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NATIONAL ATLAS OF THE ARCTIC

ABSTRACT. The National Atlas of the Arctic is a set of spatio-temporal information about the geographic, ecological, economic, historical-ethnographic, cultural, and social features of the Arctic compiled as a cartographic model of the territory. The Atlas is intended for use in a wide range of scientific, management, economic, defense, educational, and public activities. The state policy of the Russian Federation in the Arctic for the period until 2020 and beyond, states that the Arctic is of strategic importance for Russia in the 21st century. A detailed description of all sections of the Atlas is given. The Atlas can be used as an information-reference and educational resource or as a gift edition.

KEY WORDS: GRACE, Arctic, Atlas, concept, structure, outcomes

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INTRODUCTION

This modern large-formate encyclopedic edition reflects the results of the Arctic studies of recent decades, which allowed accumulating unique information on a global scale. The Atlas represents a reference source and a scientific folio and, at the same time, it is a colorful album. In addition to maps, the Atlas contains illustrations, diagrams, graphs, schematic drawings, and tables. Each map is accompanied by a text description. The Atlas helps its readers to gain critical insight and understand the importance of the Arctic region for Russia and the world as a whole. The Atlas includes maps related to general Arctic problems, the Russian Arctic, and the regional issues. This edition represents the most complete modern body of knowledge of the region. The cross-border and interdisciplinary

nature of the Atlas will allow its readers to draw new conclusions and take into account those relationships that are not visible from the point of view of individual branches of science or spheres of activity; it will facilitate the new ideology of industrial revival of the region while preserving its nature.

The characteristic features of the Arctic zone of the Russian Federation, which influence the national policy in this region, are:

- a) extreme natural and climatic conditions, including permanent ice cover and drifting ice in the Arctic seas;
- b) focal character of industrial and economic development of territories and low population density;

c) remoteness from the main industrial centers, high resource intensity, and dependence of economic activities and livelihood of the population on fuel, food, and essential goods from other regions of Russia;

d) low stability of environmental systems determining the biological stability and climate of the Earth and their vulnerability to even minor anthropogenic influences.

Solutions to the problems of sustainable development of the Arctic zone of the Russian Federation in the context of the national interests and international dialogue, preservation of the environment, and development of Arctic natural resources require creation of a new integrated cartographic work — the National Atlas of the Arctic.

The Atlas is based on the concept outlined in the “National Atlas of the Arctic: Structure and Development Stages” (Kasimov et al. 2015). The main positions of this concept incorporated in the Atlas are as follows. Organizational and coordination work on the Atlas was made by the Joinet-Stock Company “Roscartography”.

CONCEPT OF THE ATLAS

The Atlas is an information-reference resource containing the most current and detailed data. In essence, it is a transboundary database that addresses the tasks of developing the region and preserving its biological diversity. The Atlas is not just a system for providing information to different social groups and the entire population of the region, but a system of information integration, which influences territorial management towards the optimal solution of the regional problems. It is designed not only to propagate the ideas of nature conservation, but also to emphasize the dependence of quality of life on quality of the natural environment and to offer environmentally sound management methods and environmental technologies.

The Atlas is an educational resource, i.e., a reference manual for all levels of education, from schools and universities to public and state organizations, professional schools, refresher courses, etc. The material integrates a highly advanced science and a clear presentation. In a highly understandable way it describes the indigenous population's traditions of careful treatment of nature. Tourist maps of the Atlas serve as guides to the Arctic, showing its landscape and ethnocultural diversity.

The Atlas is published as a gift edition; its design allows considering it as a general cultural asset that follows the best traditions of Russian cartography as exemplified by the “Atlas of the Arctic” (1985); “Atlas of Snow and Ice Resources of the World” (1997); “Ecological Atlas of Russia” (2002, 2017); “Atlas of the Russian Arctic in the 21st Century ...” (2013); “National Atlas of Russia” (2004-2008); and other works. A wide distribution of the Atlas will help maintain and develop the image of the Arctic as a global and the Russian national asset.

The Atlas presents in an optimal way the degree of study of the Arctic, its environmental problems, and the state of rare and endangered species; it also describes ethnic groups and their cultures. Russia differs from many circumpolar countries in that its Arctic territories are more populated and much more strongly involved in the economic life of the country. Therefore, much attention is paid to the problems of nature management — economic management and its consequences.

The scale of pollution of these territories is astonishing. Only in the Novaya Zemlya archipelago, 130 atomic explosions were conducted in 1955-1990. In the Barents and Kara Seas, there are flooded reactors from Soviet nuclear submarines. Numerous items have been abandoned on the islands of Franz Josef Land — nearly 250 thousand barrels with 40-60 thousand tons of oil products, about a million of empty barrels, and various equipment (airplanes, radar stations, vehicles and structures). In the

Severnaya Zemlya, where ships carrying out northern deliveries for military and civil needs moored, the total area polluted with waste is about 100 hectares. A special section of the Atlas comprehensively characterizes the environmental ills of the Arctic and discusses environmentally protective measures to address these problems. The description of potentially dangerous objects of the Arctic will be of interest to companies that conduct economic activities in the region.

One of the characteristic features of the Atlas is that all its sections contain maps with environmental content. The Atlas targets solutions to the problems of sustainable development of the region. Its task is to overcome the disconnect between the main information flows and the decision-making process, to create an information and analytical base for solving an array of problems. The creation of such an atlas will provide the basis for the scientific substantiation of the strategic planning of the socio-economic development of the Arctic zone of the Russian Federation and ensure the national security of Russia.

SCIENTIFIC FOUNDATIONS OF ATLAS

In order to design and create the National Atlas of the Arctic at high scientific and methodological levels that incorporate modern scientific achievements, a number of requirements have been met; these

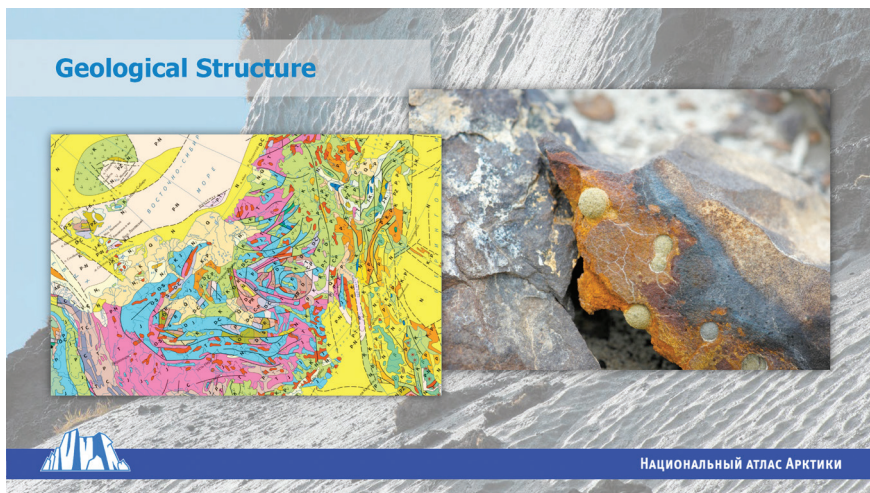
requirements were formed in the practice of cartographic research. The Atlas is a body of information and knowledge accumulated to date in the course of long-term and comprehensive study of the Arctic region and a means of research and development strategy.

The Atlas utilizes the latest scientific and methodological achievements of the complex of modern subject sciences (geography, biology, ecology, and history) and cartography, while preserving continuity with the best examples of the national and international cartographic works. The Atlas is part of the information system of the Arctic region of Russia; it is designed and functions as the system's constantly updated cartographic and geographic component.

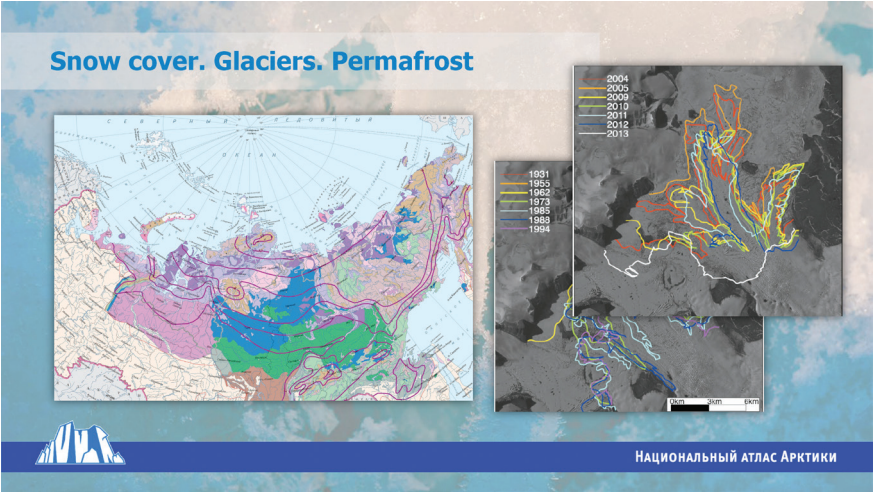
The Atlas can address multi-purpose goals; its content is versatile. It is thematically complete, geographically specific and detailed; it possesses internal unity (complementarity, consistency, and comparability of maps), scientific validity, modernity, clarity, and accessibility.

The Atlas reflects the features of the natural environment, the resource potential, the current state of society and the economy, and the level and direction of the socio-economic development of the Arctic region. Much attention is paid to the

(a)



(b)



(c)



(d)



comparative representation of a number of indicators characterizing the region.

The Atlas contains topics that reveal the main problems of the modern development of the Arctic, e.g., ensuring sustainable development of the region, preserving the resource potential, solving environmental problems and the problems of social infrastructure development, accelerating economic development, etc Fig. 1.

The variety of thematic maps and their large number require that different thematic sections be balanced among themselves in terms of the number of maps, their scales, levels of generalization, and other characteristics. When possible, the maps display phenomena in their dynamics and historical developmental context, which allows for a deeper understanding of the current processes and a forecast of their development features.

Mapping in the Atlas is realized on four spatial levels, each utilizing the appropriate scales and layouts (overall Arctic, Russian, regional, and local). All levels are closely linked.

The content of the maps is based on modern scientific approaches (integrated, system, inventory-resource, regional,

estimated-forecast, geo-engineering, ecological-geographic, historical, and comparative-geographic).

Cartographic objects and phenomena and their states and interrelations are evaluated and represented on three levels of generalization: analytical (mapping of "homogeneous" objects in one system of indicators), integrated (mapping of several interrelated phenomena or their elements, each in its own system of indicators), and synthetic (mapping of selected complex objects with integral characteristics).

PUBLICATION OUTCOMES

The Atlas targets primarily three groups of users: 1) decision-makers; 2) teachers and students; and 3) professionals in various fields of science, economics, culture, health care, etc. For decision-makers, the reference nature of the Atlas will serve as a cross-border database necessary for the development and preservation of the region. The Atlas will not be just a system for providing information for various social groups, but a system of information interaction and influence on the management of the territory towards its optimization.

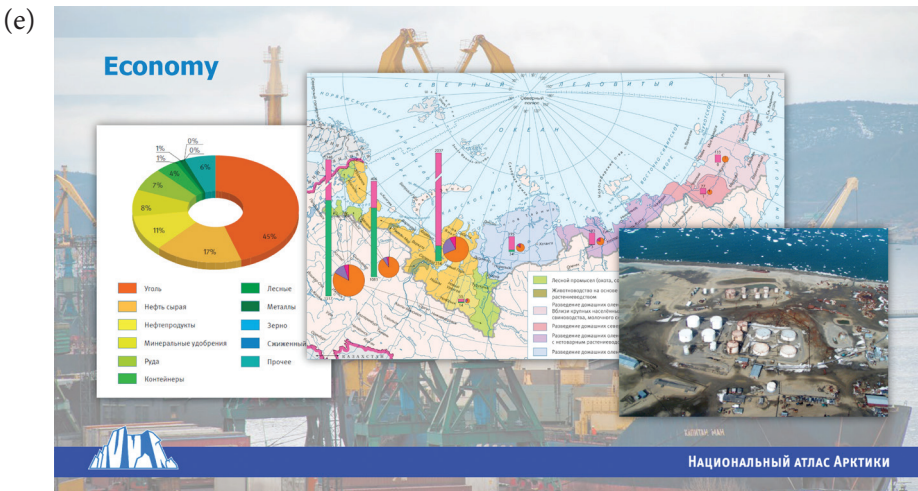


Fig. 1. Sample maps pages of the National Atlas of the Arctic: a – geological structure; b – Snow cover, glaciers, permafrost; c- Flora and Fauna; d – Population; e - Economy

Scientific Outcomes

The publication of the Atlas sets certain research tasks. The Atlas is not so much the statement of the existing order of things and the static reproduction of the realities of the Arctic region. Its purpose is to represent the dynamic nature of the region, because it is in the dynamics of relations that the significance of the region is recognized.

Public Importance

The Atlas describes the various features and prospects of the Arctic. The Atlas not only propagates the ideas of nature conservation, but it reveals the dependence of quality and diversity of life on quality and diversity of its natural environment and offers environmentally sound management practices and technologies. The presentation of the material combines a high scientific level and a clear language. The Atlas will be an important channel for interdisciplinary discussions for the broadest range of professionals.

Publication Impact

The full-color and richly illustrated edition of the Atlas can become a reference source for thousands of people — students of schools and colleges, scientists, teachers, and business and industry community. Its English edition will have a significant impact on the business climate in favor of rapprochement and cooperation between participants of political, economic, and cultural activities.

The National Atlas of the Arctic will serve as the scientific substantiation of strategic planning for the social and economic development of the Arctic zone of the Russian Federation towards strengthening Russia's leading positions in the Arctic.

Supplementary

Supplementary material, including list of maps of the Atlas is available at:
<https://ges.rgo.ru/jour/manager/files/Supplementarymaterials.pdf> ■

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