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Air temperature change in the northern and southern tropical Andes linked to North-Atlantic stadials and Greenland interstadials

Dunia H. Urrego (1) and Henry Hooghiemstra (2)

(1) College of Life and Environmental Sciences, University of Exeter, United Kingdom, (2) Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, The Netherlands

We use eight pollen records reflecting climatic and environmental change from northern and southern sites in the tropical Andes. Our analysis focuses on the signature of millennial-scale climate variability during the last 30,000 years, in particular the Younger Dryas (YD), Heinrich stadials (HS) and Greenland interstadials (GI).

We identify rapid responses of the vegetation to millennial-scale climate variability in the tropical Andes. The signature of HS and the YD are generally recorded as downslope migrations of the upper forest line (UFL), and are likely linked to air temperature cooling. The GI1 signal is overall comparable between northern and southern records and indicates upslope UFL migrations and warming in the tropical Andes. Our marker for lake level changes indicates a north to south difference that could be related to moisture availability. The direction of air temperature change recorded by the Andean vegetation is consistent with millennial-scale cryosphere and sea surface temperature records from the American tropics, but suggests a potential difference between the magnitude of temperature change in the ocean and the atmosphere.