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Geoderma

Volume 119, Issues 1–2, March 2004, Pages 113-120

Lead distribution in near-surface soils of two Florida cities: Gainesville and Miami

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[https://doi.org/10.1016/S0016-7061\(03\)00244-1](https://doi.org/10.1016/S0016-7061(03)00244-1)

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Abstract

Knowledge of the distribution of soil lead (Pb) is useful for making sound environmental decisions. The objective of this study was to determine soil Pb distribution in two Florida urban areas of similar size with different levels of industrial development and population: Gainesville and Miami. About 200 and 240 soil samples were collected within a depth of 0.2 and 0.1 m in Gainesville and Miami, respectively. These samples, from three land-use classes (residential, commercial and public land), were digested using USEPA method 3051a and analyzed using graphite furnace atomic absorption spectrophotometry (GFAAS). Soil Pb concentrations varied greatly in both cities, with geometric mean (GM) values of 16 and 493 mg kg^{-1} in Gainesville and Miami, respectively. Both the median (15 mg kg^{-1}) and the 95th percentile concentrations (101 mg kg^{-1}) of the whole dataset in Gainesville were below the Florida soil clean-up target level (SCTL, 500 mg kg^{-1}) for residential areas. Although the corresponding values (median and 95th

percentile) for Miami were significantly higher, they were also both below the Florida residential SCTL for Pb (98 and 453 mg kg⁻¹, respectively). Residential and commercial areas in both cities showed higher Pb concentrations than public parks. Results from this study can be used as a rough guide on how Pb is distributed in Gainesville and Miami.



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Keywords

Natural; Pedogenic; Anthropogenic background; Lead

Abbreviations

AM, arithmetic mean; GM, geometric mean; GSD, geometric standard deviation; OC, organic carbon; SCTL, soil clean-up target level; MDL, method detection limit; GPS, global positioning system

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Approved for publication as the Florida Agricultural Experiment Station Journal Series No. R-

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