

Electronic Supplementary Material to: Differential Vegetation Feedback on the Global Land Monsoon System during the Mid-Holocene and Last Interglacial*

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Table S1. Summary of CMIP6–PMIP4 models in this intercomparison.

Model	Institution	Horizontal Resolution	Citation
ACCESS-ESM1-5	Australian Community Climate and Earth System Simulator	145 × 192	Ziehn et al. (2020)
AWI-ESM-1-1-LR	Alfred Wegener Institute	96 × 192	Sidorenko et al. (2015)
CESM2	National Center for Atmospheric Research	192 × 288	Otto-Bliesner et al. (2020)
EC-Earth3-LR	Stockholm University	160 × 320	Zhang et al. (2021)
FGOALS-f3-L	Chinese Academy of Sciences	180 × 288	Zheng et al. (2020)
FGOALS-g3	Chinese Academy of Sciences	80 × 180	Zheng et al. (2020)
GISS-E2-1-G	NASA's Goddard Institute for Space Studies	90 × 144	Kelley et al. (2020)
HadGEM3-GC31-LL	Hadley Centre	144 × 192	Williams et al. (2020)
INM-CM4-8	Institute of Numerical Mathematics of the Russian Academy of Sciences	120 × 180	Volodin et al. (2018)
IPSL-CM6A-LR	Institution Pierre-Simon Laplace	143 × 144	Boucher et al. (2020)
NESM3	Nanjing University of Information Science and Technology	96 × 192	Cao et al. (2021)
NorESM1-F	Bjerknes Centre for Climate Research	96 × 144	Guo et al. (2019)
NorESM2-LM	Bjerknes Centre for Climate Research	96 × 144	Seland et al. (2020)

*The online version of the original article can be found at <https://doi.org/10.1007/s00376-024-4284-6>.

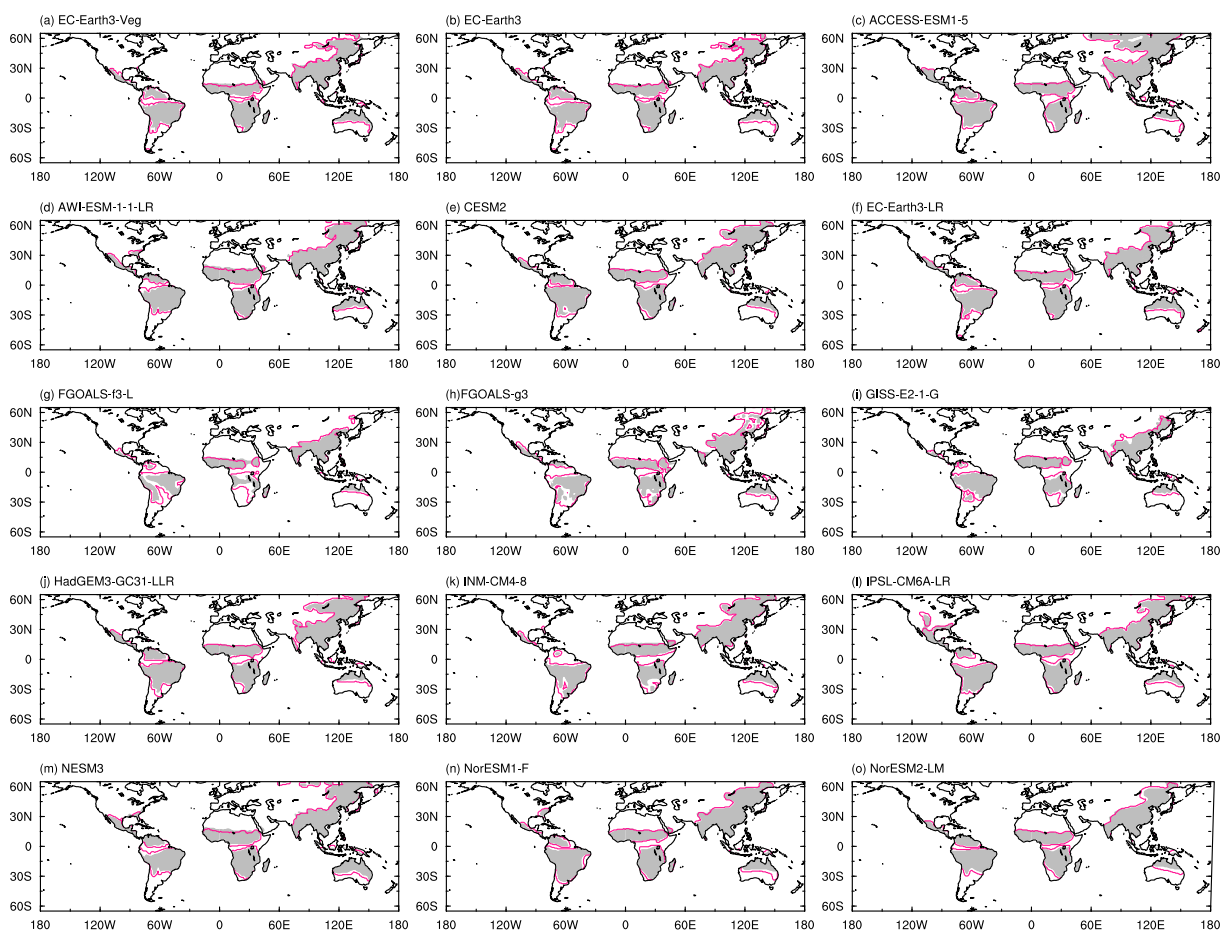


Fig. S1. Distribution of global land monsoon regions during the Pre-Industrial (PI, pink lines) and Mid-Holocene (MH, shading) in various (a–o) PMIP4-CMIP6 models.

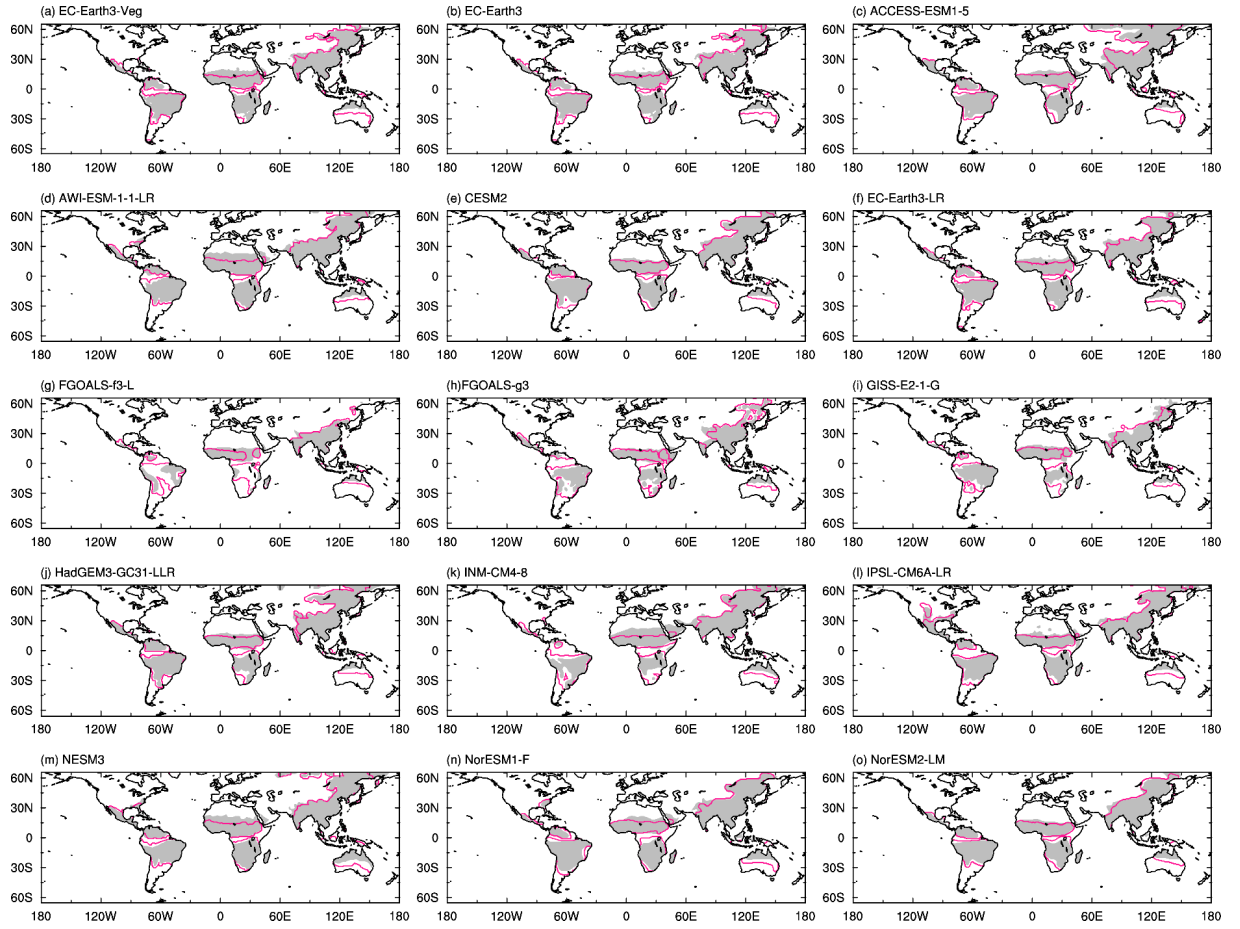


Fig. S2. Distribution of global land monsoon regions during the Pre-Industrial (PI, pink lines) and Last Interglacial (LIG, shading) in various (a–o) PMIP4-CMIP6 models.

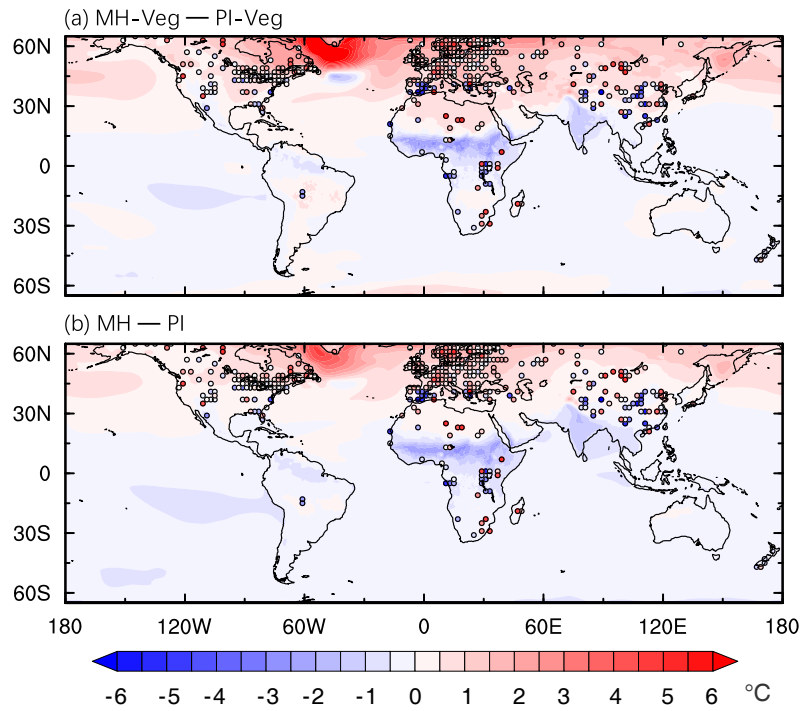


Fig. S3. Mean annual surface temperature (°C) anomalies from simulated model data versus proxy data. The shadings are simulated anomalies (MH-Veg – PI-Veg and MH – PI) from (a) EC-Earth-Veg and (b) EC-Earth overlaid by the proxy data anomalies from [Bartlein et al. \(2011\)](#).

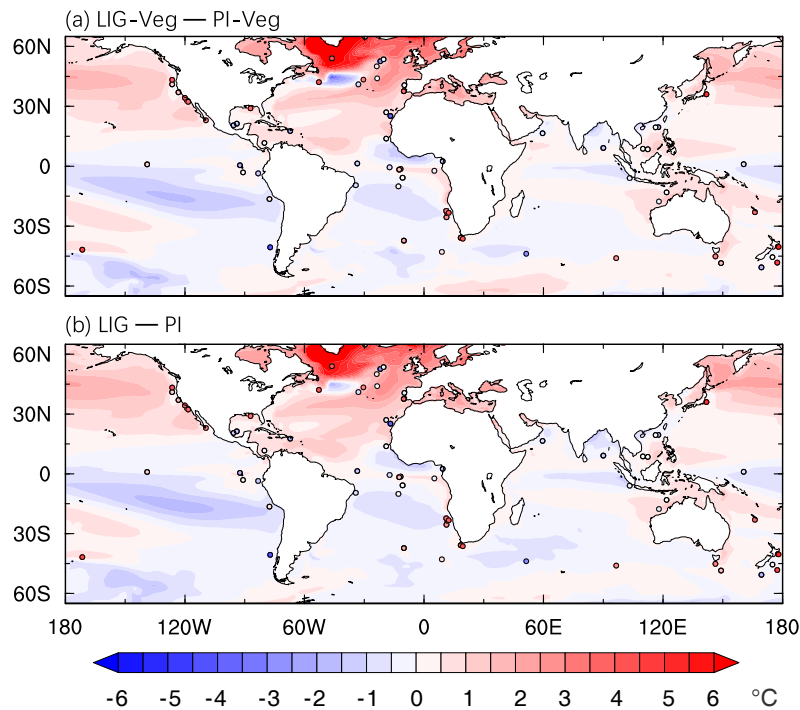


Fig. S4. Mean annual sea surface temperature (°C) anomalies from simulated model data versus proxy data. The shadings are simulated anomalies (LIG127k-Veg – PI-Veg and LIG127k – PI) from (a) EC-Earth-Veg and (b) EC-Earth overlaid by the proxy data anomalies from [Hoffman et al. \(2017\)](#).

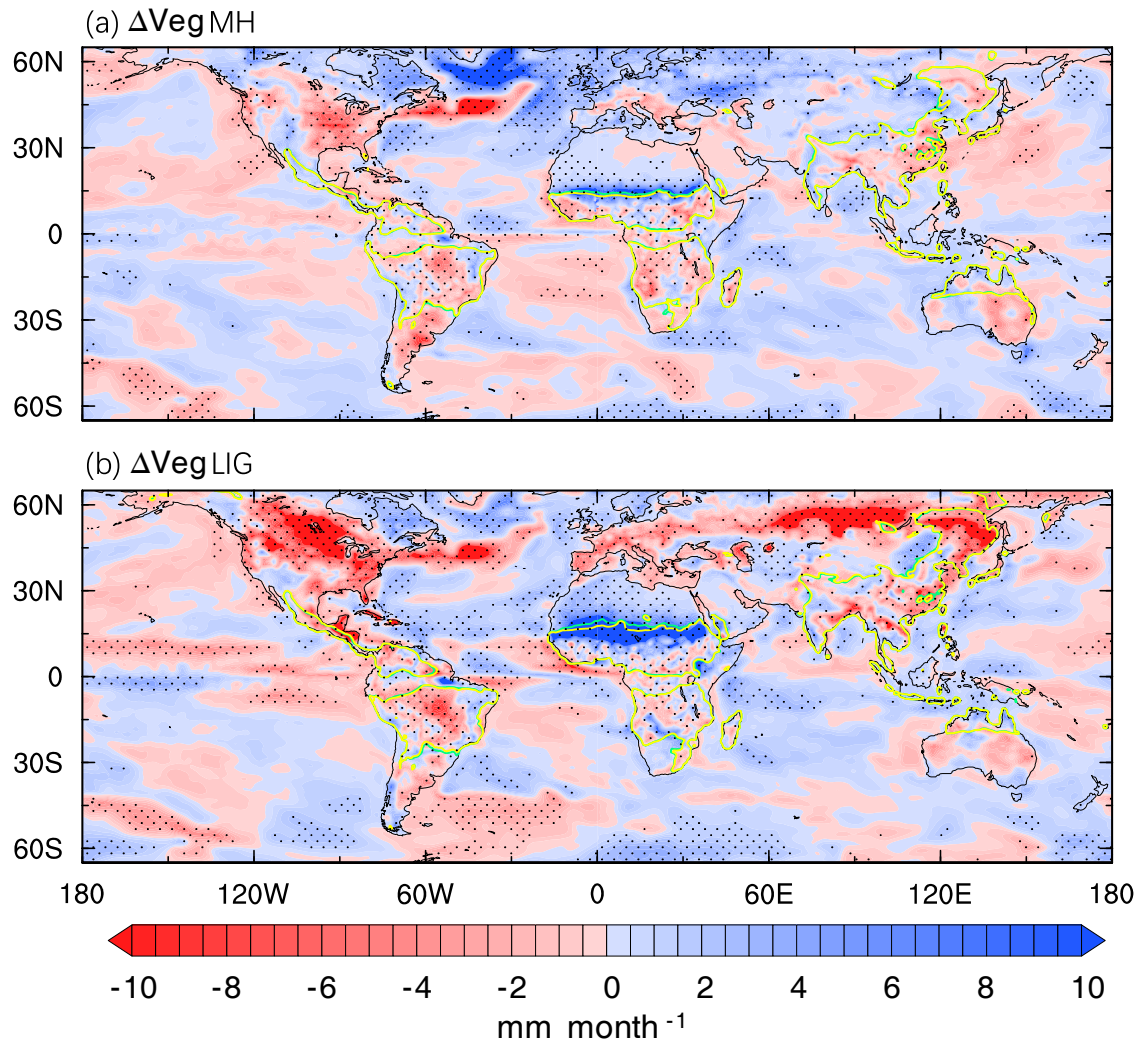


Fig. S5. ET changes in summer due to vegetation-climate feedback (ΔVeg) during the (a) MH and (b) LIG. The green line and the yellow line represent the global land monsoon boundaries of (a) MH-Veg, (b) LIG127k-Veg and (a) MH, (b) LIG127k, respectively. The grey dots indicate a 5% of significance level.

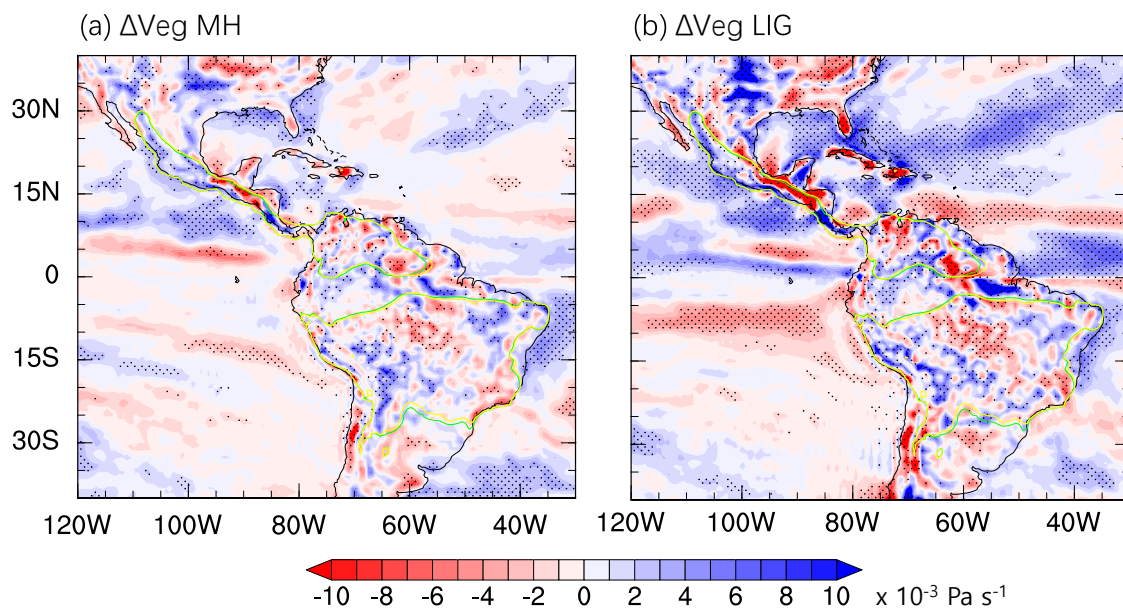


Fig. S6. 850-hPa vertical velocity (unit: $10^{-3} \text{ Pa s}^{-1}$) changes in summer due to vegetation-climate feedback (ΔVeg) during the (a) MH and (b) LIG. The green line and the yellow line represent the global land monsoon boundaries of (a) MH-Veg, (b) LIG127k-Veg and (a) MH, (b) LIG127k, respectively. The grey dots indicate a 5% of significance level.

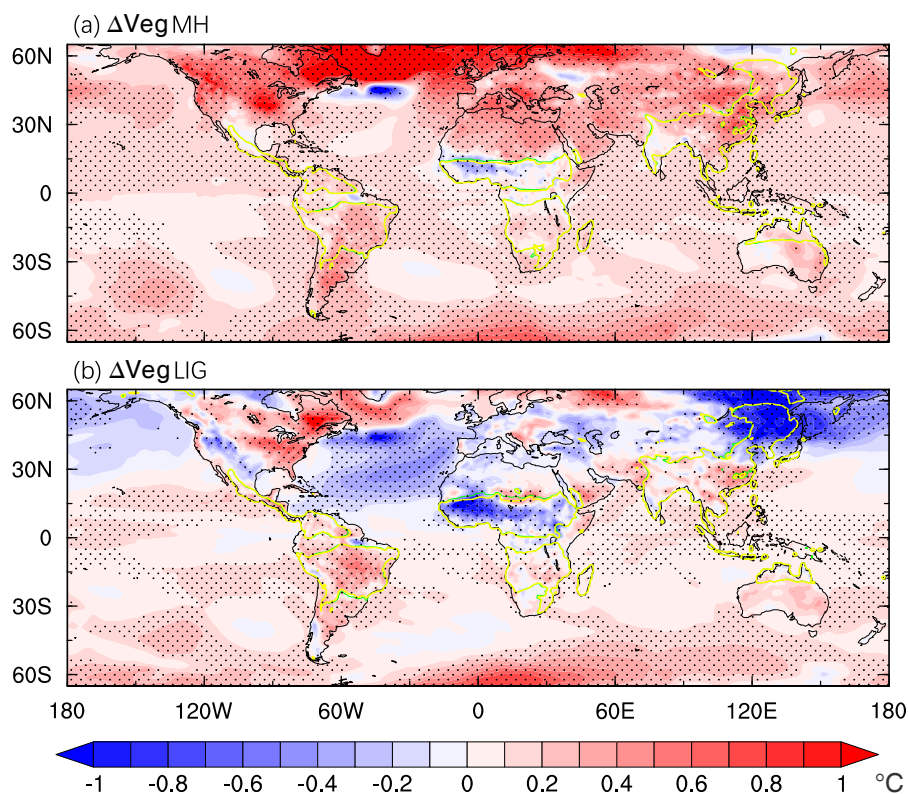


Fig. S7. Surface temperature changes in summer due to vegetation-climate feedback (ΔVeg) during the (a) MH and (b) LIG. The green line and the yellow line represent the global land monsoon boundaries of (a) MH-Veg, (b) LIG127k-Veg and (a) MH, (b) LIG127k, respectively. The grey dots indicate a 5% of significance level.

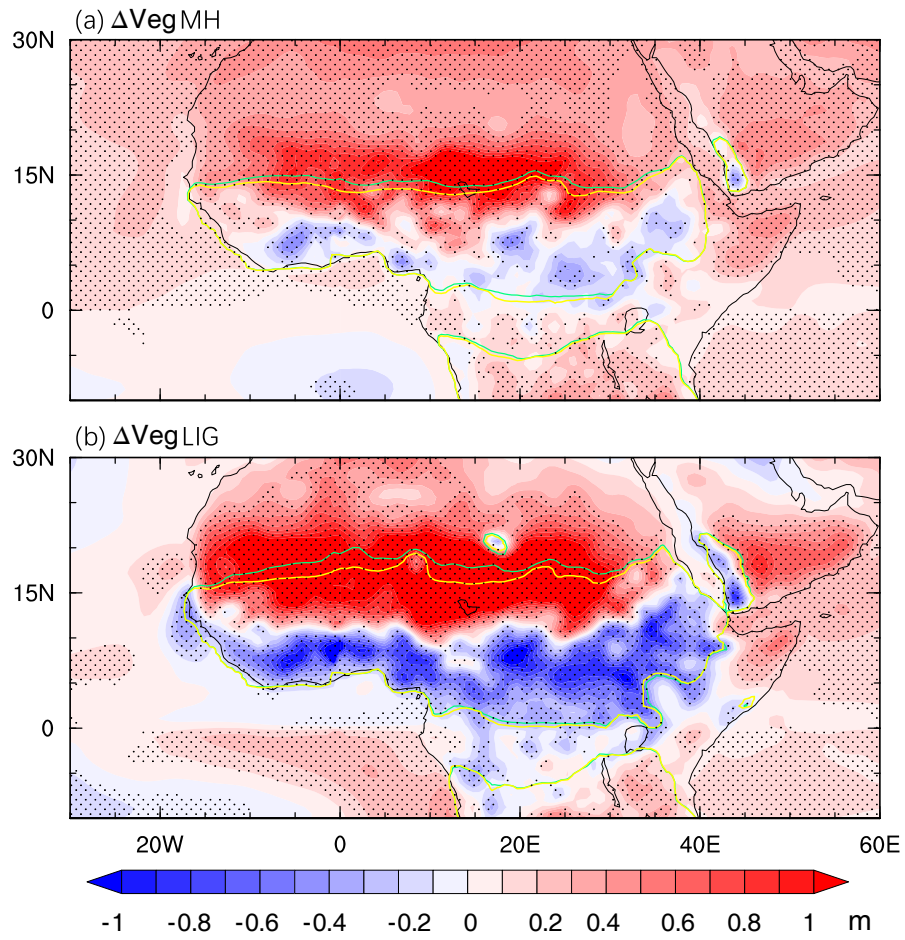


Fig. S8. Surface temperature changes due to vegetation-climate feedback (ΔVeg) during the (a) MH and (b) LIG in the months preceding the monsoon season (March to April). The green line and the yellow line represent the global land monsoon boundaries of (a) MH-Veg, (b) LIG127k-Veg and (a) MH, (b) LIG127k, respectively. The grey dots indicate a 5% of significance level.

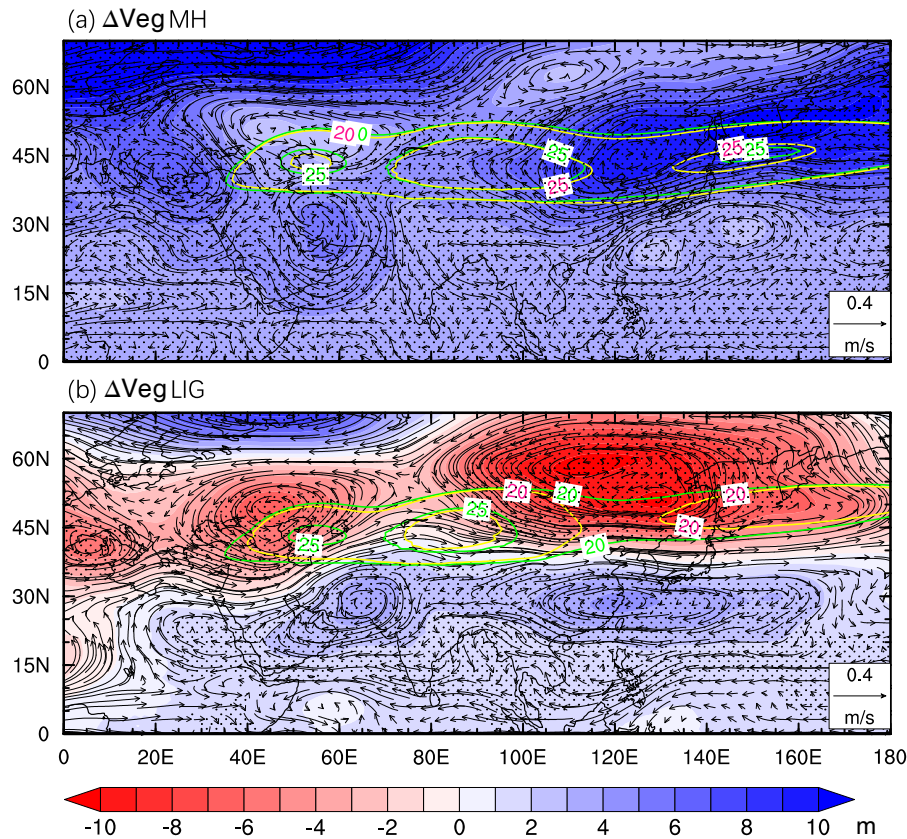


Fig. S9. Changes of 500-hPa geopotential height and wind due to vegetation-climate feedback (ΔVeg) during the (a) MH and (b) LIG in summer. The green line and the yellow line represent the westerly jet of (a) MH-Veg, (b) LIG127k-Veg and (a) MH, (b) LIG127k, respectively. The grey dots indicate a 5% of significance level.

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