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SOIL SECTION IN RUSSIAN COMPLEX ATLASES - NEW IDEAS ON SOIL ECOLOGICAL FUNCTIONS

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BACKGROUND AND OBJECTIVES

The present-day national and regional atlases with their systems of harmonized and mutually complementary maps (Berliant, 2001) are aimed at comprehensive studies of large areas. Their objectives are forecasting consequences of human effects on the environment and revealing situations providing the environment sustainability. Soil sections in the atlases contribute to solving these problems.

Soil sections usually have a basic map and some complementary maps, including the applied ones. High proportion of soil maps is explained by the functions of soil both as the “mirror of the landscape” and as a resource of resilience of the landscape under human impacts. Among numerous soil functions, the regulation of pollutants’ behavior in different environments is important, and this gave birth to the functional-ecological approach in soil mapping. It presumes a purposeful choice of soil properties and parameters, maintaining due soil functioning in the changing environment. In this paper, soil sections in recent atlases are analyzed in terms of presenting soil ecological functions.

APPROACHES AND METHODS

Lists of maps in soil sections of the National Atlas of Russia (vol. 2, 2007) and 3 regional atlases were analyzed in order to reveal the cartographic presentation of soil functions; the regions were contrasting by their nature and economy. Map scales: 1:20Ì … 1: 2.5Ì.

RESULTS

Along with the basic soil map, there are complementary ones presenting individual soil properties, soil-forming agents, soil regimes and processes, zoning, and soil cover pattern, às well as applied maps of agricultural and ecological orientation.

The National Atlas of Russia contains 19 maps in its soil section: Soils, ÑÎ2 emission by soil cover, Soil-geochemical, Soil salinity and alkalinity, Soil hydromorphism, Soil age, Zoning, Soil cover pattern, Nutrients budget in farming, Humus content in the arable layer, Land use, Soil monitoring, Pesticides in soils, Heavy metals in soils, Lead in soils, Soil potential for purification, Soil ability of purification of oil and oil products, Soil degradation. Thus, 10 maps of 19 are innovative.

Less diverse are complementary maps in regional atlases.

The atlas of Khanty-Mansi district (2008; tundra and taiga plains, intense oil production): Carbon pool in soils, Potential soil purification of oil and oil products.

The atlas of Irkutsk oblast (2004; taiga – forest-steppe low mountains, open-cut mining of coal): Transformation of arable lands, Soil Erosion, Rehabilitation of disturbed lands.

The atlas of Bashkortostan (2005; steppe uplands, advanced agriculture): Soil texture, Humus horizon depth, Humus content, pH, Parent rocks, Content of available P, exchangeable Ê, mobile Mn, B, Zn, Cu, Co, Mo; Productive moisture, Erosion, Disturbed lands, Agro-soil zoning.

The enumerated complementary maps are diverse in themes, although depending on natural and economic features inherent to the area; they are either based on empirical data, or compiled by means of ecologically oriented interpretation of information on soils and soil-forming agents.

CONCLUSION AND FUTURE PLANS

These few examples illustrate recent trends in soil mapping: increase of themes and compilation of innovative maps. New environmental problems, advances in technologies, interdisciplinary research, and creation of databases provide for further development of specialized soil mapping.