



Last centuries climate variations inferred from moraine records in Ecuador

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A significant effort has been made to improve our knowledge on climatic variability in the outer part of the tropical Andes by using proxies such as glacial moraines, pollens, isotopic variations in ice core records, and tree rings. However, there is much to learn about climate fluctuations during the last millennium in Ecuador because most of these proxies are lacking. Here we present climate reconstruction inferred from 19 and 23 moraine records from two glaciers at the base of Chimborazo and Carihuarazo summits located in the western cordillera.

Moraines were mapped by means of a GPS survey in the field and dated by lichenometry using the new statistical approach based on extreme value theory. In order to distinguish between these two glacial behaviors, the morphological characteristics (size, shape, and slope inclination) of the moraine were analyzed. Prominent moraines with a sharp slope were attributed to phases of stabilization or advance, while small gentle moraines represented only short stops in a continuous process of recession.

Temperature and precipitations changes between two moraine stages were inferred with a coupled approach combining a Positive Degree Day model (PDD) (to calculate the ice mass balance) with a ice flow model(Harper and Humphrey, 2003).

Finally in order to highlight glacial cycles, Kirkbridge and Brazier's method was applied.