Open Data and Earth Observations

The Case of Opening Up Access to and Use of Earth Observation Data Through the Global Earth Observation System of Systems

by **Catherine Doldirina**, Dr., European Commission, Joint Research Centre (JRC), Institute for Environment and Sustainability (IES), Digital Earth and Reference Data Unit

Abstract: Earth observations (EO) represent a growing and valuable resource for many scientific, research and practical applications carried out by users around the world. Access to EO data for some applications or activities, like climate change research or emergency response activities, becomes indispensable for their success. However, often EO data or products made of them are (or are claimed to be) subject to intellectual property law protection and are licensed under specific conditions regarding access and use. Restrictive conditions on data use can be prohibitive for further work with the data. Global Earth Observation System of Systems (GEOSS) is an initiative led by the Group on Earth Observations (GEO) with the aim to provide coordinated, comprehensive, and sustained EO and information for making informed decisions in various areas beneficial to societies, their functioning and development. It seeks to share data with users world-wide with the fewest possible restrictions on their use by implementing GEOSS Data Sharing Principles adopted by GEO. The Principles proclaim full and open exchange of data shared within GEOSS, while recognising relevant international instruments and national policies and legislation through which restrictions on the use of data may be imposed.The paper focuses on the issue of the legal interoperability of data that are shared with varying restrictions on use with the aim to explore the options of making data interoperable. The main question it addresses is whether the public domain or its equivalents represent the best mechanism to ensure legal interoperability of data. To this end, the paper analyses legal protection regimes and their norms applicable to EO data. Based on the findings, it highlights the existing public law statutory, regulatory, and policy approaches, as well as private law instruments, such as waivers, licenses and contracts, that may be used to place the datasets in the public domain, or otherwise make them publicly available for use and re-use without restrictions. It uses GEOSS and the particular characteristics of it as a system to identify the ways to reconcile the vast possibilities it provides through sharing of data from various sources and jurisdictions on the one hand, and the restrictions on the use of the shared resources on the other. On a more general level the paper seeks to draw attention to the obstacles and potential regulatory solutions for sharing factual or research data for the purposes that go beyond research and education.

Keywords: Open Data; GEOSS; Data Sharing; Creative Commons; Open Data Commons;

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A. Introduction

1 Open data is a trend that a growing number of actors across the globe support, promote and implement. Benefits of its application to Earth observation data are widely promoted and emphasised.[1] It is not always an easy task to adopt and implement an open data strategy with regard to such data. The reasons behind the difficulties include the complexity of the activity as such, of its regulatory framework, as well as multiplicity of various actors involved in generation and use of Earth observation data and information products, and of their interests. For this reason, the discussion within this paper of the open data concept applied to Earth observations necessitates a brief overview of the activities during which Earth observations are made and data are generated, as well as of the range of applications or other activities for which these data can be used. One of the premises of this paper is that the nature of Earth observation data and their usefulness for various purposes are two major factors that can be used for making the case for applying the concept of open data to them.

2 Taking into account the specificities of Earth observation data the paper also highlights complex regulatory environment – various legal norms applicable to Earth observation data that impact the ability to access and use them. In addition, the options for ensuring access to Earth observation data – through regulation or licensing – are analysed. The exercise is carried out in the context of the Global Earth Observation System of Systems (GEOSS). GEOSS is an initiative set up by the Group on Earth Observations (GEO) to provide wider access to Earth observation data and information products, preferably on the open and unrestricted basis. It represents an excellent platform for conducting such efforts and assessing their effectiveness and sustainability. Activities within GEO reveal existing practices with regard to data sharing, as well as hurdles to ensuring legal interoperability and hence to genuine open access to and use of the shared data. The international character of GEO and the outreach of its activities are indicative of the complexity of the regulatory environment that affects legal interoperability of the shared data, and needs necessarily to be taken into account when GEOSS Data Sharing Principles are promoted for implementation by GEO members and participating organisations.

3 Overview of the legal issues pertinent to data shared through GEOSS, primarily due to their nature or in other words technical characteristics, is indicative of potential similarities within sectors of activities that involve use of geographic or other types of factual data. For this reason it is anticipated that the analysis of the applicable and compatible licences for sharing data through GEOSS may have implications or at least provide lessons learned to those involved in data sharing in other spheres. To mention a few, the Research Data Alliance (RDA),[2] European Data Infrastructure (EUDAT) project,[3] the European Copernicus programme,[4] Policy Recommendations for Open Access to Research Data in Europe (RECODE) project,[5] The European Thematic Network on Legal Aspects of Public Sector Information,[6] are projects that place legal interoperability as one of the most important aspects of their activities. Most of them are also aware of GEO's efforts in this regard. They also realise the importance of synergy of the separate efforts to promote legal interoperability for the enhanced effectiveness of each of them.

B. Context

I. Earth observation activities and data

4 Earth observation data are characterised by certain specificities including their nature, the process of their generation, the players who generate them (in particular their organisational origins: public, private, mixed players), their users and uses to which these data can be applicable.

5 Earth observation data are a type of factual data that represent fixated signals reflected from objects on the surface of the Earth, its depths or oceans. They are generated by special satellites. The process of acquiring such data starts when an operator sends a command to the satellite with the coordinates of the location to be observed. Once the satellite sensors acquire the data, it sends them by means of telemetry to a ground station, where the initial processing takes place.[7] It is only after this that Earth observation data may be made available to users, archived, or further processed.

6 Initial processing is required to make raw data usable, and correction, classification and interpretation involve use of computer algorithms[8] and of some *in situ* data.[9] For example, exact geographic coordinates are used as a base on which Earth observation data are projected in order to correct them so that they match the exact geographic location of the territory over which Earth observation data are acquired. A sufficient degree of processing – "interpretation of processed data, inputs of data and knowledge from other sources"[10] – transforms Earth observation data into analysed information.[11] The way Earth observation data are processed is often determined by the anticipated results or applications for which the processing is done. They are also decisive for the level or degree of processing, because what for some

applications or uses is considered data, for others is information.

7 Some applications for which satellite Earth observation data are used require complex analysis and integration of various types of data, often not only from Earth observation satellites, but other sources. For instance, emergency response requires a service that in order to be satisfactory to the customer (an actor carrying rescue operations, etc.) has to combine data from different satellite sensors (optical, RADAR and multispectral) processed to such a degree as to represent a ready-to-use information product (map or interactive map). In addition, this service has to be delivered rapidly and by means available when the terrestrial infrastructure is damaged or not available, for instance by a direct transmission from a telecommunication satellite to a mobile device (phone).[12] Other applications require delivery of other information products and services.[13]

8 Even this brief snapshot of technical characteristics of Earth observation data is indicative of potential hurdles of applicability of copyright to this subject-matter. They are discussed in detail later on in this article. This difficulty is also reflected in the available normative definitions of Earth observation data in international and national law.

9 On the international law level there is no universal convention or treaty that defines Earth observation data. The only relevant document is Principles Relating to Remote Sensing of the Earth from Outer Space[14] adopted by the United Nations (UN) General Assembly. Its first Principle distinguishes three distinct categories of Earth observation data depending on the degree of processing applied to them: 'primary data', 'processed data' and 'analysed information'. 'Primary data' are raw data transmitted by satellites to the ground stations.

10 On the national law level approaches to defining Earth observation data differ. The United States (US) and Canada[15] follow an approach similar to the UN Remote Sensing Principles. The US Land Remote Sensing Policy Act[16] defines Earth observation as an activity in the following way: "collection of data which can be processed into imagery of surface features of the Earth". Read together with the definition of the raw or unenhanced (Earth observation) data – "land remote sensing signals or imagery products that are unprocessed or subject only to data pre-processing" – it is clear that the US legislation makes a clear distinction between data and information depending on the processing applied. Canadian law also makes a distinction between 'raw data' and 'remote sensing product', based on processing.[17]

11 Laws in Europe do not generally follow the definitional distinction between raw[18] Earth observation data and information products made from them, as within the UN Remote Sensing Principles, the US and Canada. For example, the German Satellite Data Security Law[19] explicitly negates the importance of the distinction between raw and processed data or information by defining that Earth observation data as signals of satellite sensors and all products derived from them, notwithstanding the level of processing and the mode of their storage or presentation.[20] European Space Agency does reference the UN Remote Sensing Principles in its Data Policy, but categorises data based on their availability or accessibility (free and restrained datasets), not processing.[21]

12 The differences in approaches to defining Earth observation data[22] may have very specific implications on the availability and type of protection applicable to them. This above all is true with regard to application of copyright protection to Earth observation data. No distinction between raw and processed data or information may create difficulties in assessment of fulfilment of copyright protection criteria, since such an approach ignores differences between raw and processed data or information. In its turn, availability of copyright protection can directly affect the legal interoperability of data from various sources, especially when they are generated by actors based in different jurisdictions.

13 Differences as to how to treat Earth observation data may also be determined by the type of activity that generates them. Earth observation is pursued both by governments and private companies, and today is becoming a more lucrative business.[23] The purposes or applications for which Earth observation data can be used for are also of different nature, and can also be commercial or non-commercial. For instance, the humanitarian nature of using satellite Earth observation data under the Charter on Space and Major Disasters[24] may need to be accommodated differently than the applications regarding maritime surveillance services.[25] Due to the fact that many Earth observation satellites are quite unique, either due to their sensors or position, data they generate find users globally. As a result, the same data are used in different jurisdictions, where distinct laws, regulations and policies are in place. Better and less restrictive access to and use of Earth observation data can be ensured when various national policies and regulations are streamlined in accordance with the international trends and practices of open data.

II. Legal interoperability

14 The multiplicity of actors who generate Earth observation data and information products often

leads to different conditions or restrictions on their subsequent sharing and use. By analogy to the issues pertaining to technical interoperability that arise when data are generated and stored using different stan dards, procedures or formats, varying legal conditions and restrictions of access to and use of data reduce their legal interoperability. The GEO Data Sharing Working Group who among other issues addresses legal interoperability, proposed the following definition:

"Legal interoperability among multiple datasets from different sources occurs when:

- use conditions are clearly and readily determinable for each of the datasets,
- the legal use conditions imposed on each dataset allow creation and use of combined or derivative products, and
- users may legally access and use each dataset without seeking authorization from data creators on a case-by-case basis, assuming that the accumulated conditions of use for each and all of the datasets are met."[26]

15 Legal interoperability also implies online capability to search or track licenses and their compatibility with legal conditions of access to and use of data from various sources. When data from multiple sources are combined or used otherwise the resulting dataset incorporates the accumulated restrictions imposed by each and every source. Therefore, any restrictions need to be tracked. The fewest restrictions contained in original data results in the fewest restrictions in information products made with or from them. Full legal interoperability is achieved when data are provided without any restrictions on access and use, by analogy with copyright protection regime – placed in the public domain.

16 As was highlighted earlier and is analysed later in the paper, the complexity of the regulatory framework applicable to Earth observation data may negatively impact their legal interoperability. Specific challenges and ways to overcome them are discussed in the context of GEO and GEOSS.

C. GEO and GEOSS

I. Features of the initiative

17 GEO is a voluntary partnership of states and organisations, currently with 185 participants.[27] It was set up over ten years ago due to the realisation of the necessity of international cooperation to fully exploit the potential of Earth observation data for informed decision-making. The primary focus of GEO work is the development and operations of GEOSS. In 2015 GEO will complete the milestones of its first 10-Year Implementation Plan.[28] The implementation plan for the next decade of GEO activities is currently being developed and will be submitted for the approval by the GEO Plenary that as its highest governing body by consensus will decide whether to adopt it.

18 GEOSS is the most ambitious initiative to set up a platform to provide gateway and access to widest possible amount of Earth observation data initiated on the international level. GEOSS is designed to become a global network connecting data, information and other geographically referenced content from multiple providers – "an extraordinary range of information". This system of systems aims at offering decision-support tools to a wide variety of users[29] by linking together national and international Earth observation satellites and systems, as well as other sources of information about the Earth. It is set up to promote common technical standards to achieve interoperability and coherence of data generated from different sources.

19 Primary goal of GEOSS is to enable "open data exchange across different legal traditions and jurisdictions and reducing institutional, legal, and cultural impediments to data sharing."[30] Use of "coordinated, comprehensive and sustained Earth observations and information"[31] accessible through GEOSS is concentrated on nine societal benefit areas – fields of societal activities for which use of Earth observation data can be useful – disasters, health, energy, climate, water, weather, ecosystems, agriculture and biodiversity. The aim of such use is to promote and enable decision-making and execution for the benefit of mankind. For the achievement of this goal GEO adopted two data sharing mechanisms – GEOSS Data Sharing Principles,[32] and GEOSS Data Collection of Open Resources for Everyone (Data-CORE).[33] The success of reaching common, or in other words communal or societal good of making people information rich central to goals that GEOSS pursues depends on widest implementation of its Data Sharing Principles.[34]

II. GEOSS Data Sharing Principles and GEOSS Data-CORE

20 The three overarching principles[35] that govern exchange and use of data within GEOSS were agreed upon by the GEO Plenary in 2005. The Implementation Guidelines for the GEOSS Principles[36] provide the interpretation of the principles in the light of the GEOSS vision and goals, and should be followed when relationships with GEO are set up and data contributed to GEOSS. Adherence to the non-

binding GEOSS Data Sharing Principles by members and participating organisations ensures their coherent implementation. According to the first principle, data, metadata, and products available through GEOSS should be shared fully and openly. The second principle states that such data should be made accessible with "minimum time delay and at minimum cost". Third, last principle encourages provision of data for research and education purposes "free of charge or at no more than cost of reproduction".

21 The principle of full and open access to data shared through GEOSS emphasises the necessity to grant freedom to re-use and re-disseminate data to effectively enable their use[37] and therefore better achieve benefits from their use. The possibility for GEO participants to impose restrictions on these activities, based on obligations imposed by relevant international instruments, national policies or legislation, should be kept at the minimum. This principle is applicable to data independent from the source of their generation: government, private[38] or mixed.[39] The logic behind this guideline is that the principle of full and open access should be applicable to use of all shared Earth observation data because it makes their use more beneficial for all stakeholders and thereby contributes to the achievement of the aims and goals GEO pursues. The drafting history shows that the principle of full and open access to data shared through GEOSS is based on the premise that the shared data and information represent a public good.[40] This choice is made because GEOSS helps to disseminate Earth observation data as widely as possible and thereby to maximise societal benefits from their use.[41]"

22 Since the adoption of GEOSS Data Sharing Principles the situation with regard to data sharing has improved considerably, both within GEO and across the Earth observation and environmental data landscape. In accord with the emerging trend of open data the 2010 Beijing Ministerial Declaration announced creation of the GEOSS Data-CORE – a pool of resources that consists of data shared by the GEO community without any restrictions on use: "full, open and unrestricted access at no more than the cost of reproduction and distribution". The so-called conditions of use – registration and attribution – can be imposed on GEOSS Data-CORE users, but they are not seen by the GEO community as restricting use.[42] Currently this pool of resources is being made more extensive due to the willingness of many GEO members to contribute their data under such conditions.

23 Today the consensus regarding the benefits that full and open exchange of data can bring is strong.[43] The open data trend in particular affected policies and regulations regarding re-use of public sector information: establishment of the full and open access principle as a default basis for sharing government-produced and -held data and information resulted in a significant increase of their accessibility and usability without any restrictions. Examples include amended[44] or newly adopted[45] public sector information legislation in Europe, open data policies in countries like Argentina,[46] Finland,[47] Japan,[48] New Zealand,[49] the US[50] and many others, as well as the G8 Open Data Charter.[51] GEO has played a part in bringing about these changes in policy and attitude,[52] and should continue to do so. Taking into account new policy and legislative choices the GEO Data Sharing Working Group decided to introduce changes to the current GEOSS Data Sharing Principles in order to reinforce their forward-looking nature. The main goal is to elevate the status of GEOSS Data-CORE that at the moment is not part of the GEOSS Data Sharing Principles, and make it the default data sharing mechanism for GEOSS to further promote unrestricted sharing of Earth observation data that best ensures their legal interoperability.

D. Challenges to effective sharing of data and information through GEOSS Complex regulatory framework

24 The challenges of full implementation of GEOSS Data Sharing Principles across the GEO community have several dimensions. The first such dimension is "institutional". GEO as a voluntary organisation cannot impose or enforce their implementation, as it has to rely on the will and efforts undertaken by its members who provide the data. For this reason members can share data also with restrictions on use, which reduces interoperability but increases the amount of available data. It needs to be emphasised, however, that the progress GEO made with regard to making GEOSS operational and offering a wide range of fully and openly accessible and usable data and information resources is indicative of the commitment on the part of many within the GEO community to share their data without restrictions, or to keep those minimal.

25 The second dimension of challenges in implementing GEOSS Data Sharing Principles is related to the terminology they use. Terms like "full", "open", provided with "minimum time delay" and "at minimum cost"[53] are not *verbatim* common to all GEO members and participating organisations.[54] For instance, many jurisdictions and organisations use "full and open" or other terms as umbrella concepts that in fact encompass conditions of access and use, as well as rules regarding cost of access. The level of detail and specificity of the definitions varies making some of them clearer and more precise than others. Provision of data with minimum time delay also

seems to be an uncertain notion since most of the regulations and policies adopted by GEO members do not include any reference to the timeframe of providing or making available data they produce of acquire.

26 The third dimension is that of scope. Often GEOSS' "data, metadata and products" are a wider concept than what is defined as "open data" in jurisdictions of GEO members. The former, even though in practice limited to Earth observation or more generally geographic data, may include data from many various sources. The latter – open data – is most often limited to a specific type, like public or research data, or other types as per relevant policy or legislative regulation. In most cases private data are explicitly excluded from any open data policies or regulations. Differences in scope may have quite substantial implications as to what data can be fully and openly shared through GEOSS and as a result limit its resourcefulness, in particular reduced availability of GEOSS Data-CORE resources. Absence of uniformity in this regard may hinder interdisciplinary research and development of applications, since legal interoperability of shared data may be reduced.

27 The fourth dimension relates to different legal protection regimes applicable to the same data types, as well as differences between national sources of law that have the same subject-matter. For example, public data are often subject to public sector information legislation, as well as copyright law protection. However, each of these legal regimes in different jurisdictions may have varying provisions regarding, for example, characteristics of the protected subject-matter or specificities (scope, conditions, duration, etc.) of protection granted. This dimension potentially has the most serious impact on legal interoperability of data, not only shared through GEOSS, but any data shared across jurisdictions. This is illustrated on the example of copyright and public sector information regulatory regimes in the sections below.

I. Copyright: international minimum standards and jurisdictional differences

28 The key characteristics of copyright protection regime include the following: its subject-matter is works of authorship;[55] it is available without registration formalities; it consists of exclusive economic rights enforceable for a limited time, limitations to them, and moral rights. It should be noted that because of the fact that copyright protects intangible – in other words artificially created – property, it cannot go beyond boundaries of the law that codifies it. Characteristic features of copyrightable subject-matter and the scope of protection result in differences in the enforcement and governance of copyright (and intellectual property in general) and of tangible property.[56] The matter is further complicated by the fact that the exact scope of copyright protection is determined by national copyright laws that are not identical to each other.

29 Even the very subject-matter of copyright protection is an instance of different approaches. According to Article 2 of the Berne Convention[57] copyright protection encompasses "literary and artistic works", examples of which it codifies. By analogy, national legal instruments of copyright protection[58] contain open lists of protected subject-matter not to exclude potentially protectable works, or to include certain works, particularly those not listed in the Berne Convention,[59] into the scope of statutory protection. Focus and policy priorities in a given jurisdiction may result in refusal to protect subject-matter that in other jurisdictions is considered copyrightable.

30 The fixation criterion for copyright protection is another example, since the Berne Convention in Article 2(2) leaves indispensability of the requirement of material fixation of the work to the decision by nation states that of course end up being different. The US Copyright Act requires that that a work is created when it is "fixed in a copy ... for the first time",[60] while the German Copyright Law declares exploitation rights as applicable to work's material copies,[61] and the Canadian Copyright Act requires fixation of only specific works, like phonograms.[62]

31 The most important, primary criterion for copyright protection in accordance with the Berne Convention is that a protectable work shall be an intellectual creation. As in case with other mentioned criteria and elements of scope of copyright protection, interpretation of creativity under national laws or jurisprudence differs, whereby in the civil law system creativity reflects personality of the author,[63] his personal input in making a work, while in the common law countries it is rather the investment of "skill, judgment and labour" or "selection, judgment and experience."[64] However, this distinction is not very vivid, and many common law jurisdictions have recently started supporting less labour- and more personal creativity-oriented approach to interpretation of this criterion.[65] Also, the lower thresholds of creativity are not explicitly determined and differ not only across national laws, but sometimes even in individual court decisions within the same jurisdiction.

32 In addition, the important field of exceptions to the exclusive rights of authors[66] that insure access to existing works, sustain the public domain and facilitate exchange of ideas and creation of new

works, is also majorly left to the legislative choices made by individual states. As a result, for example Europe introduced a closed list of exceptions that users are allowed to perform with regard to work without prior permission of the author.[67] At the same time, in the US, in addition to individually specified exceptions, widely uses the so called fair-use doctrine[68] that is applied on the case by case basis and can exempt many more uses that those codified in the European legislation. The implication of the resulting differences is that two copyrightable works created in different jurisdictions may be subject to different exceptions, and that a user may not be able to apply same actions (quote, sample, etc.) to both of them. As a result, creation of other, independent works may be jeopardised or at the very least made more burdensome since active clearance of right is required when exceptions cannot be applied. This obviously can reduce legal interoperability of shared data and information.

33 Another significant difference is the term of copyright protection that can be life of the author and additional fifty years if the minimal threshold of the Berne Convention is followed, or seventy years in Europe[69] and the US.[70] Differences in the duration of the term of protection, as well as of the system as to how to count it, can also lead to various status of protected subject-matter created at the same time but in different jurisdictions. However, for data shared through GEOSS that are eligible for copyright protection this most likely will not become problematic in the next thirty or so years since most of satellite Earth observation data and information products weren't generated long enough to have available protection expired.

34 Highlighted discrepancies in copyright protection across jurisdictions, in particular those related to protected subject-matter and criteria for protection may indeed pose significant challenges for sharing data through GEOSS, in the first place because shared data and information products with the same level of processing and other matching technical features will be protected by copyright in some jurisdictions but not in others. This situation translates into potentially different restrictions applied to the shared data and as a result inability to integrate or otherwise work with data from multiple sources, which is exactly what GEO would like to avoid since the goal of sharing data to provide or produce useful information for decision-making purposes in various societal benefit areas.

II. Copyright: not always the best fit for Earth observation data

35 However many differences there are among copyright protection regulations around the world, the application of this legal regime to Earth observation data is not a matter of fact and needs careful assessment. The applicability problem is primarily linked to technical characteristics of Earth observation data, most important of which were discussed in section II. They preclude at least some types of Earth observation data from fulfilling criteria for copyright protection.

36 One of the *de minimis* rules established by international copyright law is that factual data are excluded from the protection scope.[71] The regulatory distinction in some jurisdictions[72] between raw and other types of Earth observation data may be interpreted as an implicit recognition of this obligation not to protect data. It can be argued that even in jurisdictions where there is no such distinction made, like in Germany, the (non)copyrightability of raw and processed Earth observation data will not be affected. Such a premise is based on the fact that the German Satellite Data Security Law[73] states that enforcement of other laws potentially applicable to EO data should not be affected by its provisions. The German Copyright Act,[74] in its turn, defines a copyrighted work as "author's personal intellectual creation"[75] and thereby rules out possibility to protect raw Earth observation data by virtue of copyright.

37 It is hard to deny, however, that copyright is applicable to at least some types of Earth observation data, partly because the lists of protected subject matter practically in any jurisdiction include maps,[76] which are one of the information products made by processing Earth observation data. It is therefore sufficient degree of creative processing that makes certain types of Earth observation data (or rather information products) eligible for copyright protection.[77] Most likely any products that result from processing that requires "interpretation of processed data, inputs of data and knowledge from other sources"[78] will qualify for copyright protection. The tricky part of analysis is the answer to the question as to when, with what degree of processing data are transformed into protectable work. The difficulty lies in the fact that various applications necessitate different degrees of processing, but each of them transforms mere data into information[79] for the purposes of that application or further use. However, most certainly raw and initially processed Earth observation data hardly fulfil the criterion of creativity indispensable for copyright protection.

38 The same concerns databases in form of which Earth observation data and information are commonly stored: their eligibility for protection is conditioned by creativity of their authors. Although most of the spatial data databases, including those arranging EO data are set up following more utilitarian rather than creative principles, the copyright protection cannot automatically be denied.

39 The implications for GEOSS that issue of copyrightability of Earth observation data brings is primarily linked to differences in interpreting the "sufficient degree of creativity" in various jurisdictions. A user will most probably be affected when he integrates or otherwise works with data from multiples sources. Having to work with two digital elevation models one of which is claimed to be a copyrighted work, while the other is explicitly stated to lack the sufficient degree of processing is indeed difficult, since such a situation creates confusion as to what in fact can be or is protected by copyright and what is not.

III. Public sector information law

40 Governments are quite substantially involved in pursuing Earth observation activities and in generation of Earth observation data, and in fact produce or fund production of most of Earth observation data. This practice results in applicability to such data of regulations governing access to and use of data and information[80] that are produced by governments or by private entities on their behalf.[81] The rationale for regulations that are applicable to government-produced or -held data and information is promotion and securing access to them and their use, while their basis is normally found in securing the right to freedom of opinion and expression, as well as in adhering to principles of democratic governance. For this reason, the fundamental principle of such regulations in many jurisdictions is free, full and open access to data and information. The number of countries establishing and enforcing this principle is growing and has transformed in the so called open data trend that encourages open access to and unrestricted use of as much government data and information as possible.[82]

41 Norms applicable to access to and use of government-produced or -held data and information have found less harmonisation on the international level than copyright protection discussed in the previous section. Even where appropriate international treaties are in place, they are either sectorial in application or not universally accepted. This is the case, for example, with the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters.[83]

42 Sufficiently independent development of this regulatory field within separate national jurisdictions leads to differences in the content of their provisions, even more so than in the case of copyright protection laws outlined above. One of the first noticeable differences to highlight is use of different terminology by statutes in different jurisdictions: such concepts as information,[84] documents[85] or records[86] are used. Their definitions also do not always coincide; hence Earth observation data may be treated differently. One of the more important instances that may have significant implications on subsequent handling of government-produced or -held data and information is their ownership. Some governments or their agencies own data and information they produce or hold as custodians,[87] others – as proper owners.[88] Consequently, governments and their agencies have different rights with regard to these data and information: they are either obligated to release them,[89] or have the discretion of making decisions as to what data and according to which conditions are made available. Some governments may decide to put their data and information into the public domain, *i.e.* lift any restrictions on reuse of released data and information. This is the case, for instance, in the US, notably not only on the level of the general Freedom of Information Act, but specifically applicable to Earth observation data through National Strategy for Earth Observations.[90]

43 Probably the most important instance of differing provisions within the regulations governing access to and use of government-produced or -held data and information is those dealing with restrictions regarding access to certain categories of otherwise freely available data and information.[91] Often even the principles on which imposition of these restrictive exemptions or exceptions to full and open access to data is based, can be different, as for example absolute and discretionary exemptions in the Freedom of Information Acts of the UK[92] and Australia,[93] or nine broad categories in the US Act.[94] As a rule, exemptions apply when, for example, information is accessible by other means than through a government body; when information should be published in future; when national security and defence, or international relations may be harmed by making information available; or when information is protected as personal information.[95] Some of the exemptions, notably potential infringement of intellectual property rights,[96] directly influence access to and use of Earth observation data and information. Furthermore, access to certain geological and geophysical information and data, which by definition include Earth observation data and information, may also be restricted.[97]

44 The last but not least is the issue of cost recovery. Even though in itself it does not affect the accessibility and usability of government data that are made available, high costs of access may be prohibitive, if users are unable or unwilling to pay them. In some jurisdictions cost recovery is allowed, as for example in many European countries, while in others, like in the US, it is not. Whatever the rationale for making

one or the other choice, it affects in the first place the amount of accessible data used by the public.

45 All highlighted differences inevitably impact usability of Earth observation data when falling under the provisions of relevant regulations that are shared through GEOSS, and can jeopardise successful implementation of GEOSS Data Sharing Principles or sharing of data as part of the GEOSS Data-CORE. However, despite the differences on the regulatory level, there are ways to ensure that both government-produced and -held data and information, and information eligible for copyright protection (independent of the public or private nature of its creator) can be effectively shared through GEOSS and utilised by its users for various purposes. The most common way is to use licences that allow use of data without restrictions. The next section provides an overview of licences that are the best fit for the purpose of sharing data through GEOSS without restrictions, and thereby contribute to good practices of adhering to the GEOSS Data-CORE conditions and the GEOSS Data Sharing Principles.

E. Licences as a mechanism to freely share Earth observation data

46 The option of placing Earth observation data (at least government-produced or -held) into public domain, in particular when they are eligible for copyright protection, was invoked as a possibility in the paper. In fact, it would be the most effective measure for some categories of Earth observation data, and a welcome step in the development of relevant national legislation or even international treaties. Some GEO members do introduce policy or regulatory measures of such nature with regard to data they can or share through GEOSS. Examples include unrestricted and free of charge access and use of Earth observation data from the US Landsat satellites[98] or China Brazil Earth Resources Satellites.[99] However, introduction of such a regulatory change, even for a certain subset or type of data, may not be easy to achieve. In addition, it will not apply, for example, to privately generated Earth observation data. Therefore, licences seem to be a much more practical solution that can be applied when sharing any type of Earth observation data through GEOSS, as the decision to do so is left with their author, rightholder or owner. Licenses are based upon existing statutory rights and are applied automatically, without dependence on a contractual agreement between the rights holder and individual user.

47 The mechanism that enables sharing data with virtually no restrictions is a waiver. It is an express declaration of the author or rightholder that no rights[100] comprising copyright protection are retained. This is a way for the author to proactively place a work, the term of protection of which has not yet expired, into the public domain and enable full usability of the shared data. Such waiver is the aim to achieve with regard to the Earth observation data shared through GEOSS, because this will level proprietary data with other data made available without restrictions. Using this type of waiver ensures full interoperability with no restrictions.

48 In case it is impossible or impractical for the author to waive all possible rights, a licence that retains some of them can be used. In order to avoid the necessity of drawing up licensing clauses on one's own, standard licences (as well as standard waivers) can be used. The most widely used are the licences offered by Creative Commons[101], but others like Open Data Commons,[102] and the UK Open Government Licence[103] for government data and information also exist and can be effectively used. The licence closest to a waiver, taking the example of Creative Commons CC-BY licence,[104] is the one that requires only attribution, while any use of the licensed work is permitted. This is essentially the only licence that meets the criteria of sharing Earth observation data as part of the GEOSS Data-CORE, and hence the one that ensures their full legal interoperability.

49 If attribution is not the only "return" that data author or rightholder wishes to receive in exchange to sharing them, the option of, in the terminology of Creative Commons,[105] Attribution-ShareAlike, Attribution-NonCommercial licences or a combination of the two can be opted for. By putting obligations to share the created derivative works under the same conditions as the originally licensed works, or to use licensed works only for non-commercial purposes, the licence narrows down the scope of use of the work, but does not affect the actual uses (dissemination, adaptation, translation, etc.) that can be applied to it. The ShareAlike clause, in addition, restricts freedom of the author of derivative work to use his own copyright as he sees fit, since it is independent from the copyright in the original work.[106] These licences are compatible with the GEOSS Data Sharing Principles.

50 The common use licence least desirable to be applied to Earth observation data shared through GEOSS is the one prohibiting creation of derivative works. Such restriction undermines the very purpose of operational GEOSS and the achievements of the benefits from the use of data envisaged by GEO. In addition, such a restriction, albeit compatible with copyright law norms, can significantly undermine creation of new information products that may be useful for various applications or purposes. For this reason use of such a restriction within licences for data shared through GEOSS should be avoided. Also, the more different licences are used to share data, the more reduced is their legal interoperability when

more than two data (sets) or information products are combined or used otherwise.

51 The limiting feature of a licence is that it is based on statutory copyright law (or for instance in the European Union based on the *sui generis* database right) and therefore cannot be used for data and information that are not eligible for copyright protection. However, in such cases to ensure the ability to use shared data, contracts may be opted for, in particular because their enforcement is dependent not on the statute they may invoke, but on the agreement of the parties.[107] Contracts, however, by their nature only bind the agreeing parties, and do not create an obligation of all third parties against the author or rightholder as the licences do. Suitable contracts can draw upon the clauses of licences that are compatible with GEOSS Data-CORE or GEOSS Data Sharing Principles described above. If adhered to, such practice will also contribute to ensuring maximum legal interoperability possible. By the same token, whenever data author or rightholder cannot use a standard licence, customized licence or waiver can be formulated using standard clauses of the widely used standard common use licences like Creative Commons.

52 In addition to the content or type of licences compatible with GEOSS Data-CORE or GEOSS Data Sharing Principles, the specificities of GEO as an organisation need to be taken into account. In the first place it is its international character: more than 80 jurisdictions are members of GEO and Earth observation data shared through GEOSS, in particular without restrictions on use, may be accessed and used essentially anywhere in the world. This situation stipulates use of licences that are valid under the laws of different jurisdictions, and increases the viability of opting for standard licences recognised by many. In addition, despite the voluntary nature of GEO, members who decide to share their data through GEOSS should be committed to the spirit of its goals and incorporate in licences they use clauses compatible with the GEOSS Data-CORE or at least with the GEOSS Data Sharing Principles.

F. Lessons learned for sharing factual data

53 Analysis undertaken in this paper identified specific challenges to making Earth observation data available through GEOSS, as well as mechanisms to overcome them and ensure legal interoperability of shared resources. The accomplished research allows to assume that essentially any other type of factual data can be made available for full and open access and use according to the same or similar approaches, rules, decisions or actions.

54 The option that ensures full legal interoperability of shared data and information is their active placement into the public domain. This can be done either through adopting a regulatory or policy option,[108] or through applying waivers of use rights by data authors or owners. Such waiver should provide users with the ability to freely use them,[109] and what is particularly important for the use of factual data – to allow creation of new works.[110] Possibility to accomplish the latter is indispensable for a more extensive use of factual data and for full realisation of their value.[111]

55 In cases where waiver of all or most of the rights is impossible, licences or contracts can be used. Their key feature should then be to incorporate comparable clauses that authorise the user to create and further distribute derivative products he makes. This step will contribute to interoperability of the shared resources. These licences or contracts should be compatible with the overall goal of the activity or a project, successful operation of which they are used to support. For the purpose of promoting legal certainty and acceptance, standard common use licences should be the primary choice. Customised licences and contracts should draw upon the provisions of such standard licences.

* Only personal views of the author are expressed in this paper. Catherine Doldirina, Dr. European Commission, Joint Research Centre (JRC), Institute for Environment and Sustainability (IES), Digital Earth and Reference Data Unit, Via Enrico Fermi 2749, 21027 Ispra VA, Italy

1 *See* e.g. Business, citizens and environment to benefit from free access to EU satellite data, press release of the European Commission IP/13/1067 (13/11/2013), online: http://europa.eu/rapid/press-release_IP-13-1067_en.htm; US National Strategy for Civil Earth Observations (April 2013) at 9-14, online: http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc_2013_earthobsstrategy.pdf.

2 Online: https://rd-alliance.org/.

3 Online: http://www.eudat.eu/.

4 Online: http://www.copernicus.eu/.

5 Online: http://recodeproject.eu/.

6 Online: http://www.lapsi-project.eu/.

7 Today often this initial processing is done by the satellite itself.

8 Raber, G. Tullis, J. & Jensen, J. Remote Sensing Data Acquisition and Initial Processing (2005) XIV *Earth Observation Magazine* 5.

9 Collected by terrestrial or aerial sensors.

10 Principle I United Nations Principles Relating to Remote Sensing of the Earth from Outer Space. G.A. Res. 41/65, U.N. Doc. AIRES/41/65, December 3, 1986 (hereinafter UN Remote Sensing Principles).

11 In the terminology of the UN Remote Sensing Principles; terms used in national regulations do differ. For the discussion regarding the potential significance of the distinction among data, processed and information *see* Doldirina, C. *The Common Good and Access to Remote Sensing Data* (LAMBERT Academic Publishing, 2011), chapters 1 & 2.

12 For more details on the requirements for the applications developed for emergency response, *see* Kassebom, M. & Penne, B. Fast Emergency Response & Maritime Security. *Earth Observation: Solutions for Decision-Making*, Conference (May 27-28, 2008, Munich), online: http://www.dlr.de/Portaldata/1/Resources/veranstaltungen/eo_konferenz/02_ohb_2.pdf.

13 For the use of satellite Earth observation data to check compliance of agricultural practices with current EU regulatory requirements, *see* Richardson, P., Åstrand, P.J. &Loudjani, P. The CAP fits. GeoConnexion International Magazine (Nov/Dec 2014), online: http://www.geoconnexion.com/uploads/publication_pdfs/int-v13i10-the-cap-fits.pdf. For water management activities, *see* Wever, T. Earth Observation for improved water/land use management – experiences from Africa and Arabia. *Earth Observation: Solutions for Decision-Making*, Conference (May 27-28, 2008, Munich), online: http://www.dlr.de/Portaldata/1/Resources/veranstaltungen/eo_konferenz/06_gaf_ag.pdf.

14 Note that the term 'Earth observation data' as used in this article does not differ from the term 'remote sensing data' in the UN Remote Sensing Principles.

15 Remote Sensing Space Systems Act. S.C. 2005, c. 45. November 25, 2005.

16 H.R.6133. 1992.

17 *See* §2 "Definitions", Canadian Remote Sensing Space Systems Act.

18 Primary, unenhanced, etc. – the actual terminology used is secondary to the content of the definitions and the current analysis.

19 §2 Satellitendatensicherheitsgesetz (November 23, 2007) BGBl. I S. 2590, as amended.

20 For a more extensive analysis regarding definition of Earth observation data *see* in Doldirina, C. A Rightly Balanced Intellectual Property Rights Regime as a Mechanism to Enhance Commercial Earth Observation Activities (2010) 67 *Acta Astronautica* at 639–647.

21 ESA Data Policy, unclassified version, October 2012, online: https://earth.esa.int/documents/10174/296006/Revised_Simplified_EO_Data_policy_03102012.pdf/7df6dcc0-fe19-428c-bbf3-4335dee70fe4?version=1.0.

22 For further overview of Earth observation regulatory and policy framework *see* Dunk, F., European Satellite Earth Observation: Law, Regulations, Policies, Projects, and Programmes (2008-2009) *Chreighton Law Review* 42, at 397-445.

23 *Cf.* world-wide freely available Landsat data and imagery, as well as the decision of the European Union to make Sentinel data also freely available, vs. the policies of commercial Earth observation satellite operators and data processing companies like Blackbridge who offers slightly different licences depending on the territory where EO data are purchased (*see* online http://blackbridge.com/rapideye/about/resources.htm), or Airbus Defence & Space who differentiate among sensors and products (*see* online http://www.geo-airbusds.com/en/886-legal-documents-and-supply-conditions).

24 *See* online https://www.disasterscharter.org/web/guest/home.

25 See e.g. information from the European Maritime Safety Agency, online: http://www.emsa.europa.eu/combined-maritime-data-menu/data-sources.html. For an overview of the features of the most common fields that greatly profit from the use of satellite Earth observation data see Surrey Satellite Technology, Applications of Earth Observation, online: http://www.sstl.co.uk/Downloads/Brochures/SSTL-Applications-Brochure-Web.

26 GEO Data Sharing Working Group, Mechanisms to Share Data as part of GEOSS Data-CORE, *Draft White Paper* on file with the author (Hereinafter Draft White Paper).

27 As of December 2014. Participants are referred to in GEO documents and throughout this paper as members (governments) and participating organisations. For more information about GEO, *see* online: https://www.earthobservations.org/about_geo.shtml.

28 February 16, 2005, online: https://www.earthobservations.org/documents/10-Year%20Implementation%20Plan.pdf.

29 Description of GEOSS, online: http://www.earthobservations.org/geoss.shtml.

30 GEO Report on Progress (November 5, 2010), at 38, online: https://www.earthobservations.org/documents/ministerial/beijing/MS2_The%20GEO%20Report%20on%20Progress.pdf.

31 GEOSS 10-Year Implementation Plan (February 16, 2005), at 1.

32 GEOSS 10-Year Implementation Plan, at 8.

33 GEOSS Data Sharing Action Plan (November 8, 2010), at 3, online: http://www.earthobservations.org/documents/geo_vii/07_GEOSS%20Data%20Sharing%20Action%20Plan%20Rev2.pdf.

34 *See* an article focusing on the relation of GEOSS to the concept of the common good: Doldirina, C. The Progress of Setting up GEOSS after November 2010 – the Necessity to Secure Adherence to its Data Sharing Guidelines. *IAC Proceedings* 2011.

35 For the comprehensive overview of the content of the GEOSS Data Sharing Principles, as well as of their implementation *see* Uhlir, P.F., Chen, R.S., Gabrynowicz, J.I., Janssen, K. Toward Implementation of the Global Earth Observation System of Systems Data Sharing Principles. 35 *Journal of Space Law* 1 (2009) 201.

36 November 18, 2009, online: https://www.earthobservations.org/documents/geo_vi/07_Implementation%20Guidelines%20for%20the%20GEOSS%20Data%20Sharing%20Principles%20Rev2.pdf.

37 Section 2 Implementation Guidelines for the GEOSS Data Sharing Principles, as accepted at GEO-VI (November 17-18, 2009). Online: <http://www.earthobservations.org/documents/geo_vi/07_Implementation%20Guidelines%20for%20the%20GEOSS%20Data%20Sharing%20Principles%20Rev2.pdf> (last accessed 29.08.2011).

38 Section 2.2 Implementation Guidelines, *supra* note 28; Draft White Paper, *supra* note 17.

39 Draft White Paper, *ibid*.

40 Draft White Paper, *ibid*. *See* also Section 4 Implementation Guidelines, *supra* note 28, where the link between the concept of the public good and GEOSS data pricing policy is emphasised. For a more extensive discussion regarding implementation of GEOSS Data Sharing Principles and the common (or public) good, *see* Doldirina, C. Implementation of GEOSS Data Sharing Principles: Relationship with the Regional and National Data Access Initiatives. *IAC Proceedings* 2012.

41 The White Paper, *ibid*., lines 545-550.

42 Imposition of the use conditions normally depends on the national regulatory requirements or data policies of those sharing the data. For example, it is the default rule of the European Union to demand attribution for the data (or other subject-matter protected by intellectual property rights) it shares and makes available for further use. See the EU legal notice, online: http://europa.eu/geninfo/legal_notices_en.htm.

43 *See* e.g. Davies, T. The Open Data Barometer 2013 Global Report, online: http://www.opendataresearch.org/dl/odb2013/Open-Data-Barometer-2013-Global-Report.pdf.

44 Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive of 2003/98/EC on the re-use of public sector information [2013] *OJ L* 175, at 1-8.

45 Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents [2011] *OJ L*, at 39-42.

46 *See* online: http://www1.hcdn.gov.ar/dependencias/dsecretaria/Periodo2012/PDF2012/SANCIONES/1927-D-2011.pdf.

47 Finland's Public Sector ICT Strategy 2012-2020, November 2012, online: https://www.vm.fi/vm/en/04_publications_and_documents/03_documents/20121112Public/name.jsp.

48 White Paper on Information and Communication in Japan in Open Data (April 19, 2013), online: http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/Releases/Telecommunications/130419_01.html.

49 Principles for Managing Data and Information held by the New Zealand Government (August 8, 2011), online: http://www.ict.govt.nz/programmes/open-and-transparent-government/new-zealand-data-and-information-management-princi#fn1.

50 Open Data Policy – Managing Information as an Asset (May 9, 2013), online: http://www.whitehouse.gov/sites/default/files/omb/memoranda/2013/m-13-13.pdf.

51 June 18, 2013, online: https://www.gov.uk/government/publications/open-data-charter/g8-open-data-charter-and-technical-annex.

52 GEO Data Sharing Working Group, Proposal for the updated GEOSS Data Sharing Principles, online: ftp://earthobservations.org/Data_Sharing/1_DSWG%20Documents/10_GEOSS%20Data%20Sharing%20Principles%20post%202015.doc.

53 For the GEO interpretation *see* Implementation Guidelines for the GEOSS Data Sharing Principles (November 2009), online: https://www.earthobservations.org/documents/geo_vi/07_Implementation%20Guidelines%20for%20the%20GEOSS%20Data%20Sharing%20Principles%20Rev2.pdf.

54 For a more detailed comparison *see* GEO Data Sharing Working Group, Interpretation of the "full and open" access to and use of (geographic) data: existing approaches, living paper (October, 2013), online: ftp://earthobservations.org/Data_Sharing/1_DSWG%20Documents/08_Interpretation%20of%20the%20%E2%80%9Cfull%20and%20open%E2%80%9D%20access%20to%20and%20use%20of%20(geographic)%20data%20existing%20approaches.docx.

55 *I.e.* they represent author's original expression of ideas.

56 On differences between the nature and characteristics of protection of intellectual property vs tangible property, *see* Jeremy Waldron, From Authors to Copiers: Individual Rights and Social Values in Intellectual Property, (1993) 68 *Chi.-Kent L. Rev.* 841, at 850-51; Wagner, R.P. Information Wants to be Free: Intellectual Property and the Mythologies of Control (2003) 103 *Colum. L. Rev.* 995, at 1001-1003; Smith, H.E. Intellectual Property as Property: Delineating Entitlements in Information (2006-2007) 116 *Yale L.J.* 1742.

57 Berne Convention for the Protection of Literary and Artistic Works (September 9, 1886), as last amended September 28, 1979, 1161 *U.N.T.S.* 30.

58 The US Copyright Act. Title 17 US Civil Code (October 19, 1976) Pub. L. No. 94-553. 90 Stat. 2541 as amended; German Copyright Law, Urheberrechtsgesetz (September 9, 1965) *BGBl.* I S. 1273 as amended; UK Copyright, Designs and Patents Act 1988) C 48 as amended, and French Intellectual Property Code (July 1, 1992) Law No. 92-597 as amended all serve as good illustrations.

59 See e.g. designer clothes as works of authorship under Art. L. 112-2(14) French Copyright Code, *ibid*.

60 §101 – the definition of 'created', *supra* note 46.

61 §15(1), *supra* note 46.

62 *See* e.g. the definitions of 'computer program', 'dramatic work' and 'sound recording' Sec. 2, R.S.C., 1985, c. C-42.

63 *See* e.g. §2(2) German Copyright Law: protected works should be personal intellectual creations (WIPO translation, online: http://www.wipo.int/clea/en/text_html.jsp?lang=EN&id=1008), *supra* note 46.

64 'Original' being something that is not copied. For a discussion on the interpretation of the authorship and creativity principle, *see* e.g. Ginsburg, J. The Concept of Authorship in Comparative Copyright Law (2002-2003) 52 *DePaul L. Rev.* 1063, at 1072-1091; *see* also Perry, M. & Margoni T. From Music Tracks to Google Maps: Who Owns Computer-generated Works? (2010) *Law Publications*. Paper 27, section 3.

65 E.g. in the US, after the case *Feist Publications, Inc., v. Rural Telephone Service Co*, 499 U.S. 340 (1991).

66 *See* Articles 9(2), 10 Berne Convention, *supra* note 45 and Article 10 WIPO Copyright Treaty (December 20, 1996) 2186 *U.N.T.S.* 121.

67 Article 5 Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society [2001] *OJ L* 10-19.

68 Codified in Section 107 US Copyright Act, *supra* note 46.

69 Directive 2011/77/EU of the European Parliament and of the Council of 27 September 2011 amending Directive 2006/116/EC on the term of protection of copyright and certain related rights.

70 Chapter 3 US Copyright Act, *supra* note 46.

71 Arts. 2, 5 WIPO Copyright Treaty, *supra* note 54.

72 *See* the US Land Remote Sensing Policy Act (1992) H.R.6133, and the UN Remote Sensing Principles, *supra* note 6.

73 §3(3), Satellitendatensicherheitsgesetz, *supra* note 13.

74 §2(2) of the German Copyright Law, *supra* note 46.

75 Author's own translation.

76 *See* e.g. *Stadtplanwerk* BGHZ 139, S. 68; *NJW* 1998, S. 3352, reconfirmed in I ZR 227/02 *GRUR* 2005, S. 854.

77 West, J.R, "Copyright Protection for Data Obtained by Remote Sensing: how the Data Enhancement Industry Will Ensure Access for Developing Countries" (1990)11 *Nw. J. Int'l L. & Bus.* 403, referring to the United States' submission at the UN COPUOS stating that enhanced data being the product of the analyser should be considered his property. *See* UN COPUOS, Report of the Scientific and Technical Sub-Committee on the Work of its 15th Session (1978) U.N. Doc. A/AC.105/216 at 8.

78 Principle I Remote Sensing Principles, *supra* note 6.

79 *See* e.g. details regarding processing in *Transforming Remote Sensing Data into Information and Applications* (National Academies Press, 2001) 16, online: http://www.nap.edu/catalog/10257.html.

80 Depending on the jurisdiction referred to as Access to Information Acts, Freedom of Information Acts or regulations regarding access to and use of public sector information.

81 This section only aims to give a very brief overview of the existing FOIA regulations. For a more extensive analysis *see* Smith, L.J. & Doldirina, C. Remote Sensing: The Three E's – A Case for Moving Space Data towards the Public Good (2008) 24/1 *Space Policy Journal* 22-32.

82 This trend is briefly mentioned in section III.2 of this paper.

83 Known as Aarhus Convention. June 25, 1998 *2161 U.N.T.S. 447*.

84 E.g. UK Freedom of Information Act 2000, c.36.

85 E.g. Freedom of Information Amendment (Reform) Act No. 51 of 2010, as amended; Council of Europe Recommendation Rec(2002)2 on access to official documents, available at http://www.coe.int/T/E/Human_rights/rec(2002)2_eng.pdf, last visited 02.02.2007.

86 E.g. U.S. *Freedom of Information Act, 5 U.S.C.* sect. 552; Canadian Access to Information Act. R.S. 1985, c. A-1, s 3.

87 Schedule 1, Sec. 3 Australian Freedom of Information Act, *supra* note 73; Part. 2 Interpretation New Zealand Official Information Act 1982 No 156.

88 Like in the UK, where the Ordnance Survey is a Crown corporation, as well as in some other member states of the European Union, even though the situation has been substantially changing in recent. *See* Onsrud, H. J. Geographic Information Legal Issues, in *Encyclopedia of Life Support Systems* (EOLSS) (EOLSS Publishers, Oxford, UK, 2004).

89 The example of the US federal regulations is the most prominent one, although the situation may differ on the states' level. *See* e.g. Dansby, H.B. A Survey and Analysis of State GIS Legislation (1992) *GIS Law* 1(1) at 7-13.

90 *Supra* note 1. Earth observation data should be fully and openly available promptly, without discrimination and free of charge whenever possible.

91 This is a standard approach, since most of the rules operate alongside exceptions or limitations that constrain their application. See e.g. Canadian Access to Information Act, Section 2(a): The purpose of the Act is to "allow any person a *right of access* to the records in the custody or under the control of a public body *subject to limited and specific exceptions*" (emphasis added), *supra* note 74.

92 Part II UK Freedom of Information Act, 2000 c. 36.

93 Schedule 3 Freedom of Information Amendment (Reform) Act, *supra* note 73.

94 The Freedom of Information Act 5 *U.S.C.* § 552, as amended.

95 These exemptions (called also exceptions or restrictions) are quite extensive, but have to be read narrowly. This stance is in accord with regulatory practices in other jurisdictions. For instance, in the US disclosure of information by public bodies is the main rule as well, and "any exception to that rule will be narrowly construed in light of the general policy of openness expressed" in the Freedom of Information Act (*Ottochian v. Freedom of Info. Comm'n*, 604 A.2d 351 (Conn. 1992). For a general discussion of the impact of the new technologies on the enforcement of FOIAs and access to databases (in the US) *see* Bloom, I. "Freedom of Information Laws in the Digital Age: The Death Knell of Information Privacy" (2005-2006) 12:3 *Rich. J.L. & Tech.* 9; *see* also MacDonald J. & Jones, C.H. eds. *The Law of Freedom of Information* (Oxford University Press, 2003) at 9.25-9.77.

96 E.g. Art. 4(2) Regulation (EC) No 1049/2001 of the European Parliament and of the Council of 30 May 2001 regarding public access to European Parliament, Council and Commission documents [2001] *OJ L 145 at 43–48*.

97 § 552(b)(9) US Freedom of Information Act, *supra* note 74.

98 Sec. 105(a) the US Land Remote Sensing Policy Act, *supra* note 60; *see* Landsat Data Distribution Policy, online: https://landsat.usgs.gov/documents/Landsat_Data_Policy.pdf.

99 *See* Soares, J. V., Epiphanio, J.C., Camara, G., CBERS-2B For Africa, report, online: ftp://ftp.earthobservations.org/C4/Giovanni/06/06%20-%20CBERS%20revOct.doc.

100 Depending on the will of the author or rightholder, or applicable legislation (e.g. with regard to moral rights).

101 *See* online: http://creativecommons.org/licenses.

102 *See* online: http://opendatacommons.org/licenses.

103 *See* online: http://www.nationalarchives.gov.uk/doc/open-government-licence/version/2; for context and further details *see* online: http://www.nationalarchives.gov.uk/information-management/uk-gov-licensing-framework.htm. A version of it is also used in Canada.

104 *See* online: http://creativecommons.org/licenses/by/4.0/legalcode.

105 For short description and links to full text of all mentioned licences, *see supra* note 89.

106 *See* e.g. definition of the 'adaptation' in Sec. 20 UK Copyright, Designs and Patents Act, *supra* note 46; of the 'Bearbeitungen' (adaptations) in §23 German Copyright Law, *supra* note 46; of the 'derivative work' in §§101, 103 US Copyright Act, *supra* note 46.

107 Here some jurisdictional differences need to be kept in mind, in particular, for example in Europe, where copyright laws contain more requirements to contracts than in the US. However, where a contract serves the purpose of enabling use, rather than restricting it, no immediate issues with it enforceability arise.

108 With regard to the discussion as to whether intellectual property is (always) the most adequate option, see Perry, M. Digital Propertisation of the New Artefacts: the Application of Technologies for "Soft" Representations of the Physical and Metaphysical (2003-2004) 11 *Cardozo J. Int'l & Comp. L.* 671.

109 *See* Boyle, J. *The Public Domain: Enclosing the Commons of the Mind* (New Haven, London: Yale University Press, 2008), at 65 ff.

110 *See* Besser, H. Commodification of Culture Harms Creators (American Library Association, 2001), online: http://www.ala.org/offices/oitp/publications/infocommons0204/besser.

111 *See* e.g. Ryerson, B. Making Remote Sensing Operational: A Changing World Requiring Changing Approaches to Data Policy. *The First International Symposium on Cloud-prone and Rainy Areas Remote Sensing* (Hong Kong, October 6-8, 2005), online: http://kimgeomatics.com/uploads/kim/2008/10/invited-paper-on-rs-data-policy-hong-kong-2005.pdf.