

New seismic vessel will look deep under oceans

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The academic community's most advanced seismic-research vessel was dedicated here today, opening potential new windows on natural hazards, earth's evolution, and other vital questions. The R/V Marcus G. Langseth, owned by the U.S. National Science Foundation, will generate CAT-scan-like 3D images of magma chambers, faults and other structures miles below the world's seabeds. To be used by dozens of cooperating institutions, it will be operated for NSF by Columbia University's Lamont-Doherty Earth Observatory.

The 235-foot Langseth is designed to pulse sound through seabottoms and read the return signals with vast arrays of hydrophones towed in "streamers" stretching as long as 5 miles. Previous vessels operated by Lamont have used similar technology, but the scale of the setup, combined with newly sophisticated computing and other improvements, is expected to offer unprecedented resolution and depth in looking at sub-ocean phenomena.

The ship also carries multibeam sonar to map the topography of deep seafloors with greater accuracy than before. It will deploy seismometers and other instruments on ocean floors that can monitor earthquakes, detect waves and tides, or warn of tsunamis. Sensitive microphones will be used to detect the calls of marine mammals at long distances; onboard research space will also be dedicated to the study of marine mammals.

The ship "will revolutionize researchers' ability to study the sources of deep earthquakes, to image the plumbing that feeds the global undersea

volcanic system, and produce an understanding that could lead us to ideas about new energy resources,” said G. Michael Purdy, Lamont’s director. “We know now that the earth is not at all still, but dynamic. We’re hoping to better understand what drives movements, and shed light on ongoing changes that could affect our global society.”

NSF paid more than \$20 million to buy and refit the vessel, previously used in commercial oil exploration. It spent months at dry dock in Nova Scotia before sailing to Galveston earlier this year. Following Monday’s dedication, it will undergo about two months of shakedown cruises in the Gulf of Mexico. Its first scientific mission, probably in early 2008, will be a study of geologic subduction zones off the Pacific and Caribbean coasts of Costa Rica, to be led by researchers at the University of Wyoming. Subsequent cruises will take scientists over submerged mountain ranges in the eastern Pacific; offshore of Alaska’s great St. Elias volcano; and to the earthquake and volcanism-wracked Juan de Fuca Ridge, off Oregon.

The vessel is named for the pioneering Lamont geophysicist Marcus Gerhardt Langseth. In a career from the 1950s to the 1990s, Langseth drew up the first global map of heat flow under the oceans; helped show that the planet’s seafloors are continually replenished by volcanism; and was a leader in sending the first unclassified scientific missions by U.S. Navy submarines underneath the northern ice, opening the way to mapping and understanding the Arctic Ocean. The Langseth replaces the Lamont-operated Maurice Ewing, U.S. scientists’ previous main seismic vessel. Named for one of Lamont’s founders, the Ewing was retired in 2005. Along with three other previous Lamont vessels over the past 50 years it was key in establishing our modern understanding of plate tectonics other basic knowledge of the earth.

Biologists are concerned that widespread human-made sounds in the oceans, including sonars, engine noises and seismic pulses like those

used in scientific research and oil exploration could potentially affect sea creatures. Thus the ship will take extensive precautions to minimize contact with marine mammals, some of which may be especially sensitive. Cruises are scheduled to avoid migrations or other activities of many species. In addition to listening for animals' vocalizations, the ship will post observers to search visually from deck and, if needed, in aircraft or onshore.

Source: The Earth Institute at Columbia University

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