

## REMOTE SENSING FOR GEOLOGY AND EXPERT SYSTEMS METHODOLOGY

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Remote sensing (RS) allows to obtain various information about the Earth. To receive high-quality information one needs to deal with huge amount of information that is why computer data processing and mathematical procedures have happened to be very successful. At the same time geology is an expert activity, its essence is based upon knowledge and experience of human who's conclusions are fuzzy and incomplete. That is why strong mathematical procedures such as statistics and pattern recognition have not yielded any new effect in geology. Expert systems (ES) methodology is extremely attractive for solving geological problems because it allows to unite computer power and human intelligence. ES Genesis-2 is implemented and being developed by authors. ES includes knowledge base, database, and logical conclusion engine. The knowledge base contains forecasting models created directly of the expert-geologist's knowledge. Database contains set of standard objects. The engine makes forecasting conclusion for objects presented to ES. A number of forecasting models is created for Genesis-2: the epigenetic gold mineralization within Precambrian rocks (Bamskoe deposit); large Cu-Ni-PGE deposits (Pechenga in Paleoproterozoic rift environment); and Norilsk in Mezozoic paleorift. Different problems can be solved using described expert technology. ES is implemented for recognition of lithological types of rocks on the base of their remote images. Database contains a set of standard objects for 17 widespread types of rocks. The attributes of standards for different geological and climatic environments are included into knowledge base (about 100 ones were used). During dialog ES makes inquiries to user about attributes of her object, makes logical conclusion, and informs user about it.