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Quantitative relations between soil heavy metal contamination and landscape pattern in Wuxi, China

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Land use practices changed landscape pattern and meanwhile, brought forth numerous environmental problems including heavy metal contamination in soil. In this study, we investigated the quantitative relations between soil heavy metal contamination and its surrounding landscape pattern based on topsoil samples and land use map of Wuxi in 2009. The results of vector fitting with Redundancy analysis in R package vegan showed that Percent Coverage of build-up area (PCB) within 2500 m, Perimeter-Area Fractal Dimension (PAFD) within 2500 m, Edge Density (ED) within 2500 m, Patch Density (PD) within 200 m, Percent Coverage of wetland (PCW) within 2000 m and Patch Cohesion (PC) within 200 m significantly affected the contents of heavy metal elements. The results of Stepwise regression suggested that increase of build-up area and fragmentation would increase Cu and Zn, while increase of wetland would decrease the contents of As and Cu. PAFD was negative with Cd, Hg, Pb and Zn.