



Methane venting offshore Vesterålen, northern Norway governed by subsurface geology

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Natural hydrocarbon gas seepage discovered offshore Vesterålen in 2008 during one of the MAREANO cruises was the first active seepage site reported along the continental shelf off northern Norway. We conducted multiple studies along this area to investigate various aspects of this seep site, including acquisition of detailed bathymetry, high resolution sub bottom profiler, side scan sonar data and photos from automated underwater vehicle (AUV) and collection of carbonate sample using an ROV. The survey was also aimed first to check the authenticity of seeps observed on multi beam and single beam sonar data. Multibeam sonar data indicated acoustic flares at the same location of flares observed using single beam echosounder from MAREANO cruise. The high resolution bathymetry from side scan sonar and photos gave a detailed morphology of the seafloor. The surface and water column data was then analysed together with deep seismic data. The seismic data indicates that the gas leakage occurs from the deep Ribban Basin separated by crystalline basement ridges which formed during Norway-Greenland rifting. The thick Jurassic-Cretaceous sedimentary succession which constitutes the major part of the sedimentary infill is inferred as the source of the gas. The geomorphology and subsurface geology indicates focussed fluid flow along the basement ridges as the main channelling mechanism for the gas towards the surface.