

# Asian Ecology Section Newsletter

## *New Elected Section Chair*

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Dr. Shuijin Hu from the Department of Plant Pathology at North Carolina State University has been elected as AES chair, 2013-2015.

Dr. Shuijin Hu is a professor of ecology at North Carolina State University. He received his BS in Agronomy from Hefei Institute of Science and Technology (1983), MS in genetics from Nanjing Agricultural University (1987), and PhD in ecology from the University of Georgia (1994). Prior to joining the NCSU faculty, he was a Research Associate at UC Davis and a National Science Foundation Postdoctoral Fellow at UC Berkeley. Dr. Hu's research interests center on plant-microbe interactions and their responses to both natural and anthropogenic perturbations.

He has extensive experience with microbial controls over C and N cycling in both natural and agricultural ecosystems. He has been actively participating collaborative projects in China and South Korea, and co-organized the 40th Annual

Air Pollution Workshop. Dr. Hu has authored and co-authored over 60 publications in peer-refereed journals, including *Nature*, *Science*, and *Ecology Letters*. In addition to having taught seven courses to undergraduate and graduate students, he advised or co-advised seven graduate students and supervised six postdoctoral fellows as well as ten visiting scientists from China, India and South Korea. Dr. Hu was the first recipient of the *William Boright Hewitt & Maybelle Ellen Ball Hewitt Award* of the American Phytopathological Society (2002) and was also recognized by an outstanding young scientist award from the National Natural Science Foundation, China (2002).



*Dr. Shuijin Hu, Professor of Ecology, Department of Plant Pathology, North Carolina State University*

## *Member News*

### *Climate change & the rise and fall of Chinggis Khan's Mongol Empire*



*Dr. Hanqin Tian and colleagues in the Orkhon Valley, Mongolia*

Dr. Hanqin Tian, AES Chair together with a team of scientists from West Virginia University, Columbia University, Princeton Advanced Institute of Studies, and National University of Mongolia, conduct field studies in the Orkhon Valley, the seat of the Mongol Empire (see picture) for investigating the role of energy and water in the rise and fall of the Mongol Empire, the largest contiguous land empire in the history of the world. The success of the Mongol Empire is a historical enigma. At its peak in the late 13th century, the empire controlled areas from the Hungarian grasslands to southern Asia and Persia. Powered by domesticated livestock, the Mongol Empire grew at the expense of farmers in Eastern Europe, Persia, and China. What environmental factors contributed to the rise of the Mongols? What factors influenced the disintegration of the empire by 1300? Energy is considered as critical for

human and natural systems to function, yet few studies have examined the role of energy in the success and failure of past societies. As modern energy sources become increasingly taxed, examples of how past societies adapted to changing energy sources is critical. In a similar way, as societies become rapidly urbanized, freshwater will be threatened. Water allows biological systems to capture solar energy and humans to capture, transform, and allocate this energy through their development of social and political systems. This project combines archaeological and historical data from the Mongol Empire with tree-ring records of past climate, modeled estimates of grassland productivity and livestock abundance, and lake sediment records of water quality to illuminate the role of energy and water in the history of the Mongol Empire.

This project is supported by the NSF Dynamics of Coupled Natural and Human Systems (CNH) Program and the NSF Office of International Science and Engineering. This interdisciplinary research project enhances basic understanding on multiple topics, including the role of water and energy in human and natural systems, the change in climate from the warm Medieval Climate Anomaly to the cold Little Ice Age, the application of lake sediment data for understanding impacts of livestock on water quality, and relationships between climate variation and ecosystem health. Understanding the role of water and energy in the evolution of a historical society of international renown will help advance consideration of current perspectives on modern systems and their dependence on energy and water sources. Tree-ring records developed through this project allow hundreds of wooden artifacts to be dated, thereby providing an annual history of events at Karakorum, the ancient capital of the Mongol Empire. This project also provides education and training opportunities for undergraduate students, graduate students, and post-doctoral fellows in an international collaborative context.

### *AES members selected as 1000 Young Talents*

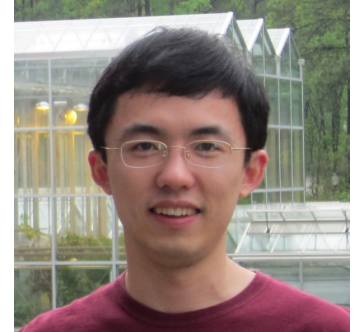
Dr. Lingli Liu, the Secretary of AES, and Dr. Yuanhe Yang, the 2012 AES Early Career Awardee, have been selected as 1000 Young Talents by China's Central Government in recognition of their outstanding achievements in ecological research.

## Member News

### *Kai Zhu from Duke received DDIG*

Kai Zhu from Nicholas School of the Environment at Duke University recently received a Doctoral Dissertation Improvement Grant (DDIG) in the Directorate for Biological Science from the National Science Foundation for his research on the general trends of tree responses to climate change in the eastern United States.

One key question in forest ecology is whether tree species can keep pace of climate change by changing their own geographic distribution. It has been found in the eastern US forests, the climate mediate tree migration substantially lags behind the fast changing climate. To better understand such a lag in responses, Zhu proposes to explore how tree change their climatic requirements through life history based on the rationale of dependence of the future of forests on current tree responses to climate variations. Supported by DDIG, Zhu will analyze the forest inventory data of seedlings and adult trees with combined efforts of ecology, forestry and information technologies.

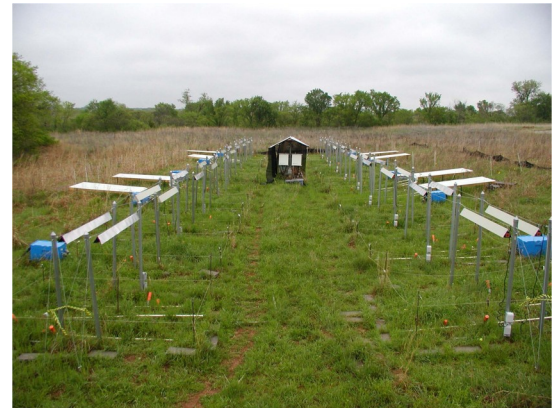


*Kai Zhu, PhD candidate, Nicholas School of the Environment, Duke University*

### *Meng Lu and colleagues published a paper in Ecology*

Dr. Meng Lu, a former PhD student from the Institute of Biodiversity Science at Fudan University, Shanghai, China, and now a postdoctoral research fellow at the Smithsonian Environmental Research Center, and colleagues, recently conducted a meta-analysis on the responses of ecosystem carbon cycle to experimental warming. A paper on this study was recently published in *Ecology* in March 2013 (Lu M, XH Zhou, YQ Luo, CM Fang, Q Yang, JK Chen, X Yang, and B Li. 2013. Responses of ecosystem carbon cycle to experimental warming: a meta-analysis. *Ecology*, 94:726-738; correspondence to bool@fudan.edu.cn).

Buildup of carbon dioxide and other greenhouse gases induces global warming. In return, elevated temperature potentially alters terrestrial carbon cycle. Numerous manipulative experiments have been conducted to show diverse responses of ecosystem carbon fluxes and pools to experimental warming. Dr. Lu and colleagues synthesized these results to better understand the general patterns of ecosystem carbon cycle responses and feedbacks to climate warming, with a special focus on belowground carbon dynamics, such as litter decomposition, litter, root and soil carbon contents, microbial biomass carbon, and dissolved organic carbon. They revealed that warming stimulates gross ecosystem photosynthesis, net primary production, and plant carbon pools from both above- and belowground parts, and accelerates litter mass loss, soil respiration, and dissolved organic carbon leaching. However, they did not find that climate warming triggers strong positive carbon-climate feedback in terrestrial ecosystems, as the stimulation of plant-derived carbon influx basically offset the increase in warming-induced efflux and resulted in insignificant changes in litter and soil carbon content. These results are also potentially useful for parameterizing and benchmarking land surface models in terms of carbon cycle responses to climate warming.



*A warming experiment by infrared heaters in a tallgrass prairie established in Oklahoma, USA.  
Photo credit: Y. Luo*

## 2013 AES Awards

### *AES Early Career Ecologist Award*



*Dr. Chaoqun Lu, Research Fellow, International Center for Climate Change and Global Change Research, and School of Forestry and Wildlife Sciences, Auburn University*

Dr. Chaoqun Lu is one of the winners of AES Early Career Ecologist Award. Dr. Lu is a research fellow in the International Center for Climate and Global Change Research, and the School of Forestry and Wildlife Sciences at Auburn University.

Dr. Lu's research focuses on understanding and quantification of terrestrial ecosystem responses to multiple global changes by process-based ecosystem model development, application, and data-model assimilation. She has published 27 peer-reviewed journal papers in *Global Change Biology*, *Global Biogeochemical Cycle*, *Ecological Application*, *Journal of Geophysical Research*, and *Frontier of Ecology and the Environment*, etc. The one published in JGR has been cited for 90 times.

One of the most important contributions of Dr. Lu is her pioneer work on reactive nitrogen enrichment and its role in carbon sequestration, greenhouse gas emission and food security in China. Her work has estimated the spatial and temporal patterns of nitrogen deposition onto China's land surface, the alteration of terrestrial carbon sequestration capacity in China by atmospheric nitrogen input, the nitrogen addition impacts on greenhouse gas emissions, and food benefit and climate warming potential of nitrogen fertilizer use in China.



*Dr. Lei Cheng, Professor, College of Life Sciences, Zhejiang University*

Dr. Lei Cheng is the other winner of AES Early Career Ecologist Award. Dr. Cheng was a postdoctoral fellow in the Department of Ecosystem Science and Management at the Pennsylvania State University, and is now a professor at Zhejiang University.

Dr. Cheng's research focuses on understanding the impacts of global change factors on belowground processes and how these changes feed back to climate change. He has publications in *Ecology Letters*, *PLoS One* and *Science*.

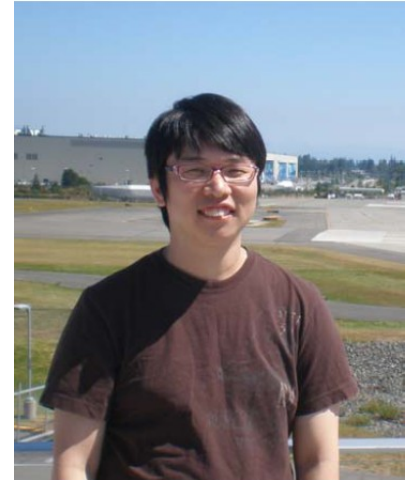
Dr. Cheng has recently emphasized on how arbuscular mycorrhizal fungi mediate organic C decomposition and N cycling under elevated atmospheric CO<sub>2</sub>, O<sub>3</sub> and N inputs. His findings suggest that CO<sub>2</sub>-enhancement of arbuscular mycorrhizal fungi accelerate C transfer from terrestrial soils to the atmosphere, alleviating the role of terrestrial ecosystems in mitigating the rise of atmospheric CO<sub>2</sub> and climate warming.

## 2013 AES Awards

### *AES Outstanding Graduate Student Award*

Jiaqi Tan is the winner of the AES Outstanding Graduate Student Award. He is a PhD candidate in the School of Biology at the Georgia Institute of Technology.

Tan is interested in exploring the interactive effect of ecological and evolutionary processes on biodiversity. His recent findings suggest that environmental fluctuation promotes biodiversity of evolving communities by allowing more emerged species to coexist through temporal niche dynamics. These studies have been published in the *American Naturalist*, *Ecology* and *Nature Communications*.



*Jiaqi Tan, PhD candidate, School of Biology, Georgia Institute of Technology*

### *Membership Information*

Asian Ecology Section (AES) was established in 1994, and now has more than 100 members. Our activities through the past year focused on promoting the professional development of young members by providing more opportunities to establish their professional networks, and fostering communications and collaborations among ecologists from Asia and other regions.

AES aims to promote communications and collaborations among ecologists who are interested in the advancement of ecology in Asia, and to promote ecological research and education in Asia. Any member of any class of the Ecological Society of America who desires may become a member of the Asian Ecology Section by a payment of \$5 section annual dues when renewing the ESA membership. Membership can be renewed online or by mail. Details can be found at: [http://www.esa.org/member\\_services/joinrenew.php](http://www.esa.org/member_services/joinrenew.php). When you become an AES member, you will be eligible to apply for the AES Outstanding Student Award and the AES Early Career Ecologist Award. AES also invite you to get connected through our new Facebook page by click the like button: <https://www.facebook.com/ESAAsianEcologySection>. We encourage you to share your research, interesting thoughts, experiences, readings and online articles with us.

### *Call for Contribution to the Next Newsletter*

Dear AES members:

We would like to make the newsletter a forum for communication and strongly encourage you to submit contributions for next newsletter. Potential contributions can be, but not limited to

- Your willingness to accept interview about your career path and research story by AES;
- Your experiences and suggestions on ecological research to fellow and future ecologists;
- Thoughts and ideas on broader issues such as environmental issues, higher education and outer reach.

Your recent achievement, awards, promotions, relocation and publications. Advertisement for conference and symposium information. Contributions can be sent to Chi Yuan ([cyuan@email.arizona.edu](mailto:cyuan@email.arizona.edu)) and Jiaqi Tan ([jtan@gatech.edu](mailto:jtan@gatech.edu)). Related high quality photographs are always encouraged with all the submissions.

## *AES Activities at this Year's ESA Meeting*

### *Booth and business meeting/mixer at ESA*

AES will organize a booth and a business meeting/mixer at this year's meeting.

The booth will be held everyday during poster sessions. The business meeting and mixer will be held on Tuesday, August, 2013 at 6:30 pm, at Room 200F, Minneapolis Convention Center.

### *Networkings for Students and Early Career Professionals*

ESA will again host the *Networking for Students and Early Career Professionals* event at this year's Annual Meeting. AES members will participate as mentors. The event will take place on Sunday, August 4<sup>th</sup>, and is geared towards mentoring students of various levels, ranging from undergraduates to post-docs. Everyone is welcome to attend.

### *Symposium "Ecological Sustainability in a Telecoupled World"*

Dr. Jianguo Liu from Michigan State University has organized an symposium themed "Ecological Sustainability in a Telecoupled World" at this year's ESA Annual Meeting.

This symposium will be held on the morning of Thursday, August 8, 2013 at Room M100EF, Minneapolis Convention Center.

Speakers include Jane Lubchenco, Peter Gleick, Karen C. Seto, Thomas Hertel, Joanne Gaskell, and Steven J. Davis.

Following is the abstract of this symposium.

New and powerful interactions between distant places are escalating across the world and are profoundly shaping ecological sustainability from local to global scales. Such distant interactions include trade, species invasions, human migration, direct foreign investment, and transnational land deals. However, particular distant interactions have largely been studied in isolation, and findings have been fragmented. In this symposium, speakers will present exciting work related to an integrated framework called telecoupling – socioeconomic and environmental interactions over distances. The umbrella concept of telecoupling is a natural extension of concepts such as coupled human and natural systems, which tend to focus on couplings within a specific place. Although distant forces are sometimes considered, they are often treated as exogenous variables and little effort has been directed toward understanding how telecouplings affect sustainability in multiple places. Because changes in one place can drastically shape both socioeconomic and environmental outcomes in distant places and can cause cascading and spillover effects in many other places, it is essential to treat distant forces as endogenous variables and explicitly analyze feedbacks as part of an integrated system. Although many disciplines have addressed distant interactions separately, numerous questions remain: How do different types of distant interactions enhance or offset sustainability at different locations? How may telecouplings be facilitated to enhance sustainability? To answer these and other related fundamental questions, we have chosen a number of cutting-edge research projects that have taken innovative approaches to address complex issues in telecouplings and sustainability across different places. The symposium covers rapidly developing countries (e.g., China) and developed countries (e.g., the U.S). It includes a diverse set of ecosystems (e.g., urban, agricultural) from around the world. Each speaker will present novel insights from a systems perspective and use the study to help consolidate the telecoupling framework. The symposium will begin with an introduction and end with a synthesis and dialogue among the speakers and the audience. The synthesis will compare and contrast the studies, provide insightful perspectives, and discuss future directions for telecouplings and sustainability at multiple locations.