

Integrated Marine Information System (IMIS) can support ICZM in Flanders

In the previous EURASLIC-newsletter, a concise description was given of the different tasks of the Flanders Marine Institute VLIZ (Molendijk, Belgium). One of the main goals was described there as: 'Marine information management [must lead to] integration of all partners and knowledge items'. The IMIS-database was developed for this purpose. Currently, the VLIZ Marine Data and Information Centre is developing version 2 of this database. It was clear that the needs of ICZM, and anything related to this activity, were to be considered in detail, while developing and enhancing the functionalities of this information tool.

Below you will find an abbreviated translation of a paper presented on this subject at an ICZM-related Symposium in Belgium earlier this year. Since the publication of this paper, new steps have already been taken in the development process of IMIS 2. For current information on this subject, you are invited to contact us at the Flanders Marine Institute.

(Original citation: **Vanden Berghe, E.; Schrijvers, J.; Seys, J.; Mees, J.** (2002). Integrated coastal zone management needs integrated information management: IMIS as a support tool for ICZM. Pp 1-11 in **Van Lancker, V.; De Turck, K.; Mees, J.; Mostaert, F.; Seys, J.; Vandeveld, D.; Van Rooij, D.** (Ed.): *Symposium 'Coastal zone management from a geo-ecological and economical perspective', 16-17 May 2002, Oostende. VLIZ Special Publication, 10.* Genootschap van Geologen van de Universiteit Gent (GGG)/Vlaams Instituut voor de Zee (VLIZ): Oostende, Belgium.)

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In Belgium, as in any other country, it is important to use data and information in the best possible way, and to target it as correctly as possible. This is the best way to give ICZM (Integrated Coastal Zone Management) a good chance to succeed in its goals. Most of

all, we need to present the information in a relevant and understandable way for the policy maker(s), without bothering this audience with superfluous details. Tailoring information is nothing less than developing accessible and transparent information. Managing this kind of information process is a three-levelled operation:

- Filtering information and compiling several 'Files' (vertical hierarchy)
- Categorizing information in different 'Entities' (horizontal hierarchy)
- Quality control of information

1. General context: what is needed?

To translate data sets into information, which in turn can be translated for policy purposes, we need a 'knowledge management structure'. In this section we explain which elements are mandatory in such a system.

1.1. Files

Raw data can only be used if placed in a certain context. This context gives meaning and relevance to the data. The result of this (the information) can be analysed, evaluated and discussed, and is as such the first basis for understanding and insight. Eventually this insight will be coupled to coastal zone management, in itself strongly supported by administrations and the general public.

It is important that a contextual approach, already starting at the level of raw data, is used. Carefully selected aspects which have important consequences for coastal communities need to undergo a conflict-driven analysis. The results of such analyses, together with the input of all interested parties, will lead to the choice of relevant 'Files'.

1.2. Entities

The horizontal approach starts from pools of data at different levels. The data are placed in strictly defined 'Entities'. Firstly, a geographical outline and a spatial and temporal scaling need to be considered. Secondly, a 'File' that has been detected by conflict analysis of data, will be characterised by several entities, which will place the 'File' in a certain context. This will make the 'File' ready for analysis and accessible for all concerned parties.

Deliberation on these files will lead to a spectrum of indicators, supported by data sets and maps. The purpose of indicators is to

present information, derived from extensive data pools, in a comprehensive, clear, and especially, a generally accepted format. Some of these indicators are selected for further use in policy-supported advice. Criteria such as availability, accessibility, equality between indicators, and the participation level are very important in these selections.

1.3. Quality

A third level emphasizes on the quality of the data in the system. The main concern is the 'fitness for use' of the data. Most importantly, one needs to document the information quality, by providing a consistent description of the quality checks the data have undergone, and of the used standards.

2. What has the Flanders Marine Institute (VLIZ) to offer?

Within the ICZM-context, the IMIS database will be the most interesting VLIZ-activity to consider. This database integrates information concerning expertise, organizations, projects, conferences, literature, infrastructure and datasets. IMIS is managed by the Flanders Marine Data and Information Center of VLIZ. The different information sources ('Entities') are identical to the different modules in IMIS, and each one has its own access point in the database. In this respect it is evident that IMIS, given a focused adaptation and expansion, would be an excellent 'knowledge management infrastructure' for ICZM.

2.1. Files

VLIZ is able to acquire, manage and redistribute information on a coastal 'File', in an intelligent way. We refer in this respect to the implementation of a new entity 'Files' within IMIS. An automatic coupling of this new source will be made with a set of 'Descriptors' (title, abstract, location, contact person). This business-card of the 'File' will be the first level of ICZM-information within IMIS, serving as a practical access point.

2.2. Entities

The content analysis of a 'File' will also be translated in an extra set of 'Entities', serving as a second level within IMIS: 'basic entities' such as places, persons, organisations, publications, projects and events; 'data entities' such as indicators, maps and data sets; 'background entities' such as regulations, uses, case studies, habitats and instruments.

The content scope will be much broader than the purely marine scientific context, with input from all concerned sectors and from other than environmentally related sources.

As mentioned before, a series of indicators can support a file, analyse it and discuss it. The module 'Indicators' must therefore be considered as one of the most important new entities to be added to IMIS. Each selected indicator will be presented with a set of descriptors. This set will provide an unambiguous interpretation of the indicator, preventing identification-, definition- and interpretation problems.

2.3. Quality

The quality label assigned to the 'Entities', 'Indicators', 'Datasets' and 'Maps', is an essential part of the system. The quality label will focus mainly on data related to accessibility, inadequacies, restraints, availability, validity, relevance and comparability.

3. Integrated Marine Information System

IMIS has been conceived to map all information relevant to marine and coastal aspects. This information is stored in separate modules. Currently, modules exist for 'Persons', 'Institutes', 'Publications', 'Projects', 'Conferences' and 'Datasets'. All modules are linked to each other. The information compiled in IMIS forms a network, comparable to a road map. The newly proposed entity 'Files' would then be the route planner, indicating which roads in the network will lead to the needed information. The extension of IMIS to a knowledge management tool for ICZM is an example of the flexibility of IMIS.

3.1. Existing 'Entities' within IMIS

For an overview of the current version of IMIS and of the already implemented 'Entities', see the paper on IMIS published in the IAMSLIC/EURASLIC-Proceedings¹. In this

¹ Haspeslagh, J.; Vanden Berghe, E. (2002). IMIS: Integrated Marine Information System. Pp 37-63 in Markham, J.W.; Hyett, D.J.; Duda, A.L. (Ed.): *Managing Resources in a Sea of Change: Proc. 27th Ann.Conf. Internat.Assoc. Aquat.Mar.Sci.Lib. Inf Cent./9th Conf.Eur.Assn Aquat.Sci.Lib. Inf Cent., joint IAMSLIC/EURASLIC Conference held 14-19 October, 2001 at Brest, France*. IAMSLIC: Fort Pierce, FL (USA)

paper we have used the word modules, whereas here we use the word 'Entities' to indicate the same concept.

3.2. New 'Entities' to be developed

As stated already it will be necessary to adjust certain existing entities, and to create new ones, to be able to capture all relevant information for ICZM. We will discuss here the 'Entities' 'Files', 'Indicators' and 'Attributes', as being the most important and indispensable. For 'Maps', 'Locations', 'Places', 'Habitats', 'Uses', 'Instruments' and 'Regulations', new entities will be needed too. These will not be discussed here.

3.2.1. Entity 'Files'

This new source of information, called 'Files' will be joined automatically to a new set of descriptors. These descriptors will be filled in by the coordination centre. The most elementary descriptors are:

- Title: name of the file
- Description: description of the file
- Location: place connected with the file
- Contact: person available for more information on the file

The new entity with its basic descriptors must be seen as a business card for the file, giving access to an underlying world of information and networking. Further information on the 'File' is added through links:

- Links with other 'Files': related files and sub- or super-files
- Links with other entities: 'Indicators', 'Persons', 'Institutes', 'Publications', 'Events', 'Projects', 'Datasets', 'Maps', 'Places', etc.

3.2.2. Entity 'Indicators'

Indicators are synthetic and representative depictions of a more complex set of phenomena, which, by preference, can be measured on a quantitative scale. These figures must be interpretable, and they must have a clear meaning within the 'File' framework. Through these 'Indicators', and through the primary datasets, from which these 'Indicators' are deduced, a 'File' is substantiated with facts and findings.

The number of 'Indicators' per 'File' can increase strongly. From such a set, a selected

list of key indicators needs to be filtered out. These selected indicators will be presented by a set of descriptors. Two aspects in this descriptors set are important: an unambiguous general description, and the relations between the indicator and the underlying datasets (through means of 'Attributes').

The unambiguous interpretation of the indicator must prevent problems with identification, definition or interpretation. It can be defined by the following descriptors:

- Title: name of the indicator
- Definition: short and unambiguous description of the indicator
- Measurement unit of the indicator
- Measurement level/resolution: spatial and temporal scale
- Statistical level: ratio, intervals, ordinals, nominals
- Meaning: relation between the indicator and the 'File' where it is used for
- Evaluation: assessment of the data evolutions

In a second stage, the set of descriptors will specify the quality, availability and relevance of the indicator. This data level is also important for the entities 'Datasets' and 'Maps'.

3.2.3. Entity 'Attributes'

A second part of the descriptor set will describe the data quality, the lack of data, the validity, the relevance for policy, the comparability in time and space, etc. A possible set of 'Attributes' would be:

- Indicator: what the specific indicator is related to
- Primary data source: origin of the data (linking to 'Datasets')
- Availability: which Institute provides the data (linking to 'Institutes')
- Lack of data: missing data
- Price
- Data quality
 - Reliability: level of accurate primary collection of data
 - Validity: validity problems related to use of these data
 - Comparability: to what extent are comparisons in time and space possible?