Geophysical Research Abstracts, Vol. 8, 03837, 2006
SRef-ID: 1607-7962/gra/EGU06-A-03837

Geochemical Geoindicators as a SOE Reporting Method

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The method of Geoindicators is a new approach directed to the environmental research, report and monitoring, which have been developed by IUGS (International Union of Geological Sciences). Geoindicators are measurers of geological processes and phenomena that can be changed significantly within a century or less [1]. The checklist of geoindicators includes 27 parameters (see www.geoindicator.org).

The method of geoindicators also allows collecting available data and creating accessible data-base on environment, which can provide generalized state report to raise public awareness, and in help to laypersons and decision-makers.

Armenia, as a mountainous country with wide diversity of geographical and geological landscapes and processes, is an ideal territory for applying geoindicators. Actually the possibilities of their application are limited only by availability of data bases characterizing the trends of development of this or that geological or geographical process [2]. While applying the noted geoindicators we made an attempt to develop and suggest additional geochemical geoindicators (www.ecocentr.am).

Geochemical geoindicators are used to assess the disturbance of natural equilibrium of chemical elements contents, which nowadays is one of the harmful factors of anthropogenic impact upon the environment. They can be applied to the both natural and man-made ecosystems. However, in this respect cities-open ecosystems, where man-made geochemical stream of pollutants and heavy metal in particular reaches its peak, are the most visual examples of the application of geoindicators.

Geochemical indicators were applied on the example of Yerevan and Kajaran cities as Armenia's major oldest industrial centers. The problem of the city's environment

pollution with heavy metals is topical, for such pollution threatens the health of the population of the republic [3, 4, 5,].

As indicators, snow cover, waters, soil (horizon A) and crops were taken as mediums. Geochemical indicators can be used for two aspects: 1. to assess short-term pollution, 2. to assess long-term pollution.

To evaluate a man-made geochemical stream in the air and water basins in concrete short intervals (day, month, season, year) the snow cover and river water samples were analyzed. As integrating geochemical geoindicator we apply a Summary Index of Intensity (SII) representing the sum of heavy metals (Pb, Cu, Zn, Mo, Ag, Ni, Cr) contents in selected samples standardized by the natural or regional background.

The intense inflow of chemical elements to the environment through a man-made geochemical stream results in their accumulation in depositing mediums (soils) and separate objects of biosystems including the elements of trophic chains. A geoindicator of such a phenomenon is Summary Index of Heavy Metal Accumulation (SIA) in plants and soils

(horizon A).

To show the range of heavy metals man-made stream the quantity and quality series were identified in the noted mediums as well.

References

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