September 2015

Challenger Wave

Monthly newsletter of the Challenger Society for Marine Science (CSMS)

NEWS

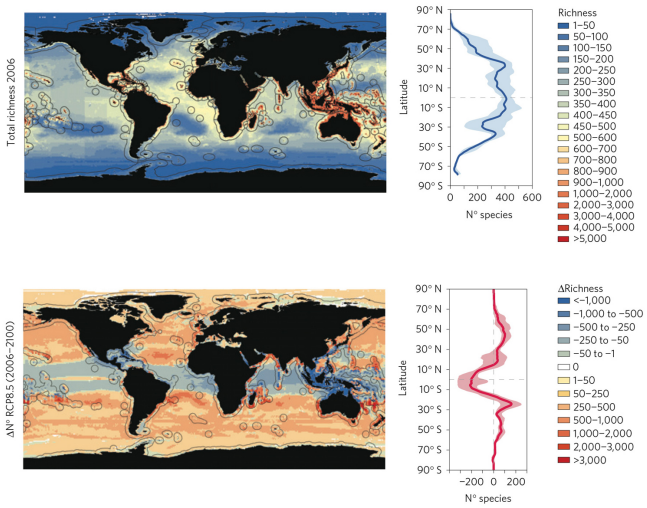
Climate change will bring greater biodiversity to global seas

Tropical marine animals that currently thrive in warm habitats around the equator will have to spread north and south to avoid extinction as global sea temperatures rise, a study has found.

Scientists at the Scottish Association for Marine Science (SAMS), alongside international partners, modelled data for nearly 13,000 marine species and found that by the end of this century, countries either side of the Tropics would have a greater variety of marine species, while the Tropics would suffer a net loss. The study, published in the journal Nature Climate Change, is based on global climate models and is the most comprehensive to date on expected shifts in marine animal populations. It shows that such shifts are likely, even if carbon emissions were reduced over the forthcoming decades.

Dolphins off the Isle of Barra.

SAMS marine ecologist Professor Michael Burrows, who devised the study, said the prediction of increased biodiversity away from the Tropics contrasted the general message of climate change causing widespread extinctions. He said: "While some species may evolve and adapt to cope with increasing temperature, the predictions are that many will find cooler climates away from the equator. For example, the fish we currently catch in UK waters could potentially be replaced by a new species from the Mediterranean as our own fish, such as cod, move further north. The result of that will be an increase in biodiversity across many oceanic regions as the global marine communities reorganise themselves."



The top figure shows the richness of marine biodiversity in 2006. The bottom figure shows an obvious net loss from the Tropics for the period 2006-2100.

The group of international scientists is now calling for greater cross-country co-operation to accommodate these regional shifts in species distribution. As species move into new areas, they could potentially thrive in the absence of traditional competitors and predators, crowding out native species. This will, in turn make distinct ecological communities much more similar across the world.

Lead author of the study, Dr Jorge García Molinos, who conducted his research while at SAMS, said: "The projected losses and gains of marine biodiversity represents unprecedented challenges to conservation in terms of interactions between climate-migrants and local biota on one hand, and the anticipated development of novel communities and ecological surprises on the other."

The study used a measurement called future climate velocity, which combines the rate and direction of movement of ocean temperature bands. Barriers to the movement of species, such as land mass boundaries, depth limits and temperature tolerances were also accounted for. The study, which was funded by the Natural Environment Research Council (NERC), used two climate change models, one based on the status quo and another based on a more controlled level of carbon emissions.

SAMS marks anniversary of former director's death. Statue to Professor Laurence Mee unveiled at Oban institute.

A sculpture was unveiled at the Scottish Association for Marine Science (SAMS) as staff marked the first anniversary of the death of their former director. Father-of-four Professor Laurence Mee died, aged 63, on August 13 2014, having suffered a severe stroke the previous day while on business in Inverness.

'The Seafarer' will be a permanent memorial at SAMS to the late Professor Laurence Mee

He joined the Oban-based SAMS as director in 2008 and led the institute with youthful energy, positive promotion of marine science and creative thinking. As SAMS is an academic partner of the University of the Highlands and Islands, Professor Mee was also instrumental in the birth of the new university. SAMS staff, board representatives and council members gathered for a private ceremony on the campus grounds, where the oak sculpture gifted by the Mee family was unveiled.

SAMS staff gather by 'The Seafarer' sculpture as they remember Professor Laurence Mee.

Speaking at the ceremony, SAMS Board Chairman Angus Ross said: "Laurence was a great scientist, a truly inspirational leader, a keen sailor and a marvellous friend whom we all miss tremendously, but it was wonderful to have known such a huge presence both in SAMS and the local area. We are much indebted to the Mee family for the gift of such an imaginative sculpture now placed beside the SAMS Laurence Mee Centre for Society and the Sea, just one of his great ideas."

Earlier in the day, SAMS representatives, in conjunction with *West Connel Mooring* Owners' *Association*, unveiled an information board at the Falls of Lora in Connel, near to SAMS. Teaching was a priority for Professor Mee, who was chairman of the moorings association when he died, and this mounted display, detailing how the dynamic stretch of water is created, is designed to educate people about currents and geology of the seabed.

There followed a coffee morning at SAMS which raised £370 for the Stroke Association.

Professor Mee was regarded as the UK's leading professor of marine and coastal policy and held

previous positions at the National Autonomous University of Mexico, the Marine Environmental Studies Laboratory in Monaco, the Global Environment Facility Black Sea Environment Programme in Istanbul, and later as director at the University of Plymouth. Since 1998 Laurence was a Pew Fellow in Marine Conservation and was an environmental advisor to the UK Government, European Commission and the United Nations. Following his death, Professor Geoffrey Boulton, SAMS President, said: "His enthusiasm for the societal implications of the changing marine environment was unbounded. His planning horizon was far and wide; his future contributions to science and society are a loss to us all."

VIEWS

Scottish expert warns of biological invasions via second Suez Canal

A team of international experts on invasive marine species is calling for further investigation into the ecological effects of a second Suez Canal, which was scheduled to officially open on the 7th August 2015.

Dr Elizabeth Cook, a senior lecturer at Scottish Association for Marine Science (SAMS), near Oban, is the only British member of the crack team, which has published a study into how nearly 700 mulitcellular 'alien' species have already navigated through the existing canal from the Red Sea to the Mediterranean.

Dr Liz Cook of the Scottish Association for Marine Science (SAMS) has raised concerns at the ecological impact of a second Suez Canal channel.

The scientists fear the introduction of a second, parallel Suez Canal, the fastest shipping route between Europe and Asia, could cause an ecological setback to the ecosystem of the Mediterranean Sea, damaging native species, coastlines and industry.

The group is now requesting a detailed environmental impact assessment and Dr Cook has raised her concerns with the Department for Environment, Food and Rural Affairs (DEFRA), via the Scottish Government. Dr Cook, a marine biologist specialising in invasive species, said: "We are not aware of any ecological impact assessment having been done on the effect this new canal would have on the movement of alien species. Most of the non-indigenous species (NIS) introduced via the Suez Canal have established thriving populations and this has often resulted in the decline of native species. Since the early 1980s, a scyphozoan jellyfish, *Rhopilema nomadica*, has formed huge swarms every summer along the Levantine coast, adversely affecting tourism and coastal industry. There has also recently been a spread of a potentially poisonous pufferfish, *Lagocephalus sceleratus*, westwards towards Italy."

The scientists believe the NIS 'invasion' is one-way from the Red Sea into the Mediterranean, as only a handful of Mediterranean species were recorded in the Gulf of Suez, but none proved invasive.

Dr Cook is co-author of various articles raising these concerns, one of which was recently published in the respected science journal ASLO Bulletin. She has previously been part of the Horizon scanning programmes in the UK and Europe, identifying NIS species likely to arrive in Europe.

The plan to build a second canal channel was announced in August last year by the Egyptian Government, which believes the $8.5 billion project will boost trade and increase employment as the volume of traffic passing through increases.

SALTS

No news from sea this month I'm afraid

I know that this is a favourite section for many readers, where we get the inside information about life at sea, its thrills and spills. So please the next time you are at sea or carrying out any

fieldwork, please remember that a simple paragraph or two will get you published here. – **Ed**

CALENDAR

14th-18th September 2015: 3rd CLIOTOP Symposium
San Sebastian, Spain.

16th-18th September 2015: UK Arctic Science Conference 2015
University of Sheffield, UK
We are pleased to announce that the call for abstracts for the 2015 UK Arctic Science Conference is now open ! Please see http://www. arctic.ac.uk/research/uk-arctic-science-conference-2015/ for further information.

The Conference will take place in the Richard Roberts Auditorium, The Richard Roberts Building, University of Sheffield and will be hosted by The University of Sheffield. This three day conference aims to bring together UK Arctic scientists of all natural and social science disciplines to present and discuss recent findings. We welcome presentations on:

Terrestrial Biogeochemistry
Terrestrial Ecology
Arctic Oceanography
Ice-Ocean Interaction
Landscape Processes and Dynamics
Arctic Climate
Terrestrial Cryosphere: Snow and ice – past and present
Arctic Change – implications for society and culture

Professor Grete Hovelsrud of the Nordland Research Institute will give an invited talk on the Arctic change impact theme. Details to follow.

Conference Contacts:
Local Organising Committee Chair: Professor Grant Bigg - grant.bigg@sheffield.ac.uk (University of Sheffield)
Conference registration point of contact: Nicola Munro – arctic@bas.ac.uk (NERC Arctic Office)

Side meetings:
Meeting: UK Sea ice group meeting
Date: After lunch on Tuesday 15th September to midday Wednesday 16th September (Time to be confirmed)
Venue: Ron Johnston Research Room of the Department of Geography, Geography and Planning Building, University of Sheffield
Contact: Jeff Ridley (jeff.ridley@metoffice.gov.uk)

Meeting: The Challenger Society AGM 2015
Date: Midday Wednesday 16th September 2015 (straight after the UK sea-ice group meeting)
Venue: Ron Johnston Research Room of the Department of Geography, Geography and Planning Building, University of Sheffield
Contact: John Bacon (john.bacon@cefas.co.uk)

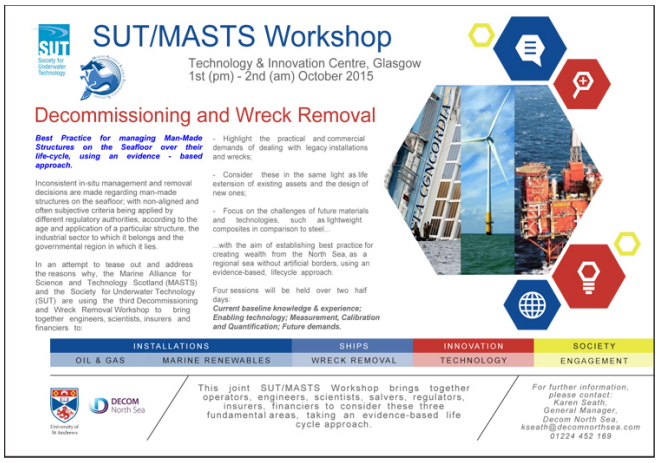
30th September-2nd October 2015: 5th MASTS Annual Science Meeting: Influencing our Marine Future
Technology & Innovation Centre, Glasgow, UK
Now the largest gathering of marine scientists in the UK, this cross-disciplinary meeting brings together members of the marine science community, with the aim of promoting and communicating research excellence and forging new scientific collaborations. The cross-disciplinary nature of the event as well as the high calibre of the selected talks means that scientists and practitioners can broaden their knowledge in marine science as well as benefit from expertise and ideas

gained in a range of fields other than their own.

Science presentations and e-poster sessions will take place on the first two days, together with opportunities to network.

We also invite you to join us at the conference dinner to be held on the evening of Thursday 1st October at the Millennium Hotel Glasgow (featuring MASTS own Prof Nick Hanley and his Hoochie Coochie Ceilidh band).

On the third day, the venue will host a number of meetings and workshops. If you would like to host a workshop or side meeting please contact ecd2@st-andrews.ac.uk for details



Please accept this invitation to submit abstracts for a **Sustainable Aquaculture Workshop** that will be held at the MASTS Annual Science Meeting on Friday 2nd October (9.00am-1.30pm). Prof. Brendan McAndrew who is championing the workshop invites you to submit abstracts in the following priority subject areas:

- Fish Health
- Sustainable Fish Feeds
- Stock Improvement
- Shellfish farming
- Sustainable Aquaculture

Presenters are requested to ensure that their talks do not focus solely on past and/or current research but also speculate on future directions of research. Presentations should be 15 minutes long (12+3). This will allow for six presentations, plus an open discussion at the end. If you are interested in presenting at this workshop (either by oral presentation or e-poster), please provide a title and a short (up to 200 words) summary of your presentation/e-poster (which will be made available to participants) to masts@st-andrews.ac.uk before close on **Wednesday 9th September 2015**.

Marine Alliance for
Science and Technology for Scotland

MASTS ANNUAL SCIENCE MEETING - MARINE RENEWABLES WORKSHOP

Issues and opportunities at the interface between engineering and ecology in offshore and marine renewables.
Including the TeraWatt Project as a case study

When? - Friday 2nd October 2015, 09:00 to 17:00, 2015 (see full agenda on page 2)

Where? - Technology and Innovation Centre, 99 George Street, Glasgow, G1 1RD. Please register on the MASTS Annual Science Meeting web site http://www.masts.ac.uk/annual-science-meeting/registration and note that you can apply for the One-Day attendance fee ift his is the only day you will participate.

Why? The deployment of offshore and marine renewables has sparked a wide range research studies on how they mighti mpact marine processes and life in coastal seas. However, the natural environment and organisms within it can also have impacts on the engineered structures and power take-offpotential. These impacts can derive from a wide variety of means ranging from reduced efficiency of moving parts by fouling, through to large animals colliding with and potentially damaging components. Engineering and ecological interactions will also drive the constraints in the level of resource (wind, waves or tidal-streams) available for exploitation. As the renewables sector moves from proof of concepts to site specific realities, then these physical and biological processes will become ever more important.
This workshop will bring together engineers, physicists, environmental scientists, developers and regulators to develop mutual understandings oft hese interactions and explore ways to mitigate challenges and optimise opportunities in this emerging and potentially rewarding topic area.

EPRSC Marine Challenge Programme TeraWatt CASE STUDY: In the afternoon part oft he session we will use the recently completed EPSRC funded project TeraWattas a case study to illustrate the benefits of bringing together multidisciplinary expertise to deliver a toolbox of models (including MIKE3D, DELFT3D) designed to help both developers and regulators streamline the deployment of wave and tidal arrays.

Who should attend? A mixed audience of specialists and non-specialists from different disciplines. The case study will be of particular relevance to developers and regulators. Presentations will be concise and provide the audience with an overview of a range of engineering and environmenti nteractions in sufficient detail to encourage cross disciplinary understanding and stimulate discussion.

What will be the output? A brief report oft he workshop will be compiled, capturing key discussion points, highlighting knowledge gaps and identifying potential opportunities for cross disciplinary work to contribute to the development oft he sector.

The MASTS ASM is an inclusive event and we encourage all members of the Marine Science community to attend, whether you are based in Scotland, the UK or further afield. Everyone is welcome, so please circulate this notice widely.

For more details visit: http://www.masts.ac.uk/about/annual-science-meeting.aspx, or contact me, Emma, at ecd2@st-andrews.ac.uk

We look forward to welcoming you at the MASTS ASM. Early bird registration for the event will open on Monday 1st July.

9th October 2015: Scottish Inshore Fisheries Conference
Inverness, UK

20th October 2015: EMODnet Open Conference

Oostende, Belgium

You are kindly invited to join us at the **First Open European Marine Observation and Data Network (EMODnet) Conference**. The Conference is free to attend but **registration is necessary.**

To register:
http://www.emodnet.eu/conference/registration#content
For more information about the programme, speakers and regular updates, consult the Conference website:
http://www.emodnet.eu/conference
For more information about the programme contact info@emodnet.eu
For more information about the logistics contact registration@emodnet.eu

About the Conference

Halfway through the development of EMODnet, it is timely to consider progress made since its inception in 2009, learn from past experiences and make plans for the third and final development phase (2015-2020) – and beyond. The Conference provides a unique forum to bring together the marine observation and data community, policy makers/advisors and diverse stakeholders to meet, discuss and respond to the future challenges and opportunities. It will provide an opportunity to showcase the wealth of marine data and information that is already made available at European level through EMODnet and to listen to the needs and advice from key users from industry, policy, science and civil society. The main objective of the Conference is to reinforce the EMODnet foundations and to consider what avenues to take to further develop an open, user-friendly and fit-for-purpose pan-European marine data infrastructure. A fully operational EMODnet, corresponding to user requirements, will reduce costs for offshore operators, stimulate innovation and blue growth, improve our knowledge of the marine environment and support effective marine management and maritime policy making.

About the EMODnet

EMODnet is a network of organisations working together to observe the seas, to make marine data freely available and interoperable, to create seamless data layers across sea-basins and to distribute the data and data products via the internet. The primary aim of EMODnet is to unlock already existing but fragmented and hidden marine data and make them accessible for a wider range of users including private bodies, public authorities and researchers. Currently, seven thematic assembly groups have been created to develop thematic web-based Data Portals covering data resources from diverse fields including hydrography, geology, physics, chemistry, biology, physical habitats and human activities. Many of these thematic portals are already operational. In addition, six sea-basin checkpoints have been established to assess the observation capacity and adequacy of marine data available at regional sea-basin level. To strengthen the coherence and functionality for users, a common 'EMODnet Entry Portal' provides an entry point delivering access to data, metadata and data products held by EMODnet thematic sites. More information about EMODnet in general can be found on the information pages of the central portal www.emodnet.eu.

27th-30th October 2015:IMBER IMBIZO IV - Marine and human systems: Addressing multiple scales and multiple stressors

Trieste. Italy

IMBER will hold the fourth in its IMBIZO* series at the Istituto Nazionale di Oceanografia and Geofisica Sperimentale (OGS) in Trieste, Italy.
(* Zulu word for "a gathering").

IMBIZO IV will be bigger and better! The proven format of concurrent and interacting workshops, with joint plenary and poster sessions will be followed, but IMBIZO IV will have four, instead of the

usual three workshops. This format has been shown to provide an excellent forum for stimulating discussion between interdisciplinary experts, and encourage the linkage between biogeochemistry, ecosystem and social science research. To optimize participant interactions, the size of the workshops will be restricted to 40 participants per workshop.

The themes of the four concurrent workshops are:

1. Marine ecosystem-based governance: From rhetoric to reality
2. Coastal upwelling ecosystems as models for interdisciplinary studies of climate and global change
3. Integrated modelling to support assessment and management of marine social-ecological systems in the face of global change
4. From regime shifts to novel systems - evaluating the social-ecological implications of lasting ecosystem changes for resource management

Each workshop will prepare a white paper or a special journal issue containing synthesis and primary research papers resulting from the workshop contributions and discussions.

Bonus workshops on 26 October 2015!

On the day before the start of IMBIZO IV, several interactive sessions, including scientific writing and publishing, and data management will be organised. For further information about IMBIZO IV and detailed descriptions of the workshops, visit the IMBER web site http://www.imber.info/index.php/Meetings/IMBIZO/IMBIZO-IV or contact us at imber@imr.no

14th-18th December 2015: AGU Fall Meeting
San Francisco, USA
We would like to invite you to contribute a paper for the IMBER session (OS #21) Trajectories of change in the Southern Ocean that we are convening.
This session is a contribution to the IGBP celebration synthesis and is co-convened by the IMBER, SOLAS and PAGES core projects of the IGBP

Session ID#: 8669, Session Description:
The Southern Ocean is a critical part of the Earth system and host to unique and diverse marine ecosystems. The region is experiencing rapid changes as the climate continues to warm: dynamic and thermodynamic processes are affecting sea-ice cover, oceanographic processes, atmosphere-ice-ocean interactions as well as the Antarctic ice sheet. How will these changes alter the Southern Ocean's ability to absorb heat, carbon dioxide and support ocean productivity? Will the changes result in feedbacks that accelerate or slow the rate of climate change? This session will address such questions by assessing recent insights from contemporary and palaeoclimatic observations and models. We solicit integrative contributions that explore topics such as sea ice, ice-sheet stability, biogeochemical cycling, atmosphere-ice-ocean processes and marine food webs. We will also consider contributions that explore the current and potential value of Antarctic ecosystem services and how they can be safeguarded.
https://agu.confex.com/agu/fm15/preliminaryview.cgi/Session8669.html

6th-8th January 2016: AMBIO VII, Advances in Marine Biogeochemistry Conference
University of Oxford, UK

17th-18th February 2016: Society of Maritime Industries Annual Conference
Hull, UK
Maritime Engineering: Exploring Business Opportunities in a Diverse Sector. As per previous editions the 2016 conference will include industrial visits, one-to-one meetings and an evening reception and dinner The programme will soon be announced info@maritimeindustries.org

12th-17th June 2016: Gordon Research Conference on Ocean Biogeochemistry, *Hong Kong*

The 1st Gordon Research Conference (GRC) on Ocean Biogeochemistry will be held at the Chinese University of Hong Kong. The topic of this first conference will be *The Biologically-Driven Ocean Carbon Pumps*.

Interested researchers, postdoctoral fellows and graduate students are invited to apply for participation as soon as possible on the GRC website (Online Application):
http://www.grc.org/programs.aspx?id=17297

Nianzhi Jiao and Eileen E. Hofmann (Chairs)
Louis Legendre and Sylvia Sander (Vice Chairs)

5th-8th September 2016: Challenger Society 2016 Conference

Liverpool, UK

The 17th Biennial Conference of the Challenger Society for Marine Science will be held at the University of Liverpool located within the heart of the city of Liverpool, famous for its maritime history, cultural diversity and exciting nightlife.

The 2016 Challenger Conference promises to provide a fantastic showcase of marine science and technology covering all areas of ocean research. The official conference programme will commence with an ice-breaker event on the evening of the 5th September followed by a three day lecture and poster programme, culminating in a conference dinner within the breathtaking Liverpool Anglican Cathedral.

Alongside the formal conference programme there will be early career events and education and outreach opportunities that continue the ongoing contribution of this conference series to our next generation of scientists. Free facilities are available for special interest groups and large projects that may wish to combine annual meetings with this important conference that already brings together large parts of the UK marine science community. A call for sessions will be announced in October 2015.

We look forward to welcoming you to the 2016 Challenger conference in Liverpool, jointly organised by the University of Liverpool, Liverpool John Moores University and the National Oceanography Centre.

12th-16th September 2016: CIESM Congress

Christian Albrechts University, Kiel

I have the pleasure to inform you that the CIESM Board, by a unanimous vote, has just accepted the kind invitation of German Authorities to host the next Congress of our Commission in Kiel on the Baltic shore. This will be the first time that our Congress takes place in Germany, which is a Member of our Commission since 1969.

More information will follow in the near future on our CIESM web pages and via circulars, detailing the Congress themes (a dozen per committee) which will soon be selected by the Science Council. The submission period will run from 4 January to 15 February 2016. We hope that as many of you as possible will be able to join us in Kiel. With my best regards, Frederic Briand,Director General, The Mediterranean Science Commission, CIESM

CSMS email addresses are president, admin, membership, secretary and treasurer@challenger-society.org. Contributions for next month's edition of Challenger Wave should be sent to: john@vectisenvironmental.com by the 30th September.

We continue to send printed copies of Challenger Wave to members of the CSMS without email addresses. However it is in everybody's interest to send your email address to Jennifer Jones jxj@noc.ac.uk as soon as possible

JOBS

The Department of Oceanography at the University of Cape Town is seeking to appoint one PhD student starting in 2016.

The University of Cape Town has a strong international reputation in ocean and climate research. Within the Department of Oceanography, particular areas of interest include the Agulhas and Benguela Current systems, the Southern Ocean, climate change and variability, marine biogeochemistry, severe weather and mesoscale meteorology, and modelling. The department seeks to appoint a PhD student within any of these fields.

The department has well developed computing facilities (including access to the Centre for High Performance Computing in Rosebank), a marine biogeochemistry laboratory, and access to ship time for research cruises in the South Atlantic, South Indian and Southern Oceans.

The PhD fellowship is tax free and valued at 320 000 ZAR over 3 years.

To apply please email the below documents in a single pdf to the Oceanography Head of Department, Chris Reason Chris.Reason@uct.ac.za

Motivation letter
Curriculum Vitae
1 page project proposal

For more information about the Department of Oceanography, please peruse our website: http://www.sea.uct.ac.za