

CARTOGRAPHICAL GEOINFORMATION APPROACH IN REGIONAL SYSTEMS RESEARCH

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The modern stage of economical reforms realization in Siberian regions is characterized by sequel of anthropogenic influence on landscapes, decrease of financing for nature protection measures and keeping of human health. This combined with earlier existing negative change in environment caused by intensive development of nature resources increases the ecological geographical problems on large area and leads the environment in crisis.

Realization of necessary way out of the situation to the sustainable development sets new tasks before modern geography and cartography, which ensure the solution of above-mentioned problems in coordination between socio economical perspective and environmental opportunities.

Such widening of problems spectrum caused by changes in the researching object leads to the necessity of new ideas, approaches and methods of analysis, including the alternative. Everything will require the increasing of information volume and knowledge widening about occurring on this territory and generalization of new facts for elaboration of efficient information promising system for environmental management and resources use in the broad sense.

It seems that this position is constructive and will help to solve the problems, to explain the material and to open the way to further deepening of knowledge about researching region, where totality of relation between nature and society and the role of these relation in forming of above-mentioned new problems is a difficult, contradictory process, which leads to the realization of renovating perspectives and sustainable self-development. On the example of the solution of these connected problems in Siberian region the algorithms of actions co-ordination can be carried out for other problem areas (on the local, regional and national levels) on the way out of crisis. So, complication of the object in geographical cartography on each development stage requires more sophisticated means and methods of its research and solution of new difficult cartographical geographical problems caused by increasing complexity its invariable structure, interaction, management and mapping of operation process and results.

The main methods of new information technology belong to such modern methods. Endowment and variety of means and opportunities of this technology for solution of geographical and cartographical tasks is realized by application of great deal of thematic and complex data base and maps, geoinformation systems of different intellectual levels, characterized by interaction of information simulation models with thematic expert systems and developed means of visualisation and graphical mapping of territorial occurrence.

Now, solution of mentioned problems in cartographical geographical researches is possible on the basis of modern information technologies application for the search of constructive compromise in the conflict between human life activity and nature from all possible alternatives in an effort of sustainable development of the territory.

From the spatial aspect of this solution, one of the species of fundamental generalization is working out of cartographical geoinformation approach in research of regional complexes on the basis of systematic mapping in computer maps of forming and development of geographical objects (process and occur-

rences) depended on natural social economical structure of territorial formation. Much attention is paid to system forming relations (information, material energetical and socio-economical) between objects and environment with consideration of their natural potential and unique.

The key components of new approach are cartographical, geoinformation provision, where the main problems are - co-ordination of social and natural interests in realization of territorial action, increase of efficiency of information provision of nature use management and realization of environmental measures in conditions of natural resources territorial framework and bio-diversity of protected landscape complexes.

Important properties of this management system are worse to note. From the one side, these are estimation, and forecast of socio economical and ecological consequences, ability for adoption. From the other side improvement of information provision can be realized only on the basis of modern information communication technologies, forming program, technological surrounding, which is insensitive to structure management methods changes in sphere of nature preservation, resources use, biodiversity conservation and social demographical structure of the region in conditions of co-ordination between social economical perspectives and reproductional opportunities of landscape structure.

Consequently, the management subject, who has persistently to go deep and even interfere in events occurring on this territory, will connect the efficiency increase of the solutions with modern information in provision with GIS-technologies application. It gives an opportunity to have information in tangible form, what lets to give its own understanding of situation and its precise model.

Conception of cartographical geoinformation researches consists in integration on the basis of the modern GIS-technologies of geosystem model and complex cartographical approaches in handling, analysis and spatial temporal forecast of information data and maps. The integration key link is spatial temporal extrapolation of researching processes and occurrences, mapped on computer maps with regard to their system forming relations. Principles and methods of conception realization base on system of system-hierarchical consideration of natural and social economical factors of environmental situation forming in the region in their dynamics and interrelation.

Working out methodic of real computer ecological geographical maps consists in territory differentiating with regard to environmental forming, stabilizing and regulating role of natural spatial systems. These structures pull apart into parts which are subject to sustainable development, protecting, operation, landscapes disrupting with regard to self-restoration and stabilization. This or other level of anthropogenic influence will base the relationship between rayons with sustainable natural territorial complexes and zones with different stage of ecologically unfortunate situation (risk, crisis, disaster).

Applying to the considering conception in the work [1] the methodological principles, apparatus-program and organization form of cartographical-geoinformation researches are elucidated and the solution of actual methodological tasks is shown, as spatial extrapolation of geographical conformities revealed on local level, for the whole region; impartial approach to the zoning and revealing of intact natural territorial systems.

Methodological opportunities of this approach let: to determine recreational, environmental stabilizing, protecting and resources-restoring role of landscape complexes; to estimate quality and environmental biodiversity; to reveal the compromise for contours and territorial characteristics of special protected areas; to estimate practical efficiency of information provision in environmental protection

management and rational nature resources use in conditions of ecological limitation; to determinate the compromise in procedure of territorial interests co-ordination with regard to importance of spatial objects situated there; to form the territorial conception on sustainable development on the basis of spatial temporal model of given structure of geographical space.

As applying of cartographical geoinformation approach we will watch its opportunity during research of intermountainous hollows bioclimate in the South of Siberia - Nazarovskaya, Minusinskaya, Tuvinskaya, Tunkinskaya, Baikalskaya, Barguzinskaya, Verkhneangarskaya, Muiskaya, Charskaya. One of the tasks was to determinate the conditions of human provision with heat for estimation of his life activity. For rough analysis the data basis was created, which includes more than 100 pages of material about climat observation in hollows and surrounding areas. Each of stations has been characterized by elevation of its location and 12 meteorological indices (wind speed, temperature and air humidity). One part of these was used in calculating of quantitative importance of bioclimatic indices (on the basis of their mathematical models) seasonally. On the first stage the quantities of these indices were used for working out of maps in figures with the help of GIS Arc/Info. By means of maps analysis (with regard to earlier made physical geographical area differentiating) the bioclimatic rayons borders were determined. In the revealed rayons the structures of moment weather were considered for making more precise in situation and determinating of climatic resources potential. They were considered in seasonal and daily motion. This all lets to determine the human heatstand on the territory of researched hollows.

On the second stage the initial data basis was replenished with calculated importances as bioclimatic, as other weather-climatic indices. These data were used in cluster-analysis procedures which let to make more precise in bioclimatic hollows zoning on more objective basis and to realize their classification. As a result the basis of maps in figures was built which includes different weather-climatic indices and describing bioclimatic potential of each hollow and its surrounding areas. Complex maps and hollow classification results analysis showed the following: 1) the orographical conditions inside the hollows foredetermine climatic differences of revealed rayons in consequence of heat and moisture redistribution and local specialities circulation forming; 2) for strongly breaking up hollows the difference in bioclimatic conditions from surrounding mountains is typical. This fact is also typical for hollows with middle breaking up and economical development of territory; 3) for Baikalskaya hollow the reverse tendency is typical because of softening influence of lake's water; 4) with decrease of dimensions and increase of hollows breaking up the infavourable climate influence on human health increases. As compared with their surrounding area the increasing of population adaptation in hollows is possible. In the whole the cartographical geoinformation researches gave an opportunity to reveal the main natural climatic factors determining population life activity and more favourable areas for human health.

Such approach to the analysis of landscape geochemical situation in Baikal watershed let to reveal more contrast and subjected to technogenic pressure areas.

References

- [1] Batuev, A., Bashalkhanov, I., Snytko, V., 1994. Geoinformation Systems in Researches of Environmental in Siberia. //InterCarto: GIS for Environmental Studies and Mapping Conference, 23-25 May, 1994, Moscow, Russia, p.55-57.