

Water availability in a mountainous Andean watershed under CMIP5 climate change scenarios

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Abstract Recent updates to climate change scenarios developed under the Coupled Model Intercomparison Project Phase 5 (CMIP5) are used to compare water resources availability in an Andean mountainous snow-dominated watershed, Maipo en San Alfonso, located in the vicinity of Chile's capital city, Santiago. monthly hydrologic simulations for a base line period and future scenarios are carried out through the software WEAP, considering precipitation and temperature monthly time series predicted for scenarios A2 by GCM MK3.0, as well as for RCPs 2.6 and 8.5 scenarios by GCM MK3.6. Ensembles given by the GCM MK3.6 are used as inputs to the hydrological model to obtain uncertainty of water availability projections. Future hydrological simulations are carried out from years 2011 to 2070. Results show that mean annual flows tend to decrease by 8%, essentially during the snowmelt period for A2 and RCP 8.5 scenarios. Nevertheless for the RCP 2.6 scenario, the tendency to decrease is reversed at the end of the period.

Key words water availability; CMIP5 climate change scenarios; uncertainty; mountainous Andean basin