

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

MEETING OF THE EUTROPHICATION COMMITTEE (EUC)

BERLIN: 10 - 14 JANUARY 2005

Proposal for arrangements for the preparation of JAMP product EA-5**Presented by the UK as initiator of the ICG-EMO**

This document proposes to EUC 2005 arrangements for the preparation of an assessment of the expected eutrophication status of the OSPAR maritime area following the implementation of agreed measures (JAMP product EA-5).

Background

1. The 2003 JAMP schedules the production in 2006 of an assessment of the expected eutrophication status of the OSPAR maritime area following the implementation of agreed measures (JAMP product EA-5). In relation to this, EUC 2003 had noted that Contracting Parties currently lacked the necessary predictive modelling tools to develop an assessment of expected eutrophication status that would go beyond the assessment already agreed by OSPAR 2001 and had made arrangements for work by an Intersessional Correspondence Group on eutrophication modelling (ICG-EMO) to review existing national and international modelling activities relevant to the work of EUC and to develop ideas for the cooperation and coordination of these activities and further work.

2. Based on an overview of the state of art of the use of models in exploring nutrient reductions and on experiences reported by France on the eutrophication modelling project LITEAU II initiated in co-operation with Belgium, ETG noted 2004 noted that the availability and suitability of models had improved since the review by ASMO in 1996. ETG observed that the main obstacle was that there was a difficulty in reaching consensus over which model to use in cooperative initiatives at the OSPAR level and that there were extremely limited resources for such modelling activities.

3. ETG concluded that, to this end, further work was necessary to exchange experiences on the use of models but that this should be focussed around the development of predictions of eutrophication status in relation to future nutrient reduction scenarios for specific sea areas as the basis for the 2006 JAMP assessment product. Where possible, Contracting Parties should be encouraged to develop such predictions through bilateral or multilateral approaches following the example of the LITEAU II project.

4. ETG agreed on arrangements for intersessional work, under the lead of the UK, to prepare the assessment required under JAMP product EA-5, through predictive modelling of the expected eutrophication status of the OSPAR maritime area in relation to future nutrient reduction scenarios. This agreement is presented to EUC in document EUC 05/5/Info.1.

5. According to these arrangements, the UK, as convenor of ICG-EMO, was invited to draft proposals comprising (i) a revised version of the ICG overview on the state of art of modelling, presented to EUC in document EUC 05/5/4; (ii) terms of reference; (iii) defined scope and outputs; (iv) activities and approach to be taken e.g. intersessional correspondence; workshop; (v) schedule for delivery of products; (vi) relevant previous work to be taken into account (e.g. ASMO 1996 workshops, NOMAD).

6. These proposals are attached at Annex 1 in track change modus, building on the agreed arrangements of ETG, including a completed table summarising the “state of art” eutrophication models used by Contracting Parties. These proposals were circulated to ICG members on 6 January 2005 for comments.

Actions requested

7. EUC is invited to
 - a. examine and approve the attached proposals for further work preparing for JAMP product EA-5;
 - b. to ensure that the necessary arrangements are in place to bring this work forward.

Proposal for arrangements for the preparation of JAMP product EA-5

Background

1. OSPAR 2001 agreed and published an evaluation of eutrophication status expected following achievements of the 50% reduction target for nutrients (N and P) inputs.
2. The OSPAR Joint Assessment and Monitoring Programme (JAMP) includes the production in 2006 of an assessment of the expected eutrophication status of the OSPAR maritime area following the implementation of agreed measures (JAMP Product EA-5).
3. ETG 2004 agreed on the following arrangements to develop a proposal to EUC 2005 for intersessional work on predictive modelling of the expected eutrophication status of the OSPAR maritime area in relation to future nutrient reduction scenarios.

Objectives

4. The main objective of the work to be proposed to EUC 2005 will be to prepare and deliver JAMP Product EA-5 based upon predictive modelling of eutrophication status in the OSPAR maritime area in relation to future nutrient reduction scenarios. The work involves facilitating the co-ordinated development of modelled predictions of the eutrophication status of sea areas of specific interest e.g. problem areas by Contracting Parties, working in partnership or individually.

Scope and outputs

5. The nutrient reduction scenarios to be addressed by the work will include:
 - a. achievement of the 50% reduction target under PARCOM 88/2 for nutrient inputs into areas currently classified as problem areas;
 - b. the reduction in nutrient inputs required to achieve non-problem area status in areas currently classified as problem areas.
6. For each reduction scenario the results will be presented in the standard format used for the formal assessment of eutrophication. These will be comprised of maps displaying the status of each water body (problem area/non problem area) and tables showing the values of direct and indirect variables derived from scenario testing.

Activities and approach to be taken

7. For the results of scenario testing based upon the use of models there is a fundamental requirement for the results to be regarded as robust and 'believable'. The ICG needs to consider how the levels of uncertainty in model predictions may be ascertained in order to promote confidence in model results. One approach to building confidence in outcome from applications of models to assessment of eutrophication effects is exemplified by the bilateral approach taken by Belgium and France within the LITEAU II programme. Regional bilateral and multilateral groupings are proposed as a mechanism for achieving the objectives where new or additional scenario testing is carried out. A further area for consideration by the ICG is to review the sources of uncertainty in model prediction. Assumptions about the boundary conditions at the coast and at the open boundary will be critical. For example, it is likely that the quality of the riverine nutrient flux data input to the model is a major source of uncertainty in any model predictions. A critical part of the strategy for scenario testing will be to verify the models by comparison with observations (hindcast). Where there is an acceptable level of agreement between observations and model results then greater confidence may be attached to the use of the model in a forecasting (predictive) mode. The ICG should systematically evaluate sources of uncertainty with a view to identifying what steps may be needed to improve the reliability of results from scenario testing.
8. The ICG will need to assess whether the results from previous work carried out are still applicable or whether new model runs are required to meet the needs of OSPAR. The mechanisms for carrying out further

work will need to be determined locally. Regional collaborative modelling exercises could be constituted as follows:

- UK, Netherlands, Germany
- Ireland, UK
- France, Belgium, (Netherlands)
- Sweden, Norway, Denmark
- Spain, Portugal

Schedule for delivery

- | | | |
|-----|--|----------------|
| 9. | Preparatory work | 15th May 2005 |
| | <ul style="list-style-type: none">• Assimilate any feed back from EUC• Agree regional collaboration• Establish web-site to promote communication between ICG members• Prepare for Workshop | |
| | Hold workshop | 30th June 2005 |
| | Completion of report by ICG for ETG | 15th Sept 2005 |
| | Report presented at ETG Meeting | October 2005 |
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| 10. | Technical issues to be addressed by the work will include: | |
| | <ul style="list-style-type: none">a. defining boundary conditions especially riverine nutrient inputs;b. defining open boundary condition;c. common physical forcing data;d. need for common hydrodynamic and state of the art model;e. data requirements for model verification;f. desirable attributes in the model(s) of choice;g. develop a proposal to ETG/EUC 2005 for possible follow-on work on modelling of transboundary inputs. | |
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| 11. | Wider considerations | |
| | <ul style="list-style-type: none">a. the outcome of other relevant programmes e.g. EUROCATb. the outcome form the previous ASMO workshops | |

Arrangements for developing a proposal to EUC 2005		
Activity	Target Date	Lead
Contracting Parties to inform United Kingdom (d.k.mills@cefas.co.uk) of the details in Table 1 of the “state of the art” eutrophication prediction models used for their waters (to update summary of models presented to 1996 ASMO Workshop)	15 November 2004	Contracting Parties
Draft proposal to EUC 2005 circulated to ICG: <ul style="list-style-type: none"> revised version of ETG 04/4/1 terms of reference defined scope and outputs activities and approach to be taken e.g. intersessional correspondence; workshop schedule for delivery of products relevant previous work to be taken into account (eg. ASMO 1996 workshops, NOMAD) 	1 December 2004	UK
ICG to comment on the draft proposal	12 December 2004	Belgium Denmark France Germany Netherlands Norway Portugal Sweden
Revised draft proposal submitted to EUC 2005	14 December 2004	UK
EUC 2005 to consider revised proposal for work to deliver by the target date for ETG 2005 and to be invited to establish an intersessional correspondence group to carry out the work	10-14 January 2005	EUC

Timeframe for intersessional work to deliver JAMP assessment EA-5.	
Activity	Date
EUC 2005 to approve proposal for intersessional work to develop JAMP Product EA-5	10-14 January 2005
ETG 2005 to examine draft assessment for JAMP product EA-5 and make arrangements for their finalisation in time for EUC 2005/6	October/November 2005
EUC 2005/06 to examine revised draft assessment for JAMP Product EA-5 with view to recommending publication to OSPAR 2006	Dec 2005/January 2006
OSPAR 2006 to agree to publish the assessment	June/July 2006

Table 1. Summary of “state of the art” eutrophication prediction models used by Contracting Parties

Country	Institute	Model Name and purpose	Model Area	Coupled biological physical model	Dimensions of physical model (1D, 2D, 3D)	Physical model
Belgium						
Denmark						
France	IFREMER	ELISE3D	Channel and Southern North Sea	Yes	3D	MARS3D
		ELISE	Channel and zoom on the Bay of Seine	Yes	3D (n two-layered boxes)	Box model, each box being splitted into a surface layer and a bottom one of time-varying thicknesses according to an thermohaline integral 1DV model
Germany	IfM-HH, Institute for Marine Research, Hamburg Univ.	ERSEM	North Sea	No	Box	
		HCN4/ECOHAM		Yes	3D	HAMSOM
Ireland						
Netherlands	RIKZ and Delft Hydraulics	GEM	Southern North Sea (nested: Dutch Coastal Zone, Estuaries and Dutch Wadden Sea)	Yes	3D	Delft3D-Flow
	Alterra	EcoWasp	Specially for tidal systems, but not necessarily tidal. Dutch Wadden Sea Sylt-Rømø-bight (DE/DK)	Biological, chemical and physical model Box-model	2D	Any

	NIOZ	ERSEM-II	North Sea, Baltic Sea, Adriatic Sea	Set of non-dimensional biogeo-chemical modules, to be coupled to any hydrodynamical model	From 0D tot 3D depending on physical model	Any
Norway	met.no / IMR	MIPOM-BIO: operational forecasting (daily) of nutrients and algal blooms	Nested system: Greater North Sea @ 20km resolution N. North Sea / Skagerrak @ 4km resolution	Yes (biological module by IMR)	3D	MIPOM (physical model by met.no)
Norway	IMR	NORWECOM: coupled physical-chemical biological model system applied to study primary production and dispersion of particles (e.g. fish larvae and/or pollution)	Nested system: Greater North Sea @ 20km resolution N. North Sea / Skagerrak @ 4km resolution	Yes	3D	Based on the Princeton Ocean Model (POM)
Sweden	Swedish Meteorological and Hydrological Institute	SCOBI - Swedish Coastal and Ocean Biogeochemical Model To assess eutrophication status, changes and pollution load scenario as well as operational forecasting	Baltic Sea, Kattegat and Skagerrak area, including the coastal zone	Yes	3D and 1D models	Probe-Baltic (1D) and HIROMB (3D)
Portugal	IST	MOHID-CE-Qual-W2/WASP/ERSEM	Generic	Yes	3D	MOHID
Spain						
UK	POL	POLCOM-ERSEM	Irish Sea	Yes	3D	POLCOMS