

USAGE OF SATELLITES FOR THE EARTH REMOTE SENSING: LEGAL PROBLEMS AND PROSPECTS

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Article info

Received –
2022 January 13

Accepted –
2022 June 20

Available online –
2022 September 20

Keywords

Remote sensing of the Earth,
principles of remote sensing,
space monitoring,
intergovernmental agreements

The subject of the study incorporates the problems and prospects of remote sensing of the Earth, an analysis of the effectiveness of the international legal framework in this area is given in the article.

General and special methods of legal analysis were used.

The main results of the research include the proof that from a technical point of view, the definition and concept of remote sensing do not cause disagreement among professionals, but it was not possible to achieve consensus on the international legal status of remote sensing. It is not in the main sources of international space law. The Principles of Remote Sensing of 1986 are imperfect and outdated in many respects, although they remain the only universal international document regulating remote sensing, and have not been challenged for more than 30 years. A balance has been established between the interests of states on the main controversial issues, such as the relationship between freedom of space monitoring, state sovereignty and access to remote sensing data.

The results are practically significant, as they can serve as the basis for new normative legal acts at the international level, in the long term it is important to further expand cooperation in the field of remote sensing within the UN and other international organizations, conclude regional and bilateral agreements and develop national legislation.

The conclusion of the study is that the formation of the legal framework for remote sensing occurs by integrating the norms of "soft laws" into national laws, fixing them in international treaties and, as a consequence, the emergence of norms of customary law and norms of international law.

1. Introduction

The main trends in the study and exploration of outer space have been clearly defined for more than 60 years period of the space age.

First, the scale of space activities is rapidly expanding. Since the United Nations Register of Objects Launched into Outer Space was created in 1961, more than 7,300 such objects (satellites, probes, planetary rovers, manned spacecraft, etc.) have been registered, data on which have been provided by more than 55 states, as well as a number of international organizations. In 2018, a record number of space launches were carried out – 114¹.

Secondly, if initially space was exclusively the domain of states, and above all, military departments, now it is massively used by non-state, that is, private structures. As noted at a meeting of the Security Council of the Russian Federation in 2019, “the volume of the global market for commercial services related to space today is about 183 billion US dollars per year. And it will only increase in the upcoming years and decades.”².

Thirdly, competition in space is intensifying. The “first-born” of the space age were only two countries - the USSR and the USA. To date, more than a dozen countries have created independent space industries. Space is the focus of the «highest», competing technologies. Launches of small satellites by state and private structures, universities of different countries are becoming massive. If in 1990-2003 64 small satellites with a mass of less than 30 kg were launched into orbit, then in 2014-2018 - 900 increasingly tiny small satellites. The British One Web satellite system planned, including in cooperation with the

Roscosmos corporation, to provide users around the world with broadband Internet by 2027 on the basis of several hundred satellites. The competition for this project is the multifunctional information and communication satellite system Sphere, conceived in Russia, consisting of more than 600 satellites. According to the state program “Space activities of Russia for 2013-2020”, Russia’s share in the world production of space technology should increase to 16 percent.

Fourth, despite the competition, space exploration is unthinkable without international cooperation. Only industrially large or politically motivated powers (for example, the DPRK) can afford to create a complete space cycle: development - production - launching rockets and satellites - ground infrastructure. I.A. Chernykh rightly points out that most of the 60 countries participating in space exploration are not able to have such a cycle, and therefore satisfy their interests through international cooperation [32. c. 89].

The most complex technical projects are generally beyond the reach of anyone without internationalization of efforts. A striking example is the operation of an international civil space station with the participation of the governments of Russia, the United States, Canada, Japan and the European Space Agency. The station has already exhausted its resource, but it was decided to extend its operation until at least 2024. Another recent example is the unification of the efforts of Russia and China in the field of the use of global, navigation, satellite systems GLONASS and Beidou for peaceful purposes, which provides for the mutual placement of measuring stations on the territory of both countries.

Fifth, outer space has opened up unprecedented opportunities for the widespread introduction of modern technologies in all spheres of public life and everyday life of people. As domestic experts wrote back in 1960, “outer space, which until recently seemed inaccessible, is now becoming one of the” ordinary “spheres of human activity.” J. Popper and S. Rakotoniaina are absolutely right when they call for leaving the poetic imagination and unthinkable fantasies in the approach to space [22. P. 21-25].

¹ OECD. 2019. The Space Economy in Figures: How Space Contributes to the Global Economy. Available at: URL: <https://www.oecd-ilibrary.org/sites/c95bd574-en/index.html?itemId=/content/component/c95bd574-en&imeType=text/html> (date of the application: 15.12.2021).

² Enlarged meeting of the Security Council of the Russian Federation. 2019. Access mode: URL: <http://kremlin.ru/catalog/keywords/123/events/copy/60301> (date of the application: 15.12.2021).

The object of the study was the UN treaties and resolutions on outer space, documents of the UN Committee on Outer Space, its Scientific and Technical and Legal Subcommittees, the International Law Commission, as well as acts of national legislation on outer space of a number of states.

The methodological basis of the study is a set of general scientific methods, such as dialectical, logical, system-structural, functional, comparative legal, comparative historical analysis, modeling, and others. In the course of the study, an integrated approach to the analysis and disclosure of the problems under study was applied.

The focus of the study is the comparison and identification of contradictions in national and international legal acts. In this regard, it is important to note that the main legal and regulatory source is Resolution 41/65 of the UN General Assembly of December 3, 1986³.

In general, the literature on remote monitoring of the Earth is reduced to the possibilities of its use. For example, the following articles can be singled out: [18] describes groundwater mapping technologies [8. P. 1-13] describes the overall impact of these technologies on climate change [10], describes the use of Earth remote monitoring in archeology describes the use of Earth remote monitoring in the economic tracking of forest resources [27. P. 282-297] describes the use of remote monitoring of the Earth in the study of water quality [19] tracking these parameters in general, especially in the framework of compliance with the Treaty on the Non-Proliferation of Nuclear Weapons. Speaking in terms of a multidisciplinary approach, the prospects described in [9] seem interesting and commercially ambitious.

The authors develop the idea of correlation between economics, statistics, physics, ecology and remote monitoring of the Earth as a new research

tool. Thus, the problems of regulating remote monitoring of the Earth are rarely discussed and mainly in the context of the need to modernize the legal system, but there are no specific proposals in the discussions. So, for example, the following article [26. P. 143-156] points to the obvious imperfection of the regulation of the use of data obtained from space in general, but does not show either the full scale of the problem or the possibility of further development of regulation. Another approach, described in the following article [25], points to the possibility of national regulation as the basis for international regulation of remote monitoring of the Earth. At the same time, the problem of the fact that remote monitoring of the Earth is not defined as a single conceptual unit is not indicated and is not discussed. Thus, when using the proposed approach, legal harmonization at the international level seems impossible. The next article [5] points out the need for remote monitoring of the Earth, especially in the context of the struggle for ecology. This also points to regulatory issues, but the author comes to the conclusion that the environment is more important than respect for the right to privacy, so this approach is also quite limited.

The methodology of the study is based on the study of the basic principles of regulating the remote sensing of the Earth. In this vein, the main subject seems to be figuring out what Earth remote sensing is. Thus, within the framework of this study, "Remote Sensing of the Earth" (ERS) receives visual information about what is happening on the earth and in its depths, by observing with the help of space satellites.

It is proposed to consider the Russian and American approaches as the basis for regulating this sphere, since the Russian Federation and the United States are the pioneers of the space industry, which today, despite serious competition, are the leading space powers.

The general logic of the study includes a consistent indication of the problems and contradictions of ERM, followed by a proposal for a solution for each specific problem. Both national and international legislations are considered, their comparison reveals systemic contradictions in this area.

³ UNOOSA. 1986. Resolution adopted by the general assembly. 41/65. Principles Relating to Remote Sensing of the Earth from Outer Space. Available at: URL: <https://www.unoosa.org/oosa/en/ourwork/spacelaw/principles/remote-sensing-principles.html> (date of the application: 15.12.2021).
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2. The concept of remote sensing of the Earth under Russian legislation: Prospects for the development of remote sensing of the Earth in Russia

Among the leading areas of application of artificial satellites is "remote sensing of the Earth" (ERS) - obtaining visual information about what is happening on the surface of the Earth and in its depths, by observing with the help of space satellites. As Y. Sheffran explains, "outer space is permeable to all parts of the electromagnetic spectrum and, therefore, is well suited for various types of monitoring at large distances, when systems observe space from the Earth (tracking), and systems in space (satellites) probe the Earth. The accuracy is close to 10 cm in both directions" [23. P. 9-14].

In the Law of the Russian Federation "On Space Activities", remote sensing of the Earth from space, including environmental monitoring and meteorology, are classified as the main areas of space activities.

In technical terms, the term remote sensing does not cause noticeable controversy among professionals. In Russian practice, the definition given in the Regulation on planning space surveys, receiving, processing, storing and disseminating data from remote sensing of the Earth, approved by the Decree of the Government of the Russian Federation in 2005, is used. According to the Regulations, "remote sensing of the Earth" is the process of obtaining information about the Earth's surface by observing and measuring from space the intrinsic and reflected radiation of elements of the land, ocean and atmosphere in various ranges of electromagnetic waves in order to locate, describe the nature and temporal variability of natural parameters and phenomena, natural resources, the environment, as well as anthropogenic factors and formations.

The National Oceanic Service of the US Department of Commerce considers remote sensing as the science of obtaining remote information about objects or locations at a distance using space sensors that detect energy that is reflected from the Earth.

If we talk about the scale of remote sensing activities, then according to the "Concept for the development of the Russian space system for remote sensing of the Earth for the period up to 2025" in various stages of development in the world "there are from 200 to 300 new projects to implement promising opportunities for observing and shooting the Earth from space".⁴

There is every reason to predict that in the period up to 2025, remote sensing space facilities will become the most priority and effective class of civil spacecraft both abroad and in our country. At the same time, the world and potential Russian markets for remote sensing space data products continue to grow rapidly: by approximately 10-20% per year. The potential share of the promising Russian market can reach 10-15% of the global one.

In 2019, the Russian constellation of spacecraft (SC) remote sensing clustered of 13 spacecraft, including: 2 spacecraft for natural resources, 5 spacecraft for hydrometeorological purposes and 6 spacecraft for monitoring emergency situations.

Russian scientists believe that examples of the most important areas of application of remote sensing data are "geodes and cartography, cadastral registration of land plots, agriculture, environmental protection, emergency response, transport, communications, communications, energy industry, defense and security" [20. P. 28], [7]. In our opinion, it is almost impossible to make an exhaustive enumeration of the goals of remote sensing, because more and more new areas of application may arise, such as archeology, where Turkish scientists received a new tool [15. P. 83-88].

In 2017, the President of Russia set the task of "building up the orbital constellation that provides remote sensing. And by 2025, in accordance with the Federal Space Program of Russia, the orbital group of remote sensing is planned to be increased to 23 spacecraft, which "will significantly reduce Russia's dependence on the use of foreign space information and at the same time fulfill international obligations in the field of

⁴ The concept of the development of the Russian space system for remote sensing of the Earth for the period up to 2025. (2006). Access mode: URL: <https://refdb.ru/look/3251673-pall.html> (date of the application: 15.12.2021)

global hydrometeorological observation".⁵

3. International legal regulation of remote sensing of the Earth

In the aspect of international contractual regulation of remote sensing, it was not possible to achieve a common legally binding denominator. The issue of remote sensing was not reflected in the basic sources of international space law, including the fundamental 1967 Outer Space Treaty. There is no well-established legal definition of the term "remote sensing of the Earth", fixed by other international treaties. Already the first attempts of international legal regulation of remote sensing caused sharp disputes between states for political and economic reasons. The problem is that the remote sensing satellite monitors the surface of the Earth and its subsoil in automatic mode, without distinguishing between state borders, peaceful and military targets, without the demand of the probed states. And the subsequent dissemination of space monitoring data is not regulated in any way in the legal plan. Accordingly, the center of disagreement was and partially remains the question of the balance between the interests of the probing states, which advocated the freedom of global and unlimited collection of remote sensing data and their market distribution, and the interests of the probed states, insisting on the principle of sovereignty and unhindered, including free, obtaining remote sensing data [24. P. 1252-67].

Discussions on the international legal regime of remote sensing began in the Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space. Initially, it was supposed to develop an appropriate convention. However, work on her project stalled. The first major obstacle was the question of how to distinguish between legitimate and "espionage" activities to collect remote sensing data. In 1962, the USSR presented a draft declaration of basic principles on the exploration and use of outer

space, which contained a radical demand to ban "space espionage". However, in subsequent years, the position of our country, and of most other states, has changed. Domestic lawyers put forward the concept, according to which "the basis for distinguishing between legitimate and illegal remote sensing data can be the criterion for the purpose of obtaining, analyzing and using remote sensing data." The essence of the matter was that in the late 1960s and early 1970s, a system of bilateral and multilateral arms control and disarmament treaties began to take shape. Confidence in their observance could be provided, first of all, with the help of observation from space. In those years, only the USSR and the USA had satellite monitoring capabilities. In the Treaty on the Limitation of Anti-Ballistic Missile Systems and the Interim Agreement on Certain Measures in the Field of Limitation of Strategic Offensive Arms (START) signed by the USSR and the USA in 1972, for the first time, the provision was fixed that the Parties use the national technical equipment at their disposal to monitor compliance with them. means of control (NTSC). Moreover, it was forbidden to interfere with these means and to use deliberate means of disguising them. Similar wording was included in a series of subsequent treaties: in the Treaty between the USSR and the United States on the Elimination of Intermediate-Range and Shorter-Range Missiles, which has now ceased to have effect due to the unilateral withdrawal of the United States, in the texts of a series of treaties on START, including the last valid START-3 Treaty of 2010. The Comprehensive Nuclear-Test-Ban Treaty of 1996 (not yet in force, signed by 185 states), in addition to allowing the use of NTSC, explicitly states the obligations of States Parties to cooperate in exploring the potential of additional monitoring technologies in terms of verification, such as satellite monitoring^{6 7}. In the

⁵ Federal Space Program of Russia for 2016-2025. Approved by Decree of the Government of the Russian Federation of March 23, 2016 No. 230. Access mode: URL: <https://www.roscosmos.ru/22347/> (date of the application: 15.12.2021)
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⁶ Comprehensive Nuclear Test Ban Treaty. 1996. Available at: URL: https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mt_dsg_no=XXVI-4&chapter=26 (date of the application: 15.12.2021).

⁷ Comprehensive Nuclear-Test-Ban Treaty. 1972. Available at: URL: <https://www.un.org/disarmament/wmd/nuclear/ctbt> (date of the application: 15.12.2021).

late 1970s and 1980s, at the suggestion of France, even the possibility of creating an International Satellite Monitoring Agency to monitor the implementation of international disarmament treaties and promote the settlement of international disputes was widely discussed [21. P.124-142]. A group of UN governmental experts agreed with the idea of creating such an Agency in a special report⁸. However, this initiative was never implemented. Over time, the world began to perceive legitimate and wider activities of states to use space monitoring to assess the global and regional military-political situation. Members of the UN Security Council often refer to their satellite observations when discussing international crises. The IAEA relies on the results of space monitoring when analyzing nuclear activity, in particular, in the DPRK. Without space reconnaissance, the operation of the Russian military space forces in Syria would have become impossible [17. P. 1-45]. Thus, it can be stated that space monitoring of probing states for the purposes of national security and control over the global and regional situation without requesting the permission of the probed states has become a pragmatic reality. In fact, this practice has led to the formation of a customary rule of international law. (A clumsy dissonance here was recently voiced by the position of France, which proclaimed in 2019 a new "space defense strategy". French Minister of the Armed Forces F. Parly justified the need for such a strategy, in particular, by the fact that, they say, "the Russian spy satellite Luch-Olympus" quietly approached the Franco-Italian military communications satellite Athena-Fidus" [2].

Other obstacles arose on the way to international treaty regulation of remote sensing. Western countries insisted on a "free market" mode of remote sensing data and sounding of the territories of foreign states without their consent.

Developing countries demanded unlimited provision of data on sounding of their territories. The USSR and its allies insisted on a permissive regime under which the dissemination of remote sensing data on the probed state would be allowed only with its consent. This position was fixed in the Convention on the Transfer and Use of Earth Remote Sensing Data from Space, signed in 1978 by a group of socialist countries. The Convention contains obligations of the probing party not to transfer remote sensing data about the probed party to third parties without its consent and not to use such data to the detriment of the probed party. However, fundamental disagreements between different groups of states persisted, and this Convention never became universal. It was only in 1986 that a compromise was reached, according to which, instead of a universal convention, the negotiators agreed to adopt Principles relating to remote sensing of the Earth from outer space. The document was adopted in the form of a resolution of the UN General Assembly and, accordingly, is not legally binding, but is a recommendation set in the form of political obligations of states⁹.

Principle I defines the key terms of remote sensing. "Remote sensing" is defined as "probing the Earth's surface from space using the properties of electromagnetic waves emitted by reflected or scattered objects being probed, with the aim of better managing natural resources, improving land use and protecting the environment." As we can see, today the subject of remote sensing practice is wider: it includes the state of the World Ocean and its interior, and weather forecasting, and assessment of natural and man-made disasters, as well as, as noted above, monitoring for military and verification purposes, for the state of global and regional stability.

Principle II can be assessed as a declarative nod to countries that do not have sufficient resources for independent operation of remote sensing systems: "remote sensing activities are carried out for the benefit and in the interests of all countries, regardless of their level of economic,

⁸ The Implications of Establishing an International Satellite Monitoring Agency. 1983. Report of the Secretary-General. Dept. for Disarmament Affairs. Available at: URL: https://www.un-ilibrary.org/disarmament/the-implications-of-establishing-an-international-satellite-monitoring-agency_25f38257-en (date of the application: 15.12.2021).

⁹ Principles Relating to Remote Sensing of the Earth from Outer Space. (1986). Available at: URL: https://www.unoosa.org/pdf/publications/st_space_11rev2_E.pdf (date of the application: 15.12.2021).

social or scientific and technological development and with particular regard to the needs of developing countries”.

Principle III provides a common international legal basis for remote sensing: “Remote sensing activities are carried out in accordance with international law, including the Charter of the United Nations, the Treaty on Principles for the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, and relevant documents of the International Telecommunication Union (ITU).

Principle IV, again formulated in a declarative way, reflects the positions of the USSR and developing countries in favor of taking into account sovereignty and not damaging the rights and interests of the probed state. However, the permissive principle was not included in the document. It is stated that remote sensing activities are carried out in accordance with the provisions of the Outer Space Treaty of 1967, which provide that “the exploration and use of outer space is carried out for the benefit and in the interests of all countries” “This activity is carried out on the basis of respect for the principle of full and permanent sovereignty of all states and peoples over their wealth and natural resources, with due regard to the rights and interests of other states and organizations under their jurisdiction recognized under international law. Such activities must be carried out in such a way as not to prejudice the legitimate rights and interests of the probed state.”

Principles V-IX guide states towards international cooperation and determine its conditions. Here one can see a compromise between the interests of the probed states, which demanded unlimited access to remote sensing data, and Western countries, which advocated dissemination of remote sensing data only on market conditions. Thus, Principle V states that cooperation “is based in every case on fair and mutually acceptable terms”. Principle VI recommends the conclusion of international agreements. Principle VII provides for the provision of “technical assistance to other interested States on mutually agreed terms”. Principle VIII

encourages “technical assistance and coordination” through the United Nations. Principle IX calls on probing states to inform the Secretary-General of their remote sensing program and to provide “to the fullest extent possible and practicable, any other relevant information to any other state, in particular any developing state affected by this program, upon request.”

Principles X - XI focus on two essential subjects of space monitoring. Firstly, it is “protection of the natural environment of the Earth” - if the probing states “have established that they have information at their disposal that can prevent any phenomenon harmful to the natural environment of the Earth, they communicate this information to the relevant states.” Secondly, it is the “protection of mankind from natural disasters” - if the probing states “have established that they have processed data and analyzed information at their disposal that could be useful for states affected by natural disasters or at risk from impending natural disasters, they transmit such data and information to the States concerned as soon as possible.”

Principle XII continues the logic of data exchange conditions. Here, the paid basis for providing data is clearly fixed, as the countries of the West insisted on: “As soon as primary data and processed data on the territory under its jurisdiction are received, the probed state is given access to them on a non-discriminatory basis and on reasonable payment terms. The probed State shall also be granted access to analyzed information on the territory under its jurisdiction held by any State participating in remote sensing activities on the same basis and under the same conditions, taking particular account of the needs and interests of developing countries.”

Principle XIII provides for a standard procedure for consultation between probing and probed states if requested by the latter.

Principle XIV states that “States operating remote sensing satellites shall bear international responsibility for their activities and shall ensure that such activities are carried out in accordance with these principles and rules of international law, whether carried out by governmental bodies or non-governmental entities or in within the framework of international organizations. This Principle does not

provide an answer to the question of whether the responsibility extends to the ground stage and remote sensing infrastructure. The US and a number of other Western countries referred to the fact that terrestrial remote sensing activities are not space activities and are not regulated by the Outer Space Treaty, and therefore they are not subject to liability provisions. At the same time, other countries countered these arguments by saying that, according to Principle I, "the term "remote sensing activities" means the operation of space-based remote sensing systems, stations for the reception and accumulation of primary data, and activities for the processing, interpretation and dissemination of processed data." A.V. Yakovenko believes that the interpretation of the Remote Sensing Principles "gives grounds for the conclusion that the liability regime in international space law extends to all remote sensing activities at both stages" [33]. Principle XV declares that the settlement of disputes is carried out "by means of established procedures for the amicable settlement of disputes". Here, however, it is not clear which "established" procedures are referred to. When it comes to possible disputes, one should also take into account that their source lies in the fact that not only state structures, but also private firms and public-private partnerships are entering the market more and more actively. Often the interests of these three subjects are different. Accordingly, legal conflicts may arise. The Principles also contain no wording on the important issue of observing the rights of the probed object to intellectual property. According to A.V. Yakovenko, the issues of ensuring the rights of citizens from interference in their private lives as a result of remote sensing remain outside the scope of legal regulation. In particular, the issue of the admissibility of transmitting remote sensing data on individuals to state law enforcement agencies and courts has not been resolved [33].

As the Russian researchers conclude, "the long and complicated way of harmonizing the ERS Principles explains the vague, inconsistent and contradictory nature of the provisions contained in these Principles." "The regulation of activities in outer space is characterized by a lack of clarity of

the applicable law," said the report of the Space Law Committee of the International Law Association, an authoritative global organization of scientists, at its Sydney session in 2019. Nevertheless, when evaluating the Principles, it should be taken into account that they would not have come into being at all if their authors had not come to compromise, often declarative formulations. It is also clear that the authors of the Principles could not foresee all modern trends and technological innovations in remote sensing. The literature provides many examples of how the development of technological innovations requires the improvement of legal regulation [13. P. 326-332]. "This area of activity is developing and expanding extremely rapidly," states the article by three authors [4].

The uniqueness of the Principles to this day is that they managed to fix the main provisions on international cooperation and maintain an approximate balance of interests of states. Despite all the obvious imperfections, the principles of remote sensing are ipso facto today the only universal international document regulating the issues of remote sensing. Although the Remote Sensing Principles do not formally have legally binding force, they have nevertheless been observed for quite a long time (more than 30 years). For this reason, most Russian researchers rightly conclude that these Principles reflect the generally accepted practice in the field of remote sensing and they can be considered as a customary norm of international law. Let us add to confirm this that for the entire period of the ERS Principles there have not been any well-known lawsuits challenging the content of this document.

Thus, the Principles are, if not a binding document, then one of great moral force. Many provisions of the Remote Sensing Principles have been included in the national legislations of the states. Their actual recognition by the majority of states gives the principles the character of a normative factor [12. P. 121-123]. One cannot but agree with A.V. Yakovenko, who, pointing to the duration and uniformity of the application of the principles, believes that they have acquired the character of customary legal norms [33].

Remote sensing issues are not on the agenda of the Legal Subcommittee of the UN

Committee on the Peaceful Uses of Outer Space today. Technical aspects are discussed within the framework of the Scientific and Technical Subcommittee. Ideally, it would be possible to close the existing legal gaps by adopting a universal international convention on remote sensing. Such an initiative, for example, was put forward by a group of Latin American countries in the Legal Subcommittee in 2005. In their opinion, technological innovations and the commercialization of space activities dictate the need to adopt a relevant convention under the auspices of the UN. Western countries, however, blocked this proposal [1].

Pragmatism suggests that in the current conditions it is not realistic to adopt such a convention. It is not possible to put into the form of an international treaty not only this, but also other even more topical problems of space activity, for example, interaction to prevent the formation of space debris, the use of nuclear energy sources in space, and the reduction of asteroid danger.

Basic universal space conventions have not been adopted since the 1970s. After the approval of the Moon Agreement by the UN General Assembly in 1979, the UN Committee on Outer Space adopted the approach of adopting specific non-legally binding documents, in particular, in the mentioned format of the Principles. As stated in 2018 by the Deputy Minister of Foreign Affairs of Russia S.A. Ryabkov, "such an approach seemed acceptable and reasonable, since it made it possible to provide a regulatory framework in specific areas of space activities on the basis of political commitments. Such a concept essentially implied proper regulation, which was characterized by additional flexibility and fully met the needs of responsible behavior in space."¹⁰

4. Perspectives for strengthening the legal foundations of international cooperation

in the field of remote sensing of the Earth

According to the authors of this article, one of the most dangerous positions in the absence of a universal convention on remote sensing is a disregard for international law, attempts to solve existing problems by non-legal methods [3. P. 275-297]. The possibilities provided by the adopted international treaties are far from being exhausted [29. C. 82-95].

International law, including its various branches, contain various methods of regulation, which, however, cannot be applied without a thoughtful approach [11. P. 90].

How can we further strengthen the legal foundations of international cooperation in the field of remote sensing? To this end, the authors of the article propose the following international legal program of action.

First, in order to promote international cooperation in the field of remote sensing, actively use the discussion platform of the UN Committee on the Peaceful Uses of Outer Space, which "serves as a unique common platform for the development of international cooperation in the exploration and use of outer space for peaceful purposes at the global level"¹¹. Its Scientific and Technical Subcommittee reviews national and international cooperation programs using remote sensing [28. P. 1-2]. These include, for example, space monitoring of greenhouse gas emissions, air quality, atmospheric processes, climate change; prevention and liquidation of emergency situations; ozone loss; natural resource management; ecosystem management; forestry; hydrology; meteorology and forecasting of weather anomalies; monitoring land use and land cover changes; sea surface temperature monitoring; changing environmental conditions; mapping and research of glacial systems; crop and soil monitoring; irrigation systems; precise agricultural technology; groundwater detection; law

¹⁰ Speech by Deputy Minister of Foreign Affairs of Russia S.A. Ryabkov at the opening of the first UN Conference on Space Law and Space Policy. Moscow, September 11, 2018. Available at: URL:

http://www.mid.ru/web/guest/foreign_policy/news/asset_publisher/cKNonkJE02Bw/content/id/3339537 (date of the application: 15.12.2021).

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¹¹ UNOOSA. 2019. Committee on the Peaceful Uses of Outer Space Sixty-second session Vienna, 12-21 June 2019. Draft report. A/AC.105/L.318/Add.7. Available at: URL:

https://www.unoosa.org/res/oosadoc/data/documents/2019/aac_105/aac_105l_318add_4_0.html/AC105_L318Add04E.pdf

enforcement; urban planning, etc.¹² As a first step, focus on promoting the Russian initiative, put forward in the Subcommittee, on the creation under the auspices of the UN of a single Center for Information, monitoring of near-Earth space, improving the mechanism for registering space objects and increasing the safety of space operations¹³.

Secondly, to make greater use of the potential of specialized, international, intergovernmental organizations. Today, the issues of using space technology, including space monitoring, are on the agenda of most organizations that are part of the UN system [31. C. 172]. Among them are the World Meteorological Organization, the International Maritime Organization, the International Civil Aviation Organization, the International Telecommunication Union, the Food and Agriculture Organization, the United Nations Environment Programme, the International Atomic Energy Agency, and others. [16. P. 23].

Third, build up national efforts and resources, and improve Russian legislation. In 2017, the President of Russia set the task "to make remote sensing data available to both Russian and foreign consumers. Therefore, it is necessary to consolidate all the resources available in this area, improve the procedure for certification of data and the regulatory framework for their use in various industries."¹⁴.

According to the specialists of the Higher School of Economics, improvement of Russian legislation is required, taking into account international developments on the issues of

"development of mechanisms for legal regulation of the processes of certification of remote sensing data from space." We are talking about determining the format of the public service provided in the interests of public and private consumers, regulating the procedures for certification of remote sensing data and giving certified remote sensing data the status of legally significant" [6. P. 1-45], [14].

Fourth, to develop regional and bilateral cooperation in every possible way. Thus, the UN Committee on the Peaceful Uses of Outer Space positively assessed the intention of the BRICS countries to jointly create a remote sensing satellite constellation. It would be important to sign the relevant intergovernmental agreement of the BRICS countries, which was planned to be done back in 2018¹⁵. In 1992, within the framework of the CIS, an Agreement was signed on the interaction of the member states of the Commonwealth in the field of geodesy, cartography, cadaster and remote sensing of the earth. There is a need to update the contractual base of the CIS on remote sensing.

Fifth, expand the practice of concluding bilateral agreements on cooperation in the field of remote sensing. Among the previously signed are the Agreement with Kazakhstan on cooperation in the field of the use of space and aviation equipment, technologies and remote sensing of the Earth in 1998, as well as the Memorandum between the State Corporation "Roscosmos" and the National Academy of Sciences of the Republic of Belarus on the intentions to create a Russian-Belarusian remote sensing spacecraft in 2017. Negotiations are underway with China on the mutual reception of remote sensing data by ground stations of both countries.

5. Conclusions

Summing up, we note that the creation of a legal framework in the field of remote sensing occurs through the integration of "soft law" norms into national legislation, fixation in international treaties and, as a result, the emergence of

¹² UNOOSA. 2018. Inter-Agency Meeting on Outer Space Activities: 2018, Thirty-eighth session. Available at: URL: <https://www.unoosa.org/oosa/en/ourwork/un-space/iam/38th-session.html> (date of the application: 15.12.2021).

¹³ Annual report of the State Corporation for Space Activities "Roscosmos" for 2017. (2017). Available at: URL: <https://www.roscosmos.ru/media/img/docs/Reports/repourt.2017.pdf> (date of the application: 15.12.2021).

¹⁴ Meeting on the development of the Russian space industry. (2017). Access mode: URL: <http://kremlin.ru/events/president/news/54539> (date of the application: 15.12.2021)

¹⁵ UNOOSA. 2018. Inter-Agency Meeting on Outer Space Activities: 2018, Thirty-eighth session. Available at: URL: <https://www.unoosa.org/oosa/en/ourwork/un-space/iam/38th-session.html> (дата обращения: 15.12.2021).

customary norms of international law.

As they were formed in practice, a balance of interests of states was formed on the main "node" of relations in the field of remote sensing, namely between the freedom of space monitoring, state sovereignty and access of the probed states to remote sensing data, as well as the use of space monitoring in the interests of national security and international stability.

Taking into account the increasing drift of remote sensing activities into a commercial direction, we agree with M. Yuzbashyan that it would be more expedient to resolve legal conflicts through private international law procedures [30].

In terms of further strengthening the legal principles in the field of remote sensing, it is important to increase cooperation within the UN and other international organizations and platforms, conclude relevant bilateral and regional agreements, and improve national legislation.

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BIBLIOGRAPHIC DESCRIPTION

Lysenko M.N., Lozhkovoi P.N. Usage of satellites for
the Earth remote sensing: legal problems and pro-
spects. *Pravoprimenenie = Law Enforcement Review*,
2022, vol. 6, no. 3, pp. 147–160. DOI: 10.52468/
2542-1514.2022.6(3).147-160. (In Russ.).