

NEWS RELEASE

Ocean Drilling Program



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Leg 118.2

COLLEGE STATION, Tx -- A team of oceanographers and engineers from the Ocean Drilling Program (ODP) finally got what earth scientists have wanted for two decades--more than a quarter of a mile of rock recovered from the deepest layer of the ocean's crust.

Scientists on board JOIDES Resolution, drill ship for the ODP, spent November and December drilling into one of Earth's great geologic features, the Atlantis II Fracture Zone located in the remote waters of the Indian Ocean. The Grand Canyon could easily nestle inside this giant gash in the seafloor that cuts north to south for more than 400 miles, plunges to depths of more than four miles and is as wide as 25 miles.

Previous surveys have indicated that layers of the ocean crust and the underlying mantle lie exposed on the walls of the world's great fracture zones. No team to this date, however, has been able to recover long, continuous sections of the deep ocean crust and mantle material at these sites.

The crew on board JOIDES Resolution first surveyed the fracture zone with an underwater television camera. They found a suitable site on the top of a giant submarine mountain that shoaled up more than three miles--as high as Mont Blanc in the Alps. The site was ideal;

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it lay only half a mile beneath the sea surface, its top sheared off by wave action, forming a broad mesa four miles long and two miles wide.

The crew first deployed a special guide base. Traditional drilling methods depend on thick layers of sediment to provide stability for the drill bit before it penetrates hard rock, but the lack of sediment at this site would have caused the drill bit to spin off the stony surface. ODP engineers manufactured a special structure, a 40,000 pound, 17 foot by 17 foot metal box supported by an additional 100,000 of cement, to give the drill bit the ballast that sediment usually provides.

The scientists and engineers recovered a little more than 500 meters (1,650 feet) of rock from an ancient magma chamber formed more than 12 million years ago. As the liquid cooled along the walls of the magma chamber, it formed the coarsely crystalline rock called gabbro which makes up the ocean crust's deepest layer. The recovered rocks contain a record of how molten magma rises from deep within the earth, cools and then solidifies.

The recovered material also reveal to scientists how the circulation of cold sea water dramatically alters the hot rocks deep within Earth's crust. For the first time, scientists have the material in hand in which to study how water is heated beneath the seafloor and driven to the surface.

The scientific and engineering success of Leg 118 will change the thrust of future deep-sea drilling. By being able to penetrate the deepest layers of the ocean crust, scientists now have excellent

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opportunities to study Earth's interior secrets in all the world's oceans.

Co-chief scientists for the cruise were Dr. Paul T. Robinson, Dalhousie University, Halifax, Nova Scotia, Canada, and Dr. Richard P. von Herzen, Woods Hole Oceanographic Institution, Woods Hole, Mass. Staff scientist was Dr. Andrew C. Adamson of Texas A&M University, College Station.

The drill ship departed Port Louis, Mauritius, on Oct. 22, 1987, and returned Dec. 14. Twenty-five scientists from Belgium, Canada, Japan, Federal Republic of Germany, France, Sweden, the United Kingdom and the United States sailed on the 18th cruise of the ODP.

JOIDES Resolution, registered as SEDCO/BP 471, is the research vessel for ODP which is funded by the United States National Science Foundation, Canada, 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, paleomagnetism and sedimentology. Marine geophysics research is conducted while the ship is under way.

Texas A&M University serves as science operator for the program. The university 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.

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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, gives scientific direction. Joint Oceanographic Institutions (JOI, Inc.), a nonprofit consortium of 10 major U.S. oceanographic institutions, manages the program.

ODP winds up its 18-month Indian Ocean expedition this summer, said Dr. Philip D. Rabinowitz, director. "Beginning this fall, we will spend the next two years drilling in the Western and Central Pacific," he explained.

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(Note: JOIDES institutions are: University of California at San Diego, Scripps Institution of Oceanography; Columbia University, Lamont-Doherty Geological Observatory; University of Hawaii, Hawaii Institute of Geophysics; University of Miami, Rosenstiel School of Marine and Atmospheric Science; Oregon State University, College of Oceanography; University of Rhode Island, Graduate School of Oceanography; Texas A&M University, Department of Oceanography; University of Texas at Austin, Institute of Geophysics; University of Washington, College of Ocean and Fishery Sciences; and Woods Hole Oceanographic Institution.

Non-U.S. members are Department of Energy, Mines, and Resources, Earth Sciences Sector, Canada; European Science Foundation Consortium for the Ocean Drilling Program, Belgium, Denmark, Finland, Iceland, Italy, Greece, the Netherlands, Norway, Spain, Sweden, Switzerland and Turkey; Bundesanstalt fur Geowissenschaften und Rohstoffe, Federal Republic of Germany; Institut Francais de Recherche pour l'Exploitation de la Mer, France; University of Tokyo, Ocean Research Institute, Japan; and Natural Environment Research Council, United Kingdom.)

Scientists on board JOIDES Resolution for Leg 118 were:
Paul T. Robinson, co-chief scientist, Dalhousie University, Halifax, Nova Scotia, Canada; Richard P. von Herzen, co-chief scientist, Woods Hole Oceanographic Institution, Woods Hole, Mass.; Andrew C. Adamson, staff scientist, Texas A&M University, College Station; Keir Becker, Rosenstiel School of Marine and Atmospheric Science, Miami, Fla.; Sherman H. Bloomer, Duke University, Durham, N.C.; Mathilde Cannat, Universite de Bretagne Occidentale, Brest, France; Henry J.B. Dick, Woods Hole Oceanographic Institution, Woods Hole, Mass.; Rolf F. K. Emmermann, Institut fur Geowissenschaften und Lithospharenforschung, Federal Republic of Germany; Gunilla Gard, University of Stockholm, Sweden; David Goldberg, Lamont-Doherty Geological Observatory, Palisades, N.Y.; Hartley Hoskins, Woods Hole Oceanographic Institution, Woods Hole, Mass.; Gerardo J. Iturrino, Purdue University; West Lafayette, Ind.; J. Dirk C. Kassenaar, University of Waterloo, Ontario, Canada; Eiichi Kikawa, University of Tokyo, Japan; Stephen H. Kirby, U.S. Geological Survey, Menlo Park, Calif.; Rejean Hebert, Universite Laval, Quebec, Canada; Jan G.H. Hertogen, Fysico-chemische Geologie, Leuven, Belgium; Pamela D. Kempton, The Open University, Milton Keynes, United Kingdom; Peter S. Meyer, Woods Hole Oceanographic Institution, Woods Hole, Mass.; James H. Natland, Scripps Institution of Oceanography, La Jolla, Calif.; Kazuhito Ozawa, University of Tokyo, Japan; Janet H. Pariso, University of Washington, Seattle; James H. Scott, Lakewood, Colo.; Debra S. Stakes, University of South Carolina, Columbia; Stephen A. Swift, Woods Hole Oceanographic Institution, Woods Hole, Mass.

ODP Leg 118 Fracture zone drilling on the Southwest Indian Ridge.

