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GEOLOGY - Cruise 05/17

Period: 4-8/07/2005

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1. BELGICA CRUISE ST2005-17

1.	Cruise number	2005-17
2.	Date / hour	Zeebrugge 04/07, cancelled Zeebrugge 05/07, cancelled Zeebrugge 06/07 departure 9h Zeebrugge 07/07 arrival 23h40 Zeebrugge 08/07 disembarkment
3.	Chief scientist Participating institutions	Vera VAN LANCKER UG-RCMG, FSE, IFREMER, MAGELAS
4.	Measurement area	Eastern Belgian coastal zone, area around the Akkaert Bank, Sierra Ventana region
5.	Number of scientists	July 4 – July 8: 11

General remark: Weather circumstances were largely unfavourable to carry out acoustic measurements.

2. PARTICIPANTS

		July 4-6 (Zeebrugge harbour)	July 6-8
UG-RCMG	Vera VAN LANCKER, <i>chief scientist</i>		X
	Samuel DELEU		X
	Valérie BELLEC		X
	Els VERFAILLIE		X
	Isabelle DU FOUR		X
	Mieke MATHYS		X
	Koen DE RYCKER		X
FSE	Marc ROCHE	X	X
	Koen DEGRENDELE	(X)	X
IFREMER	Yves LE GALL	X	X
	Marc DERRIEN	X	X
TOTAL		(3)-4	11

3. PROGRAM OBJECTIVES

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)

STUDY OF THE GEOLOGICAL EVOLUTION OF THE BELGIAN CONTINENTAL SHELF (UG-MATHYS, RCMG)

Within the framework of a PhD investigation regarding the development of a genetic model of the geological Quaternary evolution of the Belgium Continental Shelf, additional seismic data are required. An important zone where data lack is situated near the 'Vlakte van de Raan'. This zone, with a continuous Quaternary cover, is situated in the middle of three well-investigated areas: the Thornton Bank, the coastal plain and the area offshore Oostende (Belgica 2004-15). The study of this 'hinge point' will make it possible to correlate the latter areas. Moreover, the seismic data will be compared to a number of deep cores, which are already obtained in the proposed investigation area.

Federal Public Service Economy, SMEs, Self-employed and Energy, Marine Sand Fund (P. Degavre)

Implementation of the continuous investigation laid down in section 3, §2, subsection 3, of the law of June 13th 1969, concerning the exploration and exploitation of non living resources on the Belgian Continental Shelf, and the concession decisions.

The follow up of the repercussions of the sand extraction on the stability of the sand banks en surrounding area in the exploitation zones, in order to formulate policies

concerning the exploitation in the concession zones on a scientific base. The sediments of the Belgian continental shelf will be investigated in order to:

1. Establish the impact of sand extraction on the sand budget and seabed sediments.
2. Survey the sand winning sites to detect significant changes of the seabed sediments and the morphology of the seabed and sand banks in order to guarantee the availability of sand to extract in the future.

4. LOCALISATION, MEASUREMENTS & RESULTS

MAREBASSE / MESH (UG-VAN LANCKER, RCMG)

The purpose of this campaign was

- to collect highly detailed side-scan sonar data in the swale between the West- and Oosthinder sandbank
- seismic lines along the Kwinte Bank
- cooperation in the 13hrs multibeam cycle on the Kwinte Bank

Given the bad forecasts, provided on Monday July 4, it was decided to plan an alternative campaign scheme in case the weather would remain unfavourable to carry out acoustic measurement during the rest of the week. As such, Van Veen sample locations and video stations were prepared.


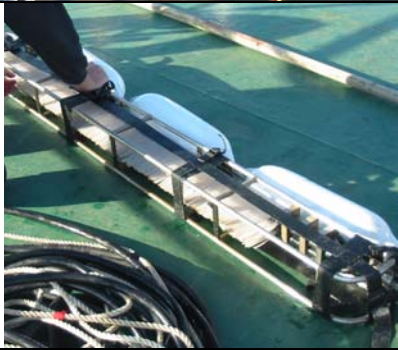
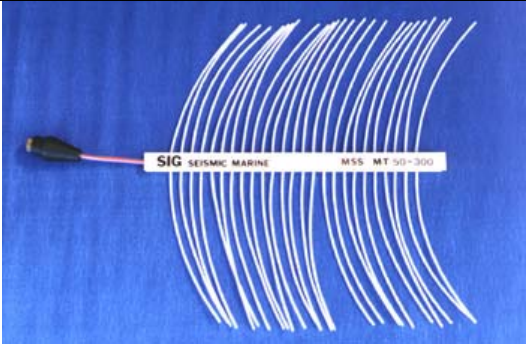
The Van Veen locations were chosen in function of the refinement of the new sedimentological map of the Belgian shelf. Although, the knowledge gaps are mainly situated to the north of the Belgian shelf, the samples were chosen not too far from the coast where the sea state is somewhat better than further offshore. Additional samples were also taken in the area of the Sierra Ventana in favour of supporting on-going research related to the dumping site of dredged material and its potential rehabilitation into an area of aggregate extraction.

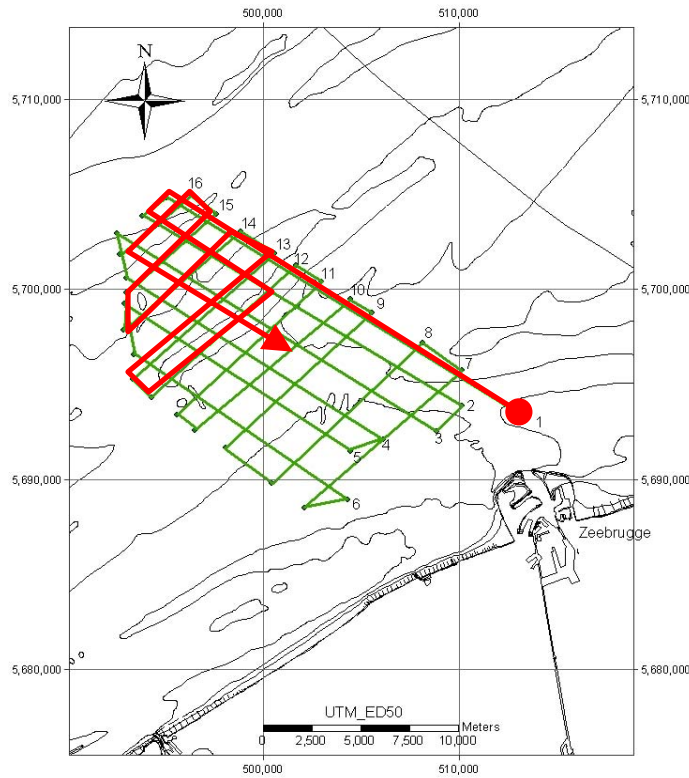
All of the Van Veen samples (53) were taken. The weather did not allow video recordings.

STUDY OF THE GEOLOGICAL EVOLUTION OF THE BELGIAN CONTINENTAL SHELF (UG-MATHYS, RCMG)

Research area: 'Vlakte van de Raan', Akkaert Bank, Goote Bank

Measurements: Seismic recordings were planned using different sources: boomer (Seistec) and sparker (Centipede and SIG). The weather circumstances permitted only the use of the SIG sparker.

<p>Boomer (Seistec):</p> <ul style="list-style-type: none"> -Until 3 Beaufort -1000-5000Hz (main frequency of 2500Hz) -frame: 257*73*65cm; 100kg -75m cables: 1 signal, 2 high-voltage -30m towrope -SPA-3 receiver unit + lunchbox-pc -HV-power supply: 220V-16A -winch + A-frame 	
<p>Sparker (Centipede):</p> <ul style="list-style-type: none"> -Until 3 Beaufort -1100-1200Hz -frame: 195*20*20cm; 25kg -50m cable -30m towrope -HV-power supply: 220V-16A -streamer (5m + 75m cable); receiver-unit/band-passfilter/lunchbox-PC 	
<p>Sparker (SIG):</p> <ul style="list-style-type: none"> -Until 4 Beaufort -800-900Hz -frame: 40*100cm; 1,25kg -50m or 75m cable -30m towrope -HV-power supply: 220V-16A -streamer (5m + 75m cable); receiver-unit/band-passfilter/lunchbox-PC 	



Map of the seismic lines that were planned (green) and actually acquired during the campaign (red)
Coordinates of the seismic lines

	Lat (WGS84)	Long (WGS84)	Lat (WGS84)	Long (WGS84)
Profiel	NW-uiteinde		SE-uiteinde	
1	51 29.558	2 55.631	51 23.291	3 11.488
2	51 29.030	2 54.569	51 23.652	3 08.689
3	51 28.553	2 53.426	51 22.922	3 07.545
4	51 27.261	2 53.838	51 22.687	3 05.181
5	51 26.546	2 53.758	51 22.364	3 03.767
6	51 25.101	2 54.196	51 20.987	3 03.602
	NE-uiteinde		SW-uiteinde	
7	51 24.656	3 08.692	51 20.749	3 01.728
8	51 25.423	3 06.927	51 22.467	2 58.251
9	51 21.447	3 00.289	51 26.292	3 04.698
10	51 26.667	3 03.746	51 23.385	2 56.103
11	51 22.943	2 56.892	51 27.178	3 02.467
12	51 27.637	3 01.351	51 24.404	2 54.143
13	51 23.877	2 54.960	51 27.978	3 00.398
14	51 28.590	2 58.901	51 26.869	2 53.839
15	51 25.798	2 53.732	51 29.100	2 57.838
16	51 29.627	2 56.721	51 27.941	2 53.564

Results: About 84km of the planned 225km has been covered during the campaign, using the SIG sparker. The quality of the data is not optimal, but acceptable. Seismic lines, which are not good enough, will be covered again during the next campaign (ST2005-23).

Federal Public Service Economy, SMEs, Self-employed and Energy, Marine Sand Fund (P. Degavre)

No measurements. The weather conditions were largely unfavourable for the kind of measurements planned by FSE.

5. OPERATIONS

All times are given in local time.

Monday, July 4th

9h00 – 11h00 Embarkation of instruments: seismic equipment (both from IFREMER & RCMG), side-scan sonar equipment (Magelas) and of RCMG, FSE, IFREMER & MAGELAS staff.

Weather circumstances were largely unfavourable to sail off from Zeebrugge. The Commander demanded a detailed forecast and this was evaluated together with the scientific teams.

Given the sensitivity of the planned acoustic measurements, it was decided to postpone the measurements up till Wednesday morning 8h.

Given the bad forecasts, it was already decided to cancel the side-scan sonar operations and to give priority to the seismic investigations. A new plan was prepared that also included Van Veen samples and video recordings in case the weather would remain unfavourable for the acoustic measurements.

15h30 Disembarkation of RCMG and Magelas staff. FSE and IFREMER decided to stay on board until Wednesday (12h50-15h00: manoeuvres along the quay).

Tuesday, July 5th

Zeebrugge

12h Confirmation of the Commander to sail off from Zeebrugge on Wednesday morning, 9h.

Wednesday, July 6th

9h Sail off from Zeebrugge.

Transit to the area of interest of Mieke Mathys for seismic investigations. Meanwhile, multibeam recordings are carried out. The latter data will be used for seabed classification.

10h10	On track, preparation of SIG and Centiped sparker
10h30	Start recordings with SIG sparker, bad quality data
12h30	Stop recording and test streamer
12h50	Continuation recordings, better quality after adapting transfo for battery streamer
14h30	Stop recording with SIG sparker
14h50	Test Centiped sparker, but short-circuit in cable, change back to SIG sparker
15h00	Continue recordings with SIG
22h30	Stop recording, adjustment of the SIG sparker
22h43	Continue recording with SIG sparker

Thursday, July 7th

Continuation seismic recordings

03h10 Stop seismic recordings, weather is too bad

Transit to Kwinte Bank with the purpose of testing the seismic instrumentation of Ifremer when the weather becomes favourable.

The weather circumstances and forecasts remain bad and as such it is decided to start Van Veen sampling. If the sea state would improve priority is given to the seismic measurements.

Transit to the area around the Akkaert Bank for Van Veen sampling

(09h20-09h29 helicopter exercises)

09h42 – 15h32 Van Veen sampling in function of the new sedimentological map of the Belgian shelf

Transit to the Sierra Ventana area

16h35 – 22h30 Van Veen sampling in the Sierra Ventana region

Weather circumstances were frequently evaluated in favour of the testing of Ifremer's equipment. However, the sea state remained unfavourable and finally, around 18h30, it was decided to cancel these operations and to head for Zeebrugge after the Van Veen sampling is finished.

Sail towards Zeebrugge

23h40 Arrival at Zeebrugge

23h40 - Preparation to allow an efficient disembarkment of all equipment on Friday morning

Friday, July 8th

- 02h00 Preparation to allow an efficient disembarkment of all equipment on Friday morning

06h00 – 08h00 Disembarkment of all equipment and scientific personnel to allow the RV Belgica to join the Fleet review on time.

- End of campaign ST0517 -

6. REMARKS ON THE MEASUREMENT INSTRUMENTS AND ON THE OPERATIONAL COURSE OF THE CAMPAIGN

The officers and crew of the Belgica are greatly acknowledged for their cooperation.

Annex - LIST OF THE SAMPLINGS

MAREBASSE / MESH (neighbourhood of Kwinte Bank, Akkaert Bank, Sierra Ventana)

Id	E_UTM_WGS	N_UTM_WGS	lat_UTM	long_UTM
ST0517_S01	483581	5693891	51 23.761	2 45.840
ST0517_S02	485113	5695392	51 24.573	2 47.157
ST0517_S03	486458	5696549	51 25.199	2 48.315
ST0517_S04	486083	5693922	51 23.782	2 47.997
ST0517_S05	485801	5691921	51 22.702	2 47.759
ST0517_S06	483925	5690983	51 22.193	2 46.144
ST0517_S07	482080	5689795	51 21.548	2 44.558
ST0517_S08	487802	5692171	51 22.839	2 49.484
ST0517_S09	489710	5693078	51 23.331	2 51.127
ST0517_S10	492430	5691640	51 22.557	2 53.474
ST0517_S11	490835	5690608	51 21.999	2 52.101
ST0517_S12	489366	5689451	51 21.374	2 50.836
ST0517_S13	487896	5687981	51 20.579	2 49.573
ST0517_S14	484425	5694673	51 24.184	2 46.566
ST0517_S15	485801	5696017	51 24.911	2 47.749
ST0517_S16	485958	5694985	51 24.355	2 47.887
ST0517_S17	485020	5693422	51 23.510	2 47.081
ST0517_S18	486114	5692890	51 23.225	2 48.026
ST0517_S19	490522	5693516	51 23.568	2 51.827
ST0517_S20	488740	5692484	51 23.009	2 50.292
ST0517_S21	486833	5691984	51 22.737	2 48.649
ST0517_S22	484894	5691452	51 22.447	2 46.979
ST0517_S23	483018	5690483	51 21.921	2 45.364
ST0517_S24	491492	5691202	51 22.320	2 52.666
ST0517_S25	490116	5690139	51 21.746	2 51.482
ST0517_S26	488584	5688763	51 21.002	2 50.164
ST0517_S27	507000	5703083	51 28.732	3 6.048
ST0517_S28	508282	5703959	51 29.203	3 7.157
ST0517_S29	509408	5704834	51 29.674	3 8.131
ST0517_S30	510408	5705803	51 30.196	3 8.997

MAREBASSE / MESH (Sierra Ventana region)

Id	E_UTM_WGS	N_UTM_WGS	lat_UTM	long_UTM
ST0517_SV01	503721	5696768	51 25.326	3 3.211
ST0517_SV02	502748	5696768	51 25.327	3 2.372
ST0517_SV03	503170	5697218	51 25.569	3 2.735
ST0517_SV04	502240	5697218	51 25.570	3 1.933
ST0517_SV05	501703	5696739	51 25.311	3 1.469
ST0517_SV06	501238	5697218	51 25.570	3 1.068
ST0517_SV07	500701	5696768	51 25.327	3 0.604
ST0517_SV08	500236	5697247	51 25.586	3 0.203
ST0517_SV09	500730	5697741	51 25.852	3 0.630
ST0517_SV10	501775	5697741	51 25.852	3 1.532
ST0517_SV11	502255	5698278	51 26.142	3 1.946
ST0517_SV12	501238	5698249	51 26.126	3 1.069
ST0517_SV13	500236	5698249	51 26.126	3 0.204
ST0517_SV14	500744	5698787	51 26.416	3 0.642
ST0517_SV15	500250	5699251	51 26.667	3 0.216
ST0517_SV16	500221	5699760	51 26.941	3 0.191
ST0517_SV17	500192	5700413	51 27.294	3 0.166
ST0517_SV18	501267	5700224	51 27.192	3 1.094
ST0517_SV19	501746	5700762	51 27.482	3 1.508
ST0517_SV20	501093	5700892	51 27.552	3 0.944
ST0517_SV21	501732	5701735	51 28.007	3 1.496
ST0517_SV22	502269	5701328	51 27.787	3 1.960
ST0517_SV23	502865	5702229	51 28.273	3 2.475

Overall trackplot of campaign ST0517

