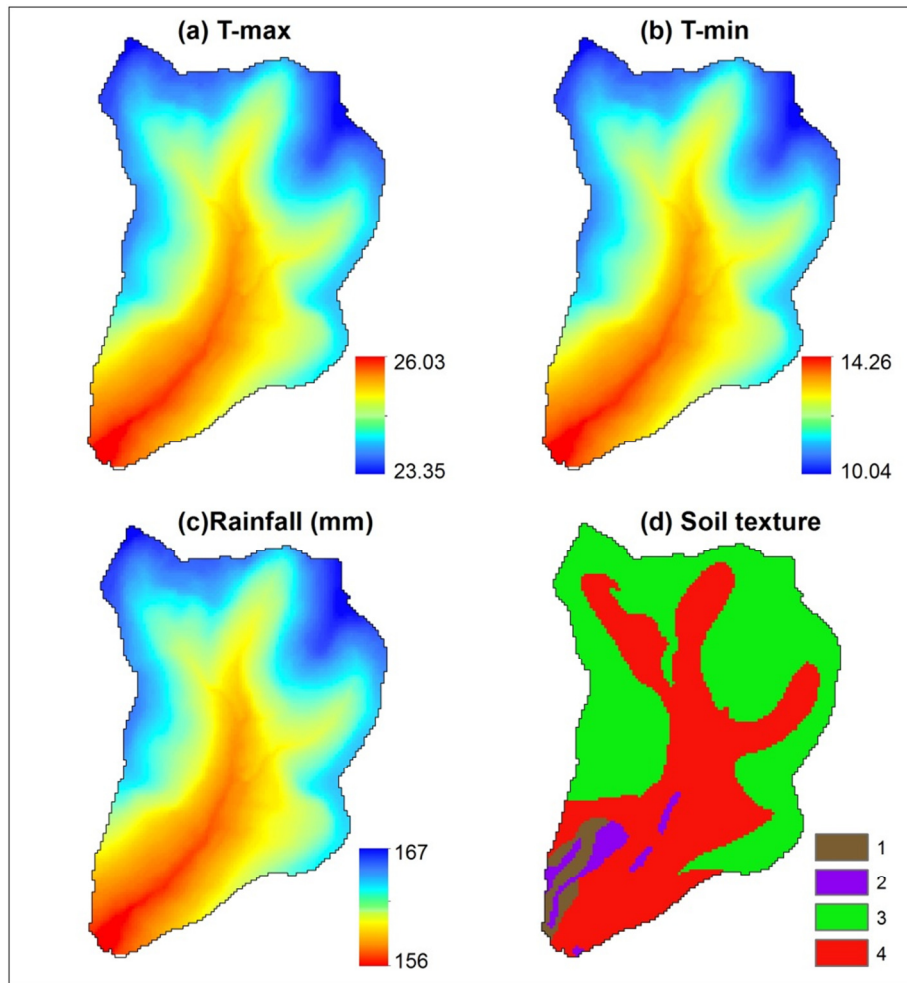


## Supplement

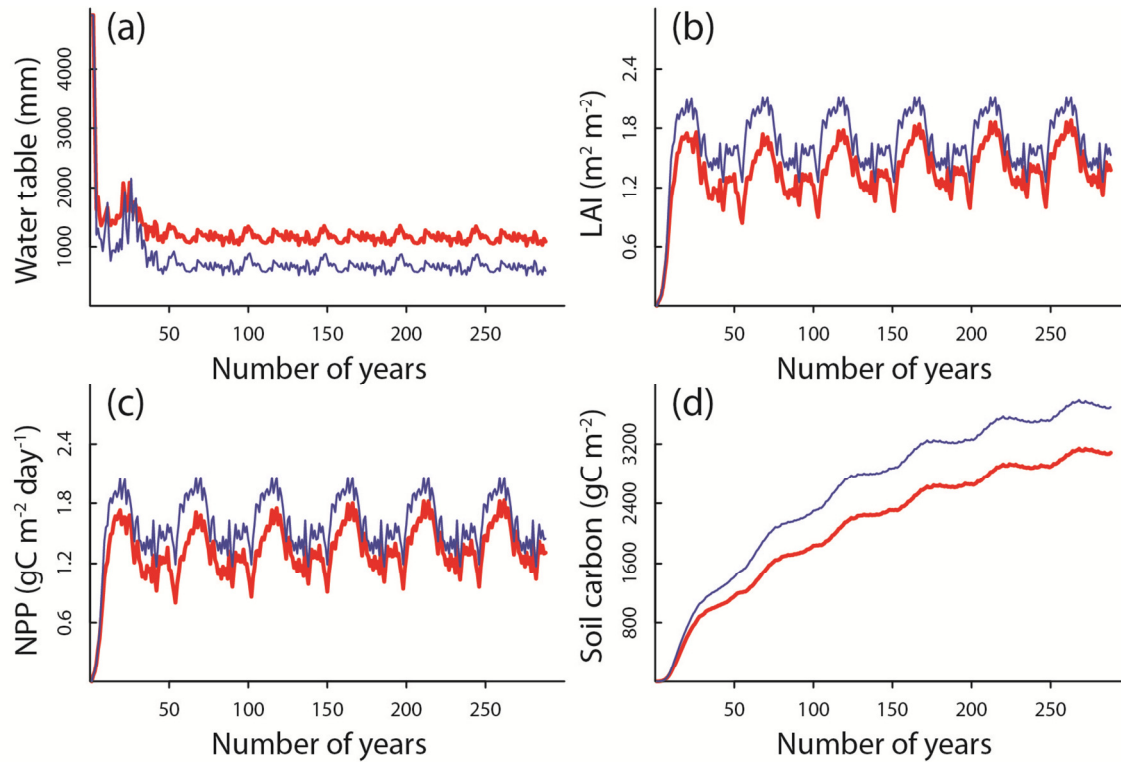
**Table S1.** Comparison of simulated flow data and leaf area index (LAI) under the two simulations with corresponding observed flow data for the calibration and evaluation period

Water routing	Statistics	Calibration period (1992-1993)					Evaluation period (1994-1995)				
		S-SF <sup>1</sup>	O-SF <sup>2</sup>	S-BF <sup>3</sup>	O-BF <sup>4</sup>	LAI <sup>9</sup>	S-SF	O-SF	S-BF	O-BF	LAI
<b>No</b>	Mean	2.34	2.76	1.78	1.79	4.06	2.54	2.51	1.92	1.63	3.89
	STD <sup>5</sup>	2.91	4.43	1.46	1.76	1.51	3.68	4.00	1.92	1.67	1.45
	NS <sup>6</sup>	0.59		0.68			0.66		0.71		
	R <sup>2</sup>	0.62		0.68			0.67		0.80		
	Bias <sup>7</sup>	-15.7%		-0.17%			1.25%		18.3%		
	RMSE <sup>8</sup>	2.84		0.99			2.33		0.90		
<b>Yes</b>	Mean	2.30	2.74	1.51	1.79	3.66	2.50	2.51	1.59	1.63	3.36
	STD	2.94	4.44	0.99	1.76	1.36	3.46	4.00	1.12	1.67	1.27
	NS	0.59		0.59			0.63		0.69		
	R <sup>2</sup>	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		

S-SF<sup>1</sup> and S-BF<sup>2</sup> refers to simulated stream and base flow, respectively; O-SF<sup>3</sup> and O-BF<sup>4</sup> refers to observed stream and base flow, respectively. STD<sup>5</sup> stands for standard deviation; NS<sup>6</sup> refers to Nash-Sutcliffe coefficient; Bias<sup>7</sup> is calculated as the average difference in simulated minus observed values for the comparison period divided by the average observed value in terms of percent. <sup>9</sup>LAI is annual averaged value for the entire watershed and in m<sup>2</sup> m<sup>-2</sup>.



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



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2 1 **Fig. S2** The model's behavior in simulating annual average daily (a) soil water table depth, (b)  
 22 leaf area index (LAI), (c) net primary productivity (NPP), and (d) soil carbon for the Biscuit  
 23 Brook watershed under simulation considering water routing (solid red line) and that ignoring  
 24 water routing (solid blue line).

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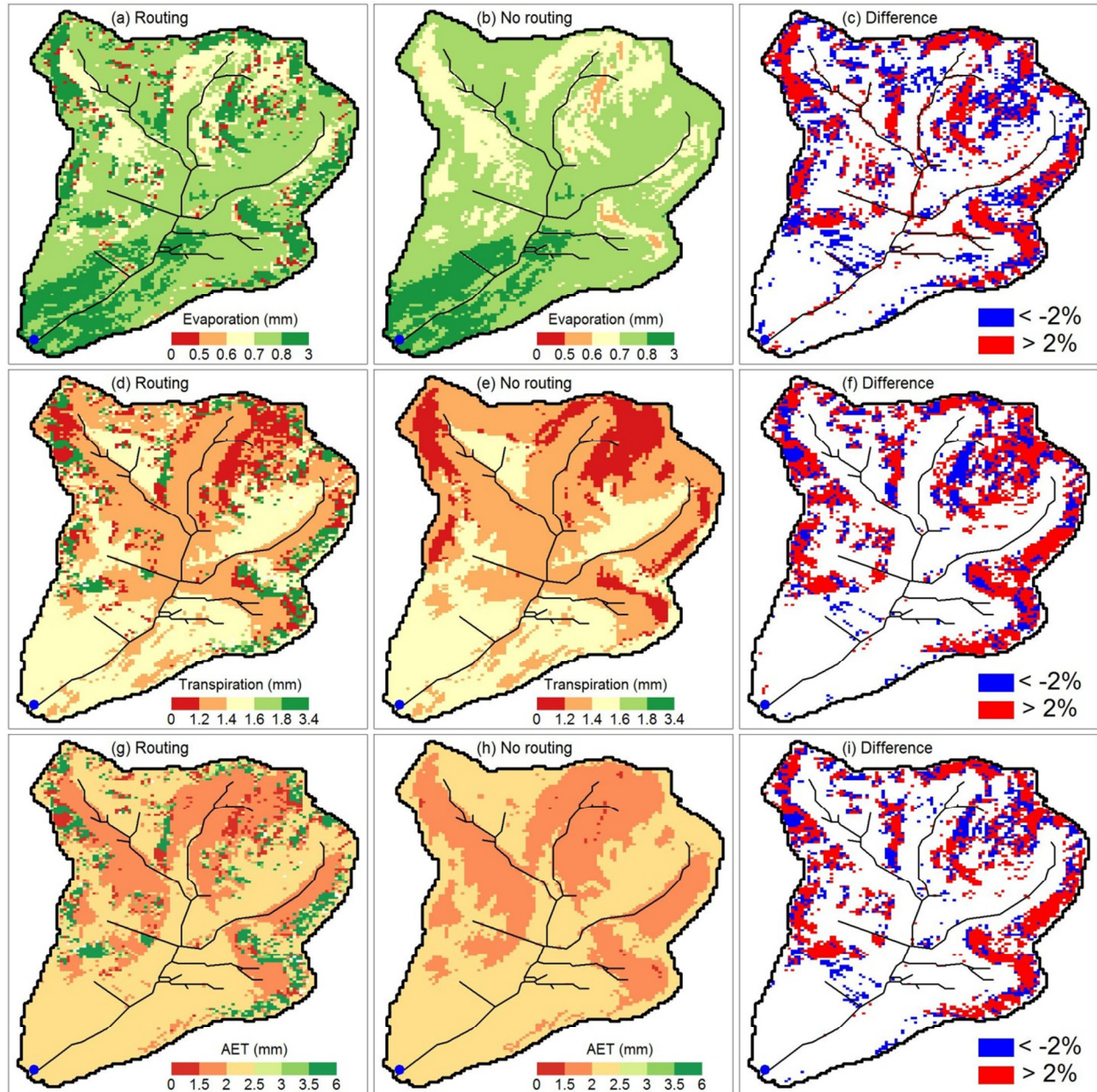
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**Fig. S3** Comparison of simulated monthly average daily evaporation, transpiration and actual evapotranspiration (AET) in July, 1994 between the two simulations: (a), (d) and (g) considering water routing with (b), (e) and (h) ignoring water routing. (c), (f) and (i) show percentage differences between the two simulations divided by results from the simulation considering water routing. The white areas show no significant differences.