

Supplemental Table. 2 RMSE_{EOF} values relative to the observations as shown in Fig. 9 for all models.

Model Name	North Pacific		Tropical Indo-Pacific		North Atlantic		Tropical Atlantic		Southern Ocean		Global Summary	
	High-pass	Low-pass	High-pass	Low-pass	High-pass	Low-pass	High-pass	Low-pass	High-pass	Low-pass	High-pass	Low-pass
CMIP3												
BCCR-BCM2.0	53.6	75.7	52.4	52.2	38.5	71.6	42.6	37.0	43.4	78.1	46.1	62.9
CGCM3.1 (T47)	32.8	39.2	68.4	31.5	26.9	40.2	45.2	16.5	54.0	70.1	45.5	39.5
CGCM3.1 (T63)	37.8	42.9	69.0	41.4	26.2	54.6	42.3	18.7	55.3	66.4	46.1	44.8
CNRM-CM3	39.1	42.4	19.3	43.0	36.7	43.7	30.4	23.4	51.8	82.6	35.4	47.0
CSIRO-Mk3.0	43.6	62.4	43.9	48.6	73.5	65.5	41.6	30.3	38.7	81.0	48.3	57.6
CSIRO-Mk3.5	35.9	57.4	31.5	35.9	53.2	74.0	34.7	29.0	36.0	71.3	38.2	53.5
GFDL-CM2.0	45.2	66.8	28.9	34.2	57.9	77.1	33.3	42.8	48.2	78.0	42.7	59.8
GFDL-CM2.1	32.0	63.0	17.1	49.8	39.0	59.0	27.0	29.4	40.4	75.3	31.1	55.3
GISS-AOM	39.8	54.5	88.4	73.0	35.5	49.9	54.6	45.6	61.0	80.1	55.9	60.6
GISS-EH	50.3	86.8	76.0	53.1	49.8	73.5	53.3	39.4	42.8	82.4	54.4	67.1
GISS-ER	46.2	69.8	83.2	68.8	45.0	69.2	45.7	30.6	45.6	82.8	53.1	64.3
FGOALS-g1.0	35.8	65.6	42.9	33.4	29.8	30.4	32.6	26.7	43.8	74.2	37.0	46.1
INGV-SXG	24.5	29.9	32.5	33.8	38.3	61.1	43.8	37.7	40.8	71.5	36.0	46.8
INM-CM3.0	38.8	62.5	60.0	43.9	47.9	54.7	40.0	39.1	51.9	72.2	47.7	54.5
IPSL-CM4	31.0	50.9	19.8	34.1	32.9	64.4	25.1	34.2	46.9	82.0	31.1	53.1
MIROC3.2 (hires)	47.7	76.5	79.3	45.7	38.1	59.1	38.0	23.0	52.5	80.6	51.1	57.0
MIROC3.2 (medres)	37.4	41.6	65.4	45.5	39.4	61.9	29.3	20.4	37.5	80.7	41.8	50.0
ECHAM5/MPI-OM	38.2	45.8	13.5	31.8	55.1	77.1	33.1	42.8	52.5	81.9	38.5	55.9
MRI-CGCM2.3.2	19.6	26.1	35.9	35.0	22.1	59.2	24.6	37.6	46.5	69.7	29.8	45.5
CCSM3	26.3	40.6	32.0	56.2	46.2	66.6	43.4	39.0	40.8	73.8	37.7	55.2
PCM	24.0	49.1	62.1	57.5	52.1	67.2	56.8	51.7	49.6	83.5	48.9	61.8
UKMO-HadCM3	55.4	39.3	39.3	39.0	55.8	70.0	49.6	52.8	49.6	82.8	50.0	56.7
UKMO-HadGEM1	51.0	61.4	71.6	45.9	41.8	55.4	51.6	46.6	37.9	81.3	50.8	58.1
CMIP5												
ACCESS1.0	35.2	69.9	40.7	58.0	39.4	59.8	42.9	25.4	38.9	81.9	39.4	59.0
BCC-CSM1.1	39.1	55.9	56.7	61.0	55.4	75.8	42.0	31.0	33.1	72.2	45.2	59.2
CCSM4	17.7	45.2	12.8	44.4	21.5	46.4	24.4	25.3	32.7	67.6	21.8	45.8
CNRM-CM5	37.5	51.6	31.7	42.7	33.4	57.8	38.2	30.6	34.8	83.3	35.1	53.2
CanESM2	29.7	26.6	21.8	34.0	45.4	59.5	38.1	27.2	37.6	69.4	34.5	43.3
GFDL-CM3	24.8	59.3	22.9	45.6	42.4	62.6	29.0	20.4	37.7	62.7	31.4	50.1
GFDL-ESM2G	45.1	48.0	55.3	44.6	39.1	30.2	40.6	26.7	44.5	80.0	44.9	45.9
GFDL-ESM2M	35.3	58.1	19.8	47.0	45.5	81.9	41.0	43.3	39.7	78.4	36.2	61.7
GISS-E2-H	30.9	68.2	49.8	67.4	29.8	55.7	46.2	19.6	38.9	81.0	39.1	58.4
GISS-E2-R	37.4	52.1	43.9	49.9	22.4	66.5	48.7	37.8	41.2	76.5	38.7	56.5
HadCM3	58.1	68.8	50.3	37.7	55.5	59.0	52.9	39.1	47.7	74.8	52.9	55.9
HadGEM2-CC	43.5	58.8	50.7	33.5	38.8	42.6	50.9	24.9	35.5	74.3	43.9	46.8
HadGEM2-ES	44.5	60.2	62.1	32.1	40.0	57.6	53.0	42.1	38.2	74.8	47.6	53.3
INM-CM4	46.4	63.7	63.7	47.2	56.7	71.8	62.9	52.9	63.4	78.4	58.6	62.8
IPSL-CM5A-LR	32.1	37.1	57.2	35.7	27.2	52.4	38.3	19.0	43.8	62.9	39.7	41.4
IPSL-CM5A-MR	31.8	18.0	49.1	30.0	30.6	55.2	41.4	31.5	32.5	78.2	37.1	42.6
IPSL-CM5B-LR	39.1	47.6	50.8	51.2	28.9	60.5	46.8	31.6	46.7	84.8	42.5	55.1
MIROC5	24.2	47.4	21.2	29.9	34.2	54.5	26.4	33.6	35.8	77.9	28.4	48.7
MPI-ESM-LR	50.6	68.4	56.6	25.0	56.8	69.7	49.4	34.0	57.5	86.9	54.2	56.8
MPI-ESM-P	47.1	66.7	51.2	39.2	53.9	73.4	45.7	40.0	55.2	79.4	50.6	59.7
MRI-CGCM3	33.7	63.1	59.0	43.8	58.5	60.3	49.8	35.2	38.6	79.2	47.9	56.3
NorESM1-M	25.3	46.3	21.2	33.6	29.3	44.0	45.3	21.2	37.5	77.0	31.7	44.4
NorESM1-ME	29.6	54.3	25.1	41.1	32.1	65.0	39.0	32.9	37.9	68.5	32.7	52.3