

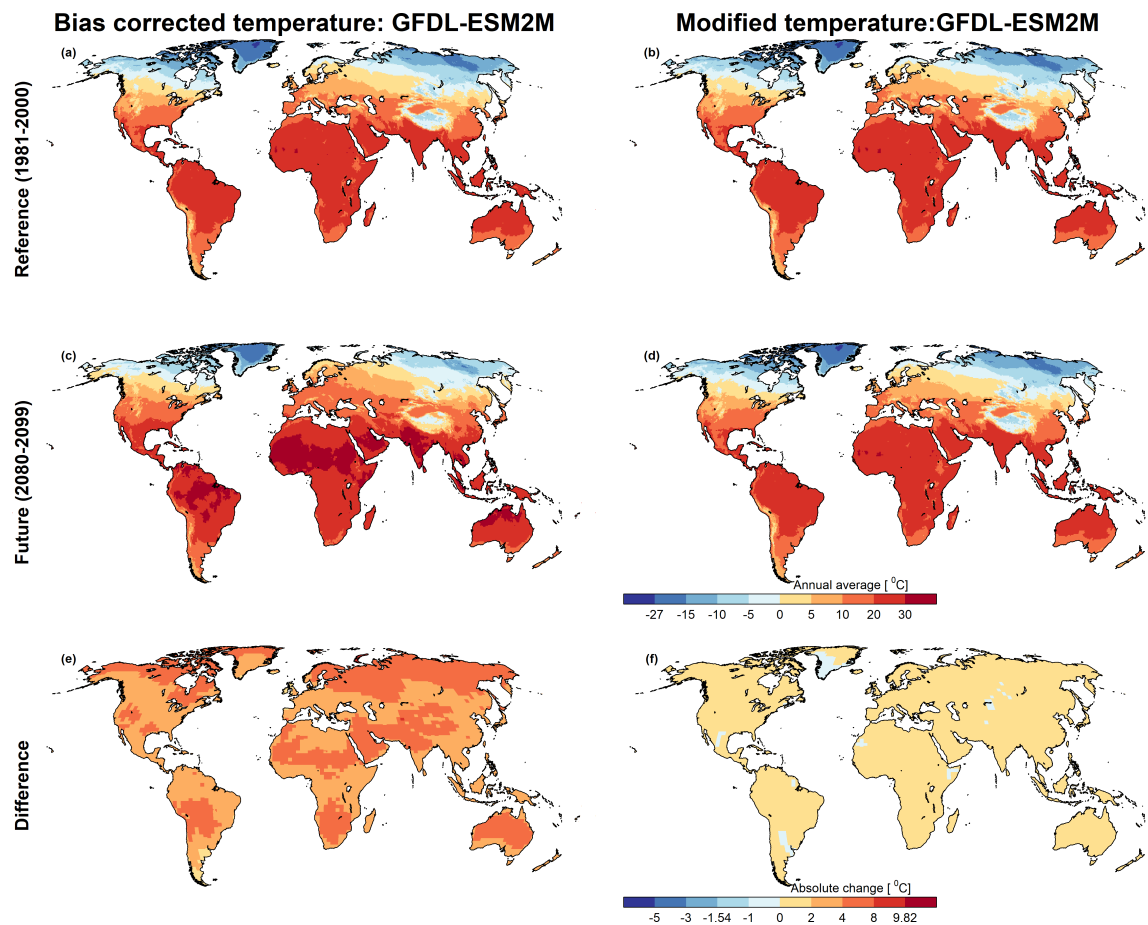
# **Supplement of: Improving the quantification of climate change hazards by hydrological models: A simple approach for mimicking the impact of active vegetation on potential evapotranspiration**

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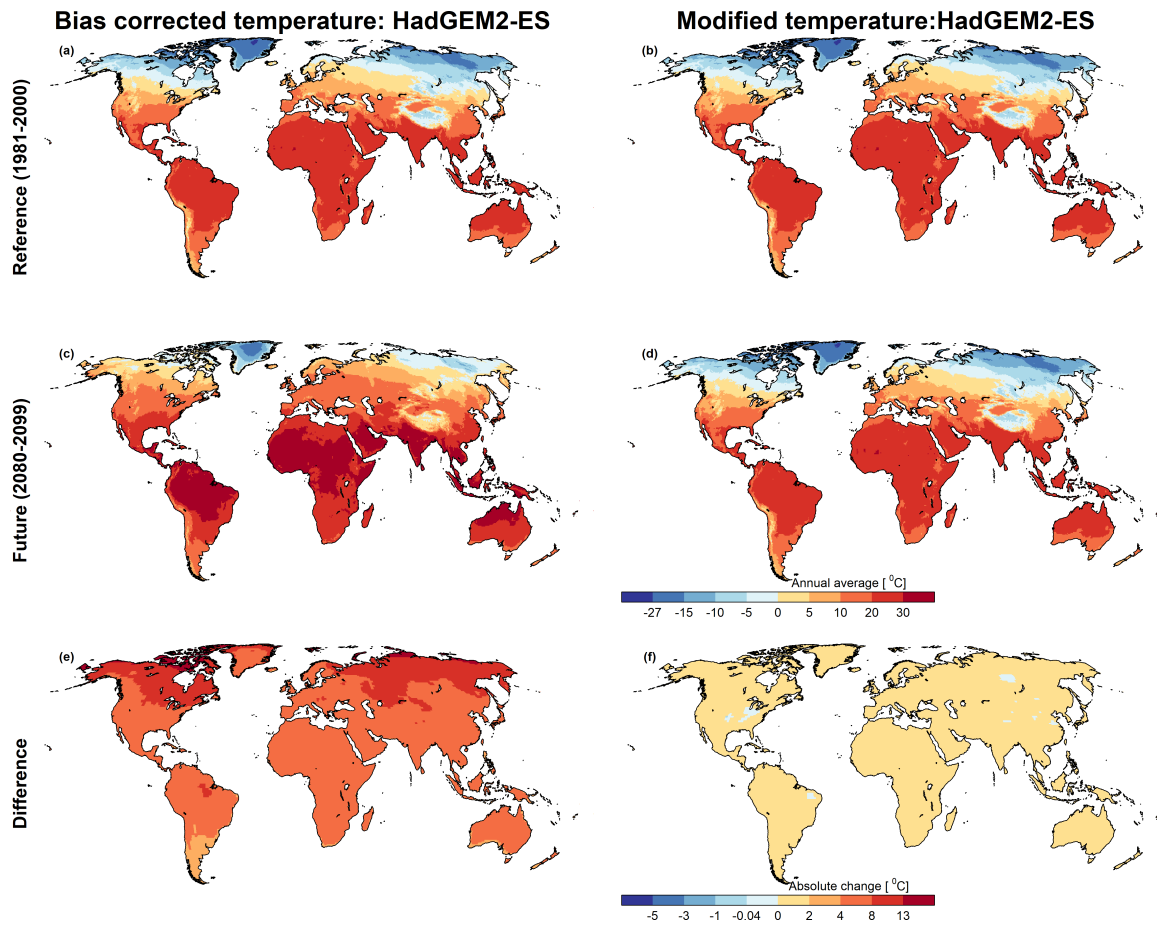
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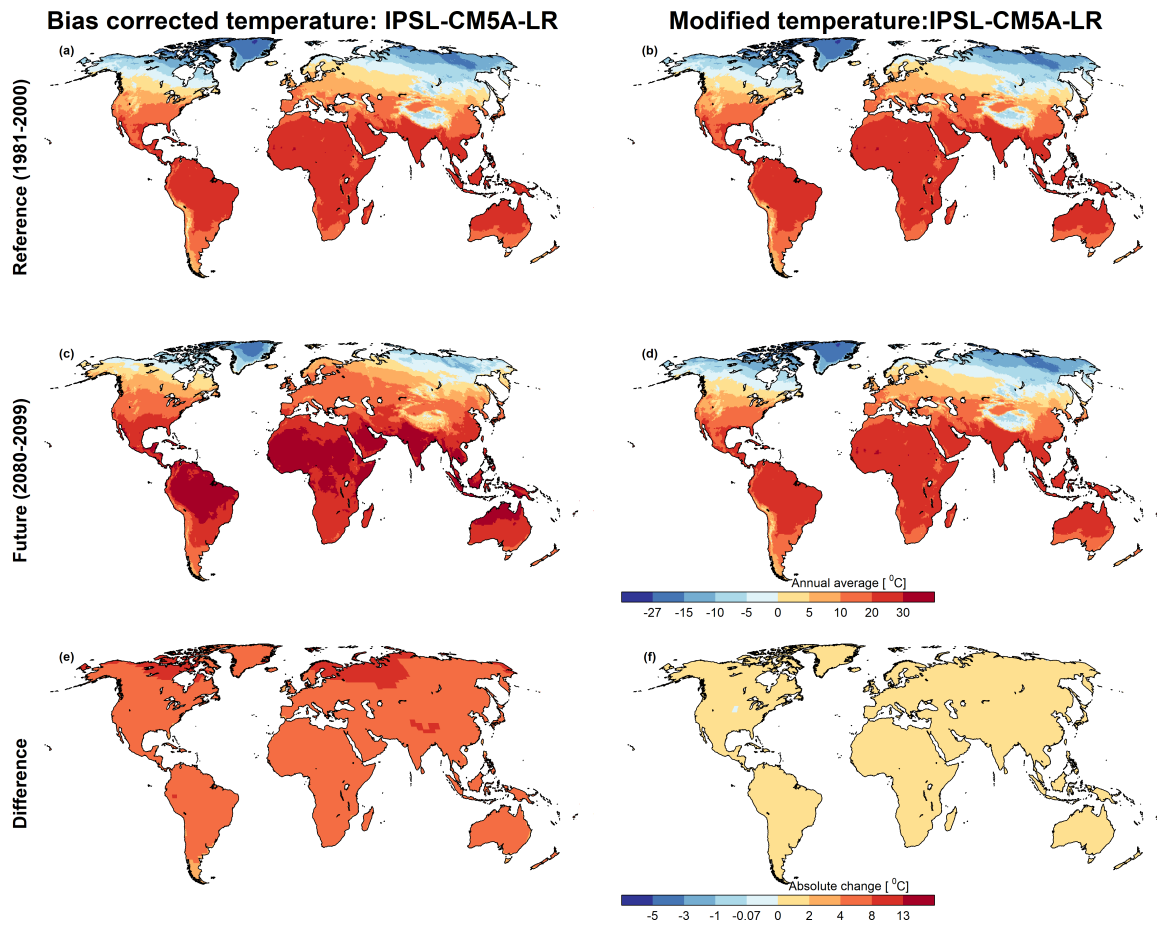
## 1 Temperature data



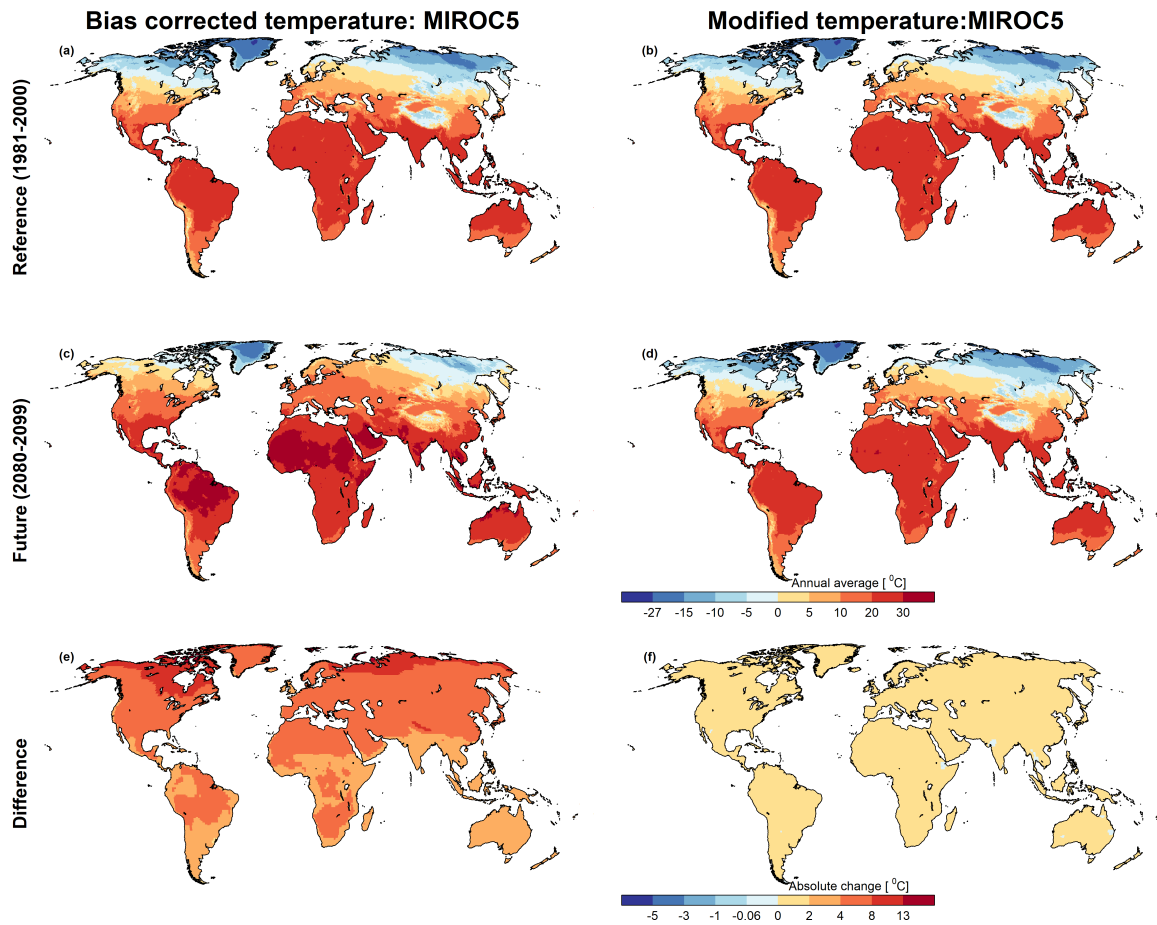
**Figure S1.** Bias corrected temperature and modified bias corrected temperature based on the GFDL-ESM2M climate model under RCP8.5. (a) and (b) annual average temperature in reference period (1981-2000) [ $^{\circ}\text{C}$ ], (c) and (d) annual average temperature in future period (2080-2099) [ $^{\circ}\text{C}$ ], (e) and (f) absolute change of temperature.



**Figure S2.** Bias corrected temperature and modified bias corrected temperature based on the HadGEM2-ES climate model under RCP8.5. (a) and (b) annual average temperature in reference period (1981-2000) [°C], (c) and (d) annual average temperature in future period (2080-2099) [°C], (e) and (f) absolute change of temperature between future and reference periods.

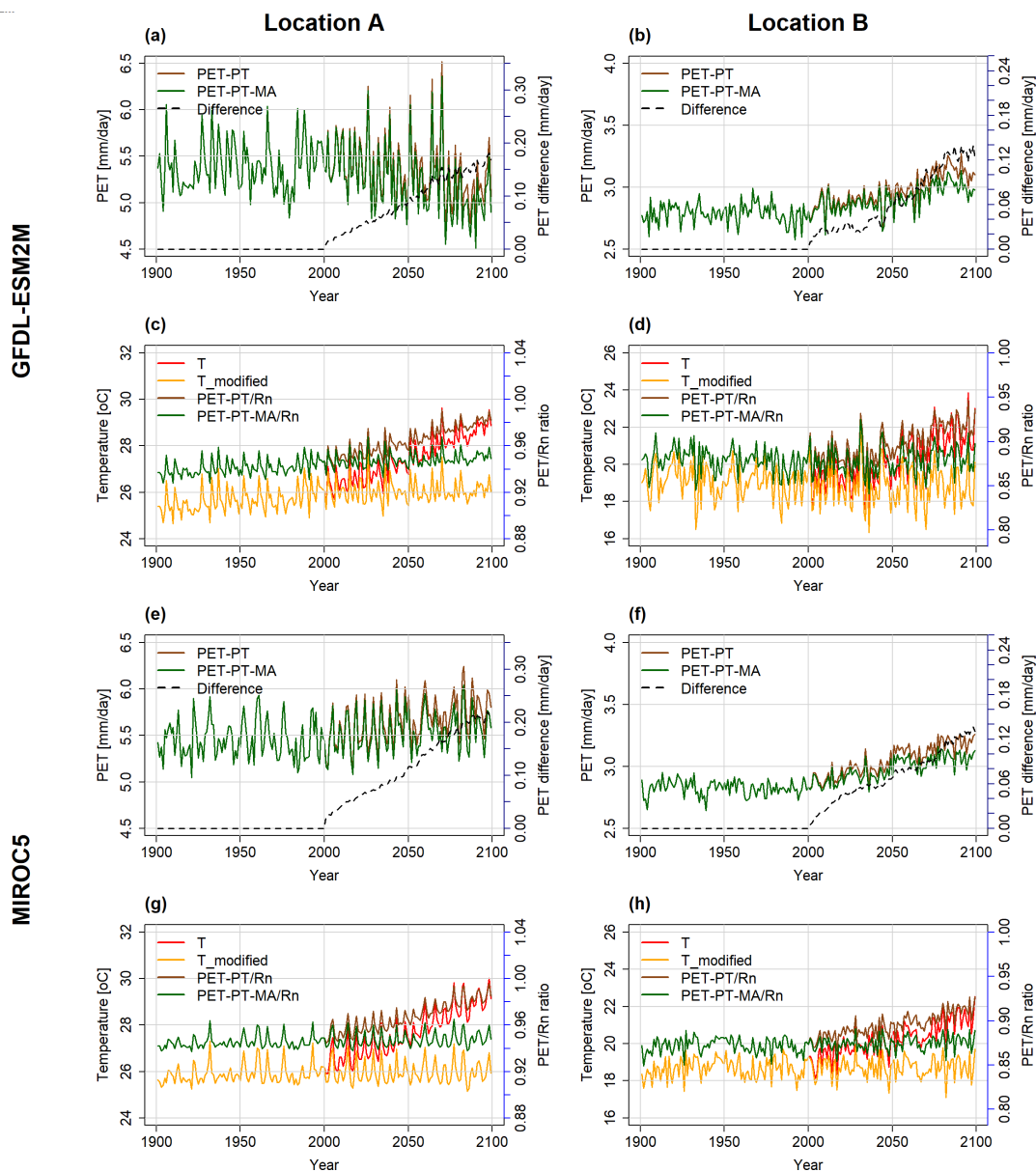


**Figure S3.** Bias corrected temperature and modified bias corrected temperature based on the IPSL-CM5A-LR climate model under RCP8.5. (a) and (b) annual average temperature in reference period (1981-2000) [ $^{\circ}\text{C}$ ], (c) and (d) annual average temperature in future period (2080-2099) [ $^{\circ}\text{C}$ ], (e) and (f) absolute change of temperature.

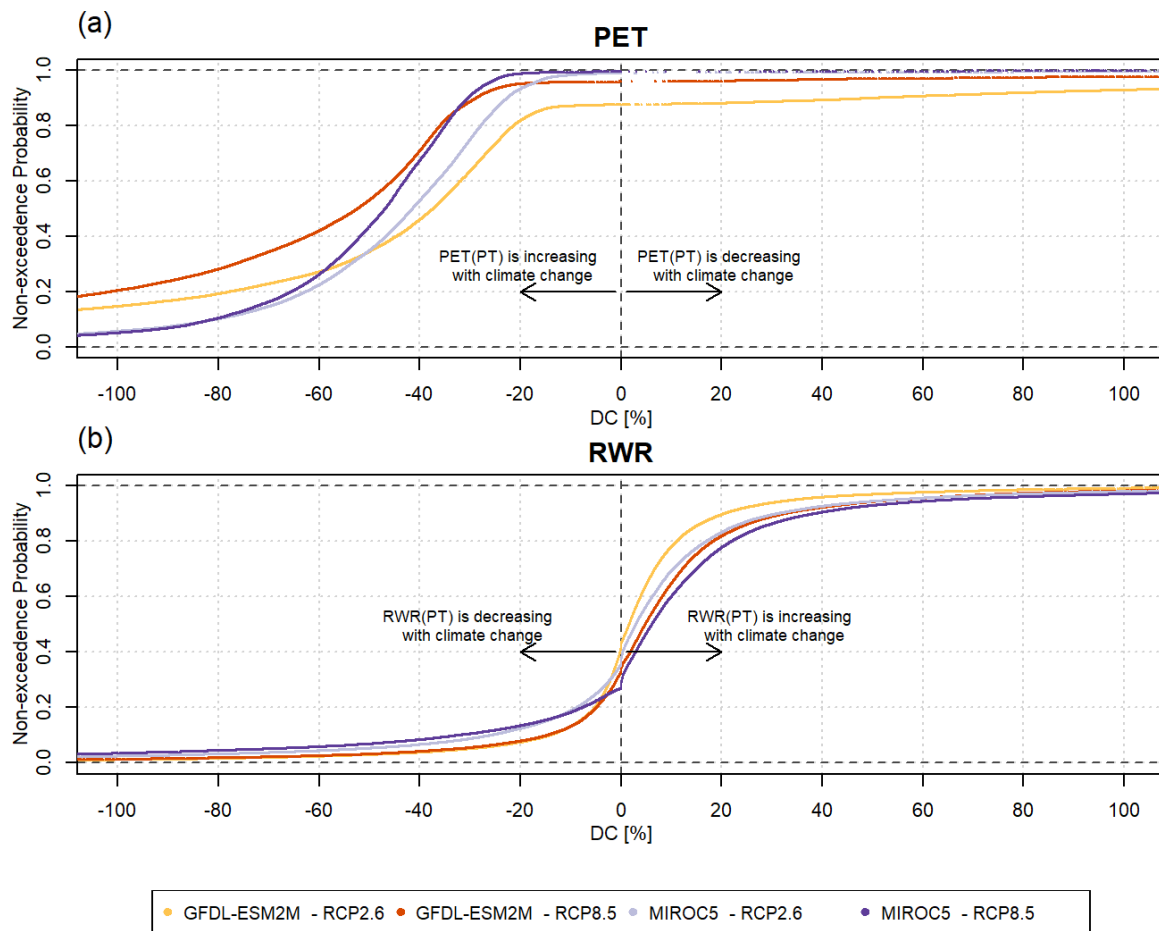


**Figure S4.** Bias corrected temperature and modified bias corrected temperature based on the MIROC5 climate model under RCP8.5. (a) and (b) annual average temperature in reference period (1981-2000) [ $^{\circ}\text{C}$ ], (c) and (d) annual average temperature in future period (2080-2099) [ $^{\circ}\text{C}$ ], (e) and (f) absolute change of temperature.

## 2 Additional results



**Figure S5.** Temporal development of the PET and temperature variables at location A (left) and location B (right), as computed by the WGHM forced by GFDL-ESM2M (first two rows) and MIROC5 (last two rows) under RCP8.5 scenario. In (a), (b), (e), and (f), PET with PT (brown) and PET with PT-MA (green) are on the primary y-axis, the difference between the two methods (black dashed line) is on the secondary y-axis. In (c), (d), (g), and (h), PET to Rn ratio with PT method (brown) and PT-MA (green) method are on the secondary y-axis, bias-corrected input temperature (red) and modified temperature (yellow) is on the primary y-axis.



**Figure S6.** The cumulative probability distribution of the DC matrix computed (impact of the PT-MA approach with respect to the standard PT method) for (a) PET and (b) RWR variables with WGHM output forced with GFDL.ESM2M and MIROC5 climate models under RCP8.5 and RCP2.6. The lighter colors correspond to the RCP2.6, and darker colors correspond to RCP8.5.