Supplement of

Intensification characteristics of hydroclimatic extremes in the Asia monsoon region under 1.5 and 2.0 °C of global warming

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Table S1. Results of GCM evaluation based on the skill score method.

Table S2. Statistical results of the VIC model validation at the selected basins in this study.

Table S1. Results of GCM evaluation based on the skill score method.

No.	GCMs	Score of each variable												Total score	Rank	Select (O,X)
		pr	tas max	tas min	rlut	psl	tos	ta	tas	zg	hus	ua	va			
1	ACCESS1.0	1	1	0	1	-1	0	1	-1	-1	-1	1	1	2	8	X
2	ACCESS1.3	-1	-1	1	0	-1	0	1	-1	-1	-1	1	1	-2	13	X
3	bcc-csm1-1	-1	-1	-1	-1	1	0	-1	1	1	1	0	0	-1	12	X
4	bcc-csm1-1-m	1	1	1	1	1	0	1	1	1	1	-1	1	9	2	O
5	BNU-ESM	1	-1	-1	1	1	1	-1	1	1	1	-1	0	3	7	X
6	CanESM2	1	-1	-1	1	-1	1	1	1	1	1	1	1	6	5	O
7	CMCC-CM	-1	1	1	0	-1	0	1	1	1	1	1	1	6	6	X
8	CMCC-CMS	1	1	1	0	-1	0	1	1	1	1	1	1	8	4	O
9	CNRM-CM5	1	1	-1	1	1	0	1	1	1	1	1	1	9	3	O
10	GFDL-CM3	1	1	1	1	-1	0	1	-1	-1	-1	1	0	2	9	X
11	GFDL-ESM2G	0	1	-1	1	-1	0	-1	-1	-1	-1	1	1	-2	14	X
12	HadGEM2-CC	1	1	1	1	-1	1	-1	-1	-1	-1	-1	1	0	11	X
13	IPSL-CM5A-LR	-1	0	1	-1	0	0	1	-1	-1	-1	-1	-1	-5	16	X
14	IPSL-CM5A-MR	-1	1	1	-1	0	0	1	-1	-1	-1	0	-1	-3	15	X
15	IPSL-CM5B-LR	-1	-1	-1	-1	0	0	-1	-1	-1	-1	-1	-1	-10	19	X
16	MIROC-ESM	-1	-1	-1	0	0	1	-1	-1	-1	-1	-1	-1	-8	18	X
17	MIROC-ESM-CHEM	-1	-1	-1	1	0	1	-1	-1	-1	-1	-1	-1	-7	17	X
18	MRI-CGCM3	-1	0	1	-1	1	1	1	-1	-1	-1	1	1	1	10	X
19	NorESM1-M	0	1	1	1	1	1	1	1	1	1	1	0	10	1	O

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25 **Table S2. Statistical results of the VIC model validation at the selected basins in this study.**

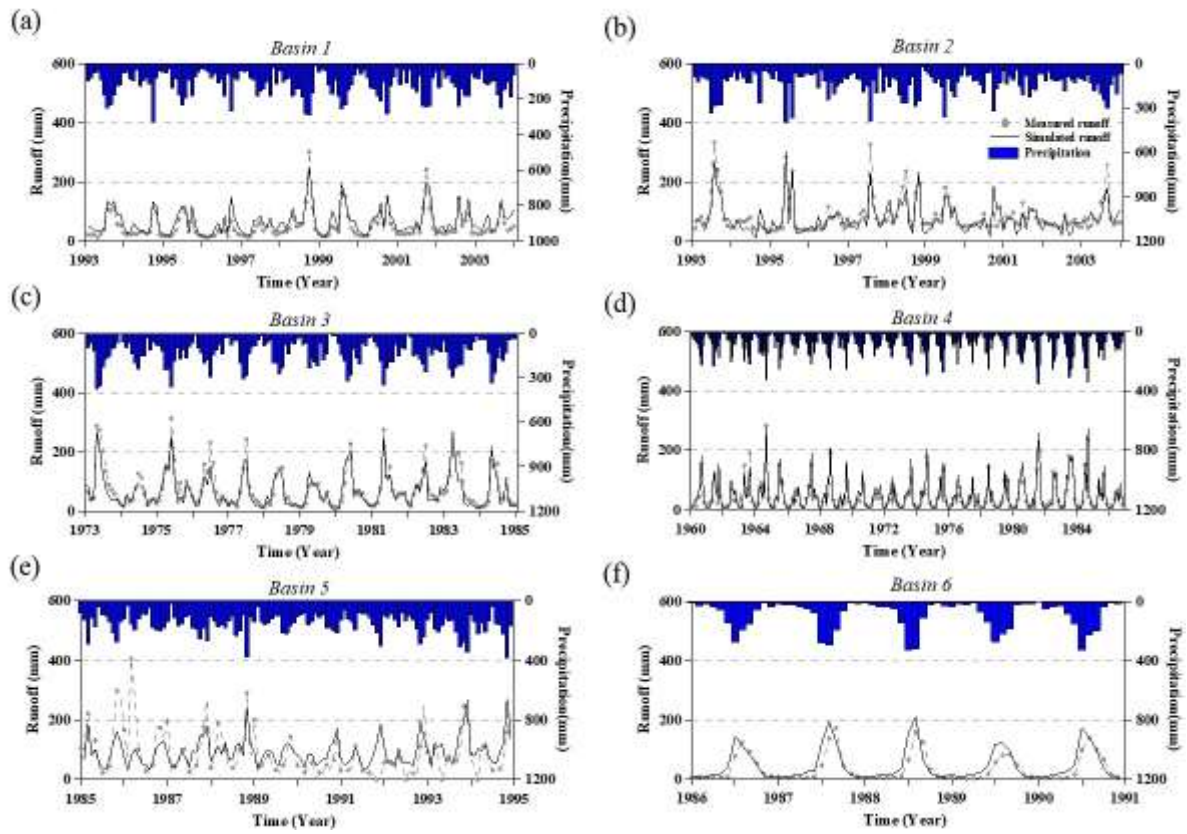| No.	Basin	GRDC station	Area (km²)	Statistics			
				CC	ME	RMSE (mm/month)	VE (%)
1	Tone	Fukawa	12,458	0.91	0.68	24.6	33.62
2	Yodo	Hirakata	7,281	0.87	0.75	28.6	-8.31
3	Gan Jiang	Jian	56,200	0.93	0.84	26.8	-12.5
4	Han Shui	Ankang	41,400	0.95	0.84	17.7	15.8
5	Muar	Buluh Kasap	3,130	0.58	0.33	62.0	9.2
6	Ganges	Hardinge Bridge	846,300	0.86	0.59	29.3	-32.2

Figure Captions

Figure S1. Six River basins for validation for the VIC model in this study.

Figure S2. Time series of measured runoff and simulated runoff averaged at each grid in six River basins suggested in Table S2. The simulated runoff obtained from the VIC model fed by observational meteorological input on a monthly basis (unit: mm). The blue bars in the upper x-axis indicate the mean areal precipitation averaged at each grid within the individual River basins.
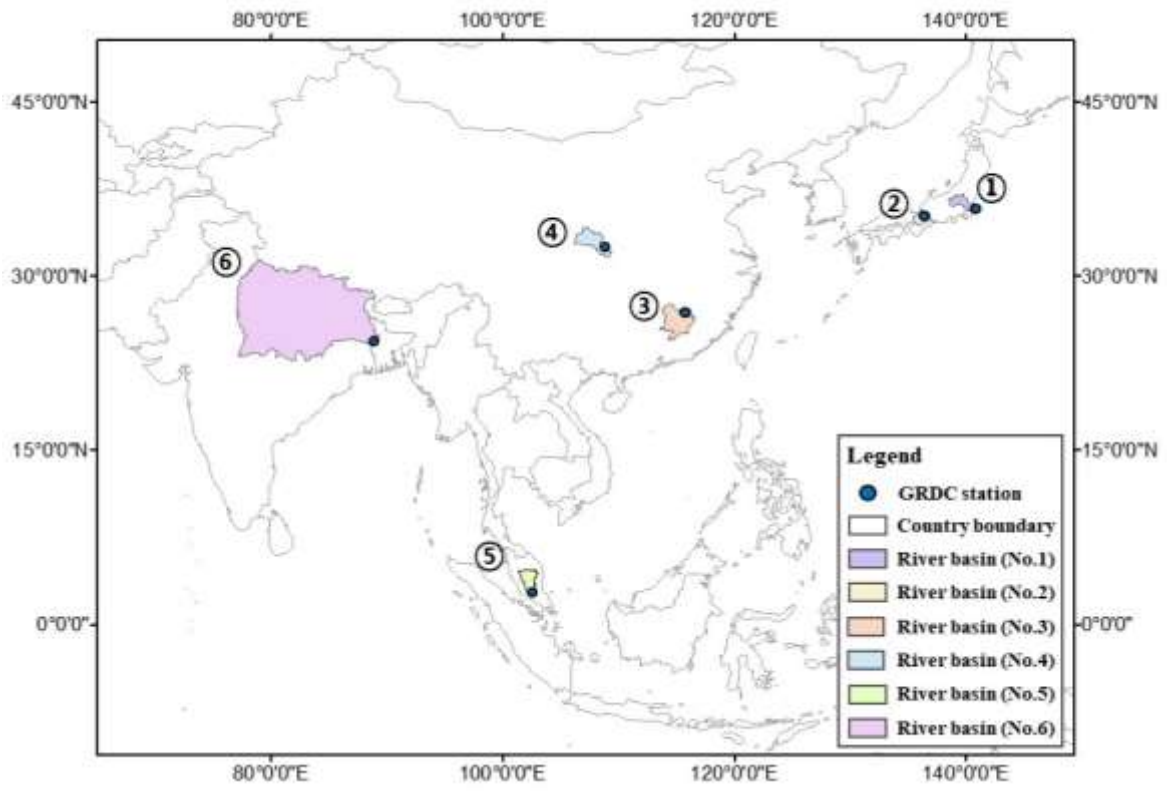
35 **Figure S1: Six River basins for validation for the VIC model in this study.**

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Figure S2: Time series of measured runoff and simulated runoff averaged at each grid in six River basins suggested in Table S2. The simulated runoff obtained from the VIC model fed by observational meteorological input on a monthly basis (unit: mm). The blue bars in the upper x-axis indicate the mean areal precipitation averaged at each grid within the individual River basins.