



Antarctic shelf ocean warming and sea ice melt affected by projected El Niño changes

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Supplementary Table 1 | Details of the 31 CMIP6 models used in the present study. The 31 CMIP6 models are used as ocean temperature, sea surface temperature, zonal wind stress, heat flux (latent heat flux of KIOST-ESM is unavailable) and sea ice concentration are available for both historical and SSP5-8.5 scenarios. Where there are multiple realizations, we use the first experiment that is available as indicated in the third column. Changes in ENSO variability (standard deviation of Niño3.4 scaled by per °C of global warming) between the 21st and 20th century are listed in the fourth column. **Top (bottom)** five models that simulate the **largest (smallest)** ENSO response are indicated in **red (blue)**.

CMIP6 Model	Model Group	Realization	Niño3.4 variability change	Global mean SST change
ACCESS-CM2 ^{1,2}	CSIRO-ARCCSS	rlilp1f1	0.092	1.327
ACCESS-ESM1-5 ^{3,4}	CSIRO	rlilp1f1	0.102	1.161
BCC-CSM2-MR ^{5,6}	BCC	rlilp1f1	-0.112	1.037
CAMS-CSM1-0 ^{7,8}	CAMS	rlilp1f1	-0.125	0.762
CanESM5 ^{9,10}	CCCma	rlilp1f1	0.050	1.683
CESM2 ^{11,12}	NCAR	rlilp1f1	0.011	1.192
CESM2-WACCM ^{13,14}	NCAR	rlilp1f1	0.022	1.362
CIesm ^{15,16}	THU	rlilp1f1	-0.025	1.387
CMCC-ESM2 ^{17,18}	CMCC	rlilp1f1	0.276	1.415
E3SM-1-1 ^{19,20}	E3SM-Project	rlilp1f1	0.144	1.803
EC-Earth3^{21,22}	EC-Earth-Consortium	rlilp1f1	0.393	1.385
EC-Earth3-CC ^{23,24}	EC-Earth-Consortium	rlilp1f1	0.242	1.265
EC-Earth3-Veg^{25,26}	EC-Earth-Consortium	rlilp1f1	0.341	1.297
EC-Earth3-Veg-LR ^{27,28}	EC-Earth-Consortium	rlilp1f1	0.185	1.144
FGOALS-f3-L ^{29,30}	CAS	rlilp1f1	0.080	1.079
FGOALS-g3 ^{31,32}	CAS	rlilp1f1	0.056	0.895
FIO-ESM-2-0 ^{33,34}	FIO-QLNM	rlilp1f1	0.101	1.243
GFDL-CM4 ^{35,36}	NOAA-GFDL	rlilp1f1	0.211	1.162
GFDL-ESM4 ^{37,38}	NOAA-GFDL	rlilp1f1	0.232	0.880
INM-CM4-8^{39,40}	INM	rlilp1f1	-0.054	0.967
INM-CM5-0 ^{41,42}	INM	rlilp1f1	-0.044	0.879
IPSL-CM6A-LR ^{43,44}	IPSL	rlilp1f1	0.153	1.346

KIOST-ESM ^{45,46}	KIOST	rli1p1f1	0.002	0.986
MIROC ^{47,48}	MIROC	rli1p1f1	0.484	0.823
MPI-ESM1-2-HR ^{49,50}	MPI-M	rli1p1f1	0.121	0.875
MPI-ESM1-2-LR ^{51,52}	MPI-M	rli1p1f1	0.081	0.875
MRI-ESM2-0 ^{53,54}	MRI	rli1p1f1	-0.017	1.121
NESM3 ^{55,56}	NUIST	rli1p1f1	-0.056	1.229
NorESM2-LM ^{57,58}	NCC	rli1p1f1	0.700	0.833
NorESM2-MM ^{59,60}	NCC	rli1p1f1	0.295	0.881
UKESM1-0-LL ^{61,62}	MOHC	rli1p1f2	-0.200	1.640

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