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Antarctica was once a warm "greenhouse" world

ANI, Apr 30, 2010, 07:51pm IST

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WASHINGTON: Antarctica, the ice-covered mass of land on the earth was once a warm "greenhouse" or "hothouse" world, according to results of a research expedition in Antarctic waters.

The findings revealed that some 53 million years ago, Antarctica was a warm, sub-tropical environment and during this period-called the known as the "greenhouse" or "hothouse" world- atmospheric carbon dioxide levels exceeded those of today by ten times.

Then suddenly, Antarctica's lush environment transitioned into its modern icy realm.

Newly acquired climate records tell a tale of this long-ago time. The records were recovered from Antarctica, preserved in sediment cores retrieved during the Integrated Ocean Drilling Program (IODP) Wilkes Land Glacial History Expedition from Jan. 4 - March 8, 2010.

Wilkes Land is the region of Antarctica that lies due south of Australia, and is believed to be one of the most climate-sensitive regions of the polar continent.

In only 400,000 years--a mere blink of an eye in geologic time--concentrations of atmospheric carbon dioxide there decreased. Global temperatures dropped. Ice sheets developed and Antarctica became ice-bound.

The researchers wondered how did this change happen so abruptly, and how stable can we expect ice sheets to be in the future.

Thus, an international team of scientists participating in the Wilkes Land Glacial History Expedition spent two months aboard the scientific research vessel JOIDES Resolution, drilling geological samples from the seafloor off the coast of Antarctica.

"The new cores offer an unprecedented ability to decipher the history of glaciation in Antarctica. The climate record they preserve is immensely valuable, especially for testing how well current global climate models reproduce past history," said Jamie Allen, program director in the National Science Foundation (NSF)'s Division of Ocean Sciences.

Despite braving icebergs, near gale-force winds, snow and fog, Wilkes Land Expedition scientists recovered approximately 2,000 meters (more than one mile) of sediment core.

"These sediments are essential to our research because they preserve the history of the Antarctic ice sheet," said Carlota Escutia of the Research Council of Spain CSIC-University of Granada, who led the expedition.

"We can read these sediments like a history book. And this book goes back 53 million years, giving us an unprecedented record of how ice sheets form and interact with changes in the climate and the ocean," said co-chief scientist Henk Brinkhuis of Utrecht University in the Netherlands.

The new core samples collected during the expedition are unique because they provide the world's first direct record of waxing and waning of ice in this region of Antarctica.

Combined, the cores tell a story of Antarctica's transition from an ice-free, warm, greenhouse world to a cold, dry, "icehouse" world.

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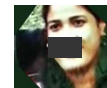
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Sediments and microfossils preserved within the cores document the onset of cooling and the development of the first Antarctic glaciers, as well as the growth and recession of Antarctica's ice sheets.

Cores from one site resemble tree rings--alternating bands of light and dark sediment preserve seasonal variability of the last deglaciation, which began some 10,000 years ago.

Understanding the behaviour of Antarctica's ice sheets plays an important role in our ability to build effective global climate models, which are used to predict future climate say scientists.

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Carl Sagan Hades 01/05/2010 at 01:19 am

Not enough information in this article. Where are the assumptions? For example, has the albedo of the planet been assume to remain the same?

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