



## Supplementary Information for

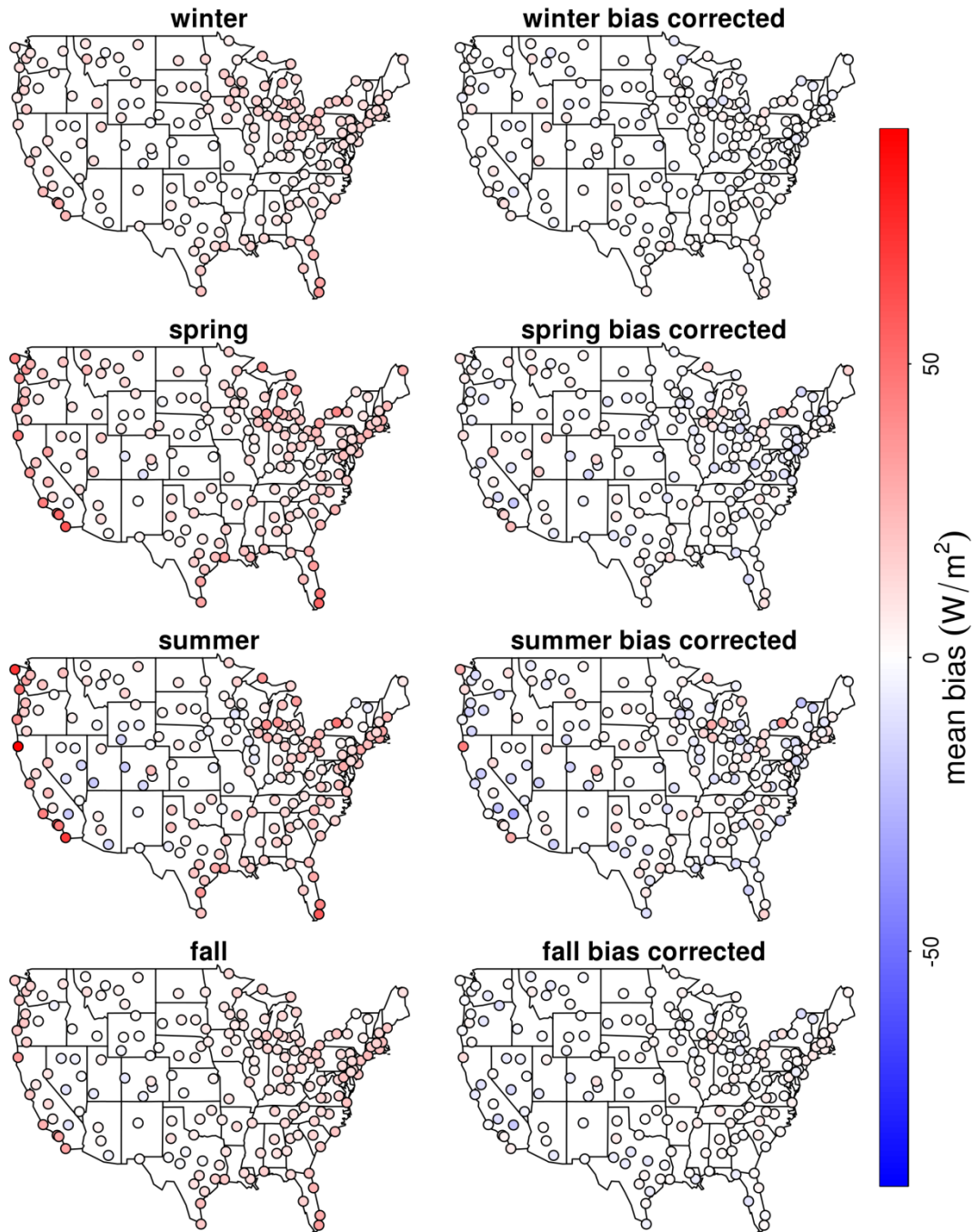
### **Decreasing fire season precipitation increased recent western US forest wildfire activity**

Zachary A. Holden, Alan Swanson, Charles H. Luce, W. Matt Jolly, Marco Maneta, Jared W. Oyler, Dyer A. Warren, Russell Parsons and David Affleck

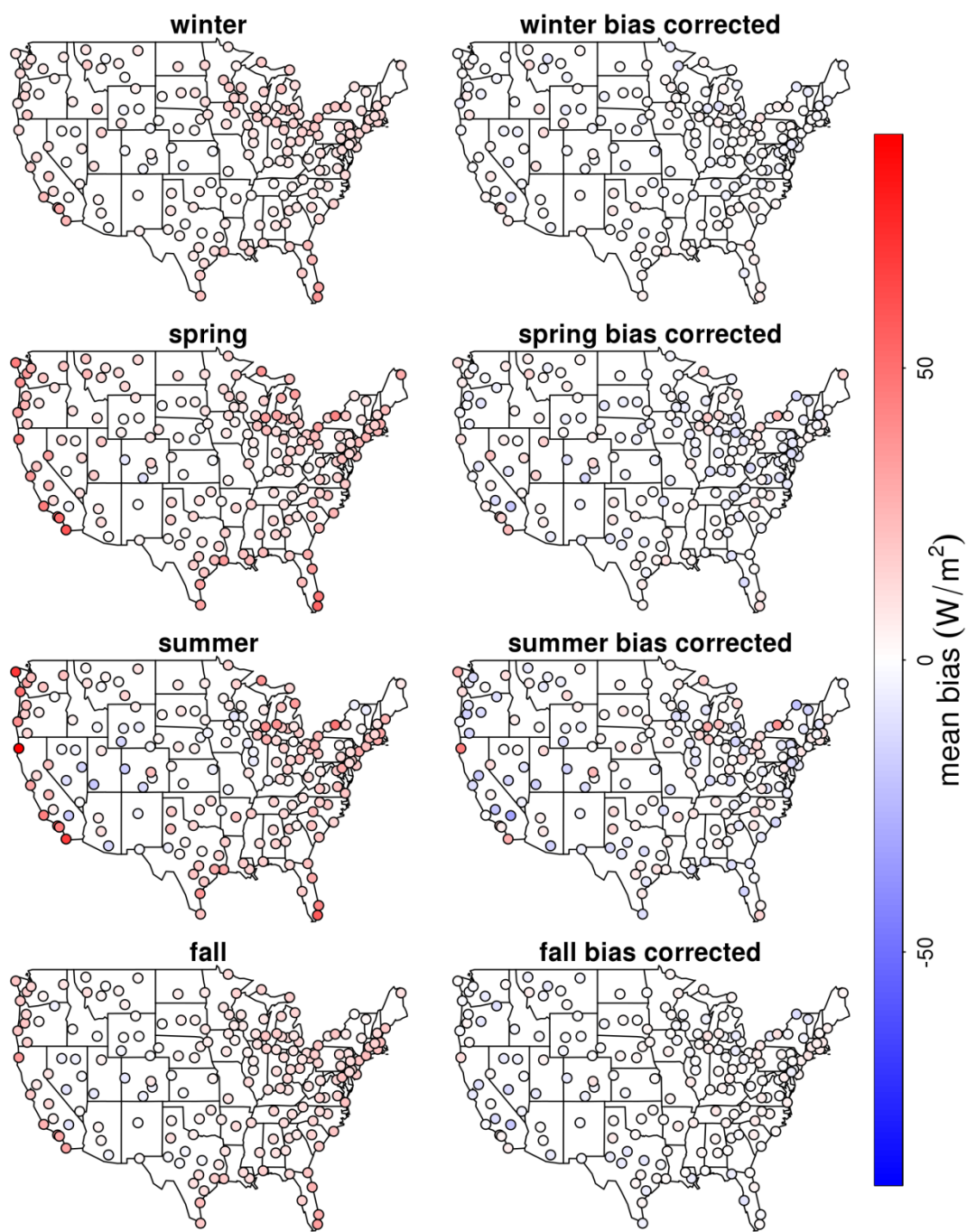
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#### **This PDF file includes:**

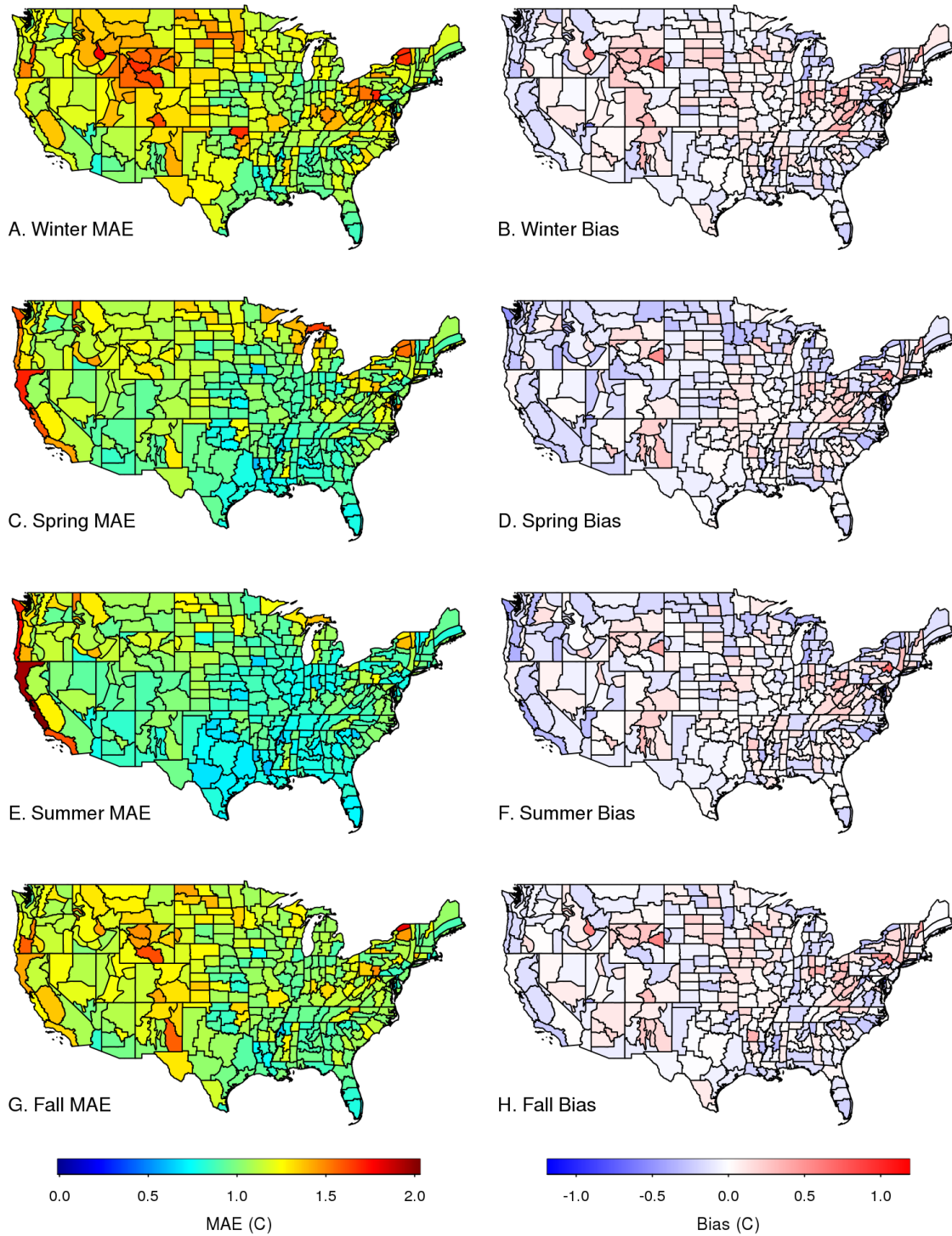
Figs. S1 to S10  
Table S1



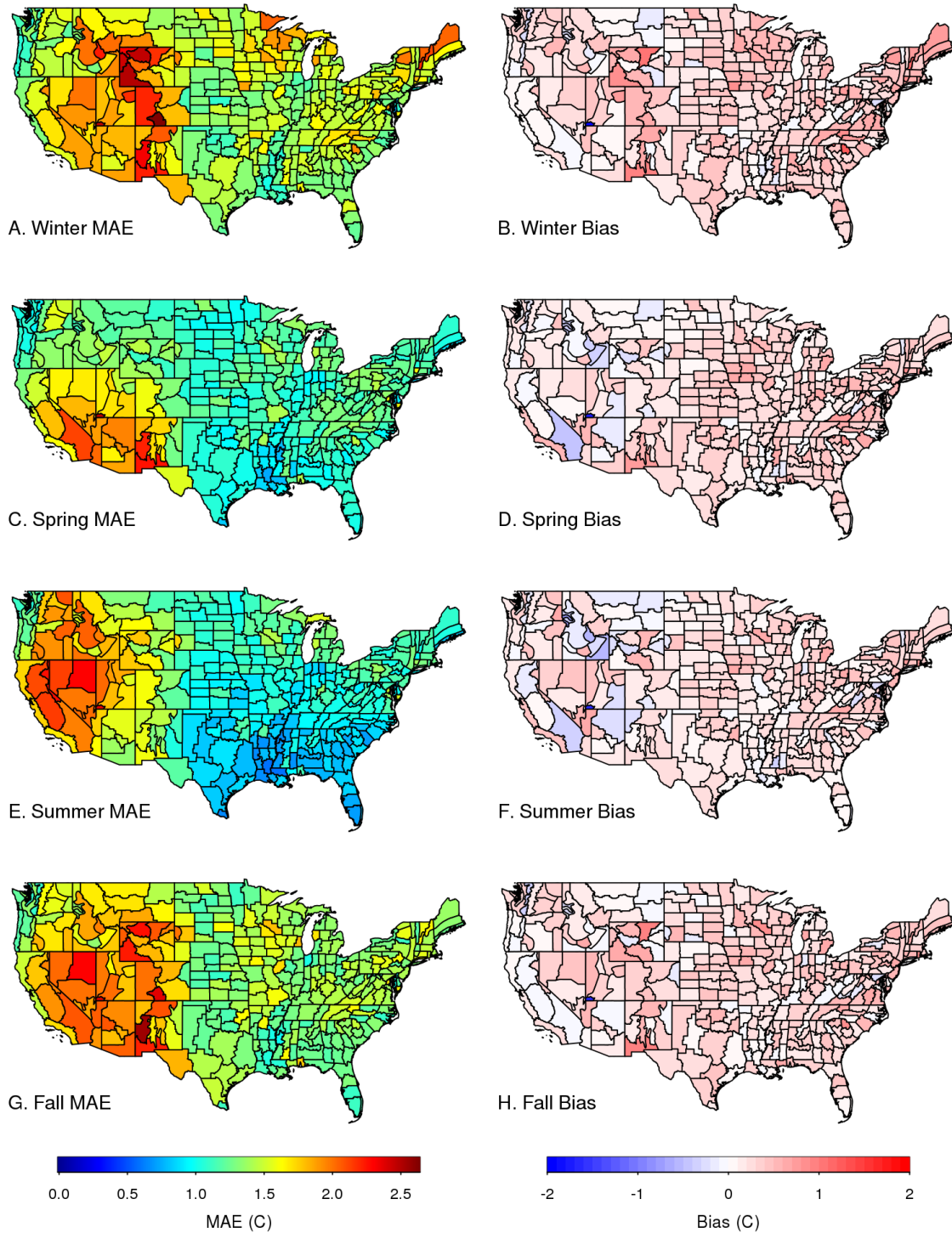
**Fig. S1.** Seasonal errors in NLDAS-2 shortwave radiation (1979-2010) compared with NSRDB shortwave radiation observations before and after bias correction.



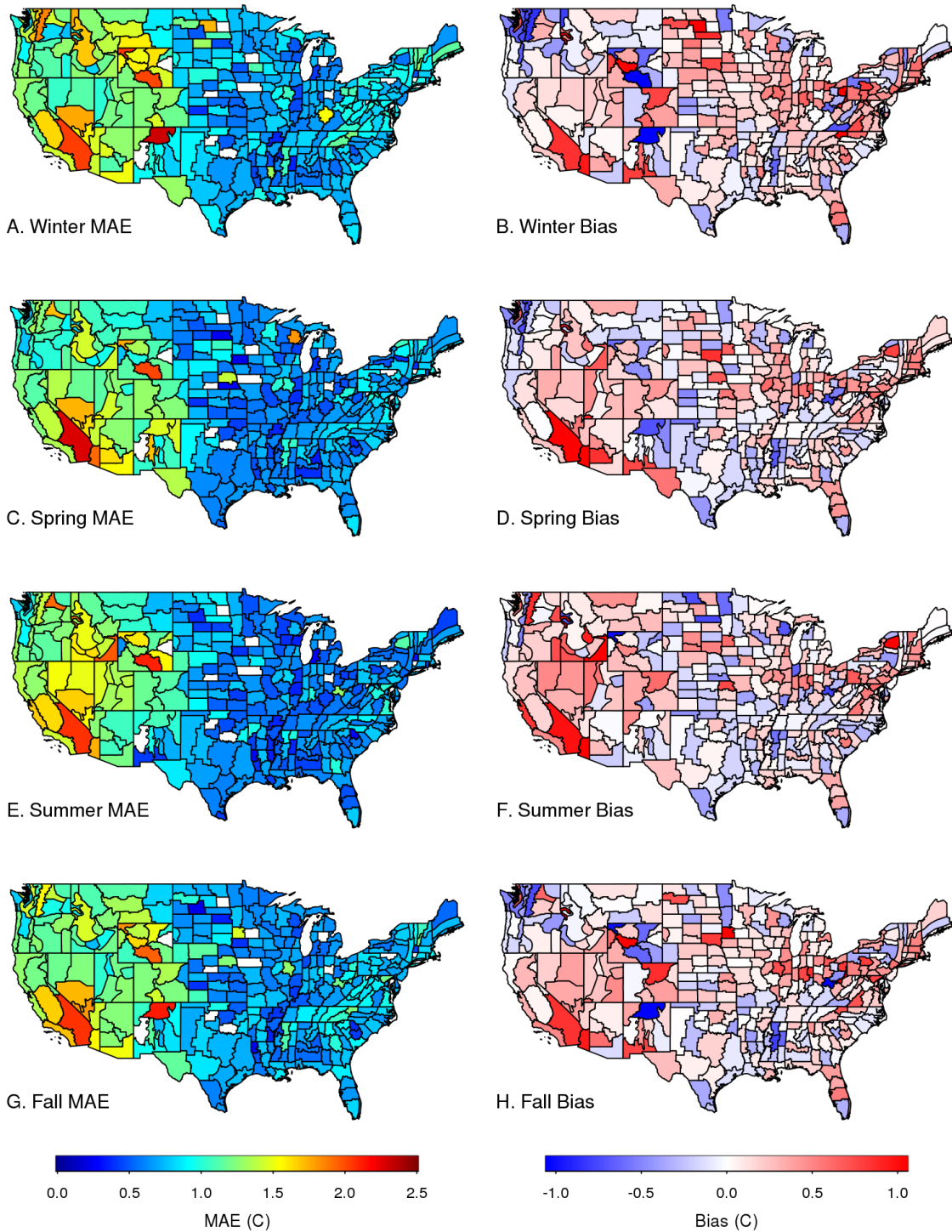
**Fig. S2.** Seasonal errors in NLDAS-2 shortwave radiation compared with Climate Reference Network stations from 2010-2015.



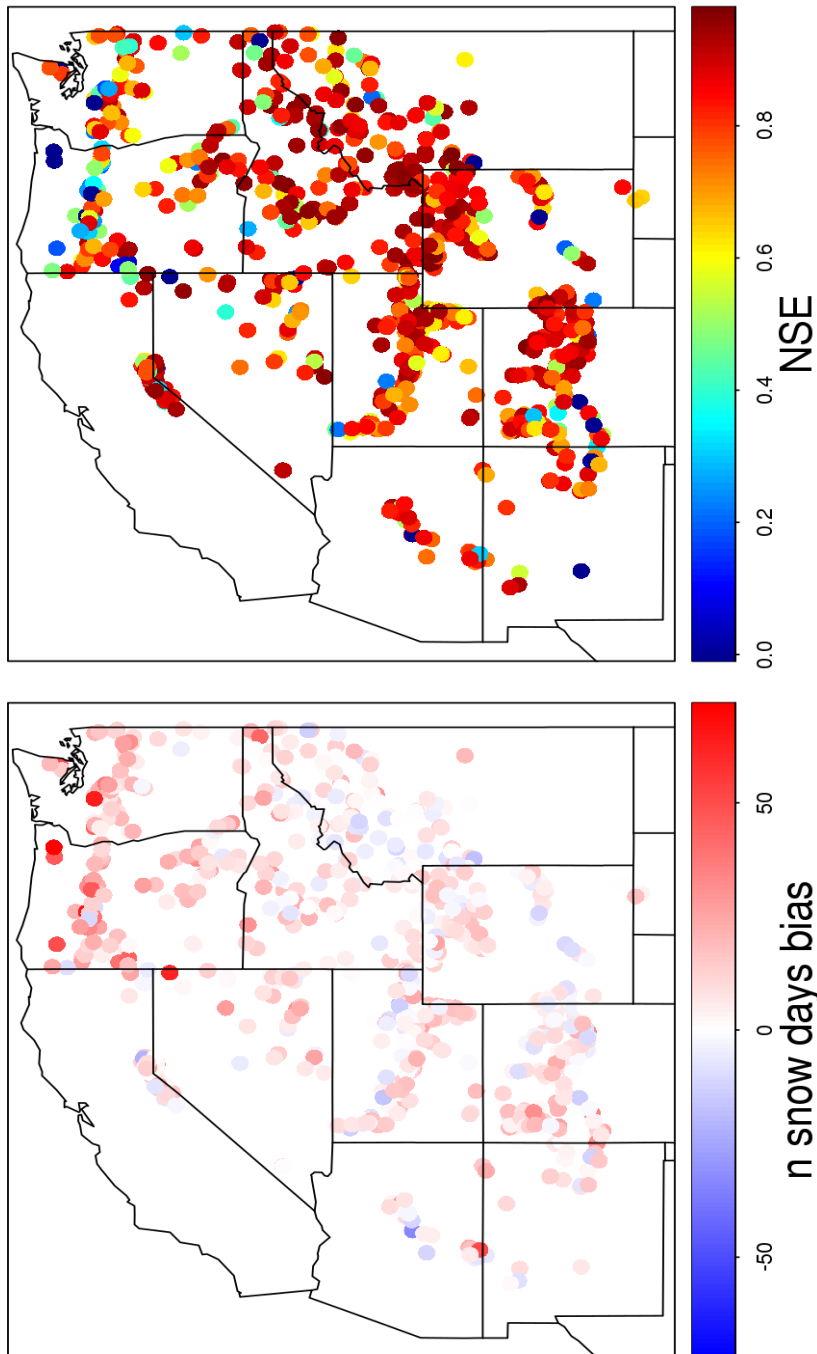
**Fig. S3.** Seasonal errors in daily maximum air temperature averaged by US climate division, with Mean Absolute Error (MAE) in the left panel and bias in the right panel.



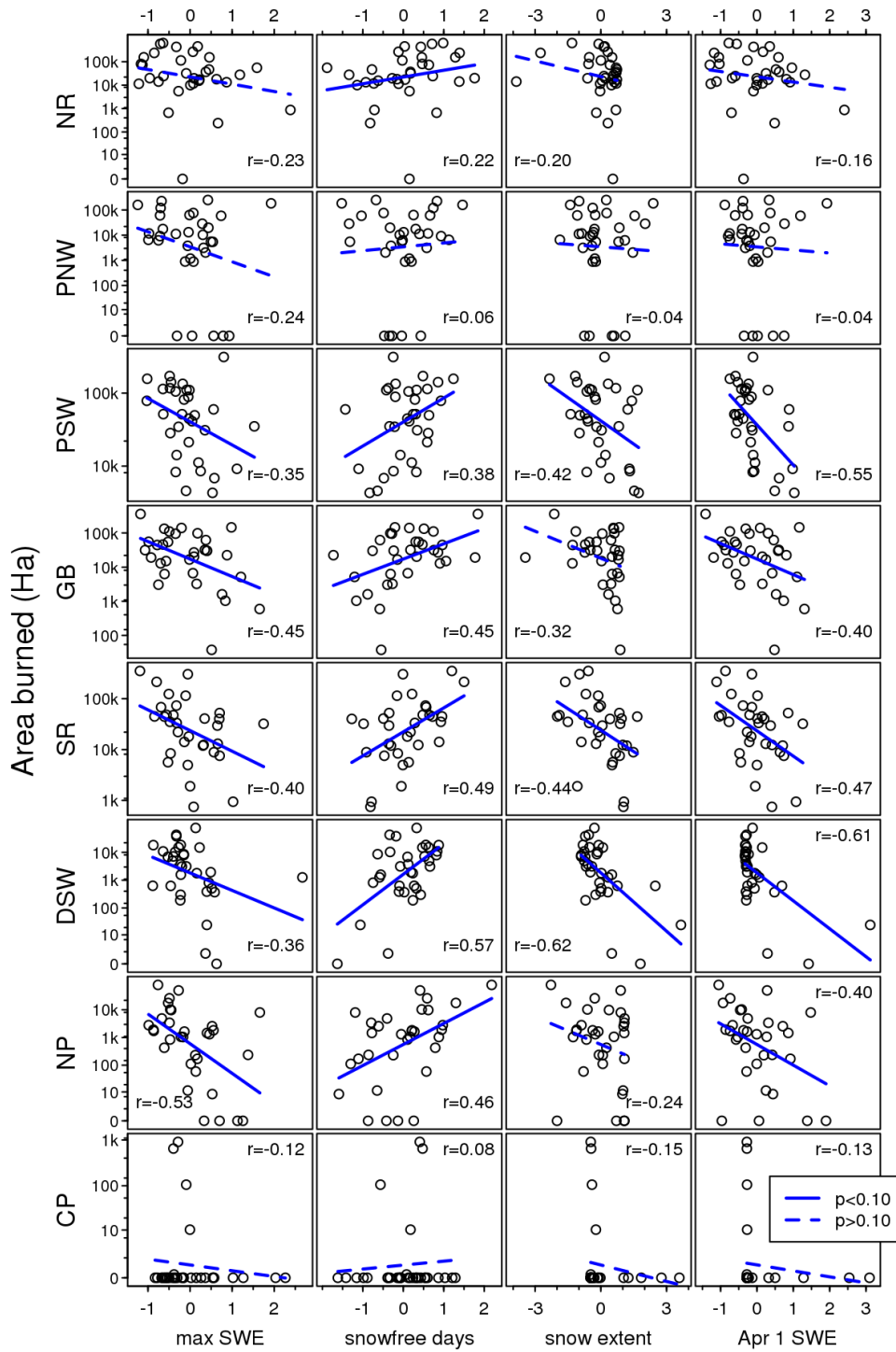
**Fig. S4.** Seasonal errors in daily minimum temperature averaged by US climate division, with Mean Absolute Error (MAE) in the left panel and bias in the right panel.



**Fig. S5.** Seasonal errors in mean daily dewpoint temperature averaged by US climate division, with Mean Absolute Error (MAE) in the left panel and bias in the right panel.

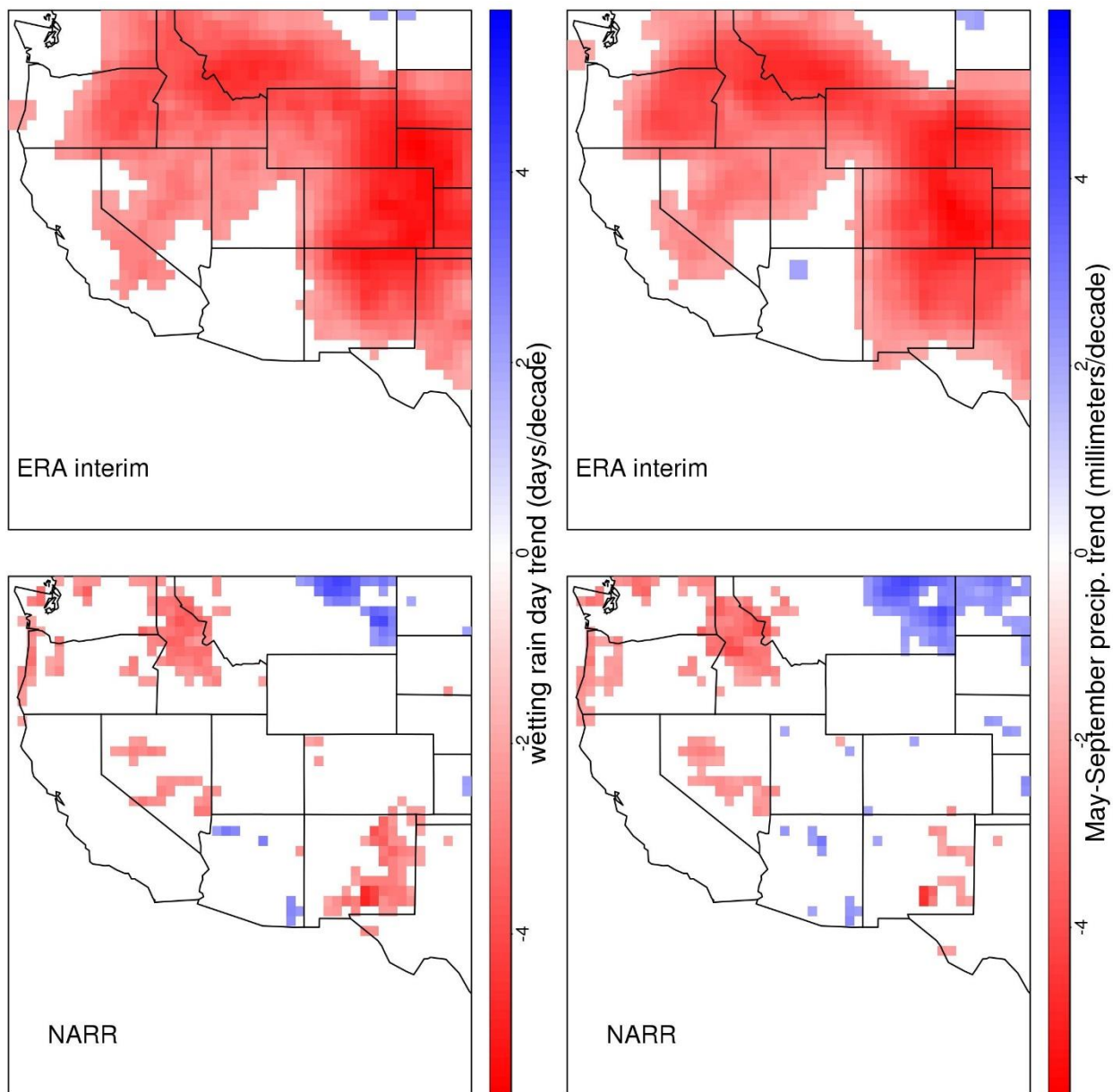


**Fig. S6.** Daily snow model validation at 844 western US SNOTEL stations. The upper panel shows the Nash-Sutcliffe efficiency statistic of the observed versus modeled snow water equivalent from 2000-2015 at each station. The lower panel shows the mean absolute error in the number of snow-free days for the same period.

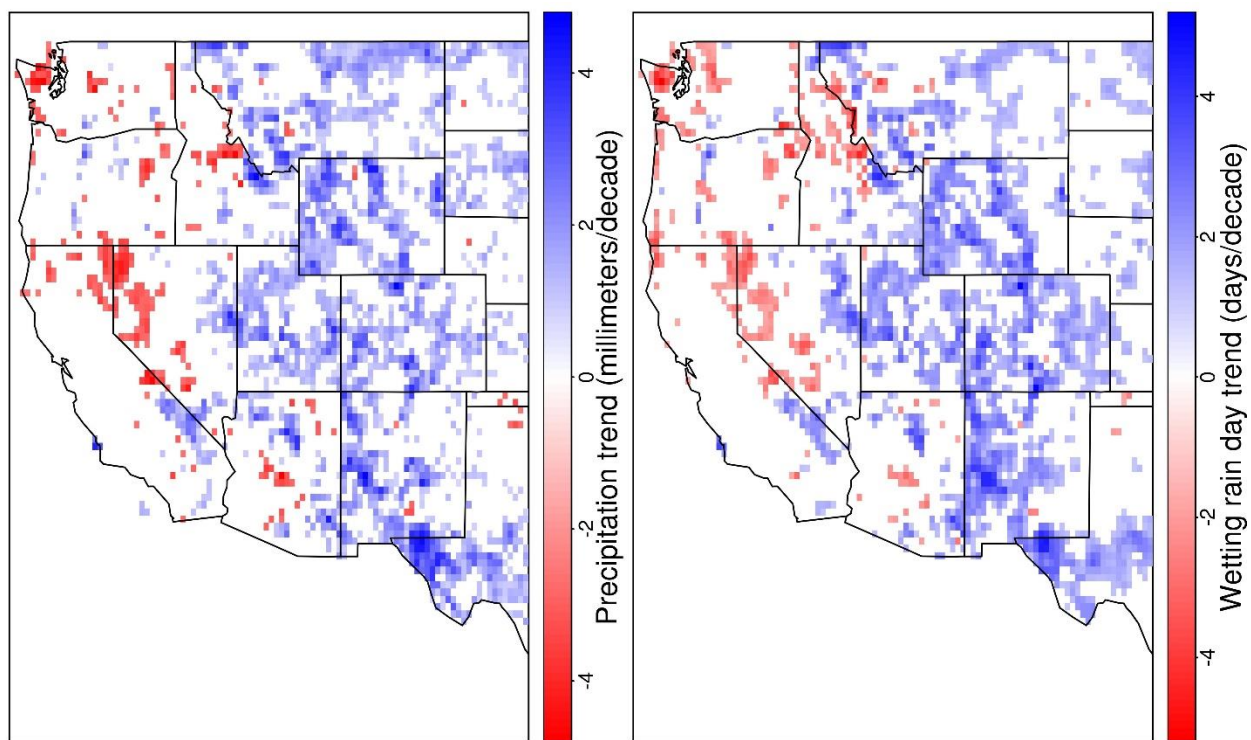


**Fig. S7.** Correlations between metrics of snowpack and snowmelt timing and wildfire area burned calculated for 8 NEON domains. Solid blue fit lines indicate statistical significance at  $p < 0.10$ . A dashed blue line indicate lack of statistical significance.

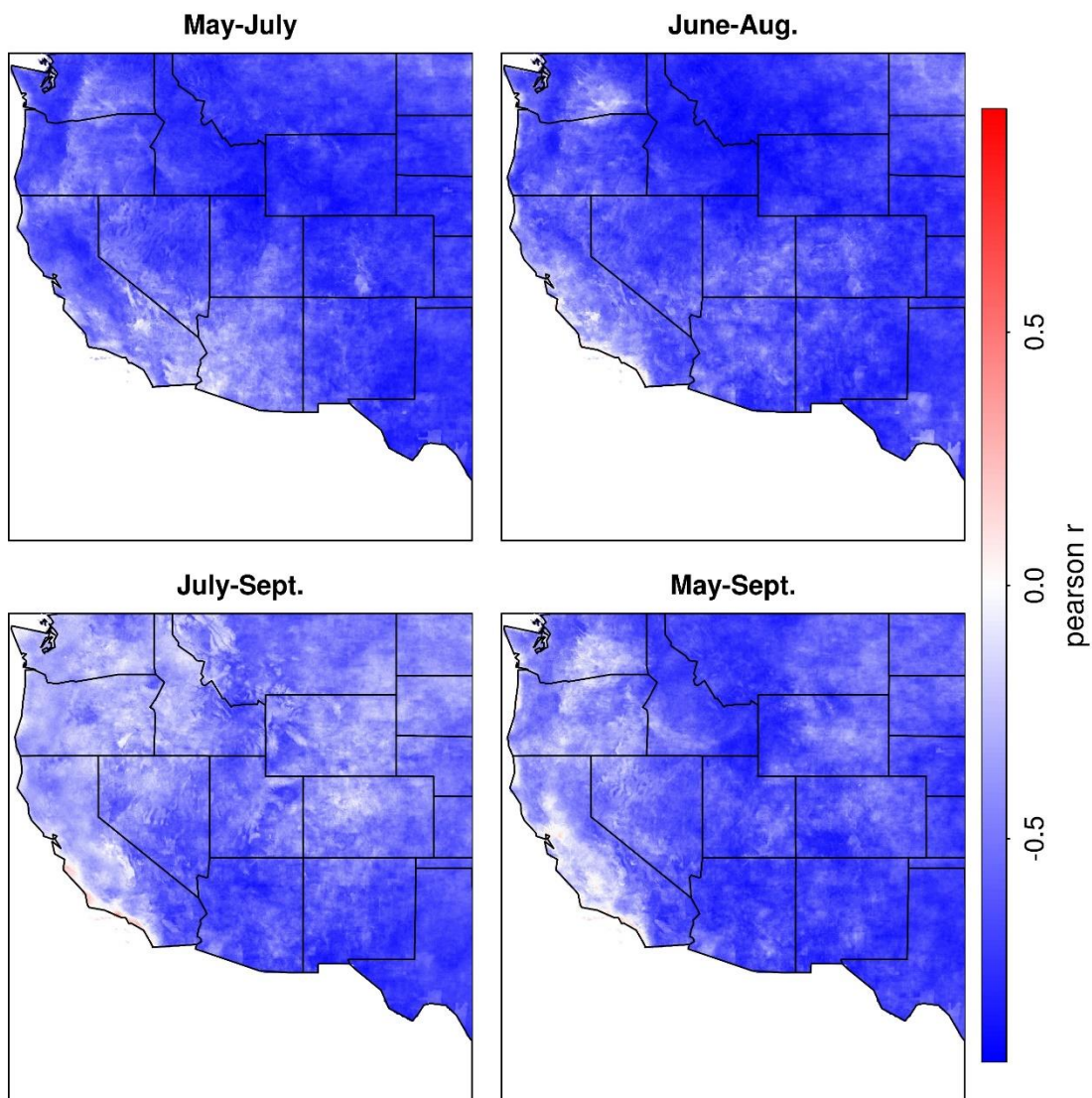




**Fig. S8.** Trends in May-September total precipitation and wetting rain days from 1979-2016 in the ERA-interim reanalysis and North American Regional Reanalysis (NARR) datasets. Trends are calculated using the Mann-Kendall trend test. Only pixels with significant trends at  $p < 0.10$  are shown.



**Fig. S9.** Linear trends in the NOAA Climate Prediction Center unified gauge-based precipitation analysis from 1948-2016. Trends were calculated using the Mann-Kendall trend test. Only grid cells with trends significant at  $p < 0.10$  are shown.



**Fig. S10.** Pixel-wise linear correlations from 1979-2016 between the average maximum vapor pressure deficit and GRIDMET wetting rain days for the periods May-July (upper left panel) June-August (upper right panel) July-September (lower left panel) and May-September (lower right panel). 250 meter resolution vapor pressure deficit grids were resampled to 4km resolution prior to calculating correlation values.

**Table S1. Coefficients used to correct for local terrain effects in models of minimum and maximum temperature and mean daily dewpoint temperature.**

	$T_{\min}$	$T_{\max}$	$T_{\text{dew}}$
Intercept	-2.472	1.024	-0.02369
CFSR free-air tmin	1.0000	-	-
CFSR free-air tmax	-	0.9186	-
CFSR free-air tdew	-	-	0.6045
CAD-P	0.9814	-	-
CFSR 2m RH	0.02688	-	-
CRSR standardized geopotential height	-0.2529	-	-
SRAD	-	0.0005757	-0.0003794
Modeled soil moisture	-	-0.0006660	-0.001320
SOIL:SRAD	-	-	0.000001064
CAD-P:std. Geo. Height	0.2035	-	-
CAD-P:CFSR RH	-0.006694	-	-
modeled Tmin	-	-	0.4462