Coastal Futures 2014
Review and Future Trends

January 22nd & 23rd January
SOAS, University of London

Delegate Notes

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Best Wishes
Jayne and Bob

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*(for Conferences and Events we charge the delegate rate if more than £130+VAT)

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Dear Colleagues

New Developments

I am taking this opportunity to let you know of some changes that will be taking place during the next few months. I have decided to stop running one-day conferences from April. During the last 20 years I have run more than 200 events, including 100 for CIWEM, however, the time has come to change tack and get my teeth into some new projects that I have been thinking about for some time, and which I may never get to do unless I make some changes. Christina Beech, who has ably assisted me during the past 13 years will be leaving CMS,

I will be developing four strands that will build on my existing work, including:

1. **Coastal Futures** The January CF conferences with continue; 2014 will be the 21st and I envisage running at least another five of these.

2. **CMS Emails – News – Jobs and Conferences** The service we've provided will continue with Jayne O'Nions running this; we hope to develop this in a number of ways. This emailing service, closely linked to the website and which goes to 8,700 contacts, will continue to advertise jobs and it will be much more active in promoting clients' conferences and there will be a new rate card for this. CMS NEWS, the main weekly email, will continue to promote news and comments as well as jobs and conferences.

3. **Consultancy on conferences** Having run hundreds of events, I will be providing this expertise to clients who require assistance in planning and organising their own events. We'll be able to offer promotional services through our emailing service.

4. **New projects** I do want to start work on some new projects that involve delivering sustainability, marine conservation and marine life identification and so I hope to be continuing to work with many of you on these in the future

So, I am not going away or retiring, just changing tack and taking on some new projects. This news is not a secret so please pass on this information as you see fit. Thanks for all your support.

Best wishes

Bob Earll
January 2014

South West Marine Ecosystems Conference 2014

DIARY DATE

Friday April 4th 2014 at the Plymouth Marine Laboratory (PML)

The 2014 South West Marine Ecosystems Meeting (SWME) meeting will take place in the new lecture theatre at the Plymouth Marine Laboratory (PML) on April 4th. The format and content will be similar to previous years with a mix of long and short presentations and good time for discussion and networking. Thanks to the generosity of PML the price will remain the same at £15 to help attract the widest range of people and in particular volunteers, students interested this area of work.

The programme will be designed to facilitate networking and to review the events of 2013 – both ecological and oceanographic. It will focus mainly of the wider ecology of 'mobile' species – fish, birds, mammals - and the status of their populations. It will also cover the linkages between science and managing human activities with a view to supporting the health of southwest marine ecosystems.

The programme will be published in the 4th week of January and if you have any offers or suggestions for topics please contact Bob Earll at bob.earll@coastms.co.uk or ring 01531 890415.

South West Marine Ecosystems – Objectives

1. **Networking** To provide a networking opportunity for a wide cross section of people to meet and exchange views on south-west marine ecosystems; this would include volunteer observations and schemes, marine science and research interests, managers and a range of sea users including nature conservation, fishing, tourism etc.

2. **To assess the annual events – ecological and oceanographic - of the previous year** that have affected the south west marine ecosystems – making the linkages between environmental and biological phenomena e.g. SST on plankton or mackerel and cetaceans

3. **Ecology of mainly 'mobile' species** To explore research studies that throw particular light on aspects of ecology of marine species, and in particular 'mobile' species (fish, birds, mammals, turtles) and the ecosystem that supports them and to understand **the status of populations of marine species** in the south west and how they are responding to environmental and anthropogenic pressures

4. **Management and southwest marine ecosystems** To understand the linkages between science to managing human activities the marine environment with a view to supporting the health of southwest marine ecosystems

Welcome to the conference

This information gives the answers to some of the most frequently raised questions that arise at the conferences we organise.

Conference Outputs

- **The Power Point presentations** and delegate notes will be available shortly after the event on the CMS www.coastms.co.uk website. We will notify you by email when these have been placed on the sites.

Questions – Bookings – Receipts – In house information If you have any questions during the event about bookings, finances, or logistics please see ***Christina Beech*** at the registration desk; she will be pleased to help.

Timing We will try to ensure that the conference runs on time to allow the allocated time for speakers and as importantly for discussion. A bell will be rung 5 minutes before the start of sessions.

Refreshment Breaks In running events in London over the last 20 years we have used two main refreshment breaks during the day that enable us to split the sessions and breaks more evenly. A sandwich buffet is available in the first break and sweet course during the second.

Food There is always ample food at the events and you can come back for more. Once you have collected your food ***could you move away*** from the serving table. Catering staff are on hand if you need anything, including extra drinks.

Delegate notes See separate pamphlet for Mike Elliott's delegate notes.

Delegate list A list of the delegates to Monday 13th January is at the end of the delegate notes.

Evaluation form There is a questionnaire and evaluation form at the end of delegate notes; your views will help us improve future events. Please leave these at the registration desk along with your badge when you leave.

NB Valuables **If you have anything you value keep it with you i.e. do not leave laptops unattended.**

Before you leave Check you haven't left anything in the conference hall.

Please also take any **leaflets or reports.**

Wednesday January 22nd

9.00 Registration and refreshments

Session 1: **Chairman: Sian John** Royal HaskoningDHV
9.30 **Welcome to the conference**
9.35 **The European ICZM & MSP Directive proposals Rob Bowman & Steve Collins** Defra

9.55 **Developing Coastal Economies: schemes, funds and initiatives – an overview of Government programmes Keith Thorpe** Head of Coastal communities, Thames Gateway and Olympic Legacy Unit, DCLG

10.15 **Coastal Partnerships and their developing roles Niall Benson** Heritage Coast officer at Durham Heritage Coast Partnership

10.35 **Coastal activity mapping and economic valuation David Jones** Project Manager at the Pembrokeshire Coastal Forum

10.55 **Managed realignment 20 years on – an overview Colin Scott** ABPmer

11.15 **Biodiversity offsetting at the Coast Jan Brooke**, Environmental Consultant, Lead on the ICE Maritime Panel's initiative on coastal offsetting

11.35 **Developments in the use of economics for coastal and marine programmes and schemes Ian Dickie**, Director of Business Development, eftec
11.55 First Break: Sandwiches and refreshments

Session 2: **Chairman: Daniel Bastreri** Thompson Ecology
12.40 **Climate change – key messages from the IPCC and implications for UK adaptation Daniel Johns** Head of Adaptation, Committee on Climate change
13.00 **Licencing – and overview and current developments Dickon Howell** Head of Marine Licencing MMO
13.20 **Offshore wind: Lessons form the Dogger Bank EIAs Gareth Lewis** Head of Offshore Development Forewind Ltd
13.40 **Post-consent monitoring of offshore wind: key outcomes of the assessment Shaun Nicholson** Head of Offshore Marine Licensing MMO
14.00 **Tidal stream and wave- impacts review Gareth Davies & Ian Hutchinson** Aquatera
14.20 Break & refreshments

Session 3: **Chairman: Toby Gethin** The Crown Estate

15.00 **Impacts of wave and tidal technologies on birds, fish and marine mammals – Outcomes of ` NERC, RenewableUK & Scottish Renewables funded study Kit Hawkins** Technical Director, PMSS

15.20 **Cumulative effects – the impossible question ..... Ian Reach** Marine Space Ltd
15.40 **A framework for Cumulative impact for wave and tidal in Pentland Firth & Orkney Waters John Pomfret** Amec Environment & Infrastructure UK Ltd
16.00 **The State of Oceans Report Professor Alex Rogers**, University of Oxford
16.20 **Marine Autonomous Systems – new developments and applications in marine mapping and monitoring Russell Wynn** National Oceanography Centre

16.40 - 17.10 **The remarkable ecosystems of Rockall; discovery, diversity and management Francis Neat** Marine Scotland's Marine Laboratory
30 Mins (20 mins / 10 mins Q&A)
17.20 **Wine reception**

Thursday January 23rd

9.00 **Registration and refreshments**

Session 4: **Chairman: Steve Hull** ABPmer

9.30 **Marine Strategy Framework Directive – Update & marine monitoring programme consultation**
Dominic Pattinson Defra

9.50 **Understanding planktonic systems: Update & links to MSFD**
Abigail McQuatters-Gollop Sahfos

10.10 **Ocean acidification - An Update** **Phil Williamson** Science Coordinator, UK Ocean Acidification research programme, NERC/University of East Anglia

10.30 **Marine Spatial Planning update: the East and South Coasts plans**
Jo Stockill MMO

10.50 **Marine planning: A perspective on the East coast plans**
Rodney Anderson, Advisor to the North Sea Marine Cluster

11.10 **How green is 2015?** **Richard Benwell** Parliamentary Programme Manager RSPB

11.30 Break and refreshments

Session 5: **Chairman**: **Simon Cripps** CEO Dorset Wildlife Trust

12.10 **Fishing in European Marine Sites: Update** **Mark Duffy** Natural England

12.30 **IFCA Update** **Rob Clark,** Chief Fishery Officer, Southern IFCA

12.50 **Dogger Bank update** **Euan Dunn** RSPB

13.10 **Discards, Quota and MSY - policy and practice - an overview** **Jerry Percy** New Under Tens Fishermen's Association

13.30 **Discards – developments in gear selectivity in towed gear** **Mike Montgomerie** Seafish

13.50 **Fishing down the food chain: some implications** **Bob Earll** CMS

14.10 **Mapping marine legislation** **Mike Elliott** IECS University of Hull
(*Please see separate pamphlet in the delegates pack*)

14.20 -15.00 Break and refreshments

Session 6: **Chairman: Peter Barham** Seabed User and Developer Group

15.00 **MCZ's and evidence** **Keith Hiscock** MBA

15.15 **MCZ's in England Update** **Nigel Gooding** Defra

15.30 **The MPA network in Scotland: an update** **Owen McGrath** Scottish Natural Heritage

15.45 **Marine Protected Areas: Perspectives on progress** **Lynda Warren** Natural Resources Wales

16.00 – 16.30 **Panel discussion**

16.30 End & refreshments

DAY 1 - Wednesday 22nd January

The European ICZM & MSP Directive proposals

Rob Bowman & Steve Collins
Defra
E: rob.bowman@defra.gsi.gov.uk / stephen.collins2@defra.gsi.gov.uk

On 13th March 2013 the European Commission published a proposal for a Directive establishing a framework for maritime spatial planning and integrated coastal management. The original objectives for this were simply to ensure implementation of maritime spatial planning (MSP) and integrated coastal management (ICM) throughout Europe while ensuring cross-border coordination between Member States. The UK Government does not believe legislative action is required but we understand why the Commission have proposed the Directive. However, the published proposal goes further than what is required of a framework Directive and imposes obligations which could affect the substance of plans and strategies.

Accordingly we are working constructively with the Commission, the Presidency and other Member States to ensure that the Directive does not undermine existing work to implement marine planning and IC(Z)M across the UK.

The presentation will provide a brief overview of the Proposal, UK Government views and the Proposal's progress through the European legislative process.

Proposal for a Directive establishing a framework for maritime spatial planning and integrated coastal management http://ec.europa.eu/environment/iczm/prop_iczm.htm

Impact Assessment studies and Member States reports
http://ec.europa.eu/environment/iczm/pdf/ICZM%20-%20Information%20sources%20-%20overview.pdf

European Parliament deliberations http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-%2f%2fEP%2f%2fTEXT%2bREPORT%2bA7-2013-0379%2b0%2bDOC%2bXML%2bV0%2f%2fEN&language=EN

European Parliament TRAN Committee
http://www.europarl.europa.eu/committees/en/tran/home.html

European Parliament PECH Committee
http://www.europarl.europa.eu/committees/en/pech/home.html

European Parliament ENVI Committee
http://www.europarl.europa.eu/committees/en/envi/home.html

EU Committee of the Regions http://cor.europa.eu/en/news/Pages/eu-marine-coastal-planning-proposals.aspx

EU European Economic and Social Committee http://www.eesc.europa.eu/?i=portal.en.nat-opinions.29044

Developing Coastal Economies: schemes, funds and initiatives – an overview of Government programmes

Keith Thorpe
Head of Coastal Communities, Thames Gateway and Olympic Legacy Unit, Department for Communities and Local Government (DCLG)
T: 0303 444 3148 E: keith.thorpe@communities.gsi.gov.uk

This talk explains the policies and programmes that Government is supporting to help promote the economic and environmental regeneration of coastal communities. They cover a wide toolkit of powers, flexibilities, options and incentives to coastal and seaside towns drive growth and create jobs in their area, strengthen their economy and improve local opportunities.

Coastal communities face a range of unique challenges including physical isolation, high deprivation/ benefit dependency, inward migration of the elderly, outward migration of young people, with a heavy reliance on low wage, low skill and often seasonal employment.

Government support can help address market failure by signalling the investment potential in coastal areas to ensure their assets and opportunities are exploited. This includes traditional economic assets like the seaside economy (still a major employer), and new opportunities to diversify their employment base through marine technology, offshore renewable energy and the creative, digital economy.

The Coastal Communities Fund (CCF), launched in 2012, supports the economic development of coastal areas by promoting sustainable growth and jobs, enabling people to better respond to the changing economic needs and opportunities of their areas.

Coastal communities also benefit from a wide range of other Government programmes that, whilst not specifically targeted on them, are supporting local economic growth and jobs and environmental regeneration linked to growth in coastal places. These programmes include the coastal Local Enterprise Partnerships, Enterprise Zones, Regional Growth Fund, Growing Places Fund, coastal City Deals, and marine planning supporting growth and enterprise.

Government skills, training and apprenticeship programmes are helping too, together with schemes to address housing challenges in coastal communities and efforts to improve transport and digital connectivity. Many communities are seizing the initiative themselves and using the powers in the Localism Act to help shape their own future.

Coastal Partnerships and their developing role

Niall Benson
Durham Heritage Coast Partnership
Chair - Coastal Partnerships Network
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The Coastal Partnerships Network (CPN) is a not for profit umbrella body, formed in 2006, that exists to encourage the exchange of information and debate between around 80 Coastal Partnership Officers representing the 40 local coastal partnerships around the English coast.

CPN offers increased opportunities for learning and influence, strengthening and supporting Coastal Partnership Officers in their work. It is increasing representation of the value of the work of Coastal Partnerships to their supporting partners, other coastal stakeholders and relevant initiatives including policy development.

CPN believes in and supports Integrated Coastal Management and is working to facilitate a joined up approach to the management of coastal areas and to represent coastal partnerships and their interests at regional, national and European levels.

Work over the past year has included working with the MMO on the publication of the "Baseline report for developing Partnership working at the coast" and the delivery of a successful 8th Annual Forum in Southampton. CPN is actively lobbying for ICM to remain in the proposed EU Directive for Maritime Spatial Planning and Integrated Coastal Management.

CPN are working to ensure a clear understanding by key agencies of the opportunity provided by CPN for the use of Coastal Partnerships for more effective delivery. These opportunities extend beyond delivery to exploiting the extensive experience of the individual Coastal Partnerships and their individual networks; to the use of the partnership model for consensus building, education and awareness raising as well as communication.

CPN also has a role in ensuring that its members are aware of and embrace the opportunities and challenges as they arise.

See:

Baseline report for developing Partnership working at the coast
http://www.marinemanagement.org.uk/marineplanning/key/documents/cpn_baselinereport.pdf

Coastal activity mapping and economic valuation

David Jones
Project Manager, Pembrokeshire Coastal Forum, 1st Floor, Pier House, Pembroke Dock, Pembrokeshire, SA72 6TR
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Web: www.walesactivitymapping.org.uk www.pembrokeshirecoastalforum.org.uk

Pembrokeshire Coastal Forum (PCF) formed the Coastal Recreation Audit Working Group in 2004 (now known as the Wales Activity Mapping Working Group), a partnership of organisations involved in the management of the coast and countryside across South West Wales. The group recognised that there was a lack of adequate data on the capacity of individual activities, interaction between them, impacts on resources and subsequent management needs.

In an attempt to take an evidenced based approach to the sustainable management of the coastal area the project set about to obtain a clear understanding of the key recreational activities within the study area; to determine the scale and distribution of key activities on a site by site basis; to ascertain actual and perceived negative impacts of activities on a site in terms of the environment, community and human safety and identify conflicts between users and user groups and to provide an indication of likely future trends.

This presentation will cover how the group tested a number of data collection methods and data storage systems before deciding on the most effective way to collate and display the information. The uses of the data will be covered which have been wide ranging and include being the evidence base for the Pembrokeshire Coast National Park Authority (PCNPA) Recreation Plan. Information from the project has also assisted in providing data for the PCNPA Enjoy website where management issues and knowledge of capacity have proved a useful tool in drawing up messages for best practice.

Recreation layers have been used in the Management Plan for the Carmarthen Bay and Estuaries European Marine Site. The project is confirmed to be part of Welsh Government's Destination Management Toolkit looking at sustainable management of tourism destinations throughout Wales. It will also be used by ARCOPOL when emergency planning for coastal pollution responses. Used by Local Authorities in the applications to the Welsh Government for designation of bathing waters and grant funding.

The data has been used recently in a coasteering feasibility study and the system is being used to display consenting layers within the Pembrokeshire Marine SAC. Building on the use and evidenced based approach PCF utilising the expertise of Marine Planning Consultants and Atkins have recently completed a project to provide an economic value to the mapped areas of marine/coastal recreation and tourism in two pilot areas of Pembrokeshire. The study has provided clear evidence and methods to state how much individual activities are worth to the local economy.

The overall objective of the project was to source individual expenditure per person per day for each activity and to apply this to the number of participant days per year for a given location as defined by the Wales Activity Mapping project. This therefore provides the total value of an area per year for each activity; and by combining all activities, the total recreation value for any unique location can be calculated.
As this scale of marine recreation valuation has not been carried out to date in the UK, the project was intended as a pilot study, focusing on two case studies in southwest Wales: the St David's area and Dale. The intention was that the methodology developed may help enable relatively rapid recreation valuations across broad areas for multiple activities in the future. This will aid the developments being made in policy and commerce alike, particularly to inform marine planning and the designation of Marine Protected Areas, allowing the recreation sector to be better represented (and therefore considered) in future plans.
A Non Technical Executive Summary, the full report and more info can be found here http://www.walesactivitymapping.org.uk/economic-valuation/

Managed realignment 20 years on – an overview

Colin Scott
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Two decades ago Managed Realignment was a relatively novel concept; today it is a mature and well understood coastal management practice. In the UK alone, over 60 projects have been completed through a variety of different approaches. With each new project, lessons have been learned which have increased our confidence in the effectiveness and value of this approach. As a result we have moved from the small-scale trial initiatives of the early 1990s to much more ambitious landscape-scale projects in recent years.

The primary strategic motives for realignment include: improving flood protection, lowering defence maintenance costs; reducing intertidal erosion and achieving a more sustainable coastal morphology. The creation of intertidal habitat, often as compensation under the Habitats Directive, is also a main driver. Completed projects have been successful in achieving these core objectives but many other socio-economic benefits have also been identified over the years such as: enhanced fish populations; improved water quality; carbon sequestration; provision of recreational areas; community education and engagement; job creation and an injection of money into the local economy.

However, implementing these schemes is complex and costly especially at a large scale. There are many, major challenges associated with: securing the correct land; communicating with stakeholders, obtaining planning consent and undertaking the construction itself. This situation is only likely to get worse in the future as competition for coastal land increases. Therefore, if we are to meet our national targets, changes of approach are likely to be needed. For example, we may need to move towards more partnership-based approaches which recognise and realise more of the multiple benefits arising from such schemes. Policy developments such as proposals for Biodiversity Offsetting and commitments for no net loss of habitat and for placing sustainable development and ecosystem services at the heart of planning decisions may provide new frameworks and contexts within which to achieve this.

Related Information:

Database on Completed Managed Realignment Projects in Northern Europe

http://www.abpmer.net/omreg/

LinkedIn Discussion Forum of Coastal Habitat Creation and Managed Realignment

http://www.linkedin.com/groups?home=&gid=3744666&trk=anet_ug_hm

Biodiversity Offsetting at the Coast

Jan Brooke
Environmental Consultant, Leader of the Institution of Civil Engineers Maritime Panel's initiative on coastal offsetting
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Biodiversity offsetting describes conservation actions (such as restoration, enhancement or habitat creation) which are designed to deliver biodiversity benefits in compensation for losses in a measurable way. Offsetting was highlighted in the Government's 2011 Natural Environment White Paper as an important mechanism for delivering no net loss of biodiversity in the wider environment. In 2013 the possible implementation of a system in England was the subject of a Defra Green Paper consultation https://www.gov.uk/government/consultations/biodiversity-offsetting-in-england and the concept has since received plenty of attention in the national press following the launch of an Environmental Audit Committee inquiry into the Government consultation.

Biodiversity offsetting is being trialed as a voluntary initiative in England in six pilot schemes introduced through the White Paper. However, these trials have focused principally on the terrestrial environment. Both the White Paper and the subsequent Defra consultation have largely overlooked the important differences that would affect the implementation of such a policy at the coast.

Whilst coastal and estuarine habitats play a vital role in the provision of ecosystem goods and services, development pressures over many decades have led to the degradation of these habitats and their associated functions in turn affecting not only wildlife, but also coastal defenses, fish nursery areas, recreation and amenity resources and so on.

A 2013 Institution of Civil Engineers' Discussion Paper on biodiversity offsetting at the coast http://www.ice.org.uk/topics/maritime/Best-practice-documents-maritime/Biodiversity-Offsetting concluded that, if further degradation of undesignated coastal and estuarine habitats (including losses which result from multiple small impacts) is to be reduced through biodiversity offsetting, consideration needs to be given to various coast-specific challenges.

The Discussion Paper and the ICE's follow up Position Paper http://www.ice.org.uk/Information-resources/Document-Library/ICE-Position-Paper---Biodiversity-Offsetting identified several potentially significant benefits which could result from a well-informed and carefully implemented biodiversity offsetting initiative. However, it was also clear that coastal biodiversity gain will be limited whilst the current policy uncertainty persists. A clear and consistent framework is needed which takes into account the complexities of both the physical/natural environment at the coast, and the regulatory regime. Further, the policy must be well promoted and its potential benefits to developers, offset providers and regulators alike must be highlighted.

This presentation will explore these issues and challenges as well as the potential opportunities, and it will consider the implications for the range of stakeholders likely to be involved with the implementation of a policy of biodiversity offsetting at the coast.

Developments in the use of economics for coastal and marine programmes and schemes

Ian Dickie
Director of Business Development, economics for the environment consultancy
E: ian@eftec.co.uk

The use of environmental economics in marine policies and programmes is expanding rapidly. There are two reasons for this. Firstly, marine analysis is following the trend for increased use of environmental economics in terrestrial environments. Secondly, marine activities that require economic analysis are expanding (e.g. protected area designation, MSFD, marine planning, biodiversity offsets).

The usefulness of environmental economics to marine management is dependent on availability of appropriate science. This is because economics analyses the consequences of changes: not "*what is the environment worth?*", but "*how will people be affected by an environmental change?*" As scientific understanding of changes becomes more detailed, so environmental economics becomes more accurate.

Environmental economics uses different languages in different contexts. At the science-economics interface, ecosystem services frameworks are useful to answer the change question described above. At the commerce-economics interface, natural capital language is preferred, being more familiar to business notions of production. They are broadly similar concepts, but differ in that natural capital is concerned with the capacity to provide goods and services, rather the services themselves, and includes some abiotic goods and services not usually included in ecosystem services.

Some areas of work still remain very poorly understood, including some effects of different pressures on the UK marine environment (e.g. abrasion from fishing, noise, climate change); and human impacts in the deep sea. Greater use of environmental economics requires further primary research to expand the currently sparse evidence bases, and to make best use of available information. A key approach for using available economic evidence more efficiently is value transfer. Transfer of existing economic evidence needs to recognise that economic values are dependent on timing, substitutes, beneficiaries and other characteristics. Value transfer helps us take account of these variables in interpreting value evidence, and understand the limitations of our knowledge.

MSFD targets and indicators impact assessment
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82640/20120327-msfd-consult-ia.pdf

and cost-benefit analysis:
http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=16817&FromSearch=Y&Publisher=1&SearchText=ME5405&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description

Natural Capital Committee's 'State of Natural Capital:
http://www.defra.gov.uk/naturalcapitalcommittee/files/State-of-Natural-Capital-Report-2013.pdf

Value transfer guidelines: http://archive.defra.gov.uk/environment/policy/natural-environ/using/valuation/

Scoping Study on Marine biodiversity Offsets:
http://www.thecrownestate.co.uk/media/397708/marine-biodiversity-offsetting-uk-scoping-study.pdf

Climate change – key messages from the IPCC and implications for UK adaptation

Daniel Johns
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The Committee on Climate Change is an independent statutory body tasked with advising the UK and devolved administration governments on setting and meeting greenhouse gas emission targets whilst considering how best to prepare for the extent of climate change that may unfold.

In recent years, awareness and concern regarding climate change has diminished as other priorities have come to the fore; most notably the fallout from the global economic recession and the Government's focus on encouraging growth and reducing the UK deficit. Momentum on the global stage has also stalled. Whilst governments have collectively agreed that action is needed to limit the increase in average global temperatures to no more than 2 degrees celsius (in comparison with pre-industrial times) there is no binding agreement for how it will be achieved. Analysis by the Committee on Climate Change shows that global greenhouse gas emissions need to peak by the early 2020s and then decline rapidly to maintain even a 50:50 chance of limiting the increase in average temperatures to 2 degrees. Scientists warn that more than two degrees would usher dangerous climate change.

Without a global deal we are on course for a four degree rise in global average temperatures by 2100. There has already been close to a 1 degree rise since 1900. Last May, concentrations of carbon dioxide in the atmosphere breached 400 parts per million for the first time in an estimated 3-5 million years.

Climate change is expected to have profound implications for managing the coast. Decisions taken now will have far reaching consequences for our coastal communities, both positive and negative. The recent winter storms and 'weather blocking' may become the new norm due to dramatic recent losses in Arctic summer sea ice. The coastal surge in December reminds us of the risk posed by increasing sea levels when combined with low pressure systems, strong winds and high tides.

This presentation will summarise the latest science including from the Intergovernmental Panel on Climate Change and the implications for the UK coastline.

Related Information:

Climate change – is the UK preparing for flooding and water scarcity?

http://www.theccc.org.uk/publication/climate-change-is-the-uk-preparing-for-flooding-and-water-scarcity-3rd-progress-report-2012/

Managing the land in a changing climate

http://www.theccc.org.uk/publication/managing-the-land-in-a-changing-climate/

Enabling sustainable growth in our marine area

Dickon Howell
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W: www.marinemanagement.org.uk

This talk will cover an update on a wide range of work that MMO has been doing on marine licensing including:

- Streamlining marine licensing in the MMO
- Implementing the Focus on Enforcement action plan http://discuss.bis.gov.uk/focusonenforcement/review-findings/government-takes-action-to-cut-red-tape-for-coastal-projects-and-investments-summary/
- Upcoming changes
  Fees and charges revision
  Navigational dredging requirements
  Plan-led management

Offshore wind: Lessons from the Dogger Bank EIAs

Gareth Lewis
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In June 2008 The Crown Estate announced proposals for the third round (Round 3) of offshore wind farm leasing, following on from the 8 gigawatts (GW) planned from earlier United Kingdom (UK) offshore wind leasing programmes (Rounds 1 and 2). Subsequent to this announcement, the Offshore Energy Strategic Environmental Assessment (Department of Energy and Climate Change (DECC) 2009) was carried out, to examine the potential for 25GW of additional UK offshore wind. In this process nine Round 3 Zones were identified by The Crown Estate with a combined target energy generation capacity of 25GW. In January 2010, following a competitive tender process, The Crown Estate awarded Forewind Limited (Forewind) the exclusive development rights for 'Zone 3, Dogger Bank'; the largest of the Round 3 offshore wind farm zones. The Dogger Bank Zone comprises an area of 8,660km2, and is located in the North Sea between 125km and 290km off the coast of Yorkshire.

Forewind's commitment is to secure all of the necessary consents for the construction and development of the Dogger Bank Zone, up to the point of an investment decision. At the time of award of the site by The Crown Estate in 2010, it was believed that a capacity of 13GW might be achievable if the Zone was found to be completely developable with only limited constraints. Forewind's zone appraisal work has identified the possibility for up to eight Dogger Bank projects, with a total capacity more than 9 GW. The organisation's current priority is to secure consent for the first six projects, each up to 1.2 GW, or a total installed capacity of 7.2 GW.
The optimum capacity will be achieved by a series of individual wind farm projects being developed in phases, based on the identification of development areas referred to as 'tranches'. Projects will subsequently be constructed by different parties over a phased period that is anticipated to commence in 2016.

The boundaries of tranches A to D have now been identified within the Dogger Bank Zone. Selection of tranches A and B was informed by data which was collated during Zone Appraisal and Planning (ZAP) and presented in the Zone Characterisation Document (ZoC). This process uses information collected in a series of stakeholder workshops and discussions, as well as considering relevant technical, environmental and commercial aspects associated with offshore wind farm project delivery and operation.

Forewind's development of the Dogger Bank Zone began with Dogger Bank Creyke Beck A & B for which planning application was lodged during 2013. Dogger Bank Teesside A & B has just completed its final stage of formal consultation and will be lodged Spring 2014. Each application will comprise two wind farm arrays, each generating up to 1.2GW, and will connect to the existing National Grid substations at Creyke Beck in East Riding of Yorkshire and Lackenby, in Teesside. Dogger Bank Creyke Beck A & B and Dogger Bank Teesside A & B projects will have a total combined generating capacity of up to 4.8GW.

The offshore infrastructure for each application will comprise of two wind farm arrays, within each array there will be four offshore collector stations, one converter platform and two accommodation platforms along with sub-sea inter-array and export cabling. The onshore elements of the project will include two buried cable systems from the landfall point to the onshore converter station and then onto the National Grid connection point. This detail coupled with methodology and programme information provides the Rochdale envelope to which Environmental Impact Assessment can be carried out.

This presentation attempts to share a few of the key lessons learned during the zonal appraisal process and subsequent Environmental Statement compilation work with particular focus on some of the challenges relating to Cumulative Impact Assessment, Habitats Regulations Assessment and making this all work in the relatively new consenting framework for Nationally Significant Infrastructure Projects.

Reviewing of Post-consent Monitoring Information Offshore Wind Farms

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The Marine Management Organisation (MMO) is responsible for licensing offshore energy generating installations between 1 and 100 MW within our marine area. Wind farms generating more than 100 MW may be consented by the Secretary of State following a recommendation from the Planning Inspectorate (PINS). Such consents may include a deemed marine licence.

Marine licences often include conditions that require developers to undertake post-consent environmental monitoring. The rationale for this monitoring is often to validate predictions made in the supporting Environmental Statements; provide evidence on the effectiveness of mitigation measures; or allow identification of any unforeseen impacts.

There is wide agreement that the results of these surveys should be a key contribution to the evidence base associated with potential environmental impacts, and hence should inform new developments. It is therefore important that regulators, advisers, and developers review information arising from this type of monitoring. This was recognised in the recent Habitats and Wild Birds Directives Implementation Review. This review included a measure to establish a Habitats and Wild Birds Directives Marine Evidence Group (MEG) which would oversee a rolling programme of post-consent monitoring reviews for priority marine sectors.

In November 2012, The MMO and Cefas, on behalf of MEG, commissioned a consortium of external experts to provide an independent review of Offshore Wind Farm monitoring reports, with the aim of identifying lessons learnt and providing recommendations on improving future licence-related monitoring strategies. The scope of the project included a review of all available post-consent monitoring reports for 18 UK projects as well as a number of international sites.

The outputs of this project were disseminated at a stakeholder workshop in July 2013, and the final report was completed in December 2013. This project is part of an ongoing work programme of the MEG to review post-consent monitoring information, and outputs will help ensure that licence-related conditions are in accordance with the principles of Better Regulation, and in particular, are proportionate, consistent, and targeted.

Consolidation of wave and tidal energy EIA/HRA issues and research priorities for the UK

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As part of a current initiative to assist with developing a coordinated approach to addressing the key strategic Environmental Impact Assessment (EIA) and Habitats Regulations Appraisal (HRA) issues associated with wave and tidal stream arrays (under, for example, an Offshore Renewables Joint Industry Programme (ORJIP) for wave and tide), Aquatera Limited was commissioned by The Crown Estate to undertake a short, focused consultancy project; 'Consolidation of wave and tidal EIA/HRA issues and research priorities'.

The key driver for this project was the recognition of the benefits of a coordinated effort to obtain and translate learning, knowledge, experience, information and data from single device and particularly first array projects to larger array deployments. It is considered that a coordinated approach will ensure that the best possible information is available to developers, regulators, Statutory Nature Conservation Bodies (SNCBs) and other stakeholders to inform the consenting process and project planning and design activities.

The main aims of this project were to:

- Produce a consolidated up-to-date list identifying the key strategic EIA/HRA issues facing the wave and tidal stream sectors
- Identify the priority research gaps relevant to wave and tidal stream demonstration scale arrays and then outline potential approaches to address them
- Identify strategic research priorities which could be addressed through a coordinated programme

It is intended that the outputs from this project, by guiding future research work, will assist in resolving the priority EIA/HRA issues relevant to the consenting of wave and tidal stream arrays. It will do this by focusing any coordinated approach to research that is developed (e.g. via ORJIP Wave and Tide). The priorities identified in this project can also help focus any research which individual developers, regulators/advisors, academic institutions etc. may plan to undertake.

This talk will outline the process applied during the project and present the key outputs including the research priorities that were identified.

Related Information:

Consolidation of wave and tidal EIA/HRA issues and research priorities (Aquatera, 2014)

http://www.thecrownestate.co.uk/media/485012/consolidation-of-eia-hra-issues-and-research-priorities.pdf

Impacts of wave and tidal technologies on birds, fish and marine mammals – Outcomes of NERC, RenewableUK & Scottish Renewables funded study

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RenewableUK, Scottish Renewables and the Natural Environment Research Council (NERC) recently published a series of industry position papers developed by PMSS TÜV SÜD and SMRU Marine Limited (SMRU Marine) on the key impacts of wave and tidal devices on fish and shellfish ecology, birds and marine mammals, as the 'big three' environmental receptors presenting challenges to consent and deployment. Using a methodology based on review of existing literature and pro-forma based interviews with wave and tidal energy developers and regulators, a consolidated understanding of the key issues and knowledge gaps was identified.

The past five years has seen a rapid expansion in the wave and tidal industry as the technology has matured. Moreover, during this period the industry has largely embraced the 'survey-deploy-monitor' approach where devices have been installed and the environmental effects monitored before further projects consented. Despite several developers achieving impressive numbers of hours of deployment and testing of devices at test sites, there remains uncertainty regarding environmental impacts on key receptors, particularly given the individual nature of many of the technologies. This uncertainty, coupled with the assessment requirements of The Conservation of Habitats and Species Regulations 2010 (as amended) in England and Wales and The Conservation (Natural Habitats, etc.) Regulations 1994 (as amended) in Scotland, and the fact that most marine energy sites have a degree of connectivity with protected sites and species, is in danger of hindering the continued development of the industry.

As the industry continues its up-scaling journey to larger arrays (first recognised in 2011 when Scottish Power Renewables' 10MW Sound of Islay tidal stream project received consent and more recently MeyGen's 86MW Pentland Firth tidal array project), there is still a reliance on extrapolating the existing knowledge gained from small sites. A key recommendation from the PMSS TÜV SÜD & SMRU Marine study was to encourage the phased deployment of larger arrays with concurrent monitoring focusing only on key impacts/uncertainties to enable critical learning to take place and ensure commercial scale developments are not hampered by uncertainty over impacts.
In return, these projects need to provide statistically robust impact monitoring studies with scientific and regulatory oversight to reduce uncertainty around impacts to advance the industry position as a whole. Early deployment will provide the industry with the opportunity to reduce consenting risk to future projects by avoiding the prolonged precautionary approach characteristic of both onshore and offshore wind.

Closing existing knowledge gaps to achieve an effective level of understanding will need a strategic approach and investment from government on advancing current research. Reliance on investment from individual projects would be considered disproportionate to the scale of these individual projects, although it has been recognised that some research investment should be provisioned where necessary.
As the industry moves toward installing large commercial scale arrays, an opportunity exists to reduce consenting risk. This focuses on ensuring uncertainty can be reduced sufficiently to avoid the prolonged precautionary approach adopted by regulators during the deployment of offshore wind. The key to success will be ensuring monitoring design is appropriately focused on answering specific questions and does not simply repeat the surveys undertaken to inform the consenting process.

The papers can be accessed via the following URLs:
http://www.renewableuk.com/en/publications/reports.cfm/Marine-Mammals-Impacts
http://www.renewableuk.com/en/publications/reports.cfm/Impacts-on-Fish-and-Shellfish-Ecology
http://www.renewableuk.com/en/publications/reports.cfm/Ornithological-Impacts

Cumulative Effects – the impossible question…

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All proposals for projects that are subject to the EC Environmental Impact Assessment (EIA) Directive require an Environmental Statement (ES) to be produced, describing the environmental footprint of the project and any resultant significant environmental effects. The Directive requires that the "…*potential significant effects of projects must be considered in relation to… the cumulation of impacts with the impacts of other projects (in particular existing and/or approved) by the same or different developers*" i.e. a Cumulative Impact Assessment (CIA) is required. A CIA is therefore necessary for all projects submitted for consent under the appropriate domestic legislation: The Marine Works (Environmental Impact Assessment) Regulations (as amended 2011); The Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2012; and The Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008. Cumulative effects/impacts of certain plans and programmes on the environment are also referred to in the Strategic Environmental Assessment (SEA) Directive.

The EC Habitats Directive, and therefore The Conservation of Habitats and Species Regulations 2010 and The Offshore Marine Conservation (Natural Habitats, &c) (Amendment) Regulations 2010, also require in-combination effects to be considered for relevant Natura 2000 site features; through the screening for likely significant effects and, if necessary, a Habitats Regulations Assessment (HRA) and Appropriate Assessment (AA).

Despite there being legal requirements for CIA for the last two decades, there remains a surprising lack of clarity over the cumulative impacts that need to be considered by developers and their consultants, or strategic guidance on the appropriate scope, scale, and methodologies for such assessments. As an example, CIAs prepared as part of ESs for projects in England have been described as inadequate and unsatisfactory across all industry sectors (IEMA, 2011). Fundamental constraints appear to be: availability of information to undertake a meaningful assessment, particularly parameterising other project footprints (both known and reasonably foreseeable), and an apparent lack of baseline conditions upon which to build assessments; the lack of detailed guidance regarding the scope and appropriate spatial scale of the CIA required by regulators (and their advisors); uncertainty of suitable environmental parameters required to be assessed; and reviews of assessments by regulators lacking in appropriate detail/information, and subsequent feedback of these deficiencies to inform subsequent assessments.

Rather than moving the process of CIA forward – as has been done with the site-specific EIAs - the default position appears to be to continually reinvent the wheel. This continues to result in an inconsistent and uncertain regulatory environment for industry and wider stakeholders and practitioners such as environmental consultants, regulators, and their advisors.

Recently in the UK there have been several industry sector-led initiatives which have provided the building-blocks for deliverable CIA e.g. the Marine Aggregate Regional Environmental Assessments (MAREAs); Offshore Renewables Round 3 Zone Appraisal and Planning (ZAPs); and Renewable UK's CIA Guidelines. In all cases, these initiatives have been proactively instigated in recognition of the fact that adequately addressing the cumulative impact of a development in the marine environment remains one of the most significant obstacles to successfully securing the necessary regulatory consents required for an activity to occur. However, there is a growing feeling that developers are increasingly being asked to provide answers to impossible questions, with unrealistic considerations of sufficiency/proportionality of a CIA, and the management of uncertainty (assessment envelopes) associated with the process.

Recent guidance has been produced by regulators such as The Marine Management Organisation's review of CIA for offshore wind farm development, and advisors such as Natural England's draft Generic Framework for Informing CIA in relation to Marine Protected Areas (MPAs).

The MMO has also recently announced a project to consider cumulative effects at a more strategic level across its various functions.

Whilst informative and advancing the processes for conducting meaningful CIA, these approaches may highlight a fundamental constraint to effective CIA, namely an industry sector-by-sector and regulator/agency specific approach. This 'silo' approach consumes considerable time, effort and cost for developers and regulators alike, as there may be little guidance and consideration given to integration across sectors, or between disciplines. But it should not need to be like this, as the principles and issues that need to be considered are unlikely to vary across functions/receptors, similar to the EIA process.

Rather than keeping CIA in the '*too difficult to do*' drawer and leaving the onus with individual developers or industry sectors to resolve the inevitable issues, the move towards more integrated management at a regional seas scale should provide a platform to enable a smarter approach to tackling this issue – building on the considerable practical experience that already exists.

Related Information:

Institute of Environmental Management and Assessment (IEMA), 2011. *The state of Environmental Impact Assessment practice in the UK.* Special Report.
http://www.iema.net/state-environmental-impact-assessment-eia-practice-uk

MMO, 2013. *Evaluation of the current state of knowledge on potential cumulative effects from offshore wind farms (OWF) to inform marine planning and marine licensing*. A report produced for the Marine Management Organisation, pp 71. MMO Project No: 1009. ISBN: 978-1-909452-07-7.
http://www.marinemanagement.org.uk/evidence/documents/1009.pdf

RenewablesUK, 2013. *Cumulative Impact Assessment Guidelines: Guiding Principles for Cumulative Impacts Assessment in Offshore Wind Farms*.
http://www.renewableuk.com/en/publications/index.cfm/cumulative-impact-assessment-guidelines

Marine Aggregate Regional Environmental Assessments – various.
http://www.marine-aggregate-rea.info/about-marea

A framework for cumulative impact assessment for wave and tidal power in Pentland Firth & Orkney Waters

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For projects requiring environmental impact assessment, different EIA regulations have been enacted in relation to different consents and permits but all include effectively the same requirements regarding what are referred to as 'cumulative' or in some cases 'combined effects'. Similarly, for projects where assessment of the potential effects on European sites is needed under the Habitats Directive, the various Habitats Regulations require assessment of effects 'in-combination' with other plans and projects. In all cases, the first test is whether effects are 'likely to be significant' but the use of this term varies between EIA and assessments under the Habitats Regulations, in that case law dictates adoption of a precautionary approach for the latter.

This presentation considers application of these requirements (together referred to as 'cumulative impact assessment' or CIA) in the specific case of wave and tidal energy projects in the Pentland Firth and Orkney waters strategic development area.

The presentation will cover the following key issues identified in relation to the cumulative impact assessment process:

- legal definitions of cumulative impact assessment requirements;
- timing of screening/scoping;
- methods for collaboration between key stakeholders and between developers during the screening/scoping stage;
- the use of the Source-Pathway-Receptor (S-P-R) model in the screening/scoping process;
- which projects to include in the CIA process and the stage of consenting at which projects should be included in CIA;
- how best to determine which receptors to include in the CIA process and at what spatial scale; and
- the arguments on qualitative versus quantitative assessment and how best to simplify data acquisition and analysis.

Through a workshop approach involving relevant stakeholders the study developed a series of recommendations to assist developers in approaching CIA for wave and tidal energy projects in the development area.

Related Information:
Pentland Firth and Orkney Waters, cumulative assessment report
http://www.thecrownestate.co.uk/media/420420/PFOW-cumulative-impact-assessment.pdf
Other Pentland Firth and Orkney Waters enabling actions reports
http://www.thecrownestate.co.uk/media/184617/identification-of-cumulative-effects-associated-with-wave-and-tidal-development-in-pfow.pdf
http://www.thecrownestate.co.uk/media/391513/pfow-onshore-infrastructure-information-note.pdf
http://www.thecrownestate.co.uk/media/420424/PFOW-ornithological-cumulative-impact-assessment-framework.pdf
http://www.thecrownestate.co.uk/media/391521/socio-economic-methodology-and-baseline-for-pfow-wave-tidal-developments.pdf
http://www.thecrownestate.co.uk/media/391513/pfow-onshore-infrastructure-information-note.pdf
http://www.thecrownestate.co.uk/media/391509/report-on-rochdale-envelope-workshop-wave-tidal.pdf
http://www.thecrownestate.co.uk/media/391505/study-to-identify-opportunities-for-strategic-measurements-in-pfow.pdf
PFOW map
http://www.thecrownestate.co.uk/media/395203/pentland-firth-and-orkney-waters.pdf

The IPSO State of the Oceans Report 2013

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The International Programme on the State of the Ocean (IPSO) was established to improve our understanding of the role of the ocean at an Earth System Level and its contribution to enabling life to exist on Earth.

Every sea and ocean on our planet is part of one, global Ocean. This Ocean is like the earth's circulatory system: it performs numerous vital functions which make the planet habitable and we cannot survive without it. Currently, the Ocean is in a critical state of health. If it continues to decline, it will reach a point where it can no longer function effectively and our planet will be unable to sustain the ecosystems that support humankind. Climate change is the biggest single threat to our Ocean's health, but it's not the only one. If the Ocean is to continue functioning at a level capable of sustaining life as we know it, we need to tackle climate change and alleviate the other pressures we exert upon it. IPSO's unique consortium of scientists and other Ocean experts — including those from the legal, communications and political arenas — identify the current problems, project the future outcomes of these problems and develop workable solutions to alter the trajectory of degradation.

Everything that IPSO does, it does to preserve our Ocean so that life as we know it can continue.

IPSO, an international panel of marine scientists is demanding urgent remedies to halt ocean degradation based on findings that the rate, speed and impacts of change in the global ocean are greater, faster and more imminent than previously thought.

Results from the latest International Programme on the State of the Ocean (IPSO)/IUCN review of science on anthropogenic stressors on the ocean go beyond the conclusion reached last week by the UN climate change panel the IPCC that the ocean is absorbing much of the warming and unprecedented levels of carbon dioxide and warn that the cumulative impact of this with other ocean stressors is far graver than previous estimates.

Decreasing oxygen levels in the ocean caused by climate change and nitrogen run-off, combined with other chemical pollution and rampant overfishing are undermining the ability of the ocean to withstand these so-called 'carbon perturbations', meaning its role as Earth's 'buffer' is seriously compromised. The link to the full report is:

The State of the Ocean 2013: Perils, Prognoses and Proposals: Executive Summary

Marine Autonomous Systems – new developments and applications in marine mapping and monitoring

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I will be covering the following topics in my talk:

1. The perfect storm of marine mapping and monitoring – how do we do more for less?

2. Marine Autonomous Systems (MAS) – what, where and how?

3. New applications in MAS to underpin UK monitoring needs

4. Engaging UK business and government in MAS development

5. Working towards an integrated UK marine mapping and monitoring network

NOC website:
http://www.noc.ac.uk

Marine Autonomous and Robotic Systems (MARS)
http://noc.ac.uk/research-at-sea/nmfss/mars

Co-ordinator, MAREMAP
http://www.maremap.ac.uk

Chairman, The Seabird Group:
http://www.seabirdgroup.org.uk

The remarkable ecosystems of Rockall; discovery, diversity and management

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Rockall is a tiny islet, not much bigger than a semi-detached house, lying some 200 miles out into the Atlantic. Its small size however gives no indication of the significance of what lies beneath the waves; a vast plateau of continental crust that once connected Greenland to Europe. The occurrence of a large expanse of shallow water habitat in what is otherwise a deepwater open ocean environment is unusual and the ecosystems, habitats and fish stocks found there are unique and remarkable. The area has long been a prime fishing ground and in recent years a series of multidisciplinary scientific surveys have revealed that it is also an area of exceptional biodiversity and ecological importance. The presence of extensive cold-water coral reefs, bedrock reefs and cliffs, sponge fields, sea-pen meadows and methane-seep communities are all now known to occur there. Many of these habitats classify as 'Vulnerable Marine Ecosystems' for which United Nations resolutions have been drafted to protect. Balancing fishing interests with the protection of such habitats became a focus for the International Council for the Exploration of Sea (ICES). Through ICES Rockall was among the first areas in the North Atlantic to be spatially managed with fishing closures imposed specifically to protect coral reefs. In the past year the area has been proposed as an 'Ecologically and Biologically Significant Area' under the Convention on Biological Diversity. Importantly, however, there are large sections of the Rockall plateau that can be fished sustainably without threatening vulnerable marine ecosystems. An approach based on marine spatial management offers a way forward for allowing both sustainable fisheries to persist and nature conservation to be achieved.

Related Information:

Topic sheet on Rockall;

http://www.scotland.gov.uk/Resource/Doc/295194/0119390.pdf

ICES Working Group on Deepwater Ecology (advice on Marine Spatial Planning and bottom fishing closures)

http://www.ices.dk/community/groups/Pages/WGDEC.aspx

Publication on Rockall fish communities

http://onlinelibrary.wiley.com/doi/10.1111/j.1095-8312.2011.01699.x/abstract

DAY 2 - Thursday 23rd January

Marine Strategy Framework Directive – update and marine monitoring programme consultation

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The UK Government and Devolved Administrations are committed to taking action to improve the state of the UK's marine environment, most notably through the UK Marine and Coastal Access Act (2009), the Marine (Scotland) Act (2010) and the Marine Act (Northern Ireland) (2013). This is in addition to implementing existing EU legislation, such as the Water Framework Directive (WFD) and the Birds and Habitats Directives and commitments under the OSPAR convention that also contribute to improving the state of the UK's marine and coastal environments.

The Marine Strategy Framework Directive (2008/56/EC) (MSFD) supplements this activity and aims to ensure that national action to protect the marine environment is supported by a framework that ensures action is taken across Europe. To do this it requires Member States to put in place the necessary management measures to achieve Good Environmental Status (GES) in their marine waters by 2020. To do this, Member States must:

1. carry out an initial assessment of the current status of their seas, determine specific characteristics of GES for their marine waters and set out specific environmental targets and indicators;
2. put in place monitoring programmes to measure progress towards GES; and
3. develop and implement management measures to achieve GES by 2020.

The UK completed this first stage in December 2012. The next stage is to consult on summaries of our proposed monitoring programmes. The consultation was launched on 8th January 2014 and will close on 2 April. The proposals have been jointly developed with the Devolved Administrations, the Joint Nature Conservation Committee (JNCC), the Centre for Environment, Fisheries and Aquaculture Science (Cefas), environment agencies, other Government Departments, and relevant UK experts. We are now looking for input from others to inform our proposals. In particular, we would like to hear from trade associations/bodies and Non-governmental organisations (NGOs) concerned about the marine environment and those that have relevant marine data and information not currently used in the UK Marine Monitoring and Assessment Strategy.

Related information:

Marine Strategy Part 1:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69632/pb13860-marine-strategy-part1-20121220.pdf.

Responses or queries to the consultation should be submitted no later than 2nd April 2014 either in writing to MSFD.Team@defra.gsi.gov.uk or online via
https://www.gov.uk/government/publications?publication_filter_option=consultations.

Understanding planktonic systems: Update & links to MSFD

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A key feature of the MSFD is consistency and comparability in ecological datasets used for indicator construction and monitoring towards environmental targets; however this may be challenging due to the cost of modifying existing monitoring programmes or starting new ones. The preservation of existing time-series, particularly those which are multi-decadal, should be a priority, especially when attempting to separate the climate change signal from that occurring due to manageable human pressures. The UK has developed plankton indicators for the MSFD's 'biodiversity' descriptors (D1 Biodiversity, D4 Foodwebs, D6 Seafloor integrity) which allow the combination and integration of data arising from existing plankton datasets, with disparate methods of sample collection and analysis, to be used to monitor changes in the state of the plankton. This method is based on the use of plankton lifeforms and encourages the continuation of established long-term datasets. Associated environmental targets have been developed which allow for ecosystem response to unmanageable climate change yet trigger management action if changes in the plankton are linked to anthropogenic pressure. The UK's pelagic habitat indicators and targets have been recently approved for further development as OSPAR common indicators which, if operationalized, will be used by all OSPAR contracting parties to assess the state of the plankton component of pelagic ecosystems at the regional scale. Here the challenges and proposed solutions to MSFD pelagic habitat implementation at the UK and OSPAR levels are outlined.

Understanding planktonic systems: Update & links to MSFD

In 2008 the European Union enacted the Marine Strategy Framework Directive (MSFD). The objective of the MSFD is to achieve Good Environmental Status (GES) of European seas by 2020; plankton are an ecological component which must be assessed under the Directive's biodiversity descriptors (D1 Biodiversity, D4 Foodwebs, D6 Seafloor integrity). Each EU member state must use ecological indicators to monitor towards environmental targets for GES; the selection and development of these indicators and the setting of associated targets are the responsibility of the individual member states. In a process coordinated by OSPAR, all Northeast Atlantic member states will be required to monitor certain 'common indicators' towards agreed common targets which will allow the assessment of the state of the plankton at the regional ecosystem scale.

When developing plankton indicators for the UK's implementation of the MSFD, three key challenges were immediately identified (Gowen et al. 2011):

1. No individual species are representative indicators for UK plankton due to high variability of plankton composition over a range of spatial and temporal scales
2. Separation of anthropogenically-driven change from climate-driven change or natural variability is difficult
3. Differences in sampling and analysis methodologies and taxonomic resolutions between monitoring programmes

To address these three challenges, the UK has developed a suite of indicators and associated targets based on the use of plankton lifeforms (Tett et al. 2008). The assignment of groups of species to plankton lifeforms summarises large amounts of plankton species data without losing important information on seasonal fluctuations in species abundance. Because lifeforms are coarser than individual species level, they are comparable between datasets with varying degrees of taxonomic resolution. Changes in lifeform abundance can serve as indicators for the biodiversity, food webs, and seafloor integrity descriptors. Combining the plankton lifeforms used for these three descriptors will give a holistic plankton indicator that may be used to monitor changes in the structure and functioning of the planktonic component of pelagic ecosystems (Gowen et al. 2011).

Separating anthropogenically-driven ecosystem changes from those caused by climate change (a 'prevailing', or unmanageable, condition under MSFD time scales) or natural variability is a challenge that impacts indicator and target selection and ultimately the management of marine ecosystems. Comparing changes observed in coastal waters, which are normally more severely impacted by land-based anthropogenic activities, with changes observed in less impacted open waters can be used to separate the signals, but spatially appropriate time-series data are also essential. Long-term datasets are key to signal separation and can help identify changes in ecological indicators, detect sudden and gradual ecosystem shifts, and provide a baseline against which to interpret future changes (McQuatters-Gollop 2012). Associated environmental targets have been developed which allow for ecosystem response to unmanageable climate change yet trigger management action if changes in the plankton are linked to anthropogenic drivers. The UK's pelagic habitat indicators and targets have been recently approved for further development as OSPAR common indicators which, if operationalized, will be used by all OSPAR contracting parties to assess the state of the plankton component of pelagic ecosystems at the regional scale.

Figure 1: The lifeform approach allows the use of plankton indicators from multiple time-series, such as those that currently comprise the UK's plankton monitoring network.

The national and international monitoring of plankton indicators and targets is challenging due to lack of consistency and comparability in ecological datasets available for indicator construction and target monitoring. For example, the UK's pelagic monitoring network is comprised of multiple monitoring time-series employing disparate methods (Figure 1). This situation is reflected at the OSPAR scale where national monitoring programmes also differ in frequency of sample collection and methodologies as well as taxonomic techniques and level of resolution.

Gowen, R.J., McQuatters-Gollop, A., Tett, P., Best, M., Bresnan, E., Castellani, C., Cook, K., Forster, R., Scherer, C. and Mckinney, A. 2011. The Development of UK Pelagic (Plankton) Indicators and Targets for the MSFD. Advice to Defra, Belfast, UK, 41 pp.

McQuatters-Gollop, A. 2012. Challenges for implementing the Marine Strategy Framework Directive in a climate of macroecological change. Philosophical Transactions of the Royal Society, 370: 5636-5655.

Tett P, Carreira C, Mills DK, van Leeuwen S, Foden J, Bresnan E, Gowen RJ. 2008. Use of a Phytoplankton Community Index to assess the health of coastal waters. ICES Journal of Marine Science, 65: 1475-1482.

More information on challenges for implementation of the MSFD: McQuatters-Gollop, A., (2012). Challenges for implementing the Marine Strategy Framework Directive in a climate of macroecological change. Philosophical Transactions of the Royal Society, 370: 5636-5655. http://rsta.royalsocietypublishing.org/content/370/1980/5636.short

Background on the MSFD: http://www.defra.gov.uk/environment/marine/msfd/

Ocean acidification update

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For the past decade, ocean acidification has been one of the fastest-growing and highest-profile research areas - not just in marine science, but across all disciplines. The number of worldwide researchers has increased from around 50 to more than 1,000, with the rate of publications increasing 15-fold, to more than 300 per year. As a result there is much wider awareness (by many policy makers, as well as the scientific community) that human-driven changes in atmospheric composition not only have serious implications for climate, ocean circulation and sea level, but are also now altering ocean chemistry at the global scale, causing an 'invisible storm' with the potential to directly or indirectly affect all marine life.

In 2010, the £12m UK Ocean Acidification research programme was started, co-funded by NERC, Defra and DECC, to improve our understanding of the chemical changes involved in ocean acidification, their biological impacts and their socio-economic consequences. UKOA involves more than 120 researchers in 26 laboratories, and has carried out fieldwork in European shelf seas, in the Arctic and in the Southern Ocean. Strong linkages with relevant EU and international research efforts have been developed, including the establishment of a Global Ocean Acidification Observing Network (GOA-ON, co-led by NOAA), close liaison with the Ocean Acidification International Coordination Centre (OA-ICC), and science-to-policy engagement with the Marine Climate Change Impacts Partnership (MCCIP), the Intergovernmental Panel on Climate Change (IPCC), the Intergovernmental Oceanographic Commission (IOC), the Group on Earth Observations (GEO), the Convention on Biological Diversity (CBD), other UN bodies, NGOs and the private sector.

At the most recent UKOA Annual Science Meeting (St Andrews, July 2013), UKOA researchers and international colleagues discussed and identified the most important recent advances in ocean acidification science, whilst also short-listing priorities for future research. The main recent achievements (emerging results from both the UKOA programme and research elsewhere) were considered to include:

- *Recognition of the importance of multiple stressors.* Ocean acidification is occurring in the context of other environmental changes (temperature, food/nutrient availability, oxygen levels, pollutants and habitat changes); we now know that interactions are complex and not readily predictable.
- *Improved techniques.* New sensors have been developed and deployed for observational studies (eg for underway measurements); there have also been major improvements in experimental and modelling methods.
- *Awareness of biological variability.* Experimental studies have shown some organisms are highly sensitive to pH reduction; however, others may be unaffected or even benefit. Biological responses can also depend on physiological condition (including energetics) and other factors.
- *Awareness of chemical variability.* The chemistry of ocean acidification is relatively straightforward; nevertheless, field measurements of pH (and other associated changes in carbonate chemistry), show much greater temporal and spatial variability than anticipated, with important implications.
- *Importance of scope for adaptation.* There is now evidence that both phenotypic and genotypic adaptation to ocean acidification can occur, potentially accentuating the difference between 'winners' and 'losers' under future high CO_2 conditions.
- *Insights from palaeo- studies.* Although ocean acidification has occurred before (resulting in the extinction of benthic calcifiers), the current rate is 10-100 times faster than has occurred for at least 55 million years, and is probably unprecedented.

- *Development of ecosystem-level studies.* Many important insights have been obtained from observations and experiments at natural CO_2 vents, also experimental manipulations using large, in situ mesocosms.

Although the UKOA programme is now coming to an end, other NERC and Defra-supported studies will continue, with emphasis on whole ecosystem responses, socio-economic impacts, and international partnerships on a worldwide basis.

Related Information:

Website of UK Ocean Acidification research programme: www.oceanacidification.uk.org

UKOA research cruise blogs: www.surfaceoa.org.uk/?page_id=39 (sea surface consortium; NW European Shelf, Arctic Ocean and Southern Ocean) and www.changingoceans2012.blogspot.co.uk (benthic consortium: coldwater corals)

Ocean Acidification review for MCCIP:
www.mccip.org.uk/media/13199/2013arc_backingpapers_5_ocac.pdf

Ocean Acidification Summary for Policymakers (IGBP, IOC and SCOR):
www.igbp.net/publications/summariesforpolicymakers/summariesforpolicymakers/oceanacidificationsummaryforpolicymakers2013.5.30566fc6142425d6c9111f4.html

Ocean Acidification international Coordination Centre: www.iaea.org/ocean-acidification/page.php?page=2181

Global Ocean Acidification Observing Network (including interactive map)
www.pmel.noaa.gov/co2/GOA_ON/2013/

Marine Planning update: the East and South marine plans

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Through the Marine and Coastal Access Act, in April 2010 the Marine Management Organisation (MMO) was delegated as the statutory body to undertake marine planning in England. Marine planning is a new approach to the management of English waters, seeking to ensure sustainable development by balancing environmental, economic and social interests. Planning needs to fit in to a landscape of other management measures and statutory and non-statutory policy including the introduction of the Marine Strategy Framework Directive, the reform of the Common Fisheries Policy, the recently revised Habitats Directive and the designation of Marine Conservation Zones and their associated management measures, all of which involve the MMO in one way or another. The marine planning team currently has 20 members, and is working on a number of fronts to deliver the suite of 11 English marine plans on a rolling programme through until 2022. At the same time the MMO, along with other public bodies, is faced with meeting the challenge of continuing to deliver with reduced and reducing resources.

The consultation on the first English marine plans for the East Inshore and East Offshore marine plan areas came to a close in October 2013. The plans represent over two and a half years of development work in collaboration with stakeholders interested in the many assets, resources and activities in our marine area. In addition, the plan is supported by a number of documents including a Sustainability Appraisal, Habitats Regulations Assessment and an 'Analysis' which provides a largely qualitative discussion of potential economic impacts. The Defra Secretary of State, rather than the MMO, approves the plans and supporting documents for going out to consultation; they also adopt the final plans.

The plans contain 11 plan objectives and 38 policies across a wide range of topics and sectors, and seek to:

- Be an enabling mechanism, providing greater certainty, e.g. to industry, through 'shortening the odds' and reducing the time from concept to consent. In doing so, the plans seek to add value by complementing rather than duplicating existing measures or adding new burdens.
- Provide a strategic and integrated approach, enabling early involvement of stakeholders, improved governance, and consideration of other measures.
- Consider the environment at an early stage, providing context for regulators, developers and others to inform their decision-making.

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- Consider the environment at an early stage, providing context for regulators, developers and others to inform their decision-making.

The planning team is currently analysing over 100 consultation responses including more than 2000 comments and making revisions to the plan. Resolving some issues raised during the consultation has required follow up engagement. Only once this discussion and assessment is complete will the MMO be in a position to provide an informed and transparent recommendation to Defra on the possible need to hold an independent investigation on the issues raised in respect of the plans. The Defra Secretary of State will then take the decision on whether or not an independent investigation is required.

As set out in the legislation (s58 of MCAA), plans will be implemented through the decisions taken by public authorities. In addition to preparing the draft East marine plans for adoption, the planning team is also working with other MMO functions and other decision makers to raise awareness of the duty to take account of the East marine plans in decision making. Three decision maker workshops were held in September 2013, attended by over 60 national bodies, statutory nature conservation bodies and decision makers specific to the East marine plan areas in order to raise awareness of the duty on all public authorities to implement plans, and to share experiences in implementing and monitoring existing measures.

Work is also underway to develop the approach to monitoring these first marine plans. Development of the monitoring approach has been informed by case studies from both the terrestrial and marine areas, and statutory and non-statutory plans. It has also drawn on available guidance in such as the Magenta Book and Defra description document. Monitoring will gather evidence to assess the effective implementation and impact of marine plans, drawing where appropriate from existing monitoring programmes. The monitoring process will recognise that marine plans are but one of many drivers contributing to change in the marine area. Should the evidence base and stakeholder appetite allow for marine plans to become more spatially prescriptive, then it should become easier to measure the impact of plans. The implementation, monitoring and review process will allow judgement of the soundness of the plans, and provide a mechanism for adaptive management, keeping the plans alive.

Marine planning is an evolving process, and we need to be adaptive in our approach to planning as more evidence and stakeholder feedback is gathered. Learning from the development of the draft East marine plans includes:

- The importance of the process and bringing stakeholders on the journey
- To be strategic in our evidence gathering – some evidence is 'no regrets', in that it will benefit long term development of plans, whereas some is more specific to address plan area issues. As the evidence base improves, the plans could become more prescriptive
- Try to focus on the key issues for planning to address early in the process
- Convey the strategic nature and implications of the plans – they are not an Local Development Framework for the seas

- The plans should complement and not duplicate existing measures. For the latter, in response to stakeholder views, we 'signposted' to information elsewhere that will be updated by those responsible for those measures,
- We need better, not more engagement – we do not have the resources to attend every event and working locally through liaison officers and coastal partnerships is invaluable. We need to engage government early at all levels.

Planning in the South Inshore and Offshore marine plan areas formally began with the publication of the Statement of Public Participation in April 2013.Whilst a smaller area compared to the East Inshore and Offshore marine plan areas they are very intensively used with some of the busiest shipping and recreational areas in the country.

We are building on our experience of planning to date and continuing to develop our evidence base to lay the foundations for the development of the South marine plans. With evidence budgets being reduced in 2014, a number of projects have been commissioned this year to increase our understanding of current activities and key issues in the South plan areas. The MMO is also undertaking work on 'big ticket issues' to develop our approach to planning and our role alongside other bodies. For example, how to apply an ecosystem approach to planning, and how to take a more strategic approach to cumulative effects assessment. The MMO is just one piece in the evidence jigsaw and we will continue to work with others to build the evidence base.

But do the lessons from the East hold true in the South?

The evidence and issues that marine plans can address in the South plan areas has been presented in the draft South Plan Analytical Report (SPAR). Based on feedback during the East planning process, this report is more digestible, more spatially defined, and takes an early view on the key issues through cross cutting themes, rather than presenting issues in 'siloes'. Consultation on the draft SPAR closed in November 2013, with over 1000 separate comments received.

Five workshops were held during the consultation, delivered in partnership with the Devon Maritime Forum, Dorset Coast Forum and Solent Forum. These were attended by over 200 stakeholders who provided more than 2000 comments. A full report of the workshops has been produced by the three coastal partnerships. This work will feed into the next phase in the development of the South marine plans which will be to refine the Vision and consider more detailed objectives.

As we analyse responses to the consultation it is clear that while some of the lessons from the East have improved our approach, others do not hold true for the South. For example, while moving to key issues under cross-cutting themes is seen as a positive step, feedback indicates that too much was attempted too soon. A real challenge also exists in creating a plan that suits all needs – from those who favour brevity, others seeking a 'one-stop-shop', or those that would like a great deal of local prescription compared to those that would like a strategic plan.

The following links may provide useful context:

The draft East Inshore and Offshore Marine Plans-

http://www.marinemanagement.org.uk/marineplanning/areas/east_plans.htm

East of England Marine Planning Evidence and Issues Report

http://www.marinemanagement.org.uk/marineplanning/areas/east_issues.htm

MMO Strategic Evidence Plan

http://www.marinemanagement.org.uk/about/documents/strategic_evidence_plan.pdf

South Plan Areas Statement of Public Participation

http://www.marinemanagement.org.uk/marineplanning/areas/south_spp.htm

Evidence Projects Register

http://www.marinemanagement.org.uk/evidence/register-reports.htm
The draft South Plan Analytical Report
http://www.marinemanagement.org.uk/marineplanning/areas/documents/south_draftspar.pdf
Marine planning animation
http://www.marinemanagement.org.uk/marineplanning/about/index.htme

Marine planning: A perspective on the East coast plans

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When finalised, the East Marine Plans will be the first set of marine plans, under the Marine and Coastal Access Act 2009. As such, they will not only set the planning and related decisions making framework for the East Coast area but will also form a template for future plans for areas elsewhere around the English coast. They represent the next stage in a process that began more than 8 years ago.

The East Marine Plans are intended to apply and clarify marine planning obligations already in force. Following the publication of the UK marine policy statement in 2011, the Marine and Coastal Access Act 2009 already requires all public authorities taking authorisation or enforcement decisions that affect or might affect the UK marine area to do so in accordance with the MPS unless relevant considerations indicate. The East Marine Plans will provide more detail specific to the areas covered and are equally binding, though even the current draft plans qualify as a relevant consideration.

Consultation on the draft East Marine Plans has closed and the MMO is currently considering the responses. The MMO and the Secretary of State will have to consider whether an independent investigation is required. Published information suggests that Defra and the MMO have little enthusiasm for an independent investigation and will seek to demonstrate that they have been able to resolve stakeholders' concerns.

The draft East Marine Plans provide the first indications of whether marine planning in England will have substance behind the rhetoric. Whether it will improve matters or create a further set of obstacles to marine conservation and economic growth. Whether the draft plans contain any unexpected pitfalls or risks for different users or whether they provide the promised clarity. Whether there are the resources and capacity to deliver what is required or whether marine planning in England in reality will be largely a heavily documented exercise with limited added value to day-to-day decision making.

Related information:

Response of the North Sea Marine Cluster to the draft East Inshore and Offshore Marine Plans:
http://www.nsmc.eu.com/news/article/202

How green is 2015?

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In 2009, during the passage of the *Marine Conservation and Coastal Access Act 2009*, Nick Herbert MP (Conservative Member for Arundel and South Downs) said that the Secretary of State would "need to explain why economic and social consequences are to be taken into account" in the designation of Marine Conservation Zones. Recourse to science-led policymaking was a regular refrain throughout the bill's passage.

In 2013, the Secretary of State announced the designation of 31 MCZs with the statement that "my absolute priority, with clear instruction from the prime minister, is to do everything I can to... generate wealth and jobs in the rural economy".

The apparent shift from science-based conservation policy to the pre-eminence of economic imperatives should not be reduced to an explanation based on change in government. Shifting public priorities and underlying economic conditions have led to an apparent downgrading of environmental protection in the main messages of the three big political parties.

This section explores the question of how the natural environment can be raised as a political issue in the upcoming European elections and the General Election of 2015, by bringing protection together with politically relevant themes like prudence, well-being, health, education and equality. It suggests that significant new avenues for environmental protection are opening, if the right inter-disciplinary links can be made.

Fishing in English European marine sites: update 23 Jan 2014

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In the summer of 2012 Defra announced a revised approach to managing fishing activities within EMSs in English waters out to 200nm. This was to bring commercial fisheries into line with how other marine activities were managed in and around such marine protected areas. Defra oversaw the initiation of a large ambitious project involving the MMO, the ten IFCAs (and their association) and Natural England, all supported by Cefas to implement the required changes. After development of a risk prioritisation tool "*the matrix*", those sites with features most at risk (assigned a "red" status") were identified. Thereafter a process of securing appropriate statutory protection was put in place by the responsible IFCA and/or the MMO, drawing on advice from Natural England and JNCC. This partnership project has been supported throughout by an Implementation Group including fisheries representatives and the appropriate environmental NGOs so that the necessary management measures designed met site objectives but where possible without undue costs.

The high risk (red) sites are protecting mostly reef, eelgrass and maerl features, and the most prevalent damaging fishing activity that needed urgent management was mostly towed bottom gear. Over the last year, the MMO and IFCAs have largely succeeded in meeting the December 2013 deadline for achieving the necessary protection for all but 3 of the "red sites". This includes 4 MMO byelaws that will restrict the impacts of UK foreign (mostly Belgian and French) vessels operating in our territorial waters. For the 3 outstanding "red" features statutory protection (byelaws) will be in place before end March 2014. The delivery partners are seeking to continuously improve the process and in that vein will hold a lessons learnt exercise on 21 Jan – with the learning to be incorporated in to how the "Ambers" will be progressed. The Ambers represent those activity-feature combinations where an Appropriate Assessment may be needed, and represents the next stage of the project.

So far, the key areas that will need addressing for successful implementation of the ambers includes improved mapping of feature / sub-feature extent, collation of spatial and temporal fishing activity data, and improved evidence regarding gear-feature interactions. The latter is large area requiring a degree of prioritisation and will be supported by a specific technical working group. Appropriate management must be in place for all ambers by 2016.

For further information and access to the Matrix see:
http://www.marinemanagement.org.uk/protecting/conservation/ems_fisheries.htm

IFCA Update

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Inshore Fisheries and Conservation Authorities were created in 2011 with the shared vision to lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry.

Southern IFCA, in common with the nine other IFCAs which manage the inshore fisheries in England, has an established set of Success Criteria and High Level Objectives. In the context of these criteria and objectives the speaker will reflect on the work of the Southern IFCA towards the attainment of its vision, with a particular focus on the implementation of the revised approach to the management of fisheries within European Marine Sites. The talk also considers the management of marine protected areas more generally, including the management of marine conservation zones.

The role and importance of community participation in evidence based decision making is presented with case studies from the work of the Southern IFCA in the diverse and productive seas off the Hampshire, Dorset and Isle of Wight coast.

The challenges and opportunities to achieving compliance in inshore fisheries are discussed with an overview of Southern IFCAs work to develop risk based, intelligence led compliance framework which involves community participation and a partnership approach.

Dogger Bank update

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For centuries, the Dogger Bank, the biggest sandbank in the North Sea, has been a vital fishing ground but it also has other assets, notably nature conservation value and renewable energy, now being addressed by Natura 2000 designations and windfarm development, respectively.

The Dogger Bank is subject to Natura 2000 designations for habitat H1100 (submerged sandbanks). Dutch, German, UK and Danish fleets, and to a lesser extent vessels from Belgium, France, and Norway, operate freely across the boundaries of the emerging Dogger Bank Natura 2000 complex, comprised of adjoining Special Areas of Conservation (SAC) designations for the Netherlands, Germany and UK. Denmark has no Natura 2000 ambitions for its edge of the Dogger Bank but has major sandeel fishing interests in the region.

This presentation is a progress report on efforts to develop a joint recommendation (for submission to the European Commission) for fisheries management measures. The proposal focuses on a zoning proposal for excluding bottom-contacting gears from representative habitats in order to meet the Natura 2000 conservation objectives of the Dogger Bank area.

Following the failure in 2012 of the North Sea RAC to achieve a consensus on the extent and location of closures (and to which gears), the legal responsibility to agree a proposal fell to the four North Sea Member States (UK, Germany, Neths, Denmark), the so-called Dogger Bank Steering Group (DBSG), with invited observers from the NGOs and the fishing sector who had been active stakeholders in the NSRAC process.

The DBSG finalised a draft proposal in July 2013, with consensus except on the issue of whether seine nets should be among the gears included in the exclusion zones (The DBSG's intent was to let the European Commission decide on management options for seine nets). However, before the joint recommendation could be submitted to the Commission, a linked legal progress in the Dutch Parliament required the latter's approval. With insufficient support from her Parliament to approve the DBSG's proposal, the Dutch Minister has sought room for manoeuvre, in particular with Germany, in efforts to meet the concerns of Dutch fishermen.

The DBSG had intended to submit the proposal under the 'old' Common Fisheries Policy but the latest complications have carried the process into the new CFP, Article 11 of which significantly changes the conditions under which the DBSG's joint recommendation would be implemented. Regionalised decision-making under the new CFP also impacts on, and is challenged by, the Dogger Bank process. The implications of this new CFP framework are explored, not just for the Dogger Bank SAC complex but for other Natura 2000 sites requiring fisheries management measures. The Dogger Bank finds itself embroiled in a multinational Rubik's Cube and is condemned to be devoid of adequate protection from bottom-trawling for the foreseeable future.

Related Information

Final report of the NSRAC (April 2012):
http://nsrac.org/wp-content/uploads/2012/07/NSRAC-1112-7-2012-04-09-Dogger-Bank-SACs-Position-Paper-FINAL.pdf

New CFP (Council 1st reading approved by European Parliament without changes, Oct 2013)
http://register.consilium.europa.eu/doc/srv?l=EN&t=PDF&gc=true&sc=false&f=ST%2012007%202013%20INIT&r=http%3A%2F%2Fregister.consilium.europa.eu%2Fpd%2Fen%2F13%2Fst12%2Fst12007.en13.pdf

Discards, Quota and MSY – Policy and Practice – An Overview

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Since joining the Common Market and thereby coming under the umbrella of the Common Fisheries Policy [CFP] it has been generally accepted that the policy has been an almost complete failure with regard to its expressed aims of maintaining fish stocks and fisheries related employment in European waters.

Repeated ten yearly reforms have done little to improve the policy and therefore its outcomes, many of which have forced fishermen into unsustainable practices. It has created a centralised top down system of micro management that has undermined compliance and resulted in an ongoing reduction in fish stocks and associated quotas to the detriment of all concerned.
The most recent Reform of the CFP is the first such process to be considered under the Lisbon Treaty that introduced co decision making between the European Commission and the European Parliament.

This opened the debate to a far wider audience of decision makers, importantly to those reliant on the public vote, and together with a very high profile campaign driven largely by celebrity chefs and environmental NGO's in support of significant change, as well as a recognised need by fishermen that they had to improve selectivity it has for the first time produced, in theory at least, a CFP somewhat more fit for purpose than previous incarnations.
What is clear is that whilst the aims and aspirations of the many that have led to the creation of this brave new world of fishing to maximum sustainable yield, an end to discards and a bottom up and regionalised approach to fisheries management may well have been driven by the best of intentions, there remains little clarity as to just how the practical implementation of the reformed CFP will be accomplished, especially within the very tight deadlines required.

There is a real danger that implementation, against a background of these tight deadlines together with a raft of disparate views on definitions and despite the best efforts and intentions of officials and operators alike, will result in a long list of unintended consequences that will end up doing more harm than good to fish and fishermen.
There is however an enormous amount of work and research being carried out, albeit sometimes at what seems to be the eleventh hour and fishers have already displayed their intent by dramatically improving selectivity in many areas of operation. At the same time and despite swingeing service cuts to government bodies, officials are working hard, in partnership with industry to develop appropriate implementation schemes.
At the time of writing, the manner and method of implementation remains less than clear and in such a dynamic and fast moving environment are likely to remain so for some time.

Related Information:
New Common Fisheries Policy:
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:354:0022:0061:EN:PDF

Omnibus Regulation amending technical measures and control regulations to implement the landing obligation (roadmap). 24 July 2013.
http://ec.europa.eu/governance/impact/planned_ia/docs/2013_mare_108_omnibus_tm_and_control_regulations_en.pdf

Scientific, Technical and Economic Committee for Fisheries (STECF)
STECF is advising the Commission on how it can implement the landings obligation at Member States it is also drafting advice to Member States to consider at a regional level.
http://nwwrac.org/admin/publication/upload/STECF%20EWG%2013-16%20TOR.pdf

http://stecf.jrc.ec.europa.eu/documents/43805/610582/2013-11_STECF+13-23+-+Landing+obligation+in+EU+Fisheries+-+part1_JRCxxx.pdf

Discards – Developments in Gear selectivity

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A gear development to improve size or species selection is not a new concept. All fishing gear has evolved over time to target specific species with further developments to target the more profitable size of these species. The very fact of placing fishing gear in a specific position within the water column is a form of species selection and the differences in mesh sizes used shows the need for size selection. Much of these developments happened prior to accurate catch data and stock assessment figures being readily available.

To develop more selective gear there is a need to have a thorough understanding of the behaviour of the target species at various stages through its life cycle. Probably more important, is an understanding of how the species that you want to exclude behaves in normal circumstances and how it reacts in the vicinity of the relevant fishing gear.

Different species react in different ways to fishing gear and small fish often react differently to mature fish of the same species. With this information the fisherman should be able to select a suitable selectivity measure to reduce his catch of unwanted fish. However the efficiency of many selectivity devices varies with the time of year and some are more efficient in some areas than others. For this reason many tried and tested devices require extensive trials in the specific fishery before being generally accepted for use.

Very few selectivity measures will release all the required species without loss of some of the target species.

Originally the emphasis was on size selectivity, i.e. release fish below the minimum landing size. Basically the easiest way to do this is with larger mesh sizes or mesh shapes that will remain more open such as square mesh (T45) or T90 mesh.

More recently with the enforcement of quota allocations there has been more emphasis on species selection. Particularly in the last few years when poor cod stocks have resulted in the implementation of the cod recovery plan. This is where the more complex devices such as separator trawls, inclined grids, square mesh codends, coverless trawls etc have come in either many in more refined versions. All these devices are very effective at reducing discards in the right gear at the right time but very few are able to release all the required species and allow the vessel to remain profitable.

More information on selective gear developments and discards is available at:

http://www.seafish.org/publications-search
http://www.seafish.org/media/Publications/Discards_NewDevelopments_2008.pdf
http://www.seafish.org/media/Publications/Discards_NewDevelopments_2009.pdf
http://www.seafish.org/media/Publications/Discards_NewDevelopments_2010_201012.pdf
http://www.seafish.org/media/Publications/Discards_NewDevelopments_2011.pdf
http://www.seafish.org/media/Publications/Discards_NewDevelopments_2013.pdf
http://www.seafish.org/media/Publications/SeafishGuidetoDiscards_201309.pdf

Fishing down the food chain: some implications

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This presentation is set in the context of helping to deliver a more sustainable future. In essence this requires a strong view of the future and a clear view of what it is that needs to be tackled (content), the strong engagement and participation of stakeholders and communities and processes that seek to ensure that we make progress. The 'content' element of this talk is fish, fisheries, including societal interests and biodiversity.
http://www.coastms.co.uk/pages/sustainability

This presentation has 3 main objectives

1.Fishing down the food chain To remind and highlight the key points of this concept not only for fish but the health of seabed species. http://en.wikipedia.org/wiki/Fishing_down_the_food_web

2.To highlight the implications of recent work in two areas the work of Callum Roberts and his co-workers on the Clyde and Irish Sea, and Heath & Speirs on the Clyde. This work has highlighted the growth of shellfisheries for scallops and *Nephrops*. It has highlighted a relationship between *Nephrops* fisheries through bycatch and the simultaneous reductions of major edible fish stocks that are unable to withstand this fishing pressure. This has had fundamental impacts on marine biodiversity, fisheries and fishermen.
http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0011767
A further report developing Heath and Speirs has been published by Marine Scotland 2012 Report http://www.scotland.gov.uk/Publications/2012/06/7562/downloads
These reports highlighting the '**changed ecosystem**' in the Clyde and are prompting at least two initiatives by Sustainable Inshore Fisheries Trust http://www.sift-uk.org/PageProducer.aspx and Clyde 2020 http://news.scotland.gov.uk/News/Clyde-2020-vision-825.aspx

One of the major points made by Roberts and his co-workers is the damage done to the seabed species by both *Nephrops* trawling and scallop dredging. In 2009 by far the greater proportion of 'shellfish' taken from the Irish Sea was by scallop dredging (15,500 tonnes). A report by Cook and co-workers in 2013 proved the blindingly obvious in confirming the damaging effects of bottom trawls on seabed communities. It would be safe to say that the seabed ecosystems have also been changed in the Irish sea by Nephrops trawling and scallop dredging.
http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0069904&representation=PDF

3.To highlight the important implications of the work in the Clyde and the Irish Sea for our management of the marine environment on the measures we use to achieve this; these include:

- The Government's vision for our oceans
- Marine Planning?
- The Marine Strategy Framework Directive - Fisheries - Biodiversity
- The regional seas assessment process
- MSC accreditation of *Nephrops* fisheries
- Discard policy and practice

It is these implications I would like to draw attention to and summarise these for three main areas:

The Government's vision is for: clean, healthy, safe, productive and biologically diverse oceans and seas. Put simply what the findings from the Clyde and Irish Sea do is beg the question about whether the Government's long standing vision for our seas is being achieved. One might hope that stakeholders start to ask rather more challenging questions of this vision and whether the measures being used are delivering it.

Marine planning Marine planning is becoming common place throughout Europe and the world. The draft east coast plan has been published and provides no metrics to enable us to see what the balance between shellfisheries and other edible fisheries even in a simple table. There is no table like Table 1 in either the plan or the evidence report so we cannot see whether fishing down the food chain is taking place. Given the importance to those involved with fisheries and biodiversity management this is a strange omission.

I have been told the current situation in the Clyde and Irish Sea are a because of 'societal choice'. Although stakeholder engagement has been a key part of the preparation of the marine plans – indeed probably the only public opportunity to participate in marine policies for areas of sea - one wonders what 'societal choices' stakeholders would make faced with the actual realities of the fishing down the food chain scenario.

Table 1 Irish Sea fishery landings (tonnes)

Data Source ICES From: Woodcock and Roberts in prep.

Year	1970	1980	1990	2000	2009	2020
Demersal Fish	22611	35184	36645	13387	3897	?
Prawns and scallops	11248	15505	23360	18905	25794	?
ALL species	58138	66757	66581	38945	34796	?

The Marine Strategy Framework Directive (MSFD) As time goes on the MSFD seems destined to provide an important opportunity for decision making for management policies in our regional seas. Given the Irish Sea scenario it is difficult to see how MSFD objective for at least four of the MSFD descriptors, namely biodiversity, commercial fisheries and shellfisheries, food webs and seabed integrity can be reconciled with the current situation. The results from the Clyde and Irish Sea pose fundamental questions to a number of the MSFD descriptors, in terms of:

- How they will measure the status of the descriptors?
- How they will be monitored singly?
- How they will be monitored in terms of their interactions? (by say fisheries that affect 2 or more descriptors with their activity)
- Rather more fundamentally whether they will prompt any corrective measures away from the current business as usual scenario?

Conclusions If we are to avoid large scale ecosystem change we need to be able to see what information we have, the mechanisms for assessing 'societal choice' need to meet modern criteria re participation and decision making needs to be more transparent.

Note: A fuller version of this note with reference web links will be available on request from the author.

MCZs and evidence

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Introduction
Defra has defined 'Evidence' as "*Reliable and accurate information that Defra can use to support sound decisions in developing, implementing and evaluating policy*". That imperative is well-expressed but is it being applied and especially in the case of design and management of sets of MCZs?

'Evidence' is our first port-of-call when applying criteria for the identification of areas that will protect representative examples of biodiversity and especially including habitats and species that are rare, scarce, in decline or threatened with decline. We rely greatly on the knowledge that we have but too much on flawed ecological concepts and poorly developed lists of the features to be protected that do not pass an 'evidence test'.

This presentation tries to 'weed-out' flawed concepts that have made the MCZ process more difficult than it needed to be and identifies where available and sound evidence seems not to have been used – but could now be used for management.

The Ecological Network Guidance (ENG)
In the MCZ process, the ENG was a 'given' – it was to be followed religiously (indeed it was described as our 'bible'). Evidence that we have now suggests that many of the 'givens' in the ENG were flawed – and some of those flaws have consequences for the way that we identify and design sets of MPAs wherever we are in the world.

Ecological coherence. The first stumbling block for the ENG was the OSPAR imperative of creating an 'ecologically coherent network of well-managed MPAs'. Pity that OSPAR didn't think that slogan through in 2003 and, even at the end of 2012 had to state that "no specific definition for the term 'ecological coherence' has yet been formally agreed upon internationally ….". Thank you.
'Networks'. The word "network" has become entrenched in the language of policy advisors and policy makers but is meaningless for all but a few very mobile species. The evidence that we have for dispersal of seabed species is of a very mixed-bag that ranges from virtually no dispersal away from parents to the possibility of hundreds of kilometres. Add to that the peculiarities of larval behaviour and the generally high connectivity that the water column supports and there is no evidence for direct targeted connections between different locations for marine species that disperse passively (the majority of benthic species that MCZs were aiming to protect). Attempts to identify connectivity distances between MCZs became mired in meaningless heuristics.

Viability (part of the translation of 'Ecological coherence'). Seabed species that have foraging territories may need large (several hundred metres+) areas to thrive. However, we know that many rare or threatened habitats and species occur in small areas (perhaps as small as a metre across) and persist there over decades and probably centuries. Whilst identifying tiny areas for conservation may be impractical from the point-of-view of management, the concept that MCZs needs to be a prescribed minimum size to be 'viable' was flawed.

Features of Conservation Importance (FOCI). The quantitative measures used to identify FOCI species in the ENG can only be applied to a minority of species that have evidence of rarity and decline. Although the Regional Projects were given the opportunity in the ENG to suggest other species for protection, they did not. Many species 'worthy' of protection did not get listed even though criteria to overcome that lack of quantitative data were available. We should be using species sensitivity as a measure of worthiness of protection (providing that we have relevant information on life history traits). However, bear in mind that many species will be protected if their habitat is protected and it may not be necessary to identify protected sites for species except in a small number of cases.

Outcomes – the MCZs that we have and the ones that we will have
At the end of the Regional Project consultations, the candidate MCZs had been identified based on the ENG and on the compromises that had been made or the allowances that had been given in the stakeholder process. In many cases, flawed 'evidence' of what was where was accepted, perhaps to fulfil quotas for habitats and species. Some of that flawed evidence was 'shaken-out' in the next stage but that stage was cloaked in secrecy and the suspicion amongst many was that meaningful sites and attributes that should have been listed for protection were not included because of political and industry interference and was nothing to do with lack of evidence.
Many of the important (for conservation) seabed features known to be present within the boundaries of MCZs did not find their way into the Designation Orders. They need to be listed even if the MCZ overlaps a SAC with habitats that encompass those features so that the site manager knows to protect them and include them in monitoring. Many of the MCZs are very 'thin' on listed features and the listed features or broad scale habitats are often ones that are not threatened or could be protected by other means – are some MCZs worth designating just for the attributes listed?

When it comes to managing MCZs, our evidence of natural variability and of recovery rates of species and habitats that might benefit from help from us is not being adequately brought-together. We need to find ways of better documenting and making available evidence of what are natural fluctuations and on what sorts of recovery rates can be expected when damage occurs.

In conclusion
I argue that we should use the evidence that we now have to put-to-rest flawed (but often cherished) concepts (especially of connectivity and viable areas) and methodologies (especially predictive mapping using algorithms and acoustic ground discrimination survey) – although improvements are possible. We need to keep reminding ourselves that MPAs are just one of the 'tools in the box' that we have to protect seabed biodiversity and the evidence we now have of the importance of widespread pressures (mobile bottom fishing gear, eutrophication, non-native species) needs to be used to much better effect. Perhaps there should be more emphasis on a duty-of-care for the marine environment as a whole and MPAs reserved for areas where there is a specific threat or threats to be averted and where natural change can be studied in the absence of extractive or depositional activities (this, of course, means Reference Area MCZs).

We need to use the knowledge that we have together with experience and a pinch of common sense to create the 'wisdom' that is essential if we are to make best use of the patchy evidence that is out there to identify where marine biodiversity could benefit from the creation of MPAs. Evidence is not just in peer-reviewed papers or competently executed survey reports. There is a need for expert judgment.

We now need to target research on improving the knowledge and the evidence that we have to inform the protection of seabed biodiversity. My list is:

- Improving knowledge of **biological traits** especially of designated taxa and of species characteristic of or dominant in threatened biotopes in order to use 'sensitivity' more extensively in environmental protection and management.
- Analysing and cataloguing in an accessible way knowledge of **events** (usually with regard to species) that help to interpret change.
- Getting a better understanding of **rarity** and how to identify species that are 'rare' and 'scarce'.
- Identifying (again) **Nationally Important Marine Features** using criteria that are not restricted by requirements of quantitative data.
- Mapping distribution of habitats, species and biotopes by ***in situ* survey**.
  And, we should ensure that the evidence we produce for biodiversity conservation is presented in a way that is influential and that the public, press, stakeholders and politicians can understand.

Post script
For those who wish to follow the 'network' (or not) debate, I have this morning been alerted to:

Roff, J.C. 2014. Networks of marine protected areas – the demonstrability dilemma. *Aquatic Conservation: Marine and Freshwater Ecosystems*, vol 24, pp. 1-4

The main quote is "Indeed there does not yet appear to be any demonstration that a true network of MPAs has been implemented, or that any set of MPAs actually constitutes a true network of interdependent MPAs."

Don't just jump on the bandwagon – think about whether there is evidence for the slogans that are so readily repeated.

Marine Conservation Zones : England Update

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In December 2012 Defra launched a 3 month public consultation on proposals for designation of up to 31 Marine Conservation Zones (MCZs) in 2013. These sites were considered by Defra to have adequate levels of evidence and an appropriate balance between environmental protection and socio-economic costs.

Defra received over 40,000 responses to the public consultation. Following careful examination of these responses, together with new information and updated evidence assessments, Ministers announced the designation of 27 MCZs on 21 November 2013. A decision on a 28th site (Hythe Bay) has been deferred and is subject to further discussions with local interests with the aim of making a decision on designation early in 2014.

The announcement on 21 November also included plans for two further tranches of MCZs over the next three years to complete the English contribution to an ecologically coherent network of marine protected areas.
The new MCZs add to the hundreds of sites that already protect the habitats and wildlife in our seas.

Related information:

https://www.gov.uk/government/collections/marine-conservation-zone-2013-designations

Scotland's Marine Protected Areas: Scotland's evolving MPA network and fresh approaches to stakeholder engagement

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Scottish inshore waters and the Scottish offshore zone account for over 60% of the UK marine area. Scottish Ministers lead on nature conservation in Scottish seas and the existing network includes over 150 marine protected areas covering some 12% of Scottish seas. Through a collaborative project led by Marine Scotland (a Directorate of The Scottish Government), a suite of 33 possible Nature Conservation Marine Protected Areas (pMPAs) have been identified for Scottish seas to help meet our international commitments. If all are taken forward to designation, they will cover an additional 11% of Scottish seas and provide spatial protection for a range of nationally important marine wildlife, habitats and undersea landforms.

Early engagement and transparency were considered key principles to the successful development of the Nature Conservation MPAs. A series of national stakeholder workshops and bilateral meetings with industry sectors and interest groups provided opportunities for local, national and international stakeholders to help shape the network of MPAs in Scotland. Strategic level discussions also took place at the Marine Strategy Forum. In 2013 Scottish Ministers ran a major consultation on a draft national marine plan, the pMPA network proposals and sector plans for renewables. The general public and local stakeholders were invited to attend drop-in sessions and evening presentations held in coastal communities as part of the Scottish Government's formal consultation on the proposals. There was also engagement with national and international interests.

As we have moved through the project, project partners Marine Scotland, Scottish Natural Heritage and Joint Nature Conservation Committee have found new ways to engage, educate and inspire stakeholders, organisations and the public to get involved. From social media to virtual underwater dives, online tools and live GPS tracking, we are utilising some innovative technologies to encourage involvement in marine conservation, planning and designation processes now and in the future.

Additional information:

Marine Scotland website:
http://www.scotland.gov.uk/Topics/marine/marine-environment/mpanetwork
e: Marine_Environment_Mailbox@scotland.gsi.gov.uk

Scottish Natural Heritage website:
http://www.snh.gov.uk/mpas

Joint Nature Conservation Committee website:
http://jncc.defra.gov.uk/page-5269

Marine Protected Areas: Perspectives on Progress

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Marine protected areas in the UK have the origin in the Wildlife & Countryside Act 1981 which introduced provision for the creation and management of Marine Nature Reserves. These measures were hard fought for and their inclusion in the Act was largely attributable to a sustain effort from the voluntary sector coupled with strong support in the House of Lords. The main issues had been identifying the need for conservation measures at all and finding a way to deliver meaningful conservation in the light of so many sectoral interests. Thirty years later we are still considering the same issues, this time in relation to Marine Consultation Zones as provided for in the Marine & Coastal Access Act 2009

The talk will provide a brief overview of the history of statutory marine protected areas in the UK including Marine Nature Reserves, European Marine Sites and Marine Consultation Zones. I will then go on to consider the efficacy of these different types of protected area and try to identify the factors that have led to successes and failures. This part of the talk will focus in particular on recent experiences with the designation of Marine Consultation Areas and will draw on the outputs from the recent conference *Managing UK's Marine Natural Resources*.

The talk will finish with a more radical perspective on marine protected areas with a discussion of why we need them and what we want them to achieve.

Related Information:
Marine Conservation Zone 2013 designations (England):
https://www.gov.uk/government/collections/marine-conservation-zone-2013-designations

Written Statement – Marine Conservation Zones and Marine Protected Areas in Wales:
http://wales.gov.uk/about/cabinet/cabinetstatements/2013/mcz/?lang=en

Marine Protected Areas (Scotland):
http://www.scotland.gov.uk/Topics/marine/marine-environment/mpanetwork

Ministerial Statement on the Creation of a Network of Marine Protected Areas (Northern Ireland):
http://www.doeni.gov.uk/index/protect_the_environment/natural_environment/marine_and_coast/marine_policy.htm

Marine Conservation Zones (UK):
http://jncc.defra.gov.uk/page-4525

Managing UK's Marine Natural Resources: Conference Outputs:
http://www.coastms.co.uk/conferences/480

28th November Conference (Managing UK's Marine Natural Resources)

Summary of delegate responses from Session: 'What are the barriers to unblocking the MCZ process in England? What should be done next?'

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The delegate notes for the conference set out a number of options which the audience were able to vote for. They are ranked in order below with the number of votes in brackets.
Delegates were also able to provide additional feedback. 194 comments were made and these can be seen in full on the CMS website. Brief summaries can be seen below. Where possible these are direct quotes, but in some cases have been edited for clarity.

Rank of options

1. We need to be able to articulate to stakeholders and the public more clearly what is being protected and what it will mean for them (61)
2. We need a fair, transparent, future-orientated decision-making process that allows ecosystem services to punch their weight (46)
3. We need to ensure that low or moderate levels of evidence should not be a barrier to designation (45)
4. We need appropriate regulation to effectively protect MCZs (33)
5. We need to help mobilise and encourage communities in special places to work together to develop agreements or codes of conduct that can be a step towards regulation (33)
6. We need to articulate more clearly what we are seeking to complete an ecologically coherent MPA network (29)
7. We need to use the European Directives and pressure from Brussels to achieve the completion of the marine Natura 2000 sites and implement effective management to ensure their conservation objectives are met (26)
8. We need to be mindful of our international commitments and use OSPAR principles to help measure the achievement of ecological coherence' (5)

Summary of Comments

1. **Ecological coherence**-Greater clarity is needed to provide guidance on where we need to get to. This is a challenging concept to prove, with a very subjective definition that is difficult to convey to stakeholders. It needs to be more clearly explained and achieved using a more pragmatic approach. Representativity is key, and is a requirement that is embedded within section 123 or the Marine Act.

2. **Management**-We need better management within our existing designations so that they are acting as real 'site-based' MPAs and not as incoherent collections of features. Broad scale habitats should be used as the feature through which sites are designated and managed. Without protection, MPAs become...well, 'the sea'

3. **Marine Natura 2000**-The 'teeth' behind EU Directives has provided strong impetus for MPAs in the face of industrial interests. However, more work is needed to produce conservation objectives which are providing real protection. Lessons learned from Marine Natura sites can help guide us in the future. It is not clear why there are separate management approaches for MCZs and Marine Natura sites. The Natura system was designed with terrestrial ecosystems in mind, and is poorly adapted for the marine environment.

4. **Partnership MPAs**-There is now enough evidence to prove MPAs are more successful when stakeholders are engaged. We need trust and commitment from local communities to underpin management and compliance. However, voluntary measures alone will not bring

about large-scale, long-term changes. Therefore we need top down regulation when local agreements are damaged by external parties or new economic pressures.

5. **Ecosystem Services-** We need to provide a stronger economic rationale for MPAs and the benefits of protecting ecosystem services. The benefits of MCZs need to be articulated more clearly and using a language that policy makers understand. Ecosystem Services are a nice way to make the importance and existence of the marine environment more tangible. If they are to be used it is important that they are fair and balanced and that non-monetary values carry sufficient weight. However, a single focus on these can backfire. Furthermore, values often require significant assumptions and have a huge range in values. The use of threshold enhancement as a methodology for Cost Benefit Analysis has been used successfully in Australia.

6. **Political will**-We need to question the approach which is putting short-term interests above long-term sustainability. All other points emanate from here. Decision makers are currently unsure why we need MPAs and if they work.

7. **Data**-First of all we need to determine what level of evidence we want and define an equal evidence threshold for both industry and conservation designation. Therefore we need to determine the level of evidence that we want. There is enough evidence now to judge whether a site merits designation. We should also not become too focused on protected features and bear in mind the wider importance of the site. Ultimately we have to become more comfortable with uncertainty and follow the best available evidence principle. Unreasonable and unrealistic demands for data are impractical and lead to a dead-end for conservation. We can't play the 'not enough evidence' game for ever.

8. **Communication-**The reasons why we need MPAs have to be explained more clearly. We should be able to articulate our high level objective and explain what MCZs will do for communities and future generations.

9. **International Convention**-This is important to define a target and is an important driver of progress. So many issues are regional and we have to co-operate. Although this achieved a low rating in this conference; it is important to remember that the audience linked it to MCZs rather than wider MPA management.

CF2014 Meeting Evaluation

1. **Name:**_____ **Phone No:** _____
   Anonymous if you wish

2. **How valuable did you find the meeting? (circle)**

   Not valuable **Very valuable**

   1 2 3 4 5

3. **What benefits did you get from the conference?**

   - _____
   - _____
   - _____
   - _____

4. **Could you suggest one thing that would have improved the event?**

   - _____
   - _____

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