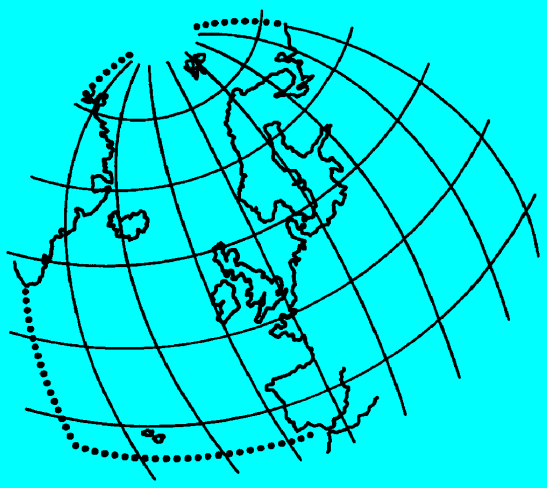
OSPAR Commission

for the Protection of the Marine Environment of the North-East Atlantic



1

OSPAR's development of an Ecosystem Approach

- How and why have we adopted an ecosystem approach?
- What does it involve?
- How can we make it operational?

2

OSPAR – a reminder of who we are

15 States in the North East Atlantic catchments:

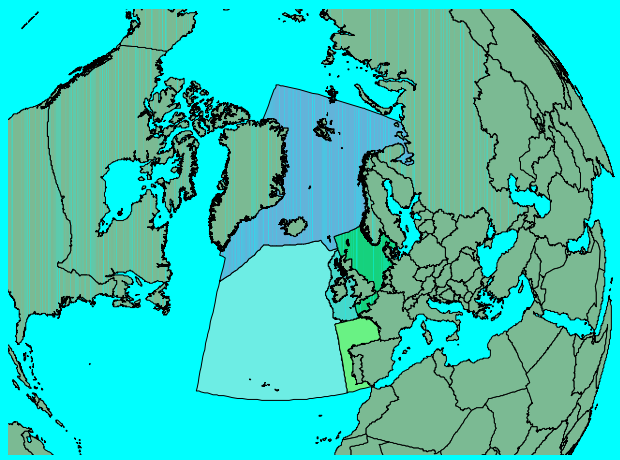
Belgium*	Denmark*	Finland
France*	Germany*	Iceland
Ireland	Luxembourg	The Netherlands*
Norway*	Portugal	Spain
Sweden*	Switzerland	The United Kingdom*

and the European Community*

** also working in the North Sea processes*

3

OSPAR Convention Area



4

The ecosystem approach to what?

In 2003, the Ministerial Meeting of the OSPAR Commission agreed a statement entitled

"Towards an ecosystem approach to the management of human activities which may affect the marine environment"

5

How did we get there?

It is the result of three decades of development

6

OSPAR's Incremental Build-up

- 1969 - Bonn Agreement on response to shipping disasters
- 1972 - Oslo Convention controls dumping
- 1974 - Paris Convention controls land-based discharges, including offshore installations
- 1992 - OSPAR Convention merges and up-dates, but still focused on pollution – possibility to extend to other human activities
- 1998 – Annex V covers all relevant human activities – but no measures on fisheries management and preference for IMO action on shipping

but no mention of an ecosystem approach

7

What changed?

- UN Convention on the Law of the Sea made States think;
- Lead up to Rio Earth Summit
  - Integration, Integration, and Integration
- OSPAR's 1993 North Sea QSR showed that the main problems were no longer pollution

8

1997 North Sea Ministerial Meeting on Fisheries and the Environment

Based on available scientific understanding and information

A. Critical ecosystem processes

B. Interactions within food-webs

C. High-level of protection of chemical, physical and biological environments

9

Six strategies in search of integration

1. Hazardous Substances Strategy
2. Radioactive Substances Strategy
3. Eutrophication Strategy
4. Offshore Oil and Gas Industry Strategy
5. Protection of Marine Biodiversity and Habitats Strategy
6. Joint Environmental Assessment and Monitoring Programme

10

Consistent and comprehensive

- OSPAR Strategies and other international commitments and obligations are partial descriptions
- Are they mutually consistent? (OSPAR thinks its strategies are - but needs to show it!)
- Need to integrate with all other policies - especially fisheries and shipping

11

But how to integrate?

- Action has to be sectoral:
  - UN Convention on the Law of the Sea sets up sectoral machinery
  - National structures are sectoral
  - Management of human activities is sectoral
- Nevertheless, the sea is one environment
  - How do we integrate and show that we are integrating everything?

12

Healthy and sustainable? 1

- Must be based on a characterisation of the marine environment addressed – for OSPAR the QSR 2000 has fulfilled this role.
- Critical ecosystem processes – primary production, reproductive success, migration etc…
- Threatened and declining species and habitats – highlight what processes are critical
- Marine protected areas – poles for crystallising protection of critical processes

13

Healthy and sustainable? 2

The different trophic levels:

Phytoplankton

Zooplankton

Macrophytes (eg - large seaweeds)

Benthic species (inc shellfish)

Fish	-	Reptiles
Sea Birds	-	Marine Mammals

14

Healthy and sustainable? 3

The different human activities:

Fisheries	Shipping
Minerals extraction	Tourism
Coastal protection	Cables/Pipelines
Land-based discharges	Wind power
Etc Etc Etc	

15

Put it together!
Ecological Quality Objectives

- **Fifth North Sea Conference (Bergen) 2002**
  - North Sea Pilot Project, result of a decade's thinking and discussion
- **OSPAR 2002 and 2003**
  - takes up the pilot project as part of OSPAR work
- **OSPAR 2005**
  - Report on the Ecological Quality Objectives

16

How to visualise the ecosystem approach?

- Ecosystems have a natural variability
- We cannot specify a single state for any ecosystem
- We need to concentrate on the “envelope” within which we can be reasonably confident that the ecosystem is healthy and sustainable

17

How to envisage this ecosystem envelope?

The allium analogue

18

Ecological Quality Issues

1. Reference points for commercial fish species
2. Sea mammals
3. Birds
4. Fish communities
5. Benthic communities
6. Plankton communities
7. Eutrophication
8. Threatened and declining species
9. Threatened and declining habitats

19

Creating EcoQOs

- For each “ecological quality issue” (the different dimensions in which health and sustainability can be measured)

identify one or more “ecological quality elements” – the dimensions which are to be measured and the scales against which to measure them

- For each “ecological quality element”

identify an “ecological quality objective” (EcoQO) – the desired level of that dimension on that scale.

20

What is a good EcoQO?

- ***Measurable***
- ***Cost effective***
- ***Concrete***
- ***Easily understandable***
- ***Grounded in theory and based on existing time series***
- ***Sensitive over a reasonable time-frame***
- ***Responsive to management action***
- ***Specifically linked to issues OR Integrating a range of issues***

21

An specific EcoQO example

- **Question**: Oil from ships
- **Measure:** Proportions of samples of dead or dying guillemots (*Uria aalge)* found on beaches marked with oil
- **Implementation:** Sampling protocols, judgement criteria, reporting data, evaluating data.

22

Some other specific EcoQOs example

- **Question**: Impact of chemicals
- **Measure:** Levels of organohalogens in seabird eggs
- **Question:** Impact of fisheries on non-target species
- **Measure:** Number of harbour porpoises caught as bycatch as proportion of estimated population

23

Another type of EcoQO

- **Element**: Seabird populations, as an integrator of the effects of all three aspects of the ecosystem approach
- **Element:** Seal populations, again as an integrator

24

Pilot project EcoQOs

- 21 ecological quality elements proposed in 2002
- 2 should not be pursued
- 10 are well advanced, but some amendments were needed
- 9 need much further work
- Gaps can be seen - some may be filled with existing work
  - macrophytes (seaweed)
  - wider range of pollutants
  - how to specify objectives for threatened species and habitats

25

EcoQO Pilot Project Report

- The system is workable
- We can define a good ecological quality objective
- Some of the original proposed EcoQOs are good – others are not
- Agreement is needed on the implications of missing an EcoQO

26

Implications of missing an EcoQO

- Are EcoQOs targets, which ***must*** be achieved?
  - *can you commit yourself to a target of that kind before you know what is involved?*
- Are EcoQOs indicators, where a miss means that you need to study why it is being missed, and what action that indicates?
  - *can an indicator of this kind be a credible "objective"?*

27

Conclusions

- The ecosystem approach is not a new start - it is a way of delivering integration
- This integration will show where there are gaps or inconsistencies in what we are doing, and give an impetus to fill or correct them
- The use of ecological quality objectives can give a clear framework for making the ecosystem approach into something where the state of the oceans can be measured and the success in delivering our goals evaluated.

28

Envoi – We all want it to be healthy and sustainable. How best to do it with the resources that can be made available?

29

OSPAR'S DEVELOPMENT OF AN ECOSYSTEM APPROACH

Presented by Alan Simcock, Executive Secretary, OSPAR Commission[1]

Introduction

1. The aim of this presentation is to explain how and why OSPAR has adopted an ecosystem approach, to show what such an approach has involved, and to set out the approach being made to make it operational?

2. At the start, it may help to give a reminder of who we are: OSPAR has 15 States in the North East Atlantic catchments as its Contracting Parties: Belgium*, Denmark*, Finland, France*, Germany*, Iceland, Ireland, Luxembourg, the Netherlands*, Norway*, Portugal, Spain, Sweden*, Switzerland and the United Kingdom*, together with the European Community*. In addition, the eight countries marked with an asterisk and the EC have cooperated in the North Sea processes (with some involvement also of Luxembourg and Switzerland), which has acted as a "ginger group" outside the formal framework of international agreements.

Towards an ecosystem approach

3. It is important to be clear to what the ecosystem approach is an approach. Some references talk about an ecosystem approach to the management of the marine environment. But in OSPAR it has always been clear that the ecosystem approach is an approach to (as the 2003 Ministerial Meeting of the OSPAR Commission made clear) "Towards an ecosystem approach to the management of human activities which may affect the marine environment"

4. OSPAR has reached this stage by a long process of incremental development. The main stagers have been:

1969 - Bonn Agreement on response to shipping disasters;

1972 - Oslo Convention introduces controls dumping;

1974 - Paris Convention controls land-based discharges, including offshore installations;

1992 - OSPAR Convention merges and up-dates, but was still focused on pollution – nevertheless the possibility was introduced to extend obligations and commitments to cover other human activities;

1998 – Annex V covers all relevant human activities – but does not permit OSPAR to adopt measures on fisheries management and gives a preference for IMO action on shipping.

5. In these various stages, however, there was no introduction of the concept of the ecosystem approach. The environment as a whole was, of course, important, but more as something that would be affected by the various impacts being considered, than as a guide to what needed doing.

6. The changes that led to the move to an ecosystem approach were part of a more general change in thinking based on an understanding of the importance of the operation of a whole ecosystem as determining the health of its many components. Important milestones can be noted as:

a. the UN Convention on the Law of the Sea which, by its comprehensive approach, made States think about the interrelationships when they came to implement it;

d. the lead up to the 1992 Rio Earth Summit, where Agenda 21 proclaimed clearly that the message for proper management of the worlds oceans and seas was "Integration, Integration, and yet more Integration";

c. OSPAR's 1993 North Sea Quality Status Report, which looked at all aspects of the marine environment of the North Sea, and showed that the main problems were no longer pollution.

7. Within OSPAR, the 1995 North Sea Conference considered the problems of fisheries and agreed to summon a special joint meeting of Ministers of the Environment and Ministers of Fisheries. This North Sea Ministerial Meeting on Fisheries and the Environment was accordingly held in Bergen, Norway, in 1997.

---

[1] This presentation is based upon material agreed by the OSPAR Commission, but the views expressed are those of the Executive Secretary, and are not necessarily those of the OSPAR Commission or of its Contracting Parties.

This agreed that an ecosystem approach was needed, not merely to the management of fisheries, but to the whole range of human activities which can affect the marine environment. This emphasised the need for

> "the development and application of an ecosystem approach which, as far as the best available scientific understanding and information permit, is based on in particular:
>
> i. the identification of processes in, and influences on, the ecosystems which are critical for maintaining their characteristic structure and functioning, productivity and biological diversity;
>
> ii. taking into account the interaction among the different components in the food-webs of the ecosystems (multi-species approach) and other important ecosystem interactions; and
>
> iii. providing for a chemical, physical and biological environment in these ecosystems consistent with a high level of protection of those critical ecosystem processes."

8. The statement of conclusions also stressed the need to base this work on the best available scientific understanding and information, and the limitations that lack of good scientific understanding imposed.

9. These conclusions can be summarised as stressing three themes for an ecosystem approach:

a. critical ecosystem processes;

b. interactions within food-webs;

c. a high-level of protection of the chemical, physical and biological aspects of the marine environment.

Developing a framework for implementing an ecosystem approach

10. These conclusions have informed the thinking of OSPAR. In parallel with this work on fisheries and the environment, OSPAR had been developing six strategies to guide its collective work. Each of these set out long-term, undated, aims, time-constrained immediate goals, and the way in which these objectives would be pursued. The six strategies are:

1. Hazardous Substances Strategy
2. Radioactive Substances Strategy
3. Eutrophication Strategy
4. Offshore Oil and Gas Industry Strategy
5. Marine Ecosystem and Biological Diversity Strategy
6. Joint Environmental Assessment and Monitoring Programme Strategy.

11. The questions that the work on the ecosystem approach raised were whether these strategies, taken together, were consistent and comprehensive. The OSPAR Strategies and other international commitments and obligations – like any sectorally based approaches - are partial descriptions of what is needed. Are they mutually consistent? (OSPAR thinks its strategies are - but needs to show it!). And partial descriptions of what is to be done need to integrate with all other policies - especially fisheries and shipping.

12. But how can such integration be delivered? Action has to be sectoral:

a. the UN Convention on the Law of the Sea sets up sectoral machinery;

b. national structures are sectoral;

c. management of human activities is sectoral.

Nevertheless, the sea is one environment. How do we integrate and show that we are integrating everything?

13. The overall goal can be stated fairly simply as ensuring that our marine environment is healthy and sustainable. Based on the analysis of what the ecosystem approach entails, and a characterisation of the marine environment (for OSPAR, the Quality Status Report 2000 has fulfilled this role), this means that we need to address three sets of questions:

a. the cross-cutting aspects:

i. the critical ecosystem processes – primary production, reproductive success, migration etc…

ii. threatened and declining species and habitats – like the traditional miners' canary, these highlight what processes are under pressure;

iii. marine protected areas – which are poles for crystallising protection of critical processes

b. the full range of the living components of the marine environment:

i. phytoplankton;

ii. zooplankton;

iii. macrophytes (eg - large seaweeds);

iv. benthic species (including shellfish);

v. fish;

vi. reptiles;

vii. sea birds;

viii. marine mammals;

c. the full range of the different human activities:

i. fisheries;

ii. shipping;

iii. minerals extraction (oil and gas, sand and gravel);

iv. tourism;

v. coastal protection;

vi. cables/pipelines;

vii. land-based discharges

viii. offshore wind-power and other renewable power installations;

ix. etc etc etc

14. All these individual aspects are being addressed separately. The problem is how to put all this together into a consistent, coherent and comprehensive system to protect the marine environment.

Ecological Quality Objectives as a means of shaping an ecosystem approach

15. OSPAR had been organising work since 1990 on the idea of ecological quality objectives (EcoQOs) as a means of setting verifiable measures of how we were doing in moving towards our overall goal of a healthy and sustainable marine environment. This work was the natural outcome of the monitoring and assessment process: if you are monitoring and measuring something, then naturally you start asking what the value of the measurements ***should*** be, as well as what it is.

16. By the time of the Fifth North Sea Conference, also in Bergen, Norway, in 2002, the work had progressed enough for the Ministers to agree a North Sea Pilot Project, to show how a system of EcoQOs could be established. The annual meetings of the OSPAR Commission in 2002 and 2003 took up the pilot project as part of OSPAR work, and in 2005 agreed a Report on the North Sea Pilot Project on Ecological Quality Objectives (OSPAR publication 239, available at: (http://www.ospar.org/documents/dbase/publications/p00239_North%20Sea%20Pilot%20Project%20on%20ECOQO%20REPORT.pdf)

17. How can one visualise the ecosystem approach and the contribution that EcoQOs can make? Ecosystems have a natural variability. We cannot specify a single state for any ecosystem. We need to concentrate on the "envelope" within which we can be reasonably confident that the ecosystem is healthy and sustainable. This envelope can be envisaged as a shape joining the points on a series of vectors (each vector representing one of the scales of measurement of the EcoQOs) which are regarded as consistent with a

healthy and sustainable marine environment (the analogy of the allium seed-head). Each of these vectors represents one of the dimensions in which ecosystem health and sustainability can be measured.

18. To implement this approach, we need to identify the measurement scales that we should use. OSPAR has identified nine "Ecological Quality Issues" as the fields within which these dimensions should be sought. These nine issues are:

1. Reference points for commercial fish species
2. Sea mammals
3. Birds
4. Fish communities
5. Benthic communities
6. Plankton communities
7. Eutrophication
8. Threatened and declining species
9. Threatened and declining habitats

19. For each "ecological quality issue" we are then identifying one or more "ecological quality elements" – the dimensions to be measured and the scales on which the dimensions can be measured. For each of these elements, we then have to identify an "ecological quality objective" (EcoQO) – the desired level of that dimension on that scale.

20. With the help of the International Council for the Exploration of the Sea, we have established a set of criteria that a good Eco QO should meet. A good EcoQO will unite the following qualities:

a. the EcoQO will have a clear scientific basis, linking it to significant aspects of the quality of a marine ecosystem;

b. data on the EcoQO can be collected effectively and economically across the whole range to which it applies;

c. there is a clear reference level or target against which the data on the EcoQO can be evaluated;

d. there is general acceptance of the validity of the EcoQO by all relevant stakeholders.

21. To achieve these qualities, EcoQOs will be better the more that they are:

a. relatively easy to understand by non-scientists and those who will decide on their use;

b. sensitive to manageable human activity;

c. relatively tightly linked in time to that activity;

d. easily and accurately measured, with a low error rate;

e. responsive primarily to a human activity, with low responsiveness to other causes of change;

f. measurable over a large proportion of the area to which the EcoQ metric is to apply;

g. based on an existing body or time-series of data to allow a realistic setting of objectives.

22. To help understand how these principles are applied, it helps to take a few examples:

a. illegal oil discharges from ships a matter of concern. To measure this, the chosen environmental quality element is the proportions of samples of dead or dying guillemots (*Uria aalge)* found on beaches marked with oil. To implement this, it is necessary to establish sampling protocols, judgement criteria, and systems for reporting and evaluating data;

b. the impact of chemicals on the marine environment is a long-standing concern of OSPAR. To measure our success in this field, one of the chosen ecological quality elements is levels of organohalogens in seabird eggs. To implement this, we need a similar set of implementation processes;

c. the impact of fisheries on non-target species is a major concern. The chosen ecological quality element is the number of harbour porpoises caught as bycatch as proportion of the estimated population.

23. These are examples of EcoQOs tied closely to single, specific issues. Another type of EcoQO integrates the effects of a number of human activities on a significant element of the marine environment. Examples of these are the EcoQOs for:

a. seabird populations, as an integrator of the effects of all three aspects of the ecosystem approach

b. seal populations, again as an integrator

24. So far in the pilot project, we have examined the 21 ecological quality elements proposed in 2002. We have concluded, on closer examination that two should not be pursued. 10 are well advanced and are to be adopted and applied, but some amendments are needed to the precise formulations of some of them. Nine need much further work. Gaps can be seen - some may be filled with existing work, but we probably need to look in more detail at macrophytes (seaweed), a wider range of pollutants, how to specify objectives for threatened species and habitats, and how to address questions of radioactive substances. The main conclusions are that EcoQO system is workable. We can define a good ecological quality objective. Some of the original proposed EcoQOs are good – others are not. We need to consider how to extend the system to other parts of the OSPAR area.

25. One of the most important conclusions is the need for agreement on the implications of missing an EcoQO: Are EcoQOs targets, which ***must*** be achieved? (That approach has the difficulty that it may not be prudent to adopt such a commitment/obligation before you know what is involved?) Or are EcoQOs indicators, where a miss means that you need to study why it is being missed, and what action that indicates? (That approach has the difficulty that such an objective may not be credible). This set of questions is what we are now working on.

Conclusions

26. What general conclusions can be drawn from all this work. I would suggest the following:

a. the ecosystem approach is not a new start: it is rather a way of integrating what we have been doing under international and national obligations and commitments, and showing that what is being done is coherent and comprehensive;

b. this integration will also show where there are gaps or inconsistencies in what we are doing, and give an impetus to fill or correct them;

c. the use of ecological quality objectives can give a clear framework for making the ecosystem approach into something where the state of the marine environment can be measured and the success in delivering the ecosystem approach can be evaluated.

27. We all want the marine environment to be healthy and sustainable. How best to do it with the resources that can be made available? OSPAR thinks that the ecosystem approach and the use of ecological quality objectives can help in this.