

IMIS: Integrated Marine Information System

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Abstract: The Flanders Marine Institute has taken the initiative to build an integrated information tool, called IMIS. The objective of this database is to provide information on all topics relevant to marine sciences - be it people with their expertise, institutions and their mandate, publications, etc. Different types of 'knowledge items' correspond to different modules in the system, each with their own entry into the database. These modules are (currently): Persons, Institutes, Literature, Journals, Conferences, Projects and Datasets. IMIS version 1.0 (accessible at: <http://www.vliz.be/vmdcdata/Imis/index.htm>) is in operation and the VMDC (Flanders Marine Data and Information Centre) schedules a new enhanced version in 2002.

Introduction

The Flanders Marine Institute, VLIZ was established in 1999. One of its primary goals is to provide the necessary tools for coordinated marine research in Flanders. The VMDC (Flanders Marine Data and Information Centre) has some more specific objectives, within this framework :

- To provide data and information to researchers, public authorities and other interested parties, in a suitable and prompt way
- To stimulate networking and to maximally centralise the nationally and internationally available data of research groups and governmental authorities
- To develop and maintain databases for interdisciplinary research, according to the established international standards
- To integrate various kinds of data, and perform consistency and quality controls

VMDC took the initiative to build a system, called **IMIS (Integrated Marine Information System)**, with multiple functionalities. Its main goal is to map the marine-scientific landscape in Flanders in its totality.

But how did this idea come up?

Historical development

In May 2000, VLIZ decided to build an online information system, mainly based on the large literature collection the institute inherited from two former marine-scientific institutes.

In a first phase we looked at several commercially available cataloguing programmes. Soon we realised that cataloguing software is an excellent tool to store and retrieve information on titles available on library shelves. But records in a library catalogue do not tell us where the authors work, we cannot find out in what subject fields they are active, we do not know anything about their colleagues, and we cannot ask them for this information, as any contact data (address, e-mail, telephone) are missing.

In a second phase we started looking for software that could present all these variables in an integrated, concise format. Surprisingly, not much came up. What we found were still more library catalogues and many many software tools that could present us splendid directories of all kinds. Still, not one developer apparently had looked into the possibility of linking these two concepts into a brand new one: presenting all the different data sets in one interface!

This diagnosis, and the fact VLIZ had the inhouse expertise, led us to a drastical solution: building the whole product ourselves!

First, we agreed on some very important basics.

- The developed product should be as compatible as possible with other currently used platforms, and database programmes.
- The record structure should be compliant with the ASFIS-structure (Aquatic Sciences & Fisheries Information System). This was necessary as one of the VLIZ objectives is to become the ASFA Input Center for Belgium.
- The finished product will be distributed freely to all interested parties, especially in developing countries, with the objective to enable an international information network based on the same system everywhere.
- All data and information in the information system should be accessible to all users without thresholds; this meant implementing a web-based interface.
- Finally, the developed database should be an open system, without any thresholds to source codes, to make changes and improvements possible where and when needed.

The road we have chosen did mean hard work. As with any new product, problems come up at the least expected time and place, and a lot still needs to be done. However, after one year of hard thinking, programming, testing, refusing, restarting, hoping and with a

lot of cooperation and good humour, we were able to implement a first version of our 'integration idea'. IMIS 1.0 was born.

Technical description

IMIS Integrated Marine Information System

As explained already, IMIS is intended to be an integrated management system for a variety of information and data sources. The current system enables the management of:

- Library catalogue
- Directory of scientists and institutions
- Catalogue of research projects
- Metadata of ocean data sets
- Database of conferences and events

The integrated approach allows for cross-referencing between the information sources e.g. the Author field in the bibliographic database crosslinks to a record in the directory of scientists.

TECHNICAL SOLUTION DESCRIPTION

IMIS is developed as an SQL-server relational database system running on a MS NT server. For web serving the Apache 1.3.9 web server software is used. Accordingly cgi-bin applications were developed in VBasic 6.0 and the library CGI VB 1.4 (Kevin O'Brien, 1996).

For data entry, forms were developed in MS-Access, linked to the SQL-server database using ODBC.

TECHNICAL REQUIREMENTS

CONFIG 1: Less than 10 simultaneous users

- Database engine: In this case SQL-server is not required and can be replaced with MSDE that is included in MS-Office Professional 2000 (but is not installed by default).
- Data entry: MS-Access 2000
- OPAC: web server. Currently tested only with Apache web server (v. 1.3.9)

CONFIG 2: more than 10 simultaneous users

- Database engine: SQL-server 2000 Standard version (Academic Price: US\$1500)
- Data entry: MS-Access 2000
- OPAC: web server. Currently tested only with Apache web server (v. 1.3.9)

Note: it is possible to develop an IMIS system with another RDBMS (eg ORACLE, MySQL, Filemaker) if the RDBMS is ODBC compliant. However, this has not been tested and additional engineering work may be required.

LIBRARY MANAGEMENT MODULE

The current IMIS library module allows for catalogue management only. In order to allow for possible collaboration with ASFA as an ASFA input centre, IMIS uses the ASFIS (ASFISIS-3) record structure and scroll-lists (controlled vocabulary) such as ASFA Thesaurus, ASFA Geographic Descriptors, ASFA Journal Title Monitoring List. VLIZ decided not to use the ASFA Taxonomic Authority list because it is too limited. VLIZ is considering the use of the ITIS Taxonomic Reference list (as is the case also for ASFA).

An IMIS bibliographic record allows for 3 levels: analytic, monographic and serial. An interesting advantage of the relation structure is that e.g. for 20 chapters of a book, the monographic information needs to be entered only once in IMIS, whereas ASFISIS will require 20 duplicates.

IMIS allows for the generation of a user notification when new records have been created in the catalogue.

IMIS plans to add several library functions in the near future:

PATRONS

- add/edit patron info
- patron groups and rights
- address labels

CIRCULATION

- charge/discharge/renew item to patron
- reserve/unreserved item for patron
- notifications

ORDERS

- create/update/receive order

SUPPLIERS

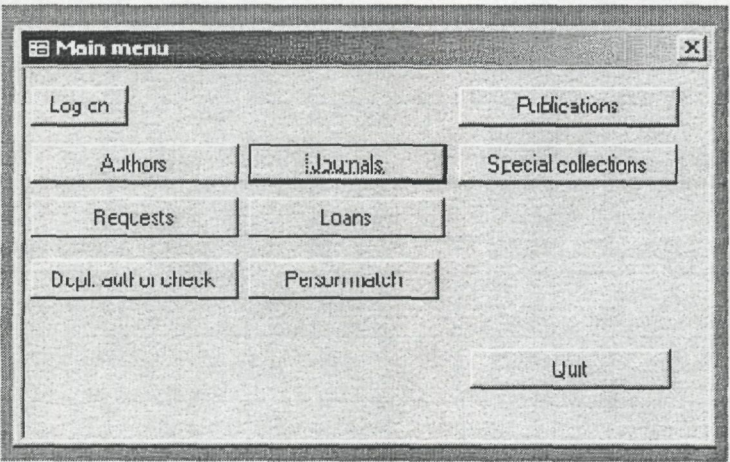
- create/edit supplier

Also SERIALS CONTROL will be added (verify arrival of serials and generate warnings of non-arrival)

IMIS LIBRARY MODULE: TECHNICAL INFO

Vlizlit.mdb is started up in Access on the workstation:

- Authors:** reference list of authors (surname, first name, initials)
- Journals:** list of all journals and of the library holdings of these journals
- Requests & Loans:** library management tools
- Duplicate Authors:** checking tool to eliminate duplicate input
- Person match:** linking author names to person name in Persons-module
- Special collections:** enables identification of eg donated collections or specific bibliographies



Journals: main entry form to enter bibliographic descriptions

JournalForm : Form

ID: 4 ☒ In Antilope Public ☒
 Approved for distribution ☒

JourTitle: Acta Adriatica

JourAbbrev: Acta Adriat.

Publisher: Institute of Oceanography and Fisheries

City: Split, Croatia

ISSN: 0001-5113 ASFACode: 000005

ASFA Inp. C.: CS Shelf Location: 1a

URL:

Holdings Management Remarks Memo

Order	From	Year	Volume	Number	Till	Year	Volume	Number
10	1932	1	1	1966	13	1		
20	1970	14	1	1978	17	15		
30	1978	19	1	1988	29	2		
40	1990	31	1	1999	41	suppl.		
50	2000	41	1					

Record: 11 of 3506

Publications: main entry form to enter bibliographic descriptions

Basic mandatory fields are situated in the main section. Several tab-sheets allow data input related to the specific bibliographic form of the record:

- **Analytic:** relation to the source publication
- **Abstracts:** English abstract and original language abstracts when available
- **Keywords:** Thesaurus, geographical terms, taxonomic terms and free keywords are added here as needed
- **Description:** standard description of physical features and general content description
- **Address:** corresponding author's address
- **Special collection:** enables identification of e.g. donated collections or specific bibliographies

Main form and Analytic tab-sheet

Publications : Form

BIBID: 21018 In library ☒ Public ☒

Bb Leye AS Approved for distribution ☒

Englsh Title New evidences on the micrine Holocene in the western Belgian coastal plain

OrigTitle:

Language title English ☐ Translated by input centre

Author	Ed	Cor	Order	Details
Baeteman, C	1	1	1	

Analytic Abstracts Keywords Description Address Spec. Coll.

AnaID: 17167

PublicationDate: 1970

Volume: 07

Issue: 1

PageInation: 49-54

Journal Bull. Belg. Ver. Geologie

Book/Monograph

Record: 19175 of 19216

Abstracts tab-sheet

Analytic

Abstracts

Keywords

Description

Address

Spec. Coll.

Abstract 1

☐ Abstract translated by input centre

☐ Abstract composed by input centre

Investigations in the machal plain yielded new data regarding the stratigraphy of the marine Holocene and the evolution of the plain during the Atlantic and Subboreal periods. Formerly it was accepted that the Calais sediments were deposited during one single transgression. However at least four distinct transgressions were found belonging to the Calais Member. By means of 14C dating the development of the western coastal area is briefly considered.

Abstract 2

Record: 19175 of 19216

Keywords tab-sheet

Analytic

Abstracts

Keywords

Description

Address

Spec. Coll.

Thesaurus terms

holocene sediments

Taxonomic descriptors

Geographic descriptors

ANE, Belgium

BibOtherDescriptors:

Record: 19175 of 19216

Description tab-sheet

Analytic | Abstracts | Keywords | **Description** | Address | Spec. Coll.

Environment: ☒ Marine ☐ Brackish ☐ Freshwater

Document type: Journal article Phys. medium: Paper

BibNotes:

Literary styles:

Languages: English Summary * Summary

Record: 19175 of 19216

Address tab-sheet

Analytic | Abstracts | Keywords | **Description** | **Address** | Spec. Coll.

AdrLine1: Belgische Geologische Dienst

AdrLine2: Jennerstraat 13

AdrLine3: B-1000 Brussel

Country: Belgium

Phone:

Fax:

Email: cecile.basteman@mineco.fgov.be

Record: 19175 of 19216

Special collections tab-sheet

Analytic	Abstracts	Keywords	Description	Address	Spec. Coll.
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VLIZ Geographical Scope	▼	▲
VLIZ Author Scope	▼	▲
▶	▼	▲

Record: 14 of 19216

19175

▶ ◀ ▶▶ ◀◀ 🔍 ▶▶▶ ▶▶▶▶


WEB-BASED OPAC

Integrated Marine Information System - Microsoft Internet Explorer

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Address http://www.vliz.be/vmddata/lms/bibsrch.htm Links



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IMIS - Search for publications

Enter search terms in the form below. Make use of ANSI SQL wildcards in the name ('%' replaces zero or more characters, '_' replaces a single character, click [here](#) for details and examples).

Title:

Author:

Initials:

Abstract/Title word:

Word in any field:

Publication year:

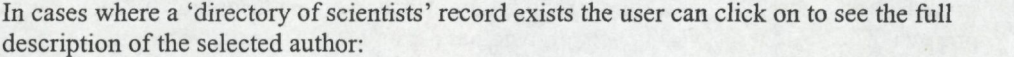
Acquisition date (dd/mm/yyyy)(note):

Note

This search option can be used to check recent acquisitions in the library. The date used is the date that the record was created in the database. For retrospective input (which is a main activity in the library, and will continue to be so for quite a while), this is obviously a later date than the one when the publication came to the library.

Start | Kleur ri... | IMIS - M... | Main menu | Untitled ... | Publicat... | Integra... | Docume... | 16:55

The current web-based OPAC is quite basic allowing for searching in Title, Author, Initials (of author name), Abstract or Title word, Word in any field, Publication year and Acquisition date.



VLIZ Integrated Marine Information System: Person - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Address http://www.vliz.be/cg-bin/vmdc2web?action=AuID&AuID=698 Links

IMIS: Details on Person

De Troch, Marleen

Initials: M.

Institute

Universiteit Gent (RUG) Vakgroep Biologie, Afdeling Mariene Biologie

Postal address K.L. Ledeganckstraat 35
B-9000 Gent
Belgium

Phone: +32-(0)9-264 52 31
Fax: +32-(0)9-264 53 44
E-Mail: Isolde.DeGrem@rug.ac.be
URL: allserv.rug.ac.be/~qdamet/MarBioWebsite/

Direct contact

Phone: +32-(0)9-264 52 14
Fax: +32-(0)9-264 53 44
E-Mail: marleen.detroch@rug.ac.be

Publications in IMIS: [List](#)

Project(s)

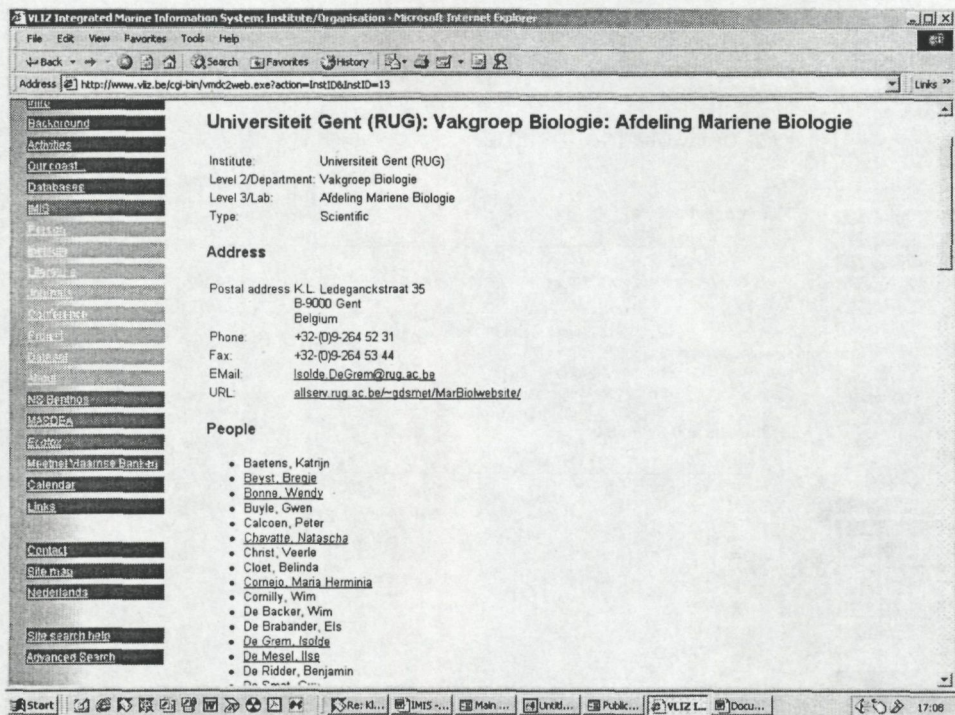
- [Ecologie van copepoden: structurele en functionele biodiversiteit in tropische zeegrasvelden_I](#)
- [Ecologie van copepoden: structurele en functionele biodiversiteit in tropische zeegrasvelden_II](#)
- [Effect van biogeografische isolatie op mariene biodiversiteit: harpacticoid copepoden in tropische zeegrasvelden als modelstudie.](#)

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Start | | Re: ID... | IMIS... | Main... | Untid... | Public... | VLIZ L... | Docu... | 17:05

From here it is possible to click through to full information on the institution, to see what projects the researcher is working on, or to go back from here to a list of papers




VLIZ Integrated Marine Information System Project - Microsoft Internet Explorer

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Address http://www.vliz.be/cgi-bin/vmdc2web.exe?action=ProjD6&ProjID=213 Links



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IMIS - Project details

Ecologie van copepoden: structurele en functionele biodiversiteit in tropische zeegrasvelden I

Short name: Biodiversiteit van copepoden in zeegrasvelden
Reference number: 1128697N
Period: 10/1996 - 9/1998
Sponsor: Fonds voor Wetenschappelijk Onderzoek - Vlaanderen

Institutions and Scientists

- Universiteit Gent (RUG) Vakgroep Biologie Afdeling Mariene Biologie
 - De Troch


Start | Re: K... | IMIS ~... | Main ... | Unt... | Publi... | VLIZ L... | Docu... | 17:08

VLIZ Integrated Marine Information System: Literature - Microsoft Internet Explorer

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Address <http://www.vliz.be/cgi-bin/vmdc2web.exe?action=Liter5kps=0&Name=De+Troch&Init=M%2E> Links



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IMIS: Literature

De Troch, M.; Mees, J.; Wakwabi, E.O. (1998). Diets of abundant fishes from beach seine catches in seagrass beds of a tropical bay (Gazi Bay, Kenya). *Belg. J. Zool.* 128(2): 135-154. [\(Details\)](#)

De Troch, M.; Mees, J.; Papadopoulos, I.; Wakwabi, E.O. (1996). Fish communities in a tropical bay (Gazi Bay, Kenya): seagrass beds vs. unvegetated areas. *Neth. J. Zool.* 46(3-4): 236-252. [\(Details\)](#)

Chatterjee, T.; De Troch, M. (2000). Halacaridae (Acan) from Gazi Bay (Kenya): description and biogeography of three new and two known species. *Hydrobiologia* 427: 177-194. [\(Details\)](#)

De Troch, M.; Fiers, F.; Vincx, M. (2000). Range extension and microhabitat of *Lightiella incisa* (Cephalocarida). *J. Zool. Lond.* 251: 199-204. [\(Details\)](#)

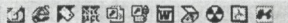
Fiers, F.; De Troch, M. (2000). New Tetragonicipitidae (Copepoda, Harpacticoida) from the Indo-Pacific. *Hydrobiologia* 434: 97-144. [\(Details\)](#)

De Troch, M. (1995). Gemeenschapsanalyse en trofische organisatie van de ichthyofauna in een tropische baai (Gazi Bay, Kenya). [Community analysis and trophic organisation of the ichthyofauna in a tropical bay (Gazi Bay, Kenya)] BSc thesis, Universiteit Gent (RUG). 136 pp. [\(Details\)](#)

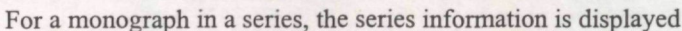
De Troch, M.; Gurdebeke, S.; Fiers, F.; Vincx, M. (2001). Zonation and structuring factors of meiofauna communities in a tropical seagrass bed (Gazi Bay, Kenya). *J. Sea Res.* 45: 45-61. [\(Details\)](#)

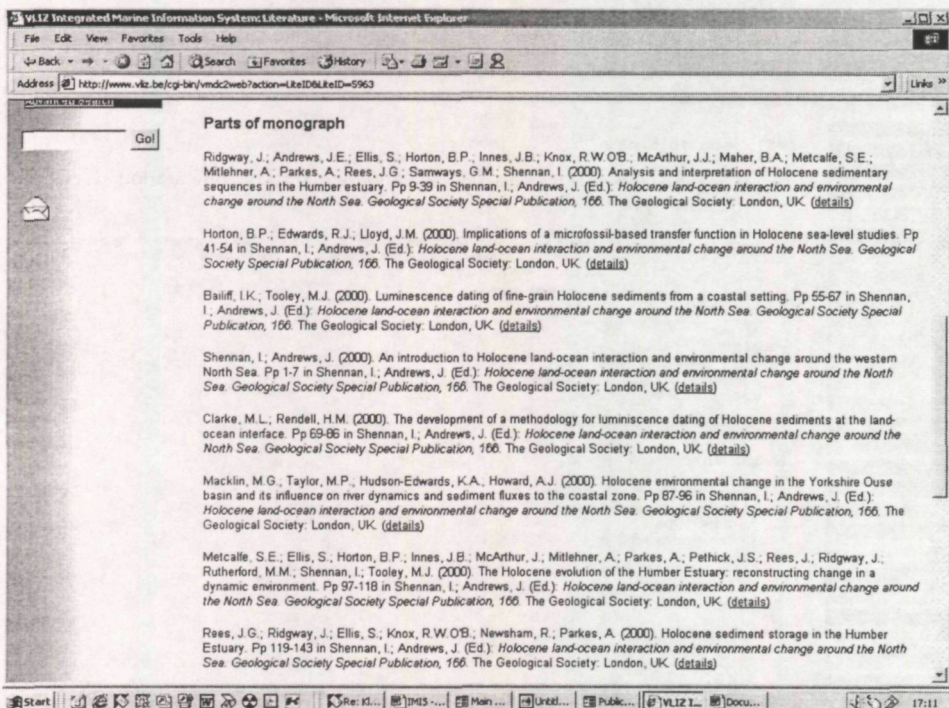
De Troch, M. (2001). Ecologie van harpacticoid copepoden: structurele biodiversiteit in tropische zeegrasvelden. [Ecology of harpacticoid copepods: structural biodiversity in tropical seagrass beds.] PhD thesis, Universiteit Gent (RUG). 254 pp. [\(Details\)](#)

De Troch, M.; Fiers, F.; Vincx, M. (2001). Alpha and beta diversity of harpacticoid copepods in a tropical seagrass bed: the relation between diversity and species' range size distribution. *Mar. Ecol. Progr. Ser.* 215: 225-236. [\(Details\)](#)

Start |  | Re: KL... | IMIS... | Main... | Untitl... | Publi... | VLIZ L... | Docu... | 17:09

For a monograph series, the separate monographs in the series are listed






In the Conference module information on conferences and symposia is listed:

Public Integrated Marine Information System: Conference - Microsoft Internet Explorer

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IMIS: Conference details

Studiedag: "Beheer van kust en zee: beleidsondersteunend onderzoek in Vlaanderen"

Organisers: Vlaams Instituut voor de Zee (VLIZ)
City/Place: Thermae Palace, Oostende
Country: Belgium
Begindate: 11/9/2001
Enddate: 11/9/2001
E-Mail address: info@vliz.be
web site: http://www.vliz.be

Proceedings: Mees, J.; Seys, J. (2001) Beheer van kust en zee: beleidsondersteunend onderzoek in Vlaanderen. Studiedag, Oostende, 9 november 2001. [Coastal and marine management. policy supporting research in Flanders: Symposium, Oostende, 9 November, 2001. VLIZ Special Publication, 4. Vlaams Instituut voor de Zee (VLIZ): Oostende, Belgium. IV, 82 pp. (details)]

Start Stop IMIS Main Untitled VLIZI... Docu... 17:11

[illegible]

The Projects module contains data regarding current and finished projects:

VLIZ Integrated Marine Information System: Project - Microsoft Internet Explorer

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Address http://www.vliz.be/cgi-bin/vmdc2web.exe?action=ProjD&ProjID=320 Links

IMIS - Project details

Biotic interactions in turbid estuarine systems

Short name: Biotic interactions in turbid estuarine systems
Reference number: G010499N
Period: 1/1999 - 12/2002
Sponsor: Fonds voor Wetenschappelijk Onderzoek - Vlaanderen
Description: Study of the relative importance of primary production, bacterial production and detritus aevction for the planktonic foodweb. Biotic interactions in the micro- and macrobenthic foodweb. Feeding behaviour of macrocrustacea, fish and birds.

This project aims to contribute to a better understanding of the structure and function of estuarine food webs by studying selected biotic interactions in the plankton and benthos of the schelde estuary (The Netherlands, Belgium). Objectives: (1) The study of the relative importance of primary production, bacterial production and detritus in the planktonic food web. (2) The study of important biotic interactions in the micro- and meiobenthic food web. (3) The study of the feeding ecology of higher trophic levels (fish, macrocrustacea and avifauna) and their impact on lower trophic levels.

Institutions and Scientists

- Universiteit Gent (RUG) Vakgroep Biologie, Afdeling Protistologie en Aquatische Ecologie
 - Vyverman
- Universiteit Gent (RUG) Vakgroep Biologie, Afdeling Mariene Biologie
 - Vincx
- Instituut voor Natuurbehoud
 - Meire
- Katholieke Universiteit Leuven, Departement Biologie, Laboratorium voor Aquatische Ecologie
 - Olliver
- Vrije Universiteit Brussel (VUB) Vakgroep Biologie, Laboratorium voor Ecologie en Systematiek
 - Dierckx
- Vrije Universiteit Brussel (VUB) Vakgroep Scheikunde, Laboratorium Analytische en Milieuchemie

Start Re: ki... IMIS... Main... Unk... Public... VLIZ... Docu... 17:25

The screenshot shows a Microsoft Internet Explorer browser window from the year 2000. The address bar displays the URL: http://www.vlz.be/cg-bin/vmdc2web.exe?action=InstID&InstID=732. The page title is "VLIZ Integrated Marine Information System: Institute/Organisation - Microsoft Internet Explorer".

The main content area features the heading "Universiteit Gent (RUG): Vakgroep Biologie: Afdeling Protistologie en Aquatische Ecologie". Below this, contact information is provided:

- Institute:** Universiteit Gent (RUG)
- Level 2/Department:** Vakgroep Biologie
- Level 3/Lab:** Afdeling Protistologie en Aquatische Ecologie
- Type:** Scientific

The **Address** section lists:

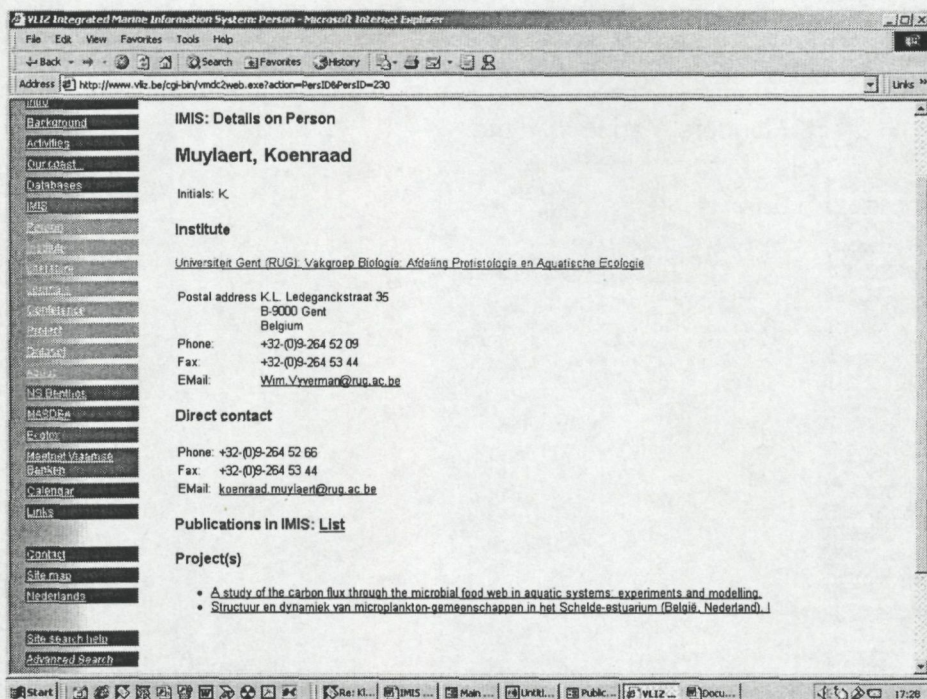
- Postal address K.L. Ledeganckstraat 35
B-9000 Gent
Belgium
- Phone:** +32-(0)9-264 52 09
- Fax:** +32-(0)9-264 53 44
- Email:** Wim.Vyverman@rug.ac.be

A **People** section follows, listing several individuals with bullet points:

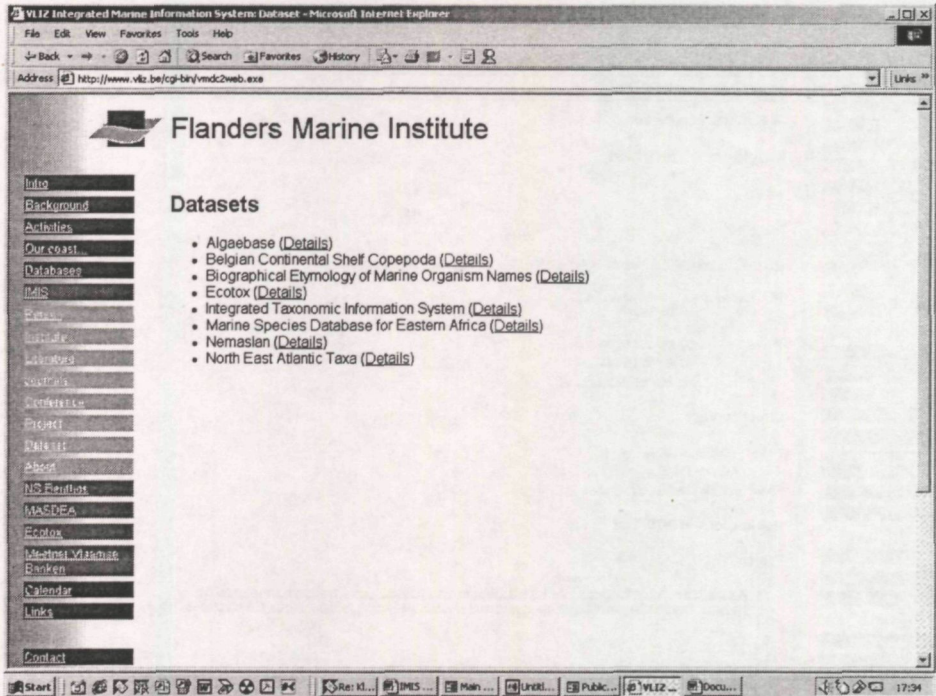
- Chepumov Victor
- Cocquyt Christine
- Cousin Sybe
- Dassaville Renaat
- De Groot Lena
- Geenens Vanessa
- Hamels Ilse
- Muylaert Koenraad
- Sabbs Koen
- Van Der Gucht Katleen
- Van Wichelen Jeroen
- Vanhoutte Koenraad
- Vanormelingen Pieter
- Verleyen Elie
- Vloemans Nele

A vertical sidebar on the left contains various navigation links such as "Background", "Actualites", "Our coast", "Database", "IMIS", "Person", "Publicity", "The project", "Projects", "Partnership", "Publicity", "Contact", "About", "US Relations", "MAGGOS", "Ecohor", "Meer informatie Banken", "Calendar", "Links", "Contact", "Site map", "Nederlands", "Site search help", and "Advanced Search".

Again, from these screens, access is given to all other modules, e.g. Persons



Finally, a list of available datasets is also presented, (experimental to date)



The good, the bad and the future

Very quickly, the marine community in Flanders started using the new information system. From the beginning people highly appreciated the integrated presentation of marine information. One single access point (the web-interface of IMIS) provided all answers to the FAQ of our marine researcher: who, where, what, when, with whom, why? Coming from a situation where one had to spend days and weeks to gather this kind of data (by phone, fax, letters, personal communication, etc.), this new tool was a long-awaited asset.

Soon enough, however, some weak points in the system became visible:

- An integrated information system gives the user an impression of completeness, but the input of data remains an intensive, relatively slow process. So, many names, addresses, core publications and other important data are still missing.
- At the level of integration of the different modules, some obvious links were missing (e.g. the merging of publication lists of an author, publishing as Prudhoe, J. and Prudhoe, J.R.M.).

- Solutions were needed to link on line full text documents to records in the databases on a permanent basis.
- A solution was needed to link references to a printed article, as well as to the same article published on a CD-ROM (or on another physical form).
- Users notified us of the need for a two-way information management: identified remote users must be able to manage and add information to the system, and have the ability of extracting data and references in a personalised format.

All these problems and other flaws of the system needed to be resolved, as well on the level of data gathering, input management as database structure and functionality. So the decision to write version 2 of IMIS was an obvious one.

However, as IMIS 1.0 proves to be a widely used and appreciated tool within the Flemish marine community, we can give the necessary time and attention to the writing and implementing of this new version. Due to the fact IMIS already exists and works, the Flemish marine community is rapidly moving towards a similar model of coordination and structural contacts, as well with VLIZ as with each other. The massive feedback we receive from all users proves that the tool was needed, but also that is it far from perfect, and needs a lot of attention to grow into a strong valuable information tool. We believe this is possible, and that integrated information management will be the best choice for the future.