

Challenger Wave



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

NEWS

SAMS research to help communities affected by climate change

The Oban-based Scottish Association for Marine Science is working with vulnerable people in the Scottish Borders to help them adapt and improve their resilience to climate change. Dr Jasper Kenter, head of SAMS' Laurence Mee Centre for Society and the Sea, will play an integral part in Scottish Borders Climate Resilient Communities project which aims to support and empower communities most disadvantaged by climate change.

The £100,000 project is one of only two in the UK funded by the Joseph Rowntree Foundation and involves Scottish Borders Council and SAMS alongside other key partners University of Dundee, Tweed Forum, Southern Uplands Partnership and International Futures Forum. Dr Kenter, who specialises in supporting community groups to discuss environmental policies, will oversee a series of workshops with people in the Borders towns of Hawick, Newcastleton and Peebles, in the coming year, and provide analysis for community action and potential policy change.

The three communities have been chosen for the 16-month pilot project because of their rural nature and a susceptibility to flooding. Dr Kenter said: "This project will enable communities to work together with researchers and policy makers so we can learn from each other. This way, communities can have more of an influence and plan for the long term consequences of climate change. As researchers we want to know what methods of community planning and learning work best, so the lessons we learn from this project can be applied elsewhere."



The project will look to build on the successful work already undertaken by Scottish Borders Council, Tweed Forum and Southern Uplands Partnership in establishing local volunteer resilience groups; the council's Resilient Communities initiative includes more than 30 communities that are now better prepared to cope with emergencies. For more information contact Euan.Paterson@sams.ac.uk or Twitter: @ScotMarineInst

SAMS co-founds spin-off company following European project success

The Scottish Association for Marine Science (SAMS) has co-founded a company to develop off-the-shelf seaweed farms following its key role in a ground-breaking European project. AT-SEA Technologies has been formed by the Oban-

based SAMS alongside seven other organisations that made up the EU project AT~SEA and are now shareholders of AT~SEA Technologies.

This project, which started in 2012, aimed to demonstrate the technical and economic feasibility of seaweed cultivation in Europe and developed seaweed cultivation 'sheets' that increased the surface area for growing and allowed for greater mechanisation in this modern industry.



The company's specially-designed sheets (known as 2D seaweed cultivation substrates) form part of the product offered by AT~SEA Technologies, which will specialise in industry start-ups. Seaweed is seen as an important source for future supply of food and feed (additives), biochemical, biomaterials and bioenergy.

Dr Adam Hughes, senior lecturer in sustainable aquaculture at SAMS, and AT~SEA member, said: "Seaweed is such an important source for food supply and biofuels, yet Europe is far behind other continents in terms of developing the industry. By offering these off-the-shelf farms, along

with the knowledge required to sustain a business, AT~SEA Technologies can help countries throughout Europe grow the industry in a sustainable way."



A movie and pictures about AT~SEA can be downloaded using the following link: <http://www.atsea-project.eu/finalevent-extra-info>

£1.7m project to train 3,000 'citizen scientists'

More than £1.7m has been awarded to a scheme that will train thousands of 'citizen scientists' to monitor and protect marine life around the UK's coastline. Designed to further our understanding of how the marine environment is responding to global climate change, the Capturing our Coast project will train more than 3,000 volunteers – making it the largest marine citizen science project ever undertaken in the UK. Collecting data around key indicator species, it is hoped the new research will help inform future policy and conservation strategies.

The Scottish Association for Marine Science (SAMS) is the only Scottish partner involved in the UK-wide survey and is encouraging people living near the coastline to play their part. Professor Mike Burrows of SAMS said: "We are living in

a time of rapid climactic change that has not been seen in millions of years. This is an opportunity to document changes in the natural world that may reflect that. We are not looking for people to become experts overnight but if a lot of people can gather evidence on little changes, we can fit that into a bigger picture. As scientists, we can't be everywhere but people can tell us what's going on in their own back yard and we can collectively gather the evidence. We would like to hear from keen naturalists and people who love the outdoors but the training given as part of the project is also a great opportunity for those who would like to find out more about the natural environment."



Funded by the Heritage Lottery Fund, Capturing our Coast is led by Newcastle University's Dove Marine Laboratory and also involves the universities of Hull, Portsmouth and Bangor. Organisations including the Marine Biological Association in Plymouth, the Marine Conservation Society, Earthwatch Institute, the Natural History Museum, Northumberland Wildlife Trust, Cefas and the Coastal Partnerships Network are also collaborating on the project.

"Collecting this information about our coastlines is vital if we are to protect them for the future but we can't do it without the help of the public," explains project leader Dr Jane Delany, a senior lecturer in the School of Marine Science and Technology at Newcastle University. "What this project aims to do is develop a network of citizen scientists who can help us build an accurate picture of marine life all around the UK - a baseline against which we can better understand the impact of climate change and other environmental and human factors."

This new project builds on previous work led by Newcastle University through the Big Sea Survey in 2010. Collecting 350,000 separate records over three years, the project identified a number of organisms which had previously not been seen so far north such as the rare stalked jellyfish and an invasive species of sea squirt known as *Corella eumyota*.

"One of the criticisms of citizen science is the accuracy of the data collected," explains Dr Gordon Watson of Portsmouth University. "What is unique about this new national project is that we will turn all our volunteers into 'specialists', working on their own chosen topics or species. The novelty of this new training scheme will allow volunteers to work alongside scientists in an unprecedented way."

The project will be open for volunteers wanting to take part from September 2015. For more information and to register your interest please email bigseasurvey@ncl.ac.uk.

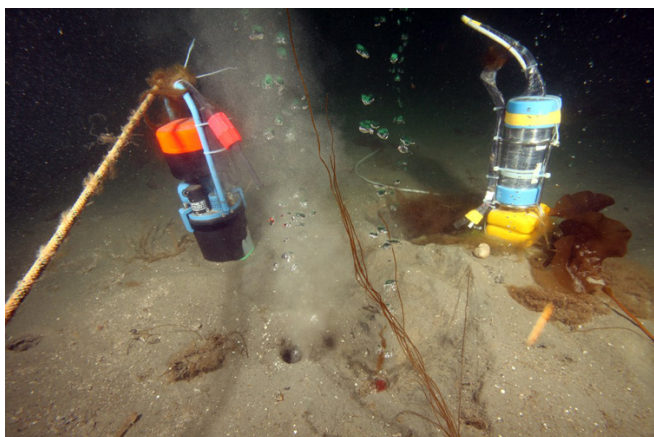
Scientists thank villagers for contribution to world-first experiment

Scientists who conducted a world-first experiment in rural Argyll have taken the unusual step of crediting a village population in its published scientific papers. Their project, which started in 2012, investigated the environmental impact of a leak from a sub-sea carbon capture storage (CCS) system. It involved injecting 4,200 kg of carbon dioxide gas into the sediments below the seabed for a 37-day period in Ardmucknish Bay, near Tralee, Benderloch.

The experiment was co-ordinated locally by Dr Henrik Stahl of the Oban-based Scottish Association for Marine Science (SAMS), in conjunction with project leader Dr Jerry Blackford of Plymouth Marine Laboratory and other scientists from the National Oceanographic Centre, British Geological Survey and Heriot Watt and Southampton universities. Results recently published in the respected scientific journal Nature Climate Change show there was little impact on sea life and no impact could be found on commercial shellfish species that were collected from the area around the gas release. Although some species of fish and shellfish left the immediate area of the gas release, they returned again within weeks of the gas release stopping.



"We could see a clear but very localised signal from the carbon dioxide towards the end of the release phase, close to the injection point," said Dr Stahl. "But we were surprised to see how quickly this signal disappeared after the injection was stopped. The sediments have a 'buffering effect' on the carbon dioxide, at least for a short term leak like this one."



Included in the acknowledgements sections of the many scientific papers published so far are land-owners Lochnell Estate, leaseholders Tralee Bay Holiday Park and the residents of Benderloch, which lies within the Ardchattan parish area. Jill Bowis, a member of Ardchattan Community Council, said: "It is nice to see the community of Benderloch being acknowledged in the credits of the report on the carbon capture research. The research team did a good job of keeping people informed along the process, with open meetings, their facebook page, website and easy contacts whenever there were questions. It is reassuring to learn that the results showed minimal environmental impact and rapid recovery from the small leakages that occurred."

The findings from this research will inform decision makers involved in the development of CCS, a technique that can be used to aid the reduction carbon dioxide emissions to the atmosphere. The process captures carbon dioxide from point-source emitters, such as power stations, and transports it to a long-term storage site, typically deep below the sea bed on continental shelves.

Dr Pete Taylor of SAMS, who also worked on the research team and is now employed by the SAMS Research Services Ltd (SRSL), said: "It simply wasn't possible to conduct the research in other parts of the country. We identified Ard-mucknish Bay as the ideal test ground but without the support and understanding of the local community we wouldn't have been able to go ahead. Although the test area was not used for commercial purposes, a nearby jetty was frequently used by locals for launching small boats, so the community put a lot of trust in us."

In total, more than 200 individual dives were conducted by UK scientific divers based at SAMS, recovering more than 650 samples of seabed sediment and 300 water samples. More than 500 images were taken and 1,600 metres of underwater cable was laid then retrieved. The gas migration was tracked through the sediment using near daily seismic profiling, and into the water column using autonomous underwater vehicles, sea-floor sensors, underwater microphones and videos. During the experiment SAMS hosted more than 50 scientists, most of whom stayed in the area for longer than three months, from as far afield as Japan.



Dr Blackford said: "The experiment has made an international impact, with results presented to researchers, governmental representatives and

other stakeholders as far away as Australia, America and Japan as well as in Europe. CCS is vital if we are to meet our CO₂ emission reduction targets, I'm confident that our work, facilitated by the hospitality of Benderloch, will make a real contribution in this respect."

The Scottish Centre for Carbon Storage has identified a large CCS resource, mainly offshore in the North Sea, which can accommodate Scotland's industrial carbon dioxide emissions for the next 200 years. For more information contact Euan.Paterson@sams.ac.uk or Twitter: @ScotMarineInst

VIEWS

Scientists will use robots to explore deepest ocean

SCIENTISTS from the Oban-based Scottish Association for Marine Science (SAMS) will use custom-built robots to explore the deepest parts of the ocean in a bid to discover how life is sustained thousands of metres below the surface. The research team led by Professor Ronnie N. Glud, who is based at the University of Southern Denmark and SAMS, will take the unique step of studying and sampling organisms in their own environment (in situ), thousands of metres below sea level. These extreme ocean regions, known as 'hadal zones', occur where one plate of the Earth's geological crust is sliding underneath a neighbouring plate, forming deep trenches in the seafloor.

The Hades Project requires three purpose-built robots to operate at depths of up to almost 11 kilometres. Previous expeditions led by Professor Glud, most notably to the Mariana Trench (2013), the deepest part of the ocean, have revealed surprisingly high levels of biological activity at nearly 11 kilometres deep. Now the aim is to investigate how life is sustained at these depths and how its activity affects the biogeochemical functioning of the oceans and the Earth.

Professor Glud said: "It is extremely difficult to investigate what actually happens in the extreme deep. Organisms that are removed from their natural extreme environment and studied in a laboratory will inevitably be affected, and potentially killed, by the large pressure difference during sample recovery. In onboard laboratories

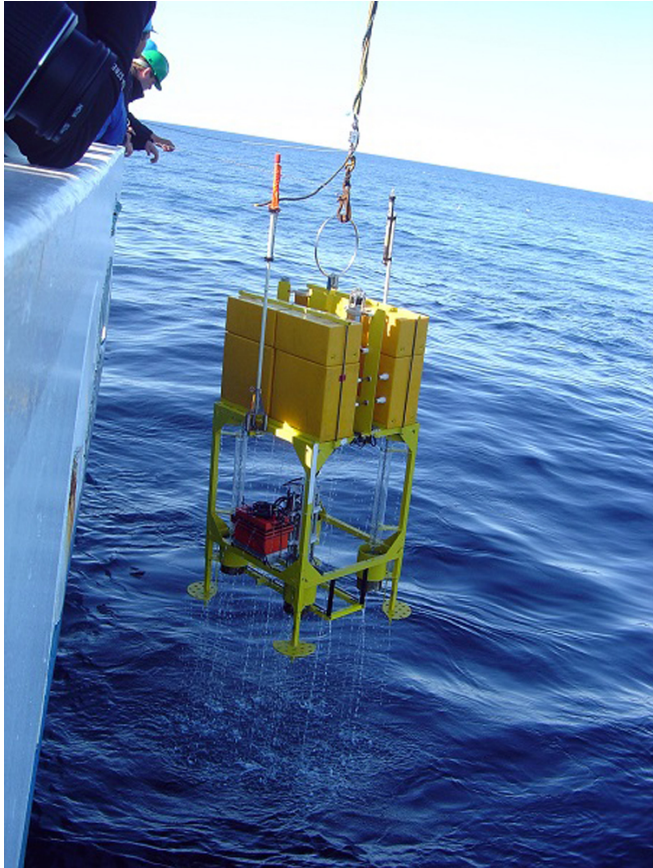
researchers generally only study organisms that can withstand the recovery; and they are not necessarily the ones that are most important in the deep. It is therefore important to examine the organisms and their metabolic activity in that environment."



The three trenches to be visited by the researchers are in the Pacific Ocean: the Atacama Trench off Chile (max depth 8068 metres), Japan Trench south and east of Japan (max depth 9,504 metres) and Kermadec Trench north of New Zealand (max depth 10,047 metres). The team believes it is necessary to investigate more of the unexplored trenches and their specialised microbial communities to understand how organisms function at extreme pressures and what role they play in the global carbon cycle. The three trenches have been selected as they are expected to receive very different amounts of organic matter (food), because of different nutrient conditions in the overlying surface waters and different physical-oceanographic conditions.

Dr Robert Turnewitsch, Principal Investigator in Marine Geochemistry at SAMS, was on the team

that explored the Mariana Trench and his expertise has been called upon again. "This will be a very interesting challenge for all of us," he said. "Taking such comprehensive readings in situ has not been done before at these depths. The hadal zone is an extreme environment that hardly anyone has looked at, so there are many unknowns. The opportunity to work on a project like this is very exciting. I want to be surprised; I want to find something that challenges our views and perceptions of the deep sea and we now have a great opportunity to do that."



Various components for the new robots are being produced around the world before finally being assembled at University of Southern Denmark. One robot will be designed to quantify the oxygen uptake by the sediments (which expresses how much organic material or 'food' is turned over), and another will be designed to investigate the different processes that may be used by sediment organisms to convert the organic material (if they use, for instance, oxygen, nitrate or sulfate for respiration). The third instrument will be designed to collect sediment samples to be brought to the surface. This instrument will ensure the sampled microorganisms are fixed in situ and can be retrieved without being modified

during sample retrieval. For more information contact Euan.Paterson@sams.ac.uk or Twitter: @ScotMarineInst

International ocean experts form world's largest marine research group

The Scottish Association for Marine Science has joined one of the largest and most ambitious marine research projects of recent decades. It held its kick-off meeting last month. AtlantOS (Atlantic Observing System) brings together 62 partners from 18 countries to significantly enhance the integration and effectiveness of Atlantic Ocean data. Oban-based SAMS is providing expertise through Professor Stuart Cunningham, current UK Oceanographer of the Year, who will use moorings to measure the warm water flow of the eastern Atlantic boundary (from the Scottish continental shelf to the Mid-Atlantic Basin). Dr Mark Inall of SAMS will also take measurements across the eastern boundary using state-of-the-art robotic sea gliders.



The EU is funding AtlantOS as part of its Horizon2020 programme with 21 million euros over a period of four years. The project is co-ordinated by GEOMAR Helmholtz Centre for Ocean Research, Germany. Professor Cunningham said: "The ocean is very complex and only by having scientists working together in these multi-national projects can we successfully integrate all of the

data we collect. It is exciting to be part of AtlantOS, a project at the cutting edge of research into the Atlantic Ocean that will make global connections and be societally relevant."

The Atlantic Ocean is a major trade route, provides the oxygen we breathe, most fish we eat and is responsible for the mild climate in northern Europe. Environmental change causes the ocean to warm, sea level to rise, fish populations to decline and migrate, the water to become more polluted, more acidic, deoxygenized and less biodiverse. Therefore, it is important to accurately observe its current condition, assess past changes and to predict future developments.

Researchers in Europe, the USA, Canada, Brazil and South Africa and other Atlantic-bordering countries are already strongly engaged in observing the ocean in their exclusive economic zones and beyond. Together they support the Global Ocean Observing System (GOOS) which coordinates global sustained ocean observations including satellites, freely drifting floats, fixed observatories, as well as ship-based systems. "However, a lot of measurements are still made on a short-term base or are restricted to a single issue," says project co-ordinator Professor Martin Visbeck, "the data is not necessarily compatible with other measurements and, in some cases not freely available."

Furthermore, data from the deep Atlantic ocean is still scarce. "Studies in recent years have repeatedly shown that even processes in the deep sea have an impact on the marine ecosystems and on climate in Africa, Europe or America," says Professor Visbeck. "There have been not enough interactions between the physics, chemistry and ecology but also between open-ocean and coastal observing. The ocean is a highly complex and interdependent system in which all components are closely linked. Our observational efforts need to reflect that also. We have set ourselves very ambitious goals. But the relevance of the Atlantic for Europe is too significant to explore it only in bits and pieces."

In 2013, the United States, Canada and the EU committed themselves to strengthening their co-operation in the sustainable exploration of the Atlantic by signing the Galway Statement on Atlantic Ocean Research Cooperation. The aim of this cooperation is a better understanding of the Atlantic Ocean and a more collaborative and sus-

tainable management of its resources. For more information on the AtlantOS project visit www.atlantos-h2020.eu

New EMODnet Video - Watch it now!

EMODnet are delighted to present a short video showing why the Blue Economy needs better information on seas and oceans and how the European Marine Observation and Data Network (EMODnet) is contributing to the EU's Marine Knowledge 2020 initiative. Please watch the video and share the link: <http://www.emodnet.eu/video>

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

7th-10th July 2015: 'Our common future under climate change' conference

UNESCO, Paris, France

This scientific conference will present updated knowledge and address key issues concerning climate change in the broader context of global change. <http://www.commonfuture-paris2015.org/>

10th July 2015: 5th UK Algae Conference

Glasgow, UK

The Systems, Power and Energy Research Division at the University of Glasgow will host the 5th UK Algae Conference. This has proven to be a successful event in the past, with a turnout of over 130 academic and industrial delegates, including leading scientists and multinational R&D companies from algae and renewable energy research fields, attending the last conference held by Cranfield University, June 2014. I would like to extend an invitation to you to attend this free event, it is a great opportunity to network with your peers as well as leading academic scientists. Discover and share pioneering algae research,

from applications in wastewater bioremediation, biofuel development, photobioreactor design and technology, synthetic engineering, photosynthesis and lipid research and more.

We would greatly value your involvement at this event and would like to ask if you are able to sponsor this event to help raise the event profile, build on the success of previous years and to keep the event free for attendees. We plan to have space available where you can exhibit. The event registration webpage will open shortly, we shall update you with news on the schedule and speakers over the next few weeks. If you are interested in sponsoring this event, to see how this can benefit your company, please get in touch as soon as possible.

Email: j.mcmillan.1@research.gla.ac.uk

Email: eng-ukalgaconference5@glasgow.ac.uk

29th-30th July 2015: Fisheries Innovation Scotland's first Annual Scottish Fishing Conference (ASFC)

University of St Andrews, Scotland, UK

The main conference theme will be:

"Working with the Landings Obligation"

The 2015 ASFC will highlight the latest advancements in understanding and working with the complexities of the Landings Obligation, and will include examples of progress made internationally. Current knowledge gaps will be identified, and a plan for practical and tactical research to overcome these will be formulated.

The main conference on July 30th will be opened by the Cabinet Secretary for Rural Affairs, Food and the Environment, **Richard Lochhead MSP**, and will feature presentations from national and international experts from within the industry and from its supporting science/policy/management base. There will be ample opportunity for structured workshops and discussion, as well as informal networking.

A Conference Dinner, with guest speakers, will be held in the splendid University of St Andrews Lower College Hall on the evening of 29th July and proceedings will be brought to a close by an informal social event for delegates the following evening. The ASFC is intended to be industry focussed and as such we would particularly welcome delegates from the following groups;

- Fishermen and vessel owners from fleet segments affected by the Landings Obligation

- Fishing industry organisations
- Processors and manufacturers associate with the fisheries sector
- Retailers
- Policy makers
- Fisheries scientists
- Fisheries managers

Registration and attendance of the Conference and dinner are complimentary; however, delegate places are limited and those wishing to attend should register early. Delegates will be expected to make their own arrangements regarding accommodation; however, we would highly recommend the University of St Andrews' Agnes Blackadder Hall: agnes.blackadder@st-andrews.ac.uk. To register, and for further information on the conference programme (also attached), please visit the FIS website at www.fiscot.org/asfc-2015

23rd-26th August 2015: Aquaculture 2015

Montpellier, France

Aquaculture 2015, using the motto Cutting Edge Science in Aquaculture will highlight the top scientific approaches being used to advance the global aquaculture industry. The conference is a must if you and your research group are at the cutting edge of aquaculture science, especially if your research is advancing aquaculture diseases, feeds, genetics, ecological interactions, and sustainable systems.

Topics:

- Research innovations on aquaculture's interactions with the environment
- Modern methods for disease detection and control
- Applications for physiology and experimental biology to improve the sustainability of aquaculture
- New targets and tools for selective breeding of aquaculture species
- Nutritional advances using molecular techniques
- The governance of aquaculture value chains

For further information, visit: www.aquaculture-conference.com

30th August-2nd September 2015: 9th European Conference on Marine Natural Products

The University of Strathclyde, Glasgow, UK

9TH EUROPEAN CONFERENCE ON MARINE NATURAL PRODUCTS

KEY DATES:
 Abstract Submission Deadline: Friday 1st May 2015
 Abstract Notification to Authors: Monday 11th May 2015
 Early Registration Deadline: Friday 22nd May 2015

WWW.ECMNP2015.COM

THE UNIVERSITY OF STRATHCLYDE, GLASGOW, SCOTLAND
 30 AUGUST TO 2 SEPTEMBER 2015

Address: C/O In Conference Ltd, Unit 1, Q Court, Quality Street, Edinburgh EH4 5BP
 TEL: +44 (0) 131 336 4203 • Email: ECMNP2015@in-conference.org.uk

14th-18th September 2015: 3rd CLIOTOP Symposium

San Sebastian, Spain.

Objectives

- Evaluate impacts of climate variability and change over seasonal to decadal time scales on pelagic species and dependent socio-economic and management systems.
- Identify risk assessment and evaluation tools that incorporate climate variability in order to improve sustainable resource management (conservation, fisheries, spatial planning, etc.).
- Identify sustainable pathways for coupled socio-ecological oceanic systems.
- Position CLIOTOP-science for the next 10 year phase as part of Future Earth, and build a collaborating community of scientists, managers, and policy-makers.

Themes

- Early life history of pelagic species – winners and losers in the future ocean.
- Implications of potential distribution shifts in oceanic organisms for food security and species conservation.
- Trophic pathways in open ocean ecosystems – changes in mid-trophic level community composition as a result of changes to physical, chemical and biological components of the marine environment.
- Integrated modeling to project and explore future patterns, including evaluation of model complexity vs generality, evidence of important processes to include in models, and evaluation of model results.
- Socio-economic aspects and management strategies – what are the key needs and resulting decisions and actions that should guide oceanic resource management under climate change.
- Influence and role of biophysical and biogeochemical processes and feedbacks on top predators.
- Biodiversity, conservation and adaptive management – future strategies for incorporating long term change.
- Scenarios of large marine organisms and their fisheries in changing marine ecosystems.

In all themes, submissions that take a comparative approach across taxa, regions, or temporal periods are encouraged.

Organizing committee

Alistair Hobday (Australia)
 Haritz Arizabalaga (Spain)
 Kevin Weng (USA)
 Karen Evans (Australia)
 Joel Llopic (USA)
 Lisa Maddison (Norway)
 Dan Costa (USA)
 Elliot Hazen (USA)

Scientific committee

Kevin Weng (USA)
 Alistair Hobday (Australia)
 Gorka Merino (Spain)
 Maria Gasalla (Brazil)
 Bob Cowen (USA)
 Patrick Lehodey (France)
 Osamu Abe (Japan)
 Olivier Maury (France)

<http://www.imber.info/index.php/Science/Regional-Programmes/CLIOTOP>

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.

Important dates:

Registration and abstract submission opens:

Monday 30th March 2015

Abstract Submission deadline: **Friday 17th July 2015**

Registration deadline: **Friday 28th August 2015**

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 Plan-
ning Building, University of Sheffield

Contact: John Bacon (john.bacon@cefas.co.uk)

**30th September-2nd October 2015: 5th MASTS
Annual Science Meeting: Influencing our Ma-
rine 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

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.

If you would like to exhibit at the event, or showcase a piece of equipment please contact ecd2@st-andrews.ac.uk for details

For more details visit:
<http://www.masts.ac.uk/about/annual-science->

www.challenger-society.org

meeting.aspx, or contact me, Emma, at ecd2@st-andrews.ac.uk

Abstracts are now also invited for a special session on Biohazards which could include topics such as marine invasive species, harmful algal blooms, jellyfish, risk assessment, economics, environmental implications of biohazards etc. Presentations should be 15 minutes long and should be accessible to other disciplines by avoiding jargon and keeping technical details simple. Guest speaker Dr Bella Galil.

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



The poster for the Scottish Inshore Fisheries Conference 2015 features a blue and green wave logo on the left. The text on the right, set against a yellow background, reads "FRIDAY 9 OCTOBER EDEN COURT INVERNESS". Below this, a photograph shows several fishing boats in a harbor. The text on the left side of the poster includes: "It's your opportunity to have a say on how inshore fisheries are managed!", "The third Scottish Inshore Fisheries Conference will be held on Friday 9 October 2015 at Eden Court, Inverness, and will be of real interest to active fishermen. The event will provide an informal opportunity to meet fishermen and others from around Scotland with an interest in inshore fishing.", "The conference will provide the opportunity to share experiences and knowledge in an informal setting on a wide range of issues. This will include long-standing fisheries management challenges and actions, and proposals to improve the evidence base on which fisheries management decisions are made.", and "For more information visit: www.gov.scot/Topics/marine/Sea/Fisheries/InshoreFisheries/InshoreFisheriesConference". The logos for "marine scotland" and "The Scottish Government" are at the bottom right.

**20th October 2015: EMODnet Open Confer-
ence**

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 informa-

tion 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 or-

ganised. 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

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



AMBIO VII: Advances in Marine Biogeochemistry Conference

Save the date!



January 6th-8th 2016 University of Oxford
Coming to the Department of Earth Sciences: The 7th biannual meeting of The Marine Biogeochemistry Forum - Special Interest Group of The Challenger Society for Marine Science. Further announcements to follow.

Registration opens in August 2015

Convenors:
Will Homoky (Oxford)
Gary Fones (Portsmouth)

For latest info: www.challenger-society.org.uk @challengersoc #ambioVII

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-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 31st July.

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



Assistant Professor in Marine Physiological Ecology

The Virginia Institute of Marine Science (VIMS) has a three-part mission to conduct interdisciplinary research in coastal ocean and estuarine science, educate students and citizens, and provide advisory service to policy makers, industry, and the public. The School of Marine Science (SMS) at VIMS is the graduate school in marine science for the College of William & Mary. Chartered in 1940, VIMS is currently among the largest marine research and education centers in the United States. VIMS employs approximately 60 full-time faculty members, more than 250 staff, and enrolls approximately 100 graduate students in master's and doctoral programs. VIMS consists of four collaborative, interdisciplinary academic departments: Aquatic Health Sciences, Biological Sciences, Fisheries Science and Physical Sciences. Further information on VIMS and the SMS may be accessed online at: www.vims.edu.

Assistant Professor in Marine Physiological Ecology: We invite applications for one tenure-eligible Assistant Professor position in the School of Marine Science, VIMS. The position is expected to begin in spring or summer 2016.

Qualifications: The successful candidates will hold an earned doctorate (Ph.D.) or terminal degree by the time of the appointment in Marine Biology, Biological Oceanography, Marine Ecology, or a related discipline. Candidates must have a strong publication record commensurate with experience, and demonstrated potential to establish an active research program and provide excellent graduate student teaching and mentoring. Preference will be given to candidates with research interests in the **physiological ecology of marine organisms in the context of global and environmental change**; individual interests could span from local to global scales and across multiple levels of biological organization. Areas of particular interest include physiological, molecular, and/or ecological responses of marine organisms, including marine plankton or benthic macro- fauna or flora, as well as communities and ecosystems to natural and anthropogenic stressors in the context of climate or other environmental change.

We particularly welcome applications from candidates with interests complementary to the expertise of current VIMS faculty and researchers, and from those using biochemical, molecular, and/or quantitative tools to understand the effects of human activities on estuarine, coastal, or oceanic ecosystems.

Responsibilities: The successful candidate will develop and maintain an active research and publication program, advise graduate students and teach core and advanced courses, participate in College and VIMS/SMS governance, and provide service to the Commonwealth. Candidates who are prepared to engage in cross-disciplinary research, teaching and service will be especially welcome.

Application materials for the position listed above should include: 1) a cover letter describing professional education, experience, and suitability for the position; 2) a full curriculum vitae; 3) a research statement; 4) a teaching statement; 5) PDFs of three representative publications; and 6) the names, addresses (including titles and institutions), email addresses, and telephone numbers of four professional references.

Application materials should be addressed to the Chair of the **Marine Physiological Ecology** Committee, and will be accepted through our On-Line Application System at <http://jobs.wm.edu>. For full consideration, complete application materials are due by July 15, 2015; however, applications will be accepted until the position is filled.

The College is an equal opportunity/affirmative action university and conducts background checks on applicants for employment. Applications by persons from under-represented groups are strongly encouraged.

WEB DEVELOPER (FULL-TIME)

£30,237.03 per annum

SIR ALISTER HARDY FOUNDATION FOR OCEAN SCIENCE (SAHFOS)

Plymouth, Devon, UK

<http://www.sahfos.org>

The Post

SAHFOS, a UK registered international charity, is looking to appoint an enthusiastic, full stack Web Developer to build interactive and informative web portals for the Foundation, incorporating intuitive data visualisation and summarisation of our unique datasets.

The CPR Survey

The Survey, started in 1931 and managed by SAHFOS since 1991, collects epipelagic plankton from CPRs towed by volunteer merchant 'ships of opportunity' on regular monthly routes in the North Atlantic, North Sea, North Pacific and Southern Ocean. Recently, the Survey has expanded into the Arctic Ocean and has carried out one-off surveys in the Indian Ocean, Baltic and Mediterranean Seas.

The analysis has generated a temporally and spatially unique dataset that provides a range of environmental and climatic indicators used throughout the world by marine scientists and policy makers. It helps them to address marine environmental management issues such as harmful algal blooms, loss of biodiversity, pollution, eutrophication, climate change and problems with fisheries. The CPR Programme is the longest, most geographically extensive marine biological survey in the world that has produced a unique dataset of marine biodiversity.

Requirements for the Post

You will need to have demonstrable skills in key web technologies including HTML5, CSS3, Javascript/AJAX, SQL, C#, ASP.NET and web analytics. You will have good communication skills, be adaptable and able to work as part of a team and independently.

It would be advantageous to have experience in the following: Umbraco, or similar Content Management System, design experience with Adobe or similar, Git or other version control system, familiarity with a Linux environment with scripting in bash/Python and a working knowledge of WebGL and OGC standards.

Responsibilities

- Maintain and develop the SAHFOS websites: SAHFOS, Global Alliance of Continuous Plankton Recorder Surveys (GACS) and Life Adrift sites
- Develop any ad hoc websites as required (i.e. Zooplankton Workshop)
- Develop web services for handling data requests and auto-minting Digital Object Identifiers (DOIs)
- Develop interactive data visualisation and web based products from SAHFOS science
- Develop scientific visualisation through commissioned research ideas to build upon SAHFOS web services and data visualisation capabilities
- To provide limited backup for the IT Manager in his absence

Conditions

SAHFOS working day is 0900-1730 Monday – Thursday and 0900-1700 Friday and has a flexible working arrangement.

July 2015

SAHFOS operates a Group Personal Pension Plan. A sum equivalent to 10% of the employee's salary will be contributed by the Foundation on successful completion of the probation period of 6 months; this is not backdated.

The annual leave allowance is 30 days per annum plus statutory Bank Holidays.

Informal enquiries concerning the post can be made to Darren Stevens 01752 633208 dpst@sahfos.ac.uk.

Interviews will be held in Plymouth, Devon on **21st July 2015**.

As part of the interview you will be required to present and discuss a mocked-up design for a new SAHFOS website.

Links to examples of previous work, either professional or hobbyist live website designs, should be included in your CV/covering letter.

References will be sought prior to interview unless advised otherwise.

Applications in the form of a CV, covering letter and names and contact details of two referees should be submitted by **10th July 2015** to:

Marion Smith, PA to the Director, SAHFOS, The Laboratory, Citadel Hill, Plymouth, PL1 2PB
Tel: 01752 633271. E-mail: sahfos@sahfos.ac.uk

3 PostDocs and 4 PhD opportunities

Centre for Marine Socio-ecology, Hobart, Tasmania, Australia

Deadline for applications: 31 July 2015

More info: <http://marinesocioecology.org/opportunities-2/>

Data management and visualization, SOCIB, Palma de Mallorca

**Vacancy notice****Publishing date:** 12 December 2014**Closing date:** Vacancy will remain open until filled

Vacancy number 3	Number of Posts	Type of Contract	Observation
Data management and visualisation for the Sur Baleares project	1	3 years	SUR_BALEARES, 3 years project

Duties:

In the SUR_BALEARES Project, the applicant will work to guarantee a seamless access to the data streams generated by the different platforms included in the Sur Baleares project. This includes the registration of platforms, the processing, quality control and visualisation of observations, both in real-time and delayed mode.

The main tasks are:

- 1- Registration of the platforms deployed during Sur Baleares and management of the generated data.
- 2- Implementation of automatic, world class quality checks on data, based on existing references.
- 3- General improvement of the data access for different types of users, through the development of specific web applications and services.

Education and experience:

We are seeking a highly motivated individual with a strong background in programming and data base management.

The applicant will have specific education in quality control systems and data visualization.

Experience in atmospheric and oceanic sciences is also welcome.

Preferred knowledge & skills:

- Data analysis tools, preferably using Python (NumPy, SciPy, Matplotlib) or Matlab/Octave.
- Relational Databases, preferably PostgreSQL/PostGIS.
- NetCDF format and CF (Climate and Forecast) conventions. Specifically, treatment of different data types : time series, grids (2D/3D/4D), trajectories, etc.

-Development and maintenance of software for automatic Quality Assessment and Quality Control procedures.

-Experience in programming in Java.

Finally, teamwork skills are essential, as the tasks will be carried out in close collaboration with enthusiastic teams of computer specialists, scientists, technicians and engineers.

For further information send detailed CV, explicitly indicating your experiences and skills related to the post, as well as details on two potential sources of references, please contact info@socib.es. Please indicate the vacancy number 3 in the email subject.

SUR_BALEARES project description:

The area south of the Balearic Sea, focused on the Ibiza Channel, is a hot spot of biodiversity related to the interaction between Atlantic and Mediterranean waters. The main elements of this project are: its focus in the south of the Balearic Sea, the multidisciplinary processing and integration of data from the multi-platform observing system as well as the development of a new quality control system and data visualization that will guarantee an international standard which is essential in order to create new products and services. The project will have duration of 3 years.

www.socib.es

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