

Megacities, air quality and climate: Seamless prediction approach

Alexander Baklanov (1), Luisa T. Molina (2), and Michael Gauss (3)

(1) World Meteorological Organization (WMO), Research, Geneva, Switzerland (abaklanov@wmo.int), (2) Molina Center for Energy and the Environment, CA, USA, (3) Norwegian Meteorological Institute, Bergen, Norway

The rapid urbanization and growing number of megacities and urban complexes requires new types of research and services that make best use of science and available technology. With an increasing number of humans now living in urban sprawls, there are urgent needs of examining what the rising number of megacities means for air pollution, local climate and the effects these changes have on global climate. Such integrated studies and services should assist cities in facing hazards such as storm surge, flooding, heat waves, and air pollution episodes, especially in changing climates. While important advances have been made, new interdisciplinary research studies are needed to increase our understanding of the interactions between emissions, air quality, and regional and global climates. Studies need to address both basic and applied research and bridge the spatial and temporal scales connecting local emissions and air pollution and local weather, global atmospheric chemistry and climate. This paper reviews the current status of studies of the complex interactions between climate, air quality and megacities, and identifies the main gaps in our current knowledge as well as further research needs in this important field of research.

Highlights

- Climate, air quality and megacities interactions: gaps in knowledge, research needs.
- Urban hazards: pollution episodes, storm surge, flooding, heat waves, public health.
- Global climate change affects megacities' climate, environment and comfort.
- Growing urbanization requires integrated weather, environment and climate monitoring systems.
- New generation of multi-scale models and seamless integrated urban services are needed.

Reference

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