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THE RESEARCHES OF INTERPOLATION OPTIMAL METHOD FOR THE ANALYSIS OF AMBER RAW MATERIAL DISTRIBUTION

Ukraine takes the second place in the world on the prospected reserves of the high-quality amber (succinite). Amber placers are complicated as on the dynamics of useful component accumulation so by lithologic-facial characteristics, that stipulate the necessity of the digital modeling in addition to the traditional methods of geological researches. The process of modeling of amber placer includes a few basic stages: forming of electronic geological database of assay for mining holes and bore pits from data of geological prospecting; construction of wire-frame model of prospective site; construction of block model of placer with the calculation of mineral distributing.

The purpose of ourtaskisto choose the optimalmethod of interpolationfor thecalculation of the distributionof rawamber. Thisstep is very importantin theblock modeling.Interpolation predicts values for cells in a raster from a limited number of sample data points. It can be used to predict unknown values for any point data.

Kriging is an advanced geostatistical procedure that generates an estimated surface from a scattered set of points with z-values. More so than other interpolation methods, a thorough investigation of the spatial behavior of the phenomenon represented by the z-values should be done before you select the best estimation method for generating the output surface.

Kriging is similar to IDW in that it weights the surrounding measured values to derive a prediction for an unmeasured location. The general formula for both interpolators is formed as a weighted sum of the data:

$$Z_{(s_0)} = \sum_{i=1}^{n} \alpha_i Z_{(s_i)}, \quad (1)$$

where $Z_{(s_i)}$ – the measured value at the *i*th location; α_i – an unknown weight for the measured value at the *i*th location; S_0 – the prediction location, *n* – the number of measured values.

Kriging is a multistep process; it includes exploratory statistical analysis of the data, variogram modeling, creating the surface, and (optionally) exploring a variance surface. Kriging is most appropriate when you know there is a spatially correlated distance or directional bias in the data. It is often used in soil science and geology.

Natural Neighbor interpolation finds the closest subset of input samples to a query point and applies weights to them based on proportionate areas to interpolate a value. It is also known as Sibson or "area-stealing" interpolation.

The Spline tool uses an interpolation method that estimates values using a mathematical function that minimizes overall surface curvature, resulting in a smooth surface that passes exactly through the input points.

The IDW(Inverse Distance Weighted) tool uses a method of interpolation that estimates cell values by averaging the values of sample data points in the neighborhood of each processing cell. The closer a point is to the center of the cell being estimated, the more influence, or weight, it has in the averaging process.Weight is a function of the return distance:

$$\alpha = \sum_{i=1}^{n} \left(\frac{1}{R^p}\right)_i \alpha_i, \quad (2)$$

where α^{α} – estimation of block on tests α_i , *R* is distance from a place of sampling to the point, that is estimated; *p* is exponential quantity.

Krigingmethodcan notbe applied to theamber placers, since it requiresthe presenceof correlation. After analyzingthe above methods, we can conclude that the most optimalfor complexamber placershaveinterpolationby the method ofIDW.