

THE marine

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scientist

Hurricane Sandy

Ocean Fronts

Open Access to Marine Science



marine Scientist

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The future of marine science

The collection of scientific data, particularly long-term data, is vital for our knowledge of the natural world. A self-evident concept to *Marine Scientist* readers perhaps, but if a theme can be discerned in this issue, it is on how marine data is (or should be) used for decision-making on marine environments.

Along with reports on the US Integrated Ocean Observation System, on a strategy for UK marine science for the next 20 years, an assessment of priorities for the conservation of biodiversity in a marine context, there is also a brief preliminary report on the recent decision by the European Union on measures to reform the common fisheries policy.

Whether the practice of harvesting fins from shark species leads to a scientifically measurable reduction of these species, some of which are already endangered or threatened, is also considered. Another important issue – that of 'Open Access' of marine science data – is considered by science journalist Eric Marx. The community of marine scientists needs to be dynamically involved in the ongoing debate about where payment should take place in the chain of science data collection and its reporting of them to the wider community.

The use of satellite data to predict 'ocean fronts' – areas of upwelling water loaded with nutrients – is looked at by Kelvin Boot. Such areas are not in the more traditional zones of breeding and so often escape notice, despite their being crucial in survival of populations, providing feeding 'corridors'. The use of such data has been shown



Bob Carling
Editor

to work in UK waters and has been used recently to determine some Ecologically or Biologically Significant Areas (EBSAs) off the coast of South America.

In a feature-length article, IMarEST Fellow John Englander contemplates the scientific assessment of sea level rises and the significance of hurricane Sandy in the USA. Added to this is a recently published report 'Coastal Impacts, Adaptations, and Vulnerabilities: A Technical Input into the 2013 National Climate Assessment', with authors from National Oceanic and Atmospheric Administration, the US Geological Survey, and various prestigious universities. The report emphasizes the importance of increased coordination and planning to ensure that US coastal communities – making up an estimated 50% of the US population and \$8.3 trillion to the 2011 US economy – are resilient to climate change effects.

With Lord Stern saying at the World Economic Forum, Davos, in January that he probably *underestimated* the effects of climate change in his 2006 report and with Jim Yong Kim, President of The World Bank, saying that "Just as the Bretton Woods institutions were created to prevent a third world war, the world needs a bold global approach to help avoid the climate

catastrophe it faces today", timely scientific data from marine scientists are clearly crucial.

However, short-term thinking and the excoriating effect of budget cuts are having a devastating effect on the future of marine science. An example of this is the threatened closure of Cumbria's University Marine Biological Station Millport (UMBSM), reported on in this issue. With over 30 universities worldwide using the UMBSM, and so few universities having marine and coastal habitats on their doorstep, such residential field courses are essential, although this appears to be falling on deaf (financial) ears.

This closure has worrying implications for the future education of marine scientists, leaving aside the impact that it would have on the local economy. It has prompted widespread concern from many and stimulated social media campaigns to save it. The training of all biologists – not just marine biologists – is only really complete when students experience plants and animals in the natural habitat, i.e. on field courses. As the UMBSM website says, training in fieldwork is "essential to the competence and employability of any 'whole organism' biologist, especially any ecologist or environmental manager". Now, more than ever, the present and future of marine science is hugely important.

As ever, please keep your comments coming in on what topics should be covered by *Marine Scientist* – send to the editor Bob Carling bob.carling@imarest.org.

Editor
Bob Carling
bob.carling@imarest.org

Publisher
Derek Wood
derek.wood@imarest.org

Advertisement Manager
For media rates and data contact:
Peter Marpuri
peter.marpuri@imarest.org

Group Sales Manager
Cheryl Fraser
cheryl.fraser@imarest.org

Publication Sales & Subscriptions
Lorraine Small
lorraine.small@imarest.org

Graphic Designer
Jo Cooper
jo.cooper@imarest.org

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Aldgate House, 33 Aldgate High Street,
London. EC3N 1EN
Tel: +44 (0)20 7382 2600
Fax +44 (0)20 7382 2669
Email: info@imarest.org
www.imarest.org

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• Threatened closure of Millport

Just before Christmas, news of the impending closure of the University Marine Biological Station Millport (UMBSM) broke. The UMBSM relies on a grant from HEFCE (Higher Education Funding Council for England) but the University of London formally informed the staff at UMBSM that this funding will be withdrawn. Therefore, on 31 January 2013, the University of London's Board of Trustees "accepted a proposal to enter into a redundancy consultation process with staff currently employed at the UMBSM". This process is expected to be completed by 20 March 2013 and that "On that date, the Trustees will be asked to make a final decision on the future of UMBSM".

The University of London has also said that it "continues to welcome any suggestions from interested parties to help secure a long term viable future for UMBSM, either as an academic facility or in some other capacity" and that "It is available for discussions at short notice wherever appropriate with local, regional and national Scottish interests." However, previous discussions between the University of London and St Andrews University about a joint management venture have already taken place but have fallen through.

Marine Scientist asked Professor John Davenport, the previous director of Millport Marine Station, and now Emeritus Professor of Zoology, University College Cork, for his reaction:

"The Millport Marine Station on the Isle of Cum-



brae was opened at the turn of the 19th and 20th centuries and has been involved in marine biological research and teaching ever since. It was sited on Cumbrae because the fauna and flora of the surrounding Clyde Sea area is very rich, and the island itself provides rocky and sandy shores, both exposed and sheltered, within easy reach (minutes) of the Station itself. For much of its history it was the base

of the organisation now known as the Scottish Association for Marine Science (SAMS), but in the late 1960s SAMS moved to a new research laboratory at Dunstaffnage, near Oban where it remains to this day. This posed a problem for those UK universities that had taken field courses (vital to the teaching of marine biology) to Millport for many years. Accordingly, the Station was taken over in 1970

by the university sector to provide a variety of crucial services to universities throughout Scotland, England and Wales. Two universities were chosen to manage the Station, London and Glasgow, with the University of London being the dominant partner and the official employer. In the late 1960s both universities were major players in the marine biological area."

"The Station, which has good transport links and can be reached within a day from anywhere in the UK, developed rapidly and became an extremely efficient way of delivering excellent field teaching and research support at undergraduate and postgraduate level to around 1000 students per year from a shifting population of around 30-35 universities, mostly from the UK, but also from Europe. Resident PhD students were also recruited by the UMBSM academic staff. The Station has residential accommodation for more than 80 students, proper lecturing and laboratory facilities, plus large stores of field survey and sampling equipment. It also has two modern research/teaching vessels and up-to-date SCUBA diving facilities. All of this permits very intensive teaching that I have experienced from three viewpoints – I was Director of the Station from 1991-1999, so was then tasked with delivering the UMBSM mission, I have also been a direct 'customer' of UMBSM whilst subsequently working at University College Cork, Ireland, accompanying undergraduate and MSc courses that have studied annually at Millport for

• MBE for Marine Current Turbines founder

Professor Peter Fraenkel, co-founder of Marine Current Turbines and its technical director until 2011, was made an MBE in the Queen's New Year Honour's list. He was rewarded for services to the UK marine energy industry. Fraenkel has played a big part in the development of tidal current energy for almost 20 years. Most notably, he invented the award-winning SeaGen, the world's largest grid-connected tidal stream turbine, which was installed in Northern Ireland in 2008. He was a founder of the



Peter Fraenkel

Image courtesy of Marine Current Turbines Ltd

British Wind Energy Association, now Renewables UK, is a Fellow of the Institution of Mechanical Engineers and the Energy Institute, and a Visiting Professor at the University of Edinburgh.

marine biological station

several years, and finally I have acted an External Examiner over the past 20 years at several UK universities that have used the Station extensively in their teaching, so have seen the written reports that stems from such courses.”

“Intensive field courses are vital to the development of basic biological knowledge, good environmental awareness and understanding, plus a variety of vital practical skills, including teamwork performed under adverse conditions. A London-based academic administrator (an accountant) once said to me “If you need to take students to the seaside, why don’t you just take them to Brighton for the day – why on earth do you want to go hundreds of miles to Scotland for a week?” This attitude sums up the uninformed idea that a field course is a) trivial and b) a sort of holiday! A typical Millport field course consists of about a week of early starts and days filled with activity (ruled by the tide tables and timing of sunrise/sunset!) until 10 pm. Students learn taxonomy, come to understand fundamentals of ecology and the influences of environmental gradients and usually perform short projects that require self-organisation and a variety of observational and sampling skills. Practical classes are long and interrupted only for meals provided by the Station cooking staff in the nearby canteen. All of this is supplemented by 2–3 lectures per day and the deployment of statistical expertise on real data. Each class is entitled to shiptime, involving short

trips into the nearby sea to trawl, use bottom sampling grabs and plankton nets and to sort catches by hand on the open deck. Typically, 40+ students can be taken to sea within half a day (Board of Trade regulations limit teaching trips to 12 students, whatever the size of boat) – and then have material to work on for a couple of days afterwards. Again, the Millport Marine Station is ideally suited for such work – only in the most severe weather are boat trips cancelled, and the nearness to deep water allows trawls to be deployed within 15 minutes of leaving the Sta-

tion pier. So, a Millport course is hard work and normally represents a full module for the university group concerned, equating to 6 weeks’ practical work at the home university. The more savvy groups take the opportunity to collect large amounts of data from rocky and sandy shores, plus laboratory experiments on freshly-collected material, thus stretching the value of the course for weeks afterwards, so that the course may function as a double module.”

“Financing of UMBSM has always involved substantial support from the Scottish

and English university funding councils and their predecessors, as well as financial input from the universities of London and Glasgow. The Station is a centralised facility that delivers excellence; none of the 30+ universities that use it regularly could possibly individually afford the ships, multiple microscopes (100+), computing facilities and one of the best specialized teaching libraries in the UK, all of which the Millport Marine Station provides. Unfortunately the two parent universities have changed greatly in the last 40 years (the University of London has fragmented and the influence of its central administration greatly shrunken; the biological departments of both universities have moved in the direction of biomedical studies and away from environmental science). Glasgow University withdrew from the management of UMBSM some time ago, and negotiations with St Andrews University (now a great centre of marine biology) have been stymied by lack of investment by the ‘parent’ universities and the now threatened withdrawal of funding by the Higher Education Funding Council for England.

“The Millport Marine Station’s plight is an impending example of the ‘tragedy of the commons’ – a sensible, valuable and rational facility for the whole tertiary sector of the UK that is likely to close because of the inability of the users to agree on a sustainable funding model!” ©

UMBSM website:
<http://www.gla.ac.uk/centres/marinestation/>

• The Marine Science Lecture Series

The Sea Changes Lecture Series: A series of lectures examining the relationship between Marine Science, Technology and Engineering.

These lectures are free to attend so come along to express your views in the audience to add to the debate and join the informal discussion afterwards with a glass of wine and canapés.

Forthcoming lectures:

Shipping and the Environment Lecture, Monday 18th March 2013, UCL, London

Invasive Species Lecture, Tuesday 7th May 2013, UCL, London

Previous lectures:

Marine Hazards: Waiting for the Flood, Monday 21 January 2013, UCL, London

Presented by: Professor

David Pugh, Visiting Professor and Fellow of Liverpool University and the UK National Oceanography Centre

Chaired by: Dr Alistair Greig, UCL Mechanical Engineering

Panel Members: Dr Tiziana Rossetto, UCL Civil, Environmental and Geomatic Engineering and Dr Helene Joffe, UCL Reader in Psychology specialising in the perception of risk

Hurricanes Katrina and Sandy, and the recent major Indonesian and Japanese tsunami have shown we can expect no mercy from marine flooding. This talk looked at the science of sea level extremes, and whether we can, or should, defend against the next big flood. It was followed by a panel discussion on the arguments, economic and social, for action.