

POS515 **CALVADOS**
CALabrian arc mud VolcAnoes: Deep
Origin and internal Structure
June 18 – July 13, 2017
Dubrovnik - Catania



Weekly Report 1 June 19 – June 25, 2017

The project CALVADOS is a cooperative study between GEOMAR (M. Riedel, J. Bialas), the University of Bremen (G. Bohrmann) and OGS Trieste (S. Ceramicola). The study is focused on determining the interactions of geological, physical, and chemical processes at mud volcanoes by observing ongoing changes and reconstructing past evolution in order to improve estimates of gaseous and dissolved methane emissions over time. Investigation of the temporal progression of individual mud flows at different mud volcanoes will be used to constrain a model for mud volcano genesis within different zones of the Calabrian accretionary complex. The project aims in achieving these goals by collecting 3D seismic data with the P-Cable system and simultaneous recordings of the airgun acoustic signals on a grid of Ocean Bottom Seismometers (OBS).

After departure from Dubrovnik in the afternoon of June 19, we completed the transit to our first study area at Venere mud volcano within 1.5 days. During this time we progressed with preparations for seismic operations around the mud volcano area and installing all gear required on deck and in the laboratories. A total of twelve OBS were prepared by building anchors, programming the recorder units and acoustic releasers. We will use these OBS instruments to determine the seismic velocity field around the mud volcano and attempt 3D imaging of the structures with a special processing technique called *mirror imaging*, which utilizes the first multiple reflection of the acoustic signals recorded on the OBS' hydrophone. After a successful test of our acoustic releasers at the first OBS drop position, we started the sequence of instrument deployment. All twelve OBS were laid out in a 1 km grid pattern within ~4 hours. This was followed with deck-preparations of the P-cable and airgun system. During the night from Wednesday, June 21, to Thursday, June 22, we collected our first 2D seismic reflection lines using a 210 in³ (3.4 L) GI airgun and a short streamer made from four P-cable sections. Data quality was excellent and we use these sections as guide for future P-Cable data acquisition. After this successful first start, we continued preparing the P-Cable system all of Thursday, Friday, and Saturday. A second attempt in collecting 2D seismic data on Friday evening was not successful due to GI gun problems.

On Sunday, June 25, the 3D P-Cable system was finally fully operational, and we deployed a total of 14 parallel streamers by 13:45. The GI airgun is also operating well, and we started the first shot into the P-cable spread at 14:15. Currently we are turning onto the first profile and officially starting the 3D data acquisition across Venere mud volcano.

An introduction science meeting was held in the evening of June 21, which was used for discussion on deployment procedures and overall science plans. Additionally, information about gas venting around the caldera and ring-faults of the Venere mud volcano from previous work by scientists from the University of Bremen and OGS Trieste was discussed.

The entire week, weather has been cooperative and the long sunny days are quite a change from the usual weather in Kiel. All crew and scientists are well and despite the continued P-Cable issues, in good spirits.

Michael Riedel, June 25, 2017

on behalf of all involved in the project CALVADOS

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