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MAPS OF HEAVY METALS IN CLUJ COUNTY SOILS DEVELOPED USING THE REGRESSION-KRIGING METHOD

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Abstract

Knowledge of the basic levels of heavy metal concentrations in soil and their spatial disposition, on a certain area, is particularly important for economic activities, but especially for preventing and stopping pollution. The spatial distribution maps, obtained by measurements performed (of a certain density), cover the entire studied area and are very useful. According to the literature several methods are known for building such maps, most of them based on a simple mathematical interpolation. The Regression-Kriging method used in this paper is one of the best ways to solve this problem, because its algorithm takes into account the influence of physicochemical characteristics of the soil and also the deviations among the calculated values – using mathematical models – and the ones measured in the field. This method was used to perform the maps of the spatial distribution for eight heavy metals concentrations (Cd, Co, Cr, Cu, Mn, Ni, Pb and Zn) in the Cluj County soils. The use of the nonlinear mathematical models and the maps for predictors (previously achieved) have provided a high precision for these spatial distributions, that can be now successfully applied in preventing and combating of soil pollution.

Key words: heavy metals, Regression-Kriging method, soil maps, statistical modeling

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