

Supplementary Information for:

**Growing prevalence of heat over cold extremes with overall
milder extremes and multiple successive events**

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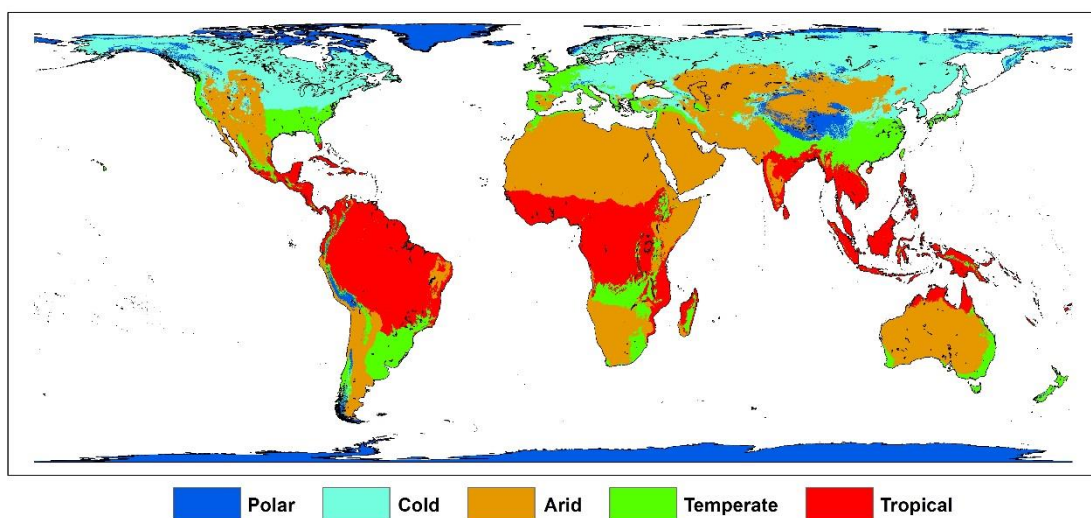


Fig. S1 Köppen-Geiger climate classification.

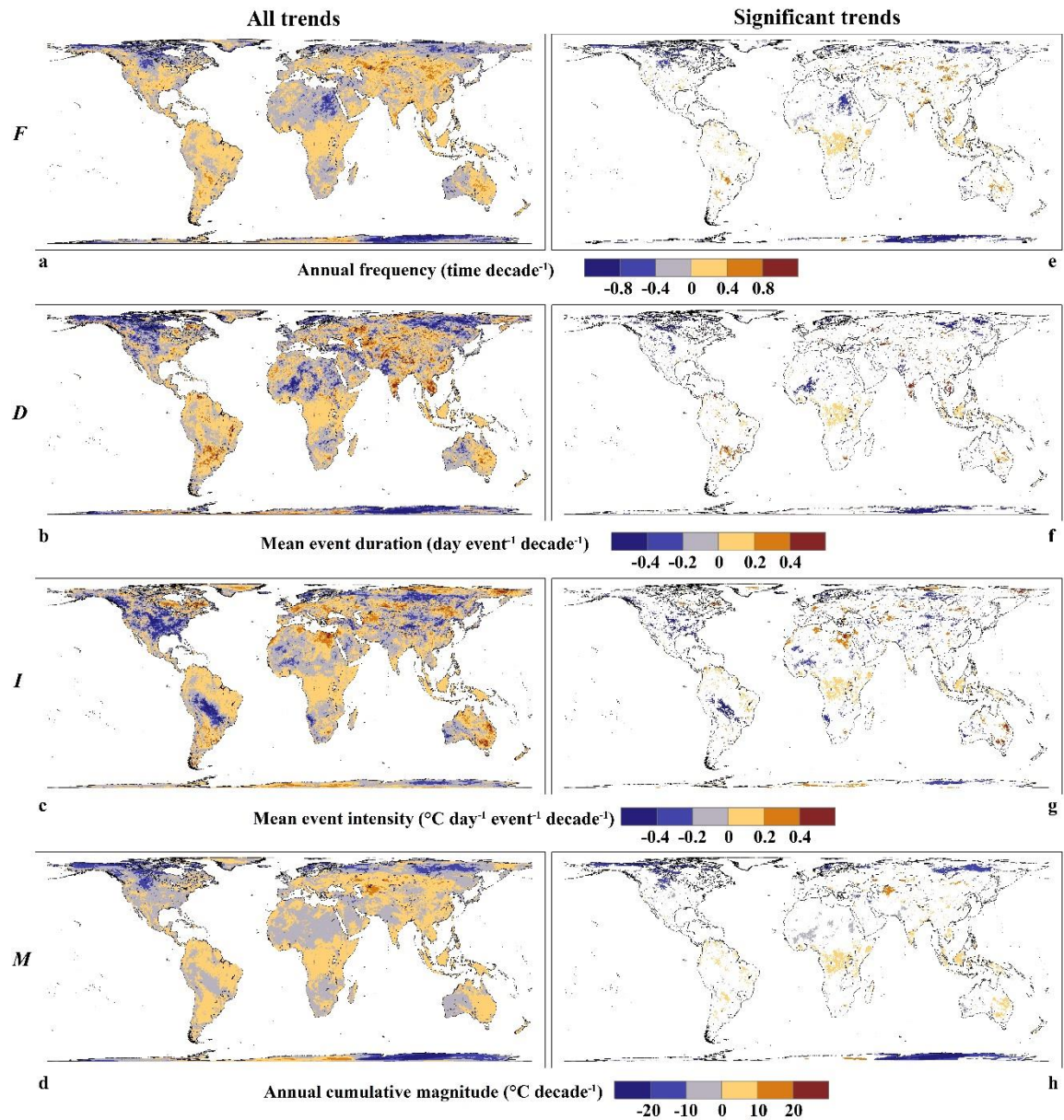


Fig. S2 Temporal trends of F , D , I , and M for all identified TEEs. (a) and (e): annual mean frequency (F); (b) and (f): mean event duration (D); (c) and (g): mean event intensity (I); (d) and (h): annual cumulative magnitude (M). Trends were estimated for 1980-2018 using Mann-Kendall test and Theil-Sen method, and (e-h) shows only significant trends at the 5% level.

Table S1 Metrics and their trends of heat and cold extremes for the world and for KG climate zones. Units of *F*, *D*, *I*, and *M* are time year⁻¹, day event⁻¹, °C day⁻¹ event⁻¹, and °C year⁻¹. Units of trends for *F*, *D*, *I*, and *M* are time decade⁻¹, day event⁻¹ decade⁻¹, °C day⁻¹ event⁻¹ decade⁻¹, and °C decade⁻¹. Units of % change rate for *F*, *D*, *I*, and *M* and of NDTI change rate are % decade⁻¹ and decade⁻¹. Trends were estimated for 1980-2018 using Mann-Kendall test and Theil-Sen method, and significant trends at the 5% level were marked with * and in bold.

		World	Polar	Cold	Arid	Temperate	Tropical
Heat extremes	<i>F</i>	1.36	2.51	1.65	1.2	0.98	0.63
	<i>F</i> change rate	0.29*	0.09	0.32*	0.39*	0.29*	0.24*
	<i>F</i> % change	22*	4	19*	33*	30*	38*
	<i>D</i>	4.76	5.05	4.65	4.56	4.35	5.24
	<i>D</i> change rate	0.05	-0.01	0.09*	0.14*	0.15*	0.12
	<i>D</i> % change	1	0	2*	3*	3*	2
	<i>I</i>	2.50	3.12	2.97	2.02	2.01	1.1
	<i>I</i> change rate	-0.11*	-0.05	0.01	0.02	0.02	-0.03*
	<i>I</i> % change	-4*	-1	0	1	1	-3*
	<i>M</i>	16.40	39.91	22.9	10.99	8.49	3.84
	<i>M</i> change rate	3.06*	0.89	4.63*	3.77*	2.90*	1.24*
	<i>M</i> % change	19*	2	20*	34*	34*	32*
Cold extremes	<i>F</i>	1.39	2.32	1.8	1.38	0.92	0.47
	<i>F</i> change rate	-0.36*	-0.41*	-0.42*	-0.40*	-0.26*	-0.18*
	<i>F</i> % change	-26*	-18*	-24*	-29*	-28*	-38*
	<i>D</i>	4.81	5.25	4.96	4.62	4.17	4.13
	<i>D</i> change rate	-0.15*	-0.20*	-0.19*	-0.18*	-0.15*	-0.14*
	<i>D</i> % change	-3*	-4*	-4*	-4*	-4*	-3*
	<i>I</i>	2.60	2.48	3.38	2.3	2.17	1.48
	<i>I</i> change rate	0.05	-0.03	0.00	0.13*	-0.01	0.03
	<i>I</i> % change	2	-1	0	6*	0	2
	<i>M</i>	18.03	30.61	31.23	15.21	8.67	2.81
NDTI	<i>M</i> change rate	-4.76*	-6.82*	-8.11*	-3.79*	-2.63*	-1.01*
	<i>M</i> % change	-26*	-22*	-26*	-25*	-30*	-36*
	NDTI	-0.05	0.13	-0.15	-0.16	-0.01	0.16
	NDTI change rate	0.23*	0.12*	0.24*	0.30*	0.32*	0.40*

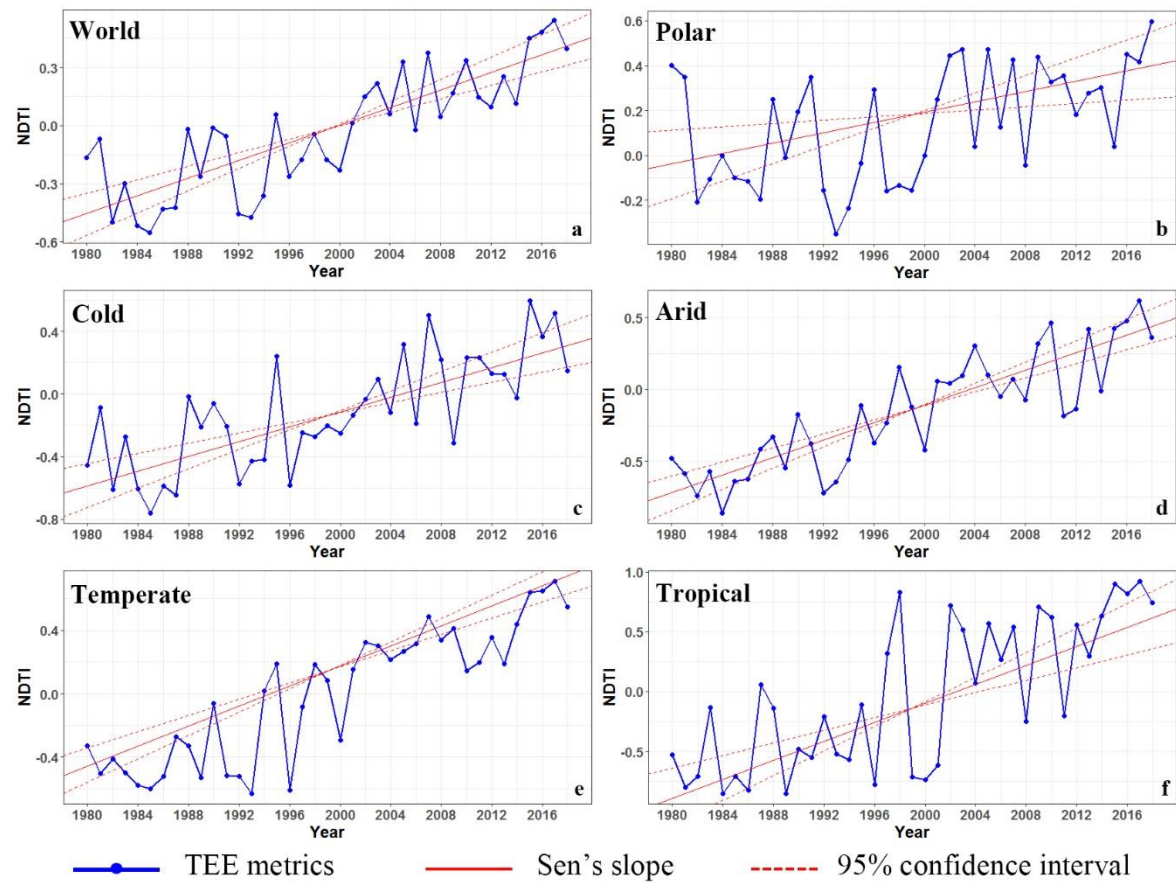


Fig. S3 Trends of Normalized Difference TEE Index (NDTI). (a): The NDTI trend in the world; (b-f): NDTI trends in KG climate zones. Trends were estimated for 1980-2018 using Mann-Kendall test and Theil-Sen method.

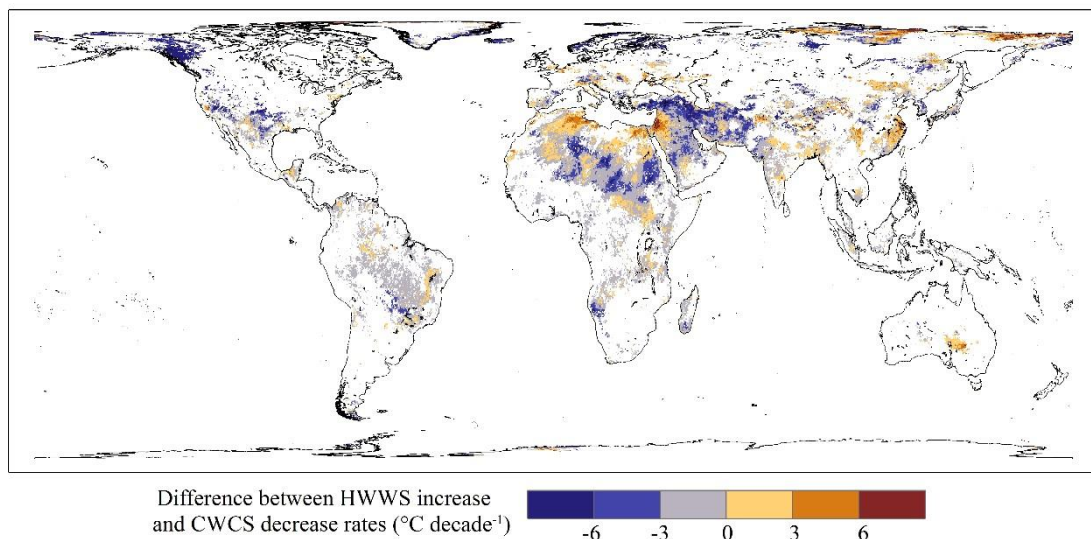


Fig. S4 Difference between significant (at the 5% level) heat extreme increase rate and significant cold extreme decrease rate in annual cumulative magnitude (M). Both rates were estimated for 1980-2018 using Mann-Kendall test and Theil-Sen method.