Landforms in Iceland

Ole Humlum, University of Oslo

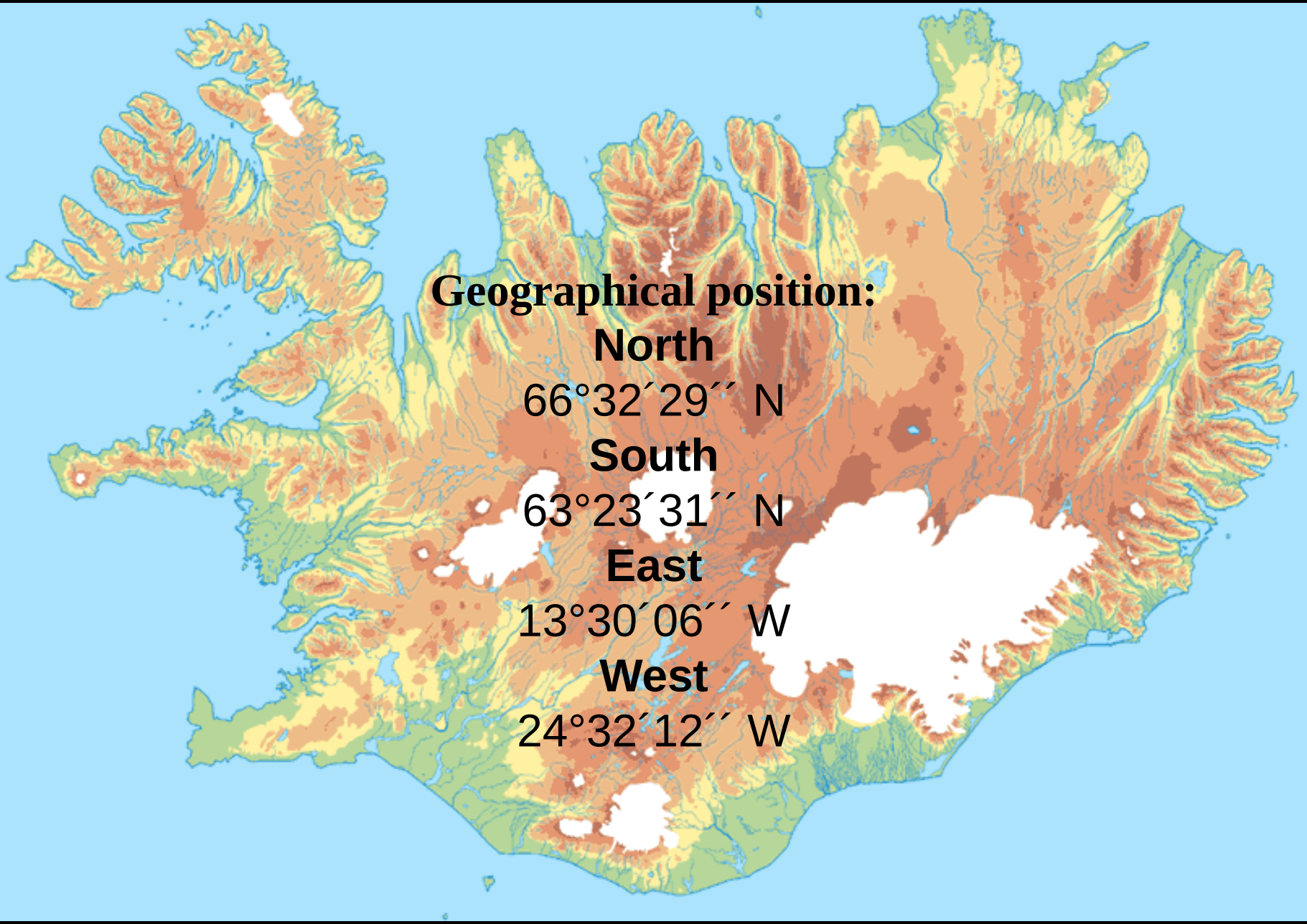
Landforms in Iceland

1. Geological and climatic background

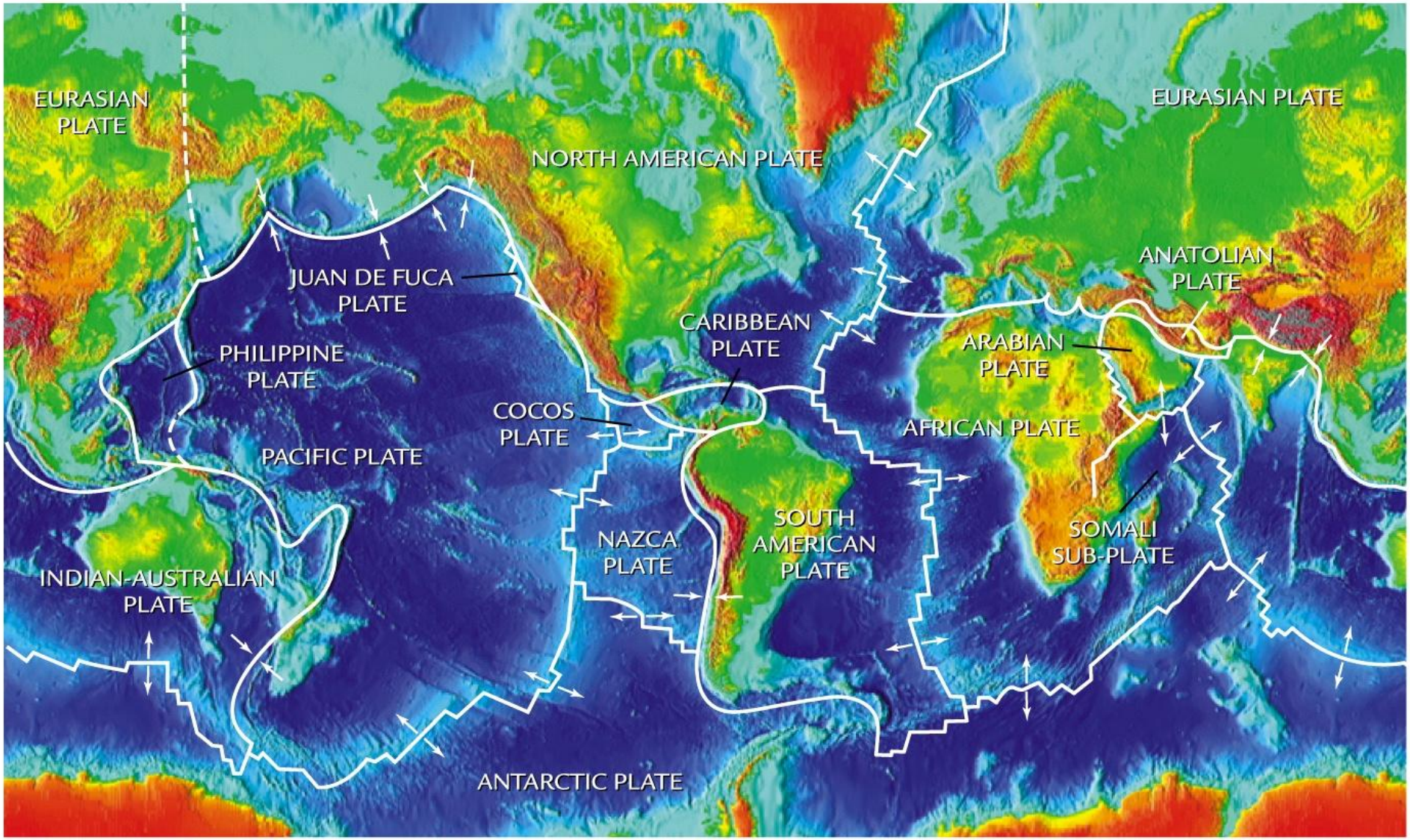
2. Volcanic landforms

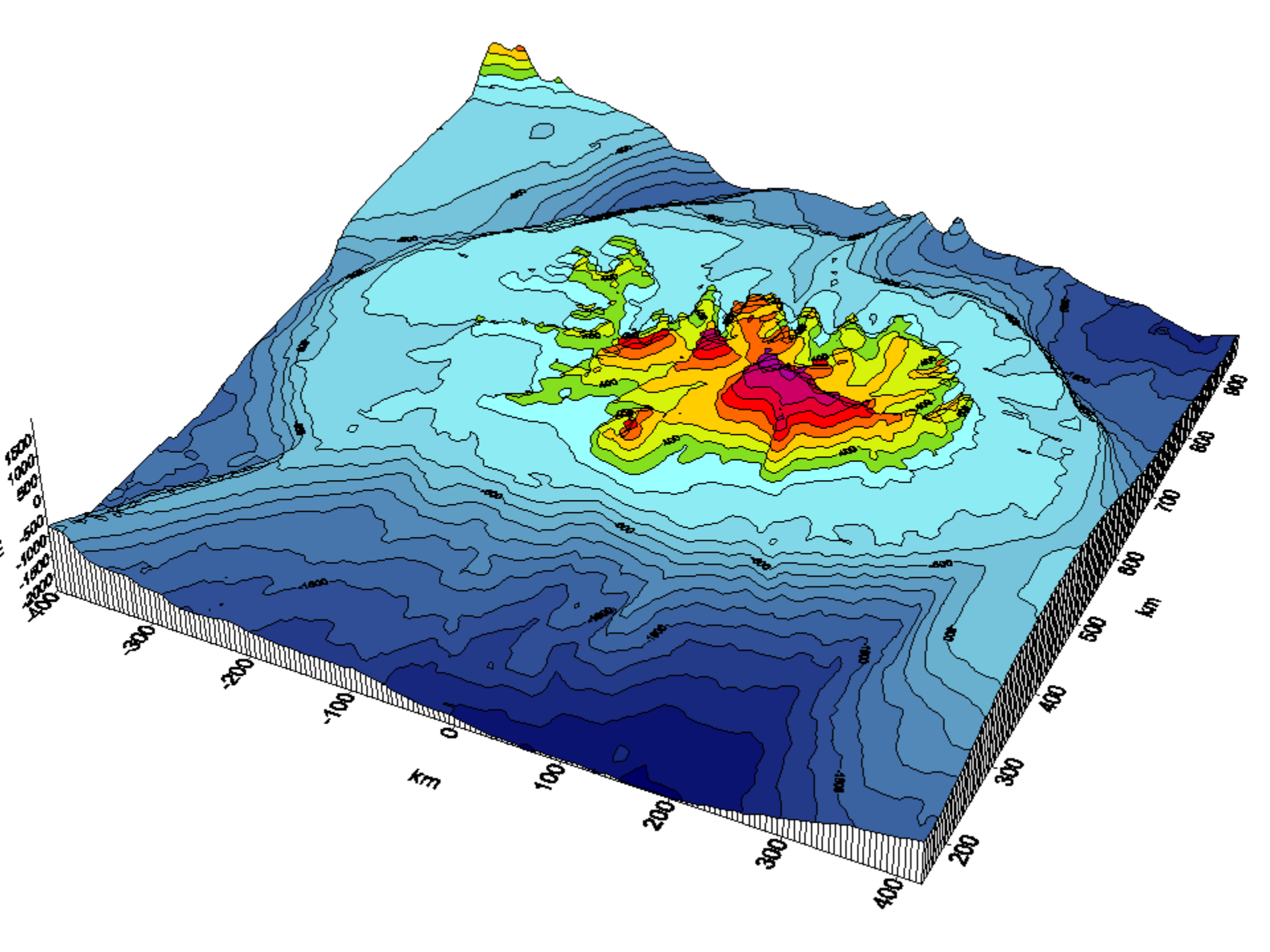
3. Glacial landforms

4. Periglacial landforms


Geographical position:
North
66°32´29´´ N
South
63°23´31´´ N
East
13°30´06´´ W
West
24°32´12´´ W

Geological background


EURASIAN PLATE
NORTH AMERICAN PLATE
EURASIAN PLATE
JUAN DE FUCA PLATE
ANATOLIAN PLATE
CARIBBEAN PLATE
PHILIPPINE PLATE
ARABIAN PLATE
COCOS PLATE
AFRICAN PLATE
PACIFIC PLATE
SOUTH AMERICAN PLATE
NAZCA PLATE
SOMALI SUB-PLATE
INDIAN-AUSTRALIAN PLATE
ANTARCTIC PLATE


1500
1000
500
0
-500
-1000
-1500
-2000
-400
-300
-200
-100
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100
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300
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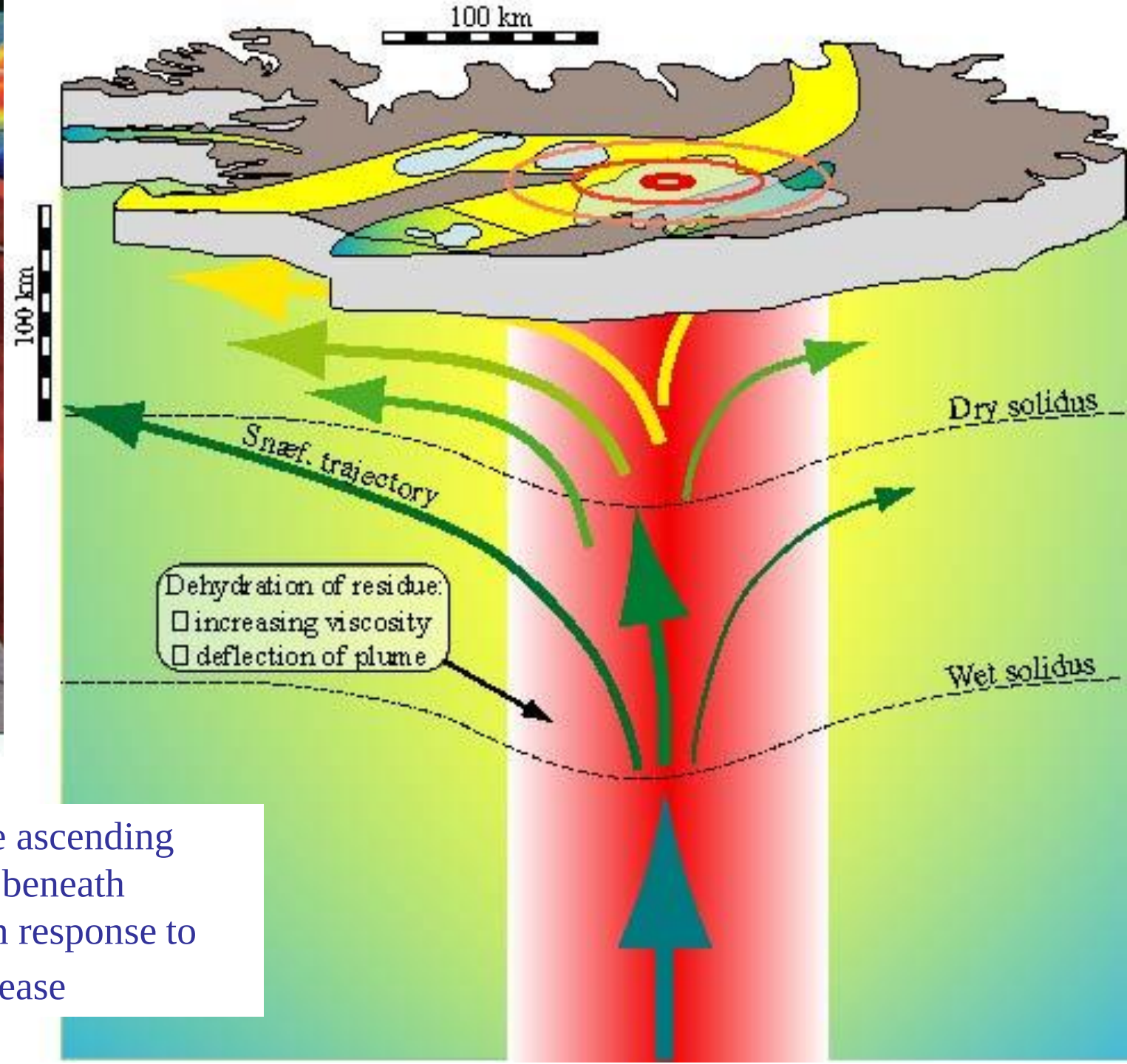
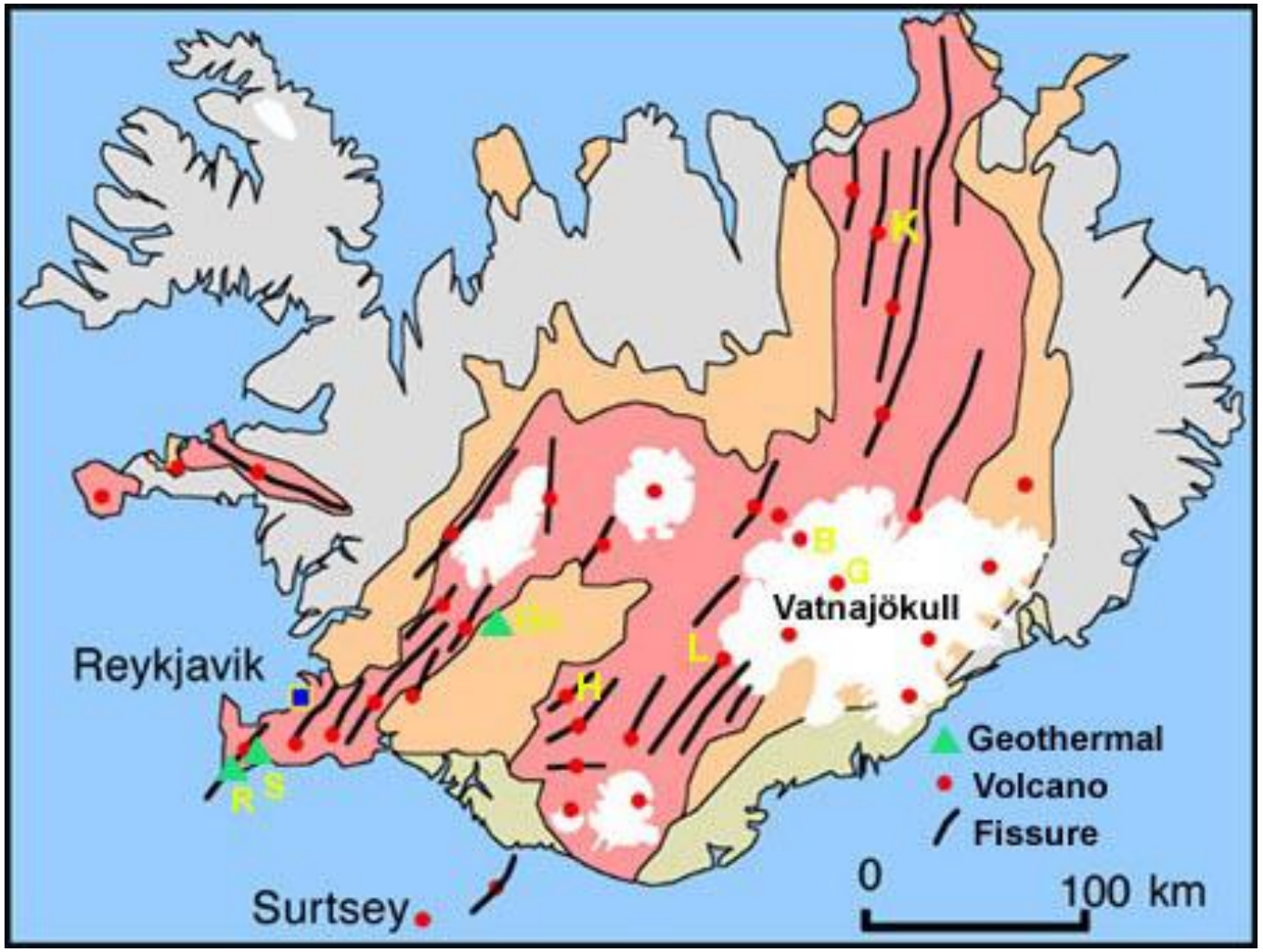
km
200
300
400
500
600
700
800
900
km



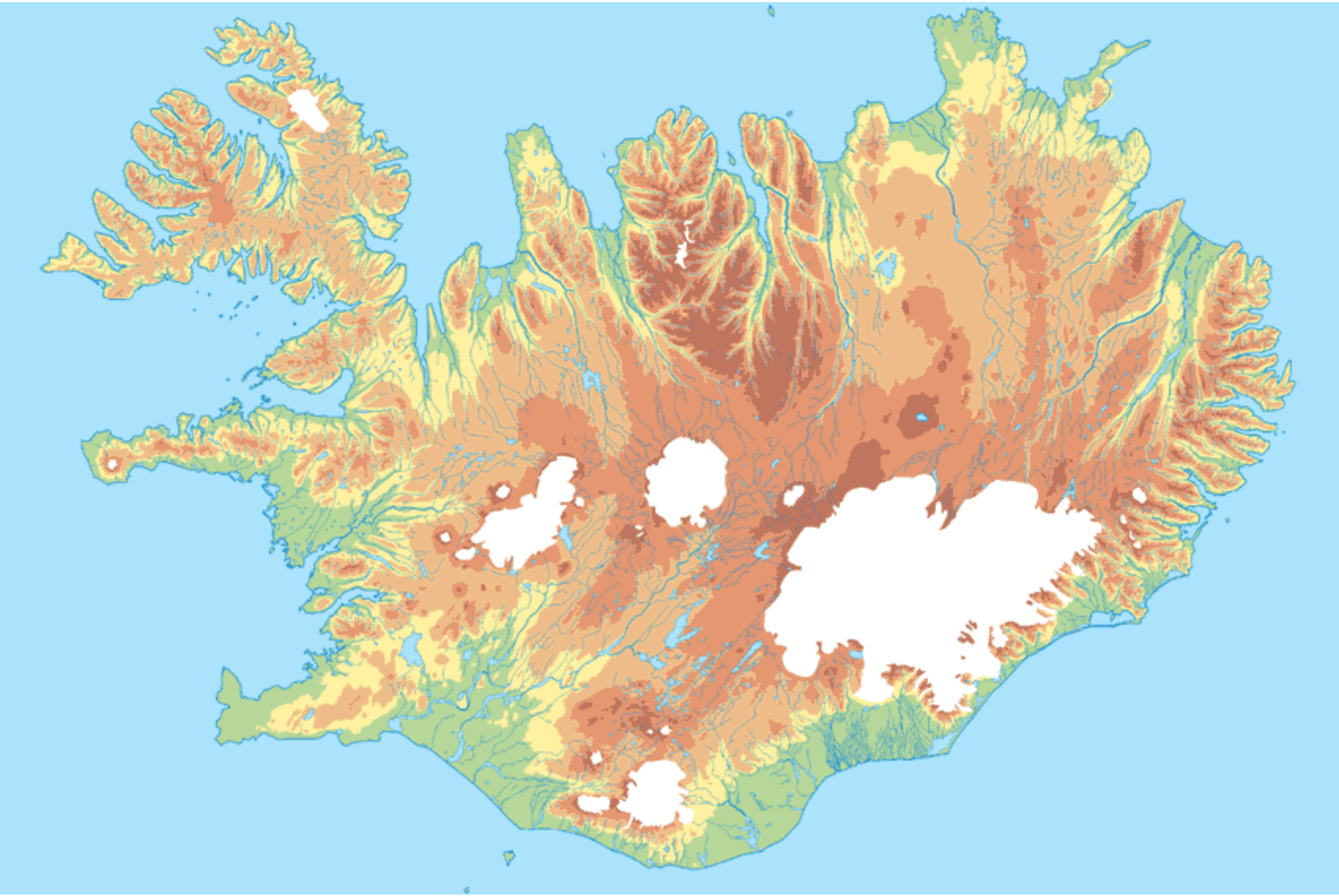
Hot plume; The ascending mantle column beneath Iceland melts in response to the pressure release

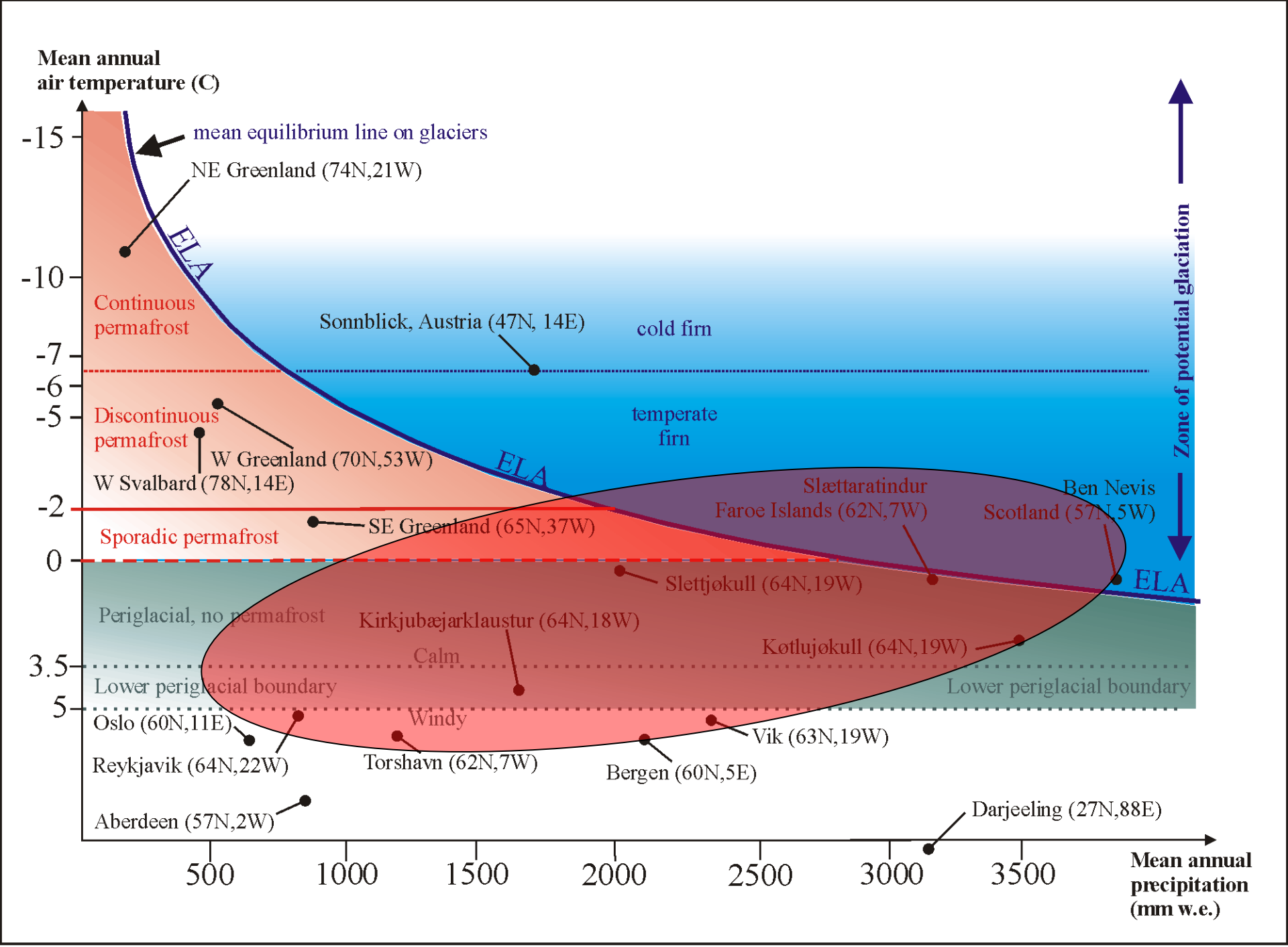


Historically active volcanoes, fissures related to rifting, geothermal systems, and basic and intermediate lavas and associated sediments less than 700,000 years old (pink). The younger volcanism and rifting are confined to the active volcanic zone (northern, western, eastern) and three off-ridge areas. High-temperature geothermal systems (>200ºC) like Svartsengi and Reykjanes are associated with the active volcanic zone. Orange and gray indicate progressively older igneous rocks and associated sediments. Low-temperature geothermal systems (<150ºC) are found on the flanks of the active volcanic zone in older rocks. The white areas are glaciers and ice caps.


Eyjafjallajökull eruption March-April 2010

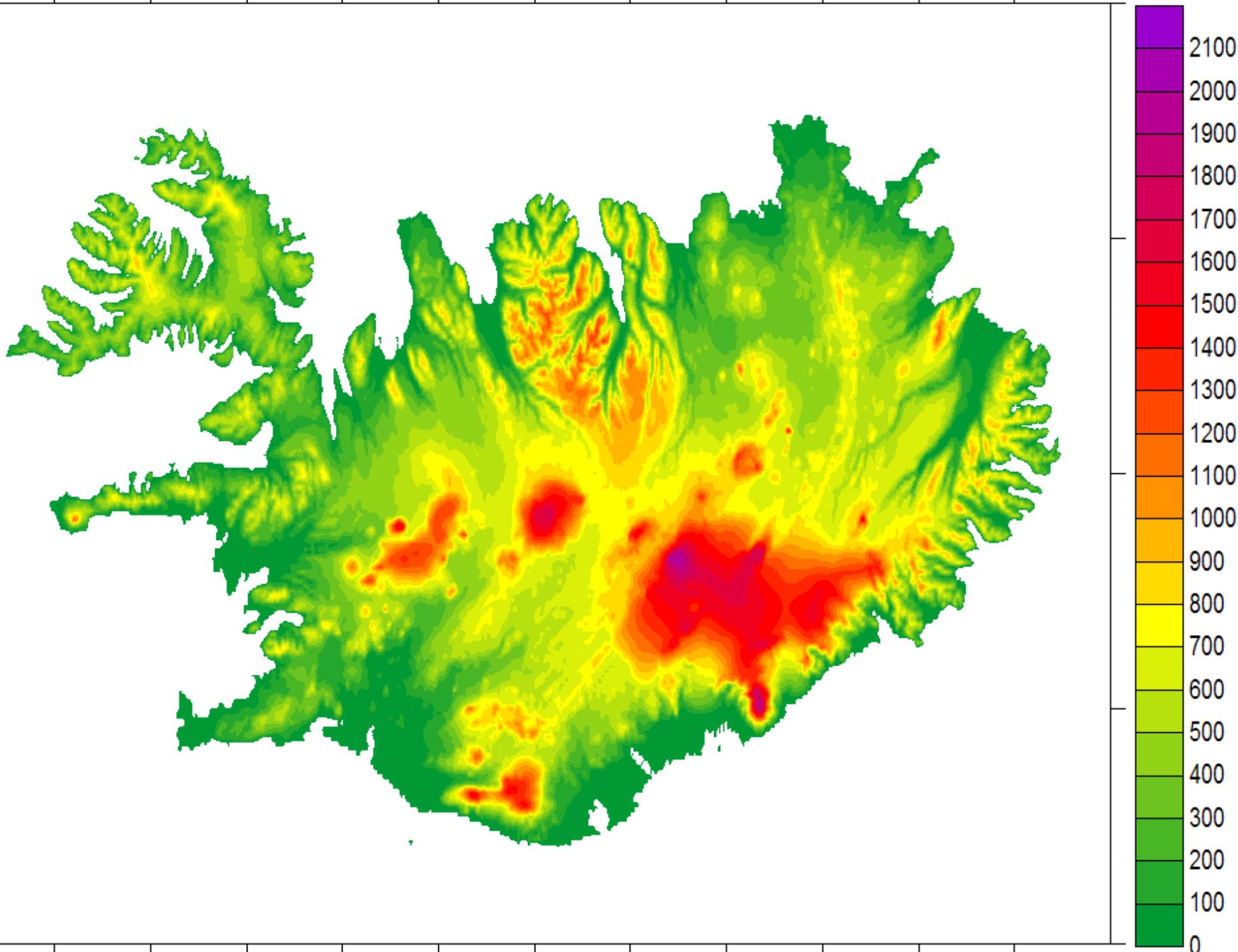
Topography and climate




Mean annual
air temperature (C)
-15
-10
-7
-6
-5
-2
0
3.5
5
mean equilibrium line on glaciers
NE Greenland (74N,21W)
ELA
Continuous
permafrost
Sonnblick, Austria (47N, 14E)
cold firn
Discontinuous
permafrost
W Greenland (70N,53W)
W Svalbard (78N,14E)
temperate
firn
ELA
Slættaratindur
Faroe Islands (62N,7W)
Ben Nevis
Scotland (57N,5W)
Sporadic permafrost
SE Greenland (65N,37W)
Slettjøkull (64N,19W)
ELA
Periglacial, no permafrost
Kirkjubæjarklaustur (64N,18W)
Køtlujøkull (64N,19W)
Calm
Lower periglacial boundary
Lower periglacial boundary
Oslo (60N,11E)
Windy
Vik (63N,19W)
Reykjavik (64N,22W)
Torshavn (62N,7W)
Bergen (60N,5E)
Aberdeen (57N,2W)
Darjeeling (27N,88E)
500
1000
1500
2000
2500
3000
3500
Mean annual
precipitation
(mm w.e.)
Zone of potential glaciation

Ole Humlum

Permafrost in Iceland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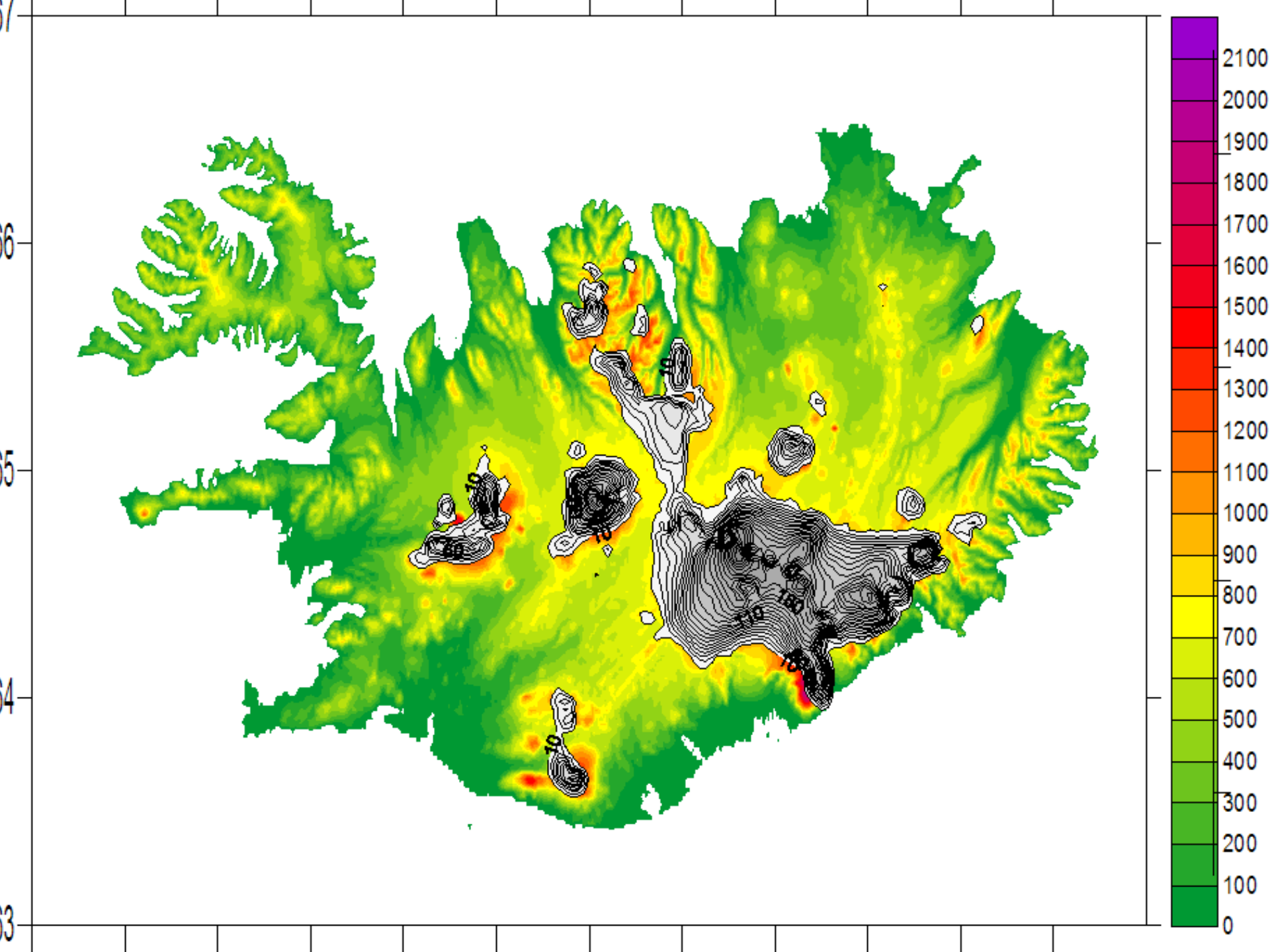
67
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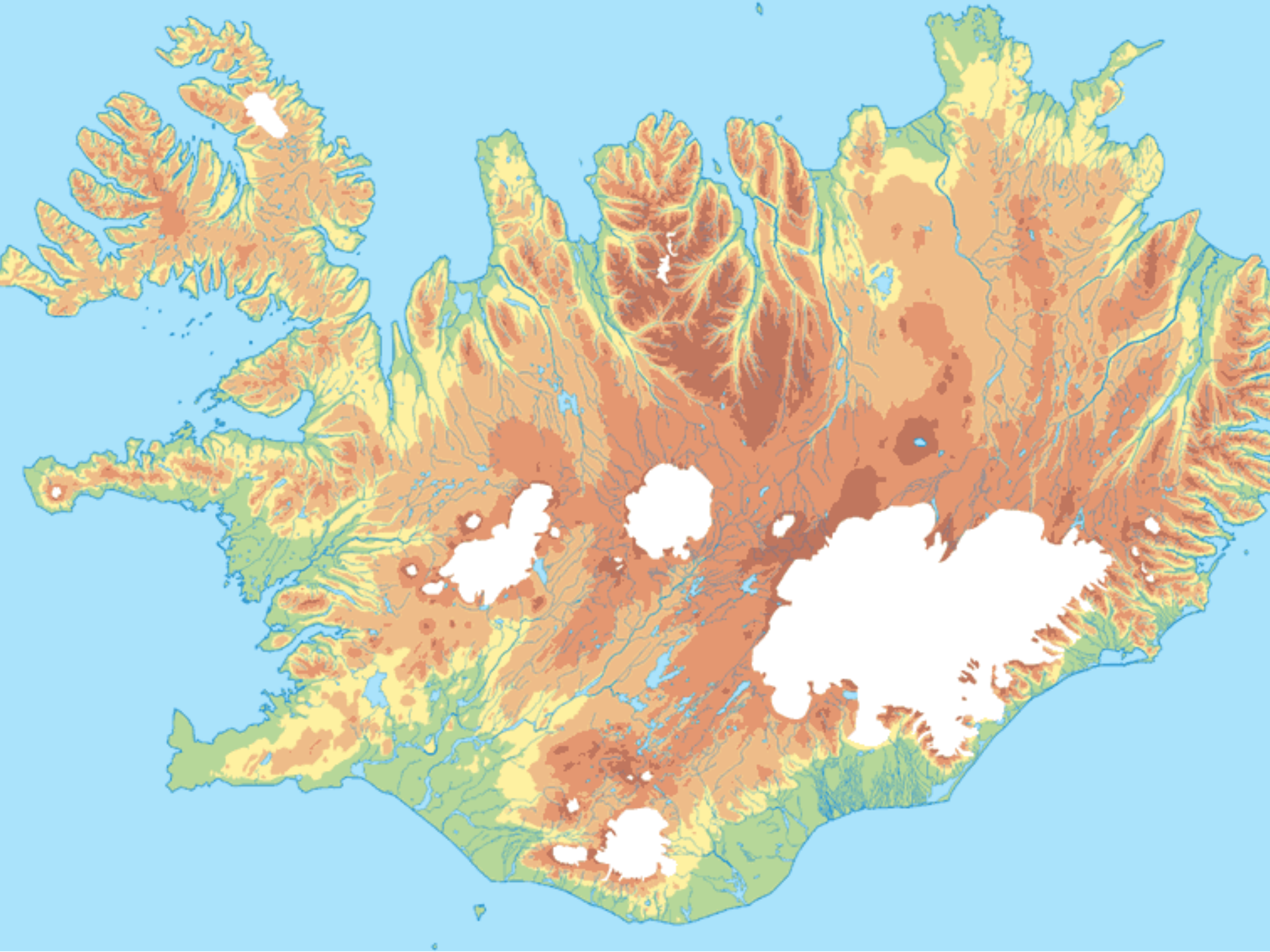
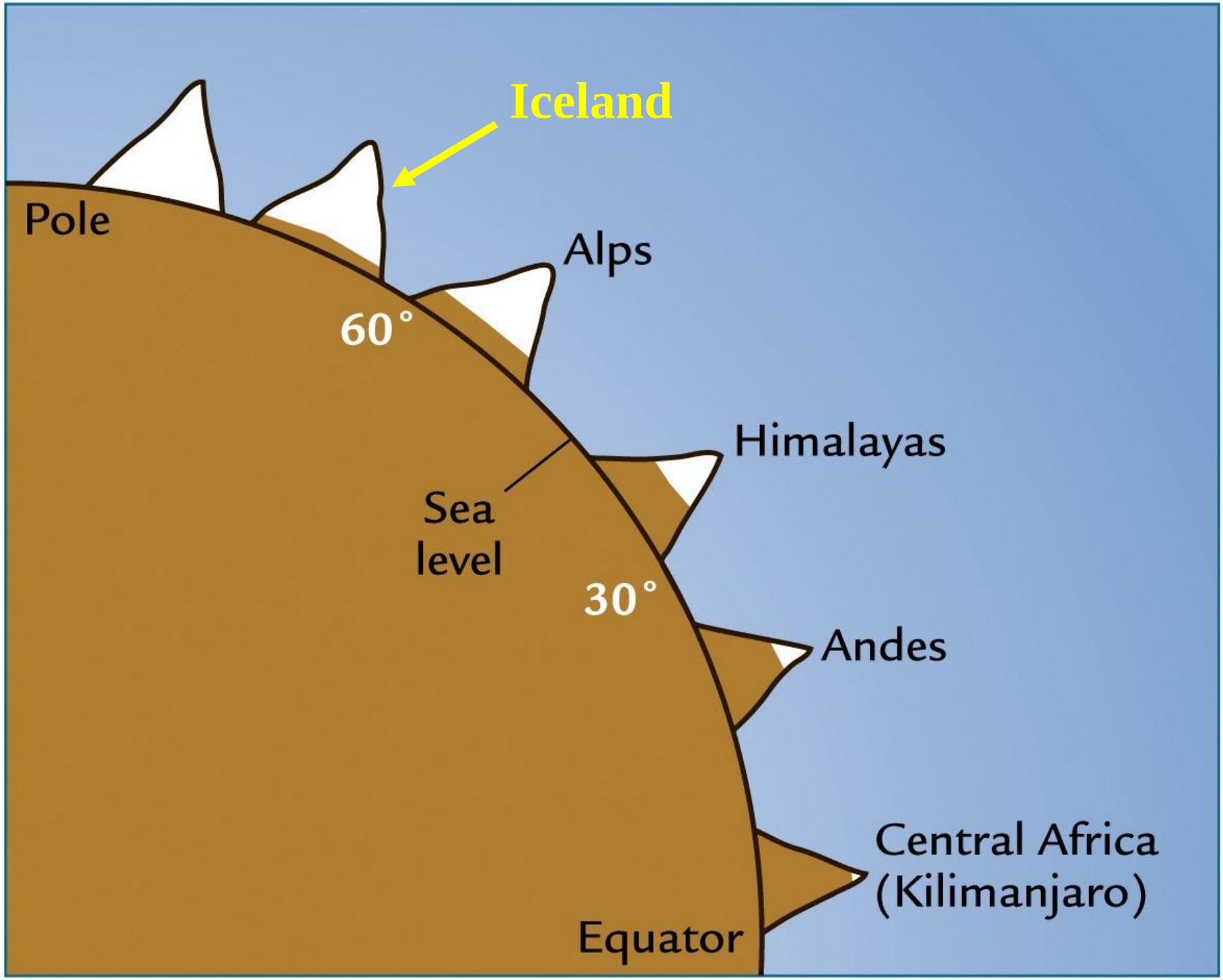
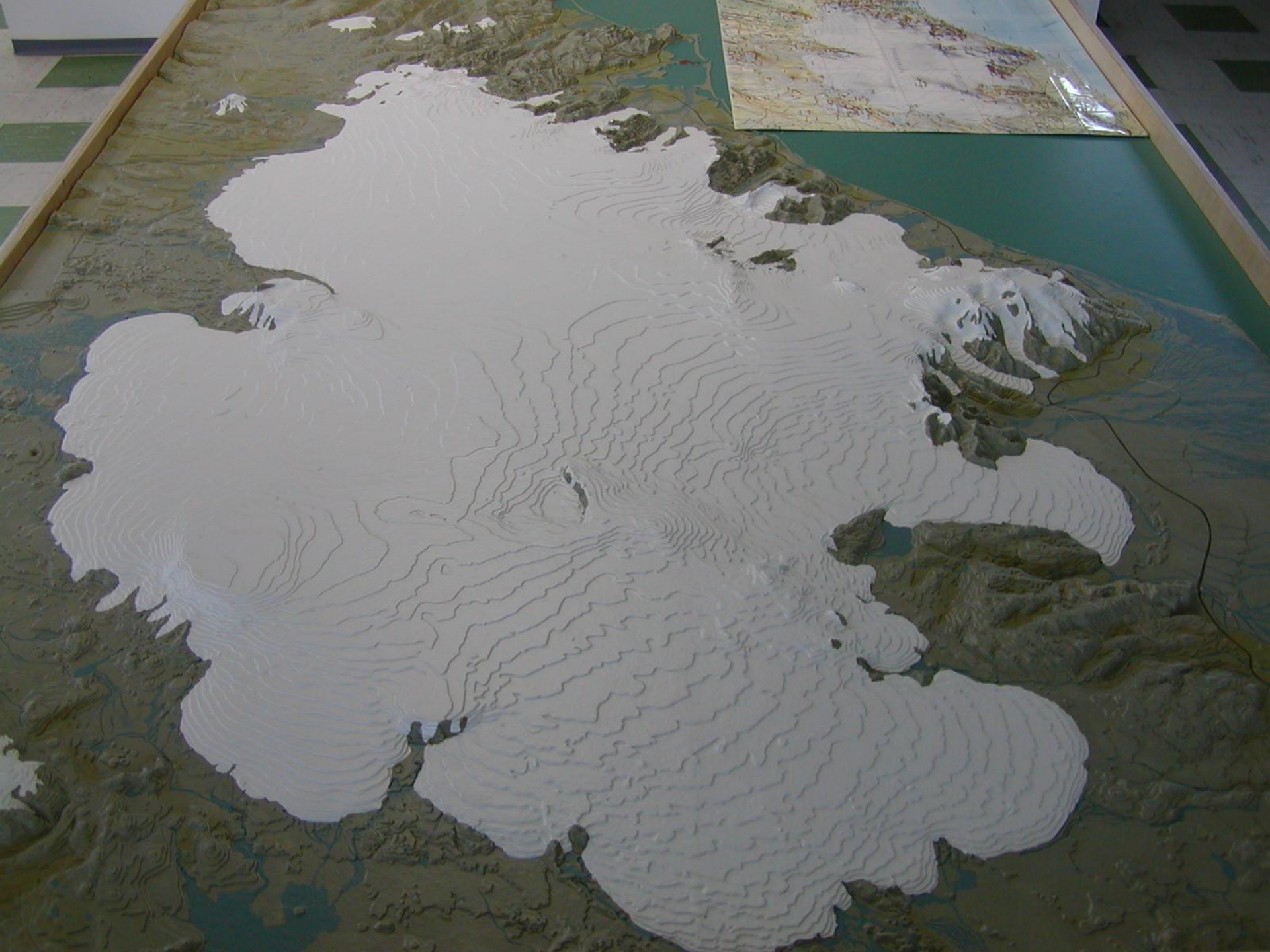
Glaciers

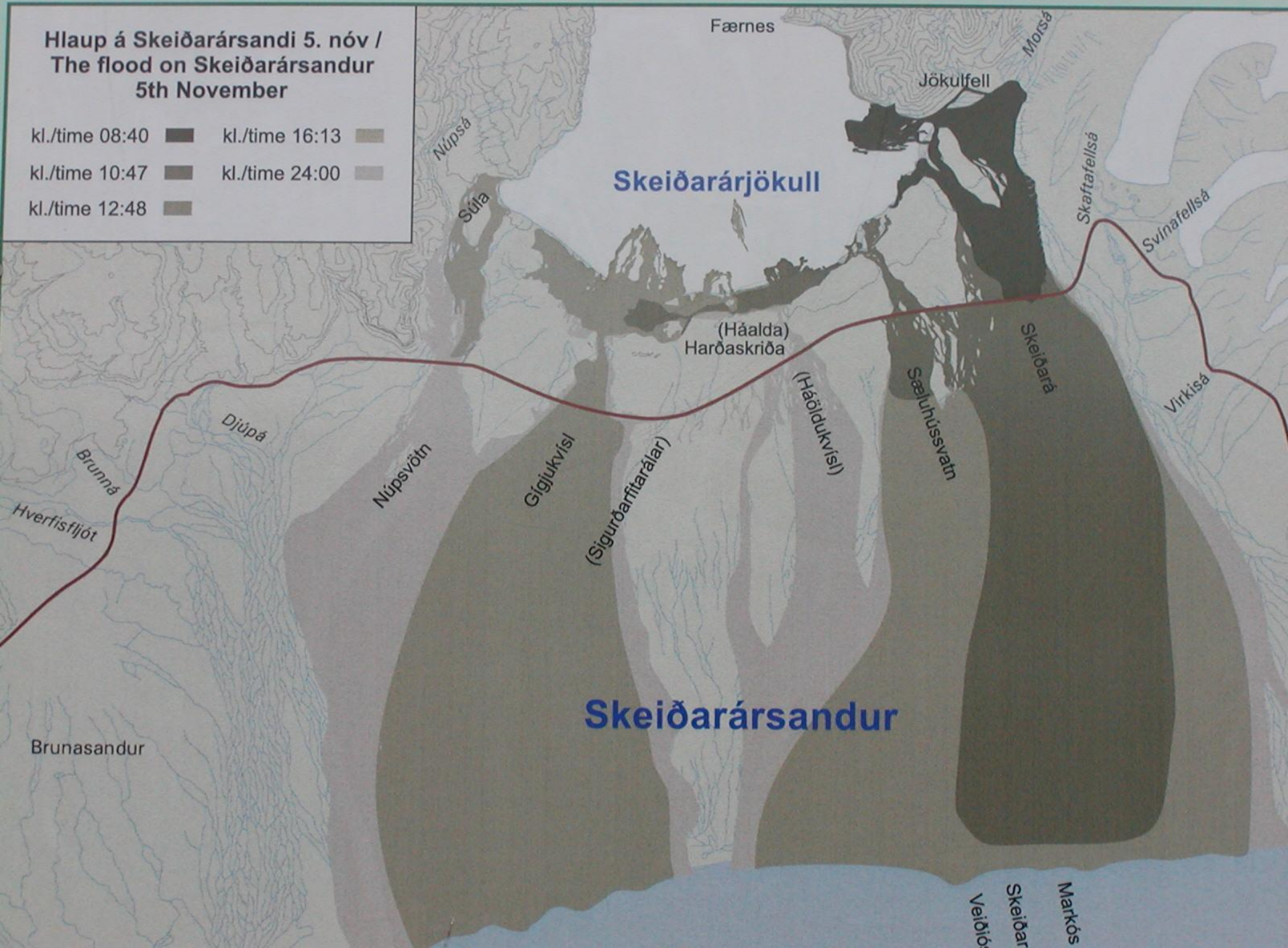



Iceland
Pole
Alps
60°
Himalayas
Sea
level
30°
Andes
Central Africa
(Kilimanjaro)
Equator

Subglacial volcanoes



days after it began.



Periglacial landforms


OLYMPUS

Eolian landforms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Fluvial landforms

Coastal landforms