

BELGICA CRUISE 06/12

Subscriber	: Prof. Dr. J. -P. HENRIET
Institution	: UG - Renard Centre of Marine Geology
Responsible	: Prof. Dr. J. -P. HENRIET
2nd Responsible	: Dr. David Van Rooij
Telephone	: +32 9 264 45 85
Fax	: +32 9 264 49 67
E-mail	: jeanpierre.henriet@ugent.be or david.vanrooij@ugent.be

GEOLOGY - Cruise 06/12 Period: 13/06/06 to 20/06/06

I - Cruise form Belgica 06/12

II - Programme Belgica 06/12

1. List of participants
2. Objectives & framework
3. Localization
4. Operations
5. Laboratories
6. Infrastructure and instrumentation needed
7. Sampling programme
8. Automatic data acquisition
9. Embarkation and disembarkation of material
10. Transport facilities

Addendum 1 : Localization (Figs. 1-6)

Addendum 2 : Request for embarkation

Addendum 3 : Planning

I - CRUISE FORM BELGICA 2006

1.	Cruise number	06/12
2.	Date/hr Start Brest (France) Arrival Cork (Ireland)	13/06/2006 at 08:00 20/06/2006 at 16:00
3.	Responsible scientists Participating institutions	Prof. Dr. J.-P. HENRIET, Dr. D. VAN ROOIJ RCMG - Ghent University, University College Cork (Ireland), IFREMER (France)
4.	Area of interest – geographical zone DIPCLEAR necessary ?	French & Irish EZ Yes
5.	Number of scientists	13/06/2006 – 20/06/2006: 13
6.	Intervention ? - Navy divers - Navy medical assistance - Pilots Place & time embarkement/disembarkement:	No No As deemed necessary by the Commandant for exiting Brest (FR) / entering Cork (IE)
7.	Infrastructure needed on the quay or onboard for the embarkment or disembarkment of equipment? Localisation and time inclusive equipment to be embarked or disembarked.	No infrastructure is needed for embarkation or disembarkation in Brest/Cork 1. Mobilisation Zeebrugge (23-24/05/2006): Belgica crane for seismic equipment. Large crane for winch and ROV 2. Demobilisation Zeebrugge (29/05/2006): Belgica crane for seismic equipment. Large crane for winch and ROV
8.	Logistic assistance MUMM ? SCTD, data acquisition (ODAS) or else	Yes, start-up ODAS and connection SCTD for multibeam, activation hull-mounted ADCP

9. <u>Remarks:</u>	<p>In addition to the original campaign proposal, 2 supplementary operations require approval or assistance from the MUMM:</p> <ul style="list-style-type: none"> - We would like to make use of the hull-mounted ADCP for assessment of currents during ROV operations. Therefore, it would be useful to meet with a MUMM scientist during the mobilization on 23-24 May for instruction - In order to facilitate the eventual relocation of equipment on deck, the MUMM Tripod chariots are requested to be on board
Chief scientist:	Prof. Dr. J. P. Henriet
Date and signature	<i>Signed 30/04/2006</i>
For approval MUMM:	

II - PROGRAMME BELGICA CRUISE 06/12

Subscriber: PROF. DR. J.-P. HENRIET
Institution: Renard Centre of Marine Geology (RCMG), Ghent University
Responsible: Prof. Dr. J.-P. Henriet
2nd responsible: Dr. D. VAN ROOIJ
telephone: +32 9 264 45 85
fax: +32 9 264 49 67
e-mail: jeanpierre.henriet@ugent.be or david.vanrooij@ugent.be

1. LIST OF PARTICIPANTS

SC1	Jean-Pierre HENRIET	UG, RCMG
SC2	Willem VERSTEEG	UG, RCMG
SC3	David VAN ROOIJ	UG, RCMG
SC4	Peter STAELENS	UG, RCMG
SC5	Andrew WHEELER*#	UCC
SC6	Erwan LE GUILLOUX*	IFREMER
SC7	Anneleen FOUBERT	UG, RCMG
SC8	Veerle HUVENNE	UG, RCMG
SC9	Jeroen VERCRUYSSSE	UG, RCMG
SC10	Koen DE RYCKER	UG, RCMG
SC11	Katja GUILINI*#	UG, RCMG
SC12	Mieke EGGERMONT*	UG, RCMG
SC13	Frederik ROOSE*	UG, RCMG
Total		13

* First embarkation on R/V BELGICA, details provided in addendum 2

Vegetarian

2. PROGRAMME OBJECTIVES

Within the framework of the EC IP FP6 HERMES project, RCMG will test for the first time its ROV on several coral-rich sites along the Celtic Margin (Area 1) and the Porcupine Basin (Area 2). The La Chapelle Bank (Celtic Margin) and adjacent canyons were earlier recognized by Zibrowius and Le Danois as a “hotspot” of deep-water corals. In the Porcupine Basin, Thérèse mound as well as the Moira mounds will be revisited for an extra visual reconnaissance. Also the recently drilling IODP expedition 307 sites will be revisited for additional high-resolution seismic profiling.

This campaign will be executed in cooperation with the department DRO-DEEP/LEP of IFREMER (France), University College Cork (Ireland) and the National Oceanography Centre Southampton (United Kingdom).

This campaign will focus on the following topics:

- La Chapelle Bank (Area 1): first test and deployment site for the ROV. Visual observations will be supported with multibeam mapping and high-resolution seismic profiling. Current information through the water column will be obtained with the hull-mounted ADCP.
- Porcupine Seabight (Area 2): ROV observation dives within the vicinity of Thérèse mound and the Moira mounds. Current information through the water column will be obtained with the hull-mounted ADCP.
- Additional high-resolution seismic profiling of previously drilled IODP sites
- Additional high-resolution seismic profiling of the Enya mounds and associated pockmark field

3. LOCALIZATION

The two study areas are located on respectively the Celtic Margin and the Porcupine Seabight, at water depths between 250 and 1000 m depth (Figure 1).

Area 1 is located in the vicinity of the *La Chapelle Bank* (7°45'W/6°30'W/47°30'N/47°45'N)

Area 2 is located in the Porcupine Seabight, comprising the *Moira mounds*, *Thérèse mound* and the *Enya mounds* (12°15'W/11°05'W/51°N/51°30'N).

4. OPERATIONS

The operational programme is illustrated with the planning schedule in addendum 3. The preferred waypoints with name of the study objective are displayed below. Electrical propulsion is preferred during the acquisition of seismic data and ROV operations. During the surface sparker measurements, an average maximum speed of 3 kt is preferred. For the multibeam acquisition, a survey speed of 8 knots is requested. During ROV observations, a near to stationary mode is required.

1. Multibeam reconnaissance coverage within area 1

- Survey box: 7°22'W/7°15'W/47°33'N/47°36'N (400-1000 m bsl)
- Upon entry of survey box: SVP (with CTD cast) and multibeam calibration
- Survey lines will be sailed in a NNE-SSW orientation
- Actual spacing and position of the lines will be decided after calibration

2. ROV operations Area 1: testing of equipment and seabed observations on selected locations (to be concreted after multibeam survey)

Station n°	Latitude	Longitude	Depth (m)
CB-1	47°35.3400'N	7°16.8600'W	251
CB-2	47°35.5800'N	7°16.8600'W	228
CB-3	47°33.2400'N	7°14.4600'W	340
CB-4	47°33.8400'N	7°19.5600'W	650
CB-5	47°34.2600'N	7°19.3800'W	530
CB-6	47°33.9600'N	7°19.0200'W	720
CB-7	47°34.2000'N	7°18.4200'W	580
CB-8	47°24.7638'N	6°37.1855'W	1000

3. Seismic survey of Area 1

Waypoint	Latitude	Longitude
C1	47°33.3801'N	6°48.6302'W
C2	47°40.4207'N	7°07.8285'W
C3	47°33.9153'N	7°20.1649'W
C4	47°33.7161'N	7°19.9013'W
C5	47°35.6706'N	7°16.2645'W
C6	47°35.5158'N	7°16.0339'W
C7	47°33.5833'N	7°19.7036'W
C8	47°33.4016'N	7°19.5058'W
C9	47°34.0948'N	7°18.2280'W
C10	47°34.9137'N	7°19.3810'W
C11	47°35.0469'N	7°19.1517'W
C12	47°34.2281'N	7°17.9987'W

4. ROV operations Area 2: seabed observations along selected tracks or on locations (to be concreted on board)

Dive track Moira N

Waypoint	Latitude	Longitude	Depth (m)
MN-1	51°26.8803'N	11°43.7994'W	900
MN-2	51°27.2590'N	11°43.7102'W	900
MN-3	51°27.0776'N	11°43.5605'W	900
MN-4	51°26.9920'N	11°43.8662'W	895
MN-5	51°26.9939'N	11°43.8631'W	895
MN-6	51°27.1075'N	11°43.6943'W	900
MN-7	51°27.0876'N	11°43.8694'W	890
MN-8	51°27.2690'N	11°44.1529'W	880
MN-9	51°27.3048'N	11°43.7580'W	900
MN-10	51°27.5639'N	11°44.1433'W	910
MN-11	51°28.0160'N	11°43.7420'W	890
MN-12	51°28.2970'N	11°44.3089'W	910
MN-13	51°28.2392'N	11°43.9809'W	900
MN-14	51°28.7052'N	11°43.6561'W	865
MN-15	51°28.6195'N	11°43.3280'W	870
MN-16	51°28.9381'N	11°43.0637'W	860
MN-17	51°28.8007'N	11°43.0510'W	865
MN-18	51°28.7947'N	11°43.2197'W	860
MN-19	51°28.6812'N	11°43.1943'W	870

Dive track Moira W

Waypoint	Latitude	Longitude	Depth (m)
MW-1	51°25.9621'N	11°49.1324'W	1090
MW-2	51°27.0439'N	11°49.9192'W	1040
MW-3	51°26.8281'N	11°48.7420'W	1080
MW-4	51°27.7065'N	11°49.6088'W	1030
MW-5	51°28.0439'N	11°48.6172'W	1040
MW-6	51°28.5751'N	11°49.5140'W	1000

Dive track Moira S

Waypoint	Latitude	Longitude	Depth (m)
TM-1	51°24.4256'N	11°45.7315'W	950

TM-2	51°24.4256'N	11°45.3458'W	950
TM-3	51°24.5651'N	11°45.2927'W	910
TM-4	51°24.7961'N	11°45.0537'W	895
TM-5	51°25.0906'N	11°44.8682'W	880
TM-6	51°24.9842'N	11°46.3227'W	990
TM-7	51°24.7727'N	11°46.1903'W	960
TM-8	51°24.8414'N	11°46.4323'W	1010
TM-9	51°24.6140'N	11°46.4209'W	1010
TM-10	51°24.5398'N	11°46.6797'W	1050
TM-11	51°24.4572'N	11°46.2210'W	990
TM-12	51°24.3496'N	11°46.2885'W	1010
TM-13	51°24.3514'N	11°46.2885'W	985
TM-14	51°24.0500'N	11°46.0575'W	1000
TM-15	51°24.0130'N	11°45.9168'W	990
TM-16	51°23.9142'N	11°46.1137'W	1010
TM-17	51°23.6303'N	11°46.0628'W	1020
TM-18	51°23.7397'N	11°45.8744'W	995
TM-19	51°23.5774'N	11°46.0121'W	1020

Dive track Thérèse mound

Waypoint	Latitude	Longitude
TM-1	51°25.9355'N	11°46.5737'W
TM-2	51°25.9345'N	11°46.0438'W
TM-3	51°25.8658'N	11°46.0423'W
TM-4	51°25.8630'N	11°46.5602'W
TM-5	51°25.7917'N	11°46.5587'W
TM-6	51°25.7880'N	11°46.0467'W
TM-7	51°25.7193'N	11°46.0438'W
TM-8	51°25.7193'N	11°46.5573'W
TM-9	51°25.6488'N	11°46.5587'W
TM-10	51°25.6450'N	11°46.0393'W
TM-11	51°25.5643'N	11°46.0423'W
TM-12	51°25.5615'N	11°46.5498'W
TM-13	51°25.4873'N	11°46.5468'W
TM-14	51°25.4910'N	11°46.1298'W
TM-15	51°25.9847'N	11°46.1298'W
TM-16	51°25.9873'N	11°46.2367'W
TM-17	51°25.4697'N	11°46.2367'W
TM-18	51°25.4678'N	11°46.3317'W
TM-19	51°25.9782'N	11°46.3272'W
TM-20	51°25.9762'N	11°46.4000'W
TM-21	51°25.4660'N	11°46.3985'W
TM-22	51°25.4642'N	11°46.4860'W
TM-23	51°25.9743'N	11°46.4875'W

Individual dive stations

Station	Latitude	Longitude	Depth (m)
Moira 1	51°26.0419'N	11°45.2115'W	940
Moira 2	51°25.9925'N	11°45.4954'W	940

5. Seismic survey of Area 2

IODP Site U1318

Waypoint	Latitude	Longitude
P1	51°26.4902'N	11°34.1934'W
P2	51°25.3649'N	11°33.2781'W
P3	51°25.4427'N	11°33.0356'W
P4	51°26.5680'N	11°33.9509'W
P5	51°26.6353'N	11°33.7253'W
P6	51°25.5136'N	11°33.7818'W
P7	51°25.5950'N	11°32.5507'W
P8	51°26.7061'N	11°33.4941'W
P9	51°26.8086'N	11°33.1896'W
P10	51°25.6941'N	11°33.1897'W
P11	51°25.7755'N	11°33.9416'W
P12	51°26.8830'N	11°32.9359'W
P13	51°26.9714'N	11°32.6427'W
P14	51°25.8499'N	11°31.6822'W
P15	51°25.9313'N	11°31.4285'W

P16	51°27.0563'N	11°32.3946'W
P17	51°27.0177'N	11°32.1350'W
P18	51°26.3808'N	11°34.2045'W
P19	51°26.2220'N	11°34.0859'W
P20	51°26.8837'N	11°32.0164'W
P21	51°26.7286'N	11°31.8977'W
P22	51°26.0668'N	11°33.9728'W
P23	51°25.9010'N	11°33.8429'W
P24	51°26.5593'N	11°31.7508'W
P25	51°26.4006'N	11°31.6265'W
P26	51°25.7423'N	11°33.7073'W
P27	51°25.5870'N	11°33.5886'W
P28	51°26.2489'N	11°31.5079'W
P29	51°26.0937'N	11°31.3723'W
P30	51°25.4282'N	11°33.4812'W

IODP Sites U1316 & 1317

Waypoint	Latitude	Longitude
M1	51°21.9422'N	11°44.0941'W
M2	51°22.8917'N	11°44.8494'W
M3	51°22.9322'N	11°44.7250'W
M4	51°21.9845'N	11°43.9641'W
M5	51°22.0251'N	11°43.8453'W
M6	51°22.9674'N	11°44.6006'W
M7	51°23.0097'N	11°44.4677'W
M8	51°22.0533'N	11°43.7125'W
M9	51°22.0883'N	11°43.6032'W
M10	51°23.0432'N	11°44.3433'W
M11	51°23.0802'N	11°44.2359'W
M12	51°22.1229'N	11°43.4768'W
M13	51°22.1624'N	11°43.3504'W
M14	51°23.1155'N	11°44.1228'W
M15	51°23.1860'N	11°43.8740'W
M16	51°22.2348'N	11°43.1272'W
M17	51°22.2736'N	11°43.0056'W
M18	51°23.2194'N	11°43.7609'W
M19	51°23.2600'N	11°43.6309'W
M20	51°22.3248'N	11°42.8755'W
M21	51°22.3706'N	11°42.7059'W
M22	51°23.2987'N	11°43.4782'W
M23	51°23.3445'N	11°43.3340'W
M24	51°21.4041'N	11°42.5589'W
M25	51°22.4499'N	11°42.4090'W
M26	51°23.3789'N	11°43.2237'W
M27	51°23.4185'N	11°43.0852'W
M28	51°22.4940'N	11°42.2818'W
M29	51°22.5363'N	11°42.1517'W
M30	51°23.4626'N	11°42.9636'W
M31	51°23.4943'N	11°42.8449'W
M32	51°22.6268'N	11°42.0705'W
M33	51°21.9723'N	11°44.2043'W
M34	51°22.1580'N	11°44.3593'W
M35	51°22.8297'N	11°42.1971'W
M36	51°22.9337'N	11°42.2921'W
M37	51°22.2623'N	11°44.4325'W
M38	51°22.3295'N	11°44.4974'W
M39	51°23.0029'N	11°42.3396'W
M40	51°23.0623'N	11°42.3870'W
M41	51°22.4002'N	11°44.5566'W
M42	51°22.4798'N	11°44.6158'W
M43	51°23.1465'N	11°42.4504'W
M44	51°23.2553'N	11°42.5453'W
M45	51°22.5788'N	11°44.7032'W
M46	51°22.6655'N	11°42.7821'W
M47	51°23.3296'N	11°42.6086'W
M48	51°23.4087'N	11°44.6719'W
M49	51°22.7503'N	11°42.8328'W
M50	51°22.8228'N	11°42.8976'W
M51	51°23.4830'N	11°44.7352'W

Enya mounds

Waypoint	Latitude	Longitude
E1	51°09.1120'N	11°35.6600'W
E2	51°07.1000'N	11°35.6600'W
E3	51°07.1000'N	11°36.1000'W
E4	51°09.1120'N	11°36.1000'W
E5	51°09.1120'N	11°36.4400'W
E6	51°07.1000'N	11°36.4400'W
E7	51°07.8000'N	11°38.0000'W
E8	51°07.8000'N	11°35.2000'W
E9	51°08.2000'N	11°35.2000'W
E10	51°08.2000'N	11°38.0000'W
E11	51°08.6000'N	11°38.0000'W
E12	51°08.6000'N	11°35.2000'W
E13	51°08.9500'N	11°35.2000'W
E14	51°09.9500'N	11°38.0000'W

5. LABORATORY SPACE

Bridge: seismic equipment, general control of operations
Wet lab: samples
Chemistry lab: additional seismic equipment and storage of samples
Fish lab: high-voltage equipment
Lab container: ROV control & observations
Deck: seismic equipment, ROV container, boxcorer

6. INFRASTRUCTURE AND INSTRUMENTATION NEEDED

DGPS *outputs will be needed for the operations systems (bridge) - time/lat/long-string*

ODAS

Atlas DESO 22

A-frame

Crane

Davit

Freezer

Boxcorer (MUMM)

(Deep-water) Sound velocity probe (side-winch needed)

7. SAMPLING PROGRAMME

Initially, no sampling is scheduled. Any additional sampling location will be derived based on the results of multibeam and shallow seismic profiling.

LIST OF CHEMICALS

Solid packed – storage on board will be discussed with the responsible officer

2 bottles (1 l) alcohol (95%)

8. AUTOMATICAL DATA-ACQUISITION

N°	Parameters	Acquisition rate – 10 sec
13	PT/ST SPEED	*
14	DEPTH SPEED	*
15	FO/AF SPEED	*
16	REL. WINDDIR	*
17	REL. WINDSPD	*
19	HUMIDITY_HR	*
20	ATM PRESSURE	*
24	SEATEMP_1	*
30	SOL-RAD	*
34	AIRTEMP.DRY	*
35	AIRTEMP.WET	*
36	SHIP HEADING	*
120	IN-WIND DIR	*
121	IN-WINDSPD	*
122	IN-WINDSPD.BF	*
123	CUMUL.DIST	*
182	HUMIDITY_DW	*
184	TSS DEPTH-L	*
185	TSS DEPTH-H	*
186	TSS HEAVE	*
191	SBE21 TEMP.	*
192	SBE21 SALIN.	*
193	SBE21 SIGTH.	*
195	TURNER FLUO.	*
197	DGPS LAT.N/S	*
198	DGPS LONG.E/W	*
199	DGPS HG_MSL	*
200	DGPS UTCTIME	*
201	DGPS SPEED	*
202	DGPS COURSE	*
203	DGPS QUALITY	*
214	MGN DGPS LAT	*
215	MGN DGPS LON	*
219	ROXANN DEPTH	*
220	ROXANN ROUGH	*
221	ROXAN HARD	*

9. EMBARKATION AND DISEMBARKATION OF MATERIAL AND SCIENTISTS

Embarkation of material: Zeebrugge, 23-24/05/06 from 09:00 Belgica crane and large crane for winch and ROV. Support in the transport of the winch & ROV would be appreciated.

Embarkation of scientists: - Brest (France), 11/06/06, 13 scientists (most will arrive in the afternoon)

Disembarkation of scientists: Cork (Ireland), 21/06/06 (departure flights in afternoon)

Disembarkation of material: Zeebrugge, 29/06/06, Belgica crane and large crane for winch and ROV. Support in the transport of the winch and ROV would be appreciated.

10. TRANSPORT FACILITIES

None

ADDENDUM 1 - LOCALISATION OF SURVEY AREAS

ADDENDUM 2 - REQUEST FOR EMBARKATION

ADDENDUM 3 - PLANNING SCHEDULE

ADDENDUM 1 - LOCALISATION OF SURVEY AREAS

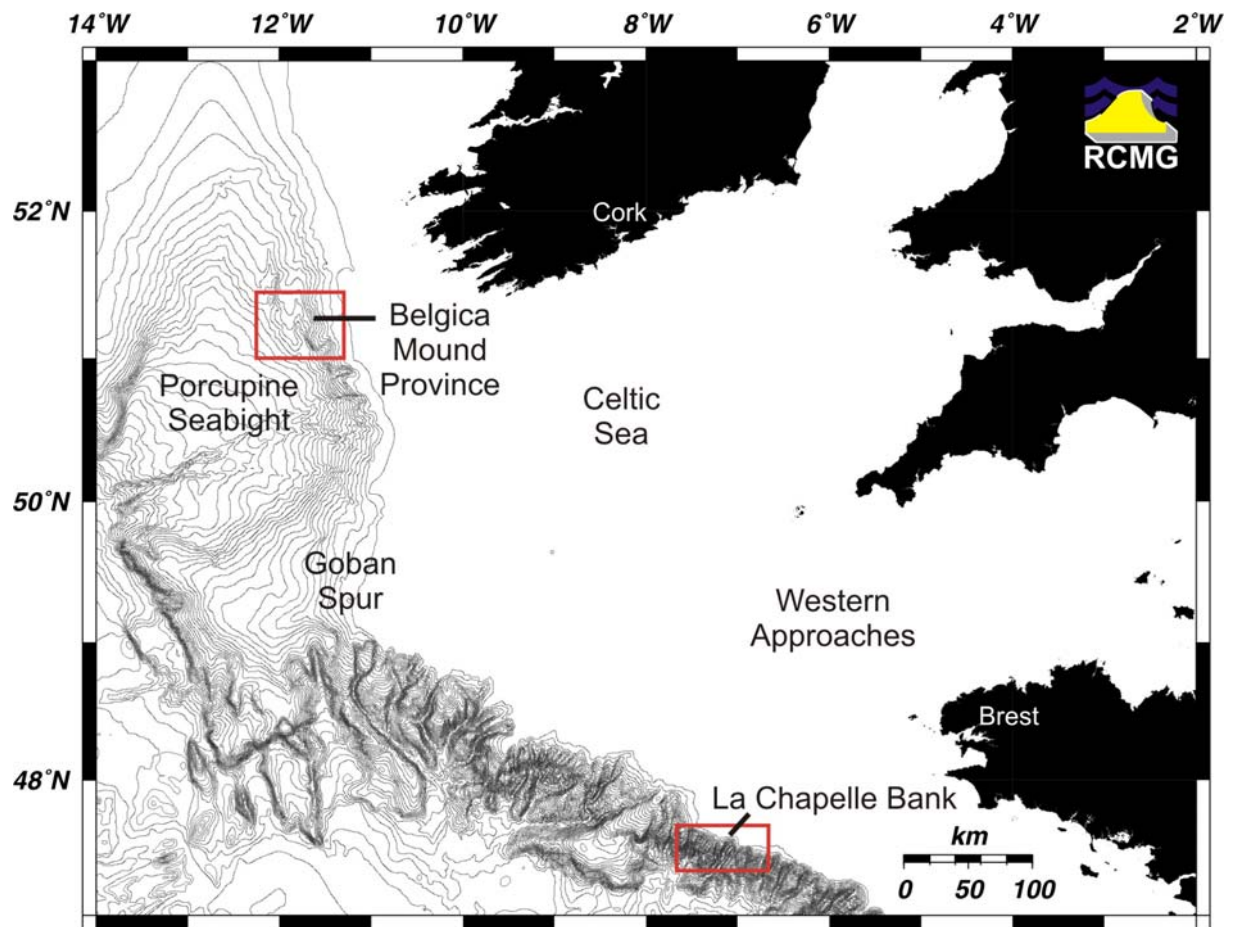


Figure 1: Areas 1 and 2

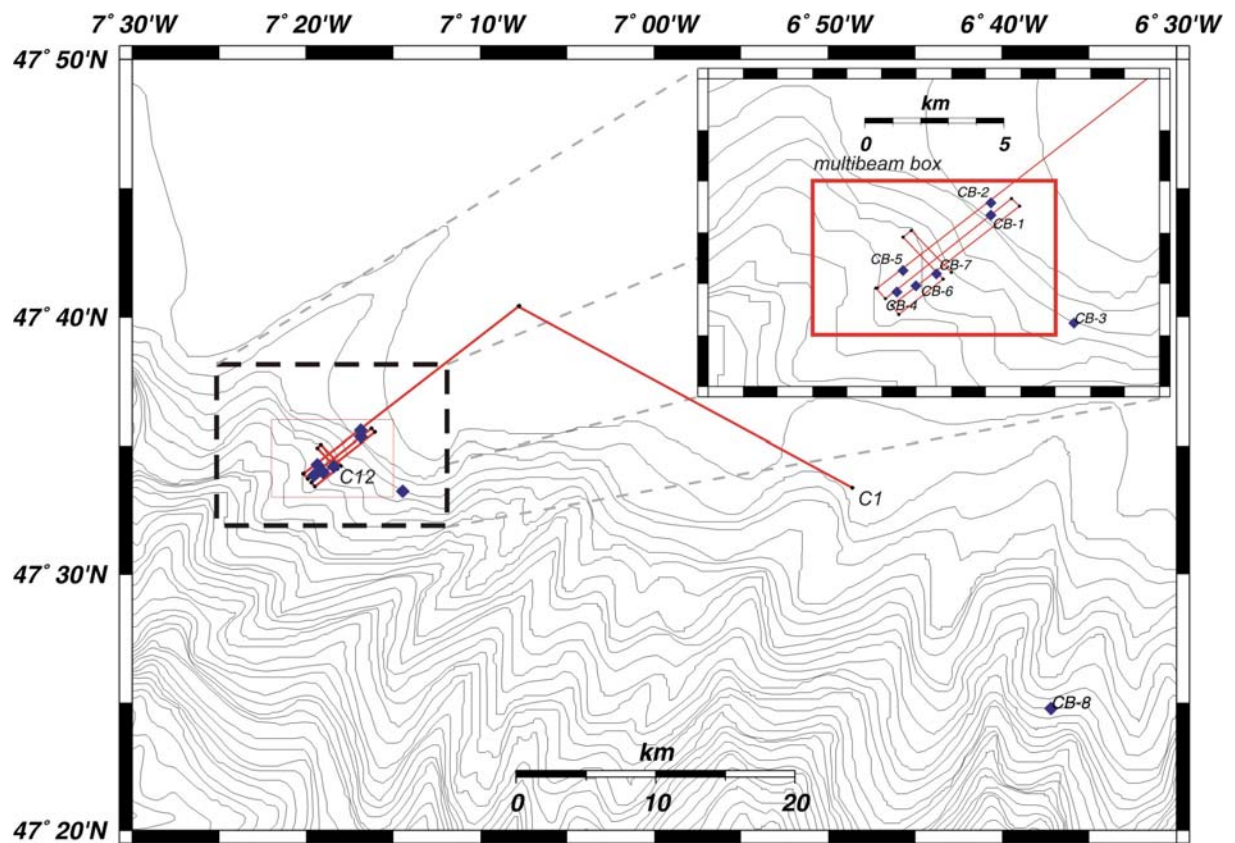


Figure 2: Tracks and stations in Area 1 (GEBCO contour lines every 100m). Seismic lines (red) from C1 to C12. ROV stations are indicated with blue diamonds. Detailed inset of ROV dive tracks and seismic lines within multibeam box.

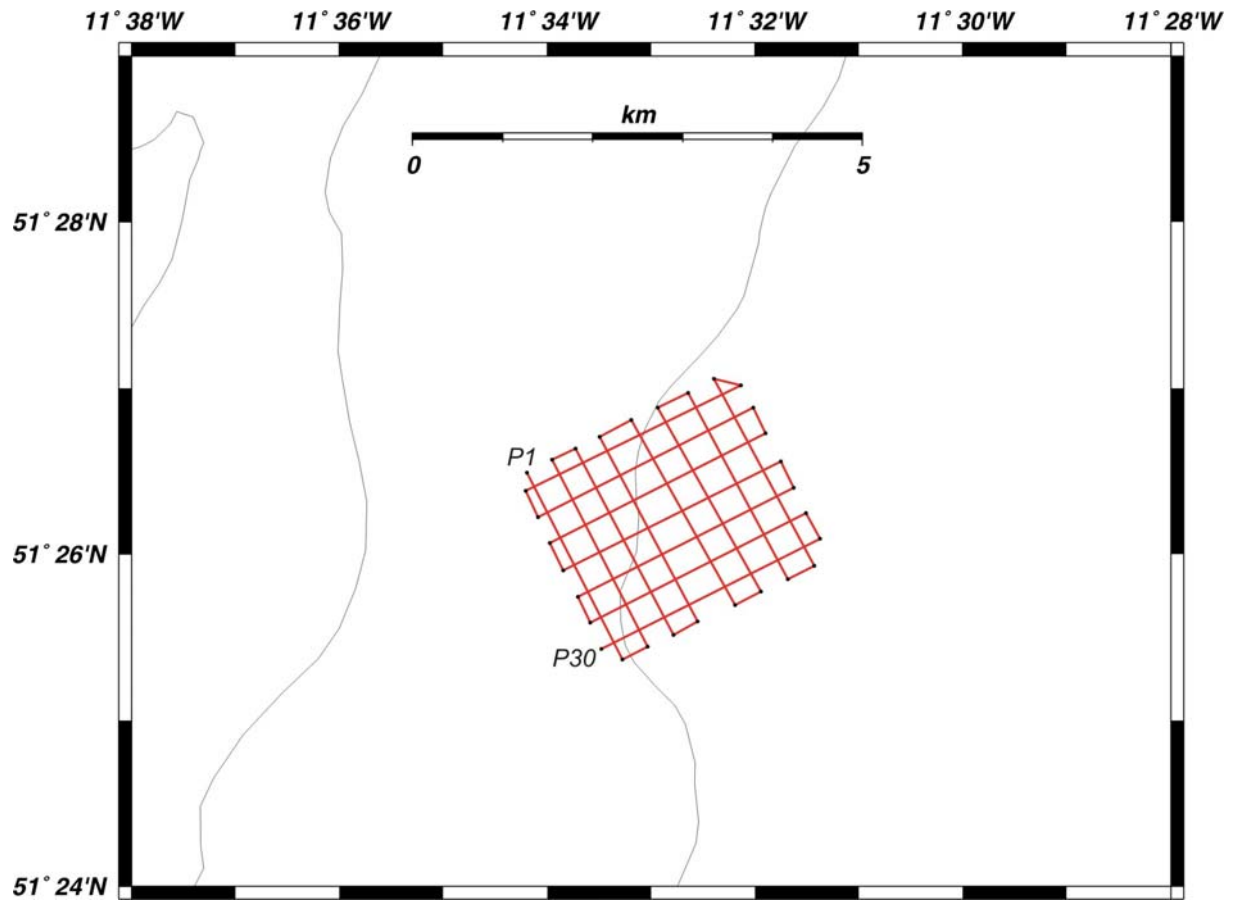


Figure 3: Seismic lines on IODP site U1318 in Area 2 from P1 to P30 (GEBCO contour lines every 100m).

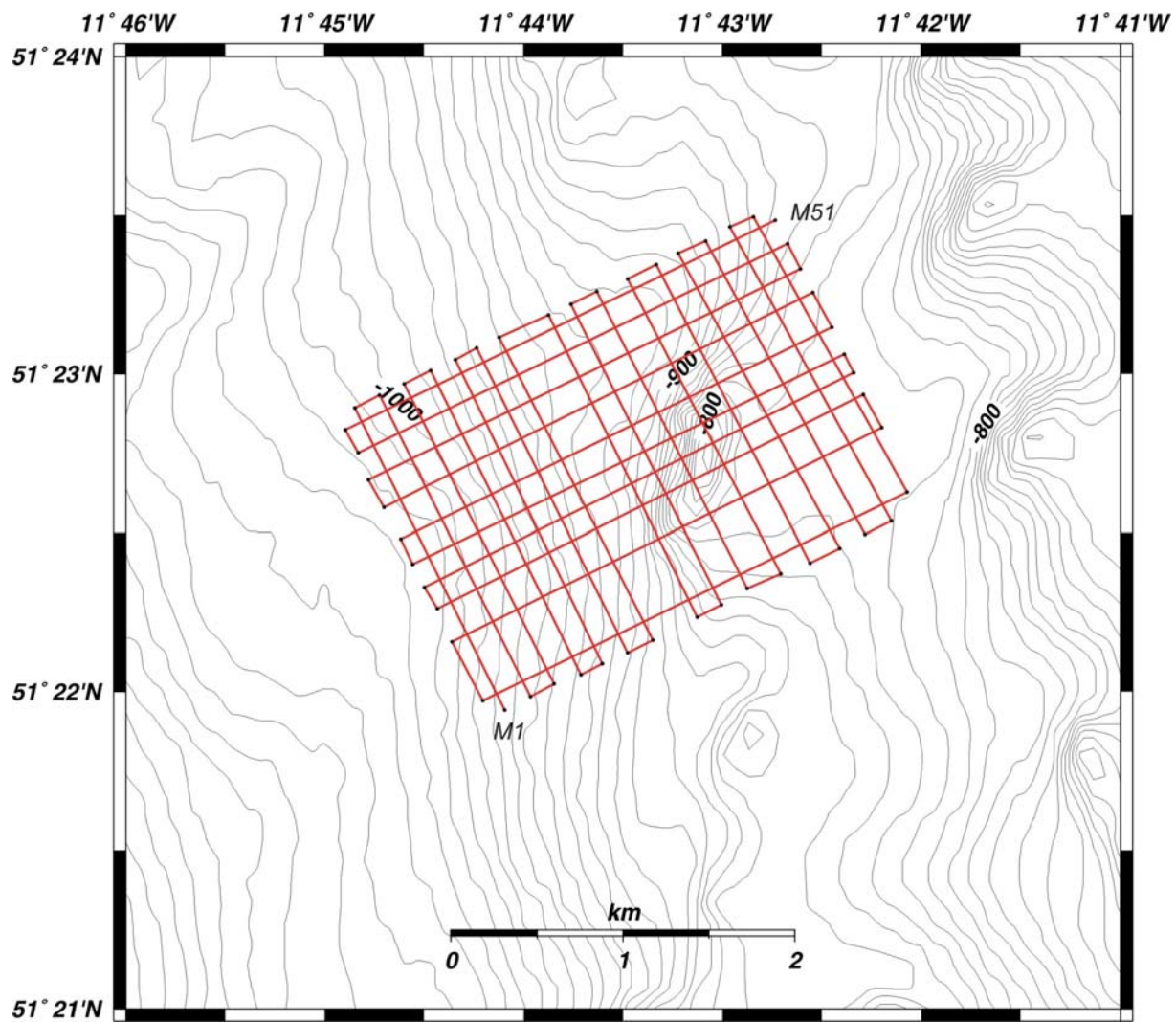


Figure 4: Seismic lines on IODP sites U1316 and U1317 in Area 2 from M1 to M51 (contour lines every 10m).

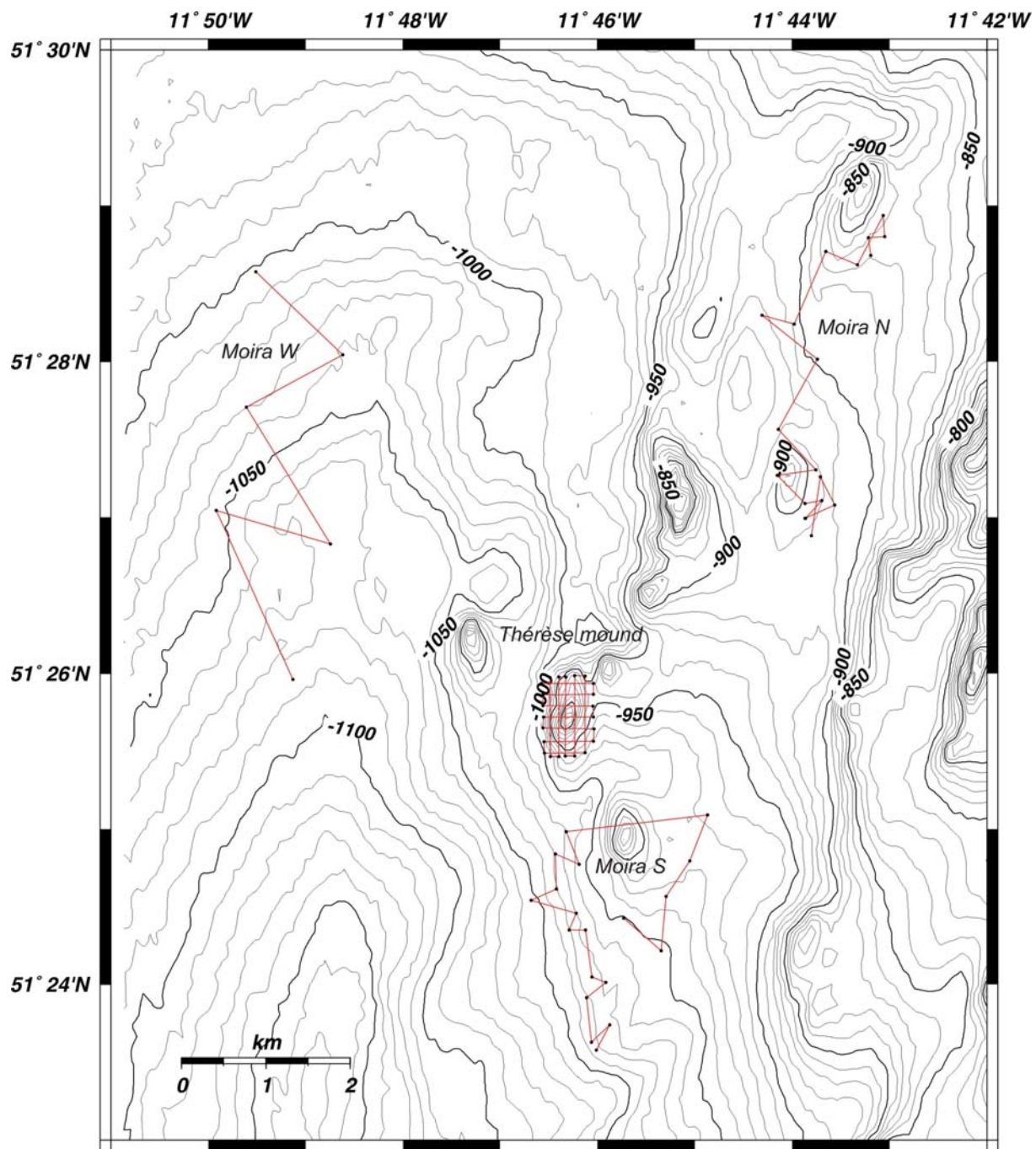


Figure 5: ROV Dive tracks and stations in Area 2 (contour lines every 10m).

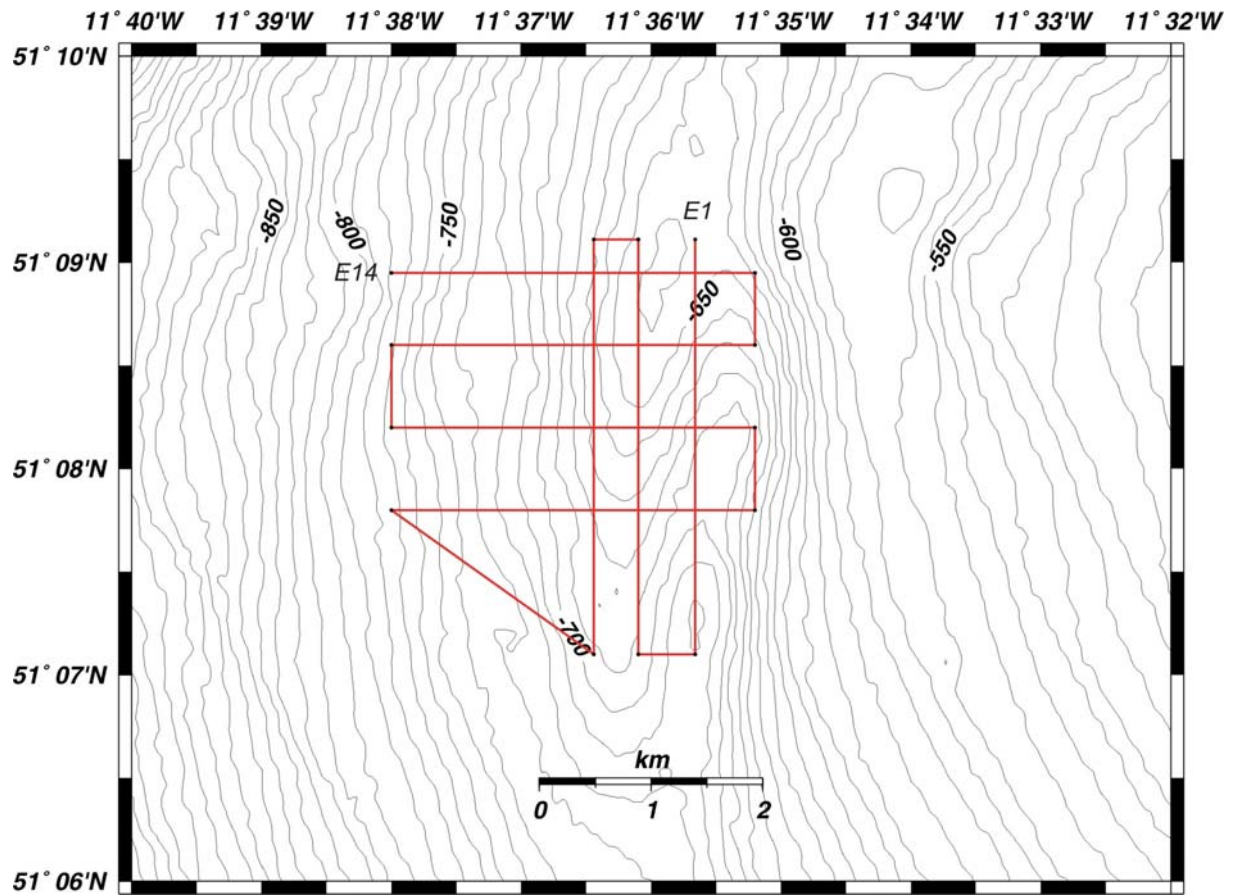


Figure 6: Seismic lines on the Enya site in Area 2 from E1 to E14 (contour lines every 5m).