



Supplement of

The 1600 CE Huaynaputina eruption as a possible trigger for persistent cooling in the North Atlantic region

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SUPPLEMENT: SEA ICE OBSERVATIONS AND SOURCES

I. Observations from Voyages of Exploration

1576 Frobisher

Sources

Richard Collinson, ed., *The Three Voyages of Martin Frobisher: In Search of a Passage to Cathaia and India by the North-West, A.D. 1576-8, Reprinted from the First Edition of Hakluyt's Voyages, with Selections from Manuscript Documents in the British Museum and State Paper Office* (London: Hakluyt Society, 1867).

James McDermott, ed., *The Third Voyage of Martin Frobisher to Baffin Island, 1578* (London: Hakluyt Society, 2001).

Vilhjamur Stefansson, ed., *The Three Voyages of Martin Frobisher*, 2 vols. (London: Argonaut Press, 1938).

George Best, *A True Discourse of the Late Voyages of Discoverie, for the Finding of a Passage to Cathaya, by the Northwest, Under the Conduct of Martin Frobisher Generall* (London: Henry Bynnyman, 1578).

E Greenland

“sayling norhweast from Englande upon the firste of July, at length he hadde sighte of a highe and ragged lande, whiche he judged Freeselande (whereof some auhtours have made mention), but durst not approche the same by reason of the greate store of ise that lay alongst the coast, and the great mistes that troubled them not a little.” (George Best, “A True Discourse of the Late Voyages of Discoverie,” in *The Three Voyages of Martin Frobisher*, ed. Richard Collinson (London: Hakluyt Society, 1867), 71.

“and on the 11th day of July they had sight of land unknown to them, for they could not come to set fote thereon for the marveilous haboundance of monstrous great ilands of ise which lay dryving all alongst the coast therof. But by conjecture had owt of histories and cartes of cosmography yt should seeme to be the great Ilond of Friseland, which they say all along the eastern syde therof.” (document attributed to Michae Lok in Richard Collinson, ed., *The Three Voyages of Martin Frobisher: In Search of a Passage to Cathaia and India by the North-West, A.D. 1576-8, Reprinted from the First Edition of Hakluyt's Voyages, with Selections from Manuscript Documents in the British Museum and State Paper Office* (London: Hakluyt Society, 1867), 80).

“Wee failed to shoare and could finde no ground at 150 fathoms, we hois[t]ed our our boate, and the Captaine with 4 men rowed to the shoare to get on land, but the land lying full of yce, they could not get on land...” (Christopher Hall, “The First Voyage of Martin Frobisher,” in *The Three Voyages of Martin Frobisher*, ed. Vilhjamur Stefansson, vol. 1 (London: Argonaut Press, 1938), 151.)

Labrador

“And the twentieth of July hee hadde sighte of a highe lande, whyche hee called Queene Elizabeth's Forlande, after hyr Majesties name, and sayling more northerlie alongst the coast he

descried another forlande with a great gutte, bay, or passage, deviding as it were, two maynelands or continents asunder. There he met with store of exceeding great ise al this coast along” (George Best, “A True Discourse of the Late Voyages of Discoverie,” in *The Three Voyages of Martin Frobisher*, ed. Richard Collinson (London: Hakluyt Society, 1867), 72).

“...iudging themselves to be not far from [the] new land named Labrador ... they saw that land and found [it] so compassed with monstrous high ilands of ise fleting [b]y the sea shore, that they durst not approche with [th]eir ship” (document attributed to Michae Lok in Richard Collinson, ed., *The Three Voyages of Martin Frobisher: In Search of a Passage to Cathaia and India by the North-West, A.D. 1576-8, Reprinted from the First Edition of Hakluyt’s Voyages, with Selections from Manuscript Documents in the British Museum and State Paper Office* (London: Hakluyt Society, 1867), 81).

“wee had sight of lande, which I supposed to be Labrador, with great store of yce about the land: I ranne in towards it, and sownded, but could get no ground at 100 fathom, and the yce being so thicke, I could not get to the shoare...” (Christopher Hall, “The First Voyage of Martin Frobisher,” in *The Three Voyages of Martin Frobisher*, ed. Vilhjamur Stefansson, vol. 1 (London: Argonaut Press, 1938), 152)

Baffin

“after he hadde passed 60 leagues into this foresayde strayte [Frobisher’s Bay] hee wente ashore.” (George Best, “A True Discourse of the Late Voyages of Discoverie,” in *The Three Voyages of Martin Frobisher*, ed. Richard Collinson (London: Hakluyt Society, 1867), 73).

“The hed land wherof he named Elizabeth Foreland in memory of the Quene’s Majestie. And drawing still nere thereto in great comfort, when they approached nere they fownd the sea-shore full of monstrous high ilands and mountayns of ise fleting and driving with the wyndes and tydes and streams so as they durst not yet approche with their ship to land theron. Nevertheles remaining...within the tyme of xvi days the yse being well consumed and gone: they did land in three or four places...” (document attributed to Michae Lok in Richard Collinson, ed., *The Three Voyages of Martin Frobisher: In Search of a Passage to Cathaia and India by the North-West, A.D. 1576-8, Reprinted from the First Edition of Hakluyt’s Voyages, with Selections from Manuscript Documents in the British Museum and State Paper Office* (London: Hakluyt Society, 1867), 82).

W Greenland

“The first day of September in the morning, we had sight of the land of Friseland, being eight leagues from us, but wee could not come nearer it, for the monstrous yce that lay about it...” (Christopher Hall, “The First Voyage of Martin Frobisher,” in *The Three Voyages of Martin Frobisher*, ed. Vilhjamur Stefansson, vol. 1 (London: Argonaut Press, 1938), 154.)

1577 Frobisher

Sources

Richard Collinson, ed., *The Three Voyages of Martin Frobisher: In Search of a Passage to Cathaia and India by the North-West, A.D. 1576-8, Reprinted from the First Edition of Hakluyt’s*

Voyages, with Selections from Manuscript Documents in the British Museum and State Paper Office (London: Hakluyt Society, 1867).

James McDermott, ed., *The Third Voyage of Martin Frobisher to Baffin Island, 1578* (London: Hakluyt Society, 2001).

Vilhjammur Stefansson, ed., *The Three Voyages of Martin Frobisher*, 2 vols. (London: Argonaut Press, 1938).

George Best, *A True Discourse of the Late Voyages of Discoverie, for the Finding of a Passage to Cathaya, by the Northwest, Under the Conduct of Martin Frobisher Generall* (London: Henry Bynnyman, 1578).

E Greenland

“Our general proved landing here twice, but by the suddaine fall of mistes (whereunto this coast is much subject) he was like to lose sight of his ships, and being greatly endangered with the driving ise alongst the coast, was forced aboard...and having spent four dayes and nights sailing alongst this land, finding the coast subject to such bitter cold and mistes, he determined to spend no more time therein...” (George Best, “A True Discourse of the Late Voyages of Discoverie,” in *The Three Voyages of Martin Frobisher*, ed. Richard Collinson (London: Hakluyt Society, 1867), 126).

Labrador

[no reports of ice on way to Baffin]

Baffin

[the ships land to collect ore]

1578 Frobisher

E Greenland

[they make land and see people]

Labrador

[no mention]

Baffin

“The seconded aye of July, early in the morning, wee had sight of the Queenes Forelande, and bare in with the lande all the daye, and passing thorow great quantitie of ise, by nighte, were entered somewhat within the staites [Frobishers Bay], perceiving no way to passe further in, the whole place being frozen over from the one side to the other, and as it were with many walles, mountains, and bulwarkes of yse, choked up the passage and denied us entrance” (George Best, “A True Discourse of the Late Voyages of Discoverie,” in *The Three Voyages of Martin Frobisher*, ed. Richard Collinson (London: Hakluyt Society, 1867), 234).

“The cause why thys yeare we have beene more combred with ise (than at other times before) may be by reason of the easterly and southerly windes” (ibid., 235)

[the ships strike heavy ice and one sinks; ships are trapped by ice; two others are missing; ships do not land on Baffin until end of July]

W Greenland

[no mention]

1585 Davis

Sources

Albert Hastings Markham, ed., *The Voyages and Works of John Davis, the Navigator* (London: Hakluyt Society, 1880).

SE Greenland

They sail around the southern tip of Greenland “not being able to come neere the shoare by reason of the great quantitie of yce” [and] “hee found so much yce, that he could not get to land by any meanes” (John James, “The First Voyage of Master John Davis,” in *The Voyages and Works of John Davis, the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 5)

Western Greenland and Baffin

In early August off the coast of Greenland near 65°N (possibly today’s Nuuk) “The weather was not very colde, but the ayre was moderate like to our April weather in England” [and] “utterly voyde of the pester of yce” (John James, “The First Voyage of Master John Davis,” in *The Voyages and Works of John Davis, the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 6)

They reach the coast at 66°44’ N “altogether voyd from the the pester of yce” (John James, “The First Voyage of Master John Davis,” in *The Voyages and Works of John Davis, the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 9)

Baffin

[They cross the Davis Strait, entering deep into the Cumberland Sound]

1586 Davis

Sources

Albert Hastings Markham, ed., *The Voyages and Works of John Davis, the Navigator* (London: Hakluyt Society, 1880).

SE Greenland

On 25 June they approach Greenland (possibly Cape Farewell) “mightily pestered with yce and snow, so that there was no hope of landing” (John Davis, “The Second Voyage Attempted by Master John Davis with Others, for the Discoverie of the Northwest Passage, in Anno 1586,” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 15)

The expedition sends two ships (*Sunshine* and *Northstarre*) to find a passage between Iceland and Greenland: They depart Iceland 26 June, heading northwest until they meet impassible islands of ice on the 13 July. They head west reaching Greenland on the 17 July, but “we could not come to harborough in to the land because we were hindered by a firme land, as it were, of ice” (Henry Morgan, “The Relation of the Sunshine and the Northstarre to the Discover the Passage Betweene Groenland and Island,” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 33–38, at 35 (quoted).)

W Greenland

Expedition rounds the cape of Greenland “after many tempestuous storms” reaching the southwest coast again at 58°30’N (John Davis, “The Second Voyage Attempted by Master John Davis with Others, for the Discoverie of the Northwest Passage, in Anno 1586,” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 15) They encounter Inuit again along the coast and explore fjords along the southwest Greenland coast during early July.

In early August, at 63°8’N “we fel upon a most mighty and strange quantity of ice” (a giant iceberg) (John Davis, “The Second Voyage Attempted by Master John Davis with Others, for the Discoverie of the Northwest Passage, in Anno 1586,” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 15–31, at 24 (qutoed).)

“the ayre at this time was so contagious, and the sea so pestered with ice, as that all hope was banished of proceeding: for the 24 of July (= 9 August in Gregorian calendar) all our shrowds, ropes, and sailes were so frozen, and compassed with ice” (John Davis, “The Second Voyage Attempted by Master John Davis with Others, for the Discoverie of the Northwest Passage, in Anno 1586,” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 15–31, at 24 (qutoed).)

“Our men through this extremity began to grow sicke and feeble, and withal hopelesse of good successe” and they intreat the captain to turn back (ibid); so he sends the *Mermaid* back and continues with the bark *Moonelight*

They reach 66°33’N on Aug 11 “void of trouble, without snow or ice”; the weather turns warmer and they are pestered by mosquitoes (John Davis, “The Second Voyage Attempted by Master John Davis with Others, for the Discoverie of the Northwest Passage, in Anno 1586,” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 15–31, at 26 (quoted).)

They crossed the Davis Strait in late August

Baffin

The expedition finds excellent fishing and hunting off Baffin Island “the fish swimming so abundantly thicke about our barke as is incredible to bee reported” (John Davis, “The Worlde’s Hydrographical Discription [1595],” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 190–228, 209.)

On Sept 11 they encountered “two very great stormes” (John Davis, “The Second Voyage Attempted by Master John Davis with Others, for the Discoverie of the Northwest Passage, in Anno 1586,” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 15–31, at 29 (quoted).)

On Sept 16: two men are ambushed and killed by Inuit; then “it pleased God further to increase our sorrowes with a mighty tempestuous storme, the winde being North northeast, which lasted unto the tenth of this moneth very extreme.” (John Davis, “The Second Voyage Attempted by Master John Davis with Others, for the Discoverie of the Northwest Passage, in Anno 1586,” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 15–31, at 30 (quoted).)

Their ship suffers damage and they turn back the following day, reaching England in mid-October

1587 Davis

Sources

Albert Hastings Markham, ed., *The Voyages and Works of John Davis, the Navigator* (London: Hakluyt Society, 1880).

Greenland

They round the Greenland coast, conducting some trade with the Inuit, sailing up to Sanderson’s Hope past 72°N, on July 10. They encountered ice and turned out to sea, then heading southwest. Davis described reaching 73°N and seeing his Strait widen, so he decided to strike out west, hoping to round America; after sailing west for 40 leagues “I fel upon a great banke of yce: the winde being North and blew much, I was constrained to coast the same toward the South” (John Davis, “The Worlde’s Hydrographical Discription [1595],” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 190–228, at 210.)

Baffin

The expedition coasted south along the Baffin coast past Frobisher’s “strait” and then; on August 10 “we fell into one of those overfals with a fresh gale of wind... This day and night we passed a very great gulf, the water whirling and roing, as it were the meetings of tides.” (probably Hudson’s Strait) (John Janes, “The Third Voyage Northwestward, Made by John Davis, Gentleman,” in *The Voyages and Works of John Davis the Navigator*, ed. Albert Hastings Markham (London: Hakluyt Society, 1880), 39–58, at 47 (quoted).)

1594 Barents

Sources

Jan Huyghen van Linschoten, “Voyagie, of Schipvaart, van Ian Huyghen van Linschoten, van bijnoorden om lans Noorwegen, de Noordkaap, Lapland, Finland, Rusland, &c. Anno 1594 en 1595.”

Novaya Zemlya

This expedition in search for a Northeast Passage consisted of three ships. Two of the ships attempted to get into the Kara Sea through the Yugor Strait, while the third ship – captained by Willem Barents – tried to get around the northwestern coast of Novaya Zemlya. The journal was written by Van Linschoten, who remained with the two ships that penetrated into the Kara Sea. Barents and his crew returned to those two ships on 15 August. Van Linschoten writes that Barents recounted that he and his crew had reached 78 °N but could not find a passage through the sea ice, and owing to that impediment – and “many other things” – they were forced to turn back.

1596-97 Barents

Sources

Gerrit de Veer, *Reizen van Willem Barents, Jacob van Heemskerck, Jan Cornelisz. Rijp en Anderen Naar het Noorden (1594-1597), Eerste Deel.*

Bjørnøya

At Bjørnøya on 8 June this expedition of two ships came to “so great a heape of Ice, that wee could not saile through it, because it was so thicke.” They maneuvered to avoid the ice and sail for the island.

Spitsbergen

After sailing west they found a way north until they discovered “a great store of ice” on 17 June, and then on 19 June the island of Spitsbergen. They couldn’t find a way through the ice so they sailed back to Bjørnøya. On 1 July the ships split up: the first ship, piloted by Barents, made for Novaya Zemlya. A crew aboard the second ship, captained by Cornelis Rijp, sailed north again to find a way through the ice around Svalbard. When they failed, they pursued the first ship.

Novaya Zemlya

On 4 August Barents and his crew found a way through the ice around Novaya Zemlya and found a way to the northeast corner of the island, yet the crew on the second ship, arriving at the island not long after, found their way blocked. Despite finding a passage through the ice, Barents and his crew were still surrounded by thick and perilous sea ice. According to a later English translation of this journal, on 10 August for example:

“The Ice began mightily to breake, and then wee first perceived that the great peece of Ice whereunto wee had made our Shippe fast, lay on the ground; for the rest of the Ice draue along [passed by] it, wherewith wee were in great feare that wee should be compassed about with the Ice.” So they laboured to get away and were in “great doubt; and being under sayle, wee sayled upon the Ice, because it was all broken under us, and got to an other peece of Ice; whereunto wee made out Shippe fast againe with our Sheate Anchor, which wee made fast upon it; and there wee lay till Evening.” But, “when wee had supped, in the first quarter, the sayd peece of Ice began on a sodaine to burst and rende in peeces, so fearfully that it was admirable; for with one great cracke it burst into foure hundred peeces at the least: wee lying fast to it, weied [weighed] our Cable, & got off from it, under the water it was ten Fadome deepe, and lay upon the grond,

and two fadome above the Water; and it made a fearefull noyse both under and above the Water when it burst, and spread it selfe abroad on all sides. And being with great feare, gotten from that peece of Ice, wee came to an other peece, that was five Dafome deepe under the Water: to which we made a Rope fast on both sides.” Then they saw another big piece of ice that was sharp on the top like a tower, and it lay 20 fathoms deep.”

After rounding the northern coast of Novaya Zemlya, Barents and his crew found that sea ice kept them from sailing far to the southeast, so in August they tried to retrace their steps, only to find their way blocked by more ice. On 27 August they were trapped by ice in northeastern Novaya Zemlya.

On 24 August, “The Ice came mightily driving in, whereby we were in a manner compassed about therewith, and withall the winde began more and more to rise, and the Ice still draue harder and harder, so that the pin of the rother [rudder, I think] and the rother were shorne in pieces and our boate was shorne in pieces betweene the ship and the Ice, we expecting nothing else, but that the ship also would be prest and crusht in pieces with the Ice.”

On 30 August, “the Ice began to drive together one upon the other with greater force then before, and bare against the ship with a boystrous south-west wind, and a great snowe, so that all the whole ship was borne up and inclosed, whereby all that was about it and in it, began to crack, so that it seemed to burst in a 100 pieces, which was most fearfull both to see and heare and made all the haire of our heads to rise upright with feare: after that, the ship (by the Ice on both sides that joyned and got under the same) was driven so upright, in such sort, as it had bin lifted up with a wrench or vice.”

On 11 September it was obvious that there would be no escape, so the crew decided to overwinter there. After the overwintering, on 14 June, they set sail for home in two small boats; their ship was still stuck in the ice. They rounded the northwestern coast of Novaya Zemlya and travelled south east in the direction of Norway. They reported extensive sea ice that repeatedly nearly trapped their boats until August. Barents died of scurvy shortly after they set sail.

1602 Weymouth

Sources

George Weymouth, “The Voyage of Captaine George Weymouth, Intended for the Discoverie of the North-West Passage toward China, with Two Fly Boates,” in *Hakluytus Posthumus, or Purchas His Pilgrimes*, ed. Samuel Purchas, vol. 14 (London: Hakluyt Society, 1905), 306–18.

Greenland

On June 28, they sight a “great Iland of Ice” and then the southern cape of Greenland. They continue due west past Greenland until they sight land at 62°30’ on July 8. They do not manage to land on Greenland.

Baffin

On July 9, they pass an inlet “and the next Southerly Inlet, where the great Current setteth to the West, must of necessity be one Sea; which will be the great hope of the passage that way” with “good stiff gale with fogge”

July 10: “fogge and Snow”

July 11: “winde was at West, with fogge and Snow; the ayre being very cold. This day wee came into many Overfals, which seemed to runne a great current”

The weather clears up on the 12th, but then very thick fog on the 13th “that we were hard by the Ice, before we could see it.”

They spot land again on July 18 at 63°53” but cannot approach for the ice

July 19: storm and dense fog.

27 July: the ships is nearly crushed by ice in the thick fog “whereupon we thought good to take in some of our sayles; and when our men came to hand them, they found our sayles, ropes, and tacklings, so hard frozen, that it did seeme very strange unto us, being in the chieftest time of Summer.”

July 28: “the ayre being very cleere and extreame cold, with an exceeding great frost”; “at two of the clock in the afternoone, the winde began to blow very hard, with thicke fogge, which freezed so fast as it did fall upon our sayles, ropes, and tacking, that we could not almost hoise or strike our sayles, to have any use of them.” “This extreame frost and long continuance thereof, was a maine barre to our proceedings to the Northward, and the discouraging of all our men.”

July 29: The crew threatens to mutiny unless the expedition turns south.

August 1: they narrowly escape being crushed by a capsizing iceberg

August 4-5: an easterly gale blows them into what felt like an inlet at 61°40’

They continue to face contrary winds, fogge and rain for a few days while leaving the inlet, until a northwesterly gale blew them out: “Now because the time of the yeare was farre spent, and many of our men in both Shippes sicke, wee thought it good to returne with great hope of this Inlet, to bee a passage of more possibilitie, then through the Straight of Davis”

Labrador

They continue to face danger from sea ice as they pass down the Labrador coast to 55°N in mid-August. They continue to meet strong winds and storms along the Labrador coast in late August and take the opportunity of a favorable westerly wind to “cleare our selves of the Land Ice” and return to England.

1603 Gorden

Sources

William Gorden, “A Voyage performed to the Northwards, Anno 1603, in a ship of the burthen of fiftie tunnes, called the Grace, and set forth at the cost and charges of the Worshipfull Francis Cherie. Written by William Gorden; being the first Voyage to Cherie Island...”.

Bjørnøya

In 1603, a small English crew set sail for the north. Their orders were to sell some goods at a well-known port and then go exploring to around 80° N if possible. Instead in August they happened across Bjørnøya, the southernmost part of the Svalbard archipelago, which had been discovered by Barents and crew in 1596. They seemed unaware of the earlier discovery and called the island Cherie Island, in honor of their merchant sponsor. They made no report of sea

ice, which is not surprising; it was August and there shouldn't have been much if any ice around Bjørnøya, even in a cold year.

1604 Poole

Sources

Jonas Poole, "Divers Voyages to Cherie Iland, in the yeeres 1604. 1605. 1606. 1608. 1609," in *Purchas His Pilgrimes* Vol. 13.

Bjørnøya

In 1604, an English crew aboard a small ship, led by Jonas Poole, sailed for Bjørnøya to hunt the abundant walrus there. They arrived on 2 July, and on 9 July, they observed a "great store of ice" on south-southeast side of Bjørnøya. They sailed around the island and reported "some scattering Ice" distributed "all along the shoare."

1605 Poole

Sources

Jonas Poole, "Divers Voyages to Cherie Iland, in the yeeres 1604. 1605. 1606. 1608. 1609," in *Purchas His Pilgrimes* Vol. 13.

Bjørnøya

A crew under Poole sailed for Bjørnøya. They initially made no report of sea ice when they arrived, even though they arrived earlier than in the previous year. On the 24 June they encountered an "abundance of yce driving toward the Iland, but the winde and tyde shifting, put it another way." It seems that the ice was coming towards Miseryfjellet, on the southeastern coast of the island.

1605 Cunningham

Sources

Christian Carl August Gosch, *Danish Arctic Expeditions, 1605 to 1620*, vol. 1 (London: Hakluyt Society, 1897).

SE Greenland

Cape Farewell "So, stadeninge all this afternoon into the shore to se if it were possible to sease upon it we comeinge within 3 english leages of the same, founde all the cost so thicke beset with yce that it was not possible for anye shippe to come into the shore; yet, notwithstanding, we ventured so far within the same as coulde convenientlye; for we were, in a manner, compassed aboute eith Ilandes of yce" (James Hall, "A Report to King Christian IV of Denmark on the Danish Expedition to Greenland ... in 1605," in *Danish Arctic Expeditions, 1605-1620*, ed. Christian Carl August Gosch, vol. 1 (London: Hakluyt Society, 1897), 5)

They continue SW "all alongst this lande the yce lieth verie far of" [and] "found oure selves often suddenlye compassed aboute with yce" (James Hall, "A Report to King Christian IV of

Denmark on the Danish Expedition to Greenland ... in 1605,” in *Danish Arctic Expeditions, 1605-1620*, ed. Christian Carl August Gosch, vol. 1 (London: Hakluyt Society, 1897), 6,7)

[on the return voyage]:

“11 of Julye, wee tooke oure waye homewardes, thinkeinge to keepe the cost alongst of the southwards, but, comminge to the southwards of Queene Annes Cape, we founde great bankes of yce, wheby we were forssed to stand to seabord” (James Hall, “A Report to King Christian IV of Denmark on the Danish Expedition to Greenland ... in 1605,” in *Danish Arctic Expeditions, 1605-1620*, ed. Christian Carl August Gosch, vol. 1 (London: Hakluyt Society, 1897), 15)

SW Greenland

After rounding the southern tip of Greenland, they are able to proceed north still meeting ice, but able to pass through; they make land and meet Inuit (James Hall, “A Report to King Christian IV of Denmark on the Danish Expedition to Greenland ... in 1605,” in *Danish Arctic Expeditions, 1605-1620*, ed. Christian Carl August Gosch, vol. 1 (London: Hakluyt Society, 1897), 8-11)

(NB: Everything in this account is confirmed in a second report by the same author reproduced in the same source.)

1606 Poole

Sources

Jonas Poole, “Divers Voyages to Cherie Iland, in the yeeres 1604. 1605. 1606. 1608. 1609,” in *Purchas His Pilgrimes* Vol. 13.

Bjørnøya

Poole and a crew again made for Bjørnøya, but this time they ran into impassable sea ice allegedly “fiftie five leagues” from the North Cape, Norway. They headed back to the Cape and finally found a way around the ice. When they got to Bjørnøya, they found it surrounded with sea ice.

1606 Godske Lindenov

Sources

Christian Carl August Gosch, *Danish Arctic Expeditions, 1605 to 1620*, vol. 1 (London: Hakluyt Society, 1897).

Labrador

The expedition, based on the surviving account, was swept by a strong E Greenland current all the way to the coast of Labrador: “The eighteenth [July], also thicke weather being forced to stand away North Northwest to double a great banke with great Mountaines of Ice almost incredible to be reported; yet, by the helpe of God, wee passed the same, sayling all this day by great and huge mountainous Ilands of Ice, with the wind at the Southwest and by South, being at no one in the latitude of 63 degrees 45 minutes. Wee did see our selves beset round with mightie bankes of Ice, being forced to make more saile and to lye to and againe all this night to keepe us cleere of great and small Ilands of Ice, where many times we were in such danger, that we did

looke for no other thin then present death...” (James Hall, “An Account of the Danish Expedition to Greenland, under the Command of Captain Godske Lindenow, in 1606,” in *Danish Arctic Expeditions, 1605-1620*, ed. Christian Carl August Gosch (London: Hakluyt Society, 1897), 61) (Note: C. Gosch takes this to describe entrance to Nachvak Fjord.)

Baffin

“wee saw the Land of America, about the latitude of 64 degrees, it lying next hand South and North, being high ragged Land covered with snow, the shoare being all beset with Ice. So, lying off and on amongst the Ice, in great perill till about no one, when God of his goodnesse sent us to espie a little gut, where we went through, and stood South Southeast away...” (James Hall, “An Account of the Danish Expedition to Greenland, under the Command of Captain Godske Lindenow, in 1606,” in *Danish Arctic Expeditions, 1605-1620*, ed. Christian Carl August Gosch (London: Hakluyt Society, 1897), 62)

“the twentieth [July], wee still sayled to the Eastwards, by many great Bankes and Ilands of Ice, being still compassed in, wee being forced to stand out to the Southwards to get cleere” (James Hall, “An Account of the Danish Expedition to Greenland, under the Command of Captain Godske Lindenow, in 1606,” in *Danish Arctic Expeditions, 1605-1620*, ed. Christian Carl August Gosch (London: Hakluyt Society, 1897), 63)

W Greenland

They are able to land for long enough to gather ore: “wee returned amongst many greene and pleasant Ilands, where we found good anchorings.” (Note: C. Gosch takes this to be Kangerlussuaq Fjord) (James Hall, “An Account of the Danish Expedition to Greenland, under the Command of Captain Godske Lindenow, in 1606,” in *Danish Arctic Expeditions, 1605-1620*, ed. Christian Carl August Gosch (London: Hakluyt Society, 1897), 67)

Knight 1606

Sources

Clements R. Markham, “The Journal of the Voyage of John Knight,” in *The Voyages of Sir James Lancaster* (London: Hakluyt Society, 1877), 281–94.

Samuel Purchas, ed., “The Voyage of Master John Knight...for the Discovery of the North-West Passage, Begun the Eighteenth of Aprill 1606,” in *Hakluytus Posthumus, or Purchas His Pilgrimes*, vol. 14 (London: Hakluyt Society, 1905), 353–65.

Thomas Rundall, ed., *Narratives of Voyages Towards the North-West in Search of a Passage to Cathay and India, 1496 to 1631* (London: Hakluyt Society, 1849).

Greenland

The expedition never approaches Greenland shore, and meets ice far out into sea:

June 13: first encounter with ice (Clements R. Markham, “The Journal of the Voyage of John Knight,” in *The Voyages of Sir James Lancaster* (London: Hakluyt Society, 1877), 281–94, at 286 (this is omitted in the edited version of the journal in Purchas).)

June 18: “all this 24 howers we were so pested with ise that we wer twice so inclosed about with ise that we were fayne to take in all our sayles” (Clements R. Markham, “The Journal of the

Voyage of John Knight,” in *The Voyages of Sir James Lancaster* (London: Hakluyt Society, 1877), 281–94, at 287.)

They are continually plagued with ice as they cross the Atlantic westward at between 57 and 58°N

June 23: They sight land, possibly islands, at 57°25” through “great flakes of Ice” (Samuel Purchas, ed., “The Voyage of Master John Knight...for the Discovery of the North-West Passage, Begun the Eighteenth of Aprill 1606,” in *Hakluytus Posthumus, or Purchas His Pilgrimes*, vol. 14 (London: Hakluyt Society, 1905), 353–65, at 358.)

June 24-25: at 58° ran into ice; tried to row through but became hampered; weather turned foggy; easterly gales driving the ship landward; “From Saturday at noone till midnight wee guided our shippe to the Westward among the Ice with our Oares, hoping to get thorough: but wee were suddenly compassed about with many great Ilands of Ice, and continued so distressed with a sore storme of wind at South-east, being foggie and thicke weather: we were so bruised betweene mightie grat Ilands of Ice, that we were in danger every minute to be crushed in pieces...” (Samuel Purchas, ed., “The Voyage of Master John Knight...for the Discovery of the North-West Passage, Begun the Eighteenth of Aprill 1606,” in *Hakluytus Posthumus, or Purchas His Pilgrimes*, vol. 14 (London: Hakluyt Society, 1905), 353–65, at 358-59.)

Labrador

June 29: they sight the mainland at 56°48”

July 2: northerly gales begin to drive ice into the ship (Clements R. Markham, “The Journal of the Voyage of John Knight,” in *The Voyages of Sir James Lancaster* (London: Hakluyt Society, 1877), 281–94, at 292.)

July 4: a northerly storm drive ice into the rudder, breaking it from the stern; they are forced to take the ship into a cove

July 5: set men to building the shallop; “Also I caused our Boate to be lanced over the Iland; and sent my Mate Edward Gorrell, with three others, to seeke a better place where to bring our ship on ground, it it were possible, to mend her againe. But they returned without any certaintie by reason of the abundance of Ice, which choked every place.” (Samuel Purchas, ed., “The Voyage of Master John Knight...for the Discovery of the North-West Passage, Begun the Eighteenth of Aprill 1606,” in *Hakluytus Posthumus, or Purchas His Pilgrimes*, vol. 14 (London: Hakluyt Society, 1905), 353–65, at 359-60.)

Their ship is damaged and after a narrow escape from ice they reach Newfoundland to seek help from fishermen.

1607 Carsten Richardson

Sources

Isaac de La Peyrère, *Relation du Groenland* (Paris: Augustin Courbe, 1647).

Claus Christoffersen Lyschander, *Den Gronlanske Chronica* (Copenhagen: Benedicte Laurentz, 1608).

Greenland

They are completely unable to land and forced to turn back: “Le huitième jour du mois de Juin suivant, il descouvrit les sommets des montagnes de Groenland; mais il ne pût aborder la terre, à causes des glaces qui y estoient attachées, & qui s'estendoient bien avant dans la mer. Il y avoit

dessus ces glaces, d'autres glaces si haut amoncelées, qu'elles sembloient de grands rochers. Et le Chroniqueur remarque en cet endroit, qu'il y a des années que les glaces de Groenland ne se fondent point en Esté. Le Capitaine Holstainois fut contraint de revenir sans rien faire; & ce qui l'obligea encore plus à cela fut, que son second navire s'estoit escarté du sien, dans une tempeste qui les avoit separées; & qu'il estoit seul lors qu'il aborda les glaces. Le Roy de Danemarc receut ses excuses, & l'impossibilité qu'il allegua.” (Isaac de La Peyrère, *Relation du Groenland* (Paris: Augustin Courbe, 1647), 166-69)

1607 Hudson

Sources

Hudson, Henry and John Playse (1860). “Divers Voyages and Northerne Discoveries of that Worthy Irrecoverable Discoverer, Master Henry Hudson,” in *Henry Hudson the navigator: the original documents in which his career is recorded*, London: Hakluyt Society.

Spitsbergen

In 1607, Hudson and a crew sought a northern passage between Svalbard and Greenland. They ran into sea ice off the southeastern coast of Greenland, then sailed northeast for Svalbard. They probably sailed to around 80 °N, off the coast of Spitsbergen, until on 10 June “we found we were compassed with ice every way about us.” They maneuver around sea ice but make no headway north.

On 16 June, “we saw that were compassed in with ice in abundance, lying to the north, to the north-west, the east and south-east; and being runne toward the farthest part of the land by us discovered, which for the most part trendest nearest hand north-east and south-west, wee saw more land joyning to the same, trending north in our sight, by meanes of the cleernesse of the weather, stretching farre into 82 degrees, and by the bowing or shewing of the skie much farther. Which when I first saw, I hoped to have had a free sea between the land and the ice, and meant to have compassed this land by the north. But now, finding by prooffe it was impossible, by means of the abundance of ice compassing us about by the north and joyning to the land, and seeing God did blesse us with a faire wind to sayle by the south of this land to the north-east, we returned”.

1608 Hudson

Sources

Hudson, Henry and John Playse (1860). “Divers Voyages and Northerne Discoveries of that Worthy Irrecoverable Discoverer, Master Henry Hudson,” in *Henry Hudson the navigator: the original documents in which his career is recorded*, London: Hakluyt Society.

Novaya Zemlya

Hudson and his crew tried to chart a Northeast Passage around Novaya Zemlya. On 9 June at over 75 °N, Hudson reported that “we entred into ice, being the first we saw in this voyage.” They sailed southeast until they began to approach the coast. They could find no way further north and, on 25 June, Hudson concluded that, with “ice on our larboord,” their “hope of passage was gone this way, by meanes of our nearnesse to Nova Zembla and the abundance of ice.”

1608 Poole

Sources

Jonas Poole, “Divers Voyages to Cherie Iland, in the yeeres 1604. 1605. 1606. 1608. 1609,” in *Purchas His Pilgrimes* Vol. 13.

Bjørnøya

A crew under Poole sailed for Bjørnøya. They did not report sea ice around the island when they arrived on 13 June, even though they anchored on the northwestern side of the island. On 20 and 21 June they reported temperatures so hot that they were reminded of summer in England. “The Pitche did runne downe the ships sides; and that side of the Masts that was to the Sunne ward, was so hot, that the Tarre did frye out of it, as though it had boyled.” They made no report of sea ice at all.

1609 Poole

Sources

Jonas Poole, “Divers Voyages to Cherie Iland, in the yeeres 1604. 1605. 1606. 1608. 1609,” in *Purchas His Pilgrimes* Vol. 13.

Bjørnøya

Poole and a crew aboard two ships arrived on 8 May, and while “it did freeze very hard,” they “found no Ice about the Iland, save that which clave to the Rockes.” On 13 May “very much Ice” surged in from the south and west, so fast that they were forced to weigh anchor and stand for the north side of the Island. Still the ice followed them and enclosed them. They managed to escape when the wind changed direction, but the sea was everywhere full of ice.

1610-11 Hudson

Sources

Hudson, Henry and John Playse (1860). “Divers Voyages and Northerne Discoveries of that Worthy Irrecoverable Discoverer, Master Henry Hudson,” in *Henry Hudson the navigator: the original documents in which his career is recorded*, London: Hakluyt Society.

Baffin

This was the fourth expedition led by Henry Hudson; the third did not approach the locations of interest. Both the third and fourth expeditions involved a search for a Northwest Passage. During this expedition, around southeast Greenland on 5 June, Hudson reported being “encombred with much ice, which hung upon the coast of Groneland.” They sailed southwest from Greenland to what was later called the Hudson Strait, where they “plyed up to the westward as the land and ice would suffer.” According to Abacuk Prickett, they navigated around a “mountayne of ice,” and then “great ilands” – which they noticed could overturn – as well as “store of the smaller sort [of ice].” A storm in late June “brought the ice so fast upon us, that in the end we were driven to put [the ship] into the chiefest of the ice, and there to let her lie.” They were shortly thereafter “inclosed with ice,” and the more Hudson “strove the worse he was, and the more inclosed, till

we could go no further.” Eventually they found their way through the ice into what was later called Hudson Bay, but by 10 November they were entirely surrounded by sea ice, and had to overwinter. They set sail in June 1611, and fell into ice on 18 June. In July, mutinous crewmates navigated north through thick sea ice that repeatedly stalled their progress, until they finally escaped through the Hudson Strait.

1611 Poole

Sources

Jonas Poole, “Divers Voyages to Cherie Iland, in the yeeres 1604. 1605. 1606. 1608. 1609,” in *Purchas His Pilgrimes* Vol. 13.

Spitsbergen

Poole now led a whaling expedition to Svalbard. In May, the expedition reached Krossfjorden, near Kongsfjordrenna, but in June extensive sea ice drove its ships from the shore. Sailors aboard a ship captained by Poole travelled west along the edge of the pack ice. In late June, they arrived at Bjørnøya. Weeks later, abundant sea ice forced a crew captained by Thomas Edge to beach the expedition’s second ship near Krossfjorden.

1612 Hall

Sources

John Gatonbe, “An Account of the English Expedition to Greenland, under the Command of Captain James Hall, in 1612,” in *Danish Arctic Expeditions, 1605 to 1620*, ed. Christian Carl August Gosch, vol. 1 (London: Hakluyt Society, 1897), 82–119.

William Baffin, “Another Account of the Latter Part of the English Expedition to Greenland,” in *Danish Arctic Expeditions, 1605 to 1620*, ed. Christian Carl August Gosch, vol. 1 (London: Hakluyt Society, 1897), 120–37.

S Greenland

They spot Cape Farewell 14 May

May 15: “we tack’d about again to the ice, again sailing NNE; and at about 10 o’clock in the morning we tack’d about again, being hard aboard the ice, having sight of the land, it stretching more to the northward. The ice lieth all along it...”

May 16: “we met with ice again”

May 17: “This day we run among the ice, and were inclosed with the ice, so that we could get no passage to the northward.” They are unable to approach land.

(John Gatonbe, “An Account of the English Expedition to Greenland, under the Command of Captain James Hall, in 1612,” in *Danish Arctic Expeditions, 1605 to 1620*, ed. Christian Carl August Gosch, vol. 1 (London: Hakluyt Society, 1897), 90-91.)

W Greenland

The expedition is able to send boats to row around islands and Inuit row out to meet them.

1612 Poole

Sources

Jonas Poole, "A Relation written by Jonas Poole of a Voyage to Greenland, in the yeere 1612," in *Purchas His Pilgrimes* Vol. 14.

Bjørnøya

In the first week of May a crew under Poole attempt to reach the southeast side of Bjørnøya but cannot get through the ice; when they attempt to sail west they again are blocked by ice again.

Spitsbergen

In late May they started whaling off Spitsbergen, "the Sounds being full of Ice." On 1 June "we saw an abundance of Ice drive out with the winde at East." They encountered "Thomas Marmaduke of Hull, in a ship called The Hope . . . Marmaduke stood to the Northward; and as we were afterward informed, discovered as farre as 82. degrees." Sea ice continues to drive out of bays of Spitsbergen; there's little sea ice to impede movement later in the summer.

1613 BaffinSources

William Baffin, "A Journal of the Voyage made to Greenland with five English Ships and a Pinnasse," in *Purchas His Pilgrimes* Vol. 14.

Spitsbergen

A Muscovy Company fleet of six ships set out for Spitsbergen, and arrived on 30 May. On 4 June they are blocked from entering a bay "by reason of the Ice," and they "sayled along the drift Ice until about one or two of the clocke in the morning, at which time, we came to an anchor in the entrance of the Sound, because the Ice came driving out so fast." That is the last reference to ice, however.

1614 FotherbySources

Fotherby, 'A Voyage of Discoverie to Greenland', in *Purchas His Pilgrimes* Vol. 14.

Spitsbergen

A large Muscovy Company whaling fleet sets out for Spitsbergen. On 20 May they "met with stragling Ice . . . in the latitude of 75 degrees 10 minutes, through which wee passed without danger, holding on our course all that day, till time of mid-night; then we found the Ice so close packt together, that we were forced to tacke about, and stand to the Westward, till wee found more open passage, wee plyed through it without any great danger, till the eight and twentieth day: but then being in sight of Land, we passed amongst very much Ice all the fore-noon, which lay in great abundance on both sides of us: but a desire (as it seemes) to get through it, drew us on to be the more intangled with it, for about no one we could neither find a passage to goe forward, nor way to retyre backe again . . . we began very suddenly to bee inclosed and shut up with Ice." It was a very icy summer around Spitsbergen.

1615 Baffin

Sources

William Baffin, “A Tru Relatyon of such things as happened in the fourth voyage for the discovery of a passage to the north west, performed in the yeare 1615” in Clements R. Markham, ed. *The Voyages of William Baffin, 1612-1622*. Works Issued by the Hakluyt Society, no. 63. London: Hakluyt Society, 1881.

SE Greenland

“We haueing had an indifferent good passage, upon the 6 of Maye we sawe land on the coste of GROYNLAND on the east side of Cape Farewell; and that night we had a storme. So keeping a southwardly course to gett about the ice which lay on that coste, we kept on our course tyll the 17 daye of Maye : all which forenoone we sayled through many greate ilands of ice. Som of them were 200 foot aboue water, as I proued by on shortly after, which I found to be 240 foote high aboue water. And if reporte of some men be tru which affirme that there is but on seuenth part of it aboue water, then the height of that peece of ice I obserued was 140 [? 280] fathoms, or 1680 foote, from the top to the bottome. This proportion doth hould I knowe in much ice, but whether in all, or no, I know nott.”

(William Baffin, “A Tru Relatyon of such things as happened in the fourth voyage for the discovery of a passage to the north west, performed in the yeare 1615” in Clements R. Markham, ed. *The Voyages of William Baffin, 1612-1622*. Works Issued by the Hakluyt Society, no. 63. (London: Hakluyt Society, 1881), 113)

Baffin

The ship is trapped in ice for several days in June off Resolution Island, although later able to proceed through the Hudson Strait to Salisbury Island.

1615 JansenSources

‘Journaal van een Groenlandvaarder, 1615’, 0120 Oud archief stad Enkhuizen 1353–1815 (1872), Westfries Archief, Hoorn.

Spitsbergen

A whaling crew in a Northern Company whaling ship set sail for Spitsbergen. Sea ice forced whalers to change course on 7 June, well before they reached Spitsbergen. On 9 June, sea ice and thick fog surrounded their ship. On 10 June, they grounded their ship on sea ice, which damaged their bow and anchor. On 11 June, they struggled to find a way through the ice and that struggle continued for several days.

1616 BaffinSources

William Baffin, “A Briefe and True Relation or Journall [1616]” in Clements R. Markham, ed. *The Voyages of William Baffin, 1612-1622*. Works Issued by the Hakluyt Society, no. 63. (London: Hakluyt Society, 1881).

Greenland

They sail around the south cape of Greenland altogether to reach the west coast: “the first land we saw was in Fretum Davis, on the coast of Groinland, in the latitude of 65° 20’.”

They anchor in a harbor at approximately 70°N, then sail far up west Greenland, past Cape Shackleton, before heading west toward Baffin Island.

(William Baffin, “A Briefe and True Relation or Journall [1616]” in Clements R. Markham, ed. *The Voyages of William Baffin, 1612-1622*. Works Issued by the Hakluyt Society, no. 63. (London: Hakluyt Society, 1881), 39).

Baffin

They are unable to approach the shore due to ice: “then wee hauing so much ice round about vs, were forced to stand more eastward, supposing to have beene soone cleare, and to haue kept on the off side of the ice vntill we had come into 70°, then to haue stood in againe. But this proued quite contrary to our expectation, for wee were forced to runne about threescore leagues through very much ice, many times so fast that wee could goe no wayes, although we kept our course due east; and when wee had gotten into the open sea, wee kept so neere the ice that many times wee had much adoe to get cleare, yet could not come neere the land till we came about 68°, where indeede we saw the shoare, but could not come to it by eight or nine leagues, for the great abundance of ice. This was on the foure and twentieth day of July; then spent we three dayes more to see if conueniently wee could come to anchor to make triall of the tides; but the ice led vs into the latitude of 65° 40’. Then wee left off seeking to the west shoare, because wee were in the indraft of Cumberland Iles, and should know no certaintie, and hope of passage could be none.”

(William Baffin, “A Briefe and True Relation or Journall [1616]” in Clements R. Markham, ed. *The Voyages of William Baffin, 1612-1622*. Works Issued by the Hakluyt Society, no. 63. (London: Hakluyt Society, 1881), 47-48.)

1616 Jansen

Sources

“Journaal van een tocht naar Groenland en Spitsbergen met het schip ‘de Hoop’ en schip- per Heertgen Jansen van Enkhuizen, 1616,” 0120 Oud archief stad Enkhuizen 1353–1815 (1872), Westfries Archief, Hoorn.

Spitsbergen

Heertgen Jansen and his crew sail for Jan Mayen, but pass quite close to Spitsbergen. While still quite far south (around 64 °N) on 3 June, they detect “wat merde ijs” – sea ice – but it is not sufficient to make them alter their journey. They arrived late at Jan Mayen – on 10 June – but made no report of sea ice.

1617 Edge

Sources

Thomas Edge, “Greenland first discovered by Sir Hugh Willoughbie,” in *Purchas His Pilgrimes* Vol. 13.

“Twee getuigenissen van deelnemers aan de reis ter walvischvangst van 1617,” in Muller (ed.), *Geschiedenis der Noordsche Compagnie*.

William Heley, “Divers other Voyages to Greenland, with Letters of those which were their employed,” in *Purchas His Pilgrimes Vol. 14*.

Spitsbergen

There are few references to sea ice in these sources, which focus on violence between English and Dutch whalers. Edge makes one reference to an expedition of 20 sailors that “discovered to the eastward of Greenland (spitsbergen) as farre to the northwards as 79 degrees, and an Iland which he named Witches Iland, and divers other Ilands.” The latitude this expedition supposedly achieved is unremarkable, but there does not seem to have been much sea ice around Spitsbergen in this whaling season.

1618 Beversham

Sources

James Beversham, “A Letter of James Beversham to Master Heley”, in *Purchas His Pilgrimes Vol. 14*.

Spitsbergen

Whalers in the whaling companies at Spitsbergen found that the northern bays of the island were filled with sea ice for much of the summer, while the southern bays (where violence again erupted between whalers) were comparatively ice-free. James Beversham in northern Spitsbergen, for example, wrote on 12 July that “we are and have been so pestered with Ice these 20 dayes that we have not beene able to goe out to Sea with our shallops above twice in the time.”

1619 Maerten Remmertszn

Sources

Maerten Remmertsz, 1619,” 0120 Oud archief stad Enkhuizen 1353-1815 (1872), Westfries Archief, Hoorn.

Spitsbergen

This was a journey to Smeerenburg on Amsterdamøya, a tiny island just off the northwestern coast of Spitsbergen. While the journal makes one reference to “drift ice” on 5 July, it includes no other observations of sea ice.

II. Iceland Sea Ice Observations

After: Ogilvie, A.E.J.: Writing on Sea Ice: Icelandic Scholars of the Late Sixteenth and Early Seventeenth Century, in: *Ice Humanities: Materiality, Ontology and Representation*, edited by: Dodds, K. and Sörlin, S., in press.

Summary of information:

1570	No sea ice came to the coasts (<i>Gottskálksannáll</i>).
1572	Sea ice left before “moving days” (<i>Gottskálksannáll</i>).
1580s	It seems likely that there was much sea ice off Iceland in the 1580s (QD, BC).
1592	No sea ice this year (BC).
1590s	Much sea ice in the early 1590s (QD, BC).
1602	Severe sea-ice year and ice until far into summer. Unusually severe year (<i>Ballarárannáll</i> ; <i>Skarðsárannáll</i> ; AF, 8; SH, ff. 17-20).
1604	Sea ice brought whales. Much seal hunting (<i>Skarðsárannáll</i>).
1605	Severe sea-ice year. Ice reached the south coast (<i>Skarðsárannáll</i>).
1608	Sea ice until summer (<i>Skarðsárannáll</i>).
1612	Sea ice present (<i>Skarðsárannáll</i>).
1615	Very severe sea-ice year. Stayed to summer and reached southwest coasts. Many bears and seals on the ice (<i>Skarðsárannáll</i> ; AF).
1618	Sea ice came in the spring (<i>Skarðsárannáll</i>).

Key to primary sources: AF=*Annalium farrago*; *Ballarárannáll*, *Annálar* vol. III; BC=*Brevis Commentarius de Islandia*; *Biskupa-Annálar* by Jón Egilsson; *Gottskálksannáll*; QD: *Qualiscunque descriptio Islandiæ*; *Skarðsárannáll*, *Annálar* vol. I; SH=Staatsarchiv Hamburg