

朱佳雷,王体健,邓君俊,姜爱军,刘冬晴-长三角地区秸秆焚烧污染物排放清单及其在重霾污染天气模拟中的应用[J].环境科学学报,2012,32(12):3045-3055

长三角地区秸秆焚烧污染物排放清单及其在重霾污染天气模拟中的应用

### An emission inventory of air pollutants from crop residue burning in Yangtze River Delta Region and its application in simulation of a heavy haze weather process

关键词: [长三角地区](#) [秸秆焚烧](#) [排放清单](#) [霾](#) [数值模拟](#)

基金项目: [国家重点基础研究发展计划\(No.2011CB403406, 2010CB428503\)](#); [国家科技部公益行业\(气象\)科研专项\(No.GYHY201206011, GYHY200806001\)](#); [国家自然科学基金\(No.J1103410\)](#); [南京大学研究生科研创新基金\(No.2012CL09\)](#)

作者 单位

朱佳雷 南京大学大气科学学院,南京 210093

王体健 南京大学大气科学学院,南京 210093

邓君俊 中国科学院城市环境研究所,厦门 361021

姜爱军 南京气象局,南京 210019

刘冬晴 南京气象局,南京 210019

摘要: 根据2008年长三角地区江苏、安徽、浙江3省各地级市及上海市水稻、小麦、玉米、油菜4种农作物的年产量,结合谷草比、秸秆焚烧比例及排放因子建立了长三角地区秸秆焚烧大气污染物排放清单.结果表明:长三角地区秸秆焚烧产生的PM<sub>10</sub>、PM<sub>2.5</sub>、SO<sub>2</sub>、NO<sub>x</sub>、CO、EC、OC分别为36.8×10<sup>4</sup>、14.4×10<sup>4</sup>、1.5×10<sup>4</sup>、9.2×10<sup>4</sup>、20.8×10<sup>4</sup>、2.6×10<sup>4</sup>、12.2×10<sup>4</sup> t.秸秆焚烧污染物排放量较大的区域主要集中在江苏中北部和安徽北部.在区域大气环境模拟系统RegAEMS中考虑秸秆焚烧源的影响,针对2008年10月底江苏一次重霾污染天气事件进行模拟,发现考虑秸秆焚烧源后模拟结果有较大的改善.秸秆焚烧可以导致区域PM<sub>10</sub>、CO浓度上升30%以上,黑碳和有机物的消光贡献明显增强.区域输送研究表明,苏中地区、外省秸秆焚烧排放源对此次重霾污染的贡献分别达到32.4%、33.3%.

**Abstract:** An emission inventory of air pollutant from crop residue burning over Jiangsu, Zhejiang, Anhui and Shanghai in Yangtze River Delta Region in the year 2008 was developed, based on the data of crops including the production of rice, wheat, corn and rape in each prefecture-level city, the mass ratio of crop residue to grain, and the emission factors of crop residue burning. Emissions from crop residue burning over Yangtze River Delta Region were 36.8×10<sup>4</sup> t for PM<sub>10</sub>, 14.4×10<sup>4</sup> t for PM<sub>2.5</sub>, 1.5×10<sup>4</sup> t for SO<sub>2</sub>, 9.2×10<sup>4</sup> t for NO<sub>x</sub>, 20.8×10<sup>4</sup> t for CO, 2.6×10<sup>4</sup> t for EC, and 12.2×10<sup>4</sup> t for OC. The larger emissions were mainly in the middle and north of Jiangsu province and the north of Anhui province. In addition, a heavy haze episode caused by crop residue burning at the end of October, 2008 was simulated with Regional Atmospheric Environment Modeling System (RegAEMS) coupled with the crop residue emission inventory. Modeling results showed that when including the crop residue emissions, the simulations agreed with the observations much better. Besides, the concentrations of PM<sub>10</sub> and CO increased by over 30%, and the contributions from the extinction of black carbon and organic matters increased significantly due to crop residue burning. Crop residue burning in the middle of Jiangsu province and that outside the province most affected this haze pollution, with the contributions of 32.4% and 33.3%, respectively.

**Key words:** [Yangtze River Delta Region](#) [straw burning](#) [emission inventory](#) [haze](#) [numerical simulation](#)

摘要点击次数: 166 全文下载次数: 132

您是第1757364位访问者

主办单位：中国科学院生态环境研究中心

单位地址：北京市海淀区双清路18号 邮编：100085

服务热线：010-62941073 传真：010-62941073 Email: [hjkxxb@rcees.ac.cn](mailto:hjkxxb@rcees.ac.cn)

本系统由北京勤云科技发展有限公司设计