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Supporting Information for

No Internal Connections Detected Between Low Frequency Climate Modes in North Atlantic and North Pacific Basins

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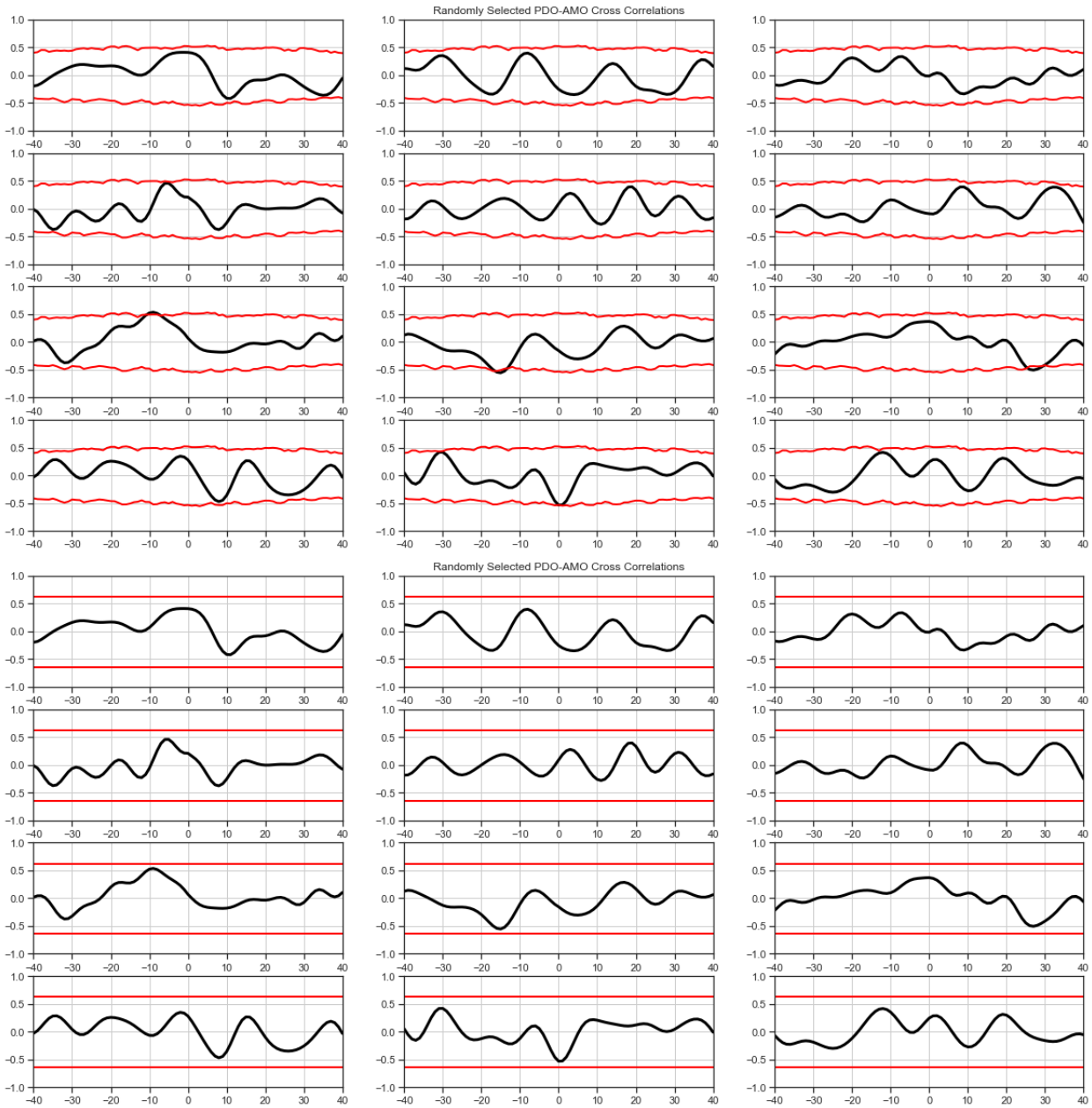
Additional Supporting Information (Files uploaded separately)

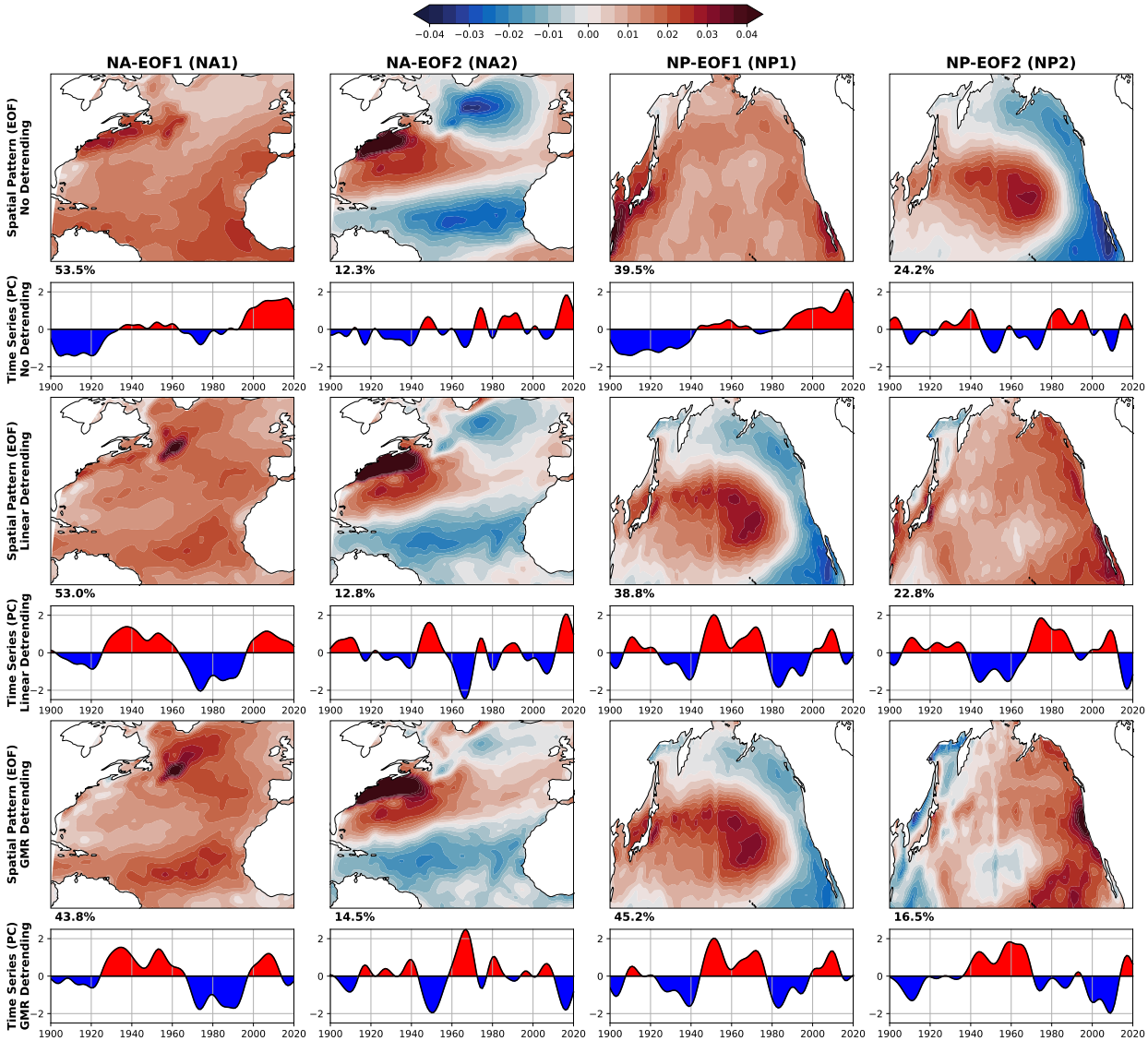
None

Modeling Center	CCCma	CESM	CSIRO	GFDL	GFDL	MPI	UKMO (Obs.)
Model Version	CanESM2	CESM1-CAM5	MK3.6	CM3	ESM2M	MPI-ESM-LR	HadISST1
Initialization Method	Macro/Micro	Micro	Macro	Micro	Macro	Macro	-----
# of Ensemble Members	50	39	30	20	30	100	-----
Latitude Resolution (grid points)	2.75° (64)	<1° (192)	1.85° (96)	2° (90)	2° (90)	1.875° (96)	1° (180)
Longitude Resolution (grid points)	2.8125° (128)	1.25° (288)	1.875° (192)	2.5° (144)	2.5° (144)	1.875° (192)	1° (360)
Start Year	1950	1920	1850	1920	1950	1850	1870
PI Length	296 years	319 years	500 years	200 years	200 years	281 years	-----

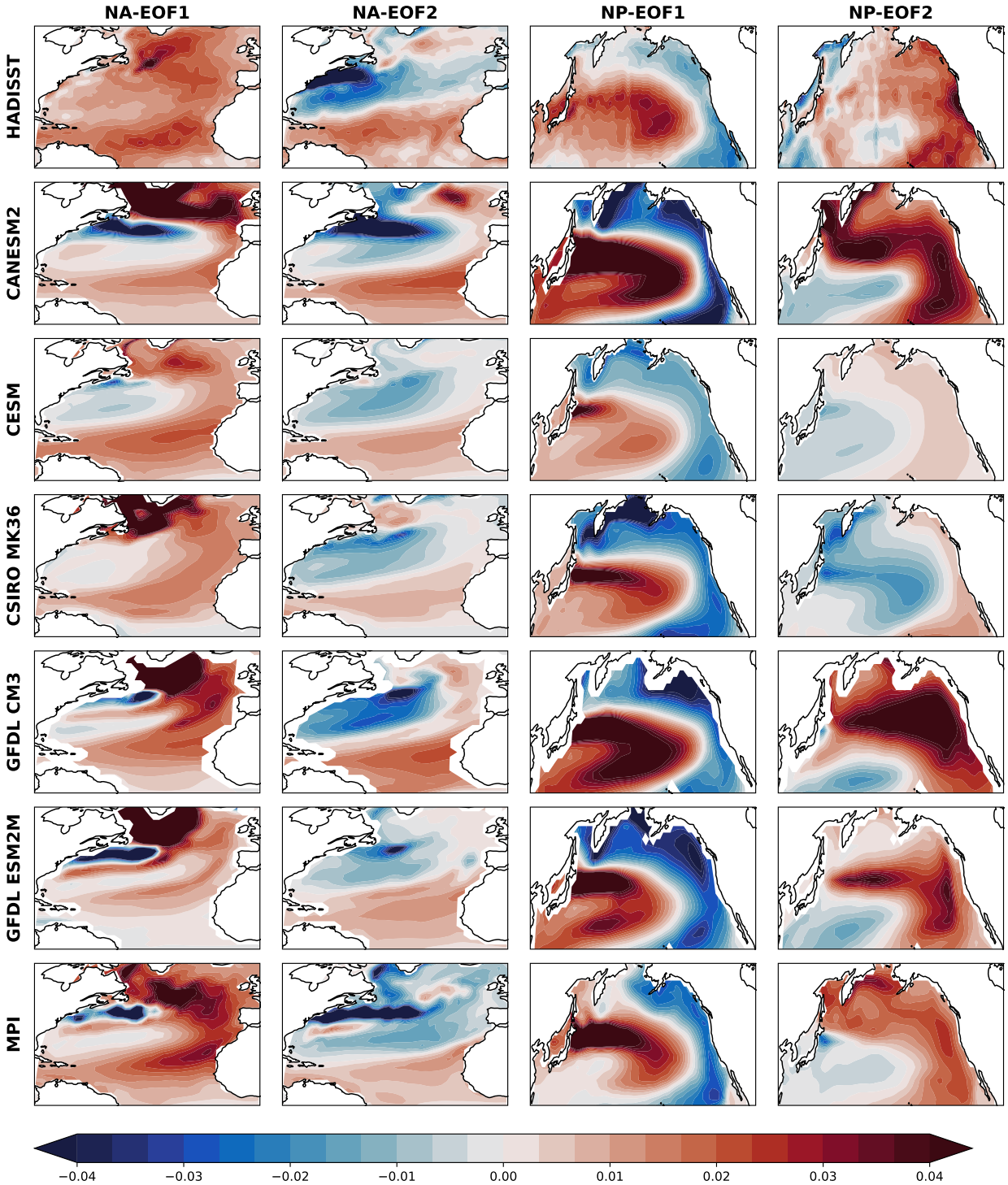
Table 1. Details of the six large ensembles from the MMLEA and observations used in this study, adapted from Deser et al. (2020).



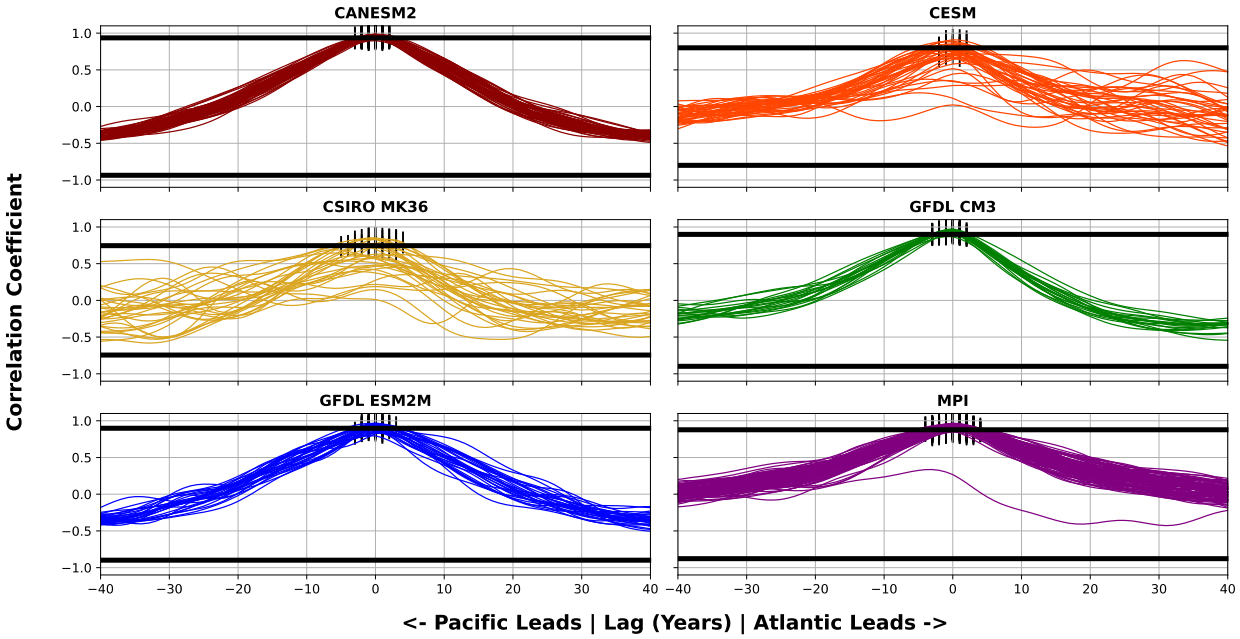
Supplemental Figure 1. Randomized NA1-NP1 (AMV-PDO) filtered phase randomized cross correlations shown with the point (first four rows) and peak (bottom four rows) statistical tests shown. 5 of 12 show significance with the point test, while 0 of 12 show significance with the peak test.



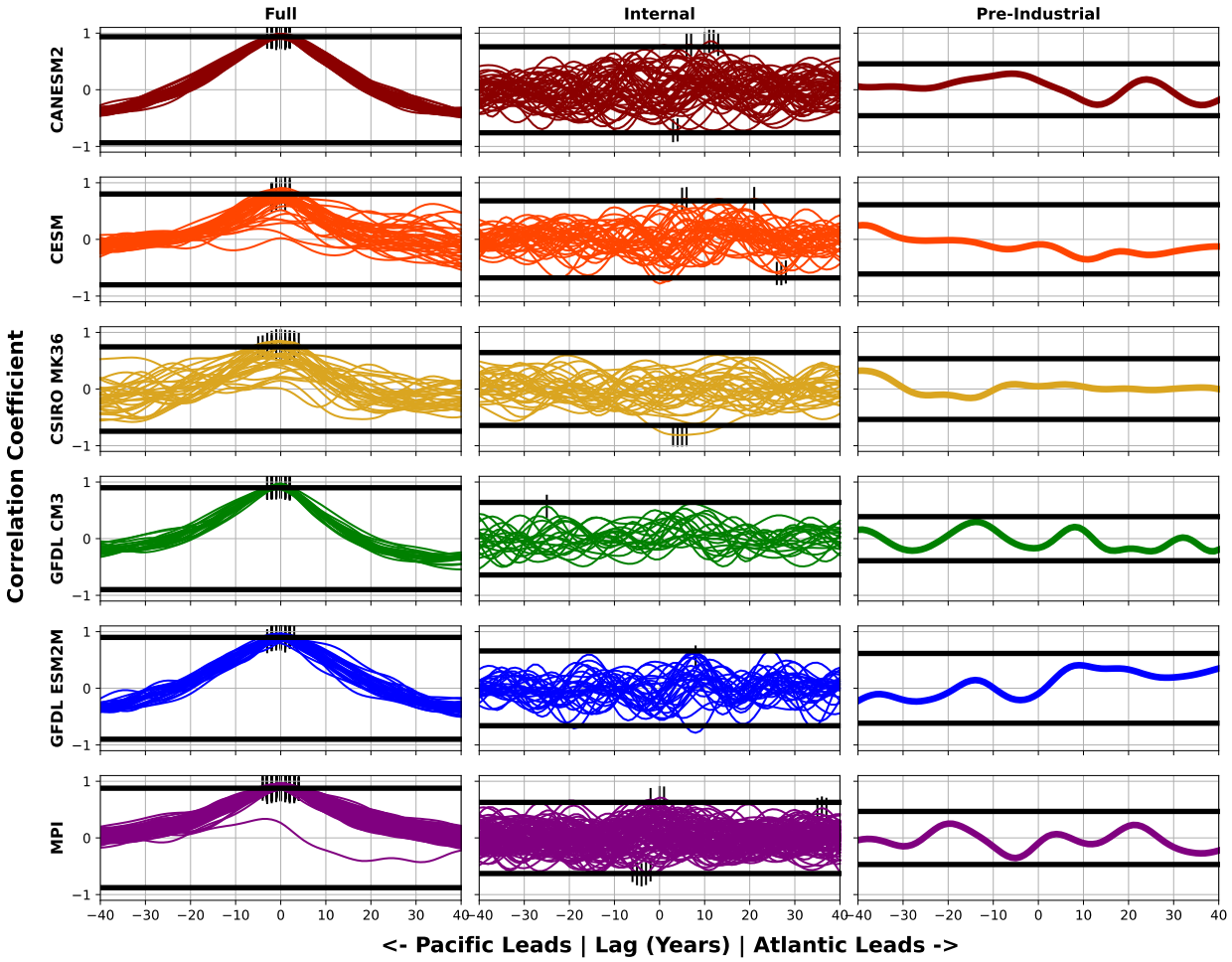
Supplemental Figure 2. EOF modes and normality analysis of observed HadISST North Atlantic and North Pacific SSTs with different detrending methods. From left to right: NA-EOF1 (NA1), NA-EOF2 (NA2), NP-EOF1 (NP1), and NP-EOF2 (NP2). The percentage below the spatial patterns represent the variance explained by each EOF. Rows from top to bottom: 1,2) non-detrended, 3,4) linearly detrended, and 5,6) GMR detrended. Red (blue) corresponds to warming (cooling) when time series is positive (negative). All time series and filtered and normalized.



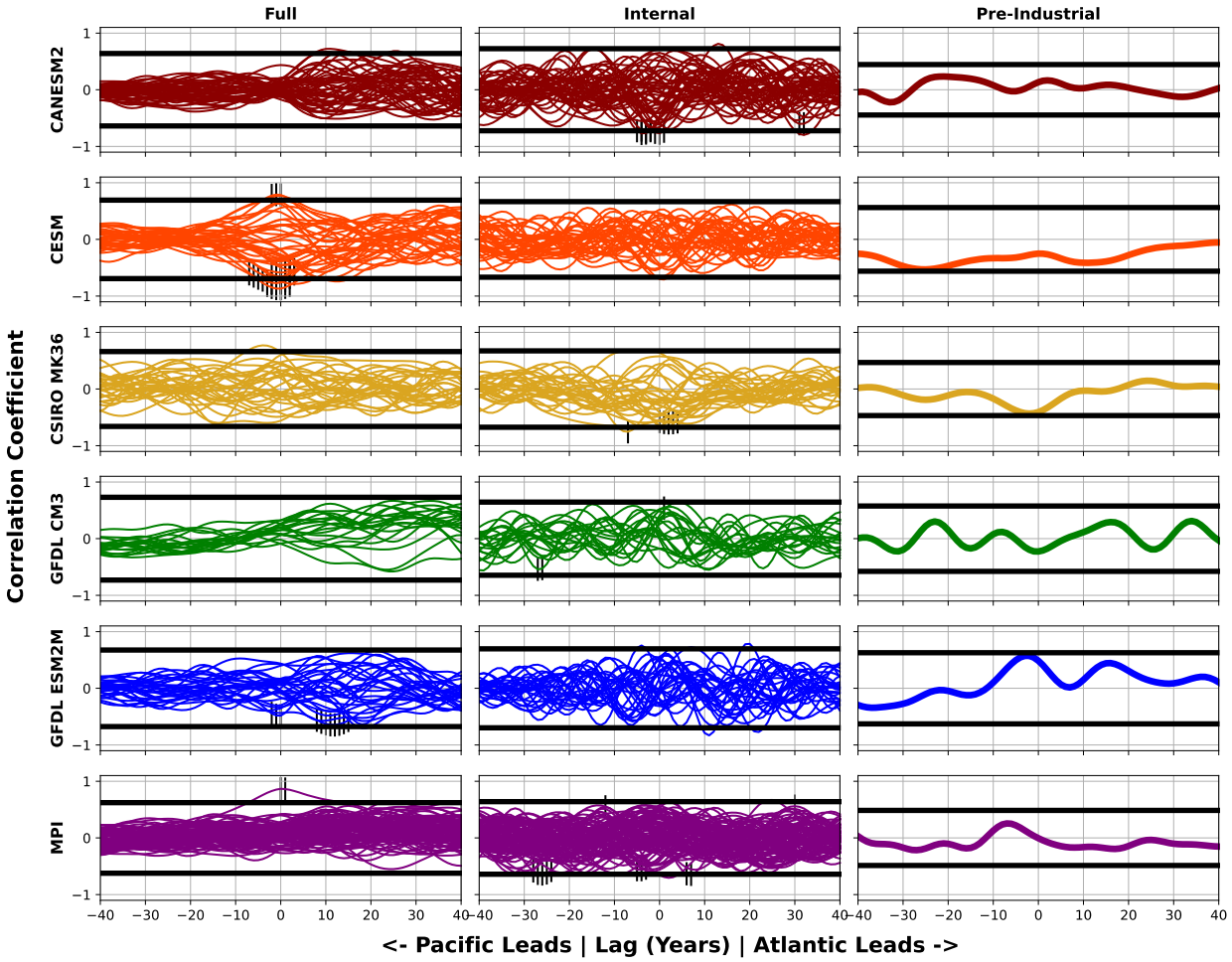
Supplemental Figure 3. EOF spatial patterns. From top to bottom: HADISST (observations), CANESM2, CESM, CSIRO-MK36, GFDL CM3, GFDL ESM2M, and MPI (six MMLEA models). From left to right: NA-EOF1, NA-EOF2, NP-EOF1, and NP-EOF2. MMLEA patterns are internal (ensemble mean detrended) composite means (EOF analysis is performed on each member, and then the resulting EOFs are averaged across all members). Color scale is dimensionless, following standard EOF output.



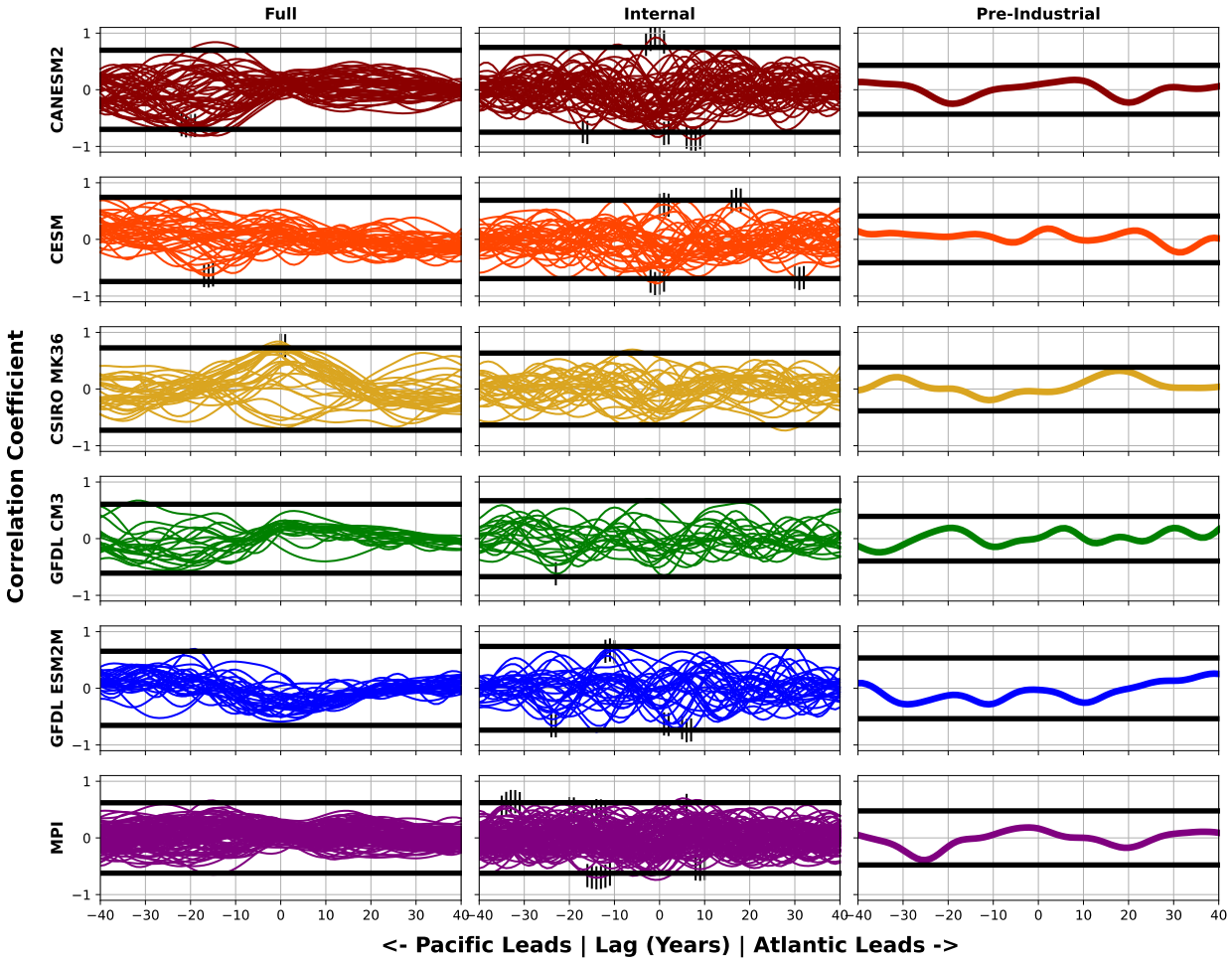
Supplemental Figure 4. As in Figure 4, but for full variability. Cross-correlations of MMLEA full (non-detrended) NA1-NP1 mode relationships for all LEs. Black horizontal lines are .1 significance levels as calculated by the "peak" test. Vertical ticks show where cross-correlations are significant. For positive (negative) lags, the NA (NP) mode leads.



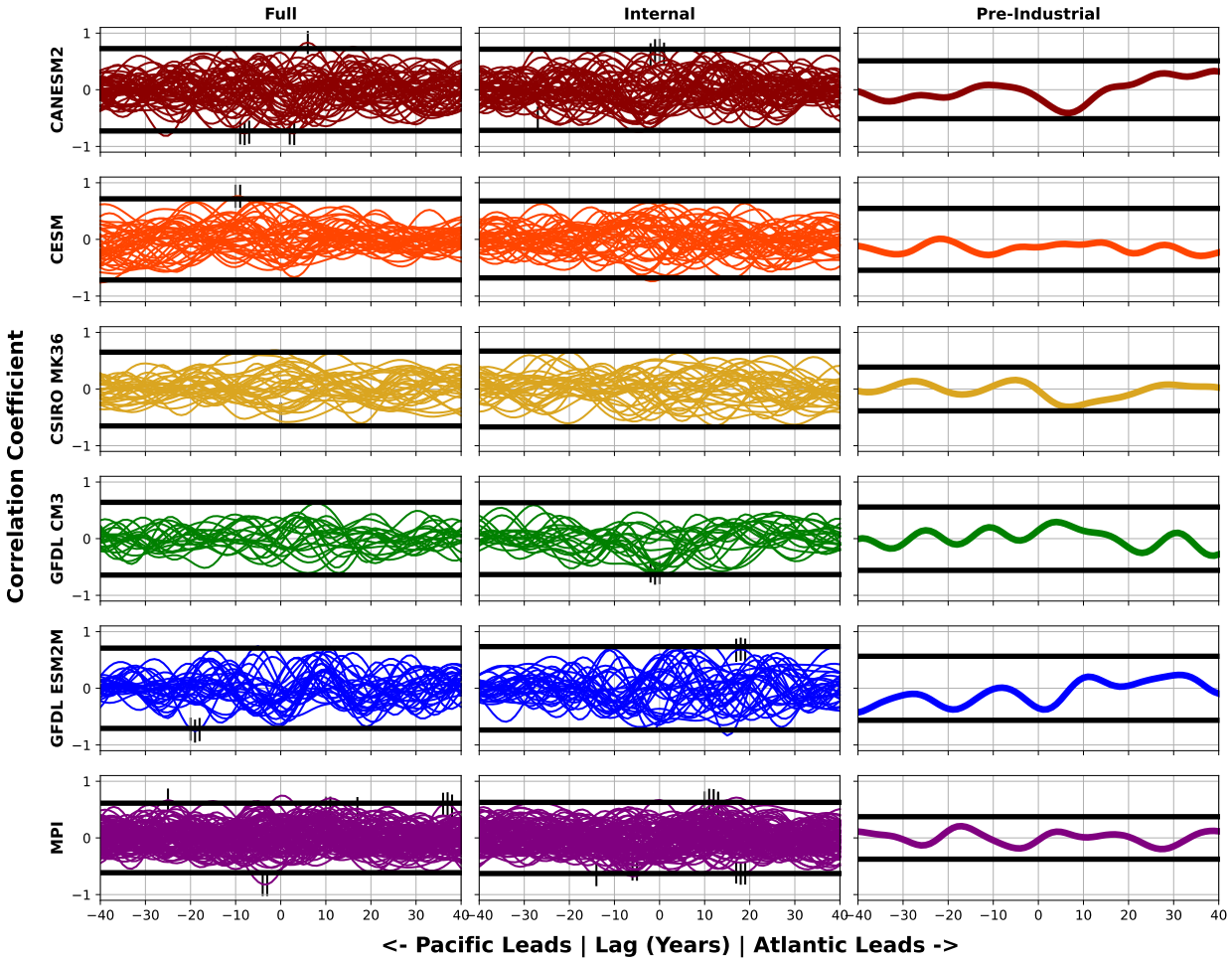
Supplemental Figure 5. MMLEA NA1-NP1 cross correlations. From left to right: full (non-detrended), internal only (ensemble mean detrended), and pre-industrial. Black horizontal lines are .1 significance levels as calculated by the "peak" test. Vertical ticks show where cross-correlations are significant. For positive (negative) lags, the NA (NP) mode leads.



Supplemental Figure 6. Same as Supplemental Figure 5, but for NA1-NP2 relationships.



Supplemental Figure 7. Same as Supplemental Figure 5, but for NA2-NP1 relationships.



Supplemental Figure 8. Same as Supplemental Figure 5, but for NA2-NP2 relationships.