

研究报告

基于GIS技术的1991—2000年中国农田化肥氮源一氧化二氮直接排放量估计

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摘要 依据政府间气候变化专门委员会(IPCC)对农田N₂O排放因子的定义, 将气候和种植制度等N₂O排放的主控因素引入到估算方法中, 结合GIS技术估计了中国农田化肥氮导致的N₂O直接排放量的空间分布和年际变异. 结果表明, 在1991—2000年间由于化肥投入量的增加, 中国农田化学氮源N₂O排放呈上升趋势. 20世纪90年代的平均年排放量为204 Gg N₂O-N, 变幅为159~269 Gg N₂O-N, 排放量最高的年份出现在1998年, 而1992年排放量为最低. 估算结果的不确定性约为23%. 受施氮量和降水的影响, N₂O排放通量表现出明显的地区差异, 东部较高, 西北偏低.

关键词 [N₂O排放清单](#) [农田](#) [排放因子](#) [GIS](#) [不确定性](#)

分类号

Estimation of chemical fertilizer N-induced direct N₂O emission from China agricultural fields in 1991-2000 based on GIS technology.

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Abstract

Referring to the definition of agricultural field N₂O emission factor by the Intergovernmental Panel on Climate Change, the main controlling factors climate and cropping system were introduced to estimate the chemical fertilizer N-induced direct N₂O emission from China agricultural fields in 1991-2000, and a spatial inventory with 10 km×10 km resolution was developed by dint of GIS framework. The results indicated that there was an increasing trend in the annual direct N₂O emission, due to the increasing input of chemical fertilizer N. The mean annual emission in 1990s was estimated to be 204 Gg N₂O-N, ranging from 159 to 269 Gg N₂O-N, and the lowest and the highest emission occurred in 1992 and 1998, respectively. The uncertainty of the estimation was quantified to be about 23%. The spatial distribution of N₂O emission was characterized by higher flux in eastern China and lower flux in western China, which was mainly attributed to the application rate of chemical fertilizer N and precipitation.

Key words [inventory of N₂O emission](#) [agricultural field](#) [emission factor](#) [GIS](#) [uncertainty](#)

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