



第三届可持续发展大数据国际论坛

The 3rd International Forum on Big Data for Sustainable Development Goals

2023年9月6日-8日 中国 北京

Session title: Big Earth Data in Support of Assessing Resilient Cities and Human Settlements

Session Organizer: International Research Center of Big Data for Sustainable Development Goals; Shenzhen Institute of Advanced Technology, CAS; The University of Hong Kong; Shanghai Normal University

Short Description

Rapid urbanisation worldwide and climate change bring various challenges for urban development, including social inequality, unbalanced economic development and inadequate environmental protection. The Sustainable Development Goal 11 (SDG 11) of the 2030 Agenda for Sustainable Development calls for "making cities and human settlements inclusive, safe, resilient and sustainable". The New Urban Agenda (NUA) aims to create conditions for a fundamental transformation of sustainable urban development patterns and implement SDG 11 indicator monitoring and evaluation. Resilient Cities and Human Settlements is one of China-GEO's four priorities. Therefore, it is important to monitor and assess the resilient cities and human settlements using advanced digital technologies.

Comprehensive and synthesized studies with multiple sourced data in urban environment, society, and sustainability are urgently needed. Comparing with the traditionally statistical techniques, new approaches involving the big earth data show great advantages in acquiring data for urban sustainability studies. Big earth data including geo-spatial data and remotely sensed data provide critical data sources for studying and improving coupled environmental, social, and economic systems to achieve urban sustainability. Therefore, big earth data has played important roles in monitoring urban infrastructure, disaster, air pollution, heat island effect and others, providing data products, algorithms and models for urban sustainable development research.

Objectives

The objective of this session will be to strengthen the collective understanding of the needs, opportunities, and challenges of big earth data in support of urban sustainable development. It will also provide the best practices and share experiences regarding big earth data in support of assessing resilient cities and human settlements.

Expected Results

Through this session's exchange and discussions, we aim to achieve the following expected outcomes:

1. Discussing the needs, opportunities and challenges of big earth data in urban sustainable development.
2. Providing the best practices and sharing experiences of big earth data in support of assessing resilient cities and human settlements.
3. Initiative to form international urban sustainable development research team through strengthening international cooperation, especially with UN-Habitat and GEO.



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Agenda

Time 13:30-15:00, September 8th, 2023 Room: 305 D

Moderators:



SUN Zhongchang

Professor

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

Dr. SUN Zhongchang is a professor at Aerospace Information Research Institute (AIR), Chinese Academy of Sciences (CAS). He also serves as deputy director of the Key Laboratory of Digital Earth Science, CAS, as well as head of the Cooperation & Development Office at the International Research Center of Big Data for Sustainable Development Goals (CBAS). He received his Ph.D. from the Center for Earth Observation and Digital Earth (CEODE), CAS in 2011. From 2016-2017, he visited the Department of Geography at the University of South Carolina as a CSC (China Scholarship Council) scholar. He had been a visiting researcher at the German Aerospace Center (DLR) in 2013 supported by the DAAD scholarship. He was honored as Nanhai Young Talent in 2020 and CAS Distinguished Core Researcher in 2022. Recently, his research interests include urban remote sensing and urban sustainability. He has published more than 80 papers in different academic journals, including more than 40 SCI papers, as well as 6 books as an associate editor. He also presided over more than 10 projects funded by agencies including the National Natural Science Foundation of China, the National Key R&D Program, and the Strategic Priority Research Program of the Chinese Academy of Sciences.



ZHANG Zhonghao

Associate Professor

Institute of Urban Studies, Shanghai Normal University, China

Dr. ZHANG Zhonghao current works as an associate professor in Institute of Urban Studies, Shanghai Normal University (SHNU), China. His research focuses on the urban ecology and urban sustainability with GIS modelling and Remote Sensing approaches. He received his Ph.D. from the Institute of Remote Sensing and Information Technology in Zhejiang University



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in 2014, and a postdoc in Northwest Institute of Ecology and Environmental Resources, Chinese Academy of Sciences, China. As a scholar with global perspective and extensive experiences in international cooperation, he visited the Department of Geography in Michigan State University (2016-2017), as well as School of Sustainability in Arizona State University (2019-2020). During his visit to Tanzania in 2014, he served as a senior engineer to guide the construction of agricultural facilities in University of Dar es Salaam. He was also honored as Croucher Scholar by Education University of Hong Kong, Excellent Young Teacher by SHNU, and “Chenguang Scholar” by Shanghai Municipal Education Committee. Recently, his work explores the urban sustainable development, big data in geo-statistics with remote sensing, and GIS application based on multi-source datasets and data assimilation. He has published more than 50 papers in different academic journals, such as Cities, Landscape and Urban Planning, Applied Geography, Land Use Policy, Environment International, Journal of Cleaner Production, Urban Forestry & Urban Greening, Growth and Change, Ecological Indicators. Currently, he is the associate editor of Stochastic Environmental Research and Risk Assessment, and also serves as a guest editor for the journal Remote Sensing.



SUN Liqun

Associate Professor

Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China

Dr. SUN Liqun is associate professor at Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences (CAS). He received his Ph.D. from the University of Hong Kong. His research field focuses on urbanization and sustainable development. He has published more than 20 papers in Chinese and English including Nature Communications. His research was selected as a highlight case in the "Big Earth Data in Support of the Sustainable Development Goals (2022)" and was reported by CCTV News.



CHEN Bin

Assistant Professor

The University of Hong Kong, China

Dr. CHEN Bin is an Assistant Professor at the Faculty of Architecture, The University of Hong Kong. Before joining HKU, he worked as a Postdoctoral researcher at the University of California Davis. Dr. Chen has been broadly trained in geospatial



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science and environmental science. His research aims to leverage geospatial big data, data-model fusion, and advanced interdisciplinary approaches to investigate the interaction loops between urban environmental change, human activities, and public health, with the ultimate goal of contributing to sustainable and healthy cities. He has published more than 60 SCI journal articles, including Science, PNAS, Nature Communications, Science Advances, Science Bulletin, RSE, EI, ISPRS P&RS, etc. He is the Associate Editor of Remote Sensing in Ecology and Conservation. He received the 2022 Global Young Scientist Award, China New Talents in Science and Technology-Shining Potential Award, 2021 AAG Early Career Award in Remote Sensing, HKU-100 Scholar Award, ISPRS Best Young Author Award, and Li Xiaowen Remote Sensing Excellent Youth Award.

Event 1

Urban green space remote Sensing-----multi-dimension and multi-angle perception of urban vegetation



MENG Qingyan

Researcher

Aerospace Information Research Institute, China

MENG Qingyan is a researcher and doctoral supervisor at the Aerospace Information Research Institute, Chinese Academy of Sciences. His main research areas include urban land surface environment remote sensing, seismic infrared remote sensing, and agricultural land surface environment remote sensing, which provide technical support and services for ecological city construction, smart city construction, urban management, and earthquake monitoring. He has published more than 190 academic papers in journals such as Remote Sensing of Environment, authored 4 books, obtained 27 software copyrights, holds 36 patents and awarded 19 prizes, and has been involved in more than 50 research projects. His work on "Urban Greenness Spatial Remote Sensing" was awarded the 10th Qian Xuesen Urban Studies Gold Award and recognized as one of the top ten events in China's remote sensing field in 2020. He also serves as the Vice Chairman of the Professional Committee on Ecological Remote Sensing Monitoring and Assessment of the Chinese Society for Environmental Sciences, Director of the Sixth Council of the Urban Planning Society of China, and Vice Chairman of the Loess Plateau Remote Sensing Branch of the Chinese Association of Remote Sensing Applications.

Event 2

SDG 11 and spatial analytical tools to facilitate performance tracking



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Robert Ndugwa

Chief

UN-Habitat

Robert Ndugwa is the Chief of Data and Analytics Section at UN-Habitat where he oversees the urban statistical methodology development in areas such as housing, transport, public spaces, etc. He has supported several countries to improve their urban statistical and analytical systems, and has authored and contributed to the production of various United Nations urban related analytical reports. Prior to joining UN-Habitat, Robert served as a lead for Research, Monitoring and Evaluation at UNICEF Kenya office. Robert has published widely in the field of urban monitoring and co-authored many papers in the fields of urban health, epidemiology and statistical, etc

Event 3 (TBD)

Heatproofing our cities: the need for a global heat resilience service



Martyn Clark

Coordinator

GEO Secretariat, Switzerland

Martyn is an urban development specialist with 15 years' experience in the public and private sector in Africa, Asia and the UK. Martyn has worked with a range of development agencies including UK FCDO (formerly DFID), the Cities Alliance, UNICEF, UN-HABITAT, FAO, WFP, Asian Development Bank, Agence française de développement (AFD), Global Green Growth Initiative, as well as national, sub-national and municipal governments. He has a decade's experience working on urban development programmes in Africa and Asia, much of which has focused on developing low-cost, replicable tools and approaches to managing urbanization. Martyn has extensive experience in providing technical assistance, capacity development support, and research design and implementation on land-use and urban planning issues in the global south. This advice has covered spatial and land-use planning, climate resilience and adaptation, Strategic Environmental and Social Assessment of plans, policies, and programmes, local economic and industrial development, urban land markets, infrastructure planning and municipal service delivery in rapidly urbanizing contexts in east and west Africa.



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Event 4

Intelligent understanding of remote sensing image scene for sustainable urban development



CHEN Jie

Professor

Central South University, China

Dr. CHEN Jie currently holds a Full Professor position and is a doctoral supervisor. He serves as an editorial board member for journals such as "National Remote Sensing Bulletin" and a member of the Intelligent Surveying and Mapping Committee of the China Society for Geodesy Photogrammetry and Cartography. He has been engaged in the research of theories, methods, and applications of remote sensing image analysis and understanding. He has made innovative achievements in the interpretation of remote sensing images based on computer vision and artificial intelligence, as well as in the geospatial intelligent cognition driven by remote sensing big data. He has led three projects funded by the National Natural Science Foundation of China, one sub-project of National Key Research and Development Program of China, and two projects funded by the Natural Science Foundation of Hunan Province. He has published more than 50 SCI/EI papers, obtained 10 granted patents, and served as the chief editor for four books. He has received the Second Prize of the Natural Resources Science and Technology Award, the Second Prize of the Geographic Information Technology Progress Award, and the Excellent Teaching Achievement Award at the University GIS Forum. He has served as a reviewer for multiple authoritative and important academic journals both domestically and internationally.

Event 5

Progress and challenges of coupling spatiotemporal big data analytics and deep learning for sustainable urban spatial optimization decision-making research



WANG Shaohua

Innovative Professor

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

WANG Shaohua, PhD, is an innovative professor and graduate supervisor at the Aerospace Information Research Institute, Chinese Academy of Sciences. His research focuses on spatiotemporal big data analysis, spatial optimization for SDGs, geospatial intelligence, and social remote sensing geocomputation. He worked as a postdoctoral researcher at the Department



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of Geography at the University of California, Santa Barbara, the SPARC Center at Arizona State University, and the CyberGIS Center at the University of Illinois Urbana-Champaign from 2016 to 2021. He has received awards such as the Special Award for Progress in Chinese Geographic Information Technology and the First Prize for Science and Technology in Beijing. In recent years, he has published over 100 academic papers, with more than 20 SCI/SSCI articles as the first or corresponding author in authoritative journals such as the International Journal of Geographical Information Science, Future Generation Computer Systems, and Sustainable Cities and Society. Additionally, he is a board member of the International Association of Chinese Professionals in Geographic Information Sciences (CPGIS) and the vice-chairman of the Social Remote Sensing Geocomputation Committee of the China Remote Sensing Application Association.

Event 6

Remote sensing monitoring and comprehensive assessment of China's urbanization sustainability based on the SDGs indicator



JIANG Huiping

Assistant Researcher

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

JIANG Huiping received the Ph.D. degree in cartography and geographic information system from the University of Chinese Academy of Sciences in 2019. Following his three-year postdoctoral study with the International Research Center of Big Data for Sustainable Development Goals (CBAS), he has joined the Key Laboratory of Regional Sustainable Development Modeling as an Assistant Research Fellow at the Chinese Academy of Sciences since 2023. His research interests focus on urban remote sensing, big data for SDG 11, sustainable urbanization, and human dimensions of global environmental change.

Event 7

Satellite observations reveal a decreasing albedo trend of global urban cities over the past 35 years



WU Shengbiao

Research Assistant Professor

The University of Hong Kong, China



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Dr. WU Shengbiao is a research assistant professor in the Division of Landscape Architecture at the University of Hong Kong. He received a Ph.D. degree in Cartography and Geography Information System at University of Chinese Academy of Sciences in 2019. His research interests focus on leveraging multi-source satellite observations and geospatial big data to study urban-built environment and human environmental exposure injustice, including greenspace, urban heat stress, and 3-D urban morphology etc., with the ultimate goal towards achieving SDG11. He received the American Association of Geographers (AAG) Early-Career Award in Remote Sensing in 2023, Special Prize of Chinese Academy of Sciences (CAS) President Award in 2019, and Li Xiaowen Remote Sensing Excellent Youth Award in 2019.

Topic: Satellite observations reveal a decreasing albedo trend of global urban cities over the past 35 years

Event 8

Analyzing patterns of urban clusters along China's mid-Spine Belt: a complex spatial network perspective



LI Sijia

PhD candidate

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

LI Sijia, the third-year Ph.D. student of joint education from International Research Center of Big Data for Sustainable Development Goals and Chengdu University of Technology. Her research field is urban remote sensing, with a focus on monitoring and analyzing the indicators of United Nations Sustainable Development Goals (SDGs) at the city level, mainly focusing on SDG11.3 "Sustainable Cities and Communities" and SDG11.A "Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning", as well as comprehensive evaluations of localized urban SDGs.

Event 9

Monitoring urban slum and deprived area in sub-Saharan Africa



LI Chengxiu

Research fellow

Department of Earth System Science, Tsinghua University, China

LI Chengxiu is a research fellow in the Department of Earth System Science at the Tsinghua University. Her current research field focuses on Urbanization and slum monitoring, rural-urban interaction and agriculture development using earth observation,



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with a specific focus on sub-Saharan Africa. She received a PhD degree from the Department of Geography at the University of Zurich, Switzerland in 2019. From 2019 to 2022, she worked on a project addressing challenges in food and water security using remote sensing in sub-Saharan Africa at the University of Southampton, UK.