



Multi-isotope comparison of ^3He , ^{21}Ne , and ^{36}Cl moraine ages from the high-altitude central Puna Plateau, NW Argentina (24°S)

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Glacial deposits on the high-altitude, arid Puna Plateau of northwestern Argentina document past changes in climate, but the associated geomorphic features have never been directly dated. The plateau is situated in the “Arid Diagonal,” the hyper-arid transition zone between the Westerlies precipitation dominated southern Andes, and the South American Summer Monsoon controlled central Andes. Despite the climatically critical position of the Puna Plateau, paleoclimate data for the region is extremely sparse. This study provides direct age control of glacial moraine deposits from the central Puna Plateau (24°S) at elevations of 4500-5000 m through cosmogenic surface exposure dating. The volcanic lithologies of the deposits additionally allow for comparison of production rates from multiple cosmogenic isotope systems at low latitude and high elevation. Moraine boulders were dated using cosmogenic ^3He from pyroxene, ^{21}Ne from quartz, and ^{36}Cl from feldspars. Preliminary data suggests that the most extensive glaciation occurred more than 80 ka ago, and that an additional prominent advance occurred at ~ 39 ka. In addition, comparison of isotope production ratios from low latitude and high elevation will contribute to better constrained production rates, particularly for ^{36}Cl , for which global production rate estimates are highly variable. This study documents Quaternary climate changes on the Puna Plateau, while at the same time improving production rate agreement between multiple cosmogenic isotope systems.