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Correlating the onset of lake breeze events of the WiscoDISCO-21 with the ozone concentrations

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Abstract

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Abstract

The lake breeze along the shoreline of Lake Michigan a ects the ozone concentrations. During the eld campaign: Wisconsin's Dynamic In uences of Shoreline Circulations on Ozone – WiscoDISCO-21, two unmanned aerial system platforms were deployed at a shoreline site at the Chiwaukee Prairie State Natural Area in Wisconsin alongside a routine air quality ground monitoring station from May 21-26, 2021. Ground monitoring station observations of winds and temperature were analyzed to identify lake breeze onset events to evaluate their impact on the ground level with ozone concentrations and other meteorology. Wind speed, wind direction, air temperature, and ozone concentrations were retrieved from the ground monitoring station maintained by the Wisconsin Department of Natural Resources (WiDNR). Seven di erent onset lake breeze events were captured, three on the 21st of May, and one each on the 22nd, 23rd, 25th, and 26th. A persistent lake breeze was observed on the 24th identi ed by winds from the southeast which was not marked by a prior large wind shift or a decrease in air temperature. During the onset lake breeze events, correlations were observed with increases of ozone, increases in wind speed, changes in wind direction, and decreases in air temperature.

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