

Supplementary Materials: Climate change impacts on hydroclimatic regimes and extremes over Andean basins in central Chile, submitted to Hydrol. Earth Sci. Sys.

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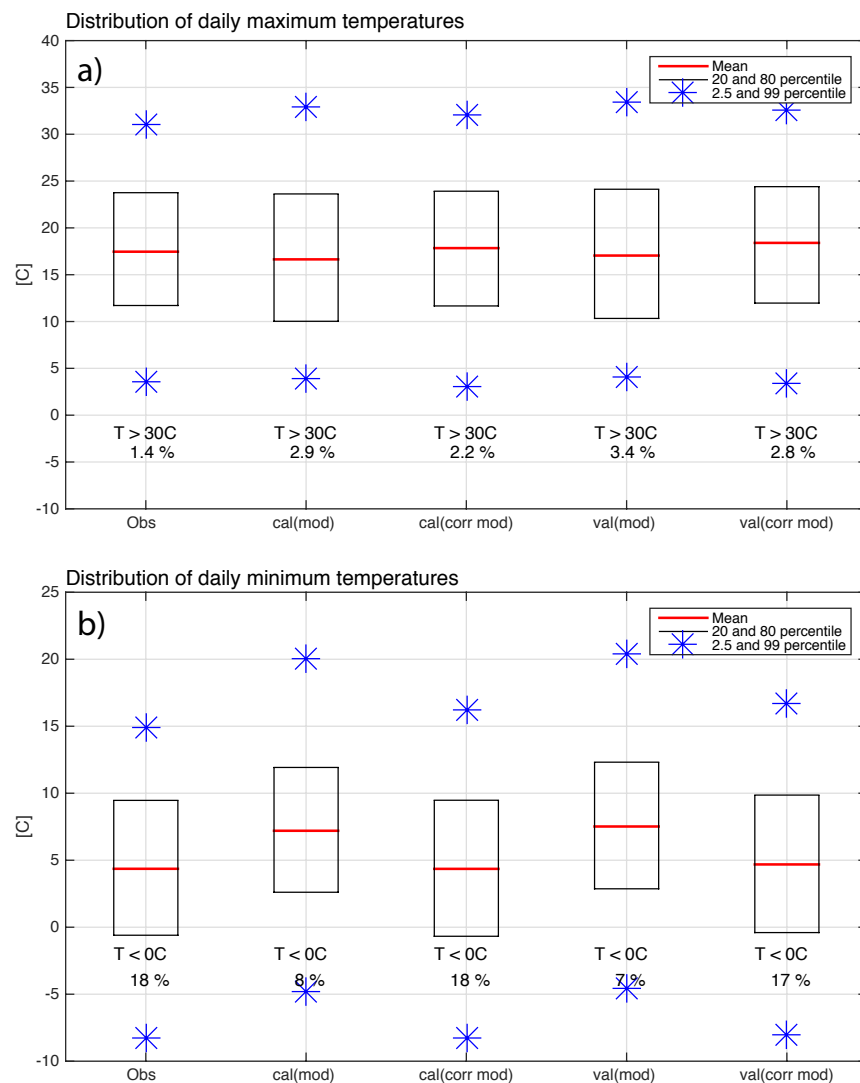


Figure S1. (a) Distribution of daily maximum temperature from observations (obs, left), CMIP5 models for calibration period (1960-1980, cal), CMIP5 models calibration period biased corrected -cal(corr mod), CMIP5 models for validation period (1986-2005, val), and CMIP5 models for validation period biases corrected -val(corr mod). Including percentage of days with temperature above 30°C, box with mean value and percentiles, (b) same as (a) but for daily minimum temperatures, including percentage of days with temperatures below freezing.

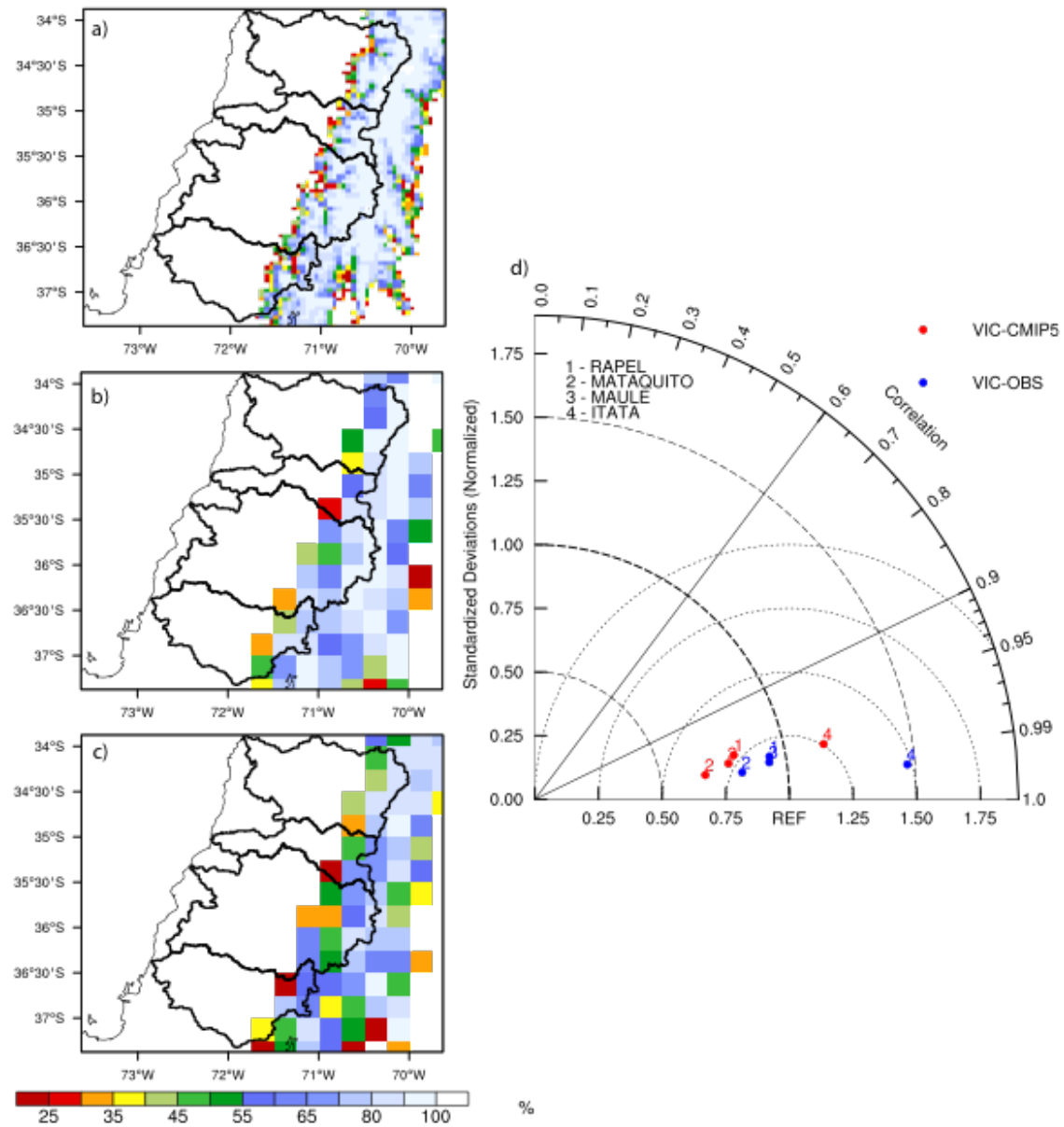


Figure S2. (a) 2001-2005 mean austral winter (JJA) snow coverage (%) for MODIS, (b) the VIC model simulation forced with gridded observation, and (c) the ensemble mean of the VIC model simulations forced with CMIP5 models. Also shown is (d) Taylor diagram of snow cover from the VIC simulations with respect to MODIS/TERRA for each basin (numbers).

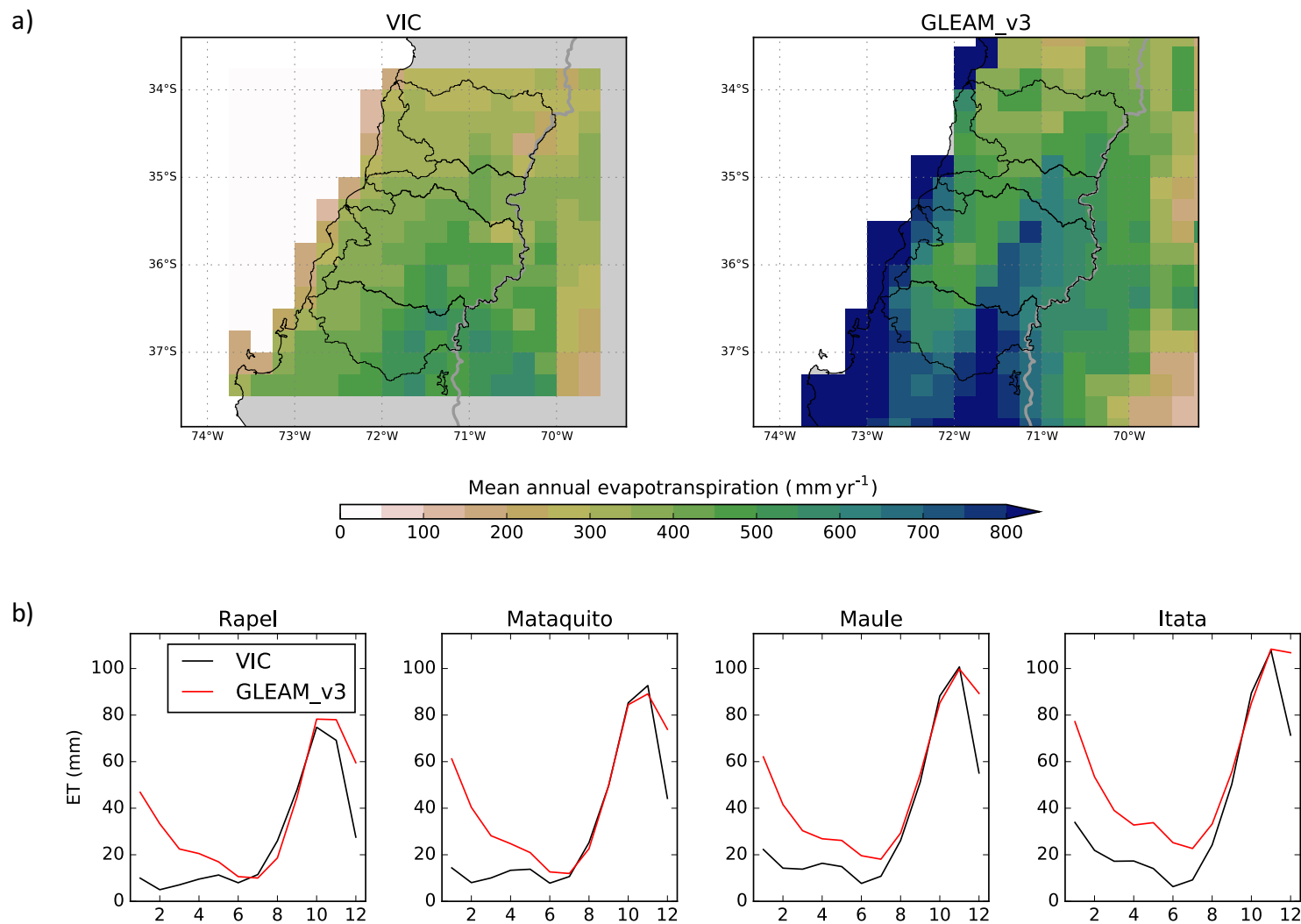


Figure S3. a) 1976-2005 mean annual evapotranspiration comparison of VIC.CMIP5 simulations with GLEAM v3.0 dataset and (b) annual cycle comparison of VIC.CMIP5 simulations with GLEAM v3.0 dataset for each basin.

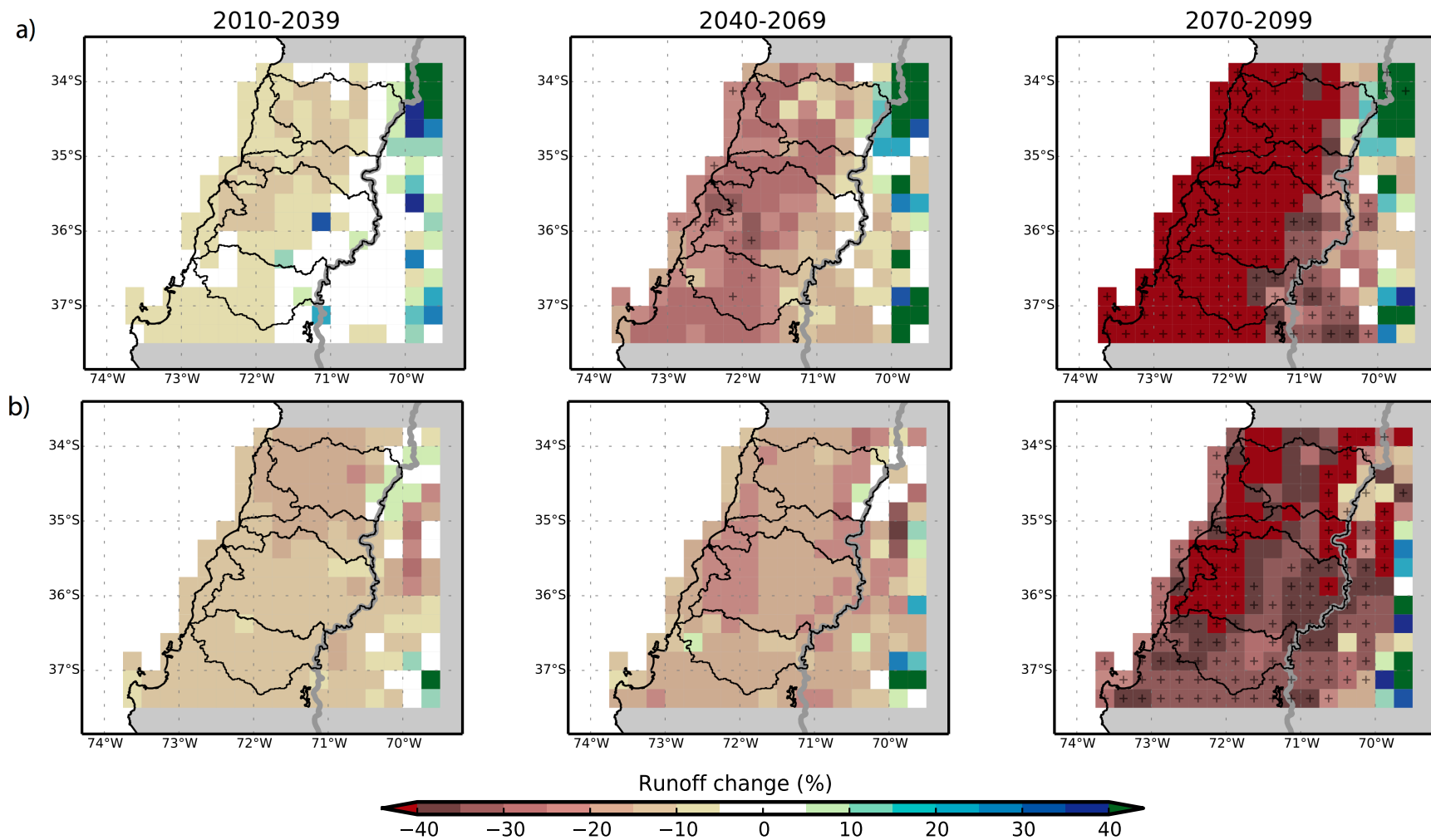


Figure S4. (a) Austral winter (JJA) runoff changes (%) for 2010-2039, 2040-2069, and 2070-2099 periods with respect to 1976-2005 reference period. Also shown is (b) austral spring (SON) runoff changes (%) for the same periods with respect to 1976-2005 reference period. Markers indicate where most of the models (>50%) have statistically significant differences at 95% confident level based on Student t-test.

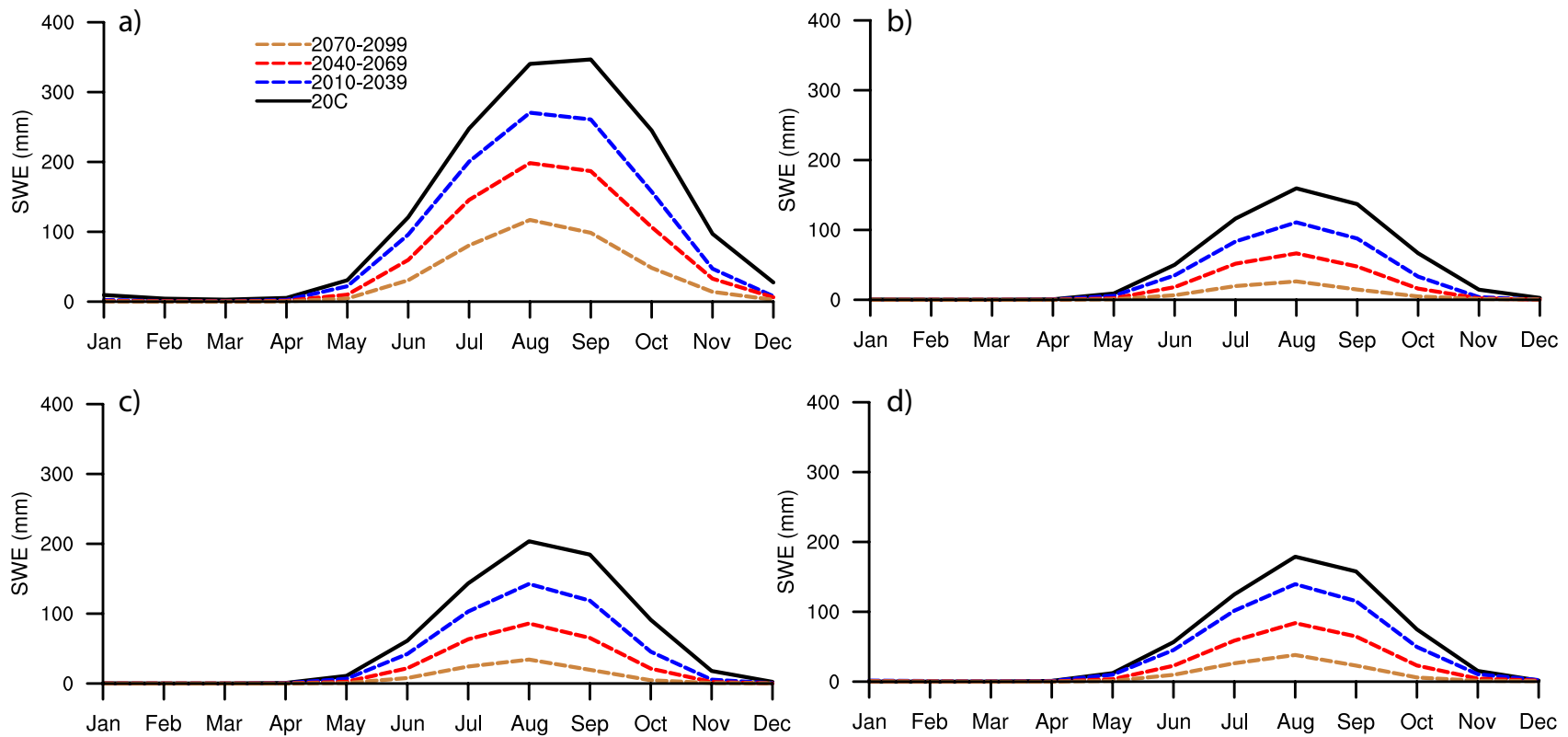


Figure S5. (a) Ensemble mean of the VIC model simulations of snow water equivalent (SWE) (>1000m) for the reference period (continuous line; 1976-2005) and future periods (dashed lines; 2010-2039, 2040-2069, 2070-2099) for Rapel, (b) Mataquito, (c) Maule, and (d) Itata basins.

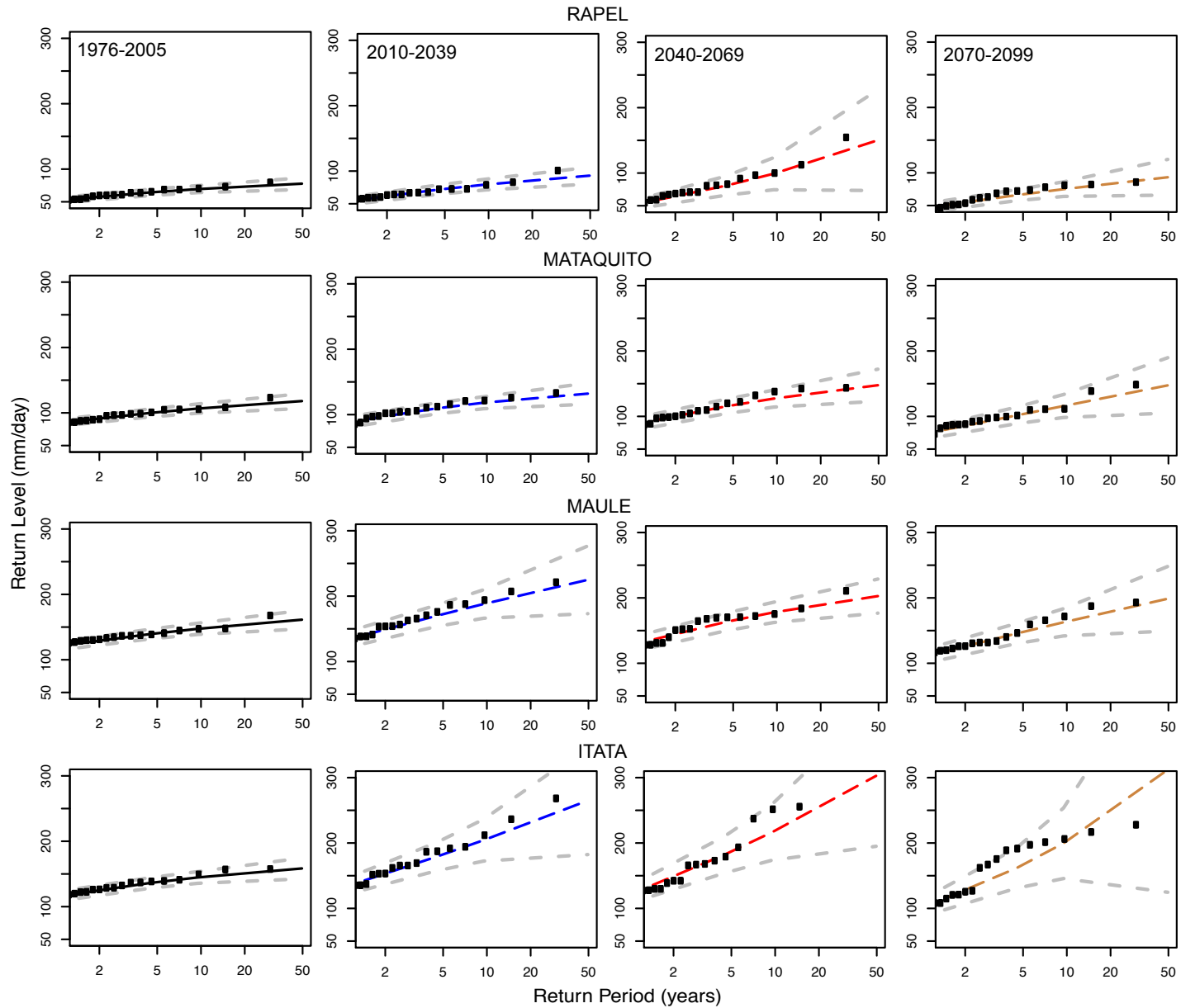


Figure S6. Return periods of annual maximum runoff events (mm/day) for each basin from the ensemble mean of VIC-CMIP5 for the reference period (1976-2005) and future periods (2010-2039, 2040-2069, and 2070-2099). Gray dashed lines correspond to the 95% confidence limit of the return periods.