The National Committee of Cartographers of the Russian Federation

Cartographic Activities in the Russian Federation 2007–2011

National Report to the International Cartographic Association's 15th General Assembly Paris, France 3–8 July 2011

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GENERAL OUTLINE

In May 1993 on the 16th Conference of the International Cartographic Association (ICA) in Germany (Cologne) Russia was recognized to be a legal successor of the Soviet Union within the ICA.

The National Committee of Cartographers of the Russian Federation (NCC) was formed on June 22, 1994 as an interdepartmental agency representing Russia in the International Cartographic Association and other international organizations dealing with the problems connected with cartography.

The National Committee of Cartographers of the Russian Federation includes the leading cartographers and specialists in geoinformatics of the Russian Academy of Sciences, universities, production plants, and non-governmental organizations which carry out research, production and other kinds of work and also the training of specialists in the sphere of cartography.

The main tasks of the National Committee of Cartographers of the Russian Federation are the following:

- Organization and realization of effective cooperation in the sphere of cartography between Russia and the International Cartographic Association, other international cartographic organizations, as well as national committees of cartographers in other countries;
- International popularization of Russian scientific and practical achievements in the sphere of cartography;
- Summarizing and spreading of foreign experience concerning the solving of scientific, technical, and technological economic problems in the sphere of cartography and working-out of recommendations to level up research and cartographic production in order to improve the quality of produced maps and atlases.

OFFICIAL ORGANAZATIONS

THE STATE CARTOGRAPHIC AND GEODETIC SERVICE OF RUSSIA – Rosreestr

Since 2008 the Federal Service of State Registration, Inventory and Cartography (Rosreestr, http://www.rosreestr.ru) has been the federal institution of the Russian Federation executive power which executes the activities concerning the rendering of state services and management of state property in the sphere of geodesy and cartography and also of geographic objects entitlement. Besides that, land and realty registers are also under the supervision of this state institution.

The Federal Service of State Registration, Inventory and Cartography exercises among others the following authorities within the stated sphere:

1. Holds competitions and concludes state contracts on cartographic and geodetic work and rendering services, on carrying out of research and development.

2. Exercises the functions of state geodetic supervision and licensing of geodetic and cartographic activities on the territory of the Russian Federation.
3. Organizes the execution of work concerning the state services in the sphere of geodetic and cartographic activities, the geographic objects entitlement, and the creation of spatial data infrastructure including
   - establishment, standardization, use, registration, recording, and maintaining of geographical objects names, formation and management of the State Catalogue of Geographical Names;
   - formation and management of federal geographical information systems;
   - the mapping of Antarctica, continental shelf of the Russian Federation, the territories of foreign states and the World ocean;
   - geodetic, cartographic, topographic, and hydrographic support of the delimitation, demarcation, and checking of the Russian Federation state boundary lines, and also of the Russian Federation maritime areas delimitation;
   - designing, compilation, and publication of comprehensive, political and administrative, scientific and reference, and other thematic interdisciplinary maps and atlases, as well as cartography study guides;

On December 17, 2010 the Government of the Russian federation approved the new "Development concept of the geodesy and cartography branch up to 2020".

Radical modernization is determined to be the main direction of development in the sphere of geodesy and cartography for the period up to 2020.

The main directions of development of the Russian Federation state cartographic support system:

- changes in technology of state topographic maps storage by means of their transformation into topographic objects databases with their metadata, that will provide their quick updating;
- changes in technology of spatial data updating by using methods of topographic monitoring and informational interaction between federal executive institutions, executive state institutions of the Russian Federation entities, and local authorities in order to update the topographic objects database;
- development, making, and placing into orbit of the Russian space mapping complex of a new generation for the purposes of the Earth remote sensing with a spatial resolution not less than 0.5 m;
- creation of a federal information system providing web-access of citizens and organizations to the state topographic maps and plans.

In order to create marine spatial data of the Russian Federation and to provide consumers with actual cartographic information it is planned to:

- provide marine zones under the jurisdiction of the Russian Federation and World ocean water areas with precise bottom relief survey using modern techniques;
- create a base of bathymetric and other marine spatial data about marine zones under the jurisdiction of the Russian Federation on the basis of existing materials and hydrographic work (surveys) data using modern techniques and information obtained as part of international exchange up to 2015, and about the World ocean – up to 2020.

The legal framework of the geodetic and cartographic activities as well as in the sphere of geographic objects entitlement is provided by the Constitution of the Russian Federation, by the Federal Laws "On Geodesy and Cartography" and "On Geographic Objects Entitlement", and by other legal regulations of the Russian Federation Government. A revised version of "The Law on Geodesy and Cartography" is being prepared and a new Law of the Russian Federation on spatial data infrastructure is being worked out nowadays.

The present head of the Federal Service of State Registration, Inventory and Cartography (Rosreestr) is Sergey V. Vasil'ev.

ACTIVITIES OF ROSREESTR IN THE SPHERE OF CARTOGRAPHY

Rosreestr continued the activities of its predecessor – the Federal Agency on Geodesy and Cartography - connected with the publication of cartographic works of high quality and rich in information. The cartographic activities of Rosreestr are aimed at the increase of cartographic production for public authorities of the Russian Federation, supporting industries, education, science, and culture.

State topographic maps are the basis of cartographic information. Nowadays Rosreestr has got the bank of digital topographic maps at scales of 1:1,000,000, 1:200,000 and 1:100,000 covering the whole territory of Russia. The formation of the full set of digital topographic maps at a scale of 1:50,000 will be finished to the end of 2011. Digital maps at a scale of 1:25,000 have been made for the great part of the country territory. Large-scale digital topographic maps of individual regions, administrative centers of the Russian Federation entities, and ecologically and technologically unfavorable areas are being created now.

Among the largest works published by Roskartografiya and Rosreestr in 2007-2011 it should be mentioned the 3rd and 4th volumes of the National Atlas of Russia, the comprehensive map "Russia" at a scale of 1:2,500,000, world political maps at scales of 1:15,000,000 and 1:30,000,000, the state map "The Russian Federation" at a scale of 1:4,000,000 (comprehensive and administrative versions), wall comprehensive maps of federal districts at scales of 1:700,000 – 1:2,500,000, and others. The publication of the map series "Comprehensive maps of the Russian Federation", "Topographic maps of Russia", "Maps of Russia's Cities", "Administrative maps of the Russian Federation", "Maps of Russia's motor roads", "Countries of the World", regional comprehensive and road atlases covering the entities of the Russian Federation have been continued. The Atlas of railroads of the Russian Federation has been issued. Regional atlases of higher informative contents on the basis of the state unclassified topographic map at a scale of 1:100,000 have been created; the updating and publishing of wall maps to support geography and history education have been continued. The program of creating digital topographic maps at a scale of 1:100,000 and of free access digital maps on their basis, as well as thematic maps of higher informative contents and navigation charts has been launched to a great extent.

BRANCH MAPPING

Together with cartographic work of federal importance some ministries and agencies of the Russian Federation carry out cartographic works supporting specific branches of science and production.

The main authorities which perform state mapping in different branches within the territory of Russia are the following:

- The Ministry of Natural Resources of the Russian Federation (geological and geoecological mapping);
- The Ministry of Defense of the Russian Federation (maps and plans to support defense capacity and navigation maps);
- The Federal Agency on hydrometeorology and environmental monitoring (meteorological charts, radioecological mapping);
- other federal executive authorities.

The Ministry of Natural Resources of the Russian Federation (MNR of Russia) has created the series of state geological maps of Russia at scales of 1:1,000,000, 1:200,000, and others including maps of pre-quaternary deposits, quaternary deposits, useful geological resources, underground waters. The compilation of regional geological maps is in progress now.

In order to provide Russia's ecological and geological security MPR of Russia performs hydrogeological, engineering geological, and ecogeological surveys at a scale of 1:200,000 which serve as a basis for the compilation of ecogeological maps at scales of 1:200,000 -

1:1,000,000; besides that MPR carries out special ecogeological research in zones of environmental hazards and emergencies.

In **the Ministry of Defense of the Russian Federation** cartographical work is performed by Military Topographical Board (MTB) of the Armed Forces General Staff and by Board of Navigation and Oceanography (BNO).

MTB creates special maps to solve specific problems of military strategy, operations planning and tactics, maps for military encyclopedias and books as well as atlases and maps for broad public use. BNO creates sea charts for navigation and the support of activities of the navy and the merchant and fishing fleets of the Russian Federation. In accordance with the recommendations of International Hydrographic Organization BNO issues new manuals for navigators in form of reference maps combining chart and nautical book features as well as special hydrometeorological reference books for the Navy.

The Federal Agency on hydrometeorology and environmental monitoring (Rosgidromet) has created ecological maps of radiologically hazardous objects at scales of 1:1,000,000 - 1:2,500,000.

CARTOGRAPHY AND GEOINFORMATICS IN THE RUSSIAN ACADEMY OF SCIENCES

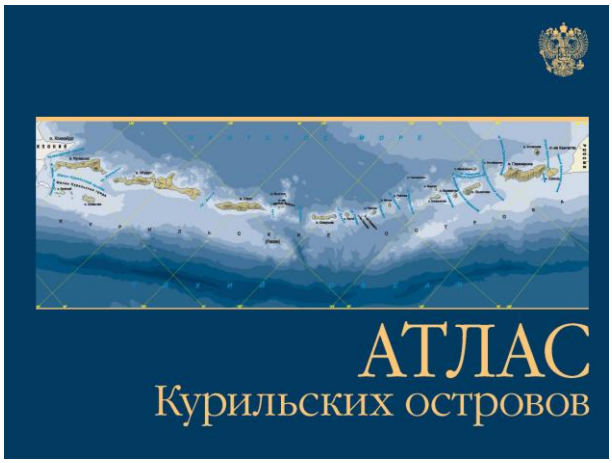
In research institutes of the Russian Academy of Sciences (RAS) different works were performed aimed at the creation of fundamental complex and thematic atlases of different territorial coverage (Russia, regions of Russia and individual cities), compilation of a new type of thematic maps, development of the theory and methods of geographical mapping, development of GIS and geoinformational mapping techniques.

The main RAS institutes performing scientific cartographic work are the following:

- the Institute of Geography of the Russian Academy of Sciences;
- V.B. Sochava Institute of Geography of the Siberian Branch of RAS;
- the Pacific Institute of Geography of the Far Eastern Branch of RAS;
- the Institute of Water and Ecological Problems of the Siberian Branch of RAS.

The Institute of Geography of the Russian Academy of Sciences

The Institute of Geography of the Russian Academy of Sciences (http://igras.ru/) in cooperation with the Pacific Institute of Geography of the Far Eastern Branch of RAS and Publishing and Producing Center «Design. Information. Cartography» has published a large detailed geographical Atlas of the Kuril Islands in 2009.



This is the first case in the world, when a regional atlas is devoted to insular geosystems. Its 270 new original thematic maps and related explaining texts characterize all principal aspects of the history, nature, population, and economy of the Kuril Islands as well as their extremely important geopolitical position among countries of the Asia-Pacific. The Atlas includes over 650 illustrations (photographs, space images, depictions of old maps and artifacts) visually demonstrating the unique nature and resources, the rich history and today's life of the Kuril Archipelago. It summarizes the results of scientific field research on the Kuril Islands and the adjacent water areas carried out by Russian scientists over the last 60 years. The Atlas is the accumulation of various sources of information and modern data on nature, resources, and the environmental potential of the region. The atlas illustrates the conditions of the regions development and use, population, economy, the development prospects of the islands, the history of their discovery, exploration, and research, as well as the position of the Kuril Islands within the geopolitical and geoeconomical context of the Asia-Pacific Region. The Atlas is aimed at providing scientific, informational, technical, and data support for various actions and developments in the principal spheres of social activity, such as economic practice, economic and regional policy, legislative and regulative practice, defense projects, science, training and education, the development of ties with foreign countries, foreign policy, and international relations. The Atlas of the Kuril Islands confirms the clear priority of Russian scientists and experts in the research and mapping of this important region for Russia. It has no analogs in modern mapping of purely developed areas as far as the scale of main basic thematic maps (1:500,000), details and novelty of presented data, deep analysis of themes and topics are concerned.

The Institute of Geography of the Russian Academy of Sciences (RAS) together with other RAS institutes participated actively in the creation of fundamental complex geographical atlases, such as the National Atlas of Russia, atlases of nature hazards and risks in federal districts of the Russian Federation etc.

The Institute of Geography of the Russian Academy of Sciences various geoinformational projests are carried out, the Internet portal "Geography" (http://webgeo.ru), the system of Northern areas resources assessment and forecasting of the state of natural environment components, and the digital cartographic ecogeomorphological model of Moscow are created.

Main requirements to basic spatial data are worked out, which are one of principal elements of the creation and development of the spatial data infrastructure in the Russian Federation. The developed regulations

change significantly the approaches to work and research activities concerning the creation, maintenance, providing, and use of data on geographical objects in broad spheres of science and practice. The results are implemented in one of the first national standards dealing with the spatial data infrastructure – GOST R 53339-2009 «Basic spatial data. General requirements».

The expert group of Roskartografiya participated in the development of proposals for the amendments to the Federal Law "On geodesy and cartography" dealing with the introduction of spatial data concept into the law and with the providing of legal possibilities to maintain cartographical and geodetic records including spatial data at the levels of the Russian Federation entities and municipal entities.

The Institute of Geography of RAS has lent consultative support to local authorities in the realization of spatial data infrastructure, more than 50 municipalities of three *oblast*s (provinces) - Moskovskaya, Nizhegorodskaya, and Kaluzhskaya - has taken part in it and also the special Internet portal http://www.municipalitet.info. Feedback portals for interaction of local authorities have been developed, more than 1,000 specialists of local authorities have been trained.

The Department of fuel and energy complex of Moscow Government has been rendered scientific and technical assistance in organizing of obtaining, integration, and distant provision of information resources of municipal basic spatial data (Moscow united state cartographic basis, Street reference book and classifier, and Address register of Moscow) to provide informational support for the management of energy, gas, and heat supply systems in the territory of Moscow.

The Institute of Geography of RAS took part in the development of “The Strategy of the creation of the Academy spatial data infrastructure” which is aimed at the creation of a distributed network of its centers in RAS institutions dealing with geography, geoecology, geology, geochemistry, and geophysics and unites geoinformational resources (special data and metadata) in the RAS Bank of scientific data.

The technology of using cartographic sources with the help of "GIS light table" has been developed to compile thematic maps http://geocnt.geonet.ru/ru/soil (Russian) and http://geocnt.geonet.ru/en/soil (English).

The methods to work with cartographic projections to image objects and phenomena on the whole Earth surface have been proposed http://geocnt.geonet.ru/ru/proj_mollweide (Russian) and http://geocnt.geonet.ru/en/proj_mollweide (English).

The Pacific Institute of Geography of the Far East Branch of RAS

The Pacific Institute of Geography of the Far East Branch of RAS (http://tig.dvo.ru/) has carried out research in two main directions of geoinformatics: 1) Development and implementation of the principles of geoinformational support of regional natural resources management in the Russian Far East (the Amur River basin); 2) Development of modern

technology and management of geospatial information based on the use of open standards and the spatial data infrastructures concept.

Informational digital comprehensive and thematic layers (geological structure, vegetation, soils, and land use (in the past and at present time), protected nature areas, geomorphological zonation) have been compiled for the Amur River basin on the ARC/INFO, ArcView, ArcGIS platforms.

The Institute for Water and Ecological Problems of the Siberian Branch of RAS

The Institute of Water and Ecological Problems of the Siberian Branch of RAS (http://www.iwep.ru:88/index.htm) has published the map "The Altay landscapes" at a scale of 1:500,000 (2011), and the complex scientific and reference atlas of Barnaul (2007), the "**Historic atlas of the Altayskiy *kray* (region)" (2007)**.

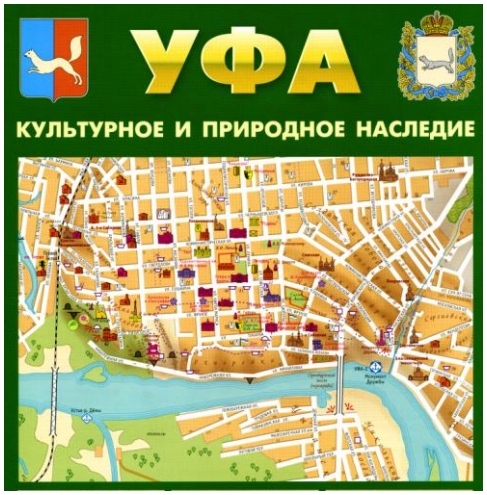
A series of environmental, medicogeographical, land use, tourist and other assessment maps has been developed for the Altay region; a series of geoinformational water resources and water environmental maps have been compiled for the Ob' and Irtysh river basins.

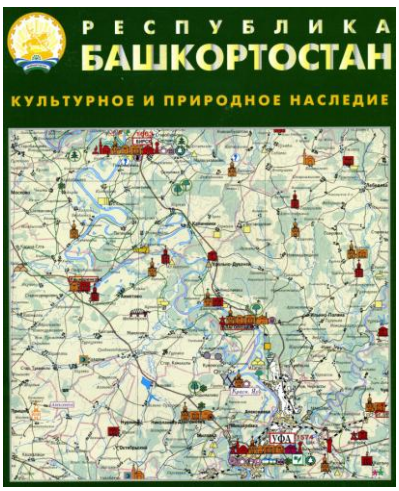
D.S. Likhachev Russian Research Institute for Cultural and Natural Heritage

The new direction of thematic cartography – the mapping of cultural and natural heritage of Russia and of its separate regions - is continuing to be developed in D.S. Likhachev Russian Research Institute for Cultural and Natural Heritage.

The institute has developed the methods of mapping of heritage objects which include archeological, historical, architecture, and monumental art sites.

In 2008-2011 the following maps were compiled and published:





1. The City of Ufa. Cultural and natural heritage. Scale 1:28,000, the city center 1:14,000. 2008.
2. The Republic of Bashkortostan. Cultural and natural heritage. Scale 1:500,000. 2008.
3. Country estates in the Kaluga region. Scale 1:350,000. 2008.
4. Country estates in the Smolensk region. 1:350,000. 2009.
5. Country estates in the Tula region. Scale 1:350,000. 2011.
6. Religious tourism in Russia. Scale 1:10,000,000. 2010.

THE ACTIVITIES OF CARTOGRAPHIC DEPARTMENTS OF RUSSIA'S NATIONAL LIBRARIES

Traditionally the group of national institutions having the biggest cartographic collections in Russia include the Russian State Library in Moscow (http://www.rsl.ru), the National Library of Russia in St. Petersburg (http://www.nlr.ru), the Library of the Russian Academy of Sciences in St. Petersburg (http://www.rasl.ru), state archives, and the State Historical Museum in Moscow (http://www.shm.ru).

The libraries perform the whole range of works with cartographic documents: acquisition, the formation of the stock, cataloguing, servicing, exhibition activities, as well as scientific research of stocks.

The activities of state archives and the State History Museum are mainly aimed at the research dealing with cartographic documents.

Acquisition

Libraries get domestic cartographic documents according to the Law of the copyright deposit; since 2003 this law has been also extended to CDs. The sources of foreign maps and atlases acquisition are diverse: buying, international exchange, gifts.

Cataloguing

The libraries perform digital cataloguing of new accessions. From 2007 till 2010 the Department of cartographic editions stock of the Russian State Library got 2949 titles (3486 stock-keeping units) of cartographic editions; the Department of cartography of the National Library of Russia got 2511 titles (4120 stock-keeping units) of cartographic editions. The stock sizes of the three libraries as at 01.01.2011 are the following:

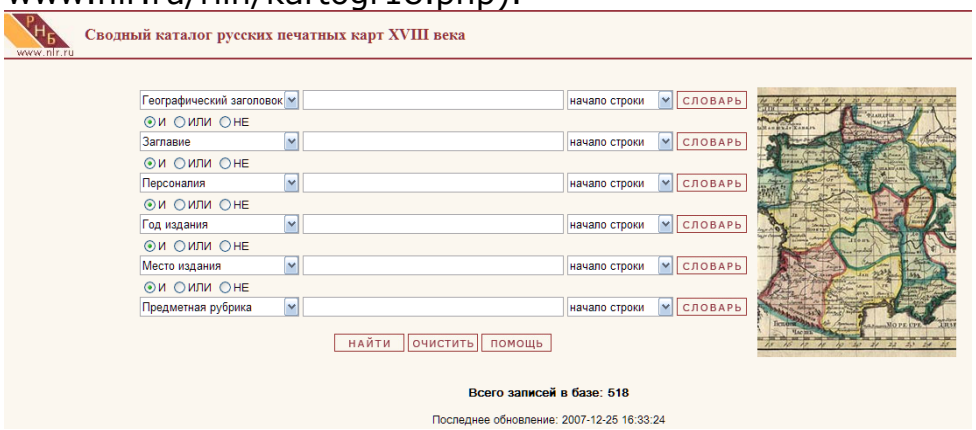
The Department of cartographic editions of the Russian State Library – 123,318 copies (160,604 stock-keeping units).

The Department of cartography of the National Library of Russia – 99,509 copies (193,982 stock-keeping units).

The Sector of cartography of the Department of stock and service at the Library of the Russian Academy of Sciences – 110,700 stock-keeping units.

Bibliographic and Scientific work

The departments of cartography of national libraries in cooperation with the Russian State Archive of Ancient Documents, the Military Historic Archive, the State Historic Museum, the Russian Geographical Society, and other organizations keeping ancient domestic maps and atlases have created the joint catalogue of Russian printed maps of the 18th century (http://www.nlr.ru/rlin/kartogr18.php).



The libraries carry out intensive exhibition activities. For example, the National Library of Russia held two large exhibitions:

"The maps of the Baltic region" (2008) and "The worthy triad: science, art, education. To the 151st anniversary of the foundation of A. Il'in Cartographic Establishment" (2010). Besides that, it provided maps and atlases for the following offsite exhibitions: 'Warsaw. Historical images. Old maps, plans, and panoramas of Warsaw" (Historical museum, Warsaw, 2008), the exhibition to the 80th anniversary of Leningradskaya *oblast'* (province) (the Smol'ny Cathedral, St. Petersburg, 2008), the exhibition to the opening of the President Library (St. Petersburg, 2009), "200 years of the Finland statehood" (Turku, Finland, 2009), "200 years of the establishment of diplomatic relations between Russia and the USA" (St. Petersburg, the Pushkin Museum, 2009). The **Department of Cartography** of the National Library of Russia has begun holding also electronic exhibitions: "Four maps of the Great war", "Lomonosov and the Geography Department of the Academy of Sciences", "Maps of Leningradskaya *oblast'* (province)", "Russia's vast expanses in Pushkin's verses".

Digital cartographical libraries

Making of digital copies is an efficient method to provide both preservation of and accessibility to the national cartographic heritage. For this purpose the National Library of Russia carries out regular scanning of the library stock and places it on the library site http://leb.nlr.ru/collections/42/Карты.

NONGOVERNMENTAL CARTOGRAPHIC INSTITUTIONS

According to the Laws of Russia, the compilation and publishing of maps and atlases may be performed without limitations by institutions in

nongovernmental ownership if they have a license for this activity from the Federal Service of Geodesy and Cartography of Russia.

Today, there are in the Russian Federation more than 400 publishing houses, firms, and companies issuing cartographic products.

As a rule, these institutions are specialized in creation of cartographic works for broad public use or in compilation of works to orders of organizations for their production activities. The geographical basis of these products is official cartographic publications issued by the Federal Service of Geodesy and Cartography of Russia.

Among the most known and productive nongovernmental institutions the following can be mentioned:

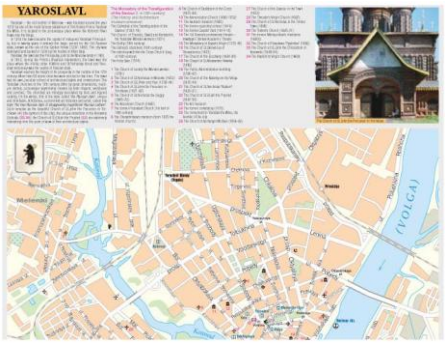
in **Feoria Publishing House** (previously named Publishing and Producing Center «Design. Information. Cartography» http://www.dik-maps.ru/) specializing issuing of large complex and thematic atlases including historical and cultural atlases of Russia's regions and adjoining countries as well as atlases devoted to specific themes (Atlas of steppes, Atlas of Orthodox icons, etc.) http://www.feoria.net/.

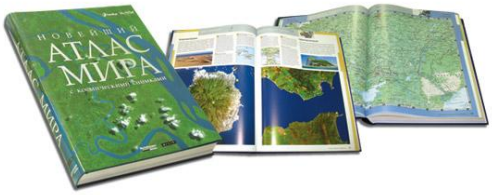
Atlas Print Company specializing in issuing road maps and atlases as well as city maps (http://www.atlas-print.ru/);

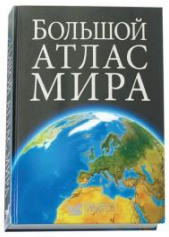
DMB *(Digital Mapping Bureau)* **Company** specializing in tourist maps, map guides, educational maps, and wall maps for different purposes; http://www.dmbmap.ru/.

«**Tsifrovye carty mestnosti**» (**TsKM**, Digital Terrain Maps) **stock company** specializing in creation of digital city maps and digital land cadastre maps (http://www.map-tskm.ru/);

Associated Cartographic Center (ACC) specializing in publishing of wall maps of Russia, the whole world, educational maps, and atlases (http://www.carta.ru/).

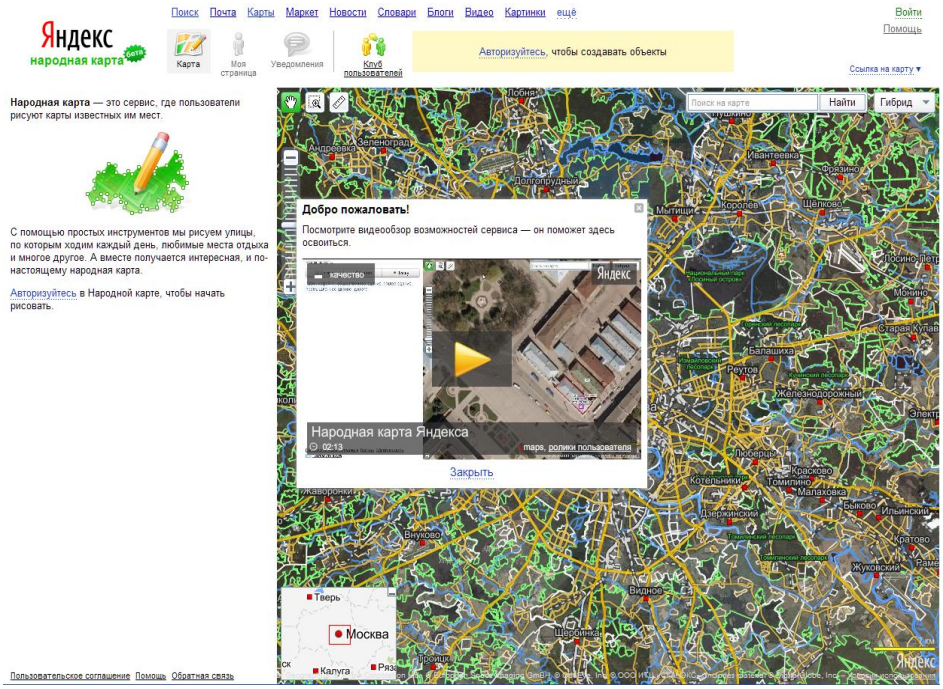




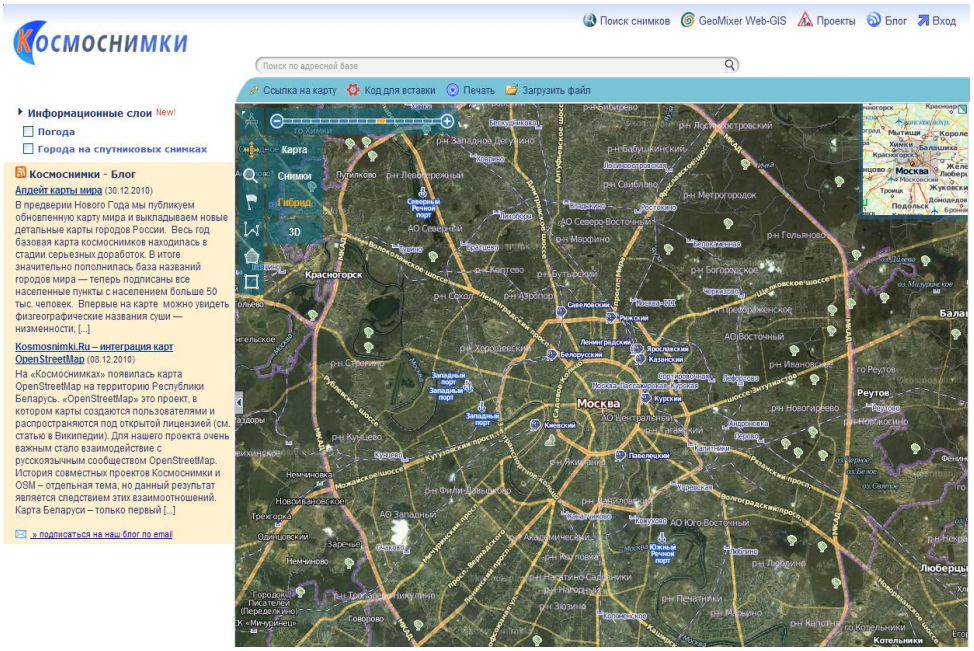


Web-mapping experienced broad development in the recent years. The most successful projects in this sphere are the developments of private companies:

- **Yandex maps** http://maps.yandex.ru/ and http://n.maps.yandex.ru



- **Kosmosnimki (Space Images)** www.kosmosnimki.ru



PUBLIC ORGANIZATIONS

RUSSIAN GEOGRAPHICAL SOCIETY

Shokal'skiy section of mathematical geography and cartography of the St. Petersburg municipal department of the Russian Geographical Society (chairman Alexander I. Sorokin, academic secretary Eduard S. Mozhenok)

The Rules of the Imperial Russian Geographical Society of 1849 provided the existence of the "Section of mathematical geography, where ... the whole metrological aspect of the science, the whole works in the sphere of geodesy and astronomy should be concentrated". In 1904 Yu.M. Shokal'skiy initiated the establishment of Cartographical commission at the Section of mathematical geography of the Imperial Russian Geographical Society. In 1953 it united with the Section of mathematical geography under the common name Yu.M. Shokal'skiy section of mathematical geography and cartography. Now it has two commissions: the Commission of aerospace methods of the Earth study, and the Commission of aeronautics. In the period of 2007-2011 the Section held 40 meetings and exhibitions of modern geodetic equipment and new accessions to the Department of Cartography of the National Library of Russia.

Under the initiative of the Department the Government of St. Petersburg named two streets of the city after two prominent persons - cartographer and geodesist V.V. Vitkovskiy and commander of the Ladoga Lake military fleet during the blockade of Leningrad vice-admiral V.S. Cherokov.

Section of cartography and remote sensing of the Moscow municipal department of the Russian Geographical Society (chairman Nikolay N. Komedchikov, scientific secretary Lyudmila N. Zinchuk) http://msk.rgo.ru/komissii-i-otdeleniya/otdelenie-kartografii-i-aerokosmicheskix-metodov/.

The Section was created in 1948. One of the prominent cartographers, Professor K.A. Salishchev, was its chairman from its creation till his death in 1988.

The Section is working regularly: meetings are held monthly as a rule.

In the period of 2007-2011 41 meetings were held on the whole which were attended by more than 1,200 people.

The themes of meetings were scientific problems of cartography and remote sensing methods, different problems of thematic and complex mapping, map compilation, creation of new cartographic works – the "*National Atlas of Russia", the "Atlas of Asian Russia. Siberia*", methods of

geoinformational map compilation, the history of cartography, problems of cartographical education, legal problems of authorship in modern cartography, results of international conferences and seminars, exhibitions and map reviews, and memorial meetings.

The Section held the seminar "Spatial metadata and geoportals as means of geoinformational resources and services integration", which gather more than forty researchers from different scientific institutions, and the round-table discussion "The problems of school geographical atlases contents" in which teachers, educationalists, cartography scientists, and publishers took part.

THE ST. PETERSBURG SOCIETY FOR SURVEYING & MAPPING (chairman Anatoliy S. Bogdanov, secretary Vitaliy B. Kaptsyug)

The St. Petersburg Society for Surveying & Mapping (http://www.spbogik.ru) was founded in 1992. The main task of the St. Petersburg Society for Surveying & Mapping is to develop cooperation of specialists of production, techniques and technology, science and education in the spheres of geodesy, topography, cartography, engineering surveys, and land management. The Society holds conferences, seminars, lectures, exhibitions, cooperates with cartographical and geodetic educational institutions and production collectives in St. Petersburg, publishes the journal "*Izyskatel'skiy vestnik*" ("Surveying bulletin"), contributes to the identification and preservation of historical and cultural heritage in the sphere of geodesy and cartography.

Two regional practical conferences on the theme "3D models in geoinformational systems of territorial management: creation and use" were held by the Society in October 2008 and May 2009 in St. Petersburg. The conference papers were placed on the site www.3d-gorod.ru.

In the period of 2007-2008 the Society secretary V.B. Kaptsyug with the assistance of state geodetic authorities of seven European countries carried out the research of geodetic results concerning the world largest measurement of the Earth's figure ("Struve Geodetic Arc", 1816-1855). These results were published in *«Vestnik Sankt-Peterburgskogo obshchestva geodezii i kartografii»* (Bulletin of the St. Petersburg Society for Surveying & Mapping) (No. 6) in 2009. The reference points of the Struve Geodetic Arc were included in the UNESCO List of World Heritage sites in 2005.

GIS-ASSOCIATION

Russian GIS-Association http://www.gisa.ru/ is an interregional community created to promote the market of geospatial technologies and services. Since 1995 it is active in Russia, the CIS countries and Baltic States. The main goal of the Association is to promote market relations in the geoinformatics sphere, which includes digital mapping, topography, navigation and RS data usage in regional and corporate GIS projects. In order to attain its goals, the Association attempts to enhance land-owner rights legislation, it defends its members legal rights and ensures informational support for geoinformational technologies users and providers.

The GIS-Association membership is available in accordance with the legislation of the Russian Federation.

The GIS-Association members are:

Such global geospatial software market leaders as Autodesk, Bentley, ESRI, Intergraph, MapInfo and others, along with principal software developers from Russia, such as Integro, GeoCAD+ Rakurs, ScanEx.

Geodetic and navigational instruments manufacturers: Trimble, Topcon, Thales, Leica, Nicon, Garmin, Optech, Riegl, Sokkia and others.

RS data providers: DigitalGlobe, Space Imaging, SPOT Image, Antrix, RADARSAT and others.

Regional and corporate geospatial projects creators, including chief Ministries, regional and local authorities and state-owned enterprises (more information on http://www.gisa.ru/10157.html, http://www.gisa.ru/9587.html).

The GIS-Association is the main developer of the "Concept for establishment and development of spatial data infrastructure in the Russian Federation" and the "Concept of Informational Systems Designed for City Planning".

CARTOGRAPHICAL EDUCATION IN RUSSIA

HIGHER CARTOGRAPHICAL EDUCATION

Cartography in Russia's classical universities

Students of cartography in classical universities are trained at geographical departments. There are departments of cartography and geoinformatics (sometimes combined with geodesy) in universities of Moscow, St. Peterburg, Tver’, Irkutsk, Mordovia, Udmurtia, the Far East, Astrakhan', Saratov, Smolensk, Kazan', the Kuban', and Stavropol'.

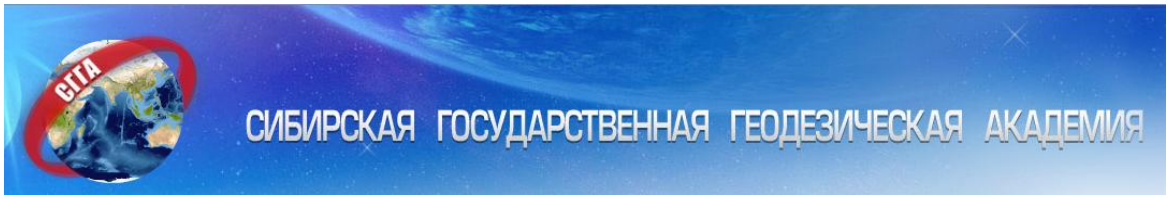
The Section of cartography and geoinformatics at the Geography educational and methodological association (EMA) of Russia's classical universities is in charge of the education and methodology activities of

Russia's universities. The tasks of the EMA include: the creation of state educational standards for the specialties “Cartography” and “Geoinformatics” of the bachelor, specialist, and magister level; the development of unified standard educational programs for these educational fields; the defining of contents of educational and industrial practices and of entrance examination programs for magister and postgraduate courses, qualifying examinations for scientific degrees, etc.

Cartographical education in specialized universities and academies

Specialists in cartography are also trained in specialized universities which include the Moscow State University of Geodesy and Cartography (MIIGAIK) (http://www.miigaik.ru) with the Department of Cartography,

and also the Siberian State Geodesy Academy (http://ssga.ru)



that has the Institute of Remote Sensing and Nature Management training specialists with the qualification “Cartography”.

SECONDARY VOCATIONAL CARTOGRAPHICAL EDUCATION

There are the following educational institutions of the secondary vocational cartographical education in Russia: Moscow College of Geodesy and Cartography (http://mkgik.org), St. Petersburg Technical School of Geodesy and Cartography affiliated to the Department of secondary vocational education of the St. Petersburg Plekhanov State Mining Institute (http://www.spbtgik.ru), Novosibirsk Technical School of Geodesy and Cartography (http://ssga.ru/main/novosibirskiy_tehnikum_geodezii_i_kartografii.html), the Far East Technical School of Geodesy and Cartography in Khabarovsk (http://dvtgik.ru), and Tomsk State University of Architecture and Building (Faculty of Secondary Vocational Education) (http://www.tsuab.ru). All of them are united with universities and are their subdivisions.

OFFICIAL DOCUMENTS. REGULATORY LEGAL FRAMEWORK AND STANDARDS

"Development concept of the geodesy and cartography branch up to 2020" was created by Rosreestr of the Russian federation and was approved by the Government of the Russian Federation Government Executive Order No. 2378 of December 17, 2010 (http://www.roscadastre.ru/common/files/concept_2020.pdf).

The Russian Federation Ministry of Economic Development prepared the Federal Law project "On changes in the Russian Federation Law 'On the Space Activities'" (Federal Law No. 5663-I of August 20, 1993 "On the Space Activities") which has been presented for public discussion: http://www.gisa.ru/file/file1823.doc. Amendments to the Federal Law "On Geodesy and Cartography" No. 209-FZ of December 26, 1995 are being prepared and discussed (http://www.legis.ru/misc/doc/552) on the basis of the Federal Law project "On changes in the Federal Law 'On Geodesy and Cartography'" proposed by the Russian Federation Ministry of Economic Development (http://www.gisa.ru/file/file1756.doc).

The Russian Federation Ministry of Economic Development prepared the Federal Law project "On changes in some Enactments of the Russian Federation concerning the improvement of the use of information about objects of capital construction and land plots addresses", that implies the creation of the Federal State Informational System (FSIS) of address information (http://www.economy.gov.ru/wps/wcm/connect/463b4f804622a725999efd293491a18d/p_fz.doc?MOD=AJPERES&CACHEID=463b4f804622a725999efd293491a18d).

According to the Concept of creation and development of Spatial Data Infrastructure (SDI) of the Russian Federation approved by the Russian Federation Government Executive Order No. 1157-r of August 21, 2006 (http://www.gisa.ru/file/file780.doc) new regional models (regional SDI) of Spatial Data Infrastructure of the Russian Federation are being created in accordance with the Russian Federation Rosreestr Order No. P/462 of August 27, 2010 "On management of development and realization of measures aimed at the creation of regional model of spatial data infrastructure" (http://www.rosreestr.ru/document/legislation/1146422). It is planned to create regional SDI in nine model regions, including the Republics of Tatarstan and Bashkortostan, the Sverdlovskaya, Kirovskaya, Yaroslavskaya, Saratovskaya, Ul'yanovskaya, Tverskaya *oblast*s (provinces), and the Altayskiy *kray* (region).

The national standard GOST R 53339-2009 "Basic spatial data. General requirements" (http://protect.gost.ru/document.aspx?control=7&id=174532) has been approved. Russian part of the Multi-Lingual Glossary of Terms of the ISO series 19100 Standards has been prepared (authors A.V. Koshkarev, Institute of Geography of RAS, and T.N. Maksimova, Technical Committee 394 "Geographical cartography /geomatics" of the Rostekhregulirovaniye of the Russian Federation); it is accessible in the Internet: http://www.tk394.ru/glossary.php.

ACTIVITIES OF COMMISSIONS AND WORKING GROUPS OF THE INTERNATIONAL CARTOGRAPHIC ASSOCIATION

ICA Commission on Planetary Cartography (chairman Kira B. Shingareva)

ICA Commission on Planetary Cartography held teleconferences and separate meetings at international conferences.

The main goal of the Commission is the creation of multi-lingual maps of planets and their satellites. Among the maps of the Earth family planets and their satellites the map of the Martian moons was created in 2007. The map of Io (the Galilean Jovian moon) has been created in cooperation with the Dresden Technical University. The works on compiling maps of Enceladus (the Saturnian moon), the asteroid Eros, and others are in progress now.

In 2010 the Commission developed a multinational project "Galileo", aiming at the involving of young people into studying of extraterrestrial areas and their mapping.

In 2008 under K.B. Shingareva's guidance E. Lazarev defended his dissertation "Development of methods and GIS-technologies for the creation of the Moon hypsometric maps using space images", in 2010 I.Yu. Rozhnev defended his dissertation "Research and development of information system for the formation and management of the Internet resource on planetary cartography".

The Commission on planetary place names under the Presidium of RAS (chairman V.P. Savinyh, deputy chairman K.B. Shingareva) began their work in 2010. The main goal of the Commission is the revision of the English version of the Gazetteer of relief forms and other formations on the bodies of the Solar system objects and preparation of its publication in Russian. The compilation work on the terminological dictionary of relief forms of extraterrestrial bodies is in progress now.

ICA Working Group GI for Sustainable Development mapping (chairman Vladimir S. Tikunov)

The main activities of the Group within the given period was connected with the holding of conferences on the theme of the Working Group (InterCarto/InterGIS), educational seminars, etc. Conferences have been held since 1994:

The InterCarto conferences took place at the following locations:

InterCarto 1 Moscow (Russia), May 23–25, 1994;
InterCarto 2 Irkutsk (Russia), June 26–29, 1996;
InterCarto 3 Novosibirsk (Russia), January 27–31, 1997;
InterCarto 4 Barnaul (Russia), July 1–4, 1998;
InterCarto 5 Yakutsk (Russia), June 17–19, 1999;

InterCarto 6 Apatity, Murmansk Province (Russia), August 22–24, 2000;
InterCarto 7 Petropavlovsk-Kamchatsky (Russia), July 30–August 1, 2001;
InterCarto 8 Helsinki (Finland), St.-Petersburg (Russia), May 28–June 1, 2002;
InterCarto 9 Novorossijsk (Russia), Sevastopol (Ukraine), June 25–29, 2003;
InterCarto/InterGIS 10 Vladivostok (Russia), Changchun (China), July 12–19, 2004;
InterCarto/InterGIS 11 Stavropol-Dombai (Russia), Budapest (Hungary), September 25–October 3, 2005;
InterCarto/InterGIS 12 Kaliningrad (Russia), Berlin (Germany), August 25–31, 2006;
InterCarto/InterGIS 13 Khanty-Mansiysk (Russia), Yellowknife (Canada), August 12–24, 2007;
InterCarto/InterGIS 14 Saratov (Russia), Urumqi (China), June 24–July 1, 2008;
InterCarto/InterGIS 15 Perm (Russia), Ghent (Belgium), June 26–July 6, 2009;
InterCarto/InterGIS 16 Rostov-on-Don (Russia), Salzburg (Austria), July 3–8, 2010.

The InterCarto conferences are thematically organized to target one of the most pressing problems of modern geography – creation and use of geographic information systems (GISs) as effective tools for achieving sustainable development of territories. Wide use of information technology by all countries has been encouraged in the *Agenda for the XXI Century (Agenda 21)* adopted by the UN Conference on Environment and Development in Rio-de-Janeiro (Brazil, 1992) and reinforced at the UN World Summit on Sustainable Development in Johannesburg, 2002. In the *Russian National Report* and the materials of the conference in Rio 10 *Information Supplement*, development of GISs has been declared one of the most relevant directions of work. The InterCarto program is supported by the International Cartographic Association (ICA) that encompasses 83 countries. The InterCarto conferences invite presentations from the most known participants - scientists and experts in the field of geo-informatics and sustainable development. Committee sessions of a number of international organizations, exhibitions, and seminars are conducted within the framework of the conferences.

The last InterCarto-InterGIS 16 conference was held in Rostov-on-Don (Russia) on July 3-4, 2010, and in Salzburg (Austria) on July 6-8, 2010. The materials of this conference are posted on the websites http://www.isep.sfedu.ru, www.ssc-ras.ru, http://InterCarto16.net, and www.intercartogis.org. The thematic sections of the conference included: *GIS Support of Sustainable Development of Territories (Theory, Geopolitical Processes, and Territorial Management)*, *Remote Sensing and Sustainable Development of Territories*, *Mobile GIS*, *GIS and Business, Sustainable Development and Tourism (Problems and Perspectives)*, *Spatial Data Infrastructure*, and *GIS-Education for Sustainable Develop*ment.

The conference presentations covered theoretical and methodological problems of cartography and temporal-spatial geo-information modeling. Conference topics also included geo-information support for promoting sustainable development of Russian and other territories, experiences of GIS use in addressing ecological problems, and infrastructure of spatial data. Several presentations addressed methods of cartographic and geo-informational modeling, problems and prospects of sustainable tourism development, and medical-geographical aspects of sustainable development. Participants also discussed outcomes of research on near-

border cooperation, education in general, and education that specifically targets sustainable development. The conference participants stressed the fact that development and use of GIS technologies, GIS-based projects, and cartographic forecast modeling are being increasingly incorporated in land use planning and management, environmental management, and education. They further stressed that these projects have important scientific and practical significance.

The next annual conference will take place in December 2011 (http://conf.nsc.ru/intercarto17). The Russian component of the conference will be held in Altay Krai followed by another meeting on Bali (Indonesia).

The Group held courses on modern problems of cartography and geoinformatics:

- in Sevastopol' and Istanbul (July 2005);
- in Urumqi (China) (August 2005; July 2006; August-September 2007 and June-July 2008).

The Institute of Water and Ecological Problems of the Siberian Branch of RAS organized Russian-Chinese seminar "Geoinformational support of sustainable development of the Large Altay" in the village of Aya in the Altayskiy *rayon* of the Altayskiy *kray* (region) on July 25-26, 2007. The seminar continued the tradition of international scientific events in near-border regions of the neighboring countries - Russia, People's Republic of China, Mongolia, and the Republic of Kazakhstan - concerning the problems of sustainable development of the Large Altay. Forty scientists took part in the seminar: 20 from the Russian side and 20 from the Chinese side.

22 papers were presented at the seminar; they deal with the use of geoinformational technologies and remote sensing to support sustainable development of the Altay region, problems of mountain hazards, biodiversity, as well as Russian-Chinese scientific cooperation in these spheres.

The ICA Working Group on Tourist Cartography (Chairman Yuriy M. Artemyev)

The Group held the Conference on Tourism Cartography in St. Petersburg (September 21-24, 2008), there were 30 papers on different problems of tourist cartography.

NATIONAL COMPETITION OF CHILDREN DRAWINGS «WORLD MAP» (NATIONAL COORDINATOR NIKOLAY N. KOMEDCHIKOV)

The national competition of children drawings «World map» was held in 2007, 2009, and 2011. The number of children drawings sent to the competition totaled 350 in 2007, 430 in 2009, and 1200 in 2011. The official site of the competition: http://www.drawing.igras.ru/.

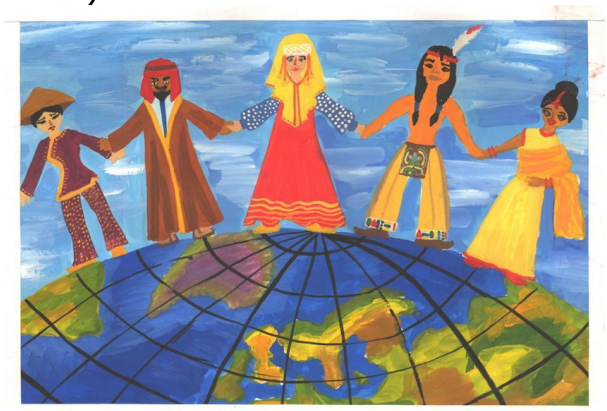
In 2009 and 2011 the National Committee of Cartographers of the Russian Federation and the Russian Geographical Society held nationwide competitions of children drawings under the title "Living in a globalized

world". In 2009 55 best drawings were awarded by Diploma of the National Committee of Cartographers of the Russian Federation and the Russian Geographical Society, and by valuable presents (books, atlases, and maps). All other participants of the competition were also awarded by encouraging diplomas. The exhibition of the best works was open at the Russian State Library since May 29. The participants of the competition, journalists, officials, etc. were invited for the exhibition opening ceremony.

Six best children's drawings were selected by the Board of adjudicators of the competition and approved by the National Committee of Cartographers of the Russian Federation for the participation in the Barbara Petchenik Children's World Map Competition in Santiago (Chile) on November 15-21, 2009. The drawing of Alina Vakhitova from the city of Naberezhnye Chelny in the Republic of Tatarstan was awarded there by a diploma and a prize in the category above 12 years.

"Children should not cry for sorrow"
Vakhitova, Alina (13)
Respublika Tatarstan, Naberezhnye Chelny

In 2011 98 children were awarded by diplomas as winners of the competition. The exhibition of the best works sent by children to the competition was opened at the Russian State Library on June 1, the International Children's Day, and the awarding of winners took place at the opening ceremony. Six best prize-winners' drawings will participate in the Barbara Petchenik Children's World Map Competition in Paris (July 3-8, 2011).

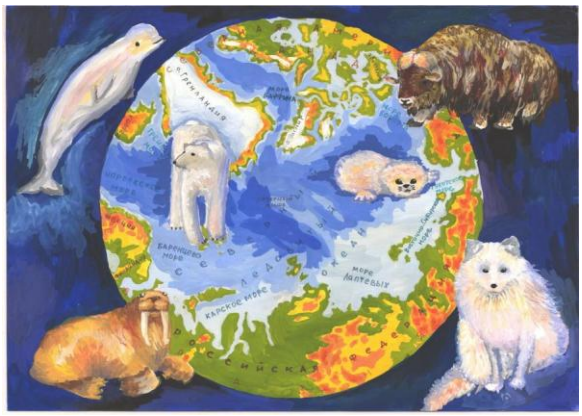


We and our world
Alisa Yurchenko (7)
Center of Creative and Arts Education,
drawing group 'Fantasy'
Omsk (Russia)

Be a protector of the Earth!
Yelizaveta Sherstneva (9)
Lycée No. 11 'Fiztekh'
Dolgoprudnyy (Russia)

SOS
Aleksandra Mozhayeva (12)
Secondary School No. 323
Moscow (Russia)

How beautiful is this world!
Vera Popova (12)
Children Arts School
pgt Kil'mez' (Russia)



Animals of the Arctic
Natalya Dmitriyeva (13)
Music School No. 1, visual arts section
Bataysk (Russia)

Children for clean world!
Anna Babadzhanova (15)
Children Arts School No. 15
Krasnoyarsk (Russia)

INTERNATIONAL COOPERATION OF RUSSIA IN THE SPHERE OF CARTOGRAPHY AND ADJACENT DISCIPLINES

The Russian Federation is a full member of many public and intergovernmental international scientific and technical organizations:
- International Cartographic Association (ICA), http://icaci.org/
- International Geographical Union (IGU), http://www.igu-online.org/,
- International Association of Geodesy (IAG), http://www.iag-aig.org/
- International Federation of Surveyors (FIG), http://www.fig.net/
- International Society for Photogrammetry and Remote Sensing (ISPRS), http://www.isprs.org/
- International Federation of Library Associations and Institutions (*IFLA*),

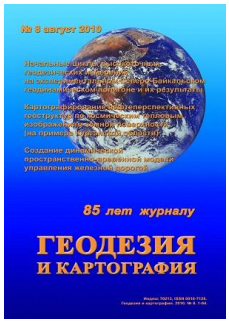
http://www.ifla.org/
- Association of European Research Libraries (*LIBER), http://www.libereurope.eu/*
- Intergovernmental Oceanographic Commission (IOC) of UNESCO, http://ioc-unesco.org/
- International Hydrographic Organisation (IHO), http://www.iho.int/english/home/
- Intergovernmental Council on Geodesy, Cartography, Cadastre, and the Earth Remote Sensing of the CIS member states,
- Scientific Committee on Antarctic Research (SCAR)*, http://www.scar.org/*
- United Nations Geographical Information Working Group (UNGIWG), http://www.ungiwg.org/
- United Nations Group of Experts on Geographical Names (UNGEGN), http://unstats.un.org/unsd/geoinfo/UNGEGN/default.html
- Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP), http://www.pcgiap.org/.

Delegations of Russia took part practically in all events organized by these institutions. Russia's participation in the activity of international organizations permits to pursue the policy of the Russian Federation in the sphere of cartography and adjacent areas of knowledge, to keep track of the trends of cartography development in the world, to take part in international projects, to adopt the advanced experience of other countries, and to promote the experience of domestic science and practice.

Besides participation in the activity of international organizations Russia carries out works aimed at the realization of some multilateral and bilateral international projects.

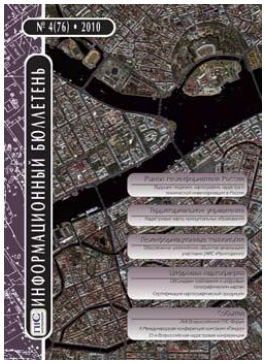
JOURNALS ON CARTOGRAPHY AND GEOINFORMATICS

Several journals on cartography, geoinformatics, and remote sensing are published in Russia; they are issued both by state authorities and by nongovernmental companies and public organizations.

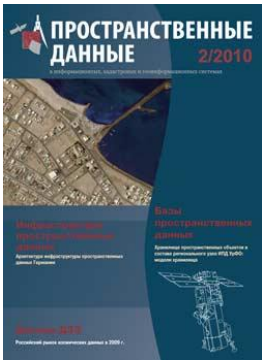


The Federal Service of State Registration, Inventory and Cartography (Rosreestr) issues the journals «*Geodeziya i kartografiya*» ("Geodesy and Cartography") and «*Vestnik Rosreestra*» ("Bulletin of Rosreestr").

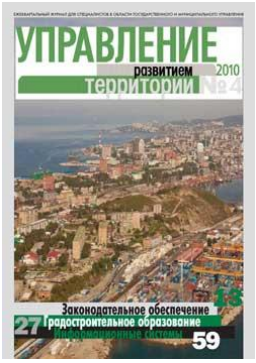
GISinfo



Informational Bulletin of GIS-Association



Spatial Data



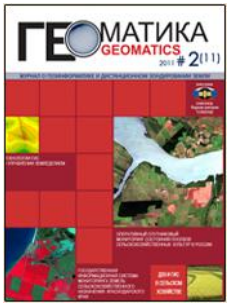
Territory Development Management

The GIS-Association issues the **"GISinfo"** newspaper (2000 copies) monthly (more info on http://www.gisa.ru/gisinfo.html), the magazine **"Informational Bulletin of GIS-Association "** five times a year (2000 copies) (more info on http://www.gisa.ru/ib.html), the magazine **"Spatial Data"** 4 times a year (2000 copies) (more info on http://www.gisa.ru/pd.html), the magazine **"Territory Development Management"** 4 times a year (2000 copies) (more info on http://www.gisa.ru/urt.html), it also issues the annual review **"Russian Geoinformatics Market"** (3000 copies) (more info on http://www.gisa.ru/obzor.html). The latter ones are delivered to the GIS-Association members and to a number of other information providers according to a subscribers database. They provide information on the recent achievements in the digital mapping field, topography, navigation, GIS education and training, GIS -aided regional planning and so forth.

GEOPROFI.RU ЭЛЕКТРОННЫЙ ЖУРНАЛ ПО ГЕОДЕЗИИ, КАРТОГРАФИИ И НАВИГАЦИИ

The journal «Geoprofi» is established by a private person and is oriented to engineering and technical staff of production establishments, developers and makers of equipment, software, and technologies, instructors and post-graduate students of educational institutions. Articles on methods of geodetic, cartographical, and photogrammetric works, on legal regulations of geodetic and cartographical activities, on new tools and software for geodetic, cartographical, and photogrammetric works, on the Internet resources, on the education in the sphere of geodesy, cartography, and the Earth remote sensing, land and urban cadastre, and navigation are published in the journal. Periodicity: 6 issues a year. Circulation of the journal: 3000 copies. The complete contents of the journal issues are accessible at its site: http://www.geoprofi.ru/. It is issued since 2003.

New periodicals



The journal «**Geomatics**» is the worldwide source of information, news and opinion on geospatial and remote sensing technologies focused on Russia and CIS countries. Founder: Sovzond Company. Circulation of the journal: 3000 copies. Periodicity: 4 issues a year. The complete contents of the journal issues are accessible at its site: http://www.geomatica.ru/rus/archive.html. It is issued since 2008.

The journal ***«Zemlya iz kosmosa. Naiboleye effektivnye resheniya»*** **("The Earth from Space. The most effective solutions")** http://zikj.ru/. Periodicity: 2 issues a year. Published by OOO "ScanEx" RDC since 2009. Some materials are accessible at the site: http://www.scanex.ru/ru/publications/default.asp.

SCIENTIFIC AND TECHNICAL CONFERENCES ON CARTOGRAPHY AND GEOINFORMATICS HELD IN RUSSIA (SELECTIVE LIST)

International conferences, seminars, and meetings

IX International Symposium "Access to the Baltic Sea: maps and other informational resources of the Baltic Sea and coastal areas " (National Library of Russia, October 23-24, 2008, St. Petersburg, 2008).

V International scientific congress «GEO-Siberia-2009», April 20-24, 2009, Novosibirsk.

International conference «Geoinformatics: technologies, scientific projects». Barnaul, September 20-25, 2010.

International conference «InterCarto/InterGIS 14: Sustainable development of territories: GIS theory and practical experience». Saratov, Urumqi, June 24 – July 1, 2008.

International conference «InterCarto/InterGIS 15: Sustainable development of territories: GIS theory and practical experience». Ghent, June 29 – July 5, 2009.

International conference «InterCarto/InterGIS-16. Sustainable development of territories: GIS theory and practical experience». Rostov-on-Don (Russia), Salzburg (Austria), July 3-7, 2010.

Scientific conference «Problems of renaming of geographical objects», Moscow, November 14, 2008.

Scientific and practical conference «Tourism cartography». St. Petersburg, September 21-24, 2008.

Seminar «Cartography on the cross-roads», Barnaul, April 17, 2009.

Seminar «Maps-Atlases-Geoportals: Which languages do we need?», St. Petersburg, March 22, 2010.

Seminar «Quo vadis modern cartography?», Barnaul, September 1, 2008.

Russia's national conferences, seminars, and meetings

XIV Russia's national forum «Geoinformatics market in Russia. Modern state and development prospects», Moscow, June 5-7, 2007.

XV Russia's national forum «Geoinformatics market in Russia. Modern state and development prospects», Moscow, June 3-5, 2008.

Russia's national scientific and practical conference «Geoinformational mapping in regions of Russia», Voronezh, December 2-4, 2009.

Russia's national seminar «Modern informational technologies for fundamental research of the Russian Academy of Sciences in the sphere of the Earth sciences», Vladivostok, April 8-11, 2010.

The ninth youth scientific school-conference «Lobachev lecturing – 2010», Kazan', October 1-6, 2010.

«Modern informational technologies for scientific research». Russia's national conference, Magadan, April 20-24, 2008.

Regional conferences, seminars, and meetings

«Space activity in navigation, geodesy, and geoinformatics; GIS - Far East 2007». Khabarovsk, May 22-24, 2007.

«Use of GIS technologies in the Primorskiy *kray* (region)». The 5th Far East scientific and practical conference, Vladivostok, July 3, 2009.

XIII scientific meeting of geographers of Siberia and the Far East. Irkutsk, November 27-29, 2007.

IX scientific conference on thematic mapping. Irkutsk, November 9-12, 2010.

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Maps and atlases

Io Map /TUD, German; MIIGAiK, RF. 2009, in 5 languages, 2 sheets

Атлас Курильских островов [**Atlas of the Kuril Islands**] /Российская академия наук. Институт географии РАН. Тихоокеанский институт географии ДВО РАН; Редкол.: Котляков В. М. (председатель), Бакланов П. Я.,

Комедчиков Н. Н. (гл. ред.) и др.; Отв. ред. картограф Фёдорова Е.Я. М.; Владивосток: ИПЦ «Дизайн. Информация. Картография», Феория, 2009. 516 с.: ил., карт. ISBN 978-5-89658-034-8

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