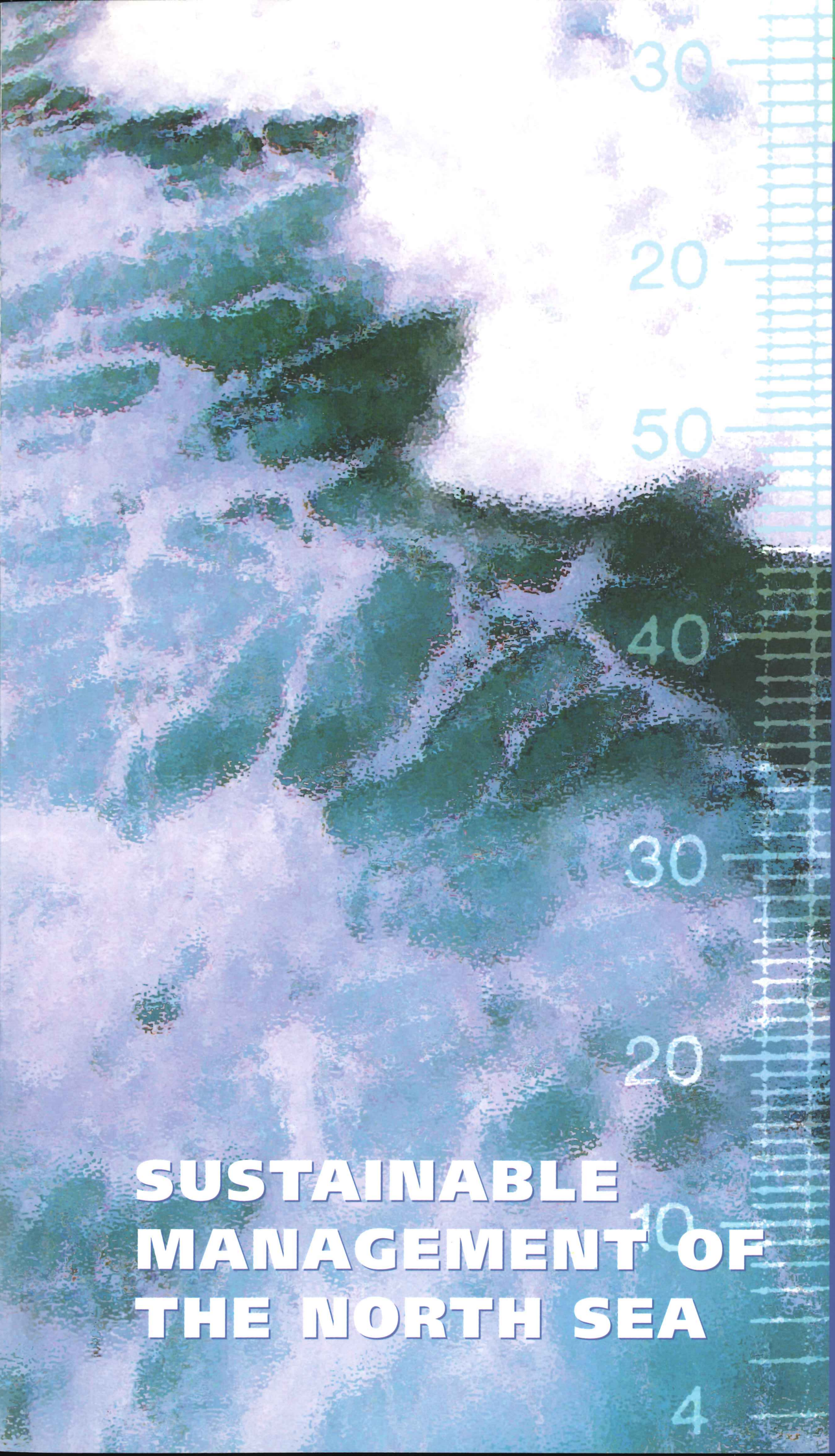


SUSTAINABLE MANAGEMENT OF THE NORTH SEA

SCIENTIFIC SUPPORT PLAN FOR A SUSTAINABLE DEVELOPMENT POLICY

THE NORTH SEA IN FIGURES

Location	5° West - approx. 13° East 48° - 62° North
Area	746,000 km²
Average depths of the northern zone	150 to 500 m
Average depths of the central zone	50 to 100 m
Average depths of the southern zone	25 to 50 m
Maximal depth	700 m
Volume of water	94,000 km³
Average flow of sea water from the North	41,000 km³ per annum
Average flow of sea water from the South	3,150 km³ per annum
Average flow of fresh water from rivers	325 km³ per annum
Average annual precipitation	425 mm
Average time of discharge	500 days
Catchment area of rivers discharging into the North Sea	841,000 km²
Countries included in the North Sea basin	Norway, Sweden, Denmark, Germany, the Czech Republic, Slovakia, the Netherlands, Belgium, Luxembourg, Switzerland and the United Kingdom
Population of the North sea basin	184,000,000
Annual flow of matter in suspension	50 to 65,000,000 million tonnes
Annual fish catch (1995)	2,900,000 tonnes
Annual shellfish catch (1995)	250,000 tonnes
Average maritime traffic	500,000 per annum
Average number of navigation accidents	150 per annum
Number of oil and gas platforms (1996-98)	475
Number of kilometres of pipelines (1996-98)	10,000
Annual gas production (1996-98)	167,700,000,000 m³
Annual petroleum production (1996-98)	285,300,000 tonnes
Annual extracted sand and gravel (1996)	40,000,000 m³
Annual discharge of dredged matter (1996)	90,000,000 tonnes

Source: Quality Status Report 2000

BRIEF BACKGROUND ON BELGIAN MARINE RESEARCH

BEFORE 1970

The interest of Belgian researchers in marine science dates back a long way.
As early as 1842, Pierre Joseph Van Beneden, a Professor at the Catholic University of Louvain, set up a rudimentary laboratory in Ostend to study marine biology. It is recognised as the first in the field in Belgium.

At the University of Liège, Professor Edouard Van Beneden pioneered research in marine science. He also established a laboratory in Ostend.

At the University of Brussels, Paul Pelseneer was one of the first to offer a regular course in marine biology; he was also an internationally renowned authority on molluscs.

On the initiative of Gustave Gilson, successor of Pierre Joseph Van Beneden, the "First International Conference on the Ocean" was held in Ostend in 1926. A year later the "Zeewetenschappelijk Instituut" (ZWI - Institute for Marine Science) was founded. Over a period of more than 30 years, the Institute's main focus was the science and statistics of fisheries. From the early 60's on, its task was taken over by the "Rijksstation voor Zeevisserij" (Public Station for Sea Fishing) of the Ministry of Agriculture.

In the same period, Ghent University and the Royal Institute for Natural Science began research related to the ocean.

At that time, the research was mainly descriptive, and cooperation between research teams and interdisciplinary work were rare.

1970 - 1976

At the end of 1970 the Belgian Government, under the influence of the European Economic Community, took the initiative of starting a national "Environment/Water" research programme, of which the "Sea" project was a part.

The "Sea" project was the first major programme in marine science in Belgium. Its purpose was to "assemble a reliable scientific basis and develop modelling techniques to permit both qualitative and quantitative simulation of the impact of natural phenomena or anthropic effects".

The programme had a very marked interdisciplinary character. Physicists, chemists, biologists, and geologists all cooperated in a study of the marine ecosystem. From 1971 to 1976, about 200 researchers from 40 different university laboratories and scientific institutes worked together on the programme. For 5 years, samples were collected within a network of 25 marine stations, at a frequency of 4 to 6 campaigns a year. The results were collated in a range of mathematical models developed over the period.

In 1976 under the aegis of the Ministry of Public Health and the Environment, a unit was installed to manage the mathematical model of the North Sea and Scheldt estuary (MUMM, the Management Unit of the Mathematical Model of the North Sea). The unit's mission was to exploit in policy decision making the scientific results achieved by the "Sea" project. At this moment the MUMM is the sixth departement of the Belgian Royal Institute of Natural Science.

1977 - 1992

The "Sea" Project was followed by two coordinated actions in marine science.

From 1976 to 1981, a coordinated "Oceanology" action and from 1982 to 1990, the coordinated interuniversity "North Sea" action. These research actions which, unlike the "Sea" project, had no central coordination system, promoted sustained research in a number of laboratories and facilitated the expansion and improvement of results already achieved.

It then became evident that Belgium needed a special marine research vessel. Up to that point, all research and monitoring activities had depended upon the availability of the infrastructure of the Navy. Consequently, Belgium commissioned the A 962 *Belgica*.

Meanwhile, two organisations were established to reinforce the inter-team and inter-disciplinary interactions already made possible in the "Sea" project and coordinated research actions. These organisations were, in the Dutch-speaking part of the country, the "Instituut voor Zeewetenschappelijk Onderzoek" (IZWO - Institute for Research in Marine Science), founded in 1970, and in French-speaking Belgium, the "Institut de Recherches Marines et d'Interactions Air-Mer (IRMA - Institute for Marine Research and Air-Sea Interactions), founded in 1980.

The 80's were distinguished by the growing interest of the European Community in the environment in general and the sea in particular. This took the form of increased budgets at EC level for research in the field and greater use of such resources by Belgian researchers.

1992 - THE PRESENT

In July 1990, the Council of Ministers approved support to and implementation of a programme designed to encourage work in Marine Science.

The objective of the programme was to give several research groups a renewed stimulus to lay the groundwork for better understanding of the marine environment and the natural and human factors that influence it. The programme aimed to contribute to international research efforts regarding the protection and sustainable use of the North Sea and Scheldt estuary and to assist the process of policy decision making at national level.

The programme enabled 18 research teams working on 12 projects to conduct research from September 1992 to December 1996.

The expertise developed in the "Marine Sciences" programme is now used under a new programme, initiated in January 1997 in the framework of the "Plan for Scientific Support for a Policy of Sustainable Development". In the context of the "International Conferences on the Protection of the North Sea" and with a view to cooperating with other North Sea coastal states, this programme aims to contribute to the management and sustainable development of the North Sea and its natural resources. All possible attention will be given to protecting the marine environment and evaluating the dangers that threaten it.

THE PROGRAMME "SUSTAINABLE MANAGEMENT OF THE NORTH SEA"

CONTEXT

To exploit and sustainably develop the North Sea and all its natural resources while preserving the marine environment and accurately assessing the dangers that threaten it, it is necessary to describe the system's present situation and to assess future developments. There are still significant gaps in our present knowledge which prevent sustainable management and limit our ability to predict and evaluate possible changes in the environment. Systematic gathering and analysis of marine environmental data will enable us to foresee the consequences of changes caused by man in the marine biota and environment.

In the "Marine Sciences" programme (1992-1996), the foundation was laid for acquiring the expertise needed to better understand the marine environment. The programme "Sustainable Management of the North Sea" in the "Plan for Scientific Support for a Policy of Sustainable Development" represents an effort to explore this knowledge in depth and use it to contribute, in cooperation with other countries of the North Sea basin, to a plan for its sustainable management and for conservation of its natural resources. This will involve two types of scientific activity.

To explore the complex nature of the phenomena that govern and influence the marine environment, longer-term and more basic research is essential. Current basic knowledge is not yet adequate to enable us to understand the various phenomena occurring in the North Sea environment, given their complex and interdisciplinary nature. **Strategic scientific research** would on the one hand help to reinforce and optimally exploit the available scientific expertise, and on the other hand facilitate creation of new centres of expertise. To this end, the programme aims to bring scientific teams together to work in multidisciplinary networks on projects in chosen subject areas, the common goal being to establish a solid foundation on which Federal authorities can base implementation of long-term policies for the sustainable exploitation of the North Sea and its natural resources.

Targeted scientific actions are the most appropriate way to enable authorities to formulate a timely answer, based on scientific data, to urgent questions of national and international policy regarding the task of monitoring the North Sea and its natural resources. These actions involve short-term research, restricted in scope and primarily of an applied nature. The research can deal with biological, physical, and chemical aspects or socioeconomic and legal issues.

OBJECTIVES

To construct a sustainable plan for the management of the North Sea and its natural resources, the authorities need:

- a better understanding of the structure and functioning of the North Sea ecosystem;

- a better understanding of the impact of human activities on the North Sea ecosystem:
  - to gain a better objective understanding of the notion of "how the North Sea can be sustainably exploited to ensure that those living on its banks can maintain a high standard of living";
  - to gain a better understanding of the socioeconomic consequences accompanying the negative impact of human activities on the North Sea ecosystem;
  - to translate properly founded scientific information and opinions from the research community into a policy designed to establish the most favourable balance possible between the various forms of exploitation of the North Sea, and to inform the public.

Apart from these scientific objectives, the goal of the programme is to enable teams of Belgian scientists having acquired expertise in the field to maintain or strengthen their international standing and to offer new teams an opportunity to demonstrate their ability to become qualified for marine research. It will also enable the scientific community to constantly track down new fields of investigation and establish a basis for new forms of expertise.

IMPLEMENTATION

- The programme began on 1 January 1997 and will end on 31 December 2002. It continues the "Marine Sciences" programme (1 Octobre 1992 - 31 December 1996).

- **Strategic scientific research:**
  - on the basis of selected proposals, multidisciplinary subject area networks will be developed:
  - two calls for proposals were published:

one for all scientific fields, socioeconomic and legal subjects excluded. These projects were to start on 1 January 1997 with a maximum duration of five years;

one for the socioeconomic and legal fields, with projects starting in 1998 with a maximum duration of four years.

- **Targeted scientific actions**: to enable public authorities to formulate answers to urgent policy questions quickly and consistently, a call for proposals is published every two years. Activities will start in 1998, 1999, and 2001.

- The programme has a budget of 407.6 million BEF and employs about 40 individuals with scientific training. The employment offered amounts to 160 man-years.

SUMMARY OF THE SCIENTIFIC CONTENT

STRATEGIC SCIENTIFIC RESEARCH

This aspect of the programme is intended to facilitate bringing together the various research units from the various disciplines and to enable them to probe in greater depth the complex problems pertaining to the marine environment.

The main guidelines for strategic research are as follows:

Eutrophication

- Where, how, and with what consequences does nutrient concentration or inflow generated by human activity produce a change in the frequency, duration, or size of planktonic algal blooms?
- How and to what extent are marine ecosystems (zooplankton, benthos, and higher trophic levels) disturbed by the increased presence of algae, by changes in algal constituents, or by the possible presence of toxic algae?

Chemical pollution

- What are the sources, flows, and destinations of inorganic and organic marine pollutants?
- Do the increase and presence of such pollutants in the sea influence marine life?

Protection of species and their habitat

- What is the spatial and temporal distribution of ecologically important species, of species playing a key role as biodiversity indicators, of species that are threatened, endangered, or on the brink of becoming so? What is the relationship between their various types of habitat in the coastal zone and high seas?
- How do human activities influence the composition (biodiversity) and density of these species and the sustainability of their various kinds of habitat?

Sustainable exploitation of the sea

- How can one determine the state of health of the sea so as to determine the impact of human activities?
- What is the socioeconomic cost of deterioration of the marine environment?
- What are the risks from accidental spills of petroleum and other chemicals in the environment?

Setting up a data bank with data series

In order to identify which way the health of the North Sea is moving and to evaluate new mathematical models, it is essential to have series of data collected over a long period. Several Belgian research teams already possess some such data.

To facilitate bringing together the fragmentary available data dispersed among the research teams, we need to evaluate the quality of these data and group them in a homogeneous manner in a central Belgian data bank. The bank will be responsible for optimal dissemination of the data to the subject-area networks and for answering external requests. As for the subject-area network teams, they should supply to the bank the information they possess, quickly and in a structured manner.

TARGETED SCIENTIFIC ACTIONS

Belgium will have to justify its international policy towards the North Sea, chiefly in the framework of the "International Conferences on the Protection of the North Sea". Consequently, targeted scientific actions will be dictated mainly by the problems arising when the Quality Status Report on the North Sea is prepared. The Report will be drawn up jointly by the various North Sea coastal States for the next Conference of Ministers in the year 2000.

LIST OF PROJECTS

STRATEGIC SCIENTIFIC RESEARCH

1 THE BIOGEOCHEMISTRY OF NUTRIENTS, METALS AND ORGANIC MICROPOLLUTANTS IN THE NORTH SEA

Professor R. Van Grieken (UA/UIA)
Professor W. Baeyens (VUB)
Professor Dr. Ir. H. Van Langenhove (RUG)
Professor R. Wollast (ULB)

2 AMORE: ADVANCED MODELLING AND RESEARCH ON EUTROPHICATION

Dr. C. Lancelot (ULB)
Professor M.-H. Daro (VUB)
Dr. G. Pichot (MUMM)

3 ICAS: THE IMPACT ON NORTH SEA ORGANISMS OF POLLUTANTS ASSOCIATED WITH SEDIMENTS

Dr. Ph. Dubois (ULB)
Professor M. Jangoux (UMH)
Professor R. Flammang (UMH)

4 THE STRUCTURAL AND FUNCTIONAL BIODIVERSITY OF NORTH SEA ECOSYSTEMS: SPECIES AND THEIR HABITATS AS INDICATORS FOR THE SUSTAINABLE MANAGEMENT OF THE BELGIAN COASTAL SHELF

Professor Dr. M. Vincx (RUG)
Professor Dr. E. Kuijken (IN)
Professor F. Ollevier (KUL)

5 NORTH SEA SEABIRDS AND MARINE MAMMALS: PATHOLOGY AND ECOTOXICOLOGY

Professor J.-M. Bouquegneau (ULg)
Professor F. Coignoul (ULg)
Professor C. Joiris (VUB)
Professor Dr. E. Kuijken (IN)

6 IDOD: INTEGRATED AND DYNAMICAL OCEANOGRAPHIC DATA MANAGEMENT

Dr. Ir. G. Pichot (MUMM)
Professor J.-P. Donnay (ULg)
Dr. J. Van Dyck (KUL)

7 MARE-DASM: MARINE RESOURCES DAMAGE ASSESSMENT AND SUSTAINABLE MANAGEMENT OF THE NORTH SEA

Professor F. Maes (RUG)
Professor H. Bocken (RUG)
Professor C. Janssen (RUG)
Dr. G. Pichot (MUMM)

TARGETED SCIENTIFIC ACTIONS

1 QUALITY STATUS AND TERRESTRIAL INPUTS FOR THE NORTH SEA

Professor Bayens W. (VUB)
Professor R. Van Grieken (UA/UIA)
Dr. Vanderborcht J.P. (ULB)
Professor Wollast R. (ULB)

2 ED-NORTH: EVALUATION OF POSSIBLE IMPACTS OF ENDOCRINE DISRUPTORS ON THE NORTH SEA ECOSYSTEM

Professor C. Janssen (RUG)
Professor F. Comhaire (RUG)

3 DEVELOPMENT OF METHODS FOR ANALYSING HYDROCARBONS AND ORGANIC MICROPOLLUTANTS IN A MARINE ENVIRONMENT

Professor Dr. E. Depauw (ULg)

4 MONITORING VOLATILE ORGANIC COMPOUNDS IN MARINE ORGANISMS: ANALYSIS, QUALITY ASSURANCE AND FEASABILITY

Professor dr. R. Declerck (CLO-Dep. Zeevisserij)

5 EVALUATION OF THE QUALITY OF TURBOT FRY ON RESTOCKING SUCCESS IN THE NORTH SEA

Professor P. Sorgeloos (RUG)

6 EVALUATION OF "THE PAARDENMARKT" SITE

Professor J.P. Henriet (RUG)

7 INTENSIVE MONITORING OF THE EVALUATION OF A PROTECTED BENTHIC HABITAT (HABITAT)

Professor M. Vincx (RUG)
Professor P. Jacobs (RUG)

8 RESEARCH ON NATURAL SAND TRANSPORTS ON THE BELGIAN CONTINENTAL SHELF: BUDGET

Dr. J. Lanckneus (MAGELAS)
Professor M. De Batist (RUG)

9 IDENTIFICATION OF MARINE ZONES AFFECTED BY EUTROPHICATION (IZEUT)

Dr. C. Lancelot (ULB)

SPECIAL ACTIVITY

1 THE COLLECTION GUSTAVE GILSON AS A HISTORICAL REFERENCE FRAMEWORK FOR THE BELGIAN MARINE FAUNA: FEASIBILITY STUDY

Dr. J. Van Goethem (KBIN-IRSNB)

PROMOTORS OF THE RESEARCH PROJECTS

PROF. W. BAEYENS
Vrije Universiteit Brussel (VUB)
Department of analytical and environmental chemistry
Pleinlaan 2
1050 Brussel
Tel.: +32-2-629 36 02
Fax: +32-2-629 32 74
E-mail: wbaeyens@vub.ac.be

PROFESSOR H. BOCKEN
Universiteit Gent (RUG)
Centre for Environmental Law
Universiteitstraat 4
9000 Gent
Tel.: +32-9-264 69 23
Fax: +32-9-264 69 90
E-mail: Hubert.Bocken@rug.ac.be

PROF. J.-M. BOUQUEGNEAU
Université de Liège (ULg)
Oceanology Laboratory
Sart Tilman B6
4000 Liège
Tel.: +32-4-366 33 21
Fax: +32-4-366 45 21
E-mail: JM.Bouquegneau@ulg.ac.be

PROF. F. COIGNOUL
Université de Liège (ULg)
Service d'Anatomie pathologique
Sart Tilman B43
4000 Liège
Tel.: +32-4-366 40 75
Fax: +32-4-366 40 65
E-mail: F. Coignoul@ulg.ac.be

PROF. F. COMHAIRE
Universitair Ziekenhuis Gent (RUG)
Laboratory for Andrology
De Pintelaan 185
9000 Gent
Tel.: +32-9-240 21 33
Fax: +32-9-240 38 97
E-mail: Frank.Comhaire@rug.ac.be

PROF. M.-H. DARO
Vrije Universiteit Brussel (VUB)
Ecology and Systematics Laboratory
Pleinlaan 2
1050 Brussel
Tel.: +32-2-629 34 02
Fax: +32-2-629 34 03
E-mail: ndaro@vub.ac.be

PROF. M. DE BATIST
Universiteit Gent (RUG)
Department of Geology and Soil Science
Renard Centre of Marine Geology
Krijgslaan 281, S. 8
9000 Gent
Tel.: +32-9-264 45 87
Fax: +32-9-264 49 67
E-mail: marc.debatist@rug.ac.be

PROF. E. DE PAUW
Université de Liège (ULg)
Mass Spectrometry Laboratory
Institut de Chimie B6
4000 Liège
Tel.: +32-41-366 34 15
Fax: +32-41-366 34 13
E-mail: e.depauw@ulg.ac.be

PROF. J.-P. DONNAY
Université de Liège (ULg)
Laboratory SURFACES
Place du 20-Août 7
4000 Liège
Tel.: +32-4-366 54 24
Fax: +32-4-366 56 93
E-mail: donnay@geo.ulg.ac.be

DR. PH. DUBOIS
Université Libre de Bruxelles (ULB)
Marine Biology Laboratory
Avenue F.-D. Roosevelt 50, CP160/15
1050 Bruxelles
Tel.: +32-2-650 28 39
Fax: +32-2-650 27 96
E-mail: phdubois@ulb.ac.be

PROF. R. FLAMMANG
Université de Mons-Hainaut (UMH)
Laboratory of Organic Chemistry
Avenue Maistriau 19
7000 Mons
Tel.: +32-65-37 33 42
Fax: +32-65-37 35 15
E-mail: robert.flammang@umh.ac.be

PROF. J.-P. HENRIET
Universiteit Gent (RUG)
Renard Centre of Marine Geology
Vakgroep Geologie en Bodemkunde Instituut
Krijgslaan 281, S. 8
9000 Gent
Tel.: +32-9-264 45 85
Fax: +32-9-264 49 67
E-mail: jeanpierre.henriet@rug.ac.be

PROF. P. JACOBS

Universiteit Gent (RUG)
Department of Geology & Soil Science,
Sedimentary Geology & Engineering Geology
Krijgslaan 281, S. 8
9000 Gent
Tel.: +32-9-264 46 51
Fax: +32-9-264 46 51
E-mail: Patric.Jacobs@rug.ac.be

PROF. M. JANGOUX

Université de Mons-Hainaut (UMH)
Laboratory of Marine Biology
Place du Parc 20
7000 Mons
Tel.: +32-65-37 34 70
Fax: +32-65-37 34 34
E-mail: jangoux@umh.ac.be

PROF. C. JANSSEN

Universiteit Gent
Laboratory of Environmental Toxicology and
Aquatic Ecology
J. Plateaustraat 22
9000 Gent
Tel.: +32-9-264 37 75
Fax: +32-9-264 41 99
E-mail: Colin.Janssen@rug.ac.be

PROF. C. JOIRIS

Vrije Universiteit Brussel (VUB)
The laboratory for Ecotoxicology & Polar Ecology
Pleinlaan 2
1050 Brussel
Tel.: +32-2-629 34 14
Fax: +32-2-629 34 38
E-mail: cjoiris@vub.ac.be

PROF. E. KUIJKEN

Ministerie van de Vlaamse Gemeenschap
Instituut voor Natuurbehoud (IN)
Kliniekstraat 25
1070 Brussel
Tel.: +32-2-558 18 11
Fax: +32-2-558 18 05
E-mail: eckhart.kuijken@instnat.be

DR. C. LANCELOT

Université Libre de Bruxelles (ULB)
Ecologie des systèmes Aquatiques
Campus de la Plaine CP 221
Boulevard du Triomphe
1050 Bruxelles
Tel.: +32-2-650 59 88
Fax: +32-2-650 59 93
E-mail: lancelot@ulb.ac.be

PROF. J. LANCKNEUS

MAGELAS
Violierstraat 24
9820 Merelbeke
Tel.: +32-9-232 57 04
Fax: +32-9-232 57 04
E-mail: Jean.Lanckneus@skynet.be

PROF. F. MAES

Universiteit Gent (RUG)
Department of Public International Law
Maritime Institute
Universiteitstraat 6
9000 Gent
Tel.: +32-9-264 68 95
Fax: +32-9-264 69 89
E-mail: Frank.Maes@rug.ac.be

PROF. F. OLLEVIER

Katholieke Universiteit Leuven (KUL)
Laboratory for ecology and aquaculture
Naamsestraat 59
3000 Leuven
Tel.: +32-16-32 39 66
Fax: +32-16-32 45 75
E-mail: aquabio@bio.kuleuven.ac.be

DR G. PICHOT

Management Unit of the Mathematical Models
of the North Sea (MUMM)
Gulledelle 100
1200 Brussel/Bruxelles
Tel.: +32-2-773 21 31
Fax: +32-2-770 69 72
E-mail: G.Pichot@mumm.ac.be

PROMOTORS OF THE RESEARCH PROJECTS

PROF. P. SORGELOOS

Universiteit Gent (RUG)
The Laboratory for Aquaculture & Artemia
Reference Center
Rozier 44
9000 Gent
Tel.: +32-9-264 37 54
Fax: +32-9-264 41 93
E-mail: Patrick.Sorgeloos@rug.ac.be

DR. J.-P. VANDERBORGHT

Université Libre de Bruxelles (ULB)
Laboratoire de Chimie Océanographique
Campus de la Plaine CP 208
Boulevard du Triomphe
1050 Bruxelles
Tel.: +32-2-650 51 98
Fax: +32-2-646 34 92
E-mail: vdborght@ulb.ac.be

DR. J. VAN DYCK

Katholieke Universiteit Leuven (KUL)
University Centre of Statistics (UCS)
de Croylaan 52B
3001 Heverlee
Tel.: +32-16-32 27 89
Fax: +32-16-32 29 99
E-mail: jvd@pophost.eunet.be

DR. J.L. VAN GOETHEM

Head of the Department of Invertebrates
Vautierstraat 29
1000 Brussels
Tel.: +32-2-627 43 43
Fax: +32-2-627 41 41
E-mail: vangoethemj@kbinirsnb.be

PROF. R. VAN GRIEKEN

Universitaire Instelling Antwerpen (UA/UIA)
Department of Chemistry
Micro- and Trace Analysis Center
Universiteitsplein 1
2610 Antwerpen-Wilrijk
Tel.: +32-3-820 23 62
Fax: +32-3-820 23 76
E-mail: vgrieken@uia.ua.ac.be

PROF. H. VAN LANGENHOVE

Universiteit Gent (RUG)
Laboratory of Organical Chemistry
Coupure Links 653
9000 Gent
Tel.: +32-9-264 59 53
Fax: +32-9-264 62 43
E-mail: herman.vanlangenhove@rug.ac.be

PROF. M. VINCX

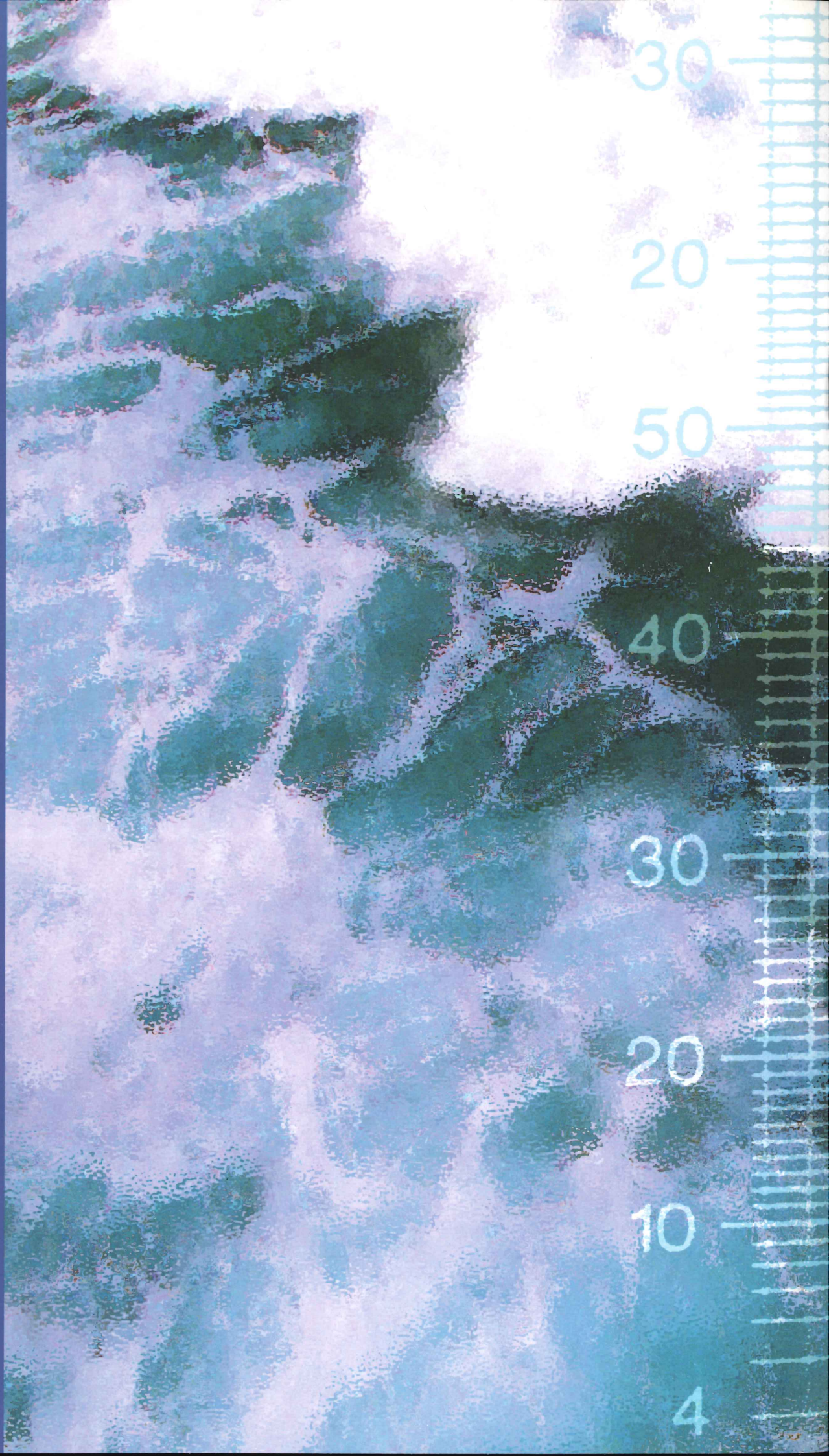
Universiteit Gent (RUG)
Marine Biology Section
K.L. Ledeganckstraat 35
9000 Gent
Tel.: +32-9-264 52 10
Fax: +32-9-264 53 44
E-mail: magda.vincx@rug.ac.be

DR. R. DE CLERCK

Ministerie van Middenstand en Landbouw
CLO - Gent
Departement Zeevisserij
Ankerstraat 1
8400 Oostende
Tel.: +32-59-32 08 05
Fax: +32- 59-33 06 29
E-mail: rdeclerck@unicall.be

PROF. R. WOLLAST

Université Libre de Bruxelles (ULB)
Laboratory of Chemical Oceanography
Campus de la Plaine CP 208
Boulevard du Triomphe
1050 Bruxelles
Tel.: +32-2-650 52 13
Fax: +32-2-646 34 92
E-mail: rwollast@ulb.ac.be



FEDERAL OFFICE FOR SCIENTIFIC, TECHNICAL AND CULTURAL AFFAIRS

OSTC

RUE DE LA SCIENCE 8
WETENSCHAPSSTRAAT 8
1000 BRUXELLES
http://www.belspo.be