

**ADVANCING URBAN DISPERSION AND AIR QUALITY MODELS USING A
COMMUNITY-BASED HIGH RESOLUTION BUILDING AND URBAN DATA BASE
SYSTEM**

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ABSTRACT

Improved accuracy of transport, air quality and atmospheric dispersion simulations applicable to situations in our population centers is an important goal. However, the reliability of such simulations is limited by the quality of its input data such as land use, and boundary layer parameterizations. In these areas, the flow fields, meteorology fields and dispersion parameters are greatly impacted by complex distribution of building morphological structures. Thus, current and future meteorological modeling systems for urban applications must accommodate such features, appropriately, so as to achieve the desired accuracy. To address these challenges, we describe the National Urban Database and Access Portal Tools (NUDAPT), an undertaking to develop data bases containing new and comprehensive sets of buildings, trees and other morphological features in metropolitan centers and related high resolution land use along with a portal retrieval system. NUDAPT will be capable of producing gridded daughter products including the current suite of new urban parameterizations for systems such as MM5 and WRF. Ancillary grid based data including diurnal population and traffic, energy usage, will be incorporated in NUDAPT so as to encourage and facilitate linkages to human exposure models.

In the spirit of model harmonization, a core-design feature is the utilization of web-Portal technology to facilitate data retrievals and handling, thus enabling NUDAPT to provide a “Community-based” modeling resource. While the initial prototype is Houston Texas, the NUDAPT will be a resource providing a capability for eventual extensibility to all cities. Further, in the context of model harmonization, we envision the NUDAPT concept to facilitate and promote a wide range of model experiments and targeted R&D studies leading to improved parameterizations. For example, model sensitivity and numerical experiments to compares results of different BL parameterization schemes and other such studies can be promoted and undertaken throughout the modeling community. Attributes from NUDAPT contributing to model harmonization using examples of MM5 and WRF meteorology, air quality and dispersion simulations for Houston is illustrated.

EXTENDED ABSTRACT NOT SUPPLIED