

1 Table 1 Mean values and standard deviation (SD) for different data groups.

Database	Number		Rainfall factors			Plot factors		Hydrological variables				
			Duration	Imax30	Depth	Coverage	ASMCM	RO	SL	P	N	COD
			h	mm	mm	%	moisture	m³/km²	t/km²	kg/km²	kg/km²	kg/km²

5 Table 2 Structural equation model fitting statistical indices. GOFs: Goodness of fit indices system  
6 for different rainfall intensities.

	GOFs	Recommended levels	Value	
			High-intensity	Low-intensity
Model fit	p	>0.05	0.311298	0.055071
summary	$\chi^2/\text{df}$	1-2	1.195225	1.848716
	RMSEA	<0.1	0.02729	0.03431
	CFI	>0.9	0.9998	0.9974
	NFI	>0.9	0.99787	0.99486
	IFI	>0.9	0.9998	0.9974
Evaluation			Acceptable	Acceptable

7 Note:  $\chi^2/\text{df}$ : the quotient of the Chi square and the degrees of freedom; RMSEA: root mean  
8 square error of approximation; CFI: comparative fit index; NFI: the non-normed fit index; IFI:  
9 incremental fit index.

11 Table 3 Stepwise multiple linear regression model results for nutrient levels.

Stepwise multiple linear regression equation	R <sup>2</sup>	p value
P = 0.481 + 0.352 (RO)	0.355	<0.001
P = <del>0.551-1.244</del> + <del>0.3770.405</del> (RO) <del>- 0.0380.027</del> (Depth) + <del>0.0880.233</del> (Imax30) <del>-0.017 (Re)</del>	<del>0.38040</del> <u>0.7</u>	<0.001
N = 4.530 + 2.184 (RO)	0.619	<0.001
N = 10.359 + 2.131 (RO) - 0.291 (Moisture) + 0.001 (SL)	0.632	<0.001
COD = 12.074 + 6.401 (RO)	0.564	<0.001
COD = <del>18.963-279</del> + <del>6.152-594</del> (RO) <del>-0.647-791</del> (Moisture) + <del>0.6211.571</del> (Imax30) <del>-0.08 (Re)</del>	<del>0.57358</del> <u>1</u>	<0.001

12 Note: P: phosphorus; N: nitrogen; COD: chemical oxygen demand; Re: rainfall erosivity.

13  
14

15 Table 4 Correlations between response variables and explanatory variables. I<sub>max</sub>30: maximum rainfall intensity over a 30-min period; RO: Runoff depth; SL: Soil  
 16 loss; P: Soil phosphorus loss; N: Soil nitrogen loss; COD: Chemical oxygen demand. Note: \* p < 0.05. \*\* p < 0.01.

	Vegetation	<u>ASMC</u>	Duration	I <sub>max</sub> 30	Depth	<u>Re</u>	SL	RO	P	N	COD
Vegetation	1										
<u>ASMC</u>	0.018	1									
Duration	0.011	0.001	1								
I <sub>max</sub> 30	0.073*	-0.183**	-0.160**	1							
Depth	0.058	-0.214**	0.288**	0.475**	1						
<u>Re</u>	<u>0.106**</u>	<u>-0.234**</u>	<u>0.086**</u>	<u>0.753**</u>	<u>0.853**</u>	1					
SL	-0.035	-0.027	-0.018	0.177**	0.059	<u>0.114**</u>	1				
RO	-0.043	-0.098**	0.002	0.353**	0.510**	<u>0.553**</u>	0.149**	1			
P	-0.016	-0.055	-0.067*	0.275**	0.213**	<u>0.248**</u>	0.111**	0.596**	1		
N	-0.081*	-0.165**	0.013	0.312**	0.437**	<u>0.439**</u>	0.185**	0.787**	0.467**	1	
COD	-0.056	-0.146**	-0.027	0.331**	0.401**	<u>0.410**</u>	0.126**	0.751**	0.518**	0.770**	1

17 Note: I<sub>max</sub> 30: maximum rainfall intensity over a 30-min period; RO: runoff; SL: soil loss; P: phosphorus; N: nitrogen; COD: chemical oxygen demand. ASMC:  
 18 antecedent soil moisture content; Re: rainfall erosivity.

19

20 | Table 5 Structural equation model fitting statistical indices for soil nutrient loss. GOFs: Goodness  
 21 | of fit indices system.

GOF		Recommended	Value		
		levels	N	P	COD
Model fit	p	>0.05	0.05257	0.421337	0.134150
summary	$\chi^2/\text{df}$	1-2	1.25382	1.561123	1.387473
	RMSEA	<0.1	0.029016	0.01124	0.0222
	CFI	>0.9	0.9989	0.9981.000	0.999
	NFI	>0.9	0.997	0.9968	0.9967
	IFI	>0.9	0.9989	1.0000.998	0.999
Evaluation			Acceptable	Acceptable	Acceptable

22  
 23