Supplementary materials

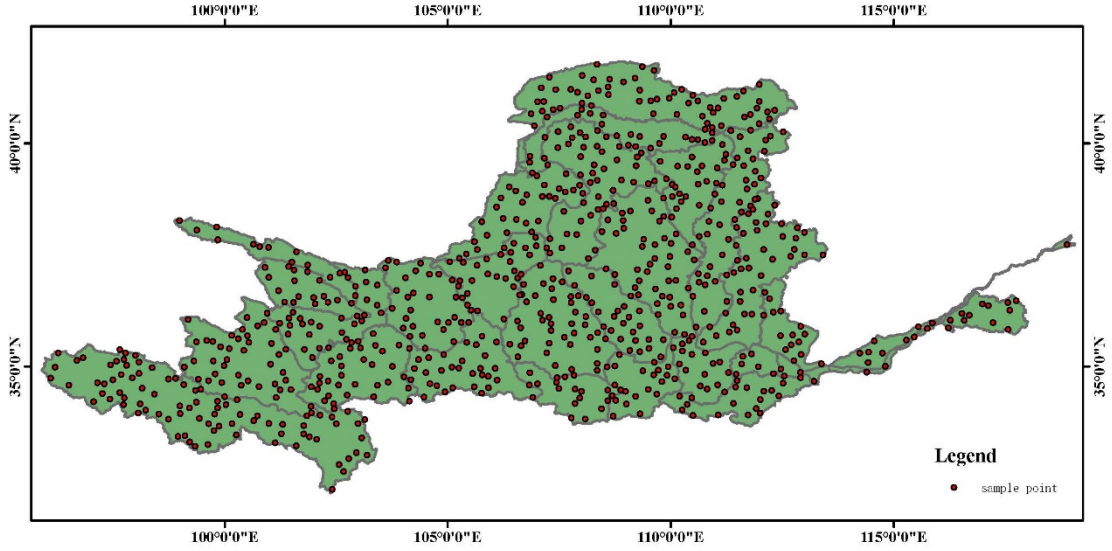

Figure S1: Distribution of sample points required by the geographic detector model.

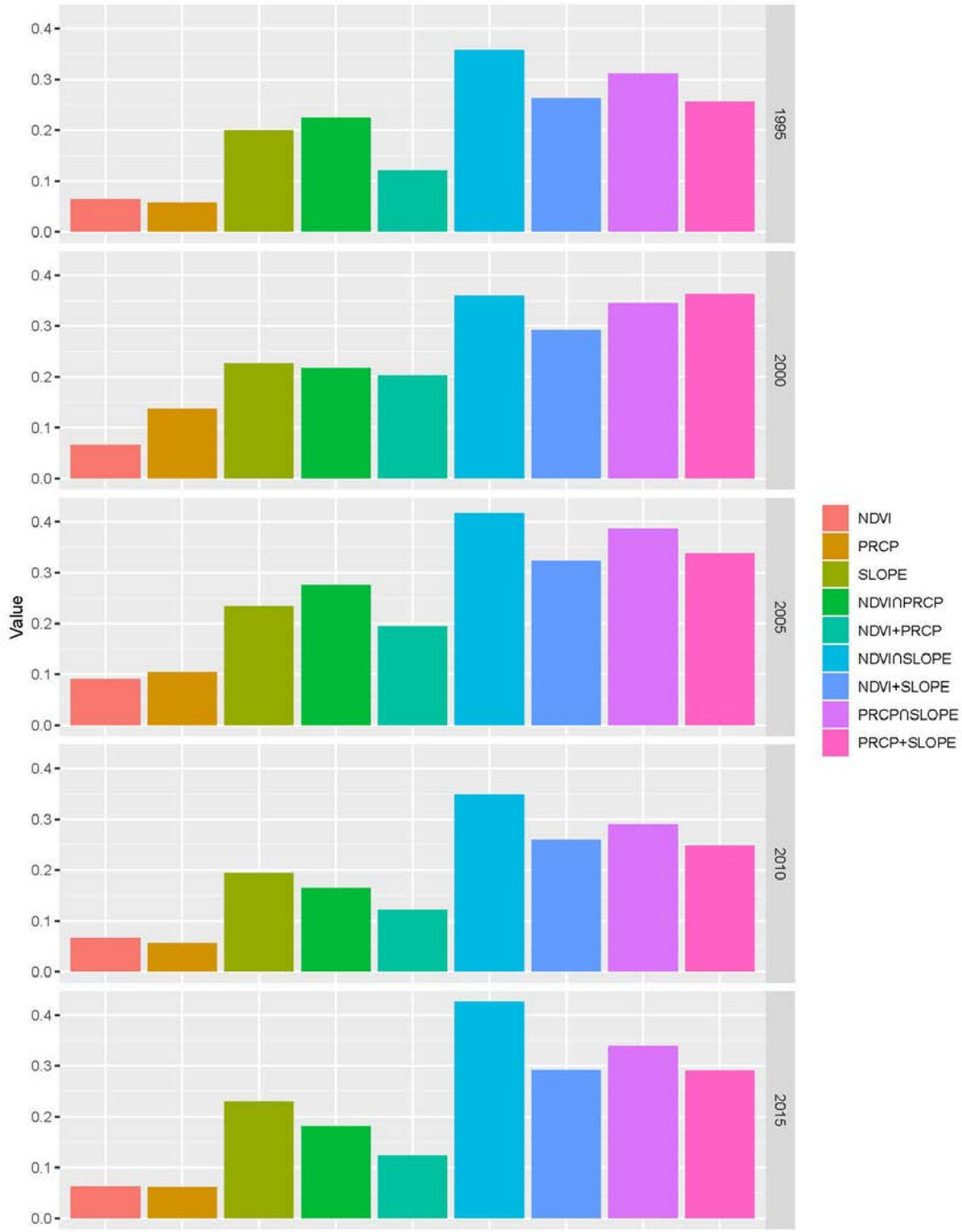

Figure S2: The q values of influencing factors and their combinations for the distribution of soil erosion on a yearly scale.

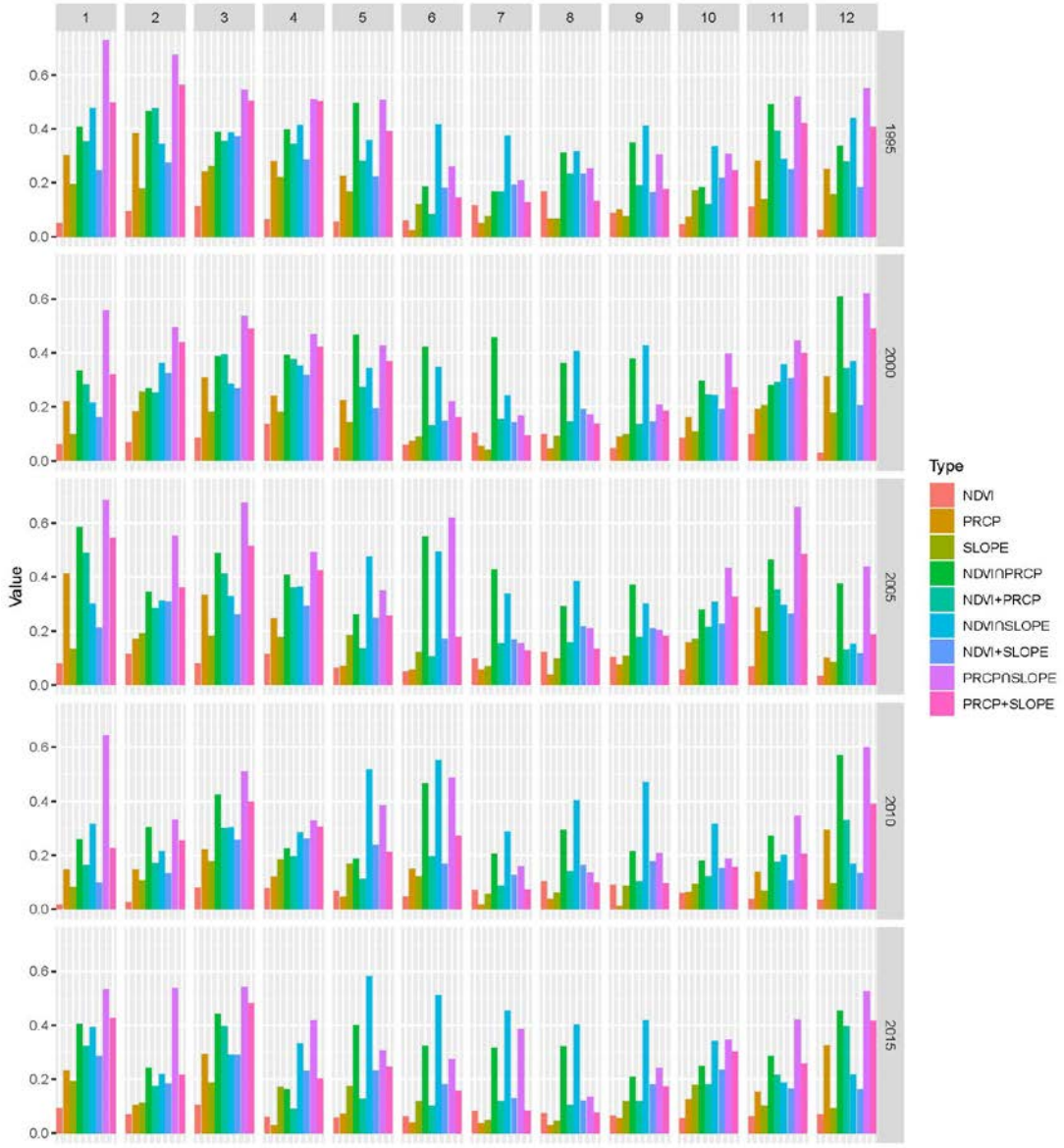

Figure S3: The q values of influencing factors and their combinations for the distribution of soil erosion on a monthly scale.

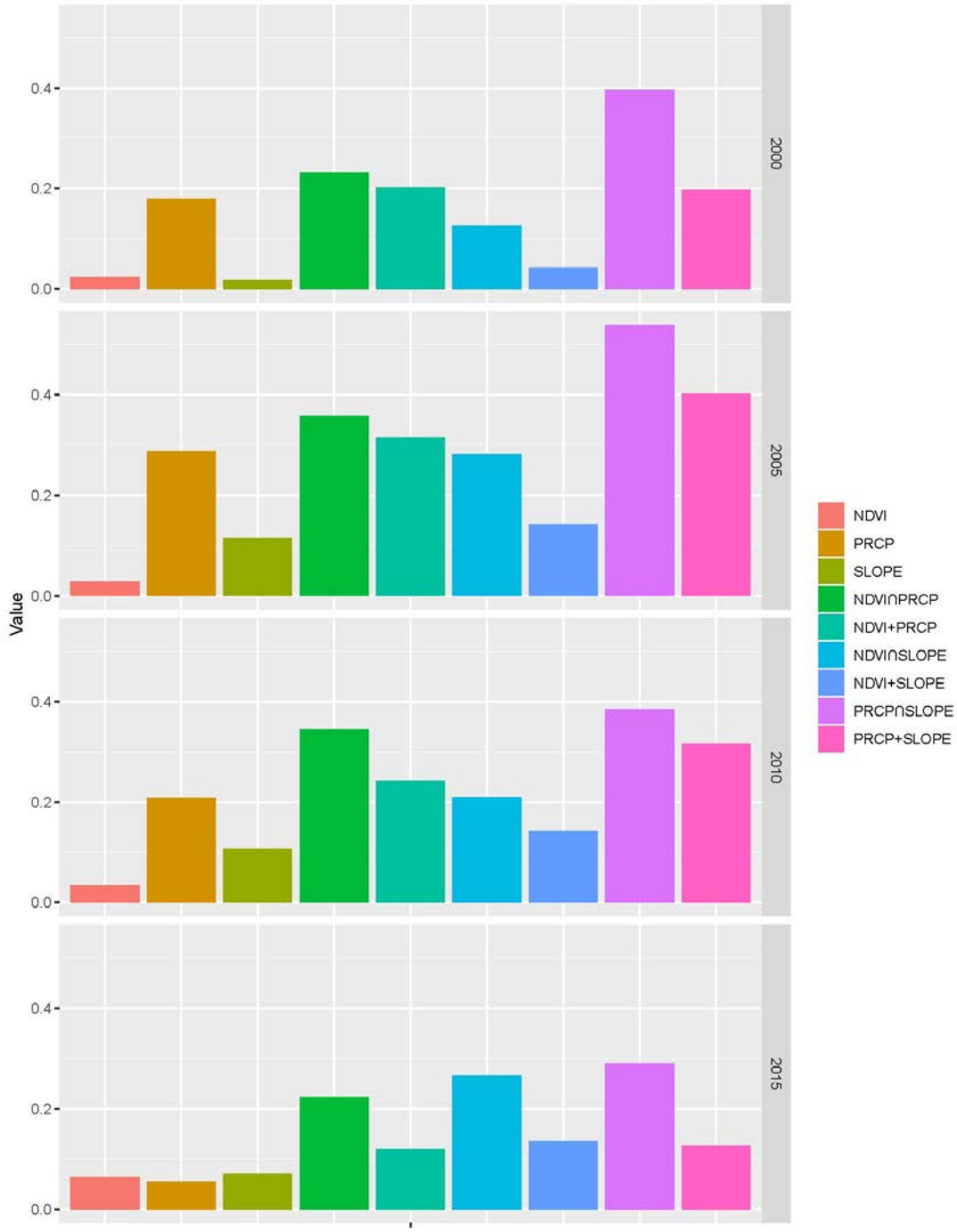

Figure S4: The q values of influencing factors and their combinations for the variability of soil erosion on a yearly scale.

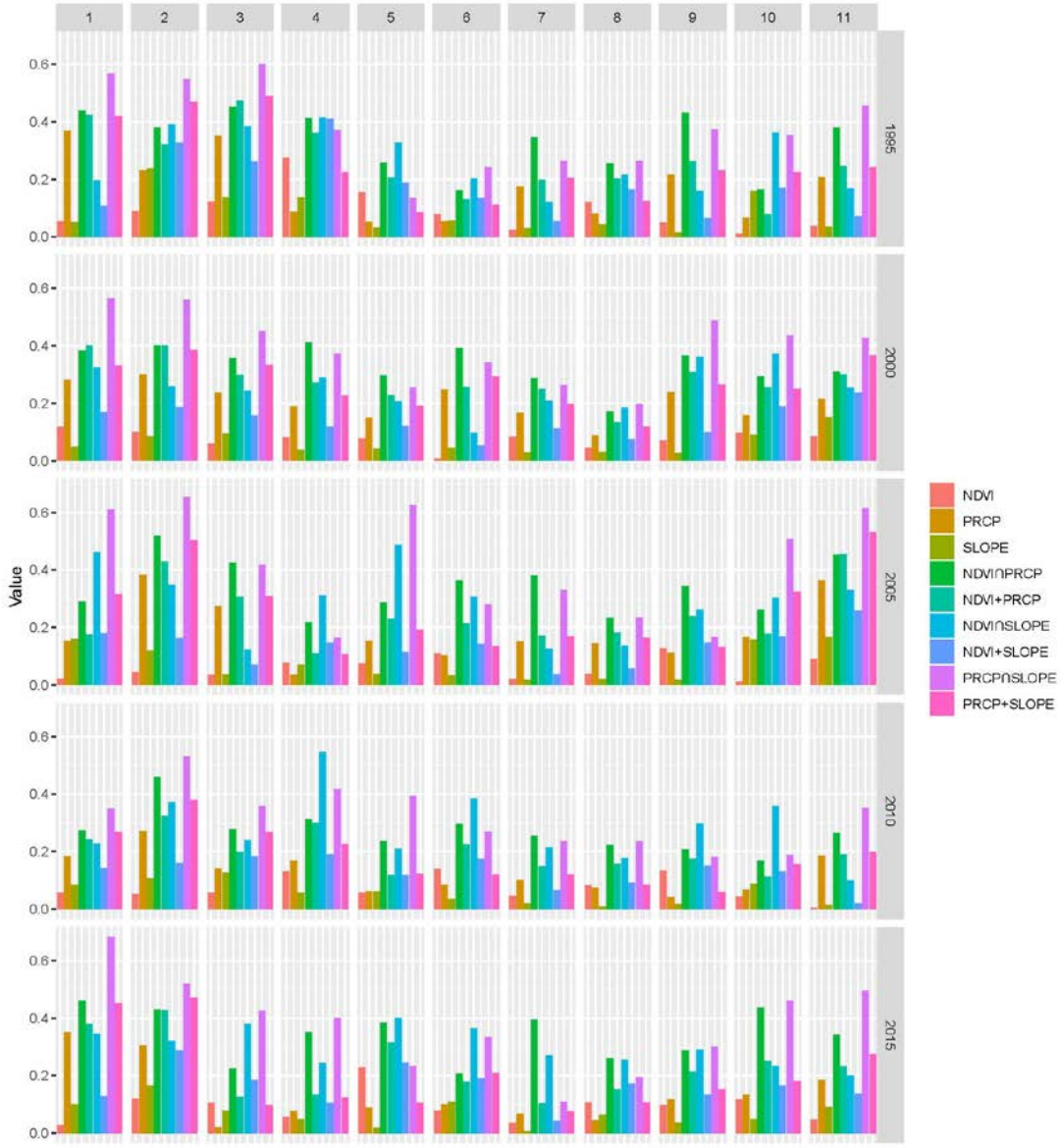

Figure S5: The q values of influencing factors and their combinations for the variability of soil erosion on a monthly scale.

Table S1. Reclassification schemes of the CCI LC land cover dataset

	CCI LC
1 Forest	50/60/61/62/70/71/72/80/81/82/90/100/160/170
2 Grassland	110/130/140
3 Shrub	120/121/122
4 Cropland	10/11/12/20/30/40
5 Wetland	180
6 Water	210
7 Construction	190
8 Bare land	150/152/153/200/201/202

9 Permanent ice and snow	220	

Table S2. Parameter values of the R factor formula

Climatic zone	$\boldsymbol{\beta}$	$\boldsymbol{\alpha}$	$\boldsymbol{\varepsilon}$
BS	1.73	$log\ \alpha = 1.85 - 1.348 \times \beta$	0.3296
BW	1.514	$log\ \alpha = 1.781 - 1.341 \times \beta$	$2.123 - 0.04 \times lat$
Cf	1.5	$log\ \alpha = 3.016 - 2.079 \times \beta$	$-0.012 \times lon - 0.037 \times lat + 3.792$
Cw	1.558	$log\ \alpha = 2.935 - 1.94 \times \beta$	0.817
Dw	1.466	$log\ \alpha = 2.637 - 1.735 \times \beta$	1.24
Df	$2.243 - 0.008 \times lat$	$log\ \alpha = 9.458 - 5.236 \times \beta$	$0.028 \times lon - 0.588$

lon refers to the longitude, and lat refers to the latitude. BS refers to arid steppe zones, BW refers to arid desert zones, Cf refers to warm temperate fully humid zones, Cw refers to warm temperate desert zones, Dw refers to snow desert zones and Df refers to snow fully humid zones.