

## Supplementary Materials

# Potential Sources of Heavy Metals in Sediments of an Urban–Agricultural Watershed and Relationship with Land Use using a Statistical Approach

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**Table S1.** Pollution assessment by sediment quality guidelines (SQGs) from heavy metal concentrations in sediments collected from mainstream and tributaries in the Yeongsan River basin, South Korea

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**Table S2.** Pollution assessment by contamination factor (CF), pollution load index (PLI), and potential ecological risk index (PERI) from heavy metal concentrations in sediments collected from the mainstream and tributaries in the Yeongsan River basin, South Korea

| Categories | Sites | CF          |             |             |             |             |      |      |      | PLI         | PERI         |
|------------|-------|-------------|-------------|-------------|-------------|-------------|------|------|------|-------------|--------------|
|            |       | Pb          | Zn          | Cu          | Cd          | Hg          | As   | Cr   | Ni   |             |              |
| Section 1  | YS1   | 0.82        | 0.87        | 0.50        | <b>1.05</b> | 0.80        | 0.54 | 0.39 | 0.35 | 0.62        | 77.2         |
|            | YS2   | 0.80        | <b>1.38</b> | <b>1.13</b> | 0.83        | <b>1.32</b> | 0.48 | 0.53 | 0.54 | 0.81        | 94.6         |
|            | YS3   | 0.71        | <b>1.05</b> | 0.69        | 0.90        | 0.66        | 0.38 | 0.58 | 0.52 | 0.66        | 66.4         |
|            | YS4   | 0.93        | <b>1.18</b> | <b>1.14</b> | 0.98        | 0.85        | 0.56 | 0.65 | 0.54 | 0.82        | 81.5         |
|            | YS5   | 0.85        | 0.96        | 0.92        | 0.85        | 0.69        | 0.50 | 0.62 | 0.51 | 0.72        | 69.2         |
| Section 2  | YS6   | <b>1.38</b> | <b>2.49</b> | <b>1.30</b> | <b>1.10</b> | <b>1.11</b> | 0.49 | 0.68 | 0.63 | <b>1.02</b> | <b>99.5</b>  |
|            | YS7   | <b>1.12</b> | <b>1.77</b> | <b>1.54</b> | <b>1.10</b> | <b>1.20</b> | 0.47 | 0.63 | 0.59 | 0.96        | <b>102.1</b> |
|            | YS8   | 0.76        | <b>1.62</b> | <b>1.58</b> | <b>1.40</b> | <b>2.22</b> | 0.60 | 0.86 | 0.66 | <b>1.09</b> | <b>151.7</b> |
|            | YS9   | 0.85        | <b>1.73</b> | <b>1.42</b> | 0.95        | <b>2.72</b> | 0.38 | 0.64 | 0.56 | 0.96        | <b>155.6</b> |
|            | YS10  | 0.64        | 0.80        | 0.69        | 0.65        | 0.83        | 0.43 | 0.48 | 0.46 | 0.61        | 65.4         |
|            | YS11  | 0.95        | <b>1.72</b> | <b>1.48</b> | 0.90        | <b>2.05</b> | 0.38 | 0.67 | 0.56 | 0.95        | <b>127.8</b> |
|            | YS12  | 0.72        | <b>1.01</b> | 0.93        | 0.83        | <b>1.29</b> | 0.51 | 0.64 | 0.59 | 0.78        | 92.1         |
| Section 3  | YS13  | 0.56        | 0.87        | 0.58        | 0.48        | 0.74        | 0.45 | 0.34 | 0.40 | 0.53        | 55.6         |
|            | YS14  | 0.57        | 0.85        | 0.78        | 0.75        | 0.94        | 0.91 | 0.52 | 0.62 | 0.73        | 77.7         |
|            | YS15  | 0.58        | 0.97        | 0.82        | <b>1.05</b> | 0.65        | 0.46 | 0.64 | 0.59 | 0.69        | 71.2         |
|            | YS16  | 0.76        | 0.62        | 0.68        | <b>1.15</b> | <b>1.06</b> | 0.56 | 0.68 | 0.62 | 0.74        | 91.7         |
|            | YS17  | 0.71        | <b>1.11</b> | 0.81        | 0.80        | <b>1.11</b> | 0.56 | 0.59 | 0.55 | 0.75        | 83.8         |
|            | YS18  | 0.52        | 0.50        | 0.44        | 0.33        | 0.28        | 0.58 | 0.91 | 0.81 | 0.51        | 33.8         |
|            | YS19  | 0.45        | 0.40        | 0.32        | 0.28        | 0.25        | 0.54 | 0.87 | 0.76 | 0.44        | 29.5         |
| Section 4  | YS20  | 0.66        | 0.86        | 0.84        | 0.75        | 0.86        | 0.68 | 0.72 | 0.68 | 0.75        | 73.5         |
|            | YS21  | 0.65        | 0.88        | 0.64        | 0.75        | 0.94        | 0.60 | 0.68 | 0.62 | 0.71        | 74.7         |
|            | YS22  | 0.51        | 0.57        | 0.47        | 0.43        | 0.63        | 0.54 | 0.81 | 0.73 | 0.57        | 50.5         |
|            | YS23  | 0.72        | 0.53        | 0.50        | 0.38        | 0.48        | 0.77 | 0.68 | 0.63 | 0.57        | 46.0         |
|            | YS24  | 0.59        | 0.79        | 0.63        | 0.38        | 0.88        | 0.59 | 0.74 | 0.66 | 0.64        | 60.6         |
|            | YS25  | 0.46        | 0.52        | 0.35        | 0.25        | 0.63        | 0.58 | 0.83 | 0.67 | 0.51        | 44.8         |

**Table S3.** Principal component analysis (PCA) analysis results of heavy metals in sediments collected from the mainstream and tributaries in the Yeongsan River basin, South Korea (PC1–principal component 1, PC2–principal component 2)

| Component               | PC1         | PC2         |
|-------------------------|-------------|-------------|
| Zn                      | <b>0.90</b> | 0.14        |
| Cu                      | <b>0.87</b> | 0.23        |
| Cd                      | <b>0.83</b> | 0.02        |
| Pb                      | <b>0.83</b> | 0.11        |
| Agricultural            | -0.70       | 0.12        |
| Hg                      | <b>0.68</b> | 0.18        |
| Urban                   | <b>0.67</b> | 0.23        |
| Wetland                 | -0.60       | -0.37       |
| Bareland                | <b>0.55</b> | 0.18        |
| As                      | -0.48       | 0.34        |
| Water                   | -0.39       | -0.22       |
| Cr                      | -0.27       | <b>0.85</b> |
| Ni                      | -0.43       | <b>0.81</b> |
| Grassland               | 0.47        | -0.60       |
| Forest                  | 0.06        | -0.08       |
| Total variance (%)      | 39.1        | 15.0        |
| Cumulative variance (%) | 39.1        | 54.1        |

Extraction method: Principal component analysis