# ICOS RI Data Policy and License

Approved 22 May 2025
ICOS/GA24/2025/12



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# Introduction

Integrated Carbon Observation System Research Infrastructure, ICOS RI, is a distributed research infrastructure to provide data that enables analyses of emissions and sinks of greenhouse gases, ecosystem function and related research. ICOS RI ensures the continuous, high-precision and long-term greenhouse gas measurements in Europe and adjacent key regions of Africa and Eurasia. The backbones of ICOS RI are the national measurement stations such as ICOS atmospheric, ecosystem and ocean stations. Together they form national measurement networks.

ICOS Central Facilities (ICOS CF), such as Atmospheric Thematic Centre (ATC), Ecosystem Thematic Centre (ETC), Ocean Thematic Centre (OTC), Central Analytical Laboratories (CAL) are the European level ICOS RI Centres, which have specific tasks in collecting and processing the data (and CAL samples) received from the national measurement networks.

ICOS ERIC is the legal entity of ICOS RI established to coordinate the operations and the data of ICOS distributed research infrastructure, and to develop, monitor and integrate the activities and the data of ICOS RI. The ICOS Carbon Portal is the ICOS data center from where ICOS data and ancillary data sets will be published and be accessible for the users. Carbon Portal is responsible for handling and providing ICOS data products.

In this document, the general ICOS data policy principles are described. The aim of this data policy is to guarantee a smooth data flow from the ICOS RI National Networks, Central Facilities and Carbon Portal to the users to provide open, easy access to ICOS data and develop user-driven services for user communities (e.g. to scientists, national and international agencies, local authorities, general public). To achieve ICOS RI objectives, General Assembly of the ICOS ERIC has adopted this data policy and may amend it.

# Definitions

"ICOS Data" are quantitative or qualitative attributes of variables or sets of variables that have been gathered by using ICOS RI recommended sensors at validated ICOS stations in an ICOS ERIC member or observer country. ICOS stations are operated at the national level and together they form an ICOS National Network in each ICOS member country.

"ICOS Synthesis Data Products" are products that can be generated from ICOS Data. Typically, they involve attribution of GHG sources and sink by region and sector. The ICOS elaborated products can be achieved with the data generated from ICOS Data but it also depends on further efforts like bottom-up and inverse/top-down modelling of ecosystem fluxes. ICOS ERIC and ICOS RI will benefit from contributions 1) from ICOS Carbon Portal itself and 2) from external user communities (e.g. from GHG modelling community). Carbon Portal is responsible for managing and coordinating the **external ICOS synthesis data products** and for providing **internal ICOS synthesis data products**. ICOS synthesis data products must meet or exceed applicable national or European requirements (e.g. INSPIRE directive) and be attached to data for any dissemination.

"ICOS Data Related Tools" are the codes, algorithms and software used to generate, collect and process ICOS Data.

"ICOS Metadata" includes information about data provenance, description, quality, processing, maturity level (raw data streams, automated quality control, processed, derivative products), and collection context, and support interoperability with other observatories, archives, and databases.

ICOS Metadata associated with ICOS Data must meet or exceed applicable national or European requirements (e.g. INSPIRE directive) and be attached to data for any dissemination.

The Carbon Portal will publish and make openly available the ICOS Metadata.
"Background" corresponds to data, databases, data products and Data Related Tools (e.g. Quality Control-, modelling-, database- and similar software) generated before the implementation of ICOS RI.

"Sideground" corresponds to data, databases, products and Data Related Tools generated along the ICOS data processing and in the scope of the activities of ICOS RI.

"Intellectual Property" shall have the meaning defined in Article 2 of the Convention Establishing the World Intellectual Property Organization, done at Stockholm on July 14, 1967 (http://www.wipo.int/treaties/en/convention/trtdocs_wo029.html).

The following interest groups and communities should read this ICOS data policy document:

- "Data Providers"
    - Researchers, technicians and data managers in the ICOS RI network organisations and ICOS ERIC, research institutes and universities
- "Data Users"
    - Researchers;
    - Policymakers and stakeholders involved in negotiating carbon reduction policies;
    - Carbon trading communities;
    - Regional authorities and carbon inventory agencies;
    - Private land owners and industrial contributors of greenhouse gas emissions;
    - International and national Operational Centres assimilating atmospheric composition data;
    - The general public interested in greenhouse gas emissions and global climate change.

# European legal framework related to environmental data, information and databases

The ICOS data policy takes into account the overall European legal framework related to environmental data, information and databases. The most important pieces of legislation which impact also to ICOS data policy are the **Aarhus Convention** (access to environmental data), **INSPIRE Directive** (sharing of the spatial information among public sector organisations and access to the spatial data), **Database Directive** (protection of the databases), **Computer Software Directive** (protection for computer programs) and **Open Data Directive** on the re-use of the public sector information (short descriptions of these legislations in ANNEX 1.).

ICOS data policy also recognizes relevant international observation system –initiatives (e.g. GEOSS) and national policies and legislation with the aim of full and open exchange of ICOS data, metadata and ICOS elaborated data products to be made available with minimum time delay and at minimum and whenever possible no-costs.

# ICOS Data processing and archiving

National ICOS National Networks are responsible for carrying out the ICOS measurements and producing the ICOS level 0 Data (raw data) and delivering it to ICOS Central Facilities (ATC, ETC and OTC) where the ICOS Data is further processed. ICOS National Networks are entitled to receive services from the ICOS CFs. The rights and the responsibilities of the ICOS National Networks, ICOS Central Facilities and the ICOS ERIC are defined in the contracts made between the ICOS ERIC and the ICOS National Networks as well as between the ICOS ERIC and the ICOS CFs.

Through the contracts between ICOS ERIC and the ICOS CFs, the Central Facilities process ICOS raw data obtain from the ICOS National networks. The ICOS CFs, such as Atmospheric, Ecosystem and Ocean Thematic Centres are responsible for processing and producing elaborated ICOS data, including e.g. data quality control and gap filling.

Background and Sideground of ICOS National Networks and ICOS CFs may be transferred to some ICOS CFs and/or to the Carbon Portal for ensuring the long-term archiving of that data and for providing easy access to it as such data is valuable for Data Users. However, due to the different measurement requirements, processing procedures and original data policy and data providers this data is not considered as ICOS Data and it does not follow the ICOS data policy. In case this data are demonstrated to be compliant with the ICOS protocols and original data policies permit it, this data can be transferred into ICOS Data after which it follows the ICOS data policy. It must be approved between the ICOS-ERIC and the relevant ICOS National networks and/or ICOS CFs.

Through the contracts between the ICOS ERIC and the ICOS National Networks as well as the ICOS ERIC and the ICOS CFs, the ICOS ERIC shall be granted the right to use the gathered data in accordance with this data policy document.

The ICOS ERIC has the right and responsibility to manage the use of ICOS Data that are sub-licensed to the Data Users via Carbon Portal. The ICOS Data management and archiving will be ensured by the Carbon Portal. ICOS ERIC shall oversee that ICOS Data is available with minimal delay, preferably in near real-time, to maximize the value for the Data Users.

All ICOS Data will be securely archived within the ICOS CFs and the ICOS ERIC database managed by the Carbon Portal. The ICOS Data from the ICOS National Networks, ICOS CFs, experiments, and selected data taken as part of instrument calibration, engineering or software testing shall be made available through the Carbon Portal as soon as possible once basic Quality Assurance/Quality Control (QA/QC) procedures have been applied. Data may be available prior to QA/QC checks by special request and these requests are coordinated from Carbon Portal.

Data archives shall include easily accessible information about data holdings; high-level data products, including quality assessments and supporting relevant information. Guidance for locating and obtaining data will be provided by the Carbon Portal.

In the case of winding up ICOS ERIC, the General Assembly is responsible that the ICOS data, databases and ICOS Data Related Tools, irrespective of where they are located/stored, shall be transferred to appropriate places where they remain openly available.

Carbon Portal (CP) will make all possible efforts to validate the external ICOS synthesis data products to keep the high quality of the products. However, ICOS ERIC cannot guarantee the accuracy or completeness of such external ICOS synthesis data products. ICOS ERIC and Carbon Portal reserve the right to remove without notice any material placed in the Carbon Portal servers should the said material be found to be erroneous or contain malicious content or if the external data providers have not respected the ICOS data policy or author's rights.

Liability for any internal ICOS synthesis data products is non-existent, but everyone is expected to provide data on a best effort basis.

# Rights to ICOS Data and Intellectual Property Rights

## Background and Sideground Intellectual Property

The ICOS National Networks, the ICOS CFs and the ICOS ERIC keep the property of Background, Sideground and any related tools and all rights related thereto.

## The Intellectual Property of ICOS Data, database and ICOS Data Related Tools

ICOS Data, databases and ICOS Data Related Tools (e.g. codes, software) that the ICOS National Networks and the ICOS CFs have collected, organised and/or created to fulfil the requirements of ICOS Data generation and processing belong to them.
Any data, tools or databases created at the Carbon Portal will belong to the ICOS-ERIC.

## Rights to ICOS Data for ICOS ERIC

The Background IP should be limited to information generated before the ICOS data processing and needed to meet the ICOS RI objectives.
The creative entities may claim Intellectual Property Rights available within applicable national jurisdictions over software tools, such as but not limited to search engines, visualization tools or processing software generated by the ICOS National Networks and ICOS CFs in parallel of the ICOS Data processing (Sideground IP) shall be subject to specific agreements for the use within the ICOS RI activities.
Transfer of Background and Sideground to ICOS CFs and Carbon Portal should be limited to Background and Sideground needed to meet the ICOS RI objectives and according to this data policy.
The ICOS National Networks and the ICOS CFs have the responsibility to transfer the ICOS Data, from their databases to the integrated Carbon Portal database, where all ICOS Data are preserved for long-term archiving. In addition, the ICOS National Networks and the ICOS CFs give to the ICOS ERIC a worldwide, free of charge, perpetual, transferable, non-exclusive right to use the ICOS Data, databases for any purpose to meet the ICOS RI objectives. This right includes, but is not restricted to, the right to modify, reproduce, incorporate to other data and other databases as well as produce new developments (e.g. ICOS Synthesis Data Products) resulting from the transferred ICOS Data. These new developments belong to ICOS ERIC. The reproduction and incorporation of ICOS Data into other databases will be done in coordination with the ICOS CFs to avoid duplications.
If, for any reason, a Data Provider (ICOS National Networks and the ICOS CFs) is withdrawing from ICOS RI, the Data Provider has a responsibility to give to ICOS ERIC a free of charge, perpetual, non-exclusive, non-transferable right to use the ICOS Data Related Tools and all necessary documentation to use the tools in order to archive and process ICOS Data to meet the ICOS RI objectives.
The same conditions shall apply to a defaulting Data Provider (ICOS National Networks and the ICOS CFs), with possible specific provisions to be decided by the ICOS ERIC General Assembly. These cases shall be clarified in the contracts between ICOS ERIC and ICOS National Networks / the ICOS CFs.

## Third party Intellectual Property rights

Third party IP rights may not be automatically made accessible to ICOS RI and ICOS ERIC.
ICOS ERIC respects Intellectual Property Rights of external groups that have made available their external ICOS elaborated data products via Carbon Portal.

ICOS ERIC and all entities generating ICOS Data shall acknowledge that, subject to any relevant Intellectual Property Right, they seek to promote the non-exclusive transfer of available information technology on mutually agreed terms to research institutions, particularly in developing countries, especially in conjunction with training and capacity development programs.

# ICOS data attribution and citation

It is important for ICOS RI and ICOS ERIC and further Data Users to acknowledge the persons and organisations, which have originally generated the ICOS Data or processed the different levels of ICOS Data. For this purpose, a persistent identifier with the information of the Data Providers/authors will be accompanied with every ICOS Data set. ICOS RI and Carbon Portal of the ICOS ERIC will seek the most feasible technical solution for attaching the identifiers to the ICOS Data together with clear information about how to properly acknowledge the ICOS community in the products that make use of ICOS Data. ICOS RI and Carbon Portal will also seek technical solutions to maintain a proper and up-to-date attribution/citation database, tracking the use of the ICOS Data to individual research paper, with a strong traceability even to the individual sites/instruments.

# Data Users' access to ICOS data and user license

ICOS RI Data Providers shall provide and make available high quality ICOS Data. ICOS RI requires collection, processing and availability of high quality ICOS Data with ICOS Metadata without significant delay.

ICOS RI aims for a wide usage of ICOS Data, which will lead to greater understanding and new scientific insights. Accordance with rights granted in article 5, all Data Users, should have equal access to ICOS data in databases affiliated with or developed in the ICOS RI activities, respecting the principles of accessibility, compatibility, comprehensive data sets, portability and quality.

ICOS Metadata is deemed to be in the Public Domain, and distributed under a Creative Commons Zero (CC0 1.0 Universal)[1] dedication. This enables (re)users to distribute, remix, adapt, and build upon the material in any medium or format, with no conditions.

ICOS Data is public data open to all Data Users. ICOS data will be available for the Data Users via Carbon Portal.

By the decision of the General Assembly charges are conceivable for commercial use of ICOS Data, having due regard to the self-financing requirements of the ICOS RI Data Providers concerned. These charges should not exceed the total costs of collecting, producing and disseminating the ICOS Data.

It is the task of the ICOS ERIC to protect Data Providers/authors' (stations, ICOS CFs and Carbon Portal) right to the proper acknowledgement and citation and relieve Data Providers/authors from any legal responsibilities on their behalf.

For an effective rights management the ICOS ERIC shall establish and maintain an ICOS Data user license. ICOS ERIC is aiming to grant one common ICOS Data user license for all the levels of ICOS data. By the decision of the ICOS ERIC General Assembly, ICOS ERIC may also use other kinds of licenses, if any situation should require so. The current license for ICOS Data is Creative Commons Attribution 4.0 International (CC BY 4.0)[2]

Data Users will have to accept the ICOS Data user license together with the act of downloading any data set. Data download incurs a registration of the Data users Internet address for usage tracking and accepting the ICOS user license and conditions. ICOS ERIC aims to have a transparent and user-friendly licencing process.

Conditions shall require that Data Providers/authors get proper attribution of their work and that this attribution is maintained in any subsequent use of the data. The license conditions shall contain an exemption of any liability that may arise as a consequence of the use of the data made available by the ICOS ERIC.

The usage tracking should be implemented at the Carbon Portal, tracking also distribution via ICOS CFs and further redistribution.

Since the Carbon Portal of ICOS ERIC may have data that has been collected outside or before the establishment of ICOS RI and which may have been acquired under different data policies, the data use and access conditions will be different for such datasets.

The different data policies in place are described in the Carbon Portal and the list of datasets under each data policy reported.

[1] https://creativecommons.org/publicdomain/zero/1.0/

[2] https://creativecommons.org/licenses/by/4.0/

Members of ICOS ERIC are not responsible for the compliance to this data policy by external Data Providers.

# Services

The ICOS National Networks, the ICOS CFs and ICOS ERIC/CP may provide services for Data Users. Services shall in principle be open to anyone. If access to the ICOS RI services must be restricted for capacity reasons the criteria for selection shall be based on scientific excellence. Detailed conditions for services shall be agreed upon separately.

# Management of the ICOS data policy

Head Office of the ICOS ERIC shall administer this data policy and ensure that the ICOS Members respect the adopted data policy document by monitoring its implementation.

ICOS ERIC may allow for exceptions to the guidance contained in this document on case-by-case basis where permitted by law and in the furtherance of the public interest. Request for exceptions to this data policy should be sent to the ICOS Director General and the exceptions will be adopted by the ICOS ERIC General Assembly.

ICOS ERIC shall review and, if warranted, update this data policy as a part of the regular reviews of ICOS RI operations.

## ANNEX 1. Short descriptions of the main components of the European legal framework related to environmental data, information and databases

Note! Following text is partly adopted from workshop document of GMES Data and Information Policy (held in 12-13 Jan 2012) and modified to meet the need of ICOS.

***The Aarhus Convention***

The Aarhus Convention, adopted in 1998, established a number of rights with regard to the environment, including rights on access to information. This can include information on the state of the environment, but also on policies or measures taken, or on the state of human health and safety where this can be affected by the state of the environment. Applicants are entitled to obtain this information within one month of the request and without having to say why they require it. In addition, public authorities are obliged, under the Convention, to actively disseminate environmental information in their possession. This Convention has been translated in EU legislation through a series of Directives and Regulations binding Member States as well as European Institutions and Bodies[1].

***INSPIRE Directive***

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE). The INSPIRE directive aims at creating a European Union (EU) spatial data infrastructure (SID). This SID will enable the sharing of environmental spatial information among public sector organisations and better facilitate public access to spatial information across Europe.

A European Spatial Data Infrastructure will assist in policy-making across boundaries. INSPIRE is based on a number of common principles:

- Data should be collected only once and kept where it can be maintained most effectively.
- It should be possible to combine seamless spatial information from different sources across Europe and share it with many users and applications.
- It should be possible for information collected at one level/scale to be shared with all levels/scales; information should be detailed for thorough investigations and general for strategic purposes.
- Geographic information needed for good governance at all levels should be readily and transparently available.
- It should be easy to find what geographic information is available, how it can be used to meet a particular need, and under which conditions it can be obtained and used.

The INSPIRE Directive is being implemented through a series of legal instruments with associated guidelines[2].

***Database Directive***

The most important directive regarding rights on data and information is Directive 96/9/EC of 11 March 1996 on the legal protection of databases[3]. The whole copyright law framework is also relevant in this matter as we will see in the last paragraph with the caveat that copyright protection does not apply in most jurisdictions to mere facts or Earth physical parameters as they are not original and in the public domain.

This lack of protection led to the adoption of the database Directive which grants a sui generis right, bearing some distant similarities with copyrights, to the person investing in the compilation of a database. However, the circumstances opening the right to the sui generis right were restrictively interpreted by the European Court of Justice in 2004[4], making a distinction between the investment needed for collecting the data and the investment needed for creating the data. Only the first category

of investment is a condition for granting the sui generis rights to the maker of the investment. This interpretation by the Court of Justice would leave the investment in a data collection infrastructure outside the criteria for sui generis protection.

Databases may also be protected by copyrights when by reason of the selection or arrangement of their contents, they constitute the author's own intellectual creation. The copyright protection of databases does not, however, extend to the database elements, i.e. data and information. These elements can be separately protected by copyrights if they fulfil by themselves the criteria for protection. When no EU directive harmonizes the criteria for protection of these elements, a legal analysis must be conducted at national and international levels as the legislation on copyrights is not fully harmonized at EU level.

***Computer Programs Directive***

Directive 2009/247EC of the European Parliament and of the Council of 23 April on the legal protection of computer programs[5] is the frame for copyright protection for computer programs as literary works in EU.

The term computer program includes programs in any form, including those which are incorporated into hardware. The term also includes preparatory design work leading to the development of a computer program provided that the nature of the preparatory work is such that a computer program can result from it at a later stage.

Only the expression of a computer program is protected and ideas and principles which underlie any element of a program, including those which underlie its interfaces, are not protected by copyright. So to the extent that logic, algorithms and programming languages comprise ideas and principles, those ideas and principles are not protected, only the expression of those ideas and principles.

The author of a computer program is the natural person or group of natural persons who has created the program or, where the legislation of the Member State permits, the legal person designated as the right holder by that legislation. Where a computer program is created by an employee in the execution of his duties or following the instructions given by his employer, the employer exclusively shall be entitled to exercise all economic rights in the program, unless otherwise provided by contract.

***Open Data Directive***

The EU 2019/1024 Directive on open data and the reuse of public-sector information[6] lays down the legal framework for the reuse of geographical, cadastral, statistical and legal information held by public-sector bodies and public-sector undertakings, and publicly funded research data. It aims to further the availability and uptake of public-sector information in general, and dynamic data with particularly high (socioeconomic) impact by both commercial and non-commercial actors, as well as promoting competition and transparency in the information market overall.

Specifically, the Directive seeks to promote Open Data. Public-sector bodies and public undertakings (any undertaking over which public-sector bodies have a dominant influence through ownership, financial participation or the rules which govern it) must, where appropriate, make their documents and data available by electronic means in formats that are open, machine readable, accessible, findable and reusable, complete with their metadata.

Publicly funded research data shall be openly available, following the principle of 'open by default', and support the dissemination of research data that are findable, accessible, interoperable and reusable (the FAIR principle). Concerning IPR, personal data protection and confidentiality, the principle of 'as open as possible, as closed as necessary' shall be applied.

Documents whose reuse is associated with significant socioeconomic benefits - so-called High-value datasets - should be made available under particularly friendly reuse conditions. Relevant to ICOS, this applies to data from the categories geospatial, earth observation and environment, and meteorological.

**References:**

[1]Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC, OJ L 41, 14.2.2003, p. 26–32.

Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC, OJ L 156, 25.6.2003, p. 17–25.

Regulation (EC) No 1367/2006 of the European Parliament and of the Council of 6 September 2006 on the application of the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters to Community institutions and bodies, OJ L 264, 25.9.2006, p. 13–19.

[2] A dedicated website is providing all the necessary information: http://inspire.jrc.ec.europa.eu/

[3]Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases; OJ L 77, 27.3.1996, p. 20–28.

[4]Cases C-46/02, Fixtures Marketing Ltd v. Oy Veikkaus Ab, ECR 2004, p. I-10365 and C-203/02, The British Horseracing Board Ltd and Others v William Hill Organization Ltd, ECR 2004, p. I-10415.

[5]Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs, OJ L 111, 5.5.2009, p. 16–22.

[6]https://eur-lex.europa.eu/EN/legal-content/summary/open-data-and-the-reuse-of-public-sector-information.html