Expedition METEOR 114

Kingston - Veracruz

1. Weekly report: 12. – 26. Feb. 2015

Research vessel METEOR left the port of Kingston, Jamaica on the 12 February 2015 at 09:00 local time, in calm and sunny weather. All participants of the expedition arrived safely at the ship, even though some had some difficulties caused by a strike, last-minute receipt of travel documents, or a formality-loaded way from the airport to the ship. The mobilization of equipment during the port call was accomplished fast, as only two containers of the autonomous underwater vehicle AUV SEAL 5000 had to be shifted from the forecastle to the working deck and scientific goods had to be unloaded from two additional containers.

At present, we are on the way to Campeche Bay forming the southern part of the Gulf of Mexico, to the so-called asphalt volcanoes in 2 to 3 km water depth. In this region ultra-heavy natural oil is emitted at the seafloor forming lava-like flows at the seabed that may be regarded as a particular type of hydrocarbon seepage. The asphalt flows were discovered during SONNE expedition 174 in 2003 and were later revisited during METEOR 67/2 in 2006. The ultra-heavy oil loses volatile compounds over time leaving behind a mixture of complex hydrocarbon molecules in the form of asphalts. The asphalts occur at knolls with crater-like central depressions, which lead to the name of asphalt volcanoes. However, the knolls and ridges were formed by the upward movement of salt from deeper strata. With this expedition we do not only continue the scientific work in the region, but also the long-lasting cooperation with the National University of Mexico (UNAM – *Universidad National Autonoma de Mexico*). The fauna recovered from asphalts during previous cruises have been comprehensively studied at the *Instituto de Ciencias del Mar y Limnologia.*

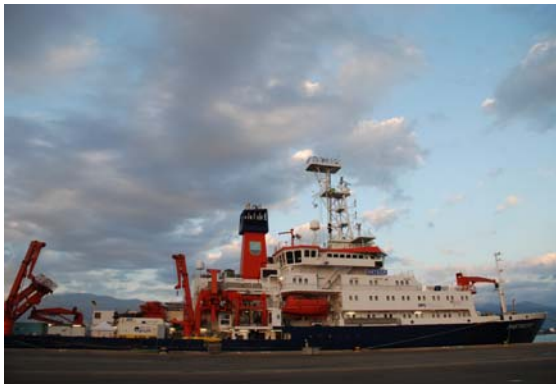

Figure 1: R/V METEOR in the port of Kingston loaded with the containers of AUV SEAL 5000 and scientific goods (Photo Markus Loher)

Figure 2: The team of M114/1.

The overarching objective of the expedition M 114 is to better understand the mechanism that leads to the emission of ultra-heavy oil at the seafloor, to study its impact on the deep-sea ecosystem, and its fate over time. Leg 1 of the expedition concentrates on mapping of

the asphalt deposits with AUV SEAL 5000, deep-towed sidescan (DT-sidescan), and ship-based echosounder, whereas leg 2 concentrates on targeted sampling with the remotely operated vehicle ROV QUEST 4000m. The team of the cruise consists of scientists from GEOMAR, the University of Vienna, Oregon State University and UNAM as well as the largest group of scientists from MARUM and the Department of Geosciences in Bremen.

Figure 3: R/V METEOR is leaving the port of Kingston at calm and sunny weather on 12 Feb 2015. (Photo Markus Loher)

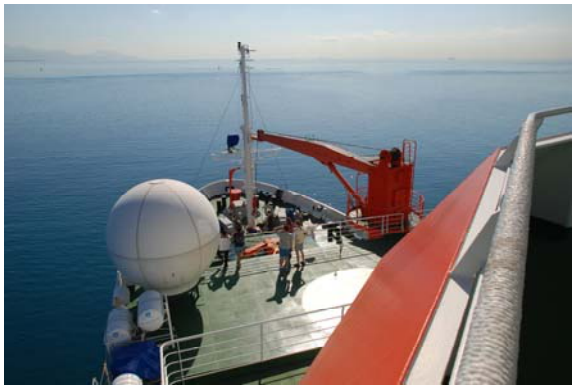

Figure 4: A splendid view ahead. (Foto Markus Loher)

After only three days of transit assisted by tail wind and favorable current, we entered the research area on Sunday 15 February 2015 at 11:40 local time. The station work started with a CTD to study methane concentration and turnover rates in the water column.

Everyone on board enjoys the pleasant living and working conditions.

Best wishes in the name of all participants,
Heiko Sahling R/V METEOR Sunday, 15 Feb 2015

For further information concerning the cruise please refer to:
www.marum.de