OCEAN ◆ DRILLING ◆ PROGRAM

News Release

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FOR IMMEDIATE RELEASE

CLIMATIC MELTDOWN

Scientists investigate temperature changes resulting in polar ice sheet melting in Northwestern U.S.

College Station, Tx -- Global warming has already settled in and those living in the northwestern area of the U.S. should be grateful. About 13,000 to 14,000 years ago, a polar ice sheet a half mile thick lay over the present location of Seattle and extended farther north. Huge freshwater lakes formed in Utah, Nevada, and the Mojave Desert of California. Within the Pacific Ocean, cold currents extended much farther south into the tropics, and the rich fisheries along the Pacific Northwest probably were less productive. Surprisingly, a change of only about four degrees Fahrenheit in average global temperature resulted in today's environment.

To learn more about both the history of climate change and the processes which cause it, an international team of scientists organized by the Ocean Drilling Program will board the scientific drillship, *JOIDES Resolution*, to collect marine sediments off the California coastline April 21 through June 16. The team will be led by Dr. Mitchell Lyle (Center for Geophysical Investigation of the Shallow Subsurface, Boise State University, Boise, Idaho) and Dr. Itaru Koizumi (Division of Earth and Planetary Sciences, Hokkaido University, Sapporo, Japan) along with scientists from the U.S., Japan, France, Germany, Great Britain, Sweden, Italy, and Mexico.

"We know that changes in North Pacific ocean temperatures and currents have strongly affected temperatures and rainfall in North America, but we are still pretty much in the dark how often major oceanographic changes have occurred in the North Pacific Ocean and to what extent they have affected the climate of North America," says Lyle. "We are particularly interested in studying the California Current, the south-flowing cold current along California, and the upwelling of cold subsurface waters along the coast, which not only causes the coastal fogs but also brings up nutrients to fertilize the growth of the plankton that are the basis of the highly productive coastal fisheries."

The scientific team will study changes in ocean temperature, productivity and chemistry through the study of microfossils within the sediments, and will also observe changes in vegetation on land through changes in the sediments' pollen content. They will also track glaciers and winds by studying the mineral content of the clays which make up the rest of the sediments. The scientific team will study climatic changes in the last few hundred thousand years in which they hope to resolve climatic events on the scale of about a hundred years, and will also study the more long-term evolution of the climate for the past 10-20 million years.

Both time frames are important in order to understand the global climate system. The shorter time frame allows scientists to understand how much the world's climate can be perturbed by transient events like global temperature changes induced by man.

"It appears that fossil fuel burning has raised global temperatures by about one degree Fahrenheit in the last century," explains Lyle. "While that doesn't sound like much, it represents 25 percent warmer tempatures following the Ice Age. We are searching for similar natural perturbations in the past to understand the way they resonate through the world's climate."

The longer records of climate events are also important, because no one knows how the latest Ice Age started even though it is now known to have begun 2.5 million years ago. Many hypotheses have been proposed, including chemical changes in the ocean induced by the erosion of the Himalayas, the perturbation of weather patterns by growing mountain ranges, and the closure of seaways between oceans, like the Panama seaway which existed between North and South America before 3 million years ago.

Each hypothesis proposes a different method to change the earth's temperature and induce the buildup of ice at the poles, with profound implications for factors which could change earth climate. None of the theories has yet gained strong support, however, since none has yet built up a reasonable body of evidence to support them. The process of trying to understand how these changes have taken place gives new insight into the processes which today keep our climate stable and which help to keep earth habitable.

The Ocean Drilling Program is funded by the U.S. National Science Foundation, Canada, Australia, the European Science Foundation Consortium, Germany, France, Japan, and the United Kingdom to investigate such topics as earth's history and evolution, climate change, and formation of the ocean crust.

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

Texas A&M University, science operator, operates and staffs the drill ship that retrieves core samples from strategic sites in the world's oceans. Lamont-Doherty Earth Observatory of Columbia University is responsible for downhole logging.

Note: U.S. members of JOIDES 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. The European Science Foundation Consortium consists of Belgium, Denmark, Finland, Iceland, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, and Turkey.

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