Supplementary Information:

Increasing contributions of climate-driven wildfires to nitrogen deposition in the United States

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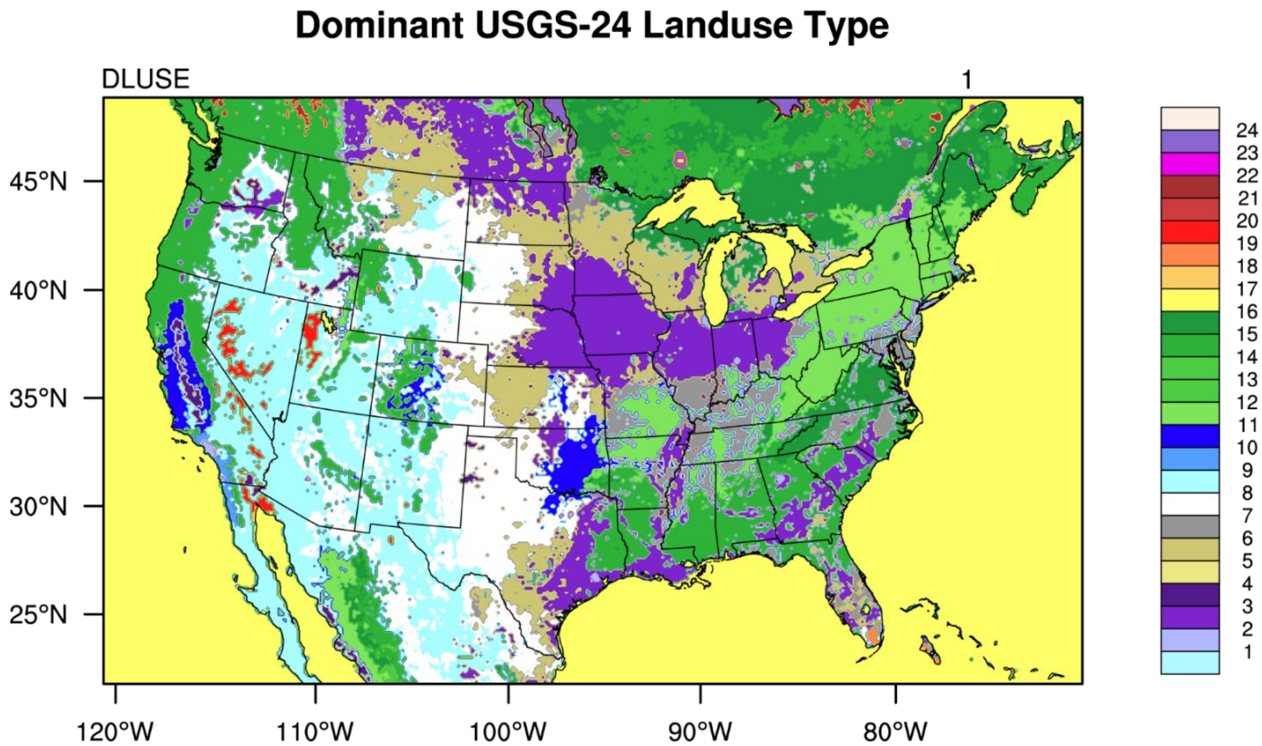
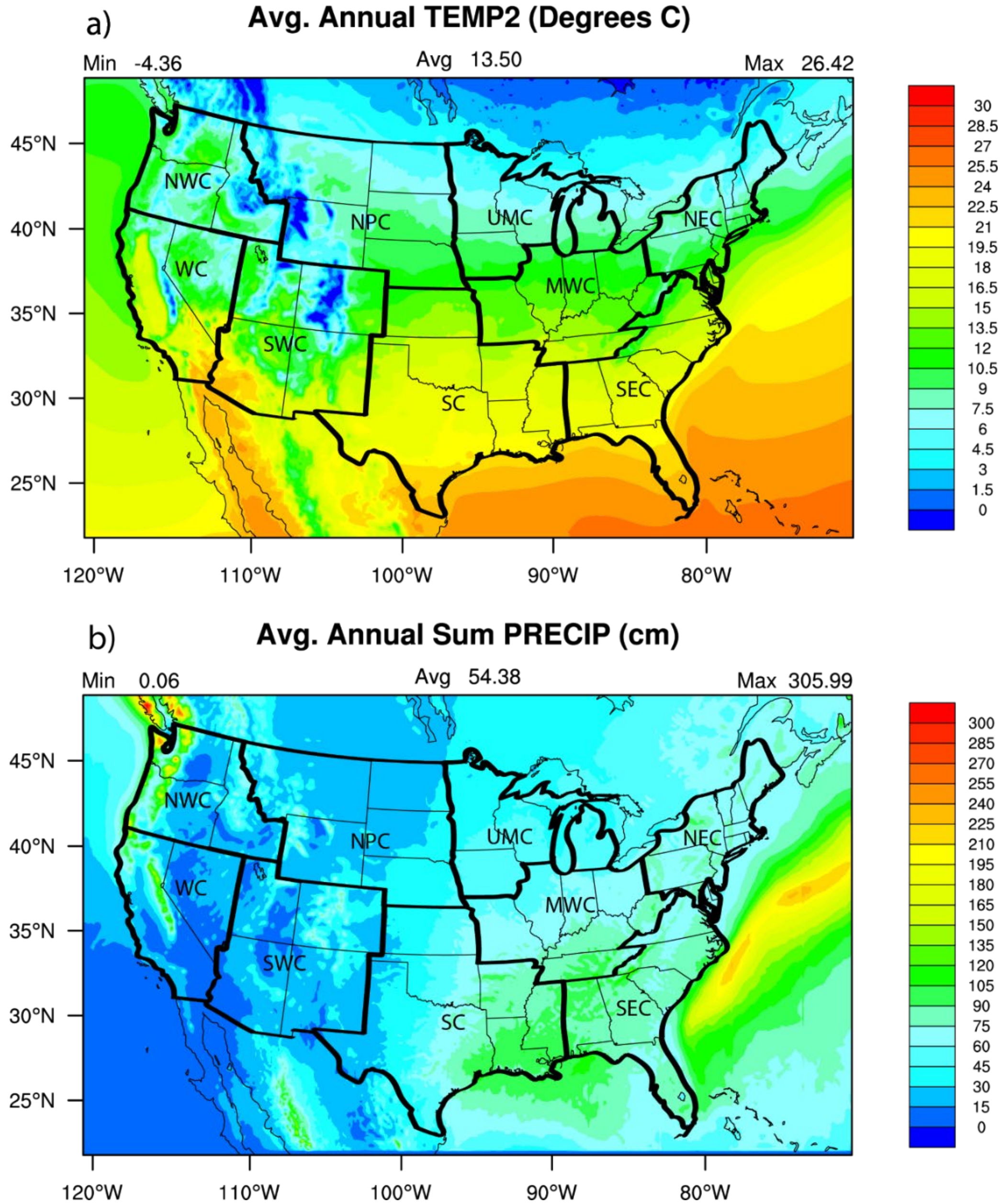
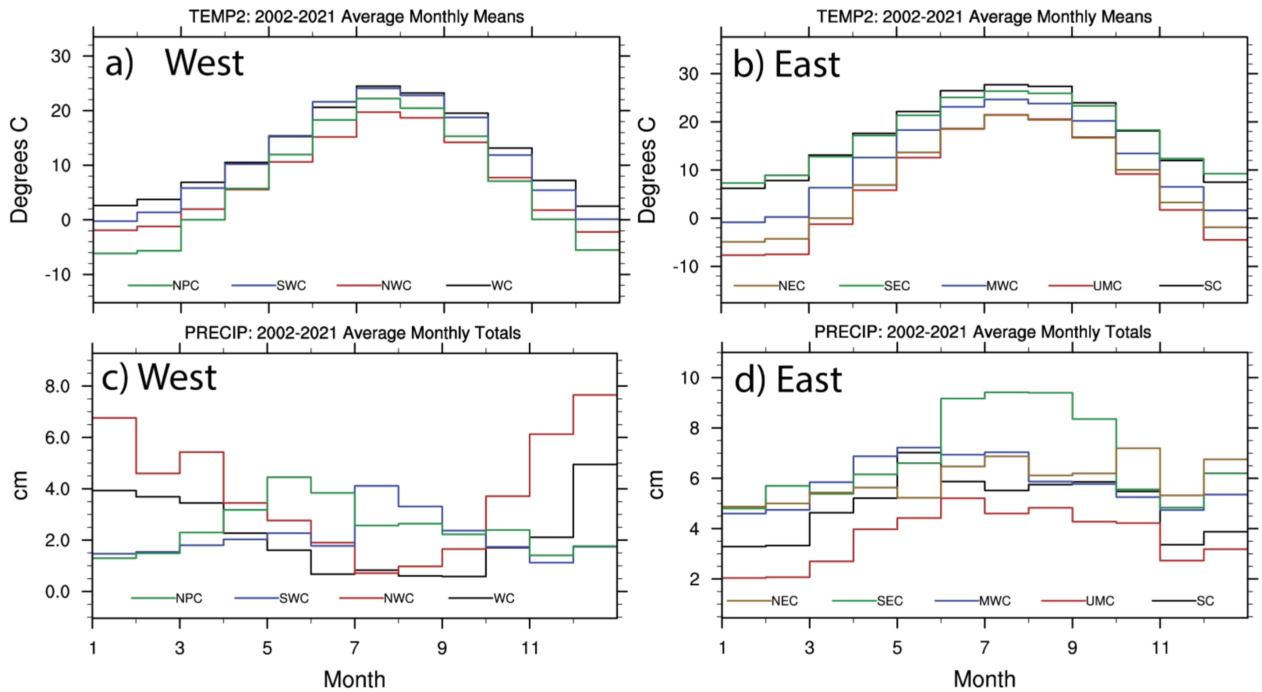


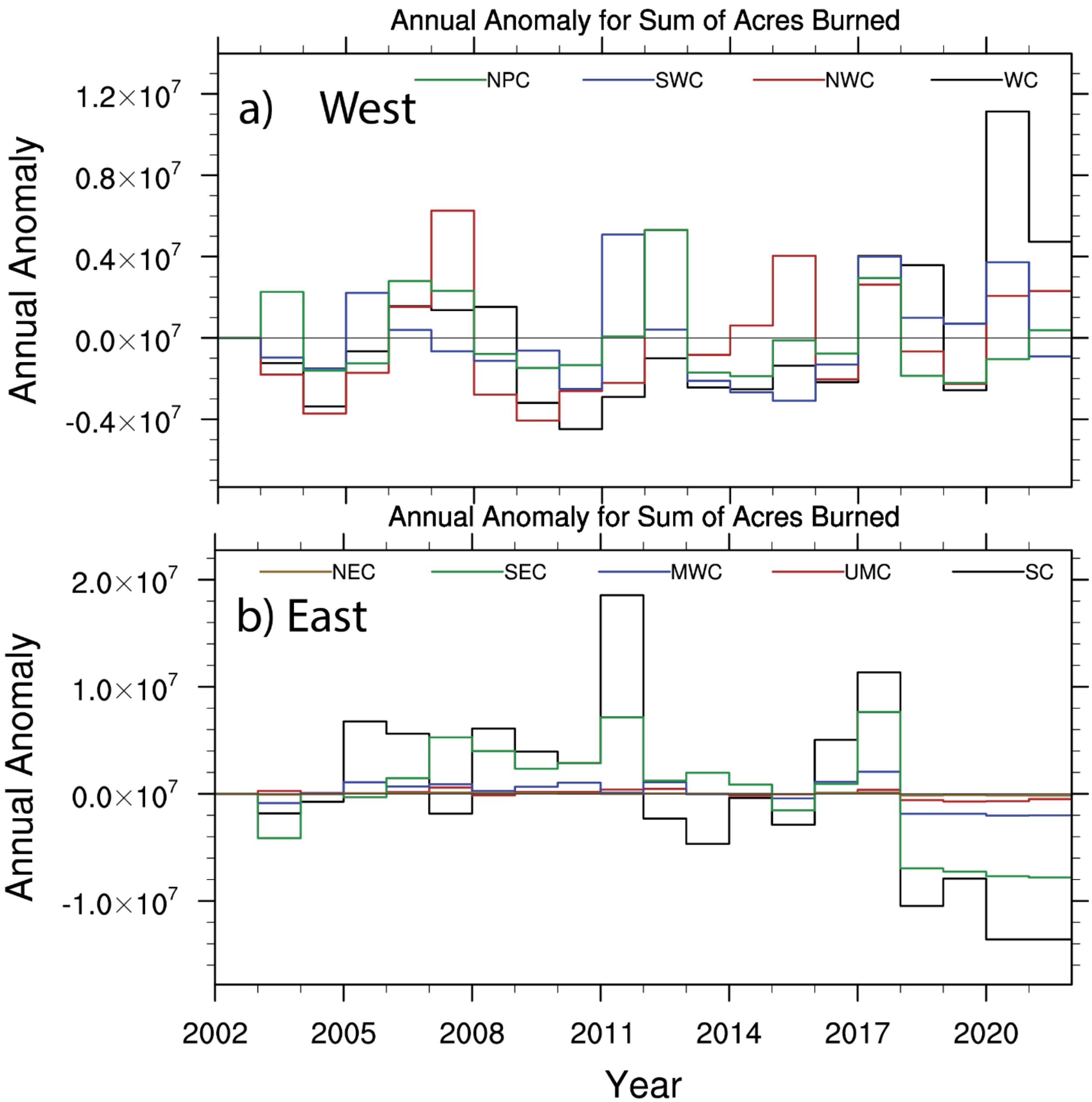
Supplementary Fig. S1. USGS 24-category dominant landuse types for the NACR domain and simulations. Categories pertain to 1) Urban and Built-Up Land, 2) Dryland Cropland and Pasture, 3) Irrigated Cropland and Pasture, 4) Mixed Dryland/Irrigated Cropland and Pasture, 5) Cropland/Grassland Mosaic, 6) Cropland/Woodland Mosaic, 7) Grassland, 8) Shrubland, 9) Mixed Shrubland/Grassland, 10) Savanna, 11) Deciduous Broadleaf Forest, 12) Deciduous Needleleaf Forest, 13) Evergreen Broadleaf, 14) Evergreen Needleleaf, 15) Mixed Forest, 16) Water Bodies, 17) Herbaceous Wetland, 18) Wooden Wetland, 19) Barren or Sparsely Vegetated, 20) Herbaceous Tundra, 21) Wooded Tundra, 22) Mixed Tundra, 23) Bare Ground Tundra, and 24) Snow or Ice.



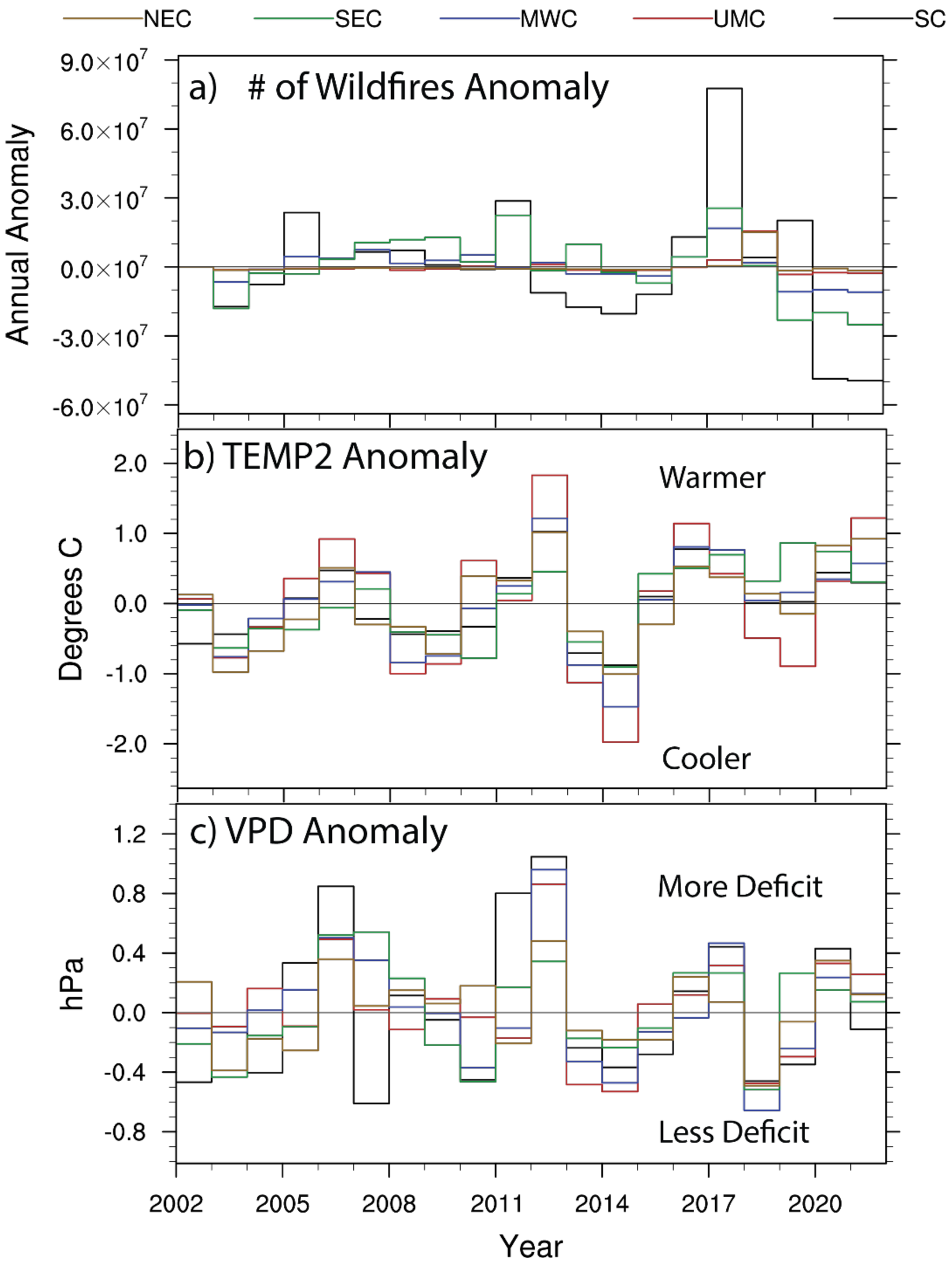
Supplementary Fig. S2. Average a) annual TEMP2 and b) annual sum PRECIP for the 2002-2021 period, which largely defines the following fire climate regions in this study: Northwest Climate (NWC), West Climate (WC), Northern Plains Climate (NPC), Southwest Climate (SWC), South Climate (SC), Upper Midwest Climate (UMC), Midwest Climate (MWC), Southeast Climate (SEC), and Northeast Climate (NEC).



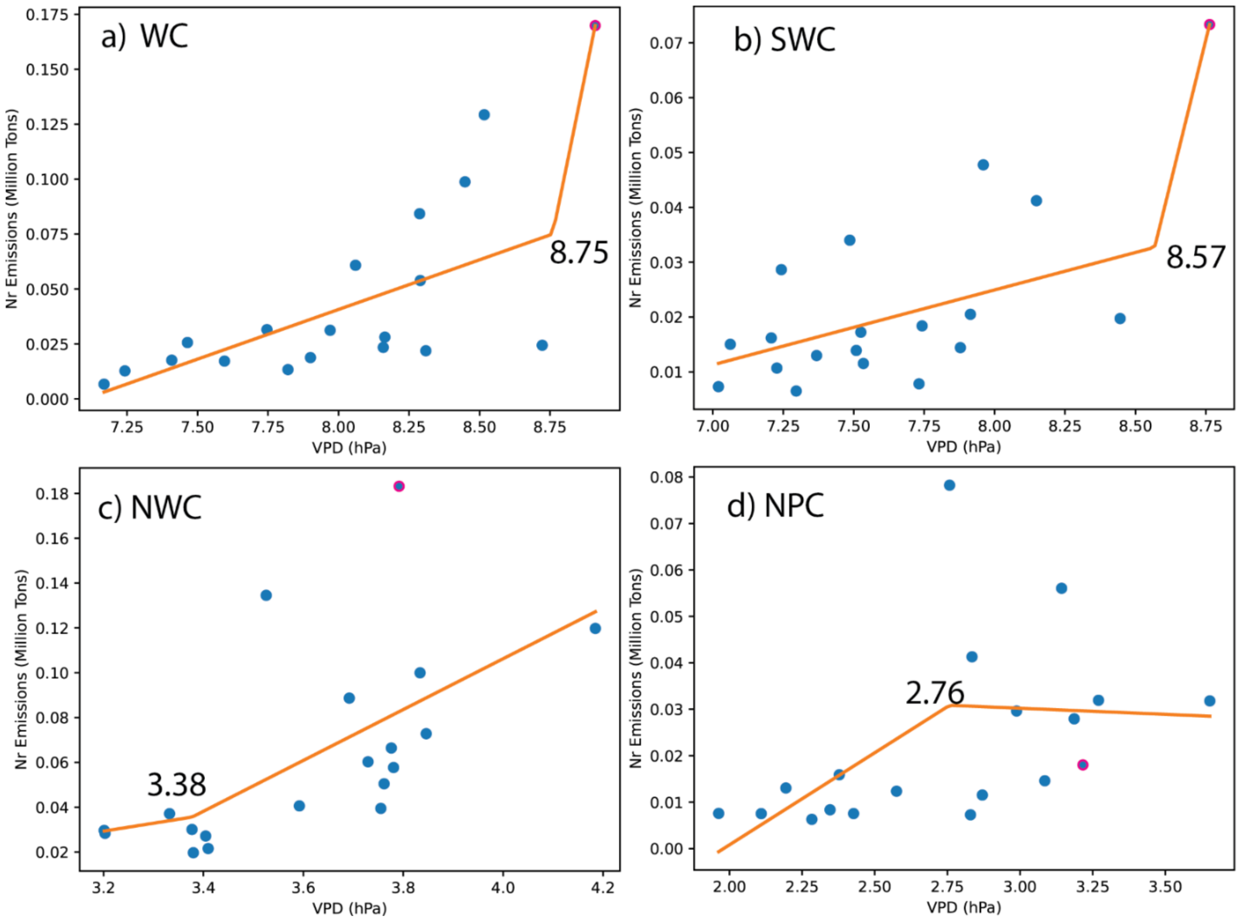
Supplementary Fig. S3. 2002-2021 monthly averaged a)-b) TEMP2 and c)-d) total PRECIP across the U.S. fire climate regions in the western (left panels) and east (right panels) U.S. (see Figure S2).



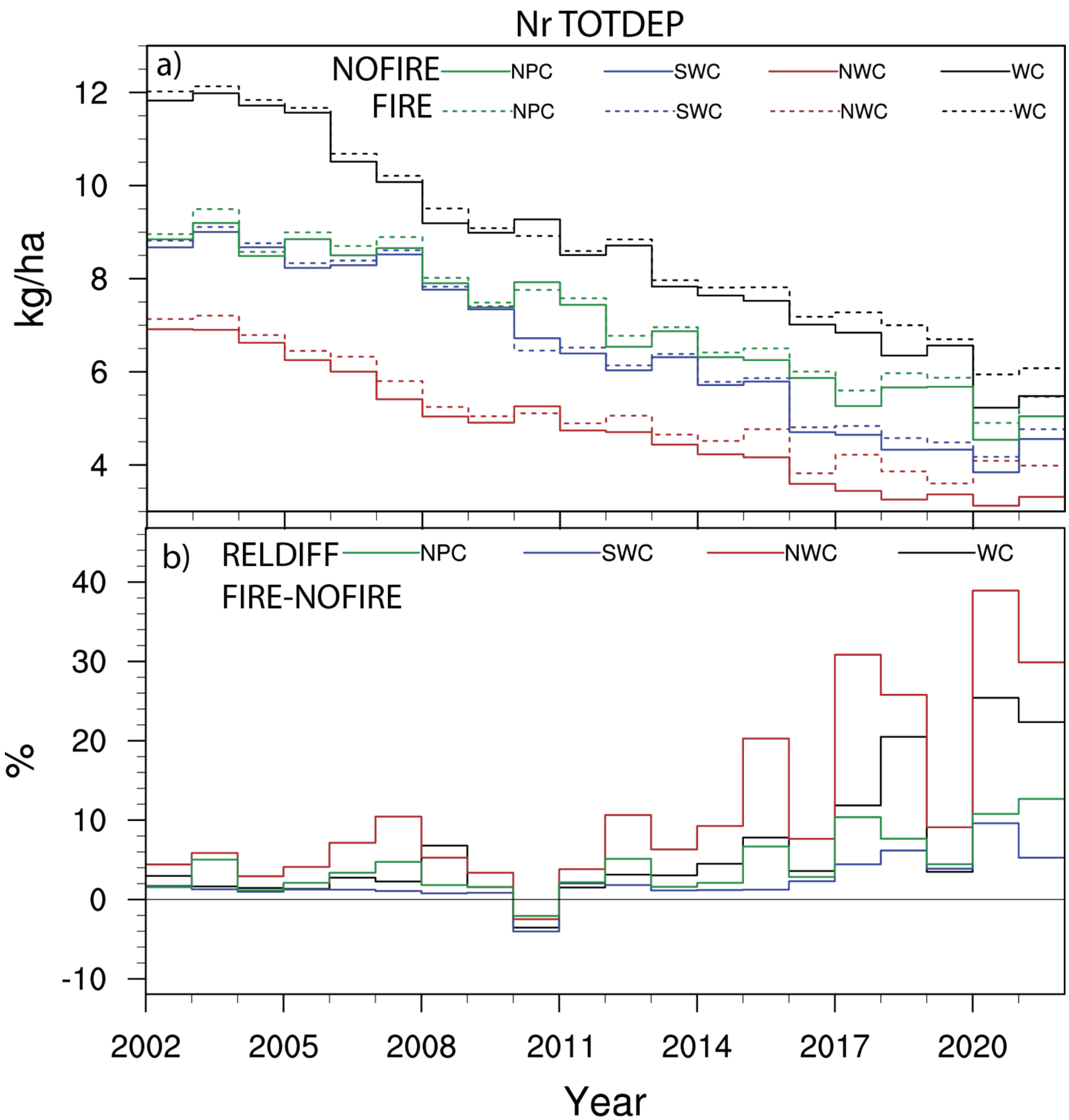
Supplementary Figure S4. Annual 2002 – 2021 total number of wildfire acres burned anomaly for the a) western and b) eastern fire climate regions (see Figure S2 for NPC, SWC, NWC, WC, NEC, SEC, MWC, UMC, and SC regions). Here we note that the EQUATES dataset does not explicitly report the 2002 year's point source fires, and thus values are artificially set to zero for that year.



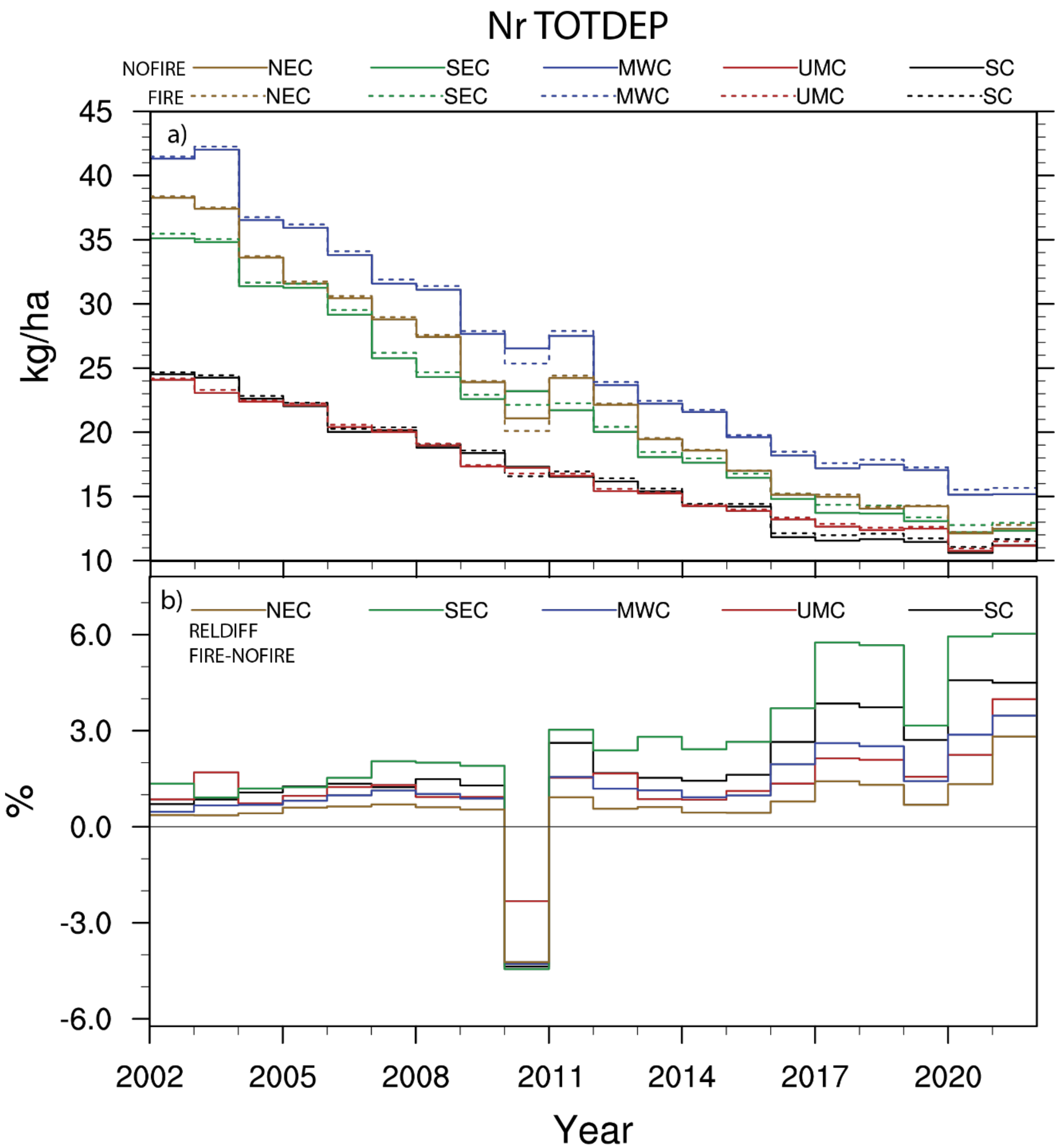
Supplementary Figure S5. Annual 2002 – 2021 a) total number of wildfires anomaly, b) TEMP2 anomaly (degrees C), and c) VPD anomaly (hPa) for the eastern U.S. fire climate regions (see Figure S2 for NEC, SEC, MWC, UMC, and SC regions). Here we note that the EQUATES dataset does not explicitly report the 2002 year's point source fires, and thus values are artificially set to zero in panel a) for that year.



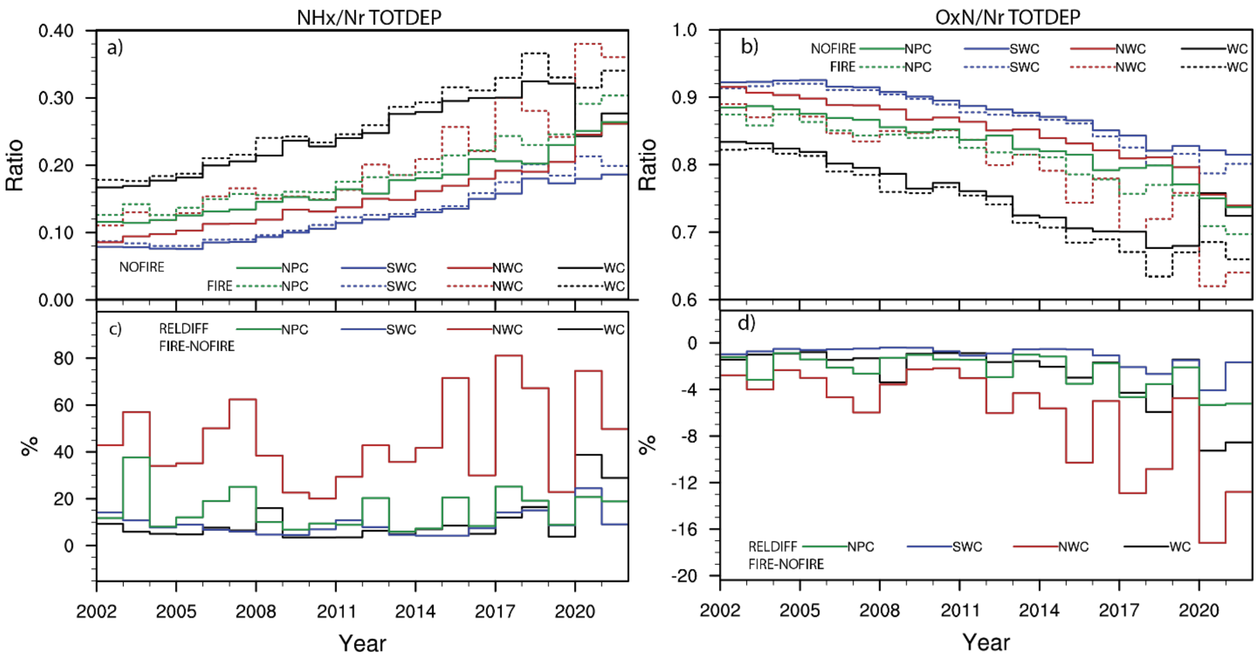
Supplementary Fig. S6. Annual 2002 – 2021 linear piecewise analysis between wildfire Nr (NO_x+NH_3) emissions and VPD for a) WC, b) SWC, c) NWC, and d) NPC (see Fig. S2 for NPC, SWC, NWC, and WC regions). The symbol outlined in red for each panel represents the year 2020. The piecewise analysis yields two estimated regression lines, with "breakpoints" in the range of about 8.6-8.8 hPa where the wildfire Nr emissions behavior changes (i.e., starkly increasing above this VPD point) for the WC and SWC. We note that both breakpoints in the WC and SWC are strongly influenced by large VPD and wildfire Nr emissions during the historic 2020 wildfire season of the western U.S. (see red outlined symbol). In the NWC and NPC there are also strong linear relationships, but less evidence of a piecewise effect and a relatively lower VPD breakpoints of about 3.4 hPa (Fig. S6c) and 2.8 hPa (Fig. S6d).



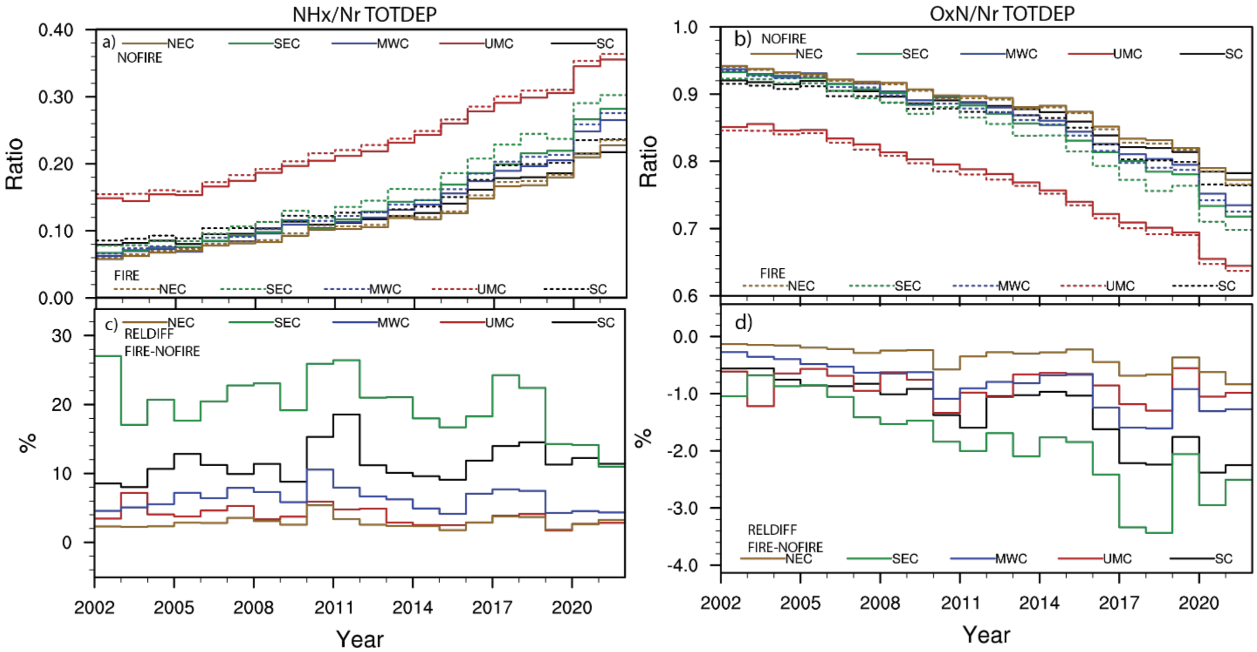
Supplementary Fig. S7. Annual 2002 – 2021 total (wet + dry) a) Nr deposition for the NOFIRE (solid lines) and FIRE runs (dashed lines) and b) relative difference ([[FIRE-NOFIRE]/NOFIRE] * 100 %)) averaged across each eastern U.S. fire climate region (see Fig. S2 for NPC, SWC, NWC, and WC regions).



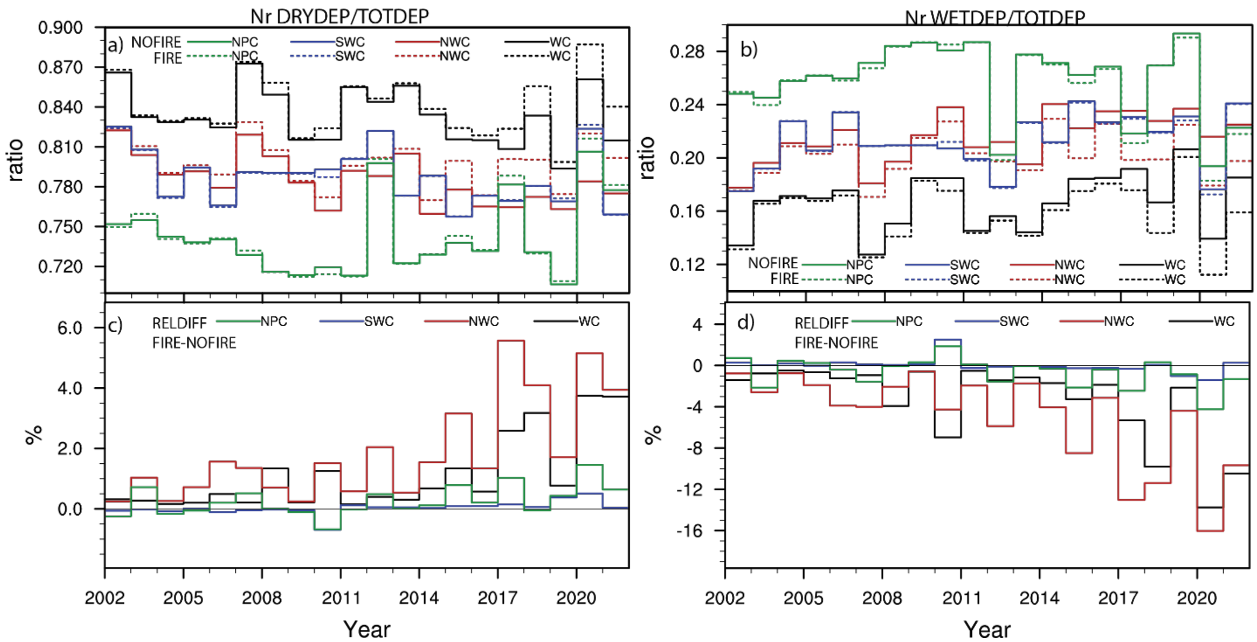
Supplementary Figure S8. Annual 2002 – 2021 total (wet + dry) a) Nr deposition for the NOFIRE (solid lines) and FIRE runs (dashed lines) and b) relative difference ([[FIRE-NOFIRE]/NOFIRE] * 100 %)) averaged across each eastern U.S. fire climate region (see Figure S2 for the NEC, SEC, MWC, UMC, and SC regions).



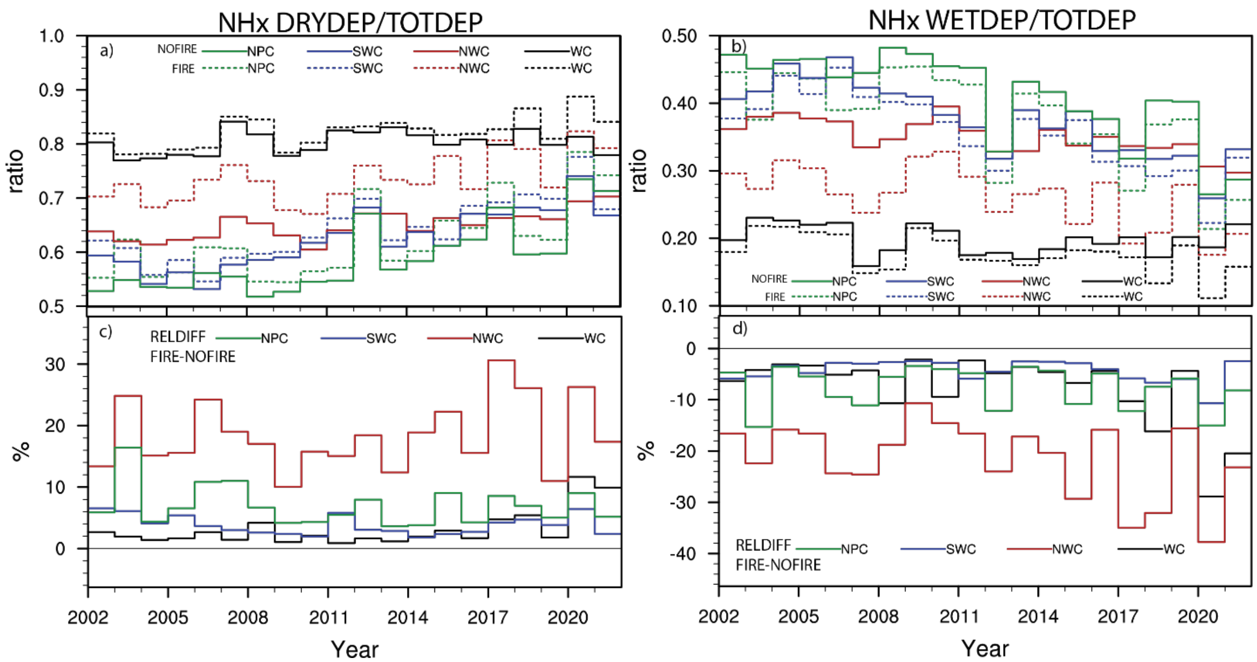
Supplementary Figure S9. Annual 2002 – 2021 total (TOTDEP = WETDEP + DRYDEP) a) NHx/Nr deposition ratio (solid; NOFIRE run, dashed; FIRE run), b) OxN/Nr deposition ratio (solid; NOFIRE run, dashed; FIRE run), c) NHx/Nr ratio relative differences ([[FIRE-NOFIRE]/NOFIRE] * 100 %)), and d) OxN/Nr relative differences averaged across each western U.S. fire climate region (see Figure S2 for the NPC, SWC, NWC, and WC regions).



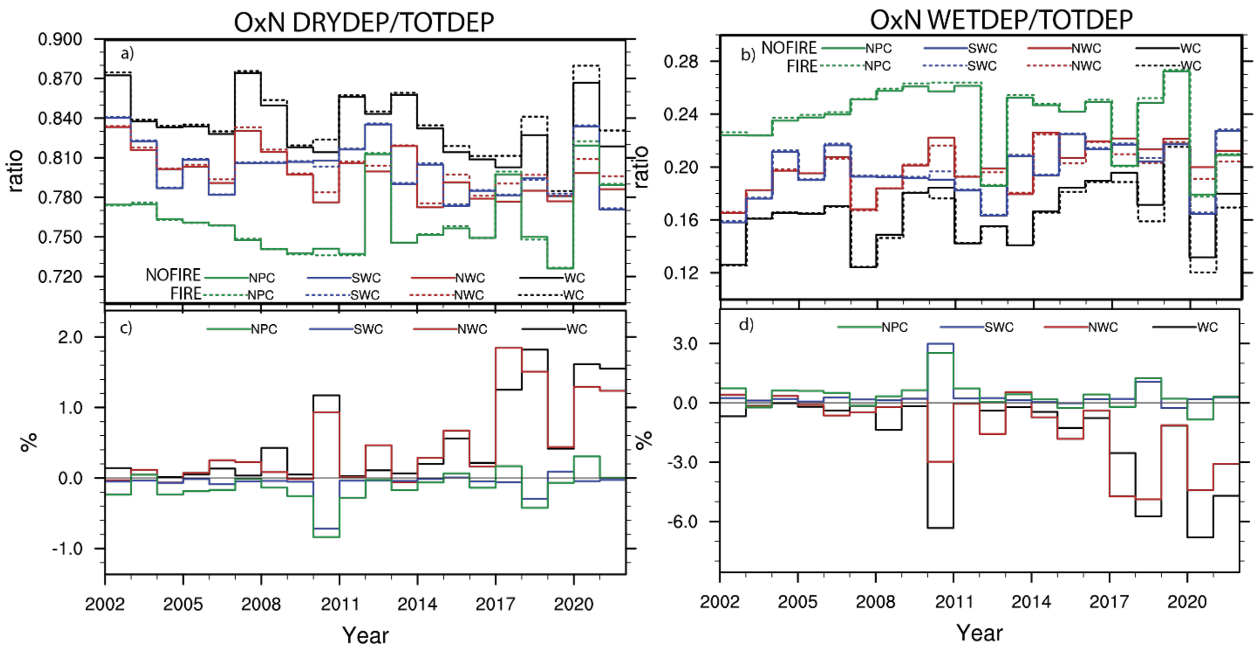
Supplementary Figure S10. Annual 2002 – 2021 total (TOTDEP = WETDEP + DRYDEP) a) NHx/Nr deposition ratio (solid; NOFIRE run, dashed; FIRE run), b) OxN/Nr deposition ratio (solid; NOFIRE run, dashed; FIRE run), c) NHx/Nr ratio relative differences ([[FIRE-NOFIRE]/NOFIRE] * 100 %)), and d) OxN/Nr relative differences averaged across each eastern U.S. fire climate region (see Figure S2 for the NPC, SWC, NWC, WC, NEC, SEC, MWC, UMC, and SC regions).



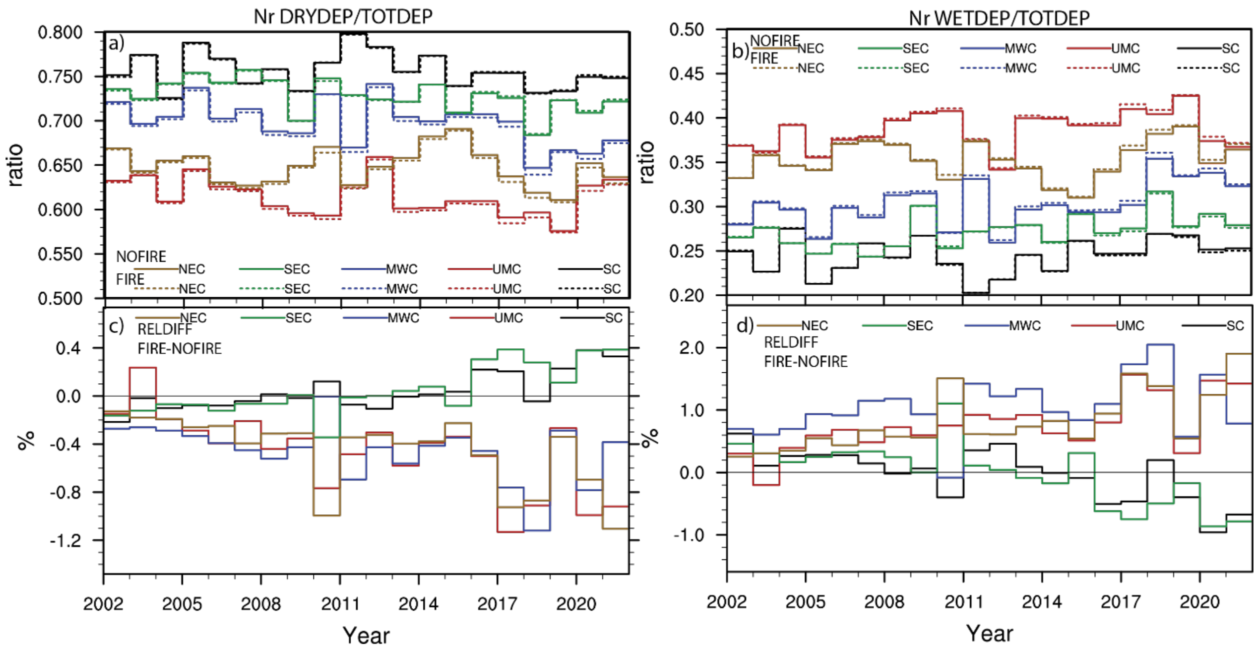
Supplementary Figure S11. Annual 2002 – 2021 total a) Nr DRYDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), b) Nr WETDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), c) Nr DRYDEP/TOTDEP ratio relative differences ([[FIRE-NOFIRE]/NOFIRE] * 100 %)), and d) Nr WETDEP/TOTDEP relative differences averaged across each western U.S. fire climate regions (see Figure S2 for the NPC, SWC, NWC, and WC regions).



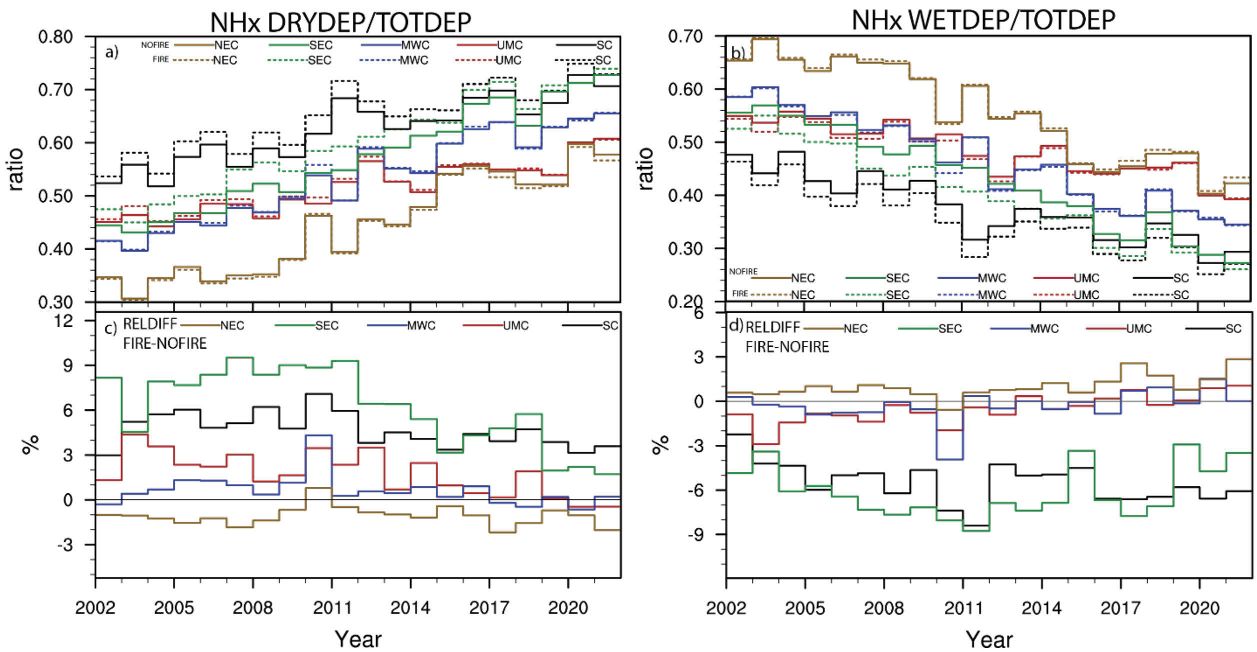
Supplementary Figure S12. Annual 2002 – 2021 total a) NHx DRYDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), b) NHx WETDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), c) NHx DRYDEP/TOTDEP ratio relative differences ([[FIRE-NOFIRE]/NOFIRE] * 100 %)), and d) NHx WETDEP/TOTDEP relative differences averaged across each western U.S. fire climate regions (see Figure S2 for the NPC, SWC, NWC, and WC regions).



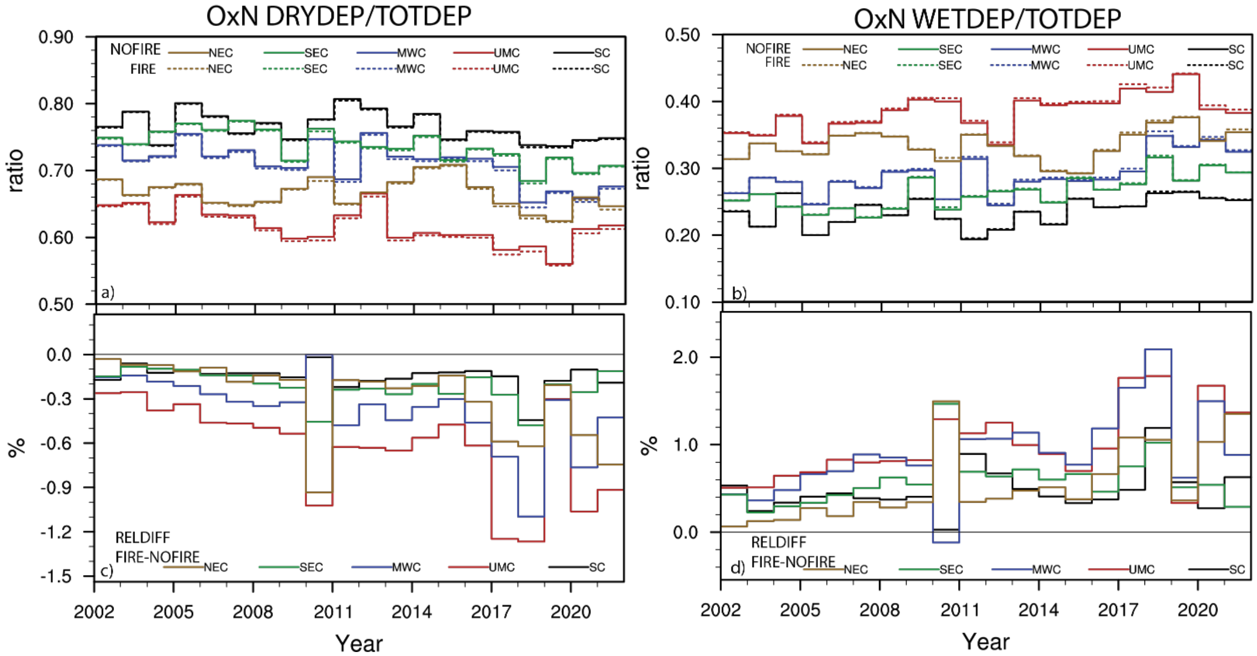
Supplementary Figure S13. Annual 2002 – 2021 total a) OxN DRYDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), b) OxN WETDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), c) NHx DRYDEP/TOTDEP ratio relative differences ([[FIRE-NOFIRE]/NOFIRE] * 100 %)), and d) NHx WETDEP/TOTDEP relative differences averaged across each western U.S. fire climate regions (see Figure S2 for the NPC, SWC, NWC, and WC regions).



Supplementary Figure S14. Annual 2002 – 2021 total a) Nr DRYDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), b) Nr WETDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), c) Nr DRYDEP/TOTDEP ratio relative differences ([[FIRE-NOFIRE]/NOFIRE] * 100 %)), and d) Nr WETDEP/TOTDEP relative differences averaged across each eastern U.S. fire climate regions (see Figure S2 for the NPC, SWC, NWC, WC, NEC, SEC, MWC, UMC, and SC regions).



Supplementary Figure S15. Annual 2002 – 2021 total a) NHx DRYDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), b) NHx WETDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), c) NHx DRYDEP/TOTDEP ratio relative differences ([[FIRE-NOFIRE]/NOFIRE] * 100 %)), and d) NHx WETDEP/TOTDEP relative differences averaged across each eastern U.S. fire climate regions (see Figure S2 for the NPC, SWC, NWC, WC, NEC, SEC, MWC, UMC, and SC regions).



Supplementary Figure S16. Annual 2002 – 2021 total a) OxN DRYDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), b) OxN WETDEP/TOTDEP ratio (solid; NOFIRE run, dashed; FIRE run), c) NHx DRYDEP/TOTDEP ratio relative differences ([[FIRE-NOFIRE]/NOFIRE] * 100 %)), and d) NHx WETDEP/TOTDEP relative differences averaged across each eastern U.S. fire climate regions (see Figure S2 for the NPC, SWC, NWC, WC, NEC, SEC, MWC, UMC, and SC regions).

Supplementary Table S1. General description of the NOAA's climate regions in this work, which can be described via the Dominant Fuels, Topography/Regional Climate, and Maximum Fire Period(s).

Region	Dominant Fuels	Topography/Regional Climate	Maximum Fire Period(s)
NEC	Spruce	Sloping/Cool & Humid	Spring & Fall
SEC	Hardwood, Pine	Flat/Warm & Humid	Spring & Fall
MWC	Hardwood, Pine, Agric.	Flat/Warm & Humid (variable)	Spring & Fall
UMC	Aspen, Fir, and Spruce	Sloping/Cool & Humid (variable)	Spring through Fall
SC	Grasses, Agric., Timber	Flat/Warm & Humid (variable)	Spring through Fall
SWC	Grass, Sage, and Pine	Sloping to Flat/Warm & Dry	Spring & Fall
NPC	Pine, Fir, and Spruce	Sloping to Flat/Cool & Dry	Spring through Fall
NWC	Sage, Grass in lowlands and Pine/Fir higher	Sloping to Flat/Cool & Dry	Spring through Fall
WC	Brush lowlands and coniferous higher	Sloping to Flat/Warm & Dry	Spring through Fall

Supplementary Table S2. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend in each western U.S. fire climate regions for annual wildfires, TEMP2, and VPD anomalies.

U.S. Fire Climate Region	Wildfire Anomaly		TEMP2 Anomaly		VPD Anomaly	
	MK	TS	MK	TS	MK	TS
NPC	0.27	-4.98 $\times 10^4$fires/year	0.42	0.02 °C/year	0.03	0.003 hPa/year
SWC	0.56	7.85 $\times 10^4$fires/year	0.96	0.05 °C/year	0.74	0.02 hPa/year
NWC	0.42	3.00 $\times 10^5$fires/year	0.89	0.04 °C/year	0.77	0.009 hPa/year
WC	0.56	1.08×10^5 fires/year	0.94	0.06 °C/year	0.97	0.04 hPa/year

Supplementary Table S3. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each eastern and western U.S. fire climate regions for annual wildfire acres burned anomalies.

U.S. West Fire	Wildfire Acres Burned Anomaly

Climate Region	MK	TS
NPC	0.52	-4.70×10^4 acres burned/year
SWC	0.33	4.14×10^4 acres burned/year
NWC	0.84	2.15×10^5 acres burned/year
WC	0.86	2.06×10^5 acres burned/year
U.S. East Fire Climate Region	**Wildfire Acres Burned Anomaly**	
	MK	TS
NEC	0.93	-9.31×10^3 acres burned/year
SEC	0.91	-3.62×10^5 acres burned/year
MWC	0.88	-1.04×10^5 acres burned/year
UMC	0.98	-4.24×10^4 acres burned/year
SC	0.98	-7.93×10^5 acres burned/year

Supplementary Table S4. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each eastern U.S. fire climate regions for annual wildfires, TEMP2, and VPD anomalies.

U.S. Fire Climate Region	**Wildfire Anomaly**		**TEMP2 Anomaly**		**VPD Anomaly**	
	MK	TS	MK	TS	MK	TS
NEC	0.11	6.29×10^3fires/year	0.94	0.05 °C/year	0.33	0.007 hPa/year
SEC	0.60	-4.10×10^5fires/year	0.98	0.06 °C/year	0.23	0.006 hPa/year
MWC	0.91	-5.57×10^5fires/year	0.87	0.03 °C/year	0.37	-0.007 hPa/year
UMC	0.33	-2.44×10^4fires/year	0.33	0.02 °C/year	0.07	0.003 hPa/year
SC	0.52	-9.57×10^5fires/year	0.93	0.04 °C/year	0.42	0.008 hPa/year

Supplementary Table S5. Mann-Kendall (MK) non-parametric test scores for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each western U.S. fire climate regions for annual 2002-2021 total Nr deposition for the NOFIRE run, FIRE run, and relative difference of FIRE vs. NOFIRE runs. The MK and TS values are associated with trends shown in Fig. 34 above.

U.S. Fire Climate Region	TOTDEP Nr NOFIRE		TOTDEP Nr FIRE		TOTDEP Nr RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NPC	0.99	-0.24 kg ha^{-1} $year^{-1}$	0.99	-0.23 kg ha^{-1} $year^{-1}$	0.99	0.38 % $year^{-1}$
SWC	0.99	-0.29 kg ha^{-1} $year^{-1}$	0.99	-0.28 kg ha^{-1} $year^{-1}$	0.93	0.18 % $year^{-1}$
NWC	1.0	-0.21 kg ha^{-1} $year^{-1}$	0.99	-0.18 kg ha^{-1} $year^{-1}$	0.99	1.2 % $year^{-1}$
WC	1.0	-0.35 kg ha^{-1} $year^{-1}$	1.0	-0.31 kg ha^{-1} $year^{-1}$	0.99	0.57 % $year^{-1}$

Supplementary Table S6. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each eastern U.S. fire climate regions for annual TOTDEP Nr for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire Climate Region	TOTDEP Nr NOFIRE		TOTDEP Nr FIRE		TOTDEP Nr RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NEC	1.0	-1.4 kg ha^{-1} $year^{-1}$	1.0	-1.4 kg ha^{-1} $year^{-1}$	0.98	0.05 % $year^{-1}$
SEC	1.0	-1.3 kg ha^{-1} $year^{-1}$	1.0	-1.2 kg ha^{-1} $year^{-1}$	1.0	0.22 % $year^{-1}$
MWC	1.0	-1.4 kg ha^{-1} $year^{-1}$	1.0	-1.4 kg ha^{-1} $year^{-1}$	1.0	0.11 % $year^{-1}$
UMC	1.0	-0.70 kg ha^{-1} $year^{-1}$	1.0	-0.70 kg ha^{-1} $year^{-1}$	0.94	0.07 % $year^{-1}$
SC	1.0	-0.77 kg ha^{-1} $year^{-1}$	1.0	-0.76 kg ha^{-1} $year^{-1}$	1.0	0.16 % $year^{-1}$

Supplementary Table S7. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each western U.S. fire climate regions for annual TOTDEP NHx/Nr ratio for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire	TOTDEP NHx/Nr NOFIRE	TOTDEP NHx/Nr FIRE	TOTDEP NHx/Nr

Climate Region					RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NPC	1.0	0.0067 yr^{-1}	1.0	0.0077 yr^{-1}	0.08	0.01 % yr^{-1}
SWC	1.0	0.0064 yr^{-1}	1.0	0.0070 yr^{-1}	0.28	0.06 % yr^{-1}
NWC	1.0	0.0071 yr^{-1}	1.0	0.0108 yr^{-1}	0.58	0.83 % yr^{-1}
WC	1.0	0.0094 yr^{-1}	1.0	0.0098 yr^{-1}	0.86	0.27 % yr^{-1}

Supplementary Table S8. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each eastern U.S. fire climate regions for annual TOTDEP NHx/Nr ratio for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire Climate Region	TOTDEP NHx/Nr NOFIRE		TOTDEP NHx/Nr FIRE		TOTDEP NHx/Nr RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NEC	1.0	0.0072 yr^{-1}	1.0	0.0075 yr^{-1}	0.58	0.01 % yr^{-1}
SEC	1.0	0.0103 yr^{-1}	1.0	0.0112 yr^{-1}	0.90	-0.36 % yr^{-1}
MWC	1.0	0.0092 yr^{-1}	1.0	0.0095 yr^{-1}	0.42	-0.03 % yr^{-1}
UMC	1.0	0.0107 yr^{-1}	1.0	0.0107 yr^{-1}	0.98	-0.12 % yr^{-1}
SC	1.0	0.0068 yr^{-1}	1.0	0.0075 yr^{-1}	0.91	0.13 % yr^{-1}

Supplementary Table S9. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each western U.S. fire climate regions for annual TOTDEP OxN/Nr ratio for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire	TOTDEP OxN/Nr NOFIRE	TOTDEP OxN/Nr FIRE	TOTDEP OxN/Nr

Climate Region					RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NPC	1.0	-0.0067 yr^{-1}	1.0	-0.0077 yr^{-1}	0.99	-0.12 % yr^{-1}
SWC	1.0	-0.0064 yr^{-1}	1.0	-0.0070 yr^{-1}	0.99	-0.06 % yr^{-1}
NWC	1.0	-0.0071 yr^{-1}	1.0	-0.0108 yr^{-1}	1.0	-0.48 % yr^{-1}
WC	1.0	-0.0094 yr^{-1}	1.0	-0.0098 yr^{-1}	1.0	-0.17 % yr^{-1}

Supplementary Table S10. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each eastern U.S. fire climate regions for annual TOTDEP Ox/Nr ratio for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire Climate Region	TOTDEP OxN/Nr NOFIRE		TOTDEP OxN/Nr FIRE		TOTDEP OxN/Nr RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NEC	1.0	-0.0072 yr^{-1}	1.0	-0.0075 yr^{-1}	1.0	-0.02 % yr^{-1}
SEC	1.0	-0.0103 yr^{-1}	1.0	-0.0112 yr^{-1}	1.0	-0.11 % yr^{-1}
MWC	1.0	-0.0092 yr^{-1}	1.0	-0.0095 yr^{-1}	1.0	-0.05 % yr^{-1}
UMC	1.0	-0.0107 yr^{-1}	1.0	-0.0107 yr^{-1}	0.79	-0.02 % yr^{-1}
SC	1.0	-0.0068 yr^{-1}	1.0	-0.0075 yr^{-1}	1.0	-0.09 % yr^{-1}

Supplementary Table S11. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each western U.S. fire climate regions for annual Nr DRYDEP/TOTDEP ratio for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire	Nr DRYDEP/TOTDEP NOFIRE	Nr DRYDEP/TOTDEP FIRE	Nr DRYDEP/TOTDEP

Climate Region					RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NPC	0.078	-0.0002 yr^{-1}	0.0	-7e-05 yr^{-1}	0.98	0.04 % yr^{-1}
SWC	0.95	-0.002 yr^{-1}	0.94	-0.002 yr^{-1}	1.0	0.01 % yr^{-1}
NWC	0.99	-0.002 yr^{-1}	0.46	-0.001 yr^{-1}	1.0	0.18 % yr^{-1}
WC	0.91	-0.001 yr^{-1}	0.58	-0.001 yr^{-1}	1.0	0.09 % yr^{-1}

Supplementary Table S12. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each western U.S. fire climate regions for annual Nr WETDEP/TOTDEP ratio for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire Climate Region	Nr WETDEP/TOTDEP NOFIRE		Nr WETDEP/TOTDEP FIRE		Nr WETDEP/TOTDEP RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NPC	0.078	0.0002 yr^{-1}	0.0	7e-05 yr^{-1}	0.95	-0.09 % yr^{-1}
SWC	0.95	0.002 yr^{-1}	0.94	0.002 yr^{-1}	1.0	-0.04 % yr^{-1}
NWC	1.0	0.002 yr^{-1}	0.46	0.001 yr^{-1}	1.0	-0.47 % yr^{-1}
WC	0.91	0.001 yr^{-1}	0.58	0.001 yr^{-1}	1.0	-0.22 % yr^{-1}

Supplementary Table S13. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each eastern U.S. fire climate regions for annual Nr DRYDEP/TOTDEP ratio for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire	Nr DRYDEP/TOTDEP	Nr DRYDEP/TOTDEP FIRE	Nr DRYDEP/TOTDEP

Climate Region	NOFIRE				RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NEC	0.42	-0.001 yr^{-1}	0.46	-0.001 yr^{-1}	1.0	-0.03 % yr^{-1}
SEC	0.99	-0.002 yr^{-1}	0.96	-0.002 yr^{-1}	1.0	0.03 % yr^{-1}
MWC	0.97	-0.002 yr^{-1}	0.98	-0.002 yr^{-1}	0.98	-0.02 % yr^{-1}
UMC	0.86	-0.002 yr^{-1}	0.94	-0.002 yr^{-1}	1.0	-0.04 % yr^{-1}
SC	0.86	-0.001 yr^{-1}	0.74	-0.001 yr^{-1}	1.0	0.02 % yr^{-1}

Supplementary Table S14. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each eastern U.S. fire climate regions for annual Nr WETDEP/TOTDEP ratio for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire Climate Region	Nr WETDEP/TOTDEP NOFIRE		Nr WETDEP/TOTDEP FIRE		Nr WETDEP/TOTDEP RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NEC	0.42	0.001 yr^{-1}	0.46	0.001 yr^{-1}	1.0	0.05 % yr^{-1}
SEC	0.99	0.002 yr^{-1}	0.96	0.002 yr^{-1}	1.0	-0.06 % yr^{-1}
MWC	0.97	0.002 yr^{-1}	0.98	0.002 yr^{-1}	0.93	0.04 % yr^{-1}
UMC	0.86	0.002 yr^{-1}	0.94	0.002 yr^{-1}	1.0	0.06 % yr^{-1}
SC	0.86	0.001 yr^{-1}	0.74	0.001 yr^{-1}	1.0	-0.05 % yr^{-1}

Supplementary Table S15. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each western U.S. fire climate regions for the ratio of annual TOTDEP Nr to conservative low-end CLs for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs). The MK and TS values are associated with trends shown in Fig. 5 above.

	TOTDEP Nr/CL	TOTDEP Nr/CL	TOTDEP Nr/CL

U.S. Fire Climate Region	NOFIRE		FIRE		RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NPC	1.0	-0.043 $year^{-1}$	1.0	-0.041 $year^{-1}$	1.0	0.38 % $year^{-1}$
SWC	1.0	-0.055 $year^{-1}$	1.0	-0.053 $year^{-1}$	0.99	0.18 % $year^{-1}$
NWC	1.0	-0.055 $year^{-1}$	1.0	-0.047 $year^{-1}$	1.0	1.24 % $year^{-1}$
WC	1.0	-0.068 $year^{-1}$	1.0	-0.062 $year^{-1}$	1.0	0.59 % $year^{-1}$

Supplementary Table S16. Mann-Kendall (MK) non-parametric test for monotonic trend and the Theil-Sen (TS) robust estimate of linear trend (in parentheses) in each eastern U.S. fire climate regions for the ratio of annual TOTDEP Nr to conservative low-end CLs for the NOFIRE run, FIRE run, and RELDIFF (relative difference of FIRE vs. NOFIRE runs).

U.S. Fire Climate Region	TOTDEP Nr/CL NOFIRE		TOTDEP Nr/CL FIRE		TOTDEP Nr/CL RELDIFF FIRE vs. NOFIRE	
	MK	TS	MK	TS	MK	TS
NEC	1.0	-0.43 $year^{-1}$	1.0	-0.42 $year^{-1}$	1.0	0.05 % $year^{-1}$
SEC	1.0	-0.34 $year^{-1}$	1.0	-0.32 $year^{-1}$	1.0	0.22 % $year^{-1}$
MWC	1.0	-0.33 $year^{-1}$	1.0	-0.32 $year^{-1}$	1.0	0.12 % $year^{-1}$
UMC	1.0	-0.14 $year^{-1}$	1.0	-0.14 $year^{-1}$	1.0	0.07 % $year^{-1}$
SC	1.0	-0.16 $year^{-1}$	1.0	-0.16 $year^{-1}$	1.0	0.17 % $year^{-1}$