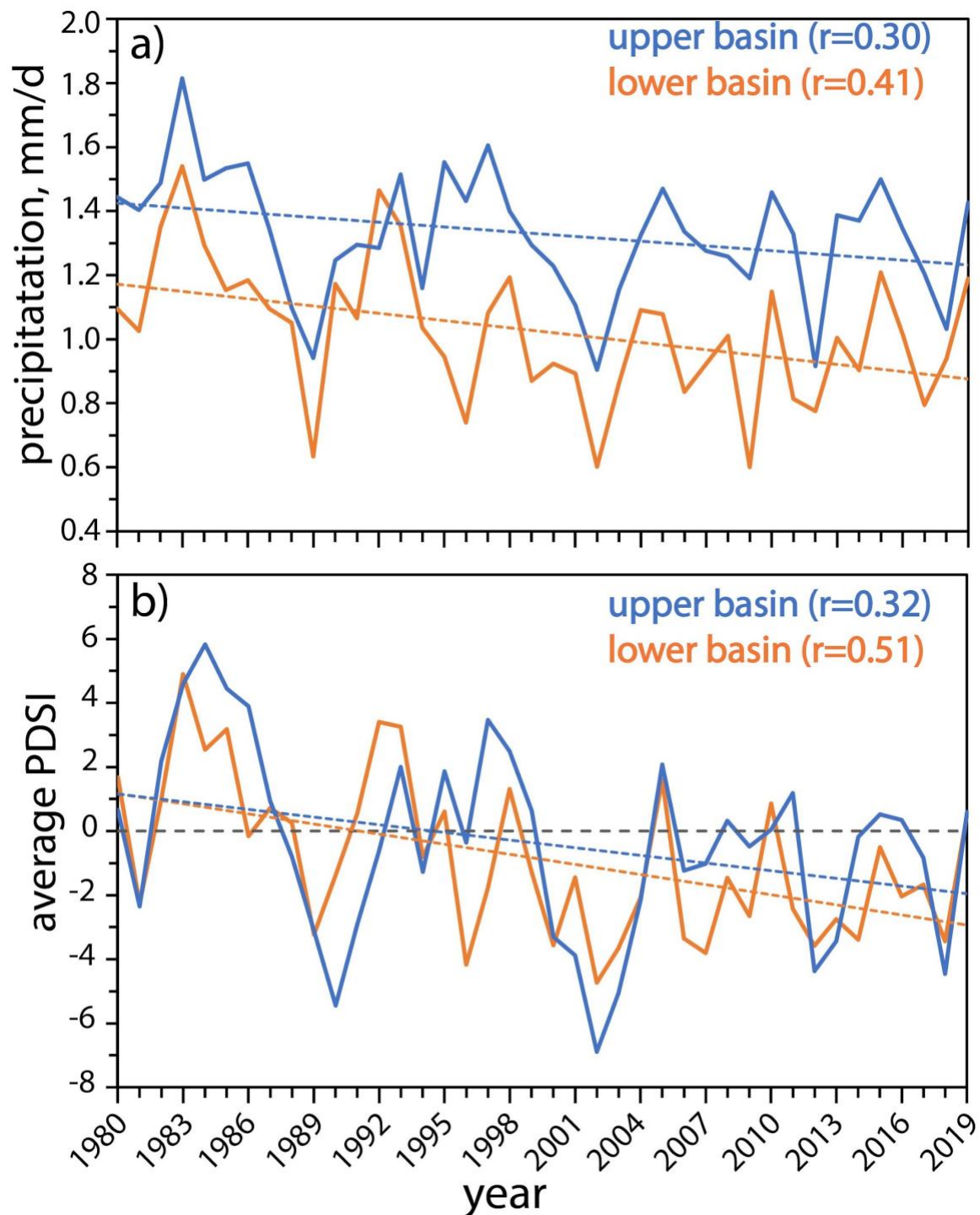Figure S1: a) Annual average precipitation (mm/day) in upper (blue line) and lower (orange line) Colorado River Basins, and b) annual average PDSI in upper (blue line) and in lower (orange line) Colorado River Basins. Blue and red dashed lines show the linear fit lines for the upper and lower basin while gray dashed line in b) shows the 0 value of PDSI.
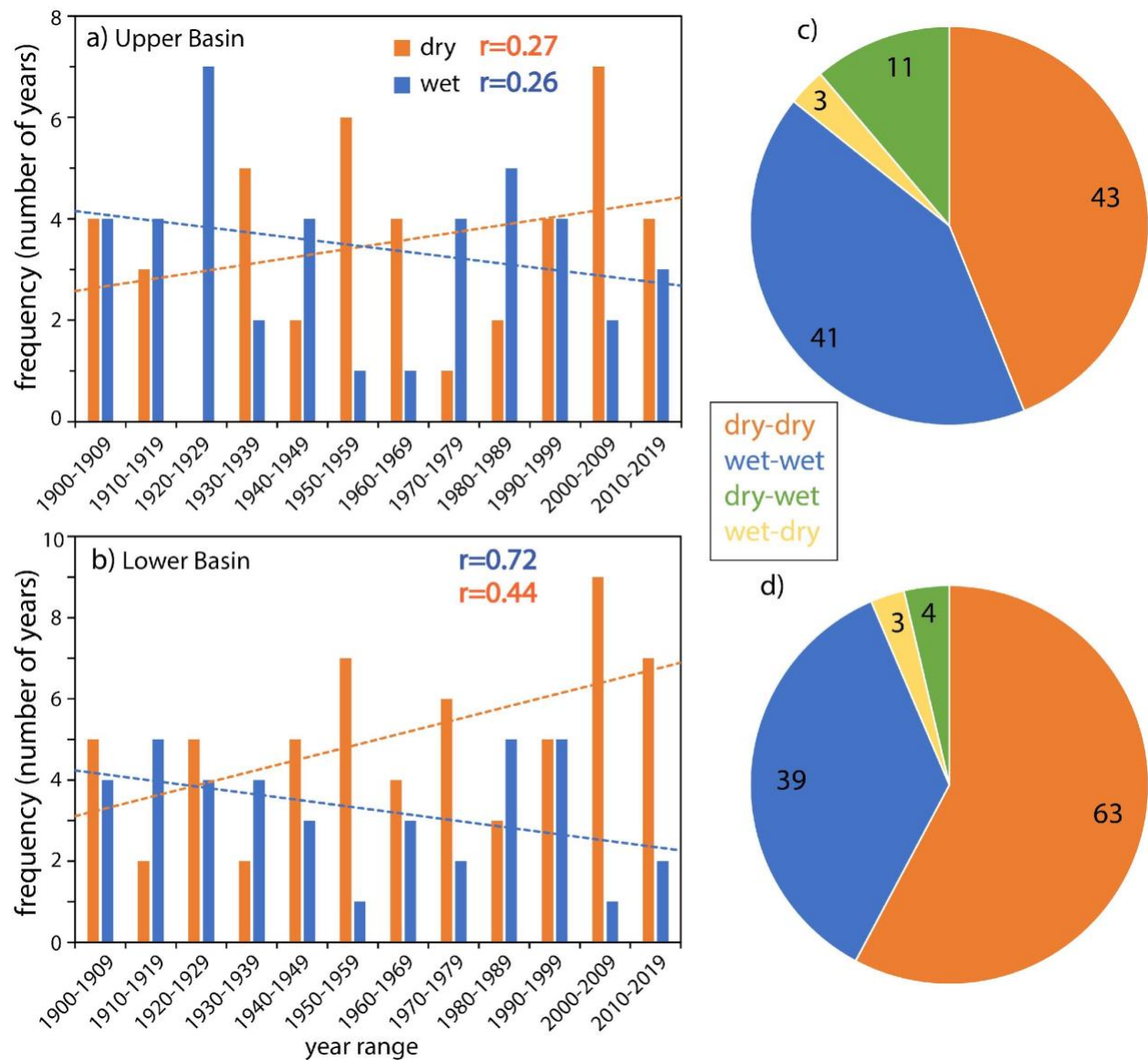
Figure S2: Average dry and wet frequency based on winter and spring PDSI value considering the months from December to May for a) upper and b) lower basins. The right panel c) and d) show the frequency pi-chart of four different transitions from winter (Dec-Feb) to spring (Mar-May) for upper and lower basins, respectively.
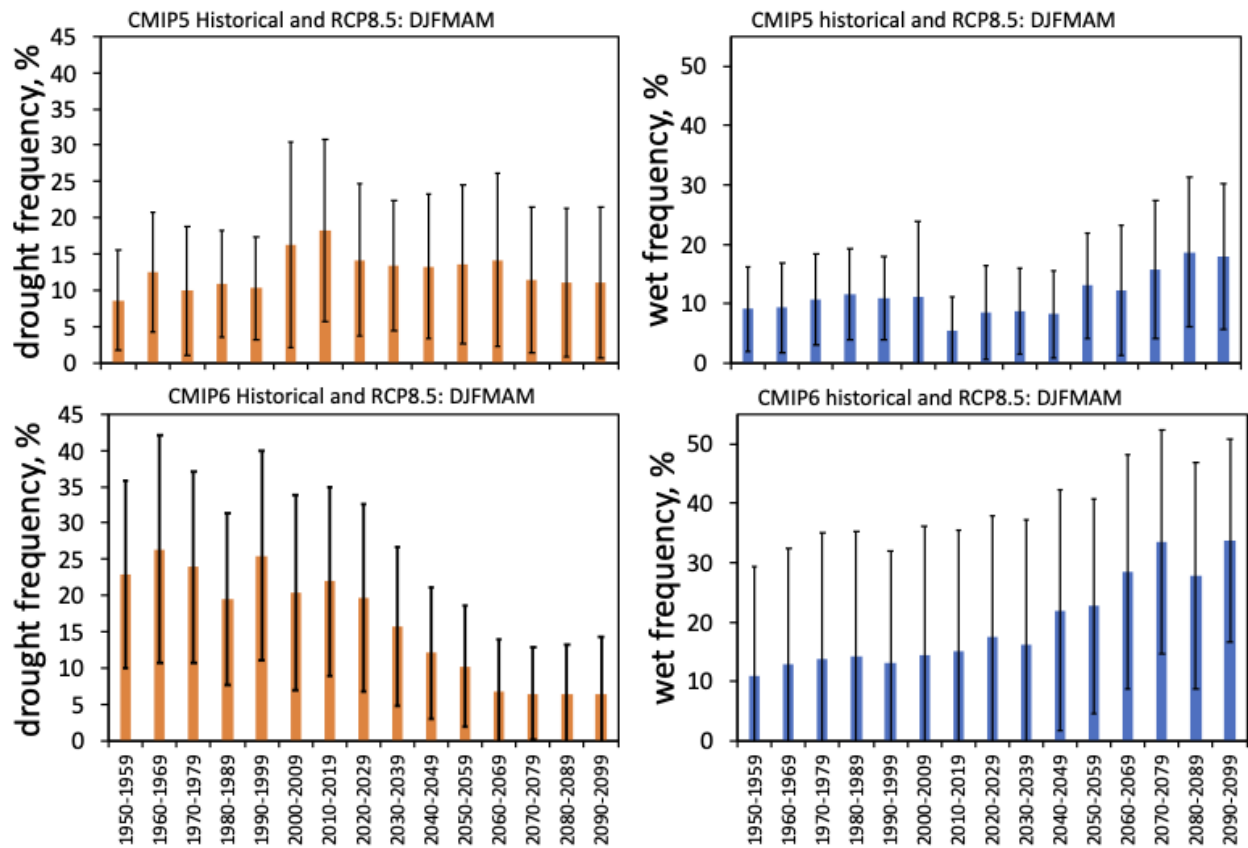
Figure S3: Dry and wet frequency from December to May (winter and spring) based on SPI3 from CMIP5 and CMIP6 data from 1950 to 2100. Dry frequency is calculated for the condition when all drought (SPI3 less than 0) in winter and spring and wet frequency is calculated for the condition when all wet (SPI3 greater than or equal to 0) in winter and spring (all six months). Left panel (a and b) shows the dry frequency and right panel (c and d) show the wet frequency based on CMIP5 (upper panel) and CMIP6 (lower panel) data.
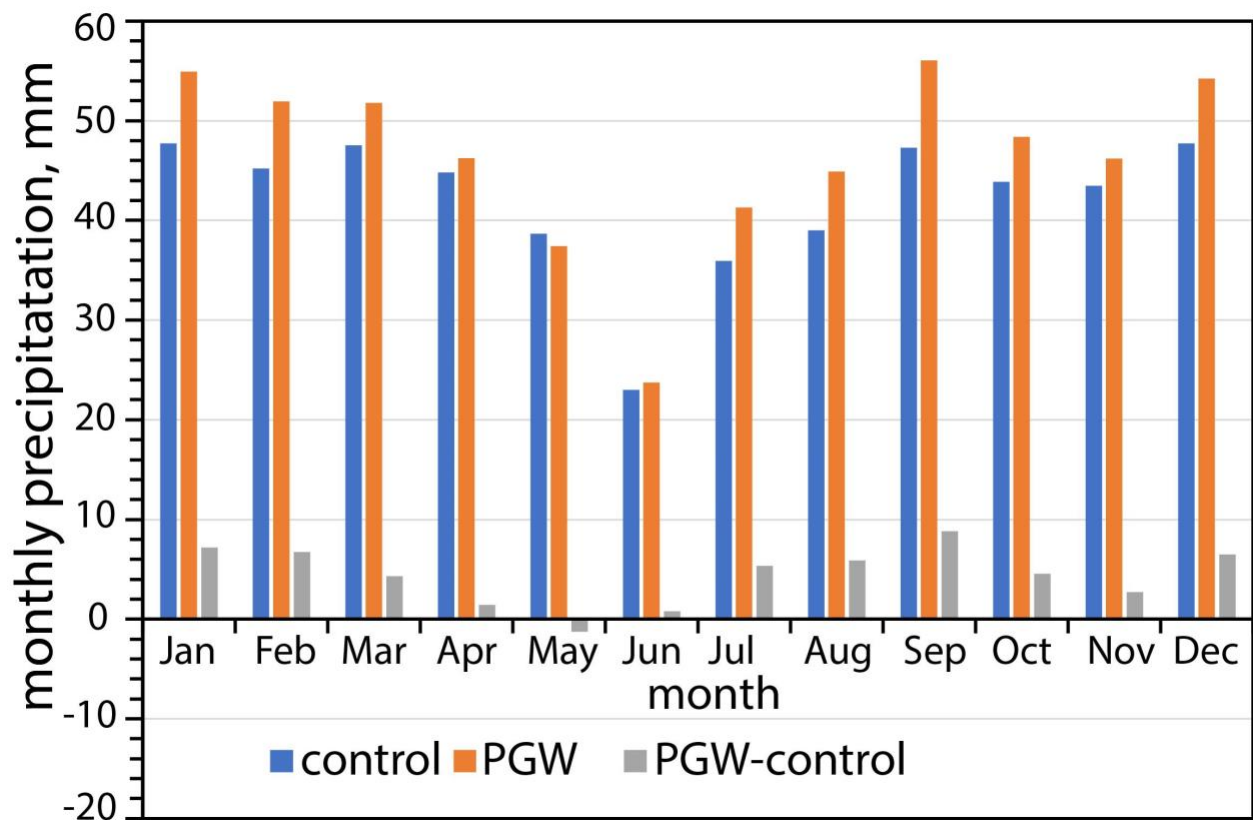
Figure S4: Monthly average precipitation in Upper Colorado River basin based on regional climate model (PNNL WRF) from control (blue bars) and PGW simulations. Also included the difference (PGW-control) in gray bars.
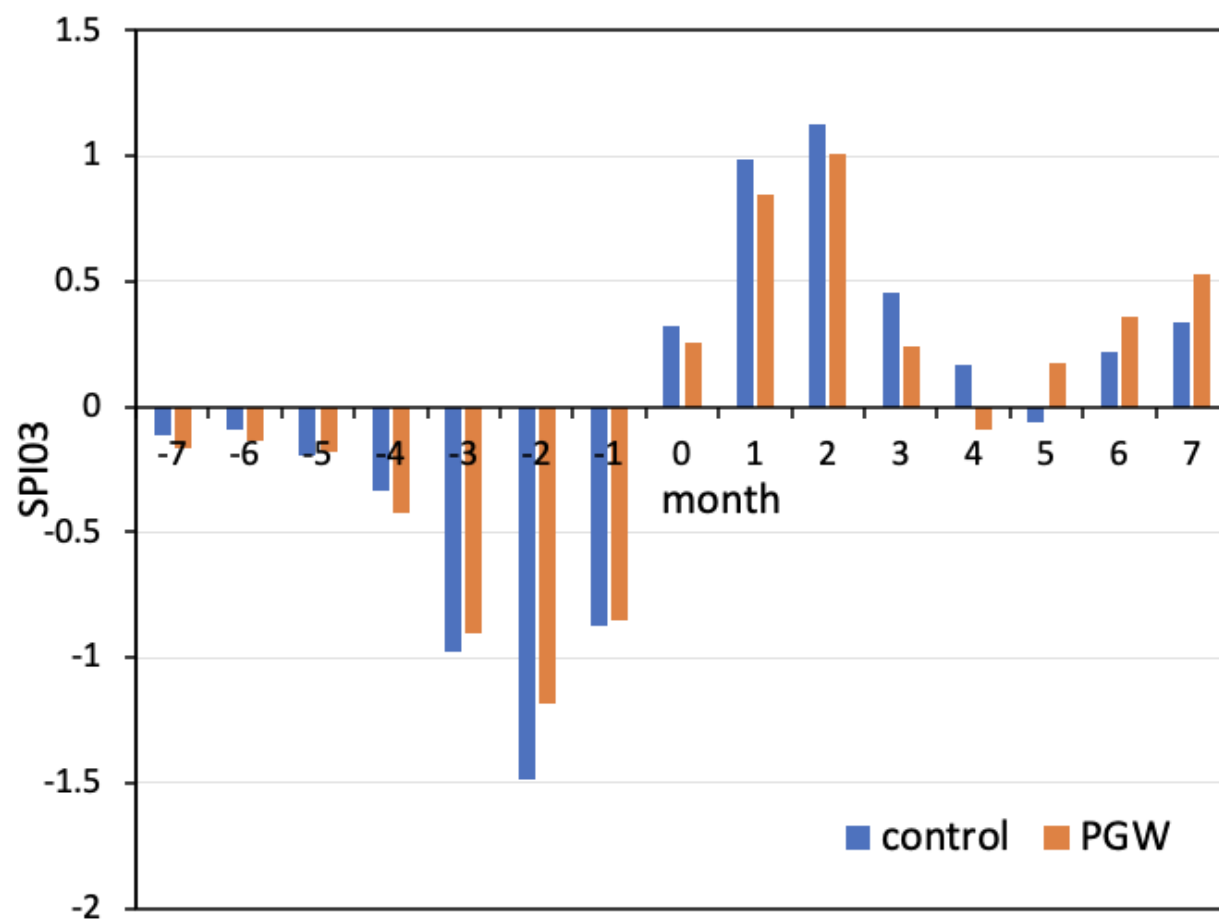
Figure S5: Average SPI3 based on miracle years from PNNL WRF control (blue bars) and PGW (orange bars) simulations.