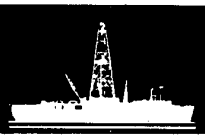
# NEWS RELEASE
## Ocean Drilling Program



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ODP Leg 125

**Scientists recover 40-million-year volcanic record**

COLLEGE STATION, Tx -- Scientists recently returning from a cruise in the Pacific Ocean reported that they recorded the 40-million-year history of a submarine volcano and recovered rocks that formed in Earth's mantle.

The 27 scientists from nine countries were on board the Ocean Drilling Program's drill ship, JOIDES Resolution, which operated near the arc-shaped volcanic chains of the Mariana and Izu-Bonin islands between Guam and Japan.

The discoveries will enable scientists to better understand the nature of volcanic processes in the circum-Pacific's chain of volcanoes, called the Ring of Fire. The scientists

--drilled a hole more than half a mile deep into the roots of a 40-million-year volcano

--drilled several holes through a thick sequence of muds near the volcano, enabling them to count and date the layers

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of volcanic ash, much like a botanist counts a tree's rings

--drilled into a volcanic-like structure where Earth's mantle -- the thick shell between Earth's crust and its core -- is exposed on the seafloor. The scientists found small pockets of natural gas trapped in the mantle rocks.

The hole drilled into the volcano -- the deepest drilled into a submarine volcano -- penetrated a thick pile of lava flows to reach the channels that once fed the magma from depth to the surface. Scientists determined the age of the volcano by dating the microfossils of plants and organisms trapped by successive eruptions of lava.

**Lava flows contain history of volcanic eruptions**

One of the holes drilled near the volcano recovered more than 1200 feet of mud and sand that recorded 100 layers of ash from violent volcanic eruptions. The ash beds show that volcanic activity in the region south of Japan has fluctuated during the last 40 million years; in recent times the area has experienced relatively intense activity.

The mantle rocks recovered from a submarine mountain belt near the deep ocean trench north of Guam will give scientists additional information about a newly discovered seafloor formation. Scientists previously had thought that these conical formations, called seamounts, were dead volcanoes. The drilling results, however, have revealed that

these mountains are composed not of lava, but rock that rises in a solid state from many miles beneath the seafloor. This new kind of seamount is a direct result of the process of plate tectonics.

Because of plate tectonics, the Pacific crustal plate is moving westward. At the deep ocean trenches that outline the western Pacific, the Pacific plate buckles and sinks as much as 400 miles into the Earth's interior. Deep within the mantle, increasing heat and pressure distill the fossil-bearing sediments' water and gases, causing the material to rise and react with the mantle's rocks.

**Scientists find pockets of hydrocarbon gases**

This process alters the amalgamation of regenerated sediment and mantle rocks, transforming it into a light, greenish-gray material called serpentine, a type of asbestos. Serpentine usually mixes with natural gases and surrounding water, causing it to rise along deep fractures. When it reaches the seafloor, it oozes out like toothpaste from a tube to form the giant, volcanic-shaped mud domes.

Recovery from these mounds of altered rock and sediment produced additional proof that natural hydrocarbon gases can be trapped in rocks that formed deep in Earth's mantle and carried to the surface of the seafloor.

In addition to the pockets of hydrocarbon gases,

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scientists recovered other natural resources such as native copper and iron pyrite from the submarine volcano.

During the next two years, the scientists will analyze the material and data obtained from the cruise to learn more about the deep plumbing systems of submarine volcanoes, the processes of mantle alteration occurring near deep-ocean trenches and possible sources of minerals for further exploration and development.

Co-chief scientists for the Leg 125 were Dr. Patricia Fryer of the University of Hawaii at Manoa, Honolulu, and Dr. Julian Pearce of The University, Newcastle upon Tyne, the United Kingdom. Dr. Laura Stokking was ODP staff scientist.

The ship departed Guam Feb. 20 and arrived in Tokyo on March 18. The 27 scientists were from Australia, Canada, Italy, the Federal Republic of Germany, France, Japan, Norway, the United Kingdom and the United States.

**Floating research center**

JOIDES Resolution, registered as SEDCO/BP 471, is the research vessel for the ODP, which is funded by the United States National Science Foundation, Canada and Australia, the European Science Foundation Consortium for the Ocean Drilling Program, Federal Republic of Germany, France, Japan and the United Kingdom.

The 470-foot-long drill ship's derrick towers 200 feet

above the waterline. A seven-story laboratory stack provides facilities for on board examination of sediment and hard-rock cores. Laboratories contain space and equipment for studies in chemical, gas and physical properties, paleontology, petrology, paleomagnetics and sedimentology. Marine geophysics research is conducted while the ship is under way.

Texas A&M University, as science operator, operates and staffs the drill ship and retrieves cores from strategic sites around the world. The science operator also ensures that adequate scientific analyses are performed on the cores. To do this, Texas A&M maintains shipboard scientific labs and provides logistical and technical support for shipboard scientific teams. On shore, in the Texas A&M University Research Park, the science operator manages post-cruise activities, curates the cores and publishes the scientific results.

Lamont-Doherty Geological Observatory of Columbia University is responsible for downhole logging.

Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES), an international group of scientists, provides scientific planning and program advice. Joint Oceanographic Institutions (JOI, Inc.), a nonprofit consortium of 10 major U.S. oceanographic institutions, manages the program.

"During the next two years, JOIDES Resolution will drill in the western Pacific," said Dr. Philip D. Rabinowitz,

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director of the ODP. "We will investigate the Pacific's complex tectonic zones, which comprise several oceanic and continental plates."

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Note: JOIDES Institutions are: University of California at San Diego; Columbia University; University of Hawaii; University of Miami; Oregon State University; University of Rhode Island; Texas A&M University; University of Texas at Austin; University of Washington; and Woods Hole Oceanographic Institution.

Non-U.S. members are Canada and Australia Consortium, European Science Foundation: Belgium, Denmark, Finland, Iceland, Italy, Greece, the Netherlands, Norway, Spain, Sweden, Switzerland and Turkey; Federal Republic of Germany; France; Japan; and the United Kingdom.)

The scientific party for Leg 125 were: Patricia Fryer, co-chief scientist, Hawaii Institute of Geophysics, University of Hawaii at Manoa, Honolulu, Hawaii; Julian Pearce, co-chief scientist, The University of Newcastle upon Tyne, United Kingdom; Laura Stokking, staff scientist, Ocean Drilling Program, Texas A&M University, College Station; Jason Ali, The University, Southampton, U.K.; Richard J. Arculus, University of Michigan, Ann Arbor; Dean Ballotti, Rosenstiel School of Marine and Atmospheric Science, Miami, Florida; Margaret M. Burke, Dalhousie University, Halifax, Nova Scotia, Canada; Giuliano Ciampo, Dipartimento Scienze della Terra-Largo, Napoli, Italy; Janet Haggerty, University of Tulsa, Okla.; Roger B. Haston, University of California, Santa Barbara; Dietrich Heling, Institut fuer Sediment-forschung, Heidelberg, Federal Republic of Germany; Mike Hobart, Lamont-Doherty Geological Observatory, Palisades, N.Y.; Teruaki Ishii, Dalhousie University; Lynn E. Johnson, Hawaii Institute of Geophysics, University of Hawaii at Manoa, Honolulu; Yves Lagabrielle, GIS Oceanologie et Geodynamique, Brest, France; Hirokazu Maekawa, Kobe University, Japan; Michael Marlow, U.S. Geological Survey, Menlo Park, Calif.; Floyd W. McCoy, Lamont-Doherty Geological Observatory; Greg Milner, University of Western Australia, Nedlands; Michael J. Mottl, Hawaii Institute of Geophysics; Bramley J. Murton, The Open University, Milton Keynes, Bucks, U.K.; Stephen P. Phipps, University of Pennsylvania, Philadelphia; Catherine Rigsby, University of California, Santa Cruz; Kristine L. Saboda, Hawaii Institute of Geophysics; Bjorg Stabell, University of Oslo, Norway; Sieger R. Van Der Laan, California Institute of Technology, Pasadena; Yulin Xu, Florida State University, Tallahassee.