

Abstract:

M61-1 was a multidisciplinary cruise addressing biological, geological and hydrographical scientific objectives in the carbonate mound province west of Ireland. The cruise started in Lisbon (Portugal) and ended in Cork (Ireland). M61/1 was embedded within the ESF-DFG “Moundforce” project of the EUROMARGINS Programme. Together with the succeeding M61/3 cruise, these Meteor activities document Germany's strong scientific and logistic support for the success of this challenging programme. Investigations are also designed as a preparatory cruise for the currently proposed EU-project HERMES (Hotspot Ecosystem Research on the Margins of European Seas; estimated start Nov. 04). All institutions participating in M61-1 are partners in HERMES Work package 2 “Coral Reef and Carbonate Mound Systems”.

Operations:

Sunday 18. 4.: The vanguard of the scientific party boarded METEOR at 9.00h and started with the unloading of three containers. The main scientific party arrived in the course of the afternoon. The rest of day was spent with the distribution of equipment to the laboratories.

Monday 19.4.: METEOR left Lisbon harbour at 10.30h with a group of 28 scientists. From the mouth of the Tejo River we took a northern course along the west coast of the Iberian Peninsula. We encountered a heavy swell of appr. 8m from the north west. The day was spent with the equipment of the laboratories, the construction of sampling gear and a plenary scientific meeting. Weather conditions were unchanged.

Tuesday 20.4.: In the evening we reached the Cap Finistere region and started our crossing of the Bay of Biscay. Gear preparations especially the installation of the lander systems continued.

Wednesday 21.4.: We continued our crossing of the Bay of Biscay. The swell changed the direction to west and caused a unpleasant rolling of the ship. Gear preparation on deck continued.

Thursday 22.4.: We arrived at our first station at 51° 10'N, 11° 40'W in the southern Belgica Mound province in the afternoon. Station work started with the deployment of the ROBIO Lander (Stat 202). After the test drive of a few winches we left the locality and steamed 17nm to the north to survey two mounds west and southeast of Therese Mound with the OFOS system (Stat 203-204). Both Mounds have so far not been investigated. We named them Castor and Pollux Mound. Both contained rich thickets of corals. We started the night with a highly resolved longitudinal CTD/Ro transect across Galway and Little Galway Mound (Stat205-214).

Friday 23.4.: We finished the longitudinal CTD/Ro transect in the morning. Next was a series of VanVeen Grab casts (Stat. 215-218) in the vicinity of the Therese Mound including the Castor and Pollux Mounds. The early afternoon was spent with the deployment of the BCL-Lander on Galway Mound (Stat 220). Afterwards METEOR headed south to the ROBIO-deployment site Station. The lander was successfully recovered and had worked well. We then steamed back to the area south of Galway Mound to sample sediments with a box corer (6 deployments, Stat.221-226).

Saturday 24. 4.: Box corer sampling ended in the morning and was followed by a highly resolved latitudinal CTD/Ro transect across Galway Mound (Stat 227-233). The first MOCNESS net was towed across Galway Mound in the afternoon (Stat. 234). In the late afternoon we retrieved the BC-Lander (Stat. 235), The rest of the day and part of the following night was again dedicated to two MOCNESS transects (Stat.236-237).

Sunday 25.4.: Another series of 6 Van Veen grabs was driven to the north and east of Galway Mound (Stat. 238-243) . Followed by another MOCNESS haul (Stat 244). In the afternoon we deployed the DOS-lander (Stat. 245) instrumented with a wide range of equipment and experimental trays on the top plateau of Galway Mound. This lander will be moored for 110 days and will be retrieved with FS POSEIDON round 10th August 04. Next came another deployment of the ROBIO Lander (Stat. 246) west of Galway Mound. The rest of the day was spent with two OFOS transects across an hitherto unexplored mound at 51°29'N, 11° 42,30'W which was named Erik Mound and at escarpment of the 660m contour further to the south (Stat. 247-248).

Monday 26. 4.: The night until mid morning was dedicated to another CTD/Ro survey (Stat. 249-256). Next we deployed the BC-Lander (Stat. 257) and retrieved the ROBIO lander (Stat. 258). A CTD in the afternoon had to be cancelled for technical reasons and was replaced by a Van Veen grab reference sample at the DOS deployment site (Stat. 259). The TV-grab was employed on the escarpment surveyed the day before to retrieve exposed carbonates (Stat 260). Although the gear fell over during sampling we were able to retrieve sufficient material. Two MOCNESS transects were driven during the late evening and the first half of the night (Stat. 262-262).

Tuesday 27.4.: The second half of the night and the early morning were spent with Van Veen grab sampling (Stat. 263-266) followed by two MOCNESS hauls until early afternoon (Stat. 267-268) . In the course of the afternoon and early evening we retrieved the BC-Lander (Stat 269) and succeeded to sample a 2,70 m and 4,05 m long core with the gravity corer on Pollux Mound (Stat 270-271). The night was spent with an extensive box corer sampling survey with 6 successful deployments (272-277).

Wednesday 28.04.: The early morning was spent with another CTD/Ro survey (278-280). We then switched over to gravity coring which gained a successful core of 5,12 m (Stat 281-282). After a successful multiple corer haul and a final CTD/Ro cast (Stat 283) we finished our station work at the Belgica Mound Province in the afternoon and headed in north-west direction towards the second working area at the south-western flank of Rockall Bank.

Thursday 29. 04.: We continued our steaming to the Rockall area. Strong head winds reduced our speed significantly to about 7-8 kn.

Friday 30.04.: We arrived at our second working area in the morning at 56° 40'N, 17° 34'W. First target was a volcanic structure that pierced through the gently dipping north-western margin of Rockall Bank. After a survey with Hydrosweep (Stat. 284) and the deployment of the BC-Lander and ROBIO-lander ("85-286) we selected two transects for the OFOS across the newly chartered mount (Stat. 287-288). The rough summit of the volcanic structure, that we denominated "Kiel Mount", was covered by mostly fossil coral thickets. We documented a number of lithified carbonate sediments or hardgrounds. Larger drop stones colonised by huge sea fans or black corals. The mid-slope of Kiel Mount is patchily plastered with carbonate crusts. They show prominent dissolution features and are often eroded beneath the crust. Sediment filled dissolution cracks were abundantly inhabited by sea pens.

Saturday. 01. 05.: We spent the night with two highly resolved CTD/Ro transect across the Kiel Mount (Stat 289-297). The BC-Lander and the ROBIO-lander were retrieved in the morning (Stat298-299). The recovery was followed by TV-grab sampling of carbonate crusts on top of Kiel Mount (Stat.300-301). The afternoon was dedicated to another multibeam survey further upslope southeast of Kiel Mount (Stat 302) . The survey revealed a multitude of interesting features. Because of the limited time we could only survey one area with the OFOS (Stat 303) until mid night. This site was dominated by an elongated carbonate mound, which was partly covered with dense *Lophelia* thickets which were hitherto not reported for the western part of Rockall Bank. The new mound was named "Franken Mound".

Sunday 02.05.: The rest of the night was dedicated to bottom sampling in the newly surveyed sites. A series of Van Veen grabs were deployed on Kiel mount (Stat 304-309). This was followed by box grab sampling and a gravity corer cast (Stat 310-313) A CTD/Ro followed at the Franken Mound (Stat. 314). The rest of the day was spent with Van Veen grab sampling on Franken Mound which was only of moderate success since the weather conditions quickly deteriorated. We left the station shortly before mid night and steamed back to the Porcupine Seabight area.

Monday 03.05.: We continued our transit with strong gale (Beaufort 8-9) from northwest. A further station on Porcupine Bank had to be cancelled because of the rough sea which prevented gear deployments. We therefore continued our passage to Cork.

Tuesday 04.05.: We continued our transit. In the meantime winds had increased to 10 Beaufort with gusts of 12.

Gears employed:

Dredging operation, Lander Deployments, OFOS, MOCNESS Net, Parasound, CTD/Rosette, Box Corer, Multiple Corer, Van Veen Grab, Gravity Corer, TV Grab

Cruise track and working areas of leg M61-1:



