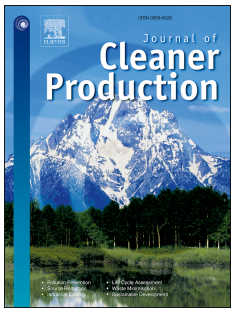
Accepted Manuscript



Methods for defining the scopes and priorities for joint prevention and control of air pollution regions based on data-mining technologies

Yujing Xie, Laijun Zhao, Jian Xue, H. Oliver Gao, Huiyong Li, Ran Jiang, Xiaoyan Qiu, Shuhai Zhang

PII: S0959-6526(18)30762-5

DOI: 10.1016/j.jclepro.2018.03.101

Reference: JCLP 12359

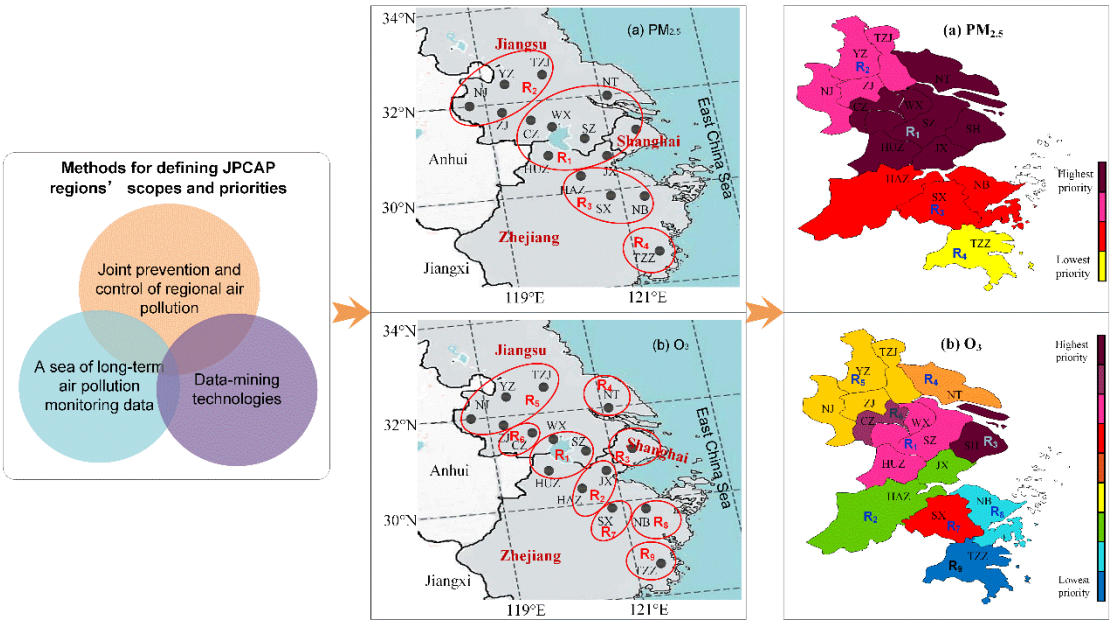
To appear in: *Journal of Cleaner Production*

Received Date: 13 July 2017

Revised Date: 20 February 2018

Accepted Date: 9 March 2018

Please cite this article as: Xie Y, Zhao L, Xue J, Gao HO, Li H, Jiang R, Qiu X, Zhang S, Methods for defining the scopes and priorities for joint prevention and control of air pollution regions based on data-mining technologies, *Journal of Cleaner Production* (2018), doi: 10.1016/j.jclepro.2018.03.101.



In order to improve the efficiency of joint prevention and control of regional air pollution (JPCAP), we, taking advantage of the big data of long-term pollution, proposed a new method for defining JPCAP scopes based on data-mining technologies and a new method for evaluating JPCAP regions' priorities based on the technique for order preference by similarity to an ideal solution (TOPSIS). And then we applied them to the case of Jointly Prevent and Control the pollutions of particulates smaller than 2.5 μm ($PM_{2.5}$) and ozone (O_3) in 15 cities of the Yangtze River Delta, China. Results showed that the 15 cities of the study region could be subdivided into four JPCAP sub-regions for $PM_{2.5}$, i.e. R_1={SZ, WX, CZ, JX, HUZ, SH, NT}, R_2={YZ, ZJ, TZJ, NJ}, R_3={HAZ, SX, NB}, and R_4={TZZ}, and nine for O_3, i.e. R_1={SZ, WX, HUZ}, R_2={HAZ, JX}, R_3={SH}, R_4={NT}, R_5={YZ, ZJ, TZJ, NJ}, R_6={CZ}, R_7={SX}, R_8={NB}, and R_9={TZZ}. The priorities order evaluated for the four sub-regions are $R_1>R_2>R_3>R_4$, and the nine sub-regions' order are $R_3>R_6>R_1>R_7>$ $R_4>R_5>R_2>R_8>R_9$. This perfectly match their actual conditions, suggesting that the new methods we developed are scientific and effective.