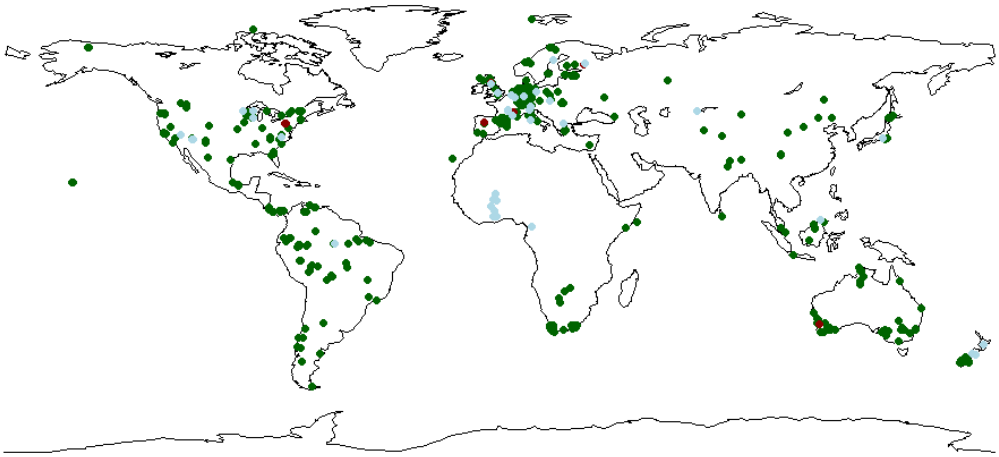
Supplementary Material

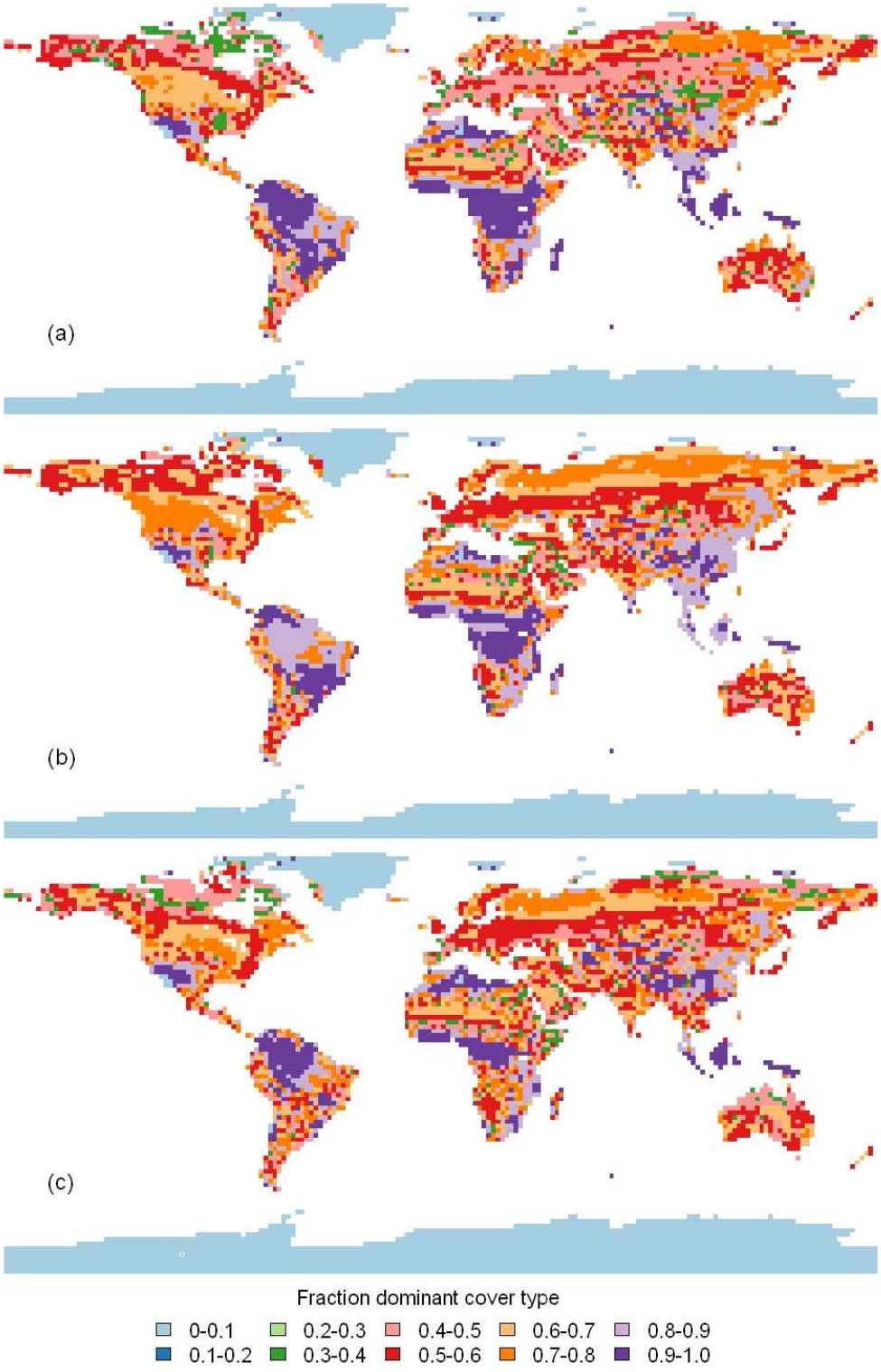
S1 World map with locations of sites from which trait data were used in this study.

Green dots sites of SLA, red dots sites of $Vcmax_{25}$ only, and blue dots indicate sites with both $Vcmax_{25}$ and $Jmax_{25}$ data.

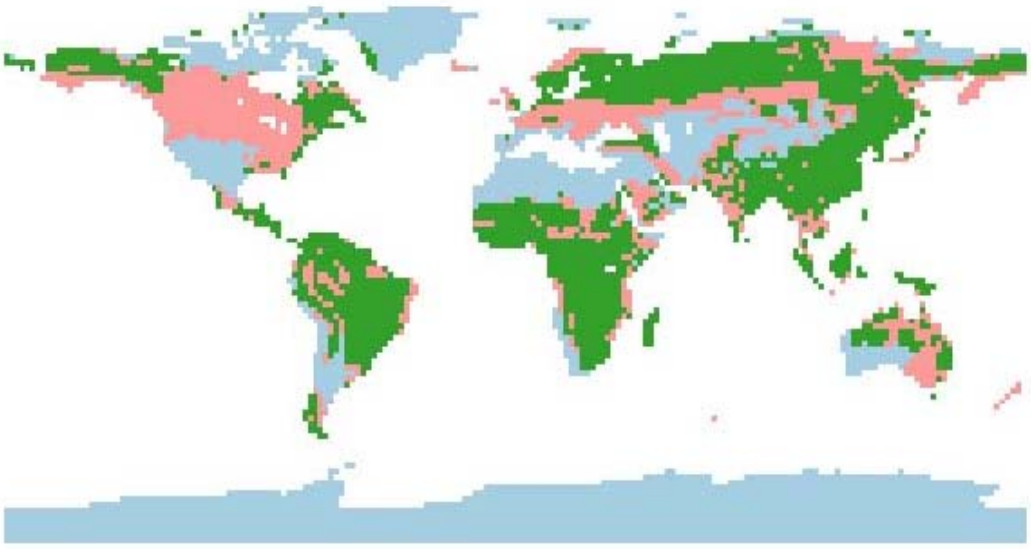


S2 World map of fractional coverage of dominant cover type (including bare soil).

(a) default simulation, (b) observed traits simulation and (c) variable traits simulation



S3 World map showing $Vcmax_{25}$ of the dominant PFTs in the variable traits simulation relative to the default simulation. The dominant PFTs in the variable traits simulations have higher $Vcmax_{25}$ than the default simulation in the green areas and lower $Vcmax_{25}$ in the pink areas. In blue areas bare ground is the dominant cover type.



S4 Comparisons between predicted dominant vegetation maps of the three simulations with the potential vegetation map of Ramankutty and Foley (1999).

Table S4.1. Aggregation of PFTs in Ramankutty and Foley to match JSBACH PFTs.

PFT	
JSBACH	Ramankutty and Foley
bare	desert
tropical broadleaved evergreen trees	tropical evergreen forest/woodland
tropical broadleaved deciduous trees	tropical deciduous forest/woodland
extra-tropical evergreen trees	temperate broadleaf evergreen forest/woodland temperate needleleaf evergreen forest/woodland boreal evergreen forest/woodland
extra-tropical deciduous trees	temperate deciduous forest/woodland boreal deciduous forest/woodland
shrubs (raingreen and deciduous)	dense shrubland open shrubland
C3-grasses	grassland/steppe
C4-grasses	savanna
--	tundra
--	evergreen/deciduous mixed forest/woodland

Fig. S4.1. Potential vegetation map with aggregated PFTs (see table S4.1). Evergreen/deciduous mixed forest and tundra were omitted from the comparisons with JSBACH vegetation distribution.

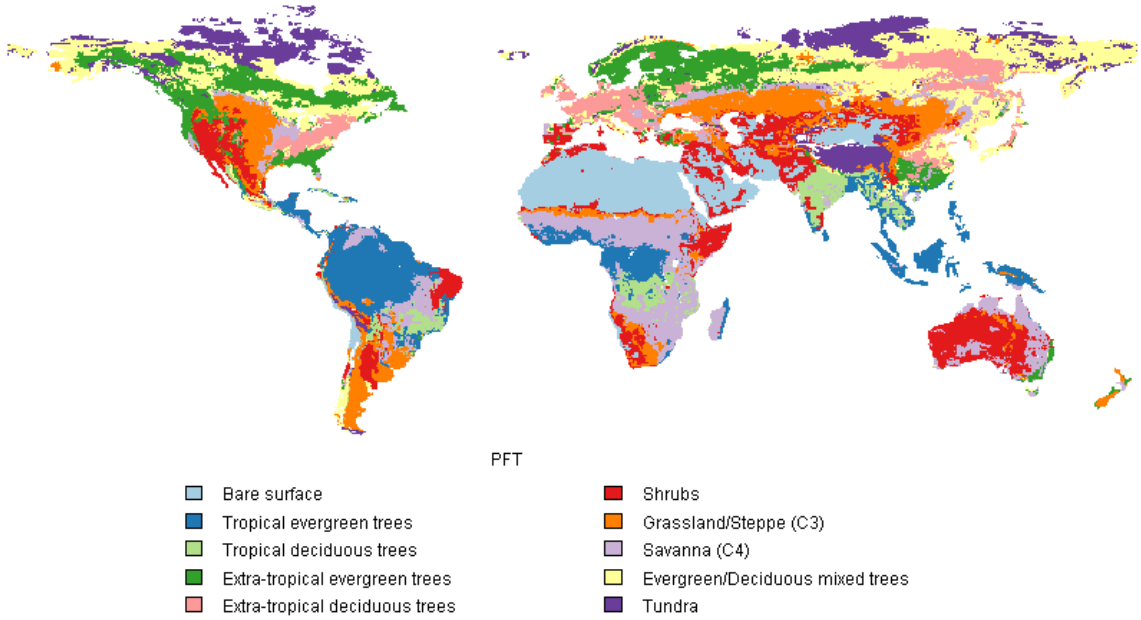


Fig. S4.2. (Mis-)match between simulations and aggregated potential vegetation map for (a) default simulation, (b) observed traits simulation and (c) variable traits simulation.