

Geophysical Research Letters
Supporting Information for

**A predicted pause in the rapid warming of the Northwest Atlantic Shelf in
the coming decade**

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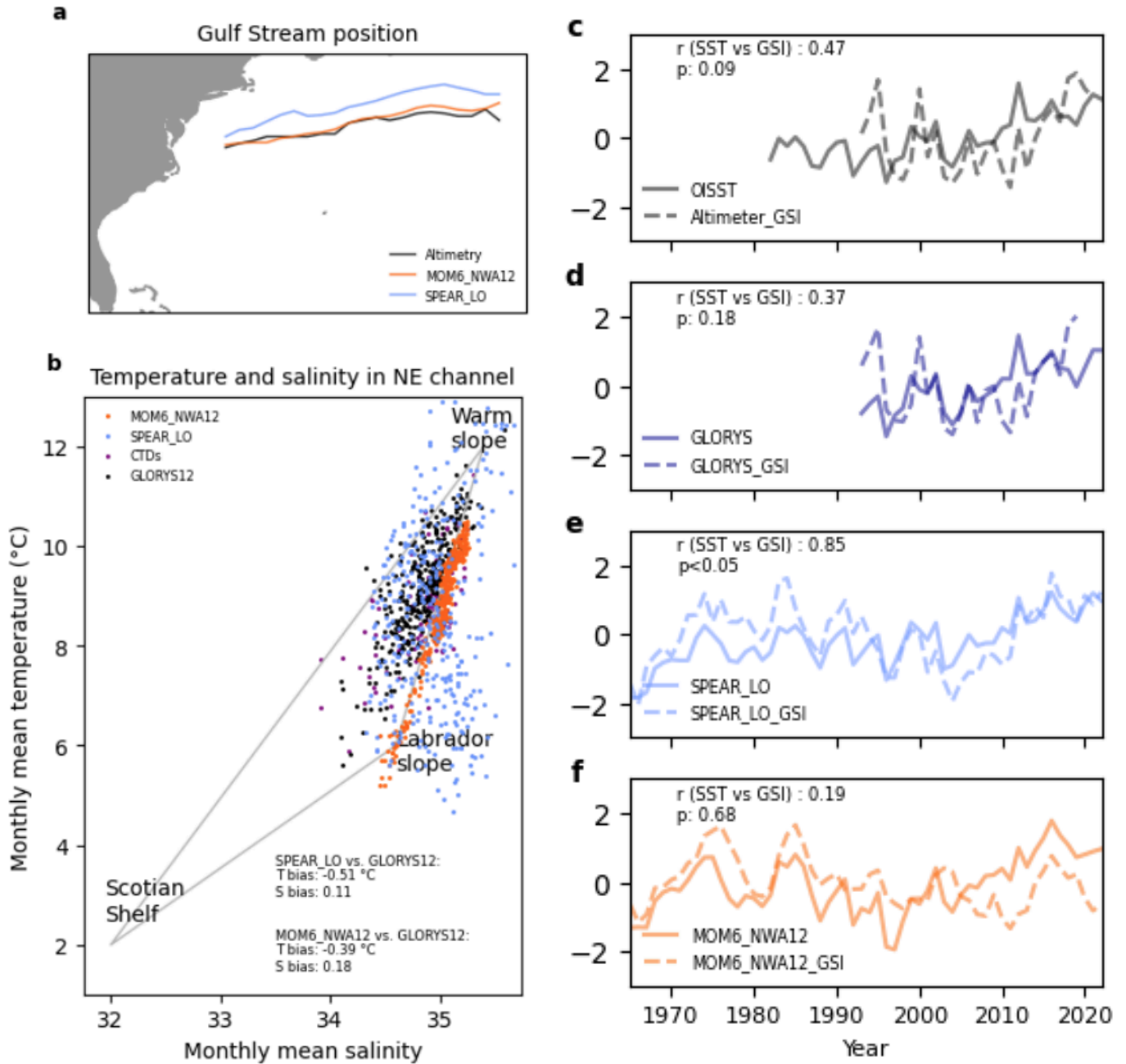


Figure S1: a. Mean position of the Gulf Stream from Altimetry, SPEAR_LO and MOM6_NWA12. b. Water mass diagram for the 150–200m mean T/S characteristics in the Northeast Channel. Time series of NEUS_LME SST anomalies and the Gulf Stream Index (GSI) from c. OISST (SST) and Altimeter (GSI) d. GLORYS e. SPEAR_LO and f. MOM6_NWA12. The correlation between the SST anomalies and GSI for the period 1993–2020 (for each pair) is also shown along with the corresponding p-value.

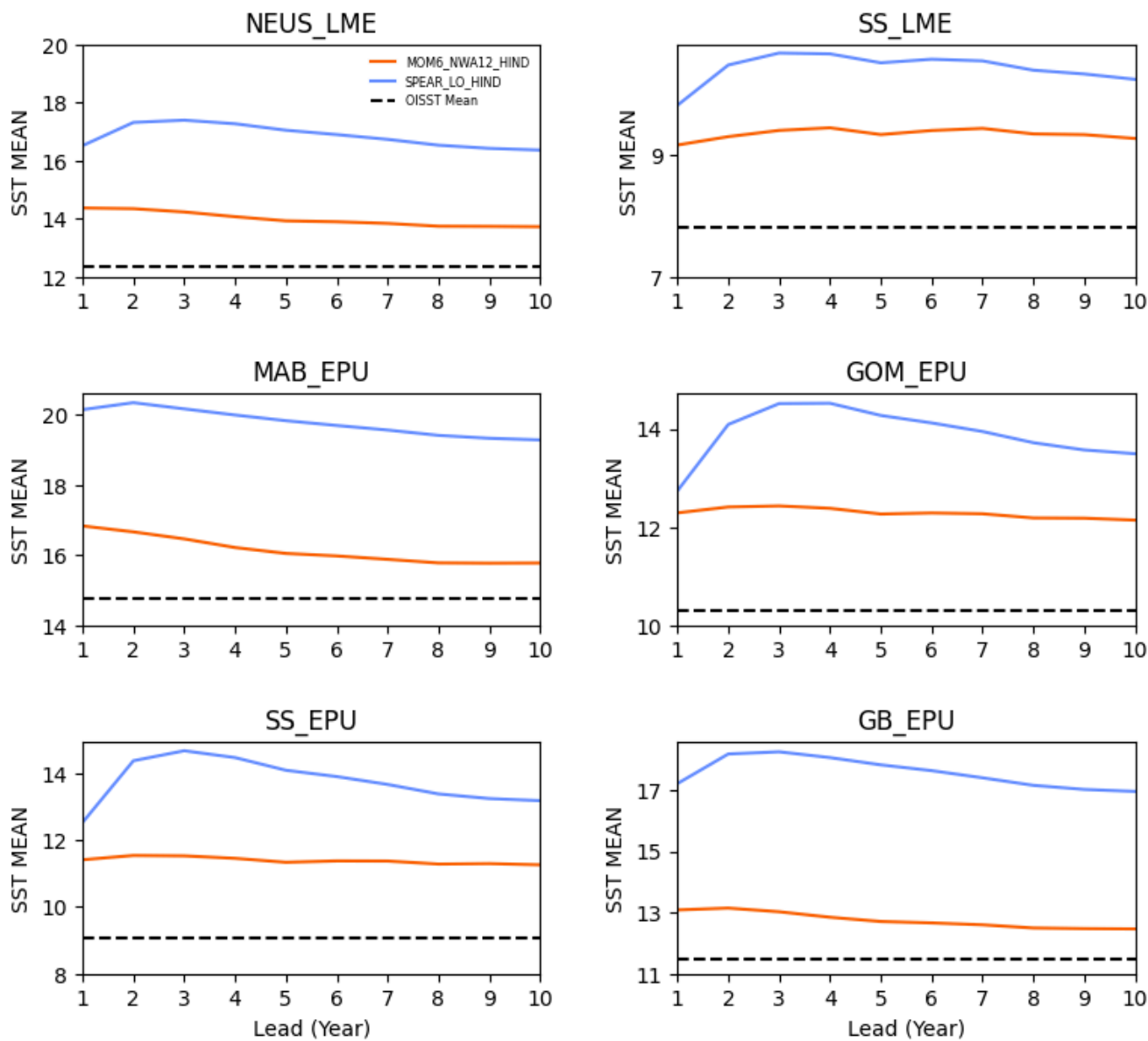


Figure S2: Evolution of lead time dependent 1982-2022 mean SST in SPEAR_LO_HIND and MOM6_NWA12_HIND for the two LMEs and four EPU's assessed. The dashed black lines show the corresponding OISST-based mean.

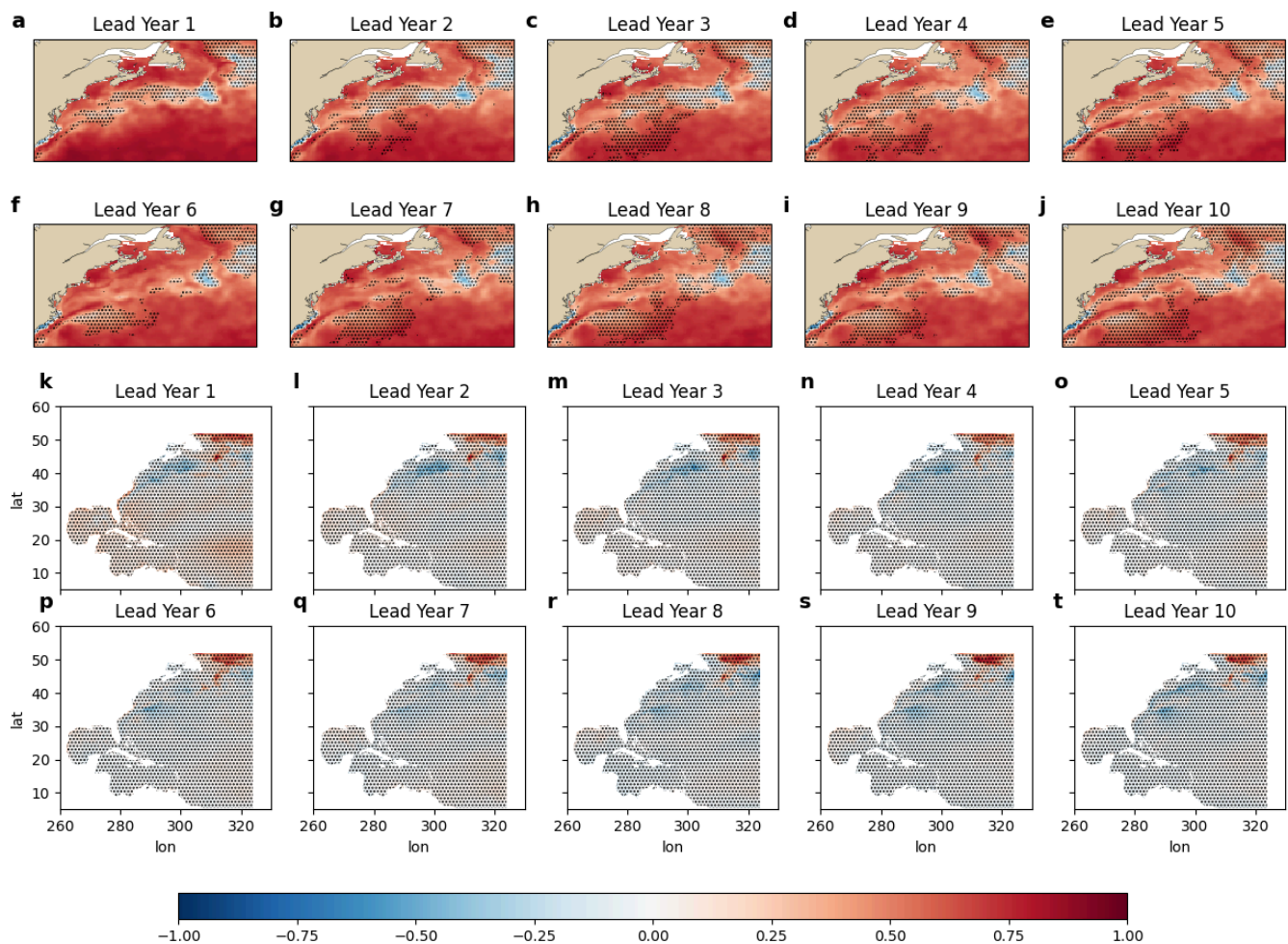


Figure S3: a-j. Correlation skill for retrospectively predicted ensemble mean annual sea surface temperature (SST) anomalies from the initialized MOM6_NWA12 model at various lead years verified against NOAA_OISST for the period 1982-2022. For grid point wise calculation of correlation, the MOM6_NWA12 SST anomalies were regridded to the coarser NOAA_OISST grid resolution. The stippling represents correlation coefficients that are not statistically significant at 90% confidence using a t-test and by taking auto-correlation into account. k-t Difference between correlation skill from the initialized and the uninitialized MOM6_NWA12 model predictions (MOM6_NWA12_HIND minus MOM6_NWA12_HIST) at various lead years. Both the initialized and the uninitialized MOM6_NWA12 model predictions were verified against NOAA_OISST for the period 1982-2022. The stippling indicates those grid cells where the difference between the initialized and uninitialized skill is not statistically significant at 90% confidence using the bootstrap approach.

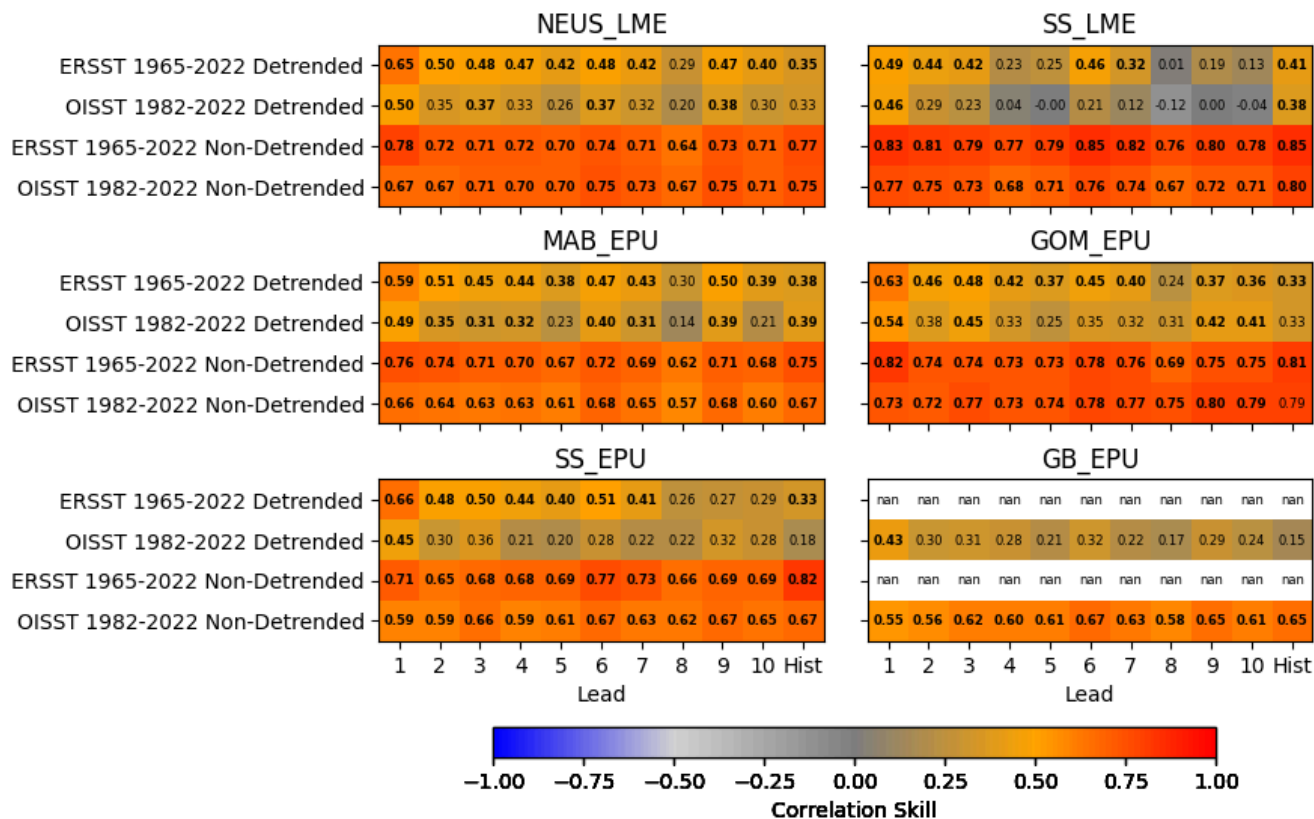


Figure S4: Correlation coefficient between the MOM6_NWA12_HIND based sea surface temperature predictions and two reference datasets, NOAA_OISST and ERSST for different time periods based on raw and linearly detrended time series. The bold numbers denote statistically significant correlations at 90% confidence based on the t-test and by taking autocorrelation into account. Correlation skill is shown for all the six regions assessed in the main text. The correlation skill for GB_EPU from hindcast versus ERSST is not shown because the coarse resolution ERSST (2°x2°) does not correctly mask onto the region delimited by GB_EPU.

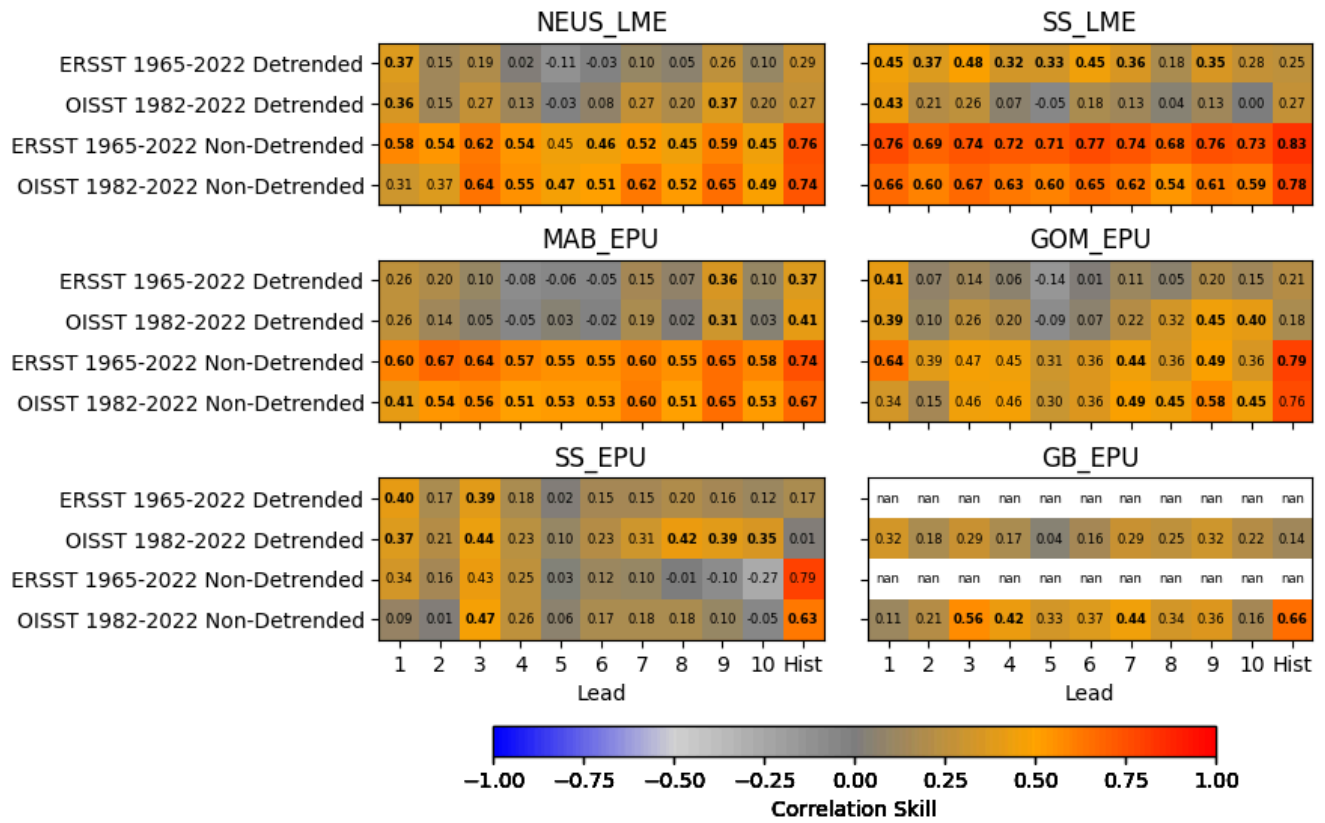


Figure S5: As in Fig. S6, but for SPEAR_LO_HIND.

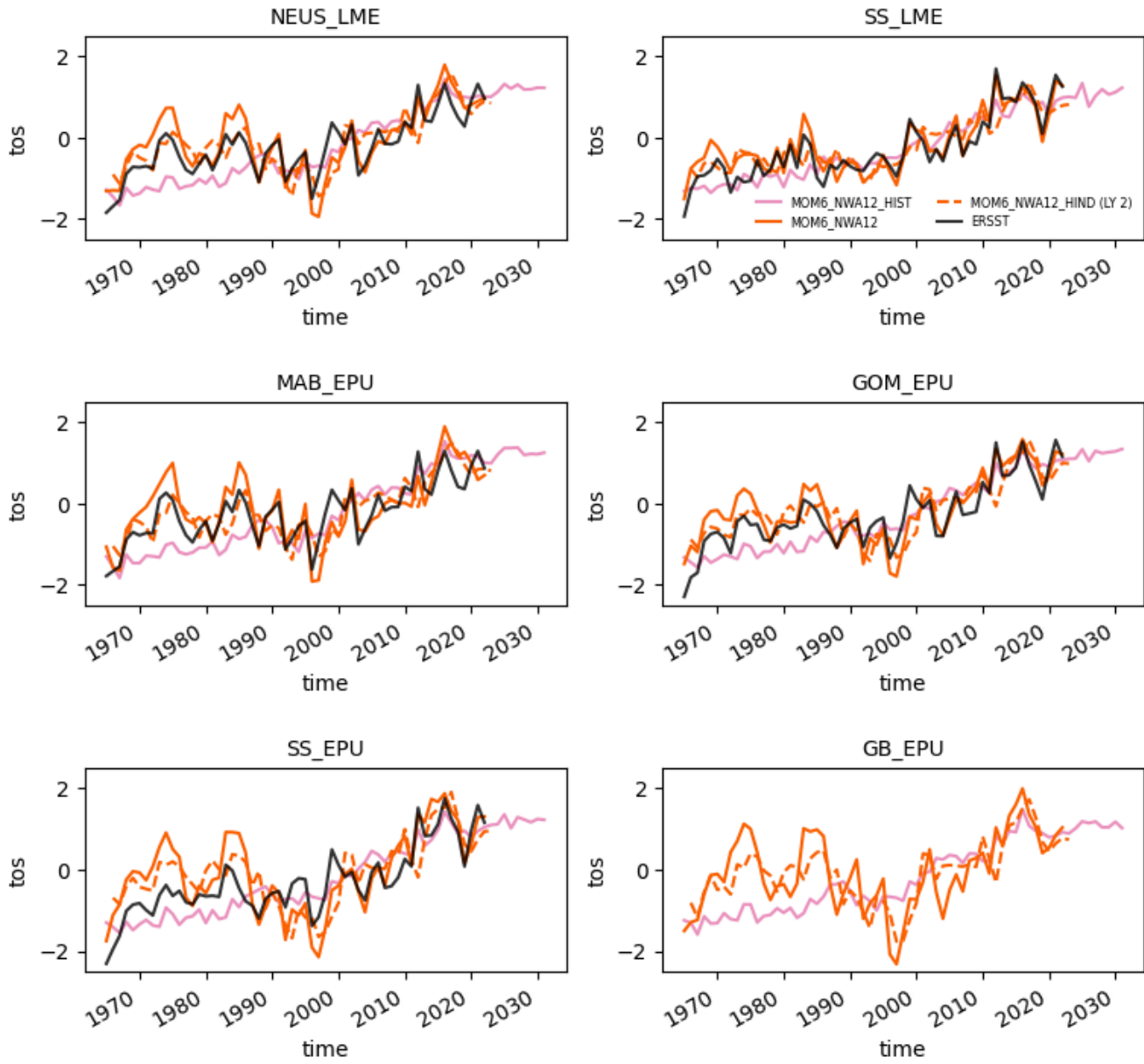


Figure S6: The time series of sea surface temperature anomalies from the ERSST (black line), the 10-member initialized MOM6_NWA12 reanalysis (solid orange line), MOM6_NWA12_HIND predictions at the second lead year (dashed orange line), and the uninitialized MOM6_NWA12_HIST simulation (pink line). The six regions are as defined in Fig 2 in the main text.

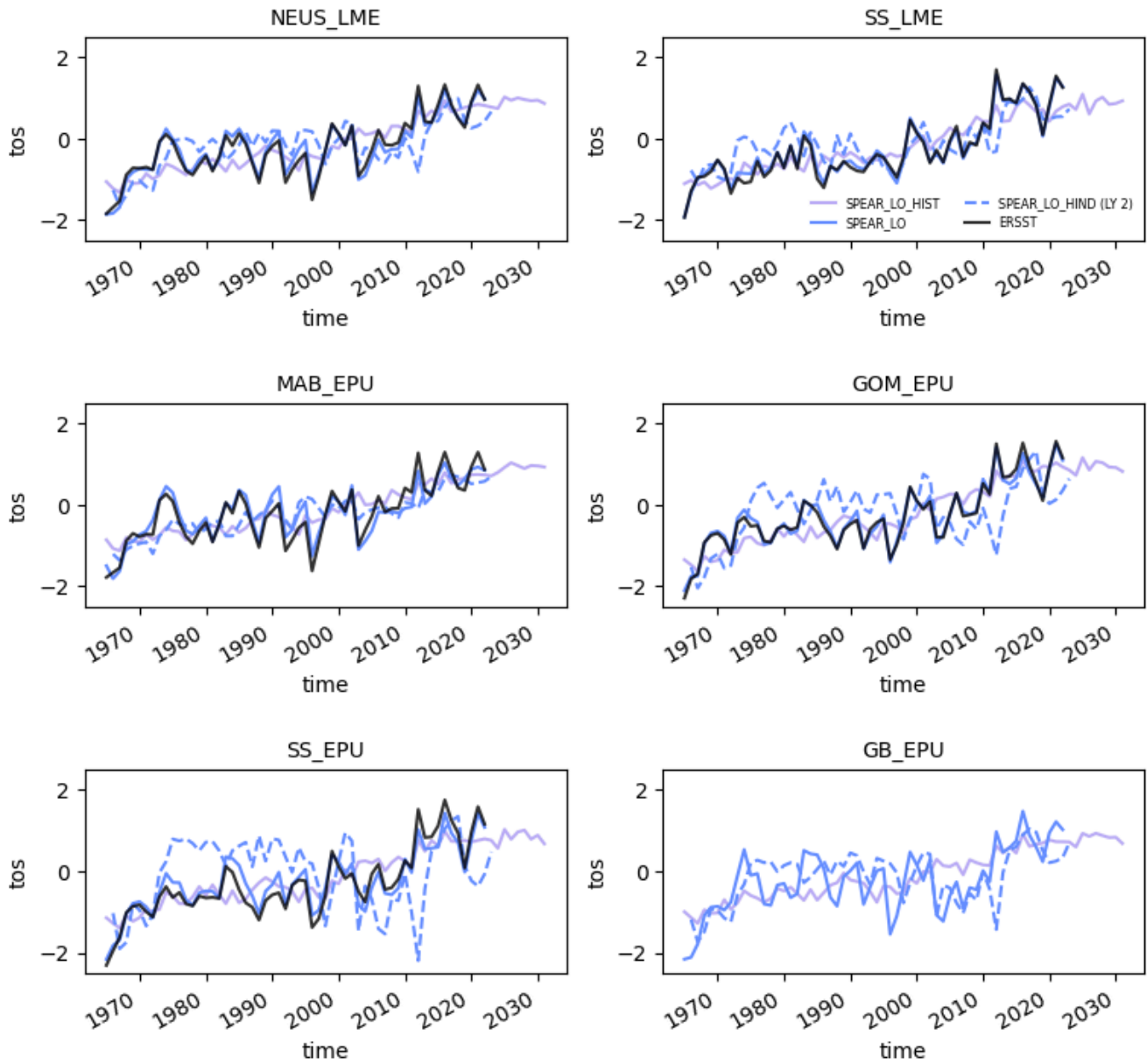


Figure S7: As in Fig. S8, but for SPEAR_LO_HIND and SPEAR_LO_HIST.

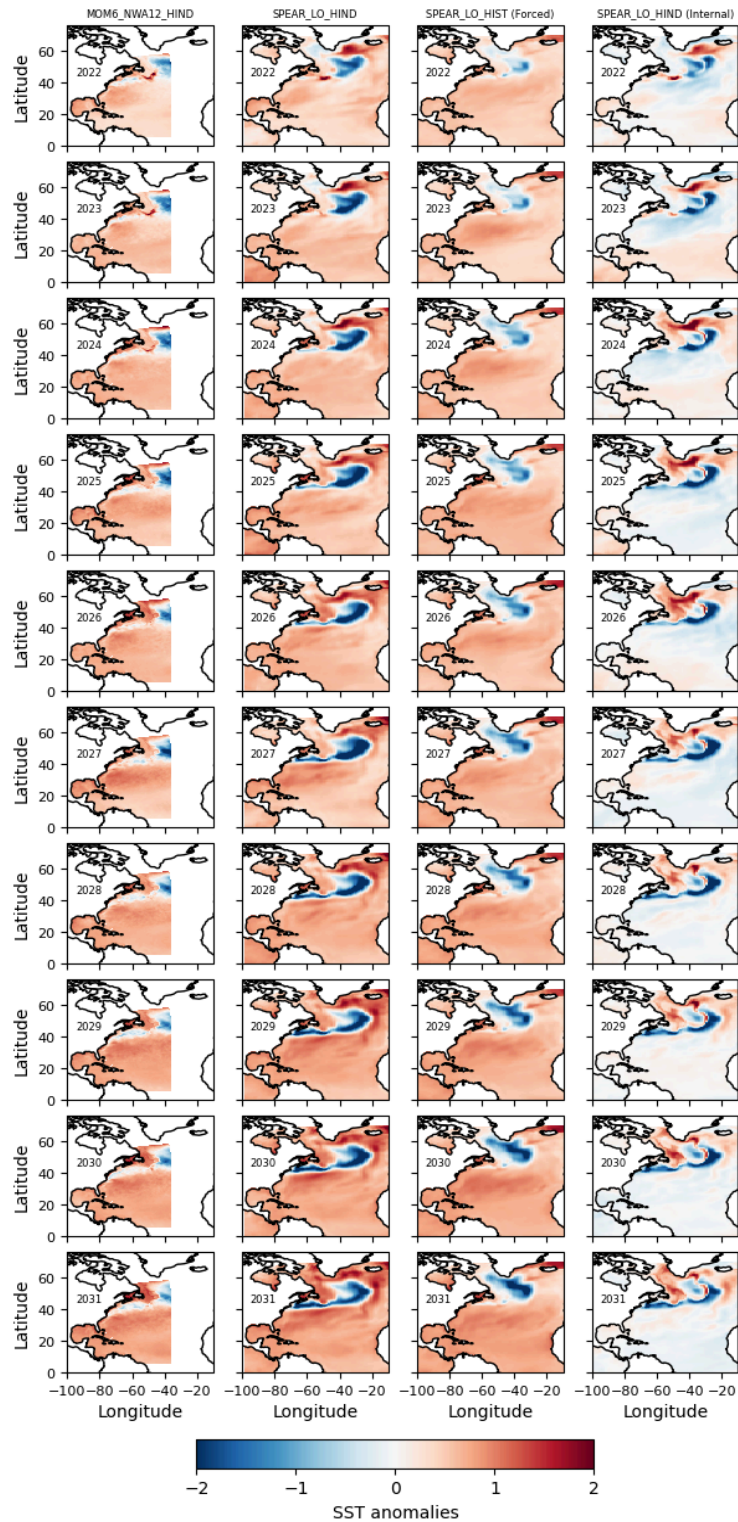


Figure S8: Forecast of ensemble mean annual sea surface temperature anomalies for the years 2022 to 2031 from the MOM6_NWA12_HIND, SPEAR_LO_HIND, SPEAR_LO_HIST (forced response) and SPEAR_LO_HIND (internal component). This 10-year long forecast was initialized on 1st January, 2022. The anomalies are shown with respect to the 1982–2022 mean.

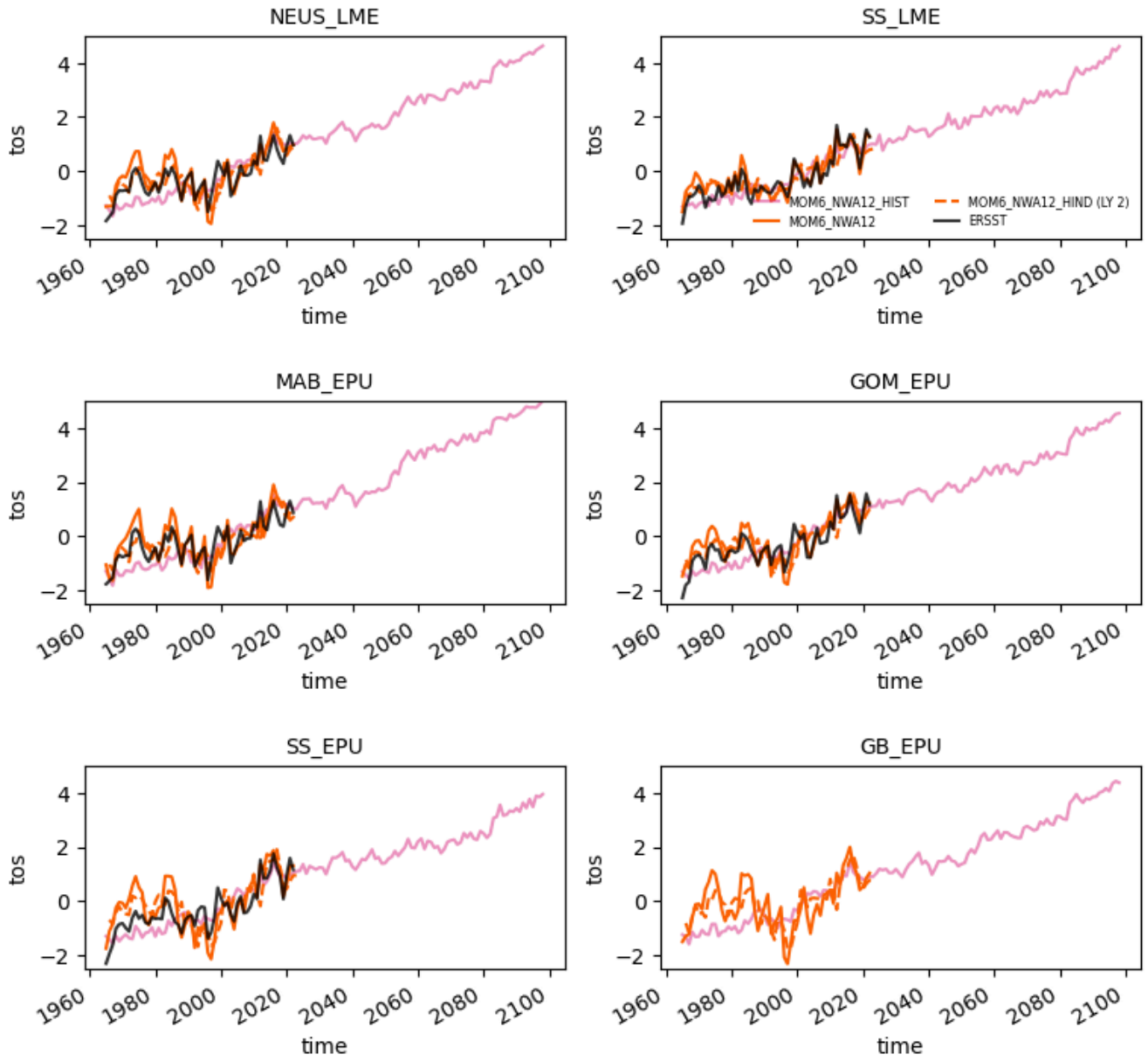


Figure S9: As in Fig. S7 but with the downscaled historical simulation (MOM6_NWA12_HIST) extended until the end of this century.