



Principles of landscape-geochemical studies in the zones contaminated by technogenical radionuclides for ecological and geochemical mapping

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Efficiency of landscape-geochemical approach was proved to be helpful in spatial and temporal evaluation of the Chernobyl radionuclide distribution in the environment. The peculiarity of such approach is in hierarchical consideration of factors responsible for radionuclide redistribution and behavior in a system of inter-incorporated landscape-geochemical structures of the local and regional scales with due regard to the density of the initial fallout and patterns of radionuclide migration in soil-water-plant systems.

The approach has been applied in the studies of distribution of Cs-137, Sr-90 and some other radionuclides in soils and vegetation cover and in evaluation of contribution of the stable iodine supply in soils to spatial variation of risk of thyroid cancer in areas subjected to radioiodine contamination after the Chernobyl accident.

The main feature of the proposed approach is simultaneous consideration of two types of spatial heterogeneities: firstly, the inhomogeneity of external radiation exposure due to a complex structure of the contamination field, and, secondly, the landscape geochemical heterogeneity of the affected area, so that the resultant effect of radionuclide impact could significantly vary in space. The main idea of risk assessment in this respect was to reproduce as accurately as possible the result of interference of two surfaces in the form of risk map.

The approach, although it demands to overcome a number of methodological difficulties, allows to solve the problems associated with spatially adequate protection of the affected population and optimization of the use of contaminated areas. In general it can serve the basis for development of the idea of the two-level structure of modern radiobiogeochemical provinces formed by superposition of the natural geochemical structures and the fields of technogenic contamination accompanied by the corresponding peculiar and integral biological reactions.