
UNIVERSITY OF Southampton

Issue 7 | Spring 2011 | Ocean and Earth Science

# SOES News

Welcome to SOES News - the School of Ocean and Earth Science (SOES) magazine for current and prospective students, alumni and friends. We look forward to sharing exciting updates on our world-renowned scientists, features on cutting-edge research, profiles about our talented alumni, and fun stories about our students. Enjoy!



National Oceanography Centre, Southampton

## In Memoriam: Professor A.P.M. (Peter) Lockwood MA, PhD, FRSA, FRSE (1931-2011)

The death of Professor Peter Lockwood breaks another link with the apparent golden age of investment in science, technology and universities during the 1950's and 60's. Peter was educated at St Paul's and Westminster, and after National Service in the Royal Artillery, went to Cambridge to read Natural Sciences. After graduating in 1954, he began post-graduate research on marine osmoregulation under the supervision of J. A. Ramsey and pioneered the use of radiotracers, developing techniques that are still the definitive means of quantifying ion and water fluxes in aquatic animals.

After the award of his doctorate, Peter took up an assistant lectureship in Edinburgh and then in 1962 he moved to Southampton to join John Raymont in setting up the multi-disciplinary Department of Oceanography. Later, as Head of department, he bore the responsibility of guiding the department through several years of dramatic change in the 1980's, that saw it emerge from the review of university oceanography and change from a post-graduate-only teaching unit to a much larger body with its own undergraduate degrees. Despite administrative pressures, Peter was active outside the department, working on behalf of the Biological Council and UNESCO and also continuing with his own research. Peter's books and many scientific papers covered the physiology and ultrastructure of estuarine animals, the distribution of relict isopod populations, as well the construction of artificial reefs in the Cayman Islands and Poole Bay, taking in diving physiology, the haemolymph of Peripetus and the impact of alien species carried in ballast water.

Those of us who knew Peter will remember him as unfailingly courteous with a dry sense of humour and possessed of a sharp intellect coupled with an immense breadth of knowledge within and without the bounds of marine biology.

Peter died peacefully on 2 January, 2011 and is survived by his wife Kathleen and their three children.

# Silver success for SOES Imperial Barrel Team

**A team of five Ocean and Earth Science undergraduate MSci students have come second at the 2011 American Association of Petroleum Geologists (AAPG) Imperial Barrel Award global finals in Houston.**

After winning gold at the European round of the annual hydrocarbon prospect evaluation competition in Prague, the Southampton team members, Peter Heath, Louise Moorhead, Nathan Payne, William Symons and Marcus Wiltshire, travelled to America to present the results from their analysis of a geophysical and geological data set based on a 600 km$^2$ site in the Netherlands.

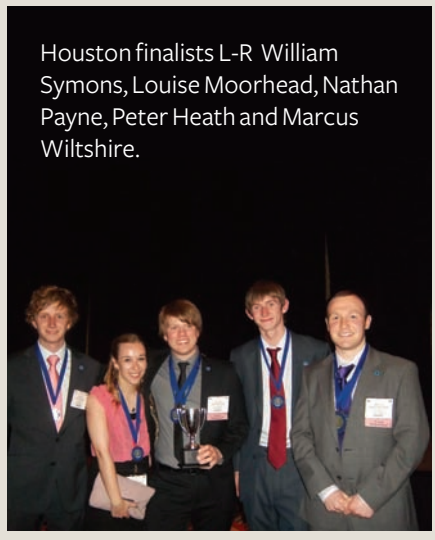
Their presentation contained an assessment of the potential of the area for hydrocarbon exploration and production, considering issues such as economics and risk, and recommendations about potential development. The competition is designed to mimic an industry exercise, so providing first-hand experience for competing students as to how their degree transfers to this environment.

Twelve teams from around the world competed at the Houston finals, selected from 97 universities who initially entered their regional competitions. The SOES team came second behind the University of Texas at Austin, securing the Selley Cup and a $10,000 prize for the University of Southampton, which will be used to further petroleum geoscience education.

Professor Tim Minshull, Head of the School of Ocean and Earth Science says: "Our students have worked exceptionally hard and I congratulate them on their achievement. This result, following strong performances in the European competition for the last three years, illustrates the strength of geoscience education at Southampton and how well prepared our graduates are for future employment in a global market."

Southampton geology graduate Dr John Cousins spent over 30 years in the oil and gas industry and recently retired from Exxon Mobil Exploration Company as Executive Vice President. John lives in Houston and watched the Southampton student team give their award-winning presentation at the IBA competition. "Southampton's second place finish in Houston is a truly commendable achievement, particularly considering the fierce competition from teams around the world representing universities specialising in Petroleum Geoscience," said John. "I have no doubt Southampton's students have the skills and training necessary to excel in the world's major oil companies."

Reflecting on the experience, Geophysics student Louise Moorhead said: "The IBA is a fantastic learning experience with the opportunity to gain a real feel of the petroleum industry and to compete against some of the most talented students around the world. I would definitely recommend it to other students as it is a great way to see how the theory we have learnt is put into practise in oil and gas companies."



Houston finalists L-R William Symons, Louise Moorhead, Nathan Payne, Peter Heath and Marcus Wiltshire.

# To the Moho and beyond!

Japanese drilling vessel *Chikyu* (JAMSTEC)

Photo: Antony Morris, Plymouth

Co-Chief Scientist Damon Teagle on the pier in Puntarenas Costa Rica shortly before boarding the *JOIDES Resolution* for the IODP Expedition 335 return to the Superfast site Hole 1256D. Below: Roller cones of a C-9 hard formation coring drill bit.

Photo: Johan Lissenberg, Cardiff

> **“A treasure trove comparable to the Apollo lunar rocks.”**

**This spring, researchers including Professor Damon Teagle of the University of Southampton, based at the National Oceanography Centre, Southampton will mark the 50-year anniversary of an ambitious project to drill to the mantle, by taking another significant step towards the same dream.**

In a comment in *Nature*, Professor Teagle and Dr Benoît Ildefonse, of Montpellier University in France, the co-chief scientists of the upcoming Integrated Ocean Drilling Program Expedition 335, say that drilling into Earth’s mantle is now possible and should hopefully begin within a decade. Next month, IODP Exp 335 scientists aboard *JOIDES Resolution* will drill into the intact lower oceanic crust for the first time to sample coarse-grained rocks called gabbros. These rocks make up the bulk of the oceanic crust and power black smoker hydrothermal systems.

Scientists’ eventual aim is to drill completely through the Earth’s crust under the ocean floor, across the Mohorovičić Discontinuity or ‘Moho,’ and recover for the first time pristine samples from the mantle. The mantle makes up the bulk of our planet, stretching from the bottom of the crust — at 30–60 kilometres under the continents but just 6 kilometres under the oceans — down to the core 2,890 kilometres below. In their paper published in *Nature*, the scientists write that retrieving a sample direct from the mantle would provide “a treasure trove comparable to the Apollo lunar rocks” and insight into the origins and evolution of our planet.

This goal has proven as difficult as going to the Moon: so far no one has drilled deeper than about 2 kilometres into the oceanic crust or a third of the way through. However, technology similar to that on the giant Japanese drilling vessel *Chikyu* (pictured) could in the foreseeable future be used to drill down to the mantle.

The idea to drill into the mantle was born at a drinking club of notable Earth scientists in 1957. ‘Project Mohole’ sailed in 1961. It took the first scientific core from the seafloor, and developed techniques for ocean drilling that are still used by the oil industry today. But it failed at its mission. Over the next few years, scientists will undertake seismic surveys to assess three Pacific Ocean sites, looking for the best place to reawaken this dream.

# At the front-line of the Deepwater Horizon

## Southampton graduates join the globa

***Southampton Geology graduate David White** (2000) **is a Response Specialist / Senior Consultant with Oil Spill Response Limited, the world's largest oil spill response organisation. David offers his perspective on the Deepwater Horizon Oil Spill and the containment efforts.***


OSRL Hercules and V

On the evening of 20 April 2010, 80 kilometres southeast from the mouth of the Mississippi River in the Gulf of Mexico, hydrocarbons escaped from the Macondo well onto the Deepwater Horizon rig resulting in an explosion and fire with the tragic loss of 11 lives. The fire continued for 36 hours until the rig sank, however hydrocarbons continued to flow from the reservoir for 87 days resulting in one of the most significant oil spill events in global history. US Government estimations suggest that a total of 4.9 million barrels were released. The resulting response to the incident involved numerous organisations from both the United States and internationally from over 16 countries. One such organisation that became heavily involved was *Oil Spill Response Limited*; an organisation based in Southampton that has close ties with the University of Southampton.

Owned by the global oil industry and primarily based in Southampton, Bahrain and Singapore, *Oil Spill Response* has stockpiles of specialist cleanup equipment and highly trained personnel that are available for mobilising to an incident anywhere in the world, 24 hours a day, 365 days a year. The organisation also operates two Hercules aircraft that can have spray systems fitted which enable large scale application of dispersant to marine oil spills. Smaller aircraft are also on standby covering the North Sea and West Africa, each of which offer surveillance and dispersant application capabilities. Other related services are also offered to the industry including oil spill training, equipment hire and consultancy. With the largest base being in Southampton, close ties have naturally developed with the University most visibly with a number of graduates working, or having worked for the organisation. Beyond this, *Oil Spill Response* has hosted research projects, supported career fairs and lectured on courses, and also provides a cash prize for the best project on the Environmental Science degree course.

The initial call from BP was for *Oil Spill Response* to mobilise half of its global stockpile of containment booms and other specialist equipment to the Gulf of Mexico. Both the Southampton and Singapore stockpiles were utilised, with over 2000m of offshore boom, 8000m of shoreline boom and 200 anchor sets being mobilised. This equated to 70 tonnes of equipment from Southampton and 41 tonnes from Singapore. In order to transport all of this equipment to the United States, two 747 freight aircraft were chartered, one from the UK and one from Singapore. In addition to this equipment, response personnel were requested by BP and later the UK-based *Oil Spill Response* Hercules aircraft along with a fitted aerial dispersant spray system.

*Oil Spill Response* personnel were actively involved in a number of areas within the overall response; being based in Command Centres providing technical advice, operating the organisation's Hercules aerial spray system, assisting in shoreline cleanup activities and working offshore. University of Southampton graduates rotated through practically all these positions. The graduates who currently work for the organisation and attended the response cover a range of course disciplines, including Geology, Oceanography, Environmental Science, Marine Biology, Geography and Coastal Engineering.

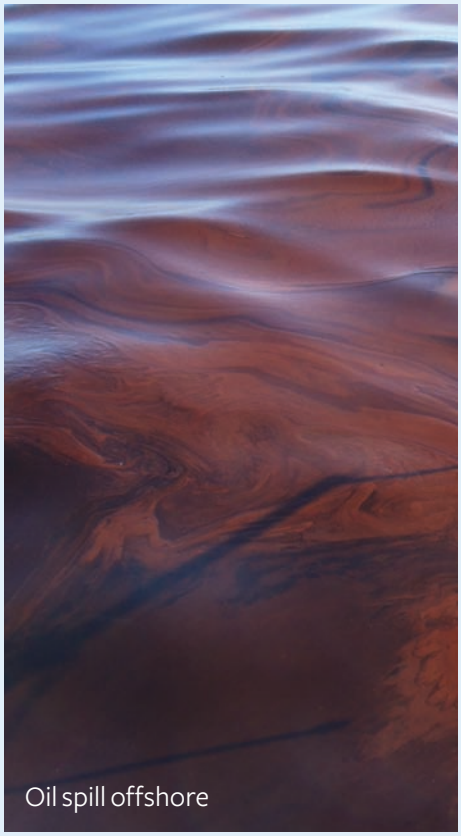
The *Oil Spill Response* Hercules was part of a fleet of aircraft that were coordinated to work offshore, applying dispersant to help break up and disperse the oil into the water column so that it can be broken down by marine organisms. At the peak of aerial operations, 127 surveillance aircraft and 12 dispersant spraying aircraft were being coordinated in the response.

Offshore, *Oil Spill Response* personnel worked on a number of supply vessels involved in dispersant operations. This included being the lead for applying dispersant at 'The Source'; the location where the Deepwater Horizon rig was located, and where well control activities were being undertaken. At the height of the incident, the spray operations at 'The Source' were on a 24-hour-a-day basis, with the aim to quicken the break-up and dispersion of oil, thus limiting the build up of any hazardous gases that may have posed a risk to those working in the area.

Another offshore operation where *Oil Spill Response* was heavily involved was the use of oceanographic equipment (fluorometers, a particle size analyser, a water quality meters, and sediment and water sampling apparatus) to monitor the efficacy of the dispersant operations, and to take samples and readings once these operations ceased. When oil slicks were present offshore, this operation focussed on collecting pre- and post-spray samples and data, for both vessel and aerial dispersant applications. Once the flow of hydrocarbons from the well had been stopped and no more oil was at

# oil spill.
# l response

essel (Southampton Water)


Oil spill offshore

Images: © BP

Working offshore

Offshore surveying and sampling operations


Applying dispersant


David White
Gulf of Mexico

sea, water column data was recorded along with taking sediment and water samples, with the aim to collect data that could be analysed to determine the presence of any dispersed oil.

With the oil impacting the shorelines, *Oil Spill Response* staff worked with local Command Centres in all affected States (Louisiana, Mississippi, Alabama and Florida) to advise cleanup crews on how to employ response techniques to maximise the effectiveness without causing any further damage to the environment. This role was also integral to ensuring good communications between the field, local Command Centres and the main Command Centres.

Now, *Oil Spill Response*'s presence in the Deepwater Horizon response has come to an end, with roles being handed over to local contractors as the activities move from an emergency phase towards a longer term restorative project. In terms of the amount of equipment and number of personnel mobilised by *Oil Spill Response*, the Deepwater Horizon incident was the largest to which the organisation has ever responded. Despite this draw on resources, the organisation still met its obligations to the global oil industry by being ready to respond to any other incidents that may have occurred. This was tested on several occasions during 2010 where the organisation mounted responses to other simultaneously occurring oil spills in various locations, all with their own diverse challenges and needs; North Sea, India, Indonesia, Kuwait, Malaysia, Nigeria and Singapore to name but a few.

David White graduated from the University of Southampton in 2000 with a degree in Geology. Following a period of travelling and undertaking a Master's degree in Marine Resource Development and Protection at Heriot-Watt University Edinburgh, David joined *Oil Spill Response* and has worked for them for over nine years. Further information about the organisation can be found at **www.oilspillresponse.com**

# Celebrating our people

Professor Harry Bryden, FRS

Dr Alberto Naveira Garabato

Professor Eelco Rohling

Casey Nixon

Dr Heiko Pälike

Michele Paulatto

Clara Bolton

Helen Miller

**SOES staff and students continue to make headlines with their achievements and accolades. We extend our congratulations to everyone.**

• Professor Harry Bryden, FRS was elected a Fellow of the American Geophysical Union (AGU) in recognition of his outstanding contributions to the Earth sciences. Since its inception in 1919, the AGU has played an important role in advancing the geophysical sciences, often through international scientific collaborations. Only eminent scientists who have made exceptional contributions to the field are nominated for Fellowships, and new Fellows are chosen by a Committee of Fellows.

• Physical oceanography expert Dr Alberto Naveira Garabato was awarded a 2010 Philip Leverhulme Prize. These prizes are awarded annually to the 'best young scientists in the UK.'

• Professor Eelco Rohling was awarded a prestigious Wolfson Research Merit Award by the Royal Society, the UK's national academy of science, to support his research on global ice volume, a key indicator of change in the global climate state and, through its control on sea level, a major concern to society.

• Casey Nixon, a second year PhD student in the Geology and Geophysics group, was presented with two awards for his research into Topology, Kinematics and Strain Variation within strike-slip fault networks, at the Tectonic Studies Group Annual Meeting in Durham.

• PhD students Steven Hollis and James Nowecki were recognised for their work at the Mineral Deposits Studies Group Conference. James won the award for Best Student Poster Presentation for his work on sedimentary copper mineralisation in the Yozgat-Delice-Yerkoy Basin, Middle Anatolia, Turkey. Steven was runner-up for his talk entitled: 'A multidisciplinary approach to VMS exploration in ancient collision zones: the Ireland - Newfoundland connection.'

• Dr Heiko Pälike has been awarded the prestigious Wollaston Fund, presented by The Geological Society, London, the learned and professional society for geoscientists in the UK.

• Michele Paulatto, a recent PhD student in SOES, has been awarded one of The Geological Society's President's Awards for 2011. Two or three of these accolades are awarded annually to young researchers of exceptional promise and ability in the Earth Sciences, and are the gift of the President of The Geological Society of London.

• Clara Bolton, a recent PhD student in SOES, has been selected by The Micropalaeontological Society to receive the Charles Downie Award for 2011. The award is made to recognise the most significant scientific paper published in a given year based on postgraduate research.

• Helen Miller, a PhD student in SOES, recently attended the BGS BUFI Science Festival 2011 (BGS University Funding Initiative) at the BGS headquarters in Keyworth and was awarded the 'Best Staff Poster Prize.'

# Oceanography graduate to row to the North Pole

**Army Captain David Mans, who studied BSc Oceanography with Physical Geography at Southampton has been chosen as part of a six-man team for a pioneering Arctic expedition - rowing to the North Pole.**

David Mans

They will set off from Resolute Bay in Canada in July 2011 for the six week 450 mile journey to magnetic north. The 28 year old won his place through a gruelling selection process involving hundreds of international entrants – including an endurance row lasting two and a half hours on indoor rowing machines.

The challenge is of global significance as both a pioneering maritime adventure and an environmental expedition – which is only now possible due to the increase in seasonal ice melt due to climate change.

"I've been interested in climate change since my time at Southampton and I'm looking forward to seeing conditions in the Arctic for myself," says David. "I've been rowing since my time at university and decided to take it up again after returning from serving in Afghanistan. This will undoubtedly be one of the biggest adventures of my life to date."

Further information can be found at **www.rowtothenorthpole.com**

# Create opportunity. Make a lasting difference for Southampton

As a SOES alumnus and friend, you will have experienced firsthand the University's commitment to innovative excellence in teaching and research.

We are committed to recruiting the most talented students and increasing the opportunities available to every student, regardless of their background. We prepare our students to become confident national and international citizens and the potential leaders of an increasingly globalised work environment. We aim to provide each generation of students with financial support and the highest quality of education using the best equipment and resources to enable then to go out into the world and make a difference in their chosen field.

At the University we also make world changing advances in research every day. We pride ourselves on being a place for opportunity and inspiration where our researchers can devise innovative solutions to address the global challenges we all face.

Our research is world leading and our reputation is one that you, as a graduate can be proud of.

You can play a vital role in the University's future by making a gift to support the University of Southampton. Support from alumni is helping to cultivate a rich and varied environment for outstanding learning and discovery and providing support for our outstanding students, academics and researchers both today and for the future.


Photo: Antony Jensen

A gift of any size makes an instant and lasting difference at the University and you can be reassured that you are helping to transform lives and investing in the next generation of great thinkers. Your gift will be matched under the Government's matched funding scheme and can also be Gift aided to make your support go further than ever before.

There has never been a better time to show your commitment to the University of Southampton.

# ‘Life after graduation’ careers event

**Continuing a successful tradition, Ocean and Earth Science alumni and companies returned to NOCS on 3 March, 2011 to participate in the 3rd Annual ‘Life After Graduation’ Careers Event.**

In 2009, the event was launched to help students learn directly from alumni about career opportunities and to provide a forum to network with national and global companies. The event has grown considerably in size and this year featured over 20 stands, a free networking lunch, panel discussions with alumni and several career talks. Over 300 students attended the day-long event and the feedback continues to be positive.

“Employability is a priority for the University and SOES graduates are highly regarded in a number of industries and fields,” said Joanne Donahoe, Associate Director, Development & Alumni Relations. “We appreciate the SOES alumni who returned to speak to our students and the many companies that participated in the event.”

Students who attended said that it helped them to improve their networking skills and their understanding of what job opportunities exist after graduation. “It was motivating to know that there is life after University if you’re proactive, even in a recession,” commented one student.

3rd Annual Careers Event, NOCS 2011

Photo: Barry Marsh

We extend a special thanks to everyone at NOCS who helped to make the event a success, particularly the GeolSoc and NOCSoc student volunteers.

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*You may also give on-line at:* ***http://www.soton.ac.uk/supportus/donatenow*** *and your gift will have immediate impact.*

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Front cover photo: Undergraduate winning team celebrate at NOCS.