

## **Spatial dynamics of soil trace element concentrations along an urban-rural transition zone in the black soil region of northeastern China**

YUANLI ZHU<sup>1</sup>, DONGYAN WANG<sup>2</sup>, LIQUN WANG<sup>3</sup>

<sup>1</sup>College of Earth Science, Jilin University, China,  
zhuyl16@mails.jlu.edu.cn

<sup>2</sup>College of Earth Science, Jilin University, China,  
wang\_dy@jlu.edu.cn

<sup>3</sup>College of Earth Science, Jilin University, China,  
wangliq@jlu.edu.cn

Urbanization is an important process that changes land use pattern and the sustainability of agroecosystems in the urban-rural transition zone. Through intensified anthropogenic activity, it magnifies trace element (TE) inputs into soils, and alters the balance of soil element fluxes. This study aims to investigate the effects of urbanization on the spatial dynamics of soil TEs in peri-urban zones and the distinct behaviors of TEs in response to urban sprawl. An area (15km × 16km) in the Chinese northeastern black soil region was selected to represent a typical urban-rural transition feature that received heavy impact by urbanization in last decade. 200 topsoil samples were taken from a Phaeozem and analyzed for total Zn, Cu, As, Pb, Cd, Cr, Ni and Hg. The results show that, except for Hg and As, the mean concentrations of the studied TEs (69.89, 23.90, 10.24, 23.38, 0.14, 63.70, 27.59, and 0.04 mg/kg for Zn, Cu, As, Pb, Cd, Cr, Ni and Hg respectively) were higher than their background values, and their concentrations were always higher in the southern part closer to the urbanized area, indicating the accumulative effect of urbanization on soil TE. Soil pollution assessment shows that the overall pollution status was moderate, but for Cd and Cu, numerous hotspots were contaminated due to the overuse of agrochemicals. Principal component analysis showed that Cu, Zn, Pb, and Cd as the first component were of anthropogenic origin due to urbanization and agronomic practices, whereas As, Ni, and Cr as a second group were primarily of lithogenic origin.