

Supporting Information

Daily Satellite Observations of Nitrogen Dioxide Air Pollution Inequality in New York City, New York and Newark, New Jersey: Evaluation and Application

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SI includes: Figures S1–S5, Equation S1, and Tables S1–S8

Table S1. GCAS and GeoTASO flight rasters on 13 LISTOS flight days. Small raster flight patterns occurred in the early morning (8:15–9:50 am LT, local time), late morning (9:50–11:30 am LT), early afternoon (1:15–3:00 pm LT), and late afternoon (3:00–4:45 pm LT). Large raster flight patterns were flown on days when elevated air pollution was predicted over the Long Island Sound region in the morning (9–11 am LT) and afternoon (1:30–4:10 pm LT).

Flight date	Morning Raster	Afternoon Raster
25 Jun 2018	Large	Large
30 Jun 2018	Large	Large
2 Jul 2018	Large	Large
19 Jul 2018	Small	Small
20 Jul 2018	Small	Small
5 Aug 2018	Small	Small
6 Aug 2018	Small	Large
15 Aug 2018	Small	Small
16 Aug 2018	Large	Large
24 Aug 2018	Small	Small
28 Aug 2018	Large	Large
29 Aug 2018	Large	Large
6 Sep 2018	Large	Large

Figure S1. GCAS and GeoTASO NO₂ TVCDs (molecules cm⁻²) during large (a) and small (b) raster flight patterns. Examples are 2 July 2018 and 20 July 2018, respectively. The black outline represents the New York City–Newark UA. Background map data: Landsat 8 composite January 2017–June 2020.

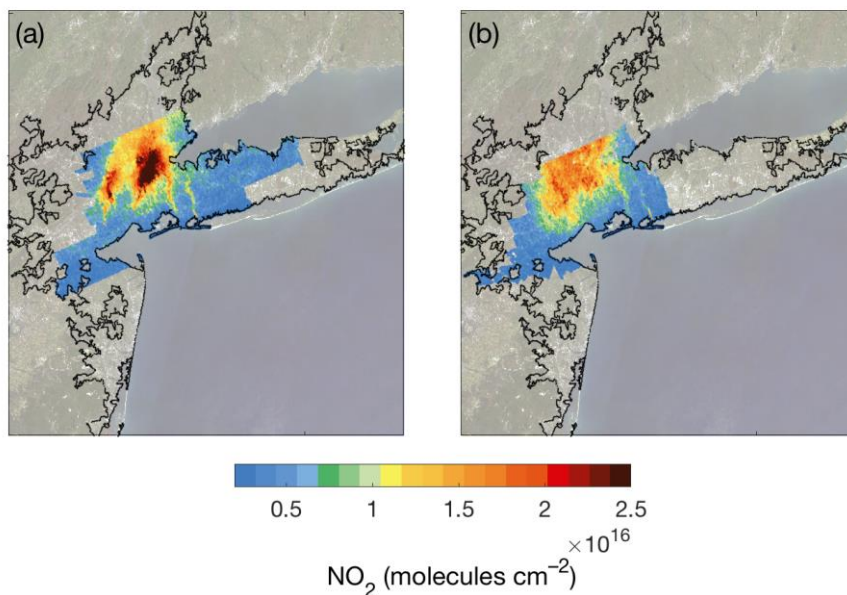


Table S2. Demographic group makeup (%) of populations sampled during each GCAS and GeoTASO flight raster, average flight raster demographic group makeup of sampled populations during LISTOS, and UA demographic composition.

Flight Circuit	Race-Ethnicity Population (%)				Race-Ethnicity and Poverty Status (%)		Poverty status (%)	
	White	Black and African American	Asian	Hispanic and Latino	LIN	HIW	Below poverty	Above poverty
25 Jun 2018								
AM	41%	17%	12%	26%	18%	15%	7%	72%
PM	41%	17%	12%	27%	18%	15%	7%	71%
30 Jun 2018								
AM	41%	18%	12%	27%	18%	15%	7%	71%
PM	41%	17%	12%	27%	18%	15%	7%	71%
2 Jul 2018								
AM	39%	18%	12%	27%	20%	14%	8%	70%
PM	39%	19%	12%	28%	20%	14%	8%	69%
19 Jul 2018								
AM 1	36%	20%	13%	28%	21%	12%	8%	68%
AM 2	36%	20%	13%	28%	22%	11%	8%	67%
PM 1	36%	20%	13%	28%	21%	11%	8%	67%
PM 2	36%	20%	13%	28%	21%	11%	8%	67%
20 Jul 2018								
AM 1	36%	20%	13%	28%	22%	11%	9%	67%
AM 2	36%	20%	13%	28%	21%	11%	8%	68%
PM 1	36%	20%	13%	27%	20%	11%	8%	68%
PM 2	36%	20%	13%	28%	22%	11%	8%	67%
5 Aug 2018								
AM 1	36%	20%	13%	29%	22%	11%	9%	67%
AM 2	36%	20%	13%	28%	22%	11%	8%	67%
PM 1	36%	20%	13%	28%	22%	11%	9%	67%
PM 2	37%	20%	12%	28%	21%	12%	8%	67%
6 Aug 2018								
AM 1	37%	19%	13%	27%	20%	12%	8%	68%
AM 2	36%	20%	13%	28%	21%	11%	8%	67%
PM	40%	20%	12%	26%	19%	14%	8%	70%

15 Aug 2018									
AM 1	37%	20%	13%	28%	21%	12%	8%	68%	
AM 2	37%	19%	13%	28%	21%	12%	8%	68%	
PM 1	37%	19%	13%	28%	21%	12%	8%	68%	
PM 2	37%	20%	13%	28%	21%	12%	8%	68%	
16 Aug 2018									
AM	44%	17%	12%	24%	14%	17%	6%	76%	
PM	39%	18%	12%	27%	19%	14%	8%	70%	
24 Aug 2018									
AM 1	35%	20%	13%	29%	22%	11%	9%	67%	
AM 2	36%	20%	13%	28%	21%	11%	8%	67%	
PM 1	36%	20%	13%	28%	21%	11%	8%	67%	
PM 2	36%	20%	13%	28%	21%	11%	8%	67%	
28 Aug 2018									
AM	40%	18%	12%	27%	19%	14%	7%	70%	
PM	40%	18%	12%	27%	19%	14%	8%	70%	
29 Aug 2018									
AM	40%	18%	12%	27%	19%	14%	7%	70%	
PM	40%	18%	12%	27%	19%	14%	7%	70%	
6 Sep 2018									
AM	40%	18%	12%	27%	19%	14%	8%	70%	
PM	40%	18%	12%	27%	19%	14%	7%	71%	
Mean of All Flights	38%	19%	13%	28%	20%	13%	8%	69%	
Mean of All UA Tracts	44%	16%	11%	25%	17%	16%	7%	73%	

Equation S1. Population-weighted NO₂ columns are calculated as the product of the census tract-averaged NO₂ TVCD (NO_{2,j}) and demographic group population (p_j) in the *i*th tract summed over all tracts with NO₂ data (*n*). The summation is divided by the demographic group population (p_j).

(SE1) Population-weighted NO_{2,j} = $\sum_{i=1}^n \text{NO}_{2,i} p_{i,j} / \sum_{i=1}^n p_{i,j}$

Figure S2. Census tract population densities in the New York City–Newark UA (black line).
Background map data: Landsat 8 composite January 2017–June 2020.

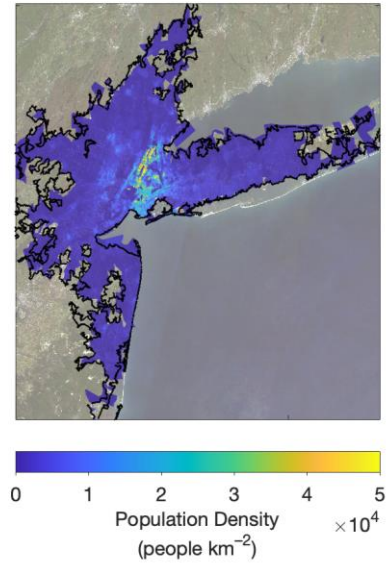


Figure S3. Locations of 11 NO₂* monitors (a), 17 O₃ monitors (b), and the 14 Automated Surface Observing System and Automated Weather Observing System stations (c). The black outline represents the New York City–Newark UA. Background map data: Landsat 8 composite January 2017–June 2020.

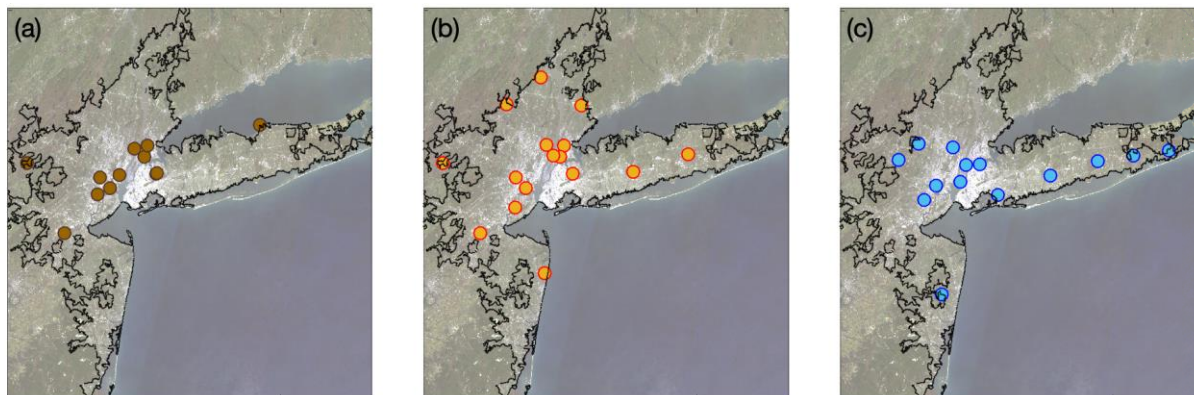


Table S3. GCAS and GeoTASO flight circuit population-weighted NO₂ (x10¹⁵ molecules cm⁻²) and relative inequalities during LISTOS for Black and African Americans, Hispanics and Latinos, and Asians compared to non-Hispanic/Latino whites, for below poverty versus above poverty tracts, and for LIN compared to HIW tracts.

Date	Population-weighted NO ₂				Difference (%)			Population-weighted NO ₂		Difference (%)	Population-weighted NO ₂		Difference (%)
	White	Black and African American	Hispanic/Latino	Asian	Black and African American	Hispanic/Latino	Asian	Below poverty	Above poverty		LIN	HIW	
25 Jun 2018													
AM	3.7 ± 0.0	4.3 ± 0.1	3.3 ± 0.0	3.8 ± 0.0	15 ± 2	-9 ± 2	4 ± 2	4.0 ± 0.1	3.6 ± 0.0	8 ± 2	3.7 ± 0.1	3.3 ± 0.1	11 ± 3
PM	4.8 ± 0.1	5.8 ± 0.1	5.0 ± 0.1	5.6 ± 0.1	18 ± 2	4 ± 2	15 ± 2	6.3 ± 0.1	4.8 ± 0.1	28 ± 2	5.7 ± 0.1	4.0 ± 0.1	34 ± 3
30 Jun 2018													
AM	8.2 ± 0.2	10.5 ± 0.1	10.4 ± 0.2	10.0 ± 0.2	24 ± 2	23 ± 2	19 ± 3	12.6 ± 0.2	8.4 ± 0.1	40 ± 2	12.0 ± 0.2	6.7 ± 0.2	57 ± 3
PM	8.2 ± 0.2	11.0 ± 0.2	14.2 ± 0.2	11.3 ± 0.2	29 ± 3	54 ± 2	32 ± 3	14.4 ± 0.2	9.3 ± 0.1	43 ± 2	14.8 ± 0.3	8.0 ± 0.2	59 ± 3
2 Jul 2018													
AM	20.4 ± 0.5	21.1 ± 0.6	32.1 ± 0.6	22.4 ± 0.6	3 ± 4	45 ± 3	9 ± 3	32.9 ± 0.8	20.7 ± 0.4	46 ± 3	32.6 ± 0.8	22.6 ± 0.8	36 ± 4
PM	9.4 ± 0.2	11.5 ± 0.3	15.8 ± 0.2	10.2 ± 0.2	20 ± 3	51 ± 2	8 ± 3	16.1 ± 0.3	9.9 ± 0.1	48 ± 3	16.6 ± 0.3	10.2 ± 0.3	48 ± 3
19 Jul 2018													
AM 1	10.3 ± 0.2	10.2 ± 0.2	10.0 ± 0.2	9.5 ± 0.2	-1 ± 2	-2 ± 2	-8 ± 2	10.4 ± 0.2	10.0 ± 0.1	3 ± 2	10.1 ± 0.2	9.3 ± 0.2	9 ± 3
AM 2	12.3 ± 0.2	11.8 ± 0.2	11.2 ± 0.2	12.2 ± 0.2	-4 ± 2	-9 ± 2	-1 ± 2	11.5 ± 0.2	12.2 ± 0.2	-5 ± 2	11.4 ± 0.2	10.7 ± 0.3	7 ± 3
PM 1	18.1 ± 0.3	19.5 ± 0.3	18.6 ± 0.3	16.8 ± 0.3	7 ± 2	3 ± 2	-7 ± 2	20.5 ± 0.3	17.5 ± 0.2	16 ± 2	20.2 ± 0.3	19.7 ± 0.6	3 ± 4
PM 2	19.9 ± 0.3	20.6 ± 0.3	23.8 ± 0.3	19.4 ± 0.3	3 ± 2	18 ± 2	-2 ± 2	25.3 ± 0.4	19.1 ± 0.2	28 ± 2	25.7 ± 0.4	21.8 ± 0.7	17 ± 3
20 Jul 2018													
AM 1	22.6 ± 0.3	26.4 ± 0.4	27.4 ± 0.3	23.9 ± 0.3	15 ± 2	19 ± 2	5 ± 2	30.9 ± 0.4	22.4 ± 0.2	32 ± 2	29.0 ± 0.4	20.6 ± 0.6	34 ± 3
AM 2	26.4 ± 0.4	25.6 ± 0.4	32.1 ± 0.4	31.1 ± 0.5	-3 ± 2	19 ± 2	16 ± 2	31.4 ± 0.5	27.2 ± 0.3	14 ± 2	31.3 ± 0.5	27.4 ± 0.8	13 ± 3
PM 1	8.4 ± 0.1	8.3 ± 0.1	10.5 ± 0.1	7.7 ± 0.1	-1 ± 2	23 ± 2	-8 ± 2	9.8 ± 0.2	8.4 ± 0.1	16 ± 2	10.5 ± 0.2	9.0 ± 0.2	16 ± 3
PM 2	7.5 ± 0.1	7.8 ± 0.1	10.2 ± 0.1	8.0 ± 0.1	4 ± 2	31 ± 2	7 ± 2	9.2 ± 0.1	8.0 ± 0.1	14 ± 2	9.7 ± 0.1	8.0 ± 0.2	19 ± 2
5 Aug 2018													
AM 1	8.4 ± 0.2	11.3 ± 0.2	9.0 ± 0.2	10.0 ± 0.2	30 ± 3	7 ± 3	18 ± 3	10.5 ± 0.2	8.8 ± 0.1	18 ± 3	10.0 ± 0.2	6.1 ± 0.3	48 ± 5
AM 2	8.1 ± 0.2	9.7 ± 0.2	7.7 ± 0.2	10.5 ± 0.2	17 ± 3	-6 ± 4	25 ± 3	8.5 ± 0.2	8.6 ± 0.2	-1 ± 3	8.2 ± 0.2	6.0 ± 0.3	31 ± 5
PM 1	6.7 ± 0.1	7.1 ± 0.1	7.2 ± 0.1	8.7 ± 0.1	6 ± 2	7 ± 2	26 ± 2	7.2 ± 0.1	7. ± 0.1	1 ± 2	7.1 ± 0.1	6.9 ± 0.2	3 ± 3
PM 2	7.1 ± 0.1	7.4 ± 0.1	7.5 ± 0.1	9.1 ± 0.1	4 ± 2	6 ± 2	25 ± 2	7.6 ± 0.1	7.5 ± 0.1	2 ± 2	7.4 ± 0.1	7.0 ± 0.1	5 ± 2
6 Aug 2018													
AM 1	10.7 ± 0.2	14.2 ± 0.2	11.1 ± 0.2	13.3 ± 0.2	28 ± 2	3 ± 2	21 ± 2	12.5 ± 0.2	11.7 ± 0.1	7 ± 2	11.6 ± 0.2	9.0 ± 0.3	25 ± 4
AM 2	14.5 ± 0.2	17.9 ± 0.3	17.8 ± 0.3	20.2 ± 0.3	21 ± 2	20 ± 2	33 ± 2	17.7 ± 0.3	16.5 ± 0.2	7 ± 2	17.1 ± 0.3	13.4 ± 0.4	24 ± 4
PM	10.3 ± 0.1	12.6 ± 0.2	12.5 ± 0.2	12.7 ± 0.2	20 ± 2	20 ± 2	21 ± 2	13.2 ± 0.2	11.0 ± 0.1	19 ± 2	13.0 ± 0.2	10.2 ± 0.2	24 ± 3

15 Aug 2018													
AM 1	8.1 ± 0.1	9.8 ± 0.1	8.4 ± 0.1	10.0 ± 0.1	18 ± 2	21 ± 2	4 ± 2	9.5 ± 0.1	8.6 ± 0.1	10 ± 2	8.9 ± 0.1	6.9 ± 0.2	26 ± 3
AM 2	8.1 ± 0.1	9.5 ± 0.1	8.2 ± 0.2	9.8 ± 0.1	16 ± 2	19 ± 2	1 ± 2	9.1 ± 0.2	8.5 ± 0.1	7 ± 2	8.4 ± 0.2	7.0 ± 0.2	19 ± 3
PM 1	6.1 ± 0.1	7.1 ± 0.1	6.0 ± 0.1	7.4 ± 0.1	15 ± 2	19 ± 2	-2 ± 2	6.8 ± 0.1	6.3 ± 0.1	8 ± 2	6.3 ± 0.1	5.1 ± 0.1	22 ± 3
PM 2	7.2 ± 0.1	8.7 ± 0.1	6.7 ± 0.1	8.4 ± 0.1	18 ± 2	16 ± 2	-7 ± 2	8.0 ± 0.1	7.4 ± 0.1	8 ± 2	7.3 ± 0.1	6.3 ± 0.1	16 ± 3
16 Aug 2018													
AM	7.8 ± 0.1	10.3 ± 0.2	7.7 ± 0.1	8.7 ± 0.1	28 ± 2	12 ± 2	-1 ± 2	10.1 ± 0.2	7.9 ± 0.1	24 ± 3	9.4 ± 0.2	7.2 ± 0.2	26 ± 3
PM	8.5 ± 0.1	11.7 ± 0.2	9.1 ± 0.1	10.6 ± 0.1	31 ± 2	22 ± 2	7 ± 2	10.1 ± 0.2	9.3 ± 0.1	8 ± 2	9.6 ± 0.2	8.0 ± 0.2	18 ± 3
24 Aug 2018													
AM 1	10.7 ± 0.2	12.2 ± 0.2	10.8 ± 0.2	11.6 ± 0.2	12 ± 2	8 ± 2	1 ± 2	12.5 ± 0.2	10.6 ± 0.1	17 ± 2	11.3 ± 0.2	8.8 ± 0.3	25 ± 3
AM 2	21.2 ± 0.4	28.5 ± 0.5	23.5 ± 0.4	23.6 ± 0.4	30 ± 2	11 ± 2	10 ± 3	27.2 ± 0.5	22.2 ± 0.3	20 ± 2	25.1 ± 0.5	19.4 ± 0.6	25 ± 4
PM 1	16.6 ± 0.3	22.5 ± 0.4	28.2 ± 0.4	20.4 ± 0.4	30 ± 3	20 ± 3	51 ± 3	26.4 ± 0.6	19.3 ± 0.3	31 ± 3	27.3 ± 0.6	18.4 ± 0.6	39 ± 4
PM 2	13.1 ± 0.2	14.2 ± 0.2	17.5 ± 0.2	15.2 ± 0.2	8 ± 2	14 ± 2	28 ± 2	17.1 ± 0.3	13.7 ± 0.2	22 ± 2	17.2 ± 0.3	14.0 ± 0.4	20 ± 3
28 Aug 2018													
AM	12.4 ± 0.2	14.3 ± 0.2	16.0 ± 0.2	17.1 ± 0.2	14 ± 2	32 ± 2	25 ± 2	16.2 ± 0.2	13.6 ± 0.1	18 ± 2	15.7 ± 0.2	11.7 ± 0.2	29 ± 2
PM	8.6 ± 0.1	8.9 ± 0.1	9.4 ± 0.2	10.3 ± 0.2	3 ± 2	18 ± 2	8 ± 2	10.1 ± 0.2	8.0 ± 0.1	15 ± 2	9.9 ± 0.2	8.8 ± 0.2	12 ± 3
29 Aug 2018													
AM	13.4 ± 0.2	15.1 ± 0.2	17.5 ± 0.2	19.0 ± 0.3	12 ± 2	35 ± 2	27 ± 2	17.5 ± 0.3	14.6 ± 0.2	18 ± 2	17.6 ± 0.3	12.8 ± 0.2	32 ± 2
PM	7.5 ± 0.1	8.2 ± 0.1	8.1 ± 0.1	9.0 ± 0.1	9 ± 2	18 ± 2	7 ± 2	8.4 ± 0.1	7.8 ± 0.1	7 ± 2	8.1 ± 0.1	7.5 ± 0.2	8 ± 3
6 Sep 2018													
AM	11.4 ± 0.2	12.1 ± 0.2	14.6 ± 0.2	14.6 ± 0.2	6 ± 2	24 ± 2	24 ± 2	15.0 ± 0.2	11.8 ± 0.1	24 ± 2	14.7 ± 0.2	11.0 ± 0.2	29 ± 3
PM	7.9 ± 0.1	8.5 ± 0.1	9.7 ± 0.2	9.7 ± 0.2	7 ± 2	21 ± 2	21 ± 2	10.4 ± 0.2	8.0 ± 0.1	26 ± 2	9.9 ± 0.2	8.2 ± 0.2	20 ± 3

Table S4. Correlation coefficients for absolute and relative inequalities observed by GCAS and GeoTASO during LISTOS and UA-mean NO₂* mixing ratios (during flight times), surface wind speeds (during flight times), surface temperatures (during flight times), daily maximum temperatures, and UA-mean MD8A O₃ mixing ratios. Pearson correlation coefficients (*r*) are given for correlations with NO₂ and Spearman rank correlation coefficients (*ρ*) are given for all others. All correlation coefficients are significant to 1% (*p* < 0.010) unless indicated unless indicated (†), which means significant to 5%.

	Correlations with Absolute Circuit Inequalities						Correlations with Relative Circuit Inequalities				
	Surface Wind Speeds	Surface NO ₂ *	NO ₂ TVCDs	MD8A O ₃	Surface Temperature	Daily Maximum Temperature	Surface Wind Speeds	NO ₂ TVCDs	MD8A O ₃	Surface Temperature	Maximum Temperature
Black and African Americans	-0.495	0.366†	-	-	-	-	-	-	-	-	-
Hispanics and Latinos	-	-	0.574	0.364†	-	-	-	0.328†	0.365†	-	-
Asians	-	-	-	-	0.363†	0.519	-	-	-	0.565	0.679
Below Poverty Tracts	-	0.459	0.613	-	-	-	-	-	-	-	-
LINs	-0.520	0.416†	0.530	-	-	-	-0.362†	-	-	-	0.329†

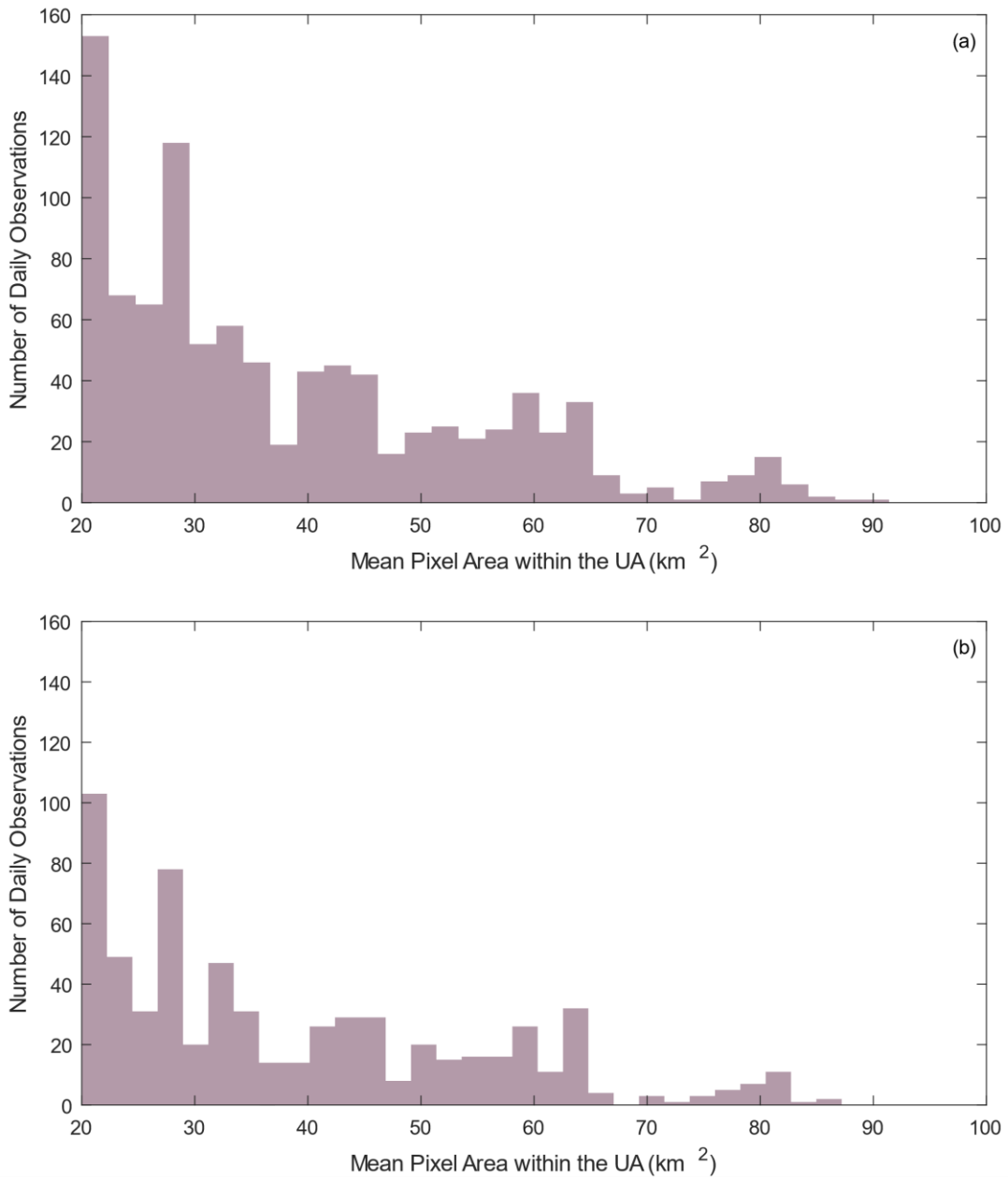


Figure S4. Daily TROPOMI overpass mean pixel areas within the UA (qa value > 0.75) over May 2018–September 2021 on all days (a) and days with over 30% UA coverage (b).

Table S5. Effect of TROPOMI pixel area on mean and individual daily relative inequalities (May 2018–September 2021) on all observation days for Black and African Americans, Hispanics and Latinos, and Asians compared to non-Hispanic/Latino whites, for below poverty versus above poverty tracts, and for LIN compared to HIW tracts. Daily inequalities are assessed using the coefficient of variation. Errors are 95% confidence intervals based on bootstrapped distributions sampled with replacement 10^4 times.

Pixel Area (km ²)	Mean of Daily Inequalities					Daily Inequalities				
	Relative Inequalities (%)					Coefficient of Variation				
	Black and African Americans	Hispanics and Latinos	Asians	Below Poverty Tracts	LINs	Black and African Americans	Hispanics and Latinos	Asians	Below Poverty Tracts	LINs
20–25	25 ± 3	24 ± 3	22 ± 2	24 ± 2	34 ± 3	0.78	0.83	0.79	0.66	0.67
25–30	23 ± 3	22 ± 3	20 ± 3	22 ± 3	32 ± 4	0.93	0.97	0.91	0.85	0.80
30–35	25 ± 3	24 ± 3	25 ± 3	21 ± 3	32 ± 4	0.76	0.76	0.62	0.78	0.70
35–45	25 ± 3	21 ± 3	21 ± 3	18 ± 5	32 ± 4	0.78	0.92	0.87	1.49	0.72
45–60	25 ± 3	22 ± 3	23 ± 3	21 ± 3	33 ± 4	0.81	0.87	0.78	0.83	0.79
>60	19 ± 3	19 ± 3	18 ± 3	19 ± 3	26 ± 4	0.91	0.97	0.88	0.81	0.86

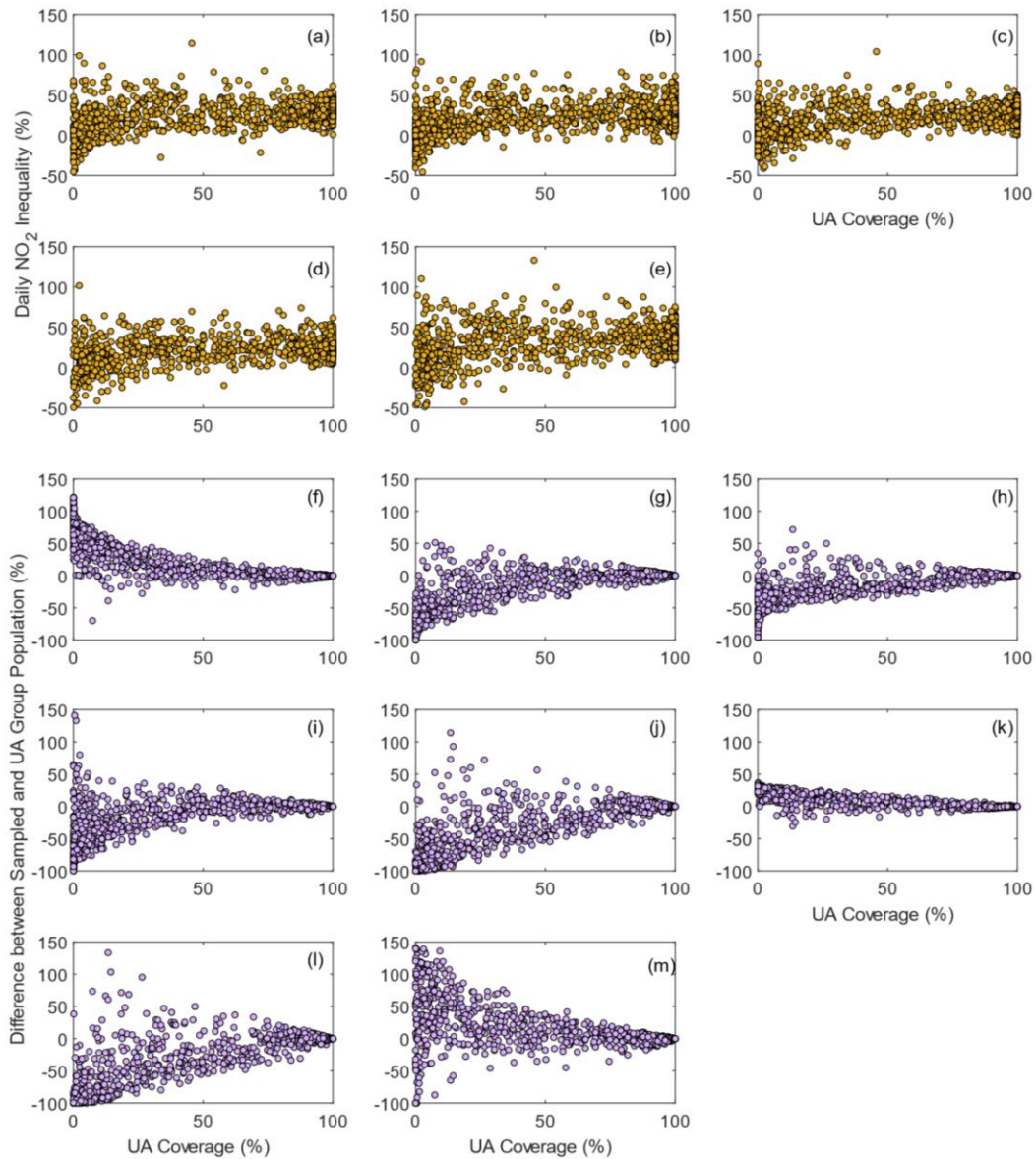


Figure S5. Daily TROPOMI relative NO₂ inequalities over May 2018–September 2021 as a function of overpass percent UA coverage (%) for Black and African Americans (a), Hispanics and Latinos (b), and Asians (c) compared to non-Hispanic/Latino whites, below-poverty versus above poverty tracts (d), and LIN compared to HIW tracts (e), and daily percent difference in sampled census tract demographics (%) from total UA demographics versus percent UA coverage (%) for non-Hispanic/Latino whites (f), Black and African Americans (g), Hispanics and Latinos (h), Asians (i), below-poverty tracts (j), above poverty tracts (k), LINs (l), and HIWs (m).

Table S6. Influence of UA-mean daily (12–3 pm LT) surface wind speeds, NO₂ mixing ratios, and TROPOMI pixel areas on mean daily Pearson correlation coefficients between TROPOMI NO₂ TVCDs and surface NO₂* concentrations at distances between TROPOMI pixel centers and surface NO₂* monitors. Bootstrapped 95% confidence intervals sampled with replacement 10⁵ times are reported for column-surface correlation coefficients on days with low and high wind speeds, surface NO₂* concentrations, column NO₂ concentrations, and pixel areas, defined as the days in the lowest quartile bin and highest quartile bin, respectively. Only significant correlation coefficients are included in means ($p < 0.050$).

	Wind speeds		Surface NO ₂ *		Column NO ₂		Pixel area	
	Low	High	Low	High	Low	High	Small	Large
<1 km	0.63 ± 0.08	0.57 ± 0.07	0.57 ± 0.06	0.65 ± 0.10	0.52 ± 0.11	0.64 ± 0.06	0.59 ± 0.06	0.63 ± 0.07
<2 km	0.61 ± 0.07	0.50 ± 0.06	0.51 ± 0.05	0.63 ± 0.10	0.50 ± 0.08	0.59 ± 0.06	0.55 ± 0.06	0.53 ± 0.07
2–5 km	0.56 ± 0.06	0.43 ± 0.05	0.47 ± 0.04	0.57 ± 0.08	0.51 ± 0.04	0.53 ± 0.05	0.49 ± 0.04	0.49 ± 0.06
5–10 km	0.50 ± 0.04	0.38 ± 0.04	0.40 ± 0.03	0.55 ± 0.04	0.42 ± 0.04	0.48 ± 0.04	0.43 ± 0.03	0.42 ± 0.04

Table S7. Correlation coefficients between daily absolute inequalities and UA-mean NO₂* mixing ratios (12–3 pm LT), NO₂ TVCDs, surface wind speeds (12–3 pm LT), surface temperatures (12–3 pm LT), daily maximum temperatures, and MD8A O₃ mixing ratios and between daily relative inequalities and UA-mean NO₂* mixing ratios and NO₂ TVCDs. Pearson correlation coefficients (*r*) are given for correlations between inequalities and surface NO₂* and NO₂ TVCDs. Spearman rank correlation coefficients (*ρ*) are given for all other correlations. Relationships are analyzed during ozone season (May–September) for days with TROPOMI observations with >60% UA coverage. All correlation coefficients are significant to 1% (*p* < 0.010) unless indicated unless indicated (†), which means significant to 5%.

Ozone Season								
	Absolute Inequality					Relative Inequality		
	Wind Speed	Surface NO ₂ *	Column NO ₂	Surface Ozone	Temperature	Maximum Temperature	Surface NO ₂ *	Column NO ₂
Black and African Americans	-0.40	0.58	0.63	0.36	—	—	0.21	—
Asians	-0.32	0.62	0.65	0.50	0.22	0.27	0.41	0.31
Hispanics and Latinos	-0.43	0.57	0.65	0.46	0.19	0.19	0.19	—
Below-poverty tracts	-0.38	0.64	0.63	0.46	0.18	0.23	0.34	0.18
LIN	-0.41	0.65	0.65	0.45	0.15†	0.19	0.32	0.13†

Table S8. Ratio of weekday (Tuesday–Friday) to weekend (Saturday–Sunday) population-weighted MDA8 O₃ NAAQS exceedance frequencies over May 2018–September 2021 for non-Hispanic/Latino whites, Black and African Americans, Hispanics, Asians, above poverty tracts, below poverty tracts, HIWs, and LINs for census tract center distances of 1–10 km from an O₃ monitor. Weekdays are defined as Tuesdays–Fridays and weekends as Saturdays–Sundays, with weekday and weekend census tract-averaged exceedance counts divided by four and two, respectively. Uncertainties are provided as standard errors.

Radius from Monitor	Non-Hispanic/Latino whites	Black and African Americans	Hispanics/Latinos	Asians	Above Poverty	Below Poverty	HIWs	LINs
1 km	1.2 ± 0.1	1.3 ± 0.1	1.0 ± 0.1	1.3 ± 0.1	1.2 ± 0.1	1.1 ± 0.1	4.2 ± 2.8	1.1 ± 0.1
2 km	1.3 ± 0.1	1.2 ± 0.1	1.1 ± 0.0	1.3 ± 0.1	1.3 ± 0.1	1.1 ± 0.0	1.2 ± 0.2	1.1 ± 0.0
5 km	1.4 ± 0.0	1.2 ± 0.0	1.1 ± 0.0	1.3 ± 0.0	1.3 ± 0.0	1.1 ± 0.0	1.3 ± 0.1	1.1 ± 0.0
7 km	1.3 ± 0.0	1.2 ± 0.0	1.2 ± 0.0	1.3 ± 0.0	1.3 ± 0.0	1.2 ± 0.0	1.3 ± 0.1	1.2 ± 0.0
10 km	1.3 ± 0.0	1.2 ± 0.0	1.2 ± 0.0	1.3 ± 0.0	1.3 ± 0.0	1.2 ± 0.0	1.2 ± 0.0	1.2 ± 0.0