

Government of India
Ministry of Earth Sciences

PRESS RELEASE

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**Development of an Air Quality Early Warning System for
Delhi**

Hon'ble Science & Technology, Earth Sciences; Environment, Forest & Climate Change Minister Dr Harsh Vardhan today unveiled an Air Quality Early Warning System for Delhi developed by the Ministry of Earth Sciences (MoES). This system is designed to predict extreme air pollution events and give alerts to take necessary steps as per Graded Response Action Plan (GRAP) of the Government of India.

Hon'ble Minister has also released the high resolution Emission Inventory for Delhi city and surrounding regions for major pollutants developed by the scientists of MoES.

The air pollution system has been developed jointly by the scientists at Indian Institute of Tropical Meteorology (IITM), Pune, India Meteorological Department and National Centre for Medium Range Weather Forecasting (NCMRWF). The warning system consists of a) real time observations of air quality over Delhi region and details about natural aerosols like dust (from dust storms) and particulate matter using different satellite data sets b) Predictions of air pollutants from two different air quality prediction systems based on state-of-the-art atmospheric chemistry transport models and c) Warning Messages and Alerts and Bulletins.

The prediction systems were developed by scientists of MoES institutions with the technical support from the National Centre for Atmospheric Research (NCAR) and the Finnish Meteorological Institute (FMI). The prediction part of the system consists of two modelling framework, one is based on NCAR atmospheric chemistry transport model and the second one is based on Finnish Meteorological Institute model. The modelling framework typically consists of a high resolution weather prediction model with an atmospheric chemistry transport model. Both the models have data assimilation facility, which can assimilate data from satellites on dust aerosols, particulate matter from stubble burning and other air pollutants like SO₂ and NO₂. The models will take into

account the background aerosols and pollutants, long range transport of dust from dust storms and particulate matter from stubble burning. The predictions are now available up to 72 hours lead time.

A new website has been developed for archiving all the observational and prediction products. The website will be accessed by the officials of Environmental Pollution Authority (EPA) and the Central Pollution Control Board (CPCB) for taking necessary steps depending upon the requirements. The new early warning system is meant to issue alerts on large scale air pollution events which may occur over the Delhi region.

MoES will be making further attempts to assimilate more data of other pollutants and also to improve accuracy of predictions with the technical support from the NCAR, USA and Finnish Meteorological Institute.

Scientists at IITM Pune also have carried out a mega emission inventory campaign involving around 140 students to map all possible local sources of air pollution with around 37,500 hours of work. The final product with **400 m x 400m** high-resolution emission inventory of Delhi and fringe area of all eight important air pollutants (like PM_{2.5}, PM₁₀, NO_x, CO, SO₂, BC, OC and VOCs) has been prepared and being released. Ground level activity data about emissions from as many as 23 different sources of pollution were collected. The emission inventory suggests that there is a substantial increase of emissions from transport and industrial sector, while the contributions from residences has shown a substantial decline.
