Supplement to: *Structural uncertainty in the direct human forcing of global burned area*

Contents:

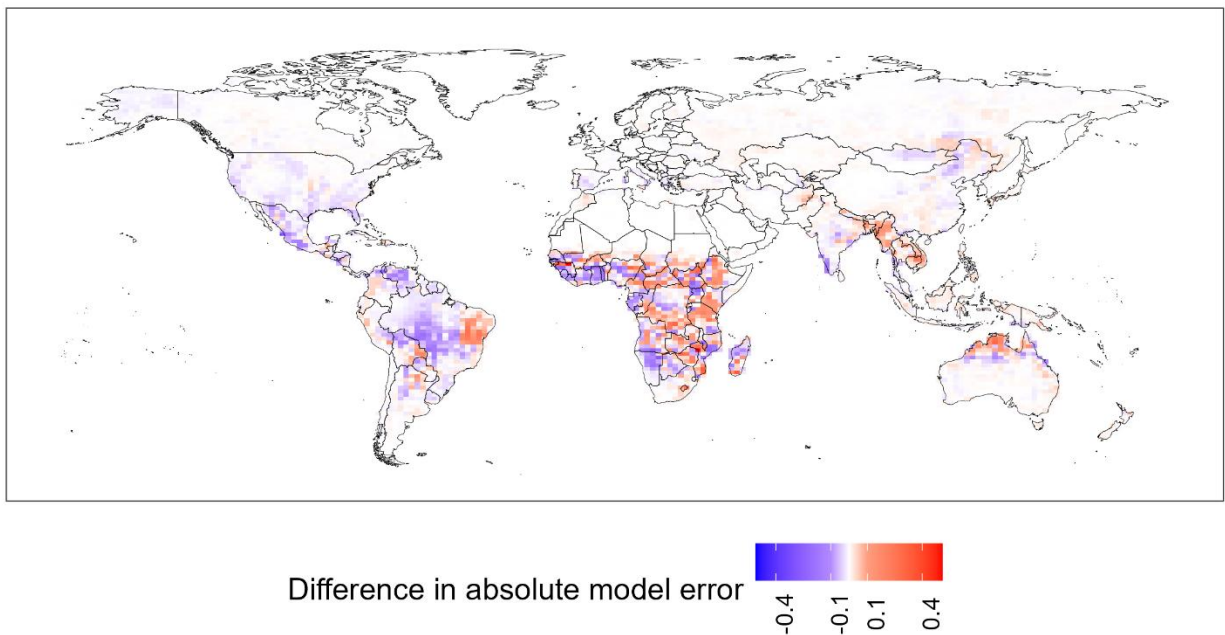Difference in absolute model error

-0.4 -0.1 0.1 0.4

Figure S1: Difference in absolute model error between WHAM-INFERNO and the Haas model. Negative (blue) values indicate lower model error in WHAM-INFERNO and vice versa.
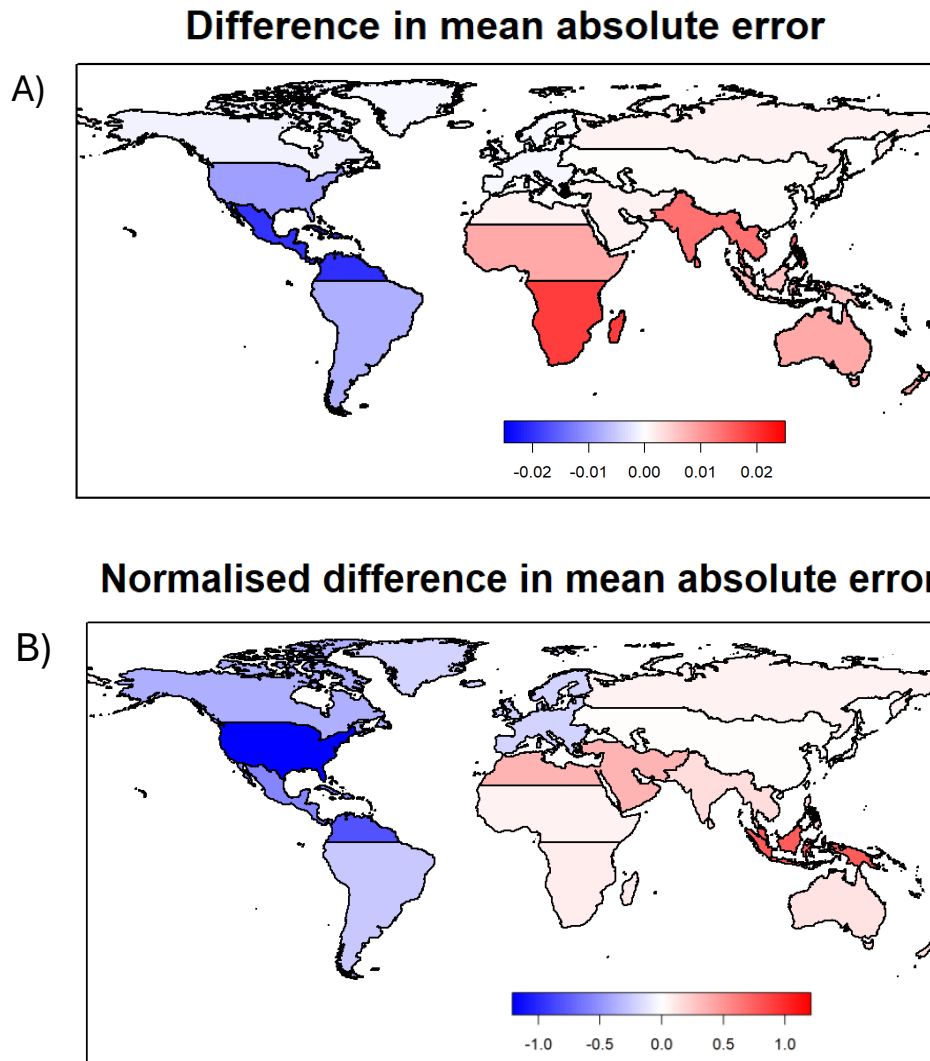
Difference in mean absolute error

A)

Normalised difference in mean absolute error

B)

Figure S2: Difference in absolute error between WHAM-INFERNO and the Haas model. A) Difference in error, B) difference normalized by GFED5 burned area. Negative (blue) values indicate lower model error in WHAM-INFERNO and positive (red) values indicate lower model error in the Haas model.
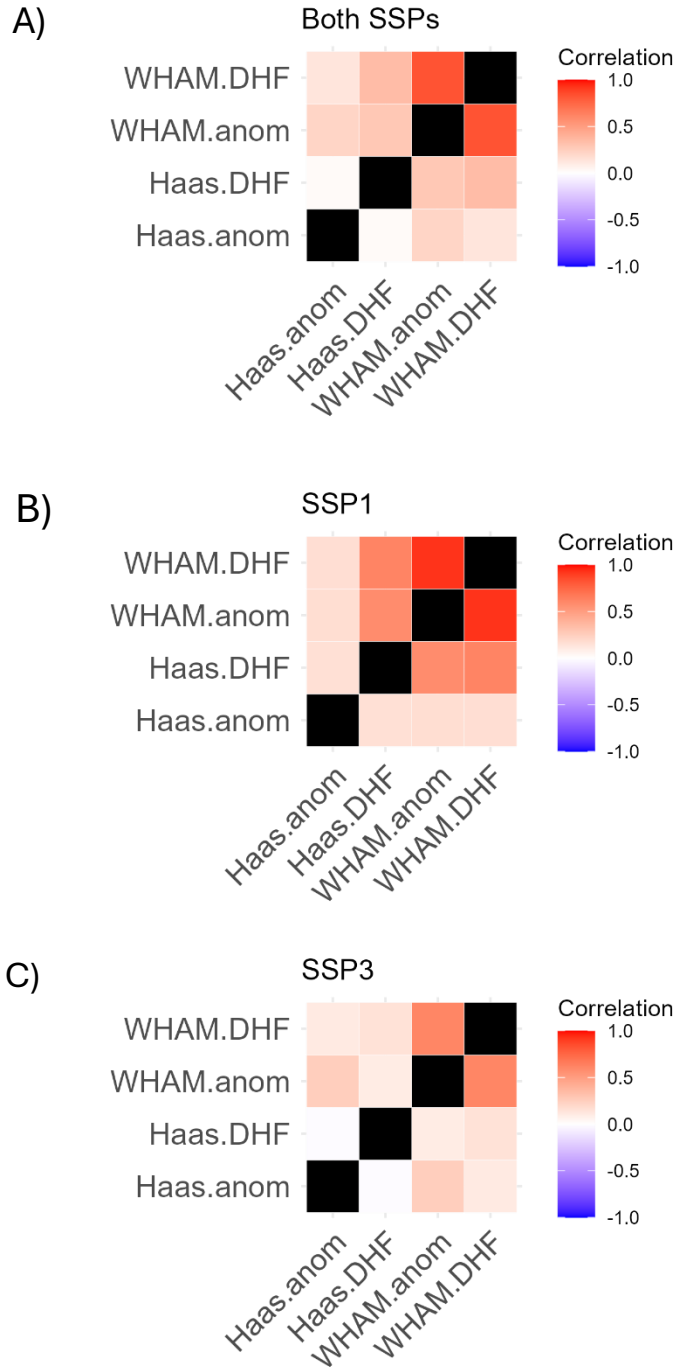
Figure S3: Pearson's correlation coefficient (r) between model change (2020-2100; "anom") and model assessment of the direct human forcing of burned area ("DHF"). DHF was calculated as the difference between model runs where socio-economic inputs were held constant at 2020 levels and baseline scenario runs with all variables updated at each timestep. A) SSP1 & SSP3; B) SSP1; C) SSP3.

Figure S4: Pearson's correlation coefficient (r) between socio-economic input variables, model change (2020-2100; "anom") and model assessment of the direct human forcing of burned area ("DHF"). DHF was calculated as the difference between model runs where socio-economic inputs were held constant at 2020 levels and baseline scenario runs with all variables updated at each timestep. A) SSP1 & SSP3; B) SSP1; C) SSP3.
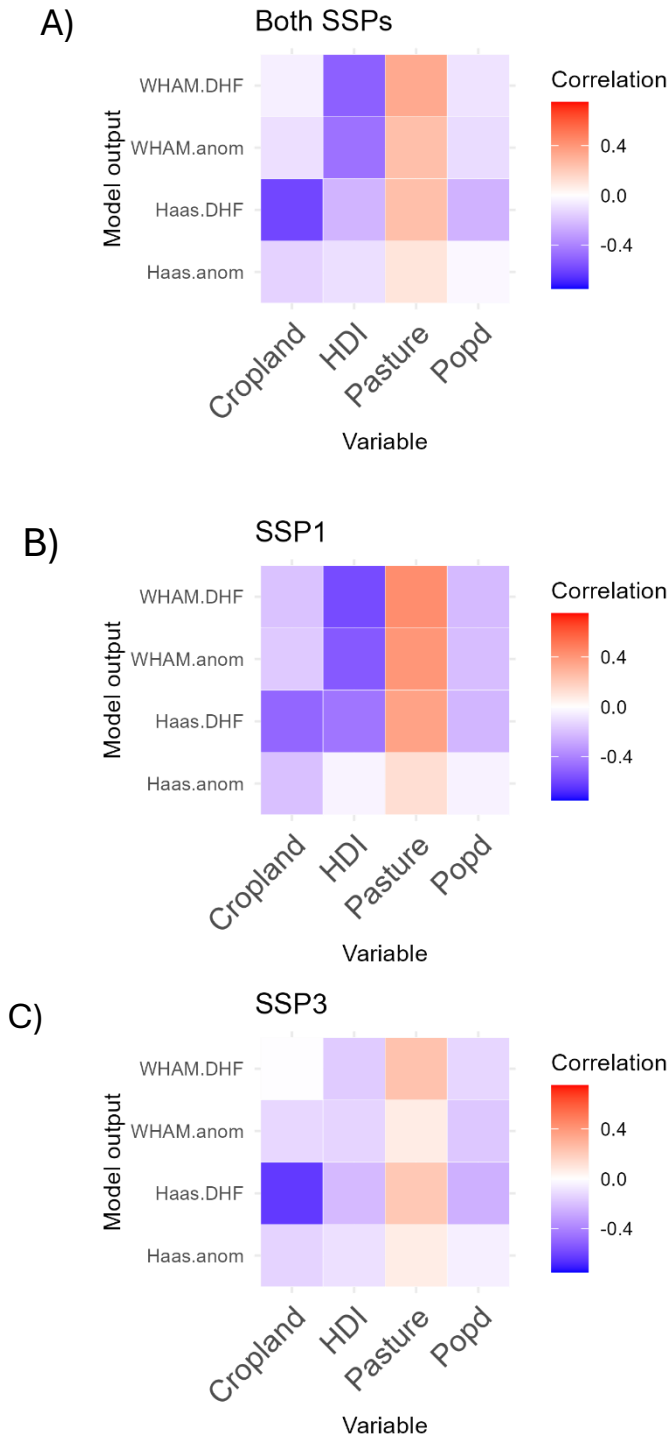
Table S1: After Perkins et al., (2024). Agent functional types (AFTs) used in the WHAM! model of human fire use and management. Non-extractive land uses primarily encompasses conservation and recreation. The state land manager favors fire exclusion, whilst the pyro-diverse conservationist prefers fire-inclusion on the landscape as a natural ecosystem process. For a more detailed description of anthropogenic fire regimes see Perkins et al., (2022). Key: SOSH = Subsistence oriented smallholder, MOSH = Market-oriented smallholder.

Anthropogenic fire regime	Land use system			
	Cropland	Livestock	Forestry	Non-extractive
Pre-industrial	Swidden	Pastoralist	Hunter-gatherer	Unoccupied
Transition	SOSH, MOSH	Extensive livestock farmer	Logger, Agroforestry	Recreationalist, Conservationist
Industrial	Intensive farmer	Intensive livestock farmer	Managed forestry	State land manager
Post-industrial	Abandoned cropland	Abandoned pasture / rangeland	Abandoned forestry plantation	Conservationist, Recreationalist

References

Perkins, O., Kasoar, M., Voulgarakis, A., Smith, C., Mistry, J., Millington, J.D.A., 2024. A global behavioural model of human fire use and management: WHAM! v1.0. Geoscientific Model Development 17, 3993–4016. https://doi.org/10.5194/gmd-17-3993-2024

Perkins, O., Matej, S., Erb, K., Millington, J., 2022. Towards a global behavioural model of anthropogenic fire: The spatiotemporal distribution of land-fire systems. Socio-Environmental Systems Modelling 4, 18130–18130. https://doi.org/10.18174/sesmo.18130