



WOODS HOLE OCEANOGRAPHIC INSTITUTION

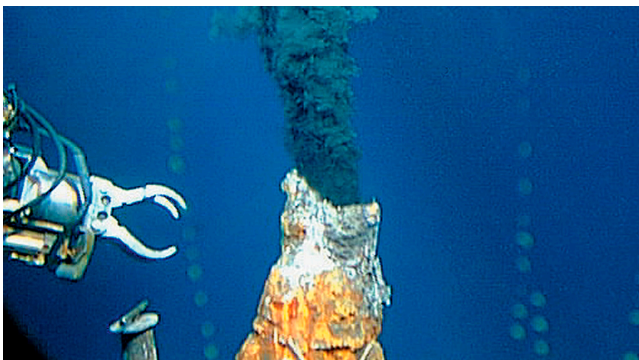
Deepwater Horizon Oil Spill Position Statement and Summary of Qualifications

EXECUTIVE SUMMARY

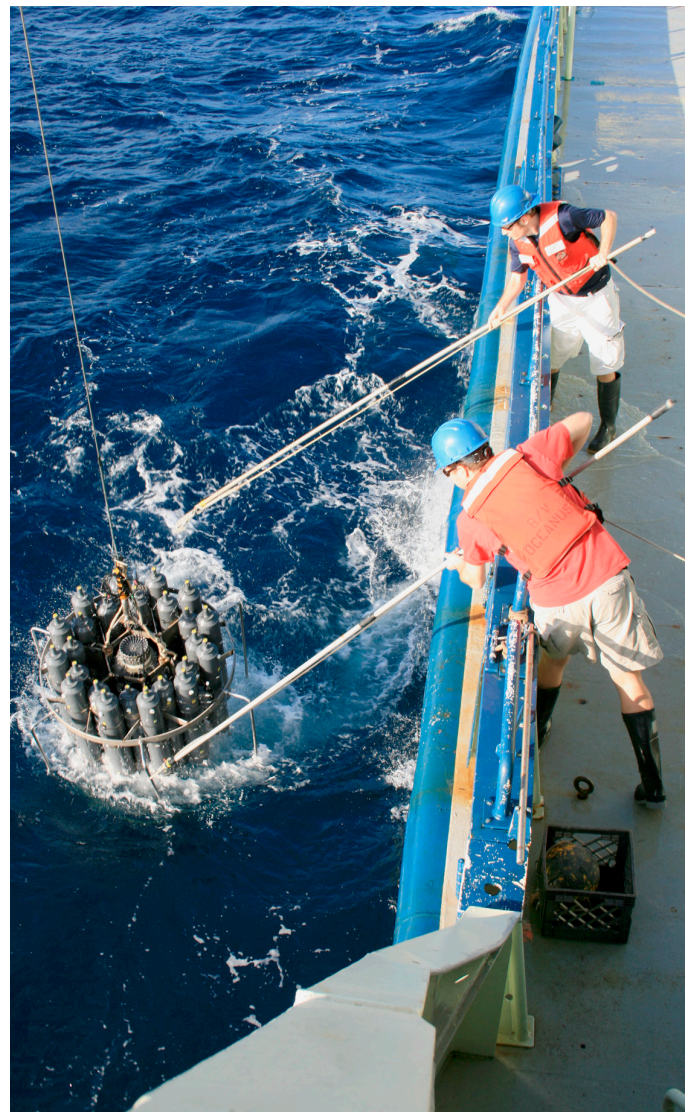
The extent and complexity of the *Deepwater Horizon* oil spill demands the mobilization of the U.S. oceanographic community in order to characterize and monitor the scope, fate and effects of the event. As a leader in oceanographic research and engineering with four decades of experience conducting and managing the science of oil spills, the Woods Hole Oceanographic Institution has developed a response strategy that includes:

- Providing the scientific and engineering expertise necessary to conduct a comprehensive program
- Developing and adapting the tools and processes necessary to support the science and engineering objectives
- Coordinating and collaborating across disciplines with a range of institutions to facilitate communication within the scientific community and among agency and industry partners
- Conducting all activities in accordance with standard scientific protocols, emphasizing balance and impartiality
- Providing executive oversight and project management expertise to coordinate internal and external activities and manage finances

The scientists and engineers at WHOI have made many discoveries that underlie what is known about the ocean and its interaction with the planet's atmospheric, terrestrial, biological and human systems. The *Deepwater Horizon* oil spill warrants application of this knowledge and the skills developed over decades working at sea and in the lab to the Gulf of Mexico.



The experience gained from making measurements of fluid flow from hydrothermal vents have enabled WHOI researchers to help refine measurements of flow rates from the *Deepwater Horizon* well.



WHOI ships, instruments and personnel regularly deploy around the globe to study physical, chemical, biological and human processes in the oceans. Data- and sample-handling protocols developed at WHOI ensure that analyses performed at the Institution meet the highest standards for accuracy.

ABOUT WHOI

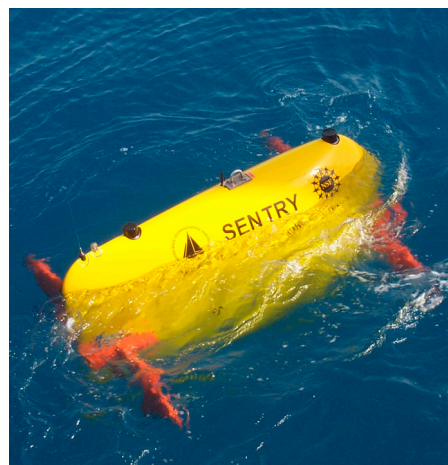
The Woods Hole Oceanographic Institution (WHOI) is a private, non-profit institution dedicated to research and education in the ocean sciences and engineering. Founded in 1930, WHOI today has a staff of 1,000 and an operating budget of \$170 million. Its operations are funded by the U.S. Government, foundations, industry and private donations.

WHOI is distinguished by its singular focus on ocean science and by the independence with which its scientists and engineers pursue their research. This focus allows WHOI to maintain an unparalleled depth and breadth of scientific and technical talent in oceanographic research and education as well as a reputation for objective, unbiased scientific research. The Institution combines a unique complement of assets including scientists who study many of the most pressing and complex questions about the relationship between humans and the oceans, engineers who invent and deploy new tools and technology, and research vessels and deep-submergence vehicles that provide unparalleled access to the sea.

WHOI's preeminence in ocean research spans all areas of marine science and engineering through five principal departments: Applied Ocean Physics

and Engineering; Biology; Geology and Geophysics; Marine Chemistry and Geochemistry; and Physical Oceanography. The Institution also operates four interdisciplinary institutes—Ocean and Climate Change, Coastal Ocean, Ocean Life, and Deep Ocean Exploration—as well as the Marine Policy Center and the Woods Hole Center for Oceans and Human Health.

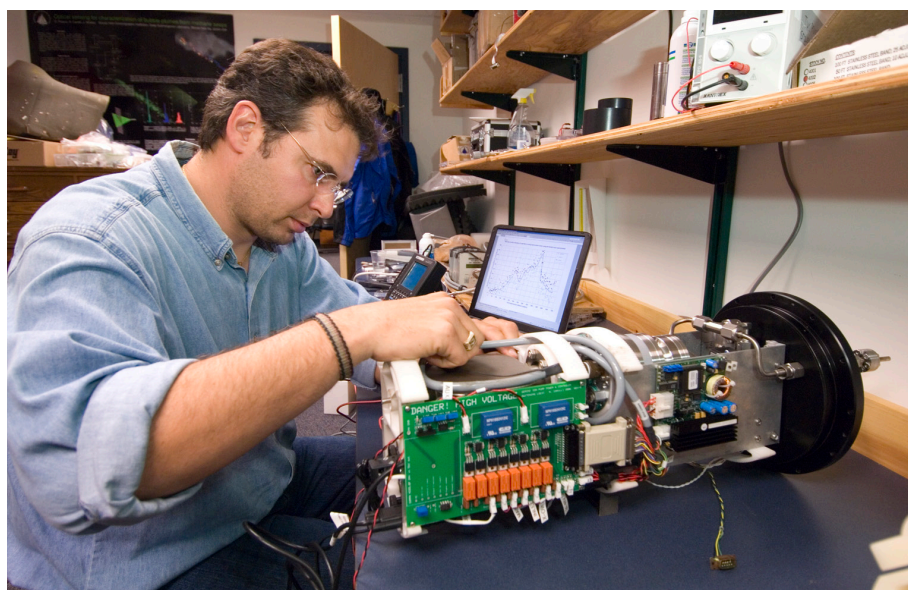
WHOI's engineering and seagoing capabilities have historically presented unmatched tools and methods facilitating ocean science research. Today, the Institution operates three ocean-going research vessels, the R/V *Atlantis*, *Knorr*, and *Oceanus*, as part of the University-National Oceanographic Laboratory System (UNOLS) and the coastal research vessel R/V *Tioga*. WHOI is also home to the National Deep Submergence Facility (NDSF), which operates deep-sea exploration vehicles for the benefit of the entire U.S. oceanographic community and includes the U.S. Navy-owned Deep Submergence Vehicle (DSV) *Alvin* and the remotely operated vehicle (ROV) *Jason*. In addition, WHOI has developed and operates a wide range of next-generation vehicles such as the autonomous underwater vehicles (AUV) *Sentry* and *Remus*.



Sentry, a fully autonomous underwater vehicle capable of exploring the ocean down to 4,500 meters (14,764 feet), carries the Tethys mass spectrometer and has been used to locate and quantify submarine hydrocarbon seeps.

WHOI occupies more than 50 buildings on two campuses in the Woods Hole village of Falmouth, Massachusetts. The Village Campus houses laboratories, shops and marine facilities, including nearly 700 feet of deep-water berthing. The Quissett Campus is a major complex of laboratories and administrative offices that house such world-leading assets as the National Ocean Sciences Accelerator Mass Spectrometry Facility, the Northeast National Ion Microprobe Facility, a dedicated computed tomography (CT) scanning facility for marine mammal research, and a deep-sea sediment core repository. WHOI also hosts extensive on-site capability for the design, fabrication, and testing of oceanographic instrumentation.

As part of its educational mission, WHOI conducts a joint graduate program with the Massachusetts Institute of Technology, conferring degrees in oceanography and applied ocean science and engineering. Alumni of the MIT-WHOI Joint Program have gone on to become international leaders in oceanography and regularly return to campus as visiting scholars or for international symposia and colloquia.



Dr. Richard Camilli's work developing miniature mass spectrometers permit AUVs to make high-density, in-situ measurements of oil plumes in the open ocean.

OIL SPILL EXPERTISE

Since 1969, WHOI has been the lead organization studying the effects of oil spilled from the barge *Florida* in Buzzards Bay. The assessment and monitoring effort developed in response to the *Florida* is considered a model for the study of the long-term fate and impacts of oil in the marine and coastal environments. Since then, WHOI scientists have been called upon to study and monitor physical, chemical and biological characteristics of spills in diverse environments and conditions, including those from the *Exxon Valdez* and *Prestige* as well as the *Cosco Busan* and *Hebei Spirit*. This experience enabled WHOI to make significant contributions to the National Research Council's report *Oil in the Sea III* and to play a leadership role in developing industry and academic best practices in responding to oil spills.

Over the years, WHOI scientists and engineers have developed a suite of innovative tools and capabilities that provide sophisticated

means for studying the characteristics, fate and impact of oil in the ocean. These include the Tethys mass spectrometer that can be deployed from an AUV and enables real-time mapping and analysis of oil-contaminated water. Sensors developed to measure the flow rate at hydrothermal vents have been adapted and deployed to provide estimates of oil and gas flow-

ing from the *Deepwater Horizon* well. Our analytical capabilities include the Fourier Transform Mass Spectrometer Facility, which is one of only a few labs in the country able to make ultra-high resolution measurements of the water-soluble component of oil, and a two-dimensional gas chromatography lab devoted to studying the long-term fate of hydrocarbons in the environment.



The 1969 spill by the fuel barge *Florida* is one of the best-studied events of its kind in history. Its effects on the coastal environment of Buzzards Bay have been monitored by WHOI scientists for 40 years, including Dr. Christopher Reddy (right), who has greatly advanced understanding of the fate and impact of oil in the environment.

PROJECT MANAGEMENT AND LEADERSHIP CAPABILITIES

WHOI has significant project management capabilities that are unique within the oceanographic community. This together with supporting administrative infrastructure have been developed from experience gained in running numerous multi-year, multi-million dollar national and international programs, including the Ocean Observatories Initiative (OOI); the Replacement Human Occupied Vehicle; and the multi-ship, multi-insti-

tutional Shallow Water 2006 program. As one of four implementing organization for OOI, WHOI is responsible for managing the \$339 million, 7.5-year effort to develop the initiative's Coastal and Global Scale Nodes.

WHOI has established a *Deepwater Horizon* incident response team to coordinate preliminary activities that require quick reaction. Early efforts have included flow-rate measurements at the blow-out preventer and riser pipe,

water sampling to ground truth acoustic mapping of the oil plume and in-situ measurements using gliders and AUVs. Long-term plans include forming a dedicated management team that will implement a comprehensive program drawing on our science and engineering expertise. The goal is to provide comprehensive, integrated and multi-disciplinary solutions which are firmly grounded in science and engineering and utilize best practices.

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