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Laboratoire Géophysique et Géodynamique

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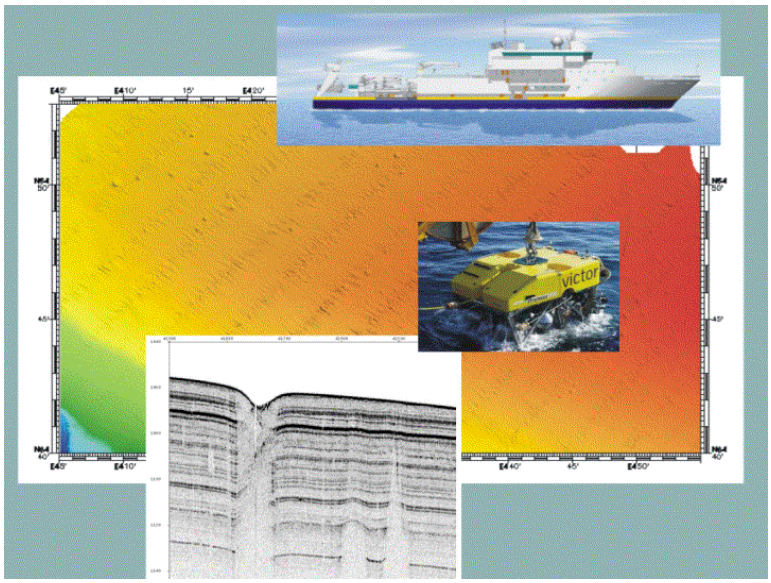
Ifremer

Département des Géosciences Marines

Vicking cruise report
Cold Seeps on the Norwegian Margin. Associated Ecosystem

R/V Pourquoi Pas ?
May 19th – June 18th, 2006. Alesund-Alesund



The VICKING cruise of the French research vessel *Pourquoi Pas ?* was organized by Ifremer (Département Géosciences Marines, chief scientist : Hervé Nouzé) in association with partners of the HERMES european programme.
We are grateful to Commandant Philippe Guillemet, to the officers and to the crew of the R/V *Pourquoi Pas ?* for their fruitful cooperation during this cruise.
Many thanks to Pierre Triger and the ROV team.
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A long list of other people did contribute to the success of the cruise. Thank you all.

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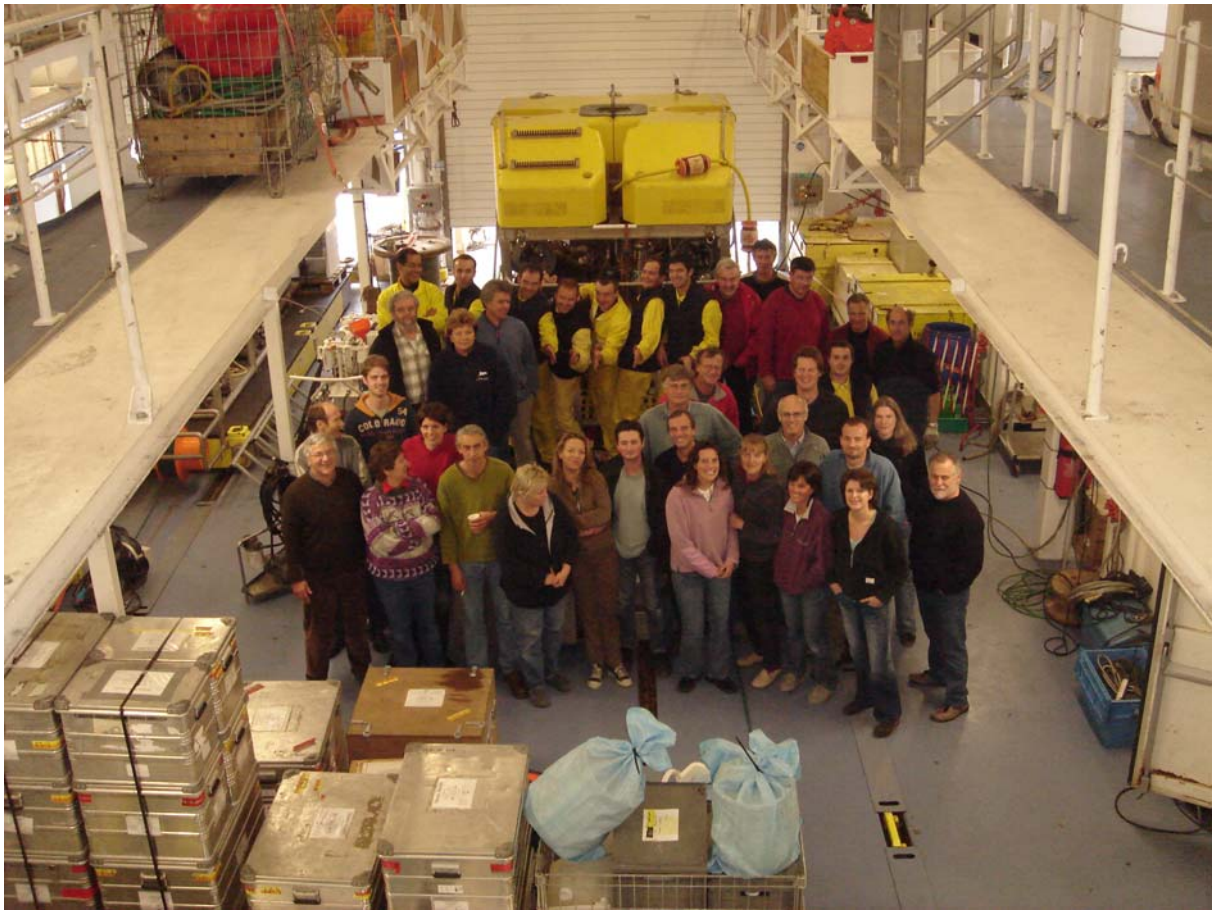
Summary

1. Cruise participants

Leg 1



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2. Overview

The VIKING cruise is a multidisciplinary (geology, geophysics, geotechnics, geochemistry, biology and microbiology) study of focused fluid escape features (pockmarks and mud volcanoes) off Norway. The objectives of the cruise are to assess the impact of these fluid escape features on methane release to the atmosphere, to determine their relevance to slope stability and their importance for the development of benthic ecosystems. The ROV Victor 6000 and a set of specific tools were used to study in detail two sites. The first site, on the northern flank of the Storegga slides, is characterized by the occurrence of gas hydrates in the slope sediments, large slides and numerous fluid escape structures, mainly pockmarks. At present, active mud expulsions are observed at the second site, the Hakon Mosby mud volcano.

The cruise focussed on trying to specify: 1/ the small scale structure, the formation and evolution models, the activity level (continuous or episodic) of the fluid escape chimneys, 2/ the relationships between the fluid escape structures and gas hydrates; 3/ the relationships between fluids and slides; 4/ models for the development of benthic microbial communities and associated ecosystems, as a function of the biogeochemical gradients at the study sites.

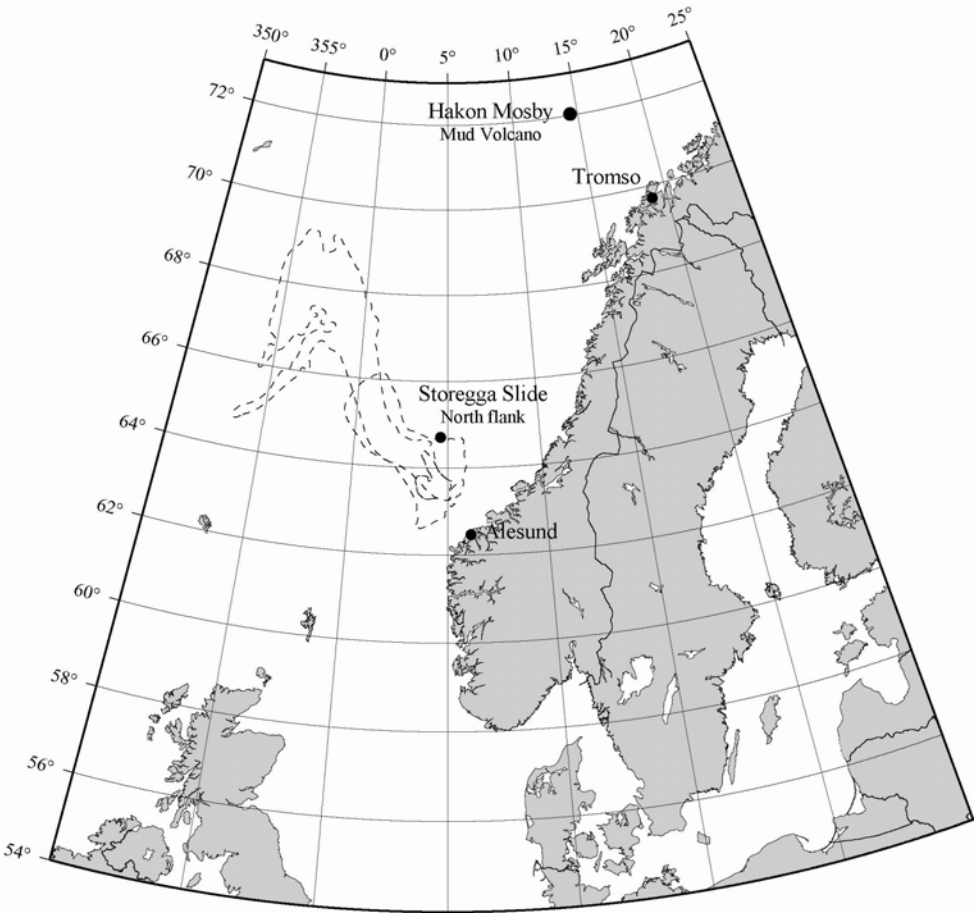

Fig. 2.1.: Location map of the two working areas: the Northern flank of the Storegga Slides and the Hakon Mosby Mud Volcano.

3. Thematic of the cruise

Nature and dynamics of cold seeps on continental margins; associated ecosystems

In the last few years, manned submersible as well as ROV dives have enabled observation of a large number of fluid escape expulsion zones on the sea floor. As opposed to mid oceanic ridges fluids, characterized by high temperature and high flow rates, fluids on margins show cooler temperatures and low flow rates, hence are called cold seeps.

Most of the time cold seeps are associated with geological structures identified thanks to their seafloor expression: pockmarks, mud domes or mud volcanoes. Mud volcanoes, including mud domes, as proposed by Guliev (1992), are defined as sites where periodical expulsions of a mixture of water, gases as well as solid material (sediment) happen. Pockmarks are craters, common on muddy seabeds. They are believed to be formed by a combination non deposition, winnowing and erosion (Hovland et al., 2002).

Pockmarks have been recorded associated immediately upslope large submarine slides: Storegga offshore Norway, Blake ridge offshore North Carolina (Bouriak et al., 2000; Baraza et al., 1999; Dillon & Max, 2000; Gardner et al., 1999; Ivanov et al., 2000; Yun et al., 1999). Mud volcanoes form in high sedimentation rates areas: Nile deep sea fan, or in accretionary prisms: Barbados, Mediterranean ridge. The sizes of pockmarks are highly variable, from a few meters to several hundreds of metres in diameter, with depths ranging from less than 1 to more than 20 metres. Mud volcanoes can be cone shaped or flat, as large as a kilometre in diameter and several tens of metres high. Pockmarks can be rooted in shallow sediments or in deeper layers. Mud expelled at mud volcanoes can originate from several kilometres deep.

Ideally, to study these fluid escape features it is necessary to combine geophysical methods, mainly seismic (rooting, size of the conduits, filling of the conduits, physical parameters measurements etc) with surface measurements and sampling (in situ chemical concentrations and fluxes, especially at the water sediment interface, thermal measurements, sediments and fluids sampling, …). This multidisciplinary approach should help answering: What are the driving mechanisms for these fluid escapes? Do cold seeps play a major role in the chemical (especially methane) exchanges from the sediments to the water masses? How much methane is consumed by methanotrophic micro fauna and fauna? What are the relationships between fluid escapes and slope stability on continental margins?

4. Study areas and previous work

4.1. Storegga

The Storegga area is well known for its giant holocene slide, one of the largest ever mapped on continental margins. Gas hydrates occurrence and fluid escape evidence (pockmarks) make it a key area to study the relationships between fluids, gas hydrates and slope stability.
Gas hydrate dissociation consecutive to the last deglaciation is one of the hypotheses to explain the triggering of the Storegga slides. Another issue is to evaluate the amount of methane that could have been released to the ocean and the atmosphere when the sliding occurred.

During the HYDRATECH 3D cruise (N/O Le Suroît 2002), a high resolution geophysical study of a part of the northern flank of the slides was conducted, and brings detailed information about gas and gas hydrate distribution, fluid escape features, sediments deformation, as well as possible links between these phenomenons.

Geological context

The end of the margin formation, as a result of the opening of the north Atlantic ocean, coincides with the Paleocene-Eocene transition, about 55 My ago (Fidalgo Gonzales, 2001).
From Miocene to Pliocene times, fine-grained hemipelagic sediments form the Kai formation. The Kai formation is affected by a network of polygonal faults, attributed to sediment contraction and dewatering (Berndt et al., 2003). From the Pliocene to the Pleistocene times, glacial - interglacial cycles deposition a thick sedimentary prism: the Naust formation (Bugge et al., 1987).

Between 2.5 and 1.3 My the platform progrades and fills the Storegga basin. Glacial – interglacial cycles influence culminates about 0.6-05 My ago when the fenno-scandian ice sheet covers repeatedly the area (Ottesen et al., 2001).

The Storegga slides

The holocene Storegga slides have been mapped over 800 km, from the head wall slide scar on the top of the continental slope at about 400 m water depth, down to the limit of the displaced sediments in the Norwegian abyssal plain at 3600 m water depth (Bugge et al., 1987). At least eight different individual sliding events that would have occurred within a few hours and happened in a retrogressive way have been identified (Haflidason et al., 2003a). Also this main sliding phase has been dated at about 7250-7300 and C14 (8150-8200 bp), recent studies on the northern flank of the slides report sliding events as young as 5000 +/- 300 years C14 and 2200-2500 years C14 (Haflidason et al., 2003b), which raises the question of the stability of this area at present.

BSR and gas hydrates

Gas hydrates are composed of gas molecules trapped within water molecules cages (Sloan, 1998). Gas hydrates formation is mainly controlled by thermo dynamical conditions (high pressure and low temperature) that occur on most of the continental margins at water depths between 500 and 1000 m. The occurrence of marine gas hydrates in the sediments is mainly inferred from the observation on seismic sections of a Bottom Simulating Reflector (BSR).

Geophysical studies (Kvenvolden et Barnard, 1983) have shown that the BSR is generated at the transition between sediments containing a variable amount of solid gas hydrate above and sediments containing a small volumetric fraction of free gas below. The stability field for gas hydrate being mainly P-T dependent and isotherms approximately parallel to the sea floor, the BSR parallels the seabed, shows a polarity opposite to the seafloor polarity and often cuts across sedimentary layer reflections. In the Storegga area, BSR have been identified north of the slides and extend below the slides in the eastern part of the area (Bouriak et al., 2003; Bouriak et al., 2000; Bünz et al., 2003). However a geotechnical boring drilled over a well defined BSR area (Mienert et Bryn, 1997) has shown no evidence for gas or gas hydrates.

Results from the Hydratech cruise on the northern flank of the Storegga slides

The HYDRATECH cruise on N/O Le Suroît (June-July 2002) aimed at a high resolution survey of a limited area of the Storegga slides. Data collected during the cruise include bathymetric and reflectivity EM300 maps (fig. 1), chirp echosounder records (fig. 3c) and high resolution (HR) 2D (fig. 2) and 3D (fig. 4) seismic data [13]. The study area (fig. 1) (about 3200 km^2) extends from the upper slope at the northern boundary of the slides, to within the slides, in over 2 km water depth. It crosses slide scars and zones of potential present-day mechanical instability on the northern flank of the slides. It covers fields of pockmarks and various intra-sedimentary structures interpreted as fluid escape structures.

Seismic data interpretation confirms that, as proposed in Bouriak et al. (2003) and Bünz et al. (2003), the existence, location and amplitude of the BSR is controlled by the sediments properties. The main controlling factor would be the sediments ability to favour circulation and trapping of free gas below the base of the gas hydrate stability zone (BGHS). The BSR could then mainly be due to free gas trapped below the BGHS, without any indication of high gas hydrate concentrations above, in agreement with the low gas hydrate concentration inferred from refraction seismic data analysis (Bünz et al., 2003).

High resolution seismic lines point to intense small-scale fracturing and diffuse degassing through the near seafloor sediments in the slides (fig. 2). In contrast, the slope area immediately north of the edge of the Storegga slides is nearly void of any seismic evidence pointing to seafloor degassing structures. Further upslope, fields of numerous gas chimney-type structures are observed starting at a distance of 10-20 km from the slides, in water depth of less than 1 km (fig. 1). High-resolution images obtained with a 2-5 kHz chirp profiler illustrate various types of these structures (fig. 3c). Not all of the chimneys are observed to reach the seafloor. When they do, the chimneys are often associated with seafloor depressions or pockmarks. Bathymetry and acoustic seafloor imagery data (fig. 3a and 3b) show that these pockmarks can be up to 500 m large in diameter, and are usually associated with a higher seabed reflectivity. They are shallow, rarely exceeding a few meters in depth. Pull-downs are commonly observed in and below the chimneys, which suggests the presence of gas. In several cases, surrounding reflectors are bent upwards near the chimneys, which may result from sediment deformation or an increase in velocity in the surrounding sediments. Most of the chimney-like structures are rooted below the BSR. On seismic and chirp profiles, amplitude anomalies are observed in the undisturbed sediments above the chimneys that do not reach the seafloor. These anomalies affect the sediments up to the seafloor and suggest recent fluid expulsion activity of these chimneys.

Bathymetric data (fig. 1) point to preferential directions in the slide scars and suggest a tectonic control of the sliding process. On the 3D seismic block (fig. 4), two shallow disturbed areas were identified located at about 150 m below sea bed. Those slides affect thin (about 15 m for the

upper slide) layers in the Naust sedimentary formation, extend over a large part of the study area and are sealed by posterior sedimentation which implies early sliding of the sediments after deposition. The upper slide affects layers dated approximately 120 000 years bp. There is no clear link between these slides and gas hydrates occurrence in the sediments: gas hydrate dissociation that could have had an impact on the strength of the sediments is expected to take place preferentially at the BGHS. However, the slides are nowadays still located well above the BGHS. The sliding layers are identified as glide planes for the -8200 years main Storegga slide event (Haflidasson et al., 2003) which means that the instability of these layers could have lasted since the last 120 000 years. In places where these layers are undisturbed the present day stability is thus still in question.

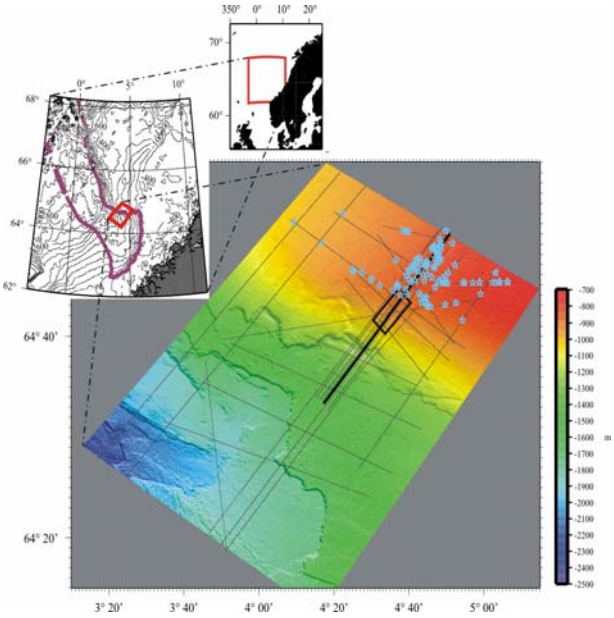

Figure 4.1.: Location and Bathymetric map of the study area. Thin lines: 2D high resolution seismic lines (thick line presented on figure 2). Bold line box: 3D data block. Stars: location of fluid escapes chimneys detected on the seismic lines.

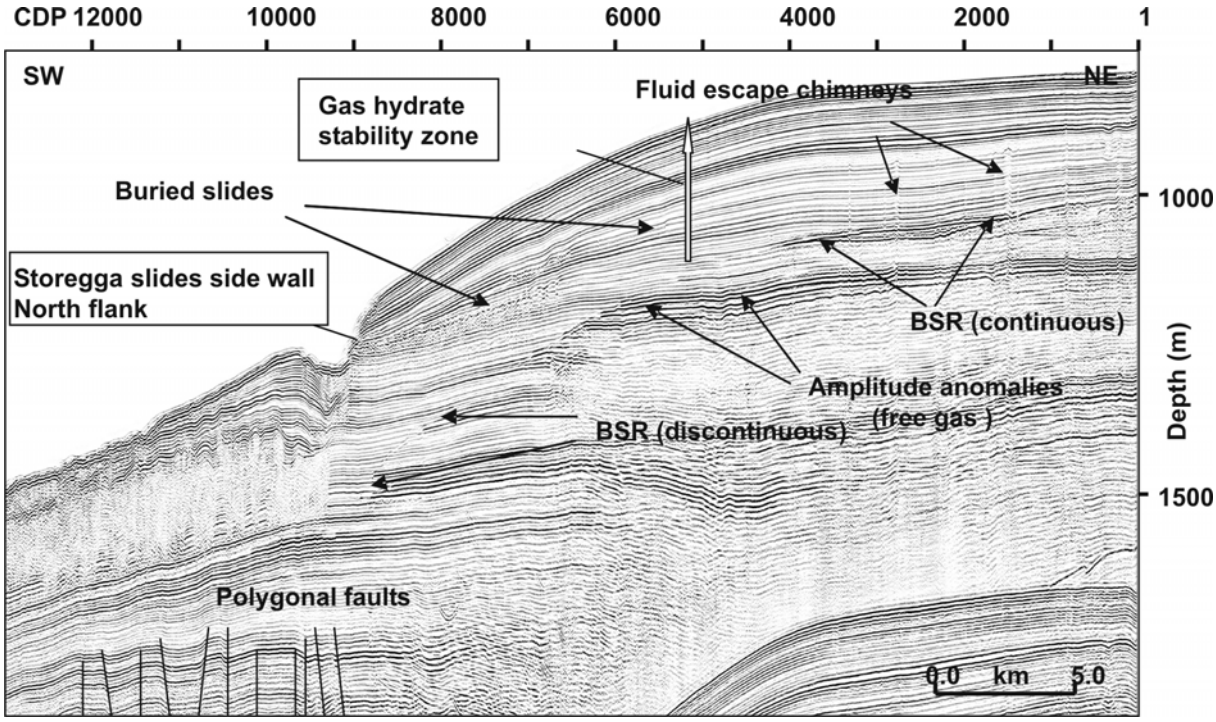

Figure 4.2.: Line HTK2D – 05 depth migrated. Horizontal axis scale: CDP (common depth points). Note that the BSR (Bottom Simulating Reflector) is marked by a continuous reflector at the NE end of the line and by the end of amplitude anomalies SW of CDP 9000. The grey shaded area corresponds to the 3D data displayed on figure 4.4.

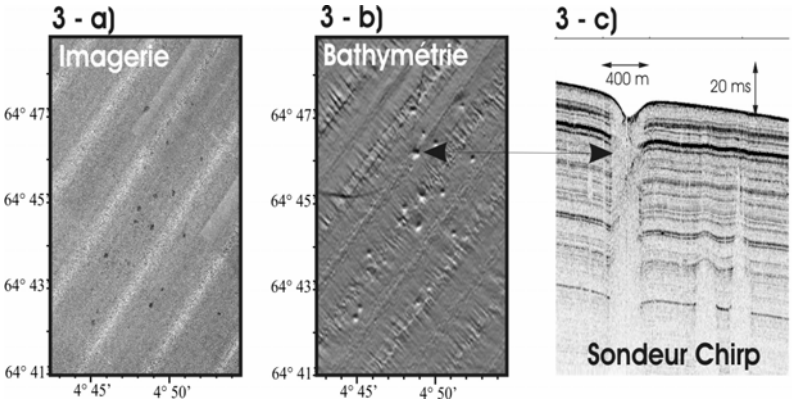

Figure 4.3.: Fluid escapes on a zoom of the bathymetric (3-a) and imagery (3-b) maps and on a record of the chirp sediment profiler (3-c).

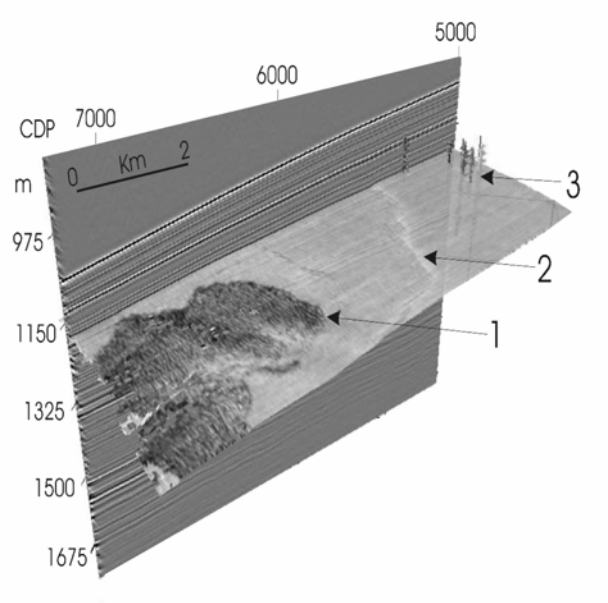

Figure 4.4.: 3D picture of a paleo slide: amplitude map of the disturbed horizon extracted from the 3D data block. 1 = upslope limit of the highly perturbed sediments, 2 = upslope limit of the slightly disturbed sediments, 3 = fluid escape chimneys.

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4.2. Hakon Mosby mud volcanoe (HMMV)

The Hakon Mosby mud volcanoe is situated on the norwegian continental slope, west of the Barents sea, and lies at about 1270 m water depth. It was discovered in 1989 during a side scan sonar survey (Crane et al., 1995). It was further studied in the 1990 (Vogt et al., 1997). The HMMV is a circular structure, about 1 to 1.5 km in diameter that lies within a slide scar, over the thick (6 km) sedimentary sequence of the Bear Island fan. These sediments are deposited at the continent-ocean transition, over Oligocene (33 My old) oceanic crust, at the HMMV location.

The detailed microbathymetric map obtained in 2003 (figure I-5) shows the central area, polygonal in shape, with a structural direction oriented NE/SW, corresponding to the structural direction of this area of the Norwegian margin. In the center and southern part of the map, recent mud flows expelled from the center of the volcanoe show little relief and contrast with more chaotic seafloor in the northern part as well as in the periphery which could correspond to older mud flows. On the outside of the volcanoe, a moat about 300-400m wide shows circular scars.

The origin of the HMMV is still poorely understood. It could be linked to the Bear Island slide which occurred about 12 000 years ago, following the last glaciation (Hald et Aspeli, 1997). It would thus be a relatively young mid volcanoe when compared to other known mud volcanoes on the European margin (about 1 Ma for the Napoli et Milano mud volcanoes on the mediterranean ridge). Recent mud flows, high temperatures (up to 20-30°C at 10 m depth in the sediments) and thermal flux as well as high methane concentrations and porely developed bacterial mats characterize the central part of the volcanoe. On the contrary, the outer part of the volcanoe shows gas hydrates occurrence at depth less than 2-3 m in the sediments, and extensive chemiosynthetic communities (pogonophorans) and bacterial mats. Three methane bubbling sites were identified during the 2003 Polarstern cruise (Sauter et al., 2006).

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5. Objectives of the cruise

5.1. In the Storegga area

The Vicking cruise aimed at analysing the developpement and functionning of a large fluid escape features field, on the Storegga slope between 600-1000 m of water depth, in the vicinity of the Storegga slide. This site is remarquable because 1/ of the size and number of fluid escape features that can be observed, 2/ it was studied recently in the framework of different EU projects (Hydratech, Costa) and thus a number of datasets are available, 3/ it is the study site chosen for the "Nyegga" very high resolution tomographic experiment in the framework of the Hermes program, 4/ because of the possible relationships between escape feature and slope stability 5/ future IODP proposals in the area.

In more details, the main objectives of the cruise were:

1/ to collect geological, chemical and biological observations and data/samples on the seafloor and in the water column, in order to determine the activity of the cold seeps in terms of fluids possibly mud expulsion. The objectives were as well to refine observations and measurement on a few (2-3) selected sites, in order to gather informations about parameters needed to model hydrodynamics as well as flux quantification on these sites.

2/ to determin the origin of fluids (methane) in the seeps by isotopic studies, and precise the links between gas hydrates occurrence and fluid escapes. Hydrodynamic modelling should enable to understand the pressure conditions in the subsurface and thus the slope instabilities in the area.

3/ to describe the microbial and faunistic faunas associated with the seeps. Studying a number of differents seeps with possibly different activity levels should help to understand how these methanotrophic ecosystems develop.

5.2. On the Hakon Mosby Mud Volcano

The Vicking cruise aimed at collecting observations on the HMMV to be compared to previoulsly existing data, especially those of the Ark XIX3/b cruise in 2003 on R/V Polarstern.

1/ microbathymetry mapping of the central area of the volcanoe, to identify recent mud flows.
2/ methane plume and bubbling sites mapping
3/ gas hydrate sampling, for geochemical analyses and hydrodynamic modelling
4/ heat flow measurements as well as recollection of a heat proble deployed in 2005 (ARCXXI 1b cruise, R/V Meteor)

6. Cruise outline. weekly reports

Week 1

The R/V Pourquoi Pas ? departed from Alesund on Sunday morning, May the 21st, 2006. The vessel headed to our first study area: the northern flank of the Storegga slides. Objectives were to determine the current strength of fluid emission and characterize the nature and functioning of the ecosystem at key gas chimney sites in a water depth of about 700 m. These had been selected mainly from previous geophysical data collected during the Hydratech cruise of Le Suroît in the summer of 2002. The ROV Victor was deployed in the evening of the 21st for a long exploratory dive of 48 hours along an east-west survey track of about 8 miles that crossed a dozen gas chimneys. Most of the chimneys were found to be associated with authigenic carbonate massifs of metric to decametric dimensions, with abundant macrofauna fixed on the carbonates (see picture 1). Although the main objective of the dive was a reconnaissance survey, Victor stopped once for sampling an interesting active seep, where white gastropods were observed. Free gas bubbles were not detected but methane anomalies were measured in the bottom sea water.

Our second dive of a total duration of 60 hours on 24-26 May was dedicated to the Nyegga pockmarks, a few miles to the west of the Hydratech sites. Pockmarks G11 and G12 were surveyed, taking advantage of the seafloor maps and some video information kindly made available to us by Statoil (Martin Hovland). Carbonate crust, metamorphic clasts and sediment samples were taken. A full suite of biological sampling and in situ characterization was completed at two active seeps (see picture 2). Interestingly, "pingoes" were found to be pillows of nested pogonophorans (see picture 3).

A swath mapping tool was installed on Victor for the third dive that started on May 28th . The dive aims at producing a detailed seafloor map of two large gas chimneys of the Hydratech transect that were selected in particular because of their different morphological expression at the seafloor. In contrast to the Nyegga pockmarks, the two gas chimneys of the Hydratech transect form mud domes. They are planned to be explored with Victor in the coming week.

Figure 6.1. : Macro fauna on carbonate crusts – Storegga area

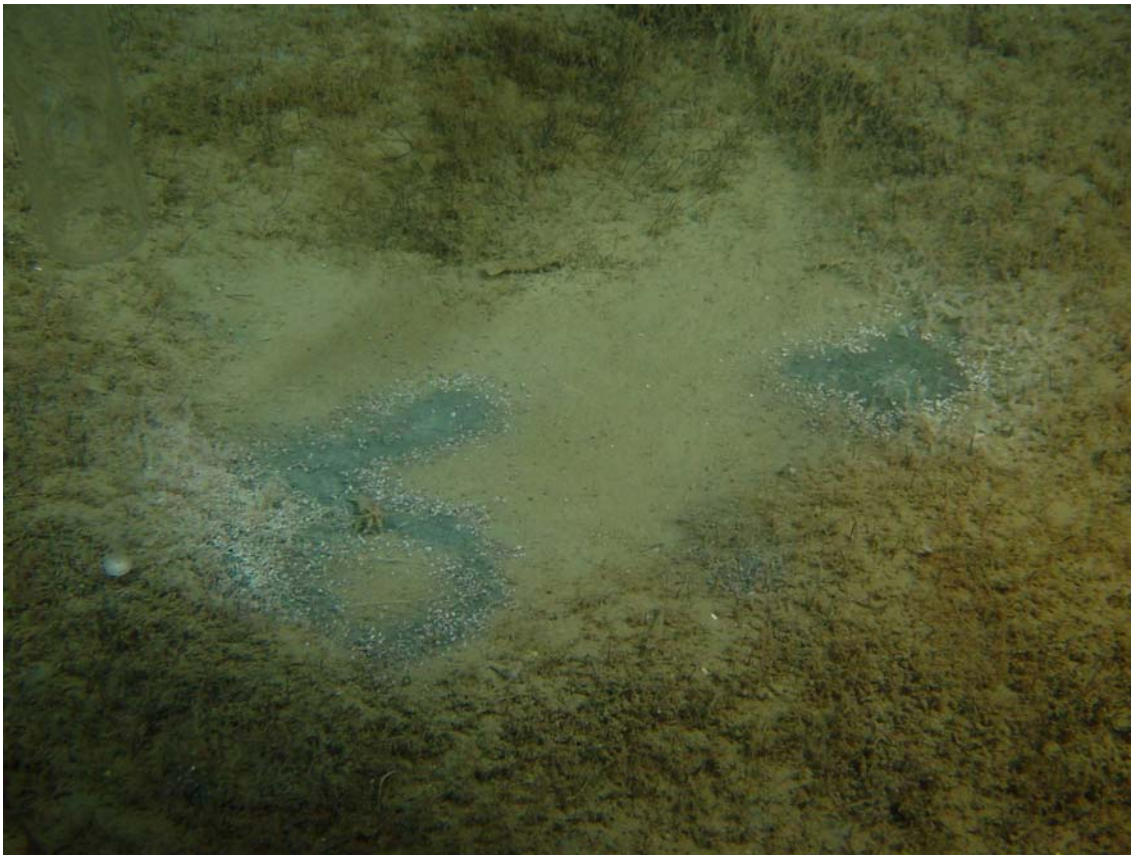


Figure 6.2. : Pogonophora and bacterial mats surrounded by gastropods – Storegga area

Figure 6.3.: Pogonophora pillow (pingoe) – Storegga area, Nyegga site

Week 2

Storegga gas chimneys were further explored using a variety of techniques, either directly carried out from the ship, such as by gravity coring and CTD rosette water sampling, or using the ROV Victor for seafloor video observations and accurately targeted sediment and fauna sampling. *In situ* chemical characterization at active seeps was made possible through the deployment by Victor of the Microprofiler Profiler (MIC tool provided by MPI Bremen) measuring S, O2, pH and T at the sediment water interface and the "Rhizone In Situ Sediment" (RISS) tool provided by AWI. Ifremer CALMAR benthic chambers were also deployed by Victor. Three sites were investigated, comprising two large gas chimneys displaying mud domes at the seafloor (structures cno01 and cno03). First conclusions were that the investigated gas chimneys diffused methane slowly through vast areas of the seafloor where pogonophoran fields were mapped. The most active seeps were found at a few spots of the central areas. These were observed to be colonized by gastropods and in several cases showing soufflé-type thin carbonate crusts (photo). The large amount of collected samples has made the biologists very busy (photo). In addition, the two mud domes cno01 and cno03 were mapped with the multibeam ROV tool, each over an area of nearly 1 km2, thus making the two sites potential targets of the seismic tomography experiment to be conducted from the Professor Logachev immediately after Vicking.

The RV "Pourquoi pas?" left the Storegga slope study area on Thursday the 1st of June and, after a 48 hour voyage to the North, reached the Hakon Mosby Mud Volcano (HMMV), where on arrival we were welcomed by a large gas flare extending 900 m above the seafloor (300 m below the sea surface). This was certainly one of the largest gas flares ever recorded at HMMV. A first

reconnaissance survey with Victor started on Saturday the 2nd, which visited previously identified sites of gas jets. These sites were not found to be currently active. The mud volcano activity might have considerably evolved since the last major ROV dives conducted in July 2003 from the RV Polarstern. This is what the next Victor dives are expected to tell us in the next days. Interestingly, the first Victor dive found a bubbling site at the transition from a recent flow to an older flow in the central part of HMMV. This was an important moment when Victor was able to recover gas bubbles coated with hydrate using the newly-developed Ifremer Pegaz sampler (photo). Furthermore, we will complete a detailed study of the biodiversity of all benthic size classes (microbes to megafauna) on several different microhabitats dominating the HMMV ecosystem. These analyses are for the first time supported by a detailed in situ characterization of the biogeochemical conditioning of each habitat, to test our hypotheses on the nature of the geosphere-biosphere interactions.

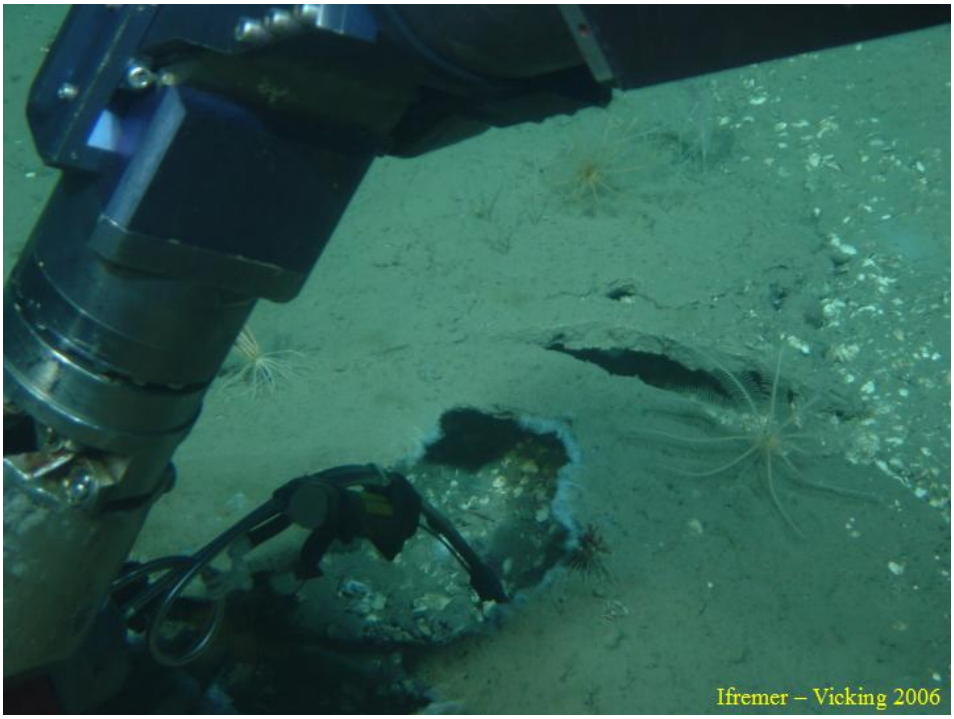


Figure 6.4. : Water sampling under a carbonate “soufflé”- Storegga area

Figure 6.5. : Biologists at work

Figure 6.6. : Pegaz sampling system, filled of methane bubbles coated with gas hydrates on the HMMV

Figure 6.7.: HMMV gas hydrate sample burning

Week 3

The week has been particularly rich in discoveries at the Hakon Mosby Mud Volcano. A new bathymetric survey with the high resolution swath mapping tool mounted on Victor has revealed significant topographic changes at the surface of the volcano by comparison with the map produced in 2003. Seafloor deformation suggests new mud flows, which will be investigated in further detail, using video records. Another exciting result came out of the recovery of a corer that had been deployed in September 2005 from RV Polarstern in the central part of the volcano. Temperature sensors had been attached to the corer. Temperature records indicate a sudden temperature drop of about 10°C in the mud temperature down to several meters below the seafloor. There have been several suggestions made aboard to explain the decrease, one involving gas hydrate dissociation. Another success of the week has been the use of a fish detecting echosounder that Ifremer engineers had installed on Victor. The echosounder could detect locations of individual gas flares when Victor was navigated at 50 meters or less above the seafloor (photo). This was helpful to guide Victor to the gas bubbling site (photo) at the origin of a gas flare. Furthermore, a dense coverage of photos over an area of 400 m by 400 m, from the grey mud central part of the volcano to outer pogonophoran fields, has been carried out with the large aperture OTUS black and white still camera. OTUS-type surveys appear to be promising to monitor temporal changes in the faunal and microbial distributions at the seafloor.

Microbial mats are abundant on the seafloor of the Hakon Mosby Mud Volcano. Various species of giant sulfide oxidizing bacteria such as Beggiatoa (photo) have formed extensive fields of white or grey mats at the mud surface. They are typical indicator organisms for sulfide reaching the top few cm of the seafloor. Sulfide is a product of the anaerobic oxidation of methane transported to the seafloor by fluid flow. Various microbial communities are responsible for this anaerobic oxidation. *In situ* geochemical characterization at the different microbial mats have been carried out with success using the Microprofiler (MIC), the Rhizone Sampler (RISS) and the *in situ* incubator (INSINK), deployed all together by Victor, and combined with a thorough sampling by push cores. Major insights are expected to be gained into the microbial diversity and activity and their links to the methane flow intensity. The grey mats (see photo) display a previously undetected diversity in sulfide oxidizing microorganisms.

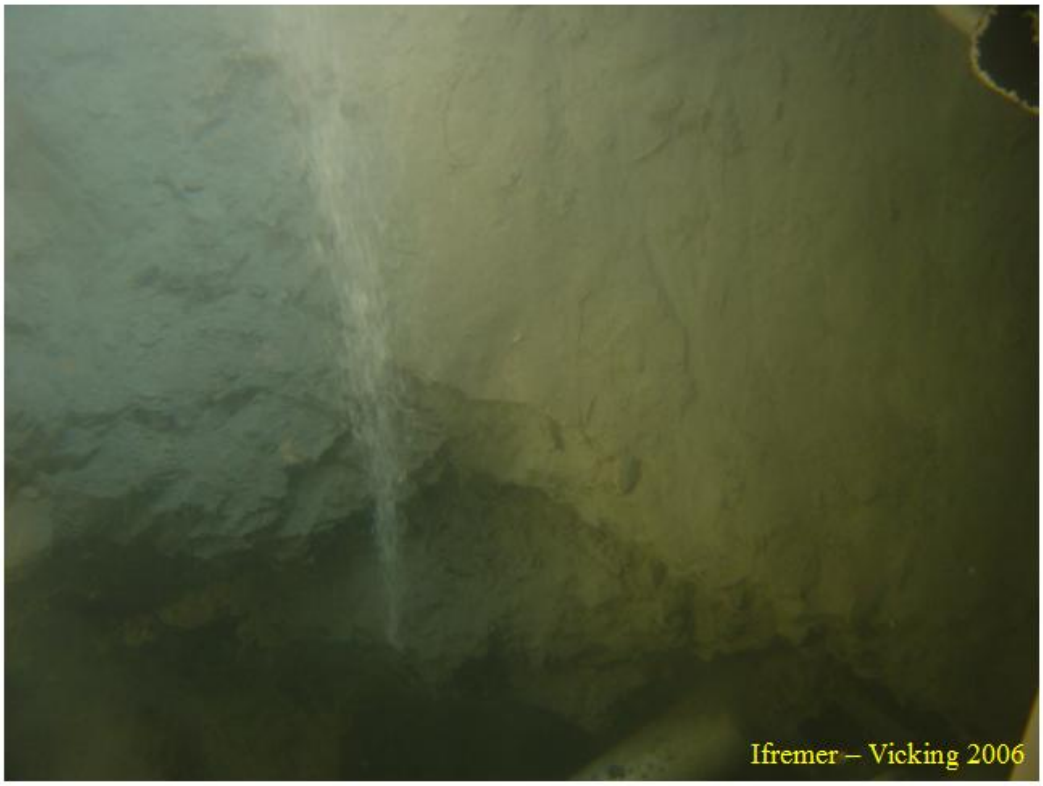


Figure 6.8.: Methane bubbles (coated with gas hydrates) stream escaping from the HMMV

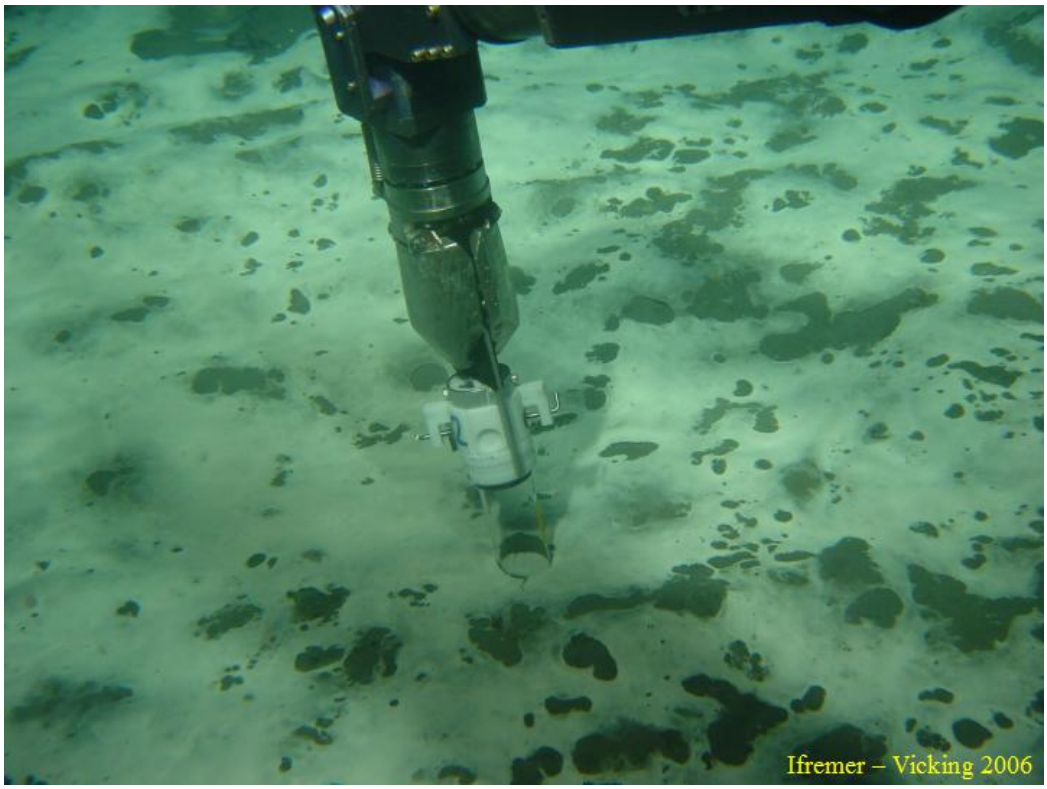


Figure 6.9. Dense white bacterial mats – HMMV

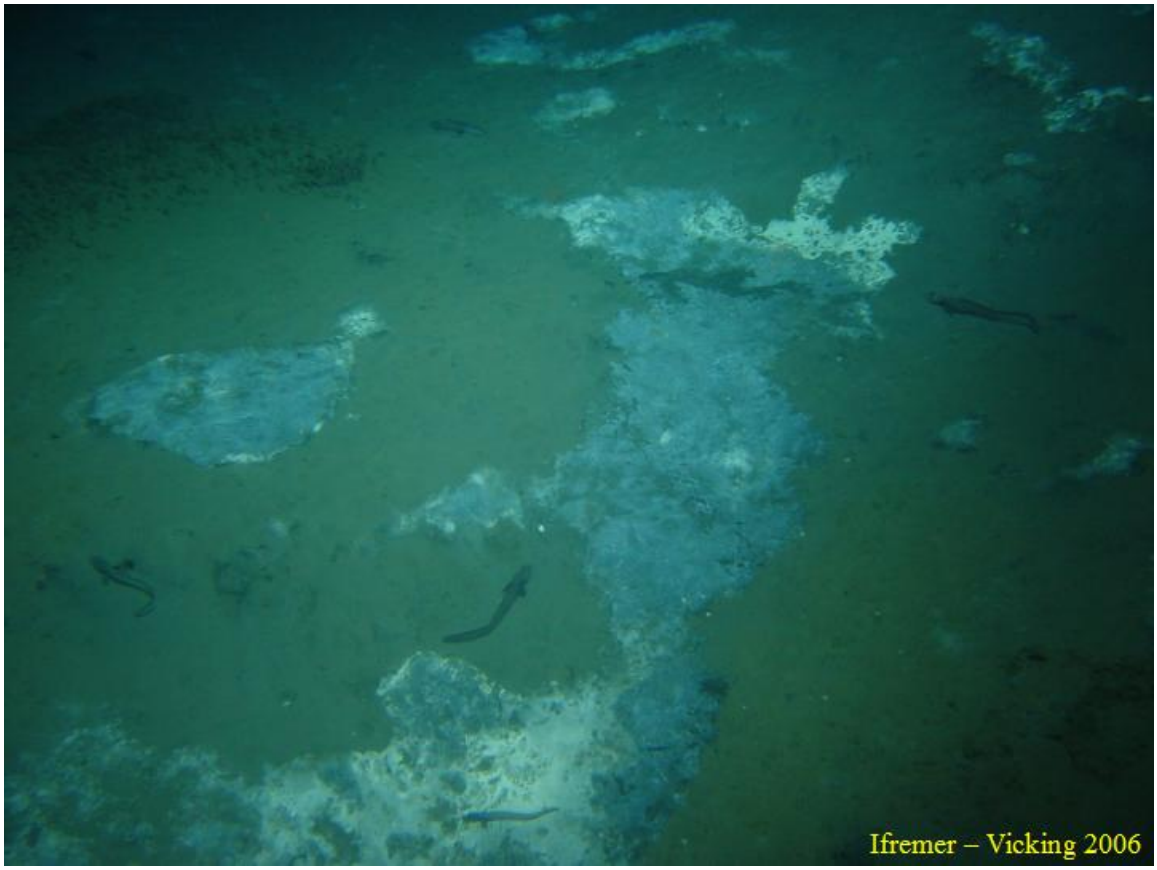


Figure 6.10.: Bacterial mats and pogonophora - HMMV

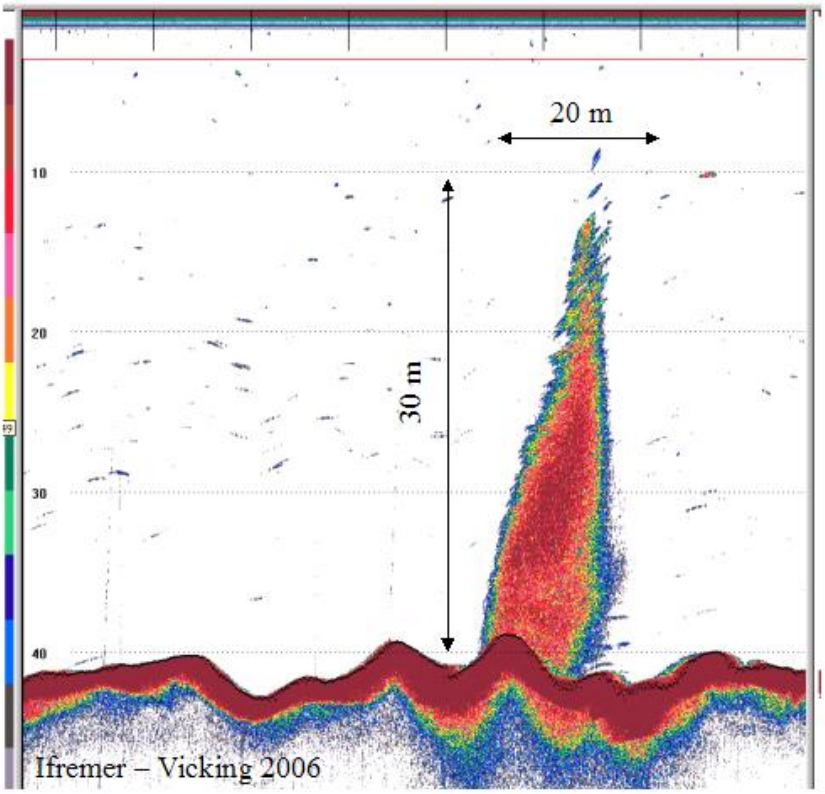


Figure 6.11.: Gas/gas hydrates bubble plume echo on the EK60 ROV mounted echosounder

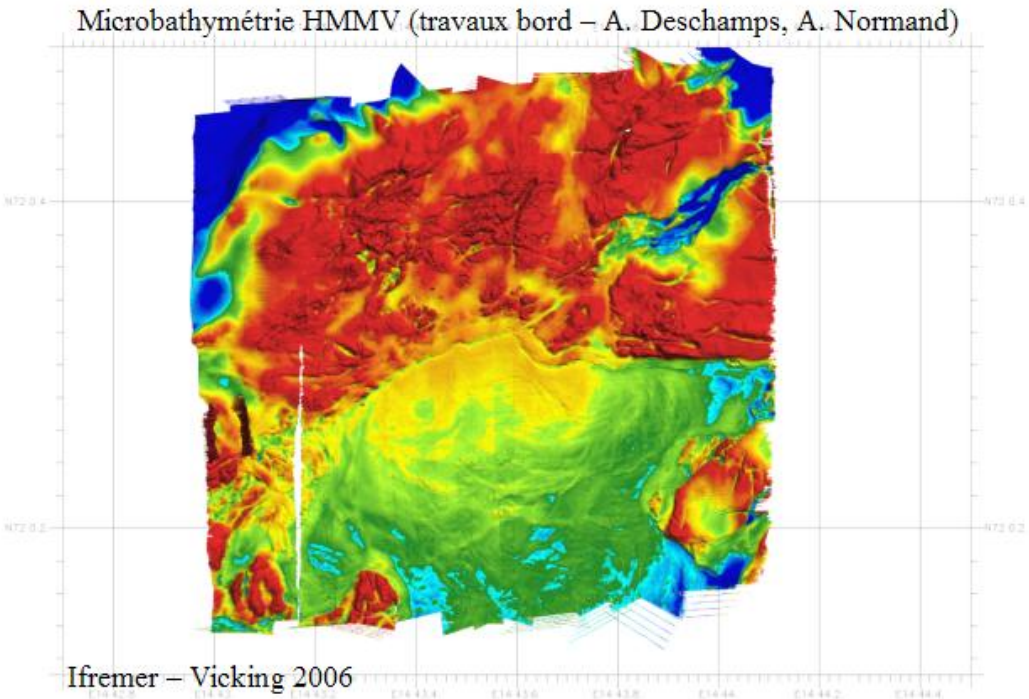


Figure 6.12.: Microbathymetric map of the HMMV

Week 4

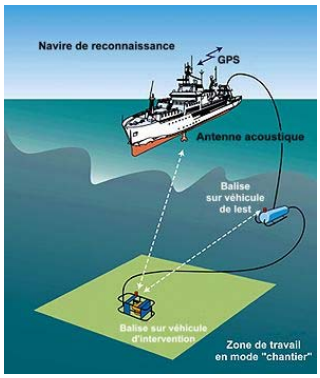
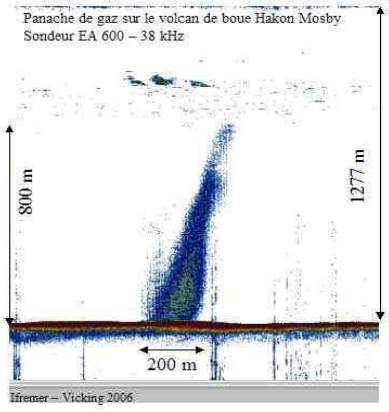
The ship sailed to Tromsoe to disembark the ROV team as well as part of the scientific team and went back to the HMMV. The short time left was used to do additional cores, CTD deployments and chirp and ER600 lines across the volcanoe. One of the striking events was an attempt to recover a 26 m long core. When arriving on board, that core was bent and empty except for a massive block of gas hydrates (see picture).

The ship started her journey back to Alesund on June the 15th and arrived on June 17th, 2006.

Figure 6.13. : Massive gas hydrates sample

7. Ship Equipments

7.1. General equipments

	Description
	Positionning DGPS Ellipsoid WGS 84
	Ultra short base (BUC) Thales – Ixsea Oceano 8.0-14.0 kHz 14.5-17.5 kHz 0-6000m positionning cone 30° (45° maxi)
	Chirp sediment echosounder 7 ERAMER transducers Max. acoustic power : 216 dB Resonant frequencies 2 & 5 kHz Amplifier ENERTEST 3kVA « chirp » 2 to 5 kHz
	EA 600 Fishing echosounder 70 khz 18 khz,

7.2. ROV equipments

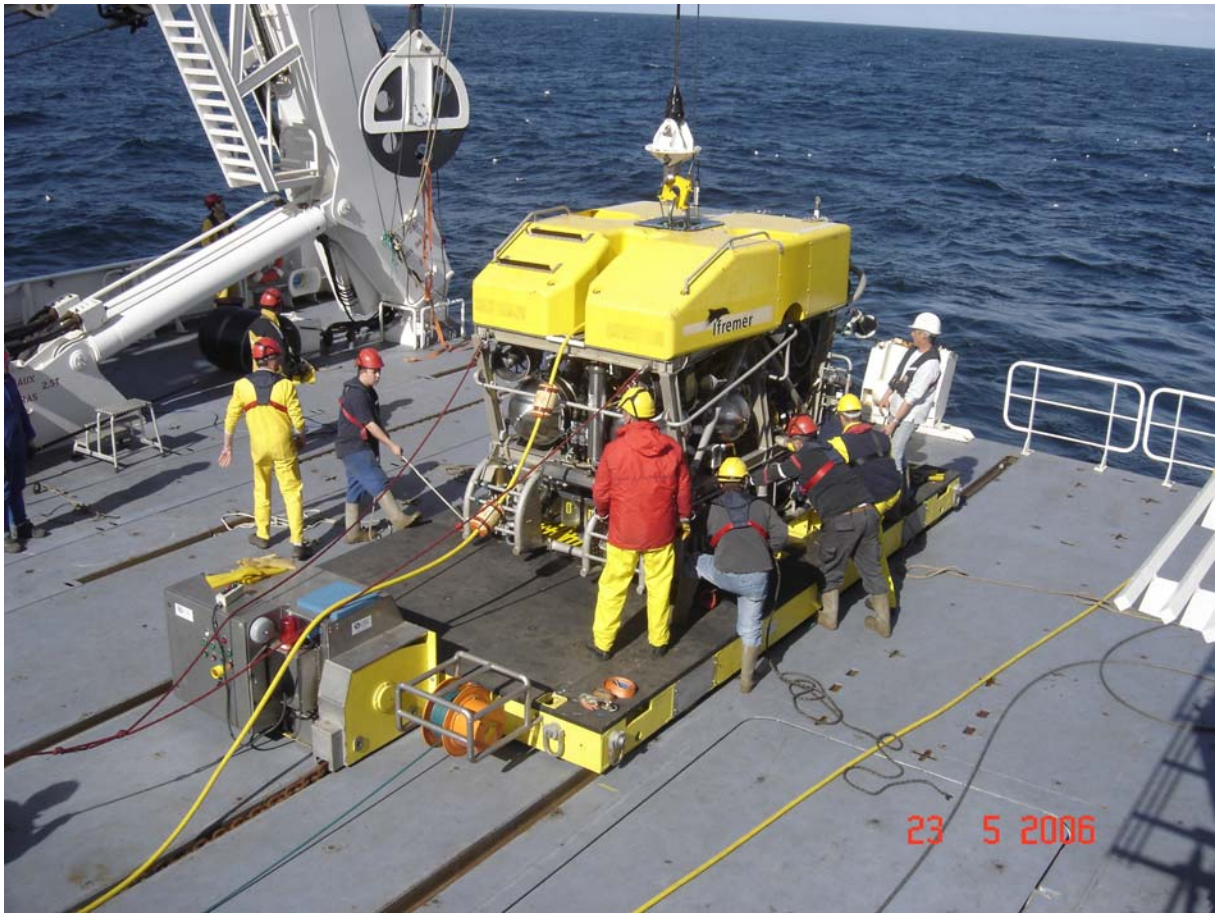


Figure 7.2.1.: Rov Victor 6000 system on R/V Pourquoi Pas ? back deck.

Victor 6000 scientific ROV is one of the most advanced remotely operated system for deep underwater science. It took benefits from experience gained by Ifremer with manned submarine like *Nautile.* In operation since 1999, *Victor 6000* has achieved ten oceanographic cruises in Atlantic, Arctic and Pacific oceans. More than 300 dives have been carried out from *L'Atalante, Thalassa, Pourquoi pas?* and *Polarstern* research vessels.

The system is designed in a modular way and includes:

- The vehicle itself which hosts components required by basic functions as propulsion, power distribution, video imaging, lighting, manipulation and navigation,

- The scientific module: a 0,70-m high frame located under the vehicle where most of the scientific instruments are installed.

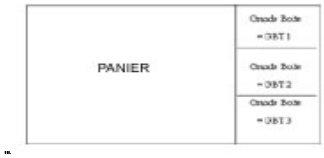
Today *Victor 6000* is proposed to users with one "basic sampling" module, which includes a basket and tools for animals, sediment, rocks and water sampling, as well as temperature probes. With such a configuration, the system is well adapted to local area dives focused on sampling,

close observation and manipulation. It is also possible to explore areas flying above the sea floor at low altitude (less than 4 metres due to limited range of colour video cameras in sea water).

	Nom - Name
	Elevator Shuttle to take down and bring back equipment during ROV dives
	Push Corer Near seafloor sediments and fauna sampling
	**In S**itu **Inc**ubator (MPI) Push core that can be closed after sampling for in situ experiments
	Blade Corer For sediments and fauna sampling

	Large Blade Corer
	Titanium bottle Water sampling

	Nom
	Small sampling box To collect fauna and small geological samples
	Pumping Water sampler 19 bottles
	Petit Poucet (Tom Thumb) Marker To mark sites of special interest

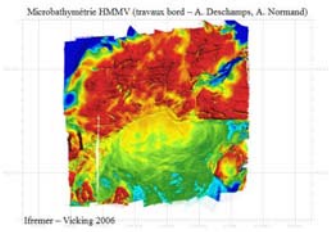
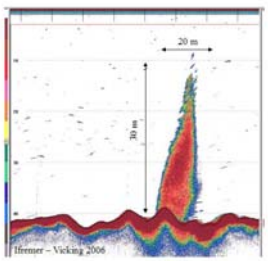
	Slurp Gun (8 bottles) Fauna sampling
	Basket with 3 big Boxes To collect fauna and small geological samples
	Thermal Probe Several deployments 1 to n

	Nom - Name
	Pegaz Sampling gaz chamber
	Chamber for Tube cores to collect gases
	Niskin Bottle
	ROV CTD
	Raman spectrometer

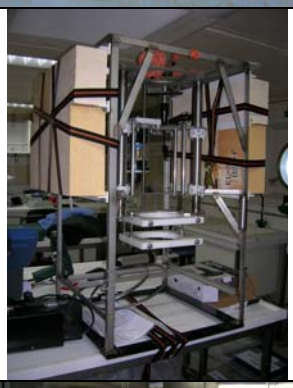
7.3. Module dedicated to survey « Module de Mesures en Route »

With 8 years of back up, there was a strong demand from the scientific community to work on a larger scale (km²) and to get data at an intermediate level between ship bathymetric data and close investigation on the sea floor.
So in 2004, IFREMER decided to start a new toolsled “Module de Mesures en Route” (MMR) with a specification of large scale survey (about 2 km² in 24h), with acoustical sensors and optical sensors.
The goal of the new module is to analyse a large area in real time during a dive and to decided witch spots will be the best for the next dive with the basic sampling tolsled.

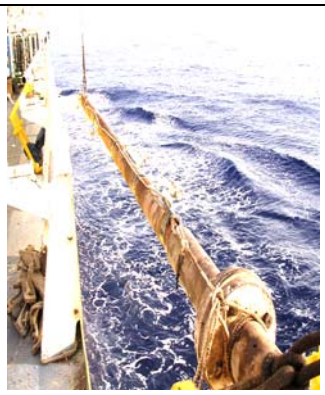
MMR is equipped with a Reson 7125 multibeam echosounder, a SIMRAD EK 60 “fishing” Echosounder and a black and white long range camera (OTUS)

	Nom - Name
	Reson 7125 multibeam echosounder Microbathymetry
	Echosounder SIMRAD EK 60 200khz Gas plume detection
	Otus camera long range optical black and white imaging with flashs

7.4. Moorings deployed by the ROV

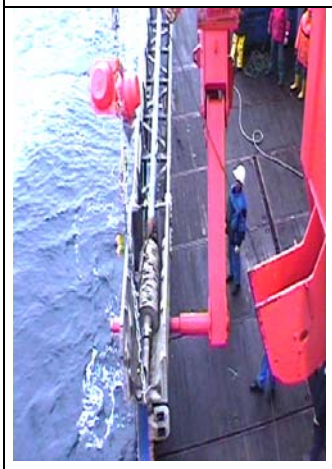
	Nom
	Benthic chamber (stays 2h on the floor, 3 times for the three chambers)
	Incubator *CNRS Paris*
	**Mic**rosensor Profiler microéléctrode de S,O2, pH, T (might be use several times 3h at several places during one dive) *MPI*
	Rhyzon In Situ Sediment (1 deployment of 30 min per dive) *AWI*
	Gel Peeper (Stays 30 min in place) *MPI*

7.5. Equipments used from the surface

	Nom
	Gravity / Küllenberg corer
	Gravity corer with thermal probes
	Bottom Water Sampler (AWI) (5 Niskin bottles)

	Nom
	CTD Rosette
	Multitube corer
	Box corer

7.6. Mooring to be recovered

	Nom - Name	**Short name**
	Carottier Thermique Thermal Corer Deployed for one year	**THER_MOOR**

8. Ship activities chronological record

Automatic Summary

Ont été effectués à partir de la surface :
Prélèvements
Biologie :
Carottier usnel : 8 prélèvements,
Carottier Multitubes 12 tubes 57mm : 8 prélèvements,
Eau :
Bottom Water Sampler(MPI) : 3 prélèvements,
Géochimie :
Carottier Küllenberg : 3 prélèvements,
Carottier Küllenberg Flux de chaleur : 14 prélèvements,
Mesures
39 mesures continues ont été recueillies,
9 plongées de submersibles,

Working areas

Station	Latitude Nord	Latitude Sud	Longitude Ouest	Longitude Est	Profondeur minimum (m)	Profondeur maximum (m)
Nyegga	N 65 00.0000	N 64 30.0000	E 005 10.0000	E 005 00.0000	600	700
Storegga Nord Est	N64 50	N64 40	E4 40	E5 15	700	730
Hakon Mosby MV	N 72 10.0000	N 72 00.0000	E 014 45.0000	E 014 43.0000	1200	1300

Dives list

Date	PL	Station	Observateur(s)
21/05/2006	271-1	Storegga Nord Est	FESEKER Thomas, BOETIUS Antje, FOUCHER Jean-Paul, ANDERSEN Ann, OLU - Le ROY Karine, PIERRE Catherine, TOFFIN Laurent, SCHLUTER Michael, DE BEER Dirk, LICHTSCHLAG Anna
24/05/2006	272-2	Nyegga	FESEKER Thomas, OLU - Le ROY Karine, FOUCHER Jean-Paul, ANDERSEN Ann, PIERRE Catherine, BOETIUS Antje, DE BEER Dirk, LICHTSCHLAG Anna, CAPRAIS Jean-Claude, FABRI Marie-Claire
28/05/2006	273-3	Storegga Nord Est	TOUTOUX Claude, DESCHAMPS Anne, EDY Christian, NORMAND Alain, SIMEONI Patrick
29/05/2006	274-4	Storegga Nord Est	NORMAND Alain, SIMEONI Patrick, TOUTOUX Claude, DESCHAMPS Anne, EDY Christian
31/05/2006	275-5	Storegga Nord Est	VAN GAEVER Saskia, CAPRAIS Jean-Claude, ANDERSEN Ann, TOFFIN Laurent, OLU - Le ROY Karine, PIERRE Catherine, LICHTSCHLAG Anna, FESEKER Thomas, BOETIUS Antje
03/06/2006	276-6	Hakon Mosby MV	FOUCHER Jean-Paul, PIERRE Catherine, BOETIUS Antje, FESEKER Thomas, DE BEER Dirk, SCHLUTER Michael, LICHTSCHLAG Anna, CAPRAIS Jean-Claude, VAN GAEVER Saskia, TOFFIN Laurent, ANDERSEN Ann, OLU - Le ROY Karine, DESCHAMPS Anne
05/06/2006	277-7	Hakon Mosby MV	FESEKER Thomas, BOETIUS Antje, LICHTSCHLAG Anna, CAPRAIS Jean-Claude, ANDERSEN Ann, OLU - Le ROY Karine, TOFFIN Laurent, VAN GAEVER Saskia, FABRI Marie-Claire, DE BEER Dirk, FOUCHER Jean-Paul, PIERRE Catherine
07/06/2006	278-8	Hakon Mosby MV	FESEKER Thomas, DE BEER Dirk, FOUCHER Jean-Paul, PIERRE Catherine, CHARLOU Jean-Luc, LEHAITRE Michel
09/06/2006	279-9	Hakon Mosby MV	DESCHAMPS Anne, EDY Christian, SIMEONI Patrick, NORMAND Alain, TOUTOUX Claude, OLU - Le ROY Karine

Moorings list :

Nom	N°	Mise à l'eau	Récupération	Localité	Latitude	Longitude	Prof(m)
MIC-Nyegga	1	26/05/2006 14:23:34	26/05/2006 16:53:52	G12	N 64 39.8329	E 005 17.3911	733
MIC-Nyegga	2	26/05/2006 17:14:32	26/05/2006 20:45:25	G12	N 64 39.8923	E 005 17.2763	727
MIC-HMMV	1	04/06/2006 05:12:00	04/06/2006 06:54:59	Hakon Mosby MV	N 72 00.2029	E 014 43.7516	1258
MIC-HMMV	2	04/06/2006 07:14:34	04/06/2006 08:40:57	Hakon Mosby MV	N 72 00.1651	E 014 43.9419	1258
MIC-HMMV	3	04/06/2006 09:06:56	04/06/2006 10:42:31	Hakon Mosby MV	N 72 00.1866	E 014 43.8836	1258
RISS	1	04/06/2006 06:26:38	04/06/2006 07:38:54	Hakon Mosby MV	N 72 00.2054	E 014 43.7721	1258
CALMAR A	1	31/05/2006 14:48:37	31/05/2006 19:57:35	Storegga Nord Est	N 64 45.2690	E 004 58.8690	745
CALMAR A HMMV	1	06/06/2006 05:22:22	06/06/2006 12:11:48	Hakon Mosby MV	N 72 00.3367	E 014 42.7369	1263
CALMAR B HMMV	1	06/06/2006 06:30:09	06/06/2006 12:17:50	Hakon Mosby MV	N 72 00.3384	E 014 42.7560	1262
MIC-HMMV	4	06/06/2006 16:27:58	06/06/2006 17:39:32	Hakon Mosby MV	N 72 00.2131	E 014 43.7219	1258
MIC-HMMV	5	06/06/2006 17:55:49	06/06/2006 22:53:14	Hakon Mosby MV	N 72 00.1614	E 014 43.9293	1258
MIC-HMMV	6	06/06/2006 23:16:45	07/06/2006 00:24:54	Hakon Mosby MV	N 72 00.1636	E 014 43.9419	1258
RISS	2	06/06/2006 17:14:37	06/06/2006 23:32:32	Hakon Mosby MV	N 72 00.2117	E 014 43.7284	1258
MIC-HMMV	7	07/06/2006 21:41:13	08/06/2006 03:25:42	PP-V12	N 72 00.3047	E 014 43.3490	1256
RISS	3	08/06/2006 02:40:03	08/06/2006 14:45:09	Hakon Mosby MV	N 72 00.3432	E 014 43.4250	1256
MIC-HMMV	8	08/06/2006 03:40:27	08/06/2006 09:27:08	Hakon Mosby MV	N 72 00.3049	E 014 43.4051	1256
Peepers	1	06/06/2006 15:19:55	08/06/2006 12:24:30	Hakon Mosby MV	N 72 00.2098	E 014 43.7142	1258
MIC-HMMV	9	08/06/2006 09:52:15	08/06/2006 15:49:12	Hakon Mosby MV	N 72 00.2985	E 014 43.5539	1257
ColonisateursFG	1	07/06/2006 22:47:58		Hakon Mosby MV	N 72 00.1443	E 014 43.2282	1257

Chronological report

Date	Heure	Lat	Long	Prof(m)	Localité	Equipement	No	Commentaire
21/05/2006	07:26:26	N 62 27.162	E 06 9.0025	51	Off shore Norway			Appareillage pour la mission VICKING
21/05/2006	20:22:55	N 64 43.021	E 05 9.0731	742	Off shore Norway			Arrivée sur la Zone Storegga
21/05/2006	22:41:32	N 64 45.760	E 05 8.7273	742	Storegga Nord Est			ROV-Victor-Mise à l'eau: dive 271-01
23/05/2006	14:52:11	N 64 44.374	E 04 47.9931	742	Storegga Nord Est			ROV-Victor-A bord: dive 271-01
23/05/2006	16:27:49	N 64 45.285	E 05 6.2171	742	Storegga Nord Est			VKGKGS1-Carottier Usnel KGS-Mise à l'eau:
23/05/2006	17:15:00	N 64 45.281	E 05 6.2172	742	Storegga Nord Est	Carottier usnel	1	VKGKGS1-Carottier Usnel KGS-Arrachement: BON
23/05/2006	17:31:47	N 64 45.281	E 05 6.2186	742	Storegga Nord Est			VKGKGS1-Carottier Usnel KGS-En surface:
23/05/2006	20:20:46	N 64 45.281	E 05 6.2165	720	Storegga Nord Est			VKGKGS2-Carottier Usnel KGS-Mise à l'eau:
23/05/2006	20:36:03	N 64 45.281	E 05 6.2180	720	Storegga Nord Est	Carottier usnel	2	VKGKGS2-Carottier Usnel KGS-Arrachement: BON
23/05/2006	20:49:58	N 64 45.281	E 05 6.2194	720	Storegga Nord Est			VKGKGS2-Carottier Usnel KGS-En surface:
23/05/2006	21:25:53	N 64 45.281	E 05 6.2169	720	Storegga Nord Est			VKGMTB1-Carottier Mutlitube MTB-Mise à l'eau:
23/05/2006	21:47:15	N 64 45.280	E 05 6.2182	720	Storegga Nord Est	Carottier Multitubes 12 tubes 57mm	1	VKGMTB1-Carottier Mutlitube MTB-Arrachement: BON
23/05/2006	22:00:19	N 64 45.281	E 05 6.2182	720	Storegga Nord Est			VKGMTB1-Carottier Mutlitube MTB-En surface:
23/05/2006	23:00:25	N 64 45.284	E 05 8.9270	720	Storegga Nord Est			VKGCHP1-chirp-début de profil:
24/05/2006	00:25:34	N 64 45.171	E 04 51.9453	720	Storegga Nord Est	Sondeur de sediments	1	VKGCHP1-chirp-fin de profil:
24/05/2006	00:42:55	N 64 45.231	E 04 52.0420	720	Storegga Nord Est			VKGCHP2-chirp-début de profil:
24/05/2006	02:06:29	N 64 45.347	E 05 9.1321	720	Storegga Nord Est	Sondeur de sediments	2	VKGCHP2-chirp-fin de profil:
24/05/2006	02:39:29	N 64 45.231	E 05 8.9595	720	Storegga Nord Est			VKGCHP3-chirp-début de profil:
24/05/2006	04:11:07	N 64 45.114	E 04 51.8753	720	Storegga Nord Est	Sondeur de sediments	3	VKGCHP3-chirp-fin de profil:
24/05/2006	04:45:16	N 64 44.027	E 05 1.0603	720	Storegga Nord Est			VKGCHP4-chirp-début de profil:
24/05/2006	05:27:20	N 64 46.428	E 05 7.0715	720	Storegga Nord Est	Sondeur de sediments	4	VKGCHP4-chirp-fin de profil:
24/05/2006	05:46:57	N 64 46.766	E 05 9.0478	720	Storegga Nord Est			VKGCHP5-chirp-début de profil:
24/05/2006	06:32:09	N 64 44.005	E 05 4.0241	720	Storegga Nord Est	Sondeur de sediments	5	VKGCHP5-chirp-fin de profil:
24/05/2006	07:03:41	N 64 45.285	E 05 6.2132	720	Storegga Nord Est			VKGMTB2-Carottier Mutlitube MTB-Mise à l'eau:
24/05/2006	07:31:47	N 64 45.284	E 05 6.2126	720	Storegga Nord Est	Carottier Multitubes 12 tubes 57mm	2	VKGMTB2-Carottier Mutlitube MTB-Arrachement: BON
24/05/2006	07:48:13	N 64 45.285	E 05 6.2129	720	Storegga Nord Est			VKGMTB2-Carottier Mutlitube MTB-En surface:
24/05/2006	08:34:47	N 64 42.044	E 05 13.0764	717	Storegga Nord Est			on fait route sur zone Nyegga pour plongee VIC 272-02
24/05/2006	09:28:24	N 64 39.981	E 05 17.4161	731	Nyegga			ascenseur au fond, dérive 150 m au 330
26/05/2006	07:15:24	N 64 40.004	E 05 17.2714	731	Nyegga			larguage de l'ascenseur
26/05/2006	08:01:41	N 64 40.079	E 05 17.7712	1	Nyegga			ascenseur 1 accroché

26/05/2006	12:54:42	N 64 39.892	E 05 17.3166	1	Nyegga			ascenseur 2 plongee 02 a l'eau
26/05/2006	21:12:56	N 64 39.951	E 05 17.3109	1	Nyegga			ascenseur 2 declenché
26/05/2006	21:23:04	N 64 39.915	E 05 17.2413	1	Nyegga			départ de l'ascenseur
26/05/2006	21:35:37	N 64 39.910	E 05 17.2304	1	Nyegga			ascenseur en surface
26/05/2006	21:56:06	N 64 39.929	E 05 17.7523	1	Nyegga			ascenseur a bord
26/05/2006	22:08:49	N 64 39.836	E 05 17.5283	1	Nyegga			on baptise le pockmark sud Nyegga : GG
27/05/2006	03:51:22	N 64 39.981	E 05 17.3860	727	Nyegga			VKGBATHY1-Bathysonde SEABIRD 19-In the water: sonde a 727 metres
27/05/2006	04:15:39	N 64 39.980	E 05 17.3863	727	Nyegga	CTD	1	VKGBATHY1-Bathysonde SEABIRD 19-Bottom: NOT VALIDE (bottle not closed)
27/05/2006	04:57:36	N 64 39.982	E 05 17.3873	727	Nyegga			VKGBATHY1-Bathysonde SEABIRD 19-Surface:
27/05/2006	06:36:47	N 64 39.999	E 05 17.3671	726	Nyegga	Bottom Water Sampler(MPI)	1	VKGBWS1-Bottom water sampler-AU FOND:
27/05/2006	06:38:02	N 64 39.999	E 05 17.3667	726	Nyegga			on a une buc et on positionne le systeme a #5m. Profondeur lisible sur sondeur EA600! top!
27/05/2006	06:52:33	N 64 39.999	E 05 17.3675	726	Nyegga			15 min au fond. On remonte le BWS
27/05/2006	07:31:27	N 64 39.998	E 05 17.3676	726	Nyegga			VKGBWS1-Bottom water sampler-En surface:
27/05/2006	07:33:35	N 64 39.998	E 05 17.3683	726	Nyegga			les bouteilles du BWS ne sont pas fermees
27/05/2006	08:07:55	N 64 40.160	E 05 17.3869	720	Nyegga			VKGKGS3-Usnel Corer KGS-In the water:
27/05/2006	08:32:09	N 64 40.161	E 05 17.3798	720	Nyegga	Carottier usnel	3	VKGKGS3-Usnel Corer KGS-Arrachement: arrachement # 1 T : BON
27/05/2006	09:00:29	N 64 40.160	E 05 17.3796	719	Nyegga			VKGKGS3-Usnel Corer KGS-Surface:
27/05/2006	09:08:53	N 64 40.160	E 05 17.3781	720	Nyegga			usnel successful
27/05/2006	09:51:43	N 64 40.167	E 05 17.3890	720	Nyegga			VKGKGS4-Usnel Corer KGS-In the water:
27/05/2006	10:16:43	N 64 40.168	E 05 17.3909	719	Nyegga	Carottier usnel	4	VKGKGS4-Usnel Corer KGS-Arrachement: BON
27/05/2006	10:30:42	N 64 40.170	E 05 17.3864	720	Nyegga			VKGKGS4-Usnel Corer KGS-Surface:
27/05/2006	11:07:36	N 64 40.170	E 05 17.3857	719	Nyegga			VKGMTB3-Multicorer MTB-In the water:
27/05/2006	11:30:17	N 64 40.171	E 05 17.3860	719	Nyegga	Carottier Multitubes 12 tubes 57mm	3	VKGMTB3-Multicorer MTB-Arrachement: BON
27/05/2006	11:44:10	N 64 40.172	E 05 17.3848	719	Nyegga			VKGMTB3-Multicorer MTB-Surface:
27/05/2006	13:21:59	N 64 39.981	E 05 17.4308	726	Nyegga			VKGKS2-Kullenberg Corer = Gravity Corer-In the water:
27/05/2006	13:48:33	N 64 39.967	E 05 17.4350	726	Nyegga	Carottier Kullenberg	1	VKGKS1-Kullenberg Corer = Gravity Corer-Bottom:
27/05/2006	14:24:33	N 64 39.966	E 05 17.4350	726	Nyegga			VKGKS1-Kullenberg Corer = Gravity Corer-Surface:
27/05/2006	15:29:23	N 64 39.967	E 05 17.4354	726	Nyegga			Calibration BUC. Début
27/05/2006	19:45:00	N 64 39.99	E 05 17.04	726	Nyegga			Fin calibration BUC
27/05/2006	20:10:41	N 64 39.027	E 05 15.9564	775	Storegga Nord Est			VKGCHP6-Chirp (Echo sondage vertical)-Starting profil:
27/05/2006	21:57:28	N 64 44.474	E 05 5.9364	725	Storegga Nord Est			cheminée avec pockmark
27/05/2006	22:07:04	N 64 45.438	E 05 3.8018	727	Storegga Nord Est			chimney
27/05/2006	22:09:52	N 64	E 05	729	Storegga	Sondeur de	6	VKGCHP6-Chirp (Echo sondage vertical)-

		45.705	3.1747		Nord Est	sediments		Ending profil:
27/05/2006	23:47:00	N 64 45.25	E 05 4.15	729	Storegga Nord Est			VKGBATHY2-Bathysonde SEABIRD 19-In the water:
27/05/2006	23:51:00	N 64 45.25	E 05 4.15	729	Storegga Nord Est	CTD	2	VKGBATHY2-Bathysonde SEABIRD 19-Bottom:
28/05/2006	00:22:00	N 64 45.319	E 05 6.662	729	Storegga Nord Est			VKGBATHY2-Bathysonde SEABIRD 19-Surface:
28/05/2006	00:34:20	N 64 46.993	E 05 6.3573	715	Storegga Nord Est			VKGCHP7-Chirp (Echo sondage vertical)-Starting profil:
28/05/2006	00:54:55	N 64 44.882	E 05 6.3307	720	Storegga Nord Est			passing cne01
28/05/2006	01:03:42	N 64 43.985	E 05 6.3154	726	Storegga Nord Est	Sondeur de sediments	7	VKGCHP7-Chirp (Echo sondage vertical)-Ending profil: passing on cne01
28/05/2006	01:21:16	N 64 44.004	E 05 8.2814	718	Storegga Nord Est			VKGCHP8-Chirp (Echo sondage vertical)-Starting profil:
28/05/2006	01:36:00	N 64 45.296	E 05 6.3144	720	Storegga Nord Est			passing cne01
28/05/2006	01:54:36	N 64 46.814	E 05 3.9707	725	Storegga Nord Est	Sondeur de sediments	8	VKGCHP8-Chirp (Echo sondage vertical)-Ending profil: passing on cne01
28/05/2006	02:12:17	N 64 46.974	E 05 4.1520	724	Storegga Nord Est			VKGCHP9-Chirp (Echo sondage vertical)-Starting profil:
28/05/2006	02:32:40	N 64 45.128	E 05 4.1580	726	Storegga Nord Est			centre cne3
28/05/2006	02:44:46	N 64 43.953	E 05 4.1666	733	Storegga Nord Est	Sondeur de sediments	9	VKGCHP9-Chirp (Echo sondage vertical)-Ending profil: passing on cne03
28/05/2006	03:02:31	N 64 44.188	E 05 5.8880	724	Storegga Nord Est			VKGCHP10-Chirp (Echo sondage vertical)-Starting profil:
28/05/2006	03:15:54	N 64 45.291	E 05 4.1643	724	Storegga Nord Est			on cne3
28/05/2006	03:56:42	N 64 46.978	E 04 58.8747	745	Storegga Nord Est	Sondeur de sediments	10	VKGCHP10-Chirp (Echo sondage vertical)-Ending profil: passing on cne03
28/05/2006	03:57:47	N 64 46.902	E 04 58.8574	745	Storegga Nord Est			VKGCHP11-Chirp (Echo sondage vertical)-Starting profil:
28/05/2006	04:17:13	N 64 45.210	E 04 58.8759	747	Storegga Nord Est			On 5.7
28/05/2006	04:31:26	N 64 43.933	E 04 58.8844	759	Storegga Nord Est	Sondeur de sediments	11	VKGCHP11-Chirp (Echo sondage vertical)-Ending profil: passing on cne5.7
28/05/2006	04:35:31	N 64 43.682	E 04 59.4506	759	Storegga Nord Est			Starting to move to coring station G11-5
28/05/2006	05:44:05	N 64 40.036	E 05 17.2329	731	Storegga Nord Est			Sur point de carottage G11-5, en preparation du déploiement
28/05/2006	06:18:49	N 64 40.040	E 05 17.3073	727	Storegga Nord Est			VKGKSF1-Gravity Corer with thermal probe-In the water:
28/05/2006	06:32:38	N 64 40.040	E 05 17.3073	729	Storegga Nord Est			enregistrement chirp position carottage dans vicchp04
28/05/2006	06:51:49	N 64 40.040	E 05 17.3062	728	Storegga Nord Est	Carottier Kullenberg Flux de chaleur	1	VKGKSF1-Gravity Corer with thermal probe-Bottom: 4,47m
28/05/2006	07:28:18	N 64 40.040	E 05 17.3085	731	Storegga Nord Est			VKGKSF1-Gravity Corer with thermal probe-Surface:
28/05/2006	09:19:15	N 64 45.438	E 05 6.1608	719	Storegga Nord Est			VKGVIC273-03-ROV-Victor-In the water: équipement MMR, profil sur Storegga, cne01 à cne 03
28/05/2006	15:04:10	N 64 45.700	E 05 6.1432	1	Storegga Nord Est			Lancement casino en batch
28/05/2006	15:24:18	N 64 45.404	E 05 6.1421	605	Storegga Nord Est			TEST1
29/05/2006	13:03:14	N 64 45.275	E 05 6.3018	720	Storegga Nord Est			VKGBATHY3-Bathysonde SEABIRD 19-In the water:
29/05/2006	13:31:30	N 64 45.270	E 05 6.3217	722	Storegga Nord Est	CTD	3	VKGBATHY3-Bathysonde SEABIRD 19-Bottom:
29/05/2006	14:02:18	N 64 45.269	E 05 6.3208	722	Storegga Nord Est			VKGBATHY3-Bathysonde SEABIRD 19-Surface:
29/05/2006	14:13:41	N 64 45.270	E 05 6.2053	723	Storegga Nord Est			On station for BWS02
29/05/2006	15:37:23	N 64	E 05	721	Storegga	Bottom Water	2	VKGBWS2-Bottom water sampler-AU FOND:

		45.283	6.1906		Nord Est	Sampler(MPI)		
29/05/2006	16:37:35	N 64 45.230	E 05 4.4988	725	Storegga Nord Est			VKGBWS2-Bottom water sampler-En surface:
29/05/2006	16:49:37	N 64 44.969	E 05 0.1949	744	Storegga Nord Est			VKGCHP12-Chirp (Echo sondage vertical)-Starting profil:
30/05/2006	02:43:51	N 64 45.248	E 05 4.1697	727	Storegga Nord Est	Sondeur de sediments	12	VKGCHP12-Chirp (Echo sondage vertical)-Ending profil:
30/05/2006	02:48:35	N 64 45.249	E 05 4.1676	727	Storegga Nord Est			VKGBATHY4-Bathysonde SEABIRD 19-In the water:
30/05/2006	03:06:17	N 64 45.265	E 05 4.1658	727	Storegga Nord Est	CTD	4	VKGBATHY4-Bathysonde SEABIRD 19-Bottom:
30/05/2006	03:30:14	N 64 45.281	E 05 4.1126	726	Storegga Nord Est			VKGBATHY4-Bathysonde SEABIRD 19-Surface:
30/05/2006	04:39:29	N 64 45.267	E 05 3.7484	730	Storegga Nord Est			VKGROV-274-04-ROV-Victor-In the water: MMR on cne03
30/05/2006	19:16:19	N 64 45.260	E 05 3.8173	1	Storegga Nord Est			marqueur sur cne03
30/05/2006	20:22:28	N 64 45.701	E 05 1.3820	1	Storegga Nord Est			ROV à bord-fin plongée 04
30/05/2006	21:04:03	N 64 45.263	E 04 58.8743	1507	Storegga Nord Est			VKGBATHY5-Bathysonde SEABIRD 19-In the water: profil sur cheminée cne5-7 Storegga
30/05/2006	21:26:06	N 64 45.274	E 04 58.8735	753	Storegga Nord Est	CTD	5	VKGBATHY5-Bathysonde SEABIRD 19-Bottom: sur cheminée cne5-7 Storegga
30/05/2006	21:45:21	N 64 45.275	E 04 58.8935	752	Storegga Nord Est			VKGBATHY5-Bathysonde SEABIRD 19-Surface:
30/05/2006	22:51:47	N 64 45.271	E 04 58.8282	1	Storegga Nord Est			VKGCHP13-Chirp (Echo sondage vertical)-Starting profil: starting profile approx 1 min before passing cne05.7
31/05/2006	00:42:03	N 64 46.667	E 04 28.9098	892	Storegga Nord Est			passing cno03
31/05/2006	02:16:12	N 64 51.762	E 04 7.1106	1032	Storegga Nord Est	Sondeur de sediments	13	Ending Profile VKGCHP13
31/05/2006	02:51:58	N 64 49.060	E 04 9.2903	1005	Storegga Nord Est			VKGCHP14-Chirp (Echo sondage vertical)-Starting profil:
31/05/2006	03:03:35	N 64 50.189	E 04 9.3789	1008	Storegga Nord Est			Passing cno02. Seafloor depression.
31/05/2006	03:13:54	N 64 51.244	E 04 9.3659	1012	Storegga Nord Est			passing cno01
31/05/2006	03:23:29	N 64 52.203	E 04 9.3661	1018	Storegga Nord Est	Sondeur de sediments	14	VKGCHP14-Chirp (Echo sondage vertical)-Ending profil: passing on cne01 and cne02
31/05/2006	04:09:58	N 64 51.160	E 04 9.3563	1010	Storegga Nord Est			VKGBATHY6-Bathysonde SEABIRD 19-In the water:
31/05/2006	04:33:24	N 64 51.160	E 04 9.3482	1009	Storegga Nord Est	CTD	6	VKGBATHY6-Bathysonde SEABIRD 19-Bottom:
31/05/2006	05:09:18	N 64 51.159	E 04 9.3504	1009	Storegga Nord Est			VKGBATHY6-Bathysonde SEABIRD 19-Surface:
31/05/2006	05:25:38	N 64 51.159	E 04 9.3492	1009	Storegga Nord Est			VKGKS2-Kullenberg Corer = Gravity Corer-In the water: carottage 3m sur cno01
31/05/2006	06:17:31	N 64 51.160	E 04 9.3506	1009	Storegga Nord Est	Carottier Kullenberg	2	VKGKS2-Kullenberg Corer = Gravity Corer-Bottom: carottage 3m sur cno01
31/05/2006	06:47:13	N 64 51.159	E 04 9.3535	1009	Storegga Nord Est			VKGKS2-Kullenberg Corer = Gravity Corer-Surface:
31/05/2006	07:23:01	N 64 50.885	E 04 10.9944	1001	Storegga Nord Est			VKGCHP15-Chirp (Echo sondage vertical)-Starting profil:
31/05/2006	12:48:24	N 64 45.261	E 04 58.9031	755	Storegga Nord Est	Sondeur de sediments	15	VKGCHP15-Chirp (Echo sondage vertical)-Ending profil:
31/05/2006	12:48:58	N 64 45.261	E 04 58.9032	756	Storegga Nord Est			il etait temps d'arreter le chirp...
01/06/2006	06:44:40	N 64 45.251	E 05 4.1015	731	Storegga Nord Est			test poste deporté
01/06/2006	15:19:52	N 64 45.328	E 05 4.1334	729	Storegga Nord Est			arrival on cne03 for gravity/heat flow core
01/06/2006	16:01:46	N 64 45.264	E 05 4.1821	729	Storegga Nord Est			VKGKSF2-Gravity Corer with thermal probe-In the water:
01/06/2006	16:43:34	N 64	E 05	729	Storegga	Carottier Kullenberg	2	VKGKSF2-Gravity Corer with thermal probe-

		45.263	4.1806		Nord Est	Flux de chaleur		Bottom: 2,80 m
01/06/2006	17:09:13	N 64 45.263	E 05 4.1801	728	Storegga Nord Est			VKGKSF2-Gravity Corer with thermal probe-Surface:
01/06/2006	18:00:00				Storegga Nord Est			Going to the north on Hakon Mosby Mud Volcano (HMMV)
03/06/2006	09:27:16	N 71 41.141	E 14 13.7186	1500	Hakon Mosby			VKGCHP16-Chirp (Echo sondage vertical)-Starting profil: enregistrement chirp et EA 600 arrivee sur HMMV
03/06/2006	12:22:13	N 72 0.2295	E 14 43.4709	1271	Hakon Mosby			arrivée sur panache de Hakon Mosby
03/06/2006	12:45:33	N 72 1.3094	E 14 45.2295	1254	Hakon Mosby	Sondeur de sediments	16	VKGCHP16-Chirp (Echo sondage vertical)-Ending profil:
03/06/2006	12:46:01	N 72 1.3485	E 14 45.2660	1253	Hakon Mosby			on continue enregistrer chirp et EA 600 pour la CTD
03/06/2006	13:25:26	N 72 0.1937	E 14 43.3893	1270	Hakon Mosby			VKGBATHY7-Bathysonde SEABIRD 19-In the water: dans le panache de Hakon Mosby
03/06/2006	13:53:03	N 72 0.1926	E 14 43.3907	1009	Hakon Mosby	CTD	7	VKGBATHY7-Bathysonde SEABIRD 19-Bottom:
03/06/2006	14:27:55	N 72 0.1936	E 14 43.3899	1272	Hakon Mosby			VKGBATHY7-Bathysonde SEABIRD 19-Surface:
03/06/2006	14:40:19	N 72 0.1917	E 14 43.0771	1271	Hakon Mosby			panache fort jusqu'à 300 m de la surface, visible sur l'ecosondeur
03/06/2006	15:05:17	N 72 0.1689	E 14 43.9771	1271	Hakon Mosby			ascenseur en descente
03/06/2006	15:15:22	N 72 0.1695	E 14 43.9672	1270	Hakon Mosby			elevator at the bottom
03/06/2006	15:40:46	N 72 0.3774	E 14 43.3708	1268	Hakon Mosby			VKGROV276-06-ROV-Victor-In the water:
04/06/2006	08:02:02	N 72 0.1629	E 14 43.8532	1270	Hakon Mosby			stop recording EA600
05/06/2006	03:06:36	N 72 0.2913	E 14 43.4175	1270	Hakon Mosby			enregistrement EA600
05/06/2006	03:46:42	N 72 0.3593	E 14 42.7021	1279	Hakon Mosby			VKGROV276-06-ROV-Victor-On board:
05/06/2006	05:00:19	N 72 0.2935	E 14 43.7182	1271	Hakon Mosby			VKGKSF3-Gravity Corer with thermal probe-In the water: enregistrement chirp sur point de carottage
05/06/2006	05:46:09	N 72 0.2947	E 14 43.7201	1271	Hakon Mosby	Carottier Kullenberg Flux de chaleur	3	VKGKSF3-Gravity Corer with thermal probe-Bottom: hydrates de gaz sur toute la longueur de la carotte: 3 m
05/06/2006	06:40:24	N 72 0.2930	E 14 43.7171	1271	Hakon Mosby			VKGKSF3-Gravity Corer with thermal probe-Surface: hydrates de gaz sur toute la longueur de la carotte
05/06/2006	06:50:41	N 72 0.2929	E 14 43.7125	1270	Hakon Mosby			carottier VKGKSF3 à bord
05/06/2006	07:33:41	N 72 0.2457	E 14 43.5737	1273	Hakon Mosby			VKGBWS3-Bottom water sampler-In the water:
05/06/2006	08:23:08	N 72 0.2471	E 14 43.5752	1266	Hakon Mosby	Bottom Water Sampler(MPI)	3	VKGBWS3-Bottom water sampler-Bottom:
05/06/2006	08:38:37	N 72 0.2469	E 14 43.5764	1272	Hakon Mosby			début de la remontée de BWS3
05/06/2006	09:02:30	N 72 0.2465	E 14 43.5737	1272	Hakon Mosby			BWS3 en surface
05/06/2006	09:21:05	N 72 0.2469	E 14 43.5768	1272	Hakon Mosby			BWS3 à bord
05/06/2006	09:43:45	N 72 0.0782	E 14 43.3473	1270	Hakon Mosby			VKGKGS5-Usnel Corer KGS-In the water:
05/06/2006	10:16:35	N 72 0.0785	E 14 43.3477	1270	Hakon Mosby	Carottier usnel	5	VKGKGS5-Usnel Corer KGS-Bottom:
05/06/2006	10:39:51	N 72 0.0776	E 14 43.3461	1270	Hakon Mosby			VKGKGS5-Usnel Corer KGS-Surface:
05/06/2006	11:29:37	N 72 0.1611	E 14 43.9474	1271	Hakon Mosby			VKGMTB4-Multicorer MTB-In the water:
05/06/2006	12:03:37	N 72 0.1600	E 14 43.9474	1273	Hakon Mosby	Carottier Multitubes 12 tubes 57mm	4	VKGMTB4-Multicorer MTB-Bottom:

05/06/2006	12:29:31	N 72 0.1599	E 14 43.9469	1273	Hakon Mosby			VKGMTB4-Multicorer MTB-Surface:
05/06/2006	12:53:21	N 72 0.1602	E 14 43.9460	1272	Hakon Mosby			VKGCHP17-Chirp (Echo sondage vertical)-Starting profil:
05/06/2006	13:57:22	N 72 0.3322	E 14 43.0819	1270	Hakon Mosby			beginning of plume
05/06/2006	14:02:58	N 72 0.5511	E 14 43.0867	1279	Hakon Mosby			end
05/06/2006	14:15:29	N 72 0.4438	E 14 43.5913	1269	Hakon Mosby			beginning of plume
05/06/2006	14:19:08	N 72 0.2747	E 14 43.6242	1272	Hakon Mosby			end
05/06/2006	14:33:04	N 72 0.3015	E 14 43.1792	1269	Hakon Mosby			beginning of plume
05/06/2006	14:38:00	N 72 0.5319	E 14 43.1912	1279	Hakon Mosby			end
05/06/2006	14:53:45	N 72 0.3790	E 14 43.8356	1271	Hakon Mosby			beginning of plume
05/06/2006	14:55:32	N 72 0.3003	E 14 43.7742	1271	Hakon Mosby			end
05/06/2006	15:14:27	N 72 0.2816	E 14 43.3940	1270	Hakon Mosby			beginning of plume
05/06/2006	15:19:29	N 72 0.5394	E 14 43.3797	1278	Hakon Mosby			end
05/06/2006	15:37:07	N 72 0.5129	E 14 43.5623	1268	Hakon Mosby			beginning of plume
05/06/2006	15:42:41	N 72 0.2756	E 14 43.4814	1272	Hakon Mosby			end
05/06/2006	15:54:37	N 72 0.3685	E 14 43.4235	1268	Hakon Mosby			on plume
05/06/2006	16:20:12	N 72 0.3248	E 14 43.2214	1270	Hakon Mosby	Sondeur de sediments	17	VKGCHP17-Chirp (Echo sondage vertical)-Ending profil:
05/06/2006	16:56:07	N 72 0.3015	E 14 43.6987	1271	Hakon Mosby			VKG 277-07-ROV-Victor-In the water:
07/06/2006	03:07:28	N 72 0.1164	E 14 44.7977	1272	Hakon Mosby			VKGROV277-07-ROV-Victor-On board:
07/06/2006	03:56:41	N 72 0.4071	E 14 43.4204	1270	Hakon Mosby			VKGBATHY8-Bathysonde SEABIRD 19-In the water:
07/06/2006	04:30:27	N 72 0.4074	E 14 43.4155	1270	Hakon Mosby	CTD	8	VKGBATHY8-Bathysonde SEABIRD 19-Bottom:
07/06/2006	05:08:27	N 72 0.4071	E 14 43.4169	1268	Hakon Mosby			VKGBATHY8-Bathysonde SEABIRD 19-Surface:
07/06/2006	06:02:01	N 72 0.3039	E 14 43.6938	1271	Hakon Mosby			VKGKSF4-Gravity Corer with thermal probe-In the water:
07/06/2006	06:40:13	N 72 0.3051	E 14 43.6942	1271	Hakon Mosby	Carottier Kullenberg Flux de chaleur	4	VKGKSF4-Gravity Corer with thermal probe-Bottom: 3,80 m
07/06/2006	07:36:41	N 72 0.3012	E 14 43.7055	1273	Hakon Mosby			VKGKSF4-Gravity Corer with thermal probe-Surface:
07/06/2006	08:35:53	N 71 59.983	E 14 43.4177	1275	Hakon Mosby			VKGCHP18-Chirp (Echo sondage vertical)-Starting profil: profils sur plume le 7 juin 2006
07/06/2006	08:41:42	N 72 0.3035	E 14 43.3394	1271	Hakon Mosby			beginning of plume
07/06/2006	08:44:04	N 72 0.4442	E 14 43.3685	1272	Hakon Mosby			end of plume on the bottom
07/06/2006	08:45:11	N 72 0.5139	E 14 43.3393	1280	Hakon Mosby			end of plume
07/06/2006	08:55:34	N 72 0.3891	E 14 43.7247	1270	Hakon Mosby			beginning of plume
07/06/2006	09:08:29	N 72 0.3133	E 14 43.2571	1271	Hakon Mosby			beginning of plume on the bottom
07/06/2006	09:09:54	N 72 0.4201	E 14 43.3011	1270	Hakon Mosby			end of plume on the bottom
07/06/2006	09:10:54	N 72 0.4885	E 14 43.3123	1276	Hakon Mosby			end of plume
07/06/2006	09:33:24	N 72	E 14	1271	Hakon			beginning of plume on the bottom

		0.4649	43.6724		Mosby			
07/06/2006	09:35:35	N 72 0.3233	E 14 43.6070	1272	Hakon Mosby			end of plume on the bottom
07/06/2006	09:54:39	N 72 0.4400	E 14 43.2058	1274	Hakon Mosby			Plume
07/06/2006	10:10:14	N 72 0.4821	E 14 43.5739	1269	Hakon Mosby			beginning of plume
07/06/2006	10:10:45	N 72 0.4493	E 14 43.5680	1271	Hakon Mosby			beginning of plume on the bottom
07/06/2006	10:12:46	N 72 0.3365	E 14 43.5519	1272	Hakon Mosby			end of plume on the bottom
07/06/2006	10:48:10	N 72 0.4721	E 14 43.5246	1269	Hakon Mosby			beginning of plume on the bottom
07/06/2006	10:51:05	N 72 0.3142	E 14 43.5259	1272	Hakon Mosby			end of plume on the bottom
07/06/2006	11:17:59	N 72 0.7438	E 14 43.1532	1277	Hakon Mosby	Sondeur de sediments	18	VKGCHP18-Chirp (Echo sondage vertical)-Ending profil:
07/06/2006	11:56:02	N 72 0.2540	E 14 43.5721	1272	Hakon Mosby			VKGKGS6-Usnel Corer KGS-In the water:
07/06/2006	12:29:44	N 72 0.2544	E 14 43.5746	1273	Hakon Mosby	Carottier usnel	6	VKGKGS6-Usnel Corer KGS-Bottom: EMPTY
07/06/2006	12:51:44	N 72 0.2547	E 14 43.5742	1272	Hakon Mosby			VKGKGS6-Usnel Corer KGS-Surface:
07/06/2006	13:08:16	N 72 0.2539	E 14 43.5754	1272	Hakon Mosby			VKGKGS7-Usnel Corer KGS-In the water:
07/06/2006	13:38:50	N 72 0.2549	E 14 43.5739	1272	Hakon Mosby	Carottier usnel	7	VKGKGS7-Usnel Corer KGS-Bottom: BON
07/06/2006	14:14:01	N 72 0.2556	E 14 43.5709	1272	Hakon Mosby			VKGKGS7-Usnel Corer KGS-Surface:
07/06/2006	15:09:20	N 72 0.1769	E 14 43.9597	1272	Hakon Mosby			VKGMTB5-Multicorer MTB-In the water:
07/06/2006	15:58:42	N 72 0.1765	E 14 43.9579	1272	Hakon Mosby	Carottier Multitubes 12 tubes 57mm	5	VKGMTB5-Multicorer MTB-Bottom: BON
07/06/2006	16:39:10	N 72 0.1773	E 14 43.9585	1272	Hakon Mosby			VKGMTB5-Multicorer MTB-Surface:
07/06/2006	17:31:08	N 72 0.1661	E 14 43.9126	1273	Hakon Mosby			VKGMTB6-Multicorer MTB-In the water:
07/06/2006	18:13:49	N 72 0.1672	E 14 43.9155	1273	Hakon Mosby	Carottier Multitubes 12 tubes 57mm	6	VKGMTB6-Multicorer MTB-Bottom: BON
07/06/2006	18:37:50	N 72 0.1668	E 14 43.9110	1272	Hakon Mosby			VKGMTB6-Multicorer MTB-Surface:
07/06/2006	19:27:38	N 72 0.3149	E 14 43.3807	1271	Hakon Mosby			larguage ascenseur
07/06/2006	20:03:49	N 72 0.3143	E 14 43.3774	1272	Hakon Mosby			VKGROV278-08-ROV-Victor-In the water:
08/06/2006	18:59:58	N 72 0.1726	E 14 43.4590	1273	Hakon Mosby			VKGROV278-08-ROV-Victor-On board:
08/06/2006	19:45:07	N 72 0.4084	E 14 43.6154	1271	Hakon Mosby			VKGBATHY9-Bathysonde SEABIRD 19-In the water:
08/06/2006	20:16:00	N 72 0.4066	E 14 43.6180	1271	Hakon Mosby	CTD	9	VKGBATHY9-Bathysonde SEABIRD 19-Bottom:
08/06/2006	20:46:38	N 72 0.4059	E 14 43.6137	1270	Hakon Mosby			VKGBATHY9-Bathysonde SEABIRD 19-Surface:
08/06/2006	21:28:29	N 72 0.3070	E 14 46.0220	1256	Hakon Mosby			VKGKGS8-Usnel Corer KGS-In the water:
08/06/2006	21:59:31	N 72 0.3065	E 14 46.0215	1256	Hakon Mosby	Carottier usnel	8	VKGKGS8-Usnel Corer KGS-Bottom: EMPTY
08/06/2006	22:29:51	N 72 0.3041	E 14 46.0235	1256	Hakon Mosby			VKGKGS8-Usnel Corer KGS-Surface: did not work!
08/06/2006	22:52:35	N 72 0.3033	E 14 46.0216	1257	Hakon Mosby			VKGMTB7-Multicorer MTB-In the water:
08/06/2006	23:27:31	N 72 0.3032	E 14 46.0210	1258	Hakon Mosby	Carottier Multitubes 12 tubes 57mm	7	VKGMTB7-Multicorer MTB-Bottom: BON
09/06/2006	00:00:15	N 72 0.3020	E 14 46.0291	1258	Hakon Mosby			VKGMTB7-Multicorer MTB-Surface:

09/06/2006	00:42:55	N 72 0.1383	E 14 43.2927	1273	Hakon Mosby			VKGCHP19-Chirp (Echo sondage vertical)-Starting profil: debut panache 3
09/06/2006	03:13:31	N 72 0.2660	E 14 43.6066	1272	Hakon Mosby			beginning of plume on the bottom
09/06/2006	03:15:40	N 72 0.3947	E 14 43.5903	1272	Hakon Mosby			end of plume on the bottom
09/06/2006	04:02:44	N 72 0.2691	E 14 43.5325	1272	Hakon Mosby			Plume
09/06/2006	04:24:18	N 72 0.3856	E 14 43.1542	1272	Hakon Mosby			Plume
09/06/2006	04:34:23	N 72 0.3927	E 14 45.2770	1262	Hakon Mosby	Sondeur de sediments	19	VKGCHP19-Chirp (Echo sondage vertical)-Ending profil:
09/06/2006	05:06:55	N 72 0.3963	E 14 43.8210	1268	Hakon Mosby			VKGBATHY10-Bathysonde SEABIRD 19-In the water:
09/06/2006	05:40:14	N 72 0.3974	E 14 43.8239	1268	Hakon Mosby	CTD	10	VKGBATHY10-Bathysonde SEABIRD 19-Bottom:
09/06/2006	06:15:08	N 72 0.3966	E 14 43.8214	1270	Hakon Mosby			VKGBATHY10-Bathysonde SEABIRD 19-Surface:
09/06/2006	07:13:10	N 72 0.2723	E 14 43.5659	1273	Hakon Mosby			VKGKSF5-Gravity Corer with thermal probe-In the water:
09/06/2006	07:51:33	N 72 0.2714	E 14 43.5648	1272	Hakon Mosby	Carottier Kullenberg Flux de chaleur	5	VKGKSF5-Gravity Corer with thermal probe-Bottom: 3 m
09/06/2006	08:23:42	N 72 0.2715	E 14 43.5636	1272	Hakon Mosby			VKGKSF5-Gravity Corer with thermal probe-Surface:
09/06/2006	09:43:58	N 72 0.4022	E 14 44.3011	1278	Hakon Mosby			VKGCHP20-Chirp (Echo sondage vertical)-Starting profil:
09/06/2006	10:44:22	N 72 0.1698	E 14 45.0272	1271	Hakon Mosby	Sondeur de sediments	20	VKGCHP20-Chirp (Echo sondage vertical)-Ending profil:
09/06/2006	10:46:56	N 72 0.1721	E 14 44.5636	1276	Hakon Mosby			transit to ROV 279-09 deployment point
09/06/2006	11:30:00	N 72 0.19	E 14 43.57	1276	Hakon Mosby			VKG 279-09-ROV-Victor-In the water:
10/06/2006	15:22:24	N 72 0.3615	E 14 43.3014	1276	Hakon Mosby			Lift aboard, moving then to bubbling line for ROV fish sounding
10/06/2006	20:16:37	N 72 0.2789	E 14 43.5635	1272	Hakon Mosby			VKGMTB8-Multicorer MTB-In the water:
10/06/2006	20:40:50	N 72 0.2784	E 14 43.5639	1273	Hakon Mosby	Carottier Multitubes 12 tubes 57mm	8	VKGMTB8-Multicorer MTB-Bottom:
10/06/2006	21:07:46	N 72 0.2789	E 14 43.5646	1272	Hakon Mosby			VKGMTB8-Multicorer MTB-Surface:
10/06/2006	21:28:39	N 71 59.779	E 14 44.4143	1276	Hakon Mosby			route vers Tromso pour la fin du premier leg
10/06/2006	21:32:18	N 71 59.276	E 14 45.0291		Hakon Mosby			Mise en route ADCP 38Khz et 150Khz
11/06/2006	13:43:27	N 69 49.605	E 17 35.1295		Hakon Mosby			sur la route de Tromsoe
13/06/2006	08:46:40	N 71 57.551	E 14 46.0681		Hakon Mosby			début enregistrement EA600
13/06/2006	09:27:14	N 72 0.3893	E 14 43.3548		Hakon Mosby			VKGBATHY11-Bathysonde SEABIRD 19-In the water:
13/06/2006	09:55:49	N 72 0.3893	E 14 43.3484		Hakon Mosby	CTD	11	VKGBATHY11-Bathysonde SEABIRD 19-Bottom:
13/06/2006	10:32:54	N 72 0.3895	E 14 43.3496		Hakon Mosby			VKGBATHY11-Bathysonde SEABIRD 19-Surface:
13/06/2006	12:19:25	N 72 0.3075	E 14 43.6957		Hakon Mosby			VKGKSF6-Gravity Corer with thermal probe-In the water:
13/06/2006	12:43:44	N 72 0.3070	E 14 43.7047		Hakon Mosby			stop recording EA600 nothing to be seen...
13/06/2006	13:03:07	N 72 0.3071	E 14 43.7028		Hakon Mosby	Carottier Kullenberg Flux de chaleur	6	VKGKSF6-Gravity Corer with thermal probe-Bottom: EMPTY
13/06/2006	13:52:08	N 72 0.3070	E 14 43.7083		Hakon Mosby			VKGKSF6-Gravity Corer with thermal probe-Surface: carottier vide
13/06/2006	15:12:37	N 72 0.3073	E 14 43.7109		Hakon Mosby			Corer on board
13/06/2006	15:29:00	N 72	E 14		Hakon			VKGCHP21-Chirp (Echo sondage vertical)-

		0.2800	45.6316		Mosby			Starting profil: start recording chirp and EA 600
13/06/2006	17:56:16	N 72 0.2648	E 14 43.2148		Hakon Mosby			plume top
13/06/2006	18:02:24	N 71 59.225	E 14 42.8061		Hakon Mosby	Sondeur de sediments	21	VKGCHP21-Chirp (Echo sondage vertical)-Ending profil:
13/06/2006	19:04:23	N 72 0.2930	E 14 43.4453		Hakon Mosby			VKGKSF7-Gravity Corer with thermal probe-In the water:
13/06/2006	19:44:29	N 72 0.2905	E 14 43.4355		Hakon Mosby	Carottier Kullenberg Flux de chaleur	7	VKGKSF7-Gravity Corer with thermal probe-Bottom: EMPTY
13/06/2006	20:25:18	N 72 0.2898	E 14 43.4365		Hakon Mosby			VKGKSF7-Gravity Corer with thermal probe-Surface: carottier vide
13/06/2006	21:32:28	N 72 0.2944	E 14 43.7373		Hakon Mosby			VKGKSF8-Gravity Corer with thermal probe-In the water:
13/06/2006	22:15:52	N 72 0.2947	E 14 43.7404		Hakon Mosby	Carottier Kullenberg Flux de chaleur	8	VKGKSF8-Gravity Corer with thermal probe-Bottom: gas hydrate
13/06/2006	23:02:10	N 72 0.2949	E 14 43.7453		Hakon Mosby			VKGKSF8-Gravity Corer with thermal probe-Surface: hydrates de gaz
13/06/2006	23:53:10	N 72 0.3087	E 14 46.0096		Hakon Mosby			VKGBATHY12-Bathysonde SEABIRD 19-In the water:
14/06/2006	00:23:51	N 72 0.3076	E 14 46.0167		Hakon Mosby	CTD	12	VKGBATHY12-Bathysonde SEABIRD 19-Bottom:
14/06/2006	01:00:52	N 72 0.3087	E 14 46.0180		Hakon Mosby			VKGBATHY12-Bathysonde SEABIRD 19-Surface:
14/06/2006	01:42:47	N 72 0.3009	E 14 43.5776		Hakon Mosby			VKGKSF9-Gravity Corer with thermal probe-In the water:
14/06/2006	02:23:14	N 72 0.3001	E 14 43.5758		Hakon Mosby	Carottier Kullenberg Flux de chaleur	9	VKGKSF9-Gravity Corer with thermal probe-Bottom: EMPTY
14/06/2006	03:17:58	N 72 0.2984	E 14 43.5791		Hakon Mosby			VKGKSF9-Gravity Corer with thermal probe-Surface: carottier vide
14/06/2006	04:37:55	N 72 0.2335	E 14 43.7575		Hakon Mosby			VKGKSF10-Gravity Corer with thermal probe-In the water:
14/06/2006	05:32:56	N 72 0.2341	E 14 43.7549		Hakon Mosby	Carottier Kullenberg Flux de chaleur	10	VKGKSF10-Gravity Corer with thermal probe-Bottom: EMPTY
14/06/2006	06:00:59	N 72 0.2346	E 14 43.7569		Hakon Mosby			VKGKSF10-Gravity Corer with thermal probe-Surface: carottier vide
14/06/2006	06:40:46	N 72 0.2514	E 14 43.5735		Hakon Mosby			VKGBATHY13-Bathysonde SEABIRD 19-In the water:
14/06/2006	07:14:32	N 72 0.2484	E 14 43.5740		Hakon Mosby	CTD	13	VKGBATHY13-Bathysonde SEABIRD 19-Bottom:
14/06/2006	07:53:02	N 72 0.2457	E 14 43.5692		Hakon Mosby			VKGBATHY13-Bathysonde SEABIRD 19-Surface:
14/06/2006	08:21:32	N 72 0.2745	E 14 43.8533		Hakon Mosby			VKGKSF11-Gravity Corer with thermal probe-In the water:
14/06/2006	09:01:09	N 72 0.2742	E 14 43.8544		Hakon Mosby	Carottier Kullenberg Flux de chaleur	11	VKGKSF11-Gravity Corer with thermal probe-Bottom:
14/06/2006	09:45:06	N 72 0.2752	E 14 43.8543		Hakon Mosby			VKGKSF11-Gravity Corer with thermal probe-Surface:
14/06/2006	10:50:15	N 72 0.2667	E 14 43.9640		Hakon Mosby			VKGKSF12-Gravity Corer with thermal probe-In the water:
14/06/2006	11:29:27	N 72 0.2652	E 14 43.9613		Hakon Mosby	Carottier Kullenberg Flux de chaleur	12	VKGKSF12-Gravity Corer with thermal probe-Bottom:
14/06/2006	12:10:52	N 72 0.2659	E 14 43.9600		Hakon Mosby			VKGKSF12-Gravity Corer with thermal probe-Surface:
14/06/2006	12:43:22	N 72 0.1958	E 14 43.8275		Hakon Mosby			VKGBATHY14-Bathysonde SEABIRD 19-In the water:
14/06/2006	13:20:40	N 72 0.1958	E 14 43.8238		Hakon Mosby	CTD	14	VKGBATHY14-Bathysonde SEABIRD 19-Bottom:
14/06/2006	13:55:54	N 72 0.1965	E 14 43.8245		Hakon Mosby			VKGBATHY14-Bathysonde SEABIRD 19-Surface:
14/06/2006	14:18:12	N 72 0.3543	E 14 43.8277		Hakon Mosby			VKGCHP22-Chirp (Echo sondage vertical)-Starting profil:
14/06/2006	14:19:49	N 72 0.2587	E 14 43.8216		Hakon Mosby			beginning of plume
14/06/2006	14:20:55	N 72 0.1970	E 14 43.8170		Hakon Mosby			end of plume

14/06/2006	14:35:07	N 72 0.1579	E 14 44.1313		Hakon Mosby			beginning of plume
14/06/2006	14:38:07	N 72 0.2923	E 14 44.1393		Hakon Mosby			end of plume
14/06/2006	14:54:59	N 72 0.3143	E 14 43.9969		Hakon Mosby			beginning of plume
14/06/2006	14:57:35	N 72 0.1732	E 14 44.0006		Hakon Mosby			end of plume
14/06/2006	15:14:00	N 72 0.1509	E 14 43.8902		Hakon Mosby			beginning of plume
14/06/2006	15:18:44	N 72 0.3355	E 14 43.9069		Hakon Mosby			end of plume
14/06/2006	15:20:59	N 72 0.4748	E 14 43.8704		Hakon Mosby	Sondeur de sediments	22	VKGCHP22-Chirp (Echo sondage vertical)-Ending profil:
14/06/2006	16:04:35	N 72 0.3851	E 14 43.7417		Hakon Mosby			Standby mecanique 30 m, avant mise à l'eau KS03
14/06/2006	16:39:02	N 72 0.3855	E 14 43.7374		Hakon Mosby			VKGKS3-Kullenberg Corer = Gravity Corer-In the water:
14/06/2006	17:11:04	N 72 0.3866	E 14 43.7446		Hakon Mosby	Carottier Kullenberg	3	VKGKS3-Kullenberg Corer = Gravity Corer-Bottom: bended core !!
14/06/2006	17:45:53	N 72 0.3868	E 14 43.7468		Hakon Mosby			VKGKS3-Kullenberg Corer = Gravity Corer-Surface: carottier tordu
14/06/2006	20:44:42	N 72 0.3296	E 14 41.5820		Hakon Mosby			démarage enregistrement EA600
14/06/2006	20:49:15	N 72 0.2216	E 14 42.4789		Hakon Mosby			VKGCHP23-Chirp (Echo sondage vertical)-Starting profil:
14/06/2006	20:58:50	N 72 0.2145	E 14 44.6519		Hakon Mosby	Sondeur de sediments	23	VKGCHP23-Chirp (Echo sondage vertical)-Ending profil:
14/06/2006	21:12:23	N 71 59.979	E 14 44.5783		Hakon Mosby			VKGCHP24-Chirp (Echo sondage vertical)-Starting profil:
14/06/2006	21:20:42	N 71 59.954	E 14 42.5171		Hakon Mosby	Sondeur de sediments	24	VKGCHP24-Chirp (Echo sondage vertical)-Ending profil:
14/06/2006	21:33:40	N 72 0.2620	E 14 42.6627		Hakon Mosby			VKGCHP25-Chirp (Echo sondage vertical)-Starting profil:
14/06/2006	21:42:31	N 72 0.2779	E 14 44.6919		Hakon Mosby	Sondeur de sediments	25	VKGCHP25-Chirp (Echo sondage vertical)-Ending profil:
15/06/2006	01:20:41	N 72 0.2013	E 14 43.3244		Hakon Mosby			VKGKSF13-Gravity Corer with thermal probe-In the water:
15/06/2006	01:58:45	N 72 0.1991	E 14 43.3256		Hakon Mosby	Carottier Kullenberg Flux de chaleur	13	VKGKSF13-Gravity Corer with thermal probe-Bottom:
15/06/2006	02:56:49	N 72 0.1983	E 14 43.3252		Hakon Mosby			VKGKSF13-Gravity Corer with thermal probe-Surface:
15/06/2006	04:24:12	N 72 0.3820	E 14 44.0257		Hakon Mosby			VKGKSF14-Gravity Corer with thermal probe-In the water:
15/06/2006	05:22:20	N 72 0.3822	E 14 44.0224		Hakon Mosby	Carottier Kullenberg Flux de chaleur	14	VKGKSF14-Gravity Corer with thermal probe-Bottom:
15/06/2006	06:03:58	N 72 0.3815	E 14 44.0209		Hakon Mosby			VKGKSF14-Gravity Corer with thermal probe-Surface:
15/06/2006	08:03:44	N 72 10.466	E 14 42.6015		Hakon Mosby			début du profil multibeam Reson
17/06/2006	14:29:02	N 62 33.865	E 05 39.6120		Hakon Mosby			fin mission

8.1. List of operations from the ship

Equipement	No	Date	Heure	Latitude	Longitude	Prof	Cap	Localite	Ech_Bio	Chimie	Sed	Mes	Photo	Fic	Commentaires
Bottom Water Sampler(MPI)	1	27/05/2006	06:36:47	N 64 39.999	E 05 17.3671	726	359	Nyegga		X					VKGBWS1-Bottom water sampler-AU FOND:
Bottom Water Sampler(MPI)	2	29/05/2006	15:37:23	N 64 45.283	E 05 6.1906	721	139	Storegga Nord Est		X					VKGBWS2-Bottom water sampler-AU FOND:
Bottom Water Sampler(MPI)	3	05/06/2006	08:23:08	N 72 0.2471	E 14 43.5752	1266	296	Hakon Mosby		X					VKGBWS3-Bottom water sampler-Bottom:
CTD		27/05/2006	04:15:39	N 64 39.980	E 05 17.3863	727	0	Nyegga						X	VKGBATHY1-Bathysonde SEABIRD 19-Bottom: NOT VALIDE (bottle not closed)
CTD		27/05/2006	23:51:00	N 64 45.25	E 05 4.15	729		Storegga Nord Est						X	VKGBATHY2-Bathysonde SEABIRD 19-Bottom:
CTD		29/05/2006	13:31:30	N 64 45.270	E 05 6.3217	722	2	Storegga Nord Est						X	VKGBATHY3-Bathysonde SEABIRD 19-Bottom:
CTD		30/05/2006	03:06:17	N 64 45.265	E 05 4.1658	727	73	Storegga Nord Est						X	VKGBATHY4-Bathysonde SEABIRD 19-Bottom:
CTD		30/05/2006	21:26:06	N 64 45.274	E 04 58.8735	753	140	Storegga Nord Est						X	VKGBATHY5-Bathysonde SEABIRD 19-Bottom: sur cheminée cne5-7 Storegga
CTD		31/05/2006	04:33:24	N 64 51.160	E 04 9.3482	1009	21	Storegga Nord Est						X	VKGBATHY6-Bathysonde SEABIRD 19-Bottom:
CTD		03/06/2006	13:53:03	N 72 0.1926	E 14 43.3907	1009	21	Hakon Mosby						X	VKGBATHY7-Bathysonde SEABIRD 19-Bottom:
CTD		07/06/2006	04:30:27	N 72 0.4074	E 14 43.4155	1270	217	Hakon Mosby						X	VKGBATHY8-Bathysonde SEABIRD 19-Bottom:
CTD		08/06/2006	20:16:00	N 72 0.4066	E 14 43.6180	1271	213	Hakon Mosby						X	VKGBATHY9-Bathysonde SEABIRD 19-Bottom:
CTD		09/06/2006	05:40:14	N 72 0.3974	E 14 43.8239	1268	288	Hakon Mosby						X	VKGBATHY10-Bathysonde SEABIRD 19-Bottom:
CTD		13/06/2006	09:55:49	N 72 0.3893	E 14 43.3484			Hakon Mosby						X	VKGBATHY11-Bathysonde SEABIRD 19-Bottom:
CTD		14/06/2006	00:23:51	N 72 0.3076	E 14 46.0167			Hakon Mosby						X	VKGBATHY12-Bathysonde SEABIRD 19-Bottom:
CTD		14/06/2006	07:14:32	N 72 0.2484	E 14 43.5740			Hakon Mosby						X	VKGBATHY13-Bathysonde SEABIRD 19-Bottom:
CTD		14/06/2006	13:20:40	N 72 0.1958	E 14 43.8238			Hakon Mosby						X	VKGBATHY14-Bathysonde SEABIRD 19-Bottom:
Carottier Kullenberg	1	27/05/2006	13:48:33	N 64 39.967	E 05 17.4350	726	79	Nyegga			X				VKGKS1-Kullenberg Corer = Gravity Corer-Bottom:
Carottier Kullenberg	2	31/05/2006	06:17:31	N 64 51.160	E 04 9.3506	1009	9	Storegga Nord Est			X				VKGKS2-Kullenberg Corer = Gravity Corer-Bottom: carottage 3m sur cno01
Carottier Kullenberg	3	14/06/2006	17:11:04	N 72	E 14			Hakon			X				VKGKS3-Kullenberg Corer = Gravity Corer-Bottom: bended core

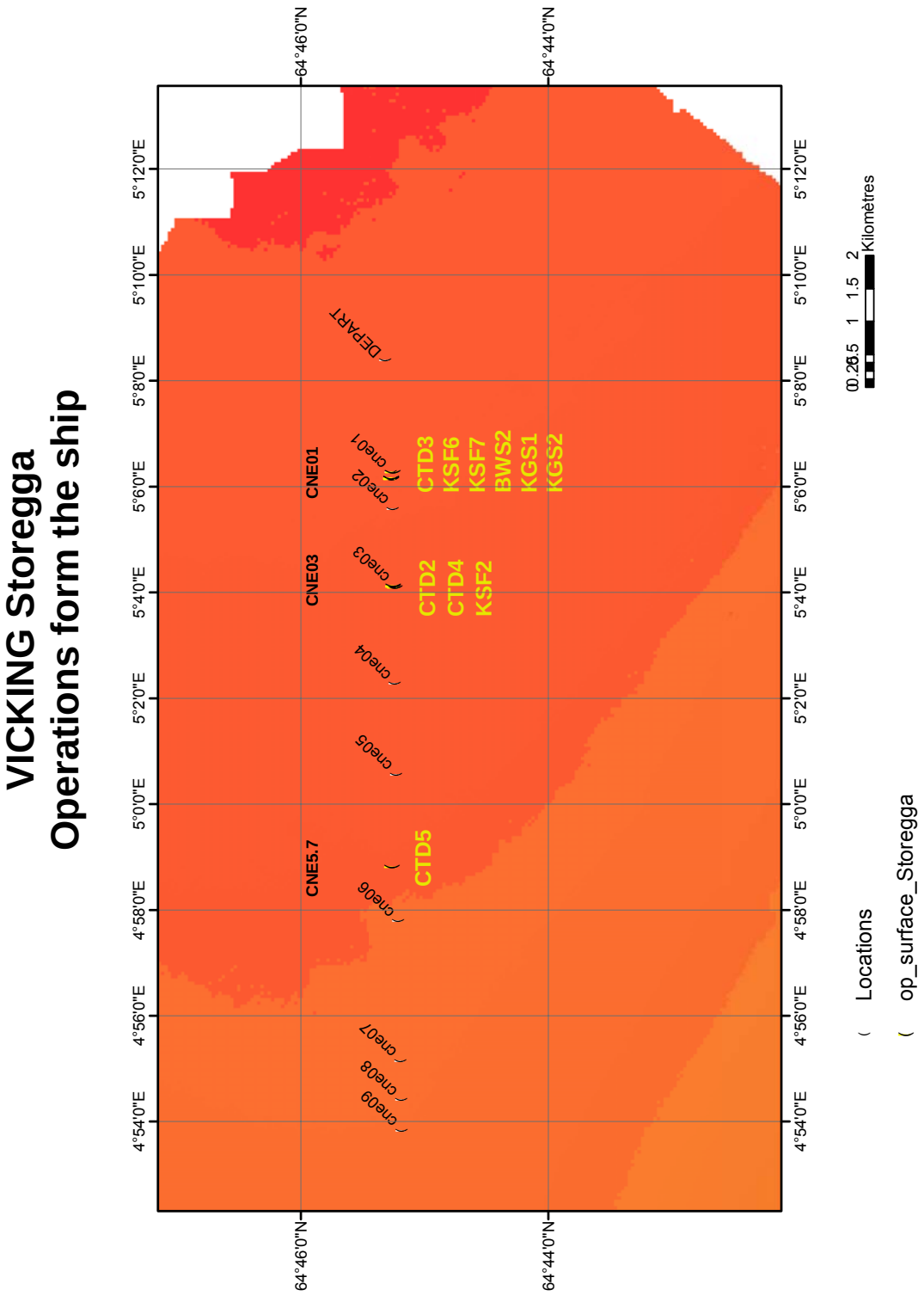
				0.3866	43.7446			Mosby							!!
Carottier Kullenberg Flux de chaleur	1	28/05/2006	06:51:49	N 64 40.040	E 05 17.3062	728	55	Storegga Nord Est			X				VKGKSF1-Gravity Corer with thermal probe-Bottom: 4,47m
Carottier Kullenberg Flux de chaleur	2	01/06/2006	16:43:34	N 64 45.263	E 05 4.1806	729	194	Storegga Nord Est			X				VKGKSF2-Gravity Corer with thermal probe-Bottom: 2,80 m
Carottier Kullenberg Flux de chaleur	3	05/06/2006	05:46:09	N 72 0.2947	E 14 43.7201	1271	321	Hakon Mosby			X				VKGKSF3-Gravity Corer with thermal probe-Bottom: hydrates de gaz sur toute la longueur de la carotte: 3 m
Carottier Kullenberg Flux de chaleur	4	07/06/2006	06:40:13	N 72 0.3051	E 14 43.6942	1271	211	Hakon Mosby			X				VKGKSF4-Gravity Corer with thermal probe-Bottom: 3,80 m
Carottier Kullenberg Flux de chaleur	5	09/06/2006	07:51:33	N 72 0.2714	E 14 43.5648	1272	296	Hakon Mosby			X				VKGKSF5-Gravity Corer with thermal probe-Bottom: 3 m
Carottier Kullenberg Flux de chaleur	6	13/06/2006	13:03:07	N 72 0.3071	E 14 43.7028			Hakon Mosby			X				VKGKSF6-Gravity Corer with thermal probe-Bottom: EMPTY
Carottier Kullenberg Flux de chaleur	7	13/06/2006	19:44:29	N 72 0.2905	E 14 43.4355			Hakon Mosby			X				VKGKSF7-Gravity Corer with thermal probe-Bottom: EMPTY
Carottier Kullenberg Flux de chaleur	8	13/06/2006	22:15:52	N 72 0.2947	E 14 43.7404			Hakon Mosby			X				VKGKSF8-Gravity Corer with thermal probe-Bottom: gas hydrate
Carottier Kullenberg Flux de chaleur	9	14/06/2006	02:23:14	N 72 0.3001	E 14 43.5758			Hakon Mosby			X				VKGKSF9-Gravity Corer with thermal probe-Bottom: EMPTY
Carottier Kullenberg Flux de chaleur	10	14/06/2006	05:32:56	N 72 0.2341	E 14 43.7549			Hakon Mosby			X				VKGKSF10-Gravity Corer with thermal probe-Bottom: EMPTY
Carottier Kullenberg Flux de chaleur	11	14/06/2006	09:01:09	N 72 0.2742	E 14 43.8544			Hakon Mosby			X				VKGKSF11-Gravity Corer with thermal probe-Bottom:
Carottier Kullenberg Flux de chaleur	12	14/06/2006	11:29:27	N 72 0.2652	E 14 43.9613			Hakon Mosby			X				VKGKSF12-Gravity Corer with thermal probe-Bottom:
Carottier Kullenberg Flux de chaleur	13	15/06/2006	01:58:45	N 72 0.1991	E 14 43.3256			Hakon Mosby			X				VKGKSF13-Gravity Corer with thermal probe-Bottom:
Carottier Kullenberg Flux de chaleur	14	15/06/2006	05:22:20	N 72 0.3822	E 14 44.0224			Hakon Mosby			X				VKGKSF14-Gravity Corer with thermal probe-Bottom:
Carottier Multitubes 12 tubes 57mm	1	23/05/2006	21:47:15	N 64 45.280	E 05 6.2182	720		Storegga Nord Est	X						VKGMTB1-Carottier Mutlitube MTB-Arrachement: BON
Carottier Multitubes 12 tubes 57mm	2	24/05/2006	07:31:47	N 64 45.284	E 05 6.2126	720		Storegga Nord Est	X						VKGMTB2-Carottier Mutlitube MTB-Arrachement: BON
Carottier Multitubes 12 tubes 57mm	3	27/05/2006	11:30:17	N 64 40.171	E 05 17.3860	719	75	Nyegga	X						VKGMTB3-Multicorer MTB-Arrachement: BON
Carottier Multitubes 12 tubes 57mm	4	05/06/2006	12:03:37	N 72 0.1600	E 14 43.9474	1273	270	Hakon Mosby	X						VKGMTB4-Multicorer MTB-Bottom:
Carottier Multitubes 12 tubes 57mm	5	07/06/2006	15:58:42	N 72 0.1765	E 14 43.9579	1272	222	Hakon Mosby	X						VKGMTB5-Multicorer MTB-Bottom: BON
Carottier Multitubes 12 tubes 57mm	6	07/06/2006	18:13:49	N 72 0.1672	E 14 43.9155	1273	210	Hakon Mosby	X						VKGMTB6-Multicorer MTB-Bottom: BON
Carottier Multitubes 12 tubes 57mm	7	08/06/2006	23:27:31	N 72 0.3032	E 14 46.0210	1258	231	Hakon Mosby	X						VKGMTB7-Multicorer MTB-Bottom: BON
Carottier Multitubes 12	8	10/06/2006	20:40:50	N 72	E 14	1273	245	Hakon	X						VKGMTB8-Multicorer MTB-Bottom:

tubes 57mm				0.2784	43.5639			Mosby							
Carottier usnel	1	23/05/2006	17:15:00	N 64 45.281	E 05 6.2172	742		Storegga Nord Est	X						VKGKGS1-Carottier Usnel KGS-Arrachement: BON
Carottier usnel	2	23/05/2006	20:36:03	N 64 45.281	E 05 6.2180	720		Storegga Nord Est	X						VKGKGS2-Carottier Usnel KGS-Arrachement: BON
Carottier usnel	3	27/05/2006	08:32:09	N 64 40.161	E 05 17.3798	720	24	Nyegga	X						VKGKGS3-Usnel Corer KGS-Arrachement: arrachement # 1 T : BON
Carottier usnel	4	27/05/2006	10:16:43	N 64 40.168	E 05 17.3909	719	50	Nyegga	X						VKGKGS4-Usnel Corer KGS-Arrachement: BON
Carottier usnel	5	05/06/2006	10:16:35	N 72 0.0785	E 14 43.3477	1270	280	Hakon Mosby	X						VKGKGS5-Usnel Corer KGS-Bottom:
Carottier usnel	6	07/06/2006	12:29:44	N 72 0.2544	E 14 43.5746	1273	237	Hakon Mosby	X						VKGKGS6-Usnel Corer KGS-Bottom: EMPTY
Carottier usnel	7	07/06/2006	13:38:50	N 72 0.2549	E 14 43.5739	1272	227	Hakon Mosby	X						VKGKGS7-Usnel Corer KGS-Bottom: BON
Carottier usnel	8	08/06/2006	21:59:31	N 72 0.3065	E 14 46.0215	1256	218	Hakon Mosby	X						VKGKGS8-Usnel Corer KGS-Bottom: EMPTY
Sondeur de sediments		24/05/2006	00:25:34	N 64 45.171	E 04 51.9453	720		Storegga Nord Est						X	VKGCHP1-chirp-fin de profil:
Sondeur de sediments		24/05/2006	02:06:29	N 64 45.347	E 05 9.1321	720		Storegga Nord Est						X	VKGCHP2-chirp-fin de profil:
Sondeur de sediments		24/05/2006	04:11:07	N 64 45.114	E 04 51.8753	720		Storegga Nord Est						X	VKGCHP3-chirp-fin de profil:
Sondeur de sediments		24/05/2006	05:27:20	N 64 46.428	E 05 7.0715	720		Storegga Nord Est						X	VKGCHP4-chirp-fin de profil:
Sondeur de sediments		24/05/2006	06:32:09	N 64 44.005	E 05 4.0241	720		Storegga Nord Est						X	VKGCHP5-chirp-fin de profil:
Sondeur de sediments		27/05/2006	22:09:52	N 64 45.705	E 05 3.1747	729	316	Storegga Nord Est						X	VKGCHP6-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		28/05/2006	01:03:42	N 64 43.985	E 05 6.3154	726	173	Storegga Nord Est						X	VKGCHP7-Chirp (Echo sondage vertical)-Ending profil: passing on cne01
Sondeur de sediments		28/05/2006	01:54:36	N 64 46.814	E 05 3.9707	725	335	Storegga Nord Est						X	VKGCHP8-Chirp (Echo sondage vertical)-Ending profil: passing on cne01
Sondeur de sediments		28/05/2006	02:44:46	N 64 43.953	E 05 4.1666	733	169	Storegga Nord Est						X	VKGCHP9-Chirp (Echo sondage vertical)-Ending profil: passing on cne03
Sondeur de sediments		28/05/2006	03:56:42	N 64 46.978	E 04 58.8747	745	176	Storegga Nord Est						X	VKGCHP10-Chirp (Echo sondage vertical)-Ending profil: passing on cne03
Sondeur de sediments		28/05/2006	04:31:26	N 64 43.933	E 04 58.8844	759	174	Storegga Nord Est						X	VKGCHP11-Chirp (Echo sondage vertical)-Ending profil: passing on cne5.7
Sondeur de sediments		30/05/2006	02:43:51	N 64 45.248	E 05 4.1697	727	21	Storegga Nord Est						X	VKGCHP12-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		31/05/2006	02:16:12	N 64 51.762	E 04 7.1106	1032	309	Storegga Nord Est						X	Ending Profile VKGCHP13
Sondeur de sediments		31/05/2006	03:23:29	N 64	E 04 9.3661	1018	3	Storegga						X	VKGCHP14-Chirp (Echo sondage vertical)-Ending profil:

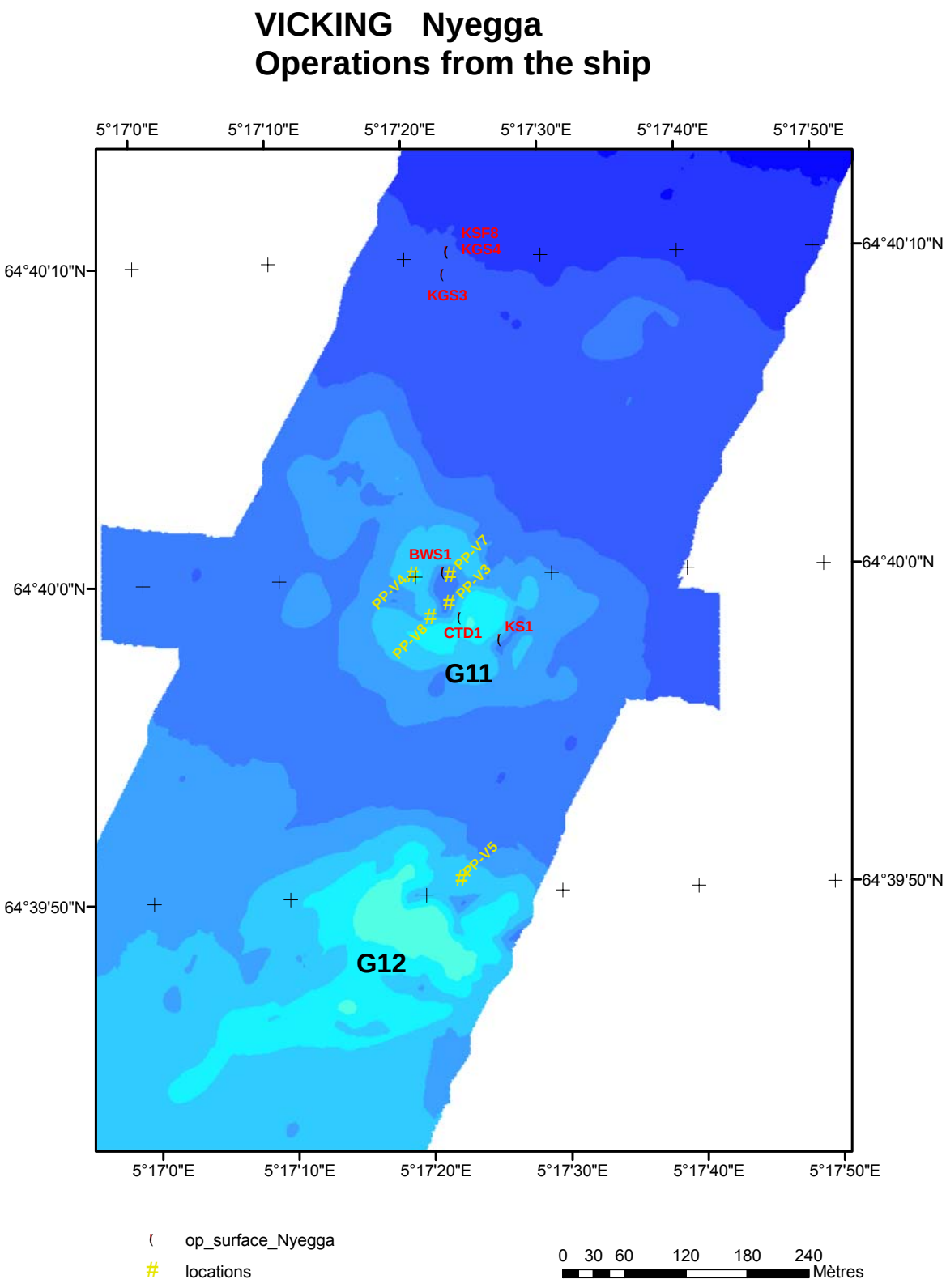
				52.203				Nord Est							passing on cne01 and cne02
Sondeur de sediments		31/05/2006	12:48:24	N 64 45.261	E 04 58.9031	755	331	Storegga Nord Est						X	VKGCHP15-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		03/06/2006	12:45:33	N 72 1.3094	E 14 45.2295	1254	17	Hakon Mosby						X	VKGCHP16-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		05/06/2006	16:20:12	N 72 0.3248	E 14 43.2214	1270	234	Hakon Mosby						X	VKGCHP17-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		07/06/2006	11:17:59	N 72 0.7438	E 14 43.1532	1277	98	Hakon Mosby						X	VKGCHP18-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		09/06/2006	04:34:23	N 72 0.3927	E 14 45.2770	1262	75	Hakon Mosby						X	VKGCHP19-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		09/06/2006	10:44:22	N 72 0.1698	E 14 45.0272	1271	262	Hakon Mosby						X	VKGCHP20-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		13/06/2006	18:02:24	N 71 59.225	E 14 42.8061			Hakon Mosby						X	VKGCHP21-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		14/06/2006	15:20:59	N 72 0.4748	E 14 43.8704			Hakon Mosby						X	VKGCHP22-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		14/06/2006	20:58:50	N 72 0.2145	E 14 44.6519			Hakon Mosby						X	VKGCHP23-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		14/06/2006	21:20:42	N 71 59.954	E 14 42.5171			Hakon Mosby						X	VKGCHP24-Chirp (Echo sondage vertical)-Ending profil:
Sondeur de sediments		14/06/2006	21:42:31	N 72 0.2779	E 14 44.6919			Hakon Mosby						X	VKGCHP25-Chirp (Echo sondage vertical)-Ending profil:

8.2. Maps of operations from the ship

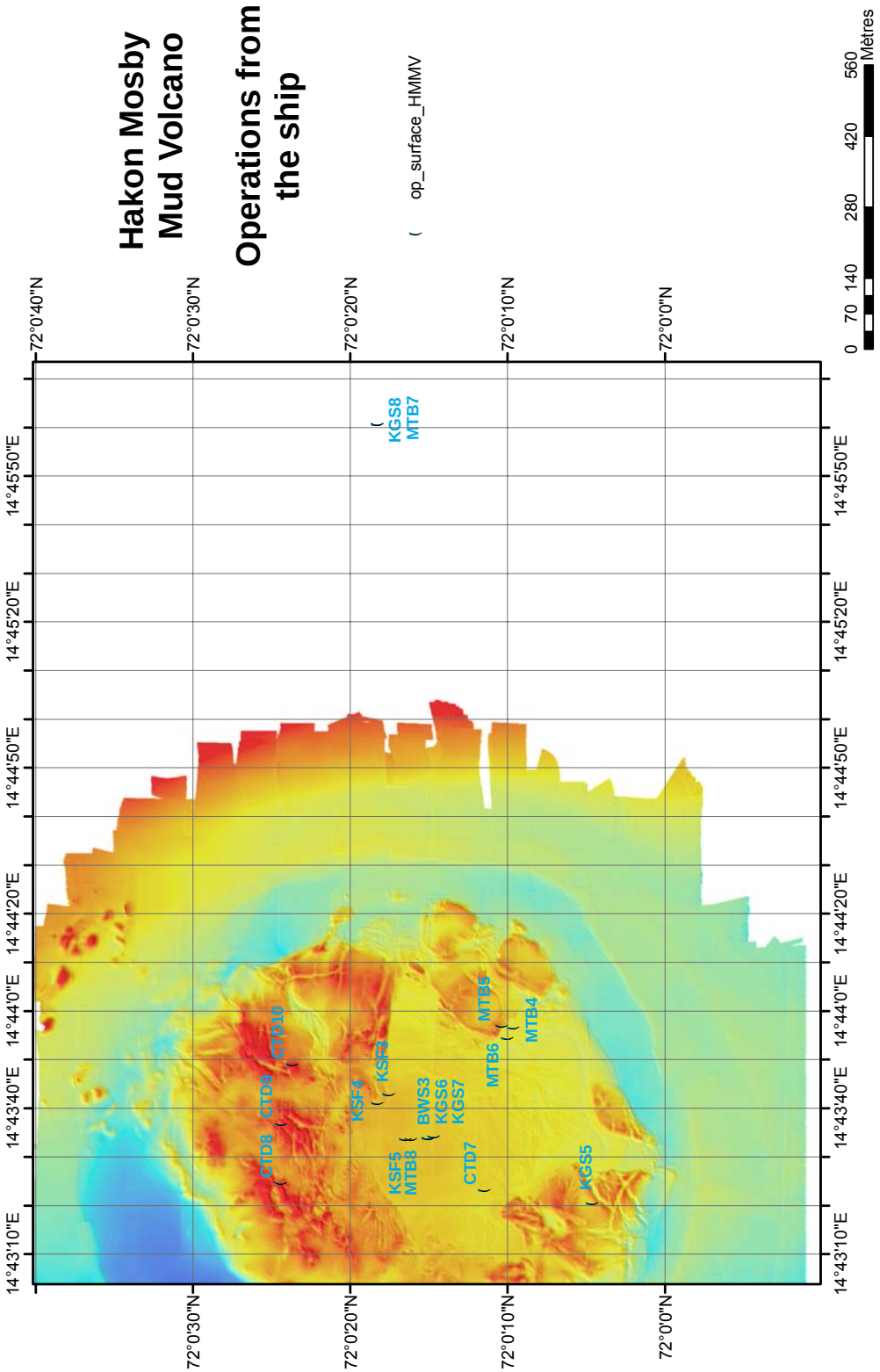
Storrega



Nyegga


VICKING Nyegga
Operations from the ship
5°17'0"E
5°17'10"E
5°17'20"E
5°17'30"E
5°17'40"E
5°17'50"E
64°40'10"N
64°40'0"N
64°39'50"N
KGS2
KGS4
KGS3
BWS1
PP-V7
PP-V4
PP-V3
PP-V6
CTD1
KS1
G11
PP-V5
G12
op_surface_Nyegga
locations
0 30 60 120 180 240
Mètres

Hakon Mosby


Hakon Mosby
Mud Volcano
Operations from
the ship
op_surface_HMMV
0 70 140 280 420 560
Metres
72°0'40"N
72°0'30"N
72°0'20"N
72°0'10"N
72°0'0"N
14°43'10"E
14°43'40"E
14°44'0"E
14°44'20"E
14°44'50"E
14°45'20"E
14°45'50"E
KGS8
MTB7
CTD10
CTD9
CTD8
KSF4
KSF3
KSF5
MTB8
BWS3
KGS6
KGS7
CTD7
MTB5
MTB6
MTB4
KGS5

8.3. Dives Chronological record

ALAMER : Résumé de plongée

Dive 271- 1 Chronological Progress on Storegga North East

VICKING
Plongée : 271- 1

Date : 21/05/2006
Observateurs :

Date	Heure	Observateurs
22/05/2006	00h00 - 04h00	FESEKER Thomas BOETIUS Antje
22/05/2006	04h00 - 08h00	FOUCHER Jean-Paul ANDERSEN Ann
22/05/2006	08h00 - 12h00	OLU - Le ROY Karine PIERRE Catherine
22/05/2006	12h00 - 16h00	TOFFIN Laurent FESEKER Thomas BOETIUS Antje SCHLUTER Michael
22/05/2006	16h00 - 20h00	FOUCHER Jean-Paul ANDERSEN Ann
22/05/2006	20h00 - 00h00	OLU - Le ROY Karine PIERRE Catherine
23/05/2006	00h00 - 04h00	BOETIUS Antje DE BEER Dirk FESEKER Thomas LICHTSCHLAG Anna
23/05/2006	04h00 - 08h00	ANDERSEN Ann FOUCHER Jean-Paul
23/05/2006	08h00 - 12h00	OLU - Le ROY Karine PIERRE Catherine
23/05/2006	12h00 - 16h00	BOETIUS Antje FESEKER Thomas

Dive 271.1.: Storegga slope
Station : **Storegga Nord Est** lat moy : N 64 38.5883 long moy : E 004 53.0192

Sites explorés :

Objectifs de la plongée :
Exploratory dive along a 19 miles long E-W transect between E5°09' and E4°48'crossing 17 seafloor geological structures (cne01 to cne17) identified as potential seep targets from subbottom profiler line (Hydratech 2002) .
Ideally, identify one active site for sampling and mapping and one inactive site for mapping only
Sampling protocol :
- PEP : sample each site (cne01 to cne14) + sample when evidence for activity
- Tube corer : 6 CT on 2 sites (bacterial mats)
- Slurp gun : if unusual density of fauna
- T probe : measure sites cne01 and cne03 (wake François up) + active sites
- Sample carbonates and large size fauna with grab (pince) and store in basket or GBTX
- Blade corer : at sites 10 to 14 if useful

- Markers : to be saved for very interesting sites...

Résumé manuel des travaux :

(1) Carbonate massifs with abundant macrofauna observed at several sites along the transect. Massifs have dimensions of meters to tens of meters.

(2) active seep not apparent on the subbottom profiler line discovered and sampled (site cne5.7)

Résumé automatique des travaux :
Samples
Biology :
ROV panier : 4 samples,
Grande Boite ROV : 4 samples,
Aspirateur bouteille : 7 samples,
Carottier a lame : 1 sample,
Water :
PEP bouteille : 19 samples,
Sediment :
ROV panier : 3 samples,
Grande Boite ROV : 2 samples,

231 pictures captured

Rapport de plongée :

Date	Heure	Localité	Latitude	Longitude	Prof (m)	N° Photo	Commentaires
22/05/2006	00:46:23	Storegga Nord Est			705	281	Arriving on the bottom, Antje and tom on shift, start dvd set 1
22/05/2006	01:01:55	Storegga Nord Est			705	282	During the entire shift until 02:00 the POSIDONIA positioning system did not work and therefore we had no information about the position of the ROV. It was decided to at least move the ship towards the first site of the transect, hoping that the problem could be solved during the transit. In addition, the part of the software that controls the DVD burners did not function properly, so the DVD burners had to be started manually when we reached the seafloor. At the beginnung of the dive, no pictures could be taken due to a malfunction of the image capturing software.
22/05/2006	01:04:14	Storegga Nord Est				002	very nice lonely gorgonocephale
22/05/2006	01:56:09	Storegga Nord Est				004	change of shift : Ann Anderson and Jean Paul Foucher
22/05/2006	01:57:09	Storegga				044	Beginning of monotonous transit with still

		Nord Est					no navigation, going toward site cne01
22/05/2006	02:33:11	Storegga Nord Est				007	Big crinoids are often seen from now until 5:35
22/05/2006	03:15:52	Storegga Nord Est				010	Bioturbation is important: holes, epifauna traces, white dots appeared to be stalked sponges.
22/05/2006	03:34:30	Storegga Nord Est				012	Small tadpole formed animals are swimming, white sea star seen
22/05/2006	03:42:10	Storegga Nord Est				014	We have found the navigation position: we are on the profile line between the start and point cne01
22/05/2006	03:52:53	Storegga Nord Est				017	The estimated position (on the profile line) and Buc Victor (close to the ship) are not in agreement
22/05/2006	04:01:39	Storegga Nord Est				018	Turbidity is important and the view at 3 m above the sediment with the principal camera is poor, only the vertical camera gives correct images, therefore not many digital photos are been taken
22/05/2006	04:02:50	Storegga Nord Est				019	Crinoids: at least 4 are visible in the mud
22/05/2006	04:06:01	Storegga Nord Est			708	020	Many burrow endings in the mud, navigation position still not sure
22/05/2006	04:07:23	Storegga Nord Est			709	021	Crinoids: two beautiful ones
22/05/2006	04:09:15	Storegga Nord Est			709	022	Small epifauna
22/05/2006	04:19:21	Storegga Nord Est	N 64 45.3411	E 005 07.5570	709	023	Crinoid: one . We are trying to localise the ROV and to navigate using Estime
22/05/2006	04:24:07	Storegga Nord Est	N 64 45.3409	E 005 07.5592	707	024	Victor ROV is moving towards the lest (weight) to get a precise initial localisation of the ROV, and we will then navigate using estime and go to point cne01 on the profile line
22/05/2006	04:28:32	Storegga Nord Est	N 64 45.3410	E 005 07.5583	664	025	We are at about 60-70 m above the sediment to move faster and find the lest.The camera is rotating to see the lest.
22/05/2006	04:36:56	Storegga Nord Est	N 64 45.3415	E 005 07.5532	661	026	The lest is seen in front
22/05/2006	04:38:45	Storegga Nord Est	N 64 45.3399	E 005 07.5562	667	027	We are at 15 m from the lest, the plancton is abundant, the turbidity is high
22/05/2006	04:41:57	Storegga Nord Est	N 64 45.3313	E 005 07.1860	664	028	We are approaching closer to the lest, we are at about 15 m lateral distance from the lest
22/05/2006	04:45:27	Storegga Nord Est				029	We are on the way to the first point of the profile cne01 at a speed of 0.5 m/sec and an altitude of 3 m or less
22/05/2006	04:49:24	Storegga Nord Est				030	GMT: 4h49 on the bottom start of profile observations
22/05/2006	04:50:25	Storegga Nord Est				031	We are 1km before reaching point cne01
22/05/2006	04:51:23	Storegga Nord Est				032	Bioturbation and crinoids present
22/05/2006	04:51:57	Storegga Nord Est				033	White tests present. They appear later to be stalked sponges
22/05/2006	04:53:56	Storegga Nord Est				036	The navigation is correct!

22/05/2006	05:04:53	Storegga Nord Est				040	Echinoderm: sea star orange in colour
22/05/2006	05:08:30	Storegga Nord Est				046	The vertical camera (DVD set 3) was on pause for unknown reason, this explain why the previous phtos are all the same, we started it again
22/05/2006	05:11:41	Storegga Nord Est				047	Holes and thin tubes sticking above the sediments
22/05/2006	05:13:20	Storegga Nord Est				049	Sparce vertical tubes
22/05/2006	05:14:51	Storegga Nord Est				050	The white test are supposed to be gastropods because of the trace they do on the surface when they move
22/05/2006	05:16:20	Storegga Nord Est				051	Thread long and thin = tube of pogonophoran ? lying on the surface?
22/05/2006	05:18:13	Storegga Nord Est				052	We are 300 m before cne01 and vertical tubes are seen out of the sediments (pogonophorans?)
22/05/2006	05:20:00	Storegga Nord Est				053	Traces of worms or other creeping animals at the surface of the mud
22/05/2006	05:21:21	Storegga Nord Est				054	We are at an immersion depht of 711 m corresponding to the depth of the profile
22/05/2006	05:24:45	Storegga Nord Est				055	Are the thead thin tubes pogonophora?
22/05/2006	05:38:42	Storegga Nord Est				062	Echinoderm: Ophiurid
22/05/2006	05:39:14	Storegga Nord Est				063	Fish swimming on the mud
22/05/2006	05:40:53	Storegga Nord Est				064	Vertical thread thin tubes Pogonophorans?
22/05/2006	05:41:35	Storegga Nord Est				065	Strange animal echinoderm? Gorgonocephale?
22/05/2006	05:44:10	Storegga Nord Est				067	Echinoderm small white starfish
22/05/2006	05:49:40	Storegga Nord Est	N 64 45.3195	E 005 06.4872	716	068	We had to change the DVD1 (set 3) because of a disc failure, so ther will be two DVD1 for the principal camera in set 3
22/05/2006	05:51:30	Storegga Nord Est	N 64 45.3252	E 005 06.3453	717	069	We should be on point cne01 as indicated by the navigation, but nothing special to see all look the same as before with bioturbation, crinoids, and stalked sponges
22/05/2006	05:57:34	Storegga Nord Est	N 64 45.3311	E 005 06.2333	718	070	We should be past the cne01 and we had to change again the DVD (set 3) for the vertical camera
22/05/2006	06:14:30	Storegga Nord Est	N 64 45.3294	E 005 06.1505	719	071	On the point cne01 (Karine and Catherine's shift). White sponges (with pedoncule) abundant at this site.
22/05/2006	06:15:20	Storegga Nord Est	N 64 45.3295	E 005 06.1489	719	072	On the same point, regularly distributed tubeworms (pogonophorans?) and small size concretions.
22/05/2006	06:24:59	Storegga Nord Est	N 64 45.3284	E 005 06.2092	719	073	PEP1 in a hole at site cne01
22/05/2006	06:32:16	Storegga Nord Est	N 64 45.3310	E 005 06.1563	719	075	PANIER 1: sampling a very long crinoide (with pedoncule) at site cne01. Animal is large and orange.
22/05/2006	06:40:48	Storegga	N 64	E 005	719	076	View of the basket with all cores.

		Nord Est	45.3316	06.1485			
22/05/2006	06:48:13	Storegga Nord Est	N 64 45.3317	E 005 06.1500	719	077	The crinoid is putted in the basket
22/05/2006	06:57:40	Storegga Nord Est	N 64 45.3317	E 005 06.1435	718	078	GBT3: indurated sediment at site cne01 (plus tube worms and sponges)
22/05/2006	07:02:59	Storegga Nord Est	N 64 45.3310	E 005 06.1455	718	079	An ophiurid on the sediment.
22/05/2006	07:05:16	Storegga Nord Est	N 64 45.3310	E 005 06.1457	719	080	GBT3 sampling tubeworm (pogonophora?) at site cne01
22/05/2006	07:09:03	Storegga Nord Est	N 64 45.3285	E 005 06.1450	719	081	GBT3 sponge sampled at site cne01.
22/05/2006	07:16:36	Storegga Nord Est	N 64 45.3283	E 005 06.1355	718	082	departure to point cne2
22/05/2006	07:19:22	Storegga Nord Est	N 64 45.3107	E 005 06.1077	718	083	Abundant crinoids, sponges, tubeworms, and ophiurids between points cne 1 and cne2 (up to 07:45).
22/05/2006	07:20:54	Storegga Nord Est	N 64 45.3016	E 005 06.0802	718	085	marine snow abundant, bottom highly bioturbated between cne1 and cne2
22/05/2006	07:34:41	Storegga Nord Est	N 64 45.2865	E 005 05.8341	717	086	Ophiurid Gorgonocephalus
22/05/2006	07:41:12	Storegga Nord Est	N 64 45.2875	E 005 05.6707	717	084	Small mound in front of Victor: arriving on cne2
22/05/2006	07:45:46	Storegga Nord Est	N 64 45.2816	E 005 05.6142	717	088	Carbonate pavements with ophiurids and crinoids
22/05/2006	07:48:33	Storegga Nord Est	N 64 45.2774	E 005 05.6122	718	089	Abundant comatules, sponges on the crusts
22/05/2006	08:00:21	Storegga Nord Est	N 64 45.2755	E 005 05.6107	717	090	Actinians were also seen on the crusts
22/05/2006	08:03:41	Storegga Nord Est	N 64 45.2759	E 005 05.6127	718	092	Ophiurid Gorgonocephalus with lasers.
22/05/2006	08:07:09	Storegga Nord Est	N 64 45.2773	E 005 05.6132	717	093	PEP 2 under the crust at site cne02 A pygnogonid.
22/05/2006	08:16:50	Storegga Nord Est	N 64 45.2776	E 005 05.6080	717	094	PANIER 2, large crust sampled at site cne02 : 271-CC1
22/05/2006	08:19:20	Storegga Nord Est	N 64 45.2782	E 005 05.6117	717	095	Crust sampled. Several animals are attached on it, comatules and others.
22/05/2006	08:25:58	Storegga Nord Est	N 64 45.2767	E 005 05.6052	717	096	The PP_V1 Marker is deposited. The operation failed, no marker fell down.
22/05/2006	08:28:45	Storegga Nord Est	N 64 45.2804	E 005 05.6130	717	097	Coming back to see if PP is deposited. It was ot possible to see it,because of resuspension of sediment.
22/05/2006	08:36:56	Storegga Nord Est	N 64 45.2764	E 005 05.6006	716	098	Re-starting exploration to point cne3
22/05/2006	08:38:10	Storegga Nord Est	N 64 45.2755	E 005 05.5983	717	099	No more carbonates, soft bottom.
22/05/2006	08:42:36	Storegga Nord Est	N 64 45.2685	E 005 05.5271	717	100	From cne 2 to cne 3 (09:38) : soft bottom with abundant bioturbation (tracks, "ronds de sorcière", holes of different sizes), sponges, tubes (polychaetes?).
22/05/2006	09:11:35	Storegga Nord Est	N 64 45.2737	E 005 05.0580	718	101	A fish (they are fairly rare).
22/05/2006	09:14:30	Storegga Nord Est	N 64 45.2695	E 005 05.0136	719	102	Echinid and its track. They seem to be not abundant, but are not easy to seen, as they rae of same colour than the seidiment.
22/05/2006	09:19:33	Storegga	N 64	E 005	719	103	More crinoids, ray.

		Nord Est	45.2782	04.8776			
22/05/2006	09:35:57	Storegga Nord Est	N 64 45.2665	E 005 04.2445	720	105	Arriving at less than 100m of cne3, more echinoderms, comatules and ophiurids.
22/05/2006	09:38:08	Storegga Nord Est	N 64 45.2713	E 005 04.1843	722	106	Arriving on cne 3.
22/05/2006	09:39:27	Storegga Nord Est	N 64 45.2758	E 005 04.1717	722	107	Carbonates bloks colonised by large size organisms.
22/05/2006	09:41:06	Storegga Nord Est	N 64 45.2771	E 005 04.1655	722	108	Blocks and ophiurids, comatules, sponges.
22/05/2006	09:42:08	Storegga Nord Est	N 64 45.2769	E 005 04.1641	722	109	Relativey large white gastropods (buccinids?) are visibles on the sediment.
22/05/2006	09:49:45	Storegga Nord Est	N 64 45.2815	E 005 04.1605	721	112	PEP3 on gastropds. at site cne03
22/05/2006	09:55:33	Storegga Nord Est	N 64 45.2813	E 005 04.1606	722	114	Gorgonocephalus and fish.
22/05/2006	10:05:12	Storegga Nord Est	N 64 45.2811	E 005 04.1619	722	115	Gorgonocephalus with lasers.
22/05/2006	10:11:09	Storegga Nord Est	N 64 45.2816	E 005 04.1594	722	116	tom and laurent begin shift
22/05/2006	10:19:49	Storegga Nord Est	N 64 45.2803	E 005 04.1598	722	117	dvds started manually due to malfunction of control program
22/05/2006	10:22:41	Storegga Nord Est	N 64 45.2811	E 005 04.1597	722	118	looking for a nice piece of crust to sample
22/05/2006	10:23:23	Storegga Nord Est	N 64 45.2814	E 005 04.1594	722	119	this piece of crust we are taking
22/05/2006	10:26:19	Storegga Nord Est	N 64 45.2798	E 005 04.1599	722	126	high quality photo taken of crust that is going to be sampled
22/05/2006	10:27:27	Storegga Nord Est	N 64 45.2803	E 005 04.1600	722	127	GBT21: sampling of carbonate crust with a comatule (and a snail) at site cne 03
22/05/2006	10:29:08	Storegga Nord Est	N 64 45.2805	E 005 04.1594	722	128	crust sampled
22/05/2006	10:37:22	Storegga Nord Est	N 64 45.2814	E 005 04.1584	722	125	GBT21 suite :caught a snail below the carbonate crust collected previously at site cne03
22/05/2006	10:40:58	Storegga Nord Est	N 64 45.2821	E 005 04.1551	721	131	try to slurp yellowish snail
22/05/2006	11:01:43	Storegga Nord Est	N 64 45.2793	E 005 04.1607	722	129	sampling failed
22/05/2006	11:10:09	Storegga Nord Est	N 64 45.2798	E 005 04.1609	722	132	PP-V01 we are going to leave a marker , is it in place?
22/05/2006	11:24:39	Storegga Nord Est	N 64 45.2878	E 005 04.0914	721	133	leaving site and continuing transect towards cne 04
22/05/2006	12:57:26	Storegga Nord Est	N 64 45.2418	E 005 02.3513	728	134	passed the center of cne 4 once, nothing spectacular
22/05/2006	13:11:50	Storegga Nord Est	N 64 45.2551	E 005 02.2433	729	135	forgotten to take PEP, return to no 4
22/05/2006	13:18:44	Storegga Nord Est	N 64 45.2530	E 005 02.3309	729	136	PEP4: on site cne 04
22/05/2006	13:28:01	Storegga Nord Est	N 64 45.2519	E 005 02.2787	729	137	continue with track to cne 5
22/05/2006	13:50:45	Storegga Nord Est	N 64 45.2546	E 005 01.6902	731	138	some worms on the sea floor , we will take a look what they are
22/05/2006	13:52:27	Storegga Nord Est	N 64 45.2556	E 005 01.6851	731	139	many sponges as well
22/05/2006	14:01:09	Storegga	N 64	E 005	731	140	Shift change JP Foucher and Ann and

		Nord Est	45.2578	01.6983			Saskia
22/05/2006	14:06:47	Storegga Nord Est	N 64 45.2681	E 005 01.6214	731	142	Many sponges and a sabellid worm seen but may be not on the photo
22/05/2006	14:13:03	Storegga Nord Est	N 64 45.2603	E 005 01.5241	732	144	We are stopping to sample some tubeworms we are between cne04 and cne05
22/05/2006	14:17:16	Storegga Nord Est	N 64 45.2596	E 005 01.5147	732	146	Tubeworm sample, probably sabellid polychaete
22/05/2006	14:22:55	Storegga Nord Est	N 64 45.2593	E 005 01.5152	732	148	Sabellidae placed in GBT22 : between cne 04 and cne 05
22/05/2006	14:31:38	Storegga Nord Est	N 64 45.2594	E 005 01.5146	732	149	grabbing two tiny tubeworms and the Sabellidae has its life save
22/05/2006	14:32:35	Storegga Nord Est	N 64 45.2588	E 005 01.5148	733	150	puting the tiny tubeworms in the same box GBT22 : between cne 04 and cne 05
22/05/2006	14:44:10	Storegga Nord Est	N 64 45.2587	E 005 01.5132	733	152	preparing to take the temperature of the water around the worms
22/05/2006	14:53:24	Storegga Nord Est	N 64 45.2573	E 005 01.5105	732	153	The thermometer has a problem (water inside the electric supply) so that the thermometer is disconnected no measure is possible.
22/05/2006	14:58:41	Storegga Nord Est	N 64 45.2567	E 005 01.5004	732	154	We start moving again towards point cne05
22/05/2006	15:38:11	Storegga Nord Est	N 64 45.2453	E 005 00.5850	736	155	We arrived at point cne05, no signs of special fauna at this site.
22/05/2006	15:56:31	Storegga Nord Est	N 64 45.2458	E 005 00.2986	737	156	Passed point 05, moving towards point 06, still the same sediment and associated fauna.
22/05/2006	16:51:34	Storegga Nord Est	N 64 45.2985	E 004 58.8738	746	157	Interesting site with carbonate crust (no indication of microbial mats), but abundant fauna of echinoderms (ophiuroidea) and gastropods between point 05 and 06 but not on the track line.
22/05/2006	17:03:00	Storegga Nord Est	N 64 45.2993	E 004 58.8736	746	158	PEP5 : on the site with carbonate crusts between point 05 and 06.
22/05/2006	17:16:08	Storegga Nord Est	N 64 45.2989	E 004 58.8705	746	159	GBT11 : Taking a sample of the soft carbonate crust : 271-CC-2, between point 05 and 06.
22/05/2006	17:19:19	Storegga Nord Est	N 64 45.2993	E 004 58.8758	746	160	Putting the carbonate crust in GBT 11
22/05/2006	17:22:51	Storegga Nord Est	N 64 45.2996	E 004 58.8707	745	161	Moving over the crust to get an idea of the dimensions.
22/05/2006	17:32:13	Storegga Nord Est	N 64 45.2875	E 004 58.8712	745	162	Back on the track line, moving towards point cne 06.
22/05/2006	17:34:19	Storegga Nord Est	N 64 45.2777	E 004 58.8761	746	163	other carbonate crust close to previous one
22/05/2006	17:39:47	Storegga Nord Est	N 64 45.2748	E 004 58.8805	747	165	Taking PEP 6 : between point 05 and 06.
22/05/2006	17:54:00	Storegga Nord Est	N 64 45.2757	E 004 58.8890	746	164	Moving back towards the track line.
22/05/2006	18:00:41	Storegga Nord Est	N 64 45.2733	E 004 58.8844	745	171	Karine end Catherine starting the shift
22/05/2006	18:07:17	Storegga Nord Est	N 64 45.2720	E 004 58.8838	746	166	carbonate mounds and fluid escapes?
22/05/2006	18:07:51	Storegga Nord Est	N 64 45.2718	E 004 58.8844	746	167	abundant fauna of tube worms, gastropods, bacterial mats
22/05/2006	18:19:09	Storegga Nord Est	N 64 45.2714	E 004 58.8812	745	168	PEP 7 on sediment black, between point 05 and 06. gastropods? (reds) , pogonophorans around on crusts

22/05/2006	18:22:54	Storegga Nord Est	N 64 45.2713	E 004 58.8801	745	169	PEP 8 between point 05 and 06. under crust gastropods? , pogonophorans
22/05/2006	18:31:22	Storegga Nord Est	N 64 45.2707	E 004 58.8814	745	172	ASPI 2: gastéros rouges + cervette between point 05 and 06.
22/05/2006	18:35:36	Storegga Nord Est	N 64 45.2705	E 004 58.8839	745	173	ASPI 3 bacterial filaments? (hard to sample), strongly attached, and one gastropod (red) living between point 05 and 06.
22/05/2006	18:45:52	Storegga Nord Est	N 64 45.2703	E 004 58.8808	745	174	CL6 : trying to sample pogonophorans, between point 05 and 06.
22/05/2006	19:00:33	Storegga Nord Est	N 64 45.2706	E 004 58.8825	745	175	(CT5) not achieved because below the sediment there was hard crust
22/05/2006	19:08:39	Storegga Nord Est	N 64 45.2780	E 004 58.8846	746	176	searching a site with bacterial mats to sample cores
22/05/2006	19:18:31	Storegga Nord Est	N 64 45.2712	E 004 58.8838	746	177	We decide to give up because we did not find a good place for CT (Push core). We decide to sample a crust.
22/05/2006	19:21:21	Storegga Nord Est	N 64 45.2710	E 004 58.8828	745	178	PANIER 3 : a crust is sampled (thin) 271-CC3, between point 05 and 06
22/05/2006	19:25:58	Storegga Nord Est	N 64 45.2711	E 004 58.8817	746	179	PANIER 3 : another crust, between point 05 and 06.
22/05/2006	19:40:54	Storegga Nord Est	N 64 45.2519	E 004 58.8877	745	180	re-starting the profile in the direction of point cne 6
22/05/2006	19:41:55	Storegga Nord Est	N 64 45.2432	E 004 58.8722	744	181	bioturbated bottom, sponges (whites with pedoncule, rounds), and may be other sponges (white, tube-like)
22/05/2006	20:10:04	Storegga Nord Est	N 64 45.2240	E 004 57.9372	750	182	80 m of point cne6
22/05/2006	20:14:02	Storegga Nord Est	N 64 45.2235	E 004 57.8163	750	183	POINT CNE 6 : nothing special
22/05/2006	21:21:26	Storegga Nord Est	N 64 45.2023	E 004 55.6577	756	184	A fish hidden under a stone
22/05/2006	21:36:22	Storegga Nord Est	N 64 45.2021	E 004 55.2041	758	185	Arrival on cne07
22/05/2006	21:37:09	Storegga Nord Est	N 64 45.1984	E 004 55.2011	758	186	This site is composed of a crusted sea floor covered by gasteropods, some of the are dead
22/05/2006	21:43:49	Storegga Nord Est	N 64 45.1925	E 004 55.1932	759	187	Some very nice ophiuridae are located on the top of the crusts
22/05/2006	21:44:33	Storegga Nord Est	N 64 45.1930	E 004 55.1930	758	188	Accumulation of gastropods
22/05/2006	21:54:21	Storegga Nord Est	N 64 45.1928	E 004 55.1998	758	189	Deposition of marker PP-V02 (we thought it was PP-V03, but no) at site cne07
22/05/2006	21:57:39	Storegga Nord Est	N 64 45.1936	E 004 55.2077	758	190	The marker is not located at the right place, we pick it up to locate it correctly.
22/05/2006	22:10:04	Storegga Nord Est	N 64 45.1930	E 004 55.1959	759	192	Marker PP-V02 in the gastropods at site cne07
22/05/2006	22:15:10	Storegga Nord Est	N 64 45.1935	E 004 55.1896	759	193	new shift. antje boetius
22/05/2006	22:20:15	Storegga Nord Est	N 64 45.1932	E 004 55.1956	758	194	PEP9 : 10 cm above seafloor at site cne 7
22/05/2006	22:26:59	Storegga Nord Est	N 64 45.1932	E 004 55.1955	758	195	trying to find carbonate below gastropods by with the rov arm
22/05/2006	22:51:57	Storegga Nord Est	N 64 45.2026	E 004 55.1678	758	196	starting to follow the track again, going from cne 7 to cne 8
22/05/2006	23:01:54	Storegga	N 64	E 004	759	197	many trails, some polychaets, some starfish,

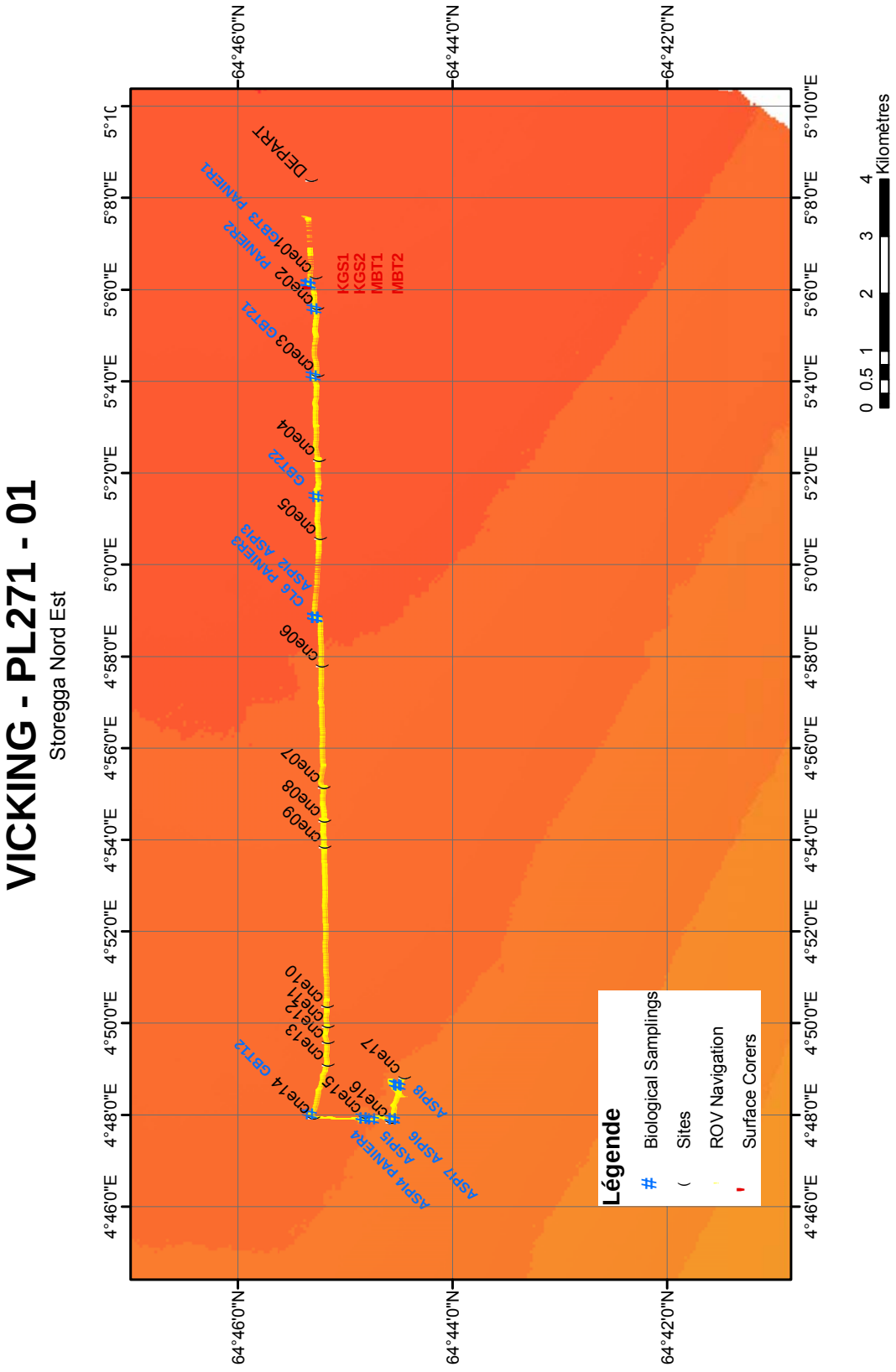
		Nord Est	45.2079	54.8687			burrows, some sponges
22/05/2006	23:26:23	Storegga Nord Est	N 64 45.1916	E 004 54.4421	761	198	arrival at site cne 8
22/05/2006	23:43:17	Storegga Nord Est	N 64 45.1964	E 004 54.4603	761	199	wrong comment: landing cne 8
22/05/2006	23:45:43	Storegga Nord Est	N 64 45.1965	E 004 54.4584	761	200	PEP 10 at site cne 8
22/05/2006	23:51:04	Storegga Nord Est	N 64 45.1965	E 004 54.4583	761	201	continuing track to site cne 9
23/05/2006	00:08:16	Storegga Nord Est	N 64 45.2013	E 004 54.1855	762	202	Tom and Dirk started their shift
23/05/2006	00:27:18	Storegga Nord Est	N 64 45.1945	E 004 53.8863	763	203	Arrival at structure 9.
23/05/2006	00:31:44	Storegga Nord Est	N 64 45.1966	E 004 53.8619	763	204	following the edge of mount in circle
23/05/2006	00:38:50	Storegga Nord Est	N 64 45.1919	E 004 53.8671	763	205	PEP 11: sampled near the center of the structure, at site cne09
23/05/2006	00:39:25	Storegga Nord Est	N 64 45.1918	E 004 53.8680	763	206	Center very low in bionumbers
23/05/2006	00:47:56	Storegga Nord Est	N 64 45.1949	E 004 53.8888	763	207	we proceed further inspection direction North, to make an 8, at site cne09
23/05/2006	00:54:48	Storegga Nord Est	N 64 45.1985	E 004 53.8675	762	208	now follow again the transect toward site cne10
23/05/2006	01:55:31	Storegga Nord Est	N 64 45.1835	E 004 52.8578	767	209	Next team takes over (Jean-Paul and Ann)
23/05/2006	02:14:22	Storegga Nord Est	N 64 45.1841	E 004 52.4077	770	210	stalked sponges, sabellidae, ophiures, star fishes, white octocorallia, small fishes on "normal"seafloor
23/05/2006	03:13:18	Storegga Nord Est	N 64 45.1702	E 004 50.5315	780	211	concretion massif 100m before site cne10
23/05/2006	03:27:10	Storegga Nord Est	N 64 45.1700	E 004 50.5303	780	213	cnidaria, neogasteropod, white sponges on carbonate at site cne10
23/05/2006	03:46:36	Storegga Nord Est	N 64 45.1702	E 004 50.3229	782	212	carbonate massif 70 m after 10
23/05/2006	04:09:36	Storegga Nord Est	N 64 45.1728	E 004 49.9864	782	214	Arriving at site cne11, a concretion of - - - larger size and extremly flat, size 15-20 cm large, hight of about 1m
23/05/2006	04:22:03	Storegga Nord Est	N 64 45.1799	E 004 49.8403	783	215	on the way to cne12, another flat concretion
23/05/2006	04:45:25	Storegga Nord Est	N 64 45.1689	E 004 49.5304	785	216	on the way to cne13, nothing special
23/05/2006	05:12:42	Storegga Nord Est	N 64 45.1832	E 004 49.0019	789	217	on way to cne14. After nothing at cne13.
23/05/2006	05:34:09	Storegga Nord Est	N 64 45.2497	E 004 48.4975	787	218	Many thin tubes sticking out from the mud
23/05/2006	05:46:21	Storegga Nord Est	N 64 45.3061	E 004 48.0765	789	219	70 m before 14. Carbonate mound.
23/05/2006	06:09:20	Storegga Nord Est	N 64 45.3173	E 004 48.0510	789	220	at 40m before cne14
23/05/2006	06:11:47	Storegga Nord Est	N 64 45.3159	E 004 48.0525	789	221	gastropods seem to be dead, echinid? at the base of a large carbonate mound with multilayered crust
23/05/2006	06:15:58	Storegga Nord Est	N 64 45.3142	E 004 48.0520	790	222	PEP 12 : 40m before cne14
23/05/2006	06:22:57	Storegga Nord Est	N 64 45.3151	E 004 48.0546	789	223	GBT12 : sampling gastropods 40m before cne14

23/05/2006	06:25:39	Storegga Nord Est	N 64 45.3151	E 004 48.0536	790	224	Two gastropods: one large white buccinidae and one smaller orange
23/05/2006	06:29:34	Storegga Nord Est	N 64 45.3155	E 004 48.0545	789	225	zoanthaire?
23/05/2006	06:34:04	Storegga Nord Est	N 64 45.3151	E 004 48.0553	789	226	amphipods?
23/05/2006	06:39:21	Storegga Nord Est	N 64 45.3151	E 004 48.0544	789	228	GBT13: friable crust, seems oxidized: sampled: 271-CC4 40m before cne14
23/05/2006	06:43:40	Storegga Nord Est	N 64 45.3150	E 004 48.0556	789	229	sediment under the crust sampled
23/05/2006	06:45:31	Storegga Nord Est	N 64 45.3147	E 004 48.0558	789	230	boarder of the crust, oxidized (red), sponges
23/05/2006	06:49:16	Storegga Nord Est	N 64 45.3160	E 004 48.0553	789	231	general view of a carbonate mound
23/05/2006	06:50:56	Storegga Nord Est	N 64 45.3182	E 004 48.0531	788	232	Continuing the route toward next point :cne 14
23/05/2006	06:58:25	Storegga Nord Est	N 64 45.3062	E 004 47.9725	790	233	Arriving on cne 14 (we were at 40 m of the point at the last sampling site)
23/05/2006	07:11:10	Storegga Nord Est	N 64 45.2616	E 004 47.9821	790	234	Still flat ans soft bottom. very few megafauna
23/05/2006	08:17:04	Storegga Nord Est	N 64 44.9128	E 004 47.9602	796	235	gorgonus ? sponge
23/05/2006	08:29:12	Storegga Nord Est	N 64 44.9127	E 004 47.9632	796	237	PEP 13 sampling at cne14
23/05/2006	08:33:50	Storegga Nord Est	N 64 44.9130	E 004 47.9638	796	238	carbonate crust removed up side down
23/05/2006	08:37:47	Storegga Nord Est	N 64 44.9127	E 004 47.9619	796	241	leaving site cne14
23/05/2006	08:47:17	Storegga Nord Est	N 64 44.8545	E 004 47.9051	797	239	on the road to approach CNE15
23/05/2006	08:51:31	Storegga Nord Est	N 64 44.8367	E 004 47.8876	797	240	first observation of carbonate crust
23/05/2006	08:54:51	Storegga Nord Est	N 64 44.8330	E 004 47.8957	797	242	gorgono cephalus on carbonate mound
23/05/2006	08:56:36	Storegga Nord Est	N 64 44.8326	E 004 47.8973	797	243	second Gorgono sp.
23/05/2006	09:05:19	Storegga Nord Est	N 64 44.8329	E 004 47.9019	796	244	PEP 14 sampling at site cne15 close to Gorgona and crust
23/05/2006	09:14:01	Storegga Nord Est	N 64 44.8323	E 004 47.9052	797	245	PEP 15 sampling at site cne15 in gasteropode field close to gorgona sp.
23/05/2006	09:33:50	Storegga Nord Est	N 64 44.8211	E 004 47.9626	797	247	PEP 16 sampling at site cne15 of carbonate mound
23/05/2006	09:39:42	Storegga Nord Est	N 64 44.8210	E 004 47.9615	797	248	ASPI4 : at site cne15 vaccum pump of gasteropodes and shrump
23/05/2006	09:44:50	Storegga Nord Est	N 64 44.8211	E 004 47.9632	797	249	red colored carbonate crust at bottom of picture after pumping
23/05/2006	09:50:48	Storegga Nord Est	N 64 44.8215	E 004 47.9611	797	250	carbonate crust removed up side down
23/05/2006	09:53:38	Storegga Nord Est	N 64 44.8220	E 004 47.9628	797	251	patella sp. below carbonate crust
23/05/2006	09:55:48	Storegga Nord Est	N 64 44.8222	E 004 47.9644	797	252	PANIER 4 : sampling at site cne15 of carbonate crust 271-CC5 and attached patella sp. inside the carbonate
23/05/2006	10:02:01	Storegga Nord Est	N 64 44.8216	E 004 47.9636	797	253	Tom and Antje begin shift, going to site cne 16

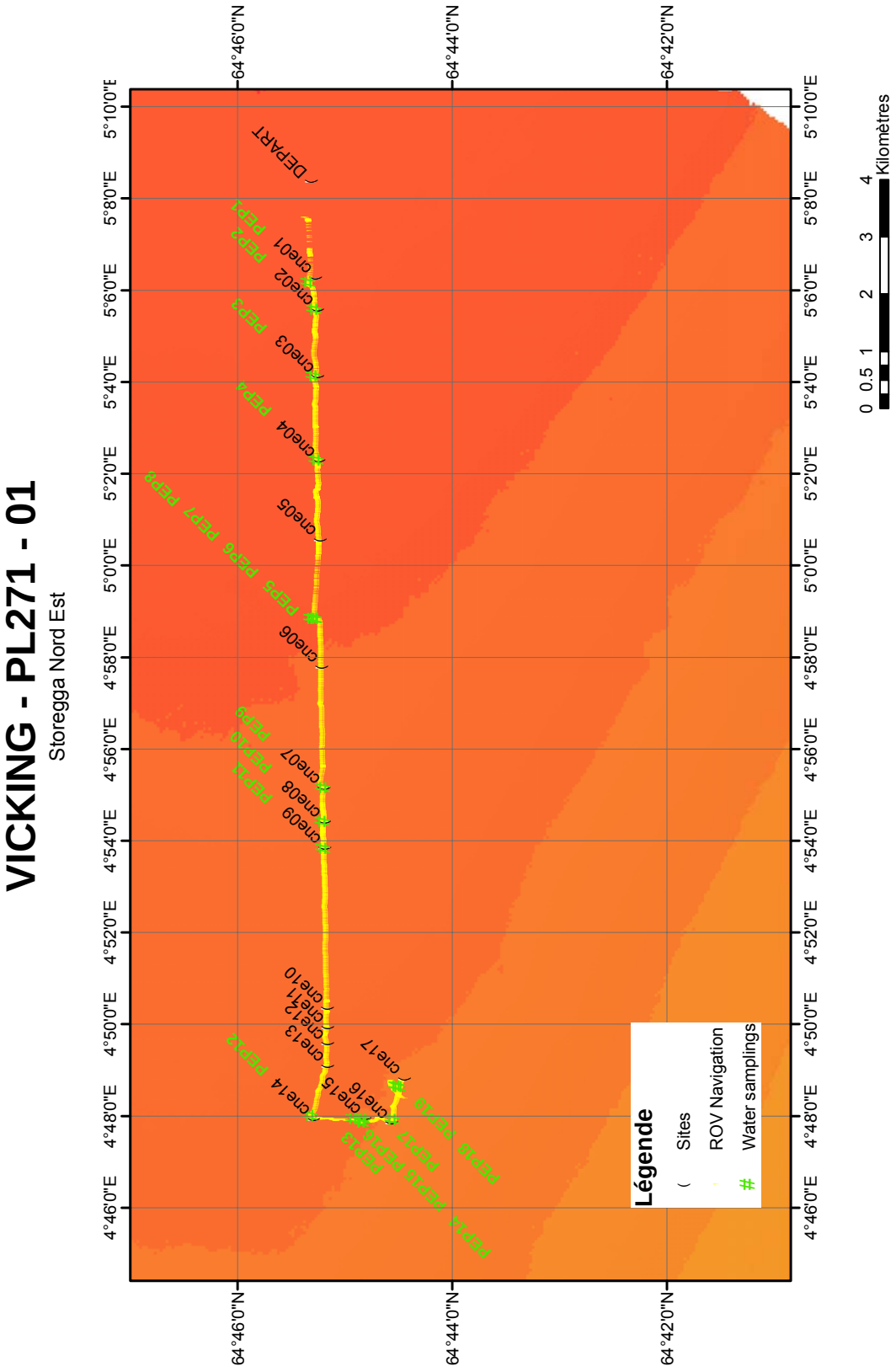
23/05/2006	10:13:43	Storegga Nord Est	N 64 44.7379	E 004 47.9243	796	254	sonar shows large structure ahead
23/05/2006	10:14:43	Storegga Nord Est	N 64 44.7369	E 004 47.9279	796	255	carbonate structure between points 15 and 16
23/05/2006	10:19:55	Storegga Nord Est	N 64 44.7328	E 004 47.9327	796	256	following the egde of carbonate mound
23/05/2006	10:22:35	Storegga Nord Est	N 64 44.7344	E 004 47.9319	796	257	white sponge? cnidaria?
23/05/2006	10:30:44	Storegga Nord Est	N 64 44.7339	E 004 47.9333	796	258	going to try to slurp yellow thing (sponge?)\n
23/05/2006	10:35:06	Storegga Nord Est	N 64 44.7347	E 004 47.9353	796	259	ASPI 5 : trying to slurp the yellow fauna, betwween saite cne15 and cne 16
23/05/2006	10:44:38	Storegga Nord Est	N 64 44.7334	E 004 47.9333	796	260	continuing transect towards site 16
23/05/2006	10:53:27	Storegga Nord Est	N 64 44.6950	E 004 47.9799	797	261	another structure ahead
23/05/2006	11:02:21	Storegga Nord Est	N 64 44.6622	E 004 47.9935	796	262	one more mound
23/05/2006	11:14:20	Storegga Nord Est	N 64 44.5569	E 004 47.9376	799	263	no structure at site 16, approaching a large sonar reflection SE
23/05/2006	11:35:32	Storegga Nord Est	N 64 44.5448	E 004 47.9448	798	264	PEP 17 at carbonate mound near site cne16, ca. 20 cm above seafloor
23/05/2006	11:40:59	Storegga Nord Est	N 64 44.5440	E 004 47.9435	798	266	we will try to slurp a hydrozoa thing
23/05/2006	11:42:52	Storegga Nord Est	N 64 44.5440	E 004 47.9426	798	267	tryng to slurp this hydrozoa
23/05/2006	11:43:46	Storegga Nord Est	N 64 44.5443	E 004 47.9431	798	268	ASPI 6: at site cne16, cnidaria
23/05/2006	11:48:50	Storegga Nord Est	N 64 44.5438	E 004 47.9448	798	269	ASPI 7: at site cne16, gastropods? and crusts
23/05/2006	11:55:37	Storegga Nord Est	N 64 44.5431	E 004 47.9450	797	270	continuing transect towards site cne17
23/05/2006	12:10:35	Storegga Nord Est	N 64 44.5511	E 004 48.2366	797	271	arriving at a mound N of the transect
23/05/2006	12:27:33	Storegga Nord Est	N 64 44.4996	E 004 48.5129	798	272	no sponges, but still many borrows
23/05/2006	12:37:17	Storegga Nord Est	N 64 44.4890	E 004 48.6570	800	273	carbonate mound 160 m before site cne17
23/05/2006	12:38:03	Storegga Nord Est	N 64 44.4880	E 004 48.6668	799	274	carbonate mound 16 m before site cne17
23/05/2006	12:51:17	Storegga Nord Est	N 64 44.4873	E 004 48.7054	800	275	nothing at site cne17, returning to the mound seen just before
23/05/2006	12:57:13	Storegga Nord Est	N 64 44.4861	E 004 48.6608	800	276	arrived at previously observed mound, looking for a nice spot to sample water and slurp some snails
23/05/2006	13:06:05	Storegga Nord Est	N 64 44.4885	E 004 48.6691	800	277	PEP 18 : at mound 160m before cne17
23/05/2006	13:16:02	Storegga Nord Est	N 64 44.4882	E 004 48.6682	800	278	ASPI 8 : at mound 160m before cne17
23/05/2006	13:25:20	Storegga Nord Est	N 64 44.5110	E 004 48.6944	799	279	PEP 19 will be used for reference
23/05/2006	13:33:49	Storegga Nord Est	N 64 44.5136	E 004 48.6973	799	280	end of dive, beginning of rise to surface

Dive 271-1 Maps

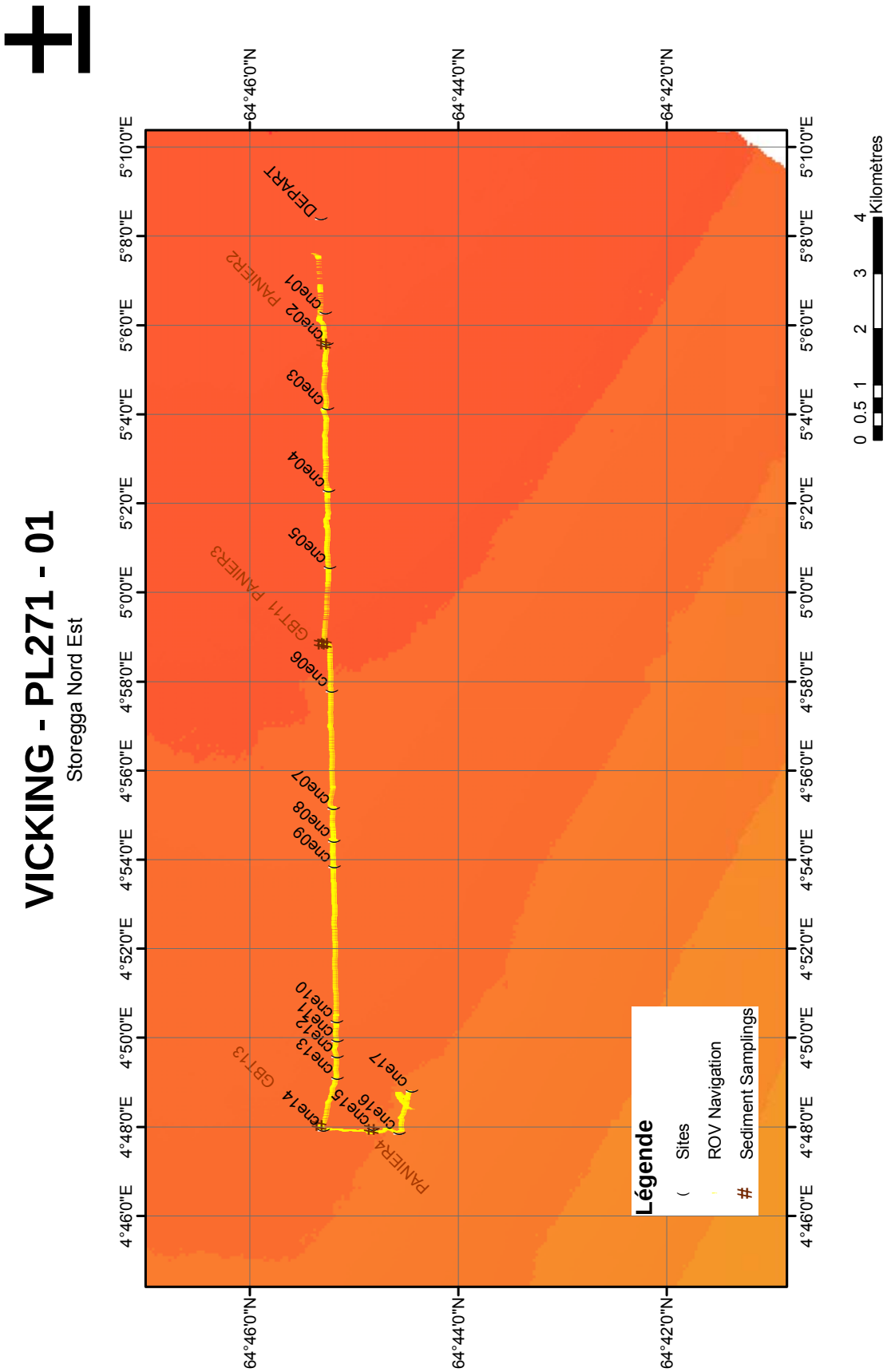
Biological Samples



Water Samples



Sediment Samples


VICKING - PL271 - 01
Storegga Nord Est
DEPART
cne01
cne02
cne03
cne04
cne05
cne06
cne07
cne08
cne09
cne10
cne11
cne12
cne13
cne14
cne15
cne16
cne17
PANIER2
GBT11
PANIER3
GBT13
PANIER4
Légende
Sites
ROV Navigation
Sediment Samplings
64°46'0"N
64°44'0"N
64°42'0"N
4°46'0"E
4°48'0"E
4°50'0"E
4°52'0"E
4°54'0"E
4°56'0"E
4°58'0"E
5°0'0"E
5°2'0"E
5°4'0"E
5°6'0"E
5°8'0"E
5°10'0"E
0 0.5 1 2 3 4
Kilomètres

Dive 271- 1 Operations list

Equipement	No	Date	Heure	Latitude	Longitude	Prof	Cap	Localite	Ech_Bio	Chimie	Sed	Mes	Photo	Fic	Commentaires
Aspirateur bouteille	2	22/05/2006	18:31:22	N 64 45.2707	E 004 58.8814	745	259	Storegga Nord Est	X				172		ASPI 2: gastéros rouges + cervette between point 05 and 06.
Aspirateur bouteille	3	22/05/2006	18:35:36	N 64 45.2705	E 004 58.8839	745	259	Storegga Nord Est	X				173		ASPI 3 bacterial filaments? (hard to sample), strongly attached, and one gastropod (red) living between point 05 and 06.
Aspirateur bouteille	4	23/05/2006	09:39:42	N 64 44.8210	E 004 47.9615	797	151	Storegga Nord Est	X				248		ASPI4 : at site cne15 vaccum pump of gasteropodes and shrump
Aspirateur bouteille	5	23/05/2006	10:35:06	N 64 44.7347	E 004 47.9353	796	93	Storegga Nord Est	X				259		ASPI 5 : trying to slurp the yellow fauna, betwween saite cne15 and cne 16
Aspirateur bouteille	6	23/05/2006	11:43:46	N 64 44.5443	E 004 47.9431	798	87	Storegga Nord Est	X				268		ASPI 6: at site cne16, cnidaria
Aspirateur bouteille	7	23/05/2006	11:48:50	N 64 44.5438	E 004 47.9448	798	87	Storegga Nord Est	X				269		ASPI 7: at site cne16, gastropods? and crusts
Aspirateur bouteille	8	23/05/2006	13:16:02	N 64 44.4882	E 004 48.6682	800	138	Storegga Nord Est	X				278		ASPI 8 : at mound 160m before cne17
Carottier a lame	6	22/05/2006	18:45:52	N 64 45.2703	E 004 58.8808	745	259	Storegga Nord Est	X				174		CL6 : trying to sample pogonophorans, between point 05 and 06.
Grande Boite ROV	3	22/05/2006	06:57:40	N 64 45.3317	E 005 06.1435	718	259	Storegga Nord Est	X				078		GBT3: indurated sediment at site cne01 (plus tube worms and sponges)
Grande Boite ROV	11	22/05/2006	17:16:08	N 64 45.2989	E 004 58.8705	746	284	Storegga Nord Est			X		159		GBT11 : Taking a sample of the soft carbonate crust : 271-CC-2, between point 05 and 06.
Grande Boite ROV	12	23/05/2006	06:22:57	N 64 45.3151	E 004 48.0546	789	181	Storegga Nord Est	X				223		GBT12 : sampling gastropods 40m before cne14
Grande Boite ROV	13	23/05/2006	06:39:21	N 64 45.3151	E 004 48.0544	789	201	Storegga Nord Est			X		228		GBT13: friable crust, seems oxidized: sampled: 271-CC4 40m before cne14
Grande Boite ROV	21	22/05/2006	10:27:27	N 64 45.2803	E 005 04.1600	722	293	Storegga Nord Est	X				127		GBT21: sampling of carbonate crust with a comatule (and a snail) at site cne 03
Grande Boite ROV	22	22/05/2006	14:22:55	N 64 45.2593	E 005 01.5152	732	254	Storegga Nord Est	X				148		Sabellidae placed in GBT22 : between cne 04 and cne 05
PEP bouteille	1	22/05/2006	06:24:59	N 64 45.3284	E 005 06.2092	719	259	Storegga Nord Est		X			073		PEP1 in a hole at site cne01
PEP bouteille	2	22/05/2006	08:07:09	N 64 45.2773	E 005 05.6132	717	240	Storegga Nord Est		X			093		PEP 2 under the crust at site cne02 A pygnogonid.
PEP bouteille	3	22/05/2006	09:49:45	N 64 45.2815	E 005 04.1605	721	294	Storegga Nord Est		X			112		PEP3 on gastropds. at site cne03
PEP bouteille	4	22/05/2006	13:18:44	N 64 45.2530	E 005 02.3309	729	103	Storegga Nord Est		X			136		PEP4: on site cne 04
PEP bouteille	5	22/05/2006	17:03:00	N 64 45.2993	E 004 58.8736	746	307	Storegga Nord Est		X			158		PEP5 : on the site with carbonate crusts between point 05 and 06.
PEP bouteille	6	22/05/2006	17:39:47	N 64 45.2748	E 004 58.8805	747	143	Storegga Nord Est		X			165		Taking PEP 6 : between point 05 and 06.
PEP bouteille	7	22/05/2006	18:19:09	N 64	E 004	745	258	Storegga		X			168		PEP 7 on sediment black, between point 05 and 06. gastropods? (reds) ,

				45.2714	58.8812			Nord Est							pogonophorans around on crusts
PEP bouteille	8	22/05/2006	18:22:54	N 64 45.2713	E 004 58.8801	745	259	Storegga Nord Est		X			169		PEP 8 between point 05 and 06. under crust gastropods? , pogonophorans
PEP bouteille	9	22/05/2006	22:20:15	N 64 45.1932	E 004 55.1956	758	280	Storegga Nord Est		X			194		PEP9 : 10 cm above seafloor at site cne 7
PEP bouteille	10	22/05/2006	23:45:43	N 64 45.1965	E 004 54.4584	761	174	Storegga Nord Est		X			200		PEP 10 at site cne 8
PEP bouteille	11	23/05/2006	00:38:50	N 64 45.1919	E 004 53.8671	763	180	Storegga Nord Est		X			205		PEP 11: sampled near the center of the structure, at site cne09
PEP bouteille	12	23/05/2006	06:15:58	N 64 45.3142	E 004 48.0520	790	182	Storegga Nord Est		X			222		PEP 12 : 40m before cne14
PEP bouteille	13	23/05/2006	08:29:12	N 64 44.9127	E 004 47.9632	796	150	Storegga Nord Est		X			237		PEP 13 sampling at cne14
PEP bouteille	14	23/05/2006	09:05:19	N 64 44.8329	E 004 47.9019	796	156	Storegga Nord Est		X			244		PEP 14 sampling at site cne15 close to Gorgona and crust
PEP bouteille	15	23/05/2006	09:14:01	N 64 44.8323	E 004 47.9052	797	195	Storegga Nord Est		X			245		PEP 15 sampling at site cne15 in gasteropode field close to gorgona sp.
PEP bouteille	16	23/05/2006	09:33:50	N 64 44.8211	E 004 47.9626	797	151	Storegga Nord Est		X			247		PEP 16 sampling at site cne15 of carbonate mound
PEP bouteille	17	23/05/2006	11:35:32	N 64 44.5448	E 004 47.9448	798	87	Storegga Nord Est		X			264		PEP 17 at carbonate mound near site cne16, ca. 20 cm above seafloor
PEP bouteille	18	23/05/2006	13:06:05	N 64 44.4885	E 004 48.6691	800	139	Storegga Nord Est		X			277		PEP 18 : at mound 160m before cne17
PEP bouteille	19	23/05/2006	13:25:20	N 64 44.5110	E 004 48.6944	799	39	Storegga Nord Est	X	X			279		PEP 19 will be used for reference
ROV panier	1	22/05/2006	06:32:16	N 64 45.3310	E 005 06.1563	719	260	Storegga Nord Est	X				075		PANIER 1: sampling a very long crinoide (with pedoncule) at site cne01. Animal is large and orange.
ROV panier	2	22/05/2006	08:16:50	N 64 45.2776	E 005 05.6080	717	240	Storegga Nord Est	X		X		094		PANIER 2, large crust sampled at site cne02 : 271-CC1
ROV panier	3	22/05/2006	19:21:21	N 64 45.2710	E 004 58.8828	745	297	Storegga Nord Est	X		X		178		PANIER 3 : a crust is sampled (thin) 271-CC3, between point 05 and 06
ROV panier	4	23/05/2006	09:55:48	N 64 44.8222	E 004 47.9644	797	151	Storegga Nord Est	X		X		252		PANIER 4 : sampling at site cne15 of carbonate crust 271-CC5 and attached patella sp. inside the carbonate

ALAMER : Résumé de plongée

Dive 272-2 Chronological Progress on Nyegga

VICKING
Plongée : 272- 2

Date : 24/05/2006
Observateurs :

Date	Heure	Observateurs
24/05/2006	12h00 - 16h00	FESEKER Thomas OLU - Le ROY Karine
24/05/2006	16h00 - 20h00	FOUCHER Jean-Paul ANDERSEN Ann
24/05/2006	20h00 - 00h00	OLU - Le ROY Karine PIERRE Catherine
25/05/2006	00h00 - 04h00	FESEKER Thomas BOETIUS Antje
25/05/2006	04h00 - 08h00	DE BEER Dirk LICHTSCHLAG Anna
25/05/2006	08h00 - 12h00	ANDERSEN Ann CAPRAIS Jean-Claude
25/05/2006	12h00 - 16h00	OLU - Le ROY Karine ANDERSEN Ann
25/05/2006	16h00 - 20h00	BOETIUS Antje
25/05/2006	20h00 - 00h00	CAPRAIS Jean-Claude ANDERSEN Ann
26/05/2006	00h00 - 04h00	FABRI Marie-Claire OLU - Le ROY Karine
26/05/2006	04h00 - 08h00	BOETIUS Antje
26/05/2006	08h00 - 12h00	PIERRE Catherine FOUCHER Jean-Paul
26/05/2006	12h00 - 16h00	FESEKER Thomas FABRI Marie-Claire
26/05/2006	16h00 - 20h00	DE BEER Dirk
26/05/2006	20h00 - 00h00	PIERRE Catherine FOUCHER Jean-Paul

Dive 272-2. Storegga slope. Nyegga pockmarks

Station : **Nyegga** lat moy : N 64 33.0392 long moy : E 005 05.1544

Sites explorés :

- G11
- G12
- GG

Objectifs de la plongée :
Sampling dive of the Nyegga pockmarks G11 and G12.
Exploration transect across pockmark GG

Résumé manuel des travaux :

Pockmarks G11 and G12 surveyed in detail. Pockmarks G11, G12 and GG are similar geological stuctures with also similar-looking seeps
Several active seeps sampled and documented at G11 and G12 (video observation of active seeps, PEP and CTD methane anomalies). Low strength of seepage, no gas flares. Abundant macrofauna. Numerous macrofauna and meiofauna samples collected. Large fauna diversity. Chemosynthetic species. An active seep site fully documented (at G11): macrofauna and meiofauna collected, chemical environment characterized, video-mosaicking completed,microbiological sampling done.
Two other active sites investigated for microbiological processes and chemical fluxes (one at G11, the other at G12 with MIC deployment)
Numerous small metamorphic clasts sampled at G11 (Origin of the clasts?)
Abundant carbonate crusts suggest large past emissions of methane in the water (When were carbonates formed?)
Pingoes found to be "pillows" of pogonophorans.

Résumé automatique des travaux :
Prélèvements
Biologie :
Grande Boite ROV : 4 prélèvements,
Aspirateur bouteille : 8 prélèvements,
Carottier tube : 8 prélèvements,
Carottier a lame : 3 prélèvements,
Carottier a lame Grand : 1 prélèvement,
Petite Boite de collecte : 1 prélèvement,
Panier geologie : 2 prélèvements,
Inconnu : 1 prélèvement,
Eau :
PEP bouteille : 19 prélèvements,
Géochimie :
Carottier tube : 36 prélèvements,
INSINC Corer (MPI) : 4 prélèvements,
Grande Boite ROV : 2 prélèvements,
ROV panier : 2 prélèvements,
Mesures
2 mesures continues ont été recueillies,
Mouillages
2 mouillages ont été posés.
2 mouillages ont été relevés.

338 images ont été numérisées,
7 nouvelles localités ont étés définies : G11, PP-V3, PP-V4, G12, PP-V5, PP-V7 et PP-V8.

Rapport de plongée :

Date	Heure	Localité	Latitude	Longitude	Prof (m)	N° Photo	Commentaires
24/05/2006	12:35:24	Nyegga North	N 64 40.0091	E 005 17.2692	726	006	ROV at seafloor, DVDs running, Tom and Karine on shift
24/05/2006	12:39:06	G11	N 64 40.0076	E 005 17.3428	733	007	Crossing the site from W to E to go to point 0, where the planned dive track starts
24/05/2006	12:53:12	G11	N 64 40.0149	E 005 17.4670	726	008	Arrived at point 0
24/05/2006	12:57:04	G11	N 64 40.0056	E 005 17.4721	731	009	Strong current from east moved the ROV from the planned track. We are going back to point 0.

24/05/2006	12:58:48	G11	N 64 40.0110	E 005 17.4724	727	010	At point 0 again
24/05/2006	13:01:05	G11	N 64 40.0039	E 005 17.4714	729	011	On the way to point 1
24/05/2006	13:01:49	G11	N 64 39.9987	E 005 17.4728	731	012	Difficulties to follow the line because of currents
24/05/2006	13:03:42	G11	N 64 39.9889	E 005 17.4740	732	013	Arrived at point 1
24/05/2006	13:21:54	G11	N 64 39.9726	E 005 17.4498	729	014	We seem to have reached point 2
24/05/2006	13:23:22	G11	N 64 39.9731	E 005 17.4508	729	015	Point 2 from above
24/05/2006	13:30:11	G11	N 64 39.9731	E 005 17.4496	729	016	Patch of bacterial mat (?) on the northern flank of point 2
24/05/2006	13:46:59	G11	N 64 39.9737	E 005 17.4468	729	017	PEP 01 on ICE 1 (hill in the east part of G11)
24/05/2006	13:54:17	G11	N 64 39.9734	E 005 17.4496	729		We are going to make a hole with the manipulator to check the consistency of the sediment.
24/05/2006	14:02:23	G11	N 64 39.9732	E 005 17.4492	729	019	The material we found just below the surface consists of soft aggregates of greyish flakes.
24/05/2006	14:14:54	G11	N 64 39.9735	E 005 17.4505	729	021	BetaCam on the "pingo"
24/05/2006	14:16:09	G11	N 64 39.9734	E 005 17.4504	729		view on the black spot with lasers
24/05/2006	14:17:19	G11	N 64 39.9736	E 005 17.4510	729	023	on pingo
24/05/2006	14:18:23	G11	N 64 39.9736	E 005 17.4509	729	024	going to do the T-probe (Francois)
24/05/2006	14:20:48	G11	N 64 39.9741	E 005 17.4497	729	025	measured water temperature: -0.4 to -0.7 °C before calibration
24/05/2006	14:27:26	G11	N 64 39.9743	E 005 17.4513	729	026	LTR 01 (T-probe, Francois), no temperature anomaly measured in the pingo ICE 1
24/05/2006	14:59:24	G11	N 64 39.9738	E 005 17.4534	729	027	the same pingo but viewed from the other side of the ridge (same side than STAtOIL video)\ncolonised by pogonophores\n
24/05/2006	15:01:41	G11	N 64 39.9755	E 005 17.4561	728	028	gorgonocephalus + orange gasteopod
24/05/2006	15:04:34	G11	N 64 39.9790	E 005 17.4613	729	029	moving along the top of the ridge, area of black sediment on the crest
24/05/2006	15:15:13	G11	N 64 39.9667	E 005 17.4388	728	030	leaving the ridge and departing N towards point 3
24/05/2006	15:15:32	G11	N 64 39.9667	E 005 17.4388	727	031	on point 4. white spots will turn out to be bivalves
24/05/2006	15:22:01	G11	N 64 39.9665	E 005 17.4403	728	032	GBT3 : sampling of bivalves on the east hill of G11 (south of ICE 1)
24/05/2006	15:34:19	G11	N 64 39.9831	E 005 17.4477	733	033	moving to point 6, steep slope
24/05/2006	15:36:24	G11	N 64 39.9910	E 005 17.4505	733	034	on point 6, muddy bottom
24/05/2006	15:43:47	G11	N 64 39.9982	E 005 17.4526	729	035	Victor is too heavy, we cut off a bag of "lest"
24/05/2006	15:47:45	G11	N 64 39.9984	E 005 17.4488	731	111	Very nice actiniaria and Ophiurids

24/05/2006	15:52:55	G11	N 64 39.9998	E 005 17.4443	732	036	trying to fix basket that does not not close properly.
24/05/2006	16:00:03	G11	N 64 39.9981	E 005 17.4532	729	037	whitish filaments on pogonophorae (on summit of ridge?)
24/05/2006	16:01:05	G11	N 64 39.9981	E 005 17.4535	729	038	same whitish filaments
24/05/2006	16:01:23	G11	N 64 39.9982	E 005 17.4537	729	039	beside a yellow commatule, whitish filaments
24/05/2006	16:05:44	G11	N 64 39.9999	E 005 17.4544	729	040	debris flows and pogonophorae
24/05/2006	16:09:28	G11	N 64 40.0016	E 005 17.4542	728	041	abundant debris flows
24/05/2006	16:11:50	G11	N 64 40.0065	E 005 17.4446	729	042	moving from point 7 to point 8
24/05/2006	16:16:54	G11	N 64 40.0120	E 005 17.4285	727	043	near point 8, large pieces of dislocated tabular carbonate concretions
24/05/2006	16:17:19	G11	N 64 40.0121	E 005 17.4277	727	044	ICE 2 displays many commatules gorgonocephales and white cnidarians
24/05/2006	16:18:42	G11	N 64 40.0120	E 005 17.4256	727	045	luxuriant life on concretion on ICE2
24/05/2006	16:20:26	G11	N 64 40.0121	E 005 17.4250	727	046	zoom on fauna ICE2
24/05/2006	16:21:15	G11	N 64 40.0121	E 005 17.4246	727	047	zoom on fauna ICE2
24/05/2006	16:21:54	G11	N 64 40.0120	E 005 17.4244	727	048	zoom on fauna ICE2
24/05/2006	16:22:20	G11	N 64 40.0121	E 005 17.4243	727	411	Nice view of a gorgonocephalus
24/05/2006	16:23:42	G11	N 64 40.0123	E 005 17.4246	727	050	we did not find Ice on Ice 2, but a lot of fauna
24/05/2006	16:25:28	G11	N 64 40.0121	E 005 17.4245	727	410	PEP2 is done at the summit of ICE 2
24/05/2006	16:26:14	G11	N 64 40.0125	E 005 17.4220	728	051	leaving point 8 and starting to move to point 9
24/05/2006	16:34:25	G11	N 64 39.9819	E 005 17.4201	737	052	on point 10, the bottom is muddy
24/05/2006	16:35:55	G11	N 64 39.9790	E 005 17.4158	738	053	white sea star on muddy bottom
24/05/2006	16:37:44	G11	N 64 39.9769	E 005 17.4126	737	054	pingo ICE 3, covered with white biofilm
24/05/2006	16:39:43	G11	N 64 39.9768	E 005 17.4116	738	055	same pingo
24/05/2006	16:45:14	G11	N 64 39.9779	E 005 17.4113	738	056	taking a sample of the pingo, outside the whitish filaments
24/05/2006	16:45:37	G11	N 64 39.9778	E 005 17.4112	738	057	very soft penetration, the pingo is made of nested pogonophorae
24/05/2006	16:49:50	G11	N 64 39.9776	E 005 17.4120	738	058	GBT2 : Sampling pogonophorans of ICE 3
24/05/2006	16:58:52	G11	N 64 39.9767	E 005 17.4120	738	059	changing DVDs (set 2 to set 3), pogonophorans and now in GBT2
24/05/2006	17:00:14	G11	N 64 39.9769	E 005 17.4121	738	060	we have not touched the whistish filaments
24/05/2006	17:00:46	G11	N 64 39.9772	E 005 17.4125	738	061	leaving the pingo
24/05/2006	17:05:03	G11	N 64	E 005	737	413	PEP 3 at 1,5 m above the floor, near ICE3

			39.9735	17.4091			
24/05/2006	17:09:21	G11	N 64 39.9723	E 005 17.4089	737	062	near point 13 (ice 4?), diverse animals are present : cnidarians, dead gastropods, white filaments
24/05/2006	17:12:03	G11	N 64 39.9689	E 005 17.4061	735	063	suddently a swarm of red amphipods
24/05/2006	17:16:33	G11	N 64 39.9620	E 005 17.4075	735	064	moving towards point 12, still in the swarm of abundant amphipods
24/05/2006	17:25:22	G11	N 64 39.9460	E 005 17.4000	731	067	cimetery of sabellidae
24/05/2006	17:35:22	G11	N 64 39.9591	E 005 17.4038	734	068	PEP4 : on ICE 4 where the amphipods were, but they are now gone (0.8m above seafloor)
24/05/2006	17:42:50	G11	N 64 39.9580	E 005 17.3909	733	069	clast and fauna
24/05/2006	17:43:12	G11	N 64 39.9581	E 005 17.3903	734	070	clast and fauna
24/05/2006	17:46:38	G11	N 64 39.9588	E 005 17.3829	732	071	ICE4 we are 7 m west from reported ice 4 position and there is a little crater
24/05/2006	17:52:07	G11	N 64 39.9636	E 005 17.3890	734	072	on the south of ICE4 we survey dead sabellidae tubes
24/05/2006	17:52:28	G11	N 64 39.9638	E 005 17.3893	734	073	ICE 4 is a small dome covered with pogonophoran tube, a new pingo discovered..
24/05/2006	17:56:46	G11	N 64 39.9698	E 005 17.3973	734	074	pogonophoran fields forever!
24/05/2006	18:03:25	G11	N 64 39.9680	E 005 17.3869	735	075	Shilft Catherine and Karine
24/05/2006	18:04:32	G11	N 64 39.9695	E 005 17.3887	733	076	Going to point 15 at 18m
24/05/2006	18:07:27	G11	N 64 39.9739	E 005 17.3981	733	078	Big structure on the right side
24/05/2006	18:09:04	G11	N 64 39.9759	E 005 17.4032	738	079	Arriving in a depression
24/05/2006	18:17:25	G11	N 64 39.9796	E 005 17.3942	738	081	inside the depression between ICE1 and ICE5
24/05/2006	18:18:35	G11	N 64 39.9817	E 005 17.3916	738	082	concretions and grey-blue sediment spots
24/05/2006	18:22:22	G11	N 64 39.9849	E 005 17.3891	737	083	slope, blocks, clasts? , and associated fauna
24/05/2006	18:23:56	G11	N 64 39.9855	E 005 17.3898	737	077	looking the slope, with holes, orange gastropod, brown pogonophorans?, gorgona
24/05/2006	18:35:27	G11	N 64 39.9861	E 005 17.3733	732	084	succession of small active areas
24/05/2006	18:38:42	G11	N 64 39.9851	E 005 17.3748	736	086	PP V3 : Deposition of Marker on Vesicomyid field
24/05/2006	18:43:41	PP-V3	N 64 39.9874	E 005 17.3723	731	087	mollusc shells
24/05/2006	18:47:24	PP-V3	N 64 39.9873	E 005 17.3718	732	088	spot with bacterial filaments ? gastropods and pogonophorans
24/05/2006	19:01:44	G11	N 64 39.9979	E 005 17.3756	726	089	summit westward from Ice 5, concretions (chaos of large blocks)
24/05/2006	19:07:25	G11	N 64 39.9982	E 005 17.3813	728	090	area with carbonate crusts, shells (or living bivalves?) and gorgonocephalus
24/05/2006	19:16:48	G11	N 64 39.9984	E 005 17.3810	728	091	PEP5: on ICE5, 0.5 m above bottom. Molluscs (vesicomids?) field

24/05/2006	19:29:45	G11	N 64 39.9990	E 005 17.3819	728	092	ASPI 1: on ICE5, vesicomids
24/05/2006	19:51:44	G11	N 64 40.0128	E 005 17.3762	729	093	going down, a lot of amphipods
24/05/2006	19:54:22	G11	N 64 40.0160	E 005 17.3765	734	094	small "pingo" (ice 6?). Same type of structure as Ice 1: small mound covered by brown material (filaments: pogoniporans?). small paspots of grey sediment
24/05/2006	19:55:26	G11	N 64 40.0163	E 005 17.3769	734	095	another view of the same pingo
24/05/2006	19:56:14	G11	N 64 40.0163	E 005 17.3772	734	414	PEP 6 on the small mound ICE 6
24/05/2006	20:22:00	G11	N 64 40.0008	E 005 17.3322	732		PP-V4 : Deposition of Marker : About 20 cm dimater black spot with a few white material, external rim of gastropods, and around them a few black pogonophorans
24/05/2006	20:36:40	PP-V4	N 64 39.9960	E 005 17.3356	731	096	chaos of large blocks which seem to be fractured crusts. Gorgonocephalus.
24/05/2006	20:47:03	G11	N 64 39.9856	E 005 17.3561	733	097	cloud of amphipods
24/05/2006	20:48:02	G11	N 64 39.9866	E 005 17.3585	734	098	blocks with associated fauna
24/05/2006	20:54:48	G11	N 64 39.9833	E 005 17.3405	732	415	PEP 7: on ICE7
24/05/2006	21:03:13	G11	N 64 39.9842	E 005 17.3553	733	099	blocks (or fractured crusts) with associated fauna
24/05/2006	21:30:28	Nyegga North	N 64 39.9897	E 005 17.3923	734	101	Going to G12 pockmark
24/05/2006	22:04:15	Nyegga North	N 64 39.8149	E 005 17.3408	742	102	Shift taken over by Tom and Anna
24/05/2006	22:05:40	G12	N 64 39.8084	E 005 17.3386	741	103	Starting exploration of G12.
24/05/2006	22:11:57	G12	N 64 39.7934	E 005 17.3346	735	104	Some black patches and possibly bacterial mats in between fields of pogonophora on top of the northern ridge/summit of G12.
24/05/2006	22:13:49	G12	N 64 39.7933	E 005 17.3365	735	105	Patches of bacterial mats, but surfaces too uneven for in-situ measurements. Point marked in GIS as 'bacterial mats'.
24/05/2006	22:39:33	G12	N 64 39.7660	E 005 17.2683	733	106	Reached the southern summit of G12. It's covered with blocks of carbonate crust. There are less dark patches than on the northern ridge.
24/05/2006	22:48:09	G12	N 64 39.7746	E 005 17.2045	737	113	Making a large turn to return to the first bacterial mat site
24/05/2006	23:26:55	G12	N 64 39.8296	E 005 17.4043	735	114	Exploring the southern flank of G12.
24/05/2006	23:52:49	G12	N 64 39.8393	E 005 17.3295	732	115	Occurence of dark patches and bacterial mats seems to be limited to the summits.
25/05/2006	00:07:45	G12	N 64 39.8284	E 005 17.3593	736	108	On the way to bacterial mat point in order to start sampling.
25/05/2006	00:20:13	G12	N 64 39.7936	E 005 17.2598	736	107	Reached bacterial mat point, starting with water sampling.
25/05/2006	00:29:43	G12	N 64 39.7917	E 005 17.2869	733	110	PEP 8, directly above dark patch, on the center of G12 depression, as CT1)
25/05/2006	00:40:12	G12	N 64	E 005	733	116	trying to take the first push core at the same

			39.7919	17.2879			spot, but the arm of the ROV is too short, so we have to move the ROV and wait until the water is clear again.
25/05/2006	00:52:43	G12	N 64 39.7919	E 005 17.2851	733	117	CT 1 black patch, on the center of G12 depression (as PEP8)
25/05/2006	00:53:08	G12	N 64 39.7919	E 005 17.2851	733	118	Sediment is compressed quite a bit during sampling
25/05/2006	01:10:53	G12	N 64 39.7915	E 005 17.2971	733	121	Next sampling locatrion, 5-10 m eastward
25/05/2006	01:14:26	G12	N 64 39.7917	E 005 17.2962	733	119	PEP 9, black spot surrounded with gastropods, on the center of G12 depression (as CT2)
25/05/2006	01:25:36	G12	N 64 39.7914	E 005 17.2971	733	120	CT2, black spot surrounded by many gastropods, on the center of G12 depression (as PEP9)
25/05/2006	02:00:47	G12	N 64 39.7921	E 005 17.2969	732	123	problems with insink, fixed too well, need to cut it open
25/05/2006	02:24:55	G12	N 64 39.7927	E 005 17.2977	733	124	Insink XI taken from bacterial mat, but core was too short. Pushed it up with more coring on pogonophora
25/05/2006	02:37:39	G12	N 64 39.7930	E 005 17.2958	733	125	InSInk X II taken on another bacterial mat, same procedure as, with InSInk X I
25/05/2006	02:54:02	G12	N 64 39.7914	E 005 17.2961	732	126	insink X1 started injection
25/05/2006	03:08:20	G12	N 64 39.7911	E 005 17.2955	732	127	Insink X2 started injection
25/05/2006	03:13:45	G12	N 64 39.7914	E 005 17.2957	733	416	CT3 in the center of the G12 depression
25/05/2006	03:29:40	G12	N 64 39.7912	E 005 17.2950	733	129	DVD changed, set 8
25/05/2006	03:38:13	G12	N 64 39.7908	E 005 17.2949	732	130	ASPI 2: gastropods, associé a CT1et CT2
25/05/2006	04:03:02	G12	N 64 39.7905	E 005 17.2976	732	131	CT4 collecting grey sediment
25/05/2006	04:08:00	G12	N 64 39.7906	E 005 17.2975	732	132	CT4 collected core (half of the tube)
25/05/2006	04:11:51	G12	N 64 39.7912	E 005 17.2941	732	133	going to another area looking for bacterial mat
25/05/2006	04:39:20	G12	N 64 39.7899	E 005 17.3134	733	134	PEP10, 10 cm above bacterial mat and Thiotrix-like in back ground
25/05/2006	04:49:01	G12	N 64 39.7895	E 005 17.3153	733	135	CT5 sampling of white bacterial mat
25/05/2006	05:06:29	G12	N 64 39.7896	E 005 17.3140	733	136	CT5 white bacterial mat on the top. sediment in less than 1/3 of the core
25/05/2006	05:20:42	G12	N 64 39.7899	E 005 17.3157	733	137	CT6 core sampling of disturbed sediment
25/05/2006	05:22:19	G12	N 64 39.7902	E 005 17.3166	733	138	CT6 disturbed sediment
25/05/2006	05:26:16	G12	N 64 39.7903	E 005 17.3149	733	139	look like thiotrix filaments
25/05/2006	05:41:42	G12	N 64 39.7904	E 005 17.3134	733	140	ASPI 3 : gasteropods, thiothrix filament and shrimps
25/05/2006	05:50:45	G12	N 64 39.7906	E 005 17.3141	733	141	laser measurment of gasteropode field
25/05/2006	05:51:24	G12	N 64 39.7904	E 005 17.3139	733	142	Aspi 3 area of sampling with laser

25/05/2006	05:56:21	G12	N 64 39.7900	E 005 17.3171	733	143	on going to another bacterial spot
25/05/2006	06:18:58	G12	N 64 39.7862	E 005 17.3250	733	144	grey sediment probably covered by bacterial mat
25/05/2006	06:19:55	G12	N 64 39.7860	E 005 17.3248	732	145	CT7 sampling of grey sediment with possible bacterial mats (Corer broken)
25/05/2006	06:32:48	G12	N 64 39.7899	E 005 17.3171	733	146	CT8 core sampling of grey sediment
25/05/2006	06:37:56	G12	N 64 39.7902	E 005 17.3164	733	147	push core CT7 retrieved, but can not be closed anymore, probably the sample will flush away
25/05/2006	06:39:26	G12	N 64 39.7903	E 005 17.3161	733	148	push core 7 which is broken
25/05/2006	06:47:23	G12	N 64 39.7908	E 005 17.3150	735	149	next bacterial mat
25/05/2006	06:52:41	G12	N 64 39.7924	E 005 17.3094	734	150	CT9 : taking push core
25/05/2006	07:12:10	G12	N 64 39.7893	E 005 17.3084	734	152	CT10 : push core broken
25/05/2006	07:20:57	G12	N 64 39.7917	E 005 17.3213	734	153	next bacterial mat
25/05/2006	07:25:57	G12	N 64 39.7913	E 005 17.3213	734	154	PEP 11 above bacterial mat
25/05/2006	07:32:40	G12	N 64 39.7906	E 005 17.3240	734	418	Beginning of T-probe (LTR02)
25/05/2006	07:46:51	G12	N 64 39.7911	E 005 17.3221	734	155	T-probe (LTR02) : 1 cm in bacterial mat
25/05/2006	08:23:42	G12	N 64 39.7893	E 005 17.3159	733	157	PEP 12 at microbial mat Thiotrix-like
25/05/2006	08:31:30	G12	N 64 39.7890	E 005 17.3147	733	158	CT 11 at microbial mat
25/05/2006	08:44:31	G12	N 64 39.7883	E 005 17.3184	733	160	CT 12, at bacterial mat just next to place where CT 11 was taken
25/05/2006	08:56:54	G12	N 64 39.8219	E 005 17.3685	737	161	End of sampling on G12, we are now looking for a place where to put the MIC mooring n°2
25/05/2006	09:00:01	G12	N 64 39.8216	E 005 17.3700	735	162	top of mount (with small bacterial mats), high density of shrimps in water column
25/05/2006	09:11:17	G12	N 64 39.8376	E 005 17.3707	731	163	large bacterial mat, but too steep to take the profile with MIC
25/05/2006	09:12:14	G12	N 64 39.8368	E 005 17.3705	731	166	small crater on top of mount (with bacterial mat), deposition of MARKER PP-V5
25/05/2006	09:26:49	G12	N 64 39.8411	E 005 17.3752	734	164	good spot for profiler (MIC 50*50 cm)
25/05/2006	09:29:09	G12	N 64 39.8417	E 005 17.3767	735	165	PEP 13 above microbial mat
25/05/2006	09:36:26	G12	N 64 39.8406	E 005 17.3772	734	167	army of shrimps above good site for MIC
25/05/2006	09:41:54	G12	N 64 39.8405	E 005 17.3780	734	168	PP-V5 : placed marker successfully (PP-V6 was stiked to PP-V5, and was recovered)
25/05/2006	09:55:52	PP-V5	N 64 39.8370	E 005 17.3630	732	169	start of DVD's 11
25/05/2006	10:06:00	Nyegga North	N 64 39.8330	E 005 17.3584	739	170	Starting to move towards PP-V4 (point 22on G11) : shift: Karine, Ann, J Claude
25/05/2006	10:38:54	G11	N 64 39.9989	E 005 17.3318	734	171	one Ctenophore (Venus belt) is passing in front of the main camera

25/05/2006	10:51:32	G11	N 64 39.9981	E 005 17.3384	734	172	preparing of mosaic square between PP-V4 (vesicomyds) and PP-V3 (pogonophorans) in order to cover au surface of 25 m2
25/05/2006	11:00:28	G11	N 64 39.9968	E 005 17.3306	733	174	beginning of mosaic (MOZA1)
25/05/2006	11:05:41	G11	N 64 39.9835	E 005 17.3312	731	173	degazing on bottom
25/05/2006	11:20:53	G11	N 64 39.9962	E 005 17.3275	734	175	beginning of profile 3
25/05/2006	11:30:17	G11	N 64 39.9949	E 005 17.3350	732	176	beginning of profile 4
25/05/2006	11:38:39	G11	N 64 39.9885	E 005 17.3490	733	177	beginning of profile 5
25/05/2006	11:47:41	G11	N 64 39.9896	E 005 17.3523	733	179	beginning of profile 5 (bis)
25/05/2006	11:54:20	G11	N 64 39.9896	E 005 17.3557	733	180	beginning of profile 6
25/05/2006	11:58:23	G11	N 64 39.9841	E 005 17.3540	731	181	beginning of profile 7
25/05/2006	12:07:58	G11	N 64 39.9886	E 005 17.3566	732	182	beginning of profile 8
25/05/2006	12:12:42	G11	N 64 39.9789	E 005 17.3550	732	183	come back to the north by profil 9
25/05/2006	12:19:20	G11	N 64 39.9900	E 005 17.3619	732	184	beginning of profile 10
25/05/2006	12:25:46	G11	N 64 39.9802	E 005 17.3598	733	185	new profile 11
25/05/2006	12:32:20	G11	N 64 39.9904	E 005 17.3656	731	186	beginning of profile 12
25/05/2006	12:38:09	G11	N 64 39.9796	E 005 17.3641	733	187	come back by profile line 13
25/05/2006	12:46:43	G11	N 64 39.9881	E 005 17.3708	729	188	begginning of profile line 14
25/05/2006	12:53:36	G11	N 64 39.9780	E 005 17.3684	735	189	beginning of line 15 (to the north)
25/05/2006	13:06:13	G11	N 64 39.9885	E 005 17.3761	728	190	beginning of line 16
25/05/2006	13:11:34	G11	N 64 39.9792	E 005 17.3775	736	191	beginning of line 20 (south to north) (pb with the regularity of the line)
25/05/2006	13:23:15	G11	N 64 39.9911	E 005 17.3524	732	192	come back to PPV4 navigation (recalage estime)
25/05/2006	13:44:04	G11	N 64 39.9869	E 005 17.3862	725	193	new departure line 21
25/05/2006	13:55:07	G11	N 64 39.9768	E 005 17.3840	734	194	beginning of profile 22
25/05/2006	14:05:16	G11	N 64 39.9894	E 005 17.3860	725	195	beginning of line 23
25/05/2006	14:17:21	G11	N 64 39.9773	E 005 17.3839	733	196	beginning of line 24
25/05/2006	14:24:38	G11	N 64 39.9894	E 005 17.3911	726	197	beginning of line 25
25/05/2006	14:28:40	G11	N 64 39.9767	E 005 17.3927	731	198	end of line 25 and mosaic (MOZA 1)
25/05/2006	14:31:43	G11	N 64 39.9742	E 005 17.3844	734	199	going to elavator 1 to change equipment

25/05/2006	17:16:18	G11	N 64 40.0366	E 005 17.3294	730	200	End of changing the equipment from Victor basket to Elevator, during the operation the Blade Corers fell down and CL5 was closed and unusable for further samplings.
25/05/2006	17:20:25	G11	N 64 40.0188	E 005 17.3337	731	201	going to PPV4
25/05/2006	18:29:07	G11	N 64 39.9971	E 005 17.3360	732	202	PPV4 is found, It was difficult to find because ship moved and BUC was shifted of 15m toward 150°
25/05/2006	18:46:55	G11	N 64 39.9894	E 005 17.3463	732	203	PEP 14 in the center of the bacterial mat of PPV4
25/05/2006	18:48:14	G11	N 64 39.9891	E 005 17.3462	732	204	PEP 15 on the snails of PPV4
25/05/2006	18:50:13	G11	N 64 39.9899	E 005 17.3446	732	205	PEP 16 second PEP on the snails
25/05/2006	18:52:46	G11	N 64 39.9901	E 005 17.3445	732	206	PEP 17 is the third PEP on the snails of PPV4
25/05/2006	18:56:35	G11	N 64 39.9900	E 005 17.3450	732	207	PEP 18 is the first PEP on the Pogonophorans of PPV4
25/05/2006	18:59:54	G11	N 64 39.9903	E 005 17.3461	732	208	PEP 19 is the second PEP on the Pogonophorans of PPV4
25/05/2006	19:01:12	G11	N 64 39.9907	E 005 17.3466	732	209	Lasers measure the distace of 15 cm between the PEP 19 and the edge of the bacterial mat
25/05/2006	19:13:27	G11	N 64 39.9904	E 005 17.3468	732	210	CT13 is the first CT east to the pogonophorans
25/05/2006	19:48:43	G11	N 64 39.9919	E 005 17.3459	732	211	6 CT are set in the Pogonophorans of PPV4: CT 13, 14, 15, 16, 17, 18, 19 (13 is the hole) and the others are placed in increasing order counter-clockwise.
25/05/2006	20:04:52	G11	N 64 39.9928	E 005 17.3473	733	212	We add 3 CT in the frontier area, where the snails are : CT 19, 20, 21
25/05/2006	20:10:24	G11	N 64 39.9928	E 005 17.3441	732	213	CT 22 is in the center of the bacterial mat of PPV4
25/05/2006	20:11:08	G11	N 64 39.9931	E 005 17.3436	732	214	All CT (except CT13) in place at PPV4
25/05/2006	20:14:57	G11	N 64 39.9931	E 005 17.3441	732	215	CT 18 is totally full in pogonophorans at PPV4
25/05/2006	20:17:20	G11	N 64 39.9929	E 005 17.3445	733	216	CT 17 is also full in pogonophorans at PPV4
25/05/2006	20:19:18	G11	N 64 39.9925	E 005 17.3457	732	217	CT 22 is half full , it is coming from the central area of the bacterial mat at PPV4
25/05/2006	20:21:56	G11	N 64 39.9922	E 005 17.3458	732	218	CT 19 is also nearly full in gastropods at PPV4
25/05/2006	20:24:13	G11	N 64 39.9929	E 005 17.3446	732	223	CT 16 is nearly full in pogonophorans at PPV4
25/05/2006	20:25:55	G11	N 64 39.9925	E 005 17.3427	732	219	CT 20 is 2/3 full in gastropods at PPV4
25/05/2006	20:29:23	G11	N 64 39.9912	E 005 17.3436	733	220	CT 21 is nearly empty in gastropods at PPV4
25/05/2006	20:35:26	G11	N 64 39.9911	E 005 17.3444	732	221	CT 15 is half full in pogonophorans at PPV4

25/05/2006	20:39:14	G11	N 64 39.9907	E 005 17.3441	733	222	CT 14 is 3/4 full with a clear oxydized superficial zone on the black deeper layer in pogonophorans at PPV4
25/05/2006	20:42:11	G11	N 64 39.9908	E 005 17.3452	732	224	The area PPV4 after the 10 pushcores
25/05/2006	20:44:36	G11	N 64 39.9908	E 005 17.3442	732	225	We are preparing Aspi 4 to take the small snails of PPV4
25/05/2006	20:48:52	G11	N 64 39.9912	E 005 17.3461	732	226	ASPI 4 : We have slurped a surface area of 10x15 cm at PPV4
25/05/2006	20:56:17	G11	N 64 39.9912	E 005 17.3460	732	227	CL7 in the Pogonophorans of PPV4 east to the central spot of bacterial mat
25/05/2006	21:08:01	G11	N 64 39.9906	E 005 17.3481	732	228	CL6 in the Pogonophorans of PPV4 and the shrimp is coming closer to sees what
25/05/2006	21:14:53	G11	N 64 39.9902	E 005 17.3489	733	229	CL8 is the third CL on the Pogonophorans of PPV4, taken north to the bacterial mat.
25/05/2006	21:20:32	G11	N 64 39.9900	E 005 17.3477	733	230	We are returning to the elevator with the four CL. The elevator is located 90 m north from here, and we will take the big CL for another sampling.
25/05/2006	21:41:00	G11	N 64 40.0398	E 005 17.3318	730	231	To put the CL basket back in the elevator is very tricky
25/05/2006	21:46:07	G11	N 64 40.0420	E 005 17.3356	729	232	To take the big GCL from the elevator is not easier!
25/05/2006	22:02:13	G11	N 64 40.0357	E 005 17.3514	730	233	We are moving towards point 17 where there is a nice Pingo to sample (seen at 10:03) which is south, cap 188 at 75 m distance.
25/05/2006	22:47:31	G11	N 64 39.9968	E 005 17.3459	735	234	We couldn't find the same Pingo but we found another pingoe close to the point 17, but probably different from the one we saw before (10:03)
25/05/2006	22:49:08	G11	N 64 39.9972	E 005 17.3462	735	235	A nice view of the area we will sample with the CLG1
25/05/2006	22:52:27	G11	N 64 39.9962	E 005 17.3458	736	236	CLG1 in place in the Pingoe
25/05/2006	23:01:44	G11	N 64 39.9980	E 005 17.3427	735	237	CLG1 full of sediment
25/05/2006	23:11:24	G11	N 64 39.9976	E 005 17.3472	735	238	ASPI 5: on pingoe, with CLG1 beeing back in the hole in order not to disturb the environment before slurping pogonophorans.
25/05/2006	23:27:20	G11	N 64 40.0034	E 005 17.3493	735	239	going to the elevator
25/05/2006	23:37:56	G11	N 64 40.0384	E 005 17.3317	729	240	arriving on the elevator, putting the CLG inside
25/05/2006	23:50:24	G11	N 64 40.0335	E 005 17.3399	731	241	going to site PP V3 vesicomyd field
26/05/2006	00:10:00	G11	N 64 39.9772	E 005 17.3914	735	242	Arriving on PPV3 vesicomyd field
26/05/2006	00:37:50	G11	N 64 39.9782	E 005 17.3929	734	244	Starting to fill in PBT 3 with bivalves
26/05/2006	01:05:16	G11	N 64 39.9782	E 005 17.3915	734	245	PBT3 : living vesicomyids PPV3 but the box was open and empty when arriving at the surface.
26/05/2006	01:53:06	G11	N 64 39.9781	E 005 17.3893	734	246	ASPI 6 : on living vesicomyids PPV3

26/05/2006	02:03:44	G11	N 64 39.9773	E 005 17.3926	734	247	ASPI 7: on living vesicomyids PPV3
26/05/2006	02:10:00	G11	N 64 39.9778	E 005 17.3942	732		INCONNU: Two shrimps found in the ROV CTD pipe
26/05/2006	02:35:39	G11	N 64 39.9763	E 005 17.4355	737	248	Transect to point 2, for sampling of Insink and 2 CT
26/05/2006	02:42:58	G11	N 64 39.9729	E 005 17.4741	729	249	reached top of ICE 1, will sit down for sampling
26/05/2006	02:45:52	G11	N 64 39.9728	E 005 17.4768	728	251	first bacterial mat spot selected for sampling
26/05/2006	02:59:27	G11	N 64 39.9732	E 005 17.4757	728	250	CT23 sampling (corer broken) on top of ICE1
26/05/2006	03:25:07	G11	N 64 39.9728	E 005 17.4731	728	253	we changed to another spot, because the one chosen for CT23 was too hard
26/05/2006	03:26:52	G11	N 64 39.9737	E 005 17.4743	728	254	CT24 taken in new spot on top of ICE1
26/05/2006	04:02:34	G11	N 64 39.9668	E 005 17.4689	728	256	Insink 5 taken
26/05/2006	04:04:57	G11	N 64 39.9678	E 005 17.4662	728	257	X5 in place
26/05/2006	04:13:18	G11	N 64 39.9662	E 005 17.4682	728	328	Attempt for X6 but it did not work
26/05/2006	04:48:33	G11	N 64 39.9725	E 005 17.4823	728	258	new spot found for Insink X6
26/05/2006	04:50:18	G11	N 64 39.9728	E 005 17.4822	728	259	Insink X6 taken
26/05/2006	04:53:26	G11	N 64 39.9731	E 005 17.4808	728	261	X6 in place
26/05/2006	04:57:57	G11	N 64 39.9736	E 005 17.4794	728	260	Insink X5 and X6 released
26/05/2006	05:20:00	G11	N 64 39.9772	E 005 17.4453	736	262	shift Cath P. and JPaul F. Geological survey and rock sampling
26/05/2006	05:24:02	G11	N 64 39.9767	E 005 17.4423	737	264	GBT11 : bottom of caldera, fragment of crust being sampled, 272-CC1
26/05/2006	05:31:51	G11	N 64 39.9788	E 005 17.4299	737	265	small clasts in the solft sediment of the center of the caldera
26/05/2006	05:38:12	G11	N 64 39.9785	E 005 17.4225	738	267	soft sediment with dead and alive sabellidae,small clasts and carbonate crusts fragments
26/05/2006	05:42:57	G11	N 64 39.9801	E 005 17.4204	738	268	taking sediment of central caldera with victor's grab
26/05/2006	05:44:04	G11	N 64 39.9800	E 005 17.4200	738	270	GBT12 : sample 272-CC2 in central caldera : soft sediment with small clasts
26/05/2006	05:57:54	G11	N 64 39.9899	E 005 17.4046	732	274	rock fragments on summit of ridge NW in pogonophora field
26/05/2006	06:01:03	G11	N 64 39.9895	E 005 17.4048	733	275	PANIER 1 : sample 272-CC3 which is a clast, rock fragments on NW ridge summit
26/05/2006	06:04:04	G11	N 64 39.9929	E 005 17.4002	729	276	climbing the NW ridge
26/05/2006	06:06:18	G11	N 64 39.9983	E 005 17.3929	727	277	top of the hill, carbonate crust in dislocated pavement
26/05/2006	06:07:44	G11	N 64 40.0007	E 005 17.3909	727	278	PANIER 2 : sample 272-CC4 on top of ridge
26/05/2006	06:15:00	Nyegga North	N 64 40.0351	E 005 17.3454	731		Elevator manipulation during almost 4 hours (Elevator was north of G11)

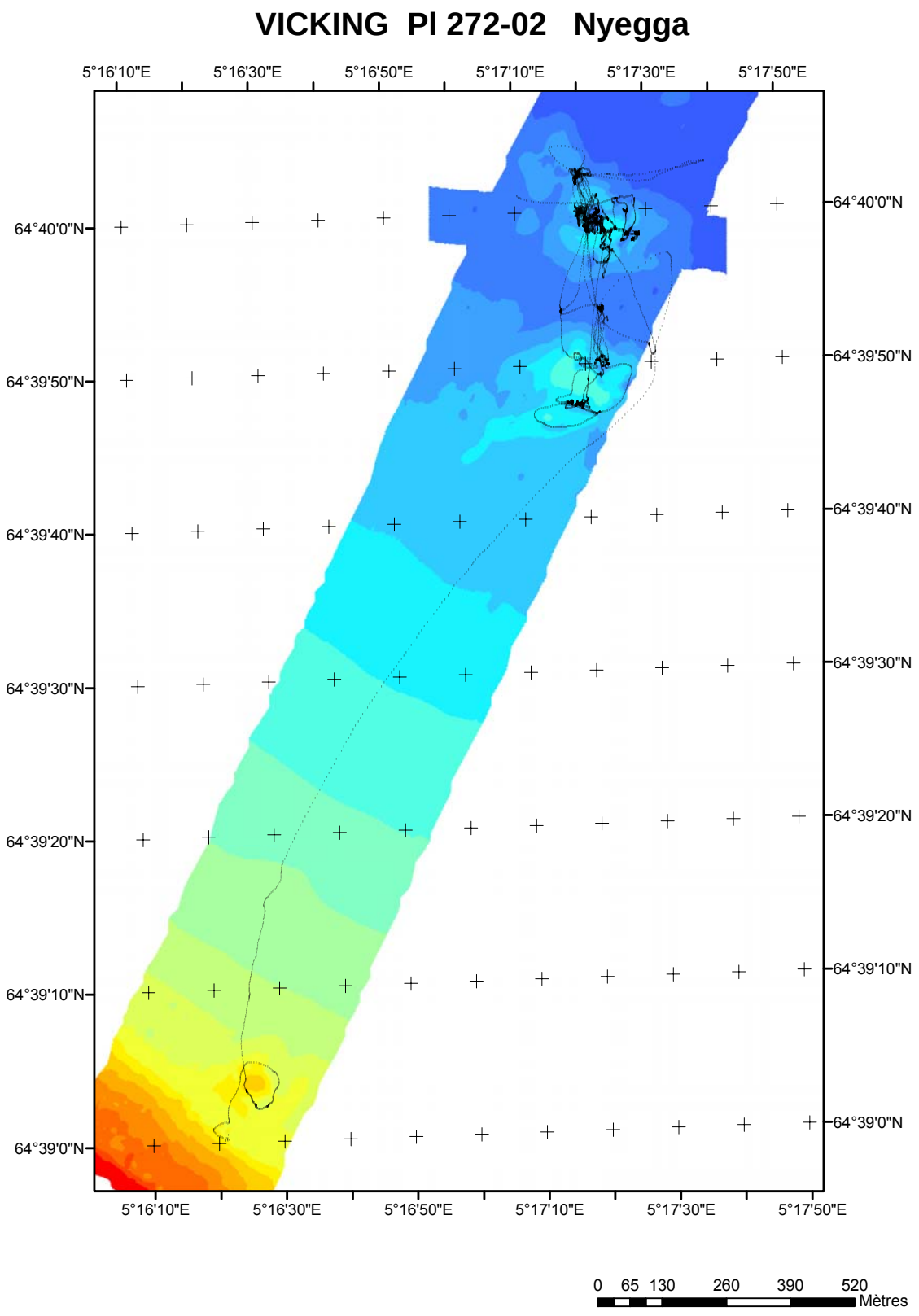
26/05/2006	09:45:06	Nyegga North	N 64 40.0437	E 005 17.3115	729	279	departure from the chain of the shuttle
26/05/2006	09:46:02	Nyegga North	N 64 40.0434	E 005 17.3118	729	280	lot of rock fragments (carbonate crusts) on the seafloor
26/05/2006	09:49:04	Nyegga North	N 64 40.0265	E 005 17.3432	729	281	circular enigmatic structure surrounded by fixed fauna
26/05/2006	09:50:50	Nyegga North			729	282	zoom on the circular structure : very hard substrate below superficial soft sediment, it is a single massive "plaque" surrounded with faune (comatule, cnidaires, sponges).
26/05/2006	09:52:21	Nyegga North			729	327	50 cm mud pie
26/05/2006	09:56:32	Nyegga North			729	329	trying to take a piece of the hard structure
26/05/2006	10:00:33	Nyegga North			729	330	close up view of the fragment broken from the edge the circular structure
26/05/2006	10:05:00	Nyegga North			729		Going back to site G11
26/05/2006	10:23:32	G11	N 64 40.0016	E 005 17.3823	728	289	top of the ridge with white and black spots
26/05/2006	10:25:00	G11	N 64 40.0015	E 005 17.3823	728	290	a pingo on the crest of the ridge with pogonophoran reef
26/05/2006	10:25:44	G11	N 64 40.0015	E 005 17.3823	728	291	pingo with white spots = ICE 5
26/05/2006	10:29:46	G11	N 64 40.0013	E 005 17.3824	728	331	Very nice Pingo ICE5
26/05/2006	10:37:51	G11	N 64 40.0000	E 005 17.3776	728	332	PP-V7 in place on a nice Pingo (= ICE 5)
26/05/2006	10:46:25	G11			732	333	going to PP-V4 in order to look for bubbles as observed previously by Ann
26/05/2006	10:47:48	G11			735	334	problems with navigation
26/05/2006	11:32:37	G11	N 64 39.9951	E 005 17.3215	730	335	Going 175 ° south to wait for the second elevator to go down
26/05/2006	12:46:37	G11	N 64 39.8523	E 005 17.5097	727	336	ELEVATOR 2 is going to the water
26/05/2006	13:27:50	G11	N 64 39.8905	E 005 17.3809	727	337	reaching the elevator 2
26/05/2006	13:45:26	G11	N 64 39.8926	E 005 17.3803	726	338	pull out MIK profiler from the Elevator
26/05/2006	13:55:20	G11	N 64 39.8921	E 005 17.3795	726	339	new DVD 23
26/05/2006	13:59:10	Nyegga North	N 64 39.8916	E 005 17.3769	727	340	leaving to site PP-VV5
26/05/2006	14:23:34	G12	N 64 39.8329	E 005 17.3911	733	342	MIC 1 deployed on site PP-V5
26/05/2006	14:24:24	G12	N 64 39.8335	E 005 17.3912	733	343	zoom on MIC 1
26/05/2006	14:49:27	G12	N 64 39.9768	E 005 17.3554	732	344	conic mound with crater showing black and white spots
26/05/2006	14:49:46	PP-V8	N 64 39.9769	E 005 17.3544	732	345	Crater is surrounded by pogonophorans with gastropods in the crater and white mats in the middle
26/05/2006	14:55:56	PP-V8	N 64 39.9783	E 005 17.3523	730	348	Nice view of the crater on digital picture
26/05/2006	14:56:26	PP-V8	N 64 39.9783	E 005 17.3517	730	349	site marked with PP-V8 : crater is about 60 cm

26/05/2006	15:15:14	PP-V8	N 64 39.8916	E 005 17.3725	726	351	approaching elevator for taking out cores
26/05/2006	16:48:18	PP-V8	N 64 39.8459	E 005 17.3598	736	352	moving to site of MIC 1
26/05/2006	16:53:52	G12	N 64 39.8374	E 005 17.3871	733	353	recovering MIC 1
26/05/2006	16:57:29	G12	N 64 39.8387	E 005 17.3825	733	354	moving to another site to deploy MIC a second time
26/05/2006	17:09:40	G12	N 64 39.8903	E 005 17.2754	727	355	on site of mic2 about 50 m to the nnw of G12
26/05/2006	17:14:32	G12	N 64 39.8923	E 005 17.2763	727	356	MIC 2 deployed and started : green light
26/05/2006	17:15:26	G11	N 64 39.8920	E 005 17.2781	727	357	starting to move to crater on PP-V8 (G11)
26/05/2006	17:29:31	PP-V8	N 64 39.9810	E 005 17.3482	732	358	reaching again crater site PP-V8
26/05/2006	17:45:31	G11	N 64 39.9799	E 005 17.3473	731	359	CT 25 (CT1 on the videos) in pogonophorans
26/05/2006	17:54:50	G11	N 64 39.9815	E 005 17.3460	731	360	CT 26 (CT2 on the videos) in gastropods
26/05/2006	18:06:59	G11	N 64 39.9809	E 005 17.3479	732	361	CT 27 (CT3 on the vidoe) in gastropods and pogonophorans
26/05/2006	18:17:01	G11	N 64 39.9806	E 005 17.3483	732	362	CT 28 (CT4 on the video) in bacterial mats on black sediment
26/05/2006	18:18:05	G11	N 64 39.9810	E 005 17.3475	732	363	CT 33 (CT9 on the video) in in the white part of the bacterial spot
26/05/2006	18:20:38	G11	N 64 39.9811	E 005 17.3464	732	365	view of the five cores inside the bacterial spot
26/05/2006	18:23:53	G11	N 64 39.9817	E 005 17.3454	732	366	CT 34 (CT10 on the video) in the black part of the bacterial spot
26/05/2006	18:43:11	G11	N 64 39.9804	E 005 17.3496	732	367	CT 29 (CT 5 on the video) in a small bacterial mat black and grey, near the crater
26/05/2006	19:27:27	G11	N 64 39.9804	E 005 17.3510	732	368	ASPI 8 on pogonophorans in the crater of PP-V8
26/05/2006	19:35:04	G11	N 64 39.9788	E 005 17.3432	734	369	leaving the site towards the north
26/05/2006	19:40:31	G11	N 64 40.0004	E 005 17.3610	735	370	searching for another bacterial mat spot on the NE flank
26/05/2006	19:48:24	G11	N 64 40.0016	E 005 17.3757	731	372	CT 30 (CT 6 on the video) in a bacterial mat spot within a pogonophoran mound close to the top of the hill (northern part)
26/05/2006	19:53:44	G11	N 64 39.9998	E 005 17.3752	732	373	searching for a new bacterial spot for sampling
26/05/2006	19:55:57	G11	N 64 39.9975	E 005 17.3719	732	374	various bacterial spot at the top of the hill
26/05/2006	20:03:31	G11	N 64 39.9948	E 005 17.3699	730	375	CT 31 (CT 7 on the video) on bacterial mats on the top of the hill
26/05/2006	20:09:58	G11	N 64 39.9941	E 005 17.3663	731	376	CT32 (CT 8 on the video) on a bacterial white spot
26/05/2006	20:24:13	G11	N 64 39.9909	E 005 17.3562	733	377	leaving the site of coring to go to the MIC 2 profiler
26/05/2006	20:34:25	G11	N 64 39.9057	E 005 17.2777	728	378	approach of the profiler MIC 2 and lift
26/05/2006	20:40:23	G11	N 64 39.8923	E 005 17.2774	728	379	CT 35 (CT 11 on the video) Reference core near the MIC 2 The sea floor is always covered with rock fragments and sabellidae

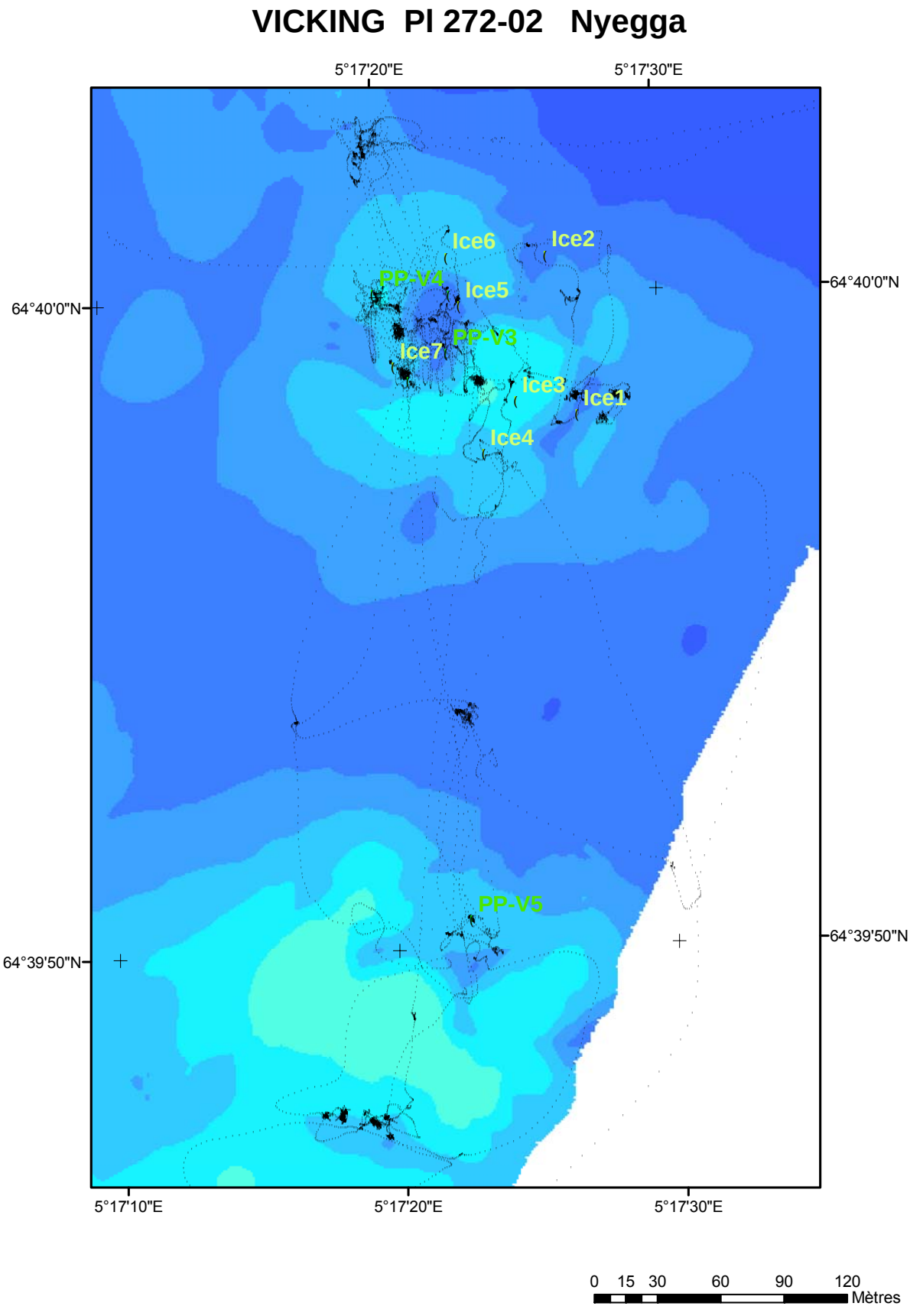
26/05/2006	20:45:25	G11	N 64 39.8915	E 005 17.2767	728	380	Recovering MIC 2 and moving to the lift
26/05/2006	21:31:35	G11	N 64 39.8367	E 005 17.3857	735	381	CT 36 (Ct 12 on hte video) Reference core near the MIC 1 site (PP-V5)
26/05/2006	22:05:25	G11	N 64 39.8988	E 005 17.5518	727	382	tom on shift
26/05/2006	22:06:13	G11	N 64 39.8888	E 005 17.5452	727	383	elevator is on deck and we have set course for the southern sites
26/05/2006	23:09:45	Nyegga	N 64 39.2694	E 005 16.4855	747	384	starting to see rock fragments, sponges, ..on intermedite spot before last pockmark
26/05/2006	23:16:10	Nyegga	N 64 39.2475	E 005 16.4696	747	385	carbonates and fauna at intermediate spot
26/05/2006	23:17:57	Nyegga	N 64 39.2373	E 005 16.4647	748	386	to the way to GG, numerous sabellidae on seafloor
26/05/2006	23:21:42	Nyegga	N 64 39.2100	E 005 16.4471	749	387	200 m north of GG
26/05/2006	23:29:56	Nyegga	N 64 39.1645	E 005 16.4239	750	388	starting to see numerous rock fragments on the seafloor
26/05/2006	23:34:13	Nyegga	N 64 39.1507	E 005 16.4182	751	389	100 m north of GG
26/05/2006	23:36:10	Nyegga South	N 64 39.1388	E 005 16.4125	751	390	approaching GG
26/05/2006	23:43:06	Nyegga South	N 64 39.0901	E 005 16.4017	757	391	lot of small sponges
26/05/2006	23:47:41	Nyegga South	N 64 39.0697	E 005 16.4069	759	392	hill with pogo
27/05/2006	00:03:39	Nyegga South	N 64 39.0560	E 005 16.4090	763	393	sampling bivalve shells at the base of the N inner escarpment
27/05/2006	00:11:12	Nyegga South	N 64 39.0482	E 005 16.4205	760	394	pogo to the SW of the crater
27/05/2006	00:15:27	Nyegga South	N 64 39.0448	E 005 16.4226	758	395	following the ridge anticlockwise
27/05/2006	00:35:01	Nyegga South	N 64 39.0388	E 005 16.4575	755	396	bacterial mats, filaments on carbonate crusts
27/05/2006	00:39:28	Nyegga South	N 64 39.0393	E 005 16.4615	755	397	site with snails and mats
27/05/2006	00:49:04	Nyegga South	N 64 39.0563	E 005 16.4812	761	398	eastern ridge summit, pogo, sabellidae, no white shells,
27/05/2006	00:51:33	Nyegga South	N 64 39.0615	E 005 16.4897	759	399	continuing on ridge, white shells yes, no pogo
27/05/2006	00:54:24	Nyegga South	N 64 39.0719	E 005 16.4874	755	400	moving on the ridge, a few microbial spots
27/05/2006	00:55:39	Nyegga South	N 64 39.0750	E 005 16.4829	755	401	moving on the ridge, crusts, small sponges, ...
27/05/2006	01:00:10	Nyegga South	N 64 39.0869	E 005 16.4333	758	402	northern ridge, nearly normal seafloor
27/05/2006	01:02:02	Nyegga South	N 64 39.0853	E 005 16.4084	756	403	north western ridge, nearly normal seafloor, sabellidae, locally with white shells
27/05/2006	01:06:44	Nyegga South	N 64 39.0700	E 005 16.3933	759	404	moving, pogo, ...
27/05/2006	01:11:53	Nyegga South	N 64 39.0478	E 005 16.3706	760	405	leaving GG and steaming to the escarpment
27/05/2006	01:15:29	Nyegga South	N 64 39.0330	E 005 16.3592	758	406	moving to the escarpment, lot of rock fragments,
27/05/2006	01:19:44	Nyegga	N 64	E 005	755	407	on 5m conical relief, carbonate crusts,

		South	39.0221	16.3550			fauna,
27/05/2006	01:25:29	Nyegga South	N 64 39.0105	E 005 16.3275	760	408	arriving at the escarpment, slope ruoture, no evidence of fracturation, sedimented scarp
27/05/2006	01:26:16	Nyegga South	N 64 39.0084	E 005 16.3342	761	409	end of dive

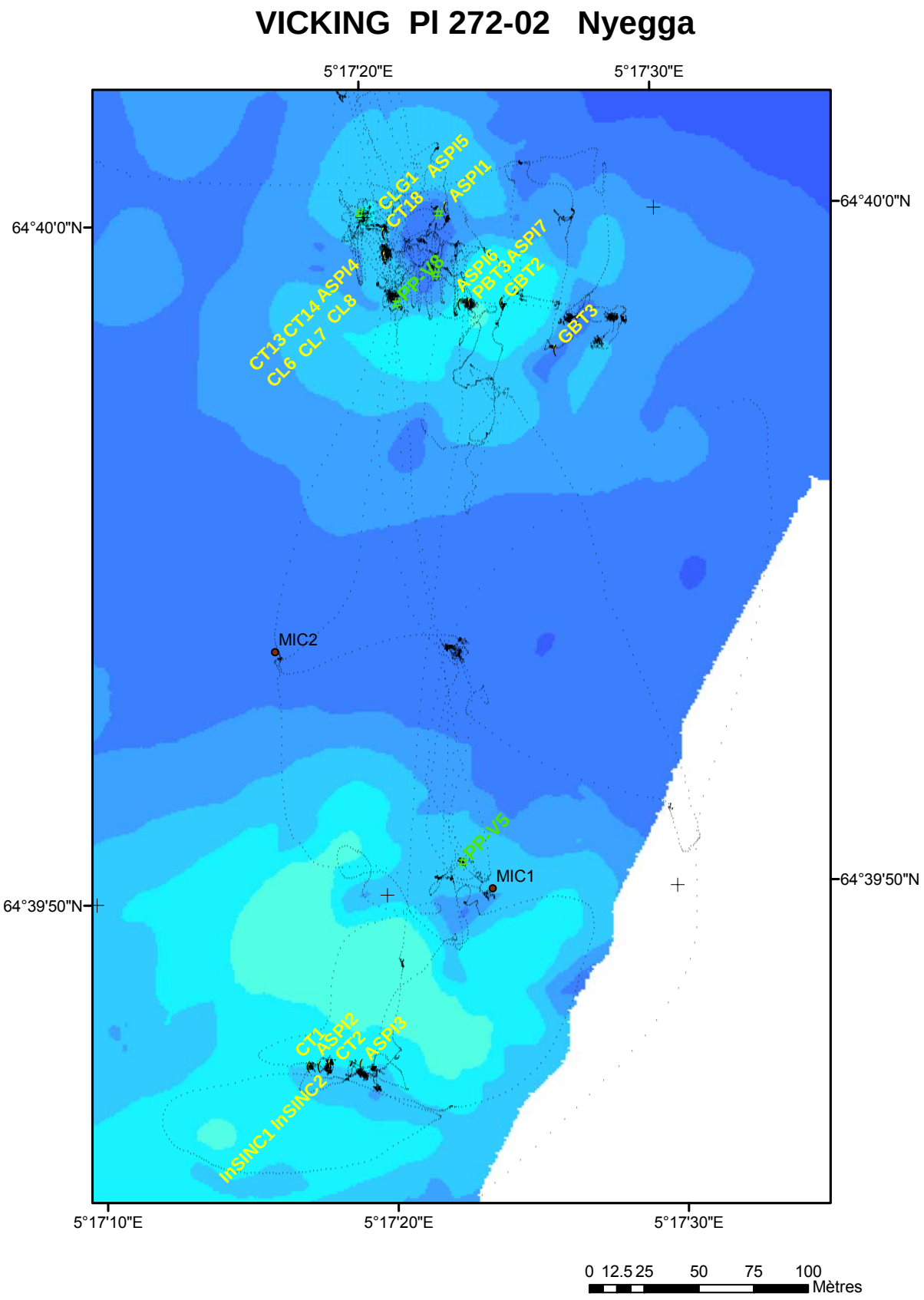
Dive 272-2 Maps



Nyegga Locations

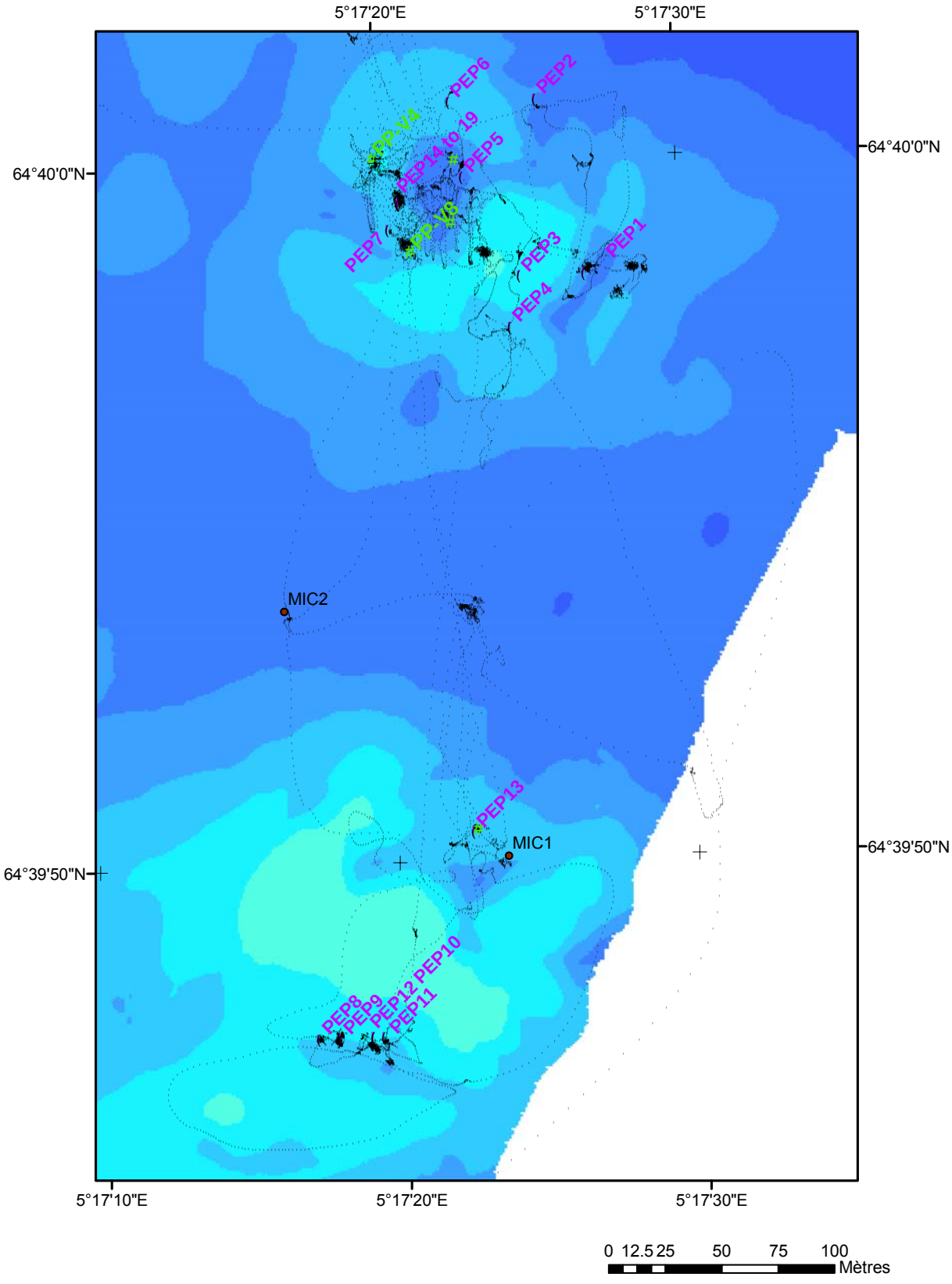


Biological sampling

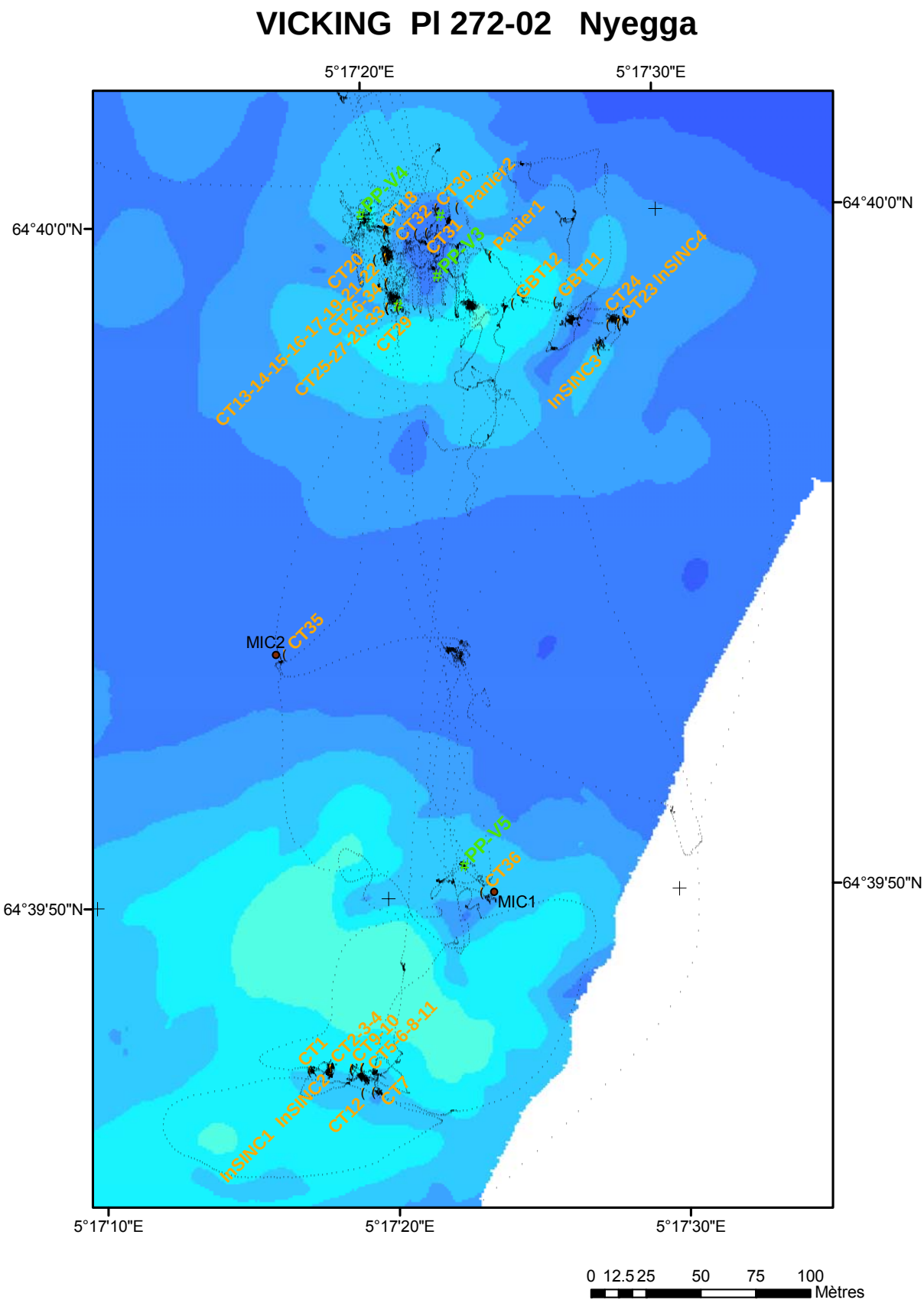


Water sampling

VICKING PI 272-02 Nyegga



Sediment sampling



Dive 272- 2 Operations list

Equipement	No	Date	Heure	Latitude	Longitude	Prof	Cap	Localite	Ech_Bio	Chimie	Sed	Mes	Photo	Fic	Commentaires
Aspirateur bouteille	1	24/05/2006	19:29:45	N 64 39.9990	E 005 17.3819	728	348	G11	X				092		ASPI 1: on ICE5, vesicomids
Aspirateur bouteille	2	25/05/2006	03:38:13	N 64 39.7908	E 005 17.2949	732	206	G12	X				130		ASPI 2: gastropods, associé a CT1et CT2
Aspirateur bouteille	3	25/05/2006	05:41:42	N 64 39.7904	E 005 17.3134	733	183	G12	X				140		ASPI 3 : gasteropods, thiothrix filament and shrimps
Aspirateur bouteille	4	25/05/2006	20:48:52	N 64 39.9912	E 005 17.3461	732	275	G11	X				226		ASPI 4 : We have slurped a surface area of 10x15 cm at PPV4
Aspirateur bouteille	5	25/05/2006	23:11:24	N 64 39.9976	E 005 17.3472	735	270	G11	X				238		ASPI 5: on pingoe, with CLG1 beeing back in the hole in order not to disturb the environment before slurping pogonophorans.
Aspirateur bouteille	6	26/05/2006	01:53:06	N 64 39.9781	E 005 17.3893	734	321	G11	X				246		ASPI 6 : on living vesicomyids PPV3
Aspirateur bouteille	7	26/05/2006	02:03:44	N 64 39.9773	E 005 17.3926	734	321	G11	X				247		ASPI 7: on living vesicomyids PPV3
Carottier a lame	6	25/05/2006	21:08:01	N 64 39.9906	E 005 17.3481	732	275	G11	X				228		CL6 in the Pogonophorans of PPV4 and the shrimp is coming closer to sees what
Carottier a lame	7	25/05/2006	20:56:17	N 64 39.9912	E 005 17.3460	732	275	G11	X				227		CL7 in the Pogonophorans of PPV4 east to the central spot of bacterial mat
Carottier a lame	8	25/05/2006	21:14:53	N 64 39.9902	E 005 17.3489	733	275	G11	X				229		CL8 is the third CL on the Pogonophorans of PPV4, taken north to the bacterial mat.
Carottier a lame Grand	1	25/05/2006	22:52:27	N 64 39.9962	E 005 17.3458	736	270	G11	X				236		CLG1 in place in the Pingoe
Carottier tube	1	25/05/2006	00:52:43	N 64 39.7919	E 005 17.2851	733	103	G12	X		X		117		CT 1 black patch, on the center of G12 depression (as PEP8)
Carottier tube	2	25/05/2006	01:25:36	N 64 39.7914	E 005 17.2971	733	200	G12	X		X		120		CT2, black spot surrounded by many gastropods, on the center of G12 depression (as PEP9)
Carottier tube	3	25/05/2006	03:13:45	N 64 39.7914	E 005 17.2957	733	205	G12			X		416		CT3 in the center of the G12 depression
Carottier tube	4	25/05/2006	04:03:02	N 64 39.7905	E 005 17.2976	732	269	G12			X		131		CT4 collecting grey sediment
Carottier tube	5	25/05/2006	04:49:01	N 64 39.7895	E 005 17.3153	733	179	G12			X		135		CT5 sampling of white bacterial mat
Carottier tube	6	25/05/2006	05:20:42	N 64 39.7899	E 005 17.3157	733	180	G12			X		137		CT6 core sampling of disturbed sediment
Carottier tube	7	25/05/2006	06:19:55	N 64 39.7860	E 005 17.3248	732	260	G12			X		145		CT7 sampling of grey sediment with possible bacterial mats (Corer broken)
Carottier tube	8	25/05/2006	06:32:48	N 64	E 005	733	260	G12			X		146		CT8 core sampling of grey sediment

				39.7899	17.3171										
Carottier tube	9	25/05/2006	06:52:41	N 64 39.7924	E 005 17.3094	734	191	G12			X		150		CT9 : taking push core
Carottier tube	10	25/05/2006	07:12:10	N 64 39.7893	E 005 17.3084	734	50	G12			X		152		CT10 : push core broken
Carottier tube	11	25/05/2006	08:31:30	N 64 39.7890	E 005 17.3147	733	133	G12			X		158		CT 11 at microbial mat
Carottier tube	12	25/05/2006	08:44:31	N 64 39.7883	E 005 17.3184	733	133	G12			X		160		CT 12, at bacterial mat just next to place where CT 11 was taken
Carottier tube	13	25/05/2006	19:13:27	N 64 39.9904	E 005 17.3468	732	275	G11	X		X		210		CT13 is the first CT east to the pogonophorans
Carottier tube	14	25/05/2006	20:39:14	N 64 39.9907	E 005 17.3441	733	275	G11	X		X		222		CT 14 is 3/4 full with a clear oxydized superficial zone on the black deeper layer in pogonophorans at PPV4
Carottier tube	15	25/05/2006	20:35:26	N 64 39.9911	E 005 17.3444	732	275	G11			X		221		CT 15 is half full in pogonophorans at PPV4
Carottier tube	16	25/05/2006	20:24:13	N 64 39.9929	E 005 17.3446	732	275	G11			X		223		CT 16 is nearly full in pogonophorans at PPV4
Carottier tube	17	25/05/2006	20:17:20	N 64 39.9929	E 005 17.3445	733	275	G11			X		216		CT 17 is also full in pogonophorans at PPV4
Carottier tube	18	25/05/2006	20:14:57	N 64 39.9931	E 005 17.3441	732	275	G11	X		X		215		CT 18 is totally full in pogonophorans at PPV4
Carottier tube	19	25/05/2006	20:21:56	N 64 39.9922	E 005 17.3458	732	275	G11			X		218		CT 19 is also nearly full in gastropods at PPV4
Carottier tube	20	25/05/2006	20:25:55	N 64 39.9925	E 005 17.3427	732	275	G11			X		219		CT 20 is 2/3 full in gastropods at PPV4
Carottier tube	21	25/05/2006	20:29:23	N 64 39.9912	E 005 17.3436	733	275	G11			X		220		CT 21 is nearly empty in gastropods at PPV4
Carottier tube	22	25/05/2006	20:19:18	N 64 39.9925	E 005 17.3457	732	275	G11			X		217		CT 22 is half full , it is coming from the central area of the bacterial mat at PPV4
Carottier tube	23	26/05/2006	02:59:27	N 64 39.9732	E 005 17.4757	728	119	G11			X		250		CT23 sampling (corer broken) on top of ICE1
Carottier tube	24	26/05/2006	03:26:52	N 64 39.9737	E 005 17.4743	728	131	G11			X		254		CT24 taken in new spot on top of ICE1
Carottier tube	25	26/05/2006	17:45:31	N 64 39.9799	E 005 17.3473	731	227	G11			X		359		CT 25 (CT1 on the videos) in pogonophorans
Carottier tube	26	26/05/2006	17:54:50	N 64 39.9815	E 005 17.3460	731	227	G11			X		360		CT 26 (CT2 on the videos) in gastropods
Carottier tube	27	26/05/2006	18:06:59	N 64 39.9809	E 005 17.3479	732	227	G11			X		361		CT 27 (CT3 on the vidoe) in gastropods and pogonophorans
Carottier tube	28	26/05/2006	18:17:01	N 64 39.9806	E 005 17.3483	732	227	G11			X		362		CT 28 (CT4 on the video) in bacterial mats on black sediment

Carottier tube	29	26/05/2006	18:43:11	N 64 39.9804	E 005 17.3496	732	226	G11			X		367		CT 29 (CT 5 on the video) in a small bacterial mat black and grey, near the crater
Carottier tube	30	26/05/2006	19:48:24	N 64 40.0016	E 005 17.3757	731	109	G11			X		372		CT 30 (CT 6 on the video) in a bacterial mat spot within a pogonophoran mound close to the top of the hill (northern part)
Carottier tube	31	26/05/2006	20:03:31	N 64 39.9948	E 005 17.3699	730	139	G11			X		375		CT 31 (CT 7 on the video) on bacterial mats on the top of the hill
Carottier tube	32	26/05/2006	20:09:58	N 64 39.9941	E 005 17.3663	731	91	G11			X		376		CT32 (CT 8 on the video) on a bacterial white spot
Carottier tube	33	26/05/2006	18:18:05	N 64 39.9810	E 005 17.3475	732	226	G11			X		363		CT 33 (CT9 on the video) in in the white part of the bacterial spot
Carottier tube	34	26/05/2006	18:23:53	N 64 39.9817	E 005 17.3454	732	226	G11			X		366		CT 34 (CT10 on the video) in the black part of the bacterial spot
Carottier tube	35	26/05/2006	20:40:23	N 64 39.8923	E 005 17.2774	728	194	G11			X		379		CT 35 (CT 11 on the video) Reference core near the MIC 2 The sea floor is always covered with rock fragments and sabellidae
Carottier tube	36	26/05/2006	21:31:35	N 64 39.8367	E 005 17.3857	735	156	G11			X		381		CT 36 (Ct 12 on hte video) Reference core near the MIC 1 site (PP-V5)
Grande Boite ROV	2	24/05/2006	16:49:50	N 64 39.9776	E 005 17.4120	738	193	G11	X				058		GBT2 : Sampling pogonophorans of ICE 3
Grande Boite ROV	3	24/05/2006	15:22:01	N 64 39.9665	E 005 17.4403	728	224	G11	X				032		GBT3 : sampling of bivalves on the east hill of G11 (south of ICE 1)
Grande Boite ROV	11	26/05/2006	05:24:02	N 64 39.9767	E 005 17.4423	737	271	G11			X		264		GBT11 : bottom of caldera, fragment of crust being sampled, 272-CC1
Grande Boite ROV	12	26/05/2006	05:44:04	N 64 39.9800	E 005 17.4200	738	272	G11			X		270		GBT12 : sample 272-CC2 in central caldera : soft sediment with small clasts
INSINC Corer (MPI)	1	25/05/2006	02:54:02	N 64 39.7914	E 005 17.2961	732	204	G12	X		X		126		insink X1 started injection
INSINC Corer (MPI)	2	25/05/2006	03:08:20	N 64 39.7911	E 005 17.2955	732	205	G12	X		X		127		Insink X2 started injection
INSINC Corer (MPI)	5	26/05/2006	04:04:57	N 64 39.9678	E 005 17.4662	728	186	G11			X		257		X5 in place
INSINC Corer (MPI)	6	26/05/2006	04:53:26	N 64 39.9731	E 005 17.4808	728	30	G11			X		261		X6 in place
Lance Thermique pour ROV		24/05/2006	14:27:26	N 64 39.9743	E 005 17.4513	729	109	G11					026	X	LTR 01 (T-probe, Francois), no temperature anomaly measured in the pingo ICE 1
Lance Thermique pour ROV		25/05/2006	07:46:51	N 64 39.7911	E 005 17.3221	734	151	G12					155	X	T-probe (LTR02) : 1 cm in bacterial mat
MIC	1	26/05/2006	14:23:34	N 64 39.8329	E 005 17.3911	733	84	G12					342		MIC 1 deployed on site PP-V5
MIC	1	26/05/2006	16:53:52	N 64 39.8374	E 005 17.3871	733	121	G12					353		recovering MIC 1
MIC	2	26/05/2006	17:14:32	N 64 39.8923	E 005 17.2763	727	3	G12					356		MIC 2 deployed and started : green light

MIC	2	26/05/2006	20:45:25	N 64 39.8915	E 005 17.2767	728	193	G11					380		Recovering MIC 2 and moving to the lift
PEP bouteille	1	24/05/2006	13:46:59	N 64 39.9737	E 005 17.4468	729	116	G11		X			017		PEP 01 on ICE 1 (hill in the east part of G11)
PEP bouteille	2	24/05/2006	16:25:28	N 64 40.0121	E 005 17.4245	727	48	G11		X			410		PEP2 is done at the summit of ICE 2
PEP bouteille	3	24/05/2006	17:05:03	N 64 39.9735	E 005 17.4091	737	146	G11		X			413		PEP 3 at 1,5 m above the floor, near ICE3
PEP bouteille	4	24/05/2006	17:35:22	N 64 39.9591	E 005 17.4038	734	5	G11		X			068		PEP4 : on ICE 4 where the amphipods were, but they are now gone (0.8m above seafloor)
PEP bouteille	5	24/05/2006	19:16:48	N 64 39.9984	E 005 17.3810	728	348	G11		X			091		PEP5: on ICE5, 0.5 m above bottom. Molluscs (vesicomids?) field
PEP bouteille	6	24/05/2006	19:56:14	N 64 40.0163	E 005 17.3772	734	99	G11		X			414		PEP 6 on the small mound ICE 6
PEP bouteille	7	24/05/2006	20:54:48	N 64 39.9833	E 005 17.3405	732	263	G11		X			415		PEP 7: on ICE7
PEP bouteille	8	25/05/2006	00:29:43	N 64 39.7917	E 005 17.2869	733	115	G12		X			110		PEP 8, directly above dark patch, on the center of G12 depression, as CT1)
PEP bouteille	9	25/05/2006	01:14:26	N 64 39.7917	E 005 17.2962	733	201	G12		X			119		PEP 9, black spot surrounded with gastropods, on the center of G12 depression (as CT2)
PEP bouteille	10	25/05/2006	04:39:20	N 64 39.7899	E 005 17.3134	733	179	G12		X			134		PEP10, 10 cm above bacterial mat and Thiotrix-like in back ground
PEP bouteille	11	25/05/2006	07:25:57	N 64 39.7913	E 005 17.3213	734	151	G12		X			154		PEP 11 above bacterial mat
PEP bouteille	12	25/05/2006	08:23:42	N 64 39.7893	E 005 17.3159	733	133	G12		X			157		PEP 12 at microbial mat Thiotrix-like
PEP bouteille	13	25/05/2006	09:29:09	N 64 39.8417	E 005 17.3767	735	248	G12		X			165		PEP 13 above microbial mat
PEP bouteille	14	25/05/2006	18:46:55	N 64 39.9894	E 005 17.3463	732	275	G11		X			203		PEP 14 in the center of the bacterial mat of PPV4
PEP bouteille	15	25/05/2006	18:48:14	N 64 39.9891	E 005 17.3462	732	275	G11		X			204		PEP 15 on the snails of PPV4
PEP bouteille	16	25/05/2006	18:50:13	N 64 39.9899	E 005 17.3446	732	275	G11		X			205		PEP 16 second PEP on the snails
PEP bouteille	17	25/05/2006	18:52:46	N 64 39.9901	E 005 17.3445	732	275	G11		X			206		PEP 17 is the third PEP on the snails of PPV4
PEP bouteille	18	25/05/2006	18:56:35	N 64 39.9900	E 005 17.3450	732	275	G11		X			207		PEP 18 is the first PEP on the Pogonophorans of PPV4
PEP bouteille	19	25/05/2006	18:59:54	N 64 39.9903	E 005 17.3461	732	275	G11		X			208		PEP 19 is the second PEP on the Pogonophorans of PPV4
Petite Boite de collecte	3	26/05/2006	01:05:16	N 64 39.9782	E 005 17.3915	734	321	G11	X				245		PBT3 : living vesicomyids PPV3 but the box was open and empty when arriving at the surface.

ROV panier	1	26/05/2006	06:01:03	N 64 39.9895	E 005 17.4048	733	320	G11			X		275		PANIER 1 : sample 272-CC3 which is a clast, rock fragments on NW ridge summit
ROV panier	2	26/05/2006	06:07:44	N 64 40.0007	E 005 17.3909	727	320	G11			X		278		PANIER 2 : sample 272-CC4 on top of ridge

ALAMER : Résumé de plongée

Dive 273-3 Microbathymetry on Storegga North East

VICKING
Plongée : 273- 3

Date : 28/05/2006
Observateurs :

Date	Heure	Observateurs
28/05/2006	08h00 - 12h00	TOUTOUX Claude
28/05/2006	12h00 - 16h00	DESCHAMPS Anne EDY Christian
28/05/2006	16h00 - 20h00	NORMAND Alain SIMEONI Patrick
28/05/2006	20h00 - 00h00	TOUTOUX Claude
29/05/2006	00h00 - 04h00	DESCHAMPS Anne EDY Christian
29/05/2006	04h00 - 08h00	NORMAND Alain SIMEONI Patrick
29/05/2006	08h00 - 12h00	TOUTOUX Claude

Dive 273-3. Storegga slope. Hydratech mud domes

Station : **Storegga Nord Est** lat moy : N 64 38.5883 long moy : E 004 53.0192

Sites explorés :

Objectifs de la plongée :
Microbathymetry of chimney cne01 of Storegga North East.

Résumé manuel des travaux :

Bathymetry completed for cne01 only for an area of 1.4km x 0.3km
ROV recovered following black out at the end of cne01 survey.

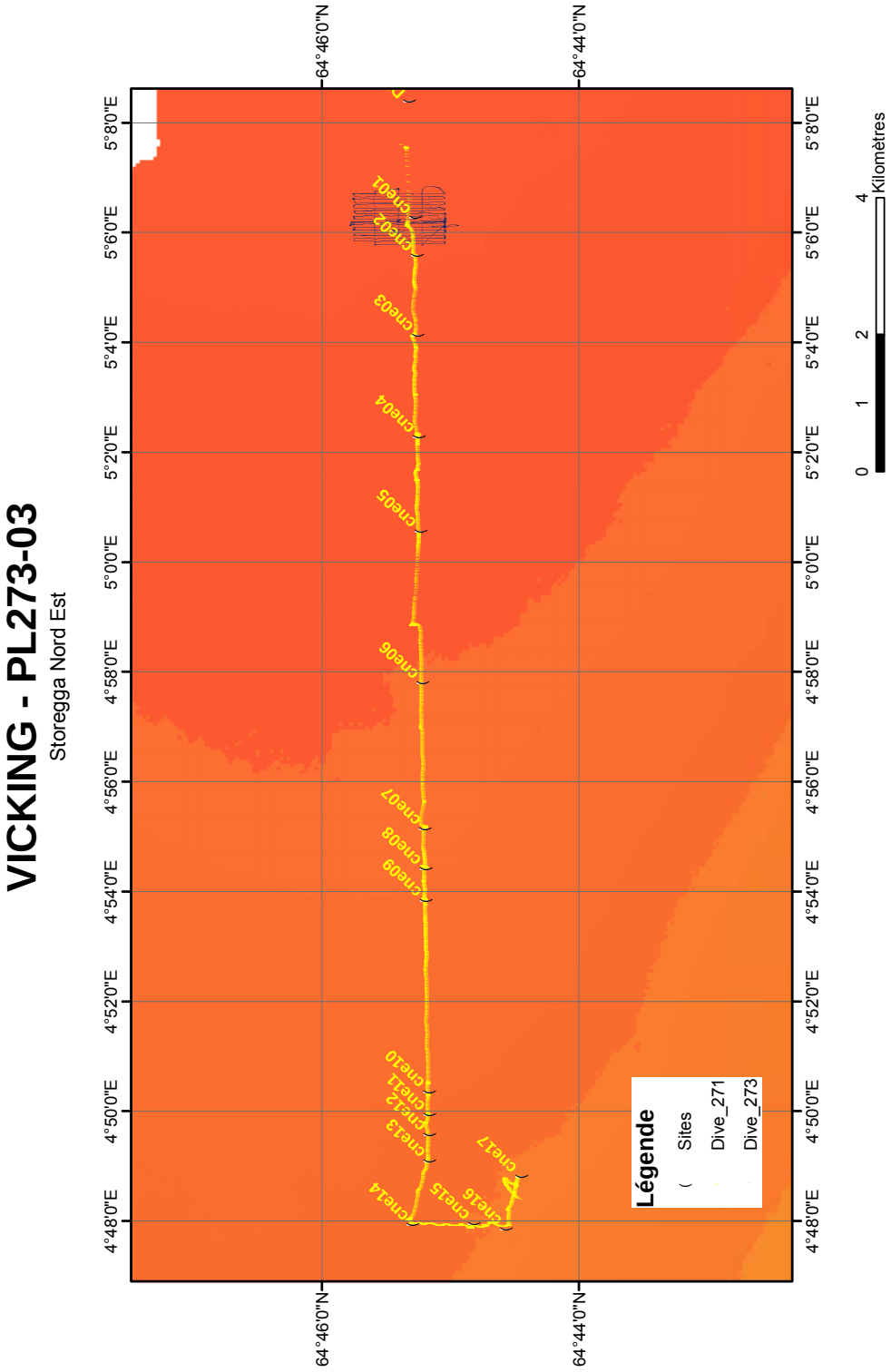
Résumé automatique des travaux :

Rapport de plongée :

Date	Heure	Localité	Latitude	Longitude	Prof (m)	N° Photo	Commentaires
28/05/2006	10:30:00	Storegga Nord Est	N 64 45.7746	E 005 06.1416	713		Arriving at the bottom
29/05/2006	09:30:00	Storegga Nord Est	N 64 45.4588	E 005 06.0524	715		Black out, end of the dive

ALAMER : Résumé de plongée

Dive 273-3 Map



Dive 274-4 Microbathymetry on Storegga North East

VICKING
Plongée : 274- 4

Date : 29/05/2006
Observateurs :

Date	Heure	Observateurs
30/05/2006	04h00 - 08h00	NORMAND Alain SIMEONI Patrick
30/05/2006	08h00 - 12h00	TOUTOUX Claude
30/05/2006	12h00 - 16h00	DESCHAMPS Anne EDY Christian
30/05/2006	16h00 - 20h00	NORMAND Alain SIMEONI Patrick
30/05/2006	20h00 - 00h00	TOUTOUX Claude

Dive 274-4. Storegga slope. Hydratech mud domes

Station : **Storegga Nord Est** lat moy : N 64 38.5883 long moy : E 004 53.0192

Sites explorés :

Objectifs de la plongée :
Microbathymetry of chimney cne03 of Storegga North East

Résumé manuel des travaux :

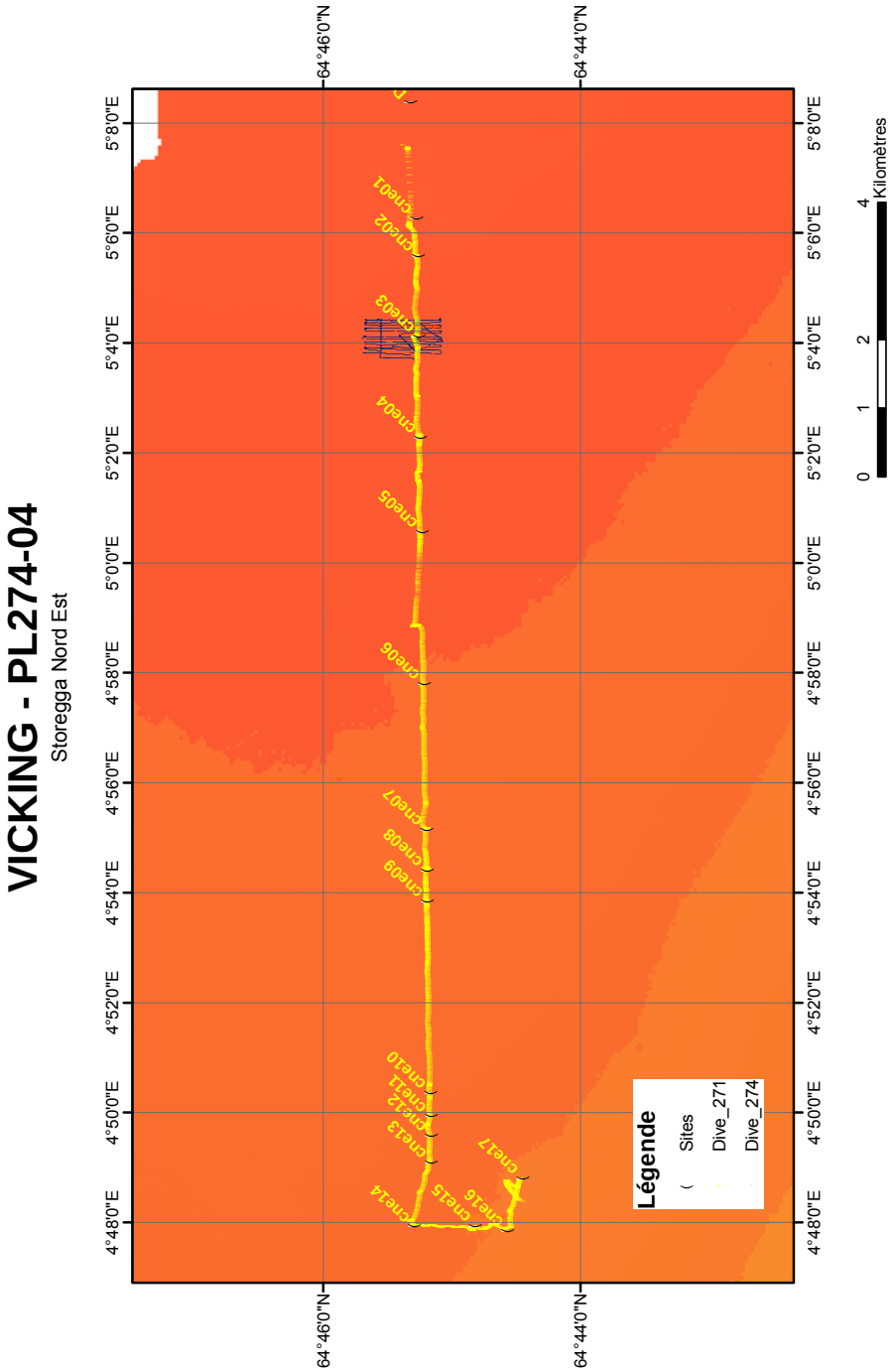
Bathymetry completed for an area of 1.1 km x 0.5 km

Résumé automatique des travaux :

Rapport de plongée :

Date	Heure	Localité	Latitude	Longitude	Prof (m)	N° Photo	Commentaires
30/05/2006	06:00:00	Storegga Nord Est	N 64 45.6990	E 005 03.5574	720		Arriving at the bottom

Dive 274-4 Map



ALAMER : Résumé de plongée

Dive 275-5 Chronological Progress on Storegga North East

VICKING
Plongée : 275- 5

Date : 31/05/2006
Observateurs :

Date	Heure	Observateurs
31/05/2006	12h00 - 16h00	VAN GAEVER Saskia CAPRAIS Jean-Claude
31/05/2006	16h00 - 20h00	ANDERSEN Ann TOFFIN Laurent
31/05/2006	20h00 - 00h00	OLU - Le ROY Karine PIERRE Catherine
01/06/2006	00h00 - 04h00	VAN GAEVER Saskia CAPRAIS Jean-Claude
01/06/2006	04h00 - 08h00	ANDERSEN Ann TOFFIN Laurent
01/06/2006	08h00 - 12h00	PIERRE Catherine LICHTSCHLAG Anna
01/06/2006	12h00 - 16h00	FESEKER Thomas BOETIUS Antje

Station : **Storegga Nord Est** lat moy : N 64 38.5883 long moy : E 004 53.0192

Sites explorés : cne03 and cne5.7

Objectifs de la plongée :

Biological sampling dive of 25hours on Storegga North East.
First sampling area on chimney cne 5.7 (between cne05 and cne06)
Second sampling area on cne03

Résumé manuel des travaux :

(1) An active site at cne5.7 fully sampled and characterized
(2) An active site sampled at cne03
(3) Survey of cne03 found several soufflé-type active sites
at the western edge of the central depression

Résumé automatique des travaux :
Prélèvements
Biologie :
Aspirateur bouteille : 8 prélèvements,
Carottier a lame : 3 prélèvements,
Carottier tube : 3 prélèvements,
ROV panier : 1 prélèvement,
Grande Boite ROV : 2 prélèvements,
Eau :
PEP bouteille : 16 prélèvements,
Géochimie :
Carottier tube : 12 prélèvements,
INSINC Corer (MPI) : 2 prélèvements,
Grande Boite ROV : 2 prélèvements,
Petite Boite de collecte : 1 prélèvement,

ROV panier : 1 prélèvement,

147 images ont été numérisées,
3 nouvelles localités ont étés définies : PP-V9, PP-V10 et PP-V11.

Rapport de plongée :

Date	Heure	Localité	Latitude	Longitude	Prof (m)	N° Photo	Commentaires
31/05/2006	13:01:08	Storegga Nord Est	N 64 45.2370	E 004 59.1392	741	001	Arriving at the bottom, going to the elevator, DVD's 1 are started
31/05/2006	13:29:57	Storegga Nord Est	N 64 45.1830	E 004 59.0629	743	002	elevator opened
31/05/2006	13:37:24	Storegga Nord Est	N 64 45.1756	E 004 59.0673	743	003	taking Benthic chamber
31/05/2006	14:09:10	Storegga Nord Est	N 64 45.2680	E 004 58.8686	745	004	looking for site cne05.7
31/05/2006	14:31:49	Storegga Nord Est	N 64 45.2707	E 004 58.8710	745	005	Benthic chamber (calmar) deployment
31/05/2006	14:35:36	Storegga Nord Est	N 64 45.2690	E 004 58.8702	746	006	calmar is deployed and digged on seafloor
31/05/2006	14:40:07	Storegga Nord Est	N 64 45.2690	E 004 58.8710	745	007	waiting around five minutes for stabilization inside the calamarBenthic chamber
31/05/2006	14:48:37	Storegga Nord Est	N 64 45.2690	E 004 58.8690	745	008	closing Benthic Chamber cell A1
31/05/2006	15:14:00	Storegga Nord Est	N 64 45.2714	E 004 58.8643	746		Deployment of PP-V9
31/05/2006	15:31:28	Storegga Nord Est	N 64 45.2760	E 004 58.8786	745	009	Beginning of the mosaic: first line to the south west
31/05/2006	15:39:51	Storegga Nord Est	N 64 45.2680	E 004 58.8600	745	011	Start of profile 2
31/05/2006	15:41:06	Storegga Nord Est	N 64 45.2720	E 004 58.8691	745	012	gastropods shells, deads?
31/05/2006	15:42:24	Storegga Nord Est	N 64 45.2749	E 004 58.8762	746	013	end of profile 2
31/05/2006	15:45:08	Storegga Nord Est	N 64 45.2738	E 004 58.8776	745	014	Start of profile 3
31/05/2006	15:47:45	Storegga Nord Est	N 64 45.2676	E 004 58.8587	745	015	End of line 3
31/05/2006	15:55:04	Storegga Nord Est	N 64 45.2670	E 004 58.8580	745	016	Starting profile 5 we decide to do only one profile every 2m instead of one. Also decide to go at 2.70 m altitude because of a shadow on the image and mosaic.
31/05/2006	15:58:26	Storegga Nord Est	N 64 45.2751	E 004 58.8790	745	017	End of 5
31/05/2006	16:00:24	Storegga Nord Est	N 64 45.2741	E 004 58.8810	745	018	Starting profile 7
31/05/2006	16:02:32	Storegga Nord Est	N 64 45.2658	E 004 58.8625	745	019	End of 7
31/05/2006	16:05:15	Storegga Nord Est	N 64 45.2670	E 004 58.8620	745	020	Starting profile 9
31/05/2006	16:10:11	Storegga Nord Est	N 64 45.2720	E 004 58.8810	745	021	Starting profile 11
31/05/2006	16:12:17	Storegga Nord Est	N 64 45.2650	E 004 58.8660	745	022	End of line 11
31/05/2006	16:14:16	Storegga Nord Est	N 64 45.2747	E 004 58.8752	745	023	We decide to do another (line 10) as thinking there is a blank in the mosaic.
31/05/2006	16:16:44	Storegga Nord Est	N 64 45.2650	E 004 58.8647	745	024	End of profile 10.
31/05/2006	16:17:54	Storegga Nord Est	N 64 45.2729	E 004 58.8808	745	025	Last line to test the mosaic real time with estimate navigation. END of the MOSAIC
31/05/2006	16:28:03	Storegga Nord Est	N 64 45.2680	E 004 58.8720	745	026	closing Benthic Chamber cell A2

31/05/2006	16:42:24	Storegga Nord Est	N 64 45.2680	E 004 58.8672	745	027	PEP1 on white spot (sulfur probably)
31/05/2006	16:44:03	Storegga Nord Est	N 64 45.2690	E 004 58.8690	745	028	PEP2 same white spot because PEP1 did not work
31/05/2006	16:46:40	Storegga Nord Est	N 64 45.2690	E 004 58.8694	745	029	PEP3 fisrt PEP in the gastropod ring.
31/05/2006	16:48:54	Storegga Nord Est	N 64 45.2706	E 004 58.8608	745	030	PEP4 second PEP in the gastropod field.
31/05/2006	16:51:11	Storegga Nord Est	N 64 45.2690	E 004 58.8670	745	031	PEP5 third and last PEP in the gastropode ring.
31/05/2006	16:54:23	Storegga Nord Est	N 64 45.2680	E 004 58.8706	745	032	PEP6 on black Pogonophora with biofilm
31/05/2006	16:57:20	Storegga Nord Est	N 64 45.2682	E 004 58.8684	745	033	PEP7 in black Pogonophora with biofilm
31/05/2006	17:00:01	Storegga Nord Est	N 64 45.2684	E 004 58.8674	745	034	PEP8 in black Pogonophora with biofilm
31/05/2006	17:03:21	Storegga Nord Est	N 64 45.2690	E 004 58.8704	745	035	PEP9 in brown curled Pogonophora field
31/05/2006	17:10:00	Storegga Nord Est	N 64 45.2700	E 004 58.8670	745		DVD set 3
31/05/2006	17:15:09	Storegga Nord Est	N 64 45.2690	E 004 58.8680	745	036	PEP10 in brown curled Pogonophora field
31/05/2006	17:17:00	Storegga Nord Est	N 64 45.2727	E 004 58.8623	745		PEP11 in brown curled Pogonophora field
31/05/2006	17:26:24	Storegga Nord Est	N 64 45.2690	E 004 58.8714	745	037	Trying to sample CT1 but we only found hard crust
31/05/2006	17:42:37	Storegga Nord Est	N 64 45.2708	E 004 58.8626	745	039	CT1 : white spot sediment
31/05/2006	17:58:14	Storegga Nord Est	N 64 45.2690	E 004 58.8626	745	041	Insinc1 new try in white bacterial spot as first failed
31/05/2006	18:01:20	Storegga Nord Est	N 64 45.2685	E 004 58.8635	745	042	INSINC 1 sediment collected
31/05/2006	18:06:43	Storegga Nord Est	N 64 45.2705	E 004 58.8601	745	043	Insink 1 started
31/05/2006	18:11:05	Storegga Nord Est	N 64 45.2699	E 004 58.8678	745	045	closing Benthic Chamber cell A3
31/05/2006	18:29:10	Storegga Nord Est	N 64 45.2702	E 004 58.8712	745	047	CT2 : sampling site
31/05/2006	18:30:14	Storegga Nord Est	N 64 45.2741	E 004 58.8702	745	048	trying to sample INSINC2
31/05/2006	18:31:06	Storegga Nord Est	N 64 45.2720	E 004 58.8720	745	049	INSIC2 : sampling
31/05/2006	18:37:17	Storegga Nord Est	N 64 45.2722	E 004 58.8726	745	051	Insinc2 starting
31/05/2006	18:41:53	Storegga Nord Est	N 64 45.2718	E 004 58.8722	745	052	gastropod field with dead and living specimen
31/05/2006	18:53:56	Storegga Nord Est	N 64 45.2704	E 004 58.8738	744	053	ASPI 1 : sampling gastropods
31/05/2006	18:56:06	Storegga Nord Est	N 64 45.2708	E 004 58.8732	744	054	sampling ASPI 1
31/05/2006	18:58:23	Storegga Nord Est	N 64 45.2705	E 004 58.8710	744	055	fish in pogonophorans
31/05/2006	19:09:10	Storegga Nord Est	N 64 45.2700	E 004 58.8737	745	056	CT3 : sampling
31/05/2006	19:10:25	Storegga Nord Est	N 64 45.2700	E 004 58.8750	745	057	CT4 : sampling
31/05/2006	19:41:35	Storegga Nord Est	N 64 45.2733	E 004 58.8705	745	058	GBT 3 : sampling 275-CC1
31/05/2006	19:57:35	Storegga Nord Est	N 64 45.2474	E 004 58.9405	743	059	we have taken the CALMAR Benthic Chamber and we are moving to the elevator
31/05/2006	20:04:45	Storegga Nord Est	N 64 45.1800	E 004 59.0644	742	060	we arrive to the elevator
31/05/2006	20:20:33	Storegga Nord Est	N 64 45.1798	E 004 59.0672	742	061	The rack of bladecorers is difficult to take in the elevator, two CL fell out
31/05/2006	20:30:13	Storegga	N 64	E 004	742	062	We return to PPV9

		Nord Est	45.1821	59.0743			
31/05/2006	20:55:28	Storegga Nord Est	N 64 45.2692	E 004 58.8725	745	069	Preparation of the location of the first blade corer CL5
31/05/2006	20:59:50	Storegga Nord Est	N 64 45.2690	E 004 58.8716	745	070	The CL5 cannot go into the sediment it is too hard
31/05/2006	21:02:06	Storegga Nord Est	N 64 45.2681	E 004 58.8757	745	071	We move to a softer bottom, maybe close to the position of the previous CALMAR benthic chamber
31/05/2006	21:06:24	Storegga Nord Est	N 64 45.2636	E 004 58.8701	745	072	This is the black spot area where we took the PEPs and put the benthic chamber CALAMAR.
31/05/2006	21:10:25	Storegga Nord Est	N 64 45.2694	E 004 58.8693	745	073	CL5 is done succesfully on the brown curled Pogonophorans just to the left of the position of the benthic CALAMAR.
31/05/2006	21:14:08	Storegga Nord Est	N 64 45.2690	E 004 58.8680	745	074	Zoom on the full CL5
31/05/2006	21:18:37	Storegga Nord Est	N 64 45.2735	E 004 58.8717	745	075	CL6 is taken
31/05/2006	21:19:40	Storegga Nord Est	N 64 45.2680	E 004 58.8680	745	076	Change of DVD to set 5
31/05/2006	21:21:35	Storegga Nord Est	N 64 45.2683	E 004 58.8697	745	077	CL6 is less full
31/05/2006	21:27:45	Storegga Nord Est	N 64 45.2680	E 004 58.8670	745	078	CL7 is taken on the exact same spot as the CALAMAR benthic bell
31/05/2006	21:29:25	Storegga Nord Est	N 64 45.2686	E 004 58.8702	745	079	The CL7 is quite full
31/05/2006	21:50:13	Storegga Nord Est	N 64 45.1783	E 004 59.0627	743	080	DVD3 was blocked. The pilots put the INSINC in the elevator.
31/05/2006	22:27:08	Storegga Nord Est	N 64 45.1800	E 004 59.0660	743	081	The elevator is closed
31/05/2006	22:43:24	Storegga Nord Est	N 64 45.2680	E 004 58.8746	745	082	We are back on site 5.7
31/05/2006	22:56:24	Storegga Nord Est	N 64 45.2685	E 004 58.8725	746	085	CT5 on black pogonophora on site 5.7
31/05/2006	23:05:51	Storegga Nord Est	N 64 45.2690	E 004 58.8695	746	087	CT6 is taken on the balck pogonophora on site 5.7
31/05/2006	23:10:35	Storegga Nord Est	N 64 45.2679	E 004 58.8711	746	088	black pogonophora in site 5.7
31/05/2006	23:16:34	Storegga Nord Est	N 64 45.2683	E 004 58.8723	746	089	CT7 is taken on the black pogonophora on site 5.7
31/05/2006	23:20:00	Storegga Nord Est	N 64 45.2690	E 004 58.8730	746		DVD set 6
31/05/2006	23:35:00	Storegga Nord Est	N 64 45.2669	E 004 58.8770	746		ASPI 2: at site 5.7 (?) should be empty, but we found some fauna inside it
31/05/2006	23:36:00	Storegga Nord Est	N 64 45.2676	E 004 58.8771	746		ASPI 3 : at site 5.7. black pogonophorans, 20*22 cm
31/05/2006	23:43:27	Storegga Nord Est	N 64 45.2731	E 004 58.8710	745	091	ASPI 4 : orange gastropod on site 5.7
01/06/2006	00:10:51	Storegga Nord Est	N 64 45.2706	E 004 58.8870	746	096	ASPI 5 : crevette on site 5.7
01/06/2006	00:27:33	Storegga Nord Est	N 64 45.2710	E 004 58.8700	746	092	ASPI 6 : pogonophora frisé (found next to marker PP-V9) on site 5.7. 20*22 cm.
01/06/2006	00:57:47	Storegga Nord Est	N 64 45.2703	E 004 58.8700	746	097	ASPI 7 : small red gastropods on site 5.7
01/06/2006	01:26:41	Storegga Nord Est	N 64 45.2709	E 004 58.8676	746	098	PBT 3 : sampling crust with microbial mat on site 5.7
01/06/2006	01:29:27	Storegga Nord Est	N 64 45.2691	E 004 58.8680	745	099	DVD set 7 started, sampling crust with microbial mat
01/06/2006	01:54:01	Storegga Nord Est	N 64 45.2700	E 004 58.8685	746	100	Laurent and Ann on shift
01/06/2006	03:04:20	Storegga Nord Est	N 64 45.2667	E 004 58.8681	745	101	We are looking for black pogonophora with bacterial biofilm for microbiology, this will take about one hour, because either the bottom is too hard, or there is no biofilm on the tubes.
01/06/2006	03:23:40	Storegga Nord Est	N 64 45.2669	E 004 58.8706	746	102	CT8 spot of pogonophora with bacterial mat
01/06/2006	03:25:00	Storegga	N 64	E 004	746	103	CT8 is taken

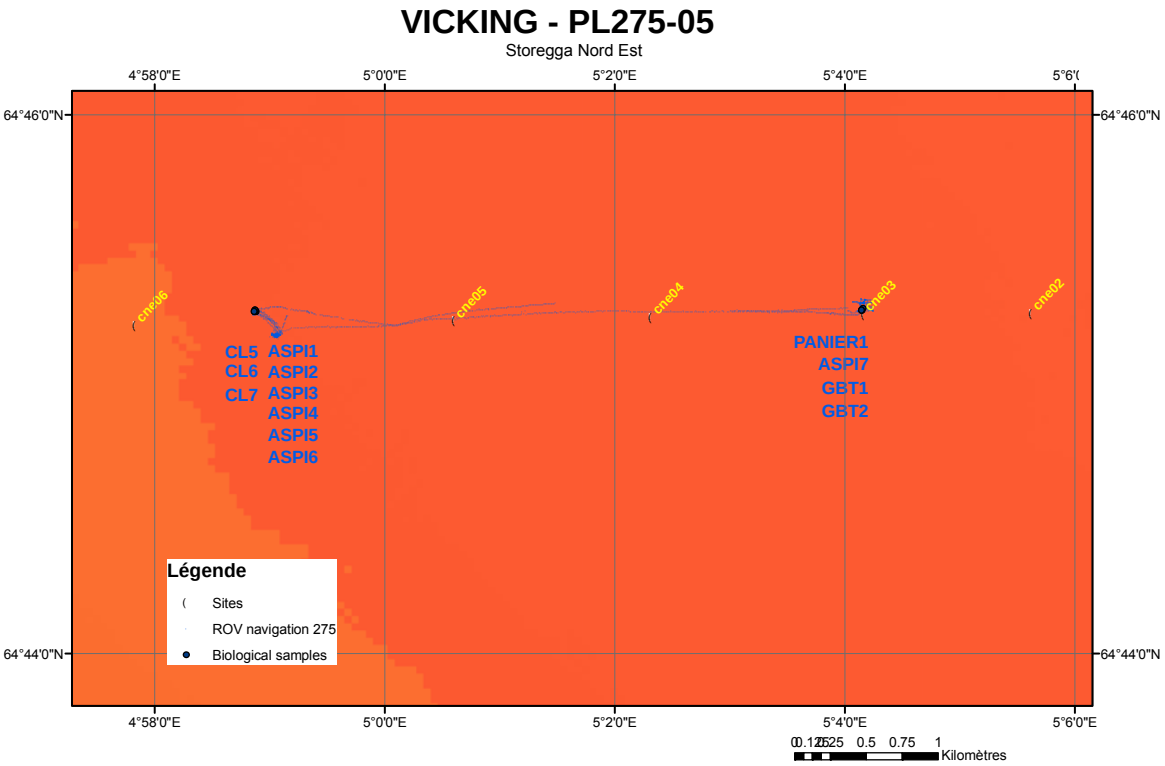
		Nord Est	45.2666	58.8713			
01/06/2006	03:27:57	Storegga Nord Est	N 64 45.2670	E 004 58.8700	746	104	CT8 in rack
01/06/2006	03:34:00	Storegga Nord Est	N 64 45.2670	E 004 58.8715	746		Start of DVD set 8. We changed the camera 4 view from Babord to Tribord to avoid seing the left arm of the ROV on the image. There was problem to start the DVD's as often during this cruise.
01/06/2006	03:42:21	Storegga Nord Est	N 64 45.2670	E 004 58.8703	746	105	CT9 spot with black pogonophora and probably bacterial mat, CT8 is seen as a whole 15-20 cm to the right side
01/06/2006	03:46:16	Storegga Nord Est	N 64 45.2660	E 004 58.8699	746	106	CT9 is taken
01/06/2006	03:47:35	Storegga Nord Est	N 64 45.2670	E 004 58.8708	746	108	CT9 recovery
01/06/2006	03:53:04	Storegga Nord Est	N 64 45.2660	E 004 58.8693	745	109	We are on way to cne03, which is 4.5 km to the east and at a speed of 1 knot the journey will take about 2 hours.
01/06/2006	06:08:00	Storegga Nord Est	N 64 45.2801	E 005 03.9154	725	110	Take over of the shift by Karin and Anna
01/06/2006	06:18:15	Storegga Nord Est	N 64 45.2685	E 005 04.1274	721	111	arrival on cne 03
01/06/2006	06:25:02	Storegga Nord Est	N 64 45.2751	E 005 04.1382	721	112	bacterial mat in small crater
01/06/2006	06:31:52	Storegga Nord Est	N 64 45.2764	E 005 04.1469	721	113	CT10 : tube core on the greyish spot of the mat, on cne03 at the center of the spot
01/06/2006	06:45:39	Storegga Nord Est	N 64 45.2760	E 005 04.1468	721	116	CT11 : with white larger fillaments on top, and pogonophorans?, on cne03
01/06/2006	06:55:10	Storegga Nord Est	N 64 45.2750	E 005 04.1472	721	118	CT12 : on the back greyish spot, bacterial mat with white dots, black sediment and white shells, on cne03
01/06/2006	07:01:23	Storegga Nord Est	N 64 45.2741	E 005 04.1499	721	119	trying to catch the gorgonocephalus
01/06/2006	07:04:58	Storegga Nord Est	N 64 45.2760	E 005 04.1466	721	120	trying to catch the next gorgonocephalus
01/06/2006	07:06:55	Storegga Nord Est	N 64 45.2760	E 005 04.1467	721	121	PANIER 1 : caching gorgonocephalus from close to the bacterial mat
01/06/2006	07:10:01	Storegga Nord Est	N 64 45.2760	E 005 04.1473	721	122	PEP 12 about 50 cm over the seafloor, directly over bacterial mat crater, on cne03 active site
01/06/2006	07:19:48	Storegga Nord Est	N 64 45.2760	E 005 04.1469	721	123	PEP 13 about 5 cm above bacterial mat, on cne03 active site, black sediment and white shells
01/06/2006	07:31:20	Storegga Nord Est	N 64 45.2755	E 005 04.1490	721	124	GBT 2 : got it (comatulide)
01/06/2006	07:36:32	Storegga Nord Est	N 64 45.2753	E 005 04.1500	721	125	placing marker PP-V10 here, on cne03 active site
01/06/2006	07:39:49	Storegga Nord Est	N 64 45.2756	E 005 04.1489	721	126	going to marked crust
01/06/2006	07:43:49	Storegga Nord Est	N 64 45.2793	E 005 04.1647	721	127	arriving at crust
01/06/2006	07:46:36	Storegga Nord Est	N 64 45.2820	E 005 04.1580	720	128	looking for alive gastropods
01/06/2006	07:47:08	Storegga Nord Est	N 64 45.2813	E 005 04.1606	720	129	seem all to be dead
01/06/2006	08:01:38	Storegga Nord Est	N 64 45.2800	E 005 04.1560	721	130	GBT 1 : carbonate crust 275-CC2 with comatulide, cne03 dead site
01/06/2006	08:02:46	Storegga Nord Est	N 64 45.2820	E 005 04.1570	721	131	changing DVD, new set 10
01/06/2006	08:12:07	Storegga Nord Est	N 64 45.2790	E 005 04.1542	721	132	ASPI 8 : using slurp gun on dead gastropods and shrimps, cne03 dead site
01/06/2006	08:19:34	Storegga Nord Est	N 64 45.2790	E 005 04.1580	721	133	end slurp gun
01/06/2006	08:30:54	Storegga Nord Est	N 64 45.2800	E 005 04.1672	721	134	C.Pierre and JP Foucher on shift, starting survey of central part of cno03 with a series iof easr wesr profiles
01/06/2006	08:33:28	Storegga Nord Est	N 64 45.2798	E 005 04.1772	721	136	sponges
01/06/2006	08:34:50	Storegga Nord Est	N 64 45.2790	E 005 04.1951	721	137	slalom between crinoids

01/06/2006	08:38:29	Storegga Nord Est	N 64 45.2770	E 005 04.2216	721	138	calmar and gorgo fight
01/06/2006	08:41:09	Storegga Nord Est	N 64 45.2776	E 005 04.2290	721	139	indurated sediment block 60 cm
01/06/2006	08:43:49	Storegga Nord Est	N 64 45.2765	E 005 04.2365	721	140	crinoid and block
01/06/2006	08:45:24	Storegga Nord Est	N 64 45.2770	E 005 04.2366	721	141	second block (several blocks of unknown origin)
01/06/2006	08:53:48	Storegga Nord Est	N 64 45.2891	E 005 04.1861	722	142	going westwards 20 m to the north of the previous eastward profile
01/06/2006	08:57:53	Storegga Nord Est	N 64 45.2944	E 005 04.1336	721	143	we passed a step of 1 m or so, are deeper now
01/06/2006	09:01:57	Storegga Nord Est	N 64 45.3050	E 005 04.0836	723	144	722 m, we are deeper by 2 m
01/06/2006	09:09:47	Storegga Nord Est	N 64 45.3030	E 005 04.1650	721	145	new spot of activity with several souffle-like active seeps
01/06/2006	09:17:26	Storegga Nord Est	N 64 45.3030	E 005 04.1688	721	146	preparing for water sampling
01/06/2006	09:20:21	Storegga Nord Est	N 64 45.3032	E 005 04.1695	721	147	PEP15 inside soufflé 1
01/06/2006	09:22:36	Storegga Nord Est	N 64 45.3033	E 005 04.1689	721	148	PEP16 at 50 cm above soufflé 1
01/06/2006	09:27:26	Storegga Nord Est	N 64 45.3035	E 005 04.1670	721	149	zoom showing gastro near soufflé 1
01/06/2006	09:28:31	Storegga Nord Est	N 64 45.3050	E 005 04.1676	721	150	seafloor immediately next to soufflé 1
01/06/2006	09:30:22	Storegga Nord Est	N 64 45.3030	E 005 04.1672	721	151	sampling the thin crust of soufflé 1
01/06/2006	09:32:21	Storegga Nord Est	N 64 45.3035	E 005 04.1665	721	152	PANIER 2 : CC3 fragment of the thin crust above soufflé 1
01/06/2006	09:35:31	Storegga Nord Est	N 64 45.3047	E 005 04.1670	721	154	inside soufflé 1
01/06/2006	09:39:27	Storegga Nord Est	N 64 45.3040	E 005 04.1678	721	157	preparing to move to the next souffle
01/06/2006	09:42:00	Storegga Nord Est	N 64 45.3036	E 005 04.1700	721	158	soufflé 2
01/06/2006	09:43:25	Storegga Nord Est	N 64 45.3030	E 005 04.1699	721	159	pingo-type dome near soufflé 2 with pogonophorans
01/06/2006	09:45:57	Storegga Nord Est	N 64 45.3015	E 005 04.1675	721	160	zoom on white spot of pingo-type dome
01/06/2006	09:49:29	Storegga Nord Est	N 64 45.3031	E 005 04.1701	721	161	inside soufflé 2
01/06/2006	09:50:51	Storegga Nord Est	N 64 45.3030	E 005 04.1700	721	162	inside soufflé 2
01/06/2006	09:57:26	Storegga Nord Est	N 64 45.3030	E 005 04.1700	721	163	PEP 17: within a cavity of a 'soufflé'
01/06/2006	10:12:02	Storegga Nord Est	N 64 45.3029	E 005 04.1681	721	164	Change DVD to set 11
01/06/2006	10:13:38	Storegga Nord Est	N 64 45.3030	E 005 04.1670	721	165	Deployment of marker PP-V11 at carbonate crust with filaments
01/06/2006	10:15:42	Storegga Nord Est	N 64 45.3030	E 005 04.1618	721	166	photo of marker PP-V11 at carbonate crust
01/06/2006	10:19:47	Storegga Nord Est	N 64 45.3040	E 005 04.2225	721	167	continue with profile W-O 3
01/06/2006	10:28:00	Storegga Nord Est	N 64 45.3152	E 005 04.1450	722	168	Start profiles north to south on structure
01/06/2006	10:32:54	Storegga Nord Est	N 64 45.2717	E 005 04.1541	722	169	start next transect from south to north
01/06/2006	10:37:50	Storegga Nord Est	N 64 45.3094	E 005 04.1760	721	170	start the third profile
01/06/2006	10:43:03	Storegga Nord Est	N 64 45.2830	E 005 04.2065	721	171	we did not observe another structure indicative of fluid flow along the north south transect
01/06/2006	10:44:20	Storegga Nord Est	N 64 45.2720	E 005 04.2074	721	172	end of profile N-S three, go back to elevator
01/06/2006	12:48:26	Storegga	N 64	E 004	743	173	arrived at elevator\n

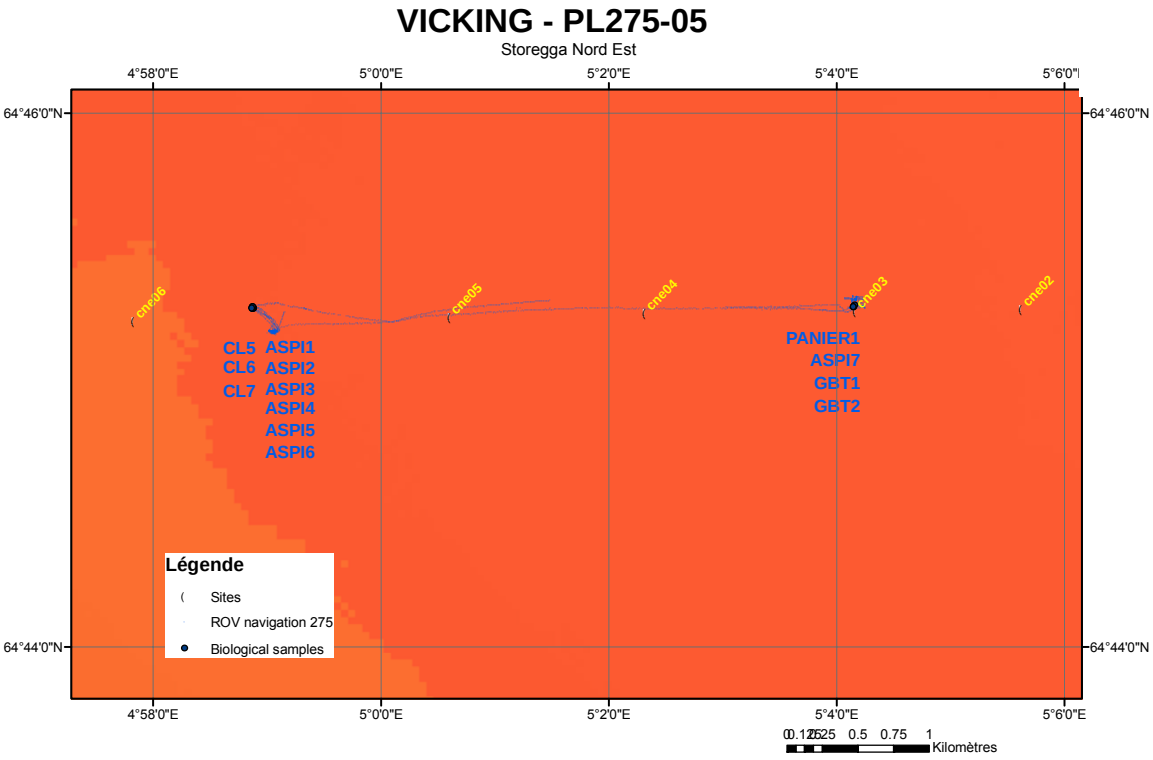
		Nord Est	45.1830	59.0410			
01/06/2006	13:43:40	Storegga Nord Est	N 64 45.1846	E 004 59.0272	743	174	End of the dive

Dive 275-5 Maps

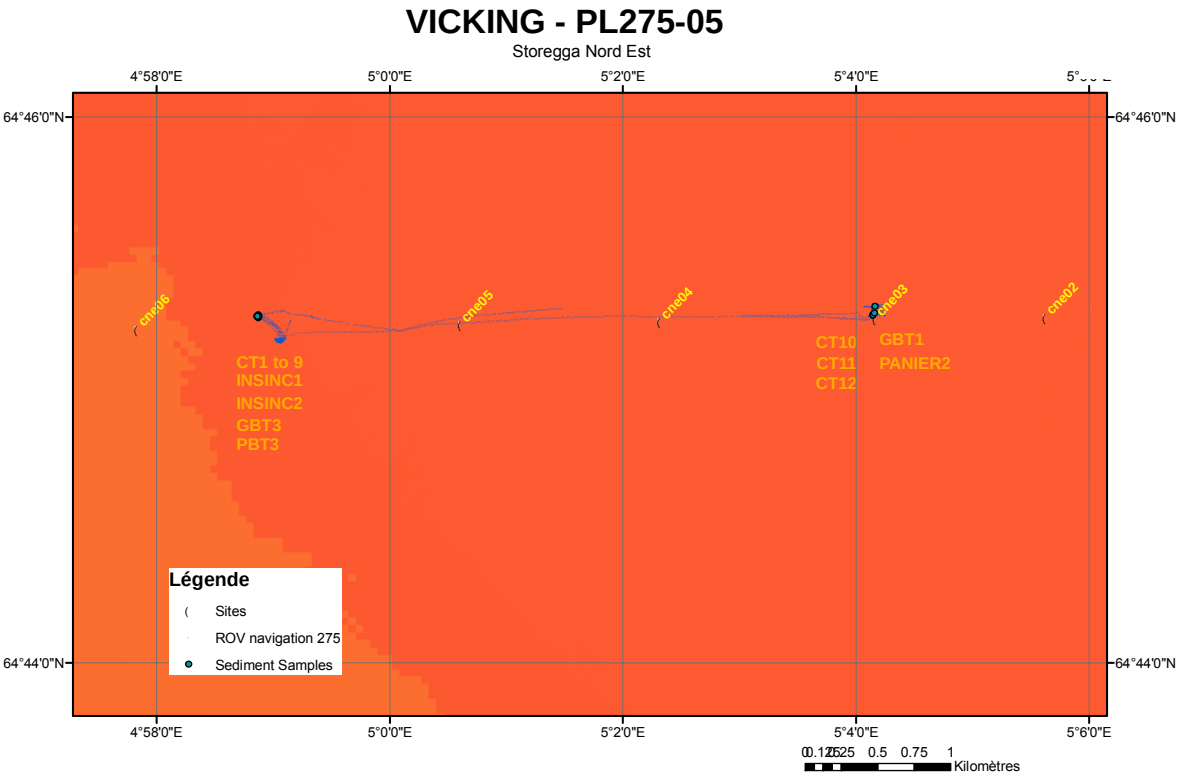
Biological samples



Water samples



Sediment samples



ALAMER : Liste des opérations

Dive: 275- 5 Operations list

Equipement	No	Date	Heure	Latitude	Longitude	Prof	Cap	Localite	Ech_Bio	Chimie	Sed	Mes	Photo	Fic	Commentaires
Aspirateur bouteille	1	31/05/2006	18:53:56	N 64 45.2704	E 004 58.8738	744	235	Storegga Nord Est	X				053		ASPI 1 : sampling gastropods
Aspirateur bouteille	2	31/05/2006	23:35:00	N 64 45.2669	E 004 58.8770	746	239	Storegga Nord Est	X						ASPI 2: at site 5.7 (?) should be empty, but we found some fauna inside it
Aspirateur bouteille	3	31/05/2006	23:36:00	N 64 45.2676	E 004 58.8771	746	239	Storegga Nord Est	X						ASPI 3 : at site 5.7. black pogonophorans, 20*22 cm
Aspirateur bouteille	4	31/05/2006	23:43:27	N 64 45.2731	E 004 58.8710	745	239	Storegga Nord Est	X				091		ASPI 4 : orange gastropod on site 5.7
Aspirateur bouteille	5	01/06/2006	00:10:51	N 64 45.2706	E 004 58.8870	746	252	Storegga Nord Est	X				096		ASPI 5 : crevette on site 5.7
Aspirateur bouteille	6	01/06/2006	00:27:33	N 64 45.2710	E 004 58.8700	746	255	Storegga Nord Est	X				092		ASPI 6 : pogonophora frisé (found next to marker PP-V9) on site 5.7. 20*22 cm.
Aspirateur bouteille	7	01/06/2006	00:57:47	N 64 45.2703	E 004 58.8700	746	193	Storegga Nord Est	X				097		ASPI 7 : small red gastropods on site 5.7
Aspirateur bouteille	8	01/06/2006	08:12:07	N 64 45.2790	E 005 04.1542	721	84	Storegga Nord Est	X				132		ASPI 8 : using slurp gun on dead gastropods and shrimps, cne03 dead site
CALMAR A	1	31/05/2006	14:48:37	N 64 45.2690	E 004 58.8690	745	255	Storegga Nord Est					008		closing Benthic Chamber cell A1
CALMAR A	1	31/05/2006	19:57:35	N 64 45.2474	E 004 58.9405	743	140	Storegga Nord Est					059		we have taken the CALMAR Benthic Chamber and we are moving to the elevator
Carottier a lame	5	31/05/2006	21:10:25	N 64 45.2694	E 004 58.8693	745	327	Storegga Nord Est	X				073		CL5 is done succesfully on the brown curled Pogonophorans just to the left of the position of the benthic CALAMAR.
Carottier a lame	6	31/05/2006	21:18:37	N 64 45.2735	E 004 58.8717	745	328	Storegga Nord Est	X				075		CL6 is taken
Carottier a lame	7	31/05/2006	21:27:45	N 64 45.2680	E 004 58.8670	745	327	Storegga Nord Est	X				078		CL7 is taken on the exact same spot as the CALAMAR benthic bell
Carottier tube	1	31/05/2006	17:42:37	N 64 45.2708	E 004 58.8626	745	132	Storegga Nord Est			X		039		CT1 : white spot sediment
Carottier tube	2	31/05/2006	18:29:10	N 64 45.2702	E 004 58.8712	745	190	Storegga Nord Est			X		047		CT2 : sampling site
Carottier tube	3	31/05/2006	19:09:10	N 64 45.2700	E 004 58.8737	745	232	Storegga Nord Est			X		056		CT3 : sampling
Carottier tube	4	31/05/2006	19:10:25	N 64 45.2700	E 004 58.8750	745	232	Storegga Nord Est			X		057		CT4 : sampling

Carottier tube	5	31/05/2006	22:56:24	N 64 45.2685	E 004 58.8725	746	239	Storegga Nord Est			X		085		CT5 on black pogonophora on site 5.7
Carottier tube	6	31/05/2006	23:05:51	N 64 45.2690	E 004 58.8695	746	240	Storegga Nord Est			X		087		CT6 is taken on the balck pogonophora on site 5.7
Carottier tube	7	31/05/2006	23:16:34	N 64 45.2683	E 004 58.8723	746	239	Storegga Nord Est			X		089		CT7 is taken on the black pogonophora on site 5.7
Carottier tube	8	01/06/2006	03:23:40	N 64 45.2669	E 004 58.8706	746	263	Storegga Nord Est	X		X		102		CT8 spot of pogonophora with bacterial mat
Carottier tube	9	01/06/2006	03:42:21	N 64 45.2670	E 004 58.8703	746	263	Storegga Nord Est	X		X		105		CT9 spot with black pogonophora and probably bacterial mat, CT8 is seen as a whole 15-20 cm to the right side
Carottier tube	10	01/06/2006	06:31:52	N 64 45.2764	E 005 04.1469	721	171	Storegga Nord Est			X		113		CT10 : tube core on the greyish spot of the mat, on cne03 at the center of the spot
Carottier tube	11	01/06/2006	06:45:39	N 64 45.2760	E 005 04.1468	721	163	Storegga Nord Est			X		116		CT11 : with white larger fillaments on top, and pogonophorans?, on cne03
Carottier tube	12	01/06/2006	06:55:10	N 64 45.2750	E 005 04.1472	721	139	Storegga Nord Est	X		X		118		CT12 : on the back greyish spot, bacterial mat with white dots, black sediment and white shells, on cne03
Grande Boite ROV	1	01/06/2006	08:01:38	N 64 45.2800	E 005 04.1560	721	83	Storegga Nord Est	X		X		130		GBT 1 : carbonate crust 275-CC2 with comatulide, cne03 dead site
Grande Boite ROV	2	01/06/2006	07:31:20	N 64 45.2755	E 005 04.1490	721	207	Storegga Nord Est	X				124		GBT 2 : got it (comatulide)
Grande Boite ROV	3	31/05/2006	19:41:35	N 64 45.2733	E 004 58.8705	745	243	Storegga Nord Est	X		X		058		GBT 3 : sampling 275-CC1
INSINC Corer (MPI)	1	31/05/2006	18:01:20	N 64 45.2685	E 004 58.8635	745	130	Storegga Nord Est			X		042		INSINC 1 sediment collected
INSINC Corer (MPI)	2	31/05/2006	18:31:06	N 64 45.2720	E 004 58.8720	745	190	Storegga Nord Est			X		049		INSIC2 : sampling
PEP bouteille	1	31/05/2006	16:42:24	N 64 45.2680	E 004 58.8672	745	246	Storegga Nord Est		X			027		PEP1 on white spot (sulfur probably)
PEP bouteille	2	31/05/2006	16:44:03	N 64 45.2690	E 004 58.8690	745	245	Storegga Nord Est		X			028		PEP2 same white spot because PEP1 did not work
PEP bouteille	3	31/05/2006	16:46:40	N 64 45.2690	E 004 58.8694	745	246	Storegga Nord Est		X			029		PEP3 fisrt PEP in the gastropod ring.
PEP bouteille	4	31/05/2006	16:48:54	N 64 45.2706	E 004 58.8608	745	245	Storegga Nord Est		X			030		PEP4 second PEP in the gastropod field.
PEP bouteille	5	31/05/2006	16:51:11	N 64 45.2690	E 004 58.8670	745	245	Storegga Nord Est		X			031		PEP5 third and last PEP in the gastropode ring.
PEP bouteille	6	31/05/2006	16:54:23	N 64 45.2680	E 004 58.8706	745	245	Storegga Nord Est		X			032		PEP6 on black Pogonophora with biofilm
PEP bouteille	7	31/05/2006	16:57:20	N 64 45.2682	E 004 58.8684	745	245	Storegga Nord Est		X			033		PEP7 in black Pogonophora with biofilm
PEP bouteille	8	31/05/2006	17:00:01	N 64 45.2684	E 004 58.8674	745	245	Storegga Nord Est		X			034		PEP8 in black Pogonophora with biofilm

PEP bouteille	9	31/05/2006	17:03:21	N 64 45.2690	E 004 58.8704	745	245	Storegga Nord Est		X			035		PEP9 in brown curled Pogonophora field
PEP bouteille	10	31/05/2006	17:15:09	N 64 45.2690	E 004 58.8680	745	245	Storegga Nord Est		X			036		PEP10 in brown curled Pogonophora field
PEP bouteille	11	31/05/2006	17:17:00	N 64 45.2727	E 004 58.8623	745	245	Storegga Nord Est		X					PEP11 in brown curled Pogonophora field
PEP bouteille	12	01/06/2006	07:10:01	N 64 45.2760	E 005 04.1473	721	139	Storegga Nord Est		X			122		PEP 12 about 50 cm over the seafloor, directly over bacterial mat crater, on cne03 active site
PEP bouteille	13	01/06/2006	07:19:48	N 64 45.2760	E 005 04.1469	721	138	Storegga Nord Est		X			123		PEP 13 about 5 cm above bacterial mat, on cne03 active site, black sediment and white shells
PEP bouteille	15	01/06/2006	09:20:21	N 64 45.3032	E 005 04.1695	721	104	Storegga Nord Est		X			147		PEP15 inside soufflé 1
PEP bouteille	16	01/06/2006	09:22:36	N 64 45.3033	E 005 04.1689	721	104	Storegga Nord Est		X			148		PEP16 at 50 cm above soufflé 1
PEP bouteille	17	01/06/2006	09:57:26	N 64 45.3030	E 005 04.1700	721	94	Storegga Nord Est		X			163		PEP 17: within a cavity of a 'soufflé'
Petite Boite de collecte	3	01/06/2006	01:26:41	N 64 45.2709	E 004 58.8676	746	169	Storegga Nord Est			X		098		PBT 3 : sampling crust with microbial mat on site 5.7
ROV panier	1	01/06/2006	07:06:55	N 64 45.2760	E 005 04.1467	721	139	Storegga Nord Est	X				121		PANIER 1 : caching gorgonocephalus from close to the bacterial mat
ROV panier	2	01/06/2006	09:32:21	N 64 45.3035	E 005 04.1665	721	108	Storegga Nord Est			X		152		PANIER 2 : CC3 fragment of the thin crust above soufflé 1

ALAMER : Résumé de plongée

Dive 276-6 Chronological Progress on Hakon Mosby Mud Volcano

VICKING
Plongée : 276- 6

Date : 03/06/2006
Observateurs :

Date	Heure	Observateurs
03/06/2006	16h00 - 20h00	FOUCHER Jean-Paul PIERRE Catherine
03/06/2006	20h00 - 00h00	FOUCHER Jean-Paul PIERRE Catherine
04/06/2006	00h00 - 04h00	BOETIUS Antje FESEKER Thomas
04/06/2006	04h00 - 08h00	DE BEER Dirk SCHLUTER Michael
04/06/2006	08h00 - 12h00	DE BEER Dirk LICHTSCHLAG Anna
04/06/2006	12h00 - 16h00	CAPRAIS Jean-Claude VAN GAEVER Saskia
04/06/2006	16h00 - 20h00	BOETIUS Antje TOFFIN Laurent
04/06/2006	20h00 - 00h00	ANDERSEN Ann OLU - Le ROY Karine DESCHAMPS Anne
05/06/2006	00h00 - 04h00	FESEKER Thomas LICHTSCHLAG Anna

Station : **Hakon Mosby MV** lat moy : N 71 55.1541 long moy : E 014 25.3575

Sites explorés :

Central grey mud site and SE beggiatoa site

Objectifs de la plongée :

Reconnaissance survey (7h),
Sampling and characterization of two key sites:
central grey mud and SE beggiatoa (24h)

Résumé manuel des travaux :

(1) Discovery and Pegaz sampling of a bubbling site
(2) Centre and beggiatoa sites sampled and characterized (INSIC, MIC, RISS)

Résumé automatique des travaux :
Prélèvements
Biologie :
Carottier tube : 1 prélèvement,
Aspirateur bouteille : 8 prélèvements,
Petite Boite de collecte : 1 prélèvement,

Carottier a lame : 4 prélèvements,
Eau :
PEGAZ : 1 prélèvement,
PEP bouteille : 9 prélèvements,
Géochimie :
INSINC Corer (MPI) : 4 prélèvements,
Carottier tube : 19 prélèvements,
Mesures
3 mesures continues ont été recueillies,
Mouillages
4 mouillages ont été posés.
4 mouillages ont été relevés.

193 images ont été numérisées,
3 nouvelles localités ont étés définies : PP-V12, PP-V13 et PP-V14.

Rapport de plongée :

Date	Heure	Localité	Latitude	Longitude	Prof (m)	N° Photo	Commentaires
03/06/2006	17:14:13	Hakon Mosby MV	N 72 00.2971	E 014 43.3561	1256	001	arrrived at bottom, go towards bubble field
03/06/2006	17:14:50	Hakon Mosby MV	N 72 00.3027	E 014 43.3598	1255	002	landed on grey mats, put marker PP-V12
03/06/2006	17:18:08	PP-V12	N 72 00.3042	E 014 43.3574	1255	003	grey mats and some pogonophora
03/06/2006	17:21:32	PP-V12	N 72 00.3181	E 014 43.3660	1255	005	still grey mats, a bit smaller
03/06/2006	17:22:44	PP-V12	N 72 00.3274	E 014 43.3721	1255	006	much white on the grey mats, probably arcobacter precipitates
03/06/2006	17:24:24	Hakon Mosby MV	N 72 00.3388	E 014 43.3821	1256	007	mats get smaller, transition to pogonophora
03/06/2006	17:25:01	Hakon Mosby MV	N 72 00.3435	E 014 43.3849	1256	008	arrived at first hill
03/06/2006	17:25:42	Hakon Mosby MV	N 72 00.3491	E 014 43.3884	1256	009	some mats on the hills
03/06/2006	17:26:57	Hakon Mosby MV	N 72 00.3567	E 014 43.3906	1255	010	large holes, now more mats
03/06/2006	17:28:43	Hakon Mosby MV	N 72 00.3636	E 014 43.3893	1255	011	another point marked tapis gris 2 on navigation screen
03/06/2006	17:29:31	Hakon Mosby MV	N 72 00.3678	E 014 43.3883	1255	012	transition to the flat - again dominated by pogonophorans
03/06/2006	17:31:48	Hakon Mosby MV	N 72 00.3840	E 014 43.3811	1255	013	again, a bit more hilly with a few mats
03/06/2006	17:33:07	Hakon Mosby MV	N 72 00.3846	E 014 43.3749	1255	014	arrived at a point with large fractures and a big hole in the ground
03/06/2006	17:34:56	Hakon Mosby MV	N 72 00.3854	E 014 43.3726	1255	015	beta cam sequence
03/06/2006	17:36:53	Hakon Mosby MV	N 72 00.3867	E 014 43.3583	1254	016	we continue to next spot
03/06/2006	17:39:36	Hakon Mosby MV	N 72 00.3862	E 014 43.3537	1253	017	we will go to the large bubble site to the east
03/06/2006	17:41:58	Hakon Mosby MV	N 72 00.3829	E 014 43.3811	1255	018	fissure with mats inside
03/06/2006	17:44:33	Hakon Mosby MV	N 72 00.3862	E 014 43.4357	1256	019	valleys have some mats, pogonophora on top
03/06/2006	17:47:45	Hakon Mosby MV	N 72 00.3838	E 014 43.4955	1255	020	again more grey sites
03/06/2006	17:50:45	Hakon Mosby MV	N 72 00.3826	E 014 43.5460	1255	022	hills and valleys showing mud flow section
03/06/2006	17:52:01	Hakon Mosby MV	N 72 00.3825	E 014 43.5712	1254	023	large grey mats
03/06/2006	18:07:41	Hakon Mosby MV	N 72 00.3665	E 014 43.6082	1256	024	going to the beginning of the profile
03/06/2006	18:12:12	Hakon Mosby MV	N 72 00.3715	E 014 43.5772	1252	025	we are at point 1, should be Bubble site

03/06/2006	18:18:25	Hakon Mosby MV	N 72 00.3651	E 014 43.5233	1255	026	we are at point 2, should be Bubble site
03/06/2006	18:22:52	Hakon Mosby MV	N 72 00.3566	E 014 43.5629	1255	027	we are at point 3, should be Bubble site
03/06/2006	18:30:53	Hakon Mosby MV	N 72 00.3137	E 014 43.6379	1256	028	numerous fishes
03/06/2006	18:32:39	Hakon Mosby MV	N 72 00.3077	E 014 43.6583	1256	029	seafloor view with holes and fishes
03/06/2006	18:35:14	Hakon Mosby MV	N 72 00.3004	E 014 43.6662	1256	030	view of the T lance
03/06/2006	18:45:00	Hakon Mosby MV	N 72 00.2986	E 014 43.6687	1257		Strating DVD set 2 (DVD1 of set1 failed)
03/06/2006	18:51:08	Hakon Mosby MV	N 72 00.2989	E 014 43.6706	1256	031	T-lance it is hot
03/06/2006	19:04:28	Hakon Mosby MV	N 72 00.2986	E 014 43.6679	1257	032	T-lance radar
03/06/2006	19:11:59	Hakon Mosby MV	N 72 00.2960	E 014 43.6625	1257	034	leaving the site of T lance
03/06/2006	19:20:49	Hakon Mosby MV	N 72 00.2932	E 014 43.6495	1256	035	fresh flow with numerous fishes
03/06/2006	19:38:49	Hakon Mosby MV	N 72 00.2815	E 014 43.5918	1257	053	poulpe à oreilles (Octopus) : beginning of the sequence
03/06/2006	19:41:45	Hakon Mosby MV	N 72 00.2770	E 014 43.5873	1256	039	poulpe à oreille, end of the sequence
03/06/2006	19:51:54	Hakon Mosby MV	N 72 00.3046	E 014 43.6010	1256	040	fresh flow
03/06/2006	19:59:45	Hakon Mosby MV	N 72 00.2982	E 014 43.6326	1257	041	surface of the flow
03/06/2006	20:34:22	Hakon Mosby MV	N 72 00.3163	E 014 43.5863	1256	042	Recovering T stick 3
03/06/2006	21:02:44	Hakon Mosby MV	N 72 00.3156	E 014 43.6188	1256	046	recovering T stick 2
03/06/2006	21:03:42	Hakon Mosby MV	N 72 00.3136	E 014 43.6252	1256	047	highly chaotic seafloor
03/06/2006	21:09:36	Hakon Mosby MV	N 72 00.3047	E 014 43.6218	1256	048	colonized mud flow showing polygonal dewatering structures
03/06/2006	21:29:48	Hakon Mosby MV	N 72 00.2990	E 014 43.6169	1256	049	fresh mud flow
03/06/2006	21:36:37	Hakon Mosby MV	N 72 00.3076	E 014 43.5405	1256	050	fresh mud flow
03/06/2006	21:41:28	Hakon Mosby MV	N 72 00.3095	E 014 43.4829	1256	051	Recovering T stick 4
03/06/2006	21:53:45	Hakon Mosby MV	N 72 00.2995	E 014 43.6283	1256	052	search for site of T stick 1, not found
03/06/2006	22:06:59	Hakon Mosby MV	N 72 00.3082	E 014 43.5743	1256	054	Giving up search for T-sticks. Continuing to sbb2
03/06/2006	22:08:27	Hakon Mosby MV	N 72 00.3126	E 014 43.5461	1256	055	White mats 30-50 percent
03/06/2006	22:11:03	Hakon Mosby MV	N 72 00.3101	E 014 43.5298	1257	056	Boundary of fresh mud?
03/06/2006	22:17:27	Hakon Mosby MV	N 72 00.2998	E 014 43.4277	1256	057	Mud flow limit?
03/06/2006	22:21:46	Hakon Mosby MV	N 72 00.2973	E 014 43.4009	1257	058	Bubbles found emerging from a small hole in the sea floor
03/06/2006	22:29:38	PP-V13	N 72 00.2980	E 014 43.3952	1257	059	Bubbles are rather large and rise slowly in a tumbling fashion,
03/06/2006	22:47:56	PP-V13	N 72 00.2977	E 014 43.4002	1257	060	Beginning of PEGAZ sampling
03/06/2006	23:41:04	PP-V13	N 72 00.2962	E 014 43.4007	1257	061	End of PEGAZ sampling
03/06/2006	23:58:08	PP-V13	N 72 00.2985	E 014 43.4005	1257	062	going to take a pep sample and water temp measurement close to bubble holes
04/06/2006	00:02:16	PP-V13	N 72 00.2972	E 014 43.4019	1257	063	PEP1, as close as possible to bubble hole
04/06/2006	00:12:54	PP-V13	N 72	E 014	1256	064	PP-V13 deployed, but it did probably not release

			00.2972	43.4118			
04/06/2006	00:16:49	Hakon Mosby MV	N 72 00.2997	E 014 43.4069	1257	065	trying to release marker using the manipulator
04/06/2006	00:18:47	Hakon Mosby MV	N 72 00.2956	E 014 43.4025	1257	066	marker released
04/06/2006	00:22:04	PP-V13	N 72 00.2986	E 014 43.4027	1256	067	PEP2 at 3m altitude above bubble site, gun at same height as sheath
04/06/2006	00:28:27	PP-V13	N 72 00.3011	E 014 43.4204	1256	068	PEP3 at 15m altitude above bubble site, gun in sheath
04/06/2006	00:31:09	Hakon Mosby MV	N 72 00.3005	E 014 43.4235	1256	070	continuing track, it seems we are already at point sbb3
04/06/2006	00:38:09	Hakon Mosby MV	N 72 00.2995	E 014 43.4347	1257	071	going to Small Bubble Point 2
04/06/2006	00:48:54	Hakon Mosby MV	N 72 00.2924	E 014 43.4582	1256	072	going back to planned dive track
04/06/2006	00:51:12	Hakon Mosby MV	N 72 00.2887	E 014 43.4370	1256	073	going southeast towards point where wood colonization experiment was deployed in 2004
04/06/2006	00:52:49	Hakon Mosby MV	N 72 00.2877	E 014 43.4337	1256	074	another small bubbling site
04/06/2006	00:59:16	Hakon Mosby MV	N 72 00.2726	E 014 43.4901	1256	075	several bubbles along the track
04/06/2006	01:06:34	Hakon Mosby MV	N 72 00.2392	E 014 43.5911	1257	076	holes at seafloor
04/06/2006	01:12:10	Hakon Mosby MV	N 72 00.2160	E 014 43.6541	1257	077	changing dvds to set 5
04/06/2006	01:17:38	Hakon Mosby MV	N 72 00.2103	E 014 43.6296	1257	078	looking for wood colonization experiment
04/06/2006	01:45:20	Hakon Mosby MV	N 72 00.2577	E 014 43.7898	1257	079	old white mats
04/06/2006	02:11:16	Hakon Mosby MV	N 72 00.1909	E 014 43.7156	1257	080	end of search for wood recolonisation experiment, not found
04/06/2006	02:15:17	Hakon Mosby MV	N 72 00.1731	E 014 43.8697	1258	081	more white mats, but small patches
04/06/2006	02:20:50	Hakon Mosby MV	N 72 00.1778	E 014 43.9212	1257	082	move out of mats in pogonophora
04/06/2006	02:23:33	Hakon Mosby MV	N 72 00.1784	E 014 43.9210	1258	083	transition zone mats - pogonophora
04/06/2006	02:41:57	PP-V14	N 72 00.1673	E 014 43.9507	1258	087	Sampling INSINC1
04/06/2006	02:50:22	PP-V14	N 72 00.1719	E 014 43.9472	1258	088	Sampling INSINC2
04/06/2006	03:03:46	PP-V14	N 72 00.1664	E 014 43.9493	1258	086	INSINCs injected
04/06/2006	03:09:32	PP-V14	N 72 00.1667	E 014 43.9473	1258	089	Sampling of Push Corers
04/06/2006	03:19:51	PP-V14	N 72 00.1676	E 014 43.9509	1258	192	Change DVD Set to #6
04/06/2006	03:28:57	PP-V14	N 72 00.1677	E 014 43.9527	1258	193	CT1 is sampled
04/06/2006	04:01:50	PP-V14	N 72 00.1666	E 014 43.9540	1258	091	CT2 sampled
04/06/2006	04:09:50	Hakon Mosby MV	N 72 00.1652	E 014 43.9647	1258	092	PP-V14 is deployed
04/06/2006	04:10:00	Hakon Mosby MV	N 72 00.1644	E 014 43.9661	1258		Going back to the elevator
04/06/2006	04:36:36	Hakon Mosby MV	N 72 00.1119	E 014 43.9815	1258	093	Take MIC out of Elevator
04/06/2006	05:12:00	Hakon Mosby MV	N 72 00.2029	E 014 43.7516	1258	094	MIC in place on Site 1
04/06/2006	05:12:51	Hakon Mosby MV	N 72 00.2026	E 014 43.7542	1258	095	MIC is triggered
04/06/2006	05:27:54	Hakon Mosby MV	N 72 00.2042	E 014 43.7561	1258	096	CT 7, near MIC position
04/06/2006	05:35:15	Hakon Mosby MV	N 72 00.2019	E 014 43.7592	1258	097	CT8, near MIC position

04/06/2006	05:41:00	Hakon Mosby MV	N 72 00.2035	E 014 43.7533	1258		T measurement skipped: not functioning
04/06/2006	05:44:08	Hakon Mosby MV	N 72 00.1984	E 014 43.7534	1258	098	going back to elevator to get RISS and deploy it at same position as MIC1
04/06/2006	06:06:49	Hakon Mosby MV	N 72 00.1130	E 014 43.9812	1258	099	RISS out of basket
04/06/2006	06:25:41	Hakon Mosby MV	N 72 00.2042	E 014 43.7769	1258	100	arrival at same site as MIC1, distance to MIC ca. 8 m
04/06/2006	06:26:38	Hakon Mosby MV	N 72 00.2054	E 014 43.7721	1258	101	RISS1 is deployed east of MIC I
04/06/2006	06:31:01	Hakon Mosby MV	N 72 00.2059	E 014 43.7702	1258	102	RISS triggered
04/06/2006	06:32:00	Hakon Mosby MV	N 72 00.2066	E 014 43.7694	1258		start search T_lance Univ. Bremen (phone box)
04/06/2006	06:32:49	Hakon Mosby MV	N 72 00.2074	E 014 43.7694	1258	104	arrival at phone box site, T_lance not found
04/06/2006	06:54:59	Hakon Mosby MV	N 72 00.2055	E 014 43.7566	1258	105	Recovering MIC1
04/06/2006	06:59:39	Hakon Mosby MV	N 72 00.1929	E 014 43.8297	1258	106	start transit of MIC to white mat ppv 14
04/06/2006	07:09:17	PP-V14	N 72 00.1668	E 014 43.9397	1258	107	arrival at marker 14
04/06/2006	07:14:34	PP-V14	N 72 00.1651	E 014 43.9419	1258	108	deployment MIC 2, sinks in a few cm
04/06/2006	07:22:49	PP-V14	N 72 00.1643	E 014 43.9507	1259	109	MIC started, then transit to RISS
04/06/2006	07:32:20	Hakon Mosby MV	N 72 00.2031	E 014 43.7876	1258	110	arriving at RISS1 site
04/06/2006	07:38:54	Hakon Mosby MV	N 72 00.2056	E 014 43.7725	1257	111	Recovering RISS1, going to the elevator
04/06/2006	08:02:40	Hakon Mosby MV	N 72 00.1091	E 014 43.9844	1258	112	RISS in elevator
04/06/2006	08:04:31	PP-V14	N 72 00.1102	E 014 43.9874	1258	113	transit back to MIC2
04/06/2006	08:18:51	PP-V14	N 72 00.1664	E 014 43.9452	1258	114	CT3, near MIC2 position
04/06/2006	08:26:12	PP-V14	N 72 00.1644	E 014 43.9486	1259	115	CT4, near MIC2 position
04/06/2006	08:40:57	PP-V14	N 72 00.1671	E 014 43.9434	1258	116	MIC2 sunk deep in sediment: deployment failed. Then transit to site MIC3, 50 m NW of MIC2
04/06/2006	09:06:56	Hakon Mosby MV	N 72 00.1866	E 014 43.8836	1258	117	MIC 3 started, not sunk deeply
04/06/2006	09:15:07	Hakon Mosby MV	N 72 00.1866	E 014 43.8811	1258	118	CT5, near MIC3
04/06/2006	09:16:26	Hakon Mosby MV	N 72 00.1868	E 014 43.8826	1258	119	CT6, near MIC3
04/06/2006	09:40:51	Hakon Mosby MV	N 72 00.1861	E 014 43.8968	1258	120	ASPI 1 : slurp gun on white mat to see if any small animals are in. Measurement of area withlasers. 0.2*0.2 m²
04/06/2006	09:43:34	Hakon Mosby MV	N 72 00.1856	E 014 43.9057	1258	121	ASPI 2 slurp gun on white mats again. Approximately same area (lasers)
04/06/2006	09:45:08	Hakon Mosby MV	N 72 00.1850	E 014 43.9056	1258	122	A View of area sampled with ASPI2
04/06/2006	09:47:31	Hakon Mosby MV	N 72 00.1857	E 014 43.8987	1258	123	ASPI 3 slurp gun on white mats again. Approximately same area (lasers)
04/06/2006	09:50:03	Hakon Mosby MV	N 72 00.1860	E 014 43.8975	1258	124	Area sampled with ASPI 3
04/06/2006	09:54:03	Hakon Mosby MV	N 72 00.1873	E 014 43.9040	1258	125	ASPI 4= zoarcid fish with slurp gun. Taken at the limit between white mats and "normal sediment"
04/06/2006	09:56:11	Hakon Mosby MV	N 72 00.1860	E 014 43.9097	1257	126	ASPI 5: two other fishes in aspi 5. Sameplace than ASPI 4
04/06/2006	10:09:50	Hakon Mosby MV	N 72 00.1865	E 014 43.9009	1257	127	ASPI 6: sediment sampled for fauna (with pycnogonide). Area of "normal colour" sediment, close to the mat area
04/06/2006	10:15:10	Hakon Mosby MV	N 72 00.1832	E 014 43.9079	1258	128	ASPI 7: second sediment sample for fauna (aspi 7)

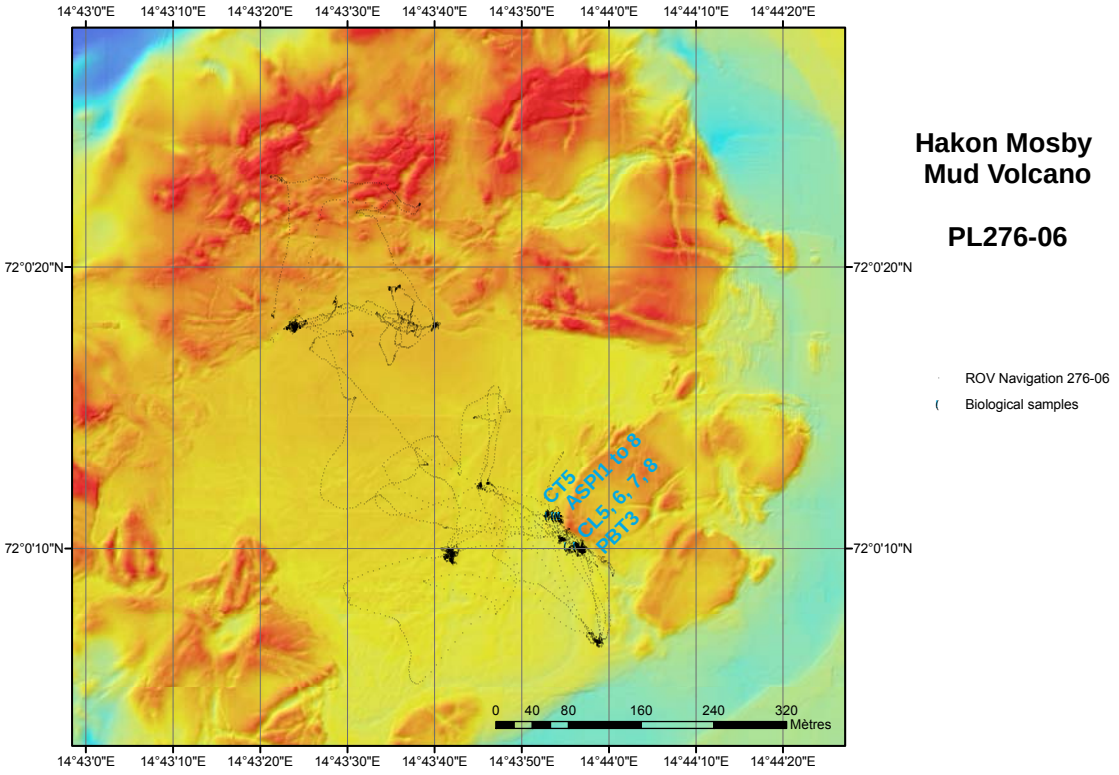
04/06/2006	10:17:24	Hakon Mosby MV	N 72 00.1835	E 014 43.9087	1258	129	View with lasers of sediment taken in aspi 7
04/06/2006	10:18:25	Hakon Mosby MV	N 72 00.1838	E 014 43.9085	1258	130	ASPI 8: third sediment sample in aspi 8 (with 2 pycnogonide)
04/06/2006	10:20:36	Hakon Mosby MV	N 72 00.1834	E 014 43.9091	1257	131	View with lasers of sediment taken in aspi 8
04/06/2006	10:29:00	Hakon Mosby MV	N 72 00.1823	E 014 43.9113	1258		One fish asdded in ASPI 4
04/06/2006	10:42:31	Hakon Mosby MV	N 72 00.1878	E 014 43.8811	1258	132	recovery of MIC 3
04/06/2006	10:49:54	Hakon Mosby MV	N 72 00.1526	E 014 43.9109	1257	133	going back to elevator 1
04/06/2006	11:08:16	Hakon Mosby MV	N 72 00.1114	E 014 43.9792	1258	134	MIC in elevator
04/06/2006	11:31:33	Hakon Mosby MV			1257	135	elevator 1 goes up
04/06/2006	12:42:38	Hakon Mosby MV	N 72 00.1647	E 014 43.9234	1258	136	PEP 4 taken at 5 cm above Beggiatoa mats
04/06/2006	12:46:21	Hakon Mosby MV	N 72 00.1671	E 014 43.9266	1258	137	PEP 5 taken at 5 cm above Beggiatoa mats
04/06/2006	12:47:21	Hakon Mosby MV	N 72 00.1655	E 014 43.9261	1258	138	PEP 6 taken at 5 cm above Beggiatoa mats
04/06/2006	12:59:36	Hakon Mosby MV	N 72 00.1707	E 014 43.9335	1258	139	sampling of pycnogonide at Beggiatoa mats (in BP3)
04/06/2006	13:02:44	Hakon Mosby MV	N 72 00.1660	E 014 43.9217	1258	140	PBT3 : red (eggs?) and pycnogonides sampled at Beggiatoa mats
04/06/2006	13:50:51	Hakon Mosby MV	N 72 00.0877	E 014 43.6263	1258	141	DVD set 11 started
04/06/2006	14:15:35	Hakon Mosby MV	N 72 00.1613	E 014 43.6342	1257	142	change shift: Antje and Laurent
04/06/2006	14:16:48	Hakon Mosby MV	N 72 00.1611	E 014 43.6630	1257	143	found elevator
04/06/2006	14:22:46	Hakon Mosby MV	N 72 00.1593	E 014 43.6907	1257	144	opened drawer 1 for exchange of Insink
04/06/2006	14:41:15	Hakon Mosby MV	N 72 00.1599	E 014 43.6985	1257	145	insink exchanged
04/06/2006	15:07:59	Hakon Mosby MV	N 72 00.1663	E 014 43.6944	1257	146	problems with exchanging the push cores
04/06/2006	15:57:04	Hakon Mosby MV	N 72 00.1616	E 014 43.6937	1257	147	change DVD set 12
04/06/2006	16:08:30	PP-V14	N 72 00.1760	E 014 43.9016	1258	148	go to PP 14 for sampling of insinc
04/06/2006	16:32:01	PP-V14	N 72 00.1654	E 014 43.9518	1258	150	INSINC 6 sample
04/06/2006	16:40:26	PP-V14	N 72 00.1668	E 014 43.9508	1258	151	INSINC 5 sample
04/06/2006	16:44:01	PP-V14	N 72 00.1663	E 014 43.9532	1258	152	Insink 6 injexted
04/06/2006	16:46:44	PP-V14	N 72 00.1649	E 014 43.9550	1258	153	insink 5 injected
04/06/2006	16:52:17	PP-V14	N 72 00.1666	E 014 43.9514	1258	154	CT 9 in Beggiatoa mats PP-V14
04/06/2006	16:54:57	PP-V14	N 72 00.1661	E 014 43.9498	1258	155	CT 10 in Beggiatoa mats PP-V14
04/06/2006	17:05:34	PP-V14	N 72 00.1655	E 014 43.9510	1258	156	CT 11 in Beggiatoa mats PP-V14
04/06/2006	17:13:54	PP-V14	N 72 00.1655	E 014 43.9541	1258	157	CT 12 in Beggiatoa mats PP-V14
04/06/2006	17:29:01	PP-V14	N 72 00.1652	E 014 43.9515	1258	158	CT 20 in Beggiatoa mats PP-V14
04/06/2006	17:32:26	PP-V14	N 72 00.1647	E 014 43.9499	1258	159	CT 19 in Beggiatoa mats PP-V14
04/06/2006	17:37:53	PP-V14	N 72 00.1654	E 014 43.9460	1258	160	CT 18 in Beggiatoa mats PP-V14
04/06/2006	17:42:03	PP-V14	N 72	E 014	1258	161	CT 17 in Beggiatoa mats PP-V14

			00.1670	43.9468			
04/06/2006	17:55:15	Hakon Mosby MV	N 72 00.1635	E 014 43.6879	1257	162	arrived at elevator
04/06/2006	18:39:38	Hakon Mosby MV	N 72 00.1642	E 014 43.7054	1258	163	Exchnage one CT rack and PEGAZ
04/06/2006	18:46:20	Hakon Mosby MV	N 72 00.1622	E 014 43.7001	1257	164	Taking the Blade corer rack
04/06/2006	18:53:04	Hakon Mosby MV	N 72 00.1658	E 014 43.6963	1258	165	The rack has fallen because the handle is not adapted to take them easily
04/06/2006	19:15:59	Hakon Mosby MV	N 72 00.1651	E 014 43.7030	1258	166	the four blades corers are now in the rack again!
04/06/2006	19:16:36	Hakon Mosby MV	N 72 00.1650	E 014 43.7001	1258	167	taking the rack to go to the Beggiatoa site PP-V14
04/06/2006	19:28:34	PP-V14	N 72 00.1708	E 014 43.9359	1258	168	Arriving on PP-V14 (Beggiatoa mats)
04/06/2006	19:31:21	PP-V14	N 72 00.1696	E 014 43.9401	1258	169	CL8 on white mats
04/06/2006	19:32:41	PP-V14	N 72 00.1689	E 014 43.9405	1258	170	the sediment is very soft
04/06/2006	19:46:05	PP-V14	N 72 00.1694	E 014 43.9400	1259	171	CL7 in white mats
04/06/2006	19:47:23	PP-V14	N 72 00.1689	E 014 43.9409	1258	172	A lot of bubbles are escaping from the sediment when taking the CL off
04/06/2006	19:59:58	PP-V14	N 72 00.1680	E 014 43.9406	1259	173	CL5 is taken on the Beggiatoa mats
04/06/2006	20:06:46	PP-V14	N 72 00.1696	E 014 43.9364	1258	174	CL6 is taken on the Beggiatoa mats
04/06/2006	20:14:45	Hakon Mosby MV	N 72 00.1766	E 014 43.9191	1258	175	We are moving towards the elevator
04/06/2006	20:57:51	Hakon Mosby MV	N 72 00.1764	E 014 43.7127	1257	176	The elevator is leaving the bottom and will be at the surface within 20mn (-1254m)
04/06/2006	21:03:30	Hakon Mosby MV	N 72 00.1833	E 014 43.7111	1257	178	Nice Octopus (Poule a oreilles)
04/06/2006	21:04:36	Hakon Mosby MV	N 72 00.1901	E 014 43.7138	1257	180	An earpulp is swimming close to us.
04/06/2006	21:36:20	PP-V14	N 72 00.1719	E 014 43.9182	1258	181	PEP 7 is the first PEP done 2cm above the Beggiatoa mats
04/06/2006	21:42:56	PP-V14	N 72 00.1729	E 014 43.9258	1258	182	PEP 8 is the second PEP done 2cm above the Beggiatoa mats.
04/06/2006	21:45:02	PP-V14	N 72 00.1715	E 014 43.9178	1258	183	PEP 9 is the third and last PEP done 2 cm above the Beggiatoa mats.
04/06/2006	21:58:30	PP-V13	N 72 00.1722	E 014 43.9124	1258	185	Big fish is relaxing on the Beggiatoa mats
04/06/2006	22:03:41	PP-V14	N 72 00.1721	E 014 43.9149	1258	186	CT 16 on Beggiatoa mats could not be closed
04/06/2006	22:07:41	PP-V14	N 72 00.1715	E 014 43.9066	1258	187	CT 15 on the Beggiatoa mats not really closed
04/06/2006	22:22:52	PP-V14	N 72 00.1722	E 014 43.9098	1258	189	CT 14 on the Beggiatoa mat could not be closed
04/06/2006	22:32:22	PP-V14	N 72 00.1720	E 014 43.9129	1258	190	CT 13 on the Beggiatoa mat is closed!
04/06/2006	22:45:11	Hakon Mosby MV	N 72 00.1728	E 014 43.9166	1258	191	tom's shift
04/06/2006	22:46:13	Hakon Mosby MV	N 72 00.1741	E 014 43.9209	1257	194	going to look for gas bubbles south of previously observed sites
04/06/2006	22:50:38	Hakon Mosby MV	N 72 00.1744	E 014 43.8571	1257	195	20 percent white mats
04/06/2006	22:59:35	Hakon Mosby MV	N 72 00.1791	E 014 43.6900	1258	196	strange metal thing on seafloor
04/06/2006	22:59:49	Hakon Mosby MV	N 72 00.1790	E 014 43.6890	1258	197	weights left by a lander?
04/06/2006	23:12:18	Hakon Mosby MV	N 72 00.1980	E 014 43.5563	1257	198	checking sonar signal from southwest
04/06/2006	23:19:19	Hakon Mosby MV	N 72 00.1951	E 014 43.4618	1257	199	not found anything, going north again

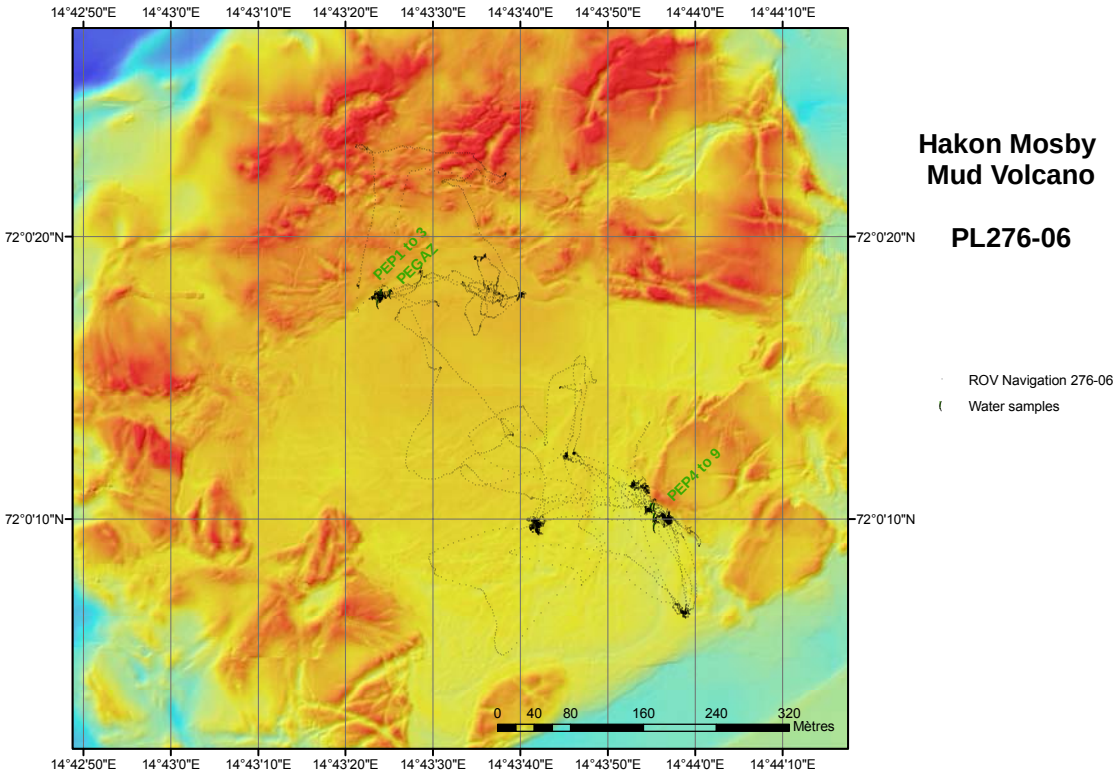
04/06/2006	23:26:07	Hakon Mosby MV	N 72 00.2269	E 014 43.4852	1256	200	after crossing white mats we are above unpopulated seafloor again
04/06/2006	23:46:00	Hakon Mosby MV	N 72 00.3003	E 014 43.4213	1256	201	strong currents from south (0.2m/s) turbid water low visibility
04/06/2006	23:48:17	Hakon Mosby MV	N 72 00.3042	E 014 43.4067	1256	202	looking for site where gas bubbles were observed yesterday
04/06/2006	23:58:45	Hakon Mosby MV	N 72 00.2984	E 014 43.3893	1257	203	yes, bubbles! directly on limit of fresh mud
05/06/2006	00:02:03	Hakon Mosby MV	N 72 00.2982	E 014 43.3999	1257	204	following limit of freh mud towards east
05/06/2006	00:15:35	Hakon Mosby MV	N 72 00.3117	E 014 43.4805	1256	205	transition into not so fresh mud
05/06/2006	00:16:17	Hakon Mosby MV	N 72 00.3129	E 014 43.4809	1256	206	T-stick 4 found!
05/06/2006	00:18:04	Hakon Mosby MV	N 72 00.3126	E 014 43.4777	1256	207	T-stick 4, already recovered
05/06/2006	00:30:34	Hakon Mosby MV	N 72 00.3043	E 014 43.4696	1256	208	crossing fresh mud towards south
05/06/2006	00:57:36	Hakon Mosby MV	N 72 00.2984	E 014 43.3867	1257	209	looking for bubbles at bubble site again
05/06/2006	01:42:29	Hakon Mosby MV	N 72 00.2975	E 014 43.3858	1257	210	Pegaz taking off the basket to try to sample on bubles area
05/06/2006	01:59:33	Hakon Mosby MV	N 72 00.3298	E 014 43.4216	1256	211	Problem to close the Pegaz bottle
05/06/2006	02:01:09	Hakon Mosby MV	N 72 00.3320	E 014 43.4238	1254	212	end of dive

Biological samples

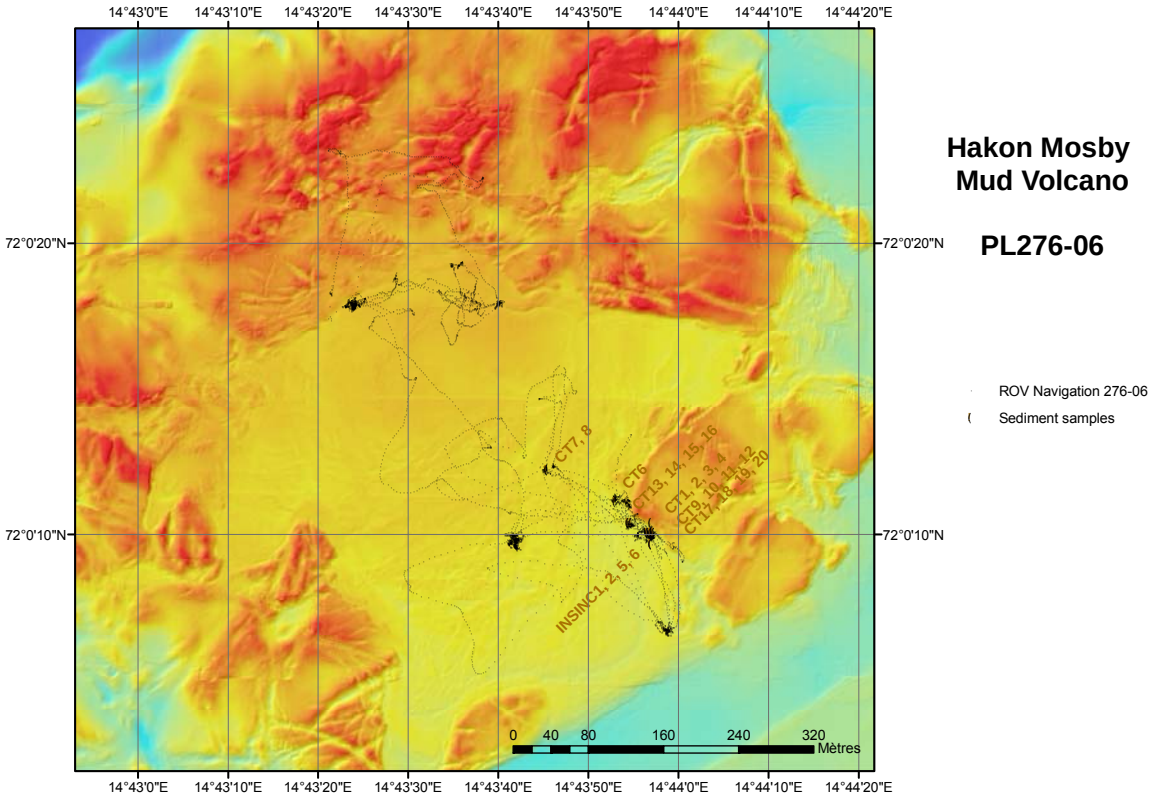
Dive 276-6 Maps



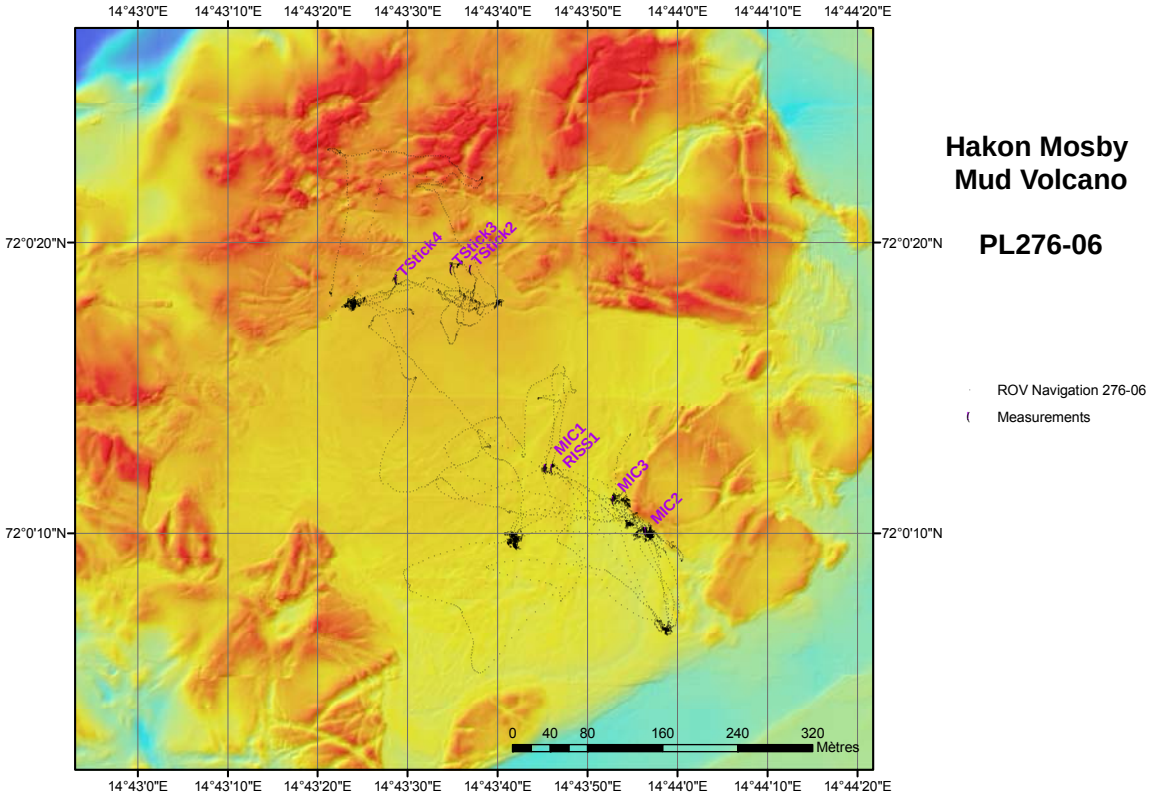
Water samples



Sediment samples



Measurements



Dive 276- 6 Operations list

Equipement	No	Date	Heure	Latitude	Longitude	Prof	Cap	Localite	Ech_Bio	Chimie	Sed	Mes	Photo	Fic	Commentaires
Aspirateur bouteille	1	04/06/2006	09:40:51	N 72 00.1861	E 014 43.8968	1258	149	Hakon Mosby MV	X				120		ASPI 1 : slurp gun on white mat to see if any small animals are in. Measurement of area withlasers. 0.2*0.2 m²
Aspirateur bouteille	2	04/06/2006	09:43:34	N 72 00.1856	E 014 43.9057	1258	149	Hakon Mosby MV	X				121		ASPI 2 slurp gun on white mats again. Approximately same area (lasers)
Aspirateur bouteille	3	04/06/2006	09:47:31	N 72 00.1857	E 014 43.8987	1258	149	Hakon Mosby MV	X				123		ASPI 3 slurp gun on white mats again. Approximately same area (lasers)
Aspirateur bouteille	4	04/06/2006	09:54:03	N 72 00.1873	E 014 43.9040	1258	149	Hakon Mosby MV	X				125		ASPI 4= zoarcid fish with slurp gun. Taken at the limit between white mats and "normal sediment"
Aspirateur bouteille	5	04/06/2006	09:56:11	N 72 00.1860	E 014 43.9097	1257	161	Hakon Mosby MV	X				126		ASPI 5: two other fishes in aspi 5. Sameplace than ASPI 4
Aspirateur bouteille	6	04/06/2006	10:09:50	N 72 00.1865	E 014 43.9009	1257	165	Hakon Mosby MV	X				127		ASPI 6: sediment sampled for fauna (with pycnogonide). Area of "normal colour" sediment, close to the mat area
Aspirateur bouteille	7	04/06/2006	10:15:10	N 72 00.1832	E 014 43.9079	1258	150	Hakon Mosby MV	X				128		ASPI 7: second sediment sample for fauna (aspi 7)
Aspirateur bouteille	8	04/06/2006	10:18:25	N 72 00.1838	E 014 43.9085	1258	150	Hakon Mosby MV	X				130		ASPI 8: third sediment sample in aspi 8 (with 2 pycnogonide)
Carottier a lame	5	04/06/2006	19:59:58	N 72 00.1680	E 014 43.9406	1259	142	PP-V14	X				173		CL5 is taken on the Beggiatoa mats
Carottier a lame	6	04/06/2006	20:06:46	N 72 00.1696	E 014 43.9364	1258	142	PP-V14	X				174		CL6 is taken on the Beggiatoa mats
Carottier a lame	7	04/06/2006	19:46:05	N 72 00.1694	E 014 43.9400	1259	142	PP-V14	X				171		CL7 in white mats
Carottier a lame	8	04/06/2006	19:31:21	N 72 00.1696	E 014 43.9401	1258	144	PP-V14	X				169		CL8 on white mats
Carottier tube	1	04/06/2006	03:28:57	N 72 00.1677	E 014 43.9527	1258	146	PP-V14			X		193		CT1 is sampled
Carottier tube	2	04/06/2006	04:01:50	N 72 00.1666	E 014 43.9540	1258	246	PP-V14			X		091		CT2 sampled
Carottier tube	3	04/06/2006	08:18:51	N 72 00.1664	E 014 43.9452	1258	321	PP-V14			X		114		CT3, near MIC2 position
Carottier tube	4	04/06/2006	08:26:12	N 72 00.1644	E 014 43.9486	1259	321	PP-V14			X		115		CT4, near MIC2 position
Carottier tube	5	04/06/2006	09:15:07	N 72 00.1866	E 014 43.8811	1258	142	Hakon Mosby MV	X				118		CT5, near MIC3
Carottier tube	6	04/06/2006	09:16:26	N 72 00.1868	E 014 43.8826	1258	142	Hakon Mosby MV			X		119		CT6, near MIC3
Carottier tube	7	04/06/2006	05:27:54	N 72 00.2042	E 014 43.7561	1258	332	Hakon Mosby MV			X		096		CT 7, near MIC position

Carottier tube	8	04/06/2006	05:35:15	N 72 00.2019	E 014 43.7592	1258	331	Hakon Mosby MV			X		097		CT8, near MIC position
Carottier tube	9	04/06/2006	16:52:17	N 72 00.1666	E 014 43.9514	1258	143	PP-V14			X		154		CT 9 in Beggiatoa mats PP-V14
Carottier tube	10	04/06/2006	16:54:57	N 72 00.1661	E 014 43.9498	1258	143	PP-V14			X		155		CT 10 in Beggiatoa mats PP-V14
Carottier tube	11	04/06/2006	17:05:34	N 72 00.1655	E 014 43.9510	1258	143	PP-V14			X		156		CT 11 in Beggiatoa mats PP-V14
Carottier tube	12	04/06/2006	17:13:54	N 72 00.1655	E 014 43.9541	1258	143	PP-V14			X		157		CT 12 in Beggiatoa mats PP-V14
Carottier tube	13	04/06/2006	22:32:22	N 72 00.1720	E 014 43.9129	1258	135	PP-V14			X		190		CT 13 on the Beggiatoa mat is closed!
Carottier tube	14	04/06/2006	22:22:52	N 72 00.1722	E 014 43.9098	1258	135	PP-V14			X		189		CT 14 on the Beggiatoa mat could not be closed
Carottier tube	15	04/06/2006	22:07:41	N 72 00.1715	E 014 43.9066	1258	136	PP-V14			X		187		CT 15 on the Beggiatoa mats not really closed
Carottier tube	16	04/06/2006	22:03:41	N 72 00.1721	E 014 43.9149	1258	136	PP-V14			X		186		CT 16 on Beggiatoa mats could not be closed
Carottier tube	17	04/06/2006	17:42:03	N 72 00.1670	E 014 43.9468	1258	144	PP-V14			X		161		CT 17 in Beggiatoa mats PP-V14
Carottier tube	18	04/06/2006	17:37:53	N 72 00.1654	E 014 43.9460	1258	144	PP-V14			X		160		CT 18 in Beggiatoa mats PP-V14
Carottier tube	19	04/06/2006	17:32:26	N 72 00.1647	E 014 43.9499	1258	144	PP-V14			X		159		CT 19 in Beggiatoa mats PP-V14
Carottier tube	20	04/06/2006	17:29:01	N 72 00.1652	E 014 43.9515	1258	144	PP-V14			X		158		CT 20 in Beggiatoa mats PP-V14
INSINC Corer (MPI)	1	04/06/2006	02:41:57	N 72 00.1673	E 014 43.9507	1258	148	PP-V14			X		087		Sampling INSINC1
INSINC Corer (MPI)	2	04/06/2006	02:50:22	N 72 00.1719	E 014 43.9472	1258	148	PP-V14			X		088		Sampling INSINC2
INSINC Corer (MPI)	5	04/06/2006	16:40:26	N 72 00.1668	E 014 43.9508	1258	143	PP-V14			X		151		INSINC 5 sample
INSINC Corer (MPI)	6	04/06/2006	16:32:01	N 72 00.1654	E 014 43.9518	1258	143	PP-V14			X		150		INSINC 6 sample
MIC-HMMV	1	04/06/2006	05:12:00	N 72 00.2029	E 014 43.7516	1258	316	Hakon Mosby MV					094		MIC in place on Site 1
MIC-HMMV	1	04/06/2006	06:54:59	N 72 00.2055	E 014 43.7566	1258	190	Hakon Mosby MV					105		Recovering MIC1
MIC-HMMV	2	04/06/2006	07:14:34	N 72 00.1651	E 014 43.9419	1258	137	PP-V14					108		deployment MIC 2, sinks in a few cm
MIC-HMMV	2	04/06/2006	08:40:57	N 72 00.1671	E 014 43.9434	1258	128	PP-V14					116		MIC2 sunk deep in sediment: deployment failed. Then transit to site MIC3, 50 m NW of MIC2

MIC-HMMV	3	04/06/2006	09:06:56	N 72 00.1866	E 014 43.8836	1258	142	Hakon Mosby MV					117		MIC 3 started, not sunk deeply
MIC-HMMV	3	04/06/2006	10:42:31	N 72 00.1878	E 014 43.8811	1258	149	Hakon Mosby MV					132		recovery of MIC 3
PEGAZ		03/06/2006	23:41:04	N 72 00.2962	E 014 43.4007	1257	300	PP-V13		X			061		End of PEGAZ sampling
PEP bouteille	1	04/06/2006	00:02:16	N 72 00.2972	E 014 43.4019	1257	300	PP-V13		X			063		PEP1, as close as possible to bubble hole
PEP bouteille	2	04/06/2006	00:22:04	N 72 00.2986	E 014 43.4027	1256	309	PP-V13		X			067		PEP2 at 3m altitude above bubble site, gun at same height as sheath
PEP bouteille	3	04/06/2006	00:28:27	N 72 00.3011	E 014 43.4204	1256	297	PP-V13		X			068		PEP3 at 15m altitude above bubble site, gun in sheath
PEP bouteille	4	04/06/2006	12:42:38	N 72 00.1647	E 014 43.9234	1258	83	Hakon Mosby MV		X			136		PEP 4 taken at 5 cm above Beggiatoa mats
PEP bouteille	5	04/06/2006	12:46:21	N 72 00.1671	E 014 43.9266	1258	84	Hakon Mosby MV		X			137		PEP 5 taken at 5 cm above Beggiatoa mats
PEP bouteille	6	04/06/2006	12:47:21	N 72 00.1655	E 014 43.9261	1258	84	Hakon Mosby MV		X			138		PEP 6 taken at 5 cm above Beggiatoa mats
PEP bouteille	7	04/06/2006	21:36:20	N 72 00.1719	E 014 43.9182	1258	136	PP-V14		X			181		PEP 7 is the first PEP done 2cm above the Beggiatoa mats
PEP bouteille	8	04/06/2006	21:42:56	N 72 00.1729	E 014 43.9258	1258	135	PP-V14		X			182		PEP 8 is the second PEP done 2cm above the Beggiatoa mats.
PEP bouteille	9	04/06/2006	21:45:02	N 72 00.1715	E 014 43.9178	1258	135	PP-V14		X			183		PEP 9 is the third and last PEP done 2 cm above the Beggiatoa mats.
Petite Boite de collecte	3	04/06/2006	13:02:44	N 72 00.1660	E 014 43.9217	1258	83	Hakon Mosby MV	X				140		PBT3 : red (eggs?) and pycnogonides sampled at Beggiatoa mats
RISS	1	04/06/2006	06:26:38	N 72 00.2054	E 014 43.7721	1258	264	Hakon Mosby MV					101		RISS1 is deployed east of MIC I
RISS	1	04/06/2006	07:38:54	N 72 00.2056	E 014 43.7725	1257	315	Hakon Mosby MV					111		Recovering RISS1, going to the elevator
T-Stick		03/06/2006	20:34:22	N 72 00.3163	E 014 43.5863	1256	323	Hakon Mosby MV					042	X	Recovering T stick 3
T-Stick		03/06/2006	21:02:44	N 72 00.3156	E 014 43.6188	1256	183	Hakon Mosby MV					046	X	recovering T stick 2
T-Stick		03/06/2006	21:41:28	N 72 00.3095	E 014 43.4829	1256	284	Hakon Mosby MV					051	X	Recovering T stick 4

ALAMER : Résumé de plongée

Dive 277-7 Chronological Progress on Hakon Mosby Mud Volcano

VICKING
Plongée : 277- 7

Date : 05/06/2006
Observateurs :

Date	Heure	Observateurs
05/06/2006	16h00 - 20h00	FESEKER Thomas
05/06/2006	20h00 - 00h00	FESEKER Thomas
06/06/2006	00h00 - 04h00	BOETIUS Antje LICHTSCHLAG Anna
06/06/2006	04h00 - 08h00	CAPRAIS Jean-Claude ANDERSEN Ann
06/06/2006	08h00 - 12h00	OLU - Le ROY Karine TOFFIN Laurent
06/06/2006	12h00 - 16h00	VAN GAEVER Saskia FABRI Marie-Claire CAPRAIS Jean-Claude
06/06/2006	16h00 - 20h00	DE BEER Dirk
06/06/2006	20h00 - 00h00	FOUCHER Jean-Paul PIERRE Catherine

Station : **Hakon Mosby MV** lat moy : N 71 55.1541 long moy : E 014 25.3575

Sites explorés :

Grey mat site and pogonophoran site

Objectifs de la plongée :

Recovery of the T-instrumented corer (6h),
Sampling and characterization of grey mats and a pogonophoran site:
(25h)

Résumé manuel des travaux :

Results:
(1) Recovery of the T-instrumented corer head with data loggers,
not the pipe
(2) Grey mats and NW pogonophoran sites
sampled and characterized (MIC, INSICS, CALMAR on pogo)

Résumé automatique des travaux :
Prélèvements
Biologie :
Aspirateur bouteille : 8 prélèvements,
Carottier a lame : 3 prélèvements,
Eau :
PEP bouteille : 9 prélèvements,
PEGAZ : 1 prélèvement,
Géochimie :
Carottier tube : 16 prélèvements,
INSINC Corer (MPI) : 3 prélèvements,

ROV panier : 1 prélèvement,
Mesures
4 mesures continues ont été recueillies,
Mouillages
6 mouillages ont été posés.
5 mouillages ont été relevés.

186 images ont été numérisées,
1 nouvelle localité a été définie : PP-V16.

Rapport de plongée :

Date	Heure	Localité	Latitude	Longitude	Prof (m)	N° Photo	Commentaires
05/06/2006	18:16:20	Hakon Mosby MV	N 72 00.3622	E 014 43.6519	1254	001	At bottom: beginning of dive. DVDs 2 and 3 are set to record the left and right arm of the ROV.
05/06/2006	18:17:55	Hakon Mosby MV	N 72 00.3456	E 014 43.6481	1256	002	STARTING recovery operation, headed for T-Lance
05/06/2006	18:26:03	Hakon Mosby MV	N 72 00.2963	E 014 43.6547	1256	003	Arrived at position, looking for T-lance
05/06/2006	18:32:34	Hakon Mosby MV	N 72 00.3017	E 014 43.6426	1256	004	Found T-lance
05/06/2006	18:36:05	Hakon Mosby MV	N 72 00.2985	E 014 43.6378	1256	005	Going to make temperature measurement next to T-lance using T-stick
05/06/2006	18:39:03	Hakon Mosby MV	N 72 00.2973	E 014 43.6359	1256	006	T-stick measurement next to lance
05/06/2006	18:50:36	Hakon Mosby MV	N 72 00.2974	E 014 43.6362	1257	007	End of T-stick 1 measurement, close to Tom's T-lance
05/06/2006	18:59:30	Hakon Mosby MV	N 72 00.2989	E 014 43.6390	1257	008	Waiting for ship to go to position for deployment of recovery cable for the T-Lance
05/06/2006	19:17:29	Hakon Mosby MV	N 72 00.3034	E 014 43.6341	1257	009	Moved away from lance
05/06/2006	19:17:52	Hakon Mosby MV	N 72 00.3044	E 014 43.6316	1257	010	Ship is deploying recovery cable
05/06/2006	19:43:33	Hakon Mosby MV	N 72 00.2978	E 014 43.5814	1256	011	Waiting for cable
05/06/2006	20:02:35	Hakon Mosby MV	N 72 00.3054	E 014 43.5846	1256	012	Heading for position of deployed cable
05/06/2006	20:17:13	Hakon Mosby MV	N 72 00.3163	E 014 43.6441	1256	013	Found cable, moving down along with the cable to the seafloor
05/06/2006	20:20:15	Hakon Mosby MV	N 72 00.3176	E 014 43.6517	1256	014	Cable at bottom
05/06/2006	20:23:46	Hakon Mosby MV	N 72 00.3162	E 014 43.6537	1257	015	Taking hook
05/06/2006	20:28:06	Hakon Mosby MV	N 72 00.3139	E 014 43.6359	1257	016	Going back to lance with cable
05/06/2006	20:36:27	Hakon Mosby MV	N 72 00.2984	E 014 43.6447	1257	017	Arrived at T-lance with cable
05/06/2006	20:49:52	Hakon Mosby MV	N 72 00.2992	E 014 43.6527	1256	018	Lance is on the hook
05/06/2006	20:54:29	Hakon Mosby MV	N 72 00.3009	E 014 43.6281	1257	019	Ship is starting to pull on cable
05/06/2006	21:11:25	Hakon Mosby MV	N 72 00.2986	E 014 43.6536	1257	020	Changed dvd 2+3 to portside and starbord cameras
05/06/2006	21:15:39	Hakon Mosby MV	N 72 00.2989	E 014 43.6492	1257	021	T-Lance is leaving seafloor. The ship will now recover the T Lance. END of recovery operation
05/06/2006	22:06:52	Hakon Mosby MV	N 72 00.3313	E 014 43.5687	1255	022	leaving for grey mat site, Antje and Anna on shift
05/06/2006	22:31:47	Hakon Mosby MV	N 72 00.3150	E 014 43.3718	1256	023	mixture grey mats / white mats
05/06/2006	22:38:15	Hakon Mosby MV	N 72 00.3148	E 014 43.3819	1256	024	beta cam of grey and white mats
05/06/2006	22:46:06	Hakon Mosby MV	N 72 00.3140	E 014 43.3798	1255	026	nice grey mats
05/06/2006	22:47:28	Hakon	N 72	E 014	1255	027	grey mat

		Mosby MV	00.3140	43.3809			
05/06/2006	22:50:49	Hakon Mosby MV	N 72 00.3147	E 014 43.3825	1256	028	choosing first CT sampling site close to pogo spot
05/06/2006	22:57:56	Hakon Mosby MV	N 72 00.3153	E 014 43.3831	1255	029	CT1 on grey mats, head oppened because of gas
05/06/2006	23:07:10	Hakon Mosby MV	N 72 00.3148	E 014 43.3802	1256	030	INSINC same spot as CT1
05/06/2006	23:11:14	Hakon Mosby MV	N 72 00.3139	E 014 43.3805	1256	031	INSINC X1 on grey mats
05/06/2006	23:13:01	Hakon Mosby MV	N 72 00.3136	E 014 43.3796	1255	032	INSINC X1 injected
05/06/2006	23:22:51	Hakon Mosby MV	N 72 00.3143	E 014 43.3825	1255	033	starting with INSINC X2
05/06/2006	23:30:55	Hakon Mosby MV	N 72 00.3145	E 014 43.3768	1256	034	INSINC X2
05/06/2006	23:39:55	Hakon Mosby MV	N 72 00.3145	E 014 43.3792	1256	035	INSINC 2 injected
05/06/2006	23:42:49	Hakon Mosby MV	N 72 00.3152	E 014 43.3791	1255	036	CT2
05/06/2006	23:53:29	Hakon Mosby MV	N 72 00.3149	E 014 43.3827	1256	037	CT3
05/06/2006	23:59:36	Hakon Mosby MV	N 72 00.3146	E 014 43.3813	1256	038	CT4
06/06/2006	00:01:00	Hakon Mosby MV	N 72 00.3146	E 014 43.3825	1256		CT5
06/06/2006	00:08:49	Hakon Mosby MV	N 72 00.3150	E 014 43.3819	1256	040	CT 6
06/06/2006	00:14:19	Hakon Mosby MV	N 72 00.3149	E 014 43.3791	1256	041	CT7
06/06/2006	00:31:03	Hakon Mosby MV	N 72 00.3145	E 014 43.3813	1256	042	CT 8
06/06/2006	00:40:39	Hakon Mosby MV	N 72 00.3138	E 014 43.3827	1256	043	CT 9
06/06/2006	00:46:18	Hakon Mosby MV	N 72 00.3136	E 014 43.3840	1256	044	CT 10
06/06/2006	01:00:00	Hakon Mosby MV	N 72 00.3544	E 014 43.2736	1254		going to elevator for exchanges of INSINC and rack of CT. Unfortunately it was problematic to do the exchange, the INSINC box fell to the floor but was recovered after some time.
06/06/2006	03:30:00	Hakon Mosby MV	N 72 00.3798	E 014 43.0936	1256		going to the other grey mat site marked as "tapis gris 2"
06/06/2006	03:44:00	Hakon Mosby MV	N 72 00.3870	E 014 43.2017	1254	045	found crust
06/06/2006	03:45:22	Hakon Mosby MV	N 72 00.3870	E 014 43.2076	1254	046	photo of crust
06/06/2006	03:46:43	Hakon Mosby MV	N 72 00.3873	E 014 43.2082	1254	047	marked on map as "croute carb"
06/06/2006	03:48:26	Hakon Mosby MV	N 72 00.3877	E 014 43.2098	1254	048	PANIER 1 : sample crust 277-CC1
06/06/2006	03:52:30	Hakon Mosby MV	N 72 00.3868	E 014 43.2108	1254	049	photo of crust
06/06/2006	03:53:09	Hakon Mosby MV	N 72 00.3870	E 014 43.2106	1254	050	inside the crust there is a hole with sediment and mat
06/06/2006	04:16:38	Hakon Mosby MV	N 72 00.3794	E 014 43.3089	1254	051	CT11
06/06/2006	04:24:19	Hakon Mosby MV	N 72 00.3785	E 014 43.3105	1254	052	INSINC X5, zoomed
06/06/2006	04:28:59	Hakon Mosby MV	N 72 00.3789	E 014 43.3107	1254	053	Insinc X5 injected ? - but this INSINC was lost during recovery
06/06/2006	04:49:36	Hakon Mosby MV	N 72 00.3830	E 014 43.0755	1256	054	We have taken CALMAR1 and are moving to the west (cap 270°) during 100m to find the Pogos field in an area >50% Pogo (M.Schluters map)
06/06/2006	05:21:16	Hakon	N 72	E 014	1263	055	We found a suitable Pogonophoran tubeworm area,

		Mosby MV	00.3365	42.7367			but the density of the Pogos is less than shown on the map
06/06/2006	05:22:22	PP-V16	N 72 00.3367	E 014 42.7369	1263	056	CALMAR-A is deployed
06/06/2006	05:29:01	PP-V16	N 72 00.3367	E 014 42.7367	1263	236	We star video-imaging with the lasers
06/06/2006	05:37:17	PP-V16	N 72 00.3373	E 014 42.7376	1263	058	CALMAR A cell A2 is the first cell to be closed on Calamar A
06/06/2006	05:52:26	PP-V16	N 72 00.3822	E 014 43.0704	1257	060	We are back to the elevator to take CALMAR B
06/06/2006	05:58:26	PP-V16	N 72 00.3799	E 014 43.0964	1257	061	CALMAR B is taken
06/06/2006	06:30:09	PP-V16	N 72 00.3384	E 014 42.7560	1262	062	CALMAR B is deployed (near 9 m in 330 of calmar A)
06/06/2006	06:36:08	PP-V16	N 72 00.3377	E 014 42.7528	1262	064	View of the Pogo area
06/06/2006	06:37:39	PP-V16	N 72 00.3374	E 014 42.7518	1262	065	CALMAR B cell B1 is the first cell to be closed on CALMAR B
06/06/2006	06:43:11	PP-V16	N 72 00.3377	E 014 42.7523	1262	066	PEP 1 is taken at 1 cm above the pogonophorans behind CALMAR 2
06/06/2006	06:46:40	PP-V16	N 72 00.3380	E 014 42.7492	1262	067	PEP 2 is taken at 10 cm left to PEP1.
06/06/2006	06:48:36	PP-V16	N 72 00.3379	E 014 42.7504	1262	068	PEP 3 is done 10cm behind PEP 1 and 2 on the Pogonophorans.
06/06/2006	06:52:38	Hakon Mosby MV	N 72 00.3390	E 014 42.7497	1263	069	Deployment of marker PP-V16
06/06/2006	07:00:32	PP-V16	N 72 00.3390	E 014 42.7595	1261	070	Digital photo of the two CALMAR bells . They form a triangle with the marker PPV16.
06/06/2006	07:08:33	PP-V16	N 72 00.3371	E 014 42.7420	1264	071	PEP 4 is done close to the Pogonophorans beside CALMAR A
06/06/2006	07:10:42	PP-V16	N 72 00.3369	E 014 42.7406	1264	072	PEP5 is the second PEP close to the Pogonophorans beside CALMAR1.
06/06/2006	07:12:44	PP-V16	N 72 00.3370	E 014 42.7415	1263	073	PEP 6 is the third PEP on the Pogonophorans close to CALMAR 1.
06/06/2006	07:17:53	PP-V14	N 72 00.3371	E 014 42.7403	1263	074	CALMAR A cell A1 is closed
06/06/2006	07:27:26	PP-V16	N 72 00.3364	E 014 42.7393	1264	075	ASPI 1 in pogonophora close to CALMAR A
06/06/2006	07:33:18	PP-V16	N 72 00.3360	E 014 42.7406	1263	076	ASPI2 on the right of CALMAR A
06/06/2006	07:40:33	PP-V16	N 72 00.3349	E 014 42.7320	1263	077	ASPI3 in Pogonophora
06/06/2006	07:48:46	PP-V16	N 72 00.3366	E 014 42.7435	1263	078	red Ophiure sp collected with arm
06/06/2006	08:04:00	PP-V16	N 72 00.3356	E 014 42.7437	1263		CT12 in pogonophora close to the CALMAR A (empty)
06/06/2006	08:10:00	PP-V16	N 72 00.3355	E 014 42.7438	1263		CT21 in pogonophora close to the CALMAR A (empty)
06/06/2006	08:13:04	PP-V16	N 72 00.3357	E 014 42.7438	1264	079	CT22 in pogonophora left of the CALMAR A
06/06/2006	08:15:00	PP-V16	N 72 00.3358	E 014 42.7450	1263		CT23 in pogonophora close to CALMAR A (empty)
06/06/2006	08:37:11	PP-V16	N 72 00.3368	E 014 42.7440	1264	080	ct24 empty but not closed. will be used once again close to CALMAR B
06/06/2006	08:43:10	PP-V16	N 72 00.3359	E 014 42.7520	1262	081	CT24 try again in pogonophora close to CALMAR B
06/06/2006	08:52:29	PP-V16	N 72 00.3360	E 014 42.7512	1262	082	CALMAR B cell B2 closed at 8h52
06/06/2006	08:56:13	PP-V16	N 72 00.3356	E 014 42.7527	1262	083	ASPI 4 on pogonophora close to CALMAR B
06/06/2006	09:09:35	PP-V16	N 72 00.3342	E 014 42.7541	1262	084	ASPI5
06/06/2006	09:21:42	PP-V16	N 72 00.3365	E 014 42.7410	1263	085	CALMAR A cell A3 is closed at 9h21 et 27s
06/06/2006	09:27:42	PP-V16	N 72	E 014	1263	086	PEP7 in pogonophora

			00.3356	42.7464			
06/06/2006	09:32:44	PP-V16	N 72 00.3352	E 014 42.7463	1263	087	PEP8 intermediate point 10 cm beside
06/06/2006	09:34:13	PP-V16	N 72 00.3354	E 014 42.7457	1263	089	PEP9 intermediate point 10 cm beside
06/06/2006	09:36:58	PP-V14	N 72 00.3353	E 014 42.7460	1263	090	ASPI6 in intermediate point (fish)
06/06/2006	09:41:40	PP-V16	N 72 00.3361	E 014 42.7490	1263	091	ASPI7 (ophiure)
06/06/2006	09:43:45	PP-V16	N 72 00.3356	E 014 42.7455	1263	092	ASPI8
06/06/2006	09:47:44	PP-V16	N 72 00.3381	E 014 42.7441	1263	098	Go back to elevator to collect Blade cores
06/06/2006	10:14:46	PP-V16	N 72 00.3840	E 014 43.0820	1257	099	taken blade cores out of elevator, going back to pogonophora field (PP 16)
06/06/2006	10:25:00	PP-V16	N 72 00.3413	E 014 42.7708	1261	100	arrival at CALMAR B
06/06/2006	10:38:31	PP-V16	N 72 00.3368	E 014 42.7556	1262	093	closing cell B3 of CALMAR B
06/06/2006	10:57:49	PP-V16	N 72 00.3350	E 014 42.7573	1261	094	sampling CL8 in pogonophora
06/06/2006	11:06:55	PP-V16	N 72 00.3354	E 014 42.7576	1261	095	sampling CL7 in pogonophora (only half of surface)
06/06/2006	11:20:31	PP-V16	N 72 00.3355	E 014 42.7565	1261	096	sampling CL6 in pogonophora (only half of surface)
06/06/2006	11:39:15	PP-V16	N 72 00.3418	E 014 42.8234	1260	097	carbonate block with fish, taking sample 277-CC1 put in rack of blade corer
06/06/2006	11:42:32	PP-V16	N 72 00.3539	E 014 42.9095	1260	101	sampled second piece of block
06/06/2006	11:44:51	Hakon Mosby MV	N 72 00.3558	E 014 42.9236	1260	102	going back to elevator
06/06/2006	11:55:32	Hakon Mosby MV	N 72 00.3726	E 014 43.0413	1257	103	arrival at elevator, put back the Blade corers
06/06/2006	12:00:20	Hakon Mosby MV	N 72 00.3766	E 014 43.0614	1255	104	going back to PP-V16 to pick up CALMARS (cloches)
06/06/2006	12:11:48	PP-V16	N 72 00.3361	E 014 42.7520	1263	105	recovery of CALMAR A
06/06/2006	12:17:50	PP-V16	N 72 00.3357	E 014 42.7534	1261	106	recovery of CALMAR B
06/06/2006	12:52:51	Hakon Mosby MV	N 72 00.3811	E 014 43.0891	1257	107	taking gel peepers out of elevator
06/06/2006	13:06:38	Hakon Mosby MV	N 72 00.3791	E 014 43.0767	1256	108	elevator going back to surface
06/06/2006	13:44:56	Hakon Mosby MV	N 72 00.3945	E 014 43.1233	1256	109	seaweed (fucus) sampled
06/06/2006	13:46:42	Hakon Mosby MV	N 72 00.3940	E 014 43.1235	1257	110	gastropod (living) found next to seaweed
06/06/2006	13:52:44	Hakon Mosby MV	N 72 00.3746	E 014 43.1459	1254	111	carbonates
06/06/2006	14:41:36	Hakon Mosby MV	N 72 00.2080	E 014 43.7199	1257	112	deployment of 3 peepers at central site, start
06/06/2006	15:19:55	Hakon Mosby MV	N 72 00.2098	E 014 43.7142	1258	114	site marked as peeper123, peeper 8 fell, peeper 5 and 6 too deep, too difficult to handle
06/06/2006	15:32:25	Hakon Mosby MV	N 72 00.2076	E 014 43.8544	1257	115	Beggiatoa strip
06/06/2006	15:33:03	Hakon Mosby MV	N 72 00.2066	E 014 43.8567	1257	116	fractures
06/06/2006	15:33:59	Hakon Mosby MV	N 72 00.2042	E 014 43.8560	1257	117	border strip with vertical camera
06/06/2006	15:34:35	Hakon Mosby MV	N 72 00.2031	E 014 43.8564	1257	118	bubble holes visible on the area without mats
06/06/2006	15:35:07	Hakon Mosby MV	N 72 00.2033	E 014 43.8571	1257	119	border strip with front camera
06/06/2006	15:59:24	Hakon Mosby MV	N 72 00.1982	E 014 43.8980	1256	120	MIC out of shuttle, leaving to site peeper123

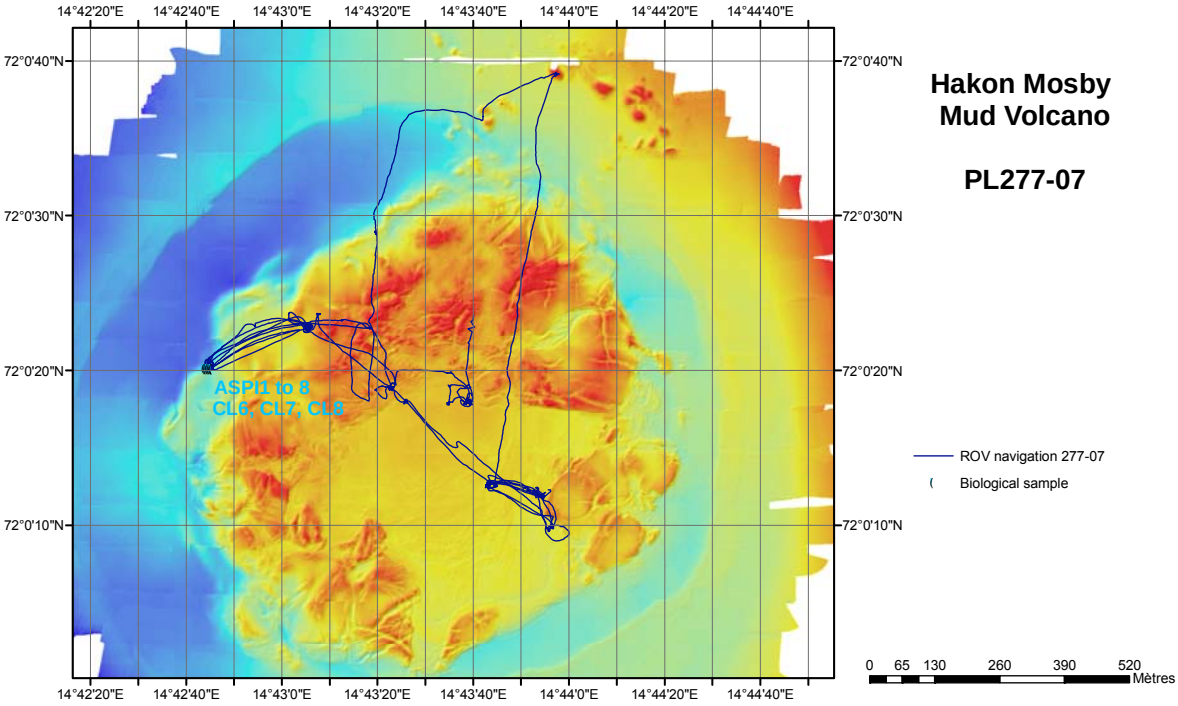
06/06/2006	16:11:46	Hakon Mosby MV	N 72 00.2127	E 014 43.7226	1258	121	MIC at spot MIC 4 close to PEEPER 123 (10m)
06/06/2006	16:23:43	Hakon Mosby MV	N 72 00.2141	E 014 43.7222	1258	122	placing of T-stick 2
06/06/2006	16:27:58	Hakon Mosby MV	N 72 00.2131	E 014 43.7219	1258	123	MIC 4 started
06/06/2006	16:48:29	Hakon Mosby MV	N 72 00.2039	E 014 43.8871	1256	124	RISS out of elevator
06/06/2006	17:14:37	Hakon Mosby MV	N 72 00.2117	E 014 43.7284	1258	125	Deployment of RISS2 (started) and going back to MIC4
06/06/2006	17:31:23	Hakon Mosby MV	N 72 00.2115	E 014 43.7226	1257	126	Bubbling during recovery of T stick 2, close to MIC4
06/06/2006	17:39:32	Hakon Mosby MV	N 72 00.2013	E 014 43.7662	1257	237	Recovering MIC 4
06/06/2006	17:55:49	Hakon Mosby MV	N 72 00.1614	E 014 43.9293	1258	127	Deployment of MIC5 (near MIC2)
06/06/2006	17:58:41	Hakon Mosby MV	N 72 00.1608	E 014 43.9307	1258	128	Deployment spot of sensors
06/06/2006	18:06:04	Hakon Mosby MV	N 72 00.1619	E 014 43.9302	1258	129	position T_stick 3
06/06/2006	18:07:20	Hakon Mosby MV	N 72 00.1611	E 014 43.9305	1258	130	depth T stick, MIC 5 started, then some detailed exploration
06/06/2006	19:00:39	Hakon Mosby MV	N 72 00.2852	E 014 43.7782	1257	131	we arrive on an old flow with white bacterial mats
06/06/2006	19:07:12	Hakon Mosby MV	N 72 00.3149	E 014 43.7942	1255	181	a pogonophoran mound with white patch on the slope
06/06/2006	19:07:53	Hakon Mosby MV	N 72 00.3181	E 014 43.7959	1256	182	white patches on a pogonophoran mound
06/06/2006	19:08:46	Hakon Mosby MV	N 72 00.3238	E 014 43.7927	1255	133	white patches on the flank of hill covered with pogonophorans
06/06/2006	19:20:19	Hakon Mosby MV	N 72 00.4001	E 014 43.8209	1254	134	edge of the volcano
06/06/2006	19:24:28	Hakon Mosby MV	N 72 00.4317	E 014 43.8337	1254	187	slope failure
06/06/2006	19:34:54	Hakon Mosby MV	N 72 00.5208	E 014 43.8926	1262	191	pogonophoran field
06/06/2006	19:46:41	Hakon Mosby MV	N 72 00.6150	E 014 43.9064	1259	139	approach of the northern mound
06/06/2006	19:49:03	Hakon Mosby MV	N 72 00.6435	E 014 43.9370	1258	203	climbing the northern hill
06/06/2006	19:49:57	Hakon Mosby MV	N 72 00.6478	E 014 43.9411	1254	204	top of the hill
06/06/2006	19:55:25	Hakon Mosby MV	N 72 00.6522	E 014 43.9631	1255	207	top of the hill with pogonophorans
06/06/2006	19:58:15	Hakon Mosby MV	N 72 00.6512	E 014 43.9573	1254	135	pogonophoran field at the top of the mound
06/06/2006	19:58:55	Hakon Mosby MV	N 72 00.6510	E 014 43.9534	1253	136	gastropods at the top of the mound
06/06/2006	19:59:49	Hakon Mosby MV	N 72 00.6508	E 014 43.9526	1253	209	white filaments with pogo
06/06/2006	20:00:48	Hakon Mosby MV	N 72 00.6509	E 014 43.9545	1253	137	white filaments, pogonophorans, a sea star
06/06/2006	20:03:34	Hakon Mosby MV	N 72 00.6528	E 014 43.9483	1253	138	leaving point C1 to go to point C2
06/06/2006	20:11:17	Hakon Mosby MV	N 72 00.6207	E 014 43.7216	1260	140	pogonophoran patches on the flank of the second mound
06/06/2006	20:14:15	Hakon Mosby MV	N 72 00.6028	E 014 43.7002	1256	141	top of the third mound
06/06/2006	20:27:15	Hakon Mosby MV	N 72 00.6019	E 014 43.4256	1263	144	turning to the south to go to point C4
06/06/2006	20:40:53	Hakon Mosby MV	N 72 00.4911	E 014 43.3260	1263	145	the first grey patch
06/06/2006	20:43:08	Hakon Mosby MV	N 72 00.4836	E 014 43.3281	1260	149	blocks of carbonate crust or indurated mud at the top of the hill
06/06/2006	20:44:21	Hakon	N 72	E 014	1260	154	chaotic carbonate crust or indurated mud

		Mosby MV	00.4821	43.3241			
06/06/2006	20:46:59	Hakon Mosby MV	N 72 00.4820	E 014 43.3247	1260	156	pogonophorans on the flank of the relief
06/06/2006	20:48:05	Hakon Mosby MV	N 72 00.4815	E 014 43.3282	1260	157	going to sample the topmost crust
06/06/2006	20:57:26	Hakon Mosby MV	N 72 00.4589	E 014 43.3259	1260	159	climbing the slope
06/06/2006	20:59:06	Hakon Mosby MV	N 72 00.4568	E 014 43.3267	1258	161	plateau covered with a pogonophoran field on the top of the hill
06/06/2006	21:04:20	Hakon Mosby MV	N 72 00.4356	E 014 43.3182	1257	163	passage d'une raie
06/06/2006	21:04:49	Hakon Mosby MV	N 72 00.4343	E 014 43.3182	1257	164	grey patch
06/06/2006	21:08:08	Hakon Mosby MV	N 72 00.4183	E 014 43.3132	1254	165	small white patches
06/06/2006	21:09:51	Hakon Mosby MV	N 72 00.4113	E 014 43.3130	1254	167	blocks of indurated carbonate at the top and on the slope of the hill
06/06/2006	21:16:01	Hakon Mosby MV	N 72 00.3891	E 014 43.3069	1252	169	hummocky relief
06/06/2006	21:17:25	Hakon Mosby MV	N 72 00.3854	E 014 43.3036	1254	170	a valley with pogonophorans and white patches
06/06/2006	21:19:41	Hakon Mosby MV	N 72 00.3754	E 014 43.3176	1255	171	a crest covered with pogonophorans
06/06/2006	21:28:02	Hakon Mosby MV	N 72 00.3021	E 014 43.3044	1255	174	hummocky relief , abundant white patches
06/06/2006	21:31:16	Hakon Mosby MV	N 72 00.3067	E 014 43.2603	1256	177	sea stars, fishes
06/06/2006	21:41:49	Hakon Mosby MV	N 72 00.3800	E 014 43.2600	1255	179	white patch in the zone of supposed methane plume
06/06/2006	21:48:56	Hakon Mosby MV	N 72 00.3529	E 014 43.3617	1257	180	a large depression
06/06/2006	22:00:29	Hakon Mosby MV	N 72 00.3001	E 014 43.4260	1257	210	contact between the old flow and the fresh flow with bubbles
06/06/2006	22:01:28	Hakon Mosby MV	N 72 00.2992	E 014 43.4317	1257	211	bubbles
06/06/2006	22:13:41	Hakon Mosby MV	N 72 00.2991	E 014 43.4340	1257	212	going to sample Pegaz 1
06/06/2006	22:22:31	Hakon Mosby MV	N 72 00.3012	E 014 43.4301	1257	214	Pegaz 1
06/06/2006	22:28:09	Hakon Mosby MV	N 72 00.2992	E 014 43.4471	1256	238	shif takeover by Dirk and Anna
06/06/2006	22:28:32	Hakon Mosby MV	N 72 00.2962	E 014 43.4548	1256	216	going back to MIC 5
06/06/2006	22:52:35	Hakon Mosby MV	N 72 00.1642	E 014 43.9222	1258	217	arrival at MIC5
06/06/2006	22:53:14	Hakon Mosby MV	N 72 00.1638	E 014 43.9222	1258	218	recover T stick 3, close to MIC5
06/06/2006	23:01:43	Hakon Mosby MV	N 72 00.1656	E 014 43.9324	1258	239	recover MIC 5, change DVD set 15
06/06/2006	23:02:55	Hakon Mosby MV	N 72 00.1671	E 014 43.9380	1258	219	repositioning MIC just to the border Beggiatoa/ mat about 10m west, named site MIC 6
06/06/2006	23:12:19	Hakon Mosby MV	N 72 00.1640	E 014 43.9387	1258	221	placing T stick
06/06/2006	23:16:45	Hakon Mosby MV	N 72 00.1636	E 014 43.9419	1258	222	MIC 6 started
06/06/2006	23:24:52	Hakon Mosby MV	N 72 00.1664	E 014 43.9363	1258	223	leaving for RISS
06/06/2006	23:32:32	Hakon Mosby MV	N 72 00.2068	E 014 43.7321	1257	224	Recovering of RISS 2
06/06/2006	23:47:48	Hakon Mosby MV	N 72 00.2113	E 014 43.7279	1258	225	leaving for elevator
07/06/2006	00:01:53	Hakon Mosby MV	N 72 00.1982	E 014 43.8954	1257	227	RISS in elevator
07/06/2006	00:05:20	Hakon Mosby MV	N 72 00.1763	E 014 43.9063	1257	228	observing seafloor till MIC is ready

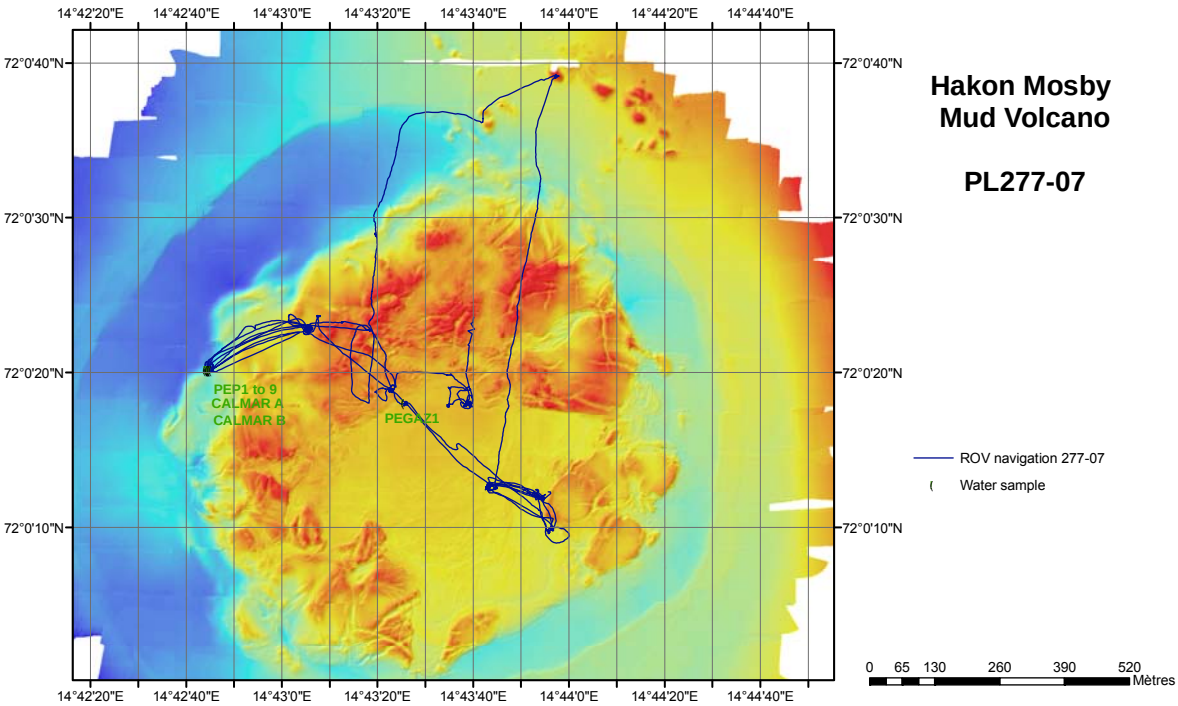
07/06/2006	00:06:21	Hakon Mosby MV	N 72 00.1712	E 014 43.9166	1257	229	nice white mats
07/06/2006	00:08:28	Hakon Mosby MV	N 72 00.1609	E 014 43.9181	1258	230	border white mats to tiny white mats
07/06/2006	00:10:00	Hakon Mosby MV	N 72 00.1541	E 014 43.9308	1258	231	hilly area
07/06/2006	00:22:52	Hakon Mosby MV	N 72 00.1662	E 014 43.9423	1258	232	Back at MIC6 site, recovery of T stick 4
07/06/2006	00:24:54	Hakon Mosby MV	N 72 00.1654	E 014 43.9432	1258	233	position of T stick
07/06/2006	00:33:10	Hakon Mosby MV	N 72 00.1665	E 014 43.9433	1258	234	going back to the elevator with MIC
07/06/2006	00:36:50	Hakon Mosby MV	N 72 00.1905	E 014 43.9138	1257	235	arrival at elevator, END of the dive

Dive 277-7 Maps

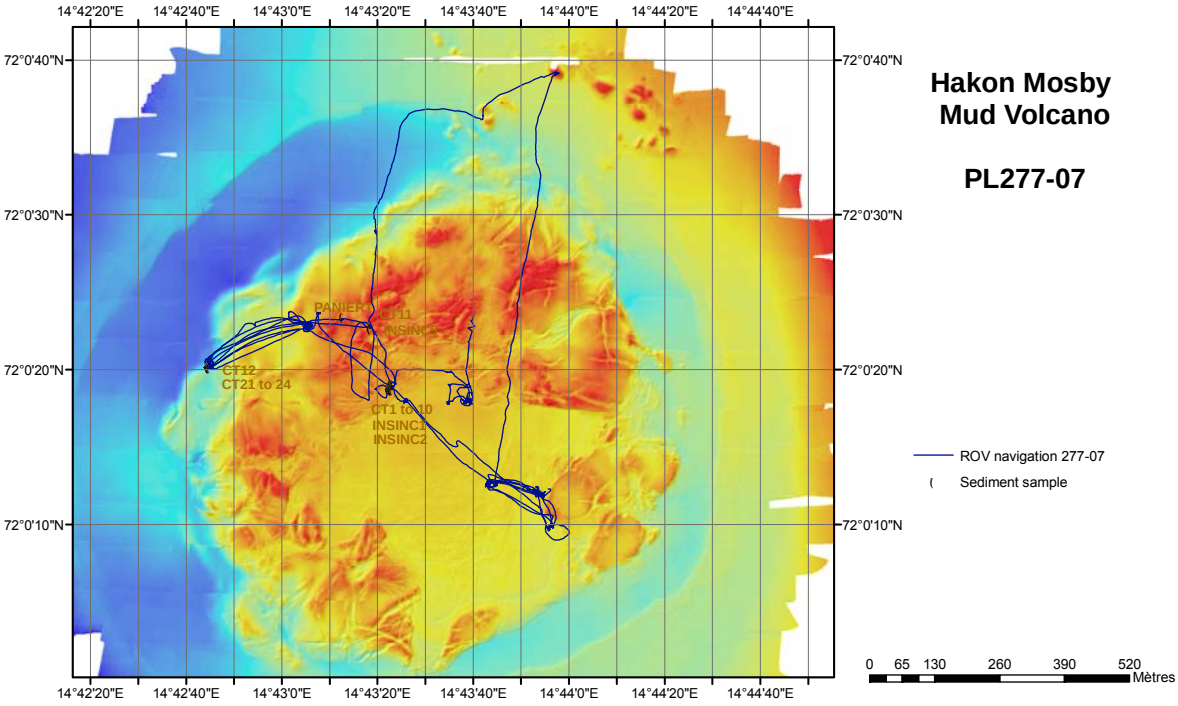
Biological samples



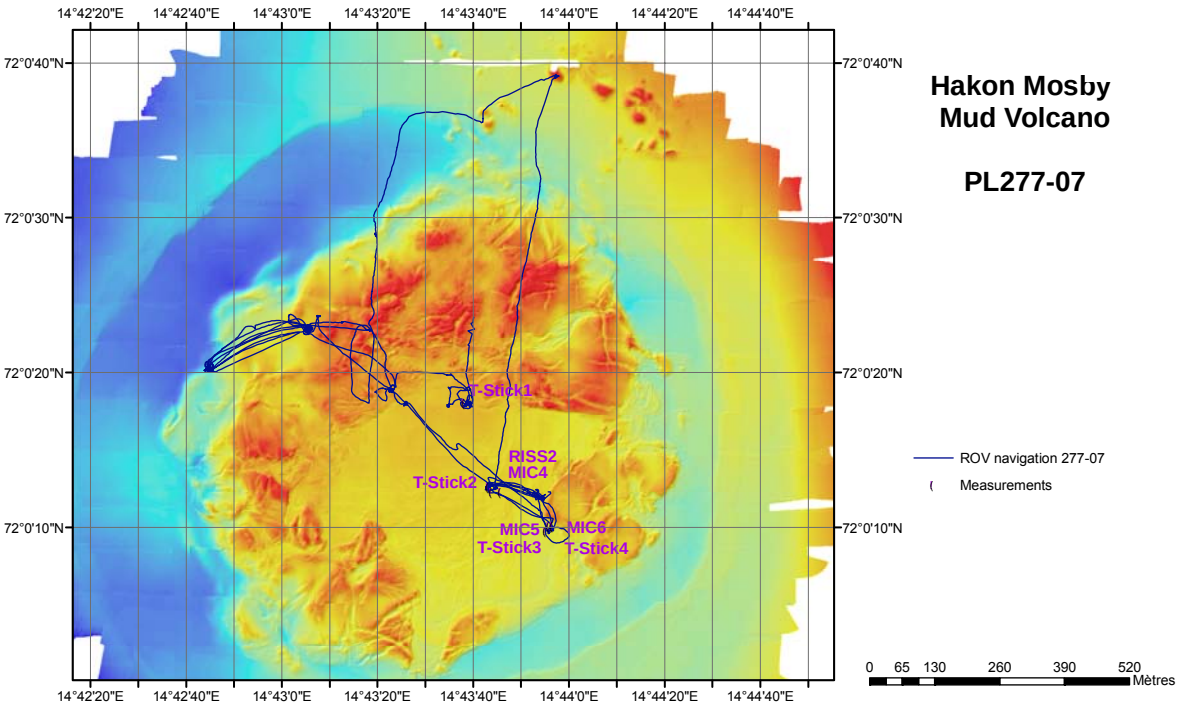
Water samples



Sediment samples



Measurements



Dive 277- 7 Operations list

Equipement	No	Date	Heure	Latitude	Longitude	Prof	Cap	Localite	Ech_Bio	Chimie	Sed	Mes	Photo	Fic	Commentaires
Aspirateur bouteille	1	06/06/2006	07:27:26	N 72 00.3364	E 014 42.7393	1264	174	PP-V16	X				075		ASPI 1 in pogonophora close to CALMAR A
Aspirateur bouteille	2	06/06/2006	07:33:18	N 72 00.3360	E 014 42.7406	1263	174	PP-V16	X				076		ASPI2 on the right of CALMAR A
Aspirateur bouteille	3	06/06/2006	07:40:33	N 72 00.3349	E 014 42.7320	1263	90	PP-V16	X				077		ASPI3 in Pogonophora
Aspirateur bouteille	4	06/06/2006	08:56:13	N 72 00.3356	E 014 42.7527	1262	138	PP-V16	X				083		ASPI 4 on pogonophora close to CALMAR B
Aspirateur bouteille	5	06/06/2006	09:09:35	N 72 00.3342	E 014 42.7541	1262	122	PP-V16	X				084		ASPI5
Aspirateur bouteille	6	06/06/2006	09:36:58	N 72 00.3353	E 014 42.7460	1263	157	PP-V14	X				090		ASPI6 in intermediate point (fish)
Aspirateur bouteille	7	06/06/2006	09:41:40	N 72 00.3361	E 014 42.7490	1263	158	PP-V16	X				091		ASPI7 (ophiure)
Aspirateur bouteille	8	06/06/2006	09:43:45	N 72 00.3356	E 014 42.7455	1263	157	PP-V16	X				092		ASPI8
CALMAR A HMMV	1	06/06/2006	05:22:22	N 72 00.3367	E 014 42.7369	1263	183	PP-V16					056		CALMAR-A is deployed
CALMAR A HMMV	1	06/06/2006	12:11:48	N 72 00.3361	E 014 42.7520	1263	189	PP-V16					105		recovery of CALMAR A
CALMAR B HMMV	1	06/06/2006	06:30:09	N 72 00.3384	E 014 42.7560	1262	157	PP-V16					062		CALMAR B is deployed (near 9 m in 330 of calmar A)
CALMAR B HMMV	1	06/06/2006	12:17:50	N 72 00.3357	E 014 42.7534	1261	188	PP-V16					106		recovery of CALMAR B
Carottier a lame	6	06/06/2006	11:20:31	N 72 00.3355	E 014 42.7565	1261	159	PP-V16	X				096		sampling CL6 in pogonophora (only half of surface)
Carottier a lame	7	06/06/2006	11:06:55	N 72 00.3354	E 014 42.7576	1261	159	PP-V16	X				095		sampling CL7 in pogonophora (only half of surface)
Carottier a lame	8	06/06/2006	10:57:49	N 72 00.3350	E 014 42.7573	1261	159	PP-V16	X				094		sampling CL8 in pogonophora
Carottier tube	1	05/06/2006	22:57:56	N 72 00.3153	E 014 43.3831	1255	156	Hakon Mosby MV			X		029		CT1 on grey mats, head oppened because of gas
Carottier tube	2	05/06/2006	23:42:49	N 72 00.3152	E 014 43.3791	1255	155	Hakon Mosby MV			X		036		CT2
Carottier tube	3	05/06/2006	23:53:29	N 72 00.3149	E 014 43.3827	1256	153	Hakon Mosby MV			X		037		CT3
Carottier tube	4	05/06/2006	23:59:36	N 72 00.3146	E 014 43.3813	1256	154	Hakon Mosby MV			X		038		CT4

Carottier tube	5	06/06/2006	00:01:00	N 72 00.3146	E 014 43.3825	1256	154	Hakon Mosby MV			X				CT5
Carottier tube	6	06/06/2006	00:08:49	N 72 00.3150	E 014 43.3819	1256	153	Hakon Mosby MV			X		040		CT 6
Carottier tube	7	06/06/2006	00:14:19	N 72 00.3149	E 014 43.3791	1256	153	Hakon Mosby MV			X		041		CT7
Carottier tube	8	06/06/2006	00:31:03	N 72 00.3145	E 014 43.3813	1256	153	Hakon Mosby MV			X		042		CT 8
Carottier tube	9	06/06/2006	00:40:39	N 72 00.3138	E 014 43.3827	1256	154	Hakon Mosby MV			X		043		CT 9
Carottier tube	10	06/06/2006	00:46:18	N 72 00.3136	E 014 43.3840	1256	153	Hakon Mosby MV			X		044		CT 10
Carottier tube	11	06/06/2006	04:16:38	N 72 00.3794	E 014 43.3089	1254	173	Hakon Mosby MV			X		051		CT11
Carottier tube	12	06/06/2006	08:04:00	N 72 00.3356	E 014 42.7437	1263	156	PP-V16			X				CT12 in pogonophora close to the CALMAR A (empty)
Carottier tube	21	06/06/2006	08:10:00	N 72 00.3355	E 014 42.7438	1263	156	PP-V16			X				CT21 in pogonophora close to the CALMAR A (empty)
Carottier tube	22	06/06/2006	08:13:04	N 72 00.3357	E 014 42.7438	1264	156	PP-V16			X		079		CT22 in pogonophora left of the CALMAR A
Carottier tube	23	06/06/2006	08:15:00	N 72 00.3358	E 014 42.7450	1263	156	PP-V16			X				CT23 in pogonophora close to CALMAR A (empty)
Carottier tube	24	06/06/2006	08:43:10	N 72 00.3359	E 014 42.7520	1262	136	PP-V16			X		081		CT24 try again in pogonophora close to CALMAR B
Grande Boite ROV	2	06/06/2006	20:48:05	N 72 00.4815	E 014 43.3282	1260	181	Hakon Mosby MV			X		157		GBT2 : sample crust 277-CC3
INSINC Corer (MPI)	1	05/06/2006	23:11:14	N 72 00.3139	E 014 43.3805	1256	156	Hakon Mosby MV			X		031		INSINC X1 on grey mats
INSINC Corer (MPI)	2	05/06/2006	23:30:55	N 72 00.3145	E 014 43.3768	1256	155	Hakon Mosby MV			X		034		INSINC X2
INSINC Corer (MPI)	5	06/06/2006	04:24:19	N 72 00.3785	E 014 43.3105	1254	175	Hakon Mosby MV			X		052		INSINC X5, zoomed
MIC-HMMV	4	06/06/2006	16:27:58	N 72 00.2131	E 014 43.7219	1258	229	Hakon Mosby MV					123		MIC 4 started
MIC-HMMV	4	06/06/2006	17:39:32	N 72 00.2013	E 014 43.7662	1257	123	Hakon Mosby MV					237		Recovering MIC 4
MIC-HMMV	5	06/06/2006	17:55:49	N 72 00.1614	E 014 43.9293	1258	212	Hakon Mosby MV					127		Deployment of MIC5 (near MIC2)
MIC-HMMV	5	06/06/2006	23:01:43	N 72 00.1656	E 014 43.9324	1258	114	Hakon Mosby MV					239		recover MIC 5, change DVD set 15
MIC-HMMV	6	06/06/2006	23:16:45	N 72 00.1636	E 014 43.9419	1258	309	Hakon Mosby MV					222		MIC 6 started

MIC-HMMV	6	07/06/2006	00:24:54	N 72 00.1654	E 014 43.9432	1258	217	Hakon Mosby MV					233		Recovery of MIC6
PEGAZ	1	06/06/2006	22:22:31	N 72 00.3012	E 014 43.4301	1257	54	Hakon Mosby MV		X			214		Pegaz 1
PEP bouteille	1	06/06/2006	06:43:11	N 72 00.3377	E 014 42.7523	1262	157	PP-V16		X			066		PEP 1 is taken at 1 cm above the pogonophorans behind CALMAR 2
PEP bouteille	2	06/06/2006	06:46:40	N 72 00.3380	E 014 42.7492	1262	157	PP-V16		X			067		PEP 2 is taken at 10 cm left to PEP1.
PEP bouteille	3	06/06/2006	06:48:36	N 72 00.3379	E 014 42.7504	1262	157	PP-V16		X			068		PEP 3 is done 10cm behind PEP 1 and 2 on the Pogonophorans.
PEP bouteille	4	06/06/2006	07:08:33	N 72 00.3371	E 014 42.7420	1264	174	PP-V16		X			071		PEP 4 is done close to the Pogonophorans beside CALMAR A
PEP bouteille	5	06/06/2006	07:10:42	N 72 00.3369	E 014 42.7406	1264	174	PP-V16		X			072		PEP5 is the second PEP close to the Pogonophorans beside CALMAR1.
PEP bouteille	6	06/06/2006	07:12:44	N 72 00.3370	E 014 42.7415	1263	174	PP-V16		X			073		PEP 6 is the third PEP on the Pogonophorans close to CALMAR 1.
PEP bouteille	7	06/06/2006	09:27:42	N 72 00.3356	E 014 42.7464	1263	158	PP-V16		X			086		PEP7 in pogonophora
PEP bouteille	8	06/06/2006	09:32:44	N 72 00.3352	E 014 42.7463	1263	157	PP-V16		X			087		PEP8 intermediate point 10 cm beside
PEP bouteille	9	06/06/2006	09:34:13	N 72 00.3354	E 014 42.7457	1263	157	PP-V16		X			089		PEP9 intermediate point 10 cm beside
Peepers	1	06/06/2006	15:19:55	N 72 00.2098	E 014 43.7142	1258	163	Hakon Mosby MV					114		site marked as peeper123, peeper 8 fell, peeper 5 and 6 too deep, too difficult to handle
RISS	2	06/06/2006	17:14:37	N 72 00.2117	E 014 43.7284	1258	189	Hakon Mosby MV					125		Deployment of RISS2 (started) and going back to MIC4
RISS	2	06/06/2006	23:32:32	N 72 00.2068	E 014 43.7321	1257	306	Hakon Mosby MV					224		Recovering of RISS 2
ROV panier	1	06/06/2006	03:48:26	N 72 00.3877	E 014 43.2098	1254	127	Hakon Mosby MV			X		048		PANIER 1 : sample crust 277-CC2
ROV panier	2	06/06/2006	11:39:15	N 72 00.3418	E 014 42.8234	1260	174	PP-V16			X		097		PANIER 2 : carbonate block with fish, taking sample 277-CC1 (in rack of blade corers)
T-Stick		05/06/2006	18:50:36	N 72 00.2974	E 014 43.6362	1257	76	Hakon Mosby MV					007	X	End of T-stick 1 measurement, close to Tom's T-lance
T-Stick		06/06/2006	17:31:23	N 72 00.2115	E 014 43.7226	1257	190	Hakon Mosby MV					126	X	Bubbling during recovery of T stick 2, close to MIC4
T-Stick		06/06/2006	22:53:14	N 72 00.1638	E 014 43.9222	1258	115	Hakon Mosby MV					218	X	recover T stick 3, close to MIC5
T-Stick		07/06/2006	00:22:52	N 72 00.1662	E 014 43.9423	1258	170	Hakon Mosby MV					232	X	Back at MIC6 site, recovery of T stick 4

ALAMER : Résumé de plongée

Dive 278-8 Chronological Progress on Hakon Mosby Mud Volcano

VICKING
Plongée : 278- 8

Date : 07/06/2006
Observateurs :

Date	Heure	Observateurs
07/06/2006	20h00 - 00h00	FESEKER Thomas DE BEER Dirk
08/06/2006	00h00 - 04h00	FOUCHER Jean-Paul PIERRE Catherine
08/06/2006	04h00 - 08h00	BOETIUS Antje SCHLUTER Michael DE BEER Dirk
08/06/2006	08h00 - 12h00	CHARLOU Jean-Luc LEHAITRE Michel
08/06/2006	12h00 - 16h00	FESEKER Thomas DE BEER Dirk
08/06/2006	16h00 - 20h00	DE BEER Dirk FESEKER Thomas

Station : **Hakon Mosby MV** lat moy : N 71 55.1541 long moy : E 014 25.3575

Sites explorés :

Objectifs de la plongée :
Geological exploration, physical and geochemical measurements and sampling.

Résumé manuel des travaux :
Exploration transects
MIC and RISS measurements
Thermal measurements
Pegaz sampling

Résumé automatique des travaux :
Prélèvements
Eau :
PEP bouteille : 16 prélèvements,
PEGAZ : 2 prélèvements,
Mesures
19 mesures continues ont été recueillies,
Mouillages
5 mouillages ont été posés.
5 mouillages ont été relevés.

96 images ont été numérisées,

Rapport de plongée :

Date	Heure	Localité	Latitude	Longitude	Prof (m)	N° Photo	Commentaires
07/06/2006	21:23:42	Hakon Mosby MV	N 72 00.3423	E 014 43.4478	1256	001	tom and dirk on shift

07/06/2006	21:24:01	Hakon Mosby MV	N 72 00.3416	E 014 43.4477	1256	002	taking mic from elevator
07/06/2006	21:33:09	Hakon Mosby MV	N 72 00.3047	E 014 43.3556	1256	003	arrived at MIC7, grey mat on PP-V12
07/06/2006	21:39:41	PP-V12	N 72 00.3061	E 014 43.3497	1256	004	grey mat spot
07/06/2006	21:41:13	PP-V12	N 72 00.3047	E 014 43.3490	1256	005	positioning of MIC7 on grey mat on PP-V12
07/06/2006	21:55:39	PP-V12	N 72 00.3031	E 014 43.3441	1256	006	placing T-stick1, close to MIC 7
07/06/2006	22:04:05	PP-V12	N 72 00.3038	E 014 43.3466	1256	008	MIC 7 site
07/06/2006	22:07:02	PP-V12	N 72 00.2982	E 014 43.3497	1256	011	searching white mats for RISS 3
07/06/2006	22:14:00	Hakon Mosby MV	N 72 00.2992	E 014 43.3495	1256		Catherine and Jean-Paul on shift : starting EXPLORATION on HMMV from south to north and north to south
07/06/2006	22:16:27	Hakon Mosby MV	N 72 00.2883	E 014 43.3332	1256	010	Contact between the fresh flow and the old flow with beggiatoa spots
07/06/2006	22:20:41	Hakon Mosby MV	N 72 00.2649	E 014 43.3054	1257	016	N20 large crack in the flow
07/06/2006	22:21:06	Hakon Mosby MV	N 72 00.2628	E 014 43.3065	1257	017	cracks and polygonal structures on the surface of the flow
07/06/2006	22:30:14	Hakon Mosby MV	N 72 00.2116	E 014 43.2871	1258	022	we cross a fresh flow
07/06/2006	22:31:57	Hakon Mosby MV	N 72 00.2025	E 014 43.2850	1258	025	we arrvie on a largely colinized flow
07/06/2006	22:35:58	Hakon Mosby MV	N 72 00.1672	E 014 43.2647	1258	028	contact between a highly colonized flow and a fresh flow
07/06/2006	22:39:09	Hakon Mosby MV	N 72 00.1484	E 014 43.2489	1256	030	pogonophoran hills
07/06/2006	22:47:58	Hakon Mosby MV	N 72 00.1443	E 014 43.2282	1257	034	deposition of colonisators C1, C2, C3 (Françoise Gaill) on Pogonophoran field
07/06/2006	23:29:21	Hakon Mosby MV	N 72 00.3832	E 014 43.4019	1256	080	next profile from 72°04 to point H4
07/06/2006	23:42:08	Hakon Mosby MV	N 72 00.3175	E 014 43.4194	1255	081	we are une the supposed plume zone
07/06/2006	23:42:47	Hakon Mosby MV	N 72 00.3125	E 014 43.4206	1255	086	PEP1, plume zone Alt 2.5 m on H2 H3
07/06/2006	23:49:44	Hakon Mosby MV	N 72 00.2728	E 014 43.4273	1257	082	PEP2, grey mud, alt 1.8m on H2, H3
08/06/2006	00:05:16	Hakon Mosby MV	N 72 00.1565	E 014 43.5465	1258	083	PEP3, abundant Beggiatoa near H4
08/06/2006	00:10:13	Hakon Mosby MV	N 72 00.1567	E 014 43.5848	1257	084	next profile from H5 to H6
08/06/2006	00:15:48	Hakon Mosby MV	N 72 00.2296	E 014 43.6443	1257	085	PEP4 Grey mud H5-H6
08/06/2006	00:29:12	Hakon Mosby MV	N 72 00.3506	E 014 43.6080	1255	089	PEP5 Plume zone H5-H6
08/06/2006	00:38:09	Hakon Mosby MV	N 72 00.4022	E 014 43.6079	1252	087	PEP6 Plume zone H5-H6 alt 2.4m
08/06/2006	00:41:11	Hakon Mosby MV	N 72 00.4359	E 014 43.6369	1254	090	we are on the pogonophoran plateau
08/06/2006	00:46:55	Hakon Mosby MV	N 72 00.4474	E 014 43.7678	1255	091	starting profile H7 to H8
08/06/2006	00:57:22	Hakon Mosby MV	N 72 00.4253	E 014 43.8084	1252	093	PEP7 near H7 alt 2.6 m
08/06/2006	01:13:50	Hakon Mosby MV	N 72 00.2872	E 014 43.8799	1257	094	PEP8 near transition to H7 H8, alt 2.2m
08/06/2006	01:25:43	Hakon Mosby MV	N 72 00.1438	E 014 43.8110	1257	095	PEP9 close to point H8, on grey ridges and beggiatoa rich flows, alt 2m
08/06/2006	01:28:22	Hakon Mosby MV	N 72 00.1274	E 014 43.8037	1258	096	white mats close to point H8, end of EXPLORATION
08/06/2006	02:06:01	Hakon Mosby MV	N 72 00.3494	E 014 43.5250	1254	097	New Shift Antje, Dirk, Michael S.

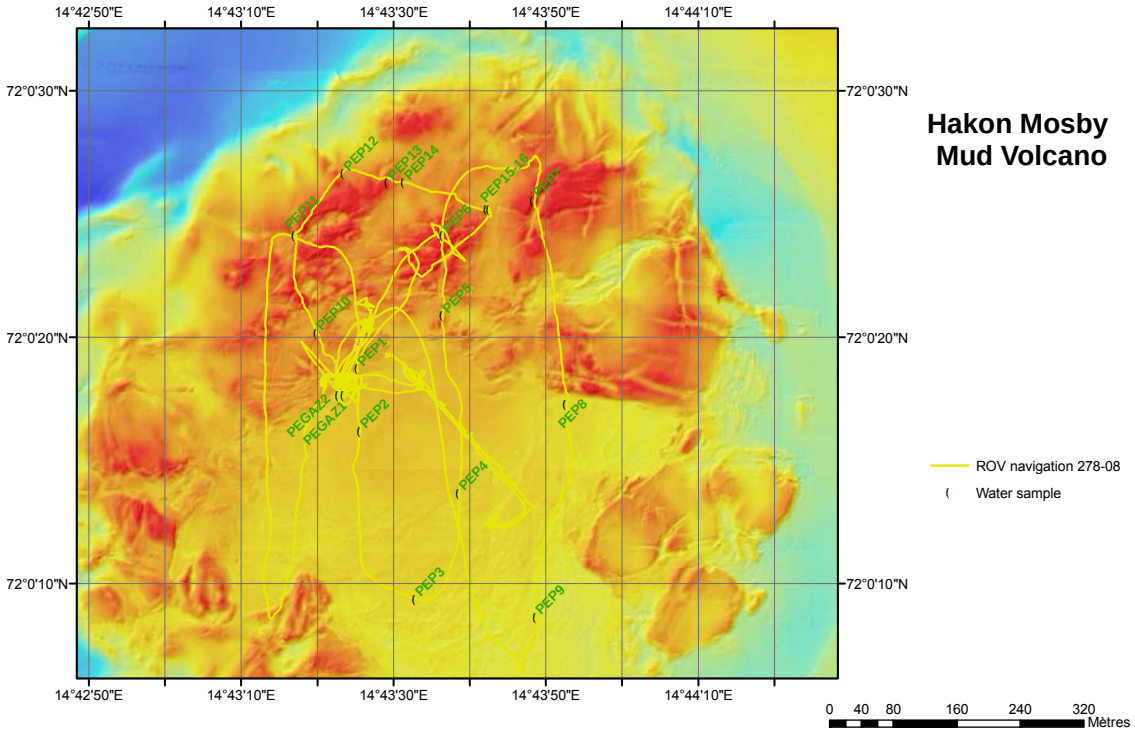
08/06/2006	02:06:29	Hakon Mosby MV	N 72 00.3510	E 014 43.5191	1254	098	Transfer to Elevator
08/06/2006	02:39:33	Hakon Mosby MV	N 72 00.3436	E 014 43.4293	1255	109	RISS is taken from elevator
08/06/2006	02:40:03	Hakon Mosby MV	N 72 00.3432	E 014 43.4250	1256	099	Deployment of RISS 3 on bacterial mat (on SBB3 site), near MIC7
08/06/2006	02:54:02	Hakon Mosby MV	N 72 00.3049	E 014 43.3902	1256	110	RISS 3 is started
08/06/2006	02:56:08	Hakon Mosby MV	N 72 00.3041	E 014 43.3924	1256	100	RISS 3 was placed on white bacterial mat
08/06/2006	03:00:40	Hakon Mosby MV	N 72 00.3005	E 014 43.3827	1256	111	foto of RISS 3 on bacterial mat, back to MIC 7
08/06/2006	03:02:02	PP-V12	N 72 00.3031	E 014 43.3441	1256	101	end of T-Stick 1 measurements from spot next to MIC 7
08/06/2006	03:25:42	PP-V12	N 72 00.3040	E 014 43.3491	1256	112	Recovering of MIC7
08/06/2006	03:31:41	Hakon Mosby MV	N 72 00.2998	E 014 43.4031	1256	113	arrived at new site for MIC 8
08/06/2006	03:32:10	Hakon Mosby MV	N 72 00.3013	E 014 43.4025	1256	103	foto of mat chosen to place instruments
08/06/2006	03:32:28	Hakon Mosby MV	N 72 00.3018	E 014 43.4025	1256	104	another foto of mat chosen to place instrument
08/06/2006	03:33:26	Hakon Mosby MV	N 72 00.3025	E 014 43.4022	1256	105	left spot for MIC 8, right for T-stick 2
08/06/2006	03:40:27	Hakon Mosby MV	N 72 00.3049	E 014 43.4051	1256	106	Deployment of MIC 8 on grey Mat
08/06/2006	03:54:23	Hakon Mosby MV	N 72 00.3069	E 014 43.4019	1256	107	t stick 2 positioned near MIC 8
08/06/2006	04:04:11	Hakon Mosby MV	N 72 00.3088	E 014 43.4060	1256	108	MIC 8 started
08/06/2006	04:11:09	Hakon Mosby MV	N 72 00.3063	E 014 43.3932	1256	114	end shift, Michel and Jean Luc take over for bubble search
08/06/2006	04:38:00	Hakon Mosby MV	N 72 00.3360	E 014 43.3324	1255		PEP10
08/06/2006	04:51:00	Hakon Mosby MV	N 72 00.4032	E 014 43.2845	1255		PEP11
08/06/2006	05:02:00	Hakon Mosby MV	N 72 00.4466	E 014 43.3944	1256		PEP12 pres du fond
08/06/2006	05:11:00	Hakon Mosby MV	N 72 00.4408	E 014 43.4908	1254		PEP13 alt 1.2m
08/06/2006	05:13:00	Hakon Mosby MV	N 72 00.4379	E 014 43.5266	1255		PEP14
08/06/2006	05:24:00	Hakon Mosby MV	N 72 00.4195	E 014 43.7027	1255		PEP15 alt 2m (empry?)
08/06/2006	05:28:00	Hakon Mosby MV	N 72 00.4192	E 014 43.7096	1255		PEP16 (empty?)
08/06/2006	06:31:09	Hakon Mosby MV	N 72 00.2923	E 014 43.3914	1257	115	Area with Bubbles
08/06/2006	06:44:18	Hakon Mosby MV	N 72 00.2946	E 014 43.3794	1257	116	Starting PEGAZ 1
08/06/2006	07:25:55	Hakon Mosby MV	N 72 00.2951	E 014 43.3923	1258	118	End of PEGAZ 1
08/06/2006	08:19:37	Hakon Mosby MV	N 72 00.2920	E 014 43.3861	1258	121	Starting PEGAZ 2
08/06/2006	08:27:00	Hakon Mosby MV	N 72 00.2912	E 014 43.3819	1258		End of PEGAZ 2
08/06/2006	08:33:06	Hakon Mosby MV	N 72 00.2946	E 014 43.3861	1258	119	Putting PEGAZ in the ROV basket
08/06/2006	08:35:32	Hakon Mosby MV	N 72 00.2955	E 014 43.3902	1258	120	Exploring along a crack from where bubbles are coming out
08/06/2006	09:16:27	Hakon Mosby MV	N 72 00.3018	E 014 43.4302	1257	122	tom and dirk shift
08/06/2006	09:21:08	Hakon Mosby MV	N 72 00.3069	E 014 43.4144	1257	123	arrived at MIC 8
08/06/2006	09:21:39	Hakon	N 72	E 014	1257	166	Pick up T-stick 2, near MIC 8

		Mosby MV	00.3071	43.4140			
08/06/2006	09:27:08	Hakon Mosby MV	N 72 00.3067	E 014 43.4111	1256	124	pick up MIC8, then go to HotSpot
08/06/2006	09:39:00	Hakon Mosby MV	N 72 00.3005	E 014 43.5623	1257		bubble observed
08/06/2006	09:52:15	Hakon Mosby MV	N 72 00.2985	E 014 43.5539	1257	167	Deployment of MIC 9
08/06/2006	09:54:21	Hakon Mosby MV	N 72 00.2990	E 014 43.5558	1257	125	placing t-stick3 next to MIC9
08/06/2006	10:04:18	Hakon Mosby MV	N 72 00.3104	E 014 43.5372	1257	126	going to the start of TEMPERATURE line profile (NW)
08/06/2006	10:07:36	Hakon Mosby MV	N 72 00.3214	E 014 43.4953	1257	127	arriving at start of profile
08/06/2006	10:09:00	Hakon Mosby MV	N 72 00.3205	E 014 43.4893	1257	128	TEMP 1 first point of profile
08/06/2006	10:16:42	Hakon Mosby MV	N 72 00.3181	E 014 43.5079	1256	129	going to next point half way back to hot spot
08/06/2006	10:20:57	Hakon Mosby MV	N 72 00.3112	E 014 43.5379	1257	130	TEMP 2 : 2. point on t-profile
08/06/2006	10:28:07	Hakon Mosby MV	N 72 00.3075	E 014 43.5457	1257	131	just crossed limit!
08/06/2006	10:29:57	Hakon Mosby MV	N 72 00.3073	E 014 43.5448	1257	132	next point 10 m from mic
08/06/2006	10:35:25	Hakon Mosby MV	N 72 00.3058	E 014 43.5544	1257	133	TEMP 3
08/06/2006	10:38:13	Hakon Mosby MV	N 72 00.3003	E 014 43.5730	1257	134	going to next point behind mic, just passed mic
08/06/2006	10:40:40	Hakon Mosby MV	N 72 00.2958	E 014 43.5811	1257	135	next point 10m SE of MIC
08/06/2006	10:41:25	Hakon Mosby MV	N 72 00.2955	E 014 43.5821	1257		TEMP 4
08/06/2006	10:48:44	Hakon Mosby MV	N 72 00.2885	E 014 43.6048	1257	138	TEMP 5
08/06/2006	11:02:33	Hakon Mosby MV	N 72 00.2747	E 014 43.6355	1257		TEMP 6
08/06/2006	11:09:10	Hakon Mosby MV	N 72 00.2692	E 014 43.6569	1257	140	TEMP 7
08/06/2006	11:17:45	Hakon Mosby MV	N 72 00.2597	E 014 43.6806	1257	141	TEMP 8
08/06/2006	11:25:29	Hakon Mosby MV	N 72 00.2509	E 014 43.7065	1258	142	TEMP 9
08/06/2006	11:33:20	Hakon Mosby MV	N 72 00.2453	E 014 43.7362	1257	143	TEMP 10
08/06/2006	11:43:21	Hakon Mosby MV	N 72 00.2340	E 014 43.7577	1258	144	TEMP 11
08/06/2006	11:52:00	Hakon Mosby MV	N 72 00.2197	E 014 43.8024	1258	145	TEMP 12
08/06/2006	11:57:39	Hakon Mosby MV	N 72 00.2159	E 014 43.7969	1258		end of profile
08/06/2006	12:24:30	Hakon Mosby MV	N 72 00.2061	E 014 43.7151	1258	147	picking up peepers
08/06/2006	12:51:17	Hakon Mosby MV	N 72 00.2055	E 014 43.7295	1258	148	going back to northern part of profile, along the profile track
08/06/2006	13:06:14	Hakon Mosby MV	N 72 00.3073	E 014 43.5281	1257	149	at limit of fresh mud in northern part of profile. Going to measure sediment temperatures on both sides of limit
08/06/2006	13:07:53	Hakon Mosby MV	N 72 00.3121	E 014 43.5225	1256	150	holes in seafloor
08/06/2006	13:29:43	Hakon Mosby MV	N 72 00.3093	E 014 43.5672	1257	163	TEMP 13 : one side of limit
08/06/2006	13:34:30	Hakon Mosby MV	N 72 00.3087	E 014 43.5616	1257	151	TEMP 14 : next measurement on other side of limit. gas bubbles escaping from fresh mud
08/06/2006	13:35:32	Hakon Mosby MV	N 72 00.3083	E 014 43.5619	1257	164	measurement on fresh mud side
08/06/2006	13:37:27	Hakon	N 72	E 014	1257	152	horizontal distance between the two measurements is

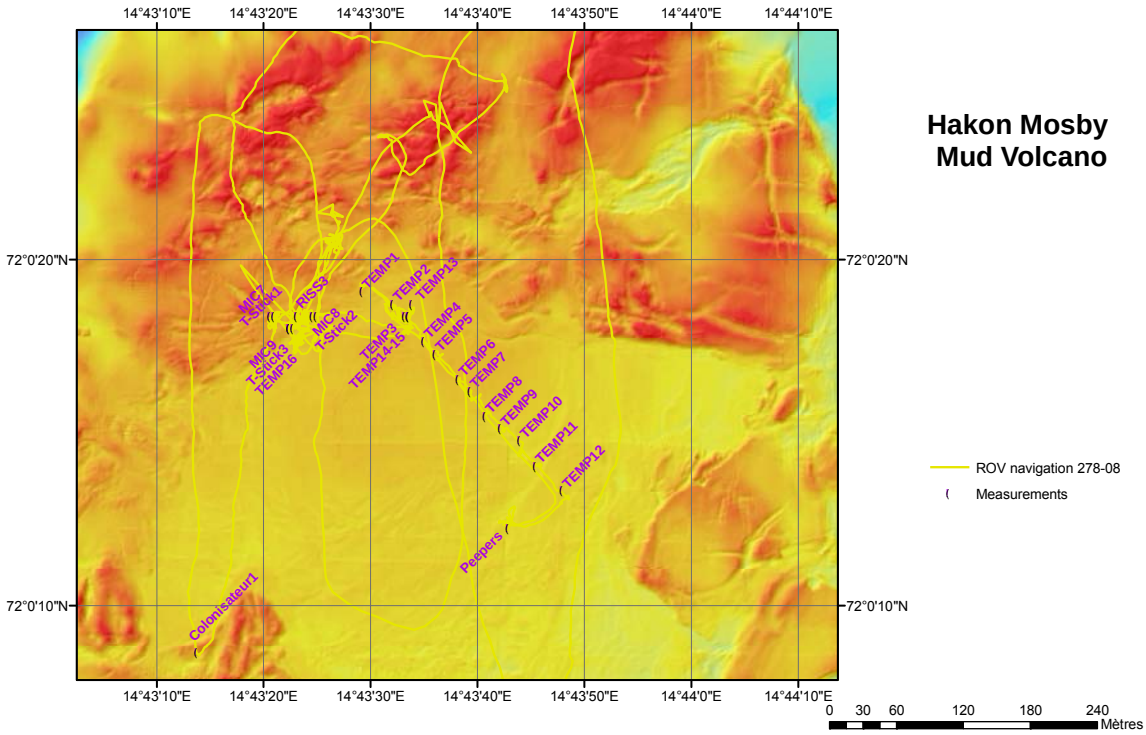
		Mosby MV	00.3083	43.5625			approximately 1.3m
08/06/2006	13:44:54	Hakon Mosby MV	N 72 00.3075	E 014 43.5612	1257	153	TEMP 15 : third T-measurement directly at limit
08/06/2006	13:53:00	Hakon Mosby MV	N 72 00.3013	E 014 43.5610	1256	154	returning to mic
08/06/2006	14:39:27	Hakon Mosby MV	N 72 00.3022	E 014 43.3806	1256	155	leaving to RISS site
08/06/2006	14:45:09	Hakon Mosby MV	N 72 00.3036	E 014 43.3867	1256	156	Recovery of RISS 3
08/06/2006	15:07:06	Hakon Mosby MV	N 72 00.3381	E 014 43.4382	1255	157	RISS in elevator
08/06/2006	15:20:49	Hakon Mosby MV	N 72 00.3004	E 014 43.3723	1256	158	arivved at MIC 9 , placing t-stick TEMP 16 next to grey mat
08/06/2006	15:28:15	Hakon Mosby MV	N 72 00.3028	E 014 43.3737	1256		hard ground prevents further penetration of t_stick, hydrates?
08/06/2006	15:36:40	Hakon Mosby MV	N 72 00.3016	E 014 43.3780	1256	169	Recovery of T-Stick 3, near MIC 9
08/06/2006	15:49:12	Hakon Mosby MV	N 72 00.3027	E 014 43.3736	1256	160	Recovery of MIC 9
08/06/2006	16:12:31	Hakon Mosby MV	N 72 00.3436	E 014 43.4422	1255	161	dropped mic9 in the elevator
08/06/2006	16:37:12	Hakon Mosby MV	N 72 00.3410	E 014 43.4485	1255	162	Mic back in elevator, peepers in
08/06/2006	16:37:49	Hakon Mosby MV	N 72 00.3410	E 014 43.4485	1254	168	dvd set 9 ended, no new one inserted, END of dive

Dive 278-8 Maps

Water samples



Measurements



Dive 278- 8 Operations list

Equipement	No	Date	Heure	Latitude	Longitude	Prof	Cap	Localite	Ech_Bio	Chimie	Sed	Mes	Photo	Fic	Commentaires
ColonisateursFG	1	07/06/2006	22:47:58	N 72 00.1443	E 014 43.2282	1257	286	Hakon Mosby MV					034		deposition of colonisators C1, C2, C3 (Françoise Gaill) on Pogonophoran field
MIC-HMMV	7	07/06/2006	21:41:13	N 72 00.3047	E 014 43.3490	1256	285	PP-V12					005		positioning of MIC7 on grey mat on PP-V12
MIC-HMMV	7	08/06/2006	03:25:42	N 72 00.3040	E 014 43.3491	1256	205	PP-V12					112		Recovering of MIC7
MIC-HMMV	8	08/06/2006	03:40:27	N 72 00.3049	E 014 43.4051	1256	132	Hakon Mosby MV					106		Deployment of MIC 8 on grey Mat
MIC-HMMV	8	08/06/2006	09:27:08	N 72 00.3067	E 014 43.4111	1256	142	Hakon Mosby MV					124		pick up MIC8, then go to HotSpot
MIC-HMMV	9	08/06/2006	09:52:15	N 72 00.2985	E 014 43.5539	1257	112	Hakon Mosby MV					167		Deployment of MIC 9
MIC-HMMV	9	08/06/2006	15:49:12	N 72 00.3027	E 014 43.3736	1256	109	Hakon Mosby MV					160		Recovery of MIC 9
PEGAZ	1	08/06/2006	07:25:55	N 72 00.2951	E 014 43.3923	1258	58	Hakon Mosby MV		X			118		End of PEGAZ 1
PEGAZ	2	08/06/2006	08:27:00	N 72 00.2912	E 014 43.3819	1258	67	Hakon Mosby MV		X					End of PEGAZ 2
PEP bouteille	1	07/06/2006	23:42:47	N 72 00.3125	E 014 43.4206	1255	180	Hakon Mosby MV		X			086		PEP1, plume zone Alt 2.5 m on H2 H3
PEP bouteille	2	07/06/2006	23:49:44	N 72 00.2728	E 014 43.4273	1257	177	Hakon Mosby MV		X			082		PEP2, grey mud, alt 1.8m on H2, H3
PEP bouteille	3	08/06/2006	00:05:16	N 72 00.1565	E 014 43.5465	1258	175	Hakon Mosby MV		X			083		PEP3, abundant Beggiatoa near H4
PEP bouteille	4	08/06/2006	00:15:48	N 72 00.2296	E 014 43.6443	1257	0	Hakon Mosby MV		X			085		PEP4 Grey mud H5-H6
PEP bouteille	5	08/06/2006	00:29:12	N 72 00.3506	E 014 43.6080	1255	0	Hakon Mosby MV		X			089		PEP5 Plume zone H5-H6
PEP bouteille	6	08/06/2006	00:38:09	N 72 00.4022	E 014 43.6079	1252	349	Hakon Mosby MV		X			087		PEP6 Plume zone H5-H6 alt 2.4m
PEP bouteille	7	08/06/2006	00:57:22	N 72 00.4253	E 014 43.8084	1252	187	Hakon Mosby MV		X			093		PEP7 near H7 alt 2.6 m
PEP bouteille	8	08/06/2006	01:13:50	N 72 00.2872	E 014 43.8799	1257	181	Hakon Mosby MV		X			094		PEP8 near transition to H7 H8, alt 2.2m
PEP bouteille	9	08/06/2006	01:25:43	N 72 00.1438	E 014 43.8110	1257	183	Hakon Mosby MV		X			095		PEP9 close to point H8, on grey ridges and beggiatoa rich flows, alt 2m
PEP bouteille	10	08/06/2006	04:38:00	N 72 00.3360	E 014 43.3324	1255	332	Hakon Mosby MV		X					PEP10

PEP bouteille	11	08/06/2006	04:51:00	N 72 00.4032	E 014 43.2845	1255	351	Hakon Mosby MV		X					PEP11
PEP bouteille	12	08/06/2006	05:02:00	N 72 00.4466	E 014 43.3944	1256	43	Hakon Mosby MV		X					PEP12 pres du fond
PEP bouteille	13	08/06/2006	05:11:00	N 72 00.4408	E 014 43.4908	1254	103	Hakon Mosby MV		X					PEP13 alt 1.2m
PEP bouteille	14	08/06/2006	05:13:00	N 72 00.4379	E 014 43.5266	1255	102	Hakon Mosby MV		X					PEP14
PEP bouteille	15	08/06/2006	05:24:00	N 72 00.4195	E 014 43.7027	1255	88	Hakon Mosby MV		X					PEP15 alt 2m (empry?)
PEP bouteille	16	08/06/2006	05:28:00	N 72 00.4192	E 014 43.7096	1255	89	Hakon Mosby MV		X					PEP16 (empty?)
Peepers	1	08/06/2006	12:24:30	N 72 00.2061	E 014 43.7151	1258	143	Hakon Mosby MV					147		picking up peepers
RISS	3	08/06/2006	02:40:03	N 72 00.3432	E 014 43.4250	1256	99	Hakon Mosby MV					099		Deployment of RISS 3 on bacterial mat (on SBB3 site), near MIC7
RISS	3	08/06/2006	14:45:09	N 72 00.3036	E 014 43.3867	1256	156	Hakon Mosby MV					156		Recovery of RISS 3
T-Stick		08/06/2006	03:02:02	N 72 00.3031	E 014 43.3441	1256	127	PP-V12					101	X	end of T-Stick 1 measurements from spot next to MIC 7
T-Stick		08/06/2006	09:21:39	N 72 00.3071	E 014 43.4140	1257	142	Hakon Mosby MV					166	X	Pick up T-stick 2, near MIC 8
T-Stick		08/06/2006	15:36:40	N 72 00.3016	E 014 43.3780	1256	110	Hakon Mosby MV					169	X	Recovery of T-Stick 3, near MIC 9
T-Stick 2		08/06/2006	10:09:00	N 72 00.3205	E 014 43.4893	1257	310	Hakon Mosby MV					128	X	TEMP 1 first point of profile
T-Stick 2		08/06/2006	10:20:57	N 72 00.3112	E 014 43.5379	1257	129	Hakon Mosby MV					130	X	TEMP 2 : 2. point on t-profile
T-Stick 2		08/06/2006	10:35:25	N 72 00.3058	E 014 43.5544	1257	131	Hakon Mosby MV					133	X	TEMP 3
T-Stick 2		08/06/2006	10:41:25	N 72 00.2955	E 014 43.5821	1257	135	Hakon Mosby MV						X	TEMP 4
T-Stick 2		08/06/2006	10:48:44	N 72 00.2885	E 014 43.6048	1257	137	Hakon Mosby MV					138	X	TEMP 5
T-Stick 2		08/06/2006	11:02:33	N 72 00.2747	E 014 43.6355	1257	138	Hakon Mosby MV						X	TEMP 6
T-Stick 2		08/06/2006	11:09:10	N 72 00.2692	E 014 43.6569	1257	138	Hakon Mosby MV					140	X	TEMP 7
T-Stick 2		08/06/2006	11:17:45	N 72 00.2597	E 014 43.6806	1257	138	Hakon Mosby MV					141	X	TEMP 8
T-Stick 2		08/06/2006	11:25:29	N 72 00.2509	E 014 43.7065	1258	138	Hakon Mosby MV					142	X	TEMP 9

T-Stick 2		08/06/2006	11:33:20	N 72 00.2453	E 014 43.7362	1257	139	Hakon Mosby MV					143	X	TEMP 10
T-Stick 2		08/06/2006	11:43:21	N 72 00.2340	E 014 43.7577	1258	136	Hakon Mosby MV					144	X	TEMP 11
T-Stick 2		08/06/2006	11:52:00	N 72 00.2197	E 014 43.8024	1258	136	Hakon Mosby MV					145	X	TEMP 12
T-Stick 2		08/06/2006	13:29:43	N 72 00.3093	E 014 43.5672	1257	250	Hakon Mosby MV					163	X	TEMP 13 : one side of limit
T-Stick 2		08/06/2006	13:34:30	N 72 00.3087	E 014 43.5616	1257	251	Hakon Mosby MV					151	X	TEMP 14 : next measurement on other side of limit. gas bubbles escaping from fresh mud
T-Stick 2		08/06/2006	13:44:54	N 72 00.3075	E 014 43.5612	1257	251	Hakon Mosby MV					153	X	TEMP 15 : third T-measurement directly at limit
T-Stick 2		08/06/2006	15:20:49	N 72 00.3004	E 014 43.3723	1256	111	Hakon Mosby MV					158	X	arivved at MIC 9 , placing t-stick TEMP 16 next to grey mat

ALAMER : Résumé de plongée

Dive 279-9 Microbathymetry on Hakon Mosby Mud Volcano

VICKING
Plongée : 279- 9

Date : 09/06/2006
Observateurs :

Date	Heure	Observateurs
09/06/2006	12h00 - 16h00	DESCHAMPS Anne EDY Christian
09/06/2006	16h00 - 20h00	SIMEONI Patrick NORMAND Alain
09/06/2006	20h00 - 00h00	TOUTOUX Claude EDY Christian
10/06/2006	00h00 - 04h00	DESCHAMPS Anne EDY Christian
10/06/2006	04h00 - 08h00	SIMEONI Patrick NORMAND Alain
10/06/2006	08h00 - 12h00	OLU - Le ROY Karine
10/06/2006	12h00 - 16h00	DESCHAMPS Anne
10/06/2006	16h00 - 20h00	SIMEONI Patrick NORMAND Alain

Station : **Hakon Mosby MV** lat moy : N 71 55.1541 long moy : E 014 25.3575

Sites explorés :

Objectifs de la plongée :
Microbathymetry mapping of the central part of HMMV, OTUS camera survey of habitats, source of gas plume localisation.

Résumé manuel des travaux :
2 Microbathymetry maps recorded (1 = 500x500m, 2=380x380m)
OTUS mosaic 380x380
Plume detected using fishing echosounder, and source observed at the bottom.

Résumé automatique des travaux :
Prélèvements
Eau :
PEP bouteille : 19 prélèvements,

20 images ont été numérisées,
1 nouvelle localité a été définie : PP-V17.

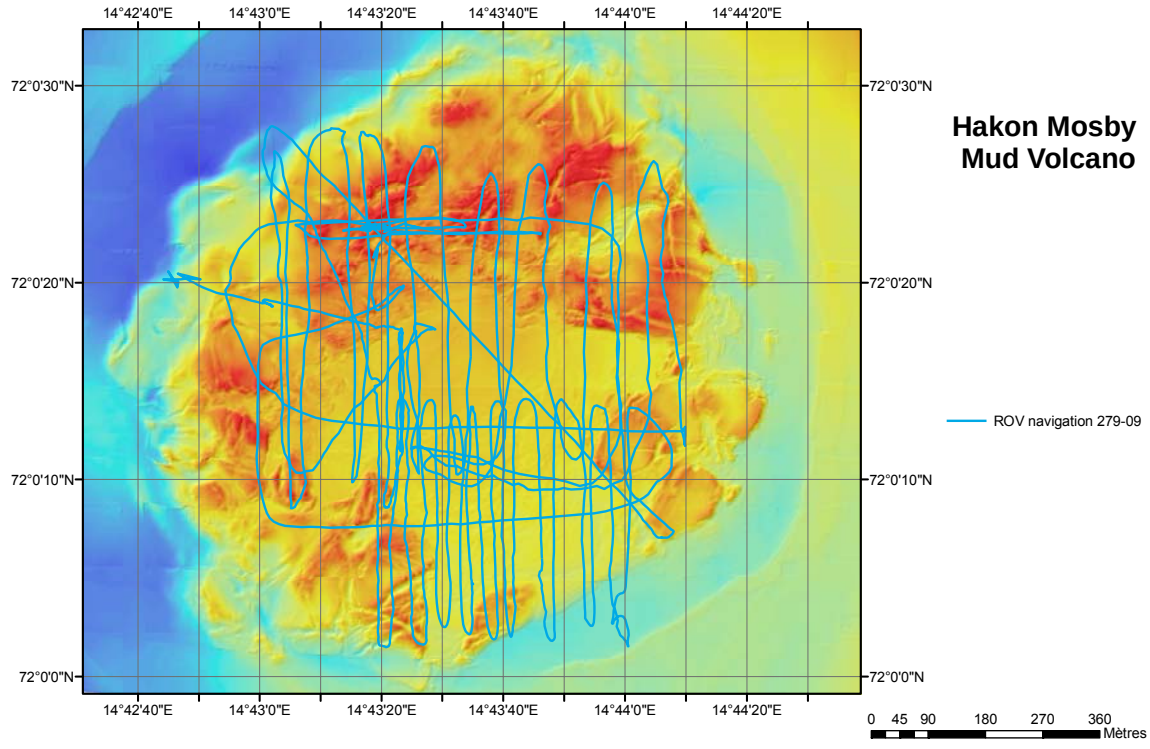
Rapport de plongée :

Date	Heure	Localité	Latitude	Longitude	Prof (m)	N° Photo	Commentaires
09/06/2006	15:00:00	Hakon Mosby MV	N 72 00.3398	E 014 42.7926	1264		Arriving at the bottom for microbathymetry
09/06/2006	15:40:00	Hakon Mosby MV	N 72 00.1973	E 014 43.3862	1263		Deployment of PP-V17
09/06/2006	16:31:55	Hakon Mosby MV	N 72 00.3928	E 014 43.3516	1258		PEP1

09/06/2006	16:59:23	Hakon Mosby MV	N 72 00.2711	E 014 43.2954	1262		PEP2
09/06/2006	17:34:07	Hakon Mosby MV	N 72 00.3652	E 014 43.2411	1259		PEP3
09/06/2006	21:08:14	Hakon Mosby MV	N 72 00.2691	E 014 43.4043	1263		PEP4
09/06/2006	21:14:24	Hakon Mosby MV	N 72 00.3466	E 014 43.4139	1261		PEP5
09/06/2006	21:19:27	Hakon Mosby MV	N 72 00.4257	E 014 43.4103	1260		PEP6
09/06/2006	21:37:47	Hakon Mosby MV	N 72 00.3586	E 014 43.5031	1261		PEP7
09/06/2006	21:46:54	Hakon Mosby MV	N 72 00.3167	E 014 43.5156	1262		PEP8
09/06/2006	22:18:55	Hakon Mosby MV	N 72 00.3334	E 014 43.5788	1262		PEP9
09/06/2006	22:21:33	Hakon Mosby MV	N 72 00.3510	E 014 43.5828	1261		PEP10
09/06/2006	22:23:58	Hakon Mosby MV	N 72 00.3685	E 014 43.5891	1260		PEP11
09/06/2006	22:27:53	Hakon Mosby MV	N 72 00.4087	E 014 43.6097	1261		PEP12
09/06/2006	22:47:00	Hakon Mosby MV	N 72 00.2767	E 014 43.6517	1262		PEP13
09/06/2006	22:47:29	Hakon Mosby MV	N 72 00.2720	E 014 43.6526	1262		PEP14
09/06/2006	23:35:16	Hakon Mosby MV	N 72 00.3579	E 014 43.7048	1262		PEP15
09/06/2006	23:39:08	Hakon Mosby MV	N 72 00.4027	E 014 43.7257	1262		PEP16
09/06/2006	23:46:21	Hakon Mosby MV	N 72 00.4286	E 014 43.7792	1260		PEP17
10/06/2006	00:38:38	Hakon Mosby MV	N 72 00.3588	E 014 43.8990	1262		PEP18
10/06/2006	04:53:56	Hakon Mosby MV	N 72 00.3824	E 014 43.3100	1258		PEP19
10/06/2006	06:34:43	Hakon Mosby MV	N 72 00.3908	E 014 43.1329	1261	021	7h49 beggining of OTUS profiles
10/06/2006	06:35:18	Hakon Mosby MV	N 72 00.3881	E 014 43.1386	1260	002	8h17 end of the first line (diagonale along the temperature sticks)\nbetween photos 195 and 225, altitude 10m
10/06/2006	06:36:39	Hakon Mosby MV	N 72 00.3813	E 014 43.1474	1259	003	going to the NW corner of the square
10/06/2006	06:54:45	Hakon Mosby MV	N 72 00.2464	E 014 43.3200	1262	004	Arriving at the first point of the square (NW)
10/06/2006	06:57:19	Hakon Mosby MV	N 72 00.2371	E 014 43.3203	1262	005	Starting the line 1
10/06/2006	07:16:03	Hakon Mosby MV	N 72 00.0272	E 014 43.3262	1266	006	end of line 1
10/06/2006	07:19:49	Hakon Mosby MV	N 72 00.0273	E 014 43.3549	1266	007	Starting line 2
10/06/2006	07:31:22	Hakon Mosby MV	N 72 00.1447	E 014 43.3681	1262	008	end of line 2
10/06/2006	07:41:11	Hakon Mosby MV	N 72 00.2301	E 014 43.4023	1262	009	Starting line 3
10/06/2006	08:05:27	Hakon Mosby MV	N 72 00.0296	E 014 43.4285	1263	010	end of line 3
10/06/2006	08:08:06	Hakon Mosby MV	N 72 00.0297	E 014 43.4560	1262	011	start of line 4
10/06/2006	08:30:36	Hakon Mosby MV	N 72 00.2331	E 014 43.4612	1263	012	end of line 4
10/06/2006	08:41:04	Hakon Mosby MV	N 72 00.1325	E 014 43.4867	1263	013	starting line 5
10/06/2006	08:49:48	Hakon Mosby MV	N 72 00.0470	E 014 43.5159	1265	014	end of line 5

10/06/2006	08:50:12	Hakon Mosby MV	N 72 00.0508	E 014 43.5179	1264	015	starting of line 6
10/06/2006	09:04:52	Hakon Mosby MV	N 72 00.2208	E 014 43.5344	1263	016	end of line 6
10/06/2006	09:06:11	Hakon Mosby MV	N 72 00.2141	E 014 43.5473	1263	017	starting line 7
10/06/2006	09:20:22	Hakon Mosby MV	N 72 00.0373	E 014 43.5666	1265	018	end of profile 7
10/06/2006	09:22:37	Hakon Mosby MV	N 72 00.0372	E 014 43.5782	1265	019	starting line 8
10/06/2006	09:42:48	Hakon Mosby MV	N 72 00.1928	E 014 43.5758	1263	020	line 9
10/06/2006	17:55:00	Hakon Mosby MV	N 72 00.3805	E 014 43.4261	1260		End of the dive

Dive 279-9 Map



ALAMER : Liste des opérations

Campagne : **VICKING**
Plongée : 279- 9

Liste des opérations :

Equipement	No	Date	Heure	Latitude	Longitude	Prof	Cap	Localite	Ech_Bio	Chimie	Sed	Mes	Photo	Fic	Commentaires
PEP bouteille	1	09/06/2006	16:31:55	N 72 00.3928	E 014 43.3516	1258	359	Hakon Mosby MV		X					PEP1
PEP bouteille	2	09/06/2006	16:59:23	N 72 00.2711	E 014 43.2954	1262	180	Hakon Mosby MV		X					PEP2
PEP bouteille	3	09/06/2006	17:34:07	N 72 00.3652	E 014 43.2411	1259	359	Hakon Mosby MV		X					PEP3
PEP bouteille	4	09/06/2006	21:08:14	N 72 00.2691	E 014 43.4043	1263	357	Hakon Mosby MV		X					PEP4
PEP bouteille	5	09/06/2006	21:14:24	N 72 00.3466	E 014 43.4139	1261	358	Hakon Mosby MV		X					PEP5
PEP bouteille	6	09/06/2006	21:19:27	N 72 00.4257	E 014 43.4103	1260	358	Hakon Mosby MV		X					PEP6
PEP bouteille	7	09/06/2006	21:37:47	N 72 00.3586	E 014 43.5031	1261	178	Hakon Mosby MV		X					PEP7
PEP bouteille	8	09/06/2006	21:46:54	N 72 00.3167	E 014 43.5156	1262	179	Hakon Mosby MV		X					PEP8
PEP bouteille	9	09/06/2006	22:18:55	N 72 00.3334	E 014 43.5788	1262	357	Hakon Mosby MV		X					PEP9
PEP bouteille	10	09/06/2006	22:21:33	N 72 00.3510	E 014 43.5828	1261	358	Hakon Mosby MV		X					PEP10
PEP bouteille	11	09/06/2006	22:23:58	N 72 00.3685	E 014 43.5891	1260	358	Hakon Mosby MV		X					PEP11
PEP bouteille	12	09/06/2006	22:27:53	N 72 00.4087	E 014 43.6097	1261	357	Hakon Mosby MV		X					PEP12
PEP bouteille	13	09/06/2006	22:47:00	N 72 00.2767	E 014 43.6517	1262	180	Hakon Mosby MV		X					PEP13
PEP bouteille	14	09/06/2006	22:47:29	N 72 00.2720	E 014 43.6526	1262	180	Hakon Mosby MV		X					PEP14
PEP bouteille	15	09/06/2006	23:35:16	N 72 00.3579	E 014 43.7048	1262	0	Hakon Mosby MV		X					PEP15
PEP bouteille	16	09/06/2006	23:39:08	N 72 00.4027	E 014 43.7257	1262	2	Hakon Mosby MV		X					PEP16
PEP bouteille	17	09/06/2006	23:46:21	N 72 00.4286	E 014 43.7792	1260	184	Hakon Mosby MV		X					PEP17
PEP bouteille	18	10/06/2006	00:38:38	N 72 00.3588	E 014 43.8990	1262	0	Hakon Mosby MV		X					PEP18
PEP bouteille	19	10/06/2006	04:53:56	N 72 00.3824	E 014 43.3100	1258	90	Hakon Mosby MV		X					PEP19

9. First scientific results and intended work

9.1. Data management

Data management and GIS
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For this Hermes cruise data management was realised using the Ifremer DEEP/LEP Alamer applications. Alamer Campagne (cruise) and Plongée (dive) are part of the Biocean package (see below). They are designed for data input on board research vessels.

Use of Alamer applications during Vicking Cruise (Data management)
Alamer applications were successfully installed and used on board the Pourquoi Pas? for the first time.

Alamer Plongée (dive) was extensively used with the help of all the participants and for their benefit. All the scientists on shift had to capture video stills during a Victor dive and had to comment Victor operations in real time. After the dive I recovered the ROV data so that scientists could finalise their reports using the Alamer Plongée (dive) application.

Alamer Campagne (cruise) application was linked to the electronic logbook Casino and every day I recovered the information concerning the operations carried out on board.

The cruise chronological report and all the dive reports were created by Alamer applications.

Geographic Information System
Adelie extension (www.ifremer.fr/adelie) for ArcMAP GIS was operated for the preparation and treatment of ROV navigations.
Alamer is linked to the GIS and this option was extensively used for the mapping of all the samples and mooring locations.

Biocean Database (www.ifremer.fr/biocean)
The Biocean database (Fabri et al., 2006) was designed to collate the extremely large volume of data collected from different deep-sea ecosystem studies conducted by Ifremer's department of 'Environnement Profond' (Deep-Sea Environment). This database comes in a 6-application package: 2 of them are used on research vessels to collect operational data, whereas the others are used to link with a core database back on land. The latter are used to: (1) manage taxonomic nomenclature, (2) monitor the identification of faunal collections, (3) fill in chemical analyses results or measurement data files and (4) add or extract data from the database.

'Alamer' ('A la mer' or 'At sea') applications: Two 'Alamer' applications are specifically designed to collect metadata while at sea. 'Alamer' can store operations chronologically, either during a cruise or a dive. These applications incorporate pick-lists and pulldown menus that facilitate the entry and storage of key metadata in a rapid and standardised way. 'Alamer'

software is designed to reference data both geographically and temporally, which is crucial for the understanding and analysis of data.

'Alamer Campagne (cruise)' collects information about the cruise itself and all the operations carried out on board. Operational data and geographical coordinates can be read in the electronic logbook, and general information, e.g. geographical region, ship navigation file, scientist name, equipment name and sample description, can also be added.

The application 'Alamer Plongée (dive)' creates a chronological report for each dive. General data, such as the geographic coordinate system (map datum), sampling and measuring equipment and the name of scientists on watch, are included. It picks up geographical coordinates directly from the submersible navigation file. Submersible data are still problematic because of the lack of accuracy of absolute geographical positioning, depending on the depth and position of the studied area. To alleviate this problem, markers are disposed on the bottom and their names are used to precisely define locations. In addition, video stills can be selected, either in real time for ROVs, e.g. ROV 'Victor', or during dive post-treatment for manned submersibles, e.g. 'Nautile'. Digital pictures are becoming essential to deep-sea ecological studies, and provide an alternative to traditional sampling methods that can potentially impact smaller fragmented habitats with low stability and resilience.

The 'Alamer' applications constitute the data input interface. The chronological reports can be enriched with event descriptions, including specific operations, such as a sediment core or water sample. Data resulting from *in situ* chemical analyses may be entered through a specific user interface, with appropriate fields for analytical method and the variable corresponding to the measured factor. Descriptions of faunal samples include names of the taxa sorted on board ship, type of preservation, sample holder name and number of individuals

Biocean was designed to facilitate ecosystem studies in the deep sea. It represents an important new resource for deep-sea ecologists and will have wide applications in biogeography and biodiversity studies at Ifremer, but also for the international community, as faunal data are linked to the Census of Marine Life information system OBIS (Ocean Biogeographic Information System). Biogeographical analyses of Biocean data recovered through the OBIS portal evidence an evolution in the deep-sea sampling strategies more focused in limited areas and is intended to reveal ecosystems functioning.

Fabri M., Galeron J., Larour M., Maudire G. (2006) Combining the Biocean database for deep-sea benthic data and online Ocean Biogeographic Information System. Mar Ecol Prog Ser 316:215-224

9.2. Geophysics

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*** Tromso University

MMR : microbathymetry

During dives 274-04, 275-05 and 279-09, three micro bathymetric maps have been recorded with the Reson 7125 multibeam echosounder mounted on the ROV MMR module.
Two sites (CNE01, CNE03), on the northern flank of the Storegga slides have been surveyed. The third map was acquired on the HMMV.

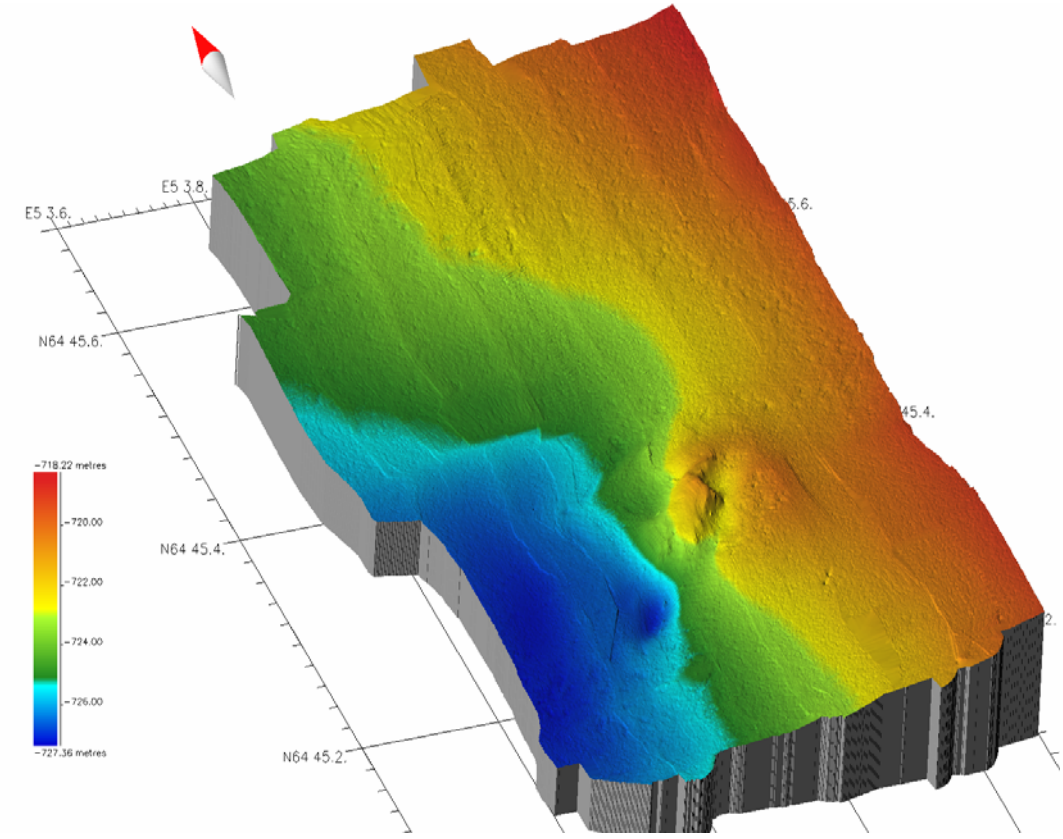

Figure 9.2.1.: Cne03 microbathymetric map
Colour scale ranges from -727m (blue) to -718 m (red). The main seafloor expression of site cne03 is a roughly circular, dome shaped structure, with a maximum relief less than 5m. The dome is affected by a negative (collapse like?) structure which terminates in its south western part as a “pockmark” structure, with again very small relief (about 1m). This map was used to prepare a very high resolution seismic tomography experiment, using precisely deployed Ocean Bottom Seismometers on and around the structure (Westbrook et al., 2006).

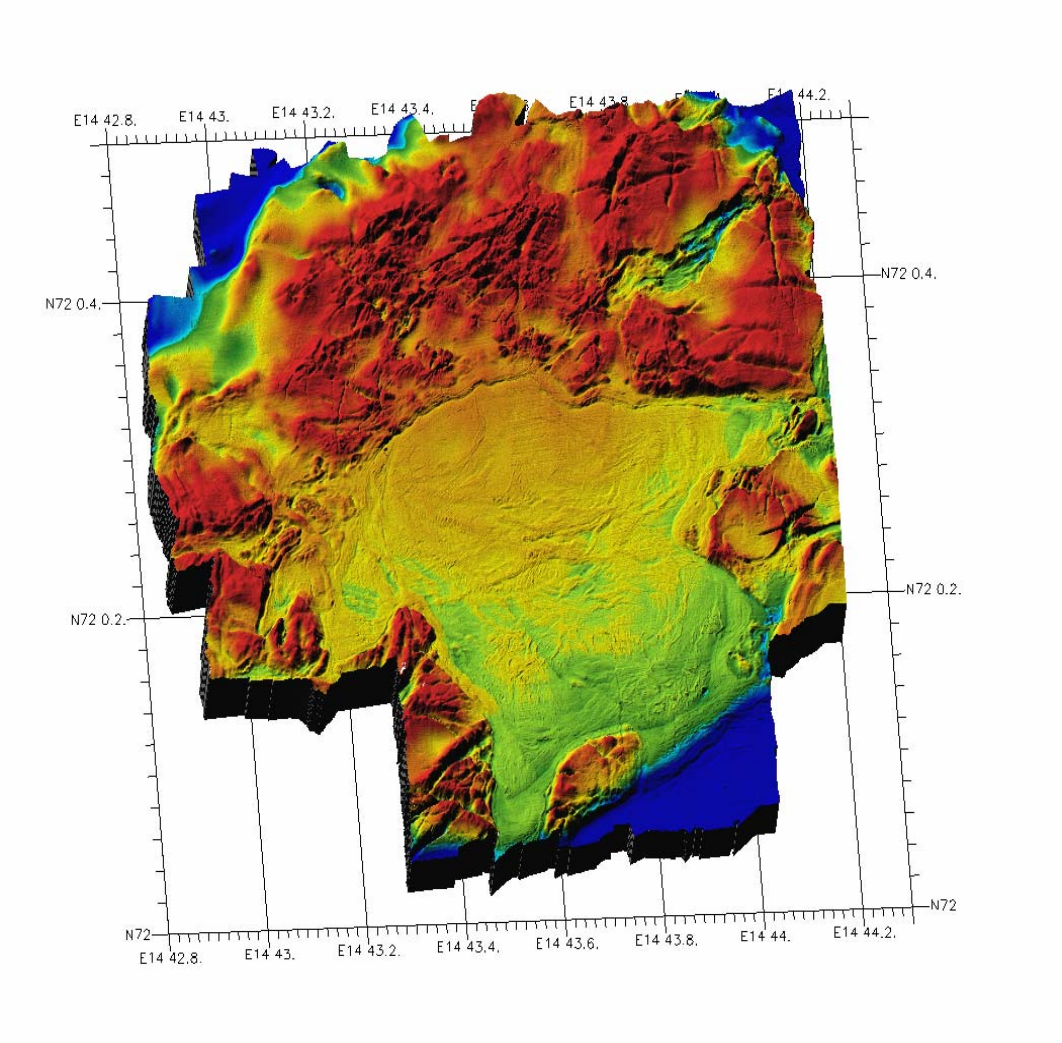

Figure 9.2.2.: HMMV microbathymetric map
Color scale ranges from -1265 m (blue) to -1250 m (red)
This map will be compared to the ARCXIX bathymetric map, in order to determine recent activity of the HMMV.

Chirp lines

The Pourquoi Pas ? chirp sediment echosounder was used for the first time during the Vicking cruise.
Data acquired during the cruise was rather noisy, due to 1/electrical noise, and 2/bubbles noise below the ship, enhanced because of the weather conditions. Electrical noise (50 Hz and harmonics, see figure) could be rather well filtered

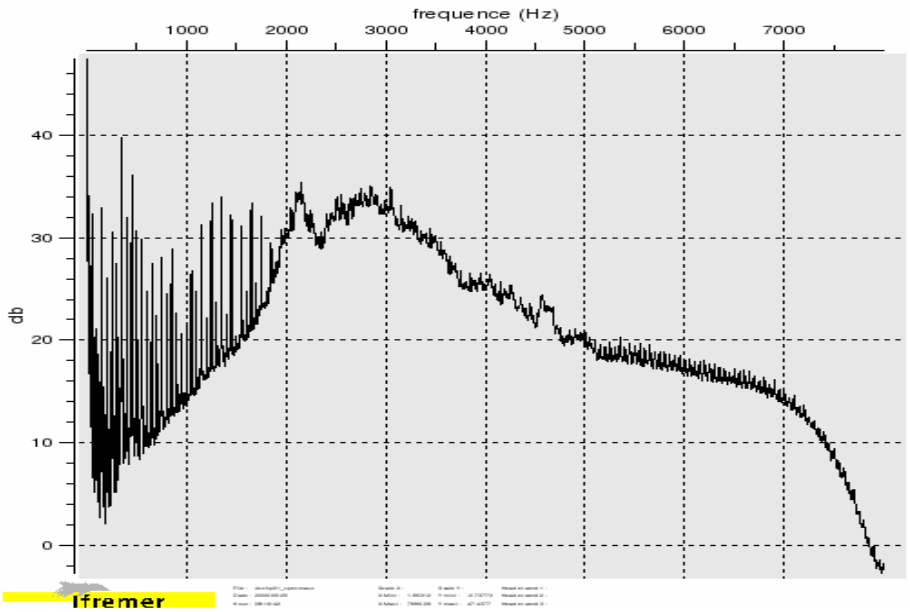

Figure 9.2.3.: Frequency spectrum calculated over 500 shots on chirp line VKGCHP01. Note the electrical noise peaks especially visible between 0 and 2000 Hz

Data had to be reprocessed (Sisbise software, Ifremer) to properly take into account the transducers movements (see figures below)

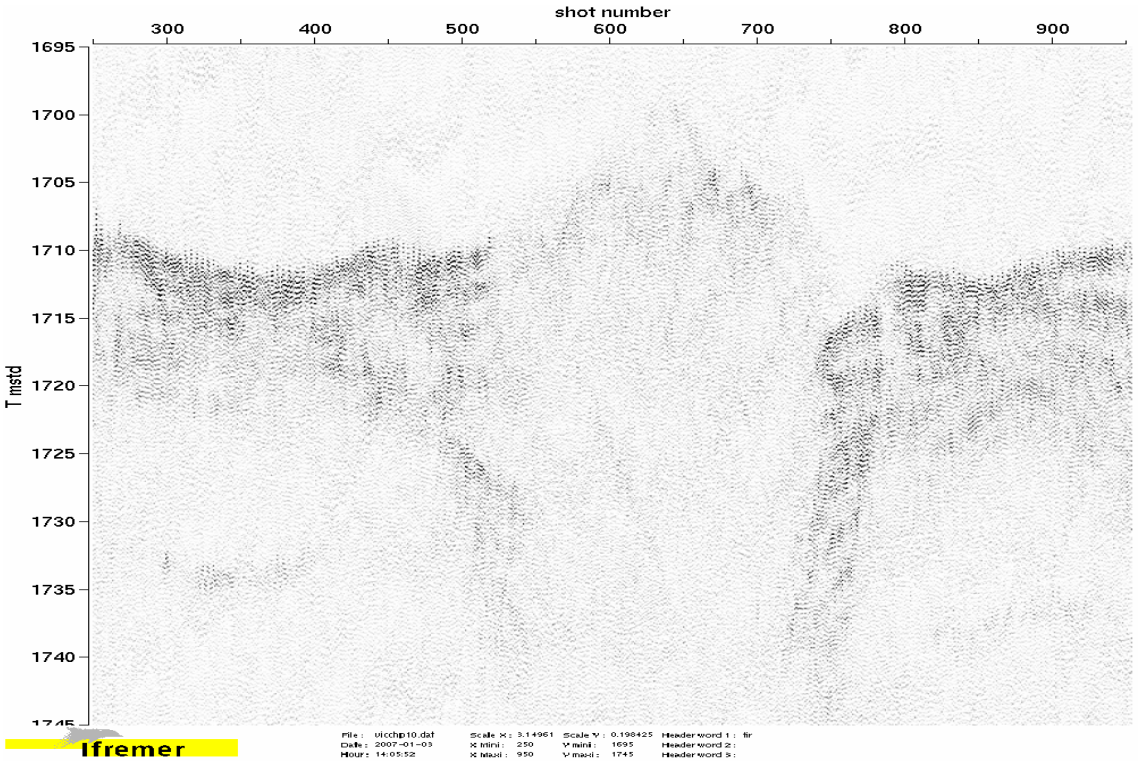

Figure 9.2.4.: Shots 250 to 950 of chirp line VKGCHP10 across the HMMV mud volcano, before ship movements' corrections (processing includes deconvolution with the source chirp signal, filtering, spherical divergence attenuation correction).

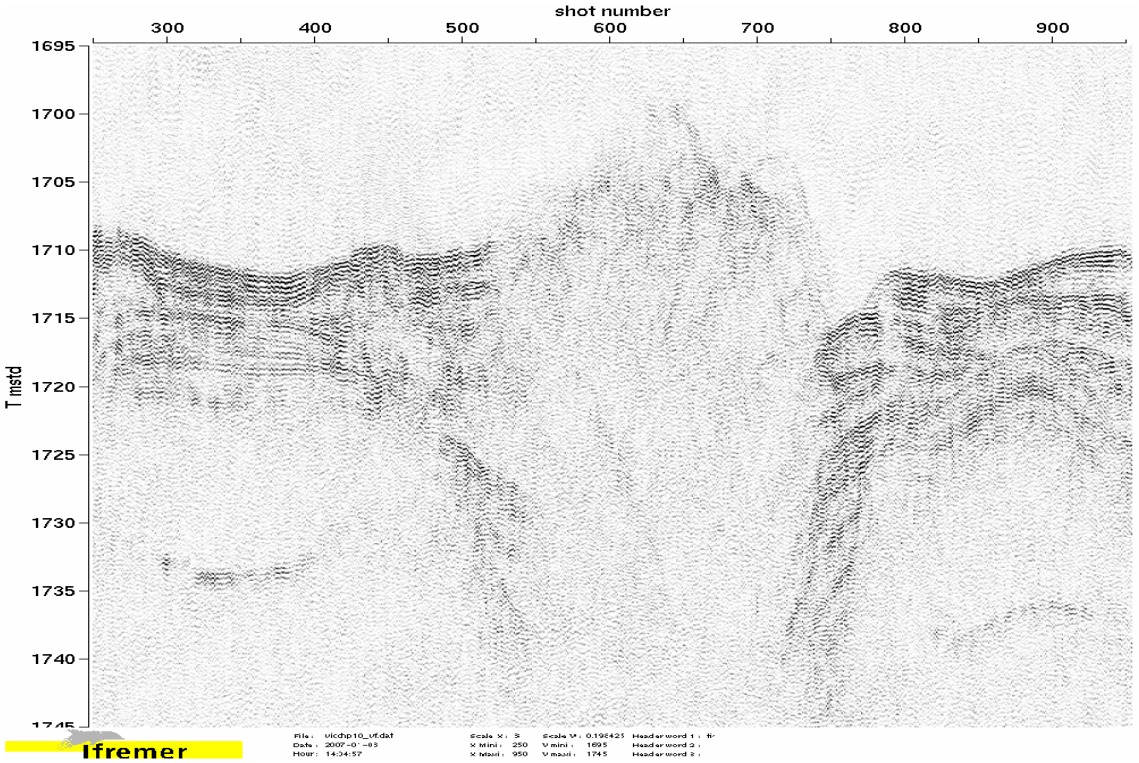

Figure 9.2.5.: Shots 250 to 950 of chirp line VKGCHP10 across the HMMV mud volcano, after ship movements' corrections (processing includes deconvolution with the source chirp signal, filtering, spherical divergence attenuation correction, ship movements' corrections). To be compared with the previous figure.

The central part (about 1000m wide) of the HMMV between shots 500 and 750 appears as very diffractive at the surface, with few coherent reflectors. On the sides of the volcano, the terminations of the reflectors define the outermost limits of the HMMV feeding pipe.

All chirp lines acquired on the HMMV have already been processed (Carolina-Perez Garcia, Hervé Nouzé) at Ifremer and will be used in addition to existing data to build a morphological model of the volcano. Lines on the Storegga sites will be added to the Hydratech 3D cruise database.

Fishing echosounder data

During the cruise, two different "fishing" echosounders were used to map the gas plume on the HMMV.

The EA600 was operated from the ship between ROV dives, in order to try and evaluate the geometry and variations of the plume size and shape with time.

The ER60, mounted on the ROV MMR module was used to precisely locate seabottom gas escapes.

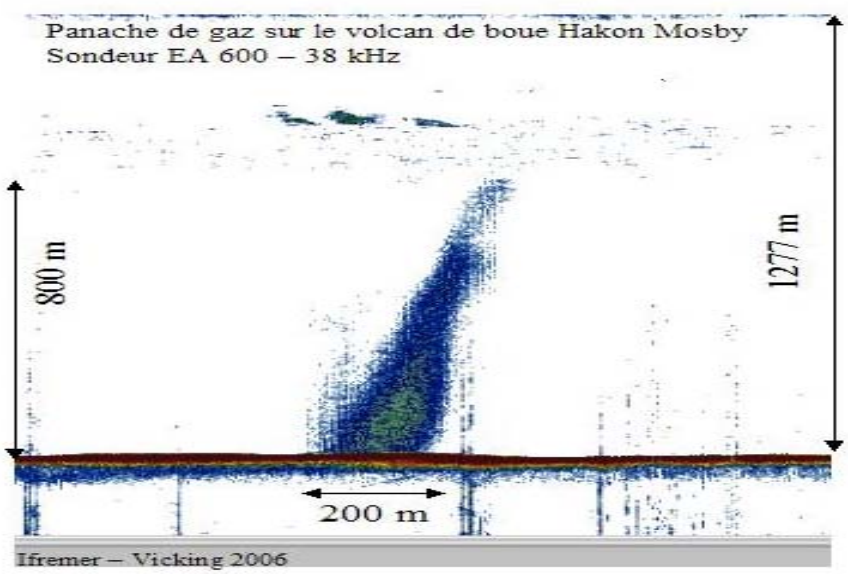

Figure 9.2.6.: Fishing echosounder EA600 line, from the sea surface, across the HMMV gas plume.

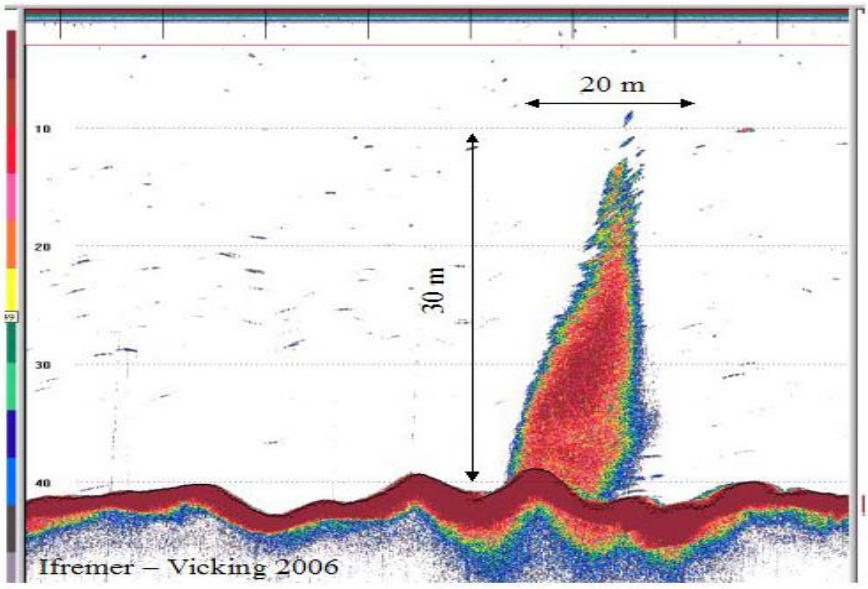

Figure 9.2.7.: ROV mounted fishing echosounder ER60 line, acquired at an altitude of 40m above the sea floor.

Although the noise level on the data is quite high, we expect to be able to quantify gas / gas hydrates bubbles density in the plume.

Heat flow

In-situ sediment temperature measurements

T. Feseker, J.-P. Foucher, F. Harmegnies and M. Schlüter

Introduction and description of instrumentation

The ascent of fluids at mud volcanoes creates temperature anomalies close to the seafloor, which can be used to identify the nature of the mud volcano activity and to quantify its magnitude and temporal variability. Previous in-situ temperature observations at Håkon Mosby mud volcano (HMMV) during the ARK-XIX/3b cruise in 2003 and the AWI-ROV cruise in 2005 have shown evidence of persistent fluid seepage and suggest that the focus of activity is located at the geometric center of HMMV. In order to assess the current temperature distribution in the surface sediments, a short temperature lance equipped with two autonomous MICREL temperature loggers was used during the ROV dives. Measurements were obtained at the same location and time of Microprofiler (MIC) deployments by A. Lichtschlag and D. de Beer, and along a transect in the central area, for which observations already exist from the fore mentioned cruises. In addition, the same type of autonomous temperature logger was used on the gravity corer to obtain in-situ measurements from greater sediment depths.

Aiming to investigate the temporal variability of fluid flow, a gravity corer instrumented with temperature sensors was deployed close to the active center of the mud volcano in the course of the ARK-XXI/1b cruise in 2005. The position of this gravity temperature lance was documented and five additional short temperature lances, so-called “T-sticks”, were deployed

a few weeks later using the ROV Victor 6000 during the AWI-ROV cruise in 2005. The gravity temperature lance and three T-sticks were recovered during the VICKING cruise. The remaining two T-sticks could not be found. All recovered instruments recorded temperature measurements at a sampling interval of 30 minutes over a period of nine months.

First results

In the course of the ROV dives 277 and 278, a total of 8 temperature measurements were obtained in connection with deployments of the MIC. These data will permit to compare models of heat transfer by fluid flow to models of solute transport and reaction derived from MIC data from the same locations. During dive 278, the previously measured temperature transect across the central area of HMMV was repeated with a total of 15 measurements over a distance of less than 350 m. As shown in figure 1, the temperature gradients measured in 2003, 2005, and 2006 vary considerably, while the general pattern of low values in the northwestern part, high values in the middle, and intermediate gradients in the southeastern part is maintained.

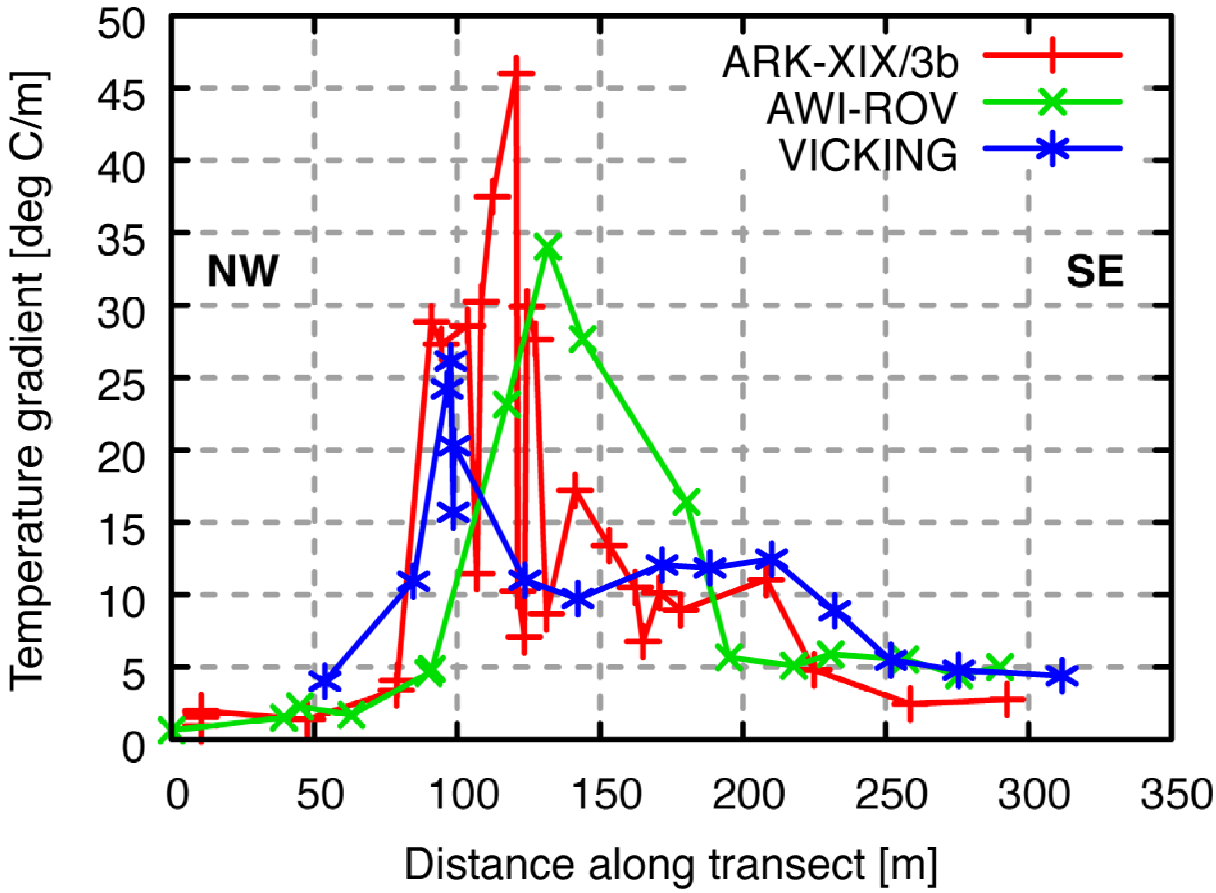

Figure 9.2.8.: Temperature gradients close to the seafloor along a transect across the central area of HMMV

The gravity corer equipped with 5 to 12 MICREL temperature loggers mounted on the corer barrel was deployed 14 times on HMMV. Due to the very liquid texture of the mud, the corer often penetrated up to above the corer weight, which yielded temperature measurements as deep as 40 meters below the seafloor, while the core recovery was poor or failed. All sediment temperature measurements with the gravity corer at HMMV are compiled in figure 2. Most profiles show a rapid temperature increase to values of more than 20 °C within the

upper 10 meters of the sediment column, followed by a section of stable temperatures or even a decrease below.

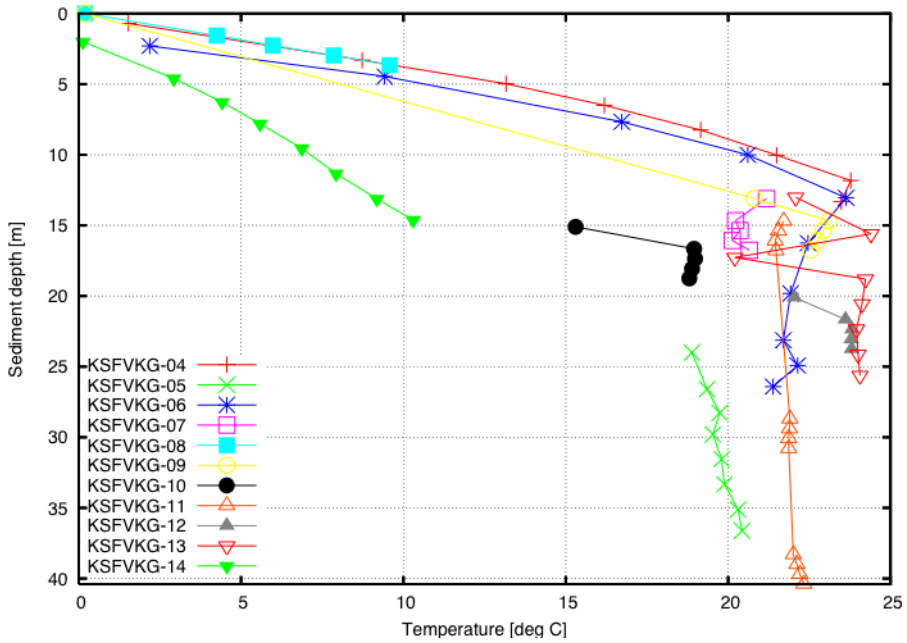

Figure 9.2.9.: In-situ sediment temperature measurements using autonomous temperature loggers mounted on the gravity corer

During the nine months in the sediment, the gravity temperature lance recorded in-situ sediment temperatures at eight different depths with 5 to 15 meters below the seafloor. The resulting profiles show sediment temperatures between 16 and 30 °C and reveal a rapid temperature drop of almost 10 degrees throughout the observed interval of the sediment column within less than 2 weeks at the beginning of December 2005. Both convex- and concave shaped temperature profiles found at several times throughout the observation period indicate a high variability of fluid flow at the position of the gravity temperature lance and suggest a three dimensional flow regime. The three short temperature lances recorded variations in sediment temperature at 25 and 55 centimeters below the seafloor at three different positions within the central area. The observed temperatures range from -0.2 to 2.5 °C for the upper sensors and from 1.3 to 2 °C for the lower sensors, corresponding to temperature gradients varying between 4 and 5 °C per meter. Even though the time series show different general temperature trends at the three locations, all relative maxima and minima of the temperature gradient occurred at the same time. With few exceptions, a relative minimum of the gradient was correlated with a temperature increase and vice versa, suggesting that the variations are caused by pulses upward flow of relatively warm porewater, affecting the entire central area of the mud volcano.

9.3. Geology

Catherine Pierre – UPMC

Authigenic carbonates from cold seeps of the Norwegian margin

The aims of this study are to understand by which processes (inorganic versus microbial), from which fluids and at what time the authigenic carbonates precipitated in the cold seep sites from the Norwegian margin. To answer to these questions, a team of researchers from different domains of expertise will conduct an integrated study on the material collected during the VICKING cruise:

- Sedimentology and Mineralogy : Marie Madeleine BLANC-VALLERON, Jean Marie ROUCHY and Catherine PIERRE
- Inorganic geochemistry (trace elements, oxygen and carbon stable isotopes, U/Th isotopes) : Catherine PIERRE and Germain BAYON
- Organic geochemistry (biomarkers) and microbiology: Ioanna BOULOUBASSI, Antje BOETIUS

Catherine Pierre, Ioanna Bouloubassi : LOCEAN, UPMC, Paris
Marie Madeleine Blanc-Valleron, Jean Marie Rouchy : Muséum National d'Histoire Naturelle, Paris
Germain Bayon : Géosciences Marines, Ifremer, Brest
Antje Boetius : MPI, Bremen

First results

The cold seeps from the Storegga and Häkon Mosby Mud Volcano (HMMV) investigated during the VICKING cruise are frequently associated with authigenic carbonates present on the sea floor as patchy occurrences of centimeter to decimeter thick crusts. They are also present deeper in the sediments (down to 2.5 m) of the Storegga gas chimneys.

These carbonate crusts are obviously related to methane venting at these sites, and produced by the anaerobic oxidation of methane (AOM) which is mediated by a microbial consortium of archea and sulfate reducing bacteria (see A. Boetius contribution).

Methane is undoubtely the source of carbon of these authigenic carbonates as it is shown by $\delta^{13}C$ values as low as –37‰ measured in a carbonate crust of HHMV collected in 2001 during a german cruise (C. Pierre, unpublished). Much lower $\delta^{13}C$ values (down to –52.1‰) are reported by Mazzini et al. (in press) in carbonate crusts from Storegga. There is thus a significant difference in the carbon isotopic signature of authigenic carbonates from the two cold seep sites of Storegga gas chimneys and HMMV which has to be related to different methane sources. The extensive sampling of carbonate crusts realised during the VICKING cruise will permit to better constrain the variability of methane source.

The carbonate crusts represent privileged sites for the colonization of a very rich fauna (see K. Olu contribution), which is fixed on the surface and generally lives in the cavities of this hard substrat.

The carbonate crusts exhibit various macrofacies :light grey to dark brown, highly porous to massive, cementing tube worms and mollusc shells. The sedimentary matrix of the crusts consists mostly of silty sands in Storegga and of silty clay rich in siliceous sponge spicules in Häkon Mosby.

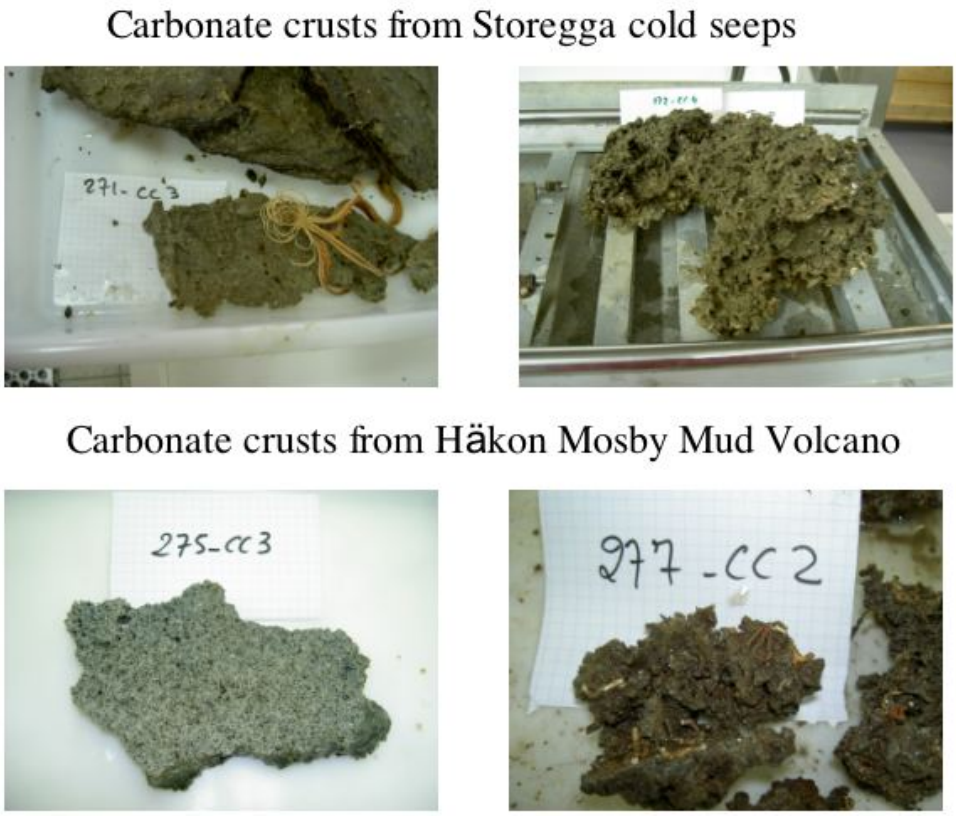

Fig. 9.3.1.: Carbonate crusts from Häkon Mosby mud volcano

Intended plan of work

There is a total of 28 carbonate crust samples collected from Storegga and Häkon Mosby cold seep sites which will be studied for detailed analyses of sedimentology, mineralogy and geochemistry; from this set 13 samples have been also sampled for biomarker and microbiology studies.

* Sedimentology and mineralogy :

description of the lithofacies and of the crystal morphologies : microscopic observations of thin sections, SEM observations , mineral composition (XRD)

* Inorganic geochemistry :

trace elements composition (XRF), oxygen and carbon stable isotopes of carbonates

* Dating of carbonate crusts :

U/Th measurements on selected samples

* Organic geochemistry and microbiology:

composition of lipids, identification of biomarkers specific of cold seep microbial communities

9.4. Geochemistry and chemistry

Connecting microbiology and geochemistry- cruise report VIKING 2006

A.Lichtschlag, L. Baumann, D.deBeer, K. Hohmann, M. Schlüter,

In the upper centimeter of sediments overlaying gas hydrates and gaseous methane seeps, the turnover of components important for the carbon, sulfur and iron cycle are driven by both chemical and microbiological processes. In cold seeps the oxidation of methane in the sediment can be either aerobically or anaerobically, whereas the anaerobic pathway often dominates, caused by limited oxygen penetration. The anaerobic oxidation of methane is coupled to sulfate reduction. A consortium of methane oxidizing archea and sulfate reducing bacteria performs these processes, resulting in CO_2 and H_2S production. The further oxidation of the sulfide can be either by thiotrophic bacteria or chemically by precipitation with iron, resulting in FeS or pyrite formation.

One part of our examinations concentrated on the Storegga and Nyegga area, where pockmarks have been detected during earlier cruises. Another major interest was the further characterization of the Håkon Mosby Mud Volcano, where different fluid flows determine the upward methane flux and limit sulfate penetration into the sediment, causing different colonization. Our methods for examining the sediment and its colonization by microorganisms concentrated on in situ chemical analyses and rate measurements and laboratory porewater/solid phase chemical analyses.

An important tool for in situ analysis is our *in situ* microprofiler (MIC), on which 10 microsensors can be deployed. The microsensors used had a tip diameter of 10-50 µm. We used sensors detecting pH, sulfide, oxygen, temperature and sulfate. The newly designed microprofiler can be positioned on the seafloor and started by a ROV, which allows precisely targeted research on small features like pockmarks or small patches of microbial mats. A total of 4 deployments was possible, 1 on the Storegga slide, and 3 on the Haakon Mosby Mud Volcano. A total of 14 stations could be measured successfully (Tab. 1). As all aims were reached, positioning by ROV proved a very good concept. The in situ rate measurements with INSINC are presented in the previous chapter.

Pushcores, taken by the ROV, were subjected to microsensor analysis followed by porewater extraction and solid phase analysis. Porewater was extracted from the sediment cores by using the new rhizone technique. With this up to 4 ml porewater was gained per 1 cm sediment depth, inserting the porewater-collecting device horizontally in predrilled holes. The porewater was fixed for measuring Fe^{2+}, H_2S, SO_4^{2-}, nutrients and Dissolved Inorganic Carbon (DIC). Furthermore, part of the porewater was trapped in oxygen free vials to measure the concentration of methane in the sediment (performed by M. Schlueter, L. Baumann). After porewater extraction, the sediment cores were sliced in 1 or 2 cm intervals. One part of the sediment was used for extracting elemental sulfur and another part was frozen for later geochemical analyses. These analyses will concentrate on the iron chemistry (and manganese if present) conducting different extraction methods (dithionite extraction, ascorbic acid extraction, HCl extraction, acid volatile sulfur AVS, chromium reducible sulfur CRS, voltammetric analyses).

Table 1. Samples and *in situ* incubations. Microsensor measurements (MSM), pore water chemistry (PW), solid phase (SP), microscopy of giant sulfide oxidizers (MI), nitrate uptake experiment (NU)

SURFACE	**parameter**	**site**	**position (N/E)**	**description dive log**
MTB 2 -1	MSM, PW, SP, NU	Storegga	64°45.2848;005°6.21283	reference site
MTB 6	NU	HMMV	72°0.1672;14°43.91546	Beggiatoa mat
272-2	**measurements**	**site**	**position**	**description dive log**
CT3	MSM, NU	Nyegga	64°39.7914;005°17.2957	microbial mat, G12
CT 9	MSM, SP	Nyegga	64°39.7924;005°17.3094	mat, pogo, G12
CT 11	MSM, PW, SP, NU	Nyegga	64°39.7890;005°17.3147	microbial mat, G12
CT 24	PW, SP	Nyegga	64°39.9737;005°17.4743	microbial mat, G11
CT 28	MSM, PW, SP	Nyegga	64°39.9806;005°17.3483	microbial mat, G11
CT 30	MSM, PW	Nyegga	64°40.0016;005°17.3757	mat, pogo, G11
CT 32	MSM, PW, SP, NU, MI	Nyegga	64°39.9941;005°17.3663	white mat spot, G11
CT 35	MSM, PW, SP	Nyegga	64°39.8923;005°17.2774	reference, MIC 2, G12
CT 36	MSM, PW, SP, NU	Nyegga	64°39.8367;005°17.3857	reference, MIC 2, G12
MIC 1	MSM	Nyegga	64°39.8329;005°17.3911	crater at G12
MIC 2	MSM	Nyegga	64°39.8923;005°17.2763	reference site, G 12
275-5	**measurements**	**site**	**position (N/E)**	**description dive log**
CT 1	MSM	Storegga	64°45.2708;004°58.8626	microbial mat
CT 2	MSM	Storegga	64°45.2702;004°04.8712	microbial mat
CT 11	MSM	Storegga	64°45.2760;005°04.1468	microbial mat
276-6	**measurements**	**site**	**position (N/E)**	**description dive log**
CT 1	MSM, MI, NU	HMMV	72°001666; 014°439540	Beggiatoa mat
CT 2	MSM	HMMV	72°001677; 014°439527	Beggiatoa mat
CT 3	MSM, MI	HMMV	72°001664; 014°439452	Beggiatoa mat, MIC2
CT 4	MSM, SP, MI, NU	HMMV	72°001664; 014°439486	Beggiatoa mat, MIC2
CT 5	MSM, PW, SP	HMMV	72°001866; 014°438811	mats, MIC 3
CT 6	MSM, PW, SP, NU	HMMV	72°001868; 014°43886	mats, MIC 3
CT 7	PW, SP, MI, NU	HMMV	72°002042; 014°437561	center area, MIC 1
CT 8	MSM, PW, SP, NU	HMMV	72°00.2019;014°43.7592	center area, MIC 1

CT 9	MSM, NU	HMMV	72°001666; 014°439514	Beggiatoa mat
CT 10	MSM	HMMV	72°001661; 014°439498	Beggiatoa mat
CT 11	PW	HMMV	72°001655; 014°439510	Beggiatoa mat
CT 12	PW, SP	HMMV	72°001655; 014°439541	Beggiatoa mat
CT 14	MSM, chemotaxis	HMMV	72°001661; 014°439498	Beggiatoa mat
MIC 1	MSM	HMMV	72°002029; 014°437516	center site
MIC 2	MSM	HMMV	72°001651; 014°439419	Beggiatoa mat
MIC 3	MSM	HMMV	72°001866; 014°438836	in between mat
277-7	**measurements**	**site**	**positio**	**description dive log**
CT 7	MSM, PW, SP	HMMV	72°003149; 014°433791	grey mat
CT 8	MSM, PW, SP	HMMV	72°003145; 014°433813	grey mat
MIC 4	MSM	HMMV	72°002131; 014°437219	grey mat
MIC 5	MSM	HMMV	72°001614; 014°439293	Beggiatoa mat
MIC 6	MSM	HMMV	72°001636; 014°439419	mats at ridge
peeper 3,8,4	sulfate content	HMMV	72°002061; 014°437151	center site
278-8	**measurements**	**site**	**positio**	**description dive log**
MIC 7	MSM	HMMV	72°003038; 014°433466	grey mat
MIC 8	MSM	HMMV	72°002998; 014°434031	grey mat
MIC 9	MSM	HMMV	72°002985; 014°435539	hot spot center

Storegga/Nyegga Area

At the Nyegga site push cores where retrieved during the dive 272-02. The sites for sampling the sediment where carefully chosen by examining the seafloor with the high resolution cameras of Victor 6000 and searching for locations where sulfur cycling was evident from white material covering the sediment. We positioned the profiler on a 1m crater on the G11 mound at the Nyegga site with a dark center, surrounded by a ring with snails, further again surrounded by *Pogonophora*. In situ microsensor profiles of O_2, H_2S, pH and temperature were measured to a depth of 10 cm. Our results indicate that in the center area chemical oxidation prevails over biological. Push cores taken by the ROV showed few sulfur oxidizing bacteria and no macrofauna. In the outer ring with snails biological oxidation occurs. This is a natural laboratory to investigate chemical versus biological sulfur oxidation. Chemical analyses on the push-cores are underway.

Additionally push cores retrieved during dive 275-05 were used for ex situ microsensor measurements, microscopy and afterwards shared with microbiologists for the determination of sulfate reduction rates (SRR), anaerobic oxidation of methane (AOM) and microbial diversity analyzes. On the Northwestern part of the Storegga a reference site was found that lacks the intense bacterial activity found in seeps. Here cores were taken by a multicorer

(MTB 2), on which the laboratory measurements like at the Nyegga cores have been performed.

Håkon Mosby Mud Volcano

During a previous cruise we found evidence to propose that the development of different habitats at the Håkon Mosby mud volcano are caused by different fluid flow velocities, whereas the upflow velocities in the central area are the highest, gradually decreasing towards the periphery. The upward flow of water reduces the penetration depth of sulfate, which is the limiting factor for conversions in the mud volcano. In the center no AOM is possible in contrary to a ring surrounding the center, where AOM occurs as sulfate can penetrate to a sediment depth of 3-4 cm. In this habitat AOM drives a prolific community of dense, white Beggiatoa mats (Fig. 1). These very large bacteria oxidize sulfide to sulfur and sulfate, using either nitrate or oxygen. As they are able to anaerobically oxidize sulfide, oxygen and sulfide profiles do not overlap. In the outer slightly elevated ring, with irregular broken surface, sulfate can penetrate further to a depth of 70 cm, aided by the pumping activity of Pogonophora tubeworms. In this habitat patches of grey mats occur, that aerobically oxidize sulfide, as oxygen and sulfide profiles overlap (Fig. 2).

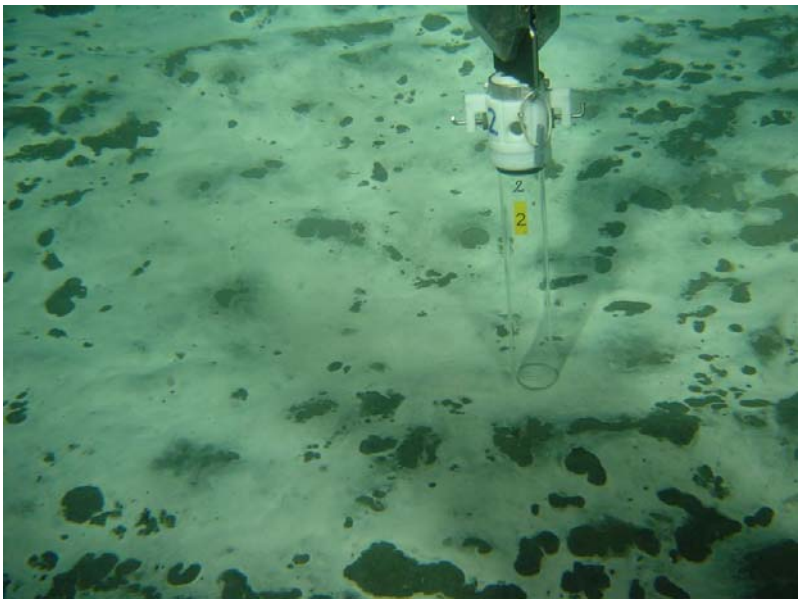

Fig. 9.4.1.: Beggiatoa mats.

Our plan was to investigate whether these differences are indeed caused by sulfate penetration and to investigate the ratio of chemical and microbiological sulfide oxidation. Biological sulfide oxidation leads to primary production and is the basis of the food chain in the volcano. Chemical oxidation of sulfide does not lead to conservation of biomass, and thus the ratio of chemical-biological conversions is essential for the ecology.

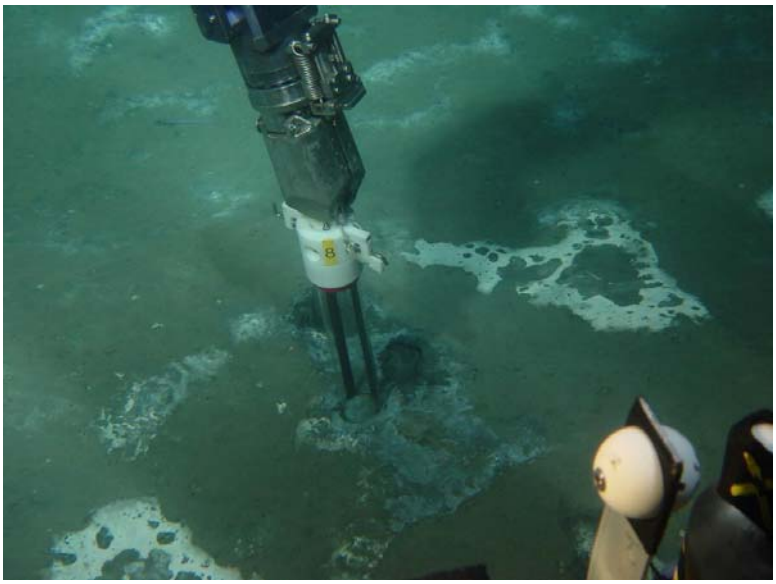

Fig. 9.4.2.: Patches of grey mats.

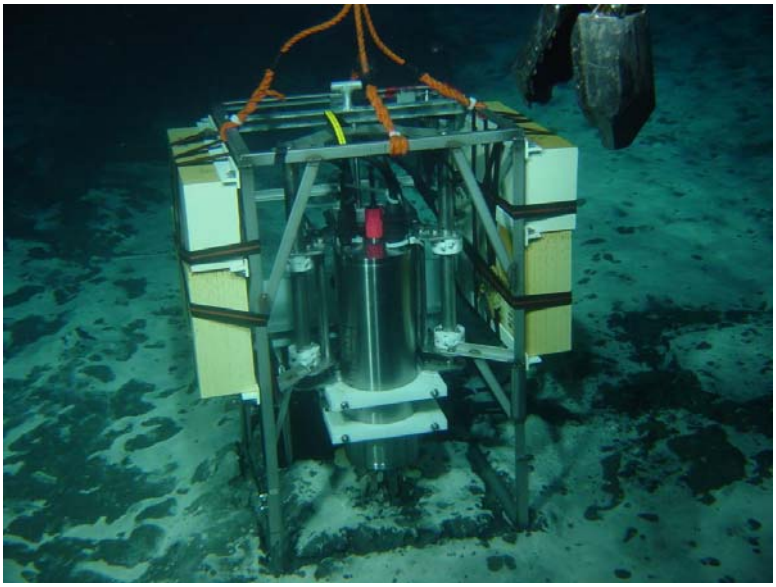

Fig. 9.4.3.: Deployment of MIC on Beggiatoa mats

Furthermore our aim was to more precisely determine the chemical gradients and to perform some detailed tests on the conversions of Beggiatoa. The sulfur/iron chemistry, which determines the abiotic conversions, was investigated by porewater sampling of retrieved cores (276-06; 277-07) and analyses of the solid phase, whereas the same measurements as on the Nyegga/Storrega area have been perform (ex situ microsensor measurements: O_2, pH, H_2S; PW: Fe^{2+}, H_2S, SO_4^{2-}, nutrients, DIC, methane; solid phase: iron and sulfur extractions). Details of the physiology of *Beggiatoa* were investigated by stable isotope incubations, nitrate uptake experiments and chemotaxis studies. Stable isotope measurements confirmed that *Beggiatoa* performs dissimilatory reduction of nitrate to ammonium, under all experimental conditions imposed. Furthermore a total of 3 MIC deployments were possible at the Håkon Mosby Mud Volcano (dives 276-06, 277-07, 278-08). The deployments on the Håkon Mosby mud volcano were aimed at grey mats, Beggiatoa mats and the center. Significant differences were found in the different habitats: the center was almost devoid of sulfide, in the Beggiatoa

mats a sulfide peak was present, and in the grey mats very high sulfide levels were observed. The graphs below (Fig. 4) illustrate the strong differences in chemical microgradients of the different habitats. The data are not yet calibrated, but give rather well approximate differences. The peepers for sulfate measurements functioned as expected, but manipulation with the ROV proved problematic. A better design is made now. The analyses of the porewater and solid chemistry of the different habitats, the sulfate reduction rate (Boetius) and nitrate exchange are underway. The results, together with the in situ data will deepen our insight in the iron and sulfur cycle of the different habitats.

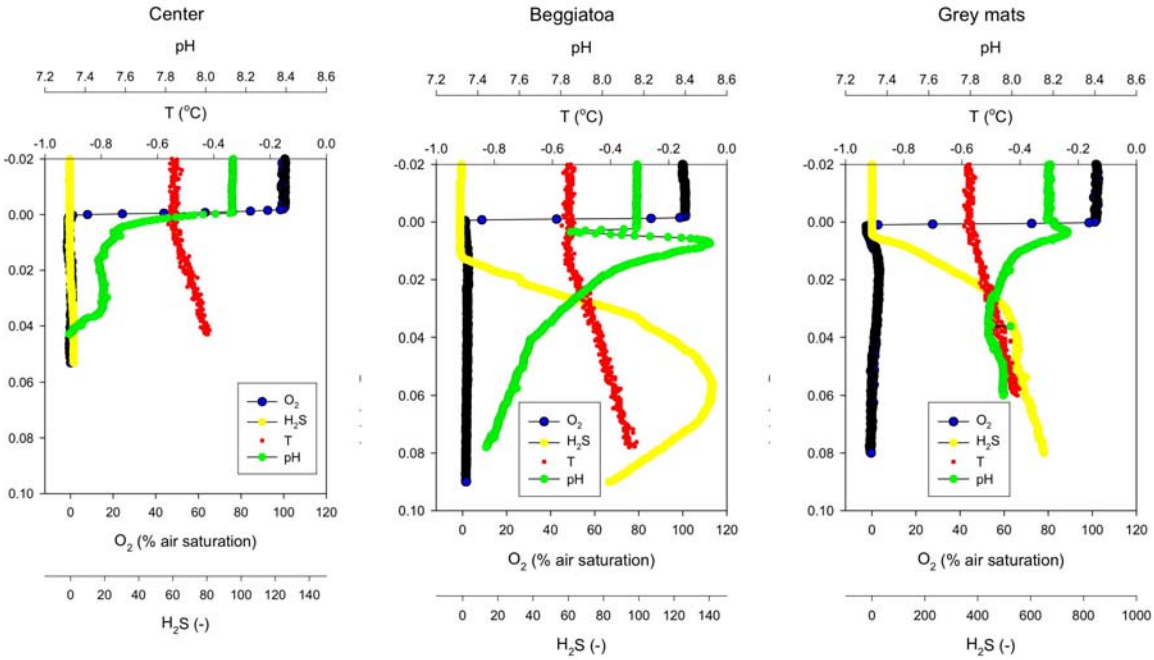

Fig. 9.4.4.: Representative examples of chemical profiles measured in situ with microsensors, in 3 different habitats. The microprofiles form distinct fingerprints of the areas. In the Center no sulfide is detected. The pH decreases very rapidly, also below the oxic zone, where no conversions are expected. Under the Beggiatoa mats a sulfide peak is found. The pH profile indicates metal-sulfur chemistry, or a step wise oxidization of reduced sulfur by Beggiatoa. Under the grey mats extremely high sulfide concentrations are present (see the different scales). Also here an interesting pH profile is found. The sulfide signals are not yet calibrated, but can be compared.

9.5. Microbiology

Microbial diversity and functions at cold seep ecosystems at the Norwegian continental margin (Storegga slide, Nyegga and Haakon Mosby Mud Volcano)

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Hot spot ecosystems like mud volcanoes, pockmarks, gas chimneys, methane-, oil-, asphalt- and brine seeps are found on Europe's margins from the Arctic to the Mediterranean Sea. Often these geo-structures are colonized by enormous biomasses of bacterial mats, chemosynthetic fauna and a variety of associated animals, adding considerably to the biodiversity of continental margins. HERMES studies a variety of fascinating ecosystems associated with fluid-, gas- and mud-escape structures. The expedition "Vicking" allowed the study of gas- and fluid flow escape structures of the Northern Norwegian margin, targeting several of the key tasks of WP 3 and 4 in HERMES, especially:

- to characterize past and present seep communities and the environmental factors influencing their biodiversity
- to define the unique key microorganisms and their biogeochemical pathways present in cold seep and anoxic ecosystems

Three types of geostructures were selected: the gas chimneys of the Storegga area, the pock marks of Nyeagga, as well as the Haakon Mosby Mud Volcano (HMMV). "Vicking" was the first expedition to explore and compare in detail ecosystems and biodiversity associated with the different fluid flow driven habitats of the Norwegian margin. The HMMV is a well-known, highly active cold seep emitting large amounts of gas to the hydrosphere (see review by Milkov et al. 2004, DeBeer et al. 2006, Sauter et al. 2006). The microbiological program of "Vicking" aimed at a comparison of the microbial diversity and activity at different gas- and fluid flow systems of the Norwegian margin, driven by a range of conditions from diffusive to highly advective flow.

Microbially mediated anaerobic oxidation of methane (AOM) is the major biological sink of methane in marine sediments. Hence, this process is crucial in maintaining a sensitive balance of our atmosphere's greenhouse gas content. However, a fundamental understanding of the associated biology is still lacking, consequently preventing a thorough biogeochemical understanding of an integral process in the global carbon cycle. Studies employing stable isotopes, radiotracers, modelling, and microbiological techniques have now established that methane in marine sediments is oxidized biologically under anoxic conditions. Although no anaerobic methanotroph has ever been isolated, biogeochemical studies have shown that the overall process involves a transfer of electrons from methane to sulfate, probably mediated by a microbial consortium that includes archaea and sulfate-reducing bacteria. The net reaction of methane oxidation can be formulated as:

$$CH_4 + SO_4^{2-} \rightarrow HCO_3^- + HS^- + H_2O$$

This process influences ecosystems driven by gas flow dramatically, as the methane-fuelled sulfide production creates highly reduced habitats, often characterized by carbonate precipitation.

In the global methane budget proposed by Reeburgh (1996), more than 80% of the methane produced annually in anoxic marine sediments is consumed before it can reach the atmosphere. The previously estimated 75 Tg/yr (not including the high AOM rates at methane seeps) indicate that methane consumption is nearly twice the annual increase in the atmospheric inventory of CH_4 (40 Tg/yr). In several sedimentary environments, AOM can be the dominant sulfate-consuming process, e.g., in sediments above gas hydrate and at methane seeps, as well as in the deep biosphere. Limited data are available from mud volcanoes, which are another important geological source of methane. An updated compilation of AOM rates shows that the consumption of methane in gassy sediments is probably several times higher than previously estimated (Hinrichs and Boetius, 2002). Hence, even if the area affected by methane seepage at continental margins is below 1%, this might have a significant impact on the total methane budget. Thus, measurements of methane turnover rates in sediments and bottom water and methane emission to the hydrosphere are extremely important for realistic calculations of methane consumption in the sea.

Thus, measurements of methane and sulfate turnover rates in sediments and bottom water and methane emission to the hydrosphere are extremely important for realistic calculations of methane consumption in the sea. Furthermore, HERMES microbiological research focuses on the biodiversity of microorganisms in anoxic habitats and at cold seeps. The sampling program of “Vicking” especially targeted the giant sulfide oxidizing bacteria, sulfate reducing bacteria and anaerobic methanotrophs, as well as associated microbial assemblages.

The main questions for biogeochemical and ecological investigations carried out at MPI are:

- Where are the hot spots of methane turnover at different cold seeps of the Northern Norwegian margin?
- How much methane is oxidized in the sediments?
- What are the dominant microbial populations mediating anaerobic methane turnover and connected processes?
- What is the link between microbial methane turnover and the chemosynthetic communities at the HMMV?

Microbiological studies carried out at IFREMER will concentrate on:

- Microbial diversity and functions at cold seep ecosystems.
- Culture-based techniques will be developed in order to assess the main active physiological groups of microbes.
- Microbial structure and dynamics in function of selected habitats (bacterial mats, Pogonophoran and snails fields) and depth in sediment will be determined.
- Microbial communities diversity in gas hydrate and associated sediment will be studied.

Methods and Materials

For cultivation, 16SrDNA and functional gene -based investigation of seep microbiology cores were collected by ROV Victor and by multiple corer (Table 1). On board, sub-samples were taken from cores to determine the total number of bacteria and identify phylogenetic groups of microbes by molecular methods (FISH, Fluorescence I*in Situ* Hybridization; 16S rDNA clone librairies; selected functional genes; fingerprinting methods such as DGGE, Denaturing Gradient Gel Electrophoresis and/or TTGE, Temporal Thermal Gradient Gel Electrophoresis). In order to investigate the metabolic activity of methanogen, sulphate-reducer, sulphur-oxidiser and methanotroph cultivation approaches will be investigated (MPN, Most Probable Number).

Table 1. List of sampling carried out for cultivation-based studies (IFREMER)

Station	**Gear**	**Parameters**
Ref. Storegga	2 multitubes	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
PL272-02	CT5 (biofilm on top only)	Bacterial cultivation (shared with A. Boetius)
	CT6	Bacterial cultivation, molecular diversity (shared with A. Boetius)
	CT7	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	CT8 (biofilm on top only)	Bacterial cultivation (shared with A. Boetius)
	CT16	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	CT19	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	CT22	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
PL275-05	CT8	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	CT9	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	PBT (carbonate crust)	Bacterial cultivation, molecular diversity
PL276-06	CT16 (*Beggiatoa*)	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	CL5 (*Beggiatoa*)	Nucleic acids extraction tests, bacterial cultivation
PL277-07	CT1 (biofilm on top only)	Bacterial cultivation (shared with A. Boetius)
	CT11	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry (shared with A. Boetius)
	CT22	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	2 multitubes (*Pogonophora*)	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	1 multitube (*Beggiatoa*)	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	2 multitubes (center)	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
	2 multitubes (reference site)	Biomass, FISH, bacterial cultivation, molecular diversity, pore water chemistry
HMMV	KSFVKG-04/Gas hydrate and sediment	Bacterial cultivation, molecular diversity
HMMV	KSFVKG-05/Gas hydrate and sediment	bacterial cultivation, molecular diversity

Insinc (In situ incubator, MPI):

During this cruise a new *in situ* tool was used to measure sulfate reduction under *in situ* conditions (Tab.2). Insinc is based on the established method to measure sulfate reduction in push cores. The system injects already at the seafloor ^{35}S sulfate radiotracer to a push core sample without previous recovered of the sample. The sediment is incubated in the closed incubator system at environmental pressure and temperature. The sulfate reduction reaction is terminated on board by transferring the sediment to ZnAc similar as in the *ex situ* method.

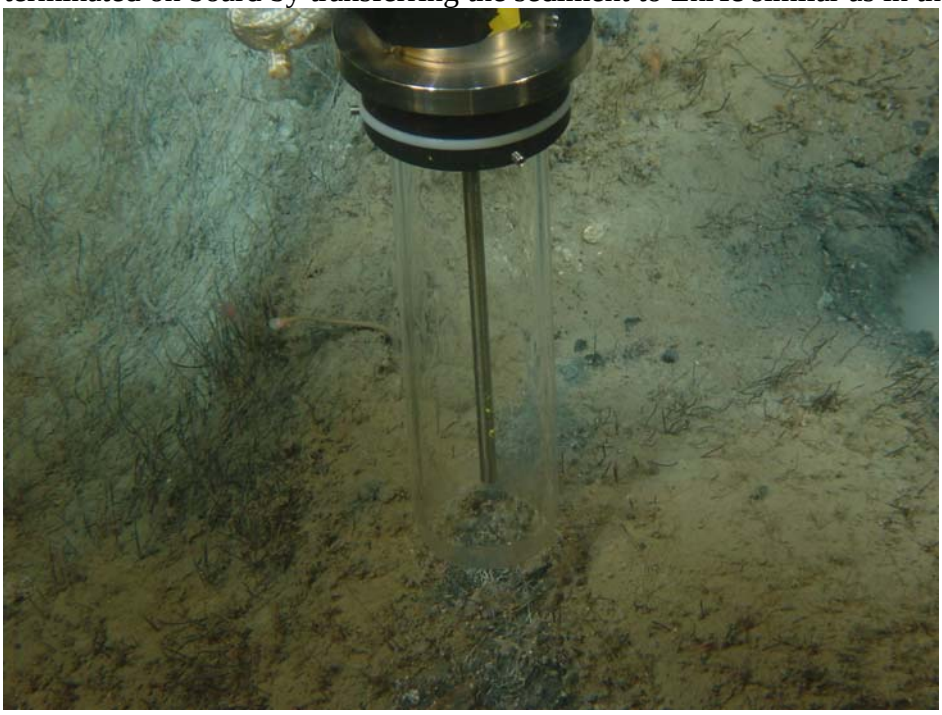

Fig. 9.5.1.: Deployment of the microbial in situ incubator Insinc with ROV Victor 6000

Ex-Situ samples for biogeochemistry and analysis of anaerobic methanotrophs, sulfide oxidizers and sulfate reducers:

Samples were obtained with the push cores of ROV VICTOR 6000 or with the winch operated multiple corer. All samples obtained are listed in Tab 2.

Sulfate reduction and methane oxidation rates: Sediment samples from various gravity cores, multi cores and push cores were investigated for sulfate reduction rates and methane oxidation. In case of multi coring as well as push coring several replicate sub cores (Ø 2.5cm) were sampled immediately after recovery. Radiotracer labeled substrate was injected in 1cm intervals through small, silicon sealed holes. Sediments were incubated with either $^{14}CH_4$ or $^{35}SO_4^{2-}$ for 1 day at *in situ* temperature under anaerobic conditions and then fixed in NaOH and Zn-Ac, respectively, for further measurements of remaining substrate ($^{14}CH_4$, $^{35}SO_4^{2-}$) and product ($^{14}CO_2$, $H_2{}^{35}S$) activity. The ratio of product to substrate activity multiplied with substrate concentrations yields then actual rates (Iversen and Blackburn 1981). Up to four biological and one abiotic control were incubated per site and sediment horizon. The samples will be analyzed in the home laboratory.

***Bacterial counts*:**
2.5 ml of sediment volume were fixed in 9ml of 2% formalin in seawater for 2 – 4h (Tab. 1). These samples await further analyses in the home laboratory.

Fluorescent in situ hybridization (FISH):
2ml of the sediment-formalin suspension for total cell numbers were centrifuged and supernatant was discarded. The pellet was washed two times in 3 ml 1*PBS-buffer (resuspension, centrifugation, discarding of supernatant). Finally, the pellet was fixed in 2 ml of a 1:1 (v:v) solution of Et-OH:1*PBS (50% final concentrations) and kept at –20°C until further analyses in the home laboratory (method according to Pernthaler *et al*. 2001).

***DNA/RNA*:**
ca. 4g of fresh sediment was frozen at –20°C until DNA analysis in Bremen (Tab. 1). RNA samples were collected in the same way but frozen at -80 °C.

Microbiology experiments:
Sediment samples were transferred to wide mouth glass bottles sealed with gas tight rubber stopper and kept at *in situ* temperature until further enrichment and biogeochemical experiments the home laboratory.

Tab.2: Sediment samples obtained by multiple corer (MUC), and ROV Pushcores (PC). Sediment samples were split into 1 cm layers for rate measurements, total bacterial counts, fluorescence in situ hybridization (FISH). Samples for microbial diversity analyses were sectioned in 2.5 cm horizons.

SURFACE	**microbiology**	**site**	**position**	**description dive log**
MTB 1 (1 tube)	SR, AOM, BF, MB	Storegga	64°45.28078; 005.621816	few pogonophora
MTB 2 -1 (3 tubes)	SR, AOM, BF, MB	Storegga	64°45.2848; 005.621283	few pogonophora
MTB 6 (7 tubes)	SR, MB	HMMV	72°00.1673; 14°43.91546	microbial mat
271-01	**microbiology**	**site**	**position**	**description dive log**
CL-6	BF	Storegga	64°45.2703; 004.58.8808	pogonophora
272-02	**microbiology**	**site**	**position**	**description dive log**
CT3	AOM, BF	Nyegga	64°39.7914; 005°17.2957	black sediment, G12
CT4	SR, BF	Nyegga	64°39.7906; 005°17.2975	grey sediment
CT 5	BF, MD, MB	Nyegga	64°.397896; 005°17.3140	microbial mat
CT 6	AOM, BF	Nyegga	64°397902; 005°17.3157	microbial mat
CT7	SR, BF	Nyegga	64°39.7903; 005°17.3161	microbial mat
CT 9	BM	Nyegga	64°39.7924; 005°17.3094	microbial mat
CT 11	MD	Nyegga	64°39.7890;005°17.3147	microbial mat, G12
CT 27	BM	Nyegga	64°39.9809;005°17.3479	gstropods
CT 29	AOM, BF	Nyegga	64°39.9804;005°17.3496	microbial mat
CT 30	AOM	Nyegga	64°40.0016;005°17.3757	white mat spot, G11

CT 31	BF, MD	Nyegga	64°39.9948; 005°17.3663	microbial mat
CT 32	MI, BF, MD	Nyegga	64°39.9941;005°17.3663	white mat spot, G11
CT 34	SR, BF	Nyegga	64°39.9817; 005.173454	microbial mat
INSINC X1	SR	Nyegga	64°39.791; 005°17.299	black spot, pogonophora
INSINC X2	SR	Nyegga	64°39.791; 005°17.300	black spot, pogonophora
INSINC X5	SR	Nyegga	64°39.970; 005°17.469	black spot, pogonophora
INSINC X6	SR	Nyegga	64°39.974; 005°17.488	black spot, pogonophora
275-05	**microbiology**	**site**	**position**	**description dive log**
CT 1	SR, BF, MD	Storegga	64°45.2708;004°58.8626	microbial mat
CT 2	AOM, BF, MD	Storegga	64°45.2702;004°04.8712	microbial mat
CT 3	SR, BF, MB	Storegga	64°45.2700; 004°58.8737	black sediment
CT 4	AOM, BF, MB	Storegga	64°45.2700; 004°58.8750	black sediment
CT 10	SR, BF, MB	Storegga	64°45.2700; 004°58.8750	microbial mat
CT 11	SR, BF, MD, MB	Storegga	64°45.2764; 005°04.1469	microbial mat
CT 12	AOM	Storegga	64°45.2760; 005°04.1468	microbial mat
INSINC X1	SR	Storegga	64°45.2685; 004°58.8635	black spot, bacteria
INSINC X2	SR	Storegga	64°45.2720; 004°58.8720	black spot, bacteria
276-06	**microbiology**	**site**	**position**	**description dive log**
CT 1	MI, AOM, BF, MD, MB	HMMV	72°00.1666; 014°43.9540	Beggiatoa mat
CT 2	SR, BF, MD	HMMV	72°00.1677; 014°43.9527	Beggiatoa mat
CT 3	MI, AOM, BF, MD, MB	HMMV	72°00.1664; 014°43.9452	Beggiatoa mat, near MIC2
CT 4	MI, MB	HMMV	72°00.1664; 014°43.9486	Beggiatoa mat, near MIC2
CT 7	MI	HMMV	72°00.2042; 014°43.7561	center area, near MIC 1
CT 13	SR, BF, MD, MB	HMMV	72°00.1720; 014°43.9129	Beggiatoa mat
INSINC X1	SR	HMMV	72°00.1673; 014°43.9507	Beggiatoa mat
INSINC X2	SR	HMMV	72°00.1719; 014°43.9472	Beggiatoa mat
INSINC X5	SR	HMMV	72°00.1668; 014°43.9508	Beggiatoa mat
INSINC X6	SR	HMMV	72°00.1654; 014°43.9518	Beggiatoa mat
277-07	**microbiology**	**site**	**position**	**description dive log**
CT 1	SR, BF, MB	HMMV	72°00.3153; 014°43.3831	grey mat
CT 3	SR, BF, BM, MB	HMMV	72°00.3149; 014°43.3827	grey mat
CT 4	MD	HMMV	72°00.3146; 014°43.3813	grey mat

CT 8	MD	HMMV	72°00.3145; 014°43.3813	grey mat
CT 10	AOM, BF, MB, MD	HMMV	72°00.3136; 014°43.3840	grey mat
CT 11	AOM, MB	HMMV	72°00.3794; 014°43.3089	grey mat
INSINC X1	SR	HMMV	72°00.3139; 014°43.3805	grey mat
INSINC X2	SR	HMMV	72°00.3135; 014°43.3768	grey mat

Sampling of Sclerolinum contortum and Oligobrachia haakonmosbiensis (HMMV)

Tissue samples for analyses of symbiotic associations of tubeworms and bacteria were fixed for processing in the home laboratory (HERMES partner University Paris 6, UMR 7138). The tubeworms were sampled from box corer USNEL #5 (05.06.2006, N 72° 0.0785, E 14° 43.3477) dominated by *S. contortum*, and multiple corer VKG MTB 5 (07.06.2006; N 72°0.1765, E 14°43.9579), dominated by *O. haakonmosbiensis.* The bacteria-containing trophosome was preserved for further analyses. DNA samples were frozen at -80°C as well as fixed in 96% Ethanol. Tissues were fixed with 2% Para-formaldehyde and afterwards washed with PBS. These samples will be analyzed by ribosomal DNA methods including FISH. Furthermore, the Trump's fixative was used to conserve samples for TEM and SEM.

Preliminary results

The major aim of this study was the investigation of microbial sulfate reduction (SRR) and anaerobic methane oxidation (AOM) in methane enriched surface sediments of the HMMV, as well as sampling the sediments for microbiological and molecular analysis targeting the diversity and biogeography of anaerobic methanotrophs, sulfate reducers and sulfide oxidizers. Samples were obtained from the sediment cores, which were retrieved by the ROV pushcores and by TV guided multiple corer hauls (Tab. 2). In parallel to the on board rate measurements, sub-samples were taken from cores to determine the total number of bacteria, as well as of specific groups of bacteria and archaea by fluorescence *in situ* hybridization (FISH, quantitative PCR) and to investigate community assemblage diversity (16s rDNA clone libraries, ARISA). Sediments were preserved anoxically for enrichment experiments targeting anaerobic methanotrophs. Furthermore, carbonate subsamples were obtained to investigate the distribution of lipid products derived from members of AOM consortia and their stable carbon isotopic composition which bears diagnostic information on the carbon source and/or metabolic carbon fixation pathway utilized by its producer. All these samples will be processed in the home laboratories of MPI in collaboration with partners at IFREMER and Univ. Paris 6. We will compare oxidation rates obtained by with ex situ and in situ radioactive tracer experiments, to measurements obtained with in situ profiling.

The investigations at the HMMV took place in the framework of studying the role of sedimentary microbes in consuming the greenhouse gas methane and in delivering energy to the chemosynthetic communities on the sea floor, and to reveal the factors influencing microbial diversity. Understanding the interaction between geology, chemistry and biology is necessary to analyze the fluxes of methane between the different compartments, and to find out about the magnitude of methane emission from mud volcanoes. At HMMV defined zones of different benthic communities can be identified and related to the morphology and activity of the mud volcano. Interestingly, a lot of methane is emitted from the barren centre of the

mud volcano. Here, we could not detect anaerobic oxidation of methane, probably due to the lack of ANME and SRB consuming methane in the sediments. Only in the top mm methane appeared to be consumed by aerobic methanotrophs according to earlier investigations (Niemann, Lösekann et al. in press). At the HMMV, the zone of highest methane turnover is indicated by the presence of white mats of giant sulfur-oxidizing bacteria (*Beggiatoa*) on the seafloor. These bacterial mats cover large areas around the centre of the HMMV. The thickest mats retrieved were up to several cm thick and consisted of tangled filaments, which were relatively easily resuspended from the sediment surface in large aggregates. Two other types of bacterial mat (grey patches with filaments and with laminated structure) were discovered in the northern part of the mud volcano and will be further investigated. Other types of sulfide oxidizer communities were detected in the Storegga and Nyegga area, and will be identified by molecular methods. Microsopic analyses on cores showed an astonishing diversity of cells (Fig. 2). Anaerobic oxidation of methane was limited to the surface sediments below the mats of sulfur bacteria covering the outer zone of the central plain dominated by ANME-3 archaea with the sulfate reducer Desulfobulbus as a partner (Niemann, Lösekann, in press).

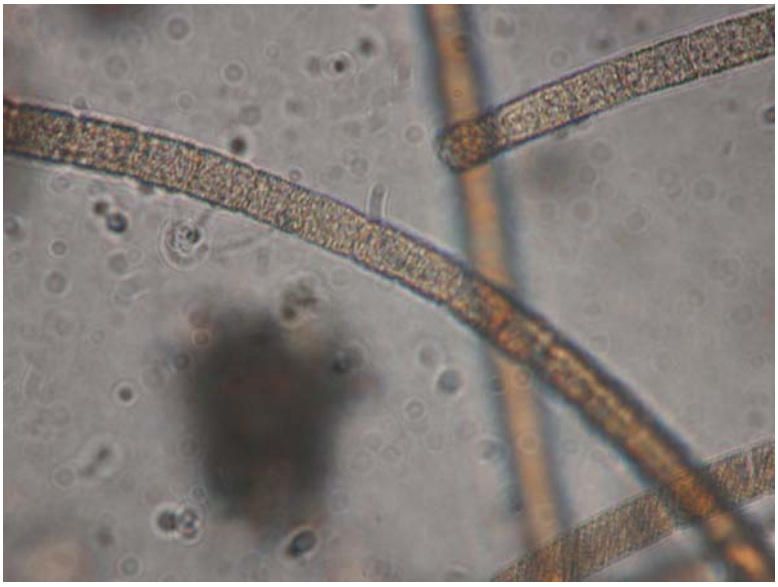

Fig. 9.5.2.: Diverse sulfide oxidizing bacteria in cores from HMMV (cell diameter appr. 8 µm; magnification 1:1000)

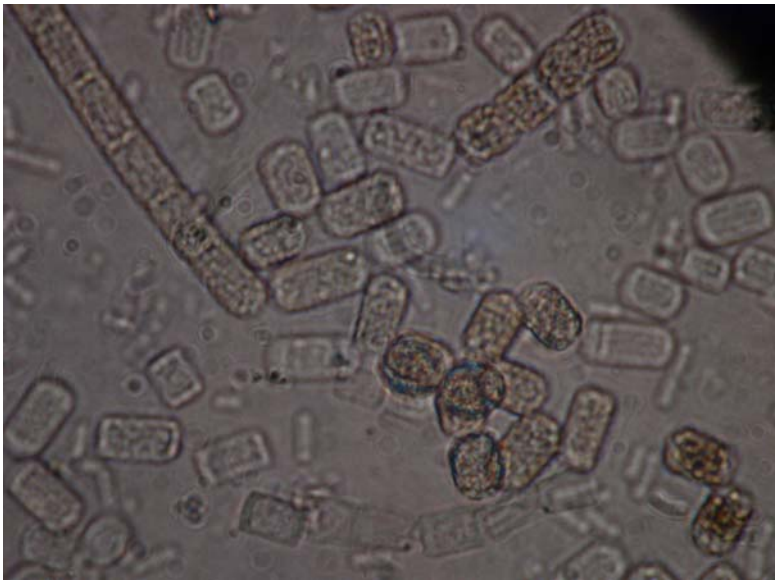

Fig. 9.5.3.: Diverse bacteria

The steeper part of the HMMV outside of the center is populated by high biomasses of tubeworms. The pogonophora manage to aerate the sediments, hence excluding the AOM communities from the surface sediments. Clearly, in the zones populated by the chemosynthetic communities only very little methane escapes to the water column compared to the barren center. The relatively high biomass of methanotrophic archaea is obviously capable of oxidising methane with sulfate in the anaerobic sediments at temperatures close to the freezing point (-1°C), producing a source of sulfide to the extensive mats of giant, sulfide-oxidising bacteria surrounding the central area.

For the Norwegian cold seep habitats our investigations will provide the first in situ rates of methane fueled sulfate reduction (Fig. 3), as well as the first detailed investigation of the identity and functioning of sulfate reducers and methanotrophic archaea of the Storegga and Nyegga seeps.

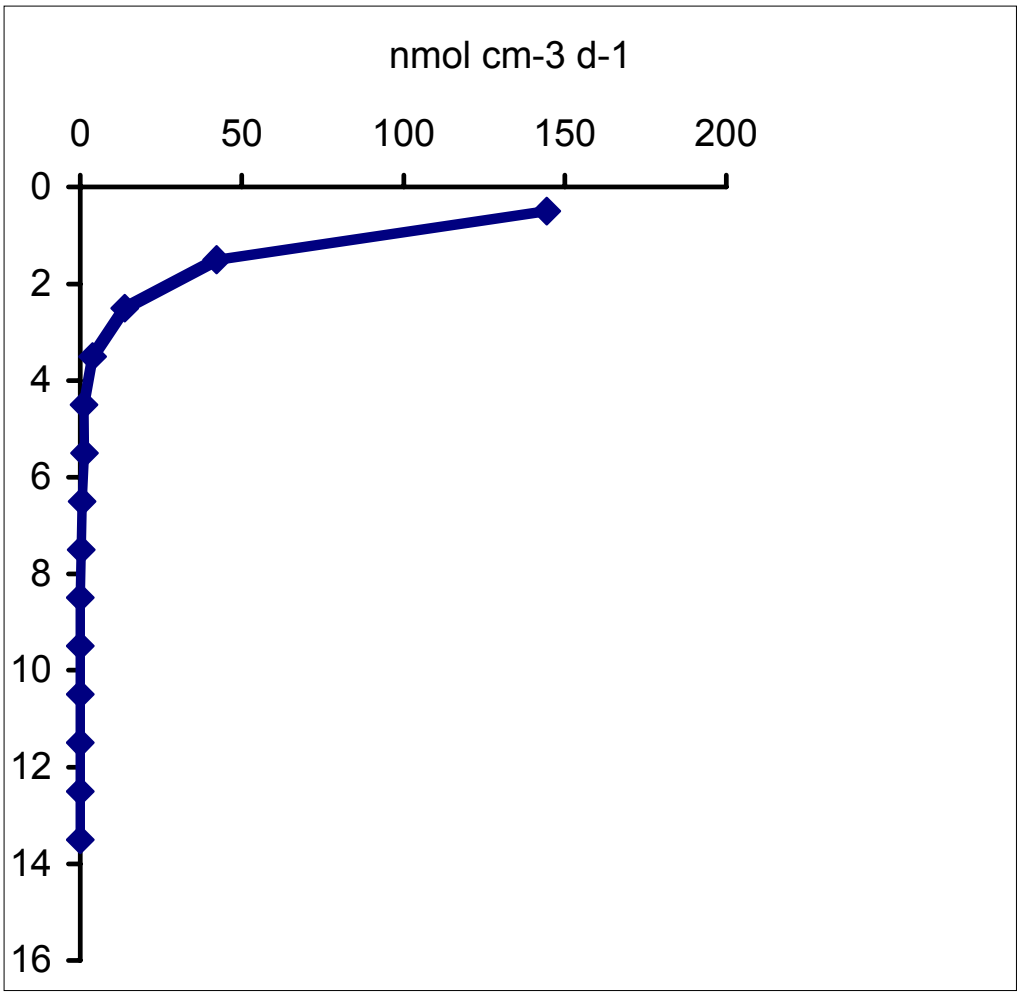

Fig 9.5.4.: In situ sulfate reduction rates in a core from a Beggiatoa mat at HMMV (INSINK)

Literature:

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9.6. Biology

Benthic communities and environmental conditions at cold seeps of the Norvegian margin (K. Olu, JC Caprais, Saskia Van Gaever)

The objectives of this ecological study were (i) to describe the composition, diversity, density, biomass of faunal communities associated with the cold seeps, compared to the background, (ii) to assess nutritional relationships using stable isotopes, (iii) to characterize the biotope and (iv) to map the benthic communities at different scales.

We sampled different habitats for comparisons at regional scale (Storrega slide/HMMV) and at the site scale (pogonophora fields/microbial mats…). Several faunal components were considered : meiofauna (32 µm-1mm) in sediment sampled with push cores at the cold seep sites and multicorer outside the seeps, macrofauna (1mm-1cm) in sediment sampled with blade corers at seeps and with USNEL box core in the background, epifauna at seeps (macro- and megafauna >1cm) using Victor slurp gun, and also the largest megafauna with the grab. Chemical biotope characterization will be studied from water sampled with the PEP as close as possible to the seep fauna for analyse of methane, oxygen, pH, CO_2, nutrients and from sediment sampled using tube cores and multicorer for analyse of organic carbon, $d^{13}C$, oxygen profiles, sulfide and sulfate. Respiration and fluxes measurements (Oxygen, methane, CO_2) were also done on pogonophorans using with the new *in situ* benthic chamber CALMAR. Finally, habitat mapping and spatial distribution of megafauna will be done using vertical camera images, MATISSE mosaics and high resolution OTUS photos at site scale and habitat scale.

The first observations on Storrega Slide revealed that the dominant seep megafauna included pogonophorans and gastropods generally arranged at small scale in a concentric zonation around the seeps. At larger scale, active sites and cemeteries were observed and may be related to temporal succession or spatial variability in seepage conditions. Abundant background megafauna (ophiurids, comatulids…) was observed, and stable isotope analyses may help to assess if they profit from the chemosynthetic production.

The first observations on Haakon Mosby m.v. seem to indicate a larger species richness and diversity in the pogonophoran fields compared to the microbial mats. Pycnogonids, polychaetes, gastropods, bivalves, small crustaceans (amphipods, isopods, tanaidaceans), sipunculis have been sampled together with the pogonophorans, whereas on microbial mats the megafauna is characterized by only zoarcid fishes and rays, the macrofauna by only one or a few species of polychaetes and a few gastropods and the extremely dense meiofauna included only one nematode species. The fauna seems very poor in the centre of the volcano characterized by active mud flows with very few meiofauna, no macro-megafauna except a few fishes, but some polychaetes were sampled in the transition zone between centre/mats. Further sorting, specific determinations and analyses are need to better understand the faunal gradients on this volcano, and compared fauna distribution patterns to environmental gradients to understand how environmental factors structure the benthic communities.

Pogonophora studies during the VICKING Cruise 2006 (A. Andersen)

Aims of the studies on Pogonophora

Pogonophora appear like hair-thin tubeworms sticking up from the mudflats, and were very abundant throughout the sites we have sampled during the Vicking cruise. These mouth- and gut-less tubeworms lives thanks to an endosymbiosis with bacteria, in a comparable way to the giant vestimentiferan-tubeworms found at vent and seeps. Both taxa, initially described as distinct phyla, have been shown to share annelidan and particularly polychaete characters, which allowed to group them together in a single polychaete family, termed Siboglinids (Rouse and Fauchald 1997). However the phylogenetic relationships between these taxa remains to be elucidated and this requires additional species. During previous cruises, two Pogonophora species have been morphologically described at Haakon Mosby mud volcano (HMMV) : *Sclerolinum contortum* and *Oligobrachia haakonmosbiensis* (Smirnov 2000), and unidentified Pogonophora have been recorded at Storegga. As a contribution to the to the Hermès WP3 task on biodiversity, our first goal is thus to identify which species we find where. We will describe the Pogonophora species using both morphological and molecular tools, enabling to check the phylogenetic relationships between the taxa.

The symbionts living in the Pogonophora are chemolithoautotrophic bacteria able to use the inorganic chemicals from the surroundings to synthesize organic carbon for the benefit of their host. These bacteria are generally sulphur-oxidizing, but a single species *Siboglinum poseidoni*, located in seeps of the Skagerrak, south to the explored Norwegian areas, contains methanothophic bacteria (Schmaljohann and Flugel 1987). Due to the geographic vicinity of this peculiar symbiosis, it is important to include the nature of the symbiotic relationship in the tubeworm species characterization, which we will investigate using electron microscopy, as a complement to the studies performed by the microbiologists.

Pogonophora are known to contain haemoglobins dissolved in their blood, resembling those of vestimentiferans and other annelids, having sub-units of about 350-450 kDa. However all Pogonophora species investigated so far lack the hexagonal bilayer molecule (HBL) of 3600 kDa that transports both oxygen and sulphide to the symbionts in the vestimentiferans and other annelids (Terwilliger et al. 1987, Nakagawa et al. 2005). Analysing the blood of the Pogonophora by electron microscopy and mass spectrometry will allow checking the composition of the Hemoglobin molecules of the Pogonophora species found at the Norwegian margin. In particular it is unknown whether the high methane concentrations recorded at the Vicking sites, influence or not the molecular chain composition of the hemoglobin structure. The blood of the specimens will be analysed in relation to the chemical concentrations recorded by JC Caprais, chemist at Ifremer, aiming to investigate eventual environmental adaptations of the Pogonophoran species hemoglobin to extreme conditions.

First results during the Vicking Cruise

During the Vicking cruise we have totalised 6 big collections of Pogonophora: 4 were performed with the ROV Victor using several blade-corers (CL or GCL) and 2 operated from the ship using either the big box-corer (KGS), or the multitube push-corers (MLT). Upon recovery on board, the tubeworms were sieved out from the mud with seawater. Sampling with the ROV gave the best quality of samples, primarily because the specimens were visually chosen and then because sieving was quick and enabled to get the worms in a good shape,

whereas sorting the tubeworms from the big box-corer was long and required high water pressure, which damaged the tissues within the tubes. Geographically, the 6 collections were distributed as follows: two collections at Storegga (dives 271 & 275), one at Nyegga (dive 272) and one at HMMV (dive 277). The corers operated from ship were done at HMMV. At each collection we photographed the sampled Pogonophora *in situ* and within the sampling tools; upon recovery, under the microscope, both in their tubes and after taking the worms out from their tubes, prior to dissection for various fixations.

From our first observations *in situ* at each site, we could distinguish two types of tubes: strait-black and twisted-brown tubes, having a marked spatial segregation. At Storegga the tubeworms were localized in concentric belts around bare spots of mud (Fig. 1), where high sulphide flows have been recorded (De Beer, personal communication during the cruise). Small red snails encircle the fluid spots. The snails are surrounded by a narrow belt of black tubeworms, and at the periphery appears an abundant field of twisted tubeworms. At HMMW, according to the previous species description (Smirnov 2000), we hypothesize that the black tubes correspond to *Oligobrachia haakonmosbiensis*, whereas the twisted could be *Sclerolinum contortum*. They appear also to be spatially segregated (Fig. 2). However it remains to be verified at the microscopic and molecular level, whether these species are the same at all investigated sites, because there seem to be size differences, and we photographed two different morphotypes taken out of the twisted tubes at Storegga. At the new site of Nyegga we investigated the small mounds covered with tubeworms first described by Hovland and Svensen (2006) as methane ice-hydrate pingoes. They appeared as soft mud pillows of clustered Pogonophora, which we could dig with the grab of the ROV (Fig. 3). The twisted Pogonophora were the predominant tubeworms of this structure, and provide habitat and protection for many other invertebrates, such as diverse polychaetes, sponges, anemones etc...(Fig. 4). This suggests that thanks to their symbiotic association with bacteria, the Pogonophora are able to colonize areas with high fluid flows, and to constitute soft reefs that sustain a diversified community of animals, and thus that Pogonophora are at the foundation of the biodiversity in the ecosystems at the Norwegian cold seeps.

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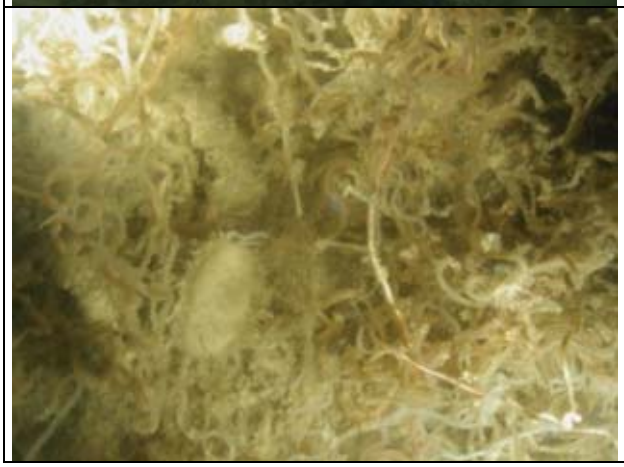
	Fig. 9.6.1.: Concentric zonation of strait-black and twisted-brown Pogonophora around the black spots of seepage at Nyegga
	Fig. 9.6.2.: Spatial segregation of black (Oligobrachia) pogonophora in the background, and brown (Sclerolinum) Pogonophora in front at Haakon Mosby Mud Vulcano.
	Fig. 9.6.3.: The Pingoe mount showed to be a soft mud pillow with Pogononophora.
	Fig. 9.6.4.: The twisted brown species was predominant in the Pingoe and offered habitat for many other invertebrates, such as the Polynoid polychaete (left) and the sponge (right spot) visible here.

10.Conclusion: communiqué de presse Ifremer

Text of the press release issued by Ifremer

Brest, le 5 juillet 2006

Retour de la campagne Vicking : des émissions de méthane plus ou moins actives selon les zones de la marge norvégienne

L'équipe pluridisciplinaire et internationale embarquée à bord du *Pourquoi pas ?* pour la campagne Vicking de l'Ifremer est rentrée à Brest le 23 juin 2006. Les scientifiques, partis le 20 mai à la découverte des cheminées à gaz de la marge[1] norvégienne, sont revenus pleinement satisfaits de leur mission sur la zone de Storegga et autour du volcan Hakon Mosby.

Des cheminées à gaz par dizaines qui percent le fond marin

Les cheminées à gaz sont les conduits privilégiés pour l'échappement du méthane issu des couches sédimentaires profondes. Il en existe des dizaines sur la pente continentale de Storegga située entre 600 et 1000 m de profondeur.

La campagne Vicking avait entre autres objectifs, l'étude du fonctionnement de ces structures géologiques particulières. Lors de la mission, les scientifiques ont pu observer des cheminées généralement marquées par la présence de croûtes sur le fond ou de massifs carbonatés, leur taille variant – sur une étendue horizontale - du mètre à plusieurs dizaines de mètres, contrastant avec l'omniprésence de sédiments fins sur la zone de Storegga.

Le fond sous-marin, à l'aplomb des cheminées, montre dans certains cas un relief en cuvette (ou « pockmark ») et dans d'autres un relief en dôme. Une différence morphologique qui ne semble pas affecter la nature de l'écosystème, puisque les chercheurs ont détecté, associés aux cheminées à gaz, une faune abondante et, localement, des tapis bactériens. Cependant, le fonctionnement de cet écosystème, caractérisé par une diversité biologique insoupçonnée, reste encore à comprendre. Les « pingoes » (petits massifs arrondis) par exemple, que l'on pensait être constitués d'hydrate de méthane affleurant au fond de l'océan, sont en réalité des amas de pogonophores[2] !

[1] Les marges continentales sont des zones océaniques situées en bordure des continents.
[2] Les pogonophores sont des animaux qui vivent dans les profondeurs marines (jusqu'à - 10 000 mètres) dans des tubes qu'ils sécrètent.

Dans leur ensemble, les cheminées s'avèrent être des diffuseurs lents de méthane, propices à la colonisation du fond par de vastes champs de pogonophores et, dans les parties les plus actives, par des colonies de gastéropodes, des voiles bactériens et des encroûtements de carbonates.

Le volcan de boue Hakon Mosby, un laboratoire sous les mers…

Le volcan de boue Hakon Mosby, situé plus au nord sur la pente continentale norvégienne, avait déjà fait l'objet d'une visite en 2003 par *Victor 6000*, le robot sous-marin télé-opéré de l'Ifremer. Repérable par son panache de bulles de méthane enrobées d'hydrate, ce volcan présente l'avantage d'être observable plusieurs centaines de mètres au-dessus du fond par les sondeurs. Contrairement à la zone de Storegga, les émissions de méthane y sont en effet très actives.

Le système PEGAZ, outil de prélèvement des hydrates de gaz, mis en œuvre pour la première fois sur le *Victor 6000*, a permis de récolter du gaz sous pression. Les échantillons collectés sont ainsi analysés dans des conditions proches de celles du fond (voir la photo 1).

Par ailleurs, un carottier instrumenté de sondes de température, qui avait été déployé au centre du volcan de boue en septembre 2005 lors d'une mission allemande, a été également récupéré sur le site. Selon les scientifiques, les écarts importants de température enregistrés, avec notamment une chute brutale de 10°C au milieu de l'hiver, reflètent probablement une activité du volcan variable à l'échelle de quelques semaines.

Le volcan de boue Hakon Mosby s'avère donc être un excellent laboratoire européen pour observer la réponse d'un écosystème benthique à des conditions environnementales en changement rapide. Le fort dégazage en cours, et les teneurs élevées d'hydrate de méthane présent dans les sédiments, intéressent aussi les climatologues qui cherchent à mieux évaluer le rôle de la déstabilisation des hydrates de méthane sous-marins dans le réchauffement climatique global.

Une campagne riche en données

Malgré une météo peu favorable, la campagne Vicking a permis d'effectuer une quantité impressionnante d'observations directes (photos et vidéos) et un nombre important de mesures physico-chimiques dans l'eau et les sédiments. De même, de nombreux échantillons (géologiques, biologiques, microbiologiques, fluides et gaz hydrates) ont pu être prélevés. Les capacités techniques du *Pourquoi pas?* (aménagement des laboratoires et réseau informatique) permettent en effet un conditionnement optimal des échantillons collectés et un traitement direct des données.

Le *Victor 6000*, équipé de son nouveau « Module de mesures en route », a quant à lui permis de dresser de façon très précise des cartes bathymétriques. Par comparaison avec les données acquises en 2003, les scientifiques peuvent déjà affirmer que la topographie du fond a évolué en 3 ans, montrant de nouvelles

coulées de boue. Ce robot télé-opéré, muni d'une nouvelle navette présentant une grande capacité d'emport, a aussi permis l'acheminement de nombreux outils sur le fond. Enfin, la nouvelle caméra OTUS de ce module a permis de réaliser des mosaïques photographiques de qualité sur de grandes surfaces.

Si les scientifiques sont pleinement satisfaits des premiers résultats de cette campagne, il faudra bien sûr attendre quelques mois pour mesurer l'ampleur des données apportées par Vicking dans l'avancée des connaissances scientifiques.

Effectuée dans le cadre d'un projet de l'Union européenne, HERMES[3], la campagne Vicking a été finacée au titre de la priorité « Changement global et écosystèmes ». Réunissant un consortium constitué de 36 instituts de recherche et de neuf entreprises de 15 pays, Hermes vise à une meilleure connaissance de plusieurs zones géographiques situées le long des marges profondes européennes, en Atlantique et Méditerranée, reconnues comme « hot spot » parce qu'elles abritent des écosystèmes particulièrement riches mais fragiles.

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[3] HERMES : Hotspot Ecosystem Research on the Margins of European Seas.