

BEWREMA BI

BELGIAN SHIPWRECK: HOTSPOTS FOR MARINE BIODIVERSITY

Duration of the project: 15/12/2003 – 30/04/2006
Budget: € 179.475
Keywords: Hard Substrates, Shipwrecks, (A)Biotic Data, Benthic Life

CONTEXT

The substrate of the Belgian part of the North Sea consists, for the vast majority, of soft bottoms. Exceptions are man-made structures and shipwrecks, which form islands of hard substrate in a 'sea' of soft, sandy sediments. The fauna of these soft bottoms is relatively well studied, mainly using sampling devices operated from the sea surface, such as trawls, box cores and Van Veen grabs (remote sampling). These techniques are inappropriate to sample hard substrates, such as the ones provided by wrecks. As a consequence, our knowledge of the fauna of the wrecks in Belgian waters, species assemblages or ecological communities, is virtually non-existent.

PROJECT DESCRIPTION

Objectives

Shipwrecks provide increased habitat complexity, and hence attract and harbour many more species than the relatively homogenous soft substrates in their vicinity. Hard substrates offer an opportunity for sessile epifauna to settle and a refugium from predators for mobile epifauna and nekton. Several wrecks are candidates for the designation of Marine Protected Areas in Belgium. They can be used as a model for other hard substrates, like the foundations of windmills that will be built in the Belgian part of the North Sea in the near future. Wrecks form an impediment to fishing, and provide a model for non-fishing areas. One of the objectives of this study is to compare the soft-bottom fauna of the open areas with the less-intensely trawled bottoms adjacent to the wrecks.

Methodology

Five wrecks located in Belgian waters will be sampled for biotic and abiotic data at different periods of the year. The meiofauna, macrofauna and epifauna of the wrecks will be studied by direct observations, photographs and sampling by divers. Slow moving sessile fauna will be sampled by scraping selected quadrats. Small swimming and/or nocturnal fauna will be caught by means of baited traps. Large swimming epifauna will be sampled visually in situ. Macrofauna in the soft substrates around the wreck will be sampled in situ by S.C.U.B.A. using suction dredger and cores.

Density, biomass, and species composition of the benthic communities of the different wrecks will be described, and biodiversity will be estimated. Within each wreck, studies will be conducted in order to compare different factors affecting biodiversity: period of the year (i.e. seasonal effect), orientation of the sampled station (i.e. horizontal and vertical surfaces), depths of the station and other abiotic factors around the wrecks such as water temperature, conductivity, irradiance, currents, turbidity. Historical data sets and mathematical models will also be used. By means of multivariate statistical techniques, the ecological communities of the wrecks will be compared to each other and to those of the surrounding sediments. The species assemblages will also be compared with those of natural and artificial hard substrates in Belgium, northern France and eastern England (both intertidal and subtidal structures: literature survey and input from end-user committee).

Interactions between the different partners

Members of the different laboratories will be involved at various levels in the milestones of this research project; participation of each partner laboratory is indicated in brackets.

- Firstly; standardisation of sampling protocols in order to compare them with those described in the available literature (UCL/VLIZ/UGent/RBINS/MUMM). Scientific divers will sample meio and macro benthos from the wrecks as well as macro fauna from undisturbed soft sediment close by the wrecks (UCL/VLIZ/RBINS/MUMM). Abiotic data will be measured in situ as well as extracted from databases, precise mapping of the wreck will be done using side scan sonar (MUMM/VLIZ).
- Identification of macrobenthos from undisturbed soft sediments (UGent) as well as meio benthos and macro benthos from the wrecks (RBINS/UCL/UGent/sub-contractors).
- Analysis of biotic data (UCL/RBINS/UGent) and abiotic data (MUMM) in order to integrate results in a model.
- Collected information will be logged in databases after quality control (VLIZ/MUMM), a web site will be build (VLIZ). Results will be presented during international congress participations, publications will be done in scientific journals, vulgarisation of results to the public through web site, brochure and book. Field work, specific determinations, data analysis and dissemination of the results will be realised through common skills and expertises of all partners. Multiple interactions will require a strong coordination by UCL.

Expected results and/or products

Results from the project will be disseminated through several channels, and in different formats as appropriate for the different user communities. A



web site will be used to post information about the project, its objectives and preliminary results. Information collected during the project will be used for a brochure on wreck biodiversity and a book describing the most important species. The brochure will increase public awareness of the importance of marine diversity, and increase public support for marine protected areas. Another outcome of the project will be a set of standard protocols adapted to monitor biodiversity of hard substrates of the North Sea, such as wrecks and the constructions of windmill farms.

PARTNERS

Activities

UCL - Laboratory of Marine Biology

Specialised in marine bioluminescence biodiversity, good knowledge in taxonomy. International recognition as scientific diver instructor, underwater photography and video.

Flanders Marine Institute

Logistic support; management of the research vessel Zeeleuw; international recognition in databases handling, website maintenance; interface between the scientific community, public authorities, and the public at large.

UGent - Marine Biology Section

International expertise on soft sediment benthos, vast knowledge in taxonomy, modelisation of benthic communities, data bases.

Royal Belgian Institute of Natural Sciences (RBINS) - Malacology Section

International reference in taxonomy, huge collections, biodiversity expertise, scientific diver and underwater photography.

RBINS - Management Unit of the Mathematical Model of the North Sea (MUMM)

Expert in mathematical modelling, data treatment; international recognition in databases handling; management of the research vessel Belgica. International recognition as scientific diver instructor (EEC expert), underwater photography.

CONTACT INFORMATION

Website of the network:
www.vliz.be/projects/bewremabi

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Users Committee

For the complete and most up-to-date composition of the Users Committee, please consult our Federal Research Actions Database (FEDRA) by visiting www.belpo.be/fedra

