

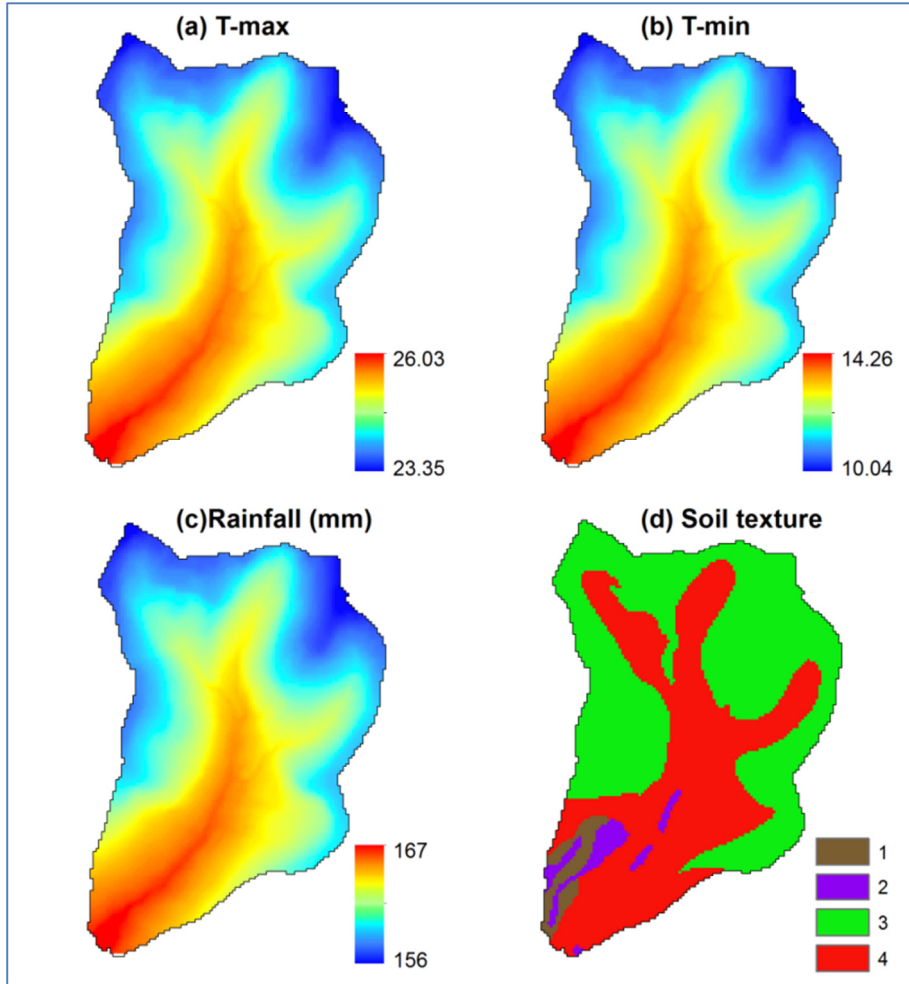
1 **Supplement**

2 **Table S1.** Comparison of simulated flow data under the two simulations with corresponding
 3 observed flow data for the calibration and evaluation period

Simulation	Statistics	Calibration period (1992-1993)				Evaluation period (1994-1995)			
		S-SF ¹	O-SF ²	S-BF ³	O-BF ⁴	S-SF	O-SF	S-BF	O-BF
No-routing	Mean	2.33	2.77	1.78	1.79	2.55	2.51	1.92	1.63
	STD ⁵	2.91	4.45	1.46	1.76	3.68	4.00	1.92	1.67
	NS ⁶	0.59		0.68		0.66		0.71	
	R ²	0.62		0.68		0.67		0.80	
	Bias ⁷	-15.7%		-0.17%		1.25%		18.3%	
	RMSE ⁸	2.84		0.99		2.33		0.90	
Routing	Mean	2.30	2.77	1.51	1.79	2.50	2.51	1.59	1.63
	STD	2.94	4.45	0.99	1.76	3.46	4.00	1.12	1.67
	NS	0.59		0.59		0.63		0.69	
	R ²	0.62		0.68		0.63		0.72	
	Bias	-16.8%		-15.3%		-0.6%		-2.2%	
	RMSE	2.84		1.13		2.44		0.94	

4 S-SF¹ and S-BF² refers to simulated stream and base flow, respectively; O-SF³ and O-BF⁴ refers to observed stream
 5 and base flow, respectively. STD⁵ stands for standard deviation; NS⁶ refers to Nash-Sutcliff coefficient; Bias⁷ is
 6 calculated as the average difference in simulated minus observed values for the comparison period divided by the
 7 average observed value in terms of percent.

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1 0 **Fig. S1** Examples of interpolated monthly average daily (a) maximum and (b) minimum
 11 temperature as well as (c) total precipitation for July, 1994. Panel (d) shows soil texture used in
 12 the study: 1, 2, 3, and 4 represents silt loam, sand loam, rocky, and loamy-skeleton, respectively.

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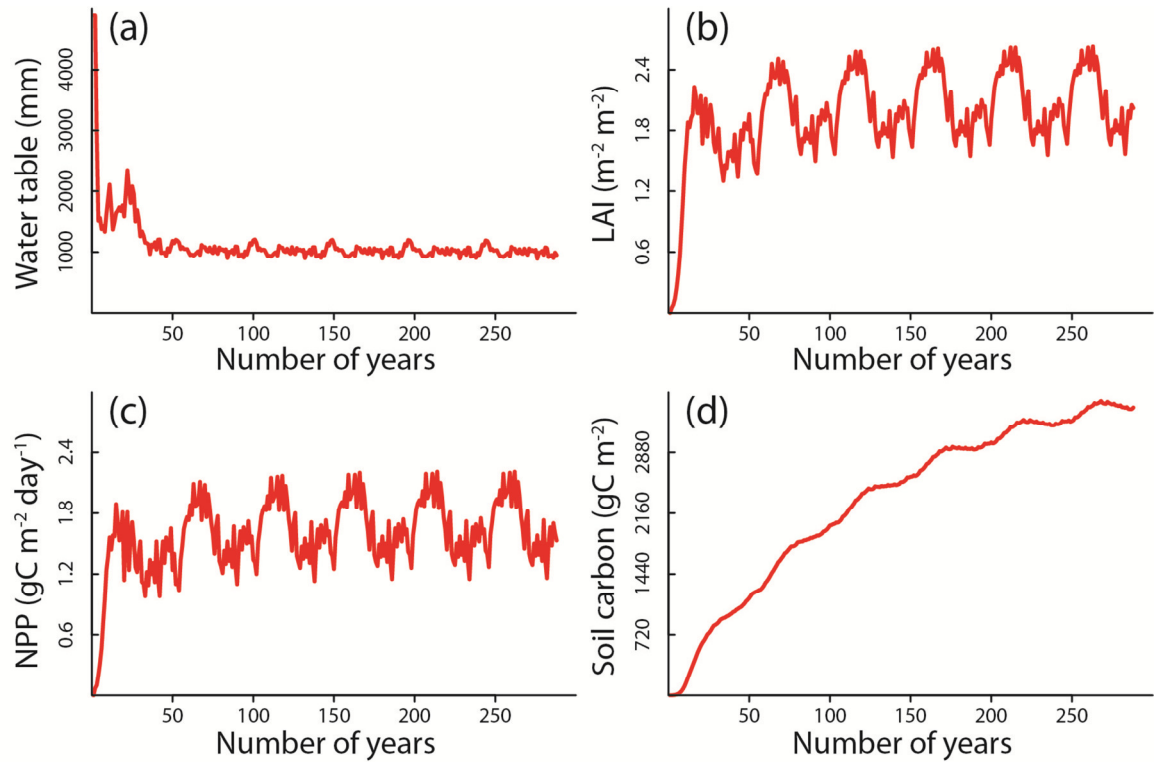
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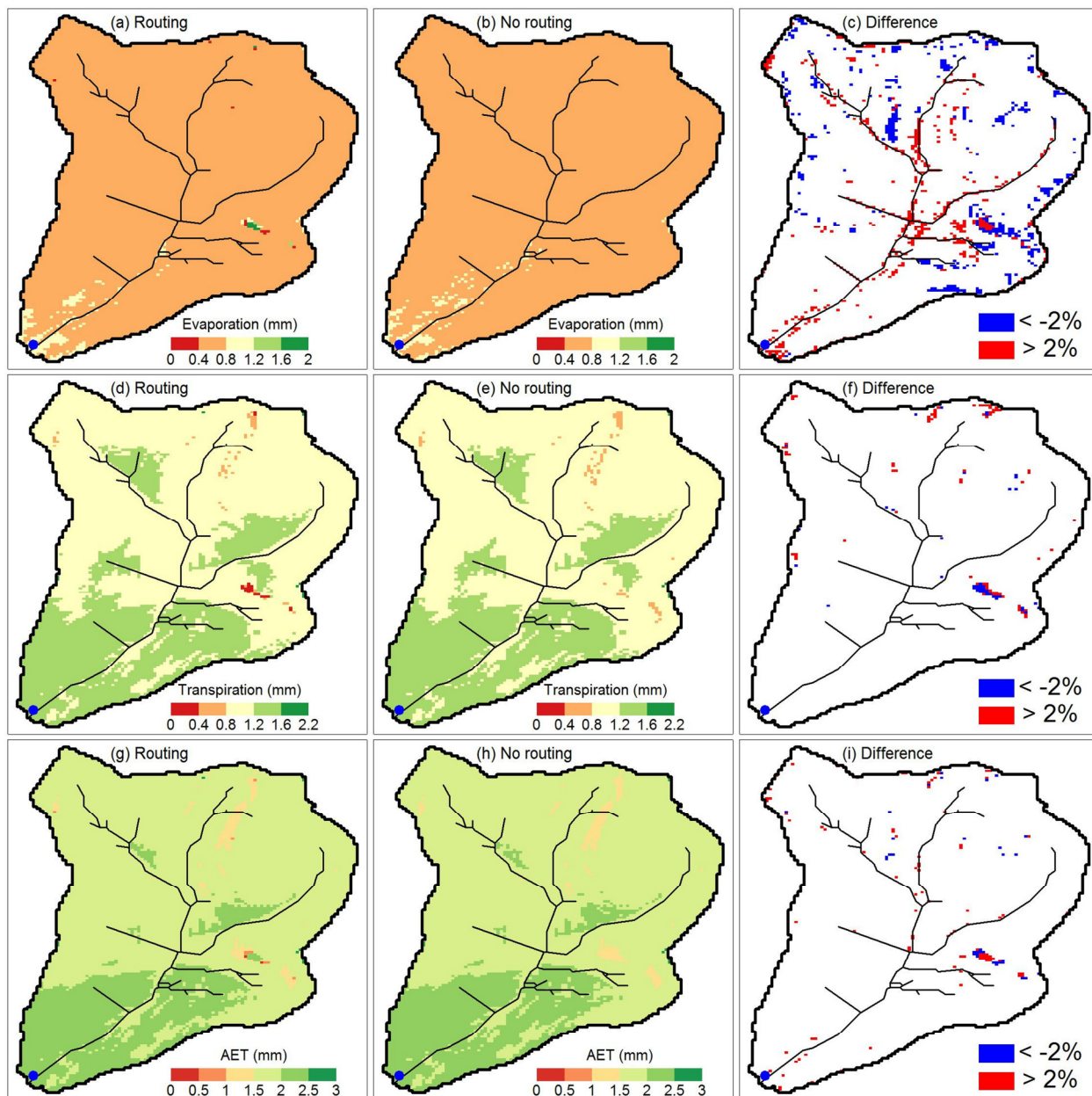
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2 1 **Fig. S2** The model's behavior in simulating (a) soil water table depth, (b) leaf area index (LAI),
 22 (c) net primary productivity (NPP) and (d) soil carbon for the Biscuit watershed. Data shown are
 23 annually averaged values for the entire watershed.

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3 7 **Fig. S3** Comparison of simulated monthly average daily evaporation, transpiration and actual
 38 evapotranspiration (AET) in July, 1994 between the two simulations: (a), (d) and (g) condising
 39 water routing with (b), (e) and (h) ignoring water routing. (c), (f) and (i) show percentage
 40 differences between the two simulations divided by results from the simulation considering water
 41 routing.

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