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## Exposure dating of Late Glacial and pre-LGM moraines in the Cordon de Doña Rosa, Northern/Central Chile (~31° S)

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**Abstract.** Despite the important role of the Central Andes (15–30° S) for climate reconstruction, knowledge about the Quaternary glaciation is very limited due to the scarcity of organic material for radiocarbon dating. We applied <sup>10</sup>Be surface exposure dating (SED) on 22 boulders from moraines in the Cordon de Doña Rosa, Northern/Central Chile (~31° S). The results show that several glacial advances in the southern Central Andes occurred during the Late Glacial between ~14.7±1.5 and 11.6±1.2 ka. A much more extensive glaciation is dated to ~32±3 ka, predating the temperature minimum of the global LGM (Last Glacial Maximum: ~20 ka). Reviewing these results in the paleoclimatic context, we conclude that the Late Glacial advances were most likely caused by an intensification of the tropical circulation and a corresponding increase in summer precipitation. High-latitude temperatures minima, e.g. the Younger Dryas (YD) and the Antarctic Cold Reversal (ACR) may have triggered individual advances, but current systematic exposure age uncertainties limit precise correlations. The absence of LGM moraines indicates that moisture advection was too limited to allow significant glacial advances at ~20 ka. The tropical circulation was less intensive despite the maximum in austral summer insolation. Winter precipitation was apparently also insufficient, although pollen and marine studies indicate a northward shift of the westerlies at that time. The dominant pre-LGM glacial advances in Northern/Central Chile at ~32 ka required lower temperatures and increased precipitation than today. We conclude that the westerlies were more intense and/or shifted equatorward, possibly due to increased snow and ice cover at higher southern latitudes coinciding with a minimum of insolation.

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