Supporting European Marine Integrated Ecosystem Assessments

"SEMIEA"

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Specific Support Actions

Participants:

ICES, CEFAS, IMR, DIFRES, BfN

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Strategic objectives addressed

To produce generic tools needed for European marine ecosystem integrated assessments which will support the implementation of the ecosystem approach, in anticipation of new policies such as the EU Marine Strategy.

Abstract

SEMIEA is attempting to produce generic tools needed for European ecosystem assessments which will support the implementation of the ecosystem approach, in anticipation of new policies such as the EU Marine Strategy. SEMIEA proposes to pilot the tools by performing the first integrated ecosystem assessment for the North Sea, utilising the data, experts and structures of the ICES system in a quasi-operational way. Such tools will be needed in the future as management moves towards being more adaptive in its approach to protect European marine ecosystems, and policy drivers such as the EU Marine Strategy are implemented. The generic tools to be developed by this proposal can in the future be applied to other European seas.

B.1 Objectives of the proposed project

Background

At the Fifth North Sea Ministerial Conference, the Ministers agreed to adopt the ecosystem approach to management of marine ecosystems. This was encapsulated in the Bergen Declaration. The ecosystem approach to management was also adopted as one of the underlying principles guiding the process towards the revised Common Fisheries Policy and the EU Marine Strategy.

An ecosystem approach to management has been defined as integrated management of human activities which may impact the marine ecosystem, based on sound knowledge of the marine ecosystem, to achieve sustainable use and ecosystem protection. The implementation of an ecosystem approach is based on a framework that includes:

- setting of operational environmental objectives,
- monitoring the status and trends in the ecosystem,
- conducting research to obtain better insight into the workings of the ecosystem,
- assessing the status of the ecosystem and the degree of human impacts,
- providing scientifically objective advice to management,
- making appropriate policy decisions and management actions,
- involving stakeholders to improve transparency and responsibility.

This proposal combines the results of monitoring with state-of-the-art research in order to assess the status of a European regional ecosystem in order to provide advice to managers using operational environmental objectives. SEMIEA will provide the integrated assessment tools needed to move towards implementing an ecosystem approach to the management of marine ecosystems in Europe.

A scientific expert conference related to the Fifth North Sea Conference was held in Bergen 20–22 February 2002. The aim of the expert conference was to identify priority issues for scientific research and monitoring to support the implementation of an ecosystem approach to management and protection of a European regional sea (the North Sea). The priority issues identified were

Short-term:

1. Operational description of currents and water masses.
2. Production of the first generation habitat map of the regional 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.

This proposal addresses aspects of item 6. It aims to provide new tools to prepare integrated assessments of regional European ecosystems in order to provide advice to managers.

These conclusions are valid for many European regional marine ecosystems. In order to maintain momentum, Norway (as the Secretariat for the Fifth North Sea Conference) passed the conclusions

of the expert conference to the International Council for the Exploration of the Seas (ICES), with a recommendation that they identify present knowledge gaps, and take action to bridge those gaps.

> ***This proposal is one of the ways ICES, its Expert Working Groups and its member nations and their institutes aim to identify knowledge gaps and propose mechanisms to bridge them.***

Gaps in R&D to Deliver European Priority Science Issues

A European national Government (UK), attempted to review its research programmes for both fisheries and environment in relation to the short- and long-term priority issues identified by the Scientific Expert Conference. The results highlighted gaps in addressing two of the short-term priority science issues, namely, 1) operational fisheries oceanography, and 2) study of fishery closure effects. This was also considered to be true of the R&D conducted by other European states, including Norway.

Essentially European R&D programmes are funded either by national governments or as part of collaborative international programmes, largely via the European Commission and DG Research, such as the Framework Programme and Interreg. ICES does not commission its own research, but because of its role in co-ordinating fish stock monitoring and assessment programmes, it is potentially in a strong position to shape the research agenda, particularly if the links between advice, monitoring and R&D can be better integrated. It is generally accepted that ICES fish stock and environmental data could be better used to provide integrated ecosystem assessments and to validate (modelled) predictions of ecosystem change. The use of monitoring data to validate model predictions is not new to Europe, but what represents a challenge for present and future assessments is the need to predict and model change of complex systems (ecosystems) not just fish stocks. There is therefore a need to have much more effective and transparent communication between the R&D community (DG Research) and ICES expert Working Groups (and vice versa). The result of this could then be measured in terms of greater evidence-based environmental policy development.

> ***This proposal attempts to bridge gaps in European Research and Development to deliver to European priority science issues.***

Exploiting an Existing European "Network of Excellence"

The expert Working Groups of ICES bring together scientists who are engaged in various national and international R&D projects, but the ability to effectively utilise this experience within Europe for its primary assessment and advisory function is presently limited. The priority science issues do not specifically address the issue of effective knowledge transfer between the monitoring, R&D and advisory/policy sectors. R&D targeted at addressing the issue of knowledge transfer could go a long way in making ecosystem-based management an operational reality within Europe. How can knowledge transfer be made effective? One European regional marine ecosystem (the North Sea) has been studied extensively for many years and although we know much about its structure and function, this knowledge, because of its complexity, is not being used as effectively as it could be to address the regulatory and management needs. Setting priorities for further research therefore becomes of foremost importance. Do we continue to develop the scientific understanding of regional European marine ecosystems at the expense of making the existing knowledge more useable for policy development and the management of pollution? These priorities must be guided by the need to understand regional marine ecosystems and to assess the degree of human impact on these systems and how management intervention can improve environmental quality and/or sustain ecosystem function and biodiversity.

This proposal captures existing European marine data, monitoring capacity and expertise in order to deliver tools needed for an ecosystem approach to the management of European marine ecosystems.

An Unexploited Management Tool

One possible solution to knowledge transfer, and one which is growing in credibility, is the development of ecosystem models. For example, results from specific European R&D examining transport, fate and effects pathways of contaminants can be used to parameterise ecosystem models, at the same time the models can be subjected to sensitivity analysis to examine which attributes (parameters) of the ecosystem are most critical to its function. These, in turn, should help to focus the design of marine monitoring programmes from which the results can be fed back to validate the model predictions. The present disconnection between R&D, monitoring and advice is therefore potentially bridged by the application of such models.

This proposal captures and utilises scientific tools which are so far unexploited for the purpose of advice and resource management.

Exploiting International Experience

Many countries outside Europe have already moved towards the implementation of an ecosystem approach to the management of human activities which may impact the marine ecosystem. Principle examples are presently New Zealand, Australia, the United States and Canada. In Canada the recent Eastern Scotia Shelf ecosystem assessment (Frank, 2004), building on techniques applied to the northeast US continental shelf (Link *et al.*, 2002), shows one way forward towards new numerical tools to integrate and assess a diverse range of measures of the health of a marine ecosystem, and to provide tools to use this information in the generation of advice to managers. It is hoped to further develop these tools within the present proposal, and to capture the expertise that already exists internationally. If successful this proposal will provide funds which will enable international experts in the field of integrated ecosystem assessments to participate in European workshops, thereby facilitating information and knowledge exchange, and capacity building within Europe.

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Developing European Infrastructure to Incorporate Environmental Information into Advice

Developments such as the reformed CFP, the developing EU Marine Strategy, OSPAR Biodiversity Committee requests and proposed work, the developments of Ecological Quality Elements (EcoQEs) and Ecological Quality Objectives (EcoQOs), European Environment Agency (EEA) developments in fishery indicators, will increasingly call upon European member states and the European Commission to provide integrated advice concerning fisheries and the environment.

There are currently different yet simultaneous approaches to delivering change:

1) Strategic discussions leading towards the realignment of the way advice is delivered to the European Commission (e.g. through client commission dialogue with ICES);
2) Research towards developing relevant environmental indicators;

3) Research towards incorporating environmental indicators in stock assessment methods and use of such environmental information in stock assessment work;
4) Practical developments designed to improve the infrastructure within Europe so that environmental indicators can be generated, integrated and fed into an assessment process.

While 1–3 are being tackled by various European initiatives, 4 is presently being neglected. This Specific Support Action attempts to utilise the existing European Network of Excellence represented by the ICES expert Working Groups to help bridge this gap in European infrastructure.

This proposal will bridge a gap in European infrastructure allowing environmental indicators to be employed in advice and European marine policy.

Need for European Capacity Building

Considering the fourth strand of the above strategy, infrastructure capacity building within European and ICES member states is required in the following areas:

- collection of multi-disciplinary data at sea;
- access to data / model products from non-fishery communities;
- collation and archiving of environmental data;
- collation and archiving of environmental / ecosystem model output;
- generation of relevant products from model/data;
- building integrated assessment capability;
- building methods to deliver advice to ecosystem managers in support of policy.

This proposal will build European capacity in collection, collation, assessment and dissemination of environmental information within Europe.

Objectives of SEMIEA

The principle objective of this Specific Support Action is to produce generic tools needed for European marine ecosystem integrated assessments which will support the implementation of the ecosystem approach, in anticipation of new policies such as the EU Marine Strategy. To achieve this, the project will utilise an existing Network of Excellence within Europe in order to establish better links between advice, monitoring and research so that present scientific knowledge of marine ecosystems can be more effectively utilised. Knowledge transfer between European member states and their monitoring, advisory and R&D programmes, is presently a key limiting step in delivering integrated assessments of the health of marine ecosystems. New infrastructure is required in order overcome this limitation.

Funding through this proposal for a Specific Support Action will support:

- ***identification and collation of existing ecosystem data from national monitoring programmes within a European regional sea.***
- ***identification and collation of existing ecosystem model simulations from national research programmes within a European regional sea.***
- ***development of new generic data integrating and assessment tools applicable to all European regional seas.***

- ***development of new generic knowledge and advice transfer tools, capable of delivering the results of science to underpin policy through advice, applicable to all European regional seas.***
- ***demonstration of the new generic tools in a pilot ecosystem assessment of a European regional sea.***

Methodology of SEMIEA

The proposal is divided into 7 Work Packages, of which the sciences Work Packages are structured around policy thematic areas:

Work Package 1 - Co-ordination and Integration
Work Package 2 - Fisheries
Work Package 3 – Chemical Pollution
Work Package 4 – Habitat and Species
Work Package 5 – Nutrients and Eutrophication
Work Package 6 – Ocean Climate and Processes
Work Package 7 - Management and Policy Issues

The work packages are described in detail in the sections below.

The methods to be employed by this proposal will:

1) ***Exploit existing networks of excellence within Europe (the ICES expert Working Group structure);***
2) ***Capture expertise from outside Europe through funded participation of international experts;***
3) ***Deliver a pilot integrated assessment of a European regional marine ecosystem by building on established lines of communication between ICES and the European Commission (DG-ENV and DG-FISH).***

References

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Frank, K. 2004. State of the Eastern Scotian Shelf ecosystem. 2003/2004 Ecosystem Status Report, Maritimes Region, Fisheries and Oceans, Canada.

B.2 Relevance to the objectives of the Priority Area ('Sustainable development, global change and ecosystems') and Specific Programme ('Integrating and strengthening the European Research Area')

This Specific Support Action is in response to the call for proposals for indirect RTD actions under the Specific Programme for research, technological development and demonstration: 'Integrating and strengthening the European Research Area' (Identifier: FP6-2004-Global-3, Publication date: 16 June 2004, Closing Date(s): 26 October 2004, 15 March 2005, OJ Reference: OJ C159 of 16.06.2004). The Priority Area this proposal addresses is 'Sustainable development, global change and ecosystems'.

Relevance to the objectives of the Priority Area ('Sustainable development, global change and ecosystems')

The Priority Area this proposal addresses is 'Sustainable development, global change and ecosystems'. Area three, 'Biodiversity and Ecosystems', of this Work Programme has as its principal objective:

"to develop a better understanding of marine and terrestrial biodiversity and of ecosystem functioning, to understand and minimise the negative impacts of human activities on them, and to ensure sustainable management of natural resources and terrestrial and marine ecosystems (including fresh water systems) as well as the protection of genetic resources".

> ***By developing the generic tools necessary for generating integrated assessments of marine ecosystems in European regional seas, this proposal will directly help Europe fulfil this objective. Integrated ecosystem assessments are necessary if we are to sustainably manage the natural resources of marine ecosystems. The generic tools this proposal will develop, to disseminate the results of integrated ecosystem assessments in the form of advice to managers, is necessary if Europe is to minimise the impact of human activities on marine ecosystems.***

Work needed to achieve this objective should focus on:

"assessing and forecasting changes in biodiversity, structure, function and dynamics of ecosystems and their services, with emphasis on marine ecosystems' functioning, relationships between society, economy, biodiversity and habitats, integrated assessment of drivers affecting ecosystems functioning and biodiversity, and mitigation options and on risk assessment, management, conservation and rehabilitation options in relation to terrestrial and marine ecosystems".

> ***This proposal directly follows this focus, by providing new tools with which to assess changes in biodiversity, function and dynamics of ecosystems, by providing integrated assessments of drivers affecting marine ecosystems, and by providing tools to manage and conserve marine ecosystems.***

Specific topics addressed by this proposal are;

SUSTDEV-3.3.1 - Assessing and forecasting changes in biodiversity, structure, function and dynamics of ecosystems and their services, with emphasis on marine ecosystems functioning

> "The research should focus on understanding biodiversity and ecosystems patterns, processes and dynamics at European and global scales, in a changing environment. Proposals should take account of developing earth systems analysis and modelling initiatives."
>
> ***This proposal takes account of the available state-of-the-art ecosystem modelling of European regional seas, and captures their output to support sustainable management of ecosystems.***

SUSTDEV-3.3.4 - Risk assessment, management, conservation and rehabilitation options in relation to terrestrial and marine ecosystems:

> "The research should be dealt with by implementing research initiatives to assess in an integrated way, large scale environmental risks impacting on biodiversity and ecosystems and to develop concepts and tools for risk management. The coastal zone management, based on integrated risk assessment is also considered here."
>
> ***This proposal directly addresses this sub-topic, by developing generic tools for integrated assessments of environmental risks to marine ecosystems, as well as developing conceptual tools for risk management. The generic tools the proposal will develop will be applicable to coastal zones of European regional seas.***

SUSTDEV-3.8 – Cross-cutting issue: Sustainable Development concepts and tools

> "The objective is to develop concepts and tools for facing the complex challenges expressed in the EU Strategy on Sustainable Development and the Johannesburg Summit and to characterise the sustainability dimension of the relevant policies. The desired tools, including potential positive and negative externalities, will support the Sustainability Impact Assessments, the assessment of the interrelations of environmental, economic and social impacts of policies and measures in qualitative and quantitative terms. The precautionary principle and the regional aspects to sustainable development will be key elements to be taken into account. The research will focus on the estimation of thresholds of sustainability and externalities and on the development of tools for integrated sustainability assessment and for the incorporation of sustainability in decision making processes."
>
> ***This proposal directly addresses this sub-topic, and will support all of the policy areas listed.***

Relevance to the objectives of the Specific Programme ('Integrating and strengthening the European Research Area'

As well as addressing the objectives of the Specific Programme 'Sustainable development, global change and ecosystems', this proposal also addresses one of the "Cross Cutting Issues" of the Work Programme 'Integrating and strengthening the European Research Area', namely that of international cooperation. Under this heading, the activities in question have the following overall objectives:

- To help European researchers, businesses and research organisations in the European Union and in the countries associated with the Framework programme to have access to knowledge and expertise existing elsewhere in the world, and

- To help ensure Europe's strong and coherent participation in the research initiatives conducted at international level in order to push back the boundaries of knowledge or help to resolve the major global issues.

This proposal will ensure that Europe gains from existing experience, knowledge and expertise which has been established in Canada and elsewhere in integrated ecosystem assessments and their application to the ecosystem approach to the management of human activities which may impact the marine ecosystem. Through participatory workshops, the proposal also ensures European expertise is used in the international effort presently underway to implement the ecosystem approach globally.

B.3 Potential Impact

Most monitoring and assessment programs carried out at present are mostly sectional, i.e. they focus on limited aspects of an ecosystem without comprehensive instruments and assessment tools. What is more, monitoring is largely limited to narrow sectors defined by political (i.e. Directives, conventions or other policy instruments) framework and results are seldomly transported into other sectors with more integrating terms of reference. Examples are chemical contaminant monitoring, sometimes complemented by biological effect monitoring. Presently the results of such monitoring are rarely used by more ecologically motivated programmes. They certainly are able to provide interpretation parameters for holistic ecosystem assessment. In addition, where some comparison of results between sectors presently does occur, there is no attempt to provide integrated assessment using adequate tools that allow for indisputable conclusions.

SEMIEA will develop such integrating tools and instruments. Data integration will be the first step followed by the identification of gaps and adjustment of scales for the various monitoring disciplines to be integrated. That will be a sometimes iterative process with interactions between the spatial and temporal scales of field surveys and data requirements as resulting from integrated assessments. In doing so SEMIEA will have potential impact on other monitoring programmes in two ways: It serves as a model to initiate development of similar instruments and tools for other European Seas. Alternatively, SEMIEA assessment methods can be transferred and adapted to the special requirements and ecological peculiarities of these regions. Thus, SEMIEA may also furnish the avenue for more ecosystem-based assessments across Europe. It is, however, quite clear that such a perspective needs to involve the relevant authorities and organizational frameworks at an early stage. This is why the 6th Framework Programme is the ideal funding source for SEMIEA, as it allows the existing framework of scientific expert groups within ICES to add value to the wider European assessment and advisory needs.

It should also be noted that convening and integrating the various monitoring disciplines will inevitably lead to synergy effects beyond the potential gain in knowledge without increasing the efforts for individual programmes. These effects may strengthen the efficiency of sectoral monitoring and assessment procedures and it may even lead to mergers of certain programs under a common umbrella, if desirable. The outputs of this SSA will therefore benefit the on-going discussions within EFARO which are looking at ways of harmonizing the marine fish stock assessment surveys.

Integrating socio-economic disciplines into ecosystem assessments and quantifying the effectiveness of policy and management action needs has to be more fully addressed in formulating ecosystem advice. There are only a few examples where these have been successfully linked with

ecology or assessments involving biological processes and oceanography. SEMIEA has the potential to develop the necessary methodological approaches which will make the integration of such data operational.

B.4 The consortium and project resources

The consortium

The consortium for this proposal consists of five institutions with excellent reputations in the field of Marine Sciences. All of them have well known expertise and qualified personal to meet the requirements of the work packages in the respective disciplines. All four partner organisations have a long standing history of cooperation. Representatives of each organisation meet on many occasions throughout the year, mainly during working group and study group meetings held under the auspices of ICES.

Coordinator: Denmark, ICES

The International Council for the Exploration of the Sea is the organisation that coordinates and promotes marine research in the North Atlantic. This includes adjacent seas such as the Baltic Sea and North Sea. ICES acts as a meeting point for a community of more than 1600 marine scientists from 19 countries around the North Atlantic.

Scientists working through ICES gather information about the marine ecosystem. As well as filling gaps in existing knowledge, this information is also developed into unbiased, non-political advice. ICES' advice is then used by the 19 member countries, which fund and support ICES, to help them manage the North Atlantic Ocean and adjacent seas.

Principal scientific personnel involved: Dr. Adolf Kellermann.

Adolf (Adi) Kellermann is Head of Science Program at ICES. He is a fishery biologist with background from polar plankton and food web studies, early life history of fishes and recruitment issues. What is more, he has extensive experience as monitoring and research co-ordinator within the framework of the Trilateral Ministerial Conferences for the Protection of the Wadden Sea. He was especially involved in developing and negotiating the concept for the Trilateral Monitoring and Assessment Program (TMAP) as a management tool, and in implementing the concept into operational monitoring in the States bordering the Wadden Sea. The co-ordinator to be employed for the SEMIEA endeavour will become part of the network of ICES' Science Program under his supervision.

Publications:

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Marencic, H., Bakker, J., Farke, H., Gätje, C., Kellermann, A., and Laursen, K. 1996. The Trilateral Monitoring and Assessment Programm (TMAP). Expert Workshops 1995/1996. Wadden Sea Ecosystem, No.4, Common Wadden Sea Secretariat & Trilateral Monitoring and Assessment Group, Wilhelmshaven, 205 pp.

Kellermann, A. 2000. Can monitoring results be applied without concomitant ecological research? Schriftenreihe Landschaftspfl. Natursch., 62: 151–161.

The partners

Partner 1: United Kingdom, CEFAS

CEFAS as an Executive Agency for the Department for Environment, Food and Rural Affairs (DEFRA) is a multidisciplinary scientific research and consultancy centre specializing in fisheries science, environmental management and marine monitoring and assessment. On behalf of DEFRA, CEFAS manages the UK National Marine Monitoring Programme (NMMP) which coordinates the monitoring activities of 6 regional agencies tasked with implementing the Water Framework Directive (2000/60/EC) and OSPAR JAMP. CEFAS plays a leading role in a number of international quality assurance programmes including BEQUALM (for biological effects) and QUISMEMME (for chemical analysis).

Under the leadership of Dr Andrew Kenny and Dr Jim Ellis, CEFAS will have the overall coordinating responsibility for WPs 2 3.

Partner 2: Norway, Institute of Marine Research, Bergen

The Institute of Marine Research does research on marine resources, the marine environment and aquaculture. The principal objective of the Institute is to provide scientific advice in the above areas to the authorities, industry and society as a whole.

The Institute of Marine Research is answerable to the Ministry of Fisheries, and its duties are to:

- monitor and carry out research on life, the environment and interactions among living organisms in coastal waters and the ocean.
- generate new and updated knowledge of marine resources of importance to fishing and aquaculture.
- develop technology and greater biological understanding as the basis of rational, future-oriented fishing and aquaculture industries.
- offer advice to the authorities and industry regarding management of the marine environment and its resources.
- disseminate the results of research in order to promote the interests of the fishing and aquaculture industries and of society as a whole.

The work of the Institute is primarily concentrated on the ecosystems of the Barents Sea, the Norwegian Sea and the North Sea, and the Norwegian coastal zone. With a staff of about 600, the Institute of Marine Research is the largest marine research institution in Norway, and in many of its areas of research it plays a leading role at international level. Most of its activities are based in Bergen, but the Institute also has a department in Tromsø and research stations in Matre and Austevoll near Bergen, as well as in Flødevigen near Arendal. The Institute operate four large research vessels.

Hein Rune Skjoldal is a marine ecologist with experience from studies of plankton and pelagic food webs in the Barents Sea, the Norwegian Sea and the North Sea. He has served as Chair of the ICES Advisory Committee on Marine Environment (ACME) (2000) and Chair of the ICES Advisory Committee on Ecosystems (ACE) (2001-2003). He was a member of the North Sea Task Force which produced the 1993 North Sea Quality Status Report (QSR). He has taken part in the work of

OSPAR with the 2000 QSRs for the Northeast Atlantic, in the OSPAR Biodiversity Committee for which he acted as interim chair in 2000, and in the OSPAR Eutrophication Committee and the Eutrophication Task Group. He has chaired a Norwegian national expert group for assessment of the eutrophication status of the Norwegian coastal waters in the Skagerrak and the North Sea. He is presently chair of an advisory group on establishment of Marine Protected Areas in Norway.

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Skjoldal, H. R. 2004. Fish stocks and fisheries in relation to climate variability and exploitation. *In:* Natural resource system challenge: oceans and aquatic ecosystems. Ed. by E. Wolanski. *In:* Encyclopedia of Life Supporting Systems (EOLSS), Developed under the auspices of the UNESCO. Eolss Publishers, Oxford, UK. (http://www.eolss.net).

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Sinclair, M., Arnason, R., Csirke, J., Karnicki, Z., Sigurjonsson, J., Skjoldal, H. R., and Valdimarsson, G. 2002. Responsible fisheries in the marine ecosystem. Fisheries Research 58: 255–265.

Also involved at IMR will be Dr. Lars Asplin. He is a Physical Oceanogapher at the Institute of Marine Research. His main work has been on water mass distribution in the Barents Sea and on dynamics and water mass distribution in coastal areas and fjords. Recently, the distribution and abundance of salmon lice in fjords has been a study topic. The scientific methods used are both 3D numerical modelling and collection of field data. Presently, Asplin is involved in a process at IMR to make numerical model results available in a operational manner for analyses necessary to perform an ecosystem based fisheries assessment. Asplin is a national member of the Oceanography Committee at the ICES.

Publications:

Asplin L., Boxaspen K., and Sandvik, A. D. 2004. Modelled distribution of salmon lice in a Norwegian fjord. ICES CM 2004/P:11, 12 pp.

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Ingvaldsen, R., Asplin, L., and Loeng, H. 2004. Velocity field of the western entrance to the Barents Sea. Journal of Geophysical Research, 109, C03021, 10.1029/2003JC001811.

Ingvaldsen R, Asplin, L., and Loeng, H. 2004. The seasonal cycle in the Atlantic transport to the Barents Sea during the years 1997-2001. Continental Shelf Research, 24: 1015–1032.

Partner 3: Denmark, Danish Institute for Fisheries Research (DIFRES, Copenhagen)

The Danish Institute for Fisheries Research (DIFRES) carries out research on living aquatic resources. This includes all aspects from the living resources to the final product derived from them. DIFRES is affiliated to the Danish Ministry of Food, Agriculture and Fisheries. DIFRES acts as advisor to the Ministry of Food, Agriculture and Fisheries, other national authorities, and international bodies on questions relating to the sustainable and variational exploitation of the living aquatic resources. It acts as an adviser to the fishing industry on questions relating to production of food products. DIFRES was established in 1995 by uniting three research institutions: Danish Institute for Fisheries and Marine Research, Inland Fisheries Laboratory and Technological Laboratory. DIFRES employs about 280 people (100 scientific and 180 auxiliary staff).

DIFRES have three main research areas: Marine Environment and Fisheries, Freshwater and Processing. It also has Advisory function in environmental issues (Dept. of Marine and Coastal Ecology), marine fisheries (Dept. of Marine Fisheries), recreational fisheries (Dept. of Inland Fisheries), processing (Dept. of Seafood Research), aquaculture (Dept. of Fish Biology) and capture and technology (Dept. of Fish Biology).

Henrik Mosegaard is at DIFRES since 1995 as senior scientist and as research co-ordinator and head of section for stock assessment in 2000. He has 22 years of experience in fish population ecology, and he is specialized in analysis and application of otolith formation processes. Main research interests are in analysis of fish population structure and dynamics. He has coordinated and participated in numerous fishery related projects at both national and international level: Danish co-ordinator for “Separation of spring- and autumn spawning herring in the Skagerrak and Kattegat” (EU CFP 96/073). External consultant on FAbOSA (FAIR CT97 3402). EU co-ordinator for "A new sampling regime for resource assessment of herring in the Skagerrak, Kattegat, and SW Baltic" (CFP DG:XIV (n°98/026). Participant in the EU-financed scientific projects: STORE (FAIR 98 3959); LIFECO (QLRT-1999-30183), HERGEN (QLRT-2000-01370), TACADAR steering committee 2002-2006 (Q5CA-2002-01891); IBACS 2002-2005 (QLRT-2001-01610); CODYSSEY 2002-2006 (QLRT-2001-00813). Co-ordinator and participant in the following Danish ministry of food, agriculture and fisheries research projects: "Growth variations and genetic structure in Danish cod populations" (1996-2001). “The genetic structure of Atlantic herring (*Clupea harengus*) in the western Baltic Sea based on microsatellite DNA variation”.

Partner 4: Germany, Federal Agency for Nature Conservation (BfN)

The Federal Agency for Nature Conservation (BfN) is a higher Federal Authority advising the Federal Ministry for the Environment, Nature Protection and Nuclear Safety (BMU). On the Isle of Vilm southeast of Rügen, the BfN maintains a branch office with a Marine and Coastal Nature Conservation Unit. This unit is responsible for all aspects of marine nature conservation in the German North Sea and Baltic Sea as well as for assessing German research activities in terms of possible impacts on nature conservation interests in the Antarctic if such aspects are part of international cooperation or if they concern several German states interests. Among the most recent tasks it coordinates NATURA 2000 research in the EEZ and develops the scientific basis for identifying marine conservation areas. The Federal Agency for Nature Conservation (BfN) has proposed NATURA 2000 sites which were nominated to the EU by the BMU in May 2004. The identified sites are administered by the BfN.

Starting in 2002, in order to fulfil the tasks concerning the nomination process of NATURA 2000 sites, the BfN and the BMU launched an extensive research programme comprising over 25 individual projects. These research activities have concentrated on the one hand upon determining the distribution and populations of seabirds, marine mammals and fishes according to the EU

habitats and birds directives. Work has further concentrated on identifying the locations of and demarcating habitat types together with their characteristic sediment structures and biocoenoses. Future tasks will be the set-up of management plans including the development of monitoring plans for the German Exclusive Economic Zone (EEZ).

Dr. Jochen Krause is the leading scientist for this part of SEMIEA. He is especially qualified because of his experience in guiding the research related to the NATURA 2000 network and his responsibility for the development and coordination of nature conservation monitoring programmes in the EEZ of the German North Sea and Baltic Sea.

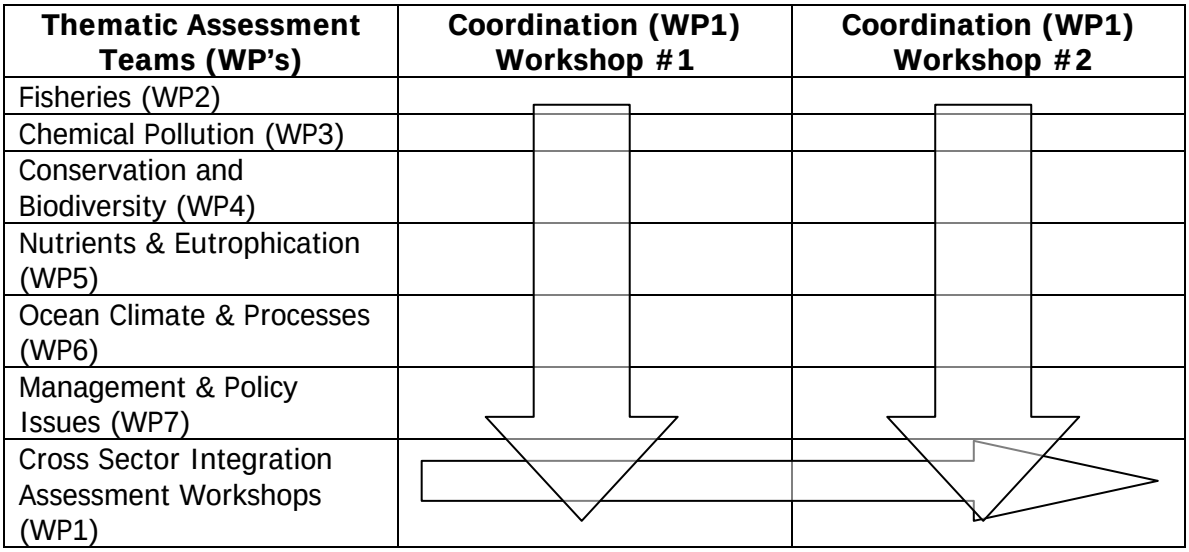
SSA Project Effort Form
Full duration of project
(insert person-months for activities in which partners are involved)

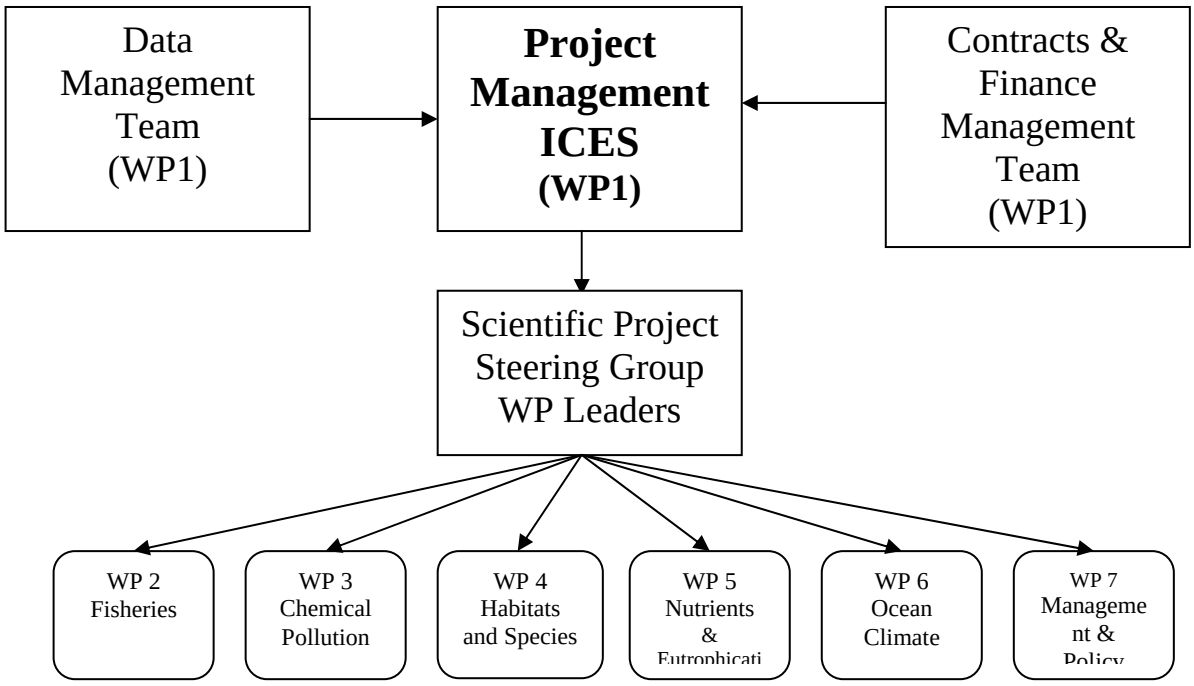
Supporting European Marine Integrated Ecosystem Assessments (SEMIEA)

	ICES	CEFAS	IMR	DIFRES	BfN	TOTAL PARTNERS
Support activities						
Framework website	1					1
Data centre	6					6
Collect data	2	3	4	2	2	13
Modelling		4	3			7
Total Support activities	9	7	7	2	2	27
Management activities						
Coordination	13	2	2	2	2	21
Consulting	2	1	1	2	1	7
Total Management activities	15	3	3	4	3	28
TOTAL ACTIVITIES	24	10	10	6	5	

B.5 Project Management

The emphasis of the management is to make sure the tasks for the assessment are structured in a logical and efficient way, building upon the organisational frameworks already within ICES and member state institutes. This SSA recognises that integrated assessment skills and expertise have evolved over many years both nationally and internationally on a sectoral basis. The project work is accordingly divided in thematic assessment topics each managed by a thematic team leader, which reflects the sectoral specialist expertise, namely; i) fisheries, ii) chemical pollution, iii) habitats and species, iv. nutrients and eutrophication, v. ocean climate and processes, and vi. management & policy issues. The coordination of activities across the themes will be the responsibility of Work Package 1 which will be managed by ICES and the integration of thematic assessments will be undertaken in workshop sessions also delivered by WP 1. Overall project management will therefore be the responsibility of ICES supported by a steering group composed of Work Package leaders (WP's 2 to 7). The emphasis of the SSA is reflected by the level of importance we attach and effort we have assigned to the work activities of WP1, but we also recognise that the credibility of the 'pilot' assessment will depend on the quality and quantity of data thematically assessed by each of the thematic assessment teams "*the quality of data into the assessment will determine the quality of the output of the assessment* ". The management process for this specific action is summarised in Figure 1 with the overall management structure presented in Figure 2:





Each thematic assessment team will collate relevant data and undertake an initial assessment which will feed directly into the cross theme integrated assessment ecosystem workshops (see Work Package Plans, section B.6).

B.6 Workplan

The main goal of the project is to undertake an Integrated Assessment of marine ecosystem data held by national institutes and international organisations to underpin the provision of ecosystem advice provided by ICES to the European Commission, OSPAR and HELCOM. Since much of the data describing the structure and function of marine ecosystems obtained with Government funding is held by marine research institutes one the most effective ways of accessing it is via the network of

scientific working groups within ICES. We have therefore identified a number of working groups which will provide the source data and organized them into assessment themes namely; i. fisheries, ii. chemical pollution, iii. habitats and species, iv. nutrients and eutrophication, v. ocean climate and processes, vi. management and policy issues. The work of the thematic assessment teams will be coordinated by a separate work package to ensure the outputs from each thematic team are effectively integrated into a single assessment.

In the workplan 7 work packages are distinguished:

WP 1: Coordination and the organisation of integrated assessment workshops.
WP 2: Fisheries
WP 3: Chemical pollution
WP 4: Habitats and species
WP 5: Nutrients and eutrophication
WP 6: Ocean climate and processes
WP 7: Management and policy issues

The main tasks of the five participants in the project will be:

ICES	Coordination of thematic assessment teams, organizing the management of data and organizing the integrated assessment workshops (WP1)
CEFAS	Collation and assessment of data from ICES marine fish stock assessment groups and fisheries log book schemes (WP2)
CEFAS	Collation and assessment of data from ICES marine chemistry working groups (WP3)
BfN	Collation and assessment of data from ICES habitat and species working groups (WP4)
IMR	Collation and assessment of data from ICES nutrients and eutrophication working groups (WP5)
IMR	Collation and assessment of data from ICES oceanographic working groups (WP6)
DIFRES	Identification of management and policy issues and objectives (WP7)

Details of the work packages are given in the Work package Descriptions, but summaries are provided below:

Work Package 1 deals with the overall coordination of thematic assessment teams, data management and organizing the integrated assessment workshops. The workshops will take place in 2005 & 2006. This WP will run the duration of the project which will be 15 months from1 July 2005. ICES has already established a Study Group called the Regional Ecosystem Group for the North Sea which will act as the delivery mechanism for WP1 and is composed of the leaders of each of the proposed thematic assessment teams (WP2 – 7).

In Work Package 2 fish stock and fisheries data for the North Sea will be collated and assessed by individuals who participate in the following ICES Scientific Working Groups; Working Group on Ecosystem Impacts of Fishing & Fisheries (WGECO), Working Group on Fisheries Ecology (WGEF). The duration of this Work Package will be 11 months from July 1st 2005

In Work Package 3 marine chemistry data on different matrices (sediment, biota, water) will be collated and assessed by individuals who participate in the following ICES Working Groups, Marine Chemistry (WGMC), Marine Sediments (WGMS) and Biological Effects (WGBEC). The duration of the Work Package will be 11 months from July 1st 2005.

In Work Package 4 data and other sources of information on habitat and species will be collated and assessed by individuals who contribute to the following ICES Working Groups, Benthic Ecology (BEWG), Marine Mammal Ecology (WGMME), Sea Bird Ecology (WGSE), extraction Activities (WGEXT) and non-native species introductions (WGITMO). The duration of the Work Package will be 11 months from July 1st 2005.

In Work Package 5 data on marine nutrients and eutrophication will be collated and assessed by individuals who parctipate in the following ICES Working Groups; Plankton Ecology (WGPE), Hazardous Algal Blooms (WGHAB) and Zooplankton Ecology (WGZE). The duration of the Work Package will be 11 months from July 1st 2005.

In Work Package 6 data on Ocean Climate and Processes will be collated and assessed by individuals who participate in the ICES Working Group on Oceanography and Hydrography (WGOH). The duration of the Work Package will be 11 months from July 1st 2005.

In Work Package 7 data on marine management and policy issues will be collated and assessed by individuals who participate in the ICES Advisory Committees, namely the Advisory Committee on Fisheries Management (ACFM), the Advisory Committee Marine Environment (ACME) and the Advisory Committee on Ecosystems (ACE). The duration of the Work Package will be 15 months from July 1st 2005.

Duration and timing of Work Package activities

	Work package	Partner	Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
WP 1	Coordination	1, 2, 3, 4, 5	22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WP 2	Fisheries	1, 2, 4, 5	15	X	X	X	X	X	X	X	X	X	X	X				X
WP 3	Chemical pollution	1, 2, 4, 5	11	X	X	X	X	X	X	X	X	X	X	X				X
WP 4	Habitat & species	1, 2, 3, 4	11	X	X	X	X	X	X	X	X	X	X	X				X
WP 5	Nutrients & eutrophication	1, 2, 4	10	X	X	X	X	X	X	X	X	X	X	X				X
WP 6	Ocean processes	1, 2, 4	11	X	X	X	X	X	X	X	X	X	X	X				X
WP 7	Policy issues	1, 2, 3, 4, 5	15			X								X	X	X	X	X

Workpackage list (full duration of project)

Work-package No[1]	Workpackage title	Lead contractor No[2]	Person-months[3]	Start month[4]	End month[5]	Deliverable No[6]
1	Coordination	1	20	0	15	1, 2, 3, 10
2	Fisheries	2	5	0	11	4, 5
3	Chemical pollution	2	5	0	11	4, 6
4	Habitat and species	3	5	0	11	4, 7
5	Nutrients and eutrophication	4	4	0	11	4, 8
6	Ocean processes	4	40	0	11	4, 9
7	Management and policy issues	5	6	0	15	4, 11
	TOTAL		49			

[1] Work package number: WP 1 – WP n.
[2] Number of the contractor leading the work in this work package.
[3] The total number of person-months allocated to each work package.
[4] Relative start date for the work in the specific work packages, month 0 marking the start of the project, and all other start dates being relative to this start date.
[5] Relative end date, month 0 marking the start of the project, and all ends dates being relative to this start date.
[6] Deliverable number: Number for the deliverable(s)/result(s) mentioned in the work package: D1 - Dn.

Deliverables list (full duration of project)

Deliverable No[7]	Deliverable title	Delivery date [8]	Nature [9]	Dissemination level [10]
1	Technical guidance on method for integrated assessment	5	R	PU
2	Website	5	O	PU
3	Internet Database	11	O	PP
	All data from the thematic assessment teams to be submitted to the ICES DOME database	11	O	PP
4	Integrated assessment of fishing & fisheries data	11	R	PU
5	Integrated assessment of marine chemistry data	11	R	PU
6	Integrated assessment of habitat & species data	11	R	PU
7	Integrated assessment of nutrients & eutrophication data	11	R	PU
8	Integrated assessment of oceanographic data	11	R	PU
9	Integrated ecosystem assessment of North Sea	15	R	PU
10	Integrated assessment of management & policy data	15	R	PU

[7] Deliverable numbers in order of delivery dates: D1 – Dn

[8] Month in which the deliverables will be available. Month 0 marking the start of the project, and all delivery dates being relative to this start date.

[9] Please indicate the nature of the deliverable using one of the following codes:

R = Report
P = Prototype
D = Demonstrator
O = Other

[10] Please indicate the dissemination level using one of the following codes:

PU = Public
PP = Restricted to other programme participants (including the Commission Services).
RE = Restricted to a group specified by the consortium (including the Commission Services).
CO = Confidential, only for members of the consortium (including the Commission Services).

Coordination and Management (full duration of project)

Workpackage number	1	**Start date or starting event:**			1st July 2004		
Participant id		ICES	CEFAS	IMR	BFA	DIFRES	
Person-months / participant:		12	2	2	2	2	

Objectives

Cross Thematic Assessment Team (TAT) integration will be the primary objective of WP1. This will be delivered by ensuring that the activities of the each TAT are coordinated.

In addition, the data and assessment outputs need to be stored and made accessible, this will be the responsibility of ICES through its data management centre through the DOME database. ICES will also establish a website which will facilitate the transfer of data files between each of the TATs.

Planning and organizing the integrated assessment workshops will also be an objective of WP1

Description of work

The leaders from each of the Thematic Assessment Teams (see additional WP descriptions) will contribute to WP1 to ensure that the outputs from each TAT are coordinated and harmonized, this is particularly relevant in the case of dealing with differences in spatial and temporal scales associated with each of the data sets and technical guidance on this issue will be provided by WP1. To achieve the required level of coordination on this WP we will establish a steering group which will meet regularly (every 2 months) during the first 11 months and then once during the following 4 months comprising all WP leaders.

The initial steering group meeting will identify an ideal list of ecosystem parameters to be included in an integrated assessment to act as a guide to the Thematic Assessment Teams (TAT) to concentrate on relevant parameters describing both function and structure of ecosystems. An assessment will then be made with input from TATs on significant gaps in parameters required. The choice of the North Sea as a pilot study is important in this respect as data holdings for the North Sea are arguably greater than any other European regional sea. So establishing technical methods for integrated ecosystem assessment are most likely to be achieved by concentrating efforts on the North Sea in the first instance.

The ICES data management centre will provide the expertise required to ensure the data are stored and managed in an efficient and accessible way. This will include adding the data to the ICES DOME database and creating a web page that will enable data files and other sources of information to be effectively exchanged between TATs and provide the common format for application of numerical statistical techniques to be applied during the integrated assessment workshops.

The integrated assessment will be undertaken during a series of workshops, this will ensure that those who are contributing to the assessment indirectly via the relevant ICES Working Group activities (see additional WP descriptions) can contribute and therefore add value to this Specific Support Action through the existing ICES activities. Organising the workshop will be the responsibility of the steering group with the necessary administrative and management support provided by ICES.

The first workshop is planned in September 2005 and will be held in conjunction with the ICES Annual Science Conference to be held in Aberdeen, Scotland. It will have the objective of reviewing the available sources of data provided by the TATs, reviewing existing (tried and tested) integrated assessment methods drawing on the Canadian Eastern Scotian Shelf and American Gulf of Maine assessments, and finally identifying and resolving differences in spatial and temporal scales in the data provided. The statistical and numerical approach for undertaking an Integrated Assessment (IA) will be defined will special consideration given to the generic applicability of such techniques, particularly in relation to their application for other regional seas within the EU. Any issues which emerge from this workshop will be addressed in the period running up to the 2nd workshop planned in May 2006.

The second workshop will undertake the IA of the North Sea using the statistical approach and data defined previously from the 1st workshop.

Presentation of the of the outputs will be made at the ICES Annual Science Conference in September 2006 as part of a Theme Session being planned by ICES on Integrated Assessments and their contribution to the provision of ecosystem advice.

Deliverables

Specific guidance will be given on the issues and technical approaches required (namely the numerical and statistical methods) to undertake an IA at an operational level. The techniques to be identified and applied will be based upon the North Sea, but differences in scaling of data (in both space & time), quality control issues, and types of measurement undertaken for each EU regional sea (Baltic, Mediterranean, Black Sea) will be assessed and included in the guidance to ensure (as far as possible) that the methods developed for the North Sea are transferable to the other sea regions. In essence the techniques will be generic.

An Integrated Assessment of the North Sea will be undertaken covering the period 1982 to 2004, a report will be provided in addition to a presentation at the ICES ASC in 2006.

An internet accessible database.

An integrated assessment website for the North Sea.

Milestones[11] and expected result

1. 1st steering group meeting – define set of ecosystem parameters
2. 1st workshop – define technical methods, resolve issues of scale, identify data gaps (uncertainty) across all TATs
3. Establish database
4. Establish website
5. 2nd workshop – undertake integrated ecosystem assessment of the North Sea
6. Final TAT reports and overall integrated ecosystem assessment report for the North Sea
7. Presentation of integrated ecosystem assessment results at ICES ASC in 2006

[11] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Fisheries (12 months duration)

Workpackage number	2	**Start date or starting event:**			1st July 20050		
Participant id		CEFAS	IMR	DIFRES	ICES		
Person-months / participant:		2	1	1	1		

Objectives

Data on fish individual abundance at length, weight at length, age at length and maturity at length, for fish species (both commercial and non-commercial), discards data for all gear types and all fleets, effort data for all gear types and all fleets based on logbook data, will be collated and assessed.

Description of work

The thematic assessment team will draw upon the work activities of the following ICES Working Groups; Working Group on Ecosystem Impacts of Fishing & Fisheries (WGECO), Working Group on Fisheries Ecology (WGEF). These working groups have access to the relevant ICES data from the stock assessment programmes and fishing fleet activities. The duration of this Work Package will be 12 months from July 1st. The data will be collated and assessed at the scale of the ICES rectangle across the North Sea area in preparation for the Integrated Assessment workshop in May 2005. This data should cover the period, where possible, 1984 -2004 to assess trends.

Deliverables

Provision of data at the scale of ICES rectangle for the North Sea to the ICES DOME database.

An assessment of the data using recognised statistical techniques to observe any multivariate spatial or temporal trends in the data will be reported. This will also be used to guide the fisheries contribution to the Integrated Assessment workshops in 2005 and 2006.

Milestones[12] and expected result

1. 1st workshop comparison of available data with list of ideal parameters
2. 2nd workshop- Integrated assessment of fisheries and fish stock data.
3. Presentation of results at ICES ASC in 2006

[12] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Chemical Pollution (12 months duration)

Workpackage number	3	**Start date or starting event:**			1st July 2005		
Participant id		CEFAS	IMR	DIFRES	ICES		
Person-months / participant:		2	1	1	1		

Objectives

To compile & assess data on marine chemistry for the North Sea by ICES rectangle for the time period 1984 to 2004.

Description of work

The data sources and availability of data will be fully assessed in December 2004 by OSPAR MON. The output and findings from this group will feed directly into this WP which will collate and assess the data using recognised statistical techniques. The assessment will draw upon the expertise present within the ICES Working Groups on Marine Sediments (WGMS), Marine Chemistry (WGMC) and Biological Effects (WGBEC).

Deliverables

Provision of data at the scale of ICES rectangle for the North Sea to the ICES DOME database.

An assessment of the data using recognised statistical techniques to observe any multivariate spatial or temporal trends in the data will be reported. This will also be used to guide the chemical pollution contribution to the Integrated Assessment workshops in 2005 and 2006.

Milestones[13] and expected result

4. 1st workshop comparison of available data with list of ideal parameters
5. 2nd workshop- Integrated assessment of marine chemistry data.
6. Presentation of results at ICES ASC in 2006

[13] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Habitat and Species (12 months duration)

Workpackage number	4	**Start date or starting event:**			1st July 20050		
Participant id		BfN	CEFAS	IMR	ICES		
Person-months / participant:		2	1	1	1		

Objectives

To compile & assess data on marine habitats and species for the North Sea by ICES rectangle for the time period 1984 to 2004.

Description of work

Expertise within the ICES Working Groups of Benthic Ecology (BEWG), Marine Mammal Ecology (WGMME), Seabird Ecology (WGSE), Extraction Activities (WGEXT) and non-native species introduction (WGITMO).

Data will be prepared which quantifies the distribution and densities of sea birds with variation in this by season at the scale of the ICES rectangle across the North Sea area. This data should cover the period, where possible, 1984 -2004 to assess trends. Also where possible, data will be collated on diet and variation of this for all species described. In addition, data on macrobenthic invertebrate abundance and biomass per species will be collated at the same scale of ICES rectangle and for the same period. Where individual species biomass or abundance data are not available total abundance and biomass at the level of the community will be provided. This is in reference to both infaunal and epifaunal communities and meiofaunal communities. Where possible data will be compiled over longer time periods to reflect trends. Data will also be provided on sediment characteristics of the relevant sampled stations where available. Habitat mapping data at EUNIS level 4 or above will also be collated and again presented at the scale of the ICES rectangle across the North Sea area. Data will also be prepared which quantifies the distribution and densities of sea mammals with variation in this by season at the scale of the ICES rectangle across the North Sea area. This data should, where possible, be for the period 1984 -2004 to assess trends. Also where possible, provide information on diet and variation of this for all species described. Data which quantifies the distribution and densities of non-native species introductions will also be collated where available.

Deliverables

Provision of data at the scale of ICES rectangle for the North Sea to the ICES DOME database.

An assessment of the data using recognised statistical techniques to observe any multivariate spatial or temporal trends in the data will be reported. This will also be

used to guide the habitats and species contribution to the Integrated Assessment workshops in 2005 and 2006.

Milestones[14] and expected result

7. 1st workshop comparison of available data with list of ideal parameters
8. 2nd workshop- Integrated assessment of habitat and species data.
9. Presentation of results at ICES ASC in 2006

[14] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Nutrients & Eutrophication (12 months duration)

Workpackage number	5	**Start date or starting event:**			1st July 2005		
Participant id		IMR	CEFAS	ICES			
Person-months / participant:		2	1	1			

Objectives

To compile & assess data on marine nutrient concentrations and eutrophication effects for the North Sea by ICES rectangle for the time period 1984 to 2004.

Description of work

Expertise will be provided by the following ICES Working Groups, Plankton Ecology (WGPE), Hazardous Algal Blooms (WGHAB) and Zooplankton Ecology (WGZE)

Summarise status and trends of phytoplankton, zooplankton and harmful algal bloom communities in the North Sea (biomass, species and size composition, spatial distribution) for the period 1984–2004, and any trends over recent decades in these communities; for input to the planned integrated assessment workshop in 2005. Comparison of geographic and seasonal patterns across the range of plankton monitoring sites by ICES rectangle with emphasis on key species will be undertaken.

Deliverables

Provision of data at the scale of ICES rectangle for the North Sea to the ICES DOME database.

An assessment of the data using recognised statistical techniques to observe any multivariate spatial or temporal trends in the data will be reported. This will also be used to guide the nutrients and eutrophication contribution to the Integrated Assessment workshops in 2005 and 2006.

Milestones[15] and expected result

10. 1st workshop comparison of available data with list of ideal parameters
11. 2nd workshop- Integrated assessment of nutrients and eutrophication data.
12. Presentation of results at ICES ASC in 2006

Ocean Processes (12 months duration)

Workpackage number	6	**Start date or starting event:**			1st July 2005		
Participant id		IMR	CEFAS	ICES			
Person-months / participant:		2	1	1			

Objectives

To compile & assess data on marine ocean climate processes for the North Sea by ICES rectangle for the time period 1984 to 2004.

Description of work

Expertise will be provided by individuals of the ICES Working Group on Oceanography and Hydrography (WGOH) which will provide summary datasets on the pelagic physical properties of the North Sea (to include salinity, temperature, tidal vectors, peak surface, mid and bottom currents, maximum annual and 50 year significant wave heights). The data should be time averaged (annual averages and annual peaks) for the period 1984 to 2004 and spatially averaged at the scale of ICES rectangles. The data should be submitted to the project website in preparation for the integrated assessment in 2005.

Deliverables

Provision of data at the scale of ICES rectangle for the North Sea to the ICES DOME database.

An assessment of the data using recognised statistical techniques to observe any multivariate spatial or temporal trends in the data will be reported. This will also be used to guide the ocean processes contribution to the Integrated Assessment workshops in 2005 and 2006.

[15] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Milestones[16] and expected result

13. 1st workshop comparison of available data with list of ideal parameters
14. 2nd workshop- Integrated assessment of ocean processes data.
15. Presentation of results at ICES ASC in 2006

[16] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Management and Policy Issues (12 months duration)

Workpackage number	7	**Start date or starting event:**				1st July 2005	
Participant id		DIFRES	CEFAS	ICES	BfN	IMR	
Person-months / participant:		2	1	1	1	1	

Objectives

To compile & assess the influence of setting management and policy objectives on the Integrated Assessment of the North Sea by ICES rectangle for the time period 1984 to 2004.

Description of work

Expertise will be provided by individuals of the ICES advisory committees, namely; the Advisory Committee on Fisheries Management (ACFM), the Advisory Committee Marine Environment (ACME) and the Advisory Committee on Ecosystems (ACE).

The relationship between policy decisions and management practice will be explored and assessed in relation to the observed changes in the ecosystem state of the North Sea for the period 1984 to 2004. In addition the relationship between observed state changes and management actions will be considered with the aim of determining effectiveness of past and more recent policy decisions and management actions.

Deliverables

Compilation of the policy decisions and management actions over the specified period will be reviewed and reported.

Links with the advisory process within ICES and relevant to the EU will be assessed as part of the Integrated assessment, but special reference will be given to understand how they can influence the nature of the assessment and in turn how the results of the assessment influence advice and policy. This will be the subject of a separate report and presentation at the ICES ASC in 2006.

Milestones[17] and expected result

16. 1st workshop comparison of available data with list of ideal parameters
17. 2nd workshop- Integrated assessment management and policy issues data.
18. Presentation of results at ICES ASC in 2006

B.7 Other issues

There are no ethical concerns for this project.

[17] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.