

Editorial

<https://doi.org/10.48130/nc-0025-0001>Inaugural editorial of *Nitrogen Cycling*Xiaoyuan Yan^{1*} and Deli Chen^{2*}

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Nitrogen (N) is an essential nutrient for all forms of life on our planet, as it plays a fundamental role in biogeochemical processes that directly and indirectly influence agricultural productivity, ecosystem health, and global climate change. Human activities, especially the widespread use of synthetic fertilizers, have significantly altered the natural N cycle across the atmosphere, hydrosphere, biosphere, and soils. While synthetic N fertilizers have sustained about half of the world's population, they have also caused severe environmental problems, including water eutrophication, air pollution, greenhouse gas emissions, and human health risks. These impacts underscore the urgent need to quantify N budgets on both global and regional scales, elucidate the key mechanisms underlying N cycling, assess its ecological and societal impacts, and promote the sustainable and science-based use of N inputs.

Over the past three decades, substantial progress has been made in understanding N budgets, management strategies, utilization efficiency, and the environmental and climatic consequences of excessive N use. The N cycle is now widely recognized as a critical component in achieving the United Nations' 17 Sustainable Development Goals (SDGs), intersecting with objectives such as 'Zero hunger', 'Clean water and sanitation', and 'Global health and well-being'.

To meet the demands of a growing global population and dietary changes while reducing N-related pollution and achieving the SDGs, future efforts must focus on: (1) Accurately quantifying N flows and fates across scales and systems; (2) Exploring N cycling mechanisms across Earth's major spheres using innovative approaches; (3) Developing new generation of models that integrate biophysical processes, human activity, climate change and socioeconomics; (4) Evaluating the environmental and health impacts of N through cost-benefit analyses; and (5) Designing new technologies, practices and policies that involve key stakeholders across sectors.

We are pleased to introduce *Nitrogen Cycling*, a new peer-reviewed journal sponsored by the State Key Laboratory of Soil and Sustainable Agriculture, Institute of Soil Science, Chinese Academy of Sciences, Nanjing, China, and published by Maximum Academic Press. This multidisciplinary platform is dedicated to publishing high-quality research across all dimensions of N science - from

fundamental studies to applied innovations. The journal welcomes a broad range of contributions, including reviews, research articles, communications, perspectives, commentaries, and correspondence. Topics of interest include, but are not limited to: (1) N cycling processes across natural and managed ecosystems; (2) Microbial roles in N transformations; (3) Environmental and health implications of reactive N; (4) Strategies and technologies to enhance N use efficiency and mitigate N losses; (5) Modeling and simulation of N dynamics; and (6) Methodological advances in N research.

With a rigorous peer-review and a commitment to scientific excellence, *Nitrogen Cycling* aims to become a leading venue for advancing N-related research and fostering collaboration across disciplines and regions. We warmly invite researchers, engineers, and policy-makers to share their latest findings, exchange pioneering ideas, and contribute to solving one of the most pressing environmental challenges of our time. We extend our sincere thanks to the editorial board members, reviewers, and production team for their invaluable support and contributions.

We look forward to working together to advance N science and to seeing your impactful research featured in our pages.

Declarations

Competing interests

The authors declare that they have no conflict of interest.

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