

Development and Application of the REACH Reduced Complexity Model for Policy Research in India

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Abstract

Air pollution has become a serious problem in recent years in many countries around the world. As per World Health Organization (WHO), around 18% of the total annual premature deaths are linked to ambient PM_{2.5} pollution in India. To curb pollution levels, policy makers rely on air quality models to simulate concentration changes in response to reduction measures. Accurate Chemical Transport Models (CTMs) are used to estimate impacts of air quality over a region. These CTMs are computationally expensive to run and often require trained personal. To overcome these limitations, reduced complexity models (RCMs) are an alternative tool for policy analysis. In this work, development and use of Rapid Estimation of Air Concentrations for Health (REACH), RCM tuned for the Indian region is presented. REACH includes gaussian plume dispersion with simple atmospheric chemistry. The model could be used to create concentration changes in response to unit emissions change (Source-Receptor matrices) over each grid cell. The S-R matrices then could be used for estimate air quality, health and economic impacts from any emission intervention. The model is easy to use and could be easily implemented over any desired region of interest. The REACH-India model setup is validated with AQ data from Central pollution control board's continuous ambient air quality monitoring stations (CAAQMS). The model setup is also used to estimate transboundary impacts with sectoral contributions.

Early Career Scientist

YES, I am an early career scientist.

IGAC Activities

MAP-AQ: Monitoring, Analysis and Prediction of Air Quality, ACAM: Atmospheric Chemistry and the Asian Monsoon, GEIA: Global Emissions Initiative

IGAC Regional Working Groups

MANGO: Monsoon Asia and Oceania Networking Group