

Supplemental Materials

Contrasting Behavior of Slow and Fast Photoreactive Gases during the August 21, 2017, Solar Eclipse

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SM_Figure 1a, b: (a) Diurnal cycle of 1-min NO data for all days of August 2017 (except August 21), with median diurnal cycle overlaid in blue. (b) Same as (a) for NO₂. (Page 3)

SM_Figure 1c, d: (c) Diurnal 1-hour O₃ data for all days of August 2017 (except August 21), with median diurnal cycle overlaid in blue. (d) Same as (c) for methane, with methane measurements performed on a 16-minute interval. (Page 4)

SM_Figure 1e: Diurnal cycle of 2-hour ethane measurements for all days of August 2017, except the 21st, with the August median diurnal ethane cycle overlaid in blue. (Page 5)

SM_Figure 2: Diurnal cycle NO_x on the eclipse day August 21 (filled circles) in comparison with the median diurnal cycle for August 2017 (except August 21). The time window of the eclipse is indicated by the vertical dotted lines (eclipse start and end), and the center of the eclipse is indicated by the solid line. (Page 6)

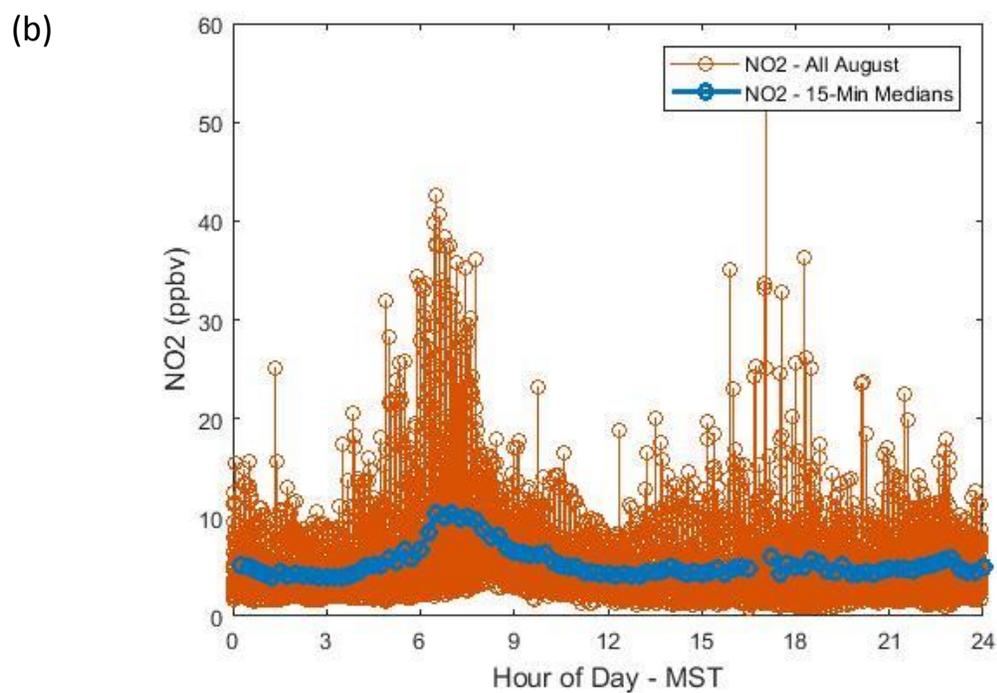
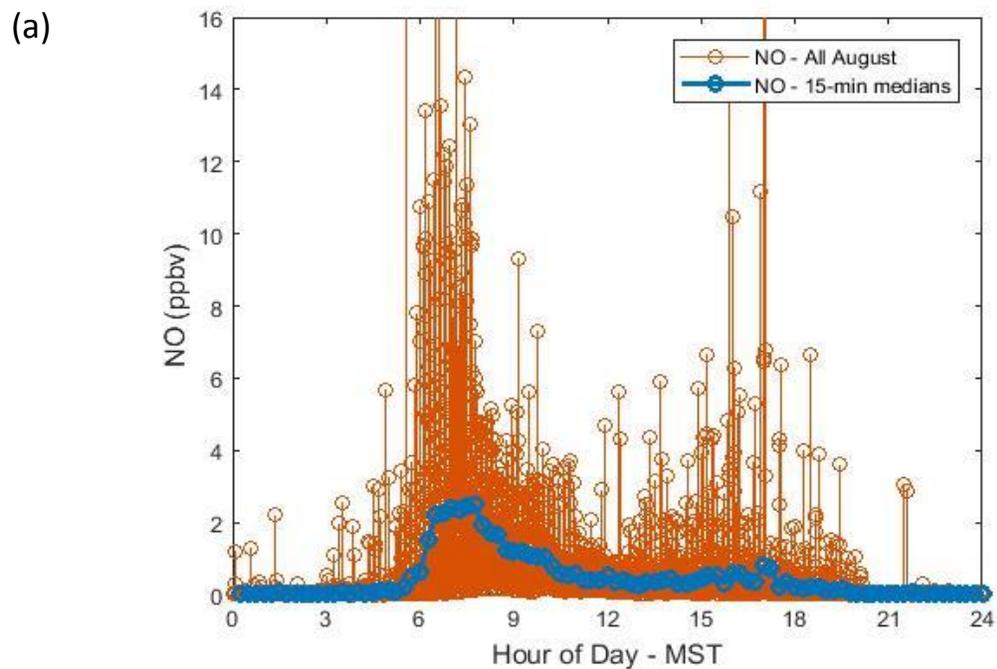
SM_Figure 3: Averaged diurnal northbound, southbound, and total hourly traffic count on Highway 119, for August 23-24, 2016. (Page 7)

SM_Figure 4: Comparison of ethane distribution at the Boulder Reservoir with literature data. (Page 7)

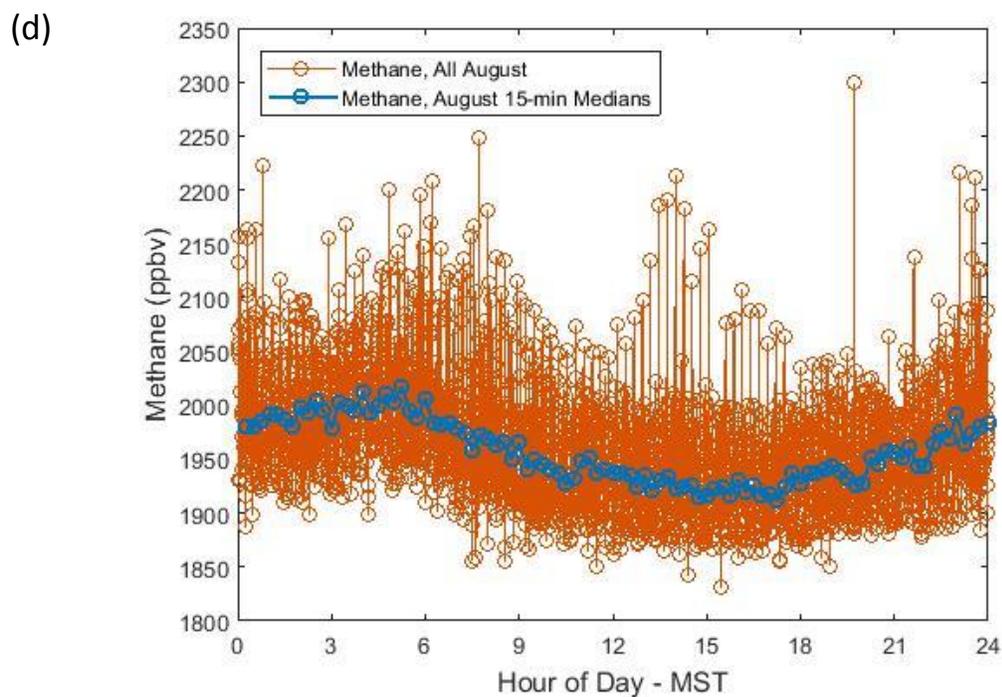
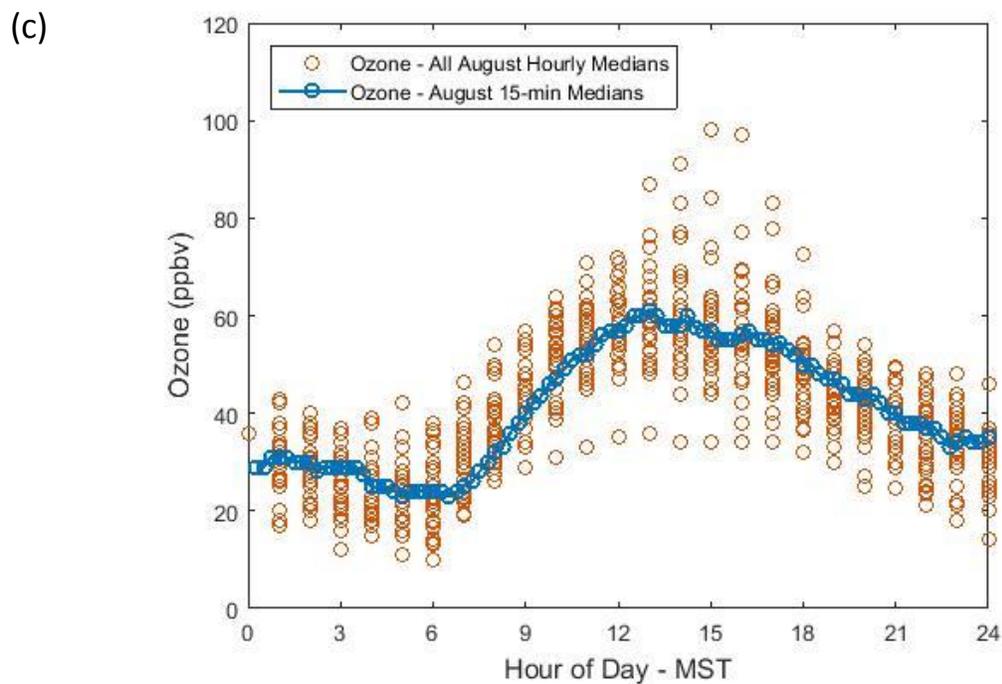
SM_Figure 5: Location of five other CDPHE-operated ozone monitoring sites within the Northern Colorado Front Range in relation to the Boulder Reservoir. Ozone records from these monitoring stations are shown in Figure 6 of the manuscript. (Page 8)

SM_Figure 6: Back-trajectories for morning to evening hours at the Boulder Reservoir on the day of the eclipse. (Page 9)

SM_Figure 7: i/n-pentane ratio on the eclipse day in comparison to the median diurnal August cycle. Back-trajectories for morning to evening hours at the Boulder Reservoir on the day of the eclipse. (Page 10)

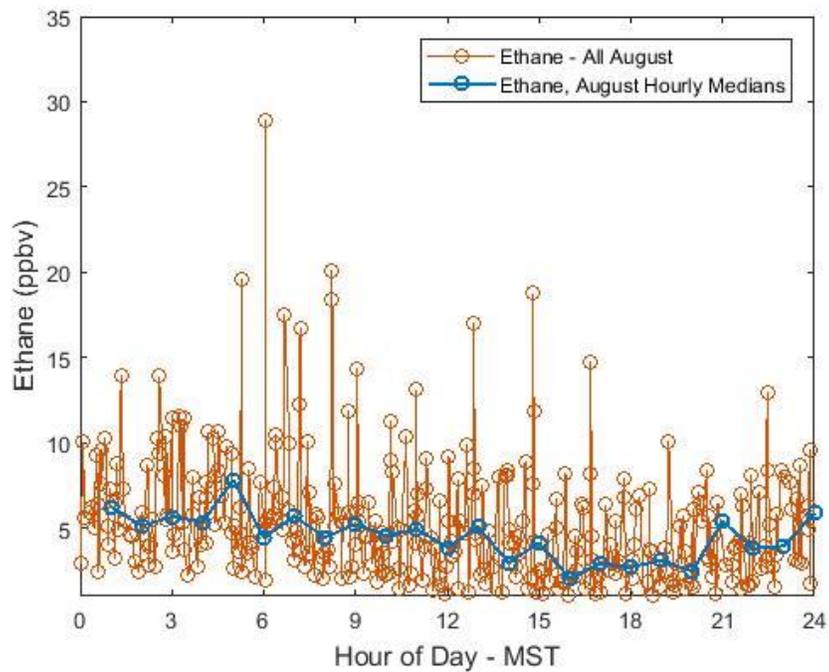


SM_Figure 1a, b: (a) Diurnal cycle of 1-min NO data for all, but August 21, days of August 2017, with median diurnal cycle overlaid in blue. (b) Same as (a) for NO₂.

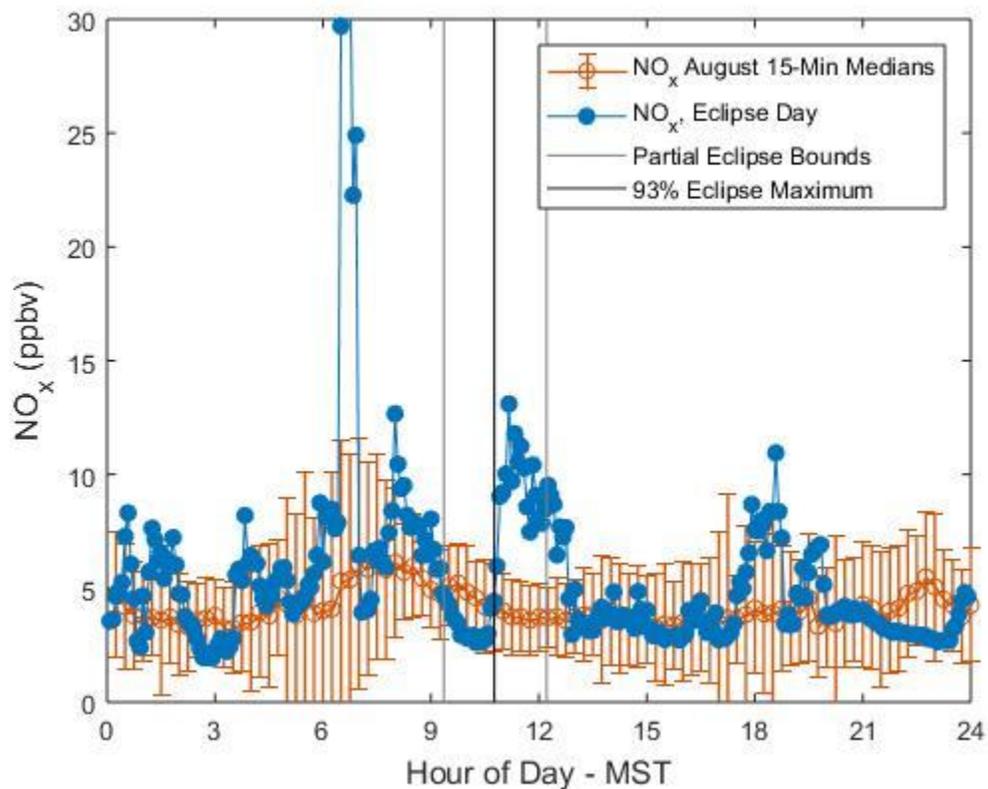


SM_Figure 1c, d: (c) Diurnal 1-hour O_3 data for all days of August 2017 (excluding August 21), with median diurnal cycle overlaid in blue. (d) Same as (c) for methane, with methane measurements performed on a 16-minute interval.

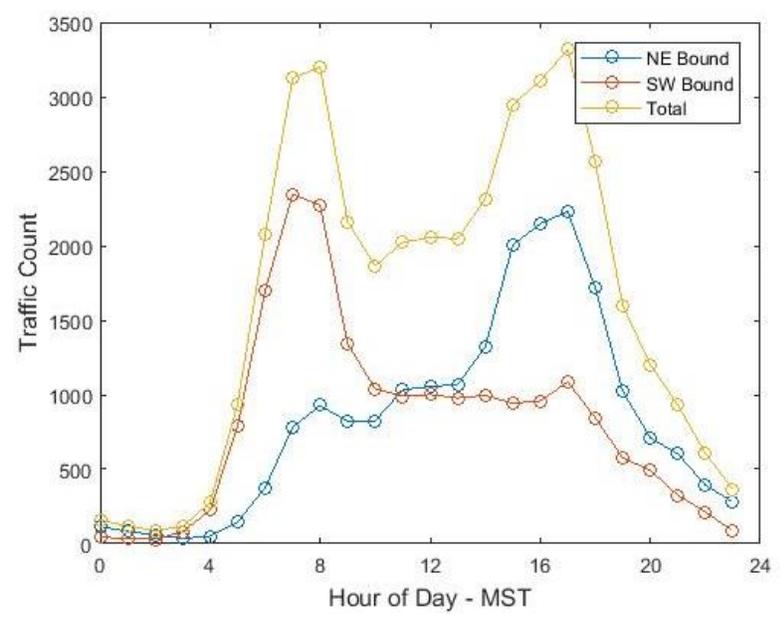
(e)



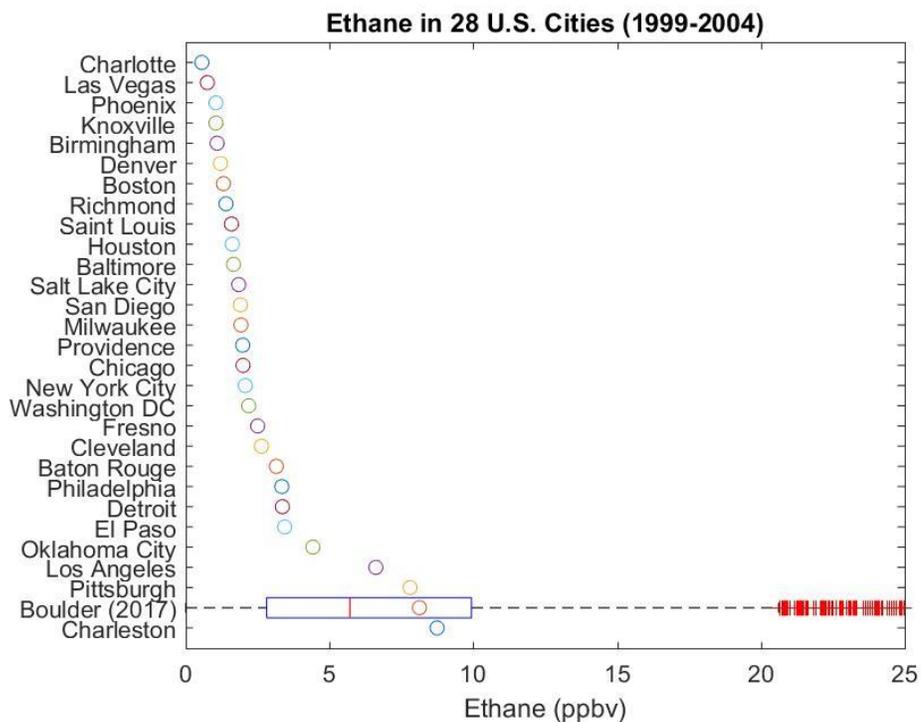
SM_Figure 1e: Diurnal cycle of 2-hour ethane measurements for all days of August 2017 (excluding August 21), with the August median diurnal ethane cycle overlaid in blue.



SM_Figure 2: Diurnal cycle of NO_x on the eclipse day August 21 (filled circles) in comparison with the median diurnal cycle for August 2017 (excluding August 21). The time window of the eclipse is indicated by the vertical dotted lines (eclipse start and end), and the center of the eclipse is indicated by the solid line.



SM_Figure 3: Averaged diurnal northbound, southbound, and total hourly traffic count on Highway 119, for August 23-24, 2016.

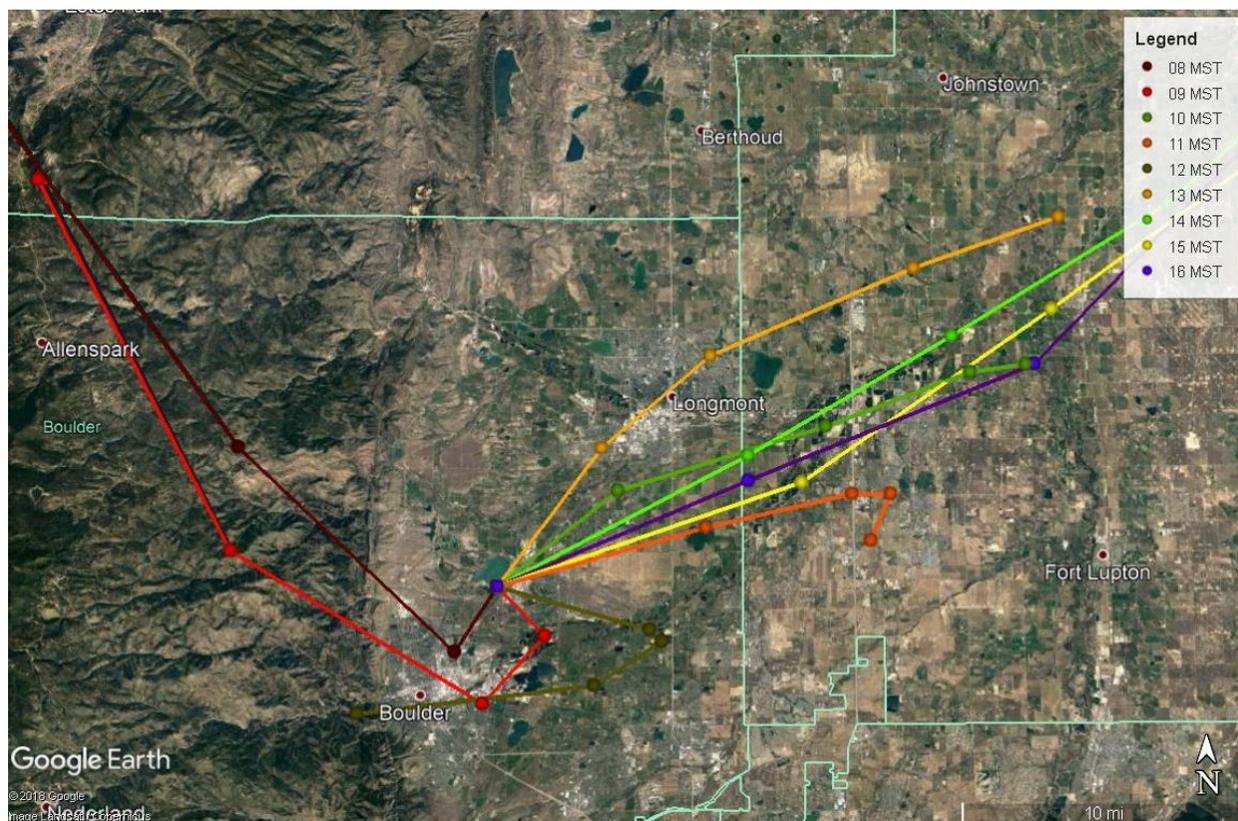


SM_Figure 4: Comparison of ethane distribution at the Boulder Reservoir (box-whisker format plot includes from May 2017 – April 2018 data; the box represents the 25-75 percentile of data, the whiskers are drawn to a length of 1.5 times the interquartile range away from the top and bottom of the boxes, and values outside of the whisker range are marked as red crosses) with published annual mean ethane mixing ratios in 28 American cities during 1999-2004 [Baker *et al.*, 2008].

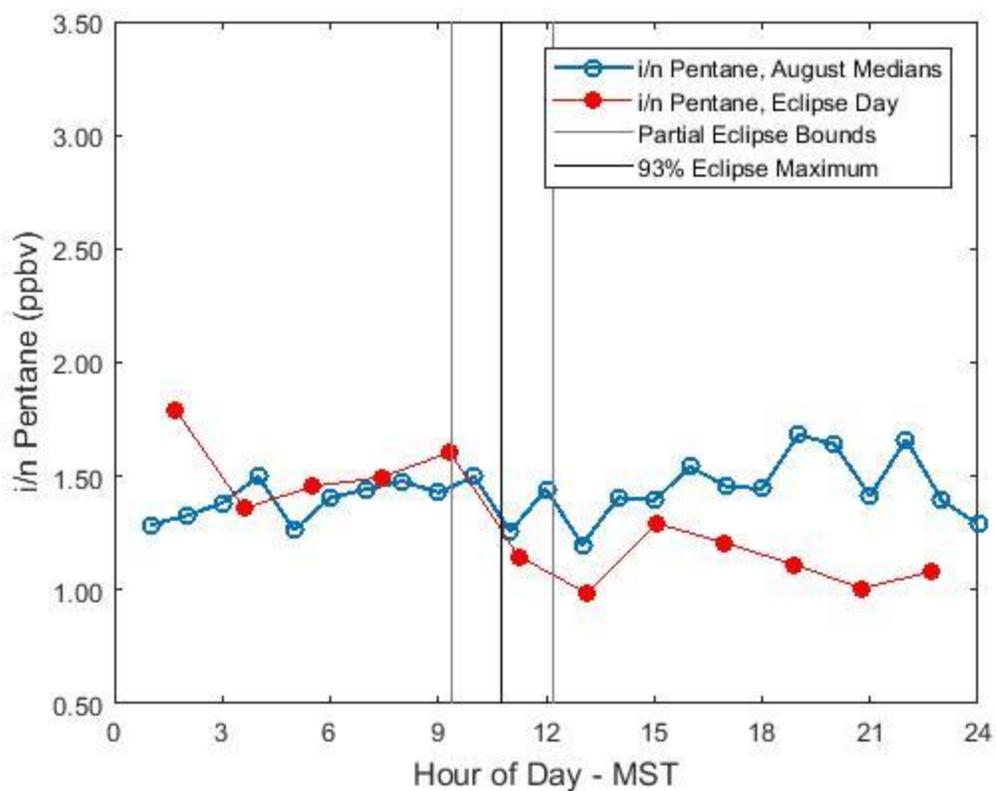
SM_Figure 4 Incoming solar radiation on eclipse day August 21, 2017, measured on the CU Boulder Campus (see Manuscript [Figure 1](#) for a map indicating the location).



SM_Figure 5: Location of five other CDPHE-operated ozone monitoring sites within the Northern Colorado Front Range in relation to the Boulder Reservoir. Ozone records from these monitoring stations are shown in Figure 6 of the manuscript.



SM_Figure 6: Back-trajectories for morning to evening hours at the Boulder Reservoir on the day of the eclipse. The trajectories were run back 4 hours in NOAA's Hysplit (online version) using their HRRR 3 km grid radar archives for meteorological parameters, at a starting height of 10 m above ground level at the Reservoir. One run was performed for each hour from 8.00 to 16.00 MST on the day of the eclipse, and they were mapped in Google Earth Pro.



SM_Figure 7: i/n-pentane ratio on the eclipse day in comparison to the median diurnal August cycle.

References cited in Supplemental Materials

Baker, A. K., A. J. Beyersdorf, L. A. Doezema, A. Katzenstein, S. Meinardi, I. J. Simpson, D. R. Blake, and F. S. Rowland (2008), Measurements of nonmethane hydrocarbons in 28 United States cities, *Atmospheric Environment*, 42, 170-182, doi:10.1016/j.atmosenv.2007.09.007.