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Data Article

Lithostratigraphic and magnetostratigraphic data from late Cenozoic glacial and proglacial sequences underlying the Altiplano at La Paz, Bolivia

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ABSTRACT

We provide lithostratigraphic and magnetostratigraphic data derived from a Plio-Pleistocene continental sediment sequence underlying the Altiplano plateau at La Paz, Bolivia. The record comprises six sections along the upper Río La Paz valley, totaling over one kilometre of exposure and forming a ~20-km transect oblique to the adjacent Cordillera Real. Lithostratigraphic characterization includes lithologic and stratigraphic descriptions of units and their contacts. We targeted gravel and diamicton units for paleomagnetic sampling to address gaps in the only previous magnetostratigraphic study from this area. Paleomagnetic data – magnetic susceptibility and primary remanent magnetization revealed by progressive alternating field demagnetization – are derived from 808 individually oriented samples of flat-lying, fine-grained sediments. The datasets enable characterization of paleosurfaces within the sequence, correlation between stratigraphic sections, and differentiation of asynchronous, but lithologically similar units. Correlation of the composite polarity sequence to the geomagnetic polarity time scale supports a range of late Cenozoic paleoenvironmental topics of regional to global importance: the number and ages of early glaciations in the tropical Andes; interhemispheric comparison of paleoclimate during the Plio-

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Pleistocene climatic transition; timing of and controls on inter-American faunal exchange; and the variability of Earth's paleomagnetic field.

Specifications Table

Subject area	Geology
More specific subject area	Plio-Pleistocene tropical glaciation, landscape evolution, and paleoclimate
Type of data	Tables, figures
How data was acquired	In-field lithostratigraphic characterization; Survey; Sapphire Instruments SI-2B magnetic susceptibility meter; AGICO JR-6A spinner magnetometer; ASC Scientific D-2000 alternating-field demagnetizer
Data format	Raw and analyzed
Experimental factors	Samples were dried then stored in a magnetic shield prior to and between magnetic measurements
Experimental features	Lithostratigraphic characterization includes texture, structure, lithology, colour, clast size and shape, sorting, weathering features, diamicton fabric, and the nature of contacts. We collected groups of typically six individually oriented cylindrical samples from 124 sample locations and processed them at the University of Lethbridge, Alberta, Canada. Magnetic susceptibility was measured with a Sapphire Instruments SI-2B magnetic susceptibility meter. Remanent magnetization was measured with an AGICO JR-6A spinner magnetometer prior to and after stepwise demagnetization using an ASC Scientific D-2000 alternating-field demagnetizer (4 to 16 steps at 2.5–30 mT spacing). Remanence directions were determined for most samples by principal component analysis and for a small number of samples ($<2\%$) by the intersection of great circles. We calculated remanence directions of samples and mean remanence directions by group, stratigraphic unit, and polarity using AGICO's Remasoft v. 3.0.
Data source location	City of La Paz, Department of La Paz, Bolivia (16°30′ S, 68°9′ W)
Data accessibility	Data are within this article and in related references
Related research article	Roberts et al. (2017, 2018)

Value of the data

- Provides detailed lithostratigraphic and magnetostratigraphic records of the earliest known tropical glaciation in the Cenozoic Era.
- Enables comparison with global records of paleoenvironmental change during the Plio-Pleistocene climatic transition.
- Presents a detailed record supporting magnetostratigraphic comparison with late Cenozoic sequences underlying other parts of the Altiplano plateau.
- Provides detailed chronostratigraphic constraints of paleoenvironmental change and spatio-temporal variability of land mammal assemblages related to biotic exchange between the Americas.
- Contributes to the growing paleogeomagnetic record for central South America.