



# Current status of open science in Japan and China:

## Policy, research data repository and management

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**INTRODUCTION:** Open science has the potential to enhance the efficiency to publish research results produced by academic institutions, such as national laboratories and universities in the world. Research results are constructed from article and research data, which are factual data, statistical data, images, sound, software, multimedia etc. Research data along with research articles in Institutional Repositories will become an integral part of library resources. Academic librarians, called data librarians, will be expected to support data repositories, including working on data management, data usage policies and data utilization. National Institute of Informatics (NII) in Japan and Chinese Academy of Sciences (CAS) in China are promoting strongly to develop open science. In this study, institutions' approach to open science and representative organizations of data repositories will be shown. Current states of open science in Japan and China, especially research data repositories are investigated. Related work and efforts will be analyzed which is helpful for libraries to understand the needs and expected information services for open science.

### Policy developments on open science in Japan

Since the signing of the joint statement on open scientific research data at the G8 Science Minister's meeting in 2013, several policy developments on Open Science have taken place in Japan. Mainly, Cabinet Office, Ministry of Education, Culture, Sports, Science and Technology (MEXT), and the NII have been developing open science in Japan.

### Policy developments on open science in China

On May 2014, China Academy of Sciences (CAS) and National Natural Science Foundation of China (NSFC) announced open access policy that researchers they support should deposit their papers into online repositories and make them publicly accessible within 12 months of publication. Now there are many institutional repositories in China, for example CAS IRgrid (covering 100 institutions), Peking University, Tsinghua University, Shanghai Jiaotong University, etc. The CAS IR grid (<http://www.irgrid.ac.cn/>) has 63 thousand papers and 20+ thousand abstracts.

On April 2, 2018, General Office of the State Council of China announced that China will strengthen and standardize the management of scientific data to guarantee data security and enhance data sharing. The measures are expected to provide better support to national scientific and technological innovation, economic and social development, as well as state security.

### Some data platform have been create in Japan, for example:

- 1) Center for Open Data in the Humanities (CODH): CODH, Joint Support-Center for Data Science Research, Research Organization of Information and Systems has the following missions toward the promotion of data-driven research and formation of the collaborative center in humanities research. (<http://codh.rois.ac.jp/index.html.en>)
- 2) Data Integration and Analysis System (DIAS): DIAS has been created by Remote Sensing Technology Center of Japan. It aims at collecting, archiving, integrating and analyzing massive amount of data observing the earth, and convert data into information useful for the society for global-scale environmental problems, risk management for large-scale natural disasters, and so on. (<https://dias.ex.nii.ac.jp/index.html.en>)
- 3) Arctic Data archive System (ADS): ADAS has been created by National Institute of Polar Research. It aims at collecting, archiving research In order to collect and archive data for collaboration across the atmosphere, oceans, land, ecology, model, in situ observation, collection data(data rescue), satellite data, numerical simulation data, and so on. (<https://www.arcs-pro.jp/ads/>)
- 4) Data ARchives and Transmission System (DARTS): DARTS has been created by Japan Aerospace Exploration Agency. It is a multi-disciplinary space science data archive for, e.g., astrophysics, solar physics, solar-terrestrial physics, lunar and planetary science, and microgravity science. (<https://www.darts.isas.jaxa.jp/index.html.en>)
- 5) The Social Science Japan Data Archive (SSJDA): SSJDA has been created by the University of Tokyo. It collects, maintains, and provides access to the academic community, a vast archive of social science data (quantitative data obtained from social surveys) for secondary analyses. (<http://csrda.iss.u-tokyo.ac.jp/en/>)
- 6) Japanese Institutional Repositories Online (JAIRO): JAIRO has been created by NII. It is a succeeding service of Japanese in which academic information (journal articles, theses or dissertations, departmental bulletin papers, research papers, etc.) accumulated in Japanese institutional repositories can be searched for cross-sectionally. (<http://jairo.nii.ac.jp/en>)

**CONCLUSION:** Scientific and technological innovation has become more dependent on large, reliable sets of scientific data. Japan and China still have a lot of work to do in developing, utilizing, opening, sharing and protecting data.

### Open science research data repository in Japan

The Research Center for Open Science and Data Platform (RCOS) (<https://rcos.nii.ac.jp/en/service/>) was established at the NII for the purpose of developing and operating research data infrastructure, thereby laying the foundation of open science in Japan. Research is expected to shift to a new research paradigm, specifically open science, through the open collaboration and sharing of research publications and data within academia and beyond, thus accelerating the progress of research and meeting the social challenges of today.

### Open science research data repository in China

China has seen a scientific data boom in both quantity and quality, with growing input in science and technology research in recent years. The data have not only impacted many scientific fields, such as bioscience, astronomy, geoscience and physics, but have also triggered important revolutions in research methods.

### Some data platforms have been create in China, for example:

- 1) Data Cloud of CAS: The platform was created by Chinese Academy of Sciences(CAS) in 1986. It have plant, minority language, geography, material science, remote sensing, lake, soil etc. scientific data, and provide data search, data repository service. (<http://www.csdb.cn/>)
- 2) National Scientific Data Sharing Platform for Population and Health: It has been supervised by Chinese Academy of Medical Sciences (CAMS). The platform includes clinical medicine, pharmacy, public health, Chinese medicine etc. (<http://www.ncmi.cn/1>)
- 3) National Data Sharing Infrastructure of Earth System Science: It covers atmosphere, polar region, ocean, land.... Some dataset of the platform can be directly downloaded. The platform supervised by Institute of Geographical Sciences and Natural Resource Research, CAS. (<http://www.geodata.cn>)
- 4) National Meteorological Information Center: It has been supervised by China Meteorological Administration. Their service police has three types (1) A part of data can be browsed to the public, (2) For the registered user, giving them an easy access to information on basic meteorological data and products, (3) For special demands, the user service and reception office provides off-line data processing and product tailoring services. (<http://data.cma.cn>)
- 5) China Earthquake Data Center: The platform was created in 2002. It includes National Earthquake sharing Data Center and ten subject branch centers. The data size has had 260TB, 103 datasets. (<http://data.earthquake.cn>)

Dataset in JAIRO (55,174)	
Chiba University Repository	52,212
Academic Repository Network	1,226
University of the Ryukyus Repository	911
E-TOPIA Tokyo Gakugei University	203
Humanities Research Data Repository	136
Nara National Research Institute for Cultural Properties: 3D Bone Atlas Database	113
Asahikawa Medical University Collection and Research	84
Osaka University Knowledge Archive	82
Saitama United Cyber Repository of Academic Resources	43
Okayama University Scientific Achievement Repository	29
Japan Aerospace Exploration Agency Repository / AIREX	18
Kanazawa University Repository for Academic Resources	16
Kyoto University Research Information Repository	14
Japan Agency for Marine-Earth Science and Technology (JAMSTEC) Repository	14
Hiroshima University Institutional Repository	13

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