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Research Article

GEOLOGICAL AND STRUCTURAL CONDITIONS AND LOCATION OF THE MINERALIZATION ZONE OF THE SARYTAU ORE FIELD ACCORDING TO REMOTE SENSING DATA

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ABSTRACT
This article presents the results of cosmogeological studies conducted at the Sarytau ore field. At first, a cosmostructural map has been compiled on the territory of the Sarytau ore field, which is a map with the main ore-controlling cosmostructures. In addition, a statistical analysis was carried out of the fact that the studied area is rich in tectonic processes and is related to these ground cracks for mining.

Keywords: *Sarytau, Gold Deposits, Landsat, ASTER, Sentinel, Factors, Mineralization Control, Mineralized Zone, Lithology, Space Structures, Carbonates, Sulfides, Quartz*

INTRODUCTION

The world experience of the last twenty years in the field of multispectral satellite survey materials processing in lithological and mineralogical mapping has shown irreplaceable efficiency associated with the geological heterogeneity of rocks exposed on the Earth's surface.
However, despite the rapid development of satellite images and the progressive development of their software, visual decoding is the leading method in cosmogeology.
Important information was obtained on the use of Landsat-5 (TM) satellite images for geological mapping and zones of hydrothermal changes (Sabins, 1999); Processing of ASTER satellite images in the short-wave infrared range (SWIR) (1.60-2.43 microns) to distinguish and compare minerals and zones of hydrothermal changes (Crosta *et al.*, 2003); Mapping of mineral indixes (Zhang *et al.*, 2007); Mapping of zones of mineralization of hydrothermal changes associated with copper porphyry and epithermal gold mineralization (Pour and Hashim, 2012) and copper molybdenum mineralization (Prasath *et al.*, 2018); Application of the ratio of channels of Landsat-7 satellite images (ETM+) in determining the area associated with minerals (Sabbaghi *et al.*, 2017); To compare of the results of processing ASTER satellite images in the thermal infrared (TIR) range (8,12-11,65 microns) and Landsat-8 satellite images (OLI) in geological mapping (Imbroane *et al.*, 2007).

According to the results of previously performed studies cosmogeological the efficiency of visualization developed in Uzbekistan structural-desifrirati systems (DCS) on the composition of the materials space surveys in the synthesis of channels 1=A, 4=G, 5=R; 1=b, 4=G, 7=R and the ratio channels (5/4, 1/7, 1/4) of the electromagnetic spectrum (Nurkhodzhaev *et al.*, 2017).

MATERIALS AND METHODS

In identifying the mineralization zone, infrared channels of Landsat-8 and Aster satellite images were used using channel ratio methods and various mineral index methods.
Multispectral satellite images of Landsat-7, 8, Aster, Sentinel-2 were used when performing cosmogeological work. The schematic cosmostructural map is drawn up in stages. The method of the principle of sequential approximation in the study of the subsurface: from the general to the particular,

allowed us to identify regional cosmogeological features of the territory and the structures manifested on it.
Linear and annular structures were revealed during visual and automated decoding of satellite images of different multispectral ranges.

RESULTS AND DISCUSSION

As a result of cosmogeological studies, a cosmostructural map of the Sarytau ore field has been compiled, which displays the linear and ring structures of the ore field (Fig.1).

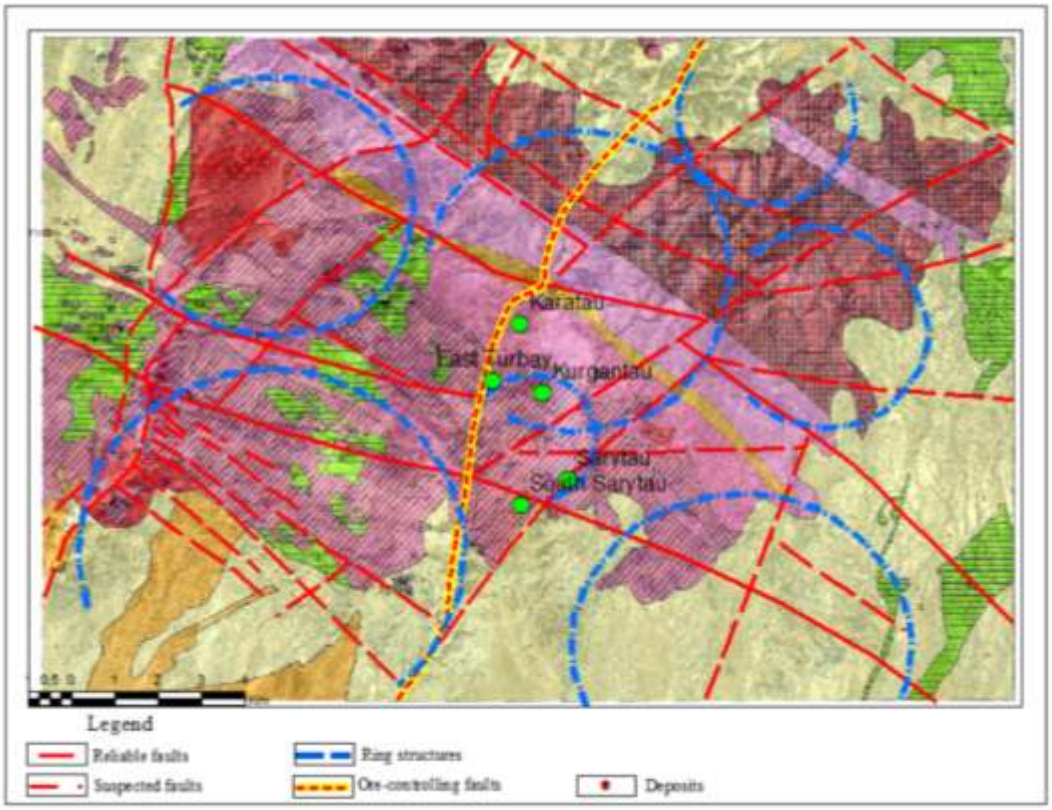

Figure 1: Cosmostructural map of the Sarytau ore field

Deep longitudinal and transverse faults, as well as dyke formations, have the same significance. Dykes belong to a complex of different ages, are characterized by a diverse composition and reflect the duration of magmatic activity and the end-to-end nature of ores about the supply structures. Dykes are the most important component of the main ore-controlling structures of the Turgai ore district - zones of increased permeability (Pirnazarov *et al.,* 2010).
Earlier, researchers found that in the Bukantau Mountains, Gold-tungsten ore fields are confined to granitoid intrusions, pre- and post-granitoid dike belts with annular (Sarytau, Turbai) or arc (Soutbay) morphology. Granitoid intrusions are accompanied by intense gravitic minima and ring structures. The root systems of granitoid intrusions are not only an indicator of the area of mobilization, but also the most important ore-bearing structure, providing high permeability and the shortest distance from the foci of ore solutions to the area of distribution and concentration.
According to cosmogeological studies, a number of small-sized ring structures and systems of north-western and north-eastern linear structures have been established within the Soutbay-Sarytau ore node, many of them correspond to existing dimensional disturbances reflected on geological and structural-

tectonic maps of the study area. A preliminary comparative analysis of the results of cosmogeological studies with a metamogenic feature of the ore node showed that the Sarytau deposit is confined to the intersection zone of the northwestern linear structure with the outer boundary zone of the ring structure.
The spatial placement of the skarn-ore bodies of the meridional direction coincides, within the Sarytau area, with the direction of the boundary zone of the ring structure.
This gives reason to believe that the ring structures, especially their complication zones by northwestern linear structures controlled the placement of the ore body. This is a new fact in the study of the regularities of the formation and placement of the skarn-tungsten mineralization of the Sarytau ore field. This fact can be used as a search feature and predictive criteria.
In addition, a statistical analysis was carried out of the fact that the studied area is rich in tectonic processes and is related to these ground cracks for mining (Fig.2).

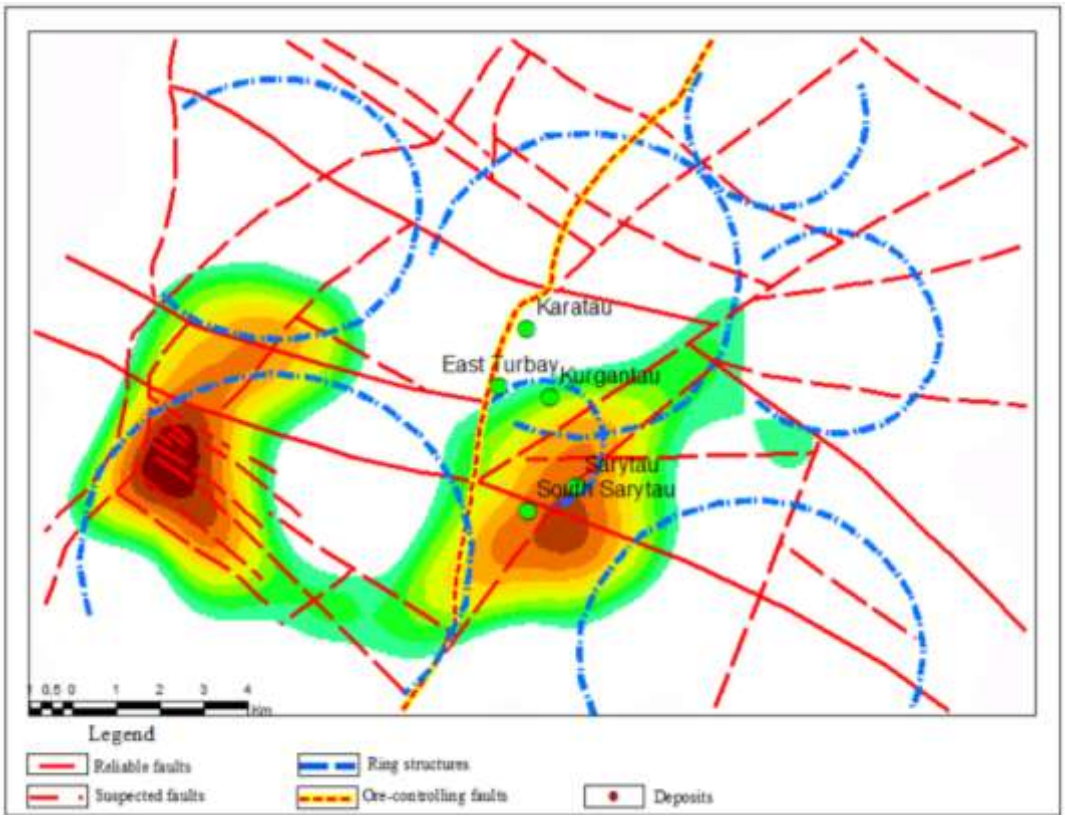

Figure 2: Identification of zones of active tectonic disturbances by the method of static analysis.

With the help of statistical analysis, we can identify areas that are tectonic assets using anomalies. Using the results of this statistical analysis, the use of precisely tectonic disturbances and ring structures in order to identify areas where intersections and tectonic processes are active ensures high accuracy.
Deep longitudinal and transverse faults, as well as dike formations, have the same significance. Dykes belong to a complex of different ages, are characterized by a diverse composition and reflect the duration of magmatic activity and the end-to-end nature of ores about the supply structures. Dykes are the most important component of the main ore-controlling structures of the Turgai ore district - zones of increased permeability (Turbai-Sarytau, Soutbay-Bulutkan, etc.).
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CONCLUSION

The use of different processing methods and the ratio of channels of satellite images of Landsat-8 and Aster, allowed us to identify the spatial location of the space structure and the mineralization zone on the territory of the Sarytau ore field, as a result of which new areas of mineralization zones were identified, which are promising for gold and wolfram mineralization.
The results of the analysis of remote sensing materials can be used to confirm and clarify the structures of the territory, lines or zones of tectonic fracturing, which can serve as a hint for predicting favorable structures where horizontal and vertical movement of ore mineralization occurs and the regular placement of endogenous mineralization.

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