Supplementary material for "Regime shifts in future ocean CO_2 fluxes revealed through machine learning"

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Figures S1 to S11

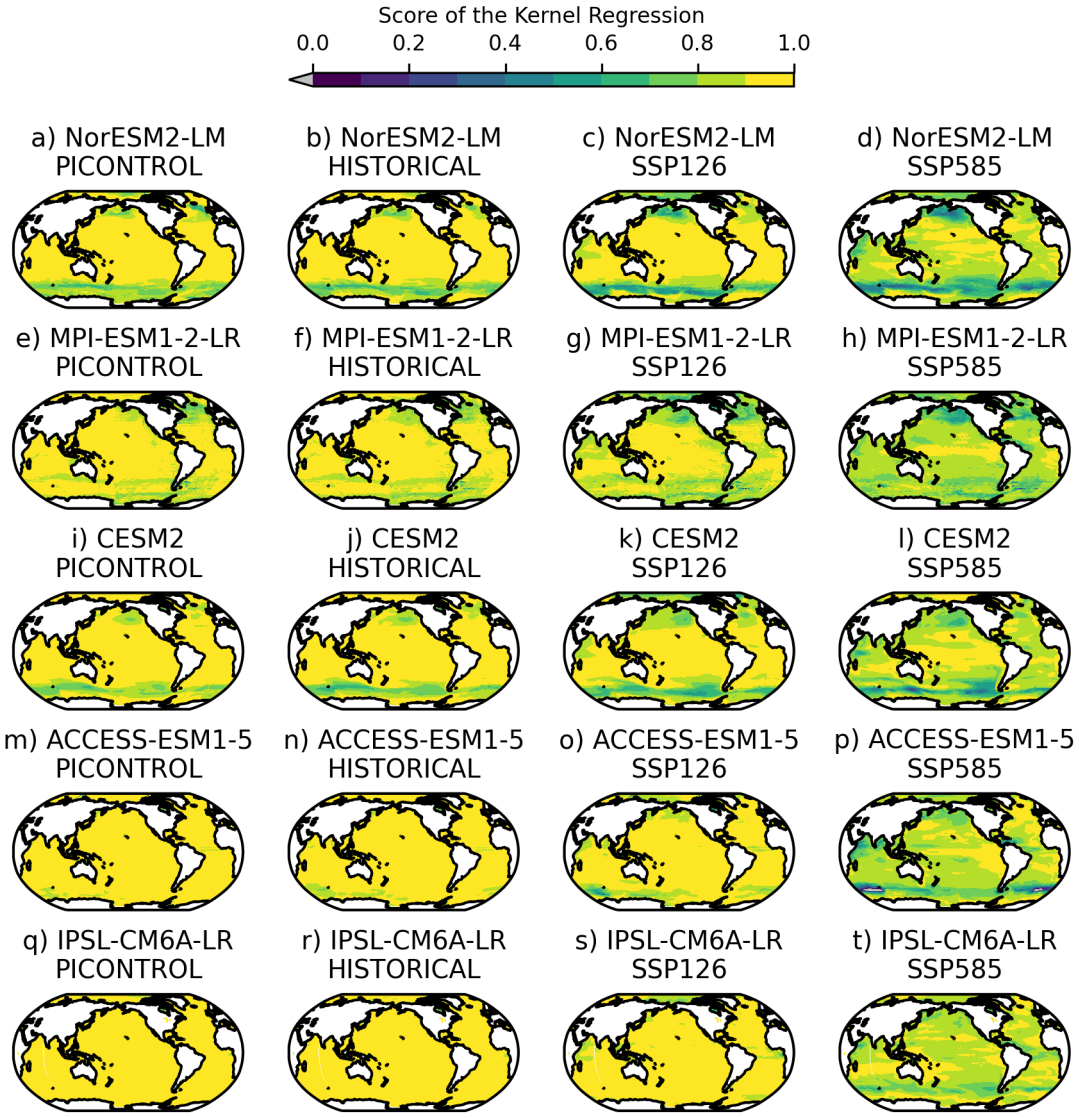

Figure S1. Kernel ridge regression score in the preindustrial, the historical, the SSP126 and the SSP585 scenarios (columns) run with 5 Earth System Models (rows).

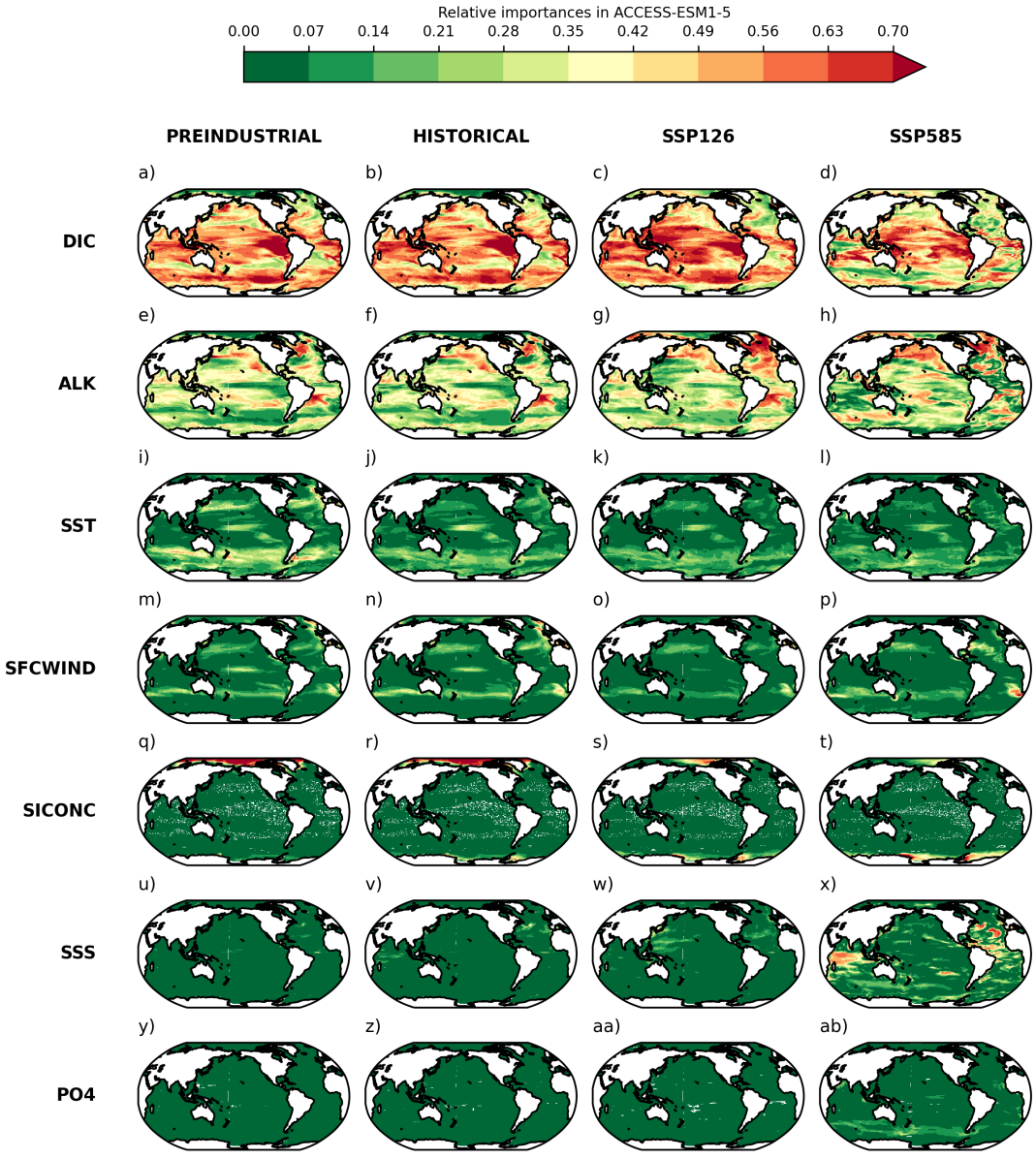

Figure S2. Relative importances of each predictor (rows) in the preindustrial, the historical, the SSP126 and the SSP585 scenarios (columns) in ACCESS-ESM1-5.

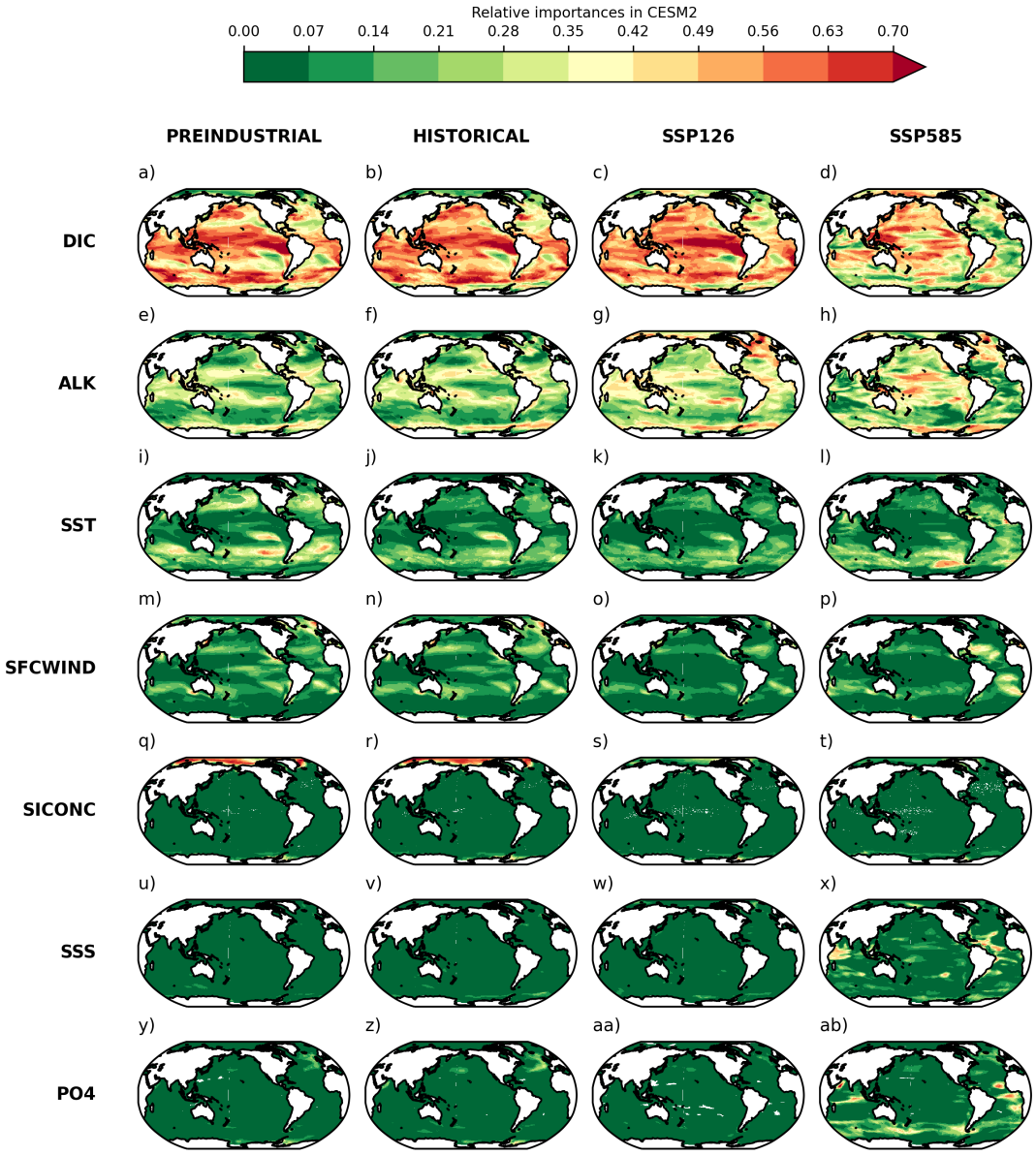

Figure S3. Relative importances of each predictor (rows) in the preindustrial, the historical, the SSP126 and the SSP585 scenarios (columns) in CESM2.

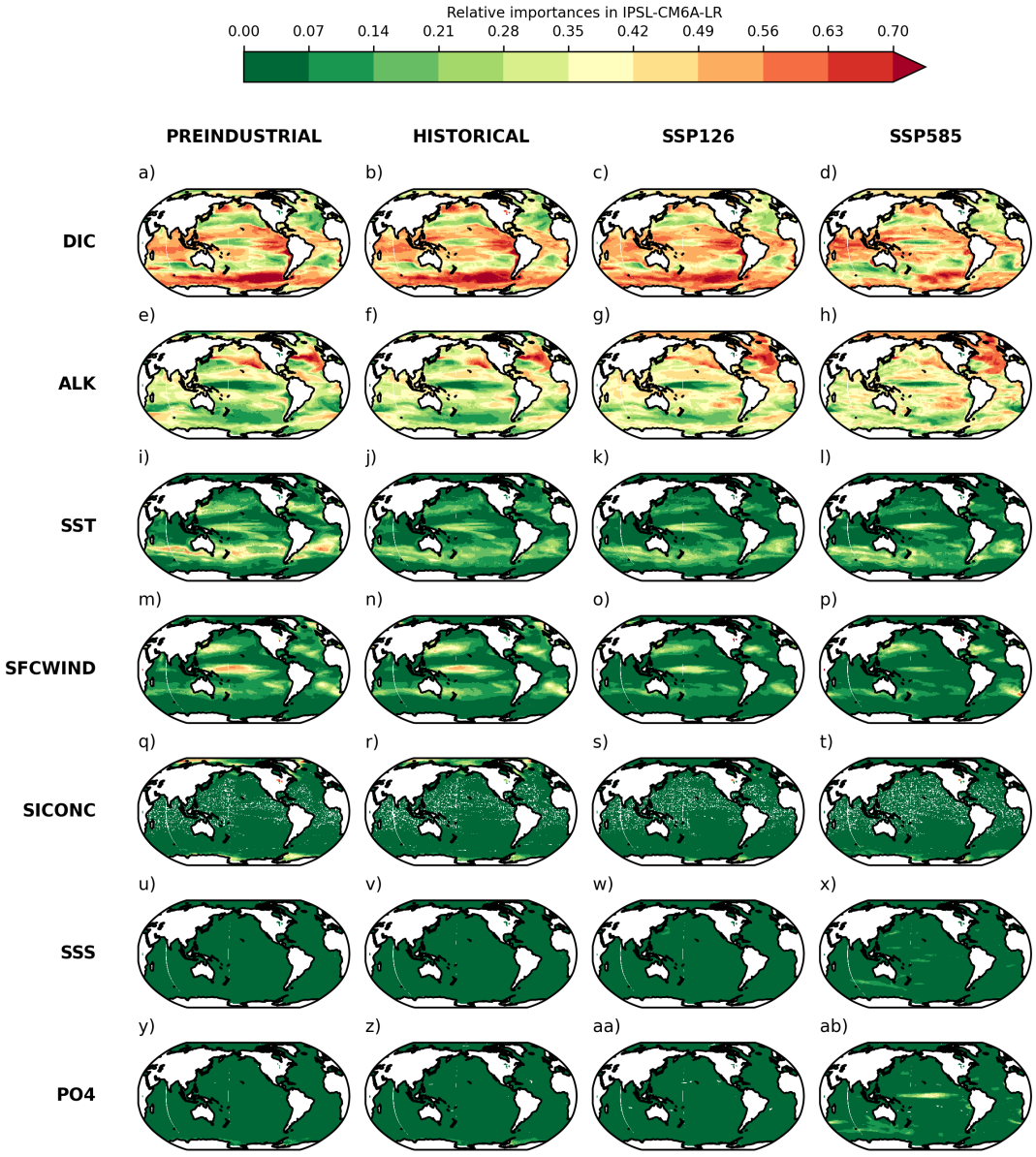

Figure S4. Relative importances of each predictor (rows) in the preindustrial, the historical, the SSP126 and the SSP585 scenarios (columns) in IPSL-CM6A-LR.

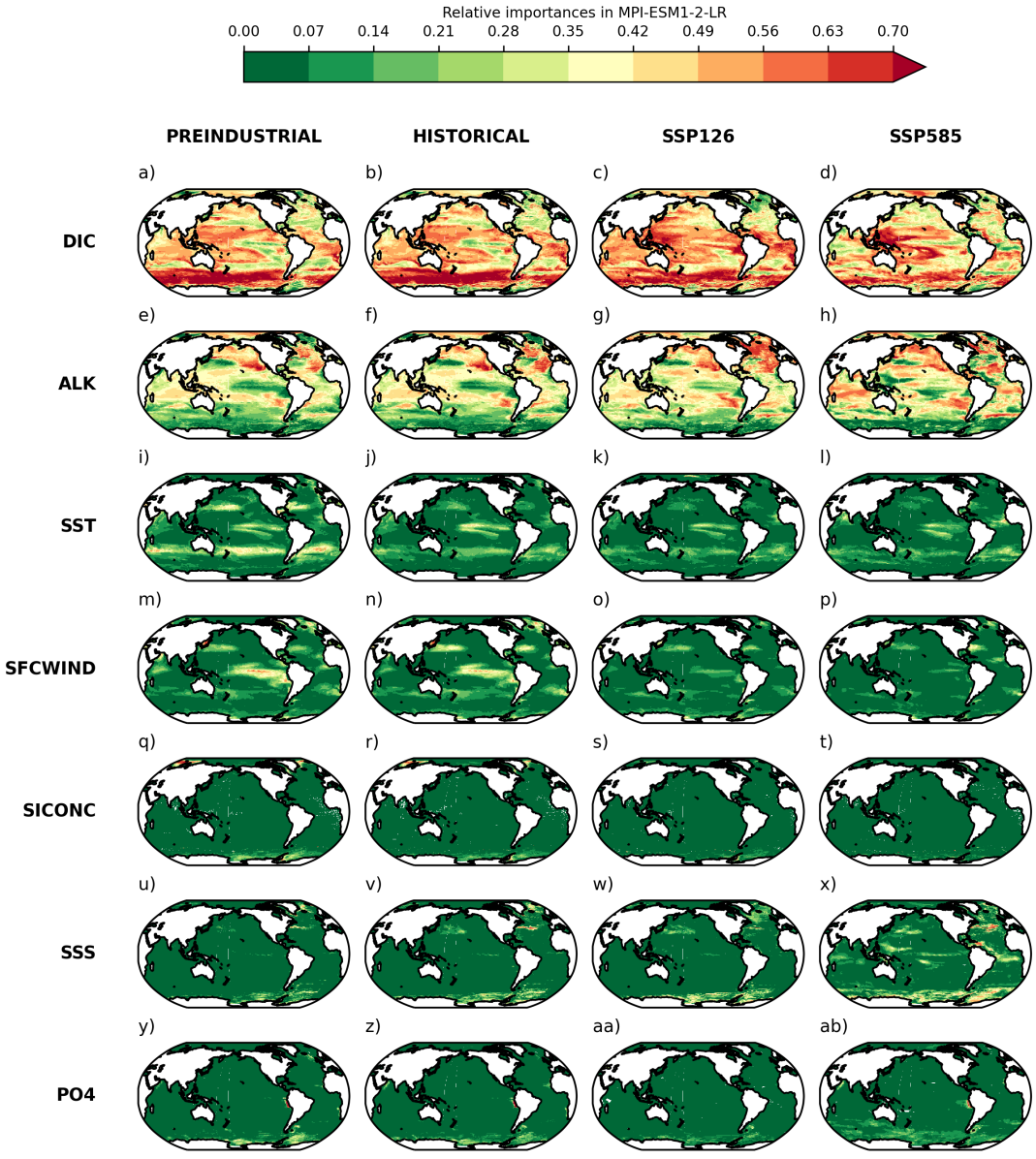

Figure S5. Relative importances of each predictor (rows) in the preindustrial, the historical, the SSP126 and the SSP585 scenarios (columns) in MPI-ESM1-2-LR.

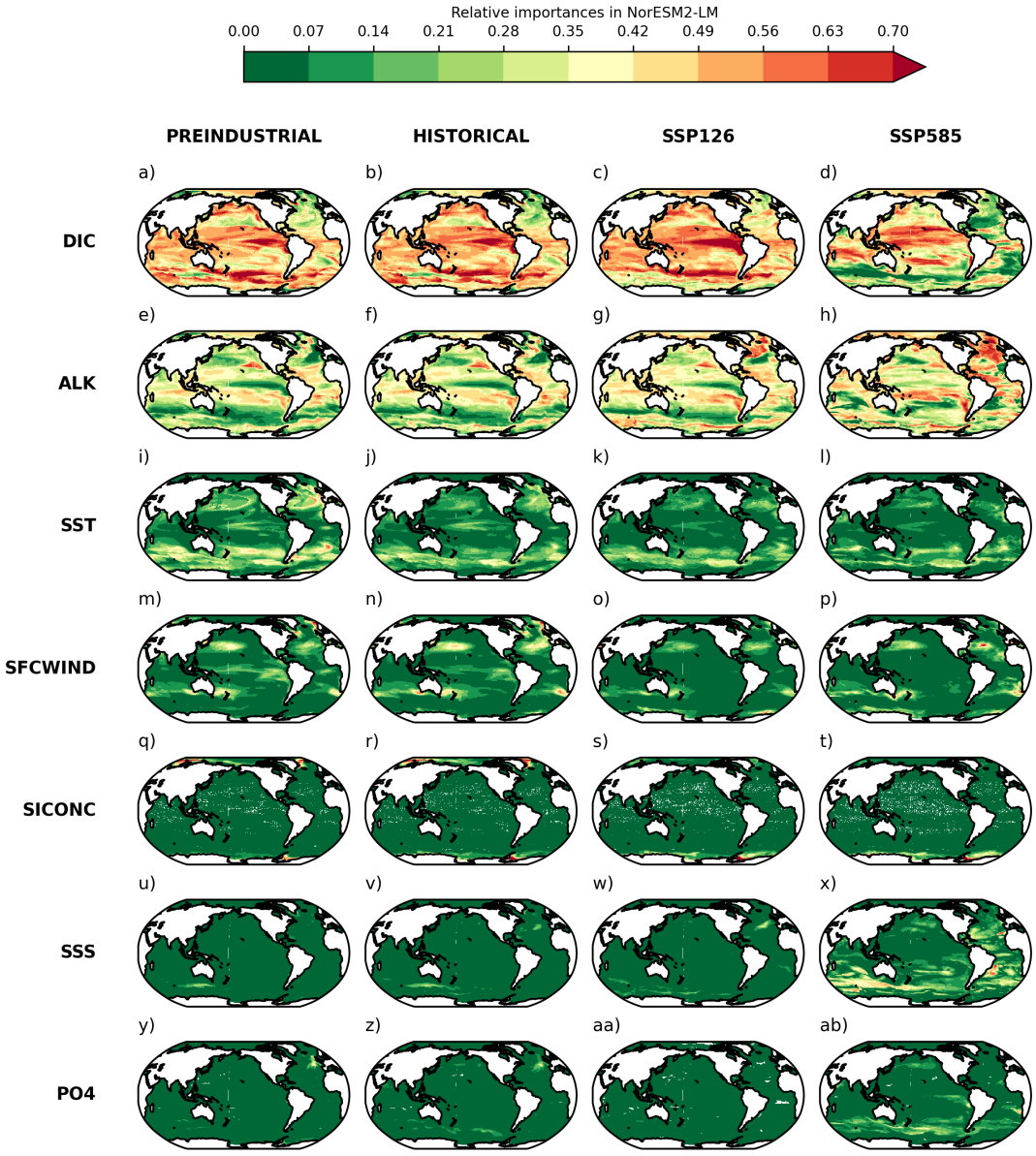

Figure S6. Relative importances of each predictor (rows) in the preindustrial, the historical, the SSP126 and the SSP585 scenarios (columns) in NorESM2-LM.

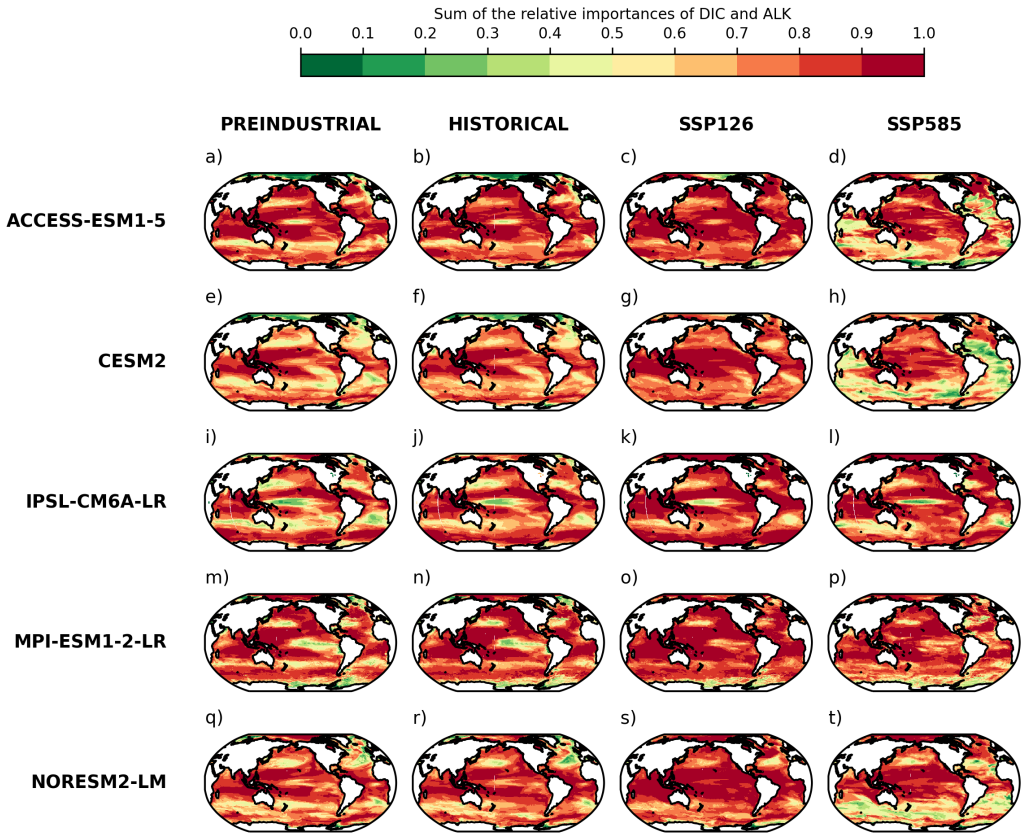

Figure S7. The sum of the relative importances of dissolved inorganic carbon (DIC) and alkalinity (ALK) in the preindustrial, the historical, the SSP126 and the SSP585 scenarios (columns) run with 5 Earth System Models (rows).

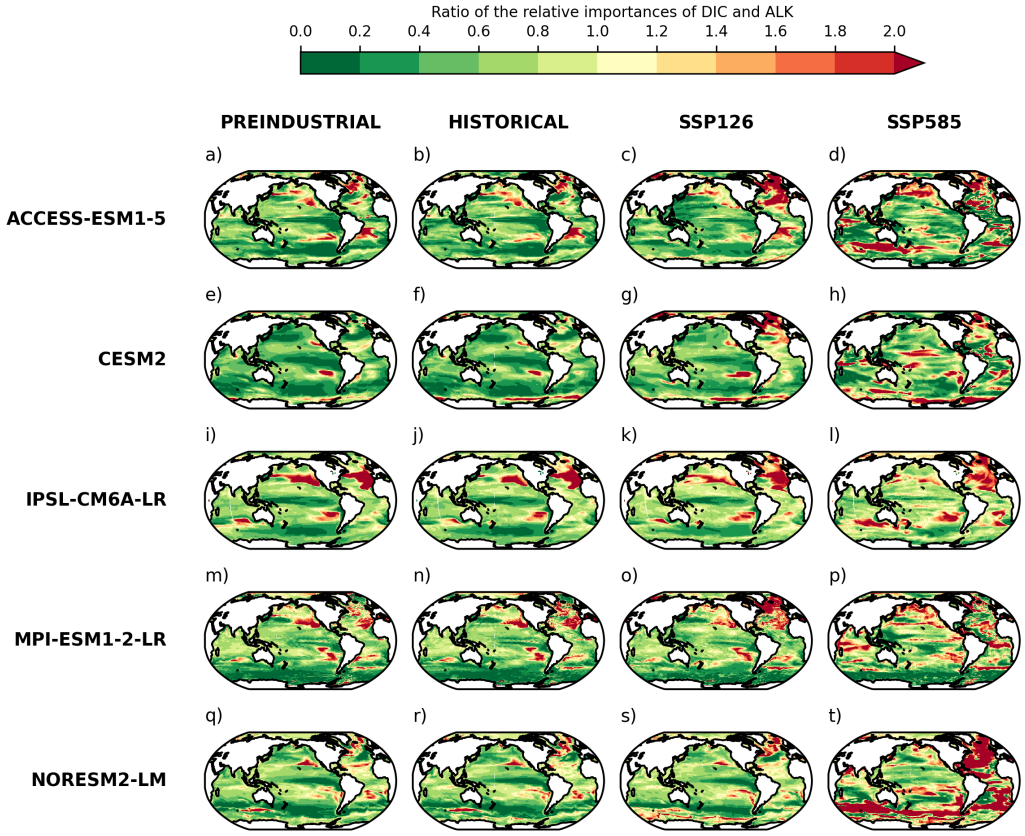

Figure S8. Ratios of the relative importances of alkalinity (ALK) and dissolved inorganic carbon (DIC) in the preindustrial, the historical, the SSP126 and the SSP585 scenarios (columns) run with 5 Earth System Models (rows). Greenish colours (ratio below one) stands for a relative importance of DIC larger than the one of ALK

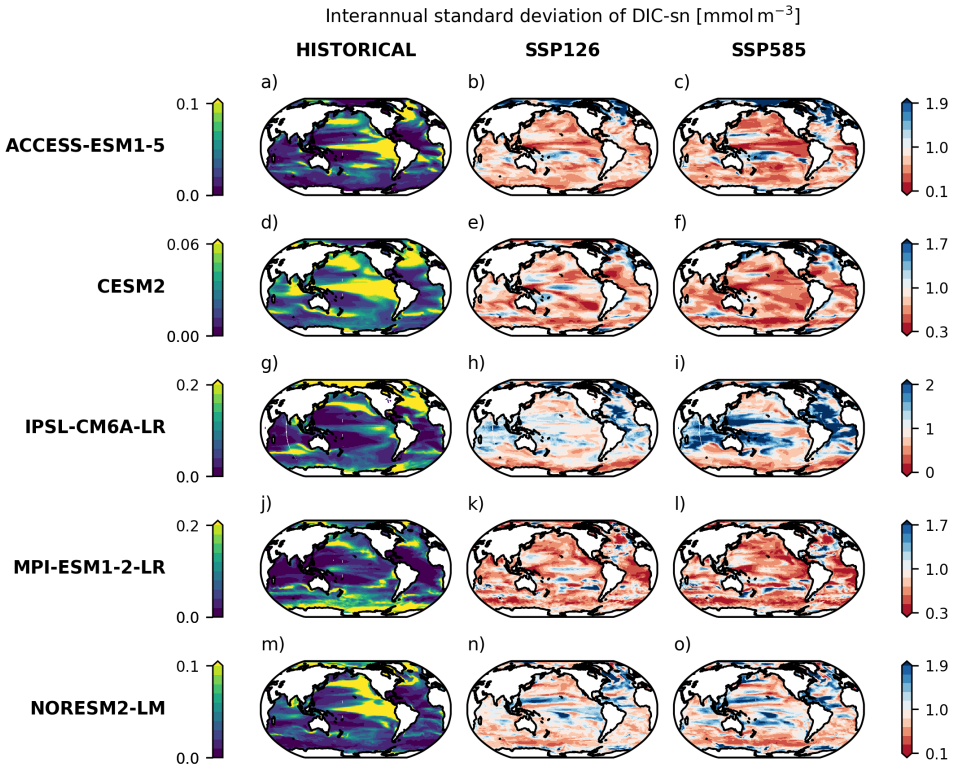

Figure S9. Inter-annual standard deviation of the salinity normalized dissolved inorganic carbon (DIC-sn) in the historical simulation (1st column) and its change in the SSP126 and SSP585 scenarios (2nd and 3rd columns) run with 5 Earth System Models (rows). Change is measured as the ratio between the SSP and historical scenario. Reddish colours (ratio below one) stands for a decrease in the inter-annual standard deviation. Inter-annual standard deviation is measure as the standard deviation of the de-trended and de-seasonalized time series. Normalizing DIC with salinity somehow removes the variability in DIC due to precipitation/evaporation.

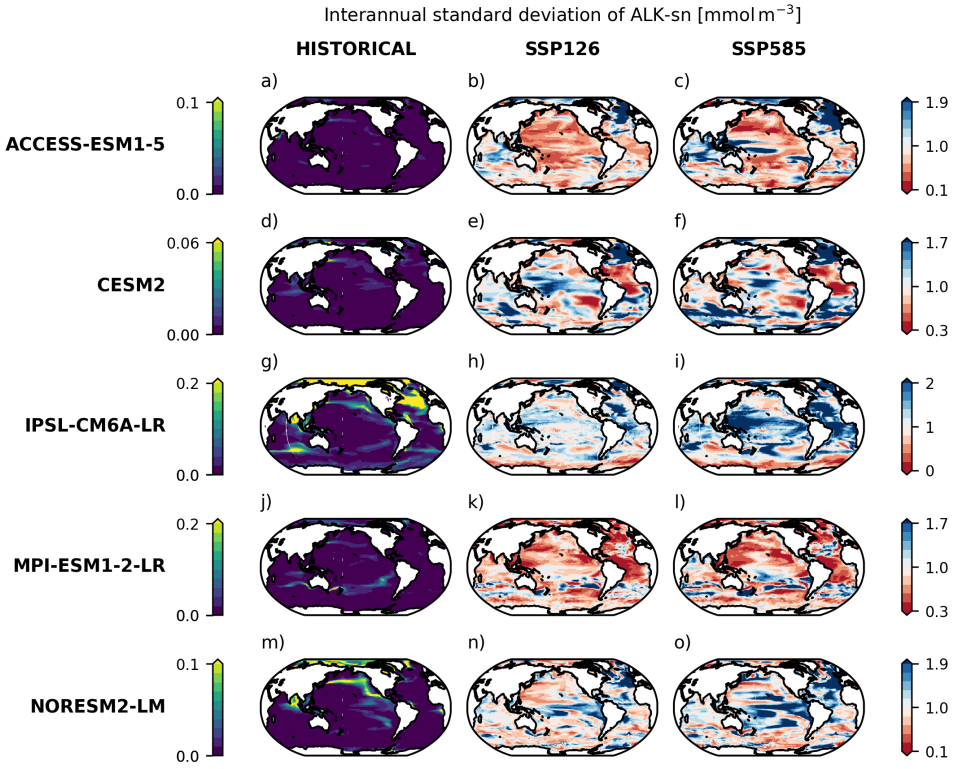

Figure S10. Same as Fig. S9 but for the salinity normalized alkalinity (ALK-sn).

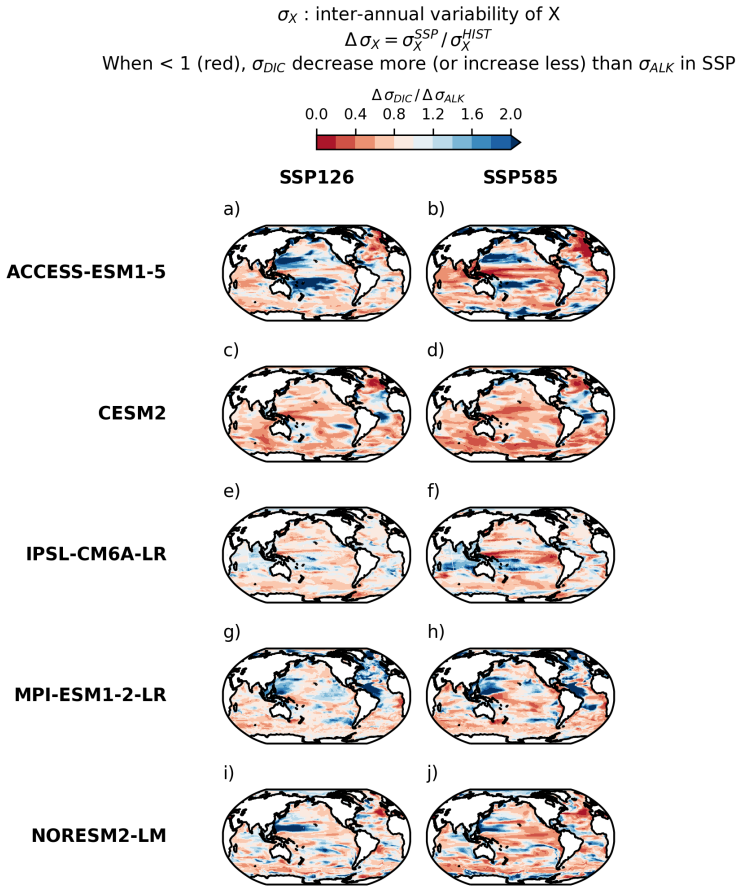

Figure S11. Ratio of the inter-annual standard deviation change of salinity normalized dissolved inorganic carbon (DIC-sn) and alkalinity (ALK-sn) in the SSP126 and SSP585 scenarios (columns) run with 5 Earth System Models (rows). Reddish colours (ratio below one) stands for the inter-annual standard deviation DIC-sn decreasing more (or increasing less) than the inter-annual standard deviation of ALK-sn.