

Issue 2 | Autumn 2008

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 on talented alumni, and fun stories on our students. Enjoy!

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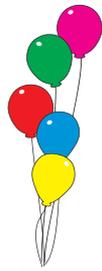
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**National Oceanography
Centre, Southampton**

UNIVERSITY OF SOUTHAMPTON AND
NATURAL ENVIRONMENT RESEARCH COUNCIL

SOES is 10 Years Old!



SOES is celebrating a special milestone—we are ten years old this Autumn. Celebrate with us at NOCS on 14th March, 2009.

SOES has become a leading school world-wide for educating the next generation of marine and Earth scientists and influencers.

“The merger of two small University departments in 1998 and the integration with the wider NOCS community has created a diverse and exciting School like no other,” said Dr Rachel Mills (Oceanography with Chemistry, 1988, Academic staff 1993 to present). “There are world experts in a huge range of subjects within a quick stroll from my office. There is always someone in the building who knows the answer to the question, or even better, has a great idea of how to go about solving it. The School is now 10 years old and the questions just get more interesting.”



We will be celebrating the 10th Anniversary of SOES at NOCS on **14th March, 2009**. The event will be held in conjunction with ‘Ocean and Earth Day’, the largest annual public event at NOCS, and a great opportunity to explore the UK’s #1 centre for marine and Earth science. Please save the date in your diary and we look forward to seeing you in March!

Front page photo: B. Marsh

A Memorable Graduation Marks School’s Tenth Year

The School of Ocean and Earth Science celebrated its tenth year with a memorable graduation ceremony and reception on 22 July.

After receiving their hard-won degrees, approximately 190 new graduates, their parents, families and friends joined academics and staff at the National Oceanography Centre, Southampton (NOCS) - where the School is based - to celebrate their success with champagne and strawberries.

The reception gave the graduates an opportunity to show off the unique waterfront setting for their studies. During their degrees, students work alongside the country’s foremost marine and Earth scientists, and a qualification from one of the world’s leading institutions in its field lends added kudos to their curriculum vitae.

Autumn 2008 marks the official anniversary for SOES, which was formed when the former departments of Geology and Oceanography merged in August 1998. The University of Southampton’s reputation is cited as

a primary reason for a student’s choice of institution. The University heads the Russell Group of leading research universities for student satisfaction, it was rated as one of the top 80 universities worldwide by the Times Higher Education Supplement and has received the top rating from the Quality Assurance Agency for its teaching. In addition, SOES was second in a student satisfaction survey across University of Southampton schools.

Head of School, Professor Andrew Roberts, congratulated the graduates on their achievement. “Gaining a degree in these important and demanding scientific disciplines requires a high level of talent and commitment – as well as the unwavering support of parents, friends and family. Here at NOCS, we are all enormously proud of the achievements of our graduates. We wish them every success in their future careers as alumni of this unique institution.”

In all, 134 undergraduate, 34 postgraduate masters and 20 PhD students graduated this year.



Photo: B. Marsh

Investigating the Causes of Devastating Earthquakes

Photo: Mattias Grossmann



Deployment of the airgun array



Tailbuoy and section of the 2.4 km 192 channel streamer used in the seismic reflection acquisition

In Summer 2008, a major research consortium involving SOES scientists Tim Henstock, Lisa McNeill, Jon Bull and Simon Dean, conducted an expedition to offshore Indonesia on the *RV Sonne*. The expedition was part of a major project funded by the Natural Environment Research Council (NERC) to understand the devastating earthquakes that happened in the region in 2004 and 2005. This truly international study was the largest exchange of marine facilities ever undertaken by NERC - the project was led from the UK, took place on a German ship, and the science party included scientists from Indonesia and the US.

The project will provide crucial information about the 2004 and 2005 Sumatran earthquakes, and about similar events that might have happened in the past. It will have important implications for understanding the risk from future earthquakes both in Sumatra and elsewhere.

All plate boundaries are divided into segments – sections of fault that are distinct and that behave differently from one another. It is not known what determines whether an earthquake

ruptures only a single segment and stays relatively small, or whether it jumps across the barriers between segments to become a major event.

“The Sumatran earthquakes provide a unique framework to tackle this problem”, explains Dr Tim Henstock, a geophysicist and the Principal Investigator for the project. “The southern boundary of the major 2004 earthquake stopped the rupture and limited the earthquake magnitude, but we don’t know why this boundary is there and how it controls the earthquake rupture process.”

A first look at the data shows that the team have successfully imaged the main plate boundary throughout the region, as well as the detailed structure of other minor faults. A further programme on the *RV Sonne* in early 2009 will be led by Dr Lisa McNeill from SOES to collect information about the geology just below the seafloor.

“Ultimately, we would like to improve our ability to assess the size of likely earthquakes elsewhere in the world,” said Dr Henstock.

Major Awards for NOCS Scientists

Highlighting the academic excellence of the Centre, NOCS scientists were honoured for a variety of awards this past year:

The Geological Society's 'William Smith Medal' for Professor Martin Sinha

One of the UK's highest awards in geology was granted to Professor Martin Sinha of SOES. The Geological Society's William Smith Medal recognises Martin's outstanding contribution to the development of seafloor controlled source electromagnetic surveying. Application of this method led to the creation of a major new sector in the hydrocarbon exploration industry and the establishment, in 2002, of a highly successful spin-out company, Offshore Hydrocarbon Mapping (OHM) Ltd, which is listed on the Alternative Investment Market of the London Stock Exchange.

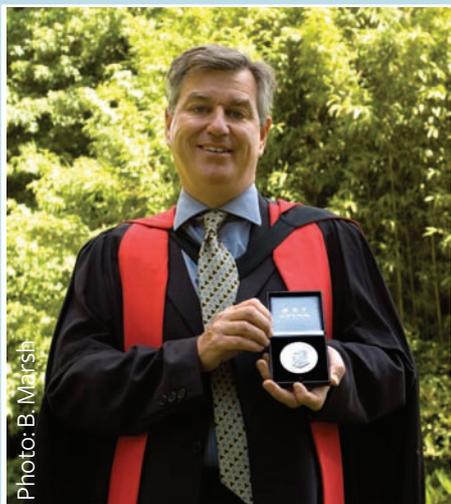


Photo: B. Marsh

Martin Sinha receives the William Smith Medal from the Geological Society

Adding his congratulations, Head of School, Professor Andrew Roberts, said: "Martin has contributed something to Earth Science that few could dream of. He is a thoroughly deserving winner of this medal, which is a testament to the creative, groundbreaking nature of his work."

'Vice Chancellor's Award for Teaching' for Dr Stephen Roberts

Congratulations to Dr Stephen Roberts who was awarded the Vice-Chancellor's Teaching Award for 2008.

Professor Andrew Roberts said "Anyone who has heard Stephen speak will know that he is an excellent communicator and teacher. He has provided leadership and innovation in the curriculum for many years and is leading the employability agenda within the School."

'Corresponding Fellow' of the Royal Dutch Academy of Sciences for Professor Eelco Rohling

Professor Rohling was elected as a 'Corresponding Fellow' of the Koninklijke Nederlandse Academie van Wetenschappen, (KNAW). KNAW is the national academy, which is the Dutch equivalent to the Royal Society. For this prestigious award, there are at any time only 70 Corresponding Fellows across all of the KNAW. Professor Rohling's specialism is ocean and climate change.

'Outstanding Young Scientist Award' for Dr Alberto Naveira-Garabato

Dr Naveira-Garabato received the 'Outstanding Young Scientist' award at the European Geosciences Union's General Assembly in 2008. He was recognised for his research into Southern Ocean mixing and its role in setting the size of the global thermohaline circulation.

'R H Worth Prize' for Dr Ian West

The R H Worth Prize is given "in recognition of meritorious geological research carried out by amateur geologists, or for the encouragement of geological research by amateurs." It was presented to Dr Ian West to honour his exceptional contribution to widening access to high quality geological information for professionals and the public through his award-winning website on the geology of Dorset's Jurassic Coast.

'Conrad Schlumberger Award' for Professor Clive McCann

Professor McCann, who established the Centre's rock physics laboratory, received the Conrad Schlumberger Award of the European Association of Geoscientists and Engineers at the EAGE Annual Meeting in Rome. It is one of the top awards for lifetime achievement in Exploration Geophysics.

Congratulations to all of our NOCS scientists!



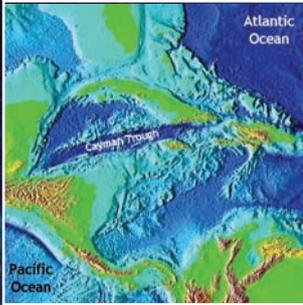
NOCS Recommended for International Environmental Standard Award

In 2006, NOCS began a process to help manage its environmental risks and to reduce its environmental impact. This Summer, the Centre's environmental management system was certified to the ISO14001 standard - a rare accolade for an organisation in the higher education sector.

"This award will serve as a distinctive selling point as both students and our research customers become increasingly aware, and possibly selective, on the basis of good environmental management practice," said Ed Hill, Director of NOCS.

The ISO14001 is not a one-off award, but represents the beginning of an on-going process of continual improvement and innovation in environmental management. Lewis Rennison, Head of Facilities said "This was very much the achievement of a whole body of staff at NOCS and is a tribute to all that we have made such a turnaround."

Exploring a “Lost World?”



Into the Abyss:
the expedition will visit
the Cayman Trough

Scientists at NOCS are set to explore the world’s deepest undersea volcanoes and find out what lives in a ‘lost world’ five kilometres beneath the Caribbean.

The team of researchers led by Dr Jon Copley has been awarded £462,000 by the Natural Environment Research Council to explore the Cayman Trough, an untouched area between Jamaica and the Cayman Islands. It contains the world’s deepest chain of undersea volcanoes, which have yet to be explored.

“The Cayman Trough may be a ‘lost world’ that will give us the missing piece in a global puzzle of deep-sea life,” says Dr Copley, a lecturer in SOES.

Before North and South America joined three million years ago, there was a deep water passage from the Pacific to the Atlantic. This means that the undersea volcanoes of the Cayman Trough could harbour a ‘missing link’ between deep-sea life in the two oceans. Finding out just what lives in the rift will help scientists understand patterns of marine life around the world.

“The deep ocean is the largest ecosystem on our planet, so we need to understand its patterns of life,” says Dr Copley. “Deep-sea exploration has also given us new cancer treatments and better fibre-optic cables for the internet, both thanks to deep-sea creatures.”

Two six-week trips are planned over the next three years, launched from Britain’s latest research ship, RRS *James Cook*. From the ship, the team will send the UK’s remotely-operated vehicle *Isis* and a new British robot submarine called *Autosub6000* into the abyss.

The team also includes NOCS scientists, geologist Dr Bramley Murton, oceanographer Dr Kate Stansfield, geochemist Dr Doug Connelly and marine biologist Professor Paul Tyler.

The public will be able to follow the progress of the expeditions through web pages updated from the ship. The team will also invite a school teacher to join them and share the scientific adventure with classrooms around the world.

Photo source:
PBase, Mikel Matto

Giving Makes the Difference

A big THANKS to all of our former students, staff and friends who made gifts to support NOCS this year. Private support is making the difference for our students' academic experiences and will enable our scientists to continue to make important global discoveries, all for the benefit of society.

A few highlights from Spring/Summer 2008:

We are pleased to announce that the memorial fund for Peter Killworth has raised over £10,000. The fund will provide annual awards to students to support their research, studies and professional development.

Princess Yachts donated £7,500 to support the 'Discover Oceanography' Programme at NOCS, the South Coast's premiere programme for educating the public about marine science.

The Swire Group Charitable Trust has pledged over £300,000 to support the Swire NOCS Ocean Monitoring System Project, which includes a four-year PhD studentship.

Thank you to all of our donors!

For more information on supporting NOCS, please contact:
development@noc.soton.ac.uk



From front: Richard Kendall, Managing Director of the China Navigation Company, a subsidiary of the Swire Group; Ed Hill, Director of NOCS; Dr David Hydes, Project Lead for SNOMS

Innovative Partnership to Address Climate Change

An innovative research programme that monitors the oceans using sensors fixed to a cargo ship has received further funding from the Swire group.

The Swire Group Charitable Trust has generously pledged over £300,000 to NOCS to support the Swire NOCS Ocean Monitoring Project (SNOMS) - an innovative programme that is yielding important information about our oceans and global climate change.

By using ocean-monitoring equipment installed on Swire's cargo ship the MV *Pacific Celebes*, NOCS scientists have been able to capture data about remote areas of the globe where the oceans' interaction with the atmosphere is largely unknown.

In 2006, Swire established the SNOMS programme by providing £100,000 to fund the design and assembly by NOCS of a system to measure the partial pressure of carbon dioxide (CO₂) dissolved in the surface waters of the ocean. The company is now making an additional investment to expand the programme. The gift includes £106,000 from the London-based Swire Education Trust to fund a four-year PhD studentship in partnership with the University of Xiamen in China.

Director of the NOCS, Professor Ed Hill, welcomed the continuing partnership with Swire. He said: "Climate change is recognised as one of the most significant environmental challenges facing humankind. As one of the world's foremost centres for ocean and Earth science, NOCS is well-poised to lead this exciting programme. We are immensely grateful to the Swire Group for enabling us to continue this vital research."

NOCS - one of "Europe's Finest"

The Times lauded the University of Southampton in a 19 June, 2008 article profiling the University's increasing international reputation, state-of-the-art facilities, continued student satisfaction and our research excellence. NOCS was also highlighted as one of "Europe's finest, encompassing teaching, research and knowledge transfer facilities."

To read more visit www.timesonline.co.uk/tol/life_and_style/education/good_university_guide/

MSc Graduate Profile - Robert Briggs ('08)

Prior to studying oceanography, I was an aerospace systems engineer for eight years. I decided to have a re-think about my career and to pursue something closer to my interests which led me to undertake an MSc in Oceanography at NOCS. I chose NOCS because of its reputation and because it was not only an academic institution - but played a pivotal role in real oceanographic research and shared learning.

I look back fondly at my year at Southampton - especially as I always felt that academic and personal support was always available. The programme was thoroughly enjoyable and very challenging - the range of modules on offer allowed me to tailor the MSc to my specific interests, and equipped me with the skills required to pursue an oceanographic career.

Almost entirely because of the inspirational people and subjects that I was exposed to at Southampton, I decided to continue my academic career and chose to read a PhD in a climate modelling related discipline.

Whilst in the latter part of my MSc, I was lucky enough to find a PhD and a supervisor that suited me exactly and I started the PhD immediately after finishing the MSc (in fact one week after handing in my thesis). I am now located at Memorial University in St John's, Newfoundland, Canada, enjoying my PhD and looking forward to the future opportunities that an oceanographic career will provide.



Robert beside his field sampling instrumentation

Breakthrough Research by NOCS Scientists



2008 saw NOCS scientists published in *Science* and *Nature* featuring break-through research on chalk-producing plankton and ocean acidity. Ocean acidification is the decrease in the pH of the Earth's oceans, caused by their uptake of anthropogenic carbon dioxide from the atmosphere and is one of the most important

environmental concerns of the 21st century.

Dr Debora Iglesias-Rodriguez was the lead author on a *Science* paper looking at the links between carbon dioxide and calcium carbonate - chalk - produced by marine plants called coccolithophores. This work has significant implications for understanding how ocean chemistry changes will affect marine organisms and overturns earlier research by showing that a CO₂ rich atmosphere would increase ocean calcification by these plants.

Dr Iglesias-Rodriguez said: 'This work contradicts previous findings and shows, for the first time, that calcification by phytoplankton could double by the end of this century. These

microscopic organisms are major players in the Earth's cycling of carbon and are responding to climate change by increasing the size of their calcium carbonate plates.'

Ocean acidity 34 million years ago was the subject of a *Nature* paper by Dr Toby Tyrrell and Professor Paul Wilson. They were keen to discover why the oceans became suddenly less acidic with the formation of ice in Antarctica, a time when green-house conditions swiftly gave way to an icehouse climate. Tyrrell said: 'Although the changes took place 34 million years ago, by understanding how the Earth System operated at this time of dramatic change we can gain insights as to how the Earth will respond as we modify it by adding carbon dioxide from fuel burning.'

Magnetic Mozambique



Just another day at the office:
Ben Saunders in Mozambique

Fourth Year Master of Geology student Ben Saunders had the fantastic opportunity to gain valuable work experience working with Rio Tinto over the summer in Mozambique. As the 2008 recipient of the Rio Tinto Bursary - the School's first industrially funded bursary - Ben received £5k to cover tuition and expenses as well as his summer placement. "I learned an incredible amount about how the mineral exploration industry operates" said Ben. "I was involved in an "order of magnitude" survey with Rio Tinto Exploration (RTX) on a heavy mineral sands deposit near Inhambane. This is the last stage in exploration before assessing the feasibility of mining."

Arriving in Mozambique at the beginning of July, Ben gained field, laboratory and

community relations experience—all important skill sets in his preparation for life after university. His training, under the supervision of SOES alumnus Drew Sargent ('05), included sonic and RC drill rigs in the field, logging samples and investigating their density in order to calculate the quality of the mineral resource. Ben will soon begin work on his MGeol project with RTX and Rio Tinto Iron and Titanium to look into the grain size distribution of the magnetite-rich sands and the implications that this may have on dredge mining.

However, as Ben is quick to note, his Summer also included a little downtime. "I had one day off a week and I usually headed to the beach to relax and experience some of the traditional Mozambican culture!"

Alumni Class Notes

We are always keen to hear how SOES graduates are doing – if you would like to contribute please drop us a line at: alumni@noc.soton.ac.uk

- **Class of '63** - Trevor Davenport (Geology) is currently Chairman of Kryso Resources plc which operates in Tajikistan. He has travelled the world for his work as a geologist/ geochemist.
- **Class of '64** - Tom Newman (Geology) spent part of his career working for Shell International Petroleum Company as a geophysicist. He is now retired.
- **Class of '65** - David Blackburn (Oceanography) is a private consultant in fisheries and biology in Canada.
- **Class of '78** - Elizabeth Stoyel (Geology) met her late husband Rod Stoyel while at the University of Southampton. They have two children. Elizabeth attended the Class of '58, '68 and '78 Reunion Event at the University and NOCS.
- **Class of '79** - Dr Gillian Scott (Geology) has been working in the oil industry for the last 25 years. She returned to SOES in March 2008 for NOCS Ocean and Earth Day.
- **Class of '86** - Angela and Timothy Moffat both received their MSc in Oceanography. They married in 1987.
- **Class of '86** - Innocent Obunikechi (Oceanography) lives in Nigeria. He is the Managing Director of Henphill Chemicals Nigeria Ltd and is married with five children.

Nuts About Exploration in Brazil!

Fieldwork is an integral part of the student experience at SOES. The School has a long tradition of providing "real-world" opportunities to students, many of them in partnership with industry.

James Nowecki is entering the 4th year of his Master of Geology degree in SOES this October. As a participant in Anglo American's Student Technical Expertise Programme (STEP), James spent his summer in the Goiás region of Brazil working with Anglo's Base Metals and Exploration divisions.

James worked at the Copebrãs (phosphate) and Boa Vista (niobium) mines which are areas of extremely complicated igneous activity. During his time at Copebrãs, James was exposed to many facets of the mining operation, from short term mine planning to longer term projects, using exploratory drilling and mapping to aid the mine expansion programme.

Fieldwork opportunities also provide SOES students with memorable cultural experiences. "I could not have asked for a friendlier group of people to spend time with. I was taken everywhere, from birthday parties and churrascaria barbeques to local club nights and even to English classes." James added "Even from my short stay, I realised that Brazil is highly addictive, from the landscape and the people, to the environment and wildlife, it all drives home the fantastic experience available in this country."



James in one of the
Goiás opencasts

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