M72/3 – First weeky report 16 – 22 March, 2007

RV METEOR sailed from the pier in Ambarli / Istanbul, Turkey at 8 a.m local time on March 17, one day later than planned. Investigations on gas hydrate deposits within the eastern Black Sea are scheduled during the upcoming 34 days. The expedition is the third leg of cruise 72 of RV METEOR. Due to logistic reasons this leg 3 is split in two sub-legs 3a and 3b with a port call in Trabzon between the two sub-legs. The investigations of leg 3 are part of the BMBF collaborative project METRO, which is funded within the subject area "Methane in the geo/-biosystem" as part of the special programme "Geotechnologies". METRO is also embedded in the German-Russian agreement on "Co-operations on the realm of marine and polar research". The distribution and the dynamics of methane and gas hydrates at active fluid emission sites as well as in areas without seepage will be examined. Near-surface marine gas hydrates in particular are of relevance for climate studies, stabilities of sediments and biogeochemical processes. They will be explored by various high-resolution geophysical, geochemical and geological methods. Research topics are different geological structures characterised by active gas and oil seepage, near-surface gas hydrate deposits, and mud volcanoes in various areas of the eastern Black Sea in Ukraine, Turkey and Georgia.

Before leaving Istanbul, RV METEOR stayed 4 days in the harbour of Ambarli where scientists and scientific equipment were exchanged. The remotely-operated vehicle QUEST was already on board since Mid-February and will be the main tool during the first sub-leg 3a. Scientists from Germany (from IFM-GEOMAR, AWI and the University of Bremen), USA, Canada, Turkey, Ukraine and Russia embarked during March 14 and 15, and the time before the ship left port was used to install all the new equipment in the laboratories of the vessel. Unfortunately, two containers had been delayed for two days which postponed the start of the cruise for at least one day.

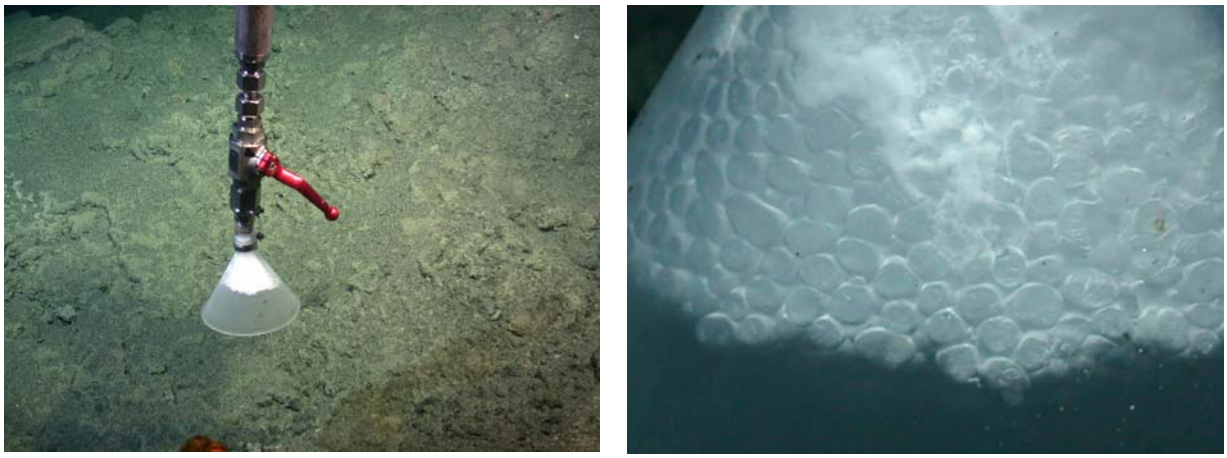

Figure 1: *The ROV-based, funnel-shaped gas bubble sampler collects gas bubbles which ascend from the seafloor. After a lever was activated the gas was sucked into a vaccum chamber above (left). Since the sample was taken in 1100 m water depth, well within the gas hydrate stability field, the gas bubbles are coated by very thin gas hydrate skins and the gas bubbles do not coalesce (right image). Images taken by ROV QUEST (MARUM)*

On Saturday March 17, everything went very quickly. The four-hour transit to the entrance of the Black Sea allowed us to enjoy a last glance on the picturesque sight of the old city of Istanbul and the historical buildings along both sides of the Bosporus. After we passed the Bosporus Strait, we had a two-day transit along the northern Turkish Coast to the easternmost area of the Black Sea. We started station and mapping work on Monday March 19 at the continental margin of Georgia. In this area oil and gas seeps associated with shallow gas hydrate occurrences had been found during earlier cruises of RV POSEIDON and RV Professor LOGACHEV, both within the project METRO. After collecting new multibeam

bathymetry data during the night we started our first ROV dive on Monday March 20 at Colkheti seep in 1100 m water depth. Beforehand, many repairs on ROV QUEST had been carried out by the ROV team during the last couple of days.

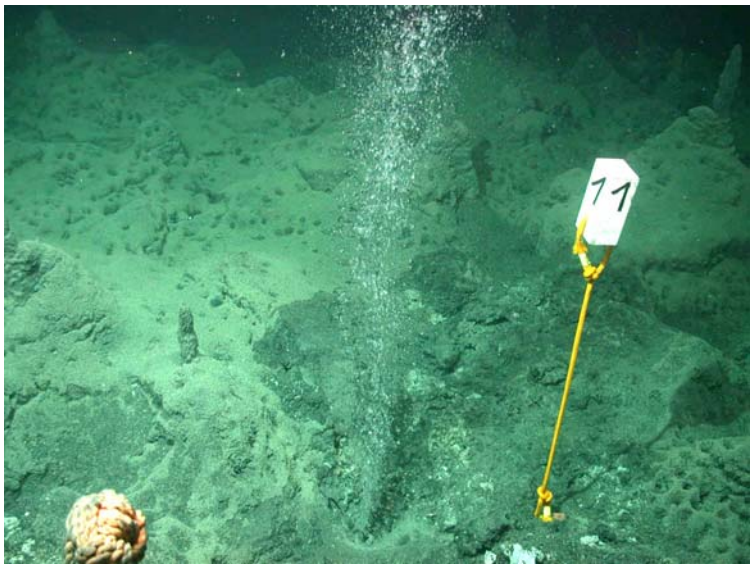

Figure 2:
Methane fountain on the sea floor in 840 m water depth at the Batumi seep area. The fountain is one of many gas expulsion sites in this area which covers an area of 1,200 x 900 m. The variously shaped submarine landscape is characterized by gas expulsion sites of various dimension, round-shaped chimneys, or just by sieve-like perforated seafloor. During M72/3 gas quantification of methane emission sites will be performed
(Image taken by ROV QUEST, MARUM).

The first ROV dive on Colkheti Seep was successful and two further dives were run the following two days at locations in the area of Batumi seeps in 850 m water depth. All dives have been successful in reaching the scientific goals like the quantification of distinct methane bubble streams. These first dives also gave us an impressive insight into the spectactular world of seeps in the anoxic seafloor environment of the eastern Black Sea.

Predominately bright weather and moderate winds helped us during our work. All participants are well and in good spirits.

In the name of all cruise participants

Gerhard Bohrmann FS METEOR, 22 March 2007