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WWII Shipwrecks May Hold Key to Biological Mysteries of the Deep

MMS and NOAA Scientists Team Up with Academic and Industry Professionals to Study Gulf Shipwrecks

Over the ages, humans have long been fascinated by the sea—by what creatures inhabit the deep, dark waters, and what has become of the many ships that now lie beneath the waves. A team of world-renowned scientists will venture into the deep waters of the Gulf of Mexico on an 18-day research mission to investigate the long-term effect of manmade structures on the deep sea, and conversely, the effect of the environment on those structures. The multidisciplinary group, overseen by the Interior Department's Minerals Management Service (MMS), will depart Port Fourchon, Louisiana on July 29 aboard the NOAA contracted research and exploration vessel *HOS Dominator*.

The MMS, in partnership with the National Oceanic and Atmospheric Administration's Office of Ocean Exploration (NOAA OE), under the auspices of the National Oceanographic Partnership Program (NOPP), awarded a contract to C & C Technologies, Inc. to conduct the research. MMS is providing $350,000 toward research costs and NOAA OE is funding the ship time, a deep submergence Remotely Operated Vehicle (ROV), and personnel for both, all provided by Sonsub Inc. of Houston.

The study has two separate but equally important objectives: an archaeological/historical objective and a biological objective. The archaeological objective is to document the wreck sites being investigated as historic properties significant to American history. The biological component of this study will approach the question, "Do manmade structures, such as shipwrecks, function as artificial reefs in deepwater?"

In the Gulf of Mexico, converting offshore oil and gas structures into artificial reefs on the continental shelf has been accepted as a benefit to fisheries. However, regarding the deeper waters beyond the shelf, additional information is needed about the significance of a deep-sea artificial reef effect.

"The Gulf is the ideal laboratory for this study because of the number of steel-hulled ships that were casualties of World War II," explained Rob Church, C & C Technologies' project manager for the study. The Gulf represents one of the greatest concentrations of Allied vessels lost to German U-boats anywhere in the world, with 56 ships sunk in 1942 and early 1943.

According to MMS Marine Archaeologist Dr. Jack Irion, "Seven of these vessels, located during oil and gas surveys that are required by MMS, were selected for this study because they represent a range of depths (from 280 feet to 6,500 feet) and carried a variety of cargoes. Because the range of water depths represent different ecological niches and most of the vessels were sunk within a few months of one another, the wrecks offer a unique opportunity to study the artificial reef effect in differing depths after a period of 60 years." In addition to the biological studies, the vessels will be documented and studied as historic sites for potential nomination to the National Register of Historic Places.

Biologists will study the environment at each site to determine what effect each shipwreck has on the seafloor biology -- the artificial reef effect. They will look at how the sediments have been modified by microbes in the immediate vicinity of the wreck sites, compared to sediments farther from the sites. The scientists hope to determine how tiny microbes cause the slow disintegration of steel structures at great depths, how the cargoes the ships carried might affect the rate of disintegration and how the biological communities might change as the ships deteriorate. In the end, the scientists hope to learn how manmade structures on the seafloor might act to enhance or detract from their environment.

The prime contractor for this study, C & C Technologies, Inc. of Lafayette, La. is a leader in the field of marine geophysical surveys and responsible for the discovery of many of the wrecks included in this study. C & C Technologies will be joined by a team of world-renowned scientists in the fields of microbiology and marine invertebrate and vertebrate zoologists. These scientists include Dr. Roy Cullimore of Droycon Bioconcepts, Inc. of Regina, Saskatchewan, Canada, whose previous research includes microbial analyses of the *RMS Titanic* and, the *DKM Bismarck*, and the *HMHS Britannic*. Dr. Cullimore is joined by Dr. William Schroeder, senior marine scientist at the Dauphin Island Sea Lab and University of Alabama professor; Dr. Thomas Shirley, professor of invertebrate biology at the University of Alaska Fairbanks; and Dr. William Patterson, assistant professor of marine vertebrate zoology at the University of West Florida.

This study will have a significant outreach and education component, overseen by Dr. Annalies Corbin, executive director of the PAST Foundation and assistant professor of nautical archaeology at East Carolina University. A full curriculum based on each component of the mission will be available to all educational institutions in an easy to download format via the PAST Foundation website. Included in the educational outreach will be an interactive project Website, http://www.pastfoundation.org/DeepWrecks/ spearheaded by Andrew Hall who has been involved with developing several nautical archaeology project websites, and a documentary film to be produced by award-winning filmmaker Dr. Dennis Aig, professor of media and theatre arts at Montana State University - Bozeman. Daily text and ROV still photos will be provided and there will 2-3-minute streaming video pieces every other day.

"This field study is an exciting opportunity for all participants," concluded John McDonough, project coordinator at NOAA OE. "We believe this joint effort will expand our knowledge in areas such as the management and preservation of historic shipwrecks and other submerged cultural resources. At the same time, this expedition uses ocean exploration and interdisciplinary oceanographic research to capture the public's imagination with the message that we have a great deal to learn about Earth's oceans and their effect on our lives."

The Minerals Management Service is the federal agency in the U.S. Department of the Interior that manages the nation's oil, natural gas, and other mineral resources on the Outer Continental Shelf in Federal offshore waters. The agency also collects, accounts for, and disburses mineral revenues from Federal and American Indian lands. MMS disbursed more than $8 billion in FY 2003 and more than $135 billion since the agency was created in 1982. Nearly $1 billion from those revenues go into the Land and Water Conservation Fund annually for the acquisition and development of state and Federal park and recreation lands.

The Commerce Department's National Oceanic and Atmospheric Administration is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and providing environmental stewardship of our nation's coastal and marine resources. NOAA is part of the U.S. Department of Commerce.

Fact Sheet - The Archaeological and Biological Analysis of World War II Shipwrecks in the Gulf of Mexico: A Pilot Study of the Artificial Reef Effect in Deep Water

MMS Main Website: www.mms.gov
NOAA Website: www.noaa.gov
PAST Foundation Website: www.pastfoundation.org
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