

## **Challenge and Opportunities in Urban Meteorology Research and Forecast\***

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**Abstract.** An international workshop on urban meteorology: observation and modeling, was jointly held by the Institute of Urban Meteorology (China) and the National Center for Atmospheric Research (US) in Beijing, October, 2004. The workshop was intended to share recent progress in urban meteorological research, discuss issues related to research and development priorities faced by diverse Chinese institutions, and explore collaboration opportunities between Chinese and US research institutions. This article summarizes the major issues discussed at the workshop, including observation on urban boundary layer, urban landuse modeling, socio-economic impacts of weather and climates, and air quality in urban environment. It includes recommendations for future urban meteorology observational and modeling research, and potential collaborative opportunities between China and US.

**Keywords:** urban meteorology, urban boundary layer, observation, landuse, urban modeling, socio-economic impacts, air quality.

Today there are over 400 cities in the world with populations over 1 million and in the foreseeable future, virtually all population growth is projected to occur in urban areas. From the United Nations' report, World Urbanization Prospects (the 2003 revision)<sup>[1]</sup>: the world's urban population continues to grow faster than the total population of the world. In 2003, about 3 billion people, that is nearly half the world's population, live in urban areas. By 2030, the urban population is expected to rise to about 5 billion, while the rural population is anticipated to decline slightly from 3.3 billion in 2003 to 3.2 billion in 2030. By 2007, the urban population is projected to exceed 50% of the total population. This will mark the first time in history that the world has more urban than rural residents. Along with the increasing urban population, the number of "mega cities" (cities with 10 million or more inhabitants) will also increase from 20 in 2003 to 22 in 2015. The number of cities with 5 million or more inhabitants is projected to rise from 46 in 2003 to 61 in 2015.

Such rapid expansion of cities and increasing population are posing formidable challenges to the world community. For instance, urban environmental issues are becoming increasingly important within the cities of the developing country and, especially for mega cities. This has serious impacts not only on the health and welfare of urban residents, but also on weather and climate patterns