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Representative meteorological ensembles of change climate change in the Araucanía Region, Chile.

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One of the main uncertainties in hydrologic modeling is attributed to meteorological inputs. When climate change impact analysis is performed, uncertainty increases due to that meteorological time series are obtained through Global Circulation Models (GCM) for a specific climate change scenario. The Intergovernmental Panel on Climate Change (IPCC) in their last report (AR5, 2013) recommend the Representative Concentration Pathway. RCP scenarios, developed under the Coupled Model Intercomparison Project Phase 5 (CMIP5). Pathways for stabilization of radiative forcing by 2100 characterize these scenarios being a radiative forcing of 8.5 w/m2, the highest future condition considered.

In order to reduce the meteorological uncertainties, we study the behavior of the daily precipitation series I three meteorological stations in the valley of the Araucanía region, in southern Chile, using ten ensembles from CGM MK-3.6 model for RCP 8.5. The main hypothesis is that good transformer functions between the observations and data obtained from the model is essential to have suitable future projections. To obtain these functions, statistical downscaling is performed; first spatial downscaling is carried out, and then a temporal downscaling of the daily precipitation data for each month is made. Ensembles whit transfer functions without discontinuities or those with the least were preferred. From this analysis we selected four ensembles.

For the three gage stations we apply the transfer's functions during the observed period and compared the average seasonal variation curve, the duration curve of daily, monthly and annually precipitation and average number of rainy days. Finally, based on qualitative analysis and quantitative criteria we suggest which ensemble are the most representative historical conditions.