Supplement of

Atlantic Multi-decadal Oscillation Modulates the Relationship Between El Niño-Southern Oscillation and Fire Weather in Australia

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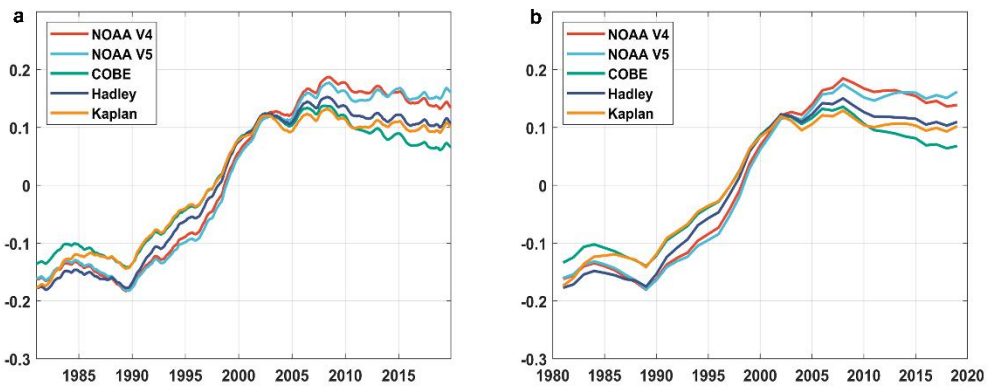

Figure S1. Time series of AMO index from 1981 to 2019 derived from different SST datasets. These time series are **(a)** monthly mean and **(b)** annual mean, respectively.

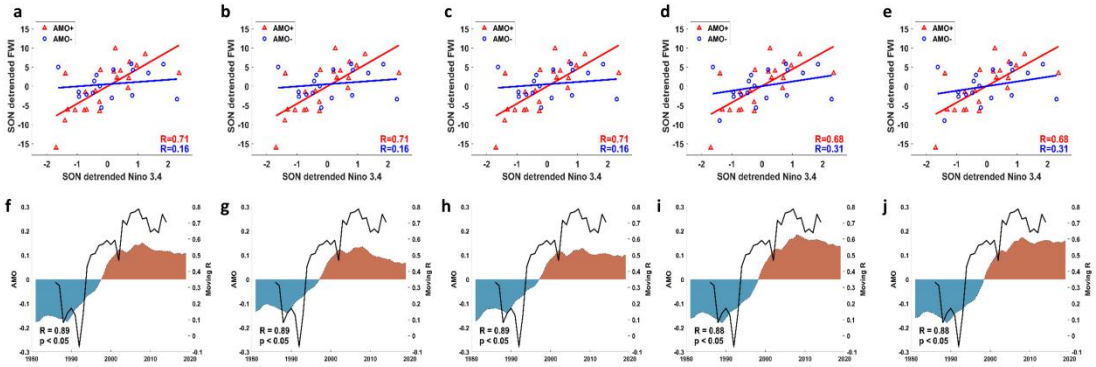

Figure S2. Similar to Figure 1, but for **(a, f)** NOAA Extended Reconstruction SST V4, **(b, g)** NOAA Extended Reconstruction SST V5, **(c, h)** COBE-SST 2, **(d, i)** the Met Office Hadley Centre's SST, and Kaplan Extended SST v2 datasets. The correlation coefficients corresponding to AMO+ passed the significance test of p-value<0.05, while the others did not.

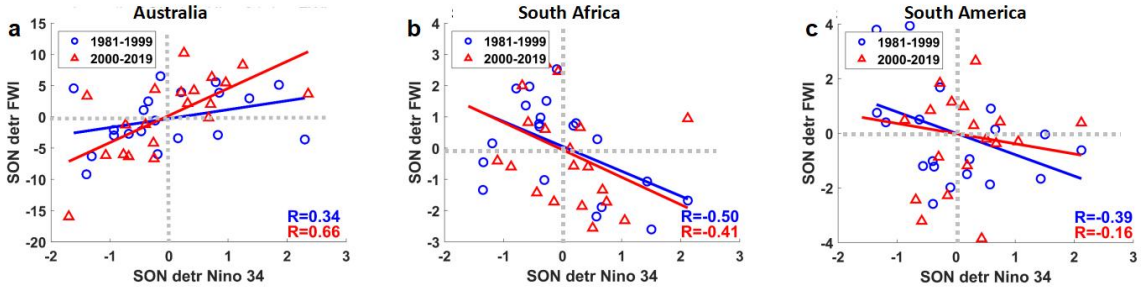

Figure S3. Scatter plots for detrended, standardized SON Niño 3.4 index and the corresponding reanalysis mean FWI in **(a)** Australia, **(b)** South Africa, and **(c)** South America from 1981 to 2019. The red upward triangles represent 2000-2019, while the blue circles represent 1981-1999. The lines are linear fit lines. Correlation coefficients except R = -0.16 passed the significance test of p-value<0.05. The selection of specific areas is the same as in the previous study (*van der Werf et al.*, 2006).

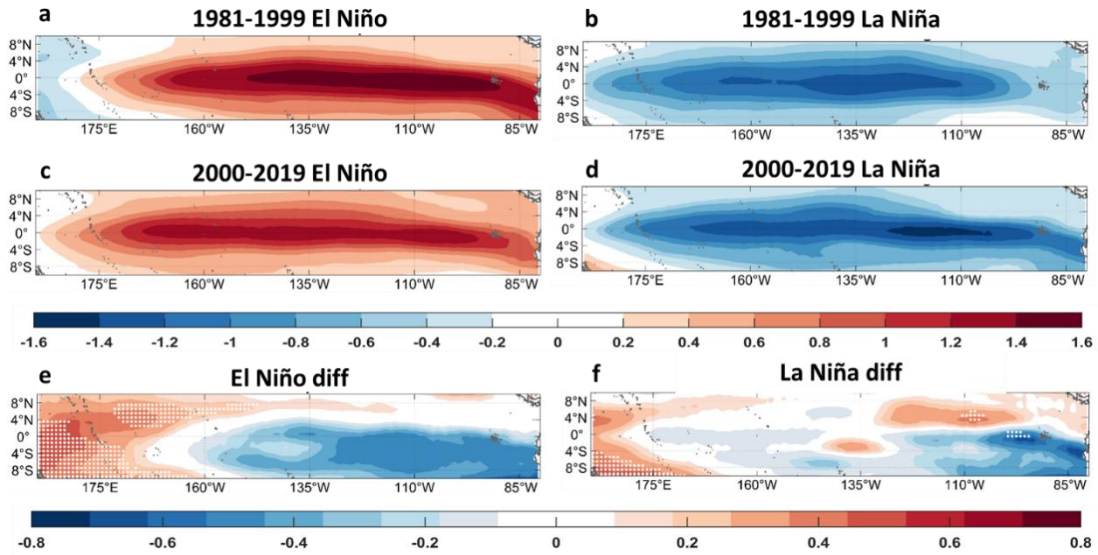

Figure S4. SST anomaly composite map for **(a)** El Niño events in 1981-1999, **(b)** La Niña events in 1981-1999, **(c)** El Niño events in 2000-2019, **(d)** La Niña events in 2000-2019, **(e)** the composite map of (a)-(c), and **(f)** the composite map of (b)-(d). The area with white dots passed the significance test of p-value < 0.05 by Student's t-test.

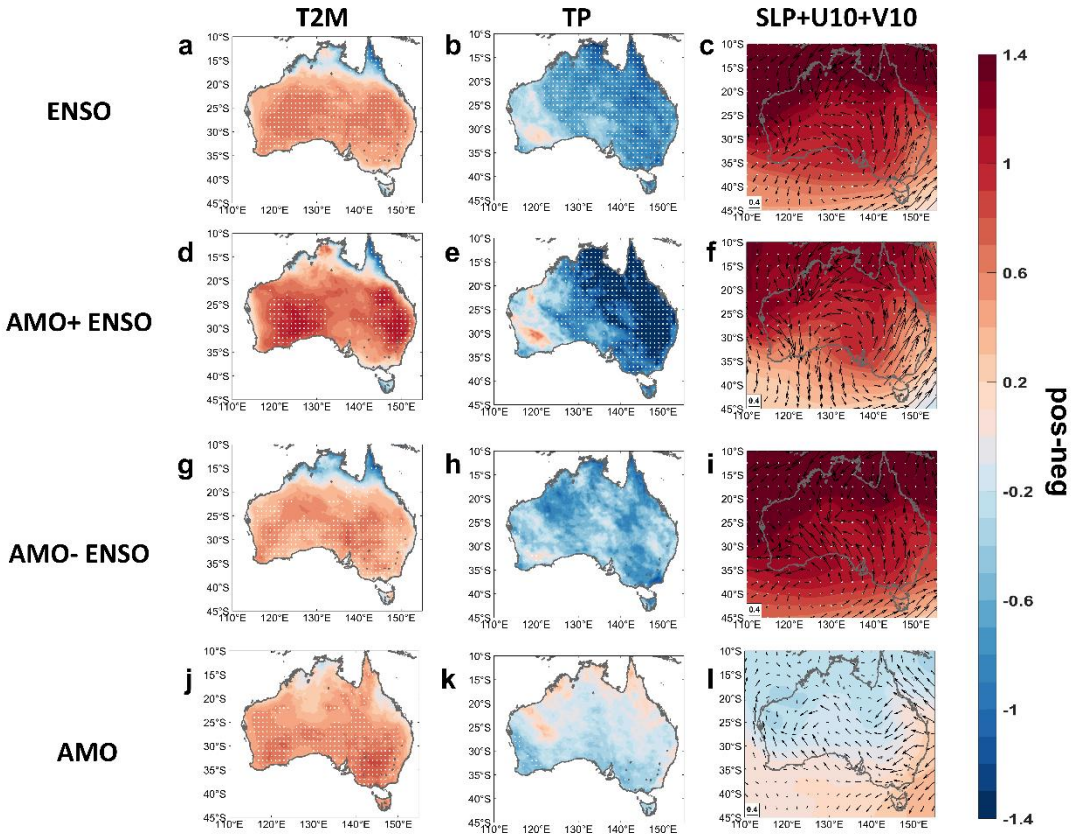

Figure S5. The difference maps for the ERA5 detrended and normalized reanalysis SON **(a, d, g, j)** 2m temperature (T2M), **(b, e, h, k)** Total Precipitation (TP), and (c, f, I, l) Sea Level Pressure (SLP)+10m zonal and meridional winds (U10+V10) in conditions with **(a-c)** ENSO composite (El Nino composite minus La Nina composite), **(d-f)** ENSO composite with AMO+, **(g-i)** ENSO composite with AMO-, and **(j-l)** AMO composite from 1959 to 2019. The composite results are calculated using meteorological variables with positive indices minus those with negative ones. The area with white dots passed the significance test of p-value < 0.05 by Student's t-test.

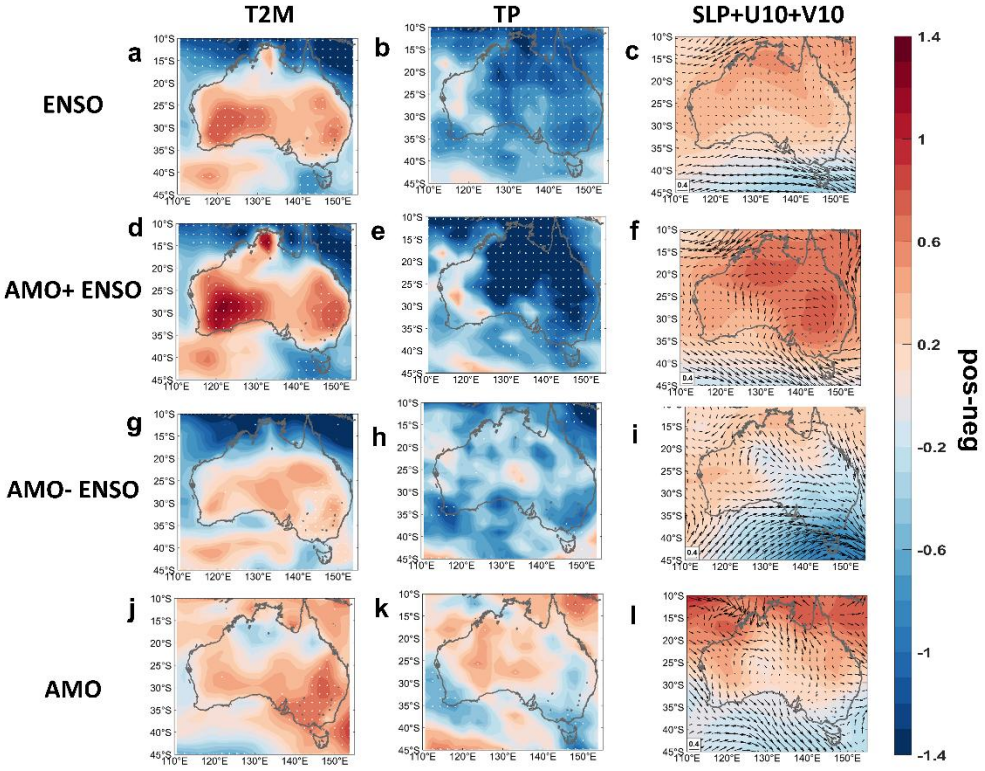

Figure S6. Similar to Figure S5, but for NCEP-NCAR Reanalysis 1 datasets (1981-2019).

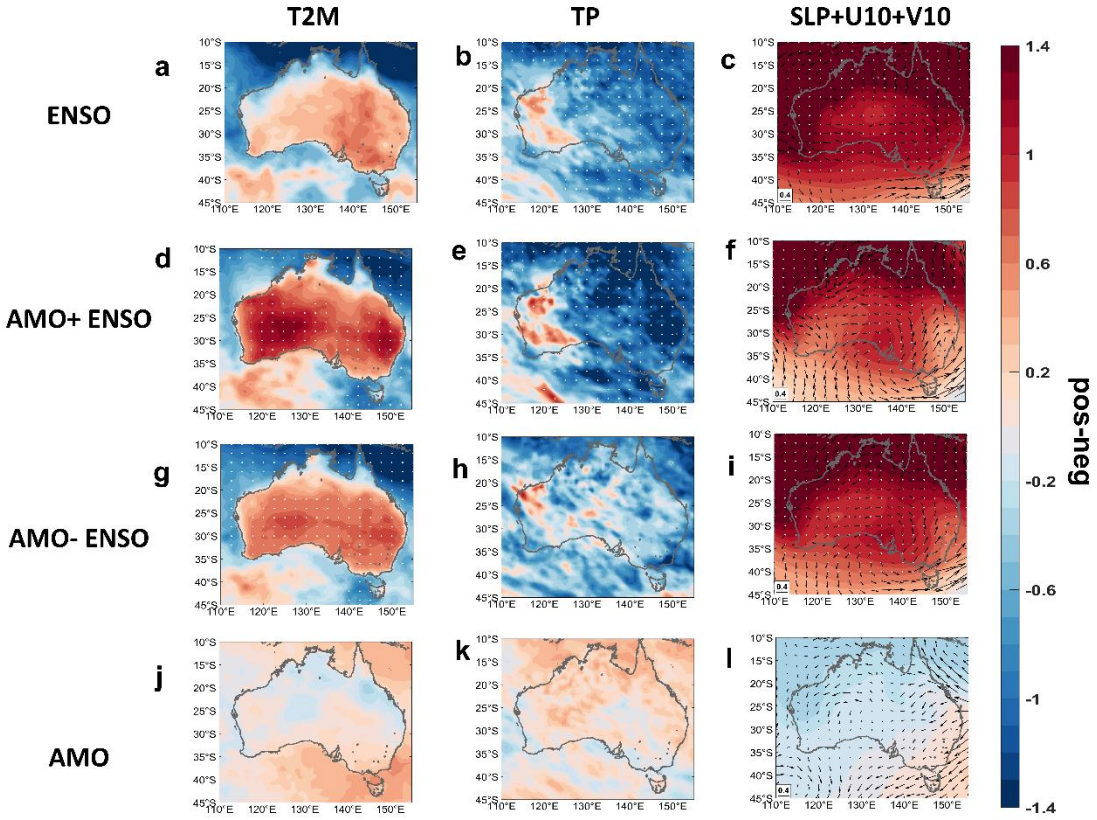

Figure S7. Similar to Figure S5, but for MERRA-2 datasets (1981-2019).

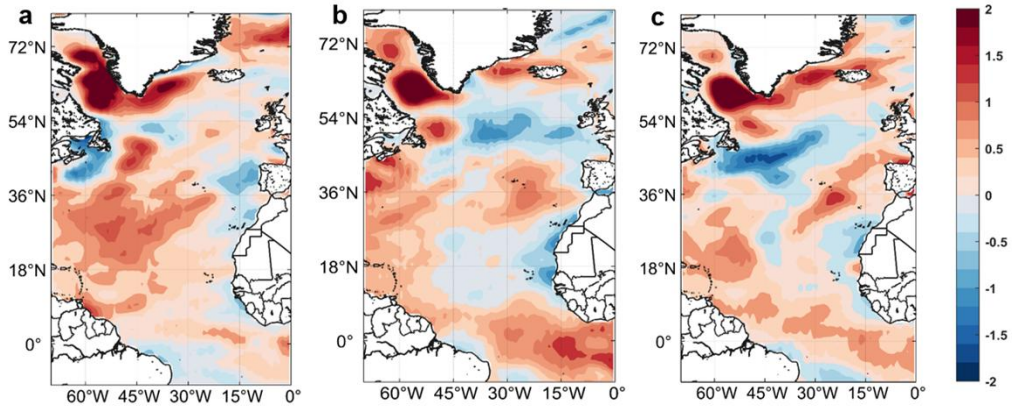

Figure S8. North Atlantic SST anomaly in **(a)** September, **(b)** October, and **(c)** November 2019. The climatology mean SST is calculated using 1980-2009 SST.

References

van der Werf, G. R., Randerson, J. T., Giglio, L., Collatz, G. J., Kasibhatla, P. S., and Arellano, A. F.: Interannual variability in global biomass burning emissions from 1997 to 2004, Atmospheric Chem. Phys., 6, 3423-3441, https://doi.org/10.5194/acp-6-3423-2006, 2006.