

## **7 Supplementary Material**

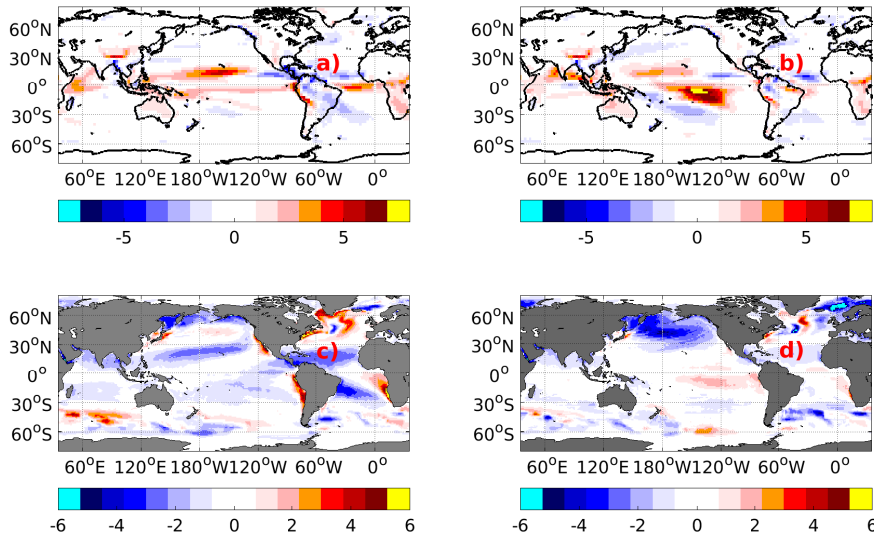


Fig. S1: SST and precipitation biases in CTRL and ACPL as in figure 1, but shown globally.

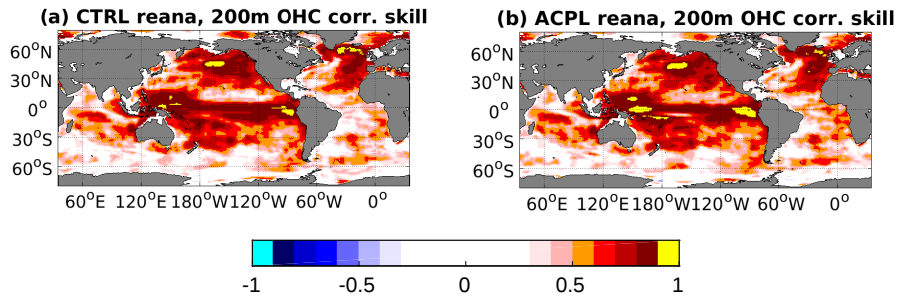


Fig. S2: Correlations of monthly anomalies of upper 200m ocean heat content from the EN4 objective analysis with CTRL (a) and ACPL (b) reanalyses. Only correlations statistically significant at the 5% level are plotted.

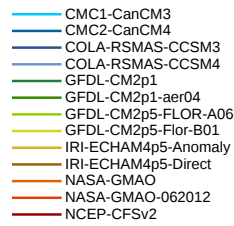


Fig. S3: Legend of the NMME systems used in Fig. 4.

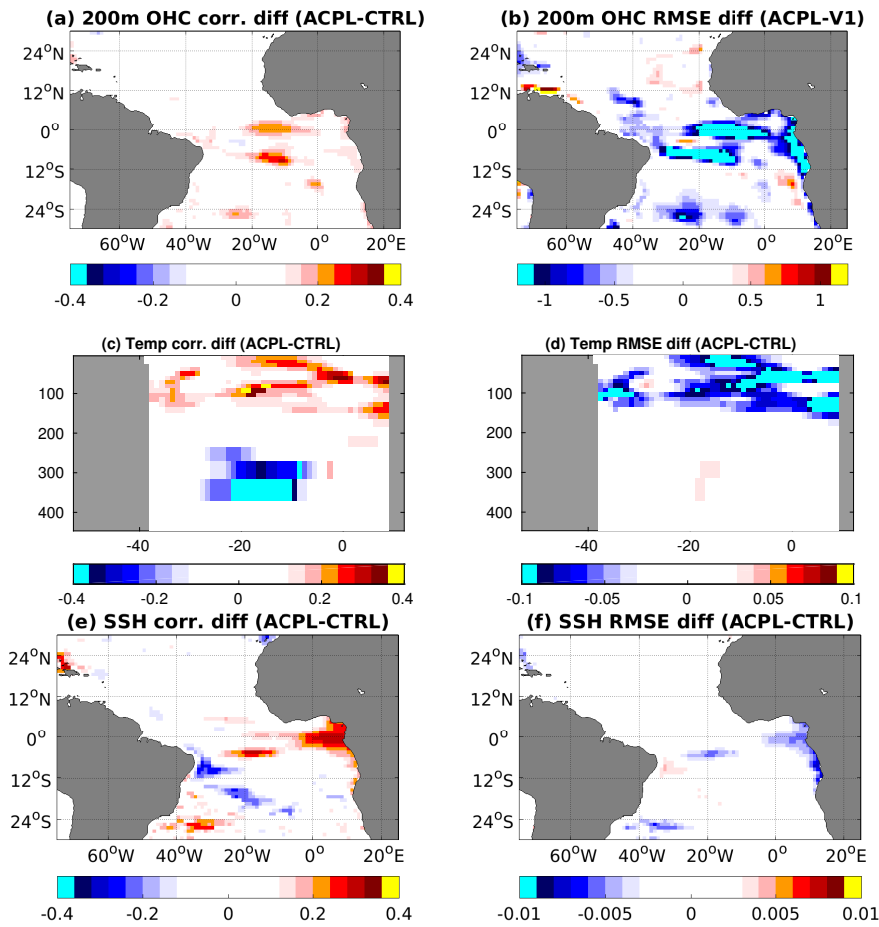


Fig. S4: As Figure 3 but with correlation difference (ACPL-CTRL) on the left and RMSE difference (ACPL-CTRL) on the right., first line is 200m ocean heat content, second is a temperature section across the equatorial Atlantic and last is for SSH.

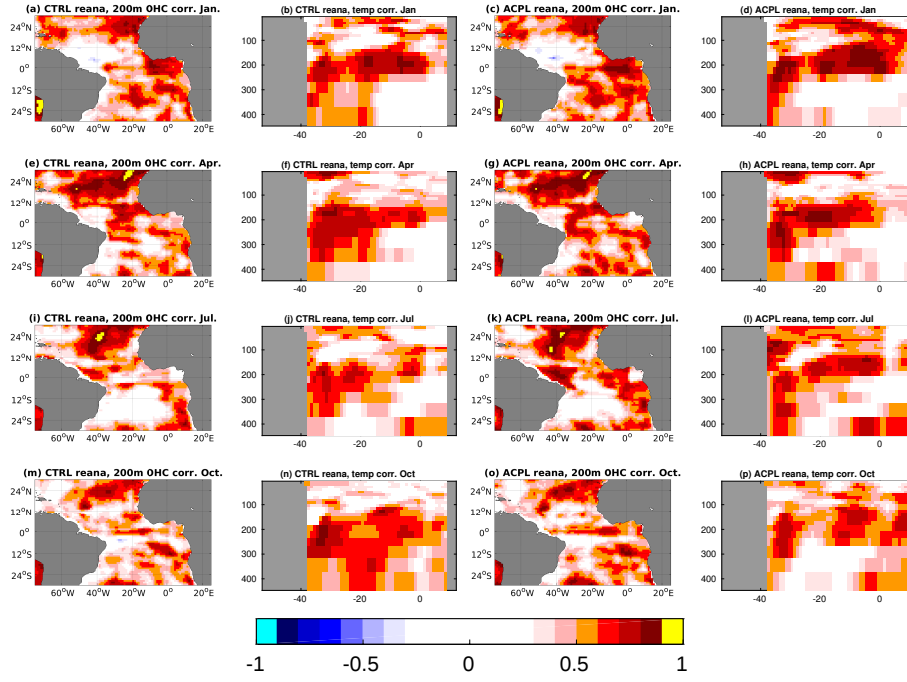


Fig. S5: The first (resp. third) column is the point-wise correlation of 200 m ocean heat content in EN4 objective analysis with CTRL reanalysis (resp. ACPL). The second (resp. 4) column shows the temperature correlation in the vertical along the tropical Atlantic band (between 3°S and 3°N) of EN4 objective analysis with CTRL (resp. ACPL) reanalysis. The first line is for January month, the second for April, the third for July and the last for October. Correlations that are not significant (at significance level of 5%) are masked.