

SERPENT scene

www.serpentproject.com
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SERPENT research published

We are pleased to announce that SERPENT research been published in the renowned international scientific journal Marine Ecology Progress Series. The paper investigates the effects of physical disturbance on cold-water megafaunal (larger seabed fauna) communities in the Total E & P UK Plc Laggan development area in the Faroe-Shetland Channel. This publication, led by SERPENT research scientist Dr Daniel Jones (based at NOC,S), focuses on work carried out on a SERPENT mission to the Transocean semi-submersible drilling rig Jack Bates. The rig team onboard the Jack Bates have been involved in several SERPENT missions both in the West of Shetland area and in Australia. We used a Subsea 7 ROV to map the distribution, density and diversity of the megafauna and quantified the effects of the drilling on seabed communities. We found that top-hole disturbance close to the rig had measurable effects on megafauna, but within 200m from the rig there was little disturbance. This is the first time the effects of disturbance of this sort have been measured in arctic deep waters.



Extended Christmas Edition!

New PhD student for SERPENT academic partner

In October, PhD student Iñigo Martinez joined SERPENT academic partner FRS Marine Laboratory, Aberdeen, to study fish assemblages around oil platforms in the North Sea. The studentship is funded through the EU Marie Curie Mobility Program "Ecosummer" (Ecosystem Approach to the Management of Marine Resources) coordinated by the University of Aberdeen. Iñigo's main study site will be the Nexen-operated Buzzard platform off the east Scottish coast. Earlier this year, he spent one month onboard the Buzzard's stand-by vessel *BUE Lismore*. Helped by the enthusiastic crew, he carried out nearly 20 deployments of a baited camera system inside the exclusion zone of the platform. This is the first time a SERPENT project has worked with a stand-by vessel and proved a great success. By identifying and counting the fish attracted to the bait, Iñigo will be able to compare relative numbers and diversity of fish in the vicinity of the platform with baited camera data from previous surveys of the area before construction commenced. This will enable him to assess the impact of the platform on the fish community and its role as a *de facto* artificial reef. All these photos (around 15000!) are currently keeping Iñigo very busy, but he hopes to repeat the survey next year. Seasonal ROV surveys from the platform itself are also planned in 2007 to allow a more detailed study of the structure and how the fish community is building up there. Contact e-mail: Matinezi@marlab.ac.uk



The crew of *BUE Lismore* retrieve the camera system.

Cold seeps and cool species!

We have recently completed the analysis of deep-sea footage collected through a collaboration with BP from approximately 1300m water depth in the Green Canyon area of the Gulf of Mexico.

One area in particular that proved extremely interesting was located directly above a diapir structure, where lower-density materials (e.g. salt or mud) have pushed upwards and pierced overlying rock layers (like a lava-lamp), forming a dome in the seabed and trapping gas. This is a cold-seep environment, inhabited by chemosynthetic animals. The mussels and clams that dominated the area are known to use methane gas as an energy source, potentially linking their presence to the escape of gases from the seafloor.

The area as a whole revealed a rich variety of marine life, including bottom-living fish such as rattails and cut-throat eels. Solitary orange tube anemones were spotted anchored into the sediment. A host of yellow sea fans attached to the sea bed were also filmed. Despite their strong resemblance to plants, sea fans are actually colonies of tiny polyps that filter the current for food particles.



Mussel bed



Tube anemone

Send us more...!



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



New collaboration with Chevron Canada Limited

Expanding their geographical reach to the deep waters off the Canadian coastline, the SERPENT Project has recently formalised a partnership with Chevron Canada Limited (co-venturers ExxonMobil Canada Ltd., Imperial Oil Resources Ventures Ltd. and Shell Canada Ltd.) to carry out research in the Orphan Basin area north of the Grand Banks, 390km northeast of St. John's, Newfoundland and Labrador. The region represents a relatively unexplored deep-sea location, both from an ecological and an oil and gas perspective.

Using an ROV (remotely operated vehicle) off the Eirik Raude drilling rig, scientists from SERPENT, Memorial University of Newfoundland and the Canadian Department of Fisheries and Oceans have the opportunity to characterise the local biological communities and improve understanding of how these ecosystems function. Data from the ROV both before and during the drilling operations will help to assess the operational impact on sediment communities as well as to potentially enable examinations

on rate of recovery, recolonisation and succession. As importantly, new data, including high resolution imagery, are being collected on what actually lives at 2,350 metres water depth in this very remote deepwater area.

So far, the collaboration has yielded compelling photography of some of the local deep-sea inhabitants, as illustrated here, and the project is anticipating more to come. Find out more about the project and view the galleries on the SERPENT web pages, www.serpentproject.com.



Brittle star on a sea anemone stalk



Bryozoan, anemone and hydroids



Hydrolagus affinis, chimaera fish



Colonial hydroid

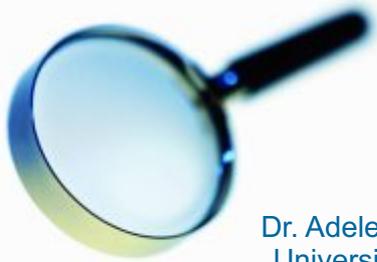


Urchin & crustacean on sea bed



Bathyraja sp. ray





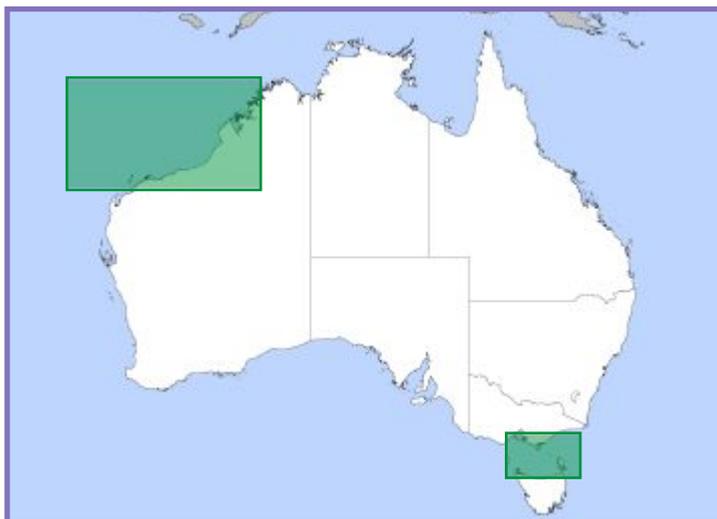
A focus on... *Australia*

Dr. Adele Pile, Senior Lecturer at the University of Sydney, reports on the successful SEA SERPENT application for an Australian Research Council Linkage grant

Working closely with Woodside and Santos the Australian consortium of Universities has obtained nearly \$500k for the next three years from the Australian Research Council as a Linkage Project. Linkage Projects support collaborative research projects between higher education researchers and industry that are undertaken to acquire new knowledge and that involve risk or innovation.

The aim of the project is to develop the fundamental deep-sea science that will underpin environmentally sustainable drilling practices. We will achieve this by:

1. Quantifying the effects of deep-sea drilling on benthic biodiversity;
2. Conducting field experiments to determine the mechanisms underlying the short- and long-term effects of the drilling disturbances on individual deep-sea fauna at the physiological level; and
3. Determining whether and to what extent sub-sea structures can create reefs in the deep sea.



Map of Australia illustrating the North West Shelf and Bass Strait

The project will take place on Australia's North West (NW) Shelf and Bass Strait which contain some of the largest ocean petroleum and gas reserves in the world. These reserves are located in the two Australian areas identified by Conservation International as deep-sea biodiversity 'hot spots'. The

only way of conducting experimental ecology in these hotspots is to use either manned submersibles or Remotely Operated Vehicles (ROVs). While Australia has no access to manned submersibles, the petroleum and gas industry increasingly uses ROVs for sub-sea intervention and through the SERPENT project we will have unprecedented access to ROVs to explore Australia's deep-sea benthos for the first time. Understanding the intricate biodiversity of the deep-sea benthos and the complex interactions between it and deep-sea structures will be a major step in developing industrial practices and technologies that protect deep-sea ecosystems in the vicinity of structures.



L: A frogfish, possibly *Chaunax pictus*, photographed at the Enfield Development Area, North West Australia

R: A grey reef shark, *Carcharhinus amblyrhynchos*. Image taken at the Enfield Development Area, North West Australia

Dr Adele Pile, the University of Sydney, will lead a multidisciplinary team of researchers. Adele is a marine ecologist with 10 years' experience in deep-sea research, specialising in invertebrates. Professor Chari Pattiaratchi based at the University of Western Australia, a physical oceanographer, will take primary responsibility for all aspects that relate to characterising the physical oceanography of the deep sea. Professor Dave Booth (University of Technology Sydney) is a marine ecologist specialising in fish, and will oversee all aspects that relate to their biodiversity and will lead the research team that will quantify the rigs to reef processes. Dr Murray Thomson (University of Sydney), an animal physiologist, will direct all aspects of the measurements of physiological stress in deep-sea fauna and Dr Danielle Skropeta (University of Wollongong), an organic chemist, will oversee all aspects related to measuring the chemical biodiversity of deep-sea fauna. Both Woodside and Santos are committed to the training of qualified scientists at all levels. The project will include a postdoctoral Research Associate, 3 PhD scholarships and 5 Honours scholarships each year.

