



KELPIE

NEWSLETTER

Marine Alliance for Science and Technology for Scotland
Issue No. 13: February 2014

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MASTS UPDATE

MASTS - Looking to the Future!

The SFC recently confirmed it will provide ongoing funds for Directorate and networking capability for pools that it regarded as being "successful". Although no details have yet been released, this support coupled to the ongoing development of MASTS should ensure that MASTS will continue to thrive beyond the current period of SFC funding which comes to an end in 2017. All Pools were also urged to interact with the emerging SFC funded Innovation Centres (IC) of which the sensors, oil and gas and aquaculture IC's are of particular relevance to MASTS.

Studentships – What next!

The lack of support for marine, organismal and evolutionary science within the recent NERC Doctoral Training Partnerships (DTP) for Scotland has been recognized at the highest level as a serious strategic issue. MASTS is therefore planning a series of initiatives to try to help address this skills shortage and will shortly be announcing a call for studentship applications. The MASTS Directorate will also be actively engaging with other marine stakeholders in Scotland together with EU partner organisations to secure additional studentships. Matched funding and the need to work collaboratively with other institutions will be critical in the future.

Theme and Forum Reviews

On 18th-19th February, the MASTS Theme Leaders and Forum Conveners gathered for an intensive two day review of progress. All of the Theme and Forum (T&F) steering groups are developing strategies to help frame their activities and provide markers against which progress can be gauged. The meeting was very informative and many aspect of good practice were shared. All participants in the review meeting left with a real sense that MASTS is developing as a community and that a multi-institutional, multidisciplinary approach provides that community with powerful opportunities to explore and secure funding to address a range of marine science questions.



MASTS - Members

www.masts.ac.uk

UK-South East Asia Aquaculture Workshop

MASTS in association with the UK Science and Innovation Network and the Network of Aquaculture Centres in Asia-Pacific is helping to organise workshops in Bangkok and Kuala Lumpur 20-25 March, on fish health and welfare and nutrition. Five researchers from the MASTS community will attend - full report in the next issue of Kelpie!

iSTAR

ANTARCTICA

iSTAR - Report by Danya Goldberg, University of St Andrews (dg53@st-andrews.ac.uk)

iStar is a national programme focused on gaining better understanding of the West Antarctic Ice sheet, the area that has experienced the greatest rates of ice loss recorded over recent decades. The Ocean2ice project is specifically aiming to understand how and why warm ocean water gets close to and in some cases, on top of the Antarctic ice shelf.

Pine Island Glacier is 2km thick and is found on the West Antarctic ice sheet. It is the largest glacial contributor of ice into the sea found on Earth. The glacier is shrinking at a rate of over 1metre per year and is therefore contributing to sea level rise faster than any other



The area of particular interest is the ocean surrounding the Pine Island glacier. A range of methods will be undertaken by the research team to investigate the movement of warm water to the ice.

The water around Pine Island hasn't significantly warmed thus far, although the rate of ice melt has increased. The circulation of water onto the ice shelf may have increased; it's essential to understand how this water is getting there to predict future melting and its consequences for global sea level rise.

lone glacier in the World.

Due to the thickness of the ice and it's huge spatial coverage it's very difficult to gather long-term data from the Antarctic environment. In the summer months, technical equipment and humans have the capacity to collect oceanographic data from the ice shelves but in the winter the coverage is too wide for such conventional methods.

The Polar Seas impact oceans across the globe and are an integral part of the climate system determining weather patterns worldwide.

Atmospheric wind currents drive ocean currents on which the Coriolis force acts to maintain networks of circulation. The Coriolis force is the deviation of air currents in the northern hemisphere to the right and the deviation of air currents in the Southern hemisphere to the left due to the Earth's rotation.

The Antarctic circumpolar current is the connection of all the worlds oceans. The Coriolis force blows across the sea as a strong westerly wind and the water in the Southern ocean moves to the left away from Antarctica due to the Coriolis force. As the water moves away from Antarctica, circumpolar deep water rises up onto the surface and is warmer than the water at the surface, this is known as upwelling. It is also saltier and therefore less dense. The Antarctic ice therefore melts. This process of deep water migrating onto the ice shelf may have increased over recent years, and the mechanisms by which it occurs are still largely unknown.

Where exactly on the ice shelf this is happening is also a mystery, and the Ocean2ice project is aiming to provide some insight into the location using southern elephant seals to reach never before sampled areas of Antarctica.

Southern elephant seals equipped with oceanographic sensors can record ocean structure and water mass changes in rarely observed areas, i.e. around the Antarctic ice shelf. The seals characteristically spend the Winter feeding in the sea-ice pack and high-latitude waters of the Southern Ocean. Sea-ice formation rates can be calculated based on salinity changes measured by the CDT tags on seals.

CDT tags are instruments that are attached to animals. They incorporate conductivity, temperature and depth sensors. They are attached to the seals using specialist adhesive glue that sticks to the seals fur. Data is transmitted via satellite to ground stations and then on to processing centres.

In January 2014 the Ocean2ice iStar team, including Professor Michael Fedak and Dr. Lars Boehme of the University of St Andrews, will set sail across the Amundsen Sea onboard the RRS James Clark Ross. They will spend 30 days putting a range of instruments and devices into the ocean near Pine Island Glacier to discover when, where, and how warm ocean water gets close to the ice.

NEW FORUM CONVENORS



The MASTS Dynamics and Properties of Marine Systems Theme has established two new forums: "Technology, Platforms and Sensors" which will be led by Dr Alan Jamieson (top image) and "Marine Biogeochemistry" which will be led by Dr Kick Kamenos (bottom image). Both forum convenors are in the process of establishing their steering groups and remit.



OPPORTUNITY AT THE AQUACULTURE UNIT OF THE NELSON MARLBOROUGH INSTITUTE OF TECHNOLOGY - NZ

The Aquaculture Unit at the Nelson Marlborough Institute of Technology (NMIT) is principally a technical college with an established aquaculture diploma programme and resources that allow for research into current aquaculture processes and systems, particularly in mussels, salmon and oysters. Check out <http://www.youtube.com/watch?v=zudm-plu2k34&list=PLC246119C7A9767A7&index=6>

NMIT are keen to link with MASTS and would welcome individuals on 3 month placements (between June and September). During this placement, you would gain teaching experience and have the chance to use some of the research facilities for your own work. MASTS would be able to offer £1k towards the cost of your travel, and we would hope for a similar in kind commitment from NMIT (this is to be discussed on a case by case basis).

This opportunity would suit postgraduate students or early career post-docs and lecturers. If you are interested in exploring this possibility further, please email a copy of your CV to masts@st-andrews.ac.uk together with an outline of your teaching/research experience and a short summary of how you would like to spend your three months in NMIT. If you would like to discuss this opportunity informally, please contact Dr Mark James on 01334 467312.



Dr Mark Burdass - NMIT Aquaculture Programme Coordinator and Tutor

MINGULAY REEF COMPLEX CASE STUDY WORKSHOP

Report by Dr Seb Hennige, Heriot Watt University

Earlier this year at the annual science meeting, MASTS 'case studies' were launched from the Dynamics and Properties of Marine Systems theme. One case study is the Mingulay Reef Complex, and the other one is Loch Linnhe, and the Lynne of Lorn. The idea behind these case studies is that the functioning of all marine systems cross MASTS 'themes', and as such, Case Studies will bring together interdisciplinary researchers from across MASTS to address common goals.

The Mingulay Reef Complex (Figure 1), situated off the west coast of Scotland is the only known inshore cold-water coral reef in UK waters, and supports high levels of biodiversity. Recent research from MASTS organizations at and around the Mingulay Reef Complex, on the hydrodynamics of the region coupled with biogeochemistry, coral physiology and ecosystem history, has highlighted how integrated the system is from the coral individuals to the ecosystem biogeochemistry and, over millennial timescales, to the surficial geology. The question remains however, as to how future climate change will impact upon the dynamics and future success of this diverse marine ecosystem and this is what the workshop set out to address.

This was addressed by firstly identifying key research gaps in our current understanding, as to understand how a system will change in the future, we need to understand ecosystem connectivity and functioning in the present, and how past environmental change helped shape this.

The major research gaps that were identified were: 1) Increased spatial and temporal understanding of the



ecohydrodynamics of the region, and the tidally driven downwelling at the Mingulay Reef Complex. Considering that much of the system connectivity is driven by this downwelling, it is crucial that it is fully characterized. 2) The carbon/ nitrogen/ trace gas cycling and storage within the Mingulay Reef Complex is only partially understood, and more knowledge of the integration between organisms, the sediment, and the water column is much needed. 3) Reconstructing past environments at the Mingulay Reef Complex. By quantifying the past environmental water conditions at the complex, we can see past environmental impacts upon 4) Reef biodiversity. By quantifying reef biodiversity in the past and present

across wider spatial scales, and linking it to current and past environments, we can predict how future changes may impact key biodiversity at the Mingulay Reef Complex.

The Mingulay Reef Complex workshop occurred at the Crieff Hydro in Perth in November 2013, and brought together people from over 9 Scottish institutions. This included representation from Scottish Universities; St Andrews, Heriot-Watt, Edinburgh, Strathclyde, Glasgow, Aberdeen, SAMS, and from Marine Science Scotland, and Scottish Natural Heritage. A summary of the identified research gaps, and projected outcomes can be downloaded from the MASTS website.

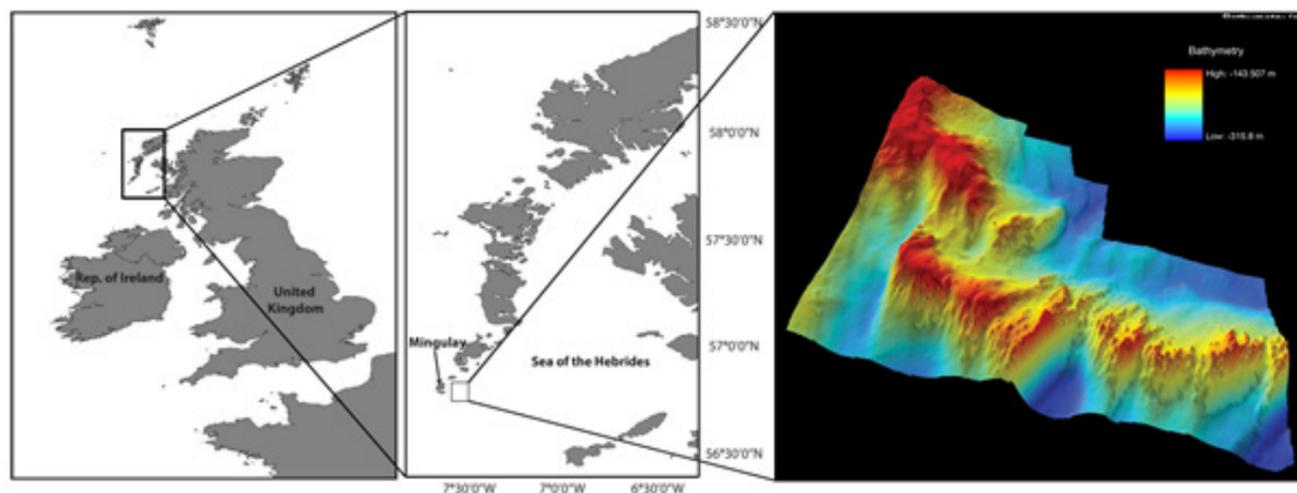


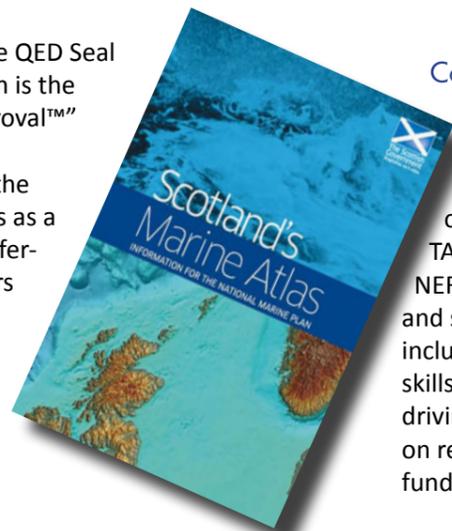
Figure 1: Location of Mingulay Reef Complex with three-dimensional shaded colour multibeam bathymetry illustrating one area within the complex

MARINE ATLAS IS A WINNER
Contact Martyn Cox for further details:
Martyn.cox@scotland.gsi.gov.uk

The Atlas has been awarded the QED Seal (Quality, Excellence, Design) which is the "Good Housekeeping Seal of Approval™" for eBooks and apps.

It has also been recognized by the judges for the Digital Book Awards as a finalist in the "Ebook Flowable-Reference/Academic" category. Winners will be announced at the Digital Book Awards Dinner in New York in January 2014.

Just goes to show that using the latest technology can raise the profile of your publication.



**CONGRATULATIONS -
TO NEW MEMBER OF NERC
TRAINING ADVISORY GROUP**



Contact Heidi Burdett for further details:
hb57@st-andrews.ac.uk

Heidi is now one of the new members of the NERC Training Advisory Group. The TAG will be the key source of advice to the NERC Executive on the strategic direction and success of NERC training investments, including NERC's role and strategy in meeting skills shortages and other training priorities, on driving up the quality, delivery of training, and on recommendations on the award of training funds.

MASTS VISITING FELLOWSHIP AWARDS

Funds from the fourth round of the MASTS Visting Fellowship were awarded to:

"Ecotoxicogenomics: Validation of a quantitative PCR macroarray for use as a biomarker of exposure to pollutants in Flounder" awarded to Dr Craig Robinson (MSS) and Dr Micheal Leaver (Stirling). Two visits: October-Nov 2014 and Feb-March 2015. Visiting Fellow: Dr Michele Giltrap, Trinity College Dublin.

"Arctic zooplankton ecology utilising acoustic techniques" awarded to Dr Finlo Cottier (SAMS). Visiting Fellow: Prof Jorgenb Berge, University of Tromso.

"COREE - The palaeoceanographic potential of rare earth element incorporation in coral Aragonite" awarded to Dr Kirsty Crockett (SAMS). May-June 2014. Visiting Fellow: Dr Edmund Hawthorne, GEOMAR.

"Improving the classification of key marine microorganisms for biogeography and ecophysiology studies" awarded to Dr Tony Guttierrez (Heriot Watt). July-August 2014. Visiting Fellow: Dr David Berry, University of Vienna.

FIFTH ROUND OF THE MASTS SMALL GRANTS SCHEME

The fifth round of the MASTS Small Grants Scheme attracted:

- * 21 applications for the £500 awards (5 of these were funded - 24% success rate)
- * 3 applications for workshop funding (1 application was funded - 33% success rate)
- * 9 applications for the cutting edge awards of up to £3k (3 of these were funded - 33% success rate)

A total amount of £10,480 was awarded to 9 successful applications.

Small grants (up to £500)

- Support for attendance at the ASLO Annual Conference (Julie Hope, St Andrews)
- Support to attend the Ocean Science Meeting (Nick Kamenos, Glasgow)
- Support for attendance at the International Temperate Reefs Symposium (Flora Kent, Heriot Watt)

- Support to attend the International Conference for Coelenterate Biology (Anna Kintner, St Andrews)
- Support to present research findings related to benthic productivity on artificial structures (Sally Rouse, SAMS)

Workshops (up to £1k)

- Workshop support - Seagrasses and sea level rise: current knowledge, gaps and new methodologies (Mark Huxham, Napier)

Cutting edge knowledge/techniques (up to £3k)

- The first fluorination enzyme from the sea (Hai Deng, Aberdeen)
- Vulnerability of Modiolus reefs to climate change: from mechanisms to management strategies (Clara Mackenzie, Heriot Watt)
- Genetic patterning of sociality in Icelandic Killer Whales (Sara Tavares, St Andrews)

The closing date for the sixth round of MASTS Small Grants is **16:00 on Monday 26th May 2014**. More details from <http://www.masts.ac.uk/about/funding/>

OCEAN SAMPLING DAY

The Ocean Sampling Day (OSD) is a simultaneous sampling campaign of the world's oceans and will take place on the summer solstice (**June 21st**) in the year 2014. These cumulative samples, related in time, space and environmental parameters, will provide insights into fundamental rules describing microbial diversity and function and will contribute to the blue economy through the identification of novel, ocean-derived biotechnologies.

The Micro B3 project is leading an open call to participate in Ocean Sampling Day hoping to invite more external participants to join the main OSD event. If you are associated with a marine research site, research cruise or a sailor/skipper and would like to participate in the OSD 2014 (or prior pilot activities) we would kindly ask you to express your interest using this link: <http://www.surveymonkey.com/s/Z6SX289>

MASTS 2014 ANNUAL SCIENCE MEETING: 3-5 SEPTEMBER

Planning for the MASTS 2014 ASM has begun! Do you have an idea for a special themed session, would you like to exhibit at the ASM or perhaps you would like to host a side meeting or workshop? Get in touch soon and express an interest. Contact Dr Emma Defew on ecd2@st-andrews.ac.uk for further details.

FORUM ROUND UP

Deep Sea Forum (by Dr Bhavani Narayanaswamy):

The DS forum has been up and running for a year now and this is a good time to reflect on some of our achievements. A small grants round was held early in the year with a total of 7 projects being funded on a wide range of topics, in addition funding support has been given to a forum workshop was held in the summer, open to all, and from that a proposal has been submitted to Eurofleets requesting ship-time to look for cold seeps in the Hatton-Rockall Basin. 2014 looks to be an exciting year.

The Deep Sea Forum supported open access papers on Atlantic Meridional Overturning Circulation and the effect of ocean acidification on cold water corals. Members of the MASTS Deep Sea community may apply for £500 towards the costs of publishing their manuscript via open access. Please send your requests by email to masts@st-andrews.ac.uk and outline the following information:

- Title and authors of the Paper
- Journal being sent to/published with
- Amount of funds being sought and evidence of other funding sought to help pay for the publication
- Details of why the paper is relevant to the provision of information that will advance Scottish science and make a significant impact
- Details of why the paper would be of interest to the MASTS DS (and wider) community

Fisheries Science Forum (Dr Paul Fernandes): The MASTS fisheries forum SG met for the first time earlier this year with the objective of improving collaboration amongst MASTS partners in the field of fisheries research. There are a number of common interests which have seen some fruitful collaborations come from the forum. The status of European fisheries was addressed in a well publicised paper by Paul Fernandes and Robin Cook which set the record straight on the record of fisheries management in northern Europe: it's not all doom and gloom and, in fact, fishing pressure has reduced considerably over the past 10 years in response to management measures introduced since the last reform of the much derided Common Fisheries Policy: stocks are now in a good position to recover and in some cases there have been some spectacular recoveries. Not everything is rosy, however, and there are still some problems such as the high mortality associated with cod stocks around the British Isles and the much publicised issue of fish discards. These are also areas which the MASTS Fisheries Forum have been working on: Vanessa Trijoulet at Strathclyde is looking at the impact of seals on cod stocks of the west of Scotland; and there are a number of studies looking into the discard problem. As a result,

the forum is going forward with a proposal from Clive Fox at SAMS to host a workshop on discards early in the coming year. Mike Heath's group at Strathclyde has been working on this and other fisheries topics, as part of their wider examination of the marine ecosystem through the use of ecosystem models. The group has a number of models, parameterised for the North Sea and west of Scotland, which can be adapted to address a variety of topics including the impact of climate change (David Morris, Strathclyde), trophic cascades (Dougie Spiers Strathclyde), sustainable multispecies fishing mortalities (Alan Baudron, Aberdeen) as well as the forthcoming discard ban (Mike Heath).

The Clyde is an area which has also been modelled and continues to provide interesting challenges for fisheries management. Neil Burns started his PhD working with Peter Wright (Marine Scotland Science) and David Bailey (Glasgow) investigating what sustains the gadoid community in this area. Several members of the Fisheries Forum participated in a workshop on future scientific directions for the Clyde's fisheries hosted by SIFT (further details can be found on the MASTS members login site). As a result of all this interest, the Fisheries Forum has initiated a community project on the Clyde which met for the first time at the MASTS ASM. If you are a researcher at any level actively engaged in marine research in the Clyde, please register your interest with Mike Heath at m.heath@strath.ac.uk and keep an eye on the MASTS website fisheries forum page for further details of a forthcoming workshop in the new year.

Finally, there has been some engagement with other fishing stakeholders. Tara Marshall and Paul Fernandes (both Aberdeen) held a smelly (with real fish!) training course on sampling at sea for fishermen as part of the Marine Scotland initiative to provide more information on west of Scotland fish stocks. This initiative was part of a wider vessel charter programme to get fishermen to conduct surveys of the resources they know so much about.

Coastal Zone (Prof Nick Hanley): The coastal forum has been recruiting an ever-widening set of researchers and policy makers to come together to discuss research issues relevant to coastal zone management. In August, we ran a session at the MASTS science conference on interdisciplinary insights into coastal zone management, featuring papers from PhD students and more established researchers on topics such as the management of coastal mangroves in Eastern Africa and coastal erosion in Scotland. Then, in November, we ran a very successful 2-day meeting at the Crieff Hydro which included PhD student feedback sessions, a policy session and a session

which aimed to lay the foundations for a science strategy for the forum. We also heard a range of very interesting papers from environmental economists and coastal ecologists on issues such as natural capital assessments for estuaries, and the economics of salt marsh restoration.

CHRONOLOGY AND CLIMATE OF THE LAST INTERGLACIAL

Thursday 15 May 2014 , 10am-5pm at Burlington House, Piccadilly, London, W1J 0BG, United Kingdom

The last interglacial period is of great interest as it appears to have experienced elevated temperatures and sea levels relative to the Holocene and had ocean circulation patterns that were significantly different from the present. This one-day meeting aims to bring together a broad community of researchers interested in the climate, timing and duration of the last interglacial period. We particularly welcome contributions that address the following research areas:

Conference themes

- 1) Quantitative Eemian-Holocene climate comparison (oceanic and terrestrial)
- 2) Ocean-atmosphere-cryosphere linkages
- 3) Stratigraphic methods and geochronology (including tephrochronology)
- 4) Climate modelling

Speakers include: Gideon Henderson (Oxford University); Jerry McManus (LDEO, Columbia University); Chronis Tzedakis (University College London) and Eric Wolff (Cambridge University)

Meeting convenors: Mark Chapman (mark.chapman@uea.ac.uk) and Bill Austin (bill.austin@st-andrews.ac.uk)

Registration information deadlines

- January 30th - online registration opens
- April 7th - deadline for submission of abstracts
- May 6th - deadline for registration

Fees: Standard £45, Student £30. Lunch and morning and afternoon coffee/tea are included in the cost.

<https://www.uea.ac.uk/environmental-sciences/news-and-events/conferences/chronology-and-climate>

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lad4@st-andrews.ac.uk

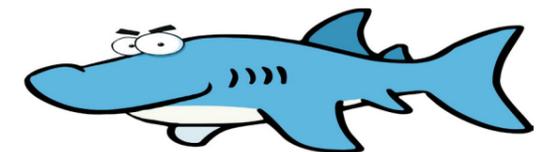


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NEW MASTS COMMUNITY PROJECT ESTABLISHED - SIORC!

Contact Dr Lea-Anne Henry (L.Henry@hw.ac.uk) or James Thorburn (j.thorburn@abdn.ac.uk)

The MASTS Marine Biodiversity, Function and Services Theme are delighted to announce the establishment of a new MASTS Community Project called "Sharks, skates and rays in the offshore region and coastal zone of Scotland" or SIORC for short, meaning 'shark' in Gaelic.



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