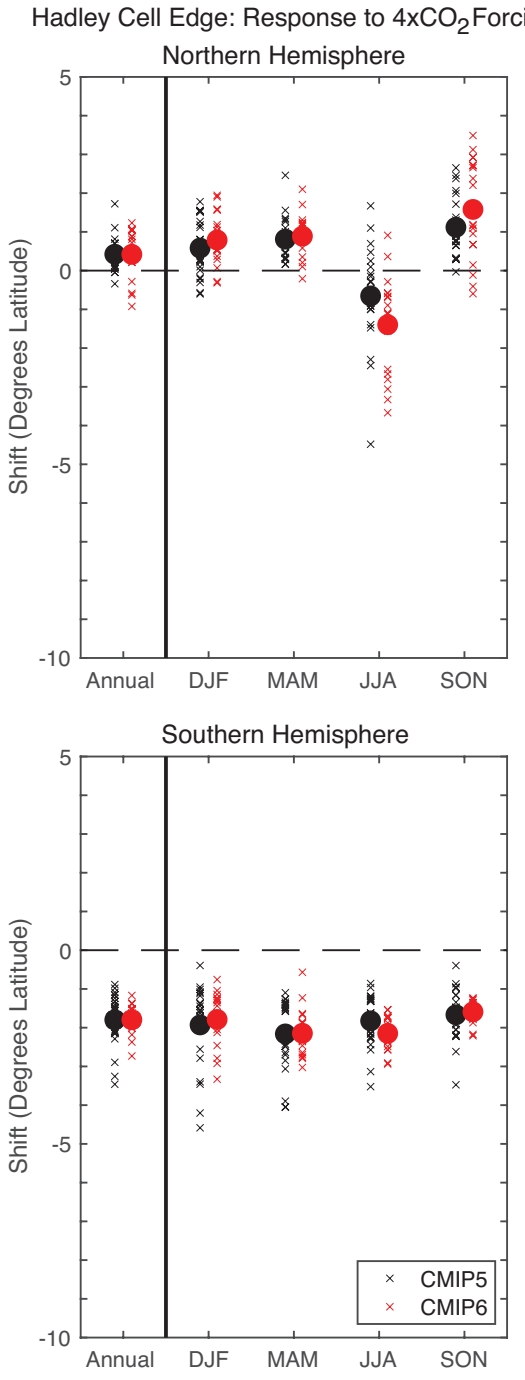

Figure S1: As in Fig. 1, but for the USFC metric.

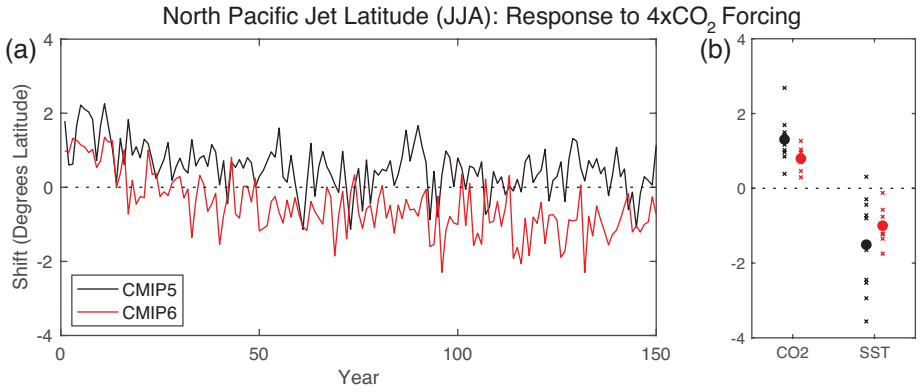

Figure S2: As in panels b and c of Fig. 2, but for the JJA North Pacific eddy-driven jet latitude.

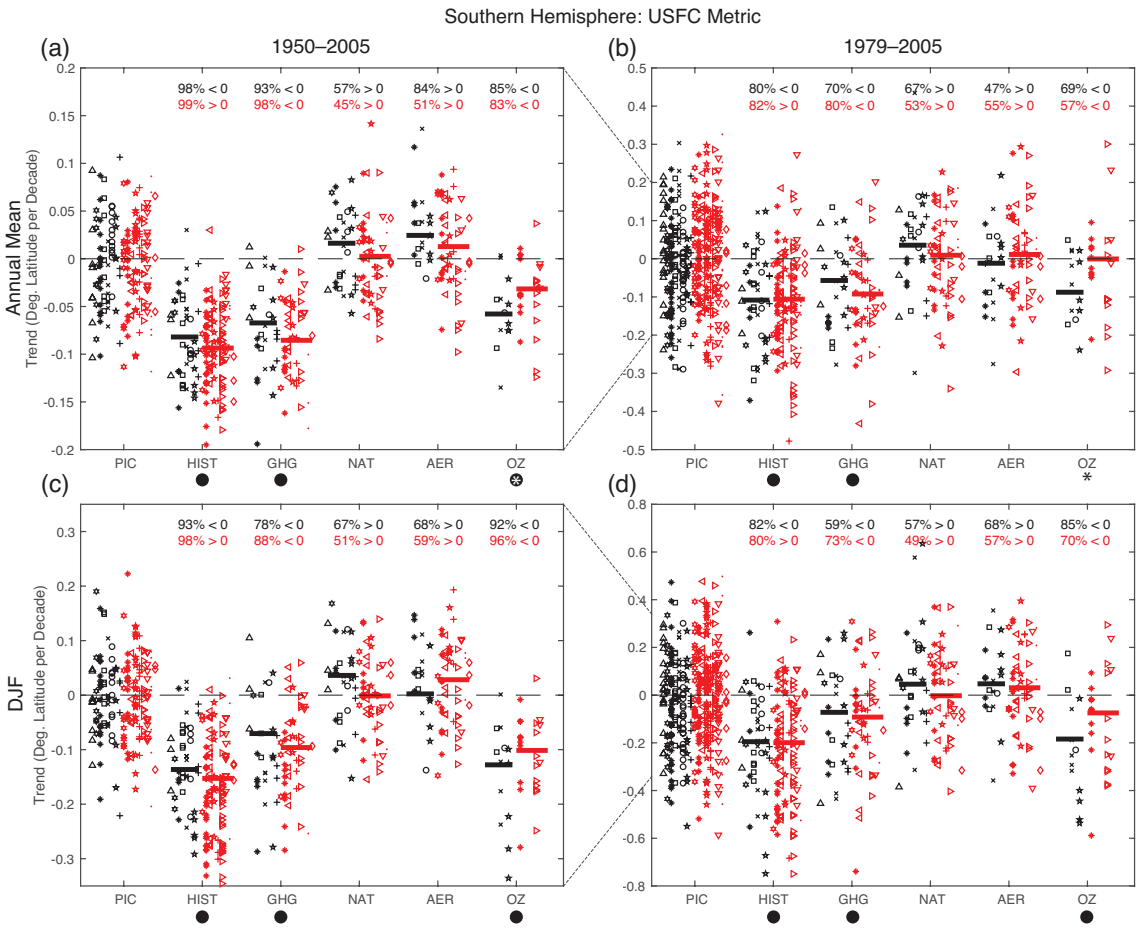

Figure S3: As in Fig. 7, but for the trends in the Southern Hemisphere Hadley cell edge latitude measured by the USFC metric.

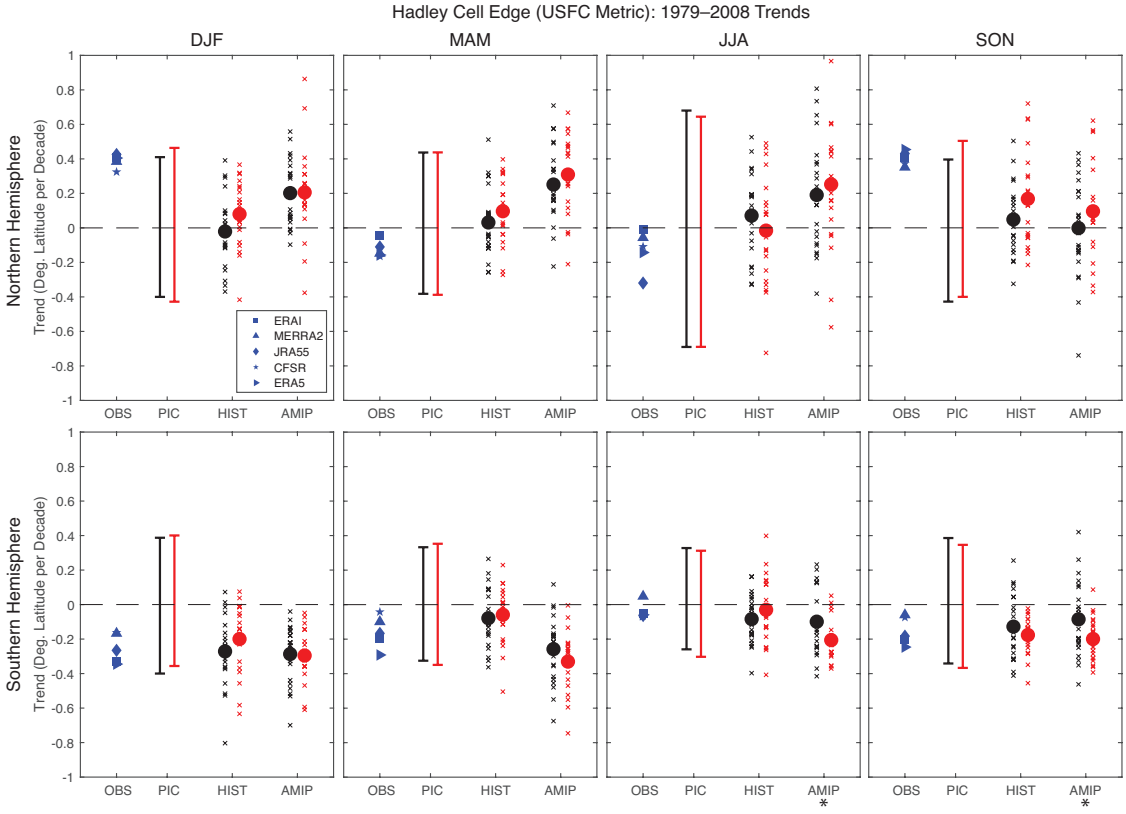

Figure S4: As in Fig. 4, but for the seasonal-mean trends in the (top row) Northern Hemisphere and (bottom row) Southern Hemisphere Hadley cell edge latitudes measured by the USFC metric.

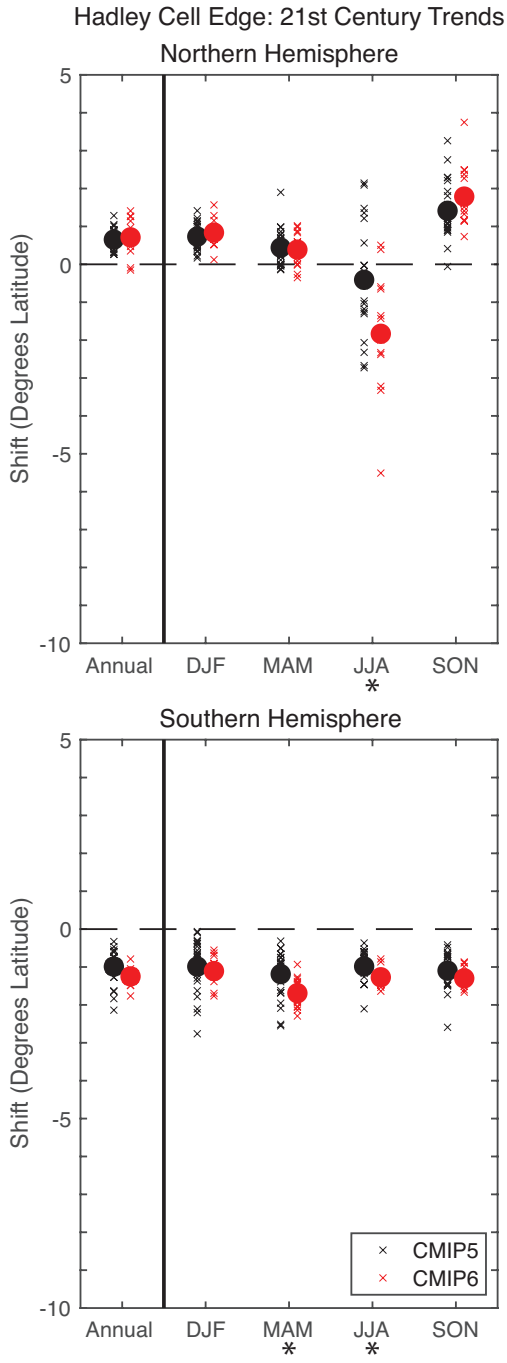

Figure S5: As in Fig. 1, but for the 21st century trends from the RCP 8.5 runs from CMIP5 models and the SSP 5-8.5 runs from CMIP6 models. Here, the 21st century trend is measured using the composite difference between two 20-year periods (2015–2034 and 2081–2100).

Model	piControl	Historical	AMIP	Abrupt $4xCO_2$	RCP 8.5	AMIP $4xCO_2$	AMIP Future
ACCESS1.0	X	X	X	X	X		
ACCESS1.3	X	X	X	X	X		
BCC-CSM1.1	X	X	X	X	X	X	X
BCC-CSM1.1(m)	X	X	X	X	X		
BNU-ESM	X	X	X	X	X		
CanESM2 (CanAM4)	X	X	X	X	X	X	X
CCSM4	X	X	X	X	X		
CNRM-CM5	X	X	X	X	X	X	X
CSIRO Mk3.6.0	X	X	X	X	X		
EC-EARTH	X	X	X	X	X		
FGOALS-g2	X	X	X	X	X		
GFDL CM3	X	X	X	X	X		
GISS-E2-R	X	X	X	X	X		
HadGEM2-ES (HadGEM2-A)	X	X	X	X	X	X	X
INM-CM4.0	X	X	X	X	X		
IPSL-CM5A-LR	X	X	X	X	X	X	X
IPSL-CM5A-MR	X	X	X	X	X		
IPSL-CM5B-LR	X	X	X	X	X	X	X
MIROC5	X	X	X	X	X	X	X
MIROC-ESM	X	X	X	X	X		
MPI-ESM-LR	X	X	X	X	X	X	X
MPI-ESM-MR	X	X	X	X	X	X	X
MRI-CGCM3	X	X	X	X	X	X	X
NorESM1-M	X	X	X	X	X		

Table S1. CMIP5 models used in this study.

Model	piControl	Historical	AMIP	Abrupt $4xCO_2$	SSP 5-8.5	AMIP $4xCO_2$	AMIP future4K
BCC-CSM2-MR	X	X	X	X	X	X	X
BCC-ESM1	X	X	X	X			
CAMS-CSM1-0	X	X	X	X	X		
CanESM5	X	X	X	X	X	X	X
CESM2	X	X	X	X	X	X	X
CESM2-WACCM	X	X	X	X	X		
CNRM-CM6-1	X	X	X	X	X	X	X
CNRM-ESM2-1	X	X	X	X	X		
E3SM-1-0	X	X	X	X			
EC-Earth3	X	X	X	X	X		
EC-Earth3-Veg	X	X	X	X	X		
GISS-E2-1-G	X	X	X	X			
HadGEM3-GC31-LL	X	X	X	X			
IPSL-CM6A-LR	X	X	X	X	X	X	X
MIROC6	X	X	X	X	X	X	X
MRI-ESM2-0	X	X	X	X	X	X	X
NESM3	X	X	X	X	X		
NorESM2-LM	X	X	X	X			
SAM0-UNICON	X	X	X	X			
UKESM1-0-LL	X	X	X	X	X		

Table S2: CMIP6 models used in this study. Note that, for the abrupt $4xCO_2$ run of EC-Earth3, the first ensemble member ('r1i1p1f1') is unavailable, so we use the 'r8i1p1f1' ensemble member instead.

Model	historical	hist-GHG	hist-aer	hist-nat	hist-ozone
ACCESS1.3	3	3	0	3	0
BCC-CSM1.1	3	1	0	1	0
CanESM2	5	5	5	5	0
CCSM4	8	3	3	4	2
CSIRO Mk3.6.0	10	5	5	5	5
FGOALS-g2	5	1	1	3	1
GISS-E2-R	6	5	5	5	5
HadGEM2-ES	4	4	0	4	0

Table S3: CMIP5 historical single forcing runs used in this study. Numbers indicate the number of ensemble members used for each single forcing scenario.

Model	historical	hist-GHG	hist-aer	hist-nat	hist-stratO3
BCC-CSM2-MR	3	3	3	3	0
CanESM5	25	10	10	10	10
CNRM-CM6-1	21	10	10	10	0
GISS-E2-1-G	10	5	5	5	0
HadGEM3-GC31-LL	4	4	4	4	0
IPSL-CM6A-LR	32	10	10	10	10
MIROC6	10	3	3	3	3
MRI-ESM2-0	5	3	3	3	0
NorESM2-LM	3	1	3	3	0

Table S4: CMIP6 historical single forcing runs used in this study. Numbers indicate the number of ensemble members used for each single forcing scenario.