

论文  
元素空间分布插值方法的对比研究:以铜陵地区土壤中的重金属元素为例

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摘要:

文中以铜陵地区As、Cd、Cu、Pb、Ti、Zn等6种土壤污染元素为例,选取常用且具有代表性的反距离加权法、径向基函数法、普通克里格法、多维分形法4种空间插值方法,进行土壤元素空间插值,并对其结果进行验证分析和评价。各方法均选取最优参数进行插值对比,土壤样本数共372个,其中337个用于插值计算,35个不参与插值计算而用于验证插值结果。对比研究显示,普通克里格法对刻画区域土壤元素的空间分布趋势效果最佳,但其半变异函数模型及参数的优选仍有待进一步研究;多维分形法对刻画土壤元素局部异常和污染效果最佳,但其对土壤元素分布普遍特征的反映仍需深入研究;反距离加权法和径向基函数法对土壤元素分布的空间插值精度一般,但其简单易用、插值最优参数易于选择。

关键词: [空间插值](#); [交叉验证](#); [重金属元素](#); [土壤](#); [铜陵地区](#)

Comparison between methods for interpolation of studying spatial distribution of elements: a case study of soil heavy metals in Tongling area, south China.

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Abstract:

Taking six kinds of elements of soil contamination including As, Cd, Cu, Pb, Ti and Zn in Tongling area as an example, we have made spatial interpolation for soil elements by using four types of representative interpolation methods, including inverse distance weighted, radial basis function, ordinary Kriging and multifractal interpolation, and have validated and appraised the results. Comparison is made between methods with optimized parameters. 337 soil samples in a total of 372 samples were used for interpolation, and the rest 35 samples not having been interpolated were used for validation. The results of comparison indicate that ordinary Kriging exhibits best effect in characterizing spatial distribution trend of soil elements, yet the optimized models and parameters of semi variogram are still pending further study; multifractal method is the best in characterizing local abnormality and contamination, whereas its function of reflecting the general texture

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of soil element distribution needs in depth study; inverse distance weighted and radial

basis function interpolate less accurately for the spatial distribution of soil elements,

but are easy to use and to select optimized parameters.

Keywords:

Key words: spatial interpolation; cross validation; heavy metals; soil; Tongling area

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