



IODP Tahiti Sea Level Expedition examines history of global sea level change, and fate of El Niño events

Dateline: Papeete, Tahiti, October 1 2005.

Scientists from 9 nations are scheduled to start the Integrated Ocean Drilling Program (IODP) Tahiti Sea-Level Expedition at the beginning of October, a research expedition designed to investigate global sea level rise since the last glacial maximum about 23000 years ago. For six weeks after they board the expedition vessel *DP HUNTER*, the science party will work on the most extensive geological research investigation ever undertaken in a coral reef area. Off the coast of Tahiti, IODP scientists will take samples of fossil corals from the ocean seafloor, to analyze the environmental records that exist in them. The scientists expect the corals to provide records of changes in sea surface temperature, and to provide information on climatic anomalies including the El Niño/Southern Oscillation events during that period.

The IODP research team aims to learn more about the timing and course of past global sea level changes. This may help to understand present and future sea level rise due to global greenhouse conditions. Since the climax of the last ice age about 23000 years ago, global sea level has risen by about 120 metres, mainly due to melting of large inland ice sheets and thermal expansion of the global body of ocean water attributed to rising temperatures. Scientists believe that Tahiti is well situated for investigating these effects because the island is located in a tectonically stable region. Consequently changes in sea level here can be solely related to global effects. Because corals have strict ecological requirements and are extremely sensitive to environmental changes, both natural and human-induced, the reefs are accurate and sensitive recorders of past sea level and climatic change.

The science party will analyze fossil, i.e. dead corals because they form archives that help decipher the long-term behaviour of the tropical ocean-atmosphere system and how it has responded to man-made and natural impacts. The expedition will not core live corals. Live reefs should be unaffected by this expedition. Corals live in a sufficiently narrow depth range that can be used as an absolute sea level indicator. Corals can be considered chronometers as they can be absolutely dated by radiometric methods. These methods are now so accurate that even in the oldest coral rocks to be studied, scientists will be able to determine the age of corals to an accuracy of about 50 years. This accuracy is critical to the reconstruction of successive past sea level positions.

Expedition co-chief scientist Yasufumi Iryu of Japan's Tohoku University says, "We are very excited about being able to understand these past environmental changes in such detail for the first time." According to fellow co-chief scientist Gilbert Camoin of the CNRS' CEREGE Institute, France, "Understanding the rate at which sea level and environments have changed is vital to understanding the effects that human activity now has on Earth's environment."

First proposed in 1998, this expedition was impossible to implement using the scientific drilling vessels available at the time. Now it has become possible only with the development of multiple drilling platforms provided by the international Integrated Ocean Drilling Program (IODP). As part of IODP, the European Consortium for Ocean Drilling (ECORD), an IODP partner and funding agency, has set up the ECORD Science Operator (ESO) to make new drilling techniques available to scientists and provide flexibility to study Earth's environment.

At the conclusion of the expedition, the fossil coral core material will be shipped to Bremen, Germany. In mid-February 2006, IODP scientists will gather again at the IODP core repository at Bremen University to further analyze the fossil corals and associated reef rocks in greater detail.

More about the science party's activities is and will be posted during the course of the expedition at www.ecord.org (general information, expedition logbook).

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Notes to editors

1. The Integrated Ocean Drilling Program (IODP) is an international marine research program dedicated to advancing scientific understanding of the Earth by monitoring and sampling seafloor environments. Through multiple platforms, IODP scientists explore the program's principal themes: the deep biosphere, climate change, and Earth processes and cycles. Mission-specific drilling platforms are operated by the ECORD Science Operator (ESO), an IODP Implementing Organization. Two more Implementing Organizations_in Japan and the United States_conduct riser-equipped and riserless drilling operations, respectively. IODP's initial 10-year, \$1.5 billion program is supported by two lead agencies, the U.S. National Science Foundation and Japan's Ministry of Education, Culture, Sports, Science, and Technology. ECORD is a contributing member and China's Ministry of Science and Technology give additional support. More program information about IODP is available at www.iodp.org.
2. The European Consortium for Ocean Research Drilling (ECORD) represents and funds international scientific ocean drilling at a European level. More information at: www.ecord.org.
3. ECORD Science Operator is a group of scientific institutions, which conducts drilling operations on behalf of ECORD for IODP. Coordinated by British Geological Survey, ESO includes University of Bremen, European Petrophysics Consortium (Universities of Leicester, Montpellier, Aachen and Amsterdam)