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Supplement of

Assessment of responses of North Atlantic winter sea surface temperature to the North Atlantic Oscillation on an interannual scale in 13 CMIP5 models

Yujie Jing et al.

Correspondence to: Yangchun Li (lych@mail.iap.ac.cn)

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Supplement

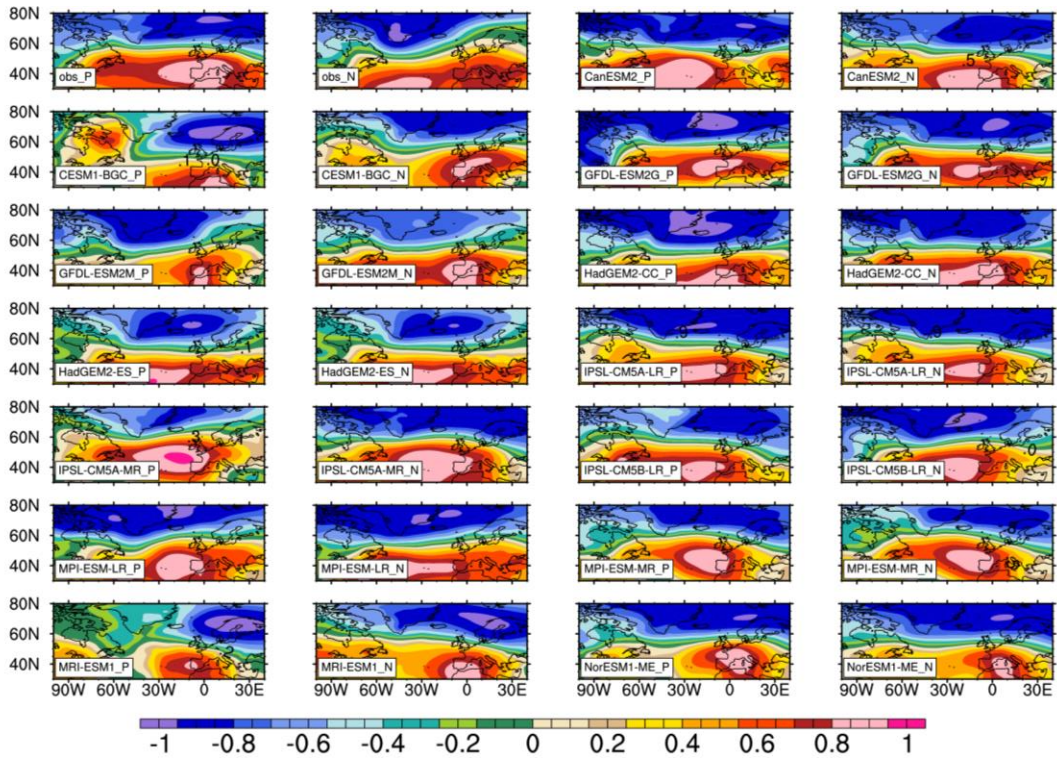
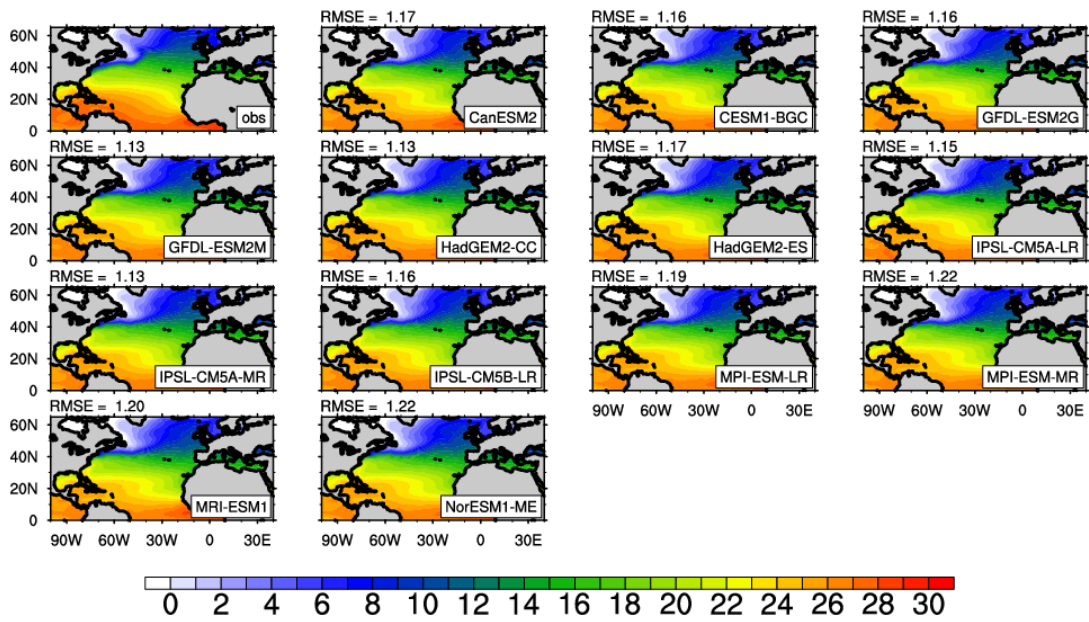
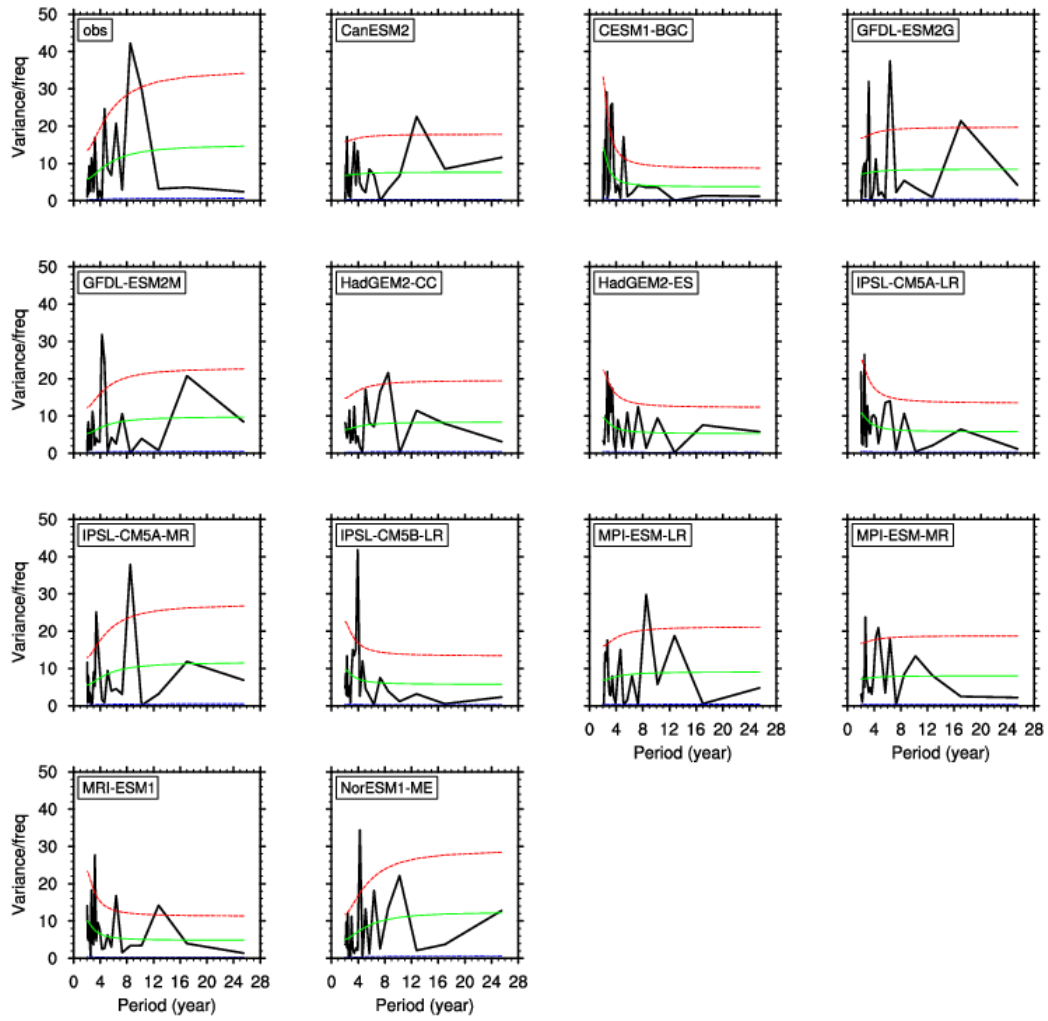


Figure S1 EOF1 of the observed and simulated standardized winter-averaged sea level pressure over the particular region of the North Atlantic (30 -80°N; 100°W-40°E) during the negative phase period (model-N) and the positive phase period (model-P). The simulated results are based on historical experiment of CMIP5 (rli1p1).

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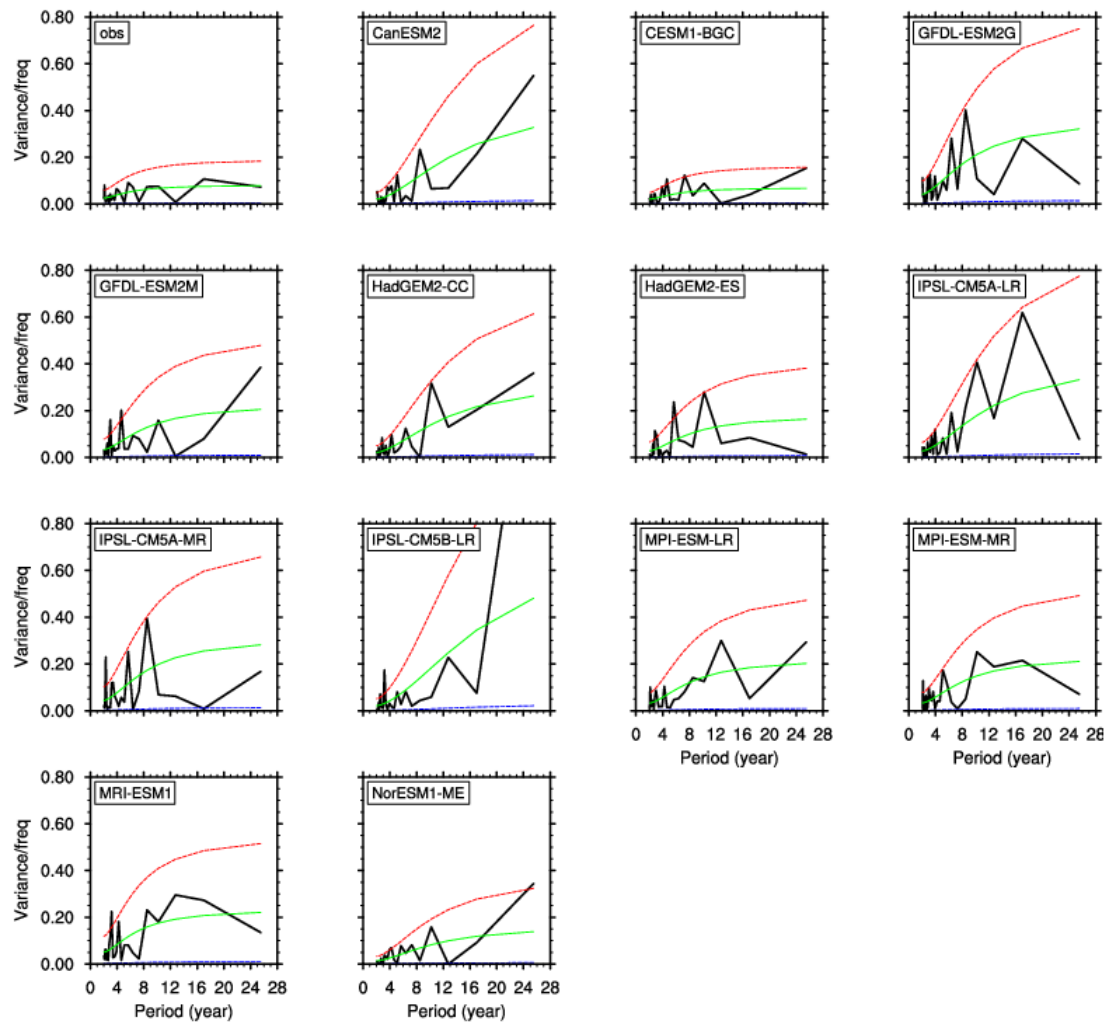


10 Figure S2 The observed and simulated winter-averaged multi-year mean SST (°C) in the North Atlantic (NA) (0-65°N). The time periods for the observation and models range from 1965 to 2015 and 1955 to 2005, respectively. RMSE is the root-mean-square error (°C). The simulated results are based on historical experiment of CMIP5 (r1i1p1).



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Figure S3 Power spectrum of observation-based and model-based NAO indexes. The time ranges for observation-based and model-based NAO indexes are 1965–2015 and 1955–2005, respectively. The simulated results are based on historical experiment of CMIP5 (r1i1p1).



20 Figure S4 Same as Fig. S3 but for winter area-averaged SST anomalies in the subtropical region (25-45°N).

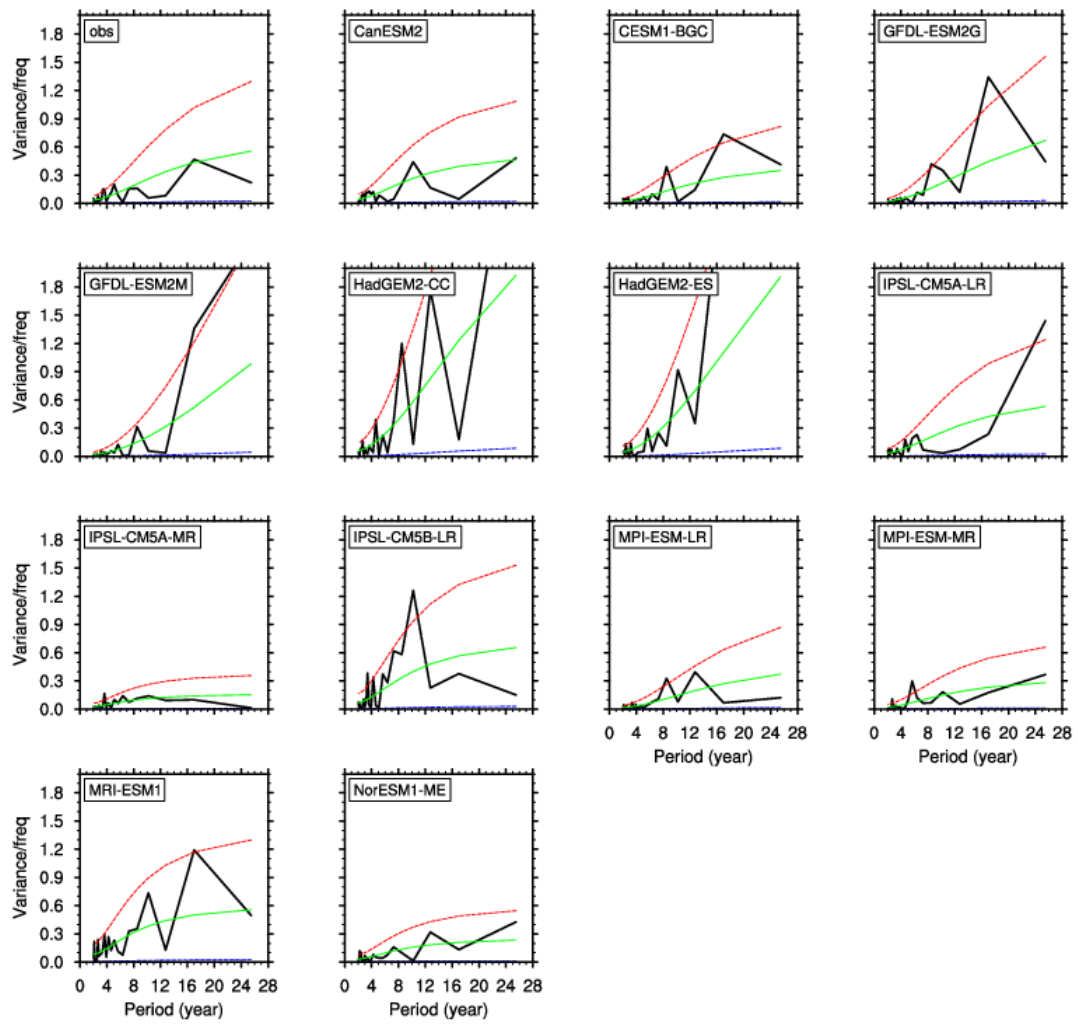
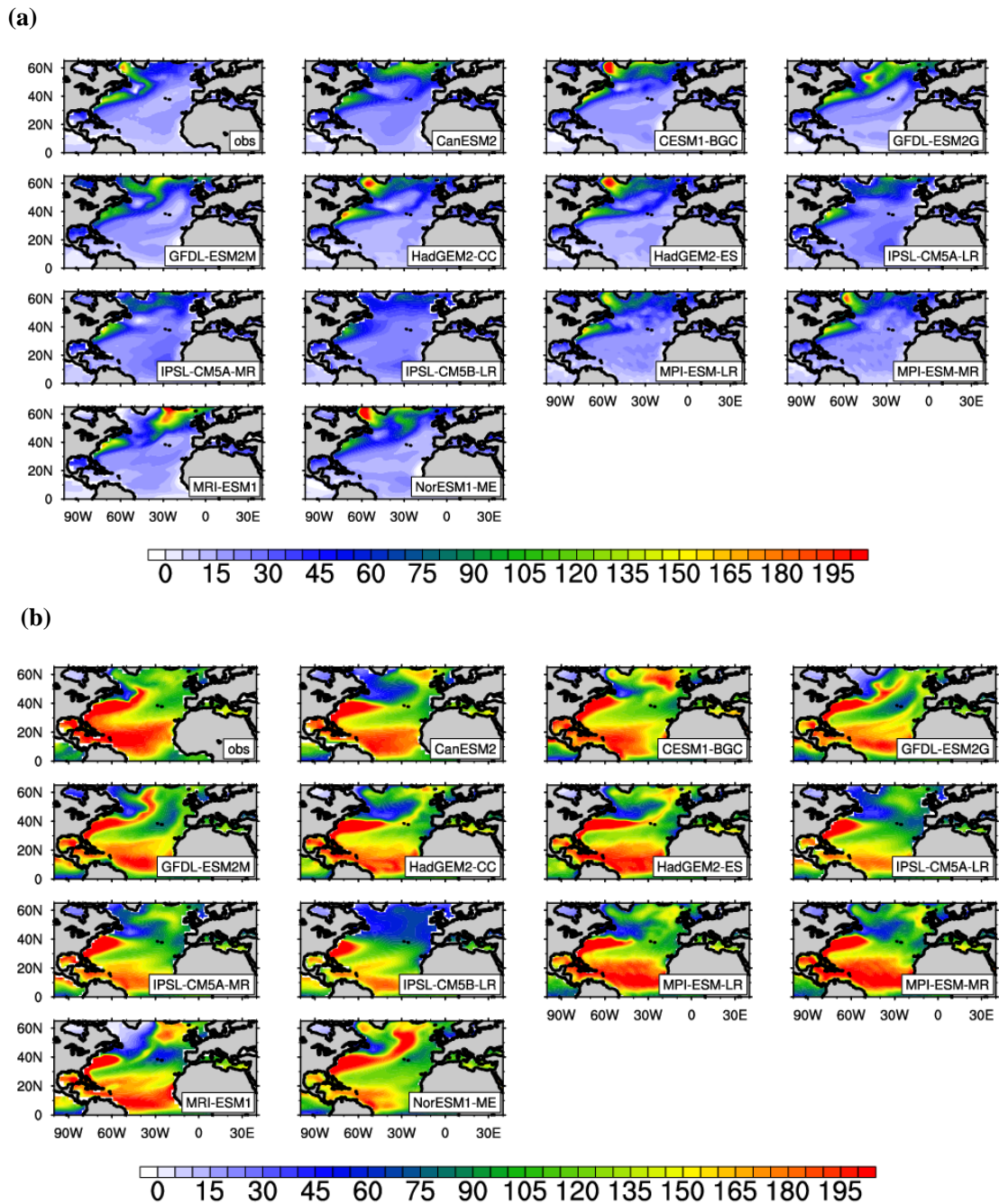
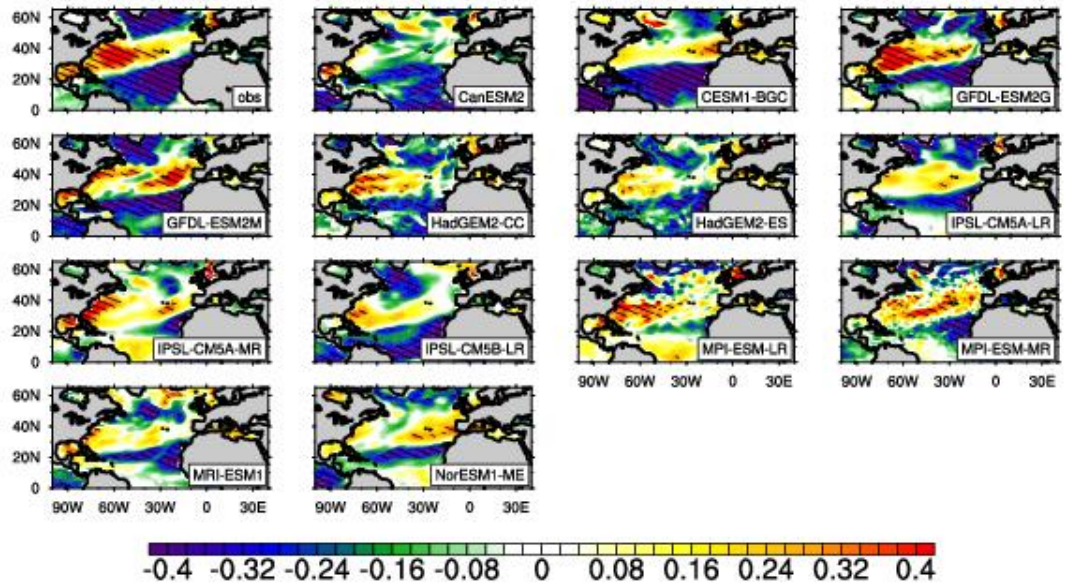


Figure S5 Same as Fig. S4 but for the subpolar region (45-65°N).

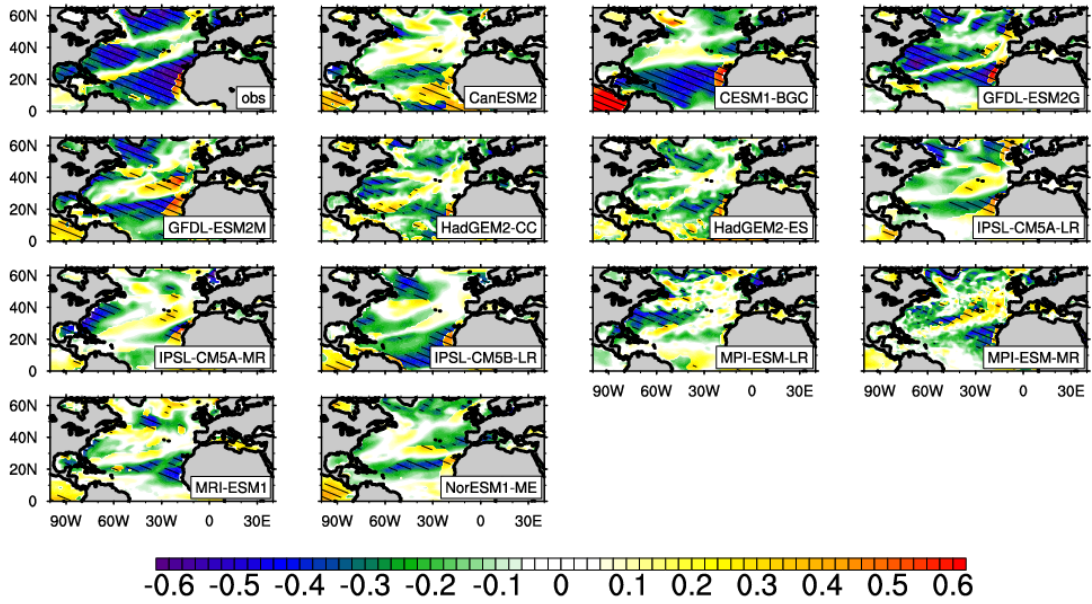


30 Figure S6. The observed and simulated multi-year mean sensible (a, SHF) / latent heat flux (b, SLF) (Wm^{-2}) in winter. The time periods for the observation and models range from 1965 to 2015 and 1955 to 2005, respectively. The simulated results are based on historical experiment of CMIP5 (r1i1p1).



40 Figure S7 Standardized regression coefficients (RCs) of the winter-averaged SST anomalies against the NAO indexes (without data filtering). Shaded areas indicate that RCs are statistically significant at the 95% confidence level of the Student's t-test. The obs is the RCs of observed SST to the NAO indexes provided by NCAR. The time periods for the observation and models range from 1965 to 2015 and 1955 to 2005, respectively. The simulated results are based on historical experiment of CMIP5 (r1i1p1).

(a)



(b)

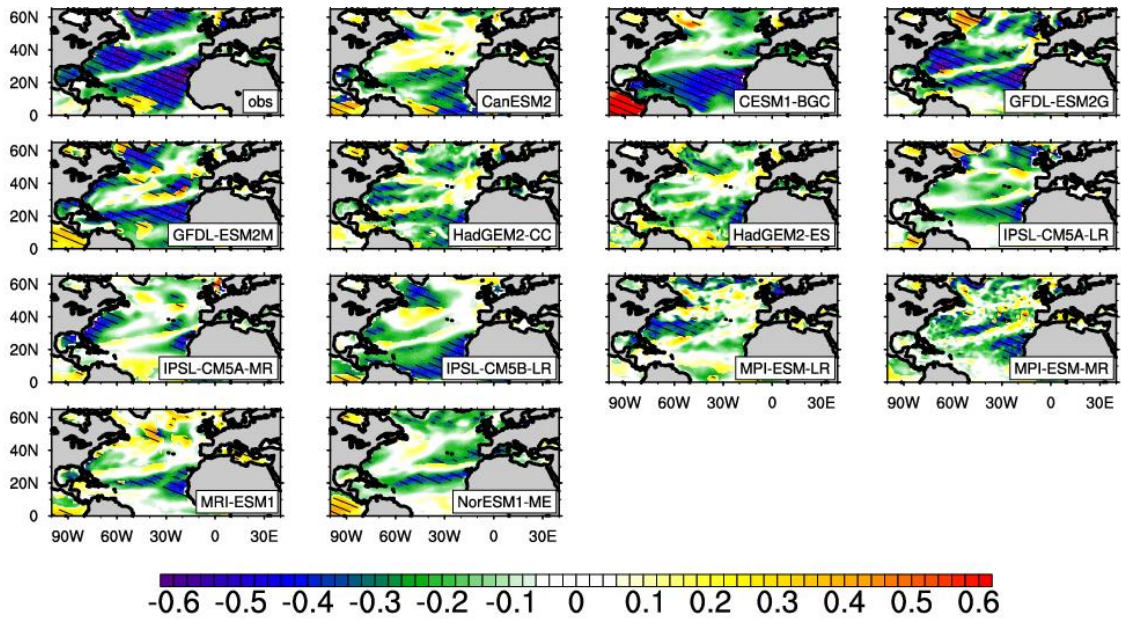


Figure S8 Same as Fig. S7 but against the NAO-driven SHF (a) / LHF (b) anomalies (without data filtering).

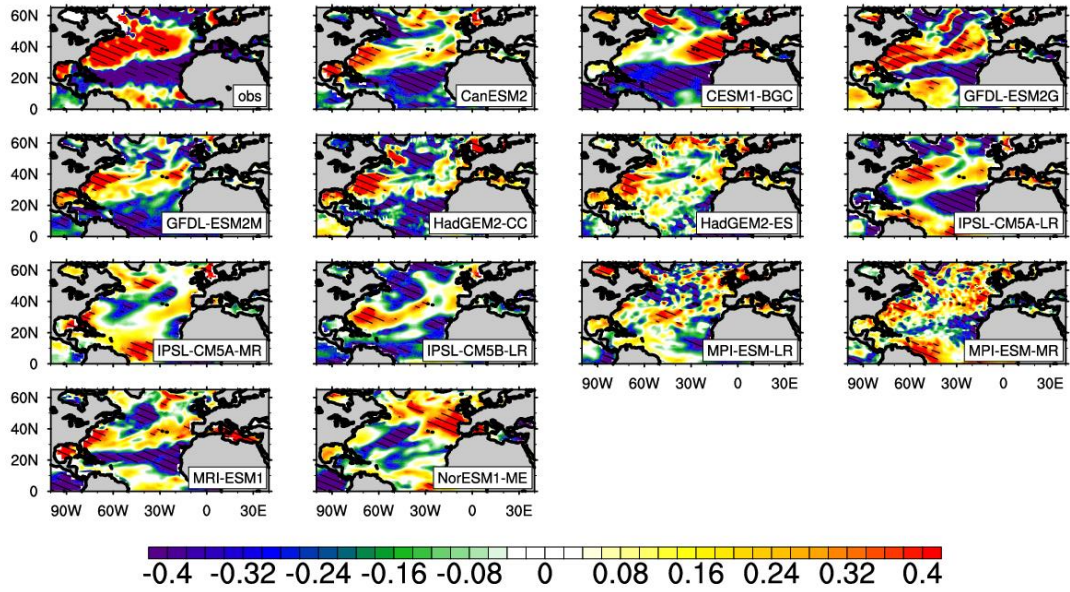
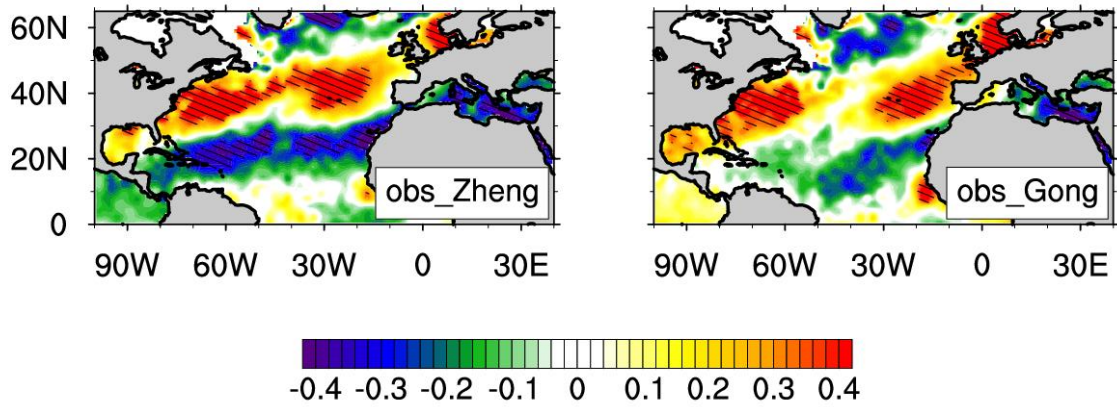
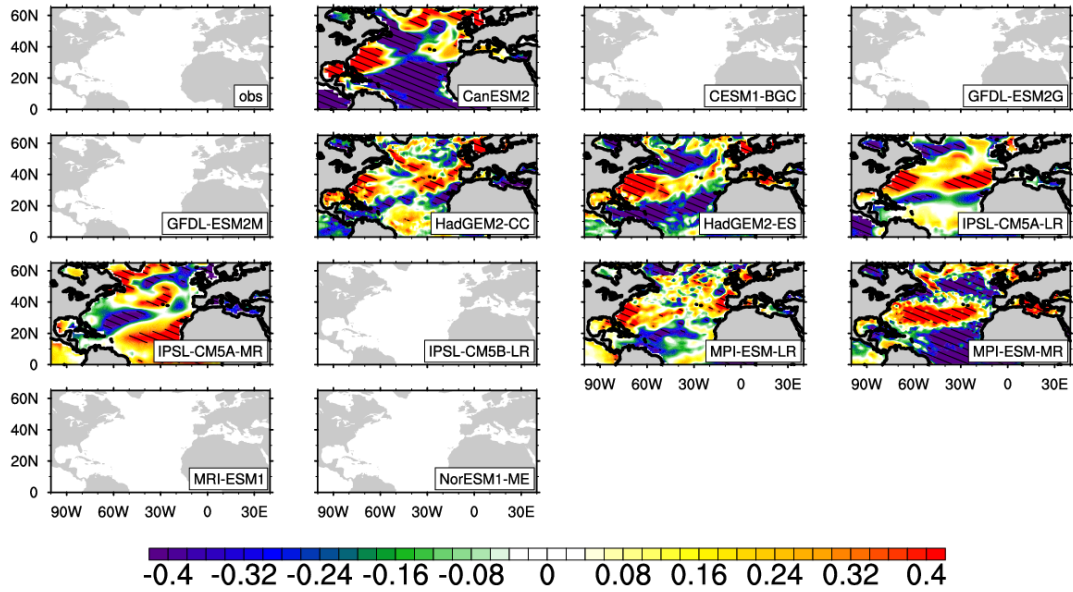


Figure S9 Same as Fig. S7 but with 2-4 years data filtering

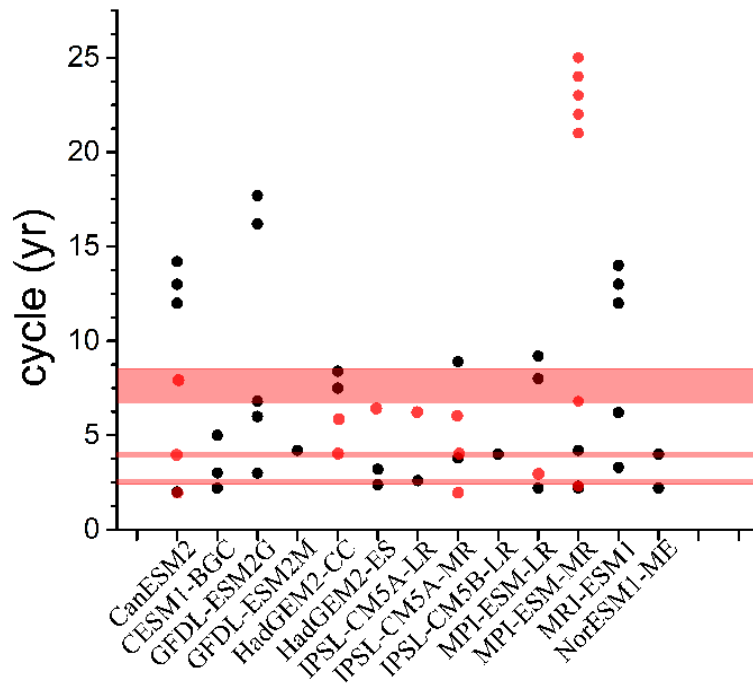


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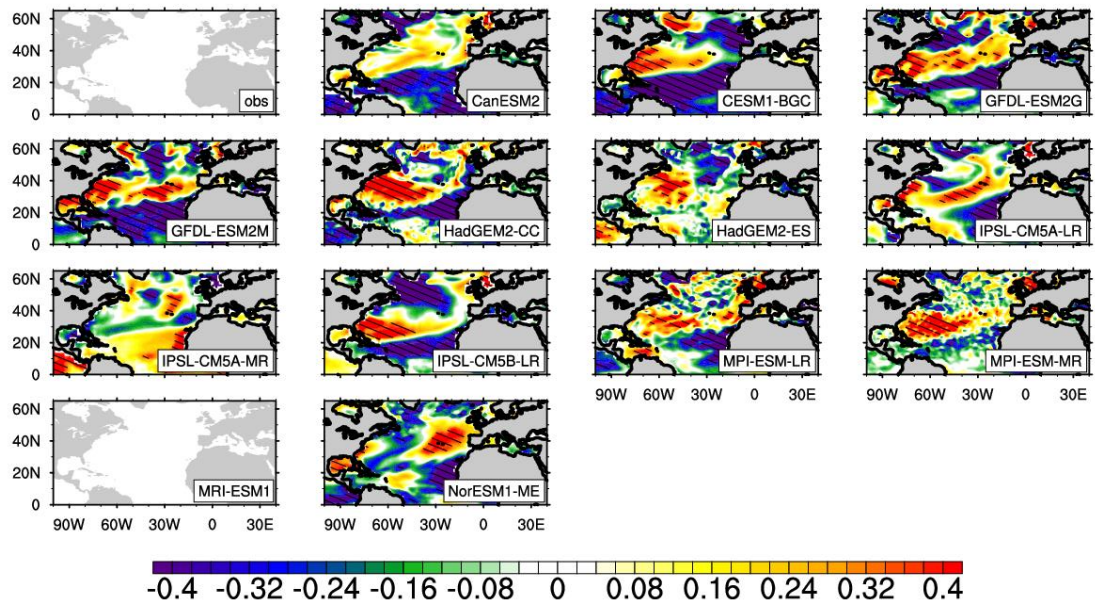
Figure S10 Same as Fig. S7 but against the NAO indexes defined by Gong and Wang (2000)'s and Zheng et al. (2013)'s method from the observation on the interannual scale (with 2-6 years data filtering).



60 Figure S11 Same as Fig. S7 but with 2-6 years data filtering and for model output from the historical experiment of CMIP5 (r3i1p1).



65 Figure S12 Periodicities of the observed and simulated winter-averaged NAO indexes determined by power spectrum analysis. The periodicities are determined by calculating the red noise confidence interval and choosing those at the 90% confidence level. The Y coordinate of the horizontal lines / areas is the significant period of observation. The time periods for the observation and models range from 1965 to 2015 and 1955 to 2005, respectively. The black spots
 70 are simulated results based on historical experiment of CMIP5 (r1i1p1), the red spots are simulated results based on historical experiment of CMIP5 (r3i1p1).



75 Figure S13 Same as Fig. S11 but for the last 51 years of the model output from the Picontrol experiment of CMIP5.

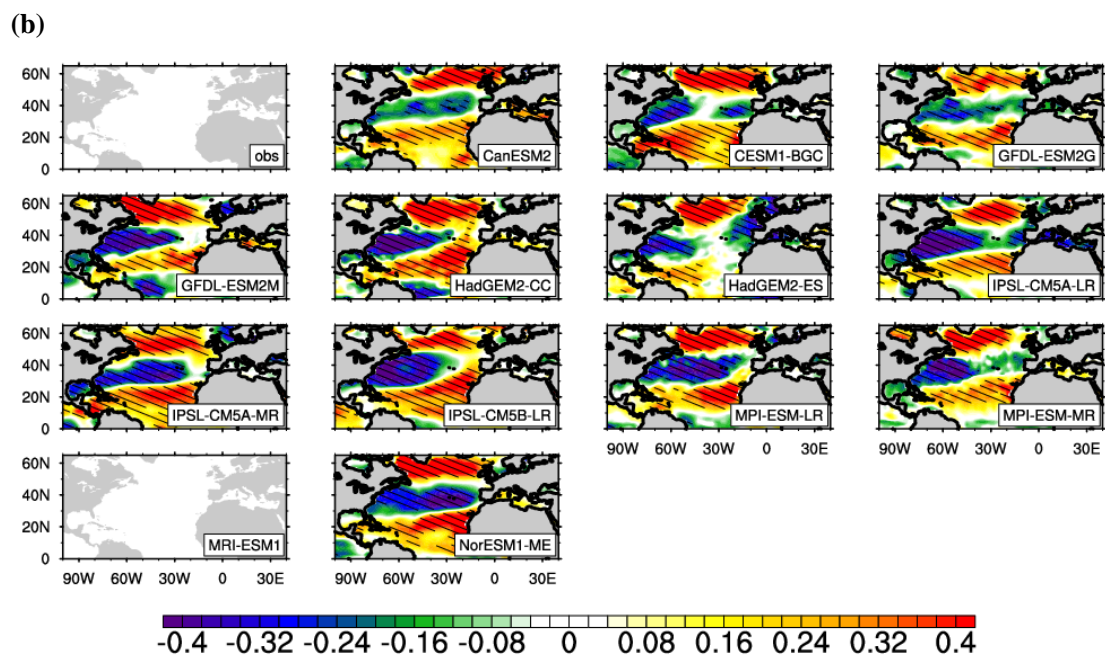
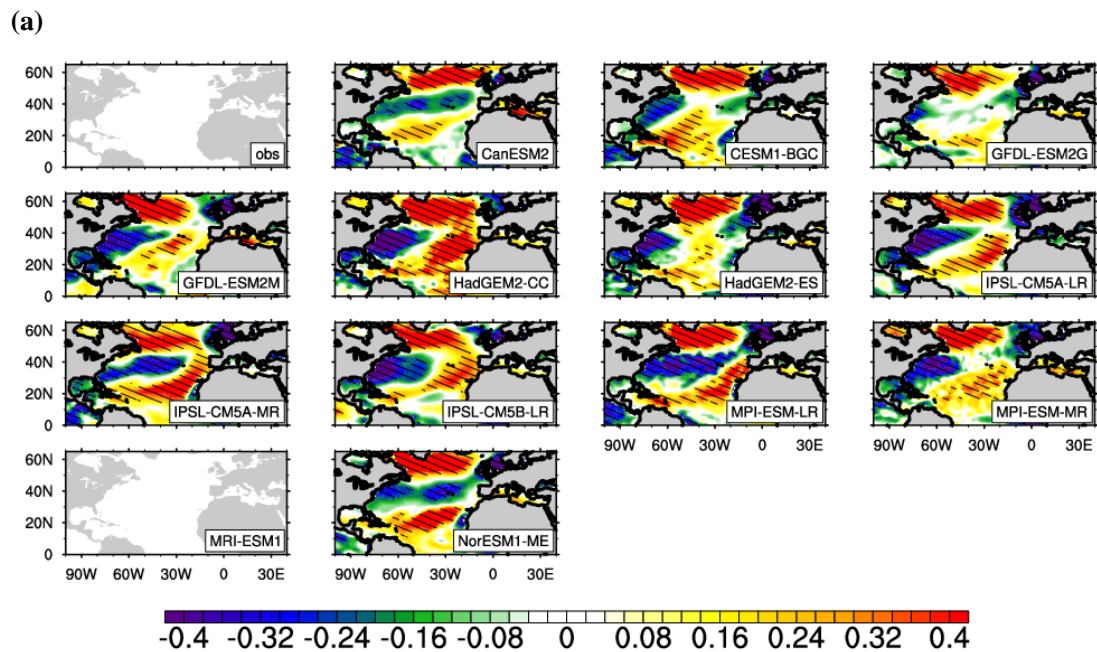


Figure S14 Standardized regression coefficients (RCs) of the winter-averaged SHF (a) / LHF (b) anomalies against the NAO indexes for the last 51 years of the model output from the Picontrol experiment of CMIP5 on the interannual scale (with 2-6 years data filtering).