

Interactive
Comment

***Interactive comment on* “Observations of the temperature dependent response of ozone to NO_x reductions in the Sacramento, CA urban plume” by B. W. LaFranchi et al.**

Anonymous Referee #1

Received and published: 24 April 2011

This manuscript describes research examining the trend in ozone and NO_x in the Sacramento region. The relationship between decreasing NO_x and ozone is quantified using observations and a model. The findings suggest that NO_x emission reductions are responsible for decreasing ozone in the region. This is a well-written manuscript that addresses an important and interesting problem in a novel and useful way. I recommend publication in *Atmospheric Chemistry and Physics*, pending revisions that address these comments below.

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Specific comments

Is there a relationship between NO_x emissions and temperature? That is, hot days could increase cooling demand, causing more electricity generation, or even higher vehicle emissions from more use of car air conditioning? If there is such a relationship, how does it impact the interpretation of your results? Since the change in temperature will change the VOC reactivity and therefore change the NO_x lifetime, it may not be easy to determine from the NO_y measurements alone.

Fig. 3: I understand the interpretation of plots (a-c) as discussed in the text. A minor point of clarification – does "standard error" here refer to the "standard error of the mean"? That is, the sample standard deviation divided by the square root of the sample size? This would explain the small estimate despite the large variability. If so, please replace "standard error" with "standard error of the mean".

A larger point of clarification – for Fig. 3 (d-f), what do the dashed lines represent? I could not find Eq. 6 as referenced in the caption. I think these dashed lines should be removed, as they are not described in the main body of the text.

In Section 6, page 6277, a "confidence time frame" is calculated, which is used to address uncertainty in the frequency of ozone exceedance. The 95% confidence time frame is calculated "from the upper bound of the 2σ uncertainty in the mean". Please define "confidence time frame" and add a few sentences that describe this calculation. How is σ calculated? Why would you be interested in the 50% confidence time frame, which seems to suggest high uncertainty – that is equal probability of having or not having an ozone exceedance? The 50% calculation seems unnecessary and confusing.

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Editorial comments

Section 2 title: sacramento should be capitalized

Section 2: unless the region is literally named "Oak Forest" this should not be capitalized. Also, tree names throughout this section (Oak) should not be capitalized.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 6259, 2011.

ACPD

11, C2245–C2247, 2011

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