FBAS

2022 International Forum on Big Data for Sustainable Development Goals

Theme: Digital Technology Empowers Global Sustainable Development

Programme

Conference Form: Online & Onsite

6-8 September, 2022   Beijing, China

Sponsored by

Chinese Academy of Sciences (CAS)

Hosted by

International Research Center of Big Data for Sustainable Development Goals (CBAS)

Aerospace Information Research Institute (AIR), CAS

Supported by

United Nations Environment Programme (UNEP)

United Nations Convention to Combat Desertification (UNCCD)

United Nations Human Settlements Programme, UN-Habitat

International Partners

Listed in no particular order

Alliance of International Science Organizations (ANSO)

Committee on Data of the International Science Council (CODATA)

International Society for Digital Earth (ISDE)

Integrated Research on Disaster Risk (IRDR)

International Center on Space Technologies for Natural and Cultural Heritage (HIST) under the auspices of UNESCO

Digital Belt and Road Program (DBAR)

Pan-Eurasian Experiment (PEEX)

World Geospatial Industry Council (WGIC)

Industry Partner

UniCloud **Unicloud Tech Co. Ltd.**

Co-organized by

Listed in no particular order

◎ Key Laboratory of Digital Earth Science, Chinese Academy of Science

◎ State Key Laboratory of Remote Sensing Sciences

◎ Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences

◎ Computer Network Information Center, Chinese Academy of Sciences

◎ Innovation Academy for Microsatellites of Chinese Academy of Sciences

◎ Northwest Institute of Eco-Environment and Resources, Chinese Academy of Sciences

◎ Institute of Botany, Chinese Academy of Sciences

◎ Institute of Oceanology, Chinese Academy of Sciences

◎ South China Sea Institute of Oceanology, Chinese Academy of Sciences

◎ Institute of Zoology, Chinese Academy of Sciences

◎ Institute of Microbiology, Chinese Academy of Sciences

◎ Institute of Atmospheric Physics, Chinese Academy of Sciences

◎ CAST-UN Consultative Committee on Disaster Risk Reduction

◎ Peking University

◎ Nanjing University

◎ Wuhan University

◎ Sun Yat-sen University

◎ The University of Hong Kong

◎ Jiangxi Normal University

◎ Nanjing Normal University

◎ China University of Geosciences, Wuhan

◎ Ocean University of China

◎ Chinese Academy of Surveying and Mapping

◎ CAS-TWAS Centre of Excellence on Space Technology for Disaster Mitigation

◎ Land Satellite Remote Sensing Application Center

◎ National Satellite Ocean Application Service

◎ Satellite Application Center for Ecology and Environment

◎ China Centre for Resources Satellite Data and Application

◎ National Satellite Meteorological Center

◎ Earth Observation System and Data Center, China National Space Administration

◎ Climate Change Research Strategy Center, National Research Council of Thailand (NRCT)

◎ Institute for Scientific Research of Aerospace Monitoring, Russia

◎ University of Helsinki, Finland

◎ University of Zambia, Zambia

◎ University of South Carolina, USA

◎ Chouaib Doukkali University, Morocco

◎ Institute of Methodologies for Environmental Analysis, National Research Council, Italy

◎ University of Peshawar, Pakistan

◎ University of Energy and Natural Resources, Ghana

Contents

Welcome Message

The implementation of the United Nations 2030 Agenda for Sustainable Development is a global consensus. However, the global pandemic unseen in a century coexists with climate change, and the global economic slowdown results in significant setbacks. The implementation of 2030 Agenda faces unprecedented challenges.

Scientific and technological innovations are important tools to support the implementation of sustainable development goals. The United Nations has setup a Technology Facilitation Mechanism to promote collaboration, foster partnerships and improve global accessibility to science and technology in order to facilitate our efforts towards sustainable development.
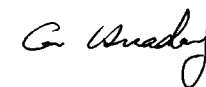
Big data, as an important content of digital technology has provided us with new opportunities to integrate vast quantities of information related to land, ocean, atmosphere, and human activities together for a more comprehensive analysis and better understanding of the complex interactions between earth systems. These technologies are pivotal to ensure rapid progress towards sustainable development goals.

On September 6, 2021, the International Research Center of Big Data for Sustainable Development Goals (CBAS) was officially established in Beijing. And this center successfully organized the 1st International Forum on Big Data for Sustainable Development Goals (FBAS). President Xi Jinping sent a congratulatory letter to the inauguration ceremony of the research center and the opening ceremony of the forum, expressing his hope that people and organizations around the world may take full advantage of the new center and the forum to work together on developing big data in support of 2030 UN agenda. On the same occasion, the United Nations Secretary-General António Guterres expressed his hope in his congratulatory video message that this center would make great contribution to the United Nations big data global platform. Nearly a thousand experts from 61 countries and regions conducted in-depth academic exchanges at the 1st FBAS forum on use of big data to facilitate actions towards sustainable development goals.

The 2022 International Forum on Big Data for Sustainable Development Goals (FBAS 2022) will be held in Beijing, China in September. The theme of this forum is "Digital Technology Empowers Global Sustainable Development". There will be systematic discussions centering on emerging technology solutions to the implementation of the sustainable development goals, for instance, the digital technology represented by big data, and global partnerships to drive technological innovation. We aim to promote the sharing of methods, technologies, and cases of big data and digital technology in support of sustainable development, and provide a global high-level academic communication platform on the use of technology facilitation mechanism to achieve the sustainable development goals.

The United Nations 2030 Agenda for Sustainable Development, which were inaugurated in September 2015, will reach its midpoint at the end of this year. The remaining half of the journey has become increasingly important. On behalf of FBAS 2022, I wholeheartedly invite the international community to assemble here to discuss theories, technologies, methods, and applications for the use of big data in the implementation of sustainable development goals, looking to the remaining half of the journey, and together envisaging the beautiful future of mankind.

Chair of 2022 International Forum on
Big Data for Sustainable Development Goals

Organization

Chair

GUO Huadong
International Research Center of Big Data for
Sustainable Development Goals

Scientific Committee

Co-Chairs

XU Guanhua
Ministry of Science and
Technology of the People's
Republic of China

Markku KULMALA
University of Helsinki,
Finland

Members Alphabetical order by last name	
Alessandro ANNONI	International Society for Digital Earth
Valery BONDUR	Russian Academy of Science
CHEN Ge	Ocean University of China
CHEN Jingming	Fujian Normal University
Deliang CHEN	University of Gothenburg
Hiromichi FUKUI	Chubu University
Gregory GIULIANI	University of Geneva, UNEP/GRID-Geneva
GONG Peng	University of Hong Kong
GONG Ke	World Federation of Engineering Organizations/Nankai University

GONG Jianya	Wuhan University
HE Changchui	Academy of Digital China
Simon HODSON	Committee on Data of the International Science Council
Natarajan ISHWARAN	International Centre on Space Technologies for Natural and Cultural Heritage under the Auspices of UNESCO
Christopher JUSTICE	University of Maryland
Gretchen KALONJI	Sichuan University
LI Deren	Wuhan University
MENG Xiaofeng	Renmin University of China
Graciela METTERNICHT	University of New South Wales
Szabolcs MIHÁLY	Hungarian Society of Surveying, Mapping and Remote Sensing
Zaffar Sadiq MOHAMED-GHOUSE	Surveying and Spatial Sciences Institute, Australia
Stefano NATIVI	National Research Council of Italy
Elibio RECH	Brazilian Agricultural Research Corporation
Barbara RYAN	World Geospatial Industry Council
Igor SAVIN	V.V. Dokuchaev Soil Science Institute, Russia
Monthip SRIRATANA	Climate Change Research Strategies Center, National Research Council of Thailand
Jens-Christian SVENNING	Aarhus University
WU Guoxiong	Institute of Atmospheric Physics, CAS
WU Yirong	Aerospace Information Research Institute, CAS
XIA Jun	Wuhan University
YAN Qin	Chinese Academy of Surveying and Mapping
ZHANG Bing	Aerospace Information Research Institute, CAS
ZHANG Renhe	Fudan University

Organizing Committee

Co-Chairs	
CHEN Fang	International Research Center of Big Data for Sustainable Development Goals
LIAO Xiaohan	International Research Center of Big Data for Sustainable Development Goals
Vice-Chairs	
YAN Dongmei	International Research Center of Big Data for Sustainable Development Goals
LIU Jie	International Research Center of Big Data for Sustainable Development Goals

JIA Gensuo	International Research Center of Big Data for Sustainable Development Goals
LI Jianhui	International Research Center of Big Data for Sustainable Development Goals
Members Alphabetical order by last name	
CHEN Hongyu	Innoration Academy for Microsatellites, CAS
CHENG Xiao	Sun Yat-sen University
CHI Xuebin	Computer Network Information Center, CAS
FAN Xiangtao	International Research Center of Big Data for Sustainable Development Goals
GUO Qinghua	Peking University
HAN Qunli	Executive Director of IRDR-IPO, under co-sponsorship of ICSU, ISSC and UNISDR
HE Guojin	International Research Center of Big Data for Sustainable Development Goals
JI Liqiang	Institute of Zoology, CAS
JIA Li	Aerospace Information Research Institute, CAS
Amos T. KABO-BAH	University of Energy and Natural Resources, Ghana
Kamal LABBASSI	Chouaib Doukkali University, Morocco
Rosa LASAPONARA	Institute of Methodologies for Environmental Analysis, National Research Council, Italy
LI Chaolun	The Institute of Oceanology, CAS
LI Guoqing	International Research Center of Big Data for Sustainable Development Goals
LI Xin	Institute of Tibetan Plateau Research, CAS
LI Xiaosong	International Research Center of Big Data for Sustainable Development Goals
LI Xinwu	International Research Center of Big Data for Sustainable Development Goals
LIN Hui	Jiangxi Normal University
LIU Qinhuo	Aerospace Information Research Institute, CAS
LU Shanlong	International Research Center of Big Data for Sustainable Development Goals
LU Xiancai	Nanjing University
LU Linlin	International Research Center of Big Data for Sustainable Development Goals
LV Guonian	Nanjing Normal University
MA Juncai	Institute of Microbiology, CAS
MA Keping	The Institute of Botany, CAS
Massimo MENENTI	Delft University of Technology, Netherlands

MENG Jihua	International Research Center of Big Data for Sustainable Development Goals
Martino PESARESI	Joint Research Centre-European Commission, Italy
QIU Yubao	International Research Center of Big Data for Sustainable Development Goals
Atta-ur-Rahman	University of Peshawar, Pakistan
SHI Jiancheng	National Space Science Center, CAS
Bob SU	University of Twente, Netherlands
SUN Zhongchang	International Research Center of Big Data for Sustainable Development Goals
Cuizhen WANG	University of South Carolina, USA
WANG Fan	Institute of Oceanology, CAS
WANG Lizhe	China University of Geosciences (Wuhan)
WANG Xinyuan	International Research Center of Big Data for Sustainable Development Goals
WANG Changlin	International Society for Digital Earth
WU Lan	Chinese Academy of Surveying and Mapping
WU Bingfang	Aerospace Information Research Institute, CAS
XUE Cunjin	International Research Center of Big Data for Sustainable Development Goals
ZHANG Li	International Research Center of Big Data for Sustainable Development Goals
ZHU Jiang	The Institute of Atmospheric Physics, CAS

Secretariat

Secretary–General

LIU Zhen

Deputy Secretary–General

CHEN Fulong, DOU Changyong, QIU Yubao, ZHANG Zhe

Members（Alphabetical order by last name）

BI Jiantao, GUO Lili, WANG Shuo, WANG Xiaomei, XUE Mengying, ZHU Lanwei

Keynote Speakers

GUO Huadong

Director General of International Research Center of Big Data for Sustainable Development Goals

Prof. GUO Huadong is the Director General of the International Research Center of Big Data for Sustainable Development Goals (CBAS), an Academician of Chinese Academy of Sciences (CAS), a Foreign Member of the Russian Academy of Sciences, a Foreign Member of the Finnish Society of Sciences and Letters, and a Fellow of TWAS. He presently serves as Honorary President of the International Society for Digital Earth (ISDE), Director of the International Center on Space Technologies for Natural and Cultural Heritage under the Auspices of UNESCO, Chair of the Digital Belt and Road Program, and Editor-in-Chief of the International Journal of Digital Earth and the journal of Big Earth Data. He served as a member of the UN 10-Member Group to support the Technology Facilitation Mechanism for SDGs (2018-2021), Chairman of the International Committee of Remote Sensing of Environment (2017-2020), President of ISDE (2015-2019), and ICSU Committee on Data for Science and Technology (CODATA) (2010-2014). He specializes in remote sensing, radar for Earth observation, and Digital Earth science. He is the Principal Investigator of Moon-based Earth Observation Research Project of National Natural Science Foundation of China and the Chief Scientist of the Big Earth Data Science Engineering Project of CAS. He has published more than 500 papers and 24 books, and is the awardee of 18 domestic and international prizes.

Irina Bokova

Former Director-General of UNESCO, Co-Chair of the International Science Council's Global Commission on Science Missions for Sustainability

Irina Bokova, born in Sofia (Bulgaria), has been two terms the Director-General of UNESCO from 2009 to 2017. As Director-General of UNESCO, Irina Bokova was actively engaged in the adoption of UN Agenda 2030 for Sustainable Development, advocating for inclusive and equitable quality education and life-long learning for all, promoting the critical role of science for development, gender equality and the protection of the world's cultural heritage. She has received state distinctions from more than 40 countries and is Doctor honoris causa of leading universities across the world, such as Tonji University, China, King's College and University of Edinburgh, UK, Paris-Saclay, France, Boston University, US, Catholic University of Milan, Italy, among others. In 2016 Irina Bokova was on the Forbes list of the most influential women. In 2020, she was elected International Honorary Member of the American Academy of Arts and Sciences and in 2021 - Honorary Fellow of the World Academy of Arts and Sciences (WAAS). Currently, she is a Member of the Board of "Ban Ki Moon Centre for Global Citizens", Member of the Board of Governors of the UN University of Peace, Costa Rica, Patron of the International Science Council (ISC) and Co-Chair of the Commission for Global Scientific Missions for Sustainability, Member of the Leadership Council of the Sustainable Development Solutions Network (SDSN), New York, , Member of the Strategic Committee of the Paris School of International Affairs /PSIA/ at SciencesPo, among other activities.

Markku Kulmala

Professor of University of Helsinki, Finland

Prof. Markku Kulmala is a world-class leader in the field of atmospheric aerosols and one of the founders of the "Meteorology of Land Ecosystems". His work encompasses the experimental and theoretical physics of aerosols, atmospheric chemistry, observation meteorology, biophysics, in particular, biosphere-aerosol-cloud-climate interactions and reverse relations as well as interactions between the air quality and the climate. The main academic goal was to reduce the scientific uncertainty with respect to problems of the global climate change, especially related to aerosols and clouds. He emphasised biogenic mechanisms of the formation of aerosol particles and their relation with problems of the interaction between the biosphere and the atmosphere, biogeochemical cycles as well as the role of trace gases in the chemistry of the atmosphere. To sole these interdisciplinary problems, Prof. Kulmala has created a complex research programme that includes continuous long-term observations of the atmosphere, the global modelling and deep theoretical and experimental understanding of the dynamics of atmospheric clusters and aerosols. In his pioneering research, Markku Kulmala works at levels from the monomolecular and the molecular to the global scale.

Brennan Van Dyke

Chief of Capacity Development and Innovation Branch of Science Division, United Nations Environment Programme

Brennan Van Dyke is currently the Chief of the Capacity Development and Innovation Branch of UN Environment's Science Division, establishing a UNEP Innovation Facility among other efforts to support country efforts to implement solutions to environmental challenges. Prior to assuming these responsibilities, she served as the Executive Coordinator of the Strategic Donor Partnerships and Global Funds section in UN Environment, established an Environmental Management System for the United Nations Secretariat and held the position of UN Environment's Regional Director for North America. She also served as Senior Advisor to the CEO of the Global Environment Facility and Secretary of the Global Environment Facility Council and worked in the US Senate. She began her international career working on trade and investment issues for the Center for International Environmental Law. She holds a law degree from Yale University and a degree in Philosophy from the University of California, Berkeley.

Jippe Hoogeveen

Officer of Land and Water Division, Food and Agriculture Organization of the United Nations

Prof. Jippe Hoogeveen graduated in 1991 as an agricultural engineer with irrigation as specialization at Wageningen Agriculture University. In 1997 he started to work for the Land and Water division of the Food and Agriculture Organization where he cooperated in activities in support of FAO's efforts towards better assessment and monitoring of water resource availability and water use in agriculture, as well as development of tools for water resources planning. Currently Jippe Hoogeveen leads FAO's work in Water Resources Assessments which includes FAO's Information System on Water and Agriculture, AQUASTAT, and methodology development on Water Accounting and Auditing. He is also Chief Technical Advisor of FAO's program on "Using Remote Sensing in support of solutions to reduce agricultural water productivity gaps".

Barron Joseph Orr

Lead Scientist of United Nations Convention to Combat Desertification

Dr. Barron Joseph Orr is the Lead Scientist for the United Nations Convention to Combat Desertification (UNCCD). He is Professor Emeritus at the University of Arizona (USA) where he also served as a NASA Geospatial Extension Specialist. As Professor avalista at the University of Alicante (Spain), he helped develop a restoration ecology graduate degree. His career has been focused on coupled human and environmental systems undergoing environmental change and bridging the divides between science, policy, practice, and society. In 2014 he was named Marie Curie Fellow and was selected as an independent scientist for the UNCCD Science-Policy Interface (SPI). After a career collaborating with local communities, he is now engaged in global environmental monitoring, including SDG 15 "Life on Land". He is also co-lead author of the Scientific Conceptual Framework on Land Degradation Neutrality (LDN) which was formally endorsed by the 196 country Parties to the UNCCD in 2017.

Virginia Murray

Head of Global Disaster Risk Reduction for UK Health Security Agency

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. She is a member of the Integrated Research on Disaster Risk (IRDR) scientific committee and Co-Chair of IRDR's Disaster Loss Data (DATA) and is currently the Chair of the UNDRR/ISC Hazard Classification and Review Technical Working Group, with the report published in 2020 and the UNDRR-ISC Hazard Information Profiles: Supplement in 2021. She is currently a member of CODATA Executive Committee. She is currently co-chair of the WHO Thematic Platform Health and Disaster Risk Management Research Network, and by working in collaboration with this network, she is one of the editors of the WHO Guidance on Research Methods for Health and Disaster Risk Management, published in October 2021. She is a member of the UNSDSN TReNDS network and is a visiting/honorary Professor and fellow at several universities.

Anna Serebryanikova

President of Big Data Association

Ms. Anna Serebryanikova is President of the Big Data Association, Member of the Executive Board of PJSC MegaFon, Head of the working group 'Information Infrastructure' of the Autonomous Non-Profit Organization Digital Economy. Since September 2018, Anna Serebryanikova has been president of the Big Data Association, the main goal of which is to create conditions for the development of the big data market and technologies in Russia while respecting the interests of citizens, business, and the state. Anna was also a founder and managing partner of nlogic, a technology company that develops solutions based on artificial intelligence technologies, a member of the GLONASS NP Council, a board member of the Russian Media and Communications Union, co-chair of the Digital Economy Committee of RSPP Russia and a member of the Expert Council under the State Duma Committee on Information Policy, Information Technology and Communications. Anna worked at MegaFon from 2006 to 2018 and rose through the ranks from General Counsel to Chief Operating Officer. Anna Serebryanikova is one of the key persons in the field of development and implementation of technologies of big data and artificial intelligence in Russia and a recognized expert in digitalization of business and economy. As head of the Information Infrastructure working group of ANO Digital Economy, Anna leads the joint efforts of business and government representatives to implement the digital program of the Government of the Russian Federation. She is the author of numerous articles and a speaker at major industry forums and conferences.

Programme at a Glance

	September 6th	September 7th	September 8th	September 9th
AM	Opening Ceremony	Plenary Session	Plenary Session	
	Plenary Session			
	Break	*Break*		
	Parallel Sessions	Parallel Sessions	Parallel Sessions	
	Lunch			
PM	Parallel Sessions	Parallel Sessions / The 6th Digital Belt and Road Conference	Parallel Sessions / The 6th Digital Belt and Road Conference	DBAR STM
	Break	*Break*		
	Parallel Sessions	Parallel Sessions / The 6th Digital Belt and Road Conference	Closing Ceremony	DBAR STM

Programme on September 6th, 2022

Time	Parallel Sessions								
9:30-10:30	Opening Ceremony								
10:30-11:00	Break								
11:00-12:00	Plenary Session								
12:00-14:00	Break								
14:00-15:30	Parallel Sessions								
	Big Earth Data for Protecting Water Environment	Sustainable Urban Development with Big Earth Data	Accelerating Climate Change Mitigation and Adaptation	Biodiversity Big Data Supporting SDGs	A New Paradigm for SDGs Research Driven by Big Earth Data	Big Data for City Sustainable Development	Geospatial Big Data and Digital Twins-Measuring the Progress towards Sustainable Development Goals	Vegetation Remote Sensing and Big Data for SDG 15	CBAS/CODATA/ SDIM Joint Session on Open Science and SDGs (1)
15:30-15:45	Break								
15:45-17:15	Parallel Sessions								
	Big Earth Data to Monitor Water Resource Stress and Water Use Efficiency	Space Technology and Big Data Facilitate the Sustainability of Cultural Heritage	Three Poles and SDGs	Sustainable Use of Terrestrial Ecosystems	LiDAR Remote Sensing Technology for Sustainable Development Goals	Remote Sensing for Crop Growth Mapping and Yield Estimation	Light Remote Sensing for Sustainable Development Goals	Digital Technology for Smart and Resilient Cities	CBAS/CODATA/ SDIM Joint Session on Open Science and SDGs (2)

September 6th, 2022

Opening Ceremony 9:30-10:30

Plenary Session 11:00-12:00

Chair   LIAO Xiaohan

Deputy Director General of International Research Center of Big Data for Sustainable Development Goals

Digital Technologies for Sustainable Development Goals

GUO Huadong

Director General of International Research Center of Big Data for Sustainable Development Goals

Science, Technology and Innovation: Fostering Inclusiveness and Empowering All

Irina Bokova

Former Director-General of UNESCO, Co-chair of International Science Council's Global Commission on Science Missions for Sustainability

Parallel Sessions

Time 14:00-15:30, September 6th, 2022

Session — **Big Earth Data for Protecting Water Environment**

Co-Chairs — **LI Junsheng, International Research Center of Big Data for Sustainable Development Goals**
DUAN Hongtao, Northwest University, Nanjing Institute of Geography & Limnology, CAS, China

Earth observation of global waters for supporting SDGs
Evangelos Spyrakos (University of Stirling, UK)

Spatial and temporal validation of water quality products in tropical riverine environment using Sentinel-2 MSI imagery and field observations
Salvatore G.P. Virdis (Asian Institute of Technology, Thailand)

Global mapping of algal blooms over inland lakes
FENG Lian (Southern University of Science and Technology, China)

Remote sensing of key water quality parameters in eastern China large lakes: implications for SDG 6 evaluation
SHEN Ming (Nanjing Institute of Geography & Limnology, CAS, China)

Time 14:00-15:30, September 6th, 2022

Session — **Sustainable Urban Development with Big Earth Data**

Co-Chairs — **WANG Lizhe, China University of Geosciences, China**
ZHOU Qi, China University of Geosciences, China

Some prospects of remote sensing in urban sustainable development
DENG Chengbin (State University of New York at Binghamton, USA)

Empowering resilient cities with geospatial data science
ZOU Lei (Texas A&M University, USA)

Urban built environment and its impact on public wellbeing: a spatial big data analysis approach
WANG Jue (University of Toronto, Canada)

Urban thermal comfort and local climate zones in Milan
Alberto Vavassori (Department of Civil and Environmental Engineering, Politecnico di Milano, Italy)

Analysing NO_2 pollution with Sentinel 5P and ground sensors
Jesus Rodrigo Cedeno Jimenez (Politecnico di Milano, Itlay)

Time-series classification of land cover in urban circles
YAN Jining (China University of Geosciences, China)

Time 14:00-15:30, September 6th, 2022

Session — **Accelerating Climate Change Mitigation and Adaptation**

Co-Chairs — **ZHONG Min, School of Geospatial Engineering and Science, Sun Yat-sen University, China**
QIU Yubao, International Research Center of Big Data for Sustainable Development Goals

Satellite observations for global water cycle
SHI Jiancheng (National Space Science Center, CAS, China)

Advances in historical velocity mapping and mass balance estimation in Antarctica
LI Rongxing (Center for Spatial Information Science and Sustainable Development Applications, Tongji University, China)

Arctic sea ice monitoring with satellite observations and its impact on climate change
YE Yufang (School of Geospatial Engineering and Science, Sun Yat-sen University, China)

Reduced risks of temperature extremes from 0.5 °C less global warming in the Earth's three poles
DUAN Anmin (State Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics, Institute of Atmospheric Physics, CAS, China)

Understanding of the rapid Arctic sea ice retreat and its potential impact on mid-latitude weather extremes
WANG Shaoyin (School of Geospatial Engineering and Science, Sun Yat-sen University, China)

The use of multi-source data to support high-resolution flood modelling and impact assessment
LIANG Qiuhua (Loughborough University, UK)

Global solar radiation and its potential effects to the climate warming at Dome C, Antarctica
BAI Jianhui (LAGEO, Institute of Atmospheric Physics, CAS, China)

A comparison of factors that led to the extreme sea ice minima in the twenty-first century in the Arctic Ocean
LIANG Xi (National Marine Environmental Forecasting Center, China)

Time 14:00-15:30, September 6th, 2022

Session   **Biodiversity Big Data Supporting SDGs**

Co-Chairs   **MA Keping, Institute of Botany, CAS, China**
SU Yanjun, Institute of Botany, CAS, China

BioONE: Integrating big biodiversity data to bring the sustainability to life

ZHU Li (Institute of Botany, CAS, China)

International cooperation program for major microbial data resources: Global Catalogue of Microorganisms (GCM)

MA Juncai (Institute of Microbiology, CAS, China)

Understanding tropical photosynthesis with climate change: integration of novel satellite remote sensing and ecological processes

WU Jin (The University of Hong Kong, China)

Assessment and prediction on distribution of main invasive pest in China

LIN Congtian (Institute of Zoology, CAS, China)

Prediction of the process of urban sustainable development in China

XIAO Huijuan (Hong Kong Polytechnic University, China)

Time 14:00-15:30, September 6th, 2022

Session   **A New Paradigm for SDGs Research Driven by Big Earth Data**

Co-Chairs   **YAN Dongmei, International Research Center of Big Data for Sustainable Development Goals**
HE Guojin, International Research Center of Big Data for Sustainable Development Goals

CODATA: Open science and FAIR data for a better world

Simon Hodson (Committee on Data of the International Science Council)

Assessment of urban public space lighting by integrating public perception and SDGSAT-1 glimmer imagery

JIAO Weili (Aerospace Information Research Institute of CAS, China)

Towards smart illumination in urban areas-from field surveys to satellite monitoring: Lessons learned from a joint China-Israel cooperation project

Boris A. Portnov (University of Haifa, Israel)

Key characteristics of the global riverine system estimated from hydroclimatic big data

LIN Peirong (Peking University, China)

Qualifying land cover and the impact of human activities in Circum-Arctic using satellite remote sensing

HUANG Huabing (Sun Yat-sen University, China)

A new paradigm for SDGs research driven by big earth data: the example of SDG 15.1.1

LONG Tengfei (Aerospace Information Research Institute, CAS, China)

Time 14:00-15:30, September 6th, 2022

Session   **Big Data for City Sustainable Development**

Chair   **YAN Qin, Chinese Academy of Surveying and Mapping, China**

3D real scene city construction and application

YAN Qin (Chinese Academy of Surveying and Mapping, China)

Empowering cities to achieve SDGs - Big data and digital transformation in a new era

Abbas Rajabifard (University of Melbourne, Australia)

Geo-information technology and big data for sustainable development of cities

Wolfgang Kainz (Austrian Cartographic Commission, Austria)

Big geo-data for urban studies: methods and applications

LIU Yu (Peking University, China)

Change detection using remotely sensed data - from 2D to 3D

TIAN Jiaojiao (German Aerospace Center, DLR, Germany)

Time 14:00-15:30, September 6th, 2022

Session   **Geospatial Big Data and Digital Twins-Measuring the Progress towards Sustainable Development Goals**

Chair   **Bhanu Rekha, World Geospatial Industry Council, Netherlands**

Towards a digital replica of planet earth, how satellites and sensors are building a sustainable, resilient, and secure world

Domenico Grandoni (Analytics and Artificial Intelligence Competence Centre, e-GEOS, Italy)

GIS and digital twins, making an impact on the global goals

Linda Peters (Global Business Development, Esri, USA)

Using Voxel-based digital twins to protect and restore terrestrial ecosystems

Peter Atalla (Voxelmaps, USA)

Digital cadastre modernisation – Taming big data

Ian Miller (Spatialvision, Australia)

Geo.AI platform for sustainable development in education & healthcare

Bushra Zaman (Data Science & AI, Deepspatial, Canada)

Time 14:00-15:30, September 6th, 2022

Session **Vegetation Remote Sensing and Big Data for SDG 15**

Co-Chairs **WU Yanhong, International Research Center of Big Data for Sustainable Development Goals**
ZHANG Xiao, International Research Center of Big Data for Sustainable Development Goals

Estimating fractional cover of photosynthetic and non-photosynthetic vegetation in the arid and semi-arid areas of China

JI Cuicui (School of Civil Engineering, Chongqing Jiaotong University, China)

Mining the drivers of forest change in the upper Indus Valley, high Asia region from 1990 to 2020

YAN Xinrong (State Key Laboratory of Resources and Environmental Information System, Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Red list assessment of higher plants in China

LI Liping (Aerospace Information Research Institute, CAS, China)

Global high spatial resolution subclasses oil palm mapping

XU You (Faculty of Geomatics, Lanzhou Jiaotong University, China)

Optimization of daily parameters for cyanobacteria in EFDC model using reinforcement learning

Seok Min Hong (Ulsan National Institute of Science and Technology, South Korea)

Time 14:00-15:30, September 6th, 2022

Session **CBAS/CODATA/SDIM Joint Session on Open Science and SDGs (1)**

Co-Chairs **ZHANG Lili, Computer Network Information Center, CAS, China**
WANG Lei, Aerospace Information Research Institute, CAS, China

Time 15:45-17:15, September 6th, 2022

Session **Big Earth Data to Monitor Water Resource Stress and Water Use Efficiency**

Co-Chairs **JIA Li, Aerospace Information Research Institute, CAS, China**
PAN Yun, Capital Normal University, China

Using open data to accelerate progress towards SDG6

Livia Peiser (Land Resources Division, UN-FAO)

Satellite products for monitoring water resource stress and water use efficiency

JIA Li (Aerospace Information Research Institute, CAS, China)

Managing groundwater for sustainable food production in NCP: an integrated agronomic and engineering approach

SHEN Yanjun (Institute of Genetics and Developmental Biology, CAS, China)

Groundwater use and protection: Cradle of Humankind World Heritage Site

Harrison Pienaar (Water Institute of Southern Africa, South Africa)

Groundwater storage changes of China (2005-2020): results from reconciling GRACE, model, and in situ data

PAN Yun (Capital Normal University, China)

Assessment of sustainable utilization of water resources in Central Asian based on carrying capacity of water resources

ZHU Wenbin (Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Time 15:45-17:15, September 6th, 2022

Session **Space Technology and Big Data Facilitate the Sustainability of Cultural Heritage**

Co-Chairs **Ana Pereira Roders, Delft University of Technology, Netherlands**
CHEN Fulong, International Research Center of Big Data for Sustainable Development Goals

Heritage zoning and urbanization: An assessment or urban densification of world heritage using land cover and land use change detection

Moses Katontoka (Delft University of Technology, Netherlands)

Spatial humanity and digitalization of cultural heritage-a case study of Gulangyu

LI Yuan (Xiamen University, China)

The use of geospatial data for SDG 11 monitoring-with examples of cultural heritage

Monika Kuffer (University of Twente, Netherlands)

Interference and SDG measurement of the World Cultural Heritage sites

TANG Yunwei (International Research Center of Big Data for Sustainable Development Goals)

HERI-GRAPHS: Constructing semi-supervised machine learning datasets of heritage values and attributes for sustainable urban heritage management using social media data

Nan Bai (Delft University of Technology, Netherlands)

Time 15:45-17:15, September 6th, 2022

Session	**Three Poles and SDGs**
Co-Chairs	**CHE Tao, Northwest Institute of Eco-Environment and Resources, CAS, China** **MEI Linlu, University of Bremen, Germany**

Progresses and impacts of recent Arctic amplification

DING Qinghua (University of California, Stanta Barbara)

Accelerating impact of polar ice sheet/ice shelf melting on global sea level rise

WANG Zemin (Wuhan University, China)

Opportunities and challenges for the Arctic sustainable development under Russia-Ukraine conflict

XU Qingchao (The Arctic Center for Sustainable Development, China Institute for Innovation and Development Strategy, CAS, China)

Big data and intelligent exploration in polar regions

CHENG Xiao (Sun Yat-sen University, China)

New insight of snow properties: modelling and observation

MEI Linlu (University of Bremen, Germany)

Time 15:45-17:15, September 6th, 2022

Session	**Sustainable Use of Terrestrial Ecosystems**
Chair	**HU Bisong, Jiangxi Normal University, China**

Identification of soil pollution hotspots in the big data era

ZHANG Chaosheng (National University of Ireland, Ireland)

Evaluating the vulnerability of Siberian crane habitats and the influences of water level intervals in Poyang Lake Wetland, China

HU Bisong (Jiangxi Normal University, China)

Voluntary geographic information and citizen science for the conservation of territorial ecological environment

YAN Wanglin (Keio University, Japan)

The 2022 Tonga Volcanic Tsunami: using big data to reconstruct a global event

Adam Thomas Devlin (Jiangxi Normal University, China)

Are we getting green after the pandemic? individual mobility behaviour change in response to Covid-19 Pandemic

CHENG Tao (University College London, UK)

Study on the habitat variation of the Yangtze finless porpoise in Poyang Lake under a shifting hydrological regime

LI Qiyue (Jiangxi Normal University, China)

Time 15:45-17:15, September 6th, 2022

Session	**LiDAR Remote Sensing Technology for Sustainable Development Goals**
Co-Chairs	**CHEN Yiping School of of Geospatial Engineering and Science, Sun Yat-sen University, China** **NIE Sheng, Aerospace Information Research Institute, CAS, China**

Large-scale mapping of wildfires using deep learning (DL)

José Marcato Junior (UFMS - Federal University of Mato Grosso do Sul FAENG - Faculty of Engineering, Architecture and Urbanism and Geography, Brazil)

3D city modeling based on crowdsource geographic information data

FAN Hongchao (Department of Civil and Environmental Engineering Faculty of Engineering, Norwegian University of Science and Technology, Norway)

Status of global mangrove forests towards the Sustainable Development Goals

JIA Mingming (Northeast Institute of Geography and Agroecology, CAS, China)

Fully autonomous UAV-borne remote sensing technology and equipment for power grid safety monitoring

CHEN Chi (The State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China)

Ensure healthy lives and promote well-being for all at all age

Baptiste Magnier (Centre d'Enseignement et de Recherche en Informatique et Systèmes, IMT Mines Alès, France)

Satellite remote sensing for monitoring Arctic terrestrial ecosystem: observation, technique, and future trends

LIU Chong (School of Geospatial Engineering and Science, Sun Yat-Sen University, China)

Time 15:45-17:15, September 6th, 2022

Session	**Remote Sensing for Crop Growth Mapping and Yield Estimation**
Chair	**ZHANG Wanchang , International Research Center of Big Data for Sustainable Development Goals**

A two-dimensional clustering approach for in-season crop type mapping with Sentinel-2 data

LIU Ronggao (State Key Laboratory of Resources and Environmental Information System, Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Future threats to agricultural food production posed by environmental degradation, climate change, and animal and plant diseases – a risk analysis in three economic and climate settings

CHEN Ying (Chongqing Economic and Social Development Research Institute, China)

Coupling driving relationship between spatial-temporal change of soil organic carbon and crop yield in Beijing-Tianjin-Hebei region

KONG Xiangbin (College of Land Science and Technology, China Agricultural University, China)

Attributing Nitrogen & Carbon emissions from satellite columns and a model free method

Jason Blake Cohen (School of Environment and Spatial Informatics, China University of Mining and Technology, China)

Time 15:45-17:15, September 6th, 2022

Session	**Light Remote Sensing for Sustainable Development Goals**
Chair	**WANG Qinjun, International Research Center of Big Data for Sustainable Development Goals**

Remote sensing ore-prospecting using the improved computer vision methodology in the northern Altun Mountain,China

WANG Qinjun (International Research Center of Big Data for Sustainable Development Goals)

Inversion of urban aerosol optical depth based on SDGSAT-1 night-time light imagery

JIANG Yichen (University of Chinese Academy of Sciences, China)

A new perspective to map the supply and demand of artificial night light based on Loujia1-01 and urban big data

YE Yang (Institute of Spatial Information for City Brain, Zhejiang University City College, China)

Remote sensing monitoring of power consumption along the China-Pakistan Economic Corridor

BIAN Jinhu (Research Center for Digital Mountain & Remote Sensing Application, Institute of Mountain Hazards and Environment, CAS, China)

Time 15:45-17:15, September 6th, 2022

Session	**Digital Technology for Smart and Resilient Cities**
Chair	**WU Fan, International Research Center of Big Data for Sustainable Development Goals**

Long-term variation of population exposure to PM2.5 in Eastern China: a perspective from SDG 11.6.2

ZHANG Yuheng (School of Geography and Information Engineering, China University of Geosciences, China)

Assessing progress toward achieving the transport dimension of the SDGs in China

LIU Xiaofei (Research Institute of Highway Ministry of Transport, China)

Low-light-level detection of migrant worker population flow in Anhui and Henan provinces during spring festival

WANG Zhao (Aerospace Information Research Institute, Chinese Academy of Science, CAS, China)

Impacts of COVID-19 on SDGs revealed by satellite remote sensing: a bibliometric analysis

CHEN Xuejuan (National Science Library, CAS, China)

Smart and resilient cities leveraging on open data

Obwaya Mogire (South Eastern Kenya University, The Republic of Kenya)

Time 15:45-17:15, September 6th, 2022

Session	**CBAS/CODATA/SDIM Joint Session on Open Science and SDGs (2)**
Co-Chairs	**ZHANG Lili, Computer Network Information Center, CAS, China** **WANG Lei, Aerospace Information Research Institute, CAS, China**

Programme on September 7th, 2022

9:00-10:00	Plenary Session					
10:00-10:30	Break					
10:30-12:00	Parallel Sessions					
	Supporting Sustainable Agriculture with Remote Sensing	Ocean Science in Support of the Sustainable Development	Partnership for an Innovative Sustainable Future: Global SDG Partnership	Digital Governance and Decision Support for SDG	Big Earth Data Spatiotemporal Analysis Facilitates SDG15	Methodology Development and Optimization for SDGs
12:00-14:00	Break					
14:00-15:30	Parallel Sessions				The 6th Digital Belt and Road Conference	
	Digital Energy and Sustainable Development	Big Data for the Construction of Marine Ecological Civilization	Big Earth Data in Support of SDG 15	Digital Earth Theory, Technology and Application	Changing Water Availability and Water Hazards in Current and Future Climates	DBAR - Digital Technology for Agricultural Monitoring and Food Security (1)	DBAR - Earth Observation and Digital Technology for Heritage Conservation	DBAR - Side Event on SDG13: Climate Action and Sustainable Development in High Mountain Asia and Arctic Region (1)	DBAR - Data Sharing for Sustainable Development Goals
15:30-15:45	Break					
15:45-17:15	Parallel Sessions				The 6th Digital Belt and Road Conference	
	Big Earth Data Helps Achieve SDG7 Clean Energy Goals	Big Data Mining Supports Sustainable Development of Coastal and Marine Areas	Big Data in Support of Sustainable Forest Conservation and Management	SDG Big Data Platform Technology and Application	Cryosphere and Water Resources	DBAR - Digital Technology for Agricultural Monitoring and Food Security (2)	DBAR - Digital Technology for Urban Sustainability	DBAR - Side Event on SDG13: Climate Action and Sustainable Development in High Mountain Asia and Arctic Region (2)	DBAR - Digital Technology Supports Water and Land Management for Sustainable Development

September 7th, 2022

Plenary Session   09:00- 10:00

Chair   HE Changchui
            Former Deputy Director-General of Food and Agriculture Organization of
            the United Nations

**Atmospheric and Ecosystem Big Data Providing Key Contributions in Reaching
United Nations' Sustainable Development Goals**

Markku Kulmala

Professor of University of Helsinki, Finland

How to Achieve Digital Environmental Sustainability

Brennan Van Dyke

Deputy Director of Science Division, United Nations Environment Programme

**The Role of Open, Big Data on Water and Agriculture in Support of Monitoring and
Obtaining the Sustainable Development Goals**

Jippe Hoogeveen

Officer of Land and Water Division, Food and Agriculture Organization of the United
Nations

Parallel Sessions

Time 10:30-12:00, September 7th, 2022

Session	**Supporting Sustainable Agriculture with Remote Sensing**
Co-Chairs	**MENG Jihua, Aerospace Information Research Institute, CAS, China** **HUANG Jianxi, China Agricultural University, China**

Regional crop yield forecast technology based on assimilation of remote sensing and crop growth model

HUANG Jianxi (China Agricultural University, China)

The role of remote sensing in smart agriculture under climate change

SHANG Jiali (AgricultureandAgri-Food Canada, Canada)

Field crop phenotypes-linking genes to the environment for efficient and sustainable breeding

YANG Guijun (National Engineering Research Center for Information Technology in Agriculture, China)

Optimizing field management with satellite remote sensing

MENG Jihua (Institute of Geographical Sciences and Natural Resources Research, CAS, China)

Integrated feature extraction from remotely sensed variables for improving wheat yield estimate using data assimilation and Copula function

WANG Pengxin (College of Information and Electrical Engineering, China Agricultural University, China)

Time10:30-12:00, September 7th, 2022

Session	**Ocean Science in Support of the Sustainable Development**
Co-Chairs	**WANG Fan, Institute of Oceanology, CAS, China** **LI Chaolun, South China Sea Institute of Oceanology, CAS, China**

To a person with a hammer, everything looks like a nail: genuine innovation in achieving sustainable blue development requires much more focus on the goals, and less on the tools

Laurence McCook (WWF-Hong Kong, Hong Kong, China)

The ocean response to climate change guides both adaptation and mitigation efforts

Viktor Gouretski (Institute of Atmospheric Physics, CAS, China)

Big ocean data exploration with AI technology

LI Xiaofeng (Institute of Oceanology, CAS, China)

10M global mangrove classification by remote sensing big data, IGSNRR

SU Fenzhen (Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Application of data-driven AI techniques in the marine environment forecast

PENG Shiqiu (South China Sea Institute of Oceanology, CAS, China)

Time 10:45-12:20, September 7th, 2022

Session	**Partnership for an Innovative Sustainable Future: Global SDG Partnership**
Co-Chairs	**LIU Jie, International Research Center of Big Data for Sustainable Development Goals** **JIA Gensuo, International Research Center of Big Data for Sustainable Development Goals**

Invited Remarks

Overview of CBAS Global SDG Partnership

Panel Discussion for the Partners

Special Guests Addresses

XU Zhengzhong (Associate Director and Professor of Economy Research Department of Chinese Academy of Governance)

Jeffrey Sachs (President of the UN Sustainable Development Solutions Network)

Time 10:30-12:00, September 7th, 2022

Session	**Digital Governance and Decision Support for SDG**
Co-Chairs	**CAO Min, School of Geography, Nanjing Normal University, China** **CHEN Yu, Aerospace Information Research Institute, CAS, China** **CHEN Min, School of Geography, Nanjing Normal University, China**

A study of changes and interactions among the sustainable development goals in China

ZHANG Junze (Research Center for Eco-Environmental Sciences, CAS, China)

Urban forests for sustainable and equitable city development: evidence from New York city

LIN Jian (University of California Merced, Merced, CA, USA)

Systems integration for sustainable development

XU Zhenci (Department of Geography, The University of Hong Kong, Hong Kong, China)

High-resolution mapping to unearth material efficiency patterns and circular economy potentials in road infrastructure

CAO Zhi (Faculty of Applied Engineering, University of Antwerp, Antwerp, Belgium)

Future land use impacts on terrestrial carbon pools under SDG scenarios, China

TIAN Ya (School of Geography and Environment, Jiangxi Normal University, Nanchang, China)

Simulation of land use change along the Silk Road under the constraint of sustainable development goals

WU Kai (School of Geography, Nanjing Normal University, Nanjing, China)

Tensor decomposition-based analysis of the spatial and temporal characteristics of the Yangtze River Delta spatio-temporal characterization of SDGs indicator correlations

BAI Yuying (School of Geography, Nanjing Normal University, Nanjing, China)

Dynamic changes of synergy and trade-off between global SDG goals from 2000 to 2020

LI Yue (School of Geography, Nanjing Normal University, Nanjing, China)

Time 10:30-12:00, September 7th, 2022

Session — **Big Earth Data Spatiotemporal Analysis Facilitates SDG15**

Chair — **WANG Chao, International Research Center of Big Data for Sustainable Development Goals**

China land surface deformation dynamics monitored with satellite InSAR technology

WANG Chao (International Research Center of Big Data for Sustainable Development Goals)

Spatial-temporal variation and attribution of salinization in the Yellow River Basin

HONG Mengmeng (Shandong University of Technology, China)

Spatial-temporal dynamic pattern and driving mechanism of desertification in the Selenga River Basin of Mongolia from 1990-2020

XU Shuxing (State Key Laboratory of Resources and Environmental Information System, Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Technology-enabled solutions for biodiversity conservation-China Nature Watch Program

CHENG Chen (Shan Shui Conservation Center, China)

Time 10:30-12:00, September 7th, 2022

Session — **Methodology Development and Optimization for SDGs**

Chair — **YU Bo, International Research Center of Big Data for Sustainable Development Goals**

Quantification of the effects of aerosols and clouds on solar energy over China using WRF-Chem

GAO Yi (State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry, Institute of Atmospheric Physics, CAS, China)

Dynamic attribution and coping strategies of sandstorms in the Mongolian Plateau

ZHANG Yu (College of Geoscience and Surveying Engineering, China University of Mining & Technology, China)

Evaluating five intercalibration methods for generating consistent brightness temperatures from AMSR2 and FY-3D

WANG Tiantian (State Key Laboratory of Remote Sensing Science, Aerospace Information Research Institute, CAS, China)

SDG#18: The missed keystone of sustainability

Eugene Eremchenko (Lomonosov Moscow State University, Russia)

Time 14:00-15:30, September 7th, 2022

Session — **Digital Energy and Sustainable Development**

Co-Chairs — **XUE Yong, China University of Mining and Technology, China**
QIN Kai, China University of Mining and Technology, China

Atmospheric CO_2 calculation from remotely-sensed data

XUE Yong (China University of Mining and Technology, China)

Tracking and tracing campaign for coal mine methane (TCM) [2]

QIN Kai (China University of Mining and Technology, China)

Analyzing of all forms of carbon emitted from energy producing areas in China: New opportunities for meeting climate goals

Jason Cohen (China University of Mining and Technology, China)

Reclaimed soil estimation in large surface coal mine area using hyperspectral remote sensing data

BAO Nisha (Northeastern University, China)

Remote sensing monitoring of ecological environment in coal mine area of Yellow River Basin

LIU Ying (Xi'an University of Science and Technology, China)

Retrieving surface deformation of mining areas using image features and multi-temporal DSMs

HU Wenmin (China University of Mining and Technology, China)

Time 14:00-15:30, September 7th, 2022

Session	Big Data for the Construction of Marine Ecological Civilization
Co-Chairs	CHEN Ge, Ocean University of China, China LI Zhongping, Xiamen University, China

Do we have the right satellite data yet for the study of phytoplankton in the global ocean?

LI Zhongping (Xiamen University, China)

Typhoon impact on marine ecological environments and regional economics

TANG Danling (Southern Marine Science and Engineering Guangdong Laboratory, Guangzhou, China)

Research progress of ocean lidar for primary productivity in the upper ocean

WU Songhua (Ocean University of China, China)

Autonomous plankton ecosystem observations with the global BGC-Argo array

XING Xiaogang (Second Institute of Oceanography, MNR, China)

Prediction of *Ommastrephes bartramii* fishing ground in northwest Pacific based on artificial intelligence and big fishery data

LIU Bin (Shanghai Ocean University, China)

Time 14:00-15:30, September 7th, 2022

Session	Big Earth Data in Support of SDG 15
Co-Chairs	LI Xiaosong, International Center of Big Data for Sustainable Development Goals JIA Xiaoxia, United Nations Convention to Combat Desertification

High-resolution spatio-temporal distribution mapping of global oil palm

XU You (Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Estimation of forest aboveground biomass by multi-dimensional synthetic aperture radar

CHEN Erxue (Research Institute of Forest Resource Information Techniques, CAF, China)

Effectiveness and gap of Chinese biodiversity protection

XU Weihua (Research Center for Eco-Environmental Sciences, CAS, China)

Preliminary construction of biodiversity survey and monitoring system in China

LI Junsheng (Chinese Research Academy of Environmental Sciences, China)

Using 'Big Data' to measure desertification for SDG target 15.3

Alan Grainger (University of Leeds, UK)

SDG 15.3.1 indicator application at EU scale

Calogero Schillaci (European Commission Joint Research Centre)

Time 14:00-15:30, September 7th, 2022

Session	Digital Earth Theory, Technology and Application
Co-Chairs	FAN Xiangtao, International Research Center of Big Data for Sustainable Development Goals HUANG Wenjiang, International Research Center of Big Data for Sustainable Development Goals

Globalizing urban and environmental applications in 3D with very high resolution satellite images

QIN Rongjun (Ohio State University, USA)

DESP in support of SDG data visualization and decision making

FAN Xiangtao (International Research Center of Big Data for Sustainable Development Goals)

Big data and AI applications in solving challenging urban environmental issues

LIU Peng (Nanjing Innovative Data Technologies, Inc., China)

Sentinel -3 global products for vegetation monitoring

Dash Jadu (Southampton University, UK)

Vegetation traits retrieval from PRISMA hyperspectral data: algorithm and first validation results

Stefano Pignatti (Institute of Methodologies for Environmental Analysis, CNR-IMAA, Italy)

Global vegetation pest and disease monitoring and forecasting by global EO products

HUANG Wenjiang (International Research Center of Big Data for Sustainable Development Goals)

Time 14:00-15:30, September 7th, 2022

Session	Changing Water Availability and Water Hazards in Current and Future Climates
Co-Chairs	LIN Peirong, Institute of Remote Sensing & GIS, School of Earth and Space Sciences, Peking University, China GUO Qinghua, Institute of Remote Sensing & GIS, School of Earth and Space Sciences, Peking University, China

Adaptive hydropower reservoir management under climate change in the Lancang-Mekong River Basin

TANG Qiuhong (Institute of Geographical Sciences and Natural Resources Research, CAS, China)

Vulnerability of irrigated agriculture to changes in snowmelt runoff under climate change

QIN Yue (College of Environmental Sciences and Engineering, Peking University, China)

How can we better estimate future flood risk?

Dai Yamazaki (Institute of Industrial Science, The University of Tokyo, Japan)

Modelling current future flood risk in the United States

Andrew Smith (University of Bristol & Fathom™, UK)

Investigating the mechanisms driving large-scale changes in streamflow regimes: opportunities and challenges

Hong Xuan Do (Nong Lam University, Vietnam)

Time 14:00-15:30, September 7th, 2022

Session **DBAR - Digital Technology for Agricultural Monitoring and Food Security (1)**

Co-Chairs **HE Changchui, Peking University, China**
WU Bingfang, Aerospace Information Research Institute, CAS, China

Keynote: multi-scale crop growth monitoring for smart farming

CAO Weixing (Nanjing Agricultural University, China)

Determining the seasonal dynamics of cropping and fallow patterns within the broad-acre region of Australia

ZHAO Yan (Centre for Crop Science, Queensland Alliance for Agriculture and Food Innovation, University of Queensland, Australia)

Combining near-infrared radiance of vegetation and fluorescence spectroscopy to detect plant environmental stresses

ZENG Yelu (China Agricultural University, China)

Winter wheat identification by integrating spectral and temporal information

ZHANG Xiwang (Henan University, China)

Global crop growth monitoring with the Chinese meteorological satellite data

FAN Jinlong (National Satellite Meteorological Center, China)

Incidence angle aided active pairwise constraint learning for time-series clustering based crop mapping of UAVSAR imagery

QIN Xingli (Aerospace Information Research Institute, CAS, China)

Time 14:00-15:30, September 7th, 2022

Session **DBAR - Earth Observation and Digital Technology for Heritage Conservation**

Co-Chairs **Rosa Lasaponara, Institute of Methodologies for Environmental Analysis, CNR-IMAA, Italy**
LUO Lei, International Research Center of Big Data for Sustainable Development Goals

On the integrated use of AI with Satellites, Drones and ancillary Big Data for the knowledge improvement, monitoring and preservation of Cultural and Natural Heritage

Rosa Lasaponara (Institute of Methodologies for Environmental Analysis, CNR-IMAA, Italy)

Auto-identification of linear archaeological traces of the Great Wall in northwest China using improved DeepLabv3+ from very high-resolution aerial imagery

YANG Shu (Aerospace Information Research Institute, CAS, China)

On the discovery of a Roman fortified site in Gafsa, southern Tunisia, based on high-resolution X-Band satellite radar data

Nabil Bachagha (Central South University, China; Institute of Arid Regions, Tunisia)

Monitoring glacier terminus and surface velocity changes over different time scales using massive imagery analysis and offset tracking at the Hoh Xil World Heritage Site, Qinghai-Tibet Plateau

MENG Qingkai (Institute of Mountain Hazards and Environment, CAS, China)

Tracking annual dynamics of mangrove forests in mangrove National Nature Reserves of China based on time series Sentinel-2 imagery during 2016–2020

CHENG Lina (Jilin University & Northeast Institute of Geography and Agroecology, CAS, China)

Spatial-temporal analysis of the changes in *Populus euphratica* in the Tarim National Nature Reserve over the past 60 years

PENG Yan (Aerospace Information Research Institute, CAS, China)

Time 14:00-15:30, September 7th, 2022

Session — DBAR - Side Event on SDG13: Climate Action and Sustainable Development in High Mountain Asia and Arctic Region (1)

Co-Chairs — LI Xin, Institute of Tibetan Plateau Research, CAS, China
Hanna K. Lappalainen, University of Helsinki, Finland

Satellite Observations of Fires and Air Quality in the Arctic
Amu-Maija Sundström (Finnish Meteorological Institute, Finland)

Multiscale analysis of greenness trend over circumpolar arctic: uncertainties and implications for arctic greening and browning
LIU Caixia (Aerospace Information Research Institute, CAS, China)

Mapping supraglacial and proglacial rivers on northeastern Greenland using Sentinel-2 and Landsat-8 satellite imagery
LIU Jinyu (Nanjing University, China)

Change analysis to the daily river ice fraction of the Yenisei River
ZHANG Yixiao (Aerospace Information Research Institute, CAS, China)

Evaluation of GF-3 and Sentinel-1 satellite for sea ice margin mapping
HUANG Lin (Aerospace Information Research Institute, CAS, China)

Extreme winter air temperatures in the Arctic and mid-latitude
Timo Vihma (Finnish Meteorological Institute, Finland)

Snow and ice observations/modelling in the Arctic Ocean and the Arctic lakes
CHENG Bin (Finnish Meteorological Institute, Finland)

iCUPE datasets applicability for evaluating impacts on social-economical activities in the Arctic
Alexander Mahura (INAR, University of Helsinki, Finland)

Time 14:00-15:30, September 7th, 2022

Session — DBAR - Data Sharing for Sustainable Development Goals

LI Guoqing, Aerospace Information Research Institute, CAS, China
Silap Boupha, Asia and Pacific Affairs of the Ministry of Science and
Co-Chairs — Technology, Laos
QIN Yuchu, International Research Center of Big Data for Sustainable Development Goals

Open DBAR platform
QIN Yuchu (International Research Center of Big Data for Sustainable Development Goals)

GEO data resource analysis for DBAR region
LI Guoqing (Aerospace Information Research Institute, CAS, China)

CBAS satellites and its international services
DOU Changyong (International Research Center of Big Data for Sustainable Development Goals)

Data policy in CASEarth programme
YAN Dongmei (International Research Center of Big Data for Sustainable Development Goals)

The HiMAC data category - an open and interoperability portal
JIA Guoqiang (International Research Center of Big Data for Sustainable Development Goals)

Open data policies and strategies roadmap towards sustainable development goals
Obwaya Mogire (South Eastern Kenya University, The Republic of Kenya)

Time 15:45-17:15, September 7th, 2022

Session — Big Earth Data Helps Achieve SDG7 Clean Energy Goals

Chair — WU Mingquan, Aerospace Information Research Institute, CAS, China

Data driven SDG7 service platform energy access Explorer
Dimitris Mentis (World Resources Institute)

Deduction of the proportion of clean fuels and skilled people in cooking activities based on big data and on-site investigation - Taking the south of the Yangtze River in China as an example
PAN Jianping (Chongqing Jiaotong University, China)

Big earth data monitoring and analysis for SDG7
WU Mingquan (Aerospace Information Research Institute, CAS, China)

Satellite-based compliance monitoring for enforcing pollution control policies: coal-fired power plants in China
YAN Xiaoxi (Department of Geography and Resource Management, The Chinese University of Hong Kong, China)

Detection and analysis of high-energy-consuming industries based on big earth data
MA Caihong (Institute of aerospace information innovation, CAS, China)

Time 15:45-17:15, September 7th, 2022

Session **Big Data Mining Supports Sustainable Development of Coastal and Marine Areas**

Co-Chairs **WEI Chunzhu, School of Geography and Planning, Sun Yat-Sen University, China**
XUE Cunjin, International Research Center of Big Data for Sustainable Development Goals

Remote sensing for integrated coastal areas monitoring: achievements, opportunities and future prospects

WU Zhifeng (School of Geography and Remote Sensing, Guangzhou University; Southern Marine Science and Engineering Guangdong Laboratory, Guangzhou, China)

Effects of land cover change on water heat fluxes in the Yellow River Delta

NING Jicai (Yantai Institute of Coastal Zone Research, CAS, China)

Projection and uncertainty analysis for ocean heatwaves over south China Sea based on high-resolution climate models ensemble

ZHU Jinxin (School of Geography and Planning, Sun Yat-sen University, Southern Marine Science and Engineering Guangdong Laboratory, Zhuhai, China)

Coastal wetland monitoring based on high-definition/hyperspectral remote sensing images

HE Zhi (School of Geography and Planning, Sun Yat-sen University, Southern Marine Science and Engineering Guangdong Laboratory, Zhuhai, China)

An iterative space-quality-based interpolation on dissolved oxygen using Argo O$_2$ profiles

YUE Linfeng (International Research Center of Big Data for Sustainable Development Goals)

An assessment of urban heatwaves and marine heatwaves in China's coastal zone and their driving factors

WAN Yuanmei (School of Geography and Planning, Sun Yat-sen University, Southern Marine Science and Engineering Guangdong Laboratory, China)

Integrating multiple resolution of satellite data and machine learning algorithms for bathymetry mapping in seaports of south China sea

XIAO Yaqi (School of Geography and Planning, Sun Yat-sen University, China)

Time 15:45-17:15, September 7th, 2022

Session **Big Data in Support of Sustainable Forest Conservation and Management**

Co-Chairs **PANG Yong, Institute of Forest Resource Information Techniques, Chinese Academy of Forestry, China**
Leonardo A. Saravia, Centro Austral de Investigaciones Científicas del Consejo Nacional de Investigaciones Científicasy Técnicas, Argentina

Critical transitions and early warnings in global forest

Leonardo A. Saravia (Centro Austral de Investigaciones Científicas del Consejo Nacional de Investigaciones Científicasy Técnicas, Argentina)

Carbon budget of global forests estimated from individual tree-based model and remote sensing observation

ZHAO Junfang (Chinese Academy of Meteorological Sciences, China)

Capability of phenology-based Sentinel-2 composites for rubber plantations mapping in a large area with complex vegetation landscapes

LI Hongzhong (Shenzhen Institute of Advanced Technology, CAS, China)

Forest resource and conservation benefits in the Natural Forest Protection Project areas of China

PANG Yong (Institute of Forest Resource Information Techniques, Chinese Academy of Forestry, China)

Ecological environment investigation and protection strategy of tropical coral islands

SHI Jiankang (Hainan Ecological Environment Monitoring Center, China)

Estimation of forest height and biomass in China

NIE Sheng (International Research Center of Big Data for Sustainable Development Goals)

A new assessment method of forest status for SDGs research

ZHANG Xiaomei (Aerospace Information Research Institute, CAS, China)

Time 15:45-17:15, September 7th, 2022

Session	**SDG Big Data Platform Technology and Application**
Co-Chairs	**LUO Ze, Computer Network Information Center, CAS, China** **WANG Wei, Institute of Software, CAS, China**

SDG big data platform

CHEN Can (Computer Network Information Center, CAS, China)

A deep learning method based on two-stage CNN framework for recognition of Chinese reservoirs with Sentinel-2 images

ZHANG Zhibin (Institute of Computing Technology, CAS, China)

Causal discovery algorithm and tool for SDGs

LIU Jie (Institute of Software, CAS, China)

Data ownership and pricing in distributed machine learning

WU Chao (Zhejiang University, China)

The global biodiversity information facility: data by and for the community

Joe Miller (Global Biodiversity Information Facility, Copenhagen, Denmark)

Time 15:45-17:15, September 7th, 2022

Session	**Cryosphere and Water Resources**
Chair	**NIU Zhenguo, Aerospace Information Research Institute, CAS, China**

Geo-spatial appraisal of glacial lakes, susceptibility analysis and potential of glacial lake outburst floods in the Peri-Glacial environment of western Himalayas

Atta-ur-Rahman (Department of Geography and Geomatics, University of Peshawar, Pakistan)

Multidimensional analysis and seasonal asymmetry of Arctic sea ice

GUO Yu (Yantai Institute of Coastal Zone Research, CAS, China)

Ice flow velocity mapping based on high-resolution COSMO-SkyMed data, Amery Ice Shelf, East Antarctica

LIN Kai (Tongji University, China)

The spatial variability of glacier mass budget in the Upper Indus Basin during the early 21st century

WU Kunpeng (Yunnan University, China)

Spatio-temporal distribution and variations of water resources in main headwater regions located on the Tibetan Plateau

FAN Xinfeng (State Key Laboratory of Tibetan Plateau Earth System, Resources and Environment, Institute of Tibetan Plateau Research, CAS, China)

Cryospheric water resources present opportunities and challenges for crop water stress in the Tarim River Basin

LIU Shiwei (State Key Laboratory of Earth Surface Processes and Resources Ecology, Beijing Normal University, China)

Time 15:45-17:15, September 7th, 2022

Session	**DBAR - Digital Technology for Agricultural Monitoring and Food Security (2)**
Co-Chairs	**CAO Weixing, Nanjing Agricultural University, China** **WU Bingfang, Aerospace Information Research Institute, CAS, China**

Keynote: Taking an overarching approach in food system: food security and nutrition and opportunities for science and technology innovation

HE Changchui (Peking University, China)

The E-commerce impacts on the poverty reduction in rural China

NIE Fengying (Agricultural Information Institute of CAS, China)

Different agricultural systems cause spatio-temporal differences in cropping patterns and policy response in Heilongjiang Province, China

DONG Jinwei (Institute of Geographical Sciences and Natural Resources, CAS, China)

Agriculture satellite monitoring over Russia: the framework-based products and solutions

Dmitry Plotnikov (Department of Satellite Monitoring Technologies, Space Research Institute of the Russian Academy of Sciences, Russia)

Rice leaf area Index estimation based on unmanned aerial vehicle RGB-imaging

LI Zhongyuan (Hubei University, China)

Remote sensing monitoring of crop type proportion in northeastern Heilongjiang based on Sentinel-2 time-series data

ZENG Hongwei (Aerospace Information Research Institute, CAS, China)

Time 15:45-17:15, September 7th, 2022

Session	**DBAR - Digital Technology for Urban Sustainability**
Co-Chairs	**LU Linlin, International Research Center of Big Data for Sustainable Development Goals** **BAN Yifang, KTH Royal Institute of Technology, Sweden**

Advances on the Global Human Settlement Layer from joint assessment of Sentinel, Landsat imagery, and Global Digital Surface Model

Martino Pesaresi (Joint Research Centre, European Commission, Italy)

Earth observation big data and AI for sustainable and resilient cities

BAN Yifang (KTH Royal Institute of Technology, Sweden)

Spatio-temporal variation of seasonal heat islands mapping of Pakistan during 2000–2019, using day-time and night-time land surface temperatures MODIS and meteorological stations data

Aqil Tariq (Department of Wildlife, Fisheries and Aquaculture, Mississippi State University, USA)

A comprehensive evaluation of SDG11 indicators using geospatial big data in Guilin, China

HAN Liying (College of Geological Engineering and Geomatics, Chang'an University, Xi'an, China)

Monitoring of groundwater quality using NDVI and WQI techniques – SDG 1 perspective

Salma Hamza (Department of Earth and Environmental Sciences, Bahria University Karachi Campus, Karachi, Pakistan)

Big earth data in support of SDG11 monitoring and assessment: progress and perspectives

LU Linlin (International Research Center of Big Data for Sustainable Development Goals)

Time 15:45-17:15, September 7th, 2022

Session

DBAR - Side Event on SDG13: Climate Action and Sustainable Development in High Mountain Asia and Arctic Region (2)

Co-Chairs

Massimo Menenti, Delft University of Technology, Netherlands
LI Lanhai, Xinjiang Institute of Ecology and Geography, CAS, China

Pilot Water Service in High Mountain Asia

Massimo Menenti (Delft University of Technology, Netherlands)

Observations and changes of lake ice phenology in High Mountain Asia for 42 years

QIU Yubao (International Research Center of Big Data for Sustainable Development Goals)

Downscale the satellite derived daily precipitation data with cloud attributes and rain gauge observations in the High Altitude Asia region

ZHANG Wanchang (International Research Center of Big Data for Sustainable Development Goals)

A dataset of Landsat 8 snow coverage in the Himalayas from 2013 to 2020

SHI Lijuan (International Research Center of Big Data for Sustainable Development Goals)

Spatial-temporal variation assessment of global rainfall-induced landslide hazards

JIA Guoqiang (International Research Center of Big Data for Sustainable Development Goals)

Time 15:45-17:15, September 7th, 2022

Session

DBAR - Digital Technology Supports Water and Land Management for Sustainable Development

Co-Chairs

JIA Li, Aerospace Information Research Institute, CAS, China
Bob Su, University of Twente, Netherlands

From global satellite products to local water management information

Bob Su (University of Twente, Netherlands)

Virtual water transfers in Africa: assessing topical condition of water scarcity, water savings, and policy implications

LI Fadong (Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Potential of remote sensing for the water-saving study in the Semi-Arid Doukkala Irrigation Scheme (Western Morocco)

Kamal Labbassi (Chouaib Doukkali University, Morocco)

Mapping of permanent and temporary water bodies in Africa

Amos Kabo-bah (University of Energy and Natural Resources, Ghana)

Remote sensing for improving food and water security in Sub-Saharan Africa - case studies from Malawi and Ghana

LI Chengxiu (Tsinghua University, China)

DBAR Water: Towards monitoring and assessment of sustainable water use and water resource management

JIA Li (Aerospace Information Research Institute, CAS, China)

Programme on September 8th, 2022

Time	Session					
9:00-10:00	Plenary Session					
10:00-10:30	Break					
10:30-12:00	Parallel Sessions					
10:30-12:00	Supporting Zero Hunger (SDG2) with Big Earth Data	Digital Wetlands for Sustainable Development Goals	Satellite Remote Sensing for SDGs	Big Earth Data for Beautiful China Initiative	Young Scientist Forum I - Youth Innovation for our Shared Goal	Young Scientist Forum II - Youth Innovation for our Shared Goal
12:00-14:00	Break					
14:00-15:30	Parallel Sessions				The 6th Digital Belt and Road Conference	
14:00-15:30	Big Data Assist Integrated Water Resources Management / Earth Observations for Sustainable Urban Environment / Radiation and Energy Balance of the Earth System and its Impacts	Big Data Enable Africa Great Green Wall	Big Data and Marine Sustainable Development Goals	DBAR - Digital Technology for Sustainable Development and Management of Coast and Sea	DBAR-Harness Technologies, Data and Knowledge for Disaster Risk Reduction	DBAR - Digital Technology for Environmental Change Assessment and Sustainable Development / DBAR - Data Sharing and Applications by DBAR WGs and ICoEs (Invited)
15:30-15:45	Break					
15:45-16:45	Closing Ceremony					

September 8th, 2022

Plenary Session   09:00-10:00

Chair   CHEN Fang
         Deputy Director General of International Research Center of Big Data
         for Sustainable Development Goals

The Role of Digital Technology in Achieving SDG Target 15.3 on Land Degradation Neutrality

Barron Joseph Orr

Lead Scientist of United Nations Convention to Combat Desertification

Using UNDRR-ISC Hazard Information Profiles to Manage Risk and Implement the Sendai Framework and its Links to the SDGs

Virginia Murray

Head of Global Disaster Risk Reduction, UK Health Security Agency

Big Data in Support of Digital Economy

Anna Serebryanikova

President of Big Data Association

Parallel Sessions

Time 10:30-12:00, September 8th, 2022

Session | **Supporting Zero Hunger (SDG2) with Big Earth Data**

Co-Chairs | ZHANG Hong, Aerospace Information Research Institute, CAS, China
YU Yongqiang, Institute of Atmospheric Physics, CAS, China

Contributing to SDG2 zero hunger: rice area monitoring in southeast Asia with time series SAR

ZHANG Hong (Aerospace Information Research Institute, CAS, China)

The carbon sequestration potential of cropland soils in China under climate change and farming practices changes

YU Yongqiang (Institute of Atmospheric Physics, CAS, China)

Monitoring and evaluation of improvement and utilization of saline-alkali soil in western Jilin Province from 1985 to 2020

LI Xiaojie (Northeast Institute of Geography and Agroecology, CAS, China)

Assessment of grassland carrying capacity in five Central Asian countries

BAI Jie (Xinjiang Institute of Ecology and Geography, CAS, China)

The welfare impact of rising potato price: evidence from rural western China

GU Rui (Overseas Agricultural Research Center of Chinese Academy of Agricultural Sciences, China)

Time 10:30-12:00, September 8th, 2022

Session | **Digital Wetlands for Sustainable Development Goals**

Co-Chairs | Wang Zongming, Northeast Institute of Geography and Agroecology, CAS, China
NIU Zhenguo, Aerospace Information Research Institute, CAS, China

Assessing the losses of surface water and the carbon storage of wetland under rapid urbanization for SDGs using long-term Landsat imagery and InVEST model

JIANG Weiguo (Beijing Normal University, China)

Global divergent trends of algal blooms detected by satellite during 1982–2018

FANG Chong (Northeast Institute of Geography and Agroecology, CAS, China)

Improving the characterization of global aquatic land cover types using multi-source earth observation data

XU Panpan (Laboratory of Geo-Information Science and Remote Sensing, Department of Environmental Sciences, Wageningen University & Research, Wageningen, Netherlands)

Remote quantification of the trophic status of Chinese lakes

LI Sijia (Northeast Institute of Geography and Agroecology, CAS, China)

Mapping fine-resolution water cover types in China based on time series Sentinel-1 and 2 images

NIU Zhenguo (Aerospace Information Research Institute, CAS, China)

Time 10:30-12:00, September 8th, 2022

Session | **Satellite Remote Sensing for SDGs**

Co-Chairs | CHEN Hongyu, Innovation Academy for Microsatellites, CAS, China
FU Bihong, Innovation Academy for Microsatellites, CAS, China

Innovative optical payloads and big data technologies support for the realization of SDGs

CHEN Fansheng (Shanghai Institute of Technical Physics, CAS, China)

Arctic sea ice leads by spaceborne thermal infrared observation in 30 m resolution

LI Xiaoming (International Research Center of Big Data for Sustainable Development Goals)

Generation of national deformation map and geohazard susceptibility map of China

ZHANG Guo (State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China)

Wide FOV hyperspectral imaging technology for SDG

WANG Yueming (Shanghai Institute of Technical Physics, CAS, China)

Urban outlook from big data

LU Ming (Shanghai Jiao Tong University, China)

Time 10:30-12:00, September 8th, 2022

Session | **Big Earth Data for Beautiful China Initiative**

Co-Chairs | LIAO Xiaohan, Aerospace Information Research Institute, CAS, China
HUANG Chunlin, Northwest Institute of Eco-Environment and Resources, CAS, China

Mining the spatio-temporal characteristics of SDGs interactions at provincial level in China

CAO Min (Nanjing Normal University, China)

Assessment of progress towards SDG 6 in China from 2015 to 2020

SONG Xiaoyu (Northwest Institute of Eco-Environment and Resources, CAS, China)

Integrated evaluation of SDG 11 indicators in China from 2015 to 2020

FENG Yaya, HUANG Chunlin (Northwest Institute of Eco-Environment and Resources, CAS, China)

Strengthening regional food security and improving environmental benefits based on optimization of crop-livestock structure

LI Yang (Institute of Geographic Sciences and Natural Resources Research, CAS, China)

The ecological security assessment based on remote sensing big data

PEI Yanyan (Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Production-living-ecological risk assessment and corresponding strategies in China's provinces under climate change scenario

HOU Wenjuan (Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Explanation of pollutant sources and control measures based on the first PM2.5 component vertical reanalysis data

YANG Ting (Institute of Atmospheric Physics, CAS, China)

Time 10:30-12:00, September 8th, 2022

Session	**Young Scientist Forum I - Youth Innovation for our Shared Goal**
Co-Chairs	**ZOU Lei, Texas A&M University, USA** **WANG Shenglei, International Research Center of Big Data for Sustainable Development Goals**

Sensing the pulse of the pandemic: revealing social-behavioral dynamics during COVID-19 through geospatial big data

ZOU Lei (Texas A&M University, USA)

Satellite laser altimetry reveals a net water mass gain in global lakes with spatial heterogeneity in the early 21st century

SONG Chunqiao (Nanjing Institute of Geography and Limnology, CAS, China)

Global aquaculture mapping based on big earth data

WANG Zhihua (Institute of Geographic Sciences and Natural Resources Research, CAS, China)

Diurnal changes of gaseous air pollutants in Asia from the geostationary infrared sounder onboard China's Fengyun-4 satellite

ZENG Zhaocheng (Peking University, China)

Decreasing rainfall frequency contributes to earlier leaf onset in northern ecosystems

WANG Jian (The Ohio State University, USA)

Predicting streamflow change under climate and land use changes in the contiguous U.S. using a time-varying Budyko framework and machine learning algorithms

LI Zhiying (Dartmouth College, Hanover, New Hampshire, USA; The Ohio State University, Columbus, Ohio, USA)

Time 10:30-12:00, September 8th, 2022

Session	**Young Scientist Forum II - Youth Innovation for our Shared Goal**
Co-Chairs	**WANG Lei, International Research Center of Big Data for Sustainable Development Goals** **LUO Lei, International Research Center of Big Data for Sustainable Development Goals**

High-precision remote sensing mapping of ice-edge landforms based on morphological and activity characteristics

FENG Min (Institute of Tibetan Plateau Research, CAS, China)

Big data and probability of landslides

XU Chong (National Institute of Natural Hazards, Ministry of Emergency Management of China, China)

Forest fire monitoring & severity mapping: a use case

Deepakrishna Somasundaram (Sri Lanka & UN-SPIDER)

Untangling multiple species richness hypotheses in China using remote sensing habitat indices for assessing SDG15.1.2

MA Xuanlong (Lanzhou University, China)

Big earth data analyses reveal patterns and drivers of the habitat loss across Asian elephant's range

LUO Lei (International Research Center of Big Data for Sustainable Development Goals)

Applications and challenges of GEDI Lidar satellite for global forestry resource monitoring

TANG Hao (Department of Geography, National University of Singapore, Singapore)

Time 14:00-15:30, September 8th, 2022

Session	**Big Data Assist Integrated Water Resources Management**
Co-Chairs	**JIANG Yunzhong, China Institute of Water Resources and Hydropower Research, China** **LU Shanlong, Aerospace Information Research Institute, CAS, China**

Big data to improve water management and boost sustainable development

Colin Herron (Global Water Partnership)

Sound water governance is key to sustainable development

ZHANG Weidong (People and Prosperity Pillar UNDP China)

Building resilience water security through improved integrated water governance

Fany Wedahuditama (Global Water Partnership Southeast Asia)

Water resources protection and sustainable development

SHI Qiuchi (International Economic and Technological Cooperation and Exchange Center)

Little giants: role of the micro water events in understanding transboundary water interaction
WANG Wenling (Yunnan University, China)

China's SDG 6 monitoring and assessment: progress, problems and prospects
LU Shanlong (Aerospace Information Research Institute, CAS, China)

Time 14:00-15:30, September 8th, 2022

Session   **Earth Observations for Sustainable Urban Environment**

Co-Chairs   **ZHANG Hongsheng, The University of Hong Kong, China**
CHEN Bin, The University of Hong Kong, China

Global urban growth throughout 2100 from integrated remotely sensed urban extent time series data and urban dynamic modeling
LI Xuecao (Chinese Agricultural University, China)

Urban climate monitoring network design: existing issues and a big data-based solution
YANG Jiachuan (The Hong Kong University of Science and Technology, China)

Contrasting inequality of human exposure to greenspace between cities of Global North and Global South
CHEN Bin (The University of Hong Kong, China)

Earth observation for geospatial decision making in sustainable transport infrastructure management
SONG Yongze (Curtin University, Australia)

Spatiotemporally enhanced normalized difference urban index data to support global resilient urban development
ZHANG Qingling (Sun Yat-sen University, China)

Integrating radar and optical data for urban monitoring in tropical and subtropical areas
ZHANG Hongsheng (The University of Hong Kong, China)

Time 14:00-15:30, September 8th, 2022

Session   **Radiation and Energy Balance of the Earth System and its Impacts**

Co-Chairs   **WANG Tianxing, Sun Yat-sen University, China**
Husi Letu, Aerospace Information Research Institute, CAS, China

Geostationary satellite-based cloud characteristics and surface radiation products(CARE): product development progress
Husi Letu (Aerospace Information Research Institute, CAS, China)

Estimation of all-sky surface net longwave radiation with remote sensing and meteorological reanalysis data
TANG Bohui (Kunming University of Science and Technology, China)

Increased aerosols can enhance cloud droplet coalescence process through radiative pathway to cause Anti-Twomey effect in water clouds
Pradeep Khatri (Center for Atmospheric and Oceanic Studies, Tohoku University, Japan)

Modeling the optical anisotropic reflectance and albedo over rugged terrain
WEN Jianguang (Aerospace Information Research Institute, CAS, China)

Estimating surface solar irradiance from satellites: past, present, and future perspectives
HUANG Guanghui (Northwest Institute of Eco-Environment and Resources, CAS, China)

GLASS all-wave net radiation product: algorithm and evaluation
JIANG Bo (Beijing Normal University, China)

Time 14:00-15:30, September 8th, 2022

Session   **Big Data Enable Africa Great Green Wall**

Co-Chairs   **LI Xiaosong, International Research Center of Big Data for Sustainable Development Goals**
JIA Xiaoxia, United Nations Convention to Combat Desertification

Achievements and experiences of Chinese desertification combatting
LU Qi (Chinese Academy of Forestry, China)

Spatial-temporal pattern of desertification in the Sahel in recent 30 years
LEI Jiaqiang (Xinjiang Institute of Ecology and Geography, CAS, China)

GGW-BDF online tool
LI Xiaosong (International Research Center of Big Data for Sustainable Development Goals)

Drought resilience and SDG indicators
JIA Xiaoxia (United Nations Convention to Combat Desertification)

Regional efforts towards "Decade of the Desert, 2021-2030: Land Degradation Neutrality"
Amos T. Kabo-Bah (University of Energy and Natural Resources, Ghana)

GGW-Accelerator
Gilles Amadou Ouedraogo (Global Mechanism, UNCCD)

Time 14:00-15:30, September 8th, 2022

Session **Big Data and Marine Sustainable Development Goals**

Chair **YANG Xiaofeng, Aerospace Information Research Institute, CAS**

Coastal Bangladesh, risk estimation, and natural disasters: accounting for probabilities with local peoples' perception

Md Abul Kalam Azad (Natural Resources Institute, University of Manitoba, Canada)

Marine Sustainable Development Goals and coral reef ecosystem management - Taking Sanya Coral Reef Reserve as an example

WU Hongrong (School of Earth Sciences, Yangtze University, China)

Research on sensitive parameters of oil species identification based on microwave experiment

MA Jing (CAS Key Laboratory of Coastal Environmental Processes and Ecological Remediation, Yantai Institute of Coastal Zone Research, CAS, China)

Spatial assessment of coastal flood risk due to sea level rise in China's coastal zone through the 21st century

XU He (Yantai Institute of Coastal Zone Research, CAS, China)

Tropical cyclone risk assessment for Pacific Small Island Developing States

YANG Hongyu (State Key Laboratory of Remote Sensing Science, Aerospace Information Research Institute, CAS, China)

Time 14:00-15:30, September 8th, 2022

Session **DBAR - Digital Technology for Sustainable Development and Management of Coast and Sea**

Co-Chairs **ZHANG Li, International Research Center of Big Data for Sustainable Development Goals**
Dewayany Sutrisno, Badan Informasi Geospasial, Indonesia
Mazlan Hashim, Universiti Teknologi Malaysia, Malaysia
Tanjil Sowgat, Khulna University, Bangladesh

Data analyses and parallel optimization of the coupled atmosphere-ocean numerical model

WANG Yanqiang (National Marine Environment Forecasting Center, China)

Urbanization-induced impacts on mangrove forests at multiple scales

ZHANG Hongsheng (University of Hong Kong, Hong Kong, China)

Monitoring the sustainability of costal and marine environment

Dewayany Sutrisno (Badan Informasi Geospasial, Indonesia)

Residential segregation: the need for a mixed method approach

Tanjil Sowgat (Khulna University, Bangladesh)

New forest inventories in Britain using remote sensing and proximal data collection methods

Juan C. Suárez (Northern Research Station of the Forestry Commission, UK)

Assessing success and failure of nature based solutions in Bangladesh with earth observation technology

Mohammad Emran Hasan (Climate Justice and Natural Resource Rights, Oxfam in Bangladesh, Bangladesh)

Theory about how manage a transversal, and scalable big data coast and sea public police in the context of the welfare state

Myriam Fernandez (Environmental Prosecution Service of the Catalan Government, Spain)

Spatial and temporal characteristics of fire-disturbed carbon loss in Chinese forest ecosystems

REN Hongge (Aerospace Information Research Institute, CAS, China)

Time 14:00-15:30, September 8th, 2022

Session **DBAR - Harness Technologies, Data and Knowledge for Disaster Risk Reduction**

Co-Chairs **Rajib Shaw, Graduate School of Media and Governance, Keio University, Japan**
HAN Qunli, Integrated Research on Disaster Risk, International Council for Science

Satellite-based earth observations for integrated disaster risk reduction in China

LI Suju (Satellite Remote Sensing Department, National Disaster Reduction Center, Ministry of Emergency Management of China, China)

Transboundary hydrology, climate change and its impact on flood factors in the Kabul-Swat Floodplain, Hindu Kush Region

Atta-ur-Rahman (Department of Geography and Geomatics, University of Peshawar-Pakistan, Pakistan)

Hazard assessment and exposure modeling using digital data in the Himalayas: an experience of Nepal

Amod Mani Dixit (National Society for Earthquake Technology, Nepal)

Ecosystem services in reducing disaster risk- issues and challenges

Deepthi Wickramasinghe (University of Colombo, Sri Lanka)

Potential of an open access satellite data for flood extent identification

Nurfashareena Muhamad (SEADPRI-Universiti Kebangsaan Malaysia)

Disaster loss data accounting to enhance impact based early warning and early actions

Bapon (Shm) Fakhruddin (Tonkin+Taylor)

Knowledge service approach for disaster risk reduction

WANG Juanle (The Disaster Risk Reduction Knowledge Service Sub-Platform of International Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO)

Time 14:00-15:30, September 8th, 2022

Session
DBAR - Digital Technology for Environmental Change Assessment and Sustainable Development

Co-Chairs
Howard Epstein, Department of Environmental Sciences, University of Virginia, USA
James Terry, Zayed University, Dubai, UAE

Environmental perturbations (drought, wildfire, erosion) in the tropical highlands of Fiji, preserved in volcanic lake sediments

James Terry (Zayed University, Dubai, UAE)

A sensor network for assessing built-natural environment interactions and their effects on permafrost stability in an Arctic community

Howard Epstein (Department of Environmental Sciences, University of Virginia, USA)

Design and implementation of spatiotemporal process intelligent analysis and mining software based on multi-source big data

CHEN Zeqiang (State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China)

Accurate ice/snow surface temperature retrieval and Arctic leads detection from Chinese FY-3D MERSI- Ⅱ data: algorithm and preliminary validation

HUI Fengming (School of Geospatial Engineering and Science, Sun Yat-sen University, China)

Arctic wildfires under climate change

XU Xiyan (Key Laboratory of Regional Climate-Environment for Temperate East Asia, Institute of Atmospheric Physics, CAS, China)

Time 14:00-15:30, September 8th, 2022

Session
DBAR - Data Sharing and Applications by DBAR WGs and ICoEs (Invited)

Co-Chairs
QIU Yubao, International Research Center of Big Data for Sustainable Development Goals
LI Guoqing, Aerospace Information Research Institute, CAS, China
Massimo Menenti, Delft University of Technology, Netherlands
Zeeshan Shirazi (Rapporteur), International Research Center of Big Data for Sustainable Development Goals

Closing Ceremony 15:45-16:45

The 6th Digital Belt and Road Conference

The Digital Belt and Road Program (DBAR) is an International Science Program which was formally established in 2016 and was initiated through the collaborations between Chinese and international experts from several countries. Currently, 59 countries, international organizations and international programs participate in the program to share data, experience, technology, and knowledge to promote and facilitate use of science and technology for the sustainable development in the Belt and Road region, as an important pillar for the Global Development Initiative (GDI). The DBAR has sets up 9 Working groups to jointly promote regional cooperation on cross-disciplinary research towards use of space observation and big data to achieving the sustainable development goals. DBAR has also established 9 International Centers of Excellence (ICoE) at Morocco, Zambia, Ghana, Thailand, Pakistan, Finland, Italy, Russia and the United States to facilitate international cooperation and research networking. The Digital Belt and Road Conference has successfully organized five times.

The 6th Digital Belt and Road Conference (DBAR 2022) will be held along with the 2022 International Forum on Big Data for Sustainable Development Goals, from September 7th to 9th, 2022. The topic of the Conference is Digital for Sustainable Future. Focusing on the innovation and application of digital technology, the Conference will discuss the scientific discovery and knowledge dissemination, helping to achieve Sustainable Development Goals in the Belt and Road region.

Conference theme
Digital for Sustainable Future

Discussion topics
- Digital Technology for Agricultural Monitoring and Food Security
- Digital Technology for Sustainable Development and Management of Coast and Sea
- Data Sharing for Sustainable Development Goals
- Harness Technologies, Data and Knowledge for Disaster Risk Reduction
- Digital Technology for Environmental Change Assessment and Sustainable Development
- Earth Observation and Digital Technology for Heritage Conservation
- Digital Technology for Urban Sustainability
- Climate Action and Sustainable Development in High Mountain Asia and Arctic Region
- Digital Technology in Support of Water and Land Management for Sustainable Development

General Information

The 2022 International Forum on Big Data for Sustainable Development Goals (FBAS 2022) is a hybrid conference. The opening ceremony and the closing ceremony will be held both online and onsite and other activities will be online only. According to the policies on prevention and control of COVID-19, onsite activities will be only available for invited guests. For regular participants, please join the online conference.

All participants (including Speakers, Regular Participants and Student Participants) need to register. Opening and closing ceremonies are open access to all registered participants. All academic events (including plenary and parallel sessions etc.) will be available exclusively for registered participants who paid registration fee.

The FBAS 2022 website is: https://fbas2022.scimeeting.cn/en/web/index

Language
The official language of the forum is English.

Time
The time for the FBAS 2022 is Beijing Time (UTC+8:00).

Online Participation

For Speakers:
Please log in your account from the home page of Forum website, and enter "Scientific Arrangement" from the left side of your account page. Click "Start ZOOM" to enter the panelist channel of the specific ZOOM webinar.

For Regular Participants:
Please log in your account from the home page of Forum website, and enter "Online Conference" from your account page (or home page). Select your interested session and click on "Enter Conference", and click on the link to the right to enter the auditorium channel of the specific ZOOM webinar.

Venue

Beijing International Convention Center (BICC)

The International Forum on Big Data for Sustainable Development Goals will be held at Beijing International Convention Center (BICC). The Beijing International Convention Center is a well-known enterprise in Beijing. Opened in 1990, the convention center has served almost 1,000 different international and domestic conventions, exhibitions and meetings each year since its conception.

In 2002 the convention center merged together under North Star Industrial Group, creating a stronger reputation with more effective management. The Center is situated on the site of the Asian Games Village, a flourishing area of Beijing which has a collection of conference centers, businesses, shopping centers and entertainment venues. It is located on the North Fourth Ring road, just 20 kilometers from the International Capital Airport and 9 kilometers from the city center. The Center is also very close to the Olympic Games central area, including the Bird's Nest.

The Beijing International Convention Center provides 5 star services and comprises 48 different conference rooms. The exhibition hall is 5,000 square meters. The North Star Continental Grand Hotel is a 4 star hotel with 538 guest rooms and 5 restaurants serving different types of cuisine. It's the ideal place to conduct international and domestic conferences, display cultural events and hold business meetings.

Introduction to Hosts of FBAS 2022

International Research Center of Big Data for Sustainable Development Goals (CBAS)

The International Research Center of Big Data for Sustainable Development Goals (CBAS) was launched in Beijing, China on September 6, 2021, to facilitate the implementation of the UN 2030 Agenda for Sustainable Development.

The Center is hosted by the Chinese Academy of Sciences (CAS), featuring multidisciplinary research related to Earth system science, social and economic sciences, as well as sustainability science.

The Center works towards a vision where data is open and accessible across borders and disciplines, technology is available to support the entire policymaking process, and knowledge and ideas are communicated and grown, especially among developing countries. The Center is devoted to monitoring and evaluating indicators of the Sustainable Development Goals (SDGs) in areas where big data plays a key role, including environmental commons, urban and peri-urban development, food security, and energy decarbonization.

The Center has five key missions: the development of SDG data infrastructure and information products, the development and launch of a series of SDG satellites, providing new knowledge for SDG monitoring and evaluation, the establishment of a think tank of STI for SDG progress, and providing capacity development for SDGs in developing countries.

Aerospace Information Research Institute (AIR), CAS

The Aerospace Information Research Institute (AIR) under the Chinese Academy of Sciences (CAS) was established in 2017 to promote the development of the aerospace information and to inspire technology innovations that can solve issues related to sustainable development.

Currently AIR hosted 3, 200 employees and runs two schools under the University of the Chinese Academy of Sciences, namely, the School of Electronic, Electrical and Communication Engineering and the School of Optoelectronics, with some 1, 500 postgraduate students in total.

AIR has 21 national- / CAS- level key laboratories as well as research centers, and conducts research from following aspects: payload and device technology; global Satellite Data Receiving Ground Station Network; remote sensing science and Digital Earth; BeiDou navigation and positioning technology; aerospace information and technology applications.

The international S&T cooperation platform hosted by AIR includes: the International Society for Digital Earth (ISDE), the International Centre on Space Technologies for Natural and Cultural Heritage (HIST) under the auspices of UNESCO, the International Programme Office for Integrated Research on Disaster Risk (IRDR IPO) and the CAS-TWAS Centre of Excellence on Space Technology for Disaster Mitigation (SDIM).

Introduction to Industry Partner of FBAS 2022

UniCloud   **Unicloud Tech Co. Ltd.**

With unique scenario-driven solutions for digital innovation in various industries, Unicloud is committed to leadership in cloud services in China for clients in the public and private sectors.

In 2018, Unigroup announced its Cloud Strategy, giving birth to Unicloud Tech Co. Ltd. In 2020, cloud and digitalization was highlighted as a strategic priority at the group level. A cloud and intelligence business unit was set up for all-in engagement. As the only cloud computing entity within the group, Unicloud have extensive practices in the public and private sectors and capability of delivering cloud resources nationwide, it provides full-stack, full-domain and full-scenario cloud computing solutions for government and enterprise clients. It focuses on government cloud, chip cloud, construction cloud, and industrial cloud, and delivers flexible options of public cloud, hybrid cloud and private cloud. By deeply engaging in the construction of smart cities, Unicloud empowers digital innovation of various industries and businesses with cloud-native full-stack infrastructure. Expert teams and R&D systems have been set up to cover over 10 segments, including cloud services, industrial internet, chip cloud, construction cloud and smart city, etc., with strong track record in the construction and operation of smart cities in Tianjin, Hangzhou, Chengdu, Hohhot and Lianyungang. Unicloud solutions for cloud services and smart city have been deployed in over 30 provinces and cities across China, with 10,000+ customer cases. It has built 4 regional nodes + 27 regional nodes nationwide, supplemented by pervasive peripheral and shared nodes, to adequately meet the need for local deployment and local data storage and management.

Composed of basic services, platform services and application services, the full-stack cloud services offer 300+ products in 17 categories. With an industry-driven and industry-first approach, Unicloud caters to industrial needs in various business scenarios with its technical know-how. In addition to generic solutions such as public cloud, private cloud, cloud disaster recovery, and enterprise cloud, it also offers customized solutions for government cloud, medical service cloud, construction cloud, chip cloud, and industrial cloud, as well as office automation solutions, MSP and ecological solutions.

In acknowledging its industry-leading technologies, superior products and proven solutions, Unicloud has been awarded many credentials, including the Tianjin Special Award for Science and Technology Advancement, the Trusted Cloud Award for Technology Innovation, and the Trusted Cloud Award for Best Practice. It was nominated an Outstanding Performer in the Forrester China Industrial Internet Platform, and listed in the 5th Catalogue of State-level Industrial Design Centers and Leading Cases of Innovation in Industrial Internet by the Ministry of Industry and Information Technology 2021, and the 1st Catalogue of Service Providers for Industrial Internet Parks by China Academy of Information and Communications Technology. In addition, it ranks among the top three in government data governance and cloud infrastructure, and among the top five in cloud service operation, reinforcing the leading position among government big data management platforms in China.

Notes

Notes

Notes

Notes

Notes

Notes

2022 International Forum on Big Data for Sustainable Development Goals