



## **Observations on volcanic activity of a cold seep, the Hakon Mosby Mud Volcano, (HMMV)**

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A long-term observatory aimed to study mud eruptions (LOOME) was positioned for a year on the HMMV. From the Håkon Mosby Mud Volcano (HMMV) on the SW Barents Sea shelf, methane-rich fluids are expelled by active mud volcanism. The HMMV has a diameter of ca 1500 m and consists of three concentric habitats: a central area with grey mud, a surrounding area covered by white mats of giant sulfide oxidizing filamentous bacteria (*Beggiatoa*), and a peripheral area colonized by symbiotic tube worms (*Pogonophora*). The peripheral area has an underground of gas hydrates, the central area has an elevated temperature and consists of very soft mud originating from subsurface sediments. Several studies have shown that the high upflow velocity of porewater in the central area can explain the absence of anaerobic microbial processes. Previous measurements with temperature loggers showed that the volcano has periods of increased activity North of the geographic center with a diameter of ca 50 m in diameter. Our observatory consisted of sensing units that measured temperature and seismics deep in the sediment, units that measured dynamics of temperature and chemistry at the sediment surface, and units that measured in the water column (time lapse camera, CTD and scanning sonar). It was deployed July 26, 2009, and recovered September 27, 2010. During the deployment and recovery cruises intensive auxiliary biogeochemical measurements were performed. The raw data, displacements of sensors and bathymetric maps showed that several eruptive events occurred, and massive movements of mud. We will analyze and integrate all available data, and will present an overview of the events leading to and following a sudden eruption. Insight in the mechanisms and frequency of such events are important in understanding the development of the biological filters against methane emission.