This meeting addressed the need for a closer link between coastal zone managers and scientists. High quality science combined with appropriate coastal zone management practices is key for the sustainable use of European coastal zones. Project leaders from the Integrated Coastal Zone Management (ICZM) Demonstration Programme (managed jointly by the Directorates General XI - Environment, XVI - Regional Policy and XIV - Fisheries) and from the European Land-Ocean Interaction Studies programme (ELOISE, managed by DG XII - Research) were brought together.

The ICZM Demonstration Programme includes a series of projects located in a wide variety of natural, socio-economic and cultural settings. Each project involves an innovative approach to addressing the complex issues posed by management of coastal zones.

The ELOISE programme represents the primary research contribution to the Demonstration Programme on integrated coastal zone management. It consists of 29 projects sponsored by the European Commission within its programmes Marine Science and Technology (MAST) and Environment and Climate. The major aims of ELOISE have been fundamental and applied research on land-ocean interactions within different disciplines, including socio-economics, and the groundwork for a forum of discussion between the different fundamental sciences and their users in society.

The two main objectives of this meeting were:

- The promotion of a concrete exchange of information between European coastal zone science and management
- The development of suggestions for how future EU policy can facilitate co-operation between science and management with regard to European coastal zones.

The meeting was introduced by Bruno JULIEN (DG XI) and Christos FRAGAKIS (DG XII). Anne BURRILL (DG XI) gave an overview of the ICZM Demonstration Programme. Klaus-Guenther BARTHEL (DG XII) gave an overview of the ELOISE Programme. Two meeting reports were given; Linda BRIDGE gave a brief report of the Info-Coast '99 conference (annex II) and Jozef PACYNA gave a brief report of Socio-Economic aspects of biogeochemical fluxes (annex III). An explanation of the working groups was given by Christos FRAGAKIS and Steven LUTZ (stagiere, DG XI). Meeting participants split into three working groups and discussed the meeting topic questions. After lunch each working group regrouped and presented their answers to the topic questions. After which followed a general discussion. Closing remarks were given by Christos FRAGAKIS & Rutger DE WIT. The contents of the working groups and general discussion are summarized hereafter.
There was also a poster session in which participants presented overviews of their projects, focussing on the lessons in terms of links between science and management. Abstracts of the posters can be found in annex IV.

General context –

The role of the active scientist -

- seeks new knowledge.
- has the right to enjoy the freedom to be creative and to pursue curiosity in the pursuit of knowledge and understanding of natural, social, cultural and economic systems.
- his or her products (mainly scientific papers) are directed toward peer review by other scientists rather than users of the new knowledge and information.
- some tasks asked of the scientist by managers, such as routine monitoring of environmental variables, do not attract professional recognition and are given low priority.
- frameworks for integrating scientific information from different disciplines are poorly developed and there is little recognition within disciplines of the value of cross-disciplinary scientific effort.

The role of the coastal zone manager -

- searches for and implements solutions.
- needs a broad, interdisciplinary training.
- often finds that pertinent scientific knowledge often not available.
- works in a political system with ‘here and now’ decisions.
- requires comprehensive information formed from the fusion of information and knowledge from different disciplines.

Common language - How can we overcome communication barriers between coastal zone science and management?

The main barriers in communication between coastal zone science and management were found to be:

- The problem of many different administrative levels (regional, national, E.U.), and different levels in political control and decision making. For the scientist it is often difficult to identify the appropriate manager. A very local management approach can be in conflict with a natural science approach because natural processes occur at many scales of space and do not respect administrative boundaries.
- The problem of time (a crucial factor). Both managers and scientists have little time available for joint discussions in addition to their regular duties.
- The problem of different languages and cultural backgrounds in coastal zones. Difficulties in communication between science and management due to language/culture barriers are evidenced by; differences in time and spatial scales of concern; different purpose orientations;
methodological differences (approaches); different structures and driving forces (worlds of concern); and a certain degree of distrust.

The main needs to overcome communication barriers between coastal zone science and management were found to be:

- The need to bring science and management together in order to develop mechanisms of communication between coastal managers and scientists. In this respect it is important to bring scientists and managers physically together early in projects in order to assimilate and disseminate knowledge, i.e. make science transparent.
- The need to tailor science to specific issues or areas.
- The need to consider the role of intermediate actors between scientists and managers, such as science writers trained to present scientific information to generalists.
- The need for the dissemination and transfer of data to be designed for the end user. For example; displaying information graphically through maps and GIS. However, GIS can be often too expensive for many local authorities.
- The need to work with indicators that are understood by both scientists and managers.

Limits to science – What are the limitations of coastal zone science, what can managers realistically expect?

The main limitations/difficulties of coastal zone science were found to be:

- Societal expectations of the applications of science and scientific advice can be problematic. Often, public and managers expects sound advice from the renowned expert in the field, a concept represented by the French “scientifique agréé”. However, science requires and is driven by competing hypothesis for its advancement. This controversy in the scientific community can be very confusing for the general public and managers alike.
- Managers typically look for clearly defined answers which scientists may be unable to provide. This can sometimes lead to political/managerial problems, as the answers may not always be the ones that are wanted, or can be accepted.
- The difficulties of the incorporation of science into management. For example; gaps in knowledge, great variability in structures and processes, etc.
- The difficulties of the integration of social science concerns to other science fields.
- A fundamental problem is that often the wrong questions are being asked. For example, the majority of fisheries research is directed towards fish dynamics but we should be examining the social and economic driving forces that are behind over fishing.
- The application of coastal zone science can be a deeply political issue.
- The lack of good monitoring & data collection (EEA should take larger role).

The main needs realized by the discussion of the limitations of coastal zone science were:
• The need to include a scientific board in each ICZM project of the Demonstration programme or its continuation.
• The need to train managers to ask the right questions, and the need to anticipate urgent questions.
• The need for metadata sets of environmental indicators at different scales. Data sets need to be matched to the issues of concern.
• The system of peer review for evaluating the significance of scientific endeavors needs to be extended to more accurately reflect the value of scientific results to society.

Setting priorities - Scientists and managers rarely work at the same time scale. How are priorities set? How can time scales and schedules of needs be matched?

The main problems of time-scales between coastal zone scientists and managers were found to be:
• Managers tend to ask advice for short term interventions, ie. to solving urgent questions.
• Natural sciences are often concerned with long-term time-scales, this requires time to resolve questions. Scientific research in coastal zones can be compared with meteorology, it cannot guarantee the certitude of its short-term predictions, but it is still the best advice available concerning the environment.
• There are often limits to management which are to a great extent artisanal, i.e.; often lacking a long-term perspective (vision) and political support, etc.
• There are fundamental differences in the administrative, political and financial timeframes. Managers want to be able to make better everyday decisions and want ongoing dialogue with scientists in order to facilitate this.
• The most important natural time scales are often much longer than administrative time scales.

Nature and management – How can coastal zone science help bridge the gap between natural and administrative time scales?

The main needs concerning gaps between natural and administrative time scales were found to be:
• The need for long-term engagements (funding). For science this offers the possibility of developing monitoring projects and work on long-term data series. Good examples for management are the Habitat directive and Water E.U. directives. Such a policy would require indicators to evaluate performance. The development of such indicators is a role of the scientists.
• The need to build on the obligation of disseminating results to the wider community, for example, through metadata databases or local projects and regional observatories.
• Public funding needs to guarantee open access to data. Otherwise there exists a possibility of paying twice for the same information. A good example is the ELOISE data code and the general policy of data management in the E.U. framework programmes.

Vulgarisation of science – How can we further raise the awareness and the relevance of science to social and economic concerns and management issues?
Note: “Communication or Sensibilisation” was preferred over “vulgarisation”.

The main problem concerning the vulgarisation of science was found to be:

• The problem of disseminating information, including intellectual property rights and commercial/economic secrets.

The main needs realized by the discussion of the vulgarisation of science were found to be:

• The need to make people feel actors in their environment, including: the role of children and their education, the importance of collaboration with primary and secondary schools, and the importance of mass media and mass media training required.
• The need for scientific communication to be simplified, linked to common senses, and to be used in conflictive/urgent situations.

Role of socio-economic – How can scientists better link or interact with socio-economic factors?

The main problem of the linking of socio-economic factors was found to be:

• That scientists do not deal with urgent questions. Scientific advice is often neglected during the planning process.

The main needs concerning the linking of socio-economic factors were found to be:

• The need for bargaining between both communities is necessary to find terms of collaboration to deal with urgent questions.
• The need for coherent planning between scientific research and managers work.

Specific needs – What should be the future role of research in ICZM? (Recommendations)

Specific needs/recommendations:

• The need for regional balanced approach to research – e.g. Atlantic coast, Wadden Sea…
• The need to collect information on the impact of EU policy & its evolution on the CZ.
• The need for regional agenda.
• The need to Prioritize local level integration, i.e. pressure – response models at EU level – typology of EU (based on review of existing work)
• The need to focus on science/management approaches in transboundary issues.

General needs/recommendations:

• The Need to repeat meetings/networks between managers & scientists (perhaps at regional level (regional seas)). Network building would also strengthen confidence in both directions. Scientists and managers often do not have the time to meet and discuss requirements and do not have time to follow up their results, meetings such as this are very important.
• The need for collaboration at local level for local problems.
• The need to work with an integrated model, multi-sectorial and multi-disciplinary. Consensus building is often a very fruitful approach.

Recommendations to the EU:
• The EU could finance regional network projects, drawn up along the lines of ICZM science as outlined by the Demonstration Programme and coastal science as outlined by ELOISE.
• The EU could build ICZM research in various programmes and initiatives.
• The EU needs to push ‘asking correct questions’ & ‘using science’ within LIFE programmes.
• The EU needs to include end users in 5th FWP evaluation.
• The EU could require research needs to be identified in final ICZM project reports.
• The EU needs a formalization of it’s role in the coastal zone, perhaps a clear mandate for the European Commission to continue work in this area.

In conclusion, it was generally felt that this meeting was a success and good start at building a closer link between coastal zone managers and scientists. The common consensus was that all participants gained a better understanding of the other side and felt that the meeting should be repeated.
Annex I

List of Participants:

C. ANAGNOSTOU, METROMED - ELOISE Pgr
A. BERGAMASCO, FECTS - ELOISE Pgr
T.L. BOKN, EULIT - ELOISE Pgr
T.E. CAPPENBERG, ISLED - ELOISE Pgr
T. DALSGAARD, NICE - ELOISE Pgr
Rutger DE WIT, ROBUST, Arcachon - ELOISE Pgr
H. DONATH, BASIS - ELOISE Pgr
Katia FRANGOUDES, COASTMAN - ELOISE Pgr
C. HEIP, ECOFLAT - ELOISE Pgr
C. LANCELOT, EROS 21 - ELOISE Pgr
S.Y. MAESTRINI, DOMTOX - ELOISE Pgr
Y. OLSEN, COMWEB - ELOISE Pgr
Josef PACYNA, POPCYCLE - ELOISE Pgr
K. TURNER, Baltic Drainage - ELOISE Pgr
Laure VIDEMENT, ROBUST, Arcachon - ELOISE Pgr
A. WILLIAMS, DUNES - ELOISE Pgr

Jérome BARRON, La Gironde - ICZM Demo Pgr
Kathy BELPAEME, Flanders - ICZM Demo Pgr
Linda BRIDGE, Coastlink Network - ICZM Demo Pgr
Harry COCCOSSIS, Cyclades - ICZM Demo Pgr
Gilles COCQUEMPOT, Côte d'Opale - ICZM Demo Pgr
Celeste COELHO, Ria de Aveiro - ICZM Demo Pgr
Andrew COOPER, Irish Dunes - ICZM Demo Pgr
Peter DE WOLF, Flanders - ICZM Demo Pgr
Koutrakis EMANUIL, Strymonikos - ICZM Demo Pgr
Maro EVANGELODIOU, Athens - ICZM Demo Pgr
Ifigenia GHESKOU, Magnesie - ICZM Demo Pgr
Clive GILBERT, Kent - ICZM Demo Pgr
Eduardo GONZALEZ, Gandia/Valencia - ICZM Demo Pgr
Sarah JEWELL, Isle of Wight - ICZM Demo Pgr
Themis KOKOROTSIKOS, Kavala - ICZM Demo Pgr
José Luis LOPEZ, Gandia/Valencia - ICZM Demo Pgr
Brian MERCHANT, Devon - ICZM Demo Pgr
Marit NIELSEN-MAN, Wadden Sea - ICZM Demo Pgr
Brendan O'SULLIVAN, Bantry Bay - ICZM Demo Pgr
Lillian PALLA, Athens - ICZM Demo Pgr
Carole PETIT, Côte d'Opale - ICZM Demo Pgr
Heidi ROBERTS, Isle of Wight - ICZM Demo Pgr
Florence SENECHAL, Brest - ICZM Demo Pgr
Brian SHIPMAN, Cornwall - ICZM Demo Pgr
Agnes SIROPOUOU, Kavala - ICZM Demo Pgr
Kitty SOMMER, Coastlink Strom set - ICZM Demo Pgr
Tina TIHLMAN, Coast of Finland - ICZM Demo Pgr
Malcolm TURNBULL, Dorset - ICZM Demo Pgr
Aidan WINDER, Devon - ICZM Demo Pgr

Peter BURBRIDGE, Thematic Expert - ICZM Demo Pgr
Francois DESRENTES, CRPM
S. HUMPHREY, Thematic Expert - ICZM Demo Pgr
Harald KREMER, LOICZ
Oddmund OTTERSTAD, Norwegian University

Klaus-Guenther BARTHEL, DG 12 D03
Anne BURRILL, DG 11 D02
Annex II

Report on the Info-Coast meeting

Introduction from the Conference Organisers

The Info-Coast '99 Symposium brought together those involved in both gathering and using coastal and marine information so that key issues could be debated and practical solutions devised for better information provision for the integrated management of coastal zones. The need for relevant and readily available information and expertise is vital for coastal zone management. This has long been recognised by coastal planners and managers. In part, this need has been met over the past decade by a series of innovative projects which have built up a store of information and knowledge about coastal and marine systems. Yet throughout Europe there remain a number of significant technological and institutional barriers to the delivery of coastal information to those who need it most. New information technology and a wider understanding of the ICZM process suggest ways of crossing these barriers. However, increasing amounts of data and information, together with ever-expanding access points and means of dissemination, make it hard for managers and decision-makers to judge their quality and relevance. Problems of communication between decision-makers and the information community remain.

INFO-COAST '99 was a three-day symposium convened by a unique alliance of five organisations and networks involved with the coastal zone, from science to management, voluntary to governmental. The alliance came together with the common ground that all are committed to improving the delivery of data, information, knowledge and expertise to aid better management of our coasts.

The 140 participants came from 13 European Member States, Australia and USA, and from a wide range of backgrounds: local government, coastal management and planning (24%); university and research institutes (31%); regional and national government and government agencies (18%); consultancies and water companies (14%); national and international NGOs (7%); intergovernmental organisations and agencies (6%).

Through plenary sessions and five workshops the Symposium debated key issues and developed guiding principles and recommendations for better information provision and exchange of knowledge for the integrated management of our coastal zones. These recommendations are aimed at assisting all those involved in gathering and using coastal and marine information and accessing knowledge and expertise.

The Symposium also examined the recommendations of the Thematic Analysis of Information Required for ICZM (Theme F), part of the EU Demonstration Programme on the Integrated Management of Coastal Zones. The Symposium’s conclusions and recommendations are being made available to the Commission as part of the consultation phase of the Demonstration Programme.

The Symposium forms a starting point for developing actions to enhance Europe-wide networks for improved knowledge and information transfer in the coastal zone.

Executive Summary

For the first time in Europe, Info-Coast '99 brought together delegates with an exceptionally wide variety of expertise and experience - from local government planning, scientific research, regional and national governments, consultancies & water companies, and non-

Further information on the Demonstration Programme, and the Thematic Analysis on Information Required for ICZM is available on http://europa.eu.int/comm/dg11/iczm/home.htm
governmental and intergovernmental organisations - all involved closely with coastal management. In total there were 140 delegates from 13 European Member States, Australia and USA.

The symposium examined the current situation of information and knowledge management for the implementation of ICZM; addressed the major barriers to effective data, information and knowledge flow between the provider and user communities; and developed practical recommendations for improving the current inadequate situation.

**Info-Coast ‘99 confirmed** that:

European coastal zone data, information and knowledge networks (notably governmental/intergovernmental networks) generally deliver inadequately between users and providers;

coastal zone data and information management issues and needs are typical of those elsewhere, and there is much to be gained from implementing the wider common standards currently available and under development;

improving inputs from local users and access to local knowledge (as well as data and information) are vital components of information exchange networks; and

in developing more effective future networks it is essential to link the information and knowledge expertise of non-governmental organisations and networks with those of governments and intergovernmental agencies;

The Symposium, through plenaries and five issue-based workshops, developed guiding principles and recommendations for future action to improve European coastal zone information flow.

**Guiding principles:**

*Data collection and collation* should be strategic and transparent, issue led, with a user focus developed through effective communication;

*Technologies* should be designed to be fit for purpose (and not necessarily leading-edge) and match the needs and capabilities of end users;

*Information availability* should be improved through better user awareness, making data and information available for uses other then their original purpose, free or low-cost accessibility of publicly-funded work and provision of standard maps and charts of the European coastal zone;

*Information and knowledge flows* should be facilitated by consistent and widespread use of simple metadata records accessible through Internet-based and other gateways; and

*Awareness-raising and capacity-building* to enhance understanding between providers, users and their needs should involve improved education, in-service training, resource availability and marketing.

**Recommendations for improvement:**

*Sharing information and knowledge.* Further develop multi-sectoral partnerships and networks; facilitation of data and information access through improved availability of publicly-funded sources; and further promotion of the 1990 EC Directive on freedom of access to information on the environment.

*Providing a user and issue focus.* Involve end users in information needs assessments, dissemination design, and evaluation of uses.

*Using the knowledge base.* Develop enabling mechanisms for networks that improve access to, and validation of, local knowledge by linking individuals, local research fora, and local, regional and NGO institutions.

*A strategic European information exchange mechanism.* Develop local information exchange hubs, linking them to national and regional information networks; facilitated by the development (by EEA or other EU institution) of a simple metadata architecture for data, information and knowledge identification; with disseminated metadata records required for all publicly-funded data and information activities.

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**Symposium Guiding Principles**
Data collection and collation
Generating involvement and ownership are essential first steps in the process of data collection and collation. Then it is important to:

**Take a strategic view** before embarking on any data collection or collation exercise, at any scale from European to local. It is essential to review the scope of the data management, why it is needed and who should be involved;

**Be transparent**, because people need to know what is happening and feel ‘part of the information game’ if integration is to succeed;

**Be issue led**. Collect data relevant to the issues; rather than defining the issues on the basis of data availability. Take stock of available data and information but do not attempt to compile ‘all there is to know’;

**Have a user focus** in developing research agendas, decision support systems and other technologies. Involvement of the manager or policy maker in their development is essential for cost-effective deployment;

**Communicate effectively**. Agreement to share information is the first stage in developing any information exchange mechanism. It is important that this occurs not only across sectors but also between levels of institutional competence.

**Technologies**
Technologies, including geographical information systems (GIS), are too often seen as ends in themselves but they should be viewed more as tools to aid policy formulation and decision making. GIS can be particularly important because of the map-based nature of much of the information used for coastal management decision making, but other forms of information display and analysis can also be invaluable. Whatever technologies are deployed they should be:

**Accessible**. The development of leading-edge technologies is important, but such technologies will not generally be accessible or understandable to end users. The outputs of such technologies should be tailored to end user needs and capabilities; and

**Fit for purpose**. Those making decisions on the coast do not, for example, always need fully validated numerical models and decision support tools.

**Information availability**
Although there is plenty of data and information on the coasts and seas of Europe, it is ‘fragmented, incomplete and incompatible’ and so hard to access. Furthermore there are no standard maps and charts available for the European coastal zone. Another impediment to information availability lies in organisations (notably publicly funded bodies) that continue to see data as a revenue source. In order to improve accessibility and remove some of the barriers to information flow there should be recognition of the need for data and information to be:

**Promoted** so that users are aware of available information;

**Free or low cost**. The large volumes of data that are collected as a result of publicly-funded research, survey or monitoring activities, including mapping and use of satellites, should be made more freely available;

**Fit for purpose**. Data are usually collected for a single purpose. This project-orientation is damaging as it often prevents data reuse in meeting future information needs. Data owners should recognise that what they deem to be unsuitable may fit the purpose of another user, or may be all there is available to those needing to make decisions.

**Information and knowledge flows**
The compilation of data into information products and the exchange of knowledge are as important as the data themselves in helping to promote integrated coastal management at all institutional levels and geographical scales. Better mechanisms for data and information flow and exchange of knowledge depend crucially on the improved use of metadata (information about the data and information) rather than attempting to tailor information specifically for each use and user community.

Metadata needs to be a) attached to all data and information sets; and b) made available in metadata directories, through Internet-based and other clearing-house gateways, so as to provide:
Signposts to where and by whom the data and information are held, and who is knowledgeable about it; Noticeboards that indicate what is available, at what cost and under what other conditions; and Pathways for accessing and using the data and information. Awareness-raising and capacity-building

Users of information (including managers and policy makers) and providers (both those collecting data and information and those developing information tools) have a different understanding of the of the nature of information required for ICZM. It is, however, common to all that improving the flow and hence availability of information at all levels is a key to better management. Achieving this requires awareness-raising and capacity-building through improved:

Education in interdisciplinary awareness, data handling, communication and project management skills;
In-service training on ICZM for planners and economic development staff, and data and information providers;
Resources and training, including provision of hardware, software, personnel and helpdesks to help build capacity;
Marketing by data source organisations (e.g. CEO).

**Symposium Conclusions and Recommendations**

Info-Coast ‘99 identified four main issues that affect information provision on the coasts and seas of Europe. For each issue conclusions were drawn and key recommendations identified that are intended to help develop more integrated coastal management through better information flow.

The four issues are:
Sharing information and knowledge
Providing a user and issue focus
Using the knowledge base
A strategic European information exchange mechanism

**Sharing information and knowledge**
Achieving integrated coastal zone management requires improved information and knowledge flows. Therefore, existing barriers to exchange must be removed. Any improvement in the flow of information and knowledge must begin at the local level and must be a participatory process. As a first step in the process there must be a recognition by those who collect and collate data of the benefits to be gained by sharing them with others. Whilst commercial organisations may have intellectual property right concerns, no such impediments should exist for work funded by public subscription. This includes the work of the European Union commissioned through DG XII and other EC Directorate Generals that collect or use coastal data (Agriculture, Transport, Regional Development) and the European Environment Agency.

**Recommendations**
Local multi-sectoral partnerships should be developed to raise awareness and promote networking amongst the coastal and marine communities, using examples of existing good practice.
Facilitate access to data and information by ensuring that research, survey (including mapping) and monitoring funded by public subscription is freely available at a reasonable cost.
Improve the integration and standardisation of fragmented and incompatible data and information through *inter alia* the production of standard maps/charts (coastal and marine) of European coasts.

Further promotion by the EU of the 1990 EC Directive on freedom of access to information on the environment.

**Providing a user and issue focus**

A recurring theme throughout the symposium was the need for information to be ‘fit for the purpose’. Since the user defines fitness for purpose it is crucial that the user be the first point of reference at all times. This principle holds for academic research, data collection and the development of tools supporting coastal management. Funding bodies can play a valuable role promoting this principle by requiring that funding proposals address the issue of user participation and demonstrate a link to defined issues.

**Recommendation**

Involve end users at all stages of project development including assessment of needs, proposals for the dissemination of the results and an evaluation of the use to which they are put.

**Using the knowledge base**

Empirical data is only one element of the knowledge base that can be used in decision making. Too often the value of local (artisanal) knowledge is overlooked, or ignored because it is considered unreliable. The symposium delegates recognised that in their own approaches to the provision of advice, decision-making and policy formulation they often relied on personal experience and local knowledge.

The ‘cloud of knowledge’ about a particular area or topic is often dispersed and difficult to access. Developing mechanisms to tap into this vast store of knowledge across Europe should not be left to chance. Europe-wide co-ordination is required to build effective enabling mechanisms.

**Recommendation**

Build networking initiatives which can access and validate knowledge at the appropriate level and facilitate communication between individuals, local research fora and institutions (such as those linking local and regional authorities, those attached to the Regional Seas conventions and those focusing on NGO activities).

**A strategic European information exchange mechanism**

A crucial conclusion from the symposium is that the process of information flow is as important to better management of the coastal zone as the information itself. To this end there was a considerable amount of discussion on the development of a metadata system for Europe’s coast and seas. Metadata is recognised as an effective mechanism through which signposts to data can be erected, pathways along which data can flow be identified and gateways that provide controlled access to data be defined.

A model for a strategic European information exchange mechanism is to build information exchange networks at various spatial scales that act as hubs for information exchange. This network of hubs would facilitate the cascade of information both up, down and within spatial scales. The challenge is for the European institutions and national governments to agree that this should be undertaken specifically as an initiative for the coast and marine environment.

The key lies in this providing an opportunity to link information provision directly with policy formulation and practical management. Technologies such as the Internet offer a way to achieve a European information exchange mechanism at a range of spatial scales, between many institutional levels and across all sectors concerned with the sustainable use of the coast and seas of Europe.

**Recommendations**

Support the development of local information exchange facilities (or ‘observatories’) as a practical means of providing information and advice and to provide the hub for local networks.
Link the local networks to each other and to institutions responsible for data collection and collation at higher spatial scales. This will be especially important at national and regional sea level where ‘State of the Coast Reports’ help to provide context, identification of issues, and highlight potential indicators.

The European Environment Agency or other EU institution should promote the development of a metadata architecture by which information can be made to flow between the hubs. This architecture should be comprehensive but make use of information technology and other mechanisms to make it both simple and easy to use. All publicly-funded data and information gathering activities should be required to provide and disseminate a metadata record of the activity.

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**About the INFO-COAST ’99 Participating Organisations**

A unique alliance of organisations involved with the coastal zone from science to management, voluntary to governmental came together for the first time to participate in INFO-COAST ’99. Their common ground is that all are committed to improving the delivery of data, information, knowledge and expertise to aid better management of our coasts.

**Estuarine and Coastal Sciences Association**

ECSA, formed in 1971 as the Estuarine and Brackish Water Sciences Association, is an international organisation which aims to promote the production and dissemination of scientific knowledge and understanding concerning estuaries and other brackish and coastal waters, in order to assist in the prevention of environmental deterioration and the encouragement of resource management for the public benefit.

**European Union for Coastal Conservation - UK**

EUCC-UK is the UK arm of EUCC (the largest non-governmental coastal network in Europe). EUCC-UK promotes public awareness of the need for coastal conservation and encourages the exchange of information and experience, particularly in relation to developing coastal issues at European and pan-European levels. It promotes research concerning conservation and management of the coastal zone within a European context and disseminates the results.

**Wetlands International**

Wetlands International is the world’s leading wetland conservation organisation, with 40 years of experience in the conservation and sustainable use of coastal and inland wetlands worldwide, and has long expertise in techniques of compiling and presenting data and information on habitats, species and their uses. A non-profit organisation now based in the Netherlands, Wetlands International is active in over 100 countries, including in many parts of Europe. Its partnership programmes are supported by over 120 government agencies, NGOs, foundations and private donors.

**Biodiversity Conservation Information System**

BCIS is a consortium of twelve international conservation organisations and IUCN programmes. BCIS members collectively represent the single greatest global source of biodiversity conservation information in the world. BCIS is a framework within which the members’ networks - thousands of conservation practitioners and organisations around the world - work together towards a common goal: to support environmentally sound decision-making and action by facilitating access to biodiversity data and information. Wetlands International is a founder member of BCIS.

**European Union for Coastal Conservation**

EUCC was established in 1989 by representatives of NGO’s, research institutes, conservation site managers and local and national governments. The Union is concerned with the promotion of ecologically sustainable development and with the maintenance of the integrity and natural diversity of the coastal heritage. The EUCC has 750 members and member organisations in 40 countries, 11 active National Branches and 7 professional offices.

**CoastLink: The European Network for Sustainable Coasts and Seas**
CoastLink is the first trans-national network of maritime regions and municipalities in Europe. It is committed to developing, implementing, evaluating and disseminating best practice in ICZM primarily to regional and local authorities throughout the European littoral.
CONCLUSIONS AND RECOMMENDATIONS

The European coastal region has been and will be modified by humans. Yet, the human factors, such as morphodynamic changes, cultural changes, land use changes, property/user rights, competition for space and space management are often missing in current studies on coastal zone management. One reason for slow progress in bringing human factors to CZM is an endemic problem in coastal areas related to the fact that there are multiple stakeholders in the coastal zone with conflicting interests. Major focus of the Workshop was to identify these stakeholders and their needs from science. Finally, it was discussed whether science today can address the stakeholders needs and what factors of science limitations in this respect.

The following conclusions have been elaborated during the Workshop discussions.

1. The research activities, such as ELOISE are focused on the advancement of science and less on the advancement of management in the coastal zone.

2. The science program of many research activities lacks a sufficient focus on the human dimension and socio-economic/management analytical methods and techniques.

3. The implications of the scientific and socio-economic findings should be discussed in partnership with the appropriate stakeholders, including policy matters.

4. The involvement of stakeholders in the coastal zone research is often hampered by a lack of exploitation plan of research findings.

5. The dearth of process mechanisms and outcomes for more participatory decision making on coastal zones needs to be co
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Title: Integrated Management of the Flemish Coast (West Flanders, Belgium)

Project: TERRA Network no.85 CZM (ICZM Demo Programme)

Contact: Mr Peter DE WOLF & Ms Kathy BELPAEME

Poster summary:

1. The TERRA CZM project: introduction

   ? Partnership in three regions of Europe:
   in Kavala (Greece): the Prefecture of Kavala, and the Region of Eastern Macedonia and Thrace, both public authorities. These are joint by the Kavala Development Agency;
   In Flanders (Belgium): the Ministry of the Flemish Community, Departement for Waterways and Maritime affairs and the Province of West-Flanders. Both are public authorities;
   In Algarve (Portugal): the Municipality of Faro, the Commission for Co-ordination of the Region of Algarve, the Algarve Port Authority, all public authorities.

   ? Common features of the partner regions:
   their coastal zones are under heavy pressure due to human and economic activities;
   the great number of departements and agencies involved in coastal zone management urge for development of a new coherent regional perspective of, and approach to coastal management and planning;
   request for investigating which activities and functions their coastal zones can host without damaging the natural and cultural environment.

   ? Shared objectives in the project:
   to promote sustainable development and wise use of coastal resources in the regions;
   to prepare Integrated Coastal Zone Management Plans;
   To raise awareness of the objectives, functions and techniques of ICZM Plans, and the capacity of the regional authorities to prepare and implement such plans;
   To disseminate the experience of the project as a whole.

   The “place-bound” objective of the project is to implement demonstration projects in each partner region.

2. Needs from and interaction with science. How do coastal zone managers in Flanders generally perceive scientists?

   ? call for information from the scientists is mainly considered for small scale, specific projects or to a lesser extend to evaluate a certain policy decision;
   ? scientists are rarely consulted for long term monitoring or for preparation of policy in a long term perspective;
   ? science is not spontaneous considered as a possible/helpful instrument in policy making;
   ? whether a country engages to actively incorporate Integrated Coastal Zone Management in the coastal policy is an ethical choice. Science can not motivate this choice, it can mearly reach elements and instruments;

   What arrangements or lines of communication do exist with coastal zone science in Flanders?

   ? scientists can submit projects within the frame of a specific call for proposals. The themes are assigned at the political level;
   ? there are arrangements between certain administrations and scientific centres. For instance between the nature administration and the Institute for Nature Conservation and the Universities;
   ? some arrangements have a perma nent nature, others are temporary;
2.3. What are the major impediments to co-operation and co-ordination between coastal zone science and management in Flanders?

? *exchange of information* - in both directions - is not always efficient. Efficient exchange of information implies that managers and researchers use a calibrated jargon, i.e. each technical term has a clear definition;? *time scale*: policy makers do not always have enough adequate scientific material. Scientific research takes time, and often policy needs to be ready in a shorter term. The time scale at which both groups work is different. This problem will probably always remain. It is often impossible for science to give a clear answer in a short time;

? *mutual understanding*: scientific information is often very specialised and complex, and it does not always reach the managers in a understandable language. On the other hand scientists are not always interested in policy making and loose contact with reality. A second important aspect is that one has to respect and understand each others limits: the managers have to realise what they can expect from science. On the other hand the scientist need to realise the complex factors (e.g. socio-economic factors) which play in decision making;

? *high price*: scientific research is expensive. The necessary budgets are not always available to allow adequate scientific research. A lot of “scientific research” is presently based on literature study and routine inventories. The principle of “good value for money” should dominate here;

? *fragmented financing*: the funds available for scientific research are spend in a fragmented way: too many small scale projects, executed by different researchers. Rarely money is available for long term contracts with research institutes where the same people are doing research or follow up on a certain theme. This prevents continuity in research.

? *lack of fundamental research*: there is little investment in fundamental science and long term projects;

What are the five important needs from science?

? *monitoring* of the situation of the coastal zone;

? research on *carrying capacity*: what is the carrying capacity of the coastal zone? What activities can be allowed and to what extent? What is “sustainable use” of the coastal zone?

? *development of models* for predicting future situations; physical as well as biological parameters should be taken into account in these models;

? *give scientific basis* to statements in conflict situations and support the managers in case of concrete questions;

? *fundamental research* should be the driving force for desicion making in the longer term. In this respect efficient international contacts and flow through of information is of major importance.

2.5. What is the best example of co-operation between coastal zone scientists and managers in Flanders?

? there are several examples of co-operation between coastal zone scientists and managers in Flanders. Some examples:

1. the monitoring of beach and dune evolution commissioned by the coastal defence administration;

monitoring of the quality of swimming water at beaches and communication to the municipalities and the public.

monitoring of sediment transport in harbour and along the coast line

Scientific institutions in Belgium and the Flemish region

*Management Unit of the North Sea Mathematical Models*: scientific research on the marine ecosystem, with the aid of mathematical models; impact studies concerning activities with a possible effect on the marine environment; scientific evaluation of marine pollution;

*Institute for Nature Conservation*: scientific research related to nature conservation;

*Sea Fisheries Departement*: scientific research on fishing activities, monitoring effects of dredging, monitoring of fish disease, quality of sea water and sediment.

*Flemish Institute for the Environment*: monitoring of fresh water and biological monitoring of swimming water;
Universities and experts (about 40 research teams -accounting for more than 200 researchers- are doing research on the coastal zone in Belgium): long term and short term studies.
Title: Programme for Integrated Coastal Zone Management in the Cyclades (Greece)

Project: LIFE-Environment 96/GR/537/PAZ (ICZM Demo Programme)

Contact: Mr Harry COCCOSSIS

Poster Summary:

**picamcy-Brief description**

The Program concerns the development of innovative co-operation for concerted actions in Integrated Coastal Zone Management in the island complex of Cyclades. These islands are characterized by small surface area, limited natural resources, rich cultural heritage, a natural and built environment of unique value, limited administrative and organizational capacity and intense tourism development which threatens the fragile balance between economy, society and environment.

**How do coastal zone managers perceive scientists?**

Positively. The University of the Aegean is perceived as a neutral, reliable partner who can act as a catalyst for cooperation among the partners of the Island Network. In addition the University is understood to be able to establish an effective communication with all different levels of administration.

Coastal scientists can provide the knowledge and the experience for an effective anticipation of several acute and long term problems.

**Arrangements or lines of communication with coastal zone science in the area**

N.A

**Major impediments to co-operation and co-ordination between coastal zone science and management**

The lack of policy relevant research

**Relevance of science to coastal zone management/most important needs from science**

- Assessment of the state of the environment, mainly in respect to water issues, land use conflicts, habitats and ecosystems in general
- Introduce guidelines, procedures for an integrated management of terrestrial and marine coastal systems
- Use of applied science in policy analysis

**Best example of cooperation between coastal zone scientists and managers in your area**

Elaboration of six horizontal thematic studies by experts of the University of the Aegean and of the Athens Technical University, concerning

- Planning for sustainable tourism –strategy and targeted actions-
- Promoting a sustainable agricultural development –critical issues, opportunities, targeted actions-
- Management of areas with ecological value –priorities for action, guidelines for an effective management-
- Water resources management –development of a model/GIS application-
- Waste management –elaboration of standards for waste management in small islands-
• Energy planning –opportunities for development of renewable sources of energy –solar, wind, geothermal- applications for the tourism sector

The strategy and the development of the targeted actions will be resulted from the cooperation of the thematic experts and the local managers of the islands.
Title: Integrated Management of Coastal Zones: Isle of Wight (United Kingdom)

Project: LIFE-Environment 96/UK/425/PAZ (ICZM Demo Programme)

Contact: Ms Heidi ROBERTS & Ms Sarah JEWELL

Poster summary:

The IOW project has focused on an audit of ICZM throughout the study area by examining the mechanisms used to deliver sustainable policies; these include management plans, collaborative groups and projects which have been undertaken over the past decade. The aim is to highlight examples of ‘good practice’ in a number of areas leading to true integrated management.

The poster will be focusing on the collation and dissemination of coastal data and information, an issue seen as vital to the delivery of sustainable policies. A number of examples will be used to illustrate how the collation and dissemination of data can benefit ICZM from trans-national through to local examples and a number of conclusions put forward.
Title: COASTAL PLANNING ON THE GULF OF FINLAND LIFE ENVIRONMENT PROJECT (Finland)

Project: LIFE-Environment 96/FIN/071/PAZ (ICZM Demo Programme)

Contact: Ms Tiina TIHLMAN

Poster Summary:

The Coastal Planning on the Gulf of Finland Life Project comprised the municipalities of Tammisaari, Inkoo, Porvoo, Pernaja, Ruotsinpyhtää, Pyhtää and Virolahti, the regional councils of Uusimaa, Itä-Uusimaa and Kymenlaakso, and also the Uusimaa and Southeast Finland Regional Environment Centres. The goal of the project was to draw up ratified master plans for coastal zones. The project was also part of “the Integrated Coastal Zone Management” (ICZM) Demonstration Programme of European Commission. The ICZM programme’s objective is to find practical solutions for sustainable development in the European coastal zones.

The objective of the Coastal Planning on the Gulf of Finland Project was to promote master planning on the southern coast of Finland. Because of amendments to the Building Act (1997), planning in the coastal zone is now required, but the existing regional plans and master plans only partly covered the coastal areas, and did not guide building enough. Therefore, new plans were needed. Additionally, the new Nature Conservation Act (1997) specifies that nature must be taken carefully into account. The coastal area in the project includes two national parks, several areas in the Natura 2000 network, nationally valuable protection areas and other nature protection areas. Building without good land use plans would be a threat to the coastal biodiversity.

Of primary importance were making good nature and cultural heritage inventories, and determining the building rights of the present landowners. Other important recommendations for drawing up the plans were using archipelago zones as planning zones, encouraging interest group participation, applying environmental impact assessment, and developing planning reports.

The plans should promote sustainable development and should develop the local economies of coastal and island areas. Despite the tight project schedule, the municipalities succeeded in encouraging the participation of the inhabitants and landowners in the planning. Solutions were found even for the most difficult conflicts. First-hand experiences from implementing the new or revised acts and the Natura 2000 network were gained. Progress was also made in integrating environmental impact assessment into the planning process, as well as in presenting the planning process and options together in the planning report.

This is the largest coastal master planning cooperation project ever done in Finland. The municipalities had an opportunity to become familiar with planning issues in other coastal municipalities on the Gulf of Finland, and to discuss relevant questions. The project team concluded that discussions and joint efforts had broadened the municipalities knowledge, and had given support to their own decisions. When the municipalities became familiar with nature and the geography in various parts of the Gulf of Finland it helped them to identify the development prospects of their own coasts. Working together in drawing up the plans was clearly synergistic, and cooperation also in future in land use planning would be important. Each municipality was responsible for its own planning; the role of the project was more to guide the work.

The project team also cooperated with the main regional authorities and with other interest groups. Among others, the team cooperated with local schools in the municipalities, which was a very good experience and which had a positive effect on the planning. Sustainable development along coasts was discussed with some European countries in connection with the European Union’s Integrated Coastal Management Programme. Other project discussion
topics of international interest were sustainable development of coastal municipalities in Sweden, building legislation in Estonia, and tourism development prospects in the eastern Gulf of Finland.

The project could extend considerably master planning on the southern coast and on islands. The plans cover about 173,000 hectares of land and water areas, and approximately 2,330 kilometres of coastline, which is a quarter of the total southern coastline of Finland. The plans includes about 17,600 hectares of Natura 2000 network areas, areas protected under national conservation programmes or other nature conservation areas. For recreation roughly 850 hectares are set aside in the plans. However, more resources are still needed, including state support for drawing up plans for the most valuable coastal zones.

Land use planning is one means for realizing development goals. However, to maintain the biodiversity of coastal zones and to develop coasts in a sustainable way, more discussion is needed to reconcile the development goals of various sectors. The European Union will presumably take action to promote sustainable development in coastal zones based on the experiences gained from the ICZM programme and in the context of renewing the structural funds. Despite this, or rather as a response to this, Finland should draw up its own national strategy for coastal management, as many other European countries have already done. Still, regional and local levels of administration are instrumental in adopting regional strategies. Therefore, regional councils and municipalities should jointly define those areas in which they could apply coastal zone management strategies, and start the ICZM process.
Title: La Costera-Canal (Gandia/Valencia, Spain)

Project: TERRA no.138 Concercost (ICZM Demo Programme)

Contact: Mr Eduardo GONZÁLEZ & Mr José Luis LOPEZ

Poster Summary:

The poster will refer to the follow issues with relation to the CCV project:

1. Map of the area
2. Description of the demographic characteristics and the most significant themes in each of the comarcas in the zone.
3. Description of the science-management disfunctions, existing since 1997.
4. Errors committed in the zone as a result of these disfunctions.
5. The CONCERCOST project, as an element of consensus between the public officials responsible for integrated management of the territory and the coordination of management policies.
6. Description of the 5 most important areas in which the actions of managers must be based on the studies of the scientists.
7. Some examples of scientific-management cooperation which has occurred since 1997.
Title: Concerted actions for the management of the Strymonikos Coastal Zone (Greece)

Project: LIFE-Environment 96/GR/564/PAZ (ICZM Demo Programme)

Contact: Mr Koutrakis EMANUIL

Poster summary:

Two case studies are presented, which could serve as key lessons for ICZM. The first one concerns the formulation of a Steering Committee for the management of the Strymonikos coastal zone, i.e. a Coordination Scheme of managers and scientists, which has been established in the frame of the project task “Concertation”, while the second concerns the establishment of an Information Centre in the area, which provides simplified scientific information for the project area, aiming to support environmental awareness activities, in the frame of the project tasks «Implementation of measures» and «Public awareness». The correlation of the two case studies and the corresponding project tasks with the thematic analyses of the ICZM Demonstration Programme is schematically indicated. Moreover, examples of positive actions are given for both cases, while the problems which have arisen and the future necessary actions are also presented.
Title: Integrated Management of the Coast of Kavala (Greece)

Project: TERRA Network no.85 CZM (ICZM Demo Programme)

Contact: Mr Themis KOKOROTSIKOS

Poster summary:

The prefecture of Kavala is a legal Person of Public Right, an administrative division at Nuts III level of the Greek Republic, part of the Region of East Macedonia and Thrace. In Greece new laws transformed the prefectures to Local Authorities of Second level (first level are the municipalities). The main activities of the prefecture concentrate on issues of common interest such as environment, administration, infrastructure projects as well as “soft” actions aiming at supporting and promoting local economic development through planning interventions in the industrial, tourist, social, cultural and other activities.

The Terra Coastal Zone Management is an interregional cooperation project which pursues several objectives. Some of them can be characterized as shared (promotion of sustainable development, preparation of Integrated Coastal Zone Management Plans, raising awareness of the objectives, dissemination of the experience) and one may be characterized as “place-bound”. The place-bound objective includes the implementation of demonstration projects. The demonstration project of Kavala Prefecture comprises the establishment of a coastal zone observatory for monitoring the on-going and future activities in the coastal zones using modern tools (production of updated maps, G.I.S.).

The role of Coastal Zone Science to Integrated Coastal Zone Management:

Support to decision process with the implementation of state of the art methodologies and techniques (multicriteria analysis)

Needs for Scientific Input:

- Design of Regional & Local Development in accordance with the notion of Sustainability
- Projects site location, Environmental Impact Assessment and technological appraisal
- Input for a sound and broader legal frame
- Implementation, in association with local authorities, of social awareness and sensitization programmes
- Innovative projects testing and implementation

Major impediments to co-operation between coastal zone science and management:

- Authorization of decision process is often based on political trade-off analysis instead of pure scientific evaluation
- Scientific proposals are not always comprising down to earth solutions
- Budget or time constraints impede an effective and on time cooperation

Best example of co-operation between Coastal zone scientists and managers:

Implementation of the “Regional and Spatial Development of Kavala Prefecture Study” by the Institute of Regional Development. The study paves a developmental and spatial strategy for the next century in compliance with the current European and National Development-Environmental Policies and low. Spatial and economic priorities are identified and a model for the area environmental carrying capacity quantification is proposed.
Title: Coastlink Storstrom (Baltic)

Project: TERRA Network no.13 COASTLINK (ICZM Demo Programme)

Contact: Ms Kitty SOMMER

Poster summary:

The COASTlink Baltic project is a part of the work towards a European Integrated Coastal Zones Management. The project is also a part of a network between specific areas called: COASTlink.

The COASTlink regions are:
- ANAS (Algarve-Huelva) (E,P)
- Kent County Council (UK)
- Ipiros Region (GR)
- Down District Council (UK- Northen Ireland)
- Cornwall County Council (UK)
- Devon County Council (UK)
- Storstrom County Council (DK) and “Regionaler Planungsverband Mittleres Mecklenburg/Rostock” (D)

Actions in the COASTlink Baltic project:
- Integration and implementation of the development perspective for the Southern Danish Archipelago in the planning system and by pilot green actions. (The project the Southern Danish Archipelago are a joint national demonstration project between Storstrom and Fyn Counties)
- Division of the coast and strategies and action plans for development and protection for each cell
- Local Agenda 21 in a coastal community as a bottom up process
- Building up a cooperation between “Regionaler Planungsverband Mittleres Mecklenburg/Rostock” and Storstrom County concerning ICZM and local Agenda 21 work
- Sustainable Assessment of the regional planing for the coastal zone

Facts about Storstrom County:
- consist of 24 minicipalities
- area of 339.802 ha
- Coast stretches 1099 km
- inhabitants ca. 258.000

Facts about “Regionaler Planungsverband Mittleres Mecklenburg/Rostock”
- consist of counties of Güstow, Bad Doberan and the town of Rostock
- area of 360.000 ha
- Coast stretches 110 km
- inhabitants ca. 435.000

Needs from and interaction with science

In the COASTlink Baltic project we need more and more interaction with science to ensure a sustainable development.

We now have a cooperation with Danish scientist in an expert following group for the project: The Southern Danish Archipelago. The aim is to defined indicators for a sustainable
development especially concerning nature, environment, local culture and tourist in this law watered and swallow Archipelago with large bird protection interest.

Concerning Sustainable Assessment of the regional planning for the coastal zone is an interaction with the Rostock University.
Title: The Dorset Coast Forum (United Kingdom)

Project: LIFE-Environment 96/UK (ICZM Demo Programme)

Contact: Mr Malcolm TURNBULL

Poster summary:

The Dorset Coast Forum was established in 1995 to look at the long-term strategic issues facing the Dorset coast as a whole. The overriding aim of the Forum is to promote a sustainable approach to the management, use and development of Dorset's coastal zone, which will ensure that its inherent natural and cultural qualities are maintained and enhanced for the benefit of future generations.

This aim will be met by:

- encouraging co-operation and dialogue between the different interests and users of the Dorset coast;
- encouraging the gathering and dissemination of knowledge, and the carrying out of necessary research in relation to the physical processes, natural environment and human use of the Dorset coastal zone;
- reviewing existing national, regional and local coastal policies and working towards the production of integrated policies specific to the Dorset coastal zone.

What is the Dorset Coast Strategy?

The Dorset Coast Strategy aims to set out a consensus view on the way in which the members of the Dorset Coast Forum will work together to improve the planning and management of the Dorset Coast.

The tasks of the Strategy are:
- establishing **Integrated policy**
- establishing guidelines for more detailed **coastal management plans**
- identifying strategic **opportunities for resource development**
- engaging and developing **participation** of a wide range of partners
- developing a co-ordinated approach to strategy **implementation**
- identifying **solutions** for the sustainable coastal development and management
- **evaluating success** and the reporting of results throughout Europe.

There are four key elements to the Dorset Coast Strategy:

**VISION**
A clear vision of the future of the Dorset Coast

**PRINCIPLES**
A basis for widespread agreement on future planning and management

**PRIORITIES**
Nine priorities for the future management of Dorset’s coast

**ACTION**
Detailed policies and actions to achieve progress with each priority.

Needs and interactions with science

This is to be answered with a series of policy actions taken from the strategy - areas where we need to work with scientists to further research in specific areas.

How to overcome communication barriers between coastal zone science and managers?
Coastal zone management plans such as the Dorset Coast Strategy help to outline the benefits of working together. University courses in ICZM, Student Placements - research topics (we have a number within the strategy).

**Limits to science**
- Funding research projects
- Storage and updating of information produced
- Universal understanding
- Time

**Areas within the strategy where scientific research is necessary in order to fulfil tasks/time scales and lead authority**

**Overall strategy towards coastal pollution**
Need to identify the continued sources of pollution on the coast, and ensure that they are recorded and their effects and their significance are understood.

**Underwater noise**
Increased research on the extent and of the impacts of underwater noise in Dorset.

**Local delivery of biodiversity conservation**
The Dorset Coast Forum will support the creation and maintenance of a marine wildlife database maintained within the Dorset Environmental Records Centre assisted by the Joint Dorset Marine Committee.

**Seabed mapping**
The Dorset Coast Forum will support the collation and publication of habitat maps of the seabed, and support a seabed-mapping programme in co-operation with the fishing and offshore industries.

**Maritime archaeology**
The Dorset Coast Forum will develop a baseline record of maritime archaeology, maintained by Dorset County Council, and integrated with the County Sites and Monuments Record, which covers terrestrial archaeology.

**Property likely to be affected by erosion and flooding**
Coastal Groups should be encouraged to carry out full and thorough research to predict the future evolution of the coast and identify areas likely to be affected by erosion or flooding within the next 50 years.

The Dorset Coast Forum supports the continued activity of the SCOPAC research sub-group in promoting strategic research relevant to the Dorset Coast, and recommends a similar initiative by the Lyme Bay and South Devon Coastline Group.

**Shoreline management**
There is a need to publicise national and international information on the predicted impacts of climate change, and understand the implications of new information on shoreline management policies for Dorset.

The Dorset Coast Forum will support a workable system to assemble the electronic data sets for Dorset produced by the SMPs within a single, quality controlled Geographical Information System, and make them available to the Coastal Groups and members of the Coast Forum.

**Support and development of the fishing industry**
The Forum will seek to ensure that new information on the marine environment is shared with the fishing industry, and that the industry is fully involved in the development of local marine conservation policies.

**The Jurassic Coast and the Tourism Industry**
The Dorset Coast Forum will support appropriate measures for geological conservation and the development of geological education, interpretation and geotourism strategies through the work of the Jurassic Coast Project.

**Coastal tourism information and monitoring needs**
Existing tourism research needs to be better disseminated throughout the county and further research is required to properly evaluate the use of the coast by visitors, their attitudes and demands for facilities, and the development potential and value of new markets.

**Effective information management**
An integrated Coastal Geographical Information System will be developed, and information within it made available on a shared basis with all interests on the coast, subject to copyright.

The Dorset Coast Forum will catalogue and publicise library collections of detailed information on the Dorset Coast.

The Dorset Coast Forum will strengthen the links between Universities/Colleges and coastal managers, and seek an increased number of useful postgraduate studies and placements addressing coastal information gaps.

The Dorset Coast Forum will ensure that new local databases are gathered and maintained in the following areas, building on existing local initiatives where relevant.

a. Maritime Archaeology
b. Coastal Processes and Defence
c. Geology
d. Marine Wildlife
Title: MARIA – INTEGRATED MANAGEMENT PROGRAMME FOR RIA DE AVEIRO (Portugal)

Project: LIFE-Environment 96/P/601/LBL (ICZM Demo Programme)

Contact: Ms Celeste COELHO

Poster summary:

Key – words: Integrated Management, Partnership process, Coastal zone science, Coastal zone managers

Abstract

The MARIA Project is a project under the Demonstration Programme for Integrated Coastal Zone Management (IZCM). The main aims of the project are based on the definition of an Integrated Management Structure for the Ria de Aveiro. This structure should contribute towards sustainable development, not only in the area of the Ria, but also to others areas, along Europe, with similar conditions, where the structure could adopted and adapted.

It can be pointed out as the most innovative aspect of the Project the inclusion of partners at the international, national, regional and local levels, with different perspectives on the use of coastal areas, as well as with different dynamics, cooperating under the perspective of sustainable development for the whole area.

The university as a fundamental role as coordinator and simultaneously gives facilities of information and communication with all the partners of the community, witch she integrates.

The methodology employed in the Project has tree main sequential and articulated stages. In an initial phase, the team proceeded with the identification and systematization of existing information. This was done in order to have a more accurate characterization of the actual situation, in environmental terms.

The second phase consisted in the analysis and evaluation of programmes, plans and projects already done, started or just foreseen, with the goal of finding thematic areas to put discussion.

The third and last phase consisted in the definition of an Integrated Management Structure for the Ria de Aveiro area, processo materializado através da assinatura da carta de princípios. In this last phase it was possible identify four pilot-areas for development of plans or programmes of integrated management.

Este poster pretende descrever - as principais necessidades sentidas na interacção entre as ciências das zonas costeiras e os agentes intervenientes na área da Ria:

Managers of the area try to understand investigators through participation in several working groups where practice and theory experiences to resolve problems and questions can be confronted and equated achieving the improvement of the coastal zones in the future.

The scientific community has a positive attitude in what concerns to the aperture to communities stimulating the realization of seminars and promoting discussions/debates concerning the study areas. The University plays the role of a privileged agent in its facilitator function of communication between stakeholders and the communities involved.

The major obstacles to co-operation and co-ordination between science and coastal management of the registered Ria de Aveiro areas are related with: The difference of interests between managers and investigators, that is, while stakeholders have an immediate will to take action, scientists work in details, acting in long terms; the extremely fragmented management and complex administration (undefined jurisdiction), different scales of work, different speeches usually very reserved.
The relevance of science to coastal management of the area is very important as a support of information and providing technicians to resolve and detect the problems of the area. The several scientific studies contributed and elucidated managers for the necessity of an integrated management in order to obtain a sustainable development.

To science the most important needs are related to the resolution of the main problems of the area, namely: the quality of water, planning, pollution and the preservation of the existing natural resources.

Due to this problems there are several difficulties that science as to fill in, videlicet: the difficulties of the non-understanding of the scientific speeches by managers and vice-versa; the lack of understanding of the various interests of managers; and the increased consciousness of the coastal zones problems by public in general.

The best example of co-operation between coastal zone managers and investigators is the MARIA project as well as the results obtained through that project: promotion of debate between the several managers (stakeholders) and the MARIA team; internalization of the need of partnerships as a way to achieve and promote the integrated management of the area.

It is to stress out the long tradition of linkage between the University and the communities in general as well as among the various interventions of the community in attempting to achieve the solutions to the problems of the area.
CÔTE D’OPALE
COOPERATION, CONCERTATION AND COORDINATION
(France)

Project: LIFE-Environment 96/F/434/PAZ (ICZM Demo Programme)

Contact: Mr Gilles COQUEMPOIT

Poster summary:

Le poster présenté par le Syndicat Mixte de la Côte d'Opale (S.M.C.O.) traitera :

du contexte et de l’originalité du projet Côte d’Opale par rapport aux partenaires scientifiques et techniques

d’une illustration du programme à travers la présentation schématique de la démarche diagnostic de territoire envisagé sur le périmètre du S.M.C.O.

Assurer l’interface entre ceux qui savent et ceux qui cherchent à savoir :
le rôle de l’Observatoire de l’Environnement Littoral et Marin dans le Programme LIFE DU S.M.CO.

Le programme Côte d’Opale est, rappelons-le, porté par une collectivité (le S.M.C.O.) rassemblant des élus du Littoral, l’Université du Littoral et des organismes consulaires. Il mobilise un réseau d’acteurs dynamiques autour de son programme et, pour assurer l’interface des décideurs avec les scientifiques, il s’appuie sur l’Observatoire de l’Environnement Littoral et Marin. Celui-ci fait partie d’Espace Naturel Régional, outil mis en place par la Région pour développer ses politiques environnementales.

Le fonctionnement en partenariat est au cœur de la démarche de l’Observatoire. Il agit en temps que traducteur des préoccupations des acteurs et décideurs du territoire auprès des scientifiques et s’appuie sur ces derniers pour assurer la prise en compte de l’environnement littoral dans l’aménagement du territoire auprès des élus.

Par ailleurs, il peut aussi porter à connaissance auprès des scientifiques les attentes des décideurs…ainsi ceux qui savent ne sont pas forcément ceux qu’on croit !…

Présentation de la démarche de « diagnostic du territoire » réalisée par l’Observatoire pour le S.M.C.O. dans le cadre du Programme A.I.Z.C.

- Position et objectifs du diagnostic du territoire au sein d’une démarche d’évaluation

- L’atlas cartographique du Littoral Nord-Pas de Calais

Véritable portrait de territoire, il est le résultat d’une « compilation » de données, collectées auprès de nombreux organismes et intégrées pour la plupart dans le Système d’Information Géographique de ENR /OELM. L’atlas est une exploitation cartographique de l’ensemble des données collectées.

- Le diagnostic du territoire du Syndicat Mixte de la Côte d’Opale

Il repose sur la volonté d’analyser la pluralité du territoire au regard des vocations et des enjeux reconnus et partagés par les institutions et acteurs locaux pour le développement futur du territoire. Il a pour objectif de mettre en évidence des entités territoriales cohérentes où s’expriment des dynamiques de territoires différents.

Dans la région Nord-Pas de Calais comme sur le territoire de la Côte d’Opale, ces vocations et enjeux sont clairement ceux du développement durable.
La définition des enjeux fait nécessairement appel aux acteurs et décideurs du Littoral, c’est pourquoi la mise en place d’ateliers de réflexion entre acteurs et partenaires du Littoral, c’est pourquoi la mise en place d’ateliers de réflexion entre acteurs et partenaires du Littoral a pour but de les faire émerger. C’est ensuite au travers de ceux-ci que sera analysée la pluralité du territoire.

**Le choix d’une méthode d’analyse**

Le diagnostic de territoire repose sur le principe d’une quantification de « descripteurs » mesurés selon un maillage communal.

Ces descripteurs s’articulent selon une grille de lecture du territoire dont les champs d’entrée sont les vocations du Développement Durable :

- Un territoire de potentiel environnemental,
- Un territoire de potentiel économique,
- Un territoire de qualité de vie.

Ces descripteurs ont été proposés par l’Observatoire sur la base d’un travail bibliographique (OCDE, IFEN…) et améliorés puis validés par les partenaires et experts locaux.

La méthode utilisée pour mettre en évidence les diversités territoriales et identifier des types d’espaces fait alors appel aux techniques de l’analyse multivariée. La méthodologie utilisée s’appuie sur une démarche comparative dans la mesure où elle se réfère constamment à la situation moyenne de l’ensemble des communes étudiées.

Cette méthode d’analyse typologique ne pourra intégrer l’ensemble des analyses souhaitées pour réaliser le diagnostic du territoire du fait de la non-existence ou de l’absence de pertinence des données à l’échelle communale. L’ensemble de ces données sera toute fois intégré sous forme d’analyses complémentaires ou de données de cadrage.

L’ensemble des spécialistes des groupes de réflexion sera associé tout au long de l’étude pour interpréter et commenter les résultats cartographiques et ainsi apporter leurs regards d’experts pour qualifier les dynamiques de territoire mises en évidence.
Within the framework of Life Project a first attempt has been made to introduce the concept of sustainability to coastal zone management. This objective is approached from two different sides:

- through **information procedures**. The creation of an information tool (GIS Database) that will support the decision-making environment has been one of the main priorities of Life Project and has reached a satisfactory progress level up to now.
- and through **concertation procedures**. The involvement of the local agents, that influence the formation of the coastal area, in procedures of communication and negotiation is considered critical and therefore it is strongly supported by Life Project.

In order to determine the needs from science, as well as the interaction with science, the opinion of 15 representatives (10 coastal managers and 5 scientists) from relevant agencies was asked. According to the answers that were given the following conclusions can be drawn:

**How do coastal managers in Magnesia generally perceive scientists**
- Slight majority of the coastal managers considers dialogue with scientists substantial and the great majority finds the co-operation successful.
- The great majority of the scientists considers dialogue with coastal managers substantial. Co-operation between the two sides was regarded as very successful or successful by all scientists asked.

**What arrangements or lines of communication exist with coastal zone science**
- According to the coastal managers’ opinion there is permanent and occasional co-operation with scientists mainly in the field of Constructions, Urban planning, Environmental Impact Assessments and Protection of biotopes.
- The scientists answered that there is mainly occasional co-operation for Protection of biotopes and Endangered Species

**What are the major impediments to co-operation and co-ordination between coastal zone science and management**
- Insufficient financing and long bureaucratic procedures are considered the major problems in co-operation and co-ordination with scientists by slightly less than the majority of the coastal managers asked.
- All scientists consider long bureaucratic procedures an impediment and the majority of them sees a problem in insufficient financing and in two-way information.

**What are the most important needs from science**
- Planning and Environment Protection (1st priority)
- Urban planning and Water quality (2nd priority)
- Biotopes, Fish stocks and Constructions (3rd priority)

An example of co-operation between coastal zone scientists and managers in your area:
*The management of the National Marine Park of Northern Sporades*

Positive aspects:
• MOm (Hellenic Society for the study and protection of the monk seal) mentioned the successful guarding of the Marine Park, due to:
  - successful co-operation between the Ministry for the Environment, Physical Planning and Public Works, the Ministry of Mercantile Marine and MOm
  - integrated planning
  - common target for the involved agencies

As negative aspects of this co-operation:

• The Department of Fisheries of the Prefecture of Magnesia mentioned the delimitation procedure of the land and marine areas of the Park, due to:
  - lack of substantial dialogue
  - lack of two-way information
  - conventional attitude

• The Municipality of Alonnisos mentioned unsuccessful relationship between the Municipality and MOm, due to:
  - lack of common language
  - complete ignorance of the local society and authorities

• MOm mentioned the significant delay in the establishment of a Managing Agency for the Park, due to:
  - bureaucracy
  - mistrust
  - different approach of the involved agencies
The aim of the simulation study was to quantify and evaluate both the costs and benefits of eutrophication (excess nitrogen/phosphorus loading) in the Baltic Sea, together with a policy response involving a 50% reduction in N and P loads. In order to scope the many issues, problems and agreements surrounding the scientific analysis, valuation and management of the Baltic Sea and linked drainage basins, a simplified organisational and auditing framework was adopted. This is the pressure-state-impact-response (P-S-I-R) approach, which although simple is flexible enough to be conceptually valid across a range of spatial scales. It also serves to highlight the dynamic characteristics of ecosystem and socio-economic system changes, involving multiple feedbacks within a coevolutionary overall process.

At the core of this interdisciplinary analytical framework is a conceptual model, based on the concept of functional diversity, which links ecosystem processes and functions with outputs of goods and services, which can then be assigned monetary economic and/or other values. Functional diversity can be defined as the variety of different responses to environmental change, in particular the variety of spatial and temporal scales with which organisms react to each other and to the environment. This diversity concept encourages analysts to take a wider perspective and to examine change in large-scale ecological processes, together with the relevant socio-economic driving forces causing wetland loss. The focus is then on the ability of interdependent ecological-economic systems to maintain functionality under a range of stress and shock conditions.

The current status of the Baltic Sea is determined by the set of activities present in the entire drainage basin. The load of nutrients to the various sub-drainage basins is determined by several factors such as land use, population density, climate, hydrology and air transportation of nitrogen oxides and ammonium. However, although the impacts of an increased nutrient loading into the marine system are well documented, the quantitative relationships between variations in loads of nutrients and concentration are less well understood. The different sub-basins vary in terms of water and nutrient residence times, load received and internal biogeochemical processes. These differences significantly affect the N/P ratios in each sub-basin. In the face of this uncertainty, an empirical budget mode of the Baltic Proper was expanded to cover all three Baltic sub-basins. Model simulations were then run to illustrate the consequences of nutrient reductions on an overall Baltic-wide scale.

Because of the lack of detailed data on the full range of environmental damage costs associated with eutrophication in the Baltic, the team concentrated on one system function (the provision of beach recreation and amenity) in order to gather information on the social benefits of eutrophication reduction (i.e. damage costs avoided by a clean up strategy which reduced N and P loading). A series of economic valuation studies were conducted in Sweden, Poland and the Baltic Republics in order to estimate the economic benefits of improved beach recreation and amenity. All the studies utilised the same method, contingent valuation surveys to estimate household’s willingness-to-pay for eutrophication reduction. The Swedish results and the Polish results were "transferred" to all the other Baltic countries as appropriate, based on per capita income levels. The abatement costs associated with an N and P reduction of 50% were also quantified. The analysis derived the most cost-effective mix of abatement measures, which included agricultural practice changes, sewage treatment improvements and wetland creation.

**STUDY’S RESULTS AND POLICY IMPLICATIONS**

The results of the economic analysis are summarised in Table 1. The indications were that most countries would gain net economic benefits from the simulated 50% N and P reduction policy. But the distribution of the costs and benefits across national jurisdictions was not uniform.
A policy of uniform pollution reduction targets is neither environmentally nor economically optimal. Rather what is required is a differentiated approach with abatement measures being concentrated on nutrient loads entering the Baltic proper from surrounding southern sub-drainage basins. The northern sub-drainage basins possess quite effective nutrient traps and contribute a much smaller proportionate impact on the Baltic’s environmental quality state. The countries within whose national jurisdiction these southern sub-basins lie are also the biggest net economic gainers from the abatement strategy.

SOME LESSONS FOR INTERDISCIPLINARY RESEARCH

This research project highlighted a number of issues to do with collaborative research across different disciplines and the production and communication of policy-relevant research findings. The following interrelated problems had to be mitigated in the course of the research:

Science/social science divide - although some of the researchers in the international team had worked together before, there was still a need to translate across disciplines the different terminologies and methodological approach; in particular, much of the available science and social science of the Baltic and its resource management problems proved difficult to “connect” because of spatial and temporal scale differences; joint meetings early on in the research programme were important and led to the gradual interfacing of different modelling and methodological approaches, which were eventually based on an agreed scoping framework and ecosystem function and related values model. (see figures 1 and 2).

information failure - some of the scientific work on the Baltic had not necessarily produced data of a type and form that was useful for social scientists implementing a P-S-I-R (pressure-state-impact-response) scoping methodology in order to improve the policy relevance of the research; equally required social science data on how individuals perceive and value environmental damage was completely absent for a number of Baltic states.

naive expectations across the disciplinary divide - specialists in different fields often had too high an expectation of colleagues work from other disciplines, in the Baltic research this process coalesced around several key problem issues: the need for a Baltic-wide nutrient transport model; missing environmental damage functions and missing environmental values estimates; and the complexities involved in any transfer of empirical environmental valuations estimates across geographical space and time.

communication with policymakers - this Baltic research work was deliberately designed to cover the whole drainage basin area in order to match up with relevant international policy database and agreements. Great care was needed, however, in the translation of these “simulation” results and what they actually meant for the policy formulation and action process. The beach recreation and amenity function was chosen because it is related to usage value and therefore is amenable to monetary valuation, but also because this was by and large how the public perceived the Baltic eutrophication problem. There was a gap between public perception of environmental quality decline and risk and that of scientific experts. Policymakers are driven most often than not by public attitudes and stakeholders pressures. The role of education and information provision to better inform public perceptions and preferences cannot be emphasised enough in this context.

REFERENCES


**Abstract**: Comparative Analysis of Institutional Arrangement Experiences and Needs For Integrated Coastal Zone Management in Three European Countries: France, Norway and Greece (*Coastman*). Research programme financed by EC Environment and Climate Research Programme, Research theme, Human Dimension of Environmental Change, contract n° ENV4-CT97-0445.
Title:        Coastman Project

Project: (ELOISE Programme)

Contact: Partnership: OIKOS, Rennes (Katia Frangoudes), France, Bodoe University College (Audun Sandberg), Bodoe, Norway,: Nireus Fisheries and Aquaculture Consultants (Miltos Kalamaras), Koropi, Greece

Poster summary:

Objectives:
The general objective of Coastman project is to propose a multidisciplinary assessment of institutional arrangements experienced or needed to improve the co-ordination of socio-economic development and environmental policies. ICZM concept emerges:
   As a territorial entry (political, legal and cultural recognition of the specificity of coastal areas like for mountain, rural or urban areas).
   To realise the necessity to encompass the complexity of interactions affecting natural assets (environment and resources) while implementing policy objectives by creating institutional arrangements (rules, decision-making process, organisations).
   Beyond all other policy, territorial or sectorial socio-economic policies but also specific environment and resource policies (land planning, landscape, water, fishing, forestry, wildlife and ecosystem conservation).

Coastal areas are under strong and dynamic anthropic pressure and they are fragile environments in many regards (concentrating and dispersing water pollution, remarkable ecosystems in wetlands, landscape, etc.) One question is how to realise the need to limit and co-ordinate the expansion of human activities while they are boosted by sectorial development policies; another is how to handle objectives beyond the economic short term horizon like biodiversity, landscape or simply coastline conservation when they involve the consultation among very contradictory interests. If those issues are not fully and correctly covered by the poling of sectorial and specific policy frameworks where is precisely the need for something specific to be called ICZM policy that would encompass specific objectives and lead to specific institutions. To what type of specific issues should it answer? What might be the appropriate characteristics of such institutions? How does it have to fit with existing institutional culture and history or can it have some overwhelming character specific to coastal areas?

The key question is "does the ICZM entry provide something new and effective above sectorial policies or specific environmental policies". Land use, fisheries resource management, water management, landscape policy, forestry, wildlife conservation, cultural patrimony are issues which all have a long history but do not necessarily match together and probably also do not grasp all problems. Where and what type of arrangements are needed to ensure this need for co-ordination based on a territorial entry for which border are multiple and do not necessary match administrative border and political responsibility but have to do with. By reviewing needs and experiences in three countries, the comparative approach should give a first approach to these questions. This will be illustrated by three cases studies: Baie du Mont-Saint-Michel (France), Helgeland (Noway) and Thermaikos Gulf (Greece).
Title: DOMTOX, IMPORTANCE OF DISSOLVED ORGANIC MATTER FROM TERRESTRIAL SOURCES FOR THE PRODUCTION, COMMUNITY STRUCTURE AND TOXICITY OF PHYTOPLANKTON OF THE EUROPEAN ATLANTIC AND BALTIC COASTAL WATERS; ROLE OF MICROPREDATORS FOR TRANSMISSIONS OF TOXINS TO COMMERCIAL SHELLFISH AND FISH LARVAE

Project: (ELOISE Programme)

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Poster summary:

Abstract: DOMTOX investigates whether uptake of dissolved organic nutrients from terrestrial sources promote growth and toxin production of toxic microalgae and cyanobacteria and thus influence the community structure, and whether the predation of cyanobacteria by ciliates and toxic mixotrophic dinoflagellates is a pathway for the transfer of toxin to commercial shellfish and fish larvae. The workplan combines (i) field studies in the Baltic Sea and the French Atlantic with laboratory experiments, and (ii) natural phytoplankton communities with monospecies culture studies.

1. INTRODUCTION

In recent decades, toxic events have emerged as a major environmental problem in many coastal European waters. Most responsible species were dinoflagellates or cyanobacteria. Two major hypotheses have been invoked to explain such a trend: (1) Continuous relative depletion of silica in river would led in coastal waters to diatoms being replaced by non-siliceous forms such as cyanobacteria, dinoflagellates and green algae. (2) Organic compounds from land drainage, such as humic acids, have favoured dinoflagellates growth versus that of harmless species. DOMTOX focuses on mechanisms related to hypothesis (2).

Many microalgae can take up dissolved organic nutrients. Moreover, some species, including the potentially highly toxic dinoflagellates, are mixotrophic and have been hypothesised to feed on cyanobacteria in addition to aquatic heterotrophic bacteria. On the other hand, bacteria associated with toxic algae have been shown to produce a significant fraction of the toxins.

On this basis, two new working hypotheses have been formulated: (a) The feeding of dinoflagellates on toxin producing cyanobacteria by phagotrophy is a source of toxins in toxic dinoflagellates. (b) Micropredators’ phagotrophy is a route for the transfer and accumulation of toxins in commercial molluscs and fish larvae.

2. OBJECTIVES

The overall aim of DOMTOX is to obtain enough information on the importance of dissolved organic matter from terrestrial sources for the production, community structure and toxicity of phytoplankton and protists of the European Atlantic and Baltic coastal waters. The overall strategy is to combine field studies with land-based and laboratory experiments, and

? Hypothesis (1) is the basis of another MAST program, « NUTOX », to which two DOMTOX partners are also contributing.
natural phytoplankton communities with monospecies culture studies, thus allowing for the determination of some of the regulatory mechanisms behind toxic planktonic blooms.

The specific objectives of DOMTOX are:
(i) To investigate whether uptake of dissolved organic nutrients from terrestrial sources promote the growth of toxin-producing microalgae and/or cyanobacteria, and thus influence the community structure.
(ii) To investigate whether dissolved organic nutrients from terrestrial sources can promote toxin production in toxin-forming microalgae and cyanobacteria.
(iii) To determine whether the predation of cyanobacteria may be a source of toxins in toxic dinoflagellate blooms, and to investigate whether the predation of cyanobacteria by ciliates and toxic mixotrophic dinoflagellates is a pathway for the transfer of toxin to commercial filterfeeding shellfish and fish larvae.

3. WORKPLAN

The overall strategy of DOMTOX is to combine (i) field studies (cruises at sea) with land-based (mesocosms) and laboratory experiments, and (ii) natural phytoplankton communities with monospecies culture studies (cyanobacteria, dinoflagellates, ciliates), thus allowing for the determination of some of the regulatory mechanisms behind toxic planktonic blooms.

Work package 1: Concentration of dissolved organic matter (DOM), community structure and toxicity of potentially-toxic phytoplankton from the Daugava River mouth to the open Baltic Sea; first sampling cruise occurred from 5 to 10 May, second cruise from 6 to 11 June, and third cruise is planned for 26-31 July 1999. Associated land-based experiment were carried out from 11 to 24 June; next experiment will occur between 1 and 15 August.

Work package 2: Concentration of dissolved organic matter (DOM), community structure and toxicity of potentially-toxic phytoplankton from the Charente River mouth to the open French Atlantic Ocean. Field and associated land-based research are planned for 2000.

Work package 3: Effect of addition of DOM from land origin on growth and toxin levels in summer natural coastal assemblages. Land-based mesocosm experiments in Kalmar (Sweden, Western Baltic Sea)

Work package 4: Effect of DOM from land sources on growth and toxin levels in several potentially-toxic species of importance. Laboratory experiments with cultured strains.

Work package 5: Role of phagotrophy upon cyanobacteria for the accumulation of toxins in toxic dinoflagellates and ciliates and further transfer of toxins to commercial shellfish and/or fish larvae. Several laboratory experiments have been carried out with non-toxic strains. They will be repeated when toxic species are available.
Title: EFFECTS OF EUTROPHICATED SEAWATER ON ROCKY SHORE ECOSYSTEMS STUDIED IN LARGE LITTORAL MESOCOSMS, Possible interactions with Integrated Coastal Zone Management

Project: EV5V-CT92-0183 (ELOISE Programme)

Contact: Bokn, T.L., Norwegian Institute for Water Research

Poster summary:

The overall objectives are to predict the response of rocky shore ecosystems to increased nutrient availability. The littoral mesocosms have been prepared for the EULIT. The system consists of eight outdoor concrete basins, containing about 13 m$^3$ of sea water at mid-tide. The basin water level is regulated by a sinusoidal tidal cycle and this together with wave generators simulate the natural tidal influence on the communities. Water exchange rate will normally be 2½ hours. Marine communities were established in June 1996, by transplantation of rocks covered by algae and animals from the littoral zone. Specific objectives are

(i) to detect quantitative and qualitative changes in the plant- and associated animal-community with increased nutrient availability;
(ii) to test whether increased nutrient loading may affect biodiversity through changes of key species;
(iii) to study how nutrient may affect growth of perennial brown algae;
(iv) to analyse the relationship between eutrophication induced changes at individual performance, community and ecosystem level;
(v) to detect if functional changes occur before structural changes are observed and
(vi) to explain changes in plant community composition and production from alterations in growth rates and grazing losses of the specific components. Six of the basins are continually dosed with a gradient of nutrients (N and P) for 30 months; starting in May 1998.

Exactly what is the role of nutrients in these marine systems, and how do they contribute to marine production? What scientific knowledge is needed to create a system that could lead to a more stable marine production and harvest within sustainable limits? How can we find more efficient and acceptable use of nutrients from urban sewage, agricultural runoff and aquaculture? Will a closer cooperation with the Integrated Coastal Zone Management be favourable?

Keywords: Nutrients, seawater, eutrophication, macroalgae, benthic animals, modelling.
Title: Pilot project on popularisation of scientific results and concepts from
the ROBUST\textsuperscript{*} project on the local level of the Bassin d’Arcachon
(France)

\textsuperscript{*} = Role of Buffering Capacities in Stabilising Coastal Lagoon
Ecosystems

Project: TERRA Network no.138 Concercost (ELOISE Programme)

Contact: Ms Laure VIDEMENT & Mr Rutger DE WIT

Poster summary:

Laure Videment performs a stage in Arcachon from May until September 1999 within
the frame of her training as an Ingénieur en Agronomie spécialité génie de l’environnement in
Rennes (W. France). Her task in Arcachon is to develop several dissemination projects during
the final phase of ROBUST. Target groups include the following: 1) school classes of primary
local schools (10-12 years); 2) general interested public (through creation of a WWW page);
3) institutional partners and local administrations (like the Conseil Général de la Gironde); 4)
the ICZM Demonstration project partners through the 1 July meeting in Bruxelles.

We propose a conceptual framework for the popularisation process at the local level
with definition of objectives and the role of the different actors in this process. This way, the
scientist is identified as the transmitter of a message and the target group is defined as its
receiver. A feedback loop allows to improve the message and to adapt it to the \textit{état d’esprit} of
the target group. This approach is very useful to establish a communication adapted to the
target group and to monitor the process and analyse its results.

Our first approach to the 1-July meeting was inclined to consider the ELOISE projects
as transmitters and the ICZM-Demonstration programme as the receiver. But for the future
we wish that both communities start to function both as transmitters and receivers and that a
fruitful dialogue will be established, which can be resumed in a symmetric diagram.