

Supporting tables for

**Comprehensive evaluations of diurnal NO₂ measurements during
DISCOVER-AQ 2011: Effects of resolution dependent representation of NO_x
emissions**

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28 **Table S1.** Summary of information for the 11 inland Pandora sites in the DISCOVER-AQ campaign

Site #	Site name	Latitude / ° N	Longitude / ° W	Land type	NO _x emission in 36-km REAM ¹ / 10 ²¹ molecules km ⁻² s ⁻¹	NO _x emission in 4-km REAM / 10 ²¹ molecules km ⁻² s ⁻¹	Availability of P-3B aircraft observations ²	Availability of surface NO _y	Availability of surface NO ₂
1	UMCP	38.991	76.943	urban	10.9	19.5			
2	UMBC	39.255	76.709	urban	12.9	14.8			
3	SERC	38.880	76.550	rural/coastal	5.0	0.8			
4	Padonia	39.461	76.631	suburban	2.9	12.8	Y	Y	Y
5	Oldtown	39.291	76.596	urban	12.9	33.0			Y
6	GSFC	38.993	76.840	urban/suburban	5.0	6.2			
7	Fairhill	39.701	75.860	rural	6.6	0.6	Y		
8	Essex	39.311	76.474	coastal/urban	12.9	6.4	Y		Y
9	Edgewood	39.410	76.297	coastal/urban	1.7	1.3	Y	Y	Y
10	Beltsville	39.055	76.878	suburban	5.0	4.4	Y	Y	Y
11	Aldino	39.563	76.204	rural/suburban	1.7	4.2	Y	Y	Y

29 ¹ Here, NO_x emissions refer to the mean values in one week (Monday – Sunday). Since we scale weekend emissions based on weekday emissions in this study,
30 the relative differences among different sites and between the 36-km REAM and the 4-km REAM are the same for weekdays and weekends.

31 ² “Y” denotes that P-3B aircraft observations were available at the corresponding site during the DISCOVER-AQ campaign. And blank indicates that no aircraft
32 observations were available. Similar to the “availability of surface NO_y” and the “availability of surface NO₂.”

34 **Table S2.** Setup of the 36-km and nested 4-km WRF simulations

	36-km WRF	Nested 4-km WRF
Horizontal resolution	36 km	Nested (36 km, 12 km, 4 km)
Domain center	40° N, 97° W	38.94° N, 75.76° W
Microphysics	WRF Single-Moment 6-class scheme (WSM6)	Same as 36-km WRF
Surface layer	Revised MM5 Monin-Obukhov scheme	Same as 36-km WRF
Land surface	Unified Noah land-surface model	Same as 36-km WRF
Longwave radiation	RRTM scheme	Same as 36-km WRF
Shortwave radiation	Dudhia scheme	Same as 36-km WRF
Planetary boundary layer	Yonsei University (YSU) scheme	Same as 36-km WRF
Cumulus parameterization	Kain-Fritsch (new Eta) scheme	Kain-Fritsch scheme for outer domains (36-km and 12-km); no cumulus parameterization for the 4-km domain
Urban surface	3-category urban canopy model	Same as 36-km WRF

Table S3. Comparison of NO₂ TVCDs among different simulations and datasets during the DISCOVER-AQ campaign for 9:30 and 13:30 LT on weekdays and weekends

	Weekday		Weekend	
	9:30 LT ¹	13:30 LT	9:30 LT	13:30 LT
REAM-36km ²	6.5 ± 1.1 ³	4.9 ± 0.6	4.7 ± 0.7	3.6 ± 0.6
REAM-4km	7.0 ± 1.9	6.3 ± 2.0	5.3 ± 1.6	4.3 ± 1.5
Pandora	6.5±1.8	5.3±1.0	4.9±0.9	3.7±0.5
Flight	5.3	5.0	4.5	3.2
KNMI-GOME2	6.3 ± 3.4		5.3 ± 1.4	
GOME2-retrieval	6.3 ± 2.5		4.1 ± 1.9	
NASA-OMI		3.3 ± 0.8		2.9 ± 0.6
KNMI-OMI		4.6 ± 1.3		3.2 ± 0.7
OMI-retrieval		4.7 ± 1.4		3.2 ± 0.7

¹ For REAM simulations, we use the average of NO₂ TVCDs at 9:00 and 10:00 LT to represent the value at 9:30 LT, similar to those at 13:30 LT.

² The dataset names have the same meaning as Figure 10, and the NO₂ TVCD values are the same as those shown in Figure 10.

³ The unit is 10¹⁵ molecules cm⁻².