

Megacities: A New Focus for Weather and Climate Services

A side event held on the 25th of May during the WMO 16th Congress highlighted the growing need for weather, climate and environmental services targeted towards megacities.

“Seventy percent of the world’s population will be in urban areas by 2050,” said Mr. Michel Béland, President of the WMO Technical Commission for Atmospheric Sciences. “That will have a great impact on the types of services we provide to cities. What is needed is quite different from a typical forecasting model.”

Concentrated transport, heating and industry leads to specific weather and climate patterns, as does the geographic particularities of urban areas, often located in coastal areas, and the densely constructed environment. Examples of local patterns include heat fluxes, small-scale turbulent flows, chemical weather and contrasting albedos. Among the multidisciplinary threats that arise are wind storms, poor air quality, flooding, traffic impacts, and amplification of sea level rise and storm surges.

“Many of the world’s megacities are already beyond the air quality guidelines recommended by the World Health Organization,” noted Liisa Jalkanen, manager of the GAW Urban Research Meteorology and Environment (GURME) project. WMO is conducting modelling, capacity building and pilot projects that focus on air quality forecasting, workshops and training. GURME pilot projects have recently enhanced capabilities in Shanghai, Latin America and India.

A Model for Megacities

The Shanghai Multihazard Early Warning System was singled out as a prototype for addressing weather, climate and environmental issues in megacities. The initiative, developed jointly with WMO through GURME, the Shanghai Meteorological Bureau (SMB) of CMA, and the Shanghai People’s Municipal Government, includes a health-meteorology forecasting service, and cooperation at the municipal level with many government departments. “Our experience shows that we need better understanding on atmospheric physics and chemistry including the effects of “urban ovens” and “urban chimneys”; we need new types of measurements and forecasts; and we need multidisciplinary teams,” said Tang Xu, Director-General of SMB.

Alexander Baklanov of the Danish Meteorological Institute shared results of the European Union MEGAPOLI project (Megacities: Emissions, Impact on Air Quality and Climate, and Improved Tools for Mitigation and Assessment), which focuses on multi-scaling from street to global levels and vice versa. “Megacities, air quality and climate have complex effects on each other,” he noted. “Cities see a local, meso-scale impact of greenhouse gas emissions and urban heat islands on climate. At a regional level, the impact is still unclear.”

A new initiative proposed by the Technical Commission for Atmospheric Sciences, through the Global Atmosphere Watch (GAW) and the World Weather Research Programme (WWRP) will mobilize some, but not all, of the research to address the unique and growing needs related to urban areas and megacities, Mr Béland added.

WMO is also developing a report on megacities with the International Global Atmospheric Chemistry Project (IGAC), to be issued later this year.

For more information:
<http://www.megapoli.info>