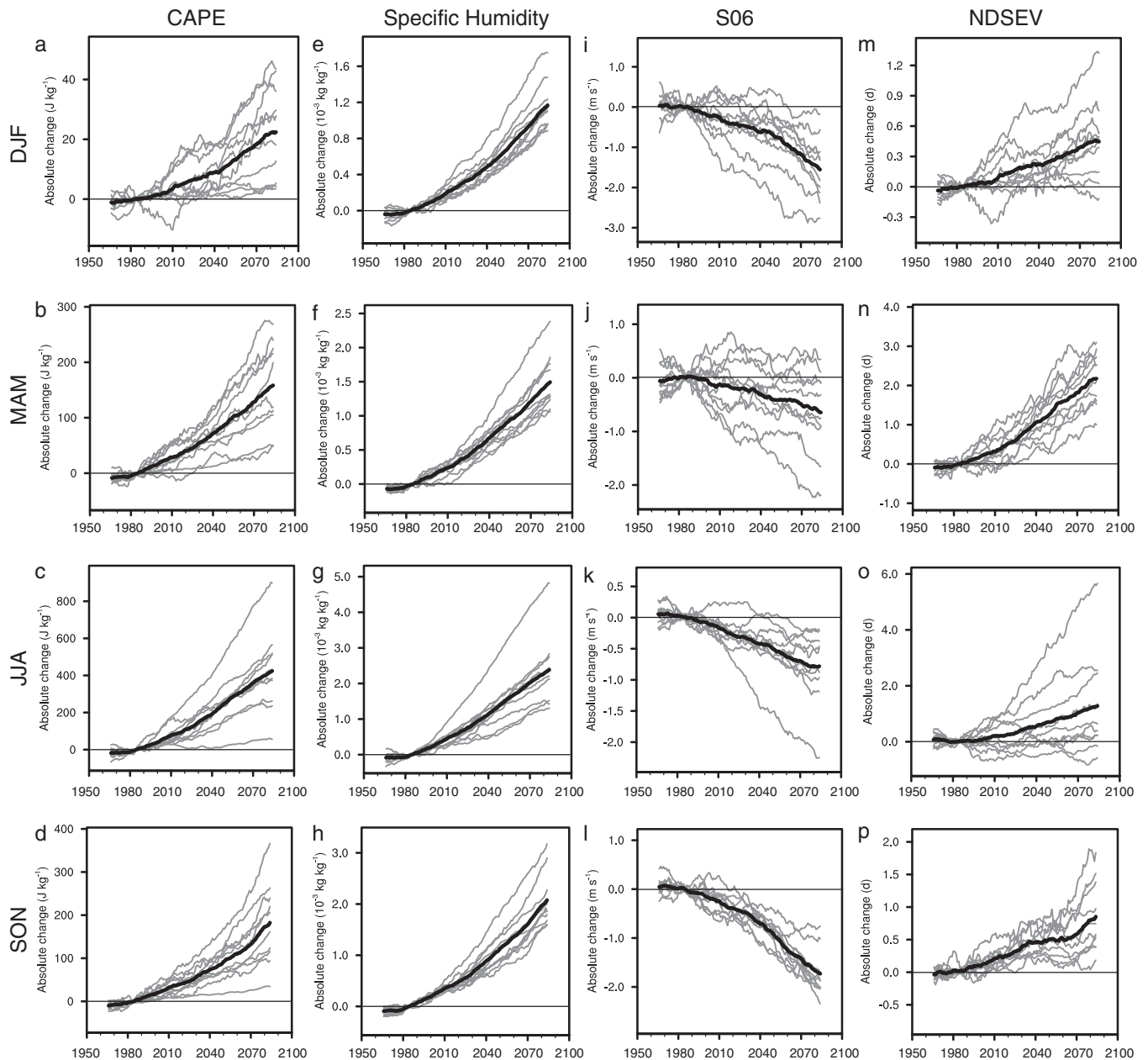
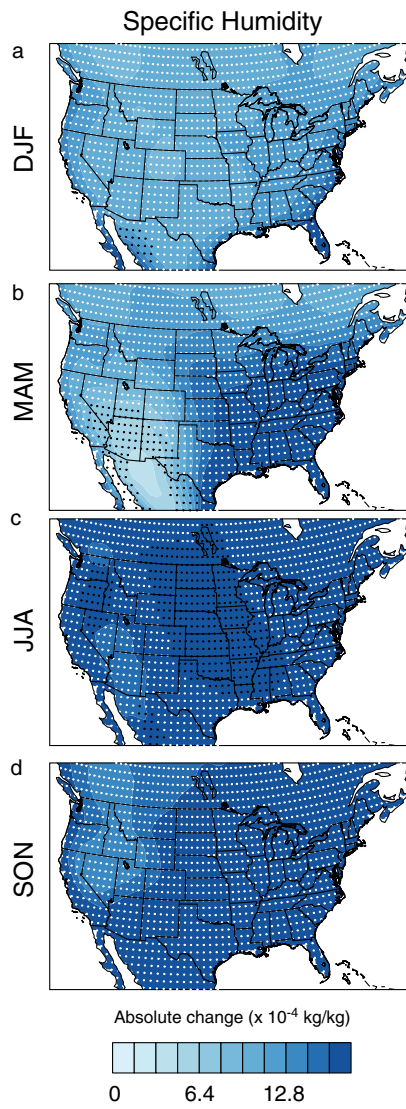


# Supporting Information

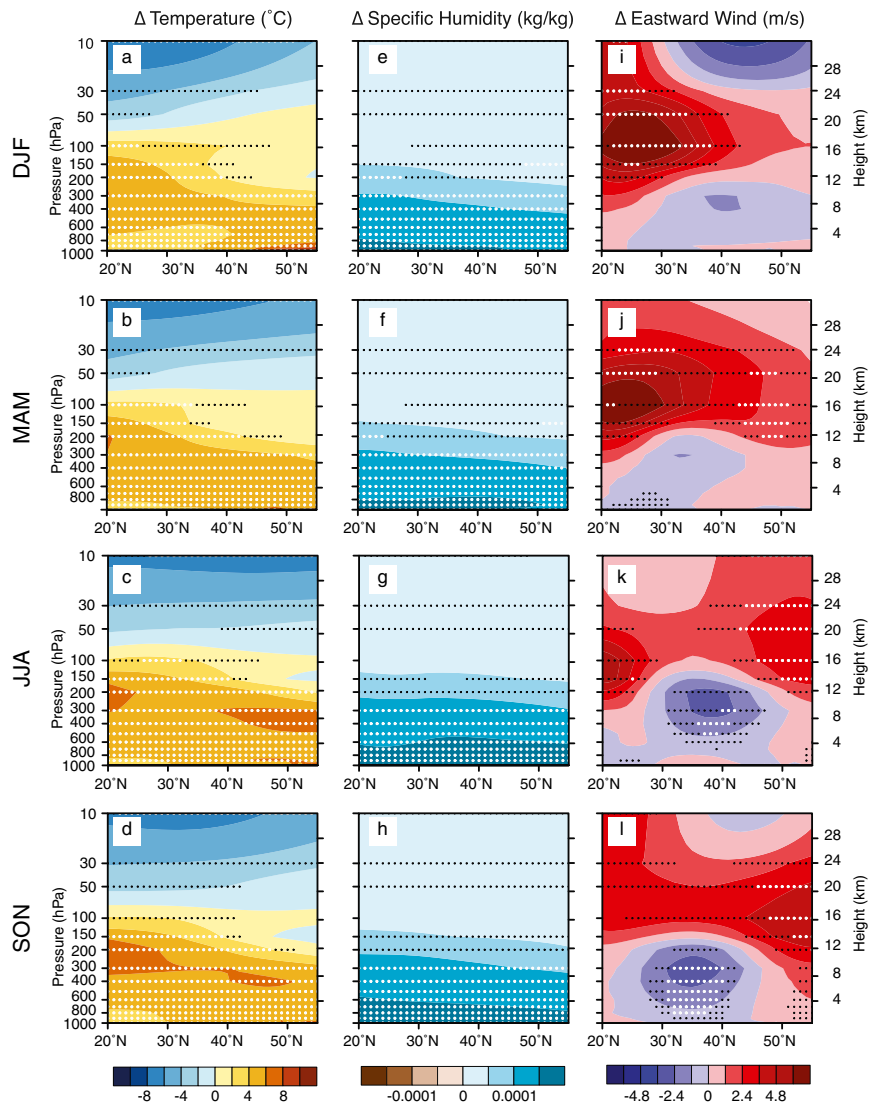
Diffenbaugh et al. 10.1073/pnas.1307758110



**Fig. S1.** Response of severe thunderstorm environments in the late 21st century period of representative concentration pathway (RCP)8.5 during the winter (DJF), spring (MAM), summer (JJA), and autumn (SON) seasons. Each gray line shows an individual model realization. For each realization, the anomaly in the regional average value of the grid points in the eastern United States (105–67.5°W, 25–50°N; land points only) is calculated for each year in the 21st century, with the anomaly expressed as the absolute difference from the 1970–1999 baseline value. A 31-y running mean then is applied to each time series of percentage anomalies. The black line shows the mean of the individual realizations. (A–D) CAPE. (E–H) Specific humidity. (I–L) S06. (M–P) NDSEV.



**Fig. S2.** As in Fig. 2, but for surface-specific humidity. (A–D) Absolute difference in specific humidity.



**Fig. S3.** As in Fig. 3, but for the winter (DJF), spring (MAM), summer (JJA), and autumn (SON) seasons. (A–D) Absolute difference in temperature. (E–H) Absolute difference in specific humidity. (I–L) Absolute difference in eastward wind.







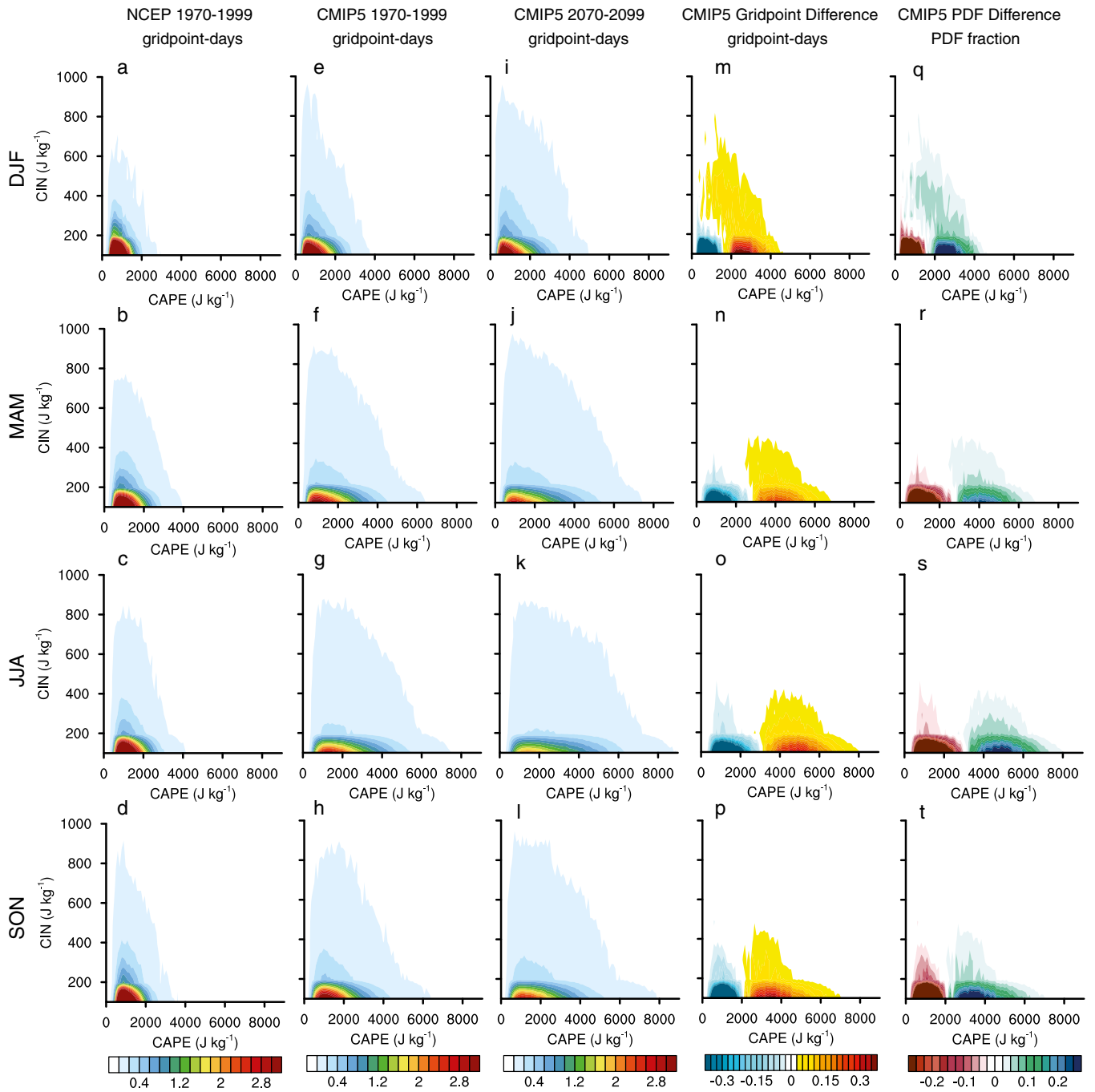












**Fig. S12.** The frequency of occurrence of daily CAPE and convective inhibition (CIN) in the winter (DJF), spring (MAM), summer (JJA), and autumn (SON) seasons. Occurrences are counted for land grid points in the eastern United States ( $105\text{--}67.5^\circ\text{W}$ ,  $25\text{--}50^\circ\text{N}$ ; land grid points only) for days in which the SEV threshold is met. (A–D) Number of occurrences in the 1970–1999 period of the NCEP reanalysis. (E–L) Ensemble-mean number of occurrences in the 1970–1999 (E–H) and 2070–2099 (I–L) periods of the CMIP5 ensemble. (M–P) Absolute difference in the ensemble-mean number of occurrences between the 1970–1999 and 2070–2099 periods of the CMIP5 ensemble. (Q–T) Absolute difference in the ensemble-mean PDF of occurrence between the 1970–1999 and 2070–2099 periods of the CMIP5 ensemble. CIN is expressed as the absolute magnitude of the most negative accumulated buoyant energy below the level of free convection, yielding positive values in units of joules per kilogram.



**Table S1. CMIP5 models and realizations used in the reported analyses**

Model	Realization ID (historical/RCP8.5)	Horizontal grid*	Vertical grid, levels
bcc-csm-1	1	64 × 128	26
CanESM2	1	64 × 128	35
CCSM4	6	192 × 288	26
CSIRO-Mk3-6-0	1	96 × 192	18
FGOALS-g2	1	60 × 128	26
GFDL-CM3	1	90 × 144	48
GFDL-ESM2M	1	90 × 144	24
IPSL-CM5A-LR	1	143 × 144	39
MIROC5	1	128 × 256	40
NorESM1-M	1	96 × 144	26

\*Lateral points × longitudinal points.

**Table S2. Regional CIN and CAPE values for the 1970–1999 baseline period over the eastern United States**

Season	Model	Mean CIN	Mean CAPE	CIN spatial correlation	CAPE spatial correlation
DJF	NCEP	4.047	92.095	—	—
	bcc-csm1-1	2.563	117.368	0.67	0.827
	CanESM2	4.569	181.753	0.649	0.919
	CCSM4	0.599	32.722	0.492	0.86
	CSIRO-Mk3-6-0	1.491	59.524	0.773	0.918
	FGOALS-g2	1.002	34.91	0.617	0.771
	GFDL-CM3	4.742	87.717	0.799	0.935
	GFDL-ESM2M	3.971	64.194	0.66	0.858
	IPSL-CM5A-LR	3.413	129.792	0.661	0.819
	MIROC5	2.622	113.265	0.609	0.916
	NorESM1-M	1.885	116.736	0.684	0.924
MAM	NCEP	30.997	407.301	—	—
	bcc-csm1-1	13.957	577.251	0.463	0.823
	CanESM2	30.622	797.786	0.479	0.794
	CCSM4	15.358	207.114	0.642	0.744
	CSIRO-Mk3-6-0	33.813	377.458	0.78	0.842
	FGOALS-g2	27.895	316.919	0.676	0.87
	GFDL-CM3	33.775	391.107	0.836	0.909
	GFDL-ESM2M	32.014	451.874	0.751	0.906
	IPSL-CM5A-LR	24.226	486.749	0.579	0.589
	MIROC5	16.869	652.395	0.419	0.859
	NorESM1-M	10.678	649.908	0.564	0.842
JJA	NCEP	59.08	717.624	—	—
	bcc-csm1-1	53.617	1,494.963	0.077	0.641
	CanESM2	80.335	1,617.55	−0.468	0.438
	CCSM4	71.175	421.951	0.322	0.49
	CSIRO-Mk3-6-0	137.232	931.845	0.484	0.706
	FGOALS-g2	148.704	802.925	0.424	0.772
	GFDL-CM3	90.216	906.819	0.724	0.652
	GFDL-ESM2M	87.671	1,189.656	0.619	0.707
	IPSL-CM5A-LR	74.74	1,128.295	0.4	0.615
	MIROC5	58.597	1,678.156	−0.349	0.658
	NorESM1-M	32.639	1,800.199	0.312	0.527
SON	NCEP	21.882	403.085	—	—
	bcc-csm1-1	15.749	804.229	0.205	0.83
	CanESM2	26.922	709.78	−0.021	0.744
	CCSM4	11.93	196.584	0.355	0.584
	CSIRO-Mk3-6-0	23.764	424.775	0.726	0.883
	FGOALS-g2	25.538	363.089	0.599	0.901
	GFDL-CM3	25.65	341.35	0.702	0.891
	GFDL-ESM2M	25.038	462.585	0.719	0.899
	IPSL-CM5A-LR	24.781	565.339	0.667	0.791
	MIROC5	20.594	712.71	0.101	0.864
	NorESM1-M	11.071	810.931	0.336	0.808

Mean CIN and mean CAPE are the mean values of grid points in the eastern US region (105–67.5°W, 25–50°N; land points only). CIN spatial correlation and CAPE spatial correlation are the spatial correlations between the grid point seasonal-mean values in the NCEP reanalysis and the corresponding grid point seasonal-mean values in the respective CMIP5 models, calculated after regridding to the common 1° geographical grid. Calculations are made using the 1° grid point values without area weighting.