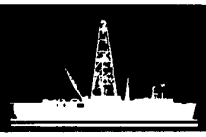
NEWS RELEASE
Ocean Drilling Program



For information:
Karen Riedel
Ocean Drilling Program
Texas A&M University
College Station, TX 77843-3469
(409) 845-9322

September 20, 1986

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COLLEGE STATION, TEXAS -- In the Lesser Antilles, the hospitable tranquility of the Atlantic waters belies the subterranean turbulence which occurs when two tectonic plates come together.

Scientists spent two months this summer about 150 miles north of Barbados investigating the geologic processes that have formed the hilly, green island and the rugged, submarine ridge beneath the surface of the Atlantic Ocean.

Earth's outer layer is composed of a series of plates that move relative to one another. In areas where the plates collide, they can, in places, make huge mountain ranges both beneath the water and on adjacent land. The island of Barbados and the underwater mountain ridge of the same name are the physical manifestation of the deformation caused by two converging tectonic plates.

At the convergent margin just east of the Lesser Antilles, the oceanic crust of the North American plate is slipping beneath the more buoyant Caribbean plate, leaving behind tremendous amounts of sediment. The scraped off sediment forms the Barbados Ridge, a three-mile-high submarine mountain belt. At one place the sediment is piled so thick that it arises above sea level to form the island

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of Barbados.

A giant fault, underlying a vast portion of the area east of the Caribbean islands and extending to the coast of South America, is sandwiched between the two converging plates. JOIDES Resolution, the drill ship for the Ocean Drilling Program (ODP), penetrated for the first time the major fault plane which separates the offscraped material from the underlying sediment.

From the recovered material, the scientists on board studied the processes controlling the sediment offscraping, the deformation these sediments go through and the reasons why sediments at some convergent margins are scraped off the lower plate while at other locations they slip smoothly beneath the upper plate, apparently unaffected by the collision.

The ship cored for sediment at six locations across the convergent area. JOIDES Resolution is the first ship to obtain samples of sedimentary rock and pore water by drilling through the material plastered onto the overlying Caribbean plate and into mudstones that are slipping underneath the upper plate.

The major fault separating the two plates is located immediately below sediments that have unusually high amounts of water. Chemical studies of water contained in sediments from the slip plane proved that these waters have traveled laterally, covering long distances and transporting dissolved natural gas from the central core of the submerged mountain ridge. Pressure changes push the water upward along the fault. The migrating water lubricates this extensive fault surface which allows the two

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converging plates to move smoothly past each other. The lubrication provided by the water pressure is the reason that this area of the world is not plagued by the earthquakes normally associated with converging plates.

More than 3.5 kilometers (nearly two miles) of holes were drilled perpendicular to the convergence zone. One hole, drilled on the undeformed Atlantic plate, was the gauge for comparing how much actual deformation happens when material is piled up against, or slides under the upper plate.

Drilling at this reference sediment site, located six kilometers away from the evident deformation zone, revealed minor reverse faulting and vein structures denoting dewatering paths. These geologic indicators are previews of sediments' impending collision with the Barbados Ridge.

Moving west across this growing submarine mountain belt, sediments closer to the Caribbean island arc show an increasingly greater amount of folding, faulting and deformation. The slip plane is deeply buried closer to the arc, and numerous secondary faults are results of the continued collision of the plates. Here, sediment that was descending beneath the slip plane is plastered onto the bottom of the growing Barbados Ridge, causing it to thicken and rise like a cork.

In addition to uplifting huge piles of sediment, plate convergence zones like this one squeeze the sediment, releasing large amounts of water. Sediment riding on the Atlantic plate is more than half water, but after compression and uplifting only one

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fourth of this water remains.

Drilling results from this cruise allowed scientists for the first time to define the water flow and deformation processes at different stages of plate convergence at the Barbados Ridge. This information will influence how scientists study other modern and ancient convergent zones around the world.

Co-chief scientists for the cruise were Dr. J. Casey Moore of the University of California at Santa Cruz, and Dr. Alain Mascle, Institut Francais du Petrole, Rueil Malmaison Cedex, France. Dr. Elliott Taylor was the ODP staff scientist.

The 23-member scientific party, a technical and operations crew of 23 and a ship's crew of 25 left Barbados on June 26 and returned to the island on August 16.

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 Ocean Drilling, France, Japan, West Germany 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

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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, provides logistical and technical support for shipboard scientific teams, manages post-cruise activities, is curator for the cores and of 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.

The ship is now on her eleventh cruise which marks the Ocean Drilling Program's first venture into the Pacific Ocean, explained Dr. Philip D. Rabinowitz, director. "During September and October the ship will deepen Hole 504B near the Costa Rica Rift, which is the deepest hole ever drilled into oceanic crust." The hole, previously drilled to almost three-quarters of a mile, will be deepened to more than a mile in an attempt to recover the bottom-most layer of the rock which forms the upper part of Earth's mantle.

"The ship will next drill off the Peruvian coast to study the record of changes in the ocean climate through time. We will also be looking at the processes of subduction by examining how the Nazca tectonic plate is sliding under South America," Rabinowitz said.

(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.)

Members of the 110 scientific party were: Dr. J. Casey Moore, co-chief scientist, University of California at Santa Cruz, Santa Cruz, California; Dr. Alain Mascle, co-chief scientist, Institut Francais du Petrole, Rueil Malmaison, France; Elliott Taylor, ODP staff scientist, Texas A&M University, College Station, Texas; Patrick Andreieff, BRGM, Orleans, France; Francis Alvarez, Lamont-Doherty Geological Observatory, Palisades, New York; Ross Barnes, Rosario Geoscience Associates, Anacortes, Washington; Christian Beck, Departement des Sciences de la Terre, Villeneuve d'Ascq, France; Jan Behrmann, Institut fuer Geowissenschaften und Lithospherenforschung, Giessen, Federal Republic of Germany; Gerard Blanc, Laboratorie de Geochemie, Universite Pierre et Marie Curie, Paris, France; Kevin Brown, Department of Geological Sciences, Durham, England; Murlene Clark, Department of Geology, University of South Alabama, Mobile, Alabama; James Dolan, University of California at Santa Cruz, Santa Cruz, California; Andrew Fisher, University of Miami, Miami, Florida; Joris Gieskes, Scripps Institution of Oceanography, La Jolla, California; Mark Hounslow, Sheffield University, Sheffield, England; Patrick McClellan, Petro-Canada Resources, Calgary, Alberta, Canada; Kate Moran, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada; Yujiro Ogawa, Kyushu University, Hakozaki, Fukuoka, Japan; Toyosaburo Sakai, Utsunomiya University, Utsunomiya, Japan; Jane Schoonmaker, Hawaii Institute of Geophysics, Honolulu, Hawaii; Peter J. Vrolijk, University of California at Santa Cruz, Santa Cruz, California; Roy Wilkens, M.I.T., Cambridge, Massachusetts; Colin Williams, Lamont-Doherty Geological Observatory, Palisades, New York.