



Geldingadalir 2021 ©Egill Árni Guðnason

GEOLOGICAL AND TECTONIC STRUCTURE OF THE REYKJANES PENINSULA

Egill Árni Guðnason, Þorbjörg Ágústsdóttir and Gylfi Páll Hersir

NASPMON Kick-off meeting, April 9th, 2021

Plate boundaries, rifts and transforms in Iceland

The **Mid-Atlantic plate boundary**
and the **Iceland hotspot**

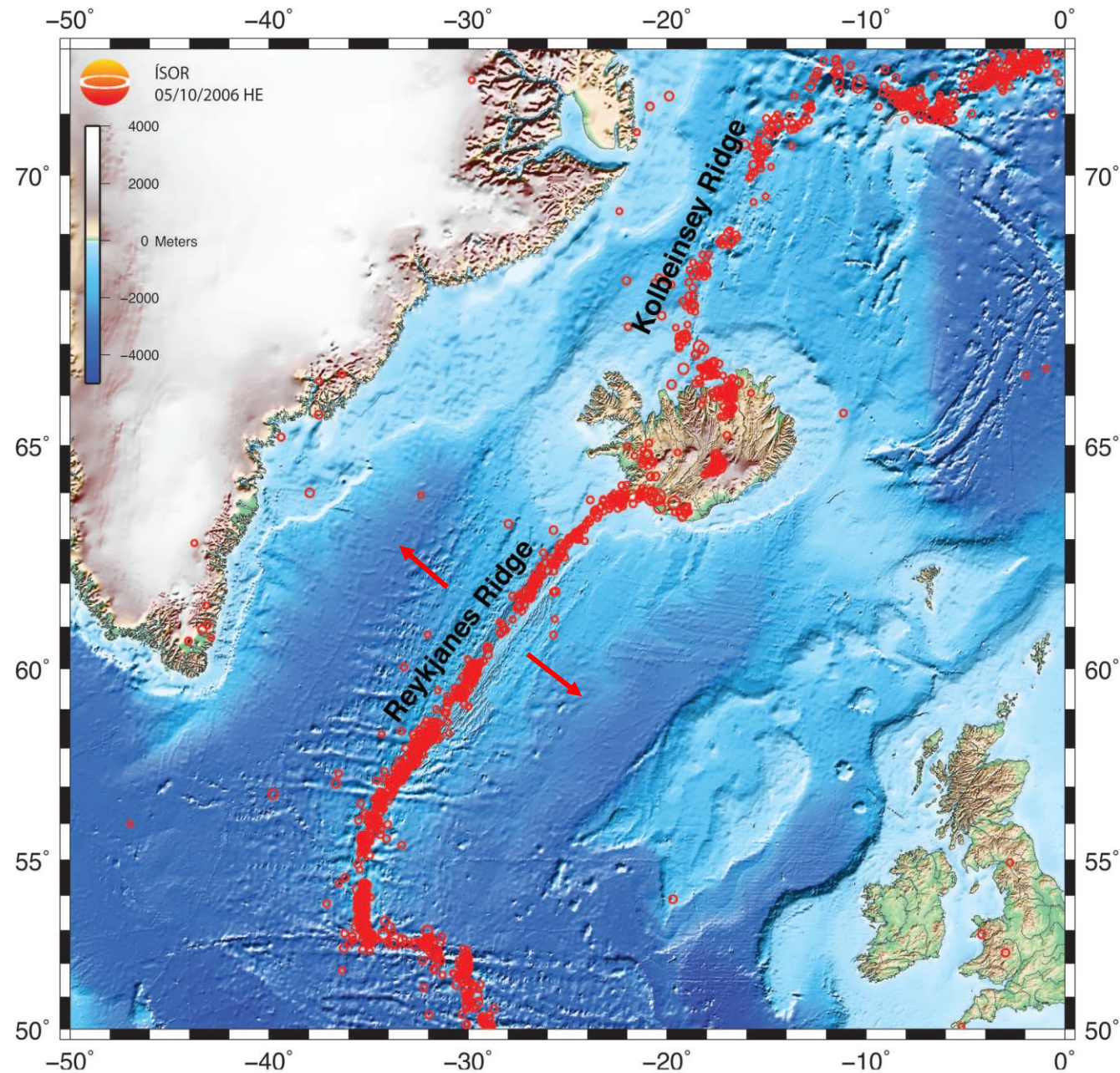


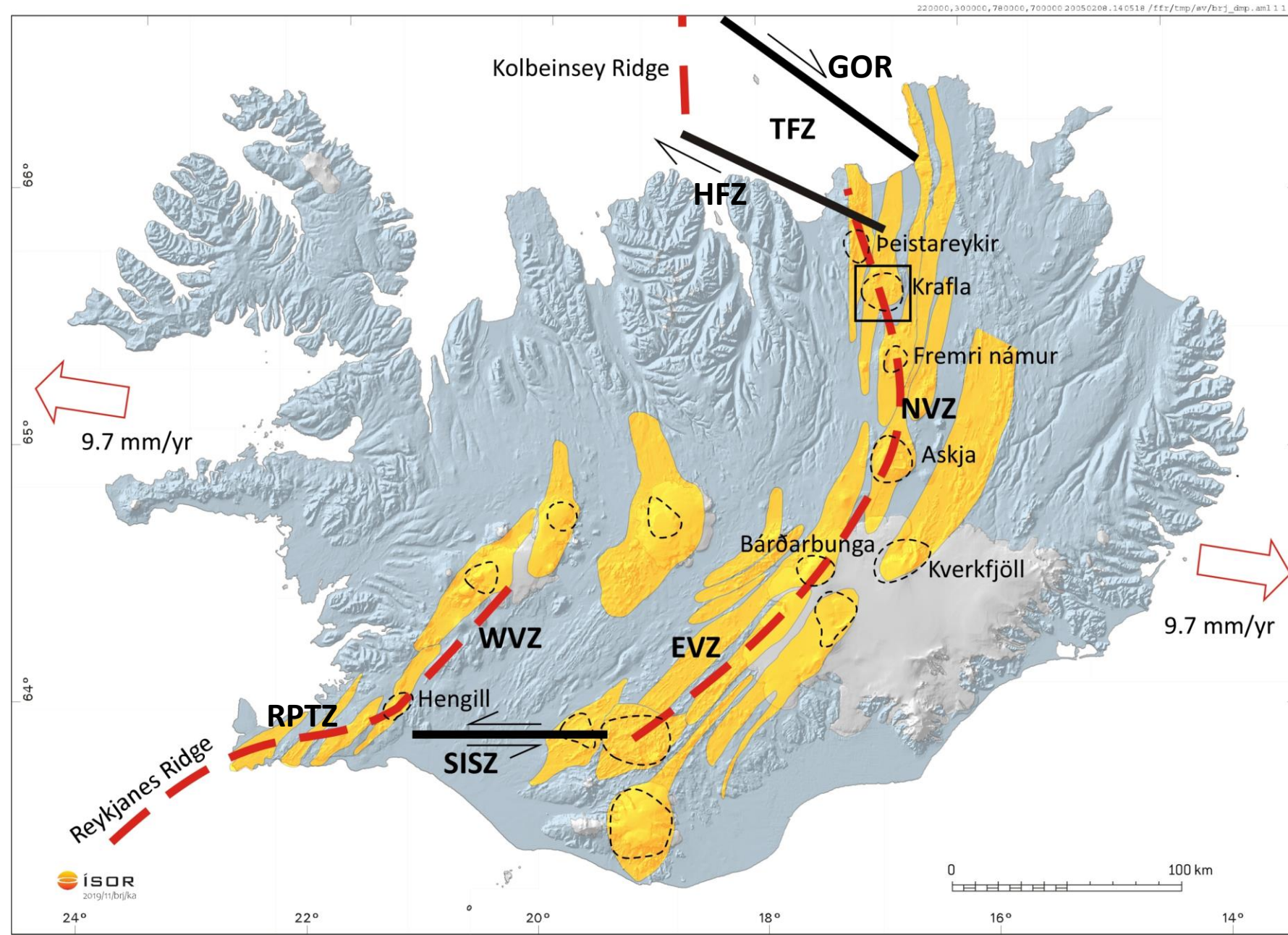
Plate boundaries, rifts and transforms in Iceland

3 main types:

- Volcanic spreading zones
- Non-volcanic fracture zones
- Volcanic oblique zones

Abbreviations:

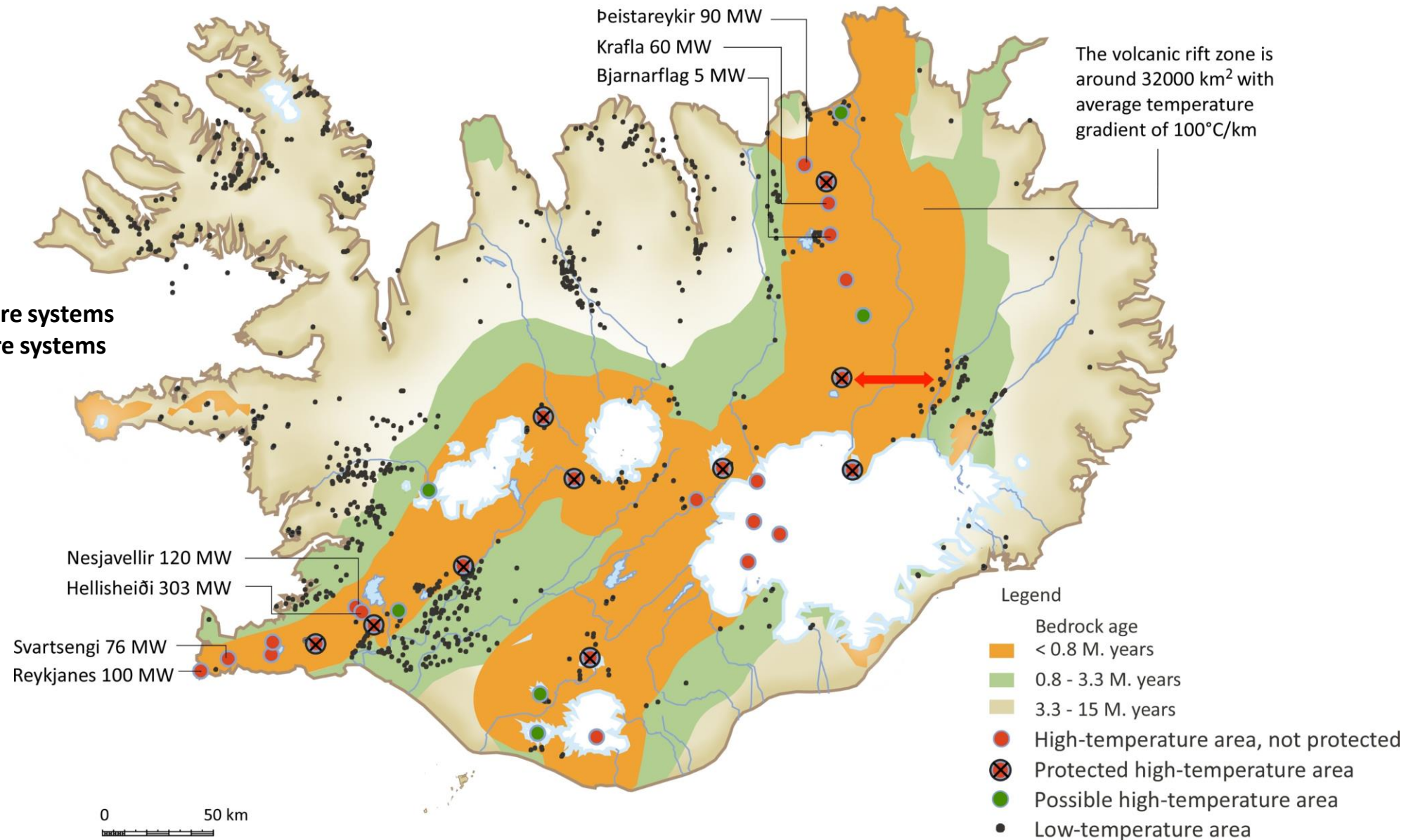
GOR: Grímsey Oblique Rift
TFZ: Tjörnes Fracture Zone
HFZ: Húsavík-Flatey Zone
NVZ: Northern Volcanic Zone
EVZ: Eastern Volcanic Zone
WVZ: Western Volcanic Zone
SISZ: South Iceland Seismic Zone
RPTZ: Reykjanes Peninsula Trans-Tensional Zone



The geothermal areas of Iceland

Classification:

- Volcanic **high**-temperature systems
- Tectonic **low**-temperature systems

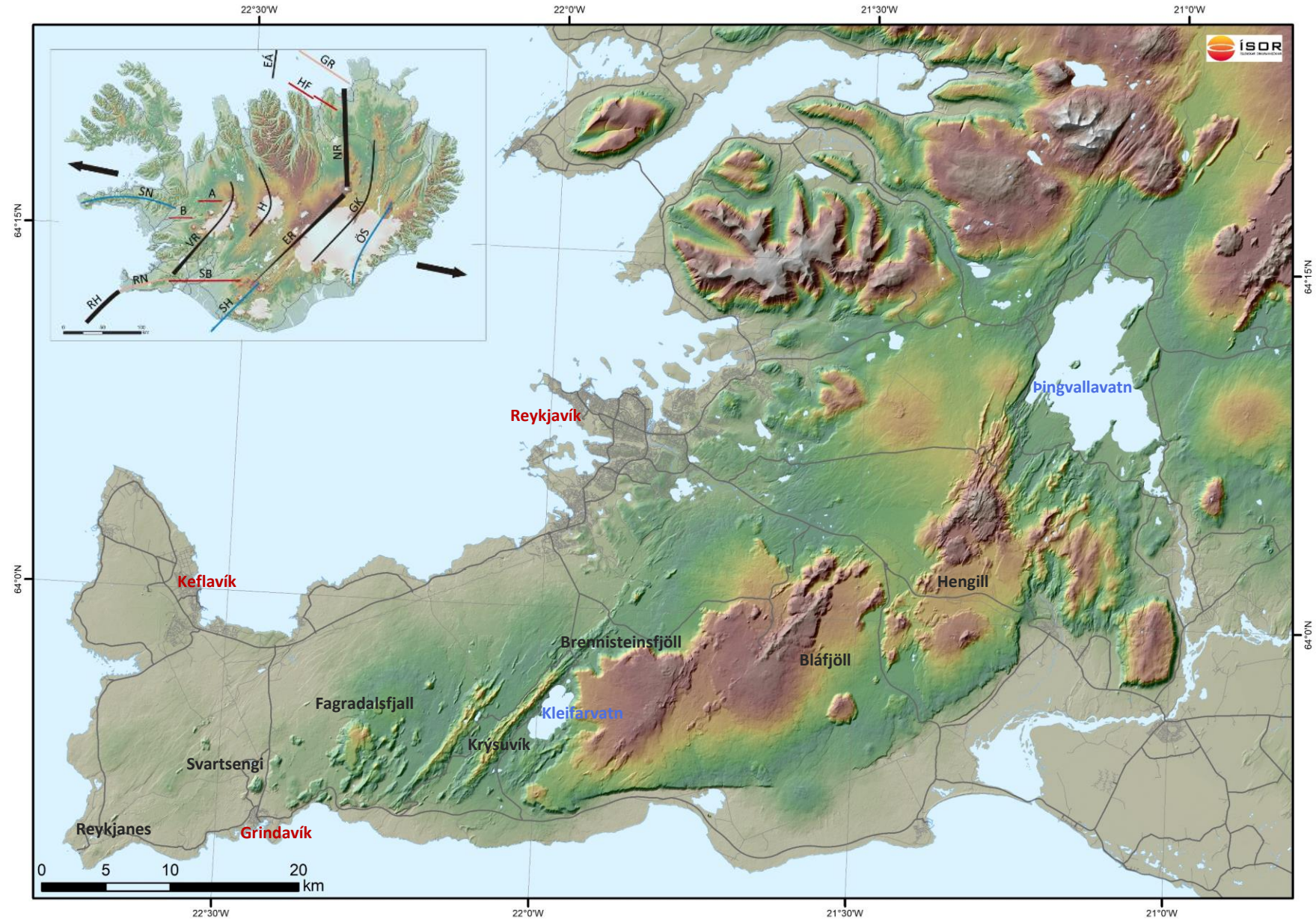


The Reykjanes Peninsula

Most prominent structural elements:

- Hyaloclastite ridges
- Eruptive fissures

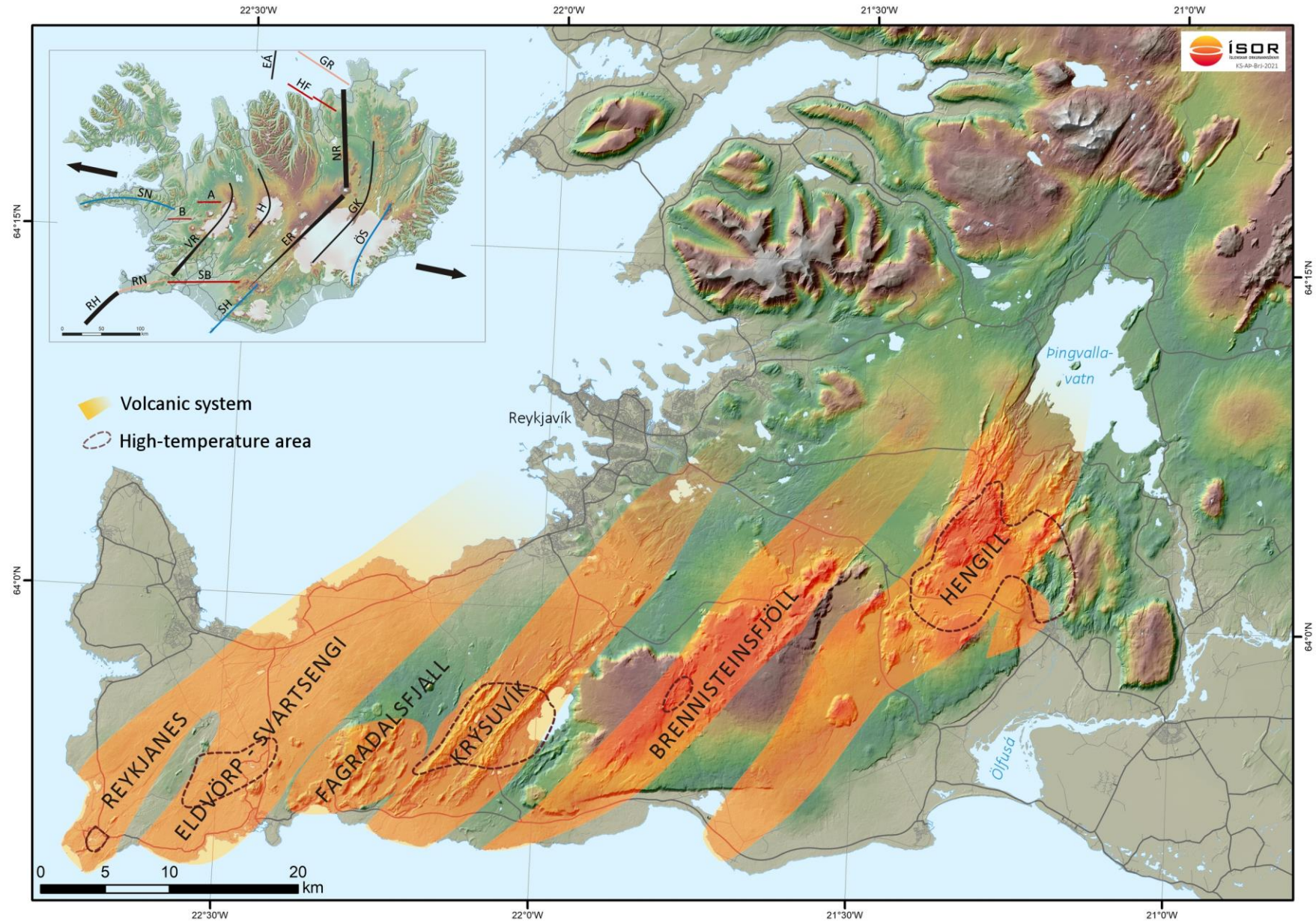
trending mostly between 30° and 40°



Volcanic systems of the Reykjanes Peninsula

6 en echelon volcanic systems:

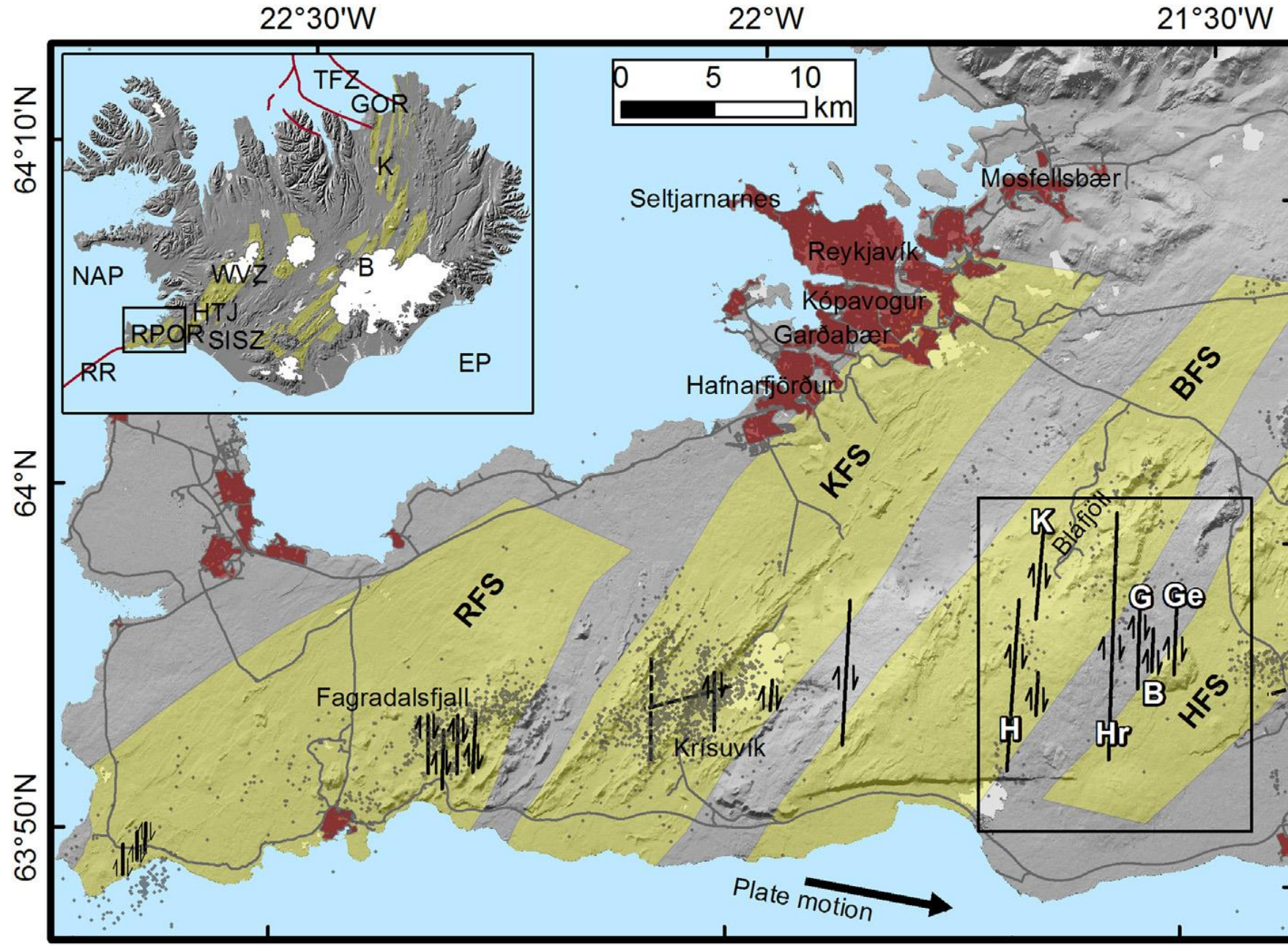
- Reykjanes
- Eldvörp-Svartsengi
- Fagradalsfjall
- Krýsuvík
- Brennisteinsfjöll
- Hengill



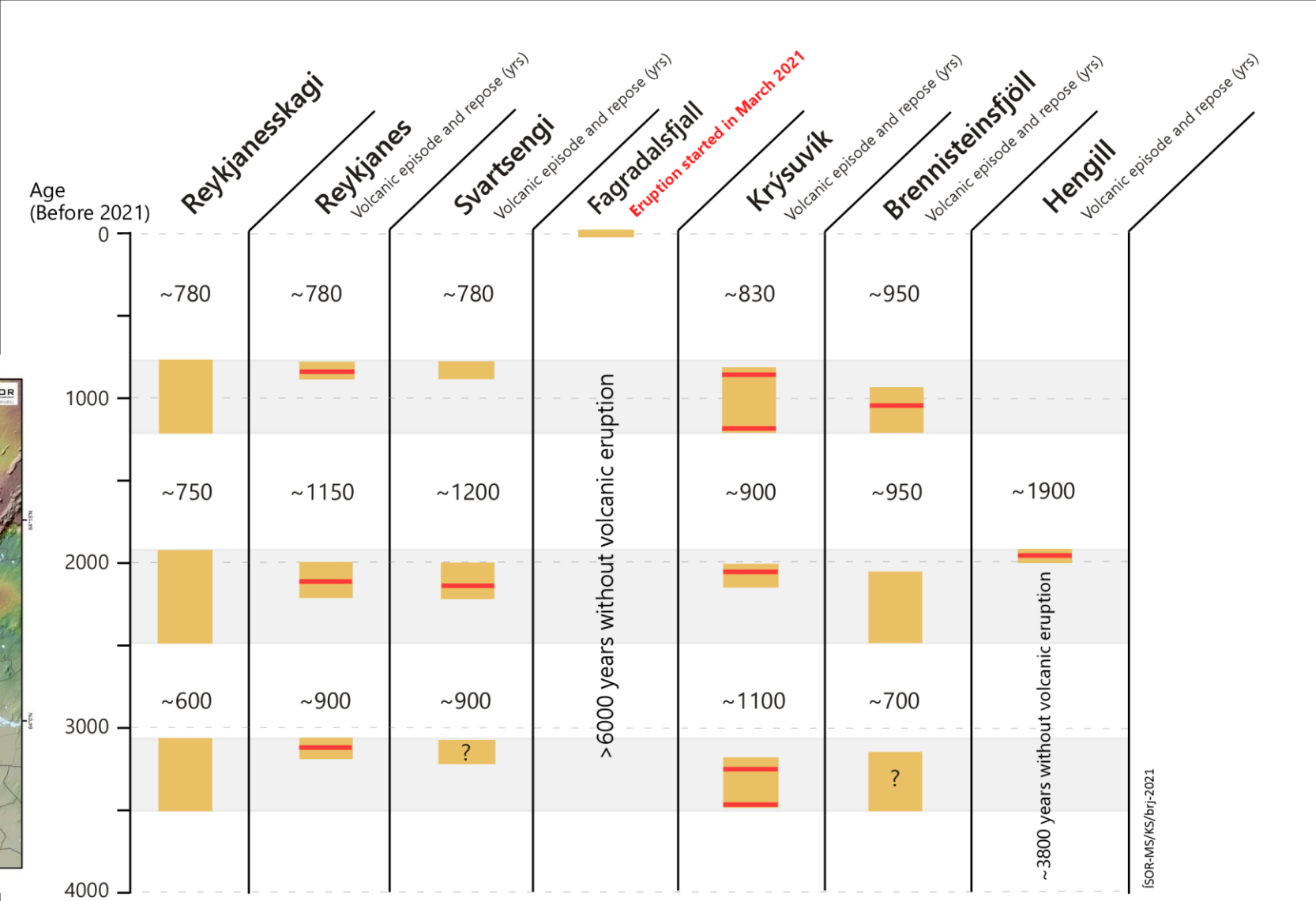
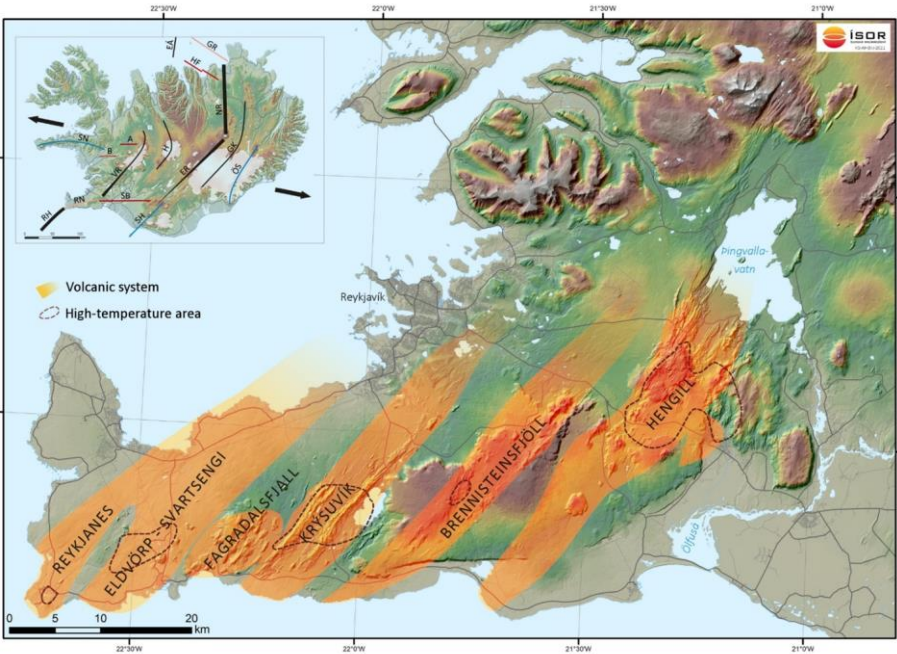
Tectonics of the Reykjanes Peninsula

The structural features of the Reykjanes Peninsula Trans-Tensional Zone

Earthquake epicenters of $M > 2$ during 1993-2013,
from the IMO.
Figure from: **Einarsson et al., 2018**



Eruption history on the Reykjanes Peninsula



Most recent lava flows on the Reykjanes Peninsula

8th - 9th century AD

10th century AD

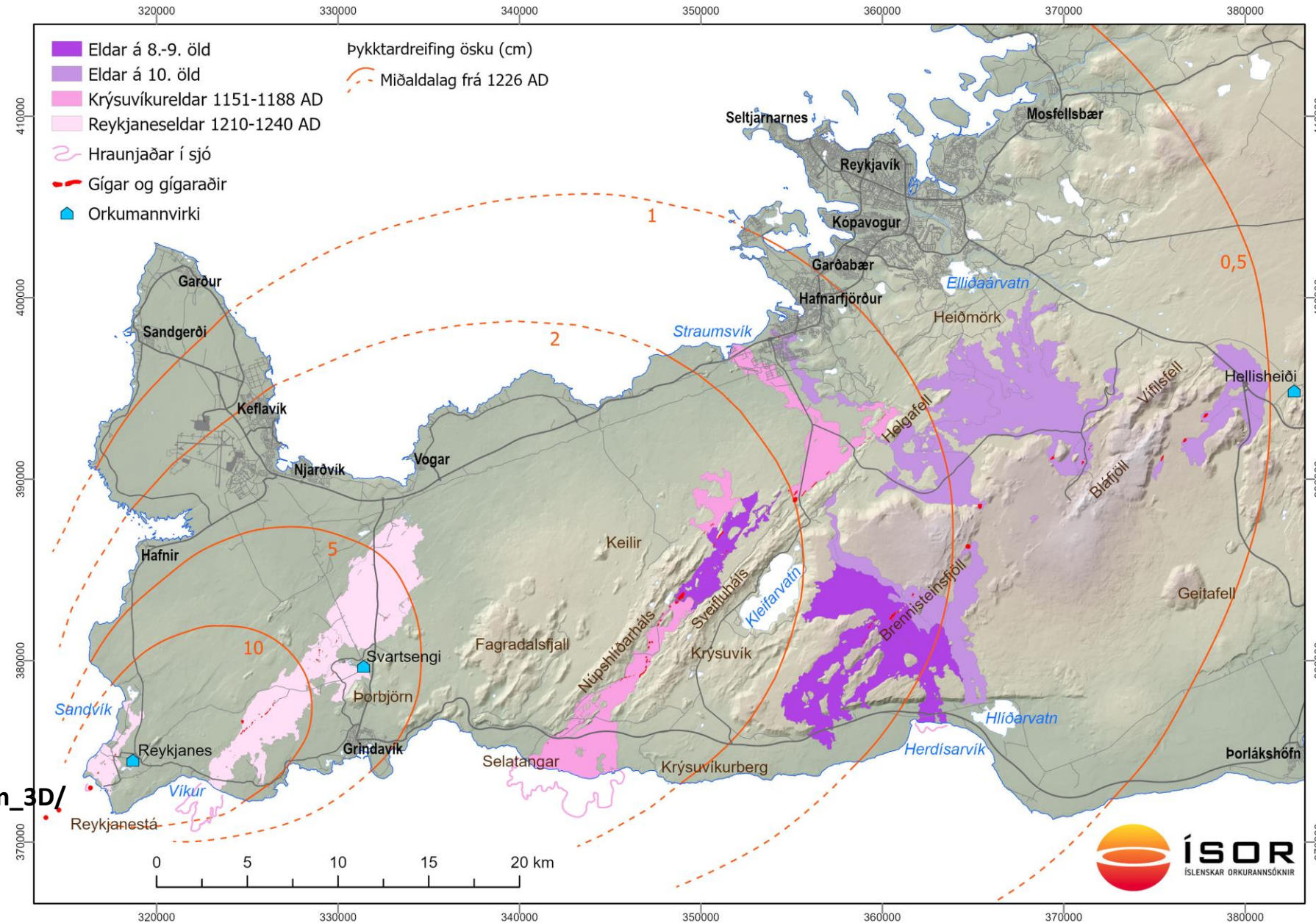
Krýsuvík Fires 1151 - 1188 AD

Reykjanes Fires 1210 – 1240 AD

and then

“Fagradalsfjall Fires” 2021 - ?

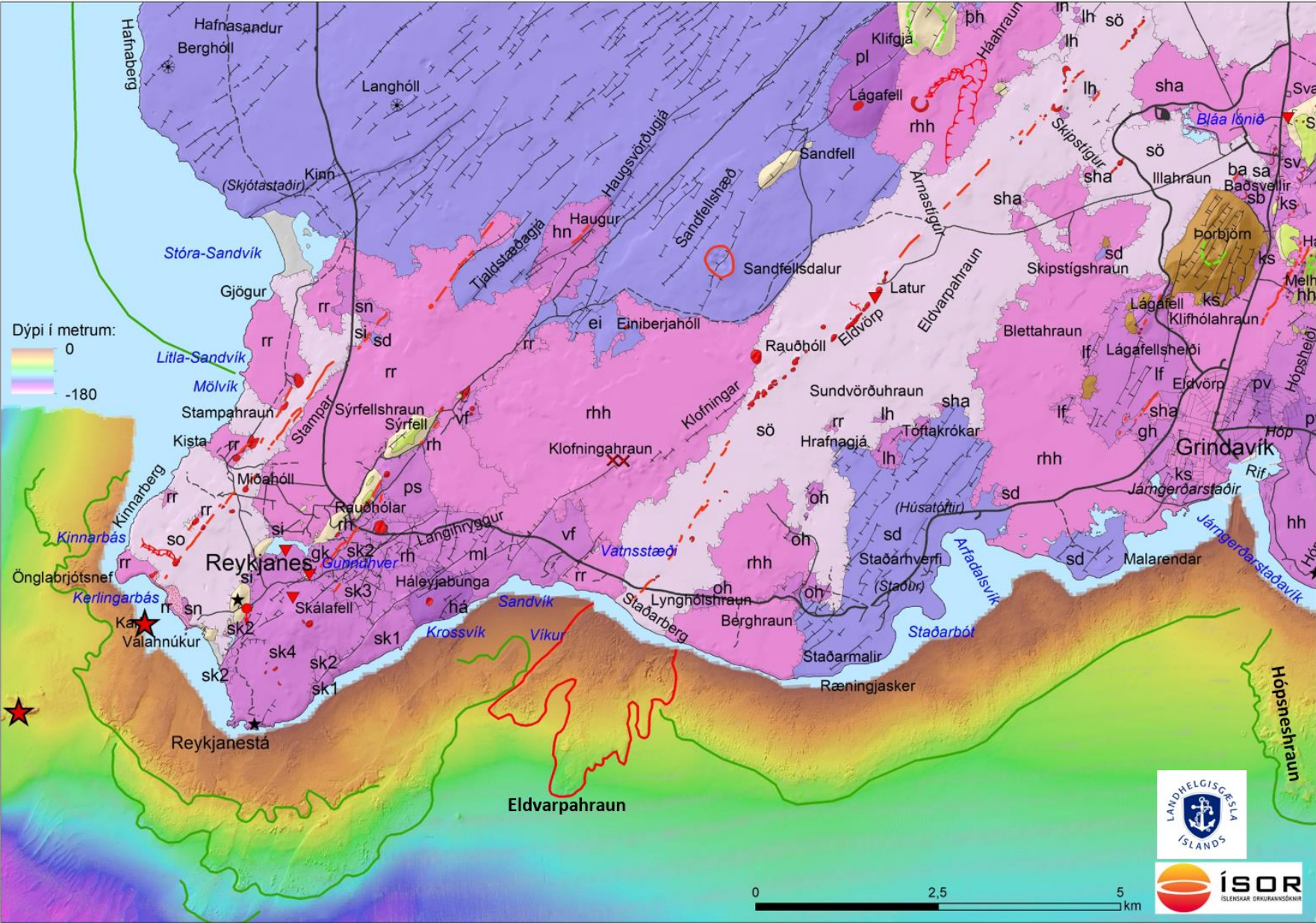
http://jardfraedikort.is/ddd/reykjanes_hraun_3D/

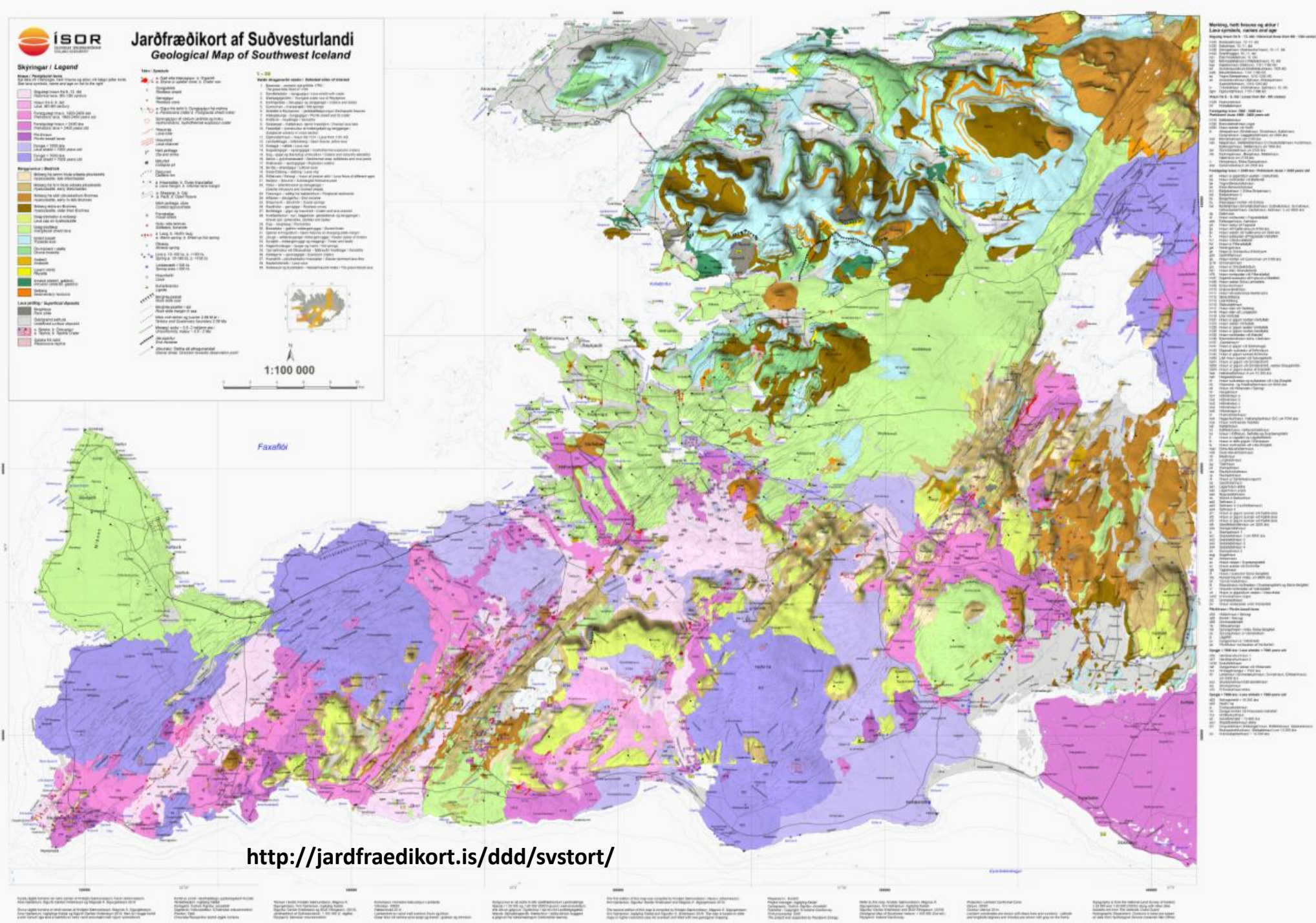


Most recent lava flows on the Reykjanes Peninsula

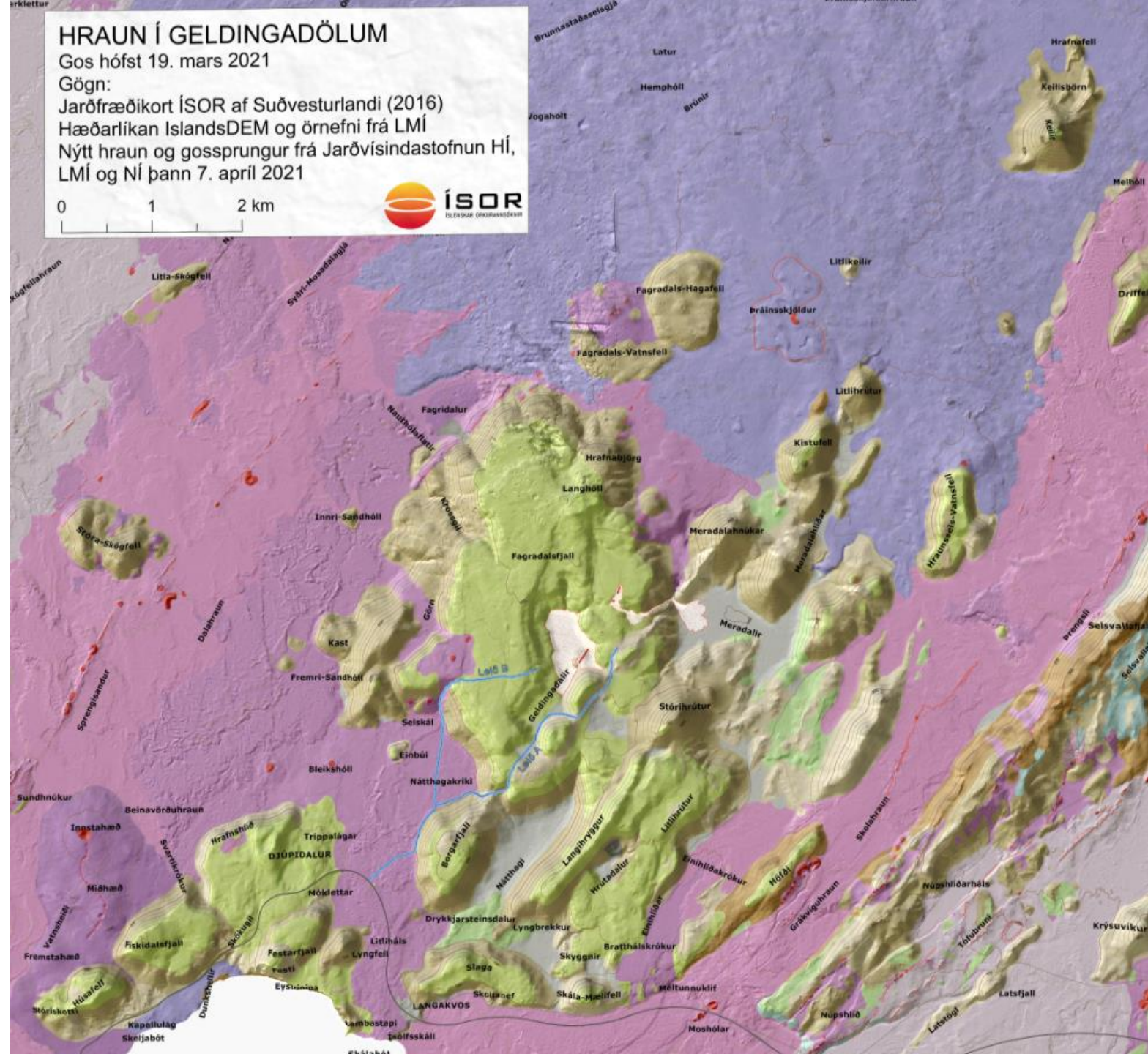
Reykjanes Fires 1210 – 1240 AD

and the offshore lava margins





http://jardfraedikort.is/ddd/geldingadalir_3D/



Thanks for your attention!

