

New Milestone of Scientific Data Sharing of China

—Speech at the First National Conference on Global Change Research Data Publishing & Sharing

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Dear Colleagues,

I am very glad to join the First National Conference on Global Change Research Data Publishing & Sharing, even though I was confirmed to be available to participate in it only two days ago.

This is a great opportunity to pay my respects and to say my thanks to the Chinese Academy of Sciences (CAS), to the Institute of Geographic Sciences and Natural Resources Research (IGSNRR), and especially, to Dr. Liu, C., for the publication of global change research datasets online, and to the *Journal of Global Change Data and Discovery*. I think the publication of both global change research data and the data paper is a new milestone in the history of China's scientific data sharing, because it will play a key part in promoting data sharing and data quality.

I have known Dr. Liu Chuang for a long time. She is very enthusiastic about scientific data sharing in both in China and abroad, and she is ambitious and resourceful.

As we all have known, data sharing is a thorny problem that thwarts the development of science and technology in China. Why has this problem been so hard and taken such a long time to tackle? There are many interweaved causes, but clearly it has led to many deleterious consequences.

Science and technology is a process of learning from and surpassing forerunners. On the one hand, we learn from our predecessors through various publications, and on the other hand, we rely on the accumulated data gleaned in the past. However, we have been walking toward our goals with only one leg, because we have been unable to use most of the scientific data developed by the predecessors.

In the past (and specifically since 2003), many steps have been taken by the Ministry of Science and Technology (MOST). For instance, we allocated special funds to some agencies, such as the China Meteorological Administration and China's State Bureau of Surveying and Mapping, to promote data sharing, but most of the publicly funded data are still locked behind doors.

Failure to share publicly funded data has become one of the negative factors for scientific advances in China. Without data sharing, some research has to be repeated, some research results cannot be verified, and we have no means to spot fraudulent science. Therefore, failure of data

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sharing is a waste of taxpayers' money and researchers' time. We need to stop it.

In the era of big data, it is impossible to overestimate the value of data sharing. Although still in its infancy, big data has demonstrated itself as a potentially powerful tool, from analogy to prediction. Big data could be a revolutionary tool for global change research in the near future. But there is a prerequisite—we first have to be ready to manage big data well. Where are big data if everyone locks up their data? Looking back now, I have to admit that data sharing is still an obstacle for scientific advances in China, although of course we did get some progress.

Today, when I review our efforts, whether it results in success or frustration, I think I can more clearly evaluate the implications of the publication of scientific data and the data journal. Dr. Liu Chuang and her colleagues, both within and outside CAS, have worked very hard in the dark for so long, and finally, their efforts have paid off. How do we evaluate their achievements? Personally, I think that their work is very important in three respects.

First, they stimulate scientific data sharing not by intimidation, but by mainstreaming data into the scientific community. In the past, when I was the Minister of the Ministry of Science and Technology, data sharing was a big headache for me. Together with many experts and officials, we created many administrative measures, including coercive and compulsive details. What was the result? The expected data were submitted, of which some might be useful, but many were just junk data. Data developers without incentives had the talents to counteract many seemingly powerful regulations. Nowadays, the publication of data and data papers remind me of the conventional research paper publication—publish or perish. Why are people so enthusiastic about research paper publication? Because that is regarded as the key indicator of their academic merit. What Liu Chuang and her colleagues have done is to transform scientific data from nearly nothing to a community-accepted academic indicator, just like the conventional research paper. When data developers find their contributions are guaranteed by publication, citation, and acceptance in their institute, they will feel very happy to proactively publish their data.

Second, they promote the formation and development of data science. In the past, data science was only a fancy term with little concrete meaning. Nowadays, we can see an emerging branch of science: data and paper submissions, peer review, quality assurance, copyright protection, publication, citation, and more. With this platform, data developers have finally found their opportunity to demonstrate their talents and contributions to the scientific community.

Third, they promote data quality. Two ways help to improve data quality. First, from data producers: they care for their feathers. Second, from data publishers: there is a set of processes to ensure the quality of data and data papers, including peer review.

Finally, this job has been done so decently, and no administrative measures have been involved. Very amazing! In the past, so many people worked so long, why did we not come up with this creative idea? It seems there is much ingenuity in our scientific community! China is lucky to have these good people, and data sharing in China is now on the right track.

Once again, allow me to say my genuine congratulations and thanks to CAS, IGSNRR, Dr. Liu C., and all contributors to the Global Change Research Data Publishing and Repository!

Background Information: The First National Conference on Global Change Research Data Publishing and Sharing was held on 29 June, 2017, in Beijing. This Conference was co-organized by the Institute of Geographic Sciences and Natural Resources Research (IGSNRR), CAS and Geographical Society of China (GSC). Over a hundred of scientists, journalists, and data managers joined the conference. Professor Xu Guanhua, the former Minister of the Ministry of Science and Technology, P. R. China (MOST), and Academician of Chinese Academy of Sciences (CAS), gave high praise to the launching of Global Change Research Data Publishing & Repository and the Journal of Global Change Data & Discovery (Both in Chinese and in English). Please refer to Volume 1, Issue 2, 2017, for details. This transcript is edited for length and clarity.