Partitioning climatic controls on global land carbon sink variability: temperature vs. moisture constraints across biomes

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Supplementary figures

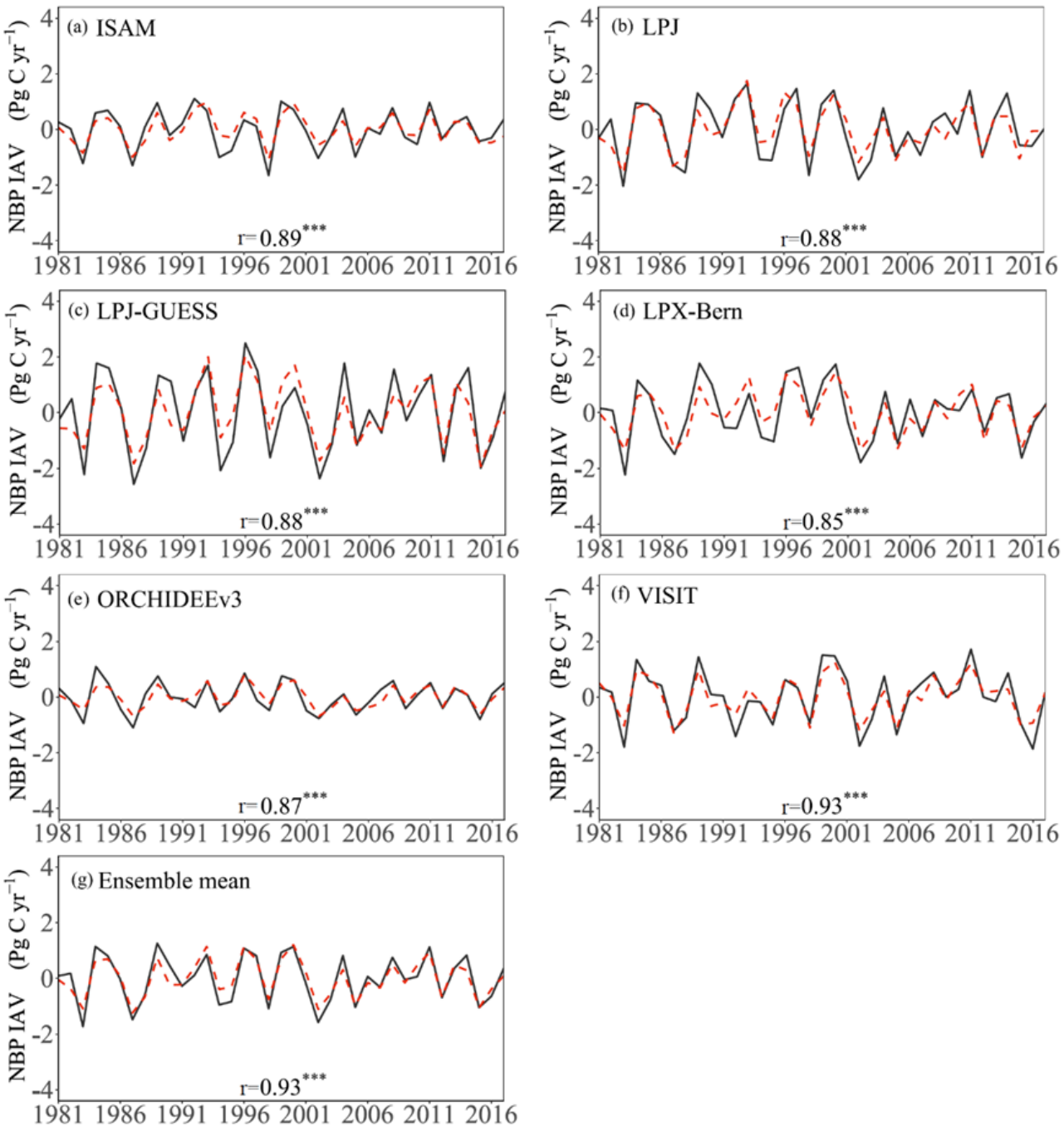


Figure S1. Correlation coefficients between reconstructed NBP anomaly (NBP anomaly with the sum of RZSM, TEMP and VPD components) and original detrended anomaly. (a. ISAM； b. LPJ； c. LPJ-GUESS； d. LPX-Bern； e. ORCHIDEEv3； f. VISIT； g. TRENDY Ensemble mean). *** indicates statistically significant coefficients at $p < 0.001$.

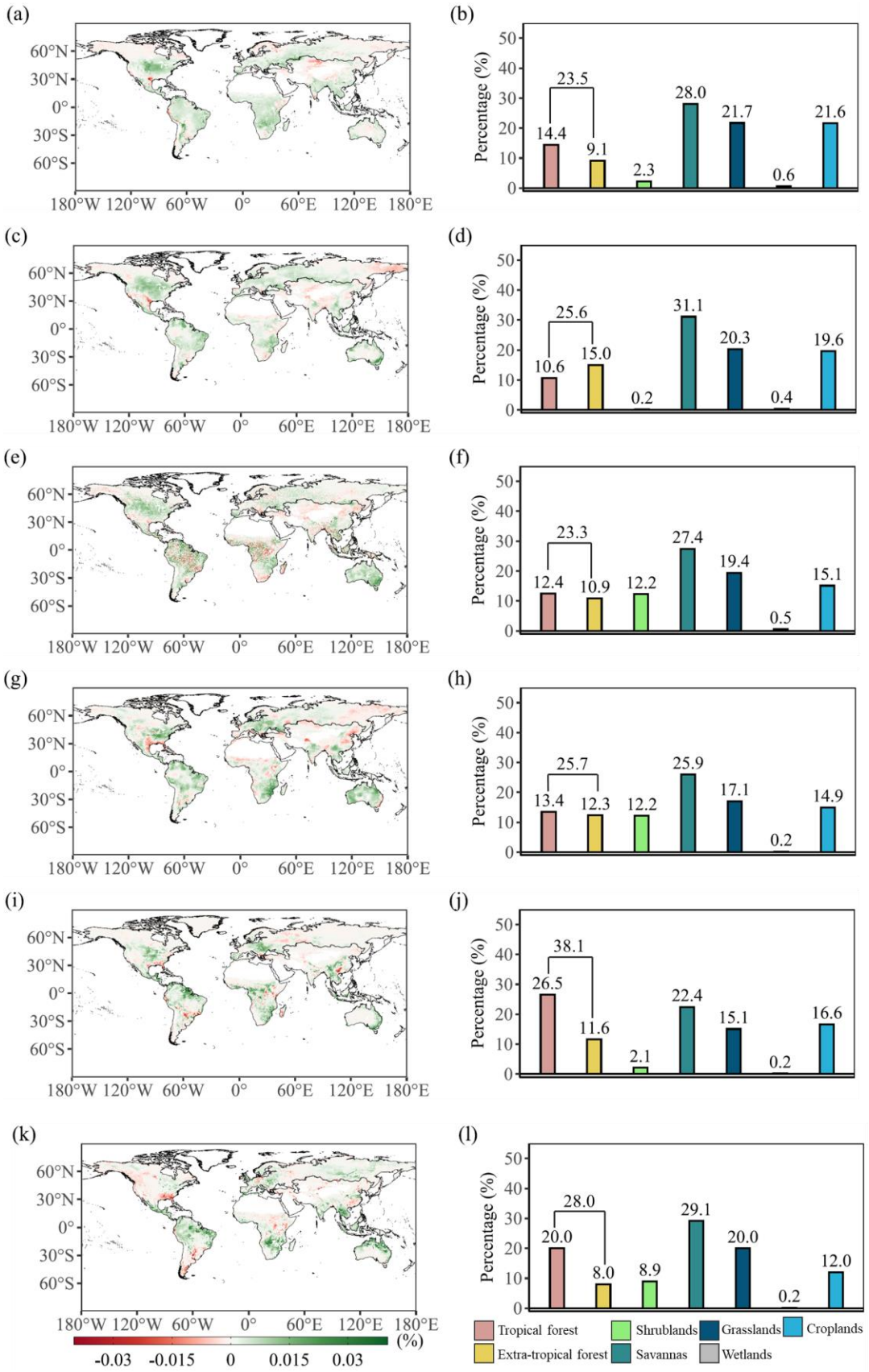


Figure S2. Relative contributions of local and different ecosystems to the global NBP IAV for (a, b) ISAM, (c, d) LPJ, (e, f) LPJ-GUESS, (g, h) LPX-Bern, (i, j) ORCHIDEEv3 and (k, l) VISIT, respectively.

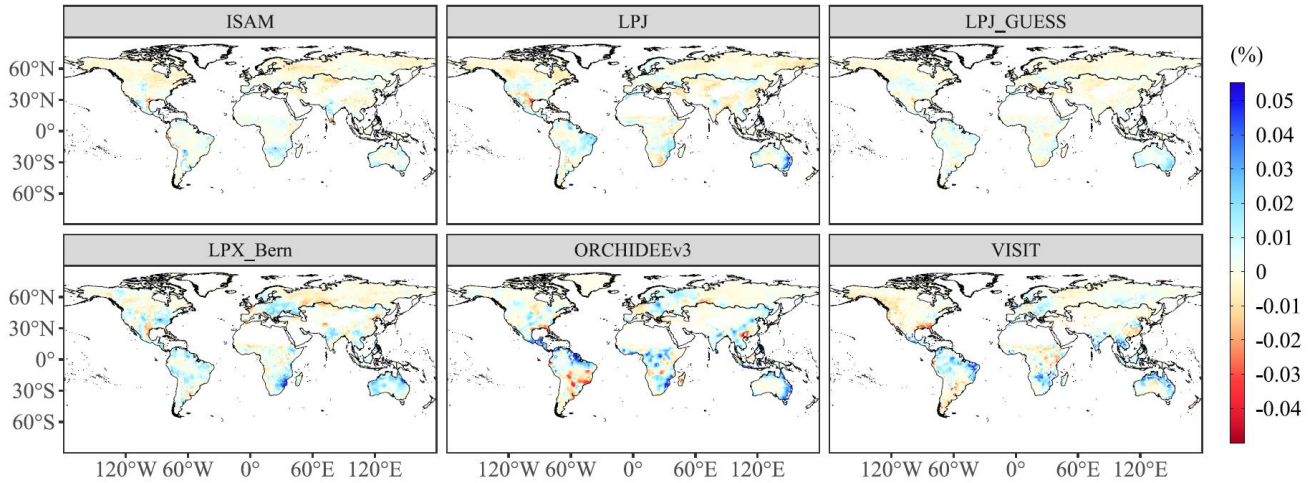


Figure S3. Relative contributions of anomalies in GPP to the global NBP IAV for ISAM, LPJ, LPJ-GUESS, LPX-Bern, ORCHIDEEv3 and VISIT, respectively.

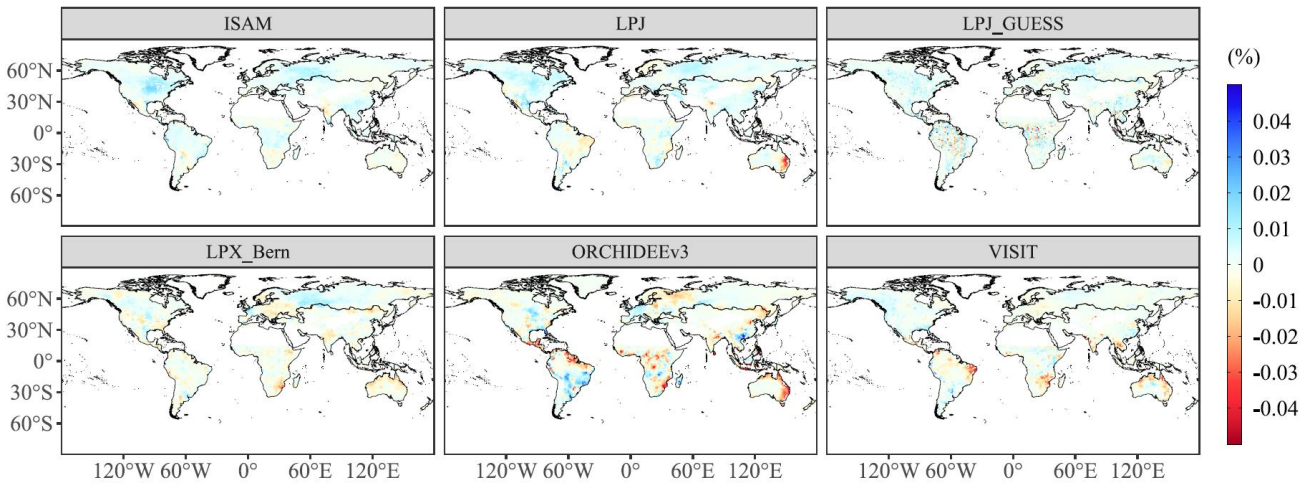


Figure S4. Relative contributions of anomalies in TER (TER=GPP-NBP) to the global NBP IAV for ISAM, LPJ, LPJ-GUESS, LPX-Bern, ORCHIDEEv3 and VISIT, respectively.

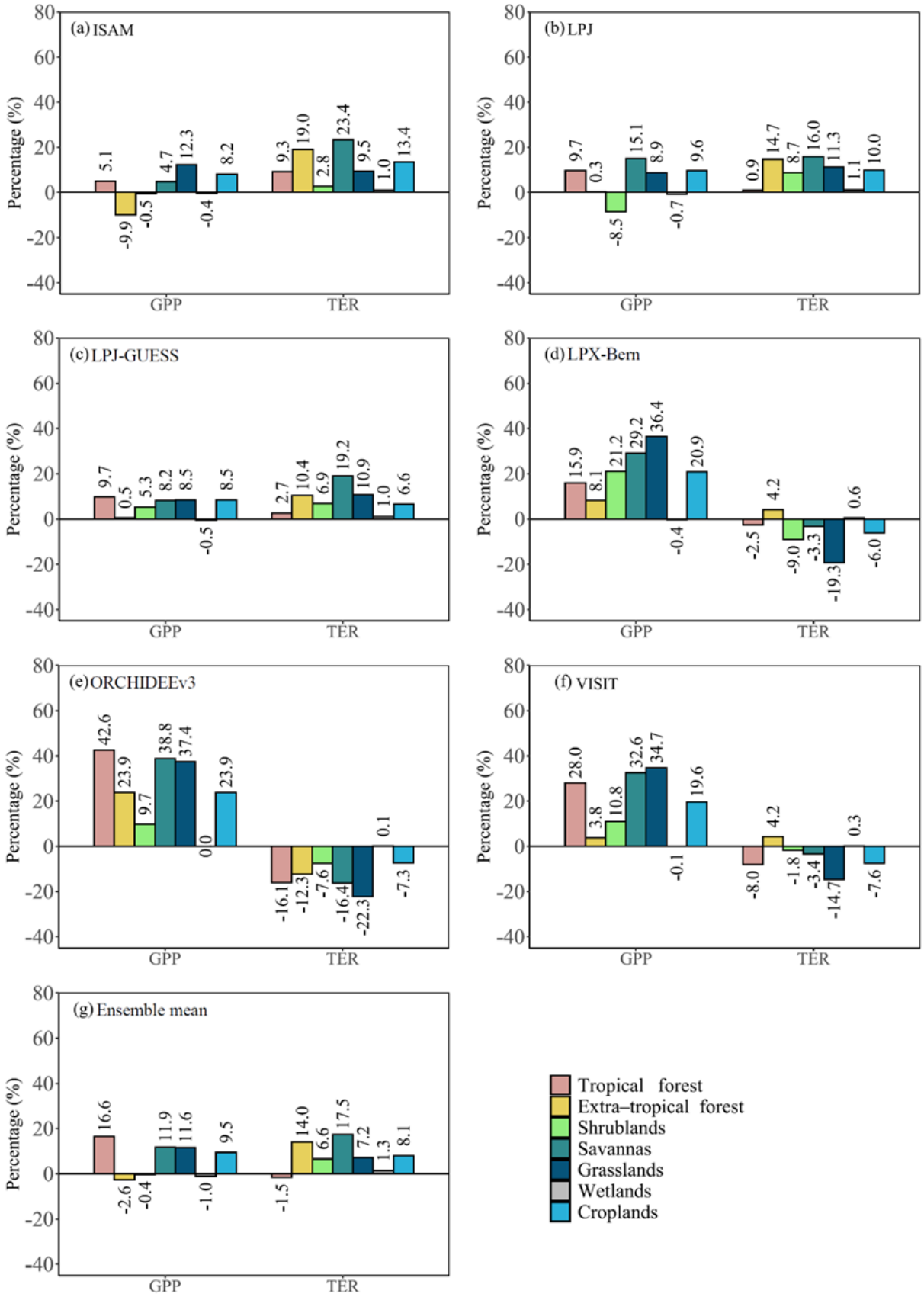


Figure S5. Relative contributions of different carbon flux components (e.g., GPP and TER) in different ecosystems to the global NBP IAV for (a) ISAM, (b) LPJ, (c) LPJ-GUESS, (d) LPX-Bern, (e) ORCHIDEEv3, (f) VISIT and (g) TRENDY multiple-models ensemble mean, respectively.

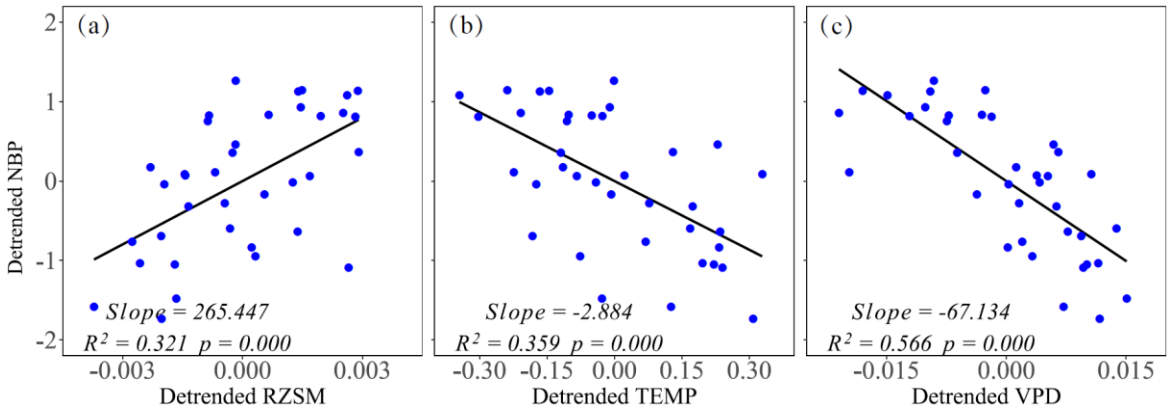


Figure S6. Relationships between detrended NBP and (a) detrended RZSM, (b) detrended TEMP and (c) detrended VPD at the global scale, respectively.

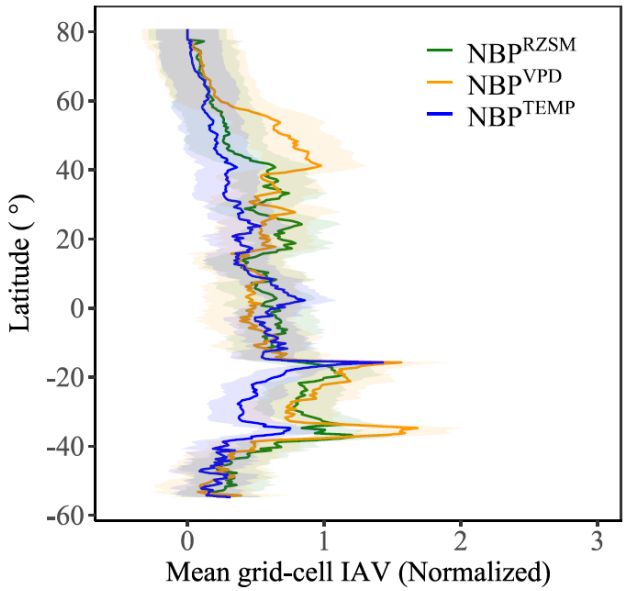


Figure S7. Latitude patterns of NBP IAV driven by climates from TRENDY ensemble mean. Mean grid-cell IAV magnitude calculated as (Jung et al., 2017). In linear decomposition progress, RZSM, VPD and temperature were involved.

References

Ahlstrom A., Raupach M.R., Schurgers G., Smith B., Arneth A., Jung M., Reichstein M., Canadell J.G., Friedlingstein P., Jain A.K., et al., 2015. The dominant role of semi-arid ecosystems in the trend and variability of the land CO(2) sink. Science. 348 (6237), 895-9. 10.1126/science.aaa1668.

Jung M., Reichstein M., Schwalm C.R., Huntingford C., Sitch S., Ahlstrom A., Arneth A., Camps-Valls G., Ciais P., Friedlingstein P., et al., 2017. Compensatory water effects link yearly global land CO2 sink changes to temperature. Nature. 541 (7638), 516-520. 10.1038/nature20780.