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Report of the Working Group on Integrated Coastal Zone Management (WGICZM)

17–20 April 2007

Mallorca, Spain

ICES International Council for the Exploration of the Sea
CIEM Conseil International pour l'Exploration de la Mer

International Council for the Exploration of the Sea
Conseil International pour l'Exploration de la Mer

H. C. Andersens Boulevard 44–46
DK-1553 Copenhagen V
Denmark
Telephone (+45) 33 38 67 00
Telefax (+45) 33 93 42 15
www.ices.dk
info@ices.dk

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Contents

Executive summary

The highlights from this year's WGICZM meeting were:

- Spatial planning has become the dominant tool for coastal planning and integrated ecosystem management especially for the coastal zone.
    - Essential fish habitat (EFH) maps need to be included in ongoing spatial mapping. EFH may be included in Natura 2000 sites, but without maps that identify these areas it is impossible to know if they are actually incorporated.
    - There is urgent need to prioritise work on producing maps on important fishing grounds and fishing activity areas that can be incorporated in coastal or ecosystem spatial planning.
- The WG acknowledge that indicators for ecosystem health or status are a primary link between science and policy for ICZM and should form the focal point for future research. More specifically, indicators need to be site specific and measurable and relevant at local levels in order to gain local acceptance and achieve practical application.

Six ICES countries; Denmark, Germany, Ireland, Spain, Sweden and the UK were represented at the 2007 WG meeting. Norway contributed by correspondence and Poland provided a country report.

The ICZM process has been initiated in all the countries that reported to this WG, but different approaches were taken and different stages of the process had been reached. ICZM is perceived as a continuous and iterative process that should be adapted as more information is generated, new sectors developed and new questions are asked. For example, the effects of climate change may require some adjustments to ongoing efforts and indicators associated with monitoring programmes. All countries recognise the need for comprehensive coastal programmes designed to resolve conflicting demands on the use of coastal resources, maintain coastal biodiversity and ensure long-term economic sustainability. The main driving pressures may differ between countries, varying from human activities such as mariculture, tourism and coastal defence to issues such as eutrophication and pollution.

All countries are still struggling with implementing Integrated Coastal Zone Management (ICZM). GIS maps on different resource uses and in some cases on potential resource uses have been drawn up and applied in order to manage or plan activities within local areas. Common to most countries is the fragmented administrative and management system for the coastal zone, lack of data compatibility and poor communication between authorities. This is further compounded for managing trans-boundary eco-regions.

Since Spatial Planning has become a dominant tool for coastal planning and management the WGICZM has identified a major weakness for the fisheries sector. Due to a lack of maps related to this resource, this sector is given little or no consideration when negotiating access with competing sectors. This is partly due to the historic open access rights of fishermen. With increasing demands on marine and coastal resources, areas where fishing is restricted have increased. To promote ICZM, specific zones need to be identified, where fishing is given priority. An example of mapping the fishing resource is provided by Sweden, where both the commercial and recreational fisheries in the Swedish waters are being mapped. Such mapping should be further encouraged to be collated by ICES at the eco-region level.

In the coastal zone, where competition for resources is fierce, essential fish habitat (EFH) maps are even more important for inclusion in ongoing spatial planning. EFH may be included

in Natura 2000 sites, but without maps that identify these areas it is impossible to know if they are actually incorporated.

The WGICZM recognised that indicators are a primary link between science and policy for ICZM and should form the focal point for future research. Much effort has been put into formulating objectives for indicators, describing how to choose them resulting in proposed lists of indicators. WGICZM recognised that indicators need to be site specific and measurable and relevant at local levels in order to gain local acceptance and achieve practical application. In order to examine this aspect in more detail, case studies will be provided for discussion at the next meeting in 2008.

1 Opening of the meeting

The Chair, Josianne Støttrup, DK, opened the meeting at 0900hrs on Tuesday, 17 April 2007 and welcomed the participants. The local host, Beatriz Morales-Nin, IMEDEA made some announcements regarding domestic arrangements.

A list of participants is included at Annex 1.

Beatriz Morales-Nin apologised for being unable to attend the meeting beyond Tuesday due to a conflicting meeting where she is representing Spain. Apologies were received from those unable to attend due to conflict with the ACME meeting or with other commitments.

Clare Greathead, UK, kindly accepted to act as main Rapporteur for the group, with support from the rest of the group who drafted parts of the report.

2 Adoption of the agenda

A draft Agenda was circulated in advance of the meeting. Small changes were made to the order to accommodate the attendance of some of the participants that were unable to attend the full meeting. The adopted Agenda is presented in Annex 2.

3 Terms of Reference

The Terms of Reference for the group were presented to the members in advance of the meeting and are presented below. Responsibility for compiling the information for each ToR was delegated to different WG members prior to the meeting.

a) update and report on activities of relevant ICES Working and Study groups to identify information pertaining to coastal zone and evaluate this information relative to ICZM needs;

b) update and report on ICZM activities in different ICES countries using the new ICES ICZM reporting format and review progress from the EU country report (http://europa.eu.int/comm/environment/iczm/), and on activities in different international organisations (e.g. EU and developments concerning EU ICZM);

c) revise and update list of tools and data products and research needs;

d) monitor and report results generated from larger projects that are directly relevant to ICZM needs;

e) provide national reports on coastal activities including:

  i) an update on monitoring coastal recreational fisheries and evaluate the progress;

  ii) an overview on national time-series coastal monitoring programmes (including Natura 2000) and the extent of the data accessibility;

f) report on the effects of thermal, chemical and saline pollution produced by desalinisation and power plants;

g) revise and develop the draft on the development of a framework for integrated evaluation of human impacts in the coastal zone and how to integrate this information for CZM, identifying ICES' role in the application of the WFD in the coastal zone.

WGICZM will report by 3 May 2007 for the attention of the Marine Habitat Committee, ACME and ACE.

3.1 Update and report on activities of relevant ICES Working and Study groups to identify information pertaining to coastal zone and evaluate this information relative to ICZM needs (ToR a)

Recommendation: WGICZM recommends continuing to update and report on activities of relevant ICES working and Study groups to identify information pertaining to coastal zone and evaluate this information relative to ICZM needs and review progress from the EU and IOC.

The information for this ToR is compiled in Annex 5, Table A5.1.

The ICES WG/SG reports that were available on the ICES website were reviewed. Due to the timing of the meeting, only the 2006 reports were available. This means that some of the comments or identified needs for information may already have been taken up and considered by a group during 2006 but would not be registered in this report.

The information for this ToR is summarised in Table A5.1. Several WG/SGs have taken on a sector approach, compiling information on ecosystem effects of a human activity such as mariculture or mineral extraction, whereas others focus on Key Issues that may be relevant to a number of human activities such as eutrophication or chemical contamination.

In the 2006 report of the WGICZM it was decided to use the Sector approach for this ToR which was based on Table 5.1 of the SGINC report (ICES CM 2004/E:08). This structure was maintained and the table updated in this year's report. However it should be kept in mind that ICZM attempts to overcome single sector management and to overcome compartmentalized approaches. The different reports were reviewed for information on coastal impacts of Natural influences such as climate change and Human Activities such as Mariculture, Fisheries, Oil and Gas, Mineral Extraction, Tourism/Recreation, Transport/Port, Residential/Urban development, Physical structures and Land use Practices/Dams. For each Human Activity a number of Key Issues were also listed, so the WG/SG information was listed according to Key Issue under each Human Activity or Natural Influence. A few WGs have a regional focus (eg. Baltic Sea, North Sea) and their task is not unlike that of this WG; with a major difference that this WG does not compile data. A disadvantage to this approach is that several Key Issues are common to a number of human activities and the generic approach of the WG made the information relevant to several Human Activities, which resulted in some repetition.

Focus within ICES WGs is primarily on the effects of fisheries and mariculture. The impacts of several human activities are largely unexamined. These include tourism, coastal erosion prevention, transport, urban development and land use practices. Much of the information compiled for key issues such as eutrophication and chemical contamination is relevant to different human activities, whereas the issue of e.g. habitat destruction needs to be related to the different human activity and how these may impact negatively different habitats.

There is some progress on the development of indicators, and on the development of Sustainability Indices for Integrated Mariculture Systems. The regional working groups are struggling with the enormous task of integrating data towards integrated ecosystem-based fisheries management.

Recommendation: The WGICZM recommends to continue to update and report on activities of relevant ICES Working and Study groups to identify information pertaining to coastal zone and evaluate this information relative to ICZM needs.

3.2 Update and report on ICZM activities in different ICES Member Countries (ToR b)

After reviewing the country updates it is evident that there is still limited development of ICZM in many European countries.

The primary reasons for this are:

- Fragmented responsibilities for legislation and policies among authorities,
- Lack of a legal framework to support ICZM nationally and internationally,
- Lack of compatibility among legislations at the national and eco-region (ICES) levels,
- Inefficient collection, communication, dissemination, and limited compatibility of available data sets.

The countries represented at the meeting could be said to cover approximately 58% of the European coastline. This meant that there were contributions from a broad range of countries and sectors in all the topics discussed at the meeting.

The available country updates are presented in full in Annex 6. The table in Annex 6 (Table A6.1) is an overview and comparison of a number of issues relevant to integrated coastal zone management for different countries. There were generally very few changes to the content of the table but the structure was changed slightly to divide the key issues section into key activities in the coastal zone and the issues that relate to these activities.

In summary, the table tells us that only two thirds of the countries represented at WGICZM have completed an ICZM stocktake and produced an ICZM strategy document.

Many of the countries had key issues in common; most of which related to a very highly or over exploited coastal zone, which lead to conflicts of interest between sectors. Many also highlighted the use of GIS in the coastal planning process to map resource use. This is picked up and discussed further in ToR c.

Although in many countries the process of managing activities in the coastal zone is still fragmented and requires integration, some countries are making progress. This can be seen by the large number of ICZM projects relating to management and data coordination, some of which are described in detail in the full country reports (Annex 6) and ToRs c and d.

All countries have ongoing programmes for the designation of sites for marine nature conservation, either under the Habitats and Birds Directives or, as in the case of Canada, Marine Protected Areas under the Oceans Action Plan. Progress towards the implementation of the Water Framework Directive is continuing in all countries; most countries have finished the classification stage, and some have monitoring programmes in place.

Recommendation: WGICZM recommends continuing to update and report on ICZM activities in different ICES countries, including information on monitoring of recreational fishing and other coastal monitoring programmes.

3.3 Monitor and report results generated from larger projects that are directly relevant to ICZM needs (ToR d)

A number of projects were presented this year representing networks or aimed at developing tools for ICZM. Some of these are ongoing, or newly initiated indicating increasing focus and emphasis on ICZM issues. Four larger EU projects deal with specific tools relevant for ICZM. One deals with the use of Marine Protected Areas as a tool for fisheries management and for marine environmental protection (PROTECT, www.mpa-eu.net). The results from this project may be useful in developing the ecosystem approach to managing the coastal zone and in particular fisheries and aquaculture activities within this zone. Spatial planning is an essential

tool for ICZM and 2 larger EU projects were identified working with implementing GIS information in management (BALANCE and Mapping European Seabed Habitats (MESH) http://www.searchmesh.net/). Marine mapping may be a useful tool in the physical planning process and the multiple layering enable integrated management. SPICOSA (www.spicosa.org) aims to develop tools and methodologies for resolving integration of information between science and policy. An EU Network has formed to facilitate access to national networks and to coordinate knowledge and experience of ICZM within 18 European countries (ENCORA, www.encora.org). A number of websites are already available containing information pertinent to ICZM (See Annex 7).

Full reports of the projects mentioned above and other relevant projects can be found in Annex 7.

Recommendation: continuing the monitoring and reporting on results generated from larger projects that are directly relevant to ICZM needs.

3.4 National reports on coastal activities (ToR e)

3.4.1 Update on monitoring coastal recreational fisheries and evaluate the progress

It is evident from the country reports on this ToR that very few countries are regularly collecting data on recreational fisheries. WGICZM considers this information to be highly important and of significance to fisheries management in general. It is particularly important for recording the abundance of non-commercial fish species.

There is a great difference in the status and definition of recreational fishing between the countries that submitted reports, but it is clear that the very nature of this activity (large sections unregulated and very dispersed) means that collecting data on it could be difficult.

Recommendation: WGICZM recommends that recreational fisheries monitoring programmes be developed and improved and that WGICZM continues to report on this topic in future within the country reports (ToR b).

Denmark

The catch registration project (2002–2004) aimed at documenting and registering fish catches in nets and traps in Danish coastal waters. This project was launched on the initiative of, and based on voluntary work by recreational fishermen organised within two organisations: Danish Organisation for Amateur Fishermen and Danish Union of Recreational Fishermen. The project comprised of a total of 30 stations which were fished with nets and/or traps. These were pooled into 23 localities an include data on species caught in the different gear at a particular area and time. Data on no catches were also reported providing CPUE and the length of the fish were measured in most cases. The catches of crabs were also registered. In cooperation with another project, accidental catches of birds or mammals were also reported.

The results from the catch registration project provided a good overview of fish occurrence, size and abundance expressed as catch per unit effort. The results were presented in a report: "Registreringer af fangster i indre danske farvande 2002, 2003 og 2004, Slutrapport, DFU-rapport no. 155.05", which is available on the website: www.difres.dk.

The highest number of fish species was registered in Århus Bay and Isefjorden. Those species caught in most areas were eel *Anguilla anguilla*, flounder *Platichthys flesus*, eelpout *Zoarces viviparus*, cod *Gadus morhus*, sea scorpion *Myoxocephalus scorpius*, plaice *Pleuronectes platessa* and turbot *Psetta maxima*. Eel and flounder are the two most common species in Danish coastal waters. Most of the registered fish were small in size. The catch per unit effort was relatively low for most species and in most areas. The highest catches of flounder per unit effort were those from Århus Bay with trammel nets. The highest catches of eel per unit effort

were those in Odense Fjord, Southern Fynen and in the southern part of Øresund. However, the precision for the comparison of catch per unit effort between areas is low. This is due to the high temporal and spatial variability of registration and the different gear used. The gear is often adapted to match local conditions with regards to currents, depth and other environmental conditions. Between the different regions of the country there are also differences in fishing season and catches.

In most areas there is an increasing distribution and abundance of crabs and therefore an increasing damage to the fisheries because they eat the caught fish.

To improve the ability to compare catches per unit effort and to better understand the variations in catches between different regions, the Danish Organisation for Amateur Fishermen, the Danish Union of Recreational Fishermen and the Danish Institute for Fisheries Research (DIFRES) decided to continue the catch registration project with associated 'key'-fishermen. This three-year project was initiated in 2005. The key-fishermen are voluntary participants fishing with nets or traps provided by the DIFRES. Key fishermen fish on fixed positions within a time-period from the 1st to the 10th of each month. A temperature logger has been provided to each fishermen to register the temperature at the gear position every third hour throughout the year. Monitoring the temperature allows the exploration of the influence of temperature on local fish catches throughout the year. Temperature is crucial for the water environment, fish welfare, distribution and growth. It is therefore important to monitor the temperature and its effects on fish catches and the environment in the years to come.

Spain

Recreational fisheries information is available on the number of designated recreational licenses but no regular monitoring is undertaken. Due to the significant number of individuals who fish recreationally without licenses; these available data are unlikely to be a realistic indication of recreational fishing pressure.

Sweden

Recreational fishing is popular in Sweden and involves about 3 million people. The expansion of recreational fisheries in Sweden calls for a new approach to the collection of data about catches. Since the 90s the Swedish Board of Fisheries has been testing the use of a postal questionnaire (see Annex 8 in ICES WGICZM Report 2006). The postal questionnaire has recently been adapted to include geographical information, so that the data can in future be used to prepare maps.

A low degree of organisation and high mobility are aspects of recreational fisheries that normally make the collection of data difficult. In the last decade, due to different reasons, the degree of organisation of recreational fishers (subsistence and sport fishing) has increased considerably in Sweden, which facilitates them being identified and accessed and makes the collection of data easier.

During 2006, the Swedish Board of Fisheries addressed ca. 850 organised subsistence fishermen from the County of Bohuslän on the West Coast, through an in-depth questionnaire. The response rate was high (ca 80%) and the answers provided a rich source of information.

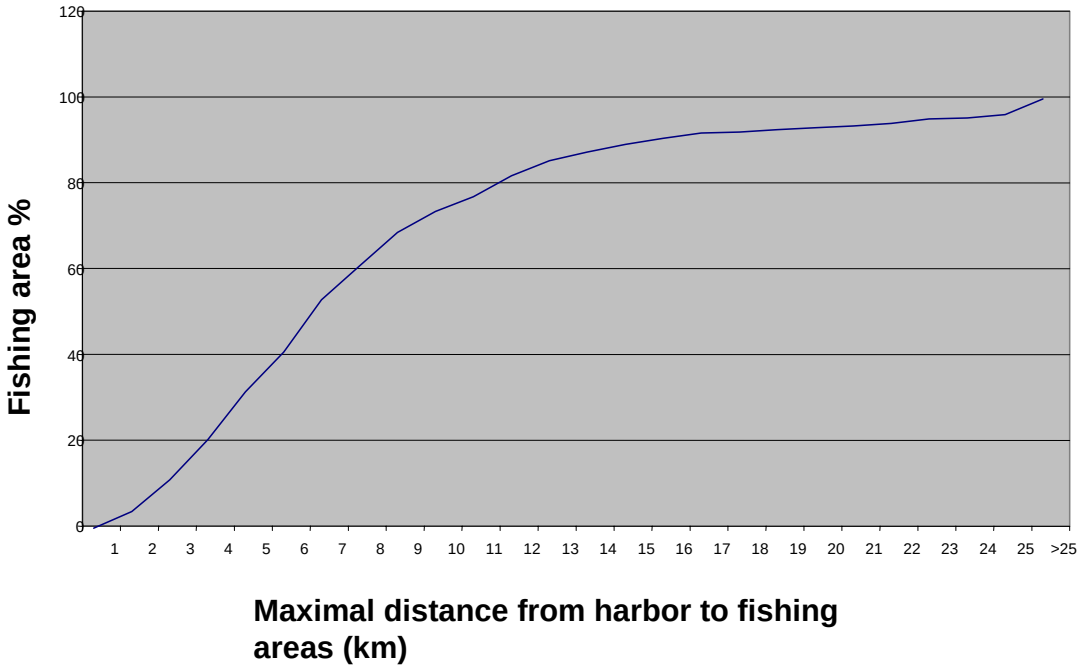

Figure 3.4.1 Respondent subsistence fishermen's maximal distance from fishing harbour to fishing area, Bohuslän, Sweden 2005.

The report, which is under preparation (forthcoming Paulrud and Thörnquist), presents conventional information, such as catch per species / kg. As illustrated in the figures below, it presents also less conventional but highly useful information such as distance to fishing areas (Figure 3.5.1) and days at sea (Figure 3.5.2). In this case also, the data collected includes geographical information which allows the preparation of maps. What is important here is to highlight that this type of information has shown to be extremely valuable to stimulate discussion on the sharing of coastal resources and the local management of fisheries.

For more information about the collection of data on and mapping of information about recreational fisheries in Sweden please contact Stig Thörnquist *stig.thornquist@fiskeriverket.se* and / or Anton Paulrud *anton.paulrud@fiskeriverket.se* at the Swedish Board of Fisheries.

United Kingdom

There is no government led system for the collection of data from recreational fisheries, although it is acknowledged that there is a need for it, if only to exclude these catches from the DCR.

The National Federation of Recreational Sea Anglers (NFSA) has produced two reports for the UK government on the scope and commercial value of recreational sea angling (RSA) to the UK economy. There are approximately one million people who participate in RSA in the UK spending some £1Bill each year and creating 19,000 jobs. About 65% of this activity is in England and Wales.

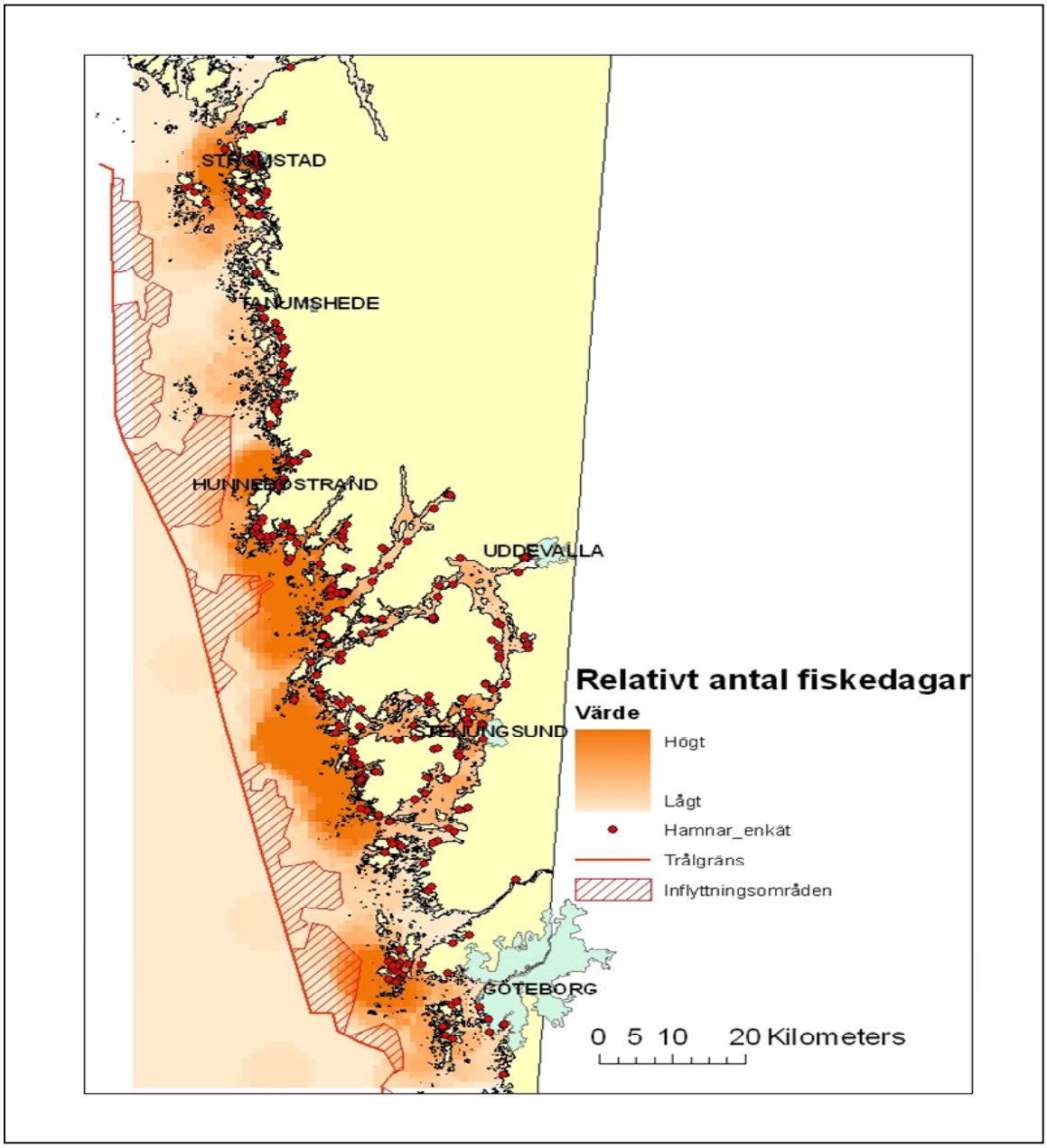

Figure 3.4.2. Respondents, subsistence fishermen's days at sea in Bohuslän, Sweden 2005. The stronger the orange colour the more intensive the fishing effort.

3.4.2 Overview of National Time-Series Coastal Monitoring Programmes

This section is intended to provide an overview of national time-series coastal monitoring programmes, including availability and distribution of information related to Natura 2000. Baseline and time-series coastal monitoring programmes are essential elements of ICZM because they allow decision makers to observe trends and patterns and to track progress towards specified goals and objectives. In addition, in order to maximize their utility, these data must be comprehendible and readily available to the public. The country reports provided below indicate that, in the majority of cases, times-series coastal monitoring programs are limited in number and efficiency and that data are not always as readily obtainable as they should be.

Recommendation: The WICZM recommends continuing the reporting on national monitoring programmes within the country reports (ToR b).

Spain

The majority of Spanish monitoring programmes have been established in response to requirements stipulated by European and national environmental legislation. In the majority of cases, they are enforced and implemented at regional levels by the autonomous regional governments. Although there are a number of significant ongoing activities, time-series data in Spain remain fragmented and, in many cases, not adequately accessible. The following paragraphs summarize some of the major activities related to time-series-coastal monitoring programmes, including Natura 2000.

Natura 2000

A map of LICs (Lugares de Importancia Comunitarias) designated under the Natura 2000 Network is available online at the Spanish Ministry of Environment's webpage (http://www.mma.es/portal/secciones/biodiversidad/rednatura2000/). There are currently 1,381 LICs listed on the website, categorized at the level of autonomous communities, including links to text files with information (characterization, vulnerability, quality etc.) pertinent to each area. Each region is required to submit a status report to the EC on habitats and habitats of species designated as LICs every six years. In addition, information on the 27 marine protected areas is available at: http://www.wwf.es/red_amp_espana.php and http://www.faocopemed.org/es/activ/research/mpas.htm#part5. These are managed by the autonomous regional governments, in addition to two national Maritime-Terrestrial Parks (Islas Atlánticas in Galicia and Cabrera in the Balearic Islands), established in 2007.

Networks of Oceanographic Data

Puertos del Estado

Puertos del Estado is a public entity within the Spanish Ministry for Transport and Public Works. It is responsible for the execution of the Government's port policy and for coordinating and controlling Spanish ports. The monitoring networks of Puertos del Estado are designed to obtain, in real time, detailed information about the physical features (waves, tides, temperature, wind, etc) of the Spanish territorial waters.

There are four principal networks of oceanographic data with different objectives (quoted directly from http://www.puertos.es):

- Deep waters: The deep sea network is based on 11 Seawatch and 3 WaveScan buoys stationed at sites with depths between 200 and 800 m and measure atmospheric and oceanographic parameters. Data are transmitted every hour via satellite to Puertos del Estado and directly posted to this web page. A new buoy has been deployed in the Mediterranean South of Mallorca Island in late 2006.
- Coasts: The Coastal Network provides real time data at some specific sites located in shallow waters. The main objective of these sites is to complement those of the Deep Sea Network at locations of special interest for the port operations or wave modeling validation. The buoys employed are scalar and directional Waverider (REMRO network), and directional.
- Current meters: The main objective of the Current meter Network is to obtain oceanographic data (currents, temperature and salinity) to complement those of the Deep Sea Network. The network is based on current meter chains, consisting of several RCM7 recorders located at different depths. No real time data is available.
- Tide gauge: The REDMAR tide gauge network has been in operation since 1992 to monitor sea level in real time and generate a historical series for their further study. Presently the network is composed of 14 SONAR acoustic sensors, 7

Aanderaa pressure sensors and 7 Miros radar sensors. The latter ones also measure agitation

Puertos del Estado also provides forecasts of waves, tides and sea levels on the Spanish coast, which are based on numerical models and an Oceanic Data Base that includes data from the monitoring networks. All of this information is available to the public, in real time, on the website http://www.puertos.es.

Instituto Nacional de Oceanografía (IEO)

The Spanish Institute of Oceanography maintains a data base that provides information to the public related to different oceanographic parameters including, temperature profiles, salinity and bio-chemistry, current time series, and sea level time series from the IEO tide gauge network (http://indemar.ieo.es).

ESEOO Consortium

ESEOO (establecimiento de un sistema español de oceanografía operacional) provides an additional public data service of time-series oceanographic data analyses (i.e. currents, waves, hydrography, atmosphere). The ESEOO also provides a unified access point to additional real-time oceanographic and meteorological data of the Spanish coast obtained by other entities (http://www.eseoo.org).

Meteorological Service of Catalunya

This service provides real-time oceanographic data through a network of buoys. In addition, data on sea temperature are collected daily in L'Estartit, Costa Brava, Girona (http://www.meteocat.com/marcs/marc_e_mar.html). This is an important initiative because it is the longest time-series of sea temperature data in Spain.

Pais Vasco (AZTI)

This service provides real-time oceanographic (currents, tides, waves, sea temperature) and meteorological data (air temperature and pressure, winds, radiation, visibility) through a network of seven buoys located in the main ports of the Basque Country, since 2003 (http://www.euskalmet.euskadi.net/s07-5853x/es/meteorologia/selest.apl?e=5). In addition, data on sea surface temperature are collected daily in San Sebastián since 1946.

Bathing Water Directive

Monitoring of bathing water quality is the responsibility of the autonomous regional governments and the results are usually available to the public through the respective web pages. The autonomous regional governments are also responsible for monitoring of HABs. These data are collected by regional agencies, generally during the summer. The Portuguese and Spanish teams working on the subject meet annually in order to standardize methodologies and discuss the emerging issues and challenges (http://www.upct.es/reunioniberica).

Water Framework Directive

The methodologies for establishing the quality status sensu the Water Framework Directive are still under development in most transitional and coastal areas of Spain. At the same time, the intercalibration process is being carried on at national and international levels. The Basque Country and Catalonia are probably the regions in which these issues are more advanced. The classification of the quality status of the transitional and coastal waters in the Basque Country, and the complete reports from the monitoring programme for the WFD, are accesible on line (http://www.ingurumena.ejgv.euskadi.net/r49-7663/es/contenidos/informacion/calidad_aguas/es_957/calidadaguas_c.html).

Plan Director de Costas

The *Plan Director de Costas* is an initiative of the Spanish Ministry of Environment which was drafted in response to the EU Recommendation 413 on Integrated Coastal Zone Management in Europe. One of the objectives of the initiative is to obtain data related to the characterization of each sector of coastline in Spain. In addition, the data will be collected on the governance system and natural and cultural resources of the coastal zone. The data are in the process of being collected and, once available, will be accessible to the public through their website.

Monitoring related to coastal erosion and oceanography is also implemented by an I&D entity under the direction of the Ministerio de Fomento (http://www.cedex.es/).

Integrated information system

Under the direction of the Ministry of Environment, an integrated information system is being developed by the University of Cantabria using GIS. This system will provide information to stakeholders for implementing the Spanish Master Plan for Sustainable Development of the Coastal Zone. Information on the system and the data sets it will provide can be downloaded from:

http://www.gisig.it/eco-imagine/pres_ppt/Nice/esri/15-sano_jpeg.pps

Seventy five percent of the Spanish coasts are included in this monitoring system (see below) with sites on the mainland and Canary and Balearic Archipelagos.

Socio-economic Data

There is no significant systematic data-collection strategy related specifically to socio-economic factors affecting the coastal zone. However, there are a number of sources of data at national and regional levels related to tourism, population demography, and the economy in particular, mostly collected by the National Institute for Statistics. All of these factors are of extreme importance to the coastal zone but, to date; data collection efforts remain somewhat fragmented at spatial and institutional levels.

Fisheries Monitoring

Under the 2001 Spanish Fisheries Law, the Spanish Institute of Oceanography is in charge of monitoring fisheries in the coastal zone on behalf of the general Fisheries Directorate of the Spanish National Government. Information collected, in addition to the data provided by the regional autonomous governments described in the following paragraph, include: catch size, length frequency composition, biological sampling of some species, and infrequent by-catch

data. However, this information is not available to the public and must be solicited independently.

The regional governments also have competences related to fisheries legislation and monitoring in onshore waters as well as in the local sales wharfs. Throughout Spain, fishermen are required to sell their project directly to local Sales Wharfs specified by the government. Data collection at these wharfs has been digitalized in the last 4 years. Information registered in the wharf data bases includes the number of boats, landings, prices, and effort. Again, these data are difficult to obtain and must be solicited independently.

Environmental monitoring

The Spanish Institute of Oceanography has a series on fixed stations that monitor phytoplankton and zooplankton levels with monthly periodicity. However, this information is not available to the public and must be solicited independently.

Water quality, bacteria and pollutants are also being monitored using mussels (*Mytilus galloprovincialis*) as sentinel organisms in a series of fixed stations all along the Spanish coast. This initiative falls under the umbrella of the international programme Mussel Watch. These data are also not available to the public.

Data on cetaceans in the coastal zone are available through the Ministry of Environment (http://www.mma.es/portal/secciones/biodiversidad/), as well as data on beachings, which may be indicators of contamination or other environmental problems (http://medaces.uv.es/).

United Kingdom

UK Monitoring and Assessment Strategy (UKMMAS): Two UK reports, Safeguarding our Seas (2002) Charting Progress (2005) and the Scottish equivalent Seas the Opportunity (2005) specified the need for an integrated assessment of our seas. The main objective of the UKMMAS is to make most efficient use of UK resources for monitoring and assessing the marine environment and consists of a high level, policy-lead Marine Assessment Policy Committee (MAPC). This is supported by a technical Marine Assessment and Reporting Group (MARG); which overseas the work of a number of other sub-groups to investigate and report on Objectives for the marine environment; preparation of Integrated Assessments; preparation of Protocols and a Monitoring Manual; Data Archiving via the Marine Data and Information Partnership (MDIP) and the Marine Environment Data – Action Group (MEDAG); and three Evidence Groups to collate data on the themes of "Clean and Safe", "Healthy and Biologically Diverse" and "Productive" seas.

http://www.defra.gov.uk/environment/water/marine/uk/science/monitoring.htm
http://www.defra.gov.uk/environment/water/marine/uk/science/pdf/ukmmas-strategy.pdf

United Kingdom Directory of Marine Observing Systems (UKDMOS): This will support the requirements of the UKMMAS and provide a discovery resource for legislation such as the Water Framework Directive (WFD). There are also a number of other ongoing initiatives that require metadata from monitoring programmes such as the European Global Ocean Observing System (EuroGOOS), and the Environmental Research Funder's Forum (ERFF). This information is also required as part of the UK contributions to EU-wide monitoring methods and systems of surveillance for species and habitats of Community interest (EUMON), and the Global Climate Observing System (GCOS). It is proposed that UKDMOS will become a single application that will meet all of these requirements.

UK Marine Environmental Change Network (MECN). This is collaboration between organisations in England, Scotland, Wales and Northern Ireland collecting long-term time series information for UK marine waters. It is coordinated by the Marine Biological Association of the UK (MBA) and is funded by the Department of the Environment, Food and

Rural Affairs (DEFRA). The goal of the network is to use long-term marine environmental data from around the British Isles and Ireland to separate natural fluctuations from global, regional and local anthropogenic (human) impacts. Currently, the MECN is working with the Marine Climate Change Impacts Partnership (MCCIP) in the production of an annual report card on the issue of climate.

United Kingdom (Scotland)

The Fisheries Research Services (FRS) Coastal Long Term Monitoring project was set up in 1999 to monitor water quality parameters at 10 sampling sites around Scotland. The measurements taken as part of this monitoring are used to create a continuous *time series* of the variation in key properties of the sea. This time series data set will enable us to study the impact of climate change on Scottish coastal waters, as well as giving us information on typical background conditions. Parameters measured include water temperature, salinity, nutrients (such as phosphate, silicate, nitrate and ammonia) and phytoplankton.

Another scheme, the Stonehaven and Loch Ewe Ecosystem monitoring, consists of one site on the East Coast (Stonehaven) and two sites on the West Coast (Loch Ewe). Weekly samples are taken (weather permitting) with the present and long-term objective to monitor and assess the state of the ecosystem in the eastern, coastal waters of Scotland from the Stonehaven site and in contrasting waters of the Scottish west coast from Loch Ewe.

WFD: The Scottish Environment Protection Agency (SEPA) and other responsible organisations in Scotland have developed a new monitoring and classification system to deliver the WFD in Scotland. The bulk of the monitoring work is operational monitoring, targeted on 66 of the 81 water bodies at risk. The objective of this work is to establish the status of those bodies and help inform the targeting of any measures that may be needed. 'Not at risk' water bodies have been grouped within coastal sediment transport cells (a relevant geographical unit for marine ecosystems) and then by the pressure profile which may be acting on the water bodies. 5–10% of these water bodies are monitored and the classification extrapolated across the group.

In Marine (coastal and transitional) waters there are 300 physico-chemistry sites and 270 biology sites for operational monitoring. The surveillance network consists of 35 transitional and 140 coastal sites and has built on the long established UK National Marine Monitoring Programme (NMMP), which in turn has been amalgamated into the new UK Monitoring and Assessment Strategy (see above). Although surveillance monitoring will be at a frequency of 4 times per year it will be ongoing; consequently within a RBMP period 24 samples will have been taken.

In order to help deliver these new monitoring requirements, SEPA has developed a Scottish Monitoring Strategy with partners such as SNH, Scottish Water, British Waterways and Fisheries Research Services.

3.5 Report on the effects of thermal, chemical and saline pollution produced by desalinisation and power plants (ToR f)

Many large fossil and nuclear power plants rely upon water for cooling and are therefore located near such bodies of water and typically in the coastal zone. Thermal plants create or use steam in the process of creating electricity and also require water for cooling. On an average they require a reduction of 45% of their thermal potential. The conventional techniques for cooling are open circuit and evaporation towers. The first system requires enormous water quantities. This water typically comes from adjacent water bodies or groundwater sources and is discharged back into the water body at significantly higher temperatures. By altering the temperature in the "mixing zone," the discharges of thermal wastewater can have impacts on aquatic life.

There was no further information on desalination plants at the time of writing this report. The following contributions were received from Spain and the UK on the impact of Thermal Power Plants.

Recommendation: WGICZM recommends continuing to investigate this ToR and report on it again in 2008.

Spain

In Spain, the open circuit thermal plant process is only possible in coastal zones because the river systems inland are inadequate and therefore can not provide the amount of water required. The nuclear power plant *Ascó*, located on the NW Mediterranean coast, uses 2, 270 $Hm^3\ yr^{-1}$ for cooling. Evaporation cooling systems have a lesser requirement in water but have the additional problem of producing brine that has to be released in the environment. For instance, an evaporation refrigeration tower needs a water flow of 40, 000 $m^3\ h^{-1}$, evaporates 500 $m^3\ h^{-1}$ and results in increased salinity from 40 mg l^{-1} in the inflow water up to 250 mg l^{-1} in the outflow.

Besides the impact on land use of the plant and associated infrastructures, they have important impacts on emission of greenhouse gases and other pollutants. In some instances, the diversion of rivers creates reservoirs adjacent to power plants for cooling, rinsing and the releases of effluents. A variety of processes associated with fuel handling and ongoing maintenance of large thermal power plants create or concentrate chemical pollutants that are then discharged into nearby water bodies. Even when releases are limited to what are permissible according to water-use standards, there is still the occasional but inevitable accidental release.

The new combined cycle thermal plants using natural gas may be associated with desalination plants having a special regulation for discharging brine dissolved with the cooling-water. Several of these are now under development in Spain.

The thermal pollution is controlled by legal provisions, which generally restrict the cooling-water effluent temperature. For instance, in Spain the limits are 8ºC above inflow water and with the proviso that the environmental temperature does not increase more than an average of 3ºC at a distance of 200 m from the outflow pipe. The total water temperature must not reach over 30ºC. An impact study therefore, is imperative before a new plant is installed.

Few studies address the effects of the cooling-water on the environment. The use of chemicals for cleaning the cooling-water systems in some cases may have a more severe effect than the temperature (Crema and Pagliai, 1980; Karas, 1992; Lardicci, et al. 1999). In semi enclosed areas the runoff of the cooling-water may have effects upon the water mass and plankton distribution (Kaartvedt and Svendsen 1990). Although the turbulence and higher temperature related to the outflow may have functional effects, a study on algal communities, exposed to hot effluent on the Mexican Gulf coast, showed different degrees of photosynthesis rate reduction, higher light requirements (>500 µE m[2] s[-1]) and lower temperature (25 °C) to achieve Pmax than algae sampled in sites without such exposure (Martínez-Arroyo, 2001).

It is relevant to note that no recent scientific publications on the subject have been found for European waters on the on-line Journal systems currently used. Neither is the information on the impacts seems to be accessible.

Scotland

There are two active nuclear power stations in Scotland Torness (1364 MW) and Hunterston B (1288MW) and four that are in the process of decommissioning. There are two coal fired and two oil and gas fired power stations. Cooling water, abstractions and discharges from coastal power stations are regulated by The Water Environment (Controlled Activities) (Scotland)

Regulations 2005. Under the WFD there are presently 2 Coastal and 3 Transitional water bodies affected by point source discharges from power stations. Discharges will include high temperature water plus some or all of the following chemicals: TBT, anthracine, naphthalene, PAHs, benzene, HCB, cadmium, mercury.

At Longannet, SEPA has carried out some monitoring in the past of boiler washings and contamination of the foreshore from Cu contamination. At present there is a fish monitoring programme carried out 12 times a year to monitor fish entrainment in the cooling water intake screens. These are checked by SEPA and the data collected and compared to fish populations in the Forth Estuary. There is also some monitoring work being carried out on particle size analysis as part of the Forth Estuary Environmental Assessment Programme (FEEAP).

At Cockenzie, SEPA undertakes Dangerous Substances Directive sampling as part of the mussel-watch programme. The contributor was not aware of any other monitoring at power stations in other parts of the country.

Tracking and monitoring for radioactive particles is in place including continuing programmes for the decommissioned stations. Information on radioactive impacts is published annually in Radioactivity in Food and the Environment (RIFE) available on the SEPA website (www.sepa.org).

No further information was provided for this ToR.

3.6 Revise and update list of tools and data products for research needs (ToR c)

A strong theme throughout the EU Maritime Green Paper is that of an integrated approach to governance but also to the development of technological approaches and in the sharing of pan-European datasets & mapping resources.

Top down legislative approaches are necessary to provide a generic, over-arching policy framework which endorses the concepts of ecosystem based management, precautionary principles and holistic approaches to management of our ocean resources. The legislative context is set in Canada and the United States, for example, through the Oceans Act and CZM Acts, respectively, which endorse these principles and support their ocean management strategies. The proposed Marine Bill in the UK similarly provides a legislative context for marine spatial planning as a tool to deliver on integrated approaches to sustainable resource development and to provide for local specificity.

The Maritime Green Paper suggests the use of marine spatial planning as a tool to deliver sustainable development of our coastal regions. Marine Spatial Planning effectively involves technological approaches to predicting areas for suitable development and areas in need of protection. This must be based on best available data & scientific evidence, stakeholder involvement & socio-economic influences. Marine Spatial Planning is best achieved by first developing the technological approaches, to first “know your resource”. This is achieved through seabed mapping programmes, hydrographic modelling and from baseline datasets derived through various national monitoring programmes.

Filling in these knowledge gaps provides for better informed management decisions. Once the resource maps are created and spatial needs identified, the datasets can be integrated into GIS. As well as utilising the resource maps, forward planning must incorporate socio-economic components and be driven by priority needs for the region. This involves public consultation and ensures local specificity. Not all aspects of the management approaches can be displayed on maps however. Many behavioural and methodological aspects will be controlled through Technical Control Measures and codes of practice. What s important though is that each sector develops their management plans within an Integrated Coastal Zone Management context,

where they provide for integrated datasets, consider other users in the region, adopt the ecosystem management approach and consider the long term effects.

The key steps in the marine spatial planning approach and the important research areas are as follows:

- Data collection standards must be applied internationally and provide for integration of national datasets as well as providing for integration with other datasets in GIS.
- Involvement of industry in sampling, for example, traditional fishing information from inshore fishermen to provide resource maps for spatial planning.
- Continued application of seabed mapping and acoustic surveys to identify ecologically important areas, for example, fish nursery and spawning areas.
- Continued development of hydrographic modelling for predictive capacities for pro-active designation of areas, for example, larval settlement areas, spawning areas, harmful algal blooms, etc.
- Provide for spatial planning approach i.e. the resource maps should be developed at an appropriate regional scale. For example, in inshore areas traditional fishing grounds should be mapped for different species and protected areas identified.
- Also temporal issues and behavioural issues need to be addressed by TCMs, Codes Of Practice (COPs), etc, and be published as part of a the wider Coastal Plan.
- Public consultation needed for local communities to identify important traditional activities and activities important to sustaining local communities. For example the fishing industry should engage in existing coastal fora such as Regional Advisory Councils, C.L.A.M.S., Coastal Development Plans public consultation. All sectors must ensure that relevant information is included in relevant socio-economic analysis, which will be a key driver in coastal planning.
- Monitoring programmes will need to be redefined to validate Marine Spatial Plans, particularly in relation to water quality. Where possible there should be an integrated approach to monitoring relative to the defined resource use.
- There should be compatibility between monitoring under the WFD and the proposed Marine Strategy Directive. This applies to monitoring programmes, sensor development programmes (currently under way to meet WFD requirements), administrative structures, etc. This is to ensure no arbitrary boundaries are established and to ensure compliance with the ecosystem based management concept.
- ICZM is specific to regions and influenced by local economic, environmental and social needs. Influences and pressures will change over time. A set of progress and sustainability indicators must be established to assess the level of ICZM achieved in a particular region and to assess to influences of socio-economic factors on planning needs.

Below are some examples of Marine Spatial Planning, including a diagram (Figure 3.6.1) showing the theoretical concept for marine spatial planning from the data level through to the wider ICZM process, involving public consultation, integration of the various layers and progress indicators to assess the level of ICZM achieved.

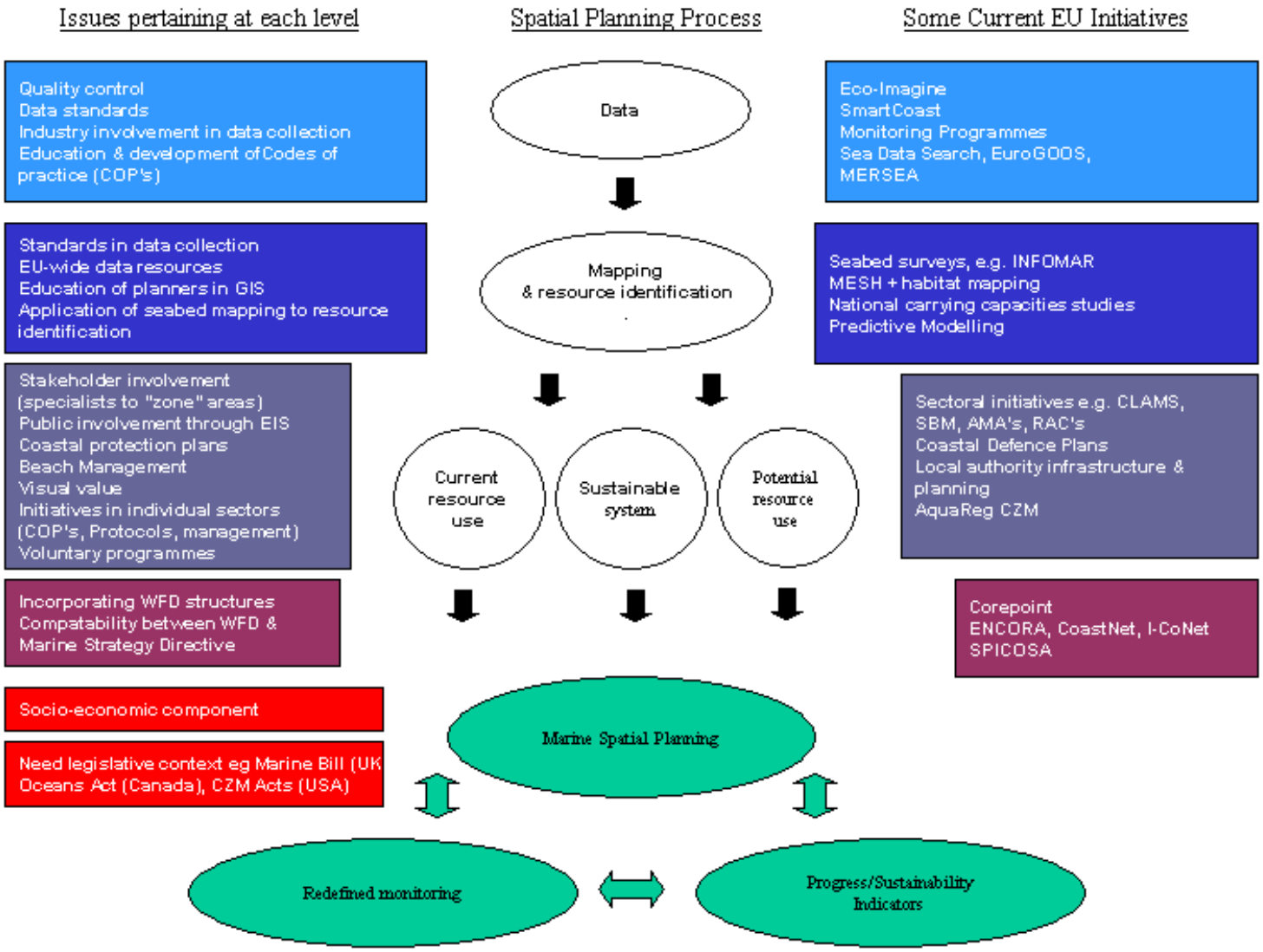

Figure 3.6.1. Diagram showing the theoretical concept for marine spatial planning from the data level through to the wider ICZM process, involving public consultation, integration of the various layers and progress indicators to assess the level of ICZM achieved.

AquaReg CZM Project

AquaReg is a co-operation between the regions of Galicia in Spain represented by the CETMAR Foundation, Border, Midland and Western (BMW) in Ireland represented by The Marine Institute and Trøndelag in Norway represented by joint forces of the South Trøndelag and North Trøndelag counties. The overall objective of AquaReg is to provide opportunities and design strategies for sustainable development of peripheral coastal communities by promotion of interregional co-operation in aquaculture and fisheries.

The pilot studies under the AquaReg CZM project looked at the application of seabed mapping to coastal management and the development of Geodatabases for the pilot areas. Much of the impetus came from the recently completed HASUT programme in Norway and various national seabed surveys, which developed thematic maps showing the suitability of areas for aquaculture production, fishing activities, special conservation areas and other resource uses.

In the AquaReg pilot studies, seabed maps were produced for the pilot areas giving bathymetry data, sediment distinction, locations of marine features and shipwrecks, slopes and elevation. Thematic maps were produced showing nursery grounds for commercial fish species (based on historical fishing data), suitable areas for anchoring fish cages, oxygen depletion zones, and water current patterns. This information was then layered into GIS. Geo-referenced information on current activities in the pilot regions was layered into the databases to provide a spatial planning tool for coastal planners. These datasets included: the location of aquaculture units; traditional fishing grounds; shore & boat angling; natural shellfish beds; habitat types & protected areas (SAC's, SPA's, etc.); piers and slips; shipping routes/navigational channels; monitoring stations; industrial discharge points; surrounding land use; coastal population structure; freshwater catchments; inter-tidal zones; and political boundaries such as WFD coastal water bodies, nautical mile limits, etc. Some thematic maps from the three databases can be seen below:

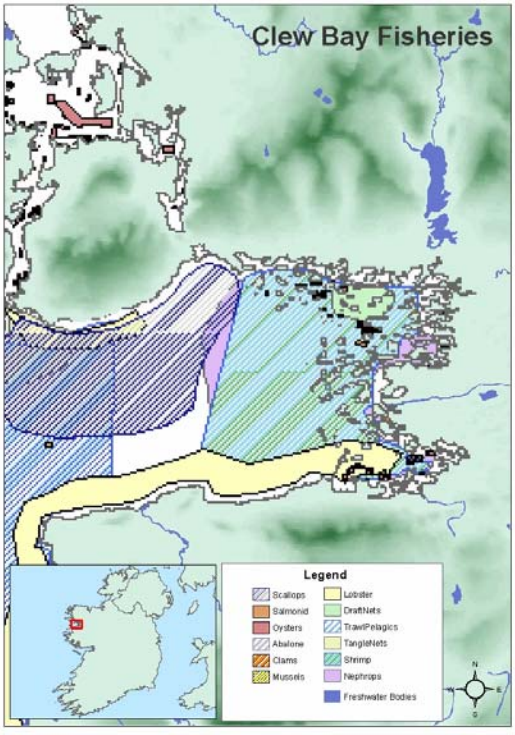

Figure 3.6.2. Fisheries information layered into the geodatabase for Clew Bay, Ireland.

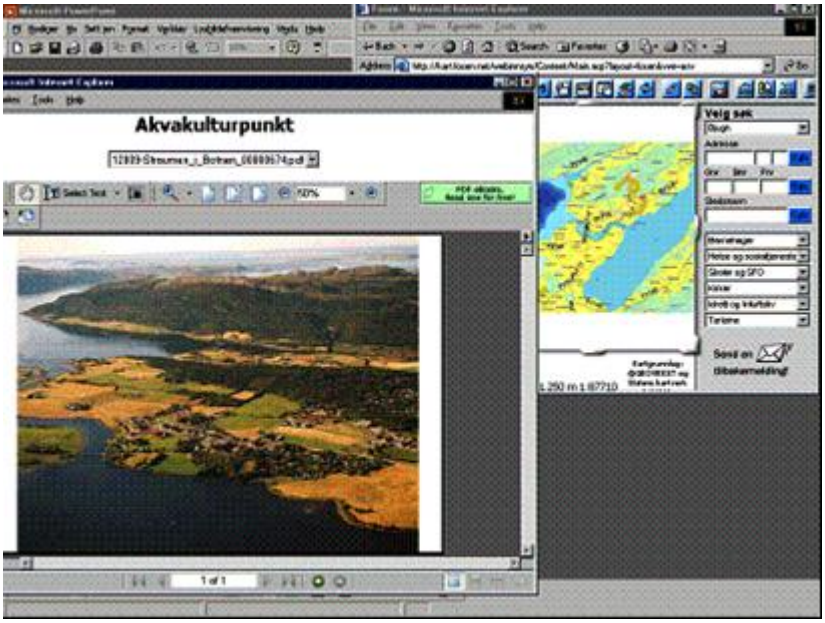

Figure 3.6.3. Aerial photography was digitally referenced and layered into the database in the Fosen region in Trondelag, Norway. This database also provides for public access to information via the web.

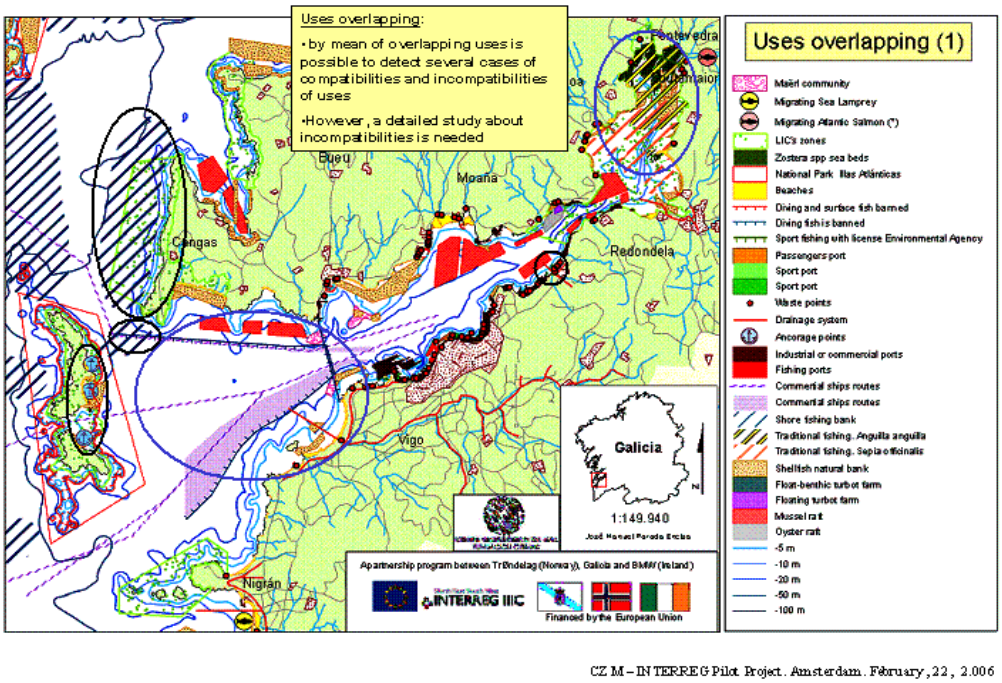

Figure 3.6.4. Geo-referenced data for a variety of activities was layered into the database for the Ria in Vigo, highlighting potential conflict areas and overlapping activities.

The Wadden Sea Forum as an example for initiating an ICZM related process

The Trilateral Wadden Sea Cooperation is a major trilateral management instrument for the Wadden Sea. Extending from the traditional nature conservation focused approach of the trilateral cooperation and as a reaction to increasing local resistance; the Wadden Sea Forum (www.waddensea-forum.org) was established after the 9th Trilateral Wadden Sea Conference in 2002. The forum focuses on development issues and developed a range of development proposals which are expected to guide future development within the Wadden Sea area. The members of the forum are local and regional representatives from authorities as well as from local communities, NGOs, chambers of commerce and other interest groups. Representatives from the government of the federal states and from the federal government participate as observers in the forum.

In its first phase, the Wadden Sea Forum (WSF) was funded by the INTERREG programme. Following the development of a common vision and developing targets and an action plan, the members of the Wadden Sea Forum decided to proceed with the forum on their own resources, including establishment of working groups, which deal with specific activities and issues. The establishment of the Wadden Sea Forum can be seen as a reaction to missing acceptance of nature protection measures requesting involvement of local people and including to expand the cooperation to development issues. One of the key experiences in the first phase of the forum was that the process was perceived by a lot of participants as more import than the outcomes. According to outside experts "in the beginning of the process, a lot of scepticism and outright dissatisfaction" were observed. "People complained about the high number of meetings, long travel distances, work load, and costs etc." At the end "the WSF has enlarged the number of people who have some kind of personal relationship across borders, as well as across sectors. It opened up channels of communication and mutual understanding […] I am sure the WSF will turn out to be a valuable exercise for future co-operation and co-existence in the area – no matter what the ministers decide to do with the final report." (Wadden Sea Forum: Final Report: Breaking the Ice, downloadable from www.waddensea-forum.org). The outcomes are seen as starting points for sustainable development perspectives of the Wadden Sea Region and encompass:

- A Common Vision;
- Common Objectives;
- Common overarching issues: Infrastructure, Coastal Defence and Shipping Safety;
- Strategies for Agriculture, Energy, Fisheries, Industries, Harbours and Tourism.

These outcomes have been translated into an Action Plan, on which working groups will work during 2006 to 2010.

Example of mapping areas of importance for fisheries

WGICZM highlighted the increasing relevance of spatial information and its potential use in integrated coastal management and the need to map areas of importance for fisheries.

The case of Sweden was mentioned as an example. In Sweden, central sectoral authorities are expected to identify areas of national interest from a sectoral point of view; these include agriculture and forestry; fishing; the extraction of raw materials such as minerals, peat or sand; industrial production; energy supply and communications; water supply and waste treatment; and national defence. The importance is then to be weighted when making decisions and physical coastal planning.

Within this framework the Swedish Board of Fisheries has recently (Thörnquist, 2006) revised the areas of special economic importance for the Swedish commercial fisheries. The previous

identification was made in 1991 and since then large changes in the patterns of fisheries have occurred. In addition, the possibilities for spatial analyses of fisheries have improved during the last fifteen years as a result of the fishermen's obligation to report the coordinates for their fishing effort and catches. In this identification the indicator used to classify the areas was the summed value of landings (SKr/km²) during the period 1999–2003 (see Figure 3.6.2). The landing values are related to a regional mean value in the Gulf of Bothnia (divided into one southern and one northern part), the Baltic, Øresund, Kattegatt and Skagerrak.

From a fisheries management perspective, the usefulness of this type of spatial information was recently made clear in the negotiations about the cod fishery in the Baltic.

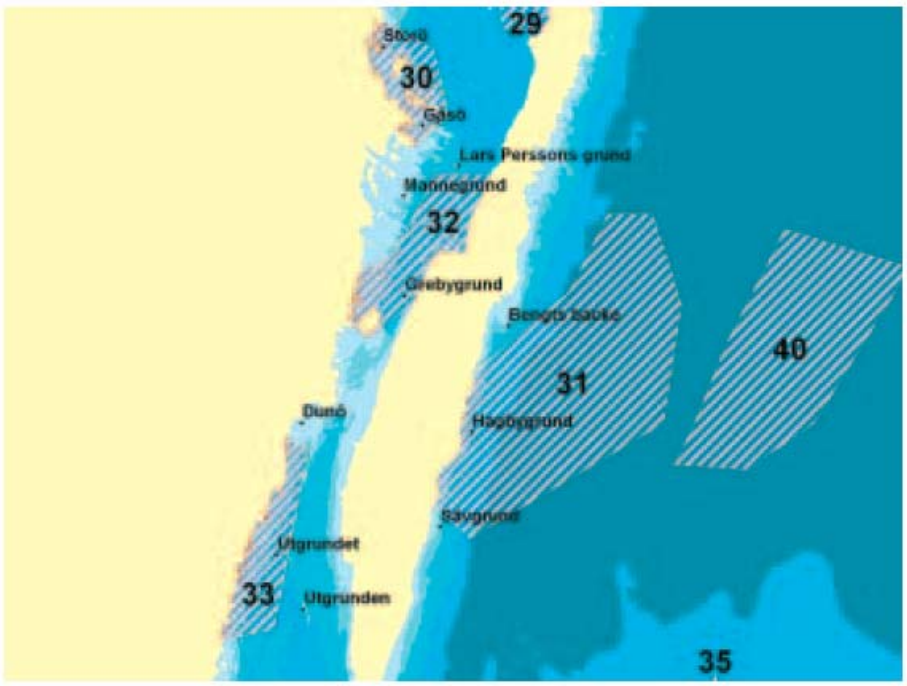

Figure 3.6.5. Shows areas of importance (SKr/km²) for commercial fisheries in ICES square 27 on the Baltic Sea. Thörnquist (2006).

Other features relevant to the economy of commercial fisheries such as spawning areas and harbors are mapped (Figure 3.6.6). This Information is being collected on the bases of surveys and interviews addressing local fishermen.

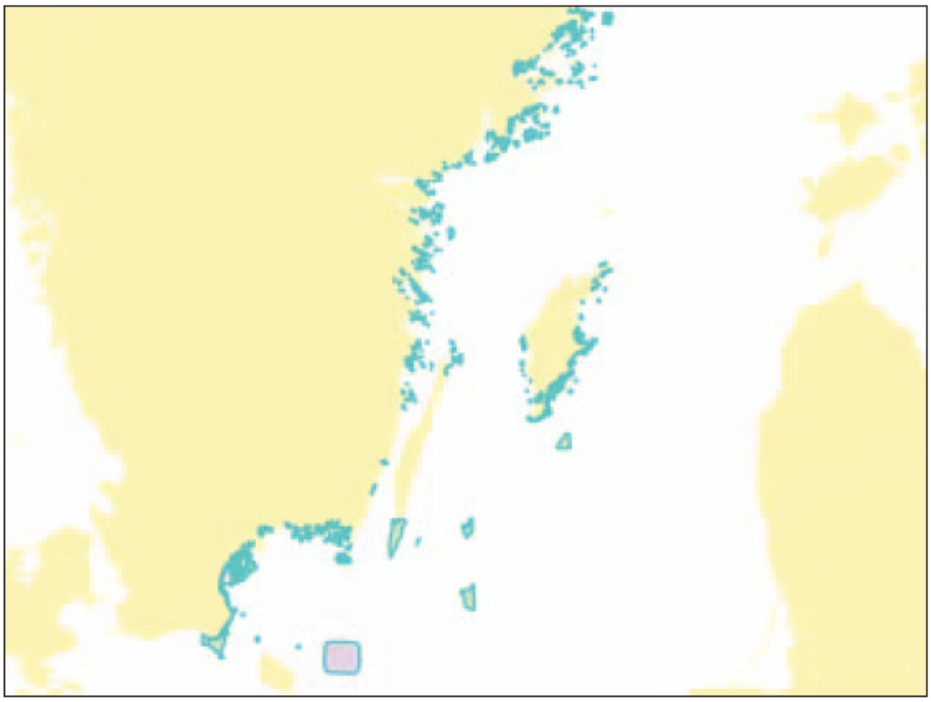

Figure 3.6.6. Spawning areas of importance for commercial fisheries in the Baltic Sea (ICES square 27) as identified by local fishermen. Source: Thörnquist, Stig (2006).

For further information about the identification and mapping of areas of importance for commercial fisheries in Sweden please contact Stig Thörnquist at the Swedish Board of Fisheries (stig.thornquist@fiskeriverket.se).

References:

Thörnquist, S. 2006. Område av riksintresse för yrkesfisket. Fiskeriverket, Finfo 2006:1. Göteborg.

http://www.fiskeriverket.se/service/publikationer/fiskeriverketinformerar/finfo2006/finfo20061.4.1490463310f1930632e80003316.html

WGICZM Recommends that ICES:

- gives priority to generating fish resource maps, including essential fish habitats and traditional fishing grounds. These should be compatible with other resource maps, to allow integration of this data in the spatial planning context (this recommendation is particularly relevant to working groups within the Resource Management Committee and the Living Resources Committee);
- provides advice on hydrographic modelling and their application in more exposed areas as future mariculture development is likely to move offshore. At present hydrographic models to support this are not available (this recommendation is particularly relevant to WGEIM).

3.7 Revise and develop the draft on the development of a framework for integrated evaluation of human impacts in the coastal zone and how integrate this information for ICZM, identifying ICES's role in the application of the WFD in the coastal zone (ToR g)

As more information on ICZM is generated, awareness has shifted towards the need for comprehensive coastal programs designed to resolve conflicting demands on the use of coastal resources, maintain coastal biodiversity and ensure long-term economic sustainability of these resources. While expert knowledge is valuable, it represents a narrow point of view and does not represent a systems view. ICZM requires generalist expertise able to understand the interaction between sea and coast and between natural and socio-economic drivers. In addition this information needs to be communicated to decision makers as well as society in meaningful formats.

The approach to ICZM may differ between countries and between regions due to differences in needs, traditions, cultures or management systems. A list of issues that need to be addressed before or while setting up an ICZM programme could be useful to encourage a comprehensive programme rather than the single-factor form of management practised today. This may counteract problems arising from the management of a system based on single-purpose management, and encourage cooperation between different agencies which have jurisdiction over the different activities or resources. Beneath environmental planning and sectoral planning and management schemes, spatial planning (extended into the sea) is recognised in several European countries as one additional tool/instrument to reach a more integrated approach in coastal and marine management. But spatial planning will have to be linked with a systems approach, which links ecological, economic and social/cultural system processes.

Within the context of ICZM a range of existing and upcoming European policies and directives need to be considered. These form an overall framework in which the work of ICES needs to be incorporated (Figure 3.7.1). These policies and directives include:

- EU Water Framework Directive;
- EU Marine Strategy Directive (proposed);
- EU ICZM Recommendations;
- EU Maritime Policy (Green Paper).

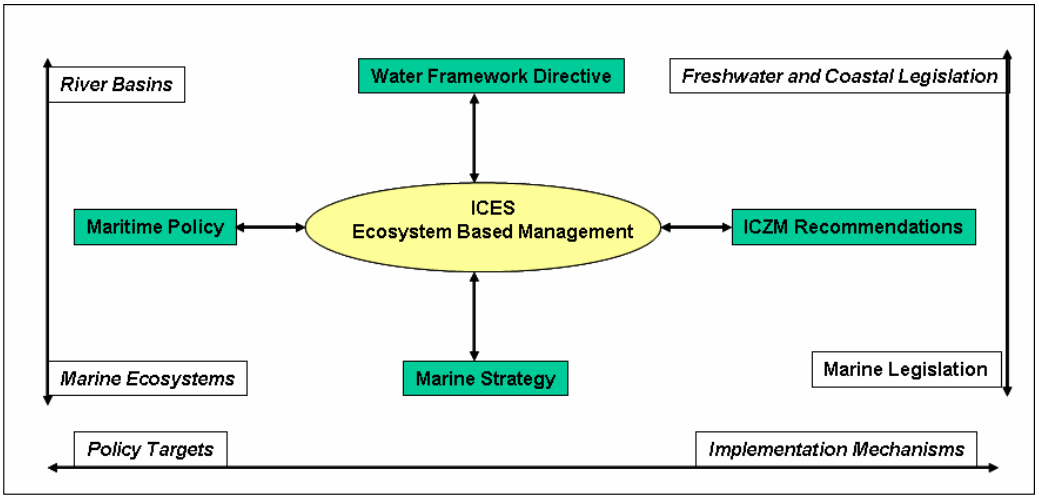

Figure 3.7.1. ICES and Ecosystem Based Management in the context of European coastal and marine policies.

In ToR c, the WGICZM identified indicators as key focal points for linking science and policy. Indicators are effective tools for assessing and monitoring ICZM efforts and for communicating results and arising issues to decision makers in government, the private sector and the civil society. Much work has been done in relation to indicators at local, regional and international levels. Such initiatives tend to be fragmented and uncoordinated, resulting in inefficient and incompatible generation of data. In response to this, a number of standardised lists of indicators have been developed with the intention of coordinating these efforts. Where such initiatives are valuable for developing an understanding of specific indicators, generic lists may not always be entirely applicable or relevant to societal, environmental and political realities at the local level. Synergy among data collection efforts is important for comparative purposes but it is suggested here that it may not be realistic to propose lists of indicators for universal application, rather, the WGICZM recommends exploring the utility of adopting standardised methods for the selection of indicators that are applicable and relevant at a local scale. Wherever feasible, it is important to try to continue to select standardised measures for comparative purposes. However, it is important also to recognise that the indicators need to be directly related to policy objectives of specific sites and sub-regions. In summary, this recommendation entails departure from the traditional idea of standardized lists of indicators and moving toward streamlining the logical approach behind the selection of those indicators.

In light of the above argument, WGICZM propose the following elements as necessary to the achievement of integrated evaluation of human impacts in the coastal zone:

- Commitment to continue and expand current efforts related to the development of indicators, and;
- Exploring the utility of adopting standardised methods for the selection of indicators that are applicable and relevant at a local scale.

An example of research on assessing interactions between ecological, economic, social and governance aspects of ICZM is the German research project “Coastal Futures”, which aims to develop an integrated assessment approach for coastal and marine changes by using offshore wind farms as case study for changing spatial structures. Issues addressed include impacts on ecosystem and habitat structures, local economy and infrastructure, conflicts between stakeholders and social values such as perception of the coast by local people. To ensure methodological integration, a system characterization structured along the Driver-Pressure-State-Impact-Response (DPSIR) approach and an integrated assessment approach linking tools from both natural and social sciences – e.g. scenario techniques, modelling and stakeholder dialogues form the overall framework.

In another effort, the Mediterranean Institute of Advanced Studies (IMEDEA) is working with the Government of the Balearic Islands to develop a science-based Integrated Coastal Zone Management (ICZM) programme for the Islands. The overall objective of the Balearic ICZM Project is to achieve sustainability in the coastal zone, a dynamic state that encompasses environmental, socio-cultural, economic and political factors. Thirty five disciplinary and interdisciplinary research projects are being carried out by more than fifty scientists in order to respond to the data needs related to implementing science-based ICZM in the Balearics. The purpose of the indicator part of the project is to propose a list of indicators to monitor and assess ICZM in the Balearic Islands. IMEDEA has taken the approach that ICZM and indicators are not all universally applicable, rather, many are site specific and restricted by political and local realities and by the availability of financial, technical and human resources. In this context, IMEDEA is in the process of developing a logical framework to assist with the identification of relevant indicators for the Balearic Islands, which may be a useful tool for other nations wishing to develop ICZM monitoring programs.

The Intergovernmental Oceanographic Commission (IOC) of UNESCO’s Handbook for Measuring the Progress and Outcomes of Integrated Coastal and Ocean Management (2006,

http://unesdoc.unesco.org/images/0014/001473/147313e.pdf) represents another notable effort to streamline approaches to indicator selection. The handbook is intended as a tool to assist decision makers in developing lists of indicators for assessing and monitoring ICZM by providing a step by step process as well as a series of pre-tested governance, socio-economic and ecological indicators.

It was mentioned previously that, wherever possible, internationally accepted standardised indicators should be selected for comparative purposes. An important source of such measurements should be those that are associated with internationally mandated standards and protocols such as the Water Framework Directive. In line with the previous statement in another section of this report, which points to the need to minimize fragmentation of legislation and responsibilities related to ICZM, indicators associated with these protocols and directives should be fully integrated into monitoring programmes.

The EU Water Framework Directive

The EU Water Framework Directive (WFD) has the following purposes related to coastal waters, including transitional waters (from Article 1):

- Prevent further deterioration and protect and enhance the status of aquatic ecosystems;
- Promote sustainable water use based on a long-term protection of available resources;
- Aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;
- Contribute to mitigating effects of floods and droughts and thereby contribute to protection of marine waters and achieving the objectives of relevant international agreements, including those which aim to prevent and eliminate pollution of the marine environment, with the ultimate aim of achieving concentrations in the marine environment near the background values for naturally occurring substances and close to zero for man-made synthetic substances.

To address these aims, the implementation of the WFD includes the characterisation of river basin districts, the review of environmental impacts of human activities, establishing coastal water types using a common typology, divide the coastal waters into surface water bodies according to the typology and assessment of ecological status of all these water bodies.

In the assessment of the ecological status of coastal water specific biological quality elements are considered (phytoplankton, macro algae and angiosperms, benthic invertebrate fauna), as well as hydro-morphological quality elements (tidal regime, morphological conditions) and physio-chemical quality elements (temperature, oxygen, transparency, nutrients, specific synthetic pollutants, specific non-synthetic pollutants).

To obtain high ecological status the values of the specific biological quality elements and physio-chemical quality elements of a water body should be close to reference values, which are undisturbed (pristine) conditions.

The role of ICES in the application of the WFD in the coastal zone

The focus of the WFD on aquatic ecosystems is in line with the ecosystem approach adopted by ICES. ICES has, on request, given advice to the EU on appropriate eco-regions in European waters, and on ecosystem based management, see http://www.ices.dk/advice/marineeco.asp.

In addition, the ICES community (committees, working groups, study groups, workshops), by responding to specific terms of reference, have contributed, and can contribute in the future, with scientific assessments and advices of relevance for the implementation of the EU WFD. The latter involve most of the ICES-member countries.

So far the contributions from ICES to the implementation of the WFD has been spread among many working- and study groups and often not very specifically communicated. Much of the WFD-relevant work by the ICES community has been done for assisting OSPAR or other commissions. ICES should identify and further improve co-ordination of the WFD related work done by its various WGs with a view to achieving ICZM.

Based on the discussions WGICZM recommends that ICES works towards:

Incorporation of indicators that describe the impact of river catchments on coastal waters within area specific indicator sets developed along the generic logical framework for indicators selection described above and thereby incorporate catchment-coast interactions in ICZM where relevant

Use of measures already standardised through the Water Framework Directive as far as possible for this purpose

Linking with LOICZ activities related to catchment-coast interactions

These recommendations are therefore included in the ToR for WGICZM for 2008.

The WGICZM further recommends that ICES:

- identifies cause-effect relationships between river catchment changes and the state of coastal ecosystems (this recommendation is particularly relevant to REGNS, MCWG, SGNSBP, WGBEC, WGMS);
- continues to develop ecological quality objectives and environmental quality indicators in coastal and transitional waters (this recommendation is particularly relevant to WGBEC, WGMS, SGEH);
- addresses cross-border trans-national pressures, for example long-distance transport of nutrients and pollutants and identifies sources and sinks for pollutants and nutrients (this recommendation is particularly relevant to SGEH, WGMS, WGHABD, WGBEC, MCWG).

The outcomes of these recommendations would be useful in the implementation of the WFD, Marine Strategy and the Maritime Policy.

In addition WGICZM would recommend that ICES in its external advice considers:

- The issue of compatibility between monitoring programmes, particularly within the context of WFD and the future Marine Strategy.

4 Other Items

4.1 Election of Chair

The Chair, Josianne Støttrup, is stepping down after completion of a six-year term of office (two with SGINC and four with WGICZM). She thanked the members of WGICZM for all their help and support during this period.

The group proposes Beatriz Morales-Nin, Spain as the new Chair of the group.

Annex 1: List of participants

NAME	ADDRESS	PHONE/FAX	EMAIL
Josianne Støttrup	DIFRES, Dept. of Marine Ecology and Aquaculture Kavalergaarden 6 2920 Charlottenlund Denmark.	+45 3396 3429 +45 33 963333	jgs@dfu.min.dk
Clare Greathead	Fisheries Research Services Marine Laboratory P.O. Box 101 375 Victoria Road Aberdeen AB11 9DB United Kingdom	Tel: +44 1224 295526 Fax: +44 1224 295511	greatheadc@marlab.ac.uk
Andreas Kannen	Forschungs- Und technologiezentrum Westkueste Hafentoern 1 D-25761 Buesum Germany	+49 4834 604-121	kannen@ftz-west.uni-kiel.de
Sunil Shastri	Scarborough Centre of Coastal Studies Univ. of Hull, Filey Rd, Scarborough, YO11 3AZ, UK.	Tel: +44 1723 357221 Fax:+44 1723 357268	S.M.Shastri@hull.ac.uk
Beatriz Morales-Nin (only Tuesday)	Instituto Mediterráneo Estudios Avanzados (CSIC/UIB) Miguel Marqués 21, 07190 Esporles, Islas Baleares Spain		IEABMN@uib.es
Joaquin Tintore	Instituto Mediterráneo Estudios Avanzados (CSIC/UIB) Miguel Marqués 21, 07190 Esporles, Islas Baleares Spain	Tel: 971 611 716 Fax: 971 611 761	imedeadir@uib.es
Einar Dahl *by correspondance* Erlend Moksness *by correspondance*	Institute of Marine Research Flødevigen Marine Research Station N-4817 His Norway		einar.dahl@imr.no
Jessica Hjerpe Olausson *By correspondance*	National Board of Fisheries P.O.Box 426 SE-401 25 Gothenburg Sweden	+46 31 7430326	Jessica.hjerpe@fiskeriverket.se
Eugeniusz Andrulewicz *By correspondence*			eugene@mir.gdynia.pl

NAME	ADDRESS	PHONE/FAX	EMAIL
Javier Franco	AZTI - Tecnalia / Unidad de Investigación Marina Herrera Kaia, Portualdea z/g 20110 Pasaia (Gipuzkoa)	Tel: 943 004 800- Fax: 943 004 801	e-mail: jfranco@pas.azti.es
Oisin Naughton	Aquaculture and Catchment Management Services Marine Institute Rinville Oranmore Co. Galway Ireland	telephone: +353 91 387 200 facsimile: +353 91 387 201	oisin.naughton@marine.ie
Laura Piriz	Laura Píriz, PhD Resource Management Division Swedish Board of Fisheries		laura.piriz@fiskeriverket.se
Amy Diedrich	Amy Diedrich, Ph.D. Investigadora Postdoctoral IMEDEA (CSIC-UIB), Instituto Mediterráneo de Estudios Avanzados C/ Miquel Marques, 21 07190 Esporles Mallorca, Baleares, Spain	Tel: (+34) 971 611 759 Fax: (+34) 971 611 761	amy.diedrich@uib.es

Annex 2: Agenda

Tuesday, 17 April.

09.00 Welcome. Josianne Støttrup (Chair). House keeping and support arrangements Beatriz Morales Nin.

09.15 Introduction of participants, Review of Terms of Reference, Designation of Rapporteurs, Report layout (chair + members).

09.45 ICES ACME – TOR of particular interest to ACME.

10.00 COFFEE BREAK

10.15 ToR b) led by Clare Greathead. Each country presents his/her report. Those not attending sent their report to Clare Greathead who will compile and present (very short) at the meeting.

12.00 *LUNCH*

13.00 Progress and update on ToR f (Lead: Beatriz Morales)

14.30 COFFEE BREAK

14.45 ToR d) different participants present status and progress within different larger projects relevant to ICZM. Josianne reporting on "ENCORA", "PROTECT", "SPICOSA", Andreas Kannen on "Coastal Futures".

The Swedish Fisheries Co-management Initiative in the light of the EU-ICZM perspective (Laura Píriz)

15.45 Status and progress regarding ToR c (Lead: Oisin Naughton).

16.45 Collate different inputs into the report.

Wednesday, 18 April.

09.00 ToR g:

Javier Franco will give a talk on "the implementation of the WFD at regional, national and international levels".

Joaquin Tintore will give a talk on "the coastal zone project in Majorca"

Initiate discussion on "draft on the development of a framework for integrated evaluation of human impacts in the coastal zone and how to integrate this information for CZM, identifying ICES' role in the application of the WFD in the coastal zone (Lead: Andreas Kannen).

10.15 COFFEE BREAK

10.30 Continue discussion on ToR g

12.00 *LUNCH*

13.00 Progress and update on ToR a (Josianne Støttrup)

14.30 COFFEE BREAK

14.45 Status and progress regarding ToR e. Each country should present their reports on coastal activities regarding a) monitoring coastal fisheries and b) overview on national time-series coastal monitoring programmes (including Natura 2000) and the extent of the data accessibility.).

16.30 Collate different inputs into the report.

17.30 Days Progress distributed for reading.

Thursday, 19 April.

09.00 Rapporteurs of the different TOR pass draft recommendations and 2008 ToR proposals to be discussed in forum.

10.15 COFFEE BREAK

10.30 Revisit ToR g.

12.00 *LUNCH*

13.00 Work in drafting groups

14.15 COFFEE BREAK

14.30 Drafting groups reconvene – short update on progress

15.30 Continue to work in small groups drafting the report

17.00 Collate the report and print out Draft 2 and distribute for reading.

Friday, 20 April.

09.00 Convene to discuss the draft report.

10.15 COFFEE BREAK

10.30 Final modifications of draft.

12.00 Voting for the new chairperson for the next 3 years.

Annex 3: Terms of Reference for 2008

The **Working Group on Integrated Coastal Zone Management** [WGICZM] (Chair: B. Morales-Nin, Spain) will meet in Mallorca, Spain from 11–14 March 2008 to:

a) update and report on activities of relevant ICES Working and Study groups to identify information pertaining to coastal zone and evaluate this information relative to ICZM needs and review progress from the EU and IOC;
b) update and report on ICZM activities in different ICES countries including information on monitoring of recreational fishing and other coastal monitoring programmes.
c) revise and update list of tools and data products and research needs;
d) continue to monitor and report results generated from larger projects that are directly relevant to ICZM needs;
e) continue to report on the effects of thermal, chemical and saline pollution produced by desalinisation and power plants;
f) explore the utility of adopting standardised methods for the selection of indicators that are applicable and relevant at a local scale;
g) further identify ICES's role in the application of the WFD, Habitat Directive, Maritime Policy (Green paper), Marine Strategy (proposed), and EU ICZM Recommendation 2002, in the coastal zone.

Supporting Information

PRIORITY:	In order to maintain and improve the quality of ICES advice, the specific requirements for scientific advice in support of client initiatives on ICZM need to be evaluated. In response to demands for ecosystem-based advice, ICES has adopted an ecosystem-based approach. Including the coastal zone would allow ICES to provide better holistic advice. Consequently these activities have high priority.
SCIENTIFIC JUSTIFICATION AND RELATION TO ACTION PLAN:	All ToRs also relate to Action Plan 1.9, 2.2, 2.3, 2.9, 2.11, 2.12, 2.13, 3.3, 4.7, 4.8, 4.14. Many ICES Study and Working groups address specific coastal zone issues. Others do not include coastal zone issues in their work, but have the expertise to, or could, with added expertise, address these issues. All the information being generated needs to be compiled and analysed to ensure consistent and integrated advice. The ecosystem based approach to the management of human activities as the leading principle for integrated coastal zone management implies that knowledge on the key ecosystem processes and properties in the coastal zone will be the core of the information ICES will be able to add into the process of ICZM. Important components include the valuation of coastal ecological niches, specific habitats, identification of essential and critical species and habitats particular to coastal areas, and development of EcoQOs specifically for the coastal zone. This work will contribute directly to the applications of emerging and present coastal directives (e.g., EU-WFD; EU-ICZM, Marine Strategy) and other local or trans-boundary management issues within ICES Member Countries.
RESOURCE REQUIREMENTS:	New experts have been recruited during the past two years and there is a need to engage experts from Canada/USA and other ICES countries involved in ICZM and not participating actively within the WG.
PARTICIPANTS:	ICES Member Countries working with coastal zone issues and 1–2 socio-economic experts also involved with ICZM.The Group is normally attended by some 10–14 members and guests.
SECRETARIAT FACILITIES:	None.
FINANCIAL:	No financial implications.

LINKAGES TO ADVISORY COMMITTEES:	There are obvious direct linkages with all three advisory committees, but especially ACE and ACME
LINKAGES TO OTHER COMMITTEES OR GROUPS:	MHC, MARC and several Working Groups within these committees.
LINKAGES TO OTHER ORGANIZATIONS:	EU, OSPAR, HELCOM.

Annex 4: Recommendations

RECOMMENDATION	ACTION COMMITTEE (WG/SG)
1. Continue to update and report on activities of relevant ICES Working and Study groups to identify information pertaining to coastal zone and evaluate this information relative to ICZM needs and review progress from the EU and IOC.	MHC (WGICZM)
2. Continue to update and report on ICZM activities in different ICES countries, including information on monitoring of recreational fishing and other coastal monitoring programmes.	MHC (WGICZM)
3. Continue the monitor and report on results generated from larger projects that are directly relevant to ICZM needs.	MHC (WGICZM)
4. WGICZM recommends that recreational fisheries monitoring programmes be developed and improved and that WGICZM continues to report on this topic in future within the country reports (ToR b).	MHC (WGICZM) ACFM
5. Continue to report on national monitoring programmes within the country reports (ToR b).	MHC (WGICZM)
6. continue to investigate the effects of thermal, chemical and saline pollution produced by desalinisation and power plants (ToR f) and report on it again in 2008.	MHC (WGICZM)
7. ICES gives priority to generating fish resource maps, including essential fish habitats and traditional fishing grounds. These should be compatible with other resource maps, to allow integration of this data in the spatial planning context.	ICES Member Countries (Resource Management Committee Living Resources Committee)
8. ICES provides advice on hydrographic modelling and their application in more exposed areas as future mariculture development is likely to move offshore. At present hydrographic models to support this are not available.	WGEIM
9. ICES works towards the incorporation of indicators that describe the impact of river catchments on coastal waters within area specific indicator sets developed along the generic logical framework for indicators selection described in ToR g and thereby incorporate catchment-coast interactions in ICZM where relevant.	ICES Member countries
10. ICES works towards using measures already standardised through the Water Framework Directive as far as possible for recommendation 9.	ICES Member countries
11. ICES works towards Linking with LOICZ activities related to catchment-coast interactions.	ICES Member Countries
12. ICES should identify cause-effect relationships between river catchment changes and the state of coastal ecosystems.	REGNS, MCWG, SGNSBP, WGBEC, WGMS
13. ICES continues to develop ecological quality objectives and environmental quality indicators in coastal and transitional waters.	WGBEC, WGMS, SGEH
14. ICES addresses cross-border trans-national pressures, for example long-distance transport of nutrients and pollutants and identifies sources and sinks for pollutants and nutrients.	SGEH, WGMS, WGHABD, WGBEC, MCWG
15. ICES in its external advice considers the issue of compatibility between monitoring programmes, particularly within the context of WFD and the future Marine Strategy.	ACE, ACFM, ACME

Annex 5: Activities and information of relevance to ICZM of different ICES Working and Study groups (ToR a)

Table A5.1. ICES Working or Study Groups that address climate change influence or impact of different human activities on coastal ecosystems, or address key issues of relevance to coastal ecosystems/ICZM (ToR a). Only 2006 reports available.

NATURAL INFLUENCES	KEY ISSUES	RELEVANT WG/SGS	GAPS IDENTIFIED
Climate change	Habitat change	**WGAGFM:** Local adaptation in fish species/evolutionary potential **REGNS[#]:** Available data on Modelled tidal currents /surge, tidal heights for coastal North Sea. Also sea level observations at fixed points.	Predictions of habitat change? Habitat changes due to climate change in coastal zone may be more pronounced?
	Alien species		The response and effect of alien species to climate change in the coastal zone.
	Coastal erosion		Monitoring the impacts on coastal systems.
	Changes in freshwater runoff	**WGAGFM:** Local adaptation in fish species	Changes in salinity as well as flow/currents, depth, etc.
	Changes in water temperature	**WGAGFM**: Genetic response to increasing water temperatures. Evolutionary ability of fish stocks to respond to climate change. **WGCCC**: effects of inc. temperature on cod, zooplankton effects, **WGPE**: to look at timeseries data to examine climate change impacts on phytoplankton. **WGZE**: zooplankton has been primary research area that has demonstrated regime shifts and climate change, yet not included in monitoring under WFD, OSPAR, etc. Time series monitoring lower priority.	What about "coastal stocks" and their evolutionary potential? Changes in temperature, salinity etc. may be more pronounced in coastal zone. More information is needed on juvenile stages, their habitats and effects/impact of climate change. Information on coastal zooplankton abundance.

	Natural Influences	Key Issues	Relevant WG/SGs	Gaps identified
Human Activity				
1	Mariculture	Eutrophication	**WGEIM:** Integrated culture systems. Sustainability indices (SI) being developed. Presently used in UK and Canada to salmon and shellfish aquaculture. **MCWG***: guidelines for frequency and spatial coverage of nutrient monitoring (OSPAR) **WGHABD***: occurrences of HABs and impacts, dynamics of HABs, develop monitoring tools, chemical nature and action of HABs. Data on HAB (monthly/yearly/seasonal in coastal areas)	Predictive models for aquaculture impacts offshore.
		Habitat deterioration/ restoration	**WGEIM**: fish and shellfish culture relative to WFD/Habitat directive. Impacts of EU Marine Strategy on Aquaculture activities.	
		Biodiversity/ endangered species	**WGEIM**: Report in progress concerning potential impact of escaped non-salmonids. Risk analysis used as a method of identifying environmental risks associated with marine aquaculture. **WGPDMO**: Disease transmission between reared and wild.	
		Changes in trophic structure	**WGEIM**: shellfish culture carrying capacity. Spatial and temporal variation – models. Risk assessments for culture of individual species.	
		Impact on local biomass	**WGEIM:** Risk analysis of potential impacts of escaped marine fish for single species being compiled. Carrying capacity into 4 subcomponents: physical, production, ecological and social cc. for shellfish farming. Sustainability index. **WGMASC**: Carrying capacity for shellfish.	
		Impact of mariculture on wild fish stocks (feed + disease)	**WGPDMO**: Disease transmission between framed and wild fish and shellfish.	Ecosystem impact of fish meal and oils in fish feed.

	NATURAL INFLUENCES	KEY ISSUES	RELEVANT WG/SGS	GAPS IDENTIFIED
2	Fisheries	Habitats, habitat deterioration/ restoration	**SGBFFI**[#] reviewed information on coastal herring grounds in the Baltic. **WGFE**: Initiated North Sea EFH maps **WGFTFB**: Topic group on environmentally friendly gear for traditional species and examining static gear such as traps and pots.	Mapping of fish resources
		Biodiversity/ endangered species	**SGEH**[#]: Loss of biodiversity mainly observed at habitat level and associated loss of fauna (Baltic Sea) **SGBFFI**[#]: reviewed monitoring data on coastal fish communities. Coastal fish poorly covered eg. in assessment, monitoring data, etc. (Baltic Sea) **REGNS** initiated integrated assessment of the North Sea. Started analyses of time series fisheries data relative to different biotic and abiotic pressures. **WGAGFM**:	**SGEH**: Identified need to examine data on fish community/fisheries available for coastal areas; Coastal fish poorly covered e.g. in assessment, monitoring data Genetic mapping of fish stocks for distribution and delineation
		Changes in trophic structure	**SGSTS**: reviewing survey trawl design and design of ICES standard bottom survey trawl, where the 'ideal standard' gear is discussed. Design of Intercalibration studies may be useful for developing intercalibration studies for juvenile trawls used in coastal surveys.	Does not address near-shore bottom trawl for juvenile fish surveys. Other gear than trawl used near-shore.
		Impact on local biomass	**WGAGFM:** Fisheries induced evolution in maturation. USE of PMRM as ECO Q metric. **REGNS** integrated assessment (North Sea).	
3	Oil and gas	Chemical contamination	JAMP guidelines on Monitoring the Environmental Effects of offshore oil and gas activities. **WGBEC** effects of oil spills coastal areas; Biological effects techniques for assessing long-term impacts of oil. **WGSE**: oil spill impact on seabird populations.	
		Habitat deterioration/ restoration	**MCWG, WGBEC**, Impact of oil on different types of habitats **SGASC**: ICES Cooperative Research Report on Acoustic Seabed Classification; its status and developments. Working with WGMHM regarding metadatabase development for biological habitat mapping (*)	Effects of artificial habitats resulting from man made under water constructions. Depth limitation of technology with respect to the intertidal zone.
		Biodiversity/ endangered species	**WGBEC, BEWG, MCWG**: on guidelines for long-term monitoring effects of oil spills on marine and coastal life. WKIMON.	
4.	Mineral extraction	Chemical contamination	JAMP Guidelines on Sediment and Biota monitoring, Contaminant Biological Effects Monitoring + ICES **WGBEC*** on methods, General biological effects monitoring. **WGMS*** on sediment contamination	

	Natural Influences	Key Issues	Relevant WG/SGs	Gaps identified
		Habitat destruction/ restoration	**WGMHM***: marine habitat mapping aimed at delineating areas for protection or utilisation. **WGEXT**: Effects of mineral extraction	Data on offshore extraction. No data on extent of nearshore sand nourishment and impact on benthos and fish.
		Biodiversity/ endangered species	**WGBEC***: review of ongoing work on biological criteria for selection of dredged material disposal sites. **WGEXT**: Effects of mineral extraction	
		Impact on spawning/ nursery habitat (critical/ essential habitat)		WGMHM need to produce EFH maps
5.	Tourism, recreation	Eutrophication	**SGEH#**: proposed as EcoQO for Baltic Sea **WGHABD***: occurrences of HABs and impacts, dynamics of HABs, develop monitoring tools, chemical nature and action of HABs.	
		Pollution	JAMP Guidelines on Sediment and Biota monitoring, Contaminant Biological Effects Monitoring + ICES WGBEC on methods, General biological effects monitoring. **WGMS*** on sediment contamination **SGEH#** consider effects of hazardous substances and monitoring several substances to include as EcoQo element/indicator (Baltic Sea)	Noise pollution Solid waste Desalinisation plant impacts
		Habitat destruction/ restoration	**WGMHM***: marine habitat mapping	Near-shore habitat difficult to map due to difficult physical conditions.
		Introduced species		
		Impact on local biomass		

	NATURAL INFLUENCES	KEY ISSUES	RELEVANT WG/SGS	GAPS IDENTIFIED
6.	Transport/Port	Chemical contamination	JAMP Guidelines on Sediment and Biota monitoring, Contaminant Biological Effects Monitoring + ICES WGBEC on methods, General biological effects monitoring. WGMS on sediment contamination	
		Noise/ infrasound	**WGFAST**: detection and reaction of fish to infrasound. Noise from vessels effects particular fish species. (mainly examining potential effects of research vessel noise on stock assessment)	Need to examine inshore impacts of noisy vessels (eg. recreational boats) for fish migration to fjords for anadrom/catadrom species.
		Introduced species	This issue has been dealt with intensively under the auspices of a previous WG working on introductions and transfers of marine organism, either intentionally or unintentionally e.g. through ballast water.	
		Navigational dredging		
7.	Residential/ Urban development	Eutrophication	**SGGIB**[#] on HAB in the Baltic Sea **WGHABD***: occurrences of HABs and impacts, dynamics of HABs, develop monitoring tools, chemical nature and action of HABs. **REGNS** Impact of eutrophication on NS ecosystem	
		Chemical contamination	WKIMON Workshop. JAMP Guidelines on Sediment and Biota monitoring, Contaminant Biological Effects Monitoring +ICES WGBEC on methods, General biological effects monitoring. **MCWG*, WGMS*, WGSAEM***. Specific pollutants, monitoring strategies. **MCWG***. Effects of different pollutants. Contaminants in marine fish and other orgs.	
		Habitat destruction/ restoration		Effects of coastal erosion prevention /harbour and other development on Essential Fish Habitats.
8.	Physical structures	Habitat destruction/restoration	**WGMHM**: marine habitat mapping	Effects of artificial habitats resulting from man made under water constructions.
		Impact on spawning/nursery habitat (critical/ essential habitat)		
		Renewable energy (windfarms, wave energy)		Effects of artificial habitats resulting from man made under water constructions.
	NATURAL INFLUENCES	KEY ISSUES	RELEVANT WG/SGS	GAPS IDENTIFIED

9.	Land use practices/ Dams	Eutrophication	**OSPAR:** Eutrophication status every 5 y in North Sea + coastal areas. **WGHABD**: occurrences of HABs and impacts, dynamics of HABs, develop monitoring tools, chemical nature and action of HABs. **WGPBI**: examined the responsiveness of ecological models to changes in anthropogenic loads (one also included atmospheric sources). Among conclusions: effects stongest in coastal areas). Models appropriate for management.	
		Chemical contamination	OSPAR (**WGSAEM, WGMS or MCWG):** data compiled (annual) on coastal atmospheric inputs of Cd, Hg, N, P,Pb, biota-radionuclides, contaminants in fish and shellfish – CBs, metals (Cd, Pb, Ni, Cu, Zn, etc), pesticides. Contaminants in seawater and sediments. **WGBEC**: TBT-specific effects in marine snails.	
		Habitat destruction/restoration	**WGNHN**: marine habitat mapping	
		Impact on local biomass		
		Impact of physical barriers on migratory species		Impact on catadromous and anadromous fish populations

*** The key Issue is addressed and the information may be relevant to a number of human activities.**

 # The information is focused regionally (eg. Baltic Sea, North Sea, etc)

Annex 6: Current ICZM activities and progress in different ICES Member Countries (ToR b)

Table A6.1: Compilation of activities and progress relevant to ICZM in the ICES member countries

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
Coastline length	longest marine coastline in the world	7,000 km	3,379 km 1,300 km North Sea 2,000 km Baltic Sea	7,100 km	Mainland without fjords: 2,650 km Mainland including fjords: 21,000 km The coastline including islets and islands: 85,000 km	500 km	6600.4 km including the autonomous cities of Ceuta and Melilla on the Moroccan coast	7,600 km	19488 km
Has the coastal zone been defined for management?	Between low water mark and 12 nautical mile line	3 km inland 6 m depth or 1 nm seaward	No, Entire German Continental Shelf is considered	No, coastal boundaries defined by WFD, EEZ, ICES areas	No The EU WFD definition of 'coastal water': 1 nautical mile off the baseline is adopted	Not reported	The EU WFD definition of 'coastal water': 1 nautical mile off the baseline of interior waters is adopted	No	Informal 5 m inland in England only but in process of being decided

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
Competent authority for coastal zone use	Department of Fisheries and Oceans	Sea: Two ministries and three authorities. Land: One ministry via the Forest and Nature Agency. In 2007, 78 new coastal municipalities will be responsible for CZM.	Land and coastal waters (12 sm): Sectoral responsibilities, EEZ: Federal Ministry of Transport, Building and Urban Development (Federal Maritime and Hydrographic Agency BSH)	Department of Communications, Marine and Natural Resources from the Marine Side. Department of Environment (& local authorities) for planning & development on terrestrial side.	Several ministries and directorates. Counties and municipalities. Municipalities are leading the planning of their areas, both on land and in the sea (from land to the baseline)	Not reported	There are 3 levels of management, at the Estate level: Directorate General of Coasts(Direccion General de Costas),; at the regional level (federal governments) Regional Autonomous Authorities:	12 authorities have on a sectoral basis competence in relation to the use of the coastal zone. The municipalities lead the physical planning out to 12 nm.	Scotland: Scottish Executive - Marine Branch England and Wales: Department for the Environment Food and Rural Affairs (DEFRA) - Marine Environment Division
with a consultation process involved through	Integrated management plans, rules governing oceans and fisheries, new oceans governance arrangements, ecosystem science	Consultation with sectors and stakeholders	Consultation with sectors and stakeholders	Depending on the issue but normally with other Departments, Governments Agencies, NGO and stakeholders.	Consultation with sectors and stakeholders	Not reported	Master Plan for Coastal Sustainability (POL in Cantabria, POLA in Asturias, PDUSC in Catalonia, PTSL in the Basque Country); Territorial sectorial plan of the littoral zone; and the city level	The local communities and resource users through the process of municipal planning and hearings; The sectoral authorities; user's organizations; the Co-management groups, where these exist.	Inter-governmental co-operation Coastal Fora Stakeholder involvement

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
Responsible authority ICZM (EU Recommendation)	Not reported	Ministry of Environment	Federal Ministry of Environment	Department of Communications, Marine and Natural Resources	Not reported	Not reported	Directorate General of Coasts of the Ministry of Environment; for inland fisheries the Regional Governments and for coastal zones the Fisheries Directorate General from the Ministry of Agriculture and Fisheries	The National Board of housing, building and planning (NBHBP)	Scottish Executive and Defra
EU ICZM Stock-take [(1)]	Non-EU yes	Ministry of Environment. Two reports. No decisions as yet on how to proceed.	Finished	In progress	Not reported	No	Yes	In progress	Yes
EU ICZM Strategy [(2)]	Non-EU yes	No strategy formed as yet.	Yes	No	Not reported	No	Yes	In progress	Yes

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
Key Activities	1. Ground fishing, 2. Oil and gas exploration, 3. Aquaculture, 4. High coastal population,	1.Coastal marine wind farms, 2. Aquaculture, 3. Coastal protection, 4. Nature rehabilitation, 5. House boats, 6. Mineral extractions, 7. Pipelines, 8. Mussel farming and dredging,	1. Offshore wind-farms, 2. Marine aggregate extraction activities, 3. Fishing, 4. Nature conservation areas, 5. Development of ports and harbours, 6. Tourism, 7. Coastal defence strategies, 8. Aquaculture,	1. Shipping and maritime transport, 2. marine energy, 3. Aquaculture, 4. Marine tourism, 5. Fishing, 6. Nature conservation,	1.Marine resource exploitation, 2. Fishing, 3. Carrying capacity, 4. Introduced species, 5. Aquaculture,	1. Seasonal tourism, 2. Coastal urbanisation, 3. Coastal industries, 4. Comercial and fishery ports, 5. Land reclaim for agriculture,	1.Urban and mass tourism development, 2. Coastal occupation, 3. Recreational marinas, 4. Recreational fisheries, 5. Intensive aquaculture, 6. Fishing,	1. Fishing, 2. Recreational fishing, 3. Tourism, 4. Marine resource exploitation,	1. Large coastal population, 2. Coastal development, 3. Coastal defence, 4. Coastal manufacturing industries, 5. Marine resource exploitation 6. Fishing, 7. Aquaculture 8. Marine renewables

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
Key issues identified	1. Over exploited fsh stocks, 2. Spatial competition and un quantified environmental impacts, 3. Spatial competition and eutrophication, 4. pollution near urban areas,	1. Spatial competition and un quantified environmental impacts, 2. Spatial competition and eutrophication, 3. Habitat loss flooding and erosion, 4. Spatial competition, 5. Spatial competition, 6. Habitat loss 7. Environmetal impacts and spatial competition, 8. Habitat loss and spatial competition,	1. Spatial competition and un quantified environmental impacts, 2. Habitat loss, Spatial competition and environmental impacts, 3. Over exploited fsh stocks, 4. Spatial competition, 5. Spatial competition and habitat loss, 6. Coastal pollution and carrying capacity issues, 7. Habitat loss flooding and erosion, 8. Spatial competition and eutrophication,	1. Environmental impacts and habitat loss, 2. Spatial competition and un quantified environmental impacts, 3. Spatial competition and eutrophication, 4. Coastal pollution and carrying capacity issues, 5. Over exploited fsh stocks, 6. Spatial competition,	1.Limited knowledge of coastal species and processes, 2. Over exploited fsh stocks, 3. Pollution 4. Competition for habitat, 5. Spatial competition and eutrophication,	1. Coastal pollution and carrying capacity issues, 2. Coastal pollution, 3. coastal pollution, 4. Habitat loss and spatial competition, 5. Habitat loss,	1. Habitat loss 2. Coastal pollution and carrying capacity issues, 3. hydro-morphological alteration, 4. Over-exploitation of natural resources, 5. Eutrophication, ecosystem changes (jellyfish blooms, biodiversity changes, habitat destruction), water quality 6. Over exploitation of fish stocks	1. Poor economy in the commercial fisheries and over exploitation of fish stocks, 2. Local over-fishing, 3. Coastal pollution and carrying capacity issues, 4. Conflicts between stakeholders Increased use of marine resources,	1. Coastal pollution and carrying capacity issues, 2. Habitat loss and pollution, 3. Habitat loss flooding and erosion, 4. Habitat loss and pollution, 5. Spatial competition and depletion of resources, 6. Over exploitation of fish stocks, 7. Spatial competition and eutrophication, 8. Spatial competition and un quantified environmental impacts,

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
ICZM relevant Legislation	Oceans Act 1997	System of laws Protection of Nature Act (1992) Planning Act (2000)	Nature Conservation Act Federal Building Act Planning jurisdiction to MHW	Planning jurisdiction to HW Foreshore Act between HW and territorial limit- licences for marine works Fisheries Act- licences for aquaculture Water Quality & pollution legislation. Transposition of EU Legislation on WFD, BWD, HD	More than 13 relevant laws including planning, management, fisheries, aquaculture pollution, nature conservation, recreation, navigation etc.	Not reported	The Shores Act = Ley de COSTAS (22/1988, July 28th), Law on Evaluation of Plans and Programmes (Ley de Evaluación de Planes y Programas) (application of the Strategic Environmental Assessment Directive); EU Framework Directives: Water, Habitat, Flows, Marine Strategy	The planning and building Act (1987) The Environmental Code (1999) The Fisheries Act (2003)	Planning jurisdiction to MLWS. Crown estate lease required to 12 nm Licences required for coastal and marine works (FEPA), other discharges and aquaculture also require a licence (CAR)
Precautionary approach applied?	yes	yes	Not reported	Yes – in the decision making process	yes		Not reported	Yes, to a certain extent on a sectoral basis and in the municipal planning process.	Yes

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
National ICZM projects, consortia or networks	Integrated management pilot programs	GIS mapping. MariNet formed	Zukunft Küste (Coastal Futures) ICZM-Odra	I-CoNet initiative. AquaReg CZM. Corepoint.	GIS Maps of marine nature for use with ICZ planning and Management		HISPACOSTA INCOME Mallorca ICZM project EKOLURRAL-DEA (Basque Country)	ENCORA/ SENCORE Regional and local projects	Local Coastal forums/Partnerships. Regional schemes e.g. Irish Sea Pilot and SSMEI.
Integrated data management initiatives	Not reported	Through MariNet	information system CONTIS (Continental Shelf Information System), NOKIS and other projects on environmental data and/or meta data	National Sea Bed Survey. http://www.gsiseabed.ie/ Marine Data Repository	Not reported		In development an Integrated Data management system for the Director Plan on the Sustainable Coastal management (http://www.gisig.it/eco-imagine/presppt/Nice/	Ongoing process. Models for integrating data on recreational fisheries are being designed.	Integrated Coastal Hydrography project, MDIP/ MEDAG, UKSEAMAP UKDMOS, MCCIP, UKMMAS

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
Environmental national research initiatives relevant to ICZM	Ecosystem overview and assessment report (EOAR), map of ecological and biological significant areas (EBSA)	Interreg programmes: BERNET, BALANCE. Baltic Sea Breeze, WATERSCETCH, Safety at Sea, Comrisk, comcoast, lancewadplan, Wadden Sea Forum, POWER, FSII,	RETRO, IMPULSE, EU-INTERREG: BaltCoast project POWER project	National Sea Bed Survey, Review of Marine Environmental Indicators.	GIS Maps of Marine nature MAREANO Project on the ecological impact of introduced King Crab.		There are 33 ongoing R&D National Funded Projects with a wide range of objectives from GIS to biodiversity including socioeconomic aspects, EU Funded initiatives (SPICOSA); Interreg projects (ENPLAN, DEDUCE, BEACHMED) and Regional funded projects (EUGIZC)	Swedish EPA is supporting many research initiatives of relevance. Major programs such SUCOZOMA and WASTRA are now completed. Sweden is involved in EU-projects of relevance such as Interreg.	Review of Marine Nature Conservation and the Habitat Classification Scheme Irish Sea Pilot State of the Seas Report MarClim MECN Seabed Indicators Species database and report (SNH) Marine National Park Project SSMEI

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
Socio-economic information	Yes, human use atlas	GIS with overview of the different usages – not integrated, within different counties	spatial plans dealing with human activities	National Spatial Strategy County Development Plans	Municipalities plans for their coastal zones, Statistics from fisheries and aquaculture		There are several initiatives at Regional level in development, the States main source of information is the Statistics National Institute (Instituto Nacional de Estadistica) where a GIS at municipality level is available	Conventional socio-economic data is used in planning.	Not reported
Marine coastal protected areas	Not reported	254 habitats protected including bird protection zones, 27 solely marine; coastal protection zone exists	Habitat and Bird protected areas proposed, 100 m inland in Schleswig-Holstein 200 m inland and seaward in Mecklenbug-Vorpommen a whale sanctuary, Wadden Sea is a National park	158 marine sites 4,196 km^2 All Natura 2000 sites	Coral reefs protected, Bird areas protected, A new national plan for protection of marine areas is in preparation		Natura 2000 and Bird Protected areas defined, 2 National Parks with land-sea domain (Islas Atlanticas and Cabrera), Coastal Biosphere Reserves and Regional protected areas (PEIN in Catalunya, Marine Biotopes in the Basque Country)	0-6 m fringe, fishing trawling line, Natura 2000 sites, HELCOM and OSPAR protected areas, World Heritage areas, marine reserves, birds/seals/fish spawning areas. A first Marine National Park is under planning	382 marine Natura sites 1 Offshore SAC 1 Marine SPA-further ones and extensions to terrestrial ones are being considered 7 MEHRAs identified OSPAR MPAs (Natura sites)

ISSUE	CANADA	DENMARK	GERMANY	IRELAND	NORWAY	POLAND	SPAIN	SWEDEN	UK
Water Framework Directive Position	Not relevant	Local municipalities responsible to elaborate and implement plans for the quality and use of coastal waters, based on environmental quality objectives. Suggestions for formation of 12 water districts being considered.	On "Länder" (county) level	Transposed to Irish legislation Characterisation finished 8 river basin districts	The first characterisation and classification performed is to be evaluated by the regional WFD authorities		At national level it has been enforced in 2001. For the Basque Country: characterisation finished the rest must be finished in 2008 (http://hispagua.cedex.es)	Five watershed authorities each governed by a board are working with the preparation of action plans.	Transposed to devolved country legislation Monitoring programme fully operational in December 2006

6a. DENMARK

The costal zone in Denmark is an important spawning and nursery ground for both commercial and non-commercial fish species. Spawning grounds for local herring stocks are found both in the fjords and along the open coasts together with spawning sites for a large number of non commercial species. The Danish Wadden Sea as well as sandy coastal areas in the inner Danish waters are important nursery grounds for many flatfish species. Small cod are found on gravel bottom interspersed with eelgrass and macro algal meadows and the ecological quality of these areas is essential for the survival and later recruitment to the fishery.

Unlike many other countries, Denmark has defined a dividing line (the mean low-water line) between the sea and the land when dealing with management. The sea is managed by several ministries and by the counties, while coastal land areas are managed by the counties and the municipalities. Denmark has therefore not formally adopted a clear definition of the coastal zone or a defined integrated coastal zone management system (ICZM). However, the ICZM-principles have been applied through a system of laws and regulations, co-ordination among sectors and a high degree of public participation, which has developed over several years. Denmark has undertaken an ICZM stock take, but as yet has not produced a strategy for implementing ICZM.

The Danish Coastline length is approximately 7,000 km

Key issues:

- Coastal marine wind farms,
- Marine aquaculture,
- The severe decline in coastal fish populations of both commercial and non-commercial species;
- coastal protection,
- nature rehabilitation,
- house boats,
- mineral extractions,
- pipelines,
- dredging,
- mussel farming.

Policy activities

A major structural reform of the Danish regional and local government structure decided upon in 2003 was implemented in 2007. Because of this no comprehensive Danish ICZM National Strategy has been formulated. A stock take on the state of coastal zone management was undertaken and reported to the EU Commission by the Forest and Nature Agency, Danish Ministry of the Environment. As part of the stock taking exercise, two reports were completed: “The report on county planning in the coastal zone” and “The analysis of administration of the coastal zone in Denmark”. Both reports provided recommendations for ICZM. The Danish Forest and Nature Agency and the Danish Coastal Authority, the two main authorities for the coastal zone, have not yet decided on how to proceed with the recommendations.

Data projects

MariNet

Research projects

Interreg programmes: BERNET, BALANCE. Other projects include Baltic Sea Breeze, WATERSCETCH, Safety at Sea, Comrisk, comcoast, lancewadplan, Wadden Sea Forum, POWER, FSII, SPICOSA, PROTECT. A number of smaller national projects were also identified. These represent case studies where GIS tools are implemented for the sustainable management of the exploitation of a local resource (shellfish).

Natura 2000 position

The Danish Ministry of the Environment through the Forest and Nature Agency is primarily responsible for terrestrial nature conservation. This Agency also administers raw material extraction at sea. The Ministry for Transport and Energy deals with transportation and infrastructure of the sea territory via the Danish Coastal Authority, and with matters related to exploitation of natural resources via the Danish Energy Agency. Fisheries and aquaculture are managed by the Ministry of Food, Agriculture and Fisheries through the Directorate of Fisheries.

The planning process for both the terrestrial and marine zone will require coordination between these authorities in order to administer Natura 2000 directives appropriately.

A number of government authorities and research institutes engaged in tasks relating to management of the national marine area and the coastal zone have formed a network MariNet. Work within this network related to different issues related to the marine environment such as:

- Development of strategies at a national scale
- National and international legal framework
- Characterisation of the marine areas
- Coordination of infrastructure to manage these areas.

254 habitats protected including bird protection zones, 27 solely marine; coastal protection zone exists

Water Framework Directive position

Local municipalities are responsible for implementation plans for the quality and use of coastal waters, based on environmental quality objectives. Suggestions for the formation of 12 water districts are being considered.

6b. GERMANY

Germany has a coastline of 3379 km divided roughly into 1300 km along the North Sea and 2000 km along the Baltic Sea. Along the German Baltic Sea coast, the tide is almost absent and the water is brackish. It is a shallow coast with numerous bays, lagoons, cliffs, peninsulas and islands. The North Sea coast is in contradiction characterised by a tidal regime and mainly characterized by tidal flats, islands and marshland.

There is no official definition of the coastal zone in Germany. For terrestrial planning purposes on the local level responsibility generally ends at the mean high tide. The state of Schleswig-Holstein has established a 100-metre inland-protected strip along the coast under its Nature Conservation Act and the state of Mecklenburg-Vorpommern has established a 200 metre wide inland- and a 200 m wide offshore-protected strip under its Nature Conservation Act. Most of the German North Sea coast is protected as National Park. In the most northern part of the North Sea coast in Schleswig-Holstein the waters between the National Park and the 12 sm line are designated as a whale sanctuary. Generally it needs to be noted that the territorial waters are in the responsibility of the regional (Laender) level, except public

waterways, especially the access routes to harbours, while the public waterways and the EEZ are managed within the responsibility of the Federal government.

According to the national ICZM strategy the following areas have to be considered in ICZM (BMU: Integriertes Küstenzonenmanagement in Deutschland: Entwurf für eine nationale Strategie für ein Integriertes Küstenzonenmanagement (as from 13 February 2006, see also www.ikzm-strategie.de (German only)) :

- the Exclusive Economic Zone (EEZ);
- coastal waters;
- transitional waters in the sense of the WFD;
- in estuaries those waters, which are influenced by the tide;
- on the terrestrial side the adjoining rural counties (Kreise);
- flexible handling of inland boundaries according to the specific problem to be addressed.

Key issues for ICZM in Germany are:

- the development of offshore wind-farms in the EEZ;
- the increase in planned sediment extraction activities in offshore waters;
- the establishment of nature conservation areas in the framework of the EU habitat and bird directive;
- the development of ports and harbours, especially in Hamburg, Wilhelmshaven and Bremerhaven;
- the decline of fish stock due to over-fishing;
- the preservation of tourism as major economic factor for the coastal region
- coastal defence strategies;
- the possible development of inshore and offshore aquaculture.

ICZM policy activities

In relation to coastal management, both the federal government as well as the federal states (Bundesländer) have joint responsibility for most areas of coastal planning issues. The Federal Ministry of Transport, Construction and Housing is responsible for providing national guidelines and coordinating planning policy from which the individual states derive their own planning legislation. This entails that for regional planning, water management, coastal protection, nature conservation and others the federal states establish their own legislative structure and adhering laws, albeit having to be in accordance with the federal legal framework.

Due to increasing activities in offshore and coastal waters, especially planning of offshore wind farms, the federal states extended spatial development and provided spatial plans dealing with human activities and potential conflicts in the territorial waters. According to the Federal Building Act, spatial planning will be introduced for the German Exclusive Economic Zone (EEZ). The formulation of targets and principles for spatial development in the EEZ is currently in preparation and will be accompanied by an environmental assessment report. Both are expected to be released during 2007.

A very detailed report covering human activities and the institutional setting from the perspective of spatial planning has been elaborated within a research project of the Ministry of Transport, Construction and Housing and the Federal Agency for Housing and Spatial Planning. This has been published in 2006. The results of the research project including recommendations for the national ICZM strategy have been discussed with a wide range of stakeholders and scientists in two conferences, one in October 2003 and one in February 2005.

A final report has been issued during the first half of 2006. Interim results have been published in several conference proceedings.

Following the conference in February 2005, a national ICZM strategy (www.ikzm-strategie.de, German only) has been prepared in 2005 by the Federal Ministry of Environment. The strategy has been publicly discussed end of April 2006 on a conference in Bremen and also sent to the EU. The report includes a revised stock take of human activities based on the above mentioned research project as well as a description of the legislative setting.

The federal government as well as the Laender are also involved in the development of the Maritime Policy under the frame of the EU. Discussion concerning the EU Marine strategy has started in expert circles. At the Wadden Sea level a major instrument of trilateral cooperation is the Trilateral Wadden Sea Cooperation. Extending from the traditional nature protection focused approach of the trilateral cooperation; the Wadden Sea Forum focuses on development issues and developed a range of development proposals which are expected to guide future development within the Wadden Sea area. The members of the forum are local and regional representatives from authorities as well as from local communities, NGOs and interest groups. Representatives from the government of the federal states and from the federal government participate as observers in the forum.

With respect to the EU Habitat and Bird Directive the federal states of Schleswig-Holstein, Niedersachsen and Mecklenburg-Vorpommern identified areas in the territorial waters that have been reported to the Commission. Based on the work of the Federal Agency for Nature Conservation, the Federal Ministry of Environment is proposing areas under the Habitat Directive and under the Bird Directive for the German EEZ to the federal government.

On 25 June 2002 the EU Water Frame Directive was implemented into national law. The different national working groups have finished their evaluation on the ecological state of the German coastal waters. Implementing the WFD is within the Federal a task of the Federal States (Laender). In a range of aspects the 16 Federal States used different approaches, especially concerning

- the selection and analysis of assessed parameters like chemical-physical parameters, specific pollutants,
- the determination of significance thresholds and threshold values,
- the aggregation of results to the whole water body

The assessment, which has been performed by the German Laender until end of 2004 came to the following conclusions regarding surface waters:

- About 14% of the assessed water bodies the environmental targets are likely to be achieved,
- for about 26% of the assessed water bodies it is unclear whether the environmental targets can be achieved
- about 60% of the assessed water bodies the environmental targets will probably not achieve the environmental targets without additional measures

About 63% der Wasserkörper have been classified as being in natural conditions, about 23 % have been classified as heavily modified and about 14 % as artificial.

CZM data projects

The Federal Maritime and Hydrographic Agency (BSH) has established an information system called CONTIS, which is the acronym for Continental Shelf Information System. This GIS database comprises information on the different existing and planned uses like offshore wind farms, pipelines, cables for energy transfer and telecommunication, military training areas, sediment extraction sites, dumping sites for dredged material, shipping routes,

anchoring areas as well as nature conservation areas on the German shelf. Maps can be downloaded from the BSH website (see www.bsh.de/en, go to CONTIS maps).

There is a wide range of other projects and mechanisms dealing with environmental data and/or metadata, especially regarding the physical setting and environmental conditions of the North Sea and the Baltic Sea. Within the frame of the setting up targets and principles for spatial planning in the German EEZ, an environmental report following the rules of Strategic Environmental Assessment will aggregate a lot of environmental information for the German EEZ.

ICZM research projects

ICZM development in Germany is accompanied by two large pilot research projects (currently funded from 2004–2007), each of them with a range of subprojects. Both projects will be extended until end of February 2008. The aim is to accompany ICZM development with relevant research as well as methodological development for ICZM including tool development.

1) Zukunft Küste Coastal Futures: The project is designed to support sustainable development along the North Sea coast of Schleswig-Holstein. The thematic focus is on the assessment of interactions regarding offshore-wind farms, including impacts for regional economic development and infrastructure, conflicts between stakeholders and associated societal values like the perception of the coast by local people. Based on scenario techniques as integrating element for natural and social sciences, the project works along four lines of ICZM:

a) human demands and perceptions and the communication processes between stakeholders;
b) dealing with risk and uncertainty in ICZM;
c) dealing with development chances and potentials in ICZM;
d) managing and steering sea use changes at different scales.

2) ICZM-Odra: The aims and tasks within the project result from the specific situation and demands of the region, especially with the aim to establish and support a regional initiative on ICZM. Major element for public participation and the involvement of authorities is the Regional Agenda 21 ‘Oder Lagoon’. The creation of sustainable perspectives and structures, exceeding the duration of the project, is the core of all activities.

Other research projects include RETRO (2003–2005), which analysed several case studies of formal planning and permission procedures in relation to ICZM and the junior research group IMPULSE, which works with modelling in an ICZM context.

Coastal Futures as well as ICZM Odra are internationally embedded in LOICZ. ICZM Odra works also cross-border in cooperation with Poland. In addition, GKSS Research Centre (www.gkss.de) runs the German node of ENCORA, thereby providing the interface between coastal research in Germany and the European arena. Ongoing EU research projects include SPICOSA and ASTRA (both using the Odra estuary as case study).

It should be noted, that a range of projects funded under the EU-INTERREG program for the North Sea and Baltic Sea regions dealt with ICZM issues or coastal and marine planning activities. Maybe the most prominent one for the Baltic Sea was the **BaltCoast** project, which covered a range of case studies dealing with spatial planning and typical conflicts between different interests in coastal areas. The ASTRA project in the Baltic Sea deals with the impacts of climate change.

For the North Sea several projects dealt with issues like coastal defence, but also with shipping safety. As well the Wadden Sea Forum in its first phase was funded by INTERREG. Following the development of a common vision and developing targets and an action plan, the

members of the Wadden Sea Forum decided to proceed with the forum on their own resources, including establishment of working groups, which deal with specific activities and issues. The **POWER** project deals with offshore wind farm development, especially from the perspective of regions, which hope to benefit economically from this development. The project includes a range of activities dealing with regional economic impacts and strengths and weaknesses of these regions in this respect.

6c. POLAND

Poland has about 500 km of coastal zone on the southern Baltic Sea that is characterised by sandy beaches and cliffs. The coast is predominantly an open, dynamic coast, subjected to strong erosion. As well as the open coast there are two lagoons that can be regarded as sheltered areas: Szczecin Lagoon (in the Odra River mouth) and Vistula Lagoon (near the Vistula River mouth). Although there are many pressures on the coastal zone, still more than 50 % of the coast is in a good natural status.

Key issues for ICZM in Poland:

- strong erosion and occasional flood events;
- high levels of seasonal tourism that can exceed the built and natural carrying capacity ;
- coastal urbanisation;
- coastal industries;
- coastal commercial and fishery port activities;
- reclamation of wetlands for agriculture.

Policy Issues

There is no natural plan for ICZM in Poland, however there is a national plan (created by the maritime authorities) which is related to coastal defence. Recreation, tourism, fisheries, coastal constructions and other coastal activities are not included in this plan. These activities are managed by the regional and local authorities.

There are many activities in the coastal zone that can be regarded have a regionally or locally integrated management. This is applicable in the case of the coastal lagoons (Vistula and Szczecin), national parks (Wolinski National Park and Slovinski National Park) and Landscape parks (Nadmorski Landscape Park and Vistula Landscape Park). Most of these management plans use a GIS system.

6e. SWEDEN

There is no formal definition of the coastal zone but the jurisdiction of the smallest administrative unit, the municipality, comprises land and coastal waters to the 12 nautical mile line. Each municipality is obliged to have an overall plan for land and water use within their jurisdiction. On regional and national scales, the definition of the coastal zone varies depending on activities and resources being managed, e.g., coastal fishery are sometimes defined by distance to the baseline (1–4 nautical miles) and sometimes by vessel size rather than by geographic boundaries.

Sweden's coastline is about 7,600 km long, including mainland bays and the coasts of the larger islands. The salinity of the water decreases from about 30 parts per thousand in the Skagerrak to about 1 part per thousand in the northern Bothnian Bay. The marine ecosystems off the Swedish west coast are rich in species whereas the estuarine ecosystems in the Baltic are characterised by few species occurring in large numbers, and the co-occurrence of marine and freshwater species.

Key issues for ICZM in Sweden:

- In the inshore areas of Sweden, several problems threaten a sustainable use of the coastal resources, e.g. local over-fishing, habitat loss and eutrophication.
- The rapid development of modern activities such as recreational fishing, nautical recreation, wind power mills and nature conservation generates conflicts between stakeholders.
- Poor economy in the coastal commercial fisheries

ICZM Policy Activities

The Swedish government has recently adopted several decisions of relevance for the management of the coastal zone. One is the establishment of a marine environmental unit at the Swedish EPA. The other is the creation of a new institute for interdisciplinary marine research. Moreover, the European Marine Strategy has been given priority by Sweden.

Data-base coordination

In Sweden a process to build an internet-based knowledge-portal for marine environmental management has recently started. Within this process, the Swedish Government has committed the Swedish EPA to describe and analyse the current knowledge base for marine environmental management. Information is being collected from 12 central authorities. All these authorities have a role to play in ICZM (Army, EPA, Energy Authority, Geotechnical Institute, Geological Survey, National Board of Fisheries, National Board of Housing, Building and Planning, Coast Guard, Swedish Maritime Administration, Statistics Sweden, National Survey Authority, Swedish Meteorological and Hydrological Institute).

The information has been collected through interviews, a questionnaire, document- and www-site analysis,

The report under preparation provides information about:

1. Existing data:

- organisation and contact person;
- type of data available, main parameters and important side parameters;
- form of data presentation (digital, paper);
- collecting sites and geographical grid;
- time-series, time grid;
- responsibility for handling data;
- quality standard (yes/no, ev. type);
- accessibility for authorities / public (classification, costs);
- relevance for important authorities/customers;
- problems and needs with these data.

2. Analysis of problems and needs (see conclusions below)

Preliminary conclusions are:

- Lack of coordination of data relevant to the Swedish EEZ! No authority has formal responsibility for overall-perspective (including management)!
- Shore-line problems: Much data collection stops at the shore line or shortly after creating problems of harmonisation along shoreline and sea-level (project under way, but takes time, low priority with some authorities). Important for modelling and exact maps.

- A lot of data, a lot already in digital form. Much old data need digitalisation (interesting for research & modelling, e.g. climate).
- Highly varying character of data. Varying standard of quality (especially old data or data provided by lower administrative levels or private actors).
- High costs of production. Charging of costs varies with authority (survey, geology, statistics, marine survey maps cost). Difficulties with exchange and actuality due to costs.
- Difficulties with classified information: exchange, storage, permits (different types of classification, most difficult to handle bathymetric data).
- Low focus on social scientific data relevant for marine/coastal management.
- Problems with natural scientific data: Need for a finer grid for information (especially offshore and in water). Bothnian Bay and Skagerrak/Kattegatt receive less attention. Co-ordination of data collection can improve even further (buoys, expeditions).
- Data portals: Many data portals with varying focus under construction nationally and internationally, bad coordination between authorities. Examples for portals in S: Geodata Portal, Planning Portal, Crisis Management Portal. Examples for international portals: EDIOS, HELCOM, ICES, GOOS. Network-design with data hosts seems most appropriate: Need for standardisation. Important external factors to consider: A national Geodata-Strategy under way affecting standardisation of data-presentation and exchange (process led by Swedish National Survey Authority). Important EU regulation affecting information collection and presentation (under way): INSPIRE-directive, Marine Strategy

Contact persons for further information: Sverker Evans, Swedish EPA (sverker.evans@naturvardsverket.se) and Andrea Morf, Univ of Göteborg, (andrea.morf@globalstudies.gu.se)

The fisheries co-management initiative

Sweden has presented a brief report of this initiative under Monitor and report results generated from larger projects that are directly relevant to ICZM needs (ToR d)

Contact person for further information: Laura Píriz, Swedish Board of Fisheries (laura.piriz@fiskeriverket.se)

ICZM Research Projects

Several studies and projects are being conducted in Sweden to address key issues. Areas of current and future research relevant to coastal zone management in Sweden are related to recreational fisheries, habitat restoration, MPAs, eutrophication and wind power.

Water Framework Directive

In accordance with the EU Water Framework Directive, Sweden has been divided into 5 regional river basin districts each draining into one of the major sea basins surrounding Sweden: The Bothnian Bay, the Bothnian Sea, the North Baltic Proper, the South Baltic Proper and the Kattegat - Skagerrak. In each district a regional water authority has been established. It is of importance that there is no responsible governmental body on national level that coordinates the work among the five regional authorities. Instead, a committee or a board governs each water authority. The committee is lead by the county governor and the delegates are non-political civil servants appointed by government. The committee is solely responsible for decisions regarding environmental objectives, programme of measures and river basin management plans. Each water authority has a secretariat with a responsible water management director. The secretariats task is to prepare different questions for the committee and to organise the work within the district.

The districts are subdivided into two or more sub districts with a county responsible for organising the work within each sub district. All counties have obligations and are on an equal level responsible for information and contributions from their own county. At each county there is a secretariat that is responsible for organising county work.

This new way of working means new institutional structures and new networks must be developed. Cooperation is central in this new way of working. The water-authorities have come up with a strategy for cooperation to ensure that all stakeholders have an opportunity to be part of the work with the WFD. The strategy is based on regional cooperation groups being formed, so called "water-councils". These water-councils should take part in the all work with the WFD, as for example the forming of action programmes. The water-authorities have had a series of meetings and workshops to identify and involve stakeholders and the interest for this new way of working has been extensive. Norway is part of one of the five water districts and a dialogue has started up dealing with how and what the countries may cooperate about and to exchange data.

Dissipation of information is one important tool to involve stakeholders. As part of this work, an interactive GIS-map with information related to water and water management has been put together by the water-authorities and the counties. The map is accessible at www.gis.lst.se/vattenkartan. Here you can find the different catchment areas, protected areas and risk and effect evaluations from The Swedish Environmental Protection Agency. The map is being continuously upgraded and the information updated.

The Swedish Environmental Protection Agency is working with the development of new criteria for evaluation to ensure coherence within Sweden as well as with other EU member states. They also work with new regulations and general advice connected to the WFD.

There are a few pilot projects started up to get experience of working within the WFD. For example, NOLIMP is an INTERREG project where an evaluation of the waters connected to the catchment area of the fiord of Gullmaren has been made (http://www.gullmarn.org/).

6e. UNITED KINGDOM

Introduction

The boundaries involved with the UK coastal zone management are not clearly defined however the Crown Estate manages the marine areas below Mean Low Water Springs (MLWS) out to 12nm. For planning purposes the Local Authority boundaries seaward limit is generally the MLWS mark. There is no statutory planning offshore, however the recent Water Environment and Water Services (Scotland) Act 2003 extended marine fish farming to local authority control in terms of planning permission out to 3 nm. There is no official development setback line policy or protected zone for the coast. Recently, however, there have been several instances where an informal 5-metre contour line has been recognised in England, specifically in relation to dealing with coastal erosion and flood defence. The coastline around UK is highly variable with rocky cliffs, firths and beaches, creating a large inshore area (within 12 miles of the coast). The diverse habitats in the inshore zone are vital to the UK's fisheries as they provide important spawning and nursery grounds for white fish and flat fish as well as rich feeding areas to several bird colonies. The clean productive seas of Scotland are also essential for the continued development of aquaculture. In the UK, but especially Scotland the network of Local Coastal Partnerships are key to implementing ICZM.

ICZM stock take – Yes April 2006

ICZM strategy – Yes: Scotland, July 2006; England and Wales, December 2006; Northern Ireland, June 2006.

Coastline length:

GEOGRAPHICAL AREA	LENGTH KM	% GB COAST
Great Britain total	19488	
England	5496	28.2%
Scotland (mainland)	6482	33.3%
Scotland (islands)	5295	27.2%
Wales	1592	8%
Northern Ireland	650	3.3%

Key issues:

- Economic contribution of activities in the marine area as per the latest available figures was GBP 67 B, which is made up of: oil and gas – 22.3; tourism and recreation – 16; strategic – 6.5; shipbuilding and repairs – 3; ports – 1.6; and fisheries – 0.5.
- The development of urban infrastructure, ports and harbours and the substantial areas of tidal land that has been converted to agriculture through enclosure. This has been particularly intense around the major estuaries.
- A significant percentage (31%) of the coastline is already developed in industrial, commercial, residential and recreational terms. Economic pressure for further expansion of these facilities is likely to increase in the future.
- Approximately 40% of UK manufacturing industry is situated on or near the coast. Much of this industry, along with major cities, is located around large estuaries.
- Most of the Scottish population lives within a few miles of the coast and on its many islands.
- Spatial issues regarding the distribution of resource exploitation in the coastal zone by inshore fisheries, shellfish gathering, aquaculture, game fishing, offshore oil and gas, shipping, recreation, tourism and small scale agriculture.
- Cumulative impacts of coastal and marine developments.
- Flooding and erosion threat resulting from climate change, sea level rise and isostatic sinking are an issue around the south and east of England, requiring coastal defence.
- Decline in inshore fish stocks due to over-fishing and habitat damage.
- Decline in runs of wild salmon and sea trout in many rivers.
- Fish farming (spatial reclamation, benthic impact, disease, escapes, algae blooms).
- Coastal water pollution threatening the collection and farming of shellfish and the local wildlife.
- Offshore energy development

Policy activities (UK)

UK submitted ICZM Implementation report in March 2006

Major developments for ICZM in the UK include the new Marine Bill which is in consultation stage at this time. A White Paper on the Marine Bill was launched by the government on 15 March This Bill outlines many proposals that will affect the coastal zone and the implementation of ICZM. The key elements of the proposed UK Marine Bill are a new system of Marine Spatial Planning; licensing reform, merging some disparate regimes for development consents (but not oil and gas licensing which DTI has ring-fenced); new nature conservation measures in territorial and offshore waters to implement marine protected areas (called Marine Conservation Areas); the creation of a Marine Management Organisation to deliver some or all of the above, together with some existing functions; and changes to inshore fisheries' management in England.

UK-wide Marine Monitoring and Assessment Strategy UKMMAS (see below) as also a Marine Climate Change Impact Partnership (MCCIP) and Marine Data Information Partnership (MDIP) have been developed.

Policy activities (Scotland)

Scottish Sustainable Marine Environment Initiative (SSMEI): This project is now in phase three, where the four pilot projects (Sound of Mull, St Abbs, The Clyde and Shetland) are up and running and have been designed to investigate different aspects of Sustainable Marine Management. Topics included are spatial planning, habitat mapping and conflict resolution.

Advisory Group on Marine and Coastal Strategy (AGMACS): This was set up to advice Scottish Ministers on delivering the vision and objectives outlined in Scotland's marine and coastal strategy (Seas the Opportunity – a Strategy for the Long Term Sustainability of Scotland's Coasts and Seas). The final report was published in March 2007, which covered four main work streams: Science, Research and Performance Indicators; Conflict Resolution and Integrated Coastal Zone Management; Marine Spatial Planning and Marine Nature Conservation. With regard to ICZM the main recommendation was that Scotland should have its own Marine Management Organisation for national coordination of ICZM and MSP. The report can be found at http://www.scotland.gov.uk/Publications/2007/03/08103826/0.

Coastal and marine national park. In June 2005, the Scottish Executive announced their intention to create Scotland's first coastal & marine National Park during 2008. The Scottish Executive have now launched a consultation (October 20096) on the possible areas for Park status and also on how a Park could operate. Scottish Natural Heritage has identified 10 areas as potential candidates for Park status.

Data projects (UK)

UKDMOS (see ToR e)

Research projects (UK and Scotland)

- SSMEI (see above)
- Developing Benthic Habitat Mapping Methodology (HABMAP, MF0757)
- UKSEAMAP Final report Jan 2007. The outputs provide a fundamental spatial information layer to support more effective management of marine resources and also support the implementation of existing international commitments and targets. A primary output of the project is an interactive web based mapping system giving access to the datasets used and maps created by the project. The project is closely linked with a wider habitat mapping initiative 'Mapping European Seabed Habitats' (MESH).
- Assessment of Pressures from Human Activities on Marine Landscapes (CEFAS)
- Closed Area Scenario Assessment (CASA, MF0168)
- Inshore habitat use by juvenile fish (MF0465)
- Managing fisheries to conserve groundfish and benthic invertebrate species diversity (MAFCONS, MF753)
- Carrying capacity of coastal waters for aquaculture – improved physical and ecosystem management modelling (AE1192)

Natura 2000 position (Scotland)

SACs in Scottish territorial waters out to 12 nautical miles are designated under the Conservation (Natural Habitats, etc.) Regulations 1994 (as amended). All candidate SACs in Scotland were approved by the European Commission as SCIs on 7 December 2004. Scottish Ministers then formally designated all these sites as Special Areas of Conservation on 17 March 2005.

As at 1 April 2005, a total of 34 sites with marine interest have been designated as SACs.

In Scotland, 6 of the 34 marine SACs have purely intertidal marine interests and are fully underpinned by the SSSI mechanism. For these sites, the duties imposed on SNH by Regulation 33 are discharged by SSSI protective measures and notifications. The remaining 28 sites contain significant subtidal areas (i.e. lying below Mean Low Water Springs) cannot be notified under the SSSI system. Documents containing the Regulation 33 advice for each of these 28 European marine sites are all now available.

Marine areas beyond 12 nautical miles (offshore waters) are under UK jurisdiction and managed by the Joint Nature Conservation Committee (JNCC). So far, one site has been formally identified as a possible SAC in offshore waters. This area is known as the Darwin Mounds and is proposed for its cold water coral reefs. Several other sites in offshore waters are under consideration as draft SACs.

Water Framework Directive position (Scotland)

The WFD is implemented in Scotland through the Water Environment and water services (Scotland) Act 2003. To control discharges from point sources the Water Environment (Controlled Activities) (Scotland) Regulations 2005 have been introduced to deliver WFD objectives and became fully operational in April 2006 and the new point source, impounding, abstraction and engineering regimes also started then. In December 2006 the monitoring programme became operational and has been reported to the EU (see below).

Annex 7: Monitor and report results generated from larger EU funded projects (PROTECT, MESH, etc) that are directly relevant to ICZM needs (ToR d)

AquaReg

AquaReg is a co-operation between the regions of Galicia in Spain represented by the CETMAR Foundation, Border, Midland and Western (BMW) in Ireland represented by The Marine Institute and Trøndelag in Norway represented by joint forces of the South Trøndelag and North Trøndelag counties. The overall objective of AquaReg is to provide opportunities and design strategies for sustainable development of peripheral coastal communities by promotion of interregional co-operation in aquaculture and fisheries.

The AquaReg CZM Project is primarily looking at reviewing best practice in aquaculture and inshore fisheries management and producing guidelines of best practice for use by these industries. The consultation stage, however, involved representatives from a variety of different sectors and resource uses, through workshops and questionnaires. This focused on highlighting issues relating to: administration; licensing; monitoring programmes; availability of results and data processing; technological approaches to management; current management fora & representative participation.

Currently, pilot studies in each of the three regions are looking at the application of seabed mapping to aquaculture and inshore fishing and at the establishment of a Geodatabases (GIS) in each of the pilot study regions. The application of seabed mapping involves the production of thematic maps looking at sediment types, exposure, biota and areas for special protection and nursery areas for wild fish species.

The Geodatabases comprises of: bathymetry data; fixed station temperature data; hydrography for surrounding catchment; marine boundaries; quays and piers; political boundaries; aquaculture site locations and inshore fisheries activities. The information gathered in these pilot studies will form the basis for developing a marine spatial plan for the area. For this the relevant agencies will be brought on board and additional survey material incorporated into the database.

www.aquareg.com

Atlantic Coastal Zone Information Steering Committee (ACZISC)

The ACZISC (http://aczisc.dal.ca) was established in 1992 to promote regional cooperation in Atlantic Canada with regard to Integrated Coastal and Ocean Management, coastal mapping and geomatics. The ACZISC is multi-disciplinary and multi-sectoral with representation from ten Canadian federal departments, four Atlantic provincial governments, community organizations, academia and the private sector. A free monthly newsletter is available via email and the website provides links to, for example, mapping programmes, websites, workshops and organisations concerned with ICZM. The information portal contains metadata records or search by subject, coverage or product type to find, evaluate, visualize and access geospatial data.

BALANCE

The project is partly financed by the European Union (European Regional Development Fund) within the BSR INTERREG III B Programme. The project started in August 2005 and runs for 2.5 years. The BALANCE partnership consists of 19 partners and 8 consultants from the all countries surrounding the Baltic Sea except Russia, but incl. Norway.

The aims of BALANCE are to:

- • develop trans-national marine spatial planning tools and an agreed template for marine management planning and decision-making. Four trans-national pilot areas are used to demonstrate the economical and environmental value of habitat maps and marine spatial planning. The tools and zoning plans integrate biological, geological, oceanographic and socio-economic data with local knowledge from stakeholders;
- • develop the "blue corridor" concept and promote "blue corridors" between protected sites adding spatial development dimensions to the implementation of EC Directives;
- • assess if the Baltic marine MPA network is ecological coherent and adequately represents and protects a continuum of habitats;
- • develop a communication strategy for stakeholder involvement to ensure that objectives and decisions address local stakeholders needs and that products is used and understood by the end of project;
- • disseminate project outputs to key users and public through various media, including a project web site, enhancing awareness of the marine natural heritage and the benefits of sustainable resource use.

The planned results are an agreed approach to identification and mapping of Baltic Sea marine landscapes and habitats through development and production of maps. In areas with little biological information habitat predictive models will be developed and validated.

For more information see www.balance-eu.org. For using, sharing or distributing marine data for the Baltic Sea, please see the BALANCE Data Portal at Http://maps.sgu.se/Portal

Corepoint

Corepoint is a network of European partners promoting Northwest Europe as an area of expertise in ICZM. It aims to achieve this through:

- Building European and local capacity to implement integrated coastal management programmes
- Providing concrete solutions for current problems in the Northwest region using current best practice approaches and identify models for sustaining ICZM initiatives
- Promoting social and political responsibility for coastal environment
- Influencing national spatial policy development in response to the EU recommendation on ICZM
- Developing an integrated coastal information management system for Northwest Europe

http://corepoint.ucc.ie/

ENCORA

This EU Network is formed by the institutes coordinating national networks within 18 European countries. It aims to overcome existing fragmentation of knowledge and experience within ICZM by facilitating access to local networks. The national networks include: Sencore, Dancore, Russian Coastal network, Cozone, I-CoNet, NCK, Bencore, GCN, Inet, Ukranian Coastal Network, RFRC, PoCoast, HispaCosta, RIC, Hencore and Regional North African Coastal network (3 countries). More information on this project can be found in www.encora.org.

I-CoNet

I-CoNet is an Irish networking project under the umbrella of the ENCORA networking project. It aims to promote good practice in coastal management by bringing together coastal practitioners, policy makers, researchers and the general public with an interest in the sustainable development of Ireland's coast. I-CoNet newsletter bulletins provides an update on current ICZM related activities and are circulated electronically. The inaugural I-CoNet conference took place in April 2007.

http://iconet.ucc.ie/pages/events.htm

MARINET

MARINET is a newly established Danish national forum with the purpose of optimizing the mapping of the Danish marine areas as well as the use of existing information based on a common coordination between relevant authorities. The members come from broad spectrum of authorities, research institutes and private companies. The common initiatives include calibration of existing multibeam datasets with geological and biological data development of a national habitat classification system.

PROTECT

The international project "Marine protected areas as a tool for ecosystem conservation and fisheries management" (PROTECT) is an interdisciplinary research project involving 17 European institutions. It aims to strengthen the decision basis regarding potential use, selection, development and management of MPAs in Europe as part of an ecosystem-based approach to fisheries management. The project is running from January 2005 to June 2008 with support from the EU 6th Framework Programme.

The main scientific objectives of PROTECT are:

- To evaluate the potential of MPAs as a tool to protect sensitive and endangered species, habitats and ecosystems from the effects of fishing in the context of EU fisheries and marine environmental policies.
- To outline and develop a suite of monitoring, assessment and management tools for MPAs. These methods are intended to assist managers in assessing (i) the fisheries impact on the ecosystem or ecosystem components to be protected, (ii) the impact of introducing MPAs with varying level of protection on the protection target, and (iii) the impact of MPAs on the fishery and related socioeconomic effects.
- To improve the linkage between science and management when designing and introducing future MPAs, including guidance on (i) timing and level of stakeholder involvement required to achieve legitimacy and to ensure that the best knowledge is applied and (ii) follow-up actions after the implementation of MPAs, ensuring achievement of objectives or introduction of necessary modifications.

An important outcome so far in the project is the report: "Review of Marine Protected Areas as a Tool for Ecosystem Conservation and Fisheries Management". This report can be downloaded from the project web-page: www.mpa-eu.net.

SPICOSA

The project "Science and Policy Integration for Coastal Systems Assessment" (SPICOSA) is funded by the EU 6th Framework Programme. It started in February 2007 and will run for 4 years. A total of 54 partners from 22 different countries are involved in the project.

The overall objective of SPICOSA is to develop a self-evolving, holistic research approach and support tools for the assessment of policy options for sustainable management, through a

balanced consideration of the ecological, social and economic sectors of Coastal Zone (CZ) Systems. The specific objectives of the project are to:

1) Create an operational Systems Approach Framework (SAF) for assessments of policy alternatives in Coastal Zone Systems;

2) Create a working science-policy interface and attempt to qualify and quantify complex systems;

3) Implement and test the SAF over 18 diverse Study Site Applications throughout the European region;

4) Generate SAF Portfolio consisting of generic assessment methodologies, decision-support tools, models and new knowledge useful for ICZM, in a manner that is user-friendly and updateable;

5) Improve the communication and integration among the main actors and infrastructures of CZ Systems;

6) Generate new opportunities for academic and professional training in ICZM.

The project has only one central focus, that of demonstrating the practicality of systems thinking into the research and management of Coastal Zones. Given that this experience will be a learning curve for all involved, it is expected that the level of achievement would not be maximal. On the other hand, requiring that several hundred researchers collectively experience and contribute to the first objective; that of creating the SAF protocol, it will certainly stimulate the evolutionary process required to develop appropriate strategies in support of Sustainable Development.

For more details about this project refer to the project website on: www.spicosa.org

Swedish fisheries co-management initiative

The Swedish fisheries co-management initiative (*Samförvaltningsinitiativet – SFI*) is an experimental program which started in January 2005. The Swedish Board of Fisheries has been commissioned by the Government to appraise the possibilities for institutionalising the local and regional co-management of fisheries in Sweden. The initiative is active in six pilot areas with different ecological, social and institutional characteristics (see Figure A7.1).

Groups made of commercial and recreational fishermen, researchers, local and regional governments, water owners, environmental NGOs and other relevant stakeholders identify problems, discuss solutions, agree on action plans and make proposals for change. In some cases the groups have already started with the implementation of their plans and some of the groups were active already before the program started.

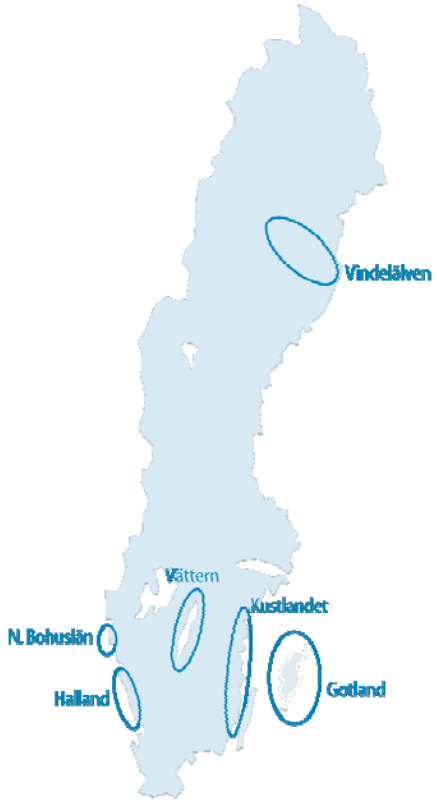

Figure A7.1. The 6 fisheries co-management initiatives in Sweden (Fiskeriverket, 2006).

The program seeks a broad involvement and looks for complementary forms of cooperation and decision making processes that may be a base for future work with co-management of fisheries in Sweden. The initiative is closely related to an ongoing process in the EU with Regional Advisory Councils (RAC) and the EU guidelines for Integrated Coastal Zone Management (ICZM). Resource users and other relevant stakeholder involvement in management is a central principle in ICZM.

The experience, the lessons learned and recommendations have recently been reported (Fiskeriverket, 2006) to the Swedish Government and are available at www.fiskeriverket.se (Swedish only).

The time given to enable an institutional environment for local co-management to evolve and for the local groups to organise themselves and start working has been short but adequate enough to spark the interest of stakeholders in this way of working and its future potential. All groups are and will continue working.

The experience and the report take the perspective of co-management as a process, rather than as a blueprint.

The local co-management initiatives have aimed to develop co-management within a demarked area. The size of the areas has varied as well as the variables used for delimitation; the areas are defined either or both hydro-morphologically and administratively. The administrative delimitation has often sought a homogenous fisheries community and has a political-administrative character as county or municipalities, or property right based demarcation referring to common or private waters or to access rights.

The groups are problem oriented and management object that is in focus for the particular initiative is often extending further and is more diffuse than specific fish species within a clearly demarked area. The local initiatives have chosen to engage in a balanced mixture of data collection, training and fisheries management (emphasising resource conservation and conditions for fisheries). They deal with issues understood to be a common problem (e.g. habitat loss) or opportunity (linking fisheries to other local development). Non-fishing activities affecting the resource or the fisheries (e.g. power plants affecting fish migration or MPAs) may also be central to the discussion depending on the characteristics of the site.

The issue of how to deal with the local co-management of mobile resources and, especially, mobile users have been an important focus in all initiatives. Despite this problem, the preference of using space and time, as the basis for regulating fisheries, has become clear in the management proposals emerging from the groups. The initiatives have varied in their composition. Figure A7.2 shows the composition of the Steering group of the Co-management initiative working on the island of Gotland on the Baltic Sea. So far this group has participated in the monitoring of bird by catch, has proposed changes in the regulation of recreational fisheries during spawning seasons by adapting to local conditions, are mapping local knowledge of areas that have been - but non longer are - spawning areas, is collecting data from recreational fisheries and participates in the Baltic Sea RAC.

"Zukunft Kueste – Coastal Futures" – coastal governance and management for changing human demands

In Germany, the emergence of offshore wind farms as a new permanent large-scale activity forms a critically discussed symbol for a change towards an "industrialization" of coastal and marine waters *Coastal Futures* (www.coastal-futures.org) aims to develop an integrated assessment approach for coastal and marine changes by using offshore wind farms as a case study for changing spatial structures, including their impacts on ecosystem and habitat structures, local economy and infrastructure, conflicts between stakeholders and social values such as perception of the coast by local people. To ensure methodological integration, a characterization system based on the Driver-Pressure-State-Impact-Response (DPSIR) approach and an integrated assessment approach linking tools from both natural and social sciences - e.g. scenario techniques, modelling and stakeholder dialogues form the overall framework, was taken. Assessments are largely based on available data, modelling exercises and expert assessments. A comprehensive stakeholder assessment combines dialogue with local, regional and national stakeholders, media analysis, document analysis, questionnaires concerning values and perceptions and an analysis of communication networks for local development along the North Sea coast of Schleswig-Holstein.

The research approach aims to raise awareness for the complexities surrounding coastal zone decision-making using a tool that forms the development of scenarios in the next 50 years. The scenario storylines are built around 5 different sea use patterns, each describing a different mix of driver settings and resulting in different priorities concerning the implementation of human activities in coastal and marine waters: They are Sea and coast as (i) a natural area; (ii) leisure and tourism area; (iii) a source for renewable energies; (iv) an industrial area; and (v) a traffic area

Following the description of the specific set of drivers, pressures and impacts resulting out of these storylines (Figure A7.2 a and b), the next step of analysis will be the discussion of the scenarios with experts from the region and several government authorities, identification of trade-offs between different stakeholders and the identification of policy and management options, which could allow to steer positive and negative effects within the scenarios and their trade-offs.

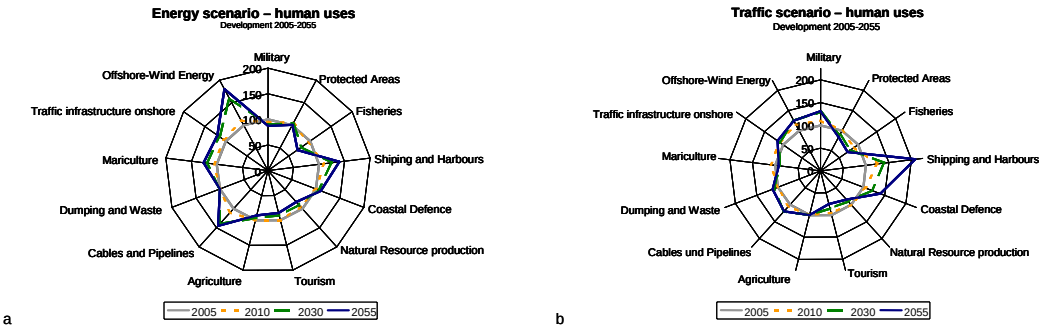

Figure A7.2. Use pattern in the energy scenario (relative values), b: Use pattern in the traffic scenario (relative values). Graphics developed by Burkhard 2005.

The project activities directly assist Integrated Coastal Zone Management (ICZM) and related strategies as well as spatial planning in marine waters by provision of assessment approaches and information about interactions that contribute to the development of sustainable governance structures and spatial planning concepts for marine areas.