

BALANS

BALANCING IMPACTS OF HUMAN ACTIVITIES IN THE BELGIAN PART OF THE NORTH SEA

Duration of the project: 01/10/2002 – 30/09/2006
Budget: € 908.000
Keywords: Anthropic Activity, Ecotoxicology, North Sea, Ecological Indicators

Methodology & interaction between the different partners

In general all partners support the calculation of management scenarios.

RUG-Laboratory Marine Biology

■ Selection and elaboration of relevant indicators for benthic and epibenthic ecology which reflect the impact of human offshore activities related to fisheries and sand/gravel exploitation, based on available literature. For fisheries special attention here will be directed to ecological impacts of the use of different types of fishing gear. For sand and gravel extraction, special attention will be given to disturbance and recolonisation of habitats.

CLO-Sea Fisheries Department

■ Study of the ecological impact of sea fisheries based on own project research collected during the last 10 years and additional literature study. Special attention will be paid to the fishing techniques applied by Belgian fishermen.

■ Synthesis of the available data sets and analysis of non-mined data in the Sea Fisheries Department concerning discarding in the Belgian shrimp and flatfish fisheries industry.

RUG-Laboratory Ecotoxicology

■ Selection and elaboration of relevant ecotoxicological indicators, which reflect the impact of various industrial activities in the North Sea (fisheries, sand and gravel extraction and discharges of pollutants).

■ Selection of indicators representative for the ecological quality status of the chemistry of the water-column and the seafloor, including ecological indicators of the toxicological quality and the effects of pollutants at the ecosystem level.

MUMM

■ Data management within the project.
 ■ Study of the feasibility of visualisation of the data and support in the visualisation of the dynamics of a first conceptual balancing model.
 ■ Support of the development and selection of different types of ecological and ecotoxicological indicators.
 ■ Support of the elaboration of ecotoxicological indicators by the use of modelling.

RUG-Maritime Institute & Ecolas

■ Selection and elaboration of social and economic indicators for fisheries, sand and gravel extraction and related shipping.

■ Development of the impact of the basic management scenario. Impact on socio-economic indicators and the relation to ecological reference points will be taken into account.

■ Construction of a conceptual balancing model (BALANS). This model will, as much as possible, be build based on dynamic relationships between the differ-

CONTEXT

In the 5th North Sea Declaration (2002) Ministers stressed the need to establish an ecosystem based management of the North Sea in order to conserve biological diversity and ensure sustainable development. To reach the latter, integration of science based, environmental and socio-economic factors influencing the functioning of the North Sea ecosystem are essential. Various research activities in the Belgian part of the North Sea identified either ecological indicators without any link to socio-economical indicators or socio-economical indicators that are not linked to potential ecological indicators. At this stage, the absence of accepted systems and techniques for integrating, weighing and balancing social, economic and ecological indicators is an important lacuna.

PROJECT DESCRIPTION

Sustainable management of the North Sea is a complex theme due to interactions between the social, the economic and the ecological dimension. Five research disciplines (socioeconomics, ecology, ecotoxicology, modelling and fisheries) strive to develop a conceptual policy model, balancing ecological, economical and social indicators in an integrated approach, to support arguments and directions for policy makers to reach a more sustainable management of the Belgian part of the North Sea (BPN).

Objectives

The purpose of this project is to gain experience in correlating and balancing relevant social, economic and ecological data, through the elaboration of indicators, weighing these indicators and the development of a conceptual policy model "Sustainable Management of the North Sea". Following items will i.a. be examined: the reliability of the model, the reduction of uncertainty and error, the relevance of policy models in the argumentation for sustainable management of the sea and the effects of changing parameters of different indicators (social, economic and ecological). As this type of research is very complex and still in an embryonic phase for the marine environment, the project boundaries are limited to fisheries, sand and gravel extraction and related shipping.



ent indicators. Different methods and techniques of integration or balancing of social, economic, and ecological indicators will be analysed and compared.

- On the basis of management optimisation scenario's and making use of the conceptual balancing model in co-ordination with the administrations, new developments in international/national law and policy will be used to make short-term and long-term predictions of their socio-economical and ecological effects.

Expected results and/or products

- Detailed database of human activities and compiled database of the benthos of the BPN, evaluation of candidate indicators and selection of indicators related to this benthos.
- Development of ecotoxicological indicators of the watercolumn as a result of the focused activities.
- Application and validation of the developed indicators in a number of management scenarios.
- Identification of social and economical indicators for the focused activities.
- Relation between socio-economic indicators and ecological indicators based on a selection of indicator species derived from literature study and the database Macrodat.
- Relation between socio-economic indicators and ecological indicators based on a selection of ecotoxicological substances derived from literature and the databases.
- Comparison of methods for integration and balancing of social, economical and ecological indicators.
- A conceptual model balancing indicators for social, economical and ecological impacts of the focused activities.
- Relational database of the information relevant to the project.
- Synthetic analysis and dynamic visualisation of these data.

PARTNERS

Activities

RUG-Maritime Institute (MI)

The MI is a university based research institute advising and carrying out studies for governmental administrations, non-governmental organisations and private companies. The staff of the MI is i.a. specialized in research topics concerning international and national environmental law and policy, nature conservation and integrated coastal zone management, law of the sea, maritime law and shipping.

Ecolas N.V., AXE Group

Ecolas N.V. is a multidisciplinary environmental consultancy firm, active world-wide, which has gained its credits in policy supporting environmental studies. Highly trained multifunctional economists, engineers, biologists and geologists form the core of the firm. As such the company and its employees are used to solve problems where environmental, economical and social problems meet.

RUG-Marine Biology Section

The Marine Biology Section has been involved in ecological and systematic research of marine ecosystems from 1970 onwards, starting with the investigation

of North Sea benthic communities, with special focus on the macro- and meiobenthos. Later on research was expanded to include the hyperbenthic and epibenthic compartments. Since about ten years, other geographical areas have been included. Next to the biological subjects geochemical characteristics are determined and analysed. All chemical methods are adapted for analysis within the sediments. Microbial aspects (radio-active labelling) and experimental microcosmos research (culture chambers and respiration chambers) are available.

RUG-Laboratory of Environmental Toxicology and Aquatic Ecology

The Laboratory of Environmental Toxicology and Aquatic Ecology has performed fundamental research on different aspects of aquatic toxicology (marine and freshwater environment), such as: development of toxicity tests with different marine and freshwater aquatic organisms; quantification of the toxicity of water sediments; development of Toxicity-Identification-Evaluation (T.I.E.) and Toxicity-Reduction-Evaluation (T.R.E.) techniques; development of biomarker techniques based on physiological and biochemical endpoints for a rapid evaluation of potential toxicity; research towards the endocrine disrupting potential of chemicals in vertebrates and invertebrates; development of (predictive) risk assessment models in freshwater and marine environment,

MUMM

Research at MUMMM focuses on providing the necessary knowledge and tools for scientific management of the North Sea ecosystem based on i.a. mathematical modelling. MUMM is the Belgian official body for the management of the marine environment and represents Belgium in various international organisations (e.g. OSPAR, ...). MUMM, as co-ordinator and leader of the IDOD project (Belgian federal oceanographic data centre), has recently gained a significant and professional experience in data management activities.

CLO

DvZ (Sea fisheries Department) is a multidisciplinary institute involved in research on: the rational and sustainable exploitation of living marine resources - the protection of the marine environment as a habitat for these resources - and the quality control of fishery products. The technical department of DvZ has over ten years of experience with national and international research projects. DvZ has good contacts with the fishing industry, fishermen's organisations and the fishery administration and worked closely together with fishermen in many project, such as: selectivity of existing fishing gears; development of alternative fishing techniques; discard monitoring and study of the environmental impact of fisheries.

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