



Sensitivity studies of mountain glacier response to climatic change scenarios in the Central Dry Andes, 33°S

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This paper presents energy balance model results for snow cover and glaciers of the Central Dry Andes of Chile and Argentina, both under present conditions and under future climatic scenarios. Although available data at a high temporal and spatial resolution are extremely limited, it is argued that modelling tools together with analysis of glacier bodies' altitudinal distribution and hypsometry gives an insight into future behaviour of the ablation component of glacier mass balance and therefore melt water resources in the region. The energy balance study requires as an input not only likely meteorological conditions for future scenarios, but also changes in the snow surface characteristics, as in this area the presence of penitentes (snow and ice pinnacles formed by differential ablation) significantly alters the ablation regime. Results suggest that by the end of this century melt differences will be at a maximum on the areas of largest ice concentration, bringing about an initial increase in the availability of melt water runoff followed by a rapid decay, both in ice mass balance and water supplies. This behaviour will be more pronounced on the Chilean side of the Andes, and more gradual on the Argentinian side, due to the different hypsographic distribution of land masses at the catchment scale.