

Geophysical Research Letters

Supporting Information for

“Projected changes of the Northern Annular Mode linked to seasonality of the ENSO teleconnection”

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Table S1

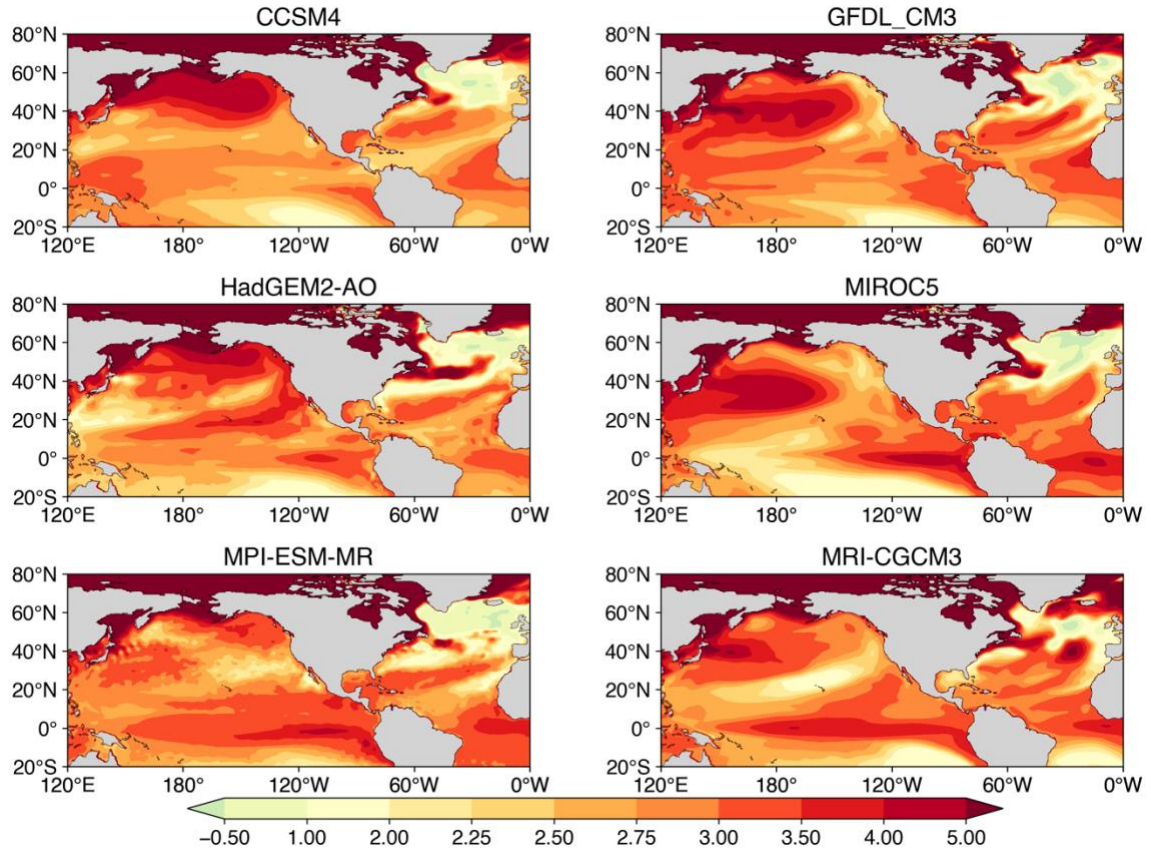


Figure S1. SST change pattern (°C) prescribed to d4PDF +4K experiment for each CMIP5 coupled model. November to March (NDJFM) averages are shown.

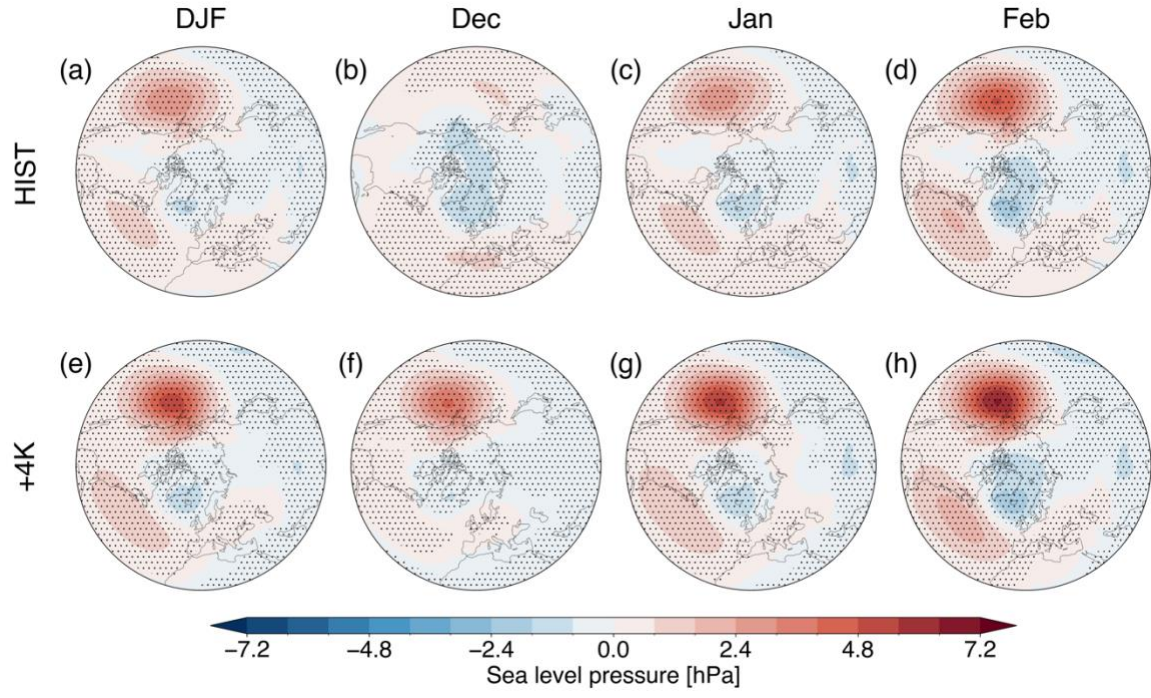


Figure S2. Same as the middle and bottom panels of Figure 1, but for the ensemble averaged SLP anomalies (hPa) regressed onto the ensemble averaged NAM index.

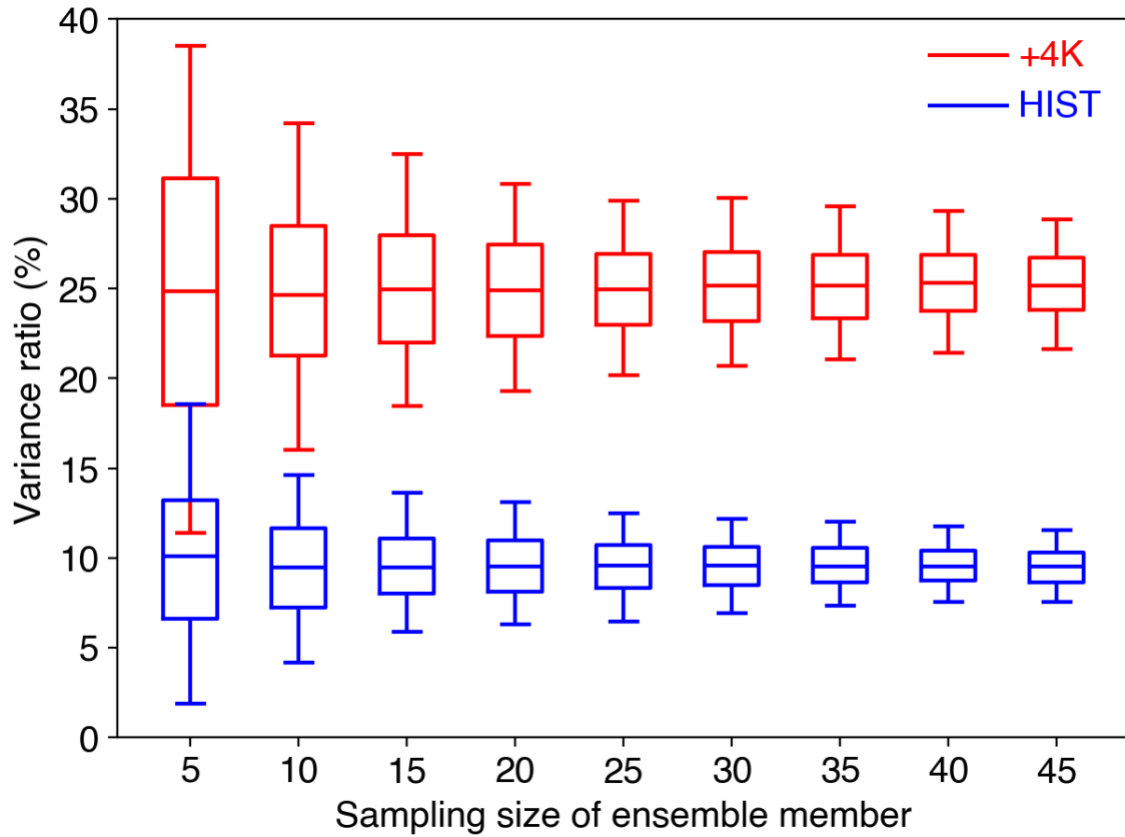


Figure S3. Box-and-whisker plots of the ratio of the variance of the externally forced component of the NAM index for DJF-mean as a function of subsampled ensemble size. Boxes and whiskers indicate ranges of one standard deviation and the 5th/95th percentile, respectively. Estimations are based on bootstrap random sampling (1,000 times). An EOF analysis is conducted on subsampled ensemble members.

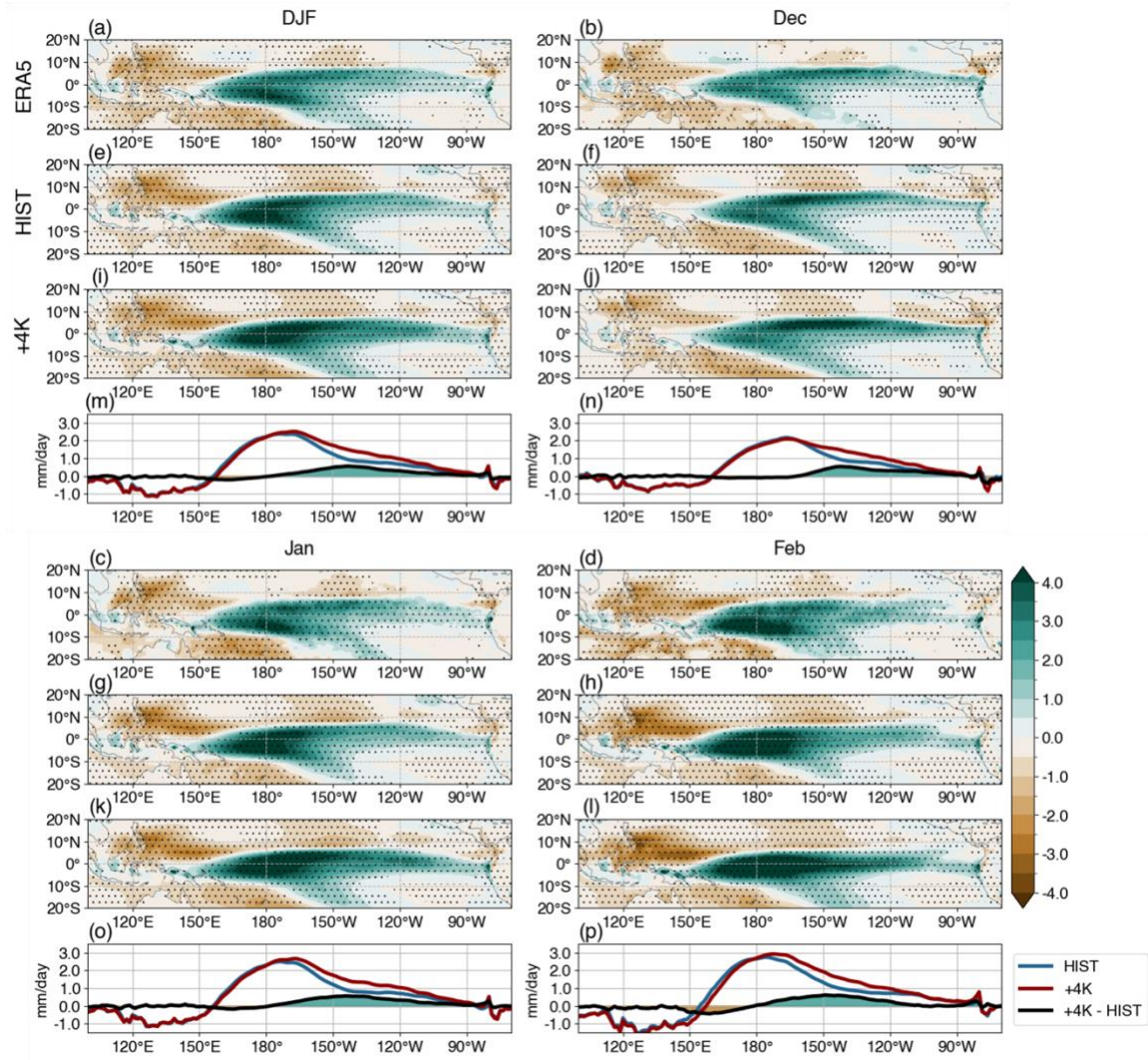


Figure S4. (a-l) Same for Figure 4, but for precipitation anomalies (mm/day) regressed onto the normalized Niño 3.4 index. (m-p) Zonal section of meridional averaged precipitation anomalies for d4PDF HIST (blue lines) and +4K (red lines) and their difference (black lines and shadings) over 10°S-10°N.

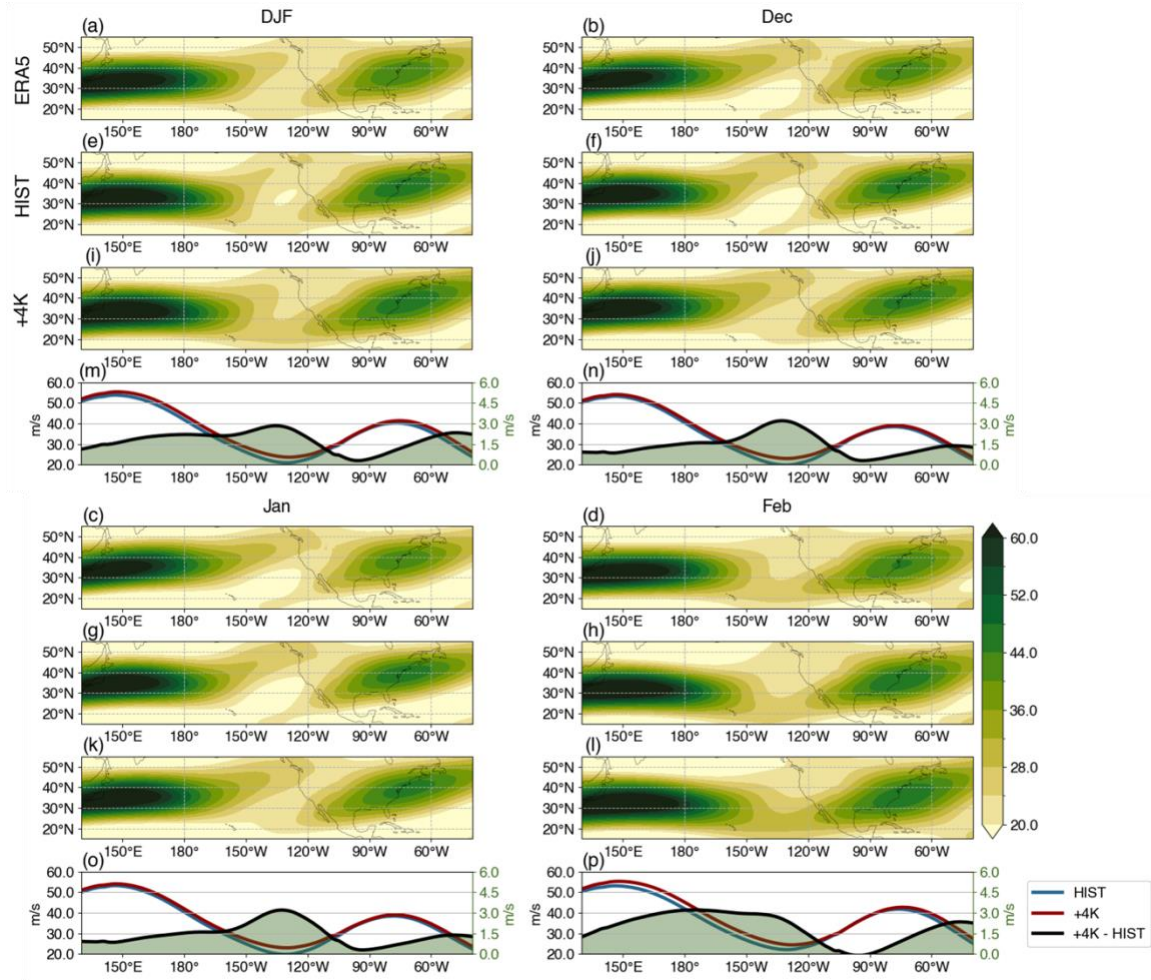


Figure S5. (a-l) Climatological zonal wind (m/s) at 250 hPa height for (a) DJF-mean, (b) December, (c) January, and (d) February based on the ERA5 dataset. (e-h) and (i-l) are the same as (a-d), but for d4PDF HIST and +4K, respectively. (m-p) Zonal section of meridional averaged zonal wind for d4PDF HIST (blue lines) and +4K (red lines) and their difference (black lines and shadings) over 25°-45°N for (m) DJF-mean, (n) December, (o) January, and (p) February.

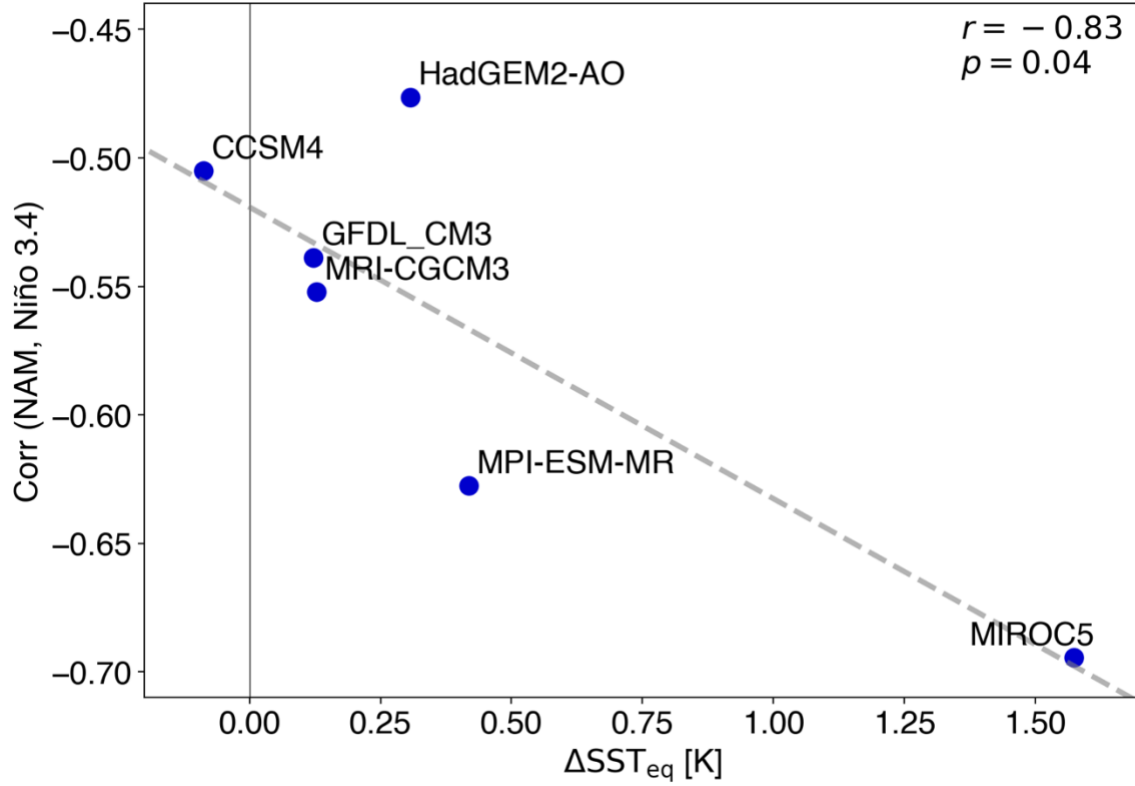


Figure S6. A scatterplot showing the correlation of the ensemble-averaged NAM index with the Niño 3.4 index in December of d4PDF +4K against climatological zonal SST gradient change in the equatorial Pacific. The latter is measured as the difference in SST changes between the eastern (5°S-5°N, 80°-130°W) and western (5°S-5°N, 150°E-160°W) equatorial Pacific. The NAM-Niño 3.4 correlation is calculated from the NAM index defined for each 15-member ensemble of a given SST change pattern. A dashed line indicates the linear fitting. The inter-warming pattern correlation (r) and corresponding p -value are shown at the top right.

Table S1. Same as Table 1, but based on different definitions of the NAM index. Concatenated: an EOF analysis is conducted across the two experiments (HIST and +4K) of d4PDF, that is, an 11,400-year anomaly time series is used. Fixed to HIST: the index of +4K is defined as the projection time series onto the EOF1 pattern based on HIST. Ensemble mean: an EOF analysis is conducted on the ensemble-averaged anomalies.

		Ratio of the ensemble-averaged NAM variance to the total variance				Correlation with the Niño 3.4 index			
		DJF	Dec	Jan	Feb	DJF	Dec	Jan	Feb
d4PDF HIST	Concatenated	12.0%	3.5%	5.8%	10.9%	-0.24*	0.03*	-0.12*	-0.25*
	Ensemble mean	-	-	-	-	-0.90*	-0.86*	-0.86*	-0.87*
d4PDF +4K	Concatenated	20.2%	3.3%	9.6%	15.4%	-0.39*†	-0.10*†	-0.25*†	-0.34*†
	Fixed to HIST	16.8%	2.7%	7.9%	14.9%	-0.39*†	-0.09*†	-0.26*†	-0.38*†
	Ensemble mean	-	-	-	-	-0.94*	-0.85*	-0.91*	-0.92*