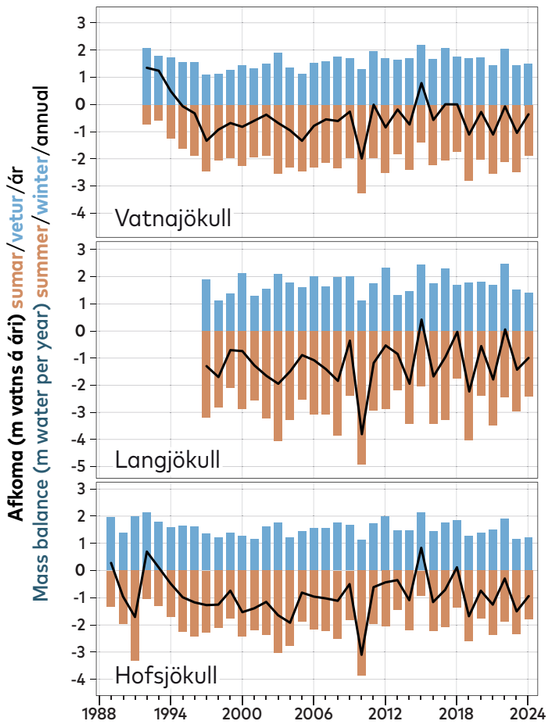


Samantekin gögn um yfirborðsafkomu þriggja stærstu jöklanna frá upphafi mælinga. Bláar súlur sýna vetrarafkomu, rauðar súlur tákna sumarafkomu og græn lína táknar ársafkomu.

Specific surface mass-balance observations for the three largest ice caps in Iceland. Blue bars show the winter balance, red shows the summer balance and green lines the annual balance.

Gögnin ásamt útskýringum eru aðgengileg á islenskirjoklar.is og í skýrslu í Jökli um afkomu jökla 2023–2024. Nánar má fræðast um samband jökla og loftslags á fræðsluvef Vatnajökulsþjóðgarðs um jökla- og loftslagsbreytingar Hörfandi jöklar: www.vatnajokulsthjodgardur.is/fraedsla/horfandi-joklar/um-horfandi-jokla

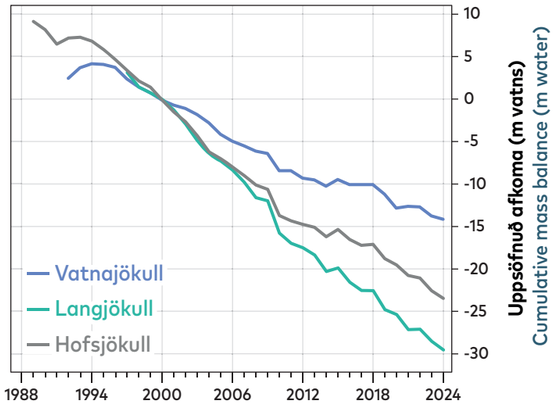
Data, supporting literature and reports are accessible at icelandicglaciers.is and in the mass balance report of the glaciological year 2023–2024 in the journal Jökull. Further information about glaciers and climate may be found on the educational website of the Vatnajökull National Park 'Melting glaciers': www.vatnajokulsthjodgardur.is/en/melting-glaciers/um-horfandi-jokla

Afkoma jöklanna

Jökulárið 2023–2024 var afkoma mæld á um 130 stöðum á jöklum landsins. Kalt og þurrt hæglætisveður einkenndi veturinn 2023–2024 og lítil úrkoma féll á jöklana framan af vetri. Vetrarafkoma stærstu íslensku jöklanna veturinn 2023–24 var um 20–25% undir meðaltali síðustu 20 ára. Sumarið var kalt og tíð hret drógu úr sumarleysingunni. Sumarafkoman (rýrnunin) var 15–20% undir meðallagi. Í heild var ársafkoma stóru jöklanna neikvæð, en þó nærri meðaltali undanfarins áratugar.

Glacier mass balance

For the glaciological year 2023–2024, mass balance was measured at ~130 locations in Iceland. Cold, dry weather prevailed during the winter months with limited precipitation in early winter. The winter mass balance was 20–25% below the average of the last 2 decades. A cold summer and occasional snow fall reduced the summer melting. The summer mass balance was 15–20% below average. The annual mass balance was negative, and close to the average of the last 10 years.



Uppsöfnuð afkoma Vatnajökuls, Langjökuls og Hofsjökuls frá upphafi mælinga. Þessir jöklar geyma >95% af rúmmáli íss í jöklum landsins.

Accumulated mass balance of Vatnajökull, Langjökull and Hofsjökull. These three ice caps contain >95% of the volume of all of the glaciers in Iceland.

Jökulhlaup

27. júlí 2024 braust stórt jökulhlaup undan Sandfellsjökli í austanverðum Mýrdalsjökli, flæddi með Leirá í farveg Skálmar og yfir þjóðveg 1. Brúin stóð að mestu af sér hlaupið. Hlaupvatnið kom frá jarðhitakötlum í norðaustanverðri öskju Kötlu, og ólíkt fyrri hlaupum rann það ekki í Múlakvísl. Erindi um jökulhlaupið má nálgast hér: https://youtu.be/S0TWG6mK2vk

Jökulhlaup (Glacier outburst flood)

On the 27th of July 2024, a large jökulhlaup (glacier lake outburst flood) emerged from Sandfellsjökull in eastern Mýrdalsjökull, following the course of Leirá river and merged with Skálm river. The ringroad was flooded but

Ljósmyndir/Photographs: **Björn Oddsson**

the bridge over Skálm survived. The flood water originated in geothermal cauldrons in the northeastern part of the Katla caldera, from which previous jökulhlaups have entered Múlakvísl river. A presentation about the glacier outburst flood can be accessed here: https://youtu.be/S0TWG6mK2vk

Upplýsingarnar sem hér birtast eru byggðar á mælingum jöklahóps Jarðvísindastofnunar Háskólans, Veðurstofu Íslands, Landsvirkjunar, Náttúrustofu Suðausturlands og Jöklarannsóknafélags Íslands.

The results presented here are based on the measurements of the glacier group of the Institute of Earth Sciences, University of Iceland, the Icelandic Meteorological Office, Landsvirkjun – the National Power Company of Iceland, the South East Iceland Nature Research Center and the Iceland Glaciological Society.

Hönnun/Design: **Kieran Baxter**

2024

Jöklar Íslands — Icelandic glaciers

Lifandi kennslustofa í loftslagsbreytingum

A natural laboratory to study climate change

Hörfandi jöklar Melting glaciers

Yfirlit um íslenska jökla 2024

Jöklar á Íslandi halda áfram að hörfa og rýrna. Í fréttabréfinu er gerð grein fyrir breytingum á jöklunum og lýst niðurstöðum mælinga á afkomu, rýrnun þeirra með gervitunglagögnum og stöðu jökulsporða sem sjálfboðaliðar Jöklarannsóknafélag Íslands sinna.

Overview of Icelandic glaciers 2024

Glaciers in Iceland continue to retreat and lose mass. In this newsletter, glacier changes are described, including the results of mass balance measurements, mass loss derived from satellite observations, along with results of monitoring of glacier termini carried out by volunteers of the Iceland Glaciological Society.

Steinsholtsjökull í norðanverðum Eyjafjallajökli hefur hörfað um 2 km frá því að hann náði upp á hrygginn framan jökulsins. Ljósmyndir eftir Ingólf Ísólfsson (1928) og Hrafnhildi Hannesdóttur (6. október 2023). Valdar sögulegar jöklaljósmyndir eru birtar á Flickr myndasíðu Jöklarannsóknafélags Íslands (https://flic.kr/ps/3ZVjMZ).

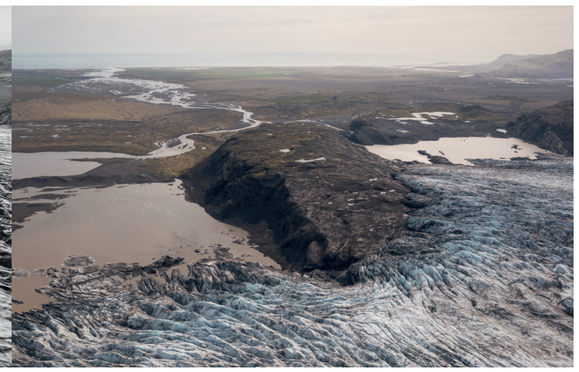
Steinsholtsjökull in northern Eyjafjallajökull has retreated about 2 km since it reached up on the hills in front of the glacier. Photographs by Ingólfur Ísólfsson (1928) and Hrafnhildur Hannesdóttir (6th of October 2023). A collection of historical glacier photographs is available on the Flickr page of the Iceland Glaciological Society (https://flic.kr/ps/3ZVjMZ).

Breytingar í hæð jökulyfirborðs og rúmmáli

Samkvæmt margvíslegum mælingum hafa jöklar á Íslandi á tímabilinu 2000–2023 þynnst að meðaltali um 1.0 m á ári og er rýrnun íslensku jöklanna örari en víðast hvar annars staðar á jörðinni*. Þessar niðurstöður eru í góðu samræmi við afkomumælingar hér á landi. Rýrnun jöklanna reynist heldur hægari eftir 2010 en á fyrsta áratug aldarinnar.

Surface elevation and mass changes

According to several diverse measurements, glaciers in Iceland have during the time period 2000–2023 on average thinned by approximately 1 m annually, which is among the highest rates of mass loss worldwide*. This is in accordance with mass balance measurements in Iceland. The mass loss after 2010 is less than during the first 10 years.



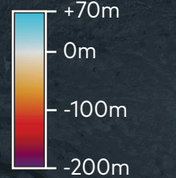
Flugsýn af tungu Fláajökuls 1982 og 2024. Myndin frá 1982 byggir á loftmyndum Landmælinga Íslands og landlíkani sem reiknað er á grundvelli myndanna. Samanburður við ljósmynd úr flygildi frá 2024 sýnir vel hörfun jökuljaðarsins og lækkun yfirborðs jökulsins á 42 ára tímabili. Myndvinnsla: Kieran Baxter.

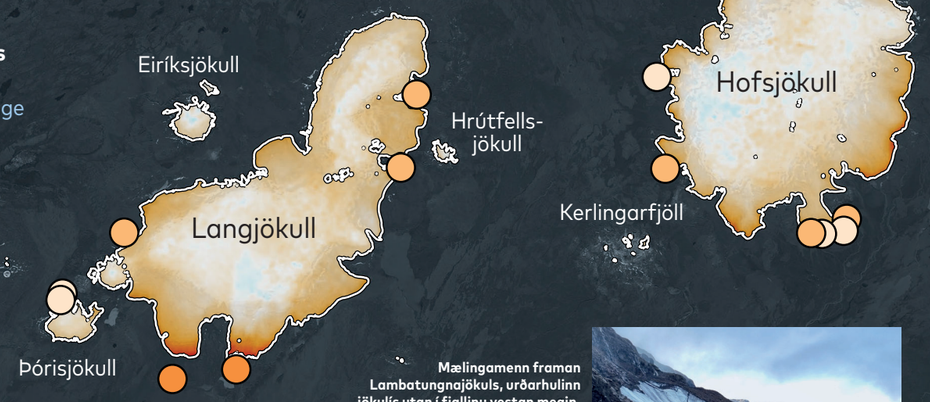
Bird's-eye views of the tongue of Fláajökull in 1982 and 2024. The 1982 view is a three-dimensional composite produced from aerial photographs from the National Land Survey of Iceland. When compared with a drone photograph from 2024 the images clearly show the retreat of the terminus and the lowering of the glacier surface over the 42-year period. Images produced by Kieran Baxter.

*The GlaMBIE Team. Community estimate of global glacier mass changes from 2000 to 2023. Nature 639, 382–388 (2025). https://doi.org/10.1038/s41586-024-08545-z

2024 Jöklabreytingar
Glacier changes

Breyting jökulyfirborðs 2000–2020*
Surface elevation change 2000–2020*

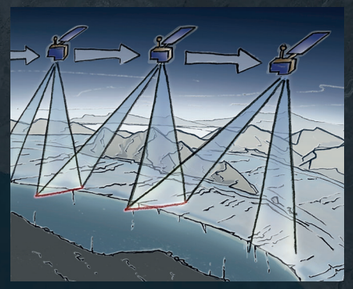




Gervitunglamælingar

Breytingar á yfirborðshæð jökla eru meðal annars fengnar með samanburði á gervitunglagögnum. Gervitunglamyndir eru notaðar til þess að reikna hæðarlíkön á mismunandi tímum. Með þessu móti fæst mat á rýrnun þeirra og meðalafkomu, með því að umreikna rúmmálsbreytinguna í ígildi vatns.

Niðurstöðurnar sýna að mesta rúmmálstapið er á jöklum við suðurströndina og þá sérstaklega stærri skriðjöklum Vatnajökuls og Mýrdalsjökuls. Rúmmálsrýrnun Breiðamerkurjökuls er áberandi mikil vegna þess að jökullinn kelfir í lón sem blandast hlýjum sjó.



Þegar gervihnötturinn fer yfir yfirborð jökulsins tekur hann myndir frá tveimur ólíkum sjónarhornum og til verða steríómyndir sem notaðar eru til þess að mæla hæðarbreytingar.

As the satellite passes over the glacier surface it captures imagery from two different angles creating stereo imagery that is used to measure elevation changes.

Satellite measurements

Glacier mass balance can be estimated from space by repeatedly measuring the glacier elevation and its changes over time. The sources of elevation data are usually Digital Elevation Models (DEMs), commonly derived from satellite stereo images. From the elevation changes, volume changes can be calculated as well as the glacier mass balance, by converting the volume loss to water-equivalent.

The highest rate of mass loss is observed at the glaciers located near the south coast, especially the larger outlets of Vatnajökull and Mýrdalsjökull. Breiðarmerkurjökull has exceptionally high mass loss because it calves into a tidal lagoon that is connected to the ocean.

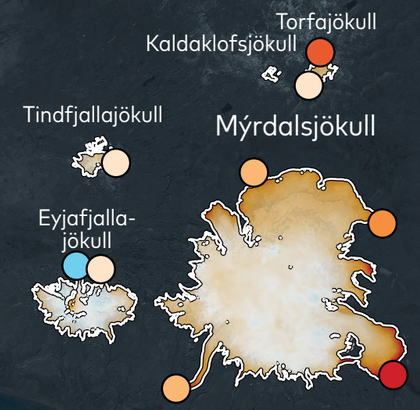
* Hugonnet, R., McNabb, R., Berthier, E. et al. Accelerated global glacier mass loss in the early twenty-first century. Nature 592, 726–731 (2021). https://doi.org/10.1038/s41586-021-03436-z

Mælingamenn framan Lambatungnajökuls, urðarhulinn jökulís utan í fjallinu vestan megin. Ljósmynd: Bergur Pálsson, 4. nóvember, 2024.

Volunteers measuring the snout of the rapidly retreating Lambatungnajökull. Photograph: Bergur Pálsson, 4th of November 2024.

Hersir Jón Haraldsson við sporð Hyrningsjökuls, sem hann mælir ásamt föður sínum Haraldi Hallsteinssyni. Ljósmynd: Haraldur Hallsteinsson, 7. september, 2024.

Hersir Jón Haraldsson at the foot of Hyrningsjökull glacier, which he is measuring with his father Haraldur Hallsteinsson. Photograph: Haraldur Hallsteinsson, 7th of September, 2024.

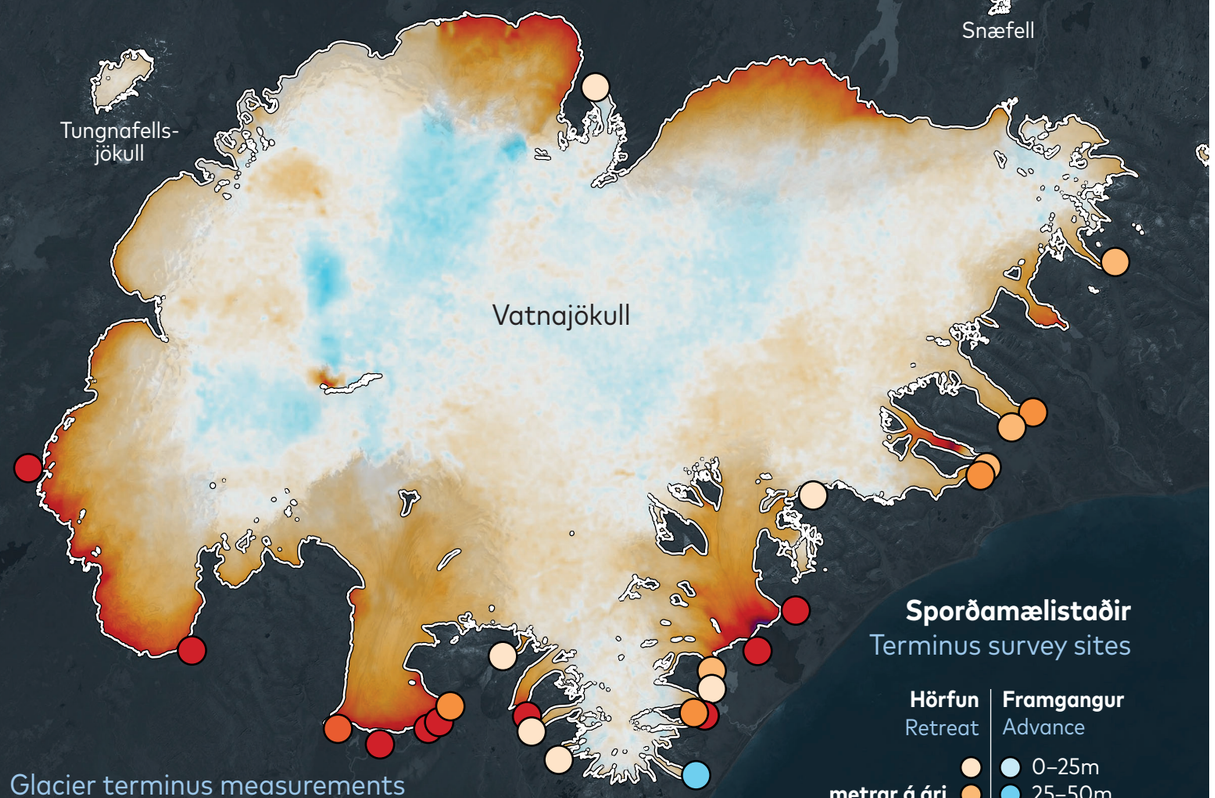


Kort byggt á Copernicus Sentinel gögnum (2023).
Map contains modified Copernicus Sentinel data (2023).

Jökulsporðamælingar

Á hverju hausti mæla sjálfboðaliðar Jöklarannsóknafélags Íslands stöðu jökulsporða víðs vegar um landið. Fjarlægð jökulsporðs er mæld frá ákveðnum viðmiðunarpunkti en þessar mælingar hafa verið gerðar síðan 1930. Mælingarnar lýsa hörfun og framgangi jökulsporða og í einhverjum tilvikum framhlaupum.

Langflestir jökulsporðar hörfa og er breytingin mest á stærri skriðjöklum Vatnajökuls og þónokkrir jökulsporðar hörfa árlega um nokkur hundruð m. Örlítill framgangur er í Kvíárjökli og Gígjökli og nokkrir sporðar sem ganga út í lón hafa lítið sem ekkert breyst. Lesa má nánar um sporðamælingar í grein í tímaritinu Jökli og niðurstöður mælinganna eru birtar á jöklavefsjánni (islenskirjoklar.is).



Sporðamælistaðir
Terminus survey sites

Hörfun Retreat | **Framgangur** Advance

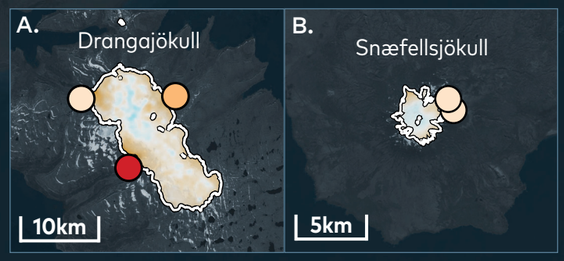
metrar á ári 2023–2024
metres per year 2023–2024

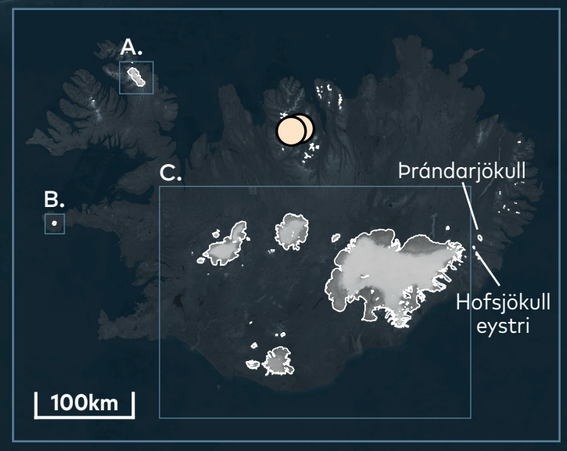
hörfun	framgangur
	0–25m
	25–50m
	50–75m
	75–100m
	>100m

Glacier terminus measurements

Every autumn volunteers of Jöklarannóknafélag Íslands measure the position of selected glacier termini, relative to a certain reference point. These measurements have been carried out since 1930. The measurements document the retreat, advance and in some cases glacier surges.

The largest changes were measured at the larger outlet glaciers of Vatnajökull and the annual retreat can reach several hundred m. Slight advances were observed at Kvíárjökull and Gígjökull, but many glaciers terminating in glacial lakes showed little change. Further information can be found in the annual report in the journal Jökull and the measurements are available on the glacier web portal (icelandicglaciers.is).





Jöklar á Íslandi og sporðamælistaðir á Norðurlandi.
Glaciers in Iceland and terminus measurement sites in North Iceland.