

## **CARTOGRAPHIC DATA SYSTEM FOR AN ESTIMATION AND FORECASTING OF A STATE NORTHERN TERRITORIES ENVIRONMENT**

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The geosystem doctrine is one of the major achievements of basic geography - it holds the key to purposeful accumulation and systematization of factual information in order to obtain new knowledge. Systematic approach to the geographical objects infrastructure is the basis of zoning, without which it is unreal to identify the problems of interaction between man, society and environment.

Human environment and the object of study - natural environment reside in a dynamic contact zone between endogenous and exogenous factors, as well as various geospheres: the lithosphere, biosphere, hydrosphere, atmosphere. These geographic components are interlinked not only in space but in time, and their development is interdependent: climate change causes changes in the organic world, lake levels, water availability, the nature of soil, and even in relief. Raising and lowering of the earth's crust cause climate that will inevitably lead to the restructuring of ecological communities, soils and geosystems in general. The main feature of any geosystem - is its integrity, manifested in the relative autonomy and resistance to external influences, as well as the presence of natural boundaries, structure order (vertical and horizontal).

Dynamics of geosystems is a reversible configuration and does not lead to a rearrangement of its structure. Evolutionary configurations are aimed (irreversible) configurations, that lead to a radical restructuring of a geosystem at local, regional or global levels. Stability and variability are geosystem's two fundamentally different properties in dialectical unity.

Because of relationship complexity in geographical features, large volumes of regional geographic studies of northern territories (quite fully described at the stage of system design), addressing major challenges of the present study is impossible without adequate methods of geographic forecast. A complete set of software for geographic features development predicting should be defined. These tools including statistical, objective and simulational modeling (each of which has positive and negative aspect), are based on some mathematical model (each of which has its own scope, as well as its advantages and disadvantages).

Meeting the challenges of resource assessment and forecasting the state of environmental components, environmental management and environmental protection of the northern territories with the help of a distributed system of geo-data is closely related to the scenarios of use and user groups for whom they were intended.

Data integration technology designed to create a single information space of spatial data.

The object of technological integration is information resources stored in distributed data systems on web-servers and geoportals of scientific organizations in the form of:

Databases;

Structured (in a particular format) data files;

Object data files (plain text documents, images, etc.).

Technology provides the following tasks:

registration and description of spatially distributed local data systems;

unification of encoding and presenting data;

Search and access to distributed data systems and data exchange between software components of technology and external software applications;

information provision through navigation queries among distributed data sources, querying and reporting their results to the external application.

Technologies include the following components:

Technical specifications of electronic exchange of spatially-distributed and semistructured data, defining data structure and metadata technology;

Software Packages "Data Source" and "Integration Server", implementing the tasks of technology.

The main subject area of geomodeling is the changes of the environment and its components, the assessment of natural resources and the environment. All of the modern environmental changes are associated with anthropogenic influences, and, therefore, one of the main tasks of geomodeling is to modeling the changes of environment and environmental practices. Development of conservation methods keeps pace with scientific and technical progress. Modern methods not only differ in the accuracy of information, but also possess such important quality as efficiency. In terms of conservation, efficiency is one of the main features necessary for natural resources conservation. In the course of its economic activity

humanity changes the surface of our planet more and more from year to year. Cities grow and invade new territories. The road networks crush the once common natural areas into isolated fragments. Deforestation processes change forest landscapes - ancient forests over vast areas are replaced by homogenous deciduous saplings, or monotypical forest plantations. In excessively dry or cold climate forests do not recover after deforestation. Rivers feeding the marshes are drained. Territories occupied by quarries, mines, drilling, industrial and municipal landfills, contaminated with oil products or damaged by industrial emissions multiply.

These problems are urgent for Russian Federation, especially for its the northern territories, and may be the main subject areas for geomodeling. Thoughtless exploitation of natural resources in the Soviet period has caused enormous damage to Russia's nature. Today's raw material orientation of the Russian economy leads to deeper problems and the radical transformation of new natural territories.