

Supporting Information for “Limited mitigation potential of forestation under a high emissions scenario: results from multi-model and single model ensembles”

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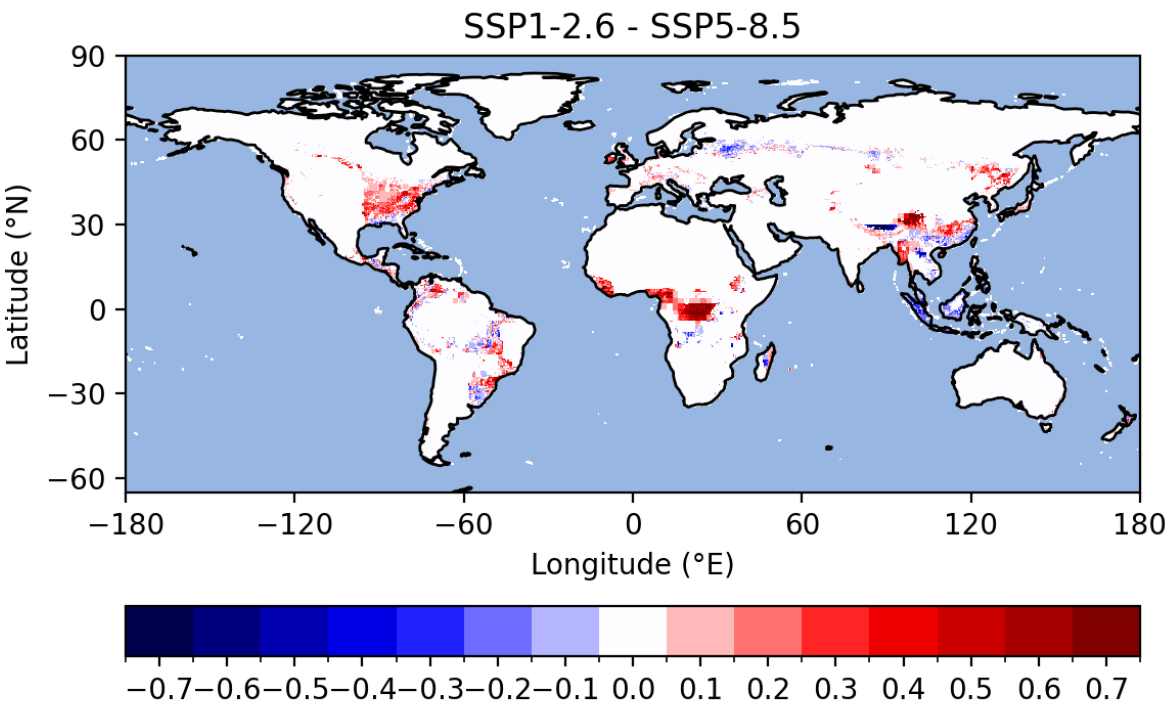


Figure S1. LUH2 primary and secondary forest cover fractions difference between SSP1-2.6 and SSP5-8.5 at 2100.

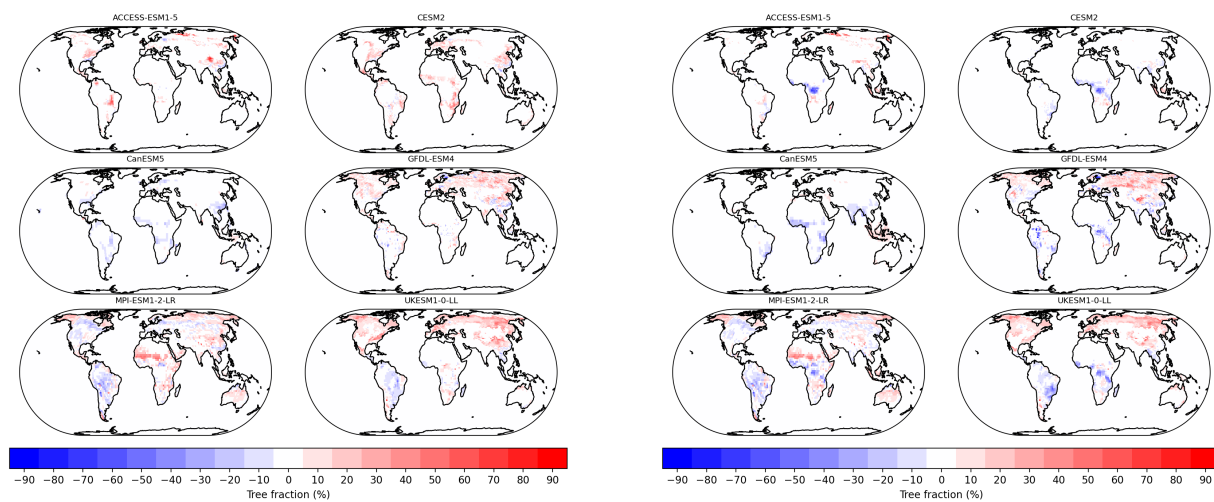


Figure S2. Tree cover fractions map for all models expressed as a temporal anomaly (2100 minus 2015). Left: From forestation experiment, esm-ssp585-ssp126. Right: From SSP585 experiment, esm-ssp585

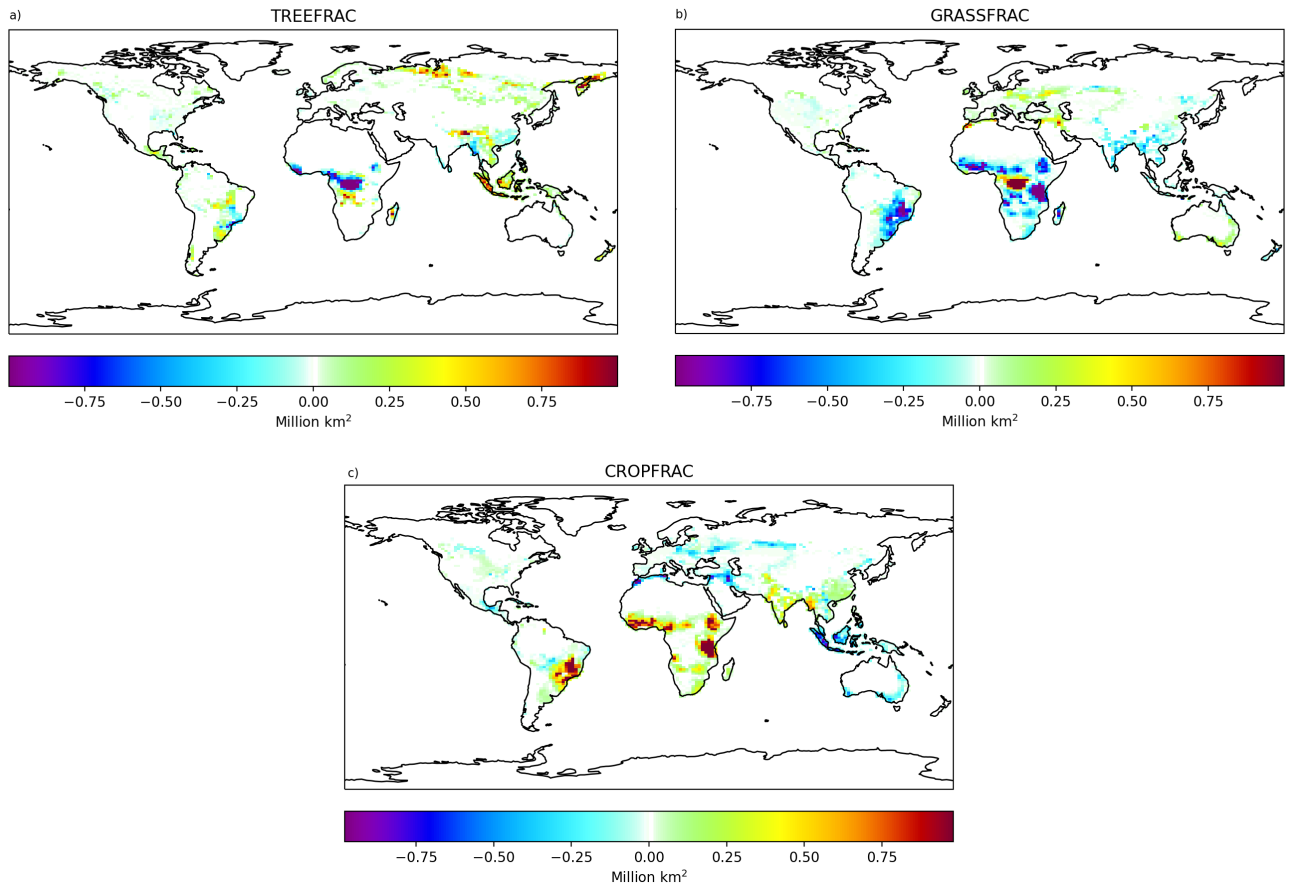


Figure S3. Temporal anomaly in area of trees, grass and crop between 2015 and 2100 for *esm-ssp585* in ACCESS-ESM1.5.

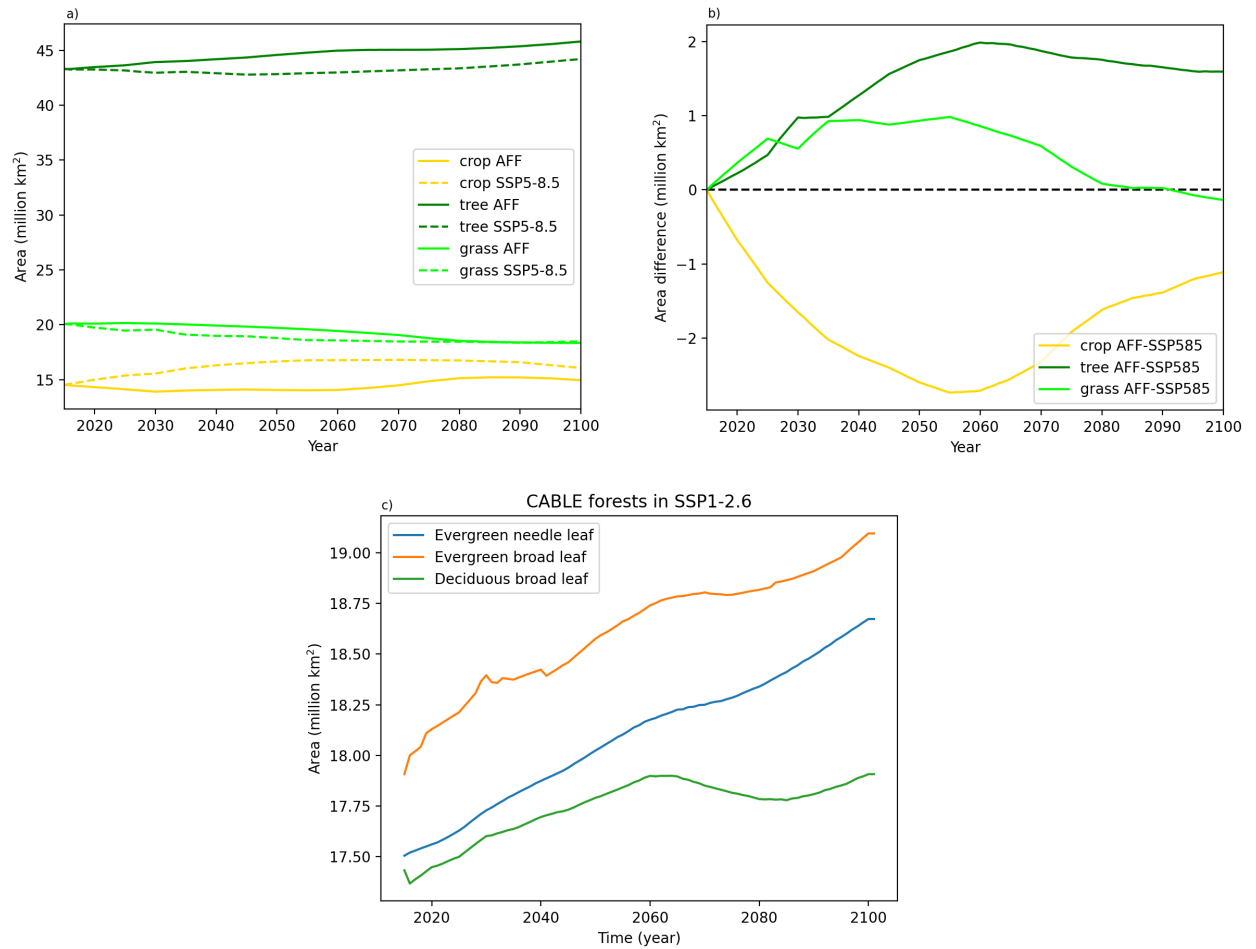


Figure S4. Global total land cover areas in ACCESS-ESM1.5 a) ssp585 (dashed) and forestation scenario (solid), b) difference between ssp585 and forestation scenario, and c) the areas for 3 forest plant functional types.

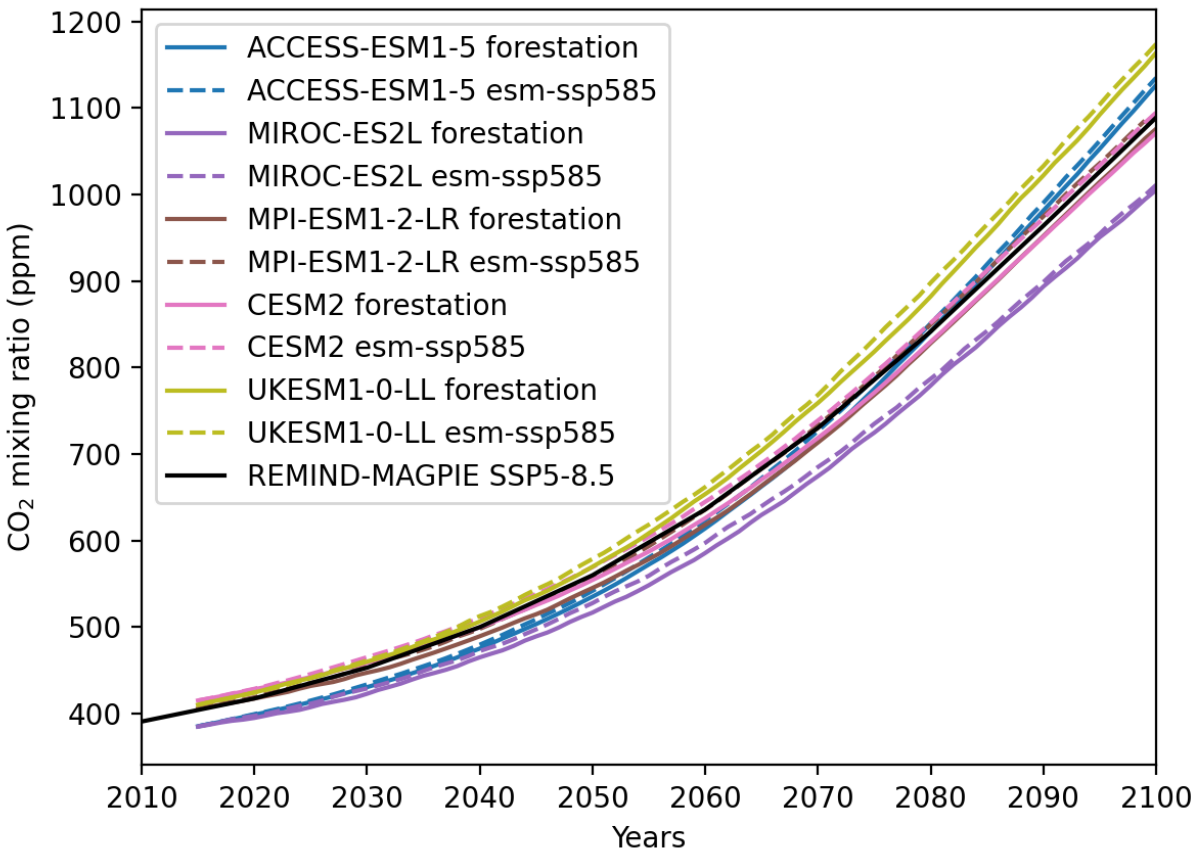


Figure S5. Absolute atmospheric CO₂ concentration for the *esm-ssp585-ssp126Lu* simulation (solid lines) and the *esm-ssp585* (dotted lines). The solid black line represents the projected CO₂ concentration from REMIND-MAGPIE scenario SSP5-8.5 used to force CMIP6 concentration driven simulations.

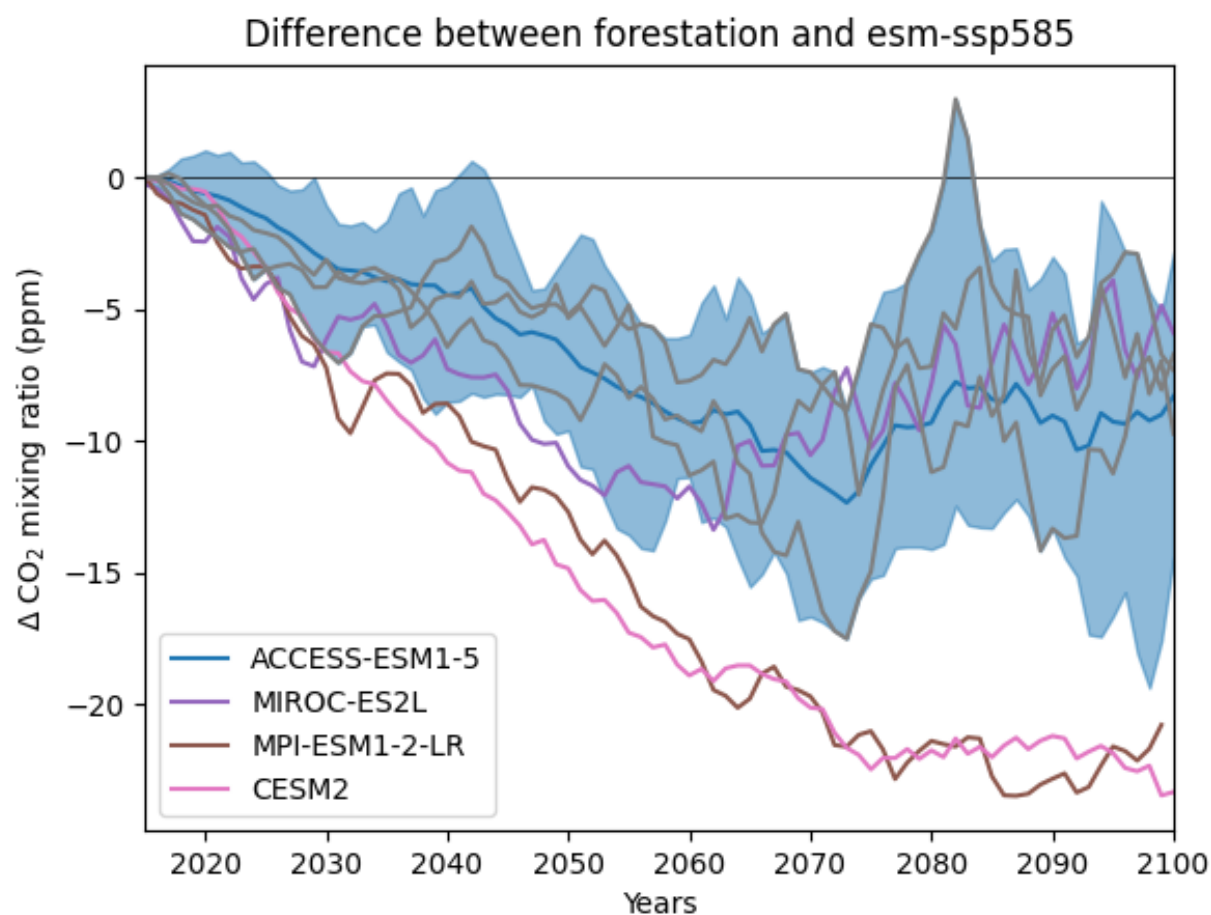


Figure S6. Atmospheric CO_2 concentration difference with three ACCESS-ESM1-5 ensemble members in gray that have significant global mean temperature trends.

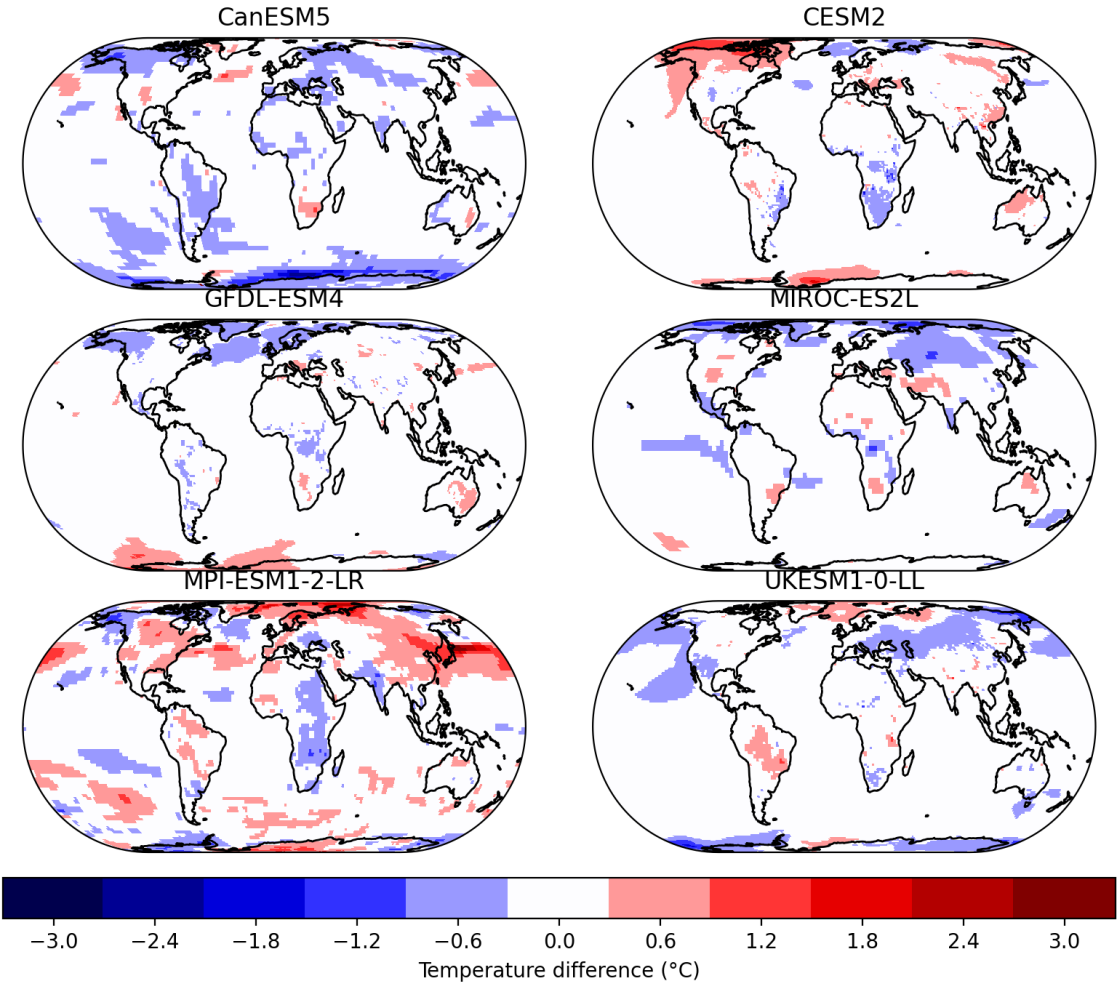


Figure S7. Surface air temperature difference averaged over the last 20 years of the century (2081-2100) for each model.

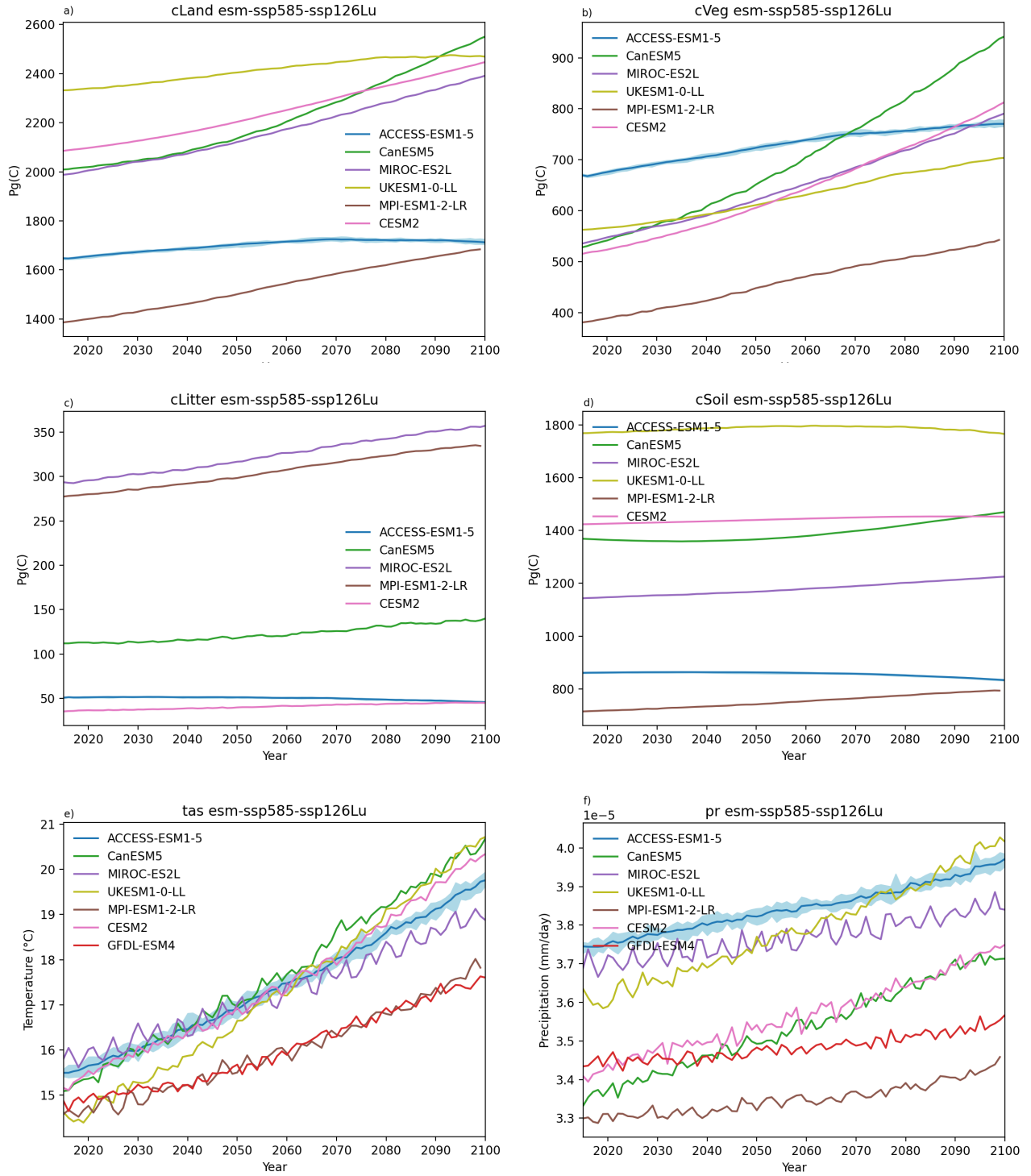


Figure S8. Absolute values of the forestation scenario's global mean carbon pools a) total land carbon, b) vegetation carbon, c) litter carbon, d) soil carbon, e) 2 m surface air temperature and f) precipitation for each model. The solid line for ACCESS ESM-1-5 is the ensemble mean and the shading indicates the ensemble range.

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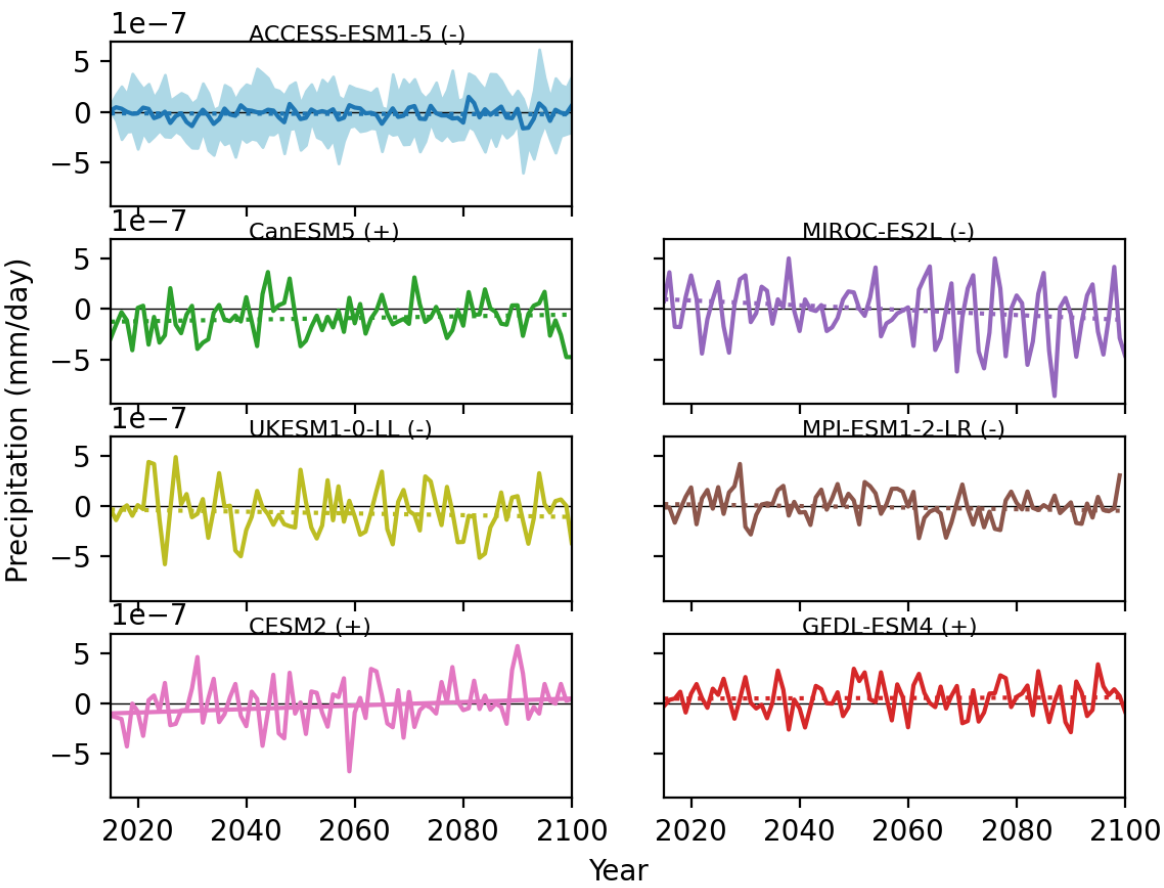


Figure S9. Difference in surface global precipitation rate between the forestation scenario and the reference simulation (solid lines) and the corresponding trends (dotted lines). Only the CESM2 trend is statistically significant at the 5% level (solid pink line). ‘+’ and ‘-’ denote the sign of the trend.

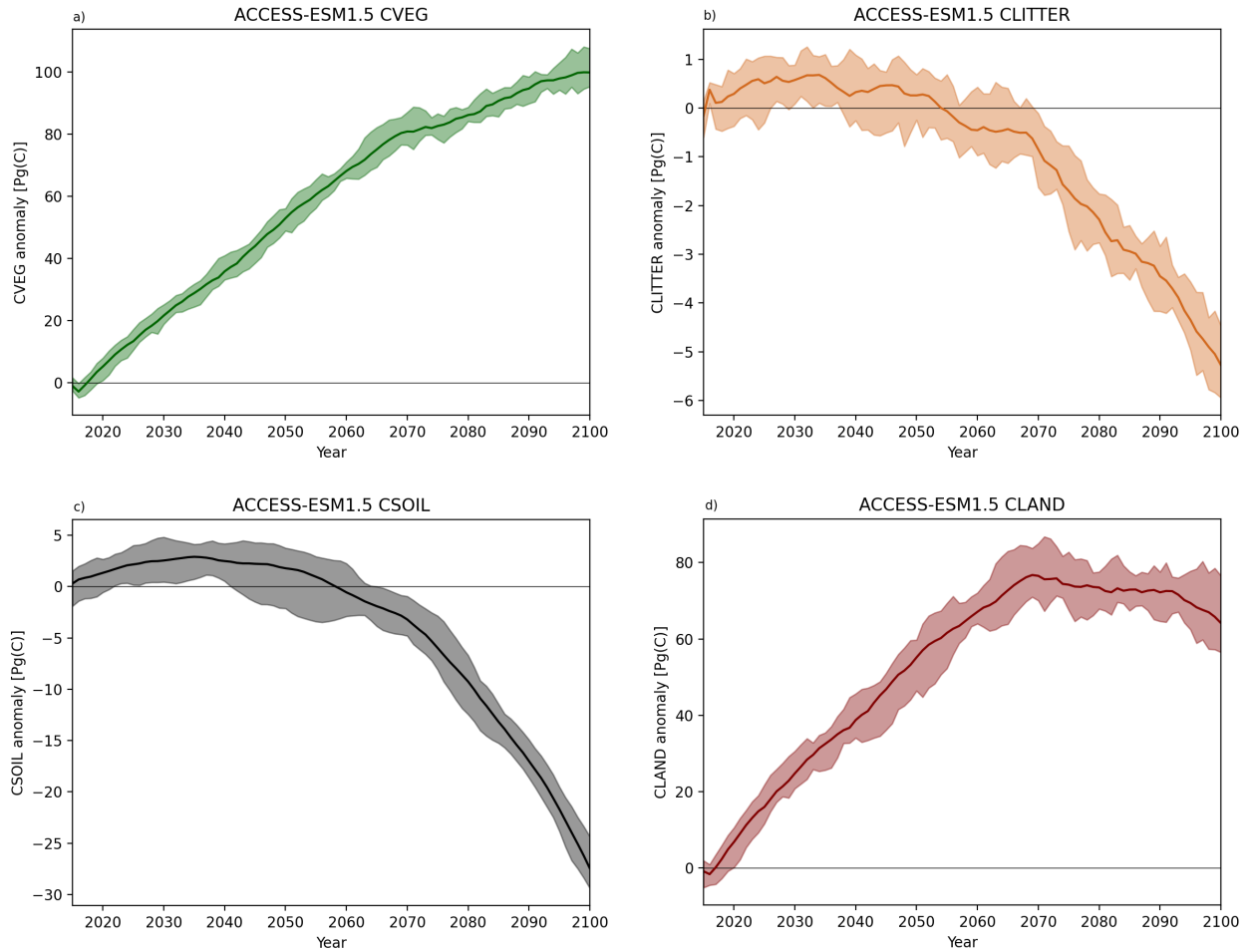


Figure S10. ACCESS-ESM1-5 carbon pools for *esm-ssp585-ssp126Lu* relative to the 2005–2025 period a) vegetation carbon, b) litter carbon, c) soil carbon and d) total land carbon.