Northeast China faces high levels of nitrogen pollution, study finds

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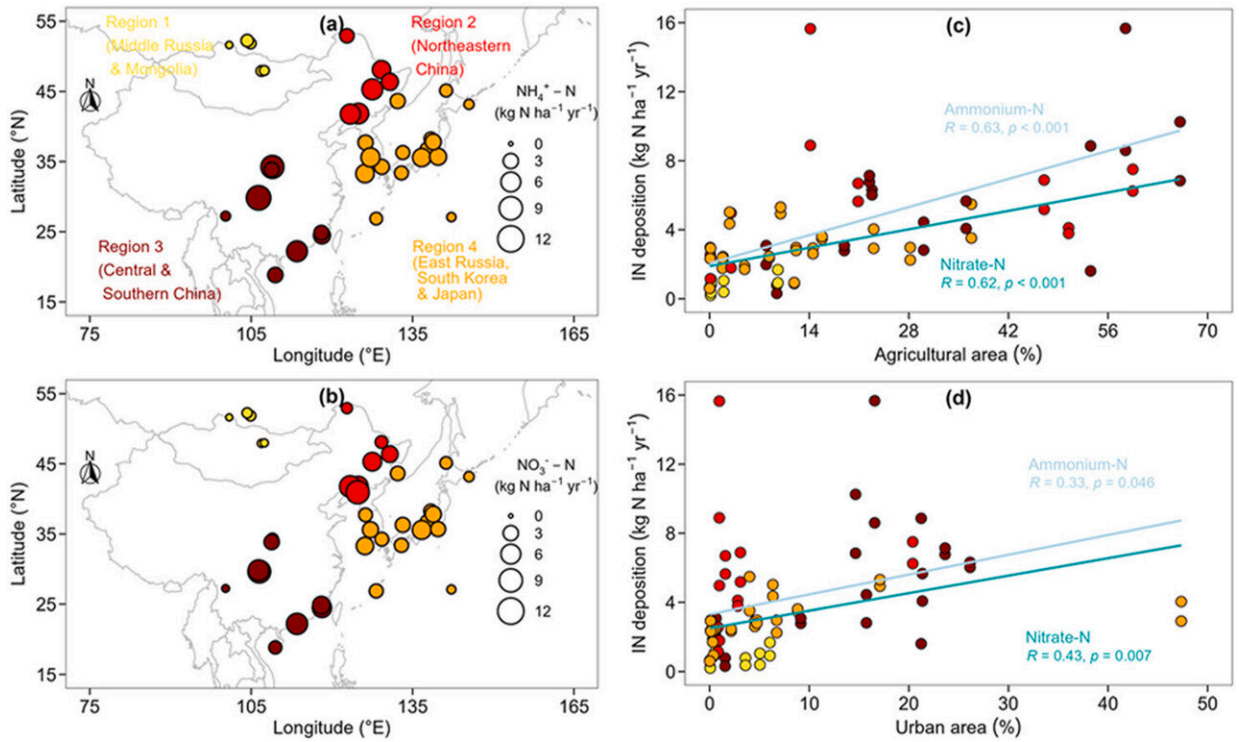

Credit: *Journal of Environmental Management* (2023). DOI: 10.1016/j.jenvman.2023.119343

A new study has revealed the extent and sources of nitrogen pollution in Northeast Asia, a region that suffers from severe air pollution and environmental degradation.

Researchers from the Institute of Applied Ecology of the Chinese Academy of Sciences used data from 38 sites in China, Russia, Mongolia, Korea, and Japan to analyze the amount and origin of nitrogen compounds falling from the air to the land and water.

The study, titled "Patterns and drivers of atmospheric inorganic nitrogen deposition in Northeast Asia," was published in the *Journal of Environmental Management*.

They found that the total inorganic nitrogen (wet) deposition in Northeast Asia was about 7.5 kilograms of nitrogen per hectare per year, which is twice as high as the level in Europe and the United States. They also showed that nitrogen deposition varied widely across the region, with some hotspots receiving more than 10 kilograms of nitrogen per hectare per year.

These areas included northeastern China, as well as central and southern China. Most of this nitrogen deposition came mainly from the agricultural, industrial and transportation sectors, and occurred mainly in autumn and winter.

Nitrogen pollution can have negative effects on both natural and human systems, the researchers warned. Excess nitrogen can cause eutrophication, acidification, and loss of biodiversity in terrestrial and aquatic ecosystems. It can also contribute to the formation of fine particulate matter ($PM_{2.5}$) and ozone depletion, which are harmful to human health.

The study suggested that reducing nitrogen emissions from various sectors, such as coal-fired power plants and vehicles, as well as from agricultural and urban expansion, could help mitigate the problem of nitrogen pollution in Northeast Asia. It also called for more regional cooperation and monitoring to better understand and manage the

transboundary transport of nitrogen pollutants.

More information: Abubakari Said Mgelwa et al, Patterns and drivers of atmospheric inorganic nitrogen deposition in Northeast Asia, *Journal of Environmental Management* (2023). DOI: 10.1016/j.jenvman.2023.119343

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