# Grímsvatna hlaup: vatnsgeymir upphaf og rennsli

VEGAGERÐIN

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Jöklahópur Finnur Pálsson

***Jöklahópur Jarðvísindastofnunar Háskólans***
*Finnur Pálsson, Eyjólfur Magnússon, Guðfinna Aðalgeirsdóttir og Helgi Björnsson*

*Náið samstarf við rannsóknahóp Magnúsar T. Guðmundssonar prófessors*

*Sérstakar þakkir til*
*tæknimanna Jarðvísindastofnunar Sveinbjörns Steinþórssonar og Þorsteins Jónssonar*
*Hlyns Skagfjörð Pálssonar HSSR*
*Andra Gunnarssonar hjá Landsvirkjun*
*Jöklarannsóknafélags Íslands og þátttakenda í vorferðum þess á Vatnajökul*

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JÖKLARANNSÓKNAFÉLAG ÍSLANDS • ICELAND GLACIOLOGICAL SOCIETY •

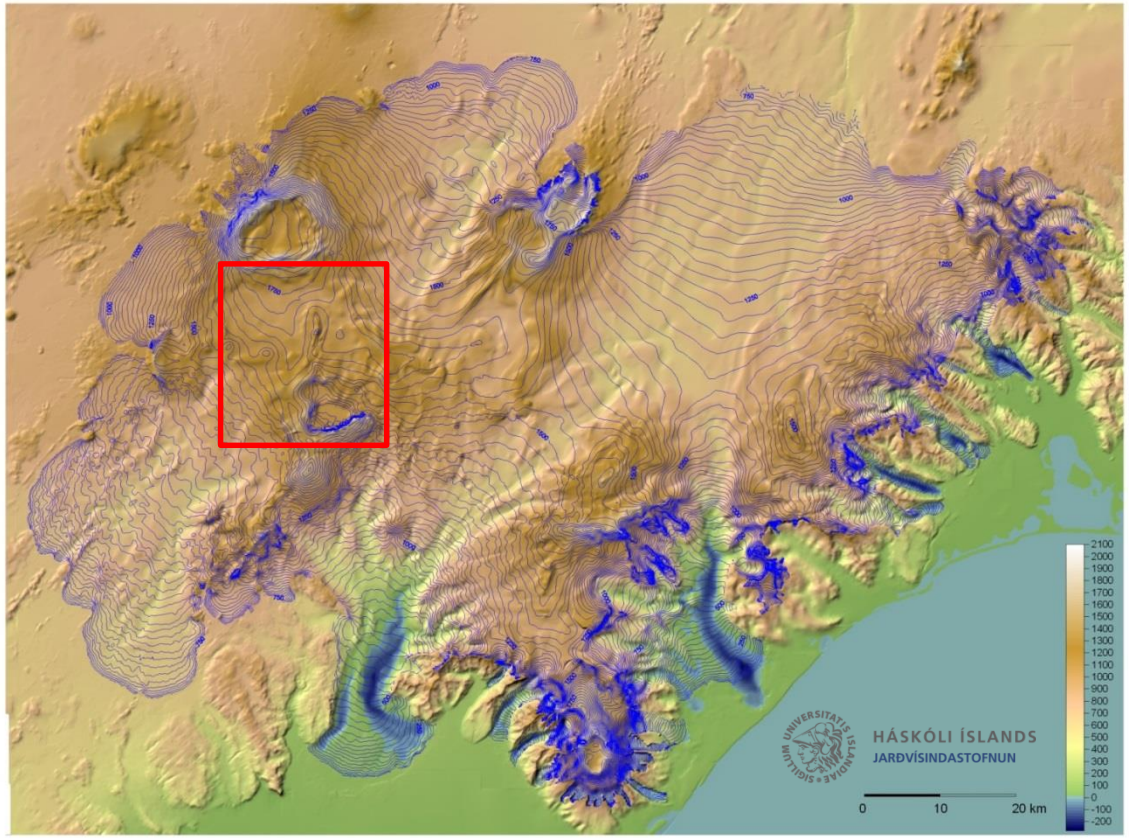
Jökulhlaup frá lónum í og við Vatnajökul hafa mótað land, landnytjar og samgöngur á suðausturlandi

Þekktust eru hlaup frá Grímsvötnum (Skeiðará, Gígja, Sæluhúsakvísl)
Skaftárkötlum (Skaftá)
Grænalóni (Súla)
Vatnsdalslóni (Kolgríma)
Veðurárdal
Efstadalslón (Hornafjarðarfljót)

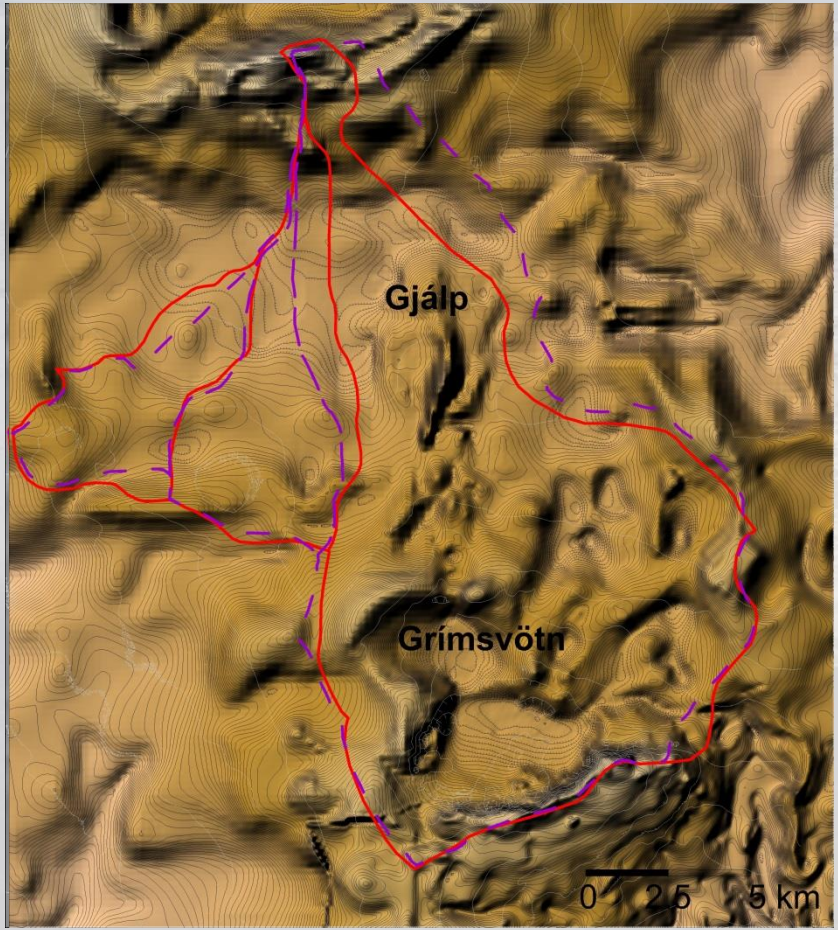
Stærstu jökulhlaupin síðustu öldina komu öll frá Grímsvötnum

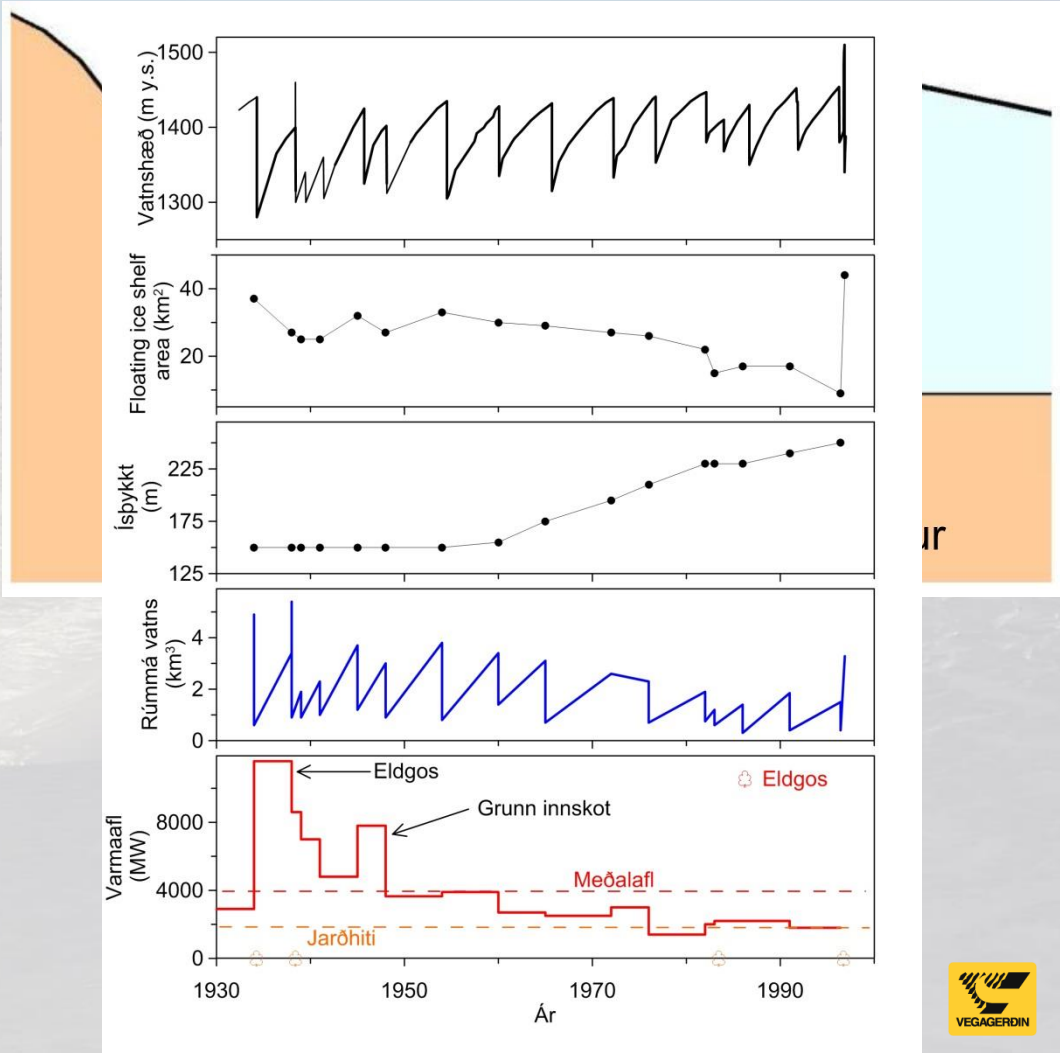
Nú eru þessi hlaup að mestu hætt nema
frá Skaftárkötlum og Grímsvötnum

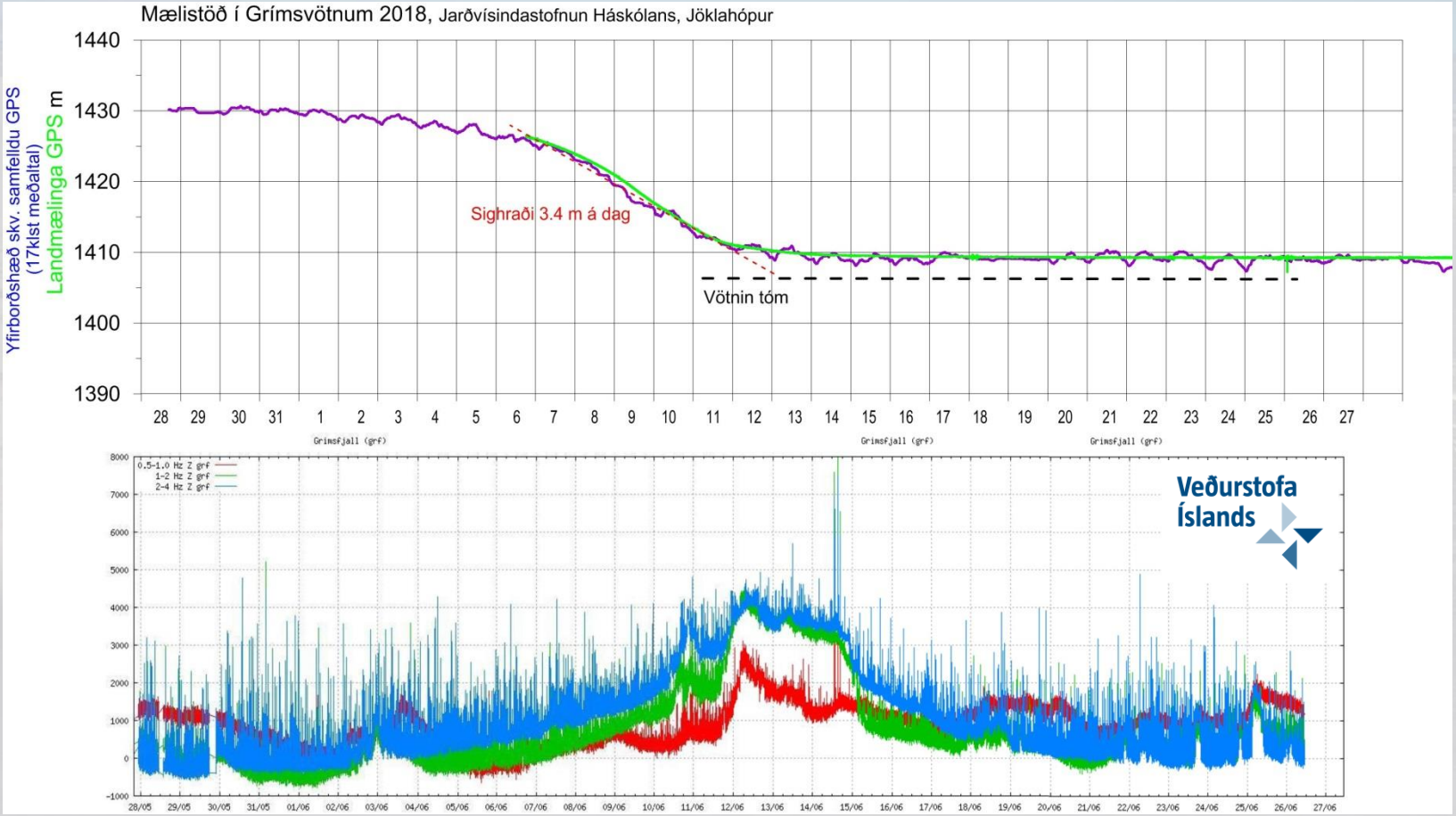
Skoðum Grímsvötn



# Vatnasvið Grímsvatna



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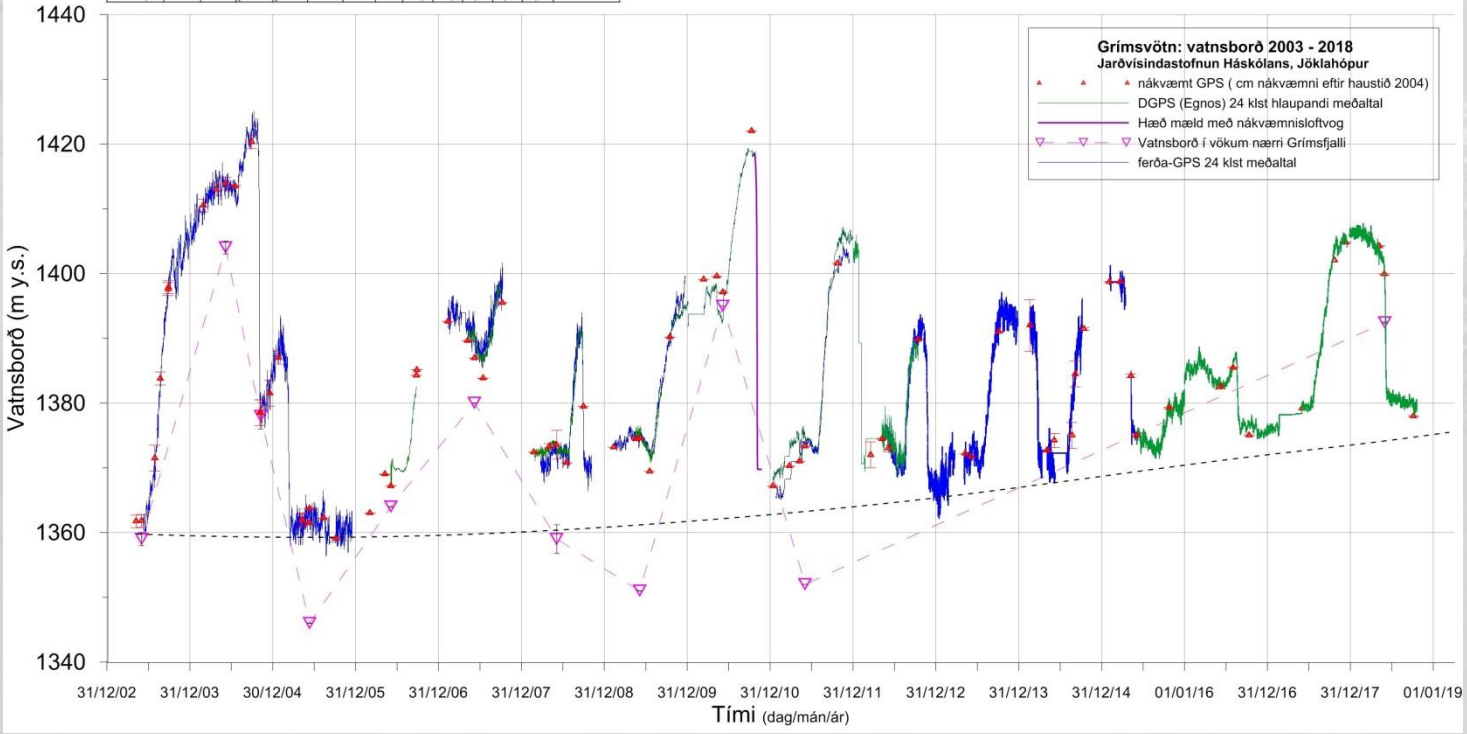
| | dnu-max | dnu-min | man-max | man-min | vb-max | vb-min | dz | A-max | A-min | V-max | V-min | dV | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1998,13 | 46 | 61 | feb | mars | 1407 | 1348 | 59 | 13,4 | 2,8 | 0,51 | 0,05 | 0,46 | |
| 1999,08 | 31 | 34 | jan | jan | 1390 | 1338 | 52 | 10,3 | 1,3 | 0,30 | 0,03 | 0,27 | |
| 1999,81 | 295 | 317 | sept | okt | 1386 | 1349 | 37 | 9,7 | 2,9 | 0,27 | 0,05 | 0,22 | |
| 2000,56 | 206 | 218 | júl | agúst | 1369 | 1350 | 19 | 5,6 | 2,9 | 0,12 | 0,05 | 0,07 | |
| 2001,92 | 337 | 354 | des | des | 1397 | 1391 | 7 | 11,6 | 10,5 | 0,38 | 0,31 | 0,08 | |
| 2002,20 | 72 | 106 | feb | apríl | 1399 | 1361 | 38 | 12,0 | 4,0 | 0,41 | 0,09 | 0,32 | |
| 2004,79 | 288 | 315 | okt | nov | 1422 | 1378 | 44 | 16,5 | 8,1 | 0,73 | 0,19 | 0,55 | +0.1bráðnun |
| 2005,18 | 66 | 77 | mars | mars | 1385 | 1361 | 25 | 9,6 | 4,0 | 0,26 | 0,09 | 0,17 | |
| 2007,83 | 301 | 305 | okt | okt | 1400 | 1372 | 28 | 12,1 | 6,8 | 0,42 | 0,15 | 0,27 | |
| 2008,72 | 264 | 275 | sept | okt | 1391 | 1369 | 22 | 10,7 | 5,8 | 0,32 | 0,13 | 0,19 | |
| 2010,84 | 304 | 310 | okt | nóv | 1419 | 1370 | 49 | 15,8 | 6,1 | 0,68 | 0,14 | 0,55 | |
| 2012,16 | 28 | 32 | jan | feb | 1405 | 1370 | 35 | 13,1 | 6,1 | 0,50 | 0,14 | 0,36 | |
| 2012,88 | 323 | 331 | nóv | nóv | 1388 | 1367 | 21 | 11,0 | 5,7 | 0,32 | 0,10 | 0,22 | |
| 2014,21 | 71 | 86 | mars | mars | 1392 | 1371 | 22 | 11,0 | 5,8 | 0,35 | 0,14 | 0,21 | |
| 2015,36 | 126 | 138 | maí | maí | 1398 | 1374 | 24 | 12,0 | 7,3 | 0,40 | 0,16 | 0,24 | |
| 2016,62 | 228 | 239 | águ | ágú | 1386 | 1376 | 10 | 9,7 | 7,8 | 0,27 | 0,18 | 0,09 | |
| 2018,44 | 152 | 163 | jún | júní | 1400 | 1379 | 21 | 12,1 | 8,3 | 0,42 | 0,19 | 0,23 | |

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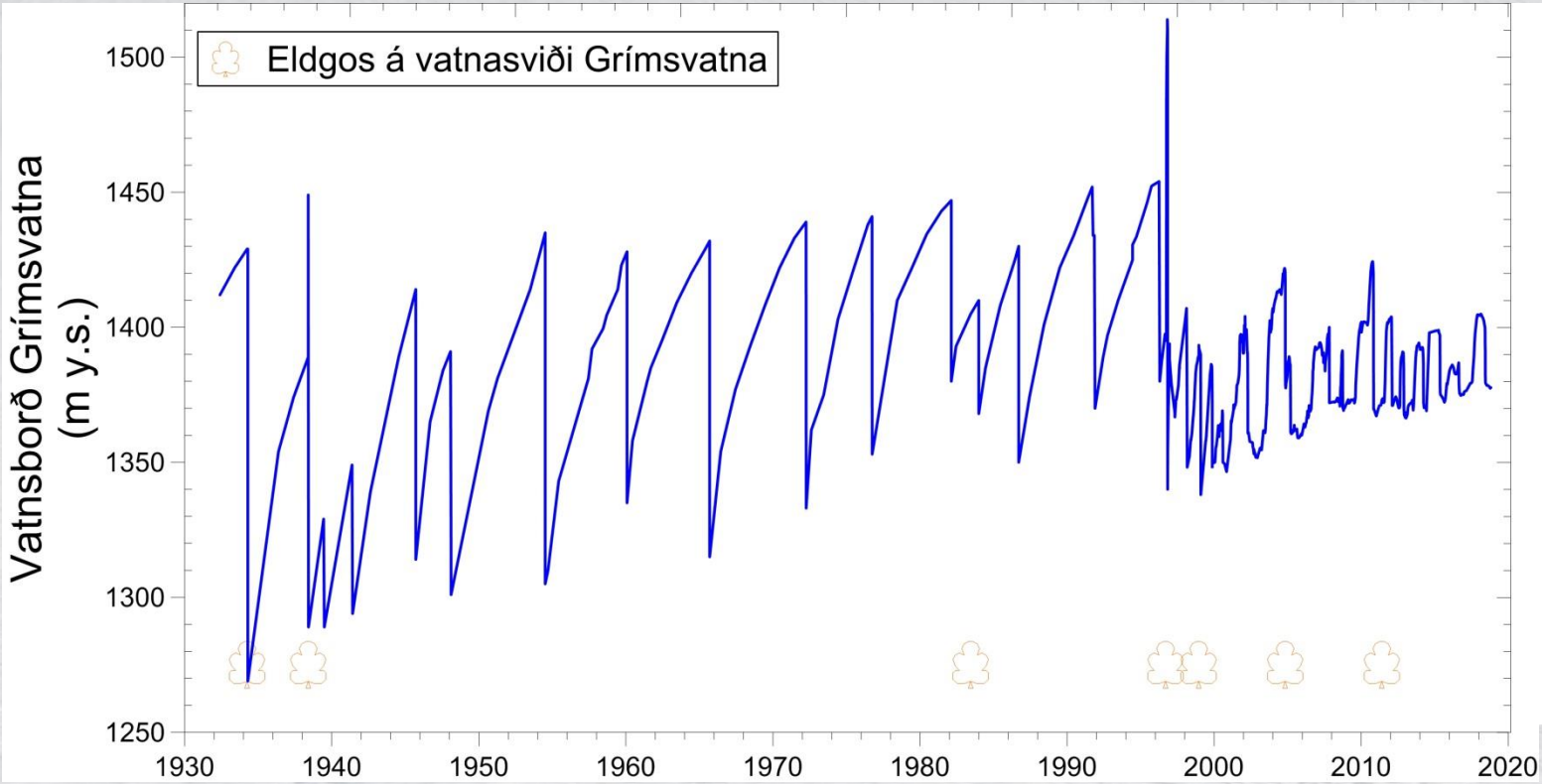


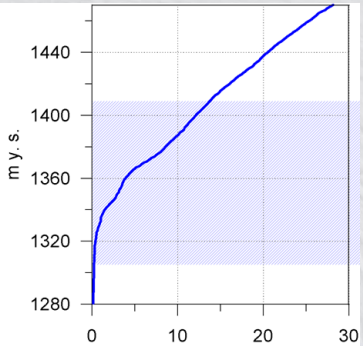


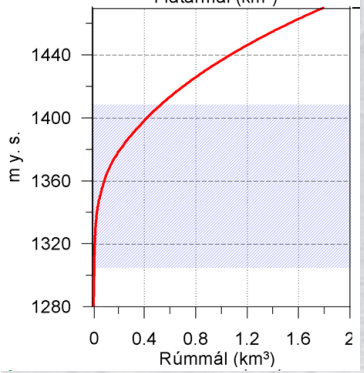


**Frá Grímsvötnum voru hlaupin regluleg til 1996; síðan þá óregluleg og lítil**

# Hvað veldur ?

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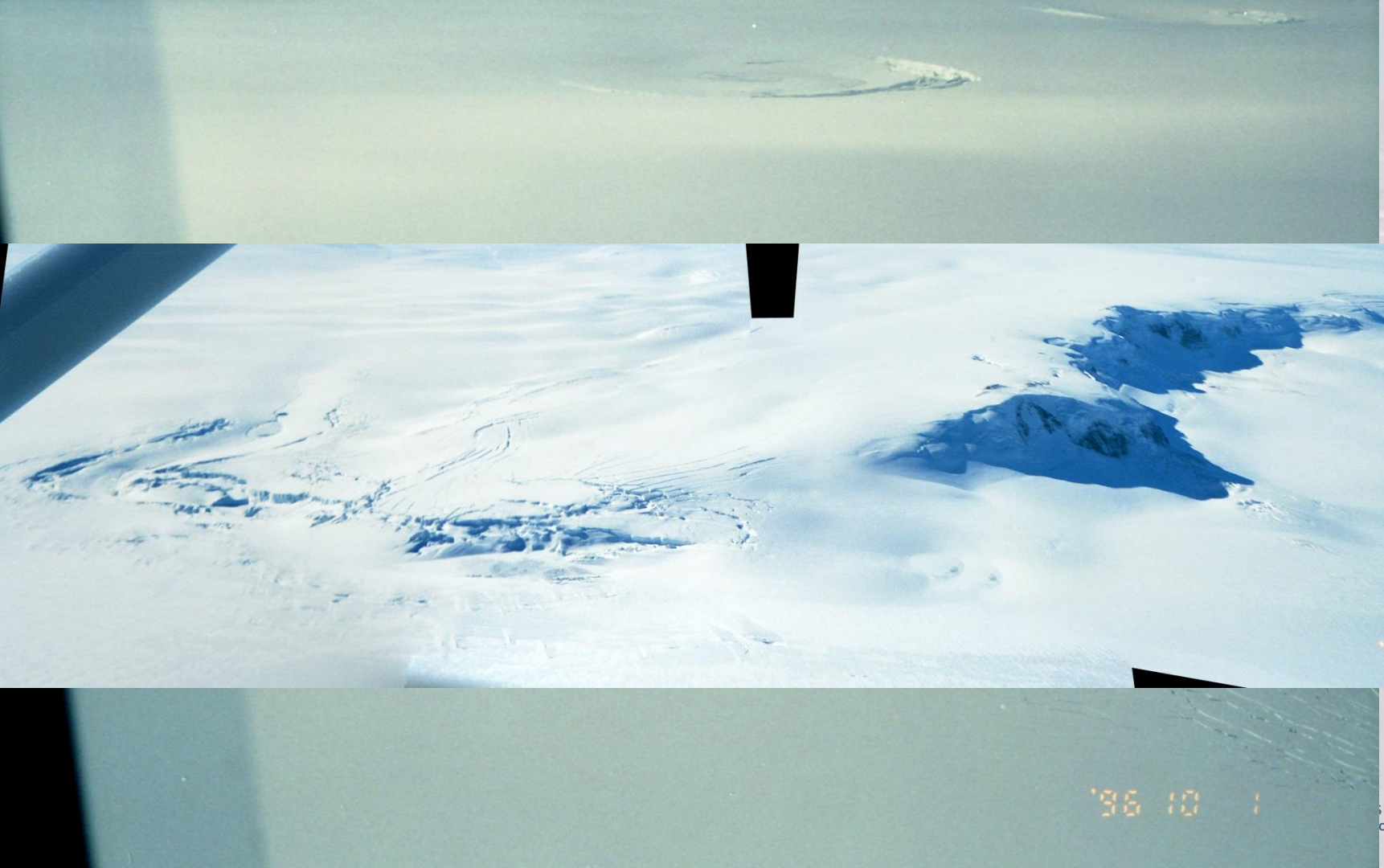
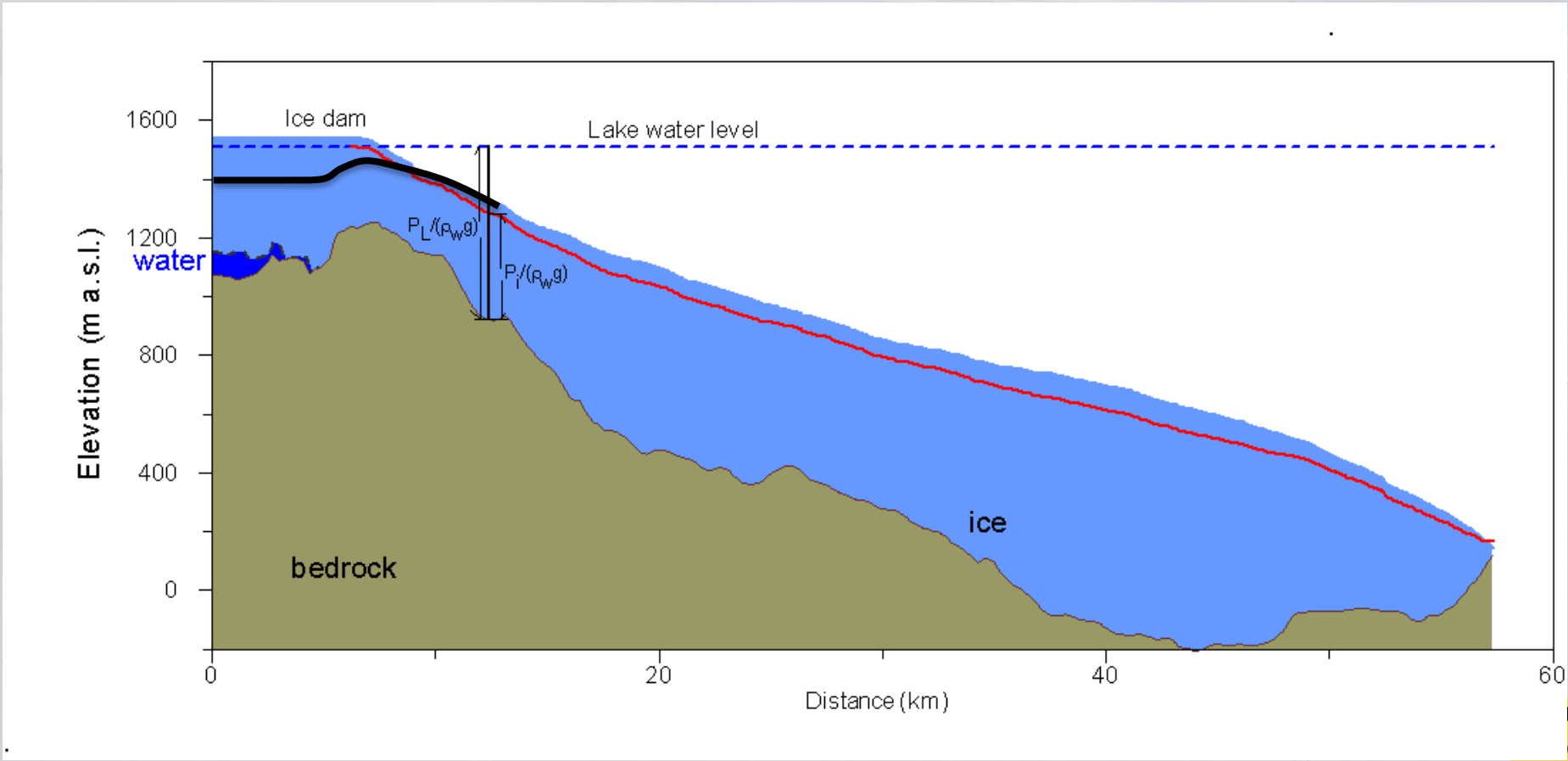
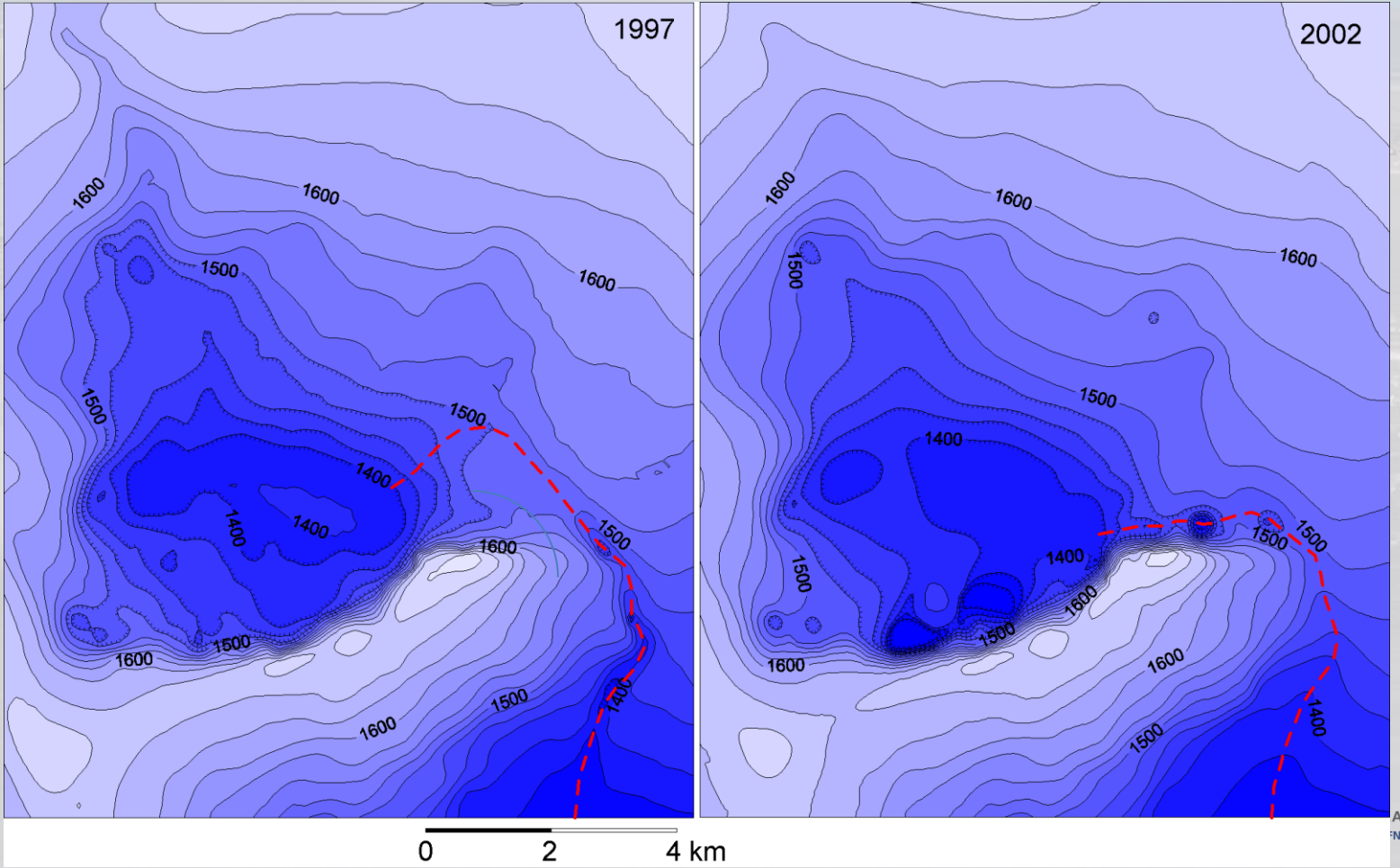
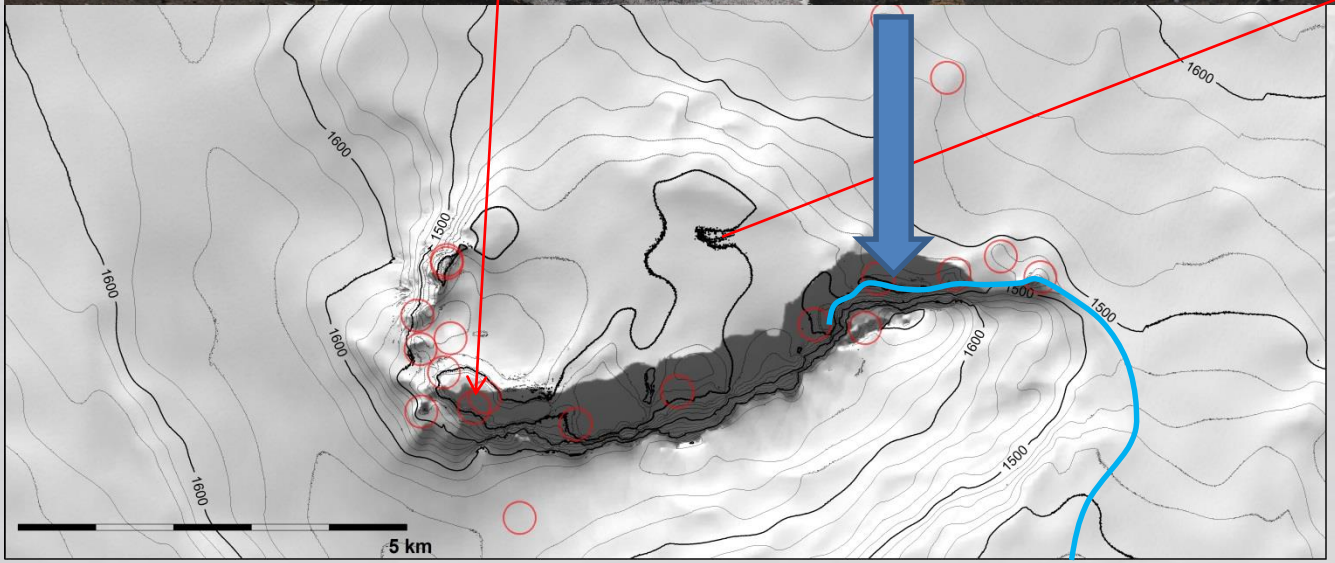

'97 9 13
'96 10 1

# Eftir Gjálpargos 1996



# Tilfærsla hlaupleiðar úr Grímsvötnum



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**Vegna breytinganna á ísþröskuldi Grímsvatna, rennslisleiðum og þykknunar íshellunnar er ekki mögulegt að þar safnist fyrir vatn í sama mæli og fyrir haustið 1996**

**Vatnsmagn verður að óbreyttu ekki meira en ~1 $km^3$ og þá helst ef hluti íshellunnar bráðnar í eldgosi.**

**Þannig eru líkur á stóru hlaupi frá Grímsvötnum litlar nema í upphafi öflugs eldgoss á vatnasviði Grímsvatna en utan öskjunnar**

**En flóðtoppur gæti þó orðið stór ef vatnið sem fer af stað er heitt vegna eldgoss.**

# Einnig nemendur í framhaldsnámi nýta mæligögnin og leggja til nýja þekkingu

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## Thermal power of Grímsvötn, Iceland, from 1998 to 2016: Quantifying the effects of volcanic activity and geothermal anomalies

Hannah I. Reynolds *, Magnús T. Gudmundsson, Thórdís Högnadóttir, Finnur Pálsson

*Nordvulk, Institute of Earth Sciences, University of Iceland, Sturlugata 7, Reykjavík 101, Iceland*

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ABSTRACT

Grímsvötn lies beneath the centre of the Vatnajökull ice cap, Iceland, and has for centuries been one of the most geothermally active calderas in the world as well as being Iceland's most active volcano. Calorimetric studies of its heat output have suggested long-term heat release of 2–4 GW. We have performed a detailed study of the heat release at Grímsvötn over the period 1998–2016, which includes the eruptions of 1998, 2004 and 2011. Annual mapping of the ice surface is used to monitor ice volume changes, combined with results of mass-balance monitoring over this same period. We estimate an average heat release of 1800 ± 200 MW, whereof about ~1200 MW is the base geothermal heat flux. The remaining ~600 MW is an average over the study period, composed of peaks above the base flux from melting during eruptions and geothermal anomalies. The most intense melting occurred at eruption sites during eruptions. Less intense signals lasting several months to years were due to increased geothermal melting creating new ice cauldrons and deepening pre-existing ones. Such thermal anomalies were observed both as precursors to the eruptions, and in the 2–3 years following. The strongest signal followed the 1998 eruption which produced an average of 650 MW in the two years following. After the 2004 eruption a thermal anomaly of 500 MW was observed in the following years, and an average signal of 450 MW followed the 2011 eruption. These thermal signals demonstrate a post-eruption link to increased geothermal activity at the caldera walls.



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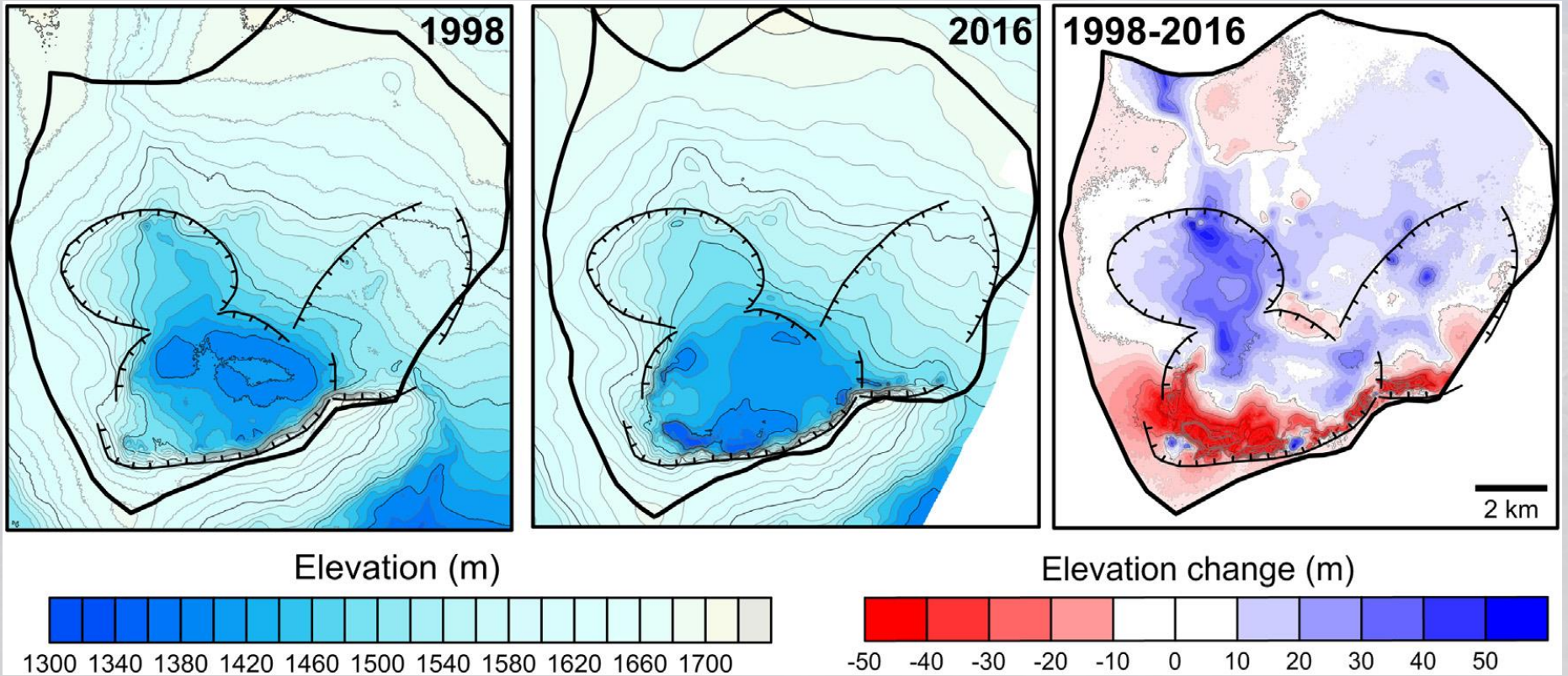
# Yfirborðshæð þykktarbreyting

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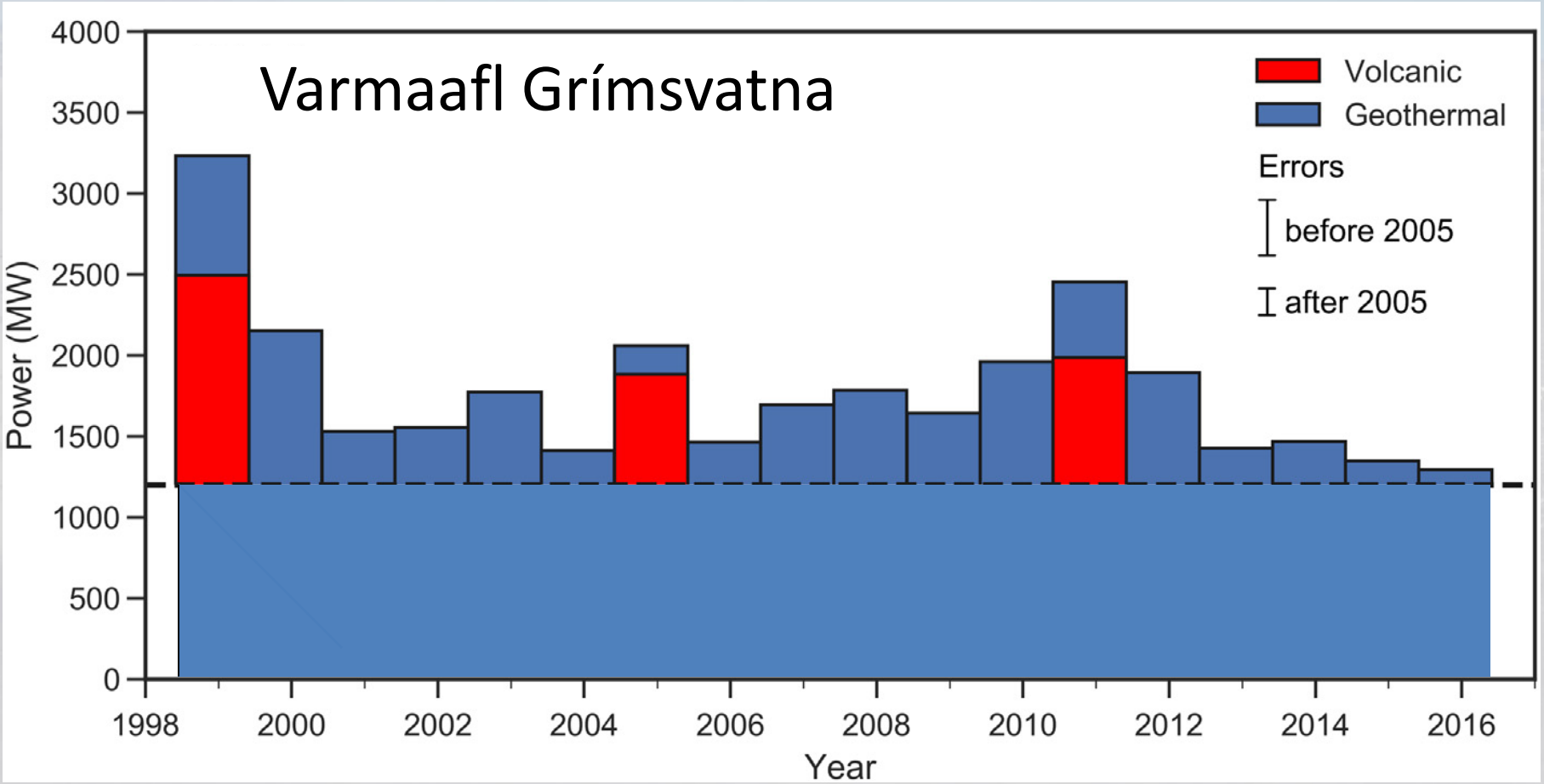
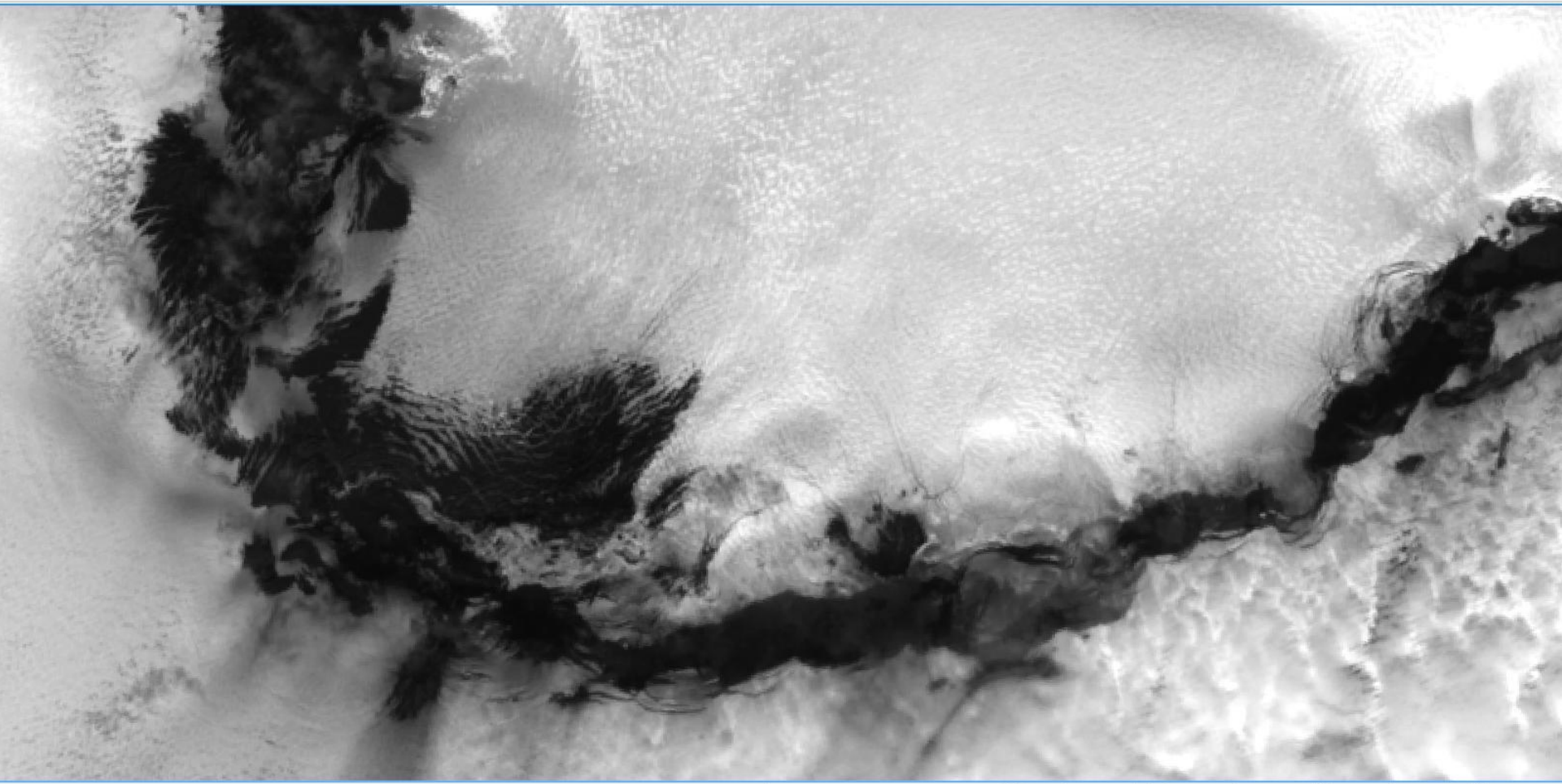

Varmaafl Grímsvatna
Volcanic
Geothermal
Errors
before 2005
after 2005
Power (MW)
4000
3500
3000
2500
2000
1500
1000
500
0
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Year




Njótið dagsins !