

Update report to the Ministerial Marine Science Group (2013)

UPDATE PROGRESS REPORT - THE MARINE SCIENCE CO-ORDINATION COMMITTEE

Summary:

The work of the Marine Science Co-ordination Committee (MSCC) is overseen by the Ministerial Marine Science Group. This report to the Ministerial Group outlines the progress that the MSCC and its working groups have made in the delivery of the UK Marine Science Strategy, from September 2012 – August 2013.¹

The UK Marine Science Strategy sets out a 15 year vision. The MSCC's activities to deliver the Strategy span a wide range of scientific and practical actions and continue to be pursued within the context of the current financial constraints. Many of the MSCC's recently initiated actions are directed at more cost effective ways of delivering key outcomes. Total public spend on marine science in 2012/13 was £170.5m, a decrease of 7.5% on the previous year's total of £184.4m; details of marine science spend by MSCC member organisations for 2012/13 is provided at Annex I.

The MSCC has, over the past 12 months, provided input to the House of Commons' Science and Technology Committee's inquiry into marine science² and has undertaken its own internal review³ of MSCC priorities, operation and structure. This work has clearly highlighted the support that exists for MSCC work amongst its members, the value of the outputs it provides, and the desire of others, notably industry, to be more involved in its work.

This report highlights key activities and outcomes delivered by the MSCC over the past 12 months, as well as examples of coordinated work between MSCC members. These include:

Joint working with industry

MSCC has worked increasingly closely with industry to deliver economic and scientific benefits, through jointly funding a Government-industry needs and capability study which has led to: identifying the potential for closer public/private sector working to secure economic opportunities in international markets and joint working between the Marine

¹ Details of the MSCC's delivery of the UK Marine Science Strategy and related actions for Feb 2010 – Sept 2012 are provided in the previous Annual Progress Report to Ministers (<http://www.defra.gov.uk/mscc/files/Ministerial-Marine-Science-Group-report-2012.pdf>)

² The Government's contribution to the Select Committee's inquiry (written evidence, oral briefing and Government's Response to the Select Committee' report) is available online at: <http://www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/inquiries/parliament-2010/marine-science/>

³ The report of the MSCC Review was published in August 2013. <http://www.defra.gov.uk/mscc/files/MSCC-Review-report.pdf>

Industries Liaison Group (MSCC working group) and the Department for Business Innovation and Skills led Marine Industries Leadership Council.

Development of new technologies

Market research suggests autonomous underwater vehicles will generate a multi-million pound market. MSCC members have successfully secured significant funding for developing this sector, with Natural Environment Research Council (NERC) receiving a £10m capital allocation for marine autonomous systems technologies, and are actively working with industry, the Technology Strategy Board and others to take forward this work area jointly.

Co-ordination of Marine Research Vessels

Marine research vessels are essential for marine science. They are also costly facilities to maintain and operate, particularly with recent increases in marine fuel prices. An MSCC Marine Research Vessels Group, composed of Government vessel owners, has produced an assessment of how to manage and operate the 7 large-scale (>50 m) Government marine research vessels more efficiently across the UK. The assessment highlighted the timeframe for future decisions and the need for owners to jointly plan the future direction of travel for the UK fleet as a whole. The assessment has generated a number of co-ordinating activities that should lead to national cost savings. Although the assessment has now been completed, the group will retain oversight of the ships operating around the UK. A Liaison Group will carry out more detailed investigation of the extent to which industry should be involved in UK marine research vessel provision and operation.

Effective marine monitoring

MSCC partners have worked closely to identify opportunities for cost savings through greater co-ordination of monitoring between Government bodies, through the UK Marine Monitoring and Assessment Strategy (UKMMAS), and with industry, through the recognition that new technologies might offer savings, and through the sharing of resources. UKMMAS has been strongly involved in the development of monitoring programmes to enable assessment of the targets and indicators developed for the UK implementation of the EU Marine Strategy Framework Directive. Further MSCC initiatives, such as the UK Integrated Monitoring Observing Network (UK-IMON), offer the potential for efficient, co-ordinated, high quality approaches to observation and monitoring of the marine environment.

Marine Environmental Data and Information Network - access to data

The Marine Environmental Data and Information Network (MEDIN) continues to be an important data resource which benefits both public and private sectors. An independent review has taken place during the year, to assess whether MEDIN is achieving its objectives,

to identify how any barriers can be addressed and help to determine future priorities. The review has made a series of recommendations which are currently under consideration.

Joint research programmes

MSCC partners have continued to work closely together, to deliver joint world class, cutting edge research, for example on shelf seas and deep ocean biogeochemistry. This work will play a key role in helping to understand and manage the marine ecosystem more effectively.

Communication of marine science

The MSCC has continued to encourage the sharing of news of new marine science developments by the marine science community through its Marine Ripple Effect (MaRE), which is an email and Twitter-based news alert system. Subjects highlighted have ranged from a report on the largest pod of sperm whales ever seen in the North Sea to the launch of an on-line Atlas detailing the current and future state of the European marine environment. Awareness of marine science developments is increasing as the number of recipients for MaRE steadily grows.

Further details of activities undertaken by the MSCC are outlined in the body of the report.

Implementation Plan

The MSCC will publish an Implementation Plan early in 2014, which captures all the actions being currently undertaken by the MSCC, provides a transparent record of progress and will include success indicators and longer-term objectives spanning a 10 year period. The implementation plan is being developed in line with a commitment by the Government, made in response to a recommendation by the House of Commons' Science and Technology Committee's inquiry into marine science. This approach should reinforce MSCC's existing mechanisms and help to provide greater accessibility to information for outside interests.

Next steps:

The MSCC will be focussing over the next year on a number of issues:

- **new marine science priorities** - these will include: an increased focus on Government working with industry and its contribution to the growth agenda; the development and use of new technologies; and a strengthened UK competitive presence in international marine science markets.

- **Strengthened action on existing priority marine science issues** - such as monitoring (including understanding of natural and climatic change in the marine environment), data access, the increased use of socio-economics and communications.
- **Horizon scanning** – the MSCC will work closely with Learned Societies, industry and others to identify future needs for UK marine science.
- **Awareness raising of MSCC activities** - the MSCC will seek to increase awareness of its wide range of actions and will pro-actively identify opportunities for greater co-ordination and engagement with external bodies and individuals.
- **Revised delivery structures** – the MSCC will establish a small Executive Committee to help drive forward the delivery of the UK Marine Science Strategy and wider work of the MSCC with greater focus and speed.

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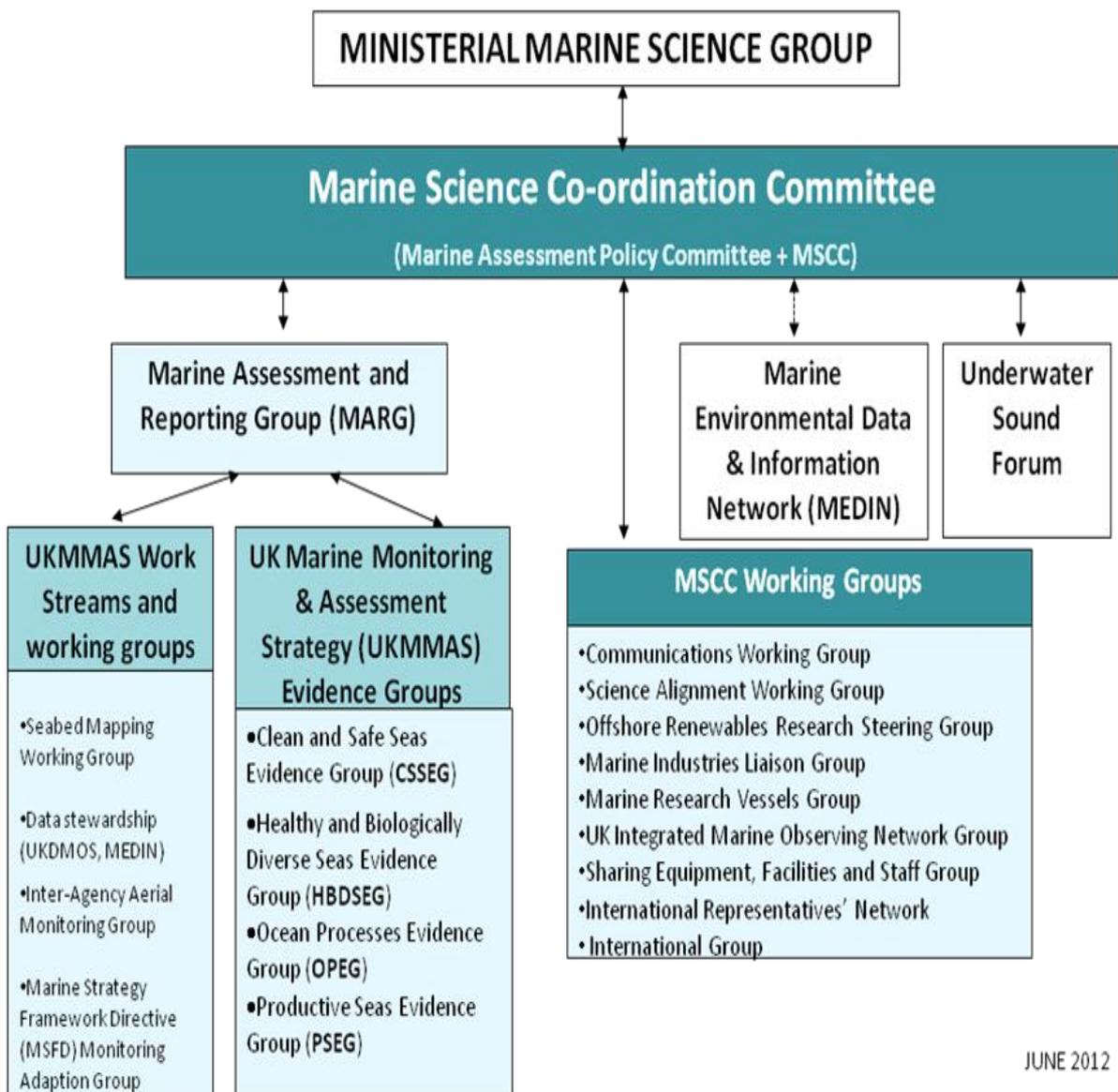
Introduction

The report covers:

1. Delivery of the UK Marine Science Strategy	7
1.1 Background to the Strategy	7
1.2 High level science priorities – progress with delivery	7
1.3 UKMMAS – UK Monitoring and Assessment Strategy	9
1.4 Progress with addressing the three key barriers:	10
1.4.1 Alignment of science effort	11
1.4.2 Sustained long-term monitoring	13
1.4.3 Communications	14
1.4.3.1 Communications Strategy	14
1.4.3.2 International Network	15
1.4.3.3 International Group	15
1.5 Working with others to deliver outcomes on:	16
1.5.1 Effective access to data	16
1.5.1.1 MEDIN	16
1.5.1.2 Other data access activities	17
1.5.1.3 The Underwater Sound Forum	18
1.5.2 Future skills needs	18
1.5.3 Development of a Marine Industry Strategic Framework	19
1.6 Horizon scanning and future actions:	19
1.6.1 Horizon scanning	19
1.6.2 Further Strategy actions	20
2. Other activities undertaken by the MSCC	23
2.1 Links with the marine science community:	23
2.1.1 Research & Academic sector link	23
2.1.2 NGO sector link	23
2.1.3 Industry sector link (MILG)	23
2.2 Website development:	24
2.3 Join-up with other organisations	24

2.4	MSCC Review	24
2.5	Implementation Plan	25
2.6	Success indicators	25
2.7	Public Sector Expenditure	25
Annex 1: Marine science expenditure 2012/13		26

Structure of the Marine Science Co-ordination Committee



JUNE 2012

1. Delivery of the UK Marine Science Strategy

1.1. *Background to the UK Marine Science Strategy*

The UK Marine Science Strategy is a framework for co-ordinating the delivery of world class marine science for the UK. It does so by identifying science priorities and addressing key barriers to delivery. The 15 year Strategy (2010 – 2025) is delivered by the MSCC with its delivery overseen by the Ministerial Marine Science Group. The establishment of the UK Marine Science Strategy was welcomed by the recent House of Commons Science & Technology Select Committee in its report of its inquiry into marine science (2013).

1.2. *Delivery of the high level science priorities:*

The UK Marine Science Strategy identified three high-level science priorities:

- *Understanding how the ecosystem functions;*
- *Responding to climate change and its interaction with the marine environment;*
- *Sustaining and increasing ecosystem benefits.*

The high-level science priorities continue to be taken forward through MSCC members' individual and joint research programmes, monitoring/observations work and via related initiatives. Examples of current activities are provided below. The UK also secures European and international research funding and has strong links through international initiatives with other countries' research bodies. The UK cannot service all its marine science evidence needs from within its own resources and these activities help to supplement both its funding and knowledge.

a) Understanding how the ecosystem functions:

Management decisions, such as marine planning and licensing, rely on having a good understanding of how the marine ecosystem works and responds to human developments. Examples of coordinated work conducted by MSCC, or by its member organisations, include:

- the UK Marine Monitoring and Assessment Strategy (UKMMAS) framework of evidence groups has continued to provide technical input to the development of the robust targets and indicators for defining the good environmental status of UK Seas thus supporting UK high level marine objectives and the implementation of the EU Marine Strategy Framework Directive;
- MSCC has overseen a review of the Marine Environmental Data and Information Network (MEDIN) to ensure that its work is fit-for-purpose of making accessible the data required for understanding how marine ecosystems operate and the potential impacts of management practices;

- joint research programmes, such as the Offshore Renewables Joint Industry Programmes (ORJIP) between The Crown Estate, Marine Scotland, the Department of Energy and Climate Change and the renewables industry, which is planning to address key evidence challenges for the consenting of offshore wind energy production;
- The Natural Environment Research Council/British Antarctic Survey/Marine Scotland research cruises have achieved a better understanding of specific marine ecosystems over the past year;
- Met Office and the National Oceanography Centre work on comparisons between a set of ocean model experiments and the RAPID mooring data at 26.5°N suggests that the atmosphere played a dominant role in driving the interannual variability of the Atlantic Meridional Overturning Circulation at this latitude during the period 2004 – 2010.

b) Responding to climate change and its interaction with the marine environment:

Changes in the oceans, as a result of climate change, have important consequences on the marine ecosystem, on the marine economy and on weather conditions, such as storm surges. Examples of coordinated work conducted by MSCC, or by its member organisations, include:

- a major jointly-funded research programme on ocean acidification which will provide a greater understanding of the actual changes taking place, the implications of these changes and risks to ocean biogeochemistry, biodiversity and the whole Earth system;
- improved understanding of climate change impacts through the work of the Marine Climate Change Impacts Partnership (MCCIP) and its annual report card (ARC)⁴;
- the introduction of seasonal assessments and predictions of Arctic sea-ice at the Met Office⁵;
- ongoing support for the international Argo programme and expansion of the number of UK-funded Argo floats;
- Support for the Inter-governmental Panel on Climate Change - UK marine scientists are playing a lead role in drafting the text for the 5th assessment report.

⁴ <http://www.mccip.org.uk/annual-report-card.aspx>

⁵ <http://www.metoffice.gov.uk/research/news/sea-ice>

c) Sustaining and increasing ecosystem benefits:

Understanding the implications of different management options is essential for marine planning. Examples of coordinated work conducted by MSCC, or by its member organisations, include:

- development of standardised methods for the analysis and mapping of fishing effort data across national boundaries to provide advice on the interactions between fishing activity and proposed Marine Conservation Zones and European Marine Sites across Europe;
- improved confidence in sea bed mapping through more advanced techniques, and more coherent approaches and standards, including through UKMMAS's Seabed Mapping Group, to support policies such as designation of marine conservation zones and marine planning;
- The finding that short-range (1-5 day) global weather forecasts using a coupled atmosphere-ocean model give significantly better predictions in the tropics than the corresponding atmosphere-only model. The performance of the two model systems outside the tropics is similar. There is now a real chance (>50%) that global weather forecasting at the Met Office will use coupled atmosphere-ocean models within 3-5 years.

1.3. UKMMAS – UK Marine Monitoring and Assessment Strategy

The UK Marine Monitoring and Assessment Strategy (UKMMAS)⁶ groups have continued to play a central role in the work of the MSCC and more specifically in the delivery of the UK Marine Science Strategy and the Marine Strategy Framework Directive (MSFD). They have enabled the co-ordination of marine monitoring and assessment activities between the Devolved Administrations, UK government departments and their agencies, and are helping to produce cost-effective information for policy, operational and management purposes.

The work of UKMMAS is steered by the Marine Assessment and Reporting Group – jointly chaired by Marine Scotland and Defra - with four thematic evidence groups⁷ providing the technical co-ordination of monitoring and assessment work. The membership of the evidence groups includes Government scientific and technical experts, scientists from

⁶ <http://www.defra.gov.uk/mscc/groups/uk-marine-monitoring-and-assessment-strategy/>

⁷ The four evidence groups are: CSSEG: Clean and Safe Seas Evidence Group; HBDSEG: Healthy and Biologically Diverse Seas Evidence Group; PSEG: Productive Seas Evidence Group; and OPEG: Ocean Processes Evidence Group.

research and academic organisations and, where relevant, from industry and non-governmental bodies.

Following the finalisation of the Marine Strategy Framework Directive's UK Marine Strategy Part One (Initial Assessment, Good Environmental Status, Targets and Indicators) in Autumn 2012, UKMMAS activity has been focused on work to establish and implement, by July 2014, MSFD monitoring programmes which support the ongoing assessment of the environmental quality status of UK waters. This work builds on existing UK marine monitoring programmes and has the purpose of developing monitoring that supports the evaluation of progress towards the targets and indicators established for good environmental status in UK seas. A key activity has been the development of a public consultation document to help shape MSFD monitoring programmes, which is due to be released for consultation in late 2013.

The UKMMAS Evidence Groups are also working, in conjunction with the Marine Environmental Data and Information Network (MEDIN), to develop data management approaches that will more effectively support national assessments and enable data to be made available into EU systems, such as Marine WISE and EMODnet. Use of the EMECO data tool to support future assessments of data is also being explored. In parallel, the Healthy and Biologically Diverse Seas Evidence Group has continued to oversee the work to develop and make operational biodiversity indicators.

A number of new monitoring initiatives linked to UKMMAS have been progressed over the past year. These include the UK Integrated Marine Observing Network (UK-IMON) – further details provided on page 20 - and the joint MSCC-IMarEST-SUT⁸ Operational Oceanography conference, which took place in Southampton in January 2013 – details on page 12. Given the range of new developments and technologies, along with the monitoring requirements arising from MSFD and the increasing need to identify more efficient monitoring systems, plans are being developed to seek input from policymakers in England, Wales, Scotland and Northern Ireland and from the wider marine science community on the best structures and processes for taking forward Government monitoring activities in the future.

1.4. Progress with addressing the three key barriers:

The Strategy identified three key barriers to delivery of UK marine science and actions for addressing them. These have been a focus of MSCC's activities to date.

⁸ IMarEST: Institute of Marine Engineering, Science & Technology; SUT: Society for Underwater Technology.

1.4.1 Alignment of science effort:

Strategy actions: to develop a rolling programme of marine science alignment where greater collaboration and alignment between MSCC members' programmes will have the largest impact. The alignment process will identify gaps in scientific knowledge, areas of duplication and areas for further collaboration and alignment. The capacity and capability to deliver the science will also be assessed. The initial group of science issues will be identified during the first quarter of 2010.

The **Science Alignment Working Group** has revised its programme of work over the past year to re-focus it on key and emerging priorities with clear, achievable objectives. The revised work programme has seen activity on accessing industry data and ecosystem modelling increasing in pace and has also led to the reallocation of a number of the Working Group's existing objectives to other delivery bodies and initiatives already in operation in related areas. The group, which is chaired by Prof Colin Moffat (Marine Scotland), has continued to use a series of sub-groups to deliver its work programme.

Key progress on alignment topics includes:

a) Access to industry data: There has been significant progress with increasing access to industry data. This issue continues to be of high priority and the Marine Management Organisation (MMO) leads this work for the Science Alignment Working Group. The recent Select Committee inquiry recommended that the MMO introduce licensing conditions requiring data from commercial activities in UK waters to be made publicly available. The Government welcomed the acknowledgement by the Committee of the valuable work that had been undertaken by the MMO in making available industry data, in the form of published environmental statements, and highlighted a number of other initiatives by The Crown Estate⁹ and the Devolved Administrations¹⁰ that are making significant contributions to providing wider access to industry marine data, as part of a shared task with the MMO.

These public bodies are using a range of routes for sourcing as much relevant data as possible from industry while seeking to avoid placing an undue burden on industry. Over the past year, public bodies have continued to gather industry data under licensing conditions, for example the MMO has been working to enhance access to data submitted via its marine licensing process. At the same time, public bodies are successfully sourcing data with the agreement of industry and without the need for any specific regulatory requirement. In addition, the Marine Environmental Data and Information Network (MEDIN) has been working closely with industry to ensure that data collected from marine organisations use common standards and can be sourced through the MEDIN data

⁹ <http://www.marinedataexchange.co.uk>

¹⁰ www.scotland.gov.uk/Topics/marine/science/MSInteractive and <http://www.scotland.gov.uk/Topics/marine/Licensing/marine>

discovery portal¹¹, which acts as a single point of access. The MSCC's Marine Industries Liaison Group has linked with the MMO, Natural England and other bodies to consider ways of strengthening access to industry data. The MMO has committed to work proactively with the Devolved Administrations, The Crown Estate, Natural England and others active in this area, to increase the amount of data collected at sea by industry that is made available for wider use.

b) Marine renewables: The **Offshore Renewables Research Steering Group (ORRSG)** – a sub-group of the Science Alignment Working Group - is co-chaired by Marine Scotland and the MMO and composed of the main Government funders of marine renewables research. Its purpose is to align publicly-funded research programmes on marine renewables, by sharing information between funders on what research is currently underway or planned, and so help to avoid costly overlaps or duplication of research. ORRSG, in addition to enabling the co-ordination of research programmes between public funders, has also continued to work jointly with the Natural Environment Research Council's Knowledge Exchange programme on marine renewables to identify future research priorities. The group is currently commencing work on elements of two identified priorities – cumulative impacts and dealing with risk.

One of the challenges addressed by ORRSG this year has been to ensure that it is adding value. There are a number of coordination groups in operation on marine renewables issues including the Offshore Renewable Energy Licensing Group (ORELG), the Habitats and Birds Directive Marine Evidence Group (MEG) and it was questioned whether these effectively made ORRSG redundant. ORRSG has, in response, re-visited its remit and priorities and is considering if it has a function in what is a very complex landscape. Further details of ORRSG's work are provided on its webpage¹².

c) Operational Oceanography: this is a new workstrand under the Science Alignment Working Group. Operational oceanography provides an important source of information and evidence on the state and dynamics of the marine environment, which is used to help develop sustainable management of ecosystems and to understand the impacts of climate change on the marine environment.

MSCC jointly hosted a very successful conference, 'Setting the Course for UK Operational Oceanography' with the Institute for Marine Engineering, Science and Technology (IMarEST) and the Society for Underwater Technology (SUT) in January 2013. Approaching 100 participants from the NERC research community, government bodies, the marine environmental service sector and commercial companies met to discuss a range of aspects of operational oceanography (for example, the measurement network, prediction

¹¹ <http://portal.oceannet.org/search/full>

¹² <http://www.defra.gov.uk/mscc/groups/offshore-renewables-research-steering-group/>

capabilities and the exploitation of both real-time predictions and of historical data in assessments of the state of the marine environment). A conference paper summarising the findings of the conference has been submitted to the Journal of Operational Oceanography. An initiative is also underway to refresh the Ocean Processes Evidence Group in order to ensure it serves the needs of the Ocean Processes Community, including how best to address the requirements of UK Operational Oceanography arising from the conference.

d) Alignment of joined-up technologies: Following the revisions to the Science Alignment Working Group's work programme, the work objective on maximising the number of sensors that each of platforms (buoys, autonomous floats [eg ARGO] and gliders) hosts is now being taken forward by the UK Integrated Marine Observing Network (UK-IMON), which is already delivering related work. This approach should avoid duplication of effort.

e) Ecosystem modelling: increasingly sophisticated decision tools for operational management and scenario planning (i.e. ecosystem models) are needed for the management of ecosystems. A number of major projects are currently being delivered by MSCC members that will contribute to the refinement of key ecosystem models. These include research on shelf seas' and deep ocean biogeochemistry. The Ecosystem Modelling sub-group has adjusted its focus to deliver a series of actions which will more strongly complement the outputs from current research. These actions, which are being led by Cefas on behalf of the sub-group, include carrying out an exercise to identify what ecosystem models exist and what they do, and to clarify how the models meet policy needs. A joint workshop is being planned with the Marine Alliance for Science and Technology for Scotland¹³ in early 2014 which will focus on the diversity of models and map the ecosystem modelling landscape.

1.4.2 Sustained long-term monitoring:

Strategy action: to make the process for selecting long-term monitoring and observation systems for funding more transparent and provide secure, longer-term and cross-cutting funding for priority datasets.

Discussions have taken place between Sir John Beddington and public sector funders around the issues of funding for environmental observations during the first half of the year. Building on these, the new Government Chief Scientific Adviser intends to take forward a thematic review of scientific observations needed to meet the UK's requirements for environmental data to inform and support research, operational needs, and policy making. The aim of this review would be to set out a vision for environmental observations for the coming decade; to identify current and future challenges; and the data and monitoring activities needed for decision-making with respect to these challenges. The MSCC supported

¹³ <http://www.masts.ac.uk/>

the work undertaken by Sir John Beddington and the outputs from the MSCC's Long-Term Monitoring Working Group - the differentially weighted score card and Funders' Committee approach for agreeing priority programmes for funding - have been fed into this work.

1.4.3 Communications:

1.4.3.1 UK Marine Science Communications Strategy

Strategy action: to develop a pro-active communications strategy for strengthened two-way engagement with the public on the importance of marine science and deliver an action plan for improving communication between scientists and policy makers.

The MSCC's Communications Working Group has made good progress with its delivery of the UK Marine Science Communications Strategy, '[Communicating UK Marine Science](#)'¹⁴. The Group, which is chaired by Professor Dan Laffoley and consists of public and private sector communications experts, including a leading scientific journalist, has shown itself to be dynamic and output/outcome focussed.

The main aim of the UK Marine Science Communications Strategy is to raise awareness of the importance of the marine environment and the central role that marine science plays in understanding it. Key outputs delivered by the Group over the past year include:

- the initiation of work to develop a unified UK Marine Science identity. The branding of UK marine science will raise its profile both in the UK and internationally and, through showcasing its world-leading capabilities, will enable UK marine science to be better positioned to benefit from economic opportunities.
- increased numbers of articles about new marine science developments being sent to an expanding body of recipients via the [Marine Ripple Effect \(MaRE\)](#) - a communication tool that circulates articles on marine science via email alerts and Twitter. Recipients currently include national journalists, Government policy advisors, Government agencies, NGOs, academics and members of the public. It is maintained by Plymouth Marine Laboratory.
- a promotional [leaflet](#), produced by Marine Scotland on behalf of the Group, which describes the work of the MSCC and which should lead to greater knowledge and engagement by the wider marine science community.
- improvements to the functionality and use of the MSCC's [Marine Science Events Calendar](#) - a system for viewing details of future meetings and conferences and which helps to avoid wasteful clashes of dates for events within the marine science community. The calendar is maintained by the Marine Biological Association.

¹⁴ <http://www.defra.gov.uk/mscc/files/mscc-comms-strat.pdf>

The Communications Working Group has also:

- supported a consortium of marine scientists and educators who are developing an initiative, 'Ocean Literacy UK', which seeks to increase marine science-related themes within the school system; and has
- started planning for a joint event with the Parliamentary and Scientific Committee to explore a key/emerging marine science issue with scientists and parliamentarians.

1.4.3.2 International Representatives' network

Strategy action: to establish a network of UK marine science representatives to identify common marine science issues and to exchange views on the latest scientific thinking.

This is a network that helps to develop a co-ordinated UK position between government bodies to take to inter-Governmental fora like the United Nations Educational, Scientific and Cultural Organisation (UNESCO) /Intergovernmental Oceanographic Commission (IOC), Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), International Hydrographic Organisation (IHO) and the Joint [World Meteorological Organisation/ Intergovernmental Oceanographic Commission] Technical Commission for Oceanography and Marine Meteorology (JCOMM) on areas such as capacity building, tsunami warning, the role of industry and the role of the Advisory Board of Experts on the Law of the Sea.

1.4.3.3 International Group

The MSCC's **International Group** is working to promote more targeted and effective international engagement. Its remit is complementary to that of the International Representatives' Network. The Group, which is chaired by Professor Stephen de Mora (Plymouth Marine Laboratory), has previously developed a *Strategy for International Engagement*, which contains a number of low cost actions to encourage those representing the UK on trade missions and other overseas activities to publicise UK marine science alongside other areas, and to encourage researchers travelling abroad to form links with the local Embassies/High Commissions and the Foreign and Commonwealth Office to help identify funding opportunities. As part of the delivery of the International Engagement Strategy, the group is exploring the potential for a shared national stand for UK marine science at major international conferences, like Oceanology International held in London every two years. The recent MSCC Review identified further work on international issues as being a priority, including:

- the creation of a marine science identity (discussed further under section 1.4.3.1, 2nd bullet), to which some members of the International Group have already provided input;
- the improved identification of research funding opportunities overseas; and

- clearer communications to the marine science community of how they can access EU funds and help to identify marine science topics for future rounds of the EU Framework Programmes.

The International Group oversees the work of the **UK Inter-Governmental Oceanographic Commission (IOC) sub-group**. The sub-group membership provides the core UK representation at international IOC meetings. The UK delegation had a highly successful meeting at the IOC Assembly in Paris in June 2013, where the UK made 19 written interventions during the Assembly and was re-elected to the Executive Committee.

1.5 *Working with others*

1.5.1 *Effective access to data –*

Strategy action: The MSCC will work with UK stakeholders, in particular MEDIN, and, where appropriate, European and International bodies to address the data access issue. MEDIN should consider whether to develop an Information Strategy to help improve the discovery and accessibility of data, the harmonization and promotion of marine data policies and data management.

1.5.1.1 *MEDIN*

The **Marine Environmental and Information Network (MEDIN)** has continued to provide the focal point for MSCC's data access and sharing activities – receiving metadata from a range of sources and making them available, via its Data Discovery Portal and from its Data Access Centres (DACs).

MEDIN has delivered a number of important outputs over the past year, these include:

- an expansion in the Data Archive Centre network when the Fisheries and the Marine Historic Environment DACs became operational in October 2012;
- delivery of a series of very successful MEDIN standards workshops in 2012/13 which introduced organisations to the MEDIN data guidelines and to the metadata tools, with the aim of helping users apply the relevant MEDIN standards to their data;
- an upgrade to the MEDIN Data Discovery Portal which offers improved geographical and hierarchical keyword searching, and a clearer presentation of search results. Over 4000 data sets are now searchable through the portal.

- the establishment of an authoritative single marine gazetteer for UK marine regions and locations, through close working with the UK Hydrographic Office and Ordnance Survey;
- delivery of a joint UK Location /MEDIN workshop in October 2012. MEDIN has continued to work closely with the UK Location Programme to provide co-ordination for marine organisations' links to data.gov.uk and implementation of the European INSPIRE Directive; and
- input by MEDIN to new initiatives, including the UK-IMON Executive Committee and the MSCC's current work on Operational Oceanography, to ensure consistent approaches to data management.

An independent review of MEDIN was commissioned during the year, to evaluate whether MEDIN is achieving its objectives, to identify how any barriers can be addressed and help to determine future priorities. The recommendations from the review are currently being considered.

1.5.1.2 Other data access activities

Other activities by MSCC members to improve access to data include:

- **foreign research cruises in UK waters** - ongoing work by the Foreign and Commonwealth Office (FCO) to collate information from marine scientific research cruises in UK waters, to enable the collection of unsubmitted data reports;
- **access to industry data** –
 - The MSCC's Marine Industries Liaison Group (MILG) worked with a range of other organisations to explore data access issues in depth at the MILG meeting in February 2013. The session sought to develop the dialogue between the public and private sectors on co-operation on marine data and information. Its ultimate purpose was to identify ways to increase access and use of data and so reduce costs and improve the available evidence base. Further details of the session are at: <http://www.defra.gov.uk/mscc/files/MILG-meeting-minutes-Feb-2013.pdf> (Agenda item 4, page 7).
 - Further details of activities to increase access to industry data are discussed under section 1.4.1 (*Science Alignment Working Group*), part a).

1.5.1.3 The Underwater Sound Forum

Over the past year, the activities of the **Underwater Sound Forum** have continued to be of key importance both for the UK's delivery of the Marine Strategy Framework Directive objectives on underwater noise and in relation to understanding cetacean strandings. The Forum, which was established to share knowledge about the effects of underwater noise on marine life, currently has an expanding membership of 80+ key stakeholder organisations from Government, academia, Non-Governmental Organisations (NGOs), industry and other EU countries. It has sought to learn from the experience of other countries, for example receiving updates on the US Bureau of Ocean Energy Management's workshop on the effects of noise on invertebrates, fishes and fisheries, and from closer to home, with discussions of the Royal Navy's environmental planning for their joint Warrior exercises.

Key areas of progress and activity by the Underwater Sound Forum include:

- The frequent, proactive sharing of information by members between meetings - of key scientific, technical and policy papers, etc;
- Direct input by Forum members to the development of the Marine Strategy Framework Directive (MSFD)'s indicator on noise, ensuring that it is based on robust evidence;
- The establishment of a working group on Ambient Noise, which is developing an advisory paper on how to standardise the processing and archiving of ambient noise data in order to make it more readily available for use, via MEDIN.

1.5.2 Future skills needs –

Skills needs were identified as an important area within the UK Marine Science Strategy. NERC has recently completed a refresh ('Skills Review 2012'¹⁵) of its earlier 'Skills needs of the environmental sector' survey (2008-2010)¹⁶. The Skills Review 2012 identified the most wanted Postgraduate and Professional Skills needs in the environment sector and will be used to inform future action. The Institute for Engineering, Marine Science and Technology (IMarEST) has carried out a parallel assessment - the IMarEST 'Marine science skills and continuing professional development assessment'¹⁷ - which is aimed at developing a career path for a new generation of marine science professionals. The MSCC's Marine Industries Liaison Group has discussed the IMarEST survey and will be providing input to the next stage of the assessment. Details of the IMarEST assessment will be supplied to the wider MSCC membership. NERC, in liaison with industry, will continue to assess and inform MSCC members on emerging skills issues.

¹⁵ <http://www.nerc.ac.uk/funding/available/postgrad/skillsreview/review2012.asp?cookieConsent=A>

¹⁶ <http://www.nerc.ac.uk/funding/available/postgrad/skillsreview/index.asp?cookieConsent=A>

¹⁷ <http://www.imarest.org/Portals/0/IMarEST/Technical/TechnicalActivities/MarineScienceSkillsandCPDSurvey/MarineScienceSkillsAndCPDConsultationResults.pdf>

Section 1.6.2 of this report details work to promote sharing between MSCC organisations of the skills and time of specialist staff, which should help to address any immediate skills gaps.

1.5.3 *Development of a Marine Industry Strategic Framework –*

The past twelve months have seen a strengthened working relationship between the Department of Business, Innovation and Skills (BIS)–industry led Marine Industries Leadership Council (MILC) and the MSCC’s Marine Industries Liaison Group (MILG). This has led to increased joint working between the groups and other MSCC members on aspects of the growth agenda, particularly those included within the MILC’s *‘Strategy for growth for the UK marine industries’*¹⁸ with related activities supported by others, including Scottish Enterprise¹⁹. Specific areas of action include:

- Marine Autonomous Systems (MAS) - the MILC has worked closely with MSCC organisations involved in this sector (such as NERC), to provide a workshop at Ocean Business 2013. The workshop reviewed current demand and supply for MAS, particularly in the marine science sector, and explored whether a development centre for MAS should be established in the UK. Discussions are ongoing.
- A number of specific actions arising from the MILG’s co-funded Government-industry needs and capability study are being taken forward by the MILC or jointly by the MILC and MILG. These link to the Strategy for Growth for the UK Marine Industries.

The closer working of these groups is helping to focus outputs more strongly on the growth agenda and ensure more effective delivery.

1.6 *Horizon Scanning and future actions:*

1.6.1. *Horizon scanning –*

Strategy action: options for commissioning ‘horizon scanning’ projects will be considered by the Marine Science Co-ordination Committee during 2010/11.

The recent Select Committee inquiry into marine science recognised the importance of horizon scanning and the need for the MSCC to focus more strongly on it. While informal horizon scanning activities routinely take place in many of the MSCC’s groups - for example,

¹⁸ <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/s/11-1310-strategy-for-growth-uk-marine-industries.pdf>

¹⁹ Scottish Enterprise has supported the development of a coherent UK brand and website for marine industries in the form of the UK Marine Industries Alliance. The Marine Industries Leadership Council produced the growth strategy on behalf of the Alliance.

UKMMAS evidence groups identify future needs and issues relating to monitoring - work to look at future issues for marine science as a whole has progressed less quickly than intended. Horizon scanning will therefore be an area of greater focus over the next couple of years - the MSCC will seek to work with Learned Societies, industry, GO-Science and others to develop routes for identifying future needs through Foresight/Horizon Scanning.

1.6.2 *Further Strategy actions –*

Strategy action: Further actions will be developed during the life of the Strategy.

In March 2011, the Ministerial Marine Science Group agreed six new activities for the MSCC to deliver, following a Ministerial write-around. The actions were developed in the context of pressures on marine science budgets and aim to strengthen the ways in which MSCC members work together, in order to achieve efficiency savings. Progress with the six activities, which are at different stages of delivery, is summarised below (*points i) – vi)*). Further actions have since been added to the MSCC's portfolio, in response to the recommendations of the recent Select Committee inquiry and to the MSCC's own internal review. Progress is also reported for those actions below (*point vii onwards*).

i. Assessment of options for increased co-ordination of the operation and maintenance of large Government Research Vessels – an assessment of marine research vessels was published earlier this year by the MSCC's Marine Research Vessel Group. Its content was welcomed by industry representatives. The assessment highlights the timeframe for future decisions on new (and existing) research vessels and the need to plan for the direction of travel for the UK fleet as a whole. It has also identified co-ordination activities that should lead to national cost savings. While the assessment has been completed, the Marine Research Vessel Group will continue to work on options for the future size and configuration of the UK marine science fleet, the potential for new technologies and joint procurement, and exchanging ship programme information. A Liaison Group, with input from industry, will carry out more detailed investigation of the extent to which industry could be involved in UK marine research vessel provision and operation.

ii. The integration of the UK's marine observatories – the UK single integrated marine observing network (UK-IMON), which was established last year, has continued to develop apace. Its purpose is to ensure that a national marine observing network is in place to improve the evidence base for future assessments of environmental status, using the most cost-effective technologies available to the UK marine science community. It has been very successful at securing research funding and this has led to it undertaking high profile work, for example on the suitability of new technologies to meet current and future monitoring requirements through a workshop in September 2013.

iii. **Sharing and/or pooling of Government-funded equipment and facilities** – this action is aimed at reducing costs through sharing expensive systems, such as gliders and technical equipment. The online table detailing equipment and facilities for sharing between MSCC members has been updated during the year. Uptake has been at a low level to-date, due in part to a lack of visibility of the site and the need for further clarification of the remaining potential costs (e.g. transport, insurance, etc). Steps are being taken to address the issues identified including publicising the site more widely to MSCC members. The cost savings that could result from the loan of even one or two pieces of equipment per year could be significant.

iv. **Sharing staff, skills and technology development between MSCC organisations** - there is a willingness across the MSCC membership to make use of the diverse resource pool available in the network. An informal agreement exists that if there is any short-term specialist science delivery need that cannot be delivered within current staff, members can alert MSCC colleagues to their need and should be notified of any spare capacity available.

v. **Strengthened data co-ordination through the Marine Environmental Data & Information Network (MEDIN)** – the extent and effectiveness of engagement by Departments and the Devolved Administrations with MEDIN is being considered as part of the review of MEDIN.

vi. **Data mining of past research and monitoring** – the purpose of this action is to develop guidelines which ensure that, prior to commissioning new work, checks are undertaken to identify whether data already exist. This work has just commenced.

A number of new MSCC actions have been agreed; these include:

➤ ***Actions arising from the Government Response to the Select Committee inquiry report:***

Progress with the MSCC-related commitments in the Government's Response is included under other sections of this progress report:

- the development of an Implementation Plan (*Recommendation 1 of the inquiry report – covered in Section 2.5 of this report*);
- the consideration of evidence submitted to the Select Committee inquiry as part of the MSCC's internal Review (*Recommendation 2 – section 2.4*);
- the development of Marine Autonomous Systems (*Recommendation 11 – section 1.6.2 vii*); and
- increased access to industry data (*Recommendation 9 – section 1.4.1 a*).

➤ **Actions arising from the MSCC's Review Report:**

vii. New technologies - MSCC members have recognised the significant opportunities that new technologies, such as Marine Autonomous Systems (MAS), offer for improving the quality, coverage and cost of monitoring in the future and have committed to a major programme of work. This includes the establishment, by NERC, of a joint MSCC-MILC sub-group of Government and industry members with a shared interest in new technologies, the creation of a roadmap for the development and use of Marine Autonomous Systems and close ongoing working with the Marine Industries Leadership Council, the Technology Strategy Board and the Marine Industries Liaison Group in the development of this initiative. The group has commenced work and is seeking to ensure that all their areas of activity are visible to, and co-ordinated with, other work on new technologies.

viii. Awareness raising of MSCC activities –

It was clear from evidence given to the Select Committee inquiry into marine science that the MSCC had not sufficiently publicised the wide range of activities it was undertaking. The Select Committee's recommendation of an Implementation Plan is part of a new approach of increasing awareness and therefore providing a greater understanding of the work being taken forward by the MSCC. This should encourage increased joint working with non-MSCC bodies to help ensure that Government-funded research and actions are benefiting the widest possible audience and are enabling overlaps in activities between funders to be avoided, through a greater awareness of existing plans. A range of actions have been proposed, which are being considered further by the MSCC membership, including holding a large-scale public meeting to update and seek input from the UK marine science community, and seeking increased visibility of MSCC activities through online/electronic communication approaches, such as Twitter.

ix. Establishment of an Executive Committee of the MSCC -

A smaller Executive Committee of the MSCC is being established to provide stronger direction to the content of MSCC meetings, to oversee its work programme and to propose future priorities to the wider membership. The Committee will consist of the main marine science funders (NERC, Defra/Cefas and Marine Scotland), BIS, the Devolved Administrations and others who provide key resources for taking forward the work of the MSCC, and will draw on the advice of the non-executive and *ad hominem* members and others, as and when needed. Draft Terms of Reference for the Executive Committee are being developed.

Other actions within the Review Report are addressed elsewhere within this progress report, such as:

- strengthening links with industry/growth agenda (*sections 1.5.3 & 2.1.3*);

- horizon scanning (*section 1.6.1*);
- a strengthened UK competitive presence in international marine science markets (*sections 1.4.3.1 and 1.4.3.3*).

2. Other activities undertaken by the MSCC

2.1 Links with the marine science community:

Strategy action: MSCC members to be nominated to act as ‘links’ to industry, the research and academic sector and Non-Governmental Organisations (NGOs), to develop networks with these communities and to grow an integrated relationship with them.

2.1.1 Research & Academic sector link (Prof Howard Roe, non-executive member)

Organisations have been kept informed about MSCC activities, and invited to provide feedback, via a regular email newsletter and through a series of talks and presentations, including to members of the Marine Climate Change Impacts Partnership (MCCIP)²⁰, the European Marine Science Educators Association²¹, NERC Knowledge Exchange Network, industry oil spill response specialists, and attendees at the 2013 Coastal Futures conference.

Professor Roe retired from the MSCC in March 2013.

2.1.2 NGO sector link (Prof Dan Laffoley, non-executive member)

Six monthly e-bulletins have continued to be issued to Non-Governmental Organisations containing update summaries of progress on relevant MSCC activities. Evidence submitted to the Science and Technology Select Committee’s marine science inquiry from NGOs indicated a desire by NGOs for greater direct engagement in MSCC activities and Working Groups. Steps have been taken to increase engagement – examples of where NGOs are already becoming more involved in MSCC activities are the Communications Working Group’s programme and the Marine Industries Liaison Group.

2.1.3 Marine Industries Liaison Group (MILG)

The Marine Industries Liaison Group (MILG) provides advice to the MSCC on marine industry issues. In the past year the MILG has increased the frequency of its meetings, at the request of its members, and, in early 2013, the MILG industry members elected a marine industries representative to sit on the MSCC and to act as co-Chair of the MILG. It has considered a wide range of issues in the course of the year, including: a workshop on improving access to Government and industry data; lessons that can be learned from past research funding

²⁰ <http://www.mccip.org.uk/>

²¹ <http://www.emsea.eu/>

schemes, such as the Aggregate Levy Sustainability Fund; and practical barriers to marine science entrepreneurs. Joint working between Government and industry has increased, initially through the joint funding of an industry-Government needs and capability study project and latterly through the commitment by Government and industry to deliver a series of actions arising from the study's recommendations. Stronger links have also been established with the Marine Industries Leadership Council, as outlined in section 1.5.3.

2.2 Website development:

The MSCC's website (<http://www.defra.gov.uk/mscc/>) provides a clear and accessible picture of the range and nature of the work being undertaken by the MSCC. The website content is expanded and updated on a regular basis. The website itself continues to be hosted by Defra, on behalf of the MSCC organisations, as a cost saving measure. It is scheduled to transfer to the Government website - GOV.UK – later in 2013. It is clear from feedback that the MSCC web-site is a valued source of up-to-date information on MSCC activities.

2.3 Join-up with other organisations:

The MSCC works closely with a range of other organisations and individuals. Experts from research, academic, industry and NGO sectors provide key input to a number of the MSCC's/UKMMAS' sub-groups. Strong links have continued with the Marine Climate Change Impacts Partnership, while the involvement of the Institute of Marine Engineering, Science & Technology (IMarEST) in the work of the MSCC has been strengthened. The ongoing engagement with other initiatives and organisations has led to a number of highly productive outcomes over the course of the year, including the very successful Operational Oceanography conference in January 2013, organised jointly by the MSCC, IMarEST and the Society for Underwater Technology (SUT). However, the recent Select Committee inquiry reported concerns expressed by external organisations that there was insufficient opportunity for them to share their expertise and resources with the MSCC. Actions are being taken to strengthen engagement with these and other bodies.

2.4 MSCC Review

The MSCC Review was initiated to provide a critical look at the work and priorities of the MSCC. It was undertaken via a number of routes and involved MSCC members, industry sector representatives and incorporated the evidence submitted to the Select Committee inquiry into marine science. It ran in parallel to the Select Committee inquiry and provided useful insight to aspects of the MSCC's work that were not as prominent in the inquiry. The main conclusions from the Review included:

- The UK Marine Science Strategy remains fit-for-purpose.
- the existing marine science issues being addressed by MSCC Working and sub-groups continue to be of importance, with monitoring (including understanding of natural and climatic change in the marine environment), data access, the increased use of socio-economics and communications being priority areas.
- new marine science priorities should include an increased focus on Government working with industry and its contribution to the growth agenda, the development and use of new technologies and a strengthened UK competitive presence in international marine science markets.
- the MSCC should work with Learned Societies, industry and others to identify future needs through Horizon Scanning.
- the MSCC should increasingly raise awareness of its actions and identify opportunities for greater engagement with external bodies.
- a smaller Executive Committee, composed of the main marine science funders, should be established to provide more constant oversight and direction of the MSCC's work programme.

The Review's actions will be included in the MSCC Implementation Plan.

2.5 *Implementation Plan*

The Science and Technology Committee inquiry into marine science recommended the development of a 10 year Implementation Plan for the UK Marine Science Strategy. The MSCC has developed an initial Implementation Plan – covering the first 18-24 months of activity - and will further refine and develop the latter sections of the Plan leading to 2023 on an ongoing basis. This will include using its planned work on horizon scanning to help define the future direction of the MSCC's work.

2.6 *Success indicators*

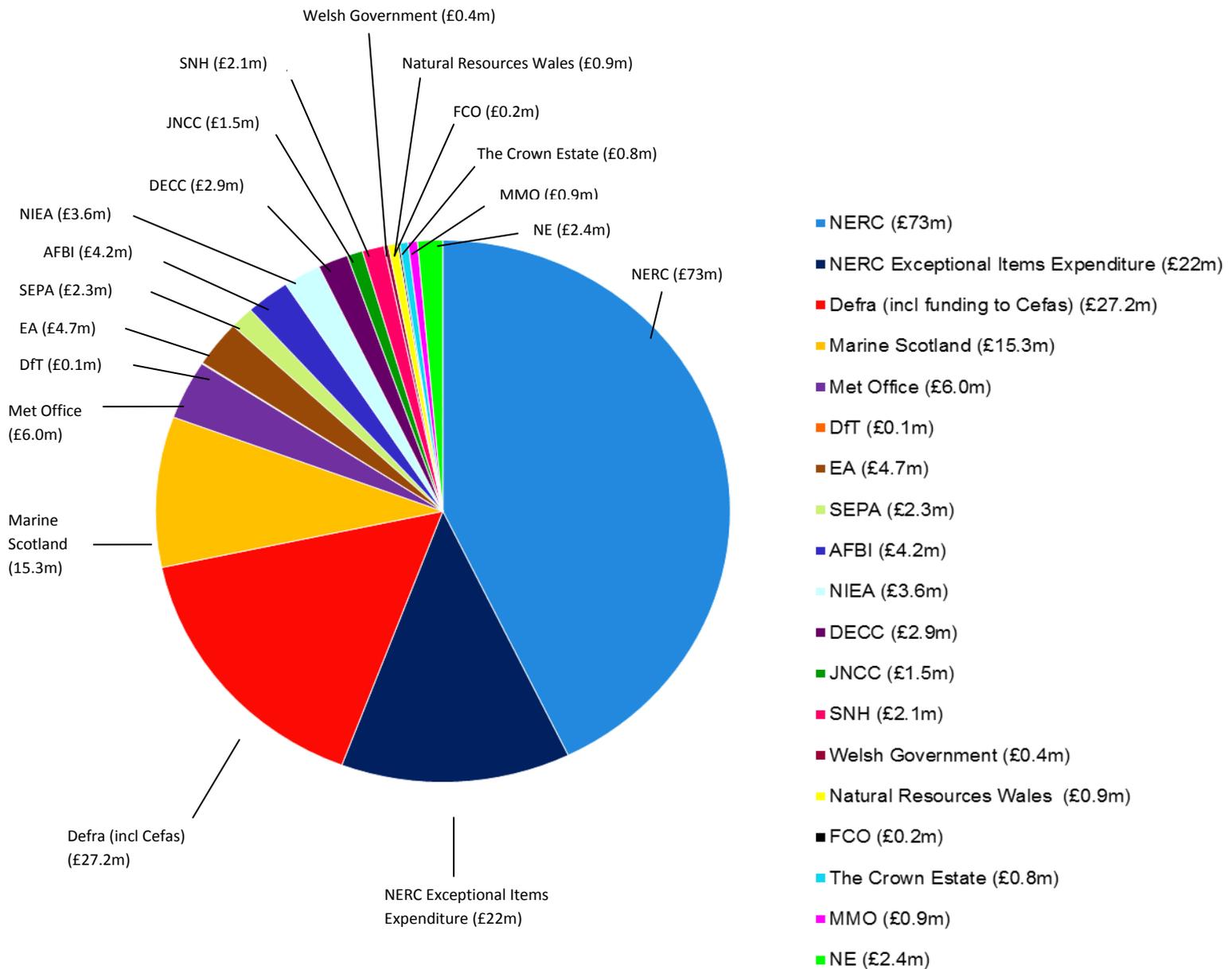
Strategy action: more detailed success indicators will be developed during 2010

Success indicators are being identified for inclusion in the Implementation Plan, in liaison with the MSCC's Working Groups and stakeholders.

2.7 *Public Sector Expenditure*

Strategy action: Latest available details of public sector expenditure on marine science will be published with the update report. See Annex I.

Annex I: Marine science funded by MSCC member organisations 2012/13 (£m)



Total spend: £170.5m

(Total spend excluding NERC 'exceptional items expenditure': £148.5m)

Key: NERC: Natural Environment Research Council; Defra: Department for Environment, Food and Rural Affairs; Cefas: Centre for Environment, Fisheries and Aquaculture Science; EA: Environment Agency; AFBI: Agri-Food and Biosciences Institute; NIEA: Northern Ireland Environment Agency; DECC: Department of Energy and Climate Change; SEPA: Scottish Environment Protection Agency; JNCC: Joint Nature Conservation Committee; NE: Natural England; SNH: Scottish Natural Heritage; FCO: Foreign and Commonwealth Office; DfT: Department for Transport; MCA: Maritime and Coastguard Agency; MMO: Marine Management Organisation; MOD: Ministry of Defence.

Notes:

It is difficult to obtain accurate data from past years that are consistent across MSCC members because of different ways that organisations categorise their spending. The figures in the pie chart are the most accurate available but should be viewed with caution. In particular:

- The annual marine science expenditure data that **NERC** has reported to the MSCC since 2008/09 does not include: i) the Ship Operations costs of the British Antarctic Survey (BAS); ii) the National Capability expenditure on marine science at BAS, the British Geological Survey, and the National Centre for Earth Observation; and, iii) expenditure within multi-science area research programmes, such as the UK Surface Ocean-Lower Atmosphere Study.
- **Defra's** 2012/13 spend takes into account the re-imburement received from the EU for DCF related monitoring, which offsets our total evidence budget.
- The reduction in Defra's Marine Evidence budget reflects the changes to Defra's overall budget allocation over this period.
- Defra figures include vessel operating costs.
- **MOD** funds occasional environmental research projects - none was carried out in 2012/13 and 2011/12. The research previously included in the 2008/09 spend chart (£11.4m) is no longer classified as marine research.
- **DfT** funding is directed through the Maritime and Coastguard Agency but the maritime component of the Public Weather Service is excluded from the figure shown. However, the **Met Office** figure does include spend within the Public Weather Service programme on marine R&D.
- The **MCA** has rationalised its spend on research by combining its efforts with **DfT** to provide a more focussed and targeted strategy. The reduction in DfT/MCA's Marine Evidence budget also reflects the changes to DfT/MCA's overall budget allocation over this period.
- The **EA** figures do not include any additional marine expenditure by regional offices for conducting investigations. Funding during 2012/13 remained in line with that for the previous year with an increase in Flood Risk research and a reduction in Air/Land/Water science. Investment in marine monitoring activities is currently under review and will be informed in the Autumn 2013. The EA figure includes details for Environment Agency Wales.
- The reduction in **SEPA's** reported marine science budget during 2012/13 reflects the overall changes to SEPA's budget allocation over this period and the ongoing work to reduce costs. SEPA has undergone significant internal restructuring to integrate the work of Marine Science into a number of science departments in order to improve inter-disciplinarity and increase cost-effectiveness.
- The **FCO** spend figure represents a best estimate as the FCO has no dedicated R&D fund and spend details are not recorded against R&D criteria. This figure does not include small amounts of indirect support for marine science.
- Examples of marine research being developed include: ocean acidification

and satellite and in situ observations of ocean temperatures, salinity and sea levels; the costs and benefits of offshore wind, wave and tidal energy to the marine environment; and research to inform broader environmental assessment of marine energy plans, programmes and projects.

- **Natural Resources Wales** was established on April 1st 2013, comprising the former bodies; CCW, Environment Agency Wales and Forestry Commission Wales.
- The **MMO** is working with others to build a robust marine evidence base to inform its decision making. Most of the evidence the MMO uses is gathered from a variety of existing sources, including commercial sources, research

councils and academia. Critical gaps in this evidence are filled by the MMO's evidence programme to inform MMO functions, particularly marine planning and licensing.

- **JNCC** provides UK level coordination on MSCC for the country conservation agencies including **Natural England (NE)**. The majority of the NE marine science spend is on a combination of statutory monitoring of Natura 2000 sites and spend on improving the evidence base for recommended MCZs in English waters. Both these elements include considerable partnership working with both **Cefas** and the EA. Where sites cross the 12 nautical mile boundary, NE works in partnership with JNCC to collect sound evidence on the location and monitor the state of MPAs.