Researchers identify a 'heartbeat' in Earth's climate

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A few years ago, an international team of researchers went to the middle of the Pacific Ocean and drilled down five kilometers below sea level in an effort to uncover secrets about the earth's climate history. They exceeded their expectations and have published their findings in the Dec. 22 edition of the journal Science.

The researchers' drilling produced pristine samples of marine microfossils, otherwise known as foraminifera. Analysis of the carbonate shells of these microfossils, which are between 23 million to 34 million years-old, has revealed that the Earth's climate and the formation and recession of glaciation events in the Earth's history have corresponded with variations in the earth's natural orbital patterns and carbon cycles.

The researchers were particularly interested in these microfossils because they came from the Oligocene epoch, a time in Earth's history known for falling temperatures.

"The continuity and length of the data series we gathered and analyzed allowed for unprecedented insights into the complex interactions between external climate forcing, the global carbon cycle and ice sheet oscillations," said Dr. Jens Herrle, co-author of the paper and a micropaleontology professor at the University of Alberta.

The authors also show how simple models of the global carbon cycle, coupled to orbital controls of global temperature and biological activity, are able to reproduce the important changes observed after the world entered an "ice-house" state about 34 million years ago.

In the early half of the 20th century, Serbian physicist Milutin Milankovitch first proposed that cyclical variations in the Earth-Sun geometry can alter the Earth's climate and these changes can be discovered in the Earth's geological archives, which is exactly what this research team, consisting of members from the United Kingdom, the U.S. and Canada, has done.

"This research is not only concerned with the climate many millions-of-years-ago. Researching and understanding 'extreme' climate events from the geological past allows us to better tune climate models to understand present and future events, and the response to major perturbations of

Earth's climate and the global carbon cycle, Herrle added.

Source: University of Alberta