



Deglacial history of the Ecuadorian Andes: Implications for the driving forces of tropical climate change

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Paleoclimate reconstructions are essential for evaluating the future evolution of natural climate variability and for determining climate sensitivity to external and internal forcing. Reconstructing climate conditions from the Last Glacial Maximum (LGM) to the Holocene represents a unique opportunity to understand climate variations from full glacial conditions to modern warm conditions.

The primary goal of our project is to verify if the changes in temperature and precipitation driving the glacier event in the tropics during the LGM, may also account for the glaciations related to the late glacial and possibly the Little Ice Age periods. This inter-disciplinary project brings together specialists in glacial geology, surface exposure dating, and climate modeling. We developed detailed maps of the snowline lowering in the Papallacta Valley at the rim of the Potrerillos Plateau and took samples in well-exposed sections for radiocarbon dating. The first radiocarbon ages did not allow us to draw unambiguous conclusions about the valley's glacial history. The use of Surface Exposure Dating (SED) offers a possible means of improving on this situation and for this purpose we sampled boulders and bedrock surface. We will present the cosmogenic ^{36}Cl chronology of the late glacial periods together with the refined deglacial history of the valley.

We used our maps and the age constraints on the deglacial history of the Papallacta Valley to estimate the possible combinations of changes in climate parameters related to reconstructed snowline variations. This local study represents the first step in a broader project that will cover most of the Ecuadorian Andes. The goals of this study

are to reconstruct the regional timing and amplitude in Ecuador, to identify the relative importance of precipitation and temperature changes using climate models, and to investigate how the driving mechanisms of climate changes in the tropics relate to the ones driving the climate changes at higher latitudes.