NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART A : GENERAL ORGANISATION

1. Name of research ship **RV BELGICA** Cruise N° **2014/16**

2. Dates of cruise From **13 June** to **23 June 2014**

3. Operating Authority
Belgian Navy under contract for Belgian Ministry of Science Policy
Royal Belgian Institute for Natural Sciences 'RBINS'
Operational Directorate Natural Environment, Measurement Services Ostend
3de & 23ste Linieregimentsplein, 8400 Ostend
☎ **+ 32 59 70 01 31** • 🖷 **+ 32 59 70 49 35** • ✉ bmmost@mumm.ac.be

4. Owner **Belgian state represented by Minister for Science Policy**

5. Particulars of ship

Name	**Belgica**	
Nationality	Belgian	
Overall length	51 meters	
Maximum draught	4,5 meters	
Nett tonnage	232 NRT	
Propulsion	Diesel	
Call Sign	ORGQ	
Telephone	INMARSAT	00870 76 218 73 27
Facsimile	INMARSAT	00870 32 052 18 12
Email	belgica@mumm.ac.be	

6. Crew
Name of master Cdr (BeN) Luc VAN TRICHT
N° of Crew **15**

7. Scientific Personnel
Name and address of scientists in charge :

Prof. Dr. David Van Rooij (PI 18a)
University of Ghent
Renard Centre of Marine Geology (RCMG)
Krijgslaan 281, S8
B-9000 Ghent
☎**+32 9 264 45 83** • 🖷**+32 9 264 49 67** • ✉**david.vanrooij@UGent.be**
www.rcmg.ugent.be

N° of scientists **10**

The names of non-Belgian participants will only be known one month ahead of the campaign. However, they will be associated to one of the following institutes: British Geological Survey (UK), University of Plymouth (UK), IGME - Spanish Geological Survey (Spain) and IEO – Spanish Oceanographic Institute (Spain)

8. Geographical area in which ship will operate (with reference in latitude and longitude).

UK EEZ: Celtic Margin • Dangeard & Explorer Canyons
48°45'N – 48°00'N – 10°15'W – 09°15'W

ES EEZ: Asturias Margin • Upper Ferrol Canyon
44°15'N – 43°45'N – 09°00'W – 08°15'W

9. Brief description of purpose of cruise

Project MINIMOUND: investigation of the palaeoceanography and evolution of 'small' cold-water coral mounds in the Bay of Biscay

10. Port of Call. Dates. Reasons.

Porto	**11/06-12/06/2014**	**Relaxation of crew. Embarkation of scientists research cruise 2014/16**
Porto	**13/06/2014**	**Start of RV Belgica research cruise 2014/16**
Zeebrugge	**23/06/2014**	**End of RV Belgica research cruise 2014/16**

11. Any special logistic requirements at ports of call (other than water, fuel provisions, etc.)

N.A.

NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART B: DETAIL

1. Name of research ship **BELGICA** Cruise N° **2014/16**

2. Date of cruise From **13 June** To **23 June 2014**

3. Purpose of research and general methods. (If the research work is being taken on behalf of a research institution of a third state, it is the responsibility of that state to obtain prior permission; it is essential that written confirmation that this has been done is obtained and quoted in this application.

   The FWO research project "MINIMOUND" will investigate the palaeoceanography and evolution of "small" cold-water coral mounds in the Bay of Biscay. This campaign aims to sample both "on-mound" as "off-mound" sites by means of a 3 m vibrocorer (BGS), in water depths of 400 m, in the UK sector of the Explorer & Dangeard Canyons (Armorican margin) and the Ferrol Canyon (Asturias margin). In each sector, a minimum of 3 days of activities will be scheduled. In case of bad weather on 1 sector, the program will be revised towards the other sector. With respect to the size of these mounds, the coring location of the vibrocorer will be steered by means of a USBL GAPS system. Additionally, the seafloor will be visually characterized using a small and light-weight camera dropframe (University of Plymouth). During the nighttime, shallow ADCP and multibeam transects will be sailed, in combination with high-resolution reflection seismics.

   Important note with respect to the seismic profiling

   The acquisition of seismic profiles during this campaign will have a low priority and will only focus on a very limited area. The used methodology concerns single channel high-resolution reflection seismics using a sparker seismics source, which is known as a low-energy high-resolution source. The sparker signal is generated by a high-voltage pulse released through electrode tips in the water. At a (standard) energy level of 300 J, this wil create an instantaneous intensity of 204 db (compared to a reference value of 1 µP at 1 m distance), with a frequency range between 200 and 700 Hz. The resulting "Sound Energy Level" (SEL) will approacg 170 db, necessitating a small exclusion zone of about 200 m. This source will be towed at 10 m behind the vessel, whereas the receivers (streamer) will be towed at 20 m behind the vessel, which will sail at a velocity of 3 knots using "silent" electrical propulsion. We will apply a soft-start method, starting with low energy level, gradually increasing to 300 J.

4. Attach chart(s) showing (on an appropriate scale) the geographical area of the intended work, positions of intended stations, tracks of survey lines, positions of moored / seabed equipment.

   For charts, please see annex.

   Regarding the locations of the seismic profiles, they will be located inside the bounding box focusing on the study area (see charts)

Coordinates within Upper Ferrol Canyon • Asturias Margin (ES EEZ)

Coring Locations			
Feature:	Latitude	Longitude	Depth(m)
Minimound_23	43°52,149'	-8°42,537'	-432,08
Minimound_20	43°51,808'	-8°44,033'	-439,77
Minimound_18	43°51,707'	-8°43,912'	-438,24
Minimound_35	43°56,334'	-8°40,064'	-455,92
Minimound_36	43°57,248'	-8°40,047'	-454,84
Minimound_70	44°04,744'	-8°43,883'	-432,69
Minimound_54	44°03,309'	-8°45,540'	-487,87
Minimound_59	44°02,734'	-8°46,589'	-520,28
Minimound_39	43°50,438'	-8°47,912'	-482,60
Minimound_1	43°48,725'	-8°48,051'	-464,14
Minimound_3	43°49,546'	-8°48,003'	-471,50
Minimound_7	43°50,134'	-8°45,084'	-431,92
Pockmark_3	43°55,711'	-8°38,927'	-447,19
Pockmark_47	43°48,504'	-8°41,707'	-369,32
Pockmark_6	43°53,255'	-8°38,317'	-391,32
Pockmark_4	43°54,210'	-8°38,153'	-406,91
Off_mound_1	43°52,442'	-8°43,268'	-443,04
Off_mound_2	43°56,041'	-8°39,505'	-448,19
Off_mound_3	43°49,871'	-8°47,970'	-488,94
Off_Mound_4	44°02,994'	-8°46,031'	-507,17

Area for Seismics and Multibeam acquisition		
Vertices	Latitude	Longitude
NW	44°06,094'	-8°51,462'
NE	44°06,094'	-8°34,596'
SE	43°47,985'	-8°34,596'
SW	43°47,985'	-8°51,462'

Coordinates within Dangeard & Explorer Canyons • Celtic Margin (UK EEZ)

A small survey prior to the sampling will determine which points will receive priority for sampling

Coring Locations		
Name:	Latitude	Longitude
DI_1	48°17,878'	-9°38,542'
DI_2	48°18,065'	-9°38,657'
DI_3	48°17,662'	-9°38,477'
DI_4	48°17,798'	-9°37,349'
DI_5	48°17,706'	-9°37,288'
DI_6	48°17,685'	-9°37,492'
DI_7	48°17,552'	-9°38,496'
DI_8	48°18,608'	-9°36,171'
DI_9	48°17,914'	-9°37,473'
DI_10	48°17,735'	-9°37,360'
DI_11	48°18,476'	-9°38,636'
DI_12	48°17,800'	-9°39,08'
DI_13	48°17,768'	-9°38,544'
DI_14	48°17,592'	-9°38,510'
DI_15	48°18,116'	-9°35,716'
DI_16	48°18,283'	-9°35,631'
DI_17	48°18,409'	-9°35,581'
DI_18	48°16,870'	-9°36,652'
DI_19	48°16,877'	-9°36,844'
DI_20	48°17,368'	-9°37,170'
DI_21	48°17,433'	-9°37,178'
DI_22	48°17,446'	-9°37,256'
DI_23	48°18,118'	-9°38,833'
DI_24	48°18,482'	-9°36,261'
DI_25	48°18,614'	-9°36,263'
DI_26	48°18,577'	-9°35,985'
DI_27	48°18,532'	-9°36,247'
DI_28	48°18,499'	-9°36,329'
EI_1	48°24,186'	-9°42,096'
EI_2	48°24,078'	-9°42,226'
EI_3	48°24,119'	-9°42,083'
EI_4	48°23,736'	-9°43,412'
EI_5	48°23,729'	-9°43,496'
EI_6	48°23,850'	-9°43,688'
EI_7	48°23,739'	-9°43,928'
EI_8	48°23,792'	-9°43,795'
EI_9	48°23,036'	-9°43,124'
EI_10	48°23,041'	-9°43,205'
EI_11	48°23,039'	-9°43,052'

	Latitude	Longitude
EI_12	48°23,199'	-9°42,736'
EI_13	48°23,371'	-9°42,327'
EI_14	48°23,381'	-9°42,507'
EI_15	48°23,376'	-9°42,415'
EI_16	48°23,126'	-9°41,621'
EI_17	48°23,204'	-9°41,455'
EI_18	48°23,283'	-9°41,393'
EI_19	48°24,224'	-9°38,906'
EI_20	48°24,305'	-9°38,950'
EI_21	48°24,751'	-9°38,770'
EI_22	48°23,889'	-9°41,050'
EI_23	48°23,825'	-9°41,015'
EI_24	48°23,762'	-9°40,975'
EI_25	48°22,859'	-9°41,097'
EI_26	48°22,829'	-9°41,191'
EI_27	48°22,897'	-9°40,997'
EI_28	48°23,437'	-9°39,903'
EI_29	48°23,829'	-9°39,767'
EI_30	48°23,829'	-9°39,768'
EI_31	48°23,475'	-9°39,821'
EI_32	48°24,832'	-9°40,464'
EI_33	48°24,814'	-9°40,523'
EI_34	48°26,670'	-9°36,520'
EI_35	48°26,614'	-9°36,563'
EI_36	48°25,922'	-9°37,418'
EI_37	48°25,103'	-9°37,714'
EI_38	48°25,157'	-9°37,706'
EI_39	48°25,733'	-9°35,363'
EI_40	48°25,570'	-9°35,393'
EI_41	48°24,098'	-9°41,303'
EI_42	48°23,989'	-9°41,630'
EI_43	48°24,104'	-9°41,738'
EI_44	48°24,158'	-9°41,586'
EI_45	48°23,940'	-9°41,776'
EI_46	48°24,416'	-9°42,115'
EI_47	48°24,423'	-9°42,024'
EI_48	48°24,435'	-9°41,935'
EI_49	48°23,720'	-9°43,573'
EI_50	48°24,127'	-9°41,660'
EI_51	48°24,131'	-9°41,199'
EI_52	48°24,119'	-9°42,022'

Area for Seismics and Multibeam acquisition		
Vertices	Latitude	Longitude
1	48°15,351'	-9°40,181'
2	48°17,049'	-9°35,444'
3	48°15,075'	-9°35,047'
4	48°14,424'	-9°35,604'
5	48°12,201'	-9°35,604'
6	48°11,534'	-9°38,050'

5. Types of samples required, e.g. Geological / Water / Plankton / Fish / Radioactivity / Isotope ….

   Geophysical / sediment / water

   and methods by which samples will be obtained (including dredging/coring/drilling).

   - **High-resolution single channel seismic reflection profiling**
   - **Multibeam echosounder profiling**
   - **Vibrocoring, boxcoring, gravity coring**
   - **CTD data**
   - **Video data (dropframe)**

6. Details of moored equipment :

Dates Laying	Recovery	Description	Latitude	Longitude

7. Explosives : **N.A.**

   (a) Type and Trade Name
   (b) chemical content
   (c) Dept of trade class and stowage
   (d) Size
   (e) Depth of detonation
   (f) Frequency of detonation
   (g) Dates of detonation

8. Details and reference of

   (a) Any relevant previous/future cruises

   - **RV Belgica, 15-29 May 2002, CADIPOR (Lissabon, PT – Cadiz, ES)**
   - **RV Belgica, 17-27 May 2005, CADIPOR II (Cadiz, ES – Cadiz, ES)**
   - **RV Belgica, 3-15 June 2007, CADIPOR III (Cadiz, ES – Cadiz, ES)**
   - **RV Marion Dufresne, 15-25 July 2008, MD169 MiCROSYSTEMS (Brest, FR – Algeciras, ES)**
   - **RV Belgica, 29/05-07/06/2013, COMIC (Cadiz, Port-ES-Mor EEZ)**

(b) Any previous published research data relating to the proposed cruise

- **Van Rooij, D., De Mol, L., Le Guilloux, E., Wisshak, M., Huvenne, V.A.I, Moeremans, R. & Henriet, J.-P. (2010). Environmental setting of deep-water oysters in the Bay of Biscay. Deep-Sea Research, Part I, 57 (12), 1561-1572.**

- **De Mol, L., Van Rooij, D., Pirlet, H., Greinert, J., Frank, N., Quemmerais, F. & Henriet, J.-P. (2011). Cold-water coral habitats in the Penmarc'h and Guilvinec canyons (Bay of Biscay): Deep-water versus shallow-water settings. Marine Geology, 282 (1-2), 40-52.**

- **Frank, N., Freiwald, A., Lopez-Correa, M., Wienberg, C., Eisele, M., Hebbeln, D., Van Rooij, D., Henriet, J.P., Colin, C., Van Weering, T., De Haas, H., Buhl-Mortensen, P., Roberts, J.M., De Mol, B., Douville, E., Blamart, D. & Hatte, C., (2011). Northeastern Atlantic cold-water coral reefs and climate. Geology, 39 (8), 743-746.**

- **Hernández-Molina, F.J., Serra, N., Stow, D.A.V., Llave, E., Ercilla, G. & Van Rooij, D. (2011). Along-slope oceanographic processes and sedimentary products around the Iberian margin. Geo-Marine Letters, 31 (5/6), 315-341**

9. Names and addresses of scientist of the coastal state in whose waters the proposed cruise takes place with whom previous contact has been made.

SPAIN

Dr. Estefania Llave
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UNITED KINGDOM

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E-mail: hast@bgs.ac.uk

10. State :

(a) Whether visits to the ship in port by scientists of the coastal state concerned will be acceptable.

YES

(b) Whether it will be acceptable to carry on board an observer from the coastal state for any part of the cruise and dates and ports of embarkation / disembarkation.

Yes, cfr. part A § 10

Also, contacts have been made with coastal scientists, which have been invited to actively participate

(c) When research data from intended cruise is likely to be made available to the coastal state and if so by what means. (If the final report is likely to be delayed beyond 12 months, interim progress reports are required.

- **Cruise report: 1 month after end of campaign**
- **Scientific data will be given to the participating coastal scientists and/or distributed upon request**
- **Scientific publications when available by request to the project chief**

PART C : **SCIENTIFIC EQUIPMENT**

COASTAL STATE : **SPAIN**

INDICATE "YES" OR "NO"

LIST SCIENTIFIC WORK BY FUNCTION eg. MAGNETOMETRY : GRAVITY DIVING : SEISMICS: BATHYMETRY SEABED SAMPLING TRAWLING ECHO SOUNDING : WATER SAMPLING U/W T.V. : MOORED INSTRUMENTS: TOWED INSTRUMENTS:	WATER COLUMN INCLUDING SEDIMENT SAMPLING OF THE SEABED	FISHERIES RESEARCH WITHIN FISHING LIMITS	RESEARCH CONCERNING THE NATURAL RESOURCES OF THE CONTINENTAL SHELF OR ITS PHYSICAL CHARACTERISTICS	DISTANCE FROM COAST		
				WITHIN 12 NMS	BETWEEN 12-200 NMS	CONTINENTAL SHELF WORK ONLY) BEYOND 200 NM BUT WITHIN THE CONTINENTAL MARGIN
High-resolution seismic profiling	**YES**	**NO**	**NO**		**YES**	
Vibro/gravity coring	**YES**	**NO**	**NO**		**YES**	
Video drop frame	**YES**	**NO**	**NO**		**YES**	
ADCP	**YES**	**NO**	**NO**		**YES**	

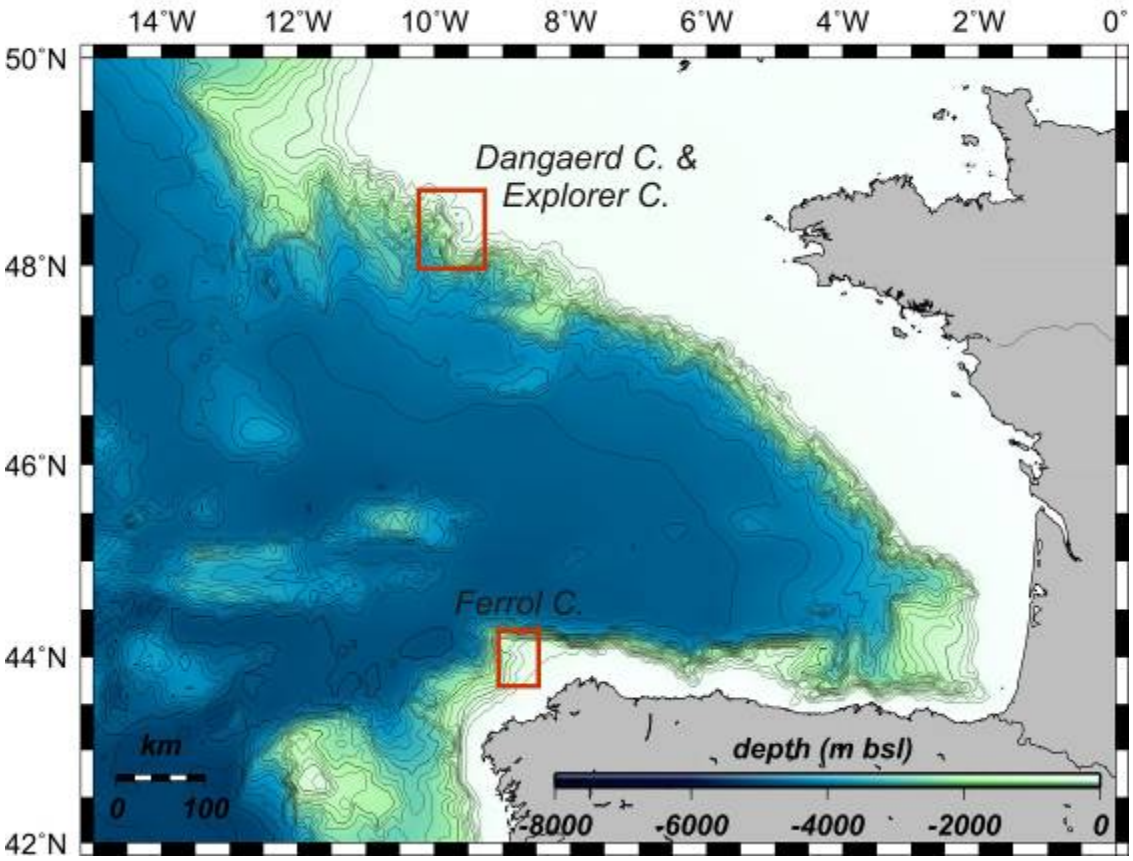
PART C : **SCIENTIFIC EQUIPMENT**

COASTAL STATE : **UNITED KINGDOM**

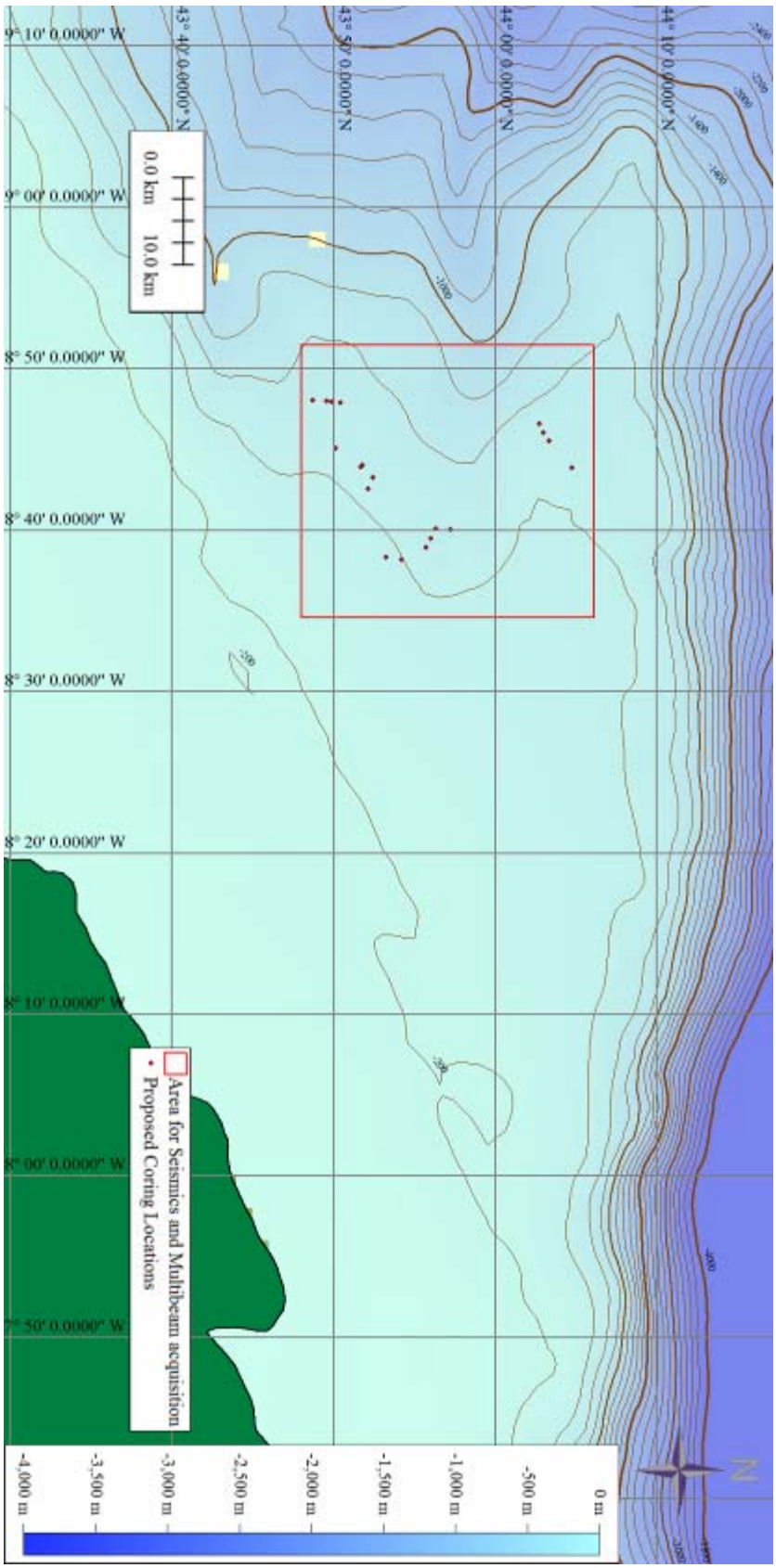
INDICATE "YES" OR "NO"

LIST SCIENTIFIC WORK BY FUNCTION eg. MAGNETOMETRY : GRAVITY DIVING : SEISMICS: BATHYMETRY SEABED SAMPLING TRAWLING ECHO SOUNDING : WATER SAMPLING U/W T.V. : MOORED INSTRUMENTS: TOWED INSTRUMENTS:	WATER COLUMN INCLUDING SEDIMENT SAMPLING OF THE SEABED	FISHERIES RESEARCH WITHIN FISHING LIMITS	RESEARCH CONCERNING THE NATURAL RESOURCES OF THE CONTINENTAL SHELF OR ITS PHYSICAL CHARACTERISTICS	DISTANCE FROM COAST		
				WITHIN 12 NMS	BETWEEN 12-200 NMS	CONTINENTAL SHELF WORK ONLY) BEYOND 200 NM BUT WITHIN THE CONTINENTAL MARGIN
High-resolution seismic profiling	**YES**	**NO**	**NO**		**YES**	
Vibro/gravity coring	**YES**	**NO**	**NO**		**YES**	
Video drop frame	**YES**	**NO**	**NO**		**YES**	
ADCP	**YES**	**NO**	**NO**		**YES**	

ANNEX: **RV Belgica research cruise 2014/16: chart**



Detail Asturias Margin • Upper Ferrol Canyon



Detail Celtic Margin • Dangeard & Explorer Canyons