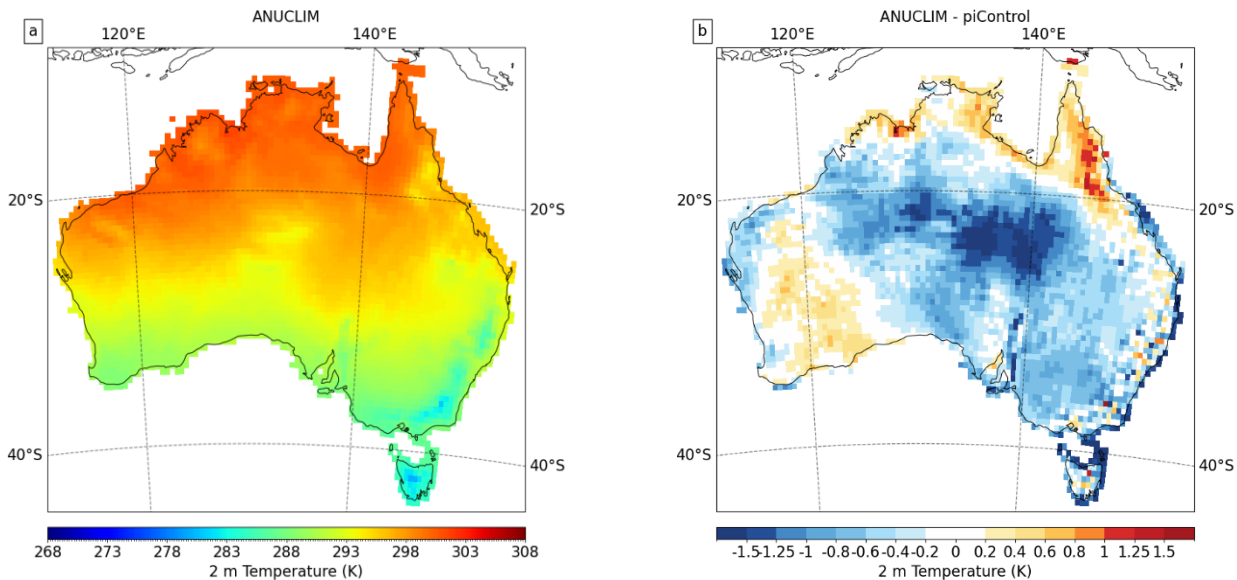
Supplement

USGS Category		Allen et al. (2020) BIOME	
Code	Description	Code	Description
Urb	Urban and Built-up Land		
DryCp	Dryland Cropland and Pasture		
IrrCp	Irrigated Cropland and Pasture		
MxCp	Mixed Dryland/Irrigated Cropland and Pasture		
CpGr	Cropland/Grassland Mosaic		
CpWd	Cropland/Woodland Mosaic		
Gr	Grassland	St	Steppe
		TrG	Tropical Grassland
Sh	Shrubland	TeSh	Temperate Shrubland
		TePk	Temperate Parkland
MxShGr	Mixed Shrubland/Grassland	Se-des	Semi-desert
Sav	Savannah	WTeWo	Warm Temperate Woodland
		Sav	Savannah
		TrRF	Tropical Raingreen Forest
BLDF	Deciduous Broadleaf Forest	BSBF	Boreal Summergreen Broad-leaved Forest
		TeSF	Temperate Summergreen Forest
NLDF	Deciduous Needleleaf Forest	BSNF	Boreal Summergreen Needle-leaved Forest
BLEvF	Evergreen Broadleaf Forest	TeBEF	Temperate Broad-leaved Evergreen Forest
		TrEF	Tropical Evergreen Forest
NLEvF	Evergreen Needleleaf Forest	BENF	Boreal Evergreen Needle-leaved Forest
		TeNEF	Temperate Needle-leaved Evergreen Forest
MxF	Mixed Forest	TeMxF	Temperate Mixed Forest
		BPk	Boreal Parkland
Wat	Water Bodies	OL	Ocean or Lake
HWet	Herbaceous Wetland		
WdWet	Wooden Wetland		
Bar	Barren or Sparsely Vegetated	Des	Desert
HTun	Herbaceous Tundra		
WdTun	Wooded Tundra	BWo	Boreal Woodland
MxTun	Mixed Tundra	ShT	Shrub Tundra
BGTun	Bare Ground Tundra	Tun	Tundra
SnIc	Snow or Ice	ICE	Ice Sheet
Lake	Lakes	OL	Ocean or Lake

Table S1: Vegetation mapping between the USGS classification used in WRF to the BIOME classification used in Allen et al. (2020).

635 **Figure S1: MAT from the ANUCLIM dataset (Xu and Hutchinson, 2011) for 1970–1999 (a) and the difference between ANUCLIM and the WRF pre-industrial simulation (b).**

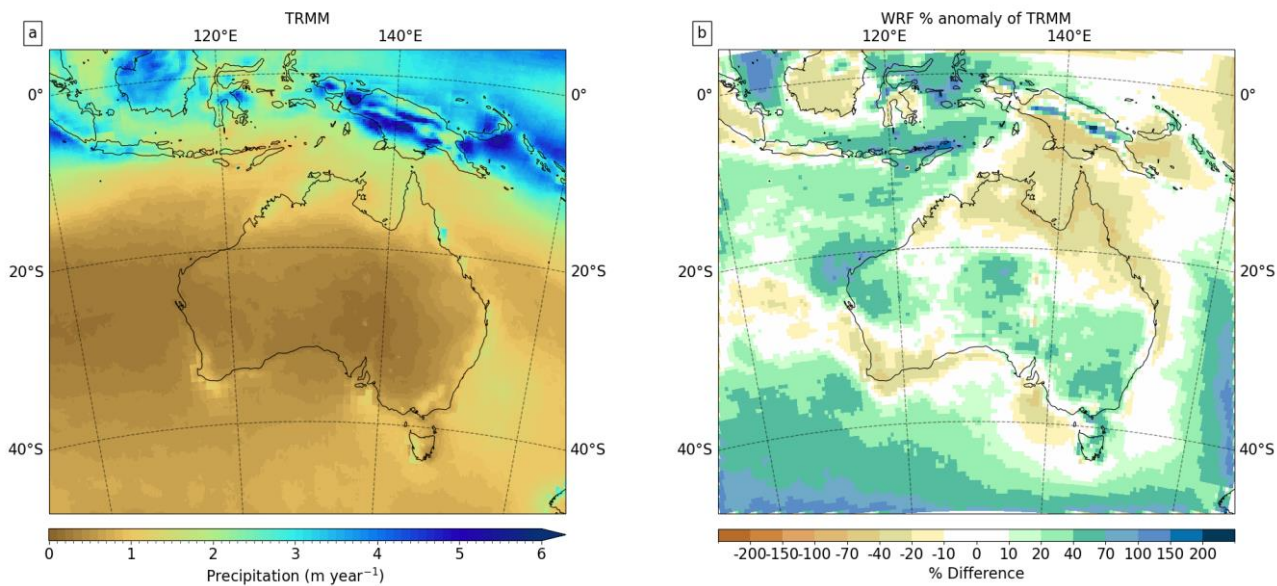



Figure S2: MAP from the Tropical Rainfall Monitoring Misson (TRMM) for 1998–2019 (a) and the difference between the WRF pre-industrial simulation and TRMM given as a percentage of TRMM precipitation (b).

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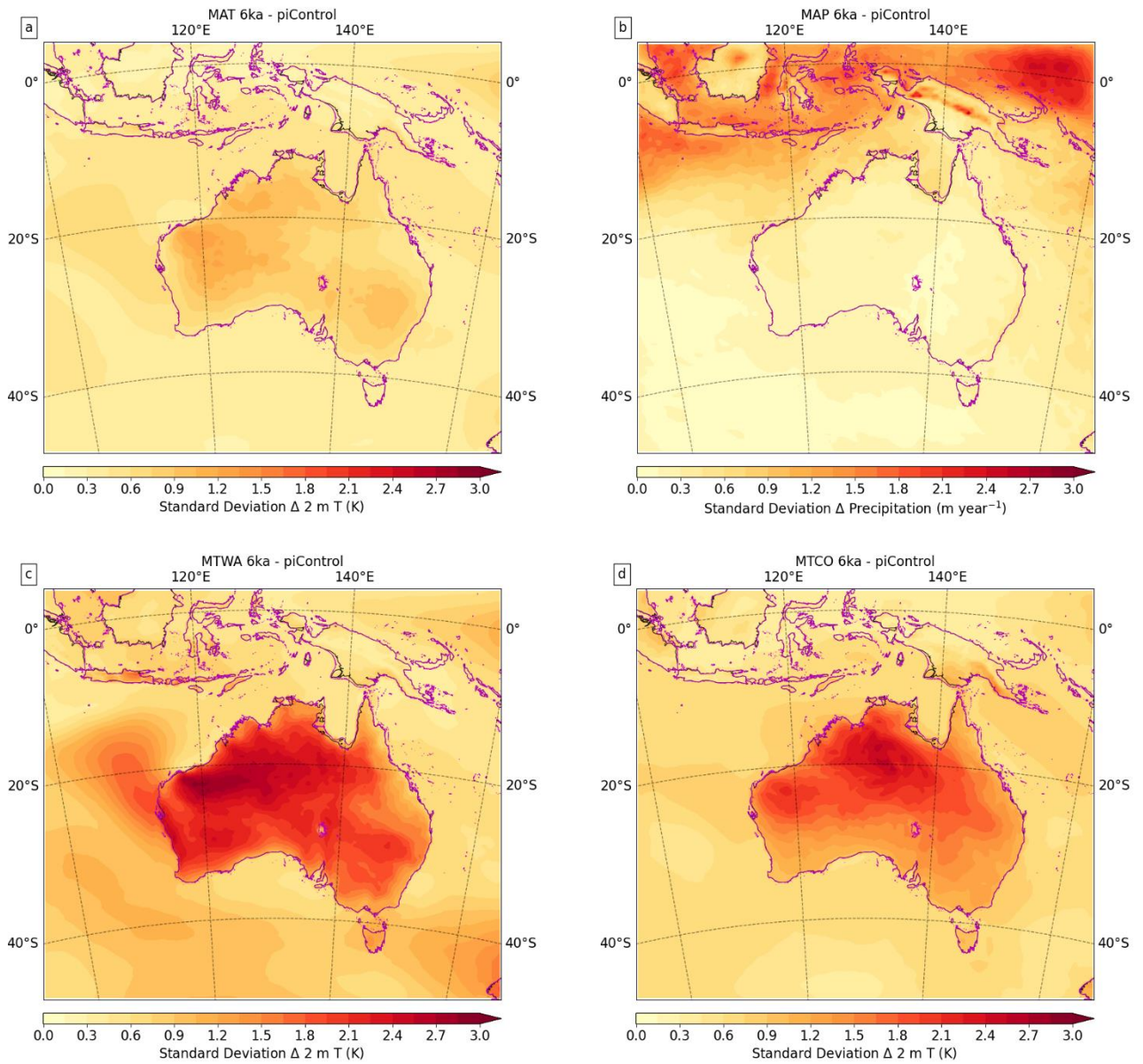
Figure S3: The inter-year spread (given as the standard deviation) from the WRF simulations in MAT (a), MAP (b), MTWA (c), and MTCO (d). The purple line is the coastline in the mid-Holocene.

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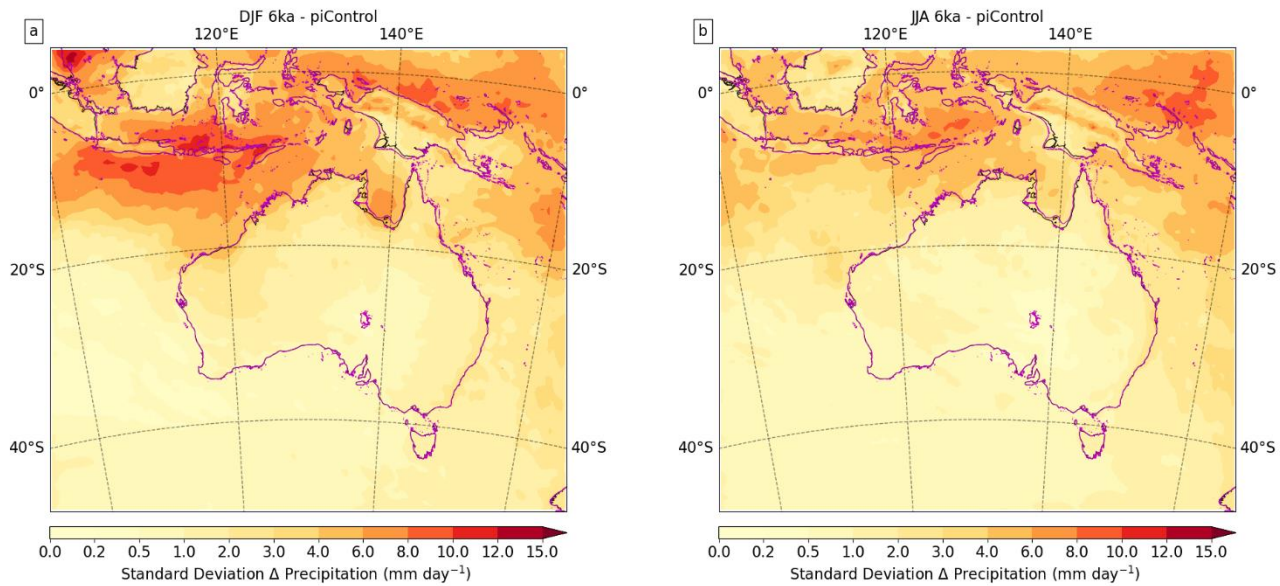
Figure S4: The standard deviation from the WRF simulations of precipitation for Dec, Jan, and Feb (a), and Jun, Jul, and Aug (b). The purple line is the coastline in the mid-Holocene. Note the different units from MAP in Fig. S3b.

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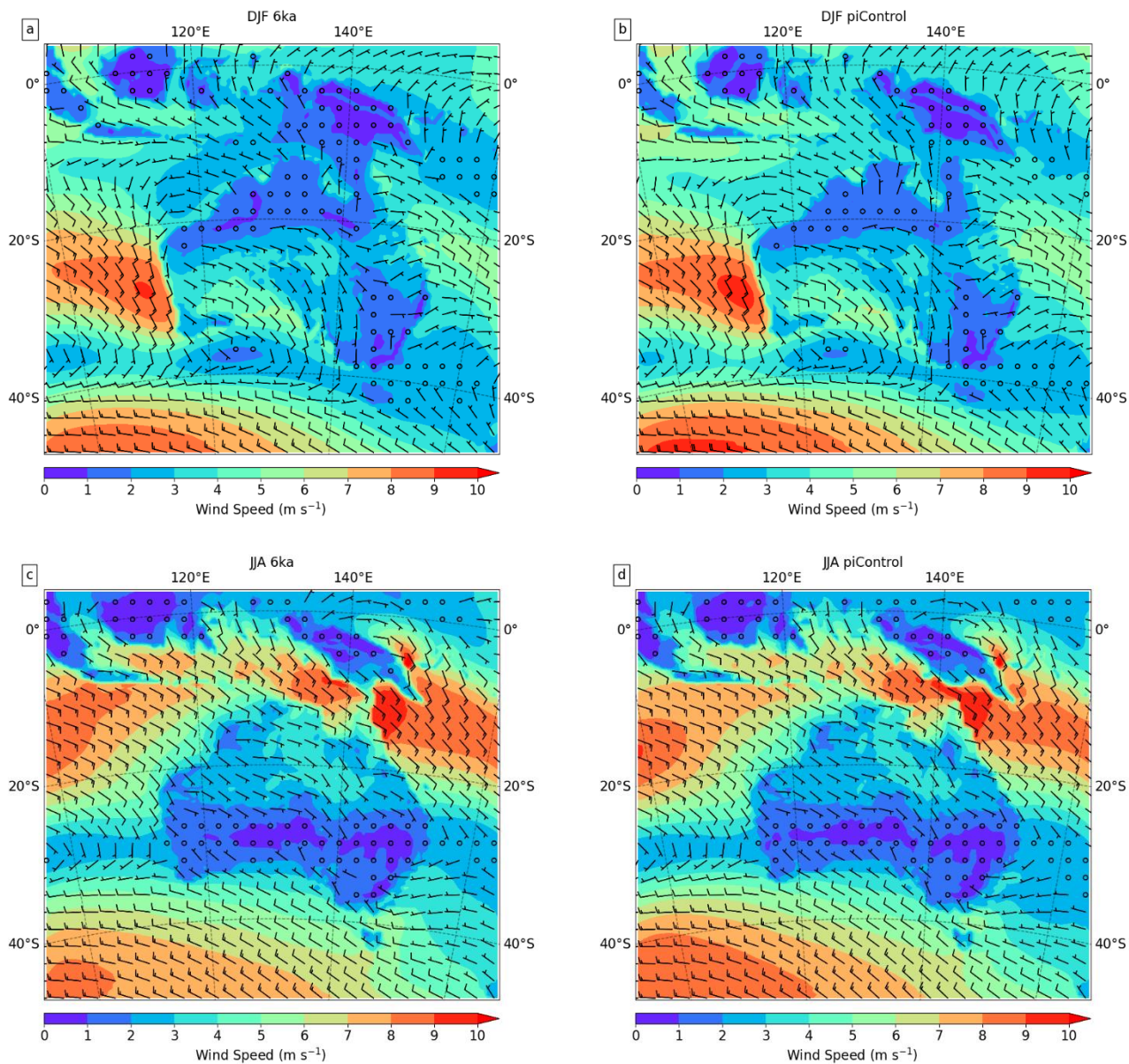
Figure S5: Seasonal 10 m wind for Dec, Jan, and Feb mid-Holocene (a), Dec, Jan, and Feb pre-industrial (b), Jun, Jul, and Aug mid-Holocene (c), and Jun, Jul, and Aug pre-industrial (d).
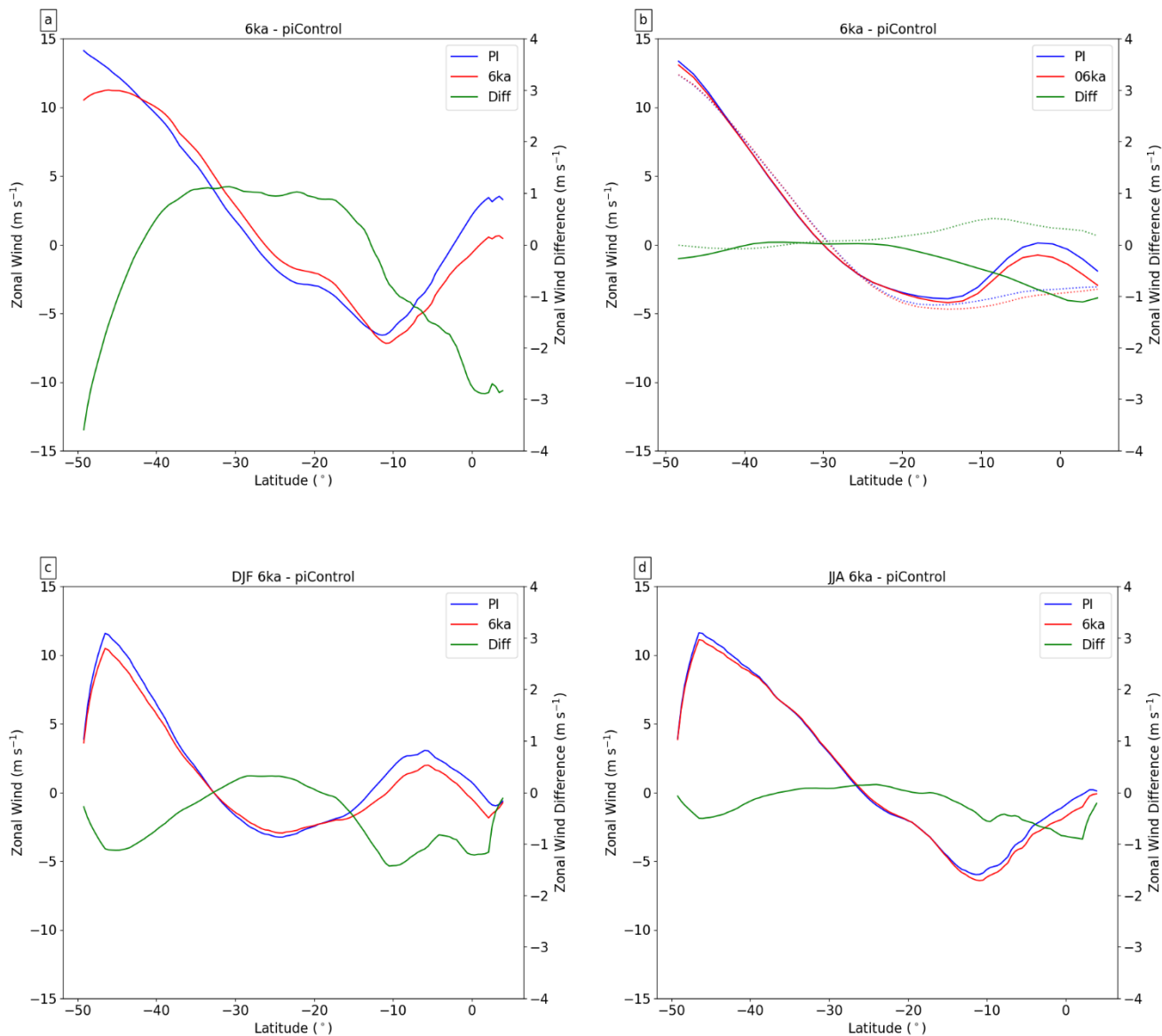
Figure S6: 850 hPa zonal wind for the pre-industrial and mid-Holocene. The annual mean from the WRF simulation (a). The annual mean from the CESM simulation, the solid lines are the Australian domain (100°E–170°E) and the dotted lines are the global values (b). The Dec, Jan, and Feb mean from the WRF simulation (c). The Jun, Jul, and Aug mean from the WRF simulation (d).

References

Allen, J. R. M., Forrest, M., Hickler, T., Singarayer, J. S., Valdes, P. J., and Huntley, B.: Global vegetation patterns of the past 140,000 years, J. Biogeogr., 47, 2073–2090, https://doi.org/10.1111/jbi.13930, 2020.