

Interpretation of the “full and open” access to and use of (geographic) data: existing approaches

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¹ Primary author is Catherine Doldirina. Additional contributions regarding interpretation of the terms “full and open” access that highlight regulatory and policy developments, trends and status quo in various jurisdictions are welcome to be added to the body of this paper any time.

A. Summary of approaches

1. Main issues

Quite a few states and organisations from those highlighted as examples in the current document have adopted some degree of open access to the data they produce or own. However, there is little harmonisation between the approaches these different entities undertake (and the GEOSS Data Sharing Principles that the EU would commit to follow provided the Copernicus draft Regulation on the access to GMES dedicated data and GMES service information is adopted) on several levels. It should be noted upfront that the regulations/policies/approaches cited are potentially in an unbalanced way Europe-centred (with the exceptions of the USA, Australia, Canada and a few others, including international organisations). All examples highlighted represent good practices and in this sense or dimension may be relied upon for development of regulatory or policy approaches by those actors who still have not adopted these.

Firstly, it is the formal aspect – the terminology used in case access to data is granted. “Full”, “open”, provided with “minimum time delay” and “at minimum cost” terms used in GEOSS Data Sharing Principles are not *verbatim* common to all jurisdictions and organisations. For instance, many jurisdictions and organisations use “full and open” (or other, alternative terms) as umbrella concepts that in fact encompass conditions (ideally none or very limited) of access and use, as well as rules regarding cost of access. In the European context, a term “full” is also used, but not all other jurisdictions follow this choice. Most of the regulations and policies highlighted do not include any reference to the timing/time of provision or making available open data. Some states and organisations, in particular the EU and its Member States, allow the possibility of recovering “reasonable return on investment” when making relevant types of data accessible.

Secondly, and most importantly, the interpretation of these (different) terms often is not homogeneous either: the level of details and specificity of the definitions varies making some of them more clear and precise than others. Thirdly, the definition of “open data” or “open access to data”, if or when used, is most often limited to a specific type of data – public, research, government-produced or -held, or other types as per relevant policy or legislative regulation. In addition, the documents cited do not necessarily have proper documented interpretation of the terms used in their policies or regulations. This fact contributes to more complications when data from various sources are used together.

2. Comparative table

The table below aims to provide an overview of differences in terminology and content of the principles regarding access to data. It is organised according to the four elements of GEOSS Data Sharing Principles (full, open, provided with minimum time delay and at the minimum cost) and their interpretation within the GEOSS Data Sharing Principles and the Implementation Guidelines, as well as two additional parameters – subject and scope of use, and the type(s) of data to which a particular policy or regulation is applicable. The cells where no alternatives to the terms of GEOSS Data Sharing Principles were discovered are left blank. But different terminology used or interpreted along the lines of the Principles is highlighted. Note that no regulations of the EU Member States are reflected in the table, as the highlighted EU-level regulations are either directly applicable in all of them, or have been implemented by them on the national level. However, regulatory examples from a number of the EU Member States are brought in Section B.2.e. below.

GEOSS terms	Full	Open	Minimum delay	Minimum cost	Who/what use	Applied to
Interpretation	taking into account international instruments and national policies and legislation			free or cost of reproduction	research and education	data, metadata, products
Other						
<i>Policies of international organisations</i>						
UN, Disaster Charter	universal access				identified group of users for specific (limited) purpose	
WMO		Unrestricted – non-discriminatory		Cost of reproduction & delivery for non-commercial activities	research and education communities	Basic meteorological data and products
<i>Regional policies and regulations</i>						
EUMETSAT Data Policy		unrestricted		no cost except for the cost of decryption key units	a) all EUMETSAT data, products & services, for official use. b) “Essential” data and products (WMO Resolution 40) for research & educational use	Member states (National Meteorological Services) of EUMETSAT
EU, PSI Directive				cost of collection, production, reproduction and dissemination, together with a reasonable return on investment	Commercial/non-commercial re-use	documents held by public sector bodies

GEOSS terms	Full	Open	Minimum delay	Minimum cost	Who/what use	Applied to
EU, Draft Copernicus data policy Regulation	full	Open: security restriction, licensing conditions & registration may apply		Free of charge / cost of fulfilling user request	Commercial/non-commercial re-use	information produced by Copernicus services and data collected through Copernicus infrastructure
EU, ERC Guidelines for Open Access		efficient		free		information, including scientific publications and original data
ESA, Sentinel Data Policy	full	open		Free		
OECD		Open access & unrestricted use. Conditions/restrictions possible	Timely access	Preferably marginal cost of dissemination	scientific progress and training of researchers	research data from public funding
<i>National legislation and policies</i>						
Australia		Open: CC BY standard as default		the lowest reasonable cost	Re-use of public sector information	public
Natural Resources Canada	A fully paid right	A right		royalty-free	exercise all intellectual property rights in the data	government (geographic) data
Switzerland	direct	Open: non-restricted		Free of charge		Government (geographic) data

GEOSS terms	Full	Open	Minimum delay	Minimum cost	Who/what use	Applied to
USA, Landsat Policy		Non-discriminatory: no preference, bias, or any other special arrangement		no more than the cost of fulfilling user requests	full spectrum of civilian, national security, commercial and foreign users	all (unenhanced) data products
<i>Institutional (private) policies and approaches</i>						
Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities	right of access			free	all users worldwide; copy, use, distribute, transmit and display the work publicly; to make and distribute derivative works; for any responsible purpose	Open access contributions
International Council for Science World Data System	Mirrors GEOSS Data Sharing Principles					
Open Definition initiative		no discrimination, in open format obligation to of attribution & sharing		Marginal cost of supply or zero cost (for digital supply)	Anyone; use, reuse, and redistribution	A piece of content or data

GEOSS terms	Full	Open	Minimum delay	Minimum cost	Who/what use	Applied to
The League of European Research Universities Roadmap	Available permanently	Open Access; restraints e.g. from grant conditions possible	Available immediately	Costs nothing	Everybody, for any lawful use	Open data
SeaDataNet project Data Policy		Without restriction: no discrimination Registration may be required		no more than the cost of reproduction and delivery (free)	Dissemination & commercial use require prior permission	Project data

B. Examples of approaches

1. International policies and norms

WMO Resolution 40 (Cg-XII) WMO policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in commercial meteorological activities²: **free and unrestricted exchange** of basic meteorological data and products, free and unrestricted meaning non-discriminatory and without charge (Resolution 23 (EC-XLII) Guidelines on international aspects of provision of basic and special meteorological services), the latter referring to avoiding charging for the data and products themselves, and to limiting charges to the **cost of reproduction and delivery**. The Resolution focuses on provision of data on such conditions to the research and education communities for their non-commercial activities, whilst commercial activities may be subject to different policies/approaches/models.

International Disaster Charter: universal access to identified group of users for specific (limited) purpose.

OECD

Declaration on access to research data from public funding (2004):³ **open access** to, and **unrestricted use** of, data promotes scientific progress and facilitates the training of researchers. Open does not exclude imposition of conditions/restrictions.⁴

Principles and Guidelines for Access to Research Data from Public Funding:⁵

A. “**Openness** means access on **equal terms** for the international research community at the **lowest possible cost**, preferably at no more than the **marginal cost of dissemination**. Open access to research data from public funding should be easy, timely, user-friendly and preferably Internet-based.”

D. Legal conformity: “data access arrangements should respect the legal rights and legitimate interests of all stakeholders in the public research enterprise. Access to, and use of, certain research data will necessarily be limited by various types of legal requirements...”

*Science, Technology and Industry Outlook 2012*⁶

Commercialisation of public research: “**openness in science (open science) increases the channels for transferring and diffusing research results while open innovation in business firms creates a division of labour in the sourcing of ideas and their exploitation**. This has given rise to intermediaries that broker commercialisation activities, notably intellectual property (IP) services.”

² <http://www.wmo.int/pages/about/Resolution40.html>.

³ <http://www.oecd.org/science/sci-tech/sciencetechnologyandinnovationforthe21stcenturymeetingoftheoecdcommitteeofscientificandtechnologicalpolicyatministeriallevel29-30january2004-finalcommunique.htm>

⁴ Openness: balancing the interests of open access to data to increase the quality and efficiency of research and innovation with the need for restriction of access in some instances to protect social, scientific and economic interests.

⁵ <http://www.oecd.org/science/sci-tech/38500813.pdf>.

⁶ <http://www.oecd.org/sti/sti-outlook-2012-commercialisation-public-research.pdf>.

2. Regional and national regulations and policies

a. EUMETSAT

EUMETSAT Data Policy (January 2013): "I. National Meteorological Services ("NMSs") of the Member States will receive all EUMETSAT data, products and services for their Official Duty use at no cost except for the cost of decryption key units."

"IV. A set of data, products and services to be determined by Council will be available on a free and unrestricted basis as "Essential" data and products in accordance with WMO Resolution 40 (Cg-XII)." ... as well as other sets of data available for research and educational use, Official Duty use by non-member states, commercial users, and "all others" who may have to pay for the data and be bound by conditions/restrictions on use.

b. EU

PSI Directive, Article 2(4): "re-use" means the use by persons or legal entities of documents held by public sector bodies, for **commercial or non-commercial purposes** other than the initial purpose within the public task for which the documents were produced. Exchange of documents between public sector bodies purely in pursuit of their public tasks does not constitute re-use.

Article 6: Where charges are made, the total income from supplying and allowing re-use of documents shall **not exceed the cost of collection, production, reproduction and dissemination**, together with a **reasonable return on investment**. Charges should be cost-oriented over the appropriate accounting period and calculated in line with the accounting principles applicable to the public sector bodies involved.

Draft Copernicus data policy Regulation – full and open access to information produced by GMES services and data collected through GMES infrastructure as the basic principle. Security restrictions and licensing conditions, including registration, may limit the general principle. Free of charge (or COFUR) is envisaged as well. Purpose of use is of no importance.

ERC Scientific Council Guidelines for Open Access (17 December 2007):⁷ "**free and efficient access** to information, including scientific publications and original data, will be the key for sustained progress."⁸

c. ESA

This approach is shared by ESA as expressed in the ESA document "**The Joint Principles for a Sentinel Data Policy**" (ESA/PB-EO(2009)98, rev. 1). The latter document states that access to Sentinel data should be free, full and open. ESA data policy applicable to other sensors is, however, different and does impose limitations on re-use.

d. Individual states

Australia

⁷ <https://www.openaire.eu/component/attachments/download/3>.

⁸ It is indicated as essential that primary data, as well as data-related products such as computer codes, are deposited in the relevant databases as soon as possible, preferably immediately after publication and in any case not later than six months after the date of publication.

Principles on PSI – open to public access at the lowest reasonable cost, re-use on open licensing terms (CC BY standard as default).⁹

Canada

The country has recently decided in favour of an open access approach to sharing of government (geographic) data. For example, the GeoGratis portal maintained by Natural Resources Canada makes available all distributed data in accordance with the Unrestricted Use Licence Agreement. With this licence, users are granted a **non-exclusive, fully paid, royalty-free right and licence to exercise all intellectual property rights in the data**. This includes the right to use, incorporate, sublicense (with further right of sublicensing), modify, improve, further develop, and distribute the data; and to manufacture and/or distribute Derivative Products. The Licensee shall identify the source of the Data, in the following manner, where any of the Data are redistributed, or contained within Derivative Products: "© Department of Natural Resources Canada. All rights reserved."¹⁰

Another project follows the same policy objectives and requirements: Geobase "provides access to: quality geospatial data (current, accurate, consistent and maintained), unique geospatial data (one data, collected once and maintained closest to the source), data at **no cost** and with **no restrictions** for users".¹¹

Switzerland

Exchange of data among governmental institutions should provide **direct and free** (at no cost) access to data.¹² Exchange of data with international organisations is also **direct and free of charge**, unless the relevant international agreements specify otherwise.¹³ The basic principle of access to and use of the communal (of the local authorities) data is that it is free (of charge), but prices can be set in accordance to the legislation. Cantons may adopt their own legislation in this regard. For instance the law passed in Basel establishes a regime of sharing government geo data on the principles of the "Open Government Data" with **open access and free** (non-restricted) **re-use** of the data made available.¹⁴

USA

Landsat policy: "all data products are available to any user at no more than the cost of fulfilling user requests" "to the full spectrum of civilian, national security, commercial and foreign users."¹⁵ 51 USC Subtitle VI §60101: "(1) Cost of fulfilling user requests.— The term "**cost of fulfilling user requests**" means the incremental costs associated with providing product generation, reproduction, and distribution of unenhanced data in response to user requests and shall not include any acquisition, amortization, or depreciation of capital assets originally paid for by the United States Government or other costs not specifically attributable to fulfilling user requests." Landsat 7 policy: §60113. Data policy for Landsat 7 (a) (1) "ensure that **unenhanced data are available to all users** at the cost of

⁹ http://www.oaic.gov.au/publications/agency_resources/principles_on_psi_short.html.

¹⁰ <http://www.geogratias.gc.ca/geogratias/en/index.html>. Which is essentially the same as the general Canada Open Data Licence Agreement: <http://www.data.gc.ca/default.asp?lang=En&n=46D15882-1>.

¹¹ <http://geobase.ca/geobase/en/about/index.html;jsessionid=3D8FE454F4DF7490289E0037D14E1376>.

¹² Article 3 Verordnung über die Gebühren für Zugang, Abgabe und Nutzung von Geodaten und Geodiensten (Geodatengebührenverordnung, GeoGV) vom 21. August 2012.

¹³ Article 42ab 2. Verordnung über Geoinformation (Geoinformationsverordnung, GeoIV) vom 21. Mai 2008.

¹⁴ <http://www.medienmitteilungen.bs.ch/showmm.htm?url=2012-08-09-bd-001>. Information in English: <http://epsiplatform.eu/content/city-basel-makes-geodata-free>.

¹⁵ http://landsat.usgs.gov/documents/Landsat_Data_Policy.pdf.

fulfilling user requests". §60141 Nondiscriminatory data availability (a) "**any unenhanced data** generated by the Landsat system or any other land remote sensing system funded and owned by the United States Government shall be made **available to all users without preference**, bias, or any other special arrangement..."

The USA are the originator of the term "open data".

e. EU Member States

Austria

Legislation based on the INSPIRE Directive, hence limited to public data that are used for environmental purposes (directly or indirectly). The possibility to charge for data and impose licensing conditions is reserved with the governmental institutions that produce or hold the data.¹⁶

Germany

Geographic data and metadata shall be made available **for commercial and non-commercial use free of charge**.¹⁷ A dedicated inter-ministerial committee IMAGI works on the issues of data sharing, access and use. In the end of 2012 it made a decision to produce a basic strategy as to how to **make available geographic data produced through research according to GEO/GEOSS Data Sharing Principles**. This should be done by Fall 2013.

Italy

Article 68 Codice dell'amministrazione digitale ("Digital Public Administration Act") establishes the core rules for all aspects related to openness in the Italian public sector: free and open source software¹ ("FOSS", par. 1 and 2), open formats and open data (par. 3). The changes introduced to the wording of this article in 2012 resulted in an unprecedented opening of government-held or produced data. An **open format** is a "data format which is public, documented exhaustively and neutral with respect to technological tools for the use of data".

Open data are: "1) available under the terms of a license permitting their **use by anyone, even for commercial purposes**, in disaggregated format; 2) accessible through the information and communication technologies, including public and private telecommunication networks, in **open formats**; are suitable for automatic processing by computer programs and equipped with relative metadata; 3) available **for free** through the information and communication technologies, including public and private computer networks, or are available to the marginal costs incurred for their reproduction and dissemination."¹⁸

Spain

No consolidated approach yet, but the tendency to open, free and unrestricted access to and use of (government) data is becoming more widespread, in particular due to the transposition of the EU

¹⁶ § 10 Regierungsvorlage Bundesgesetz über eine umweltrelevante Geodateninfrastruktur des Bundes 02.03.2010.

¹⁷ § 11 Gesetz über den Zugang zu digitalen Geodaten 10.02.2009.

¹⁸ The Agenzia per l'Italia digitale shall establish, with deliberation, exceptional cases, identified according to objective, transparent and verifiable, in which they are made available at higher rates to marginal costs. In any case, the Agency, in the treatment of exceptional cases identified, will follow the guidance provided by Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information, implemented by legislative Decree 24 January 2006, n. 36.

Public Sector Information Directive¹⁹ and enactment of the Law 11/2007 on Citizens' Digital Access to Public Services.²⁰

The Spanish National Mapping Agency, IGN (*Instituto Geografico Nacional*) defined core geographic datasets as free and available for commercial and non-commercial uses, subject to acknowledgement of the source. The rest of IGN production, including collaborative projects is free and open for non-commercial use and re-use. In both cases marginal costs can be charged if a copy in digital support is required.²¹

UK

Ordnance Survey licence (OS Open Government Licence): "a **worldwide, royalty-free, perpetual, non-exclusive licence** to use the Information..." The users "are encouraged to use and re-use the Information that is available under this licence, the Open Government Licence, freely and flexibly, with only a few conditions."²² Other governmental institutions are bound to use a so-called Open Government Licence (OGL).²³

3. Institutional (private) policies and approaches

Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003)²⁴

Open access contributions must satisfy two conditions:

1. The author(s) and right holder(s) of such contributions grant(s) to all users a **free, irrevocable, worldwide, right of access to**, and a license to **copy, use, distribute, transmit and display the work publicly** and to make and distribute **derivative works**, in any digital medium for any responsible purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use.
2. A complete **version of the work** and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is **deposited (and thus published) in at least one online repository** ... supported and maintained by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving.

The **International Council for Science World Data System** (ICSU WDS), recognizing the benefits and importance of contributing to the growing international efforts of data sharing, has adopted the **same principles from GEO/GEOSS data sharing principles** as follows:²⁵ **full and open exchange** of data, metadata and products shared within WDS, recognizing relevant international instruments and national policies and legislation; all shared data, metadata and products will be made available with **minimum time delay and at minimum cost**; all shared data, metadata and products being **free of charge or no more than cost of reproduction** will be encouraged for research and education.

¹⁹ Spanish Law 37/2007, online: <http://www.boe.es/buscar/doc.php?id=BOE-A-2007-19814>.

²⁰ <https://www.boe.es/buscar/doc.php?id=BOE-A-2007-12352>.

²¹ FOM/956/2008, online: <http://www.boe.es/buscar/doc.php?id=BOE-A-2008-6229>.

²² <http://www.ordnancesurvey.co.uk/oswebsite/docs/licences/os-opendata-licence.pdf>. More information: <http://www.ordnancesurvey.co.uk/oswebsite/opendata/licensing.html>.

²³ Available online: <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/2/>.

²⁴ signed by more than 300 institutions. <http://oa.mpg.de/lang/en-uk/berlin-prozess/berliner-erklarung/>.

²⁵ <http://www.icsu-wds.org/organization/data-policy>.

The League of European Research Universities

Roadmap: towards Open Access:²⁶

- Costs – Open Knowledge **costs nothing** to the user, but needs sustainable business models.
- Time – Open Knowledge is **available immediately and permanently**. Open Access research outputs may be subject to publisher embargos, which have to be balanced with the public interest as expressed, for example, by research funders' conditions of grant.
- Rights and rewards – Open Knowledge is available for people to **use in any lawful way**, including for commercial purposes.
- **Technology** – Open Knowledge is made available in ways that enable computer-based tools to exploit it.

Open Access, therefore, is one element in a broader landscape of **Open Scholarship and Knowledge**, which could rapidly change the way research is undertaken and communicated globally.

Interpretation developed by Open Definition initiative:²⁷

"A piece of content or data is open if anyone is free to use, reuse, and redistribute it — subject only, at most, to the requirement to attribute and share-alike."

"A **work is open** if its manner of distribution satisfies the following conditions:

1. Access –available as a whole and at **no more than a reasonable reproduction cost**, in a convenient and modifiable form.
2. **Redistribution** –no restrictions as to selling or giving away the work either on its own or as part of a package made from works from many different sources.
3. **Reuse** – modifications and derivative works are allowed, as their distribution under the terms of the original work.
4. **Absence of Technological Restriction** – e.g. in open data format
5. Attribution – may be required for distribution or re-use
6. Integrity – the modified work should carry a different name or version number with the original name.
7. **No Discrimination** against Persons or Groups
8. No Discrimination against Fields of Endeavour
9. Distribution of License – the rights over the work apply to all to whom it is redistributed.
10. License Must Not Be Specific to a Package
11. License Must Not Restrict the Distribution of Other Works – the license must not place restrictions on other works that are distributed along with the licensed work."

Marginal costs and zero costs "Setting a price equal to the short run marginal cost of supplying data", that is, the cost of supplying data to an extra user. When considering digital data, this cost is essentially zero and marginal cost and zero cost pricing are identical.²⁸

SeaDataNet project Data Policy, 4.1 General Conditions: data are available **freely and without restriction**. "Freely" means at **no more than the cost of reproduction and delivery**, without charge for the data itself. "Without restriction" means **without discrimination** against, for example, individuals, research groups, or nationality."²⁹ Registration may be required.

²⁶ http://www.leru.org/files/publications/LERU_AP8_Open_Access.pdf.

²⁷ <http://www.opendefinition.org/okd/>.

²⁸ Pollock (2009): The Economics of Public Sector Information.

²⁹ <http://www.seadatanet.org/content/download/3899/29604/file/SeaDataNet%20Data%20Policy%20.pdf>.

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