

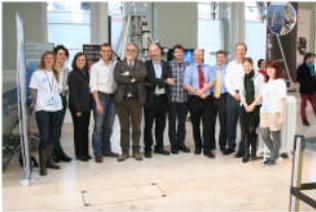


# THE KELPIE

Newsletter of  
The Marine Alliance for Science and Technology for Scotland

Issue No.10: June 2013

## INSIDE:



MASTS hosts the first ever  
Marine Science cabaret!



Annual Science Meeting –  
abstract submission now  
open!



MASTS T-Shirts on sale now!

## From a Centenary Symposium to Cabaret in a Day! Report by Mark James

In the last issue of Kelpie we exposed you to the delights of the Edinburgh Science Festival and the challenges of grappling with the beast of public outreach. Here we explore two of the other events that took place during this cultural extravaganza!

The British Ecological Society celebrated its centenary in 2013 with a public marine symposium organised by MASTS in association with the National Museum of Scotland. Hosted by BBC Radio 4 presenter Quentin Cooper (QC), the symposium featured a parade of international experts talking about everything from biological exploration of the deep seas to cold water coral ecosystems and jellyfish blooms. Prof Teresa Fernandes (MASTS' Marine biodiversity, function and services Research Theme Leader) opened the day with an outline of what we actually mean when we talk about these complex concepts and set the scene for the following speakers:

- Prof David Paterson – MASTS' Executive Director explained the importance of biofilms in stabilising sediments and why mud and stromatolites matter in the context of evolution.
- Dr Alan Jamieson provided a captivating insight into biology beyond the abyss and reminded us that ground breaking science can still begin life in your garage – the crucible of all good DIY and Nobel Prize winning ideas.
- Prof Ferdinando Boero of the Universita' del Salento, Italy is an internationally recognised expert in jellyfish blooms and charmed the audience with anecdotes of how not to engage the public in science – jellyfish are perfectly safe – unless you choose to put them on your face! And, how he became bosom buddies with Frank Zappa – name an organism after a pop star and get a song written about you!
- In line with previous adventures in mud, Prof Mark Huxham explained the importance of mangroves – how the black, blue and green bits can serve as important carbon stores and the implications for restoring these important coastal habitats in some of the world's poorest countries.
- Prof Murray Roberts provided some exquisite images of deep sea life and cold water corals in particular, and provided some insights into life on board ship during scientific cruises. Of particular note was the ship board visit of school children from the Isle of Barra during exploration of cold water corals off Mingulay.



Although the audience was smaller than expected, QC with a style somewhere between slam poet and slightly aggressive stand-up comedian led the audience in a wide ranging panel discussion. Lolling in soft furnishings the panel relaxed into their role perfectly and explored the pros and cons of supporting eye-wateringly expensive particle science at CERN versus little known species and habitats in our seas. The merits of citizen science Italian style using mobile phone technology versus conventional data collection.

The BES Symposium over, the MASTS Team together with QC retired to the bar to recuperate in advance of the evening's entertainment – the Marine Science Cabaret!

Imagine being asked to give a presentation on your life's work in six minutes and – to add insult to injury, to do so in language and using images understandable to mere mortals. Surprisingly, the invitation to experience this level of pain and frustration met with a very positive response from the MASTS community and the Royal Society for the Protection of Birds (RSPB). MASTS Graduate students seemed particularly keen on this form of masochism – perhaps because when you are younger six minutes can seem like a long time.

Hosted once more by the intrepid QC (spot the trend), the cabaret event was designed to both inform and entertain with some marine science “nibbles” over a glass of wine. The incentive of booze and a few free tickets coupled with the promise of being exposed to a series of “short highly visual presentations including some scientific oddities and some hard facts” was sufficient to attract a full house! The venue – a large trapezoid space in the Museum of Scotland presented some logistical challenges in terms of sound and light, but also the opportunity to project images against a seriously big white wall.

Snappy presentations punctuated by some stunning graphics explored food and energy security and the role of the marine environment, using marine mammals to explore our oceans, together with a series of related presentations based on the use of novel tagging technologies to track the behaviour of everything from sharks to sea birds. Fascination with the deep sea appears to be universal and the dream team from Aberdeen did not disappoint with video sequences of fish and giant amphipods. And, everything you ever wanted to know about reform of the Common Fisheries Policy but were afraid to ask is always a blast. The potentially sobering demise of seal populations through intoxication by algae clearly made an impression on the audience.

All Cabarets must have a finale! Enter stage left – Sea Bird Spies with Hip Hop Vibes! Crawford and Owen of the RSPB performed (mimed) a catchy duet - starting with the serious business of understanding sea bird behaviour and ending with the even more serious business of lobbying politicians whilst dressed in puffin costumes outside the Scottish Parliament.

Judging by the applause and the subsequent feedback the event was well received and, with a few tweaks to the format, well worth doing again. The audience was varied – with senior representatives from Government, regulators and academia in attendance as well as members of the public who clearly enjoyed the fringe-like atmosphere. Let's not kid ourselves, public engagement on this scale isn't easy or inexpensive, but presenting important concepts and understanding in language that can be understood and appreciated by the majority of non-scientists is vital to gaining public support for the minority who have the privilege of being involved in marine science. So – if you have a desire to condense your serious life's work into six minutes of pure infotainment and harbour masochistic tendencies please get in touch.

---

## MASTS Webinars



The first MASTS webinar successfully took place on 20 May and was hosted by Susan Chambers from the National Museum of Scotland. Susan took us through the wonderful world of polychaetes.

The next webinar will take place on Wednesday 5 June. This will be a talk by Prof Alan Decho who is a MASTS visiting fellow from University of South Carolina- Columbia. Then on Monday 1 July, Martyn Cox of Scottish Government will host a webinar on the National Marine Plan Interactive website.

Anyone interested in presenting a webinar should contact Emma on [ecd2@st-andrews.ac.uk](mailto:ecd2@st-andrews.ac.uk)

## Shark spawning ground discovered on Scotland's only inshore cold-water coral reef

Report by Dr Lea-Anne Henry

The Mingulay Reef Complex is an inshore seascape of deep (120–190 m) reefs formed by the cold-water coral *Lophelia pertusa* in the Minch off the island of Mingulay in the Outer Hebrides. Prof. Murray Roberts at Heriot-Watt University has led research on these reefs since first mapping them in 2003, and visited the complex in 2012 during the month-long JC073 “Changing Oceans Expedition” on board the RRS James Cook.

During remotely operated vehicle (ROV) dive surveys of the complex, the team discovered extensive aggregations of large black egg cases on the reefs. Dr Lea-Anne Henry, a benthic ecologist at Heriot-Watt, examined the eggs and others collected during previous research cruises to the complex. She not only confirmed that they belonged to the deepwater blackmouth catshark (or dogfish) *Galeus melastomus*, but also that eggs were being laid in very specific reefal habitats. High-resolution multibeam bathymetry data combined with ground-truthed data revealed how sharks were depositing eggs mostly during the spring to early summer on living corals found in slight seabed depressions exposed to moderate currents on the leeward side of ridges. Analysis of fisheries data from Marine Scotland collected in the Minch revealed that densities of *G. melastomus* significantly increased with proximity to a reef, which could indicate additional roles of coral reefs for this species such as enhanced feeding or socialisation opportunities. Other sharks were spotted resting among the reefs during the JC073 cruise, including the lesser-spotted catshark *Scyliorhinus canicula*, and there are potentially nursery grounds for another species, the critically endangered spurdog *Squalus acanthias* nearby. All three species are prized by the recreational sea angling community, an industry that captures over £140 million for the Scottish economy. Sea anglers catch the sharks and release them, which helps document and conserve local shark populations.



Image of an embryonic shark (*Galeus melastomus*) removed from its egg case collected on the reef complex. Image credit to Heriot Watt University.

The team speculate that catsharks select corals as spawning habitat in the Minch because these niches are a safe haven. *Lophelia* is a hard stony coral with an extensively branched colony that likely deters predators. Depositing egg cases on the leeward side of strong currents also reduces the risk of eggs drifting away, while the height of the coral ensures that eggs are adequately ventilated and not clogged by sediments.

The Mingulay Reef Complex was proposed by the Scottish Government as a candidate Special Area of Conservation (SAC) in 2011 as part of the Natura 2000 Protected Areas Network. In November 2012 it was adopted by the European Commission as a Site of Community Importance ahead of its anticipated formal designation as an SAC by the Scottish Government.

### Biological Conservation (Vol 161, pages 67-70)

The Heriot-Watt University team published its findings in an article entitled, “Cold-water coral reef habitats benefit recreationally valuable sharks”.



## Dr Cédric Cotté – Successful MASTS Visiting Fellowship

Report by Dr Lars Boehme ([lb284@st-andrews.ac.uk](mailto:lb284@st-andrews.ac.uk))

Ecosystem functioning in the Southern Ocean is still largely unknown because of strong constraints and logistical difficulties in sampling such vast and remote areas. On top of that, this region currently faces important environmental changes such as the increase of the southern annular mode and a predicted warming trend. In the open ocean realm of the Southern Ocean, the Antarctic Circumpolar Current (ACC) is a dominant physical feature. It is also arguably the most influential current in the world ocean; flowing completely around the globe and connecting all oceans. Within this dynamic environment, information on ecosystems is strongly lacking. However, new technologies and methodologies enable us to investigate how the physical environment controls and structures the marine biota. From satellite measurements of the first trophic level, i.e. Chlorophyll, to data from remotely tracked top predators; it is now possible to look into the inner workings of the Southern Ocean ecosystem.

Dr Cédric Cotté (L'OCEAN, Paris) has been interested in the foraging ecology of marine predators in this complex environment for many years now, and he was able to visit the Sea Mammal Research at the University of St Andrews as a MASTS fellow for 6 months. Together with Dr Lars Boehme and Prof Mike Fedak, he used the extensive database of behavioural information of Southern elephant seals built within the framework of the international MEOP program (Marine Mammals Exploring the Oceans Pole to Pole) to understand the dynamic mesoscale habitats and to examine how these top predators cope with its variability.

The post-moult migration of elephant seals during the austral winter covers long distances over all sectors of the Southern Ocean. It results in a circumpolar, but heterogeneous distribution of these top predators, which is still largely unexplained.

To investigate the physical forcing potentially driving this circumpolar pattern, a Lagrangian approach was used. An average surface chlorophyll concentration during the spring bloom was calculated and advected using geostrophic currents derived from satellite altimetry data. The purpose was to examine how the ACC transported waters, which had held high chlorophyll concentrations during the spring. The results show that elephant seal movements match closely the distribution of advected waters, which supported the bloom in the preceding spring and, therefore, have a high biological potential. The advection of these waters was identified as a major process in the Southern Ocean to drive the distribution of upper trophic levels. These exciting results provide new insights in explaining the range and circumpolar areas prospected by elephant seals, where ecosystems may develop and generate favourable feeding grounds for top predators. This multi-disciplinary and ecological approach to ocean observations - highlighting direct links between physical parameters, the first trophic level and higher level predators - significantly enhances our understanding of marine ecosystems.

This fellowship also facilitated collaborative work between different scientific communities in the UK and France, and we hope not only to publish the results soon, but also plan a workshop, anticipating discussions within and input from several MASTS forums.



Dr Cédric Cotté



## MASTS Annual Science Meeting: 27-29 August

This cross-disciplinary meeting brings together all members of the MASTS 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 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 (Tuesday 27th to Wednesday 28th), together with Plenary Speakers and opportunities to network. Abstract submission deadline is **13:00 on Thursday 4th July**. Abstracts can be submitted to:

- **General Science Session**
- "Interdisciplinary insights into coastal zone management". Championed by Prof Nick Hanley
- "Improving the sustainability of aquaculture production". Championed by Prof Brendan McAndrew
- "The future of deep-water research" - Championed by Dr Bhavani Narayanaswamy
- "Dynamics and Properties of Marine Systems - Numerical Hydrodynamic Modelling". Championed by Prof David Dritschel

On the third day (Thursday 29th), the venue will host a number of meetings and workshops:

- Marine predators and high energy environments: challenges and solutions to understanding behaviour
- Interdisciplinary approaches to the study of marine connectivity and its applications to MPA network design and fisheries management
- Researching Scottish Elasmobranchs - opportunity for a combined approach
- To remove or not to remove? The challenge posed by man-made structures on the Marine Environment: considerations for the O&G community
- Remotely Piloted Aircraft Platforms for Marine Research: Past Successes and Future Plans
- Micro-plastic litter in the marine environment: sources, sinks, effects and impacts
- Aquatic food security - Scotland's role for a global market
- Role of genomics in aquaculture development

More information from <http://www.masts.ac.uk/annual-science-meeting.aspx>

## "Deep Sea" Forum Small Grants Scheme makes its first awards

The MASTS Deep Sea Forum issued a call for small grants. Thirteen applications from the MASTS community and a range of topic areas were received and seven of these proposals were funded:

- Georgios Kazanidis (MASTS PhD student at Aberdeen University): "Nitrogen assimilation pathways in two dominant demosponge species inhabiting the North East Atlantic Cold-Water Coral Reefs"
- Dr Joanne Porter (Heriot Watt University): "Diversity of Bryozoa from offshore and deep water in the North East Atlantic Ocean"
- Dr Robert Turnewitsch (SAMS): "Recent sediment dynamics in hadal trenches"
- Herdayanto Putro (Aberdeen University): "A bacterial dipeptide as potential high pressure osmolyte"
- Dr Dan Mayor (Aberdeen University): "Trophic ecology and physiological adaptations of the deep-sea morid, *Antimora rostrata*: investigating size-based trends"
- Philipp Boersch-Supan (St Andrews University): "Microsatellite genotyping of the mesopelagic hatchetfish *Argyropelecus aculeatus* from the southwest Indian Ocean"
- Dr David Pond (MASTS Lecturer at SAMS): "Synergistic effects of temperature and hydrostatic pressure on the membrane lipids of benthic marine invertebrates"



## Other News

### Round Three Results of the MASTS Visiting Fellowship Scheme

The third round of the MASTS Visiting Fellowship Scheme attracted a total of 11 applications, of which two have been funded:

- Eduardo Nicolas Fuentes Jofre from Chile will be visiting Prof Ian Johnston (St Andrews) and Dr Daniel Macqueen (Aberdeen) for 6 months from October 2013. The fellowship will investigate the interaction between growth and stress signalling pathways in skeletal muscle of Atlantic salmon (*Salmo salar*). Anyone interested in this fellowship and becoming more involved should contact Daniel on [daniel.macqueen@abdn.ac.uk](mailto:daniel.macqueen@abdn.ac.uk)
- Dr Silvina M Rosa from Buenos Aires will be visiting Dr David Pond and colleagues from SAMS and Prof Gordon Bell (Stirling) for 6 months from August 2013. This fellowship will investigate the isolation and culture of Thraustochytrids from Scottish marine environments: why do these protists synthesise high amounts of unsaturated lipids? Anyone interested in this fellowship and becoming more involved should contact David on [David.Pond@sams.ac.uk](mailto:David.Pond@sams.ac.uk)

The application deadline for the fourth round of the MASTS Visiting Fellowship Scheme is **13:00 on Friday 1st November**. Further details from:

<http://www.masts.ac.uk/about/funding.aspx>

### Reports from MSCC

The Marine Industry Liaison Group of the UK government's Marine Science Coordination Committee asked Defra to commission a review of private and public sector marine science and evidence needs, and the capability of the UK's private sector marine science and technology organisations to support meeting those needs, and what opportunities may exist for future growth. Published 10th May by Defra: <http://www.defra.gov.uk/mscc/files/MILG-marine-science-needs-and-capability-study.pdf>

The UK Marine Research Vessels group is considering the capabilities, capacity and schedules of use of these vessels in order to identify costed options for strengthened co-ordination of Government vessel operation. Its report "UK Marine Research Vessels An assessment and proposals for improved co-ordination" is now available to download from:

<http://www.defra.gov.uk/mscc/groups/marine-research-vessels-group/>

### NERC Doctoral Training Programme

NERC is changing its approach to funding Ph.D. training and has requested applications from single organisations or consortia from across the UK to host Doctoral Training Partnerships (DTP). Organisations may bid to host significant number (up to 24) doctoral candidates per annum for a period of 5 years.

MASTS already runs a highly successful graduate school, under the guidance of the MASTS Dean of Graduate Studies (Prof Axel Miller), with almost 40 students. Building on this experience MASTS has submitted a DTP proposal to NERC joining the resources of the majority of MASTS members (new associate members and one core member excepted). The proposal attracted significant high level support from the Government, regulators and industry together with additional matched funding support from the MASTS members of the DTP. If successful, the DTP will, for the first time, guarantee a significant intake of PhD studentships dedicated to marine science in Scotland over the next five years. The outcome of the proposal is expected to be announced in November.

### MASTS T-Shirts for sale



We are delighted to announce that we have MASTS T-shirts for sale. The t-shirts are 100% cotton and feature twin needle stitching on neck sleeves and hem and a cotton / Lycra rib crew neck for added comfort, durability and shape.

<http://www.masts.ac.uk/news/masts-t-shirts-for-sale.aspx>

### MASTS Contact Details:

Office:	<b>Jane Williamson</b> 01334 467200
Executive Director:	<b>Prof David Paterson</b> dp1@st-andrews.ac.uk
Operations Director:	<b>Dr Mark James</b> maj8@st-andrews.ac.uk
Programme Co-ordinator:	<b>Dr Emma Defew</b> ecd2@st-andrews.ac.uk
Project Manager:	<b>Dr John Thompson</b> jbt5@st-andrews.ac.uk