

Getting to the bottom of it



We have an active diving team supporting a wide variety of research in the U.K. and around the world. Locally, there is considerable effort off the Dorset coast studying an artificial reef and several key habitats and species, currently maerl (a calcareous algae), Sabellaria worm reefs, seagrass, brittlestars, sea fans and sea pens.



Diver training is available locally through the university sub aqua club and several dive schools. We do not train people to dive at the Oceanography Centre. If you are, (or become) a competent diver, we can extend your skills with a wide range of scientific diving techniques and memorable experiences.

There are many opportunities for divers to participate in these studies, either as volunteers or as part of their own research projects.

You can find out about how to join our diving team by looking at the diving pages of the SOC website: www.soc.soton.ac.uk. All you need to know is there, including how to sign on to our e-mail list, soc-diving, which is the main method of advertising dives, talks and equipment.



Ocean and Earth Science

This newsletter is published by the School of Ocean and Earth Science at the Southampton Oceanography Centre. The School offers undergraduate and post graduate training across the full range of Ocean and Earth sciences with an Excellent grading for teaching quality and a grade 5A in the 2001 Research Assessment Exercise.

For further information contact: tel. 023 8059 5898

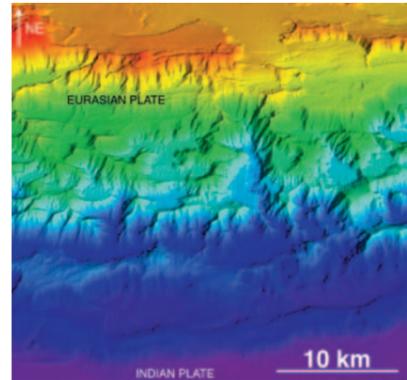
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soes news

April 2005

News from the
School of Ocean and Earth Science
at the Southampton Oceanography Centre

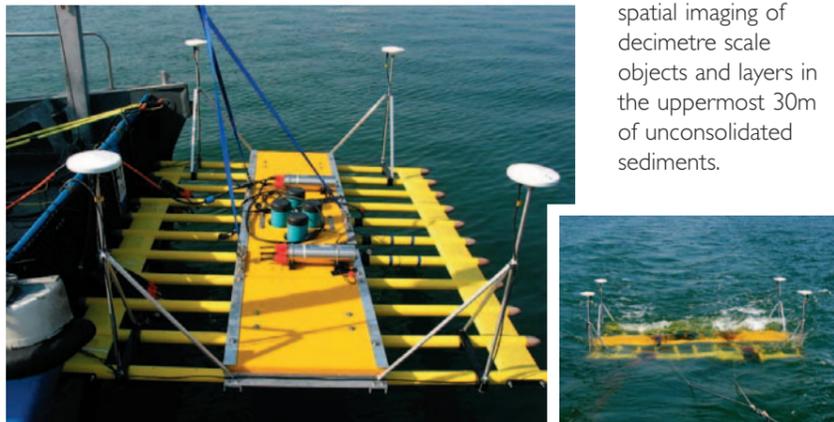


The world's first commercial 3D Chirp profiler

The University and GeoAcoustics Ltd, a world-leading manufacturer of sonar seabed survey equipment, have signed a licensing agreement under which the company will develop GeoChirp 3D, the world's first commercial 3D Chirp profiler.

The agreement was signed by the University and GeoAcoustics Ltd in December and represents the culmination of 10 years of research work by the Southampton Oceanography Centre (SOC), the Institute of Sound and Vibration Research (ISVR) and the Company.

Chirp sub-bottom profilers are marine acoustic devices that use a known and repeatable swept frequency source signature to produce decimetre vertical resolution cross-sections of the



sub-seabed. The new 3D profiling system has the capability to acquire a cube of information rather than individual profiles. This technological breakthrough enables full acoustic sampling of the sub-surface, making the detection of small objects viable. Testing has shown that the 3D Chirp array allows unprecedented spatial imaging of decimetre scale objects and layers in the uppermost 30m of unconsolidated sediments.

Collecting geological data over the submarine fault zone of the 2004 Indonesian earthquake from the Royal Navy's HMS Scott

Lisa McNeill and Tim Henstock of the School of Ocean and Earth Science were invited, along with Dave Tappin of the British Geological Survey, in January 2005 to join the Royal Navy's HMS Scott to collect seafloor data over part of the 2004 Indonesian earthquake rupture zone. This was the first survey over the earthquake zone. The data collected will be used to better understand the tectonics of the region and plan other research cruises which will ultimately help to assess the future earthquake and tsunami hazards. This information can be used by local governments to educate local populations about potential hazards and what to do in the event of an earthquake or tsunami.

The earthquake occurred on a "subduction zone": a region where two tectonic plates collide with the Indian plate sliding beneath the Eurasian plate above it. This process produces large deformed ridges on the seafloor caused by fault movement. As the plates collide, strain builds up on the subduction zone and is periodically released as a large earthquake. The movement of the

seafloor from these earthquakes often produces tsunamis, which are fast moving waves which can travel across the ocean and build up to large heights near to the coast. In 2004, the earthquake ruptured an area of 1200 by 150 km with movement of about 10-20 m – this huge area explains why the earthquake was so large. The earthquake was the second largest event ever recorded and the largest in the world for over 40 years.

The survey was very successful and the data are already being interpreted and used for the next research phase. For the scientists on board it was a chance to work with the Royal Navy and an opportunity to contribute to the international science effort which is needed to understand this disaster and its geological background.

Students at SOES also will benefit from using the data in practical sessions and in research projects, and will learn about the upcoming results and future work during their regular lectures.



New Catamaran to support teaching and research at the soes

Construction is now well underway on the new £1.1 million pound vessel, which will greatly increase the scope for training students in fieldwork spanning all the disciplines from marine biology, physical and chemical oceanography to geology and geophysics.

The new 18 metre catamaran will have capacity for 30 students and includes both wet and dry laboratory facilities and berthing and delivery is anticipated in July 2005. Staff are presently investigating new ways to ensure that fieldwork opportunities on the boat are an exciting and rewarding experience for all disciplines in the School of Ocean and Earth Science.



3D rendered graphic of new Catamaran



views of construction - March 2005

New Degree Programmes include a Year in North America

Building on scientific links through the Worldwide Universities Network (WUN) staff from the School have developed exchange programmes with US Universities. These new degree schemes are going through the final approval stage and we anticipate that the first student exchanges may occur from 2006. Applicants who achieve the appropriate grades will be eligible for selection for these programmes following arrival in Southampton in October. The exchange year will offer a scientifically and culturally enriching experience.

Master of Geology/Geophysics with Year in North America

The Pennsylvania State University is one of the great American powerhouse universities. Excellent academic programmes taught by world-class researchers link in the same institution with one of the premier league College Football teams. Students will spend the third year at Penn State and interact with some outstanding leaders in Earth Sciences.

Master of Oceanography with Year in North America

The School of Oceanography at the University of Washington is located on part of Seattle's attractive and varied waterfront and is one of the very few US campuses to offer ocean science undergraduate programmes. Exchange students from Southampton will benefit from fieldwork in Puget Sound and be able to explore the Pacific Northwest.

New Masters in Marine Biology Degree

Building on our 3 year programme in "Marine Biology with Oceanography", the new Masters in Marine Biology will offer a 4 year programme with added depth of treatment of the subject and additional project and fieldwork opportunities. An expected highlight of the course will be an additional field course that will introduce students to the tropical sea life of Bermuda or the Bahamas. Our recent recruitment of new academic staff in this field has enabled us to diversify our teaching. The presence at Southampton of the NERC Research Division marine biologists enables us to provide a greater range of project work that will offer the opportunity for more advanced and detailed research on subjects such as tropical marine ecology, molecular marine biology, deep-sea ecology and Antarctic biology. Suitably qualified entrants can opt to transfer to the new degree on arrival in October or at the end of their first year of study.



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Time Team film the *Grace Dieu*

Henry V's 'great ship' *Grace Dieu* of 1418 was the largest ship ever built in England, up to that time, and bigger than almost everything else for another two hundred years. She was built for war with France but never saw action and by 1420 was in reserve, functioning more as a technological marvel to impress foreign dignitaries. In 1439, while moored in the Hamble river, she was struck by lightning and burnt to the waterline. The remains of her lower hull still lie in the river where she sank, preserved in a remarkable condition.

The wreck attracted antiquarian attention in the 19th century and at one time was believed to be the remains of a Viking ship burnt by the Saxons in 877. It wasn't until the inter-war years that its true identity was discovered.

In 1970 the University of Southampton purchased the wreck from the MoD for £5 and since then several seasons of fieldwork have been carried out, notably by Seán McGrail, formerly of the National Maritime Museum and now visiting Professor of maritime archaeology at Southampton. In 1997 the University formed its own *Centre for Maritime Archaeology* (CMA) which has been continuing investigation of the site as part of an ongoing monitoring programme. In 2004 the CMA linked up with 'Time Team' to film part of the field season. The outcome of this collaboration was shown on Channel 4 on Sunday February 6th. Highlights of the work included:

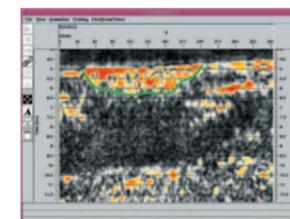
Dr Jon Adams leading a CMA team (Charles Pochin, Colin McKewan, Lindsay Doulton, Paul Donohue and Alex Farnell) excavating on land and under water. Prior to this Dr Justin Dix led the marine geophysics team (Ruth Plets, Simon Dean, Stuart Heath and Cristina Serra-Ruiz) in a challenging shallow water (< 4m) survey of the wreck site. Vital assistance was provided by

the Hamble Harbour Master; the Hampshire & Wight Trust for Maritime Archaeology, the Mary Rose Trust and the Manor Farm Country Park.

Jon Adams said 'the geophysics results matched our most optimistic expectations and the underwater work solved technological mysteries of the ship's construction that have been puzzling historians for years'.



A digital reconstruction of the *Grace Dieu* (Courtesy of Channel 4's Time Team)



An acoustic cross-section of the *Grace Dieu* (highlighted in green above) and a plan of the whole buried vessel (right)

