NATIONAL ACADEMIES Sciences Engineering Medicine

China-U.S. Scientific Engagement on Sustainability: A Workshop Series
Workshop I: Sustainability and Biodiversity

July 27-29, 2022 / July 28-29, 2022
All times are US Eastern Daylight Time
All times are China Standard Time

Virtual
Zoom Webinar

AGENDA

Meeting Goals:

- Promote scientific coordination, cooperation, and collaboration between China and the United States on sustainability and biodiversity issues;
- Examine the state of biodiversity and sustainability research and practices and identify priority areas for scientific collaboration on specific sustainability challenges; and
- Discuss opportunities for advancing policy actions to secure biodiversity conservation in China and the United States.

Wednesday, July 27, 2022 / Thursday, July 28, 2022

7:30 pm EDT / 7:30 am CST — **Welcome from the National Academy of Sciences**
Marcia McNutt (NAS), President, U.S. National Academy of Sciences

7:35 pm / 7:35 am — **Welcome from the Chinese Academy of Sciences**
Jianguo Hou (CAS), President, Chinese Academy of Sciences

7:40 pm / 7:40 am — **Overview and Goals of the Workshop Series**
Karen Seto (NAS), Yale University, U.S. Committee Chair
Yongguan Zhu (CAS), Chinese Academy of Sciences, Chinese Committee Chair

7:50 pm / 7:50 am — **Framing Remarks: The State of Biodiversity and Sustainability**
Each speaker will review the current state of biodiversity and sustainability in their home country, including the importance of sustainable consumption and production.

- Peter Raven (NAS), Missouri Botanic Garden
- Fuwen Wei (CAS), Institute of Zoology, Chinese Academy of Sciences

8:30 pm / 8:30 am — **Q&A and Discussion**
All Participants

8:50 pm / 8:50 am — BREAK

9:00 pm
9:00 am

Panel I: Strategies for Post-2020 Global Biodiversity Framework

Given that the United Nations Biodiversity Conference (COP 15) will convene governments from around the world to agree on a new set of goals for nature over the next decade, this panel will include a discussion on how to measure progress on biodiversity protection.

Moderators:

- Jianguo "Jack" Liu, Michigan State University
- Keping Ma, Institute of Botany, Chinese Academy of Sciences

Panelists:

- Stuart Pimm, Duke University
- Keping Ma, Institute of Botany, Chinese Academy of Sciences
- Zhiyun Ouyang (NAS), Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences

10:00 pm
10:00 am

Q&A and Discussion

All Participants

10:30 pm
10:30 am

Adjourn

Thursday, July 28, 2022 / Thursday, July 28, 2022

7:30 am EDT
7:30 pm CST

Welcome

Karen Seto (NAS) and Yongguan Zhu (CAS), Committee Chairs

7:35 am
7:35 pm

Panel II: Biodiversity and Implications for Food

This panel will discuss biodiversity and sustainable food systems, including areas such as urban and urban agriculture, food security, and complex social-ecological systems.

Moderators:

- Ashok Gadgil (NAE), University of California, Berkeley
- Binbin Li, Duke Kunshan University

Panelists:

- Chaodong Zhu, Institute of Zoology, Chinese Academy of Sciences
- Thomas Tomich, University of California, Davis
- Jikun Huang, Peking University
- Ivette Perfecto (NAS), University of Michigan

8:35 am
8:35 pm

Q&A and Discussion

All Participants

9:05 am
9:05 pm

BREAK

9:15 am
9:15 pm

Panel III: Biodiversity and Health

This panel will focus on the importance of biodiversity for health, including the complexity of biodiversity in soils, the dynamics of disease systems that connect human and animal populations, and infectious diseases that impact wildlife conservation.

Moderators:

- Judith Wasserheit (NAM), University of Washington
- Zhiyun Ouyang (NAS), Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences

Panelists:

- Diana Wall (NAS), Colorado State University
- Raina Plowright, Cornell University
- Yi Shi, Institute of Microbiology, Chinese Academy of Sciences
- Binbin Li, Duke Kunshan University

10:15 am
10:15 pm

Q&A and Discussion

All Participants

10:45 am
10:45 pm

Adjourn

Thursday, July 28, 2022 / Friday, July 29, 2022

7:30 pm EDT
7:30 am CST

Welcome

Karen Seto (NAS) and Yongguan Zhu (CAS), Committee Chairs

7:35 pm
7:35 am

Panel IV: Biodiversity and Climate Change

This panel will examine the impacts of climate change on biodiversity, including forest landscape restoration for climate change mitigation, carbon sequestration and biodiversity, how climatic change influences species distributions, and climate scenario development and evaluation.

Moderators:

- Karen Seto (NAS), Yale University
- Chaodong Zhu, Institute of Zoology, Chinese Academy of Sciences

Panelists:

- Zhiheng Wang, Peking University
- Julie Winkler, Michigan State University
- Xiaojuan Liu, Institute of Botany, Chinese Academy of Sciences
- Hannah Fairbank, Global Environment Facility Secretariat

8:35 pm
8:35 am

Q&A and Discussion

All Participants

9:15 pm
9:15 am

Adjourn

Friday, July 29, 2022 / Friday, July 29, 2022

7:30 am EDT **Welcome**
7:30 pm CST Karen Seto (NAS) and Yongguan Zhu (CAS), Committee Chairs

7:35 am **Panel V: Urbanization and Biodiversity**
7:35 pm *This panel will explore how the expansion of urban areas directly and indirectly impacts biodiversity conservation and ecosystem services in both China and the United States.*

Moderators:

- Steward Pickett (NAS), Cary Institute of Ecosystem Studies
- Yongguan Zhu (CAS), Chinese Academy of Sciences

Panelists:

- Steven Handel, Rutgers University
- Robert McDonald, The Nature Conservancy
- Weiqi Zhou, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences
- Jun Yang, Tsinghua University

8:35 am **Q&A and Discussion**
8:35 pm All Participants

9:15 am **A Path Forward: Future Needs and Opportunities**
9:15 pm *Participants will discuss opportunities for scientific collaboration relating to biodiversity and sustainability.*

9:45 am **Summary Remarks**
9:45 pm

10:00 am **Workshop Conclusion**
10:00 pm

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Workshop I: Sustainability and Biodiversity

Biographies of Speakers and Moderators

KAREN SETO (NAS) (U.S. Committee Chair) is the Frederick C. Hixon Professor of Geography and Urbanization Science at Yale University. An urban and land change scientist, she is one of the world's leading experts on contemporary urbanization and global change. She uses satellite remote sensing, field interviews, and modeling methods to understand how urbanization will affect the planet, including land change, food systems, biodiversity, and climate change. She has pioneered methods to reconstruct urban land use with satellite imagery and has developed novel methods to forecast urban expansion. She has conducted urbanization research in China for twenty years and in India for more than ten. She has extensive fieldwork experience in Asia, especially China and India, where she has conducted research for over 20 and 10 years, respectively. Dr. Seto has served on numerous national and international scientific bodies. She was a coordinating lead author for the 2022 IPCC 6th Assessment Report and the 2014 IPCC 5th Assessment Report. She is a former co-editor-in-chief of the journal, *Global Environmental Change*. From 2000 to 2008, she was faculty at Stanford, where she held joint appointments in the Woods Institute for the Environment and the School of Earth Sciences. She has received many awards for her scientific contributions, including the Outstanding Contributions to Remote Sensing Research Award from the American Association of Geographers. Dr. Seto is an elected member of the U.S. National Academy of Sciences, the Connecticut Academy of Science and Engineering, the American Academy of Arts and Sciences, and the American Association for the Advancement of Science. She received a Ph.D. in Geography from Boston University.

YONGGUAN ZHU (CAS) (Chinese Committee Chair), Professor of Biogeochemistry and Environmental Biology, is the Science Director of the Institute of Urban Environment, Chinese Academy of Sciences (CAS). He has been working on environmental pollution, food system and urban health for over three decades. Before returning to China in 2002, he was working as a research fellow (Supported by the Royal Society London), the Queen's University of Belfast, UK (1994-1995); and a postdoctoral fellow in The University of Adelaide (1998-2002), Australia. He obtained his B.S.c. from Zhejiang Agricultural University in 1989, and M.S.c. from CAS in 1992, and then a Ph.D. in environmental biology from Imperial College, London in 1998. He is a scientific committee member for the ISC program on Human Health and Wellbeing in Changing Urban Environment, and served for nine years as a member of Standing Advisory Group for Nuclear Application, International Atomic Energy Agency (2004-2012). Dr. Zhu is the recipient of many international and Chinese merit awards, among them including TWAS Science Award 2013, National Natural Science Award 2009 and International Union of Soil Science Von Liebig Award (2022). He was selected as a Web of Science Highly Cited Researcher (2016-2021), an elected Fellow of the American Associate for the Advancement of Science, elected fellow of The World Academy of Science.

HANNAH FAIRBANK is Asia Regional Coordinator and Senior Biodiversity Specialist for Asia at Global Environment Facility (GEF) Secretariat. She leads a team of technical experts serving 17 Asian countries across GEF environmental sectors; manages a GEF grant portfolio of nearly $300 million and is a member of the GEF biodiversity team supporting GEF's engagement with the Convention on Biological Diversity (CBD). Ms. Fairbank is on the Global Wildlife Program (GWP) management team and works on several integrated programs in Asia including Food Land Use and Restoration and Sustainable Cites. Ms. Fairbank joined the GEF in November 2017 after more than thirteen years with the U.S. Agency for International Development (USAID) where she was a member of the senior management team of

USAID's office of Forestry and Biodiversity. She co-chaired the development and launch of USAID's first-ever Biodiversity policy that shapes the investment of $265 million annually and led the Agency's biodiversity mainstreaming portfolio. Ms. Fairbank worked on engaging the private sector in creative approaches to fight wildlife and fisheries crime resulting in two public-private partnerships and significant leveraged resources. Prior to joining USAID, Ms. Fairbank worked for Conservation International as a Luce environmental fellow, Iwokrama International Centre for Conservation and Development in Guyana and the Vermont Forum on Sprawl. Ms. Fairbank has a master's degree from The Fletcher School at Tufts University and a Bachelor of Science from University of Oregon.

ASHOK GADGIL (NAE) (U.S. Committee Member) holds concurrent appointment on the University of California (UC) Berkeley Campus as Professor of Civil and Environmental Engineering, and at the Lawrence Berkeley National Laboratory (LBNL) as Faculty Senior Scientist. At UC Berkeley, Dr. Gadgil is a Distinguished Chair Professor of Safe Water and Sanitation in Civil and Environmental Engineering. He is the Principal Investigator and Faculty Director of Development Impact Lab (DIL.berkeley.edu) and of the Clean Energy Research Center for Water Energy Technologies (CERC-WET.berkeley.edu). At LBNL Dr. Gadgil is a Senior Faculty Scientist in the Energy Technologies Area. He has a Ph.D. in physics from University of California, Berkeley. His expertise ranges from computational fluid dynamics of indoor air and pollutant flows, simulation of entry and transport of indoor radon, building energy efficiency, and methods to treat drinking water to make it potable. Dr. Gadgil has more than 140 refereed archival journal papers, 150 conference papers, and several patents.

STEVEN HANDEL is Distinguished Professor of Ecology and Evolution at Rutgers University. He studies the potential to restore native plant communities, adding sustainable ecological services, biodiversity, and amenities to the landscape. He has explored pollination, seed dispersal, population growth, ecological genetics, and most recently, problems of coastal, urban, and heavily degraded lands. Working with both biologists and landscape designers, he is improving our understanding of restoration protocols and applying these concepts to public environmental projects. Previously, he was Visiting Professor of Landscape Architecture at the Harvard University Graduate School of Design during 2016-2019, and a biology professor and director of the Marsh Botanic Garden at Yale University. He also was awarded an appointment as Adjunct Professor of Ecology at the University of California, Irvine and was Visiting Professor of Ecology at Stockholm University in 2009. Dr. Handel is a Certified Senior Ecologist of the Ecological Society of America and is the Editor of the professional journal *Ecological Restoration.* He is also a Fellow of the American Association for the Advancement of Science (AAAS), the Australian Institute of Biology, and of The Explorers Club. He has been a lead member of landscape design teams doing ecological restoration in urban parks and other public landscapes, including the landscape for the Beijing 2008 Olympic Summer Games. Dr. Handel received his B.A. in Biological Sciences from Columbia University and his M.S. and Ph.D. in Ecology and Evolution from Cornell University.

JIANGUO HOU (CAS) is President and Executive President of the Presidium of Academic Divisions of the Chinese Academy of Sciences (CAS). A prominent physical chemist and nanomaterial expert, Dr. Hou has made significant contributions in synthesis and characterization of nanomaterial and nanostructures, physical and chemical properties of single molecules and their assemblies, and scanning tunnel microscopy. He studied physics at the University of Science and Technology of China (USTC) from 1978, completing his Bachelor degree in 1983 and then received his M.Sc. and Ph.D. degrees in 1986 and 1989, respectively. From 2008 to 2015, Dr. Hou held the position as President of USTC until he became Vice Minister of the Ministry of Science and Technology of China (MOST). Afterwards, he worked successively in Guangxi Zhuang Autonomous Region and General Administration of Quality Supervision, Inspection and Quarantine from 2016 to 2017. In 2018 He was appointed as Vice President (full ministerial level) of CAS. He was elected CAS Member in 2003 and Fellow of the World Academy of Sciences for the advancement of science in developing countries (TWAS) in 2004. He is also Fellow of

the Royal Society of Chemistry of United Kingdom. Dr. Hou holds a series of awards and honors, among which the most prestigious are the National Natural Science Award (second-class) of China, the Holeung Ho Lee Advancement Prize, the TAN KAH KEE Science Award (Chemistry), and the Distinguished Award of CAS.

JIKUN HUANG is Professor and Director of the New Rural Development Institute at Peking University. He is founding director of China Center for Agricultural Policy, Fellow of the World Academy of Sciences (TWAS), Honorary Life Member of the International Association of Agricultural Economists, Fellow of Agricultural and Applied Economics Association, and the president of Asian Society of Agricultural Economists. His research covers a wide range of issues on agricultural policy, food security and rural development. He has been in several policy advisory committee of the central and local governments, including the Expert Advisory Committee Member of the Rural Leading Group Office of the Central Committee of CPC and the Ministry of Agricultrue and Rural Affairs. Dr. Huang received his Ph.D. in agricultural economics from University of the Philippines at Los Banos (UPLB) in 1990. He has published 24 books and about 600 journal papers, including the papers published in Science, Nature and many leading journals in development economics, and received several awards from China and abroad.

BINBIN LI is the Assistant Professor of Environmental Sciences at Duke Kunshan University. She holds a secondary appointment with Nicholas School of the Environment at Duke University. Her research focuses on loss of biodiversity, endangered and endemic species conservation such as giant pandas, priority setting and management of protected areas, and promotion of innovative technology, markets and policies to solve conservation problems and local community development. Dr. Li received her Ph.D. in Environment from Duke University (2017), M.S. in Natural Resources and Environment from University of Michigan (2012). and B.S. in Life Sciences with a dual degree in Economics from Peking University (2010). Dr. Li's work covers the identification of conservation priorities and national parks in China, impacts of One Belt One Road on biodiversity, giant panda conservation and management via Footprint Identification Technique (FIT), impacts of oil palm and rubber plantations on biodiversity in Southeast Asia, influence of national environmental policies on human-wildlife conflicts, and behavioral study of endemic species. She is also a member of the IUCN Species Survival Commission (SSC) Small Mammal Specialist Group. Dr. Li is engaged in science communication and nature education. She is a signed nature photographer at Swild in China. From 2013-2015, she was on the advisory board for Disney nature documentary "Born in China." She is devoted in using photography, social media, drama, and other art formats to promote conservation science in the public.

JIANGUO "JACK" LIU (U.S. Committee Member) holds the Rachel Carson Chair in Sustainability, is University Distinguished Professor at Michigan State University and serves as director of the Center for Systems Integration and Sustainability. A human-environment scientist and sustainability scholar, Dr. Liu takes a holistic approach to addressing complex human-environmental challenges through systems integration, such as the integration of ecology with social sciences, policy and advanced technologies. He is particularly keen to connect seemingly unconnected issues, for example, telecoupling (human-nature interactions over distances), divorce and environmental sustainability. His work has been published in journals such as *Nature* and *Science* and has been widely covered by the international news media. Dr. Liu has served on various international and national committees and panels, editorial boards of international journals such as *Science*, and Commission on Sustainable Agriculture Intensification. Also, Dr. Liu was a coordinating lead author of the global assessment of biodiversity and ecosystem services organized by the Intergovernmental Platform on Biodiversity and Ecosystem Services. In recognition of his efforts and achievements in research, teaching, and service, Liu has received many awards and honors, such as being elected to the American Academy of Arts and Sciences, the American Philosophical Society and named a fellow of the American Association for the Advancement of Science (AAAS). Dr. Liu completed his postdoctoral study at Harvard University. He was also a visiting scholar at Stanford, Harvard and Princeton.

XIAOJUAN LIU is an Associate Professor in the Institute of Botany, Chinese Academy of Sciences. She is the leader of the management group of the world largest forest biodiversity experiment (BEF-China) and member of the Youth Innovation Promotion Association of Chinese Academy of Sciences. Her work focuses on biodiversity and ecosystem functioning in the forest ecosystems. She is particularly interested in how functional traits could affect tree survival and growth and how that could mediate the multi-dimension diversity effect on the ecosystem functioning at the temporal and spatial scale. She is committed to advancing the efforts for biodiversity conservation and forest restoration. She currently serves as the associate editor of *Journal of Ecology* and *Journal of Plant Ecology*.

KEPING MA (Chinese Committee Member) is Professor of Institute of Botany and University of Chinese Academy of Sciences (CAS), IUCN councilor and Asia Regional Members Committee chair, Vice Chair and Secretary-General of Biodiversity Committee of CAS, a member of Board of Directors for Species 2000. He initiated the Chinese Forest Biodiversity Monitoring Network (CForBio). Based on CForBio facilities and associated experiences, he and his colleagues established Chinese Biodiversity Monitoring Network (Sino BON) covering major dimensions of biodiversity in China with 10 thematic networks and a synthesis center. Cooperating with German and Swiss colleagues, he and his Chinese colleagues established a platform of Biodiversity and Ecosystem Function (BEF-China) to explore the effects of biodiversity loss on ecosystem function and services. He promoted the development of Biodiversity Informatics in China, especially on the progress of National Specimen Information Infrastructure (NSII), Chinese Virtual Herbarium (CVH) and Species 2000 China node (Sp2000-China). He has published more than 400 papers in journals including Science, Science Advances, PNAS, Ecology Letters, Ecology.

ROBERT MCDONALD is Lead Scientist for the Nature-Based Solutions at The Nature Conservancy. He researches the impact and dependencies of cities on the natural world, and helps direct the science behind much of the Conservancy's urban conservation work. He holds a Ph.D. in Ecology from Duke University and has published more than 50 peer-reviewed publications, and a recent book, entitled *Conservation for Cities* (Island Press) which documents the role green infrastructure can play in the well-being of urban residents. Prior to joining the Conservancy, Dr. McDonald was a Smith Conservation Biology Fellow at Harvard University, studying the impact global urban growth will have on biodiversity and conservation. He also taught landscape ecology at Harvard's Graduate School of Design, helping architects and planners incorporate ecological principles into their projects. He holds a B.S. degree in biology from The University of North Carolina at Chapel Hill.

MARCIA MCNUTT (NAS) is a geophysicist and the 22nd president of the National Academy of Sciences. From 2013 to 2016, she was the Editor-in-Chief of Science journals. Dr. McNutt was the Director of the U.S. Geological Survey (USGS) from 2009 to 2013, during which time USGS responded to a number of major disasters, including the Deepwater Horizon oil spill. For her work to help contain that spill, Dr. McNutt was awarded the U.S. Coast Guard's Meritorious Service Medal. She is a Fellow of the American Geophysical Union (AGU), the Geological Society of America, the American Association for the Advancement of Science, and the International Association of Geodesy. Dr. McNutt is a member of the U.S. National Academy of Engineering, the American Philosophical Society, and the American Academy of Arts & Sciences and a Foreign Member of the United Kingdom Royal Society, the Russian Academy of Sciences, and the Chinese Academy of Sciences. In 1998, Dr. McNutt was awarded AGU's Macelwane Medal for research accomplishments by a young scientist. She received the Maurice Ewing Medal in 2007 for her contributions to deep-sea exploration. Dr. McNutt received a B.A. in physics from Colorado College and a Ph.D. in Earth sciences from the Scripps Institution of Oceanography.

ZHIYUN OUYANG (NAS) is professor and director of Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, and the president of the Ecological Society of China. He was elected as an international member of the National Academy of Sciences in 2022. Dr. Ouyang's research

interests include ecosystem assessment, ecosystem services, ecosystem restoration and biodiversity conservation. In particular, he is known for his contributions to China's national ecosystem survey and assessment, mainstreaming biodiversity and ecosystem services into policy-making and urban management through establishing ecological function conservation areas (EFCAs) paradigm, developing Gross Ecosystem Product (GEP) concept and accounting methodology, and designing financial mechanisms based on natural capital and ecosystem services.

IVETTE PERFECTO (NAS) is the James E. Crowfoot Collegiate Professor of Environmental Justice at University of Michigan. Her research focuses on biodiversity and arthropod-mediated ecosystem services in rural and urban agriculture. She also work on spatial ecology of the coffee agroecosystem and am interested more broadly on the links between small-scale sustainable agriculture, biodiversity and food sovereignty. She is co-author of four books, *Breakfast of Biodiversity*, *Nature's Matrix: Linking Agriculture, Conservation and Food Sovereignty*, *Coffee Agroecology*, and *Ecological Complexity and Agroecology*. Dr. Perfecto teaches Globalization and its Discontent: Struggles for Food, Water and Energy; Diverse Farming Systems; and Transformative Food Systems Seminar. She conducts research in Latin America (Mexico, Mesoamerica, and Puerto Rico), and most of my courses are interdisciplinary and are taught from a social justice perspective. Dr. Perfecto received her Ph.D. in Natural Resources and an M.S. in Ecology at the University of Michigan, and a B.S. in Biology at the Universidad Sagrado Corazon in Puerto Rico.

STEWARD PICKETT (NAS) (U.S. Committee Member) is a Distinguished Senior Scientist at the Cary Institute of Ecosystem Studies. He is an expert in the ecology of plants, landscapes, and urban ecosystems. Recipient of the Ecological Society of America's 2021 Eminent Ecologist Award, a member of the National Academy of Sciences, and the founding director of the Baltimore Ecosystem Study (1997-2016), Dr. Pickett also co-directed the Urban Sustainability Research Coordination Network. This project established lasting, interdisciplinary connections between urban designers, policymakers, and managers; the National Science Foundation deemed the project a model for research coordination networks. Dr. Pickett's research focuses on the ecological structure of urban areas and vegetation dynamics, with national and global applications. Among his research sites: vacant lots in urban Baltimore, primary forests in western Pennsylvania, post-agricultural fields in New Jersey, China's rapidly urbanizing Yanqi Valley, and riparian woodlands and savannas in Kruger National Park, South Africa. By applying ecological theory to urban planning, architecture, and landscape architecture, Dr. Pickett strives to convert cities and suburbs from ecological liabilities into ecological assets. He forges partnerships between ecologists and people who design and manage cities to protect and promote ecosystem services in urban environments. Patterns in ecologically-important factors like water retention, vegetation growth, and wildlife habitat availability change when humans develop natural areas. Using satellite data, Dr. Pickett studies urban landscape composition as it evolves and links this information to social and demographic influences. He has a Ph.D. from the University of Illinois.

STUART PIMM is the Doris Duke Professor of Conservation Ecology at the Nicholas School of the Environment at Duke University. His research covers the reasons why species become extinct, how fast they do so, the global patterns of habitat loss and species extinction and, importantly, the management consequences of this research. Dr. Pimm wrote the highly acclaimed assessment of the human impact to the planet: *The World According to Pimm: A Scientist Audits the Earth* in 2001. His commitment to the interface between science and policy has led to his testimony to both House and Senate Committees on the re-authorization of the Endangered Species Act. He was worked and taught in Africa for nearly 30 years on elephants, most recently lions— through National Geographic's Big Cats Initiative—but always on topics that relate to the conservation of wildlife and the ecosystems on which they depend. He founded SavingSpecies in 2007, then after 12 years of remarkable growth, Saving Nature in 2019. Dr. Pimm's international honors include the Dr. A.H. Heineken Prize for Environmental Sciences 2006 on behalf of the Royal Netherlands Academy of Arts and Sciences (2006), the John and Alice Tyler Prize for

Environmental Achievement (2010) and the International Cosmos Prize (2019). He received his B.S.c. degree from Oxford University and his Ph.D. from New Mexico State University.

RAINA PLOWRIGHT is a Cornell Atkinson Scholar and a Professor in the Department of Public and Ecosystem Health at the College of Veterinary Medicine at Cornell University. Her research program develops the science of pandemic prevention through transdisciplinary leadership, innovation, and translation. Her work advances a One Health approach by bridging the best available science in disease dynamics with effective public health practice and meaningful policy. Her systematic and interdisciplinary approach focuses on five areas of inquiry: Transmission of pathogens between species, Links between land-use change and pathogen spillover, Dynamics and drivers of viral pathogens in reservoir host populations, Prevention of epidemics, and Implementation of science for the protection of ecosystem and human health. Dr. Plowright was recently named a fellow of the American Association for the Advancement of Sciences (AAAS). Her training is in veterinary medicine (University of Sydney), epidemiology (UC Davis M.S.), and ecology (UC Davis Ph.D.).

PETER RAVEN (NAS) is President Emeritus of the Missouri Botanical Garden. Dr. Raven is one of the world's leading botanists and advocates of conservation and biodiversity. For four decades, he headed the Missouri Botanical Garden, an institution he nurtured into a world-class center for botanical research, education and horticultural display. Described by *Time* magazine as a "Hero for the Planet," Dr. Raven champions research around the world to preserve endangered plants and is a leading advocate for conservation and a sustainable environment. In recognition of his work in science and conservation, Dr. Raven is the recipient of numerous prizes and awards, including the prestigious International Prize for Biology from the government of Japan and the U.S. National Medal of Science, the country's highest award for scientific accomplishment. He has held Guggenheim and John D. and Catherine T. MacArthur Foundation fellowships. Dr. Raven was a member of President Bill Clinton's Committee of Advisors on Science and Technology. He also served for 12 years as home secretary of the National Academy of Sciences and is a member of the academies of science in Argentina, Brazil, China, Denmark, India, Italy, Mexico, Russia, Sweden, the U.K. and several other countries. The author of numerous books and reports, both popular and scientific, Dr. Raven co-wrote *Biology of Plants*, an internationally best-selling textbook. He also co-authored *Environment*, a leading textbook on the environment. Dr. Raven received a Ph.D. from the University of California, Los Angeles.

YI SHI (Chinese Committee Member) holds concurrent appointment on the University of Chinese Academy of Sciences (CAS) as Professor of Pathogen Microbiology and Immunology, and at the Institute of Microbiology, CAS. As the Executive Director of CAS-TWAS Center of Excellence for Emerging Infectious Disease (CEEID), Chinese Academy of Sciences, he has co-organized several academic and cooperation issues with the scientists in UK, USA, Australia, Russia, Brazil, and other countries. He is also the Secretary-general of the Biological and Medical Sciences Committee of the Chinese Association of Young Scientists and Technologists, committee member of the Chinese Society of Immunology. His expertise mainly focuses on the molecular mechanism of pathogen infection and regulation by the host, and the interaction between receptors and ligands during immune response. He has made remarkable progress on the infection mechanism of a range of important human pathogens including influenza virus, Ebola virus, ZIKV, arenavirus, and coronaviruses. He has published more than 100 refereed papers in the international academic journals including Cell, Nature and Science.

THOMAS TOMICH is distinguished professor of sustainability science and policy in the Department of Environmental Science and Policy and founder of the Food Systems Lab at the University of California, Davis, where he teaches in the Sustainable Agriculture and Food Systems program. Dr. Tomich has over 25 years of leadership in sustainability science, integrated ecosystem assessment, and food policy. From rainforest conservation in the Amazon to economic development strategy in Tajikistan and his current role in food systems informatics, Dr. Tomich brings global perspective and an innovative and pragmatic

approach to sustainability. He serves as an advisor to governments, international organizations, and companies, notably 10 years as a policy advisor with the Harvard Institute for International Development and four years as a member of the CGIAR's Independent Science and Partnership Council. He spent most of his career abroad, including significant periods in Egypt, Indonesia, and Kenya. Dr. Tomich received his B.A. from the University of California, Davis, and his Ph.D. in agricultural and food system economics from Stanford University.

DIANA WALL (NAS) is University Distinguished Professor and the Inaugural Director of the School of Global Environmental Sustainability at Colorado State University. She is currently science chair of the Global Soil Biodiversity Initiative (GSBI). Dr. Wall's research examines climate change impacts on soil biodiversity, particularly soil invertebrates and how they interact to provide healthy soils, ecosystem services and nutrient cycling. Her work on responses of soil foodwebs to climate change in earth's lowest diversity soils in Antarctica was recognized with the designation of Wall Valley, Antarctica. Dr. Wall is a 2013 Tyler Prize Laureate for Environmental Achievement, and was honored with the Ulysses Medal in 2013 by University College Dublin, the 2019 President's Medal of the British Ecological Society and served as President of the Ecological Society of America and Society of Nematologists. She received a B.A. and Ph.D. at the University of Kentucky, Lexington.

ZHIHENG WANG is Professor of College of Urban and Environmental Sciences at Peking University. Dr. Wang received his Ph.D. at Peking University in 2009. After that he worked as a postdoctoral researcher at University of Zurich (2009-2010) and University of Copenhagen (2010-2011), and then received the Marie Curie Fellowship at University of Copenhagen (2011-2012). In 2012, he was recruited as an assistant professor at University of Copenhagen. In 2013, he joined Peking University as an assistant professor, and was promoted as tenured associate professor in 2019 and Boya Professor in 2022. He is a macroecologist, and has worked extensively on large-scale patterns of species diversity and biodiversity conservation under global changes. Since 2005, he has been working on the Database of China's Woody Plants, which contains the distributions and climatic niches of the 11,405 woody species in China. In the last a few years, his team compiled two new databases, i.e. the Database of Seed Plant Distributions in Eastern Eurasia and the Database of Seed Plant Functional Traits in Eastern Eurasia. His current research is focused on how climate and macroevolution influence species diversity, and the conservation of biodiversity under global changes. He has published two books and more than 100 peer-reviewed papers, and his work has been cited for more than 8500 times (Google Scholar).

JUDITH N. WASSERHEIT (NAM) (U.S. Committee Member) is Professor of Global Health, Medicine and Epidemiology, and Co-Director of the Alliance for Pandemic Preparedness at the University of Washington. Dr. Wasserheit has worked extensively at the interface of sexually transmitted infections (STI) and HIV clinical-epidemiological research, programs and policy in the U.S. and globally. Research to evaluate approaches that improve both environmental sustainability and human health, and pandemic disease preparedness are more recent areas of focus. Previously, she was the Founding Chief of the U.S. National Institutes of Health's STD Research Branch; Director of the U.S. Centers for Disease Control and Prevention's STD/HIV Prevention Program, Director of the HIV Vaccine Trials Network, and Chair of the University of Washington Department of Global Health. She was the founding Board Chair of the Consortium of Universities for Global Health and assisted in the development of the Chinese Consortium of Universities for Global Health. She has worked in Bangladesh, Colombia, Egypt, Indonesia, Kenya, Thailand and Zambia. Her development of the concept of epidemiological synergy between HIV infection and other sexually transmitted infections has had a major influence on HIV prevention policy and programs worldwide. Dr. Wasserheit has broad experience working with agencies, governments, and colleagues on STD and HIV research, policy and programmatic issues. She is a member of National Academy of Medicine, the American Epidemiological Society, the Johns Hopkins Society of Scholars, and was a London School of Hygiene & Tropical Medicine's Heath Clark Endowed

Lecturer. Dr. Wasserheit earned her M.D. from Harvard University, her M.P.H. from Johns Hopkins University, and her B.A. from Princeton University.

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JULIE WINKLER is a professor of Geography at Michigan State University. She is interested in many aspects of geography and climatology including synoptic and applied climatology, regional climate change, and climate scenario development and evaluation. Current and past research topics include heavy precipitation, nocturnal thunderstorms, low-level wind maxima, airflow within midlatitude cyclones, wildland fire risk, and the possible impacts of potential future climate change particularly on agriculture. Much of Dr. Winkler's research has focused on the Central Plains and Great Lakes region of the United States. She is a Fellow of the American Association of Geographers and the American Meteorological Society, and a recipient of the William J. Beal Outstanding Faculty Award at Michigan State University. Dr. Winkler served as President of the American Association of Geographers in 2013-2014. She has authored or co-authored over 75 peer-reviewed research articles. Dr. Winkler received her Ph.D. in Geography from University of Minnesota-Twin Cities.

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WEIQI ZHOU is a professor of urban ecology, and deputy director of the State Key Laboratory of Urban and Regional Ecology, Research Center for Eco-Environmental 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 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.

CHAODONG ZHU is Professor of the Institute of Zoology at Chinese Academy of Sciences, where he received his Ph.D. in Zoology. He has been trained as an insect taxonomist since 1993. He is currently leading a research group to study insect diversity and function, particularly focusing on pollinator bees and herbivore moths. Working with both morphology and DNA taxonomists, he is trying to explore and understand plant-bee and plant-moth-parasitoid species interactions networks. Nearly half of his team members are sampling insects all over China to find and name new species, while another half are staying at the biodiversity and ecosystem function experiment sites (BEF-China) to monitor and study insect dynamics. With more than 250 papers published in peer-reviewed journals, Dr. Zhu is also working as a full professor on biosystematics and evolutionary biology in the College of Biological Sciences/International College, Chinese Academy of Sciences. He was selected to chair the Special Committee of Pollinator Insects, Chinese Entomological Society, Vice President of Beijing Entomological Society, and leading scientist of Insect Monitoring Network, Sino-BON.