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Supplement of

Dangerous degree forecast of soil loss on highway slopes in mountainous areas of the Yunnan–Guizhou Plateau (China) using the Revised Universal Soil Loss Equation

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Table 3. Soil data for natural slope catchment areas

A section of a expressway	Sand (%)	Silt (%)	Clay (%)	Organic carbon (%)	<i>K</i>
K83+500~K84+900	51.50	33.00	15.50	0.75	0.3064
K85+200~K85+300	67.00	24.00	9.00	2.1	0.2546
K85+500~K86	75.40	18.90	5.70	0.83	0.2483
K86+300~K87+600	71.00	19.70	9.30	1.12	0.2522
K88+200~K90+200	66.80	20.00	13.20	1.18	0.2561
K90+200~K92+700	70.00	15.20	14.80	1.73	0.2397
K93~K94	33.30	29.00	37.70	1.05	0.3161
K94~K95	42.60	34.00	23.40	0.74	0.3205
K96+900~K97+800	58.00	25.00	17.00	2.7	0.2630
K97+800~K99	65.00	23.00	12.00	2.8	0.2541
K99~K100+500	60.00	12.00	28.00	1.15	0.2476
K100+500~K101+100	60.00	16.00	24.00	0.95	0.2580
K101+100~K102+100	71.00	9.90	19.10	0.73	0.2384
K102+100~K104	70.00	12.30	17.70	1.72	0.2355
K104~K105	66.00	20.50	13.50	0.79	0.2630
K105~K106+910	60.00	26.50	13.50	1.05	0.2775
K106+910~K109+100	61.00	15.00	24.00	1.18	0.2521
K109+100~K110+100	58.00	12.80	29.20	1.28	0.2490
K110+100~K111+100	61.50	14.00	24.50	1.33	0.2479
K111+100~K112+100	59.00	13.20	27.80	1.57	0.2458
K112+500~K113+500	63.00	18.10	18.90	1.66	0.2503
K114+900~K115+900	69.00	17.50	13.50	1.88	0.2434
K115+900~K116+800	55.90	24.20	19.90	1.06	0.2766
K117~K118	59.00	13.30	27.70	1.4	0.2477
K118~K121	58.00	13.00	29.00	1.58	0.2461
K121~K122	60.40	11.20	28.40	1.05	0.2470
K122~K123	57.00	14.20	28.80	1.02	0.2562
K123~K125	58.10	12.90	29.00	1.37	0.2480
K125~K126	62.40	12.80	24.80	1.42	0.2440
K126~K129	63.30	14.70	22.00	1.57	0.2452
K129~K131	59.00	13.10	27.90	1.08	0.2515
K131~K134+300	62.00	13.30	24.70	1.24	0.2473
K134+500~K135+800	59.00	13.80	27.20	1.28	0.2501

K136~K137	59.00	13.60	27.40	1.33	0.2491
K137~K138	61.00	13.20	25.80	1.53	0.2447
K138~K139	65.10	13.40	21.50	1.16	0.2461

Table 4. Soil data for artificial slope catchment areas

A section of a expressway	Sand (%)	Silt (%)	Clay (%)	Organic carbon (%)	<i>K</i>
K83+500~K84+900	40.10	33.00	26.90	0.75	0.3216
K85+200~K86	74.00	18.00	8.00	0.78	0.2491
K86+300~K87+600	72.00	19.00	9.00	0.83	0.2531
K88+200~K89+400	64.90	20.90	14.20	1.01	0.2622
K89+600~K90+600	60.00	23.10	16.90	0.86	0.2735
K90+600~K91+600	47.60	35.00	17.40	0.725	0.3164
K91+600~K92+600	31.10	29.00	39.90	0.96	0.3222
K92+900~K94+200	32.60	36.60	30.80	0.74	0.3421
K96+900~K97+800	29.00	50.00	21.00	0.92	0.3746
K97+800~K99	42.30	49.00	8.70	0.91	0.3544
K99~K100+500	37.00	50.20	12.80	0.75	0.3686
K100+500~K101+100	41.50	52.00	6.50	0.95	0.3619
K101+100~K102+100	41.00	42.50	16.50	0.73	0.3438
K102+100~K104	40.70	27.00	32.30	1.02	0.3015
K104~K105	50.00	27.80	22.20	0.79	0.2956
K105~K106+910	46.00	37.80	16.20	1.05	0.3179
K106+910~K109+100	51.00	32.00	17.00	1.18	0.2955
K109+100~K110+100	58.00	22.00	20.00	1.02	0.2708
K110+100~K111+100	57.40	25.10	17.50	1.03	0.2775
K111+100~K112+100	43.00	31.00	26.00	1.07	0.3058
K112+500~K113+500	30.60	29.70	39.70	0.76	0.3291
K114+900~K115+900	31.90	27.50	40.60	0.89	0.3192
K115+900~K116+800	35.40	24.20	40.40	1.06	0.3020
K117~K118	57.00	14.00	29.00	0.94	0.2568
K118~K121	59.80	13.00	27.20	1.03	0.2513
K121~K122	54.00	22.10	23.90	1.05	0.2745
K122~K123	57.00	24.70	18.30	1.02	0.2773
K123~K125	49.00	22.20	28.80	0.93	0.2823
K125~K126	52.50	20.40	27.10	0.88	0.2753

K126~K129	53.50	24.60	21.90	0.91	0.2827
K129~K131	49.50	23.30	27.20	1.08	0.2812
K131~K134+300	42.00	25.50	32.50	1.04	0.2960
K134+500~K135+800	49.00	33.80	17.20	1.02	0.3059
K136~K137	32.00	33.00	35.00	1.03	0.3275
K137~K138	28.00	22.00	50.00	1.05	0.3094
K138~K139	50.00	27.00	23.00	1.06	0.2888
K139~K139+800	38.50	33.40	28.10	1.09	0.3167

Table 5. Amount of soil erosion of monitoring areas ($t \cdot ha^{-1}$)

The time of storm event or rainfall event	1	2	3	4	5	6
2014.06.05	42.12	132.65	59.22	64.23	128.96	8.88
2014.06.07	19.97	31.33	28.12	30.89	61.70	4.26
2014.06.17	8.67	32.57	12.27	13.41	26.64	1.85
2014.06.28	57.00	127.45	81.07	89.79	179.15	12.25
2014.07.01	4.77	85.47	6.86	7.48	14.98	1.03
2014.07.13	15.60	47.96	21.59	23.74	47.57	3.27
2014.07.20	38.57	136.28	56.17	61.83	123.23	8.49
2014.08.02	56.01	92.09	79.39	86.00	172.31	11.94
2014.08.12	19.55	33.59	28.81	31.48	62.94	4.35
2014.08.26	62.11	98.02	87.50	95.61	191.96	13.15
2014.08.29	15.39	41.39	21.61	23.56	47.01	3.26
2014.09.02	6.11	22.70	8.68	9.50	19.10	1.31
2014.09.04	14.87	29.57	21.72	23.72	47.61	3.24
2014.09.17	15.77	92.14	22.50	24.51	48.09	3.36
2014.09.20	10.76	35.21	15.12	16.33	32.52	2.24
2014.10.05	7.49	23.19	10.64	11.72	23.56	1.60
2015.07.04	52.16	122.84	72.60	78.77	156.53	10.90
2015.07.15	15.75	31.14	21.92	24.16	47.75	3.34
2015.07.24	9.91	26.40	13.94	15.22	30.02	2.12
2015.07.28	42.00	76.03	59.07	65.44	130.05	8.86
2015.08.13	8.29	16.00	11.89	12.92	25.67	1.77
2015.08.19	10.10	20.90	13.90	15.21	30.16	2.08
2015.08.26	16.82	37.40	24.15	26.73	52.63	3.64
2015.09.03	3.86	23.87	5.43	5.83	11.69	0.81

2015.09.12	5.91	24.16	8.57	9.40	18.68	1.29
2015.09.17	11.72	56.53	16.32	17.89	35.55	2.45
2015.09.25	13.69	28.01	19.06	20.89	41.52	2.87
2015.10.03	11.88	14.68	16.71	18.32	36.64	2.52
2015.10.08	29.08	37.07	42.20	45.99	91.96	6.25
2015.10.12	7.79	9.63	11.11	12.15	23.39	1.64

Table 6. Calculation results of m_a

The time of storm event or rainfall event	m_{12}	m_{13}	m_{14}	m_{23}	m_{24}	m_{34}
2014.06.05	0.29	0.31	0.30	0.34	0.32	0.28
2014.06.07	0.29	0.31	0.31	0.34	0.34	0.33
2014.06.17	0.34	0.32	0.31	0.27	0.29	0.31
2014.06.28	0.32	0.32	0.33	0.32	0.33	0.36
2014.07.01	0.35	0.33	0.32	0.30	0.30	0.30
2014.07.13	0.30	0.30	0.30	0.30	0.31	0.33
2014.07.20	0.34	0.34	0.34	0.35	0.34	0.34
2014.08.02	0.33	0.32	0.31	0.29	0.29	0.28
2014.08.12	0.35	0.35	0.34	0.36	0.34	0.31
2014.08.26	0.30	0.31	0.31	0.34	0.33	0.31
2014.08.29	0.30	0.31	0.31	0.33	0.32	0.30
2014.09.02	0.31	0.32	0.32	0.34	0.33	0.32
2014.09.04	0.35	0.35	0.34	0.34	0.33	0.31
2014.09.17	0.31	0.32	0.32	0.35	0.33	0.30
2014.09.20	0.30	0.31	0.30	0.32	0.30	0.27
2014.10.05	0.30	0.32	0.32	0.35	0.34	0.34
2015.07.04	0.29	0.30	0.30	0.32	0.30	0.29
2015.07.15	0.29	0.30	0.31	0.32	0.33	0.34
2015.07.24	0.33	0.31	0.31	0.27	0.28	0.31
2015.07.28	0.31	0.31	0.32	0.32	0.33	0.36
2015.08.13	0.35	0.33	0.32	0.29	0.29	0.29
2015.08.19	0.29	0.29	0.30	0.30	0.30	0.32
2015.08.26	0.33	0.33	0.33	0.34	0.34	0.36
2015.09.03	0.32	0.31	0.30	0.30	0.28	0.25
2015.09.12	0.34	0.34	0.34	0.35	0.34	0.32

2015.09.17	0.29	0.30	0.30	0.32	0.32	0.32
2015.09.25	0.30	0.30	0.30	0.30	0.31	0.32
2015.10.03	0.31	0.31	0.31	0.32	0.32	0.32
2015.10.08	0.35	0.34	0.33	0.32	0.31	0.30
2015.10.12	0.31	0.32	0.32	0.35	0.33	0.31
The average value of m_a				0.32		

m_{xy} represents the m value simultaneously solved by erosion intensity values for monitoring plots that are numbered x and y .

Table 10. Statistical table of absolute error ($t \cdot ha^{-1}$)

The time of storm event or rainfall event	K83+550	K93+550	K133+550
2014.06.05	0.86	1.10	0.32
2014.06.07	0.33	0.38	0.11
2014.06.17	0.38	0.18	0.05
2014.06.28	0.79	1.40	0.46
2014.07.01	0.06	0.10	0.04
2014.07.13	0.40	0.46	0.12
2014.07.20	1.45	0.90	0.31
2014.08.02	0.86	0.55	0.30
2014.08.12	0.43	0.54	0.11
2014.08.26	0.71	1.20	0.34
2014.08.29	0.22	0.34	0.08
2014.09.02	0.22	0.25	0.04
2014.09.04	0.31	0.35	0.11
2014.09.17	0.33	0.37	0.11
2014.09.20	0.09	0.16	0.06
2014.10.05	0.08	0.11	0.04
Average	0.47.	0.53	0.16

Table 11. Statistical table of relative error (%)

The time of storm event or rainfall event	K83+550	K93+550	K133+550
2014.06.05	28.10	27.70	28.00
2014.06.07	37.74	40.33	36.24
2014.06.17	37.36	40.31	35.87
2014.06.28	28.70	27.67	29.00
2014.07.01	27.70	27.61	27.23

2014.07.13	28.70	29.82	28.59
2014.07.20	27.00	27.66	28.77
2014.08.02	41.84	40.15	36.24
2014.08.12	34.23	40.45	38.89
2014.08.26	36.05	40.17	38.22
2014.08.29	36.43	42.38	35.98
2014.09.02	26.20	28.71	27.00
2014.09.04	26.40	36.11	26.39
2014.09.17	27.80	38.18	26.00
2014.09.20	37.36	40.29	37.93
2014.10.05	27.20	40.27	35.87
Average	31.80	35.49	32.26

Table 12. Statistical table of root mean square error

A section of a expressway	Natural slope catchment area		
	K83+550	K93+550	K133+550
RMSE	0.59	0.66	0.21