OSPAR Commission

for the Protection of the Marine Environment

of the North-East Atlantic

Quality Status Report 2000

Region II Greater North Sea

Quality Status Report 2000
Region II – Greater North Sea

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FOREWORD

The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention 1992) requires that Contracting Parties shall 'take all possible steps to prevent and eliminate pollution and shall 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 and, when practicable, restore marine areas which have been adversely affected'.

To provide a basis for such measures, the Contracting Parties are required to undertake and publish at regular intervals joint assessments of the quality status of the marine environment and of its development. These assessments should also evaluate the effectiveness of measures taken and planned for the protection of the marine environment and should identify priorities for action.

The Ministerial Meeting at which the OSPAR Convention was signed also issued an action plan for the OSPAR Commission, with a commitment to prepare a quality assessment of the whole maritime area by the year 2000. A comprehensive quality status report on this scale has not previously been produced.

To implement these commitments the OSPAR Commission decided, in 1994, to subdivide the maritime area into five regions and to prepare, coordinated by the Environmental Assessment and Monitoring Committee, five detailed quality status reports. As a result, five regional task teams were set up to produce reports for the following areas (see inset in ***Figure 1.1***): Region I (Arctic Waters), Region II (Greater North Sea), Region III (The Celtic Seas), Region IV (Bay of Biscay and Iberian Coast) and Region V (Wider Atlantic). It was agreed that these reports should be developed in a scientifically sound manner and should be based upon an assessment plan and a scientific programme (covering monitoring, research and the use of assessment tools). It was also agreed that the information contained in the reports should reflect the outcome of the appropriate quality assurance procedures.

In 1995 the OSPAR Commission adopted a Joint Assessment and Monitoring Programme, to take over and build upon experience gained through its former Joint Monitoring Programme and the Monitoring Master Plan of the North Sea Task Force (NSTF).

The findings of the five regional quality status reports ('the regional QSRs') form the basis of a holistic quality status report for the entire maritime area (the 'QSR 2000'). This regional report is thus part of an overall quality status assessment for the North-east Atlantic in the year 2000. The QSR 2000 will represent an integrated summary of the quality status of the entire OSPAR maritime area and will both fulfil the commitment made by the parties to the 1992 Convention and provide a basis upon which the future work programmes of the Commission can be decided. In the Sintra Statement, which concluded the 1998 Ministerial Meeting of the OSPAR Commission, importance was attached to the outcome of the QSR 2000 as a basis for identifying and prioritising future tasks at the Ministerial Meeting of the OSPAR Commission to be held in 2003.

The term 'OSPAR Commission' is used in this report to refer to both the OSPAR Commission and the former Oslo and Paris Commissions. The 1972 Oslo Convention and the 1974 Paris Convention were superseded by the 1992 OSPAR Convention when it entered into force on 25 March 1998.

The conclusions and recommendations contained in this report draw attention to problems and identify priorities for consideration within appropriate fora as a basis for further work. Within its sphere of competence, the OSPAR Commission will decide what follow up should be given to these conclusions, recommendations and priorities for action. The rights and obligations of the Contracting Parties are not therefore affected by this report.

THE PARTICIPANTS

Framework

The Environmental Monitoring and Assessment Committee (ASMO) has overall responsibility for the preparation of periodic quality status reports, assisted by a working group, the Assessment Coordination Group (ACG). ASMO outlined the basic arrangements for the quality status reports in the Joint Assessment and Monitoring Programme (JAMP). Further scientific and technical arrangements were prepared by ACG. Regional Task Teams (RTTs) were set-up for each of the regions of the maritime area. The lead countries for the respective RTTs were responsible for providing logistical support to the RTT.

Information relating to the entire maritime area was prepared in 1996 – 1998 by the following OSPAR working groups: the Working Group on Inputs to the Marine Environment (INPUT), the Working Group on Impacts on the Marine Environment (IMPACT), the Working Group on Concentrations, Trends and Effects of Substances in the Marine Environment (SIME) and its Ad Hoc Working Group on Monitoring (MON). This information constituted the basis of the five regional quality status reports, and was supplemented by relevant national information as appropriate.

Regional Task Team for the Greater North Sea

The RTT for the Greater North Sea had primary responsibility for drafting this report. The Netherlands acted as lead country for the preparation of the report. In the period 1995 - 1999 the RTT comprised the following persons: Belgium: Willy Baeyens, Mia Devolder, Jasna Injuk, Pieter Joos, Martine Leermakers, Koen Parmentier, Georges Pichot, Jean-Pierre Vanderborght. Common Wadden Sea Secretariat: Folkert de Jong. Denmark: Thomas Forbes, Henning Karup, Mikkel Aaman Sørensen. European Commission: David Armstrong. France: Marcel Chaussepied. Germany: Hartmut Heinrich, Karin Heyer, Roland Salchow. The Netherlands: Hans Balfoort, Els de Wit, Lisette Enserink, Karel Essink, Frans Feith (Chairman), Kees Kramer (Technical Editor), Bob Oudshoorn (Secretariat), Jakolien Tijink, Tjark van den Heuvel, Frank van der Valk (Chairman), Carien van Zwol. Norway: Per Erik Iversen, Einar Svendsen. Sweden: Sverker Evans. United Kingdom: John Cotter, John Davies, Andrew Franklin, Richard Millner, Andrew Osborne.

The drafting of chapter 1 was co-ordinated by the United Kingdom, chapter 2 by Norway, chapter 3 by Germany, chapter 4 by Belgium, chapter 5 by Denmark and chapter 6 by The Netherlands. The drafting panels for these chapters, which were assited by RTT II members, comprised the following persons: Chapter 1: Andrew Franklin; Chapter 2: Einar Svendsen, Gerd Becker, Tjark van den Heuvel, Johan Rhode; Chapter 3: Karin Heyer, Roland Salchow; Chapter 4: Willy Baeyens, Jasna Injuk, Koen Parmentier, Jean-Pierre Vanderborght; Chapter 5: Thomas Forbes, Mikkel Aaman Sørensen, Henning Karup, Karel Essink, Richard Millner; Chapter 6: Lisette Enserink, Frank van der Valk, Bob Oudshoorn, Gerrit Baarse, Ton Kuik, Saskia Werners.

ACG and ASMO – representation by Contracting Parties

Chairmen of ACG: Ben van de Wetering (1994), Frank van der Valk (1995), Philip C. Reid (1996 – 1999).
Chairmen of ASMO: Georges Pichot (1994 – 1997), Roland Salchow (1998 – 2000).
Contracting Parties' delegates to ACG 1994 – 1999:
Belgium: Mia Devolder, Georges Pichot*, Wilfried Vyncke; Denmark: Jens Brøgger Jensen*, Henning Karup, Mikkel Aaman Sørensen; EC: Patrick McCutcheon*; France: Pascale Babillot, Marcel Chaussepied, Philippe Maire*, Jean-Marie Massin; Germany: Hartmut Heinrich*, Roland Salchow; Iceland: Helgi Jensson*; Ireland: Rick Boelens, Jacqueline Doyle*; The Netherlands: Lisette Enserink*, Frans Feith, Kees Kramer, Bob Oudshoorn, Folkert Post, Frank van der Valk, Carien van Zwol; Norway: Per Erik Iversen, Hein Rune Skjoldal, Rune Vistad*; Portugal: Antonio Macieira Antunes, Maria E.F. Avila Goulart, Graça Noronha, Irene Pereira, Joaquim Pissarra, Teresa Vinhas*; Spain: Victor Escobar, Pilar García, Argeo Rodríguez de León*; Sweden: Stig Carlberg, Sverker Evans*, Ingrid Jansson; United Kingdom: Mike Burn, John A. Campbell, Stephen Churley, Theresa Crossley*, John M. Davies, Andrew Franklin, Andrew J. Osborne, Philip C. Reid.
* also acting as Head of Delegation during ASMO(3) 1999 which adopted this report.

Observer organisations attending meetings of ACG and ASMO 1998 – 1999

Arctic Monitoring and Assessment Programme (AMAP), European Environment Agency (EEA), International Council for the Exploration of the Sea (ICES), Secretariat of the North Sea Conferences, Conseil européen des fédérations de l'industrie chimique (CEFIC), European Fertilizer Manufacturers Association (EFMA), Euro Chlor, World Wide Fund for Nature (WWF).

OSPAR Secretariat for ACG and ASMO (logistics, organisation, scientific and technical editing)

Stefan Hain (1994 – 1995), Carolyn Symon (1994 – 1998), Dornford Rugg (1998 – 2000), Gert Verreet (1995 – 2000), Ben van de Wetering (Executive Secretary 1995 – 2000).

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OSPAR COMMISSION FOR THE PROTECTION OF THE MARINE ENVIRONMENT OF THE NORTH-EAST ATLANTIC

QUALITY STATUS REPORT 2000: REGION II – GREATER NORTH SEA

EXECUTIVE SUMMARY

Introduction

This report is one of five regional quality status reports prepared by the OSPAR Commission as part of its commitment to produce the first quality status report of the North-east Atlantic by the year 2000.

The report presents an assessment of marine environmental conditions and of its developments in that part of the maritime area of the OSPAR Convention which, for assessment purposes, is known as the Greater North Sea. The Greater North Sea is regarded as being bound by the coastlines of England, Scotland, Norway, Sweden, Denmark, Germany, the Netherlands, Belgium, and France, and by imaginary lines delimiting the western approaches to the Channel (5° W), the northern Atlantic between Scotland and Norway (62° N, 5° W), and the Baltic in the Danish Straits.

This quality status report assesses information collected until 1999 and aims to describe the present status and temporal changes that have been observed in the Greater North Sea, building on the 1993 QSR.

After the introductory chapter, the following topics are dealt with: geography, hydrography and climate (Chapter 2), human activities (Chapter 3), chemistry (Chapter 4) and biology (Chapter 5). Chapter 6 provides an overall assessment of the quality of the Greater North Sea.

Overall assessment

The general improvements that have been made and the means provided for continuing improvement, through the implementation of OSPAR strategies and other programmes, are reassuring. Inputs of heavy metals, oil from refineries and cuttings, and phosphorus have significantly decreased. In addition, the dumping of sewage sludge ceased in 1998 and the number of chemicals used in mariculture have decreased.

However, certain activities continue to give cause for concern because of their continued widespread impact or increasing trend, such as the impact of fisheries, inputs of nitrogen from agriculture, and inputs of oil and chemicals associated with increased quantities of produced water from offshore oil and gas. Concentrations of the antifouling agent tributyltin (TBT) still exceed safe levels in marina areas and biological effects remain a common phenomenon in the North Sea. An increasing number of synthetic compounds are being detected for which the ecological significance is not known. Though dredging impacts have diminished because of reduced contaminant loads, the quantities of dredged material are expected to increase in future, due to anticipated increases in the size of cargo vessels.

Human impacts are greatest in the coastal zones. Many sensitive habitats with large ecological significance are disturbed or vanish due to a range of activities. It is foreseen that there may be significant impacts due to demographic developments and climate change.

In conclusion, the intensive – sometimes conflicting – use of the North Sea causes a number of problems in relation to a healthy ecosystem and sustainable use. The ecosystems continue to suffer from a number of old problems, sometimes showing some signs of amelioration, but new problems have also arisen. The effects of hazardous substances, eutrophication, and the direct as well as indirect impacts of fisheries comprise the most important issues.

Main human pressures

To identify impacts of concern, human pressures on the North Sea environment have been ranked into four classes by using expert judgment, the results of which are shown in Chapter 6. The chapter focuses on the pressures of importance, supplying information on their impacts and the effectiveness of measures taken to reduce undesired impacts. Recommendations for future action are made for further consideration by the competent authorities. Although the impacts of the human pressures ranked in the lower priority classes are perceived to be less important, they may be of more serious concern in combination with other pressures. More information is provided in chapters 2 – 5.

Owing to the very broad scope of its causes and effects, climate change has the potential for significant impacts on the North Sea. It may influence factors in the North-east Atlantic which control the climate of Western Europe.

Human pressures on the North Sea were ranked in 4 priority classes.

First priority class

Fisheries

The main impacts of fisheries result from the removal of target species, from seabed disturbance by towed demersal gear and from the discarding and mortality of non-target species. Many target fish stocks are outside Safe Biological Limits.

These impacts are widespread and ecologically important and fully justify the further development and implementation of the ecosystem approach. Recommendations for consideration by the appropriate authorities are to continue efforts to reduce fleet capacity, the additional identification and use of closed areas which can protect juveniles and closed areas which are of conservation benefit through protecting benthos. The development of fishing gears which reduce or eliminate catches of non-target organisms and habitat disturbance is also encouraged.

Trace organic contaminants

Trace organic contaminants occur throughout the Greater North Sea area. Some are persistent and recovery times for the environment can be very long. Some reductions in concentration have been observed, but an increasing

number of synthetic compounds are detected, for which the ecological effects are largely unknown.

Recommendations call for stronger efforts in the implementation of the OSPAR Strategy on Hazardous Substances[1], and the policies agreed within the frameworks of, for example, the North Sea Conferences, the European Union and the International Maritime Organization.

Nutrients

The anthropogenic inputs of nutrients may cause eutrophication effects, for example increased phytoplankton blooms and oxygen depletion. Heaviest impacts are recognised in estuaries and fjords, the Wadden Sea, the German Bight, Kattegat and eastern Skagerrak. Since 1985, there has been a significant reduction in the total input of phosphorus and, although direct inputs of nutrients have reduced, there was no discernible reduction in the overall nitrogen inputs.

The main recommendations are to pursue vigorously implementation of the OSPAR Strategy to Combat Eutrophication, and where applicable the EC urban wastewater treatment and nitrates directives, and to focus research efforts on links between nutrient enrichment and ecosystem responses.

Second priority class

Oil and PAHs

Reliable estimates on inputs of oil from rivers and land run-off are lacking. Significant reductions are noted for refineries and the offshore oil and gas industry, although for the latter, inputs from produced water have increased progressively in recent years. Polycyclic aromatic hydrocarbons (PAHs) are widespread in the North Sea, but inputs are unknown. Reductions of PAH inputs are expected by virtue of the reduction of inputs of oil.

Recommendations include establishing better estimates of oil and PAH inputs from all land-based sources and of PAH concentrations and effects in the marine environment, fulfilling the objectives of the OSPAR Strategy for offshore oil and gas activities, and strengthening existing measures to ensure continuation of the present decline of illegal discharges of oil from ships.

Heavy metals

Policy measures have been successful in reducing discharges and emissions of cadmium, mercury, lead and copper resulting in reductions of concentrations in sediments, water and biota. However, there is still evidence of local effects close to known sources. Further improvements will be achieved with the fulfilment of the OSPAR Strategy with regard to Hazardous Substances.

Other hazardous substances from sea-based sources (other than oil, PAHs and antifouling substances)

Inputs of hazardous substances occur from the offshore oil and gas industry particularly via produced water. Currently available information is too limited to make an assessment of their impacts. Inputs from shipping consist of elemental phosphorus (found on beaches), pesticides and lipophilic substances originating from the cleaning of tanks, burning fuel, discharges of wastes and loss of cargo.

Recommendations call for more information on inputs, field concentrations, chemical fate and biological effects of the hazardous chemicals concerned. Effective implementation of the OSPAR Strategy for offshore oil and gas activities and various international agreements on shipping should be pursued, with co-operation on control, enforcement and sanctions further strengthened.

Biological impacts

The introduction of non-indigenous species by shipping and mariculture as well as microbiological pollution from land may affect the health of organisms (including man) and the structure of ecosystems.

It is recommended that the presence and further dispersal of non-indigenous species should be recorded, as well as the presence of algal toxins and pathogens, as required for the EU Shellfish Hygiene Directive.

Limitations in knowledge

Limited knowledge in the following subject areas was identified as particularly important:

- The possible impacts of climate change;
- Organic hazardous substances. There is a general lack of data in this area;
- Chemicals from some sectors, for example the offshore industry, shipping and agriculture. Information on inputs, environmental concentrations and biological effects was not readily available;
- Chronic and combined effects of hazardous substances on organisms, and effect concentrations and ecological impacts of substances affecting the hormone system;
- Reliable quantitative information on sources and inputs of nutrients and the relationship with eutrophication, including the role of seasonal variations;
- Trend monitoring. At present, this is unsatisfactory in the OSPAR area;
- Budgets and fluxes for substances, both within the North Sea area and between OSPAR regions. This could be addressed with better harmonised monitoring efforts;
- The lack of Background/Reference Concentrations and Ecotoxicological Assessment Criteria for several hazardous substances;
- Modelling of multi-species interactions in fisheries. Improved data for this purpose are also needed;
- The longer term impacts of fisheries, especially with regard to demersal gears and the seasonal and spatial variability in discards;
- Comparable data on economic aspects of the use of the North Sea;
- Assessment indicators regarding tourism;
- Ecological Quality Objectives to contribute to the protection and conservation of the ecosystems and biological diversity of the maritime area.

Recommendations

The quality status report concludes with the following general recommendations:

- To ensure continued improvement of the quality of the North Sea, adequate resources should be made available to implement the OSPAR Strategies;

[1] The objective of the OSPAR Strategy on Hazardous Substances is to prevent pollution of the maritime area by continuously reducing discharges, emissions and losses of hazardous substances, with the ultimate aim of achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man made synthetic substances.

- Future assessments of the quality status of the North Sea could benefit from improved co-operation with other European and global fora;
- Steps should be taken to close the gaps in knowledge highlighted in this report, in particular regarding the occurrence and effects of hazardous substances in the marine environment;
- Further development of tools for the assessment of substances and effects of concern should be pursued, where possible integrating biological effects and chemical monitoring. More efficient data gathering is crucial, for example by one-off surveys by a lead laboratory;
- The impact of those human pressures thought likely to increase, or unlikely to diminish, should be reviewed in the short term and action taken accordingly;
- The implications for the North Sea environment of possible changes associated with global warming should be evaluated;
- The ecosystem approach needs further development and application to achieve effective protection and conservation of the ecosystems and biological diversity of the North Sea.