
Board 0609: Evaluation of marine layer characteristics at a Lake Michigan shoreline impacted by high ozone



Wednesday, 14 December 2022



14:45 - 18:15



Poster Hall, Hall A (South, Level 3, McCormick Place)

Abstract

The Wisconsin's Dynamic Influence of Shoreline Circulation on Ozone (WiscoDISCO) campaign involved obtaining atmospheric measurements to create a model of atmospheric layering of a shoreline environment impacted by high concentrations of ozone. During the 2021 and 2022 campaigns, Uncrewed Aerial Systems (UAS) were flown at a Lake Michigan shoreline in southeastern Wisconsin to obtain overwater and overland measurements of air temperature, relative humidity, ozone concentration, and wind speed and direction. Measurements from WiscoDISCO 21 and 22 have been used to characterize the marine layer using height of maximum buoyancy suppression. During WiscoDISCO-21 fixed wing observations and Doppler lidar also provided measurements of winds to higher altitudes (up to 2 km AGL for lidar and 500 m AGL for fixed-wing UAS) such that lake breeze circulation patterns opposing synoptic flow can be characterized by maximum height of easterly winds. Marine layer depth analysis has been compared to the National Oceanic and Atmospheric Administration High-Resolution Rapid Refresh (HRRR) model output of planetary boundary layer heights at locations over water and over land. The marine layer dimensionality, layering of ozone concentrations within inversion, and agreement between observations and HRRR model and will be discussed.

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