

Cover Design for the *Journal of Global Change Data & Discovery* in both Chinese and English

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Abstract: The *Journal of Global Change Data & Discovery* (a bilingual quarterly) was launched in March 2017. It is an online and offline academic journal to publish global change research data papers, combined with a dataset, in both Chinese and English. The cover of this Chinese and English co-publication reflects the spirit of this new journal, the contents, the dual-language nature, and the core content of global change scientific data. Therefore, the cover adopts a combination of a static section, which reflects the core content of global change scientific data, and a dynamic issue-specific section, which reflects the content of the current issue's high quality datasets. The spirit and style of the journal determined the core design of the blue and white layout. Visualized charts of the high quality datasets in each issue are the main focus of the issue-specific layout. During more than two years of publication, the cover design of *Journal of Global Change Data & Discovery* has played an irreplaceable and unique role in the publishing, dissemination, and sharing of scientific data, thus establishing its brand and unique logo.

Keywords: global change; data journal; bilingual journal; cover design; data visualization; high quality dataset

1 Introduction

The *Journal of Global Change Data & Discovery* is a quarterly bilingual academic journal, which was officially launched in March 2017, with the Chinese Standard Serial Number (CN) 10-1493/P and the International Standard Serial Number (ISSN) 2096-3645. It is the world's first academic journal to publish global change research data papers accompanying datasets in both Chinese and English^[1]. The journal is an important part of the Global Change Scientific Research Data Publishing and Repository (GCdataPR), which includes metadata, datasets, and data papers. In 2017, the journal's publication was funded by Scientific Communication Projects of the Institute of Geographic Sciences and Resources Research, the Chinese Academy of Sciences, the Chinese Geographical Society, and the Science Communication Bureau of the Chinese Academy of Sciences. In 2018, GCdataPR was awarded the Leading Science and Technology Achievement Award at the Big Data Expo., the Honor of Innovation Project at the Digital Publishing Expo., and the WSIS Prize (e-Science Champion) of the

Received: 01-03-2019; **Accepted:** 16-03-2019; **Published:** 25-03-2019

Foundation: Chinese Academy of Sciences (2018)

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Article Citation: Ma, J. H., Liu, C., Shi, R. X. Cover design for the *Journal of Global Change Data & Discovery* in both Chinese and English [J]. *Journal of Global Change Data & Discovery*, 2019, 3(1): 10-18. DOI: 10.3974/geodp.2019.01.02.

United Nations. It was honored as “a new milestone of scientific data sharing in China” by Xu Guanhua, the former Minister of the Ministry of Science and Technology, China (MOST, June 2017, Beijing)^[2].

The cover of an academic journal is an important showcase for the journal contents^[3]. This new and different form of bilingual journal, combining datasets with papers, is unlike monographs by virtue of its dynamic and quarterly issues. The first consideration for the cover design was how to reflect the special field of global change research data. Therefore, the cover design should deal not only with the relationship between publication standards and the journal’s individual design but also the relationship between the static layout representing brand significance and the dynamic issue-specific layout for each issue. It should also deal with perfectly balancing bilingual publication in Chinese and English, and the relationship between the scientific content of high quality datasets and the artistic expression of data science. When considering the composition of pictures, characters, and colors on a journal’s cover, the journal’s scientific significance should be a primary consideration. This is so that because it can provide the most intuitive impression and play an irreplaceable role in disseminating scientific knowledge, creating an image, building the brand, expanding the market, and promoting dissemination.

Bearing in mind the scientific significance and the artistic considerations involved in cover design, the editorial office of the *Journal of Global Change Data & Discovery* designed the cover color, structural layout, and text content in order to create a unique image that strengthens the brand, honors scientific research, displays the beauty of data visualization, and promotes the scientific agenda and overall aims.

2 Cover Design to Manage Three Central Relations of the Journal

First, it is important to deal with the three relations included in the journal when designing the cover: (1) the differences and correlations between Chinese and English in bilingual journals; (2) the fixed and the changing relationship between the journal brand and the dynamic of the high quality datasets in each issue; and (3) the fusion of the scientific connotations of global change data and the art of data visualization.

2.1 Methods to Balance Between Two Languages

The first consideration in designing the cover of the *Journal of Global Change Data & Discovery* was how to present Chinese and English in a bilingual journal while giving each language equal prominence. The cover display allows both Chinese and English speakers to experience the same cover layout design and content in their first language. The *Journal of Global Change Data & Discovery* adopts a double cover design (e.g., Figure 1 is for the Chinese front cover and Figure 2 is for the English front cover). The Chinese cover and the English cover both represent the current edition of the journal.

The bilingual publication not only presents a double cover in Chinese and English but also contains the same cover information, including the visual representation of the high quality dataset and the title of the issue. In addition the English title is freely translated using keywords for concise expression.

2.2 Methods to Balance Journal Brand and Change of High Quality Datasets in Each Issue

2.2.1 Journal Brand

A static layout with dynamic issue-specific elements is adopted for the cover of each issue. The cover structure is inspired from ancient Chinese books. It is divided into three parts: the header and the footer for the journal brand, the middle part for the content of each issue

(Figures 1–2). Space allocated to the header, footer, and middle follows the ratio of 2:1:5, which not only give a certain amount of space to display the brand, but also highlight the characteristics and changes for each issue, so that the cover has enough space to promote the content and nature of the scientific data.

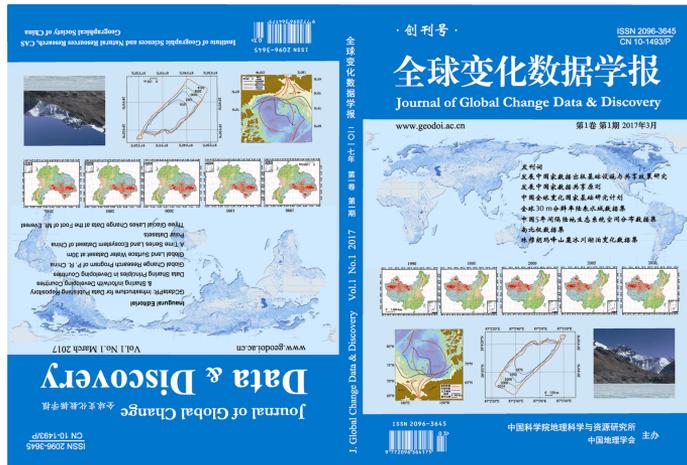


Figure 1 The Chinese front cover of the journal

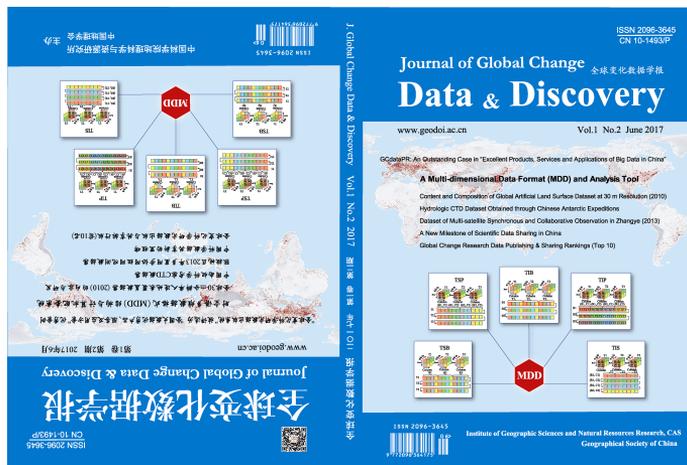


Figure 2 The English front cover of the journal

The Chinese name of the journal in the Chinese front cover is supplemented by the English name in smaller font, and vice versa. The ISSN and the CN are located in the top-right corner of both covers. The publishing barcode and sponsors are printed in the brand part of the cover (in the footer).

2.2.2 High Quality Datasets

High quality data display is the key consideration of the issue-specific element of the cover of the *Journal of Global Change Data & Discovery*. Global change research is a comprehensive discipline with multi-disciplinary intersections, covering a wide range of disciplines, including atmosphere, ocean, geography, agriculture, cities, environment, animals and plants, biodiversity, world heritage sites, national parks, population, health, policy, foreign affairs, and so on. The selection of excellent data from papers published in different disciplines is the key component and an essential element of the cover design representation of each issue's scientific data content.

2.3 Methods to Integrate Academic Value and Data Visualization

2.3.1 Basic Principles of Selecting High Quality Datasets for the Cover

Data visualization has different performance advantages to digital data. Representing data patterns in visualized charts enables understanding of the connotations of the data in the shortest possible time. The cover picture also has clear intuitionistic characteristics, and has become an important part of the cover design^[4]. The basic principles for selecting the cover dataset are as follows: (1) the academic value and long tail effect of the scientific data; (2) the originality and foundation of the scientific data; (3) the intersection and fusion of multi-disciplines; (4) the particularity and typicality of the data research area; and (5) the expressiveness of the data visualization.

2.3.2 Integration of the Content and the Visual Expressiveness of Scientific Data

(1) Cover color

Some colors have specific symbolic significance in global change research. Global change is an issue of concern to every country and an important field of a series of international cooperation programs, such as the United Nations Paris Agreement on Climate Change, sustainable development goals, disaster reduction, and disaster prevention. This journal adopts the dominant colors of the United Nations flag—white text on a blue background—thus echoing the United Nations' theme of global change. The background color in the middle part of the journal cover is light blue.

(2) Cover fonts

The name of the journal on the Chinese cover is in Fangzheng Song Chinese font. Bold font is square, simple, and concise, conveying a steady, rigorous, and standardized impression^[5]. Several of the bold characters in the Chinese cover are of the same size, which makes the name eye-catching and serious and accords with the design concept of a sci-tech journal. The title of the journal on the English cover is in Times New Roman font, and the English title on the English cover highlights “Data & Discovery,” which stresses the scientific nature of the journal.

The titles of the article in the middle of cover are mainly guides to the content. These vary with the number of pictures and the titles selected for the cover of each issue. The main principle is to select the title of the article related to the cover picture. The Chinese cover uses standard Chinese fonts to distinguish them from the fonts used for the journal name in Chinese, and Times New Roman is still used for the title of English cover articles.

(3) Design of the journal spine

The spine of the journal functions for quick searching. The title, volume, issue, and year of publication are arranged on the spine in a way that is eye-catching and clear, so that it is easy to read and find^[6]. English titles, volumes, and issue numbers, are abbreviated. The design of the spine can be seen as an extension of the cover design. Therefore, the spine is blue with text printed in white so that the whole cover design is complete, harmonious, and unified.

3 Cover Characteristics of the *Journal of Global Change Data & Discovery*

3.1 2017 Covers

3.1.1 The First Issue

Four representative datasets were selected for the cover of the first issue in 2017: (1) Global land surface water dataset at 30 m resolution^[7-8]; (2) Time series of land ecosystem classification dataset of China in five-year increments^[9-10]; (3) Dechloranes in multi-medium data-

set from sample areas in the Arctic and Antarctic^[11–12]; (4) Three glacial lakes (Rongbuk, Karda, Imja) change data at the foot of Mt. Everest, Himalaya^[13–14].

“The content and composition of the global land surface water dataset at 30 m resolution (2010)” was developed by the team led by Chen Jun, chief engineer of National Geomatics Center of China. The dataset was funded by the Ministry of Science and Technology and the National Natural Science Foundation of China, and was collated over four years. This is the world’s first global land surface water dataset in the field of global change science and the earliest at a spatial resolution of 30 m.

“A time series land ecosystem classification dataset of China in five-year increments (1990–2010)” is an important product of remote sensing monitoring of terrestrial ecosystems on a national scale. The dataset at 100 m spatial resolution, collated during 1990, 1995, 2000, 2005, and 2010, shows that the spatial regions of global change scientific research data include not only the global scale but also the national scale, and include some periods of data and also time series data.

Since the establishment of Great Wall Antarctic Station and its participation in the Antarctic Treaty Organization, China has carried out more than 30 Antarctic scientific explorations. In recent years, explorations have also been carried out in the Arctic. Some datasets accumulated by these explorations were published in the first issue of the GCdataPR and the *Journal of Global Change Data & Discovery*. The data visualization chart of the polar datasets on the cover shows that the GCdataPR paid special attention to the publication and sharing of datasets from the polar region. Although the polar research team is not large in the field of global change, the polar region is of particular concern to the world. It is an indispensable geographical area for scientific research on global change.

Three glacial lakes on the north and south slopes of Mount Everest provided historical change data. The datasets included the Geographic Information System (GIS) data of shore-line changes in 1976, 1992, 2000, 2008, and 2014 of three lakes: Imja Lake (Nepal) on the southern slope of Mount Everest, Rongbuk Lake (China), and Karda Lake (China) on the northern slope of Mount Everest. This is the first ever comparative data of typical glacier lakes on the north and south slopes of Mount Everest. In addition, the cover showed a picture of Mount Everest, taken in the winter of 2016 at the center of the southernmost water body (frozen state) of the lake. This was the first scientific exploration of the Himalayas in winter.

3.1.2 Covers of Issues 2, 3, and 4

The cover picture of Issue 2 of 2017 (Figure 3) is selected from the data paper “A multi-dimensional data format (MDD) and analysis tool”^[15] and the accompanying datasets of “Inter-operational tool for temporal-spatial data analysis in Multi-Dimensional Data Format (.mdd)”^[16]. This new data format was developed by Prof. Zhang Lifu’s team from the Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, and could be used to store and process multi-spatial, multi-content, and time series fusion data. The data format is an important advance in data technology and has the characteristics of flexibility, multi-dimensionality, extensibility, and integrity, with a wide range of potential applications.

The cover picture of Issue 3 of 2017 (Figure 3) is taken from “A 5 km/daily Downward Shortwave Radiation Data Product over China-ASEAN (2013)”^[17–18]. China and ASEAN countries have long coastlines and vast sea areas rich in marine resources. A series of articles on China-ASEAN research in this issue provides strong data support for changes in the ecological environment of China-ASEAN countries. The data visualization map from one of these articles was selected for the cover.

The cover picture of a pika in Issue 4 of 2017 (Figure 3) was taken from the “Dataset of little terrestrial mammals and birds in Barun Valley, Himalaya, Nepal (1973)”^[19–20]. The dataset includes the specimen information and photos collected by the author in 1973 on a Czechoslovak national expedition to the southern footer of the Himalayas. The article is a review of a scientific investigation history of more than 40 years ago. The precious field investigation data and image records are not only important historical materials but also provide an important reference for future exploration. The picture of Mount Everest on the cover was taken by the author during his later expedition to the Himalayas. The photos from the two different periods are combined on this cover to show the important roles of time series data and the long tail.



Figure 3 Journal covers of Issues 2, 3, 4 in 2017

3.2 2018 Covers

The cover picture of Issue 1 of 2018 (Figure 4) is the symbol of the WSIS Prize (*e*-Science Champion) awarded to GCdataPR at the United Nations’ World Summit on the Information Society in 2018^[21]. This is the first time that scientific data has won this award. The GCdataPR was honored as “A new milestone of scientific data sharing in China” by Academician Xu Guanhua^[2]. The World Summit on the Information Society in 2018 was divided into 18 categories according to the United Nations action maps, directly tracking the 11 action lines of the World Summit on the Information Society in Geneva. Therefore, in support of the United Nations sustainable development goals (STG)^[21], the STG logo was placed under the prize symbol.

The cover picture of Issue 2 of 2018 (Figure 4) is taken from physical inventory pictures of “The spatial dataset of 2555 traditional Chinese villages”^[22–23]. The dataset analyzes and visually expresses the spatial data of the historical and cultural heritage of traditional villages, which combine geography and architecture organically, and play a leading role in the intersection of literature, science, and art in the big data era. It is a very characteristic dataset and data paper. A picture, taken by the author, of Anchang town, Shaoxing, Zhengjiang province was selected as the cover for this issue, showing the living existence of a traditional village in the context of modern society.

The cover of Issue 3 of 2018 (Figure 4) is a group photo of the authors (Prof. Zhang Yili, Prof. Li Bingyuan, and Academician Zheng Du) of “Datasets of the boundary and area of the Tibetan Plateau”^[24–27], which was placed first in the Datasets Impact Ranking of global change. The authors have been devoted to collecting GIS data on the boundary of the Qinghai-

Tibet Plateau. After 27 years of persistent exploration involving geomorphology, physical geography, plateau ecology, GIS, geographical data, and integration of multi-disciplines^[27], they finally topped the 2018 Datasets Impact Ranking. Having their group photo on the cover of this issue not only affirmed the dataset but also paid tribute to the scientists who have persevered in their work over a long period.



Figure 4 Journal covers of four issues in 2018

The cover picture of Issue 4 of 2018 (Figure 4) is taken from the “Enhancement algorithm for quantum remote sensing image data”^[28]. Prof. Bi, Siwen was the first to propose the concept of quantum remote sensing, and his achievements in de-noising, enhancement, and

segmentation algorithms of quantum remote sensing were quickly recognized by international experts in this field^[28–30]. He has opened up a new field in big data processing and the calculation of remote sensing, which is of epoch-making significance.

4 Discussion and Conclusion

Through the coordination of its cover and highlighted content, the *Journal of Global Change Data & Discovery* has created a unique cover design style with scientific data content and bilingual expression at its core. Based on the representation of scientific datasets and issue-specific data visualization, the covers of the journal embody the core values of publishing the latest scientific data, disseminating the academic value of scientific data, advancing scientific initiative, the “craftsman spirit,” and playing a leading role through the concise representation of scientific data.

It should be noted that the artistic expression of the cover of the *Journal of Global Change Data & Discovery* is based on the scientific data published in any particular issue, thereby differing from general visual art works. Therefore, the creative space is limited to the published datasets. Without the published datasets in an issue, no matter how special the visual art works are, they will not appear on the cover of the *Journal of Global Change Data & Discovery*.

Data visualization is a special field in big data science. The visualization of the scientific data of global change has a profound heritage. Since the 19th century, the development of cartography and GIS has become an important basis for the visualization of global change research data. In recent years, the development of database analysis and data mining has enriched the technology and tools of data visualization. It can be predicted that, with the development of data visualization technology and the abundance of tools, the covers of academic journals related to scientific data will become a display platform for the achievements of scientific data visualization; in turn, the dissemination of academic journals will benefit from the development of data visualization.

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