

BELGICA CRUISE 2005/29 - REPORT

MOMO/MAREBASSE/MESH Period: 21-24/11/2005



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CONTENT

1. Cruise details
2. Participants
3. Scientific objectives
4. Operational course
5. Remarks
6. Track Plot
7. Measurements
 - 7.1 MOMO project
 - 7.2 MAREBASSE/MESH project

1. CRUISE DETAILS

1.	Cruise number	2005-29
2.	Date / hour (local time)	Zeebrugge TD: 21/11, 16h30 Zeebrugge TA: 22/11, 10h45 Zeebrugge TD: 22/11, 12h30 Zeebrugge TA: 23/11, 9h45 Zeebrugge TD: 23/11, 10h45 Zeebrugge TA: 24/11, 0h00
3.	Responsible scientist	Dr. Michael FETTWEIS (21-22/11) Samuel DELEU (22-24/11) with Isabelle DU FOUR as assistant chief scientist
	Participating institutions	MUMM, UG-RCMG, UG-MARBIO, MAGELAS
4.	Area of interest	B + NI continental shelf

2. SCIENTIFIC PERSONNEL

Name	Institution-Team	On board 21-22/11	On board 22-23/11	On board 23-24/11
FETTWEIS Michael	MUMM-MOMO	X		
VAN DEN EYNDE Dries	MUMM-MOMO	X		
FRANCKEN Fritz	MUMM-MOMO	X		
BACKERS Joan	MUMM-MOMO	X		
DE BLAUWE Jean-Pierre	MUMM-MOMO	X		
DELEU Samuel	UG-RCMG		X	X
DU FOUR Isabelle	UG-RCMG		X	X
VERCRUYSSSE Jeroen	UG-RCMG		X	X
SCHELFAUT Kristien	UG-RCMG		X	X
MOERNAUT Jasper	UG-RCMG		X	X
BAEYE Matthias	UG-RCMG		X	X
RABAUT Marijn	UG-MARBIO		X	X
BEUSELINCK Bart	UG-MARBIO		X	X
MOERKERKE Geert	MAGELAS			X
TOTAL aboard		5	8	9

3. SCIENTIFIC OBJECTIVES

MOMO project (MUMM):

MOMO stands for the *monitoring and modelling of cohesive sediment transport and the evaluation of the effects on the marine ecosystem due to dredging and dumping operations*. The primary objective of the project is the study of the cohesive sediments on the Belgian Continental Shelf (BCS) using numerical models and field measurements. The combination of monitoring and modelling will provide information on the transport processes of this fine fraction and is therefore fundamental to answer questions on composition, origin and residence of it on the BCS, the change in characteristics of this sediment due to dredging and dumping operations, the effects of the natural variability, the impact on the marine ecosystem especially due to alterations of habitats, the estimation of the net input of hazardous substances in the marine environment and the possibilities to reduce these last two items.

MAREBASSE project (RCMG/MUMM/MARBIO/MAGELAS):

The -Marebasse- research project is essentially meant to set-up an integrated assessment framework for marine aggregates. This framework is regarded important to answer management/policy questions on how a sustainable exploitation of marine resources should be viewed and what approaches should be envisaged. This implies that essentially an increase of knowledge is necessary on the level of the sediments themselves and their distribution, but also on the dynamical environment. The project is structured around a three-tiered approach encompassing three spatial scales: broad-based, regional and site-specific. Fieldwork programmes are the focal point of the regional and site-specific research, however with a coupling towards the broad-based approach.

MESH (Development of a framework for Mapping European Seabed Habitats) (RCMG)

MESH is an EU Interreg IIIb-funded international marine habitat mapping programme aiming at the development of international standards and protocols for seabed mapping. Partnership: Joint Nature Conservation Committee (JNCC, coordination) (UK); Ghent University (B); IFREMER (FR); Marine Institute (IRL); Alterra-Texel (NL); TNO Environment, Energy and Process Innovation (NL); Centre for Environment, Fisheries and Aquaculture Science (CEFAS) (UK); Department for Agriculture and Rural Development, Northern Ireland (DARD) (UK); English Nature (UK); Envision Mapping Ltd (UK); National Museums and Galleries of Wales (NMGW) (UK); Natural Environment Research Council (British Geological Survey) (BGS) (UK)

4. OPERATIONAL COURSE

All times are given in local time.

Monday, November 21st

10h00-	embarkation of instruments, calibration of Lisst reparation of 'grand com'
16h30	Departure from Zeebrugge.
16h30-17h15	Transit to 'Meetpaal MOW1' Anchoring at location: 51°N 21.812', 3°E 7.1955'
17h45-	Start of through tide cycle, SeaCat in water
17h55	Rosette in water
	18h00
18h20, 18h40, 19h00	Niskin samples 1, 2, 3, 4
19h20, 19h40, 20h00	Niskin samples 5, 6, 7
20h20, 20h40, 21h00	Niskin samples 8, 9, 10
21h20, 21h40, 22h00	Niskin samples 11, 12, 13
22h20, 22h40, 23h00	Niskin samples 14, 15, 16
23h20, 23h40,	

Tuesday, November 22nd

	00h00	Niskin samples 17, 18, 19
00h20, 00h40, 01h00		Niskin samples 20, 21, 22
01h20, 01h40, 02h00		Niskin samples 23, 24, 25
02h20, 02h40, 03h00		Niskin samples 26, 27, 28
03h20, 03h40, 04h00		Niskin samples 29, 30, 31
04h20, 04h40, 05h00		Niskin samples 32, 33, 34
05h20, 05h40, 06h00		Niskin samples 35, 36, 37
06h20, 06h40, 07h00		Niskin samples 38, 39, 40 End of through tide cycle
07h11		Van Veen grab sample at MOW1: 51° N 21.783', 3° E 7.2082'
07h00-08h00		downloading of data from LISST failed, LISST could not been reprogrammed for mounting on tripod preparation of tripod (without LISST) + ADCP
08h00		anchor up
09h11		deployment of tripod at 51° N 21.687', 3° E 7.4071' (tss depth -10 m)
09h33		deployment of ADCP at 51° N 21.669, 3° E 7.4080'
09h35-10h45		Transit to Zeebrugge
10h45-12h30		Touch & Go at Zeebrugge. Disembarkation of MOMO team. Embarkation of UG-RCMG and UG-MARBIO teams.

12h30-14h30	Transit to Thorntonbank for multibeam calibration over a wreck.
14h30-15h00	Sound velocity profile.
15h00-17h00	Calibration multibeam: roll, heading and outer beam calibration.
17h00-18h00	Transit to Vlake van de Raan.
18h00-	Sound velocity profile and multibeam measurements.

Wednesday, November 23rd

- 8h30	Multibeam measurements.
8h30 - 9h45	Transit to Zeebrugge.
9h45-11h30	Touch & go at Zeebrugge for embarkment of Geert Moerkerke and Sidescan sonar equipment.
11h30-13h00	Transit to Vlake van de Raan.
13h00-22h30	Sidescan sonar measurements.
22h30	An oil leakage is noticed at the propeller-shaft, measurements are cancelled and it is decided to end the campaign.
22h30-	Transit to Zeebrugge.

Thursday November, 24th

0h00	End of campaign.
8h00-11h30	Disembarkment UG-RCMG, UG-MARBIO and MAGELAS staff and equipment.

5. REMARKS

Part 1 of the campaign: MUMM

The departure from Zeebrugge on Monday 21/11 was delayed until 16h30, because the 'grand com' installation did not work. After reparation the Belgica left Zeebrugge.

The delay did not change the MOMO programme fundamentally, because sufficient time was still available to carry out the through tide measurements (13h). Nevertheless the scientific objectives were only partly fulfilled, because of failure of the LISST 100 and the Valeport 106 instruments:

- In the afternoon of the 21/11 problems were encountered during establishing of communication with the LISST. After several trials we succeed to measure a background spectrum and to programme the LISST for deployment on the Rosette. The problem could have been solved by waiting 25 minutes between disconnection of old and connection of new battery pack.
- After recuperation of the LISST on 22/11 we did not succeed to download the data from the LISST. No communication was possible with the instrument. The LISST was thus not mounted on the tripod.
- During the beginning of the through tide measurements problems were encountered with the Valeport 106 current meter and the instrument was taken out of the water.

Mooring of tripod and ADCP was carried out very efficiently, which is partly explained by the good weather conditions but largely due to the skills of the Belgica crew. We want to thank everybody again for help and good will.

Part 2 of the campaign: UG-RCMG, UG-MARBIO, MAGELAS

Serious problems were observed during acquisition of multibeam data.

-A first problem was observed during heading calibration over a wreck. Two lines were sailed, one with its eastern outer beams covering a wreck, the second with its western outer beams covering the same wreck. When trying to match the overlap depth values, a very large heading offset was observed: more or less 4 degrees.

-The biggest problem is however the 'smiley' over each swath causing a systematically pattern of the outer beams curving upwards. The important question arises here which values are correct, the inner beams or the outer beams. The intensity graph over the swath with phase/amplitude detections has in general a different intensity distribution as it used to be before. This problem should be solved for future useable multibeam recordings.

The hydraulic side-winch had an oil leakage, observed Tuesday evening, making it impossible to perform video recordings or Van Veen grabs.

An oil leakage was observed Thursday night near the propeller, leading to the end of the campaign.

Thanks to the crew of the Belgica and to Joan Backers for the assistance, making a GPS input string needed for Sidescan sonar measurements.

6. TRACK PLOT

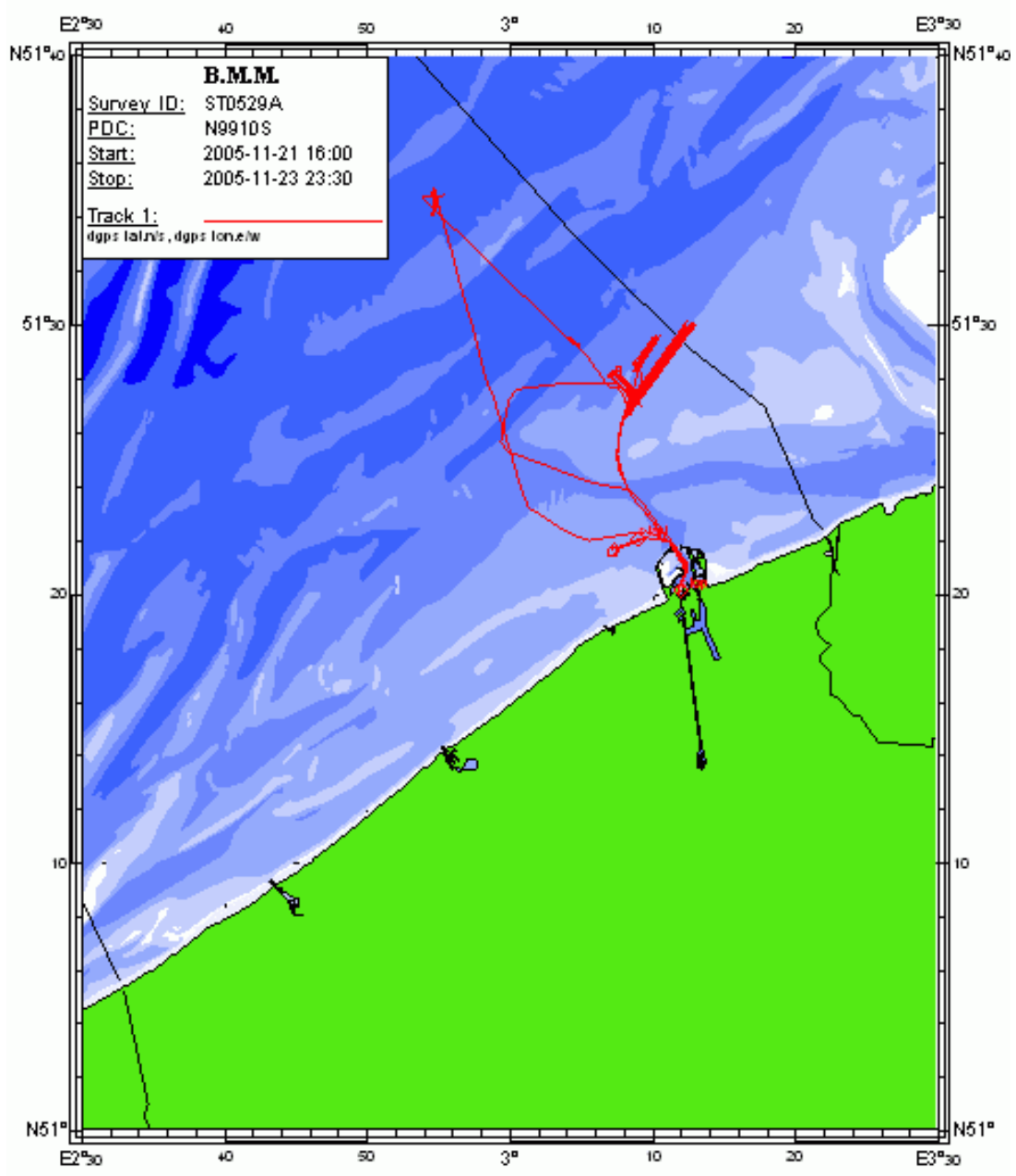


Figure 1: Track plot of the whole campaign.

7. MEASUREMENTS

7.1. MOMO-project

1) Moorings

In order to measure suspended sediment transport during a longer period, the tripod, the bottom mounted ADCP and a buoy have been moored near the 'Meetpaal MOW1', on the same locations as during campaign 2005/02-03, 2005/07-08 and 2005/15-18, see table below.

On the tripod the instruments (SonTek/YSI ADV Ocean/Hydra, SonTek/YSI 3MHz ADP, OBS) were mounted for a long period (10 days).

It is planned to recuperate the instrument on Friday 2 December during campaign 2005/30.

Table 1: Position of the moorings and through tide measurements.

Station	Instrument	Lat/lon WGS 84	Start (GMT)	End (GMT)
MOW1	Through tide	51°N 21.812' 3°E 7.1955'	21/11/2005 16h45	22/11/2005 6h00
"	Tripod	51° N 21.687' 3° E 7.4071'	22/11/2005 08h11	to be recovered on 2/12
"	ADCP	51° N 21.669 3° E 7.4080'	22/06/2005 08h33	to be recovered on 2/12

2) Through tide measurement and water sampling

One through tide cycle was carried out during the night of Monday/Tuesday near Meetpaal MOW1 (see table 1).

Instruments used were: SBE19 CTD SeaCat, SBE09 CTD Rosette, Lisst 100C, Valeport Model 106 current meter (did not work, see above), hull mounted ADCP

Water samples were taken every 20'. Rosette was taken out of water every hour for emptying Niskin bottles. Filtration to determine SPM concentration was carried on every 20' samples and to determine POC/PON concentration on every 1 hour samples. Water samples for salinity were taken every hour.

3) Bottom sample with Van Veen grab

A Van Veen grab was taken on the through tide location.

Table 2: Coordinates, time and description of Van Veen grab sample (WGS84).

Station	Lat (°N)	Lon (°E)	Date Time (GMT)	Description
VV0529-MOW1	51° 21.783	3° 7.2082	22/11/05 6h11	thin layer (1-2 mm) of sand on soft to medium consolidated mud (Holocene)

7.2. MAREBASSE/MESH project

-25 multibeam lines have been recorded at the Vlakte van de Raan.

Start line: 510304; 5700087 or 51°27.11; 3°08.89 to 514259; 5704690 or 51°29.59; 3°12.32

-9 sidescan lines have been recorded at the Vlakte van de Raan in 2 closeby areas.

Part 1

Start line: 509991.28; 5700348.09 or 51°27.25; 3°08.62 to 508384.00; 5701733.65 or 51°28.00;
3°07.24

Part 2

Start line: 510501.26; 5702654.24 or 51°28.49; 3°09.07 to 511818.90; 5704277.28 or 51°29.37;
3°10.21