

# UKMMAS News

Updates from the United Kingdom Marine Monitoring and Assessment Strategy Community

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UKMMAS

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The UK Marine Monitoring and Assessment Strategy aims to shape capacities for understanding the state of the marine environment through coordinated and integrated marine monitoring programmes and assessment initiatives.

UKMMAS provides vital data and information necessary to help assess progress towards achieving the UK's vision of clean, healthy, safe, productive and biologically diverse seas.

## Feature Topic

### Improving assessment of eutrophication using SmartBuoy

Naomi Greenwood and David Mills, Cefas

Assessments of eutrophication are necessary to meet the requirements of a range of international (OSPAR) and the EU legislative drivers. This requires a marine monitoring programme designed to meet the requirements of formal assessment procedures whose outcome may be challenged in court. Historically, monitoring programmes have relied on survey vessels to collect water samples offshore and carry out *in situ* measurements. Survey vessels provide good spatial coverage but low spatial resolution. In order to improve the evidence base for eutrophication assessments new monitoring strategies have been introduced to resolve the higher

frequency and episodic variability characteristic of our coastal waters. In order to provide high frequency data from discrete locations, Cefas has developed SmartBuoy (Figure 1), an autonomous, instrumented mooring which provides high frequency measurements of physical, chemical, biological and ecological variables (Table 1) in near surface waters. Data are returned in near real-time and published on the internet ([www.cefas.co.uk/monitoring](http://www.cefas.co.uk/monitoring)). SmartBuoys have been deployed operationally in the southern North Sea since 2000 and in the Irish Sea since 2002 and the network currently comprises seven SmartBuoys (Figure 2).



Figure 1. SmartBuoy ready for deployment

Moorings are serviced at intervals between 1 and 2 months when measurements are made alongside the moorings to gather independent data sets for calibration of SmartBuoy sensors.

Table 1. Parameters collected by SmartBuoy

Variable	Sample Frequency
Salinity Temperature Chlorophyll fluorescence Turbidity PAR irradiance Dissolved oxygen	1 Hz in 2 x 10 minute burst/hour Data acquisition and control via ESM-2
TOxN (total oxidisable nitrogen)	Up to every 2 hours
Dissolved silicate	Up to daily
Phytoplankton counts and composition	Every 4 days

The data obtained to date from SmartBuoy illustrate the importance of high frequency (> daily) measurements of variables such as dissolved nitrogen concentration (ToxN) and chlorophyll concentration to resolve the full scale of variability, including episodic events, in chemical and biological parameters in coastal seas. The wide range of concentrations encountered over short periods of time, especially during the winter period, means that low frequency ship-based observations fail to capture the full range of environmental variability.



Figure 2. Locations of SmartBuoys

Legislative requirements to demonstrate compliance with regulations (such as not exceeding specific concentrations of key parameters) and to demonstrate the environmental response to pollution control measures demands an understanding of this variability. The results of nutrient measurements from SmartBuoy in the Thames Estuary clearly demonstrate that high frequency variability in the concentration of TOxN is not reliably captured by lower frequency measurements. SmartBuoy is just one of a range of relatively novel observational systems that are providing data to be used in environmental assessments.

Satellite derived temperature and chlorophyll estimates together with the so-called FerryBox approach are beginning to be used to further bolster the evidence base for assessments. These approaches are moving us from a data poor to a data rich situation where new approaches are required to integrate data sets that are disparate in space and time. The European Marine Ecosystem Observatory (EMECO; [www.emecogroup.org](http://www.emecogroup.org)) is beginning to address this challenge and is developing web based tools to create new knowledge and better evidence based on these new data sets.

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## **UKMMAS Updates**

### **Charting Progress 2**

Stephen Malcolm, Chair, Charting Progress 2 Steering Group

We are making significant progress with Charting Progress 2 and expect to have a first semi-polished draft available in December. This looks achievable but means there is no let up on the key individuals who have already put in a lot of great effort. The challenge is now to ensure that all of the evidence that has been collected, summarised and assessed is reflected in the overall conclusions about the state of our seas and the progress we are making since the first report in 2005.

It is becoming clear that seeing what progress has been made is the easy task while assessing the state of the seas is still a bit of a challenge. This is because we are still developing indicators and discussing what we mean by the clean and safe, healthy and productive and biologically diverse components of the overall vision. Charting Progress 2 will point at the answers but with the advent of the Marine Strategy Framework Directive these will need to be refined further.

We are also starting to prepare the overall style and shape of the report with thought going into formats, layouts and importantly illustrations. Charting Progress 2 will be an attractive publication and we are looking out for great pictures and illustrations that both tell particular stories and provide a high quality backdrop. The last meeting of the Editorial Group marked a significant change from production to editing of the material. Gabrielle Walker, a well-respected science writer, is busy working through all of the evidence contributions with a view to making our text accessible and easy to read. It is also very useful to be challenged on the emergent messages by someone who has not been involved in the process to date.

Finally, providing a bit of relief to the final stages of publishing the report, MAPC has decided that it would be sensible to delay the publication of CP2 and the Feeder Reports until July 2010. However, we are still working to a demanding timetable.

## Call for CP2 photos!

The CP2 Editorial team are on the lookout for photographs to include in the report. We are interested in high quality photos of UK coastal views, marine habitats and species, and industry activities. If you can supply photos please contact [david.cook@defra.gsi.gov.uk](mailto:david.cook@defra.gsi.gov.uk) by **8<sup>th</sup> January 2010**. We are unable to pay for photos but will acknowledge the source and / or photographer.



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## Charting Progress 2 – Stakeholder workshop

David Cook, UKMMAS Secretariat

A workshop was held on 19<sup>th</sup> August in Reading to present to stakeholders the main findings of the CP2 Feeder reports. The event had the following aims;

- To inform stakeholders about how the Feeder reports were produced and share summaries of the evidence and key findings
- To check whether stakeholders had any robust evidence that had been overlooked
- To provide a forum for feedback and to address any questions or concerns stakeholders may have had about the reports

Over 50 people took part, including representatives from industry groups, NGOs, fisheries organisations, Government Departments and Agencies, and the UKMMAS community. Participants were asked to provide feedback on the reports through comments added to posters displaying the main conclusions of each report chapter, and during breakout session discussions.

### Feedback and responses

Stakeholders provided useful feedback; identifying possible gaps and overlooked evidence sources; challenging key findings; and suggesting improvements to the presentation of the evidence. A number of changes have been made to the reports in response to this feedback, examples include; the redrafting of the PSEG report

introduction to clarify the approach taken by the Evidence Group; the addition of further detail on carbon budgeting of marine aggregate activities to the PSEG Mining chapter; and the inclusion of a study relating to hazardous substances in the CSSEG report. Other comments described the type of final product participants would like to see, such as a report rich in illustrative material, and the use of maps to display the differences between marine industry and impacts across the Charting Progress regions.

## **Outcomes**

The workshop has raised the profile of CP2 among industry and NGOs. Attendees will obviously now be aware of the report and its expected launch time, and through providing presentation slides to those requesting them attendees will be able to make colleagues aware of CP2, its policy context, and the findings of the Feeder reports. Holding the workshop has contributed to stakeholder “buy-in” to CP2. At the workshop a transparent assessment process was presented, which includes a lengthy independent peer-review. Stakeholders were provided an opportunity to give input into the evidence base and review and challenge report conclusions. In doing this the UKMMAS has secured the support of stakeholders who at the very least understand the process and the challenges and in some cases may now feel a degree of ownership towards the reports, resulting from the use of their constructive input.



Workshop participants viewing posters displaying the key findings of Feeder report chapters

The event has contributed towards the UK’s high level marine objective outcome of providing all those who have a stake in the marine environment an opportunity to give input into associated decision-making. Workshops are a useful forum for stakeholders to hear the views of other organisations. All questionnaires answered after the event noted the importance of hearing the views of other attendees.

## **Lessons learned**

It was a challenge to convey the findings of lengthy Feeder report chapters in presentation sessions. Many participants felt that the morning presentation sessions were too long, expressing a preference for longer interactive sessions. Attendees were not given sufficient time to view report summaries in advance. Access to the full report chapters would have improved the ability of attendees to provide detailed

feedback. In future evidence base workshops it would be useful to make full report chapters available to stakeholders in an online format, well in advance of an event. By making the assessments available in advance presentations could be reduced to headline messages.

The OSPAR Commission will be holding an online consultation during November to present the draft Quality Status Report 2010 to all interested parties. The Secretariat will pay close attention to the outcomes of this method of engagement.

**The Secretariat would like to thank all UKMMAS community members who took part in the event for their hard work to make the workshop a success. I would like to thank those who provided information and support during my MSc project placement.**

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## **UKMMAS Groups**

### **Clean and Safe Seas Evidence Group**

Robin Law, Cefas

The Clean and Safe Seas Evidence Group's feeder report for Charting Progress 2 is essentially complete. Final comments are being incorporated into individual chapters, a process which should be complete within a couple of weeks. The four feeder reports will not, however, be published ahead of the Charting Progress 2 report itself – all five documents will be freely available in July 2010. Meanwhile, work has continued on the CSSEG chapter for CP2. Highlights from the feeder report have been compiled and the plain text is with the editor for comment. Current activity is focused on identifying the illustrations (graphs and figures) from the feeder report chapters which best help to convey the messages to the general reader. Incorporation of these and of relevant photographs awaits design guidance for Charting Progress 2 itself, as a similar style will be applied to the feeder reports.

### **CSEMP Redesign Progress**

Thomas Maes, Cefas

The Clean Seas Environment Monitoring Programme (CSEMP) redesign was initiated in 2005 to improve efficiency, coordination and integration with national and international monitoring drivers and the ability of the programme to give unbiased results for larger areas. The new programme should be able to detect a 50% decrease in contaminant concentration in 10 years, which equates to 7 or 8% detectable difference in concentrations yearly. Pilot surveys were necessary to gain estimates of the variation between stations within the strata and used in power studies which help determine the number of samples that need to be taken. The optimum number of observations will vary between pollutants. We focussed on Polycyclic Aromatic Hydrocarbons as those are the contaminants of greatest concern in current assessments. An internal CEFAS meeting with experts from different fields took place on 21<sup>st</sup> October during which we discussed how the issue should be tackled in practice. Possible spatial and temporal scenarios were

developed which are currently being tested for their statistical power. The outcome of the statistical tests will indicate the best scientific scenario, but meetings between DEFRA and other Competent Monitoring Authorities will have to determine the UK's final approach (Joint meeting to be held February/March 2010).

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### **Healthy and Biologically Diverse Seas Evidence Group**

Sophie Green, British Geological Survey

A HBDSEG meeting was held at the Scottish Environment Protection Agency (SEPA) on October 7<sup>th</sup> 2009. HBDSEG are close to completing their contribution to Charting Progress 2 and an update on progress was provided by the editor, Matt Frost. It has become clear that some important lessons can be learnt from undertaking this ambitious assessment of the state of UK seas. These lessons will be taken forward through an action plan for the group and through discussions with the other Evidence Groups.

The group has also been working to identify effective indicators of environmental state and impacts, human pressures that cause change and important aspects of marine ecosystem structure and function. This project covers a wide biological scope and is evaluating indicators against standard scientific and economic criteria through the use of an online database. The group is currently reviewing 7 draft indicator reports which will be used in future as a basis for identifying a suite of indicators for UK marine biological monitoring.

HBDSEG Members David Connor and Ian Mitchell are involved in a Marine Strategy Framework Directive (MSFD) expert task group set up by the International Council for the Exploration of the Sea (ICES) and Joint Research Centre (JRC). This group is working towards identifying criteria and methodological standards for the assessment of Good Environmental Status (GES) under the EU MSFD by March 2010. HBDSEG had some very productive discussion on what achieving GES might mean and how this may affect the group with regards to future monitoring and assessment requirements and their work programme.

The National Marine Biological Analytical Quality Control Scheme (NMBAQC) presented an annual update on their extensive work programme to the group; identifying new schemes and pilots developed for biological elements such as epibiota, macroalgae and fish, together with proposals for future work. This is an area of great importance to HBDSEG and its success will contribute to the production of high quality evidence for the status assessments undertaken by the group.

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### **Productive Seas Evidence Group**

Jim McKie, Marine Scotland

Much of the summer has been spent completing the Feeder report and the Chapter for CP2; are we really moving into that life after period! The last PSEG meeting was

held on the 4th November in London. Amongst the agenda items were: a post production lessons learnt session on the Feeder report; discussions on a future PSEG project which we hope will add value to tackling the requirements of the MSFD, in particular Article 8.1(C) and considering what contributions the group could make to a Crown Estate's project on assessing Total Economic Value.

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### **Ocean Processes Evidence Group**

Adam Mellor, Agri-Food and Biosciences Institute

The Ocean Process Evidence Group (OPEG) has held its first two full meetings. The terms of reference for the group have been agreed, as has the division of work areas with respect to the other evidence groups. Alongside a comprehensive review of national, European and global ocean process monitoring, the group has considered specific ocean monitoring needs relating to climate mitigation and adaptation such as long term monitoring of ocean temperature through the ARGO float programme and the implementation of international ocean carbon monitoring.

In addition to contributing to CP2, one of the key tasks OPEG will be addressing will be the formulation of a strategic plan identifying priorities for future monitoring of ocean processes.

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### **Seabed Mapping Working Group**

Sophie Green, British Geological Survey

Bob Gatliff of HBDSEG's Seabed Mapping Working Group presented progress with their draft report detailing the current knowledge of the physical characteristics of the seabed. Proposals are being drawn up that will detail the options available to improve coverage of the seabed through more integrated and coordinated survey using the latest technologies. This is an important piece of work which the group has recently commented on and which they aim to sign off for further consideration by MARG during a meeting to be held in January 2010.

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### **OSPAR Quality Status Report 2010**

Richard Moxon, Defra

The QSR 2010 is progressing well and the OSPAR Secretariat has worked hard to compile draft 2 which is subject to an ongoing peer review and online consultation. The UKMMAS Secretariat has reviewed the key findings of the draft QSR to compare its conclusions with those emerging from the CP2 Feeder reports. To take part in the consultation visit <http://www.ospar.org/> and follow the link to e-consultation. The closing date is 30<sup>th</sup> November.

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## Marine Strategy Framework Directive

David Cook, UKMMAS Secretariat

The introduction of the Marine Strategy Framework Directive (MSFD) will require the redesign of UK monitoring programmes to deliver evidence for ongoing assessment of the environmental status of our marine waters against the environmental targets that will be established under the Directive. At the last meeting of MARG members highlighted that a structured work plan was needed to take account of new monitoring requirements that will arise from the MSFD. It was agreed that a time limited working group will be set up to address these issues. The Group will include representatives from the Evidence Groups, MARG and the Defra MSFD policy team. The Secretariat is preparing draft terms of reference for the group, which will be chaired by Richard Moxon.

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### Staff changes at the UKMMAS Secretariat

Since the summer edition Alison Kerrigan has gone on maternity leave. Lauren Rose Kerrigan was born on Sunday 13<sup>th</sup> September, 5 days overdue, weighing 7lbs 11.5oz. Best wishes to Alison and family from the UKMMAS community, we look forward to seeing you soon!

We welcome David Cook to the Secretariat. David completed a placement during the summer period as part of his MSc degree, and will be with the team until summer 2010.

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### UKMMAS Meeting Calendar

8 <sup>th</sup> December 2009	CSSEG meeting, SEPA, Edinburgh
10 <sup>th</sup> December 2009	9 <sup>th</sup> CP2 Steering Group meeting, Defra, London
20 <sup>th</sup> January 2010	15 <sup>th</sup> Marine Assessment and Reporting Group (MARG) meeting, Defra, London

#### Next issue - UKMMAS News No.10

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Ideas and contributions for future newsletters are always welcome!

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