Supplementary materials for "Pacific decadal variability and its hydroclimate teleconnections in CMIP6 models"

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	PDO							IPO							
	DPSD%	#	r'	#	EP/NP error	#	PDO #	DPSD%	#	r'	#	EP/(NP+SP) error	#	IPO #	Total rank
UKESM1-0-LL	82	5	0.89	1	0.34	9	3	94	6	0.72	3	0.12	5	2	1
CESM2	91	9	0.71	8	0.17	3	7	82	2	0.76	1	0.51	11	2	2
MPI-ESM1-2-HR	100	14	0.74	6	0.36	10	10	90	5	0.74	2	0.12	4	1	3
NorCPM1	90	7	0.75	5	0.48	12	9	100	11	0.61	6	0.04	1	4	4
CanESM5	72	1	0.72	7	0.14	1	1	86	3	0.40	15	1.59	16	15	5
MPI-ESM1-2-LR	90	7	0.83	2	0.30	7	4	100	11	0.61	9	0.19	7	9	5
GISS-E2-1-G	83	6	0.65	10	0.26	4	7	100	11	0.60	10	0.12	3	6	7
GISS-E2-1-H	76	2	0.76	4	0.26	5	2	100	11	0.51	14	0.29	8	13	7
ACCESS-ESM1-5	77	3	0.69	9	0.29	6	6	87	4	0.56	12	0.54	12	11	9
IPSL-CM6A-LR	94	11	0.82	3	0.17	2	4	100	11	0.52	13	0.98	15	16	10
EC-Earth3	91	9	0.64	11	0.49	13	11	100	11	0.61	7	0.35	9	9	11
CNRM-CM6-1	100	14	0.50	14	0.37	11	14	100	11	0.64	5	0.18	6	5	12
CNRM-ESM2-1	100	14	0.45	15	0.33	8	13	100	11	0.58	11	0.08	2	6	12
INM-CM5-0	80	4	0.39	16	0.81	16	12	80	1	0.35	16	0.56	13	12	14
MIROC-ES2L	100	14	0.56	13	0.64	15	16	100	11	0.64	4	0.39	10	8	15
MIROC6	100	14	0.56	12	0.56	14	15	100	11	0.61	8	0.68	14	13	16

Table S1: Model rankings by key indices in Figure 6. Decadal power spectral density percentile (DPSD%) is the percentile of the observed decadal band-averaged (20–50 years) power spectral density within the model distribution of decadal power as shown in colors in Figure 6. EP/NP error and EP/(NP+SP) error are calculated as the magnitude of difference between 1 and the metric shown on the y-axes of Figure 6, so a value closer to 0 indicates better model match to observations. Total rank is calculated as the average rank over the six indices ranked.

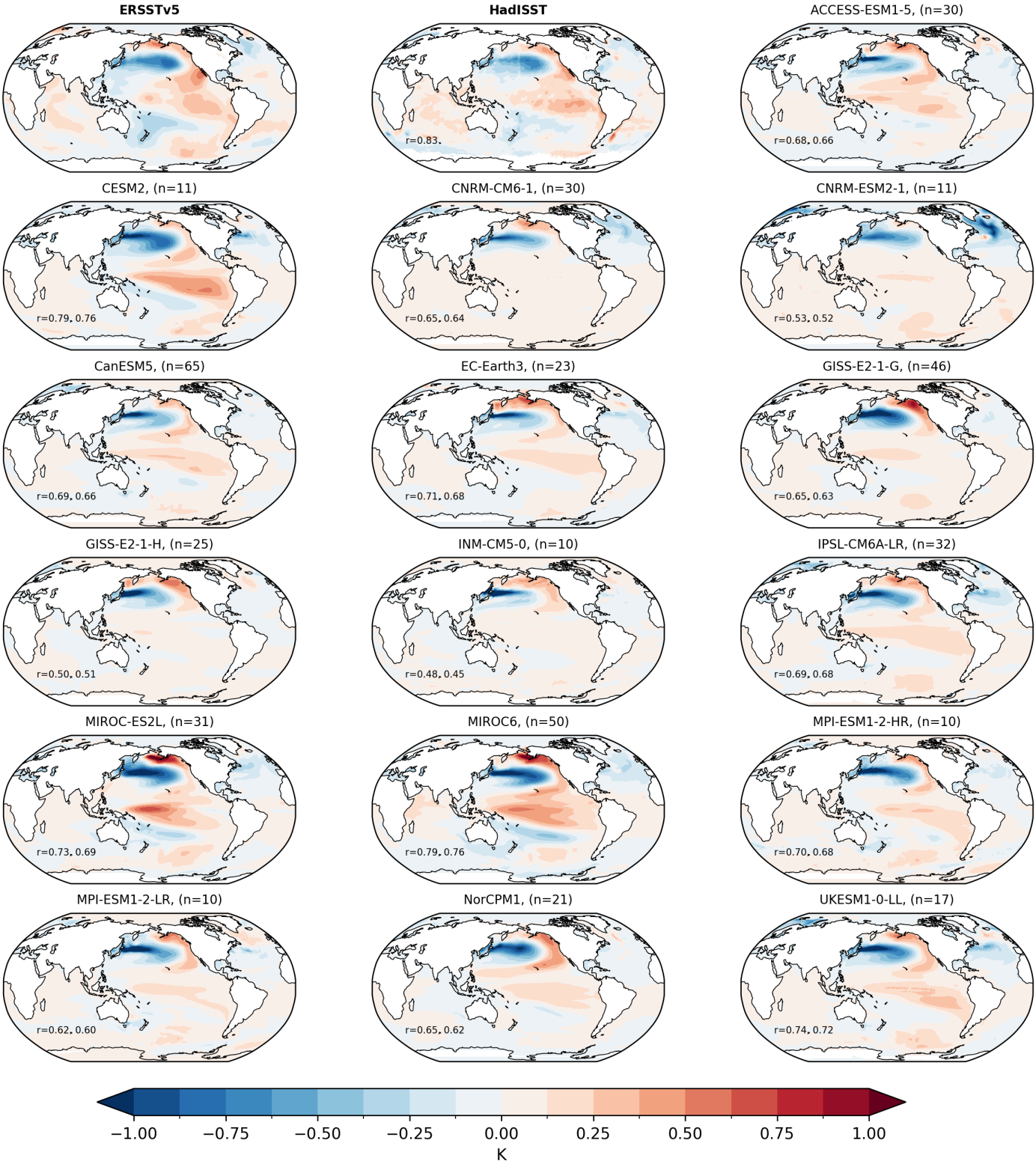

Figure S1: PDO patterns from CMIP6 models and observations as in Figure 1, calculated with low-pass filtered SST anomalies using a 13-year Chebyshev filter.

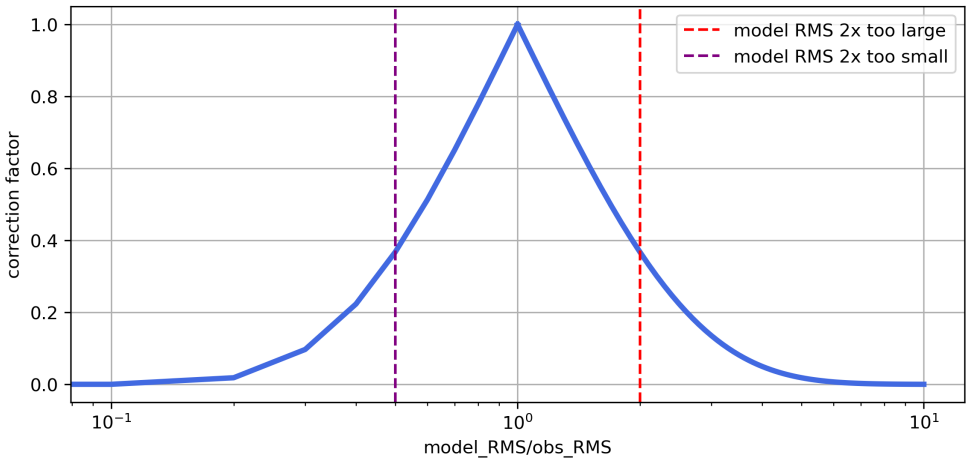

Figure S2: Correction factor from Equation (1) used to correct pattern correlation for RMS magnitude in the Pacific as a function of the ratio of RMS_{model} to RMS_{obs}. Dashed red and purple lines represent modeled-to-observed RMS ratios of 2 and 0.5 respectively.

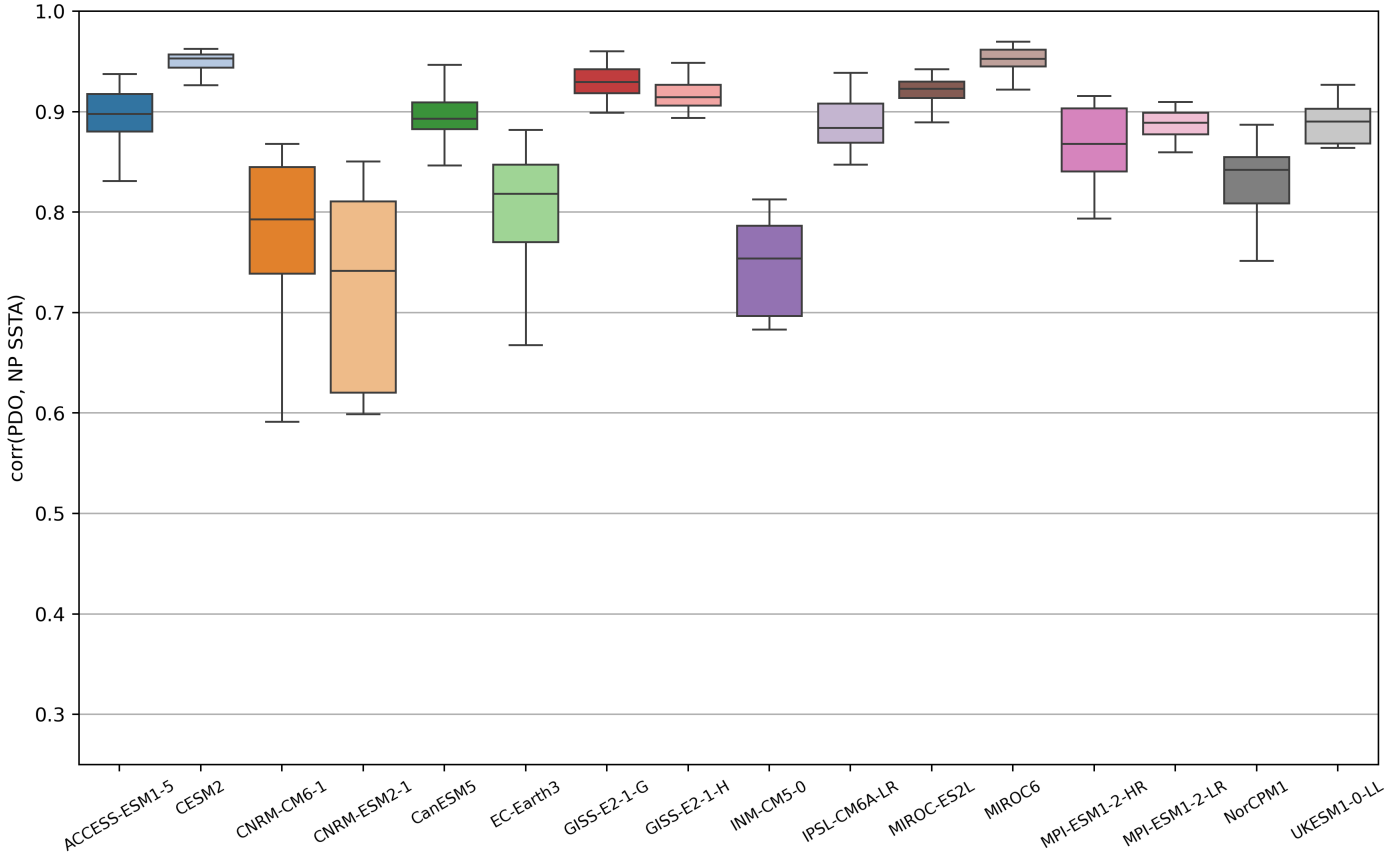

Figure S3: Boxplots showing the distribution of correlation coefficients between model ensemble PDO PC1 time series and model SSTA in the North Pacific (25°- 45°N, 140°E-145°W). Boxes show quartiles and whiskers show 1.5 times the interquartile range.

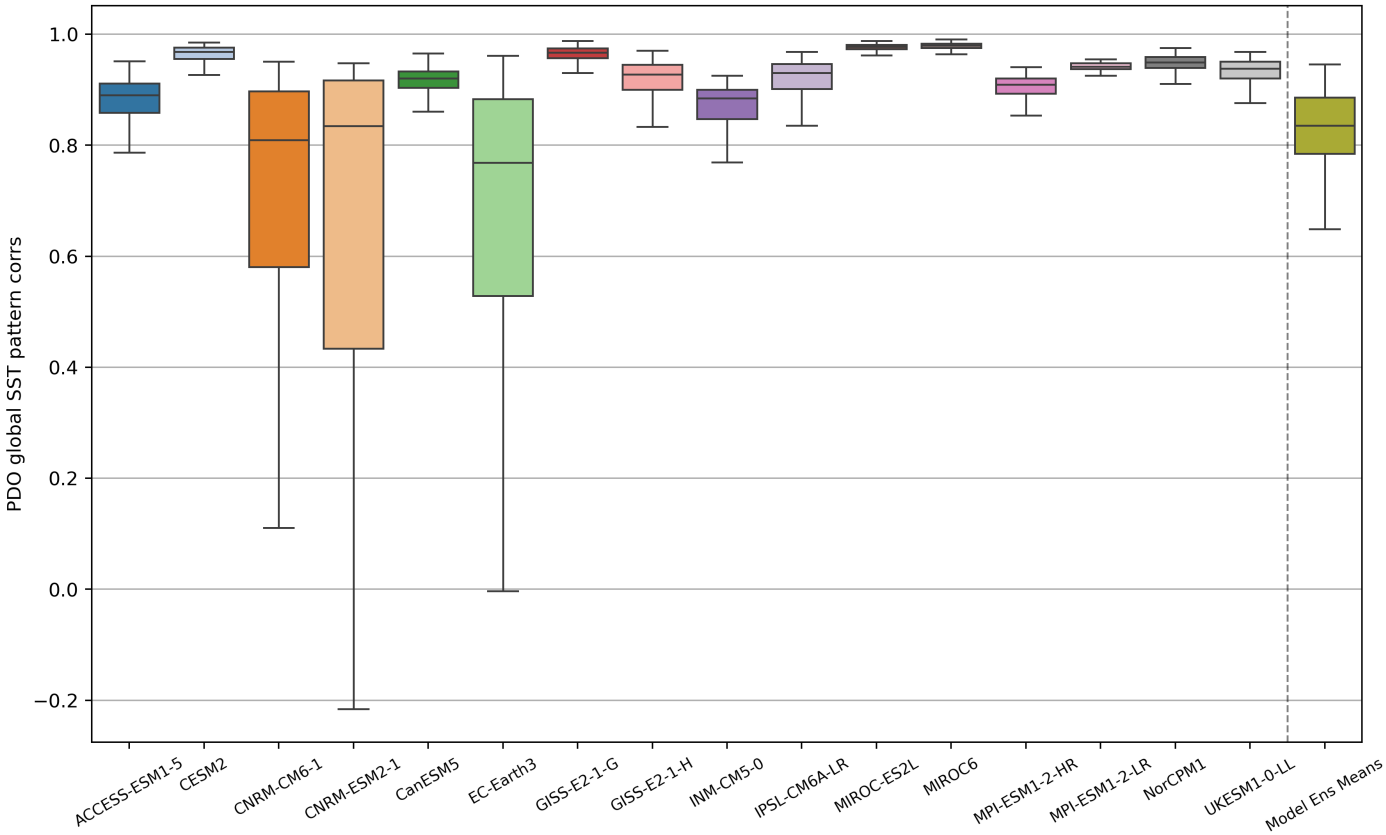

Figure S4: Boxplots showing the distribution of weighted global pattern correlation coefficients between pairs of model PDO SSTA patterns. For each model, all possible pattern correlations of combinations of distinct pairs of ensemble members are used to calculate the distributions. Rightmost box shows the distribution of pattern correlations of the means of ensemble member PDO patterns (as shown in Figure 1) for all pairs of models. Boxes show quartiles and whiskers show 1.5 times the interquartile range.

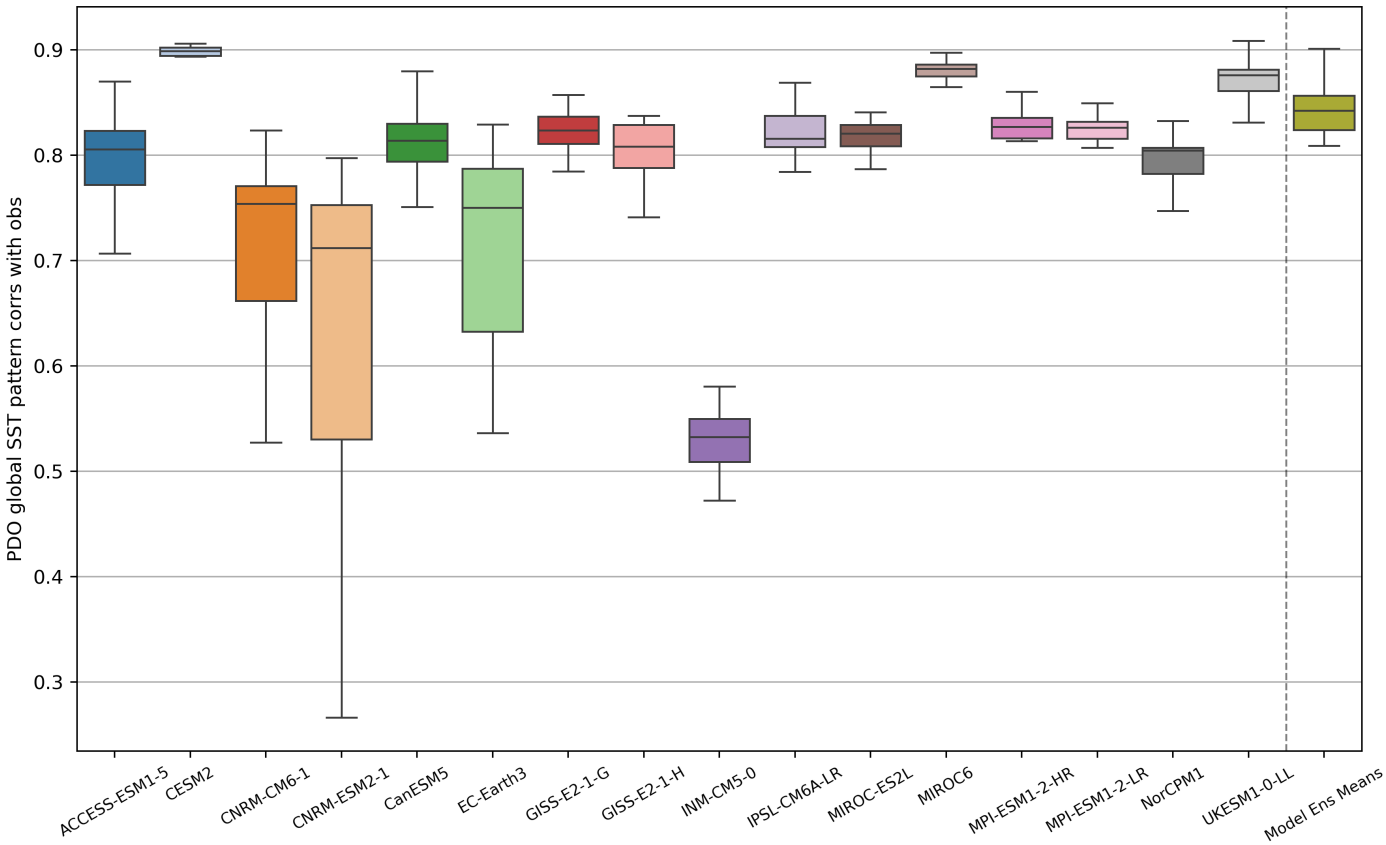

Figure S5: Boxplots showing the distribution of weighted global pattern correlation coefficients between modeled and observed (ERSSTv5) PDO SSTA patterns. Rightmost box shows the distribution of correlations between ERSSTv5 and the means of ensemble member PDO patterns (as shown in Figure 1). Boxes show quartiles and whiskers show 1.5 times the interquartile range.

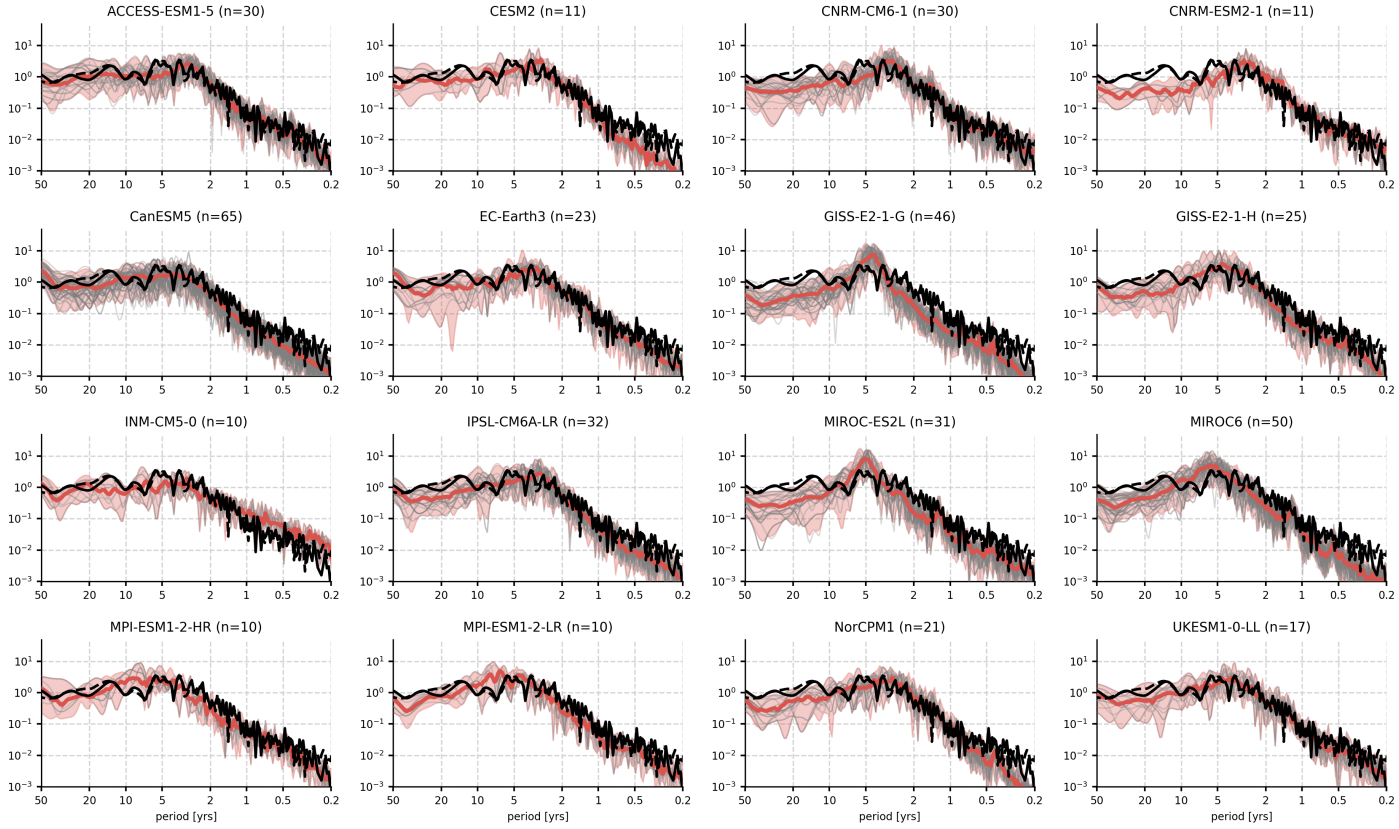

Figure S6: Power spectral density by periods for Nino 3.4 time series from model runs (thin gray lines) versus observations (ERSSTv5, thick black solid line; HadISST, thick black dotted line). Ensemble means are shown by the thick red line, and red envelopes show 95% confidence intervals.