

³He along the ultraslow spreading AMOR in the Norwegian-Greenland Sea

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The majority of undiscovered vent sites is thought to be located on slow and ultraslow spreading ridges and finding new vent sites on these ridges is important due to the assumption that the majority of new seafloor massive sulfides will also be discovered along the same ridges [1]. We wanted to quantify the hydrothermal activity along the ultraslow spreading Arctic Mid-Ocean Ridge (AMOR) in the Norwegian-Greenland Sea by using the primordial isotope ³He. Between 2013 and 2015, we collected 375 water samples along the Mohns Ridge and the Knipovich Ridge and 117 samples in two transects crossing each ridge. The samples were collected using a conductivity, temperature, density (CTD) probe with a Niskin water bottle rosette (911plus Seabird). Our preliminary results indicate the occurrence of at least two undiscovered vent sites along the Mohns Ridge, making a total number of 7 vent fields along this 550 km ridge segment. In addition, our results also demonstrate how the spreading ridges affect the water column and circulation patterns. The surface layer directly above each ridge segment shows higher than equilibrium values of $\delta^3\text{He}$, which is interpreted as an upwelling of deep water towards the surface layer above the ridges.

[1] German *et al.* (2016) *Chemical Geology* **420**, 114-126.