

**ECONOMIC-GEOLOGICAL MAPS-  
A NEW TYPE OF ECONOMIC MAPS**

Alexander I. Burde

Russian Geological Research Institute (VSEGEI)

74 Sredny pr., St.Petersburg, 199026, Russia

**Abstract**

Compilation of economic-geological maps is proposed for mapping of conditions of deposit exploitation. The integral complex of the conditions is characterized by a degree of economic development and a degree of favourability for the exploitation of various groups of minerals. Conditions of every region are shown by an individual index.

**1 Introduction**

Mining conditions are an important factors in optimal management of prospecting and investments in deposit exploitation. Mining conditions can be represent in a new type of economic maps - "maps of economic-geological conditions". Such a map named as "Map of geological-economic conditions for prospecting and mining in Russia" on 1:10 000 000 scale has been included into the "Geological Atlas of Russia" (see report by A. Smislov a.o. in this book).

The main problem in map compilation is development of integral assessment of condition complex and cartographical design which enable combination of integral assessment and individual characteristics of every map field.

## 2 Classification of conditions

The economic-geological conditions are subdivided into two groups:

1. Positive conditions which facilitate the exploitation of deposits. They involve a degree of geological-cartographical coverage, degree of prognostic mineral resources, the availability of mines, reserve deposits, ways of communication, electric power and fuel supply, density of population and some other factors. Five conditions have been taken for map compilation on 1:10 000 000 scale: availability of mines, ways of communication, oil and gas pipe-line, electric power supply and density of rural population. For most conditions a zone of influence from 100 to 250 km wide depending on density population and landscape, and for population three gradations of density has been mapped (see table with example for the "Map of geological-economic conditions for prospecting and mining of Russia").

Integral assessment of the combination complexes as the "degree of development" has been introduced.

2. Negative conditions which make geological prospecting and deposits exploitation difficult. They include geological hazards, hindrances in search (sheet superficial deposits, etc), alpine relief, agricultural lands and other territories under protection, a degree of ecological tension. Other negative conditions have lesser significance.

Combination of positive and negative conditions has been considered as an integral assessment of the "degree of favourability for deposit exploitation". Minerals (except building materials) are divided into three groups:

Classification and indexes of region types (partly)

Degree of development	Complex of conditions and their indexes				
	Zones of condition influence				Density of rural population
	mines	ways of communication	electric power system	oil and gas pipeline	
Developed	1	1	1	1	2
	1	1	1	1	1
	1	1	1	1	0
	1	1	1	0	2
	0	1	1	1	2
	0	1	1	1	1
	0	1	1	1	0
Medium-developed	1	1	0	0	1
	1	1	0	0	0
	1	0	1	0	1
	1	0	1	0	0
	0	1	1	0	2
Low-developed	1	0	0	0	1
	1	0	0	0	0
	0	1	0	0	1
	0	1	0	0	0

Values of numbers: 1st - 4th positions: 1 - presence, 0 - lack of a conditions;

5th position: density of populatuin,pers./sq. km: 0 - less than 1, 1 - from 1 to 10, 2 - more than 10

- heavy-tonnage minerals (iron, coal, phosphorites, etc.) - require powerful energy and fuel sources, railways and/or water transport;

- medium-tonnage minerals (copper, tungsten, tin, etc.) - can be produced using energy of local electric power stations and other local energy and fuel sources, demands in transport could be met roads;

- low-tonnage minerals (placer gold, precious stones, etc) - can be produced with employment of mobile electric power stations or without its, and demands in transport could be met by flying vehicles.

The assessment of the degree of favourability has been carried out separately for every group of minerals.

### 3 Cartographical design

The degree of development is shown by coloured background, individual characteristics of map field - by five-valued digital positional index for combination of positive conditions (see table) and coloured specks and line for negative conditions. Degree of favourability is shown on additional scheme.

### 4 Conclusion

Integral assessments, individual characteristics, and cartographical design can be used in compilation of maps on a larger scale. In this case the positional index is supplemented with positions of necessary local conditions. Symbols of conditions common for the whole region can be eliminated from it.