

# THE HINDER BANKS: YET AN IMPORTANT REGION FOR THE BELGIAN MARINE BIODIVERSITY?

**Duration of the project:** 15/12/2003 – 30/04/2006

**Budget:** € 140.000

**Keywords:** Epifauna, Westhinder Bank, Data Collection, Sedimentology, Environmental Management, Reference framework

The project will target three main objectives:

- The definition of a “reference situation” for “gravel” habitats of the southern bight of the North Sea (Eastern coast): analysis of the historical collection.
- The description of the current situation at reference stations.
- The analysis of changes observed between the historical and the current situations.

On one hand, this project will provide facts to support ancient texts describing the Hinder banks as a rich and ecologically important region. For instance, it is known that it once hosted large flat oyster (*Ostrea edulis*) banks and was used as spawning ground by the North Sea herring (*Clupea harengus*). On the other hand, it will allow determining whether biodiversity and habitats have been altered at the reference stations since one century.

## Methodology

The historical data represented by the specimens and archives of the Gilson collection will be digitised. A validation will be performed on sampling information (date, position, sampling gears), on taxonomy and on sedimentological information. The list of species collected by the dredge of Gilson at every station will be reconstituted and linked to the bottom conditions.

These data will be used to identify stations potentially representative of a reference situation for what regards destruction caused by fishing gears. We will evaluate whether the potential distribution of certain habitats, species or species associations could be inferred based on these results and information found in the literature.

Quantitative data on fish collected between 1903 and 1914 (abundance of size classes for every species) will be analysed. In particular, we will analyse the local distribution of fish species as well as their associations in relation with their known diet and the observed distribution of prey species.

Two sampling campaigns will be carried out at reference stations using video imagery and a small robust beamtrawl.

The situations measured in 1905-1907 and 2005 will be compared based on diversity indices (presence/absence), on the relative dominance of certain species and on the occurrence of particular species (sessile erect fauna, rarefied species or recent invasive species).

The nature and range of observed changes will serve as a basis to draw hypotheses on their causes, using available data on habitat and species sensitivity to various impacts.

## CONTEXT

The North Sea, and in particular its southern bight, is heavily influenced by human activities. Overfishing, pollution and eutrophication have resulted in a general degradation of the ecosystem as demonstrated by various long-term studies. Their impacts are combined and it is difficult to distinguish them from the effects of the recent climatic changes. The sustainability of natural resources cannot be guaranteed at the current exploitation rates. The situation is thus characterised by an ecosystem imbalance, which is difficult to describe because we lack data on its initial status. A policy of sustainable management of the natural resources must therefore rely, among others, on “reference” situations where human impact was minimal as well as on adequate evaluations of the distance that separates us from the reference.

## PROJECT DESCRIPTION

### Objectives

Our project focuses on the epifauna of “gravel” grounds in the area of the Westhinder bank with both an analysis of the material collected by G. Gilson between 1900 and 1910 and new sampling campaigns. Based on some elements found in ancient literature, we formulate the hypothesis that some stations of Gilson’s programme were located on areas yet avoided by fishermen in the early 20th century. These areas could have acted as shelters for the local benthic biodiversity, at a time when pollution and eutrophication were yet strongly reduced. These elements also tend to indicate that the strong development of fishing gears which took place in the 1920s, in particular the emergence of engine powered vessels, has allowed exploiting some of them later on.

In the recent literature, no study allows to determine whether changes have occurred on these grounds since the 1900s. The knowledge of the epifauna of our maritime zone remains incomplete. Comprehensive studies on the nature and distribution of “gravels” are just starting and their epifauna remains poorly known. On the other hand, it is acknowledged that such grounds are generally rich and attract larger predator fishes. Consequently, it is reasonable to believe that they have – or have had- a certain importance for the local ichthyofauna as feeding grounds.



The results will be published and validated data will be made available through the database of the Belgian Marine Data Centre (BMDC). A map of Gilson's stations digitised in the course of 2003 can be consulted on the internet [http://www.mumm.ac.be/datacentre/Documentation/stations\\_gilson.php](http://www.mumm.ac.be/datacentre/Documentation/stations_gilson.php).

This project will allow to feed the debates around the sustainable management of mineral and biological resources and to open new perspectives for research and environmental management in the considered area.

### Collaborations

Collaborations are developed with two ongoing projects: the project "MAREBASSE", dedicated to the sedimentological aspects of sand and gravel extraction, includes sampling sites in the area of the Westhinder bank. The project "Belgian shipwrecks: hotspots of marine biodiversity" focuses on artificial substrates sheltering particular species associations and possibly acting as refuge areas. A collaboration is also engaged with the Museum of the University of Liège which hosts the material of E. Van Beneden, collected some 20 years before that of Gilson.

### CONTACT INFORMATION

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#### Users Committee

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