Special Issue

Multiscale Nitrogen Emission and Its Impacts

Message from the Guest Editors

Nitrogen is an essential element for plant growth, but it is tightly coupled with other nutrients (e.g., carbon, phosphorous) that influence biological productivity and the structure and functioning of ecosystems in the long run. Since the pre-industrial era, the global nitrogen cycle has been altered due to the expansion of agricultural lands, biomass burning, the combustion of fossil fuel, and the cultivation of leguminous crops that carry out biological nitrogen fixation. “Nitrogen cascade” has been raised as an issue by previous scientists as a substantial amount of reactive nitrogen has been introduced into ecosystems. Anthropogenic perturbation of the global nitrogen cycle contributed approximately two-thirds of the annual flux of reactive nitrogen into the atmosphere in the early 21st century, including oxides of nitrogen (NO*x*), nitrous oxide (N2O), and ammonia (NH3). These nitrogen-containing gases remain a matter of great concern to human health and the environment. Thus, in order to sustain human and environmental health, it is essential to have a complete quantification of these N-containing gases and their effects on terrestrial and aquatic ecosystems.

Guest Editors

Dr. Rongting (Tina) Xu

1. Forest Ecosystems and Society, Oregon State University, Corvallis, OR, USA
2. Climate and Ecosystem Sciences Division, Berkeley National Laboratory, Berkeley, CA, USA

Dr. Naiqing Pan

1. State Key Laboratory of Urban and Regional Ecology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, China
2. International Center for Climate and Global Change Research, School of Forestry and Wildlife Sciences, Auburn University, Auburn, AL, USA

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Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
sustainability@mdpi.com

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Prof. Dr. Marc A. Rosen
Faculty of Engineering and Applied Science, University of Ontario Institute of Technology, Oshawa, ON L1G 0C5, Canada

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