

## **PROSPECTS FOR THE USE OF GEOGRAPHIC INFORMATION SYSTEMS IN MINING**

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There are more and more enterprises in the modern world, which are engaged in exploration and geological prospecting, introduce computer modeling, using special software and information systems.

The use of information technologies in mining enterprises and scientific research shows that software products are increasingly becoming a means of solving a wide range of problems of geotechnology.

Geographic information systems - systems of collection, storage, analysis and graphical visualization of spatial (geographical) data and related information about the required objects - are single out as a separate class. Geographic information systems have found applications in many industries, and mining industry is no exception. General-purpose software (Gemcom, Maptek, Mintec, Surpac and Datamine) and specialized mining programs (K-Mine, Whittle, etc.) have been use here.

Geographic information systems such as Golden Software Surfer and Mineframe are actively use in the educational process at the Mining Faculty of BNTU.

Golden Surfer software allows you to create and transform surfaces and perform various operations with them, such as:

- calculating the volume between two surfaces;
- switching from one regular grid to another;
- surface transformation by means of mathematical operations with matrices;
- surface area calculation;
- smoothing of surfaces using matrix or spline methods;
- file format conversion;
- other functions.

Such software as Mineframe, intended for modeling of objects of mining technologies and solution of various tasks that are find in practice of the enterprises of mining industry.

The system is used to solve a wide range of geological, surveying and technological problems encountered in the practice of mining enterprises, scientific and design organizations.

Mineframe contains an extensive set of tools to work with three-dimensional models of objects. These include geological sampling material, ore bodies and formations, surveyor's points, mine workings, excavation units, mining system components and assemblies, natural and technological surfaces (including open-pit mines and underground mining workings, spoil dumps).

Creating a digital model of deposits has a number of indisputable advantages. It is possible to correct the information with minimal costs of restructuring and recalculation of data at any stage. There is a clear visual representation of objects in three-dimensional form and the ability to recalculate the characteristics when adding new information.

The Mineframe software system with a wide range of functions and tools in practice allows obtaining a full-fledged digital model of the deposit for its future use in layout of plan and planning of mining operations, as well as an additional set of output documentation (various statements and plans / sections).

Modeling of deposits by means of geographic information systems allows using statistical and geostatistical methods. The digital models most accurately and fully demonstrate the spatial distribution of a wide spectrum of mineralization parameters for solid mineral deposits. Adaptation of three-dimensional modeling and reserve estimation technologies makes it possible to improve the method of geological models creation, increase accuracy, reliability and truthfulness of field reserves estimation. These circumstances are very relevant in the modern economic environment.

The advantage of implementing the above mentioned information technologies is the formation of a complex of automated tools for production preparation from the initial geological data on reserves to the preparation of a full set of mining and special documentation for the production of mining operations by the mine's technological service.