

Supplementary Materials

Table S1. Performance of HBV and GR4J hydrological models calibrated using observed and four reanalysis data sets during the historical periods

Criteria	Used datasets and models	Observed data		ERA5-land		CFSR		JRA-55		MERRA	
		HBV	GR4J	HBV	GR4J	HBV	GR4J	HBV	GR4J	HBV	GR4J
Kling-Gupta efficiency		0.37	0.18	0.82	0.9	0.78	0.7	0.72	0.69	0.75	0.52
Nash-Sutcliffe efficiency		-0.96	-2.82	0.66	0.82	0.5	0.4	0.4	0.42	0.41	0.2
Pearson correlation		0.26	0.22	0.8	0.85	0.75	0.64	0.57	0.52	0.65	0.41
Relative bias		-0.38	-0.62	0.1	-0.05	-0.17	-0.22	-0.13	0.09	-0.16	-0.09

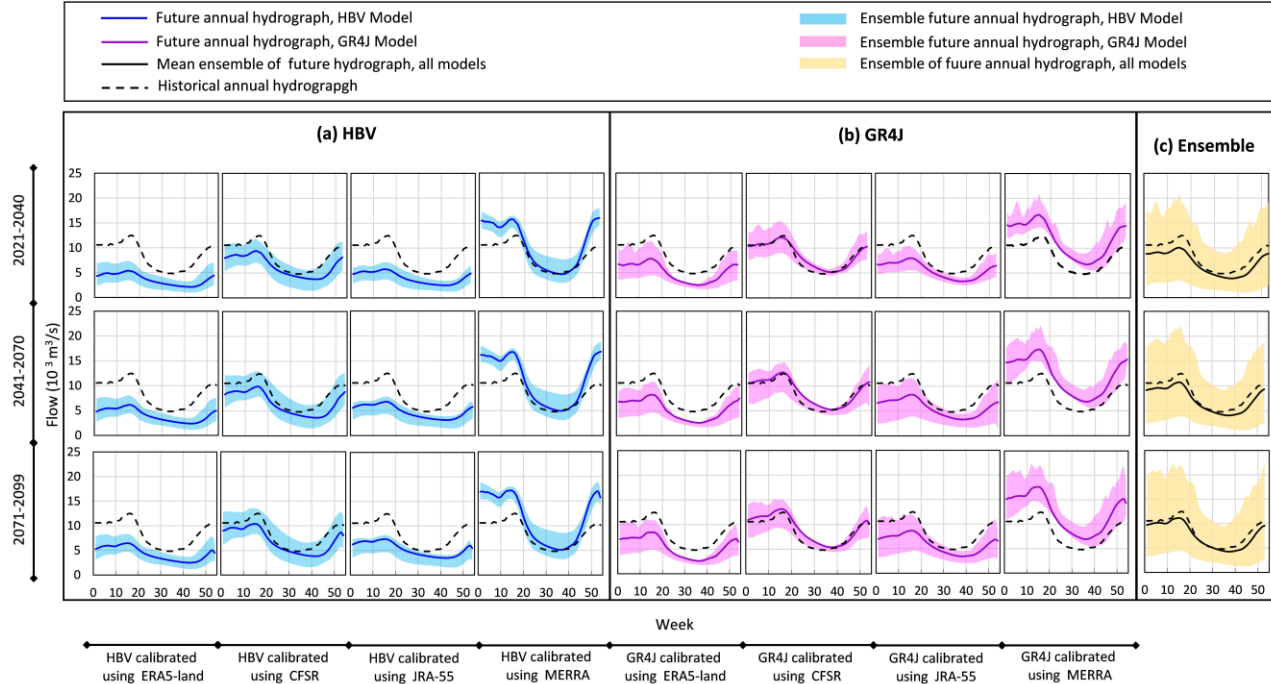


Figure S1. Projected ensemble and expected mean annual streamflow hydrograph (shaded area and solid line) at basin's outlet under RCP4.5 using two hydrological models, HBV (left) and GR4J

(middle), and the ensemble of all models (right) versus historical annual flow hydrograph (dashed line).

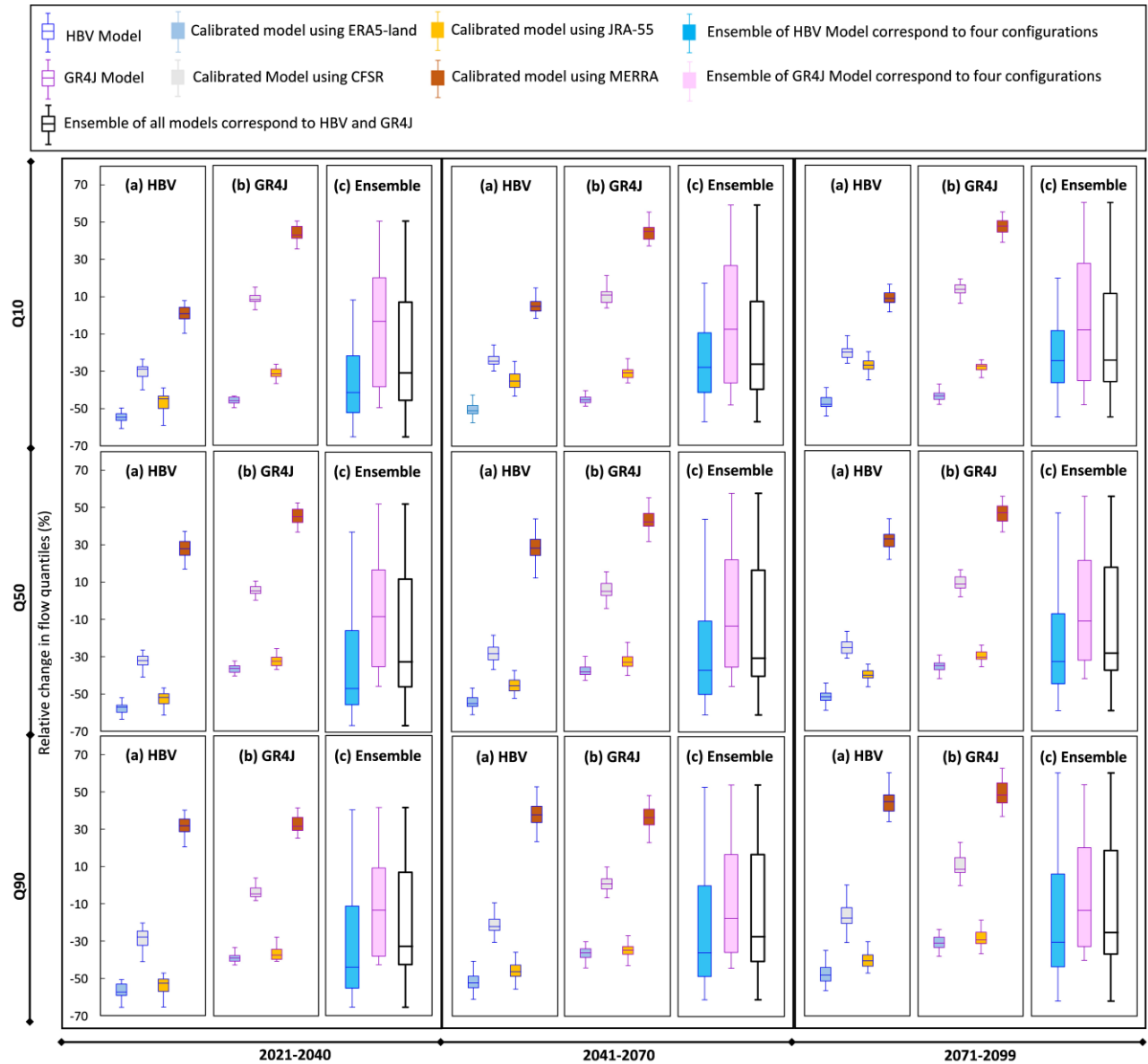


Figure S2. Relative changes of annual future streamflow quantiles based on the different configurations using GR4J and HBV Models and the ensemble of all simulations under RCP4.5 with respect to the long-term historical values.

Table S2. P-value and trend slope of expected future annual Q90 based on individual and all model configurations under scenario RCP4.5

Model	Test results Datasets used in calibration	RCP 4.5			RCP 8.5		
		P-value	Slope	Trend Significance	P-value	Slope	Trend Significance
HBV	ERA5-land	7.9E-09	19.98	Yes	6.5E-18	50.96	Yes
	CFSR	7.7E-10	27.62	Yes	6.0E-18	57.19	Yes
	JRA-55	1.3E-14	28.92	Yes	7.6E-22	58.18	Yes
	MERRA	1.9E-09	28.65	Yes	4.2E-18	69.57	Yes
GR4J	ERA5-land	1.7E-08	12.80	Yes	2.1E-17	32.22	Yes
	CFSR	3.2E-08	18.35	Yes	5.4E-17	45.34	Yes
	JRA-55	3.1E-05	11.95	Yes	4.4E-15	34.50	Yes
	MERRA	1.2E-06	19.35	Yes	6.9E-16	46.96	Yes
All models	Ensemble of 8 configurations	4.5E-10	21.54	Yes	1.5E-18	49.95	Yes