Marine Ecosystems Research Programme

Stakeholder Advisory Group meeting report November 2015

16 November 2015

The Marine Ecosystem Research Programme is funded by

NERC SCIENCE OF THE ENVIRONMENT

Department for Environment Food & Rural Affairs

MERP Stakeholder Advisory Group Report

16 November 2015, Manchester

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- **Becca Lowe to investigate whether the UK MSFD Indicators list can be made more widely available.**
- **SAG members to advise MERP on ways of engaging with organisations beyond just English ones.**
- **MERP to provide Defra 2-page summary for SAG comment/input.**
- **Kelly-Marie Davidson to provide list of KE outputs with details of intended audience.**
- **MERP to provide advance notice where possible of stakeholder engagement along with general updates on communication activities.**
- **SAG to be invited to any future Workshop organised by MERP to discuss impact (to be arranged via doodle poll).**
- **MERP to provide current list of policy issues to the SAG so these can be discussed at the next SAG meeting.** *See Table 1.*
- **SAG members to provide comments by email on activities for inclusion in scenario modelling.** *See Annex 3 for notes from recent MERP Workshop*
- **MERP to provide a summary of proposed map outputs including detail such as geographic range.**
- **Jessica Surma to provide SAG with next draft of the WP3 proposal.**
- ***MERP Project Manager to arrange another SAG meeting early 2016 for SAG members (+ one or two key individuals from MERP). All necessary materials to be provided in advance.*** *Date agreed for 23rd February 2016*

Background

The Marine Ecosystems Research Programme (MERP) exists to '*develop new understanding of the processes governing the dynamics of marine ecosystems, and how changes in them affect delivery of ecosystem services, from a whole ecosystem perspective*'. The Stakeholder Advisory Group (SAG) was established to advise the Programme Steering Committee on how to maximise the impact of the programme to societal stakeholders. The Terms of Reference can be found in Annex 1 and a list of SAG members in Annex 2.

Meeting background

The first meeting of the SAG was held in London on December 17th 2014 with the focus being on the TORs and SAG working methods. The aim of this meeting was to evaluate the delivery of the recommendations from the December 2014 meeting and agree recommendations for the next phase. Dr Frost noted that:

- Sam Burgess had left the Marine Management Organisation (MMO) and her replacement on the SAG was Dickon Howell (Acting Chief Scientific Adviser, MMO). For Defra, Carole Kelly is replaced by Becca Lowe.
- Members of the Programme Advisory Board (PAG) were also in attendance as observers.

SAG Activity Update

The main activities of the SAG were summarised as follows:

- The SAG have been kept up-to-date with MERP activities via the newsletters, biannual reports and the more detailed annual report.
- The SAG Chair has had regular meetings with the MERP Programme Leader and Project Manager.
- The SAG chair also attended the MERP Annual Science Meeting in Glasgow, presented the aims of the SAG and summarised the main identified policy issues.
- There was a specific workshop at the May Meeting looking at Ecosystem services. The SAG did not attend but were provided with the report.

It was noted that the SAG had, at the December 2014 meeting, agreed to focus on the development of Work Package 3. The delay in the WP3 call meant however that the SAG had not been given this opportunity resulting in SAG input being less than had been anticipated.

MERP science update for SAG

An overview of progress was provided by Dr Paul Somerfield (MERP programme leader). The key points from the discussion were:

- Data collated by MERP (biotic and abiotic) are a valuable resource for policy makers but it is important that an appropriate dialogue was established. As examples it is important that Defra release its list of MSFD indicators (to help MERP see what data would be most useful) and that MERP ensure actual policy makers are made aware of the resource, not just scientists or scientists embedded in policy organisations.

Action: Becca Lowe to investigate whether the UK MSFD Indicators list can be made more widely available.

- The SAG is pleased to see engagement by MERP scientists while the programme is in progress (rather than when the project is completed, which is what often tends to happen). There appears however to be significant engagement with English government departments (Defra) and agencies (MMO, Cefas) but not with the equivalent organisations in the Devolved Administrations.

Action: SAG members to advise MERP on ways of engaging with organisations beyond just English ones.

MERP KE and impact

The Knowledge Exchange (KE) work package leader (Kelly-Marie Davidson) presented the main KE activities with the following points being made:

- The SAG can submit articles for the MERP newsletter (or encourage others to do so) if they want to publicise policy and wider stakeholder needs and issues.
- The MERP website is not a record of MERP outputs only but focused on all information (e.g. papers, events) of interest to the MERP and wider community.

- The information provided to the SAG is often of a very detailed and technical nature and is not always useful (e.g. for new SAG members). The 2 page summary being produced for Defra's project reporting might be more helpful as a programme summary. Also it is not clear who all the KE outputs (website, MERP video, newsletters) are aimed at and this makes it difficult to assess their usefulness.

Action: MERP to provide Defra 2-page summary for SAG comment/input.

Action: Kelly-Marie Davidson to provide list of KE outputs with details of intended audience.

- More information is required on who MERP are engaging with as the SAG cannot facilitate communication or add value to current communication channels (e.g. by seeing if other people can be involved in MERP/stakeholder meetings) if not kept informed of current activity.

Action: MERP to provide advance notice where possible of stakeholder engagement along with general updates on communication activities.

Action: SAG to be invited to any future workshop organised by MERP to discuss impact (to be arranged via doodle poll).

MERP Policy

Dr Michaela Schratzberger showed a list of policy issues that MERP had compiled from various sources. The SAG believe a clear focus on a small number of priority issues is most helpful so are concerned that the refined set of policy questions provided by the SAG has now become a long list of issues. The SAG had not been shown the list in advance of the meeting so were unable to provide advice.

Action: MERP to provide current list of policy issues to the SAG so these can be discussed at the next SAG meeting.

The SAG will also respond to the request from MERP modellers on what activities should be included as drivers in the modelling as this issue was only raised at the meeting and requires some collaboration with colleagues. The SAG would also like further information on the maps being produced by MERP as there are a large number of projects nationally and internationally producing maps (habitats, species etc) and the added value of the MERP maps needs to be established.

Action: SAG members to provide comments by email on activities for inclusion in scenario modelling.

Action: MERP to provide a summary of proposed map outputs including detail such as geographic range.

Work Package 3 proposal

Jessica Surma from NERC stated that an announcement would be made on WP3 most likely in March or April 2016. WP3 will look at the socio-economic and social service aspects and focus on marginal changes rather than total valuation. The SAG feel that a decision support tool allowing the impact of different management decisions to be modelled and analysed would be very useful, even more so if it could take into account cumulative impacts. It could also potentially; inform the cost-benefit analysis used by Defra and others for decision-making (e.g. by using trends in economic value);

inform the mutli-criteria analysis used by HM Treasury; inform the development of novel evaluation procedures.

Action: Jessica Surma to provide SAG with next draft of the WP3 proposal.

General feedback and next steps

The SAG felt that there was not enough time at the meeting for a thorough discussion and analysis of the MERP stakeholder engagement (largely due to the large number of individuals present in addition to the SAG). Also, there were a number of important issues raised at the meeting but no advance notice had been given of MERP requirements and key documentation had not been supplied beforehand. A further meeting (early 2016) is required to:

- prioritise the policy issues
- review the maps from MERP to assess value
- develop advice to improve engagement with Devolved Administrations
- review the impact of the MERP KE activities

Action: MERP Project Manager to arrange another SAG meeting early 2016 for SAG members (+ one or two key individuals from MERP). All necessary materials to be provided in advance.

Matt Frost (SAG Chair) on behalf of the SAG.

Annex 1 – terms of reference (updated)

Marine Ecosystem Research Programme Stakeholders Advisory Group

Introduction

The Marine Ecosystems Research Programme is jointly funded by the Natural Environment Research Council (NERC) and the Department for Environment, Food and Rural Affairs (Defra). It is a five-year programme which brings together ten institutes from across the United Kingdom to address key knowledge gaps in marine ecosystem research. MERP is a highly integrated programme designed to develop new understanding of the processes governing the dynamics of marine ecosystems, and how changes in them affect delivery of ecosystem services, from a whole ecosystem perspective. The programme will bring together existing data and targeted new data and integrate these data with current models and knowledge of ecosystem services, to develop a common framework. The aim is to improve our understanding of the whole UK marine ecosystem and how the services humans derive from it will vary under different future scenarios. It will make step-changes in:

- marine macroecology, through applying the latest ecological theory coupled to novel integration of existing data using ecoinformatic approaches;
- marine ecosystem science, through targeted field sampling and experimental studies to address key knowledge gaps;
- marine ecosystem modelling, by enhancing our capacity to assess trophic and spatial controls on the structure of marine ecosystems through improving the representation of biodiversity and ecosystem function in models; and
- ecosystem services science, through use of macroecology and models to hindcast and forecast ecosystem states, indicators, and estimates of goods and services.

The programme will facilitate the development of a more accurate suite of marine ecosystem models and provide vital evidence, tools and advice to policymakers and environmental managers. Work will address the development and implementation of marine policy initiatives including the Marine Strategy Framework Directive (MSFD), the UK Marine and Coastal Access Act (2009), Marine (Scotland) Act (2010), Northern Ireland Marine Act (2013), Common Fisheries Policy and the OSPAR Joint Assessment and Monitoring Programme.

The Marine Ecosystem Research Programme Stakeholder Advisory Group (SAG) exists to:

- advise the Programme Steering Committee on how to maximise the impact of the programme for the wider community ;
- facilitate dialogue between scientists and users, identifying and prioritising topics with maximum potential impact for on-going development
- provide channels for consultation and dissemination to government departments and organisations representing sectoral interests relevant to the Programme;
- support the MERP community in placing the programme in a wider context to improve the scope and impact of its outcomes.
- ensure programme results are communicated in a timely manner and in a format relevant to end-users

Responsibilities

To monitor the progress of the project and make recommendations to the Steering Committee on:

- new and innovative ways to deliver science to stakeholders;
- networking with other projects and stakeholders to reinforce the results obtained in MERP;
- promotion of the results obtained in MERP across the network of contacts;
- advice on how to maximise impact of MERP results;
- provide advice and views on existing and emerging issues which may inform, or impact on, the Programme.

Working Methods

The SAG will attend at least one physical meeting per year, at the expense of the Programme. Other SAG interactions are expected to take place by conference call or electronic mail. The Coordinator will keep the SAG informed of project developments and outputs, providing access to the Programme website and all related documents. Group members may also be approached individually or collectively for advice or for targeted information exchange outside Stakeholder Group meetings.

The Stakeholder Group Chair will chair meetings and arrange for minutes to be taken and provided to the Programme Coordinator for broader discussion and dissemination.

The SAG will also be engaged at as early a stage as possible in all elements of the programmes development. This 'front-loading' allows the SAG to play a more active role in ensuring outputs are fit-for-purpose for stakeholders.

Stakeholder Group work plan

In order to make the best use of the Group's expertise, the following action plan is proposed:

- the recommendations will be taken to the next SC meeting, assessed and if accepted they will result in tasks/actions for either the Programme community
- feedback on Programme activities will be provided prior to the Annual Meeting so that recommendations can be discussed by the community
  the Coordinator will be responsible for the follow-up of the recommendations and tasks/actions

Confidentiality

Members of the SAG are privy to materials in the conduct of their duties that may be confidential in nature or not for wider distribution. All materials shared with the SAG are assumed to be confidential, unless otherwise stated.

Annex 2 – SAG members

Name	Organisation
Matthew Frost (Chair)	Marine Biological Association
Edward Ross	Marine Scotland
Lyndsay Dodds	Celtic Seas Partnership
Dickon Howell	Marine Management Organisation
Dale Rodmell	National Federation of Fishermen's Organisations
Peter Barham	Seabed Users Group
Kirsten Ramsay	Natural Resources Wales (NRW)
Steve Gibson	Joint Nature Conservation Committee (JNCC)
John Baxter	Scottish Natural Heritage (SNH)
Mark Dickey-Collas	ICES

Meeting Participants

John Baxter (SNH, SAG)

Adam Cook (MMO, SAG)

Mark Dickey-Collas (ICES, SAG)

Lyndsay Dodds (CSP, SAG)

Matt Frost (MBA, SAG)

Kirsten Ramsay (SNRW, SAG)

Dale Rodmell (NFFO, SAG)

Christopher Sweeting (MMO, SAG)

Icarus Allen (PML, MERP)

Melanie Austen, (PML, MERP)

Kelvin Boot (PML, MERP)

Kelly-Marie Davidson (PML, MERP)

Mark Emmerson (QUB, MERP)

Jessica Heard (PML, MERP)

Mike Heath (University of Strathclyde, MERP)

Michaela Schratzberger (Cefas, MERP)

Paul Somerfield (PML, MERP)

Tom Webb (SU, MERP)

Tasman Crowe (University of Dublin, PAG)

David Raffaelli (University of York, PAG)

Mike St. John (PAG)

Rebecca Lowe (Defra)

Jessica Surma (NERC)

Table 1. MERP priority list of policy questions/demands from various sources

Policy question/need	Org.	Spatial scale	Timeline
State of food webs (or its components) in relation to specified targets			
Are we achieving Good Environmental Status (GES) for MSFD Descriptors at regional scales?	MBA	UK/Celtic Seas & Greater North Sea subregions	First nat. assessm. due 2018 (Ospar IA in 2017)
Are we achieving Conservation Objectives (COs) for species and habitats at local MPA scales?	IFCAs?		Ongoing
What is the relationship between ecosystem services and Good Ecological/Environmental Status?	NRW	UK	Ongoing
Identification of areas of particular importance to fish populations	MMO	UK	Indeterminate
How can we define and describe biodiversity hotspots?	MMO	UK	Indeterminate
Seasonal bird densities and key foraging areas	MMO	UK	Indeterminate
Effects of natural and anthropogenic change on the state of marine food webs and the services they provide			
How does the removal (e.g. by tidal lagoon projects) or alteration (e.g. by towed fishing gears) of benthic habitat affect populations of marine mammals and birds (those mammal and bird species included in Habitats and Birds Directives)?	NRW, SNH	UK	Ongoing
What are the impacts of removal of fish prey species on marine bird and mammal populations (Habitats and Birds Directives)?	NRW, SNH	UK	Ongoing
How to evaluate cumulative impacts, especially for mobile species (to ultimately create the ability to carry out strategic assessments through marine planning or SEA that consider the capacity of marine mammal and bird populations to cope with cumulative impacts across their biogeographic range)?	NRW, SNH	UK	Ongoing
How do impacts on rare and/or threatened habitats and species affect ecosystem services (especially for BAP/OSPAR habitats and species but also Habitats Directive/SSSI habitats and species)?	NRW	UK	Ongoing
Future state of marine food webs and ecosystem service provision under scenarios reflecting management situations in UK waters			
What are the effects of changes in fisheries management on the environment, in particular through food web effects?	MSCC etc.	UK	Indeterminate
What are the responses of indicators to specific management measures for MSFD descriptors?	MSCC etc.	UK	Indeterminate
What are future changes in ecosystem services in response to different management scenarios?	MMO	UK	Indeterminate
What is the impact of (multiple) MPA closures on fisheries and recreation?	MMO	UK	Indeterminate

Setting Common Scenarios session

Session aim: To develop a preliminary list of MERP scenarios driven by the policy questions as discussed with the SAG.

What are we going to do with these scenarios…

Model sensitivity analysis

of multiple ecosystem services,

with respect to multiple anthropogenic factors (individually and cumulatively),

over given time and space scales,

in a given geographic and climate context.

Key issues…

Policy/societal relevance/motivations

What are the tensions and trade-offs between services – ie. Cascading trophic effects?

Do different models tell different stories?

Identify remaining knowledge and modelling gaps

High impact publications

Figure out how to frame and present advice to stakeholders

Reminder of ecosystem services agreed at Drymen meeting:

- **Food provision**
  - Yields of fish/shellfish/macroalgae…
- **Leisure and recreation**
  - Top-predator populations, fish populations (sea angling), eutrophication (water quality)…
- **Bioremediation**
  - Denitrification, organic burial, phosphorus immobilisation..
- **Biological checks and balances**
  - Disease and parasite dynamics as population regulation processes…

Each MERP model needs to be able to output simulated data enabling quantification and/or valuation of one or more of these services and processes

Anthropogenic factors

The factors were suggested by the SAG and generally agreed by the workshop group:

- Top issue – physical disturbance of the marine environment by – towed fishing gears, aggregate extraction, dredging, disposal and cable laying, offshore structures
- Harvesting of biomass, gear selectivity, landing obligation, by catch mortality
- Disturbance by leisure and tourism, shipping, noise
- Nutrient inputs (rivers, atmospheric, direct discharges)

Each MERP model needs to include external driving factors which mimic or represent multiple anthropogenic factors from an agreed list

The group discussed which areas they could be best feed into:

- **Fisheries:** most models could provide information. Population consequences models are being developed, can look at better understood top predators

- **Disturbance: it is difficult to** deal with the multiple impacts of multiple uses over small spatial scales e.g tidal lagoons, dredging. How do small scale regional impacts interact with each other and are there broader regional impacts. The Consortium needs to think about at what scales we can apply disturbance? Benthic disturbance can be explored at whole shelf scale. Need to take a different approach for example wind-farm scales. MERP does not model noise but does model the effects of noise. Could do a sensitivity analysis to look at impacts at whole system scale. However noise not a key priority for MERP as this is not an area we have expertise in. Lots of impacts about sub lethal effects but these are very hard to model.

Moving forward discussion:

- What can our models tell us already? E.g. how can be model noise with what we have?
- Not all models have to be dynamic. Different models can tell us different things.
- Need a taxonomy of models, and mapping exercise to understand what each model does, how do they map on to the scenarios. Match our model understanding to key questions - this has partly been done through the Hyder paper.
- How do we tweak our models to give us the answers we need?
- What the models can do depends on the type of model – it is necessary to look at perturbations in aggregated groups.

Time, space and taxonomic resolution (graininess)

These are dictated by policy drivers/motivations:

- MSFD/Good Environmental Status
  - Assessments at regional sea scales, annual time scales, maybe at aggregated taxonomic resolution, but data and models need to integrate variability occurring at smaller scales
- Habitats and species
  - Requirement to resolve key species of interest/concern, and key habitats, but potentially at annual time resolution?
- Marine Protected Areas/Spatial Planning
  - Specifically addressing questions at the scale of individual MPAs – 1-10s of km, and key species, at fine time resolution

It was agreed that there were basically two temporal scales the modellers could work at with a whole system view (something with a climate drive) to get large scale regional averages. From that there is a subset of perturbations that could be done at different scales.

Geographic and climate context

Dictated by the space and time scale of policy motivations …

- MSFD/Good Environmental Status
  - Generally regional sea space scale, longer/strategic time scales (20-50 years) – hence requiring consideration of shifting temperature / salinity / advection / diffusion / CO2 context
- Habitats and species
  - Generally regional sea space scale, longer/strategic time scales (20-50 years)?
- Marine Protected Areas/Spatial Planning
  - Generally small scale and shorter time scales – effectively disregarding climate trends

Different MERP models for large and small scale geographic context. Where relevant, MERP models will need to be capable of reflecting trends on environmental conditions reflecting climate changes.

Other comments

- Assembly of VALIDATION data sets of each geographic/climate context
- Need to horizon scan the models to determine what time/space and taxonomic graininess of validation data are needed
- With regards to the model ensemble: it does not rely on all the models producing outputs in the same form, there are mechanisms to pull outputs together that are the same scenario but producing different information on that scenario

Next steps

- List the anthropogenic factors
- For each MERP model…
  - What input data are needed to set/mimic/caricature the agreed anthropogenic factors
  - What regional and climatic context is possible and what input data are needed to enable these configurations?
  - What space/time and taxonomic graininess is possible?
  - Exactly what outputs are available to inform on ecosystem services?
- Which models can be 'clustered together' and run with common/equivalent/comparable geographic/climate setup and anthropogenic drivers?

Continued discussions on how to develop and agree common scenarios took place in a smaller break out group, outcomes of which are provided below.
Present: Icarus Allen, Mel Austen, Mike Heath, Sheila Heymans

The group discussed how best to develop suitable scenarios for the MERP community, summarised in the table below:

					What aspects can models output on?	
Components of scenarios to be simulated in models	scales			**notes** *things* that could be simulated in models	spatio-temporal scales	habitats and species
Fleet model (Mike Heath example)				12 different fishing gears, activity rate per gear, selectivity per gear, effort proportional to harvest ratio, plough rate per gear, area dredged per gear, spatial distribution of activity across 6 habitats of model, proportion of area ploughed, spatial distribution of discard deposition on seabed, whole system harvest rate per fish group, catch removed as landings, climate context from ERSEM model		
Demersal trawl fisheries	low intensity	medium intensity	high intensity	target species/aggregated biomass extraction, aggregated bycatch changes, species specific bycatch change, physical impacts on sediment/benthos/benthic process, landing obligations - proportion of catch returned to sea (offal and non quota species not subject to landing obligations)		
Static fisheries	low intensity	medium intensity	high intensity	target species/aggregated biomass extraction, bycatch changes, specie specific bycatch change, landing obligations		

Landing obligation						
By catch mortality						
Spatial exclusion through MPA - highly restricted activity	small area	large area	multiple areas	spatial effects?	far field/near field	
Exclusion through MPA weakly restricted activity	small area	large area	multiple areas	spatial effects?	far field/near field	
Spatial exclusion due to structures (Marine renewable energy)	small area	large area	multiple areas	spatial effects?	far field/near field	
Closure of UK sea space (MPA as % of UK waters)	30%	20%	10%			
climate scenarios	1	2	3			
Nutrient enrichment	1	2	3			
construction phase noise	small area	large area	multiple areas	spatial effects?	far field/near field	

Domains

where (domain)	spatial scale	0/1/2/3d	what can/will be manipulated (e.g. of Mikes list)	what can/will be manipulated additional to Mike's list
			• 12 different fishing gears, • activity rate per gear, • selectivity per gear, • effort proportional to harvest ratio, • plough rate per gear, • area dredged per gear, • spatial distribution of activity across 6 habitats of model, • proportion of area ploughed, • spatial distribution of discard deposition on seabed, • whole system harvest rate per fish group, • catch removed as landings, • climate context from ERSEM model	