EUROPEAN AND NATIONAL LEGAL ASPECTS OF OWNERSHIP OF GEOSPATIAL DATA OBTAINED THROUGH SATELLITE AND UAV TECHNOLOGIES

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Keywords: *Geospatial data, Satellite data, UAV data, Intellectual property, European law, National legislation*

Abstract: *The development of satellite systems and unmanned aerial vehicles (UAV) expands the possibilities for acquiring, processing and using geospatial data. Their increasing application in science, public administration and economic activities raises questions concerning rights over raw and derived data, conditions of access and the permissibility of their reuse. The aim of this study is to identify and analyse the applicable European and national legal regimes. The methods used include normative, systematic and comparative legal analysis, a review of the case law of the Court of Justice of the European Union and practical case studies. The study finds that geospatial data are not subject to a single, absolute right of ownership. Their legal regime is determined by the combination of copyright, contractual, licensing and public-law provisions. An approach has been proposed for the ex ante determination of rights and obligations governing the use of data obtained through remote sensing technologies.*

ЕВРОПЕЙСКИ И НАЦИОНАЛНИ ПРАВНИ АСПЕКТИ НА СОБСТВЕНОСТТА ВЪРХУ ГЕОПРОСТРАНСТВЕНИ ДАННИ, ПОЛУЧЕНИ ЧРЕЗ САТЕЛИТНИ И БЛА ТЕХНОЛОГИИ

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Ключови думи: *Геопространствени данни, Сателитни данни, БЛА данни, Интелектуална собственост, Европейско законодателство, Национално законодателство*

Резюме: *Развитието на сателитните системи и безпилотните летателни апарати (БЛА) разширява възможностите за придобиване, обработване и използване на геопространствени данни. Нарастващото им приложение в науката, публичната администрация и стопанската дейност поставя въпроси относно правата върху първичните и производните данни, условията за достъп и допустимостта на повторното им използване. Целта на изследването е да се установят и анализират приложимите европейски и национални правни режими. Използвани са нормативен, систематичен и сравнителноправен анализ, преглед на съдебната практика на Съда на Европейския съюз и практически казуси. Установява се, че геопространствените данни не са обект на единно абсолютно право на собственост. Правният им режим се определя от съчетаването на авторскоправни, договорни, лицензионни и публичноправни разпоредби. Предложен е подход за предварително определяне на правата и задълженията при използване на данни, получени чрез дистанционни технологии.*

1. Introduction

Modern remote sensing technologies for Earth observation offer significant opportunities to obtain accurate spatial information for diverse applications. Satellite imagery, digital terrain models, orthomosaics, multispectral measurements and thematic maps are used in environmental monitoring, agricultural land management, spatial planning, scientific research and public administration Technological progress, however, has outpaced the ability to explain the relationships among data creators, holders, processors and users through the traditional concept of ownership [1–7].

However, technological progress has outpaced the ability of traditional ownership concepts to adequately explain the legal relationships among data creators, data holders, data processors, and data users. Different forms of access to such data can be identified by examining how they are made available to various organisations for different purposes.

Furthermore, there is a need to examine and analyse these relationships in the context of statutory and contractual licensing arrangements, as well as intellectual property rights.

Technological progress creates opportunities for downstream growth and value creation. These developments enable geospatial data to be incorporated into new information services and products [8]. This, in turn, necessitates the establishment of an appropriate legal and regulatory framework governing the relationships among the creators, holders, and users of such data.

Technological development, however, has outpaced the ability to explain the relationships between data creators, holders, processors and users through the traditional concept of ownership.

The principal legal issue arises when determining rights over information obtained through satellite or UAV imaging. Ownership of the technical system, financing of the imaging operation or ownership of the observed immovable property does not automatically entail the acquisition of exclusive rights over the resulting geospatial data [9–11].

Further complexity arises from the fact that a single geospatial product may contain raw measurements, processed images, structured databases, software algorithms and cartographic visualisations. Different legal regimes may apply to the individual components [2, 9, 11].

Of particular importance are copyright, the *sui generis* right (from Latin, “of a special, independent kind”; the right of a database maker arising where the substantial investment required by law has been made in obtaining, verifying or presenting the contents of the database), contractual and licensing rights, personal data protection and the rules governing the reuse of public sector information [9, 11, 12, 13, 14].

The relevance of this study stems from the need for scientific organisations, public institutions and commercial operators to apply several legal instruments simultaneously when creating and using geospatial products [9–21].

2. Aim, materials and research methods

The study aims to identify, systematise and analyse the European and national legal aspects governing the acquisition, access, processing, use and dissemination of geospatial data obtained through satellite and UAV technologies. The overall methodological framework of the study is presented in Fig. 1.

To achieve this aim, European Union legislation, relevant Bulgarian legislation and the case law of the Court of Justice of the European Union have been examined.

A legal-dogmatic method has been applied to clarify the content of legal provisions, systematic interpretation to establish the relationships between individual regulatory regimes, and comparative legal analysis of the European and national legal frameworks.

The practical application of the provisions examined is considered through four illustrative case studies involving public institutions, scientific organisations, agricultural producers and commercial satellite service providers. The cases are analytical in nature and do not represent the results of an independently conducted empirical experiment.

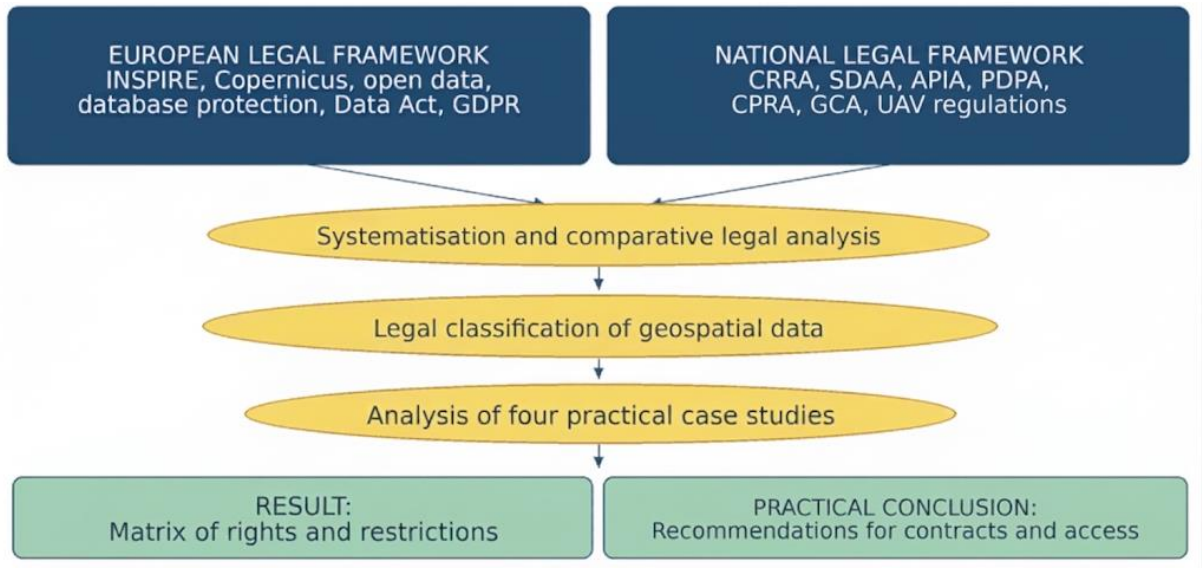


Fig. 1. Methodological framework of the study

3. Results and discussion

3.1. Legal characteristics of geospatial data

The legal analysis demonstrates the need to distinguish between the individual technological components of geospatial products.

Raw data include automatically acquired images, coordinates, radiometric values and telemetry information. They constitute factual measurements which, in themselves, do not always meet the conditions for copyright protection. Processed data include orthorectified images, orthomosaics, point clouds and digital surface or terrain models. Their legal classification depends on the nature of the processing performed, the presence of an original creative contribution and the applicable contractual terms [2].

Derived products, including thematic maps, classifications and results obtained by calculating the Normalized Difference Vegetation Index (NDVI), should likewise not be treated as a single legal category. Individual numerical values constitute data, whereas an original cartographic visualisation may qualify as a protected work [15].

Consequently, the legal regime must be determined separately for each technological component.

3.2. European legal framework

Directive 2007/2/EC, known as INSPIRE, establishes an infrastructure for spatial information in the European Union. Its main objectives relate to interoperability, metadata, access to and exchange of spatial information. It does not establish a general right of ownership over geospatial data [1].

Directive (EU) 2019/1024 on open data and the reuse of public sector information introduces rules promoting access to public information resources. Of particular importance is Commission Implementing Regulation (EU) 2023/138, which identifies specific high-value datasets. These include geospatial data and information related to Earth observation and the environment. Conditions for reuse are provided for the datasets covered, including open licences such as CC0 and CC BY 4.0 [2, 3].

Regulation (EU) 2021/696 establishing the Union Space Programme governs the policy of the Copernicus programme. Under Article 53, data and information from the programme are, as a rule, made available on a free, full and open-access basis, subject to certain restrictions, including those relating to security and third-party rights [18].

However, open access to data from Sentinel satellites does not mean that their users acquire an exclusive right of ownership over those data [11, 12, 18].

Regulation (EU) 2022/868 on European data governance establishes an additional framework for sharing and reusing certain categories of protected data without introducing universal ownership over them [10].

3.3. Intellectual property and database protection

Directive 96/9/EC on the legal protection of databases provides for two separate mechanisms: copyright protection where the selection or arrangement of the contents is original, and a sui generis right of the maker where there has been a substantial investment in obtaining, verifying or presenting the data [19].

This distinction is important because investment in the creation of data itself is not necessarily an investment giving rise to the sui generis database right [20].

Regulation (EU) 2023/2854, known as the Data Act, introduces rights and obligations concerning access to certain data from connected products and related services. Article 43 restricts the application of the sui generis database right in relation to data obtained from or generated by products and services falling within the scope of the Regulation [12].

When UAVs are used, the applicability of this regime must be determined according to the nature of the specific data. Telemetry information and captured images should not automatically be given the same legal classification.

3.4. National legal framework

Several interrelated legal instruments are relevant under Bulgarian law.

The Copyright and Related Rights Act (CRRA) establishes the conditions for the protection of works, including maps, diagrams and other outputs of an original creative nature. Facts and data do not, in themselves, automatically enjoy copyright protection [16].

The Spatial Data Access Act (SDAA) regulates the national infrastructure for spatial information, access to the relevant datasets and services, and certain grounds for restricting such access [21].

The Access to Public Information Act (APIA) contains provisions on the reuse of public sector information. Their applicability must be taken into account, particularly in publicly funded scientific projects and information resources [22].

The Cadastre and Property Register Act (CPRA) and the Geodesy and Cartography Act (GCA) regulate specialised matters relating to cadastral, geodetic and cartographic information [10].

The distinction between information about the ownership of immovable property and rights over the geospatial data themselves is essential [14, 23].

3.5. UAV technologies and personal data protection

Commission Implementing Regulation (EU) 2019/947 and Commission Delegated Regulation (EU) 2019/945 establish basic rules concerning the operation of unmanned aircraft systems. The relevant national regulatory framework also applies in Bulgaria [24].

Compliance with aviation requirements, however, does not automatically determine rights over the images and other data obtained during a flight [16, 24].

Where images contain information relating to identified or identifiable natural persons, Regulation (EU) 2016/679 – the General Data Protection Regulation (GDPR) – applies, together with the relevant national provisions. Consequently, possession of a file or the right to use it does not exempt the operator from personal data protection obligations [25].

4. Practical case studies and case law

Case study 1. A municipality commissions UAV imaging

A municipality commissions imaging of an urbanised area using an unmanned aircraft system. The operator obtains raw images, while a subcontractor creates an orthomosaic, a digital surface model and a three-dimensional point cloud.

Commissioning and paying for the service does not automatically mean that the municipality acquires all possible rights over the resulting outputs [10-12].

Legal conclusion: the contract should expressly regulate the delivery of raw data, rights over processed products, permitted disclosure to other administrations, and the applicable requirements for public access and reuse.

Case study 2. SRTI–BAS combines Sentinel-2 and UAV data

In a scientific project, the Space Research and Technology Institute at the Bulgarian Academy of Sciences uses Sentinel-2 imagery and multispectral information obtained by UAV.

The input satellite data are used in accordance with the Copernicus policy, whereas the UAV data may be subject to separate contractual terms.

Processing may result in the creation of algorithms, structured databases and thematic maps. The individual outputs may have different legal statuses.

Legal conclusion: rights over the input data, developed software, database and final scientific product must be distinguished, including by reviewing publication and open-science requirements.

Case study 3. An agricultural producer commissions multispectral imaging

An agricultural producer commissions a specialised company to image cultivated areas using a UAV.

Based on the resulting imagery, the provider prepares maps and analyses of vegetation condition.

The client has an interest in obtaining access to both raw and processed data, while the contractor may hold separate rights over previously developed algorithms and software solutions.

Legal conclusion: the contract should distinguish the deliverables, rights of subsequent use and the conditions for using client data in the development of other products.

Case study 4. A commercial satellite imagery provider

A commercial provider supplies a high-resolution satellite image to a client under a licence.

The licence may restrict the number of users, the distribution of the image and its inclusion in other products.

When creating derivative cartographic materials, the terms of the original licence must be taken into account.

Legal conclusion: acquiring access to a satellite image does not necessarily mean acquiring exclusive rights over it [11, 12. 18].

4.1. Case law of the Court of Justice of the European Union

The judgment in Case C-203/02, British Horseracing Board, distinguishes investment in the creation of data from investment in obtaining pre-existing contents for a database [14].

In Case C-604/10, Football Dataco, the Court emphasised the importance of originality for copyright protection of databases [26].

The judgment in Case C-30/14, Ryanair, considers the significance of contractual restrictions in relation to a database that does not qualify for the relevant protection under Directive 96/9/EC [27].

Case C-762/19, CV-Online Latvia, examines the conditions for protection against extraction and reuse of database contents and the importance of the investment being protected [17].

This case law confirms that the technical complexity and economic value of data are not, in themselves, sufficient to establish exclusive rights.

5. Recommendations for practical application

The findings of the study substantiate the need for scientific organisations and public institutions to determine in advance the legal regime applicable to the geospatial data they use.

An appropriate tool is a rights matrix that includes the data source, type of technological product, applicable licence, potential intellectual property rights, access restrictions and conditions for subsequent use.

Contracts for satellite and UAV services should expressly distinguish rights over raw imagery, processed data, metadata, algorithms and derived products.

Traceability of acquisition and processing should also be ensured by retaining information about the sensor used, the time and location of imaging, the software and any modifications made.

6. Conclusion

The study finds that the legal regime of geospatial data obtained through satellite and UAV technologies is characterised by multiple interrelated legal grounds.

European and national legislation do not establish a universal, absolute right of ownership over all categories of geospatial data.

Depending on their nature, copyright, sui generis database rights, contractual rights or statutory restrictions on access and processing may arise.

Therefore, in scientific, administrative and commercial applications, the prior legal classification of each information component is of decisive importance.

The main conclusion is that legal certainty in the use of geospatial data is achieved through clearly defining rights, obligations and restrictions, rather than broadly referring to them as “ownership”.

References:

Note: the links lead to official primary legal sources. The analytical conclusions in the text are the authors’ own and are derived through systematic interpretation of the listed legal acts and case law.

1. European Parliament and Council, Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) [2007] OJ L 108/1.
2. United Nations General Assembly, Principles Relating to Remote Sensing of the Earth from Outer Space, GA Res 41/65, UN Doc A/RES/41/65 (3 December 1986).
3. European Parliament and Council, Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (recast) [2019] OJ L 172/56.
4. Stankova, N., & Avetisyan, D. (2026). A Multispectral Satellite-Based Integrated System for Monitoring Fire Disturbance and Recovery Dynamics in Forest Ecosystems. Geomatics, 6(3), 55. https://doi.org/10.3390/geomatics6030055
5. Dimitrov, P., Roumenina, E., Ganeva, D., Gikov, A., Kamenova, I., & Bozhanova, V. (2024). Enhancing pléiades-based crop mapping with multi-temporal and texture information. Remote Sensing Applications: Society and Environment, 36, 101339. https://doi.org/10.1016/j.rsase.2024.101339
6. Ivanov, I., & Filchev, L. (2025). Transition Metal Elemental Mapping of Fe, Ti, and Cr in Lunar Dryden Crater Using Moon Mineralogy Mapper Data. Engineering Proceedings, 94(1), 5. https://doi.org/10.3390/engproc2025094005
7. Atanasova, D., Bozhanova, V., Biserkov, V., & Maneva, V. (2021). Distinguishing areas of organic, biodynamic and conventional farming by means of multispectral images. A pilot study. Biotechnology & Biotechnological Equipment, 35(1), 977–993. https://doi.org/10.1080/13102818.2021.1938675
8. Dimitrov, Z. (2025). Multi-Frequency SAR Utilization in Mountainous Regions in Bulgaria for Forest Boundaries Determination with Impact of Seasonality. Aerospace Research in Bulgaria, 37, 73–81.

9. Smith, L.J., Petrovici, G. (2018). Legal Aspects of Satellite Based Earth Observation—An Introduction. In: Brünner, C., Königsberger, G., Mayer, H., Rinner, A. (eds) Satellite-Based Earth Observation. Springer, Cham. https://doi.org/10.1007/978-3-319-74805-4_18
10. European Parliament and Council, Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act) [2022] OJ L 152/1.
11. European Parliament and Council, Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases [1996] OJ L 77/20.
12. Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act), OJ L, 2023/2854, 22 December 2023, Article 43.
13. European Commission, Commission Implementing Regulation (EU) 2023/138 of 21 December 2022 laying down a list of specific high-value datasets and the arrangements for their publication and re-use [2023] OJ L 19/43.
14. Access to Public Information Act (Bulgaria), State Gazette No. 55, 7 July 2000, as amended.
15. European Parliament and Council, Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ L 119/1.
16. Copyright and Related Rights Act. Promulgated in State Gazette No. 56 of 29 June 1993, as amended and supplemented, most recently by State Gazette No. 70 of 20 August 2024.
17. Commission Implementing Regulation (EU) 2023/138 of 21 December 2022 laying down a list of specific high-value datasets and the arrangements for their publication and re-use (Text with EEA relevance). Official Journal of the European Union, L 19, 20 January 2023, pp. 43–75.
18. European Parliament and Council of the European Union (2021). Regulation (EU) 2021/696 of 28 April 2021 establishing the Union Space Programme and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and Decision No 541/2014/EU. Official Journal of the European Union, L 170, 12 May 2021, pp. 69–148.
19. European Parliament and Council of the European Union (1996). Directive 96/9/EC of 11 March 1996 on the legal protection of databases. Official Journal of the European Communities, L 77, 27 March 1996, pp. 20–28.
20. The British Horseracing Board Ltd and Others v William Hill Organization Ltd, Case C-203/02, Judgment of the Court (Grand Chamber) of 9 November 2004, ECLI:EU:C:2004:695.
21. Republic of Bulgaria, Spatial Data Access Act, State Gazette No. 19 of 9 March 2010, as amended.
22. Republic of Bulgaria, Access to Public Information Act, State Gazette No. 55, 7 July 2000, as amended.
23. Republic of Bulgaria, Cadastre and Property Register Act, State Gazette No. 34, 25 April 2000, as amended.
24. Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft [2019] OJ L 152/45.
25. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ L 119/1.
26. Court of Justice of the European Union, Football Dataco Ltd and Others v Yahoo! UK Ltd and Others, Case C-604/10, Judgment of 1 March 2012, ECLI:EU:C:2012:115.
27. Court of Justice of the European Union, Ryanair Ltd v PR Aviation BV, Case C-30/14, Judgment of 15 January 2015, ECLI:EU:C:2015:10.