



## **GIS-mapping of environmental assessment of the territories in the region of intense activity for the oil and gas complex for achievement the goals of the Sustainable Development (on the example of Russia)**

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The uniform system of complex scientific-reference ecological-geographical should act as a base for the maintenance of the Sustainable Development (SD) concept in the territories of the Russian Federation subjects or certain regions. In this case, the assessment of the ecological situation in the regions can be solved by the conjugation of the two interrelated system – the mapping and the geoinformational.

The report discusses the methodological aspects of the Atlas-mapping for the purposes of SD in the regions of Russia. The Republic of Tatarstan viewed as a model territory where a large-scale oil-gas complex "Tatneft" PLC works. The company functions for more than 60 years. Oil fields occupy an area of more than 38 000 km<sup>2</sup>; placed in its territory about 40 000 oil wells, more than 55 000 km of pipelines; more than 3 billion tons of oil was extracted.

Methods for to the structure and requirements for the Atlas's content were outlined. The approaches to mapping of "an ecological dominant" of SD conceptually substantiated following the pattern of a large region of Russia.

Several trends of thematically mapping were suggested to be distinguished in the Atlas's structure:

- The background history of oil-fields mine working;
- The nature preservation technologies while oil extracting;
- The assessment of natural conditions of a humans vital activity;
- Unfavorable and dangerous natural processes and phenomena;
- The anthropogenic effect and environmental surroundings change;
- The social-economical processes and phenomena.

• The medical-ecological and geochemical processes and phenomena;

Within these groups the other numerous groups can distinguished. The maps of unfavorable and dangerous processes and phenomena subdivided in accordance with the types of processes – of endogenous and exogenous origin. Among the maps of the anthropogenic effects on the natural surroundings one can differentiate the maps of the influence on different nature's spheres – atmosphere, hydrosphere, lithosphere, biosphere, etc.

In this way, all thematic groups brought together into four main sections:

- The introduction (the maps of a general condition and social-economical state, a region's rating in Republic;
- The components of natural, social-economics systems that form the conditions for the ecological situations;
- The integrated maps of exertion and change of the environment;
- The strategy to reach an ecological equilibrium.

The following data confirm that: more than 200 electronic analytical, complex and synthetic maps; more than 1000 small rivers basins, 6000 landscapes areas, 500 anthropogenic pollutions source, etc.

The extensive information, richness and diversity of the maps content, objective indices used in the maps, open the door to wide opportunities to apply different methods of cartography analysis comprising both usual visual one and the geographical constructions, cartometry statistical data treatment, respectively. The methods of mathematical-mapping and computer modeling presume to compute spatial correlations and mutual conformity of phenomena and to estimate the homogeneity of the ecological conditions, to reveal the leading factors of distribution and phenomena and processes development using the means of multidimensional statistical analysis.