

Figure S1: The Houston-Galveston-Brazoria (HGB) region (grey) and the TCEQ monitoring sites (yellow dots) used in this work.

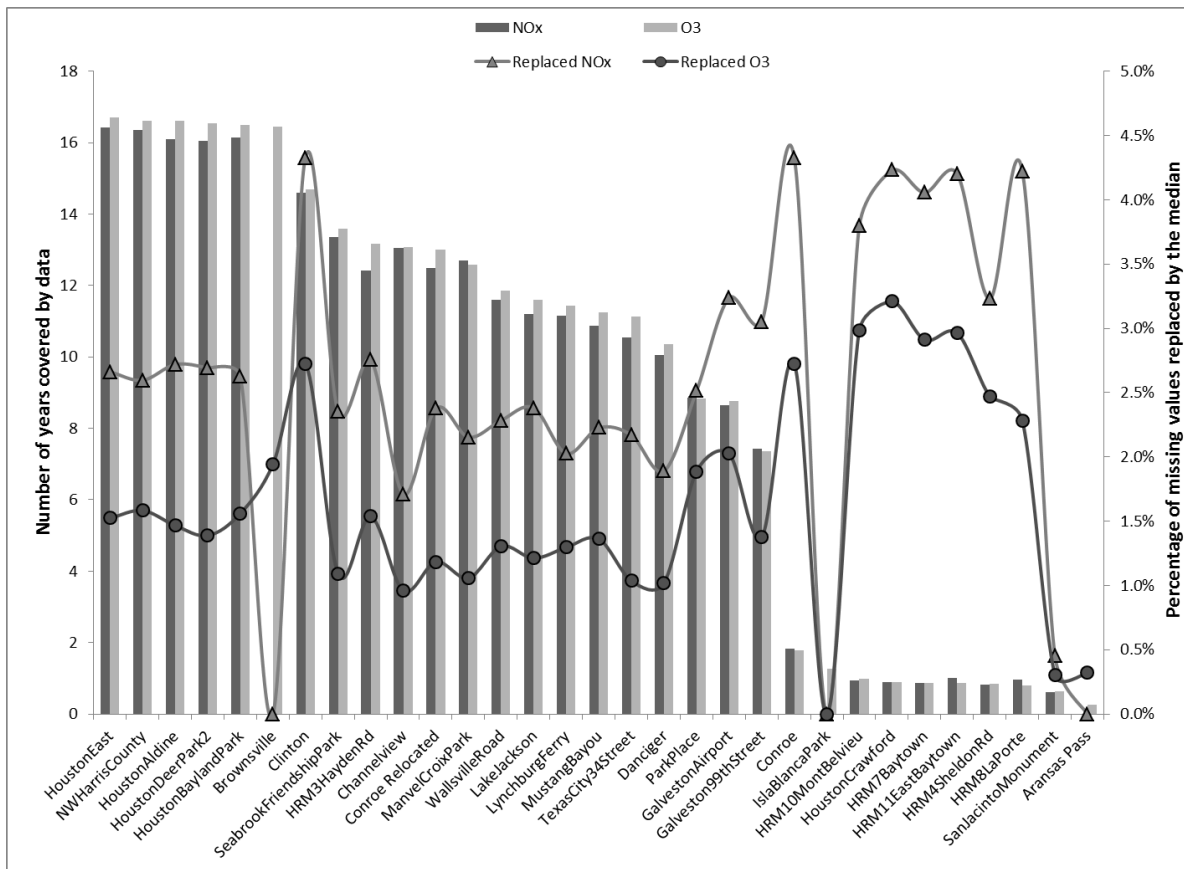


Figure S2: Statistics of data availability and replacement by the hourly median for the sites used in this work.

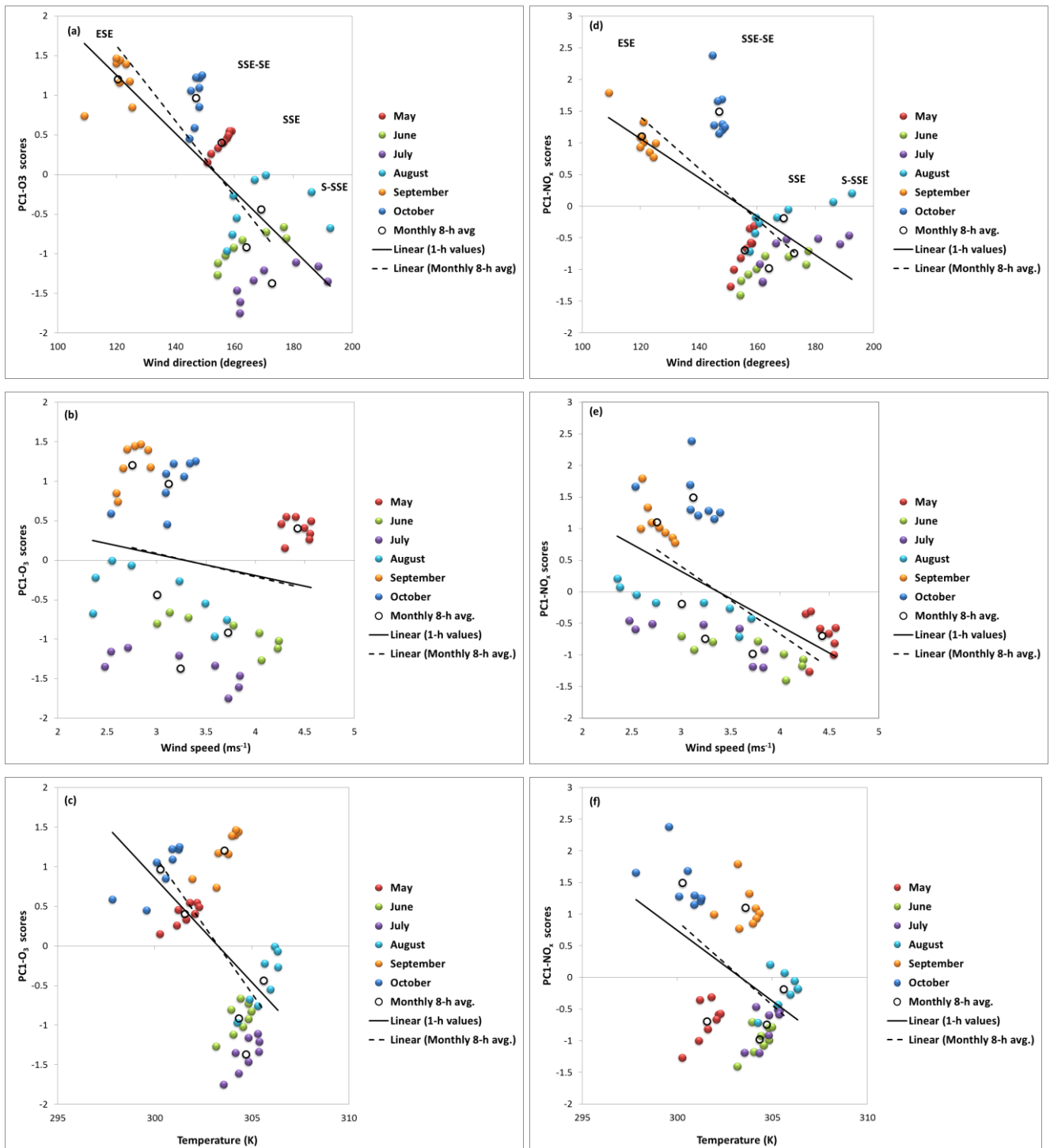


Figure S3: Relationships between meteorological variables and the first component for O₃ (a-c) and NO_x (d-f). Dots represent daytime hours (10 am - 6 pm) in each month. Empty circles are the monthly 8-h averages.

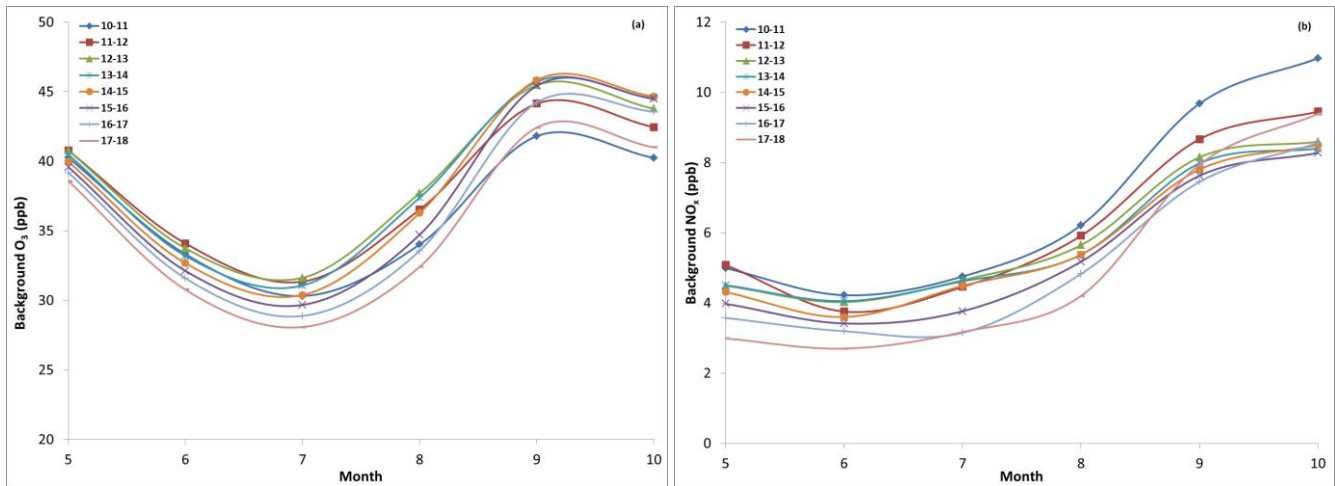


Figure S4: The 6-month trends in background O₃ (a) and background NO_x (b) for each daytime hour.

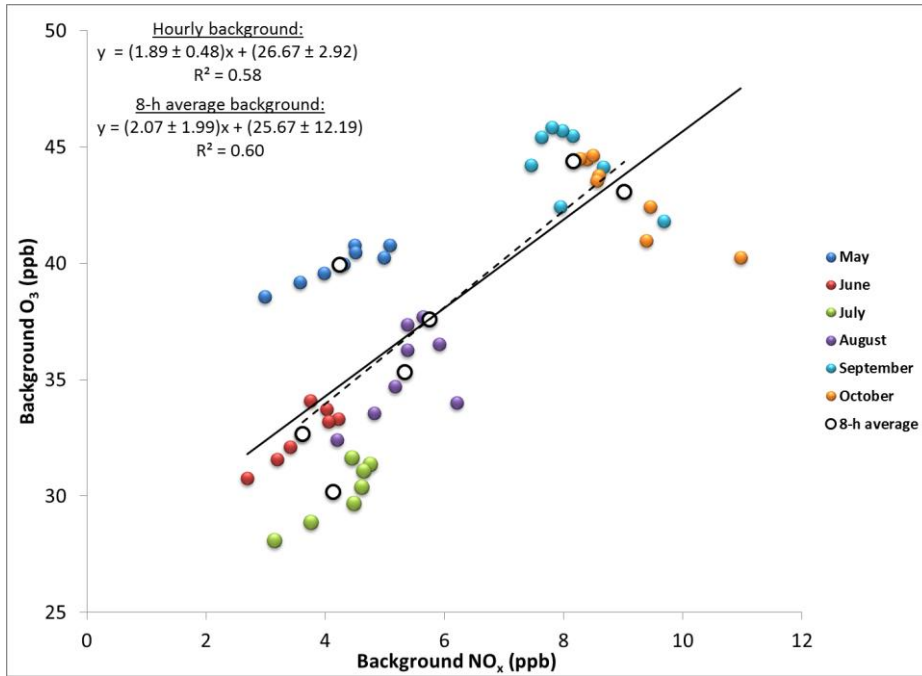


Figure S5: Relationship between PCA-estimated background O₃ and NO_x at both 1-h and 8-h levels. Dots represent daytime hours (10 am - 6 pm) in each month. Empty circles are the monthly 8-h averages.

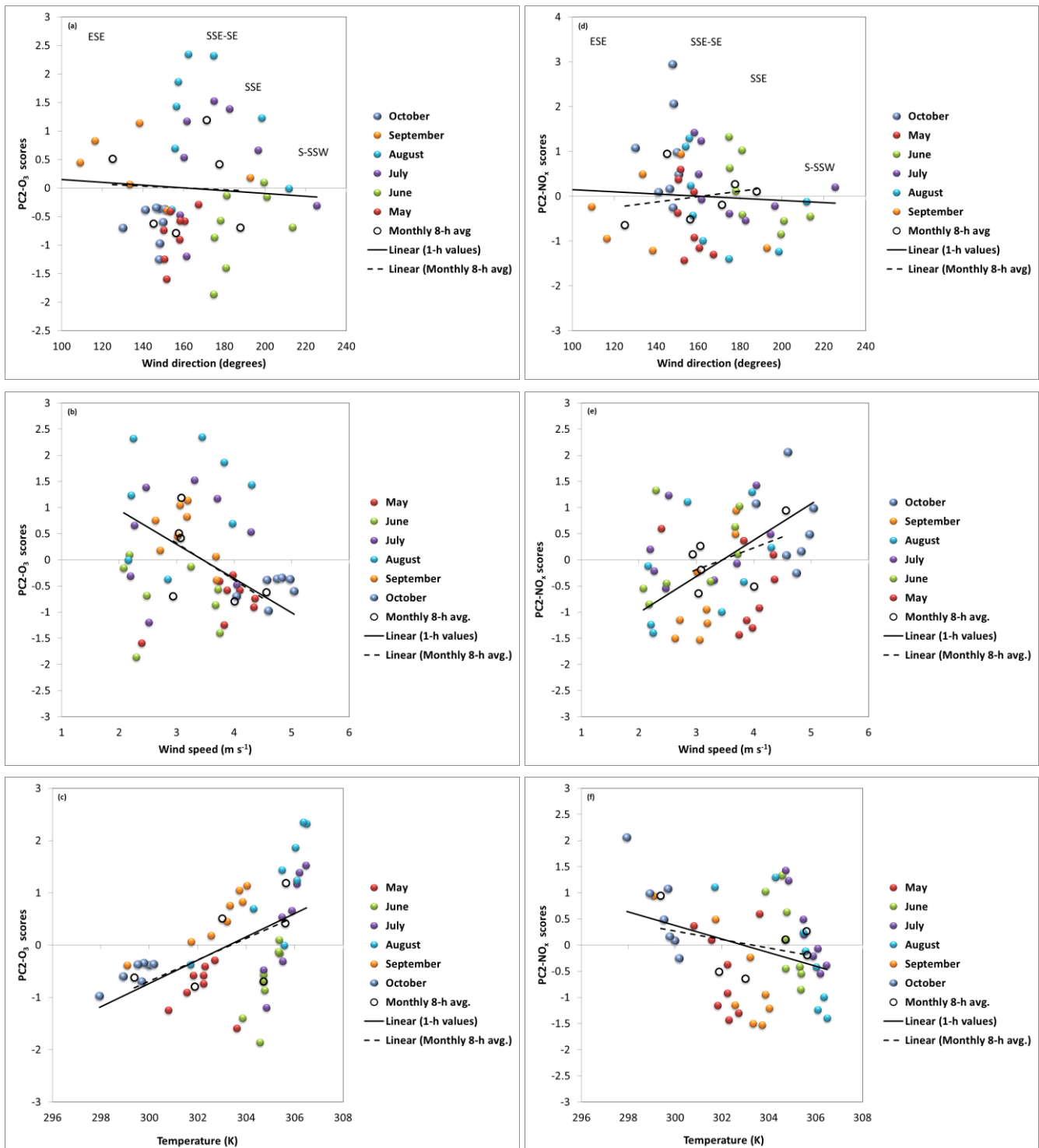


Figure S6: Relationships between meteorological variables and the second component for O₃ (a-c) and NO_x (d-f). Dots represent daytime hours (10 am - 6 pm) in each month. Empty circles are the monthly 8-h averages.

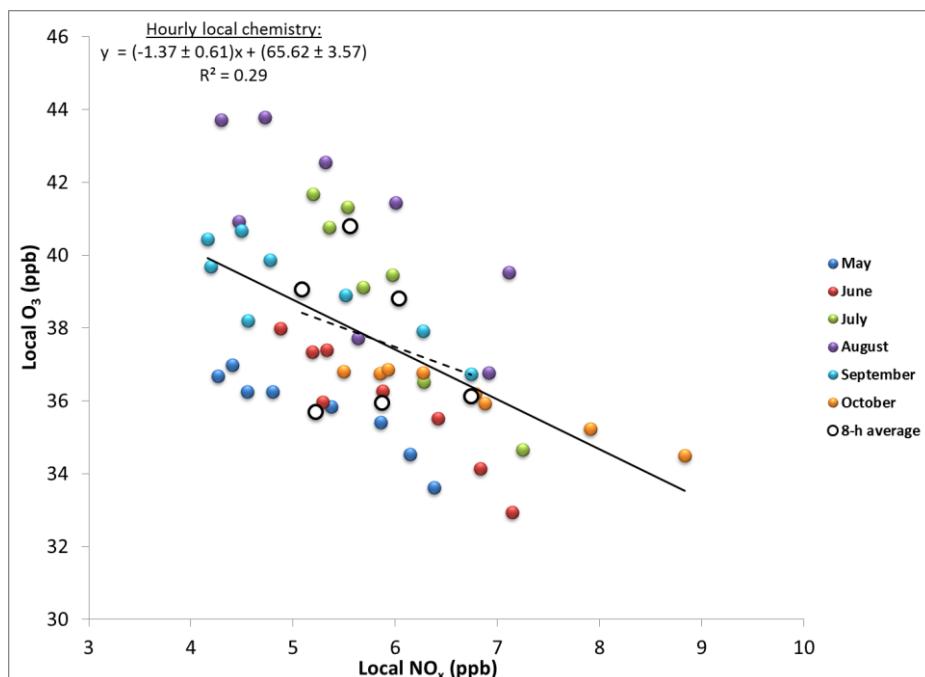


Figure S7: Relationship between PCA-estimated local O₃ and NO_x at the 1-h level. Dots represent daytime hours (10 am - 6 pm) in each month. Empty circles are the monthly 8-h averages.

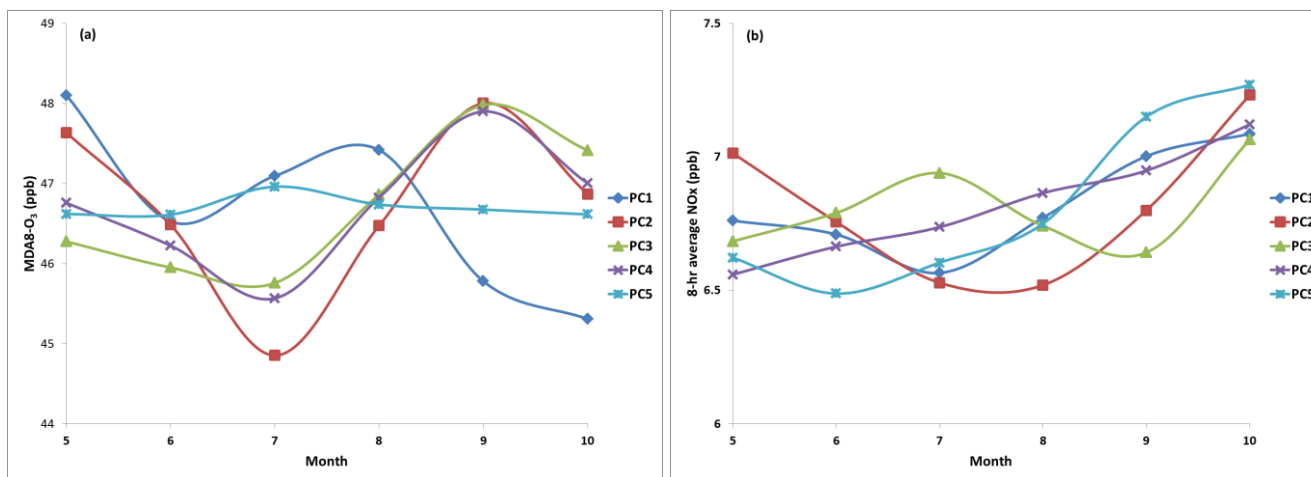


Figure S8: The 6-month trends of principal components converted to MDA8-O₃ (a) and 8-h average NO_x (b) to help distinguish between regional and local contributions. Points represent the 17-year average values. The regional contributions are expected to peak in spring and late summer/early fall, and drop in mid-summer. The opposite is expected from local contributions.

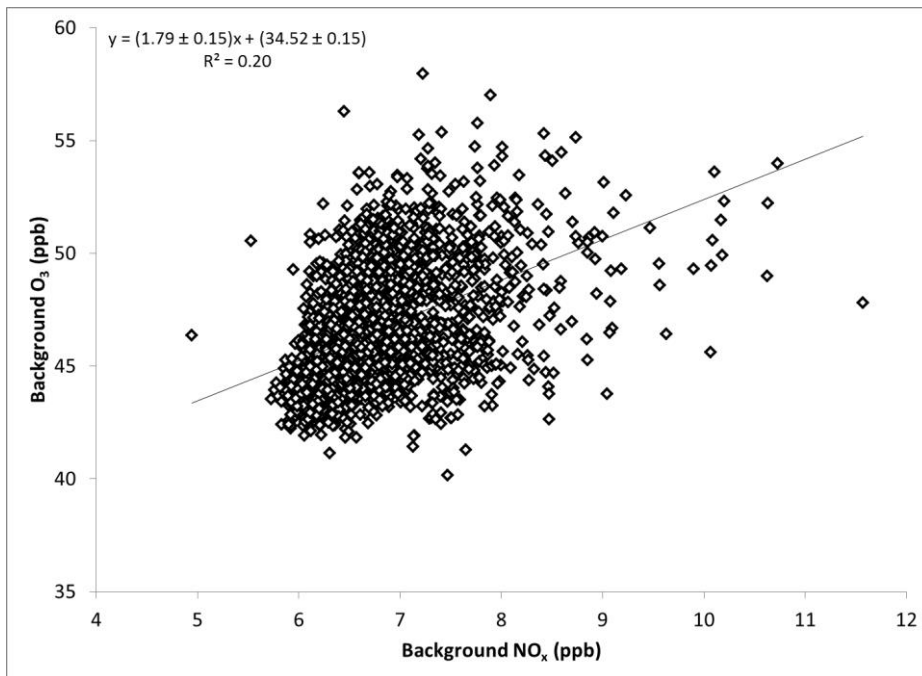


Figure S9: Relationship between regional background O_3 and NO_x (Approach A).

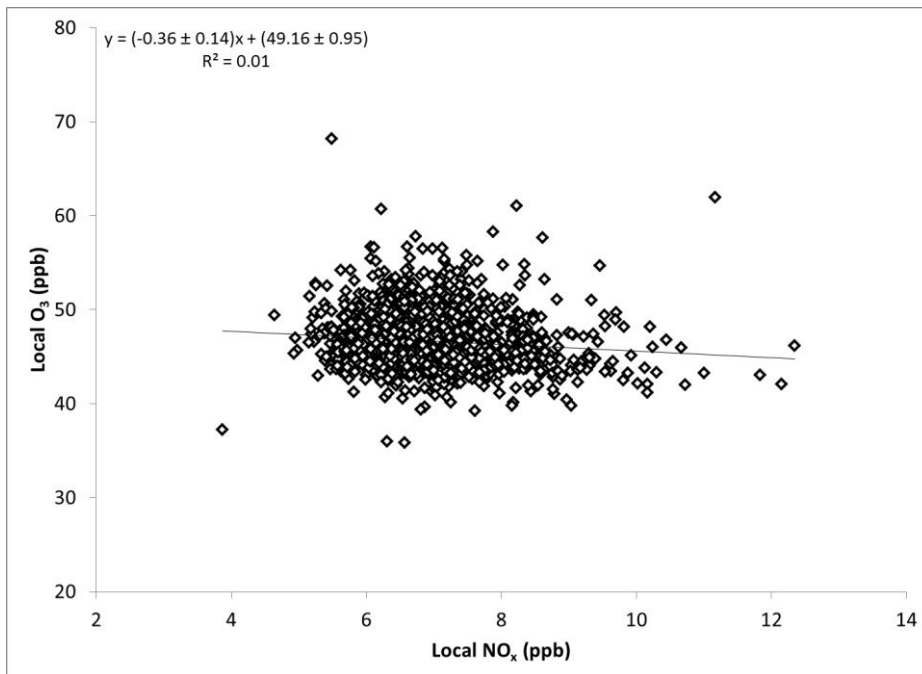


Figure S10: Relationship between local O_3 and NO_x (Approach A).

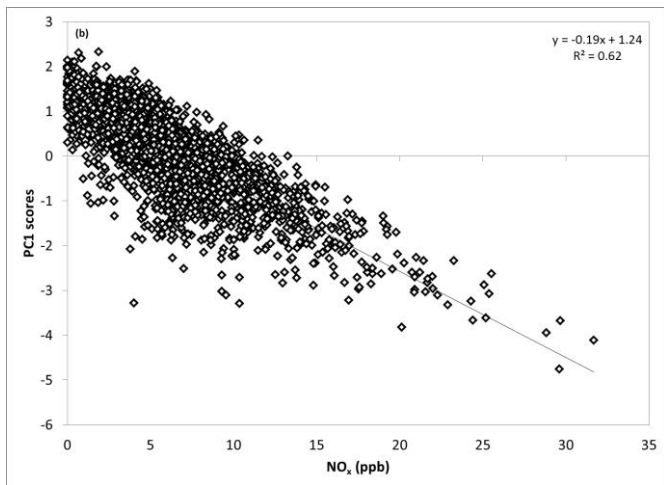
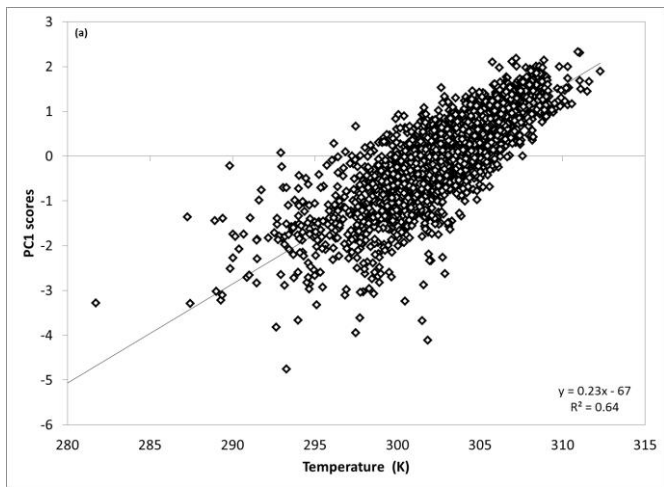


Figure 11: Example of a “NO_x-T” site (Aldine) where temperature (a) and NO_x (b) explain the variation in PC1 scores.

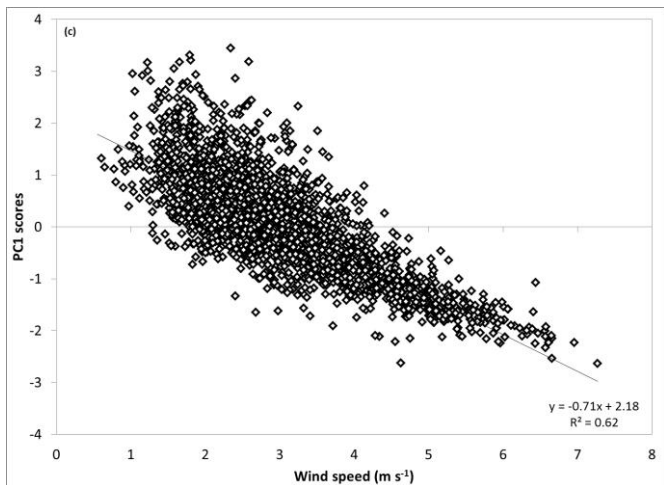
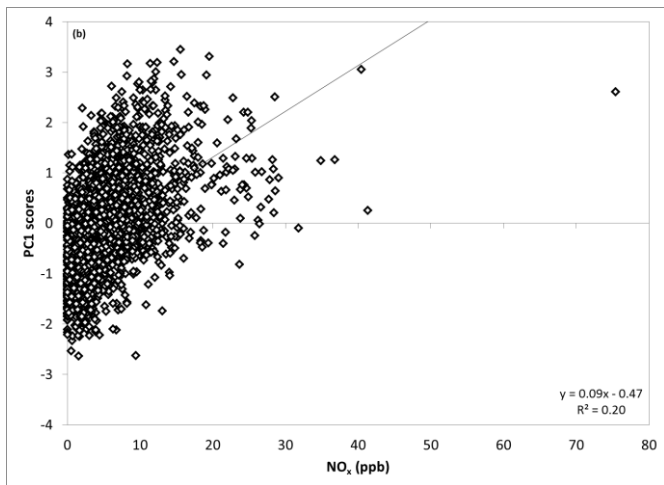
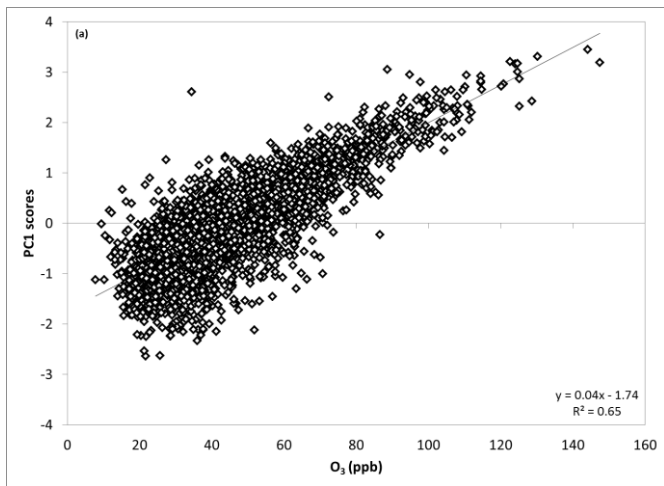


Figure S12: Example of an “O₃-NO_x-WS” site (Bayland Park) where O₃ (a), NO_x (b) and WS (c) explain the variation in PC1 scores.

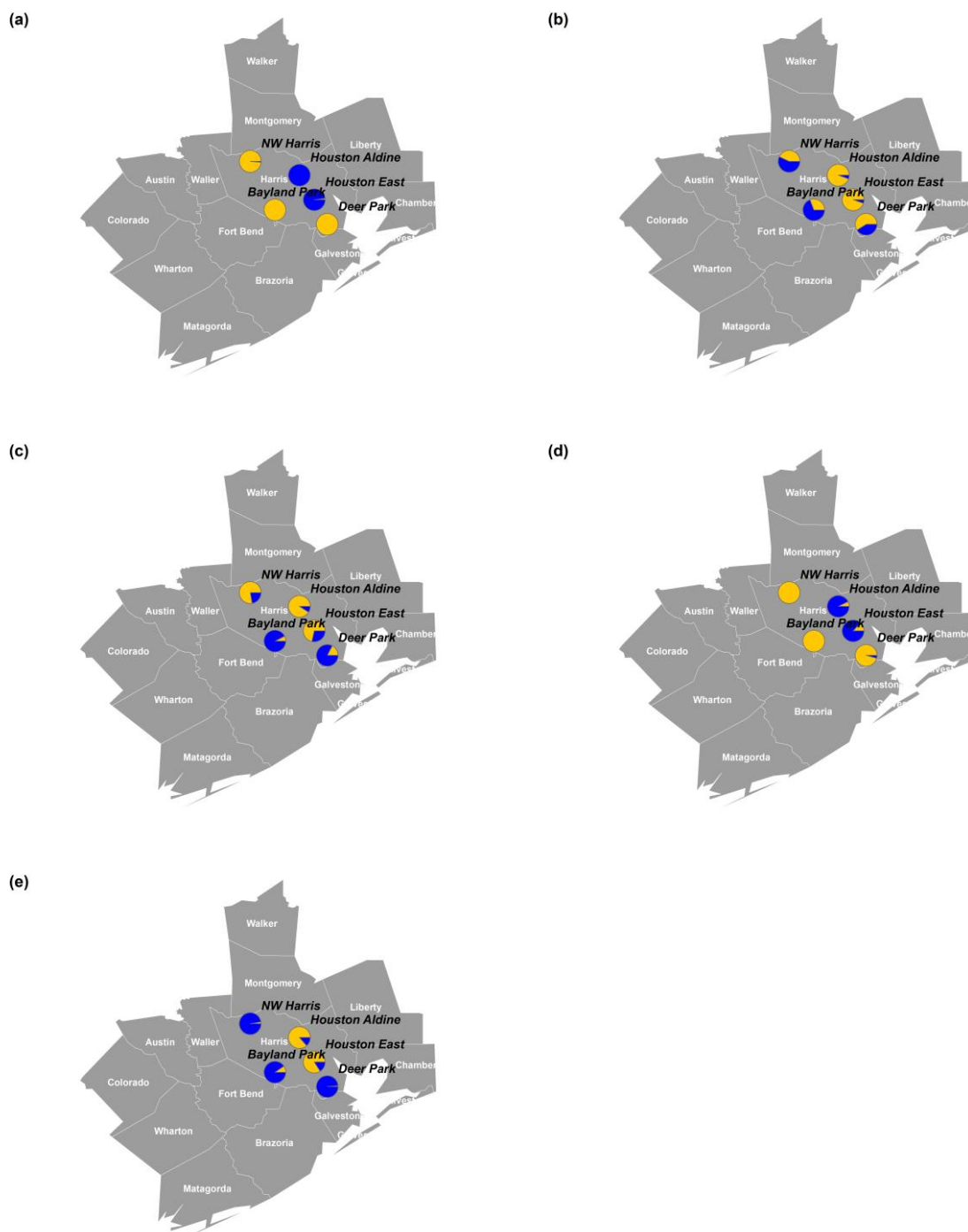


Figure S13: Partition of O_3 (a), NO_x (b), WD (c), WS (d) and T (e) between the two components (PC1 in yellow and PC2 in blue).

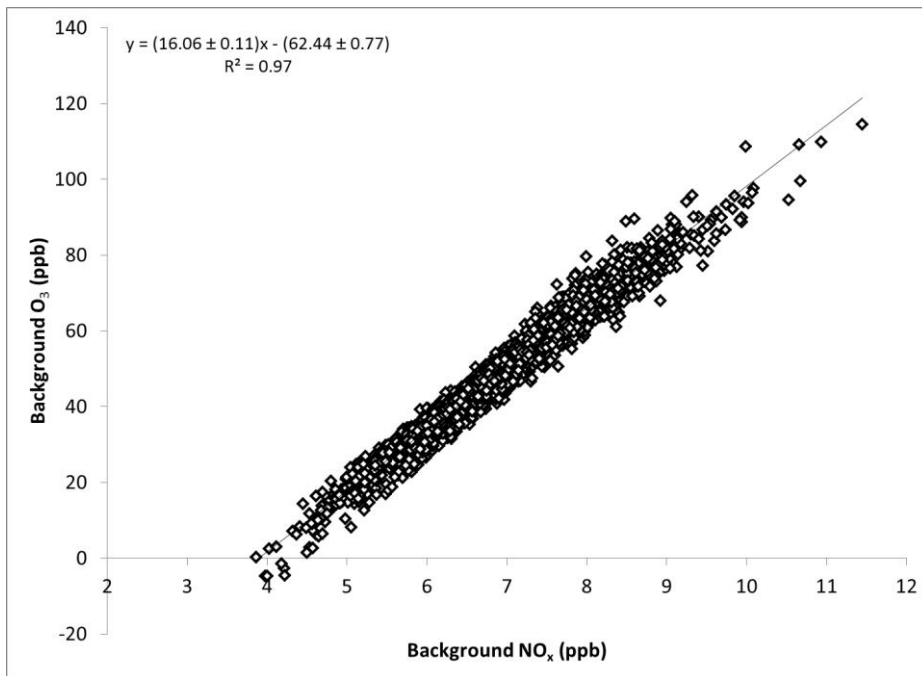


Figure S14: Relationship between regional background O₃ and NO_x (Approach B).

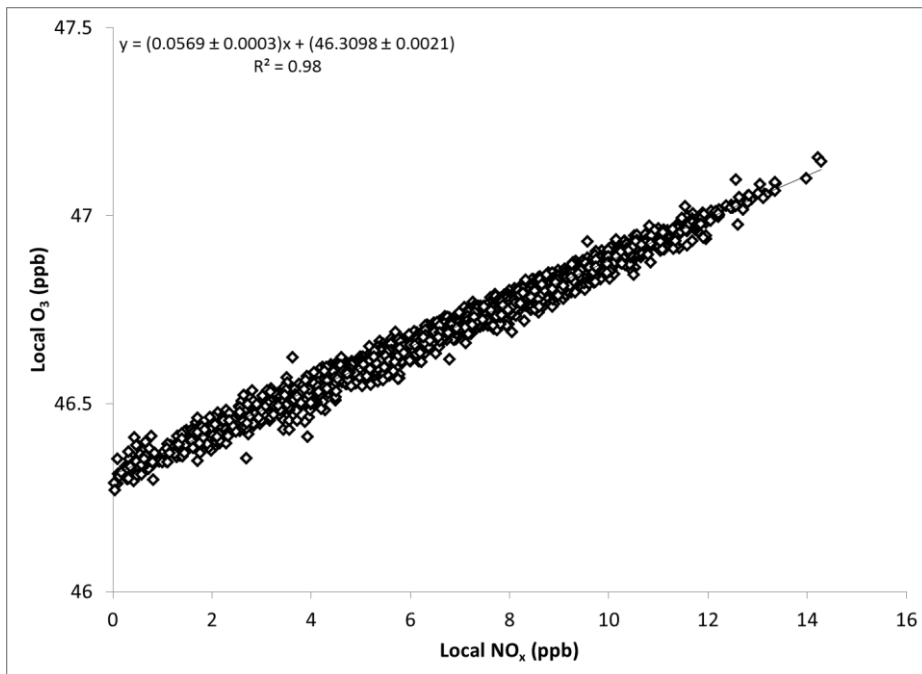


Figure S15: Relationship between local O₃ and NO_x (Approach B).

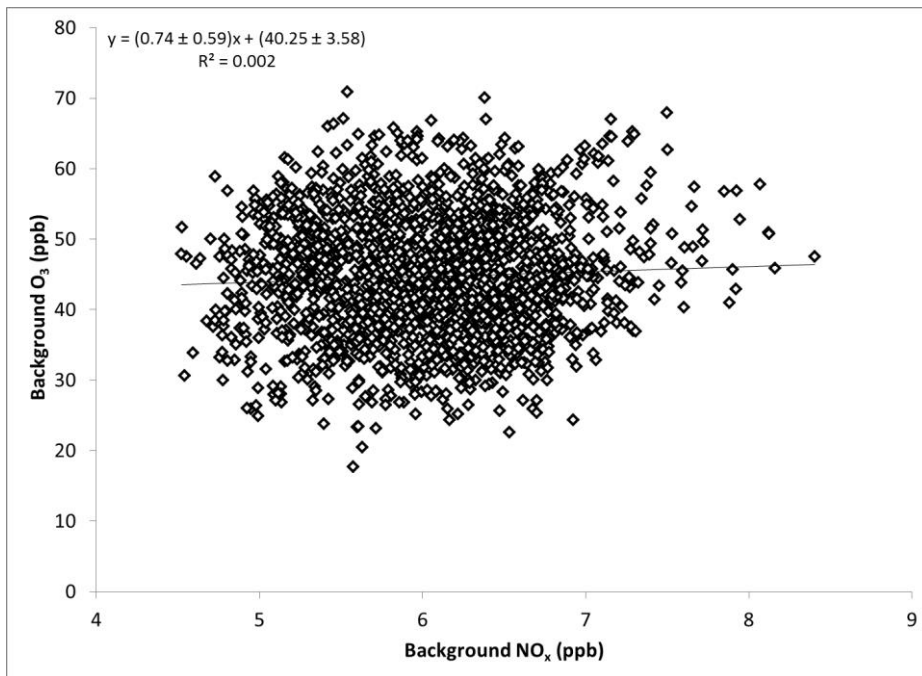


Figure S16: Relationship between regional background O_3 and NO_x (Approach C).

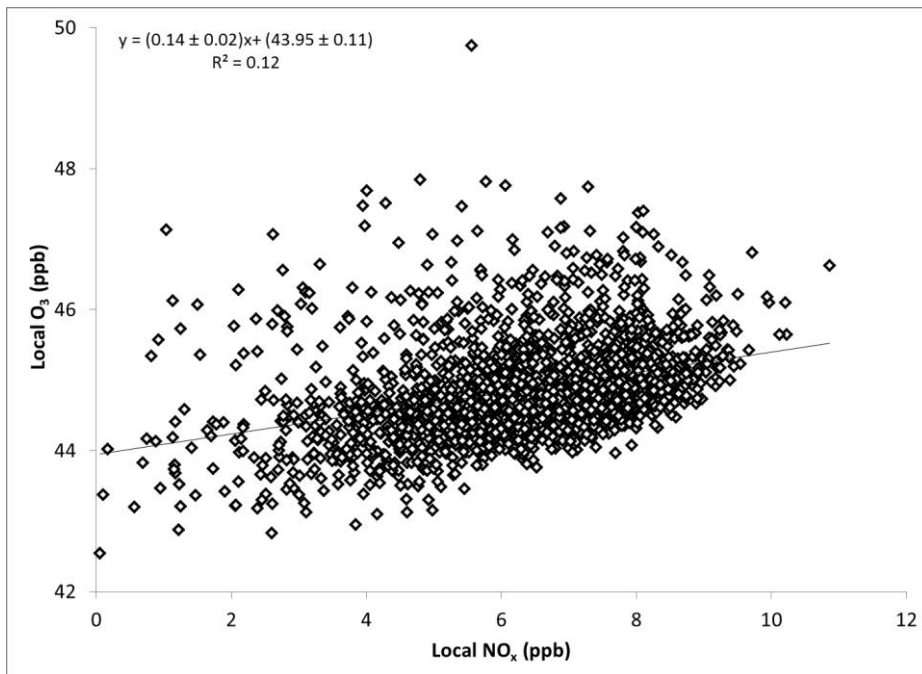


Figure S17: Relationship between local O_3 and NO_x (Approach C).

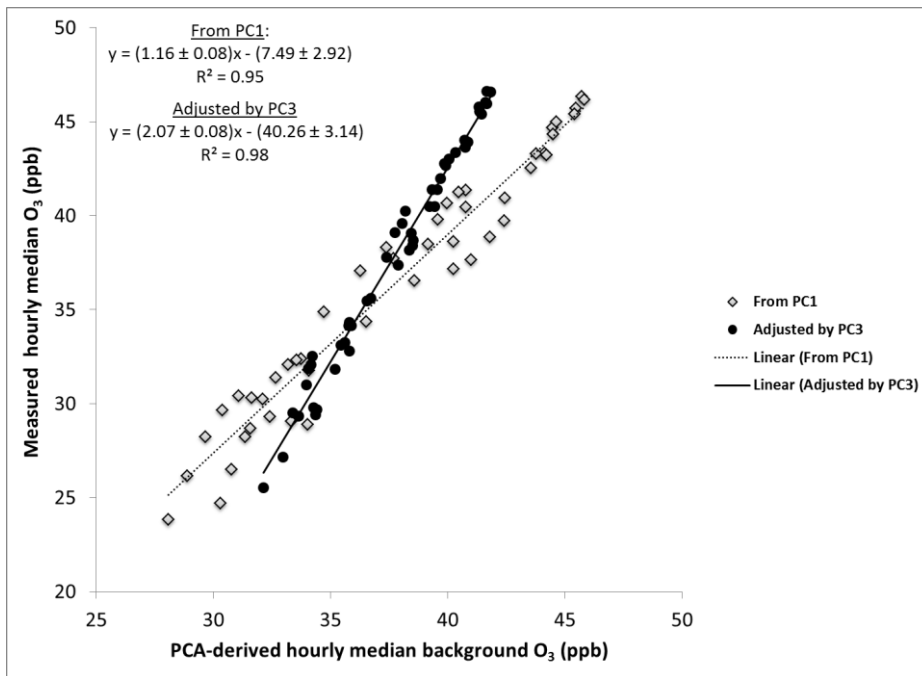


Figure S18: Measured hourly median O_3 (average of 16-19 sites) vs. estimated background O_3 from PCA.

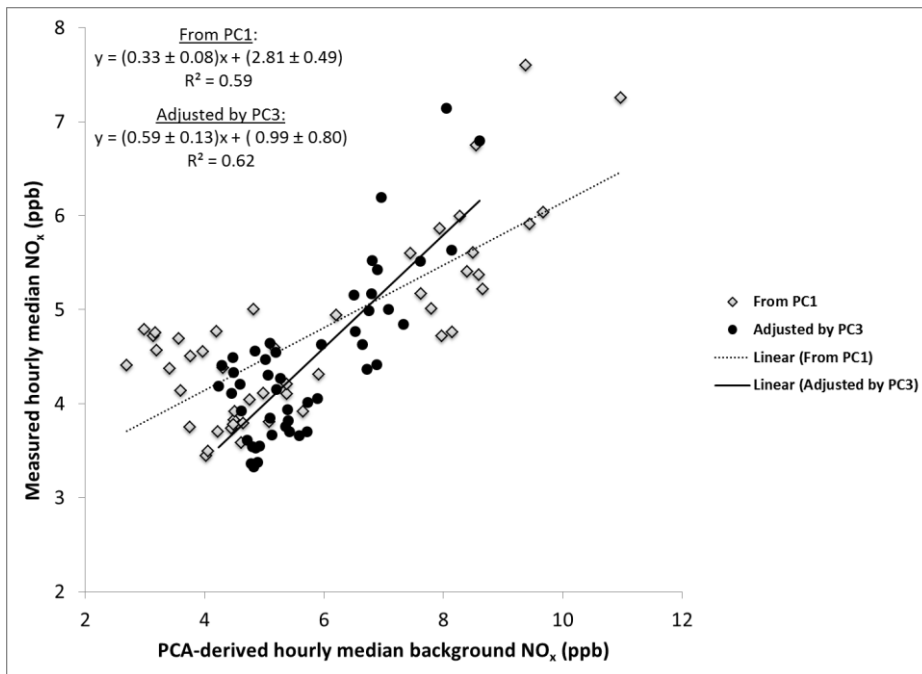


Figure S19: Measured hourly median NO_x (average of 15-18 sites) vs. estimated background NO_x from PCA.

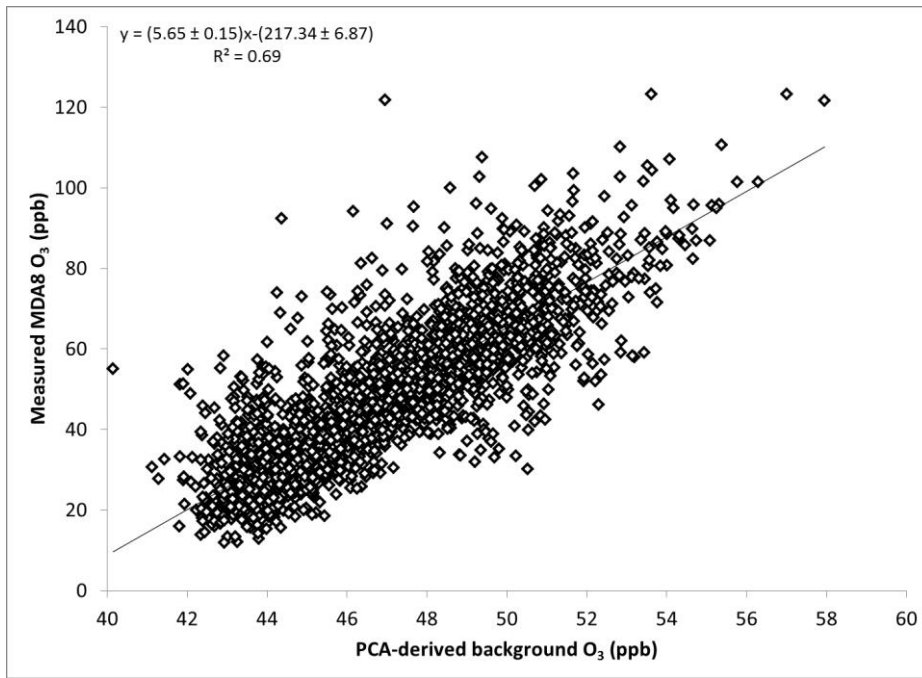


Figure S20: Measured MDA8-O₃ (average of 5 sites) vs. background O₃ derived from PCA (Approach A).

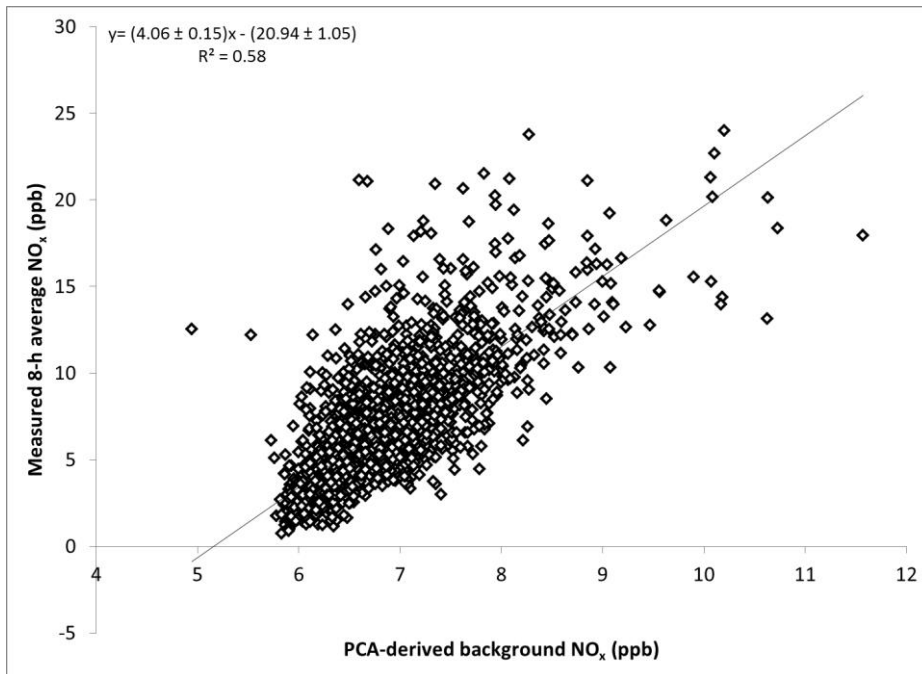


Figure S21: Measured 8-h average NO_x (average of 5 sites) vs. background NO_x from PCA (Approach A).

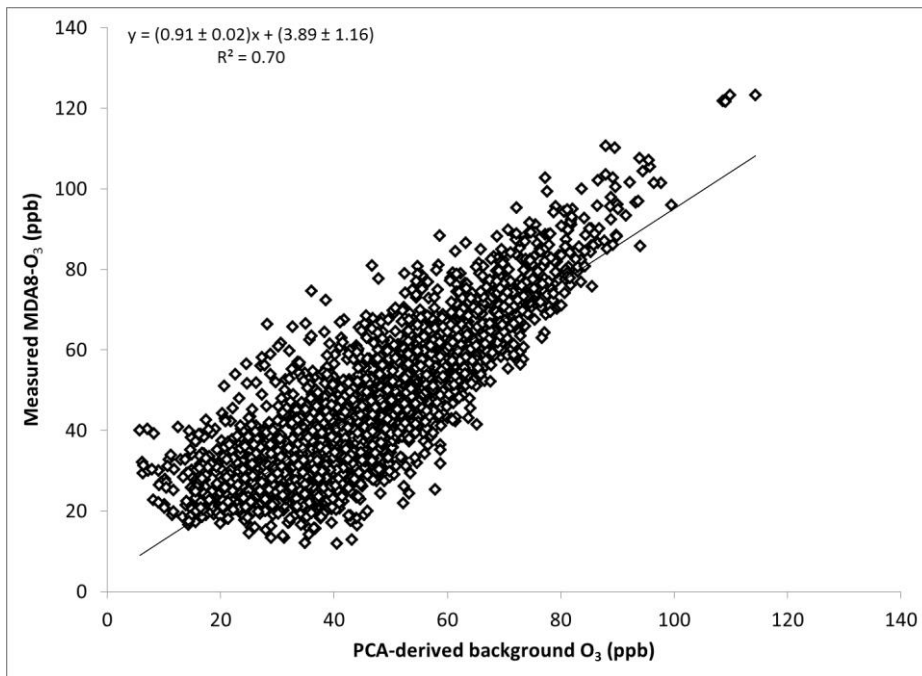


Figure S22: Measured MDA8-O₃ (average of 5 sites) vs. background O₃ derived from PCA (Approach B).

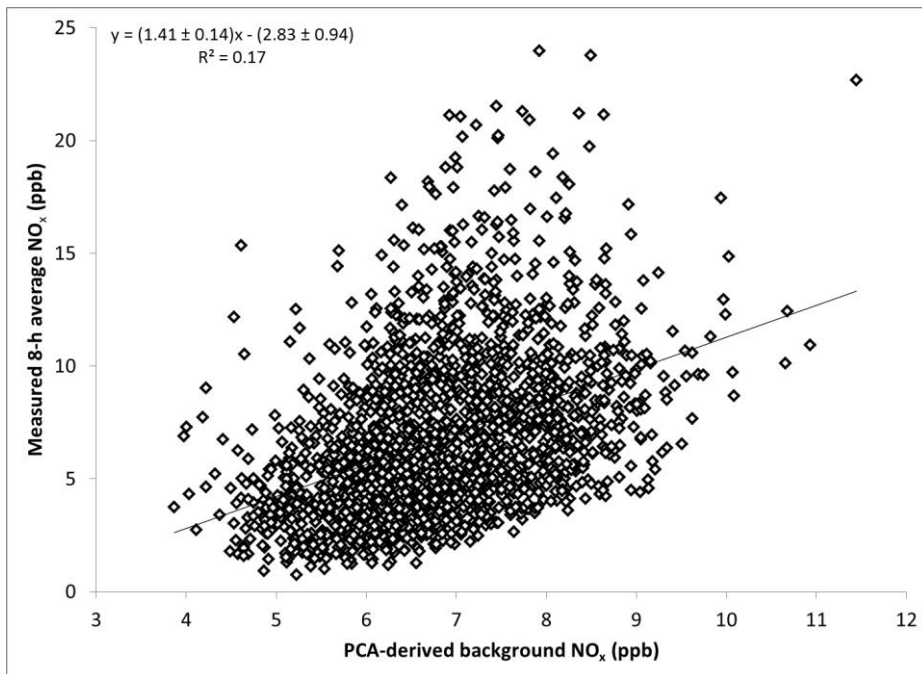


Figure S23: Measured 8-h average NO_x (average of 5 sites) vs. background NO_x from PCA (Approach B).

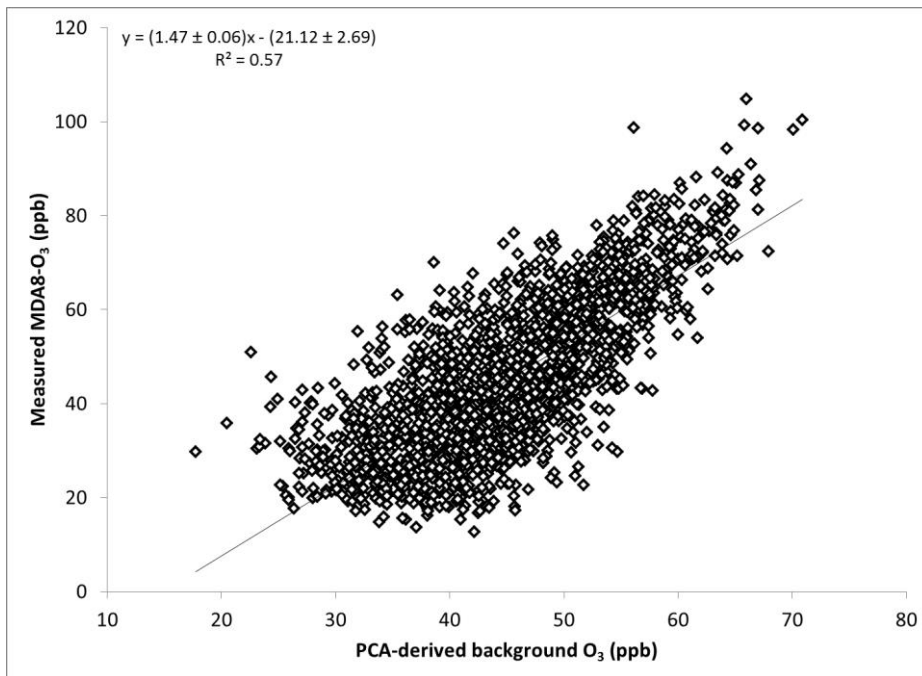


Figure S24: Measured MDA8-O₃ (average of 10 sites) vs. background O₃ derived from PCA (Approach C).

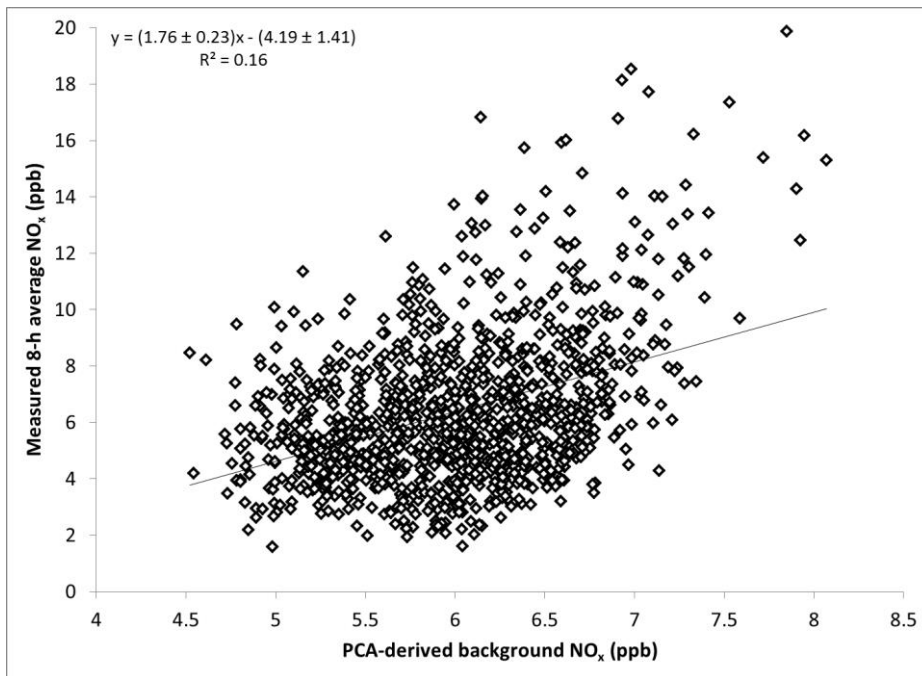


Figure S25: Measured 8-h average NO_x (average of 10 sites) vs. background NO_x from PCA (Approach C).