



## **Simulation of Nitrogen Deposition Pattern in China based on WRF-EMEP**

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Atmospheric nitrogen deposition problem in China is increasingly serious, causing harm to the local ecological environment. A major challenge in accurately simulating nitrogen deposition is to identify the key sources and pattern of each nitrogen components in dry and wet deposition. In this study, we coupled the EMEP model with the Weather Research and Forecasting (WRF) Model and simulated the China's nitrogen deposition pattern of 2015. The performance of the WRF-EMEP model results was verified and evaluated by the observed data of nitrogen deposition from Nationwide Nitrogen Deposition Monitoring Network (NNDMN). The distribution of oxidized nitrogen (OXN) and reduced nitrogen (RDN) were analyzed separately: 1. As for the dry deposition of OXN, the high value areas are concentrated in megacities or city-clusters, such as the Yangtze River Delta region, Pearl River Delta region and the Beijing-Tianjin-Hebei region. 2. The wet deposition of OXN is mainly spread to the whole eastern China by atmospheric circulation but the model result overestimated about 129.32% overall. 3. For the dry deposition of RDN, the result of simulation is 29.18% lower than the observation, the high-value ( $> 15 \text{ kg}\cdot\text{ha}^{-1}\cdot\text{yr}^{-1}$ ) areas of deposition are mainly concentrated in the Chengdu-Chongqing Region, Henan Province and Hebei Province. 4. For the wet deposition of RDN, the model simulation result was overestimated about 15.39%, and the high-value area was concentrated around Sichuan basin. Above all, the spatial pattern of the total nitrogen deposition in China has obvious regional difference, and the main regions of the deposition are concentrated in eastern China because of the relatively advanced industry and agriculture.