

Status and prospect of creation public geospatial data of the Russian Federation

Gennady POBEDINSKIY and Alexander PRUSAKOV, Russian Federation

Keywords: State of topographic maps and plans, geospatial data, spatial data infrastructure, unified cartographic basis.

Positioning and Measurement

SUMMARY

The state and problems of usage and creation of geospatial data of the Russian Federation are considered in the light of modern world trends. Considered in detail the issues of creation and use of the State topographical maps for the universal of the inter-branch destination. The analysis of individual provisions of the new Federal law «On surveying, mapping and spatial data» adopted at the end of 2015 is presented. The strategic priorities are addressed in improving State maintenance of geodesy and cartography in the Russian Federation. The main provisions of the draft Strategy of topographic-geodetic and cartographic ensuring in the Russian Federation up to the year 2030 reviewed. As well as the adopted by the Government of the Russian Federation Program "Digital economy of the Russian Federation" (spatial data) and Plan of priority actions in the medium period (2017-2018) to raise the level of modern mapping supply in the Russian Federation in order to operationalize the formed regulatory in industry of surveying, mapping and spatial data.

SUMMARY

Рассматриваются состояние и проблемы создания и использования геопространственных данных в Российской Федерации с учётом современных мировых тенденций. Подробно рассмотрены вопросы создания и использования государственных топографических карт универсального межотраслевого назначения. Выполнен анализ отдельных положений, принятого в конце 2015 года нового Федерального закона «О геодезии, картографии и пространственных данных». Рассматриваются стратегические приоритеты в совершенствовании топографо-геодезического и картографического обеспечения Российской Федерации. Рассмотрены основные положения проекта Стратегии топографо-геодезического и картографического обеспечения Российской Федерации на перспективу до 2030 года, а также принятые Правительством Российской Федерации Программа «Цифровая экономика Российской Федерации» (в части пространственных данных) и План первоочередных мероприятий на среднесрочный период (2017 – 2018 годы) по повышению уровня современного картографического обеспечения в Российской Федерации в целях практической реализации сформированного нормативного регулирования отрасли геодезии, картографии и пространственных данных.

The Status and Prospect of Creation of the State Geospatial data of the Russian Federation

Gennady POBEDINSKIY and Alexander PRUSAKOV, Russian Federation

1. INTRODUCTION

Based on global trends in geospatial information management set out in the Reports of the UN Secretary General and the organizational structures of the United Nations on global geospatial information management and analyzing total state mapping and upgrading base geodata in the World it is possible to formulate two main directions in the field of geospatial information management:

collection and updating geospatial data performed mainly by national agencies worked with geospatial information;

use of geospatial data by public and private sectors of the economy, mainly through market mechanisms.

The interaction of these two directions is mainly connected with the issues of availability and compatibility (complementary nature) of the state geospatial data, license agreements, fees for the use of public geospatial data and constraints related to the security issues.

The assertion that all government geospatial data should be open have to be critical commented for the following reasons.

First, consumers need not any open geospatial data, but the data necessary and sufficient for specific tasks and, accordingly, with specific accuracy and detail. Traditionally, these requirements are disclosed in the form of technical rules, regulations, instructions and guidelines for the creation of state topographic maps established by the state scale series and full site content. Some of the information about spatial objects related to information constituting state secrets. For example, information on mine workings, natural cavities, metro lines or other structures which may be used in the interests of national defense, or information revealing the water supply schemes of cities with populations over 200 thousand people, or junctions, the location of the head works of the water pipe or conduit that feeds them.

Second, restrictions on the provision of geospatial data is defined even for the open data of the European Union. It is an article 13 of the INSPIRE Directive of 14 March 2007, 2007/2/EC establishing an infrastructure for spatial information in the EU, provide the possibility of limiting public access to the national spatial data and geoservices if it may adversely affect:

- a) confidentiality of administration activity determined by a specific legislative framework;
- b) international relations, public security or defense;
- c) the administration of justice, the rights of citizens to a fair trial or the ability of competent authorities to investigate criminal or disciplinary nature;
- d) the confidentiality of commercial or industrial information to the extent permitted by national or pan-European EU laws designed to protect a legitimate economic interest, including the public interest in terms of statistical confidentiality and the observance of tax secrecy;
- e) respect intellectual property rights;

- f) the confidentiality of personal data and/or files relating to individuals, in case of disagreement of a person for public disclosure, if the conditions of confidentiality are prescribed by national laws or EU legislation;
- g) interest and protection of any persons providing information on a voluntary basis without any binding conditions on that, if these individuals do not give consent to the dissemination of information;
- h) protection of the environment to which such information relates (for example, information about the habitats of rare biological species).

2. ANALYSIS OF LEGISLATION IN THE AREA OF GEOSPATIAL DATA

Until the end of 2015 in the Russian Federation the Federal law "About geodesy and cartography" dated 29 December 1995 № 209-FZ was in force, which was developed and mainly focused on the creation of geodetic and cartographic materials and data. Due to the fact that with the introduction of modern technologies, the type and form of survey and mapping products varies considerably, creating new types of products, this Federal law will surely require clarification, but not in any case cancelled or replaced by another one.

However, released at the end of 2015 the Federal law "On geodesy, cartography and spatial data and on amendments to certain legislative acts of the Russian Federation" in its turn, focused mainly on the provision and the use of geodetic and cartographic materials and data, creation on their basis of the derived spatial data, it practically missing the questions of establishment and placement to the Fund of spatial data (State Cartography and Geodesy Fund of the Russian Federation) the geodetic and cartographic materials and data themselves.

In the development and public discussion of the draft Federal law "On geodesy, cartography and spatial data and on amendments to certain legislative acts of the Russian Federation" several scientists and specialists, participants of discussion have suggested the separation of the legislative issues involved in the creation of the geospatial data and their use.

It is known that there is a world practice of a separate legislative regulation of issues of geodesy, cartography and infrastructure of spatial data. For example, in Poland there are two laws: The Law on geodesy and cartography of the Republic of Poland of 17 May 1989, amended May 15, 2015 and The Law on spatial information infrastructure of 4 March 2010. In the Federal Republic of Germany are the same two laws: the Law on geodetic system, networks and geotopographic data of Federation dated May 10, 2012 and the Law on access to digital spatial data from February 10, 2008.

Considering the above, in our opinion, it seems appropriate to reconsider earlier suggestions about the need to prepare two Federal laws – "About geodesy and cartography" and "About geospatial data infrastructure".

3. ANALYSIS OF THE CURRENT STATE AND NEEDS FOR GEOSPATIAL DATA PROVIDING

Individuality of geospatial data on the territory of the largest country in the World – Russian Federation (17125.2 thousand km²) is the need to perform topographic, geodetic, and

cartographic works to create and update the state geospatial data in areas that are not of interest to the geospatial market.

Experience of solving similar problems in countries with commensurable area examined and described in various articles, including with participation of the authors of this article.

As example, the experience of creating and updating geospatial data in China could be presented. The area of China is 9 596,9 thousand km² (3rd largest in the world) and the territory of the country is presented by not only economically developed, densely populated regions, but the desert and mountain regions of the Western part of China. The experience of China in creation and updating of geospatial data of such territory, in our view, is an example to the domestic industry of geodesy and cartography.

In developing the draft Strategy of topographic and geodetic and cartographic provision of the Russian Federation for the period until 2030, in 2015 the Federal service for state registration, cadastre and cartography (Rosreestr) made a request to describe the needs in geospatial data in accordance with the attached questionnaire for the aim to get objective assessment of the types and quantities of topographic and geodetic and cartographic works, services and products used by the Executive authorities to exercise its activities.

The Information about the requirements of state topographic maps and plans to ensure their activities was presented by 52 Subjects of the Russian Federation and 22 Federal Bodies of Executive Power (FBEP).

Generalized analysis of the requirements of the state topographic maps and plans of the Executive authorities of constituent entities of the Russian Federation and Federal Executive authorities are presented in Table 1.

Table 1

order No	Kinds of Geospatial materials and data	Needs of power authorities (amount of authorities)	
		Bodies of Executive power of the Subjects of the Russian Federation	Federal Bodies of Executive Power (FBEP)
1.	Topographic maps in scale 1:10 000	43	17
	including total object content (as well as state secret information)	31	9
2.	Topographic maps in scale 1:25 000 – 1:50 000	39	14
	including total object content (as well as state secret information)	26	9
3.	Topographic maps in scale 1:100 000 – 1:200 000	37	15
4.	Topographic maps in scale 1:1 000 000	19	11

5.	Unified cartographic basis	44	15
6.	Topographic plans of settlements in scale 1:2 000 – 1:10 000	47	15
7.	Materials of remote sensing (medium and high resolution) and derived products (orthophotos, etc.)	40	15

The need for the updating of topographic maps varies from 1 to 5 years for the scale of 1:10 000 – 1: 25 000 and from 3 to 15 years for the scale 1:50 000 – 1:1 000 000, for topographic maps of settlements of 1 to 3 years. The access time for obtaining cartographic materials is from 1 to 30 days.

The access time for obtaining remote sensing data of medium and high resolution and derived products (orthophotos, etc.) requires from 1 to 30 days with a surveying interval of 0.5 – 5 years. The access time for obtaining remote sensing data of medium and high resolution) and derived products (orthophotos, etc.) requires from 1 to 30 days with a surveying interval of 0.5 – 5 years.

From the analysis of the information received from the subjects of the Russian Federation and Federal Executive authorities it is possible to make a preliminary conclusion that 80% of the regions and the Federal authorities require state topographic maps 1: 10 000 - 1:200 000 both in full object composition and not containing information classified as a state secret.

50% of the regions and the Federal authorities need the state topographic maps and plans in digital and analog format (limited edition prints).

Pursuant to the instructions of the President of the Russian Federation in 2016 completed inventory of materials and data of the Federal cartographic-geodetic Fund (2016 Federal Fund for spatial data) stored in Federal scientific and technical center of geodesy, cartography and infrastructure of spatial data. As a result of inventory is determined that the total amount of materials and data is 86.7 million units, including 84.9 million in analog and 1.8 million in digital form. Materials and information containing information constituting a state secret are of 82.3 million storage units.

The main consumers of materials and data of the Federal Fund of spatial data are legal entities, state authorities and local self-government and individuals. Fig. 1 shows the dynamics of the issue of spatial data from the Federal Fund of spatial data in 2014 – 2017 years by consumers.

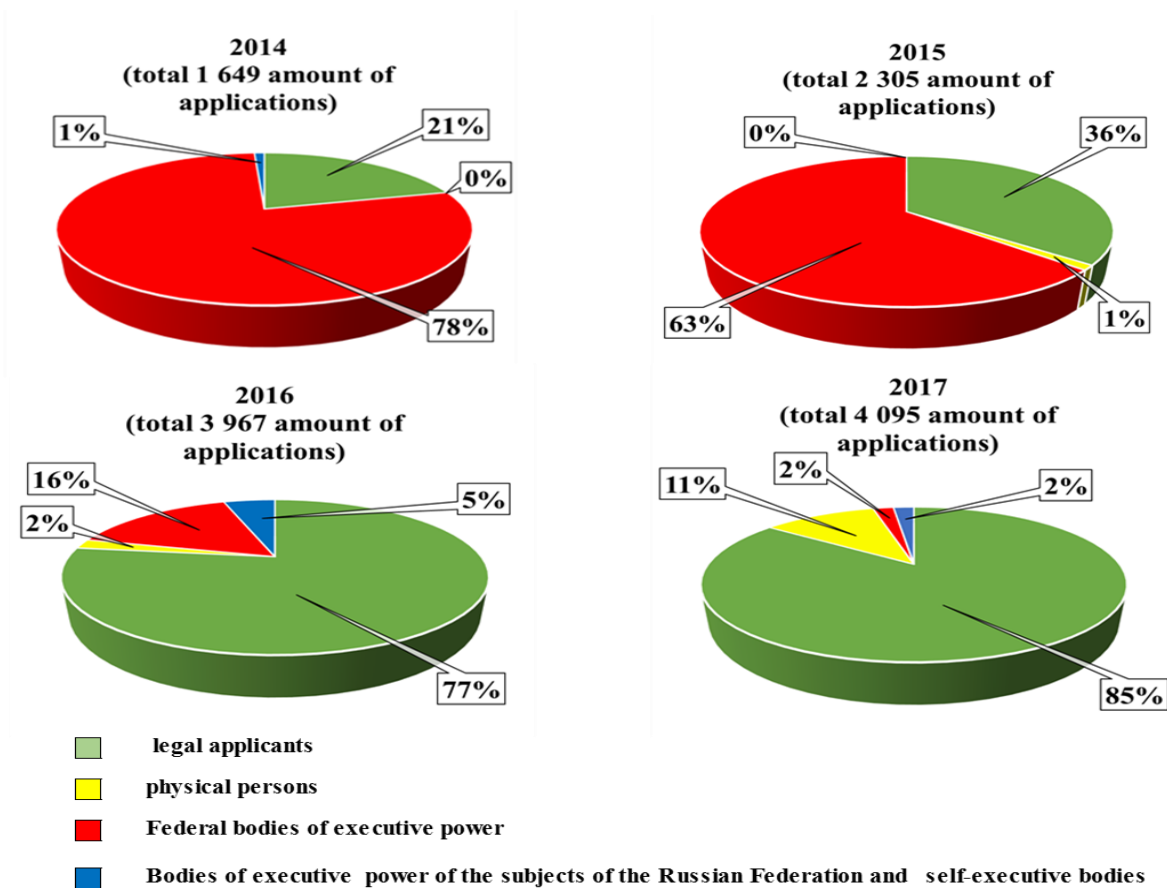


Fig. 1 Number of applications of the Fund's materials and data use

It should be noted that applicants as individuals are mainly cadastral engineers and land owners.

Unfortunately, the needs of consumers in the state geospatial data are satisfied not in full condition.

Regulatory supported area, which is provided by 100 per cent coverage is the maps at scales of 1:50 000 and 1:100 000 only.

With full coverage of the territory of the Russian Federation by state topographic maps at the scale 1:25 000, 1:50 000, 1:100 000, 1:200 000, 1:500 000 and 1:1 000 000, by the state topographic maps of scale 1:10 000 for economically developed regions and by the state topographic maps of scale 1:2 000 for most of the settlements, the country has a shortage of modern, reliable and precise surveying and mapping information. The reasons for this is the failure rate of updating of state topographic maps and plans, called organizational, financial and technological difficulties, the lack of necessary resources to perform state surveying and cartographic works.

Total volume of state topographic maps of scales 1:10 000-1:1 000 000 which do not meet the regulatory deadlines for updating is 334,9 thousand map sheets. Every year becomes obsolete (no longer compliant with norms) 21.7 thousand map sheets. To align by 2030 the state topographic maps, located in the Federal Fund of spatial data, it is necessary to organize (to create production capacity, to get the materials of the Earth remote sensing (RSE), to provide the funding) annual renewal of not less than 44 thousand map sheets.

An important question of geodetic support of the Russian Federation is the creation and exploitation on the territory of the Russian Federation state system of coordinates 2011 (SSC-2011) established by resolutions of the Government of the Russian Federation. SSC-2011 is a geocentric coordinate system. According to the principles of the orientation in the body of the Earth the SSC-2011 is identical to the International terrestrial reference system ITRF coordinates established in accordance with the recommendations of the International Earth Rotation and Reference Systems Service (IERS).

The construction of the state system of coordinates in modern conditions is not a one-time effect, culminating in the adoption of a regulation document. Due to modern requirements to the accuracy of coordinates and conditions of functioning of the points of the state geodetic network inside a physical realization of a coordinate system on the surface of the Earth, the improvement of the system of coordinates is an ongoing process that includes the performance of a complex measures for its maintenance and development.

The creation of the network of continuously operating points of Fundamental astronomic-geodetic network (FAGN) in the territory of Russia, that provides the highest level of the state geodetic framework, is a primary and very important task. It connected with the intensive use of satellite geodetic technologies and ever-increasing requirements for precision geodetic reference positioning of objects, vehicles, local and regional geodetic and geodynamic polygons.

The structure of the state geodetic network, ensuring the availability of the system of coordinates of SSC-2011 for use by consumers, also includes networks of triangulation, trilateration and polygonometry of 1-4 orders (about 283 000 points), adjusted with the based points of Fundamental astronomic-geodetic network (FAGN), Precision geodetic network (PGN) and Special geodetic networks of 1 class (SGN-1). All these nets enable to use in the system of coordinates of SSC-2011 the large number of geodetic, topographic and cartographic materials, previously obtained on traditional methods and technologies bases.

The accuracy of SSC-2011 completely meets the needs and creates the conditions for performing the unified state system of coordinates for geodetic and cartographic works in the implementation of the urban planning and cadaster activities, land management, mining, other activities. It includes as well the establishment, modification and refinement of the State border of the Russian Federation (including its delimitation, demarcation) when establishment, change of borders between subjects of the Russian Federation, borders of municipalities.

The quantitative indicators of the Federal target program «Maintenance, development and use of GLONASS system for 2012-2020» determine further development of satellite networks like points of FAGN, PGN and SGN-1 for a short-term period of 2017-2020, according to which by 2020 the number of points of the state satellite network is expected to reach following values:

50 points of FAGN;
350 points of PGN;
6000 points of SGN-1.

Thus, in the period of 2017-2020 it is necessary to create 16 FAGN points, 7 points of PGN and 1426 points of fragments of SGN-1. These will allow:

to improve the geodetic coordinate system to perform the geodetic and cartographic works, the main reason for the decline in quality of which is geodynamic processes;

participation in international projects on creation of the coordinate system of the States-participants of the CIS and, Euro-Asian ITRF based on this segment;

participation in the international project of the UN to establish a global geodetic coordinate system.

The development of satellite networks of points of FAGN, PGN and SGN-1 for the period 2021-2030 connected primarily with the need of accounting and forecasting of geodynamic processes. At the present level of development of means and methods of geodetic measurements insufficient consideration of geodynamic processes may lead to significant distortions in the implementation of geodetic works consisting of cadastral activities, design and survey and construction works, especially on high speed highways and other constructions of great length.

4. STRATEGIC PRIORITIES IN THE IMPROVEMENT OF SURVEYING AND CARTOGRAPHIC SUPPORT OF THE RUSSIAN FEDERATION

The solution of problems in many sectors of the economy requires a joint, integrated use of geospatial data coming from different sources. The basis of the information systems providing information support of management decisions are to be public geodetic data, the state topographic maps and a unified electronic cartographic base that reflects the current condition of the land. The State information may further be supplemented with specialized, thematic information on various activities. Effective solution of specific tasks should be provided with the ability to integrate a large amount of geospatial data generated by various organizations and agencies. At the same time in order to create an effective spatial data infrastructure of the Russian Federation (RF SDI) we need to involve other ministries and agencies, as the comprehensive solution to this problem is beyond the scope of topographic, geodetic and cartographic support of the Russian Federation.

In 2017, the Government decree of the Russian Federation from July 28, 2017 No. 1632-R approved the Program of "the Digital economy of the Russian Federation". In this Program one of the main purposes, relating to the information structure, was determined the creation of an effective system of collection, processing, storage and provision to consumers of spatial data, ensuring the needs of government, business and citizens with relevant and reliable information about spatial objects.

In the frames of the Program to control the development of the digital economy they formed a "Road map", which in the main areas includes a description of objectives, key milestones and objectives of the Program and dates for achieving them. On the basis of the "Road map" will be developed an action plan containing a description of the activities, sources and amounts of funding. In the "Road map there are 3 main stages of development of the directions of the digital economy, the results of which provided achievement status in each direction. In particular, the direction of "Information infrastructure" provides:

by 2018, the establishment of a system of benefits and preferences to all objects of the information infrastructure, including spatial data infrastructure;
by 2020 it is expected to deploy a modern national infrastructure for the collection, processing, storage and provision to consumers of spatial data;
by 2024, the introduction of domestic methods and software tools for automated processing, recognition and interpretation of spatial data obtained by remote sensing of the Earth (taken from space, taken from the air, including unmanned aerial vehicles, laser scanning, etc.).

The Program also includes for each area the tasks that need to be solved. So, in the direction of "Information infrastructure" is defined the following two tasks related to spatial data: creation of a national digital platform for the collection, processing and dissemination of spatial data for the needs of cartography and geodesy, ensuring the needs of citizens, business and government;

creation of a national digital platform for the collection, processing, storage and dissemination of Earth remote sensing (ERS), ensuring the needs of citizens, business and government.

The solution of the above tasks are to be implemented the following main activities:

to identify the needs of the digital economy in domestic services and technologies for the collection, processing and dissemination of spatial data and remote sensing data, as well as in products and services that are created on their basis;

to form the road map for the creation of infrastructure for collection, storage and processing of spatial data and the national digital platform for the collection, processing, storage and dissemination of remote sensing data, providing the needs of citizens, business and government; ensure ways of providing electronic spatial data and materials, as well as data and remote sensing data contained in the Federal Fund of spatial data;

to provide the possibility of automated processing, pattern recognition and validation, and use of spatial data and remote sensing data to ensure the implementation of geodetic and cartographic works;

to create a common geodetic infrastructure needed to define, clarify and disseminate state and local systems of coordinates (including to conduct scientific research to ensure its effective use);

to create a Federal network of differential geodetic stations providing increase of accuracy of definition of coordinates and the center for the integration of differential networks of geodetic stations and processing the received information;

to create a Unified electronic cartographic basis (UECB) and public information systems (GIS), ensuring its functioning and the provision of information (GIS UECB, the Federal portal GIS spatial data);

to create a Single seamless solid multilayer coating made by remote sensing data with different spatial (including high – better than 2 meters) resolution (SSSMC) and the State of the information systems, ensuring its functioning and the provision of information (GIS SSSMC, GIS Federal data portal of remote sensing data of the Earth).

In order to assess the implementation of the results of the Program identified the following two indicators:

creation of a Single electronic cartographic base (in percent);

the share of Russian remote sensing data in the total amount of ERS used in the national geographic information systems (in percent).

Dynamics of indicators of the Program until 2024 shown in Fig. 2.

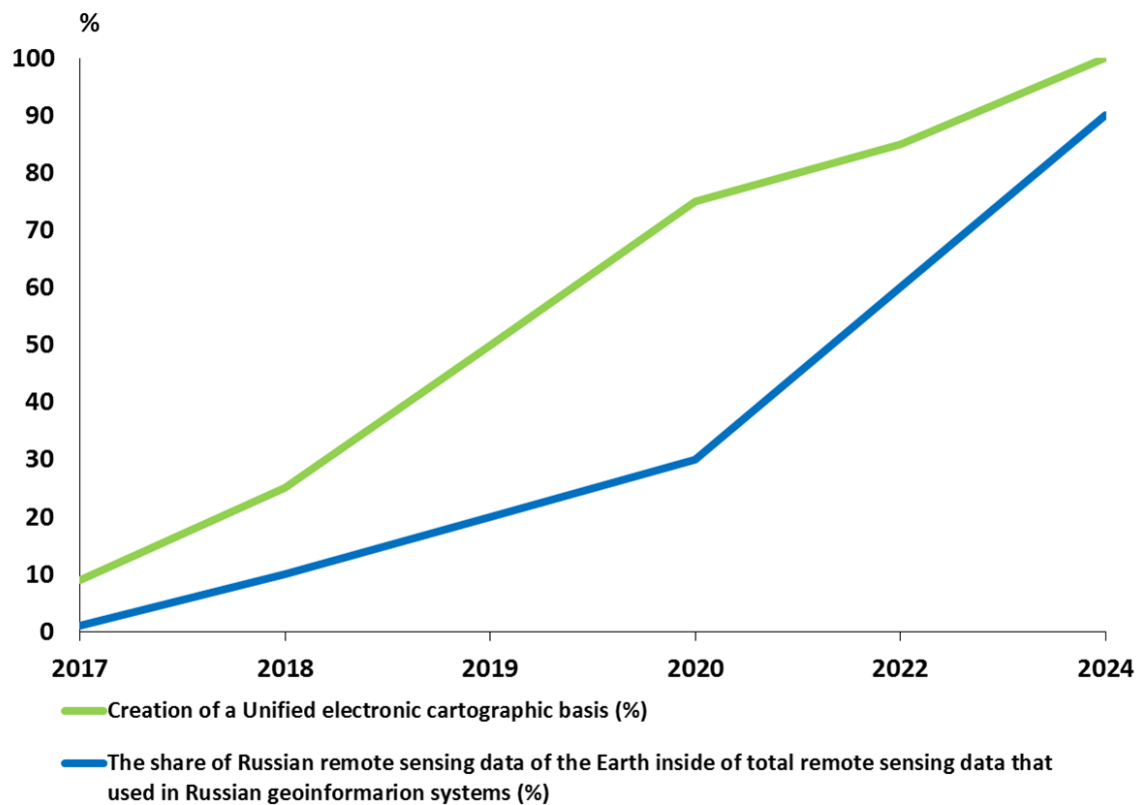


Fig. 2 Dynamics of Indicators of the Program "The Digital Economy of the Russian Federation"

The Order of the Government of the Russian Federation of 30 August 2017 №RD-P9-5691 approved the Plan of priority measures for the medium term (2017 – 2018) to improve the level of modern cartographic support in the Russian Federation for the purpose of practical implementation of normative regulation of geodesy, cartography and spatial data (Plan 2017 – 2018).

Section I of the Plan 2017 – 2018, entitled "Determination of parameters of the figure and gravity field of the Earth, and other parameters necessary to specify the state coordinate systems, state systems heights, state gravimetric system" envisages measures aimed to solve the following problems:

definition and monitoring of geodetic parameters of Earth (Earth figure, the parameters of the geoid, quasigeoid);

development of national geodetic, levelling and gravimetric networks;

development of domestic hardware and software implementing the methods of space geodesy.

Section II of the Plan 2017 – 2018, entitled "the Development of cartographic and GIS support" includes activities aimed at:

development of methods (algorithms), software tools processing, and analysis of spatial data to ensure the implementation of geodetic and cartographic works;
creation of a Unified electronic cartographic basis (UECB) in the State information systems providing its functioning, services for its use.

The Government of the Russian Federation determined the following Federal Executive authorities and state Corporation as executors of the Plan 2017 – 2018:

The Ministry of Economic Development of the Russian Federation;

The Federal Service for State Registration, Cadastre and Cartography;

The Ministry of Defense of the Russian Federation;

The Ministry of Telecom and Mass Communications of the Russian Federation;

The Federal Agency for Scientific Organizations;

Federal Service on Hydrometeorology and Environmental Monitoring;

Federal Agency on Technical Regulating and Metrology;

The Ministry of Industry and Trade of the Russian Federation;

State Space Corporation ROSCOSMOS.

In conclusion, the authors would like to note that the implementation of the named Program "Digital economy of the Russian Federation" and the Plan of priority measures for the medium term (2017 – 2018) to improve the level of modern cartographic support in the Russian Federation for the purpose of practical implementation of normative regulation of geodesy, cartography and spatial data will allow to fulfill:

conditions for the development of breakthrough technologies in the national geodesy and cartography;

full import substitution in the field of software for processing of geodetic and cartographic information;

use and processing of domestic remote sensing data of the Earth;

bases and banks of geodetic and cartographic information, other geospatial data;

producing spatial data infrastructure of the Russian Federation.

REFERENCES

1. Decree of the Government of the Russian Federation of December 28, 2012 No. 1463 "On Unified State Coordinate Systems". [Electronic resource]. – Access mode: <http://www.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=140248#0>
2. Decree of the Government of the Russian Federation of November 24, 2016 No. 1240 "On the establishment of state coordinate systems, the state system of heights and the state gravity system." [Electronic resource]. - Access mode: <http://www.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=207750#0>
3. Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 on the development of the spatial information infrastructure of the EC (INSPIRE)
4. Federal Law "On Geodesy, Cartography and Spatial Data and on Amending Certain Legislative Acts of the Russian Federation" of December 30, 2015 № 431-FZ - http://www.consultant.ru/document/cons_doc_LAW_191496/

5. Future trends in the management of geospatial information / Report of the UN Secretary-General to the second session of the Committee of Experts on the Management of Global Geospatial Information. – New-York, 13–15 August 2012 (E/C.20/2012/3). – http://ggim.un.org/2nd%20Session/E-C20-2012-3%20Future%20Trends_r.pdf.
6. Jie Jiang, Renliang Zhao / The Status of Chinese Database Construction and Updating // Global Geospatial Information. Resources: Proceedings of the International Workshop, 25 Apr. 2013 y. – Novosibirsk: SSGA, 2013. – pp. 90-96.
7. List of information classified as state secret. Approved by the Decree of the President of the Russian Federation of 30 November 1995 No. 1203. - [Electronic resource]. - Access mode: http://www.consultant.ru/document/cons_doc_LAW_8522/
8. Management of global geospatial information / Report of the UN Secretary-General to the substantive session of the Economic and Social Council (ECOSOC). – Geneva, 4–29 July 2011 (E/2011/89). – <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N11/335/34/PDF/N1133534.pdf?OpenElement>.
9. Order of the Government of the Russian Federation from August 30, 2017 No.RD-P9-5691.
10. Order of the Government of the Russian Federation dated July 28, 2017 year No. 1632-r. [Electronic resource] - Access mode: <http://government.ru/docs/28653/>
11. Pobedinsky G. G. Creation and updating of geospatial data of the Russian Federation (beginning) // Geodesy and cartography. - 2014. - No. 2. - p. 2 - 10.
12. Pobedinsky G.G. Creation and updating of geospatial data of the Russian Federation (continued) // Geodesy and cartography. - 2014. - No. 3. - p. 2 – 9.
13. Pobedinsky G.G., Prusakov A.N., Protopopova I.V. Public geospatial data of the Russian Federation. Issues of creation and use. // GeoScience-2017. №1, c. 22-35.
14. Pobedinsky G.G., Prusakov A.N., Yablonsky L.I. Organization of topographic and geodetic support of foreign countries (beginning). // Geodesy and cartography. - 2015. - No. 3. - p. 14 - 21.
15. Pobedinsky G.G., Prusakov A.N., Yablonsky L.I. Organization of topographic and geodetic support of foreign countries (continuation). // Geodesy and cartography. - 2015. - No. 4. - p. 2 - 12.
16. Pobedinsky G.G., Prusakov A.N., Yablonsky L.I. Organization of topographic and geodetic support of foreign countries (ending). // Geodesy and cartography. - 2015. - No. 5. - p. 2-7.
17. The Status of Topographic Mapping in the World. A UNGGIM – ISPRS Project 2012 – 2014 / G. Konecny, U. Breitkopf, A. Radtke, K. Lee. - Global Geospatial Information and High Resolution Global Land Cover/Land Use Mapping. Resources: Proceedings of ISPRS WG IV/2 workshop, 21 Apr. 2016 y. – Novosibirsk: SSUGT, 2016. – pp 4 - 44.
18. The strategy of topographic, geodetic, and cartographic support of the Russian Federation for the future up to 2030 (as amended on 01.04.2015) Is a project. - 2015. - [Electronic resource]. – Access mode: <http://base.consultant.ru/cons/cgi/online.cgi?base=PNPA;frame=401;n=8888;req=doc>

19. Vasiliev I.V., Korobov A.V., Pobedinsky G.G. On the Strategy of Topographic and Geodetic and Cartographic Support of the Russian Federation // Geodesy and Cartography. - 2015. - Special Issue. - C.4-11.
20. Vasiliev I.V., Korobov A.V., Pobedinsky G.G. Main directions of topographic and geodetic and cartographic-geodetic support of the Russian Federation // Geodesy and cartography. - 2015. - No.3. - P. 2-13.
21. Vasiliev I.V., Korobov A.V., Pobedinsky G.G., Pridankin A.B. Topographic and geodetic support of the Russian Federation. State and prospects of the development of the geodesy and cartography. / Geodesy and cartography. - 2014. - No. 12. - P. 2-11.

BIOGRAPHICAL NOTES

Gennady POBEDINSKIY

Ph.D. in engineering

Born January 13, 1958.

In 1980, he graduated from Novosibirsk Institute of geodesy, aerial photography and cartography (NIIGAiK).

From 1978 to 1984, he worked in Scientific-research Institute of applied geodesy.

From 1984 to 1986, he worked at the Central Research Institute of geodesy, aerial surveys and cartography (TsNIIGAiK).

From 1986 to 1989 - senior engineer, then Chief Engineer of the Expedition No. 131 of Enterprise No. 7 of the Main administration of geodesy and cartography under the Council of Ministers of the USSR.

From 1989 to 1992 - Chief of the Expedition no. 129, then Chief of the Verkhnevolzhskiy territorial geodetic center of the Moscow aerial geodetic enterprise of the Main administration of geodesy and cartography under the Council of Ministers of the USSR.

From 1992 to 2006 - Director of Federal state unitary enterprise "Verkhnevolzhskoe aerial geodetic enterprise" of the Federal service of geodesy and cartography of Russia.

From 2006 to 2009 - Deputy Head of the Federal agency of geodesy and cartography.

From 2010 to 2012 - Deputy Director of the Central Research Institute of geodesy, aerial surveys and cartography (TsNIIGAiK).

From 2012 to 2013 - General Director, Deputy General Director of the Joint-stock company «Roscartographia».

From 2013 to 2014 year - Deputy Director of Scientific-production association of geodesy and geodynamics.

From 2014 to 2017 - Director of Federal State Budgetary Establishment "Federal Scientific-Technical Center of Geodesy, Cartography and Spatial Data Infrastructure".

From 2017 - Deputy Chief Engineer of the Joint Stock Company "Verkhnevolzhskoe aerial geodetic enterprise".

Author of 4 books and more than 200 articles on geodesy and cartography.

In the 1999 by the President of the Russian Federation, he was awarded the Honorary title "Honored worker of geodesy and cartography of the Russian Federation".

Alexander PRUSAKOV

Ph.D. in economics

Born September 21, 1953.

In 1976, he graduated from Moscow Institute of engineers of geodesy, aerial photography and cartography (MIIGAiK).

From 1976 to 1981, he worked as an engineer in the Expedition No. 121 of the Enterprise No. 7 of the Main administration of geodesy and cartography under the Council of Ministers of the USSR.

From 1981 to 1991 - engineer, senior engineer, Chief of Division, Chief Surveyor, Deputy Chief of the Department of the economy and planning of the Main administration of Geodesy and cartography under the Council of Ministers of the USSR.

From 1991 to 1993 - Chief of the Department of economy and forecasting of the Main administration of cartography under the Council of Ministers of the RSFSR.

From 1993 to 1998 - Chief of the Department of the economy and planning of the Federal service of geodesy and cartography of Russia.

From 1998 to 2004 - Deputy Head of the Federal service of geodesy and cartography of Russia.

From 2004 to 2005 - Chief of the Department of the scientific and technical activities and cartography and geodesy funds of the Federal agency of geodesy and cartography.

From 2005 to 2009 - Chief of the Department of the economy, finance and management of state property of the Federal agency of geodesy and cartography.

From 2011 to 2012 - Director of Federal state unitary enterprise "Central topographic and mine surveying enterprise "Centrmarkshejderija", General Director of the Joint-stock company "Central topographic and mine surveying enterprise «Centrmarkshejderija».

From 2012 to 2015 - Deputy General Director for geodesy and cartography of the Society with limited liability «Specgeologorazvedka».

From 2015 - Head of technical regulation and measuring instruments Department of the Federal State Budgetary Establishment "Federal Scientific-Technical Center of Geodesy, Cartography and Spatial Data Infrastructure".

The author of 2 textbooks for universities on organization and economics of topographic-geodetic and cartographic production and more than 40 articles on geodesy and cartography.

In the 1999 by the President of the Russian Federation, he was awarded the Honorary title "Honored worker of geodesy and cartography of the Russian Federation".

CONTACTS

Gennady POBEDINSKIY

Joint Stock Company "Verkhnevolzhskoe aerial geodetic enterprise"

Vaneeva str., 205

Nizhniy Novgorod

RUSSIAN FEDERATION

Tel. +7 (831) 417 65 21

Fax +7 (831) 417 65 21

Email: pobedinskiy-17@yandex.ru

Web site: www.vagp.nn.ru

Alexander PRUSAKOV

Federal State Budgetary Establishment “Federal Scientific-Technical Center of Geodesy,
Cartography and Spatial Data Infrastructure”

Onezhskaja str., 26

Moscow

RUSSIAN FEDERATION

Tel. +7 (495) 456 91 49

Fax +7 (495) 456 91 42

Email: prusakov_an@nsdi.rosreestr.ru

Web site: www.cgipd.ru

The Status and Prospect of Creation of the State Geospatial Data of the Russian Federation (9302)
Gennady Pobedinskiy and Alexander Prusakov (Russia)

FIG Congress 2018

Embracing our smart world where the continents connect: enhancing the geospatial maturity of societies
Istanbul, Turkey, May 6–11, 2018