NOTIFICATION OF PROPOSED RESEARCH CRUISE

PART A: GENERAL

1. *NAME OF RESEARCH SHIP* Belgica *CRUISE NO.* 2004/03

2. *DATES OF CRUISE* From: 23 Feb 2003 To: 27 Feb 2003

3. *OPERATING AUTHORITY* Belgian Navy under contract for Belgian Ministry or Science Policy Management Unit of the North Sea Mathematical Model "M.U.M.M.", 3" and 23" Linleregimentsplein, 8400 Oostende
Email: bmmost@murpm.ac.be

Telephone: 32(0)59 70 01 31
Facsimile: 32(0)59 70 49 35

Telex:

4. *OWNER* Belgian state represented by Minister for Science Policy
(if different from No. 3)

5. *PARTICULARS OF SHIP*

NAME:	Belgica
NATIONALITY:	Belgian
OVERALL LENGTH:	51 metres
MAXIMUM DRAUGHT:	4.5 metres
GRT:	232 NRT
PROPULSION:	Diesel
CALL SIGN:	ORGQ
TELEPHONE:	32(0)59 70 01 31
FAX:	32(0)59 70 49 35

REGISTERED PORT & NUMBER:
(if registered fishing vessel)

6. *CREW*

NAME OF MASTER:	P. Ramboer, LTZ 1ste Klasse
NO. OF CREW:	15

7. *SCIENTIFIC PERSONNEL*

NAME AND ADDRESS OF SCIENTIST IN CHARGE:
Dr. Natacha BRION
Dienst Analytische en Milieu Chemie (WE ANCH)
Vrije Universiteit Brussel
Pleinlaan 2
1050 Brussel
Belgium

TEL./TELEX/FAX NO:

NUMBER OF SCIENTISTS: 15

(A nominal roll of all personal other than nationals of the applicant (flag) state is required.)

8. *GEOGRAPHICAL AREA IN WHICH SHIP WILL OPERATE*
(with reference to latitude and longitude)

Belgian, Dutch, French and UK continental shelves

Between 49°00' N 01°30' W and 52°30' N 03°30' E

9. *BRIEF DESCRIPTION OF PURPOSE OF CRUISE*

Belgian National Scientific support plan for sustainable development, programme “Global change, ecosystems and biodiversity”.

- Project “Canopy”: Biogeochemical carbon, nitrogen and phosphorus fluxes in the North Sea.
- Project “Amore II” Advanced Modelling and Research on Eutrophication linking eutrophication and biological resources.

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

Zeebrugge 23.02 – 27/02/04 Departure - Arrival

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.* 2004/03

2. *DATES OF CRUISE* From: 23 Feb 2004 To: 27 Feb 2004

a) PURPOSE OF RESEARCH

- The project "Canopy" aims to determine the importance of the international cycling processes of uptake and regeneration of carbon, nitrogen and phosphorus in the Southern Bright of the North Sea. Theses results will be compared with the inputs and outputs of C-N-P in order to visualise the global functioning of the considered ecosystem. Moreover the relative importance of the most important C-N-P compounds in these processes will be investigated. This data will allow us to calculate the ecosystem variables (uptake rate, regeneration rate,..) with a mass balance equation model (Elskens, 1999) including uncertainty ranges.

  A global budgeting of C-N-P for the Southern Bright of the North Sea will be provided.

- The research project "Amore II" addresses eutrophication processes in Belgian coastal waters. Based upon knowledge gained during the projects "Amore I" (1997-2001) and "Izeut" (2000-2001), research will further focus on establishing quantitative and qualitative links between nutrients (N,P,Sl), spreading of high biomass blooms of the colony-forming *Haptophycea Phaeocystis,* the diatom *Guinardia delictula* and the dinoflagellate *Noctiluca.* In support to governmental policy, the overall objective of "Amore II" is to provide new ecological knowledge and an upgraded version of the existing 3-Dimensional ecological model 3D-MIRO&CO.

b) GENERAL OPERATIONAL METHODS
(including full description of any fishing gear trawl type, mesh size, etc.)

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)

   See Chart 1

5. *a) TYPES OF SAMPLES REQUIRED*
(e.g. Geological/Water/Plankton/Fish/Radionuclide)

   Water & physico chemical parameters, sediment, plankton – fish - benthos

   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 (2x101) (301) and carrousel in situ measurements (SCTD Seabird system, spectroradiometer, sunphotometer).
   - Box corer, Van Veen grab and Relneck sampler
   - Bonge bet, beam net, hyper benthic sledge.

6. *DETAILS OF MOORED EQUIPMENT*

   DATES:

Laying	Recovery	Description	Depth	Latitude	Longitude

7. *ANY HAZARDOUS MATERIALS* None
   (Chemicals, Explosives, Gases, Radioactive etc)
   (use separate sheet, if necessary)

   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

   - *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

   - Previous cruises in the same area were done between 1998 and 200 on board of RV Belgica (BG9809, BG9821, BG9910, BG0009, BG0024) in the framework of the research PODO I, Biogeochemie van nutriënten, metalen en organische micropolluenten in de Noordzee. (MM/DD/11). Cruises in the present research “Canopy” program were (or will be) done in September, October and December 2003 (BG0321, BG0327, BG0332). Future cruises are planned in April, <ay and September 2004 on board of the “RV Belgica”.
   - Project “Amore II” : See annex 1

   b) ANY PREVIOUSLY PUBLISHED DATA RELATING TO THE PROPOSED CRUISE

   - Project Canopy
     Onderzoekeprogramma PODO I, Biogeochemie van nutriënten, metalen en organische micropolluenten in de Noordzee. (MM/DD/11).
   - Brion N., W. Baeyens, S. De Galan, M. Elskens and R. Laane. The North Sea Shelf in the nineties: source of sink for N and P to the North Atlantic Ocean? BIOGEOCHEMISTRY (in press).
   - Tungaraza.C., Rousseau V., Brion N., Lancelto C., Gichuki, J., Baeyens W. and L. Goeyens. 2003. Contrasting nitrogen uptake by diatom and *Phaeocystis*-dominated phytoplankton assemblages in the North Sea. Journal of Experimental Maine Biology and ecology. 292: 19-41.
   - Tungaraza.C., Rousseau V., Brion N., Baeyens W. and L. Goeyens. 2003. Influence of bacterial activities on nitrogen uptake rate sdetermined by the application of antibiotics. Oceanologia, 45(3): 473-489.
   - Borges A.V., Frankignoulle M. (1999). Daily and seasonal variations of the partial pressure of CO2 in surface seawater along the Belgian and Southern Duth coastal ares. J.Mar.Syst. 19, 251-266

     Frankignoulle M., Borges A.V. (2001) European continental shelf as a significant sink for

Atmospheric carbon dioxide. Global Biogeoch. Cycles, in press.

- Project “Amore”
  See Annex 2

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*
   - Project “Canopy”
     The Netherlands: Dr. Remy Laane, RIKZ, PO Box 20907, NL-EX The Hague, The Netherlands.

     United Kingdom: Dr Ian Joint, CCMS, Plymouth Marine Laboratory, Prospect Placo, Plymouth, PL1 3DH, UK.

     France: Josette Garnior, UMR Sisyphe CNRS, Université Pet M. Curie, Tour 26, étage 5, 4 place Jussleu, F-750005 Paris.

   - Project “Amore”
     The Netherlands: DR Marcel Veldhuis and Corina Bruussard. Department of Biological Oceanography.
     Royal Netherlands Institue for Sea Research – PO Box 59, NL – 1790 AB Den Burg, Texel – The Netherlands

     France: Drs Valeria Genilhomme, Rachid Amara and Laurent Seuront
     CNRS UPRES A 8013, Ecosystémes littoraux et cōtiers ELICO, 8013 – Station Marine BP 80, Avenue Foch 28, 62930 Wimereux, 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

N/A

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

- Cruise report available within 2 months (on request)

PART C: SCIENTIFIC EQUIPMENT

COASTAL STATE:
PORT CALL:
DATES: .

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

				DISTANCE FROM COAST		
LIST SCIENTIFIC WORK BY FUNCTION e.g. MAGNETOMETRY GRAVITY DIVING SEISMICS BATHYMETRY SEABED SAMPLING TRAWLING ECHO SOUNDING WATER SAMPLING U/W TV 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 CHARACTER-ISTICS*	*WITHIN 4 NM*	*BETWEEN 4 AND 12 NM*	*BETWEEN 12 AND 200 NM*

(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.

nnex 1

roject AMORE-II

elevant previous cruises

. **April-May-June 1979.** 3 oceanographic cruises realized by "*Groupe Matière Organique*" and organized by UGMM Unité de gestion du Modèle Mathématique de la Mer du Nord et de l'Estuaire de l'Escaut). Study of primary production nd phytoplanktonic excretion.

. **February-April-May-June-October 1982.** 5 oceanographic cruises organized by UGMM in the Channel and the outhern Bight of the North Sea. Study of impact of nitrogen nutrient enrichment by the Schedt on metabolic activities of hytoplankton.

. **April-May 1983.** Oceanographic cruise ALKAID, organized by UGMM, in the Channel and the Southern Bight of the lorth Sea. Study of phytoplanktonic metabolism.

. **June 1985.** Oceanographic cruise on board of BELGICA organized by UGMM. Scheldt and Rhine influence on etabolic activities of phytoplankton.

. **April 1986.** Oceanographic cruise on board of BELGICA organized by UGMM. Study of diatom community: etabolism and control of growth by nitrogen and silica.

. **May 1986.** Oceanographic cruise on board of R.V. CHARLES DARWIN (NERC) organized by MBA-Laboratory itadell Hill (Plymouth, U.K.). Study of metabolic activities of *Phaeocystis* colonies: light and nutrient control.

. **September 1986.** Oceanographic cruise on board of BELGICA organized by UGMM. Study of phytoplankton growth: ethod validation.

. **May 1987.** Oceanographic cruise on board of BELGICA organized by UGMM. Temporal evolution of a *Phaeocystis* loom in Belgian coastal waters.

. **18 april -6 may 1988.** Oceanographic cruise on board of BELGICA organized by UGMM in the frame of EC project on he dynamics of *Phaeocystis* bloom. Collaboration of French, Belgian and German scientists. Temporal evolution of a *haeocystis* spring bloom

0. **3-7 april 1989.** Oceanographic cruise on board of BELGICA organized by UGMM in the frame of EC project on the lynamics of *Phaeocystis* bloom. Study of metabolism of phytoplanktonic species preceding *Phaeocystis* development.

1. **11-15 march 1991.** Oceanographic cruise on board of BELGICA organized by UGMM in the frame of EC project on he dynamics of *Phaeocystis* bloom. Study of metabolism of phytoplanktonic species preceding *Phaeocystis* development.

2. **17-26 May 1994.** Oceanographic cruise on board of BELGICA in the frame of Impulse in Marine Sciences (SSTC). Study of physiological and biochemical processes associated to *Phaeocystis* bloom.

3. **2 – 12 May 1995**; european cruise on board of RV Belgica in the frame of the projet SSTC « Dynamique des systèmes marins eutrophisés » et european « Biogeochemistry of *Phaeocystis* colonies and their derivated aggregates »

4. **15 - 17 May 1998.** Oceanographic cruise on board of R.V. Belgica in the frame of the SSTC project AMORE I (Advanced Modelling and Research on Eutrophication). Identification of the spatial distribution of phytoplankton.

5. **26 April-12 May 1999.** Oceanographic cruise on board of BELGICA in the frame of the project AMORE in Sustainable Development of North Sea research Programme (SSTC). Study of the processes associated to *Phaeocystis* bloom decline: agregation, sedimentation, grazing.

6. **12-4 July 1999.** Cruise on board of R.V. Belgica in the frame of the SSTC project AMORE I (Advanced Modelling and Research on Eutrophication). Experimental study of photosynthetic process and growth of summer diatoms.

17. **3-5 March 2003.** Cruise on board of R.V. Belgica in the frame of the SSTC projects AMORE II and BELCOLOUR. Experimental study of metabolism of early spring diatoms and bio-optical properties of Belgian coastal waters.

18. **22-25 April 2003.** Cruise on board of R.V. Belgica in the frame of the SSTC projects AMORE II and BELCOLOUR. Experimental study of metabolism of phytoplankton and bio-optical properties of Belgian coastal waters during a Phaeocystis bloom.

19. **7-9 May 2003.** Cruise on board of R.V. Zeeleeuw (VLIZ) in the frame of the SSTC projects AMORE II and BELCOLOUR. Experimental study of the competition between phytoplankton species and bacteria and bio-optical properties of Belgian coastal waters during the post-bloom.

20. **6-20 June 2003.** Cruise on board of R.V. Belgica in the frame of the SSTC projects AMORE II and BELCOLOUR. Experimental study of the competition between phytoplankton and bacteria for P acquisition, relationship between phytoplankton-gelatinous organisms and bio-optical properties of Belgian coastal waters.

21. **7-10 July 2003.** Cruise on board of R.V. Belgica in the frame of the SSTC projects AMORE II and BELCOLOUR. Experimental study of the competition between phytoplankton and bacteria for P acquisition, relationship between phytoplankton-gelatinous organisms and bio-optical properties of Belgian coastal waters.

22. **8-12 September 2003.** Cruise on board of R.V. Belgica in the frame of the SSTC projects AMORE II and BELCOLOUR. Experimental study of the competition between fall diatom and bacteria for P acquisition, relationship between phytoplankton-gelatinous organisms and bio-optical properties of Belgian coastal waters

From 1988 to 2000up to xxxx: weekly sampling of station 330 reference station of Belgian coastal waters for the study of eutrophication mechanism.

Annex 2

Project Amore II

Reports

SSTC-Rapports annuals Amore I: 1997, 1998, 1999, 2000, 2002

Rousseau, V., Breton, E., De Wachetr, B., Beji, Deconinck, M., Huijgh, J., Bolsens, T., Leroy, D., Jans, S., and C. Lancelot. Identification of Belgian maritime zones affected by eutrophication (IZEUT): Towards the establishment of ecological criteria for the implementation of the OSPAR Common Procedure to combat eutrophication. Rapport final. Octobre 2003. 77pp.

Thèse de doctorat

V. Rosseau: Dynamics of *Phaeocystis* and diatom blooms in the eutrophicated waters of the Southern Bright of the North Sea. ULB. 205p.

Publications dans revues internationals:

Lancelot C. and V. Rousseau.1997. *Phaeocystis* blooms in the North Sea: Are they getting worse? Abstract of the Sixth International Phycological Congress. Phycologia: 36(4): p57.

Ruddick K. Ovidio F. Vasilkov A. Lancelot C. Rousseau V. and Mike Rijkeboer.1999. Optical remote sensing in support of eutrophication monitering in Belgian waters. Proceedings of the 18th EARSeL symposium on : Operational remote sensing for Sustainable Development. Enschede, The Netherlands. 11-14 May 1998. Niewenbuis, Vaughn and Molenaar (eds). Balkema, Rotterdam:445-452

Rousseau V, S. Becquevort J.-Y. Parent S. Gasparini M.-H. Daro M. Tackx et C. Lancelot. 2000. Trophic efficiency in a coastal ecosystems dominated by ***Phaeocystis Globosa*** colonies. *Journal of Sea Research* 43:3-4, p 357-372.

Gasparini S. M.H. Daro, E. Antajan, M. Tackx, V. Rosseau V., J.-Y. Parent et C. Lancelot.2000. Mesozooplankton grazing during the ***Phaeocystis Globosa*** bloom in the Southern Bright of the North Sea. Journal of Sea Research 43:3-4, p 345-356.

Lancelot, C. Vanderborght, J-P., Rosseau, V. and R. Wollast. 200. Gestion durable de la qualité de l'eau et des resources aquatiques face à la contaminacion par l'azote: le role des chercheurs. Actes du symposium Développement Durable: A la recherché d'un dialogue durable entre science et politique. Bruxelles. 24-25 Novembre 1999. SSTC ed. 90-98. 14pp.

Rousseau, V. 2002. The loife cycle of HAB forming haptophytes. Proceedings of the EC workshop LIFEHAB: Life histories of micro algal species causing harmful blooms. Calvia, Majorca, Span, Octobre 2001. Research in Enclosed Seas series. Vol. 12:22-26

Lancelot, C., Rousseau V., Schoemann, V. and S. Becquevort. 2002. On the ecological role of the different life forms of ***Phaeocystis.*** Proceedings of the EC workshop LIFEHAB: Life histories of micro algal species causing harmful blooms. Calvia, Majorca, Span, Octobre 2001. Research in Enclosed Seas series. Vol. 12:71-75.

Rousseau V., Leynaert A., Daoud, N and C. Lancelot.2002. Diatom succession, silicification and silicic acid availability in Belgian Coasal waters (Southern North Sea). Marine Ecology Progress Series. 236: 61-73.

Tungaraza, C. Rousseau, V., Brion, N. Lancelot, C.Gichuki, J., Baeyens, W. and L, . Goeyens. 2003. Contrasting nitrogen uptake by diatom and ***Phaeocystis***- dominated phytoplankton assemblages in the North Sea. Journal of Experimental Marine Biology and Ecology. 292:19-41.

Tungaraza, C. Rousseau, V., Brion, N. Baeyens, W. and L, . Goeyens. 2003 Influence of bacterial activities on nitrogen uptake rates determined by the application of antibiotics. Oceanologia 45(3): 473-489.

Hamm, C. and V. Rousseau. 2003. The fate of ***Phaeocystis***-derived fatty acids during a ***Phaeocystis globosa*** bloom in the Southern North Sea, Journal of Sea Research (in press).

Billen, G., Ganier, J. and V. Rousseau 2003. Nutrient fluxes and water quality in the drainage network of the Scheldt basin over the last 50 years. Proceedings of the ECSA Scheldt Estuary. Antwerp, 7-10 October 2002. hydrobiologia.