Supplement of Earth Syst. Dynam., 17, 387–414, 2026
https://doi.org/10.5194/esd-17-387-2026-supplement

Earth System Dynamics
Open Access
EGU

Supplement of

Stratospheric aerosol injection geoengineering has the potential to increase land carbon storage and to protect the Amazon rainforest

Isobel M. Parry et al.

Correspondence to: Isobel M. Parry (i.i.parry@exeter.ac.uk)

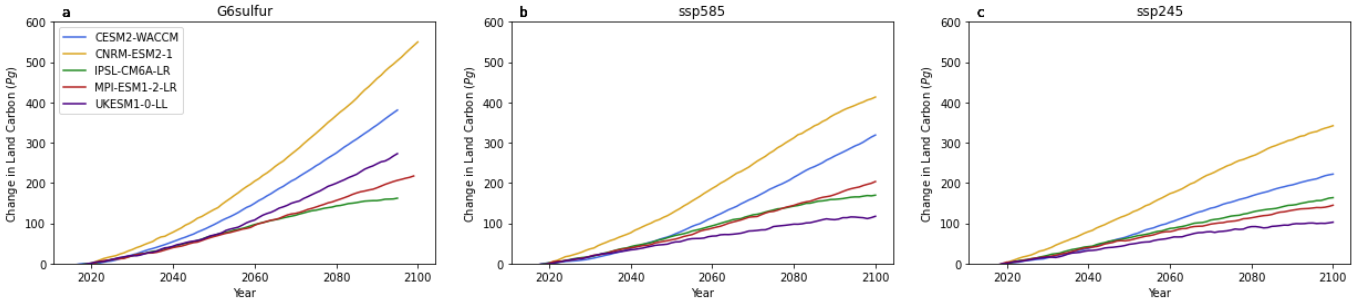

Figure S1: timeseries showing the evolution of land carbon relative to the pre-industrial period for all models analyses in **(a)** G6sulfur, **(b)** SSP585, and **(c)** SSP245

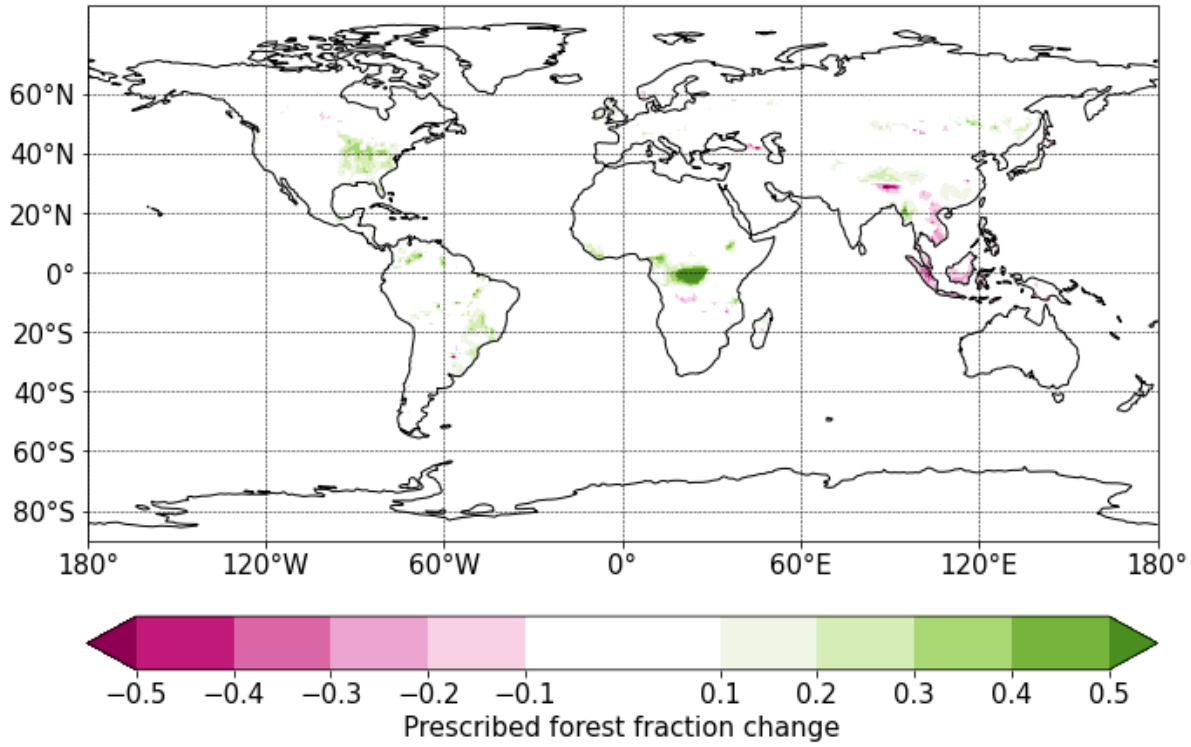

Figure S2: map showing the difference between forested land (primf+secdf) in SSP245 versus SSP585 as prescribed by the land use harmonization project which estimates the fractional land-use patterns for different projection scenarios.

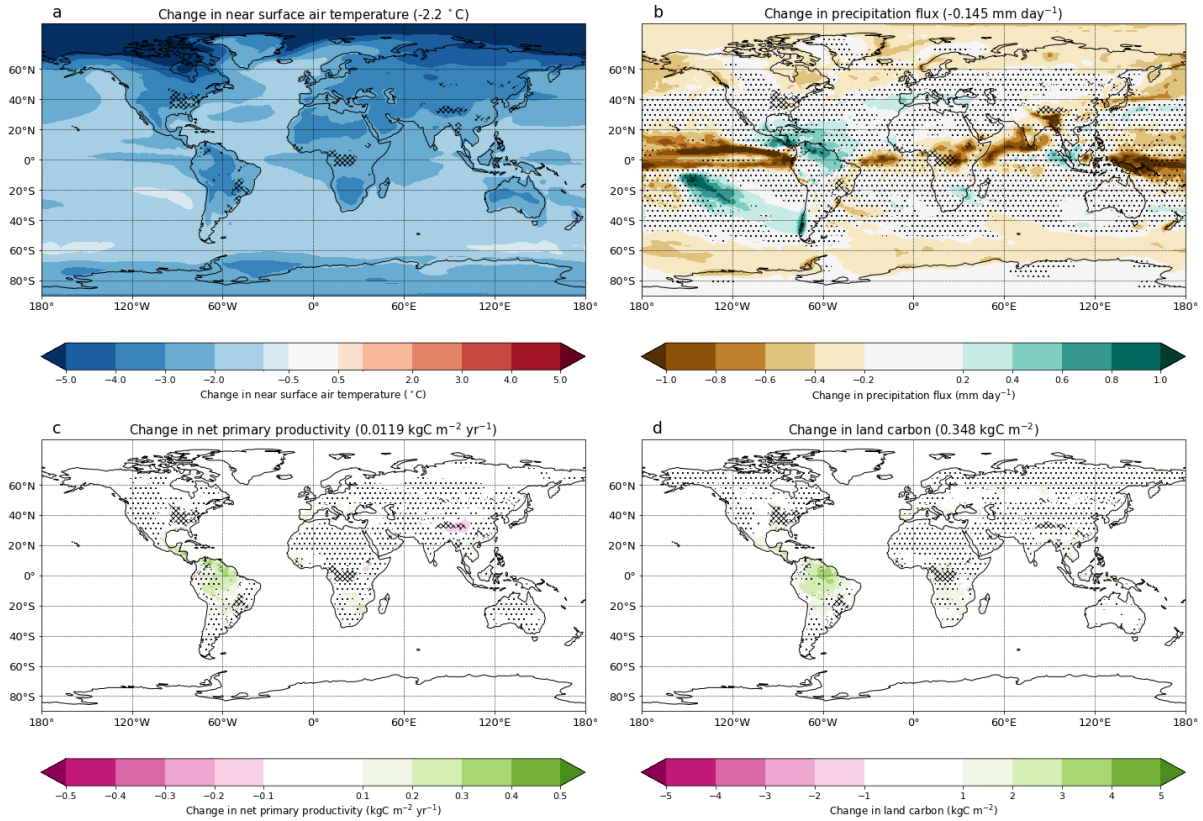

Figure S3: maps showing the difference between the 2090-2100 means of G6solar and SSP585 for **(a)** surface temperature (°C), **(b)** precipitation (mm day^{-1}), **(c)** net primary productivity (kgC m^{-2} yr^{-1}), and **(d)** land carbon (kgC m^{-2}). The numbers shown in the titles give the global average **(a, b)** or global land average for each map **(c, d)**. Stippling indicates regions where the standard deviation across the models is more than the ensemble mean change, i.e. the coefficient of variation is more than 1, while hatching indicates where differences in the forest fraction as prescribed by the land use scenarios between SSP245 and SSP585 is greater than 0.1 (see Figure S2).

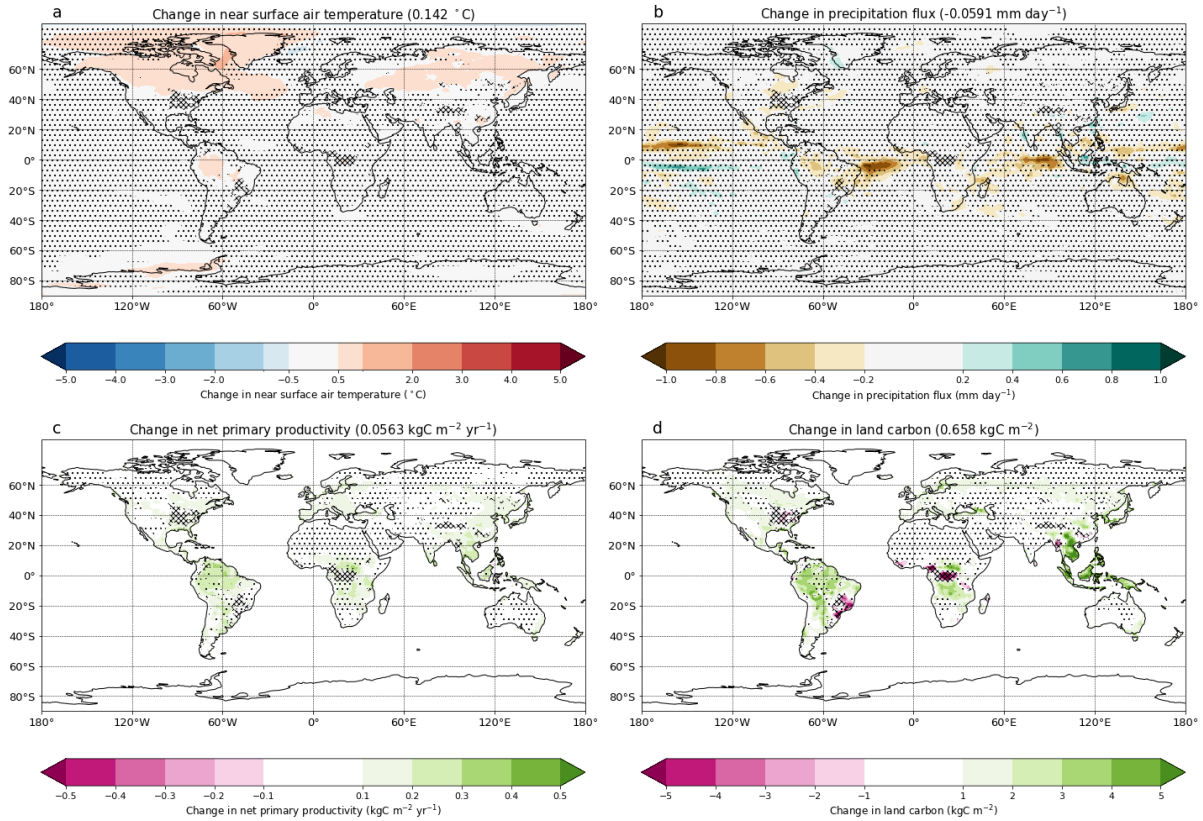

Figure S4: maps showing the difference between the 2090-2100 means of G6solar and SSP245 for **(a)** surface temperature (°C), **(b)** precipitation (mm day^{-1}), **(c)** net primary productivity (kgC m^{-2} yr^{-1}), and **(d)** land carbon (kgC m^{-2}). The numbers shown in the titles give the global average **(a, b)** or global land average for each map **(c, d)**. Stippling indicates regions where the standard deviation across the models is more than the ensemble mean change, i.e. the coefficient of variation is more than 1, while hatching indicates where differences in the forest fraction as prescribed by the land use scenarios between SSP245 and SSP585 is greater than 0.1 (see Figure S2).

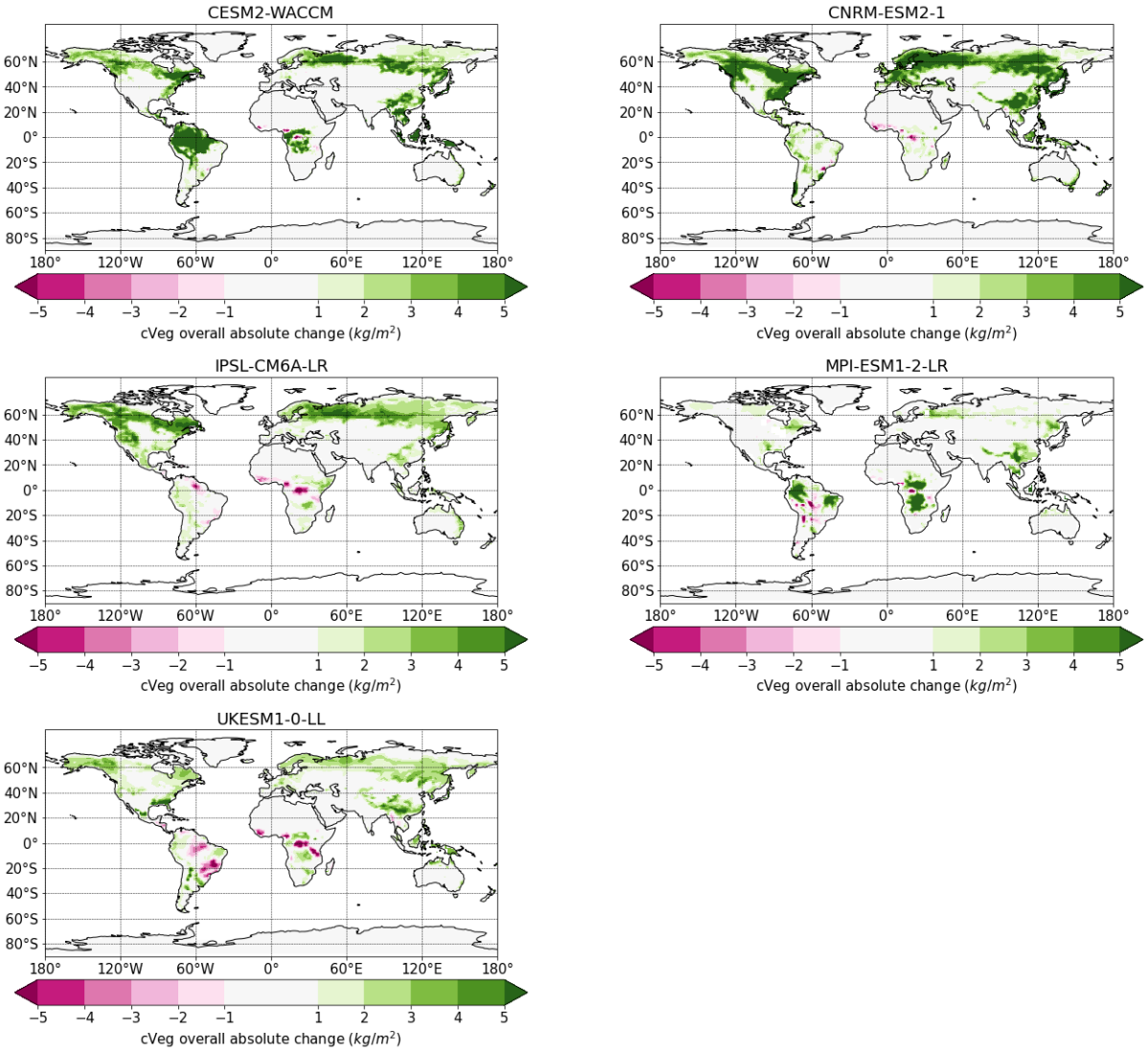

Figure S5: Maps showing the absolute change (kgC m^{-2}) in vegetation carbon in SSP585, comparing the decadal means 2020-2030 and 2090-2100. Hatching indicates where differences in the forest fraction as prescribed by the land use scenarios between SSP245 and SSP585 is greater than 0.1 (see Figure S2).

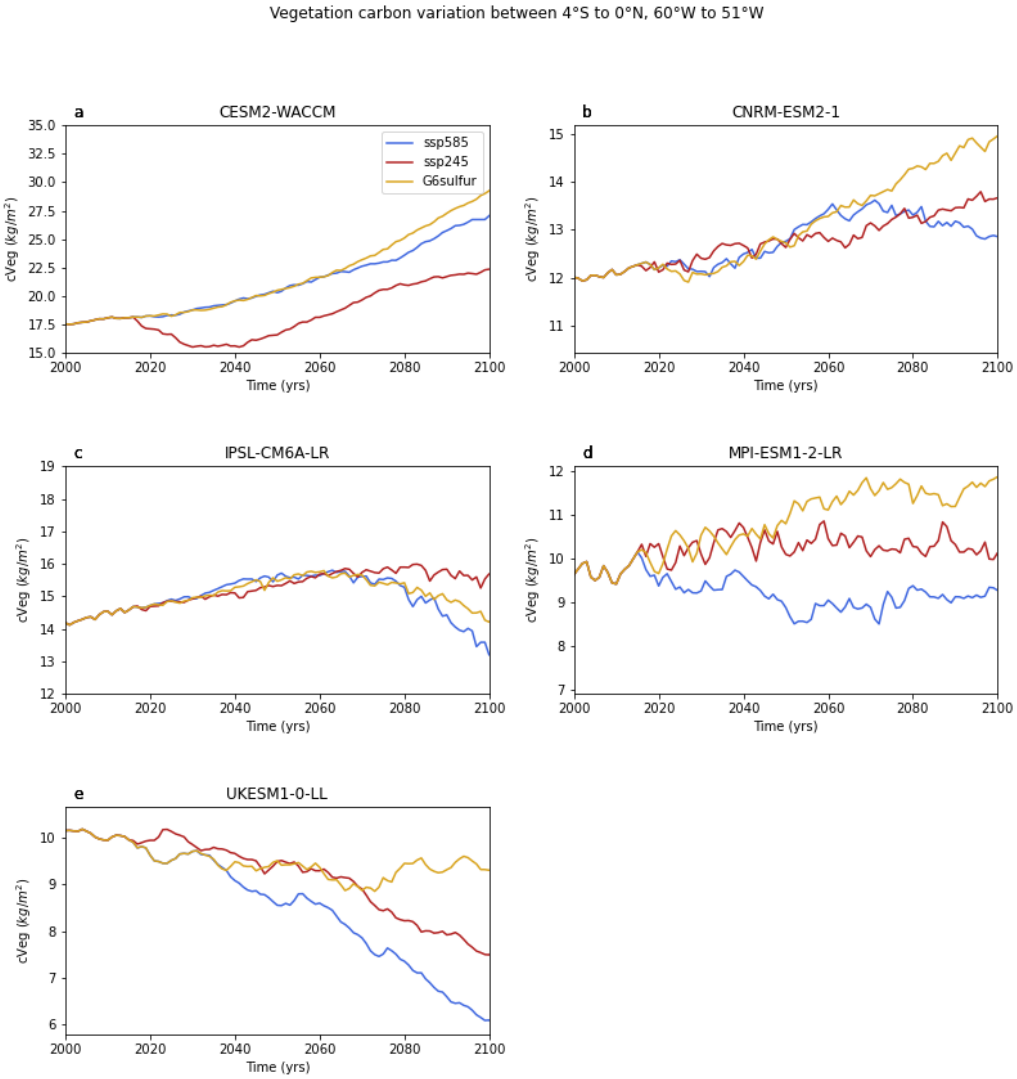

Figure S6: Evolution of vegetation carbon (kgC m^{-2}) averaged over the region 4°S to 0°N and 60°W to 51°W.

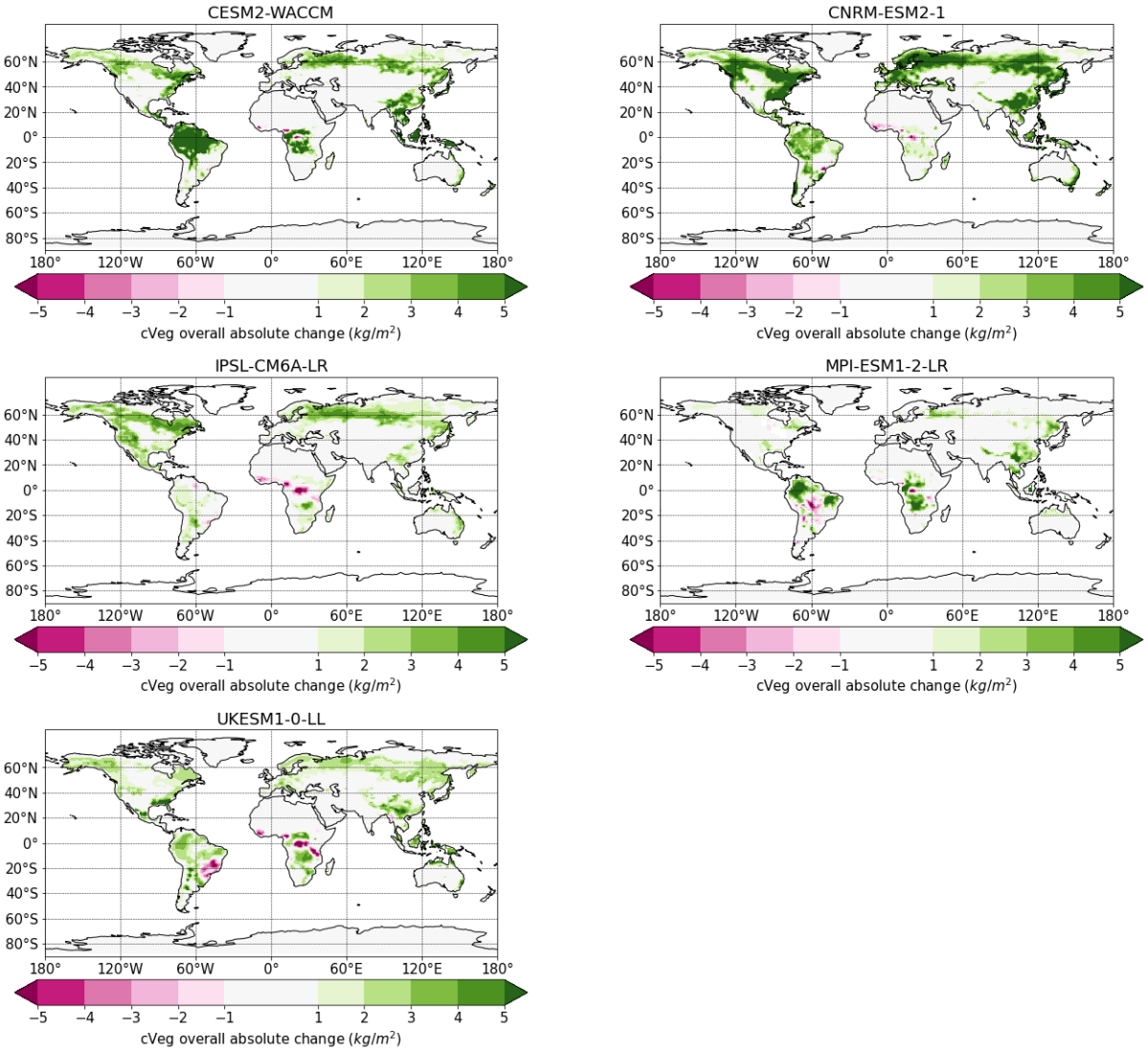

Figure S7: Maps showing the absolute change (kgC m^{-2}) in vegetation carbon in G6sulfur, comparing the decadal means 2020-2030 and 2090-2100. Hatching indicates where differences in the forest fraction as prescribed by the land use scenarios between SSP245 and SSP585 is greater than 0.1 (see Figure S2).

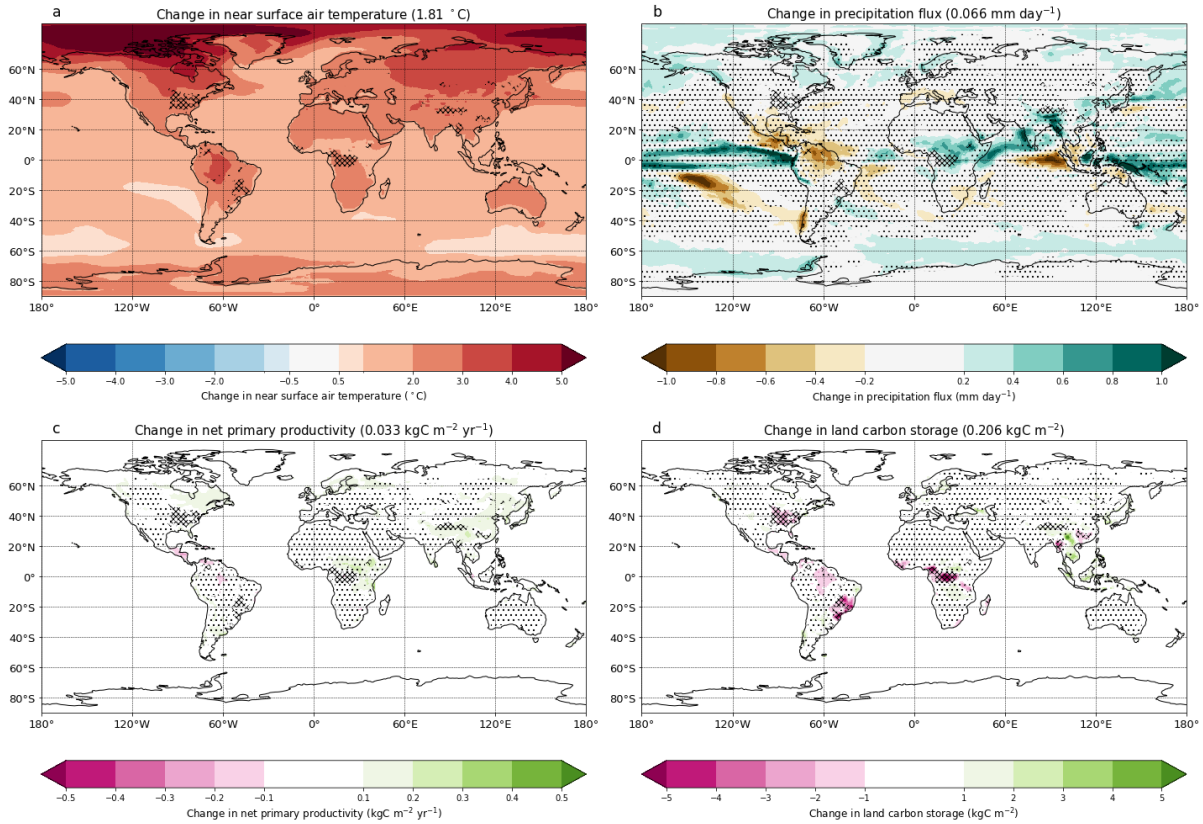

Figure S8: Maps showing the difference between the 2090-2100 means of SSp585 and SSP245 for **(a)** surface temperature (°C), **(b)** precipitation (mm day^{-1}), **(c)** net primary productivity (kgC m^{-2} yr^{-1}), and **(d)** land carbon (kgC m^{-2}). The numbers shown in the titles give the global average **(a, b)** or global land average for each map **(c, d)**. Stippling indicates regions where the standard deviation across the models is more than the ensemble mean change, i.e. the coefficient of variation is more than 1, while hatching indicates where differences in the forest fraction as prescribed by the land use scenarios between SSP245 and SSP585 is greater than 0.1 (see Figure S2).

Model	Experiment	Region	NPP change (PgC yr^{-1})	NPP % change	Land carbon change (PgC)	Land carbon % change
CESM2-WACCM	SSP585	World	0.01	0.01%	52.1	1.9%
		Amazon	1.4	11.8%	18.2	5.4%
	SSP245	World	10.8	20.3%	149.5	5.5%
		Amazon	3.1	31.2%	55.8	18.6%
CNRM-ESM2-1	SSP585	World	4.9	7.6%	95.8	3.5%
		Amazon	1.7	27.2%	21.7	8.8%
	SSP245	World	12.4	21.7%	178.1	6.6%
		Amazon	0.7	9.6%	13.6	5.3%
IPSL-CM6A-LR	SSP585	World	-0.6	-1.0%	-0.5	-0.04%
		Amazon	1.0	11.9%	5.7	3.0%
	SSP245	World	1.2	1.9%	24.1	2.4%
		Amazon	-0.4	-3.8%	-2.4	-1.2%
MPI-ESM2-1	SSP585	World	-0.6	-0.8%	15.7	1.3%
		Amazon	0.2	1.4%	7.8	3.2%
	SSP245	World	9.3	15.1%	73.6	6.4%
		Amazon	1.8	11.3%	14.6	6.2%
UKESM1-0-LL	SSP585	World	2.5	3.0%	122.4	5.5%
		Amazon	2.0	13.4%	41.0	13.2%
	SSP245	World	13.9	19.2%	148.1	6.8%
		Amazon	2.6	18.7%	30.7	9.5%

Table S1: table showing the regional average and percentage change (either for globally or for the Amazon) difference in NPP (PgC yr^{-1}) or land carbon (PgC) between the 2090-2100 means of G6sulfur and either SSP585 or SSP245.