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Supplement of

Global evaluation of runoff from 10 state-of-the-art hydrological models

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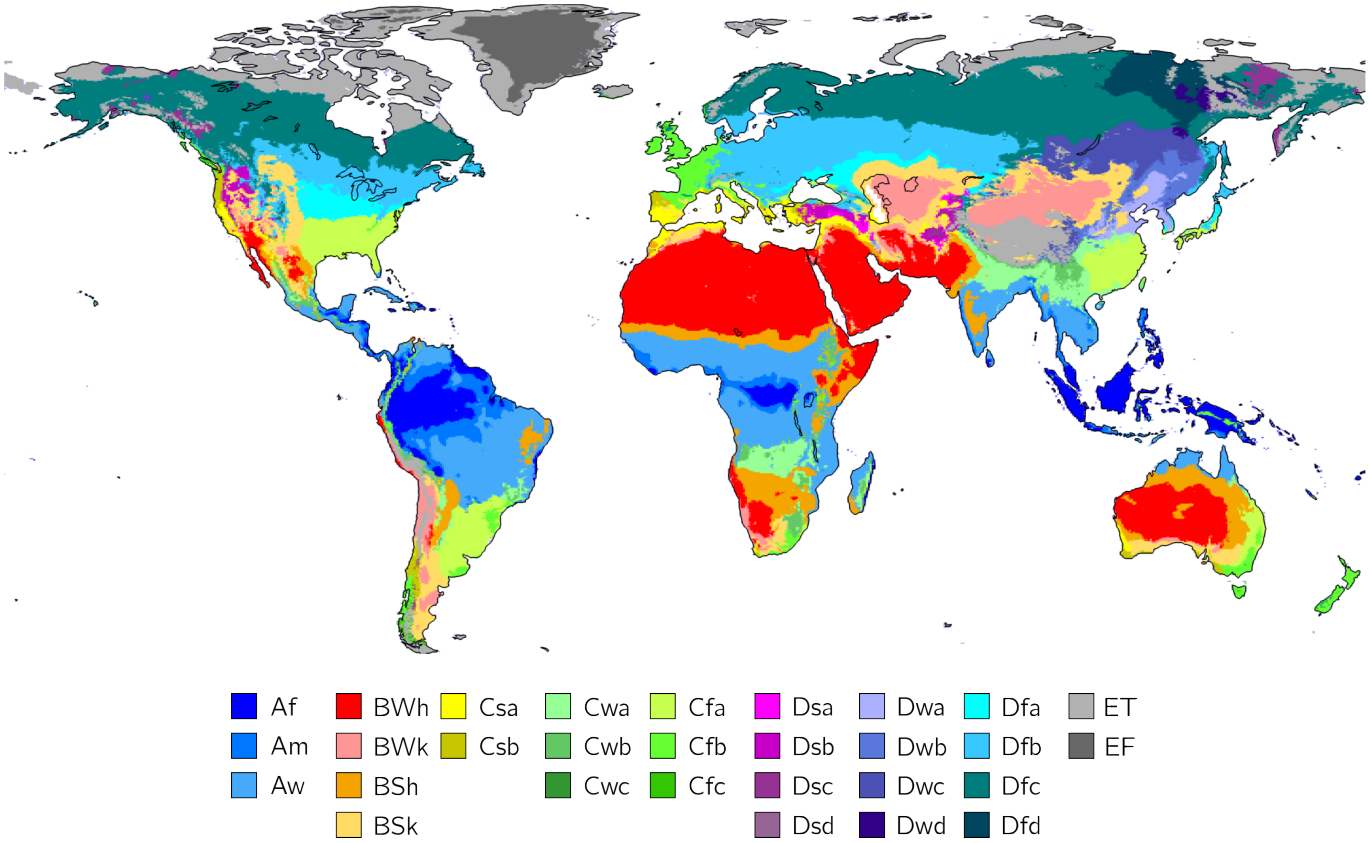

Figure S1.1: The new world map of the Köppen-Geiger climate classification.

Table S1: For the ten models and two ensembles, median NSE scores computed between simulated and observed runoff time series.

	Uncalibrated models						Calibrated models				Ensembles	
Metric	HTESSEL	JULES	ORCHIDEE	PCR-GLOBWB	SURFEX	W3RA	LISFLOOD	SWBM	WaterGAP3	HBV-SIMREG	MEAN-All	MEAN-Best4
$\overline{\mathrm{NSE}_{\mathrm{dly}}}$ ($n = 641$)	−0.38	−1.15	−1.03	−0.12	−1.23	−0.12	0.12	−2.37	−0.93	−0.05	−0.14	0.06
$\overline{\mathrm{NSE}_{\mathrm{dly\,log}}}$ ($n = 641$)	−0.22	−1.04	−2.65	−0.50	−1.76	−0.09	−0.01	−12.64	−0.27	0.21	0.07	0.18
$\overline{\mathrm{NSE}_{\mathrm{5\,day}}}$ ($n = 641$)	−0.04	−0.48	−0.45	−0.01	−0.63	−0.03	0.13	−0.66	−0.07	0.14	0.17	0.26
$\overline{\mathrm{NSE}_{\mathrm{mon}}}$ ($n = 966$)	0.00	−0.24	−0.32	0.02	−0.50	−0.00	0.14	−0.23	0.21	0.22	0.24	0.33
$\overline{\mathrm{NSE}_{\mathrm{mon\,clim}}}$ ($n = 966$)	0.04	−0.26	−0.42	−0.03	−0.65	−0.07	0.08	−0.22	0.29	0.27	0.25	0.34
$\overline{\mathrm{NSE}_{\mathrm{yr}}}$ ($n = 966$)	−1.51	−1.38	−3.80	−3.01	−1.81	−1.89	−2.70	−2.03	−0.89	−1.67	−1.28	−1.25

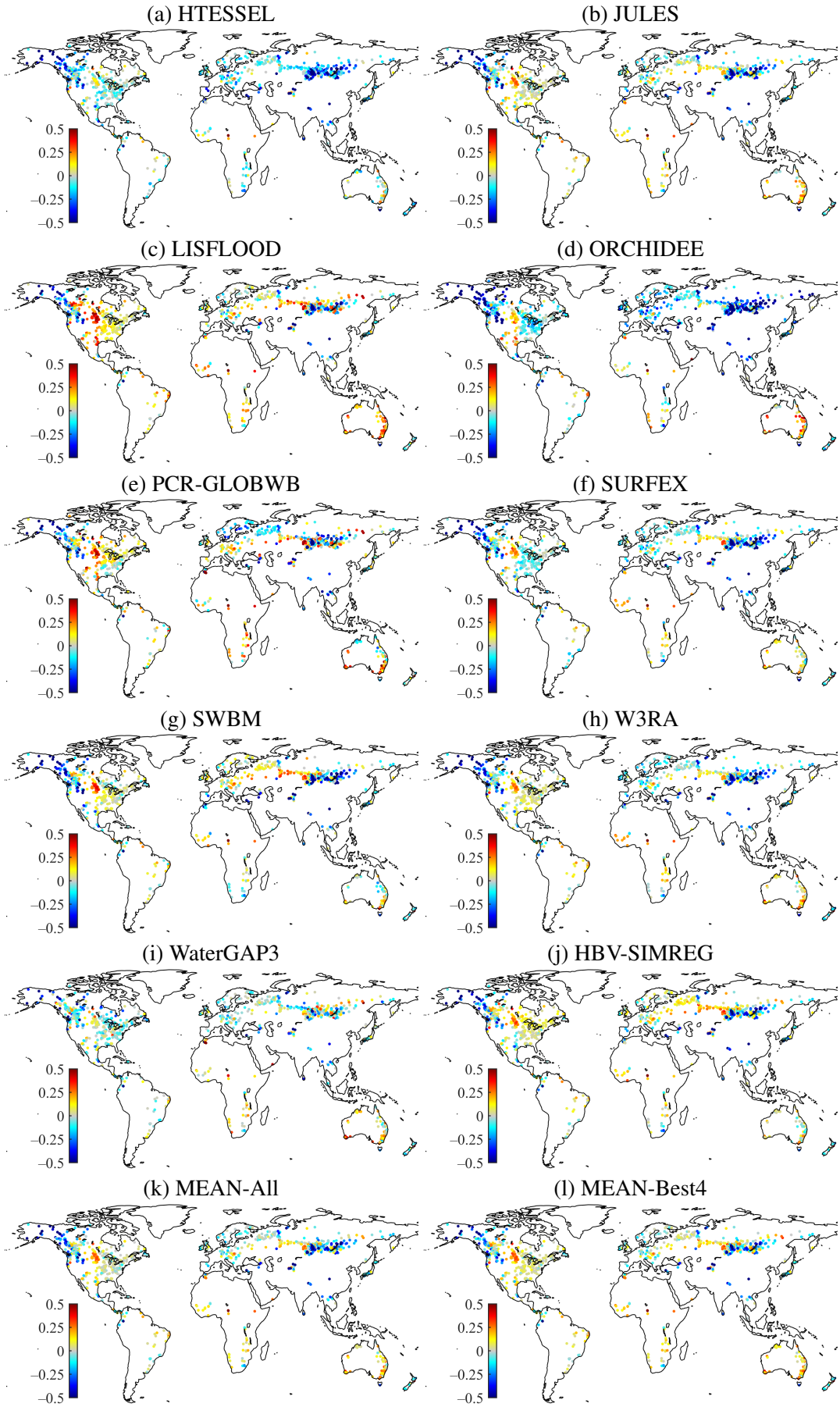

Figure S1.2: Simulated minus observed square-root transformed runoff coefficient (RC) for the catchments. Red (blue) indicates an overestimated (underestimated) RC relative to the observations. Each data point represents a catchment centroid ($n = 966$).

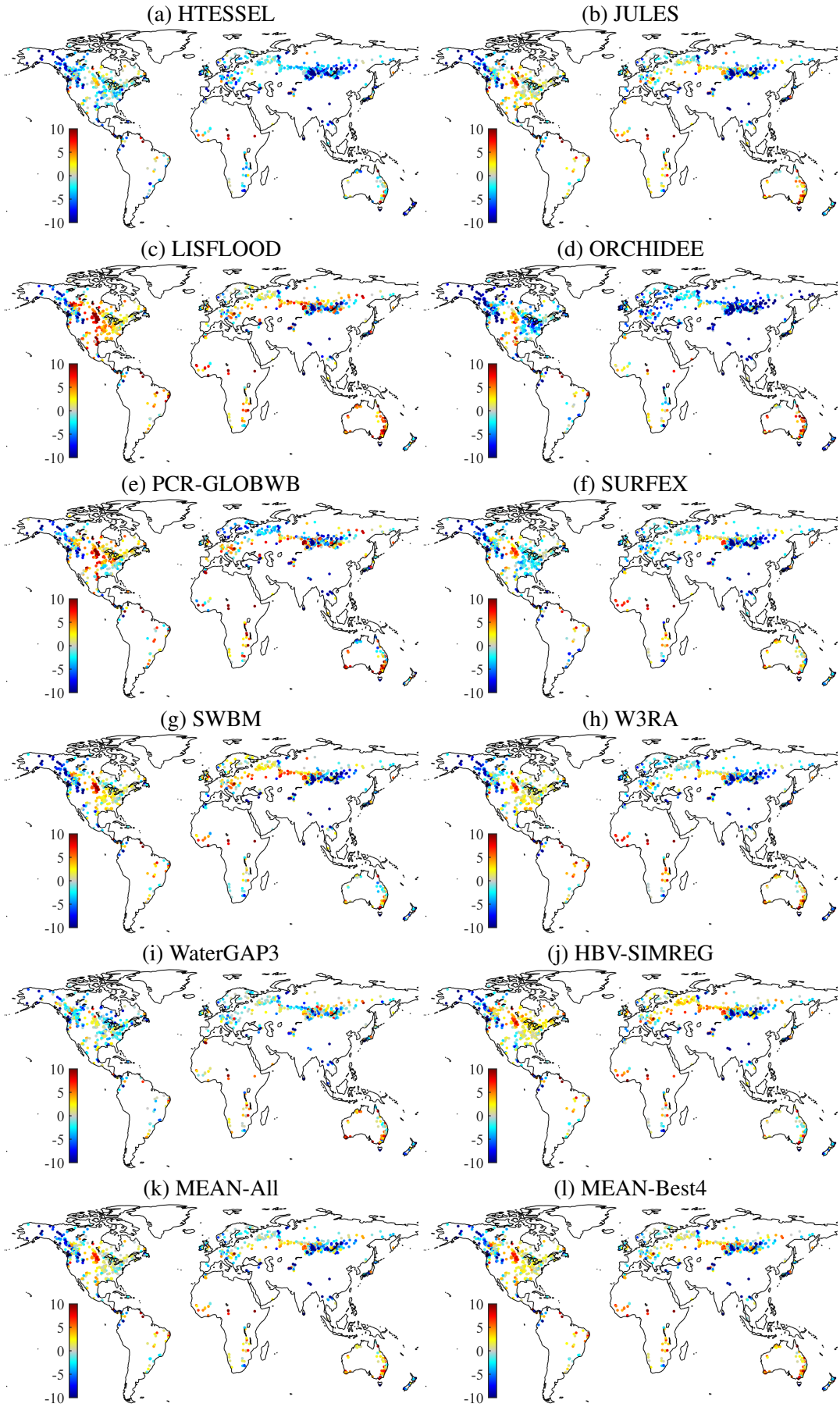

Figure S1.3: Simulated minus observed square-root transformed mean annual runoff (MAR) for the catchments. Red (blue) indicates an overestimated (underestimated) MAR relative to the observations. Each data point represents a catchment centroid ($n = 966$).

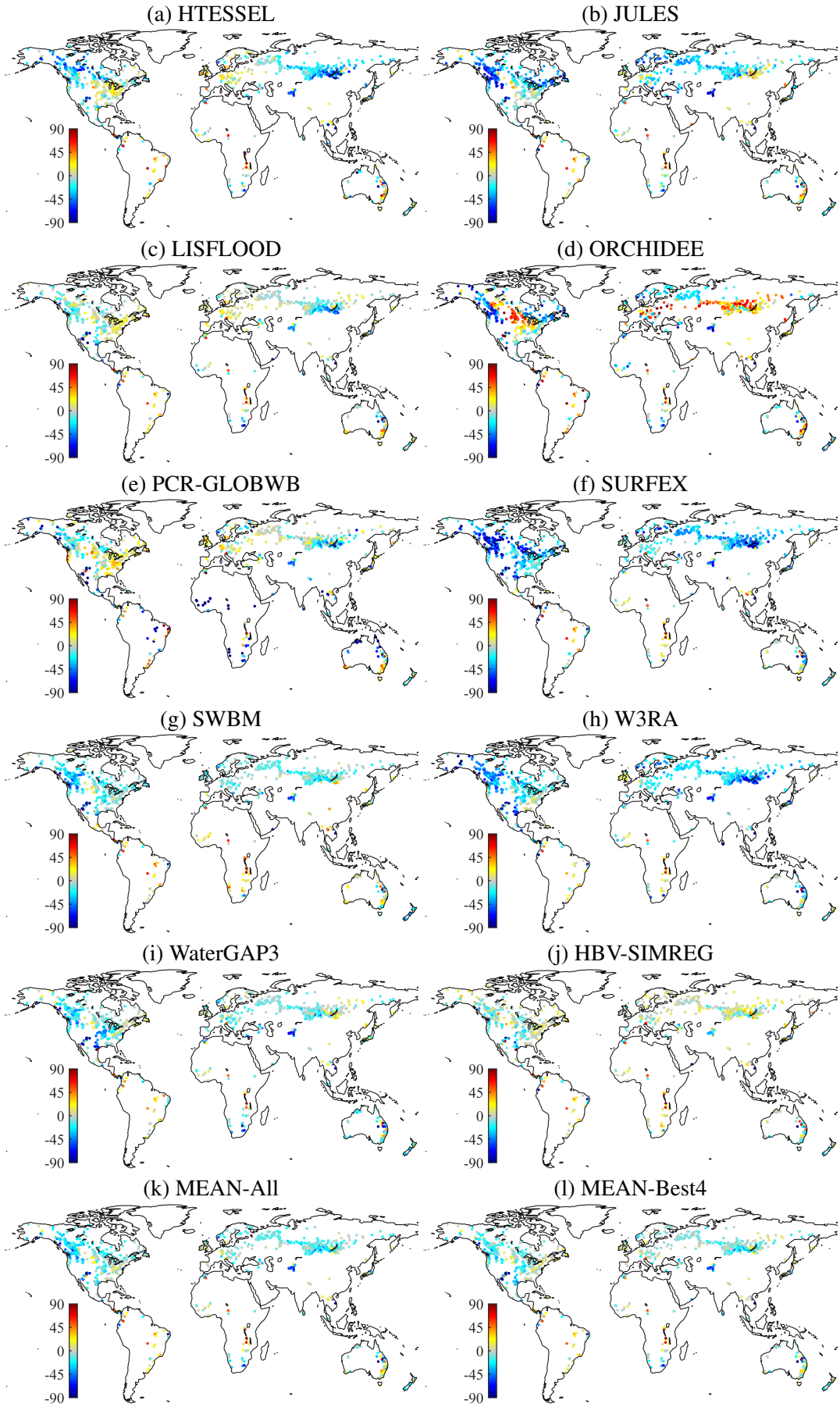

Figure S1.4: Simulated minus observed flow timing (T50) for the catchments. Red (blue) indicates an overestimated (underestimated) T50 relative to the observations. Each data point represents a catchment centroid ($n = 966$).

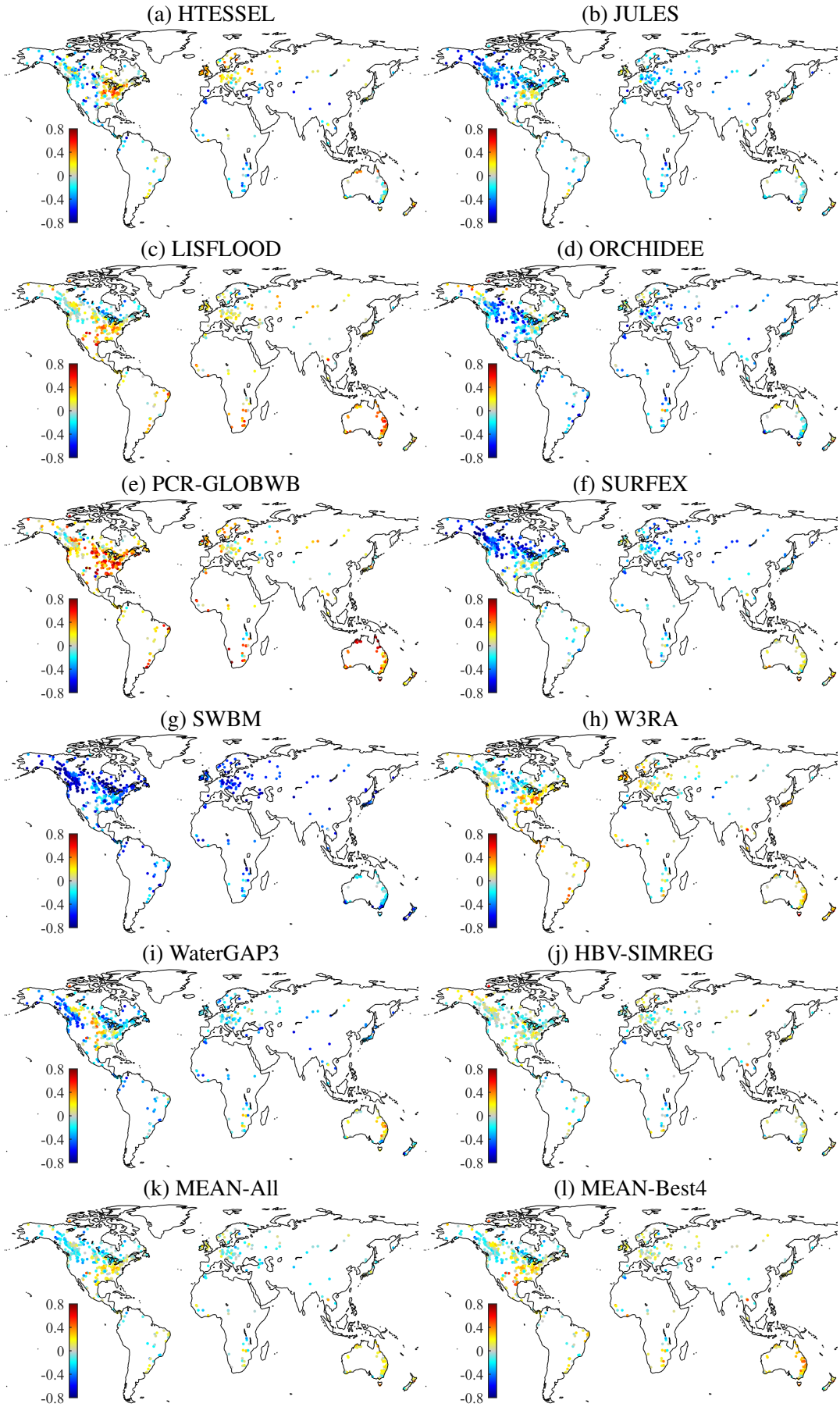

Figure S1.5: Simulated minus observed baseflow index (BFI) for the catchments. Red (blue) indicates an overestimated (underestimated) BFI relative to the observations. Each data point represents a catchment centroid ($n = 641$).

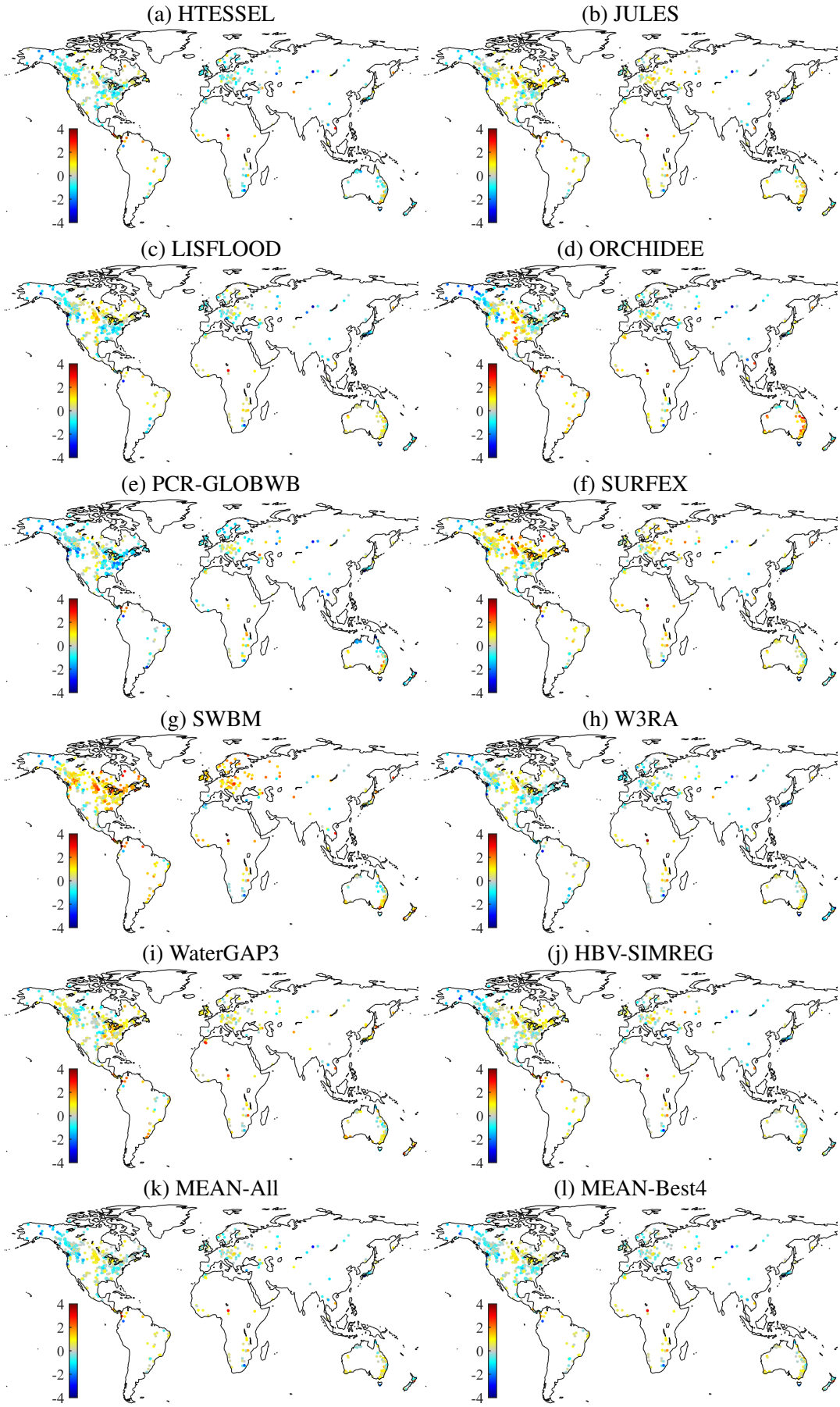

Figure S1.6: Simulated minus observed square-root transformed 1st percentile flow (Q1) for the catchments. Red (blue) indicates an overestimated (underestimated) Q1 relative to the observations. Each data point represents a catchment centroid ($n = 641$).

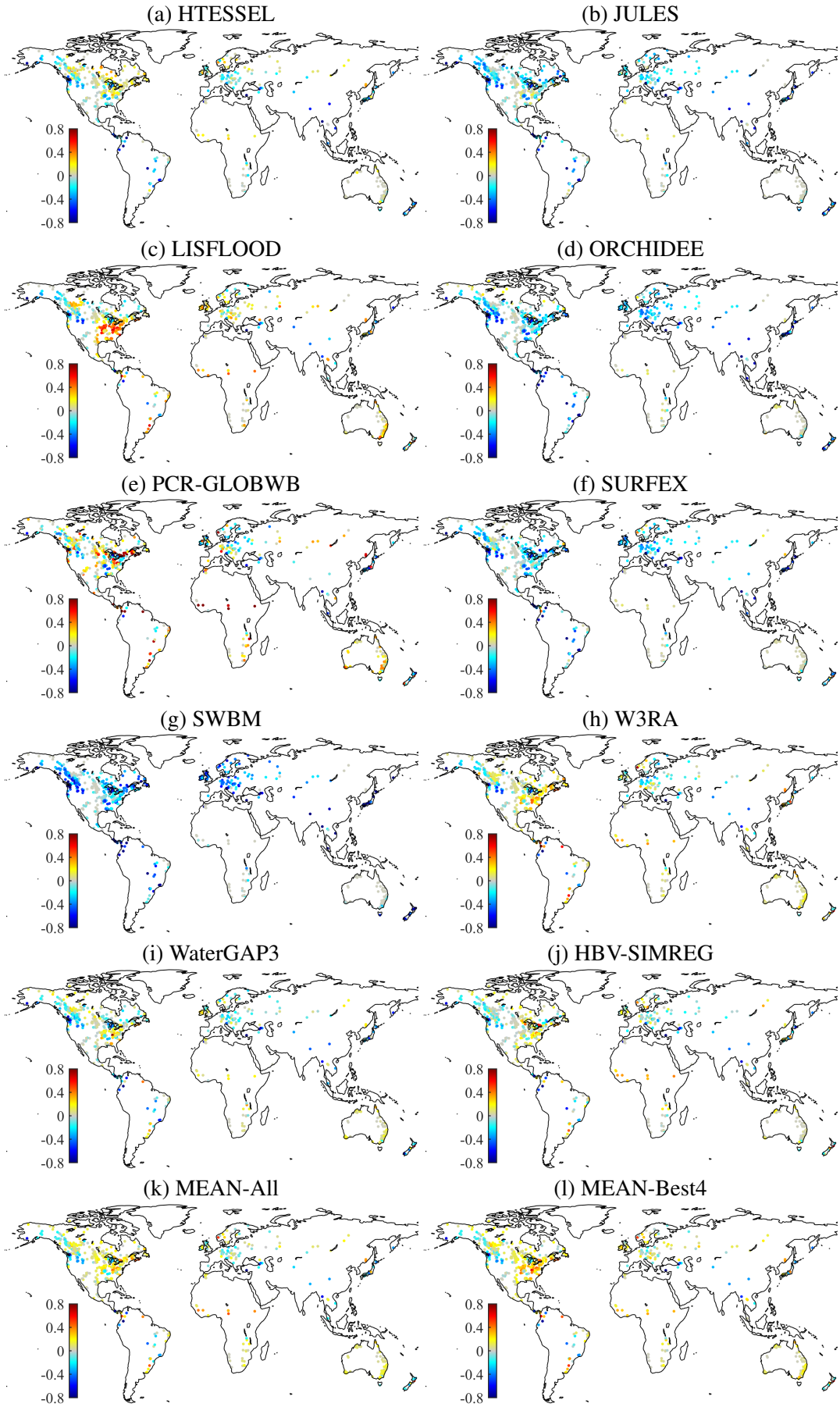

Figure S1.7: Simulated minus observed square-root transformed 99th percentile flow (Q99) for the catchments. Red (blue) indicates an overestimated (underestimated) Q99 relative to the observations. Each data point represents a catchment centroid ($n = 641$).

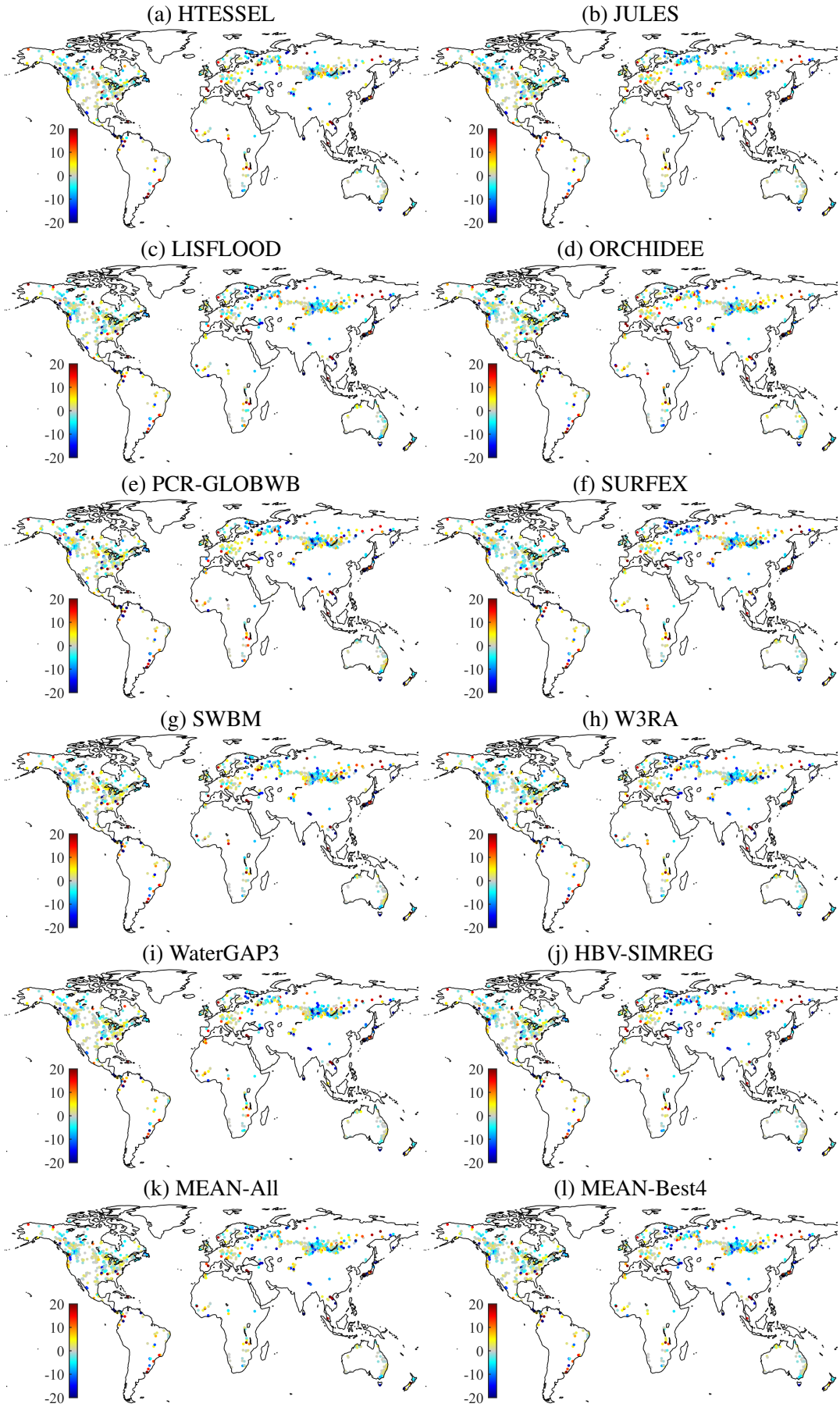

Figure S1.8: Simulated minus observed trend in mean annual runoff (MAR trend, mm yr^{-1}) for the catchments. Red (blue) indicates an overestimated (underestimated) MAR trend relative to the observations. Each data point represents a catchment centroid ($n = 966$).

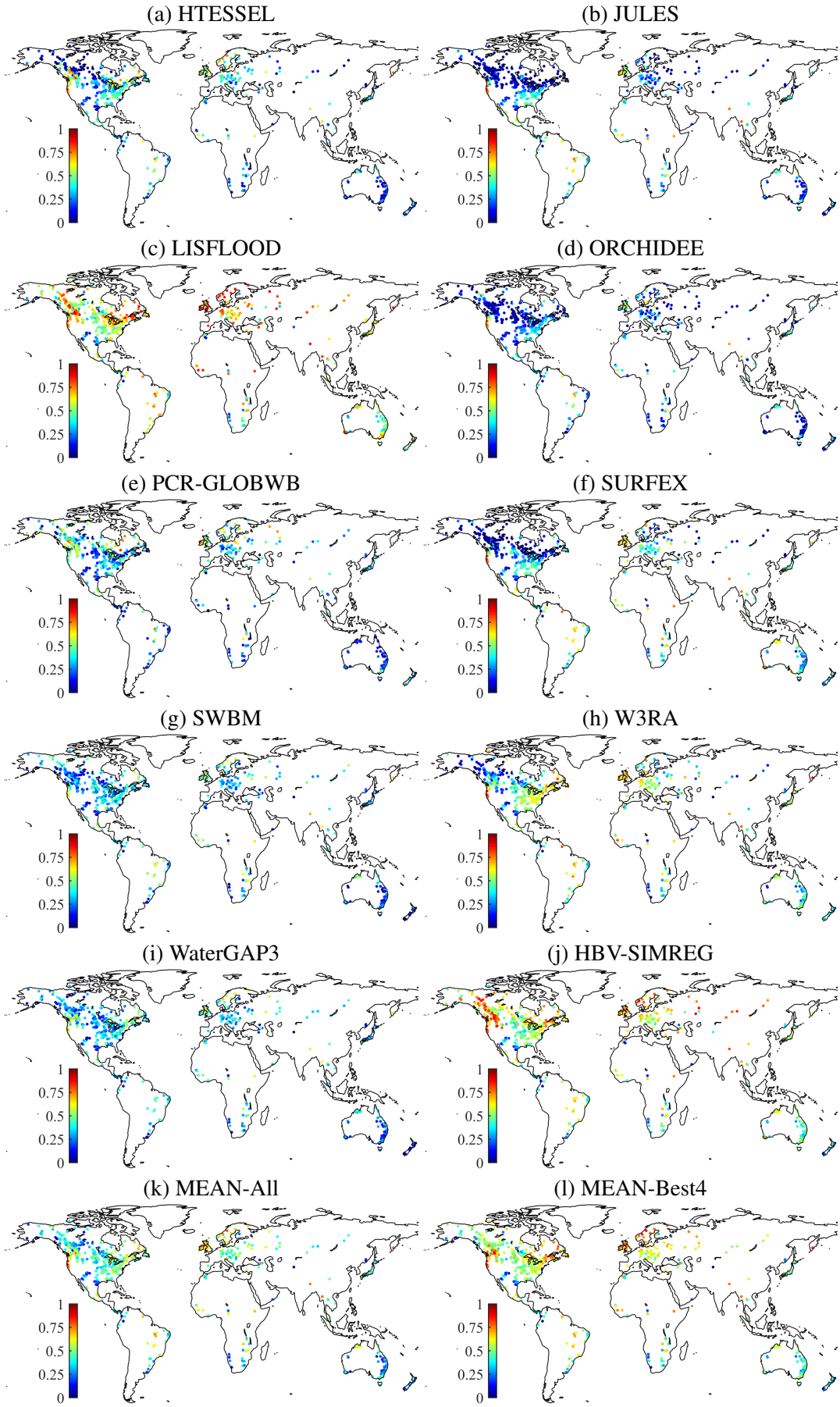

Figure S1.9: Correlation between simulated and observed daily flows (r_{dly}) for the catchments. Each data point represents a catchment centroid ($n = 641$).

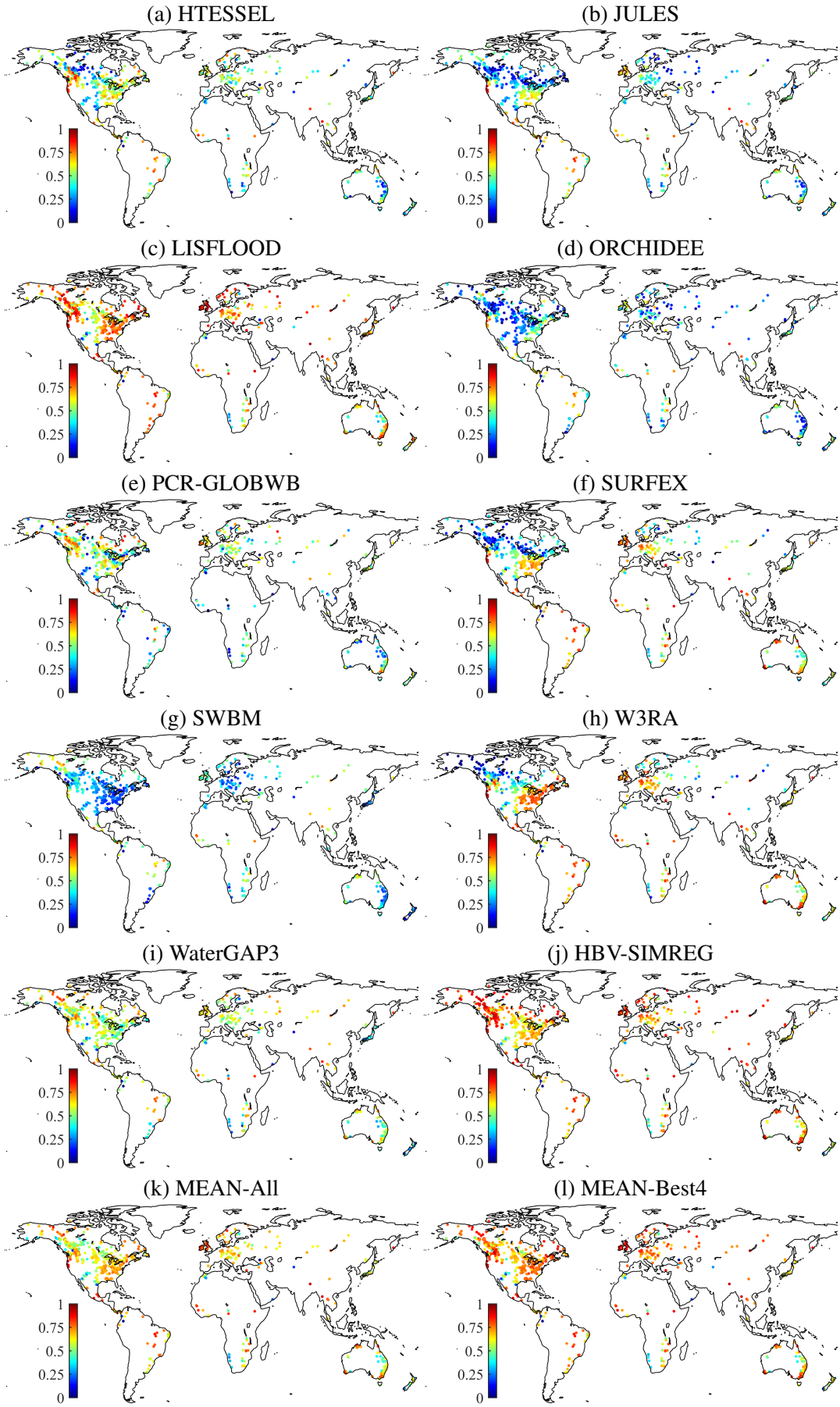

Figure S1.10: Correlation between simulated and observed daily log-transformed flows ($r_{\mathrm{dly\,log}}$) for the catchments. Each data point represents a catchment centroid ($n = 641$).

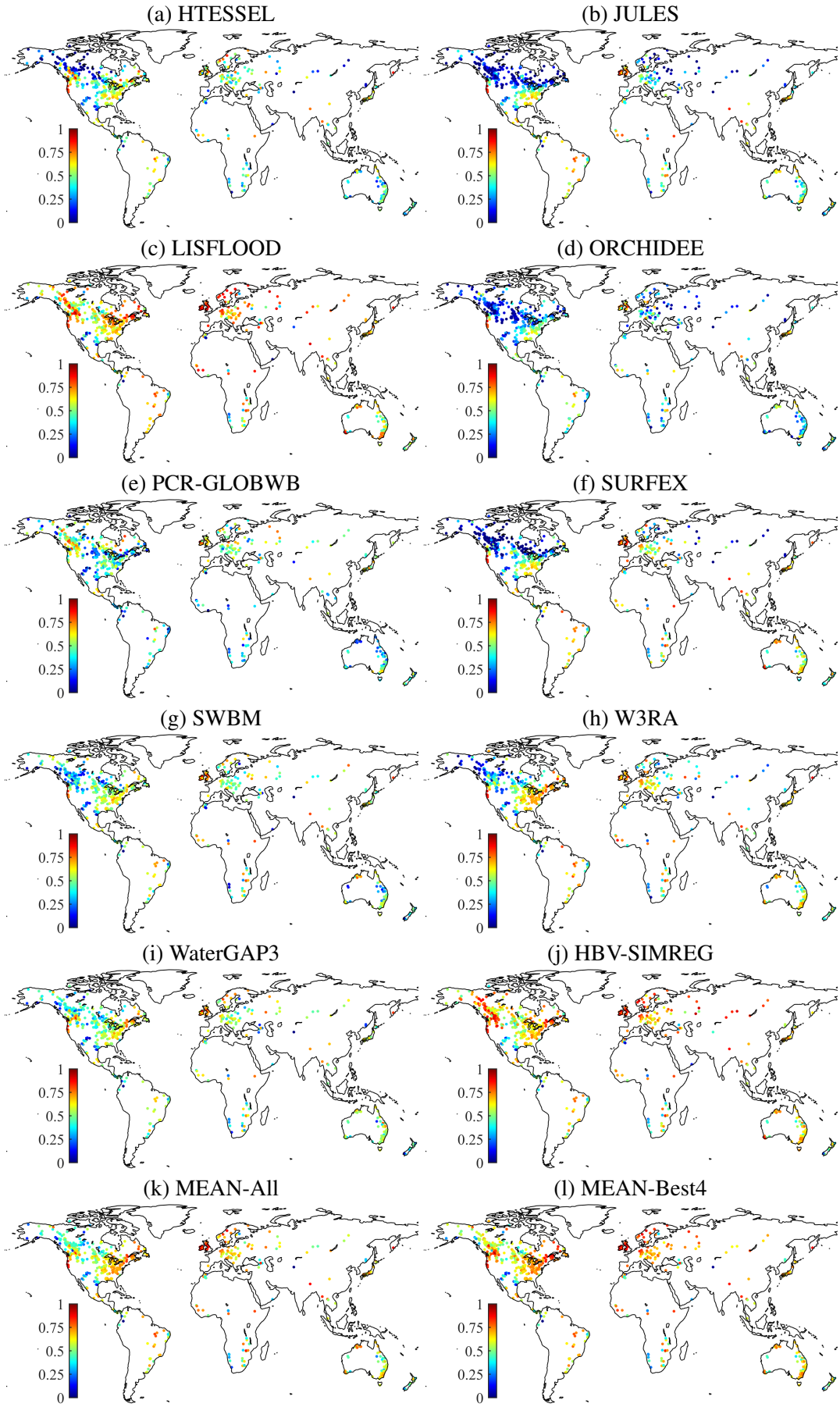

Figure S1.11: Correlation between simulated and observed 5-day flows ($r_{5\,\mathrm{day}}$) for the catchments. Each data point represents a catchment centroid ($n = 641$).

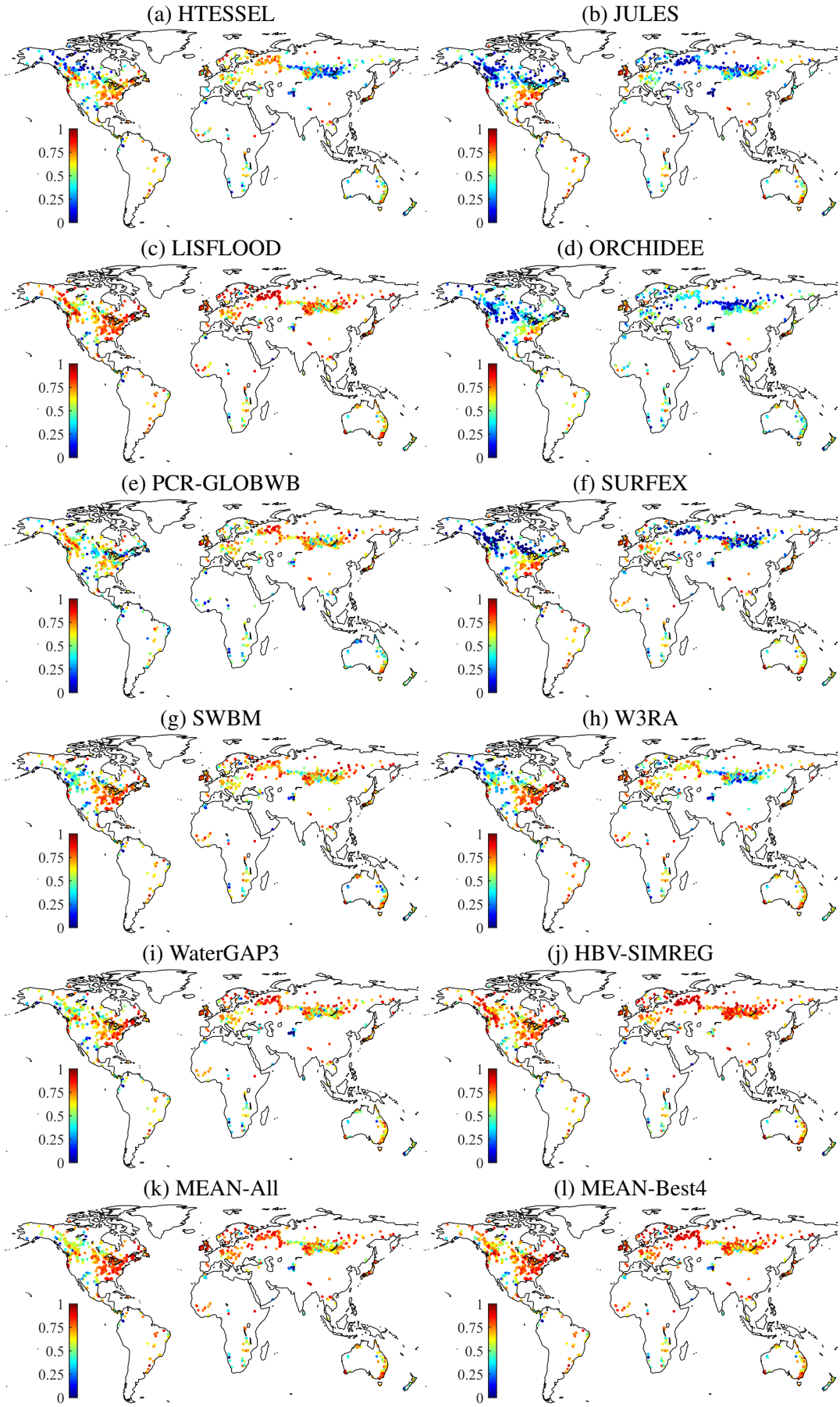

Figure S1.12: Correlation between simulated and observed monthly flows (r_{mon}) for the catchments. Each data point represents a catchment centroid ($n = 966$).

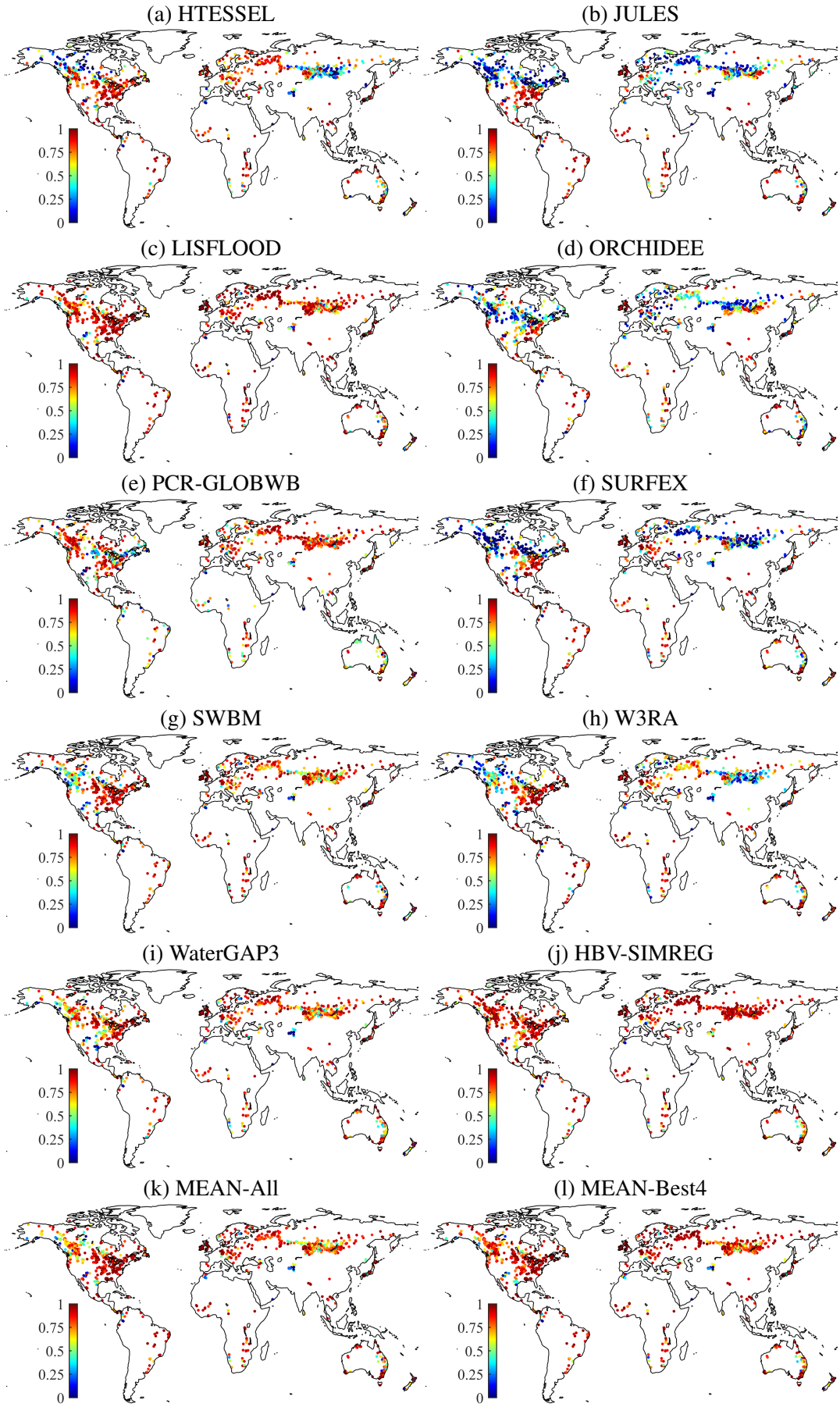

Figure S1.13: Correlation between simulated and observed monthly climatic flows ($r_{\text{mon clim}}$) for the catchments. Each data point represents a catchment centroid ($n = 966$).

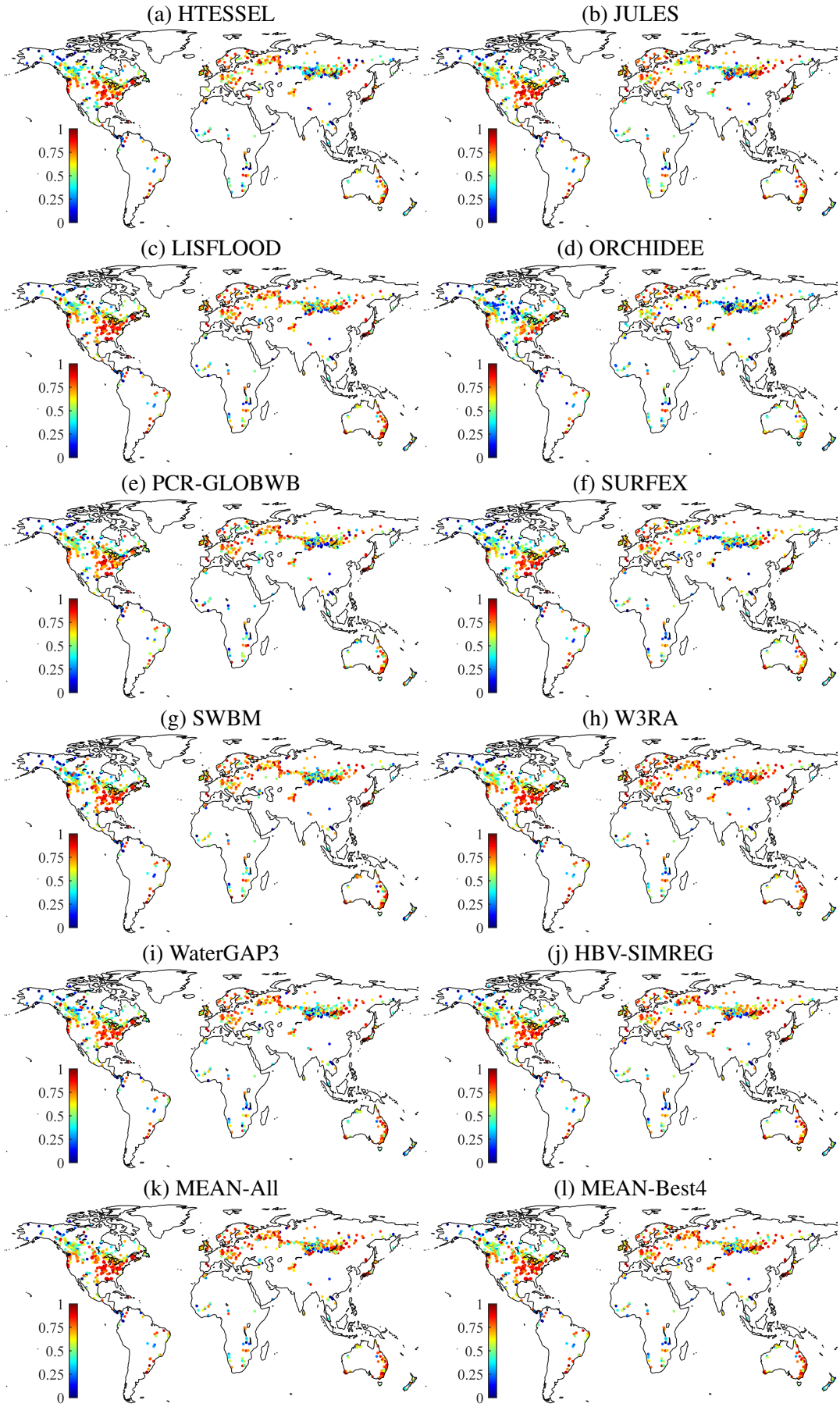

Figure S1.14: Correlation between simulated and observed annual flows (r_{yr}) for the catchments. Each data point represents a catchment centroid ($n = 966$).