Landforms in the Faroe Islands

Ole Humlum, University of Oslo

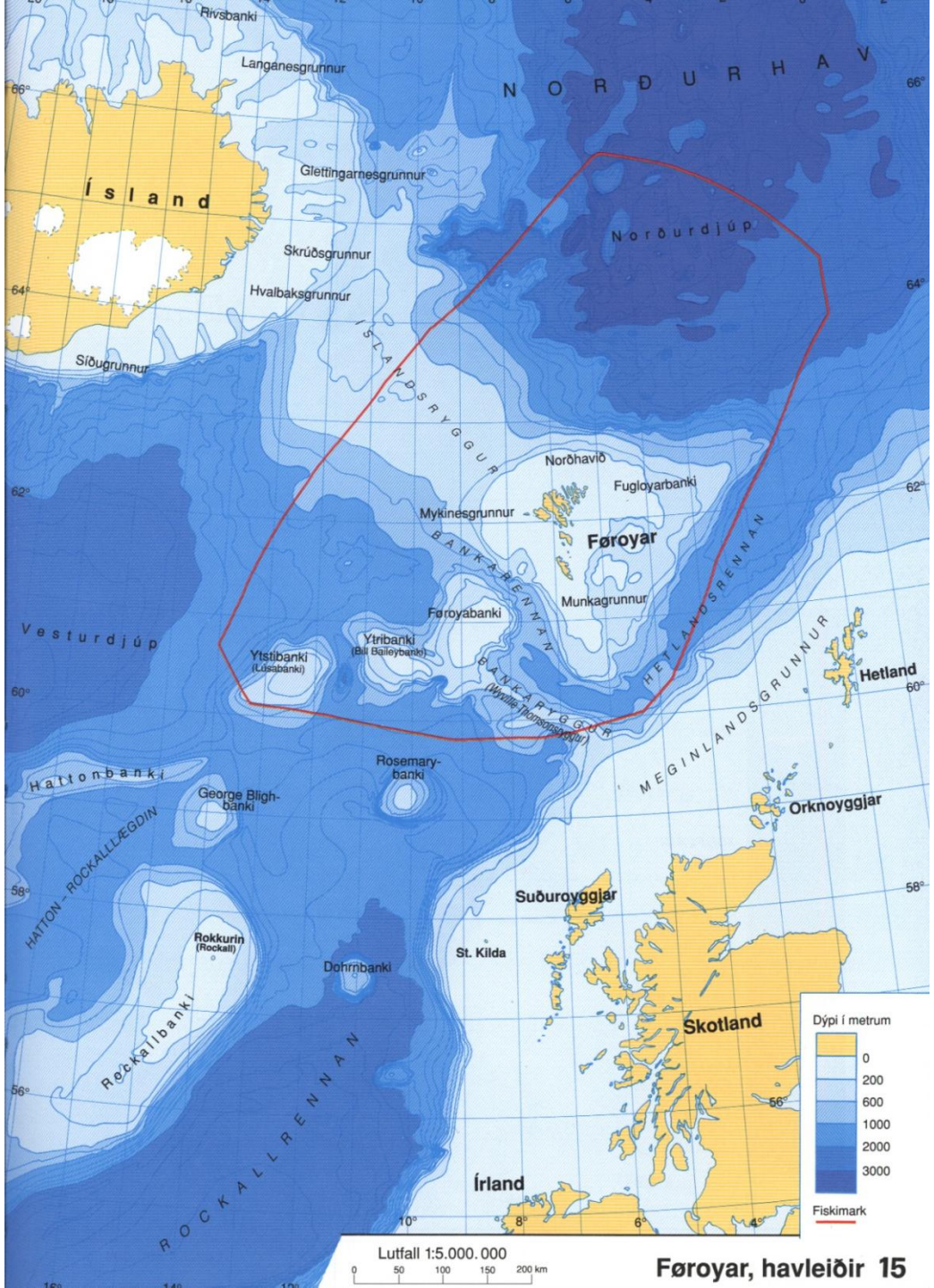
Landforms in the Faroe Islands

1. Topographic and climatic background

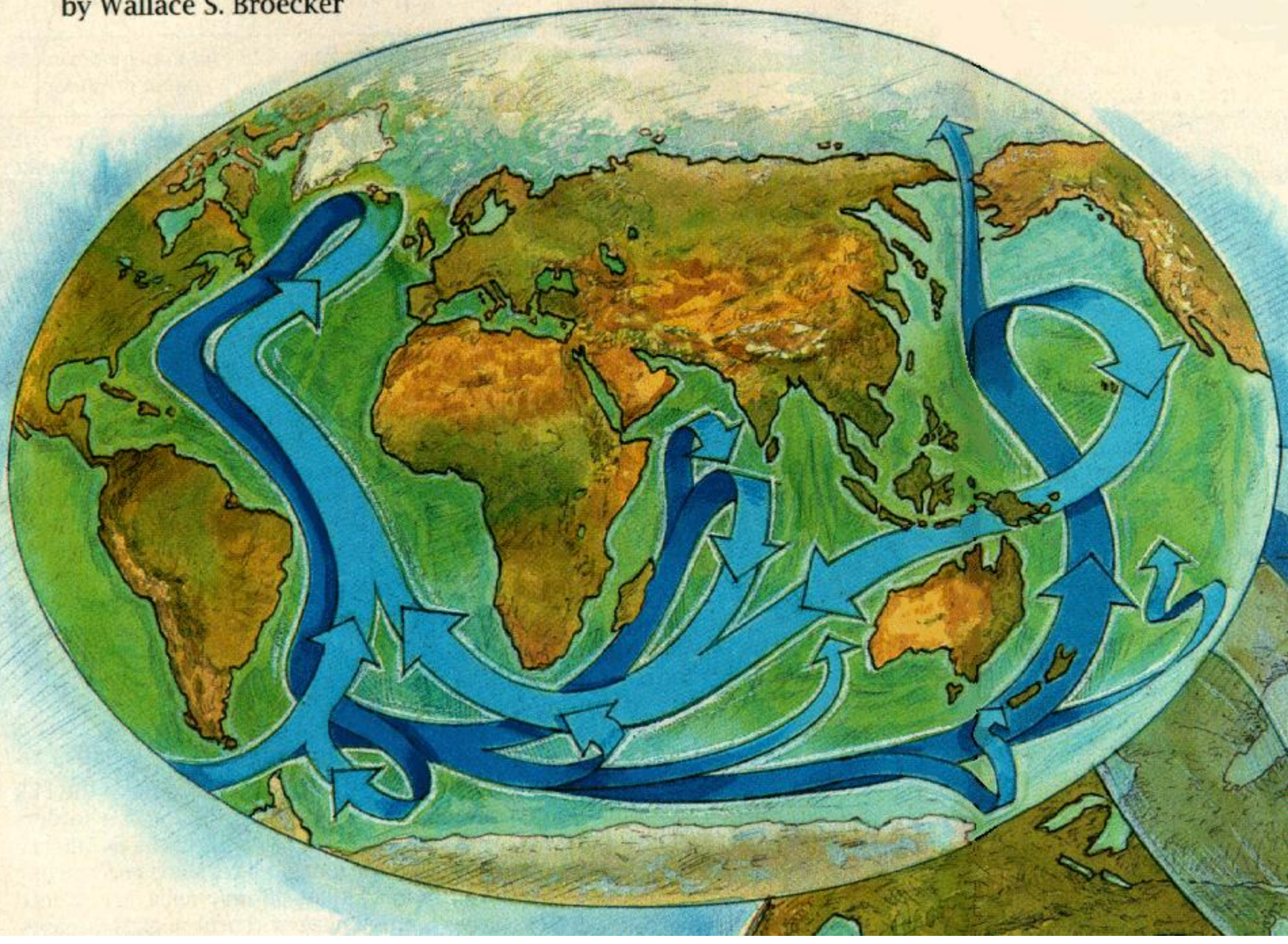
2. Glacial landforms

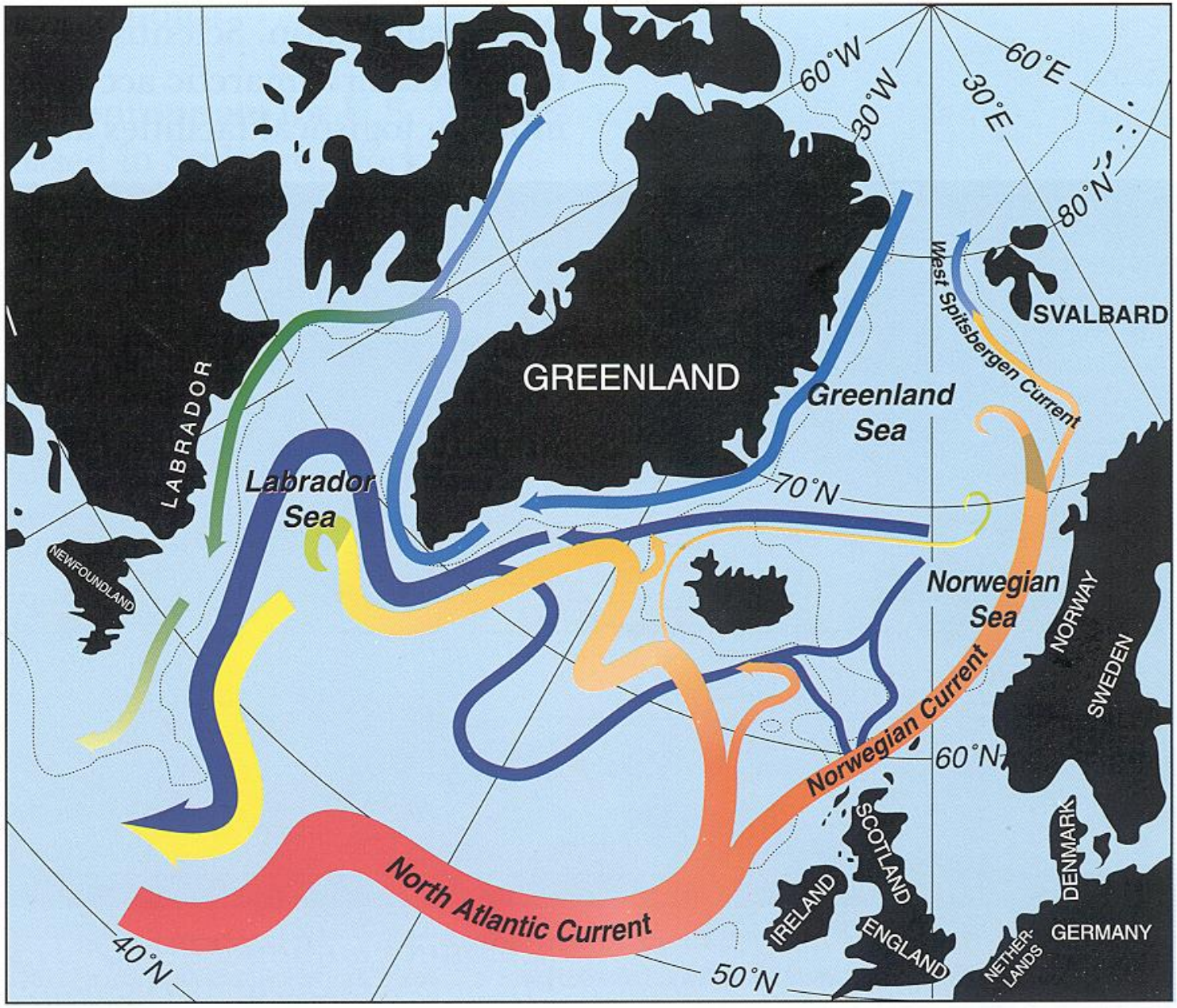
3. Periglacial landforms

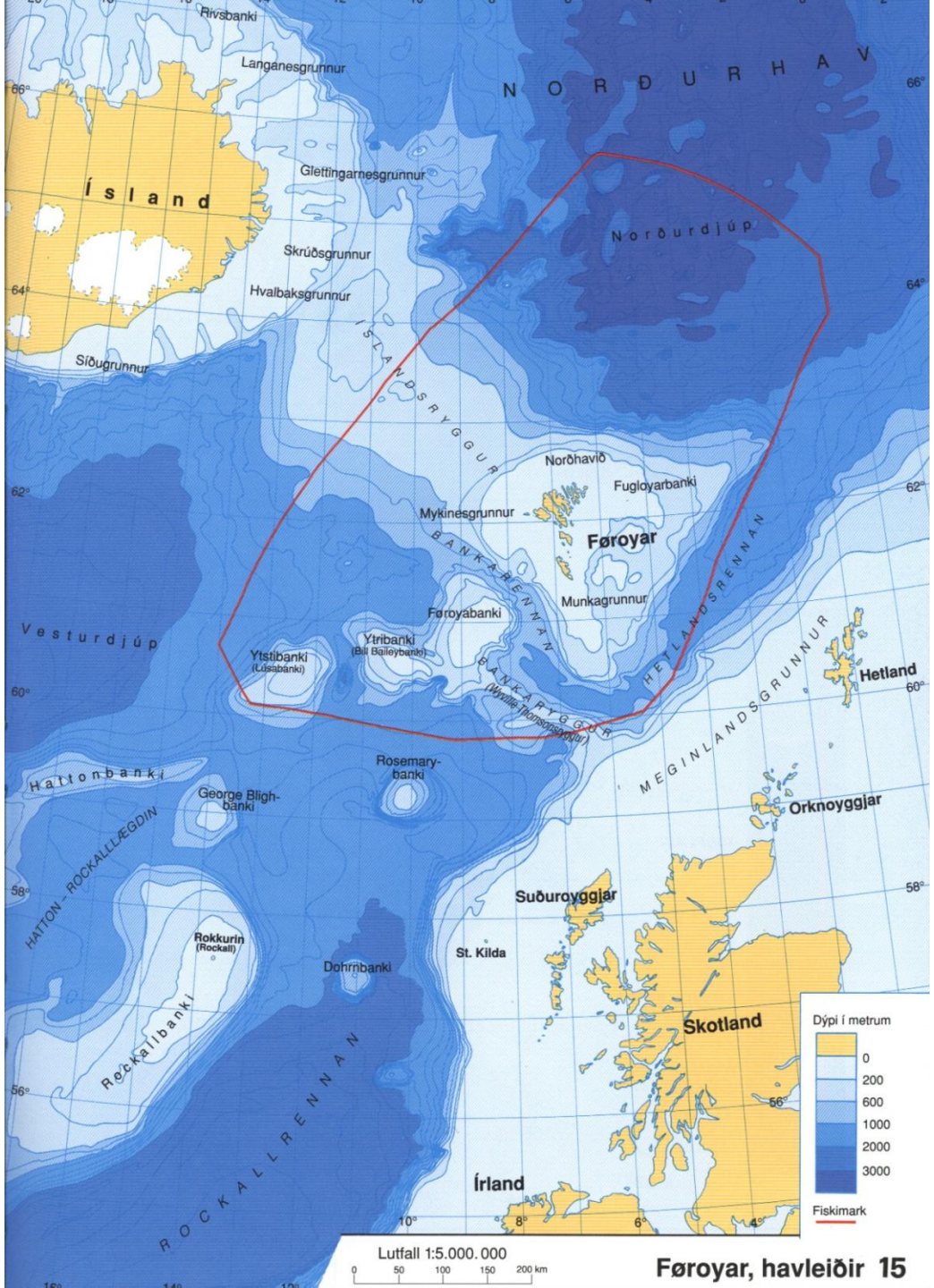
Geographical setting and topography


Rivsbanki
Langanesgrunnur
NORÐURHAV
Ísland
Glettingarnesgrunnur
Norðurdjúp
Skrúðsgrunnur
Hvalbaksgrunnur
ÍSLANDSRYGGUR
Síðugrunnur
Norðhavið
Fugloyarbanki
Mykinesgrunnur
Føroyar
BANKARENNAN
Munkagrunnur
Føroyabanki
Vesturdjúp
Ytribanki
(Bill Baileybanki)
Ytstibanki
(Lúsabanki)
BANKARYGGUR
(Wyville Thomsonryggurin)
HETLANDSRENNAN
Hetland
MEGINLANDSGRUNNUR
Hattonbanki
Rosemary-
banki
George Bligh-
banki
Orknoyggjar
HATTON - ROCKALLLÆGDIN
Suðuroyggjar
Rokkurin
(Rockall)
St. Kilda
Dohrnbanki
Skotland
Rockallbanki
ROCKALLRENNAN
Írland
Dýpi í metrum
0
200
600
1000
2000
3000
Fiskimark
Lutfall 1:5.000.000
0 50 100 150 200 km
Føroyar, havleiðir 15

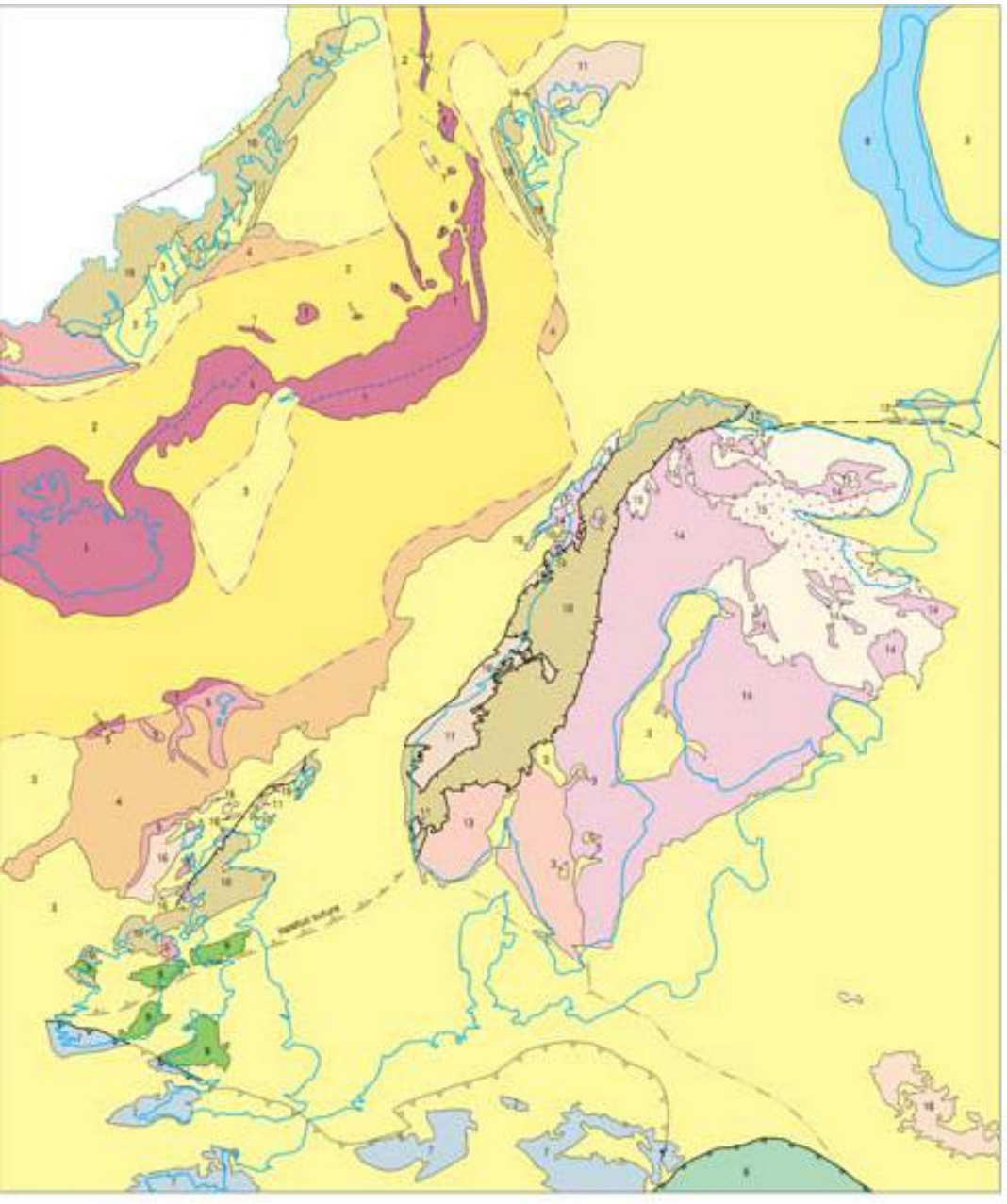
by Wallace S. Broecker




60°W
30°W
60°E
30°E
80°N
70°N
60°N
50°N
40°N
GREENLAND
SVALBARD
LABRADOR
NEWFOUNDLAND
Labrador Sea
Greenland Sea
Norwegian Sea
West Spitsbergen Current
Norwegian Current
North Atlantic Current
NORWAY
SWEDEN
DENMARK
GERMANY
NETHER-LANDS
SCOTLAND
ENGLAND
IRELAND


Rivsbanki
Langanesgrunnur
NORÐURHAV
Ísland
Glettingarnesgrunnur
Norðurdjúp
Skrúðsgrunnur
Hvalbaksgrunnur
ÍSLANDSRYGGUR
Síðugrunnur
Norðhavið
Fugloyarbanki
Mykinesgrunnur
Føroyar
BANKARENNAN
Munkagrunnur
Føroyabanki
Vesturdjúp
Ytribanki
(Bill Baileybanki)
Ytstibanki
(Lúsabanki)
BANKARYGGUR
(Wyville Thomsonryggurin)
HETLANDSRENNAN
Hetland
MEGINLANDSGRUNNUR
Hattonbanki
Rosemary-
banki
George Bligh-
banki
Orknoyggjar
HATTON - ROCKALLLÆGDIN
Suðuroyggjar
Rokkurin
(Rockall)
St. Kilda
Dohrnbanki
Skotland
Rockallbanki
ROCKALLRENNAN
Írland
Dýpi í metrum
0
200
600
1000
2000
3000
Fiskimark
Lutfall 1:5.000.000
0 50 100 150 200 km
Føroyar, havleiðir 15

Geological background



KEY MAP LEGEND

Rocks of the oceanic crust

- Tertiary and Quaternary igneous rocks, mainly ocean floor basalts
- Tertiary sedimentary rocks deposited on ocean floor basalts

Rocks of the continental crust

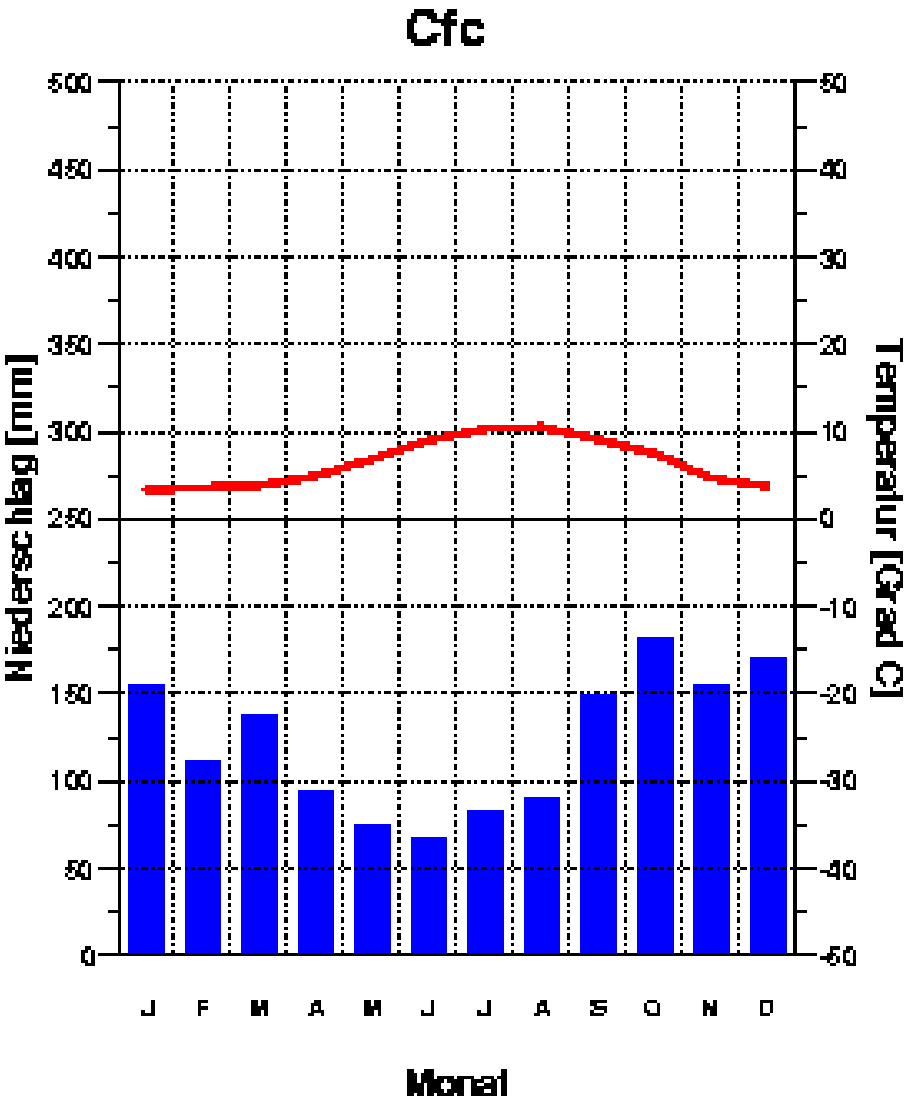
- Sedimentary, mainly non-metamorphic cover rocks of Precambrian to Tertiary age
- Sedimentary Tertiary rocks underlain by Palaeocene to Eocene basalts
- Tertiary basalts
- Rocks of Precambrian to Cretaceous age deformed and metamorphosed in the Alpine orogeny (Late Cretaceous - to day)
- Precambrian to Carboniferous rocks deformed / metamorphosed in the Hercynian orogeny
- Rocks deformed and metamorphosed mainly in Early to Mid Devonian time (extensional regime, forming rift grabens), and in Late Triassic- Early Jurassic time (folding and thrusting in a collisional regime)
- Non-metamorphic lower Palaeozoic formations folded in the Late Silurian time ("Late Caledonian")
- Rocks of Precambrian to Silurian age overthrust and metamorphosed in the Caledonian orogeny
- Rocks of Precambrian age locally deformed / metamorphosed in the Caledonian orogeny
- Rocks deformed and metamorphosed in Late Vendian time (Timanian orogeny)
- Proterozoic rocks (mainly younger than 2.0 Ga), locally deformed and metamorphosed in the Sveconorwegian orogeny
- Palaeoproterozoic rocks metamorphosed and deformed in the Svecokarelian orogeny
- Precambrian rocks
- Archean rocks locally deformed and metamorphosed in the Svecokarelian orogeny
- Boundary between Oceanic and continental crust
- Alpine thrust boundary
- Hercynian thrust boundary
- Caledonian thrust boundary
- Southern boundary of rocks influenced by the Timanian orogeny
- Tesseyre - Tornquist zone
- Mid-Atlantic ridge
- Transform

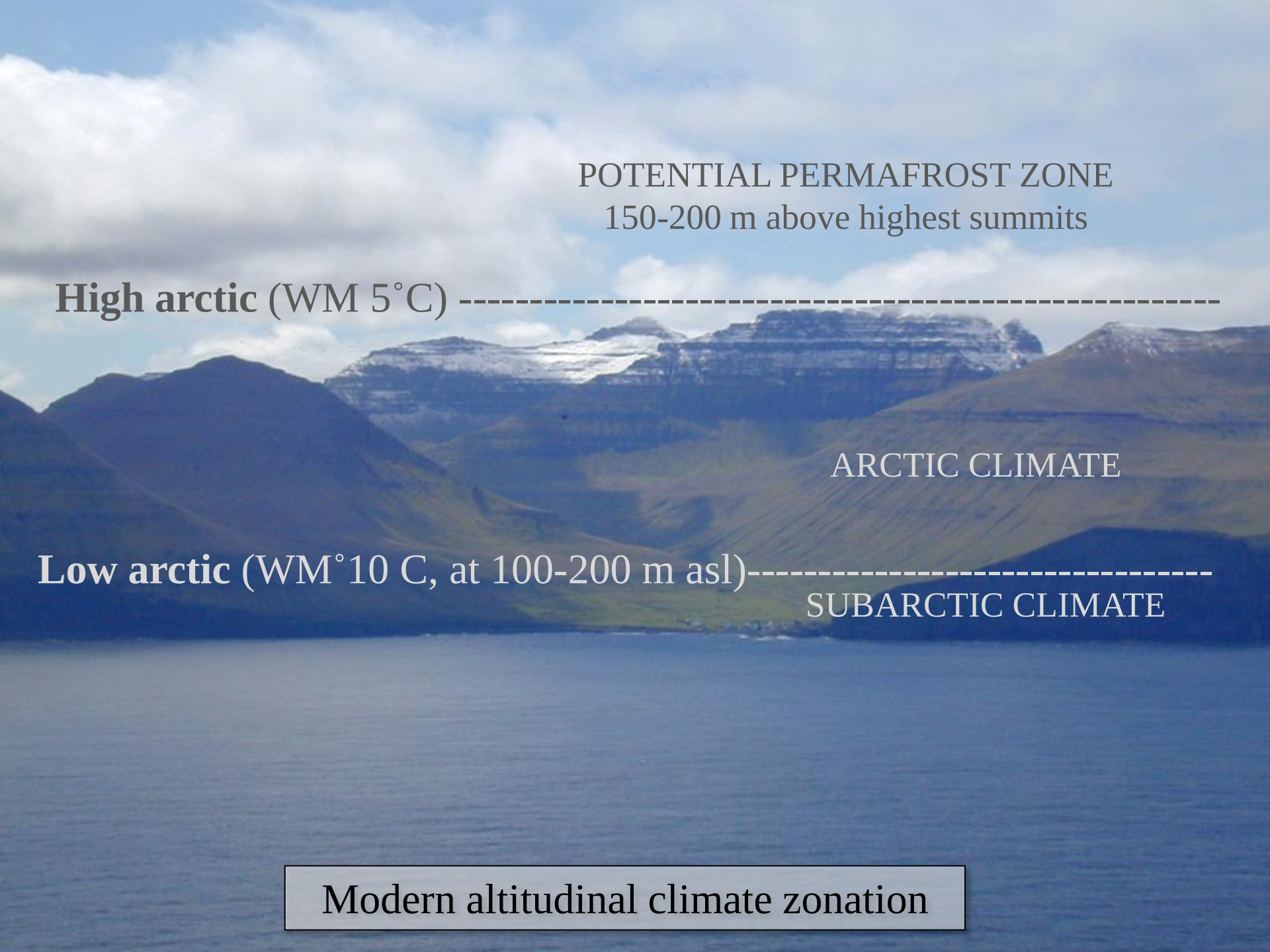
OLYMPUS

Climate

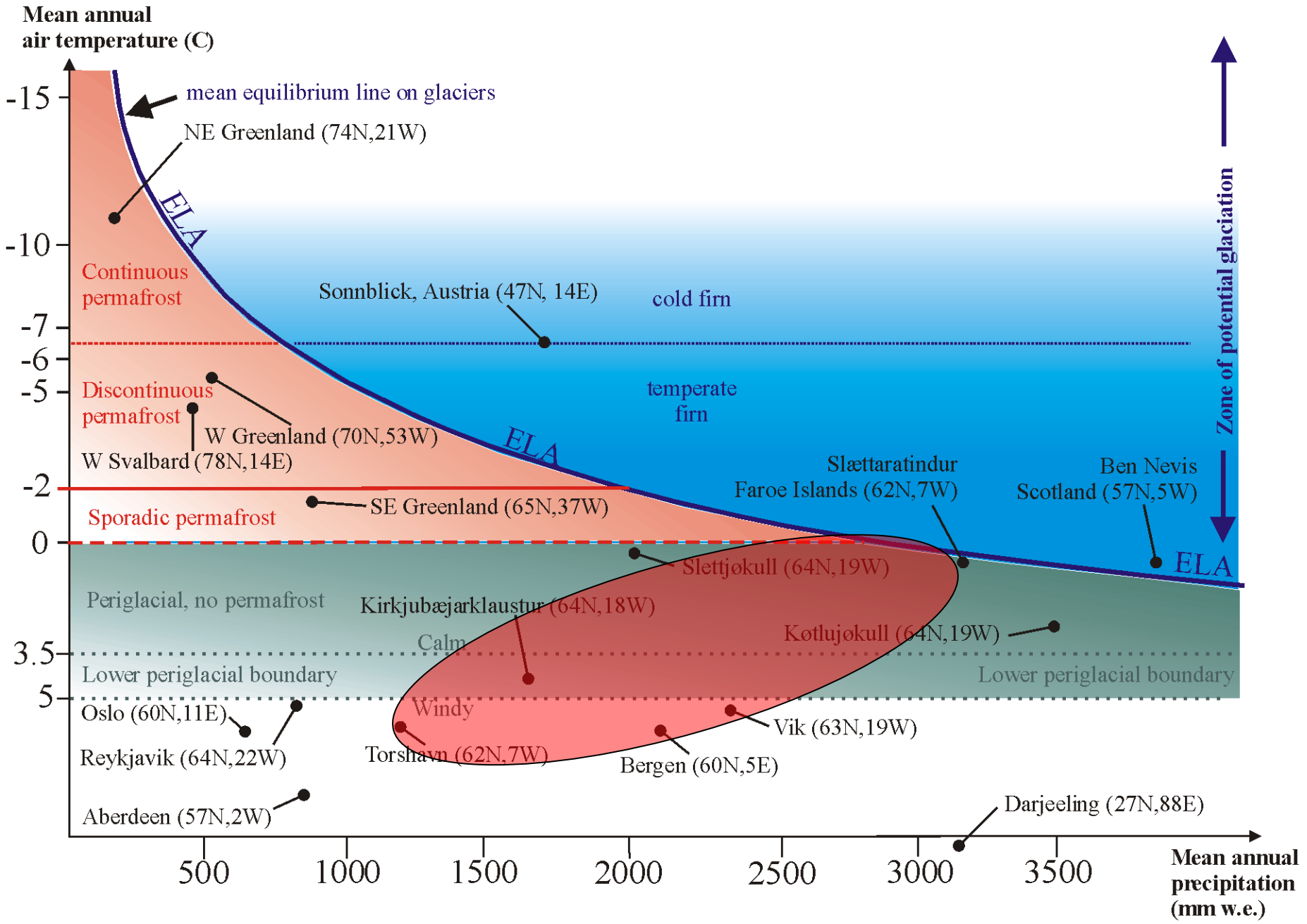
Thorshavn
26 m

6.4 Grad C
1466 mm





Modern altitudinal climate zonation

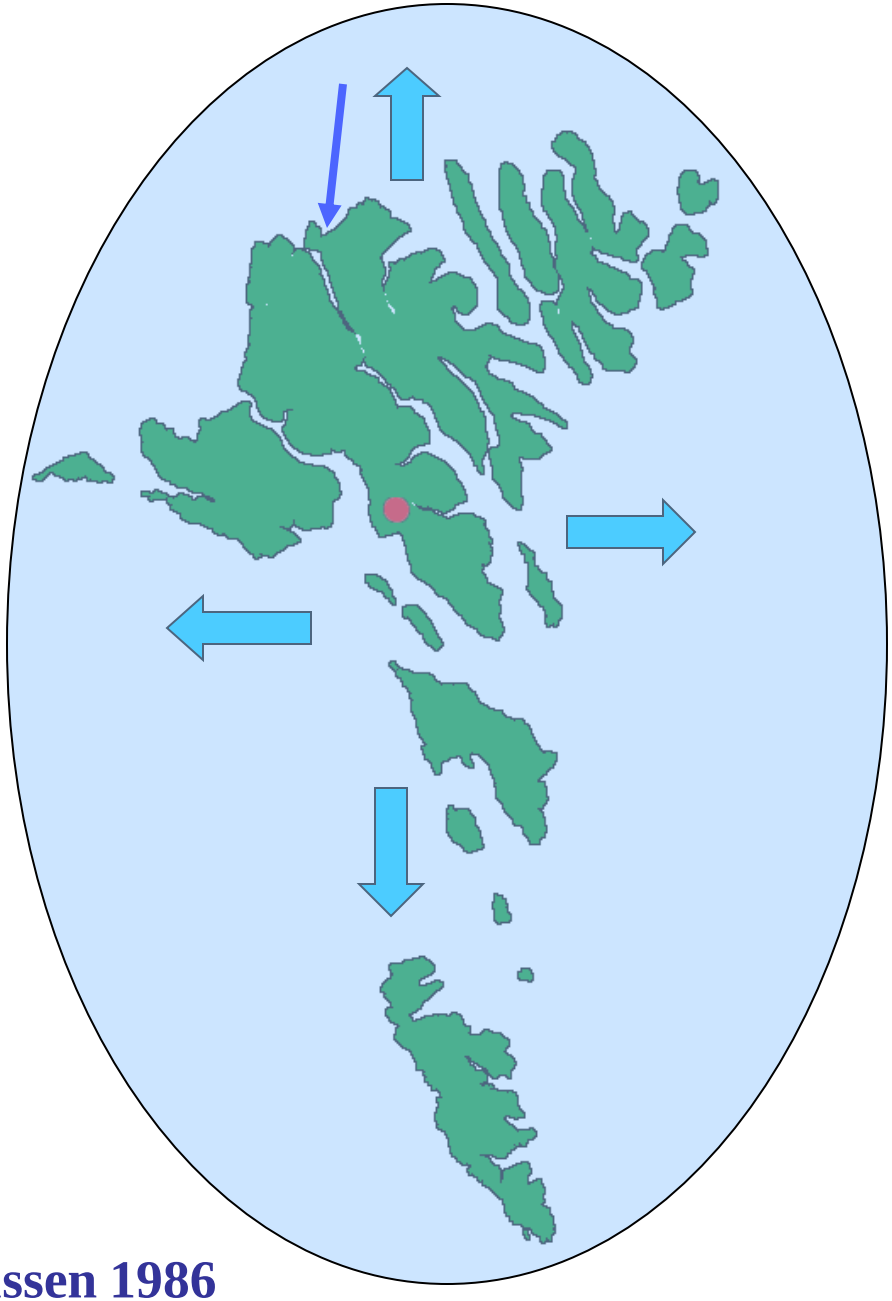

Mean annual
air temperature (C)
-15
-10
-7
-6
-5
-2
0
3.5
5
mean equilibrium line on glaciers
NE Greenland (74N,21W)
ELA
Continuous
permafrost
Discontinuous
permafrost
W Svalbard (78N,14E)
W Greenland (70N,53W)
Sporadic permafrost
SE Greenland (65N,37W)
Periglacial, no permafrost
Lower periglacial boundary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

Ole Humlum

Glacial landforms

Chambers 1855

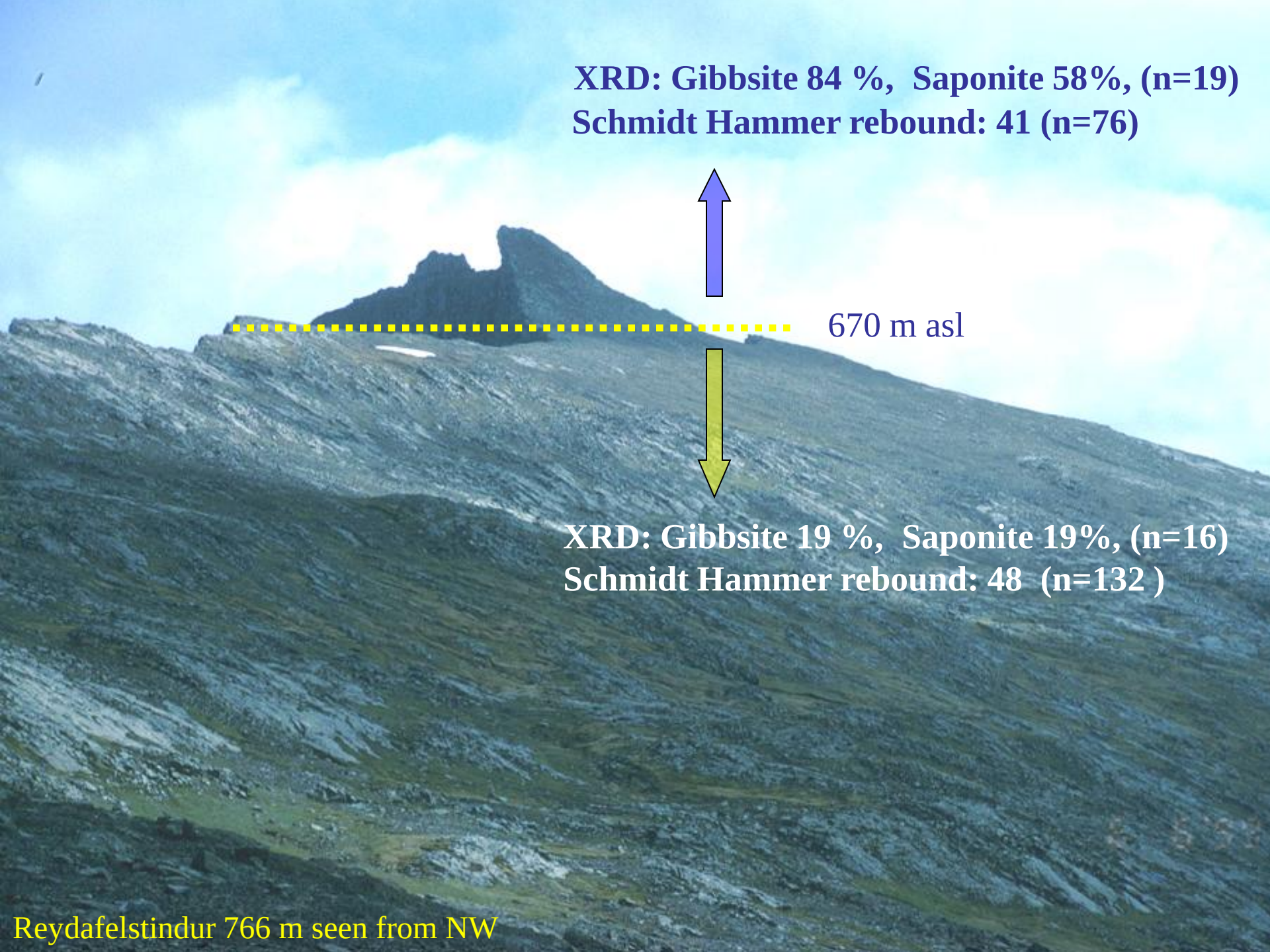
Helland 1879, 1880
Geikie 1880



Jørgensen and Rasmussen 1986

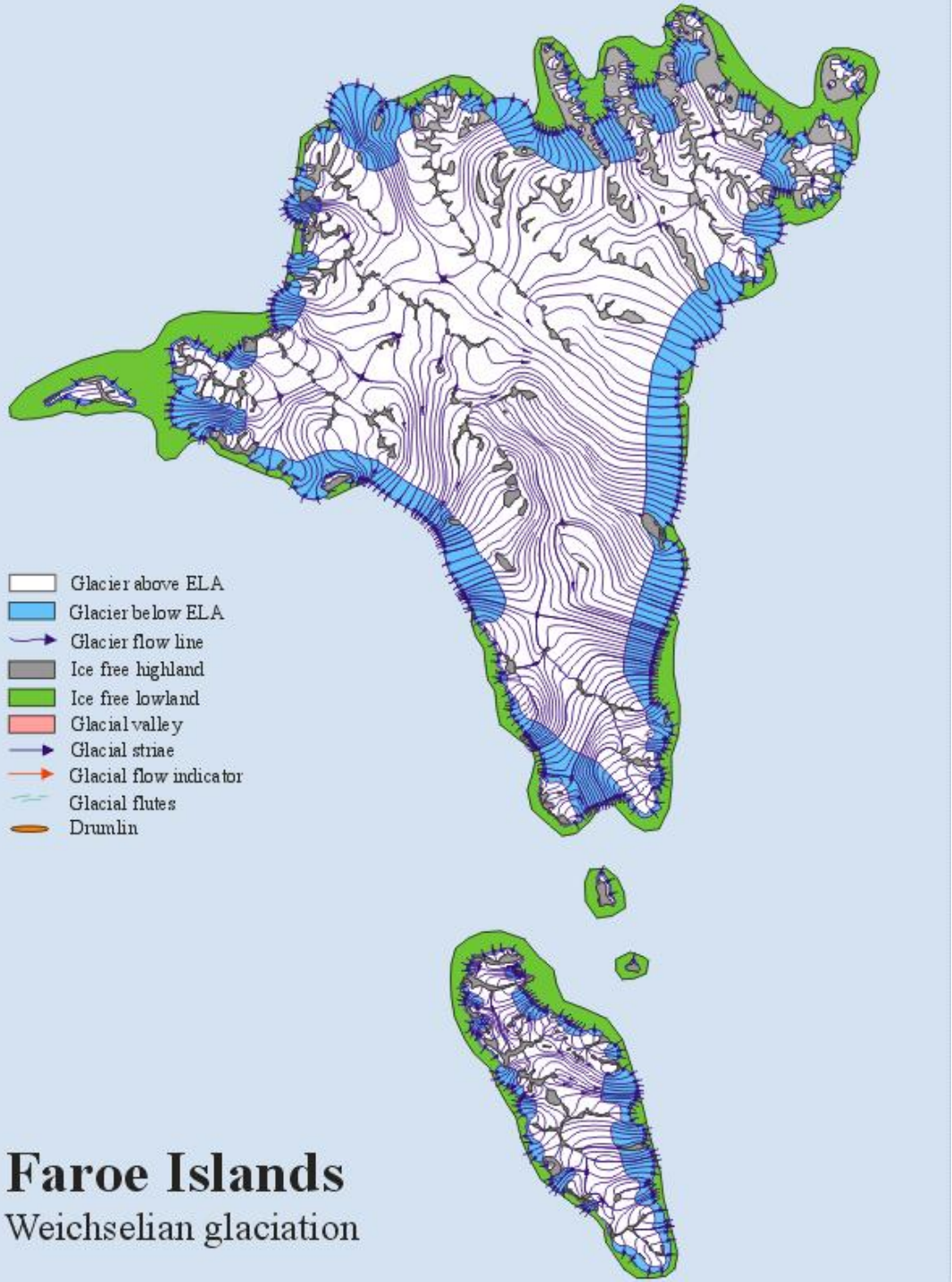
Former nunataqs

Slættaratindur



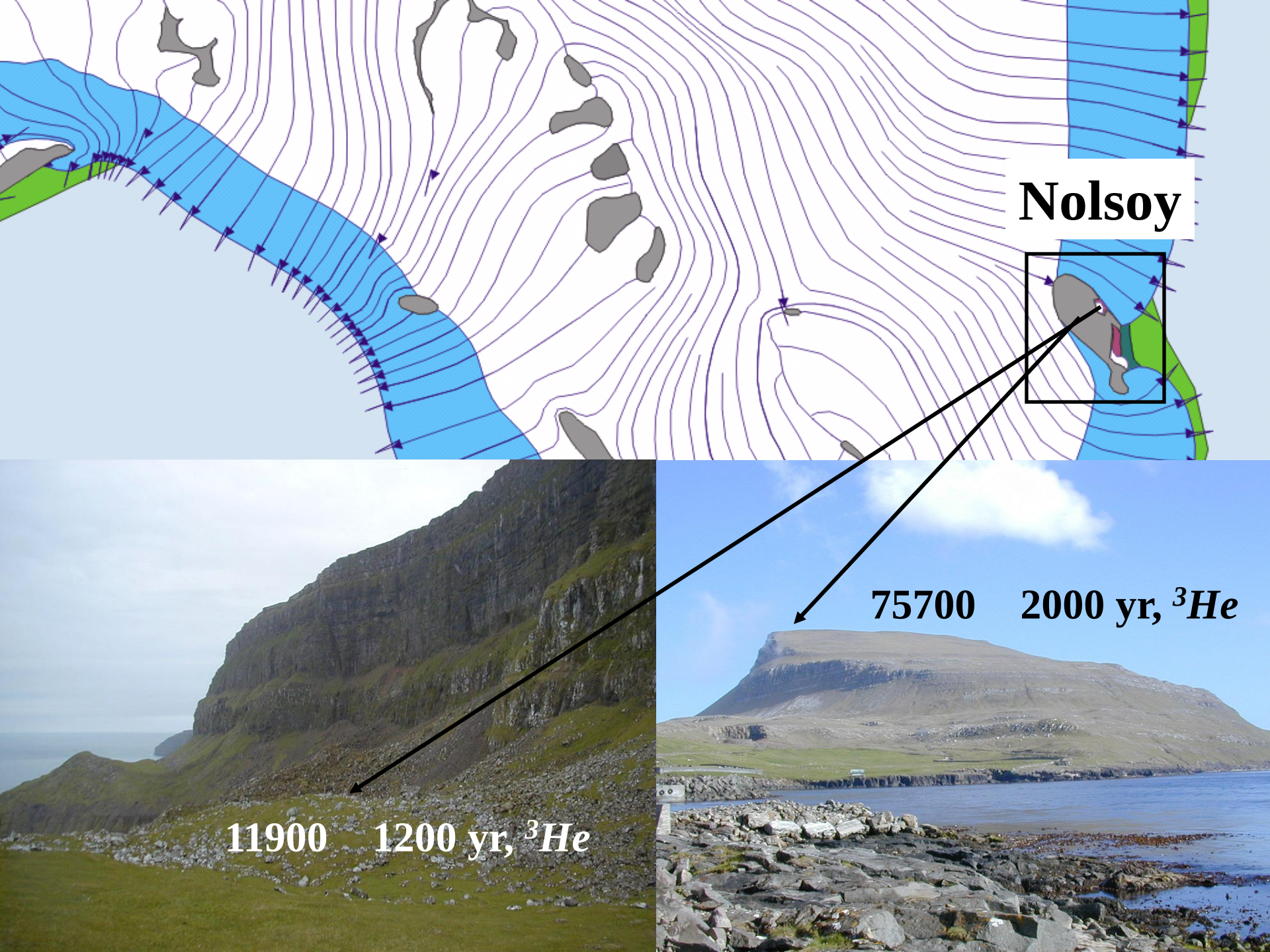
Reydafelstindur 766 m seen from NW

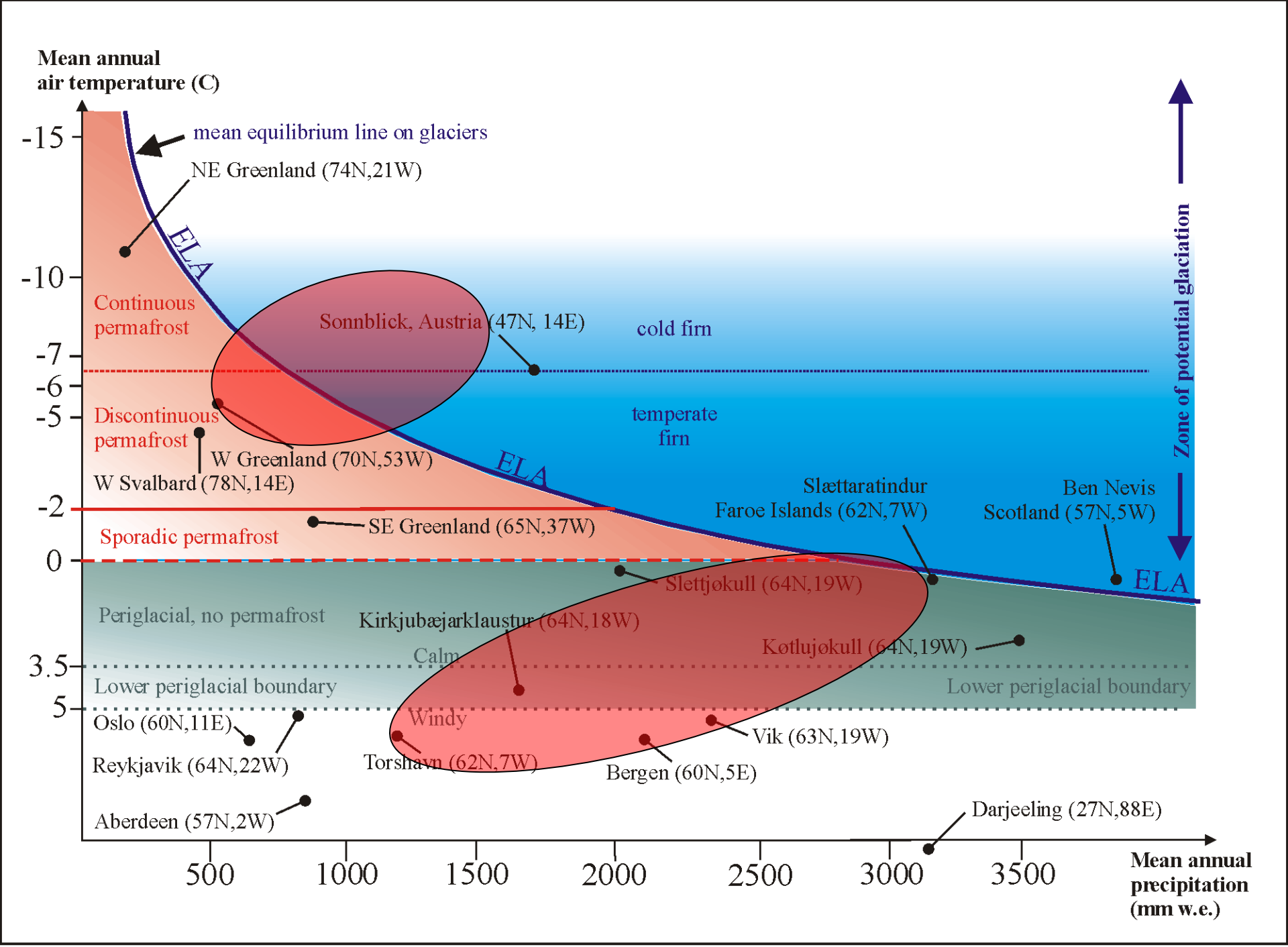

Summer view from Slættaratindur 22.000 cal. yr



Faroe Islands

Weichselian glaciation


Nolsoy
11900 1200 yr, ^{3}He
75700 2000 yr, ^{3}He

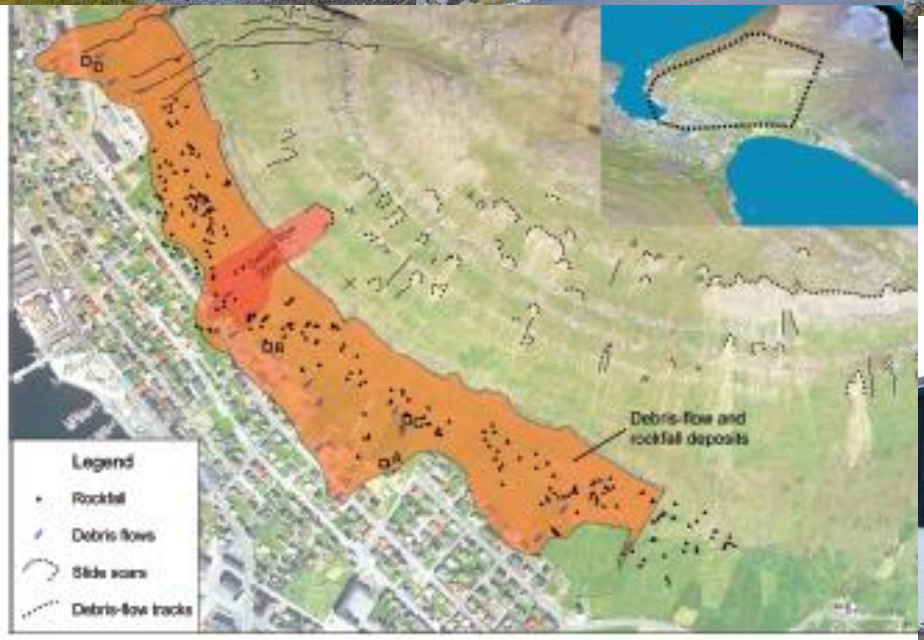

Mean annual
air temperature (C)
-15
-10
-7
-6
-5
-2
0
3.5
5
mean equilibrium line on glaciers
NE Greenland (74N,21W)
ELA
Continuous
permafrost
Discontinuous
permafrost
W Svalbard (78N,14E)
Sonnblick, Austria (47N, 14E)
cold firn
temperate
firn
W Greenland (70N,53W)
ELA
SE Greenland (65N,37W)
Sporadic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

Ole Humlum

Periglacial landforms


No trees


TAMRON



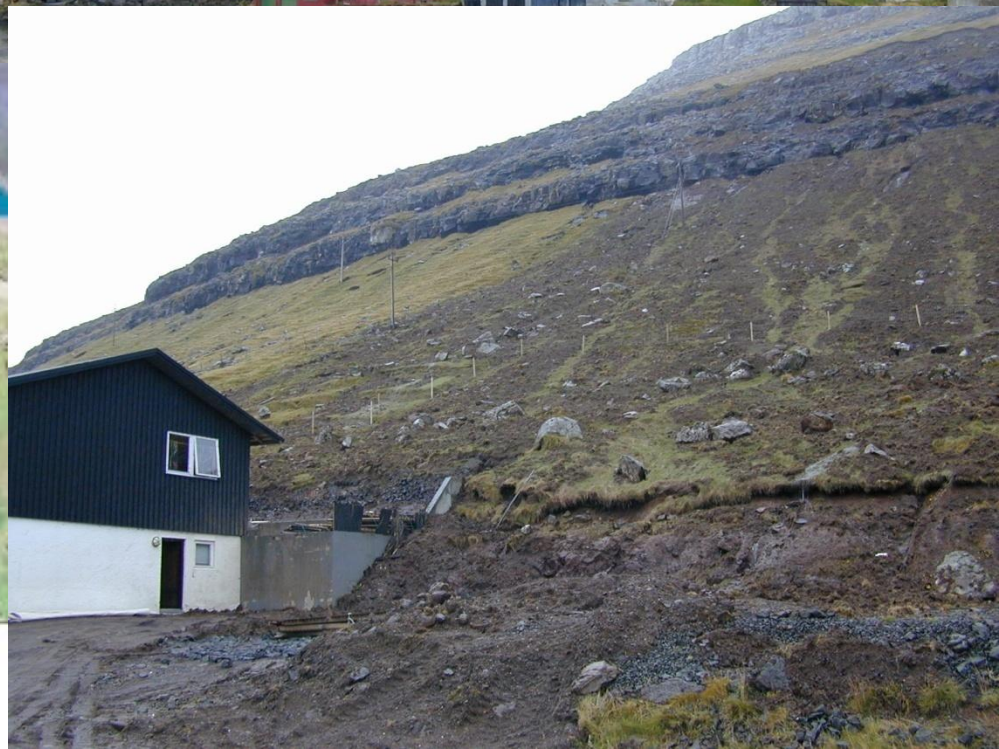
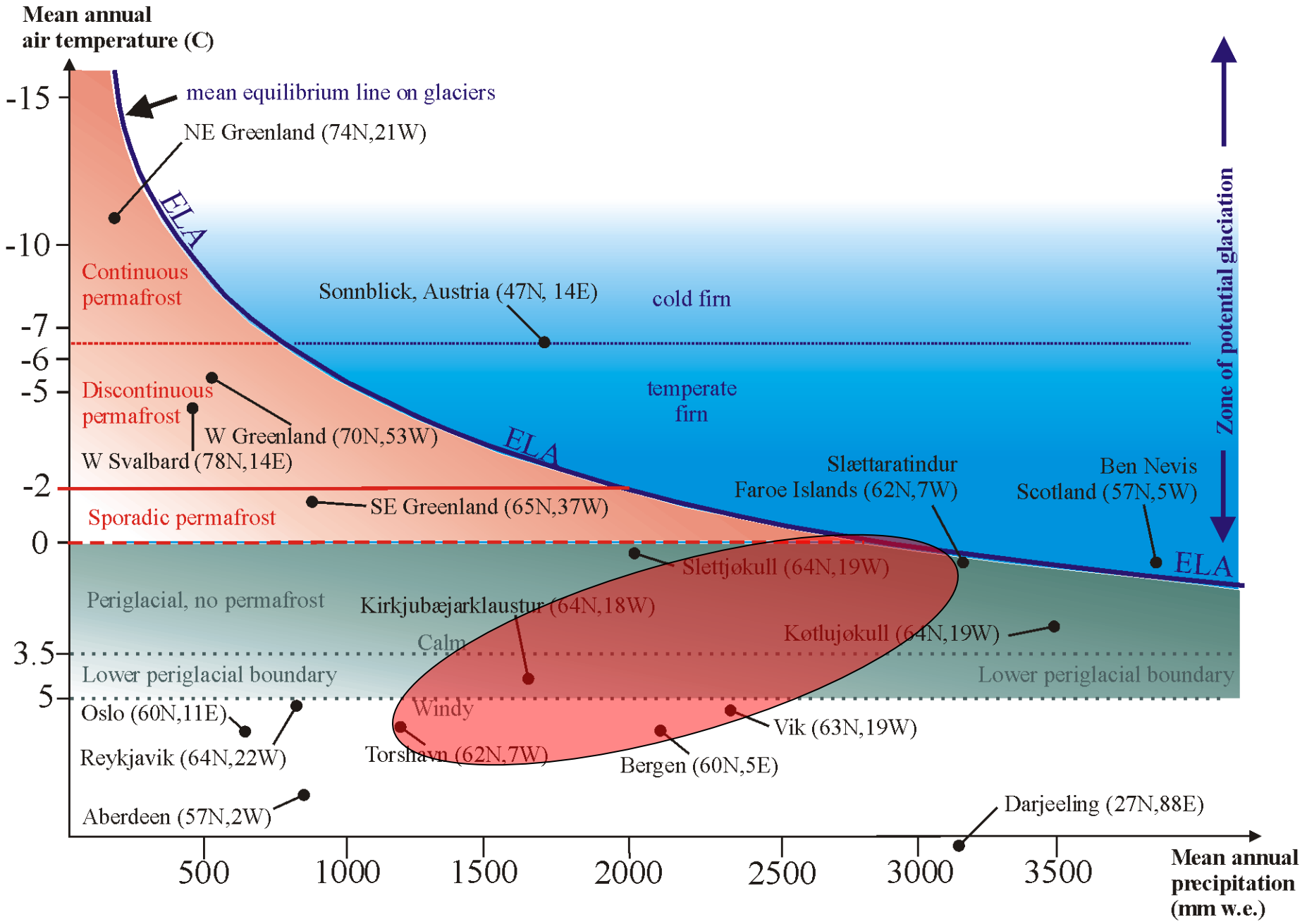


Figure 6 The investigated areas in Marknastiggjur showing the distribution of rockfall and debris-flow deposits. Note also the amount of slide scars and debris-flow tracks on the slopes. The location of the studied sections is shown (A, B, C and D). The inset gives an overview of the Klaksvík landscape seen from the south. The land surface is represented by an aerial photograph from 2001. The extent of the debris flow in 2000 that occurred in the investigated area can be seen directly above the town.


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
Discontinuous
permafrost
W Svalbard (78N,14E)
W Greenland (70N,53W)
Sporadic permafrost
SE Greenland (65N,37W)
Periglacial, no permafrost
Lower periglacial boundary
Oslo (60N,11E)
Reykjavik (64N,22W)
Aberdeen (57N,2W)
Sonnblick, Austria (47N, 14E)
cold firn
temperate
firn
ELA
Slettjøkull (64N,19W)
Kirkjubæjarklaustur (64N,18W)
Calm
Windy
Torshavn (62N,7W)
Bergen (60N,5E)
Slættaratindur
Faroe Islands (62N,7W)
Kotlujøkull (64N,19W)
Vik (63N,19W)
Ben Nevis
Scotland (57N,5W)
ELA
Lower periglacial boundary
Darjeeling (27N,88E)
Zone of potential glaciation
500
1000
1500
2000
2500
3000
3500
Mean annual
precipitation
(mm w.e.)

Ole Humlum