Supplementary Information for

Projected increases in magnitude and socioeconomic exposure of global droughts in 1.5 °C and 2 °C warmer climates

Lei Gu[1], Jie Chen[1,2*], Jiabo Yin[1*], Sylvia C. Sullivan[3], Hui-Min Wang[1], Shenglian Guo[1], Liping Zhang[1,2], Jong-Suk Kim[1,2]

[1]State Key Laboratory of Water Resources and Hydropower Engineering Science, Wuhan University, Wuhan 430072, P. R. China
[2]Hubei Provincial Key Lab of Water System Science for Sponge City Construction, Wuhan University, Wuhan, China
[3]Department of Earth and Environmental Engineering, Columbia University, New York, NY 10027, USA

* *Correspondence to*: Jie Chen (jiechen@whu.edu.cn); Jiabo Yin (jboyn@whu.edu.cn)

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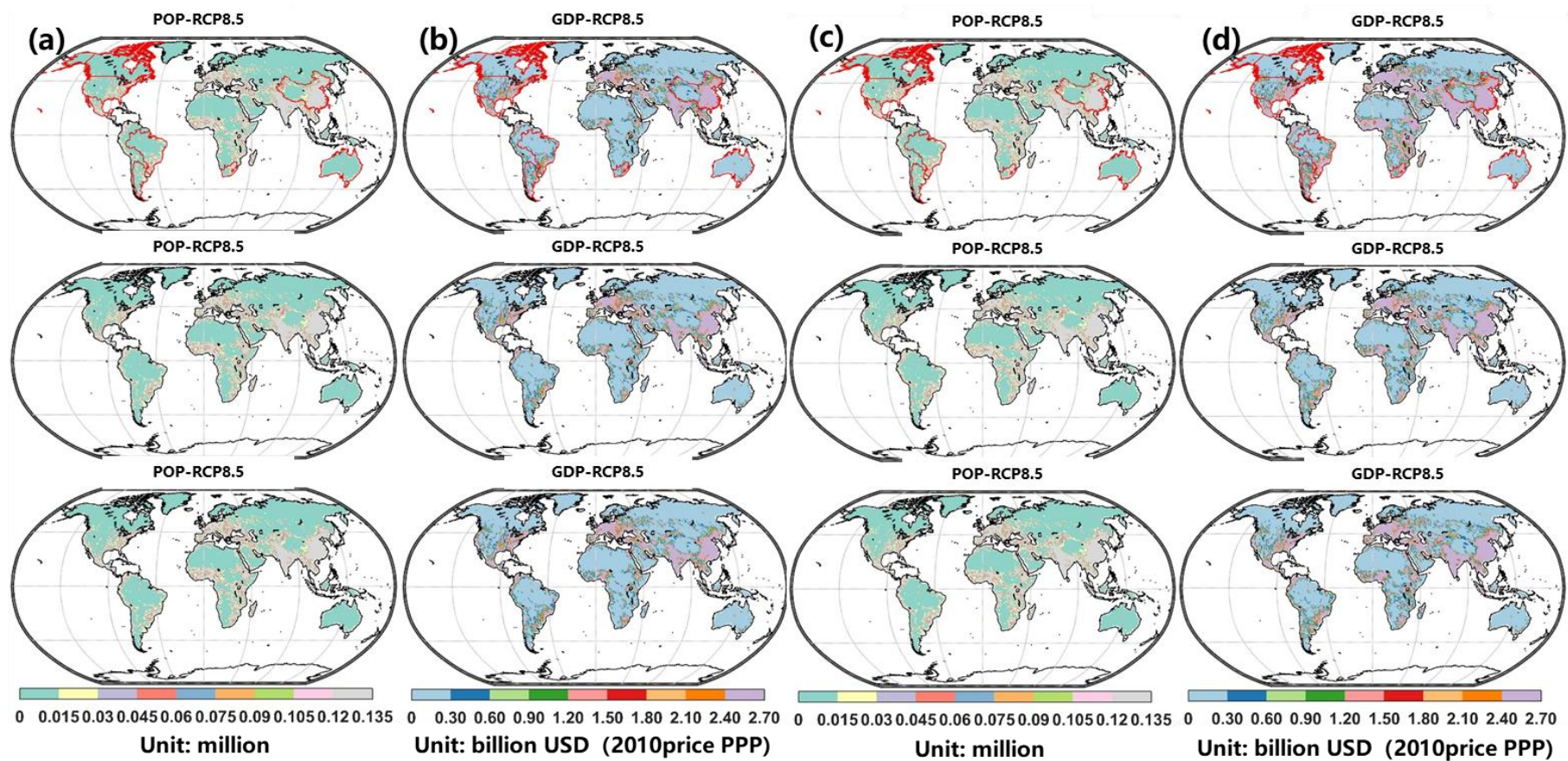
Figure S1 GDP and Population under the 1.5℃ and 2.0℃ target

Maps of the projected population (**a,c**) and GDP (**b,d**) scenarios for the 30-year 1.5°C warming period (**a,b**) and 2.0°C warming period (**c,d**) for the RCP2.6, RCP4.5, RCP8.5 scenarios. Red lines in the top panel mark the eight hotspot countries spanning over different socio-climatic regions in Section 3.5.

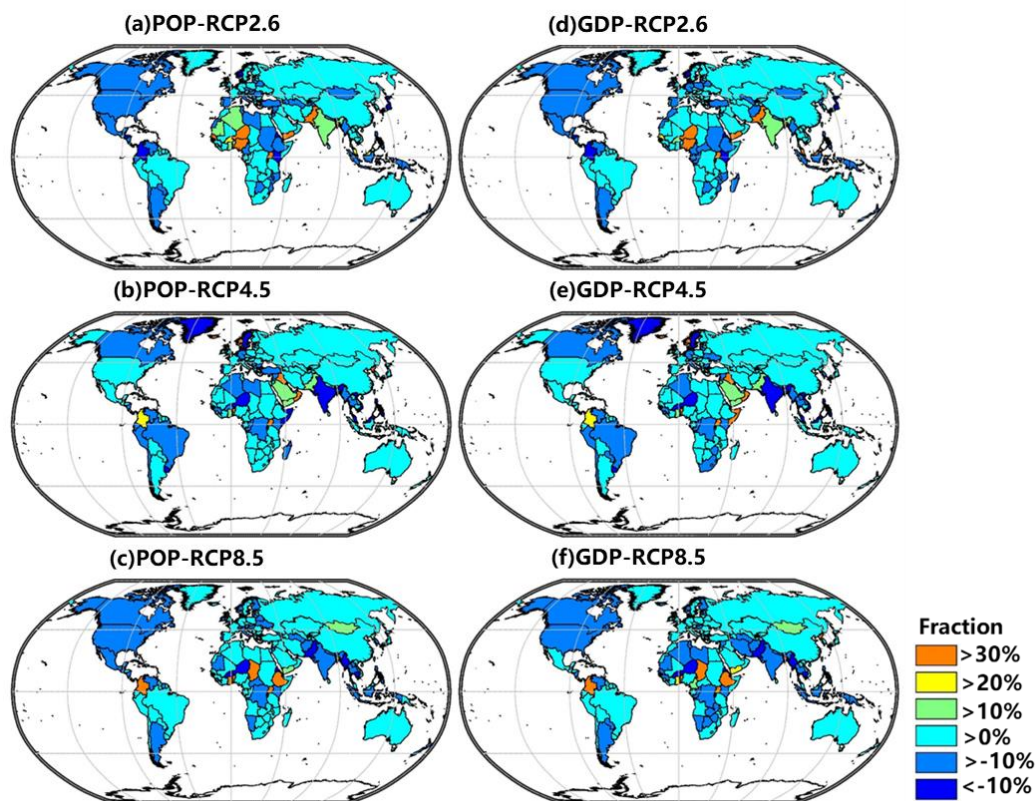**Figure S2 National population and GDP fraction exposing to more frequent severe droughts in 2.0°C relative to 1.5°C warming target.**

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Projected GCMs median changes in joint 50-year return periods of droughts (duration and severity) as a function of GDP (**a**)/ POP (**b**) fraction for 8 typical countries suffering severe droughts from the historical period to the 1.5°C warming target under RCP2.6, RCP4.5, and RCP8.5.
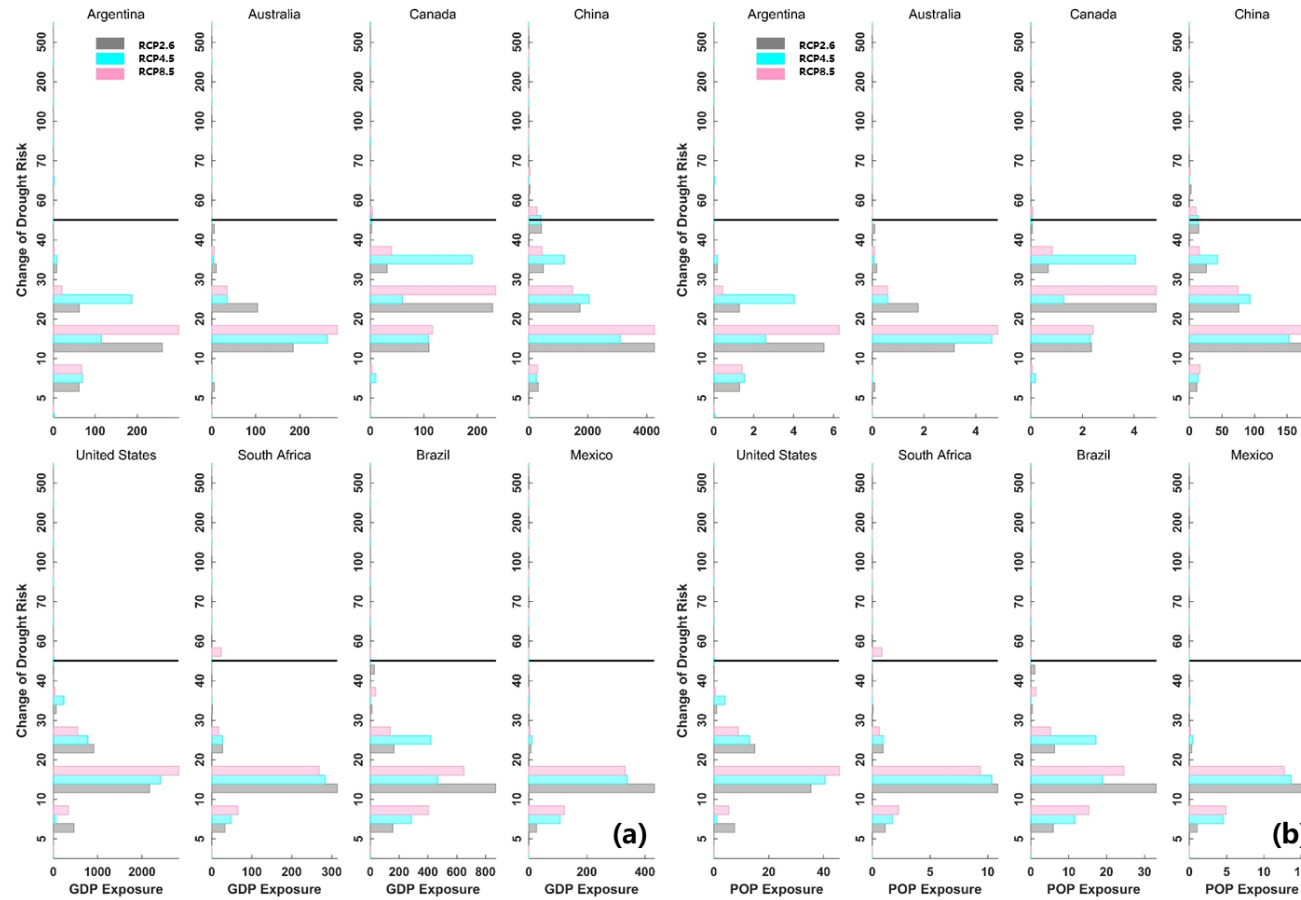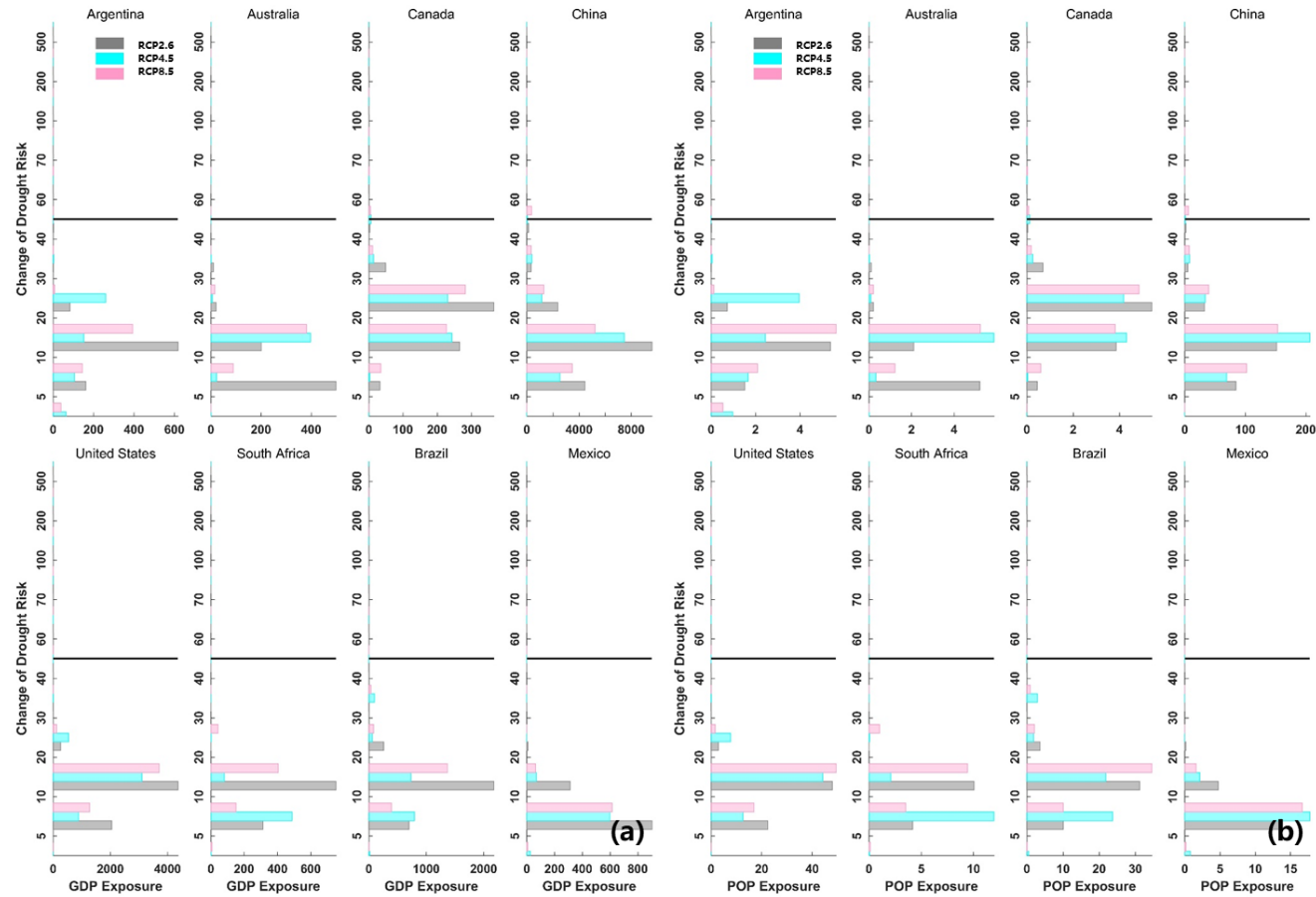
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Projected GCMs median changes in joint 50-year return periods of droughts (duration and severity) as a function of GDP (a)/ POP (b) fraction for 8 typical countries suffering severe droughts from the historical period to the 2.0 °C warming target under RCP2.6, RCP4.5, and RCP8.5.
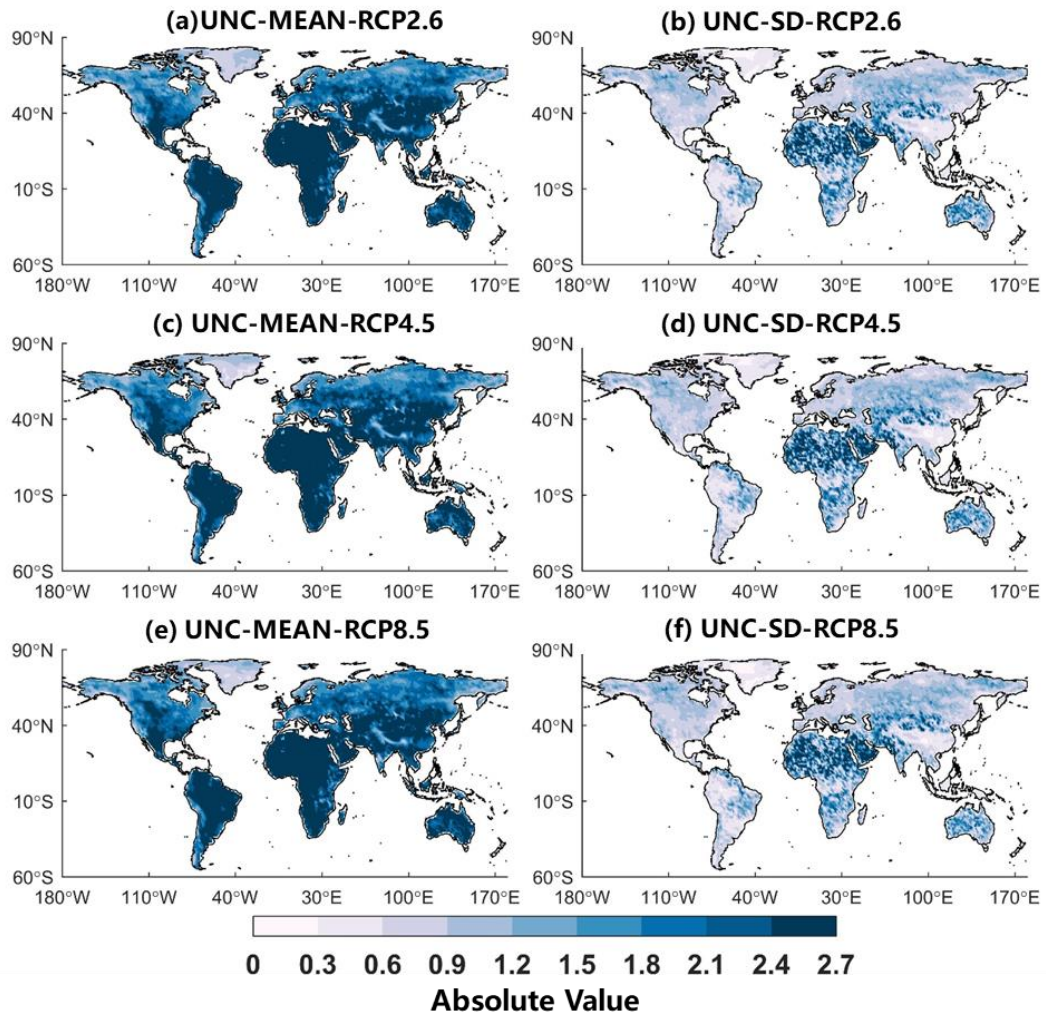
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Maps of the projected uncertainty (measured by 5-95% confidence intervals) in SPEI-3 mean (MEAN) (**a,c,e**) and standard deviation (SD) (**b,d,f**) changes under the 1.5℃ warming target relative to historical period (1976-2000) for RCP2.6, RCP4.5, RCP8.5 scenarios.
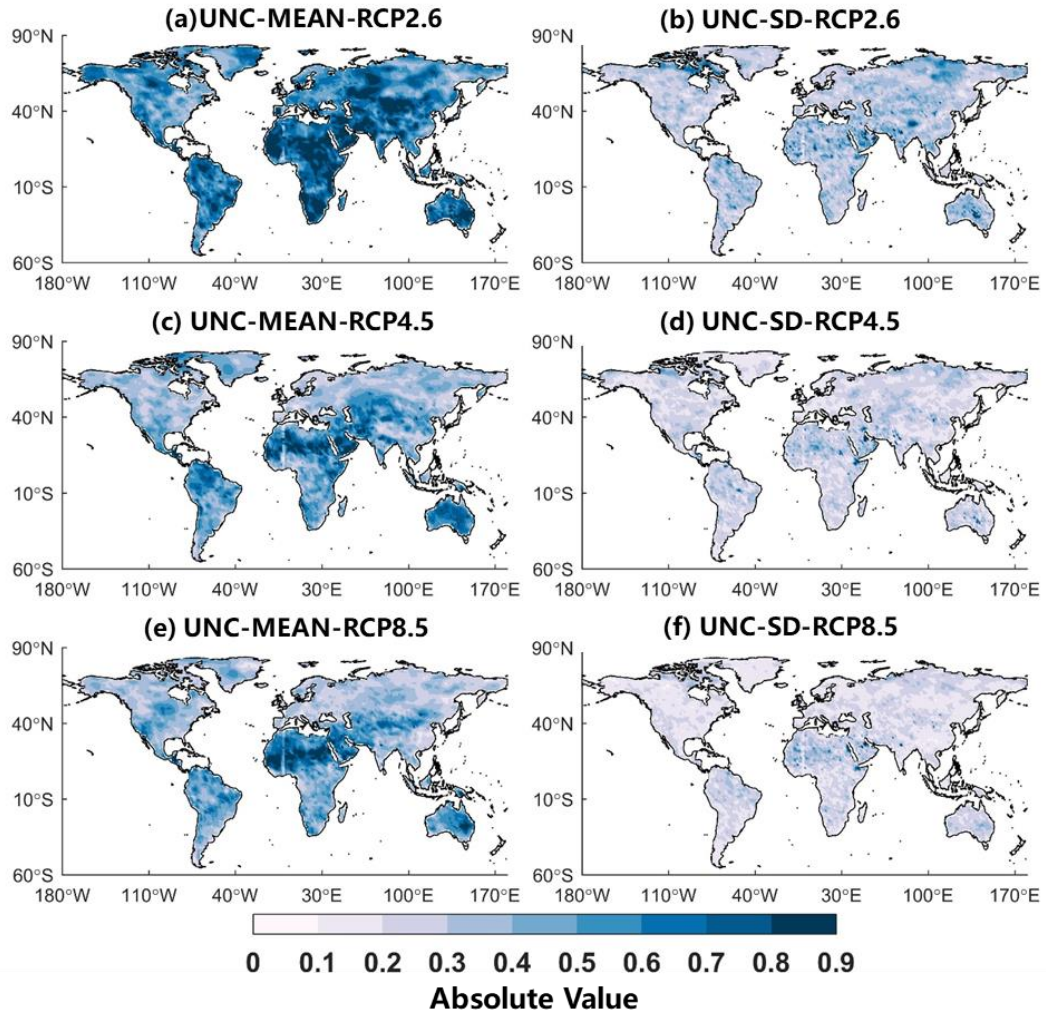
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Maps of the projected uncertainty (measured by 5-95% confidence intervals) in SPEI-3 mean (MEAN) (**a,c,e**) and standard deviation (SD) (**b,d,f**) changes under the 2.0°C warming target relative to 1.5°C warming target for RCP2.6, RCP4.5, RCP8.5 scenarios.
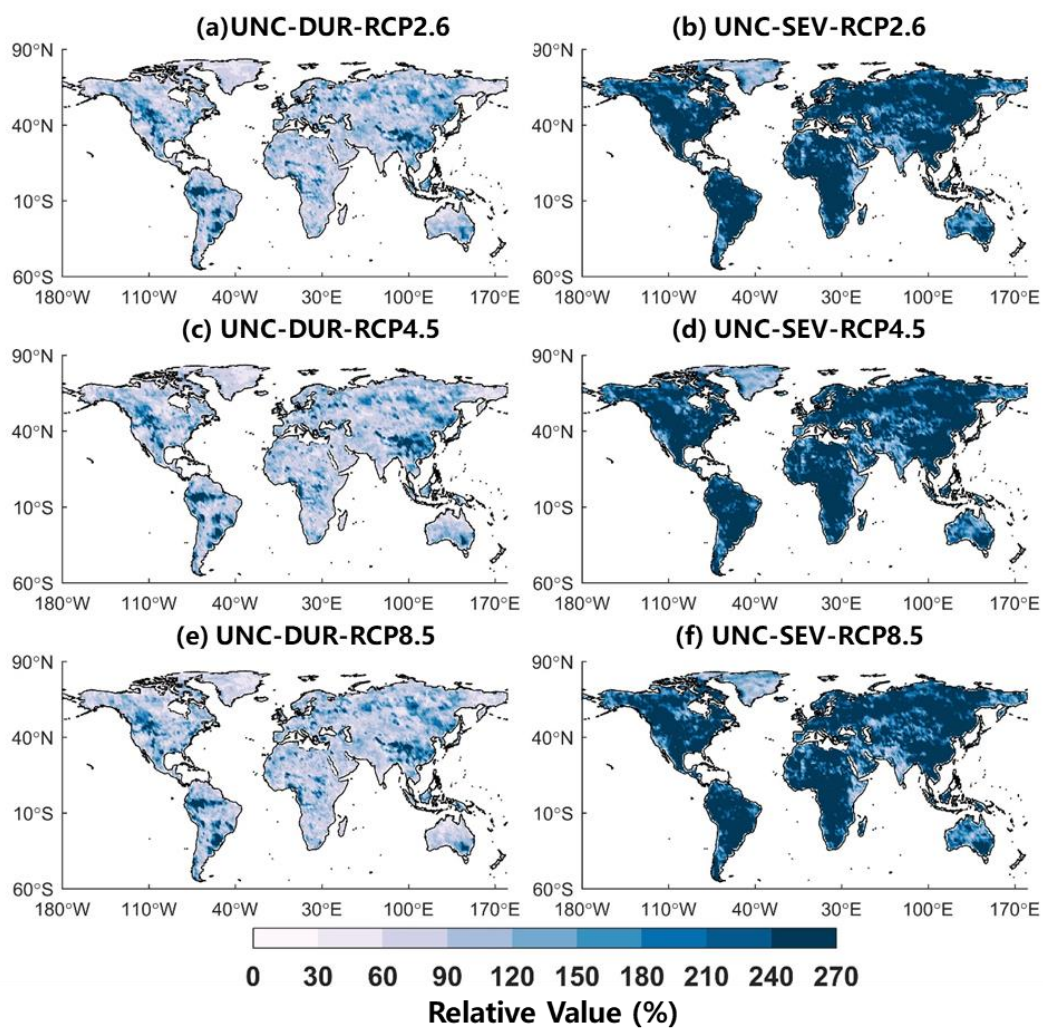
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Maps of the projected uncertainty (measured by 5-95% confidence intervals) in drought duration (DUR) (**a,c,e**) and severity (SEV) (**b,d,f**) changes under the 1.5℃ warming target relative to historical period (1976-2000) for RCP2.6, RCP4.5, RCP8.5 scenarios.
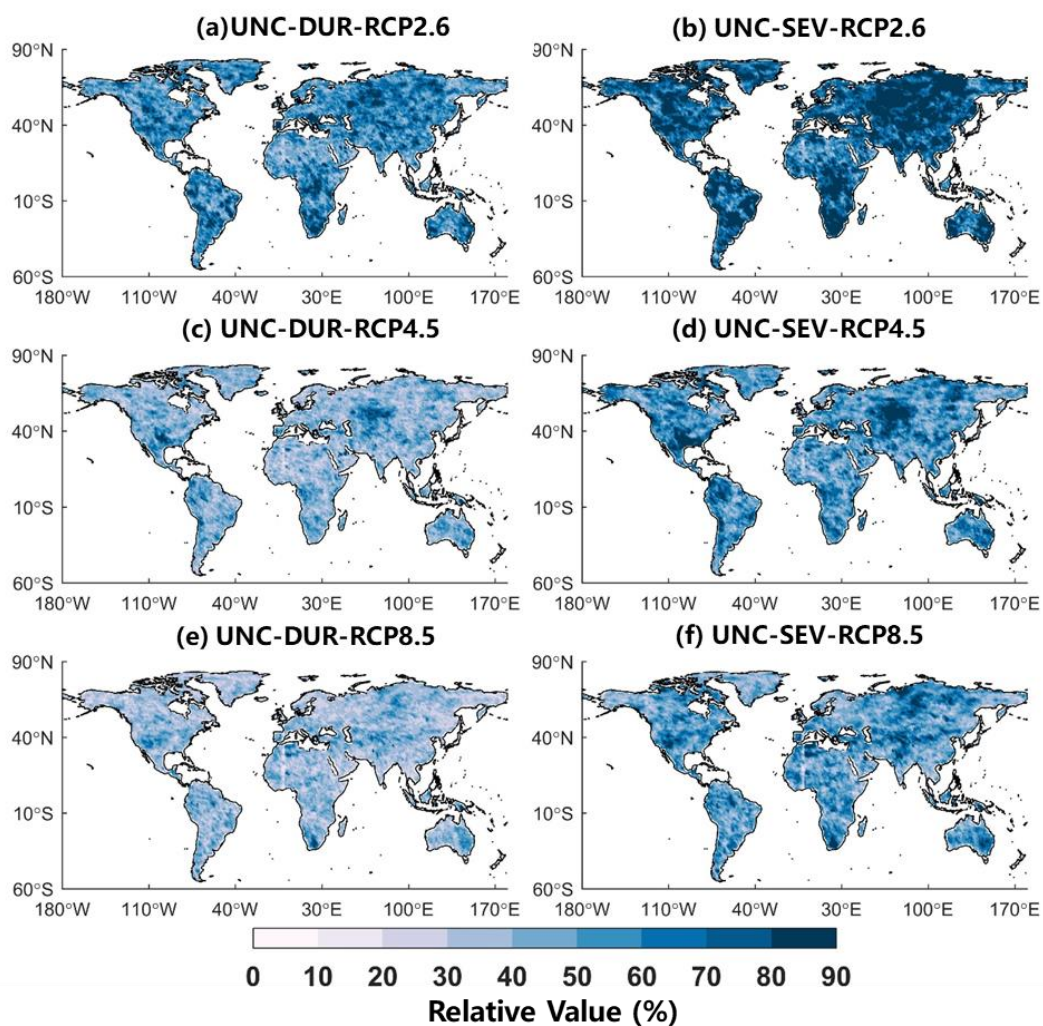
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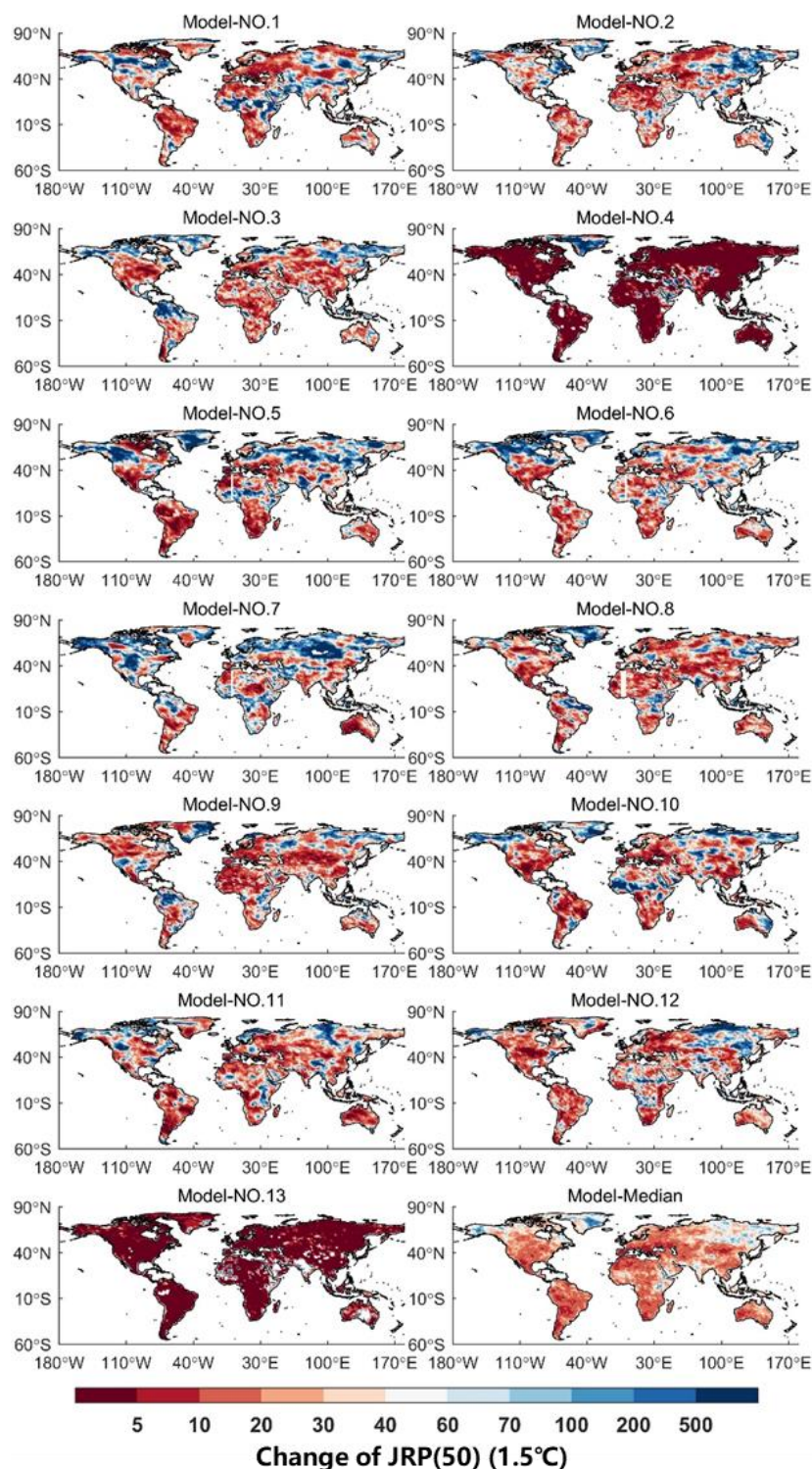
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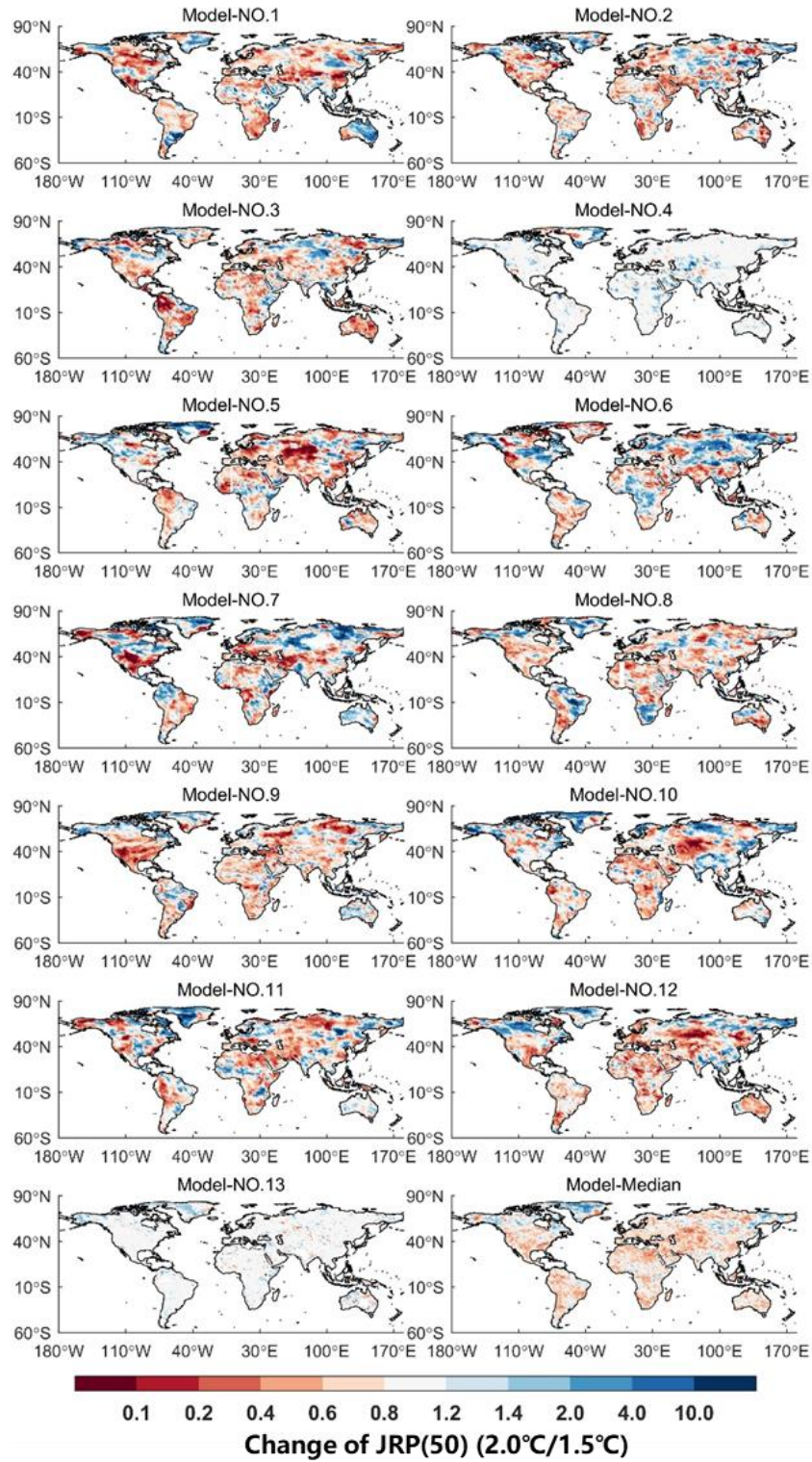
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Table S1 Summary statistic table for changes in major variables

Summary statistic			
Variable	**Explanation**	**1.5°C**	**2-1.5(°C)** [1]
SPEI$_{-3}$(Mean)	Percentage of continental areas for decreasing mean SPEI$_{-3}$	85%	58%
SPEI$_{-3}$(SD)	Percentage of continental areas for increasing standard deviation of SPEI$_{-3}$	100%	95%
Drought duration	Percentage of continental areas for increasing mean drought duration	78%	65%
Drought severity	Percentage of continental areas for increasing mean drought severity	99%	84%
50-year JRP	Percentage of continental areas for increasing occurrence of 50-year drought events	88%	71%
GDP exposure	The number of countries exhibit a 100% fraction in GDP exposed to increasing drought risks	73	17
Population exposure	The number of countries exhibit a 100% fraction in population exposed to increasing drought risks	75	17

Notes:

(1) 2-1.5(°C) means differences in effects between the 1.5°C and 2.0°C warming levels.