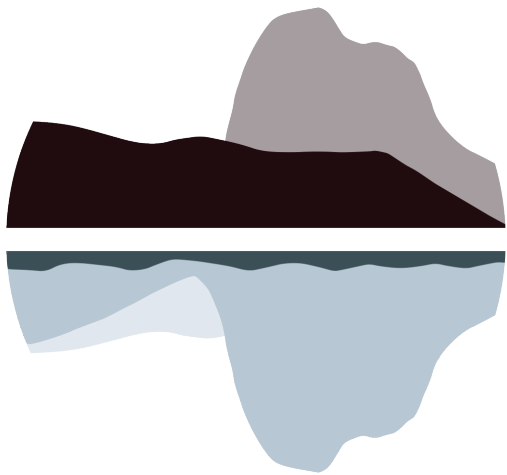




BOOK OF ABSTRACTS

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Diurnal and seasonal active layer and permafrost dynamics from boreholes of the Latin American permafrost network

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Abstract

Permafrost is present in the high-altitude mountains of the Trans-Mexican Volcanic Belt as well as the Andes, even in the extreme dry Atacama highland. The permafrost and active layer thermal state are characterized at Latin American Permafrost Network study sites. Ice rich or extremely dry permafrost was observed during drilling operations from Mexico (Pico de Orizaba, 5636m a.s.l. Iztaccíhuatl, 5230m a.s.l.), Colombia, Ecuador (Chimborazo, 6263m a.s.l.), Peru (Coropuna 5250 m a.s.l., Ampato 5850 m a.s.l., Chachani 5600 m a.s.l.) including the highest human habitation in the world: La Rinconada 5100 m a.s.l., Bolivia (Chacaltaya 5300 m a.s.l. where glacier disappeared in 2005), and the Chilean/Argentinian border (up to 6750 m a.s.l. including Parinacota, Aucanquilcha, Ojos del Salado, Llullaillaco, Tupungato and Tupungatito). The Lower Limit of Alpine Permafrost (LLAP) is redrawn from this study between latitude 19°N and 40°S where it is mainly in the tropical and arid Andes. This is not a rock glacier monitoring program that not mapping sporadic permafrost, but continuous permafrost terrains for long term temperature monitoring and understanding for local hydrological problems such as glacier/snow melt runoff or sublimation rate of higher elevations. The maximum active layer is typically influenced by the diurnal fluctuations which is between 12-30 cm deep however, maximum 2m depth of the seasonal active layer was observed at Ojos del Salado near the LLAP (5200 m a.s.l.). Daily severe frost shattering occurs near the ground surface, producing a dusty, fine-material horizon at an active layer near the LLAP, however a few freeze-thaw actions are higher than 6400 m. The snow-covered periods are important for providing protection from strong tropic solar radiation.