

NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART A: GENERAL

1. *NAME OF RESEARCH SHIP* Belgica *CRUISE NO.* 2003/12
2. *DATES OF CRUISE* From: 28/04/2003 To: 16/05/2003
3. *OPERATING AUTHORITY* Belgian Navy under contract for Belgian Ministry of Science Policy Management Unit of the Mathematical Model of the North Sea (M.U.M.M.),
3deg and 23deg Liniereregimentsplein, 8400 Oostende

Telephone: +32 (0) 59700131
Facsimile: +32 (0) 59704935
Email: bmmost@mumm.ac.be
4. *OWNER*
(if different from No. 3) Belgian state represented by minister for Science Policy
5. *PARTICULARS OF SHIP*
NAME: Belgica
NATIONALITY: Belgian
OVERALL LENGTH: 51 metres
MAXIMUM DRAUGHT: 4,6 metres
NET TONNAGE: 232 NRT
GROSS:
PROPULSION: Diesel
CALL SIGN: O R G Q
VESSELS COMMUNICATION:
PHONE:
FAX:
REGISTERED PORT & NUMBER:
(if registered fishing vessel)
6. *CREW*
NAME OF MASTER: J. Dujardin, 1LZ

NO. OF CREW: 15
7. *SCIENTIFIC PERSONNEL*
NAME AND ADDRESS OF SCIENTIST IN CHARGE: Prof. L. Chou,
Universite Libre de Bruxelles,
Laboratoire d'Océanographie
Chimique et Géochimie des Eaux,
Campus de la Plaine, CP 208,
Boulevard du Triomphe,
B-1050 Brussels, Belgium.

TELEPHONE:
FAX:

NUMBER OF SCIENTISTS: 15
8. *GEOGRAPHICAL AREA IN WHICH SHIP WILL OPERATE*
(with reference to latitude and longitude)
French, UK and Irish Continental Shelf and slope
Between 46deg N - 51deg N, 03deg W - 11deg 30'W

9. *BRIEF DESCRIPTION OF PURPOSE OF CRUISE*

- (i) To assess the oceanic inorganic carbon cycle and its role in climate change. We aim, in particular, at quantifying the role of calcifying phytoplanktonic organisms in sequestering CO₂.
- (ii) To investigate the structural biodiversity (density, species composition and population structure) of the hyperbenthos along depth gradients in different geographic regions and its relevance for marine ecosystem functioning.

10. *DATES AND NAMES OF INTENDED PORTS OF CALL*

Brest: 16 May 2003 (p.m.) to 19 May 2003 (a.m.)

Disembarkation of the scientific staff and part of their equipment for the present cruise

Embarkation of the scientific staff and their equipment for the following cruise

The duration of this port of call may be shortened depending on the following cruise

11. *ANY SPECIAL REQUIREMENTS AT PORTS OF CALL*

N/A

NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART B: DETAIL

1. *NAME OF RESEARCH SHIP* Belgica *CRUISE NO.* 2003/12

2. *DATES OF CRUISE* From: 28/04/2003 To: 16/05/2003

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 present cruise consists of water column and benthic studies.

The objective of the water column study is to assess the oceanic inorganic carbon cycle and its role in climate change (<http://www.ulb.ac.be/sciences/dste/ocean/carbonate/frame.html>). We aim, in particular, at quantifying the role of calcifying phytoplanktonic organisms in sequestering CO₂. Water and suspended particulate matter will be sampled on the continental shelf and along the continental margin in the northern Gulf of Biscay. The study focuses on processes associated with the oceanic production and dissolution of calcium carbonate, including measurements of primary production, rate of calcification, zooplankton grazing and microbial respiration.

For benthic investigation, the structural biodiversity (density, species composition and population structure) of the hyperbenthos along depth gradients in different geographical regions and its relevance for marine ecosystem functioning will be studied. This includes the inventarisation of the biodiversity of marine hyperbenthic communities and an investigation of patterns in hyperbenthic biodiversity on different spatial scales along depth gradients. During this cruise, sediment samples along a depth gradient (200 - 1250 metres) will be taken by means of a box corer for the study of the macrofauna.

4. *ATTACH CHART*

(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, areas to be fished)

Chart 1: Belgica 2003/12 cruise transects for water column study

Chart 2: Belgica 2003/12 cruise transect in the Eporon Berthois area for benthic study

5. a) *TYPES OF SAMPLES REQUIRED*

(e.g. Geological/Water/Plankton/Fish/Radionuclide)

Water, plankton, suspended matter, sediment

b) *METHODS OF OBTAINING SAMPLES*

(e.g. dredging/coring/drilling/fishing, etc.)

(When using fishing gear, indicate fish stocks being worked, quantity of each species required, quantify of fish to be retained on board)

Niskin bottles - SCTD rosette - Plankton net - In situ filtration pump - In situ incubators - short term drifting sediment trap - box corer - Van Veen - Reineck

6. *DETAILS OF MOORED EQUIPMENT*

DATES:

<u>Laying</u>	<u>Recovery</u>	<u>Description</u>	<u>Latitude</u>	<u>Longitude</u>
During the entire cruise		Short-term (1-2 days) drifting sediment trap	On Continental Shelf and slope; exact positions are to be determined depending on the remote sensing data received at the time of the cruise	

7. ANY HAZARDOUS MATERIALS
(Chemicals, Explosives, Gases, Radioactive etc)
(use separate sheet, if necessary)

N/A

- a) TYPE AND TRADE NAME
- b) CHEMICAL CONTENT (& FORMULA)
- c) IMO IMDG CODE REFERENCE & UN. NO.
- d) QUANTITY & METHOD OF STOWAGE ON BOARD
- e) IF EXPLOSIVES GIVE DATE(S) OF DETONATION None
 - Method of detonation
 - Position of detonation
 - Frequency of detonation
 - Depth of detonation
 - Size of explosive charge in Kgs

8. DETAIL & REFERENCE OF

a) ANY RELEVANT PREVIOUS/FUTURE CRUISES

(i) Marine inorganic carbon cycle:

During an EU funded project "OMEX" (1993-2000), there were many Belgica cruises conducted in the same research area. Both France and UK have participated in this project. OMEX (<http://www.pol.ac.uk/bodc/omex/omex.html>) was devoted to the study of the biogeochemical fluxes of carbon and associated elements such as nutrients at the continental margin in the Northern Gulf of Biscay and in the Iberian upwelling region. See also (b) below.

The OMEX Belgica cruises are listed here below:

Global Change/OMEX BELGICA 93/22 : 21.09 - 07.10.93
Global Change/OMEX BELGICA 94/12 : 19.04 - 06.05.94
Global Change/OMEX BELGICA 95/06 : 03.03 - 17.03.95
OMEX BELGICA 95/21 : 11.09 - 29.09.95
OMEX BELGICA 97/14 : 21.06 - 07.06.97
OMEX BELGICA 98/15 : 25.06 - 14.07.98
OMEX BELGICA 99/19 : 30.08:99 - 22.09.99

One similar cruise was conducted this year in the framework of the present Project:

CCCC BELGICA 2002/11 : 22.04.2002 - 11.05.2002

Three scientists from the Plymouth Marine Laboratory (Plymouth, UK) and from the Laboratoire des Sciences du Climat et de l'Environnement (Gifs-sur-Yvette, FR) participated in the cruise.

(ii) Biodiversity of the hyperbenthos:

BELGICA cruise 2000/16 and 17 : 09 June - 29 June 2000
BELGICA cruise 2001/13 : 14 May - 25 May 2001
BELGICA cruse 2002/11 : 22 April - 11 May 2002

b) ANY PREVIOUSLY PUBLISHED DATA RELATING TO THE PROPOSED CRUISE

(i) Marine inorganic carbon cycle:

A special issue was published concerning the carbon biogeochemical fluxes along the continental margin in the Gulf of Biscay area:

Wollast R., L. Chou, B. Avril and J. Huthnance (2001, Guest Editors) Ocean Margin EXchange in the Northern Gulf of Biscay: OMEX I. Deep-Sea Research II, 48 (no. 14-15), 2971-3293.

Other manuscripts are in preparation related to the research project:

Delille, B., F. Frankignoulle, J. Harlay, L. Chou, R. Wollast, J-P Gattouso, I. Zondervan, U. Riebesell and S. Jacquet. Calcification and organic production of coccolithophorides *Emiliana huxleyi* under different atmospheric pCO₂ in a mesocosm experiment. To be submitted to Global Biogeochemical Cycles.

Gehlen, M., F. Bassinot, L. Chou and D. McCorkle (in preparation). Reassessing the dissolution kinetics of oceanic carbonates in seawater.

Harlay, J., L. Chou, V. Dedonder, R. Wollast, B. Delille and K. Aerts. Assessment of the importance of the carbonate pump in surface waters of the Bay of Biscay. Abstract submitted to IGBP Open Science Conference on OCEANS - Ocean Biogeochemistry and Ecosystems Analysis. 7-10 January 2003, Paris, France.

Zondervan, I., K. Aerts, L. Beaufort, A. Benthien, L. Chou, B. Dellile, A. Engel, J-P Gattuso, J. Harlay, C. Heemann, L. Hoffmann, S. Jacquet, J. Nejtgaard, M-D Pizay, U. Riebesell, E. Rochelle-Newall, U. Schneider, A. Terbruggen, R. Wollast. Biological responses to CO₂ - related changes in seawater carbonate chemistry during a bloom of *Emiliana huxleyi* - a mesocosm study. To be submitted to J. Exp. Mar. Biol. Ecol.

(ii) Biodiversity of the hyperbenthos:

Ann Dewicke, Veronique Vanquickenberghe, Jan Mees, Jean-Claude Sorbe and Ann Vanreusel. On the structure of the hyperbenthic communities inhabiting the benthic boundary layer of the shelf break versus the upper continental slope in the NE Atlantic (Bay of Biscay).

9. NAMES AND ADDRESSES OF SCIENTISTS OF THE COASTAL STATE(S) IN WHOSE WATERS THE PROPOSED CRUISE TAKES PLACE WITH WHOM PREVIOUS CONTACT HAS BEEN MADE

(i) Marine inorganic carbon cycle:

Prof. Patrick Buat-Menard, University de Bordeaux I Departement de Geologie et d'Océanographie, Av. des Facultes, F-33405 Talence Cedex, France.

Prof. P. Liss, University of East Anglia, School of Environmental Sciences, Norwich, NR4 7TJ, United Kingdom

Prof. N. Owens, Plymouth Marine Laboratory, Prospect Place, The Hoe, Plymouth, PL1 3DH, United Kingdom

ii) Biodiversity of the hyperbenthos:

Mr. Sorbe, Laboratoire d'Océanographie Biologique, UMR 5805 (CNRS/UB1), 2 rue Jolyet, F-33120 Arcachon, France.

10.STATE

a) *WHETHER VISITS TO THE SHIP IN PORT BY SCIENTISTS OF THE COASTAL STATE CONCERNED WILL BE ACCEPTABLE*

Yes

b) *PARTICIPATION OF AN OBSERVER FROM THE COASTAL STATE FOR ANY PART OF THE CRUISE TOGETHER WITH THE DATES AND PORTS FOR EMBARKATION/DISEMBARKATION*

Yes - Zeebrugge April 28th / Cork May 9th and Cork May 12th / Brest May 16th .

c) *WHEN RESEARCH DATA FROM THE INTENDED CRUISE IS LIKELY TO BE MADE AVAILABLE TO THE COASTAL STATE AND BY WHAT MEANS*

Preliminary cruise report : within 2 months by request to the chief scientist

Project Annual Report

Publication in scientific journals (on request to the chief scientist)

PART C: SCIENTIFIC EQUIPMENT

COASTAL STATE: France
PORT CALL:
DATES:

11. COMPLETE THE FOLLOWING TABLE - SEPARATE PAGE FOR EACH COASTAL STATE
(indicate "Yes" or "No")

<i>List all major scientific equipment, including scientific sonar other than standard navigational echo sounders, it is proposed to use and indicate waters in which it will be deployed</i>	<i>In Territorial</i>	<i>On Continental Shelf</i>
Niskin bottles	Yes	Yes
SCTD system	Yes	Yes
Plankton net	Yes	Yes
In situ filtration pump	Yes	Yes
In situ incubators	Yes	Yes
Short-term sediment trap mooring	Yes	Yes
Box corer	Yes	Yes

PART C: SCIENTIFIC EQUIPMENT

COASTAL STATE: United Kingdom

PORT CALL:

DATES:

11. COMPLETE THE FOLLOWING TABLE - SEPARATE PAGE FOR EACH COASTAL STATE
(indicate "Yes" or "No")

<i>List all major scientific equipment, including scientific sonar other than standard navigational echo sounders, it is proposed to use and indicate waters in which it will be deployed</i>	<i>In Territorial</i>	<i>On Continental Shelf</i>
Niskin bottles	Yes	Yes
SCTD system	Yes	Yes
Plankton net	Yes	Yes
In situ filtration pump	Yes	Yes
In situ incubators	Yes	Yes
Short-term sediment trap mooring	Yes	Yes
Box corer	Yes	Yes

(On behalf of the Principal Scientist)

Dated

N.B. IF ANY DETAILS ARE MATERIALLY CHANGED REGARDING DATES/AREA OF OPERATION AFTER THIS FORM HAS BEEN SUBMITTED, THE COASTAL STATE AUTHORITIES MUST BE NOTIFIED IMMEDIATELY.