

## **POTENTIAL OF ECOLOGICAL AND MINERAL RESOURCES: TO MEANINGFUL EXPLOITABILITY VIA GEOCHEMICAL ASSESSMENT**

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Multi-disciplinary studies of definite levels in hierarchical ecosystems, representativity and objectiveness of the estimates, and cartographic compatibility of the data are the keystones of a new approach to the geochemical mapping. This philosophy enables to quantify the mineral potential of the objects and soil fertility, as well as locate natural and anthropogenic hazards. This approach is a tool to make the utilization of natural resources efficient at minimum negative ecological consequences. When comparing alternative mining projects, it is vital to estimate a total natural potential of the area, ecological characteristics of the objects, pre-start environmental situation, and possible losses. The systems approach to the geochemical mapping and assessment of territories is tested in 6 areas in Russia differing in landscapes, geology, metallogeny and economics. A GIS-based digital map set has been created using geochemical characteristics of the adjoining environmental components. A unique map of the expedient land use is designed as a sumup. It assists in the analysis of spatial and causal relationships in the natural potential, economics, and environments. Hence the objective conclusions concerning the constraints on economic activities, selection of economic priorities, establishment of reciprocal effects caused by adjoining territories, and the land use restrictions. This concept of geochemical mapping presumes heterogeneous and heterochronous nature inherent in the entirety of an area of economic development. The methods and data organization accepted by the authors constitute a multi-aspect informational system focused on the assessment of biospherical transformations and taking of timely decisions aimed at sustainable development of the environment.