



High resolution seafloor mapping survey of the Hakon Mosby Mud Volcano, off northern Norway: results from the Vicking expedition (June 2006)

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As part of the Vicking expedition of the RV Pourquoi pas? to the Norwegian margin in June 2006, in the frame of the EU-supported Project HERMES, high resolution bathymetry and acoustic imagery maps of the Hakon Mosby Mud Volcano (HMMV) were produced from a survey using a ROV-borne multi-beam echo-sounder (Reson 7125 mounted on the Ifremer ROV Victor 6000). When compared to the maps produced from the ARKTIS XIX/3 cruise in 2003, the new data indicate recent seafloor deformation in the central, flat area of the volcano. The recent deformation affects a large part of this area. We relate the deformation to the occurrence of mud eruption since 2003. Several mud eruption centers can be identified from the new maps.

In addition, a gas plume survey was carried out using on one hand the Simrad EA600 fishery echo-sounder (12 and 38 kHz) of the vessel, on the other hand a Simrad ER60 (200 kHz) mounted on the ROV. Large gas plumes were detected above the volcano with the EA600, thus confirming the long-lasting, intense activity of degassing of HMMV. The use of the ER60 allowed us to locate in detail one of the plumes, while the ROV was navigated at about 40 m above the seafloor. The plume detection was shortly followed by a video inspection with the ROV Victor 6000 of a string of free gas bubbles rising from the seafloor that we interpret as the cause of the plume. The observation of this string of free gas bubbles was made in the northern part of the volcano where degassing probably concentrates at a few seafloor cracks, in contrast to a more broadly distributed degassing activity expected through the soft mud flows of the central and southern parts of the volcano.