ESF – COST
EXPERT WORKSHOP ON SUSTAINABILITY INDICATORS FOR THE COASTAL ZONES OF EUROPE

25th & 26th April 2005.
Deerpark Hotel, Howth, County Dublin,
IRELAND

Host: Marine Institute (Ireland)

Co-ordinated by the Coastal and Marine Resources Centre, UCC

Coastal & Marine Resources Centre
Ionad Acmhainní Cósta is Mara

List of Participants

Surname	First Name	Organisation	Country
Allen	Icarus	Plymouth Marine Laboratory	UK
Bartlett	Darius	Dept of Geography, University College Cork	Ireland
Charbonnière	Aurélien	ESF-Marine Board	France
Cummins	Valerie	Coastal & Marine Resources Centre, UCC	Ireland
Gault	Jeremy	Coastal & Marine Resources Centre, UCC	Ireland
Hoffman	Jens	University of Applied Sciences Neubrandenburg	Germany
Jackson	Dave	Marine Institute	Ireland
Joffre	Sylvain	Finnish Meteorological Institute	Finland
Kryminski	Wlodzimierz	Institute of Meteorology and Water Management	Poland
Leppänen	Juha-Markku	Helsinki Commission, HELCOM	Finland
Longhorn	Roger	IDG Ltd	UK
Meiner	Andrus	European Environment Agency	Denmark
Meincke	Jens	Centre of Marine & Climate Research, University of Hamburg	Germany
Niesing	Hugo	Dutch National Institute for Coastal and Marine Mgt (RIKZ)	Netherlands
O'Hagan	Anne Marie	Marine Law & Ocean Policy Centre, NUIG	Ireland
O'Mahony	Cathal	Coastal & Marine Resources Centre, UCC	Ireland
O'Sullivan	Geoffrey	Marine Institute	Ireland
Pickaver	Alan	EUCC - The Coastal Union	Netherlands
Vetter	Lutz	University of Applied Sciences Neubrandenburg	Germany
von Storch	Hans	GKSS Institute for Coastal Studies	Germany
Ragué	Xavier Martí	Generalitat de Catalunya	Spain

ESF-COST Workshop on Sustainability Indicators for the Coastal Zones around Europe Dublin, April 2005

Seated (left to right) – Anne Marie O'Hagan; Cathal O'Mahony; Jens Hoffman; Jens Meincke; Valerie Cummins.

Standing (left to right) – Geoffrey O'Sullivan; Hugo Niesing; David Jackson; Jeremy; Aurélien Carbonnière; Alan Pickaver; Wlodzimierz Krzyminski; Andrus Meiner; Xavier Martí Ragué; Juha-Markku Leppänen; Hans Von Storch; Roger Longhorn; Icarus Allen; Lutz Vetter; Darius Bartlett.

Day 1

April 25th	ESF-COST Workshop on sustainability indicators for the Coastal Zones of Europe	
9:00 – 9:15	Geoffrey O'Sullivan (Marine Institute)	**Welcome**
9:15 – 9:45	Jens Meincke (CMCR) Sylvain Joffre (FMI)	**Introduction: Aims and Objectives of Workshop and Supporting Role of ESF- COST**
9:45 - 10:30	Andrus Meiner (EEA)	**Building a Common Analytical Framework for Coastal Data at European and National Levels**
10:30 – 11:00	Xavier Marti i Ragué (Generalitat de Catalunya)	**A Regional Approach to Implementing Coastal Sustainability Indicators**
11:00 – 11:30	Coffee Break	
11:30 - 12:00	Juha – Markku Leppanen (HELCOM)	**HELCOM Recommendations and Indicators Related to Good Status of the Baltic Sea**
12:00 – 12:30	Roger Longhorn (MOTIIVE)	**The Development of a European Data Model for the Coastal Zone – The Potential Impact of the EU INSPIRE Initiative**
12:30 - 14:00	Lunch	
14:00 – 14:30	Alan Pickaver (EUCC)	**The ICZM Progress Indicator Set**
14:30 – 15:00	Hugo Niesing (RIKZ)	**Issues Related to the Development of European Indicators for Coastal Erosion – Lessons Learned from the EUROSION Project**
15:00 – 15:30	Jens Hoffman (University of Applied Sciences Neubrandenburg)	**Coastal Indicators for the Oder Estuary Region**
15:30 – 16:00	David Jackson (Marine Institute)	**Sustainability Indicators for the Use of Inshore Waters**
16:00 – 16:15	Coffee Break	
16:30 – 17:30	Roundtable Discussions	
21:00	Dinner	

Day 2

April 26th	ESF-COST Workshop on sustainability indicators for the Coastal Zones of Europe
9:30 – 11:00	Roundtable Discussions
11:00 – 11:15	Coffee Break
11:15 – 13:00	Conclusions
13:00 – 14:00	Lunch
14:00	End

ESF – COST EXPERT WORKSHOP ON SUSTAINABILITY INDICATORS FOR THE COASTAL ZONES OF EUROPE

WELCOME, BACKGROUND AND PURPOSE OF WORKSHOP:

Geoffrey O'Sullivan, Marine Institute, Ireland
Valerie Cummins, CMRC

The main objective of the ESF-COST ICZM Indicators Workshop is to identify a suite of robust indicators for the sustainability of the coastal zones in Europe in order to provide reference points against which changes in the coastal zone system can be quantified for political and regulatory use and public information.

More than any other time in Europe's history, the quality of life for coastal communities and biodiversity in the coastal zone are impacted by resource exploitation and habitat destruction. Our best efforts at managing environmental, social and economic degradation, as a consequence of human activities, have met with only limited success. Dealing with these issues is a major challenge to society as we strive to achieve sustainable development in the coastal zone. In order to achieve this we must increase our understanding of the complex interplay of processes and management practices that occur in our coastal regions.

In preparing the ICZM Indicators Workshop Programme, it became quickly apparent that a great deal of effort is currently underway in relation to coastal indicators. Accordingly, workshop participants have been drawn from a selection of key European ICZM Indicator projects in order to:

- Coordinate efforts to avoid duplication.
- Realise potential synergies from indicator related projects.
- Develop indicators with the end user in mind to ensure their uptake by coastal practitioners.

The Workshop is a two-day event and comprises a day of presentations and discussion (Monday 25th April) followed by a day of roundtable dialogue (Tuesday 26th April).

Roundtable discussions will:

- Identify a suite of usable Sustainability Indicators for use in the Coastal Zone.
- Identify key projects (model projects) developing and/or testing the applicability of Sustainability Indicators for use in the Coastal Zone.
- Identify data issues that must be addressed in order to make sustainability indicators more useable by the coastal practitioner community.
- Identify the main issues (methodology/science, data & application) that need to be solved in order to have a suite of robust and user-friendly Sustainability Indicators for Coastal Zones.
- Outline the core issues to be addressed, with related possible methodologies, to solve the above in order to deliver such Sustainability Indicators.

At the end of the meeting, the Group will prepare a roadmap and work plan for the preparation of a COST Action and an ESF Programme forming a cluster aiming at solving these issues.

INTRODUCTION: AIMS AND OBJECTIVES OF WORKSHOP AND SUPPORTING ROLE OF ESF- COST

Sylvain Joffre (FMI) & Jens Meincke (CMCR)

Institutional Background

The COST-ESF Partnership is based on a Memorandum of Understanding between the two organisations stating that ESF would act as the Implementing Agent for the secretariat of COST. Previously, until 2003, the European Commission (EC) fulfilled this task but wished to stop due to the continuous contradiction between its bureaucratic internal rules and the expected flexibility of COST. The ESF has entered into a SSA contract with the EC in order to perform the secretarial tasks using funding allocated to COST in FP6.

Since 1.01.2004, the Secretariat duties are performed by a COST Office in Brussels, which handle the scientific and administrative secretariat and the administration of the COST budget. Nevertheless, COST and ESF remains two independent organisations with their own specific instruments and agenda. The COST Committee of Senior Officials (CSO – responsible to Member States Ministries) still has the responsibility of strategic decisions on COST, while COST Technical Committees (TC) have the responsibility of assessing new proposals, monitoring ongoing Actions and evaluating finished Actions. One of the purpose of the partnership is making both ESF's and COST's instruments available to the scientific community in a more coherent and complementary manner within the ERA vision.

Although both organisations have a bottom-up approach, such a strategic vision can only be achieved if some top-down incentives are brought into the process, at least in the beginning. Thus, a few COST-ESF Synergy Working Groups have been established to implement this strategy. One of these WGs identified marine sciences as a suitable field for synergies. Further analysis and discussions identified the following topics:

- Methodologies for validation/QA of marine models, incl. data requirements: Hamburg, 23.05.2005.
- Characterising ocean climate (Hamburg, 20-21.01.2005)
- **Developing sustainable indicators (Dublin, 25-26.04.2005)**.
- Sea ice within the freshwater cycle: variability and feedbacks (Vigo, 23.10.2004).

The objective of these workshops is to define a roadmap and launch a call for proposals for volunteers to prepare both a COST-Action and an ESF Programme/activity that aim at working in a cluster.

What is COST

The mission of COST is to "*strengthen European scientific and technical bases through the support of cooperation and interactions between National Projects and Scientists"*. COST is an intergovernmental co-operation framework since 1971 (the oldest in Europe), involving 34 COST Member States and 1 co-operating Country (the widest frame), and covers all fields of science and technology (17 domains). Furthermore, international organisations and research establishments from non-COST countries can participate based on mutual benefits. The EC has also the right to participate to or launch COST Actions.

Concerted Actions of nationally funded R&D is the basic COST instrument. The main characteristics of COST Actions are: Networking & Co-ordination; Pan-European or cross-border problems; Non-competitive (pre-normative, public utility); Participating scientists are funded nationally; Bottom-up; Flexibility (a loose Memorandum of Understanding linked participants); "A la carte" participation; Multi-disciplinary no discipline limitation; Open to wider cooperation; and a forum for Exploratorium of new ideas.

From idea to COST Action

When a group of scientists get an idea, it drafts a 2 page description of the main objectives and deliverables, which is presented to one of the Technical Committee (TC). If the TC accepts the idea, the group of scientists formulates the full MoU. The TC performs the assessment of the proposed MoU. After TC-approval, the final approval is given by the CSO. The Action can start after signature of the MoU by a minimum of 5 countries. Thus, an Action can start as quickly as about ½ to 1 year after the launch of the idea. The Action is steered by a so-called Management Committee (MC) involving two delegates from each participating countries. The work is performed through different Working Groups (WG) or Work Packages.

The Technical Annex of the MoU describes the scientific work. It has a fixed structure: (A.) Background (ca. 2-3 pages), (B.) Objectives and benefits (1 page), (C.) Scientific programme (3-5 pages), (D.) Organisation (1-2 pages), (E.) Timetable (1 page), (F.) Economic dimension (½ page), and (G.) Dissemination Plan (1-2 pages). Information such as a list of proposers and interested scientists) can be annexed to the MoU.

COST Actions – what is supported?

COST does not support research per se, it supports coordination, mobility and dissemination, i.e.: management meetings (MC and WGs), scientific workshops and seminars, Short Term Scientific Missions (STSMs = visits), training schools and research conferences, evaluations, publications/Dissemination.

International Organisations and Institutions from non-COST countries may participate on an Action by Action basis. The MC decides on such participation provided there is mutual S&T benefit. These organisations have no right to vote in the MC and participate with their own funding.

Marine Sciences within COST

A TC Oceanography-Meteorology was formed in the 70s. Then it was disbanded and a new TC reinstalled in 1991 named only Meteorology. Consequently, only few oceanographic Actions were launched within COST. Within the holistic vision of the Earth system, whereby observations, modelling and understanding are based on an integrated framework, the TC-Meteorology initiated in 2002 to integrate Atmospheric Sciences, Oceanography, Hydrology and Earth Observation into a single Earth-system science domain. This interaction of closely related scientific activities should enhance impacts of the results. The partnership with ESF should even provide a wider and more synergistic approach to marine issues.

Some COST-Oceano/Meteo Actions were real success-stories with tangible impacts. COST-40 (European sea level observing system) defined a framework guaranteeing and coordinating the long-term monitoring activities and data exchange along the entire European coastline. COST-43 (Experimental European network of ocean stations) set up the basis for an operational network of ocean stations providing meteorological and oceanographic data on a real-time basis and established a pilot network. COST-714 (Measuring and using directional spectra of sea waves) improved the methods used to extract the directional wave spectra from satellite-borne radar imagery. COST-70 (European Centre for Mid-range Weather Forecasts – ECMWF) set the basis for the foundation of the ECMWF, while COST-72-75 contributed to the implementation of European Regional Weather radar Networks.

BUILDING A COMMON ANALYTICAL FRAMEWORK FOR COASTAL DATA AT EUROPEAN AND NATIONAL LEVELS

Andrus Meiner (EEA)

An Irish EU Presidency event, held in Dublin during April 2004, stated, that successful environmental policies need to be underpinned by relevant and reliable information. There is often a gap, however, between the information available and that needed for sound policymaking, which would bring closer sustainable development policy and practice.

The main conclusions on data and information needs covered what is working well? (data flows and networks, new developments), what is not working well? (growing gaps between policy needs and data availability), new vision in monitoring and reporting (thematic strategies of 6th EAP) and future information needs (multi-scalar, spatial and accessible).

Regarding the specific issue of providing information on sustainability of coasts: this is reflected in the European Council and the Parliament Recommendation on the implementation of ICZM in Europe (2002/413/EC), which also recognises that good decisions are based on relevant, credible and reliable information.

The EEA 2004-2008 Strategy prioritises analysis of spatial change and regional sustainable development, among other areas in coastal zones on Europe. Main activities of EEA regarding coastal environment cover support to Commission and Member States in implementation of the EU ICZM Recommendation (in particular providing information for EU ICZM Expert Group by assisting its Working group on Indicators and Data (WG-ID)) and producing assessments of coastal environment.

Consultation with Member States is organised through the EU ICZM Expert Group, which is set up by the European Commission and covers representatives of 20 EU coastal Member States. WG-ID was set up in 2003 and is coordinated by the European Topic Centre for Terrestrial Environment. The main objective is to provide an overview: are Member States (and EU) moving towards a more sustainable future for coasts? To achieve this, an European set of indicators for measuring sustainable development of the coastal zone is under development. The role of Member states in information collection will also be enhanced, as the ICZM Recommendation invites Member States to report by February 2006.

Work on indicators for sustainable development of the coastal zone has the strategic approach to address 8 main goals from EU ICZM Recommendation (Ch 1), where each individual goal is covered by 3-6 indicators. Each indicator is based on 1-3 measurements (calculation level). The current set contains 27 indicators calculated by 42 measurements.

EEA assessments of coastal environment are focusing on three main objectives:

- Validated **analytical framework** for the coast
- **Data** relevant for EU coastal policy development
- **Analysis** of spatial and temporal trends

It should be noted that EEA's assessment of coasts are limited by several conditions, such as relevance to EU policies, European focus, use of spatial data, environment as an entry point, focusing on trend analysis and contribution to conceptual development.

Development of analytical framework for coastal assessments is organised around three activity lines:

1) Approach for spatial **trend analysis**
2) Towards **spatial integration** of coastal processes
3) Building the **concept** for coastal information

The approach for spatial trend analysis deals with data and methodology. The basis of the work is data availability (20 coastal counties, European data coverage) and spatial data integration (building a GIS database). The methodology is represented by land accounts for change detection, which analyse flows between land cover stocks 1990-2000 and can be also applied for ecosystems and water. Conceptual basis for spatial integration is formalised as platform for integrated spatial assessment, which links land, biodiversity and water on the basis of CORINE Land Cover data.

Spatial integration of coastal processes is experimenting with spatial analysis, where main work directions are related to coastal conflict analysis, conceptual model for coastal urbanisation and environmental profiles for coastal zone of regional sea catchments.

Discussion related to the concept for coastal information attempts to create a comprehensive picture of different elements. Coastal systems tend to have high complexity, which needs to be properly tackled. Coastal assessment would much benefit from emergence of agreed spatial units, even if useful extent of coast is often dependent in the topic in question. Spatial assessment puts challenges for integration of indicators, developed by multiple actors on the field. Vertical integration to tackle the diversity of EU coasts and maintain the appropriateness of the information for decision making on different levels is an issue. Finally, the awareness-raising by effective communicating of the “coastal story” appears as important element.

Lessons learnt from the work so far will emphasize the need to further develop a coastal analytical framework, continue work on integration of information, assure links to INSPIRE and GMES. Work in line with European integrated and horizontal policies such as Water Framework Directive, Habitat and Birds Directives (NATURA2000) and coming European Marine Strategy, review data gaps and data needs for future work. There is need for distinctive consultation phases focusing on data and information, and on creating the baseline for the state of the coast. Role of WG-ID in design and implementation as well as wider consultation with many other coastal stakeholders is essential in development of sustainability indicators for coastal zone.

HELCOM Recommendations and Indicators Related to Good Status of the Baltic Sea

Juha – Markku Leppanen (HELCOM)

The governing body of the Convention on the Protection of the Marine Environment of the Baltic Sea Area is the Helsinki Commission - Baltic Marine Environment Protection Commission - also known as HELCOM. The Convention covers the whole Baltic Sea coastal and open sea waters, the sea-bed, and measures are also taken in the whole catchment area to reduce land-based pollution. The present Contracting Parties to HELCOM are Denmark, Estonia, European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.

The aim of the Convention is to prevent and eliminate pollution in order to promote the ecological restoration of the Baltic Sea Area and the preservation of its ecological balance. In addition to the pollution, the Convention requires the Contracting Parties to take all appropriate measures to conserve natural habitats and biological diversity and to protect ecological processes and to ensure the sustainable use of natural resources.

HELCOM has from its establishment in 1974 had a holistic “ecosystem approach”, taking into account the whole ecosystem, to the restoration and protection of the Baltic Sea marine environment. HELCOM has always used broad scientific advice as the basis for decision-making by regularly producing comprehensive assessments on pressures affecting the marine environment and their effects on the whole marine food web. Since the 1990s HELCOM has promoted the implementation of integrated coastal zone management covering the whole Baltic Sea area.

HELCOM has adopted a large amount of Recommendations dealing with the protection of the coastal zone and open sea areas of the Baltic Sea (cf. http://www.helcom.fi/Recommendations/en_GB/front/). In addition, HELCOM has committed itself to implement the ecosystem approach to the management of human activities affecting the Baltic Sea environment. The ecosystem approach involves developing sets of coherent and integrated ecological quality objectives, taking account of the Baltic specific regional needs.

HELCOM Commission meeting 2005 (HELCOM 26/2005) decided that HELCOM will develop an Action Plan for the Baltic Sea in anticipation of the regional action plans to be developed for the future European Marine Strategy. It was decided that the HELCOM Ecological Objectives and Indicators developed will provide the foundation for this work.

HELCOM strategic goals, ecological objectives and indicators are assessment tools that measure progress towards the vision adopted by HELCOM 25/2004:
Healthy Baltic Sea environment with diverse biological components functioning in balance, resulting in a good ecological status and supporting a wide range of sustainable human economic and social activities.
The full assessment chain for making operational these visions require general strategic goals (based on identified concern areas), management- and ecological objectives, indicators and corresponding target values to show how these objectives are met and finally data for the selected indicators.

For the development of Ecological Objectives and associated Indicators, HELCOM has established a specific project, partly funded by the EC. This HELCOM Project is defining a set of Ecological Objectives which can be made operational with performance indicators. This work is been carried out using the knowledge already available at ICES and OSPAR, taking into account the developing European Marine Strategy and implementation of the EU WFD in close cooperation with the BSRP, and the HELCOM Groups.

The Ecological Objectives and indicators are divided into three groups of Eutrophication, Hazardous substances & Biodiversity and nature conservation. All the remaining identified concerns of HELCOM, such as environmental impacts of fishing and maritime safety, have been taken into account within these three topics. Ecological Objectives and Indicators for internationally assessed commercial species of the Baltic Sea are covered by ICES. The HELCOM Ecological Objectives and indicators should be considered as an interconnected system of indicators, not as a collection of single indicators.

For eutrophication HELCOM's Goal is to "*reduce eutrophication in order to restore ecological balance within the Baltic Sea and to ensure a functioning marine ecosystem*" with the following objectives under discussion:

- Restored water clarity
- No oxygen depletion where it should not occur naturally
- No exceptional massive algal blooms
- Depth range of perennial water plants and algae returned to regionally defined levels
- Growth of opportunistic (nuisance) species returned to regionally defined levels

For biodiversity, the goal is "*a resilient ecosystem that has a sufficient number of interconnected habitats ensuring healthy species composition and maintained diversity*" and the objectives:

- preserve an ecologically coherent network of natural coastal landscapes, seascapes and ecosystems within the Baltic Sea,
- restore and preserve communities characteristic to the Baltic Sea,
- ensure healthy and viable populations of Baltic Sea characteristic species,
- minimize the introduction of non-native species, especially from ship mediated introductions.

For hazardous substances, HELCOM has the goal "*Toxic substances shall not affect the health of marine organisms and thus pose a risk to humans*" with the following objectives:

- concentrations of hazardous substances in the Baltic Sea near background values for naturally occurring substances and close to zero for man-made substances,
- all fish caught in the Baltic Sea should be suitable for human consumption,
- attain pre-Chernobyl concentrations of man-made radioactivity in the Baltic Sea ecosystem causing risk neither to humans nor the Natural systems sustaining human, plant and wildlife populations,
- Hazardous substances shall not cause lethal, sub-lethal, intergenerational or transgenic effects to the health of marine organisms.

For maritime and offshore activities the HELCOM goal is "*to ensure that the increasing maritime traffic and offshore activities are carried out in a safe and environmentally sound way and that in case of incidents a swift national and trans-national response is in place*". The objectives are:

- no illegal discharges of ship generated waste and cargo residues in the Baltic,
- emissions from ships should not have negative impact to human health and marine environment,
- minimized risk of the introduction of the non-indigenous organisms via shipping,
- minimized number/risk of shipping accidents and their negative impact to the environment.

A REGIONAL APPROACH TO IMPLEMENTING COASTAL SUSTAINABILITY INDICATORS

Xavier Marti I Rague (Generalitat de Catalunya)

The world-wide coastal areas suffer great pressures as a result of a high demographic concentration, (people who live and people who go in summer), industries, marine traffic…

However the existence of these problems, the population hasn't got the conscious about them, the coast areas are non-visible. In this case, the indicators can help to do the coast problems more visible, because they show the positive or negative tendency.

This is the main objective of the project Interreg III C DEDUCE where the Government of Catalonia is the Head Leader of the project. In this project participates 9 regions from 6 different states:

- Department of Environment and Housing. Government of Catalonia. Spain
- Prat de Llobregat City Council. Spain
- Viladecans City Council. Spain
- Autonomous University of Barcelona (ETC-TE). Spain
- Institut Français de l'Environnement (IFEN). France
- Malta Environment and Planning Authority (MEPA). Malta
- Province of Western Flanders. Belgium
- University of Latvia. Latvia
- Maritime Institute in Gdanks. Poland

The partners will calculate 28 indicators defined by the EU ICZM Expert Group and related with the ICZM.

1. Demand for property on the coast	15. Sustainable tourism
2. Area of build-up land	16. Quality of bathing water
3. Rate of development of previously undeveloped land	17. Amount of coastal estuarine and marine litter
4. Demand for road travel on the coast	18. Concentration of nutrients in coastal waters
5. Pressure for the coastal and marine recreation	19. Amount of oil pollution
6. Land take by intensive agriculture	20.Degree of social exclusion
7. Area of semi-natural habitat	21. Relative household prosperity
8. Area of land and sea protected by statutory designations	22. Number of second homes
9. Effective management of designated sites	23. Fish stocks and fish landings
10. Change to significant coastal and marine habitats & species	24. Water consumption
11. Loss cultural distinctiveness	25. Sea level rise and extreme weather conditions
12. Patterns of sectoral employment	26. Coastal erosion and accretion
13. Volume o port traffic	27. Natural, human and economic assets at risk
14. Intensity of tourism	28. Integrated coastal zone management

The calculation of these indicators will show the importance of an integrated approach to the coast.

Furthermore in the framework of the DEDUCE project, the partners have to:

- Propose a GIS WEB as integrated tool.
- Establish a common model to reporting the sustainability of the coast
- Do a guide of the indicators
- Study the option of setting a European regional observatory of the coast

DEDUCE project is an opportunity in order to put into practice the multi-scale integration of the indicators. Because the indicators will be calculated in four different territorial scales (local, regional, national and European) with the same methodology.

In case of Catalonia, in order to interact between the local scale and the regional scale, we are working with a functional division of Catalonia. It is based on these functions: industrial, touristic, nature, agricultural.

The benefits of the multi-scale integration of the indicators are double. In the one hand there are the benefits from regional to local, and in the other hand there are the benefits from the local scale to the regional.

Anyone local catalan administration can access to the regional information through the web of the Department of Environment and Housing of the Government of Catalonia. (http://mediambient.gencat.net/cat/inici.jsp) This web will permit to the planners the application of the Environmental evaluation Directive.

In this website it is consultable three king of dates the data bases, the cartography in GIS format and the rapports about the state of the environment. The new concept of Environmental Information System it will be structured in the objectives of the UE VI Environmental Framework Program.

In this sense, the environmental information could be organized in these categories:

- Climate change
- Biodiveristy
- Environmental quality for the health
- Efficient management of the resources and waste

Conclusion

So that, the main objective in the coast zone is doing visible the coast and their problems, in order to get it the project DEDUCE is a good tool through the calculation of the 28 indicators.

The observatory of the coast has to be built by a basis of adaptation from one territorial scale to the other, and in this sense, the project DEDUCE can be a pilot project to get the multi-scale indicators.

THE DEVELOPMENT OF A EUROPEAN DATA MODEL FOR THE COASTAL ZONE – THE POTENTIAL IMPACT OF THE EU INSPIRE INITIATIVE

Roger Longhorn (Director, Info-Dynamics Research Associates Ltd; MOTIIVE Project Steering Committee Leader & EUCC Information Policy Advisor)

INSPIRE - the Infrastructure for Spatial Information in Europe - is a draft Directive of the European Commission, now making its way through the co-decision procedure of the EU Institutions. This is expected to take up to another year. INSPIRE sets out to specify the geospatial data content, access, use and re-use regulations for a pan-European Spatial Data Infrastructure (ESDI). INSPIRE is the latest manifestation of ESDI efforts that began as long ago as 1995 with the GI2000 initiative.

The draft Directive has two major elements that are of concern to the marine/coastal geospatial stakeholder communities - of which there are many. The first component relates to the various implementation regulations on access, use and re-use of geospatial data held by all "public authorities" at all levels of government, from local government on up. These proposed rules form the bulk of the Directive's main text and articles and apply to all geospatial data holding communities.

The second component of the Directive is the listing and definition of the 31 types of geospatial data that the Directive will govern, introduced over different periods of time. The data types are listed in three Annexes, as listed in the table below:

Annex 1	Coordinate reference systems Geographical grid systems	Geographical names Administrative units	Transport networks *Hydrography* Protected sites
Annex 2	*Elevation* (incl. shoreline) Identification of properties	Identification of properties Cadastral parcels	Land cover Orthoimagery
Annex 3	Land use Human health & safety *Oceanographic geographical features* *Meteorological geographical features* *Sea regions* *Government service and environmental monitoring facilities* *Habitats & biotopes* *Agricultural and aquacultural facilities* *Area management / restriction / regulation zones & reporting units (ICZM)*	Statistical Units *Population distribution* Buildings Soil Geology *Species distribution* Production and industrial facilities Natural risk zones Atmospheric conditions Bio-geographical regions	

Readers will note that one of the most important geospatial data types for coastal work - shoreline - is not even listed in Annex 1, as the draft Directive text currently stands (it is in Annex 2). Nearly all of the other data types of importance for coastal sustainability monitoring fall into Annex 3 (see *italicised text* in the table).
What is the significance of the different Annex assignments? The main impact is on when public authorities would be required to enforce the "implementing rules" that are being developed separately from the Directive's legislative content. The text today states that metadata (at least) must be collected, made available by electronic means and made "freely" available (no cost) not later than 3 years after entry into force of the Directive for Annex 1 and 2 data (estimated to be around 2010) and not later than 6 years for Annex 3 data (estimated to be not later than 2013).

This bodes ill for many coastal/marine conservation, monitoring and planning initiatives across the EU, especially at regional (trans-national) level, where access to harmonised data reduces cost and time to implement (as proven in the recently complete EUROSION project).

Funds are being made available from various EC programmes to begin developing and testing the implementing rules for INSPIRE. These relate to the actual standards, harmonisation technologies and methodologies that will be needed to achieve easier, more cost effective integration of INSPIRE-related data sets.

MOTIIVE - Marine Overlays on Topography for Annex II Valuation and Exploitation - is one such project, focusing squarely on the data harmonisation issues relating to the coastal and marine communities. MOTIIVE builds on prior work already completed in earlier EC-funded projects, such as DISMAR and MarineXML. It shares the task of defining implementing rules with several other projects also being funded by the European Commission, including RISE, MARSEA, ORCHESTRA, the INSPIRE Pilot Project, Flood-Risk, etc.

MOTIIVE aims to build on existing pre-standardisation work in the marine community carried out in some of these projects, then to develop and apply Open Geospatial Consortium (OGC) interoperability methodologies and specifications to enable more cost-effective data sharing across multiple disciplines. MOTIIVE offers the opportunity for the wider marine community to know and understand how to use OGC/INSPIRE specifications to deliver real services and the cost-benefit of doing this using such integration technology and tools. MOTIIVE is also working with the IOC (Intergovernmental Oceanographic Commission) IODE group and the International Hydrographic Organization (IHO) to develop and promulgate marine data standards registries

As regards coastal sustainability indicators, MOTIIVE can try to ensure that the data needed to underpin the monitoring of coastal sustainability indicators is among the coastal/marine datasets that the project uses in its OGC Interoperability Experiment, one of the planned deliverables of the project. We will also try to ensure that the coastal sustainability indicator “community” is informed and involved in the OGC Marine SIG or Working Group that we plan to create as an output of this project.

INSPIRE offers a tremendous opportunity to the pan-European geospatial community to ensure wider knowledge of, and access to, hundreds of important datasets currently collected and maintained by all levels of government. However, the marine and coastal data communities are currently not considered to have a high priority in the INSPIRE draft Directive text. MOTIIVE offers an opportunity to develop the interoperability technologies and tools, and to more widely promulgate existing standards, so that the coastal/marine community is well served in the very near future (by 2007), even if the access, use and re-use legislation of INSPIRE does not come into play for this community until 2013.

THE ICZM PROGRESS INDICATOR SET

Alan Pickaver (EUCC)

The ICZM Progress Indicator Set has been published. EUCC has, together with the European Topic Centre – Terrestrial Environment developed an Indicator Set that is designed to determine the progress Member States have made with respect to their implementation of ICZM. Such an indicator was deemed desirable by the ICZM Group of Experts that met in 2002 as a result of the ICZM Strategy developed as a result of the ICZM Recommendation. The work has been done under the auspices of the Working Group on Indicators and Data that was set up by the EU's ICZM Group of Experts.

The methodology that has been used recognises that the ICZM management cycle can be broken down into a series of discrete, ranked actions. These actions show what is needed, using a straightforward, step-wise methodology, to pass from a situation where no ICZM is being used to one where it is being fully implemented, by being grouped into a series of five, discrete, ordered and continuous phases. These are:

- Phase I: Non-integrated (often sectoral) coastal management is taking place which can lay the basis for the introduction of ICZM. It contains 5 discrete actions.
- Phase II: A framework for ICZM exists. It contains 6 discrete actions.
- Phase III: Vertical and horizontal integration of administrative and planning bodies exists within an ICZM programme. It contains 10 discrete actions.
- Phase IV: An efficient, participatory, integrative planning exists. It contains 3 discrete actions.
- Phase V: There is full implementation of ICZM. It contains 2 discrete actions.

The actions, 26 in total, are not completely exhaustive but are comprehensive enough to allow progress in ICZM to be measured.

The actions have been refined further by a number of tests conducted principally by ICZM practitioners at all administrative levels in Spain, the southern North Sea region (including coastal planners and managers from Belgium, France, UK and Holland), Poland and Germany.

Against each of the 26 actions a simple 'yes' or 'no' response at three spatial levels, national, regional and local, is required. However, because it is important to identify a trend through time, a layer of complexity is added at each level by asking respondents to consider the action in two time periods. The Indicator Set will allow Member States to see how far around the ICZM cycle a given authority, agency or area has travelled and reveal the degree of integration between the three spatial levels.

In the future, it is envisaged that the simple binary response will be further as more experience is gained such that the degree of implementation at any one-action step can be assessed. This may be envisaged with a star rating of * to ***** or with a numbering system of e.g. 0 – 5. Furthermore, the quality of the response at any action step could also be further broken down into more discrete steps or sub-actions.

The Indicator Set will allow the trend in implementation within any one country to be compared at regional and local levels. Set alongside indicators of sustainable development or state of the coast, this indicator set will also be a test of the hypothesis underpinning the EU ICZM Recommendation - that ICZM is a prerequisite for a more sustainable coast.

The Indicator Set has been published in Ocean and Coastal Management Vol. 47, 449-462 2004. It is also downloadable from the EUCC website, www.eucc.net.

Hugo Niesing (RIKZ)

Identification of a set of reference indicators

The identification of a set of reference indicators aims to provide a meaningful and measurable "snapshot" – as of 2002 – of the major details of coastal erosion processes throughout Europe. This was based upon the DPSIR model (Driving forces - Pressure - State - Impact - Responses) as recommended by the European Environment Agency (EEA). Because of the complexities of the interactions a simplified PSIR approach has been adopted as a basis for policy recommendations for specific stretches of coast, based upon an identification of the most important reference indicators for the Pressures acting on the physics of the coast, for its physical State, for the potential Impact of these pressures (to life, economy and environment) and, finally, for the Responses implemented from a technical point of view. As a preliminary to this process, the project found it convenient to introduce the concept of radius of influence of coastal erosion (RICE).

Radius of influence of coastal erosion

The EUROSION project found it convenient to introduce the concept of radius of influence of coastal erosion (RICE). The exposure of population, infrastructure and ecological valuable areas to the effects of erosion (and or flooding) depends on their direct and surrounding physical location. In order to come to a first assessment of these exposed areas and their related level of risks, the quantity, quality and location has been determined. The RICE concept is meant to provide a proxy of the terrestrial areas, which may potentially be subject to coastal erosion or flooding in the coming period of 100 years. To determine this radius a distinction between the two most important flooding and erosion parameters is made. Once defined the concept of RICE, the approach led to consider 13 indicators in relation with the current and expected future exposure to coastal erosion and flooding.

Calculation of indicators at the regional level

The above-mentioned list of indicators has been calculated and reported at the regional level. By regional level, the project means, as a general rule, the executive level which operates directly below the national level. With reference to the Nomenclature of Territorial Units (NUTS) defined by Eurostat, this may correspond to NUTS 1 level (e.g. Belgium, Germany, United Kingdom) or NUTS 2 level (e.g. France, Spain, Italy) depending on the country. In some cases, small countries have been considered as a whole (e.g. Denmark, Baltic countries). It is also important to notice that "executive level" does not necessarily mean that a "regional government" exists at that level. This is in particular the case for England where the regional level is a level of representation of the central government in the fields (via government offices) and not a level of devolution as such.

Rating of European regions in terms of exposure to coastal erosion and flooding

It is assumed that the exposure of European regions to coastal erosion and flooding can derived by combining the above mentioned indicators in such a way that the combination considered

a) reflects the current and future pressure factors relating to coastal erosion and flooding
b) reflects the potential impact of coastal erosion and flooding to assets located in the coastal areas.

This leads to an approach that makes the priority of shoreline management depending on the extent to which threshold values for all indicators are exceeded or not, using "pressure scoring" and "impact scoring" as follows:

Due to limitations in the data available, it is not possible to include at this point indicators on the responses – e.g. budget invested in coastline management – which help mitigate the potential impact of coastal erosion and flooding, and therefore to fine tune the impact scoring. The following chapters provide the methodology for the calculation of the RICE and the 8 indicators.

Rationale for the threshold values adopted

Establishment of threshold value in the above mentioned scoring system undeniably constitutes the major challenge faced by the project team. A pragmatic approach which consisted to consider chosen as follows:

- a low threshold value representing a level of concern about the expected future risk or impact of erosion and flooding
- a higher threshold value representing a level of considerable concern about the expected future risk or impact of erosion and flooding.

The threshold values finally adopted for each of the indicators rely on the following assumptions:

Relative sea level rise best estimate for the next 100 years: it is assumed that when the relative sea level is expected to fall (due to land uplift) or remain close to zero during the next 100 years, this does not add to the risk of erosion or flooding; with a higher level of expected relative sea level rise risks will increase, especially for the real damaging events - storms and storm surges as far as life and property are concerned; a rise more than 40cm over the next 100 years (corresponding to a doubling of the recent trend; also corresponding to about half the expected sea level rise) would be considered a considerable risk factor.

Shoreline evolution: it is assumed that when the shoreline has not been eroding in 1985-1990 (former CORINE Costal erosion database) nor recently (according to the EUROSION database), this factor will not add to the risk of erosion or flooding; with a continued status erosion (both 1985-'90 and recently) concerns will increase; when there is erosion now and there was no erosion 10-15 years ago, there is an indication of a new phenomenon so this is to be considered a considerable risk factor.

Highest water levels: In 1992, Delft Hydraulics and RIKZ conducted a study for the account of the Intergovernmental Panel on Climate Change (IPCC). This study recommended the adoption of 1,5 and 3m as respective thresholds to characterize low energy, medium energy and high energy coast.

Coastal urbanisation: thresholds proposed for characterising coastal urbanisation are best guess which will have to be carefully calibrated once the first results are available. An iterative process might be needed to fine-tune these thresholds and finally come with a more sensible figures.

Reduction of sediment supply from rivers: River damming has sealed an outstanding proportion of European water catchments. In the worst cases, the volume of sediment supplied in 2002 represents less than 50% of what used to be the annual supply before the 1950s. In those cases, the impact on coastal erosion is undeniable. Between 50% and 80%, the impact of river sediment shortage on coastal processes is probable but has not necessarily been highlighted since not all the sediments drained by rivers participate to coastal sediment transport processes. Above 80%, dam sealing has probably not a significant impact on coastal erosion (with some exceptions).

Geological coastal type: it is assumed that the presence of a hard rock substrate is considered least sensitive for erosion; a soft rock substrate would have an increased sensitivity for erosion; a sedimentary coast would be highly sensitive to both erosion and flooding.

Elevation of nearshore coastal zone: it is assumed that when a coastal area is elevated above 5m above mean sea level (the 5-meter-contour line is one of the layers of the EUROSION database) there would not be risk of flooding; a situation below 5 m would be a considerable risk factor. Limitations of the EUROSION database does not make it possible to further discriminate areas which are below 5m (for example, no discrimination of areas below 1m and above 1m is possible at this point).

Density of engineered frontage (including protection structure): it is assumed that the presence of coastal protection structures is an indication of a past or present erosion problem or flood risk; as such this would be a reason for concern, but only in a soft rock or sedimentary coast, where these structures would have knock-on effects on coastal sections downshore (i.e. in the direction of the longshore drift). The presence of a harbour or marina and its piers would considerably increase the physical sensitivity to erosion downshore, again - only in a soft rock or sedimentary coast.

Population living within the RICE: it is assumed that when a regional population located within the radius of influence of coastal erosion and flooding exceeds 50,000 inhabitants per region, there would be a considerable potential impact of erosion or flooding. A population of over 200,000 inhabitants per region would correspond to a very high exposure. The thresholds 50,000 and 200,000 have been established by calibrating the values obtained after calculation of the population living within the RICE, so that there are approximately the same number of regions below, between and above the thresholds.

Urban and industrial assets lying within the RICE: it is assumed that when the combined surface of urban and industrial assets located within the radius of influence of coastal erosion and flooding exceeds 40% of the total surface of this zone (the case encountered in highly industrialized and urbanized regions such as Zuid-Holland, or London for example), there would be a very high exposure

to erosion or flooding on these economic assets. The thresholds 10% and 40% have been established by calibrating the values obtained after calculation of the urban and industrial assets lying within the RICE, so that there are approximately the same number of regions below, between and above the thresholds.

Areas of high ecological value within the RICE: it is assumed that the presence of protected natural areas with regional or national designations in the radius of influence of coastal erosion and flooding (below the 5m plus contour line) would correspond to a moderate exposure to erosion or flooding on the environmental assets. The presence of a (candidate) Natura 2000 site (SPA, SAC) would correspond to a high potential impact.

It should be noted that baseline information on indicator nr. 13 is subject to data restrictions from the Commission and EU Member States. However it is possible to use the CORINE Biotopes database (more ancient and less accurate than future Natura 2000 data) as a proxy for areas of high ecological value. It is however recommended that the assessment using Natura 2000 data is performed by national or local agencies in charge of assessing shoreline management priority.

In this way the EUROSION consortium is able to perform an assessment of seven indicators resulting into a number of “sensitivity points” in a scale from 0 up to max. 16 and a number of “impact points” in a scale from 0 up to 8.

COASTAL INDICATORS FOR THE ODER ESTUARY REGION

Jens Hoffman (University of Applied Sciences, Neubrandenburg)

Coastal indicators for the Oder estuary region

The project IKZM Oder is one out of two national German ICZM case studies of the Federal Ministry of Education and Research (duration from May 2004 to April 2007). It is associated with the German-Polish Agenda 21 Oder Lagoon. General aims of the project are the promotion of the idea of a regional ICZM and the production of research results with regional, national and international relevance. Research activities are e.g. (a) the analysis and evaluation of catchment-coast interactions, (b) the analysis of climate change impacts, (c) the harmonisation und integration of tools, plans and stakeholder networks, (d) regional participation, coordination and information and (e) the development of coastal indicators for the region.

The region is a German-Polish border region situated in the north-east of Germany. It is a rural, structurally weak area. Nearly 840.000 inhabitants live in an area of 7.400 km^2. The main potentials of the region are an intact and varied natural landscape, an image as a very attractive tourist destination, efficient agriculture and Stettin as a potential regional growth core. The most important economical sectors are agriculture and tourism. Other aspects relevant to ICZM are fisheries, nature conservation, shipping and maritime industry. A major problem related to the coast is the eutrophication and organic pollution arising from agriculture, wastewater of households and industries. The main influx comes via the river Oder.

Actually the framework for the indicators is under construction. Especially three aspects shall be considered during this stage:

1. The region is a border region and a coastal region. So one of the main challenges is the integration of the German and the Polish side and the land side and the sea side (double integration). The relation of the river basin, the estuary and the coastal waters is also very important.
2. Many different networks (connected with integrated concepts and strategies) have defined regional guidelines and goals and work on their realization. The consideration of these existing networks, strategies and goals is very important because only in this way the acceptance of ICZM efforts can be ensured. ICZM is only one part of regional development and its integration into the existing regional context gives the chance to connect ICZM with other strategies.
3. The experiences from the development of sustainability indicators on the local and regional level show that the potential of this tool is absolutely not exhausted yet. Two studies in Germany (Heiland et al. 2003, Gehrlein 2002) found out that there is still a divergence between scientific demands and their practical realization. Recommendations for the further work are given: consideration of different functions and target groups, participation of stakeholders, identification of interfaces with the practical work, orientation towards accepted goals. The use of indicator systems structured in modules is described as a possibility to meet the user needs.

For the Oder estuary region an indicator set structured by modules (common core indicators and thematic modules: coast/estuary, tourism, agriculture) will be developed. The consideration of the defined regional guidelines and goals, accepted selection criteria and stakeholder participation are the basis for the development of the indicators. Amongst other case studies the application of the indicators developed by the working group on indicators and data (WG-ID) could be a good input for the research activities and for the development of goals for the seaside in the Oder estuary region.

SUSTAINABILITY INDICATORS FOR THE USE OF INSHORE WATERS

Dr. David Jackson (Marine Institute)

The challenge in developing Sustainability Indicators for the culture of food in inshore waters is to balance a number of potentially conflicting goals including, restricting coastal development, reducing social exclusion in coastal communities, promoting and supporting a dynamic & sustainable coastal economy and using natural resources wisely. In achieving this balance there are lessons to be learned from the traditional approaches to management of the inshore marine resource. The procedures involved in licensing operations following from assessment of environmental impacts (e.g. by way of EIS) and subsequent monitoring of the resulting activity have, in general worked well.

When these process are refined by the inclusion of a formalised bay management approach and feedback loop via regular audits of operations there is a sound basis for utilising the current monitoring and regulatory processes as the basis of sustainability indicators for the sector.

Given the work underway in Ireland to refine these processes and set them in an international context it is proposed that the current approach (EIS, Monitoring Protocol, Bay Management Plans) is both appropriate and workable.

Partnership between:
COST
(Cooperation in Science & Technology)
and
ESF
(European Science Foundation)

COST-ESF Partnership

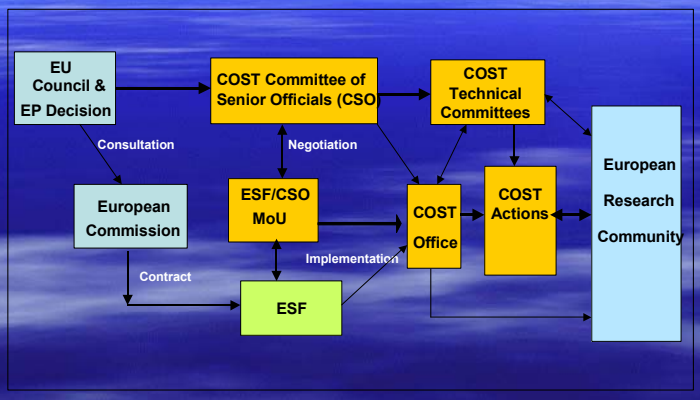
- Memorandum of Understanding (MoU) between COST and ESF that ESF would act as the Implementing agent for the secretariat of COST)
  - Previously, the European Commission fulfilled this task
- ESF has a SSA contract with Commission to perform this task from fund from FP6
- Secretariat duties performed by a **COST Office** in Brussels (under the responsibility of ESF, located in Strasbourg):
  - Started on 1.1.2004
  - Scientific and administrative secretariat
  - Administrates and uses the COST-budget
- Strategic Decisions on COST still responsibility of its Committee of Senior Officials (under Ministries)

COST-ESF Synergies

- COST and ESF have different instruments
- Making these instruments available to the scientific community in a more coherent and complementary manner
- Construction of the **ERA** (European Research Area) implies more coordination and synergies between various organisations in Europe
- Both organisations based on bottom up initiatives !
  Nevertheless, ad-hoc COST-ESF synergy working groups have wished to bring some top-down incentives into the process.
  => reason to be here

Notes

COST- Sixth Framework Programme



Presentation of COST

- What is COST?
- COST mechanisms and profile
- From idea to COST Action
- New synergies COST-ESF

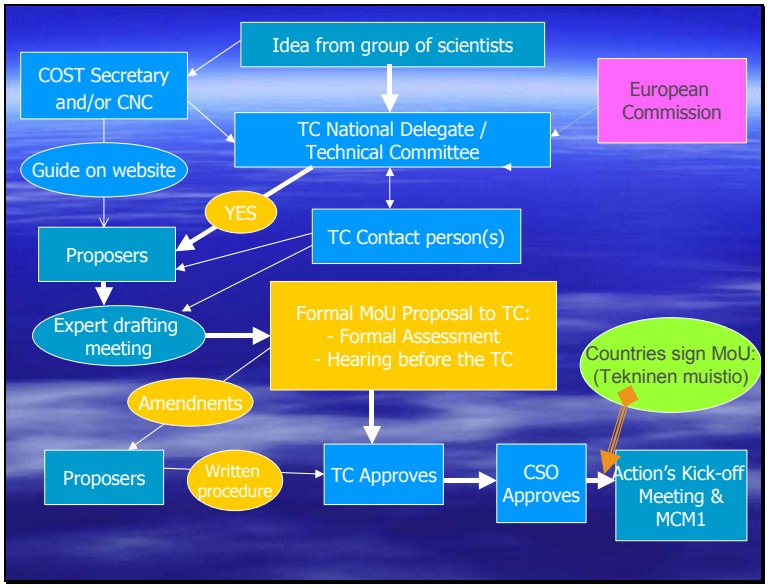
COST Mission

- Strengthen European scientific and technical bases through the support of cooperation and interactions between National Projects and Scientists
- Intergovernmental co-operation
  - Since 1971
  - Cover all fields of science and technology (17 domains)
- 34 COST Member States + 1 co-operating Country (Israel)
  - International organisations and research establishments from non-COST countries welcome based on mutual benefits
  - European Commission
- COST Actions
  - Concerted Actions (Networks) of nationally funded R&D

Notes

COST Characteristics

- Networking & Co-ordination
- Pan-European
- "Non-competitive" (pre-normative; environmental and cross-border problems; public utility)
- National Financing of Researchers – national responsibility
- Bottom-up / Flexible
- "A la carte" participation
- Multi-disciplinary: wide range of disciplines covered
- Open to wider cooperation
- Exploratorium of new ideas



.. from idea to COST Action …

- .. a group of scientists get an idea ..
- Draft a 2 page description of the main objectives and deliverables
- Presentation to the Technical Committee (TC) to get support
- The group of scientists (+ An expert meeting) formulates the MoU
- Quality check and approval by TC
- Approval by CSO
- Signature by minimum 5 countries
- .. Action starts .. ½ to 1 year after launch of idea

Notes

Technical Annex (MoU) - *Structure*

A. Background (why? 2 pages)
B. Objectives and benefits (1 page)
C. Scientific programme (3-4 pages)
D. Organisation (1 page)
E. Timetable (1 page)
F. Economic dimension (½ page)
G. Dissemination Plan (1 page)

Additional Information (includes List of proposers and interested scientists)

COST Actions – what is supported:

- Science management meetings (MC and WGs)
- Scientific workshops and seminars
- Short Term Scientific Missions (STSMs)
- Training Schools and Research Conferences
- Evaluations and Studies
- Publications/Dissemination

International Organisations and Institutions from non-COST countries

May participate on an Action by Action basis:

- There is mutual S&T benefit
- Approval by CSO (following MC and TC approval)
- Participation confirmed by an exchange of letters between the Organisation/Institution and the CSO.
- No right to vote in the MC
- Participation with own funding

Notes

OCEANOGRAPHY WITHIN COST

- Oceanography identified at the start as a field of strategic importance.
- TC Oceanography-Meteorology in the 70s
- Then disbanded and new TC reinstalled in 1991 named only Meteorology => only few oceanographic Actions within COST.
- Within holistic vision of the Earth system: observations, modelling and understanding are based on an integrated framework:

  => TC-Meteorology initiated in 2002 to integrate Atmospheric Sciences, Oceanography, Hydrology and Earth Observation into a single Earth-system science domain
- Will enhance impacts of results by joining force with closely related scientific activities.
- Recent partnership with ESF => wider approach to marine issues.

Success stories in COST-Oceano/Meteo with real impacts

- **COST-40: European sea level observing system (EOSS):** Defined a framework guaranteeing and coordinating the long-term monitoring activities and data exchange along the entire European coastline.
- **COST-43: Experimental European network of ocean stations**
  Set up the basis for an operational network of ocean stations providing meteorological and oceanographic data on a real-time basis and established a pilot network, and assessed and tested the necessary sensors, structures and transmission systems.
- **COST-714: Measuring and using directional spectra of sea waves**
  Improved the methods used to extract the directional wave spectra from satellite-borne radar imagery, and disseminated them to operational meteorological centres and research groups.
- **COST-70: European Centre for Mid-range Weather Forecasts - ECMWF**
- **COST-72-75: European Regional Weather radar Networks**

Call for clustered COST-ESF projects

New partnership => taking full benefit of available instruments with distinct character and capacities.

Call for proposals on following topics with parallel projects:

- Developing methodologies for validation and QA of marine models, incl. data requirements (Hamburg, May 23-24, 2005).
- Characterising ocean climate (Hamburg, Jan. 20-21, 2005)
- **Developing sustainable indicators (Dublin, 25-26.04).**
- Sea ice within the freshwater cycle: variability and feedbacks (Vigo, Oct. 23, 2004).

OBJECTIVE: roadmap for volunteers to prepare both a COST-Action and an ESF Programme/activity that aim at working in a cluster.

Notes

CONTACTS & MORE INFO

- http://cost.cordis.lu/src/home.cfm/
  - http://ue.eu.int/cost/default.asp
- COST Office/Brussels,
  Pavol Nejedlik: **pnejedlik@cost.esf.org**, +32-2-5333830
- COST/Meteorology-Ocean-Space:
  Sylvain.joffre@fmi.fi ; +358-9-1929 2250
  Finnish Meteorological Inst.
- WMO Bulletin, Vol. 51, No.2 (April 2002), p. 150-155.

Notes

The ESF promotes the development of European science at the forefront of knowledge in all disciplines, by bringing together leading scientists and research funding agencies to debate, plan and implement European research

ESF Key Characteristics

- **Multidisciplinary** – all disciplines are covered:
  - Physical and engineering sciences
  - Life, earth and environmental sciences
  - Medical sciences
  - Humanities
  - Social sciences
- **High scientific quality** – leading scientists and leading funding agencies, ethically sound research practice
- **Independent voice** – independent of governments and interest groups
- **Flexible decision making** – swift, flexible, efficient responses to new developments in open and transparent variable geometry

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ESF Promotes

- Integration of the European research community
- Development of a European research agenda in areas of strategic importance
- Coordinated European approaches to global programmes
- Management of programmes on behalf of its MOs

EUROPEAN SCIENCE FOUNDATION

Notes

ESF Member Organisations

78 in 30 countries

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ESF Instruments

- Forward Looks
- Exploratory Workshops
- EUROCORES
- EURYI
- *À la carte* Scientific Programmes
- COST Actions
- ESF Research Conferences
- Research Infrastructures
- Science Policy Actions

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Scientific Forward Looks

- Medium - long term scientific perspectives
- Multidisciplinary topics viewed from a European level
- Brings together scientists and policy makers from ESF Member Organisations
- Wide consultation
- Major reports and action plans should result

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Notes

Exploratory Workshops

EUROPEAN SCIENCE FOUNDATION

- Normally one-off specialist meetings
- 'Spearheading' topics
- 'Bottom-up' through Open Call
- Occasionally 'top-down' on key topics
- May lead to ESF or other *à la carte* programmes; FP proposals; position statements
- 25-30 scientists involved

European Science Foundation Collaborative Research Programmes

EUROCORES

EUROPEAN SCIENCE FOUNDATION

- To provide European critical mass in specific topics
- To develop multilateral funding collaboration
- Open and transparent variable geometry
- International peer review essential
- Funding remains national but 'networked'

European Young Investigator Awards – EURYI

EUROPEAN SCIENCE FOUNDATION

- To stimulate the best young researchers in any field, from all over the world, to pursue their career in Europe
- Selection criteria: scientific quality, originality, quality of host institution
- Selection by panels of the highest scientific quality
- Initiative of EUROHORCs and ESF
- 1st Call: 25 grants of 250000 €/yr-5years

Notes

Scientific Programmes
(*à la carte* funding)

- Coordination of major scientific endeavours over a five-year period
- Supported by ESF Member Organisations through additional *à la carte* funding
- Typically include workshops, inter-laboratory exchanges, fellowship programmes and dissemination
- 'Core' Steering Group of 8-12 scientists
- May link to other initiatives, including the Framework Programme
- Financing in the range of €90k - €250k per annum

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ESF Research Conferences

- High profile framework for scientific discussion on frontline topics
- Bring together younger and established leaders
- Partnerships with others in Europe
- ESF World Conferences: Japan, US, China, International Partners
- 100-200 participants
- Limited number of attractive venues

EUROPEAN SCIENCE FOUNDATION

Research Infrastructures (RI)

- In ESF mandate since 1974
- ESF scientific studies for RI has led to the creation of new facilities eg ESRF
- RI studies comprise analysis of the scientific and technical care and follow up with funding organisations
- ESF also undertakes assessments and evaluations of RI

EUROPEAN SCIENCE FOUNDATION

Notes

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Notes

Building a common analytical framework for coastal data at European and national levels

Andrus Meiner, EEA
ESF-COST expert workshop on Sustainability Indicators for the coastal zones of Europe

ESF-COST workshop Dublin, 25-26 April 2005

European Environment Agency

This presentation

- Reflections from Bridging the Gap conference (by Jane Feehan, EEA)
- Towards European indicator set for measuring sustainable development of the coastal zone
- EEA assessment of the State of Coasts in Europe

European Environment Agency

bridging the gap
Information for Action

A conference on mobilising knowledge for a better environment

An Irish EU Presidency event, held in Dublin during April 2004. Organised by the EPA of Ireland together with EEA, Copenhagen

'Successful environmental policies need to be underpinned by relevant and reliable information. There is often a gap, however, between the information available and that needed for sound policymaking. Bridging the Gap aimed at closing the gap between sustainable development policy and practice.'

European Environment Agency

Notes

The data gap

- *The challenge*: Environmental policymaking has evolved from addressing **specific pressures** (industrial dangers, protecting threatened sites) to **sectoral influences** through broadly-based approaches (urban waste water treatment), and now to **integrated management approaches** (water framework directive)
- *The response?* Requires integrated decision making, which in turn demands integrated information to underpin policy design and to monitor progress with implementation.

Bridging the Gap conference session: 'Environmental information needs 2010 and beyond'

- The session aimed to address the gaps between foreseen policy needs for information, and current data flows and indicators.
- Initiatives such as GMES, INSPIRE and the review of EU reporting obligations provide opportunities to bridge these gaps, but also present risks if not effectively co-ordinated.

Outline of session's programme

Current information needs, role of indicators and data flows
Speakers included Prudencio Perera, Director, DG ENV: *Information needs for environmental policy making*

Beyond current networks, data flows and analysis: How to close the gap up to 2010 and thereafter
Speakers included Jock Martin, Programme Manager, EEA: *Environmental information needs – 2010 and beyond. Integrated spatial assessment*

Examples of how Europe could move forward on closing the gap
Speakers included Brendan Kelly and Gerard O'Leary, EPA of Ireland: *Integrating environmental data in Ireland*; Philippe Crouzet, Institute Francais de L'Environnment (IFEN): *Maximising existing data and modelling techniques*

Notes

Some selected conclusions…

- **What is working well? Data flows and networks**
- **What is not working well? The gaps**
- **New vision in monitoring and reporting**
- **Future information needs.**

What is working well? Data flows and networks

- Infrastructure: **EIONET and ReportNet**
- Examples of efficient organisation by member states to deliver **European reporting requirements**
- **Exciting developments** on earth observation, modelling techniques and integrated environmental assessment
- Some advances in refining the way in which priority information is presented to **politicians and policymakers**.

What is not working well? The gaps

- **Timeliness** of data delivery… basic information being reported 3+ years after the monitoring
- Monitoring that is **anchored in outdated legislation**, tying up limited resources. Gaps are growing between policy needs and data availability
- Overly prescriptive **monitoring+reporting requirements** in legislation prevent logical rationalisation of these requirements in later years. Legislation should more focus on policy guidance.

Notes

New vision for monitoring and reporting

- The EU Environmental Policy Review Group (EPRG) recognises the need for change. But it is difficult to repeal a directive, even if it is no longer useful and still has legally binding reporting requirements…
- 6th EAP Thematic Strategies (including marine strategy): important role in defining future info needs. An opportunity to establish better frameworks?

Future information needs

- National-level data not enough. Information needed at **various scales – local, regional** – in order to inform policy action
- **Removing barriers** to accessing certain data, e.g. social and economic datasets: vital to pursuing a more integrated approach
- Data will increasingly have to be analysed and presented in their **spatial dimension**. Major economic sectors (agri, transport…) and social factors (urbanisation…) are all strongly embedded in space and territory.

Coastal zone management requires combination of instruments

- Law
- Economic instruments
- Voluntary agreements
- Information provision
- Technological solutions
- Research
- Education

Right mix in a specific coastal area will depend on problems at hand and the institutional and cultural context.

Notes

Objective: provide information on sustainability of coasts

European Council and the Parliament Recommendation on the implementation of ICZM in Europe (2002/413/EC) recognises that good decisions are based on relevant, credible and reliable information

EEA 2004-2008 Strategy prioritise analysis of spatial change and regional sustainable development

- Tackling biodiversity loss / understanding spatial change
- Project: Sustainable spatial development of regions of Europe (focus: coastal zones)

Main activities of EEA regarding coastal environment

Supporting the Commission and Member States in implementation of the EU ICZM Recommendation

- Provide information for EU ICZM Expert Group by assisting it's Working group on Indicators and Data (WG-ID)

Producing assessments of coastal environment

Policy guidance for indicator work

The Commission's Communication on ICZM Strategy for Europe (COM(2000)547)

… integrated management of coastal zone requires […] action at the local and regional level, guided and supported by a national vision and appropriate framework at the national level

… EU should support the generation of factual information and knowledge about the Coastal zone by definition of indicators for the coastal zone

… sustainable coastal zones as example for more widespread adoption of Integrated Territorial Management Principles across Europe

Notes

Consultation with Member States

EU ICZM Expert Group

- Set up by the European Commission
- Representatives of 20 EU coastal Member States

WG-ID set up in 2003, coordinated by European Topic Centre for Terrestrial Environment

- Provide overview: Are Member States (and EU) moving towards a more sustainable future for the coasts?
- European set of indicators for measuring sustainable development of the coastal zone

ICZM Recommendation invites Member States to report by February 2006

Indicators for SD of the Coastal Zone

- The strategic approach: 8 main goals from EU ICZM Recommendation (Ch 1)
- WGID set of SD indicators address each individual goal with 3-6 indicators
- Each indicator is based on 1-3 measurements (calculation level)
- Current set contains 27 indicators calculated by 42 measurements

Principles of SD indicators for coasts

- Measuring progress in the state of coast
  - what effect coastal strategies are having on coastal sustainability
- Indicators are chosen on the sound basis of indicator development
  - EEA core set of indicators - Guide
    Technical report No 1/2005, 6 Apr 2005
    http://reports.eea.eu.int/technical_report_2005_1/en
- Multi-scale implementation: EU, national and local/regional level
  - Reflect diversity of EU coasts and be appropriate to decision making of the coastal zone in question

Notes

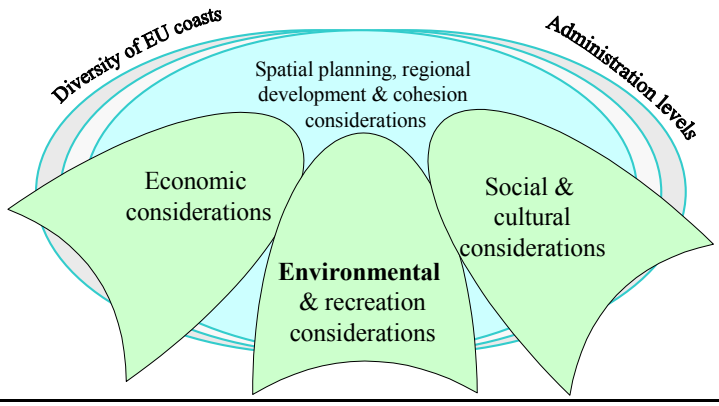
Implementation of SD indicators for coasts

- Voluntary testing by Member States and regions
  - Interreg IIIB project DEDUCE
- GMES contribution – GSE Coastwatch
- EUrosion project deliverables
- EEA marine and coastal environment indicators

EEA: assessments of coastal environment

- Validated **analytical framework** for the coast
- **Data** relevant for EU coastal policy development
- **Analysis** of spatial and temporal trends

ICZM targets SD of the coasts



Notes

Boundary conditions for EEA assessment of coasts

- Relevant to EU policies
- European focus
- Spatial assessment
- Environment as entry point
- Trend analysis
- Contribution to conceptual development

Where we are now

- Background paper 2004
  - Disseminated 22 Nov
  - Contents:
    - Setting the ground
    - Note on methodology
    - Trends: early results
    - Lessons learnt
- Consultation 2005
  - March, June, September
- State of Coast report 2006
  - Final draft November this year


For information

State of the Coasts in Europe

Towards a EEA assessment report

Background paper

Prepared by:

22 November 2004

Project manager:

State of Coast in Europe: Annotated Outline

1. Introduction - setting the scene
2. Data and methodology
3. Trends in state of coasts - c…s, extent, impact
   - 3.1. Five top land cover c…es in 10 km coast
   - 3.2. Analysis of urban …opment patterns
   - 3.3. Coastal natural …emi-natural areas
   - 3.4. Coastal wate…
   - 3.5. Towards in…ted spatial assessment
4. Current trends i… olicy responses
5. Synthesis
   - 5.1. Building the concept for coastal information
   - 5.2. The way forward

Climate change

Notes

Towards analytical framework for coastal assessments

1) Approach for spatial trend analysis
   - ? Data and main methodology
2) Towards spatial integration of coastal processes
   - ? First attempts for spatial analysis
3) Building the concept for coastal information
   - Coastal data model and issues of integration

(1) Approach for spatial trend analysis

- Data availability
  - 20 coastal counties, European data coverage
- Spatial data integration
  - building a GIS database
- Land accounts for change detection
  - flows between land cover stocks 1990-2000
  - can be also applied for ecosystems and water
- Platform for integrated spatial assessment
  - conceptual basis for spatial integration

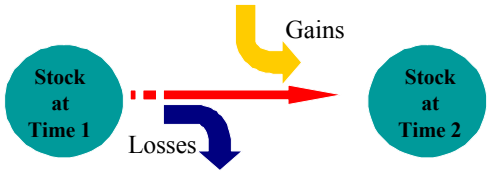
Data availability: relevant spatial data sets

Data source	LaCoast database	Corine database 1990	Corine database 2000	Corine Coastal Erosion	Natura 2000 database	EUrosion
Status	Finished	Historical	Under development	Historical	Finish in 2004	Finish in 2004
Responsible authority	JRC (joint Research centre) and DG Env	European Commission – DG-Environment Nuclear Safety and Civil Protection	EEA	European Environment Agency	DG ENV is the owner of the database. Management under ETC NPB	DG-Environment
Start date	1975-76, depending on the country	1986	1999	1985	Staring network in 1992 when Council of Ministers adopt the Habitat Directive.	January 2002
End date	1986-95, depending on the country	1995	On going	1990	At the end of 2004 the Commission will review Natura 2000 contributions from Member States.	May 2004
Probability of availability	100%	100 % (Archive)	Once finished 100%	100 % (Archive	Once finished, ETC TE will have 100% access	Depending on the layer

Additional:
GSE Coastwatch
FP6 EuroCat...
WG-ID tests

Notes

The concept of stock & flow accounts



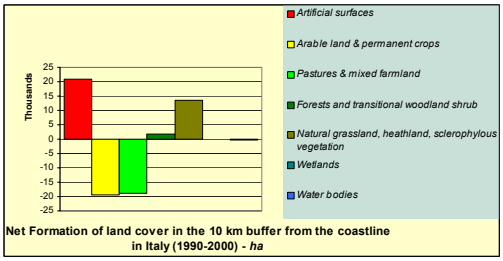
Do gains compensate for losses?

Does quality of stock carried over change?

Which are the processes in question?

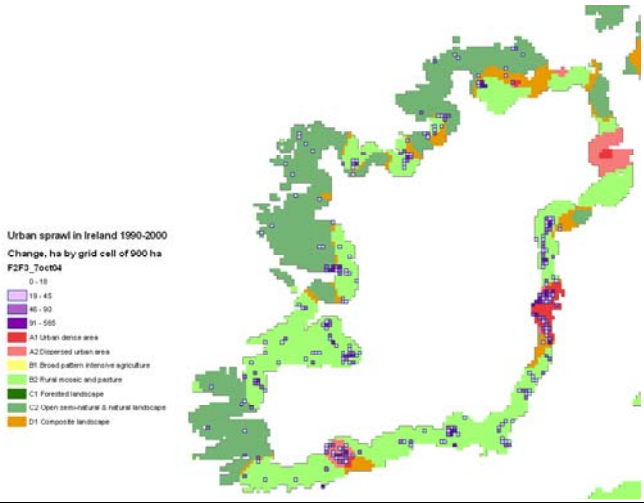
Land and ecosystem accounting for the coast

- Spatial changes in 10 km terrestrial coastal zone
- Sprawl of urban areas and infrastructure
- State of natural resources at the coast



Net Formation of land cover in the 10 km buffer from the coastline in Italy (1990-2000) - *ha*

Source: LEAC/EEA-ETC/TE



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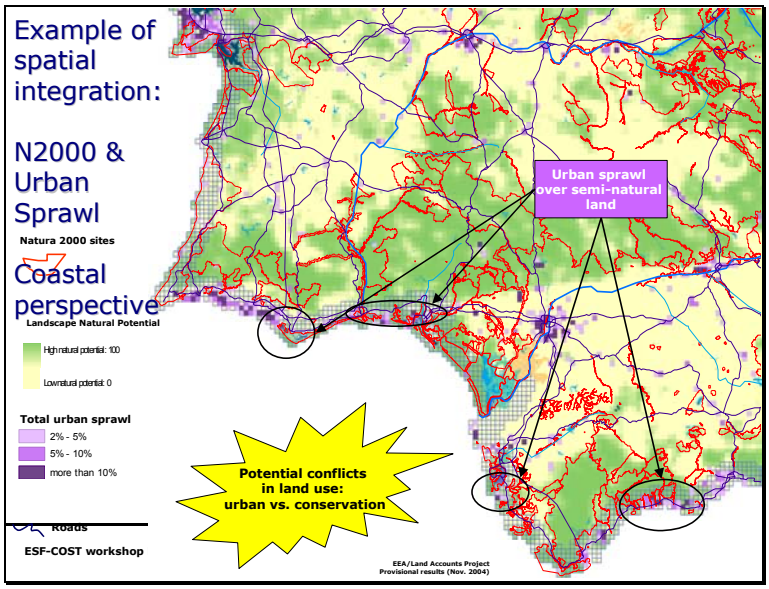
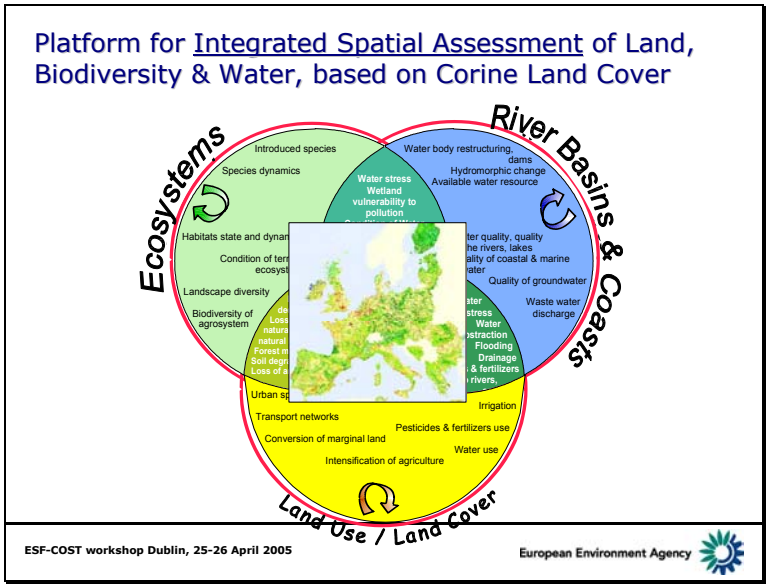




(2) Towards spatial integration of coastal processes

Main lines for spatial analysis :

- Coastal conflict analysis
- Conceptual model for coastal urbanisation
- Coastal profiles of regional sea catchments

ESF-COST workshop Dublin, 25-26 April 2005

European Environment Agency

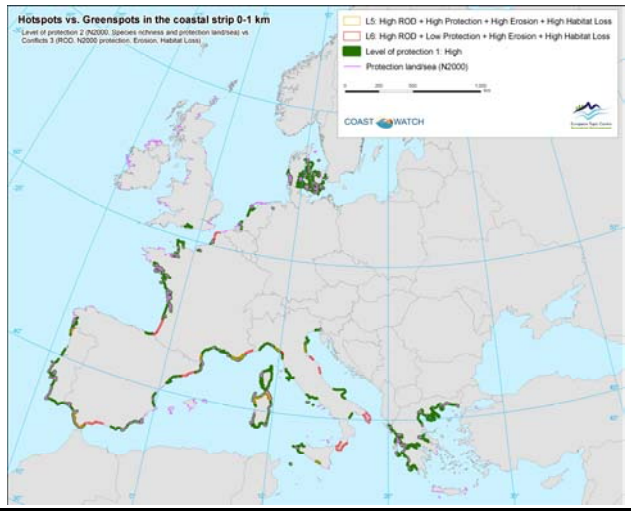
Spatial conflicts at the coast and preservation of biodiversity

Hotspots

high urbanization, loss of semi-natural areas, erosion and low degree of protection (or high)

Green areas

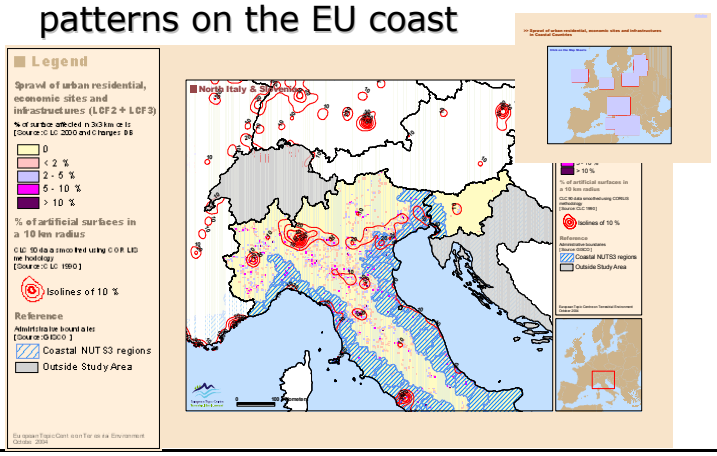
high protection (>30% of NUTS3 surface), high species richness and N2000 connections on land and sea.



ESF-COST workshop Dublin, 25-26 April 2005

European Environment Agency

Analysis of the urban development patterns on the EU coast

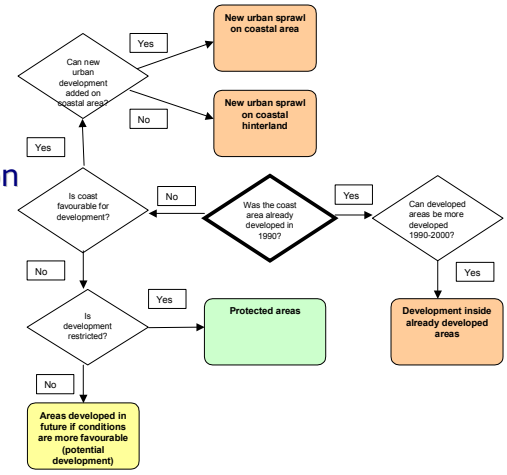


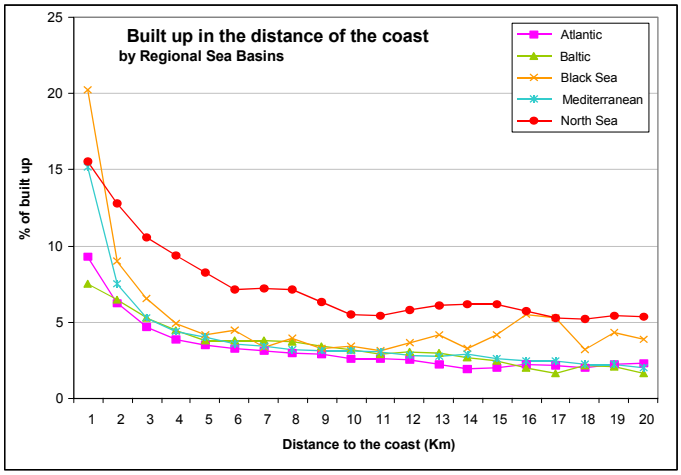
ESF-COST workshop Dublin, 25-26 April 2005

European Environment Agency

Notes

Conceptual model of coastal artificialisation



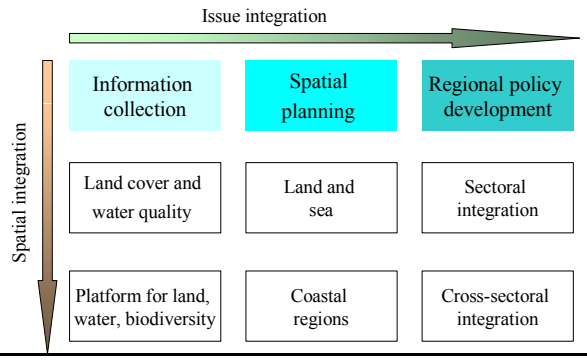


(3) Building the concept for coastal information

- Aspects of coastal complexity
- Spatial units for coastal assessment
- Spatial integration of indicators
- EU and regional/local context
- Communicating the "coastal story"

Notes

Bridging the gap between coastal information, practitioners and policy



Coastal integration: aspects of complexity

- Integration of sectoral policies
  - Environmental concerns
  - Inter-sectoral sustainability
  - Stakeholder interests
- Integration of marine and terrestrial parts of coastal zone
- Spatial location and spatial interaction
- Integration along causal links (DPSIR for coasts)

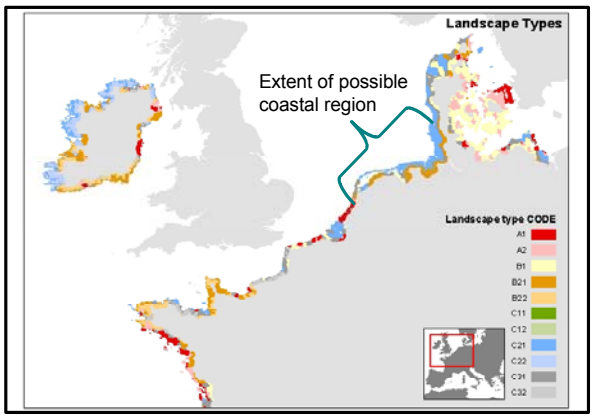
Search for Coastal assessment units

Generic category	Example
Coast of the continent	European coast
Coast of the regional sea	Coast of North Sea & NE Atlantic
Coast of the sea compartment	Southern North Sea coast
Coastal region	"Wadden Sea" coast
Coastal management unit	A sediment cell

Suitable unit for EU-level assessment?

Notes

Land Accounting Units/ Coastal Units



Spatial integration of indicators: multiple sources and approaches

- EU ICZM Expert group WGID indicators
  - Progress in ICZM implementation
  - Sustainable development of coasts
- EEA reports
  - Marine and coastal environment
  - Development of sectors
- Coastal factsheets
  - developed by 3 ETC-s TE, Biodiversity, Water
- Other relevant sources
  - Regional Sea conventions
  - CPRM

EU, national and regional/local context

- Vertical integration
  - ICZM implementation takes place on local/regional level
  - National strategies and EU Recommendations provide the frame
- Issues relevant to all levels
  - e.g. bathing and shellfish water quality
- Issues relevant to EU
  - e.g. protection of coastal habitats and species of European importance

Notes

Storyline for communication: which angle?

- **Coast is very attractive environment for living and has high value for business, recreation and biodiversity,**
- **… which has increasing impact from**
  - **climate change** (sea level, storms, coastal erosion),
  - **economic activities** (agriculture, transport, tourism, fisheries, industry) and related pollution,
  - **land take** (for urbanisation and infrastructure).
- **Thus, extra measures are necessary to achieve sustainable development on the coasts, such as**
  - **policy framework** for coastal integration,
  - definition of coastal regions and collection of relevant spatial information based on **common indicator sets**,
  - encouraging additional **sectoral integration**,
  - carrying out change detection, **trend analysis** and projections,
  - **spatial planning** for cross-sectoral integration and stakeholder involvement,
  - elaboration of coastal regional **management plans**.

Lessons learnt from the work so far

- Need of a coastal analytical framework
- Continue the work on integration of information, assure links to INSPIRE and GMES
- Work in line with European integrated and horizontal policies
  - ✓ Water Framework Directive
  - ✓ coming European Marine Strategy
- Review data gaps and data needs for future work
- Need of distinctive consultation phases
  - ✓ For data and information
  - ✓ Creating the baseline for the state of the coast

  - ➢ role of WG-ID in design and implementation as well as wider consultation in development of sustainability indicators

Notes

A REGIONAL APPROACH TO IMPLEMENTING COASTAL SUSTAINABILITY INDICATORS

Dr. Xavier Martí Ragué
Dublin, 25 of April of 2005

Government of Catalonia

SUMARY

- The visualization of the coast
- DEDUCE-Interreg IIIC Project
- The multiscale indicators
- Interaction between regional and local scales
- Adapting the regional basis of information
- Conclusions

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1. THE VISUALIZATION OF THE COAST

- The coast has a great importance to the European countries. In this space live a lot of people (more than 60%), and **the coast generates a great richness.**

- All **the coast zones suffer a great demographic pressure** during all the year, but specially, in the mediterranean countries, this pressure increase a lot in summer.

- The **demographic pressure** and the intensity of the marine traffic **have produced a great velocity and intensity of destruction of the terrestrial and marine landscape.**

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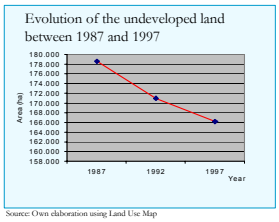
Notes

1. THE VISUALIZATION OF THE COAST

- Usually the **population hasn't got the conscious about these phenomena.**
- One of the tools in order to make more visual and conscient this process and phenomena is the **use of indicators**
- The **indicators permits an objective comparison of the coastal situation among the different dates** and check if the situation has improve or not.. **We need to understand well what happen.**



Source: Own elaboration using Land Use Map

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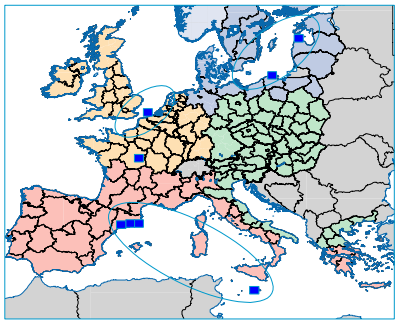
2. DEDUCE-INTERREG IIIC PROJECT

- The project **Interreg III C DEDUCE has as a main objective the establishement and calculation of common indicators among european coasts**.
- In DEDUCE participate **9 partners of european, national, regional and local level**.



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2. DEDUCE-INTERREG IIIC PROJECT

- Department of the Environment and Housing. Government of Catalonia. Spain
- Prat de Llobregat Town Council. Spain
- Viladecans Town Council. Spain
- The Autonomous University of Barcelona – European Topic Centre on Terrestrial Environment (ETC/TE) of the European Environment Agency. Spain
- Institut Français de l'Environnement (IFEN) which depends on the French Ministry of the Environment. France
- Malta Environment and Planning Authority (MEPA). Malta
- Province of Western Flanders. Belgium
- University of Latvia
- Maritime Institute in Gdansk. Poland

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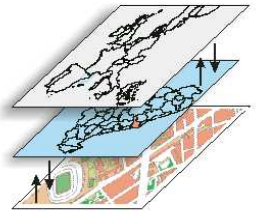
Notes

2. DEDUCE-INTERREG IIIC PROJECT

- In the framework of this project the partners will calculate 28 indicators defined by the **EU ICZM Expert Group** relationed with the objectives of the **Recommendation** concerning the implementation ICZM (2002).

- The characteristics of the partners permit **to calculate and compare the results of the same indicator with the same methodology but with different territorial ambit from more detailed to more global.**



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2. DEDUCE-INTERREG IIIC PROJECT

- DEDUCE-Interreg IIIC Project: 28 Indicators

Nº	INDICATOR
1	DEMAND FOR PROPERTY ON THE COAST
2	AREA OF BUILT-UP LAND
3	RATE OF DEVELOPMENT OF UNDEVELOPED LAND
4	DEMAND FOR ROAD TRAVEL ON THE COAST
5	PRESSURE FOR COASTAL AND MARINE RECREATION
6	LAND TAKE BY INTENSIVE AGRICULTURE
7	AMOUNT OF SEMI-NATURAL HABITAT
8	AREA OF LAND AND SEA PROTECTED
9	EFFECTIVE MANAGEMENT OF DESIGNATED SITES
10	CHANGE TO SIGNIFICANT HABITATS AND SPECIES
11	LOSS OF CULTURAL DISTINCTIVENESS
12	PATTERNS OF SECTORAL EMPLOYMENT
13	VOLUME OF PORT TRAFFIC
14	INTENSITY OF TOURISM
15	SUSTAINABLE TOURISM
16	QUALITY OF BATHING WATER
17	AMOUNT OF COASTAL, EST. AND MARINE LITTER
18	CONCENT. OF NUTRIENTS IN COASTAL WATERS
19	AMOUNT OF OIL POLLUTION
20	DEGREE OF SOCIAL COHESION
21	RELATIVE HOUSEHOLD PROSPERITY
22	SECOND AND HOLIDAY HOMES
23	FISH STOCKS AND FISH LANDINGS
24	WATER CONSUMPTION
25	SEA LEVEL RISE AND EXT. WEATHER CONDITIONS
26	COASTAL EROSION AND ACCRETION
27	NATURAL, HUMAN AND ECONOMIC ASSETS AT RISK
28	INTEGRATED COASTAL ZONE MANAGEMENT

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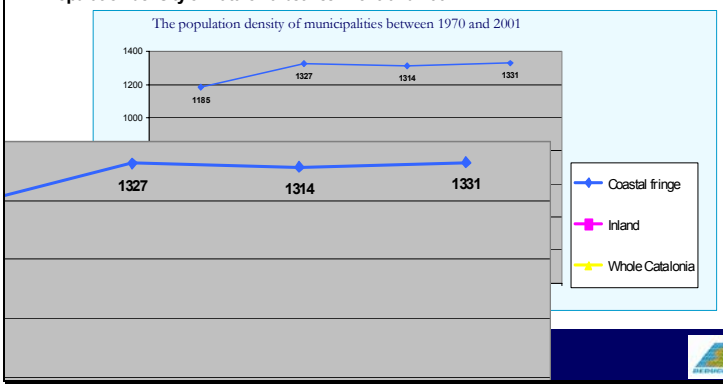
2. DEDUCE-INTERREG IIIC PROJECT

- One of the most importants things that we must demosntrate in DEDUCE project is **the importance of the coast and the integrated approach. In a lof of indicators we can show the environmental specificity of the coast.**

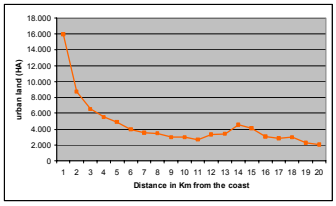
Population density of Catalonia between 1970 and 2004



Notes

2. DEDUCE-INTERREG IIIC PROJECT

- Another indicator that shows the importance of the coastal line is **the concentration of the urban land near the shore line.**
- **People in Europe and in this case in Catalonia tend to live in the coastal zones.**
- As this indicator shows, **in Catalonia, in the first kilometre there are a high urban concentration**, and when the kilometres increased the concentration decrease.



•All the municipalities of the coast

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2. DEDUCE-INTERREG IIIC PROJECT

- All the partners will work (in the next three months) in the **first five indicators** tried, measuring:
  - **Demand for property on the coast:** Population density and value of residential property
  - **Area of built-up land:** % of built land by distance coast
  - **Area of land and sea protected by statutory designations**
  - **Volume of port traffic:** passengers and goods
  - **Quality of bathing water :** % with compliance

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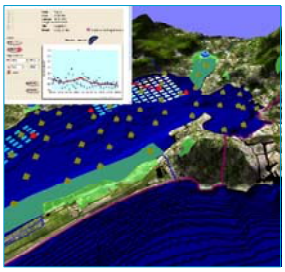
2. DEDUCE-INTERREG IIIC PROJECT

- **Other actions:**
  - **To evaluate and compare the GIS** for the analisys of the coast and to propose and integrated tool (GIS WEB)
  - **To establish a common model for reporting the sustainability of the coast**
  - **To draw uo a guide** for the use of indicators
  - **To study the posibility of setting an European regional observatory of the coast**



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Notes

2. DEDUCE-INTERREG IIIC PROJECT

WORKSHOPS

- NOVEMBER 2005 IN BELGIUM
- MARCH 2006 IN FRANCE
- JULY 2006 IN POLAND
- SETEMBER 2006 IN ITALY
- NOVEMVER 006 IN LATVIA
- DECEMBER 2006 IN SPAIN

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3. THE MULTISCALE INDICATORS

- DEDUCE project is also an opportunity to put into practice the **multi-scale integration of the indicators**. More than 10 indicators can be calculated at the 4 scales (European, State, region and local).
- We design a **feedback methodology** in order to get that the local information, usually the more detailed, pass to the regional level, from the regional to the national and from the national to the European.
- In the other hand it is also needed a integration from the European level to the local level.

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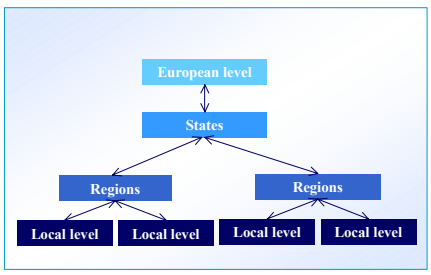
3. THE MULTISCALE INDICATORS

- This integration, that it is tried in the DEDUCE's project, will permit to save time in the calculations of this indicators.



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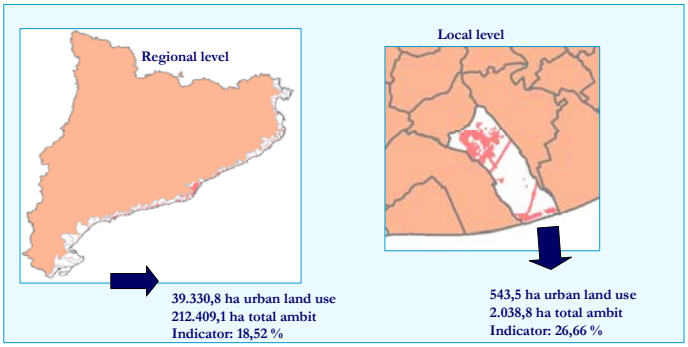
Notes

3. THE MULTISCALE INDICATORS

- One **example of the calculation of this integrated indicators** is the area of built up land:



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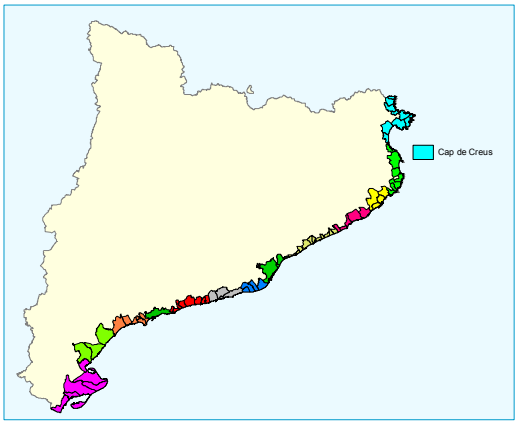
4. INTERACTION BETWEEN REGIONAL AND LOCAL SCALES

- To interact well the regional and the local level we are working with a functional division (most important fonctions: industrial, touristic, nature, agricultural, fisheries) of its area.



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4. INTERACTION BETWEEN REGIONAL AND LOCAL SCALES

? <u>FROM REGIONAL TO LOCAL:</u>

- **Transposition of the directives and the state rules for the regional scale**. These regional rules mark limitations and opportunities to the municipality.
- **Give the tools** in order to develop and accomplish the regional objectives and rules
- **Give to the municipalities the methodology, the information and the data bases** that could be useful to apply these objectives.

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Notes

4. INTERACTION BETWEEN REGIONAL AND LOCAL SCALES

? **FROM REGIONAL TO LOCAL:**

- **Having the dates in a detailed scale**. These dates could be aggregate and integrated in a regional scale.
- **Appling the directives and regulations in local scale.**
- **Knowing the problems about the application of one rule**, these problems should be explained to the regional level in order to solve it.

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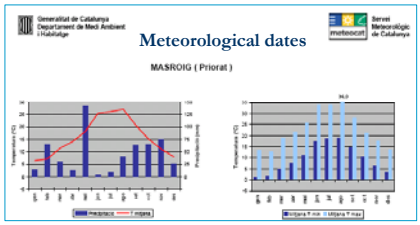
5. ADAPTING THE REGIONAL BASIS OF INFORMATION

- **To integrate the indicators calculation and to permit the interaction between the regional and the local data and knowledge** we are adapting the environmental information system.
- **According with different European directives**, all the public can access to these dates.
- But also the integrated basis must help to the planners to **apply the Environmental evaluation Directive (2001/42/CE) at all scales.**



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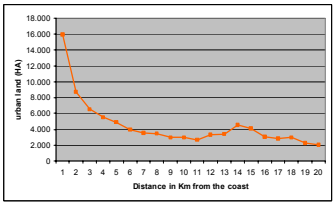
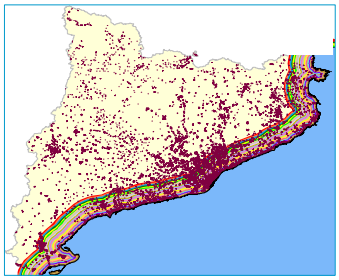
5. ADAPTING THE REGIONAL BASIS OF INFORMATION

- **To calculate the urban sprawl in relation with the distance to the coast** is necessary to reclassified the 22 categories of the land use map.





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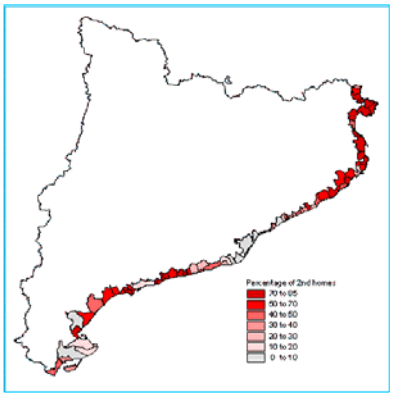
Notes

5. ADAPTING THE REGIONAL BASIS OF INFORMATION



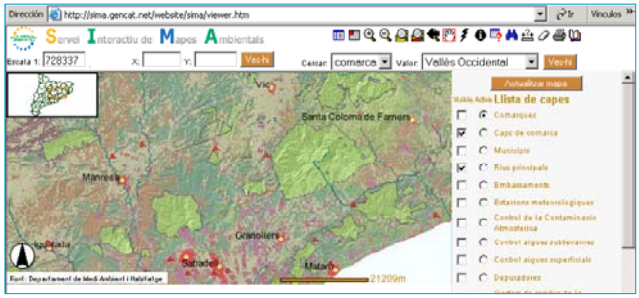
RATIO OF FIRST TO SECOND AND HOLIDAY HOMES:

- The percentage of second homes by local council in 2001 indicates that the most important growth in Catalonian coasts are concentrated in the northern and southern parts.
- This is a consequence of the urban pattern named the "Iberian Peninsula effect" based on a high specialization in tourism and tertiary sectors of the coastal municipalities.

Government of Catalonia

5. ADAPTING THE REGIONAL BASIS OF INFORMATION

- In the sense of the transparence, the Department of Environment and Housing of the Government of Catalonia has done a great effort in order to people can access to the environmental information. **http://mediambient.gencat.net/cat/inici.jsp**



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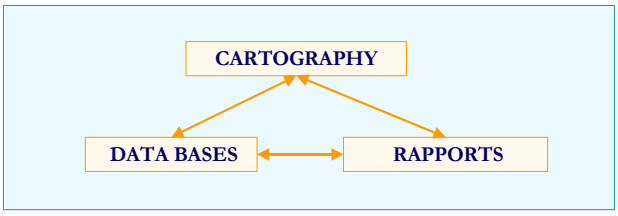
5. ADAPTING THE REGIONAL BASIS OF INFORMATION

- In should be consultable this **different kinds of dates**:



- The new concept of Environmental Information system (we are working in) it will be structured in the objectives of the **UE VI Environmental Framework Programme**

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Notes

5. ADAPTING THE REGIONAL BASIS OF INFORMATION

- This change will permit more order and structure to access to the information to the most quantity of people and give the basis to the analysis to the planners.
- The environmental information that should be exposed to the public could be organised in these categories:

  - Climate change
  - Biodiversity
  - Environmental quality for the health
  - Efficient management of the resources and waste

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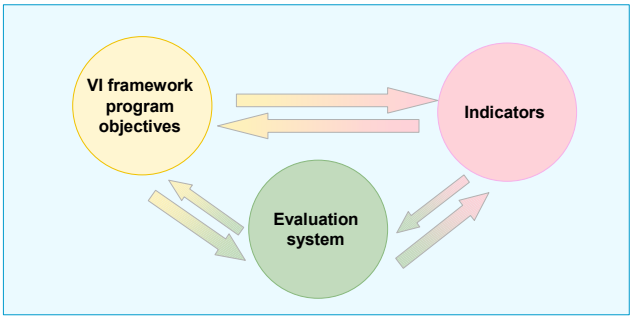
5. ADAPTING THE REGIONAL BASIS OF INFORMATION

- This change will permit an **structured relation between objectives, indicators and evaluation.**



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6. CONCLUSIONS

- **Making visible the coastal zones in Europe is the first step to develop the ICZM strategies** that the EU Recommendation demands.
- **The DEDUCE project is an opportunity to build a solid methodological fundament to make visible the European Coastal Zones** through the 28 indicators and 46 measurements.
- To build the observatory of the coast it **will be necessary to adapt the local, regional, national and European environmental information system, integrating the indicators and increasing the disseminating capacity.**

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Notes

Convention on the Protection of the Marine Environment of the Baltic Sea Area

- The Convention covers
  - the whole Baltic Sea coastal and open sea waters,
  - the sea-bed, and
  - measures are also taken in the whole catchment area to reduce land-based pollution.
- The present Contracting Parties to HELCOM are Denmark, Estonia, European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.
- The governing body of the Convention is the Baltic Marine Environment Protection Commission, HELCOM.

Aims of the Helsinki Convention

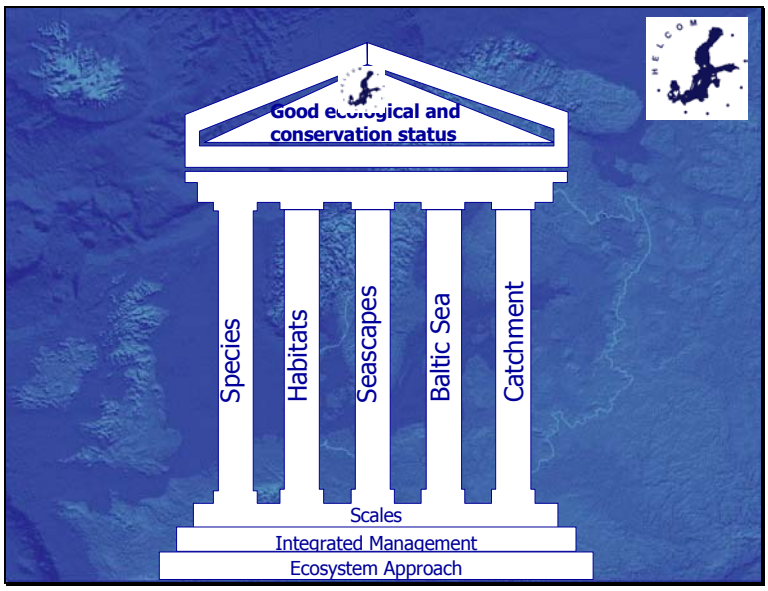
"to prevent and eliminate pollution in order to promote the ecological restoration of the Baltic Sea Area and the preservation of its ecological balance"

"to take all appropriate measures to conserve natural habitats and biological diversity and to protect ecological processes and to ensure the sustainable use of natural resources"

Notes

HELCOM as the environmental policy maker for the Baltic Sea area

- an environmental focal point providing information about
  - pressures and resulting environmental state;
  - efficiency of protection measures
  - common initiatives for other international fora;
- a body to produce
  - Recommendations for Baltic specific purposes
  - Recommendations supplementary to measures for other international organisations
- a supervisory body to ensure that same environmental standards are fully implemented throughout the Baltic Sea and its catchment area;
- a body to coordinate multilateral response in case of major maritime incidents



Notes

HELCOM Recommendations

- Implementation of Integrated Marine and Coastal Management of Human activities in the Baltic Sea Area
  - Sustainable and Environmentally friendly tourism in the Coastal Zones of the Baltic Sea Area
  - Protection of heavily endangered or immediately threatened Marine and Coastal Biotopes in the Baltic Sea Area
  - Preservation of Natural Coastal Dynamics
  - Protection of the Coastal Strip
  - Information and Consultation with Regard to Construction of New Installations Affecting the Baltic Sea
  - System of Coastal and Marine Baltic Sea Protected Areas (BSPA)

Ecosystem approach

- To implement the Ecosystem-based approach to manage human activities affecting the Baltic Sea
- Linking human activities to marine life
- Baltic Sea specific Ecological Objectives and associated indicators to make the HELCOM's vision operational
  - *Healthy Baltic Sea environment with diverse biological components functioning in balance, resulting in a good ecological status and supporting a wide range of sustainable human economic and social activities* .

From vision to indicators

Vision

Strategic goals

Ecological Objectives

Indicators

Targets and limits

Notes

Eutrophication

- reduce eutrophication in order to restore ecological balance within the Baltic Sea and to ensure a functioning marine ecosystem
  - Restored water clarity
  - No oxygen depletion where it should not occur naturally
  - No exceptional massive algal blooms
  - Depth range of perennial water plants and algae returned to regionally defined levels
  - Growth of opportunistic (nuisance) species returned to regionally defined levels

Biodiversity

- a resilient ecosystem that has a sufficient number of interconnected habitats ensuring healthy species composition and maintained diversity
  - preserve an ecologically coherent network of natural coastal landscapes, seascapes and ecosystems within the Baltic Sea,
  - restore and preserve communities characteristic to the Baltic Sea,
  - ensure healthy and viable populations of Baltic Sea characteristic species,
  - minimize the introduction of non-native species, especially from ship mediated introductions.

Hazardous substances

- Toxic substances shall not affect the health of marine organisms and thus pose a risk to humans
  - concentrations of hazardous substances in the Baltic Sea near background values for naturally occurring substances and close to zero for man-made substances,
  - all fish caught in the Baltic Sea should be suitable for human consumption,
  - attain pre-Chernobyl concentrations of man-made radioactivity in the Baltic Sea ecosystem causing risk neither to humans nor the Natural systems sustaining human, plant and wildlife populations,
  - Hazardous substances shall not cause lethal, sub-lethal, intergenerational or transgenic effects to the health of marine organisms.

Notes

Maritime and offshore activities

- to ensure that the increasing maritime traffic and offshore activities are carried out in a safe and environmentally sound way and that in case of incidents a swift national and trans-national response is in place
  - no illegal discharges of ship generated waste and cargo residues in the Baltic,
  - emissions from ships should not have negative impact to human health and marine environment,
  - minimized risk of the introduction of the non-indigenous organisms via shipping,
  - minimized number/risk of shipping accidents and their negative impact to the environment.

Pan-European Approach

- European Marine Strategy
- EEA indicator-based assessments
  - DPSIR approach
  - Indicator-based assessments
- Cooperation between the Marine Conventions
  - OSPAR
  - BSC
- Cooperation with US through BSRP

Notes

MOTIIVE Marine Data Interoperability & INSPIRE

Developing a European Data Model for the Coastal Zone: Potential Impact of the INSPIRE Directive & the MOTIIVE Implementation Project

Roger Longhorn
MOTIIVE Project Steering Committee Leader
EUCC Information Policy Advisor
Info-Dynamics Research Associates Ltd

MOTIIVE Marine Data Interoperability & INSPIRE

Main Topics

- Defining a Spatial Data Infrastructure (SDI) for the coastal / marine science & management communities
- Role of data model(s) in SDI formulation and implementation – ontologies & semantics
- Different data models representing different communities – science, transport, urban development
- Impact of INSPIRE on coastal / marine spatial data stakeholder communities – underpinning the data needed for sustainability indicators?
- MOTIIVE – Marine Overlays on Topography (INSPIRE Project)
- INSPIRE & MOTIIVE underpinning for sustainability indicators

ESF-COST Workshop on Sustainability Indicators for Coastal Zones of Europe, Dublin, 25-26 April 2005
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MOTIIVE Marine Data Interoperability & INSPIRE

Coastal/Marine Data Models and SDI

- Coastal management initiatives require data interoperability – marine, land, meteorological, social-economic, cultural
- The "coast" is the meeting place of multiple "information communities", not just complex physical and jurisdictional environments
- No one is fully in charge of the "coast" – so who defines the SDI? using which data model(s)?
- The information-related hurdles for creating a coastal SDI (CSDI) are more organisational and jurisdictional than technological.

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Why Create SDIs?

- So we can collect, process, publish, access and share data – as easily and cost effectively as possible – for all who need access…but beware the ramifications of "all"! (intelligent use v. unintended misuse).
- Sharing across organisational and national boundaries …
- … but more importantly – and often with more difficulty - across disciplinary boundaries…
- … especially in the coastal zone - one of the most complex environments in which to work.

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Why Create Coastal SDIs?

- SDIs are supposed to aid in data harmonisation, integration and interoperability.
- People expect technology to provide practical solutions to data access and exploitation problems … and experience shows some success here (OGC).
- The main barriers to success are acknowledged to be organisational and political, not technical.
- We don't have a strong record for CSDI/MGDI in Europe – other than oceanographic data exchange

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Coastal SDI should support all disciplines

- How do you capture and express the data sharing needs of multiple disciplines - who happen to work in a place called "the coast"?
- "Coasts" are the interface between ocean and land – regardless of how you define "coast" for specific purposes, functions or applications.
- Coastal SDI is seldom – never? – implemented in isolation from national (generic) SDI.
- SDI itself is implemented under the umbrella of a wider "information infrastructure" – e-Govt.

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What is the "coast" – for SDI purposes?

- The 'coast' is not a physical meeting of land and sea…
- … rather it is a **complex of "information territories"**.
- This information is a strategic resource and can be commercially sensitive and 'secret'.
- Compartmentalisation, data sharing and integration barriers
- … are nothing to do with technology.
- No one government agency 'owns' the coast …
- … so no single agency has the power to deal with the problems that lead to information access & sharing barriers.

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MOTIVE Marine Data Interoperability & INSPIRE

How do you describe the "coast"?

- Data modelling?
- Shoreline – which "shoreline"?
- Seafloor – data for whose use?
- Time series – when? - the sea & coastline are very dynamic
- Interactions between land, sea, atmosphere = some of the most complex numerical models created.
- Implementing the different models (is the data "fit for purpose"?) – data grids.
- Integrating different models (computational grids)

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How do you describe the "coast"?

- What is your country doing in regard to its national SDI – initiatives across Europe are highly uneven, many 'fledgling' visions and 'strategies' being developed.
- What is happening with regard to marine/coastal SDI at national level – typically, very little, e.g. UK MDIP 7 April 2005
- Consider the impact that regional (trans-national) initiatives may have on your discipline's needs (e.g. INSPIRE vs. EuroGOOS, EuroGOOS vs. MDIP, etc.).
- Why no coastal/marine focus at the global level (GSDI? Global Map Project? OGC?)
- Oceanographic & Met communities have ISO-IODE, WMO, JCOMM – working together – but limited "coastal" focus.

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Data models in SDI formulation & implementation

- Developing ontologies to describe your knowledge base – labour and expertise needed
- Agreeing the semantics – among and across communities
- Agreeing how to express and implement the model(s)
  - UML
  - XML Schemas (typical method today)
- Achieving interoperability
  - Open Geospatial Consortium (OGC) specifications & standards
  - ISO geospatial/geomatic standards (ISO 19xxx series)
- Testing and verification of standards, tools, methodologies

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Different Data Models for Different Communities

- GOOS / EuroGOOS
  - Global Ocean Observing System
  - GOOS Coastal Ocean Observations Module
    - COOP = GOOS + IGBP + FAO
  - JCOMM (WMO/IOC)
- LOICZ
  - LOICZ II (June 2005)
- GMES (EC/ESA)
  - Global Monitoring for Environment & Security
  - European contribution to GEOSS
  - Supposedly linked to INSPIRE – reality ??
- Coastal "Community" ?

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INSPIRE – the draft Directive

- A draft legislative Directive of the EC
- Focuses primarily on access and exploitation issues
- Does name the types of data to be covered
  - Annex I, Annex II, and Annex III
  - **Not** good news for the coastal/marine communities
- Implementing rules are being developed independently of the Directive – by projects such as MOTIIVE (more later)
- Spatial Data Interest Communities (SDICs) are the latest (unfunded) ploy by the EC to try to get thematic communities involved in creating implementing rules

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Notes

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INSPIRE and related initiatives

Environmental Policies

- Water Framework Directive
- ICZM Recommendation

Supports

GMES

- IGOOS/EuroGoos/JCOMM
- GEOSS

MOTIIVE

MERSEA

INSPIRE European SDI

MarineXML

FP V/VI/VII Research

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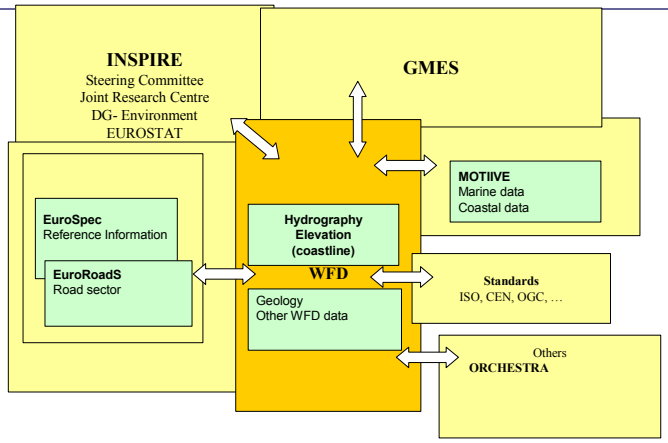

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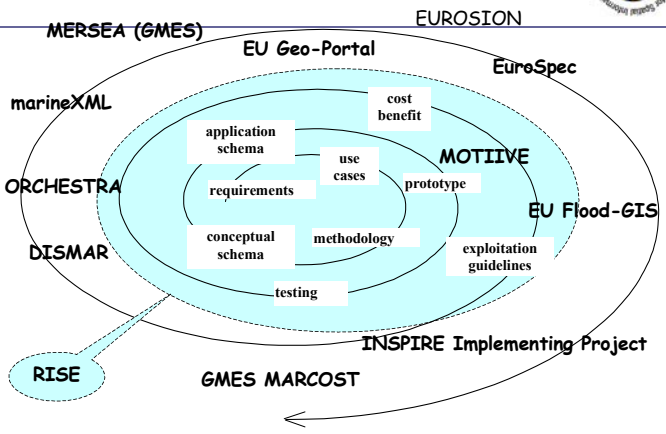

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Notes

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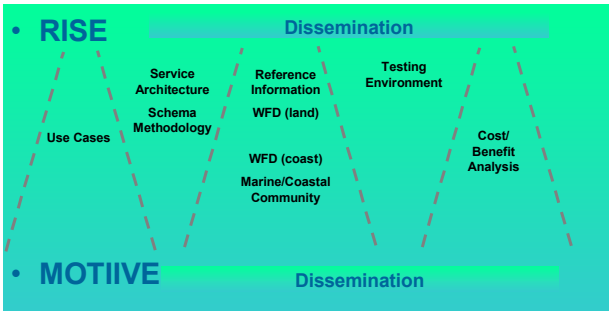
Linkages with other INSPIRE-related Projects



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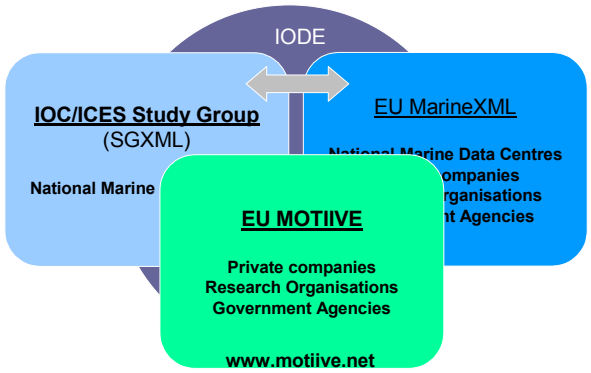
MOTIIVE Marine Data Interoperability & INSPIRE

MarineXML Initiatives leading to MOTIIVE



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MOTIIVE Marine Data Interoperability & INSPIRE

MOTIIVE Aims

- Build on pre-standardisation in the marine community to develop and apply OGC specifications
- Begin implementation of INSPIRE principles and technology so that real services can delivered.
  - **Needs to happen now - GMES and INSPIRE are out of synchronisation**
- Engage the wider marine community such that they know and understand how to use OGC/INSPIRE specifications to deliver services and the cost:benefit of doing this
- Provide enabling infrastructure in the form of a standards registry (IOC/IHO)
- Offer support and guidance to related INSPIRE projects

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Notes

MOTIIVE Marine Data Interoperability & INSPIRE

How can MOTIIVE help with coastal sustainability indicators

- Try to ensure that the data needed to underpin the monitoring of coastal sustainability indicators is among the coastal/marine datasets that MOTIIVE uses in its OGC Interoperability Experiment (OGC-IE for MOTIIVE).
- Ensure that the coastal sustainability indicator "community" is informed and involved in the OGC Marine SIG or Working Group that we plan to create as output of this project.

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MOTIIVE Marine Data Interoperability & INSPIRE

Thank you for your attention!

If any questions, please contact me at:

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ESF-COST Workshop on Sustainability Indicators for Coastal Zones of Europe, Dublin, 25-26 April 2005

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Notes

EU Working Group on Indicators and Data (WG-ID)

The ICZM Progress Indicator Set

Dr. Alan Pickaver
EUCC – the Coastal Union

Tasks set by the EU ICZM Expert Group

How can Member States measure the extent to which integrated coastal zone management is being implemented?

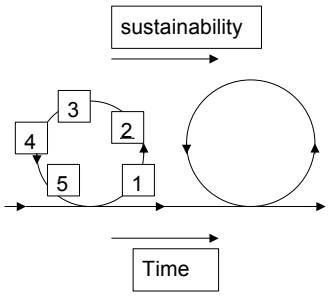
How can Member States tell whether they are moving further towards, or away from, a more sustainable future for their coasts, and at what pace?

Response of the Working Group on Indicators and Data

An indicator to measure the progress in implementing ICZM (the ICZM Progress Indicator Set)

Notes

ICZM: A dynamic, multi-disciplinary and iterative process



1 . Issue identification and assessment
2. Programme preparation
3. Formal adoption and funding
4. Implementation
5. Evaluation

from Gesamp (1996)

Earlier attempts at a progress indicator

- Simple generic framework for assessing ICZM initiatives (Burbridge, 1997)
- Horizontal and vertical integration and public participation – in 181 regions and 14 countries (van Elburg-Velinova et al, 1999)
- Seven different process indices (Henoque, 2003)
- Sorting coastal management initiatives (Olsen, 2003)

A new model

- Recognises that the cyclical ICZM process can be broken down into a series of discrete, ranked actions.
- The 26 actions, though not completely exhaustive, are comprehensive enough to measure progress.
- A straightforward, step-wise methodology passing from situation with no ICZM to one where the technique is being implemented fully.
- Grouped into a series of 5 discrete, ordered and continuous phases.
- Requires (initially) only a binary response.

Notes

The five phases

- Phase I: Non-integrated (often sectoral) coastal management is taking place which can lay the basis for the introduction of ICZM. It contains 5 discrete actions.
- Phase II: A framework for ICZM exists. It contains 6 discrete actions.
- Phase III: Vertical and horizontal integration of administrative and planning bodies exists within an ICZM programme. It contains 10 discrete actions.
- Phase IV: An efficient, participatory, integrative planning exists. It contains 3 discrete actions.
- Phase V: There is full implementation of ICZM. It contains 2 discrete actions.

WG-ID progress indicator (part)

Phase	Action	Description	National		Regional		Local	
			1995	2000	1995	2000	1995	2000
I. Laying the basis for ICZM	1	Aspects of coastal management are taking place.	Yes	Yes	Yes	Yes	Yes	Yes
II: A framework for ICZM exists	7	Ad hoc demonstration projects are being carried out that contain recognisable elements of ICZM.	No	Yes	No	Yes	No	Yes
III: Vertical and horizontal integration exists between coastal planning and management agencies. Most of the time, decision-making includes relevant stakeholders and coastal communities.	18	Adequate mechanisms are in place to allow the general public to take a participative and inclusive (as opposed to consultative) role in ICZM decisions.	No	No	No	No	No	Yes
IV: Efficient, adaptive, participatory, integrative planning and management is in place	22	A long-term financial commitment is in place for the implementation of ICZM.	No	No	No	No	No	Yes
V: Full implementation of ICZM	25	All of the above actions have been implemented with problem areas given special attention.	No	No	No	No	No	No

German federal response (unofficial)

Action	National		Regional		Local	
	1995	2005	1995	2005	1995	2005
1	No	No	No	Yes	No	No
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes
6	No	No	No	No	No	No
7	No	No	No	No	Yes	No
8	No	No	No	No	No	No
9	No	No	No	No	No	No
10	No	No	No	No	No	No
11	No	No	No	No	No	No
12	No	No	No	No	No	No
13	No	No	No	No	No	No
14	No	No	No	No	No	No

Action	National		Regional		Local	
	1995	2005	1995	2005	1995	2005
15	No	No	No	No	No	No
16	No	No	No	No	No	No
17	No	No	No	No	No	No
18	No	No	No	No	No	No
19	No	No	No	No	No	No
20	No	No	No	No	No	No
21	No	No	No	No	No	No
22	No	No	No	No	No	No
23	No	No	No	No	No	No
24	No	No	No	No	No	No
25	No	No	No	No	No	No
26	No	No	No	No	No	No

Notes

Composite response

Action	National 1995	National 2005	Regional 1995	Regional 2005	Local 1995	Local 2005
1	Yes	Yes	Yes	Yes	Yes	Yes
2	No	Yes	No	Yes	No	Yes
3	No	Yes	Yes	Yes	Yes	Yes
4	No	Yes	Yes	Yes	Yes	Yes
5	No	No	No	No	No	No
6	No	No	No	No	No	No
7	No	Yes	No	Yes	No	Yes
8	No	Yes	Yes	Yes	Yes	Yes
9	No	No	No	No	No	No
10	No	No	No	No	No	No
11	No	Yes	Yes	Yes	Yes	Yes
12	No	Yes	No	Yes	Yes	Yes
13	No	Yes	No	No	No	No
14	No	No	No	Yes	No	Yes
15	No	No	No	Yes	No	Yes
16	No	Yes	No	No	No	No
17	No	No	No	Yes	No	Yes
18	No	No	No	No	No	Yes
19	No	No	No	Yes	No	Yes
20	No	No	No	No	No	No
21	No	No	No	No	No	No
22	No	No	No	No	No	Yes
23	No	No	No	No	No	No
24	No	No	No	No	No	No
25	No	No	No	No	No	No
26	No	No	No	No	No	No

What can it tell you?

- A patchwork response is as likely as a blocked response
- Can determine horizontal blockages
- Can determine vertical blockages
- Number of yes responses should increase with time

Future development ..

The simple binary response can be readily refined in the future

The quality of the response at any action step can also be assessed

Notes

..an example.

- Concerning participation

Action	Description	National		Regional		Local	
		1995	2000	1995	2000	1995	2000
14a	No mechanism	20	5	10	0	-	-
14b	Mechanism in progress	35	40	55	35	-	-
14c	Exists but not in use	10	10	5	5	-	-
14d	Exists, partial use	5	15	25	35	-	-
14e	Exists, routinely used	20	30	5	25	-	-

Percentage of regions nationally and municipalities regionally

Testing the progress indicator

- Tested by over one hundred practitioners from municipalities, regions and central governments; coastal and estuary partnerships; port authorities and other sectoral interests in England and Wales, Belgium, Holland and France.
- HELCOM (in Germany, Denmark, Poland and Lithuania) and the COREPOINT project (in Ireland and Wales) will test the current methodology by end 2005. ENCORA will develop the indicator set further.
- WG-ID recommends that Member States join with practitioner groups over the following year and organize national workshops (or regional workshops) to further test the progress indicator.
- Response of the practitioners generally positive. All comments will be used in a revision of the indicator in 2005.

Conclusions regarding progress indicator

- Step-wise model has taken the cyclical ICZM management process towards a more comprehensible, semi-quantitative, comparative analysis.
- Model will need to be refined as experience in monitoring ICZM progress is developed.
- In the longer-term, mapping of coastal areas in terms of the progress in ICZM should be achievable.
- Set alongside the indicators of sustainable development, it is a test of the hypothesis underpinning the EU Recommendation - that an ICZM process is a prerequisite for a more sustainable coast.
- Like ICZM itself, the indicator is dynamic!

Notes

Where you can find it.

- *An indicator set to measure the progress in the implementation of ICZM in Europe.* Pickaver A et al. **Ocean & Coastal Management Vol. 47 449-462 2004.**
- *An Indicator Set to Measure Progress in Integrated Coastal Zone Management: Further Advances.* Pickaver A et al. **Proceedings of the Littoral 04 Conference pp 31-36 2004.**
- **www.eucc.net**

EU Working Group on Indicators and Data (WG-ID)

Thank you

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Email: a.pickaver@eucc.net:

www.eucc.net

See also: Ocean & Coastal Management Vol. 47 449-462 2004

Notes

Experiences and recommendations from the EUROSION project

EUROSION

Indicator Development

Hugo Niesing
National Institute for Coastal and marine Management,
Ministry of Transport Public Works and Water Management

Start & Objectives EUROSION

Goal: Policy and management recommendations

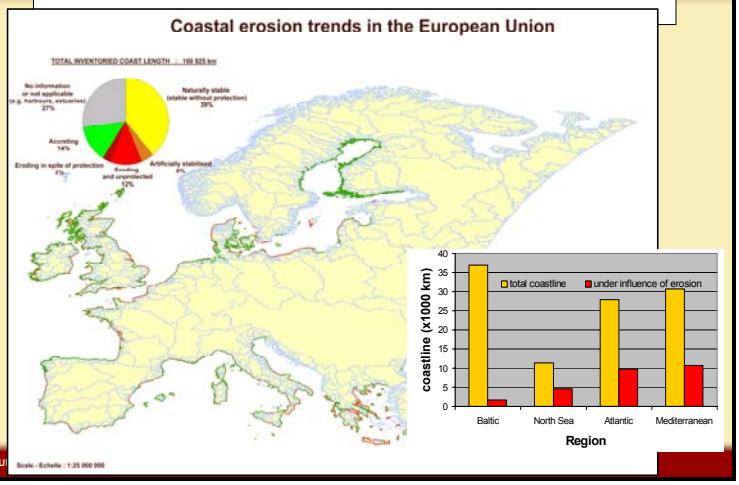
1. Assessment
   - Pressures
   - Impacts
2. Review management options

Example of Happisburgh (UK)

2001

Notes

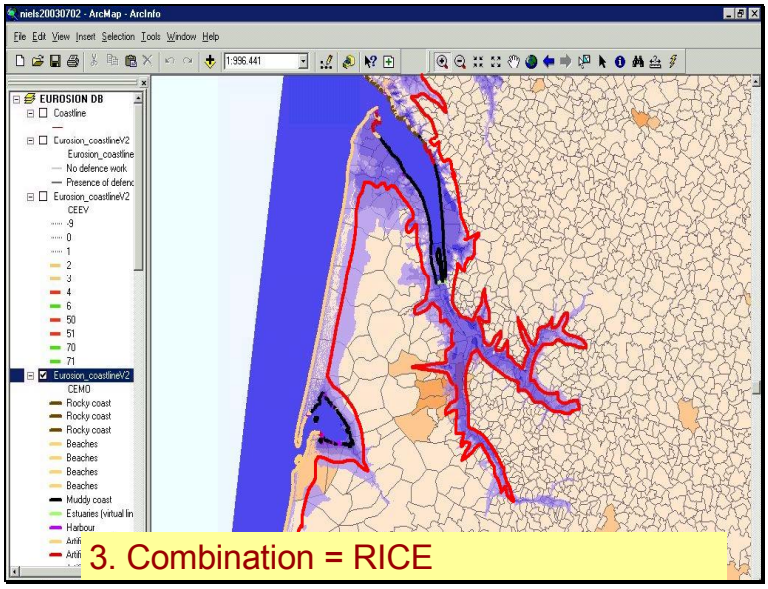
Erosion in Europe



Items

1. Radius of Influence of Coastal Erosion - RICE
2. Sensitivity indicators
3. Impact Indicators
4. Example methodology
5. Limitations and subjectivity
6. Results
7. Examples of other Coastal Indicators

EUROSION



3. Combination = RICE

Notes

Sensitivity

1. Relative sea level rise
2. Coastal Erosion occurence
3. Shoreline evolution trend status
4. Highest water level
5. Coastal urbanization (in the 10 km land strip)
6. Reduction of river sediment supply (ratio)
7. Geological coastal type
8. Elevation
9. Engineered frontage

EUROSION

Sensitivity Analysis


GEOMORPHOLOGY
(Field surveys and image processing)


BATHYMETRY (GEBCO)

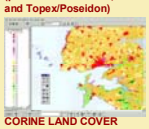

ELEVATION (MONA PRO)


TIDAL REGIME (national tide gauges)


WAVE AND WIND CLIMATE
(processed from ERS, Geosat, and Topex/Poseidon)


GEOLOGY (Corine)


SEA LEVEL RISE


CORINE LAND COVER


EROSION EVOLUTION

EUROSION

Impact

1. Population living within the RICE
2. Coastal urbanization (in the 10 km land strip)
3. Urban and industrial living within the RICE
4. Areas of high ecological value within the RICE

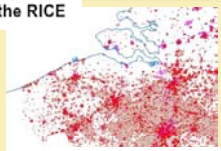
EUROSION

Notes

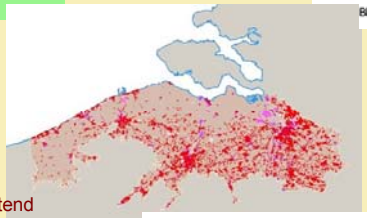
Example

Urban and industrial areas located within the RICE

– Belgium RICE



BE-Vlaams CLC90 Artificial Surfaces



BE-Vlaams Clipping of Artificial Surfaces and RICE

Asses urbanization extend in coast
Sensitivity to erosion and flooding

EUROSION

Coastal urbanisation rate

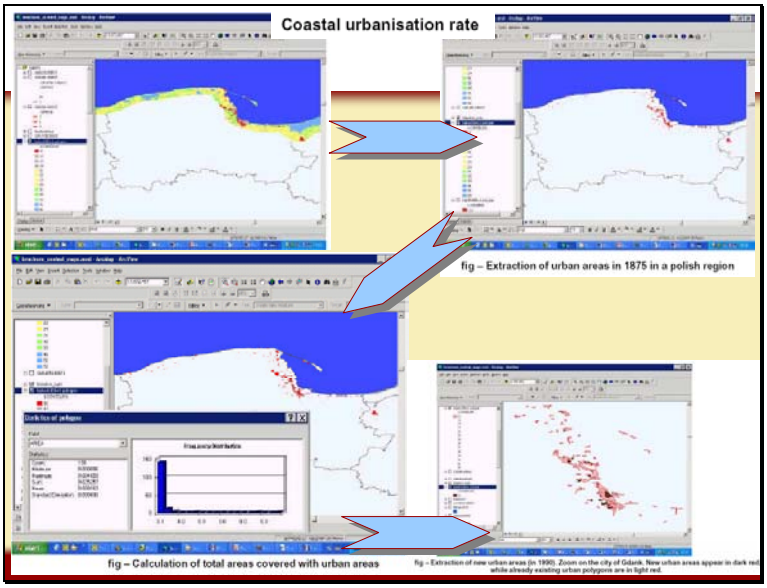
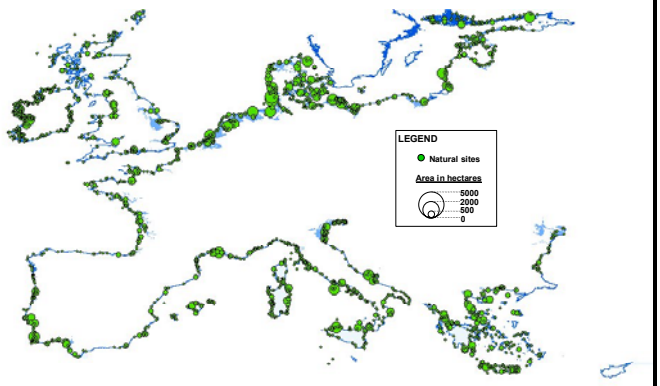


fig – Extraction of urban areas in 1875 in a polish region

fig – Calculation of total areas covered with urban areas

fig – Extraction of new urban areas (in 1990). Zoom on the city of Gdank. New urban areas appear in dark red while already existing urban polygons are in light red.

Natural sites with high ecological value under the influence of coastal erosion



Notes

Score

SENSITIVITY... IMPACT... & SCORE

1. Relative sea level rise
2. Shoreline evolution trend status
3. Highest water level
4. Coastal urbanization (in the 10 km land strip)
5. Reduction of river sediment supply (ratio)
6. Geological coastal type
7. Elevation
8. Engineered frontage

1. Population living within the RICE
2. Coastal urbanization (in the 10 km land strip)
3. Urban and industrial living within the RICE
4. Areas of high ecological value within the RICE

Exposure to coastal erosion

- Very high exposure
- High exposure
- Moderate exposure
- Low exposure

EUROSION

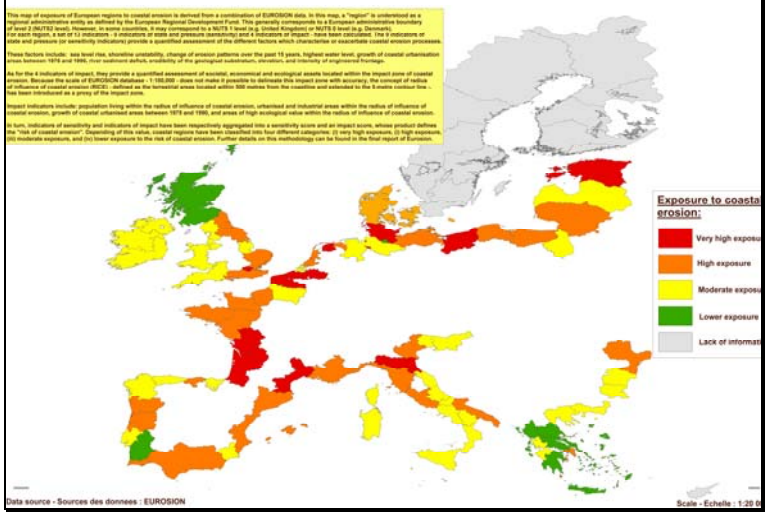
TABLE 5. EXPOSURE OF EUROPEAN COASTAL REGIONS TO COASTAL EROSION: REGIONAL WEIGHT FACTORS AND SCORINGS

REGION CODE	REGION Name	REGION Total area (km2)	REGION Total population (inhab.)	sea level rise (range*)	Coast length which is eroding (km)	Former stable coastline (1958) which is unstable in 2001 (km)	Highest water level (range**)	urbanisation rate 1975-1990 within 10 km	Likely non-erodable coast length (km)	Area under the influence of coastal erosion - RICE* (km2)	Coast length with defence works & artificial beaches (km)	Population living within the area of influence of coastal erosion (inhab.)	Urbanisation rate 1975-1990 OR Urbanised and industrial area under the influence of coastal erosion (km2)	Area of high ecological value under the influence of coastal erosion (km2)	SENSITIVITY SCORE	IMPACT SCORE	FINAL SCORE	EXPOSURE	Reliability
BE2	Vlaams Gewest	13.552	3.300.000	2	1	1	2	2	2	2	2	2	2	0	16	4	63	Very High	2
BG03	Varna	19.777	-	0	1	-	1	0	2	0	2	-	1	2	6	5	35	Medium	1
BG06	Burgas	14.476	-	0	1	-	1	0	1	0	1	-	2	2	5	6	31	Medium	1
CY	Kypros / Kibris	9.336	-	1	1	-	1	-	2	0	1	-	-	0	9	-	-		0
DE3	Bremen	357	1.456.356	2	0	0	2	2	2	2	2	2	2	1	14	5	66	Very High	2
DE6	Hamburg	747	1.888.757	2	0	0	2	1	2	0	2	0	1	1	10	2	20	Low	2
DE8	Mecklenburg-Vorpommern	23.040	-	0	1	-	1	1	2	1	2	-	1	2	10	5	46	High	1
DE9	Niedersachsen	30.019	7.945.183	1	0	0	2	1	1	2	1	2	1	1	9	4	36	Medium	2
DEF	Schleswig-Holstein	15.730	2.702.729	2	1	0	2	1	2	2	1	2	1	2	12	5	62	Very High	2
DK00	Danmark	42.910	7.339.267	2	0	0	2	1	2	2	0	2	1	2	10	5	51	High	2
EE	Eesti	45.175	-	0	2	-	1	2	2	1	0	-	2	2	10	4	42	Very High	1
ES11	Galicia	29.575	2.732.164	2	0	0	1	2	0	0	0	2	2	2	6	6	34	Medium	2
ES12	Principado de Asturias	10.607	1.084.259	1	0	0	1	2	0	0	2	1	2	2	7	5	34	Medium	2
ES13	Cantabria	5.326	527.136	1	0	0	1	2	0	0	2	2	2	2	7	6	41	High	2
ES21	País Vasco	7.159	2.102.915	1	0	0	1	2	0	0	2	2	2	1	7	5	34	Medium	2
ES51	Cataluña	32.147	6.967.170	1	1	0	1	2	2	0	1	2	2	1	9	5	45	High	2
ES52	Comunidad Valenciana	23.291	3.953.195	1	1	0	1	2	2	0	1	2	2	2	9	5	41	High	2
ES53	Illes Balears	4.992	732.759	1	0	0	1	2	2	0	1	2	2	2	7	6	41	High	2
ES61	Andalucía	87.268	6.940.264	2	1	0	1	2	2	0	0	2	2	2	9	6	54	High	2
ES62	Región de Murcia	11.336	1.050.170	1	0	0	1	2	1	0	2	1	2	2	6	5	39	Medium	2
ES70	Canarias - Tenerife	2.042	629.998	1	0	0	1	2	0	1	0	1	2	2	6	5	36	Medium	2
FI4	Oulu / Uleåborg	45.256	-	0	0	0	1	-	1	-	0	-	-	-	3	-	-		0
FI5	Lappi / Lappland	106.215	-	0	0	2	1	-	1	-	0	-	-	-	4	-	-		0
FI1	Etelä-Suomi / Södra Finland	9.485	-	0	0	0	1	-	0	-	1	-	-	-	3	-	-		0
FI2	Länsi-Suomi / Västra Finland	57.234	-	0	0	0	1	-	0	-	2	-	-	-	5	-	-		0
FI6	Åland	1.461	-	0	0	0	1	-	0	-	0	-	-	-	2	-	-		0
FR22	Picardie	19.635	1.810.087	1	1	0	1	2	1	0	2	0	2	2	9	4	36	Medium	2
FR23	Haute-Normandie	12.318	1.737.247	1	2	0	1	2	1	0	1	2	2	2	9	4	34	High	2

*Because not all indicators all available for all regions, the sensitivity and impacts score of regions with missing indicators have been adjusted by an extrapolation formula in order to become comparable with the score of other regions in that respect.

22

Exposure of European regions to coastal erosion



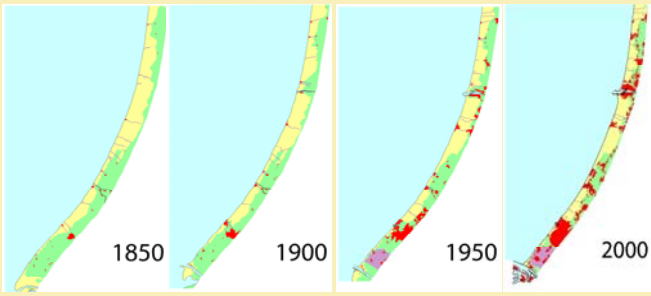
Notes

Limitations

1. Completeness
2. Subjectivity
3. Treshold usage
4. Indicator
5. Methodology
6. Roughness
7. Differences
8. ….

EUROSION

Increased urbanisation of the coastal zone

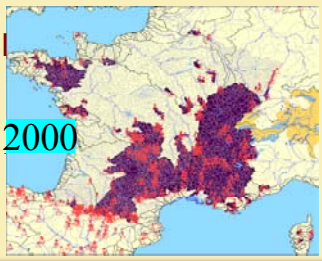


Increased urbanisation of the coastal zone

EUROSION

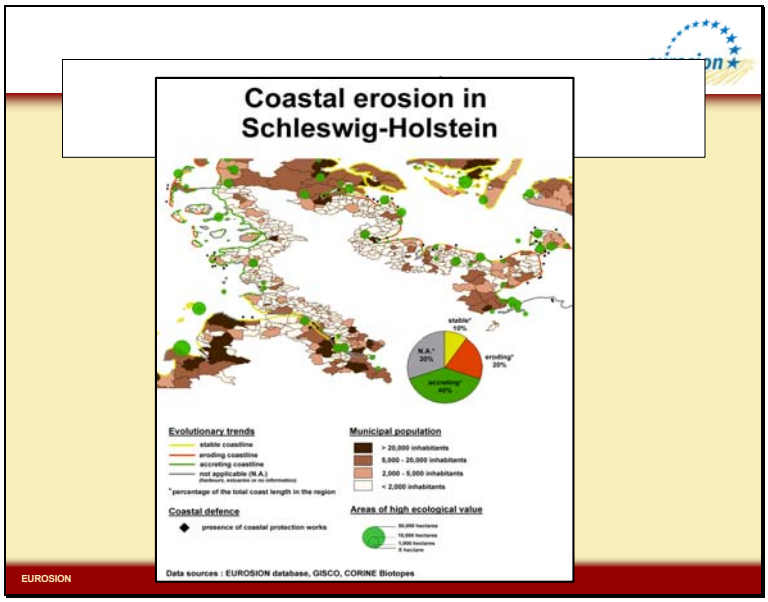
Erosion in Europe

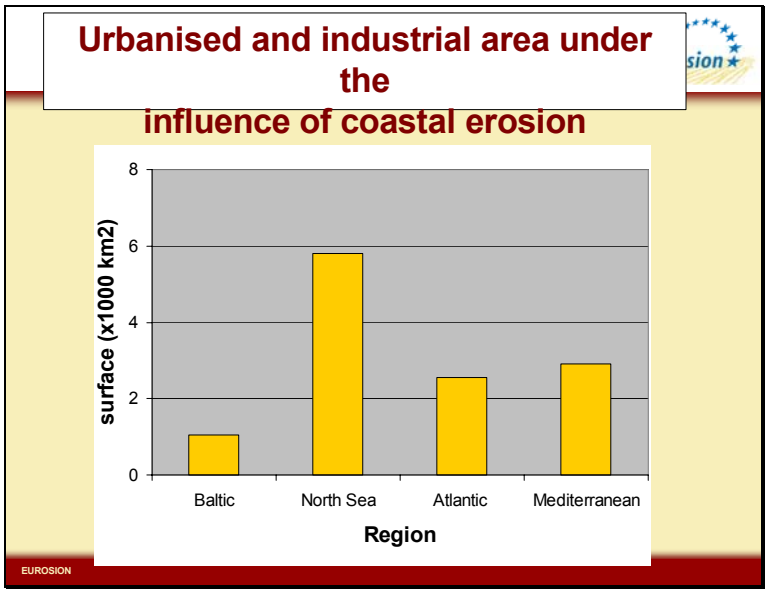
- EU coast 20 % eroding or protected
- Major impact of engineered frontage
- 100 million tons sediment yearly "trapped"
- Annually 15 KM_2 coastal land lost
- 3.2 billion € spend on coastal defences

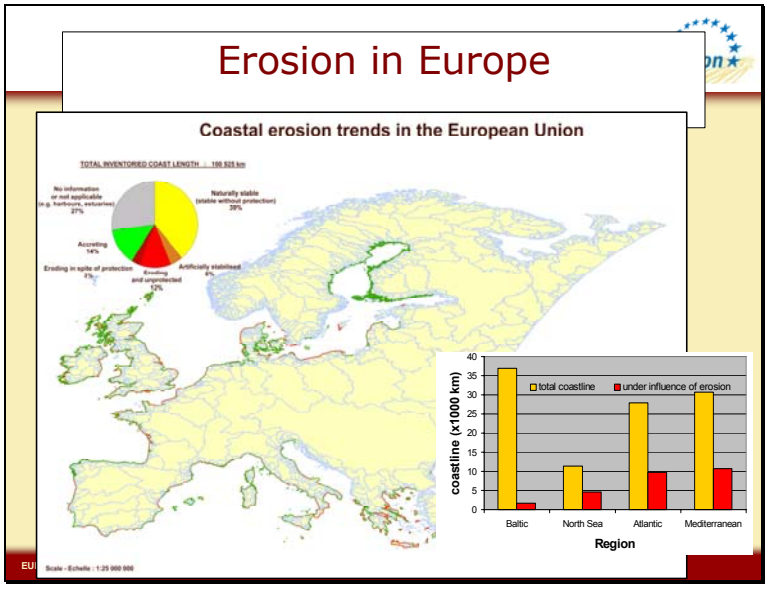


EUROSION

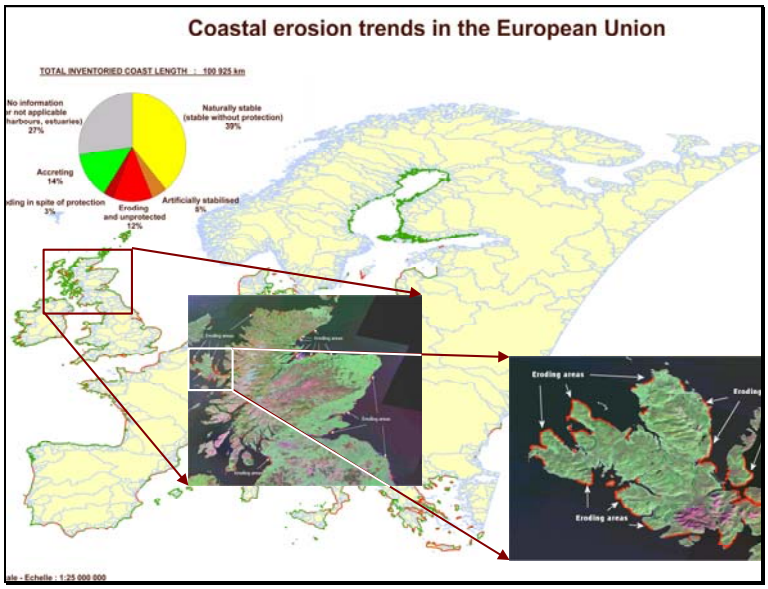
Notes


Coastal erosion in Schleswig-Holstein
Evolutionary trends
stable coastline
eroding coastline
accreting coastline
not applicable (N.A.)
Municipal population
> 20,000 inhabitants
5,000 - 20,000 inhabitants
2,000 - 5,000 inhabitants
< 2,000 inhabitants
Coastal defence
presence of coastal protection works
Areas of high ecological value
Data sources : EUROSION database, GISCO, CORINE Biotopes
EUROSION


Urbanised and industrial area under the influence of coastal erosion
surface (x1000 km2)
0
2
4
6
8
Baltic
North Sea
Atlantic
Mediterranean
Region
EUROSION

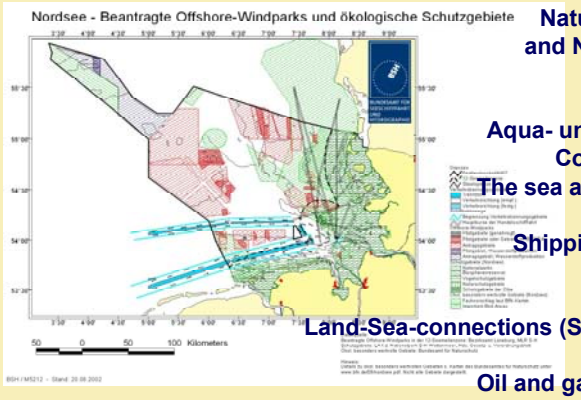

Erosion in Europe
Coastal erosion trends in the European Union
TOTAL INVENTORIED COAST LENGTH : 100 525 km
No information or not applicable (e.g. harbours, estuaries) 27%
Naturally stable (stable without protection) 39%
Accreting 14%
Eroding in spite of protection 5%
Eroding and unprotected 12%
Artificially stabilised 4%
coastline (x1000 km)
0
5
10
15
20
25
30
35
40
total coastline
under influence of erosion
Baltic
North Sea
Atlantic
Mediterranean
Region

Notes



Stocktaking:

Current use pattern of the German North -Sea



- Offshore wind farms
- Fisheries
- Marine Protected Areas
- Nature protection and National Parks
- Tourism
- Agriculture
- Aqua- und Mariculture
- Coastal defence
- The sea as public good
- Sea cables
- Shipping and safety
- Harbours
- Dredging
- Land-Sea-connections (Service-nodes)
- Dumping
- Oil and gas exploration
- Military

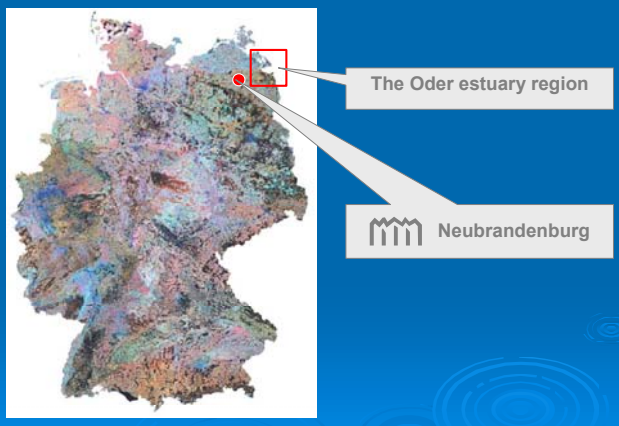
EUROSION

Notes

COASTAL INDICATORS FOR THE ODER ESTUARY REGION

Workshop on sustainability indicators for the coastal zones of Europe
Dublin, April 2005

WHERE IS THE REGION / NEUBRANDENBURG ?



SOME FACTS ABOUT THE PROJECT (1)

- one out of two national German ICZM case studies of the Federal Ministry of Education und Research
- duration from May 2004 to April 2007
- associated with the German-Polish Regional Agenda 21 Oder Lagoon

GENERAL AIMS OF THE PROJECT

- to draw attention to the special problems of the coastal zone
- to promote the idea of a regional ICZM
- to produce research results of regional, national and international relevance

Notes

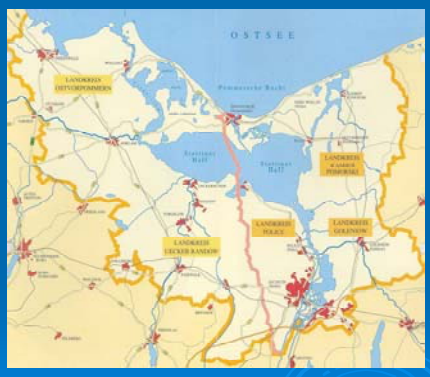
SOME FACTS ABOUT THE PROJECT (2)

RESEARCH ACTIVITIES

- Analysis and evaluation of catchment – coast interactions
- Analysis of climate change impacts
- Harmonisation und integration of tools, plans, stakeholder networks relevant to ICZM
- Integration of information about the region (GIS, DSS, meta information system)
- Suggestions towards sustainable tourism
- Regional participation, coordination and information
- Development of an indicator set

SOME FACTS ABOUT THE REGION (1)

- German-Polish border region
- a rural, structurally weak area
- German part: 2 districts
- Polish part: 3 districts, cities Stettin, Swinemünde
- area: 7.400 km²
- inhabitants: 840.000 (incl. Stettin: 415.000)



SOME FACTS ABOUT THE REGION (2)

POTENTIALS OF THE REGION:

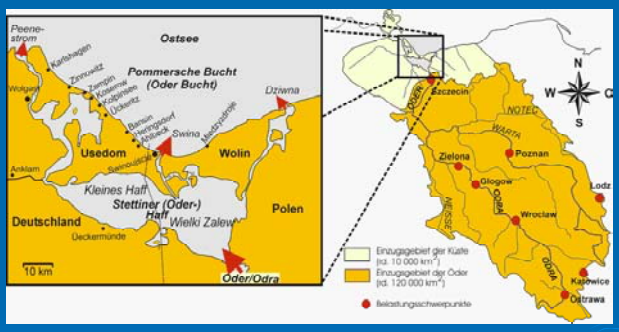
- an intact and varied natural landscape
- a popular tourist destination
- efficient agriculture
- Stettin as a potential regional growth core

IMPORTANT ECONOMICAL SECTORS: agriculture, tourism

OTHER ASPECTS RELEVANT TO ICZM: fisheries, nature conservation, shipping, maritime industry

Notes

SOME FACTS ABOUT THE REGION (3)



A MAJOR PROBLEM related to the coast is the eutrophication and organic pollution arising from agriculture, wastewater of households and industries. The main influx comes via the river Oder.

THREE ASPECTS TO CONSIDER

1. A BORDER REGION AND A COASTAL REGION
   → THE CHALLENGE OF THE DOUBLE INTEGRATION
2. THE CONTEXT OF EXISTING REGIONAL CONCEPTS, STRATEGIES AND NETWORKS
3. LESSONS LEARNED FROM THE DEVELOPMENT OF SD INDICATORS

1. A BORDER AND A COASTAL REGION

- border region with different and common problems / with a common perspective
- mental and language barriers as a problem

German sea side	Polish sea side
German land side	Polish land side

River Oder with river basin and estuary

- THE CHALLENGE OF THE DOUBLE (TRIPLE) INTEGRATION
  - → integration German / Polish side
  - → integration sea / land
  - → (integration catchment area / estuary)

Notes

2. ICZM AND THE REGIONAL CONTEXT

VARIETY OF INTEGRATED CONCEPTS, STRATEGIES, NETWORKS

many different activities of regional development involving often the same stakeholders in different networks
→ Regional Agenda 21 as a potential common umbrella
→ Compilation and consolidation of regional guidelines and goals

CONCLUSIONS

→ The integration of ICZM into the context of regional development is the chance to connect ICZM with other strategies. (ICZM is only one aspect of regional development.)
→ The consideration of the existing networks, strategies and goals ensures acceptance of ICZM efforts.

3. LESSONS LEARNED

DEVELOPMENT OF SD INDICATORS – EXPERIENCES

- The potential is absolutely not exhausted yet.
- divergence between scientific demands and practical realization
- A reason for the development is often an external impulse.
- criteria at the local and regional level: The indicators must be applicable, understandable and connected with existing data. Systematic frameworks and comparability with other communities or regions are not so important.
- main functions: reports, information and public relations
- rare use for control and evaluation of management processes

(Heiland et al. 2003, Gehrlein 2002)

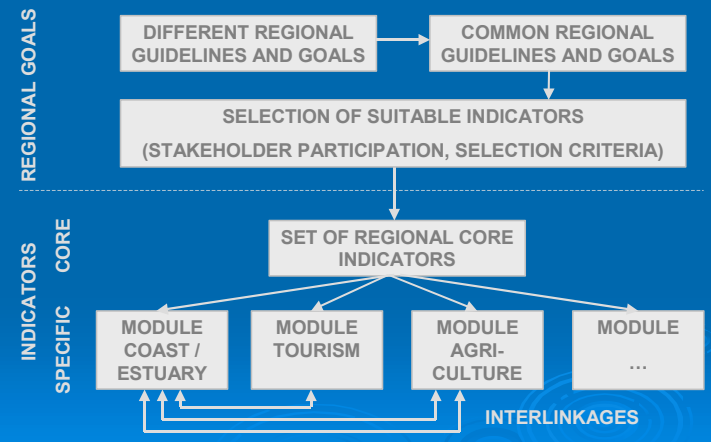
3. LESSONS LEARNED

RECOMMENDATIONS FOR THE FUTURE

- consideration of different functions and target groups
- indicator system structured in modules in relation to existing problems and activities
  (core indicators and thematic modules with specific indicators)
- identification of interfaces with the practical work (user needs)
- participation of stakeholders
- orientation towards accepted goals
- responsibilities for indicators or modules

Notes

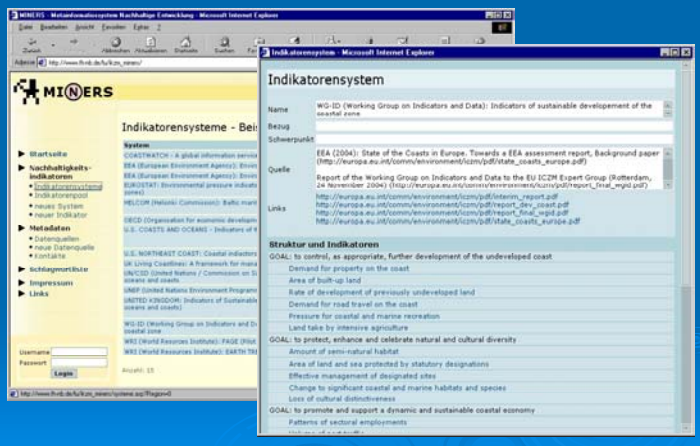
FROM REGIONAL GOALS TO INDICATORS



REGIONAL GOALS - EUROPEAN INDICATORS

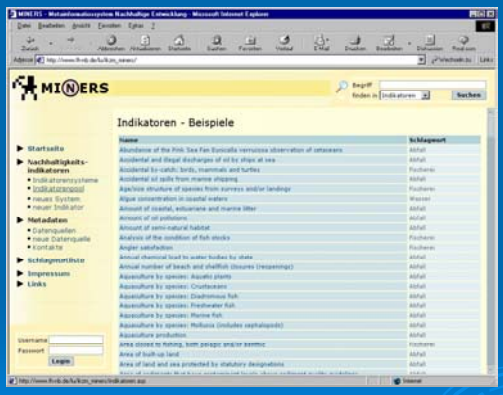
- CASE STUDY: application of the WG-ID indicators in the Oder estuary region
- THESIS: Most of the European indicators are suitable to regional guidelines and goals.
- EFFECTS:
  - → input for the development of regional goals for the sea side (draft of a common regional coastal management plan, regional planning for the sea)
  - → inputs for the European discussion and the applied research in the Oder estuary region

DATABASE: INDICATORS FOR THE COAST



Notes

DATABASE: INDICATORS FOR THE COAST



NEXT STEPS: thematic grouping and ranking

University of Applied Sciences Neubrandenburg / Jens Hoffmann / Lutz Vetter

www.ikzm-oder.de / www.agenda21-oder.de

RESEARCH ON INDICATORS FOR THE COAST:

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Fachhochschule Neubrandenburg
(University of Applied Sciences Neubrandenburg)
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www.fh-nb.de

Notes

Sustainability Indicators for the use of inshore waters
For Food Production

David Jackson

Structure of Presentation

1. Describe the Task/Challenge
2. Describe the Traditional (current) Approach & it's strengths
3. Review recent developments in Ireland
4. Look to a way forward

The Challenge

ICZM is about finding a balance between potentially conflicting goals:-

- To restrict further development of undeveloped coast
- To promote & support a dynamic& sustainable coastal economy
- To reduce social exclusion in coastal communities
- To use natural resources wisely

Report to the EU ICZM Expert Group (WG on Indicators & Data)2003

Notes

The Challenge

- The way forward is not seen as requiring a new layer of bureaucracy or structures
- A closer integration and inter-relation of current management structures & processes is necessary
- Widespread consultation & appropriate stakeholder participation

What models are available ?

Current Practice

The EIS process:-

- Scientific data collection (physical & biological characteristics)
- Analysis of potential Impacts (environmental damage, biological interactions, impacts on other resource users)
- Publication & Consultation Process
- Post EIS submissions & formal consultations (stakeholders, other {regulatory} agencies)

Feedback to licensing Process:-

- Basis for statutory consultation
- Basis for decision making (yes/no)
- Influences limitations & conditions attached to licenses

Information to be contained in and EIS for salmon farming

Location and dimensions of proposed farm

Site Characteristics
Natural Features , Water depths,Currents (speed and direction), Water exchange, Wave climate
Benthic flora and fauna, Temperature / Salinity, Dissolved oxygen, Location of existing fish farms in the area, nearest SAC/SPA, Fishing activity, Recreational activity , Salmon and sea trout runs……..

Production process
Production model**,** Husbandry management, Fallowing periods
Single Bay Management and CLAMS plans……

Potential Impacts
Amount of solid and dissolved waste produced, Sediment loading
Impact on benthic flora and fauna, water quality, seabirds, marine mammals
Impact on tourism, existing infrastructure , Visual impact…….

Mitigation measures
Description of measures to mitigate adverse impacts of the project

Monitoring

Difficulties in completion of EIS

Consultation
List of individuals/organisations consulted, Responses of consultees

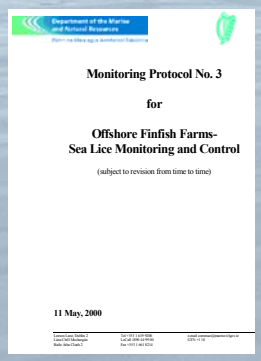
Notes

Monitoring (as an indicator & management tool)

Monitoring Protocols 2000

- Series of five covering:-

1. Benthic Monitoring
2. Water Column Monitoring
3. Sea Lice Control
4. Fallowing
5. Audit of Operations



Monitoring Protocol No. 3

for

Offshore Finfish Farms-
Sea Lice Monitoring and Control

(subject to revision from time to time)

11 May, 2000

Bay Management

- First integration efforts date back to 1993/'94
- Single Bay Management (SBM) for Salmon Farms
- CLAMS (co-ordinated local Aquaculture Mangement System)
- Included as a licence condition in all new licences
- But: no statutory basis

- Both monitoring protocols & SBM/CLAMS feed back into licences via:

1. Permission for incremental increases in production
2. Renewals

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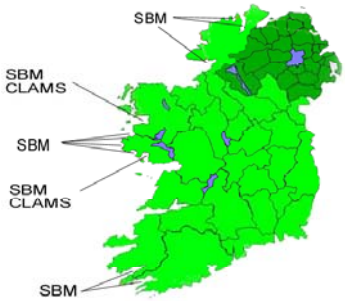


Notes

CLAMS – Co-ordinated local aquaculture management systems

- Incorporates and extends the concepts of SBM to all farmed species
- Allows for various codes of practice to be customised and integrated with the aquaculture industry operating within the bay
- Acts as focus group for local community
- CLAMS in Kilkieran since 2000 and Clew Bay since 2001

Risk Assessment

- The Risk Assessment Approach is advocated widely (*eg* ICES, FAO, OIE)
- EIS/Licensing Process contain elements of Risk assessment.
- Monitoring protocols (esp. Audit of Operations) allow for re-assessment of risks
- More formalised risk assessment protocols are currently under development (nationally & internationally)

Developments

- Use of CLAMS process as a management tool
- Modelling on a bay wide basis (*eg Clew Bay*)
- EIS documents prepared on a bay wide basis (*eg Cuan Chill Chiarain {Kilkieran Bay}*)
- Use of Audit of Operations as a "look back" indicator

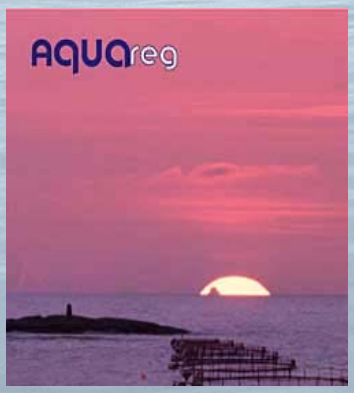
Notes

Monitoring Protocol No. 4
for
Offshore Finfish Farms – Audit of Operations

- The purpose of the Audit is to provide for an integrated assessment of finfish farm operations & to:-

1. Establish whether the terms and conditions of licences are being complied with
2. Inform decisions on proposals for increased production
3. Advise farm operators of changes in environmental parameters or other factors
4. Make public information from monitoring programmes

Coastal Zone Management



www.aquareg.com

- CZM project under Aquareg programme
- Liaise with other regions with aquaculture management expertise throughout EU and US
- Draw on experience of current management systems throughout these regions
- Develop code of best practice
- Run pilot studies and produce "how to" handbook for all stakeholders in a bay or region

CZM a common framework for Sustainable Aquaculture

- Joint Project (BMW, Trondelag, Galicia) under INTERREG IIIC
- Take the best from 3 regional initiatives:-

1. CLAMS in BMW
2. HASUT in Trondelag
3. Polygons/Cluster of Aquaculture in Galicia

- Local input through questionnaires & workshops
- Both industry & agencies highlight issues & concerns with current management and regulatory approaches

Notes

Hasut
Trondelag

- Series of sub-projects
- Multiculture of species
- Aquaculture 2010
- Area Project (mapping GIS)
- Site Quality Project
- Model for Public Coastal Management

Polygons
Galicia

- Participative planning for mussel culture
- Administration & aquaculture sector together
- Evaluate planning criteria
- Shared infrastructure
- Parallel organisation for fin-fish "Cluster of aquaculture of Galicia"

Potential Refinements to the Current practice

- Development of modelling & GIS approach
- Build in essentials of developing "Risk Assessment" approaches
- Full utilisation of the Audit of Operations "feedback" potential
- Impliment lessons from co-operative studies
- Develop *fora* for wider stakeholder participation
- Strengthen SBM/CLAMS approach

Summary

- In Ireland we have a sound basis for developing good sustainability indicators for inshore culture/fishing activities
- The EIS; Monitoring Protocol; Bay Management approach is appropriate & workable
- Refinement and international standardisation is needed/desireable
- There is a good body of existing data to provide a context for management processes

Notes

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