

Vatnarannsóknir á Íslandi

Jöklarannsóknir

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Hofsjökull



Vatn á jörðinni reiknað sem meðalhafdýpi eða breyting á sjávarmáli

	Vatnsmagn (m)
Höfin	3500–4000
Jökull Suðurskautslandsins	61.1
Grænlandsjökull	7.2
Aðrir jöklar	0.5
Sífreri	0.03–0.1
Íslenskir jöklar	0.01

Ferskvatn á jörðinni jafnað yfir þurrlendi eða jörðina alla

	Vatnsmagn (m)
Jökull Suðurskautslandsins	155
Grunnvatn ($d < 0.8$ km)	30
Grunnvatn ($0.8 < d < 4$ km)	30
Grænlandsjökull	18
Aðrir jöklar	1.3
Fersk stöðuvötn	0.9
Jarðlög ofan grunnvatnsborðs	0.5
Vatn í lífríki á landi	0.35
Sífreri	0.08–0.25
Lofthjúpurinn (öll jörðin)	0.025
Vatn í ám	0.01

Vatn á Íslandi

reiknað sem meðaltal yfir allt landið

	Vatnsmagn (m)
Grunnvatn	≈100
Jöklar	30–40
Stöðuvötn	0.13
Lofthjúpurinn yfir landinu	0.007
Vatnsföll	≈0.005

Ýmsar heimildir

Árleg vatnsafkoma landsins, 1950-1980

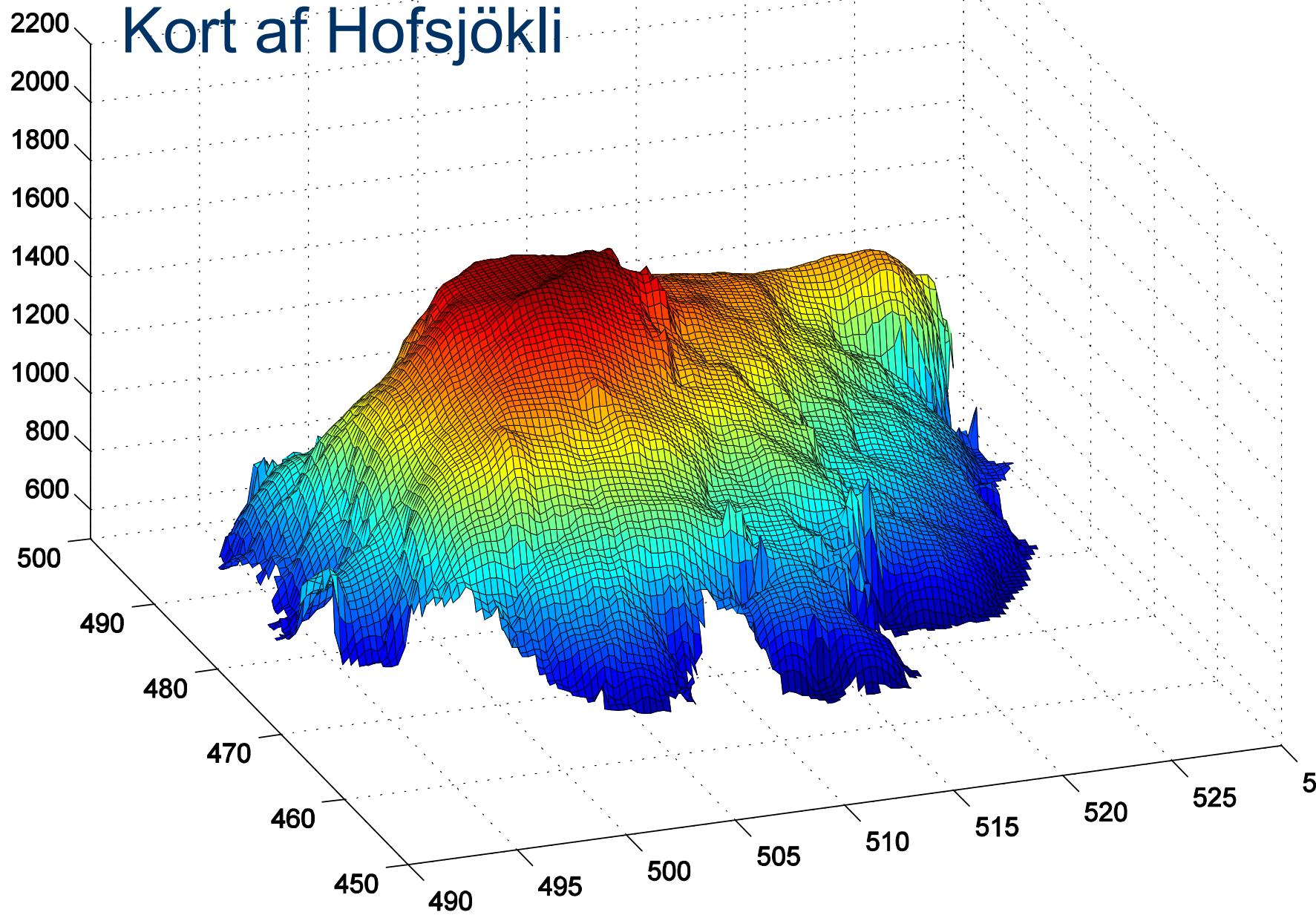
	Vatnsmagn (mm)
Úrkoma	2000
Afrennsli vatnsfalla	1600
Uppgufun	350
Grunnvatnsstraumur	40
Rýrnun jökla	40

Heimild: Orkustofnun/HT

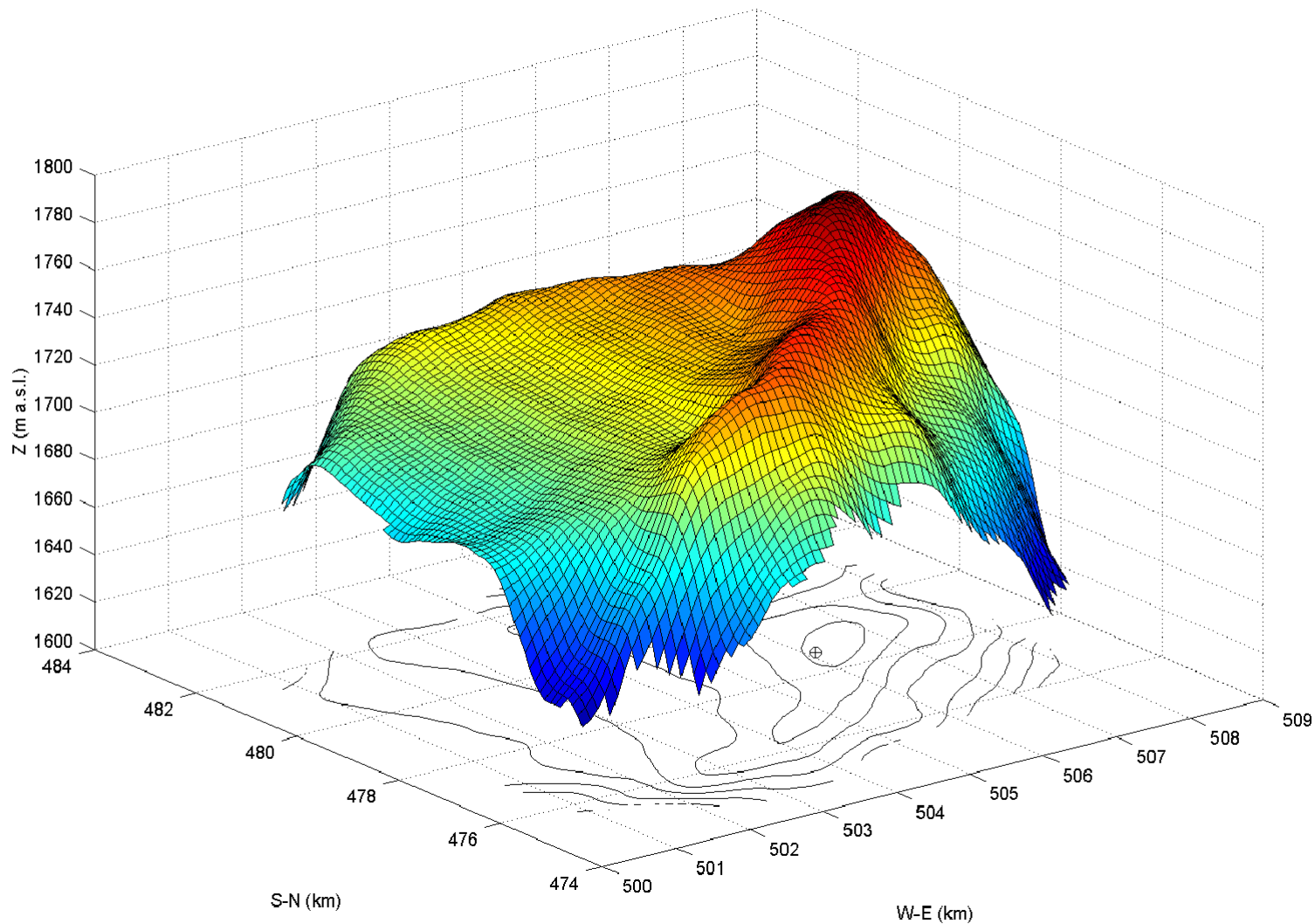
Jöklarannsóknir

- Kortlagning
- Sporðamælingar
- Afkomumælingar
- Mælingar á ísskriði
- Vatnafræði jökuláa
- Borun ískjarna
- Líkanreikningar
- Afleiðingar loftslagsbreytinga
- Jökulhlaup
- Framhlaup jökla
- Eldgos undir jökli
- Efnafræði úrkomu og afrennslis

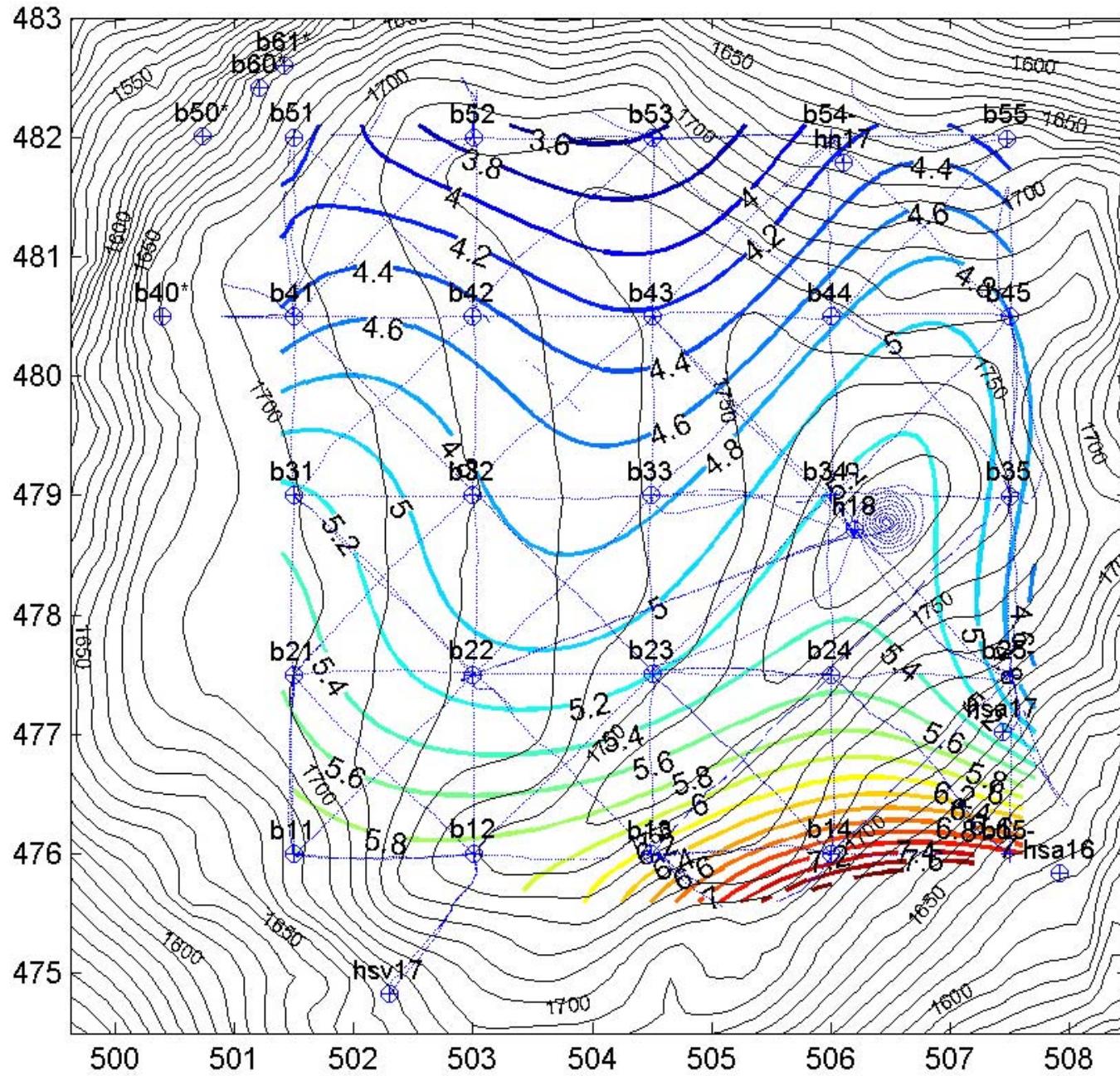
Kort af Hofsjökli



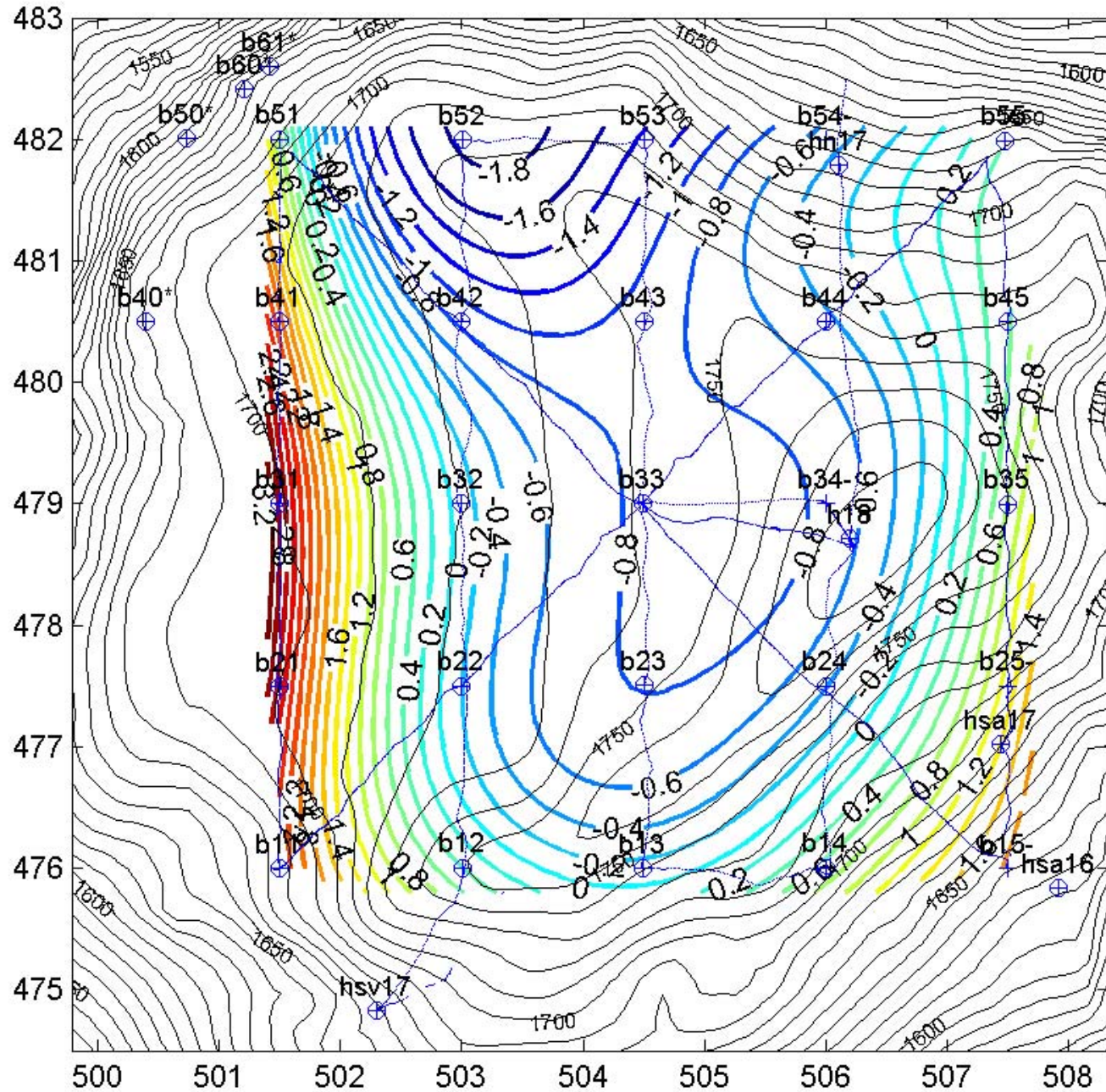
Kort af toppi Hofsjökuls byggt á GPS mælingum



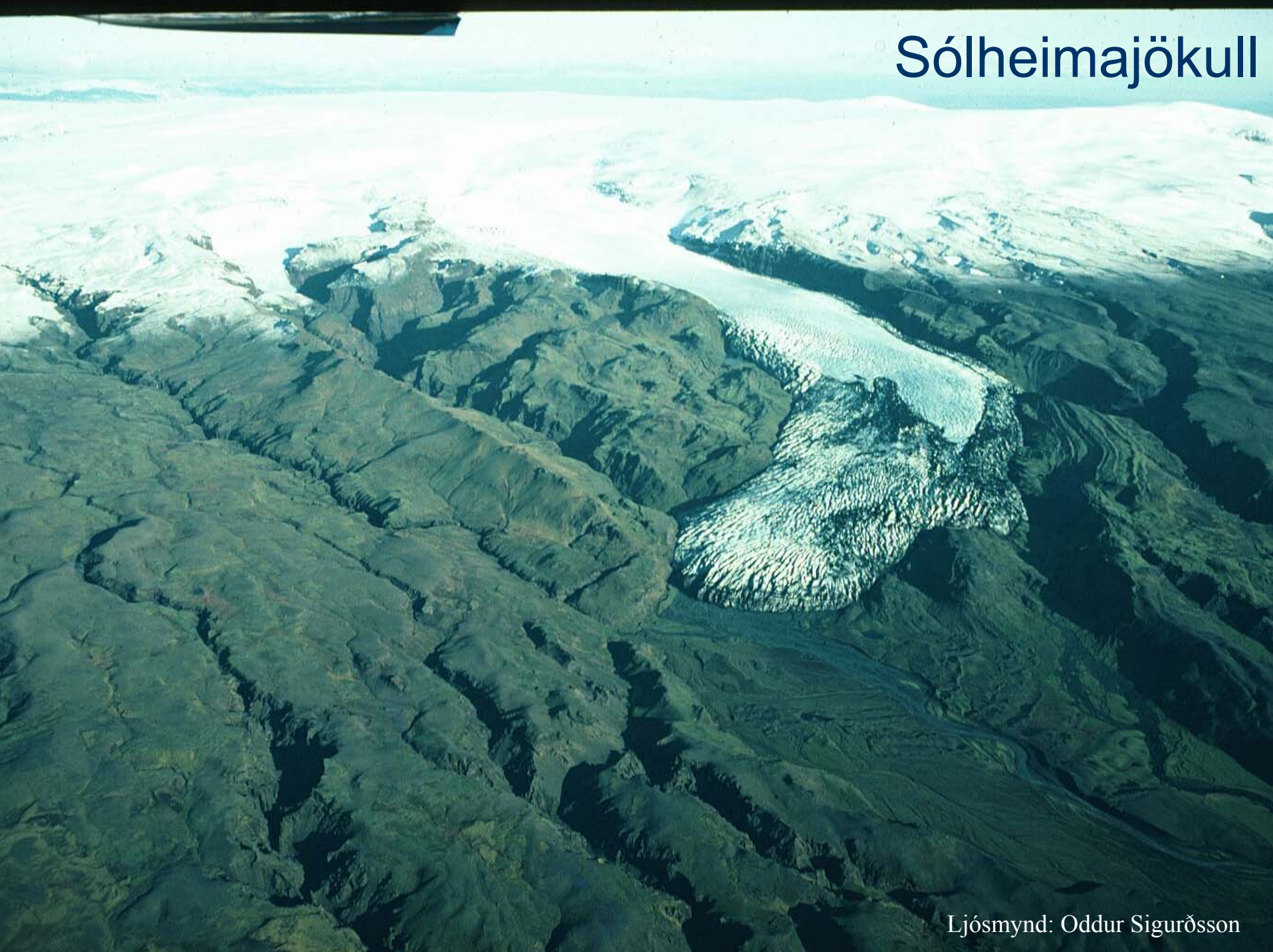
Breyting á hæð yfirborðs, ágúst 2001 til maí 2003 (GPS)



Breyting á hæð yfirborðs, ágúst 2001 til september 2003 (GPS)

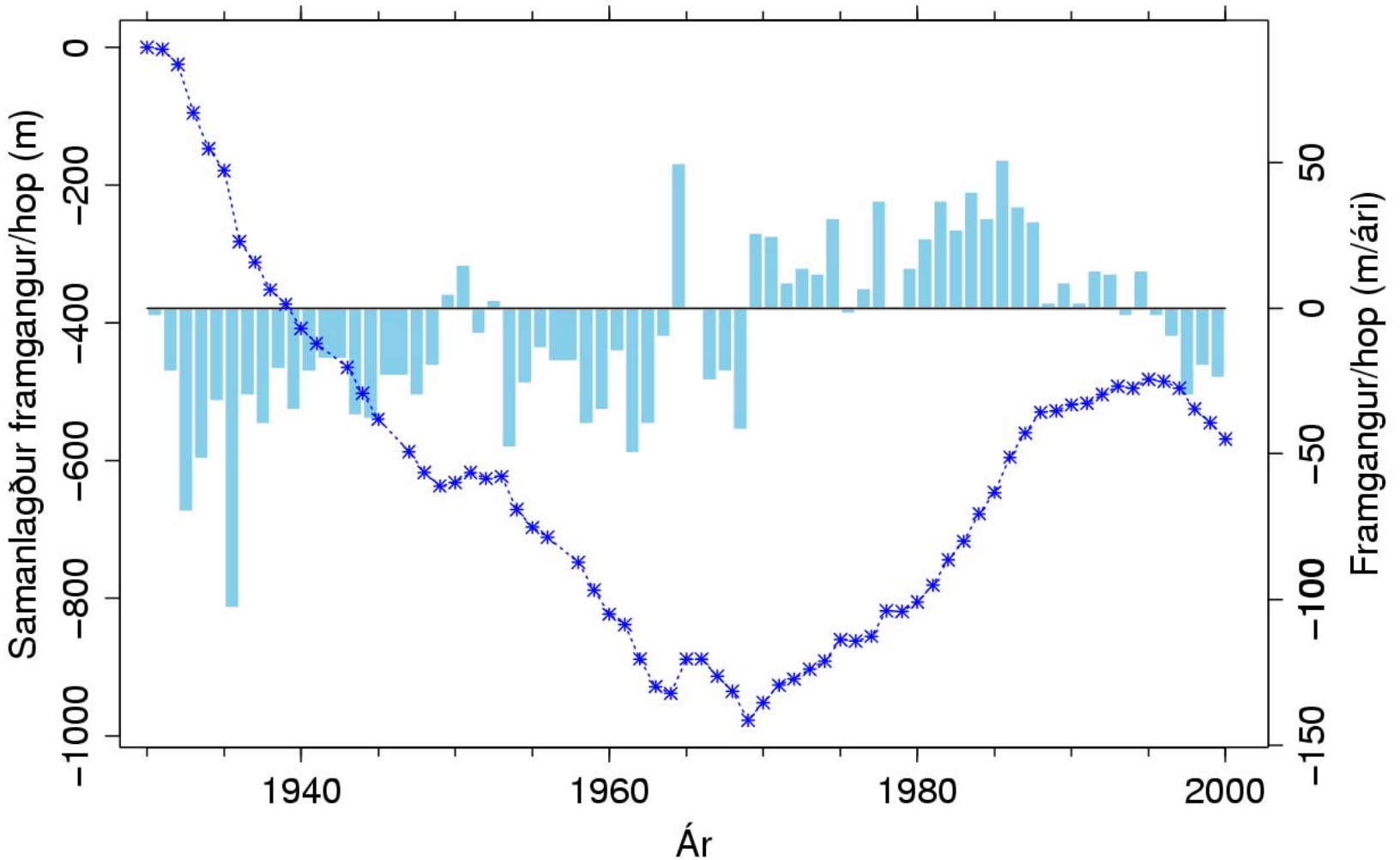


Sólheimajökull

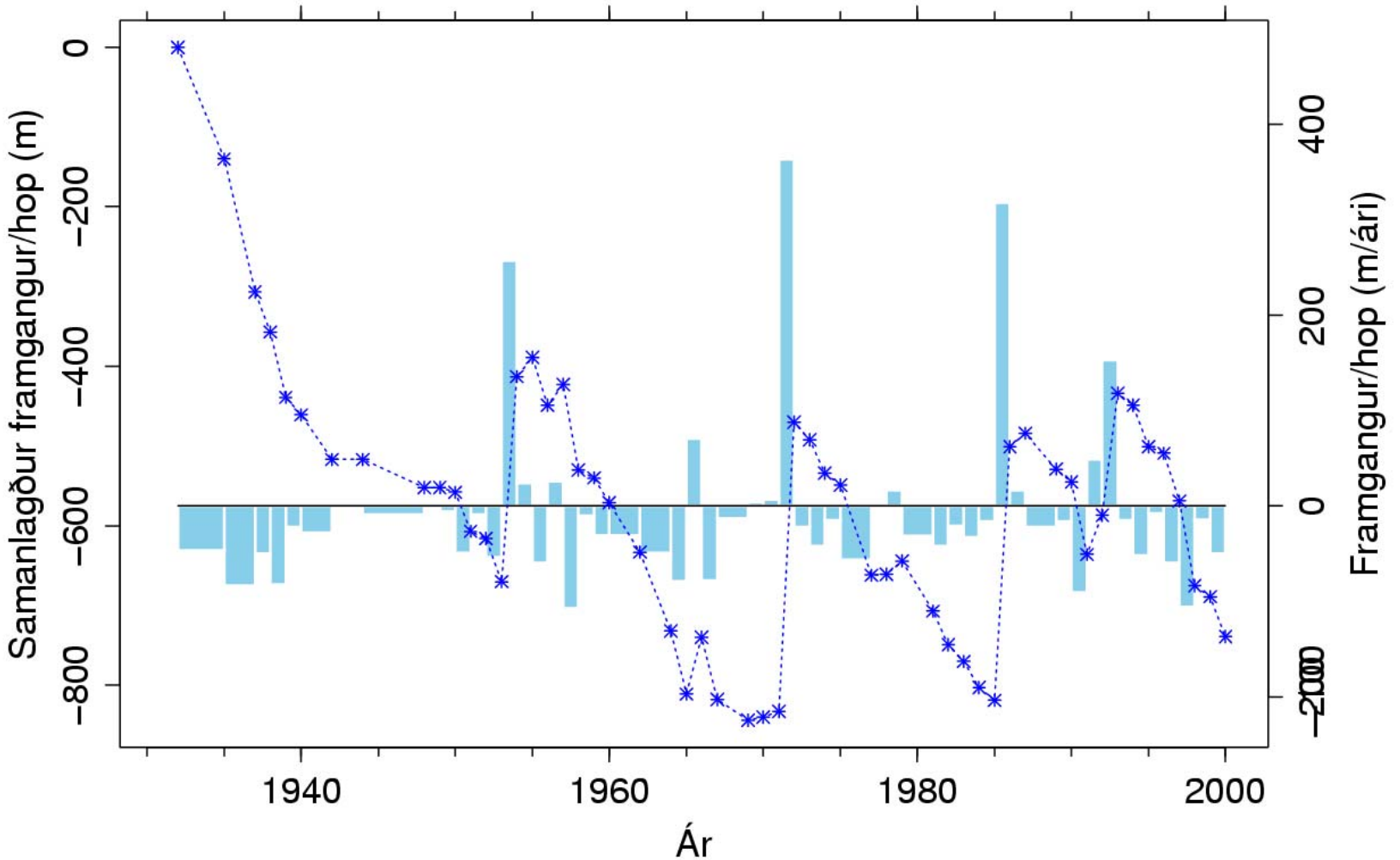


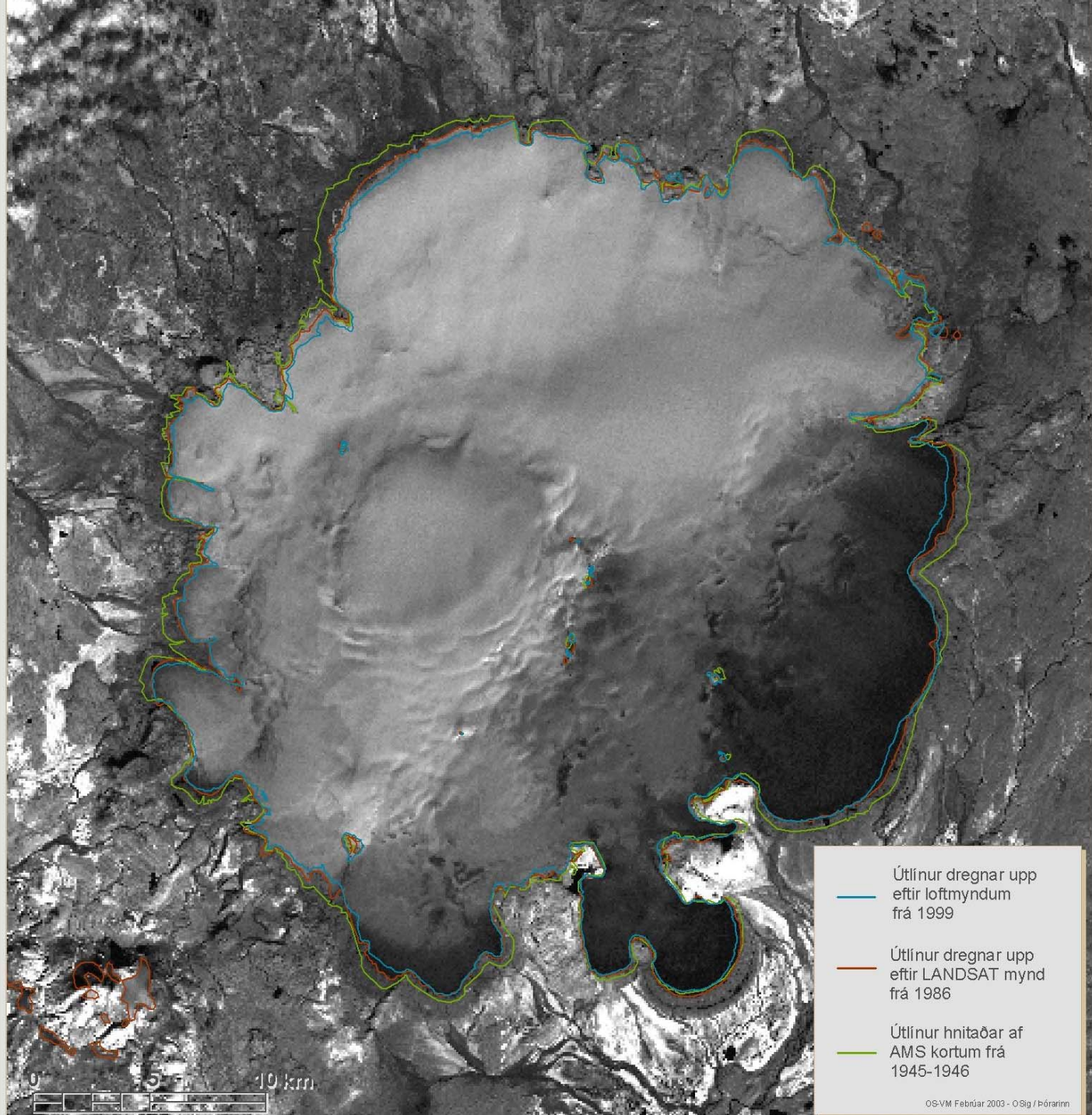
Ljósmynd: Oddur Sigurðsson

Sólheimajökull 1931 - 2000



Múlajökull 1931 - 2000

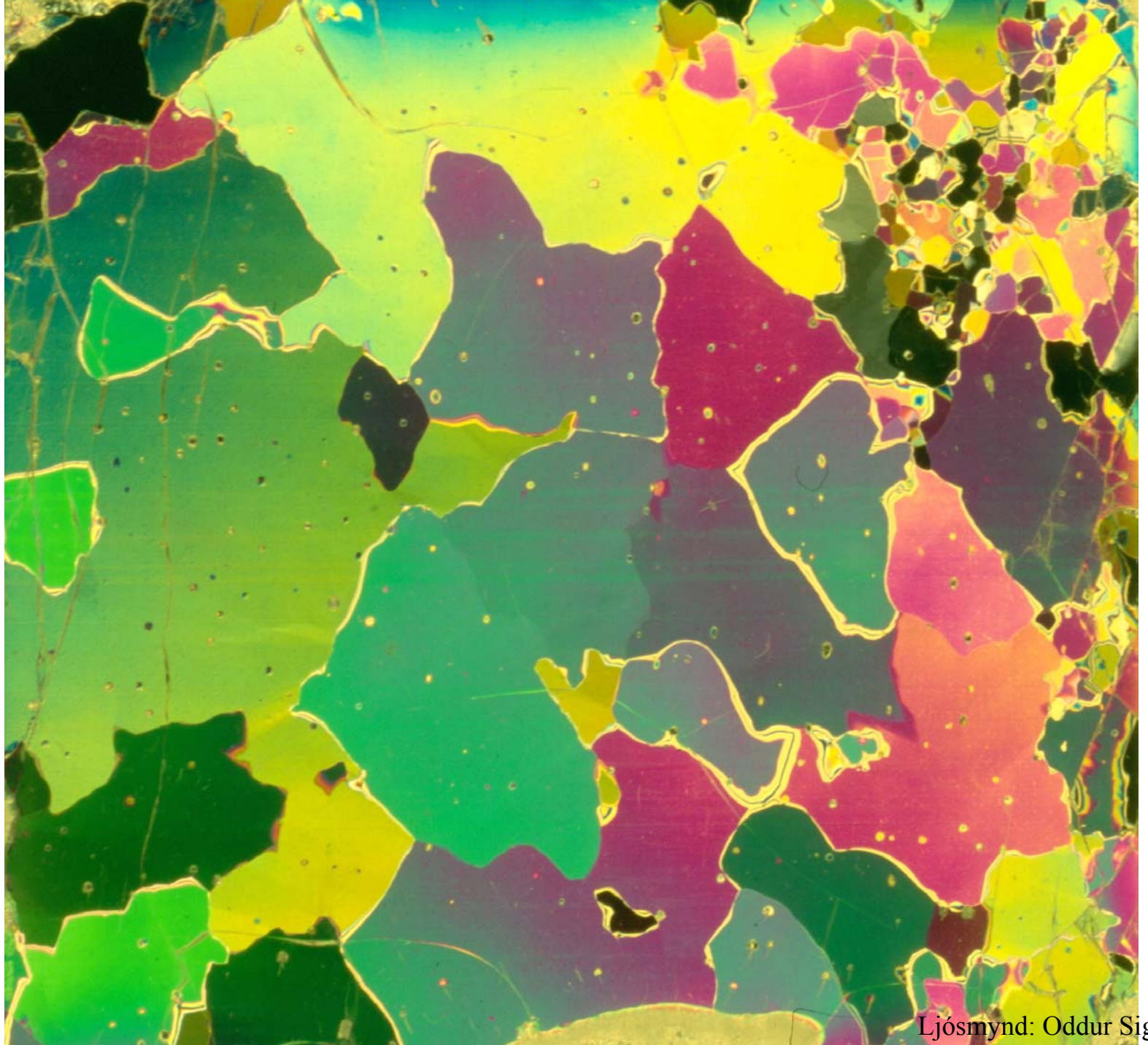


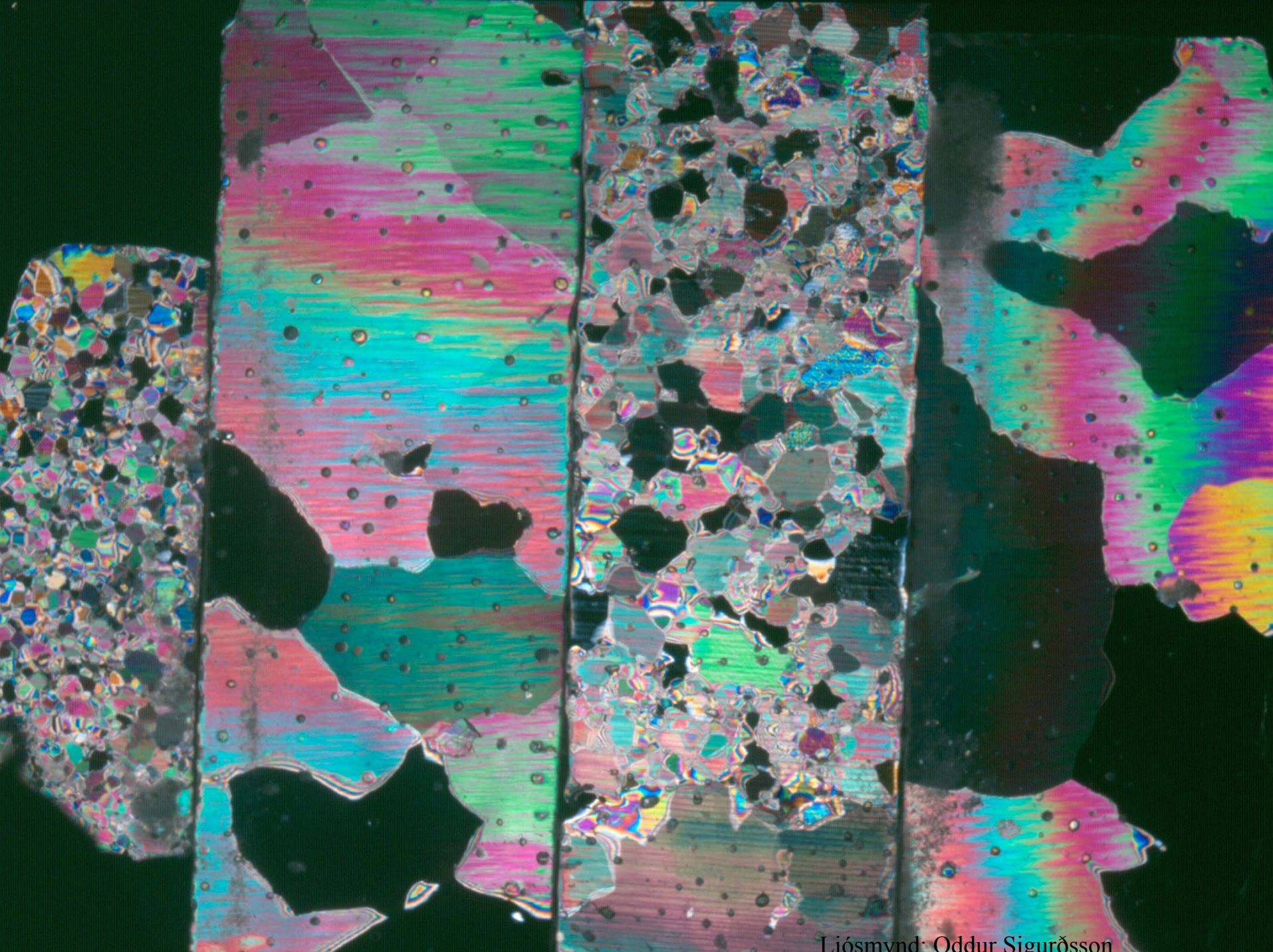


Útlínur dregnar upp
eftir loftmyndum
frá 1999

Útlínur dregnar upp
eftir LANDSAT mynd
frá 1986

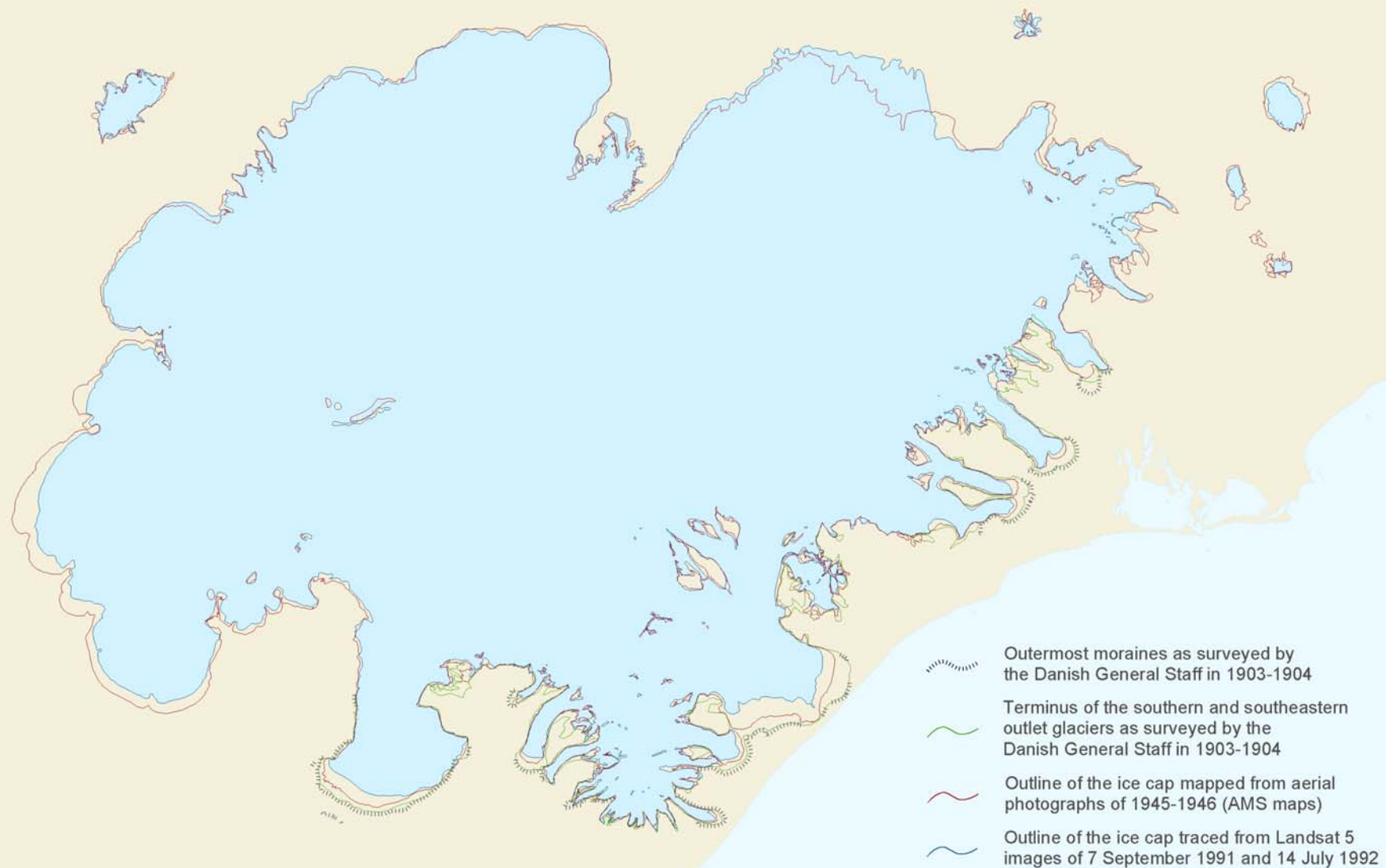
Útlínur hnitaðar af
AMS kortum frá
1945-1946



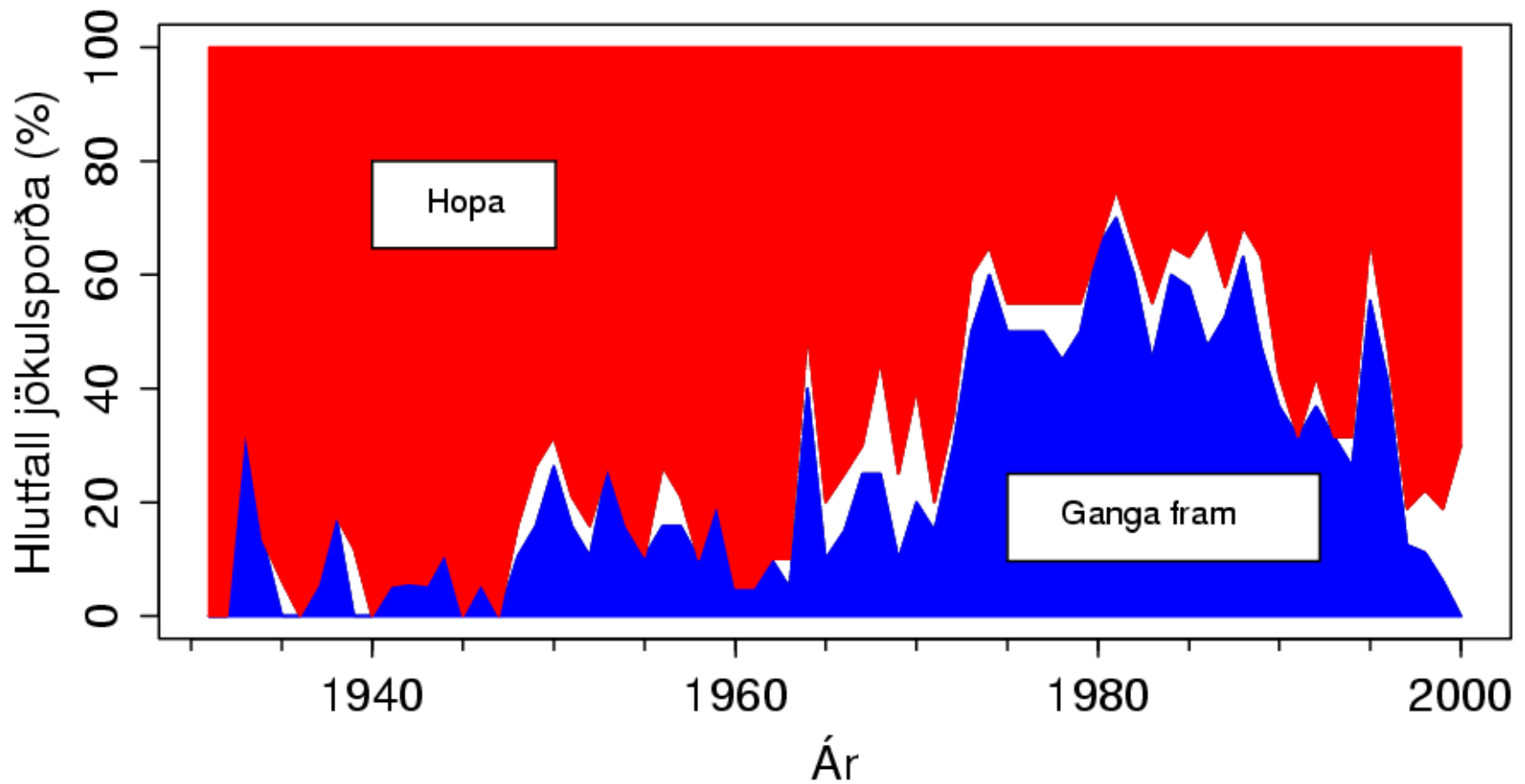


Sporðamælingar á Vatnajökli

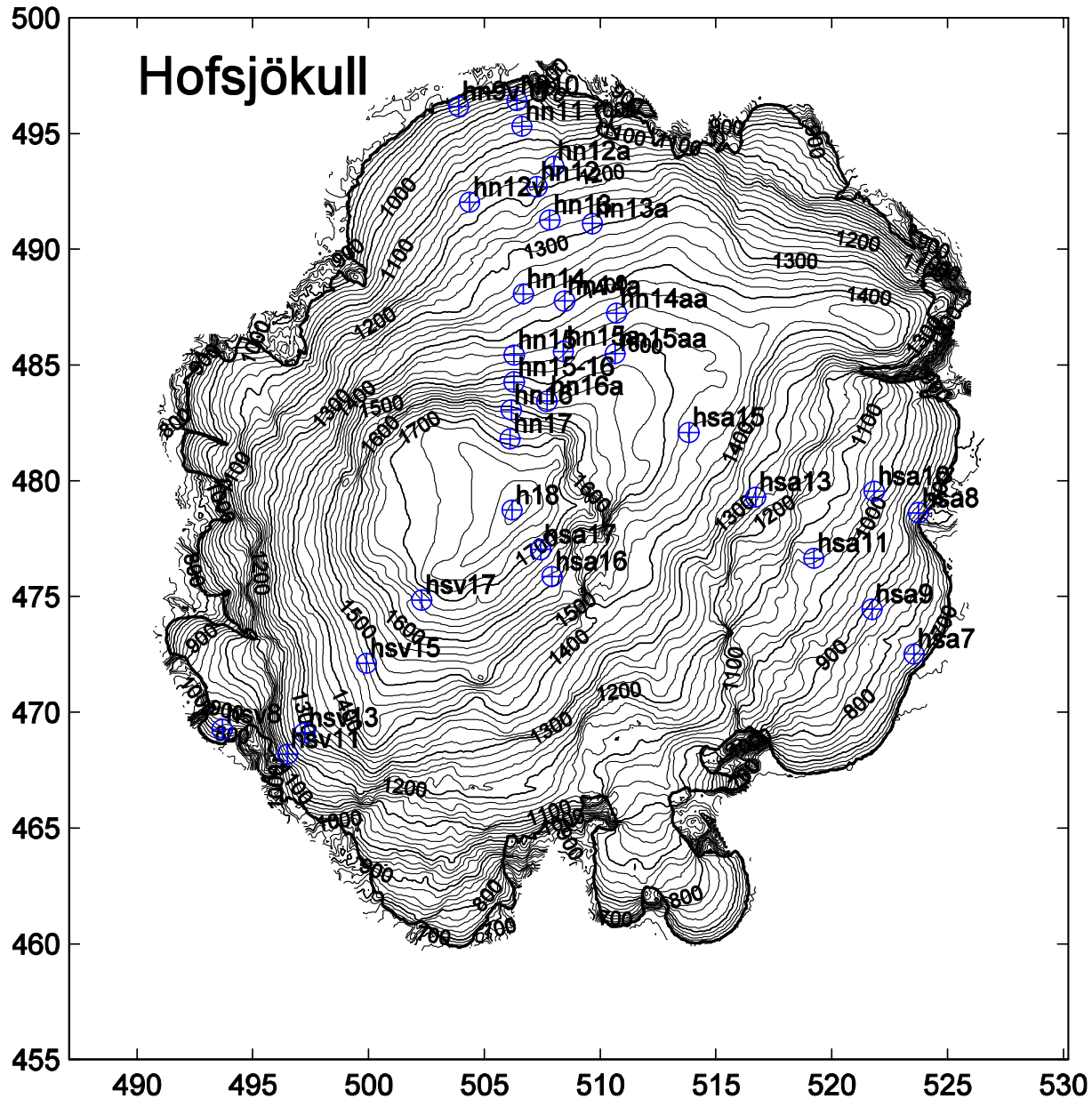


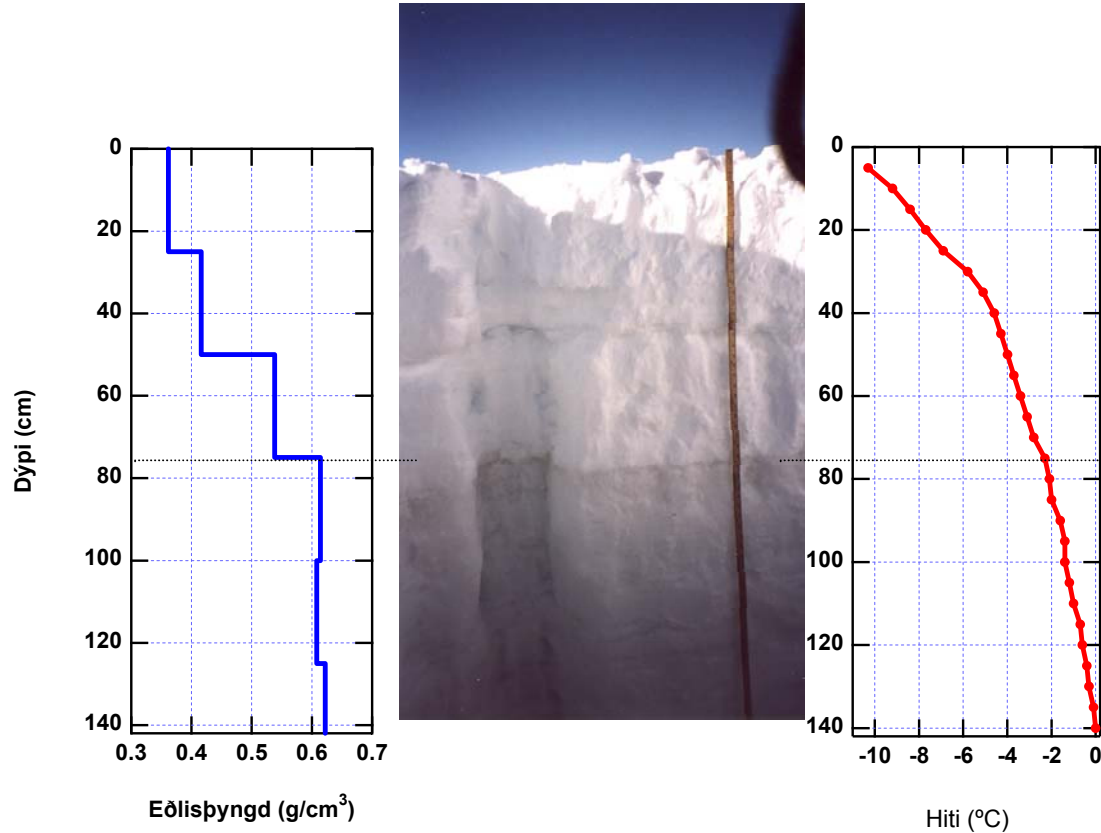


Hop íslenskra jökla 1930 - 2000



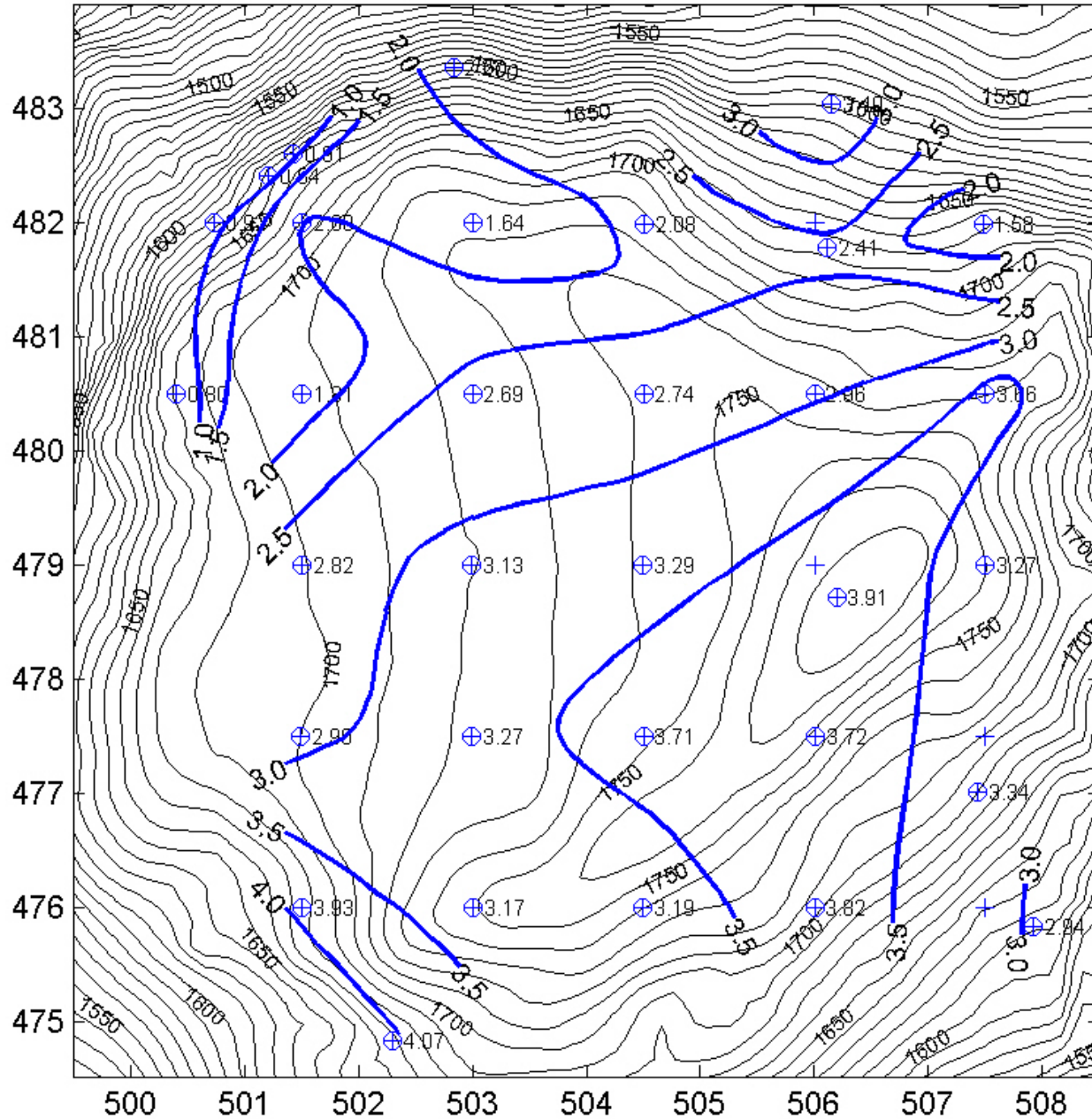
Afkomustikur, 1988-2002





Snjógrýfja á toppi Hofsjökuls í 1790 m h.y.s. (H18)
þann 25 september 2003, sumarsnjór sést á 75 cm dýpi

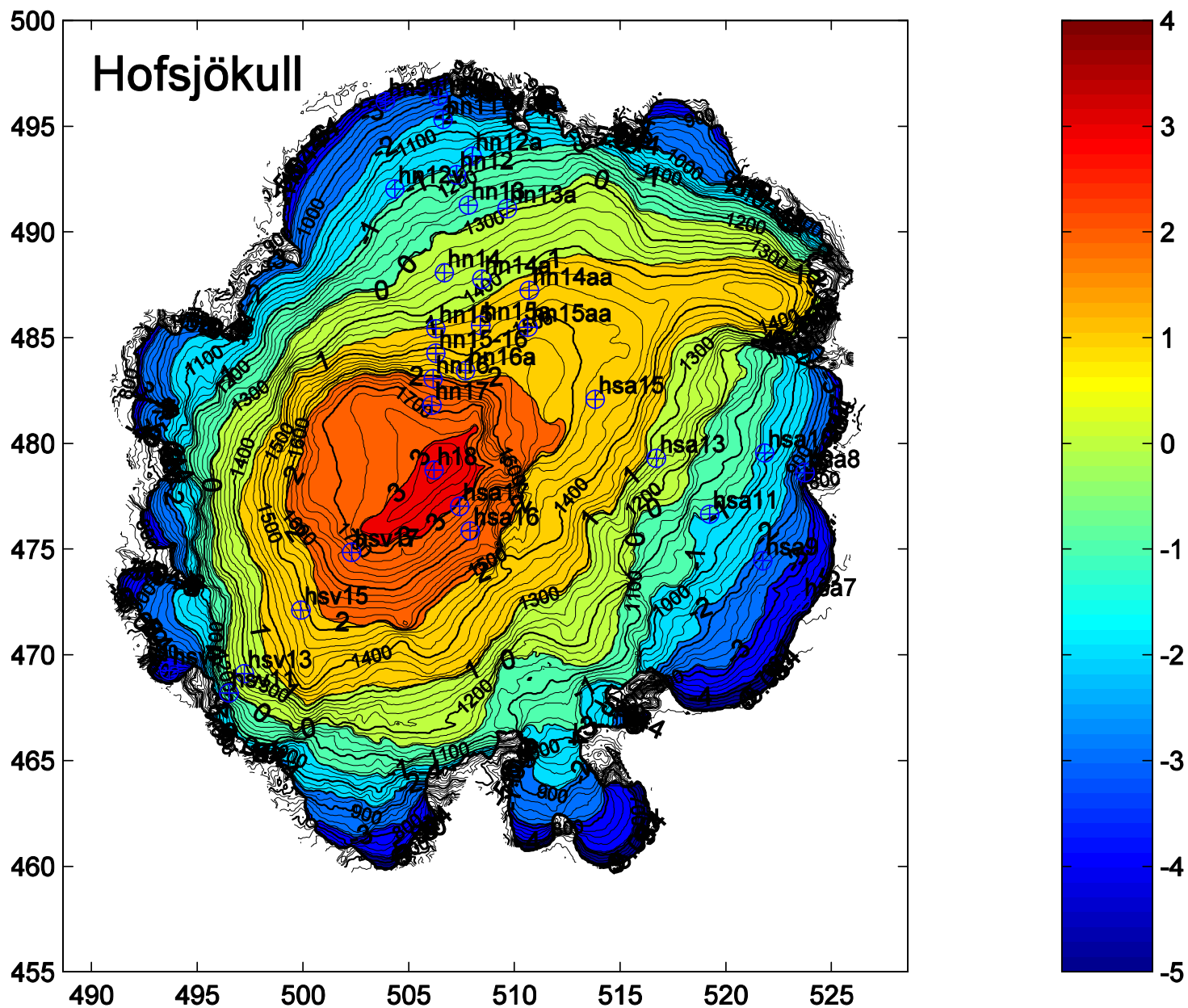
Vetrarafkoma 2002-2003, jafnþykktarlínur

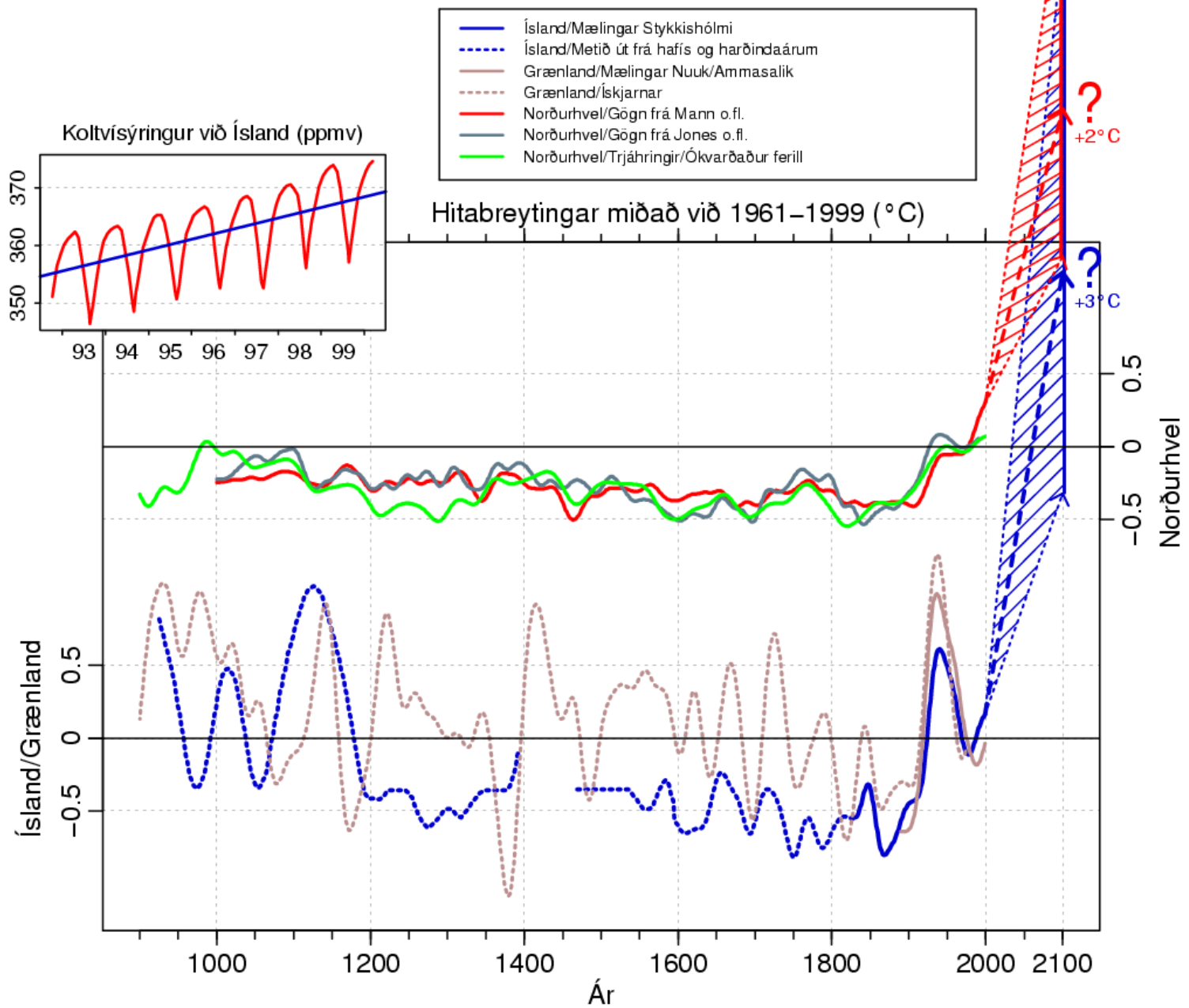


Gjóska frá Heklugosinu 1991 á 18 m dýpi
í sprungu í norðausturhorni mælinets (B55)



Reiknuð meðalafkoma, 1981-2000

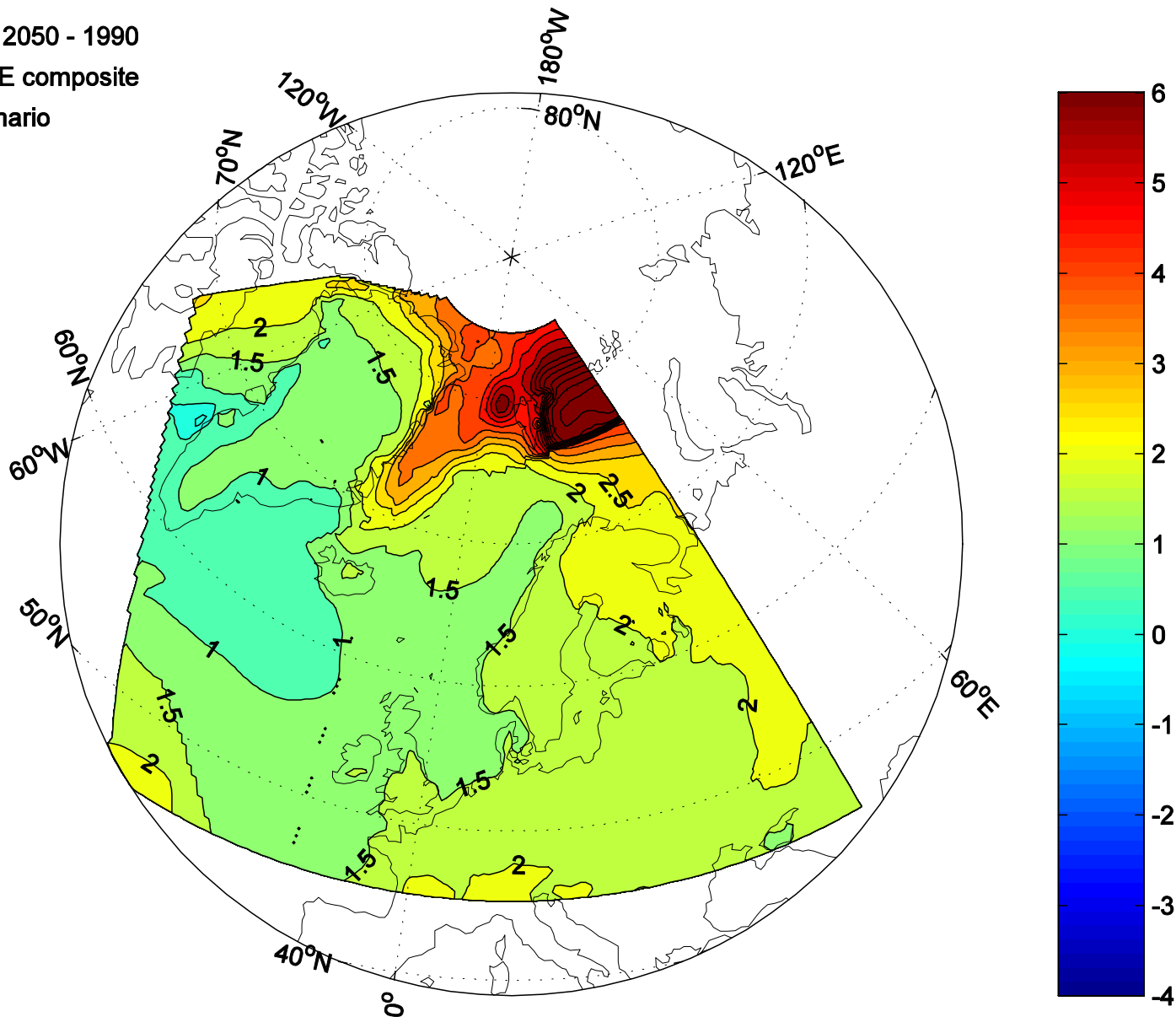




CWE sviðsmynd fyrir hita, 1990-2050

DT, 2050 - 1990

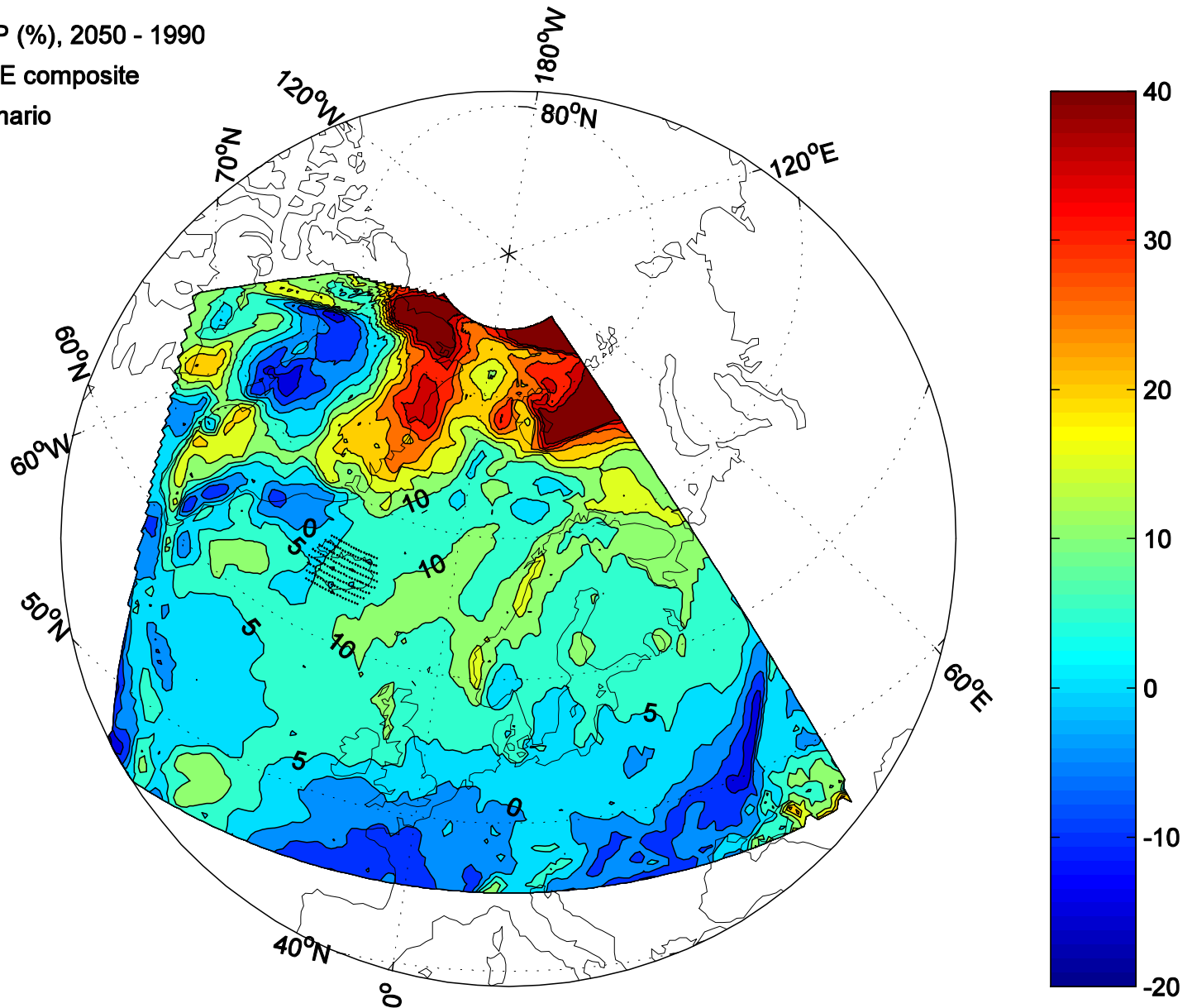
CWE composite
scenario



CWE sviðsmynd fyrir úrkomu, 1990-2050

RDP (%), 2050 - 1990

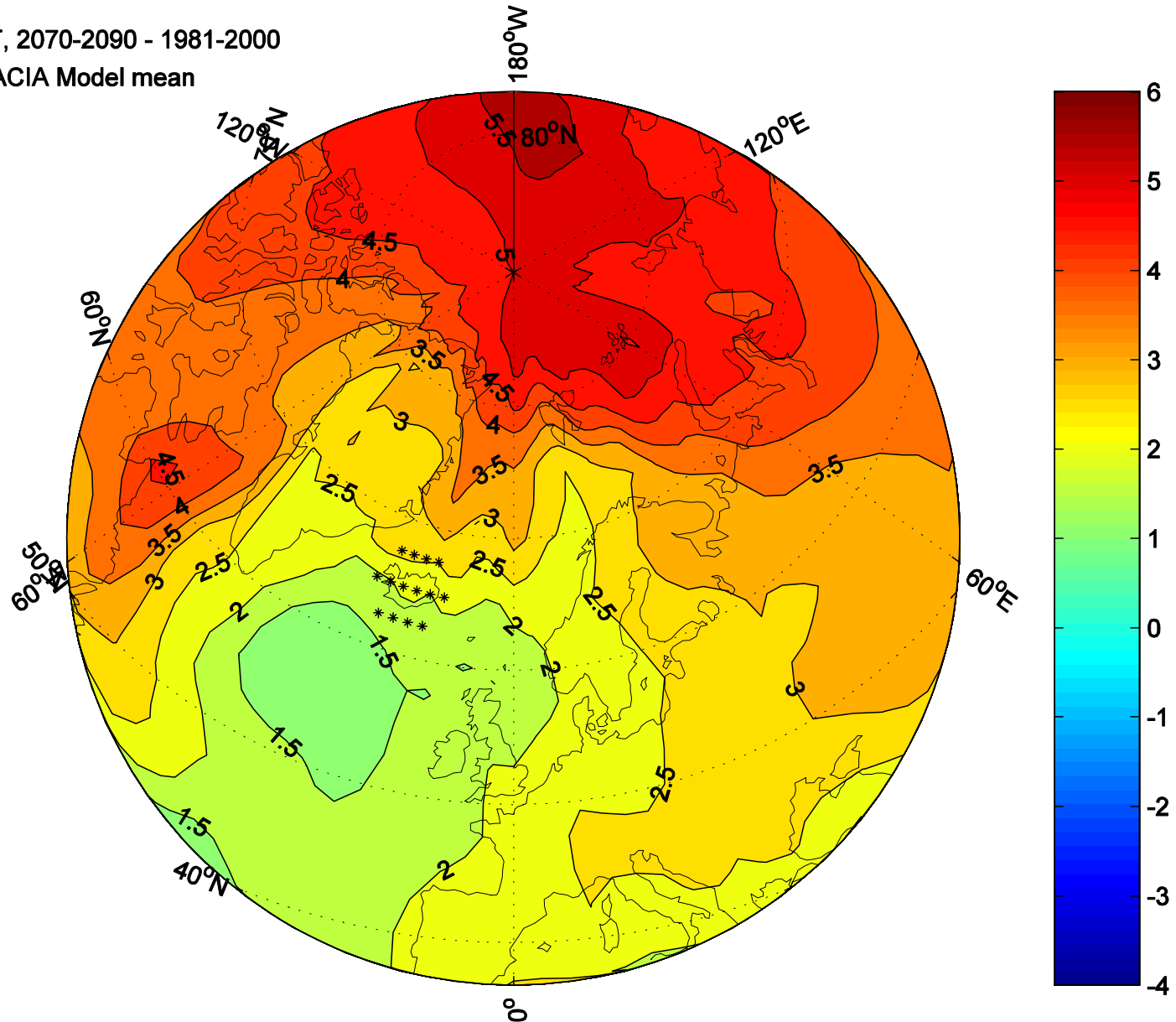
CWE composite
scenario



ACIA, hitabreyting, meðaltal 5 líkana, 1990-2080

DT, 2070-2090 - 1981-2000

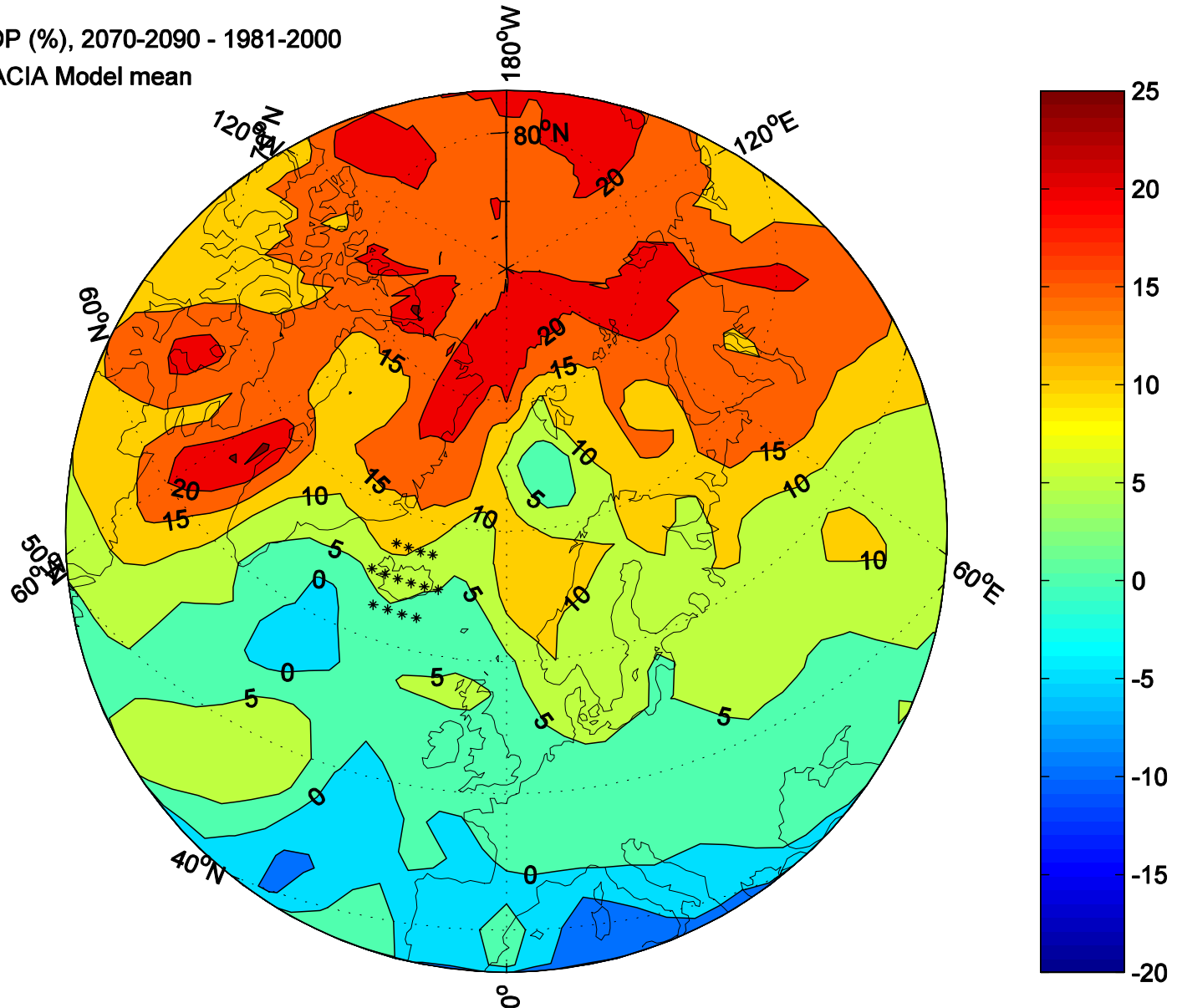
5 ACIA Model mean



ACIA, úrkomubreyting, meðaltal 5 líkana, 1990-2080

RDP (%), 2070-2090 - 1981-2000

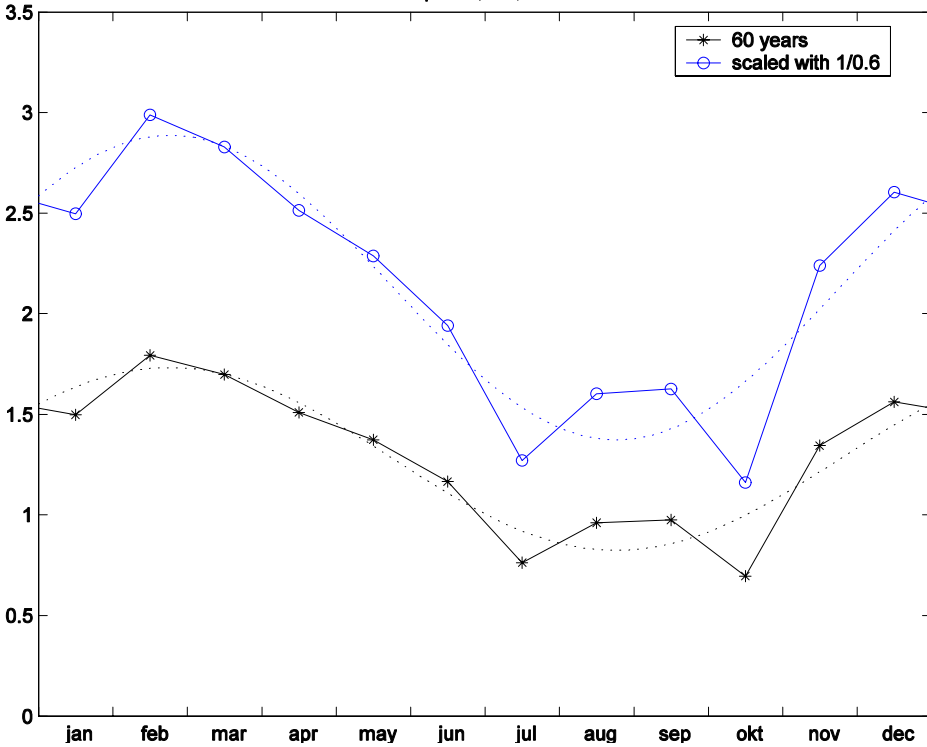
5 ACIA Model mean



CWE sviðsmynd, 1990-2050

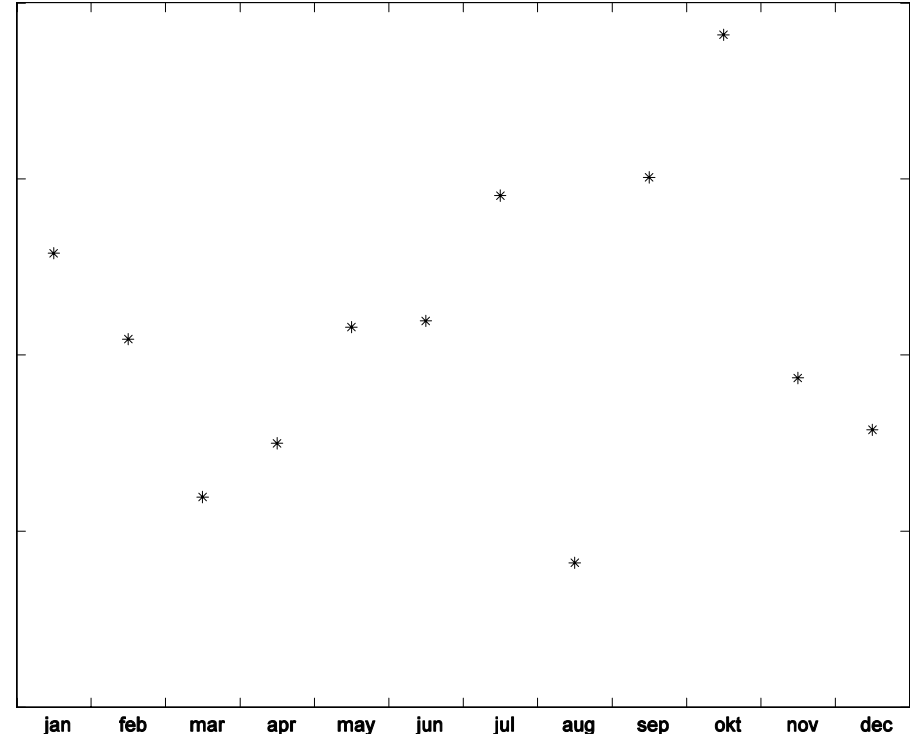
Hitabreyting

CWE-composite, DT, 2050 - 1990



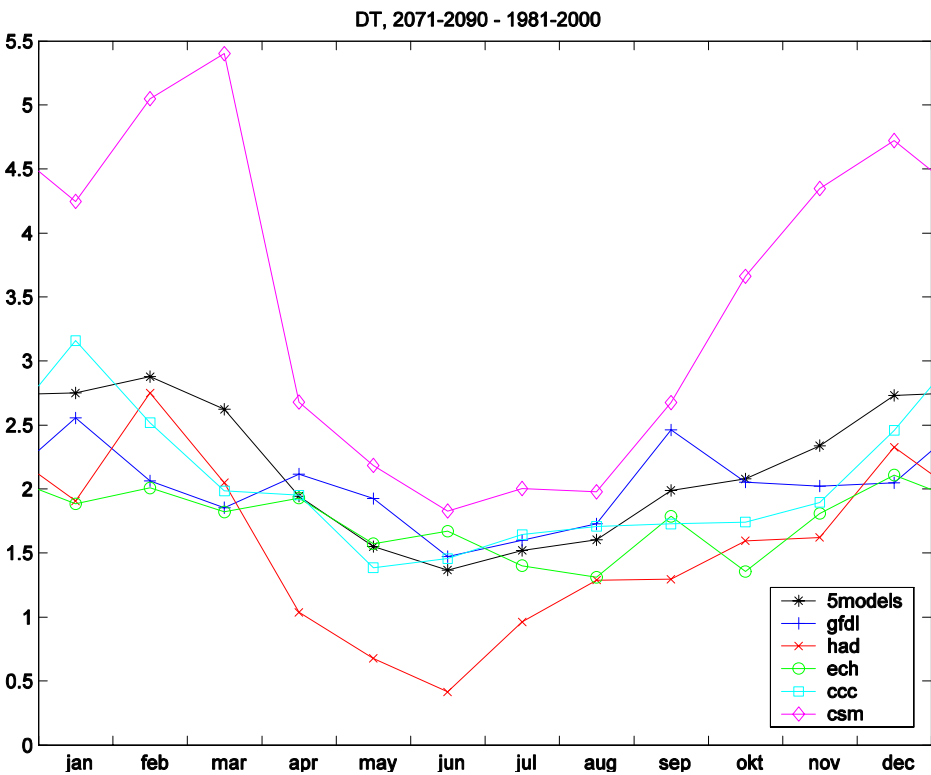
Hlutfallsleg breyting á úrkomu

CWE-composite, RDP/DT (%/°C), 2050 - 1990

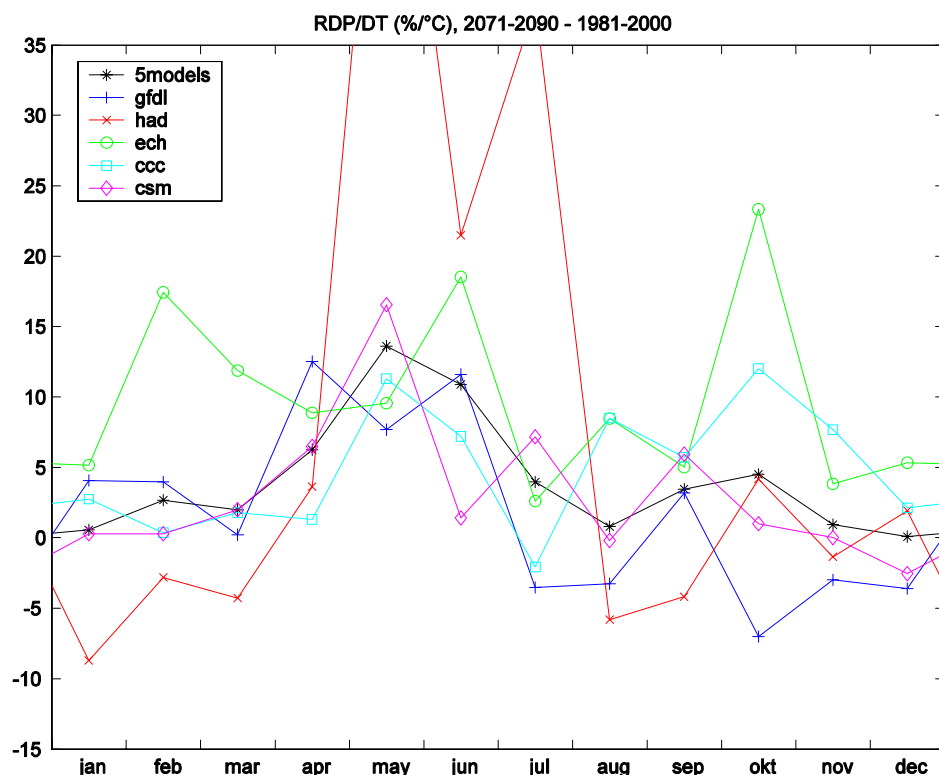


ACIA meðaltal 5 líkana, 1990-2080

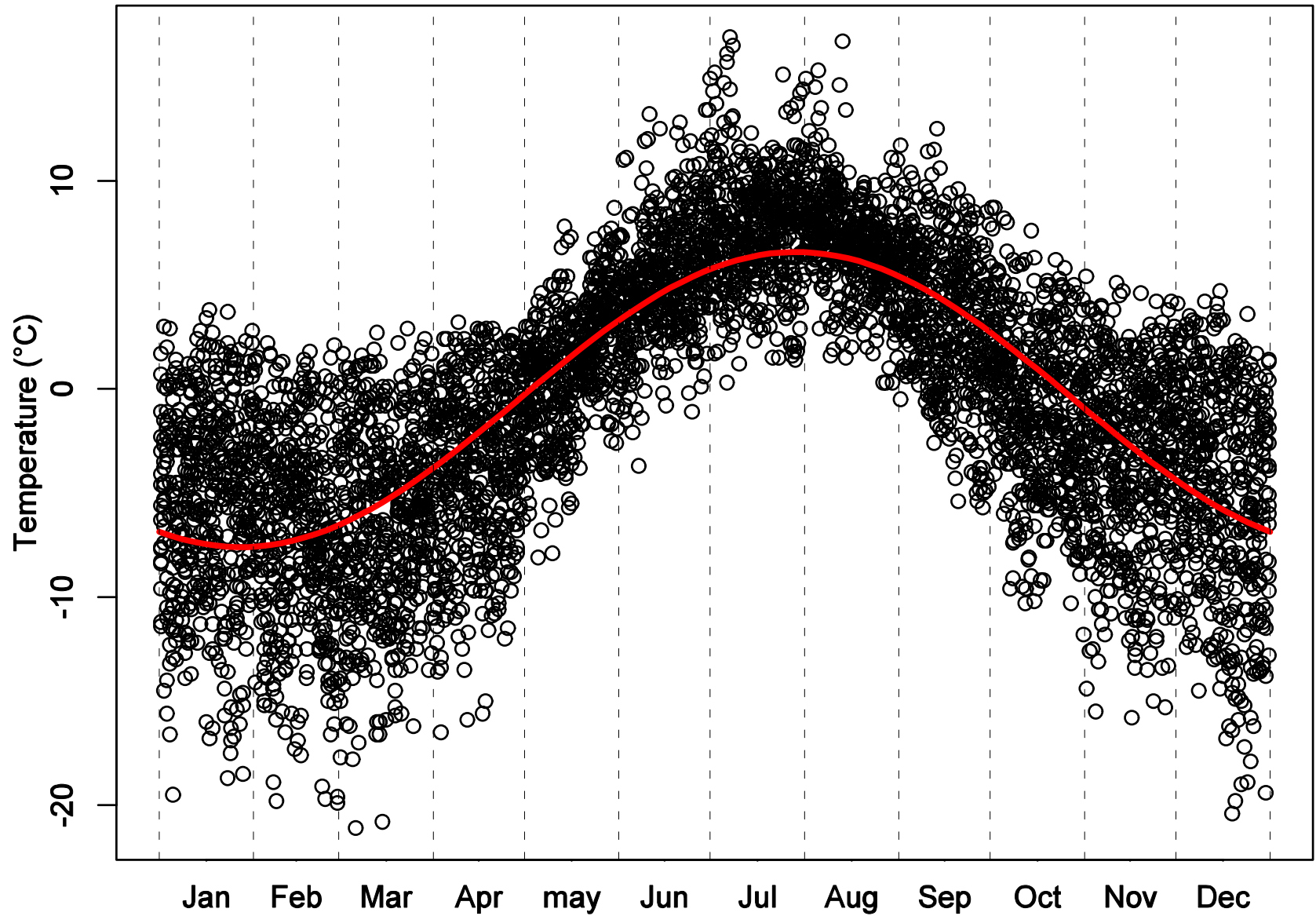
Hitabreyting



Hlutfallsleg breyting á úrkomu

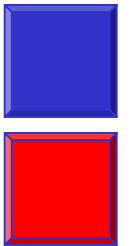


Árstíðasveifla hita, Hveravellir, 1987-2002

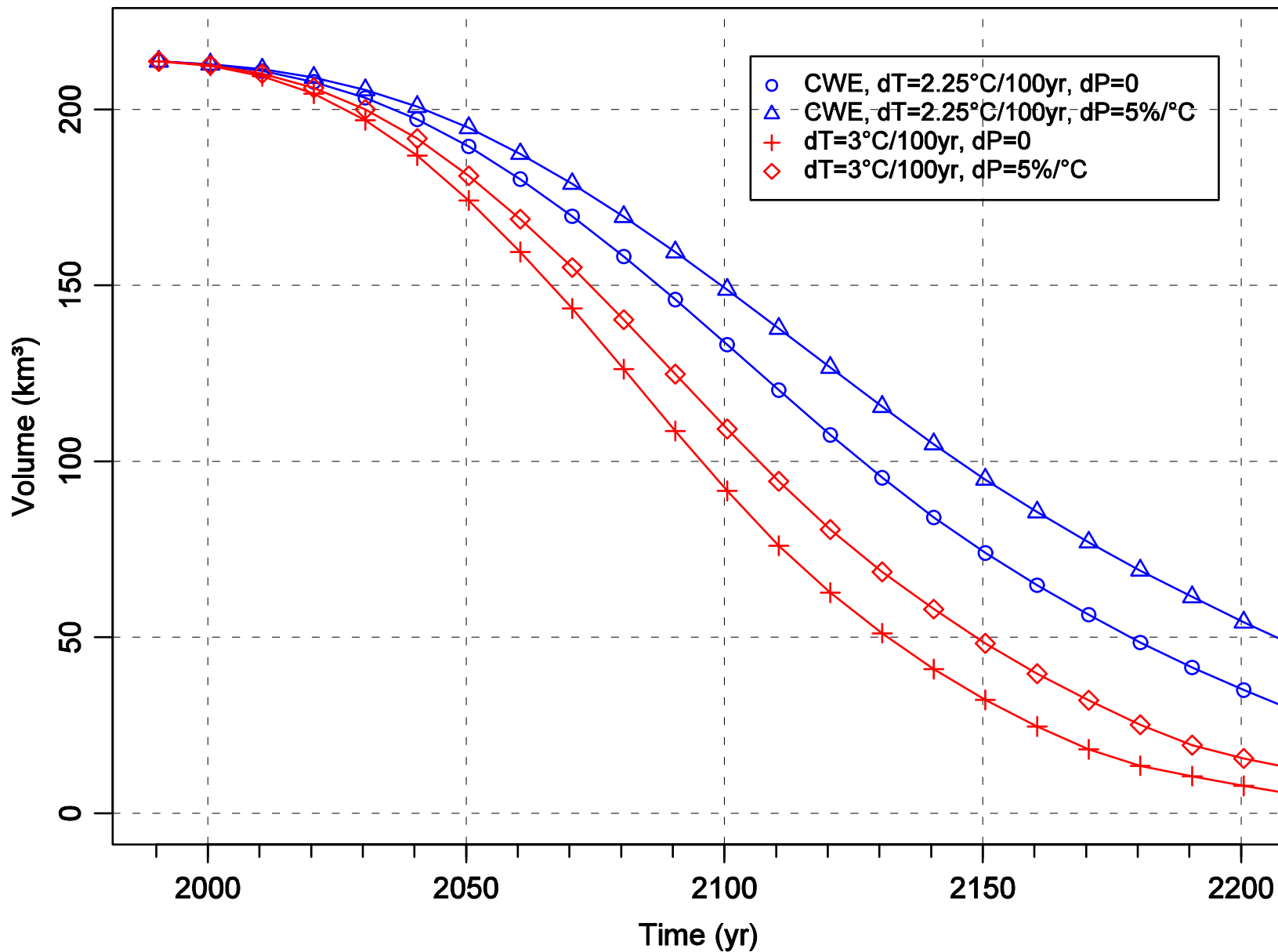


Hofsjökulslíkan

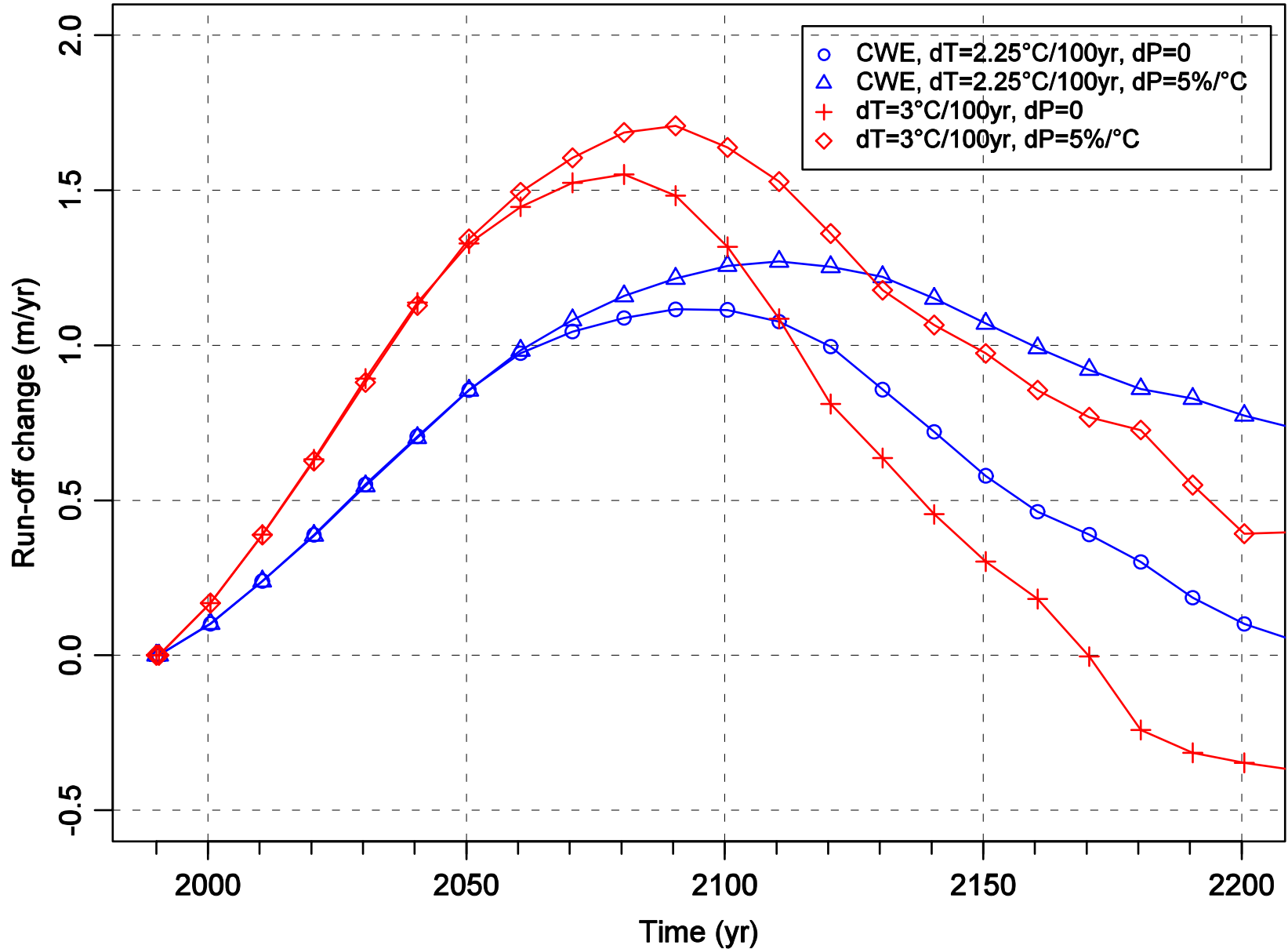
- Afkomulíkan, kvarðað með gögnum frá 1988-2002, viðmiðunartímabil 1981-2000
- Tvívítt ísflæðilíkan (Guðfinna Aðalgeirsdóttir, 2003)
 - 500x500 m reikninet
 - víxlátta, semi-implicit reiknirit
- Seigja jökulíssins er valin með tilliti til þess að lögun jökulsins verði sem líkust núverandi lögun fyrir viðmiðunarafkomuna



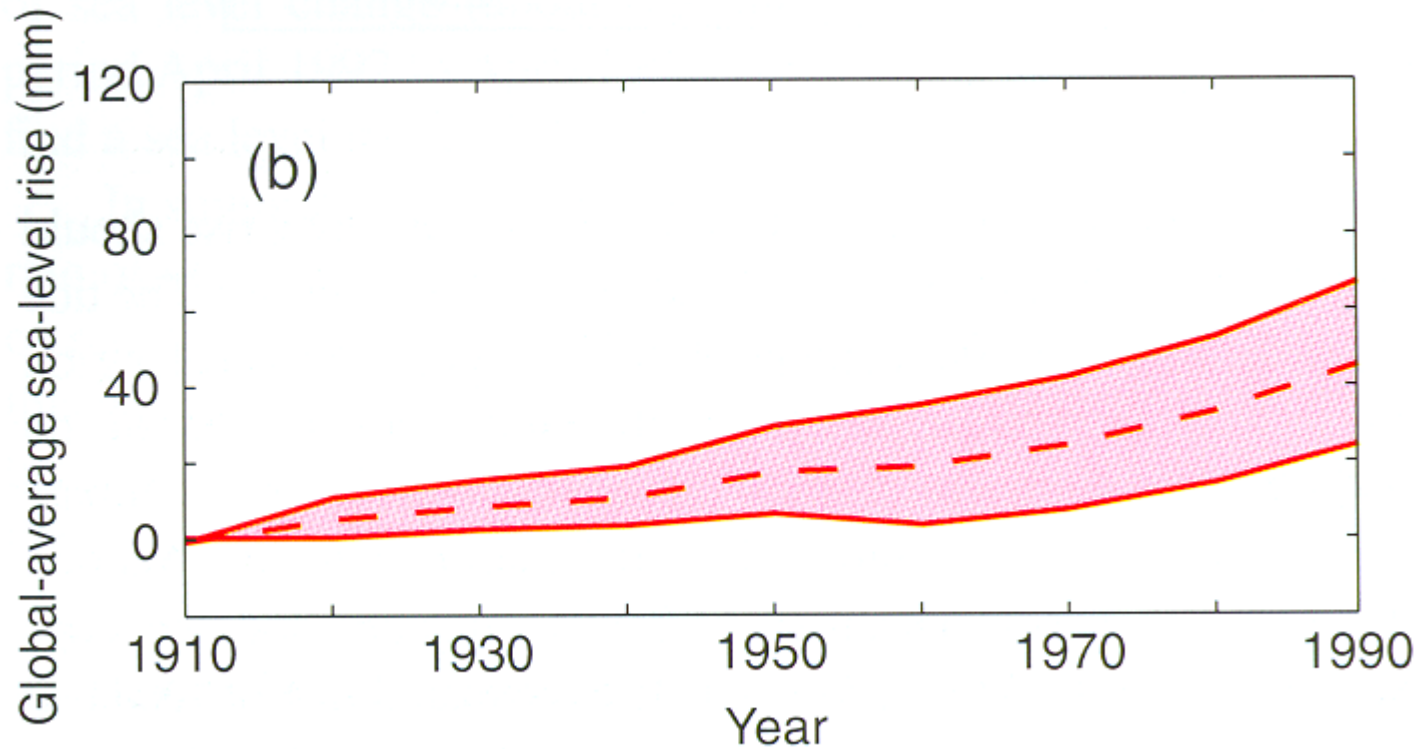
Hofsjökull, breyting á rúmmáli



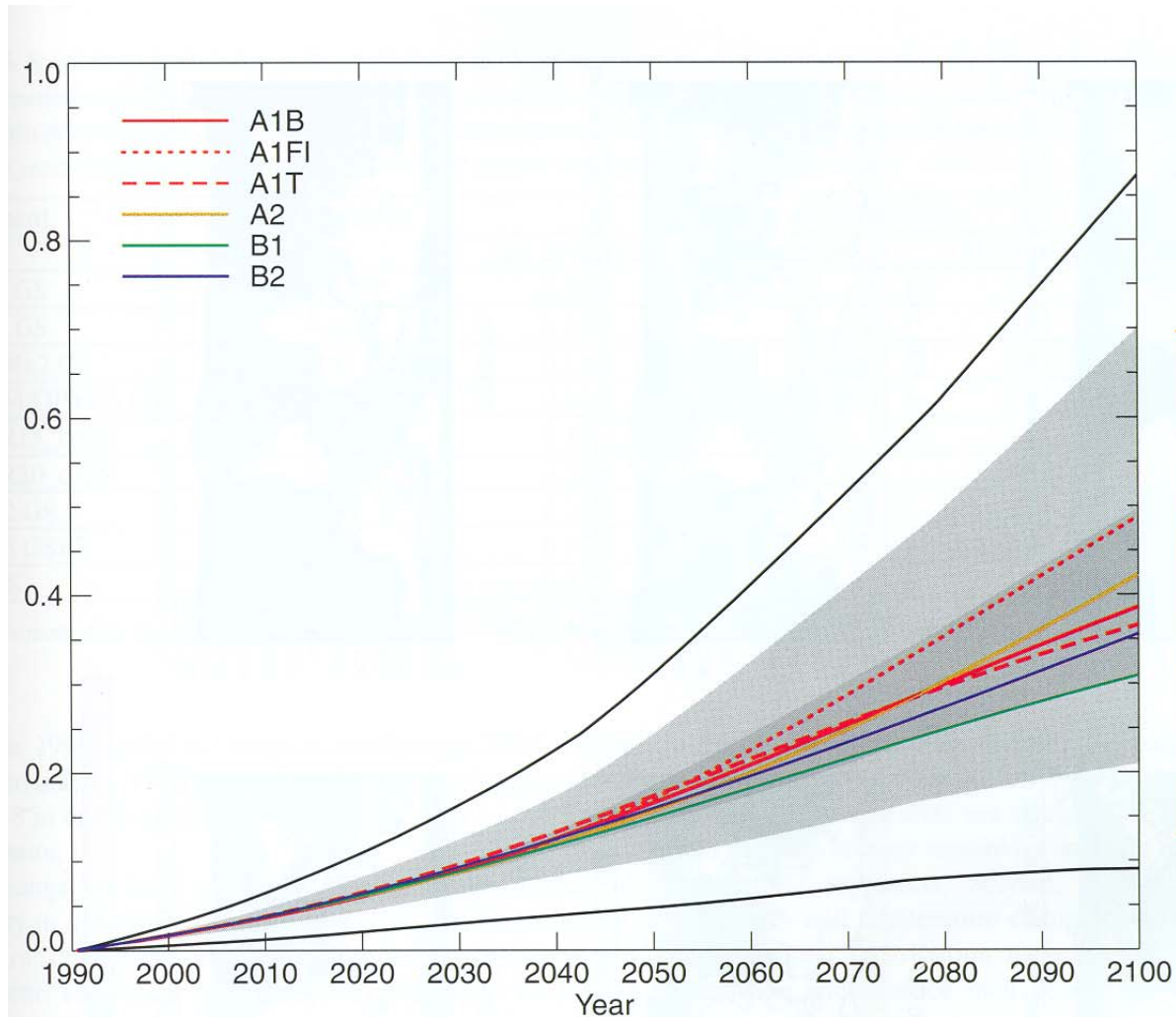
Hofsjökull, afrennslibreyting

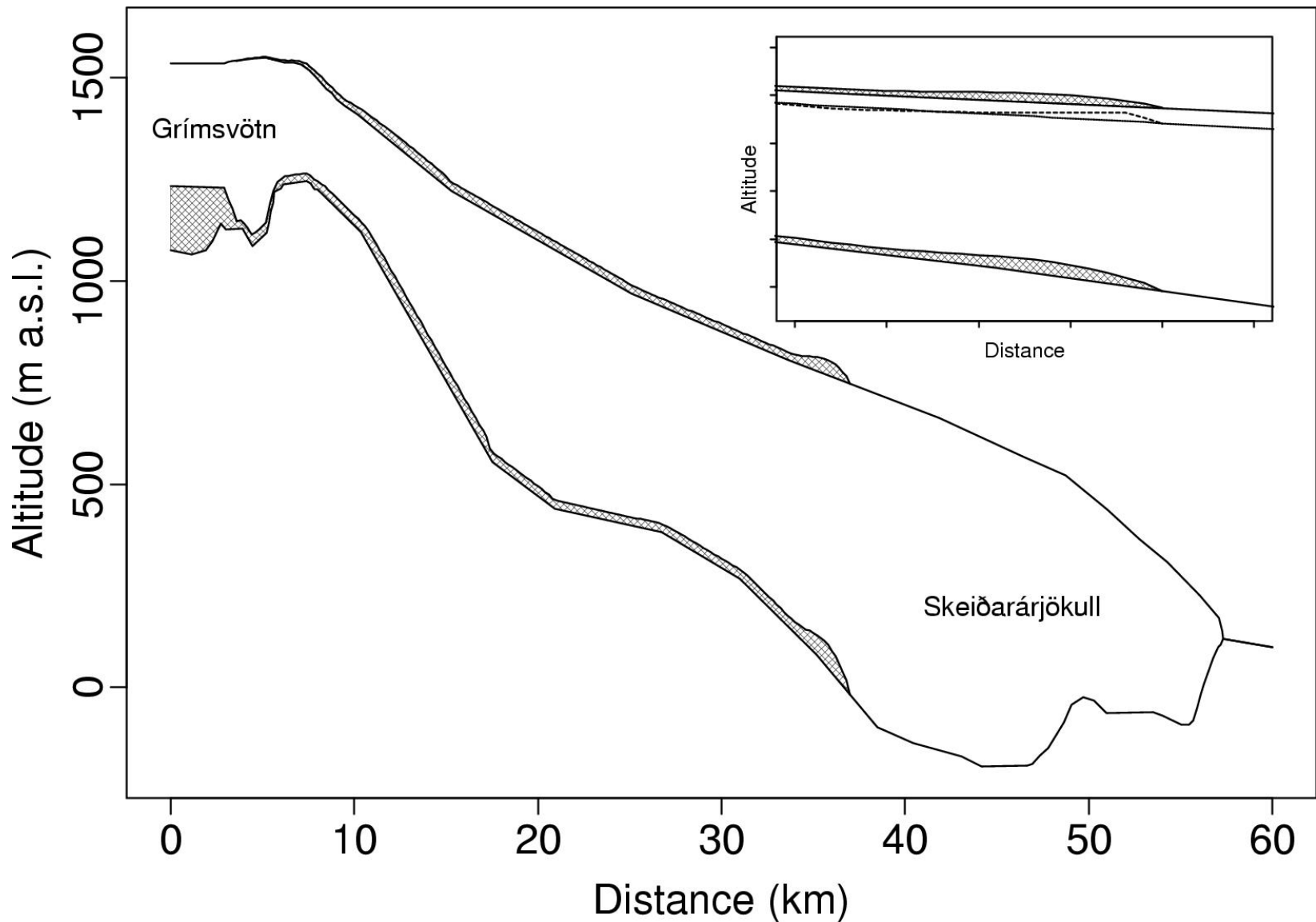


Hækkun sjávarborðs heimshafanna af manna völdum 1910 til 1990, IPCC



Hækkun sjávarborðs heimshafanna af manna völdum 1990 til 2100, IPCC





Yfirlitsmynd af framrás jökulhlaupsins úr Grímsvötnum í nóvember 1996 niður Skeiðarárjökul (þykkt og lögun jökulsins er einfölduð frá mynd Helga Björnssonar (1997))

Viðbrögð og viðbúnaður

- Alþjóðlegir samningar og skuldbindingar
- Rekstur virkjana, vatnsveitna o.þ.h.
- Skipulag strandsvæða og hönnun hafnarmannvirkja
- Hönnun nýrra mannvirkja, einkum virkjana
- Breytingar og endurbygging eldri mannvirkja
- Álitamál er hversu mikið tillit á taka til óvissra sviðsmynda við hönnun kostnaðarsamra mannvirkja
- Réttast kann að vera að búa í haginn fyrir breytingar þar sem það er hægt með litlum tilkostnaði með sveigjanlegri hönnun („no regret“)

Framtíðin er ekki eins og hún átti að sér að vera!

