

December 2009 Newsletter

BP Funds New Gulf SERPENT Video

Last year's highlights video was so popular that we're currently working on a sequel from 2009. This year, with a generous grant from BP, we'll be able to produce something with even better quality. BP's funding will enable us to work with a professional filmmaking company (Lakefront Films, based in New Orleans) to produce a short video documenting the value of Gulf SERPENT and highlighting interesting findings from our participating sites. The new video will also feature some of our Wellsite Leaders, ROV Supervisors, and HSE Coordinators. Who knows, this could be the start of some new acting careers! The video should be released in late-January 2010. Thanks BP!!!

Bony-Eared Assfish Found Below the Deepwater Nautilus

I bet that got your attention! My apologies for the strange headline but it's true! There really is a fish called the bony-eared assfish and it was observed beneath the Deepwater Nautilus by the crew of Millennium 14. Its scientific name is *Acanthonus armatus*. It's a pale, tadpole-shaped creature whose body is described as being jelly-like by those scientists who've collected them. Another factoid about this fish is that there is a published study that reports that among all bony fishes – it has the smallest brain relative to its body size. That same study suggests that it may hold the record for the smallest relative brain size of any vertebrate.



A bony-eared assfish sizes up Millennium 14.

This appears to be the first time that the bony-eared assfish has been imaged in its natural habitat. They live so deep that they are normally only observed when they are collected in a net. It may also be the first record for the Gulf of Mexico. This species has been found in the waters off the Bahamas so being in the Gulf is to be expected. Little is known about them. They're believed to drift above the bottom feeding on bioluminescent organisms. They were thought to be very sluggish swimmers. Based on the way this one moved about when its small brain told it the ROV was too close, they can swim quite well! Thanks to the crew of Millennium 14 (Dave Workman, Shea McDonald, and Rodney Williams) and the Deepwater Nautilus for the unusual observation and to Shell, Oceaneering, and Transocean for supporting the Gulf SERPENT Project.



Acanthonus armatus collected with a net. These beat-up specimens aren't nearly as nice as our images. Source: Fishdb.sinica.edu.tw.

SERPENT Project Scientific Coordinator Visits LSU and Oceaneering

Dr. Dan Jones recently visited LSU to discuss ways of strengthening the linkages between SERPENT and Gulf SERPENT. Dan is a scientist at the National Oceanographic Center in Southampton, UK. He leads the scientific team for SERPENT. While here, he and Mark Benfield visited Oceaneering's production and training facility in Morgan City, where Anthony Harwin gave them a tour. Later Dan presented a seminar at LSU's School of the Coast and Environment on the impact of deep-sea drilling



Dan Jones (SERPENT) and Anthony Harwin (Oceaneering) discuss the capabilities of the Millennium ROV in Morgan City.

operations of benthic marine communities. Dan's visit will lead to closer coordination and collaboration between Gulf SERPENT and the SERPENT Project over the next year.

Creature Feature: *Apolemia*

One of the largest invertebrate organisms that an ROV may encounter is the siphonophore *Apolemia* (pronounced Ap-oh-lee-mee-ah). Siphonophores are colonial relatives of the jellyfish. Different parts of the colony are responsible for tasks such as propulsion, prey capture, and digestion.

One of the largest siphonophores is *Apolemia*. Colonies can be over 100 feet in length. When first encountered they may be oriented in a 'U' shape or a loose spiral with their tentacles hanging downwards. In such postures they are 'fishing' for any prey that accidentally swim into their deadly net of tentacles.



An *Apolemia* imaged by EMAG1 below the Deepwater Horizon using the new DPC-8000 digital camera funded by BP.

Gulf SERPENT Featured in LSU Alumni Magazine

The Winter 2009 issue of the LSU Alumni Magazine features an article on Gulf SERPENT that highlights the use of the new digital camera funded by BP. A copy of the article is included on the next page of this newsletter. The article isn't available online yet but please email Mark Benfield (mabenfie@lsu.edu) if you would like a copy.



AROUND CAMPUS

Deep See

A Novel Partnership Reveals More About Life in Oceans

"The pictures we got just blew us all away! It really was National Geographic quality."



LSU Associate Professor Mark Benfield next to a ROV equipped with the new high-resolution camera.

The remotely operated vehicle moved slowly forward through the ocean. More than a mile down, the ROV probed the darkness with its lights. A translucent blue jellyfish appeared, and the pilot on the surface carefully flew the car-sized ROV toward the delicate organism. A bright flash recorded an incredibly detailed image of the deep-sea predator. Later it would be examined by an oceanographer and studied as part of a research project documenting life in the depths.

If this sounds like something you've seen on the Discovery Channel involving Woods Hole or Scripps, guess again! The ROV is working in the Gulf of Mexico for BP and the research is part of an innovative project called Gulf SERPENT based at LSU.

SERPENT is a novel partnership between the oil and gas industry and universities around the world that provides scientists with access to rigs, ships, and ROVs. The goal is to learn more about life in the oceans.

SERPENT is a win-win situation for everyone. The rigs and ships provide oceanographers access to the sea. Hundreds of powerful ROVs work for industry. Compare that to the scientific ROV fleet which numbers less than 20! Allowing LSU to use ROVs makes more efficient use of these expensive systems and demonstrates industry's commitment to the environment. Plus the skills necessary to maneuver close to a jellyfish provide valuable training for new ROV pilots.

SERPENT is a global project. Here in the Gulf, the Gulf SERPENT Project is focused on the animals that inhabit the waters below 600 feet. These dark waters are one of the largest unexplored habitats on earth. There may well be more different species in the depths of the oceans than there are in the rain forests. Their DNA and biochemistry may contain compounds to treat our most challenging biomedical problems. The oceans are the largest reservoir of CO₂ on the planet. Deep-sea animals transport carbon from the upper ocean to depths where it remains trapped for hundreds to thousands of years. Determining what species occur, where they are located, and how they migrate up and down can help us understand climate change.

Since 2006, Mark Benfield, an associate professor in the Department of Oceanography and Coastal Sciences, has been coordinating Gulf SERPENT research in the Gulf of Mexico. He's worked closely with colleagues at BP, Shell, Chevron, and the ROV companies

such as Oceaneering, Saipem America, and Subsea7 to establish Gulf SERPENT. Funding for the project comes from the Minerals Management Service and BP. Once an ROV team has been trained on what to look for and how to search for it, they do the rest. Each week new videos are sent back to Benfield at LSU for analysis. One of the exciting things about the project is that it gives the ROV pilots – people who see a lot more of the deep sea than most scientists – a chance to be oceanographers.



Left: A 'galaxy' siphonophore in a spiral fishing pose. Siphonophores are colonies of jellyfish-like animals that use stinging tentacles to catch their prey. The galaxy siphonophore is a new species that scientists haven't yet named.



Right: A dinnerplate jellyfish (*Solmissus*) drifts past the ROV.

"When we began, we relied on the existing video cameras. The quality was good, but we knew that we could see a lot more with better cameras", recalls Benfield. Identifying these animals from a picture requires a lot of detail. In 2008, BP provided LSU with \$30,000 to equip one of the ROVs with a state-of-the-art underwater camera system. "The pictures we got just blew us all away! It really was National Geographic quality."

In the few years that Gulf SERPENT has been in operation, it's documented thousands of strange animals and demonstrated the benefits of an industrial partnership that is priceless. With each day, LSU and its industrial partners are learning more about the amazing life in the depths of the Gulf of Mexico.

Merry Christmas from Gulf SERPENT

Best wishes to all our partners for the holidays! Thanks for all the great video you've provided this year. I hope you have a safe and relaxing Christmas. If you have to be offshore working, as will likely be the case for many of you, at least there won't be any risk of snow in the Gulf! And if time permits, a SERPENT survey makes a great Christmas present.



Mark Benfield

