Developing international reactive nitrogen policy and the uncertainties in land-atmospheric reactive nitrogen process

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Due to increased fossil fuel combustion and anthropogenic nitrogen use, the biogeochemical flow of nitrogen has exceeded the planetary boundary, causing various environmental problems due to reactive nitrogen. The 4th United Nations Environment Assembly (UNEA) in 2019 adopted a resolution on sustainable nitrogen management, which referred to the importance of integrated nitrogen management and efforts to reduce the total amount of waste nitrogen at the global level (In the resolution at UNEA4, the target was set to halve the nitrogen waste, but this was changed to a "significant reduction" at the UNEA5 in 2022). In the international discussion, it is planned that UN member countries will be encouraged to make national action plans for nitrogen reduction in each country. In other words, it is highly likely that Japan will be required to report on its national waste nitrogen inventory and take actions for nitrogen waste reduction, and it is essential to understand the nitrogen flow and balance at the national scale.

This presentation provides a review of the latest global nitrogen budget studies, with a particular focus on atmospheric-land surface nitrogen processes. Similarly, our work on estimating the reactive nitrogen budget in Japan will be introduced and its uncertainties will be discussed. Finally, the impact of NH_3 combustion in thermal power plants on the nitrogen budget will be presented.

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