Supplement of

Global escalation of more frequent and intense compound heatwave-extreme precipitation events

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Table S1 The four global climate models from CMIP6 selected in this study.

Model Name	Modeling Center / Country	Spatial Resolution	Temporal Resolution	Key Experiments Available
CanESM5	Canadian Centre for Climate Modelling and Analysis (Canada)	1.0° × 0.5°	Daily	historical, SSP1-2.6, SSP2-4.5, SSP5-8.5
MRI-ESM2-0	Meteorological Research Institute (Japan)	1.0° × 1.0°	Daily	historical, SSP2-4.5, SSP5-8.5
ACCESS-CM2	CSIRO & Bureau of Meteorology (Australia)	1.0° × 1.0°	Daily	historical, SSP2-4.5, SSP5-8.5
BCC-CSM2-MR	Beijing Climate Center (China)	1.0° × 1.0°	Daily	historical, SSP2-4.5, SSP5-8.5

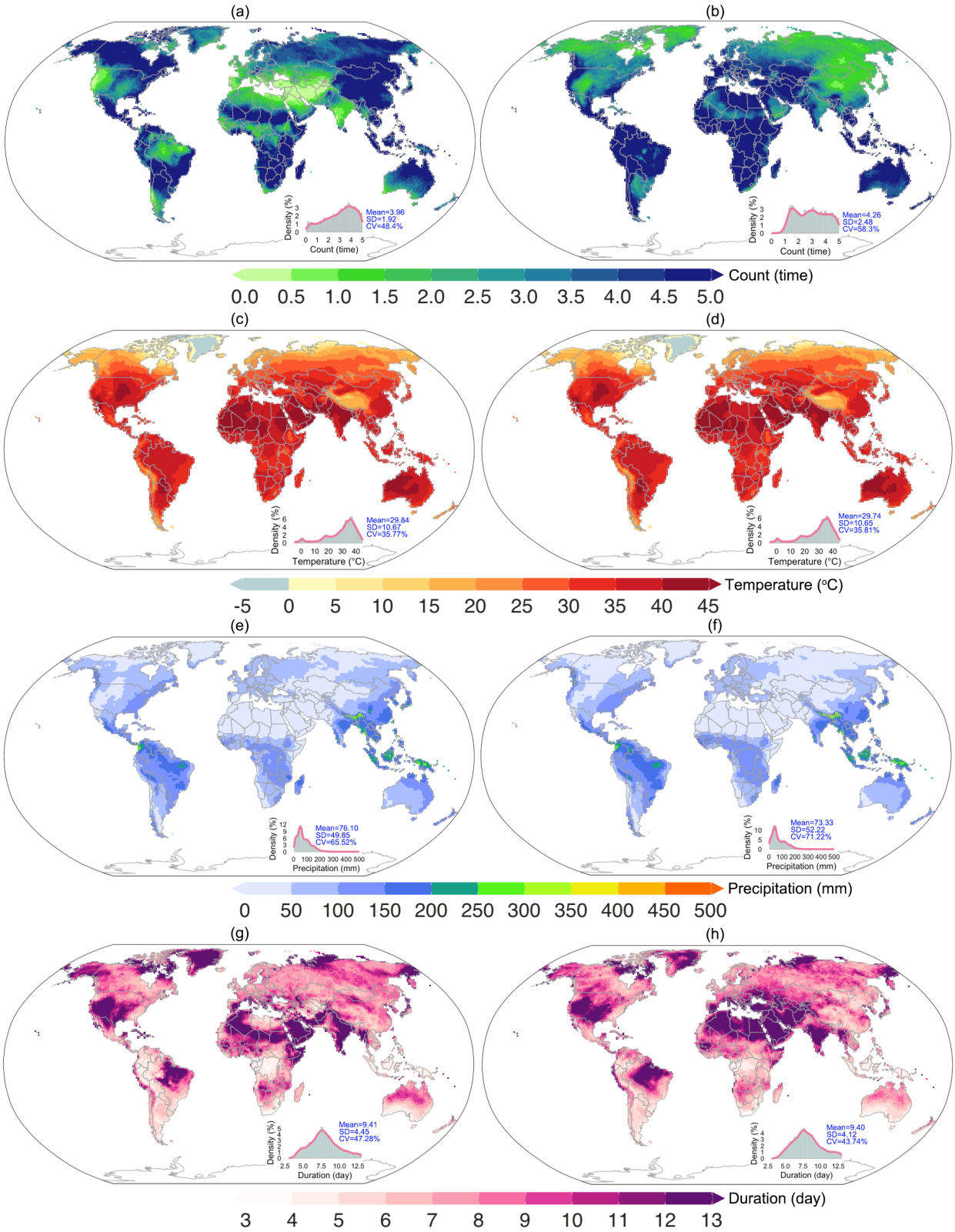

Figure S1. Spatial distribution of the mean values of the frequency (a and b), heatwave intensity (c and d), extreme precipitation intensity (e and f), and heatwave duration (e and f) of CHWEP

(a, c, e, and g) and single extreme events (b, d, f, and h) from 2056 to 2100 under SSP2-4.5 scenario.

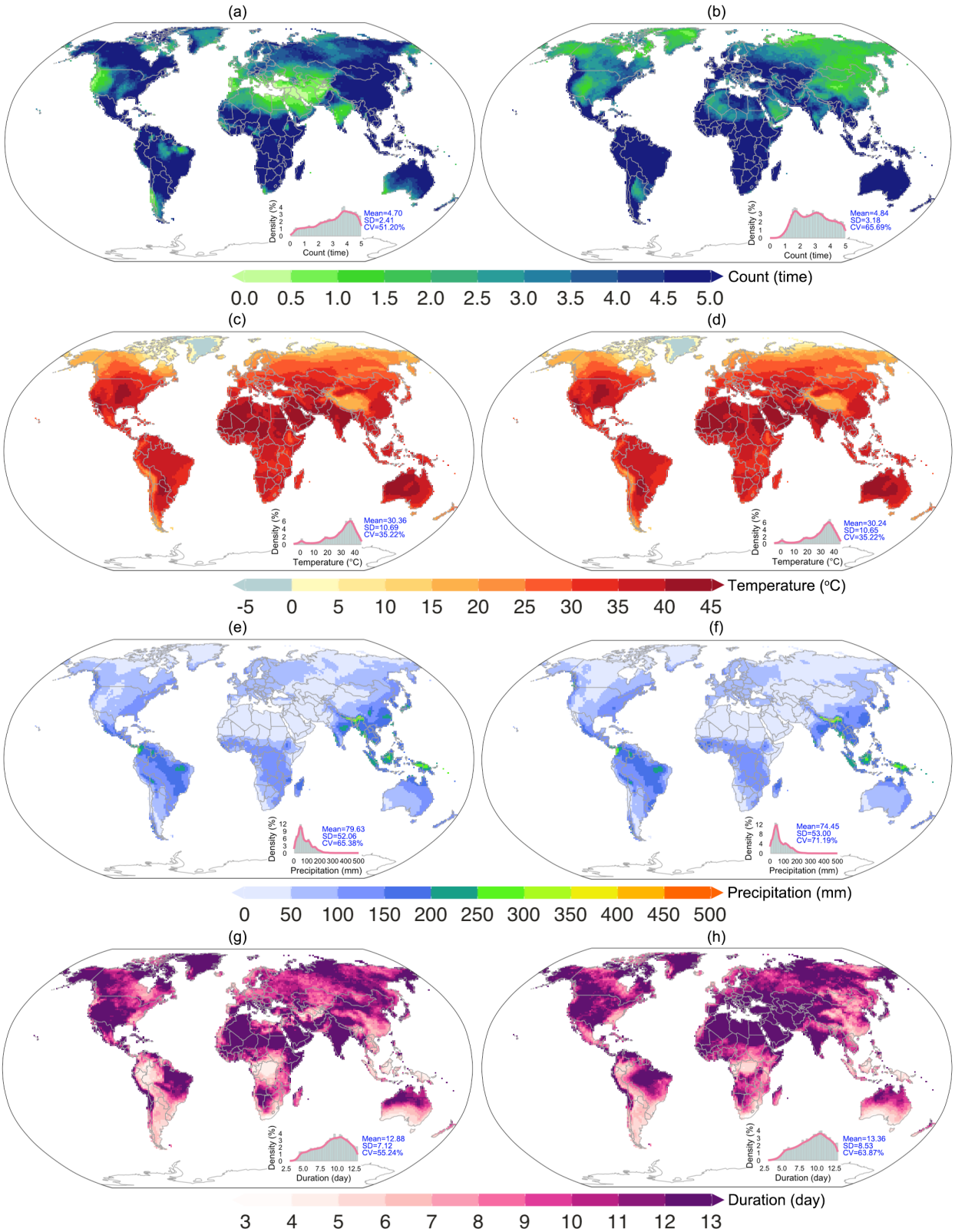

Figure S2. Spatial distribution of the mean values of the frequency (a and b), heatwave intensity (c and d), extreme precipitation intensity (e and f), and heatwave duration (e and f) of CHWEP

(a, c, e, and g) and single extreme events (b, d, f, and h) from 2056 to 2100 under SSP5-8.5 scenario.

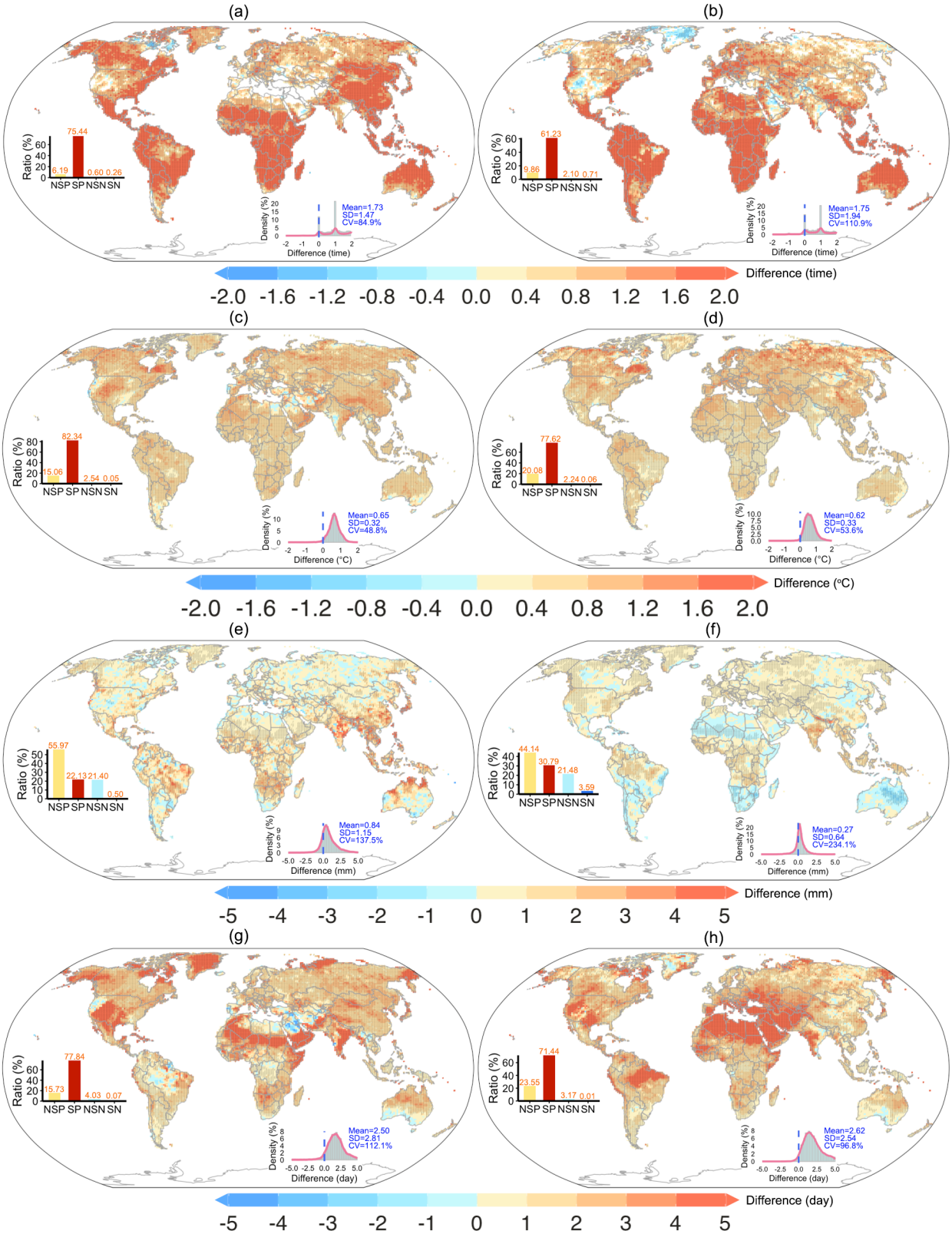

Figure S3. Spatial distribution of the median differences in the frequency (a and b), heatwave intensity (c and d), extreme precipitation intensity (e and f), and heatwave duration (g and h) of

CHWEP (a, c, e and g) and single extreme events (b, d, f, and h) in the future period under the SSP2-4.5 scenario compared with the historical period. (Note: In the left bar chart, NSP denotes Non-Significant Positive, SP denotes Significant Positive, NSN denotes Non-Significant Negative, and SN denotes Significant Negative. The same abbreviations apply hereinafter.)

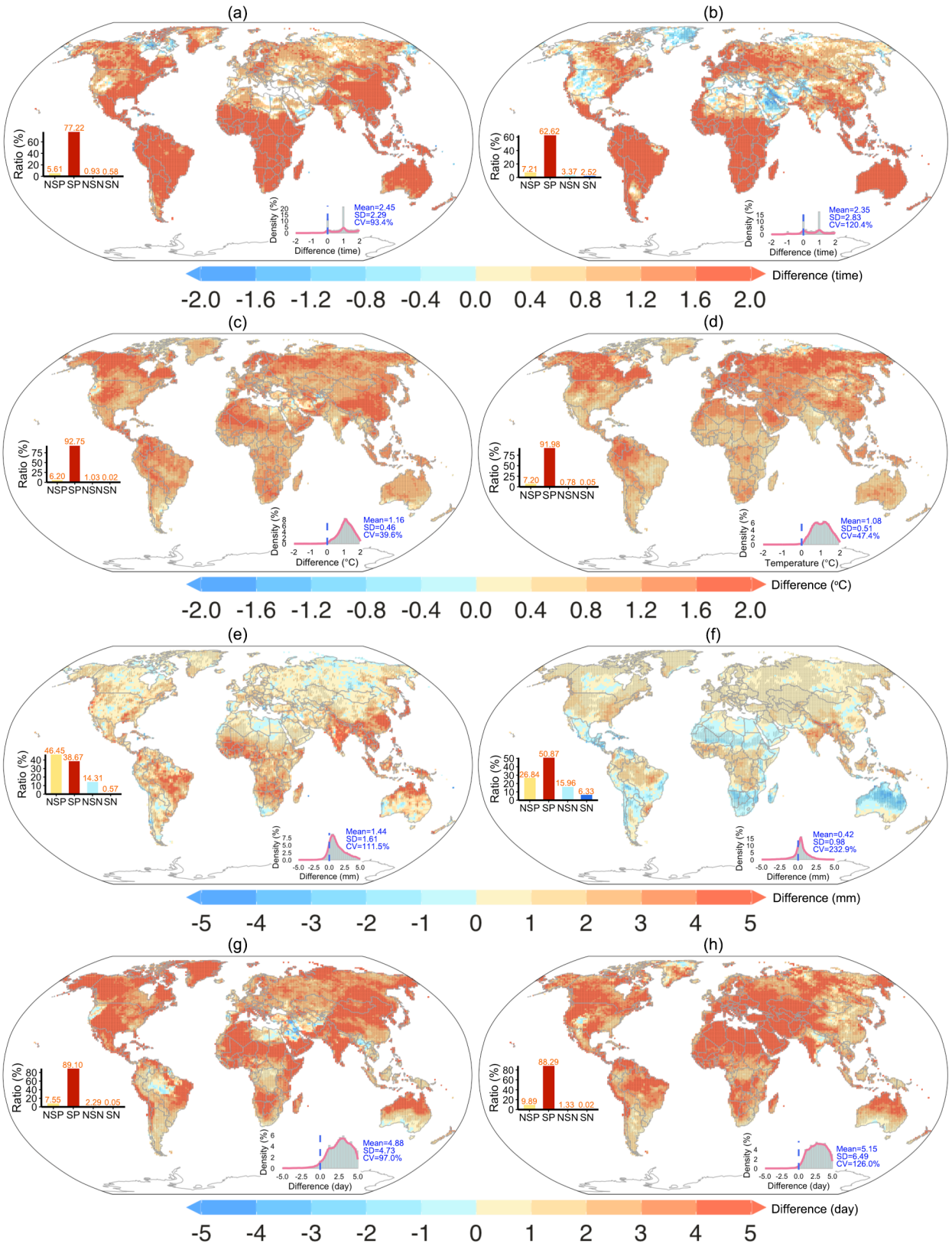
(a)
(b)
(c)
(d)
(e)
(f)
(g)
(h)
Ratio (%)
NSP SP NSN SN
77.22
5.61
0.93 0.58
62.62
7.21
3.37 2.52
92.75
6.20
1.03 0.02
91.98
7.20
0.78 0.05
46.45
38.67
14.31
0.57
50.87
26.84
15.96
6.33
89.10
7.55
2.29 0.05
88.29
9.89
1.33 0.02
Density (%)
Mean=2.45
SD=2.29
CV=93.4%
Difference (time)
Mean=2.35
SD=2.83
CV=120.4%
Difference (time)
Difference (time)
-2.0 -1.6 -1.2 -0.8 -0.4 0.0 0.4 0.8 1.2 1.6 2.0
Mean=1.16
SD=0.46
CV=39.6%
Difference (°C)
Mean=1.08
SD=0.51
CV=47.4%
Temperature (°C)
Difference (°C)
-2.0 -1.6 -1.2 -0.8 -0.4 0.0 0.4 0.8 1.2 1.6 2.0
Mean=1.44
SD=1.61
CV=111.5%
Difference (mm)
Mean=0.42
SD=0.98
CV=232.9%
Difference (mm)
Difference (mm)
-5 -4 -3 -2 -1 0 1 2 3 4 5
Mean=4.88
SD=4.73
CV=97.0%
Difference (day)
Mean=5.15
SD=6.49
CV=126.0%
Difference (day)
Difference (day)
-5 -4 -3 -2 -1 0 1 2 3 4 5

Figure S4. Spatial distribution of the median differences in the frequency (a and b), heatwave intensity (c and d), extreme precipitation intensity (e and f), and heatwave duration (g and h) of CHWEP (a, c, e and g) and single extreme events (b, d, f, and h) in the future period under the SSP5-8.5 scenario compared with the historical period.