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GCdataPR Specification for Registration and Digital Codes System (Version 3)

GCdataPR Office, Beijing 100101

Chapter 1: General Provisions

Article 1: Amendment Background

1 Amendment versions

GCdataPR, Global Change Research Data Publishing & Repository, is a regular member of the World Data System of the International Council of Sciences (WDS/ICSU) approved in October 2016. It is the publishing house for the *Journal of Global Change Data & Discovery* (CN 10-1493/P, ISSN 2096-3645) and *Digital Journal of Global Change Data Repository* (CN 11-9377/P, ISSN 2096-868X). The first version of the GCdataPR specification for registration and digital codes of science and technology products (GCdataPR Specification for short) was published on June 25, 2014, and then there are two versions in amendment on January 30, 2017 for version 2, and September. 25, 2021 for version 3.

2 Basis and References

The GCdataPR Specification was conducted based on the followings:

- (1) Universal Copyright Convention (1971), Berne Convention for the Protection of Literary and Artistic Works (1971) and Copyright Law of the People's Republic of China (2020);
- (2) Regulations on the Administration of Publications of the People's Republic of China (2020);
- (3) Regulations on the administration of electronic publications of the People's Republic of China (2015);
- (4) Scientific data management Law of the People's Republic of China (2018);
- (5) Data security law of the People's Republic of China (2021);
- (6) Specification for National Science and Technology Resources Management Platform of the People's Republic of China (2018);
- (7) *Journal of Global Change Data & Discovery*, ISSN 2096-3645, China National Center of the International Standard Serial Number (2016);
- (8) *Digital Journal of Global Change Data Repository*, ISSN 2096-868X, China National Center of the International Standard Serial Number (2020);

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<https://cstr.escience.org.cn/CSTR:20146.99.2021.03.08>.

- (9) ISO 26324: Digital Object Unique Identifier (2012);
- (10) GB/T 32843—2016, Science and Technology Resources Identification;
- (11) GB/T 7714—2015, Information and documentation—Rules for bibliographic references and citations to information resources.

3 Versions

There were three versions since the GCdataPR Specification published. They are:

- (1) GCdataPR specification for registration and digital codes of science and technology products (version 1, 2014),
- (2) GCdataPR specification for registration and digital codes of science and technology products (version 2, 2017);
- (3) GCdataPR specification for registration and digital codes of science and technology products (version 3, 2021);
- (4) besides, the guidelines of Global Change Research Data Publishing & Repository (2017) was published in 2017;
- (5) objectives of the amendment version 3, 2021.

The objectives of the amendment version 3, 2021 are:

- (1) protect the intellectual property of the digital products published at the *Journal of Global Change Data & Discovery* and the *Digital Journal of Global Change Data Repository*;
- (2) credit the pioneering and original discoveries of the authors, who published their digital products at the *Journal of Global Change Data & Discovery* and the *Digital Journal of Global Change Data Repository*;
- (3) ensure the products, published at the *Journal of Global Change Data & Discovery* and the *Digital Journal of Global Change Data Repository*, are effectively managed in the World Data System and the national scientific and technological resources management system; and
- (4) maintain its honors as World Data Centre and WSIS Prize winner (2018 and 2021, *e-Science Champions*), strictness of science and technology resources Management and sustainable development under the open science framework.

Article 2: Scope of Application of the Specification

All products published at the *Journal of Global Change Data & Discovery* and the *Digital Journal of Global Change Data Repository*, activities organized, jointly commissioned with GCdataPR, the World Data Center and co-sponsored by the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences (IGSNRR/CAS) and Geographical Society of China (GSC), shall be implemented in accordance with this specification.

Chapter 2: Registration with DOI

Article 3: DOI-ISO 26324

GCdataPR's DOI codes is based on the ISO26324: Digital Object Unique Identifier by the DOI foundation established in 2005 and approved by the ISO in 2002.

Article 4: DOI and GCdataPR's Digital Products

The following four types of science and technology resources produced by GCdataP should be coded with DOI:

(1) All datasets published at the *Digital Journal of Global Change Data Repository* (ISSN 2096-868X);

(2) All articles published at the *Journal of Global Change Data & Discovery* (ISSN 2096-3645);

(3) All documentations about policies, principles, guidelines, standards, specifications, which are produced by the Editorial Office of GCdataPR;

(4) All the platforms or knowledge and data hubs, computer system and software developed and operated by the GCdataPR.

Article 5: DOI Registration and Services for GCdataPR

GCdataPR's DOI is assigned DOI:10.3974/by the DOI system, the GCdataPR Office is responsible for each products assigned the DOI code, and the Crossref provides services for GCdataPR to link DOI system.

Article 6: DOI Code System for Dataset

The DOI code system for the GCdataPR's datasets is consisted of two parts, the first part is fixed code for all of the datasets using DOI:10.3974/geodb; the second part is an unique code for each individual dataset using ×××× (year).×× (package number of published in this year).×× (order of the dataset published).V× (version of the dataset).

For example: The dataset on eco-regional boundary data of the Roof of the World was published in 2014, Vol.1, No.1, its DOI code is DOI:10.3974/geodb.2014.01.01.V1. The Crossref provided services for the DOI system through <https://doi.org/10.3974/geodb.2014.01.01.V1> and link to the GCdataPR's system.

If the computer system source code is published using package files, the DOI coding package goes to the dataset code system. If the computer system is published in the form of computer software platform, its DOI coding the platform shall be handled in accordance with the coding system in Article 9.

Article 7: DOI Code System for Articles

The DOI code system for the GCdataPR's articles published in *Journal of Global Change Data & Discovery* is consisted of two parts. The first part is fixed code for all of the articles using DOI:10.3974/geodp; the second part is an unique code for each individual article using ×××× (year).×× (package number of published in this year).×× (order of the article published).

For example: The article on Inaugural Editorial of the *Journal of Global Change Data & Discovery* was published in 2017, Vol.1, No.1, its DOI code is DOI:10.3974/geodp.2017.01.01. The Crossref provided services for the DOI system through <https://doi.org/10.3974/geodp.2017.01.01> and link to the GCdataPR's system.

Article 8: DOI Code System for Standards

The DOI code system for the GCdataPR's Standards is consisted of two parts, the first part is fixed code for all of the datasets using DOI:10.3974/dp, the second part is an unique code for each individual article using ×××× (documentation type such as policy, standards).××××

(year).xx (order of the standards).

For example: The DOI code of the GCdataPR's data sharing policy is DOI:10.3974/dp.policy.2014.05. The Crossref provided services for the DOI system through <https://doi.org/doi:10.3974/dp.policy.2014.05> and link to the GCdataPR's system.

Article 9: DOI Code System for Computer Systems, Software and Platforms

The DOI code system for the GCdataPR's computer systems, software and platforms is consisted of two parts. The first part is fixed code for all of the software using DOI:10.3974/geodh, the second part is an unique code for each individual article using. xxxx (year). xx (platform type) .xx (order of the platform published).

For example: The DOI code of the GCdataPR is DOI:10.3974/geodh.2014.00.01. The Crossref provided services for the DOI system through <https://doi.org/doi:10.3974/geodh.2014.00.01> and link to the GCdataPR's system.

Chapter 3: China Science and Technology Resource Identification (CSTR)

Article 10: CSTR Code System for GCdataPR

Code System of CSTR for GCdataPR is established according to the GB/T 32843—2016 (Science and Technology Resources Identification), Scientific Data Management Law of P. R. China (2018) and Management Specification for the National Science and Technology Platform Services.

Article 11: CSTR and GCdataPR's Products

The following fourteen types of science and technology resources produced by GCdataPR should be coded using CSTR code system:

(1) All datasets published at the *Digital Journal of Global Change Data Repository*, (ISSN 2096-868X);

(2) All articles published at the *Journal of Global Change Data & Discovery* (ISSN 2096-3645);

(3) All documentations about policies, principles, guidelines, standards, specifications, which are produced and released by the Editorial Office of GCdataPR;

(4) All the platforms or knowledge and data hubs developed and operated by the GCdataPR;

(5) All public available equipments which are related to the GCdataPR's data collection;

(6) All openly available bases for research;

(7) All openly available bases for education and tourism;

(8) All openly available plant germplasm resources which are related to the data knowledge publications;

(9) All openly available animal germplasm resources which are related to the data knowledge publications;

(10) All openly available samples which are related to the data knowledge publications;

(11) Computer software system which related to the GCdataPR publishing, repository and services;

(12) Patten records which related to the GCdataPR publishing, repository and services;

(13) Practice case records which related to the GCdataPR publishing, repository and

services;

(14) All of the report about the conferences, symposiums, workshops, training classes, meetings sponsored by GCdataPR.

Article 12: CSTR Registration and Services for GCdataPR

GCdataPR is assigned CSTR:10.20146/, the GCdataPR editorial office is responsible for each products assigned with the CSTR code, and the CSTR platform at <https://escience.org.cn/identification/service>) provides services for the GCdataPR's CSTR system.

Article 13: CSTR Code System for Dataset

The CSTR code system for the GCdataPR's datasets is consisted of two parts, the first part is fixed code for all of the datasets using CSTR:20146.11; the second part is an unique code for each individual dataset using ×××× (year).×× (package number of the year). ×× (order of the dataset published).V× (version of the dataset).

For example: The dataset on eco-regional boundary data of the Roof of the World was published in 2014, Vol.1, No.1, its CSTR code is CSTR:20146.11.2014.01.01.V1. The Crossref provided services for the CSTR system through <https://cstr.escience.org.cn/CSTR:20146.11.2014.01.01.V1> and link to the GCdataPR's system.

Article 14: GCdataPR Service on CSTR for Products Produced by National Data Centers

The CSTR coding system of the scientific dataset published in the *Digital Journal of Global Change Data Repository* assigned by the National Data Center of China shall be registered according to the CENTER's CSTR code system. The DOI code assignment should be follow the Article 6 of the GCdataPR Specification.

Article 15: CSTR Code System for Articles

The CSTR code system for the GCdataPR's articles published in *Journal of Global Change Data & Discovery* is consisted of two parts. The first part is fixed code for all of the articles using CSTR:20146.14; the second part is an unique code for each individual article using ×××× (year).×× (package number of published in the year).×× (order of the article published).

For example: The article on Inaugural Editorial of the *Journal of Global Change Data & Discovery* was published in 2017, Vol.1, No.1, its CSTR code is CSTR:20146.14.2017.01.01. The Crossref provided services for the DOI system through <https://cstr.escience.org.cn/CSTR:20146.14.2017.01.01> and link to the GCdataPR's system.

Article 16: CSTR Code System for Standards

The CSTR code system for the GCdataPR's Standards or policies is consisted of two parts, the first part is fixed code for all of the standard using CSTR:20146.17, the second part is an unique code for each individual standard using.×××× (year).×× (order of the standards).V× (version)

For example: The CSTR code of the GCdataPR's data sharing policy is CSTR:20146.17.2014.05. The Crossref provided services for the CSTR system through <https://cstr.escience.org.cn/CSTR:20146.17.2014.05.V1> and link to the GCdataPR's system.

Article 17: CSTR Code System for Computer Systems and Platforms

The CSTR code system for the GCdataPR's computer systems and platforms is consisted of two parts, the first part is fixed code for all of the computer systems and platforms using CSTR:20146.02, the second part is an unique code for each individual computer systems and platforms using .×××× (year).×× (platform type).×× (order of the platform published).

For example: The CSTR code of the GCdataPR is CSTR:20146.02.2014.00.01. The National Science and Technology Platform provides services for the system through <https://cstr.escience.org.cn/CSTR:20146.02.2014.00.01> and link to the GCdataPR's system.

Article 18: CSTR Code System for Equipments and Infrastructure

The CSTR code system for the GCdataPR's equipments and infrastructure is consisted of two parts, the first part is fixed code for all of the equipments and infrastructure using CSTR:20146.01, the second part is an unique code for each individual equipments and infrastructure using .×××× (year) .×× (equipment type).× (order of the equipment).

For example: The CSTR code for the equipment in Lanjia village ecosystem monitoring system CSTR:20146.01.2021.03. The National Science and Technology Platform provides services for the system through <https://cstr.escience.org.cn/CSTR:20146.01.2021.03> and link to the GCdataPR's system.

Article 19: CSTR Code System for Research Bases

The CSTR code system for the research bases is consisted of two parts, the first part is fixed code for all of the datasets using CSTR:20146.03, the second part is an unique code for each individual article using .×××× (year).× (order of the base).

For example: The CSTR code for the research base in Lanjia village CSTR:20146.03.2021.03. The National Science and Technology Platform provides services for the base through <https://cstr.escience.org.cn/CSTR:20146.03.2021.03> and link to the GCdataPR's system.

Article 20: CSTR Code System for Education and Tourism Bases

The CSTR code system for the education and tourism bases is consisted of two parts, the first part is fixed code for all of the education and tourism bases using CSTR:20146.21, the second part is an unique code for each individual education and tourism bases using .×××× (year).× (order of the base).

For example: The CSTR code for the education base in Yanchi Tan sheep education and tourism base is CSTR:20146.21.2021.01. The National Science and Technology Platform provides services for the base through <https://cstr.escience.org.cn/CSTR:20146.21.2021.01> and link to the GCdataPR's system.

Article 21: CSTR Code System for Plant Germplasm Resources

The CSTR code system for plant germplasm resources is consisted of two parts, the first part is fixed code for all of the plant germplasm resources using CSTR:20146.04, the second part is an unique code for each individual plant germplasm resources using .×××× (year).×× (order of the plant germplasm resources).

For example: The CSTR code for coffee in Baoshan, Yunnan province of China is

CSTR:20146.04.2021.04. The National Science and Technology Platform provides services for the Baoshan Coffee through <https://cstr.escience.org.cn/CSTR:20146.04.2021.04> and link to the GCdataPR's system.

Article 22: CSTR Code System for Animal Germplasm Resources

The CSTR code system for animal germplasm resources is consisted of two parts, the first part is fixed code for all of the animal germplasm resources using CSTR:20146.05, the second part is an unique code for each individual animal germplasm resources using .×××× (year).×× (order of the animal germplasm resources).

For example: The CSTR code for Tan sheep in Yanchi county, Ningxia Hui autonomous regions of China is CSTR:20146.05.2021.01. The National Science and Technology Platform provides services for the Yanchi Tan sheep through <https://cstr.escience.org.cn/CSTR:20146.05.2021.01> and link to the GCdataPR's system.

Article 23: CSTR Code System for Specimens

The CSTR code system for Specimens including animal, plant, soil specimens, items of museum etc., is consisted of two parts, the first part is fixed code for all of the specimens using CSTR:20146.10, the second part is an unique code for each individual specimens using .×××× (year).×× (order of the specimens).

For example: The dataset of post stamps on rocket and satellite (1957–1959) was published at the *Digital Journal of Global Change Data Repository* titled on Dataset of post stamps on rocket and satellite (1957–1959) in 2014. All of the post stamps mentioned in the dataset were archived in LIN Chao Geomuseum. The CSTR code for specimen items is CSTR:20146.10.2014.01. The National Science and Technology Platform provides services for the specimens through <https://cstr.escience.org.cn/CSTR:20146.10.2014.01> and link to the GCdataPR's system.

Article 24: CSTR Code System for Computer Software

The CSTR code system for computer software or tools is consisted of two parts, the first part is fixed code for all of the computer software or tools using CSTR:20146.19, the second part is an unique code for each individual computer software or tools using .×××× (year).×× (order of the computer software or tools).

For example: The Global Change Research Data Publishing System software was registered the software at the Administration of Copy Right of China as No. 0788406 on 18 July 2014, its CSTR registration is CSTR:20146.19.2014.01, the National Science and Technology Platform provides services for the software through <https://cstr.escience.org.cn/CSTR:20146.19.2014.01> and link to the GCdataPR's system.

Article 25: CSTR Code System for Patents

The CSTR code system for patents is consisted of two parts, the first part is fixed code for all of the patents using CSTR:20146.16, the second part is an unique code for each individual patent using .×××× (year) .×× (order of the patent).

For example: A multi-dimensional data format (MDD) and analysis was published at the *Digital Journal of Global Change Data Repository*. The extraction method for time-space-

spectrum four-dimensional remote sensing data was registered as Patent No.: US 10,740,873 B2 by the United States Patent Office in August 2020. Its CSTR registration is CSTR:20146.16.2020.01, the National Science and Technology Platform provides services for the patents through <https://cstr.escience.org.cn/CSTR:20146.16.2020.01> and link to the GCdataPR's system.

Article 26: CSTR Code System for Best Practices Cases

The CSTR code system for best practices cases is consisted of two parts, the first part is fixed code for all of the best practices cases using CSTR:20146.22, the second part is an unique code for each individual best practices cases using .xxxx (year).xx(month).xx (order of the best practices cases).

For example: The CSTR code for the Yanchi Tan sheep Huamachi town arid grassland case on ecosystem protection and sustainable development is CSTR:20146.22.2021.05.01. The National Science and Technology Platform provides services for the case through <https://cstr.escience.org.cn/CSTR:20146.22.2021.05.01> and link to the GCdataPR's system.

Article 27: CSTR Code System for Events, Conferences and Outreach Activities

The CSTR code system for events, conferences and outreach activities is consisted of two parts, the first part is fixed code for all of the events, conferences and outreach activities using CSTR:20146.23, the second part is an unique code for each individual events, conferences and outreach activities using .xxxx (year).xx (month).xx (order of the conferences and outreach activities).

For example: The CSTR code for the report of WSIS Prize 2018 (*e-Science* Champion) to the GCdataPR Project is CSTR:20146.23.2018.05.01. The National Science and Technology Platform provides services for the base through <https://cstr.escience.org.cn/CSTR:20146.23.2018.05.01> and link to the GCdataPR's system.

Chapter 4: Application of the Scientific and Technology Resources with Coding DOI:10.3974 and CSTR:20146

Article 28: GCdataPR Office and DOI:10.3974 and CSTR:20146

The Editorial Office of *Journal of Global Change Data & Discovery* (GCdataPR Office) is the official office for providing services on DOI:10.3974 and CSTR:20146. Either one of them cannot be transferred to or borrowed by any individual person or organizations else for any reason under any circumstances.

Article 29: License of using the DOI:10.3974 and CSTR:20146

All authors, co-authors of the products under DOI:10.3974 and CSTR:20146 granted by the GCdataPR Office have the permanent license to reuse, copy, distribute and disseminate the scientific and technological resources for research, education, public welfare or commercial uses for end users. The permanent or temporary license for the transformation of the deliver right or dissemination right should get written permission from the GCdataPR Office.

Article 30: Restatement of Declaration Conditions for DOI:10.3974 and CSTR:20146 Registration

The author(s) of the metadata, datasets, and data papers should agree the following principles and submit the requested information and dataset; the dataset should be submitted and evaluated before submitting the data paper. Dataset and its metadata as well as the data paper will be published as soon as they are passed the peer review:

- (1) the data, metadata, data paper should be original.
- (2) the data, metadata, data paper do not contain any unlawful, scandalous, libelous, obscene or otherwise objectionable information.
- (3) the author(s) of the metadata, datasets, and data papers agrees to give the following licenses to the GCdataPR Office:
 - a) publish the metadata in either or both printed format or digital format in any media, including internet;
 - b) publish the dataset(s) in digital format in any media including internet;
 - c) coordinating with *Journal of Global Change Data & Discovery* to publish the data paper in either or both printed format or digital format in any media including internet;
 - d) host and transfer the deliver right and service right of part or as a whole of the published metadata, datasets, and data papers;
 - e) maintain online or mirror sites which include the metadata, data paper and dataset (in part or as a whole).
- (4) the dataset author(s) agrees not to grant any other DOI publisher the exclusive right to publish the dataset and data paper again.
- (5) besides the special cases, this should be indicated specifically, all the metadata, data paper, dataset are published as open access under the terms of the GCdataPR Data Policy which permits browsers for free uses; end users for free uses subject to citation; value added provider servicers for uses with written permission from GCdataPR and 10% principle for dataset resampling uses.

Article 31: Restatement of Peer Review for all Products with DOI:10.3974 and CSTR:20146

All Products assigned with DOI:10.3974 and CSTR:20146 should go to peer review procedure according to the guidelines of Global Change Data Publishing & Repository.

Article 32: Restatement of Data Sharing Policy for all Products with DOI:10.3974 and CSTR:20146

Data from the Global Change Research Data Publishing & Repository includes metadata, datasets (in the *Digital Journal of Global Change Data Repository*), and publications (in the *Journal of Global Change Data & Discovery*). Data sharing policy includes:

- (1) data are openly available and can be free downloaded via the internet;
- (2) end users are encouraged to use data subject to citation;
- (3) users, who are by definition also value-added service providers, are welcome to redistribute data subject to written permission from the GCdataPR Editorial Office and the issuance of a data redistribution license; and
- (4) If Data is used to compile new datasets, the 'ten per cent principal' should be followed

such that Data records utilized should not surpass 10% of the new dataset contents, while sources should be clearly noted in suitable places in the new dataset

Chapter 5: Citation DOI:10.3974 and CSTR:20146

Article 33: GCdataPR Registrations Codes

All products published and registered by GCdataPR, including datasets, articles, cases, etc., should be coded with DOI:10.3974 and CSTR:20146 in a suitable way.

Article 34: Citation

Any users who re-use GCdataPR's products, should be cited according to ISO 690 2010(E) or GB/T 7714—2015. Any end users are granted the free of charge license for all of the GCdataPR's products subject to citation.

Chapter 6: Statistics, Reward and Punishment

Article 35: Statistics

The GCdataPR Editorial Office is responsible for the statistics regularly base on the registration with DOI:10.3974 and CSTR:20146 according to the procedure and methodology published in the guidelines of Global Change Research Data Publishing and Repository (Article 73, 2017).

Article 36: Award

The GCdataPR will award the outstanding contributors based on the registration with DOI:10.3974 and CSTR:20146 according to the procedure and methodology of the Guidelines of Global Change Research Data Publishing and Repository (Article 72, 2017).

Article 37: Punishment

The GCdataPR will punish all authors (including the principal, corresponding, or co-authors, who publish datasets at the *Digital Journal of Global Change Data Repository*, and data papers or articles at the *Journal of Global Change Data & Discovery*), who have made any verified forgery or plagiarism in their dataset or data paper or article based on the registration with DOI:10.3974 and CSTR:20146, according to the procedure and methodology of the Guidelines of Global Change Research Data Publishing and Repository (Article 73, 2017).

Chapter 7: Amendment of the Specification and Implementation

Article 38: Amendment of the Specification

The Specification will be modified according to the updated standards in national and international levels, as well as the GCdataPR's needs.

Article 39: Coding Management for Updating Records

The procedure and method for updating data records registration with DOI:10.3974 and CSTR:20146 follow the Guidelines of Global Change Research Data Publishing and Repository (Article 39 and 40, 2017).

Article 40: Implementation

(1) The GCdataPR Specification will be implemented on September 25, 2021. The previous version will be closed.

(2) The GCdataPR Office should complete the evaluation for registration with DOI:10.3974 and CSTR:20146 for all products published at *Digital Journal of Global Change Data Repository*, Journal of Global Change Data Publishing & Discovery and the Global Change Data and Knowledge Hub platform by December 31, 2021.

The GCdataPR Office will check and evaluate the implementation situation of GCdataPR Specification regularly, in order to find any problems and potential troubles in time and to correct them timely based.

Article 41: Appendixes

(1) Acknowledgment

The GCdataPR Specification is a necessary technical standard and specification for the management of digital scientific and technological resources in the global change studies. The first edition of Specification was officially released in June 2014. It was completed by a group led by Prof. Liu, C., Institute of Geographic Sciences and Natural resources Research, Chinese Academy of Sciences. The contributors include: Prof. Zhu, Y. Q., Dr. Shi, R. X., associate Prof. Wang, Z. X., Prof. He, S. J., and chief engineer Guo, X. F., deputy director of DOI registration and service center of China Institute of science and technology information.

The first update version on GCdataPR Specification was released on January 30, 2017. Prof. Liu, C. led the team for the update version. The team member includes Prof. Zhu, Y. Q., associate Prof. Wang, Z. X., Prof. He, S. J., and Prof. Ge, Q. S., the Editor-in-Chief of the *Journal of Global Change Data & Discovery*.

The second update version of the GCdataPR Specification was released on May 30, 2021. The second update version was completed by the group led by Prof. Liu, C., the contributors included Prof. Zhu, Y. Q., Dr. Shi, R. X., associate Prof. Wang, Z. X., Prof. He, S. J., Prof. Ge, Q. S., Dr. Ma, J. J., Senior Engineer Yu, B. H., Prof. Song, X. F. Dr. Shi, L., director of the science and technology resource platform center of the Ministry of science and technology, Professor Li, G. Q., director of the National Earth Observation scientific data center.

(2) Background for the update version of the GCdataPR Specification

There was an urgent need for the GCdataPR dataset and data papers publishing and repository in 2014. Because of the GCdataPR system would be online in June 2014, the GCdataPR Specification became the critical part of the publishing infrastructure. Since the data paper was published in the supplement of volume 69 of *Acta Geographica Sinica* in 2014, it was registered with DOI:10.11821/dlxb2014s, while the dataset was registered with doi:10.3974/geodb.

When the *Journal of Global Change Data & Discovery* was approved to be launched in

March 2017, the DOI code system for the new journal was assigned with DOI:10.3974/geodp, which should be linked to the datasets with DOI:10.3974/geodb. Based on the progress, the first updated version of the GCdataPR specification for registration and digital codes of science and technology products was released in 2017.

The background of the second updated revision of the GCdataPR Specification in 2021 is as the following.

The *Digital Journal of Global Change Data Repository* was launched in June 2020.

The Scientific Data Management Law of China (2018), National Scientific and Technology Resources Sharing Services Platform of the Ministry of Science and Technology of China (2018) and CSTR standard (GB/T 32843—2016) were published separately, the GCdataPR specification for registration and digital codes of science and technology products should be updated.

The content of the Global Change Research Data Publishing & Repository was expanded, it consists not only the *Journal of Global Change Data & Discovery*, *Digital Journal of Global Change Data Repository*, but also the Global Change Data and Knowledge Hub platforms.

The new content on Geographical Indications for Environment and Sustainability (GIES) was developed since January 2021. It related to datasets, articles, samples, bases for research, education, tourism, environment monitoring equipments, plant germplasm, animal germplasm, etc. Therefore, the updated revision focused on adding S&T resources with CSTR code are necessary.

(3) Bilingual ID with DOI:10.3974/ and CSTR:20146/

All products published by GCdataPR are bilingual both in Chinese and English. Although the languages are different, the scientific connotation is the same. Because of most international users to have scientific cooperation in English, for this reason, the GCdataPR Specification adopted the method of bilingual publication, system and logo in both Chinese and English with same ID registered in DOI system. In this identification system, the same scientific achievement, no matter in which language it is published and disseminated, is regarded as a scientific achievement and an identification mark.

In order to identify Chinese version and English version, when both appear the same pages, the CN (for Chinese version) and En (for English version) should be added.

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