**Creating of a geological GIS database of Eastern Kazakhstan using the Kalba-Narym Zone as an example**

Bekishev Ye.T.1, Rakhymberdina M.Ye.2\*, Levin E.3, Assylkhanova Zh.A.4, Kapasov A.K.5

1 Doctoral student, School of Earth Sciences, D. Serikbayev East Kazakhstan Technical University, Kazakhstan

2 Dean of School of Earth Sciences, Ph.D, D. Serikbayev East Kazakhstan Technical University, Kazakhstan

3 Prof., Ph.D, School of Applied Computational Sciences, Meharry Medical College, USA

4 Lecturer, School of Earth Sciences, D. Serikbayev East Kazakhstan Technical University, Kazakhstan

5 Lecturer, School of Earth Sciences, D. Serikbayev East Kazakhstan Technical University, Kazakhstan

[\*MRahymberdina@edu.ektu.kz](mailto:*MRahymberdina@edu.ektu.kz)

***ABSTRACT***

GIS is an indispensable tool for modern geology, allowing efficient management of spatial data, complex analysis and support for important decisions in the geological industry. In the Republic of Kazakhstan, the need for unified collection, analysis and further creation of GIS database, as well as storage in electronic media or publication on the Internet, was expressed as early as the 90s of the last century. In Kazakhstan, one of the topical issues is the creation of a unified or regional (separate for each ore zone) database, which is reflected in the strategic documents for the development of the geological exploration industry of Kazakhstan. The existence of a national, public and relevant geological GIS database is an indicator of involvement and interest in the development of the geological sector of the economy. Today, many countries, mostly developed ones, have a developed GIS. At the same time, the detection and mapping of ore deposits based on remote sensing data using machine learning methods, including artificial intelligence, is of particular importance, which will be a breakthrough to improve prospecting based on remote sensing methods. The object of the study is the Kalba-Narym zone in Eastern Kazakhstan. The geological database of GIS of Kalba-Narym zone of East Kazakhstan is based on 1: 200 000 scale maps, remote sensing data, field survey materials. Data processing and analysis were performed in QGIS software. The key aspect is to bring heterogeneous data to a single coordinate system, which allows to integrate them into a single GIS and conduct complex spatial analysis. On the basis of the conducted research the data structure for creation of GIS of Kalba-Narym zone was developed, the main problematic issues in the development of geological GIS database were identified.

**Keywords:** database, GIS, geology, remote sensing