

CREATION EXPERIENCE OF "THE NATIONAL ATLAS OF RUSSIA

KRAYUKHIN A., POZDNYAK G., RYABCHIKOVA V.

MPA Kartografija, MOSCOW, RUSSIAN FEDERATION

The idea of creation of "The National Atlas of the USSR", and then "The National Atlas of Russia" has begun actively to develop from the end 1950 – the beginning of 1960 period. However real steps have been undertaken only in the end of 1980th years when the Geographical faculty of the Lomonosov Moscow State University under the order of the Industrial cartographical union "Kartografija" has prepared the scientific report on a problem of such atlas creation. In 1994 the Government of the Russian Federation made the Decision "About the federal target program for 1994-1995 and till 2000 "Progressive technologies of cartographical-geodetic provision of the Russian Federation" in which creation of "The National Atlas of Russia" is certain as one of the major problems. In 1995 by efforts of leading scientific geographers, cartographers, historians, geologists and other specialists had been developed the Design of "Concept of "The National Atlas of Russia" in which the basic purposes, problems and scopes of the atlas have been certain, as well as the structure, contents and organizational questions of its creation. "The National Atlas of Russia" should consist of 10 volumes: "Geographical"; "Nature and resources"; "Population and social life"; "Economy"; "Ecology"; "History"; "Culture and national heritage"; "Russia and space"; "Regions of Russia"; "Summary".

Scientifically-help character of ten volumes version of "The National Atlas of Russia" demanded use of a number of large scale maps (for territory of Russia as a whole it was planned to use scale 1:10 000 000). The scientifically-help type of the atlas and the basic scale of maps in it defined a format of the atlas – 57×45 cm.

The project of "Concept of "The National Atlas of Russia" was recognized in Russia and abroad, but for its realization significant funds which were not at Roskartographya were required, therefore the "Concept of "The National Atlas of Russia" in a ten-volume variant of the atlas edition has not been approved.

MPA "Kartografija" in coordination with Roskartographya has reduced a format of "The National Atlas of Russia" in half, accordingly having changed scales of maps. The contents of volume has undergone some changes in comparison with "Concept of "The National Atlas of Russia" ten-volume variant; its format has decreased up to 43×29,5 cm, but the volume of each book thus has increased. It has allowed to use available in MPA "Kartografija" reserve of cartographical works and to facilitate work on the first volume.

"The National Atlas of Russia" is a fundamental complex cartographical product, called to allow complete representation of the nature, population, economy, ecology, history and culture of Russia, the national code of scientifically processed and mutually coordinated existential information. It is a special kind of cartographical product in which the State acts as object of mapping in all aspects and spheres of its existence and development. Concentrating the diverse information on Russia in the systematized, comparable and evident form "The National Atlas of Russia" carries out that functions of a databank, means of scientific research, a source of knowledge and formation of national consciousness of the Russian citizens, transfer of the information to new generations of people.

"The National Atlas of Russia" as the official state edition is created by Roskartographya on the instruction of the Government of the Russian Federation from May, 26, 2000.

Per 2004-2009 "The National Atlas of Russia" was published in four volumes: volume 1 "General characteristic of territory" (2004), volume 2 "Nature. Ecology" (2007), volume 3 "Population. Economy" (2008); volume 4 "History. Culture" (2008.) Each volume, being a component of "The National Atlas of Russia", at the same time is an independent cartographical product, having own informational and cognitive worth. Each volume keeps all basic features of the four-volume publication. It is internal unity; a coordination of maps and other materials of a volume; completeness of contents; a level of the subject cartographical study and generalizations; load density of maps conventional signs and inscriptions; configuration of pages of a volume; repeatability of a volume decorating-graphic as a whole and its separate pages; equal amount of pages, etc.

As scientific-theoretical baseline at creation of "The National Atlas of Russia" the state-of-the-art achievements of domestic science in the field of geography, geodesy and cartography served, as well as "Concept of "The National Atlas of Russia", approved by Head of Roskartographya. A methodological basis for development of "The National Atlas of Russia» contents were the state-of-the-art methods

established on domestic experience of atlas cartography, and also on the state-of-the-art technical and technological achievements in the field of cartographical manufacture.

Mapping of territory of Russia in “The National Atlas of Russia” is realized at four spatially-geographical levels: global and Eurasian (maps of the world and large parts of the Earth; Russia in the world, the Europe and Asia, the CIS, map scales – 1:150 000 000, 1:90 000 000, 1:60 000 000; all-Russian (the Russian Federation as a whole), map scales – 1:40 000 000, 1:30 000 000, 1:20 000 000, 1:15 000 000; regional (geographical areas, federal districts and subjects of the Russian Federation, separate regions, etc.), map scales – 1:5 000 000, 1:4 000 000, 1:2 500 000, 1:1 000 000; local (separate cities, industrial units, territories and sites most interesting as objects of nature, culture and economy), map scales – 1:5 000 000, 1:4 000 000, 1:2 500 000, 1:1 000 000.

“The National Atlas of Russia” includes maps (geographical; maps of the modern federal division of the Russian Federation and the administrative-territorial system of its each subject; thematic maps executed on a uniform cartographical basis; text explanatory to maps; aerial- and space images; illustrative material (portraits; engravings of military actions; reproductions of ancient maps; illustrations, giving representation about peculiarities of life in Russia; photos); chronological tables; help materials (lists of used sources, dictionaries of terms, index of place names.

Volume 1 “General characteristic of territory” contains 496 pages of maps and a text material which are grouped in six sections: Introduction; Formation, research and mapping of territory of Russia; Federal division of Russia; Geographical regions and the seas washing territory of Russia; Help data; Index of place names.

In the volume the Russia territory and its separate regions geographical characteristic are presented in cartographical form, as well as the basic data on a geographical position and geographical features of its territory, on formation and research of territory of the country, on the modern federal and administrative-territorial arrangement of the Russian Federation.

The section “Formation, research and mapping of territory of Russia”, for the first time created in the Russian atlas cartography, is included in the volume. In the section it is shown how the territory of Russia from the most ancient times up to now was formed and changed; how it was investigated by explorers, industrialists, travelers, scientists and experts and how changes of territory and results of its exploration were represented on topographical, geographical and thematic maps. As a result the section shows how the modern territory of the state and its map were generated. The contents of the section are presented in the chronological order on time periods by creation of the complex product synthesizing text, by cartographical (maps of modern compilation and reproduction of old maps) and the illustrative information. The section comes to the end with the chronological table of the major events which have led to changes of boundary lines of territory of Russia; of the major researches and dates of significant cartographical products creation.

The section “Federal division of Russia” reflects the modern federal arrangement of Russia and the administrative-territorial arrangement of its subjects.

The section “Geographical regions and the seas washing territory of Russia” is presented by geographical maps of Russia as a whole, the geographical regions and separate territories, and of the seas circumambient them. The space images which have been included in the section, allow the reader to look in a new fashion on known by geographical maps territory of our country. Besides, use in the atlas of domestic space images serves as ascertaining of Russian priority in an outer space exploration.

The section “Help data” includes texts, tables, thematic maps giving over-all geographical data on Russia, its nature and natural resources, population and economy.

The index of place names contains more than 53 000 names of geographical features and is generated by way of the Russian alphabet. The index has also independent worth, being the most volumetric list of names of geographical features of Russia.

The volume 1 of “The National Atlas of Russia” is the I&R encyclopedic cartographical aid for experts of various areas of science, production and culture, employees of the State machinery, teachers and students of academy and special high school, and also for wide layers of the population, both in our country and abroad.

The volume 1 of “The National Atlas of Russia” is geographical one, but at the same time it is an introduction volume for all “The National Atlas of Russia”. Therefore in the contents of the volume are included geographical maps; the maps reflecting history of the country territory formation; the federal arrangement of the Russian Federation and the administrative-territorial arrangement of each of the subjects entering into it. For more complete geography of Russia image in help section the thematic maps

describing physical-geographical zoning of the country, the basic components of the nature, especially guarded natural territories, the population, natural resources and economy, are included. It has allowed making logic transition to the subsequent thematic volumes of the atlas where the data generalized in the first volume are opened in more details.

Volume 2 "Nature. Ecology". Mapping objects in the volume are the natural conditions and resources of territory of Russia, environment and conservancy.

The volume contains 496 pages of maps, text and illustrative material which are grouped in 15 sections: Introduction section; Evolution of the environment; Geological structure and resources of bowels; Relief; Climate; Waters of the land; Snow. Ice. Frozen ground; Seas; Soil cover and land resources; Vegetation; Fauna; Landscapes; Environment condition; Wildlife management, Help section.

The Volume "Nature. Ecology" has the big scientific value as it contains the results of the complex scientific analysis representing modern data on the nature, natural resources and ecological condition of territory of Russia.

The Introduction section includes the material of historical-geographical character connected to the basic survey stakes of research and mapping of the nature and resources of Russia.

The section "Evolution of the environment" is devoted to the maps describing evolution of the environment in territory of Russia with climatic and hydro meteorological characteristics.

In the section "Geological structure and resources of bowels" are presented the maps reflecting a geological structure, hydro-geological and engineering-geological conditions, distribution of geophysical and geochemical fields, disposing of principal kinds of minerals. Series of maps are devoted to a theme of geological environment protection.

In the section "Relief" the maps are presented describing a geomorphologic structure and zoning of territory of Russia, over-all orography and hypsometry of landform, relief formation processes.

The section "Climate" consists of maps and schemes showing the space representation of climatic characteristics of the country and trends of climate change in view of natural and anthropogenous factors.

The section "Waters of the land" contains the maps which are representing a hydrographic network, catchment basins, various aspects of flow, dangerous hydrological phenomena, etc.

The section "Snow. Ice. Frozen ground" sheds light on glaciological conditions and snow-ice resources.

In the section "Seas" the information on the seas which are surrounding territory of Russia, their physical, chemical and hydrological characteristics, etc. are given.

In the section "Soil cover and land resources" maps are brought and schemes showing general characteristics and profiles of the basic soil types, data on their fertility, structure, water and temperature regimes.

The section "Vegetation" includes assemblage of the maps reflecting characteristics of the modern vegetative cover.

The section "Fauna" represents the series of the maps describing various kinds of land and water animals, including rare and disappearing.

In the section "Landscapes" the maps which are representing modern landscapes and landscape profiles, maps of physical geographical zoning and maps of the population living conditions estimation.

The section "Environment condition" is devoted to conditions of ecological situation formation and includes the maps reflecting various aspects of man impact on the nature, of various industries, agriculture and forest utilization impact.

The section "Wildlife management" includes maps of nature management optimization, recreational resources, wildlife management, participation of Russia in the international nature protection conventions and agreements.

Volume 3 "Population. Economy" represents complex multi-purpose cartographical model of the population and national economy systems at the present stage of development. The volume is intended for wide use in sphere of public administration, in social, economic, scientific, educational and other fields of activity. Objects of mapping are the population and economy of the Russian Federation, and also formed by their interaction social and economic systems.

Contemporaneity of the volume is attained by use of the latest on the time of publication official statistical data on the population and economy. Almost all thematic contents of maps are constructed on use of design data from official statistics, including "Results of the All-Russia population census, 2002".

Scientific reliability of the volume contents is attained by use of different approaches to mapping social and economic objects, phenomena and processes – inventory-network, spatially-typological, spatially-

statistical, historical, and estimation-recommendatory. Scientific reliability of the volume is attained, also, by use of three levels of generalization at mapping the objects: analytical, with allocation of elementary (separate) objects and their properties in one system of parameters; complex, providing the joint image of interconnected objects in their own systems of parameters; synthetic, with uniform (integrated) characteristics of integrated and generalized objects.

Map to map coordination and with other volumes of "The National Atlas of Russia" is attained by application of the system approach to cartographical representation of the social and economic phenomena and processes. Thus in the volume, thematic plots are used close in relation to other volumes, but discriminate by the contents and the form of information presentation.

The basic scales of maps for territory of Russia as a whole – 1:15 000 000, 1:30 000 000 and 1:40 000 000. Considering specificity of the territorial division of Russia, the significant number of maps is presented in a following kind: for the European part of Russia the scale 1:10 000 000, for the Asian part of Russia – 1:22 000 000. As a unit of mapping a subject of the Russian Federation (republic, kraj, oblast, autonomous oblast, and autonomous district) is accepted.

Almost all thematic contents of maps are constructed with use of settlement parameters from official statistical data, including "Results of the All-Russia population census, 2002".

The volume contains 496 pages of maps, text and illustrative material which are grouped in 4 sections: "General characteristic of the Russian Federation"; "Population and social development"; "Economy and economic development"; "Regions and regional development" (each section includes a number of subitems) and help data.

The section "General characteristic of the Russian Federation" includes subitems "Place of Russia in the world", "Territorial arrangement of the Russian Federation" and "Geographical conditions of settling and economy".

One of primaries on value and volume is the second section of the volume "Population and social development" which is devoted to characteristic of the population, social habitat and social evolution. Accordingly there are three subitems: the population and settling, social sphere, sociopolitical evolution.

The third section under the name "Economy and economic development" does not concede to the extensive section "The population and social evolution" on extent of importance. The structure of the section is built on the consecutive characteristic of the basic spheres of economy: Manufacture – Infrastructure – Investments into subitems "Industrial sphere", "Infrastructural sphere", "Investment sphere".

In the fourth section "Regions and regional development" series of the complex social and economic maps on federal districts are given reflecting their social and economic structure and the basic features of regional economy. In the volume the maps of Russia regions basic types are presented on a level and type of social and economic evolution, problematical character and stability of a region, long term prospects of evolution, etc.

The volume 3 "Population. Economy" comes to the end with the dictionary of terms and the list of the used sources (literary, cartographical, and statistical).

Volume 4 "History. Culture" is devoted to domestic history and culture. The volume is intended for wide use in scientific, educational, administrative and other kinds of activity. A course of historical development of the Russian state from an antiquity till now is opening consistently there; the major events connected with formation of territory, its settling, wars, political events and directions, evolution of economy are shown; the existential information on the cultural and natural heritage of the country is present. The volume contains 496 pages of maps, text and illustrative material which are grouped in two parts "History" and "Culture".

The section "History" consists of 14 subitems generated in the chronological order: "The most ancient cultures", "Early iron age and great resettlement of people", "Ancient Russia in the IX–beginning of XIII century", "Mongol–Tatar invasion. Struggle for independence of Russia", "Integration of Russian lands in XIV – first half XV centuries", "Russia in the second half of XV–XVI centuries", "Russia in XVII century", "Russia in the first half of XVIII century", "Russia in the second half of XVIII century", "Russia in the first half of XIX century", "Russia in the second half of XIX century", "Russia in the beginning of XX century", "Russia in XX century. The Soviet period", "Russia in the beginning of XXI century".

The contents of subitems consistently and in the chronological order throws light upon historical events and the phenomena reflecting the most significant stages of coming into being, formation and evolution of

the Russian statehood. The time periods making subitems of given section are singled out in view of the time of the state boundary lines essential changes, level of its geographical study and mapping.

In the section the travel, geographical discoveries and researches of our country during the certain historical period are reflected, the history of the Russian cartography origin and evolution of domestic mapping (from the first hand-written maps to creation of fundamental cartographical products) is shown. The text is accompanied by maps, fragments of ancient maps, portraits of researchers and cartographers.

The maps of the "History" section are created on the basis of the big actual material analysis, are rich on the thematic contents, and are colorfully issued. This section supplements and essentially expands the historical materials presented in the first volume of "The National atlas of Russia" in the section "Formation, research and mapping of territory of Russia".

The section "History" comes to the end with the chronological table of the major dates and events.

The section "Culture" consists of two subitems: "Cultural and natural heritage of Russia" and "Modern culture".

The culture in the section is considered as public phenomenon and as branch of social sphere which development was caused by historical events. Here the collection of the modern information and knowledge of the cultural and natural heritage of Russia is given, mechanism and characteristics of distribution and development of regional and national cultures, interrelation and mechanisms of their interaction is shown. Also there the material for development of the all-Russian and regional programs on protection and use of heritage objects for preservation and restoration historical, cultural and the human environment of Russia is presented.

The cultural heritage is one of the major modern resources defining social and economic, and welfare development of Russia at a global level. The heritage includes not only the art values, separate architectural or history-memorial objects, but also slightly changed environment, the historical environment of cities and rural settlements.

The subitem "Cultural and natural heritage of Russia" is the greatest one and covers the extensive list from small-scale maps covering all territory of Russia up to of city plans and schemes of separate objects. Here maps of archeology monuments which are under federal protection, monuments of military history, cult architecture, civil, industrial architecture, monumental art, country estate architecture are presented. The big interest represent maps of national art crafts and crafts represent as well, as maps "Russia in products of domestic writers" and "Russia in products of domestic painters".

The significant attention is given to maps of subjects of the Russian Federation; their administrative centers both historical cities and settlements with display on them of monuments of the cultural and natural heritage, namely under the world, federal and regional levels of protection.

The maps in the subitem "Modern culture" reflect activity of establishments of culture (theatres, museums, libraries, archives, club establishments, and higher educational institutions in sphere of culture). There the information block, devoted to cognitive tourism and the excursions, showing use of objects of the heritage in sphere of tourism is included. The history of Russia cultural and natural heritage objects protection and the organization of protection and restoration management of heritage objects is covered.

The section "Culture" comes to the end with the dictionary of terms and the chronological table of the major dates and events.

In creation of "The National Atlas of Russia" in four volumes about 1 000 scientists, cartographers and experts took part from more than 50 scientific organizations of various departmental subordination.

"The National Atlas of Russia" is created with use of the most extensive modern information base and modern technologies. Drawing up and map preparation were carried out by means of GIS–Neva program.

Electronic versions of the first volume "General characteristic of territory", the second volume "Nature. Ecology" and the third volume "Population. Economy" were released. Release of the electronic version of the fourth volume "History. Culture" is planned, and also GIS versions of all four volumes of "The National Atlas of Russia" are planned.

"The National Atlas of Russia" published in Russia for the first time is an example of a modern fundamental encyclopedic cartographical complex scientifically help – informational resource of the state, which represents the base information layers in an information system, promoting development of national and regional programs of ecological, economic, social, cultural-educational and other value.

The scientific community has highly estimated the published volumes of "The National Atlas of Russia": "The award for outstanding achievements in cartography" was adjudged to Roscartographya for creation of "The National Atlas of Russia", Volume 1, in 2005 at the International exhibition of maps during the 22-nd International cartographical conference of the International cartographical association (July, 9–16,

2005, La Coruna, Spain). The award of 1-st degree "For outstanding achievements in cartography" was adjudged to Russia for creation of "The National Atlas of Russia", Volume 2 "The Nature. Ecology" in 2007 at the International cartographical exhibition during XXIII International cartographical conference of the International cartographical association (August, 4–10, 2007, Moscow, Russia). In St.-Petersburg at Russian geographical society (September, 21–24, 2008) Scientific-practical conference "Cartography to tourism" "The National Atlas of Russia", Volume 3 "The Population. Economy" has been awarded by DIPLOMA of the I-st degree: "MPA "Kartografija" is awarded for development of "The National Atlas of Russia", Volume 3, as the winner of competition "The Best tourist map" 2008 in the nomination "The Best scientific development". At the Sixth International specialized exhibition and the scientific Congress – «GEO-SIBIR-2010» (April, 27–29, 2010, Novosibirsk), MPA «Kartografija» has participated in competition "The Gold Medal of the Siberian Fair" in the nomination "Cartography" having presented "The National Atlas of Russia" in four volumes. "The National Atlas of Russia" has won "The Big gold Medal of the Siberian Fair GEO-SIBIR-2010".

The report will be accompanied by presentation.