

Figure S3: Column a) shows the  $p\text{CO}_2$  seasonal amplitude calculated as summer minus winter for each hemisphere respectively. b) and c) show the thermal and non-thermal contributions to  $p\text{CO}_2$  seasonality respectively. First row shows CMIP5 models ensemble mean for the 2006-2026 period under the RCP8.5 scenario. Second row shows the estimates from Takahashi et al., (2014b) dataset for a reference year 2005, with summer-minus-winter thermal and non-thermal contributions calculated as Takahashi et al., (2002). Third rows show the same components for the Landschützer et al., (2017)  $p\text{CO}_2$  data-set, and the thermal and non-thermal estimations that Peter Landschützer facilitated us, for the period 1982-2015.

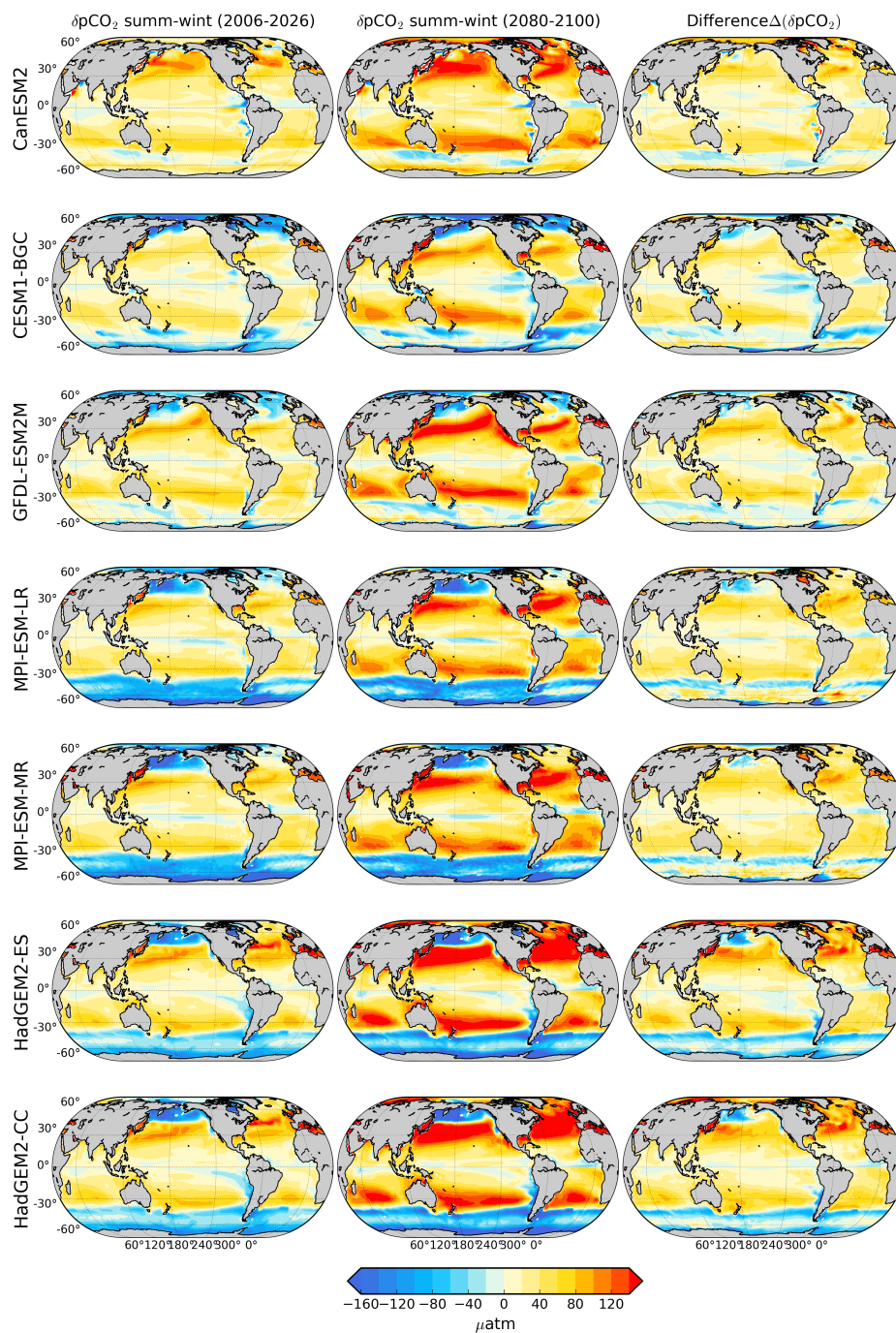


Figure S4:  $\delta p\text{CO}_2$  climatology for column a) 2006-2026 and b) 2080-2100 periods calculated as in Fig. S2; each row is the result for a different model. column c) shows the differences between column b) and a).