Mission to the Deep: Exploring the Ocean with the Monterey Bay Aquarium Research Institute (MBARI)
Press Kit Index

NEWS RELEASE

For information contact:
Karen Jeffries, (831) 644-7548; kjeffries@mbayaq.org
Angela Hains, (831) 647-6804; ahains@mbayaq.org
Ken Peterson, (831) 648-4922; kpeterson@mbayaq.org

FOR IMMEDIATE RELEASE
September 7, 2007

EMBARK ON A 'MISSION TO THE DEEP' WITH NEW AQUARIUM EXHIBIT

~~~~~~

Interactive exhibit highlights state-of-the-art technology used by deep-sea researchers

Deep-sea exploration is at your fingertips in "Mission to the Deep: Exploring the Ocean with the Monterey Bay Aquarium Research Institute," an exciting new exhibit that opens at the Monterey Bay Aquarium on September 15.

"Mission to the Deep" celebrates the 20th anniversary of the aquarium's sister research institute – also known as MBARI – a world leader in exploring and studying the deep sea. The exhibit highlights new tools and technologies from MBARI that are dramatically changing the way we view and monitor the oceans. These tools have helped MBARI researchers uncover new habitats and life forms we never imagined existed. They also allow MBARI researchers to conduct experiments that measure the impact of human activities on the oceans, from water pollution to global climate change.

"Mission to the Deep" draws visitors into this exciting world by combining stunning high-definition video footage with interactive computer animations of undersea robots and other high-tech tools that help the MBARI team explore the largest and most mysterious habitat on Earth.

Through large, multi-screen presentations and some interactive displays, the new permanent exhibit invites visitors to join MBARI researchers on three different missions – photograph deep-sea animals, map vast undersea mountains and monitor environmental changes on the seafloor.

"Visitors are keenly curious about the deep sea," said Senior Exhibit Developer Ava Ferguson. "They love seeing cool animals in our 'Mysteries of the Deep' auditorium program, but they usually don't get to learn about the tools that allow MBARI researches to go where few people have gone before."

- more
~~~~~~

The three simulated missions are designed like video games, where visitors race against a clock to perform three different tasks using a computerized touch screen. In one mission, visitors deploy a remote-controlled sub into the mysterious depths of the midwater – the largest habitat on Earth – to photograph bizarre deep-sea creatures, such as a vampire squid, a giant deep-sea jelly and a spookfish.

In the second mission, visitors launch self-guided robots to explore and map seamounts – undersea mountains that lie hundreds of fathoms below the ocean's surface, yet are covered with unique marine life. The third mission involves operating a camera attached to a virtual deep seafloor observatory to monitor the surprisingly rich and varied marine life around a sunken whale carcass.

"These missions mimic components of actual deep-sea research," Ferguson said. "Better yet, they give visitors a chance to learn about the high-tech tools MBARI researchers use."

MBARI and aquarium staff worked closely over the past year to make "Mission to the Deep" both exciting and informative. MBARI researchers and engineers reviewed facts and shared images of strange animals, underwater volcanoes, deep-sea robots and deep-sea instruments. Video technicians prepared hours of beautiful high-definition footage. Even the ships' crews and the pilots of MBARI's remotely operated vehicles (ROVs) got involved, sharing the experience of what it's like to be onboard a deep-sea research vessel during an ROV dive.

In showing how MBARI researchers do their work, "Mission to the Deep" is a perfect companion to the aquarium's "Mysteries of the Deep" auditorium program, which presents what MBARI researchers are studying on a daily basis: the fantastic animals and other-worldly environments of the deep sea. Some programs even include live video coverage of ROV expeditions. "Mission to the Deep" is just the thing for anyone who has ever wondered what it's like to pilot a robotic submarine, monitor an undersea observatory or sit in the control room of a research vessel during an ROV dive.

"Mission to the Deep," like the "Mysteries of the Deep" auditorium program, is included with aquarium admission: $24.95 adult; $22.95 senior (over 65) and student (full-time college, with I.D.); $15.95 children and the disabled; under 3 free**.** For general information and more information about the new exhibit, visit www.montereybayaquarium.org/deep.

The mission of the Monterey Bay Aquarium is to inspire conservation of the oceans.

– 30 –

Editors: Contact Public Relations for images of MBARI research tools, deep-sea animals and the "Mission to the Deep" exhibit.

Back to Index

MONTEREY BAY AQUARIUM RESEARCH INSTITUTE
7700 Sandholdt Road; Moss Landing, CA; 95039-9644; tel: 831-775-1700; fax: 831-775-1620

Quick Facts

Mission
The Monterey Bay Aquarium Research Institute (MBARI) is a private, non-profit research institution where scientists and engineers work together to develop new instruments and methods for studying the ocean.

Origin
MBARI was founded in May 1987 by David Packard. Among his many accomplishments, David Packard (along with William Hewlett) started the Hewlett-Packard Company, a maker of computers and electronic equipment.

Relationship to the Monterey Bay Aquarium
The Monterey Bay Aquarium and MBARI both were established through the generosity of the Packard family. They are separate institutions but maintain close ties, and their missions of education and research complement each other. MBARI supports many activities at the Monterey Bay Aquarium, including exhibits and educational programs.

Funding
The David and Lucile Packard Foundation funds at least 80 percent of MBARI's annual budget for operations and research, which is typically between $30 to $40 million per year. MBARI researchers also receive funding from additional sources such as the National Science Foundation.

Staff
Marcia K. McNutt serves as MBARI's president and chief executive officer, managing a work force of approximately 220 scientists, engineers, and operations and administrative staff.

Facilities
MBARI is located in Moss Landing, California, at the head of the Monterey Submarine Canyon. This location provides researchers with year-round access to deep water habitats. MBARI's facilities include docks for three research vessels, scientific and engineering laboratories, machine shops, administrative offices and a 10-meter-deep salt-water test tank.

Selected research topics

Marine biology—Animals and communities on the deep seafloor and in the water column; effects of nutrients, climate and ocean circulation on ocean productivity and the oceans' ability to absorb carbon dioxide; genetic analyses of ocean microbes and harmful algal blooms.

Marine geology—Undersea volcanoes, hydrothermal vents, cold seeps, gas hydrates, submarine canyons and the structure of the Earth's mantle.

Marine chemistry—Iron and carbon dioxide in the ocean; gasses in seafloor sediments.

Engineering—Design and construction of ocean observatories, moorings, undersea robots and instruments that can measure the physical, biological, and chemical properties of seawater.

Economics—Human use of ocean and coastal resources and the economic value of these resources at local, state and national levels; relationships between ocean policy and science.

Visit www.mbari.org for the latest news and information from MBARI

Back to Index

MONTEREY BAY AQUARIUM RESEARCH INSTITUTE
7700 Sandholdt Road; Moss Landing, CA; 95039-9644; tel: 831-775-1700; fax: 831-775-1620

"Mission to the Deep"

The technology behind the exhibit

Autonomous Underwater Vehicles
Autonomous underwater vehicles, or AUVs, are robot submarines that are programmed at the sea surface, then launched to follow a predetermined path through the water, collecting data as they go. MBARI researchers use different AUVs to collect information about seawater temperature and chemistry, to bring back water samples and to map the seafloor.

MBARI's seafloor-mapping AUV can simultaneously measure the depth of the seafloor, create images of rock outcrops, and map layers of sediment beneath the seafloor. In the "Mission to the Deep" exhibit, aquarium visitors use a virtual AUV to create maps of undersea volcanoes.

For more information, see http://www.mbari.org/auv/

Remotely Operated Vehicles
MBARI's researchers use remotely operated vehicles, or ROVs, as their eyes, ears and hands in the sea. ROVs are underwater robots that are tethered to, and powered from, a ship on the sea surface. From the relative safety of the ship, researchers and ROV pilots can view the ocean through high-resolution video monitors as they collect samples or perform experiments using the ROV's manipulator arms.

Over the last two decades, ROVs have dramatically changed how marine biologists study deep-sea animals. Instead of dragging nets through the water or pulling dredges over the seafloor, biologists can now observe and collect animals in their native habitats. This has led to the discovery of dozens of new species and a much better understanding of the behavior and interactions of these animals. In the "Mission to the Deep" exhibit, aquarium visitors use a virtual ROV to photograph bizarre-looking fishes, jellies and other deep-sea creatures.

For more information, see http://www.mbari.org/dmo/vessels_vehicles/rov.html

The Eye-in-the-Sea

The Eye-in-the-Sea is an underwater camera that can be left on the seafloor for weeks or months at a time to take pictures of deep-sea animals. The Eye-in-the-Sea was developed by marine biologist Edie Widder, who has used this instrument to study animals in the Gulf of Mexico and the Atlantic Ocean, as well as in Monterey Bay.

Dr. Widder is currently developing a new version of the Eye-in-the-Sea that will be attached to the Monterey Accelerated Research System (MARS) ocean observatory (see below for details). Once installed, it will send deep-sea images back to shore 24 hours a day. In the "Mission to the Deep" exhibit, visitors will use a virtual Eye-in-the-Sea camera to monitor the surprisingly rich and varied marine life found around a sunken whale carcass.

For more information, see http://www.oceanrecon.org/research.htm

The MARS Ocean Observatory:

The MARS ocean observatory consists of a 32-mile-long cable that will carry power and data from shore out to a variety of scientific instruments located on the seafloor off Monterey Bay, 3,000 feet below the ocean's surface. Currently, most deep-sea oceanographic instruments run on batteries and store data until they are brought back to the surface after weeks or months of operation. MARS eliminates those restrictions, providing almost unlimited power and allowing oceanographers (and the general public) to see what's happening in the deep ocean in real time.

For more info, see www.mbari.org/mars

Back to Index

MONTEREY BAY AQUARIUM RESEARCH INSTITUTE
7700 Sandholdt Road; Moss Landing, CA; 95039-9644; tel: 831-775-1700; fax: 831-775-1620

20 years of Discovery at MBARI

1987-2007: Two decades of science and engineering teamwork, as envisioned by founder David Packard.

1987-2007: Discoveries via ROV of deep-sea biomass and biodiversity, showing that gelatinous animals make up about a third of the biomass in some marine food webs.

1988-2007: ROV *Ventana* performs more than 3,000 research dives, making it the most successful scientific remotely operated vehicle (ROV).

1989- 2007: The "Mysteries of the Deep" auditorium program that lets Monterey Bay Aquarium visitors observe live ROV dives in Monterey Bay.

1989 -2007: The Monterey Bay time series, a 19-year record of physical, chemical and biological ocean phenomena.

1989-1996: The design and construction of *Tiburon*, a state-of-the-art, all-electric remotely operated vehicle.

1998-2007: Experiments showing the effects of carbon dioxide sequestration and acidification in the deep sea.

1999-2007: Documentation of the diversity and importance of marine microbes.

2000: Discovery of proteorhodopsin, a pigment that allows marine bacteria to create energy from sunlight without chlorophyll.

2000-2007: The Monterey Ocean Observing System (MOOS), MBARI's innovative observatory that provides power and communications from a mooring at the surface to instruments on the seafloor 3,500 meters below.

2001-2007: Development of the Environmental Sample Processor (ESP), a device that allows underwater detection of microscopic marine organisms using their genetic material.

2002-2007: The Monterey Accelerated Research System (MARS), a deep-sea cabled observatory and science and engineering test bed.

2003: The first deep-sea laser Raman spectrometer, a "point and shoot" method for studying the chemistry of materials in the deep sea.

2003: Discovery of *Tiburonia granrojo* or "big red," a deep-sea jelly with a bell diameter of up to a meter (just over three feet) wide.

2003: Discovery of a unique undersea nursery where, for the first time, marine biologists have directly observed groups of fish and octopus brooding their eggs, like chickens on their nests

2004: Discovery of the bone-eating worms in the genus Osedax with dwarf parasitic males and symbiotic bacteria.

2004: Development of *D. Allan B.*, an autonomous underwater vehicle (AUV) equipped with state-of-the-art, high-resolution, bathymetric and sub-bottom mapping systems.

2005: Publication of study proving that the discarded feeding nets of giant larvaceans are an important source of organic carbon on the deep seafloor.

2006: Archaeological investigation, with NOAA's National Marine Sanctuary program, of the submerged wreck site of the USS Macon, the nation's largest and last U.S.-built, rigid airship.

2006: Discovery of a new species of blind deep-sea crab whose legs are covered with long, pale yellow hairs, nicknamed the "Yeti crab" after the fabled abominable snowman of the Himalayas.

2006: Publication of a study showing that females of at least one species of squid carry their eggs between their arms until the young hatch and swim away. This disputes previous assumptions that all squids lay their eggs in clusters on the sea floor, where they develop and hatch without any help from their parents.

Visit http://www.mbari.org/news/homepage/homepage.html for more discoveries.

Back to Index