

SERPENT scene

The Newsletter of the SERPENT Project

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In Brief . . .



Pages from the new web site. Take a look for yourself at www.serpentproject.com

The SERPENT Project

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Editorial

Welcome to the new-look Christmas edition of SERPENT Scene, newsletter of the SERPENT Project. Hope you like the new design which closely matches the look of the all-new SERPENT web site at www.serpentproject.com.

In this packed edition, our lead story puts the spotlight on the new web site. We have the latest from Dr Mark Benfield, from Gulf SERPENT in the Gulf of Mexico, along with a fascinating story from Dr Danielle Skropeta from SEA (South East Asia) SERPENT in Australia, about her research on deep-sea natural products. We also have very exciting news about our brand-new collaboration with Marine Simulation LLC™ and the "Oceans on Wheels" Roadshow.

Tell us what you think of the new design of the Newsletter as well as the web site; there's always room for improvement and who best to ask than our valued readers!

Thanks to all our Partners and we wish you a happy Christmas and a happy and peaceful New Year.



New SERPENT web site launched!

The brand-new SERPENT web site was launched today. The image-rich new layout incorporates features designed to make the location of information, images and video much easier for the visitor, and has already resulted in positive visitor reaction.

Among the new features are mission minisites, a quick-look format that presents a snapshot of a mission, offering mission details, the science goals and an eco highlights section that focuses on the creatures, as well as image and video galleries of the area. Visit the site to read about Dr Andrew Gates' recent visit to Haklang Prospect off the coast of Norway. A new interactive sortable mission chart is also available.

The image and video galleries are easier to browse and publications have been expanded and organised to ease searching. SERPENT Partners benefit from a higher profile too, with a Featured Partners link on every page. Given the global nature of SERPENT work, a new translation link has been created, offering instant translations in 13 languages, with potential for translation to over 300 more!



The web site home page. The header images and on-page video change on each visit, showcasing our archive. Partners are featured throughout the site.

With an eye to the environment and to help reduce paper waste, new print formatting styles have been developed for all pages. Just go to "Print Preview..." on your web browser to see what we mean. The site is now poised for a raft of new features currently being developed, including integration with Google Earth and more dynamic delivery of archive material that will benefit both researchers and the general public.

Come and visit us at www.serpentproject.com and let us know what you think - together we can make SERPENT an even better resource for everyone!

Send us your stories!

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



collaboration innovation research education **1**

Simulating SERPENT Science

Marine Simulation LLC™ partners with SERPENT to develop simulator for outreach and training

The collaboration will result in a dedicated ROVsim® simulation package that closely mirrors SERPENT research activities in the deep oceans. SERPENT aims to monitor and collect data from the world's biodiversity hotspots by using oil and gas industry ROVs. The data consists principally of images and video, making virtual simulators ideal for emulating this activity.

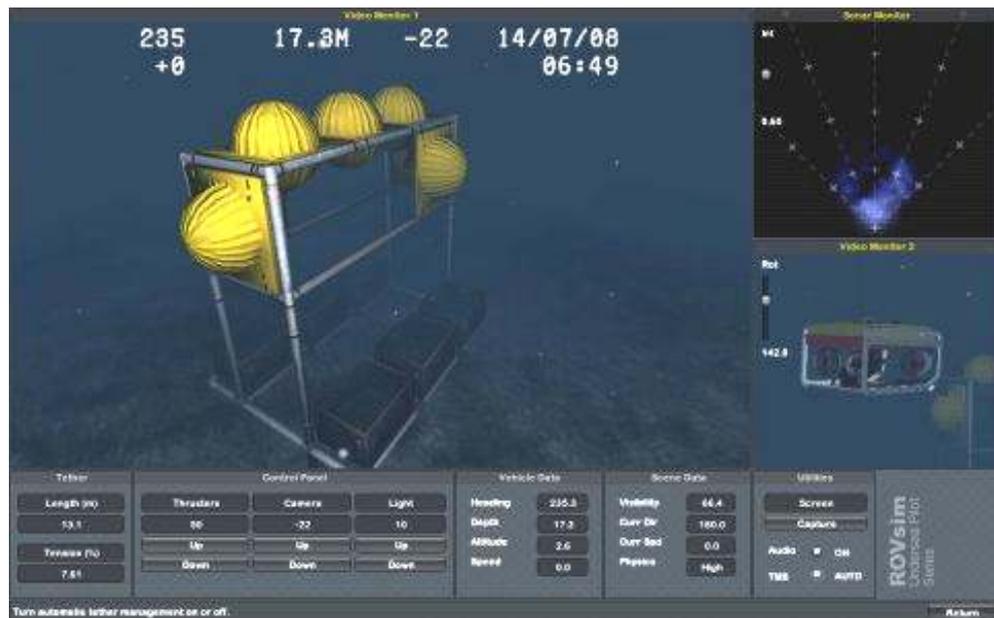
The software will have its first trial as an outreach tool. Mounted on a sit-in ROV simulator it will form one of several outreach projects in the 2009 "Oceans on Wheels" Roadshow organized by the Faculty of Engineering, Science and Mathematics at the University of Southampton. The simulator will be a fun way for teenagers to understand how SERPENT contributes to our knowledge of the deep sea environment.

SERPENT will also be using the software as part of a free training programme that will give ROV companies the opportunity to upskill their staff while at the same time providing SERPENT with a pool of pilots skilled in the basics of marine biology.

Dr Daniel Jones, SERPENT Project Coordinator said "We're very excited about this new partnership. SERPENT will benefit hugely from being able to offer virtual missions of this kind, both as an outreach activity as well as to ROV pilots who I'm sure will welcome the chance to learn more about their deep sea working environment. We are very grateful to Marine Simulation LLC for their excellent support."



Marine Simulation LLC™, based in North Carolina, USA, produces computer-based 3D simulations of surface and sub-surface craft for marine professionals and are the developers of the ROVsim® line of underwater robotic simulators. Using state-of-the art technologies originally developed for the video game industry and over 2 decades of hands on industry experience, their simulations deliver a level of visual and functional realism never before possible.



A screenshot showing a ROVsim scientific mission similar to the SERPENT mission.

Find out more about Marine Simulation LLC™ at <http://www.marinesimulation.com/>.

SERPENT Project takes to the road

SERPENT scientist Dr Tania Smith will be hitting the tarmac in early 2009 at the controls of an exciting new outreach initiative. Devised and funded by the Faculty of Engineering, Science and Mathematics at the University of Southampton, the Oceans on Wheels Roadshow will tour venues from schools and colleges to music festivals, enthusing and educating young people about ocean science. The SERPENT stand will consist of a sit-in deep-sea simulator with software provided by Marine Simulation LLC™.

OCEANS ON WHEELS



SEA SERPENT Update



Dr Danielle Skropeta

Danielle Skropeta of the South East Asia (SEA) SERPENT team at SERPENT project partner the University of Wollongong recently published a review on deep-sea natural products in the December issue of *Natural Product Reports*.

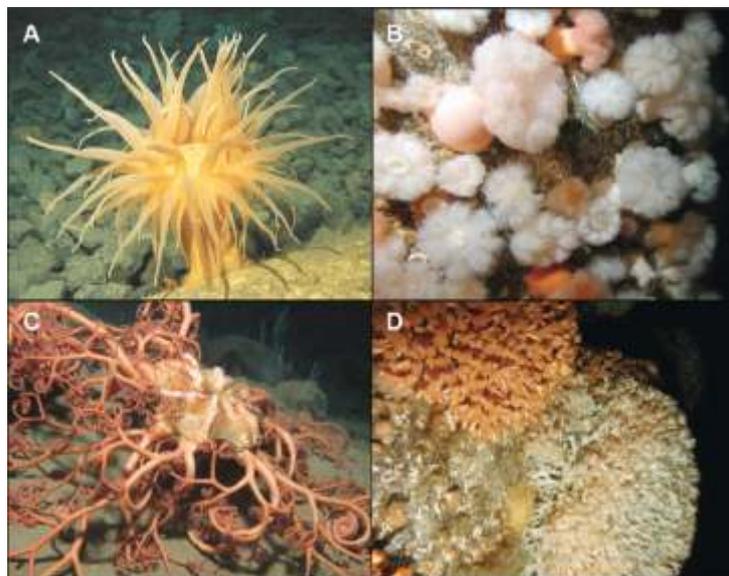
Danielle's review covers the 390 novel marine natural products discovered to date from deep-water (greater than 50m) marine fauna.

Over the past 50 years, approximately 20,000 natural products have been reported from marine flora and fauna, and yet less than 2% of those derive from deep-water marine organisms.

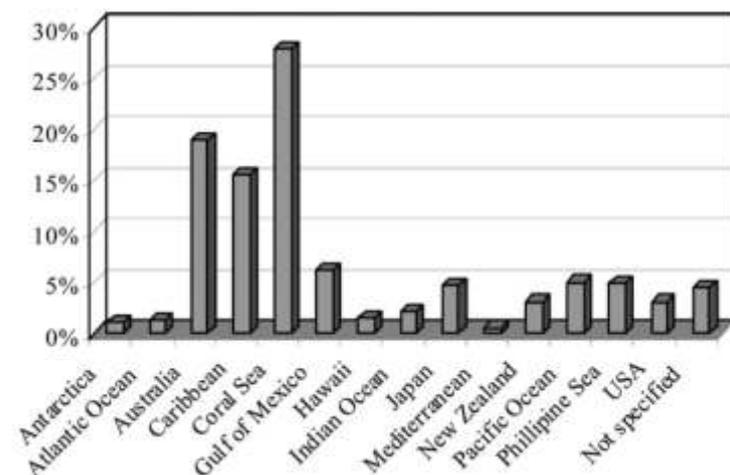
The vast oceans cover 70% of the world's surface, with 95% greater than 1000 m deep. Although difficulty in accessing these depths has previously hindered deep-sea research, today with improved acoustic technology and greater access to submersibles, deep-sea exploration is uncovering extensive deep-water coral reefs that are home to a wealth of species on continental shelves and seamounts world-wide.

It has been estimated that the number of species inhabiting the world's oceans may be as high as 10 million, and the ocean fringe with its high concentration of competing species was always thought to have the highest species diversity. On the contrary, recent analyses have shown that the deep sea is one of the most biodiverse and species-rich habitats on the planet, rivalling that of coral reefs and rainforests.

With over 60% of drugs on the market of natural origin, natural products can be considered the foundation of the pharmaceutical industry. Although in recent years the pharmaceutical industry decreased its activity in this area, today natural product-based drug discovery is experiencing a renaissance. In particular, the marine environment, a rich source of structurally unique, bioactive metabolites, has produced a number of drug candidates that are



Deep-sea marine fauna. (A) A *Bolocera* sp. anemone (500 m depth, Barents Sea, Norway); (B) A community of anemones, hydroids and corals (100 m depth, North Sea, UK); (C) The basket star *Gorgonocephalus caputmedusae* (930 m depth, Norway); (D) A colony of the deep-water coral *Lophelia pertusa* (100 m depth, North Sea, UK).



The geographic origins of reported novel deep-sea natural products. Note that Australia currently has the second highest concentration of these products in the world.

currently in clinical trials. In the ever-expanding search for sources of new chemical diversity, the exploration of deep-sea fauna has emerged as a new frontier in drug discovery and development.

Find out more about Danielle's research by visiting the publications page at www.serpentproject.com/pubs.php



GOM SERPENT Update

Dr Mark Benfield of Gulf SERPENT has had a busy and productive year so far. Here are some extracts from his recent newsletter.

2008 Highlights Video Released

At the end of October we released the first video documenting highlights from our 2008 missions. That video has become amazingly popular. If you haven't seen it yet, you can watch it online at http://zooplankton.lsu.edu/serpent_news.htm. There is also a link that will allow you to download the full resolution file (but it's big ... 105 megabytes). If you would like a copy of the video on a CD because you don't have access to a high speed internet connection, you can email us at: gulfserpent@gmail.com and we'll send you one.



A Sapiem-America ROV begins its journey into the Gulf of Mexico

Gulf SERPENT Website

The Gulf SERPENT website is progressing. We'll add more content over the fall and hope to have links to all our sites by the end of the year. You can visit us at <http://zooplankton.lsu.edu/serpent.htm>

Data Collection

After a busy and productive summer, we were hit by two hurricanes – Gustav and Ike. Both storms caused substantial damage offshore and not unexpectedly, SERPENT data collection ceased while operations focused on reconstruction and repair. The challenge we face now, is to return to regular data collection. Restarting routine SERPENT activities is a project priority as we've now gone two months without any surveys. Please help us by conducting regular SERPENT dives whenever time permits. Opportunistic observations are also important. If you see something interesting, try to collect some video of it. You never know, you may be the first person to observe something truly new!



Spear-nose chimaera below Holstein in October, 2008.

Recent Sightings

Although we hadn't received any dedicated surveys since the summer, we did receive an interesting observation from Lynn Durmon aboard Holstein. While running through some checkout dives, they spotted an unusual fish and sent in some still images followed by a short video. The strange looking creature is a relative of the sharks and rays called a chimaera (ki-meer-ah). This one is called the spearnose chimaera (*Rhinochimaera atlantica*) and its depth of 4340 feet appears to make it the deepest record of this species in the Gulf. Here's a great example of an opportunistic observation and our first data from Holstein. Thanks to Lynn and the Innovator team at Holstein!



GOM SERPENT Update (continued...)



Ocean Confidence: 8 March 2008



Thunder Horse: 17 January 2008



DDII/Atlantic: 25 July 2008



DDII/Atlantic: 26 July 2008

Creature Feature

One of the unusual invertebrate animals we observe are colonial organisms that are called pyrosomes. These animals often resemble a hollow cucumber that drifts through the water with little apparent direction. Pyrosomes are actually quite common and are primitive ancestors of animals with backbones. Their bodies consist of a jelly-like material within which, individual animals (called zooids) are embedded. The colony is closed at the front (rounded end) and open at the blunt back end. Individual zooids obtain food by pumping water through their 'mouths' into their bodies where they filter out small particles. Water is expelled through the back end of the colony giving them a slow, water-jet propulsion. Some colonies contain an unusual species of fish (which we've never seen in the Gulf but would really like to find!) Most colonies have a small shrimp or other crustacean living on them. Take a look at the pictures above. The small object attached to the underside of the pyrosome from July 25, 2008 is a hyperiid amphipod. Most pyrosomes are about a foot long, but some can be up to 12 feet in length! Many pyrosomes are bioluminescent and can produce a bright blue light

Gulf SERPENT at Ocean Commotion

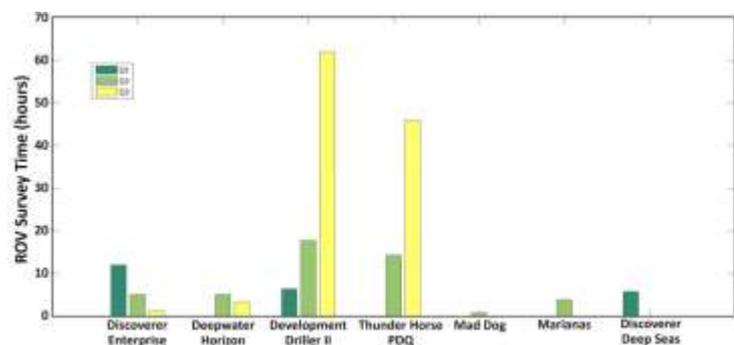
Ocean Commotion was held November 13 on the LSU campus. Gulf SERPENT was part one of 68 exhibitors who hosted over 3000 elementary through high school students at this annual coastal education forum.

Our booth featured the 2008 Highlights Video, a slideshow of what its like to work offshore, and a chance for students to try on personal protective equipment (FRC, hard hat, safety glasses). The foam ROVs and Innovator stickers donated by Saipem-America were a big hit! Judging by their enthusiasm, many of these kids will want to work offshore. They were particularly excited to learn that their video game skills may come in handy if they want to become ROV pilots!



Gulf SERPENT Data Collection Statistics

The graph on the right summarizes data collection activities supporting Gulf SERPENT for Q1 (Jan – Mar), Q2 (Apr – Jun), and Q3 (Jul – Sep) 2008.



Gulf SERPENT would like to thank all their industry partners for their help and support throughout the year. happy Christmas and a very happy and peaceful New Year from the Gulf SERPENT team!

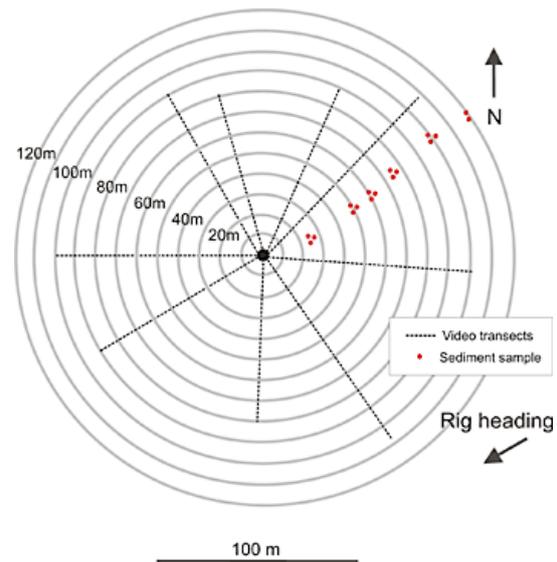


News Bites...

Haklang mission minisite

Dr Andrew Gates visited the Transocean Leader at the 1248 m deep Haklang Prospect in October. Haklang, off the North West Norwegian coast has recently been a big StatoilHydro success story. Reserves of between 8 billion and 14 billion cubic meters of recoverable gas have been found there.

Based on previous SERPENT work, Andrew's mission was to further investigate the effects that oil and gas exploration activities have on bottom-dwelling creatures. In particular he has been looking at the impact of drill spoil on creatures living on and above the sea floor. For more about the Haklang mission and a look at the new mission minisite format, visit the SERPENT Project missions page at www.serpentproject.com/miss.php



The Diagram shows the location of video transects and push core samples taken during the Haklang mission. The central black dot is the main drilling site.

Andy Guerin and BP

SERPENT founding partner BP demonstrated their continuing commitment to the project by offering us some ROV time on a couple of rigs we visited a while ago. Bruce is now a production platform, which offers a very different type of environment for us to investigate. SERPENT research student Andy Guerin had been sent videos of the undersea structures previously and he was very interested to see what changes had taken place in the intervening years. He has already received some clips which he is currently analysing.



The Bruce platform in the North Sea.

Stena Carron

SERPENT will once more be collaborating closely with the BBC to film some material to be included in a forthcoming episode of Coast, the TV series. Filming will take place in the New Year aboard the latest dynamic positioning drilling ship the Stena Carron, currently operated by Chevron.



The ultra-modern drillship Stena Carron

SERPENT collaborates with ASL

SERPENT is expanding its very successful remotely operated vehicle (ROV) operations to include the new generation of platforms, autonomous underwater vehicles (AUV). These systems contain computers that are programmed to carry out missions without any operator intervention. SERPENT has teamed up with the Autonomous Systems Laboratory (ASL) at the Virginia Institute of Marine Science in the US to carry out some unique investigations in the shallow hydrothermal vents off Iceland. Dr Mark Patterson, the director of the ASL, is delighted with the partnership, he explains "combining expertise in ROV and AUV science is vital in understanding remote marine ecosystems, technology is leading

