Útlínur jökla

...og fleiri gögn tengd loftslagsbreytingum

Ragnar Heiðar Þrastarson – Fagstjóri Landupplýsingakerfa

Veðurstofa Íslands

LOFTSLAGSSJÓÐUR
ICELANDIC CLIMATE FUND

HÍ | JARÐVÍSINDASTOFNUN

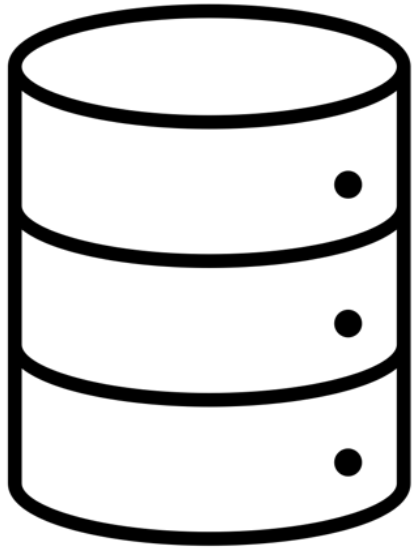
Veðurstofa Íslands

LANDMÆLINGAR ÍSLANDS

NÁTTÚRUSTOFA SUÐAUSTURLANDS

Landsvirkjun

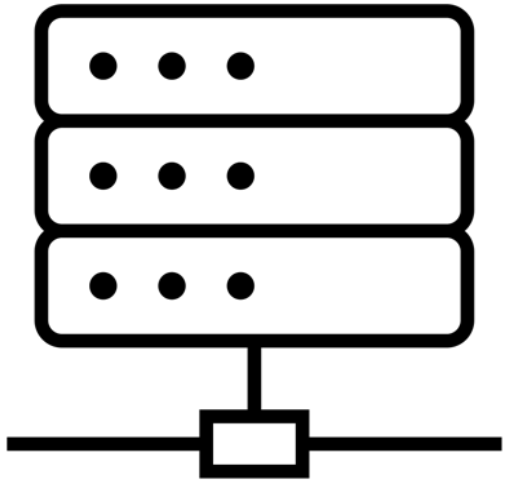
Stóra myndin



Gagnagrunnur

Postgres

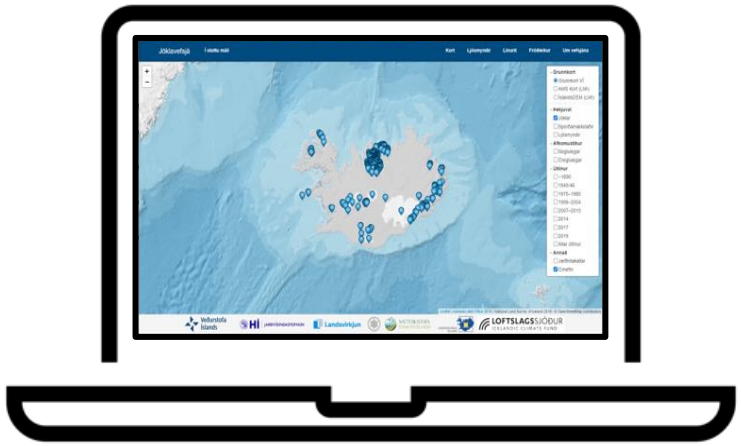
PostGIS



Vefþjónn

GeoServer (WMS+WFS)

API (línurit+ljósmyndir)

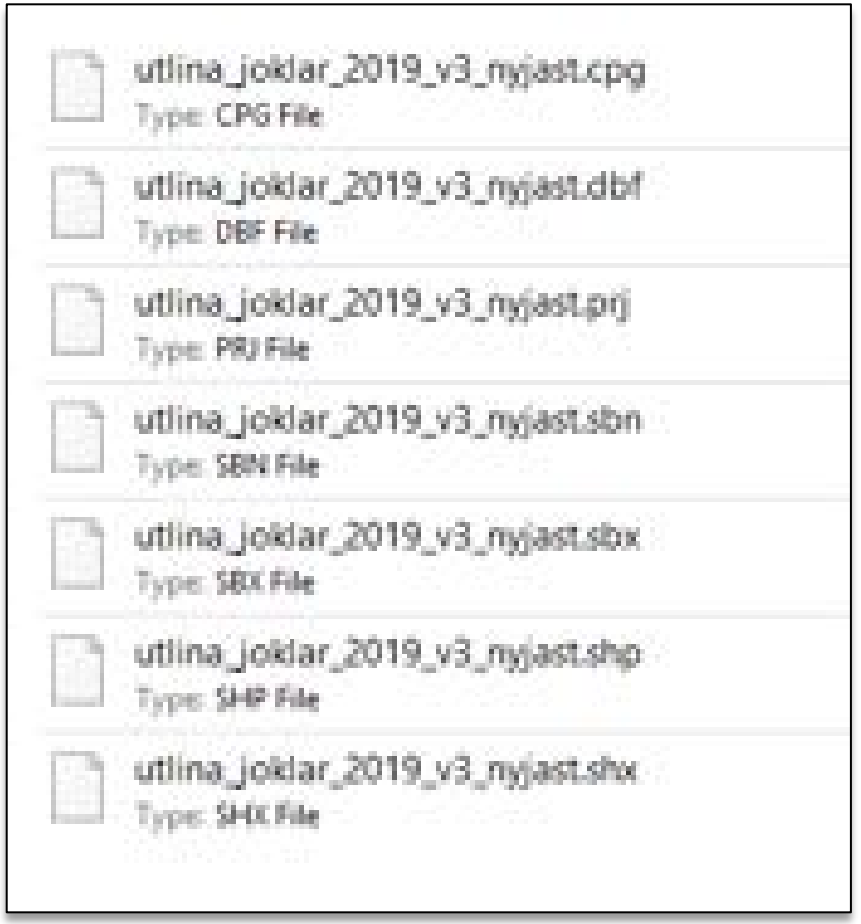


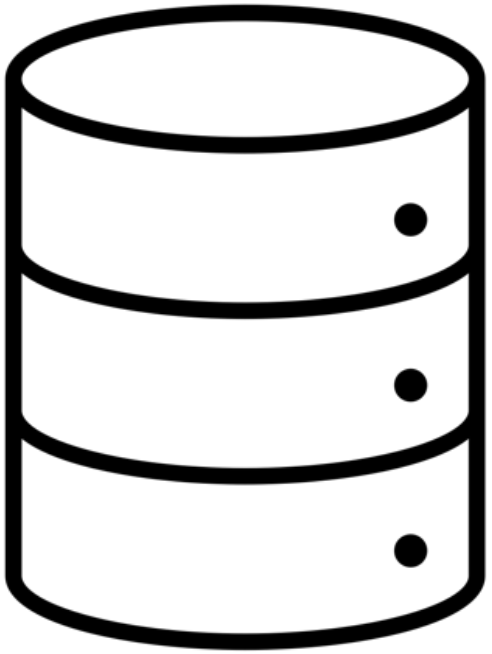
Vefsjá

Leaflet JS

Fyrsta bylgja gagna

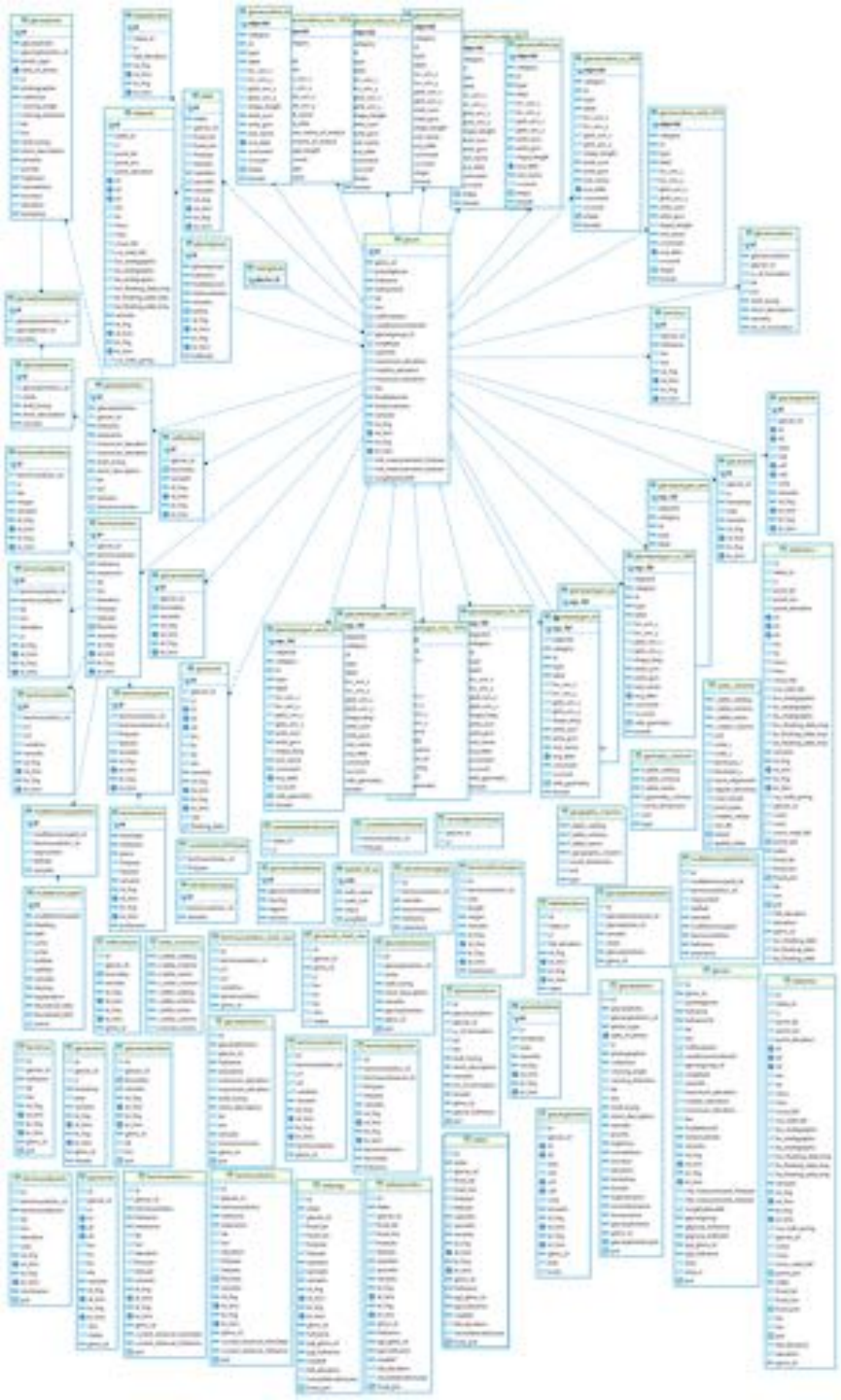
- Útlínur jökla
- Sporðamælingar
- Afkomumælingar
- Ljósmyndir
- Sigkatlar
- Örnefni





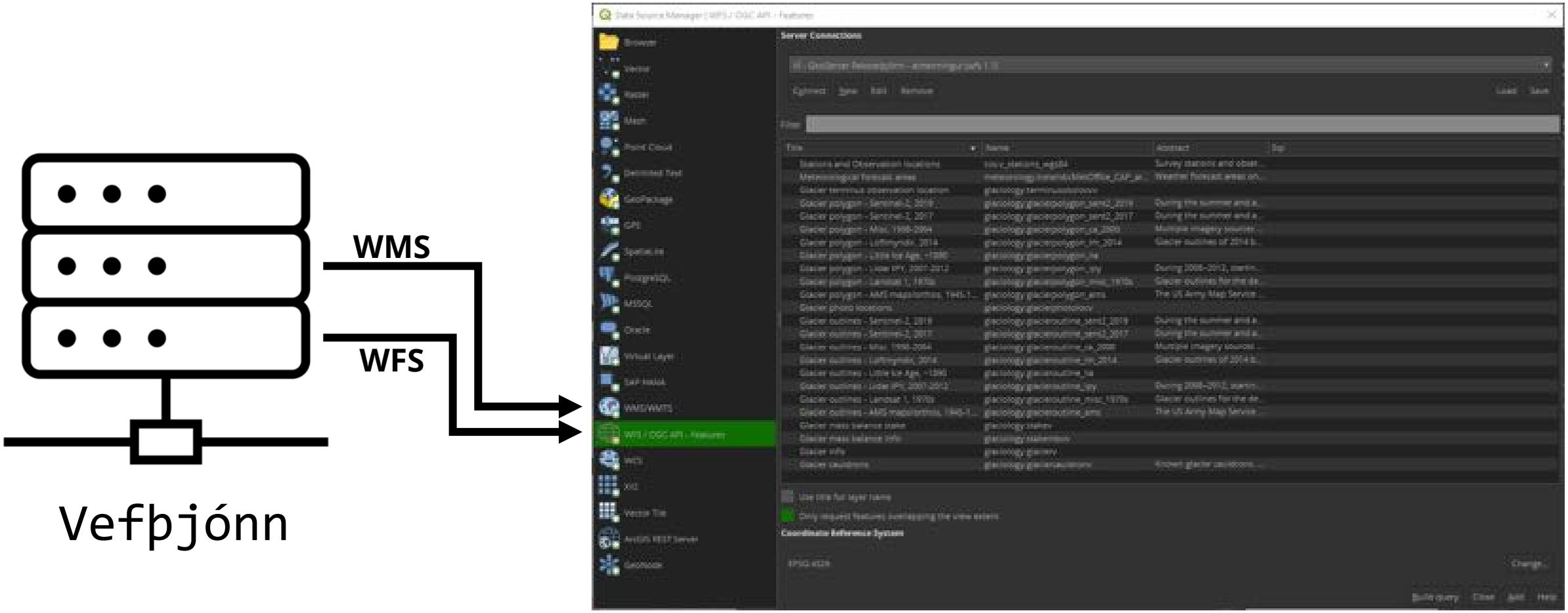
Gagnagrunnur

45 töflur
+30 sýndartöflur

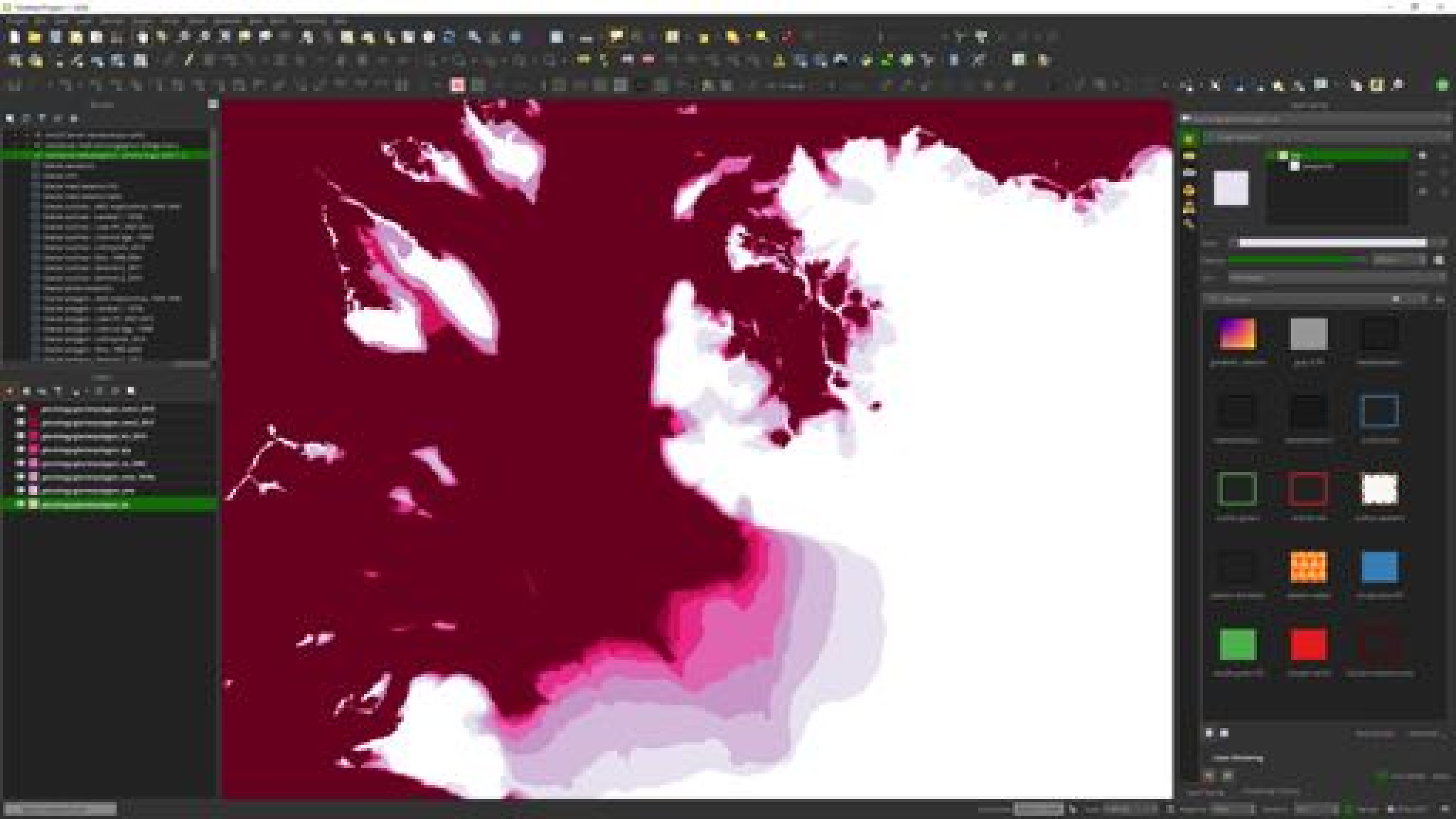


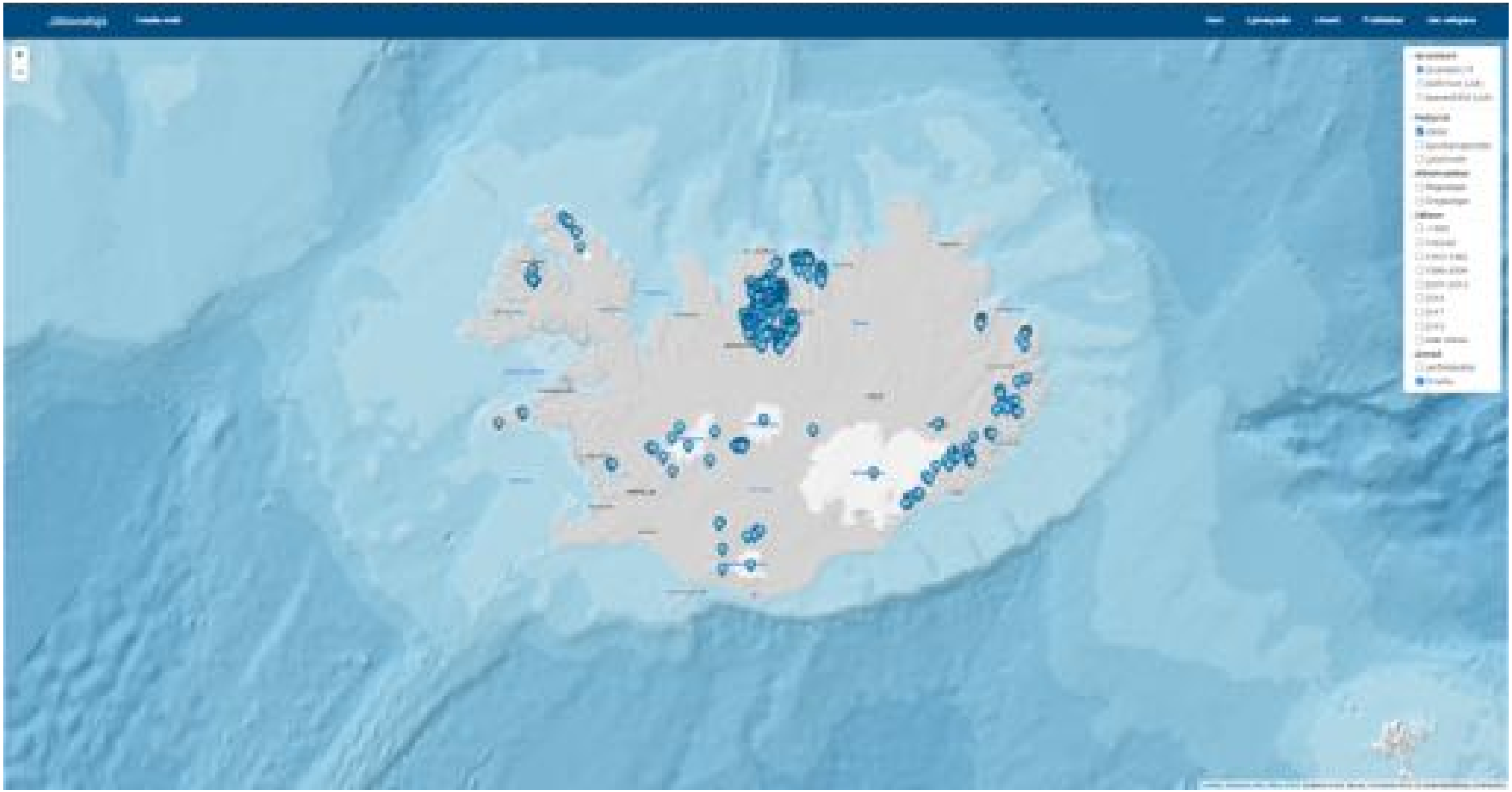
Gagnaskipulag

- WGMS
- GLIMS
- NSIDC

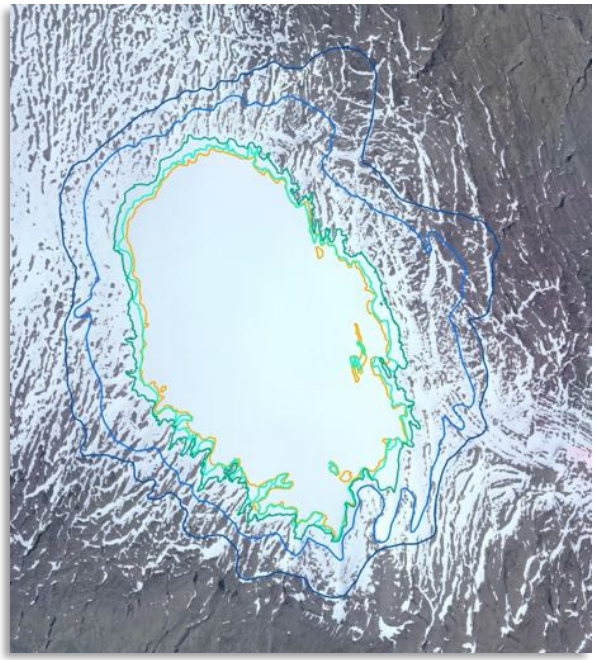


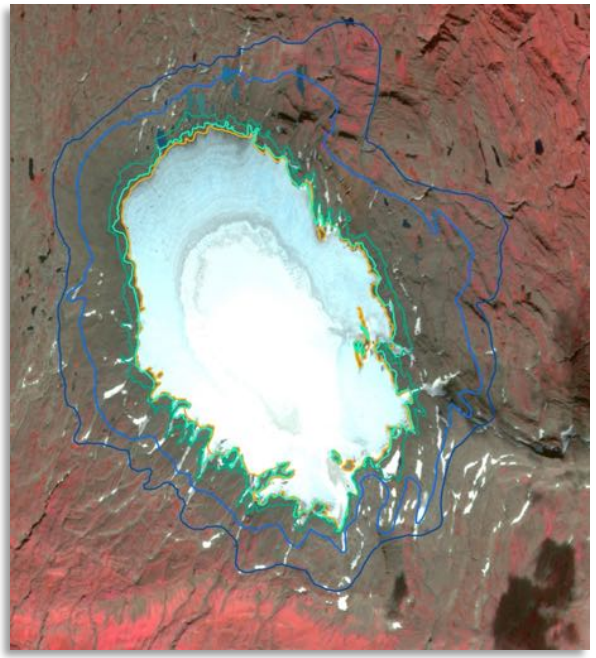
https://**geo.vedur.is**/geoserver/wms?&REQUEST=GetCapabilities

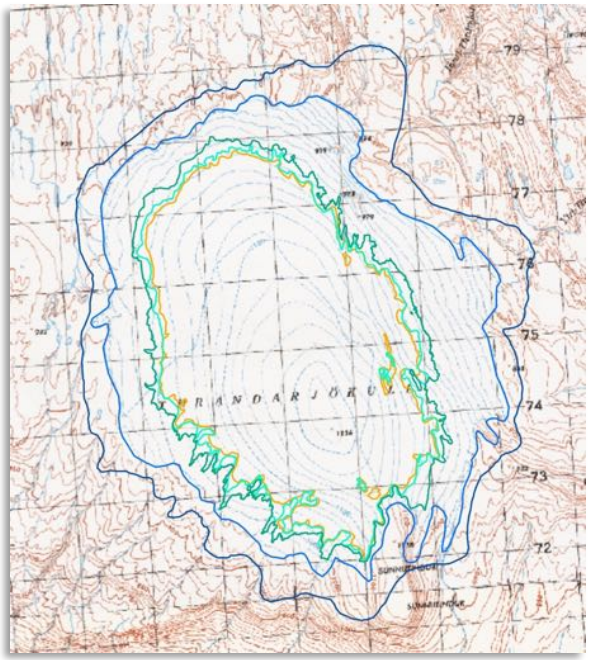


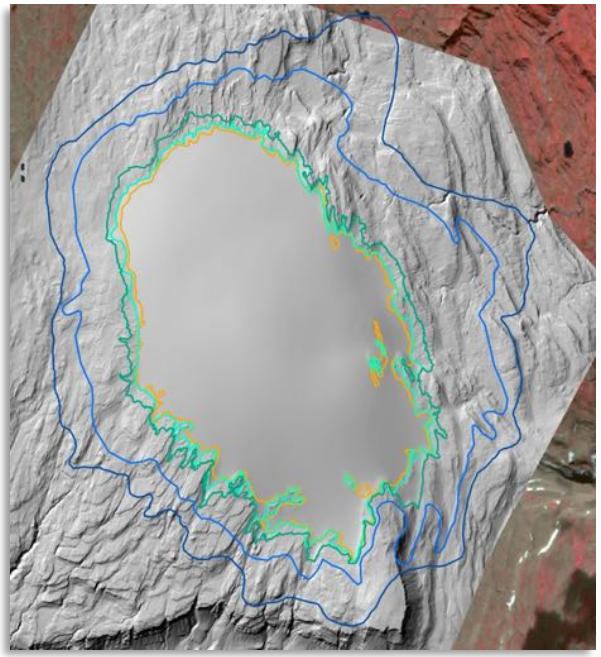


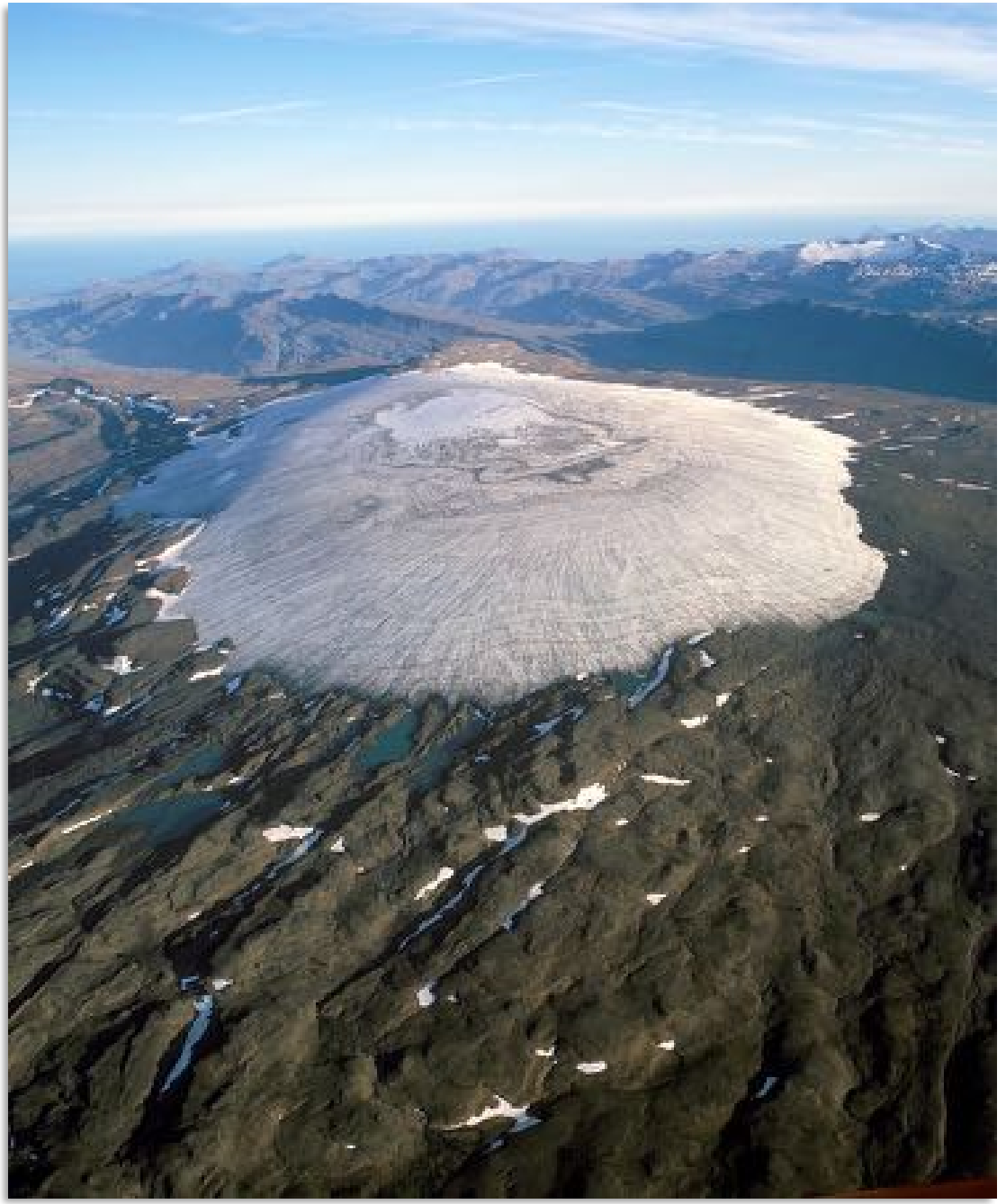
Útlínur jökla



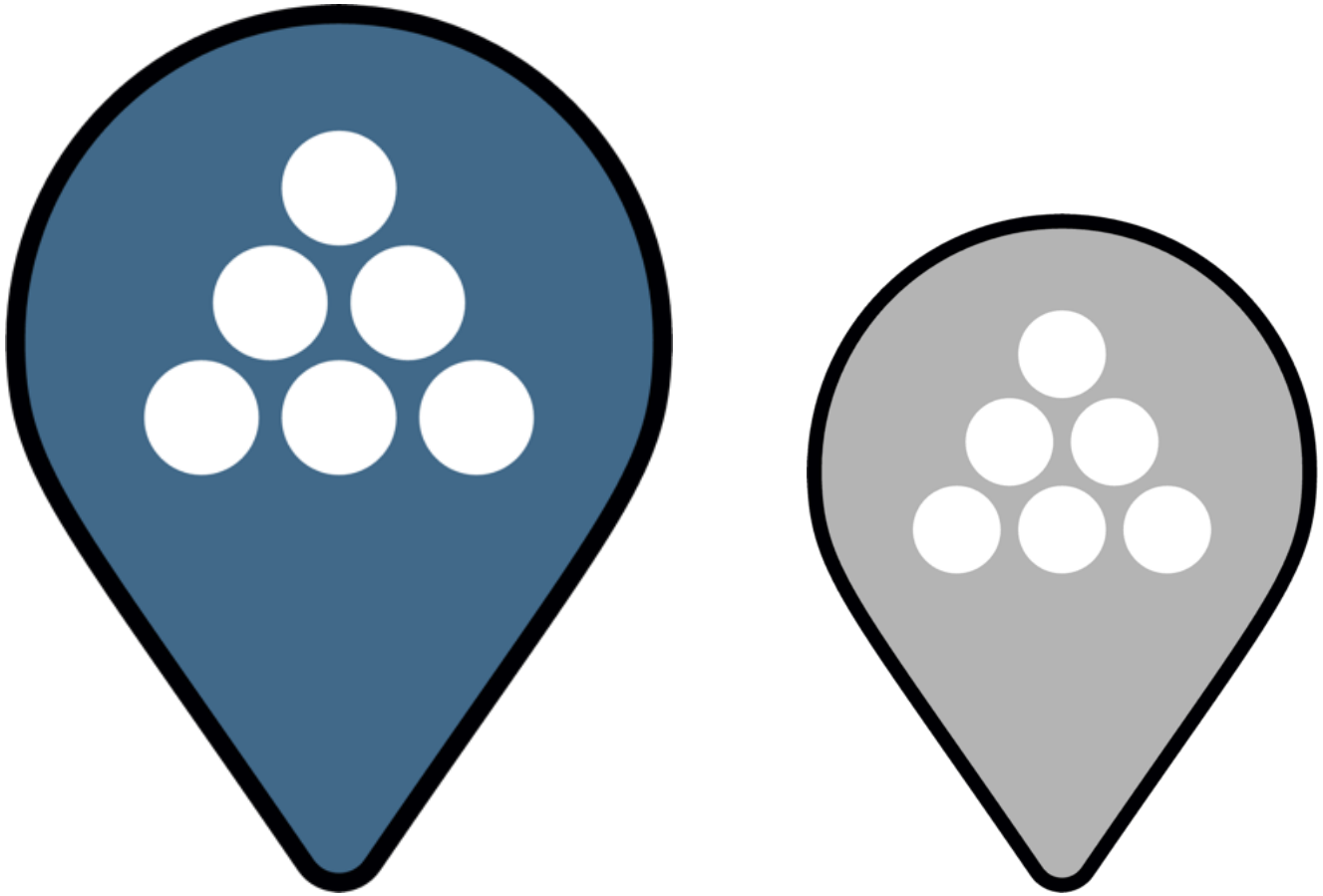


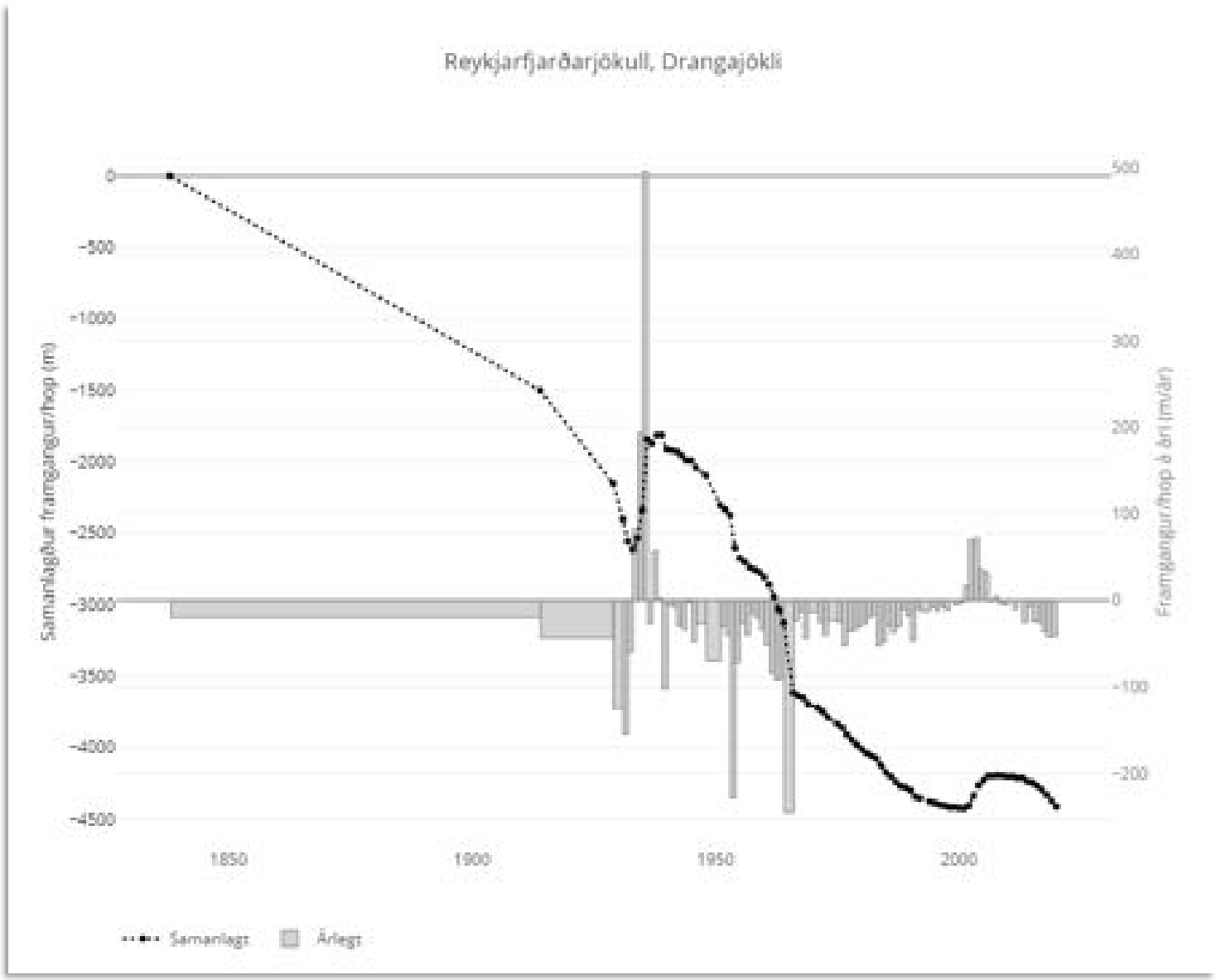

79
78
77
76
75
74
73
72



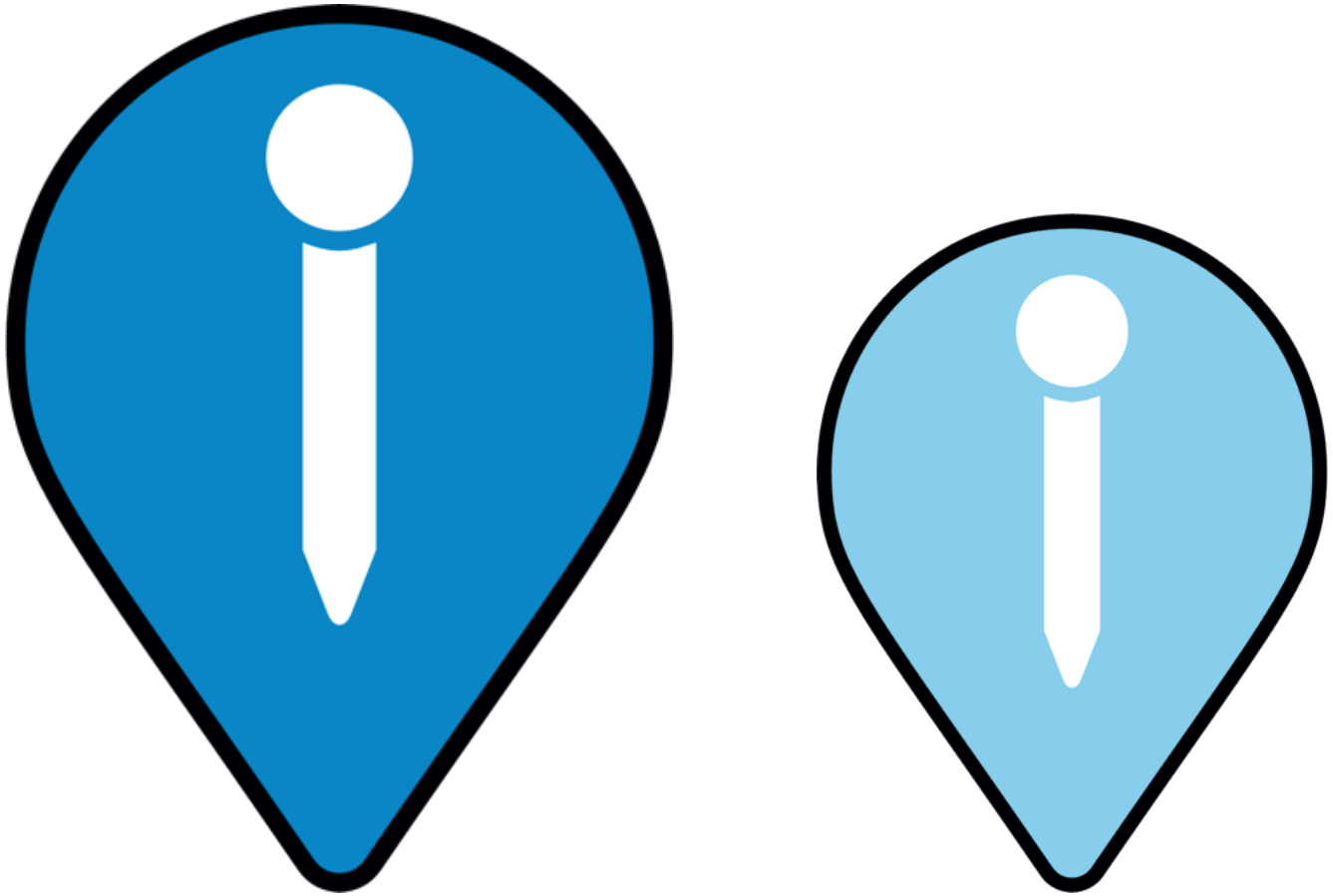


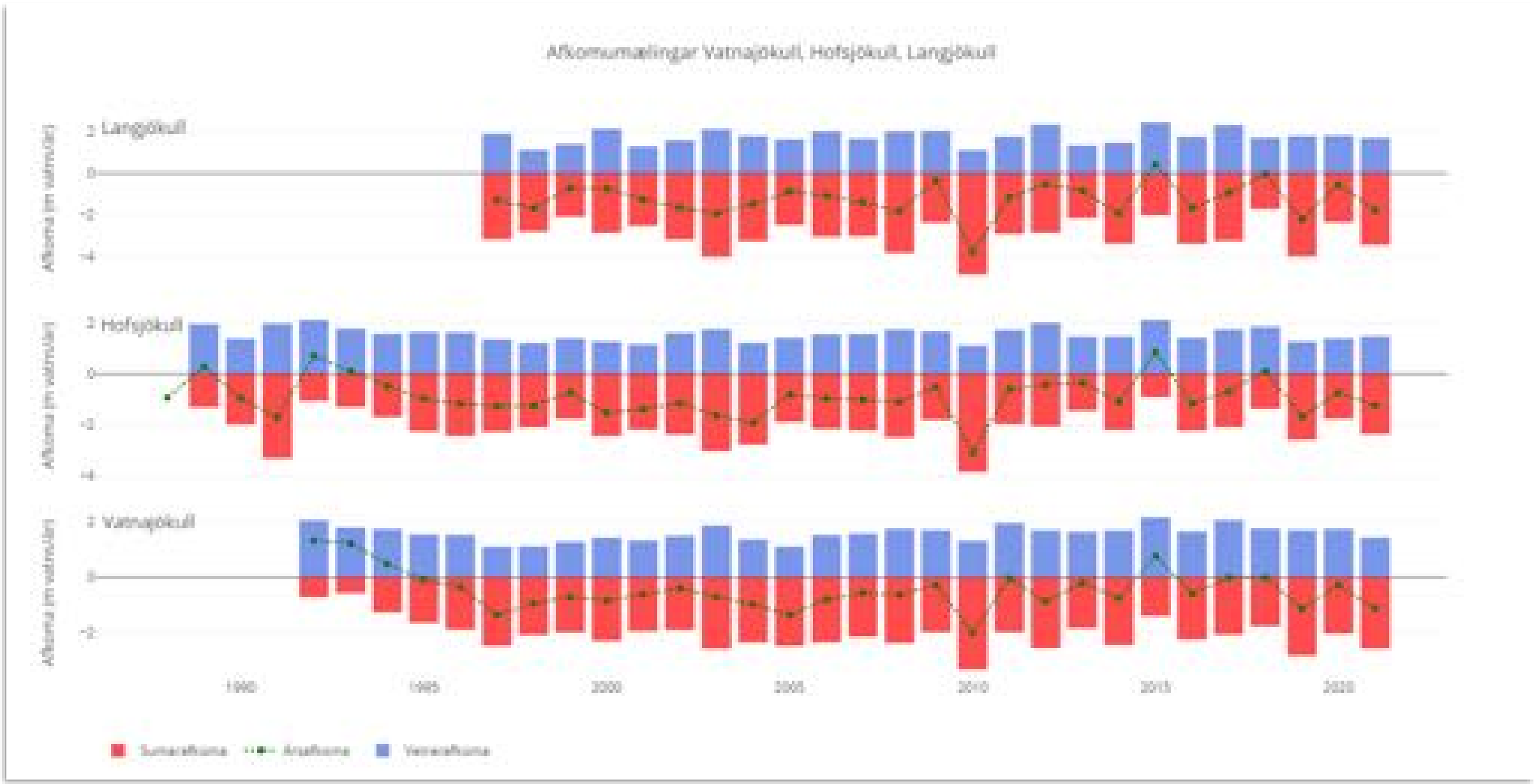
Sporðamælingar



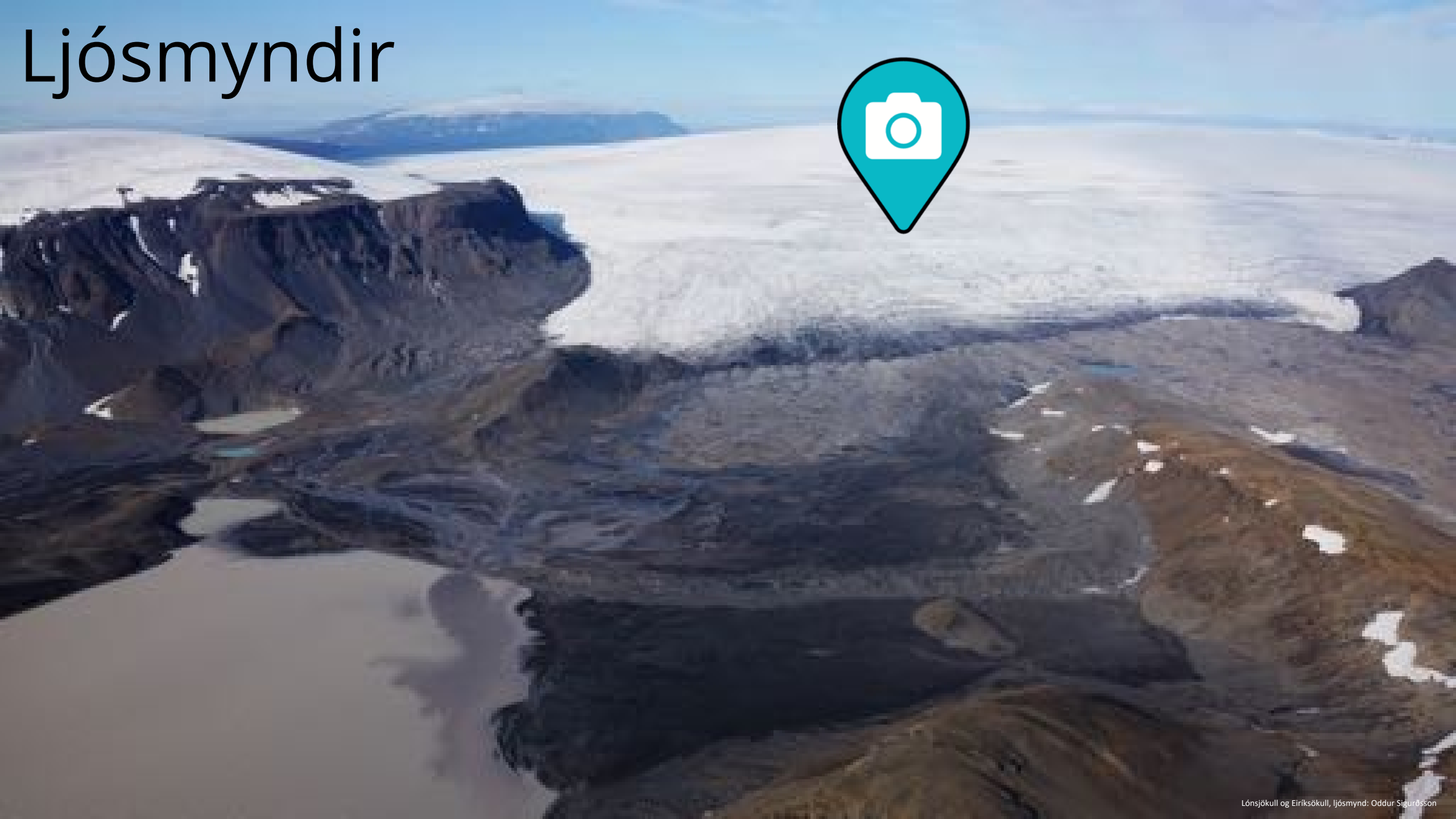

Reykjarfjarðarjökull, Drangajökli
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
Samanlagður framgangur/hop (m)
500
400
300
200
100
0
-100
-200
Framgangur/hop á ári (m/ár)
1850
1900
1950
2000
Samanlagt
Árlegt

Afkomumælingar




Afkomumælingar Vatnajökull, Hofsjökull, Langjökull
Langjökull
Hofsjökull
Vatnajökull
Afkoma (m vatnsúlur)
2
0
-2
-4
1980
1985
2000
2005
2010
2015
2020
Sumarafkoma
Ársafkoma
Vetrarafkoma

Ljósmyndir



Lónsjökull og Eiríksökull, ljósmynd: Oddur Sigurðsson

Sigkatlar

ljósmynd: Snævarr Guðmundsson

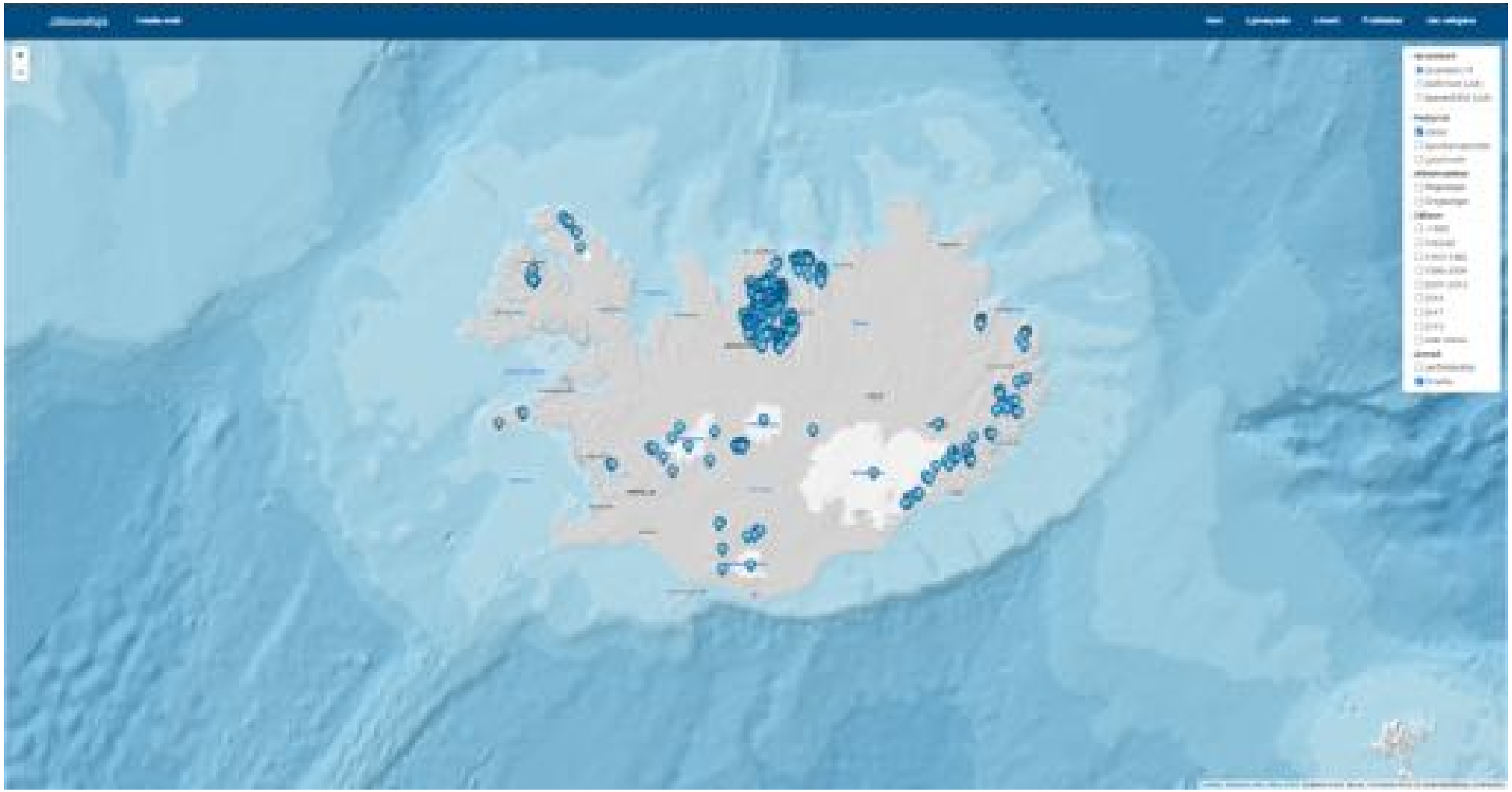
Grímsvötn
vöktunarkort

Gervitunglamynd:
Sentinel 2
Nær-innrauð litmynd
Tökudagur:
2022-10-13

Veðurstofa Íslands

Örnefni


Reykjadalsjökull eystri
Brennihnjúksjökull
Reykjadalsjökull vestri
Klaufabrekknajökull eystri
Hyrnujökull
Systrajökull
Klaufabrekknajökull vestri
Krossjökull
Sylingarjökull
Hvarfdalsjökull
Klaufajökull

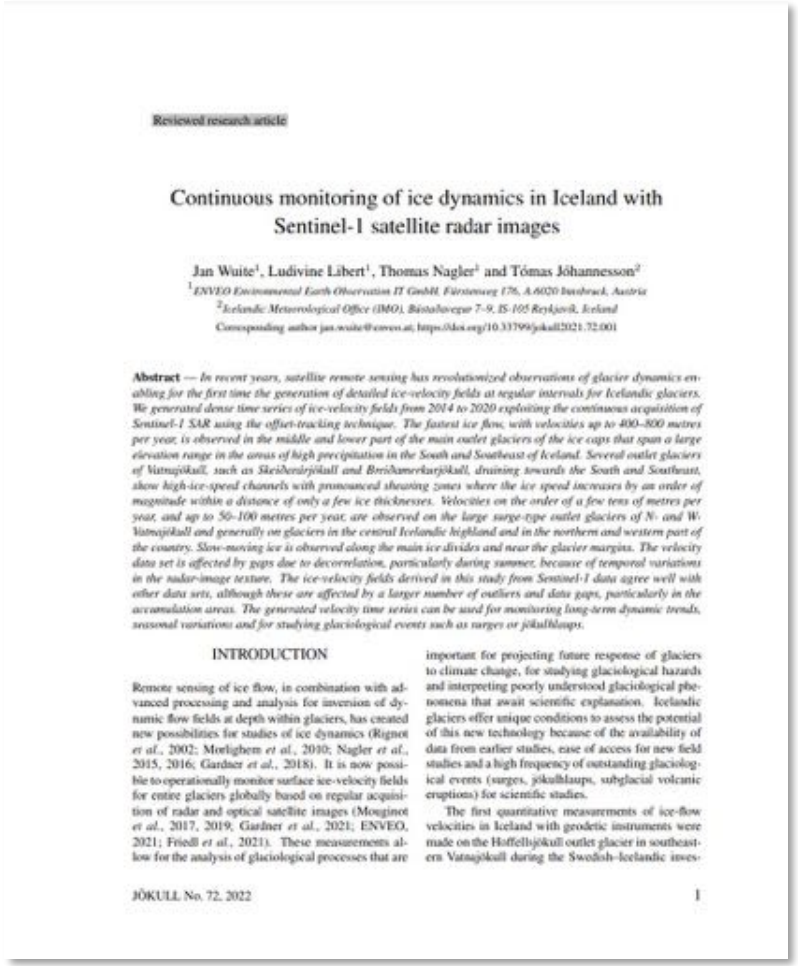


https://islenskirjoklar.is

Veðurstofa Íslands
HÍ | JARÐVÍSINDASTOFNUN
Landsvirkjun
NÁTTÚRUSTOFA SUÐAUSTURLANDS
LANDMÆLINGAR ÍSLANDS
LOFTSLAGSSJÓÐUR ICELANDIC CLIMATE FUND

Önnur mál 1/3

Skriðhraði jökla (Tómas Jóhannesson o.fl.)



Reviewed research article

Continuous monitoring of ice dynamics in Iceland with Sentinel-1 satellite radar images

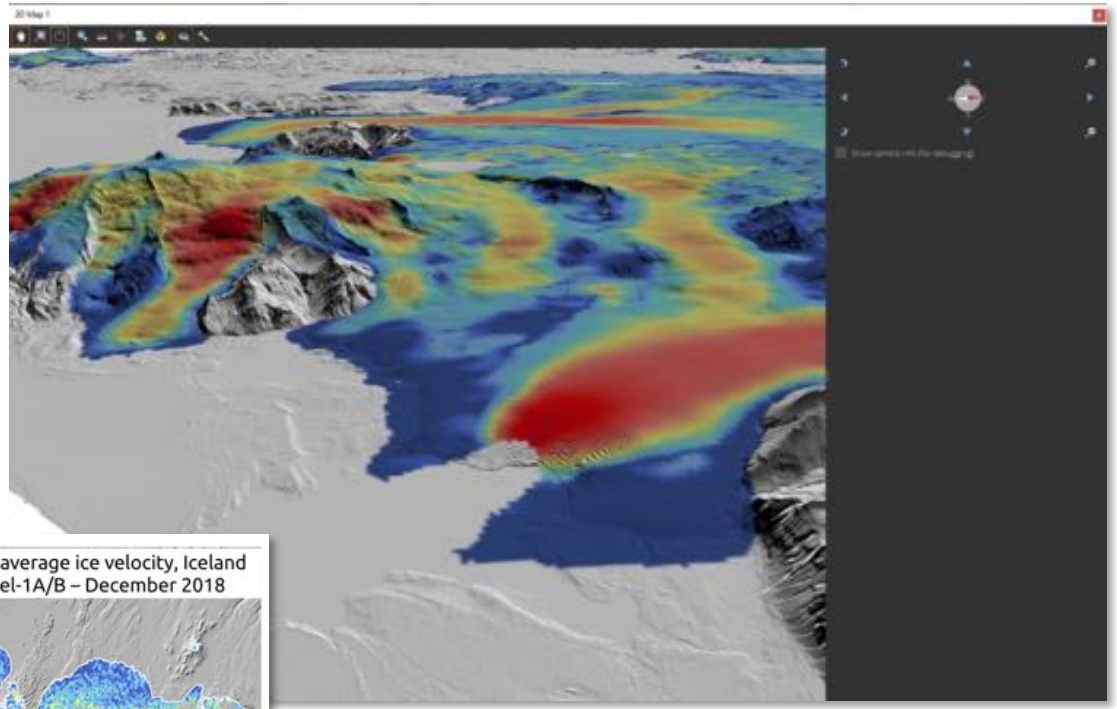
Jan Wuite[1], Ludivine Libert[1], Thomas Nagler[1] and Tómas Jóhannesson[2]
[1]ENVEO Environmental Earth Observation IT GmbH, Fürstenweg 176, A-6020 Innsbruck, Austria
[2]Icelandic Meteorological Office (IMO), Bústaðavegur 7–9, IS-105 Reykjavík, Iceland
Corresponding author jan.wuite@enveo.at; https://doi.org/10.33799/jokull2021.72.001

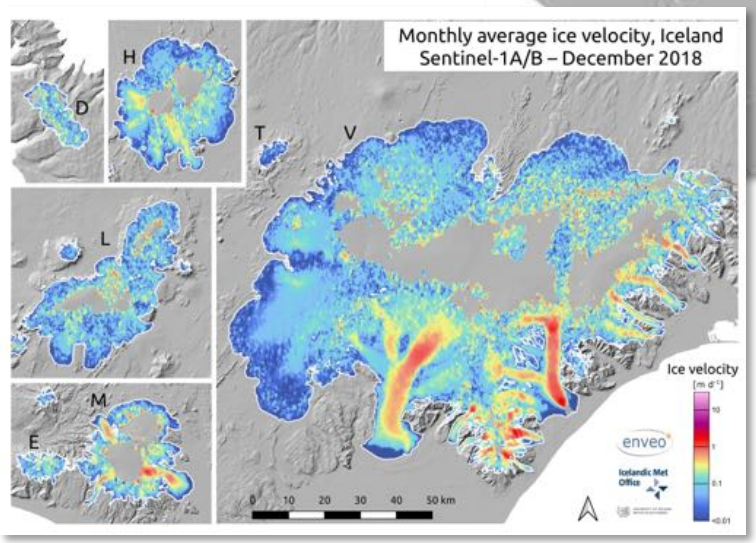
Abstract — *In recent years, satellite remote sensing has revolutionized observations of glacier dynamics enabling for the first time the generation of detailed ice-velocity fields at regular intervals for Icelandic glaciers. We generated dense time series of ice-velocity fields from 2014 to 2020 exploiting the continuous acquisition of Sentinel-1 SAR using the offset-tracking technique. The fastest ice flow, with velocities up to 400–800 metres per year, is observed in the middle and lower part of the main outlet glaciers of the ice caps that span a large elevation range in the areas of high precipitation in the South and Southeast of Iceland. Several outlet glaciers of Vatnajökull, such as Skeiðarárjökull and Breiðamerkurjökull, draining towards the South and Southeast, show high-ice-speed channels with pronounced shearing zones where the ice speed increases by an order of magnitude within a distance of only a few ice thicknesses. Velocities on the order of a few tens of metres per year, and up to 50–100 metres per year, are observed on the large surge-type outlet glaciers of N- and W-Vatnajökull and generally on glaciers in the central Icelandic highland and in the northern and western part of the country. Slow-moving ice is observed along the main ice divides and near the glacier margins. The velocity data set is affected by gaps due to decorrelation, particularly during summer, because of temporal variations in the radar-image texture. The ice-velocity fields derived in this study from Sentinel-1 data agree well with other data sets, although these are affected by a larger number of outliers and data gaps, particularly in the accumulation areas. The generated velocity time series can be used for monitoring long-term dynamic trends, seasonal variations and for studying glaciological events such as surges or jökulhlaups.*

INTRODUCTION

Remote sensing of ice flow, in combination with advanced processing and analysis for inversion of dynamic flow fields at depth within glaciers, has created new possibilities for studies of ice dynamics (Rignot *et al.*, 2002; Morlighem *et al.*, 2010; Nagler *et al.*, 2015, 2016; Gardner *et al.*, 2018). It is now possible to operationally monitor surface ice-velocity fields for entire glaciers globally based on regular acquisition of radar and optical satellite images (Mouginot *et al.*, 2017, 2019; Gardner *et al.*, 2021; ENVEO, 2021; Friedl *et al.*, 2021). These measurements allow for the analysis of glaciological processes that are important for projecting future response of glaciers to climate change, for studying glaciological hazards and interpreting poorly understood glaciological phenomena that await scientific explanation. Icelandic glaciers offer unique conditions to assess the potential of this new technology because of the availability of data from earlier studies, ease of access for new field studies and a high frequency of outstanding glaciological events (surges, jökulhlaups, subglacial volcanic eruptions) for scientific studies.

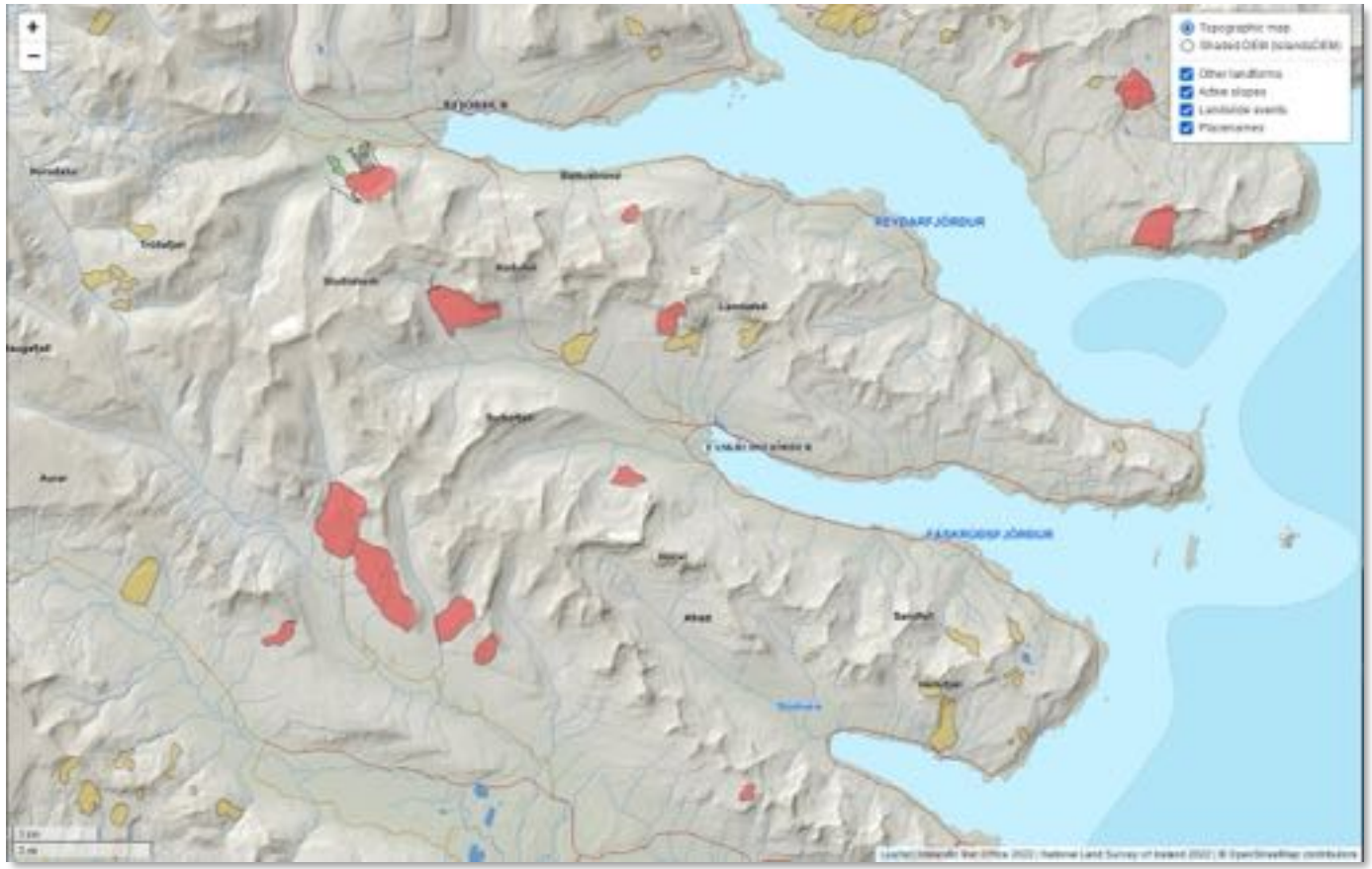
The first quantitative measurements of ice-flow velocities in Iceland with geodetic instruments were made on the Hoffellsjökull outlet glacier in southeastern Vatnajökull during the Swedish–Icelandic inves-



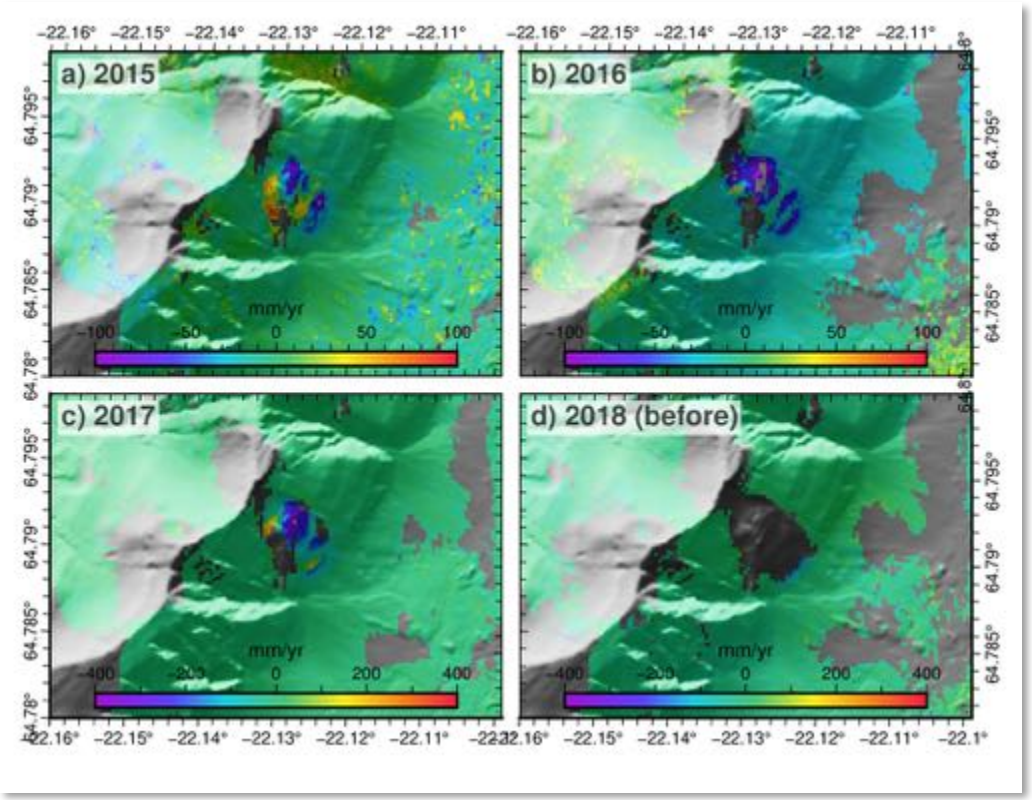


Önnur mál 2/3

Óstöðugar hlíðar (Vincent Drouin)



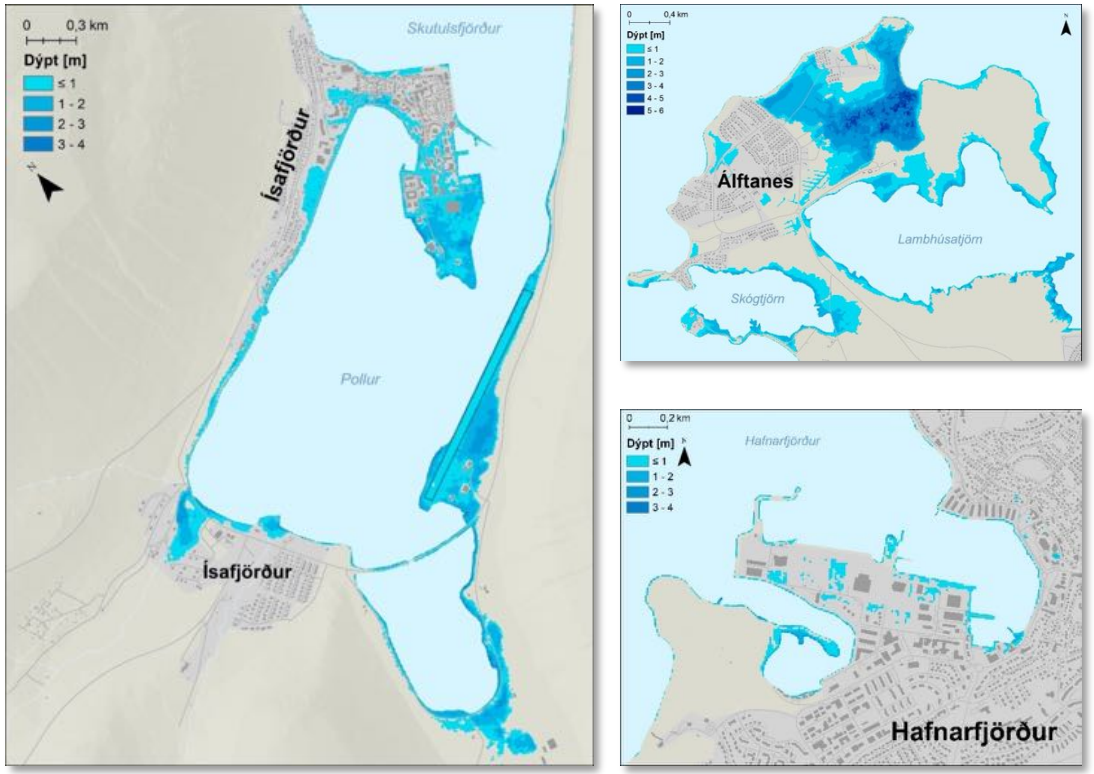
Hítardalur



Önnur mál 3/3

Sjávarflóð (Guðrún Elín Jóhannsdóttir)

Reiknuð Delft3D-FM umhverfis landið



Hæð 100 ára viðmiðunarflóðs

Ragnar Heiðar Þrastarson

rhth@vedur.is

@RagnarHeidar

Veðurstofa Íslands