

Projected hydroclimate changes over Andean basins in central Chile from downscaled CMIP5 models under the low and high emission scenarios

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© 2018, Springer Nature B.V. This study examines the projections of hydroclimatic regimes and extremes over Andean basins in central Chile (30° – 40° S) under a low and high emission scenarios (RCP2.6 and RCP8.5, respectively). A gridded daily precipitation and temperature dataset based on observations is used to drive and validate the VIC macro-scale hydrological model in the region of interest. Historical and future simulations from 19 climate models participating in CMIP5 have been adjusted with the observational dataset and then used to make hydrological projections. By the end of the century, there is a large difference between the scenarios, with projected warming of $+1.2^{\circ}\text{C}$ (RCP2.6), $+3.5^{\circ}\text{C}$ (RCP8.5) and drying of -3% (RCP2.6), -30% (RCP8.5). Following the strong drying and warming projected in this region under the RCP8.5 scenario, the VIC model simulates decreases in annual runoff of about 40% by the end of the century. Such strong regional effect of climate change