

SERPENT scene

www.serpentproject.com
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➔ Gulf SERPENT Update

SERPENT activities in the Gulf of Mexico (Gulf SERPENT) are moving forward on several fronts. Funding for the next three years has been secured following approval of a grant to Louisiana State University (LSU) from the Minerals Management Service (MMS). This US\$184,762 provides funding for the project for three years beginning September 2007. There is also an equivalent in-kind contribution by BP based on the value of some of the ROV time provided to SERPENT.

The MMS grant has a strong undergraduate education component. Each year a summer student intern will be recruited through the Marine Advanced Technology Education (MATE) Center, to participate in SERPENT research and undergraduates from LSU will work in the laboratory processing SERPENT video data.

Gulf SERPENT is currently focused on planktonic and nektonic marine life in the deepwaters of the Gulf. Another interesting aspect of our research over the next three years will be an attempt to document utilization of deepwater hard surfaces by corals and other sessile organisms.

In August 2007, LSU and Chevron signed a Boarding Agreement that paves the way for SERPENT studies on Chevron's deepwater facilities. We'll likely begin cooperative studies on Transoceans Discoverer Deep Seas drillship and Cajun Express semisubmersible.

So the next three years will be an exciting period for Gulf SERPENT. With strong support from BP and Chevron we'll be able to expand our coverage of life in the deepwaters of the Gulf. We also plan to expand our partnership with other petroleum companies and would be very happy to discuss collaborations with any interested groups.

If you want to learn more about Gulf SERPENT, check out the September issue of the Marine Technology Reporter, which is running a feature on our activities in the region. Visit <http://www.seadiscovery.com/mt/>

➔ Royal Society Success!

SERPENT was extremely pleased to be selected to exhibit at this year's Royal Society Summer Science Exhibition, which took place in London at the beginning of July. The week long event attracted over 1,500 post-16 students and nearly 2,500 members of the general public to the open days, and over 1,000 invited guests and VIPs at the renowned evening soirée events. Our exhibit included a large tank containing a mini VideoRay ROV that could be flown by visitors, filming the 'residents' of the tank (plastic lobster, anyone?) and even using the manipulator arm to try to carry out simple tasks. The event was a huge success and we received much positive feedback and interest in SERPENT, our partners and the concept of using industrial technology to explore the deep sea.



Members of the SERPENT team and visitors to the exhibition



Send us more...!



Do you have any questions, interesting stories, images or videos? Share them with us! Email lkm@noc.soton.ac.uk



A focus on...

Venezuela

Dr. Daniel Jones reports on a successful first visit to the Orca Field, Venezuela as part of a new collaboration with the Universidad Simón Bolívar

Watching the first dive with an ROV in a new geographical region is riveting, offering the opportunity of seeing a habitat that has rarely, if ever, been explored before. The sediment clears and the seabed looms into view - it is easy to forget you are several hundred metres away on the sea surface, separated by a huge body of cold water.

I recently savoured the excitement of just such an experience, investigating the deep-water fauna of the biologically unknown offshore region to the northeast of Venezuela. The Orca field is a hydrocarbon exploration area for Statoil in 545 metres of water in the Orinoco fan – an area heavily influenced by sedimentation from the Orinoco River, one of the longest in South America. Knowledge of the biology of offshore Venezuela is exceedingly poor, essentially limited to SCUBA diving depths (around 30 metres). Collaborating closely with the Universidad Simón Bolívar in Caracas and SERPENT partners Statoil, Transocean and Subsea 7, we are using ROVs to explore and document the diversity and density of seabed communities at Orca and to find out the effects of exploratory drilling on this relatively pristine ecosystem



A cerianthid anemone (left) and a blackfin spiderfish, *Bathypterois phenax* (right)

The first trip to explore the Orca field was a tantalising opportunity, as with any unexplored territory. With no prior baseline biological knowledge, it is difficult to predict the sort of animals that will be encountered. Despite a sparse population, the dive revealed an interesting range of unusual, often colourful animal life. Solitary corals, large, flowerlike tube anemones and ancient stalked crinoids, once incredibly abundant but now only found in the deep oceans of the world, dotted the seabed. Strange fish emerge from the gloom. A grinner fish splayed its modified fin rays around its head, presumably to sense its surroundings in this perpetually dark environment. Using an ROV operated scoop, much like a butterfly net, we were able to catch some of these denizens of the deep and bring them to the surface for detailed microscopic investigation.

By deploying a series of traps, it was possible to catch a sample of the common scavenging fauna in the area. These animals play an important role in the ecosystem, taking advantage of large food falls to the deep. They often gorge themselves until they can no longer move. A tuna bait was particularly effective in catching the notoriously slimy hagfish – who can produce several litres of slime per hour – but the most exciting catch was a giant isopod. Closely related to the common woodlouse, these animals have undergone, in evolution, a process of gigantism in response to limited food availability in the deep sea, and can reach nearly half a metre in length! These specimens will form the basis of a deep-sea collection of preserved fauna for future work by Dr David Bone and Dr Juan Cruz at Universidad Simón Bolívar.



Dr Daniel Jones and a *Bathynomus* sp. giant isopod

The impact of initial, or tophole, drilling is usually visible on the seafloor as a build-up of sediment on the seabed surface. No chemicals were used during this drilling phase at the Orca site, and as such we could investigate the effects of the initial sedimentation on the seabed community. The drilling activity provides a useful experimental treatment which can be used as a proxy for the effects of natural sedimentation from down-slope transportation of fluvial sediments, common in the Orca fan area. Historically, difficulties in experimentation in areas where this phenomenon occurs naturally have meant that the processes involved are extremely poorly understood, especially at a suitably large-scale in deep-waters. Our initial results suggest motile fauna quickly recolonise disturbed areas, and are not impaired by new sediments. Many of the sessile fauna (animals unable to move) showed adaptations that allowed them to clear sediment effectively from their feeding surfaces.

We hope to assess the communities again after drilling, as part of a Statoil sponsored monitoring programme, to quantify recovery in the area. Recovery of ecosystems to anthropogenic disturbance is rarely evaluated, even in the well-known deepwater areas of northern Europe.

For more information, check out the SERPENT website.



collaboration



innovation



research



education

➔ Latest news from SEA SERPENT, Australia

Industry supported scholarships training next generation of scientists

The strength of SEA SERPENT is based on successful partnerships with the oil and gas industry, and collaborations between the Universities of Sydney, Western Australia, Wollongong and University of Technology, Sydney. Recognising the need to train the next generation of scientists and to accelerate regional capacity building, Santos and Woodside are supporting 17 scholarships over the next three years within SEA SERPENT. The scholarships will enable students at the academic institutions to have the invaluable and rare educational experience of hands-on training in an offshore community environment, engaging all members of the rig community in contributing to the success of their projects.

The scholarships are integral part of the agreement with Santos and Woodside Petroleum. The companies themselves insisted on providing these scholarships, which they view as an effective and useful tool for developing an educated future workforce.

To date, we have graduated two honours students from the University of Sydney, Katie Robertson and Gareth Andrews, and we are buoyed by their recent successes and look forward many more over the next three years. At the 2007 annual meeting of the Australian Marine Sciences Association (AMSA), Katie, whose work was supervised by SEA SERPENT scientists Drs Adele Pile and Murray Thomson, was awarded AMSA's most prestigious prize, the Ron Kenny Award for Best Poster Presentation, for her research into the whether deep sea animals inhabiting drilling sites exhibit physiological stress. Katie's research was supported by Woodside Petroleum and conducted on the *Jack Bates* during the Enfield development. Gareth Andrews was awarded the William John Dakin Memorial Prize in Zoology for excellence in the subject of Zoology to a student gaining first class honours in Biology, from the School of Biological Sciences, University of Sydney, for his paper on the nutritional ecology of sea urchins. Gareth's research was supported by Santos and completed during a drilling campaign at Mutineer on the *Bounty*.

Offshore visits

SEA SERPENT's chemistry honours student Joe Carolan, from the University of Wollongong, went offshore with Santos to the Songa Mercur at Fletcher in Carnarvon Bay, Western Australia, between August 17 and August 21, to collect samples for determining the potential use of natural products.

Another two current SEA SERPENT postgraduate scholarship holders, David Cummings from the University of Sydney and Ashley Fowler from the University of Technology, Sydney, will be going offshore in the next few weeks with both Santos and Chevron in Carnarvon Bay. Watch this space for updates and reports on their progress!

➔ Successful North Sea missions

The Aberdeen based SERPENT Team are keen to find out about the variety of fish fauna associated with different sub-sea structures all over the North Sea and has been tapping into the ROV inspection work carried out this summer. In June, Nexen invited Iñigo Martinez on board Fugro-Rovtech's *Highland Eagle* during a pipeline and subsea structure survey at the Buzzard field. The mission revealed some interesting observations of use of these structures by fish and a different species composition compared to that seen with baited camera.

In July Iñigo joined the Subsea 7 ROVSV *Seisranger* in the Dutch sector to gather footage from Shell-operated platforms. Unfortunately, poor weather and visibility hampered collection of good video material, but the trip was a valuable learning experience for future trips. The team are currently getting ready to return to Buzzard again for a jacket inspection and hope to carry out opportunistic ROV surveys on the structure, such as 5 minute stationary fish counts at various depths. This footage, along with the baited camera data will allow us to better understand how the fish community is building up and utilising the Buzzard platform.



Deploying an Ocean Tiger ROV in the vicinity of Buzzard Platform from the *Highland Eagle*.

To gain a broader understanding of biodiversity around these structures the Aberdeen team are keen to get their hands on footage from other platforms in the North Sea so why not check out the North Sea ROV pack and "Most wanted" poster available on the SERPENT website and see if you can send us some video. They can be found under the North Sea section of Active Projects, or under the Publications section.

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