Results from the MarMine cruise: megafauna assemblages from Mohn's Treasure, a sediment covered massive sulphide deposit in the AMOR

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The Arctic mid-ocean Ridge (AMOR), located between Jan Mayen and Svalbard and within the extended Norwegian continental shelf, is one of the most slow-spreading ridge systems on Earth. To date only three vent fields were discovered, but recent research has provided evidence of sizeable, active and inactive SMS fields containing areas with commercial grades of metals. Although knowledge is still to small to make assessments of tonnage and grade of potential mineral resources in the AMOR, interested from industry (e.g. Nordic Mining, Statoil, as well as technological and service provider companies) is growing. The MarMine project aims to assess and develop new knowledge about exploration and exploitation technologies for seafloor massive sulphides on AMOR, to define the process mineralogical properties of typical seafloor marine mineral deposits along the AMOR, and to address environmental issues of a potential future mining industry in the region. Between 15 August and 5 September 2016, MarMine researchers, conducted geological, technological and ecological investigations in the active vent site Loki's Castle and the proposed inactive vent site Mohn's Treasure. The ecological studies were focused on Mohn's Treasure, which is mostly covered with fine sediment, with scattered rocks and rocky outcrops colonised by large numbers of sponges and crinoids. Video and photo transects were conducted for community analyses; pushcore samples were taken for analyses of metagenomics, microbial analyses, meiofauna and sediment environmental variables. Herein we will present the first description of the benthic communities found in Mohn's Tresure, with an emphasis on megafauna, and discuss our results in relation to deep-sea mining technological and environmental issues.