



Deposited via The University of Leeds.

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/id/eprint/244233/>

Version: Supplemental Material

Article:

Cook, P.A., Betts, R.A., Burke, E.J. et al. (Accepted: 2026) Improving the representation of tropical peatland processes in the JULES land surface model using data from the Central Congo Basin. *Philosophical Transactions of the Royal Society B: Biological Sciences*.
ISSN: 0962-8436 (In Press)

This is an author produced version of an article accepted for publication in *Philosophical Transactions of the Royal Society B: Biological Sciences*, made available via the University of Leeds Research Outputs Policy under the terms of the Creative Commons Attribution License (CC-BY), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

Representation of tropical peatland processes for the JULES land surface model Using data from the Central Congo Basin: Supplementary Information

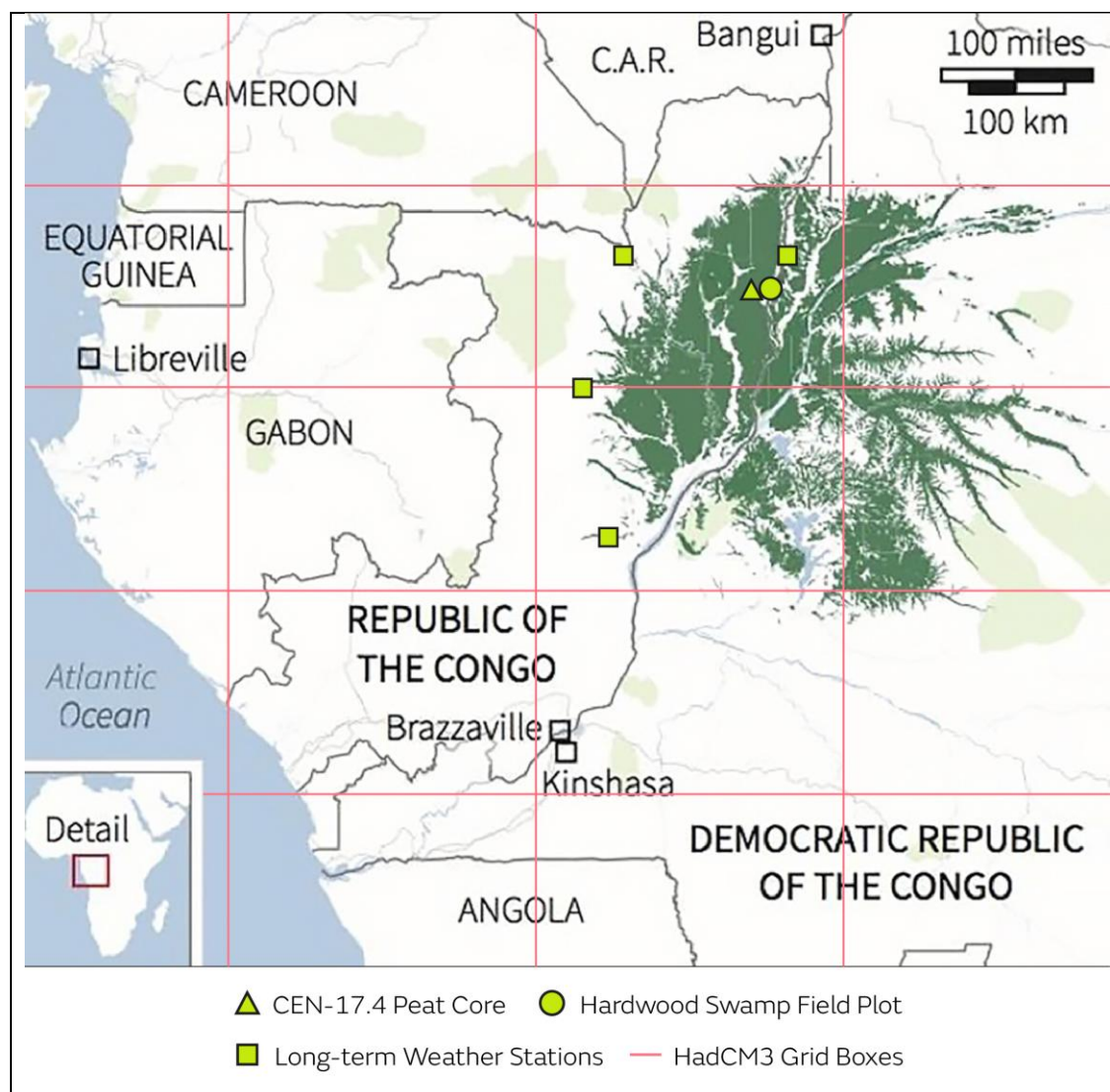


Figure S1: The Cuvette Centrale swamp forest in the Central Congo Basin (CBB), the light green areas are those presently protected (left). With a simple map showing the locations of the CEN-17.4 peat core, the hardwood swamp field plot and the four long-term weather stations in relation to the swamp forest with peatlands, plus the grid of the HadCM3 palaeoclimate model (right).

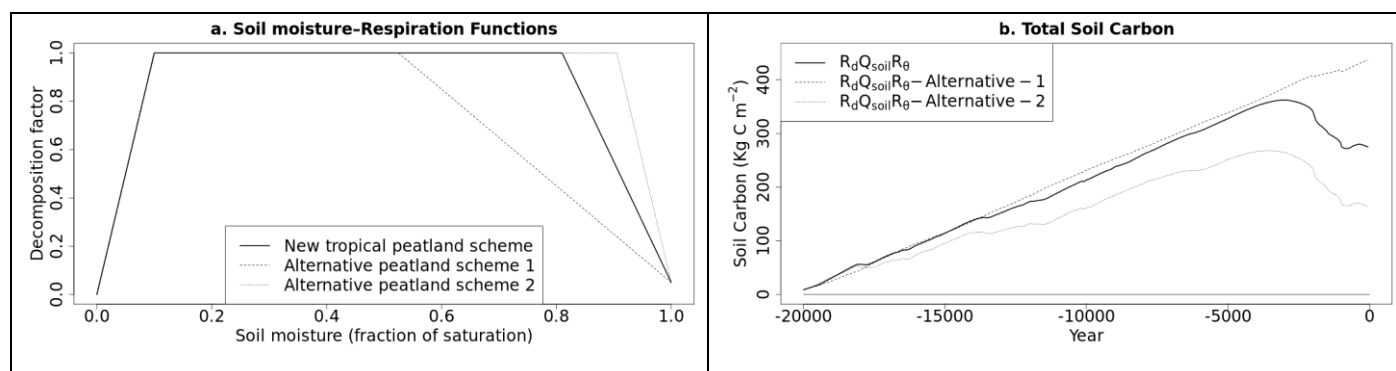


Figure S2: Sensitivity of soil carbon accumulation to alternative decomposition functions. (a) Two alternative relationships between the decomposition factor and soil saturation fraction, compared to the relationship used in this study; (b) the effect of these different relationships on the evolution of total soil carbon.

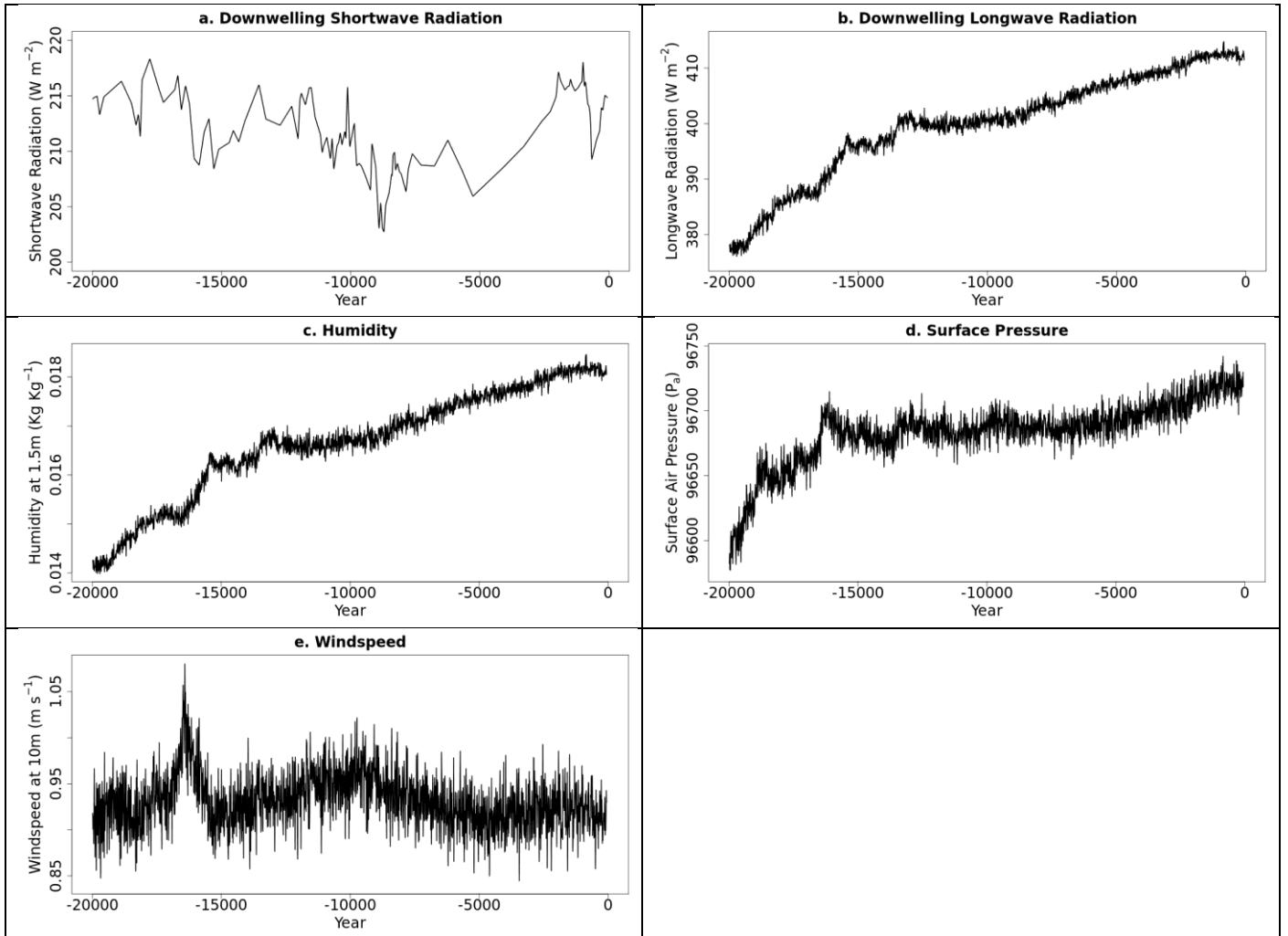


Figure S3: Further palaeoclimatic driving variables used for all simulations: (a) downwelling shortwave radiation, (b) downwelling longwave radiation, (c) air humidity, (d) surface pressure and (e) windspeed at 10 m.

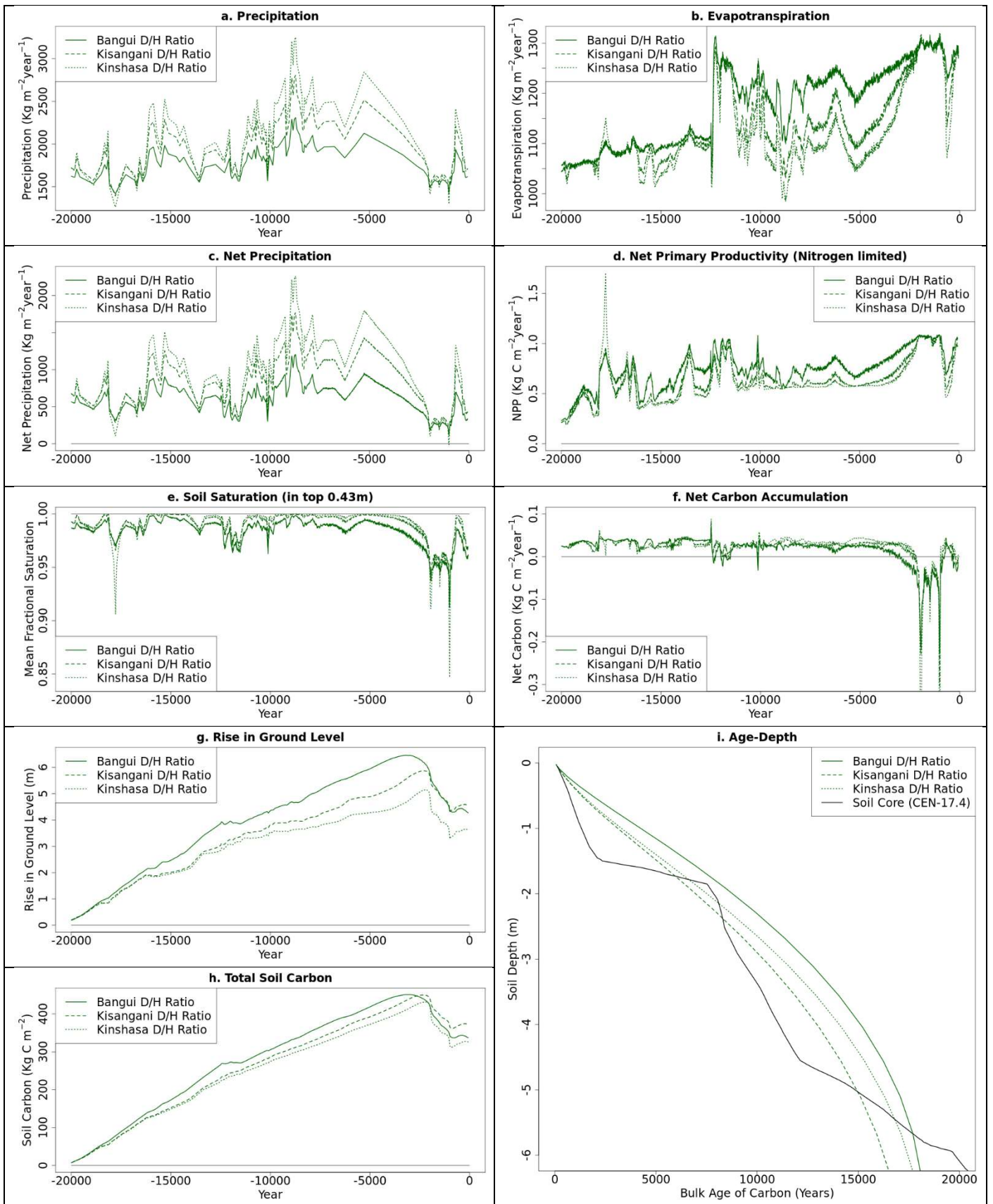


Figure S4: (a) precipitation, (b) evapotranspiration, (c) net precipitation (precipitation minus evapotranspiration), (d) net primary productivity, (e) fractional soil saturation (top 0.43m), (f) net annual increase in soil carbon, (g) rise in the ground level and (h) total carbon in the soil from simulations using three different reconstructions of the paleo annual rainfall based on isotope ratio timeseries from the CEN-17.4 core and modern precipitation isotope values (D/H) from three locations: Bangui, Kisangani and Kinshasa (Garcin et al. (2022)). Other aspects of the model setup were as in simulation $R_dQ_{\text{soil}}R_{\text{e-grass}}$. Also, (i) carbon bulk age profiles at the end of the three simulations, with radiocarbon dates obtained from the CEN-17.4 core.