

## COMPARISON OF INTERPOLATION METHODS FOR ESTIMATING NICKEL IN GROUNDWATER STUDY :JEY INDUSTRIAL ZONE

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### INTRODUCTION

In the mathematical field of numerical analysis, interpolation is a method of constructing new data points within the range of a discrete set of known data points.

In engineering and science, one often has a number of data points, obtained by sampling or experimentation, which represent the values of a function for a limited number of values of the independent variable. It is often required to interpolate (i.e. estimate) the value of that function for an intermediate value of the independent variable. This may be achieved by curve fitting or regression analysis. Because the classical statistics were not able to consider the spatial distribution of heavy metals in groundwater so as geostatistical techniques are used for this purpose (Yunfeng et al 2011). This study was designed to investigate the spatial extent of the nickel element of the four interpolation method were IDW (Inverse distance weighted) Natural neighbours, Spline And kriging used.

### MATERIALS AND METHODS

Jey Industrial Zone in the city of Isfahan in Isfahan Province, Isfahan, Nain area of 309 hectares, is located 17 km from the road. The amount of nickel by Atomic absorption were interpreted. To implement the method of creating the element nickel in an Excel file and save the file DBF format input data was prepared in GIS environment in this layer by calling arc tool box, The method in the 3D Analyst or Spatial Analysis ArcGIS software version 10.1 was used. For assessing efficacy and accuracy of these Interpolation Methods to estimate Ni, some statistical indices including mean absolute error (MAE) and R-squar were determined.

### Results and discussion

The results showed that the method is more accuracy spline methods IDW, neighbours And kriging is the more accurate method of estimating the amount of nickel.( $r=0/76$ ). This interpolation method is the best way to level them is gradual changes (height, depth, water pollution). If have many changes from the low horizontal spline interpolation method is suitable for the estimated values you more than the actual show.

**Keywords:** kriging, Inverse distance weighted, natural neighbours, spline

### REFERENCES

Yunfeng Xiea, b, Tong-bin Chena, the, Mei Leia, Jun Yanga, Qing-jun Guoa, Bo Songa, Xiao-yong Zhoua. 2011. Spatial distribution of soil heavy metal pollution estimated by different interpolation methods: Accuracy and uncertainty analysis. Chemosphere, Volume 82, Issue 3, Pages 468–476.



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