MEECE Science Meeting 2012 Report

Istanbul, 12-14 June 2012

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Executive Summary

The purpose of the meeting was to highlight the progress of the project, assess the science quality of the project outcomes and to help define the legacy of MEECE. The meeting opened with a report on the status of each work-package by the work-package leaders. This was followed by a series of science presentations which explored the progress of the modelling activities region by region. Developments in the advancement of the MEECE Model Atlas where then discussed. Science presentations followed on the resource management activities. The legacy of MEECE was discussed and proposals made. The last discussion session focused on plans and timelines for the final reporting process. Finally as this was the last project meeting the coordinator thank the participants for their contribution to the project. The following list of actions was generated from the meeting (Table 1) and includes those outstanding after the Faro workshop.

Table 1. List of actions from the MEECE Istanbul Meeting

No.	Action	Responsible	Completion date	Comments
1	Apply for 6 month no cost contract extension	I Allen (PML)	March 2012	Request submitted April 2012. Correction requested by commission June. Awaiting final decision
2	Update D1.5 with details of the anthropogenic driver experiments in wp4 by region and model	I Allen (PML), L Bopp (CNRS)	July 2012	**I Allen** to discuss with **L Bopp** way forward. **M Zavatarelli** (UNiBO) to compile information In response to 2nd consolidated report
3	Update D2.9 with ERSEM cocolithophore model	T Tyrell (NERC) M St John (DTU)	July 2012	**T Tyrell** to define generic calefaction module **Y Artioli** (PML) to provide code Final version needs editing
4	Update D2.11 with generic description of IBM models	M St John (DTU)	July 2012	Extra fish IBM model supplied by **G Huse** (IMR) (Feb 2011) D2.11 requires final update with extra text
5	Completion of D2.12 ecotoxicological	M St John (DTU)	July 2012	Component parts all complete

	parameterisations			Final version needs editing
6	Completion of D3.4 a. Reporting template b. Simulations complete (Hindcast, 2080-2100) c. Deliverable complete	G Chust (AZTI)	a. March 2012 b. April 2012 c. July 2012	**Regional responsibilities** Global Ocean (**Bopp**) Barents Sea (**Schrum** / **Skogen / Bellerby**) NE Atlantic / N Sea (**Holt, Mackinson, Butenschon, Schrum**) Baltic Sea (**C Schrum, A Christiansen** (DTU) Black Sea (**Salihoglu**) Biscay Sea (**Chust**) Adriatic Sea (**Zavatarelli, Shin**) Aegean Sea (**Triantafyllou, Shin**) Benguela Upwelling (**Garcon, Shin, Machu**)
7	Completion of D3.3 (publications)	G Chust (AZTI)	Feb 2013	Partners responsible for sending wp3 relevant papers to **G Chust / J Heard**
8	D3.4 MEECE atlas part 1 Climate driver a. Model data delivered to PML b. Final atlas	Overall G Chust (AZTI) a. Responsible regional partners b. G Chust	a. july 2012 b. August 2012	**Regional responsibilities** PML **Y Artoli** UiB **U Deawal** UiB, **G Nodal/ Bellerby** IMR **Solfrid** AZTI **M Chifflet** IRD **E Machu/ Y Shin** HCMR **Kostas Tsaris** NERC **S Wakelin**

				UNIBO **M Zavatarelli** DTU **A Christensen** Cefas **J Beecham** METU **H Cannaby** CNRS **L Bopp**
9	Completion of D4.1 a. Reporting template b. Simulations complete (Hindcast, 2080-2100) c. Deliverable complete	M Zavatarelli (UNIBO) a. M Zavatarelli b. Regional responsible c. Zavatarelli	a. March 2012 b. May 2012 c. July 2012	**Regional responsibilities** Global Ocean **(Bopp)** Barents Sea **(Schrum / Skogen/Bellerby)** NE Atlantic / N Sea **(Holt, Mackinson, Butenschon, Schrum)** Baltic Sea **(Schrum, A Christiansen (DTU))** Black Sea **(Salihoglu)** Biscay Sea **(Chust)** Adriatic Sea **(Zavatarelli, Shin)** Aegean Sea **(Triantafyllou, Shin)** Benguela Upwelling **(Garcon, Shin, Machu)**
10	Completion of D4.2 (publications)	M Zavatarelli (UNIBO)	Feb 2013	Partners responsible for sending WP4 relevant papers to M Zavatarelli & J heard
11	Completion of D4.3 a. Multiple driver simulations b. Reporting template Simulations complete (t, 2030-2040) c. Deliverable complete	M Zavatarelli (UNIBO)	a. May 2012 b. July 2012	**Regional responsibilities** Global Ocean (**Bopp**) Barents Sea **(Schrum / Skogen / Bellerby)** NE Atlantic / N Sea **(Holt, Mackinson, Butenschon, Schrum)**

			c. September 2012	Baltic Sea **(Schrum, A Christiansen(DTU))** Black Sea **(Salihoglu)** Biscay Sea **(Chust)** Adriatic Sea **(Zavatarelli, Shin)** Aegean Sea **(Triantafyllou, Shin)** Benguela Upwelling **(Garcon, Shin, Machu)**
12	D4.4 MEECE atlas part 2 Anthropogenic drivers a. Model data delivered to PML b. Final Atlas	Overall M Zavatarelli (UNIBO) a. Responsible regional partners b. M Zavatarelli Chust	a. June2012 b. August 2012	Regional responsible PML **Y Artoli** UBI **U Deawal** UBI, **G Nodal/ R Bellerby** IMR **Solfrid** AZTI **M Chifflet** IRD **E Machu/ Y Shin** HCMR **Kostas Tsaris** NERC **S Wakelin** UNIBO **M Zavatarelli** DTU **A Christensen** Cefas **J Beecham** METU **H Cannaby**
13	D5.2 Decision Support Tools a) Define data requirements b) Completion of report bar model indicators c) Completed report	G Piet (IMARES) J Holt (NERC) G Piet G Piet	March 2012 May 2012 September 2012	Responsible partner to complete components by April 2012, **IMARES, DTU , Cefas, AZTI, KUCORPI, UPIED** Key Model outputs • SST • pH • Nutrients • oxygen • net PP • Phytoplankton

				• Zooplankton • HTL's
14	D5.3 and 5.4 (MSE)	M Eero (DTU)	October 2012	Combine D5.3 and 5.4 (MSE) to make the delivery more consistent Expand to discuss all drivers, focus on the manageable , fisheries, eutrophication, pollution Model examples on fisheries, eutrophication and discussion of the limitation approaches to pollution models
15	D5.5 Indicators	Y Shin (IRD)	Jan 2013	Delay delivery till after the Nov 2012 Indiseas workshop Need to include section on pollution (**UPied**) and invasive (**KUCORPI**)
16	D6.5 Volume of factsheets a. Descriptor fact sheets b. Regional response fact sheets c. Final volume	J Heard (PML) a) Descriptor responsible b) Regional responsible c) J heard	a. July 2012 b. September 2012 c. Sept 2012 **Delivery in time for JRC biodiversity workshop in Brussels Nov 7th**	**Descriptor Fact Sheets: July 2012** **Pollutants: Mike St. John/Tanja St. John and A. Viarengo** **Eutrophication: Yuri (with Corrina, George T and Marco Z.)** **Biodiversity: Jonathan Beecham** **Invasive species: Sergej and Yuri** **Commercial species: GerJan P. and Steve M.** **Food webs: Guillem C. and AZTI** **Hydrography (climate change): Jason H. Laurent B. and Corrina**

				S.
17	D6.6 Summary of inputs form user groups	M Barange (PML)	December 2012	
18	Synthesis workshop	I Allen (PML), G Piet (IMAREES)	Oct 2012	To maximise synergy between WP 3/4 and WP5
19	Management reports	JI Allen / J Heard (PML)	May, August, November 2012 Feb 21013	
20	Final periodic report	JI Allen / J Heard (PML)	April 2013	WP reports coordinated by WP leaders. Individual partners responsible for reporting activities
21	Final report	JI Allen / J Heard (PML)	April 2013	WP reports coordinated by WP leaders. Individual partners responsible for reporting activities

Summary Workpackage Reports

WP1 Driver parameterisation and model scenarios

The discussion around WP1 went on the added value of extra work that has been done since successful implementation of the deliverables. This encompassed extra data that had been collected under MEECE experimentation. Extra work has been done implementing the new paramaterisation of the data in D1.4 into the model representation in D2.5

WP2 MEECE model library

The model library is nearing completion. The Eco toxicological sub-models have been completed (D2.12) and the coccolithopore sub-model (D2.9) has been revised in line with the reviewers' comments.

WP3: Ecosystem response to climate scale drivers

The status of WP3 has been presented deliverable by deliverable.

Deliverables D3.1 "Common set of forcing scenarios" delivered and approved

D3.2 "Common set of metrics" delivered and approved

D3.3 "Scientific papers on model analysis for the climate simulations" have until now 25 papers published and more than 12 in preparation.

D3.4 Synthesis report on climate simulations is expected to be delivered in August without delay. Among the 9 regions, 8 have completed LTL simulations, while most of HTL are not finished. Four region partners have already sent its partial contribution and it has been

reviewed from WP3 leader (AZTI). This initial contributions enabled us to present and discuss during the meeting some changes to improve the intercomparability and synthesis of all European seas models. A guide for presenting the document by region has also been presented. WP3 leader requests region-based contributions to be sent before August in order to be incorporated in the deliverable.

D3.5 Atlas of marine ecosystem climate response is also expected to be delivered in August. The final design and variable definition have been reached after Faro meeting and presented in Istanbul meeting. Also, feeding Atlas with regional model outputs is in good progress but needs to be completed.

WP4: Ecosystem response to climate scale drivers

The status of WP4 has been presented deliverable by deliverable.
D4.1 Hind casting isolated direct Anthropogenic drivers The LTL simulations are complete in all regions. The HTL simulations are nearing completion. Results are being analysed on a region by region basis

D4.2 Scientific papers

D4.3b Synthesis report on the comparison of WP3 and WP4 simulations: simulations are in progress. Due for completion June 2012. Analysis to take place late summer.

D4.4 Atlas of marine ecosystem anthropogenic driver response is also expected to be delivered in August. The final design and variable definition have been reached after Faro meeting and presented in Istanbul meeting. Also, feeding Atlas with regional model outputs is in good progress but needs to be completed.

WP5 Implications of resource management

D5.2 Decision-Support Tools (DST)
Generic framework

- D1,D5,D8 applied in Baltic: Methods for integrated assessment of GES (*PlosOne*)
- D2 applied globally: Biological Invasion Impact / Biopollution Assessment System (*Ecological Informatics*).
- D3 applied in Baltic: Expert system for indicators for fish stocks (*Ecol. Ind*.)
- D8 applied in Mediterranean: Managing Environmental Risk in marine coastal systems (*6th SETAC World Congress 2012*)

D5.3/5.4 Management Strategies and Evaluation (MSE)

- Baltic Management strategies in relation to changes in productivity (publ. Mar. Policy). Spatially explicit management strategies, including methods for their evaluation (3 related ms) . MSE framework coupled to SMS model: MSE taking into account climate and biological interactions, spatially explicit
- Bay of Biscay MSE framework for a single stock (anchovy): Evaluation of adaptive harvest control rules taking into account environmental conditions.
- North Sea MSE aimed at MSFD Descriptors other than D3 (commercial fish), i.e. D4 (Foodweb) and D6 (Seafloor integrity) . Aim is to develop OSMOSE so that it can be used to combine fisheries with other drivers (i.e. climate and eutrophication)

Outline exists but may need modification to include issues that emerged from the review:

- Links to modelling (WP 3,4)

- Addressing drivers other than fisheries in management context

Some possible ways to approach these issues earlier identified, need to be clarified and specified at this meeting:

- Review of different classes of models with respect to relevance for management (assigned to Steering Group)?
- Post-processing of models results (e.g. risks of compromising GES of eutrophication)
- Tools for evaluating management strategies of multiple drivers (eutroph., fisheries,…) (EwE, CEFAS?; others?) Etc.

WP6 Knowledge Transfer

Dissemination activities over the life of the project were highlighted including the continued development the main and knowledge transfer section of the website and stakeholders contacts database.

A number of new fact sheets were also published during 2012 and suggested for additional topics discussed at the meeting. Fact sheets currently available include:

- ✓ **FS1** MEECE: Managing a changing environment
- ✓ **FS2** The MEECE Model Library
- ✓ **FS3** Taking the pulse of regional seas: the IndiSeas-MEECE initiative
- ✓ **FS4** Improving the evaluation of marine ecosystems environment status
- ✓ **FS5** Detecting alien algae invasions: the case of the Baltic
- ✓ **FS6** Management practices and a benign environment team up to recover a heavily exploited marine fish

A report was given on the MEECE Summer School held in September 2011, with over 35 students funded to participate in the event the week as a great success training the next generation of ecosystem modellers in the areas of modelling multiple drives and pressures, developing new model parameterisations, model coupling and management strategy evaluation tools. The outputs from the summer school including lecturers, student presentations and posters are available at http://www.meece.eu/school/home.html

The web visualisation of the MEECE model atlas was reported following discussions at the Faro meetings. A draft website was presented to the consortium. The draft website had been sent to the MEECE User Group for comment and feedback prior to the meeting and their ideas were feed back to the group to see how their suggestions could be incorporated. As a result of these discussions the web team will explore whether outputs could be displayed on one main map as well as regionally and oxygen will be included as variable as appropriate for certain models.

Legacy of MEECE

The following items were proposed as the key components of the legacy of the project.

- Pioneering work on end to end models
- New science knowledge
- Lessons learnt
- FABM
- Model Library
- Simulation data
- MEECE Atlas
- Decision support tools
- Management Strategy Evaluation Tools

- Descriptor based factsheets
- Register of Foreground (what and how)

Final Reporting

The reporting process was explained to the partners. We require 2 reports at the end of the project. A periodic report for the final period of the project (M37-54); which will follow the reporting following the procedures previously used in MEECE. In addition we require a Final Report which comprises a 40 page project summary, a complete list of publications and dissemination activities and a list of the foreground generated by project. The 40 page publishable summary has to include 5 distinct parts described below:

- An executive summary (not exceeding 1 page).
- A summary description of project context and objectives (not exceeding 4 pages).
- A description of the main S&T results/foregrounds (not exceeding 25 pages),
- The potential impact (including the socio-economic impact and the wider societal implications of the project so far) and the main dissemination activities and exploitation of results (not exceeding 10 pages).
- The address of the project public website, if applicable as well as relevant contact details.

Annex 1. Meeting Participants

Participant	**Institute**
Aldo Viarengo	UPiedmont
Alessandro Diagno	UPiedmont
Angel Lopez-Urrutia	IEO
Astrid Jarre	UCT
Baris Salihoglu	IMS
Chris Smith	HCMR
Nadia Papadopoulo	HCMR
Corrina Schrum	UiB
Ekin Akoglu	IMS
Gerjan Piet	IMARES
Guillem Chust	AZTI
Heather Cannaby	IMS
Icarus Allen	PML
Isabelle Dadou	CNRS
James Harle	NERC
Jason Holt	NERC
Jessica Heard	PML
Jonathan Beecham	Cefas
Karsten Bolding	BB
Kathy Harding	PML
Kjell Rong Utne	IMR
Kostas Tsiaras	HCMR
Marco Zavatarelli	UNIBO
Margit Eero	DTU

Marina Chifflet	AZTI
Mehera Kidston	CNRS
Mike St John	DTU
Momme Butchenson	PML
Priscilla Licandro	SAHFOS
Richard Bellerby	UiB
Sarah Wakelin	NERC
Sergej Olenin	KUCORPI
Sinan Arkin	METU
Stefan Neuenfeldt	DTU
Wojciech Wawrzynski	ICES
Yuri Artioli	PML

Annex 2. Meeting Agenda

MEECE Science Meeting

12-14 June 2012, Istanbul, Turkey

Tues 12 June

9:00 Overview and status of project – Icarus Allen

Session 1: Work package summary, including status of deliverables

9:20 WP1 Richard Bellerby (15mins)
9:35 WP2 Mike St John (10mins)
9:45 WP3 Guillem Chust (20mins)
10:05 WP4 Marco Zavatarelli (20mins)
10:25 WP5 GerJan Piet (20mins)
10:45 WP6 Jess Heard (10min)

10:55 ---------- Coffee ----------

Model Coupling
11:30 FABM in MEECE - and afterwards (Karsten Bolding)

Session2: Regional modelling and application
Presentation from each model group on activities across WP3&4 and all drivers across each region. Include info on work complete, status, results and application to MSFD descriptors. Half hr per group, please coordinate with each other as necessary

11:50 Summary and Progress of Work: Global Ocean Modelling | Mehera Kidston (CNRS)
12:20 Black Sea – Baris/Heather (METU)

12:50 ---------- Lunch ----------

14:00 Barents – Corrina S. (UiB), Kjell Rong Utne? (IMR) and Richard B. (UiB)

14:30 The Benguela Upwelling System: Present versus Future (IPSL forcing) | I. Dadou (IRD)
15:00 Bay of Biscay – Marina Chifflet (AZTI)
15:30 Climate and anthropogenic driver simulations in the N. Aegean | Kostas T. (HCMR)

16:00 ---------- Coffee ----------

16:30 Adriatic | Marco Z. (UNIBO)
17:00 North Sea – Jason Holt (NERC), Momme (PML) and Corrina S. (UiB), Jonathon Beecham (Cefas). DTU?
17: 30 Invasive species | Yuri A. (PML) and Sergej Olenin (KUCORPI)
18:00 Further discussions if needed
18:30 Close of day

Wednesday 13 June

9:00 Baltic modelling | Corrina S. (UiB), Stephen Neuenfeldt (DTU)

9:20 Any additional science talks |IRD/ SAFHOS?

9:40 Summary of Day 1 modelling activities | Icarus Allen

9:50 Model Synthesis discussion session (plenary or break out groups as appropriate) 2hrs

Focus on how we complete *T4.3 Relative impact of climate and direct anthropogenic drivers*
Comparative assessment of the WP3 and WP4 results will be carried out in order to disentangle the climatic from the direct anthropogenic drivers. A common methodological approach to carry out the assessment will be defined in a dedicated meeting.
Methodologies for synthesizing the information of multi-model multi-forcing ensembles into a probabilistic picture of future ecosystem function (cooperation with WP3) will be used. We shall produce synthetic reports summarizing the main consequences of the analysed scenarios in the ecosystem. Mid-term and final year workshops will facilitate this. This distilled information will be provided as a web-based atlas to WP's 5 and 6. A joint workshop will be held between WP's 3, 4 and 5 to assess the relative impacts of climate and direct anthropogenic drivers (M50, October 2012),

This task will be led by UNIBO with participation from partners in WP3 and 4.
Start: month 24, end month 48.

11:30 Coffee (or as needed)

Session 3: Dissemination
11: 45 Dissemination, Impact and the MEECE legacy – plenary discussion
Progression of the MEECE Atlas
Descriptor Fact Sheets
Model library

13:15 ---------- Lunch ----------

Session 4: Management support tools (work package 5 Overview and status)
Presentation from each partner involved with WP5 summarising activities and work still be completed. 20-30mins each
14:15 IMARES work under WP5 (G Piet)
14:45 DTU, MSE M Eero
15:15 Higher trophic level consequences of climate change and fishing scenarios in the North Sea (Jonathan Beecham)

15:45 ---------- Coffee ----------

16:00 Evaluation of adaptive harvest control rules depending on environmental conditions. Application to anchovy in the Bay of Biscay | G. Chust

16:30 UPiedmont, - Pollution expert system | Ale / Aldo
17:00 KUCORPI, Invasive Species Expert System | S Olenin
17:30 Cape Town | Astrid Jaree
18:00 Fishing the Way to WP5 | Chris Smith

Completion of T5.3: MSE deliverables*: This task addresses the further development and application of Management Strategy Evaluation (MSE) tools. These MSE tools are needed to evaluate existing or newly developed management strategies (task 5.2) and are based on a simulation of the whole management process using fisheries management evaluation tools developed in presently running FP6 EU projects in combination with findings from task 5.1. The MSE will not only focus on the management of fisheries and their impact on ecosystems, but should cover also other drivers. The qualities of existing versus new management strategies can then be compared, using performance measures derived from operational objectives and allowing for the propagation of error and uncertainty. MSE will be applied to the strategies applied for each of the three European waters covered by Regional Advisory Councils (RACs): North Sea, Baltic Sea and South western waters.*

Completion of T5.4: Indicators deliverables
MEECE will us a two prong approach towards the development of indicators, firstly a global comparative approach which links fisheries with climate and secondly specific examples of expert systems for indicators for invasive species and pollution.

Comparative approach*: Develop a comparative approach across ecosystems in order to propose (1) common, methods to compute and estimate ecological indicators specifically for anthropogenic impacts, (2) a common protocol for elaborating a diagnosis on ecosystems state, (3) common communication methods for transferring scientific knowledge to the general public. With the difficulty in establishing baseline levels and reference points for most ecosystem indicators, the comparative approach across ecosystems will provide a range of limit or reference values (min, max) against which each ecosystem could be assessed. The comparative approach will also help in selecting robust ecological indicators that would be meaningful and measurable over a set of diverse and contrasted situations, and in specifying their conditions of use. Output from this task will feed into subtask 6.1.4 of WP6 for the creation of a website presenting the generic dashboard (computation and visualisation of ecosystem indicators) on several world ecosystems. Target: large public and decision makers.*

Expert systems. *MEECE uses the expert system approach in part because pollution and invasive species are the drivers which are currently where a modelling approach is least*

effective. Building on existing work we will implement and test expert systems for bio-pollution (Olenin et al 2007) in the Baltic Sea and a Biological Vulnerability Index (BVI) (Dagnio et al., 2007) on sediments in Italian coastal waters. Where appropriate these expert systems will be driven by simulated information (e.g. future climate) from WP3.

Thursday 14 June
9:00 WP5 continuation and discussion as needed

Session 5: Integration and reporting
10:00 Integration of W3,4 & 5 (Icarus Allen)
Information flows, best practice and improvements. Further development and strengthening of linkages for final stage of the project.

11:00 Coffee

11: 30 Final reporting, structure and synthesis
Financial reporting (PML)

13:00 Lunch

14:00 Final discussion session as needed

Close of meeting