



Focused fluid flow on the Norwegian margin: what we know and what we don't know yet

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Small scale focused fluid flow features (pockmarks and mounds) on the Norwegian margin have first been reported in the early 80's. Since then, following a number of surveys, using different methods such as bathymetry, side scan sonar, 2D and 3D seismic reflection surveys, high resolution sediment sounders, core sampling, their distribution, morphology and nature have been described in more details. Recently, very high resolution studies using an ROV have enabled detailed geophysical and geochemical studies of a restricted number of pockmarks. However, some questions remain unanswered. Is it possible to propose a unique model for their formation? How much do these features contribute to transport methane from the sediments to the ocean (and to the atmosphere) and is there any relationship between their activity and climate phases? What is the mechanism that enables free gas to be transported to the seafloor, through the hydrate stability zone, without being converted to gas hydrates? Is there a relationship between fluid escapes and slope instability? How important are these features with respect to benthic microbial communities and associated ecosystems? During the Hydratech cruise in year 2002, bathymetry, high resolution as well as very high resolution seismic data were acquired in a limited area of the northern flank of the Storegga slides. A detailed analysis of this dataset has been conducted, which emphasises the need for additional studies. Two cruises are planned in this area for year 2006. The Vicking cruise (N/O Pourquoi-Pas? May-June 2006) will investigate the surface geology, vent activity, chemistry and biological communities of some of the pockmarks and mounds, using an ROV. A new high-resolution 3D seismic experiment aims to investigate the detailed structure and properties of two of these features, one active and the other inactive (N/O Logatchev June July 2006).