Supplement of

Beyond Runoff Coefficient: Revealing Global Patterns of Process Connectivity in Runoff Generation through Intensity Integration

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Supplement

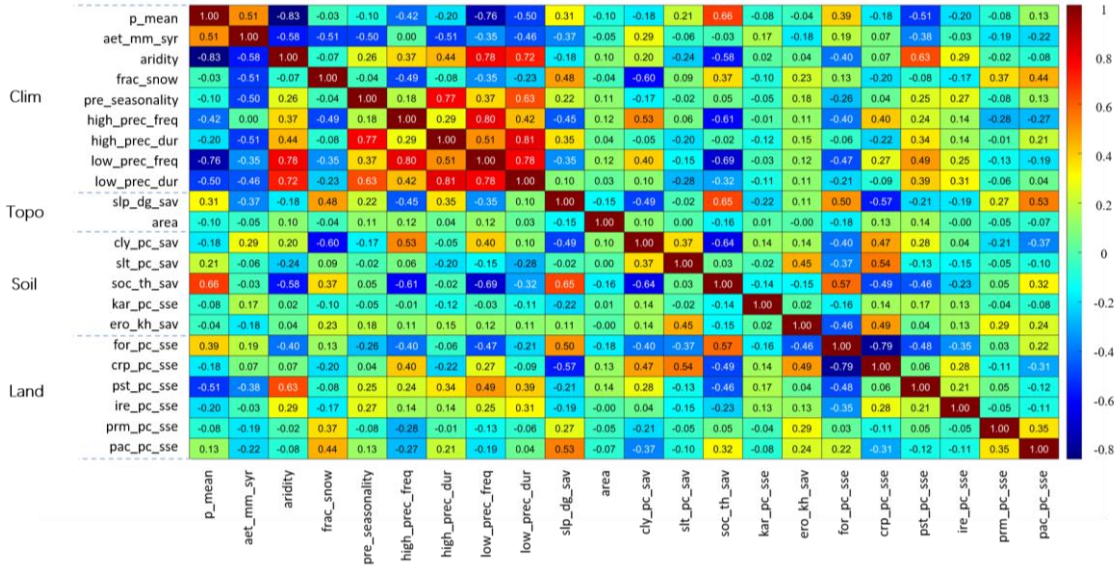

Figure S1. Pearson correlation coefficients for 22 selected catchment attributes.

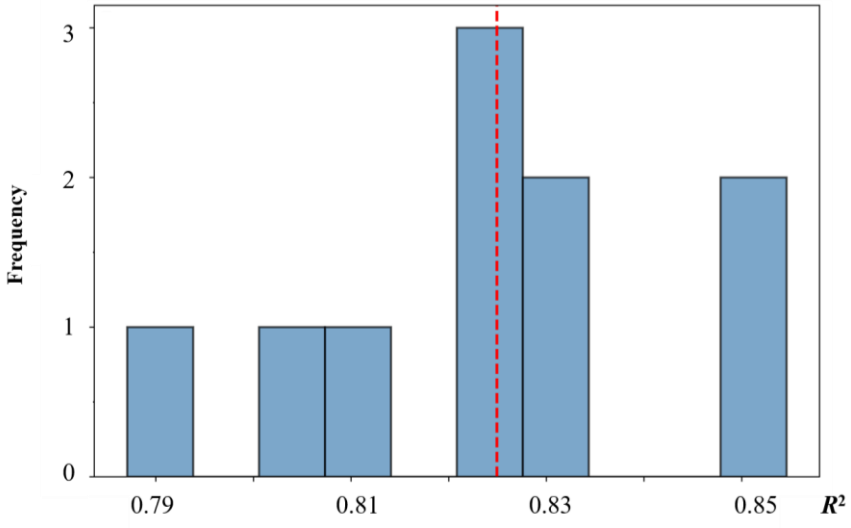

Figure S2. Distribution of R^2 of the random forest model in 10-fold cross-validation for *RC*. The red dashed line represents the mean value.

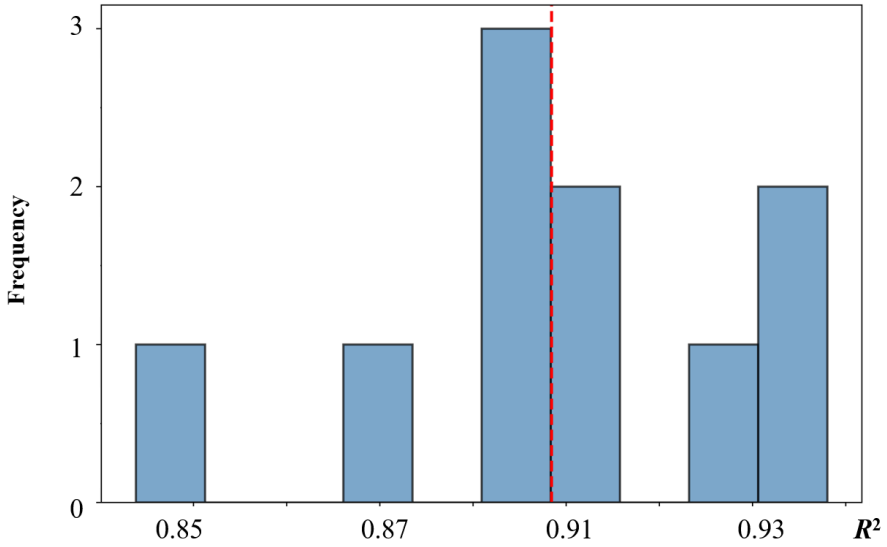

Figure S3. Distribution of R^2 of the random forest model in 10-fold cross-validation for *RI*. The red dashed line represents the mean value.

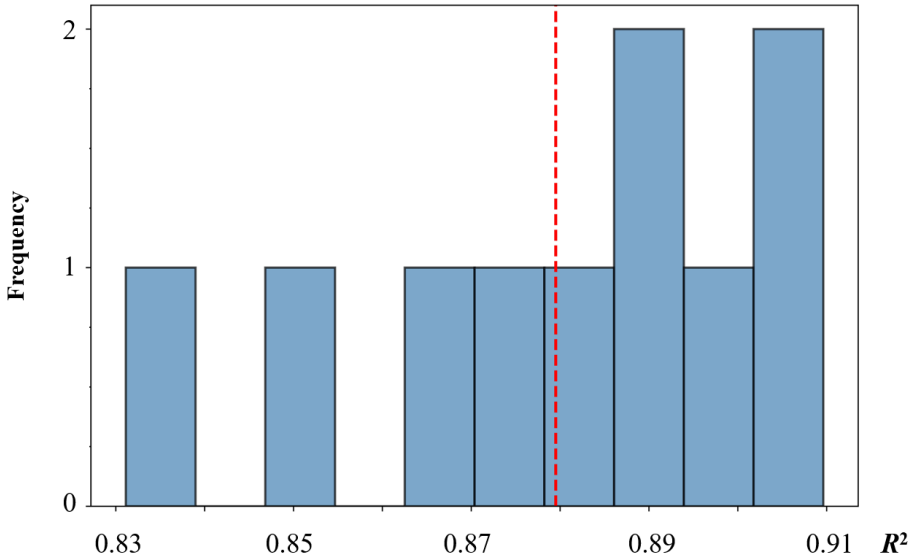

Figure S4. Distribution of R^2 of the random forest model in 10-fold cross-validation for *RE*. The red dashed line represents the mean value.

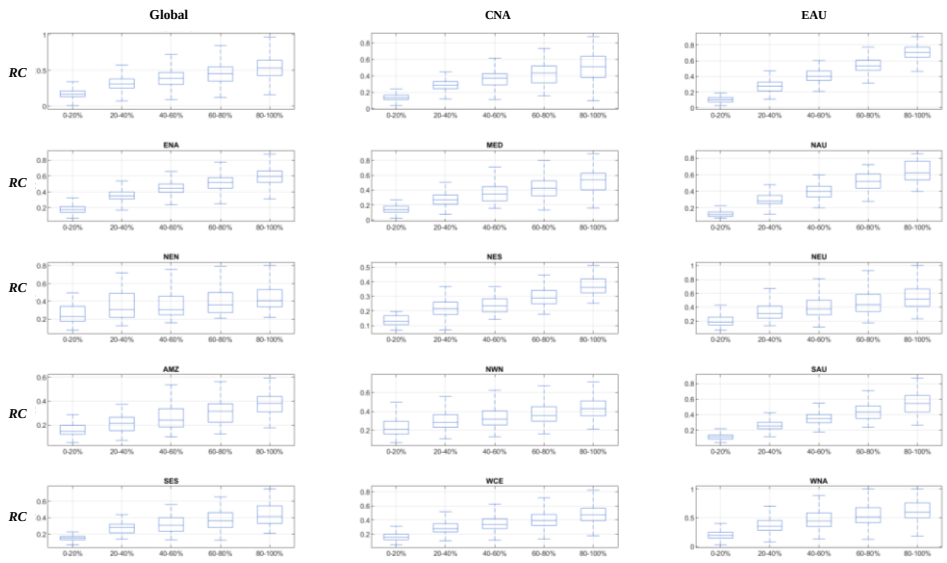

Figure S5. The changes of *RC* among events grouped by different peak discharge quantile ranges across the globe. The top and bottom of the box are the 25th and 75th percentiles, respectively. Whiskers represent the 1.5 interquartile range. The median is denoted by the horizontal line.

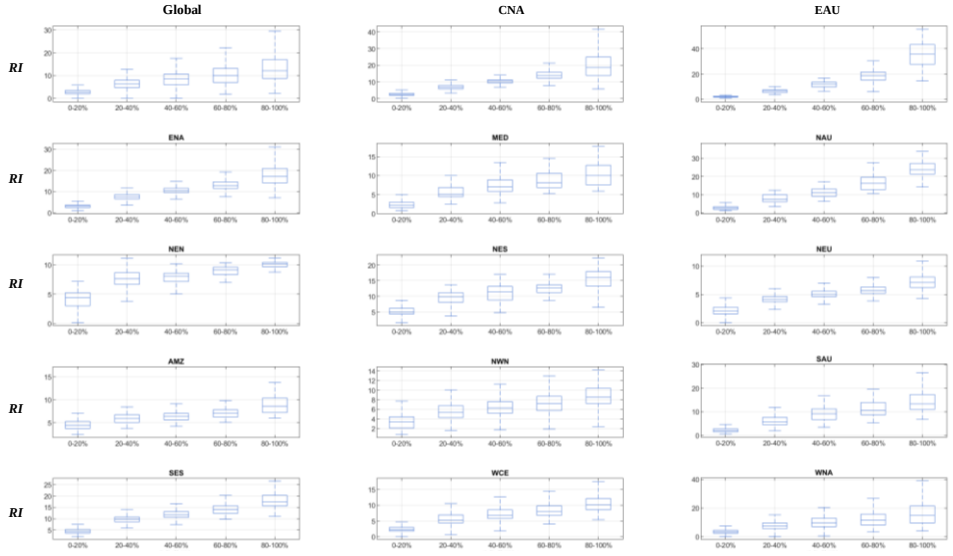

Figure S6. The changes of *RI* among events grouped by different peak discharge quantile ranges across the globe. The top and bottom of the box are the 25th and 75th percentiles, respectively. Whiskers represent the 1.5 interquartile range. The median is denoted by the horizontal line.

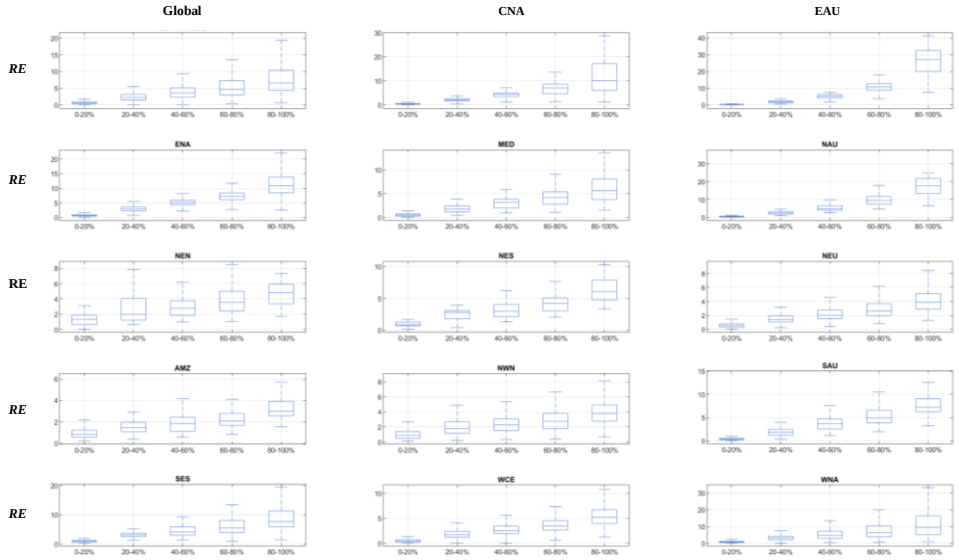

Figure S7. The changes of *RE* among events grouped by different peak discharge quantile ranges across the globe. The top and bottom of the box are the 25th and 75th percentiles, respectively. Whiskers represent the 1.5 interquartile range. The median is denoted by the horizontal line.

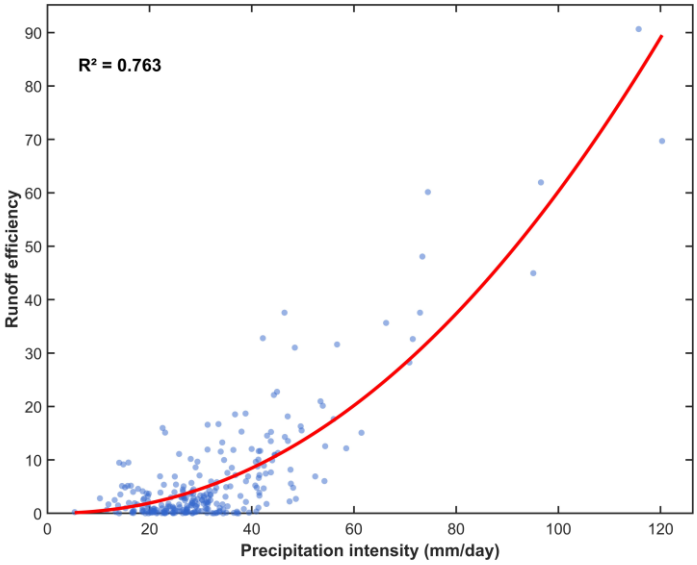

Figure S8. An example illustrating the power function fitting between precipitation intensity and runoff efficiency. The red curve represents the optimal fit.

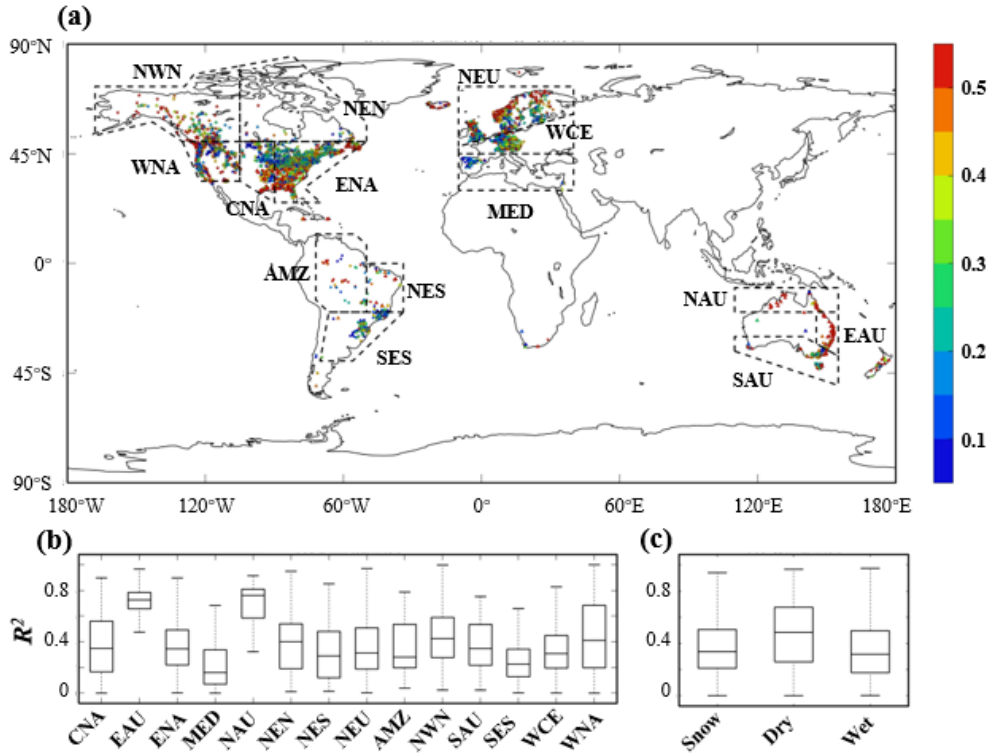

Figure S9. The fitting performance of the power-law relationships between precipitation intensity and runoff efficiency. The top and bottom of the box are the 25th and 75th percentiles, respectively. Whiskers represent the 1.5 interquartile range. The median is denoted by the horizontal line.

Table S1. Description of 22 selected catchment attributes.

Group	Attribute	Description	Unit
climate	p_mean	mean annual precipitation	mm
	aet_mm_syr	mean annual actual evapotranspiration	mm
	aridity	aridity index; ratio of mean PET and mean precipitation	—
	frac_snow	fraction of precipitation falling as snow	—
	pre_seasonality	seasonality and timing of precipitation	—
	high_prec_freq	frequency of high precipitation days	—
	high_prec_dur	average duration of high precipitation events	—
	low_prec_freq	frequency of low precipitation day	—
	low_prec_dur	average duration of low precipitation events	—
topography	slp_dg_sav	stream gradient; mean of reach segments	dm/km
	area	catchment area	km^2
soils	cly_pc_sav	clay fraction in soil	%
	slt_pc_sav	silt fraction in soil	%
	soc_th_sav	organic carbon content in soil	%
	kar_pc_sse	karst area extent	% cover
	ero_kh_sav	soil erosion	kg/hectare/yr
land cover	for_pc_sse	forest cover extent	% cover
	crp_pc_sse	cropland extent	% cover
	pst_pc_sse	pasture extent	% cover
	ire_pc_sse	irrigated area extent	% cover
	prm_pc_sse	permafrost extent	% cover
	pac_pc_sse	protected area extent	% cover