Advisory Committee on Ecosystems **ICES CM 2003/ACE:04**

REPORT OF THE

Regional Ecosystem Study Group for the North Sea

Nantes, France
4–7 April 2003

International Council for the Exploration of the Sea

Conseil International pour l'Exploration de la Mer

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1 OPENING OF THE MEETING

Dr A. Kenny (Chair) welcomed the participants (Annex 1). He explained that, overall, the Regional Ecosystem Study Group for the North Sea (REGNS) is required to take a strategic view on how ICES (over the medium- to long-term, 3 to 5 years, and > 5 years, respectively) should move towards providing ecosystem-based advice underpinned by sound science utilising the existing network of ICES Working Groups.

The Group is tasked with looking ahead beyond the North Sea Pilot Project (NORSEPP) at the future needs to support Member Countries in the delivery of the ecosystem approach (EA).

The ToRs reflect three important principles of the EA as defined by Malawi workshop (UNEP/CBD decision COP V/6; UNEP, 1998), the FAO Committee on Fisheries (FAO, 2003), the World Summit on Sustainable Development in Johannesburg 2002 and the recent EU Presidency Stakeholder Conference which took place on 4–6 December 2002 in Køge, Denmark. The content of these documents has been considered and responded to in a joint OSPAR/HELCOM Ministerial Statement (Annex 2). The ToRs for REGNS guided by these discussions reflect:

1) the need to have sound science supporting an adaptive management framework;
2) the need to undertake integrated assessments in support of management decisions to regulate activities; and
3) the need to coordinate and integrate national and international monitoring programmes.

These ToR should not be seen in isolation, but are essential components of an EA. Specifically, the Group is asked to:

a) consider the priority science issues from the Scientific Expert Conference in Bergen 20 – 22 February 2002, and how ICES can contribute to their development;
b) prepare proposals for how ICES could contribute to the development of integrated assessments of the North Sea in cooperation with other international organisations (OSPAR and EU) to facilitate production of integrated advice;
c) consider in joint session with PGNSP, the role of ICES in improving the coordination, harmonisation and efficiency of current national and international monitoring to serve the assessment process.

REGNS recognises the importance of NORSEPP in moving from the conceptual to the operational phase of the ecosystem approach and therefore the Group should provide support to this initiative by reinforcing its contribution during the joint session with NORSEPP under Item c of the Agenda.

Dr Kenny pointed out that this is the start of a three-year process with the aim to identify the "key" issues and path to take (to be agreed at this, the first meeting) leading to real solutions by the end of the process.

2 ICES MEMBER COUNTRIES AND THE ECOSYSTEM APPROACH

The majority of ICES Member Countries are responding in some way to the needs of an Ecosystem Approach (EA). The responses vary, but in some cases involve establishing regional demonstration projects that attempt to operationally integrate[1] the science, monitoring and management needs for specific activities within a region. The links between these components comprising an EA are shown in Figure 2.1. Clearly the objectives and mechanism for integration must be defined before an EA can become operational.

It is also noteworthy that to manage human activities according to the principles of the ecosystem approach, some member states of ICES are reviewing their management policies. For example the Norwegian government has presented a white paper (St.meld. nr 12 (2001–2002), *Rent og Rikt Hav*, in english: *Clean and Rich Seas*) in March 2002. The first step in the follow up of this white paper is to prepare a total management plan for the Norwegian part of the Barents Sea where the background documentation (Annex 3) is to be finalised by the end of February 2004. Also as a response to this development, the Institute of Marine Research (IMR) in Norway is now undertaking a major restructuring of its

[1] Operational integration – what does this mean? "operational" = routine application and use of monitoring and management tools; "integration" = integration of science, monitoring and management to provide an adaptive management approach. There is general acceptance of the need to ensure that monitoring should be fit for purpose. Monitoring should no longer be seen as simply complying against a set of environmental quality targets or limits, although this remains an essential requirement; monitoring must also add value to the scientific understanding of ecosystems. Monitoring programmes should validate our expert opinion and models of ecosystem response in such a way that ensures effective management of the ecosystem in an adaptive way.

organisation to better deliver ecosystem-based management advice. The IMR restructuring will be based on three ecosystem-based advisory programmes and one thematic advisory programme (the Barents Sea programme, the Norwegian/North Sea programme, the Coastal zone programme and the Aquaculture programme) all supported by multidisciplinary thematic research groups (about 20). Services for functions such as equipment use will be equally accessible to all research groups. The new organisation of IMR is intended to be made operational from 1/1 2004.

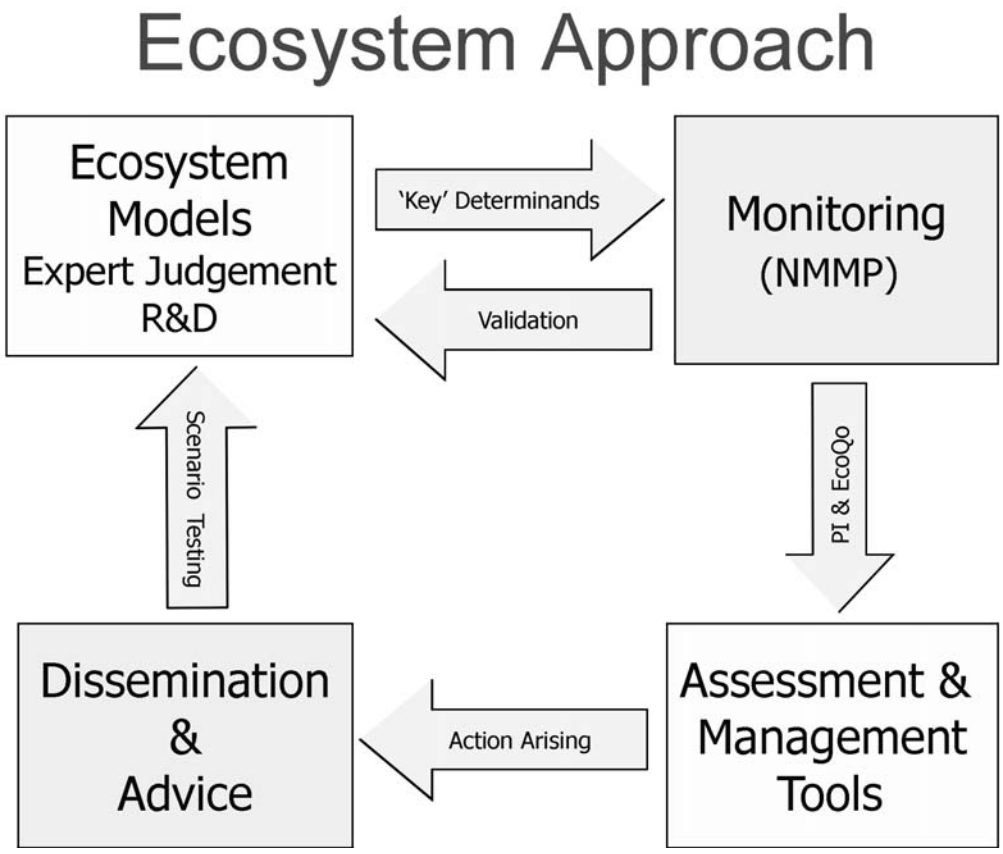


Figure 2.1. The conceptual framework of the Ecosystem Approach highlighting the connectivity (linkage) required between: i) the scientific understanding of ecosystems applied operationally using models; ii) the mandatory monitoring programmes such as the UK National Marine Monitoring Programme (NMMP); iii) the integration of monitoring data for comprehensive assessment purposes; and iv) the dissemination of advice based upon scenario testing the operational models. The whole framework when operational is an adaptive management system.

The discussions that have taken place within member states on the ecosystem approach (EA) can be related to the conceptual framework (Figure 2.1) and these are briefly described below:

i) The science needed to underpin the ecosystem approach, in particular the developments in operational models to predict the occurrence of eutrophication or chemical contamination, have been reviewed (Moll and Radach, 2001). There is wide acceptance that the science of ecosystems is under development and in many cases questions relating to ecosystem function and response are unlikely to be answered completely for many years. The challenge facing Member Countries is therefore to make better use of present scientific knowledge to establish the operational scientific tools (models) to support the thematic assessment and management needs.

ii) For most Member Countries the mandatory monitoring programmes demonstrate little integration between the scientific output from R&D programmes and the types of monitoring being undertaken. This is not surprising as the present programmes largely reflect compliance against traditional sectoral policy drivers dealing with fisheries, chemical contamination, ocean climate and nature conservation. However, the advent of the ecosystem approach now cuts across all these sectors which, in effect, results in one policy driver applicable to all. Without coordination of the respective national and international sectoral monitoring programmes, excessive duplication of effort will result. For example, fish stock assessment programmes could justifiably claim the need to monitor ocean climate parameters and contaminants to provide better assessments of stocks according to the EA principles (FAO, 2003).

However, rather than collect new data, the existing sources of information from the respective sectoral programmes must be considered and where appropriate included or modified to support the stock assessment objectives. Clearly this argument can be applied to each sector in turn and therefore some measure of control and coordination is required to ensure equitability of activities between sectors.

iii) Currently the present system of assessment and control of monitoring is very much sectoral based, which is effective for present day assessment and reporting needs, but this too is changing in response to the EA. The need for adaptive management requires not only the monitoring to be joined-up, for example nutrients monitoring should be integrated with operational modelling of ocean processes and the measurement of eutrophication effects, but it also requires the regulatory advice to respond (pro-actively) to any changing pressures and environmental conditions which may give rise to adverse effects. This last point relates to the final stage of an operational EA, see iv) below.

iv) The feedback from the assessments to regulate the inputs and pressures on a time-scale commensurate with mitigating for any effects is essential. The mechanisms by which such feedback can be applied are subject to discussion and agreement, but they will ultimately depend on the type of activity, the location, and resources available to the relevant competent authority.

3 AGENDA ITEM A – THE PRIORITY SCIENCE ISSUES FOR NORTH SEA ECOSYSTEM MANAGEMENT

The scientific expert conference in Bergen 20–22 February 2002 was linked to the 5th North Sea Conference. The expert conference identified six short-term and five longer-term priority science issues. The identification of these priorities was guided by the need to understand the North Sea as an ecosystem and to assess the degree of human impact on this system. The statement from the expert conference is given in Annex 4.

The ministers at the 5th North Sea Conference agreed to implement an ecosystem approach to the management of the North Sea. As one element of this implementation, they agreed to develop focused research and information gathering which should address the driving forces of North Sea ecosystem variability, including climatic, biological and human factors, which are critical for maintaining ecosystem structure and function. The ministers invited ICES and GLOBEC to consider the priority science issues and contribute to their development.

In brief, the scientific issues are:

Short-term (3–5 years) Priority Issues:

- Operational fisheries oceanography (NORSEPP)
- Habitat mapping (first generation)
- Spawning areas of fish populations
- Experimental studies of trawling closure areas
- Threatened and declining species and habitats
- EcoQOs and indicators

Longer-term (> 5 years) Priority Issues:

- Role of benthic species richness
- Ecological transfer efficiencies
- Population dynamics of key species
- Food web and life history interactions
- Transport and effects of contaminantsREGNS noted that the short-term and longer-term priority issues differed in their nature. The short-term issues are more specific tasks where completion or substantial progress could be achieved within 3–5 years. The longer-term issues are much broader, but have a common theme of quantifying ecosystem function. Collectively to address these longer-term issues will require sustained effort over a longer time period (> 5 years).

It was noted that a recommendation from the expert conference in Bergen 2002 was that a North Sea Ecosystem Science Programme could be established as a possible framework for the implementation and coordination of regional ecosystem R&D. A Regional Programme for the North Sea could be co-sponsored by GLOBEC. With ICES hosting the North Atlantic GLOBEC office, such collaboration would be practical. This research initiative should be open and inclusive, and care should be taken to avoid unnecessary duplication of research activities.

ICES could use its machinery with Working Groups and Science Committees in assisting the planning and implementation of the research to address the priority science issues. We suggest that REGNS could be tasked with the coordination of the initial steps in establishing the programme, namely:

REGNS Intersessional Actions

1) REGNS should fully consider the appropriate framework for coordinating R&D in support of an Ecosystem Science Programme and assess how practical this will be. Bill Turrell and Hein Rune Skjoldal will seek opinion and feedback on the possibility of establishing an ICES-coordinated Ecosystem Science Programme whilst attending the 2003 ICES ASC.
2) To assess the practicality and value of an ICES Ecosystem Science Programme, REGNS will compile readily available information from ICES Member Countries on existing and recently completed R&D to examine how national programmes contribute to the priority science issues. Andrew Kenny will compile information on R&D programmes for the UK and Hein Rune Skjoldal will do the same for Norway.

REGNS Recommendations to ICES

1. ICES should request its Working Groups to consider the priority science issues, particularly with regard to the short-term issues. The groups identified in Table 3.1 should be tasked with a common ToR to consider how they can progress, coordinate and contribute to the science issues if at all relevant to their group's activities. The feedback from the WGs could be assessed by REGNS and advice reported accordingly when REGNS meets next year; this would have implications for when REGNS would meet, namely after the identified groups (Table 3.1) have had their meetings.

Table 3.1. ICES Working Groups and the short-term science issues.

Short-Term Priority Issue	Description	ICES Working Groups to consider how to progress/coordinate/contribute
1	Operational description of currents and water masses	North Sea Pilot Project (NORSEPP)
2	Production of the first generation habitat map of the North Sea	WG on Marine Habitat Mapping (WGMHM)
3	Mapping and monitoring of spawning areas of commercial fish populations	WG on Fish Ecology (WGFE) in consultation with WGMHM
4	Experimental studies of the effects on benthic species, communities and habitats following closure of areas to bottom trawling.	WG on the Ecosystem Effects of Fishing Activities (WGECO)
5	Identification of threatened, declining and rare species and habitats.	to include WGECO, WGFE, WGMHM, Benthos Ecology WG (BEWG)
6	Further development of ecological objectives and indicators for monitoring changes in the ecosystem and for measuring the effects of management actions.	WGECO (for indicators in particular; MCWG, WG on Plankton Ecology and other similar WG)

2. Whilst the short-term scientific issues can be considered by the relevant ICES WGs, we suggest that the Science Committees should consider how ICES can contribute, progress and coordinate its activities to support the longer-term priority science issues.

3. ICES should consider initially responding to the invitation from the North Sea ministers in the Bergen Declaration from the 5th North Sea Conference, by writing to ministers to inform them of the discussions taking place in ICES on the priority science issues and the ecosystem approach. Waiting three years (for REGNS to conclude its task) may be too long to wait.

4 AGENDA ITEM B – INTEGRATED ASSESSMENTS

4.1 Introduction

REGNS recognises two types of assessment which underpin the ecosystem approach; these are i) general assessments; and ii) thematic- (or activity-) based assessments. The rationale for this distinction is given in the draft OSPAR Joint Assessment and Monitoring Programme (JAMP) (see Annex 5 for citation) and has been further described in Annex 6. It is important to appreciate that although thematic and general assessments are closely related, they have different purposes. Thematic assessments embody the adaptive management principle, which requires that activities are managed in a way that is responsive to the dynamics of the ecosystem. In considering general assessments, a combination of activities and their effects on the ecosystem needs to be assessed. This requires a greater degree of understanding of ecosystem function and the cause-effect pathways which determine state and impact. This distinction clearly has implications for how integrated assessments should be coordinated and delivered by ICES at the WG level.

In both types of assessment it helps to visualise the ecosystem as a set of biological compartments that are trophically linked and which interact with their environment, including human pressures (Figure 4.1.1). It is apparent that ICES WGs map onto the compartments (boxes) of the ecosystem reasonably well. However, the links between ecosystem compartments are not so well reflected in ICES WG structure and this represents a gap in capability that should possibly be addressed.

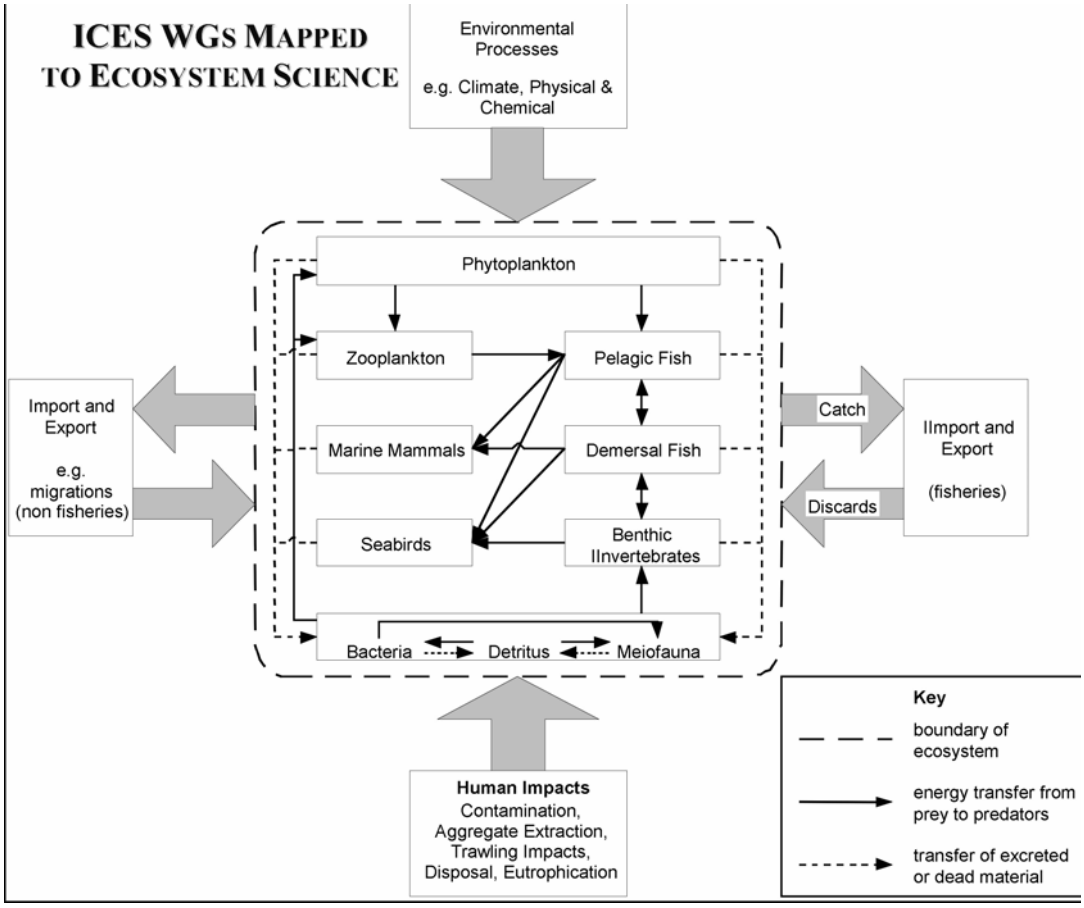


Figure 4.1.1. A conceptual description of a marine ecosystem highlighting the biological components and their trophic relationships and the external pressures (both environmental and human) acting upon them. The diagram serves to highlight those areas in which ICES has strong representation (pelagic and benthic macro-organisms) whereas other areas notably at the bottom of the food web are poorly considered.

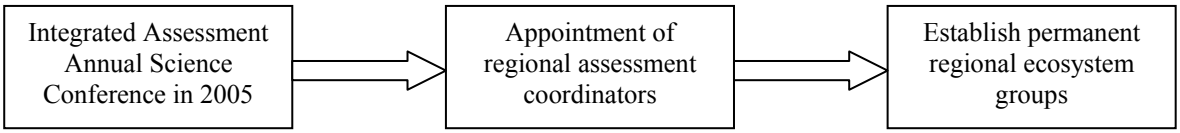
Within the existing structure of ICES, thematic assessments of the marine environment (climate, contamination, physical disturbance and eutrophication, etc.) and fish stocks are carried out by different Working Groups. These groups

report to their parent Science Committees and Advisory Committees (ACME for environmental issues, ACFM for fish stock assessments and ACE for ecosystem issues). It should be noted that the Study Group on Ecosystem Assessment and Monitoring (SGEAM) in its 2001 and 2002 reports, proposed that ICES WGs should be given a common ToR to contribute to regional integrated assessments and that regional ecosystem groups should be given the task of compiling status reports with help from the ICES Secretariat.

The ICES Council sets the terms of reference for the activities in the Advisory Committees, Science Committees and various Working Groups in accordance with the requests for thematic advice from OSPAR, HELCOM and EU.

REGNS Recommendations to ICES

In order to move towards supporting both general and thematic assessments required by OSPAR[2] (Annex 5), HELCOM and the EU, REGNS recommends that the following three proposals are considered by ICES. These should not be seen in isolation of each other, but should be considered as complementary elements towards delivering a permanent mechanism to address integrated assessments by ICES WGs. The elements could be implemented in a sequence:



The above model depends very much on the outcome of the first step, indeed subsequent steps (if any) will be shaped entirely by the outcome of the integrated assessment thematic session at the ASC in 2005 and therefore subsequent steps should be viewed as conditional.

Step 1: ASC 2005 Integrated Assessment Thematic Session

ICES should anticipate the need to provide integrated ecosystem assessments to OSPAR and the European Commission under existing or imminent MoUs. Presently the ICES WG structure does not lend itself to such integrated assessments across the different components of the marine ecosystem, or across the relevant external drivers or within individual regional ecosystems within the ICES area. A new process is required to facilitate holistic integration of advisory products within ICES.

REGNS is acutely aware of the heavy operational burden on some ICES WGs, especially the fish stock assessment WGs. While the recommendation (proposal) outlined below will involve additional work for specific WG members, REGNS wishes to stress that:

- The proposal is designed to integrate existing effort, not duplicate it, or create unnecessary new effort;
- ICES and its Member Countries will be required to undertake integrated assessments. Therefore ICES needs to establish a process where value can be added to the exiting assessment work of Member Countries;
- The proposal should take place over a two-year period in order to allow work planning.

REGNS recommends that:

For the 2005 ICES Annual Science Conference, a Theme Session covering "Integrated Assessments" should be considered. This would be timely in respect of the OSPAR intermediate quality status assessment in 2005 and other specific OSPAR thematic assessment needs (Annex 5).

By restricting the assessment to one region, for example the North Sea, the strengths and weaknesses of the ICES WG structure to deliver integrated thematic and general assessments will be revealed.

A possible mechanism for organising the contributions to an integrated assessment theme session at the 2005 ASC is given in Annex 7.

[2] OSPAR JAMP assessment schedule detailed in Appendix 1 of the draft revised JAMP (Annex 5).

Step 2: Regional Integrated Assessment Programmes

Taking advantage of the existing Working Group and Science Committee structure of ICES, Integrated Assessment Programmes could be established to meet specific customer needs (see Annex 5). The programmes could be established either on a regional or thematic basis depending on need, but in all cases would be led by a senior scientist either elected or appointed by the Council. It is anticipated that programme meetings would be required and that these would be supported by appropriate levels of intersessional correspondence. The programme meetings should be chaired by the programme leaders and attended by the relevant Working Group chairs. The meetings could be held when the relevant Working Groups have delivered products according to the specific terms of reference requested by the Integrated Assessment Programme objectives.

The advantage of this approach is that one individual is tasked with the responsibility of coordinating the inputs required from existing WGs. It represents no structural change to the existing working arrangements but rather adds an additional level of assessment which cuts across WG activities.

Step 3: Regional Integrated Assessment Groups

This step recognises the need to formally acknowledge step 2 by establishing permanent ICES integrated assessment groups. The groups should recognise the activities already in hand by Member Countries to coordinate national monitoring programmes (see Section 5) to deliver both thematic and general assessments required by OSPAR (JAMP) and the EU (Water Framework Directive, WFD). This effort in some cases is considerable, but is in general (to a greater or lesser extent) a common activity across member states.

REGNS recognises that ICES could play a role in integrating the national assessment products for regional (international) assessment purposes required by OSPAR and the EU.

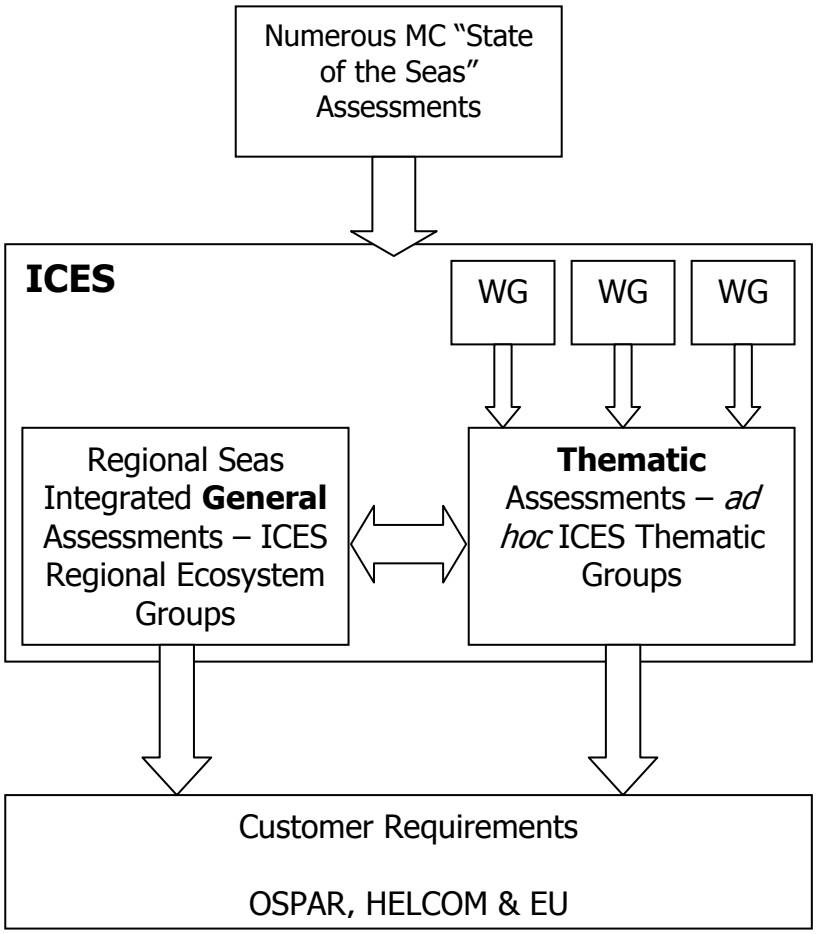


Figure 4.1.2. Proposed ICES Integrated Assessment Groups.

This could be undertaken at two levels (Figure 4.1.2), namely: i) for general assessments such as the periodic OSPAR QSR, Regional Ecosystem Groups (REGs) would be tasked with undertaking integrated assessments on a regional basis by drawing together the relevant national assessment products and, where available, thematic assessments. This would be on a time-scale commensurate with customer (QSR) reporting needs and the groups should be considered as permanent within ICES; ii) the second level would be for thematic assessments which would address specific needs such as eutrophication and contamination, Thematic Ecosystem Groups (TEGs) would be established on an *ad hoc* basis and would consist of members drawn from exiting ICES WGs that would enable the integration of the science needed to support the assessment needs. Common ToR for WGs which identify forthcoming thematic assessments (JAMP) would ensure that value is added to the work of TEGs when they are convened. These groups would in general be temporary.

5 AGENDA ITEM C – INTEGRATED MONITORING FOR INTEGRATED ASSESSMENTS!

This item was covered, in part, in joint session with the NORSEPP Planning Group.

There is in general agreement that much, if not all, the mandatory monitoring programmes undertaken at the national level by Member Countries can be placed into one of four sectors, namely: i) fisheries; ii) contamination/pollution (including physical disturbance); iii) species and habitats; and iv) ocean climate and processes. Each Member Country has different mechanisms for managing the programmes within each sector, but in general the sectors and programmes have evolved in response to specific policy and legislative drivers laid down by international conventions and the European Commission. These drivers, many of which have not yet been repealed by the EA, require specific assessment products.

The common policy objective of an ecosystem approach will inevitably require the integration of sectoral-based monitoring programmes in order to avoid unnecessary duplication of effort. Unfortunately, the task of coordination and harmonisation of cross-sector programmes has a long history of sector-specific assessment and management to overcome, and therefore the process of integration is not going to be easy. This is made even more difficult by the speed at which the sectors have been tasked with responding to their new "common" policy driver, giving rise to increased likelihood of duplication of monitoring effort between sectors which is clearly unsustainable.

REGNS recognises that the integration of monitoring programmes will need to occur at a number of institutional, national and international levels, namely: i) harmonising the monitoring effort between sectors to obtain the best use of resources is used, e.g., to identify the synergies between the existing groundfish surveys and the surveys of fish disease in support of pollution monitoring programmes, the use of ocean climate observations in support of fish stock assessments, etc.; ii) the need to integrate within each sector, e.g., can the existing monitoring undertaken in support of the WFD be integrated with the monitoring needs to support the OSPAR Hazardous Substances Strategy; iii) whilst i) and ii) enhance the thematic assessment needs, there is also the need to integrate the monitoring programmes with the R&D and our scientific understanding of ecosystems to deliver general integrated assessments.

An integrated monitoring programme should therefore have the following characteristics to allow it to be readily used for integrated assessment purposes;

1) complementary spatio-temporal scales;
2) metrics informed by R&D;
3) have a consistent suite of base metrics to which a suite of additional, adaptable metrics can be added;
4) changes to methodology should not disrupt time series;
5) time frame of resulting data availability should be similar for all metrics;
6) framework for data quality assurance.

<u>REGNS Intersessional Actions</u>

REGNS would be able to undertake an assessment of the practicability and value of regional integrated monitoring at the international level by utilising the various strategic reviews of national monitoring programmes. The Institute of Marine Research in Bergen is able to provide a review of the Norwegian region monitoring, and a strategic review of national sectoral monitoring programmes in the UK is under way. The UK Marine Pollution Monitoring Management Group (MPMMG) has submitted a draft report setting out the mechanism by which integration between sectors can be achieved to the UK Department for the Environment, Food and Rural Affairs (DEFRA). It was agreed that, in order to demonstrate the value of collating such information and comparing respective programmes in terms of spatial/temporal coverage and the determinands measured, a comparison of the Norwegian and UK monitoring programmes should be conducted. This will enable differences and similarities to be highlighted and act as a basis for establishing the

feasibility of regional integrated monitoring at the international level. Hein Rune Skjoldal (Norway) and Andrew Kenny (UK) will undertake this task prior to the next meeting.

It was also agreed that within each Member Country considerable progress could be made towards identifying the potential for integrated monitoring within Member Countries' respective programmes; such coordination and integration at the national level would serve as a template for integration at the international level. In this respect the NORSEPP provides an opportunity for Member Countries to coordinate their respective monitoring programmes within a regional context and offers this for international coordination and integration by NORSEPP. For example, the integration of ocean climate observation and fish stock assessment should be examined at the national level and then contributed to NORSEPP, but there was some concern expressed that this may not be the best use of resources since it does not service any immediate assessment product needs. It may therefore be advisable that NORSEPP also considers the role of operational oceanographic monitoring (including nutrients, and primary production) to assess the problem of regional eutrophication.

6 CLOSURE OF THE MEETING

Dr Kenny thanked the IFREMER host Dr Benjamin Planque for arranging the facilities at IFREMER and providing an excellent assortment of chocolate biscuits. He also thanked the Chair of the NORSEPP Planning Group (Martin Holt) for the joint session discussions and the participants in REGNS for their contributions to this report. Dr Kenny looked forward to seeing the participants at the meeting next year, subject to the approval of their respective official ICES delegates.

The meeting was closed at 18.00 hrs on 7 April 2003.

7 REFERENCES

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ANNEX 2: MEETING OF THE OSPAR ENVIRONMENTAL ASSESSMENT AND MONITORING COMMITTEE (ASMO), SVOLVÆR (NORWAY): 28 APRIL – 2 MAY 2003

Agenda item 8 ASMO 03/8/2-E

English only

OSPAR CONVENTION FOR THE PROTECTION OF THE MARINE ENVIRONMENT OF THE NORTH EAST ATLANTIC

MEETING OF THE ENVIRONMENTAL ASSESSMENT AND MONITORING COMMITTEE (ASMO)

SVOLVÆR (NORWAY): 28 APRIL – 2 MAY 2003

Overarching statement on the ecosystem approach to management

Presented by the Secretariat

ASMO is asked to comment on a draft of an over-arching statement on the ecosystem approach, so that further drafts can be considered by HOD May 2003, with a view to it forming part of the output of the 2003 Joint OSPAR/HELCOM Ministerial Meeting.

Background

1. OSPAR 2002 agreed that the output of the 2003 OSPAR Ministerial meeting should include a statement of the general approach to the application of the ecosystem approach to management, including the role to be played by ecological quality objectives. Such a statement should aim at fulfilling the role of the former OSPAR Action Plan in showing how all the various OSPAR strategies and programmes fit together to achieve the purposes of the OSPAR Convention, and how OSPAR's work supports sustainable development and the implementation of global environmental agreements (especially the World Summit on Sustainable Development). It should also make clear how the ecological quality objectives (EcoQOs) agreed by the North Sea Conference and any EcoQOs adopted by OSPAR fit in with this over-arching approach.

2. HOD November 2002 discussed an initial draft statement and agreed that this draft provided a good basis for development, and that each of the OSPAR main committees should be asked to examine and comment on it. Further drafts, taking into account those comments, should then go to HOD March and May 2003 for review prior to submission to OSPAR MMC 2003.

3. HOD November 2002 also agreed to propose to HELCOM that there would be advantage in making the statement a joint HELCOM/OSPAR statement, rather than simply an OSPAR one. HELCOM has agreed to this. The statement was therefore substantially redrafted to cover HELCOM aspects since the original text was OSPAR-specific. The Joint meeting of OSPAR and HELCOM Heads of Delegation (JHOD) in March 2003 made arrangements for HODs to comment further on the draft statement for consideration at JHOD in May 2003.

4. The European Commission, as part of the process of developing a European Strategy for the Protection and Conservation of the Marine Environment, sponsored with the Danish EU Presidency a Stakeholder Conference. This took place on 4-6 December 2002 in Køge, Denmark (see ASMO 03/1/Info.2). There was discussion on the ecosystem approach in one of the working groups at the Køge Conference, and HOD agreed that that the results of this discussion should also be brought to the attention of the main committees.

5. Attached to this document is the current draft of an over-arching statement on the ecosystem approach to management of human activities, that has been developed through the process described above.

Action requested
6. ASMO is invited to review the attached draft of an over-arching statement on the ecosystem approach to management of human activities, to provide material for the further drafts to be put to HOD May 2003.

Towards an ecosystem-based approach to the management of human activities

The Baltic Sea Protection Commission (the Helsinki Commission – HELCOM) and the OSPAR Commission for the Protection of the Marine Environment of the North East Atlantic (OSPAR) jointly adopt this statement of their common vision of an ecosystem-based approach to managing human activities in their maritime areas:

The foundation of an ecosystem-based approach

1. The North-East Atlantic and its adjacent seas, including the Baltic Sea, are part of the world's oceans. In conserving them and managing our activities in them, we must apply the principles that the global community has adopted for the world's oceans and seas.

2. The oceans and seas constitute the major part of the planet that supports life and drive the climate and the hydrological cycle. It is crucial to conserve marine biological diversity and its intrinsic value for maintaining life on earth in order to help provide the vital resources for sustainable use in ensuring well-being for present and future generations and economic prosperity, to help eradicate poverty, and to help ensure food security.

3. The marine environment is both an ecosystem and an interlocking network of ecosystems. The Convention on Biological Diversity defines an ecosystem as "a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit". No particular spatial unit of scale is included in this definition. The scale of analysis and action is to be determined by the problem being addressed.

4. All the components of an ecosystem, including the human component, function together and interact to form an integrated unit. Such integrated systems require a long-term integrated management of human activities, explicitly:

a. linking human needs to the capacity of ecosystems to fulfil those needs;

b. recognising the values of ecosystems, both in their continuing unimpaired functioning and specifically in meeting those human needs;

c. preserving or increasing their capacity to produce the desired benefits in the future.

5. The ecosystem approach can therefore be defined as "the comprehensive integrated management of human activities based on the best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity".

Global principles

6. The global community has progressively agreed on principles to ensure the conservation and sustainable use of the world's oceans and seas:

a. the United Nations Convention on the Law of the Sea (UNCLOS), opened for signature in 1982, sets out the overall legal framework within which all activities in this field must be considered;

b. Chapter 17 of Agenda 21, adopted in 1992, remains the fundamental programme of action for achieving sustainable development in respect to oceans and seas;

c. the Convention on Biological Diversity, also adopted in 1992, and Decisions II/10 (conservation and sustainable use of marine and coastal biological diversity) and V/6 (ecosystem approach) taken under it, set out vital aims, principles and operational guidance for an equitable and integrated approach to conservation and sustainable use of the marine and coastal environment;

d. the commitments made in 2002 at the World Summit on Sustainable Development highlight the issues on which action is most urgently needed: in particular, applying the ecosystem approach for the sustainable development of the oceans by 2010, maintaining fish stocks at sustainable levels or restoring depleted fish stocks, giving effect to FAO international plans of action for the management of fishing capacity by 2005, and to prevent, deter and eliminate illegal, unreported and unregulated fishing, establishing marine protected areas, establishing global reporting and assessment of the state of the marine environment and eliminating subsidies that contribute to illegal, unreported and unregulated fishing and to over-capacity.

The OSPAR and HELCOM frameworks

7. All States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit the marine resources available to them in accordance with the UN Convention on the law of the Law of the Sea pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

8. The OSPAR and HELCOM Conventions are [the][3] major instruments through which a proper balance of these rights and responsibilities is achieved for the North East Atlantic and the Baltic Sea Area. Within the overall framework created by those Conventions, particular significance attaches to:

a. the general obligation, in accordance with the provisions of the Conventions, to take all possible steps to prevent and eliminate pollution and to take the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems, including natural habitats and biodiversity and to restore marine areas which have been adversely affected;

b. the acceptance of the precautionary principle and the "polluter pays" principle;

c. the use of best available techniques and best environmental practice, including, where appropriate, clean technology;

d. the emphasis on monitoring and assessing inputs of nutrients and hazardous substances and all compartments of the marine environment (water, sediments and biota) and on developing priorities for action for their conservation and sustainable use;

e. the development of programmes and measures, in accordance with the provisions of the Conventions:

   i. to combat pollution from all sources, and

   ii. to address adverse impacts from human activities in the light of their extent, intensity, duration, actual and potential adverse effects on species communities, habitats and ecological processes, and the irreversibility or durability of these effects, subject to a ban on adopting programmes and measures on questions relating to the management of fisheries.

9. All OSPAR and HELCOM Contracting Parties share further commitments to promoting environmental and nature protection and sustainable development.

10. For their Member States, the instruments constituting the European Union and the European Economic Area, and the measures adopted under them, including the European Council's Gothenburg statement on biological diversity, set out additional obligations in these fields.

11. Particular commitments arise from the decisions of North Sea Ministers in the framework of the International Conferences on the Protection of the North Sea. Within this framework, the global principles have been interpreted for

[3] *This word was inserted by HODEM. The Secretariats consider that it may overstate the case.*

application at a regional level, through the commitment by Ministers in 1997 to an ecosystem approach for fisheries management[4] and the commitment by Ministers in 2002 to a conceptual framework for an ecosystem approach[5].

Applying the ecosystem approach in the OSPAR and HELCOM frameworks

12. Only by considering together the structure, processes, functions and interactions of the ecosystems relevant to the development of policies on the different issues arising in the North East Atlantic and the Baltic Sea Area can management measures be developed that will ensure the sustainable use of the Atlantic ocean and its adjoining seas, and the dangers be avoided of privileging some sectoral interest at the expense of overall optimisation.

13. OSPAR and HELCOM will therefore aim to develop the existing systems and further establish for their spheres of competence:

a. [by 2004][6] a framework for determining the full range of measures which are necessary to implement consistently an ecosystem approach to the management of human activities in the marine environment;

b. by 2010 a full series of management measures that are consistent with an ecosystem approach.

14. OSPAR and HELCOM will encourage all other authorities whose management actions impact upon the North East Atlantic and the Baltic Sea Area to do the same.

15. At the same time, OSPAR and HELCOM will pursue the implementation of their agreed strategies, so as to provide management measures consistent with an ecosystem approach. In doing so, the aim will be to work coherently towards a holistic approach to the problems addressed by the strategies.

16. OSPAR and HELCOM will focus on three elements in particular:

a. promoting understanding and acceptance by all stakeholders of the ecosystem-based approach to the management of human activities, and collaboration among the various management authorities in the North East Atlantic and in the Baltic Sea Area in implementing that approach;

b. understanding and monitoring the ecosystems of the marine environment, in order to assess the interactions between and among the different species and populations of biota, the non-living environment and humans;

c. the impact of human activities upon biota and humans, both directly and indirectly through impacts on the non-living environment, together with the effects on the non-living environment itself.

Understanding and acceptance

17. To achieve understanding and acceptance by stakeholders of the ecosystem-based approach to management will require action both by OSPAR and HELCOM collectively and by the individual Contracting Parties:

a. OSPAR and HELCOM will need to ensure that stakeholder representatives can play an effective role in developing and applying the ecosystem approach within OSPAR and HELCOM. This will require more attention to presenting the issues being studied within the OSPAR and HELCOM frameworks in ways which are more readily understood by the representatives of the various stakeholders. Only in this way can transparency and, consequently, understanding be achieved. This is particularly important for the assessments of the marine environment upon which all policy decisions must be based;

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4 Statement of conclusions of the Intermediate Ministerial Meeting on the Integration of Fisheries and Environmental Issues, Bergen, Norway 1997 – paragraph 2.6 3 Ministerial Declaration of the Fifth International Conference on the Protection of the North Sea, Bergen, Norway, 2002 – paragraph 2 and Annex 2.

5 Ministerial Declaration of the Fifth International Conference on the Protection of the North Sea, Bergen, Norway, March 2002 – paragraph 2 and Annex 2.

6 Poland would prefer to say "as soon as possible".

b. OSPAR and HELCOM will need to work with the other management authorities to develop better systems of collaboration, including systems for developing the framework to establish the full range of management measures necessary for implementing the ecosystem approach;

c. the Contracting Parties will need to ensure that they involve stakeholders in the development of their national thinking on the stewardship of the oceans and seas, and make clear the relevance of what is being done within the OSPAR and HELCOM frameworks.

Understanding, monitoring and assessing ecosystems

18. OSPAR and HELCOM have obligations to measure and monitor the quality of the marine environment and its compartments (water, sediments, biota), the activities and inputs that can affect that quality and the effects of those activities and inputs, and to assess what is happening in the marine environment as a basis for identifying priorities for action.

19. In doing all this, OSPAR and HELCOM deploy the best available scientific and technical knowledge to achieve integrated assessments.

20. In order to refine this work, and to help implement the assessment and monitoring programmes, OSPAR, for its part, will:

a. pursue the pilot project in the North Sea for identifying environmental quality issues and the specific elements against which they can be measured, and for developing ecological quality objectives for each of those elements;

b. in the light of that pilot project, decide how to evaluate environmental quality against clear ecological quality objectives, both as a long-term system for the North Sea and in other OSPAR regions;

c. continue with producing thematic assessments of specific issues and periodic general assessments of the whole of the marine environment of the North East Atlantic, as a basis for the policy decisions on managing the human activities that impact on ecosystems.

HELCOM, for its part, will:

a. initiate a pilot project in the Baltic Sea for identifying environmental quality issues and the specific elements against which they can be measured, and for developing ecological quality objectives for each of those elements;

b. continue with developing and producing indicator reports, thematic assessments of specific issues and periodic general assessments of the whole of the marine environment of the Baltic Sea Area as a basis for the policy decisions on managing the human activities that impact on ecosystems.

Managing human activities

21. On the basis of such assessments, OSPAR and HELCOM will continue to act on policy issues already identified, and identify and act on newly-emerging issues where human activities impact directly or indirectly on the biota and threaten to undermine the health, productivity and biological diversity of the ecosystems or damage valuable features of the non-living environment itself. In particular, OSPAR and HELCOM will:

a. pursue their strategies to combat eutrophication and pollution from hazardous substances, with the aim of avoiding levels of anthropogenic inputs that adversely effect the food web through their impacts on plankton populations;

b. pursue their strategies on hazardous substances and on radioactive substances and the OSPAR Strategy on Environmental Goals and Management Mechanisms for Offshore Activities, with the aim of providing for a chemical, physical and biological environment in the North East Atlantic and the Baltic Sea Area consistent with a high level of protection for the critical features of its ecosystems;

c. pursue their strategies on the protection and conservation of ecosystems and biological diversity, with the aim of identifying and controlling human activities which so affect the non-living environment and impact on biota as threaten the health, productivity and biological diversity of the ecosystems;

d. consider the need for intervention on account of threats to the health, productivity and biological diversity of ecosystems in respect of:

   i. species or habitats which have been identified as threatened or declining; or

   ii. marine protected areas.

e. draw to the attention of the authorities responsible for questions of fisheries management any issues highlighted by assessments of interactions between and among biota and humans which could justify intervention by those authorities;

f. draw to the attention of the authorities responsible for questions of maritime transport and navigation any issues concerning maritime safety, the prevention, reduction and control of marine pollution from ships and other matters concerning the effect of shipping on the maritime environment.

22. On the basis of such assessments and other studies, OSPAR and HELCOM will finally continue to act on policy issues already identified, and identify and act on newly-emerging issues, where human activities otherwise threaten to damage the marine environment.

In particular, OSPAR, for its part, will:

a. consider the cumulative and combined impact of different types of human activities on the marine environment and, where appropriate, take action under its Strategy on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area;

b. consider the extent of the adverse impact of shipping and, where appropriate, take regional initiatives, especially under agreements established by the International Maritime Organization or take initiatives to ensure consideration of the issue by the International Maritime Organization;

c. maintain close liaison with the Helsinki Commission, the Bonn Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil and other Harmful Substances and the North East Atlantic Agreement for Cooperation in the Protection of Coasts and Waters against Pollution due to Hydrocarbons or Other Harmful Substances (Lisbon Agreement), in order to ensure that marine pollution emergencies are prevented and their adverse impacts mitigated.

In particular, HELCOM, for its part, will:

a. continue to monitor and assess the environmental impacts of shipping and, when appropriate, initiate joint actions within the International Maritime Organization, within other international organisations and/or within HELCOM as well as continue to ensure effective and harmonised implementation of already adopted rules;

b. continue to ensure adequate abilities to respond to marine incidents, through the standing operational network established under HELCOM, and with the aim of further improving regional cooperation;

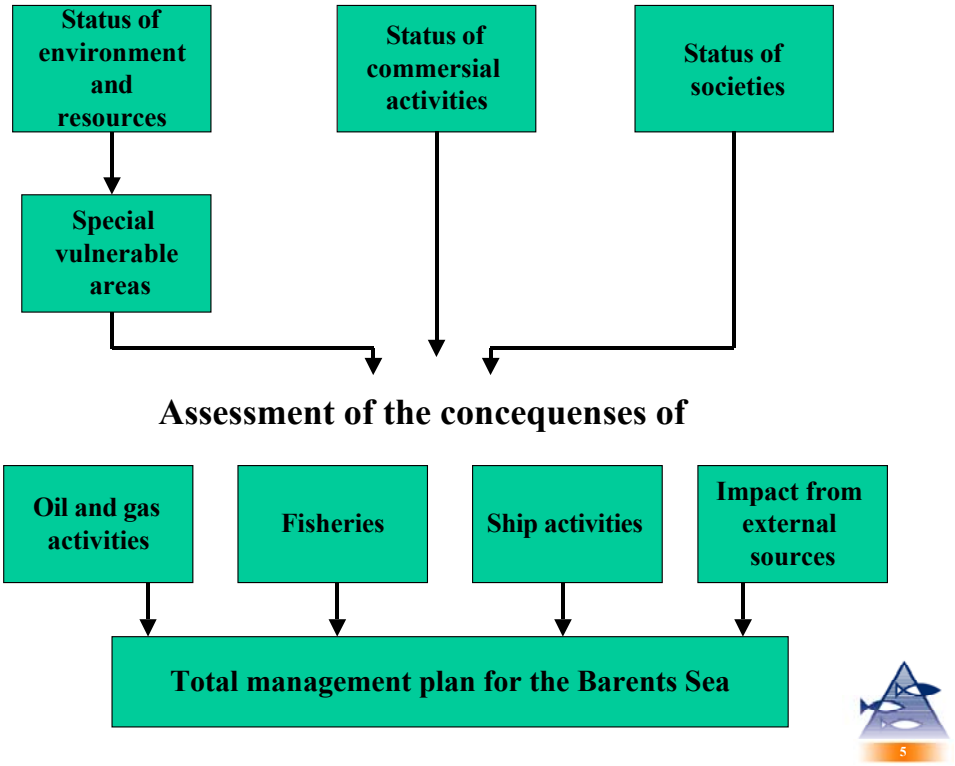
c. assess the environmental impacts caused by fisheries, and, when appropriate initiate joint actions with the competent authorities for the management of fisheries, especially with International Baltic Sea Fisheries Commission.

Feedback and review

23. Through their assessment and monitoring programmes, OSPAR and HELCOM will continue to contribute to the improvement of scientific understanding of the marine environment progresses, and on this basis will keep the implementation of their strategies and the pursuit of ecological quality objectives under periodic review in order to improve and up-date them and to determine the need for further measures to protect the marine environment.

24. In particular, with the development of the European Marine Strategy, this statement will be reviewed to ensure that it remains consistent with the ecosystem-based approach to management adopted for the purposes of that strategy.

ANNEX 3: THE PROPOSED BARENTS SEA MANAGEMENT PLAN BASED UPON INTEGRATED ASSESSMENTS AND THE NEED FOR AN ECOSYSTEM APPROACH TO MANAGE THE VARIOUS ACTIVITIES



Framework for the preparation of background documentation to develop and implement a management plan for the Barents Sea. The assessment of the consequences of the various activities will be based on several scenarios likely to arise between 2005–2020. For example linking climatic changes and the development of the different activities such as fishing, including the likely changes to gear and fishing practice.

ANNEX 4: PRIORITY SCIENTIFIC ISSUES FOR THE NORTH SEA ECOSYSTEM MANAGEMENT

Ecosystem Approach

At the 5th NSC the Ministers aim to agree to establish an ecosystem approach to management. This has been defined as integrated management of human activities based on knowledge about the ecosystem to achieve sustainable use and its protection. The implementation of an ecosystem approach is based on a framework that includes:

1) setting of operational environmental objectives;
2) monitoring the status and trends in the ecosystem;
3) conducting research to get a better insight into the workings of the ecosystem;
4) assessing the status of the ecosystem and the degree of human impacts;
5) providing scientifically objective advice to management;
6) making appropriate policy decisions and management actions;
7) involving stakeholders to improve transparency and responsibility.

Scientific Expert Conference

A Scientific Expert Conference related to the 5th NSC was held in Bergen on 20–22 February 2002. The aim of the conference was to identify the priority science issues for scientific research and monitoring to support the implementation of the ecosystem approach to the protection and management of the North Sea.

The North Sea ecosystem has been studied extensively for many years but despite this, we still have a limited description of its structure and function. Setting priorities for further research therefore becomes of foremost importance. These priorities must be guided by the need to understand the North Sea as an ecosystem and to assess the degree of human impact on this system.

North Sea Ecosystem Science

The scientific expert conference recommended that a North Sea Ecosystem Science Programme should be established as a framework for further focused ecosystem research. In this programme there should be close links:

1) between research and monitoring;
2) to work on integrated assessments;
3) to provide scientific advice;
4) to work on ecological objectives;
5) to provide management frameworks.

ICES and GLOBEC should be invited to contribute to the development of the North Sea Ecosystem Science Programme

Well-designed, coordinated and harmonised long-term monitoring of the North Sea is necessary and needs continued funding support. This should be given priority along with the supporting scientific research identified below.

Priority Science Issues

The following scientific issues have been identified as priorities for research for the short-term (3–5 years) and long-term (>5 years).

Short-term:

1) Operational oceanography of currents and water masses (ICES/EuroGOOS North Sea Pilot Project on Oceanography and Fish stocks);
2) Production of the first generation habitat map of the North Sea;
3) mapping and monitoring of spawning areas of commercial fish populations;

4) Experimental studies of the effects on benthic species, communities and habitats following closure of areas to bottom trawling;
5) Identification of threatened, declining and rare species and habitats;
6) Further development of ecological objectives and indicators for monitoring changes in the ecosystem and for measuring the effects of management actions.

Long-term:

1) The role of species richness (including the issues of key species, species diversity, species redundancy, and rare species) for the functioning of benthic communities;
2) Mechanisms influencing the transfer efficiencies between phytoplankton and higher trophic levels and the implications on ecosystem dynamics;
3) Resolution of habitats and processes influencing the population dynamics of key species;
4) Food web and life history interactions among fish populations and other ecosystem components (plankton, benthos, seabirds and marine mammals);
5) Physical and biological transport and biological and ecological effects of contaminants.

ANNEX 5: MEETING OF THE ENVIRONMENTAL ASSESSMENT AND MONITORING COMMITTEE (ASMO), JOINT ASSESSMENT AND MONITORING PROGRAMME (JAMP)

ASSESSMENT SCHEDULE

2003

BA-5 First assessments on human activities listed in Annex 4 – miscellaneous offshore structures and installations, offshore wind-energy farms, sand and gravel extraction and tourism.

2004

BA-5 At least one further assessment in the series of assessments for the other human activities listed in Appendix 3.

EA-1 Assessments of atmospheric emissions and modelled depositions of nutrients.

2005

BA-1 An assessment of the pilot project on EcoQOs for the North Sea, *and*.

EA-3 An assessment of the pilot project on EcoQOs for the North Sea.

BA-5 Two of the series of assessments for the other human activities listed in Appendix 3.

EA-2 Assessments of temporal trends and (where relevant/possible) spatial distribution for the nutrients where periodic sampling and analysis is undertaken, in particular under CAMP, CEMP and RID.

HA-1 An assessment of temporal trends and (where relevant/feasible) spatial distribution for the hazardous substances where periodic sampling and analysis is undertaken, in particular under CAMP, CEMP and RID.

HA-2 An initial assessment of biological effects of hazardous substances in the maritime area.

2006

AA-1 Overview of OSPAR assessment work 1998 – 2005.

BA-2 An assessment of the status of the species and types of habitats that have been placed on the OSPAR List, on the basis of the application of the relevant selection criteria.

BA-3 An assessment of the changes in the distribution and abundance of marine species in relation to changes in hydrodynamics and sea temperature.

BA-5 One of the series of assessments for the other human activities listed in Appendix 3.

EA-4 An assessment of the achievement of the 50% reduction target using information obtained through implementation reporting on PARCOM Recommendations 88/2 and 89/4.

EA-5 An assessment of the expected eutrophication status of the OSPAR maritime area following the implementation of agreed measures.

RA-1a An assessment (for those regions where information is available) of the sources of discharges, emissions and losses of radioactive substances to the marine environment.

RA-1b An assessment (for those regions where information is available) of the exposure of humans to radiation from pathways involving the marine environment.

2007

BA-5 Two of the series of assessments for the other human activities listed in Appendix 3.

BA-6 A trend analysis of all the different human activities listed in Appendix 3 and their collective impact on the OSPAR maritime area.

EA-6 An assessment of the eutrophication status of areas identified under the Common Procedure as problem areas and potential problem areas, and of any non-problem areas where there have been changes which give grounds for concern.

OA-1 An assessment of the impact on the marine environment of the offshore oil and gas industry.

OA-2 An assessment of the possible effects of releases of oil and chemicals from any disturbance of cutting piles.

RA-1c An assessment (for those regions where information is available) of the impacts on marine biota of anthropogenic sources (past, present and potential) of radioactive substances.

RA-1d An assessment (for those regions where information is available) (if possible) of the temporal trends and spatial distribution of concentrations of radionuclides and their fate in the marine environment.

2008

BA-5 Two of the series of assessments for the other human activities listed in Appendix 3.

HA-3 The first 5-yearly assessment of emissions, discharges and losses of chemicals identified for priority action.

RA-2 An overall assessment of radionuclides in the OSPAR maritime area.

2009

BA-4 A further assessment of the status of the species and habitats that have been placed on the OSPAR List, in the light both of the relevant selection criteria and relevant agreed EcoQOs.

HA-4 A more elaborated assessment of biological effects of hazardous substances in the maritime area.

HA-5 Assessment of temporal trends and (where relevant/feasible) spatial distribution for the hazardous substances where periodic sampling and analysis is undertaken under RID, CAMP and CEMP.

HA-6 A general assessment of the development in the quality status of the maritime area in relation to hazardous substances that should take into account the results of the assessments under HA-1 and HA-5, HA-2 and HA-4, and HA-3, and the results of any screening of levels of substances in the marine environment covered by HM-3.

OA-3 An assessment of the extent and impact of the offshore oil and gas industry, including the impacts on the marine environment of discharges of hydrocarbons and controlled offshore chemicals, both as they occur and from subsequent remobilization, together with an assessment of the significance for the marine environment of such impacts in relation to the natural changes which are occurring to the OSPAR maritime area.

2010

AA-2 An assessment of the quality status of the OSPAR maritime area and of its sub-regions.

ANNEX 6: SGAWWP (STUDY GROUP ON ACFM, ACE, ACME AND WORKING GROUP WORKING PROTOCOLS), ICES, 20–22 FEBRUARY 2003

Working paper – Hein Rune Skjoldal, ACE Chair, ICES and Ecosystem issues

Questions/issues

1) The role(s) of assessments in ecosystem approach;
2) What types of assessments are required?
3) What are the ecosystem scales and units (geographical entities) for the ecosystem approach?
4) How can the ICES "machinery" be used to perform assessments?
5) How can the ICES "machinery" be improved to be more effective in carrying out assessments?

Background – references

ACME and ACE discussion documents ACE 2001 Minutes – Annex;

SGEAM 2000–2002 Reports;

ICES 12th (Environmental) Dialogue meeting;

SGGOOS 2001 Report.

Concepts and definitions

Ecosystem approach
"ICES definition" (ACME, ACE):

Integrated management of human activities based on knowledge of ecosystem dynamics to achieve sustainable use of ecosystem goods and services, and maintenance of ecosystem integrity.

Technical definition, EU Stakeholder Conference, Køge, Denmark, 4–6 December 2002:

Comprehensive integrated management of human activities based on best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of the marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity.

Bergen Declaration – 5th NSC:

•2. The Ministers therefore **agree** to implement an ecosystem approach by identifying and taking action on influences which are critical to the health of the North Sea ecosystem. In particular, they **agree** that management will be guided by the conceptual framework set out in Annex 2, which includes:the development of general and operational environmental goals;

- best use of available scientific and technical knowledge about the structure and function of the ecosystem;
- best use of scientific advice;
- integrated expert assessment;
- coordinated and integrated monitoring;
- involvement of all stakeholders; and
- policy decisions and control and enforcement.

EU Stakeholder Conference:

The ecosystem roadmap:

- Vision, high level principles and strategic goals;
- Key classes of ecosystem, social and economic properties and qualities;
- Operational objectives, indicators, targets and limits;
- Actions and tools;
- Assessment involving science and monitoring;
- Pre-agreed risk management actions.

Bergen Declaration:

•ii) recognize the need for shared integrated expert advice and assessments of the North Sea, including marine resources, environmental and socio-economic factors, and invite OSPAR in cooperation with EU and ICES to propose how this might be undertaken at periodic intervals involving stakeholders and to take the first steps.

Assessment

OSPAR JAMP (Third draft of the OSPAR Strategy for a Joint Assessment and Monitoring Programme):

"Assessment" is both a process and its product. As a process, a marine environmental assessment is a procedure by which information is collected and evaluated. It is undertaken from time to time to estimate the state of knowledge. Its product is an assessment report, which is a document synthesising information, presenting the findings of the assessment and making recommendations for action for future work. Assessments should include both a scientific/technical assessment and a management oriented summary.

This product can either be a thematic assessment dealing with one aspect of the marine environment, or a general assessment of all aspects of that environment. This programme (JAMP) sets out to produce both kinds of assessment product, in an integrated series, with the successive thematic assessments building up to a new general assessment in (2009).

A general assessment of the quality of the maritime area or its sub-regions is defined as:

"… a statement of the whole or part of current knowledge of the health of the environment of a defined maritime area and its coastal margins. A complete statement (also known as a holistic statement) includes an analysis of the region's hydrodynamics, chemistry, habitats and biota with an evaluation of man's impact over space and time against this background of natural variability. All aspects of man's influence on the area should be examined including inputs, concentrations and effects of contaminants, nutrients and radioactivity, dumping, transport, and the exploitation of biological and non-biological resources."" **(does this definition originate from ICES – pre NSTF QSR??)**

Other terms:

Integrated assessment – can be used in contexts both of thematic assessments and general assessments. For example, a eutrophication assessment that looks at input of nutrients, concentrations of nutrients, and biological effects of nutrients can be considered an integrated assessment, integrating across input-concentrations-effects. A general assessment is also an integrated assessment.

Holistic assessment is synonymous with general assessment.

Ecosystem assessment is a general assessment or holistic assessment of the state or health of a defined ecosystem (geographical area according to given criteria such as contained in the definition of LME).

Possible definition:

An ecosystem assessment is an analysis of and statement on the state of a marine ecosystem, including the influences of man, for the purpose of evaluating the need for and effectiveness of management measures.

Fish stock assessment is an evaluation of the state of a fish stock. Analytical assessment is a quantitative estimation of the size of the fish stock.

Ecosystem

CBD

" system of plants, animals and micro-organisms (communities) together with their non-living environment, constituting a functional unit" **(check wording)**

Large Marine Ecosystem (LME)

A large area (typically 200,000 km^2 or larger) with distinct topography, hydrography and productivity, and trophically linked populations.

Types of assessments

There are a range of possible thematic assessments of:

- climate status;
- climate impact;
- fish stocks (status);
- fisheries (interactions);
- effects of fisheries;
- effects of mariculture;
- pollution;
- eutrophication;
- physical impacts;
- aggregate extraction;
- offshore oil and gas;
- dredging;
- constructions (coastal defence, energy, etc.);
- introductions;
- shipping/transport;
- tourism;
- military activities;
- ??

Ecosystem compartments

- Water (physical oceanography);
- Bottom (habitats);
- Chemical compounds (nutrients/productivity, contaminants);
- Plankton (phyto-, zoo-);
- Benthos;
- Fish (commercial stocks, others);
- Seabirds;
- Marine mammals;
- (Reptiles).

Ecosystems (LMEs)

A possible division of the ICES area into LMEs is:

- Baltic Sea;

- North Sea;
- Irish and Celtic Seas;
- Southern shelf (Bay of Biscayne, Iberian);
- Norwegian Sea;
- Barents Sea;
- Iceland Sea and shelf;
- Greenland Sea;
- Irminger Sea;
- Baffin Bay;
- Labrador Sea;
- Scotian Shelf;
- NE US shelf;
- SE US shelf.

ICES WG/SGs

"ICES has more than 100 Working/Study groups that cover most aspects of the marine ecosystem."

While this is true, the WG/SG-structure has evolved over the recent decades responding to thematic needs rather than an ecosystem focus and an overall, holistic plan. ICES has dealt with ecosystem issues—always and extensively—in its 100 years of existence. What is new now is the ecosystem dimension that is the core element of the ecosystem approach.

The about 100 WG/SGs can be broadly grouped into the following categories:

- Methodological (e.g., SGMESH, SGQAE, SGQAB, SGSSR, …)
- Processes (e.g., SGPRISM, SGPBI, WGCCC, …)
- Biological compartments (e.g., WGPE, WGZE, BEWG, WGSE, WGMMPH, WGFE, …)
- Surveys (e.g., PGSPN, WGBIFS, IBTSWG, WGMEGS, ….)
- Fish stock assessments (e.g., AFWG, WGBFAS, WGNAS, WGNSSK, …)
- Environmental impacts (e.g., WGBEC, WGECO, WGEIM, WGITMO, …)

The following tables can be used to illustrate the distribution of activities and efforts in ICES WG/SGs across ecosystem components (Table A6.1), thematic assessments (Table A6.2) and geographical areas/regions/ecosystems (Table A6.3).

Table A6.1. Ecosystem components and ICES WG/SGs.

Ecosystem components	WG/SGs
Water	WHOH, SGGOOS, WGCCC, SGPBI, WGMDM, (WGHAB)
Bottom	WGMHM, SGASC, BEWG SGCOR
Chemistry	MCWG, SGQAC
Plankton	WGPE, WGZE, WGHABD,
Benthos	BEWG, SGCRAB, WGPAND, WGNEPH, SGCOR,

Fish	
- commercial	Ca. 17 ACFM WGs,
- others	WGFE
Seabirds	WGSE
Marine mammals	WGMME

Table A6.2. Thematic assessments and ICES WG/SGs.

Thematic assessment	WG/SGs
Climate status	WGOH
Climate impact	WGCCC
Fish stocks	15 ACFM WGs, (WGMG), SGMSNS, WGEF, SGCRAB, SGHAUB
Effects of fisheries	**WGECO**, WGNSSK, WGMME, WGSE, BEWG, (WGMHM)
Effects of mariculture	**WGEIM**, WGPDMO, MCWG, (WGMS), WGBEC, BEWG
Pollution	**MCWG, WGBEC**, WGMS, WGSAEM, SGQAC, SGPBI
Eutrophication	WGPE, MCWG, WGHAB, WGBE, SGPBI, WGZE,
Extraction	**WGEXT**, BEWG, WGMS, WGBEC,
Offshore oil and gas	
Dredging	
Constructions	
Introductions	**WGITMO**, SGBOSV
Shipping/transport	

Table A6.3. Geographical areas/ecosystems and WG/SGs.

Geographical areas	/Ecosystems	
Baltic		WGBAST, WGBFAS, WGBIFS, SGHAUB, SGMAB, **PGIBSPRP**
Arctic	Barents Sea	AFWG, WGNPBW, WGHARP
	Norwegian Sea	WGNPBW
	Greenland Sea	
NW waters	Iceland Sea and shelf	NWWG, WGNPBW
	Irminger Sea	NWWG
NE Atlantic – northern shelf	North Sea	WGNSSK, WGMHSA,

		WGNPBW, **REGNS**, PGNS, SGNSBP
	Irish Sea/Celtic Sea	WGNSDS?, WGMHSA
NE Atlantic – southern shelf		WGHMM, WGSSDS, WGMHSA, SGBASS?
NW Atlantic & Arctic	Baffin Bay	
	Labrator Sea and shelf	
	Scotian shelf	
	US NE shelf	
	US SE shelf	
Wider		WGNAS, WGDEEP, WGCEPH

A more complex matrix table can be made showing the relationship between ecosystem components and thematic assessments and the contributions or potential contributions from WG/SGs.

Table A6.4. Overview of ecosystem components for which information is used (U) or could be potentially be used (P) in thematic assessment.

Ecosystem components	Climate	Fish stocks	Effects fisheries	Effects mari-culture	Pollution	Eutrophi-cation	Extraction	Intro-ductions
Water	u	p	p	u	u	u		
Bottom		p	u/p	u	u		u	
Chemical	(p)	(p)	p	u	u	u		
Plankton	(p)	p	p	u/p	p	u		u
Benthos	(p)	p	u/p	u	u/p	u	u	u
Fish	(p)							
- comm.		u	u	p	u/p	p	(u)	
- others		p	u/p	p	p	p		
Seabirds	(p)		u	(p)	u			
Marine mammals	(p)	p	u	p	u/p	p		
Regional ecosystem	x	x	x	x	x	x	x	x

Based on this:

- a gap-analysis can be made of what we lack in the current structure, as a basis for
- an analysis of how to fill the gaps.

ANNEX 7: THEMATIC AND GENERAL INTEGRATED ASSESSMENT THEME SESSION AT THE ICES ANNUAL SCIENCE CONFERENCE IN 2005

A possible mechanism to facilitate preparations for an integrated assessment "theme session" at an ASC could consist of the following steps:

1. Thematic writing panels are established by REGNS, each one tasked with integrating the output of specific ICES WGs into thematic reports or papers each covering components of the ecosystem. Each thematic panel theme will involve the combination of more than one ecosystem component or, in the case of fish, whole fish communities. Suggested panel themes are:

    - climate and primary production
    - secondary production and benthic communities
    - demersal fish
    - pelagic fish
    - sea mammals
    - seabirds
    - anthropogenic pressures – contaminants, eutrophication
    - anthropogenic pressures – fishing

2. Each thematic panel is supported by an identified list of WGs. The WGs are asked by REGNS to provide at least one (but can be more) member(s) to the panel to bring material from their host WG. Member Countries may also nominate specific experts for each thematic panel. Each panel will have a lead author or Chair.

3. Each thematic panel will be asked to produce a paper summarising, for the North Sea region:

    - a basic description of the main features of each ecosystem component, e.g., circulation, water masses, habitat distribution, population structure, community structure;
    - the status of each component in the assessment period;
    - evident trends in components.

4. The initial assessment period will be 2000–2004.

5. A session on adaptive management providing case studies putting the principle into practice will be required (not restricted to the North Sea region).

6. There will also be an overarching integration panel. This panel will receive draft and final papers from the individual thematic panels and produce an overall "general" integrated assessment paper.

7. At the ICES ASC in 2005 a modified theme session, or more correctly, assessment session will be held where the individual assessment papers are presented, along with the integration paper.

8. The combined papers, published on the ASC CD-ROM will be available on the ICES website and this will represent the first contribution from ICES to an integrated ecosystem assessment of the North Sea.

Timetable:

June 2003	REGNS proposal for a pilot ICES Integrated Ecosystem Thematic Assessment Session for the North Sea considered by Consultative Committee.
July 2003	Background and mechanism explained by REGNS to WG Chairs by e-mail and nominations requested for panel membership.
ASC (September) 2003	Science and Advisory Committees visited by members of REGNS to further explain the process. Committees identify nominations.

October 2003–October 2004	Individual WGs meet. Thematic writing panel members begin to assemble information needed for assessments. Draft papers prepared. Panels work on their papers either by correspondence, at meetings, or both.
ASC 2004	Integration panel reviews draft papers and provide feedback to Thematic Panels
October 2004–July 2005	Thematic Panels revise their papers, after dialogue with supporting WGs
July 2005–September 2005	Integration panel produces overall assessment paper.
ASC 2005	First ICES Ecosystem Assessment Session held (North Sea Region)
2005 Statutory Meeting	Process evaluated by REGNS and CONC and recommendations made on future integrated assessment process.

Thematic writing panels:

Thematic Panel	Chair	Associated WGs
Climate and primary production		WGOH, WGCCC, WGPE, WGHABD
Secondary production and benthic habitats		BEWG, WGZE, SGNSBP, WGMHM, WGCRAN, WGNEPH, WGPAND
Demersal fish		IBTSWG, WGNSDS, SGMSNS, WGNSSK
Pelagic fish		WGMEGS, WGNPBW, SGMSNS, WGMHSA
Seabirds and Mammals		WGMME, WGSE
Contaminants/Physical disturbance		MCWG, WGBEC, WGMS, WGEXT
Fishing impacts		WGECO, WGBEAM