa lake	Karlbreen glacier	79.2397	11.5358
Svalbard	5	de Wet et al. (2018)	lake Gjøavatnet	Annabreen glacier	79.766667	10.8625
Svalbard	6	van der Bilt et al., 2015	lake Hajeren	North and South glaciers	79.259297	11.517847
Russian Arctic	1	Svendsen et al. (2019) & Hafliðason et al. (2019)	lake Bolshoye Shchuchye	unnamed glaciers	67.884065	66.310627
Russian Arctic	2	Andreev et al. (2008)	Changeable lake	Vaviloc ice cap	79.120034	95.129673
Russian Arctic	3	Lubinski et al. (1999)	non-lake record	review of 16 glacier margins	80.7994	55.263712