

UC SANTA BARBARA

THE *Current*

January 25, 2001

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ANCIENT CORAL REEF RECORD GIVES HISTORY OF EL NIÑO

Using pieces of ancient coral reefs as windows on the history of climate, geologists have discovered that at no time in the past 130,000 years does the weather phenomenon known as El Niño appear to have been as intense as it has in the last century. In an article published in the January 26 issue of *Science Magazine*, the researchers reported that the strength of El Niño was diminished during ice ages. The findings are important in evaluating the hypothesis that the intensity of El Niño during the last century is related to greenhouse gas emissions and global warming.

In the Huon Peninsula of New Guinea, a series of coral reef terraces, part of an island that is being pushed up by plate movements, provided researchers with coral reef samples dating back to 130,000 years before present. Analysis of isotopic and chemical variations from these ancient corals yielded 14 different climatic windows, each spanning 20-100 years. Cold periods 40,000 years ago and warm periods of 125,000 years ago were analyzed to evaluate the behavior of El Niño during different climate regimes.

"The samples indicated that El Niño was never more intense than the events of the last hundred years," said David W. Lea, co-author and professor of geological sciences at the University of California, Santa Barbara. "Over the last 100 years we have very accurate records of El Niño, with 1982-83 and 1997-98 being the largest events on record. Of course, everyone wants to know if the intensity of these large events is somehow related to global warming. Our data suggest that the behavior of

the tropical Pacific over the last 100 years is atypical, but it does not pinpoint which factors modulate El Niño."

Lea has collaborated for many years with first author Sandy Tudhope, who is based at the University of Edinburgh, Scotland.

El Niño is generally considered to be the resulting world-wide weather changes that occur following an increase of warm water in the tropical eastern Pacific.

By analyzing the temperature and salinity of the water, as revealed by the ancient pieces of coral, the researchers were able to reconstruct past climate. Besides the discovery that past El Niño intensities were not as strong as recent ones, the researchers learned that during the ice ages the intensity of El Niño appears to be about 50 percent weaker. During the warmest times El Niño was the strongest.

Lea, who specializes in paleoceanography, the history of the oceans, hastens to add that the 14 samples do not represent a continuous time span, and that the evidence they found is rather like a book with pages missing.

"But that's just the way this science works," said Lea. "It's the same for other fields, like archaeology. You're not likely to get a continuous record."

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.