

Figure 1. The location and brief description of the headwater area of the Yellow River Basin (HYRB), China.

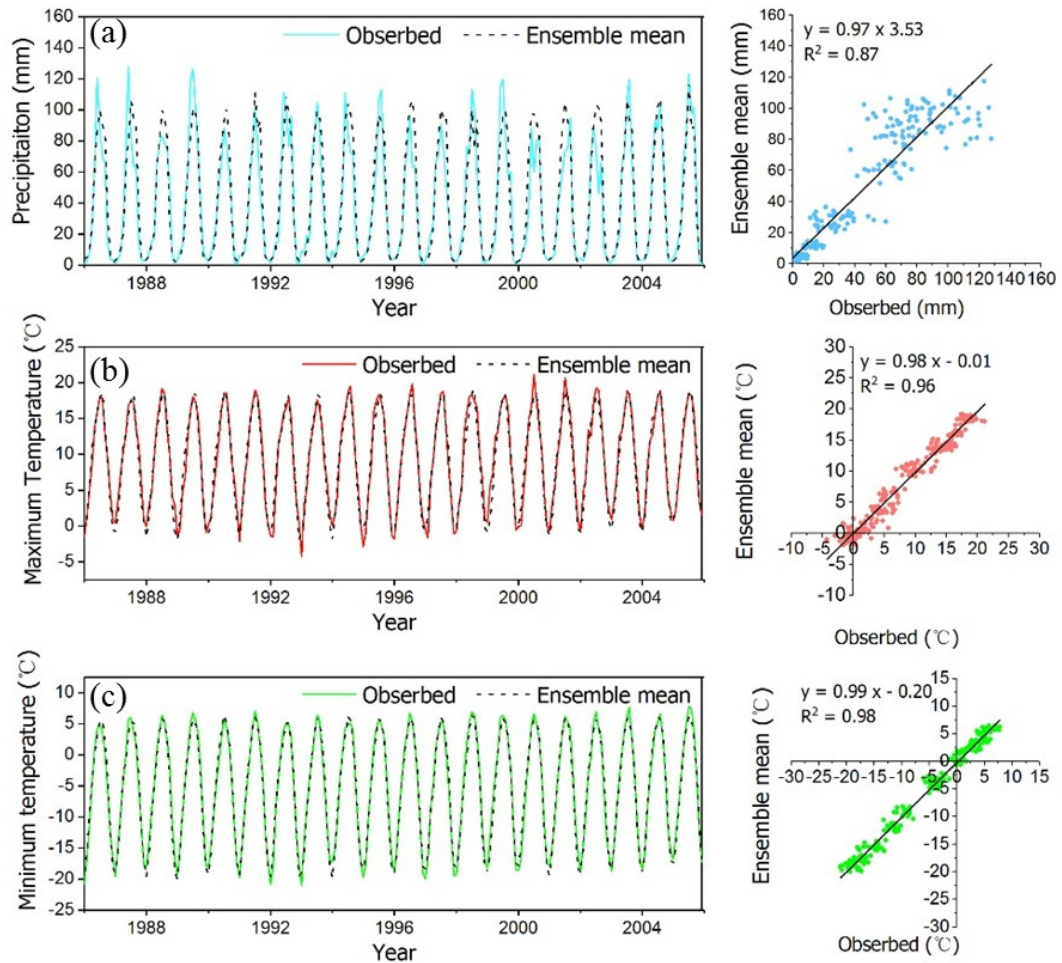


Figure 2. Comparison of observed and GCM-derived (a) monthly precipitation, (b) maximum and (c) minimum temperature in the HYRB during 1986 and 2015.

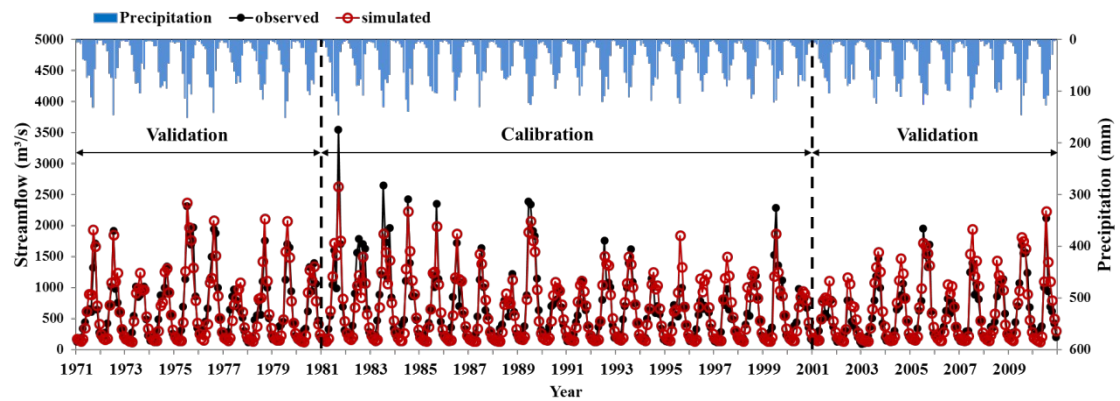


Figure 3. Monthly streamflow simulation at the Tangnaihai gaging station during the calibration period (1981–2000) and the validation periods (1971–1980, 2001–2010).

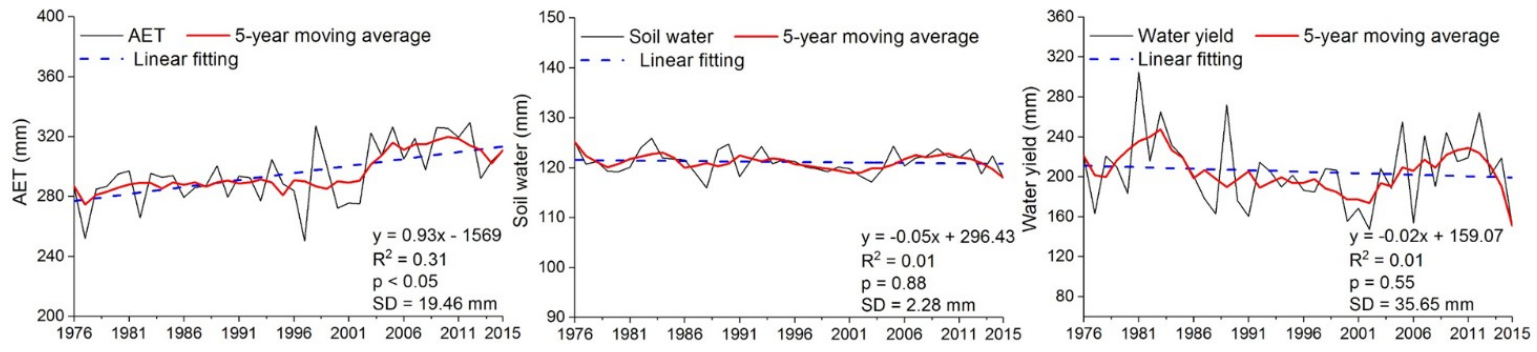


Figure 4. Temporal changes in annual AET (actual evapotranspiration), water yield, and soil water during 1976–2015. SD means standard deviation.

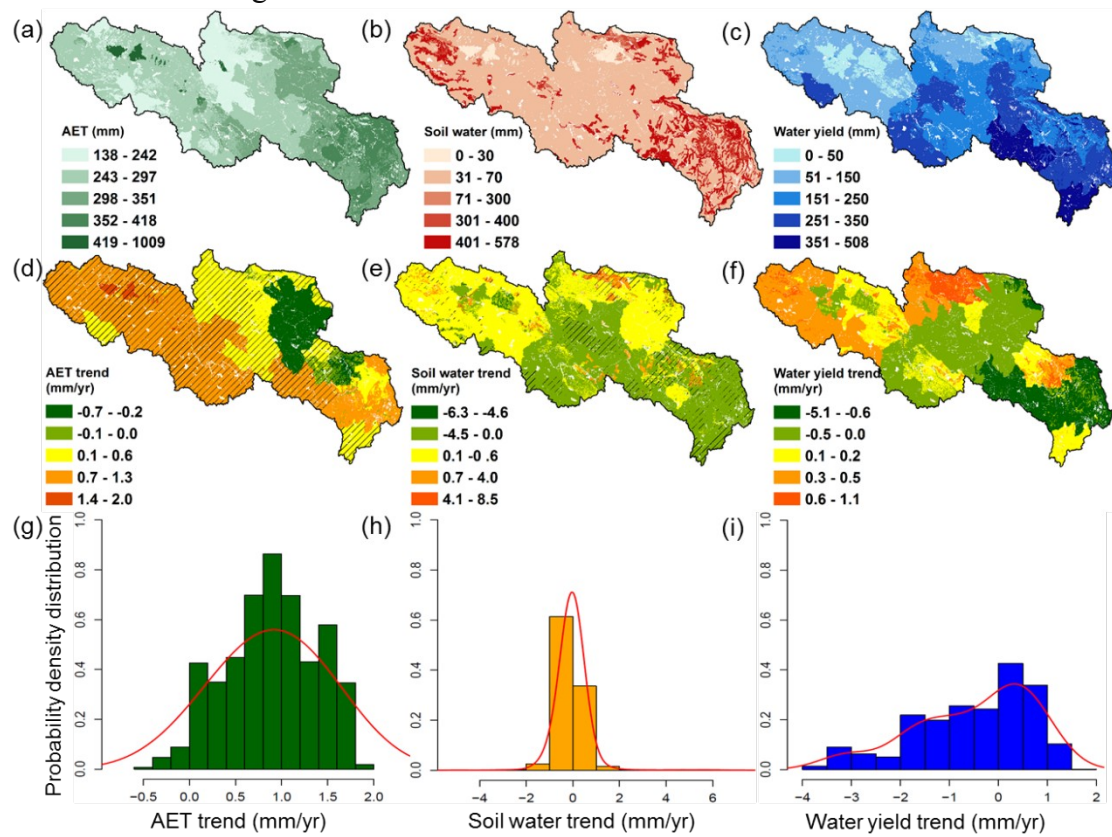


Figure 5. Spatial distributions of (a-c) annual mean key hydrological components, (d-f) annual trends of key hydrological components, and (g-i) probability density distribution of trends in the HYRB during 1976–2015 on the Hydrologic Response Unit (HRU) level. "////" indicates that the trend has passed the significance test ($p < 0.05$).

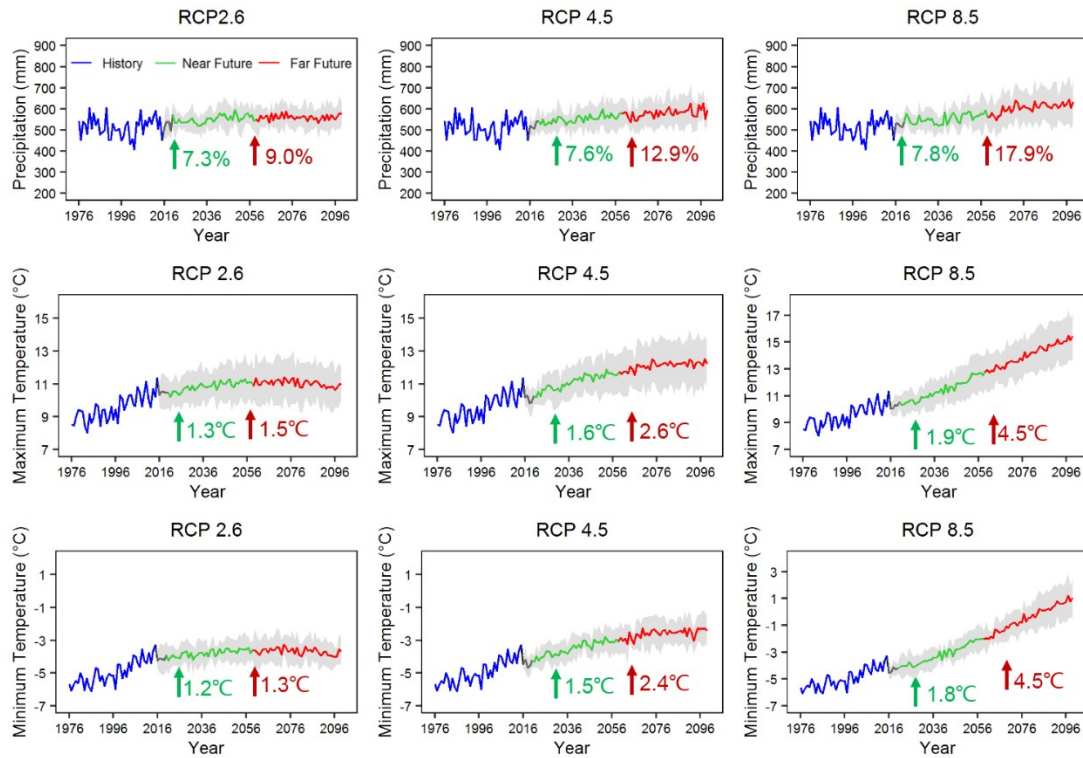


Figure 6. Ensemble values of annual mean precipitation, maximum and minimum air temperature under three RCPs during the future period of 2020–2099. The blue, green, and red lines represent the historical period, near future (NF, 2020–2059), and the far future (FF, 2060–2099) periods, respectively. The shading area denotes the ± 1 standard deviation range of model annual averages.

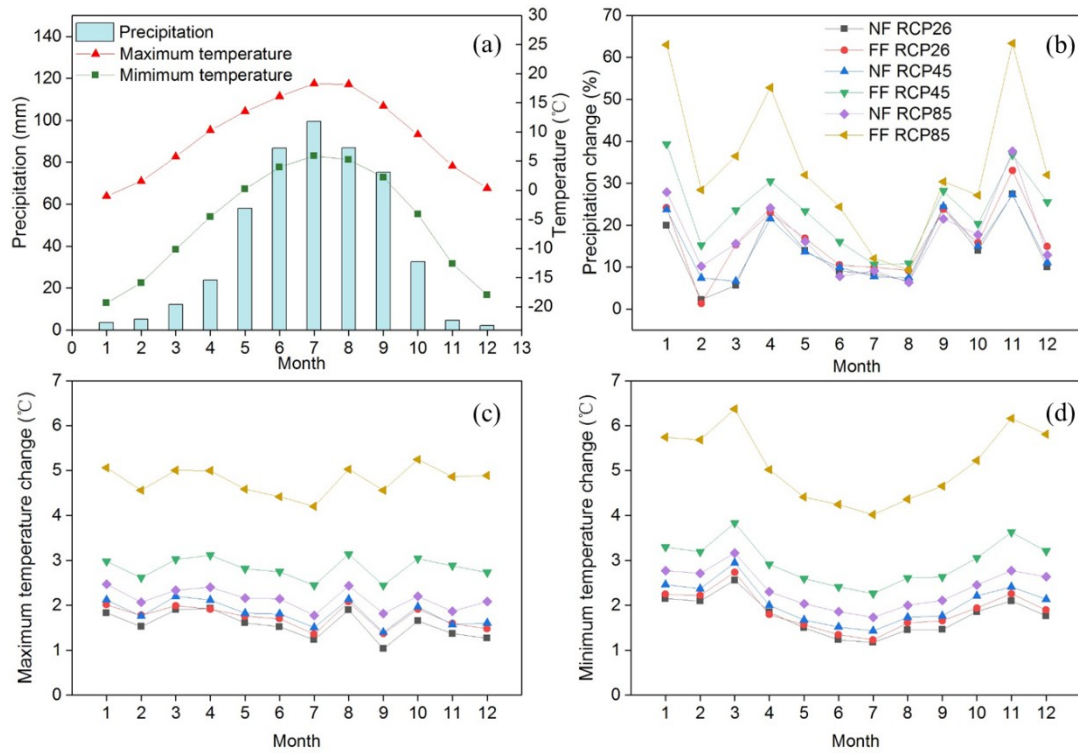


Figure 7. (a) Monthly mean precipitation, maximum and minimum air temperature during baseline period (1976–2015). (b) Projected changes in ensemble monthly mean precipitation, (c) maximum and (d) minimum air temperature during the near future (NF, 2020–2059) and far future (FF, 2060–2099) periods under RCP 2.6, 4.5, and 8.5 relative to baseline.

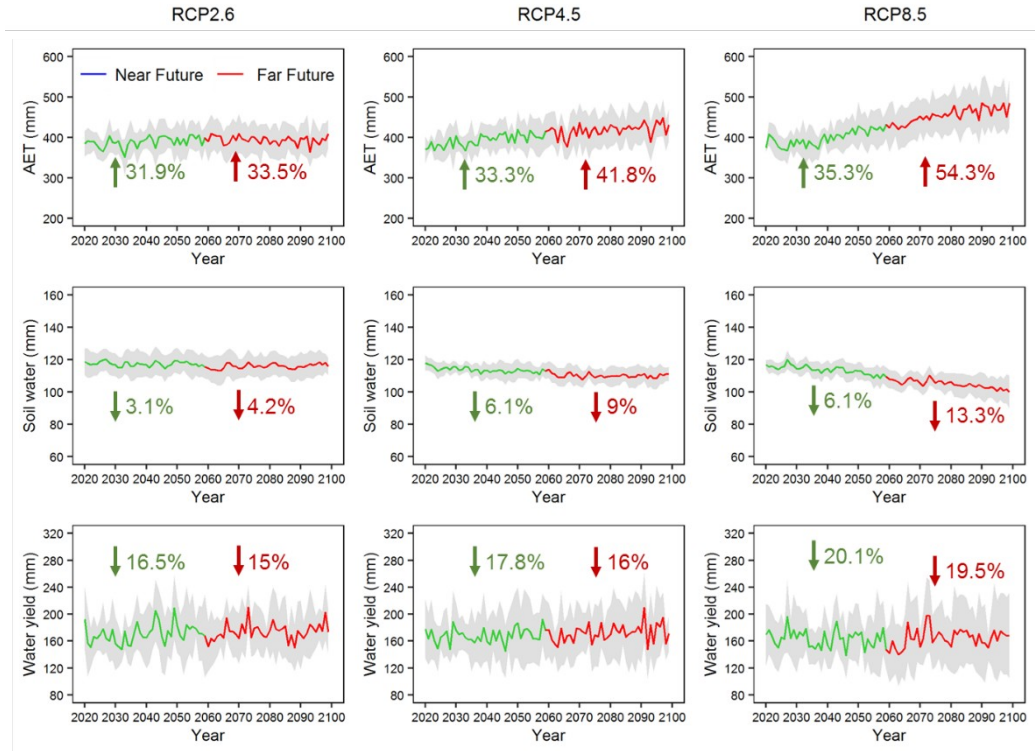


Figure 8. Ensemble values of annual mean AET (actual evapotranspiration), soil water, and water yield under three RCPs during the future period of 2020–2099. The green and red lines represent the near future (NF, 2020–2059) and the far future (FF, 2060–2099) periods, respectively. The shading area denotes the ± 1 standard deviation range of model annual averages.

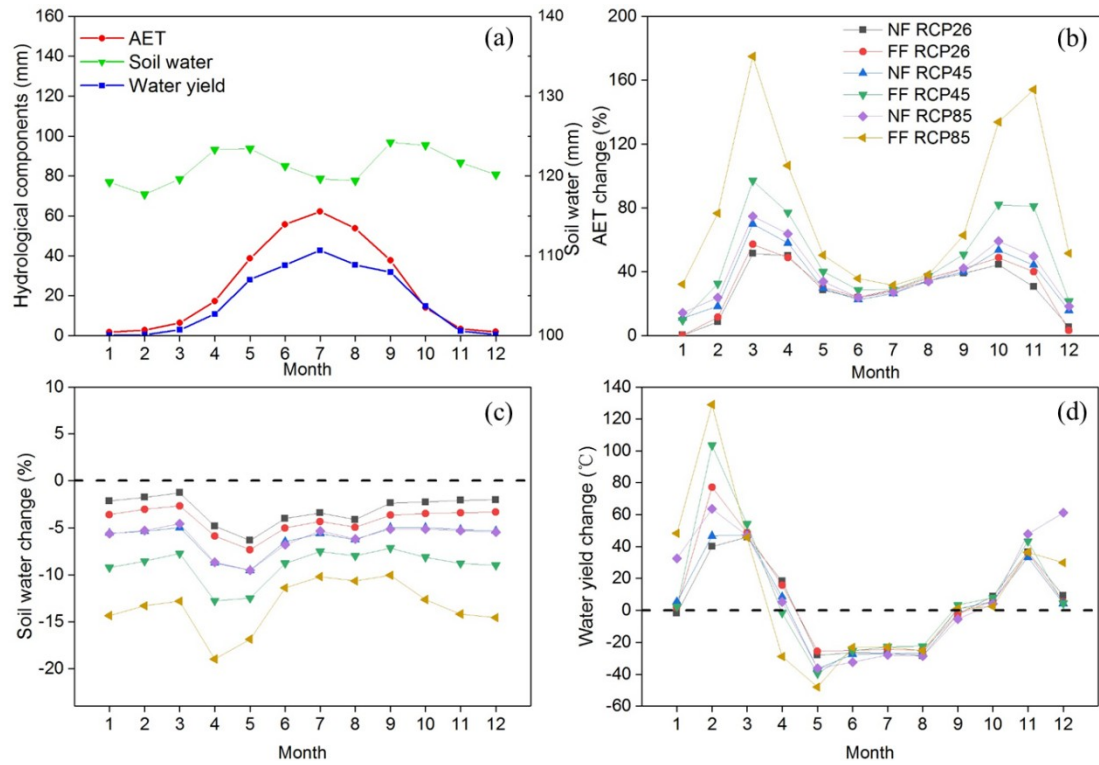


Figure 9. (a) Monthly AET (actual evapotranspiration), soil water and water yield during the baseline period (1976–2015) and the projected monthly changes in (b) AET, (c) soil water, and (d) water yield during the near future (NF, 2020–2059) and the far future (FF, 2060–2099) periods under the RCP 2.6, 4.5, and 8.5 relative to baseline in the HYRB.

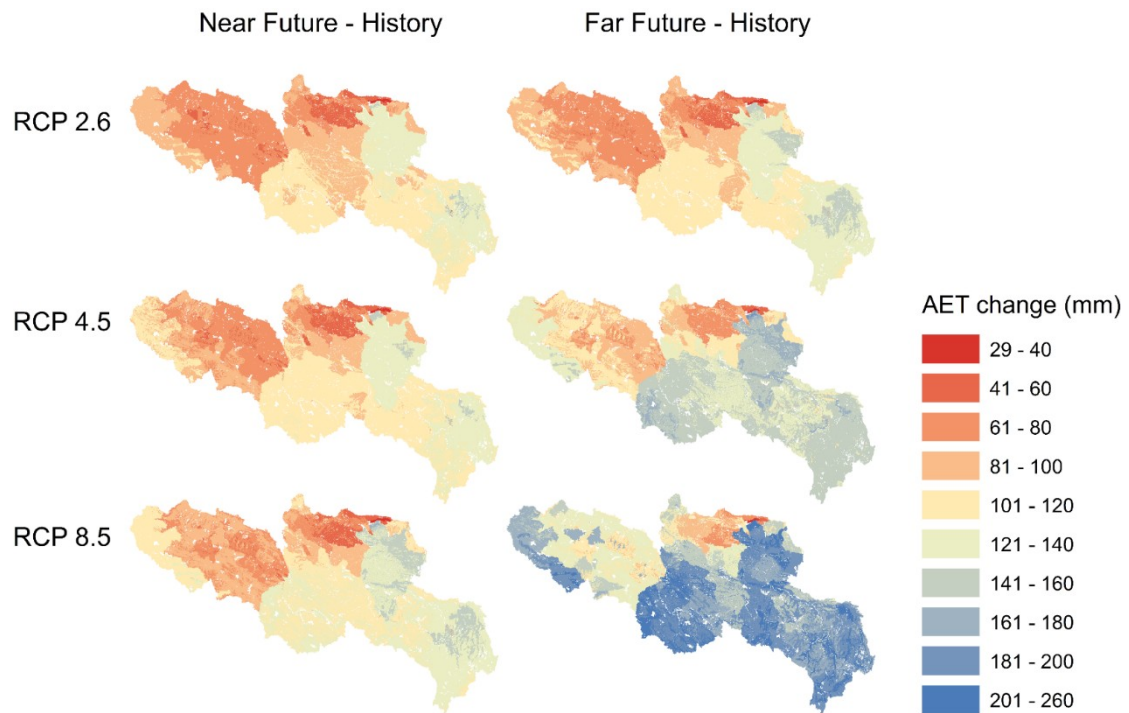


Figure 10. The difference of AET (actual evapotranspiration) between near future (2020–2059) and historical period, far future (2060–2099) and historical period under the RCP 2.6, 4.5, and 8.5.

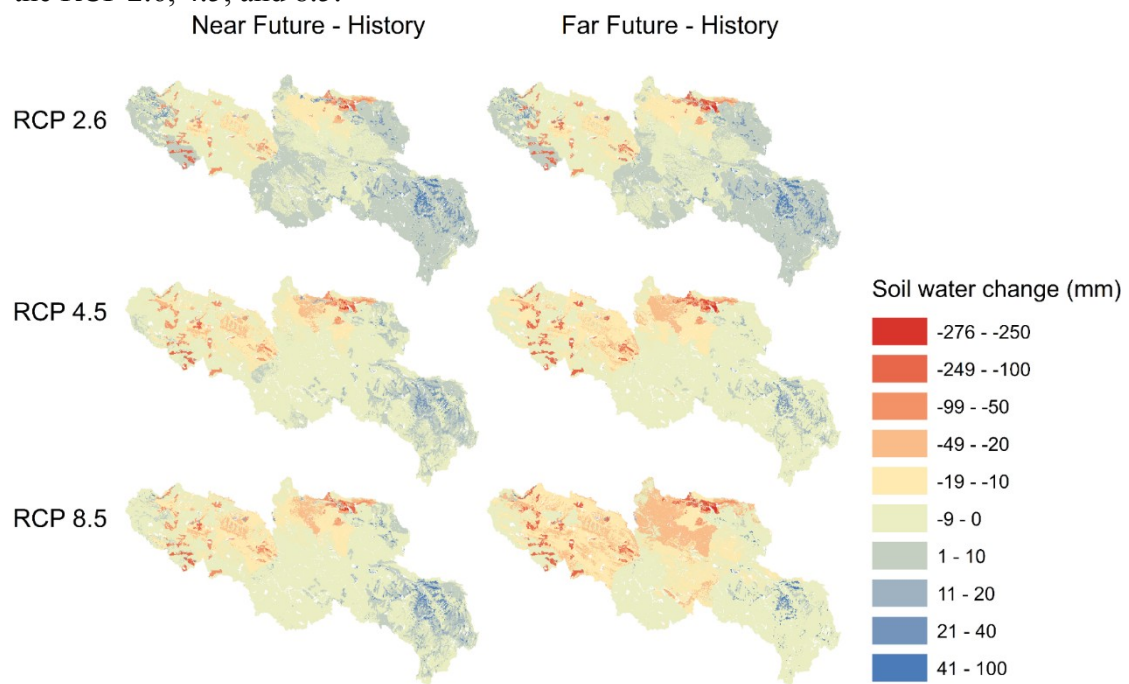


Figure 11. The difference of soil water between near future (2020–2059) and historical period, far future (2060–2099) and historical period under the RCP 2.6, 4.5, and 8.5.

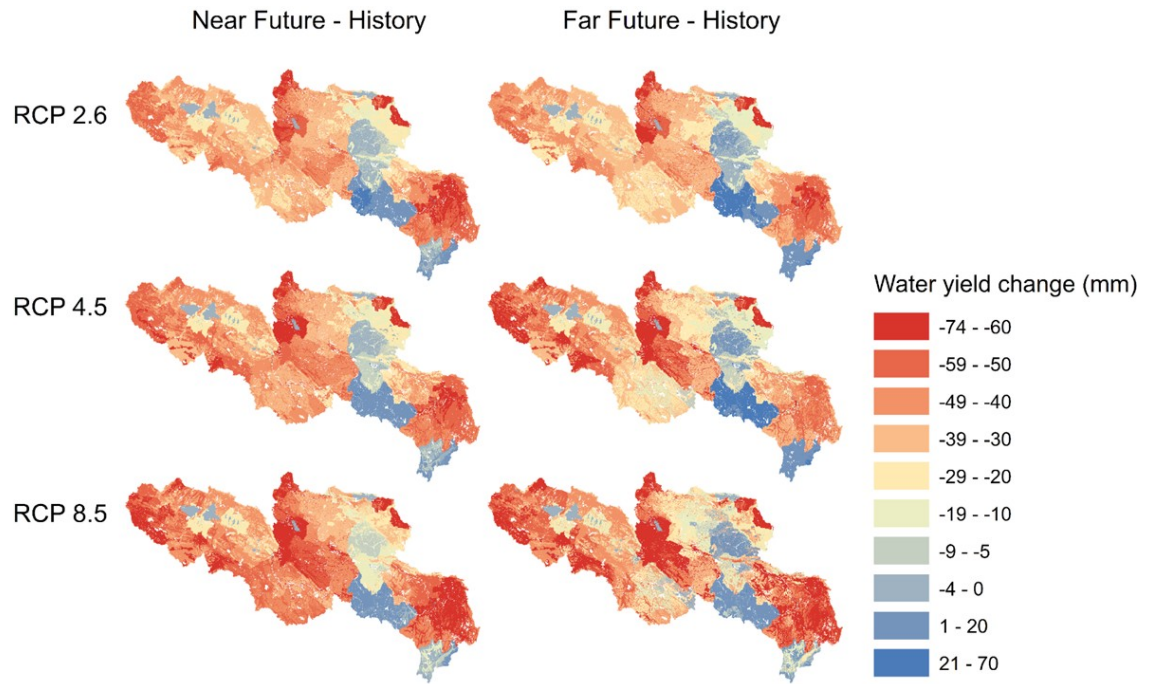


Figure 12. The difference of water yield between near future (2020–2059) and historical period, far future (2060–2099) and historical period under the RCP 2.6, 4.5, and 8.5.