Researchers deploy new tech to explore depths of Gulf of Mexico

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The Driftcam, developed by National Geographic Society, can capture high resolution images in the deep depths of the ocean. Credit: Dave McAloney, National Geographic Society

A multi-institution research team will deploy experimental technology next week to explore the deep scattering layers of the ocean.

The team which includes marine scientist Kevin Boswell from Florida

International University, is looking for information about animals in the Gulf of Mexico that make up the scattering layers—those that undergo daily vertical migrations of 100 to 1,000 meters. These animals represent the largest organized animal migration on the planet, yet little is known about them. What scientists do know is these animals are major players in the global carbon cycle, transporting carbon to deeper waters as they migrate. Some of them are part of a global discussion about whether they could have economic potential from a fisheries standpoint.

The research team will deploy an autonomous glider modified with sonar technology to collect up-close and personal data on the migrating animals in the water column. The slow-moving glider can stealthily travel through the water measuring where organisms are and how they are moving. An exciting addition to the glider is an "acoustic brain" developed by the University of Washington that processes acoustic data and sends data products home through a satellite connection. The team will simultaneously deploy a prototype camera system developed by the National Geographic Society called the Driftcam. Also an autonomous device, the Driftcam is designed to collect high-resolution images of species composition, distribution and even behavior that is not possible to capture with current technologies and methods. It too, is a minimally invasive device.

This autonomous glider, part of the University of South Florida glider fleet, is modified with sonar technology and will collect up close and personal data on the migrating animals in the water column. Credit: John Horne, University of Washington

The research project is supported by the National Oceanic and Atmospheric Administration's (NOAA) Office of Ocean Exploration and Research. Boswell leads the research team which includes scientists from NOAA National Centers for Coastal Ocean Science, National Geographic Society, Nova Southeastern University, University of South Florida, and the University of Washington.

"Our goal is to look into the deep sea without interfering," Boswell said. "We hope to observe these animals in their natural states and collect data on their sizes, how complex their aggregations are, and learn more about their behaviors."

Current methods include acoustic measurements from ship-based sonar and throwing nets into the water to collect specimens. Ship-based sonar is limited in its reach and detail at deeper depths. And net collections are invasive and don't provide great insight on animal behavior including the types of groups these animals migrate with—do they stick with their own kind or do they intermingle.

Kevin Boswell of Florida International University is the chief scientist for the

exploration and research mission into the Gulf of Mexico.

Traditional ship-based sonar and the experimental technologies will be combined to create a swarm of data collection in the same areas at the same time to provide a clearer picture of life in the oceans. If successful, the four-day mission will advance marine research by providing new, proven tools for seeing what lies beneath.

Boswell is a marine ecologist who specializes in acoustic technologies and has spent much of his career exploring the scattering layers in the Gulf of Mexico. The glider is designed by Teledyne Webb Research Corp. and has been outfitted with a Simrad EK80-Mini Echosounder for sonar, an acoustic device Boswell regularly uses in his research. The team's four-day research cruise to test the technologies will launch July 28 from St. Petersburg, Fla. aboard the R/V Hogarth.

Provided by Florida International University

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