

INTERNATIONAL TRAINING WORKSHOP ON OPEN SCIENCE INFRASTRUCTURES FOR DISASTER MANAGEMENT

NOV 14-15 2024

ULAANBAATAR, MONGOLIA

ONLINE REGISTRATION



Co-organizers

Mongolian Academy of Sciences (MAS), CAS, CNIC, GOSC IPO, CODATA

14-15 November 2024; MAS, Ulumbaartaar, Mongolia

Online venue (registration): ZOOM Meeting <https://zoom.us/meeting/register/tJctf-CvrjsqGdZJpPKpLiS3pn0J2uplH5Gw>

Onsite venue: Meeting hall of the 1st building of Mongolian Academy of Sciences, Peace avenue 54b, 13th khoroo, Bayanzurkh district, Ulaanbaatar-13330, Mongolia.

Introduction

Open collaboration and open science among global stakeholders are vital to face the great challenges of this century and to ensure a sustainable world and healthy living conditions for future generations. Extreme climate conditions due to global warming are leading to a greater frequency of sudden weather changes and their direct effects, like floods, dust storms, droughts, wildfires, and earthquakes. Mongolia too is experiencing these extreme effects of climate change. Rapid and often insufficiently planned urban developments further increase the vulnerability of localities and regions to severe climate impacts. The practice of disaster management has gradually evolved over the years from traditional approaches to advanced technological tools. Despite growing awareness and international commitments, progress in climate action has been slow and at times inadequate. Faced with these challenges, open science has emerged as a powerful tool, a catalyst for innovation, and an accelerator for transformative solutions. Open science provides a crucial pathway to overcoming deadlocks in the advancement of science and the development and implementation of technological solutions. By embracing open science and open collaboration, empowering us to take on the challenges of climate change.

The idea to co-design and co-build a Global Open Science Cloud (GOSC) was proposed during the CODATA 2019 Beijing Conference with seed funding from the Chinese Academy of Sciences (CAS). GOSC focuses on fostering collaborations, sharing resources, and

enabling data-driven research. This collective objective is to achieve a global standard for the sharing of data, collaborative research, and interpretation of data that would diagnose, predict, and prescribe solutions to world problems that affect human life for current and future generations. Last summer, the Computer Network Information Center (CNIC, CAS) and CODATA (in particular its GOSC Initiative) organized an international Training Workshop on Open Science and the UN Strategic Development Goals (SDGs) in Beijing to ensure the wide participation of developing countries in this collaborative research and data-sharing activity. Two researchers from the Mongolian Academy of Sciences participated in this workshop. This has led to ongoing communication among the participants regarding open science and the sustainable development goals. It also provided a basis for the planning of this training workshop on open science and the SDGs in Mongolia.

The research institutions and corresponding organizations in Mongolia rely heavily on the use of data coming from closed commercial resources. This data is often expensive and does not always meet the needs of Mongolian researchers. Expanding our open collaboration with GOSC should enable more autonomy while allowing us to focus more on the needs of Mongolian researchers and our communities and society as a whole. This will also reduce our dependence on data sourced outside our institutions and free up funding to advance our research priorities..

Given the needs of Mongolian researchers and in line with the *UNESCO Recommendation on Open Science* and the SDG, the Mongolian Academy of Sciences (MAS) organizes this seminar and training workshop to encourage cooperation, alignment, and ultimately open up the ways to access, use, and contribute to data from open science research clouds/platforms/initiatives around the world. The training will focus on open science and data aimed at building resilient open science infrastructures to support disaster management. Capacity building will focus on hazard data management and timely analysis to reduce disaster risks and support decision-making. Invited speakers will involve local professionals and international experts in disaster risk reduction and e-infrastructure technicians, such as speakers from CODATA IDPC, GOSC Initiative (CNIC CSTCloud team), Nanjing University, IAP CAS, and IGSR CAS. This workshop will be a significant step towards expanding disaster research and development, contributing to a reduction in the damage and harms caused by crises, inspiring a new wave of research and development in this critical field.

This training workshop will enable researchers to use big data to conduct predictive research that can prevent or mitigate several types of disasters. This is especially true these days when, for example, the risk of human lives being lost due to flooding in densely populated areas is increasing. This also holds true for other extreme weather conditions (such as sudden cold and heat during plant, growth, and harvest seasons) that similarly cause significant economic losses and negatively affect the quality of vegetables and cereals.

This training workshop represents an important step in introducing the uses of open science for producing, curating, accessing, analyzing, and implementing the results of big data to address disasters and other crises. This engagement is expected to contribute to the ongoing development of resilient data infrastructures and the training of specialists in each branch of science working on big data. This workshop is foundational for Mongolia's commitment to international cooperation and open science dialogue leading to increased capacity for disaster risk reduction.

Draft agenda

Day 1 November 14, 2024 (UTC+8)

08:30-09:00 Registration

09:00-09:10 Welcome remarks

Academician Demberel S., President of Mongolian Academy of Sciences
Addressing from Ms. Yu Chen (CNIC, CAS)

09:10-9:30 Infact based forecast in Mongolia (Dr. Gomboluudev P, Institute of Meteorology and Hydrology)

9:30-9:50 Seismic hazard study in Mongolia (Odonbaatar Ch, Institute of Astrology and Geophysics, MAS)

9:50-10:10 Disaster Risk Reduction Using Spatial and Big Data (Dr. Sodnomragchaa.D, National Emergency Management Agency of Mongolia)

10:10-10:30 Issue of estimation extreme flood and flash flood modeling in dry watershed (ephemeral stream): A Case Study on "Gants Khudag Am Watershed" in Ulaanbaatar City (Dr. Chinzorig S, Institute of Geography and Geoecology, MAS)

10:30-11:00 Big Data and AI for addressing the United Nations Strategic Development Goals (SDGs) (Prof. Jianhui Li, Nanjing University & CBAS)

11:00-11:10 Break

11:10-11:40 Legal and ethical issues in the development of open data and open science for disaster risk reduction (DRR) (Mr. Francis P. Crawley, Chair of the CODATA International Data Policy Committee [IDPC])

11:40-12:10 Co-building Future-led open science infrastructures: The GOSC vision and its pathway forward (Dr. Lili Zhang, Computer Network Information Center (CNIC), Chinese Academy of Science (CAS))

12:15-13:30 Lunch and break

13:30-14:30 Subseasonal to seasonal climate prediction systems and applications (Chenglai Wu, Institute of Atmospheric Physics, CAS)

14:30-15:30 Status, dynamics, and causes of desertification in Mongolia and combating strategies (Dr. Shuxing Xu, Institute of Geographic Sciences and Natural Resources Research, CAS)

15:30-15:45 Break

15:45-16:15 Open science and open data (Dr. Simon Hodson, CODATA, online)

16:15-16:45 Update on UN-level crisis data policies and practices for disaster mitigation (Prof. Virginia Murray, UK Health Security Agency online)

16:45-17:15 UNESCO crisis data toolkits - The case of an earthquake: Türkiye (Prof. Burcak Basbug, Middle East Technical University, online)

17:15-17:30 Q&A (Dr. Bolortuya Ulziibat, MAS, Ms. Yu Chen & Ms. Xueting Li, CNIC, CAS)

Day 2 November 15, 2024

9:00-9:30 The GOSC cloud federation: explanation and hands-on engagement: Yunkun (Dr. Haiming Zhang, Computer Network Information Center, CAS)

9:30-11:30 GOSC toolkits: explanation and hands-on engagement (VM adoption, object storage services, EVCloud, and I Harbor) (Dr. Yuepeng Li & Mr. Zuliang Guo, Computer Network Information Center, CAS)

11:30-13:30 Lunch and break

13:30-15:30 GOSC toolkits: explanation and hands-on engagement (continued)

15:00-15:30 Break

15:30-17:00 GOSC testbed and SDG adoption: explanation and hands-on engagement (Dr. Piao Yingchao, Computer Network Information Center, CAS)

17:00-17:45 Panel discussion (Co-developing resilient, open data infrastructures for disaster risk reduction)

Co-chairs: Mr. Francis P. Crawley and Dr. Bolortuya Ulziibat

Panelists: Local and International professional representatives: The Mongolian Academy of Sciences; Representatives of Mongolian Research Universities and Institutions. GOSC, CAS, & CODATA

17:45-18:00 Closing remarks

Speaker Bio

Prof. Jianhui Li is the Deputy Director General of the International Research Center of Big Data for Sustainable Development Goals (CBAS) and a professor at Nanjing University. From 2019 to 2023, he served as the Vice President of the Committee on Data of the International Science Council (CODATA, ISC). Since 1999, Jianhui has been dedicated to developing data infrastructure, managing data systems, and advancing data-intensive computing. For over a decade, he has led key research initiatives in scientific data infrastructure and open data within the Chinese Academy of Sciences (CAS), contributing significantly to national, regional, and global open science efforts.

(Online) Dr. Simon Hodson has been Executive Director of CODATA since August 2013. Simon is an expert on data policy issues and research data management. He was coordinator of the groundbreaking WorldFAIR project, which is now being extended as an international collaborative initiative, WorldFAIR+, to advance the development and implementation of the Cross-Domain Interoperability Framework (CDIF). Simon has contributed to a number of landmark reports and policy documents: he chaired the European Commission's Expert Group on FAIR Data which produced the Turning FAIR into Reality report. He was also vice-chair of the UNESCO Open Science Advisory Committee, with an influential role in drafting the UNESCO Recommendation on Open Science, which was adopted in November 2021.

(Online) Prof. Virginia Murray is a public health doctor committed to improving health emergency and disaster risk management. She was appointed as Head of Global Disaster Risk Reduction for UK Health Security Agency (formerly Public Health England) in April 2014) and is currently the Chair of the UNDRR/ISC Hazard Information Profiles Steering Group 'light touch' update for launch at the Global Platform for Disaster Risk Reduction in June 2025, following the publication of the report in 2020 and the Hazard Information Profiles in 2021 – now on line at UNDRR-ISC Hazard Information Profiles: Supplement. She is currently a member of CODATA Executive Committee and a member of the IDPC/CODATA committee. She was a member and then vice-chair of the UN International Strategy for Disaster Reduction (UNISDR) Scientific and Technical Advisory Group (STAG), 2008-2017, supporting as required negotiations for the Sendai Framework for Disaster Risk Reduction 2015–2030 by the UN member states.

Mr. Francis P. Crawley is a philosopher and bioethicist specializing in research policy, regulation, ethics, and integrity, with a focus on data, AI, and virtual twins in life sciences such as clinical trials, genomics, and new technologies. He has extensive experience in EU, US, and international health-related research, working with patients, communities,

researchers, and policymakers to establish consortia, biobanks, and data repositories. Crawley is skilled in developing patient registries, data management, and protection plans, especially for resource-poor and orphan disease settings. He has led global health projects, collaborating with organizations like UNAIDS, WHO, and the European Commission across Europe, Africa, Asia, and beyond, contributing to research, policy development, and ethics education.

(Online) Prof. Burcak Basbug is a Professor of Statistics and Disaster Science at the Middle East Technical University (METU), Ankara, Turkey. She was the Course Director MSc Disaster Management and Resilience, Coventry University between August 2019 and August 2020. Before joining Coventry University back in 2018, She was the Director of the METU Disaster Management Centre between 2008 and 2018. She received her SFHEA in the UK as of October 2019. She worked as the Academic Partnerships Director of the ICPEM (Institute of Emergency Management and Civil Protection), November 2019 to date.

Prof. Chenglai Wu is a professor in the Institute of Atmospheric Physics, Chinese Academy of Sciences (CAS). His research involves in the earth system modeling, dust-earth system interactions, and climate prediction. He got his Ph.D. degree in Meteorology from the Institute of Atmospheric Physics (IAP), CAS in 2013. After that, he started working in IAP, CAS. During 2015 to 2018, he had been in the University of Wyoming, US for post-doc research. He is one of key developers for CAS Earth System Model (CAS-ESM) and contributes critically to the CAS-ESM experiments submitted to the latest Coupled Model Intercomparison Project (CMIP6). He has published 50+ peer-reviewed journal papers. He received American Geophysical Union 2020 Editor's Citation for Excellence in Referencing. He also got the Young Talent Award for the tenth Tsinghua University-Inspur Computing Geosciences in 2022.

Dr. Xu Shuxing works at the Institute of Geographic Sciences and Resources, Chinese Academy of Sciences (IGSR), with research fields in environmental remote sensing and ecosystem service function assessment. Currently, relying on the China-Mongolia International Cooperation Fund, his main work is to develop assessment indicators and machine learning methods suitable for desertification monitoring in the Mongolian Plateau, and to assess the ecosystem services in the region, and ultimately decouple the impacts of desertification evolution on the ecosystem services. In 2023, he carried out field surveys around land degradation, and land cover in the Selenge River Basin and the southern Gobi region of Mongolia in June and August, respectively. The related research results are published in SCI journals such as Science of the Total Environment.

Ms. Yu Chen is international cooperation manager of at the Computer Network Information Center (CNIC) of the Chinese Academy of Sciences. and office director of CODATA China secretariat. She served as content developer and international cooperation manager of Virtual Science Museums of China for eight years, a CNIC website which received World Summit Award for SDG4. She has organized SDG4 collaborative activities, participated in the organization of conferences and collaborative activities related to citizen science, open data, NRNs, and joint funding calls with Asian countries.

Dr. Lili Zhang is a senior research scientist at the Computer Network Information Center (CNIC) of the Chinese Academy of Sciences. She is the director of GOSC IPO, an Ex Officio Executive Committee member of CODATA, and co-chair of the CODATA IDPC. Zhang received her M.A. and Ph.D. in information management from Peking University, with a Dural Bachelor's degree in management science and economics from Nankai University. She was a visiting scholar at CIESIN, Columbia University, from 2017 to 2018. She is the PI of an NSFC Young Scientist Fund, a collaborator for a CAS PIFI program, and actively engages in several CAS and MOST programs. Currently, as the CAS GOSC Project manager, her research mainly focuses on open science and open data technologies, policies, and information economy.

Dr. Haiming Zhang is the Director of Cloud federation and intelligent O&M Lab in Computer Network Information Center, Chinese Academy of Sciences (CNIC, CAS). He is responsible for the development and operation of China Science and Technology Cloud integrated platform. His research focus on the design and development of Global Open Science Cloud (GOSC).

Dr. Yingchao Piao is a senior engineer at the Computer Network Information Center (CNIC) of the Chinese Academy of Sciences. She obtained her Ph.D. in Computer Science and Software from the University of Chinese Academy of Sciences in 2015. Her expertise lies in the fields of remote sensing, image processing, data mining, and geoinformatics, which are crucial for advancing scientific research and applications in these areas. Her work involves the development and application of informatic technologies to support complex scientific questions, including the analysis of large-scale spatial data, the development of algorithms for processing and interpreting geospatial information, and the integration of intelligence techniques to enhance the understanding of earth observation data.

Dr. Yuepeng Li's main research directions are unified management of heterogeneous data, scientific data workflow, and unified management of heterogeneous cloud platforms. In 2019, he participated in the Global Open Science Cloud Cultivation Program and the China-Europe Intercontinental Open Science Cloud Federation Technology and Demonstration Project, enabling China Science and Technology Cloud to access EGI FedCloud as a service provider, and building a cross-platform cloud computing resource sharing prototype system. Since 2022, he has been working in the Computer Network Information Center of the Chinese Academy of Sciences, and continues to conduct scientific research in the direction of open science and cloud computing.

(Online) Mr. Zuliang Guo is a senior software engineer at the Cloud Federation Lab at the Computer Network Information Center (CNIC) of the Chinese Academy of Sciences. He is a major web developer and the UI/UX designer of CSTCloud's cloud federation platform. His goal is to provide users with better cloud computing products and better user experience using cutting-edge web development technologies. He has a strong passion for trending development technologies, as well as years of design experience. He holds a master of science in computer science degree from Georgia Institute of Technology, United States.

Ms. Xueting LI serves as the primary contact for GOSC outreach, responsible for planning and implementing GOSC's mission and vision. She oversees the content updates for the GOSC websites and publications, including flyers, meeting briefings, annual reports, and white papers. She also contributes to the design and organization of flagship conferences, meetings, workshops, and training sessions. In close collaboration with the CODATA Secretariat and CODATA IDPC, Xueting is committed to advancing Open Science and SDGs through policy dialogue, capacity building, and science communication, particularly among early-career researchers from the Global South. Before joining CNIC, Xueting graduated from the University of the Chinese Academy of Social Sciences and earned a master's degree in Digital Humanities from King's College London, UK.