

Drivers of nitrogen leaching changes in China's cropland

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Nitrate in groundwater aquifers has represented a major environmental problem worldwide, and fertilizer use accounts for more than 50% of the nitrogen leaching into groundwater in China (Gu et al., 2013). However, the patterns, trends, and the associated causes of Chinese N leaching remains subject to large uncertainty. The primary sources of this uncertainty are conflicting estimates of nitrogen inputs and the associated environmental conditions, yet none of previous estimates are based upon large-scale measurements and high-resolution activity data. Here, we quantify China's N leaching from croplands from 1990 to 2012, using updated and harmonized N input data, high-resolution environmental factors data, and a comprehensive dataset of Chinese N leaching observation networks. Two main tasks have been performed in this study: i) the magnitude and spatiotemporal patterns of N leaching over China's croplands from 1990 to 2012; ii) the drivers of the spatial variations, interannual variability and temporal trends of China's N leaching from croplands.