Naval Research Laboratory scientists investigate acoustics in Gulf of Mexico

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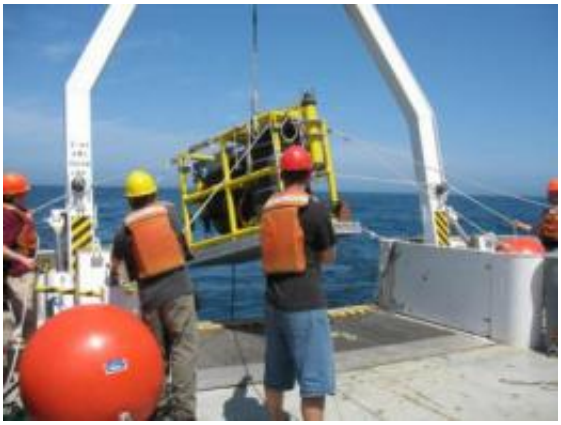

NRL scientists and R/V Cape Hatteras crew deploy the Deep Towed Acoustics Geophysics System (DTAGS) after it is outfitted with an aluminum landing plate that couples the sound energy generated by DTAGS directly into the seafloor. The large orange sphere is one of the floats used in the seafloor-mounted vertical hydrophone arrays, which listened to the sounds generated by DTAGS and their echoes off the seafloor. Credit: Naval Research Laboratory

Scientists from the Naval Research Laboratory at Stennis Space Center, MS, (NRL-SSC) and Washington, D.C., recently completed an investigation of the acoustic properties of the deep seafloor in the Gulf of Mexico.

Scientists on the cruise measured the effects of geologic faulting on the efficiency of acoustic wave propagation.

"Knowing the bottom loss—the amount of sound energy lost with each bounce off the bottom—affects how far away one can 'see' a target in the ocean using sound," said Dr. Warren Wood, a geophysicist in the Marine Geosciences Division at NRL-SSC. "What we are trying to determine with this experiment is to what extent the 'visibility' depends on the direction we are looking."

In stiff, well-consolidated sediments, sound waves traveling across the faults or cracks in the earth tend to propagate slower and with lower amplitude than waves traveling along the faults. The magnitude of this effect in soft, deep water sediments is not known.

To measure the amount of this effect (sediment anisotropy), the researchers introduced a sound and then listened with vertical arrays of hydrophones.

The sound the scientists measured was created by a unique piece of equipment called the Deep Towed Acoustics Geophysics System (DTAGS). DTAGS can produce ultra low frequency sounds (220-1000 Hz) in water thousands of meters deep. DTAGS can be towed or placed directly on the seafloor, generating transverse, as well as the more common longitudinal waves.

The investigative experiment was conducted in an area of the Gulf of Mexico where the faults have been extensively mapped and water averages 800-900 m deep.

The experiment's location was within a gas hydrate observatory run by the Gulf of Mexico Hydrates Research Consortium at the University of Mississippi.

Provided by Naval Research Laboratory