Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts.

Supplemental Information for

Spatiotemporal pattern of soil heavy metal pollution risk and driving forces of increment in a typical industrialized region in central China

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Table S1. Statistics of all soil heavy metal samples from 2016 to 2019.

	Co	Cr	Cu	Mn	Ni	Pb	Zn	Cd
Maximum (mg/kg)	152.59	276.00	3306.00	3926.28	131.00	1024.73	3547.15	23.34
Minimum (mg/kg)	2.07	6.00	6.47	59.69	1.00	7.33	9.37	0.01
Average(mg/kg)	14.77	53.96	155.74	688.92	25.50	75.82	156.38	1.01
Standard deviation	8.32	21.42	273.03	418.28	13.39	91.48	178.51	1.82
Coefficient of variation (%)	56.36	39.69	175.31	60.72	52.53	120.65	114.15	181.28
Background value(mg/kg)	15.4	86.00	30.70	712.00	37.30	26.70	83.60	0.17
Percentage of samples beyond background values (%)	43.43	6.03	89.26	36.19	15.32	83.23	65.98	83.59
K-S[a] (Observed data)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
K-S (Transformed data)	0.07	0.28	0.06	0.08	0.08	0.04	0.14	0.20

[a] K-S: Kolmogorov-Smirnov.

Table S2. Accuracy criteria of soil heavy metal concentrations estimated with STOK.

	Co	Cr	Cu	Mn	Ni	Pb	Zn	Cd
r	0.71	0.56	0.63	0.57	0.60	0.59	0.59	0.54
RMSE	3.13	13.61	74.03	288.95	7.09	49.51	78.74	0.57
MAE	2.29	10.08	45.29	211.30	5.36	29.76	53.97	0.37

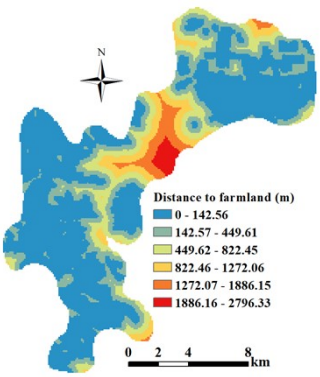
Table S3. Accuracy of RF model for soil heavy metal increment.

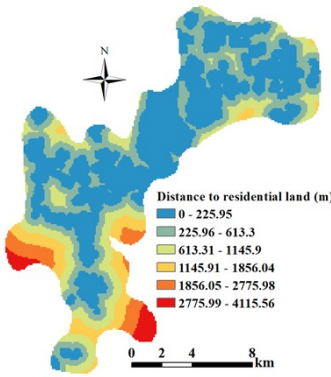
	Co	Cr	Cu	Mn	Ni	Pb	Zn	Cd
R^2	0.93	0.87	0.72	0.88	0.82	0.75	0.91	0.58
MSE	0.22	4.84	135.07	2064.93	1.14	168.12	51.07	0.03

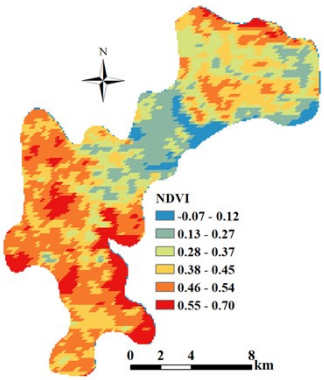
Table S4. Pearson correlations between the increment of soil heavy metal contents.

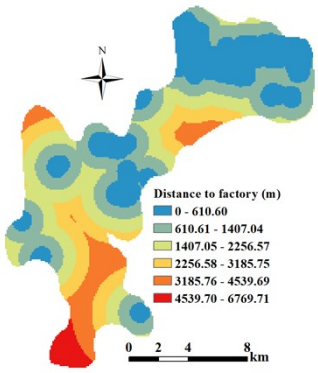
	Co	Cr	Cu	Mn	Ni	Pb	Zn	Cd
Co	1							
Cr	0.41**	1						
Cu	0.32**	0.22	1					
Mn	0.39**	0.28**	0.38**	1				
Ni	0.33**	0.46**	0.27**	0.35**	1			
Pb	0.39**	0.25**	0.32**	0.33**	0.16**	1		
Zn	0.31**	0.18**	0.35**	0.56**	0.26**	0.41**	1	
Cd	-0.01	0.02**	-0.03**	-0.05**	0.05**	-0.14**	-0.07**	1

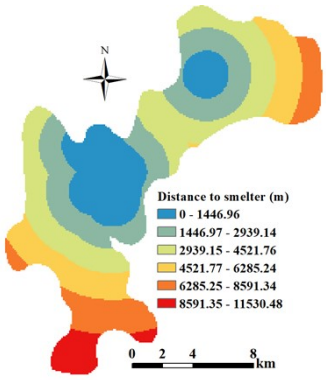
Note: *: sig<0.05; **: sig<0.01.

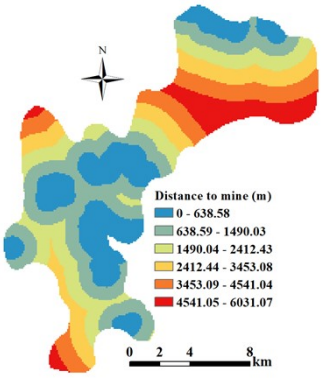

N
Distance to farmland (m)
0 - 142.56
142.57 - 449.61
449.62 - 822.45
822.46 - 1272.06
1272.07 - 1886.15
1886.16 - 2796.33
0 2 4 8 km

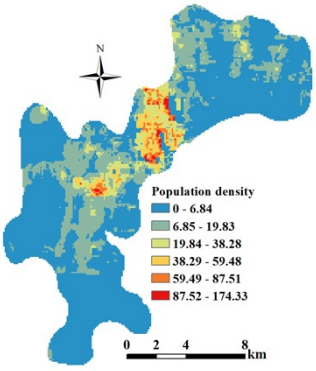

N
Distance to residential land (m)
0 - 225.95
225.96 - 613.3
613.31 - 1145.9
1145.91 - 1856.04
1856.05 - 2775.98
2775.99 - 4115.56
0 2 4 8 km

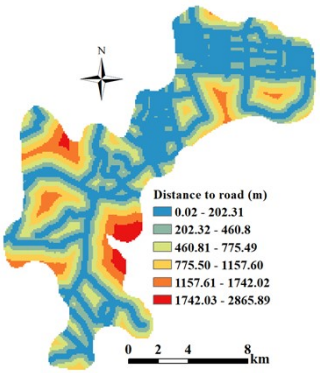

N
NDVI
-0.07 - 0.12
0.13 - 0.27
0.28 - 0.37
0.38 - 0.45
0.46 - 0.54
0.55 - 0.70
0 2 4 8 km

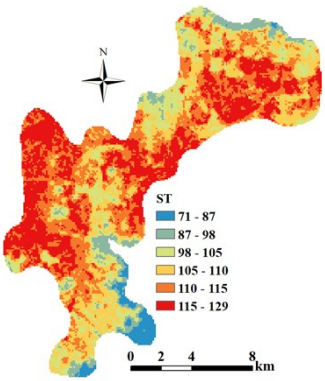

N
Distance to factory (m)
0 - 610.60
610.61 - 1407.04
1407.05 - 2256.57
2256.58 - 3185.75
3185.76 - 4539.69
4539.70 - 6769.71
0 2 4 8 km

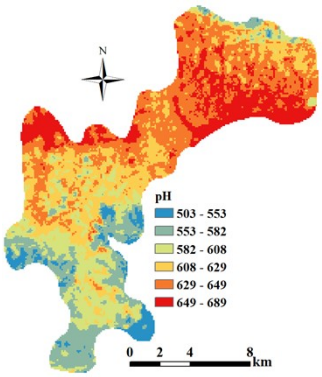

N
Distance to smelter (m)
0 - 1446.96
1446.97 - 2939.14
2939.15 - 4521.76
4521.77 - 6285.24
6285.25 - 8591.34
8591.35 - 11530.48
0 2 4 8 km

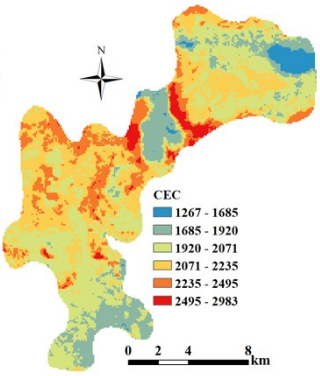

N
Distance to mine (m)
0 - 638.58
638.59 - 1490.03
1490.04 - 2412.43
2412.44 - 3453.08
3453.09 - 4541.04
4541.05 - 6031.07
0 2 4 8 km

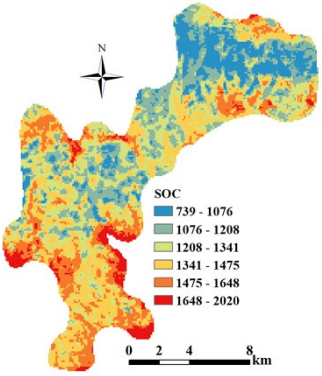

N
Population density
0 - 6.84
6.85 - 19.83
19.84 - 38.28
38.29 - 59.48
59.49 - 87.51
87.52 - 174.33
0 2 4 8 km


N
Distance to road (m)
0.02 - 202.31
202.32 - 460.8
460.81 - 775.49
775.50 - 1157.60
1157.61 - 1742.02
1742.03 - 2865.89
0 2 4 8 km


N
ST
71 - 87
87 - 98
98 - 105
105 - 110
110 - 115
115 - 129
0 2 4 8 km


N
pH
503 - 553
553 - 582
582 - 608
608 - 629
629 - 649
649 - 689
0 2 4 8 km


N
CEC
1267 - 1685
1685 - 1920
1920 - 2071
2071 - 2235
2235 - 2495
2495 - 2983
0 2 4 8 km


N
SOC
739 - 1076
1076 - 1208
1208 - 1341
1341 - 1475
1475 - 1648
1648 - 2020
0 2 4 8 km

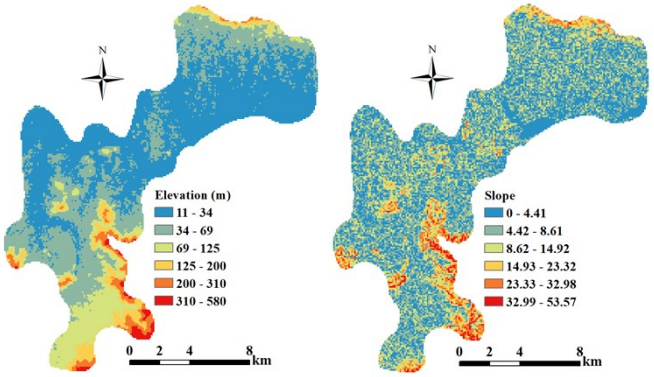
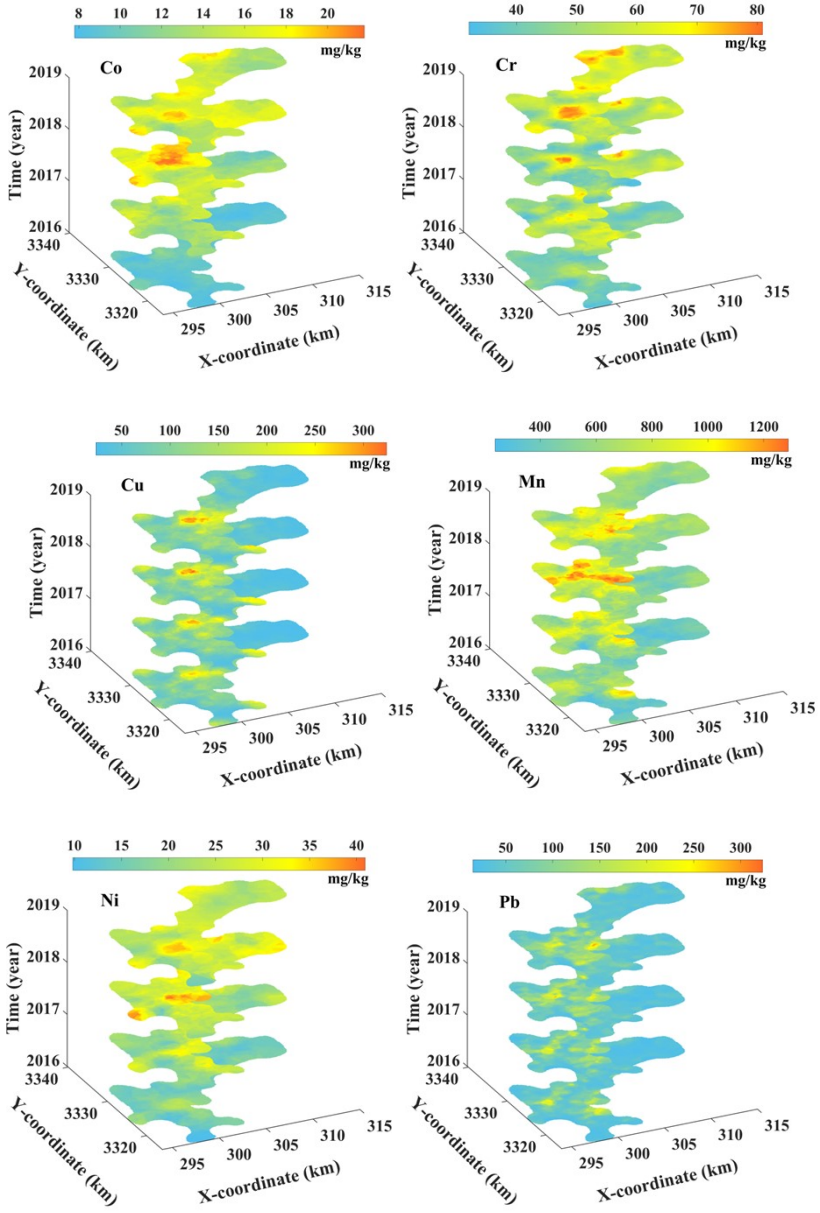


Fig. S1. Spatial distribution of driving factors for soil heavy metal pollution. Note: NDVI: normalized difference vegetation index; ST: soil thickness; CEC: cation exchange capacity; SOC: soil organic carbon.



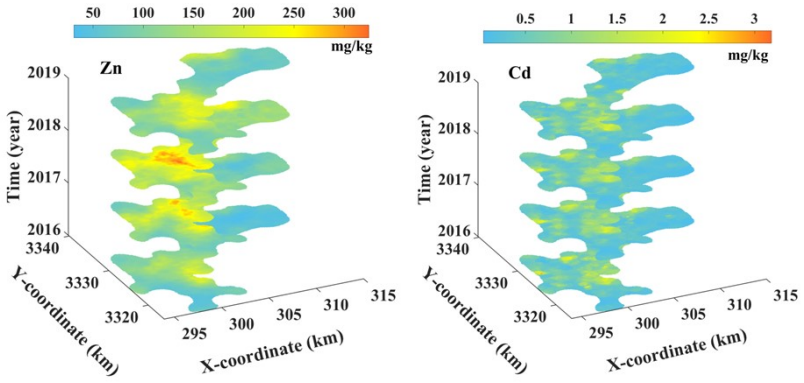


Fig. S2. Spatial distribution of soil heavy metal concentrations from 2016 to 2019.

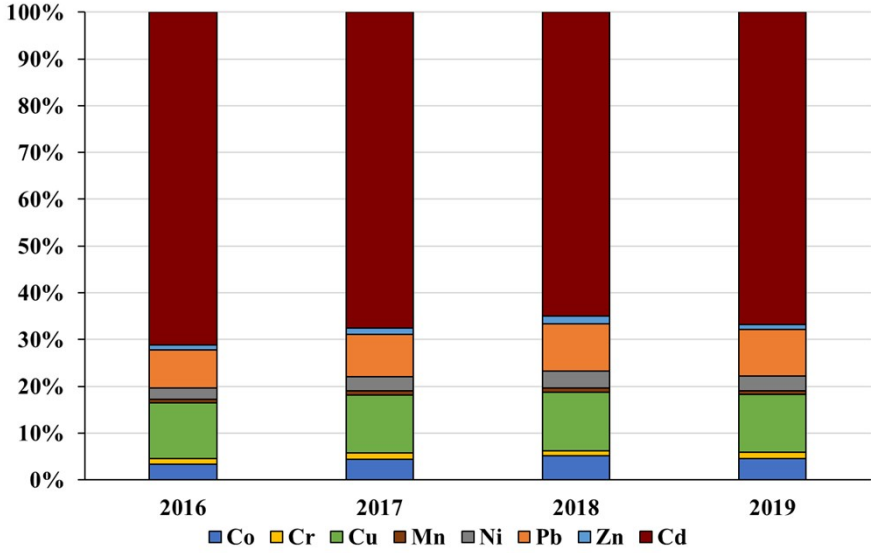
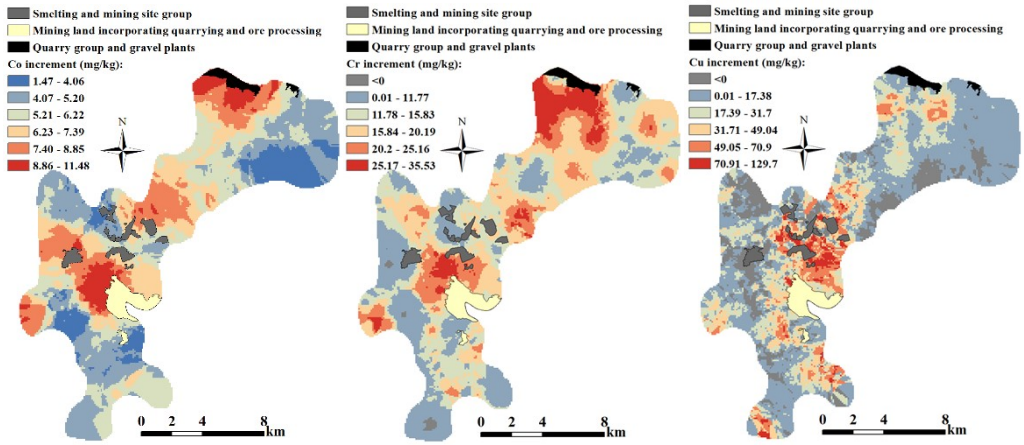


Fig. S3. The contribution percentage of each heavy metal to potential ecological risk in different years.



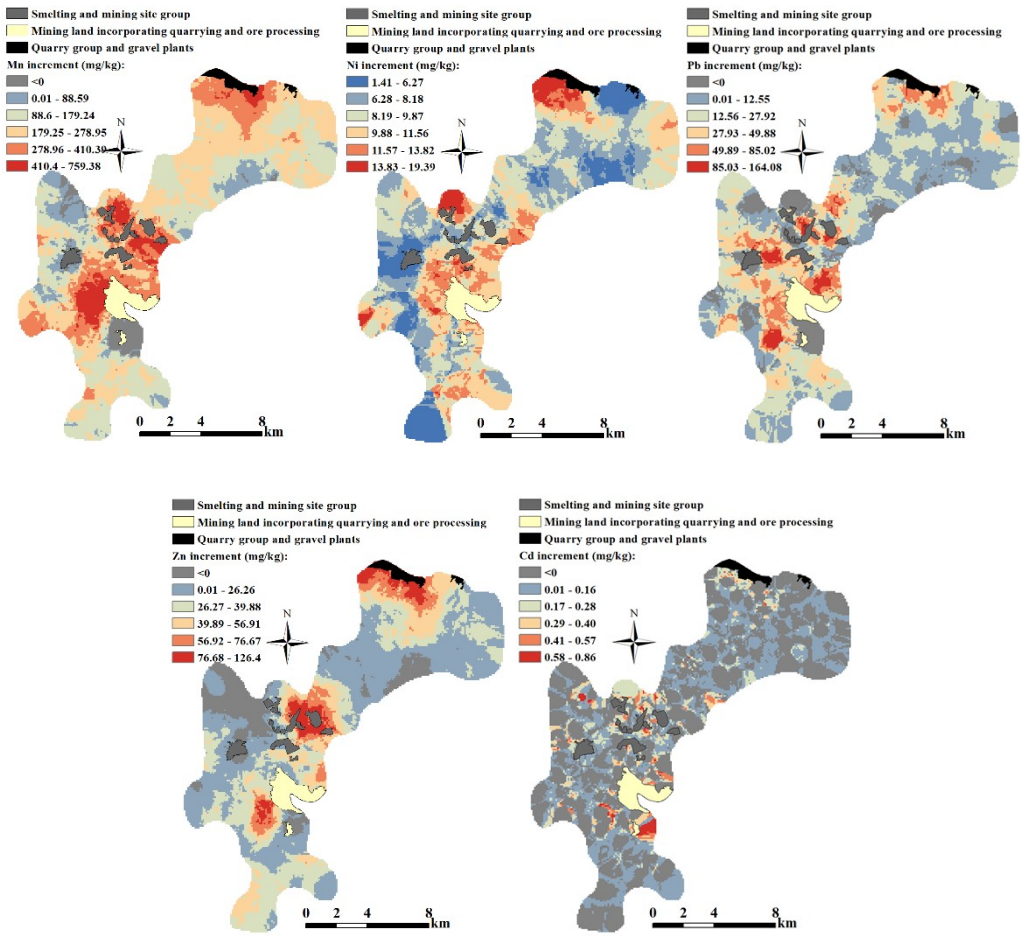


Fig. S4. Spatial distribution of soil heavy metal increments from 2016 to 2019.

Fig. S5. Mining soils reused for planting crops.