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Impacts of land use and land cover change and reforestation on summer rainfall in the Yangtze River basin

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Impacts of land use/cover change and reforestation on summer rainfall for the Yangtze River Basin

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Table S1. The percentages of land use classes under four scenarios after resampling.

Scenarios	Cropland (%)	Forest (%)	Grassland (%)	Water and wetland (%)	Urban (%)	Unused land (%)
1990 scenario	28.67	44.37	24.63	0.58	0.06	1.69
2010 scenario	28.12	45.02	24.60	0.69	0.45	1.12
20% scenario	22.97	49.85	24.83	0.69	0.54	1.12
50% scenario	14.76	57.53	25.32	0.69	0.58	1.12

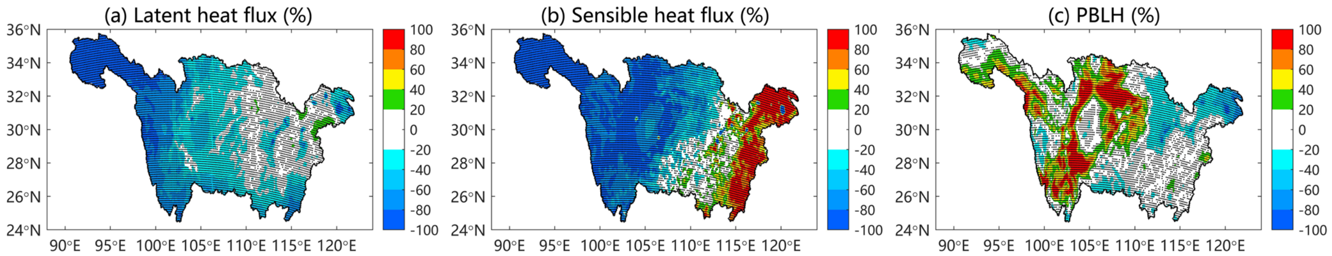

Figure S1. The biases of (a) latent heat flux (%), (b) sensible heat flux (%) and (c) PBL height (%) between the 2010 scenario and observed data. The stippling regions show statistically significance of changes identified by t-test at a 5% significance level.

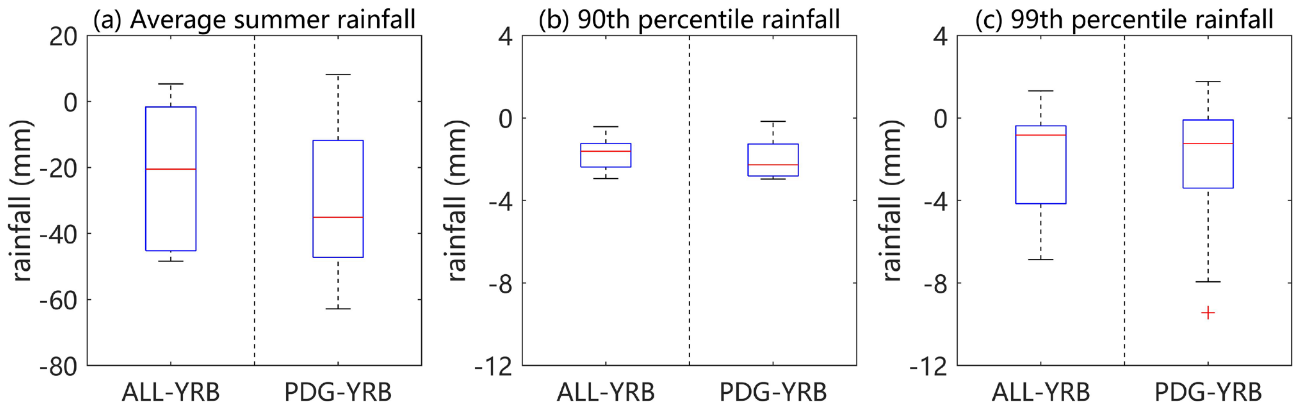

Figure S2. The changes in (a) average summer rainfall (mm), (b) 90th percentile summer rainfall (mm/day) and (c) 99th percentile summer rainfall (mm/day) between the 2010 scenario and 1990 scenario in ALL-YRB and PDG-YRB area.

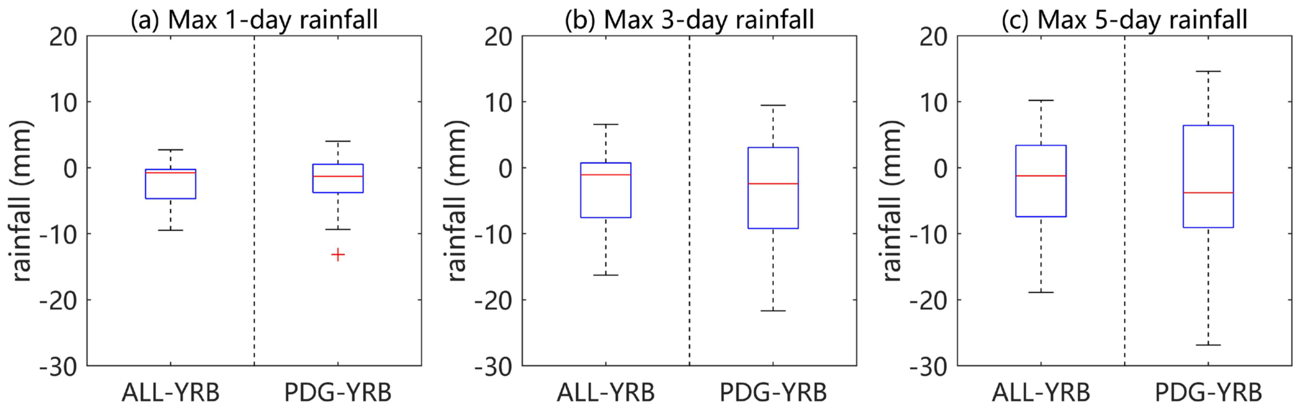

Figure S3. The changes in maximum 1-, 3-, 5-day rainfall between the 2010 scenario and 1990 scenario in ALL-YRB and PDG-YRB area.

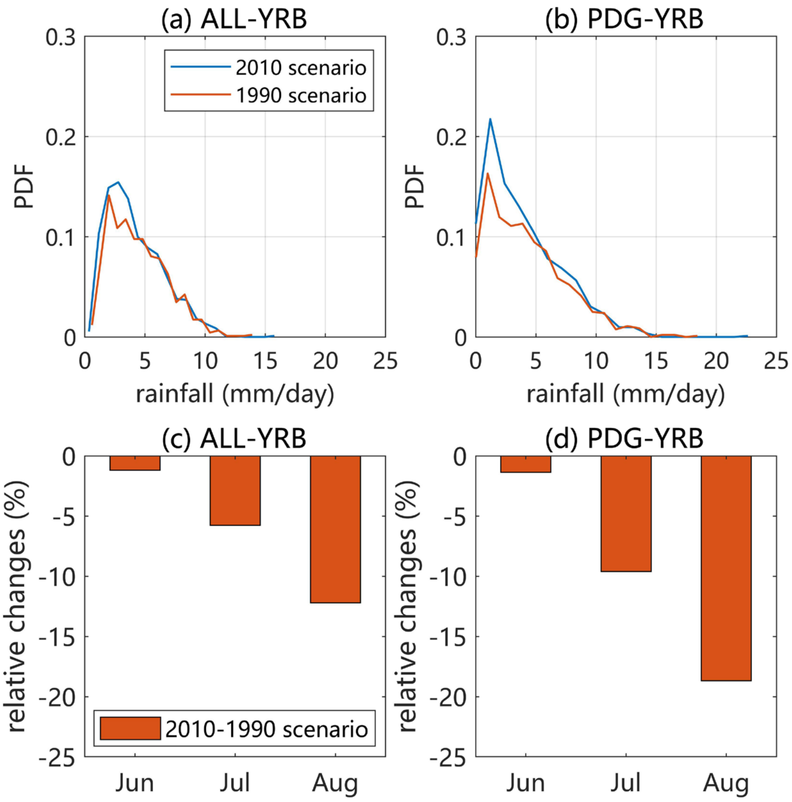

Figure S4. The probability distribution functions of summer rainfall in 2010 and 1990 scenarios in (a) ALL-YRB and (b) PDG-YRB; The changes in multiyear-averaged summer monthly rainfall between the 2010 scenario and 1990 scenario in (c) ALL-YRB and (d) PDG-YRB.

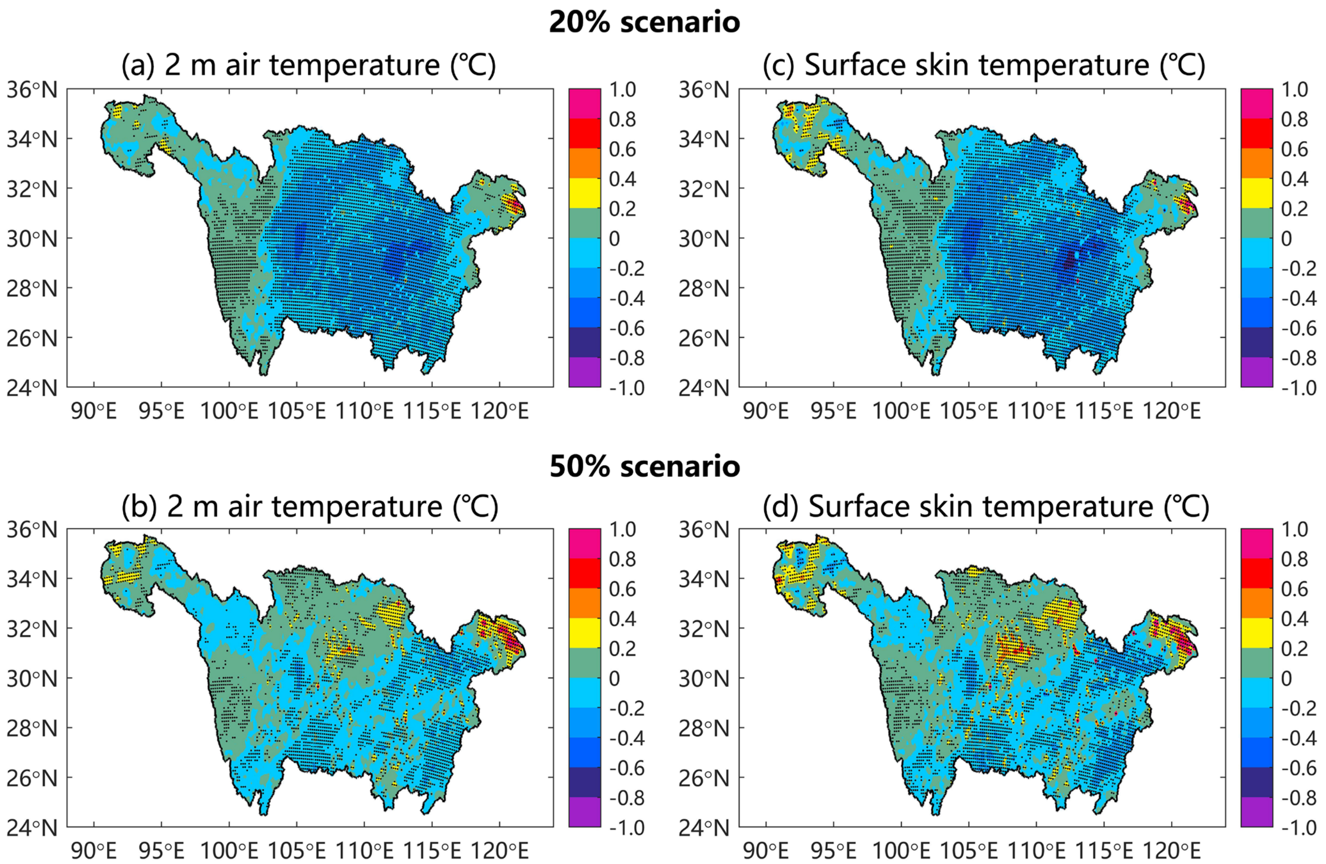

Figure S5. The changes in (a-b) 2m air temperature (℃) and (c-d) surface skin temperature (℃) between the 20% scenario and 2010 scenario, and between the 50% scenario and 2010 scenario. The stippling regions show statistically significance of changes identified by t-test at a 5% significance level.

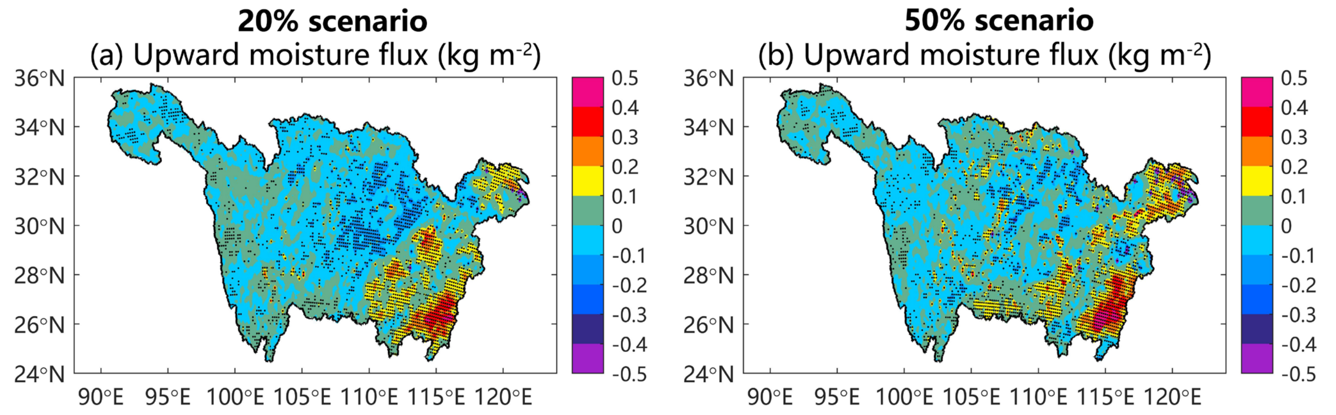

Figure S6. The changes in (a-b) upward moisture flux at the surface (kg/m^2) between the 20% scenario and 2010 scenario, and between the 50% scenario and 2010 scenario. The stippling regions show statistically significance of changes identified by t-test at a 5% significance level.

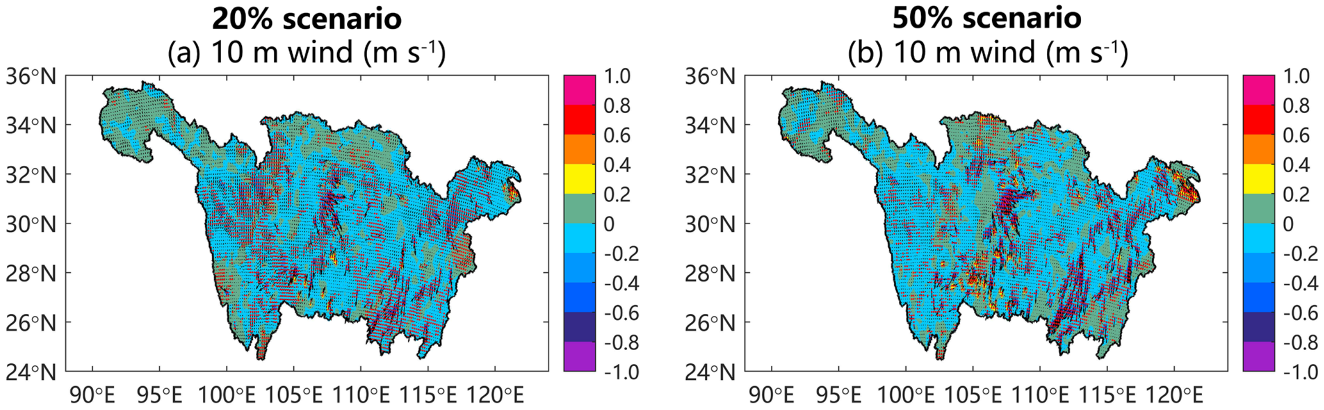

Figure S7. The changes in (a-b) 10m wind (m/s) between the 20% scenario and 2010 scenario, and between the 50% scenario and 2010 scenario. The stippling regions show statistically significance of changes identified by t-test at a 5% significance level.

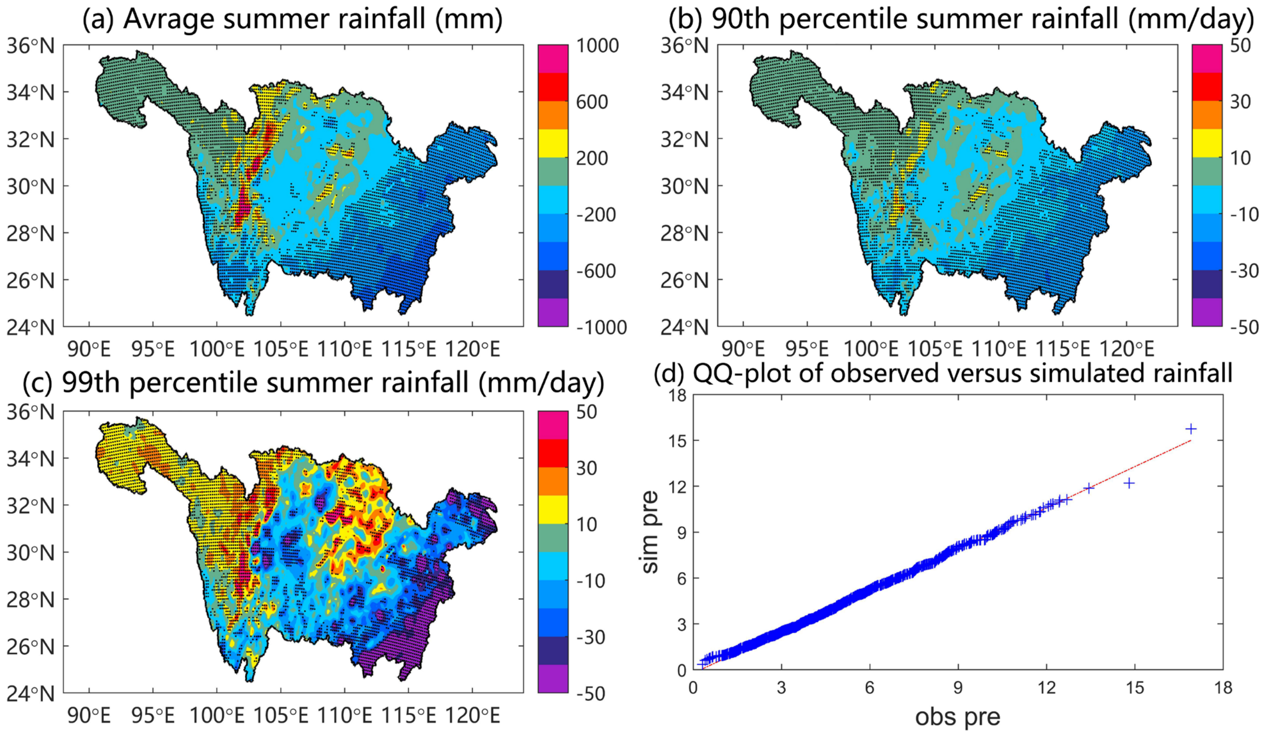

Figure S8. The bias of (a) average summer rainfall (mm), (b) 90th percentile summer rainfall (mm/day) and (c) 99th percentile summer rainfall (mm/day) between the 2010 scenario and observed data, and (d) the qq-plot of observed rainfall versus simulated rainfall. The stippling regions show statistically significance of bias identified by t-test at a 5% significance level.

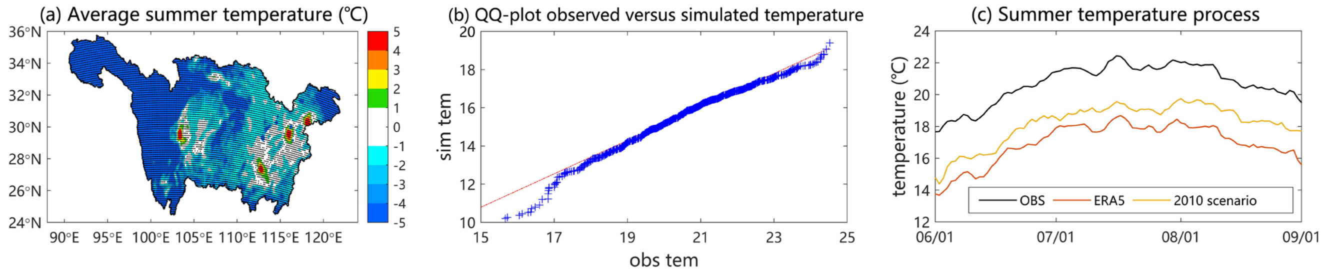

Figure S9. (a) The biases of average summer temperature (℃) between the 2010 scenario and observed data, the stippling regions show statistically significance of bias identified by t-test at a 5% significance level.; (b) The qq-plot of observed temperature versus simulated temperature; (c) The basin-averaged summer temperature processes of observation, ERA5 and 2010 scenario.

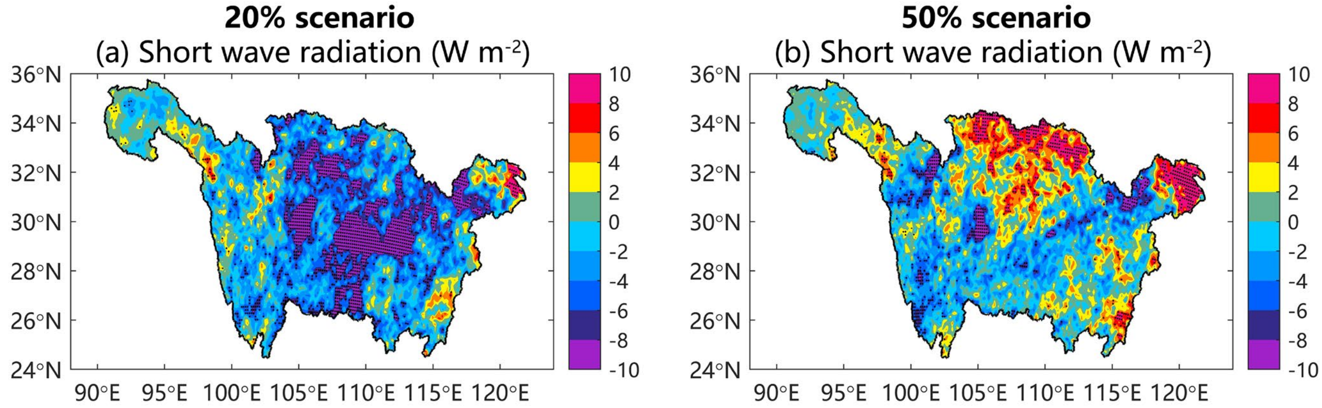

Figure S10. The changes in (a-b) short wave radiation (W/m2) between the 20% scenario and 2010 scenario, and between the 50% scenario and 2010 scenario. The stippling regions show statistically significance of changes identified by t-test at a 5% significance level.