SATELLITE AND AIRCRAFT OBSERVATIONS OF INTERACTIONS BETWEEN INTRA-URBAN NITROGEN DIOXIDE INEQUALITIES AND OZONE AIR QUALITY IN HOUSTON, TEXAS.

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Air quality has improved across the U.S.; however, there are inequalities in the distribution of primary pollutants such as nitrogen dioxide (NO_2), and many urban areas continue to experience unhealthy levels of ozone (O_3). While advances in satellite remote sensing bring new opportunities to describe intraurban inequalities, it is generally assumed that time-averaging is required to improve observation spatial detail. As a result, there is little understanding of how neighborhood-level inequalities are coupled to regional air pollution issues even though NO_2 is an O_3 precursor. First, we demonstrate daily TROPOMI observations capture ~65%–90% of intraurban NO_2 inequalities despite their coarse spatial resolution. We use high spatial resolution (250 m x 560 m) measurements from GEOstationary Coastal and Air Pollution Events (GEO-CAPE) Airborne Simulator (GCAS) collected during the NASA Tracking Aerosol Convection ExpeRiment–Air Quality (TRACER-AQ) study in September 2021 as a standard of comparison. We calculate daily TROPOMI NO_2 inequalities over 2018–2021 and construct wind clusters during O_3 season to explore covariation between NO_2 inequalities and O_3. We investigate NO_2 and O_3 chemical relationships and describe O_3 air quality co-benefits to reducing NO_2 inequalities.