Activity along the Arctic Mid-Ocean Ridge (AMOR) has been progressively explored over the past 20 years. Along the ridge, processes such as dike intrusion and faulting cause earthquakes. We focus on an area around the Loki’s castle hydrothermal vent field (LCVF), located on the Mohn ultra-slow spreading ridge. Ultra-slow spreading systems are strongly controlled by tectonic processes, which provide an opportunity to study almost exclusively the effect of tectonism on a hydrothermal vent field.

In June 2019, we deployed a network of eight broadband ocean bottom seismometers (OBS) in an area of about 20 by 20 km around the LCVF. The OBSs were deployed for a one-year monitoring period until July 2020. We processed the OBS data using an automatic detection routine and machine learning approach to pick phases, and then located the local earthquakes based on a 1D velocity model. This provided an earthquake catalogue that was interpreted to understand the seismicity in terms of spatial and temporal distribution, and to identify fault structures. Within the broader tectonic system we aim to enhance our understanding of the LCVF.