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High-altitude limnogeology at the Eastern Cordillera (Central Andes, northwestern Argentina): evidences of late Quaternary climate changes

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The region of Eastern Cordillera located above the 4000 m a.s.l. in the Central Andes from northwestern Argentina, is characterized by extreme climatic conditions with low precipitation (< 400 mm yr-1), and wide temperature amplitudes. In this high-altitude region, the sedimentary records of lakes and wetlands constitute exceptional sources for documenting the abrupt climate changes occurred during the late Quaternary. Multiproxy limnogeological studies of two different lacustrine systems allow identifying major sedimentological changes and understanding their relationship to regional paleoclimate. Laguna Salada Grande (23°S/65°W) is a shallow tectonic lake located at 4102 m a.s.l. at the Sierra de Aparzo. It is an endorheic basin that has not been glaciated during the late Quaternary. Paleoshorelines situated 20 m above the present lake level suggest the occurrence of a deeper paleolake. Sedimentary cores (1.5 m length) and gully outcrops display massive and finely laminated units. Geomorphological features combined with lacustrine core stratigraphy allow linking the main paleoshorelines with those changes observed in the sedimentary record. Laguna Leoneajo (22°S/65°W) is a small wetland and exorheic basin. It is located in a glacial valley at 4526 m a.s.l., downstream of an active rock glacier, at the Sierra de Santa Victoria. Sedimentary cores (1.5 m length) reaching the lake basement encompass the environmental history since the last deglaciation. Here, we present the first results of multiple analyses on samples from cores and outcrops including petrophysical properties (magnetic susceptibility and grain size measurements), nitrogen, organic matter and carbonate contents, microstratigraphy, and detailed mineralogy along with a radiocarbon chronology. These results combined with different paleoclimatological records in the region (e.g. glacial deposits, lake transgressions) will provide critical information to better understand past patterns of atmospheric circulation in the Central Andean region, where the knowledge about past climate conditions is still limited.