

A Record of Climate Change in the Tropics From Past Advances of Mountain Glaciers.

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1999 Fall AGU Meeting, San Francisco

Studies of paleoclimatic records from both the northern and southern hemispheres indicate a similar behavior of the climate system over the last glacial cycle. To explain this apparent interhemispheric synchrony of climate events, an atmospheric mechanism has been invoked. One of the leading theories involves an increase in the flux of moisture to the atmosphere in the tropics. An accurate reconstruction of tropical climate records is critical to understanding the role of the tropics in modulating or controlling the global climate.

We measured cosmogenic ^{36}Cl in boulders from moraines on mountains in East Africa, Bolivia and Venezuela, to establish a preliminary chronology for glacial fluctuations in the tropics. The resulting ages indicate that the LGM consisted of a series of glacial advances between ca. 27 ^{14}C kyr BP and 12 ^{14}C kyr BP. Following the last of these advances, the snowline elevation receded ca. 650 m in East Africa and deposited a second set of moraines at ca. 9 -10 ^{14}C kyr BP. The moraine ages correlate within error bars with the onset of warmer, wetter tropical conditions as deduced from previous studies of pollen and palaeolake levels. The timing of these changes in the tropics may also correlate with changes in the global climate during the last deglaciation, such as Heinrich events and the Younger Dryas. Indications that changes in the tropical climate were concurrent with events observed globally provides additional support for the hypothesis that climate events were transmitted globally during the last deglaciation. However, they neither support or preclude the possibility of a tropical mechanism for climate change.