Coastal Futures 2017
Review and Future Trends

January 18th & 19th January
SOAS, University of London

Delegate Notes

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After the closing date we provide feedback on the click and open rates for both the direct mailing and the weekly publicity in the CMS News.

Cost
Still at £150.00 plus VAT, our price remains very competitive. *(Please note that 'conference' adverts will cost the standard delegate fee for the event if this is more than £150 plus VAT)*.

NEW CMS Website
In July 2016 we launched our new and improved website. This user-friendly site emphasises 'What we do in the marine and water sector' making it easier for those looking for details of News, Jobs and Conferences, as well as our advertising clients. We have set out the details of the advertising service in five categories: Advertise with CMS / Rate card / Order form / Testimonials / Track record.

Come and talk to us if you have any questions Jayne and Bob will be at the registration desks; or email or call Jayne or Bob:

Jayne O'Nions: jayne.onions@coastms.co.uk | 07759 134801
Bob Earll: bob.earll@coastms.co.uk | 07930 535283

Best Wishes
Jayne & Bob

Welcome to the conference

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

WiFi SOAS now offers free guest WiFi via The Cloud:

- On your laptop, tablet or phone connect to **WiFi Guest** network
- A web browser should open to allow you to register or login (if you have already registered with The Cloud)
- If a web browser does not appear, open your preferred web browser and navigate to any web page. The Cloud landing page should open as above

Twitter If you're tweeting please use the hashtags #coastalfutures or #cf17

Questions – Bookings – Receipts – In-house information
If you have any questions during the event about bookings or finances, talk to **Diana Hunt** at the registration desk or logistics please visit the registration desk where someone will be available 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 hundreds events in London 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.

Special diets These should be collected from the **downstairs registration desk**

Delegate notes An electronic copy of the full delegate notes will be emailed to delegates on the 16th January.

Delegate list The delegate list to the 9th January is included in the delegate pack and an electronic copy will be on our website on the 16th January to help networking.

Feedback forms There are feedback forms on the Brexit debates, the Future of Coastal Futures and CF17 Evaluation. Please leave these at the registration desk along with your badge when you leave.

Conference Outputs The conference outputs will be available shortly after the event; we will email the link to access the delegate notes, speaker presentations and conference outputs.

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.**

Coastal Futures Website The presentations and delegate notes will be uploaded after the conference and you can also find the archive of Coastal Futures conferences; the website also provides a single point of contact for future CF events.

Programme Wednesday January 18th

8.30 Registration and refreshments

9.25 **Session 1: Welcome to the conference Chair: Chris McDougall**, Atkins

20 minute presentations [15 minutes for presentation & 5 minutes for questions and answers]

9.30 **Making sense of valuation** **Steve Hull**, ABPmer

9.50 **Innovation and multiple benefits from Coastal Management, including sand engines** **Jaap Flikweert**, Royal HaskoningDHV

10.10 **Forging the new relationships in coastal management** **Bill Parker**, Coastal Partnership East

10.30 **Tourism and recreation: understanding patterns of activity, values and implications for marine and coastal planning and management in Scotland** **Steven Orr**, Land Use Consultants Ltd

10.50 **Sustainable development and the well-being of Wales: the Well-being of Future Generations (Wales) Act 2015** **Gretel Leeb**, Deputy Director of People & Environment, Division, Environment & Sustainable Development Directorate of the Welsh Government

11.10 **Marine risk assessment and management using the Bow-tie approach and its practical applications** **Mike Elliott**, IECS, Hull University

11.30 **Short presentations: Four x 2 min updates**

Will Maclennan, Atkins **Kincardine Floating Offshore Windfarm**

Stuart Anderson, Elected member Conwy County Council **Britannia's coastal powerhouse**

Chris Pater, Historic England **Yesterday, Today and Tomorrow**

Chris Williams, New Economics Foundation **Blue New Deal Action Plan & Update**

11.40 First Break: Sandwiches and refreshments

12.25 **Session 2: Chair: Trevor Hutchings**, WWF-UK

The first two presentations in this session are 30 mins – 15 mins for presentation and 15 mins for Q&A.

12.25 **An introduction to Government's 25 Year Plan for the Environment** **Gemma Harper**, Defra

12.55 **Brexit: Processes, Governance & the Great Repeal Bill: An overview** **Professor Richard Barnes**, Hull University

13.25 **Brexit: The implications for the Sustainability & Environmental Management Directives**

This session will see short (5 min) presentations from four perspectives and discussion and points from the audience for 40 mins. The objective of the session is to fully brief the audience on what we currently know and through an interactive session produce a key point briefing note

- Chairman: **Mike Cowling**
- Rapporteur: **Chris Williams**, New Economics Foundation
- Industry perspective: **Peter Barham**, Seabed User & Developer Group
- Consultant: **Dickon Howell**, Howell Marine
- NGO: **Alec Taylor**, WWF-UK
- Consultant: **Sian John**, Royal HaskoningDHV

14.25 Second break and refreshments

15.10 **Session 3: Chair: Sandy Luk**, Marine Conservation Society

20 minute presentations [15 + 5 Q&A]

15.10 **The future for tidal range energy in the UK, post Paris, post Brexit and post Hendry** **Tim Carter**, Tidal Lagoon Power

15.30 **The RSPB's vision for offshore wind – challenges and opportunities** **Aedán Smith**, RSPB

15.50 **Cumulative effects assessment: common principles and practical implementation** **Adrian Judd**, Cefas

16.10 **The challenges of communicating science and expert information in a 'post factual world'** **Anuschka Miller**, SAMS

16.30 **Ocean warming – rising evidence of physical & ecosystem change** **Stephen Hall**, Head of International & Strategic Partnerships Office & Vice-Chair IOC-UNESCO, NOC

16.50 **Exploring, mapping and monitoring the ocean with the developing robot fleet** **Russell Wynn**, National Oceanography Centre

17.15 **Wine reception**

Programme Thursday January 19th

8.30 **Registration and refreshments**

Session 4: Chair: Heidi Roberts, ABPmer
3 x 20 minute presentations: 15 minutes for questions and 5 mins for Q&A

9.30 **Port development in the Fal: Dredging in an MPA – the role of evidence** **Miles Hoskin**, CMER
9.50 **Seaweed Cultivation: Development & multiple benefits** **Adrian MacLeod**, SAMS
10.10 **Bass: How not to manage fisheries** **Nigel Horsman**, BASS Bass Anglers Sportfishing Society
10.30 **Marine Planning – perspectives and update**
3 x 20 minute presentations: 15 minutes for questions and 5 mins for Q&A
10.30 **Marine Planning - Update on the English Programme** **Steve Brooker**, MMO
10.50 **Marine Planning - a European perspective** **Ingela Isaksson**, Coordinator and Project Manager Baltic SCOPE, Swedish Agency for Marine and Water Management
11.10 **Marine Planning in the UK - Learning & expectations in relation to infrastructure and land use planning** **Jim Claydon**, Planning Consultant

11.30 **Short presentations: Five x 2 min updates**
Jenny Oates, WWF-UK **Celtic Seas Partnership: Stakeholder engagement in marine management**
Charlotte Coombes, MCS **A unified MPA database for all UK seas**
Charlotte Billingham, SIMCelt **Supporting Implementing Maritime Spatial Planning in the Celtic Seas**
Katie McPherson, MMO **The work of the MPA management National Steering Group.**
Katie McPherson, MMO **The development of the Inshore Vessel Monitoring System (IVMS)**

11.40 First Break: Sandwiches and refreshments

12.25 **Session 5:**
12.25 **Brexit & Fisheries: Change, Opportunities and Risks**
This session will see short (5 min) presentations from four perspectives and discussion and points from the audience for 40 mins. The objective of the session is to fully brief the audience on what we currently know through an interactive session and produce a key point briefing note

- Chairman: **Jerry Percy**, Executive Director for the Low Impact Fishers of Europe - LIFE
- Rapporteur: **Suzannah Walmsley**, ABPmer
- Industry perspective: **Dale Rodmell**, NFFO
- Government perspective: **Gordon Friend**, Defra
- NGO perspective: **Helen McLachlan**, WWF-UK
- A legal perspective: **Daniel Owen**, Fenners Chambers

13.25 **The trouble with mud & prawns: Issues and opportunities in the Irish Sea** **Emily Baxter**, North West Wildlife Trusts
13.45 **The Landings Obligation & Discards: Operational experience and practicalities** **Julian Roberts**, MMO
14.05 **Global to Regional to National developments in oceans governance** **Darius Campbell**, Executive Secretary OSPAR Commission
14.25 Second Break

15.10 **Session 6: Chair: Joan Edwards**, Head of Living Seas, The Wildlife Trusts
MPA Management
Four 15 minute presentations and a 20 minute discussion
15.10 **UK Overseas Territories MPAs - British Indian Ocean Territory** **Helen Stevens**, Natural England/British Indian Ocean Territory Administration
15.25 **The international context of the UK's developing MPA programme** **Jon Davies**, JNCC
15.40 **IFCA Management of Coastal MPAs** **Tim Robbins**, Devon & Severn Inshore Fisheries and Conservation Authority
15.55 **MPAs & Brexit – An NGO perspective** **Kate Jennings**, RSPB
16.10 Panel discussion
16.30 **Conference Closes**

Rationale for the 2017 Coastal Futures Conference Programme

Bob Earll
T: 07930 535283 E: Bob.earll@coastms.co.uk

Concern and greater consideration of the environment has been developing steadily over the last 50 years and there is no doubt the European Union has played a key part in the thinking and legislation that has enabled greater protection of our environment. It is not surprising therefore that the market research voting for Brexit topics for CF17 reflected the highest scores ever. The programme reflects a number of closely related topics including:

1. Prior to the referendum the Government had already signalled its intention to develop long term – **25 year plans** - for the farming and separately for the environment. Gemma Harper (Defra) will present the thinking for this plan, a presentation made all the more timely by the referendum decision since it provides a valuable context for that debate.

2. The process that the Government will adopt to achieve leaving the EU is only gradually becoming clear and Richard Barnes (Hull University) will describe an overview of this, including the **great repeal bill.** The implications for the **Governance of the coastal and marine environment** are yet to be worked through, however, one thing is clear, which is that many of the EU legal mechanisms are also reflected in the principles, measures and work on international conventions and organisations that we will still be guided by, for example OSPAR & ICES, and so speakers will refer to the work of these organisations. A note on **Marine Governance & Brexit** (paper and diagram) by Sue Boyes and Mike Elliott from IECS are on the Coastal Futures website. In this context Darius Campbell from OSPAR will describe the work that the commission undertakes across a wide range of activities.

3. There will be two, hour-long session's one on **Environmental legislation** and the other on what might replace the **Common Fisheries Policy**. The aim of these sessions will be to provide a range of perspectives, time to allow input from the audience and then an output briefing for the delegates. On **Environmental legislation** – the Directives – everything from water quality, species conservation and environmental management we have been offered the 'comfort' of the great repeal bill. At the meeting you will hear both detailed and reasoned arguments on this process and why we need to be vigilant. Kate Jennings (RSPB) will highlight the particular issues of concern in relation to the **Habitat Directive in the marine environment** on day two. On **fisheries** there is apparently more to play for – more opportunities - but the essential elements of fisheries management are well known and have wide acceptance internationally. Given the shared and parlous state of many of our fish stocks and long-standing international agreements what real change will accrue is a matter of considerable debate.

Realities & Development – Planning, Assessment & Management

Marine planning provides the context for the rational and evidence lead management of our marine space and forms, an ongoing core of Coastal Futures presentations reflecting on its practical development. Steve Brooker (MMO) will describe the ongoing development of marine planning and the push to complete all the marine plans for England. Jim Claydon played a key part in help develop the MCA Act legislation and will reflect on progress to date and in particular on **infrastructure planning**. Marine Planning is widely regarded as normal practice throughout the world and Ingela Isaksson will provide a **European perspective** with particular emphasis on the Baltic.

We are interacting with the marine and coastal environment in a host of different ways and in the process we are finding that nature is pushing back. 2016 has been the hottest year on record and not surprisingly **ocean warming effects** have been recorded all over the world and Stephen Hall (NOC) will describe these. For those **managing flood risk and coastal erosion** the challenges are very stark and Bill Parker (Coastal Partnerships East) and Jaap Flikweert (Royal HaskoningDHV) will describe various solutions and multiple benefits. Human activities and their developing size and scale whether it be **tourism** (Steven Orr, Land Use Consultants Ltd), **port development** (Miles Hoskin, CMER), **seaweed cultivation** (Adrian MacLeod, SAMS), **offshore wind energy** (Aedán Smith RSPB) or **tidal range energy**

(Tim Carter, Tidal lagoon Power) pose new challenges for the way we view and manage our activities and these presentations will set out many issues.

How we frame and assess these activities routinely to harness their power and manage their consequences is another major theme of the conference. The plethora of **valuation techniques** and how to deploy them appropriately will be described by Steve Hull (ABPmer). **Wellbeing** and its practical implications will be described by Gretel Leeb from the Welsh Government. **Risk management** and the developing thinking about the '**bow tie approach'** and its application to project assessment will be described by Mike Elliott (IECS, Hull University). Similarly the developments of thinking in **cumulative assessment** will be covered by Adrian Judd (Cefas).

The fundamental role of science and evidence has been the basis for the Coastal Futures conferences and yet we see in a **post-truth world** many the ideas outlined by George Orwell in his book 1984 becoming all too real. Anuschka Miller (SAMS) will look at the challenges and realities of **communicating our work**. Understanding and exploring the marine environment remain major challenges still and the exciting developments of the **UK's robot fleet** will be described by Russell Wynn (NOC).

Fisheries & Marine Protected Areas – Realities & Management

The realities of fisheries and their management have been a long-standing topic at the Coastal Futures conferences and 2017 is no different. The plight of **bass stocks** reflects an almost boom–bust approach to fisheries management and the solutions needed will be discussed by Nigel Horsman of BASS. The **scampi prawn fishery** has almost by default become the staple of many UK fisheries but the discard ban throws in to sharp relief the interaction of these fisheries and their impact on white fish stocks; Emily Baxter (NWWT) will discuss the implications of this fishery. Working through the **landings obligation** in terms of practical management and regulation is a major challenge and Phil Haslam (MMO) will describe current progress. There will be a full briefing on **Brexit & fisheries** and the issues and opportunities that will arise with contributions from six organisations, including fishermen, Government and NGOs.

It has been a remarkable year for the declaration of marine protected areas and the meeting will take place against the development of the 3rd tranche of MCZs being declared. Helen Stevens (NE & BIOTA) will describe the UK Government's commitments to **MPAs in the Overseas territories**. The wider international context for our **MPA network in wider European seas** will be described by Jon Davies (JNCC). Tim Robbins will describe the developing programme of management with regard to **fisheries in MPAs** that is being implemented by the IFCAs with a focus on the Devon & Severn IFCA. Kate Jennings (RSPB) is leading NGO efforts to understand the impact of **Brexit on MPAs** and the panel will consider all these developments.

Following the high level of support for the **short presentations** at CF16, nine have been accepted for CF17 with 2 minute presentations. These support and develop many of the themes outlined above.

DAY 1 – Wednesday 18th January

Making Sense of Valuation

Dr Stephen Hull
Technical Director, ABPmer, Quayside Suite, Medina Chambers, Town Quay,
Southampton, SO14 2AQ
T: 023 8071 1849 E: shull@abpmer.co.uk Web: www.abpmer.co.uk

The presentation will review developments in the use of valuation techniques to support decision-making in the marine environment.

Background

Economics contributes to our understanding of how we make choices and how the choices we make affect our health, happiness, wealth and prosperity – different terms such as 'wellbeing', 'welfare' and 'utility' are used, but mean broadly the same thing[1]. Where goods and services are traded, market prices can be used to inform decision-making, but market prices may not take account of social and environmental impacts and therefore these externalities may not be adequately considered in decision-making.

Economic valuation provides a means for estimating economic values for some of these externalities so that their associated costs and benefits can be better taken into account in decision-making. This has included the development of a variety of theoretical frameworks to better define and integrate concepts of value in the natural environment to support environmental decision-making.

In the absence of market values, various approaches have been developed to seek to estimate economic values and there is now an increasing understanding of the scale and type of economic values associated with the natural environment.

Environmental decision-making is increasingly seeking to make use of environmental economics methods and data and there are some very good examples, particularly from terrestrial and freshwater environments, which demonstrate how such approaches can support better decision-making.

While the application of economic valuation to decision-making in the marine environment is still in its infancy, wider developments in policy towards the natural environment will mean that such concepts will become more central within the next decade. This has the potential to substantially improve the information available to inform environmental decisions and lead to better environmental and societal outcomes.

Key Themes to be Covered in the Presentation

- What's the problem?
- How can economic valuation help?
- Key concepts and frameworks
- Progress in applying the frameworks
- Future directions

[1] http://valuing-nature.net/sites/default/files/images/VNN-Demystifying%20Economic%20Valuation-Paper.pdf

Useful Web Links

https://www.gov.uk/government/groups/natural-capital-committee

https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/methodologies/naturalcapital

https://www.gov.uk/guidance/ecosystems-services

https://www.gov.uk/government/publications/defra-single-departmental-plan-2015-to-2020/single-departmental-plan-2015-to-2020

http://naturalcapitalcoalition.org/

https://www.forumforthefuture.org/project/five-capitals/overview

http://uknea.unep-wcmc.org/

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69481/pb13695-paper5-socialimpacts-wellbeing.pdf

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf

Innovation and multiple benefits from Coastal Management, including sand engines

Jaap Flikweert
Royal HaskoningDHV, Rightwell House, Bretton, Peterborough, PE3 8DW
T: +44 7887 632814 E: jaap.flikweert@rhdhv

Sandscaping is an innovative coastal management approach, inspired by the Dutch Zandmotor. It involves placing a large volume of sediment to benefit one location, designing it so that natural processes move the sediment to other places where it is needed. In the right place and if designed well, the large volume and concentrated placement can reduce cost; the scale and dynamic nature can generate benefits for amenity, tourism and habitats.

A Partnership of organisations has been exploring implementation of Sandscaping in the UK, with its very different coast and governance. This has involved national scale activities such as the identification of high-potential sites, awareness raising and an exploration of opportunities and constraints from the perspective of coastal processes, modelling, regeneration, the environment, funding and technical delivery.

Sandscaping in the UK will only work if it is the best solution locally: a competitive business case, acceptable uncertainty, driven by a local alliance (and funding) that reflects its multiple benefits, and desirable for the communities. The presentation will describe a number of case studies where this local conversation is underway, and looks ahead at future developments.

Forging the new relationships in coastal management

Bill Parker
Head of Coastal Partnership East – Coastal management team for Great Yarmouth Borough, North Norfolk, Suffolk Coastal and Waveney District Councils
Lead Officer - Local Government Association Coastal Special Interest Group (the 'SIG')
c/o Suffolk Coastal District Council, East Suffolk House, Melton, Woodbridge, Suffolk, IP121RT
T: 01394 444553 M: 07919624194 E: bill.parker@eastsuffolk.gov.uk

Local Authorities are beginning to forge new approaches to managing their coastlines that will have a seismic impact on the way the coast is managed in future. Relationships are rapidly changing between all risk management authorities and with the communities that they serve. For local authorities with a background of tightening budgets, evolving priorities and the challenges of recruiting staff this is forcing the rate of innovation.

Successful delivery for our communities requires a balanced approach to the key elements of what we do, taking advantage of new opportunities and managing the risks. This evolving thinking is impacting on the way local authorities work. All decision makers are coming under greater scrutiny as communities and businesses are become better organised and take on new responsibilities. The need for robust evidence will demand more effective incorporation of learning from academic institutions and how do the new realities of Big Data mining and other cutting edge technologies fit into this changing environment.

The presentation will examine a number of these developing themes through a case study on the Norfolk and Suffolk coast and will include examples of innovative work from around the country.

www.coasteast.org
https://lgacoastalsig.com/

Tourism and recreation: understanding patterns of activity, values and implications for coastal and marine planning and management

Steven Orr
Associate Environmental Planner, LUC
T: 0131 202 1616 E: Steven.Orr@landuse.co.uk W: www.landuse.co.uk

Coastal and marine environments afford a huge range of opportunities for recreational activities; but our seas are also a major economic resource, supporting an array of industries and communities nationwide. Balancing the competing demands of nature, economic development and tourism is complex, and a key function of the Marine Planning system introduced by the Marine (Scotland) Act 2010.

Good planning needs good data – and in 2014, no coherent national-scale information existed on who was using Scotland's coastline for tourism and recreation; where they were going; what they were doing when they got there; or, how much their activities were worth to the economy. LUC was commissioned by the Scottish Government to deliver a major research project to fill this significant knowledge gap.

Using an innovative web-based survey approach, we collected spatial, social and economic data on the recreational activities people value around the Scottish coast. More than 2,100 individuals and representatives of 137 organisations told us about over 52,000 places they had visited over the previous 12 months. We then used the information to create a series of remarkable maps showing which areas of coast and sea are most important, accompanied by detailed analysis of behaviours, patterns of seasonality and expenditure. The results provide new insights into people's use of the coast, including the suggestion that that annually, spending during recreation and tourism trips to the Scottish coastline contributes up to £3.7bn to the Scottish economy.

The presentation will cover:

- The problem: data deficiencies – spatial, temporal and economic; activity and sector-specific knowledge, understanding and preconceptions; overcoming agendas.
- Project background: developing sector partnerships and securing funding.
- Designing the project: balancing needs and aspirations with available tools; engaging stakeholders and the public.
- Interpreting the results: patterns of activity, value and expenditure – and what they tell us, and what they don't.
- Using the data in planning: value, sensitivity and susceptibility to change?

For further information on the project, please see:

Scottish Marine Recreation and Tourism Survey 2015 publications

Summary leaflet: http://www.gov.scot/Resource/0049/00498311.pdf

Main project report: http://www.gov.scot/Resource/0049/00497904.pdf

Activity maps available on project page:
http://www.gov.scot/Topics/marine/seamanagement/national/RecandTourism

Interactive map layers: National Marine Plan Interactive (NMPi)
https://marinescotland.atkinsgeospatial.com/nmpi/

Sustainable development and the well-being of Wales: the Well-being of Future Generations (Wales) Act 2015

Gretel Leeb
Deputy Director People & Environment Division, Welsh Government
T: 029 2082 3591 E: Gretel.leeb@wales.gsi.gov.uk FGActWales@wales.gsi.gov.uk

The Well-being of Future Generations Act is a Welsh law that came into effect in April 2016. It has established seven National Well-being Goals and requires 44 public bodies – including local authorities, health bodies, and the Welsh Government itself – to act in accordance with five ways of working under the Sustainable Development Principle. These ways of working – thinking and acting with long term impacts in mind, acting preventatively, looking to integrate the actions within an organisation and with other organisations in support of the Well-being Goals, collaborating with other bodies, and involving the citizens we serve – all help establish the common purpose of delivering on a shared vision for Wales' well-being. This presentation by Gretel Leeb, Deputy Director of Welsh Government's People and Environment Division, will give an introduction to the Act and the challenges it poses, and will talk about how its implementation is progressing as public bodies begin to respond to its requirements. It will also touch upon the role of the new Future Generations Commissioner for Wales established by the Act, and the creation of Public Services Boards to help bodies delivering public services work better together in local authority footprints.

Web-links and/or references:
Welsh Government web page on the Well-being of Future Generations Act:
http://gov.wales/topics/people-and-communities/people/future-generations-act/?lang=en
Welsh Government web page on Public Services Boards:
http://gov.wales/topics/improvingservices/public-services-boards/?lang=en
Welsh Government statutory guidance on the Well-being of Future Generations (Wales) Act:
http://gov.wales/topics/people-and-communities/people/future-generations-act/statutory-guidance/?lang=en
Web page of the Future Generations Commissioner for Wales: http://www.futuregenerations.wales/

Marine risk assessment and management using the Bow-tie approach and its practical applications

Professor Mike Elliott
Institute of Estuarine & Coastal Studies (IECS), University of Hull, Hull, HU6 7RX
T: +44 (0)1482 466773 E: Mike.Elliott@hull.ac.uk

Addressing human impacts in the marine environment is essential a risk assessment and risk management framework whereby all those impacts, whether singly, cumulatively or in combination, have cause(s) and consequence(s) and require responses to be tackled, accommodated, solved etc. (Borja et al., 2016; Cormier et al, xxxx). This falls within the **DAPSI(W)R(M)** framework (pronounced 'dapsiworm', a derivative of the long-used DPSIR approach (Patricio et al 2016)) whereby **D**rivers (human basic needs) require **A**ctivities which lead to **P**ressures (the mechanisms of change). The latter then produce **S**tate changes on the natural system and **I**mpacts (on human **W**elfare) – i.e. the resultant effects on the human system and ecosystem services which then allow us to obtain societal goods and benefits (Turner & Schaafsma, 2015). These adverse effects then need to be tackled using **R**esponses (often term **M**easures in EU Directives). Those measures then need to accommodate the main aspects of the socio-ecological system, the so-called 10-tenets (Barnard and Elliott, 2015) and involve all stakeholders, via the so-called stakeholder typology (Newton and Elliott, 2016). Each major human-induced problem can be thought of as a central 'knot' in a Bow-tie which then has a set of causes (the LHS of the knot) and consequences (the RHS). Between the causes and the problem we can introduce preventative mechanisms (the R(M)) to stop the problem occurring and, if they do not succeed, then we can insert mitigation and/or compensation measures (also R(M)) between the problem and the consequences. These techniques will be illustrated using the effects of climate change on fisheries, aquaculture and offshore wind farms. The presentation will also demonstrate the potential for Bow-tie analysis being quantified using Bayesian Belief Network modelling and for looking for Opportunity Assessment and Management.

References

Barnard, S. and M. Elliott (2015). The 10-tenets of adaptive management and sustainability - applying an holistic framework for understanding and managing the socio-ecological system. Environmental Science & Policy, 51: 181-191.

Borja, A., Elliott, M., Uyarra, M. C., Carstensen, J., Mea, M., (Eds.) (2016). Bridging the Gap Between Policy and Science in Assessing the Health Status of Marine Ecosystems. Lausanne: Frontiers Media. doi: 10.3389/978-2-88945-004-6; pp293. Downloaded from http://journal.frontiersin.org/researchtopic/4637/bridging-the-gap-between-policy-and-science-in-assessing-the-health-status-of-marine-ecosystems

Cormier, R, A Kannen, M Elliott, P Hall & IM Davies (Eds) (2013). Marine and Coastal Ecosystem-based Risk Management Handbook. ICES Cooperative Research Report, No. 317, March 2013, International Council for the Exploration of the Sea, Copenhagen, 60pp, ISBN 978-87-7472-115-1. http://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/crr317/CRR317%20Marine%20and%20coastal%20ecosystem%20based%20risk%20management%20handbook.pdf

Newton A and Elliott M (2016) A Typology of Stakeholders and Guidelines for Engagement in Transdisciplinary, Participatory Processes. Front. Mar. Sci. 3:230. doi: 10.3389/fmars.2016.00230 (in Borja et al., 2016).

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Kincardine Floating Offshore Windfarm

Will Maclennan
Senior Marine Environmental Scientist, ATKINS
E: Will.Maclennan@atkinsglobal.com

Kincardine is a floating windfarm development proposed to be located off the coast of Aberdeen. It will have a total output of 48MW, consisting of eight 6MW turbines. It will be one of the world's first arrays of floating wind turbines utilising the semi-spar foundation technology and has been included within Marine Scotland's Survey, Deploy and Monitoring scheme for offshore renewable systems.

The Habitats Regulations Assessment for the project was supported with 16 months of aerial bird and marine mammal surveys providing accurate site based data on species density and diversity. A parallax based methodology was also developed and applied as part of the aerial surveys to calculate site specific bird flight height distributions to a high level of accuracy. These were used as part of the collision risk modelling that forms an important part of the assessment of impacts of turbines on birds. Previous advice from SNCBs has shown a preference for using modelled flight height distributions in collision risk modelling, as it allows comparison of impacts across different windfarms, which is particularly useful when assessing relative impacts of different projects for in-combination assessments. The development of a means to accurately assess site specific bird flight heights may however provide a more realistic view of potential site specific collision impacts.

The timing of the consenting process of Kincardine in relation to the judicial review of the Forth and Tay windfarms has resulted a series of in-depth discussions with SNH and Marine Scotland regarding the accuracy and reliability of collision risk modelling estimates and how they should be used when assessing in-combination impacts.

The Habitats Regulations require that competent authorities prove beyond "reasonable scientific doubt" that a plan or project will not have an adverse effect on the integrity of a European site, but how can this be done if the process of assessing impacts is inherently full of scientific doubt?

As a demonstrator project, Kincardine offers a good opportunity to "ground truth" the essential elements of collision risk models and shed light on uncertainties through the installation of a suite of scientific instrumentation on the turbines as part of the monitoring and mitigation plan.

Stereoscopic cameras will be installed to monitor and provide important data on bird avoidance rates, the WT-Bird system will monitor impacts to each turbine blade to detect the numbers of bird collisions and this will be coupled with high definition cameras which will identify species. Alongside this, an additional 3 years of aerial surveys will identify bird densities and flight heights and monitor how the site is used by birds following the installation of the turbines.

Finally a phased approach to the construction of the turbines will mean that a single turbine will be monitored for between 12 and 18 months prior to the installation of any further turbines, providing additional confidence on the extent of potential impacts.

For further information, see: http://www.gov.scot/Topics/marine/Licensing/marine/scoping/Kincardine

BRITANNIA'S COASTAL POWERHOUSE: adaptive investment in mitigation scale outcomes

Cllr Stuart Anderson
Conway County Council
E: cllr.dr.stuart.anderson@conwy.gov.uk

This talk challenges conspiracies of silence over the British Isles' oncoming wave of clean energy and adaptation needs. Tidal range could provide over half the extra energy required to double present grid supply and meet transport needs, mostly road but including main-line railways with government-owned sea defences. The lack of other suitable renewables makes creation of market ecosystems a test for honesty over climate obligations. North Wales - central to the grid yet with coastal squeeze on its own transport, industrial and housing infrastructure - is well placed to help transform other regions, including the Northern Powerhouse, which it flanks. A recent study suggests how to model rolling programmes offering 'active barrier' management of coastal hinterland with mixed-cause flood risk. The largest such areas form the other flank of the Northern Powerhouse, defensible on a line from Humber to Wash. The first step is a pilot scheme using credible ideas for generic pump/turbine plant able to mimic natural flow patterns and fit into float-in caissons like those for modern offshore flood barriers. Second-stage schemes off North Wales and Somerset will necessitate such design to merit partnership support for cost-benefit analysis confronting truthful evidence of mixed-cause flood risk alongside energy opportunities.

Historic England: Yesterday, Today and Tomorrow

Dr Christopher Pater
Head of Marine Planning, Historic England
E: chris.pater@HistoricEngland.org.uk

Historic England[2] is the national curator for the historic environment of England. We are a non-departmental public body, sponsored by the Government Department for Cultural, Media and Sport and a primary area of our work involves providing independent advice to developers, regulatory authorities and UK Government departments. In April 2015, Historic England was established when English Heritage[3] became a Non-Governmental Organisation to manage the collection of sites, buildings and monuments in public ownership. Historic England's responsibilities were originally established through the National Heritage Act 2002 and primary action for protecting the archaeological sites, historic buildings and monuments is directed by UK law. However, more recent legal measures such as the Marine and Coastal Access Act 2009 now have a major influence[4], as highlighted here:

- The reform of the marine licensing system now encompasses activities directed at features of historic or archaeological interest (non-designated and designated); and
- Inclusion of cultural heritage and seascape as component parts of marine planning.

It is important to remember that we participate through both Strategic Environmental Assessment (SEA) and individual project Environmental Impact Assessment (EIA) exercises and that national policy recognises, subject to effective mitigation, that developments can generate new knowledge and understanding about our shared cultural heritage including prehistoric environmental conditions.

Compared with marine nature conservation protection measures under national and European law, the proportion of archaeological sites afforded statutory protection are very few compared with the overall number of sites[5]. The main protection mechanism used in the marine environment is the Protection of Wrecks Act 1973; this Act provides a high level of protection by defining a zone around the shipwreck or debris field within which all access, directed at the site, is subject to licence. In England, 52 wreck sites are designated under this Act and we have recently commissioned a project to examine the compatibility of archaeological activities where they also occur within Marine Conservation Zones.

We also have an active programme of training set up for 2017 which includes the following:

- 25th and 26th January – MaAedanSurvey Training Course at the National Oceanographic Centre: http://store.southampton.ac.uk/conferences-and-events/natural-and-environmental-sciences/national-oceanography-centre/using-marine-survey-techniques-to-meet-archaeological-conditions
- 21st March – Port Development and the Historic Environment at the University of Leicester: http://www2.le.ac.uk/departments/history/heritage/port-development-and-the-historic-environment-in-england

[2] www.HistoricEngland.org.uk
[3] www.english-hertiage.org.uk
[4] For detailed review see: Pater C. and Oxley I. (2014) Developing marine historic environment management policy: the English Heritage experience. *Marine Policy* 45 (2014) 342–348

[5] For further information see: https://historicengland.org.uk/listing/selection-criteria/wreck-selection/ihas-ships-and-boats/

- Historic Environment Local Management – Coastal and Marine Planning Course: https://historicengland.org.uk/services-skills/training-skills/helmtraining/

Blue New Deal Action Plan & Update

Chris Williams
Project Lead - Fisheries & Marine Environment, New Economics Foundation,
10 Salamanca Place, London, SE1 7HB
T: +44 (0) 207 820 6404 E: chris.williams@neweconomics.org

The Blue New Deal is a 20-point action plan, led by the New Economics Foundation, to give coastal communities control over their futures. By building on existing experience and resources, it could support up to 160,000 additional jobs and £7.2 billion of additional income in coastal Local Authorities.

Coastal communities, like other areas in the UK, feel abandoned by the political elite. Traditional livelihoods have disappeared, without new industries or investment to fill the gaps. Britain's pending exit from the EU threatens to undermine recent coastal and marine conservation efforts, and bring further division to towns and cities.

But the marine environment is a unique asset, with huge economic and social potential. Already Britain's coasts are dotted with innovative regeneration projects that form the building blocks for a coastal industrial revolution.

Developed in partnership with hundreds of individuals, communities and businesses, the Blue New Deal shows that transformative economic reform that meets people's deep desire for more control, and that supports a healthy environment for the future, is possible.

The New Economics Foundation will continue to work with coastal communities, to help them reinvent and take control of their local economies, and to speak with a louder voice in government and parliament.

The Blue New Deal was launched in November 2016, with cross-party support from dozens of MPs and a number of coastal organisations. Get the full action plan online at www.neweconomics.org/actionplan

Twitter: https://twitter.com/nef

An introduction to Government's 25 Year Plan for the Environment

Dr Gemma Harper
Deputy Director, Marine, Defra
E: gemma.harper@defra.ggsi.gov.uk

Summary:

The Government is developing a 25 Year Plan for the Environment. The presentation will cover:

- the ambition in the Plan
- the context for the Plan and the proposed approach
- six actions for driving improvements
- the design principles which will be applied to the six actions to ensure we deliver our policies in the most effective way
- how we will be testing our actions and design principles through four Pioneer projects, including a marine environment pioneer.

Conference attendees are encouraged to respond to the forthcoming consultation.

Web links: The green paper consultation on the Environment Plan will be published on www.gov.uk/government/organisations/department-for-environment-food-rural-affairs

Processes, Governance & the Great Repeal Bill: An overview

Professor Richard Barnes
The School of Law and Politics, University of Hull, Cottingham Road, Hull, HU6 7RX
T: 01482 466320 E: r.a.barnes@hull.ac.uk

On the 23 June, the UK committed itself politically to leaving the EU. In legal terms this will be done through the so-called Article 50 mechanism (Miller and Lang). Under Article 50, the UK may withdraw in accordance with its constitutional requirements. At the EU level, the terms of withdrawal are to be negotiated and agreed between the UK and the EU. This should be done within 2 year, at which point EU treaties cease to apply to the UK, unless a this period is extended. **The legal process for withdrawing is untested and legally contentious**. In 2016, the UK's constitutional process for withdrawing was subject to a legal challenge which came before the Supreme Court in December. This is focused on whether the initiation of the withdrawal process requires legislation put before Parliament or it can be done by virtue of the government's prerogative powers. A decision is expected early in 2017.

Regardless of the outcome, the Government has committed itself to introducing the somewhat misleadingly titled 'Great Repeal Bill'. This piece of legislation will deal with how the UK withdraws from the EU. The Bill would appear to have two functions: to repeal the European Communities Act 1972 and to set out the extent to which those parts of EU law not already implemented in UK law would carried over. The bill would avoid a legal vacuum arising, and allow time for the repatriation (incorporating the operative terms of EU directly into domestic law) and refinement of EU over time. The repeal of the ECA 1972 could be done quite simply. **However, in the interests of legal and political clarity, the extent of and terms by which EU law is retained need to be elaborated and this is a more complex matter**. The Great Repeal Bill' is likely to adopt a flexible structure that would allow secondary legislation to be adopted to accommodate developments arising during the negotiation process. However, the real devil is in the detail. **The process of disentangling EU law and putting in place measures under domestic law in the UK is incredibly complicated**. This is because of the complex interrelationship between laws at the international, Europe domestic level, and between laws within and across many different sectors. In the marine sector alone, making sense of the law is daunting (See Boyes & Elliott 'horrendogram'). **Repeal also raises complex issues with respect to devolved matters since much EU law relates to devolved matters** (inc fisheries and environmental law) many issues. This may require consent of the devolved bodies.

It is possible to give some indication of how the future regulation of marine areas will proceed:

- Marine cannot be viewed apart from broader trade and single market issues (including freedom of movement). This may result in limits to the extent to which foreign access to fisheries can be excluded.
- In the **medium to long term the UK will need to legislate a new legal regime for many marine matters, especially fisheries**. This would need to establish the rules for access and conduct of catch fisheries, and access to markets. There is an opportunity to draw upon the success of EU CFP, but also to develop new management tools.
- The **UK will continue to be bound by international law agreements** (UNCLOS, OSPAR and RFMOs). It will have to engage directly with international institutions governing marine issues, including UN BBNJ process, RFMOs and regional seas arrangements.
- The **UK will remain under obligations to set TACs that are sustainable**. In reality the prospects of a fishing boom are low given that most stocks are fully or over-exploited.
- The **UK will need to enter into new agreements to deal with shared or transboundary fish stocks**. These could be based on models adopted by Norway.

Web-links and or references

- Article 50 issues:
  - V Miller and E Lang, 'Brexit: How does the Article 50 process work?' House of Commons Briefing Paper No 7551, 30 June 2016 'http://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7551#fullreport
  - Outline of Brexit in the Supreme Court: https://fullfact.org/law/brexit-supreme-court-arguments/
  - Supreme Court, 'Brexit case': https://www.supremecourt.uk/news/article-50-brexit-appeal.html
- Great Repeal Bill:
  - Sionaidh Douglas-Scott, 'The Great Repeal Bill: Constitutional Chaos and Constitutional Crisis. Available at : https://ukconstitutionallaw.org/2016/10/10/sionaidh-douglas-scott-the-great-repeal-bill-constitutional-chaos-and-constitutional-crisis/
  - Alan Page, 'Brexit: the implications for the devolution settlement'. Available at http://centreonconstitutionalchange.ac.uk/blog/brexit-implications-devolution-settlement
- Fisheries and marine post-Brexit:
  - SJ Boyes and M Elliott, 'Marine legislation – The ultimate 'horrendogram': International law, European directives & national implementation. Available at http://www.sciencedirect.com/science/article/pii/S0025326X14004354
  - O Bennett, 'Brexit: What next for UK fisheries? ' House of Commons Briefing Paper CBP 7669, 27 July 2016. Available at http://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7669
  - House of Lords European Union Committee, 8th Report of Session 2016-17. Brexit: fisheries. HL Paper 78. Available at http://www.parliament.uk/brexit-fisheries-inquiry
  - Brexit: Six-months on. Available at http://ukandeu.ac.uk/wp-content/uploads/2016/12/Brexit-Six-months-on.pdf

Brexit: The marine governance horrendogram just got more horrendous!

Sue Boyes & Mike Elliott, Institute of Estuarine and Coastal Studies (IECS), University of Hull

On 23rd June 2016, the British people voted in a historic referendum on the following question: '*Should the United Kingdom remain a member of the European Union or leave the European Union?'* Of the 33,551,983 who voted, 51.9% (17,410,742) voted to leave. *Brexit* was not a result many involved in the management, governance and research of the marine environment hoped to or expected to happen. However now it has, the UK needs to decide on how it will proceed and how this situation will affect our legislation, laws and ability to manage the UK marine environment in a future outside of Europe.

At present, regulations and directives come direct from the Commission. Regulations are put straight into practice, whereas directives require implementing legislation to enact into national law. With over 40 years within the EU and its predecessor the EEC, there is a close integration between UK legislation and EU and International environmental law. The horrendogram (Fig. 1) adapted from Boyes & Elliott (2014) demonstrates the amount of UK laws implementing marine related European directives (20 regulations covering 20 different marine pressures) enacted through the European Communities Act 1972 (which incorporates the provisions of the EU treaties into UK law). This is in contrast to primary Acts of Parliament (grey boxes) made to address national policy objectives (18 Acts covering just 8 different policy areas of planning, harbour developments, conservation, archaeology, energy, flooding, marine licensing and fisheries). Key pieces of UK legislation such as the Wildlife and Countryside Act, 1981 (as amended) and the Marine and Coastal Access Act (MCAA) 2009 will still form important pieces of primary legislation protecting and managing the marine environment. Together with the Marine Policy Statement (MPS) adopted by all the devolved administrations (Scotland, Wales and Northern Ireland), which sets out a vision for the UK marine environment through objectives and policy areas, it is unlikely these marine policy instruments will change in the near future but will remain in place until they are withdrawn, amended or replaced.

Once Article 50 of the Lisbon Treaty has been invoked, the UK has two years in which to negotiate our exit and reformulate its relationship with the rest of the Europe[6]. Following the two year negotiation period, all directly applicable EU law (e.g. EU Regulations) would have no direct application in UK law and would have to be rewritten or copied into primary legislation. The most straightforward route with respect to existing secondary environmental legislation enacting EU directives would be for the UK to adopt all relevant EU legislation as its own law, until such time as the relevant government departments have had the opportunity to review and adopt their own legislation. At the Conservative Party Conference (October 2016), the Prime Minister Theresa May announced a Great Repeal Bill, which would repeal the European Communities Act 1972, ending the primacy of EU law in the UK. This Bill (to be announced in the next Queen's Speech) will transfer the body of EU law into UK legislation. It is understood that the environmental chapter of this Bill alone comprises over 200 legal acts including water and air quality, waste management, nature protection, industrial pollution control, chemicals and GMOs, noise and forestry.

Perhaps the most important change will be that the UK is not bound by the European Court of Justice and so not liable to infraction proceedings for infringing directives. The levels of environmental protection afforded by any updated legislation would depend on the political will of the elected government and could result in differing levels of protection.

[6] However the simple act of triggering Article 50 has since been made the case of a High Court decision, stating that Members of Parliament and peers should vote on triggering Article 50, not the government. This is currently being appealed (Nov 16).

However, until the post-exit scenario is known following the two-year negotiations, it is hard to comprehend how 40 years of European inspired legislation can be unpicked from our domestic law.
(See: Boyes, S.J. & Elliott, M. 2016. *Brexit*: The marine governance horrendogram just got more horrendous! Marine Pollution Bulletin, 111: 41-44.)

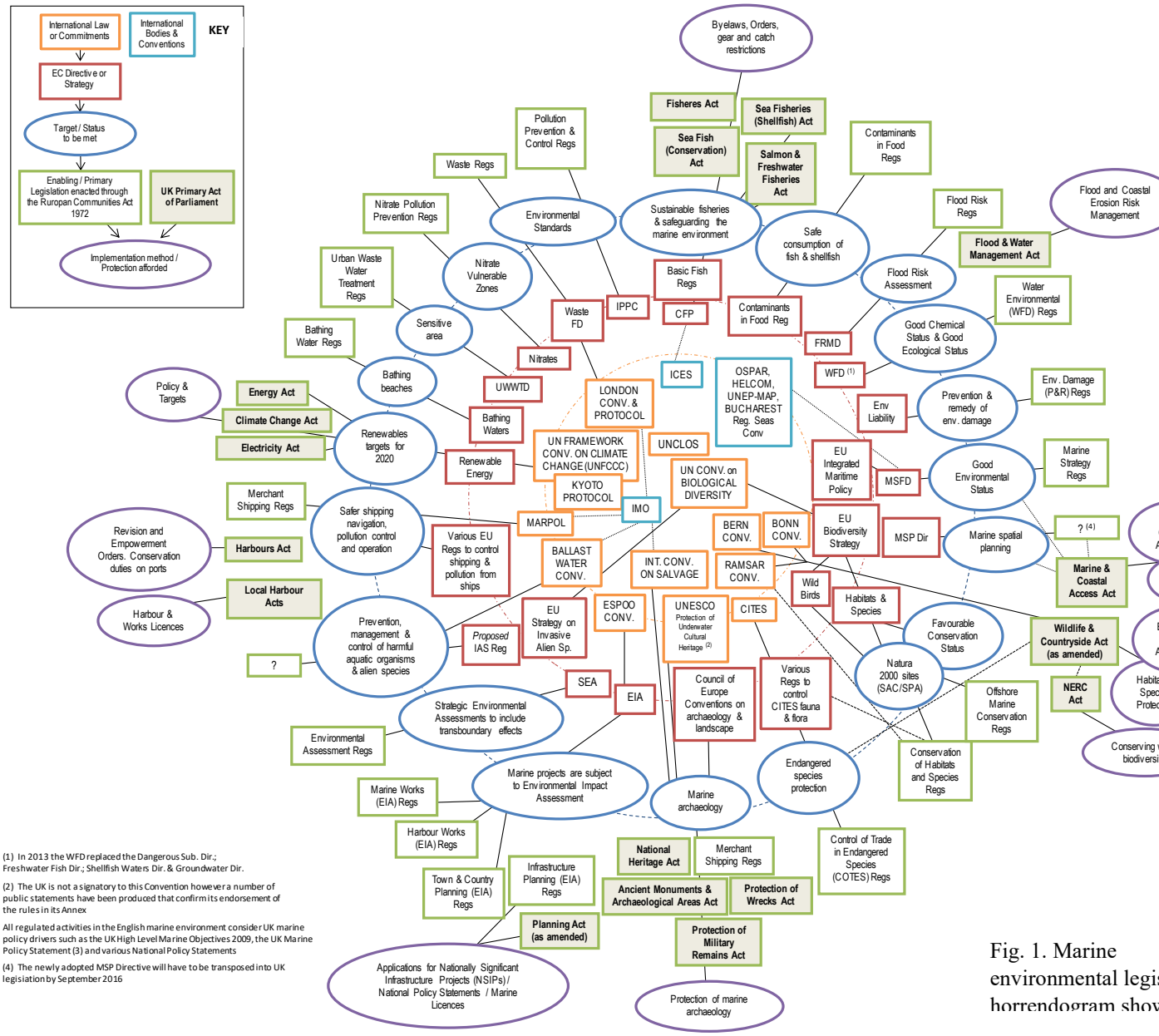

Fig. 1. Marine environmental legis
horrendogram show

Brexit & Environmental Regulations – Key Points for Discussion

Coastal Futures 2017 Bob Earll & Chris Williams V6117 inputs from Peter Barham, Dickon Howell, Alec Taylor, Sian John & Richard Benwell

The aim of this session is to brief the audience on the effects of Brexit on Environmental regulations in relation to the marine environment in particular. Richard Barnes is providing an overview of what has happened and fisheries and MPAs are considered in other sessions. This list provides key points for the discussion. The audience will be asked to contribute thoughts & links on the feedback sheets provided.

Introduction and background June 23rd Brexit Vote to leave EU. At the Conservative Party Conference, Theresa May announced **a Great Repeal Bill** (GRB) which would repeal the European Communities Act 1972, ending the primacy of EU law in the UK. She said the bill would transfer the body of EU law, into UK legislation. The environmental chapter of this alone comprises over **200 legal acts** including water and air quality, waste management, nature protection, industrial pollution control, chemicals and GMOs, noise and forestry. Without them, many of the laws that have held environmental destruction at bay would cease to exist – at the start of our EU relationship we were regarded as the 'Dirty Man of Europe'.

Government Priorities

- **Trade** high level Government goals – level playing field re regulations and standards.
- **Immigration** implications of these issues on sectoral marine policy – shipping, ports, energy, fisheries etc.
- **…how low down the list is Envt?**– Is there competition with the Brexit Department (eg CAP v CFP) What is to be done about the Common Agricultural Policy (CAP) and Common Fisheries Policy (CFP) mechanisms? – Scale of work on these two alone is colossal.

Process and timing Art 50 / Great Repeal Bill - the mechanisms by which government (Defra) will be reviewing the impact of Brexit internally – assessment using Policy outcomes? - The sheer scale of the work involved - 200 times bigger – Not a 'normal' process – Scrutiny of risks and opportunities.

International Commitments (OSPAR, ICES etc) - what are we signed up to? – the role of international bodies – OSPAR – ICES – Regional seas - Process and accountability – cross border accountability – MPA networks and environmental standards – for species, birds, cetaceans etc.

National commitments (25 year plan) - what have Govt said they'll do?

Govt commitment to leave '*the environment in a better condition'* – Govt ambition- Direction of travel – Targets - Environment and Well-being of Future Generations Acts in Wales – How will these translate into the GRB – how the marine interests will be set out – ecosystem based approach? Environmental recovery and resilience.

Governance

- Stakeholder engagement: Who will Defra engage with and how? Bunker mentality or working *with* stakeholders ….
- Accountability in the Brexit process and in future Scrutiny by Parliament (time) & others, resources staff.

Risks - Legislation at risk - Lack of clarity after transposition of existing regulation **-** Different priorities 'regulatory burden' — Throwing away the progress of the last 20 years –

Opportunities Yes, possibly – will there be time to explore? – Opportunities will need clarity – highlighting change in a morass of documentation – thinking on cumulative effects – valuation (natural capital) –

Uncertainties and inconsistencies - more certainty for all if the current legislative regimes are maintained until time allows 'normal' scrutiny of policy outcomes.- David Davis told conference that laws would be transferred across 'wherever practical'. That's very different to the whole body of EU law. Andrea Leadsom told the Environmental Audit Committee that it would be impractical to move between a quarter and a third of EU law into UK law. She said that the Great Repeal Bill would deliver certainty, but she was not able to specify which laws would be impractical to transpose. **After Brexit (GRB) Mechanisms** Priorities – untransposed legislation -

Brexit and Marine Industry

Peter Barham
Peter Barham Environment Ltd www.peterbarhamenvironment.com
T: 01780 450931 m: 07540 634324 E: peterjbarham@googlemail.com
www.sudg.org.uk

Different sectors may have different responses to the economic threats and opportunities that Brexit creates and it is not the role of SUDG to comment on these, but there are pan-industry environmental aspects that SUDG has discussed and will continue to promote as the discussions and details over Brexit progress.

Environmental legislation. SUDG strongly agrees that the environment needs protecting and that legislation is essential in achieving this. While this legislation has created significant areas of Marine Protected Areas and is continuing to do so, regulatory aspects of the legislation can be complex and often difficult to interpret and apply with clarity. The outcome of new and existing legislation is that, rightly, the marine environment is considerably better protected now than it was a 20 or even 10 years ago, but it has taken many years to create the understanding we have of the Habitats Directive and we are still working on aspects of that and the Marine and Coastal Access Act.

Working Together The only logical way of achieving clarity is by working closely with Government and the Defra group to find better ways of working which meet the needs of industry, the environment and, as a consequence, sustainable development. SUDG has a good record of this and members have been closely involved in developing good environmental practices and regulated industries have often worked in very proactive ways to achieve this.

Future Targets To date there has been little formal output from Government on the future of environmental legislation, but the Defra Secretary of State has said she expects the environment should be better protected after Brexit than before. In the same vein, those industries which comprise SUDG have all stated the need to protect and improve the marine environment and the importance of initiatives such as Marine Planning in assisting this and to provide direction for growth.

The Way Ahead Two conclusions are easily drawn from this summary of the current position. Firstly, it takes a long time to develop and implement environmental law which serves all the purposes of sustainable development; and, secondly, as a consequence there is considerably more certainty for all if the current legislative regimes are maintained, or adapted to non EU positions, than through the development of new legislation to replace those that have come from EU.

Opportunities In taking Brexit forward and assuming that there will be no wholesale changes to legislation, there will, however, be opportunities to continue to clarify some aspects of the EU legislation and how they apply to the UK. For example, currently the nature of Imperative Reasons of Overriding Public Interest (IROPI) (which are required if a development is deemed to have an adverse effect within the context of the Habitats Directive) need to be based on an EU context. Post Brexit, IROPI may need to be considered on a UK context and linked to Government policies on transport, growth and energy as well as to the environment.

At the same time, Brexit creates an opportunity to seek resolution on some of the issues which still impact on EU legislation including a better understanding of cumulative effect assessment. In addition the nature of modern legislation is that it requires socio-economic value to be part of the decision making process alongside environmental protection. Brexit provides as opportunity to examine this more closely in a UK context and alongside current thinking about natural capital as well as more conventional socio economic evaluation and UK policy.

More discussion on all this is set out in the SUDG position paper on Brexit which is accessible via:-
www.sudg.org.uk

How to solve a problem like Brexit?

Professor Dickon Howell
dickon@howellmarine.co.uk

Overview
Since the 23rd June 2016, much has been written on what exit from the EU could mean for the UK. Much of this narrative has either focused on what is currently delivered within a European framework that could be at risk, or could be done better, once this framework has been removed. This talk looks at the mechanisms by which government will be reviewing the impact of Brexit internally, and suggests some methodologies for considering how to develop any future opportunities or policy positions. The talk will cover the following points:

- **Trade & parity of regulations** There is a difference between trade and non-trade related policy (i.e. that which directly affects the value of a commercial good or service and that which doesn't). All trade related policy is likely to become part of a central negotiating package and what Government will spend most of its time on. In the majority of trade negotiations, as well as the commercial aspects, the parties look to get parity on the regulations surrounding the sale of goods and services [e.g. regulations across trading countries governing health and safety or emissions standards], and if they cannot do this impose a tariff to address any perceived advantage.

- **Trade related marine policy** In marine policy there are some areas that Government are likely to spend more time simply because of the trade elements like shipping (customs), energy, aggregate extraction and fishing where there are overlapping interests between trade and environment policy.

- **The current narrative - Analysis, opportunity and risk** Much of the existing narrative around Brexit has focused on an analysis of the legislative framework and the potential risks and opportunities of wholesale revision of this framework

- **Policy outcomes** Government will be assessing the legislative framework in the context of their policy outcomes. Policy outcomes are developed as a response to an issue of consequence that government wants to address. The mechanisms that are used to deliver these outcomes include legislation but also include funding, education and voluntary measures.

- **UK Aspirations & Time** The challenge with Brexit is to identify those policy outcomes that have been agreed with Europe, assess whether the UK still wants to achieve that policy outcome, and then review whether the measures currently deployed are the most effective or not, including the legislative framework. Defra has two very big agenda items in connection with Brexit concerning the Common Agricultural Policy and the Common Fisheries Policy so whether there will be the appetite, priority, resources or time to go for reforming other environmental regulations in the next two years will need to be seen.

- **Missing the opportunity** The majority of marine environmental policy (nature conservation, environmental protection, environmental quality, marine planning) is largely non-trade related. This creates a risk that opportunities for improvement could be missed as the focus is on trade related policy. If opportunities are to be taken they will need to be clearly stated.

Web-links and or references
https://www.linkedin.com/pulse/marine-brexit-dickon-howell
https://www.linkedin.com/pulse/marine-brexit-pt-2-its-all-funding-dickon-howell
https://www.linkedin.com/pulse/submission-welsh-government-external-affairs-committee-dickon-howell

Brexit and the 87%" – what future for wider marine ecosystems?

Alec Taylor
Marine Governance Programme Manager, WWF-UK
T: 07841316889 E: ataylor@wwf.org.uk @1TakeTaylor

Overview
As the UK considers its future outside the European Union, WWF-UK is calling on Governments across the UK to build on all the environmental protections that have come from Europe, including those that cover the UK's seas – and to go further. Our marine environment is a crucial underpinning to our economy and society, and we must secure and restore its health for future generations. As other sessions rightly debate the impact on fisheries and MPAs, I'll be considering what Brexit means for the delivery of ecosystem based planning and management outside protected areas.

- **What could and should the delivery of Good Environmental Status look like in the long term?** The MSFD is an essential, and the only real, framework for ecosystem based management, and the UK needs to build on its requirements going forward whatever the future holds.

- **Ecosystem resilience and recovery:** There are domestic tools (in theory) for positive wider ecosystem based management in the marine: the 25 year plan in England and integrated implementation of the Environment and Well-being of Future Generations Acts in Wales, for example. How to make these work?

- **Marine (spatial) planning and EIA/SEA**: Did we let the Government off too lightly in not transposing the MSP Directive? The UK was one of the first countries to give MSP a basis in domestic legislation and in theory is less affected by Brexit, but MSP also depends on strong environmental assessment at the project and strategic level, much of which comes from EU legislation.

- **What's the role of OSPAR?** OSPAR hasn't really touched MSP to date, focussing instead largely on MSFD common indicators and assessments. Post Brexit, will the Regional Seas Conventions need to up their game (and will its Contracting Parties allow it to do so)?

Brexit: the future for Environmental Directives & the UK

Sian John
Director – Renewables and Marine Development, Royal HaskoningDHV
T: 07770 533658 E: sian.john@rhdhv.com
www.royalhaskoningdhv.com/en/united-kingdom

It is widely acknowledged amongst environmental practitioners that the outcome of the EU referendum was not one that necessarily affords the best protection for our natural environment. When the UK leaves the EU, the UK governments will be free to amend or repeal the acts previously adopted to give effect to EU laws [resources allowing]. And because 'the environment' and 'energy' are devolved responsibilities the outcomes of the application of this principle are likely to differ between England, Northern Ireland, Scotland and Wales. There is, therefore, a pressing need for us to plan for the future.

On the 4th January 2017 the Environmental Audit Committee called on Government to introduce a new Environmental Protection Act during Article 50 negotiations so that the UK's environmental protections are not weakened. Chair of the Committee, Mary Creagh MP, said that changes due to Brexit could put our countryside, farming and wildlife at risk. "Existing protections for Britain's wildlife and special places could end up as 'zombie legislation' even with the Great Repeal Bill". That is, where EU legislation is transposed into UK law but is not updated, has no body enforcing it and is erodible through statutory instruments with minimal parliamentary scrutiny.

If an in/out referendum means that the UK will leave the EU but become a member of the EEA, then arguably the environmental implications could be more complicated. That is, whilst the UK will still have to abide by many of the EU regulations that exist today - including the EIA Directive - some of the most environmentally significant policies are currently excluded from EEA requirements (EEA 2011), including the habitats and birds directives and the directives on bathing and shellfish waters.

Given this, our messages need to be clear and unequivocal in terms of what needs to be done to safeguard the environment alongside sustainable development and to deliver better biodiversity outcomes in the future. We need to share knowledge widely and be proactive in looking for solutions that are as good as, or better than, the directives which we acknowledge are not perfect.

The Government has asked industry to look at post Brexit opportunities and encouraged creativity. Consequently the British Ports Association are in the process of writing to various UK Ministers proposing a concept of 'Port Zones' that, post-Brexit, would make port areas exempt from environmental designations and support fast-tracking of marine and landside planning consents to encourage port development and regional/coastal growth.

By contrast, recent consultation on the implementation of the 2014 EIA Directive has revealed that many of the 2014 European amendments have been carried over into the draft UK Regulations. The proposal is to fully replace the current EIA regulations with new 2016 regulations on the 16 May 2017.

The proposed changes include the use of 'competent experts' to undertake and examine EIA (Article 5(3)). In the draft Regulations a competent expert is defined as having 'sufficient expertise' (which is a term used in the amended EIA Directive to refer to a different requirement) and it is proposed that it will be up to the competent authorities to determine whether the people who complete an Environmental Statement are in fact competent experts. This approach carries risk of delay and costs for a developer should the planning officer not be content with an EIA professional's credentials.

The changes also aim to ensure that EIA is more proportionate and iterative assessment is not restricted by the need to ensure that Environmental Statements are 'based on' scoping opinions (Article 5). However, CIEEM are of the view that the wording use in the draft Regulations is confusing and could infer that multiple scoping opinions could be sought for the same development.

With regard to alternatives (Annex IV), the requirement to address these remains limited to reasonable alternatives studies by the developer but requires explanation of the main reasons for selecting a preferred option and comparison of environmental effects. Opportunities are currently difficult to foresee, but opportunities to achieve better outcomes for the natural environment will present themselves. The UK still has domestic environmental legislation, for example, and is a signatory to a range of other international environmental agreements which will influence any new legislation. The time to plan is now.

The future for Tidal Range Energy in the UK: post Paris, post Brexit and post Hendry

Tim Carter
Head of Environment, Tidal Lagoon Power
T: 01452 303 892 ext. 2042 E: tim.carter@tidallagoonpower.com
http://www.tidallagoonpower.com/

Post Paris: It has been 25 years since the IPCC's first Assessment Report set out the potentially serious consequences of inaction for society, biodiversity and economies, and called for united action to tackle the challenge of climate change. The Rio Convention (1992) committed the UK to an 80% reduction in CO_2 emissions by 2050 and, while there has been progress, in 2016 only around 6% of UK energy consumption came from renewable resources. This is clearly some way from achieving the UK's Rio commitments let alone the enhancement commitments set out in the COP 21. In the same timeframe the UK faces an increasing demand for energy, and 75% of the UK's existing thermal energy capacity (nuclear, gas, oil and coal) will be decommissioned by 2030. It is clear that we must act now.

Tidal Lagoon Power's (TLP's) mission is to drive a critical change in the energy mix by developing infrastructure to harness natural power from the rise and fall of the tides. That is:

- Generating indigenous, low carbon electricity at scale. Up to six lagoons could provide 8% of the UK's electricity requirement or power for 30% of UK homes.
- Creating a long term hydroelectricity manufacturing and engineering industry.
- Sustaining long term employment.
- Investing in biodiversity.
- Providing coastal protection and support for climate change resilience.
- Supporting the wellbeing of future generations.

Post Brexit: Following the Brexit vote, tidal range energy offers the opportunity to build, from scratch, a new global industry the UK; providing energy security, sovereignty and independence, as well as optimism for future economic growth, with no reliance on EU for funding. The UK currently faces a *circa* 30GW energy gap by 2030 (BWB, The Energy Crunch, 2016) and limited options exist to secure an energy supply which is home-grown, renewable, reliable and highly predictable. Tidal lagoons can do this on a large scale, near-continuously for at least 120 years using proven technology at low cost, and can deliver in the timescale required. This will provide employment for domestic industry, opportunities for regeneration and jobs in the regions that need it most; sowing the seeds for the future. By contrast, floating offshore wind and tidal stream have no commercial projects currently in development.

Post Hendry: The Hendry Review into tidal range energy was undertaken between May and November last year, with Sir Charles Hendry submitting his final report to Government in December 2016. The review considered:

- In what circumstances tidal lagoons could play a cost effective role as part of the UK energy mix.
- The potential scale of opportunity in the UK and internationally, including supply chain opportunities.
- A range of possible structures for financing tidal lagoons.
- Different sizes of projects as the first of a kind.
- Whether a competitive framework could be put in place for the delivery of tidal lagoon projects.

TLP initially focused on the development of Tidal Lagoon Swansea Bay (TLSB) as a scalable blueprint for full size lagoons. TLSB has a Development Consent Order in place and awaits its Marine Licence from Natural Resources Wales (NRW). Further, TLP has started the development phase for a programme of further lagoons, including proposals for the development of a full scale lagoon in Cardiff (TLC).

The technology has been proven to be viable and there is a wealth of data available on how it interrelates with the environment. In assessing the potential environmental impact of a tidal lagoon, TLC's areas of assessment have so far included coastal processes, sediment transport and contamination; marine water quality; intertidal and subtidal benthic ecology; fish and fisheries (including fish tracking); marine mammals; coastal birds (including bird tagging); navigation; terrestrial ecology; seascape and visual amenity; transport and air quality; marine and terrestrial noise; archaeology and the historic landscape; and economy, tourism and recreation. An Evidence Plan and detailed peer review process is in place.

Challenges include effects on migratory fish, SAC features and overwintering birds, as well as uncertainties around any seabed leasing rounds. TLP's approach to the assessment of impacts on fish, for example, has involved close collaboration with regulators and leading fisheries advisors and has included the development of new modelling methodologies.

In any competitive framework TLP will put the environment at the forefront of its proposals. This is encapsulated in our Ecosystems Enhancement Programme (EEP), which aims to enhance biodiversity alongside the generation of large-scale clean energy by 2030 through a targeted nature conservation programme (TLP, EEP Strategy, 2016).

The RSPB's vision for offshore wind – challenges and opportunities

Aedán Smith
RSPB, Scottish Headquarters, 2 Lochside View, Edinburgh Park, Edinburgh, EH12 9DH
T: 0131 317 4100 E: aedan.smith@rspb.org.uka

Whilst onshore wind in the UK has, in most cases, been developed successfully without significant harm to wildlife, offshore wind has proven much more challenging. Compared with onshore, there is less information on the distribution of marine species sensitive to offshore wind development and, although there has been some good recent progress, there is not yet a complete network of effectively managed marine protected areas in UK waters. This makes identifying suitable sites much more challenging. The UK is also globally important for many seabird species. Scotland alone is estimated to host around a third of all breeding seabirds in the EU.

Current offshore wind projects are restricted to shallower waters, often relatively close to shore. In a number of cases, this has coincided with important areas for seabird feeding. In a few instances, and as a last resort, the risk to seabirds from proposed offshore wind developments has been so great, with thousands of birds predicted to be killed each year, that the RSPB has had no option but to try and prevent the projects going ahead as proposed.

Meeting the UK's carbon reduction targets will require a significant increase in renewable energy– including offshore wind – and it is vital that this is sited to minimise impacts on wildlife. The RSPB therefore undertook a major research project to explore how a low carbon future could be achieved whilst limiting impacts on wildlife. In addition to looking at cross-sector demand reduction and energy efficiency, we used pioneering mapping techniques to assess where, onshore and offshore, a wide range of renewable energy technologies could be sited at low ecological risk. We used these findings to develop scenarios to achieve the UK's 2050 energy targets at low risk to wildlife. The full report is available on the RSPB website (http://www.rspb.org.uk/our-work/conservation/conservation-projects/details/350939-energy-futures-resource-constraints-and-sensitivity-mapping-for-renewable-energy-in-the-uk) . The report does not present a blueprint but aims to instigate a debate and to show that the targets could be met in a number of ways at low ecological risk.

Amongst a wide range of findings, the report identifies that in future the development of offshore wind technology in deeper waters could potentially play a significant role whilst minimising risks to wildlife. The technology is obviously still in its infancy but shows significant long term potential and the RSPB is currently exploring how the offshore wind sector could be encouraged to grow with low ecological risk.

Cumulative effects assessment: common principles and practical implementation

Adrian Judd
Principal Marine Advisor, Cefas, Pakefield Road, Lowestoft, Suffolk, NR33 0HT
Tel: +44 (0)1502 524302 E-mail: adrian.judd@cefas.co.uk

The policy and regulation of cumulative effects assessment is established from a wide range of environmental, societal and economic drivers. Whilst these processes operate within different legislative and management frameworks there are common principles that can be applied to help rationalise and provide coherence to the design and undertaking of cumulative effects assessment.

Experience from designing the approach to cumulative effects assessment for the OSPAR Quality Status Report has helped to define some common principles and considerations. Whilst developed for a regional sea scale assessment, these considerations are also relevant to project level cumulative effects assessment.

Meaningful cumulative effects assessments require an effective way to aggregate and filter data and information. This requires understanding and balancing a range of issues, e.g. the available evidence on effects; management measures (e.g. licence conditions); application of industry good practice to avoid, minimise or mitigate effects; risk of sensitive biota being exposed to pressures. It is also essential that the cumulative effects assessment has a clearly defined purpose and that the processes and outputs are concretely designed to address that purpose.

The aim of the OSPAR work stream is to undertake an indicator based assessment of cumulative effects that resonates with the individual components of the Joint Assessment and Monitoring Programme (JAMP). Bow-tie analysis provides a simple and transparent means to present, assess and communicate the complex DPSIR information associated with each OSPAR common indicator. Simple aggregations of indicator bow-ties in terms of both ecosystem 'compartments' and drivers (environmental, social and economic) are being used to establish likely linkages / cumulations of effects. For example, linkages / pathways of indicators on contaminants in sediment and the water column to indicators on contaminants in benthos, fish and higher predators. The bow-ties present these linkages in the context of any associated control measures (preventative and/or mitigative).

The challenges of communicating science and expert information in a 'post factual' world

Anuschka Miller
Head of Communications, Scottish Association for Marine Science (SAMS)
M: 07786 327780 E: Anuschka.Miller@sams.ac.uk www.sams.ac.uk

The marine environment is alien to people and science is complex. This makes it challenging for marine scientists to share their understanding of the marine environment. Nevertheless, marine science and the marine environment have been receiving increasing attention from the public, from policy and law makers, from industry and from the media.

This has been achieved due to better and more affordable visualisation technologies; inclusion of impact and communication plans in all larger projects; and more and better communication training for experts. It should be a time to celebrate our increasing aptitude in science communication and the emergence of a global ocean literacy movement.

But then in 2016, during the EU referendum and the US election campaigns, winning politicians postulated that 'people have had enough of experts', urging people to vote for what they felt was right. Expert understanding may thus no longer be the arbiter of legitimate power and decision making in the Brexit / Trump world that lies ahead.

This talk explores how the UK marine science community might respond to the challenges of post factual sentiments. Can we find an approach that would distance scientists from the mistrusted world of elites and corporates? Should we become more campaigning for our shared views? Should we focus more on the 50+ non-decision making audience group? Or should we withdraw once more into our ivory towers and deliver the industrial innovation politicians want from us and keep our noses out of politics all together?

Background

- Guardian: Science has always been a bit post-truth: https://www.theguardian.com/science/political-science/2016/dec/15/science-has-always-been-a-bit-post-truth
- Williamson, P. (2016) *Nature* 540, 171: Take the time and effort to correct misinformation: http://www.nature.com/news/take-the-time-and-effort-to-correct-misinformation-1.21106

Ocean Warming – Rising evidence of physical and ecosystem change

Stephen Hall CMarSci FIMarEST
Vice Chair Intergovernmental Oceanographic Commission of UNESCO, Head of International & Strategic Partnerships at the National Oceanography Centre, Southampton, SO14 3ZH
E: sph@noc.ac.uk (until 1/4/17 – then due to start as the new CEO at Society for Underwater Technology, www.sut.org)

Climate change skeptics sometimes ask my fellow oceanographers 'why do you believe in global warming?' and I've heard them reply quite correctly that 'It's not about belief - we don't BELIEVE in global warming – we MEASURE it'. Ever since the first global ocean science expedition of HMS Challenger between 1872 & 1876 scientists have taken measurements of temperature, salinity and other parameters with increasing accuracy and resolution. Today we measure the upper few hundred metres of the global ocean with an international network of over 3000 'Argo' profiling floats that drift on the great ocean currents, backed up by satellite measurements of sea surface temperature and full ocean depth measurements from ships and a new generation of robot systems.

All of them tell the same story of a global ocean that is steadily absorbing additional heat, and storing it not just at the surface layers but deep into the water column. The long-term implications are profound – it takes the ocean a long time to warm up and a long time to cool back down. Since saltwater is much denser than air the top few metres of the ocean contain more stored heat than the entire atmosphere. Returning the ocean to pre-industrial conditions, if desirable, will take centuries of geo-engineering, so we are locked-in to a long period of consequences.

For the majority of humans who live near the coast, sea level rise from thermal expansion (plus land-based ice melt) will be the most readily-felt impact, along with changes in the frequency and intensity of hurricanes as warmer waters extend the latitude range over which such storms can develop. The jury is still out on how much sea level rise is irrevocable, but over a period of the next couple of hundred years we are certainly talking about metres, not centimetres – enough for major coastal infrastructure such as nuclear power stations, ports, airports and cities to need to take future rise into account. Changes in temperature have an impact on water density gradients, so we may even change the strength & course of the great ocean currents, with extensive regional impacts – for example north west Europe could actually experience some cooling in the medium term if the 'Gulf Stream' terminated further south than it does today.

Whilst the physics of a warming ocean are relatively straightforward to measure and forecast into the future it's always more complicated for marine living resources. Scientists are already seeing ecosystem changes associated with changing temperatures, and these will increase as a warmer ocean has a reduced capacity to absorb oxygen, and species flee to cooler water in pursuit of prey. The future ice-free Arctic will likely become a major hotspot for fisheries, whilst warm tropical seas lose their coral reefs and will no longer be able to provide the right environment for any tuna or other migratory fish that have somehow survived extensive over-exploitation. For these regions, human-managed open-ocean aquaculture may become the only viable way to feed growing populations.

On top of these changes, if we continue to burn fossil fuels without carbon capture and storage there will also be the problems associated with ocean acidification. So the ocean faces a long period of change. There will be winners and losers, both in the human world and in the marine ecosystems of the future. Some say that jellyfish and cephalopods will thrive, and certainly there will be extensive opportunities for high latitude nations. We do have time to prepare and adapt, but need to understand that 'business as usual' is not an option.
Resources:

Useful websites
Intergovernmental Oceanographic Commission of UNESCO http://www.unesco.org/new/en/natural-sciences/ioc-oceans/
Global Ocean Observing System http://www.goosocean.org

Argo programme http://www.argo.ucsd.edu
Joint Technical Commission for Oceanography and Marine Meteorology
JCOMM http://www.jcomm.info
NOAA Ocean warming https://www.ncdc.noaa.gov/indicators/
UK Met Office global warming http://www.metoffice.gov.uk/research/monitoring/climate/surface-temperature

Useful recent papers
https://portals.iucn.org/library/sites/library/files/documents/2016-046_0.pdf
http://www.nature.com/nclimate/journal/v6/n4/full/nclimate2915.html

New advances in marine robotics: applications to UK environment and defence

Professor Russell Wynn
National Oceanography Centre (NOC), European Way, Southampton, SO14 3ZH
T: 02380 596553 E: rbw1@noc.ac.uk

- UK Government is investing £25M in the NERC research fleet of marine autonomous systems in the current decade; consequently, this robot fleet is now one of the most advanced in the World, and is supporting a wide range of scientific research projects

- NOC and its partners are also working across the public/third sector to support wider uptake of these new technologies, including marine environmental studies (Defra Group, WWF-UK) and maritime security and defence (Royal Navy, Defence Science and Technology Laboratory)

- NOC has co-ordinated a series of ambitious marine robot demonstrator missions annually since 2013, called Marine Autonomous Systems in Support of Marine Observations (MASSMO)

- The MASSMO missions have involved robot fleets of up to ten vehicles, and partnerships of up to 20 organisations, working together in UK waters to determine the strengths and weaknesses of these new technologies

- This presentation will showcase the range of new data collected during these recent missions, ranging from seabed mapping/imaging of Marine Protected Areas, to acoustic detection of mobile species in the water column, and measurement of oceanic fronts and weather phenomena at the sea surface

Media coverage
http://www.bbc.co.uk/news/science-environment-29464273
http://www.bbc.co.uk/news/uk-scotland-highlands-islands-37822097

References
***Wynn, R.B.**, Huvenne, V.A.I., Le Bas, T.P., Murton, B.J., Connelly, D.P., Bett, B.J., Ruhl, H.A., Morris, K.J., Peakall, J., Parsons, D.R., Sumner, E.J., Darby, S.E., Dorrell, R.M. and Hunt, J.E. (2014) Autonomous Underwater Vehicles (AUVs): their past, present and future contributions to the advancement of marine geoscience. Marine Geology, 352, 451-468 (50th Anniversary Special Issue).*

*Suberg, L., **Wynn, R.B.**, van der Kooij, J., Fernand, L., Fielding, S., Guihen, D., Gillespie, D., Johnson, M., Gkikopoulou, K.C., Allan, I.J., Vrana, B., Miller, P.I., Smeed, D. and Jones, A.R. (2014) Assessing the potential of autonomous submarine gliders for ecosystem monitoring across multiple trophic levels (plankton to cetaceans) in shallow shelf seas. Methods in Oceanography, 10, 70-89.*

Port of Falmouth capital dredging proposal: a review of recent evidence concerning likely SAC impacts

Dr Miles Hoskin
Coastal & Marine Environmental Research (CMER), 3 Restormel Terrace, Falmouth, Cornwall, TR11 3HW
T: 07976 437 463 E: miles.hoskin@cmer.co.uk

The Falmouth Harbour Commissioners and A&P Falmouth Ltd. are working towards a second application for consent to dredge a new, deeper approach channel to Falmouth docks. The scheme would cover an area of ~33 hectares and increase navigable depth by ~3m.

In 2011, a previous application was refused by the Marine Management Organisation (MMO) based on a likely adversely effect on the integrity of the Fal & Helford Special Area of Conservation (SAC). The main concern is maerl; a rare, slow-growing coralline red alga. Both live and dead maerl nodules form stable, species-rich habitats. Maerl habitats lie within the footprint of the proposed dredge and are threatened over a much wider area by the silt-plume that the dredging would create.

The proponents have recently submitted new evidence to the MMO that they believe negates the concerns that led to refusal in 2011. The Marine Conservation Society (MCS) commissioned CMER to review their case. Based on this work, and subsequent peer-review, MCS is still strongly of the opinion that dredging would adversely affect the SAC. This presentation explains the current status of the proposal viz-à-vis determination by the MMO and outlines the key legal and scientific arguments on either side.

Links to further information:

Marine Management Organisation – Key Falmouth dredging evidence documents
https://www.gov.uk/government/publications/falmouth-habour--2

Falmouth Harbour Commissioners - Port of Falmouth Approach Channel Dredge and Habitat Mitigation Scheme (Royal HaskoningDHV, April 2016)
https://www.falmouthharbour.co.uk/wp/wp-content/uploads/50-R039-01-Port-of-Falmouth-Approach-Channel-Dredge-and-Habitat-Mitigation-Scheme.HRA-Final1.pdf

Marine Conservation Society – CMER review of proponents' latest evidence (September 2016)
https://www.mcsuk.org/downloads/CMER%20Falmouth%20dredging%20review.pdf

Marine Conservation Society – online petition opposing Falmouth dredging
https://secure.mcsuk.org/ea-action/action?ea.client.id=2001&ea.campaign.id=56506

Marine Conservation Society – recent press release re CMER review and petition
https://www.mcsuk.org/press/view/735

Falmouth Bay & Harbour Action Group homepage – local environmentalists and fishermen opposed to the proposed Falmouth dredging
http://www.facebook.com/FalmouthBayandHarbourAction

Falmouth Bay & Harbour Action Group – evidence files
http://www.facebook.com/groups/112446068890751/#!/groups/112446068890751/files/

RSPB concerns re Falmouth dredging
http://www.rspb.org.uk/community/getinvolved/b/specialplaces/archive/2012/02/23/win-win-falmouth-maerl-the-economy-and-the-environment.aspx

Seaweed Cultivation: Development & multiple benefits

Dr Adrian MacLeod and Dr Michele S Stanley
Scottish Association of Marine Science, Scottish Marine Institute, Oban, PA37 1QA
E: Adrian.Macleod@sams.ac.uk Michele.Stanley@sams.ac.uk

Seaweeds or macroalgae are fast growing plants which are generally considered as a very important and valuable source of biomass for numerous applications such as food and feed (additives), biochemicals and biomaterials, pharmaceuticals and nutraceuticals, and biofuels/energy. In Europe, macroalgae cultivation is still in its infancy with a limited number of commercial farms. Nevertheless significant activities are ongoing to further develop seaweed cultivation.

National authorities are currently hesitant in giving permanent licenses for large-scale cultivation and the framework for licensing seaweed farms is still in an early stage. As we see an increase in the amount of seaweed being cultivated questions now need to be answered in terms of the potential associated risks to this form of agriculture and likely mitigation strategies. It must be noted impacts are potentially both positive and negative. For example seaweed takes up nutrients from the marine environment as the plants grow, thereby potentially contributing to a decreased eutrophication, and improved environmental status in a cultivation area. However, the potential negative effects on natural benthic communities (shading of seagrass or macroalgae vegetation, local deposition of organic material resulting in local oxygen depletion) are not documented. This presentation will explore some of the aspects of the licensing of seaweed cultivation in Scotland and potential environmental impacts both positive and negative.

Biography and contact information
Dr Adrian MacLeod completed a SuperGen PhD working on the biological communities of organisms that foul offshore structures at SAMS in 2012. He was particularly interested in communities settling on man-made equipment situated in fast flowing water (i.e. tidal-streams). Subsequently, he has worked on a NERC funded Knowledge Transfer project to determine what impact these communities will have on the loading of offshore structures and their moorings. He has been an environmental consultant with SRSL since 2013 working on a wide range of projects. He is now a PDRA for SAMS on the H2020 Macrofuels project (http://www.macrofuels.eu) researching seaweed cultivation and potentially environmental impacts. More information on Adrian can be found at http://www.sams.ac.uk/adrian-macleod and contact details are: email Adrian.Macleod@sams.ac.uk ; tel +44 (0)1631 559450.
His research is part of the Marine Biotechnology Centre at SAMS more information can be found at http://bit.ly/2iiRbzh

Bass: How not to manage fisheries

Nigel Horsman
Bass Anglers Sportfishing Society
E: nigel.horsman@btinternet.com

Bass (or Sea Bass if you only ever meet them on a restaurant menu or while watching Masterchef) is arguably Britain's most valuable fin fish. Doesn't sound plausible to you? There is so much about this story that doesn't sound plausible but is, in fact, true.

It all starts by asking a simple question – what is the point of fisheries management? I'm a businessman with a science degree and I think a question so simple deserves and needs a simple answer. Resource managers everywhere are supposed to work for the long term benefit of the resource owners. Is that how fisheries management works? Is that how bass management works? I'll show that it isn't. Not only that, I'll consider how recreational sea angling can "fund" conservation, by replacing a damaging activity with a more benign, but higher value activity.

How can bass be Britain's most valuable fin fish when we haven't heard much about it until a couple of years ago? That doesn't sound right. Well, something isn't right, that's for sure. We have two big groups that exploit bass stocks and generate economic value from it. One is economically quite small, with a big impact on stocks and a very big voice. The other is much larger, with a smaller impact on stocks but with a very small voice. The surprising thing is the former is commercial fishing and the latter is recreational sea angling (RSA). In case you thought it should be the other way around, we'll look at the actual evidence rather than beliefs, opinions and received wisdom.

In many ways bass management should be easy. Its biology enables us to see into the future, on the recruitment side at least. The vast majority of fishing effort (by both exploiter groups) is targeted. Over 95% of human consumption of bass in Europe is satisfied by farmed bass. Other developed countries manage their bass stocks in radically different ways to us and we can see the different outcomes.

Despite all this, bass stocks are in trouble. When over harvesting combined with poor recruitment caused by poor environmental conditions hits a stock that has been almost ignored by fisheries managers (possibly deliberately) and is subject to almost no harvest control rules, a disaster is bound to follow. When both the poor recruitment to adult stocks and over harvesting can be easily predicted years in advance, and was, you have to wonder what is going on?

In 2016, ICES advised a complete moratorium on bass harvesting for 2017 and warned that stocks had fallen below the point where they are concerned a recovery might not occur, even if conditions are favourable (below Blim for the technically minded). This followed two previous years of warnings from ICES. Bass even had not one but two parliamentary debates dedicated to its future, with a former Fisheries Minister urging the current holder of that post to make it a recreational fishing only species, as Ireland has done.

So why, at the EU 2017 Fishing Opportunities meeting held in mid-December, was the threat to the stocks not averted and maximum value for the resource owners not the objective? The discussions took place in secret, so we'll never really know, but the decisions were taken by politicians, not scientists or fishery managers, so that might give us some clues about where to look for the causes of this continuing management failure.

Nigel Horsman is a businessman and sea angler who has led the conservation team of the Bass Anglers Sportfishing Society for the last six years, working closely with UK and EU authorities.

He can be contacted on nigel.horsman@btinternet.com

For more information, background and sources, see:-

http://www.anglingtrust.net/page.asp?section=841&sectionTitle=Campaigning+For+More+And+Bigger+Bass

http://www.anglingtrust.net/page.asp?section=1220&sectionTitle=Bass+Fishing+In+2017+%96+No+More+Nets

http://www.ukbass.com/

http://www.saveourseabass.org/en/home/

Marine Planning – Update on the English programme

Steve Brooker
Chief Planning Officer, Marine Management Organisation
E: stephen.brooker@marinemanagement.org.uk W: www.gov.uk/mmo
Twitter: @the_MMO

Through the Marine and Coastal Access Act 2009 the Marine Management Organisation (MMO) is required to produce marine plans for all of England's marine areas under authority delegated by the Defra Secretary of State.

The East Inshore and East Offshore Marine Plans were approved on 2 April 2014. Work has been focussed on their implementation and monitoring their effectiveness.

The draft plan for the South inshore and offshore marine areas is at the formal public consultation stage. The 12 week consultation ends on 27 January 2017.

The MMO is producing the marine plans for the four remaining marine areas concurrently. The aim is to have these plans adopted by Government in 2021.

The MMO has produced a 'Marine Information System' (MIS) - see Marine Information System. MIS provides a guide to the plans and allows easy access to the different objectives and policies in the plans. The MMO is currently exploring how we might produce digital plans instead of the current pdf documents, so they are accessible online and easier to navigate.

Marine Planning - a European perspective from the Baltic

or

Learning by doing – cross-border collaboration in maritime spatial planning in the Baltic

Dr Ingela Isaksson
Swedish Agency for Marine and Water Management, Coordinator and project manager collaboration Baltic SCOPE
T: 0046 (0)10 698 6229 E: ingela.isaksson@havochvatten.se
W: www.balticscope.eu

Baltic SCOPE collaboration unites national authorities around the Baltic Sea actually responsible for maritime spatial planning, with support of regional and research organizations. It's co-funded by European Commission, DGMARE.

Maritime Spatial Planning, especially on cross-border level, is complicated. MSP is an on-going process which results will be seen in the long term. It aims to ensure that activities are sustainable and in line with ecosystem approach to marine management. MSP requires a combination of integrated cross-sectoral solutions created by relevant partnership.

Baltic SCOPE is a unique collaboration, learning by doing exercise, as national planning is done while project is running. The collaboration serves as a platform for experience exchange and implemented keeping in mind three key aspects: **sharing, understanding, adapting**; also, applying them on national and international level. We set sails for a joint journey. Identified what is needed to achieve successful cross-border cooperation, where potential barriers may lie as well as developing recommendations for cross-border MSP processes within environment, shipping, fisheries and energy.

Though it's important to acknowledge, that the collaboration is not going to result in a joint maritime spatial plan of the Baltic Sea. However, it facilitates the move towards aligned plans across the Baltic Sea Region.

Marine Planning in the UK - Learning & expectations in relation to infrastructure and land use planning

Jim Claydon
Planning Consultant
E: jim@jimclaydon.co.uk www.jimclaydon.co.uk

In his twelve years of involvement in marine planning in the UK the presenter has seen the concept turned from aspiration to reality. The UK is among the leading practitioners in this emerging global policy development. Inevitably as well as the achievements of the first wave of plans there are frustrations at the plans' limitations and unfulfilled expectations. However he will argue that there are;

Reasons to be Cheerful

- The production and adoption of marine plans with a long term perspective
- Variety in those plans in both concept and context
- An established process involving communities in plan making
- The development of plans based on principles of sustainability
- The systematic collection of data
- The recognition in those plans of the centrality of major investment decisions and strategic conservation objectives

His experience of working with terrestrial planning organisations and specifically on Nationally Significant Infrastructure Projects has led him to consider future developments that he believes will enhance marine planning practice as the profession matures and practice is refined;

Great Expectations

- Learning from alternative approaches
- Shifting the focus to coastal communities
- Coordination and cooperation with terrestrial planning agencies
- Planning across administrative boundaries
- Addressing the issues of cumulative impact
- Increasing spatial specificity
- Developing cross-sectoral policy both nationally and locally
- Integrating marine conservation planning in marine spatial plans
- Developing case law

http://neweconomics.org/turning-back-to-the-sea/?sf_action=get_results&_sf_s=blue+new

https://www.gov.uk/government/consultations/draft-south-marine-plan

http://gov.wales/topics/environmentcountryside/marineandfisheries/marine-planning/welsh-national-marine-plan/?lang=en

http://www.msprn.net/

https://www.cornwall.gov.uk/environment-and-planning/maritime-strategy/

Celtic Seas Partnership: stakeholder engagement in marine management

Jenny Oates
Celtic Seas Project Manager, WWF-UK
E: JOates@wwf.org.uk

The WWF-UK led Celtic Seas Partnership project has drawn people together from the UK, Ireland and France to develop collaborative and innovative approaches to managing their marine environment. This project, which is EC LIFE+ funded, supported the delivery of Good Environmental Status in the Celtic Seas, by facilitating engagement between sectors and across borders to ensure the long term future of the environment while safeguarding people's livelihoods and the communities that have a relationship with the sea. The Celtic Seas Partnership project engaged with over 1500 marine stakeholders, from 6 countries and 14 broad sectors, including policy makers, scientists, fisheries, energy, environmental NGOs, aquaculture and shipping.

Together with our stakeholders, we have produced a series of tools and resources which support sustainable management of the Celtic Seas. These resources include an interactive website analysing different future growth scenarios in the Celtic Seas and their potential effects on the marine environment, a series of best practice guidelines based on case studies in the Celtic Seas, and a Celtic Seas web portal and data discovery guide. These are available at our stand in the exhibition area at Coastal Futures and also available on our project website below.

Weblink: www.celticseaspartnership.eu

A unified MPA database for all UK seas

Charlotte Coombes
Conservation Projects Officer, Marine Conservation Society
E: charlotte.coombes@mcsuk.org

In 2016, the Marine Conservation Society (MCS) launched its Ocean Devotion campaign to push for marine protected areas (MPAs) that work as tools for effectively protecting marine ecosystems. A key aspect of the campaign is engaging the general public in the MPA process through an easily understandable interactive online map that covers all UK MPAs and provides information about what is protected and where.

There are many sources of data available for those who want to know more about MPAs, including online mapping functions. However, these are frequently aimed at a technical audience or exclude certain pieces of information (e.g. covering just one part of the UK, or certain types of MPA designation). Other data come in many and varied forms and finding them often requires knowing where to look and what to look for.

To achieve the aims of the Ocean Devotion campaign, MCS is working to bring all publically available MPA-related datasets for the whole of the UK into one database that can be fully interrogated, is able to process data from a number of different sources and in a number of different formats, and can support the online mapping function. MCS is keen to hear of projects that could support or be supported by this work.

Supporting Implementation of Maritime Spatial Planning in the Celtic Seas

Charlotte Billingham
Communications Officer, SIMCelt
E: cbilling@liv.ac.uk

Co-funded by the European Commission, SIMCelt is a two-year project which aims to promote practical cross-border cooperation between three EU Member States on the implementation of the Maritime Spatial Planning Directive in the Celtic Seas.

SIMCelt will improve understanding of the range of factors potentially impacting on the marine area within the Celtic Seas, their cumulative impact and projected future trends. A series of cross-border case studies will examine current demands on maritime space and address key strategic and jurisdictional barriers to effective cooperation. For example, addressing data gaps and supporting the coherence of data analysis across marine area boundaries will facilitate more effective collaboration between Member States.

A practitioner-focused project, SIMCelt involves both academic and government partners from France, Ireland and the UK. It will build upon existing mechanisms for transboundary working to enhance cooperation and engagement, reduce cross-sectoral conflict and promote the development of coherent maritime spatial plans within the Celtic Seas.

www.simcelt.eu @simcelt

Marine Protected Area (MPA) management National Steering Group (NSG)

Tim Dixon (presentation delivered by Katie McPherson)
Marine Management Organisation
T: 0208 026 5509 E: tim.dixon@marinemanagement.org.uk

There is a need to deliver a well-managed network of Marine Protected Areas (MPAs). In September 2014 the MPA Network Project Board agreed that a national group of lead authorities should be established to provide national coordination of, and reporting on, MPAs and the MPA network in waters for which the Secretary of State is responsible.

This group also provides leadership on MPA management in order to champion and steer improvements. Furthermore, the group raises the profile of MPAs within their authorities; increasing buy-in to management responsibilities and also with wider stakeholders.

The MPA management National Steering Group (NSG) is composed of representatives from key organisations that have a statutory obligation with respect to MPAs. Members of the group have the authority to influence within their organisations and actively input to the NSG at a senior level.

The NSG's role is to provide strategic coordination and oversight of the management of MPAs and has been working to deliver against objectives on an ever changing work plan.

Development of an Inshore Vessel Monitoring System

Katie McPherson
Marine Management Organisation
T: 0208 026 5329 E: Katie.mcpherson@marinemanagement.org.uk

The Marine Management Organisation (MMO) has been working with the Inshore Fisheries and Conservation Authorities to develop an inshore vessel monitoring system (I-VMS). The device will accurately record vessel position, speed and course and will assist regulators in effectively managing marine protected areas and inshore fisheries.

A specification was developed by the MMO for a device aimed at vessels under 12nm in length. The key criteria include:

- Low cost
- High frequency reporting using GPRS/GSM signal (Mobile phone)
- Store and forward capability. If there is no mobile signal the device will store reports and send once back in range
- Depending on location the reporting frequency can increase
- Reports into the UK Fisheries Hub alongside current VMS reporting.

Technology suppliers could submit devices for testing against the specification. The devices were tested both in the laboratory and at-sea. In 2016 3 devices passed the approval programme and are now available for use.

Once implemented the benefits of the device include:

- Improved fishing activity data and estimated fishing effort
- High frequency reporting in and around marine protected areas
- Provide better intelligence associated with non-compliance.
- Provide greater understanding of how the inshore fleet interacts with and impacts on other marine users e.g. windfarms

Web-links and or references:
Device approval programme: https://www.gov.uk/government/publications/inshore-vessel-monitoring-system-ivms

Device Specification: https://www.gov.uk/government/publications/inshore-vessel-monitoring-system-project-device-specification

Approved products register: https://www.gov.uk/government/publications/inshore-vessel-monitoring-system-ivms/mmo-and-ifca-i-vms-approved-products-register

Brexit & Fisheries – Key Points for discussion

Coastal Futures 2017 Suzannah Walmsley, Version 9-Jan, inputs from Dale Rodmell, Helen McLachlan, Gordon Friend, Daniel Owen.

The aim of this session is to brief the audience on potential effects and opportunities of Brexit for fisheries. Richard Barnes will provide an overview of what has happened in an earlier session, and wider environmental regulations and MPAs are considered in other sessions. This list provides key points from the speaker's notes and other recent documents to inform and guide the session's discussion. The audience will be asked to contribute thoughts on the feedback sheets provided and links.

Introduction & Background: Leaving the EU opens up the possibility of the UK subsequently leaving the Common Fisheries Policy (CFP), raising a range of questions on the policy objectives, governance and regulation of fisheries.

Legal framework: UK bound by international law. Existing (CFP) and potential legal frameworks. Need to avoid regulatory deficit. Rights and obligations of the UK as a Coastal State under UNCLOS in relation to shared stocks, dispute resolution processes.

Policy objectives: Minister has said Brexit is an opportunity to review fisheries management. UK was involved in the CFP reform and remains committed to implementing the discard ban. Various issues/questions: continue to deliver on CFP commitments; establish the UK as a world leader in sustainable fisheries; effective marine legislation and fisheries agreements setting sustainable targets; limits on fishing mortality; management to be underpinned by science; delivering MSY by 2020?

Access to waters: Equal access to UK waters will lapse when leave CFP. On what basis could/should access by EU vessels to UK waters be provided? Concept of 'surplus' under UNCLOS. Historical rights in the 6-12nm zone – limited to UK vessels? Trade-off EU access in return for UK access to EU 6-12nm zone?

Quota distribution: 'Fair' access to quota? Basis on which quotas are shared between EU and UK – relative stability, or UK's national quota share of fish stocks to broadly reflect the resources located in the UK's EEZ? Quota could be used in exchange for access to EU waters and European markets. Distribution of quota among UK fleet is a national issue, either within or outside of the CFP.

Fisheries management framework and technical measures/regulations: Potential for national management arrangements to be more tailored and responsive. Effective monitoring, control and enforcement is important – ensure compliance, avoid illegal, unreported and unregulated fishing. Contributes to reputation of UK seafood, important for supply chains. Future role (if any) of UK in Advisory Councils? Harmonised technical regulations to facilitate vessels fishing in both EU and UK (and Norwegian) waters? Potential changes in environmental regulations could also affect fisheries.

Governance: Clear processes for engagement of stakeholders in management process (and Brexit process) needed.

International cooperation: UK committed to continued cooperation with other countries over the management of shared stocks. Consistency in management across international and national boundaries also? Require effective shared management to ensure sustainable levels of exploitation — nature of these arrangements? Devolved nature of UK fisheries means consistency also required within UK. Additional resources required for UK to participate in international negotiations and Regional Fisheries Management Organisations.

Trade aspects: EU is an important trading partner. 67% of exports (by value) are to the EU, and 31% of imports. Issues of market access for UK catches, imports to the UK, potential tariffs and non-tariff barriers and their impacts? Trade in fisheries products to be addressed through wider trade negotiations, or specifically for fisheries?

Interplay with other priorities in negotiations: Will fisheries be dealt with on its own terms, or included with other negotiation portfolios?

Funding: Adequate financial support to the fisheries sector, sufficient funding to support key management measures and enforcement.

Outcomes for coastal communities: Fishing has the potential to play a central role in the renaissance of the UK's coastal communities. Doing so will help provide a viable future for the UK's rich marine and coastal area and the industries and communities that depend upon it.

Securing a Fisheries Renaissance from Brexit

Dale Rodmell
National Federation of Fishermen's Organisations (NFFO)
E: Dale.Rodmell@nffo.org.uk

Dale Rodmell will outline how the NFFO considers a renaissance in fisheries can be secured from Brexit. The talk will cover the following points:

- **Bellwether of Success** Fishing has the potential to play a central role in the renaissance of the UK's coastal communities and will form a key benchmark by which the success of Brexit will be measured. Securing this future will rest significantly on the cohesiveness and determination of the UK negotiating team and the degree to which the fishing issue is dealt with on its own terms.

- **Defining the Baseline** The principle of equal access to UK waters that has structurally disadvantaged the UK fleet will lapse post Brexit, after which the UK's national quota share of fish stocks should broadly reflect the resources located in the UK's EEZ, less any used as currency in exchange for access to EU waters and European markets. The 6-12nm zone should be limited to UK vessels.

- **Reconfiguring International Cooperation** The UK should continue to cooperate with other countries in setting high level objectives for shared stock management whether through bilateral, trilateral or coastal state management arrangements, all underpinned by science.

- **Innovative Management Tailored to the UK Fleet** National management arrangements will afford the opportunity to tailor measures more dynamically to suit the nature of our domestic fleet. This could draw upon an incentivised results-based approach that enables decisions on technical measures to be taken in the wheelhouse and builds on the Fisheries Science Partnership (FSP) model to build scientific evidence.

- **Oiling the Wheels** This approach should be underpinned with adequate financial resourcing from government that facilitates vibrant sustainable fisheries into the future.

Links:
http://nffo.org.uk/news/uk-fishermens-federations-adopt-united-stance-on-brexit.html
http://nffo.org.uk/news/brexit-resetting-the-fisheries-deal.html
http://nffo.org.uk/news/brexit-offers-opportunity-for-radical-change-says-uk-fisheries-minister.html

Brexit & Fisheries: Government perspective

Gordon Friend
Fisheries EU Exit, Marine and Fisheries Directorate, Department for Environment, Food and Rural Affairs, Area 8a Nobel House, 17 Smith Square, London, SW1P 3JR
Tel: 0208 026 3189 Mobile: 07768 258524 E: Gordon.friend@defra.gsi.gov.uk

Fisheries Minister George Eustice has stated:

"Leaving the EU is a real opportunity to review fisheries management in order to ensure fair access to quota, sustainable stocks and a healthy marine environment."

"We continue to be a leading advocate of sustainable fisheries and remain committed to implementing the discard ban, ending the wasteful practice of discarding fish."

"The UK is bound by international law, including the United Nations Convention on the Law of the Sea (UNCLOS), which gives coastal states rights and responsibilities over their Exclusive Economic Zone (EEZ) and the resources within it. We are also committed to continued co-operation with other countries over the management of shared stocks."

Brexit & Fisheries: Change, Opportunities and Risks: A legal perspective

Daniel Owen
Barrister, Fenners Chambers
E: daniel.owen@fennerschambers.com

The talk will touch on the following:

(1) The existing legal framework, at the EU level, of the Common Fisheries Policy.

(2) The potential legal framework, at the UK level, of a future domestic fisheries policy.

(3) The rights and obligations of the UK as a coastal State under the 1982 UN Convention on the Law of the Sea with respect to the following:

   (a) fish stocks that are shared between EEZs
   (b) the concept of 'surplus' within the EEZ
   (c) inter-State dispute resolution

Brexit & Fisheries: Change, Opportunities and Risks

Helen McLachlan
Fisheries Policy Manager, WWF UK
E: hmlachlan@wwf.org.uk

WWF lobbied alongside other NGOs and industry colleagues for an effective reform of the Common Fisheries Policy and welcomed the outcome of the reform which now provides important conservation commitments for managing fish stocks and our wider marine environment. Given that the UK fought hard to establish some of the more progressive elements of the CFP our hope is that they will continue to deliver on these important commitments and establish the UK as a world leader in sustainable fisheries. Doing so will help provide a viable future for the UK's rich marine and coastal area and the industries and communities that depend upon it.

This presentation will focus on some of the keys elements that WWF and other environmental NGOs believe are important to see delivered upon the UK's departure from the EU, touching on some of the risks, opportunities and challenges. The talk will cover the following points:

- **Consistency across international and national boundaries:** Fish stocks do not respect national borders and require shared management. UK stakeholders will no longer be eligible to participate in decision making in the regional Advisory Councils, nor will the UK government be part of the Member State groups negotiating the conditions of regional initiatives. To provide effective management, the UK will need to find ways to deliver a consistent approach across international boundaries and, given the devolved nature of UK fisheries, national administrations. Failure to achieve effective shared management could risk fish stocks being overfished.

- **Effective marine legislation and fisheries agreements setting sustainable targets:** Management needs to deliver sustainable, productive fisheries and a healthy, biologically diverse marine environment with clear limits on fishing mortality in line with best science and with aim of delivering MSY by 2020, and an ongoing commitment to apply the precautionary approach and ecosystem-based management.

- **Addressing the wasteful practice of discards:** Addressing discards was brought about in response massive public support and needs to remain a key commitment for UK fisheries management. Support for effective delivery needs to include full documentation and control of total catches. A failure to document mortality risks undermining the positive trends we have achieved in Northeast Atlantic fisheries over the last decade.

- **Effective monitoring, control and enforcement:** it will be important to ensure compliance and high levels of confidence in the achievement of domestic and international policy objectives, including combatting Illegal, Unreported, and Unregulated (IUU) Fishing. WWF have identified that the most cost-effective option is the application of Remote Electronic Monitoring, with cameras and sensors. This will set a strong standard within European waters and the opportunity to establish the UK as a leader in sustainable fisheries, providing assurances to buyers and sellers that UK seafood is from a demonstrably legal and sustainable source.

- **Good governance:** The development and implementation of new laws should include clear processes for engagement of stakeholders, involving scientists, NGOs and industry representatives with a wide range of perspectives, in line with the UK's international commitments under the Aarhus Convention. There should also be sufficient funding to support key management measures

Web-links and or references
http://www.wwf.org.uk/sites/default/files/2016-8/the_future_of_uk_fisheries___wwf_uk_2016.pdf
http://assets.wwf.org.uk/downloads/fisheriesmanagement__2_.pdf

The trouble with mud and prawns: issues and opportunities in the Irish Sea

Dr Emily Baxter
Senior Marine Conservation Officer, North West Wildlife Trusts
T: 01539 816318 E: emilyb@cumbriawildlifetrust.org.uk W: www.irishsea.org

About the North West Wildlife Trusts' marine policy work: The North West Wildlife Trusts (Cumbria, Lancashire, Manchester & North Merseyside, and Cheshire Wildlife Trusts) have formed a partnership to work on the **Irish Sea Marine Advocacy Programme**, a strategic project focussed on marine policy and advocacy in the Irish Sea.

The programme started in 2011 under The Wildlife Trusts' vision to restore UK seas to *Living Seas* and has evolved over time with the shifting political landscape. For centuries our sea's riches have been taken for granted. A lack of protection and management of the Irish Sea has led to significant declines in fish stocks and the marine environment. We drive change through securing public, political, legislative and industry support for the recovery of the Irish Sea's marine life and natural resources.

Background: The Irish Sea is a relatively small but very busy sea. It is has been of significant economic importance to the bounding countries and far off nations for many centuries, from trade and transport to power generation and fishing. Historically it was a sea of plenty, with fish of great size and variety. However, two centuries of increasing exploitation have led to a significantly altered ecosystem – habitats, commercial fish stocks, and marine life.

In the past there were productive mixed fisheries in the Irish Sea but the first signs of overfishing appeared in the mid-1800s with the advent of trawlers. As vessel power and gear technologies have improved over this time, there has been a continued downward trend in demersal fish. Now almost every major commercial fish stock in the Irish Sea has been over-exploited.

Stocks of fish including cod, whiting and sole are reaching crisis point – suffering declines of 80-90% since the late 1980s[1]. As we have '*fished down the food chain*'[2] the emphasis has changed from whitefish to shellfish. Prawns (Dublin Bay prawns or *Nephrops*) and scallops have now become the most economically important fisheries in the Irish Sea. Prawns are able to live in highly degraded habitats and thrive when their predators such as cod have been over-exploited.

Over recent years, TACs (Total Allowable Catches) have been set at very low levels by the EU Council of Ministers for species such as cod, sole and whiting effectively allowing for bycatch only. These species (particularly juveniles) continue to be caught, killed and discarded as bycatch from the prawn fishery. Some stocks such as common sole are so far below biological limits that they are not showing any signs of recovery despite reduced pressure[3]. It is not just fish stocks that have been impacted. Cold-water corals once present in the depths of the Irish Sea have not been recorded since they were last brought up in fishing nets decades ago, and the abundance and distribution of delicate creatures such as sea pens and sea urchins has declined dramatically.

The seabed in the northern half of the Irish Sea is dominated by deep muddy plains, the eastern and western Irish Sea by mud belts. These low energy environments have the potential to consist of highly diverse communities of marine life and tend to consist of longer-lived species. These areas

[1] ICES (2016). Advice for cod, whiting and sole http://www.ices.dk/community/advisory-process/Pages/Latest-Advice.aspx
[2] Further discussion, case studies and references http://www.fishingdown.org/
[3] Seafish (2016). Sole in the Irish Sea, Beam trawl. http://www.seafish.org/rass/do_pdf.php?id=2461&section=all

are subject to little natural disturbance, meaning they are particularly sensitive to human pressures[4]. However, these deep muddy habitats are also inhabited by prawns.

Deep muddy habitats have been severely damaged due to heavy fishing pressure on demersal fish and prawns. ICES have stated that the western Irish Sea mud belt is one of the most intensively trawled areas in European waters[5]. As a result, between 20 and 50cm of mud has been removed from the seabed surface over the past two decades by bottom-trawling[6].
Excessive fishing pressure on stocks exists because of a number failings – a lack of robust science in some instances, failure to follow scientific advice, continued targeted fishing for overfished stocks and the continued bycatch of over-exploited stocks all play a role. In order for fish stocks to recover drastic action needs to be taken on a broader scale across the management of fisheries in the wider Irish Sea. In addition to this, sensitive and highly-impacted habitats need to be allowed to recover, through the urgent protected and active management, including closures to the most damaging activities such as intensive trawling.

The Landings Obligation, implemented under the reformed Common Fisheries Policy, is designed to drastically reduce the wasteful and damaging practice of discarding, act as a driver for improving gear selectivity, and provide more reliable catch data. However a year after the demersal Landings Obligation was initiated, it has only been implemented for haddock and prawns in the Irish Sea. Industry concerns remain around how low TACs for some whitefish species could act as '*chokes*' for the prawn fishery once the Landings Obligation has been fully implemented and cease fishing. To that end, further phasing of the Landings Obligation has been put off and there is the potential for a '*big bang*' in 2019 when full implementation has to be undertaken.

We are still a long way from achieving legislative targets on maximum sustainable yield for the most commercially important fish species in the Irish Sea. At the 2016 EU December Fisheries Council, prawn TACs for ICES area VII (inc. Irish Sea) were set >17% higher than the Commission's proposal[7].

In addition to this, there isn't ecologically coherent network of Marine Protected Areas (MPAs) in the Irish Sea. Only four out of 50 designated Marine Conservation Zones (MCZs) are in the Irish Sea and even those designated have not yet had management agreed. Three MCZs that have been recommended for the protection of mud habitats in the Irish Sea have had designation delayed due to lobbying from the fishing industry.

In this talk I will cover: the pros and problems with mud… and prawn fisheries – both for fish stocks and the environment; implications for the implementation of the Landings Obligations; and the potential opportunities for the recovery of the Irish Sea including the designation of MPAs for the protection of mud habitats.

[4] Tillin, H, Tyler-Walters, H. (2013). Assessing the sensitivity of subtidal sedimentary habitats to pressures associated with marine activities. Phase 1 Report: Rationale and proposed ecological groupings for Level 5 biotopes against which sensitivity assessments would be best undertaken JNCC Report No. 512A http://jncc.defra.gov.uk/pdf/Report%20512-A_phase1_web.pdf

[5] ICES CM 2014/SSGSUE:05 Second Interim Report of the Working Group on Spatial Fisheries Data (WGSFD) http://archimer.ifremer.fr/doc/00223/33378/31806.pdf

[6] Coughlan, M. et.al. (2015) Record of anthropogenic impact on the Western Irish Sea mud belt, Anthropocene 9 56-69 http://dx.doi.org/10.1016/j.ancene.2015.06.001

[7] http://www.consilium.europa.eu/en/meetings/agrifish/2016/12/TAC-quotas-2017_pdf/

The Landings Obligation & Discards: Experience and evidence gained from using monitoring technology

Julian Roberts
Head of Fisheries Development, Marine Management Organisation (MMO)
T: 01752 228001 M: 07900 226110 E: Julian.Roberts@marinemanagement.org.uk
Web: www.gov.uk/mmo Twitter: @the_MMO
Facebook: https://www.facebook.com/marinemanagementorganisation

The new Common Fisheries Policy, with an obligation to land all catches, represents a quantum change to rules that were previously based on what was allowed to be landed and everything else thrown back. The control and surveillance system has therefore been geared to checking that only 'legal' fish is kept on board.

The fishing industry has for many years sought to reduce unwanted catches through innovative gear designs. To date however; the drivers for discarding remain strong, whether economic, practical or through quota restriction.

The new policy brings greater need to monitor at the point of capture. Instead of using human observers the MMO has been using electronic monitoring technology to evidence how key fisheries might operate through greater accountability to reduce discards. The North Sea scheme is in its 6th consecutive year during which cod discards have remained at negligible levels and other species have been phased in under the discard ban.

The experience to date has shown how fishers respond to a higher level of accountability in terms of adaptation, gear design, views on accreditation and the general attitude toward the play-off between perceptions of 'big-brother' vs. the benefits of a results-based system.

The key evidence from MMO experience falls to the following categories:

- The efficacy, methodology and processes involved in using electronic monitoring.
- Compliance with the discard ban and evidence of choke stocks.
- Collaborative working with industry and provision of data for science.
- Influencing regulatory and technical policy.

Reports from the MMO catch quota trials can be found here
https://www.gov.uk/government/collections/catch-quota-trials-reports

Global to Regional to National developments in oceans governance

Dr Darius Campbell
Executive Secretary, OSPAR Commission, Victoria House, 37-63 Southampton Row,
London, WC1B 4DA
E: darius@ospar.org

Governance structures and relationships between organisations at global, regional and national level are constantly evolving and developing. The ecosystems, species and habitats within the sea operate at their natural scales, which may be quite local, at sea basin level or indeed across the oceans. The pressures exerted by human activities also operate at varying scales depending on the industry or community involved. Darius Campbell will set out how the OSPAR Convention, an intergovernmental regional seas organisation, operates within these different aspects of the interaction between human activity and the marine environment of the North-East Atlantic.

Link: http://www.ospar.org/convention

UK Overseas Territories MPAs - British Indian Ocean Territory

Helen Stevens
British Indian Ocean Territory Administration, Foreign and Commonwealth Office,
King Charles Street, London, SW1A 2AH
E: helen.stevens@fconet.fco.gov.uk

The marine waters of the UK Overseas Territories (OTs) are some of the most unique and biodiverse in the world, occurring in four of the world's oceans and covering polar and tropical latitudes. The incredible range of habitats, from coral reefs of the British Indian Ocean Territory (BIOT) and Caribbean Territories to the freezing waters of South Georgia and the South Sandwich Islands (SGSSI) support an array of species, from southern right whales to coconut crabs.

Effective protection of these important marine habitats and species is a challenging task; the UK Government's new Blue Belt initiative will provide for the implementation of marine management and protection plans in Overseas Territories. Supporting the recent commitments for Marine Protected Areas in the Territories of St Helena, Ascension, Tristan da Cunha and Pitcairn, will be a particular priority.

Through describing marine management and protection work undertaken in Overseas Territories with existing large-scale marine protection, in particular the British Indian Ocean Territory, this presentation will illustrate the key aims of the Blue Belt initiative, by providing examples of work currently undertaken in OT MPAs.

The links to the websites of the BIOT and SGSSI Governments http://biot.io/ and http://www.gov.gs/ offer additional detail for those with further interest.

The international context of the UK's developing MPA programme

Dr Jon Davies
MPA Programme Leader, JNCC
E: Jon.Davies@jncc.gov.uk

Marine Protected Areas (MPAs) have attracted considerable policy, scientific research, regulatory and stakeholder interest over recent years. How MPAs link together into networks is currently exercising minds in national Governments, international inter-governmental organisations and NGOs. The presentation will describe the progress of the UK's MPA programme, summarise the results of recent analyses of MPA networks, provide an update on the management status of MPAs and set out how the UK currently contributes to global conservation initiatives.

International agreements, European obligations and national legislation call for MPAs to be designated to create networks that should help deliver improvements to the ecological status of marine environment and support sustainable development. In the North East Atlantic, the OSPAR Convention places an obligation on its Contracting Parties to develop an 'ecologically coherent network of well-managed MPAs' through its North-East Atlantic Environment Strategy[1]. For European waters, the EC Marine Strategy Framework Directive calls on Member States to include 'spatial protection measures, contributing to coherent and representative networks of marine protected areas' in their programmes of measures to implement the Directive.[2]

The UK Administrations published a joint statement in 2012 setting out their commitment to establish an ecologically coherent network of MPAs to meet their national policy ambitions and contribute to international commitments[3]. The UK has a long history of protected area designations with the pace of new MPA designations increasing rapidly over the past ten years, such that the UK is arguably a world leader with its MPAs. The UK is the leading contributor of MPAs to the OSPAR Commission.

JNCC[4] advises the UK Government and devolved administrations on UK-wide and international nature conservation. Its work contributes to maintaining and enriching biological diversity, conserving geological features and sustaining natural systems. It plays a key role in the UK's offshore marine nature conservation work, including identifying, monitoring and advising on protected areas and providing advice on the impacts of offshore industries.[5] JNCC has a statutory duty to raise awareness of marine systems in offshore waters and for offshore MPAs, maintains *Site Information Centres* that aim to provide a 'one-stop shop' for data, advice and general information about each offshore site.[6]

JNCC has been working with the other Statutory Nature Conservation Bodies to compile a 'stocktake' of UK MPAs for the UK Administrations to support their national and international reporting obligations. In recent years, JNCC has also completed a number of analyses to assess progress with MPA networks in the UK. Most recently, it completed analyses for Welsh Government[7] and Defra[8], the latter contributing to Defra's on-going programme to designate Marine Conservation Zones. JNCC has also coordinated the delivery of information to the OSPAR Commission on its MPA work. In 2016, JNCC led the first OSPAR-wide assessment of Contracting Parties' progress in managing their MPAs that will be reported in early 2017 alongside the next OSPAR assessment of whether the network is ecologically coherent.

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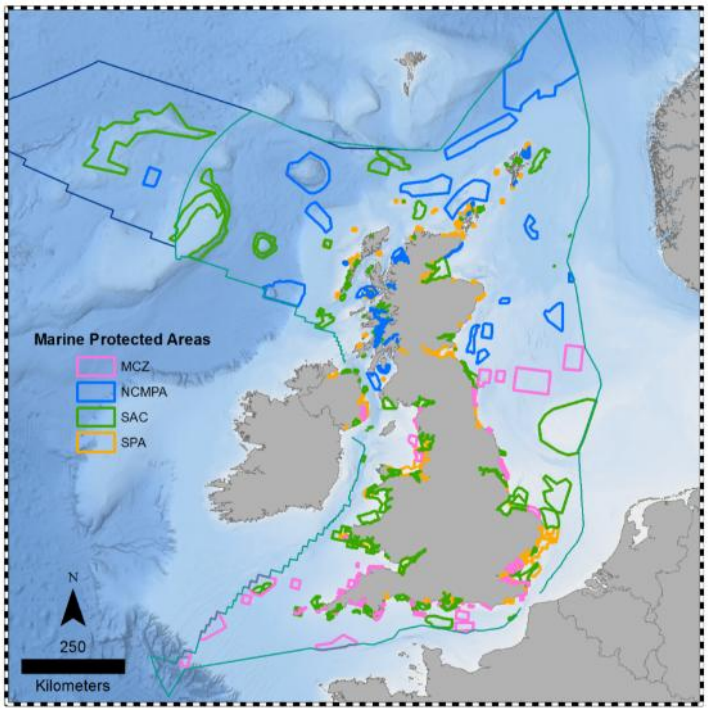
[1] See: http://www.ospar.org/convention/strategy (Biodiversity and Ecosystem Strategy)
[2] See: Preamble paragraphs 6 & 7, and Article 13 (4):
http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32008L0056&from=EN
[3] See: http://www.gov.scot/Resource/0041/00411304.pdf
[4] See: http://jncc.defra.gov.uk/
[5] See: http://jncc.defra.gov.uk/default.aspx?page=4524
[6] See: Offshore MPAs - http://jncc.defra.gov.uk/page-6895
[7] See: Welsh MCZs - http://jncc.defra.gov.uk/page-4164
[8] See: MCZs - http://jncc.defra.gov.uk/page-7119



UK MPAs (September 2016)

Over 200 of the UK's MPAs were designated to fulfil European obligations under the EC Habitats and EC Birds Directives. These MPAs make a significant contribution to meeting the UK's wider international obligations[1,2], such as the OSPAR Convention and the Aichi targets under the Convention on Biological Diversity. Furthermore, the management of human activities in MPAs away from the coast (particularly beyond 12 miles) emanates from European legislation, notably the management of fishing activity under Common Fisheries Policy. The status of these European sites after the UK leaves the European Union will have a bearing on the UK's future contribution to international conservation initiatives.

[1] See Special Areas of Conservation (SACs) with marine components: http://jncc.defra.gov.uk/page-1445
[2] See Special Protection Areas (SPAs) with marine components: http://jncc.defra.gov.uk/page-4559

IFCA Management of Coastal MPAs

Tim Robbins
Chief Officer, Devon & Severn Inshore Fisheries and Conservation Authority
T: 01803 854648 E: t.robbins@devonandsevernifca.gov.uk
W: www.devonandsevernifca.gov.uk/

The IFCAs were set up under the Marine and Coastal Access Act 2009 (MACAA) which aimed introduced a new framework for managing the marine environment and providing greater access to it. The Devon and Severn Inshore Fisheries and Conservation Authority (D&SIFCA) are one of ten IFCAs in England. The Act aimed to put in place better systems for delivering the sustainable management of the marine and coastal environment by creating a coherent network of marine protected areas (MPA) through the introduction and management of coastal European Marine Sites (EMS) and Marine Conservation Zones (MCZ).

The D&SIFCA district has 4,522km^2 of coastal waters, with 1,110km^2 of MPAs; uniquely for IFCAs it has two separate coasts and a staff of twelve officers with which to bring about effective management. There has to be a great reliance on new technology and more modern management to enable the MPAs to be protected and managed to deliver coastal waters which are diverse and productive for the future.

The main focus of the work for all IFCAs has been management of MPAs within their districts following the change of approach to fisheries management within EMS in October 2012 and the introduction of MCZ, in November 2013. The first significant deadline was to have all EMS and T1 MCZ under appropriate management by the end of 2016. The D&SIFCA approach to this challenge has been to introduce permitting byelaws for fishing based activities for the whole district and use the permit conditions to introduce restrictions. This will also allow for adaptive management of the whole district.

More details are available from the D&SIFCA website.

MPAs and Brexit – an NGO perspective

Kate Jennings
Head of Site Conservation Policy, RSPB
T: 01767 693457/07525 679625 Email: kate.jennings@rspb.org.uk www.rspb.org.uk

The fact that the UK's seas are of global conservation importance, are under pressure and are in need of protection is not news. Therefore, given the efficacy of MPAs (if properly protected and well managed), it is a good job that the UK has clearly stated ambitions for MPAs: for example we have signed up to the international Aichi and OSPAR targets for the creation of an 'ecologically coherent network' of well-managed MPAs, and the 2015 UK Conservative Party manifesto included a commitment to put in place a 'Blue Belt' in both UK and UKOT waters.

So, the question is to what extent MPA designation and management in the UK to date has been reliant on European Union legislation and associated mechanisms, and therefore what Brexit might mean for the future of MPAs in the UK.

Until the introduction of the various Marine Acts across the UK, the Birds and Habitats Directives (the 'Nature Directives') were the sole drivers of MPA designation in the UK, and it is not unfair to characterise the Government's approach to marine Natura (Special Protection Area and Special Area of Conservation) designation and management as one of foot-dragging and inaction, punctuated by bursts of activity driven by the threat – or the reality – of legal challenge under EU law or over its domestic application (examples including recent progress on marine SPA identification and the introduction of Habitats Regulations Assessment of fisheries in European Marine Sites).

While national legislation for, and progress towards designation of national MCZs and MPAs has been independent of EU requirements, progress has again been slow and painful (in stark contrast to the huge and welcome levels of ambition on MPAs shown in relation to the UKOTS), and while approaches do vary between countries within the UK, in general these sites are of significant but often lower biodiversity value than Natura 2000 sites (as the latter are selected on the basis of science alone), are subject to a generally lower and less consistent level of protection, and their selection has largely (in some cases entirely) excluded fundamental components of any ecologically coherent network, such as mobile species.

So – the scale of reliance on EU legislation and associated mechanisms for driving progress towards the designation and effective management of the UK MPA network is clear – as is their vital role in contributing to both national and international commitments. Given the huge uncertainties around what Brexit actually means and might eventually look like, it's not possible to be any more definitive about its implications for MPAs than for any other aspect of life! However, the potential threats are clear and significant- and opportunities at best theoretical…

The stated intention – and negotiation imperative – of bringing across all EU legislative requirements in as intact a form as possible through the Great Repeal Bill gives some hope both for ongoing action for marine biodiversity and the regulatory stability that the developer and investor communities require, but guarantees little in the longer term. And here it's vital to note that such transposition – however perfect – will constitute a substantial erosion of standards of protection, unless additional steps are taken to replace the monitoring, regulatory, funding, enforcement and other mechanisms currently provided by the EU institutions, and to deploy them with sufficient political will. In addition, as the environment is currently a devolved issue, Brexit could not only threaten the consistency and coherence of the network of marine protected areas and the regulatory framework for their management between the UK and its neighbours in this most transboundary of environments – but also between the four countries of the UK, where differences in approach have to date been constrained by the common EU framework.

Of course, there is nothing in theory to stop the UK from raising its ambition above that required of it by EU membership – to complete the a robust MPA network, to introduce, support and enforce

effective management, and to go further by designing and deploying other conservation measures in our wider seas – essential if we are not only to protect the best, but also to restore the rest. However, the UK's track record on MPA designation and management does little to stimulate optimism.

However, a series of reviews of the efficacy and implementation of the Nature Directives on both land and sea have demonstrated a broad consensus between industries, NGOs, Government departments and other stakeholders who recognize the need to protect biodiversity, desire the certainty and conservation benefits of complete and coherent networks of protected areas, value the clarity and certainty of a robust and consistent regulatory framework and share a desire to tackle those areas where improved implementation would improve outcomes for nature and business alike. They have also galvanized the NGO community into united action on an unprecedented scale, and stimulated responses that have demonstrated the huge strength of public support for maintaining or enhancing standards of protection for nature (as has YouGov polling in the UK, post-referendum).

The implications of Brexit for MPAs in the UK will depend not only on the outcomes of the UK's negotiations with the EU, but also on the extent to which public support and stakeholder pressure translate into political will and action.

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