

# MMM SEMINAR SERIES



## *Spatial Variability in the Diurnal Evolution of Planetary Boundary Layer Heights in a Coastal-Urban Environment*

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*CIWRO, OU-SoM, and NSSL*

The planetary boundary layer (PBL) height is a crucial parameter that determines the vertical extent of turbulent mixing, which is important for several meteorological applications such as air quality and convective forecasting and modeling. Knowledge of how PBL heights vary across coastal-urban environments is limited, as many past studies of PBL height occur at point locations for one city/place, are limited by coarse temporal resolution (e.g., twice daily radiosondes), or rely on model reanalyses with known biases and coarse spatial resolutions. This study investigates the spatial heterogeneity of PBL heights across the complex Houston-Galveston region, focusing on the effects of different characteristics and processes on the diurnal evolution of the PBL height. The Coastal Urban Boundary-layer Interactions with Convection (CUBIC) field campaign provides a unique dataset, consisting of continuous thermodynamic and kinematic observations through the depth of the PBL at three distinct locations. PBL heights are estimated via a fuzzy logic algorithm that combines Doppler lidar, Atmospheric Emitted Radiance Interferometer (AERI), and microwave radiometer data for each day at a 10-minute resolution. Results indicate substantial differences between the three locations and considerable variation, with urban PBL heights consistently deeper than the rural and coastal locations....Link to [Full Abstract here](#).

**Tuesday, January 7, 2024, 3:30PM**

**Refreshments 3:15PM**

**Please also join colleagues for refreshments and informal discussion after the seminar until 3:30pm**

NCAR-Foothills Laboratory, 3450 Mitchell Lane  
FL2-1022, Large Seminar

**Seminar will also be live webcast.**

[sundog.ucar.edu/public/page/EOL](https://sundog.ucar.edu/public/page/EOL)

Participants may ask questions during the seminar via Slido.