# What Lies On The Gulf Floor

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When most people think of Louisiana as being unique, they think of Mardi Gras, crawfish and Cajun culture. Few realize that what lies beneath the Gulf of Mexico along Louisiana's coast is also unique, from the terrain and habitat to the animals living there. And two LSU researchers are diving down some 3,000 meters to explore it.

Researchers Harry Roberts and Bob Carney are combing the most unique continental slope in the world to study some of the most unique animal communities on the planet - all just off the coast of Louisiana.

On Thursday, May 25, at 1 p.m. Eastern time, the research team will be available via satellite phone from their ship in the Gulf. To participate in the conference call, dial 866-802-1907, and enter Passcode 4314277.

Roberts and Carney are studying 14 different sites where oil and gas seep up from the bottom of the Gulf. In particular, they are studying the animals that live near these "seeps." These organisms include bacteria that feed on hydrogen sulfide gas, a by-product of the oil and gas seepage; tube worms, mussels and clams that serve as hosts to those bacteria; and shrimp, crabs, fish, snails and starfish that, in turn, feed on the worms, mussels and clams.

These animal communities are unique because they only exist near these seeps, and because the bacteria at the base of the food chain are "chemosynthetic," or grow without sunlight.

The large number of oil and gas seeps and the vast amount of salt under

the Gulf floor near Louisiana's coast, along with all the sediment dumped into the Gulf by the Mississippi River, make the continental slope off the coast of Louisiana unique.

"It's the most complicated continental slope in the world, geologically," Roberts said. "There are more seep communities off the coast of Louisiana than most places in the world. The salt, the oil and gas and the sediment create a very dynamic geologic framework."

Along with advancing science, the results of this research could also aid the oil and gas industry, as well as the Minerals Management Service, which gives the oil industry permission to drill and lay pipelines on the Gulf floor.

Both the industry and the MMS want to know more about these seeps and the federally protected organisms that live near them in order to avoid drilling and performing other activities in those areas.

Roberts and Carney left May 6 for a month-long journey that will take them anywhere from 1,000 to 3,000 meters below the surface of the Gulf.

They are diving to the floor of the Gulf in a submersible vehicle known as Alvin, which is operated by the Woods Hole Oceanographic Institute.

Alvin, best known to the public for exploring the wreck of the Titanic, is well-known among the scientific community, and is constantly in use all over the world by researchers who are able to pay for its use, either with grant or private funding.

Roberts and Carney received funding for their research through the MMS and the National Oceanic Atmospheric Administration's Ocean Exploration Program. The use of the Alvin submersible is being funded

by NOAA. Since Alvin costs approximately $50,000 a day, the researchers' use of it for nearly a month is a coup in the science world. Typically, a researcher will get to use Alvin for a few days or a couple of weeks.

As excited as they are about having Alvin for a month, Roberts and Carney admitted feeling some trepidation at being at sea for so long.

While conducting their research, Roberts and Carney will be living on a 280-foot ship with 23 other scientists who are involved in their research and the ship's crew of 17. When they are not using Alvin, things can get a little boring, they said.

"When you're not in the sub, you do your nails," Carney joked. "You can process samples and do paperwork, but there is still a lot of time to fill. Eating is a big event."

Both scientists have used Alvin before, so they know what to expect on the trip. They said that trying to exercise on a small ship can be difficult, and there is always the possibility of people on board getting seasick or stir-crazy.

"It's not going to be all fun," Carney said.

On most days, the two researchers will be using Alvin to take them down to the bottom of the Gulf. It takes a couple of hours to get to the floor of the Gulf, or the length of two Jimmy Buffet CDs, according to Roberts, who likes listening to music on the way down.

But the submersible is small, Carney said, and seats a maximum of three people - two researchers, and a pilot. "Picture three people in the trunk of a Volvo," he quipped. In addition, because of the depths that Alvin is diving, the cabin gets very cold.

There are also a number of safety issues involved with Alvin. Since a complete dive takes a total of eight hours, the crew has to be sure that the weather will be good for that length of time. Alvin cannot leave or return to the surface in bad weather. Also, there are oxygen and carbon dioxide levels to worry about, and the possibility of electrical, navigational and communication failures.

The comforting factor, the men said, is that in the Gulf, the crew is considered "within rescue" by authorities. Sometimes, researchers take Alvin to oceans that are not considered as such.

Drawbacks aside, the researchers said they are excited about the trip and the things they hope to see and learn.

"You get excited because from pre-dive data, it's clear that there is something you really want to investigate on the bottom, and this is the only vehicle to get you there," Roberts said. "Any trepidation you feel disappears when you begin to dive down, because you're seeing new things, sampling and taking notes. We will be the first people to ever see and directly sample most of these sites."

"I still get a real trip out of it," Carney said. "It's delightful to do. I really like to bring new people on these dives. It's amazing how normally rational people will act on these dives."

"People become awe-struck by the experience," Roberts agreed.

"This project has been a lot of fun and scientifically very productive," Roberts said. "In particular, the early cruises we took to the Gulf floor were fun because it seemed that every dive produced a new discovery. In those days, it was difficult to locate the sites we wanted to study. Today, because of technology that allows you to remotely evaluate the sea floor, the locations of hydrocarbon seeps are about 70 percent predictable."