# Arctic Mid-Ocean Ridge seismicity: Results from an OBS deployment at Loki's Castle

Marie Eide Lien[1,2], Matthias Pilot[3,4], Vera Schlindwein[3,4], Lars Ottemöller[1], Thibaut Barreyre[1,2]

(2) CENTRE FOR DEEP SEA RESEARCH

(3) AWI

(4) University of Bremen

UNIVERSITY OF BERGEN
DEPARTMENT OF EARTH SCIENCE

(1) UNIVERSITAS BERGENSIS

# Background

The AMOR is an ultra-slow spreading ridge, which provides an excellent opportunity to investigate the effect of tectonism on MOR hydrothermal vent fields.

The aims of this project are:

- to make an earthquake catalogue of a year long OBS-deployment around Loki's castle hydrothermal vent field (LCVF).

- To understand the spatial and temporal distribution of events, and identify local fault structures.

- Finally, to look at correlations of seismic and hydrothermal activity at Loki's castle monitored in the same time period.

## AMOR
### Arctic Mid-Ocean Ridge
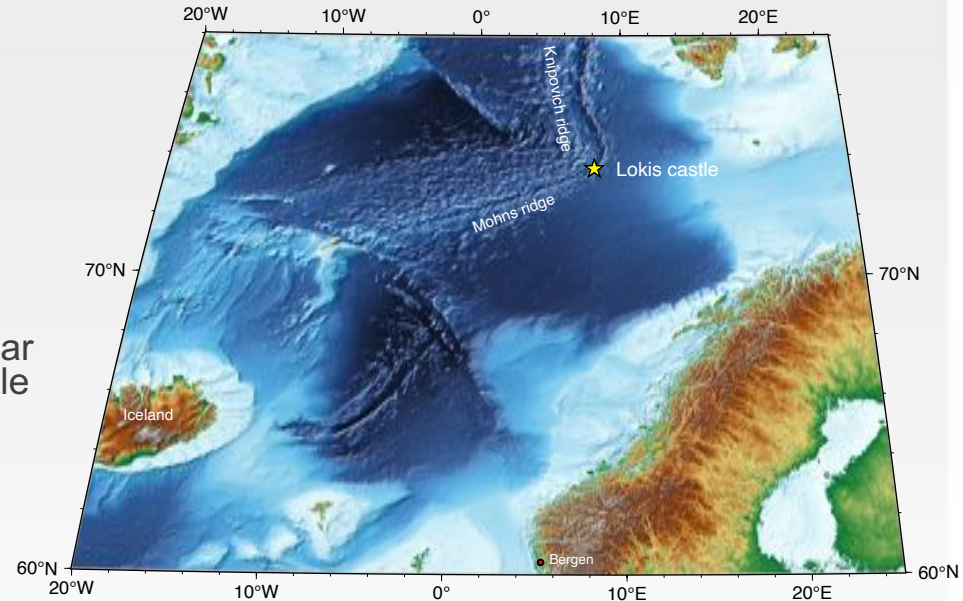
# OBS survey

- Area around LCVF

- 8 LOBSTER OBSs were deployed from June 2019 to July 2020



Water depth (m)
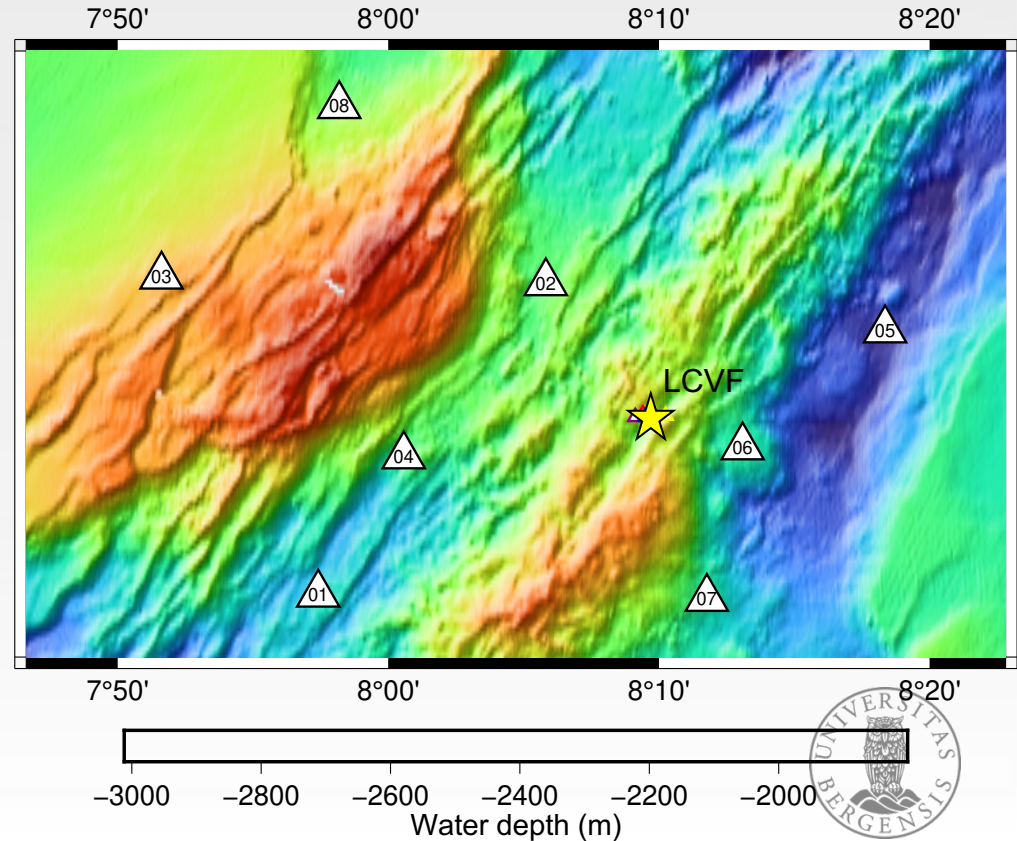
# Processing steps

1. Automatic event detection – **Lassie**
2. Neural network automatic phase picking - **PhaseNet**
3. 1D velocity model - **PyVelest**
4. Manual picking of problematic events - **Seisan**
5. Preliminary locations - **Hypocenter**
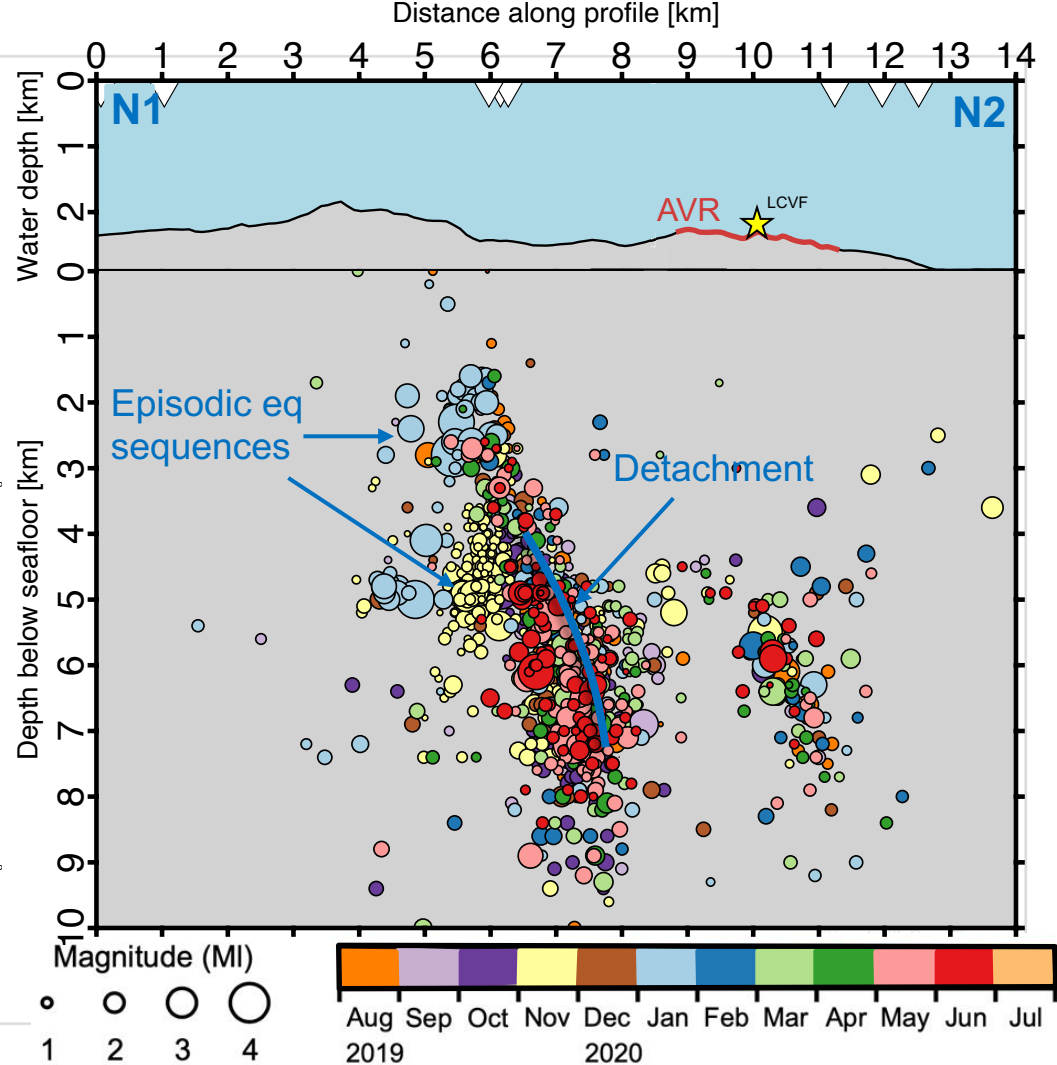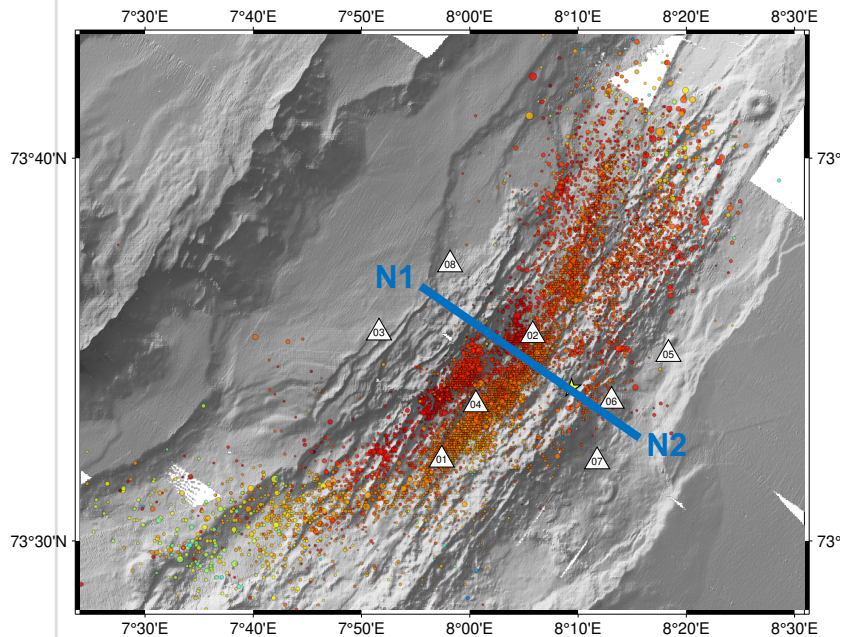6. Automatic amplitude picking - **Automag**

# Results

- 10397 events between july 2019 and july 2020
- Observations on 5+ stations
- Maximum total RMS 0.2
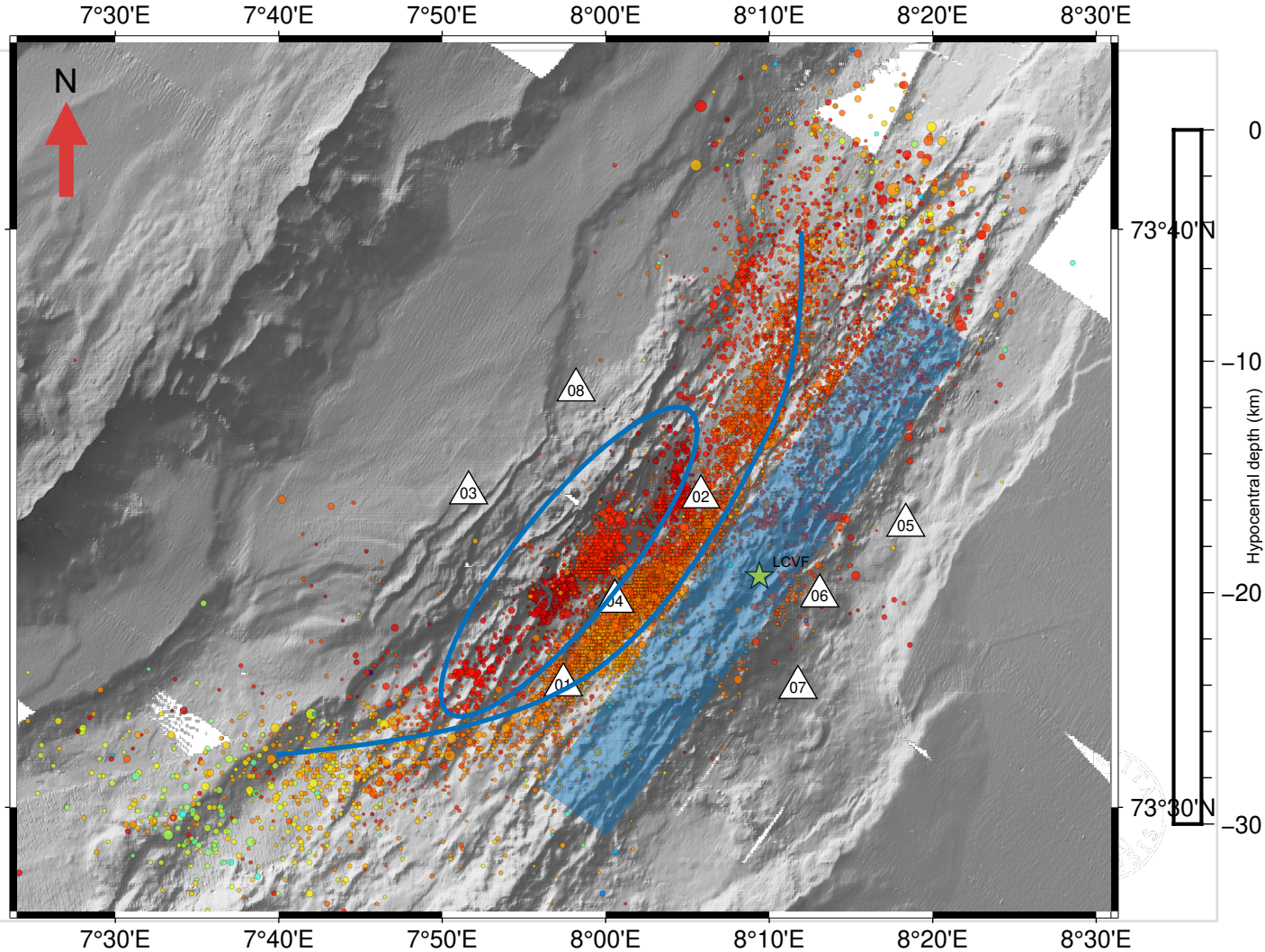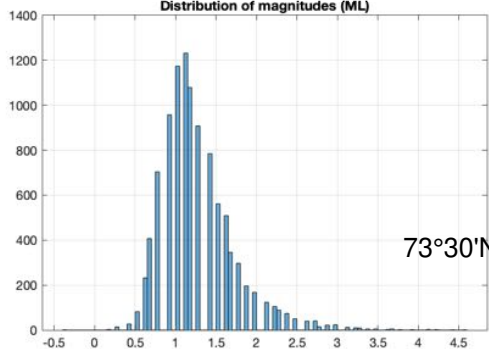
# Results

# Summary

- One year of OBS data have been processed and resulting in catalog of 10397 events

- Preliminary interpretation
  - Much of the seismicity is attributed to detachment faulting
  - Episodic sequences of earthquakes in foot wall
  - Scarce seismicity at the axial volcanic ridge

- Future work
  - Relative relocation
  - Correlations with other geophysical data from LCVF

uib.no