

FAPESP – NSFC (Logos)

KICK-OFF OF THE FIRST JOINT PROJECTS ON CLIMATE CHANGE APPROVED UNDER THE PARTNERSHIP BETWEEN THE NATIONAL NATURAL SCIENCE FOUNDATION OF CHINA (NSFC) AND THE SÃO PAULO RESEARCH FOUNDATION (FAPESP)









March 06<sup>th</sup>, 2023 – 8 pm (Chinese time)/ 9 am (São Paulo time)













In November 2021, the mutual interest of NSFC and FAPESP in strengthening efforts and building on collective expertise and resources to advance research on Climate Change was converted into the workshop [The Synergy on Climate Change Research in China and in São Paulo](#), in which invited researchers from both regions showed how scientists were involved into actions to combat climate change and its impacts, aligned with UN SDG 13.

Not much later, in February of 2021, the two agencies launched as a first collaborative action a call for joint projects on Climate Change between researchers from the State of São Paulo and from China, focused on the topic [“The dynamics of surface earth system and their relationship with sustainable development”](#).

The initiative followed NSFC’s Program on Sustainable Development International Cooperation (SDIC) to contribute to the global effort for a sustainable future. On FAPESP’s side, the call was a promotion of the [Research Programme on Global Climate Change](#), a thematic program developed by the Agency to leverage opportunities for researches that can contribute to the development of new technologies, advancement and applicability of methodologies that provide effective actions to combat global climate change.

For this kick-off, we have invited researchers of the approved projects and international scientific experts to exchange knowledge and expertise, share the expectations for the development of the projects and look for ways to create impact with this research.

<b>PROGRAM</b>	
8h pm  9h am 	<b>Introduction</b> <b>Dr. Cris de Albuquerque</b> , FAPESP <b>Dr. Liyao Zou</b> , Director General of Bureau of International Cooperation, NSFC
8h10 pm  9h10 am 	<b>Opening Remarks from Moderators</b> <b>Dr. Tianjun Zhou</b> (Institute of Atmospheric Physics, CAS), <b>Dr. Paulo Artaxo</b> (Institute of Physics/University of São Paulo (USP))
8h30 pm  9h30 am 	<b>The fate of Holocene blue carbon in the Yangtze and Amazon coastal wetlands in response to precipitation and sea level changes</b> <b>Xiaomei Nian</b> , East China Normal University <b>André Oliveira Sawakuchi</b> , Instituto de Geociências/USP
8h45 pm  9h45 am 	<b>Resilience and adaptation to climate change in cities: time for action with nature-based solutions</b> <b>WeiQi Zhou</b> , Research Center for Eco-Environment Sciences, CAS

<b>PROGRAM</b>	
	<b>Denise Helena Silva Duarte</b> , School of Architecture and Urbanism (FAU/USP)
9h pm  10h am 	<b>Flash drought event evolution characteristics and the response mechanism to climate change considering the spatial correlation</b> <b>Qianjin Dong</b> , Wuhan University <b>Eduardo Mario Mendondo</b> , Escola de Engenharia de São Carlos/USP
9h15pm  10h15 am 	<b>The impact of climate variability and weather extremes on tropical vegetation phenology and its implications on biodiversity</b> <b>Yongshuo Fu</b> , Beijing Normal University <b>Leonor Patricia Cerdeira Morellato</b> , Instituto de Biociências de Rio Claro/UNESP
9h30 pm  10h30 am 	<b>Speleothem isotopic reconstruction of interhemispheric monsoon precipitation patterns under different warming backgrounds in the past 140 ka and the Anthropocene epoch</b> <b>Haiwei Zhang</b> , Xi'an Jiaotong University <b>Francisco William De Cruz Junior</b> , Instituto de Geociências/USP
9h45 pm  10h45 am 	<b>Synergistic effects of climate change and land use on carbon source and sink in Amazon forest ecosystems</b> <b>Xiyan Xu</b> , Institute of Atmospheric Physics, CAS <b>Luiz Augusto Toledo Machado</b> , Instituto de Física/USP
10h00 pm  11h00 am 	<b>Questions and Answers</b>
10h30 pm  11h30 am 	<b>Closing Remarks</b> <b>Dr. Jinghai Li</b> , President - NSFC <b>Dr. Luiz Eugênio Mello</b> , Scientific Director – FAPESP

#### **Participants**

#### **Moderators**

**Paulo Eduardo Artaxo Netto**

Institute of Physics/University of São Paulo (USP)



Paulo Artaxo is an expert in the links between Amazonia and climate change. He dedicated 40 years studying the effects of deforestation on carbon and hydrological cycles and in the functioning of the Amazonian ecosystem. He worked at NASA, Lund and Stockholm Universities. Prof. Artaxo published more than 400 papers, 26 of them in the Science and Nature group. He is one of the most cited Brazilian researchers with an h-index of Google Scholar of 104, and 81 in the Web of Science. Among the prizes received, he was elected a fellow of the American

Association for the Advancement of Science (AAAS), received the TWAS Earth Science Prize, received the title of Doctorate of Philosophy Honoris Causa of the University of Stockholm, Sweden. He received in 2010 the Ordem do Mérito Científico Nacional medal, and in 2016 received the "Premio Almirante Álvaro Alberto" from MCTI, the most prestigious scientific prize in Brazil. He is listed in Clarivate Analytics Highly Cited Researchers in 2014, 2015, 2018 and 2019. Recently, participated in the 2021 United Nations Climate Change Conference (COP-26).

### **Tianjun ZHOU**

Institute of Atmospheric Physics, CAS



Prof. & Dr. Tianjun Zhou is a senior research scientist in the Institute of Atmospheric Physics (IAP) at the Chinese Academy of Sciences (CAS), Adjunct Professor in the University of Chinese Academy of Sciences (UCAS). He is the deputy-Director General of IAP/CAS. He served as the Lead Author on the 5th and 6th Assessment Reports by the Working Group I of the Intergovernmental Panel on Climate Change (IPCC). He is also a member of the CLIVAR (Climate and Ocean: Variability, Predictability and Change) Working Group on Coupled Modelling and co-chair of CMIP6 (Coupled Model Intercomparison

Projectphase 6) Global Monsoon Model Inter-comparison Project (GMMIP). He is the Advisory Editor of Oxford Research Encyclopedia of Climate Science, a member of Panel of Experts for Special Foundation for State Major Basic Research Program of China entitled "Earth System and Global Change". Tianjun ZHOU works on climate modeling and climate dynamics, with focus on monsoon and how the climate system responds to anthropogenic and natural forcing agents. He was named to the prestigious Highly Cited Researcher list from Clarivate Analytics for Geosciences (2018-2022), the prestigious Highly Cited Chinese Researcher list from Elsevier (2014-2022).

### **GRANTEES**

**The fate of Holocene blue carbon in the Yangtze and Amazon coastal wetlands in response to precipitation and sea level changes**



**Xiaomei Nian**, East China Normal University

Dr. Nian is Associate Professor at State Key Laboratory of Estuarine and Coastal Research (SKLEC), East China Normal University. She is also the head

of SKLEC's Luminescence Dating Laboratory. Nian's current research interests include establishing chronological frameworks for Quaternary sediments, geomorphic evolution and paleoclimate change over a range of timescales, with a focus in coastal areas. She has published more than 30 papers. She acts as a reviewer for international journals in the fields of Quaternary Geology, Quaternary Chronology, paleoclimate change, and has reviewed grants for various Chinese and international funding agencies.



**André Oliveira Sawakuchi**, Instituto de Geociências/USP

André Sawakuchi is an Associate Professor at Institute of Geosciences of University of São Paulo. He is

interested in understanding how Earth Surface Processes and ecosystems respond to climate changes, with focus on Amazonia and applying luminescence methods to track sediment routing systems and their associated landscapes through time and across space..

### **Resilience and adaptation to climate change in cities: time for action with nature-based solutions**



**Weiqi Zhou**, Research Center for Eco-Environment Sciences, CAS

Dr. Weiqi Zhou is a professor of urban ecology, and deputy director of the

State Key Laboratory of Urban and Regional Ecology, Research Center for EcoEnvironmental Sciences, Chinese Academy of Sciences. He is also the director of the Beijing Urban Ecosystem Research Station. Dr. Zhou is interested in spatial heterogeneity of the landscape. He integrates field observations, remote sensing and modeling to understand the structure of urban socio-ecological systems, and its link to ecological function. He works across many



**Denise Helena Silva Duarte**, School of Architecture and Urbanism (FAU/USP)

Dr. Duarte is Full Professor at the School of Architecture and Urbanism,

University of Sao Paulo, and Head of the Architecture and Urbanism Graduate Programme (PPGAU/FAUUSP). She is Visiting Professor at the Erasmus Mundus Joint Master's Degree on Urban Climate and Sustainability (EU). She works in interdisciplinary projects funded by FAPESP, CNPq, CAPES and USP, regarding climate change adaptation for cities and buildings, and by EU/H2020, linking nature-based solutions to urban sustainability. She serves

disciplines including landscape ecology, urban ecology, remote sensing, and GIS, and interact with various collaborators from different fields through his involvement with various collaborative projects. The interdisciplinarity of his work has allowed him to develop innovative approaches and tools to better understanding the structure of urban socio-ecological systems, and its link to ecological function, and to interact with practitioners and policy makers to help cities like Beijing and Shenzhen accomplish sustainable urban transformations. Dr. Zhou serves as the associate editor for Landscape and Urban Planning, and editorial members for the journals such as Landscape Ecology and Journal of Urban Ecology. He is a co-leader of the Urban Ecosystem Group of the IUCN Commission on Ecosystem Management. He has published more than 100 peer-reviewed papers and three books.

as Expert Reviewer for IPCC/WGII and in technical counselling for the public administration.

#### **Flash drought event evolution characteristics and the response mechanism to climate change considering the spatial correlation**



**Qianjin Dong,**  
Wuhan  
University

Dr. Qianjin Dong is an associate professor of school of water resources and hydropower engineering, Wuhan University. He is

mainly engaged in hydrological and water resources response mechanism and adaptation strategy to changing environment, water resources planning and management, multi-objective decision making and economic operation, regulation and control of hydropower energy system, etc. Recently, he has hosted the National Natural Science Foundation of China, the National Key Research and Development Program, the Third XinJiang Comprehensive Science Survey of the Ministry of Science and Technology, and other projects. He has also participated in major and key projects of the National Natural Science Foundation



**Eduardo Mario Mendiondo,** Escola de Engenharia de São Carlos/USP

BEng Water Resources (FICH/UNL, Argentina), M Sc and PhD in

Water Resources (IPH/UFRGS, Brazil) and BMBF Senior Postdoc at CESR/Univ Kassel, Germany, Mendiondo has recognized experience as a science-policy expert on hydrology and humanitarian engineering for Water Disaster Risk Reduction and Resilience (WDR3), acting with multidisciplinary teams on: Prediction in Ungauged Basins (PUB), Observations from Under-Represented Sensors (OURS), Unsolved Problems in Hydrology (UPH), linking WDR3 to social memory and citizen science through the Socio-Hydrological Observatory for Water Security (SHOWS). His interests focus on empirical, numerical and hybrid approaches to water-social inequalities, co-evolution, patterns, feedbacks and paradoxes, with WDR3-SHOWS modules linked to: Sendai's DRR, Paris? COP21, IPCC, and UN Sustainable Development Goals (SDGs). With

of China, as well as many other projects from the companies. He has published more than 70 academic papers, including more than 20 SCI and EI indexed papers. He has been awarded with the 3rd National Outstanding Postgraduate Dissertation Supervisor of Higher Education in Water Resources, the 1st Prize of the 5th National Lecture Competition for Young Teachers of Water Resources (Hydrology Group), and the Outstanding Paper Award of Natural Science in Hubei Province.

international science networks from North America, Europe, Asia and Africa, he promoted WDR3-SHOWS? studies for Brazilian and Latin America?s water aging infrastructure, coping with floods, droughts, landslides, tropical diseases, social inequality and economic affordability. After participating through science-knowledge transfer with CEMADEN (Nat Centre for Monitoring & Alerts of Natural Disasters), INCLINE and Joint Research Centre/Ispra, Italy, he envisioned PUB, OURS and WDR3-SHOWS for a wide spectrum of adapting tools, with hard and soft techniques of Low Impact Development (LID or SUDS) transformed into: Life-Cycle Analysis (LCA), AI-based insurance for non-stationary drivers and IPCC?s composite impacts from multi-hazards and multi-risks. During 2019-2023 he is leading projects of FAPESP/SPRINT Water-Health-Resilience (BR/UK), FAPESP-3rd Generation of LID/LCA Water Facilities, FAPESP UK Acad on Social Resilience, Peoples? Memory & Enigmas. Also, he is Principal Investigator of the Water Security subcomponent of 2017-2023 FAPESP/CNPq/CAPES National Institute of Science & Technology on Climate Change-Phase 2 (INCTMC2), led by CEMADEN/MCTIC; he is Associated Investigator of the 2018-2023 FAPESP/CEPID Research Centre for Innovation and Communication on Applied Maths for Industry (CEPID/CeMEAI-Phase 2), led by ICMC/USP and is Assoc. Investigator of the proposed 10-year IBM/FAPESP Centre for Artificial Intelligence. He is the Chairperson of the CAPES School of Advanced Studies on Water and Society Under Change, with open lectures available to the wide public through social media on Youtube®, Facebook®, and Twitter®. He is Associated Coordinator of the Interdisciplinary Centre for Climate Instigation (INCLINE/USP). Elected Science Coordinator of the Sao Paulo Centre for Education and Research of Disasters (CEPED/SP), supporting the 2019-2035 Braz. Water Security Plan. Since the 2004 Indonesia/Aceh disaster, when acted as a DPRI/Kyoto Visiting Scholar, until his 2014-2016 CEMADEN R&D Coordinaton, he has promoted SHOWS-OpenLabs to cope with

risks in 1,000 municipalities and 40,000 Brazilian Risk Prone Areas (BRPAs). He has served as author-fellow of the Millennium Ecosystem Assessment's, further adapting WDR3 plans for the APFM/WMO, the UNESCO-IHP and the World Bank. He is invited for the Int Flood Initiative and for IAHS' groups: 2019/2021 Panta Rhei ('Everything flows') Biennium, MOXXI (Measurements & Observations of the XXI Century), Citizen and Hydrology (CandHy) and Water Footprint Regional Studies for BRPAs. He is ad-hoc a Water Security Advisor of AmBEV Co and FIESP (Sao Paulo's Federation of Industries), CNPq, CAPES, FINEP and FAPESP. He has engaged vulnerable communities using Participatory Water Resilience Indices (PWRI) and Willingness-to-Adapt (WtA) metrics. Through hybrid learning methods called PET (Praxis, Empiricism and Theory), he performs as a social agent with: 'digital water', Artificial Intelligence (AI), big data analytics (BDa), SDG's multicriteria attainment optimization, MOXXI pre-screening, CandHy's volunteer geographic information (VGI) systems,

**The impact of climate variability and weather extremes on tropical vegetation phenology and its implications on biodiversity**

**Yongshuo Fu,**  
Beijing Normal University



Full professor; Director of the Institute of water security College of water sciences, Beijing Normal University. Interest and

Publications: Focusing on vegetation phenology and its feedback on terrestrial carbon and water cycles, using manipulative experiments, satellite/ UVA imagery, long-term monitoring plots, as well as process-based models and DGVM (LPJ-model) to explore how environmental changes affect vegetation phenology across different spatial and temporal scales, and explore how these differences can ultimately determine



**Leonor Patricia Cerdeira Morellato,**  
Instituto de Biociências de Rio Claro/UNESP

Bachelor's degree in biological sciences from the University of São

Paulo (USP), a master's and a doctorate degree in Ecology from the State University of Campinas (UNICAMP). Currently is a full Professor at São Paulo State University ((UNESP). She has experience in botany and plant ecology, working mainly in phenology and temporal ecology in tropical vegetation, investigating the effects of global climatic change in the timing of plant growth and reproduction, pollination and seed dispersion, the influence of anthropogenic

community and ecosystem responses to environmental change. The publication list including 1 nature, 7 nature family journals (NCC, NEE, NC), 3 PNAS, 16 Global change biology and in total 73 peer review papers, and more than 3433 citations over the past 5yrs. Projects involved: 1. National Science Foundation for Distinguished Young Scholars, NSFC, 2021- 2025, 4,000,000 yuan, PI  
 2. Introducing Talents of Discipline to Universities, 2018-2022, 9,000,000 yuan, PI  
 3. Thousand Talent Program for Young Outstanding Scientists, Vegetation phenology and climate change, NSFC, 2017-2022, 3,000,000 yuan, PI  
 4. Response and modelling of forest phenology to climate change in temperate China, NSFC, 2018-2021, 610,000 Yuan, PI  
 5. National Key Research and Development Program of China, Carryover effect of vegetation phenology on land surface processes, 2017-2022, 1,050,000 Yuan, co-PI. Award: 1. Distinguished Young Scholars (NSFC), 2020  
 2. The Talents Plan- Young Professionals, 2016  
 3. Pegasus Marie Curie Fellowship, 2015-2016  
 4. Excellent postdoc Peking University, 2015

disturbances and phylogeny on plant phenology, and implications for biodiversity conservation. She has produced several reviews, organized books and edited special issues. She has investigated methods in plant phenology and, as an important innovation of her recent research agenda, in collaboration with computer scientists is exploring new technologies for investigating temporal changes in natural vegetations at different spatial scales, with the application of digital cameras, drones and remote sensing. She is leading research projects in those new frontiers, e-science and transdisciplinary research. She participated, as contributing author, in the Working Group II (WGII), of the 4th Report of the IPCC (Intergovernmental Panel on Climate Change) - 2006/2007, winner of the 2007 Nobel Peace Prize.

**Speleothem isotopic reconstruction of interhemispheric monsoon precipitation patterns under different warming backgrounds in the past 140 ka and the Anthropocene epoch**



**Haiwei Zhang**, Xi'an Jiaotong University

Full Professor, Doctoral supervisor of the Institute of Global Environmental change, Xi'an Jiaotong University;

He focuses on stalagmites and global climate change, multiscale East Asian and South American monsoon changes recorded by stalagmites and their influence mechanisms, climate change and human activities. He published more than 60 SCI papers, with a total of ~3200 citations and H index of 26. Presided over 10 projects such as the National Natural Science Foundation and China Postdoctoral Foundation and international cooperation of the National



**Francisco William De Cruz Junior**, Instituto de Geociências/USP

Graduate at Geologia from Universidade Federal do Rio Grande do Norte (1995), master's at Geology from Universidade de São Paulo (1998) and ph.d. at Chemistry from Universidade de São Paulo (2003). , acting on the following subjects: brazil, paleoclimate, stalagmites, stable isotopes and isotopos estaveis.



Natural Science Foundation of China. Received the 2016 Top Ten Scientific and Technological Advances in Chinese Universities, the Second Prize of Natural Science of Shaanxi Province, the First Prize of Science and Technology of Shaanxi Academy of Sciences, and the Top Ten Research Advances of Chinese Geographical Society. Guest editor of Quaternary Science Reviews, editorial board of Frontier in Earth Science , Sustainability, and reviewer of Science Advances, PNAS, Nature Communications, Geophysical Research Letters, Quaternary Science Reviews, Global and Planetary Change, Climate Dynamics; served as a member and special convener of the organizing committee of international and domestic academic conferences for many times.

### **Synergistic effects of climate change and land use on carbon source and sink in Amazon forest ecosystems**



**Xiyang Xu,**  
Institute of  
Atmospheric  
Physics, CAS

Xiyang Xu is a full professor at Institute of Atmospheric physics of Chinese

Academy of Sciences. She received her Ph.D from City University of New York in 2013 followed by postdoctoral fellow at Lawrence Berkeley National Laboratory. Dr. Xu's primary research interest is using remote sensing datasets, climate reanalysis and numerical models to investigate land-climate interactions. Her current work focuses on terrestrial ecosystem vegetation dynamics and carbon cycle in response to climate change and human activities. She is also interested in climate feedbacks to vegetation dynamics through biogeochemical and biogeophysical processes. She leads projects from National Natural Science Foundation of China, Ministry of Science and Technology of China



**Luiz Augusto Toledo Machado,** Instituto de Física/USP

<http://www.researcherid.com/rid/C-4314-2012>

Prof. Machado has Bachelor's and Master's degrees in Meteorology from the University of São Paulo (1981 and 1984), Diplôme D'études Approfondies Océanologie - Université de Paris VI (Pierre et Marie Curie) (1989), and Ph.D. in Sciences de La Vie - Université de Paris VI (Pierre et Marie Curie) (1992). He was a visiting researcher at NASA/GISS and LMD/France. Member of the Faculty of INPE PGMET. Retired researcher at the National Institute of Space Research in 2020. He is currently a Researcher at Instituto de Física from Universidade de São Paulo and visiting researcher at the Max Planck Institute for Chemistry. He has experience in meteorology, emphasizing Remote Sensing Atmospheric Sensing and tropical convection, with an extensive background in field Campaigns, mainly in Amazonas. He serves or served as

and Chinese Academy of Sciences. She serves as the lead author of the IPBES thematic assessment of the interlinkages among biodiversity, water, food and health, and UNEP seventh edition of the Global Environment Outlook. She was the lead author of the fourth national climate assessment report of China and chapter scientist of IPCC special report on climate change and land. She won World Meteorological Organization Norbert Gerbier-MUMM International Award in 2012.

Coordinator of the Expert Team in Satellite Utilization and Products (WMO), a member of the Expert Team on the Evolution of the Global Observing System (WMO), a member of the International Commission on Clouds and Precipitation, a member of the Scientific Council of IRD-France (Institut de Recherche pour le Développement), a member of the ARM Scientific Board, a member of the ATTO SSC, and Area Coordinator (Geosciences) of FAPESP. Prof. Machado was Head of the Atmospheric Sciences Division of the IAE, the Division of Satellites and Environmental Systems of INPE, and the Coordinator of CPTEC. In 2016 he received The Outstanding Contribution to WMO and the Group Achievement Award (NASA). In 2017 he received the CAPES Best Geosciences Ph.D. Thesis Award as an advisor, and in 2018, the Peter Muranyi Award - Innovation and Technology, and top download paper 2020 Meteorological Application.