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REPORT OF THE ICES-EUROGOOS PLANNING GROUP ON THE NORTH SEA PILOT PROJECT NORSEPP (PGNSP)

11–13 APRIL 2005

BRUSSELS, BELGIUM



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

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1 Executive summary

There had been limited intersessional work but members provided updated information on NORSEPP relevant activities and products, including a modelled 50-years time-series (1955–2004) of modelled water fluxes in the North Sea.

NORSEPP agreed to start producing quarterly update reports on the conditions of the North Sea with emphasis on physical conditions and drivers. An attempt will be made to include hydrographic data from the IBTS survey this year in the update report for the 1st quarter (January–March). Information related to the seasonal development of phytoplankton will be included in the report for the second quarter. The ICES co-Chair (Hein Rune Skjoldal, IMR) agreed to be editor for the first quarterly update reports for 2005. A process will be initiated to develop practical working relationships between NORSEPP and the various groups in ICES that support the provision of ICES Advice on Fishery Management.

NORSEPP will contribute to the 2006 North Sea Assessment by REGNS by contributing time-series of model data (e.g., on water fluxes) and selected model data for recent years with high spatial and temporal resolution. NORSEPP will be represented at the REGNS meeting 9–13 May 2005.

2 The meeting

The ICES/EuroGOOS Planning Group for the North Sea Pilot Project (PGNSP – NORSEPP) met at MUMM (Management Unit of the North Sea Mathematical Models) in Brussel, 11-13 April 2005. The meeting was opened at 1430 on 11 April and closed at 1300 on 13 April and was jointly chaired by the EuroGOOS co-Chair Martin Holt and the ICES co-Chair Hein Rune Skjoldal.

The agenda for the meeting was structured according to the given Terms of Reference for the meeting (Annex 2). The meeting was attended by 8 members from 5 different countries (Belgium, Germany, Norway, Sweden, and the UK). The list of participants is included as Annex 1.

3 Terms of Reference

3.1 ToR a) Produce a summary product from NORSEPP operational deliverables.

NORSEPP last year (2004) agreed a general format of NORSEPP products as a combination of observations and validated model out-put data. Several specific products such as modelled seabed temperatures and salinities in February and modelled oxygen minimum concentrations in autumn were identified as potential products from NORSEPP. Some intersessional work were carried out comparing model data with observations, but limited work had been carried out producing operational deliverables prior to this year's NORSEPP meeting.

NORSEPP members presented updates and examples of operational activities and products from their home institutions. Stephan Dick presented activities of NOOS and BSH in Germany on validation of output from an operational model (BSHcmod) and development of an operational ecosystem model based on (ECOHAM2). Genevieve Lacroix and Kevin Ruddick presented together with other colleagues (Jose Ozer, Angelino Meerhaughe) ongoing work at MUMM, including Internet-accessible database, operational oceanographic modelling and remote sensing. Hein Rune Skjoldal and Are Salthaug from IMR presented time series (1955–2004) of modelled fluxes across

sections from NORWECOM and how these fluxes correlated with recruitment variability of North Sea fish stocks. Martin Holt presented an update on UK Met Office activities including development of an operational nowcast ecosystem model for the NW European shelf seas based on POLCOMS-ERSEM. Liam Fernand from CEFAS described oceanographic work on nutrient transport and phytoplankton production in the North Sea. Summaries of these presentations are given below, with some NORSEPP product contributions presented in Annex 3.

A proposal was made and NORSEPP agreed to follow two lines of actions:

- i) Produce quarterly updates of physical drivers and oceanographic conditions in the North Sea based on data and model results.
- ii) Build-up time series of validated model data based on hindcast runs with meteorological forcing from archived data.

NORSEPP aims at producing updates on the conditions in the North Sea for the first, second, third, and fourth quarters of 2005. These updates will build upon the 2004 ICES Ocean Climate Status Report and include updated information on:

- air pressure over North Atlantic and Europe;
- wind conditions in northern and southern North Sea;
- modelled flux of water across the northern boundary and the Channel;
- information on distributions and properties of water masses;
- information related to phytoplankton production.

The report for the first quarter will include hydrographic data from the IBTS survey in February 2005. IMR will work with IBTS partner institutions and the ICES secretariat to compile and present the IBTS hydrographic data from the cruises in February this year and to make them available for model evaluations and comparison with other data (e.g. on fish stocks). ICES holds a time-series of IBTS first quarter data up to and including 2003. NORSEPP will contribute to updating of this time-series including 2005.

The models used at IMR (NORWECOM) and MUMM (North Sea Continental Shelf 2D model) will be run to provide updated information of fluxes across the northern boundary to the North Sea and through the Channel. NORWECOM has already been run with the meteorological forcing for January–March with an estimated flux of 2.26 Sv ($1 \text{ Sverdrup} = 10^6 \text{ m}^3 \text{ s}^{-1}$).

Several models will be used to generate information on distribution of water masses and water mass properties (temperature and salinity). This will include modelled data for February for comparison with and extension of the information from the IBTS survey data. These models will include the operational models run at the UK Met Office and BSH in addition to NORWECOM and the MUMM model (OPTOS-NOS).

Note that, as recorded by PGNSP 2004, generation of this product will require timely access to the IBTS observations of temperature and salinity. Liam Fernand CEFAS undertook to explore access to the 2005Q1 IBTS CTD profiles with the originating national agencies.

The NORSEPP update report for the second quarter will include information on spring and early summer development of phytoplankton growth. This will be based on information from observations, remote sensing and model data from MUMM, IMR and the UK Met Office. An attempt will be made to include hydrographic data from the coordinated herring survey in July in the third quarter update report, in addition to model data on distribution and properties of water masses.

The report for the third quarter will include information on autumn oxygen minima from observations and modelled data. An attempt will be made to include the hydrographic data from the third quarter IBTS surveys.

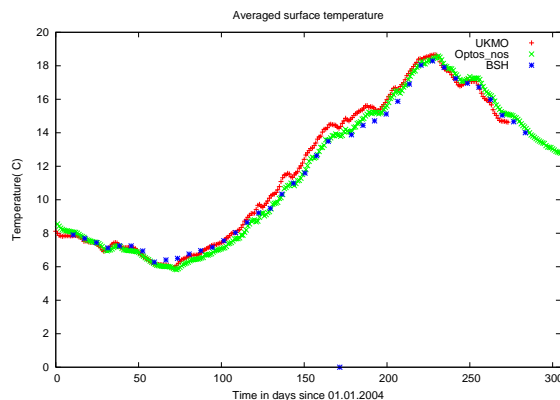
The quarterly reports will be produced as electronic documents. They will be made available either directly or through links from the home pages of ICES, EuroGOOS, NOOS and possibly national agencies of NORSEPP members. Hein Rune Skjoldal (IMR, ICES co-Chair) agreed to be the editor of the first set of NORSEPP quarterly update reports for 2005.

The quarterly update reports will be synthesised into a description of the conditions in the North Sea in 2005 as a consolidated input from NORSEPP to the ICES Ocean Climate Status Report for 2005.

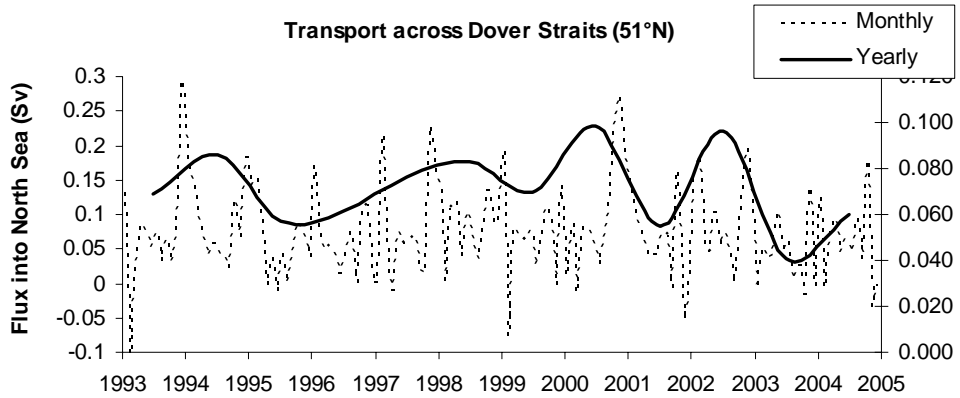
3.1.1 Contribution from MUMM

Various “products” presented during the workshop, are ready for NORSEPP, e.g.:

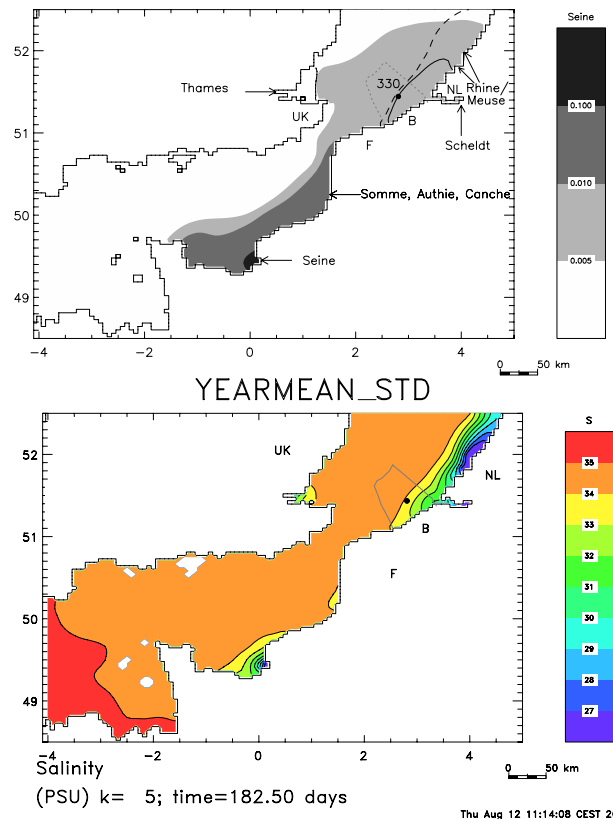
- Data from the Belgian Marine Data Centre (BMDC) for model validation. A demonstration of data extraction and visualization has been presented during the workshop. The access to the BMDC database is free from <http://www.mumm.ac.be/datacentre/>. A login and password can be obtained on request.
- Currents, temperature from OPTOS-NOS model. OPTOS-NOS is the operational version of COHERENS model applied to the North Sea (48.5°N–57°N, 5'x2.5' horizontal resolution, 20 sigma vertical layers) forced by UK Met Office meteorological conditions. This model is embedded in a 2D Continental Shelf Model that gives the boundary conditions (sea level, current). Forecasts for currents, sea-level and tides are available on www.mumm.ac.be. Temperature is a new product for which the validation gives good accuracy between results and observations. Forecast and recent hindcast are available. The figure below shows the averaged surface temperature for 2004, over the whole domain, obtained with OPTOS-NOS model (green) and a comparison with Met Office model results (red) and BSH data (blue).



- Transport into North Sea from North Sea Continental Shelf model (2D). The figure below shows an example of the transport across Dover Straits (51°N).



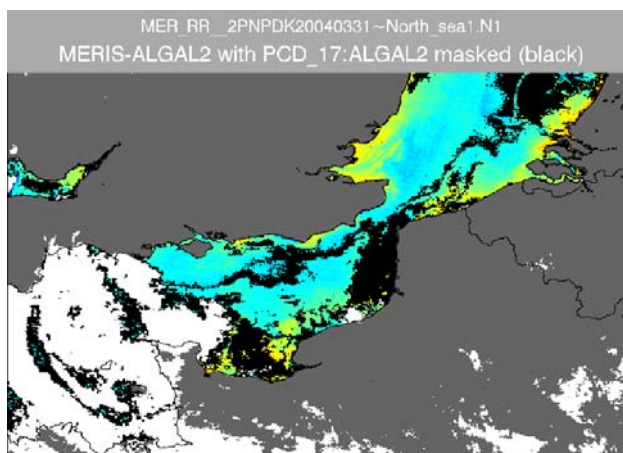
- Salinity, temperature, water mass contributions (Channel, different rivers) from MIRO&CO-3D. MIRO&CO-3D results from the coupling between COHERENS model and MIRO ecosystem model (Lancelot et al., 2005) and is applied to the Channel and southern North Sea (48.5°N–52.5°N) (Lacroix et al., 2004a, 2004b). Hindcast (1991–2003) are available. The 2 examples below show a map of the 1993–2003 average surface salinity and river 1% contribution (Rhine: dots, Scheldt: line, Seine: mid-grey). Nutrients, chlorophyll and other ecosystem-related products will be available after the validation (in progress).



References

- Lacroix G., Ruddick K., Ozer J. and Lancelot C. Modelling the impact of the Scheldt and Rhine/Meuse plumes on the salinity distribution in Belgian waters (Southern North Sea). 2004. *Journal of Sea Research*, 52: 149-163. doi: 10/1016/j.seares.2004.01.003.
- Lacroix G., Lancelot C., Ruddick K., Spitz Y., Gypens N. 2004. Modelling the relative impact of the rivers Scheldt, Rhine, Meuse and Seine on the availability of nutrients in Belgian waters (Southern North Sea) using the 3D coupled physical-biological model MIRO&CO-3D. Proceedings of the ICES Annual Sciences Conference (ASC), 22–25 September 2004, Vigo. 16p.
- Lancelot C, Spitz Y, Gypens N, Ruddick K, Becquevort S, Rousseau V, Lacroix G, Billen G. 2004. Modelling diatom-Phaeocystis blooms and nutrient cycles in the Southern Bight of the North Sea: the MIRO model. *Mar. Ecol. Progr. Ser.* 289: 63–78.

Chlorophyll satellite images. An assessment of satellite-derived chlorophyll imagery for use in model validation has been presented. Satellite imagery is a powerful data source for model validation. There is plenty of SeaWiFS CHL imagery since 1997 but most is unusable in coastal waters. MERIS CHL imagery (since June 2002) is much better for coastal waters though problems remain with atmospheric correction. The map below shows the surface chlorophyll concentration obtained from MERIS after a quality control (31/03/2004, processing Y. Park).

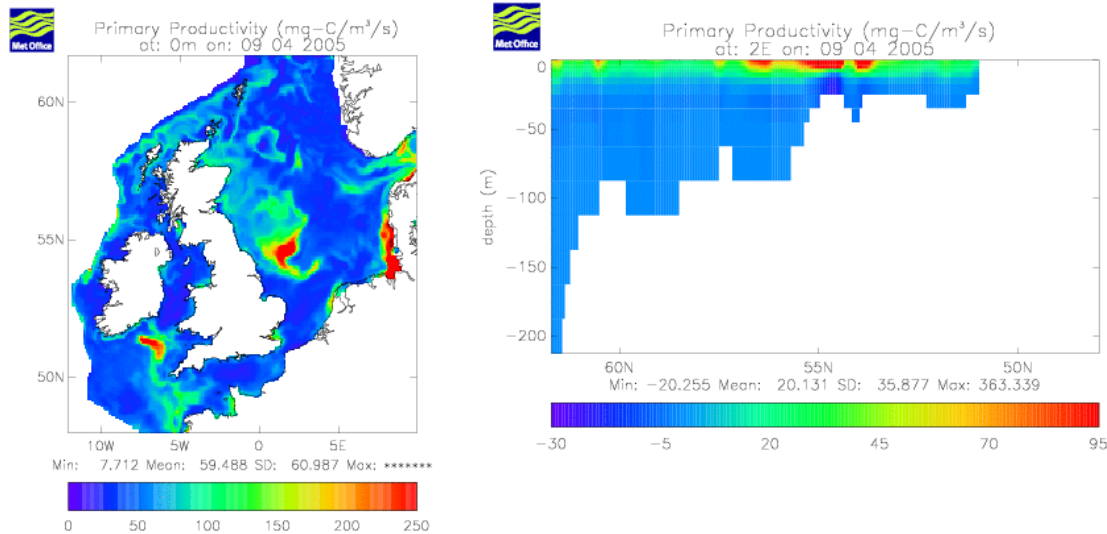


A future research axis, larvae transport modelling, should be developed in the future to assess "climatic effect" on fisheries.

3.1.2 Contribution from Met Office

The Met Office modelling system for the NW European shelf seas was described in the report of PGNP2004. The 12 km “Atlantic Margin” configuration of POLCOMS will continue to provide the data to NORSEPP. However, future data, including summaries of chlorophyll, zoo and phytoplankton, primary productivity etc. in addition to the physical properties, could be provided from the 6km POLCOMS-ERSEM medium resolution continental shelf (MRCS) model. Further information on MRCS nowcast and recent hindcast modelling is available from <http://www.metoffice.gov.uk/research/ncof/mrcs/index.html>.

The two example figures below show a plan view and a cross section through the North Sea, of modelled primary productivity on 9 April 2005.



3.1.3 Contribution from BSH

The Federal Maritime and Hydrographic Agency (BSH) operates a model system which consists of hydrodynamic numerical models for the North Sea and the Baltic (circulation model) and models to compute the drift and dispersion of substances (dispersion models). In daily routine runs, predictions for up to 84 hours are computed on the basis of meteorological and wave forecasts supplied by the German Weather Service. The dispersion models are used for water quality studies, to support search and rescue operations and to assist the coast guard in cases of marine environmental pollution.

The circulation model predicts currents, water levels, water temperatures, salinity, and ice cover in the North Sea and Baltic Sea on two nested and interactively coupled grids. Grid spacing in the German Bight and western Baltic Sea is 1 nautical mile and 6 n.m. in the other North and Baltic Sea areas. The model is three-dimensional and takes into account meteorological conditions in the North Sea and Baltic Sea area, tides and external surges entering the North Sea from the Atlantic as well as river runoff from the major rivers. The model is validated on a regular basis as model forecasts are important tools in different BSH services. The accuracy is checked using measured water levels or data of the German Marine Environmental Monitoring Network (MARNET). Figure A shows a comparison of measured and predicted bottom temperatures at the MARNET station 'German Bight'.

Figure B shows monthly mean bottom temperatures which had been calculated for February 2003, 2004 and 2005 from daily forecasts of the BSH circulation model. Computed monthly mean bottom salinities in February 2001, 2004 and 2005 are presented in Figure C. For several transects in the North Sea daily, monthly and annual mean net water transports had been computed. Figure D shows BSH model results for the Dover strait in the period 2001 to 2004.

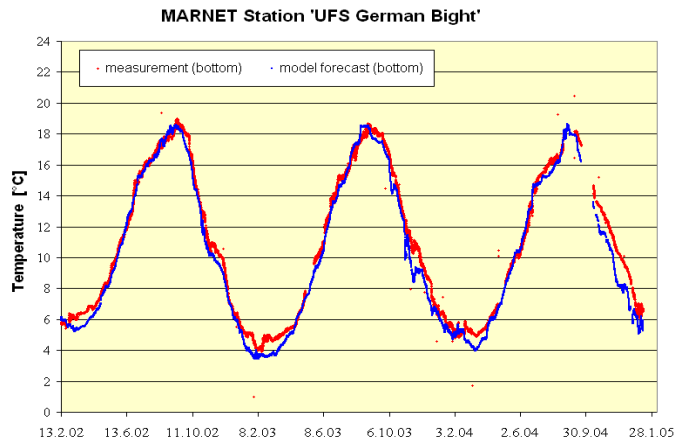


Figure A: Measured and predicted bottom temperatures at MARNET station 'German Bight'

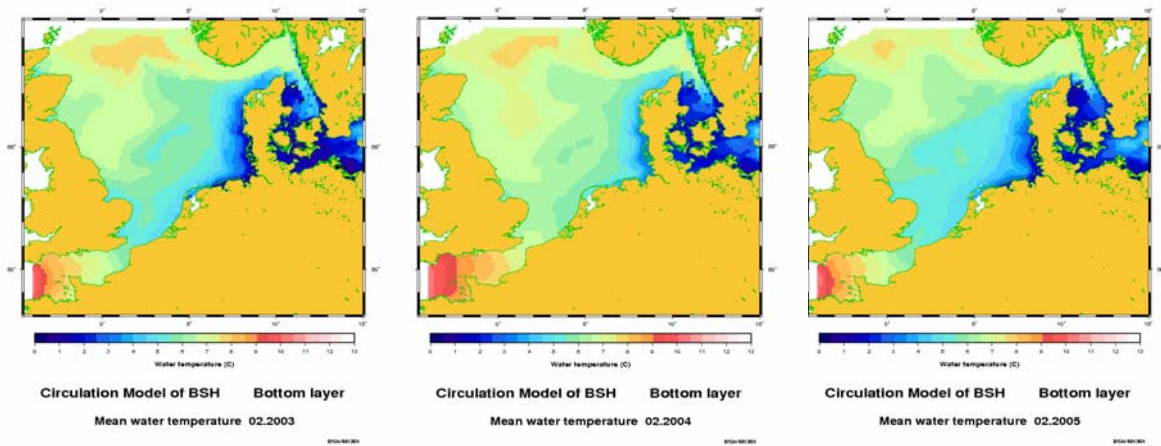


Figure B: Computed monthly mean bottom temperatures in February 2003, 2004 and 2005.

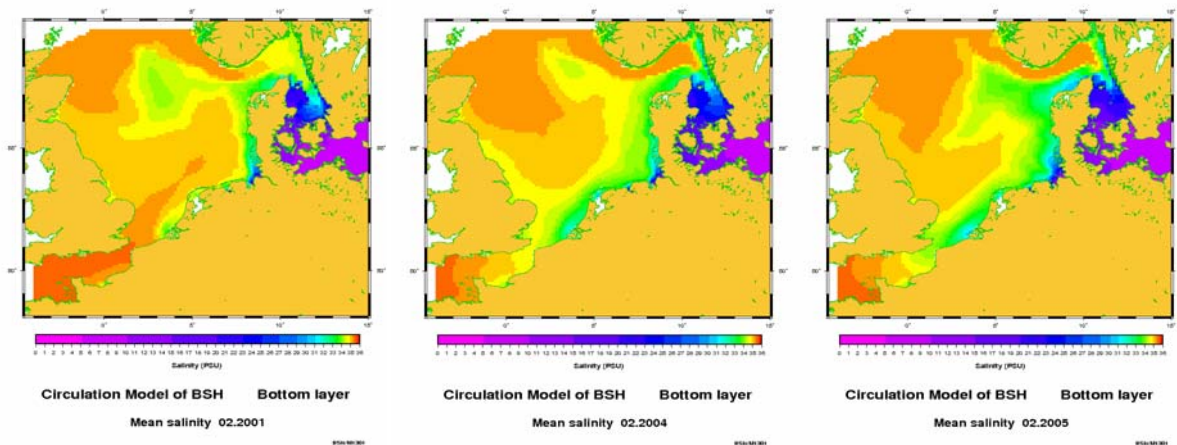


Figure C: Computed monthly mean bottom salinities in February 2001, 2004 and 2005.

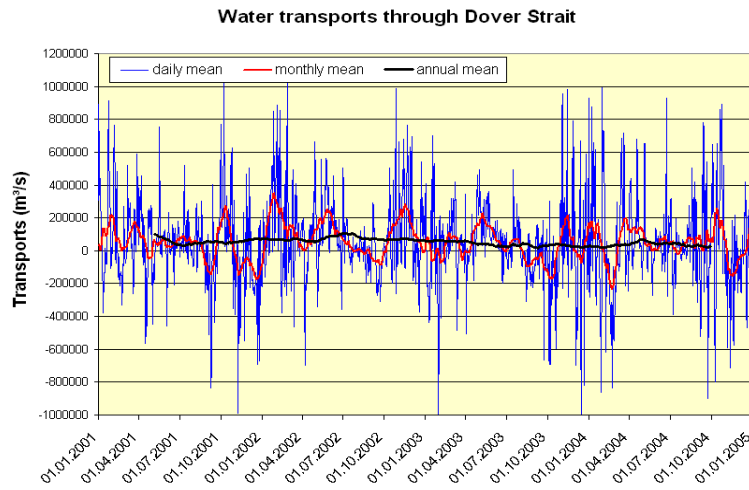


Figure D: Computed water transports through Dover Strait for 2001–2004.

3.1.4 Contribution from IMR

Hein Rune Skjoldal considered the conceptual framework for linking oceanography and fish stock dynamics. He noted that fish stocks are dynamic entities that live in a dynamic and shifting physical environment. Fish stocks have a geographical closure of their life cycles, where passive drift of spawned eggs and larvae from spawning to nursery areas and active feeding and spawning migrations are elements of their life cycles. The geographical closure is in relation to currents and circulation features to which the fish stocks are evolutionary and ecologically adapted. The fish stocks respond to changes and variability in currents and circulation patterns by changes in recruitment, stock size and distribution. Descriptions of currents and circulation are therefore relevant information for interpreting the natural dynamics of fish stocks.

Time series of modelled fluxes across the northern boundary to the North Sea, through the Channel, and between different parts of the North Sea have been generated by using the 3-D NORWECOM circulation model (Morten Skogen, IMR). These time series span the interval from 1955 to 2004 and have been generated by using archived meteorological data for this period. Time series of modelled fluxes generated by NORWECOM have previously been used in the OSPAR 2000 QSR for the North Sea and in a paper by Reid *et al.* (2003). It was suggested to use these time series of North Sea water fluxes to examine relationships between physical forcing and responses in North Sea fish stocks. Figure X presents an example of modelled mean monthly fluxes for February across the western and central parts of the transect between Hanstholm and Aberdeen (AbHa), across transects running from the Dutch coast to the eastern Dogger Bank (Dutch_north) and continuing from this point to the AbHa transect (Dogger_north), and through the Channel (EngCh).

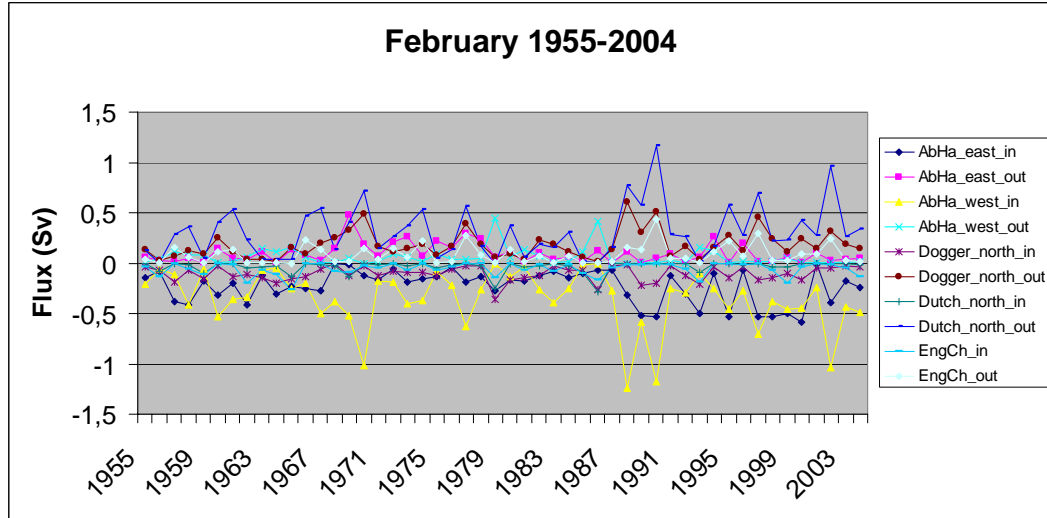


Figure X. Time series of modelled fluxes of water across sections in the central and southern North Sea generated by the NORWECOM model (Morten Skogen, IMR). “In” denotes southerly or westerly fluxes, while “out” denotes northerly or easterly fluxes.

Are Salthaug presented time series of recruitment to North Sea fish stocks based on ICES assessments and IBTS surveys. A preliminary examination of these time series in relation to the modelled flux time series revealed several correlations that indicate that the fish stocks are responding to changes in the circulation. An example is shown in Figure Y where the strength of sandeel year classes are plotted along with the modelled February flux across the middle part of the Aberdeen-Hansthalm section (northern flux component). There is a close correspondence in the temporal patterns, indicating that the circulation in this area (which is close to the main spawning areas of sandeel) has an influence on the survival of sandeel larvae and recruits.

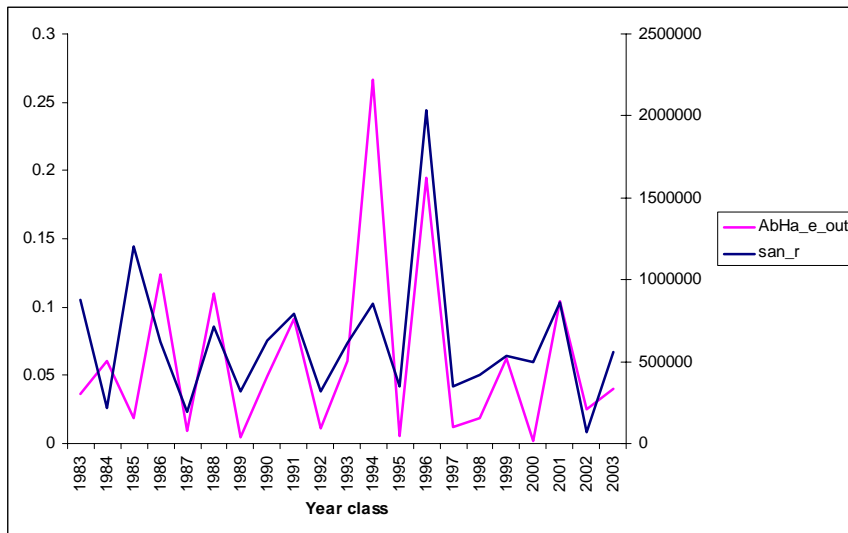


Figure Y. Time series 1983-2003 for sandeel recruitment (yearclass strength from ICES assessment) and NORWECOM modelled northwards flux of water through the mid part of the Aberdeen-Hansthalm section.

Reid, P.C., Edwards, M., Beaugrand, G., Skogen, M. and Stevens, D. 2003. Periodic changes in the zooplankton of the North Sea during the twentieth century linked to oceanic inflow. *Fisheries Oceanography* 12(4/5): 260-269).

3.2 ToR b) Submit a Strategic Support Activity to Framework 6 for NORSEPP support including a full time coordinator

This action was not addressed intersessionally. Although an SSA was submitted, it was prepared by ICES members on behalf of REGNS and although the physical ocean climate formed one of the five modules, the SSA did not address the particular NORSEPP requirements discussed during PGNSP in 2004. This SSA was not successful.

3.3 ToR c) Plan how to disseminate the NORSEPP operational deliverables and information to the ICES community

NORSEPP belongs to the Oceanography Committee and will report by 1 May for the attention of this committee as well as the Living Resources, the Resource Management, the Marine Habitat, and the Advisory Committee.

NORSEPP will also report progress to the ICES/IOC Steering Group on GOOS meeting in Brest in early June. Hans Dahlin, the Director of EuroGOOS and a member of NORSEPP, will attend the SGGOOS meeting and report from this years NORSEPP meeting.

NORSEPP will contribute to the work of the Regional Ecosystem Study Group for the North Sea (REGNS) (see the next ToR element). NORSEPP aims at producing time-series of modelled data and information (e.g., on water fluxes) and on meteorological driving forces to be used in the production of the 2006 Integrated North Sea Assessment.

NORSEPP will make the quarterly update reports, and the updated time-series they contribute to, known and available to the ICES working groups involved with assessments of the status of North Sea fish stocks. These groups include the following:

The **Herring Assessment Working Group for the Area South of 62°N [HAWG]** (Chair: Mark Dickey-Collas) met at ICES Headquarters from 8-17 March 2005.

The **Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak [WGNSSK]** (Chair: Coby Needle, UK) will meet in ICES Headquarters 6-15 September 2005.

The **Working Group on the Assessment of Mackerel, Horse Mackerel, Sardine and Anchovy [WGMHSA]** (Chair: Ciaran Kelly, Ireland) will meet in Vigo, Spain, from 6–15 September 2005.

The **Pandalus Assessment Working Group [WGPAND]** (Chair: S. Munch-Petersen, Denmark) will meet 26 October to 4 November 2005 in Halifax, Canada.

The **International Bottom Trawl Survey Working Group [IBTSWG]** (Chair: J.-C. Mahé, France) met in Hamburg, Germany, from 29 March to 1 April 2005.

The **Study Group on Multispecies Assessment in the North Sea [SGMSNS]** (Co-Chairs: M. Vinther, Denmark, and E.D. Bell, UK) met at ICES Headquarters from 5–8 April 2005.

The IMR members of NORSEPP (Are Salthaug and Hein Rune Skjoldal) will correspond with the chairs of the WGs to initiate a process of considering how the updated quarterly reports could be used by the WGs and how the contents of the reports could be shaped to meet the needs of the WGs.

Several of the ICES WGs have already met this spring (HAWG, IBTSWG, SGMSNS). A key WG is WGNSSK that deals with the demersal fish stocks of the North Sea (cod, haddock, saithe, whiting, plaice, sole) as well as industrial fish stocks (sandeel, Norway pout) and Nephrops stocks. This WG has a very heavy workload due to the large number of stocks dealt with. NORSEPP aims at providing the quarterly reports with the underlying data as working documents in the preparatory phase leading up to the meeting of WGNSSK.

NORSEPP will, through the ICES Co-Chair (Hein Rune Skjoldal), discuss with the Chair of the Resource Management Committee (Dankert Skagen, also at IMR) of how to initiate and develop working relationships between NORSEPP and the various groups in ICES that support the provision of ICES advice on fishery management.

3.4 ToR d) Review and deliver components of NORSEPP to support the 2005 and 2006 work of the Regional Ecosystem Study Group for the North Sea

The Regional Ecosystem Study Group for the North Sea (REGNS) is carrying out an assessment of the recent conditions of the North Sea ecosystem. The time period in focus for the assessment is the years 2000–2004, while setting this period in perspective by using time series information that goes back to previous decades where such information is available. The assessment is to be completed in 2006 and the outcome presented at a theme session at the 2006 ICES Annual Science Conference. REGNS will meet at ICES headquarters 9–13 May 2005 to review progress and prepare the detailed analyses that will be performed on collected data series.

NORSEPP will provide input to the REGNS 2006 North Sea Assessment. One type of information is modelled flux estimates across outer and inner boundaries of the North Sea. IMR will bring the 1955–2004 time series of monthly mean fluxes generated with the NORWECOM model to the meeting of REGNS. There is the potential that NORSEPP also can provide other modelled time series such as distribution and properties of water masses. This will be considered in parallel with work on model validation comparing model data with observations (e.g., IBTS hydrographic data).

The REGNS assessment, while holistic and integrated, will be structured with thematic layers addressing effects of contaminants, eutrophication, fisheries, and other impacts on the North Sea ecosystem. In addition to providing information on physical and biological oceanography, NORSEPP can also provide information and data that can be used in the thematic assessments of eutrophication and contaminants. This relates to model estimates of mixing, transport, and budgets of water and nutrients from river plumes into coastal and offshore water masses. Relevant in this context are also data on phytoplankton growth and biomass from models, remote sensing and in situ observations.

REGNS is planning to use different approaches including use of indicators and spatial analysis of gridded data on the scale of ICES rectangles. NORSEPP can provide information on the dynamics of the North Sea including changes and variability on time scales of months to days. It remains to be explored how the spatial-temporal patterns and variability of the North Sea ecosystem can best be analysed and expressed.

3.5 ToR e) Review lessons learned from preparation of NORSEPP operational deliverables and recommend on transition to fuller operational status

The principal lesson to be learned from 2004 is that lack of engagement, and the lack of steer during 2004 from ICES partners prior to the NORSEPP meeting meant that no operational product

was prepared. There was in practice limited or no intersessional work on NORSEPP. However sufficient information was presented during NORSEPP 2005 to show that it is feasible to consider preparation of the NORSEPP operational products as discussed above under ToR a).

The requirement for an operational, routine North Sea climate status assessment for use by ICES, along with the potential for NOOS agencies to contribute to the preparation, should be noted by the SEPRISE SSA, coordinated by EuroGOOS.

Following the production of a timely Q1 2005 outline product, the national NORSEPP members of ICES should be urged to contact the ICES Oceanography Committee to request that this activity continues to be supported by the contributing national agencies. This should help ensure the commitment of a small amount of resources to allow the data exchange (IBTS cruise data CTD, model monthly means) necessary to produce the NORSEPP product.

An opportunity may arise within the outline ECOOP European Coastal Operational oceanography integrated project for some further development and demonstration of a NORSEPP product. The lessons learned from NORSEPP could be extended to the other regional seas of Europe.

3.6 ToR f) Complete review of present operational North Sea observing programmes using the EDIOS meta-database in relation to the requirements of NORSEPP, and produce recommendations for possible improvements

The information in the EDIOS meta-database is not completely up-to-date at present, and thus EDIOS cannot be used at the present time to address this task. It is proposed that this activity is carried forward to future meetings of NORSEPP, and in particular considers the available observations used in generating the NORSEPP product.

4 Date, format, and venue for next meeting

It is proposed that NORSEPP 2006 meets before REGNS 2006, from 4–5 April at the ICES Headquarters in Copenhagen for 1 ½ days. This will allow participation by members of the ICES secretariat. The meeting will start mid-day on 4 April, and conclude at the end of the afternoon on 5 April. NORSEPP will also work intersessionally, corresponding by e-mail as required.

5 Proposed ToR for NORSEPP 2006

The Draft Terms of Reference for the NORSEPP meeting in 2006 is included as Annex 4.

The main items are to review the experiences with producing the quarterly update reports and the input from NORSEPP to the REGNS North Sea Assessment. Further developments of NORSEPP products and improvements in providing observational data will also be considered.

Annex 1: List of participants

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Annex 2: 2004 Terms of Reference

2C04 The ICES-EuroGOOS Planning Group on the North Sea Pilot Project (NORSEPP) [PGNSP] (Chair: Martin Holt, EuroGOOS) will meet in Southampton, UK, from 24–26 March 2004 to:

- a) produce a summary product from operational NORSEPP deliverables;
- b) plan how to disseminate the NORSEPP Status Report and information to the ICES community and to receive and act on feedback;
- c) continue planning components of NORSEPP, including integrated products for 2005 with input from the Regional Ecosystem Study Group for the North Sea;
- d) review lessons learned from preparation of the first NORSEPP Status Report and recommend on transition to fuller operational status;
- e) review present operational North Sea observing programmes, with input from the EDIOS project, in relation to the requirements of NORSEPP.

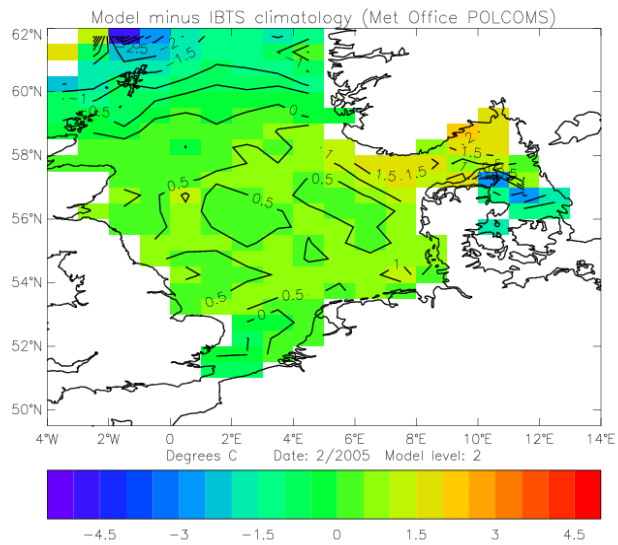
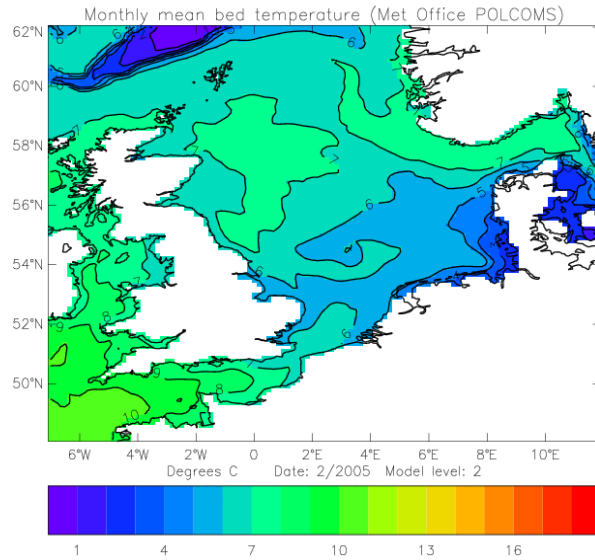
PGNSP will report by 25 April 2004 for the attention of the Oceanography, the Living Resources, the Resource Management, the Marine Habitat, and the Advisory Committees.

Supporting Information

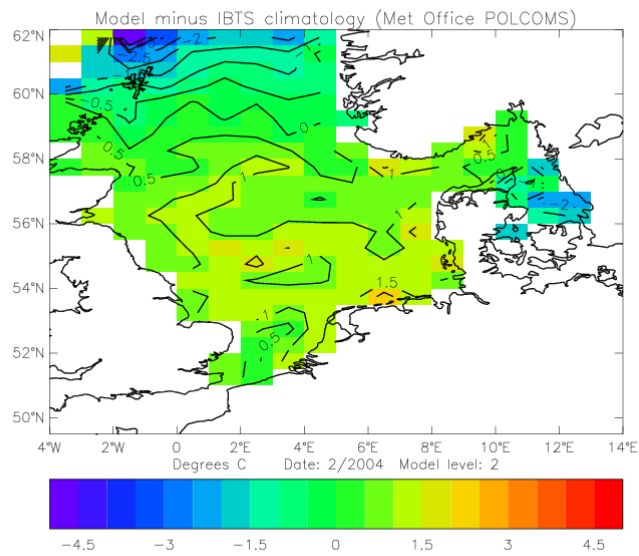
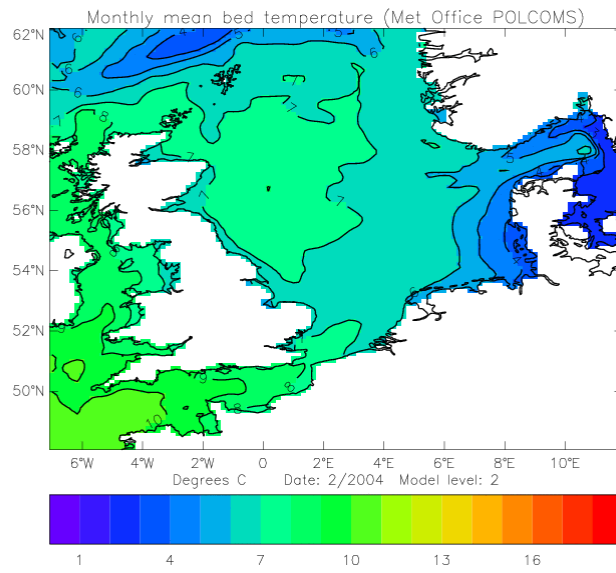
Priority:	This initiates an important initiative for ICES to actively engage itself in GOOS activities. Thus priority is high.
Scientific Justification:	The ICES/IOC Steering Group for the Global Ocean Observing System (SGGOOS) organized a workshop <i>Towards a North Sea ecosystem component of GOOS for assessment and management</i> in Bergen 5–7 September 2001 as a follow-up activity of its Implementation Plan. This Workshop produced an agreed IOC/EUROGOOS/ICES/OSPAR/NSC Statement of Conclusions which was submitted to the 5 th NSC in March 2002. Following this, ICES established this Planning Group which in 2002 prepared a implementation plan for NORSEPP. It is intended that the Project should be, if possible, supported by external funding (e.g., FP6) but should not be dependent on that. Consequently EuroGOOS and ICES have agreed that the principles laid down by NORSEPP (PGNSP) should be pursued actively as far as possible from institute sources, but clearly with limited objectives. Against this background and uncertainty, PGNSP will seek to initiate as many elements as possible to further its basic goal of encouraging the use of near real-time oceanographic products into stock assessment considerations.
Relation to Strategic Plan:	The general area of operational oceanography, environmental/fish interactions and ICES collaboration with other international/regional organisations is a fundamental component of ICES future strategy.
Resource Requirements:	Only costs of running a meeting at the host institute. Various Secretariat resources may be required to promote inter-working group collaboration in the project.
Participants:	Representatives from the physical oceanography community and fish surveys and stock assessment communities are invited. EuroGOOS will also nominate participants. Participants from institutes participating in North Sea/OSPAR monitoring programmes will be essential
Secretariat Facilities:	None, but relevant Secretariat staff should be directly involved in the Group
Financial:	None
Linkages to Advisory Committees:	Very close to ACE objectives and also highly relevant to the interests of ACFM too.
Linkages to other Committees or Groups:	LRC, MHC are closely linked. Group was created by SGGOOS. REGNS
Linkages to other Organisations	EuroGOOS, IOC-GOOS, OSPAR, NSC, COOP
Secretariat Cost Share	ICES:100%

Annex 3: NORSEPP product contributions / figures

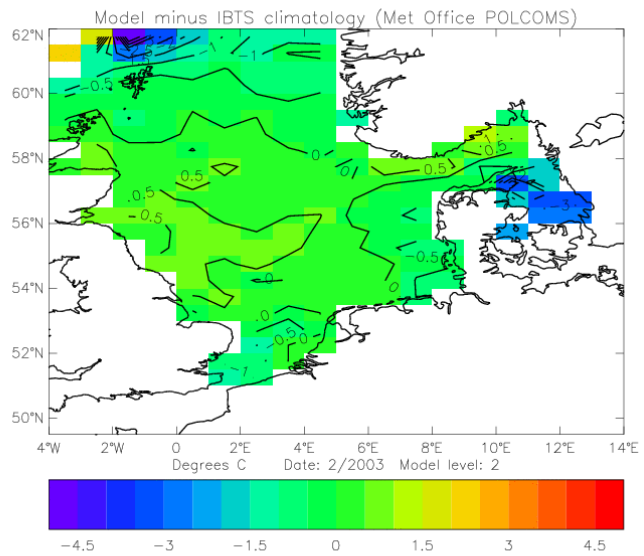
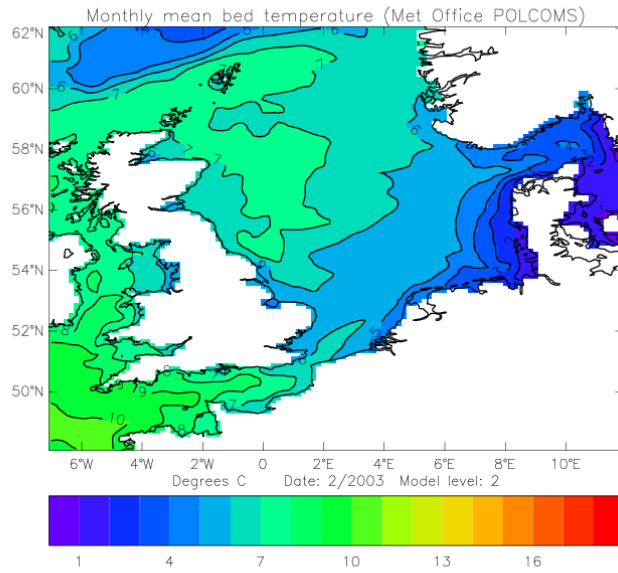
Met Office POLCOMS AMM 2005 February mean bed temperature and difference from ICES IBTS Q1 climatology:



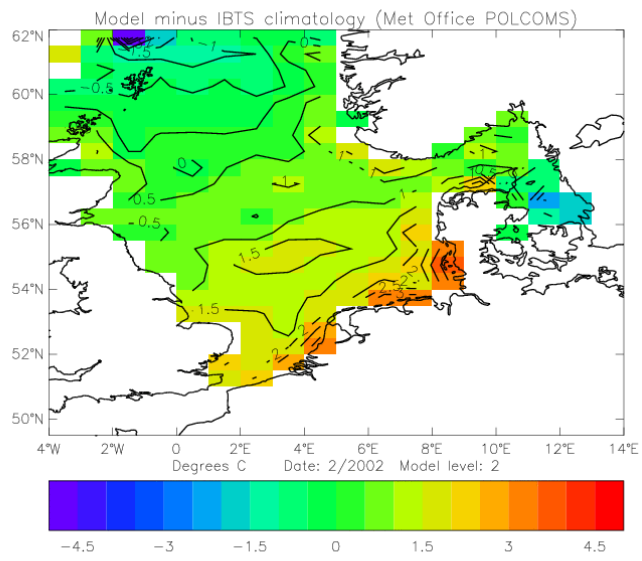
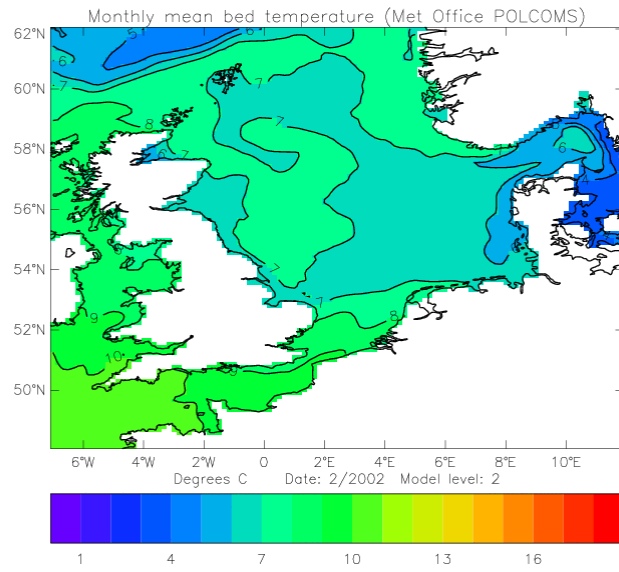
Met Office POLCOMS AMM 2004 February mean bed temperature and difference from ICES IBTS Q1 climatology:



Met Office POLCOMS AMM 2003 February mean bed Temperature and difference from ICES IBTS Q1 climatology:



Met Office POLCOMS AMM 2002 February mean bed Temperature and difference from ICES IBTS Q1 climatology



Annex 4: 2005 Draft Terms of Reference

2CXX The **Planning Group for the North Sea Pilot Project NORSEPP [PGNSP]** (Co-Chairs: Martin Holt, UK, and Hein Rune Skjoldal, Norway) will meet at ICES Headquarters in Copenhagen, 4–5 April 2006, to:

- a) Summarise the experiences with producing the quarterly update reports on the North Sea for 2005 and their consolidation into a description of conditions in 2005 as a contribution to the ICES Ocean Climate Status Report.
- b) Plan the further production of quarterly update reports for 2006.
- c) Review the use of NORSEPP products by other ICES WGs and propose ways to improve working relationships with relevant groups.
- d) Evaluate and finalise the NORSEPP products for inputs to the work of REGNS in producing an integrated assessment of the North Sea.
- e) On the basis of experiences with production of the quarterly reports and the inputs to REGNS, review and plan possible future development of the NORSEPP products.
- f) Review the observational data available for generation of the NORSEPP products, identify gaps, and make recommendations for future improvements.

PGNSP will report by 1 May 2006 for the attention of the Oceanography, the Living Resources, the Resource Management, the Marine Habitat, and the Advisory Committees.

Supporting information

Priority:	This represents an important initiative for ICES to actively engage itself in GOOS activities. Thus priority is high.
Scientific Justification and relation to Action Plan:	<p>Action Plan Numbers: 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 2.2, 2.9, 4.11, 5.13</p> <p>The ICES/IOC Steering Group for the Global Ocean Observing System (SGGOOS) organized a Workshop <i>Towards a North Sea ecosystem component of GOOS for assessment and management</i> in Bergen 5–7 September 2001 as a follow-up activity of its Implementation Plan. This Workshop produced an agreed IOC/EUROGOOS/ICES/ OSPAR/NSC Statement of Conclusions which was submitted to the 5th NSC in March 2002. Following this, ICES established this Planning Group which in 2002 prepared an implementation plan for NORSEPP.</p> <p>It is intended that the Project should be, if possible, supported by external funding (e.g., FP6) but should not be dependent on that. Consequently EuroGOOS and ICES have agreed that the principles laid down by NORSEPP (PGNSP) should be pursued actively as far as possible from institute sources, but clearly with limited objectives. Against this background and uncertainty, PGNSP will seek to initiate as many elements as possible to further its basic goal of encouraging the use of operational oceanographic products into stock assessment considerations.</p> <p>NORSEPP is now attempting to move into an operational phase by producing quarterly update reports on North Sea conditions and input to the REGNS North Sea assessments.</p>
Resource Requirements:	Costs of running a meeting at ICES. Various Secretariat resources may be required to promote inter-Working Group collaboration in the project. Secretariat support in handling oceanographic data from ICES coordinated surveys (IBTS, herring surveys).
Participants:	Representatives from the physical oceanography community and fish surveys and stock assessment communities are invited. EuroGOOS will also nominate participants. Participants from institutes participating in North Sea/OSPAR monitoring programmes will be essential
Secretariat Facilities:	Relevant Secretariat staff should be directly involved in the Group
Financial:	None
Linkages to Advisory Committees:	Very close to ACE objectives and also highly relevant to the interests of ACFM too.
Linkages to other Committees or Groups:	LRC, MHC are closely linked. Group was created by SGGOOS. REGNS.
Linkages to other Organisations:	EuroGOOS, IOC-GOOS, OSPAR, NSC, COOP
Secretariat Cost share	ICES: 100%

Annex 5: Action Plan Progress Review 2005

Year	Committee Acronym	Committee name	Expert Group	Reference to other committees	Expert Group report (ICES Code)	Resolution No.		
2004/2005	OCC	Oceanography	PGNSP		2004/C:05	2C05		
Action Plan	Action Required	ToR's	ToR	Satisfactory Progress	No Progress	Unsatisfactory Progress	Output (link to relevant report)	Comments (e.g., delays, problems, other types of progress, needs, etc.)
No.	Text	Text	Ref. (a, b, c)	S	0	U	Report code and section	Text
1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 2.2, 2.9, 4.11, 5.13	Please see Action Plan items below	Produce a summary product from operational NORSEPP deliverables	a)	S				demonstration NORSEPP products were presented to the PGNSP2005 WG meeting
1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 2.2, 2.9, 4.11, 5.13	Please see Action Plan items below	Submit a Strategic Support Activity to Framework 6 for NORSEPP support including a full-time co-ordinator.	b)			U		An SSA was submitted for REGNS activity, but nothing was done intersessionally for PGNSP. This action rests with ICES participants.
1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 2.2, 2.9, 4.11, 5.13	Please see Action Plan items below	Plan how to disseminate the NORSEPP operational deliverables and information to the ICES community;		S				This was fully discussed during PGNSP2005
1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 2.2, 2.9, 4.11, 5.13	Please see Action Plan items below	Review and deliver components of NORSEPP to support the 2005 and 2006 work of the Regional Ecosystem Study Group for the North Sea;	d)	S				discussed during PGNSP2005 and representatives attended the ICES-REGNS workshop May 2005
1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 2.2, 2.9, 4.11, 5.13	Please see Action Plan items below	Review lessons learned from preparation of NORSEPP operational deliverables and recommend on transition to fuller operational status;	e)	S				Part of routine business of PGNSP, discussed during 2005WG
1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 2.2, 2.9, 4.11, 5.13	Please see Action Plan items below	Complete review of present operational North Sea observing programmes using the EDIOS meta-database in relation to the requirements of NORSEPP and produce recommendations for possible improvements.	f)		O			The EDIOS meta-database is not yet complete. No progress made

Action Plan items are listed on page 21.

Action Plan items	
1.2	Increase knowledge with respect to the functioning of marine ecosystems. This will be achieved through continued basic research on the biological, chemical, and physical processes of marine ecosystems and specific activities directed at improved understanding of observed and potential variability in the marine environment due to physical forcing and biological interactions. [MHC/OCC/LRC/RMC/BCC/DFC]* Particular planned activities include the following:
1.2.1	Understand and quantify the biology and life history, stock structure, dynamics, and trophic relationships of commercially and ecologically important species. [LRC/OCC/BCC/MHC/DFC]
1.2.2	Quantify the changes in spatio-temporal distribution of the stocks of important species in relation to environmental change, using survey and commercial data. [OCC/LRC/RMC/BCC/DFC]*
1.3	Increase knowledge of the effects of physical forcing, including climate variability, and biological interactions, on recruitment processes of important commercial species. [MHC/OCC/RMC/LRC/MARC/BCC/DFC]*
1.5	Develop and apply biophysical modelling, and improve capacity in such modelling to cover biological-physical interactions in the sea. [LRC/OCC/BCC/MHC/DFC]*
1.6	Assess and predict impacts of climate variability and climate change, on scales from populations to marine ecosystems, including impacts on commercially important fish stocks. [OCC/LRC/BCC/DFC]
1.7	Play an active role in the design, implementation, and execution of global and regional research and monitoring programmes, in collaborations between the ICES and other international oceanographic research or monitoring programmes such as GOOS and GLOBEC. [OCC/LRC/MHC/BCC/DFC]
1.8	Implement a North Sea-oriented monitoring programme that incorporates oceanographic and fisheries data. [OCC/LRC/RMC/MHC/DFC]*
2.2	Develop a process for conducting holistic assessments of the impact of human activities, and identify a suite of indicators or variables that will facilitate the monitoring of ecosystem status and evaluating whether ecosystem quality objectives (EcoQOs) are being met. This will be achieved by the following activities:
2.2.1	Contribute to the scientific advice for the development of EcoQOs that will ensure the environmental health of marine ecosystems. [MHC/LRC/OCC/BCC/DFC/ACFM/ACME/ACE]
2.2.2	Assist in the development of spatial and temporal assessments of the indicators for those EcoQOs. [MHC/LRC/OCC/BCC/RMC/DFC]*
2.2.3	Produce holistic assessments of spatial and temporal patterns of contaminants and their effects on marine ecosystems. [MHC/LRC/OCC/BCC/DFC]*
2.9	Determine the biological response to eutrophication taking into account oceanographic conditions. [OCC/MHC/LRC]*
4.11	Develop the scientific basis for an ecosystem approach to management, including assessments and the provision of scientific advice. Specifically, the following activities are needed:
4.11.1	Continue and expand the development of tools, possibly ecosystem models, that facilitate the assessment of monitoring and scientific knowledge of ecosystem functions in a holistic manner. [MHC/OCC/RMC/BCC]*
4.11.2	Incorporate scientific information on ecosystem components and processes into the advice that is provided to clients. [MHC/RMC/BCC/Advisory Committees]*
4.11.3	Consider more fully the impacts of human activities on the marine ecosystem, through provision of more integrated ecosystem advice. [MHC/RMC/OCC/BCC/Advisory Committees]
4.11.4	Work towards the use of indicators of sustainability for a wider range of ecological properties in the provision of scientific advice to clients. [Advisory Committees/MHC/RMC/LRC/BCC]
5.13	Develop and maintain joint activities with IOC in support of the ICES/IOC Memorandum of Understanding, including the following:
5.13.1	Assist and participate in the implementation of GOOS and regional GOOS components (in particular EuroGOOS).
5.13.2	Continue to act as the North Atlantic regional implementation body for GLOBEC (The Cod and Climate Change Programme).
5.13.3	Provide input to the implementation of GEOHAB activities in the ICES Area, in particular the Baltic, and to other Harmful Algal Bloom initiatives such as the HAB event database and IOC Intergovernmental Panel on Harmful Algal Blooms.
5.13.4	Contribute expertise and know-how for the development of modern marine data management systems and maintain such systems that are of relevance to ICES activities.
5.13.5	Contribute expertise on IOC advisory and expert panels as appropriate, e.g., the SCOR-IOC Carbon Dioxide Advisory Panel and GESAMP.
5.13.6	Develop a specific plan of action for enhanced collaboration, taking into account the development and implementation of GOOS.
	[OCC/MHC]