INTRODUCTION

The Geography Faculty of Lomonosov Moscow State University has prepared and published in 2013-2014 an unique Atlas "Russian Arctic in the XXI century: nature conditions and risks in the development". The Atlas includes 8 main sections, in which the allocation of the Arctic region of the Russian Federation and its borders, the history of its development, the most common geographical features of the area, and (in more details) geological, geomorphological, geocryological, meteorological and climatological, hydrological, environmental and socio-economic specifics of the region are discussed. It includes 36 original, updated and adapted thematic maps of scale 1:20 000 000 and 1:30 000 000; 16 illustrative cartographic images, detailed text explanation to the maps and a variety of illustrative material (169 color and 15 black-and-white diagrams and drawings, 160 color photos).

AIMS AND OBJECTIVES OF THE CREATION OF THE ATLAS

The creation of the "Russian Arctic in the XXI century: nature conditions and risks in the development" is one of the practical steps towards creating an information framework of managing the Russian Arctic territories, which primarily needs objective scientific information. The maps showing the ocean bottom geology and topography are needed to address the international legal issues on national identification of specific areas of the Arctic Ocean waters and shelf. Spatially distributed information on the geographical environment state will be also required by government agencies of the constituents of the Russia Federation.

It is expected that the unique current Atlas materials obtained on the basis of modern data and research results will be a source or information for the people of the Arctic region, executive bodies, different organizations and agencies, business structures and enterprises, emergency services, teachers, and students. They will provide users with information on potential natural and social risks, adverse consequences of using natural resources in the region and will be of great importance for sustainable development of the Russian Arctic.

Based on the Atlas, cartographic generalization can be carried out characterizing the features of the natural environment and economy in different regions of the country to reveal the patterns of natural and socio-economic processes using specific data. These materials will make it possible to objectively study the current state of the geographical environment and also predict its future changes, form a holistic understanding of changing components of the environment, relationship between the mechanisms of natural and man-made impacts in the process of transforming the world around us and of the impact of economic activities on the Arctic ecosystems of different scales.

Such atlases in Russia have never been published. Atlas of the Arctic and Atlas of the Water Balance of the Northern Polar Area were published in 1985 and in 1996, respectively, but they have a different focus and structure.

The representatives from seven departments and a research laboratory of the Lomonosov Moscow State University's Faculty of Geography were involved in the Atlas creation.
The Atlas consists of one introductory and seven main parts. They are Borders and history of development of the Russian Arctic (the sections and maps - Geographic location and borders of the Russian Arctic, History of development of the Russian Arctic), Geological structure and relief of the Russian Arctic (the sections and maps - The topography of the Arctic land and bottom of the Arctic ocean, The tectonic structures, Geological-geomorphological resources), The Russian Arctic Climate (the sections and maps - Air temperature, Atmospheric pressure and wind, Atmospheric precipitation, Snow cover, The severity of the climate, Climate-formation factors), Permafrost and glaciers of the Russian Arctic (the sections and maps - Permafrost, Thickness of permafrost rocks, Cryogenic processes, Island and mainland glaciations), Russian Arctic seas. Waters of land (the sections and maps - Seas. The sea ice coverage, Rivers and lakes, Runoff and water regime of the rivers, Changes in water resources of the rivers, Ice and thermal regime of the rivers, The use of water resources, The quality of river waters and aquatic ecological problems, Dangerous hydrological phenomena), Flora and fauna of the Russian Arctic (the sections and maps - The animal world. The biological resources of the seas and rivers, Environmental protection), The population and economy of the Russian Arctic (the sections and maps - Displacement of population, The areas of displacement of the peoples of Russia within the Arctic, Industry, Traditional agriculture and nature management in the Arctic regions of Russia, Transport) (examples on the Fig.1 - Fig. 6).
Figure 2. Map of the tectonic structure in the Russian sector of the Arctic

Figure 3. Map of air temperature in July
The map of the Arctic Ocean geological and tectonic structure takes into account the latest concepts. Many cartographic generalizations are based on previously unavailable archival materials, synthesis of a variety of knowledge about the nature, population and economy of this Russian region. The original Arctic development maps are presented to reflect not only the areas of expeditions and their achievements, but also the milestones of the North's industrial development and history of populating these areas.

Figure 4. Map of runoff and water regime of the rivers of the Russian Arctic

Figure 5. Map of water resource use in the Russian Arctic
Figure 6. Section of the Atlas is devoted to the ethnic groups of the Russian Arctic

The Atlas contains the data reflecting geo-ecological conditions of the region under study in 1960-1990, at the present stage (1990-2011), and the expected changes until 2050. The Atlas includes 36 original, updated and adapted thematic maps of scale 1:20 000 000 and 1:30 000 000; 16 illustrative cartographic images, detailed text explanation to the maps and a variety of illustrative material (169 color and 15 black-and-white diagrams and drawings, 160 color photos). The Atlas volume is 145 pages; edition - 155 copies, in Russian.

CONCLUSIONS

The creation of the Atlas "The Russian Arctic in the XXI century: nature conditions and risks in the development" is one of the practical steps towards the establishment of information bases of management of Arctic territories and marine areas.

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REFERENCES