

## CONCEPT AND IMPLEMENTATION OF BASIC SPATIAL DATA SETS IN THE NATIONAL SPATIAL DATA SYSTEM OF THE RUSSIAN FEDERATION

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The concept of basic sets of spatial data (BNPD) is investigated and an analysis of its implementation in Russian legislation is carried out in order to assess the effectiveness of regulation of the circulation of spatial data in Russia. Based on foreign and Russian experience, the requirements for BNPD are determined. It is noted that the BNPD in Russia is primarily the unified electronic cartographic framework (EECO) and information to be presented using coordinates. The assessment of the EECO's compliance with the basic requirements for the BNPD showed that the EECO meets the advanced international approaches of spatial data infrastructure. To improve the efficiency of spatial data circulation in Russia, based on the analysis carried out, recommendations were made for the implementation of BNPD in the national spatial data system, including on improving the regulation of spatial data circulation in certain areas of legal regulation in the Russian Federation. The need for further research is substantiated in order to develop a technology for updating the EECO in a mode close to real time using information from the unified state register of real estate, state information systems for ensuring urban planning activities and other state land information systems.

**Keywords:** basic spatial data, the unified electronic cartographic framework, spatial information, spatial data infrastructure

### REFERENCES

1. Kapralov, E. G., Koshkarev, A. V., Tikunov, V. S. & et al. (2010). *Geoinformatika: Kn. 1 [Geoinformatics: Book 1]* (3rd ed.). V. S. Tikunov (Ed.), Moscow: Academy Publ., 400 p. [in Russian].
2. Koshkarev, A. V. (2009). Spatial data infrastructure of the Netherlands. *Prostranstvennyye dannyye [Spatial Data]*, 1, 6–16 [in Russian].
3. Kalinko, O. A., & Miller, S. A. (2005). Basic spatial data. *Prostranstvennyye dannyye [Spatial Data]*, 2, 6–13 [in Russian].
4. Olshevsky, A., Samsonenko, I., Bibova, N., & Myshlyakov, S. (2011). Basic spatial data as a component of the national spatial data infrastructure of the Republic of Belarus. *Zemlya Belarusii [Land of Belarus]*, 2, 26–31 [in Russian].
5. Spatial Data Infrastructure Cookbook. (n. d.). Retrieved from [http://gsdiassociation.org/images/publications/cookbooks/SDI\\_Cookbook\\_from\\_Wiki\\_2012\\_update.pdf](http://gsdiassociation.org/images/publications/cookbooks/SDI_Cookbook_from_Wiki_2012_update.pdf).
6. Order of the Government of the Russian Federation of August 21, 2006 No. 1157-r. The concept of creation and development of the spatial data infrastructure of the Russian Federation. Retrieved from ConsultantPlus online database [in Russian].
7. Order of the Government of the Russian Federation of December 17, 2010 No. 2378-r. Concept for the development of the geodesy and cartography industry until 2020, approved by the order of the Government of the Russian Federation. Retrieved from ConsultantPlus online database [in Russian].
8. Federal Law of December 30, 2015 No. 431-FZ. On geodesy, cartography and spatial data and on amendments to certain legislative acts of the Russian Federation. Retrieved from ConsultantPlus online database [in Russian].
9. Standarts Russian Federation. (2009). GOST R 53339-2009. Spatial basic data. General requirements. Retrieved from ConsultantPlus online database. Retrieved from ConsultantPlus online database [in Russian].
10. Standarts Russian Federation. (2019). GOST R 58570-2019. Spatial data infrastructure. General requirements. Retrieved from ConsultantPlus online database [in Russian].
11. Standarts Russian Federation. (2019). GOST R 58571-2019. Spatial data infrastructure. Requirements for information support. Retrieved from ConsultantPlus online database [in Russian].

12. Draft decree of the Government of the Russian Federation No. 01/01 / 08-21 / 00119106 of August 11, 2021. On the approval of the state program of the Russian Federation "National system of spatial data". Retrieved from <https://regulation.gov.ru/projects#npa=119106> [in Russian].
13. Development of a system project for the creation of a spatial data infrastructure of the Russian Federation: research report (State contract No. 120 / 1D of August 08, 2011). Moscow: FSUE "State Center" PRIRODA", 383 p. [in Russian].
14. Order of the Government of the Russian Federation of February 09, 2017 No. 232-р. On approval of the list of information at the disposal of state authorities and local self-government bodies to be submitted using coordinates. Retrieved from ConsultantPlus online database [in Russian].
15. Order of the Ministry of Economic Development of Russia No. 853 of December 27, 2016. On the establishment of requirements for the composition of information of a unified electronic cartographic basis and requirements for the frequency of their updating. Retrieved from ConsultantPlus online database [in Russian].
16. Order of the Government of the Russian Federation of May 25, 2004 No. 707-р. The list of constituent entities of the Russian Federation and individual districts of constituent entities of the Russian Federation (within the existing boundaries) belonging to territories with a high population density. Retrieved from ConsultantPlus online database [in Russian].
17. Decree of the Government of the Russian Federation of November 03, 2016 No. 1131. On the approval of the Rules for the creation and updating of a unified electronic cartographic basis. Retrieved from ConsultantPlus online database [in Russian].
18. Order of the Ministry of Economic Development of Russia of February 16, 2017 No. 62. About the list of information contained in the Unified State Register of Real Estate and used for the purpose of updating the unified electronic cartographic base. Retrieved from ConsultantPlus online database [in Russian].
19. Resolution of the government of the Russian Federation of December 01, 2016 No. 1276. On the procedure for information interaction between the state information system for maintaining a unified electronic cartographic framework with state information systems for ensuring urban planning activities. Retrieved from ConsultantPlus online database [in Russian].
20. Belogurova, E. B., Vorobiev, V. E., Gvozdev, O. G., & et. al. (2020). *Prostranstvennyye dannyye: potrebnosti ekonomiki v usloviyakh tsifrovizatsii [Spatial data: the needs of the economy in the context of digitalization]*. Moscow: NRU HSE Publ., 128 p. [in Russian].
21. Karpik, A. P., & Obidenko, V. I. (2021). *Issledovaniye potrebnosti federal'nykh organov ispolnitel'noy vlasti Rossiyskoy Fede-ratsii v prostranstvennykh dannyykh [Study of the needs of the federal executive authorities of the Russian Federation in spatial data]*. Novosibirsk, 216 p. [in Russian].
22. Knizhnikov, Yu. F. (2013). Is it necessary to change the paradigm of the country's topographic mapping?. *Geodeziya i kartografiya [Geodesy and Cartography]*, 2, 51–52 [in Russian].
23. Kil, Yu. E., & Sinitsyna, V. A. (2019). Digitalization of spatial data through the creation of a unified electronic cartographic framework. In *Sbornik materialov I Vserossiyskoy nauchno-prakticheskogo foruma molodykh uchenykh i studentov: Transformatsiya prava v informatsionnom obshchestve [Proceedings of I All-Russian Scientific and Practical Forum of Young Scientists and Students: Transformation of Law in an Information Society]* (pp. 183–189). [in Russian].
24. Tararin, A. M. (2012). Creation and development of spatial data infrastructure of the Russian Federation in 2012. In *Tezisy dokladov nauchno-tekhnicheskoy konferentsii: Velikie reki 2012 [Abstracts of Reports Scientific and Technical Conference: Great Rivers 2012]* (pp. 389–390). Nizhny Novgorod [in Russian].
25. Portnov, A. M. (2018). Unified approach to the spatial description of objects in the area of departmental registers/cadastrs as a promising basis for the state system of mapping territories. *Geodeziya i kartografiya [Geodesy and Cartography]*, 79(12), 41–49 [in Russian].
26. Tararin, A. M., & Belyaev, V. L. (2020). Spatial data in urban planning activity. *Geodeziya i kartografiya [Geodesy and Cartography]*, 11, 29–39. doi: 10.22389 / 0016-7126-2020-965-11-29-39 [in Russian].
27. Rosreestr order of October 23, 2020 No. P/0393. On approval of requirements for accuracy and methods for determining the coordinates of characteristic points of the boundaries of a land plot, requirements for accuracy and methods for determining the coordinates of characteristic points of the contour of a building, structure or an object of construction in progress on a land plot, as well as requirements for determining the area of a building, structure, premises, parking spaces. Retrieved from ConsultantPlus online database [in Russian].

28. Zagorovsky, V. I., & Radionov, G. P. (2014). Infrastructure of spatial data of the Russian Federation: experience, technologies, features. In *Mezhvuzovskiy nauchnyy sbornik: Geoinformatsionnye tekhnologii v proektirovanii i sozdanii korporativnykh informatsionnykh sistem [Interuniversity Scientific Collection: Geoinformation Technologies in the Design and Creation of Corporate Information Systems]* (pp. 5–14). Ufa: USATU Publ. [in Russian].

29. Tararin, A. M. (2021). Concept and classification of land information systems. *Izvestiya vuzov. Geodeziya i aerofotos"emka [Izvestiya Vuzov. Geodesy and Aerophotosurveying]*, 65(2), 221–231. doi: 10.30533 / 0536-101X-2021-65-2-221-231[in Russian].

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