INTERNATIONAL WATER RESOURCES ASSOCIATION'S
1st ISLANDS WATER CONGRESS
FAROE ISLANDS - SEPTEMBER 4-6, 2024

International Water Resources Association
IWRA

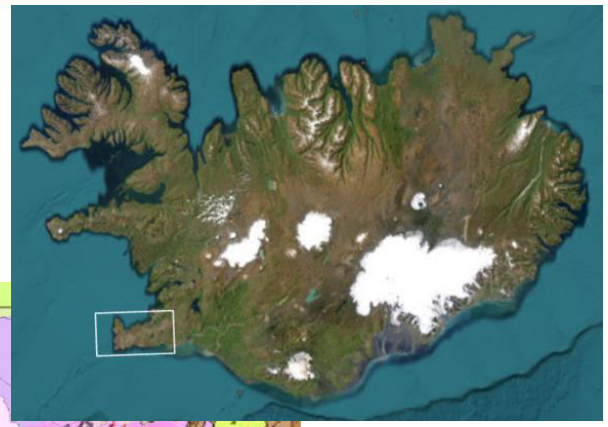
JARÐFEINGI
Faroese Geological Survey

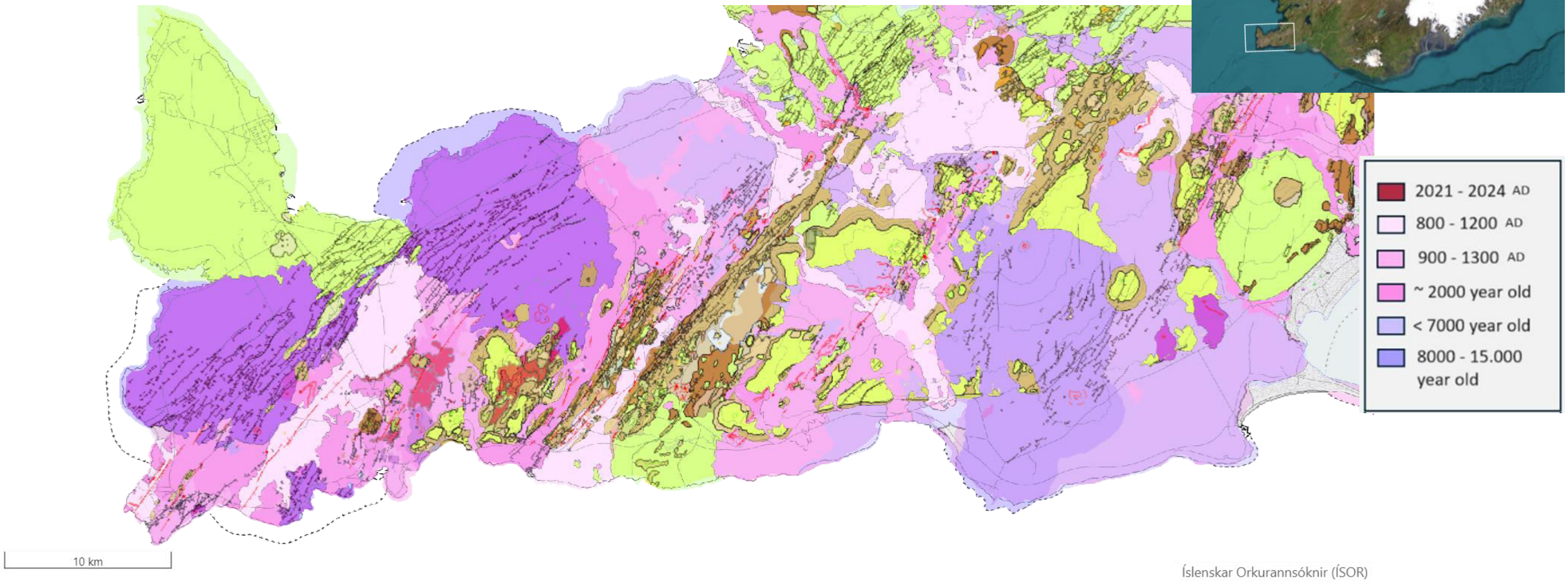
Effects of volcanic unrest on groundwater

Sigurður Garðar Kristinsson, Auður Agla Óladóttir & Eigill Árni Guðnason

Iceland Geosurvey

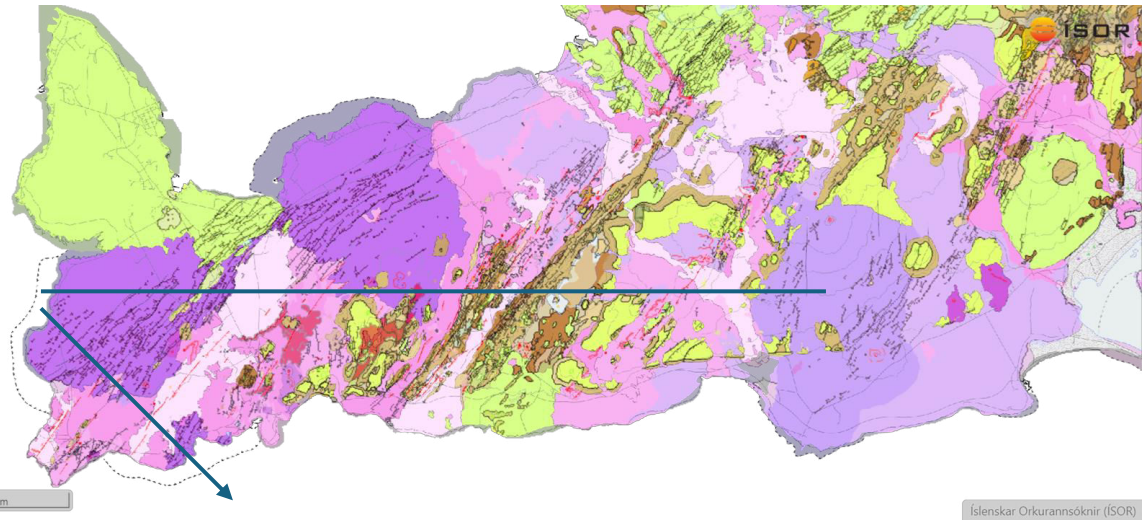
Geological settings

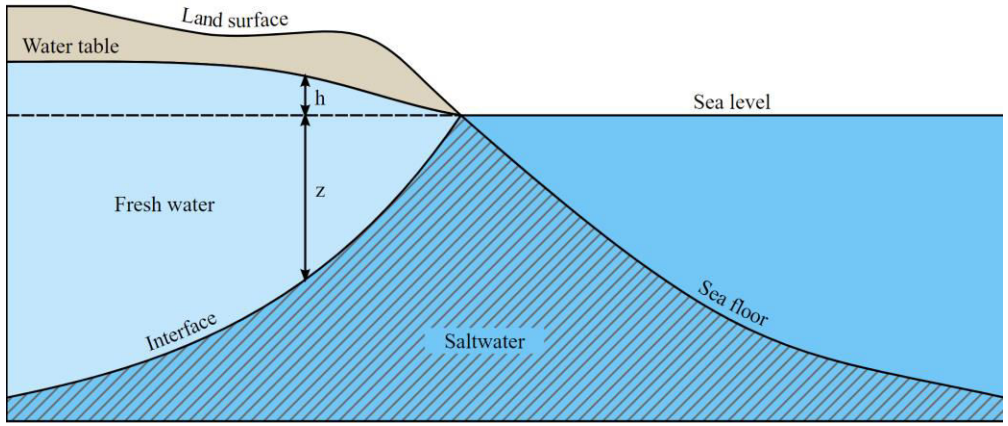


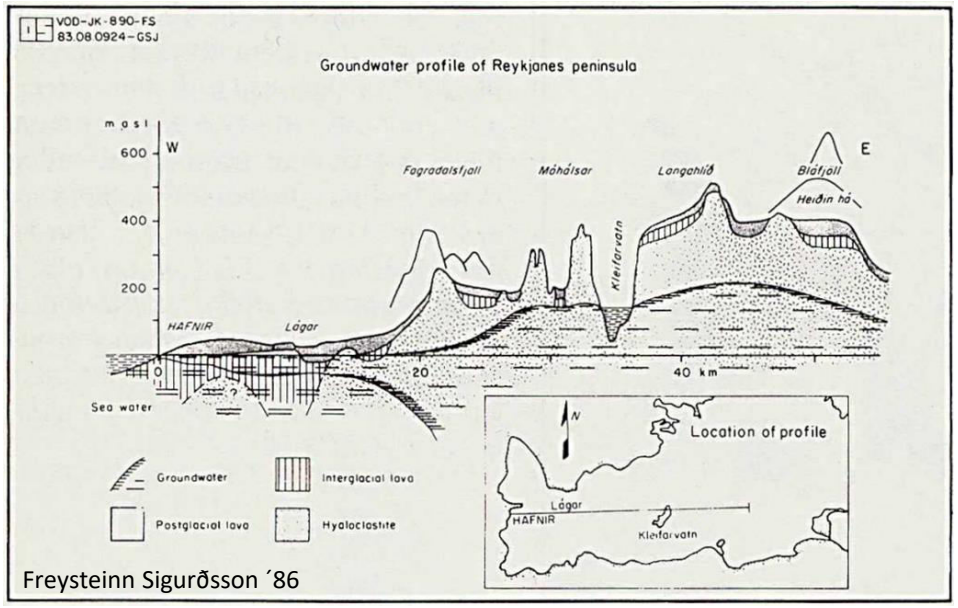


Íslenskar Orkurannsóknir (ÍSOR)

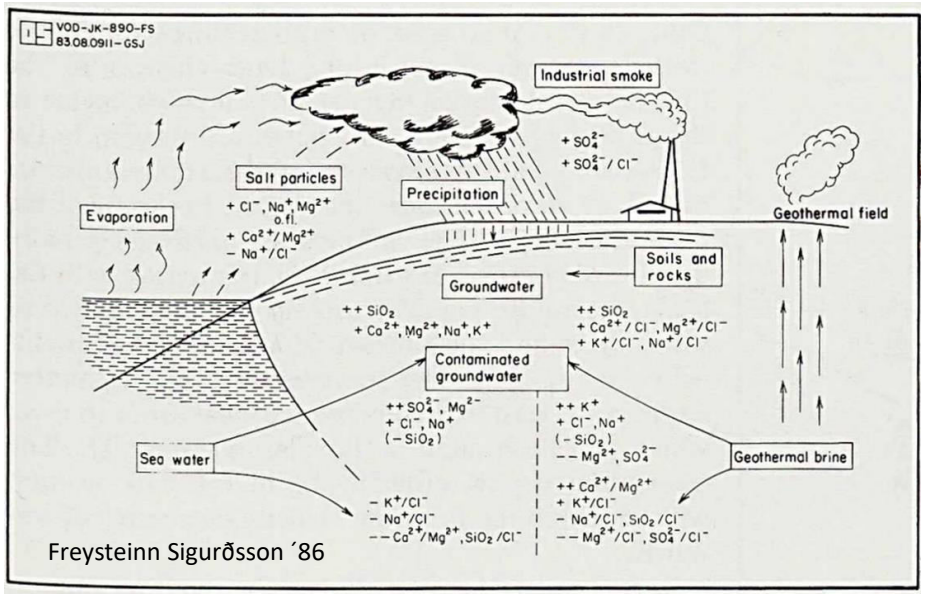
Freshwater lens and seawwater







Freysteinn Sigurðsson ´86



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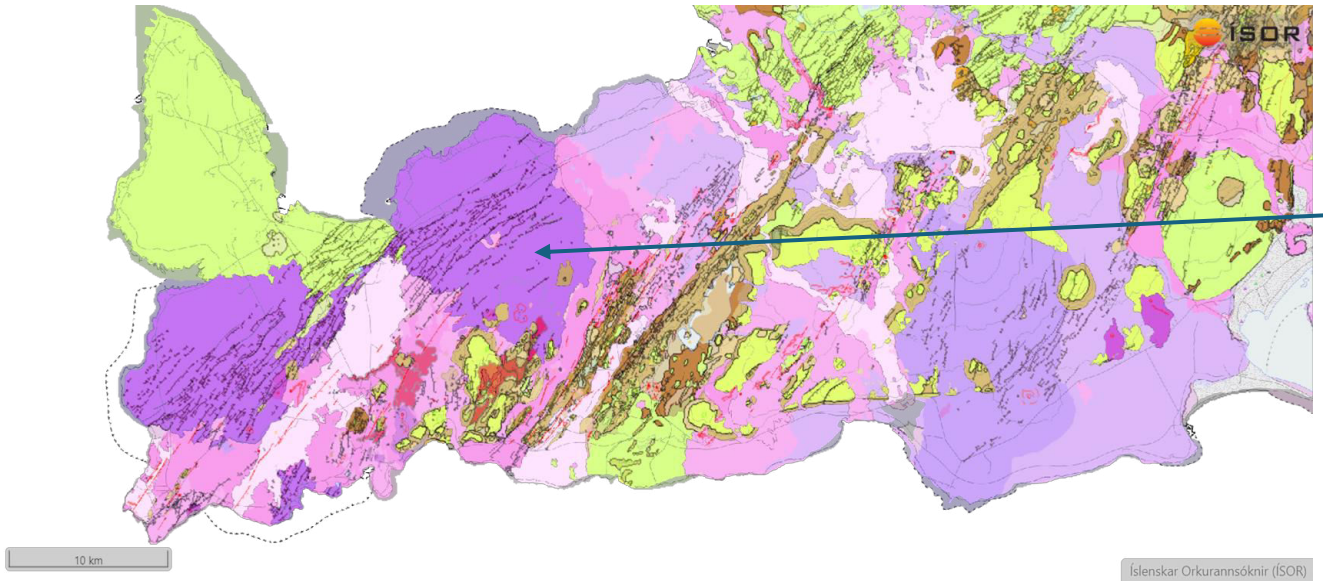
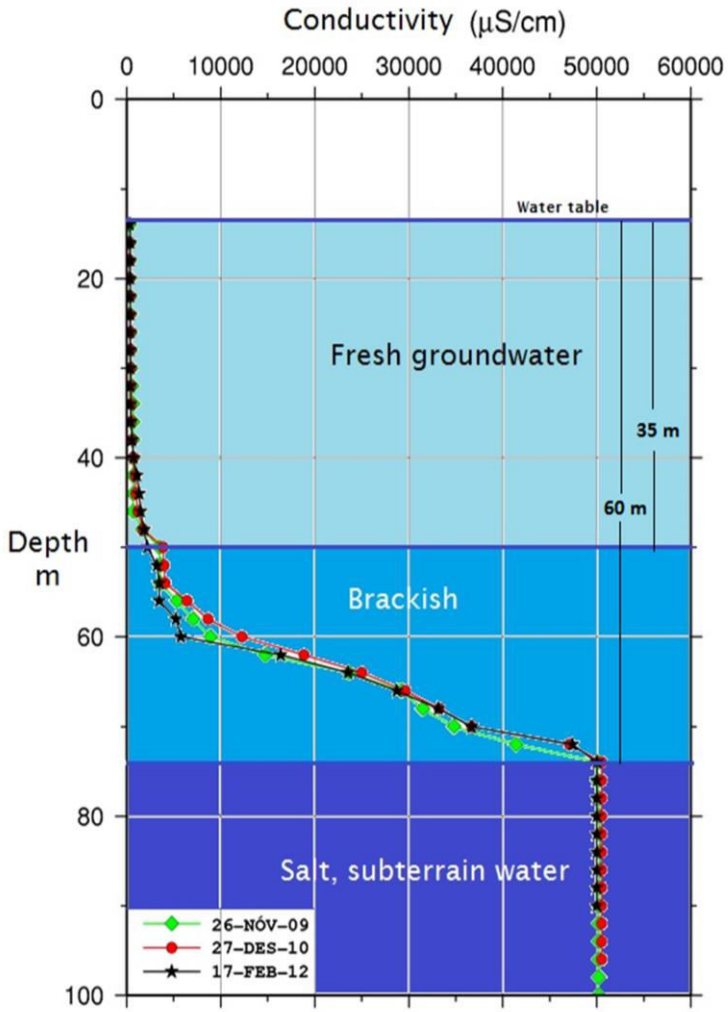
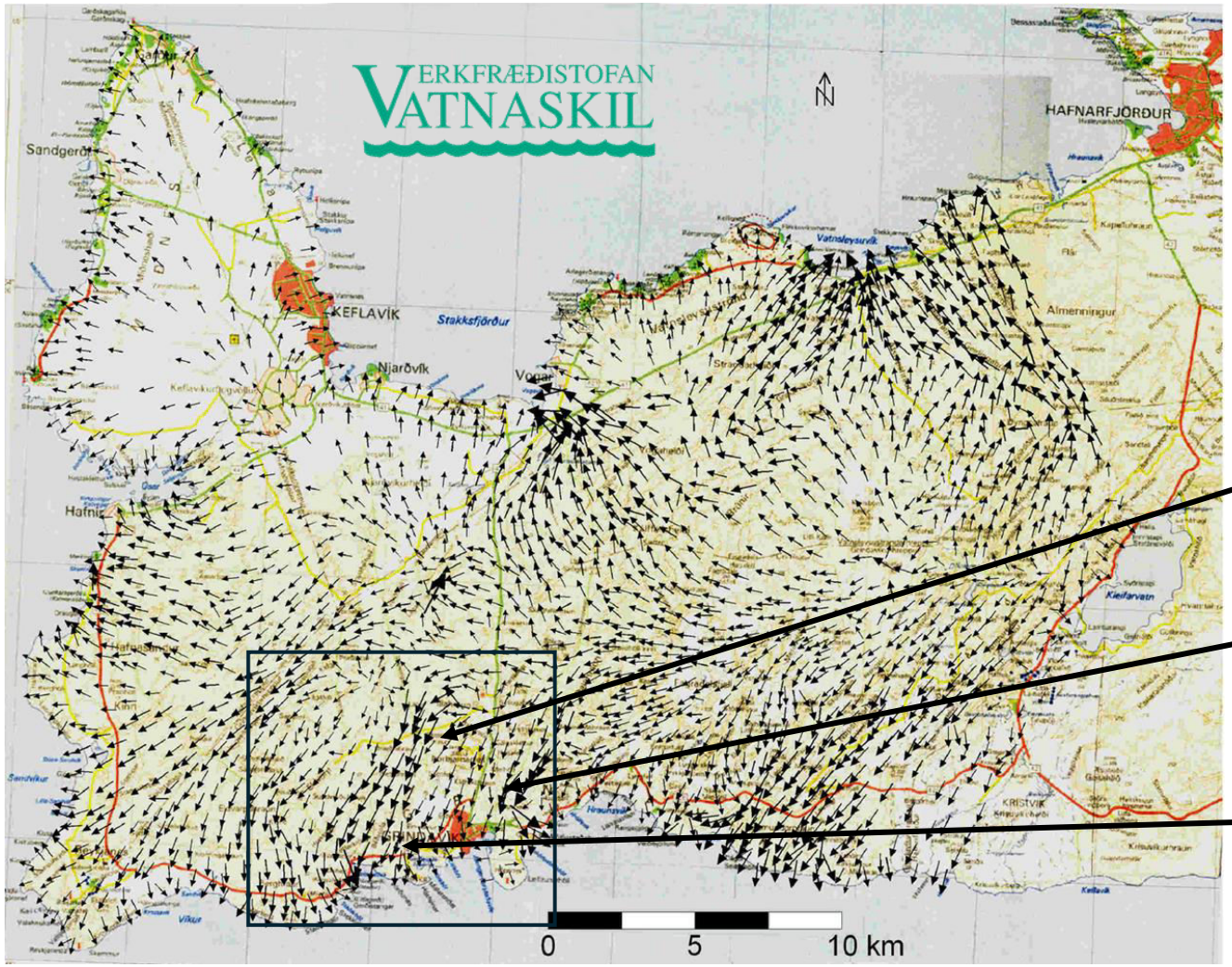
Freshwater lens and seawwater





- The observation well HSK-11 is close to the main supply area for fresh water in Reykjanes. Here, the water table is 14 m below surface and 1.6 m above mean sea level on the average.
- As shown the thickness of the fresh and brackish water lens (down to salt sea water) might be some 60 m.
- The thickness of really fresh water lens (drinkable) is on the other hand only approximately 35 m.
- Elevated salinity is observed at about 35 m depth.
- The salinity of the brackish water increases rapidly by depth and seawater salinity is reached at about 75 m depth.

Goundwater flow



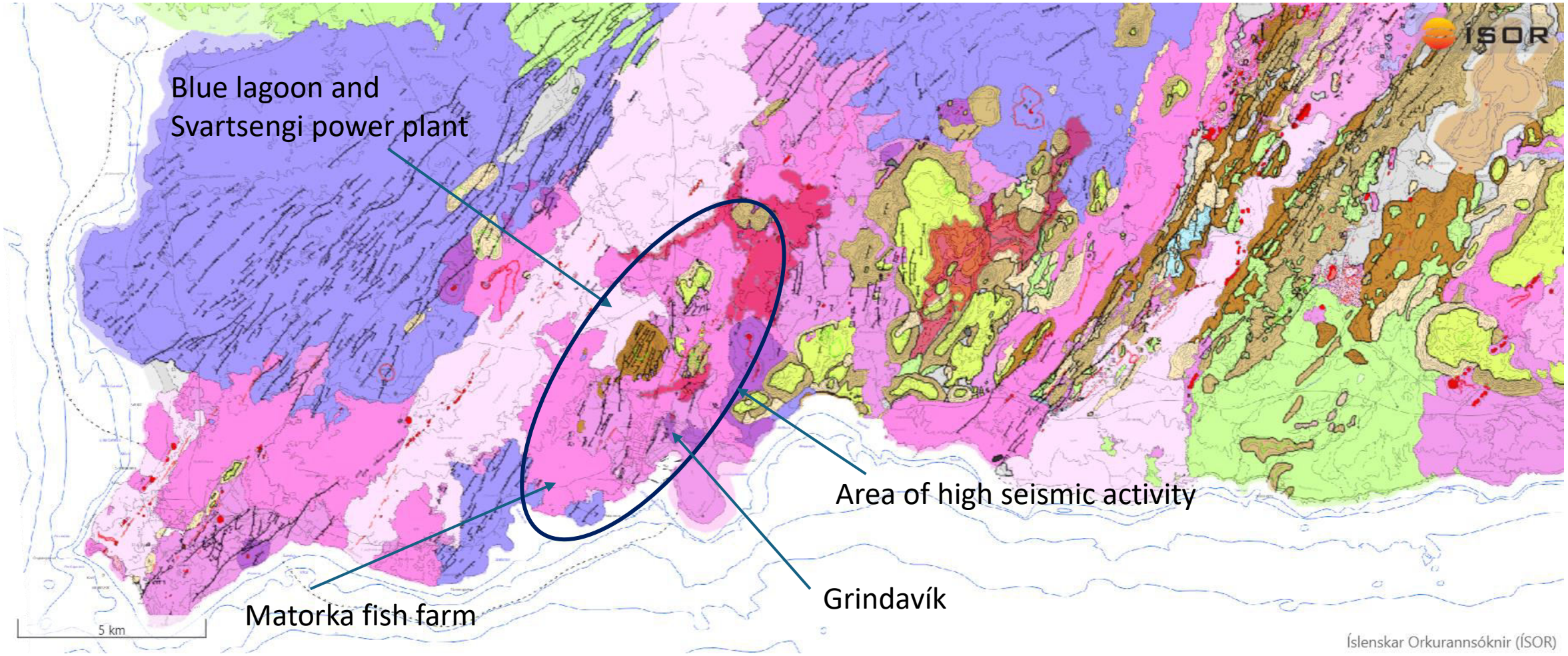
- Area of intress, town of Grindavík
- Seismic active area around Svatsengi
- Area near Matorka fish farm

Blue lagoon/Svartsengi power plant

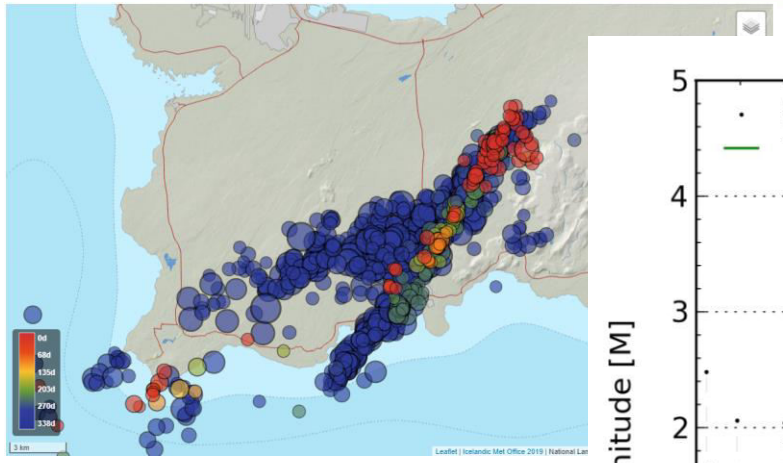
Town of Grindavík

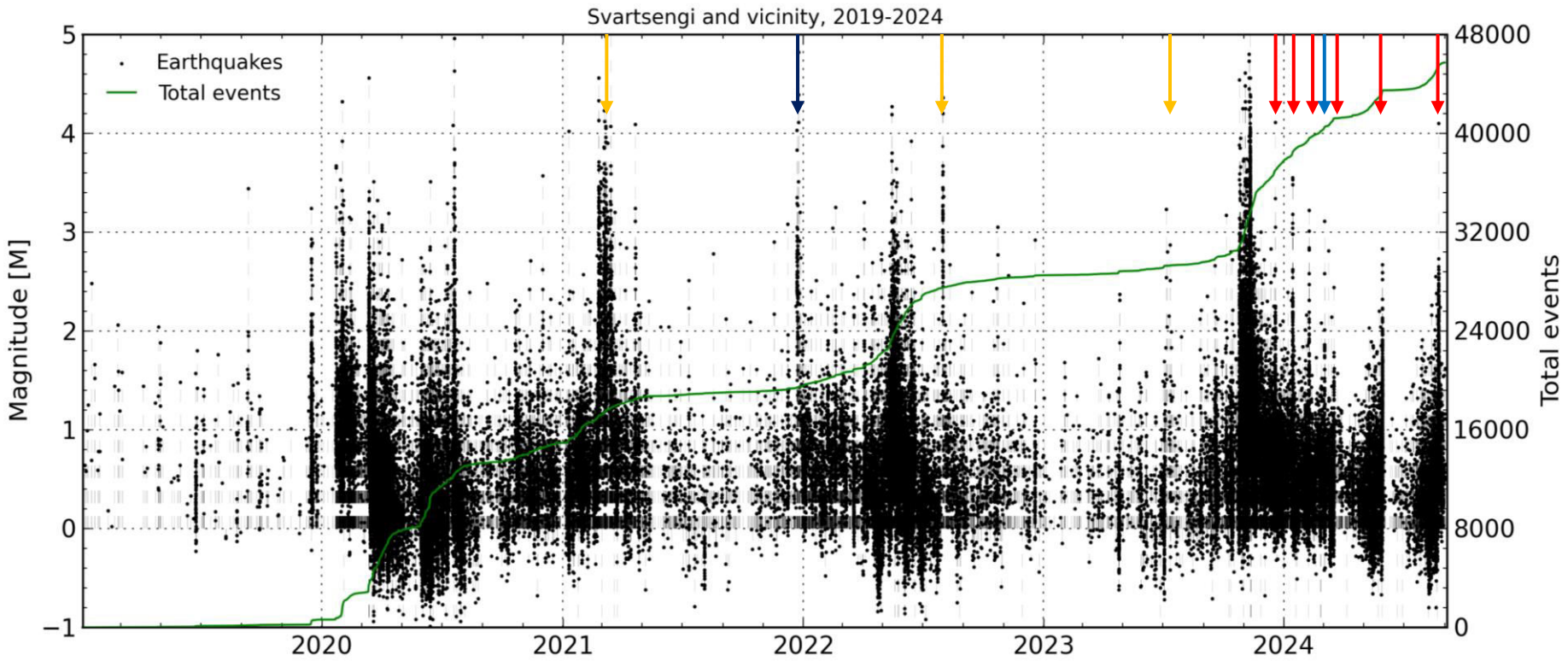
Matorka

Recent activity in Grindavík



Seismic and volcanic activity





Fagradalsfjall fissure eruptions '21-'23: 19. Mar. '21 / 3. Aug. '22 / 10. Jul. '23
Fagradalsfjall dyke intrusions '23-'24: Dec. '21

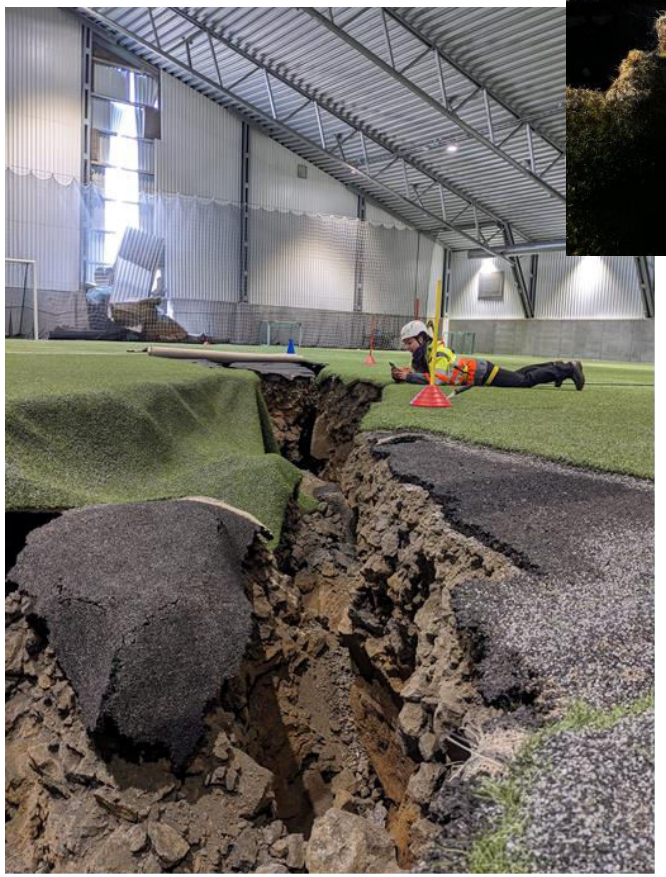
Svartsengi fissure eruptions '23-'24: 18. Dec. / 14. Jan. / 8. Feb. / 16. Mar. / 29. May / 22. Aug.
Svartsengi dyke intrusions '23-'24: 10. Nov. / 2. Mar.

Volcanic activity

Mbl/Árni Sæberg

Mbl/Eyhþór

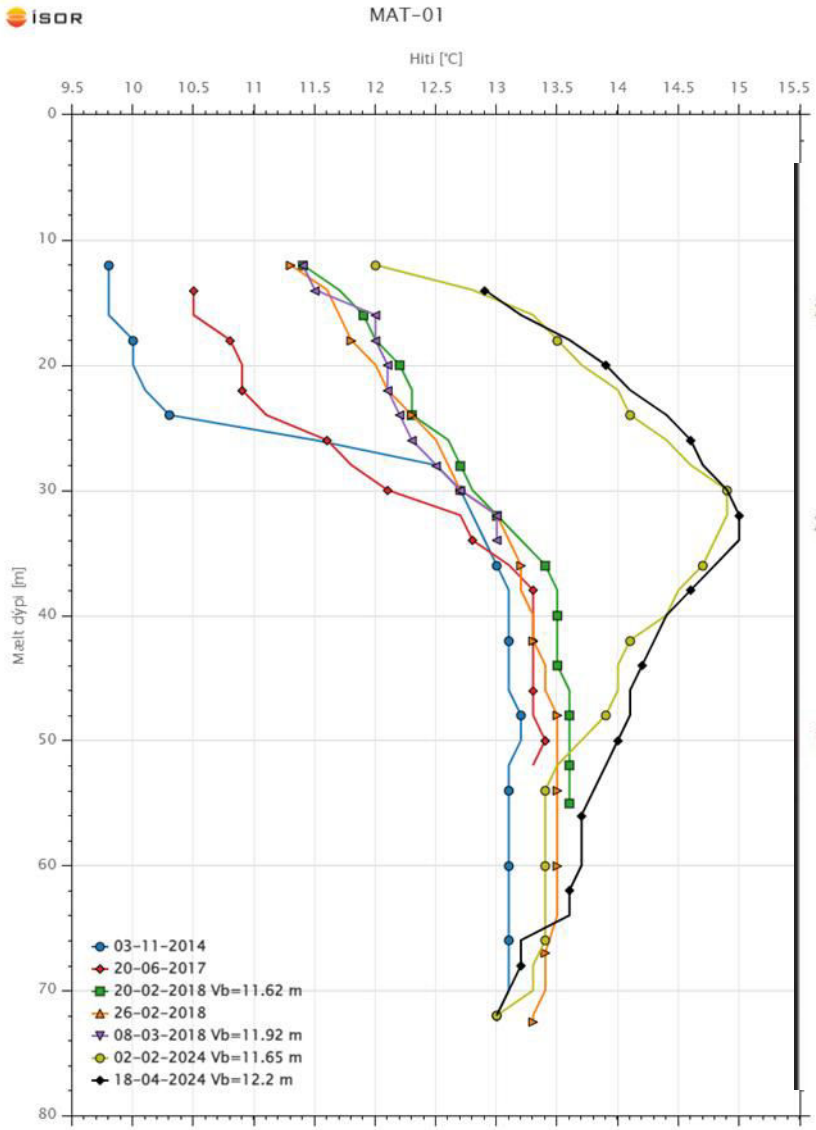
Grindavík town

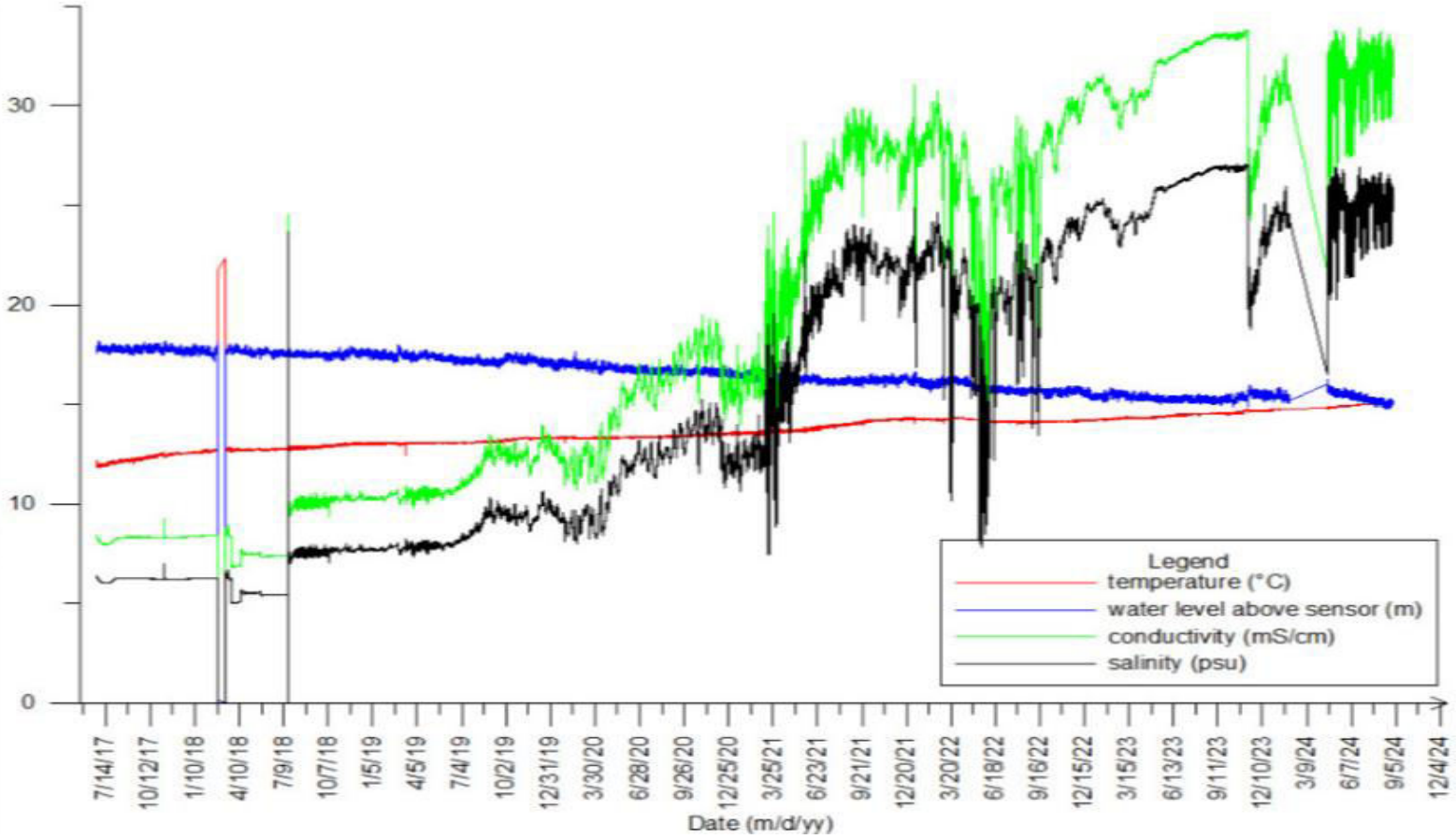


Natural flow from Svartsengi geothermal field

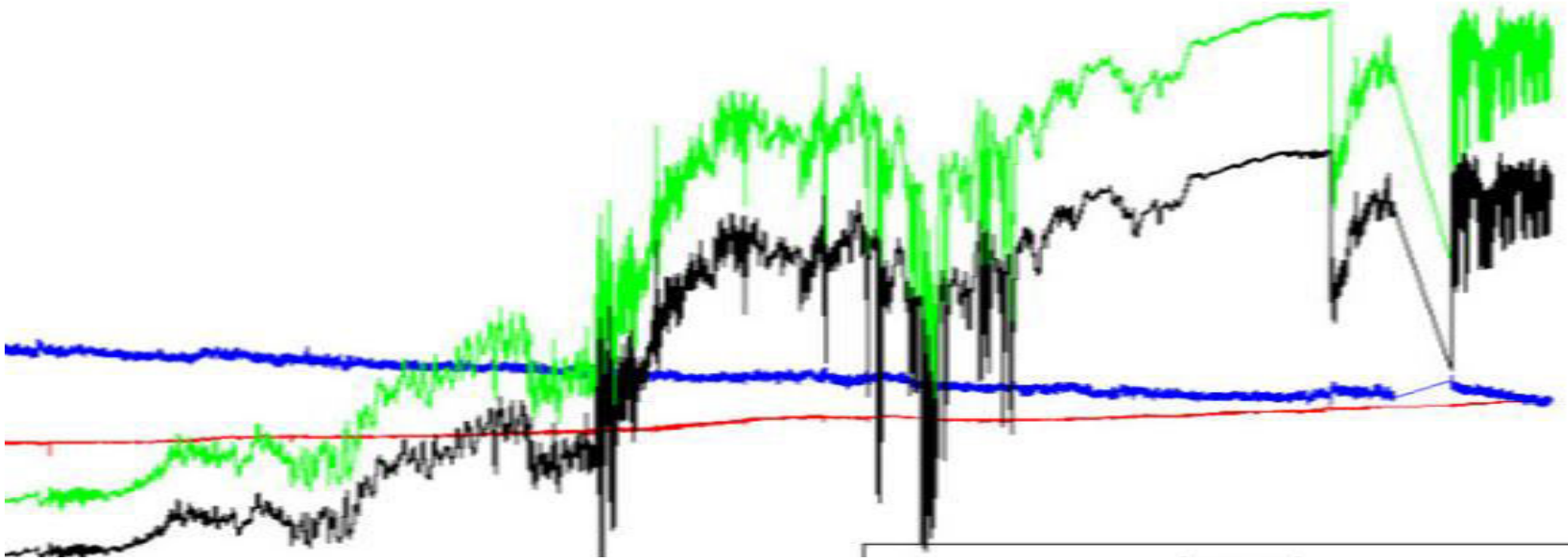
Matorka area

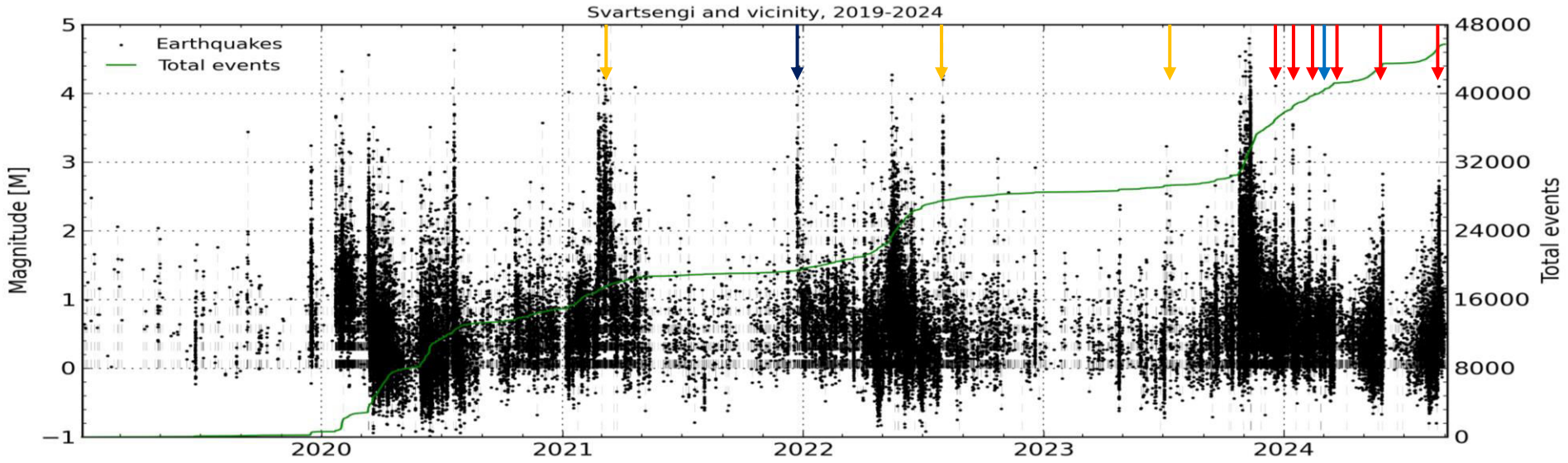
Data from MAT-1





Seismic- and data from datalogger





First results and next steps

- **Seismic activity affects the salinity localy**
- **The inflation of magma underneath Svartsengi have increased temperature of the outflow**

- **We need to measure more wells in the area to see how widespread this is**
- **Take water samples to see if the quality of the water has changed**