



Supplement of

A non-stationary climate-informed weather generator for assessing future flood risks

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Supplement

Table S1. CMIP6 General Circulation Models used for subsequent screening and weighting in the ClimWIP approach.

Modelling center	GCM	Realization	Spatial resolution (in °)
Beijing Climate Center	BCC-CSM2-MR	r1i1p1f1	1.13
Canadian Centre for Climate Modelling and Analysis	CanESM5	r1i1p1f1	2.81
National Center for Atmospheric Research	CESM2	r1i1p1f1	1.10
Centre National de Recherches Météorologiques and Centre Européen de Recherche et de Formation Avancée	CNRM-CM6-1	r1i1p1f2	1.41
EC-Earth-Consortium	EC-Earth3	r1i1p1f1	0.7
LASG/IAP, Beijing, China	FGOALS-g3	r1i1p1f1	2.13
Geophysical Fluid Dynamics Laboratory	GFDL-CM4	r1i1p1f1	1
Geophysical Fluid Dynamics Laboratory	GFDL-ESM4	r1i1p1f1	1
Met Office Hadley Centre and Natural Environment Research Council	UKESM1-0-LL	r1i1p1f1	1.59
Institute for Numerical Mathematics, Russian Academy of Sciences	INM-CM5-0	r1i1p1f1	1.77
Institut Pierre Simon Laplace	IPSL-CM6A-LR	r1i1p1f1	1.98
JAMSTEC, AORI, NIES and R-CCS	MIROC6	r1i1p1f1	1.41
Max Planck Institute for Meteorology	MPI-ESM1-2-HR	r1i1p1f1	0.94
Meteorological Research Institute	MRI-ESM2-0	r1i1p1f1	1.13
Norwegian Climate Center	NorESM2-LM	r1i1p1f1	2.21

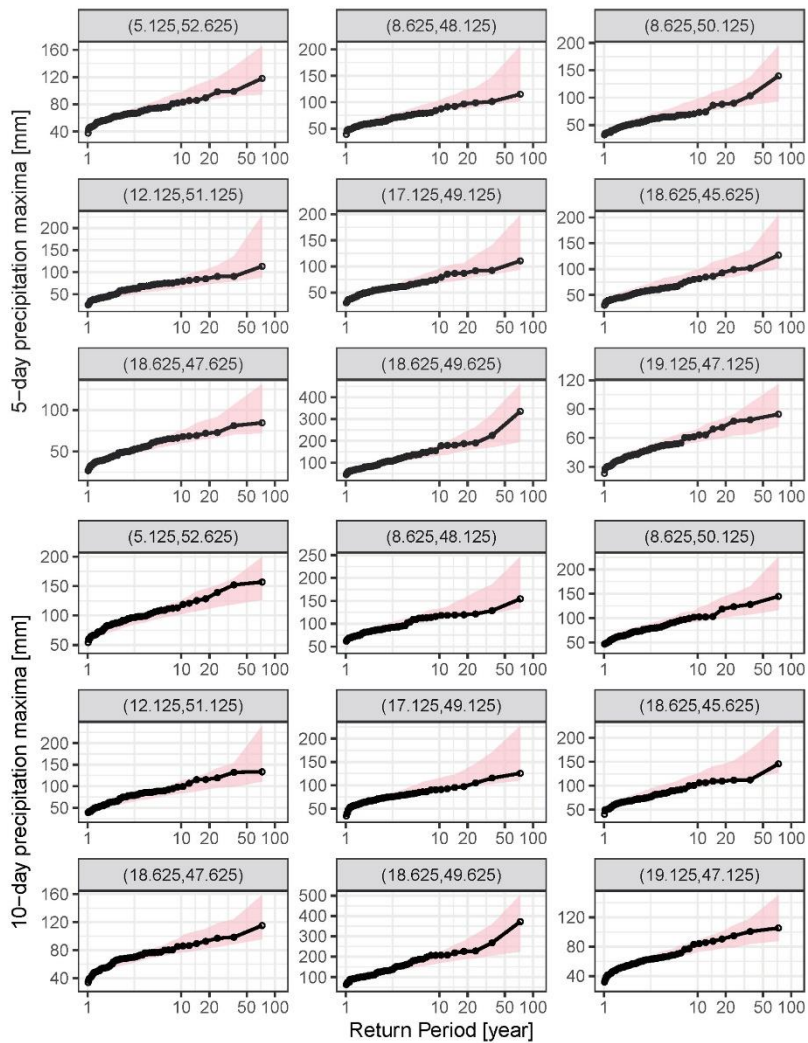


Figure S1: Frequency plots of observed (black) and simulated multi-day extreme precipitation totals (red ranges) accumulated over 5-day (upper panel) and 10-day (lower panel) periods at nine selected grid locations given by the geographical coordinates (lon/lat) in the title of each. Observed multi-day precipitation frequency based on E-OBS is shown in black. Note the log-scale of the x-axis. The Weibull plotting positions are used to estimate the return periods

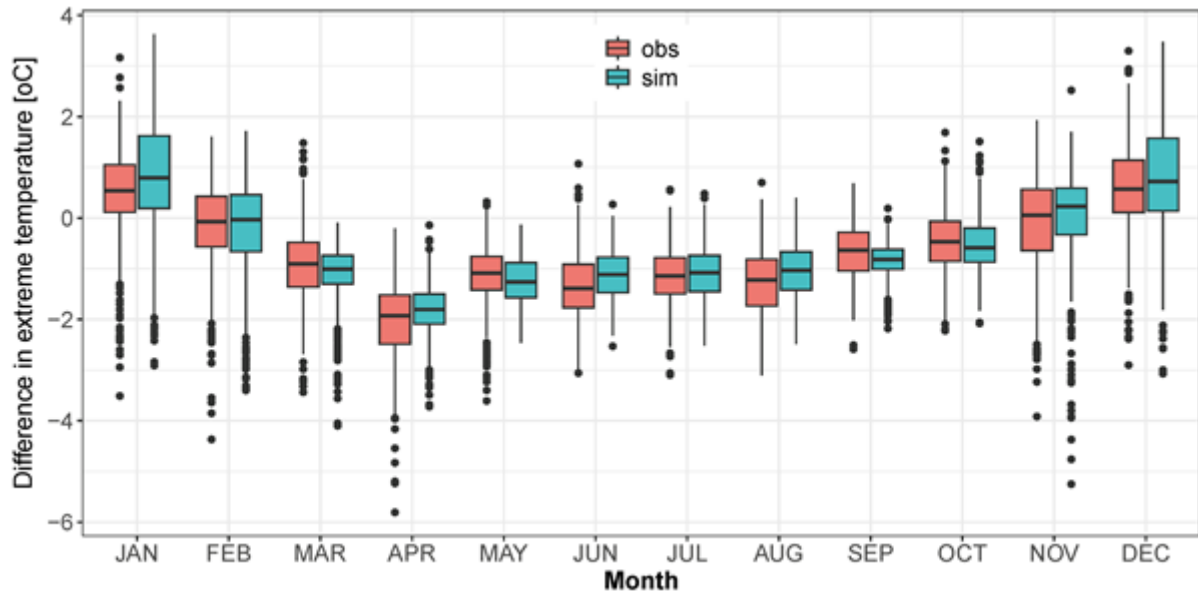


Figure S2: Boxplot demonstrating the difference between extreme temperatures (99.5th percentile) for dry and wet states (y-axis) in both the observed and synthetic data plotted across 12 months (x-axis). Boxes show the distribution across all locations in the modelled domain.