

Supplement of Atmos. Chem. Phys., 17, 2943–2970, 2017
<http://www.atmos-chem-phys.net/17/2943/2017/>
doi:10.5194/acp-17-2943-2017-supplement
© Author(s) 2017. CC Attribution 3.0 License.



Atmospheric
Chemistry
and Physics
Open Access
EGU

Supplement of

**US surface ozone trends and extremes from 1980 to 2014:
quantifying the roles of rising Asian emissions,
domestic controls, wildfires, and climate**

Meiyun Lin et al.

Correspondence to: Meiyun Lin (meiyun.lin@noaa.gov)

The copyright of individual parts of the supplement might differ from the CC-BY 3.0 licence.

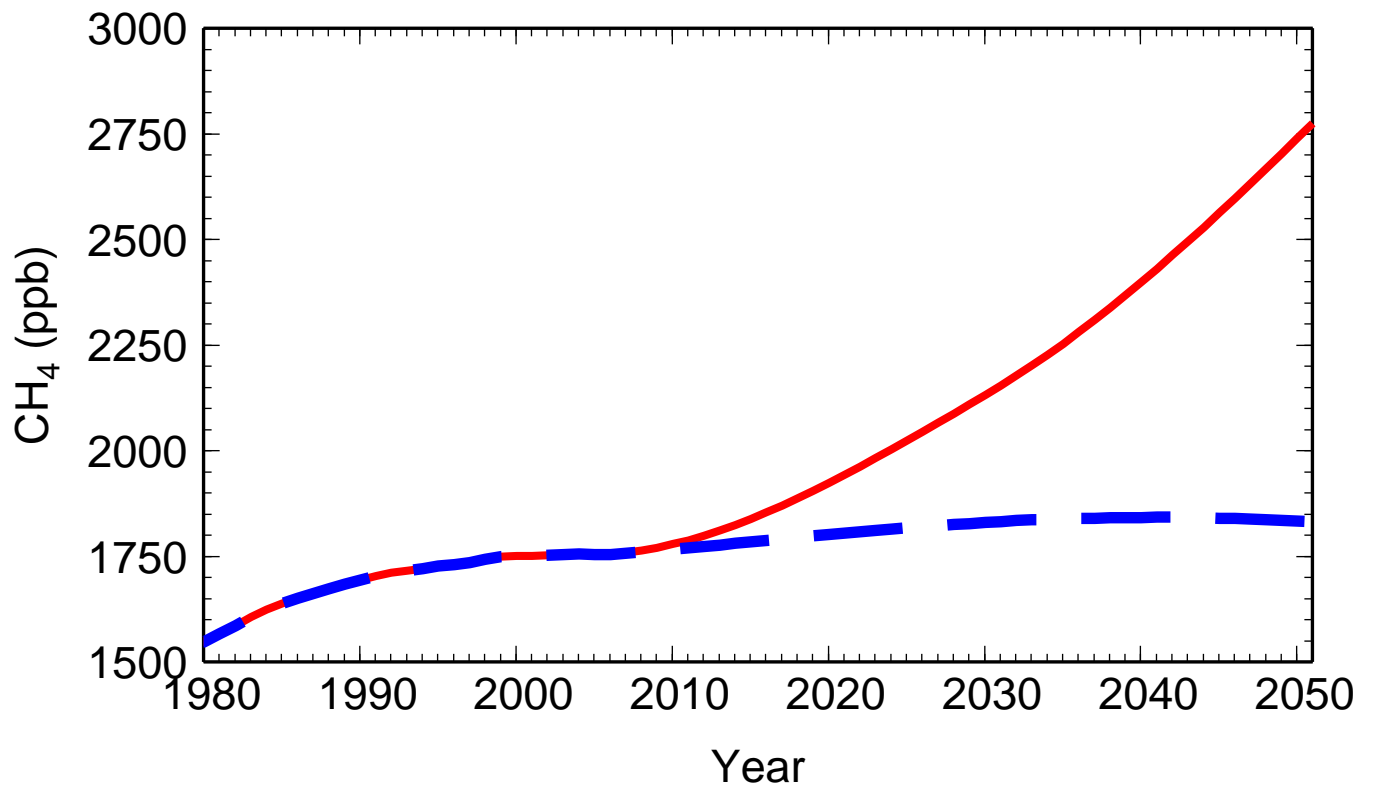


Figure S1. Historical changes in methane concentrations from 1980 to 2010 and future projections beyond 2010 in RCP8.5 (red) versus 4.5 (blue).

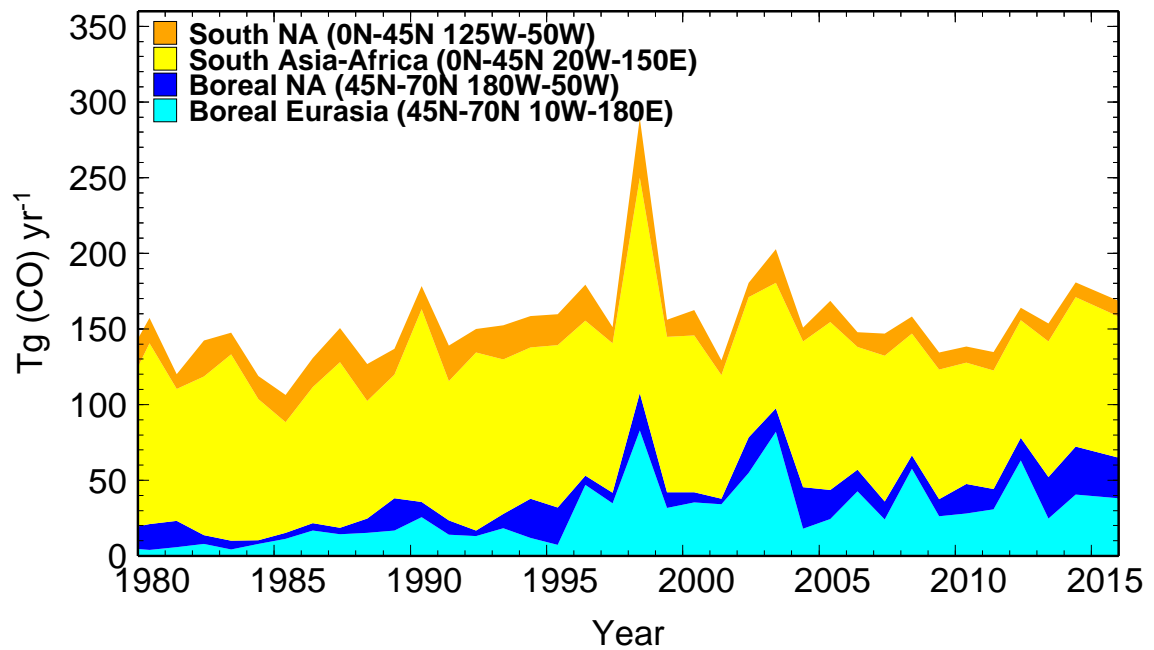


Figure S2. **Interannual variability of biomass burning emissions.** Annual CO emissions from biomass burning in boreal Eurasia (cyan), boreal North America (blue), low-latitude regions of Asia-Africa (yellow) and North America (orange).

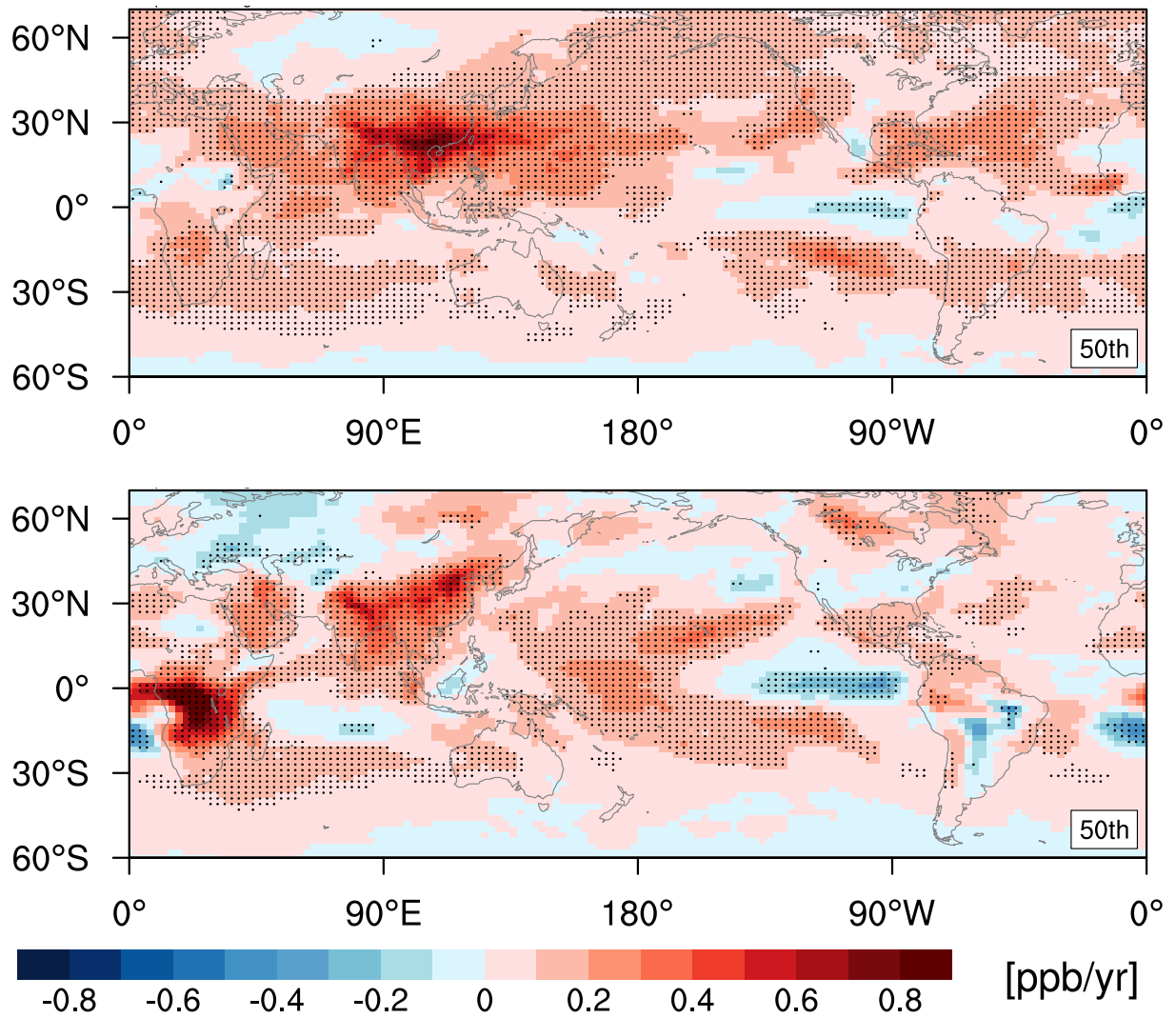


Figure S3. Global distribution of median MAM (top) and JJA (bottom) O₃ trends at 500 hPa from AM3 BASE. Stippling indicates areas where the trend is statistically significant ($p < 0.05$).

Observed

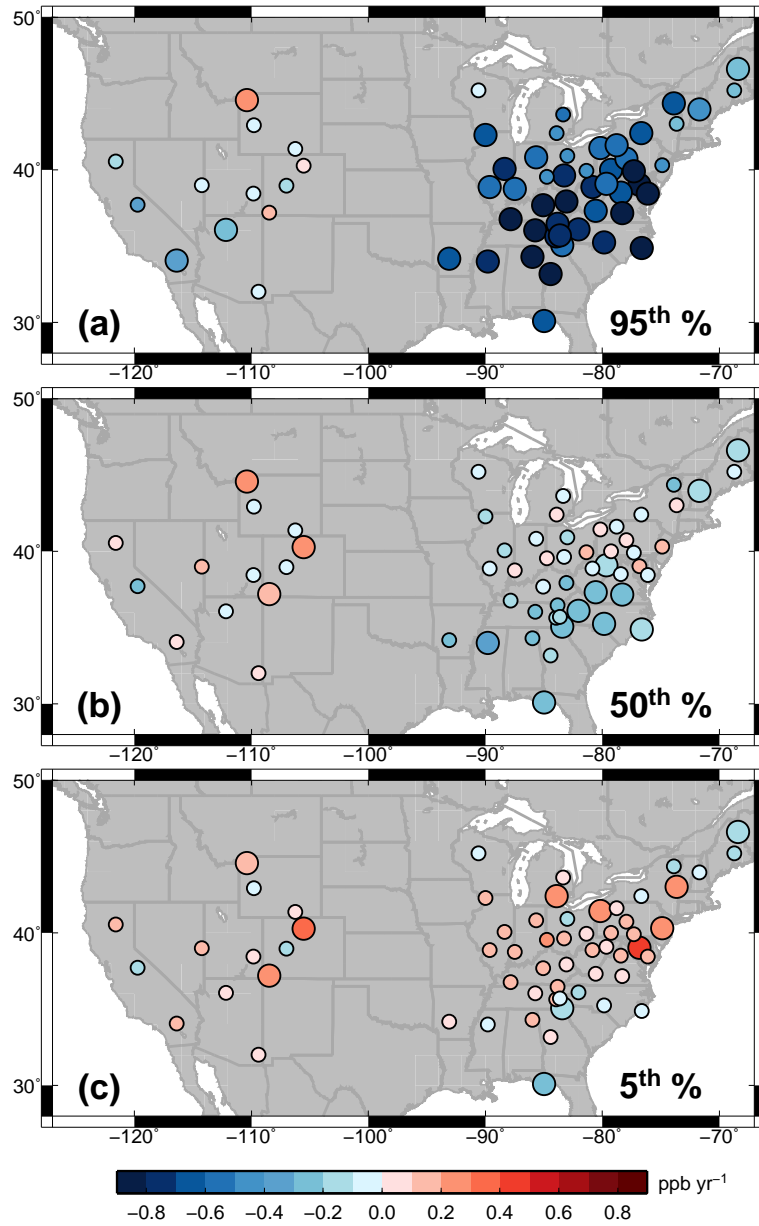


Figure S4. Linear trends in autumn (SON) MDA8 O₃ over 1988-2014 measured at US rural sites for the 95th, 50th, and 5th percentiles. Larger circles indicate sites with statistically significant trends ($p < 0.05$).

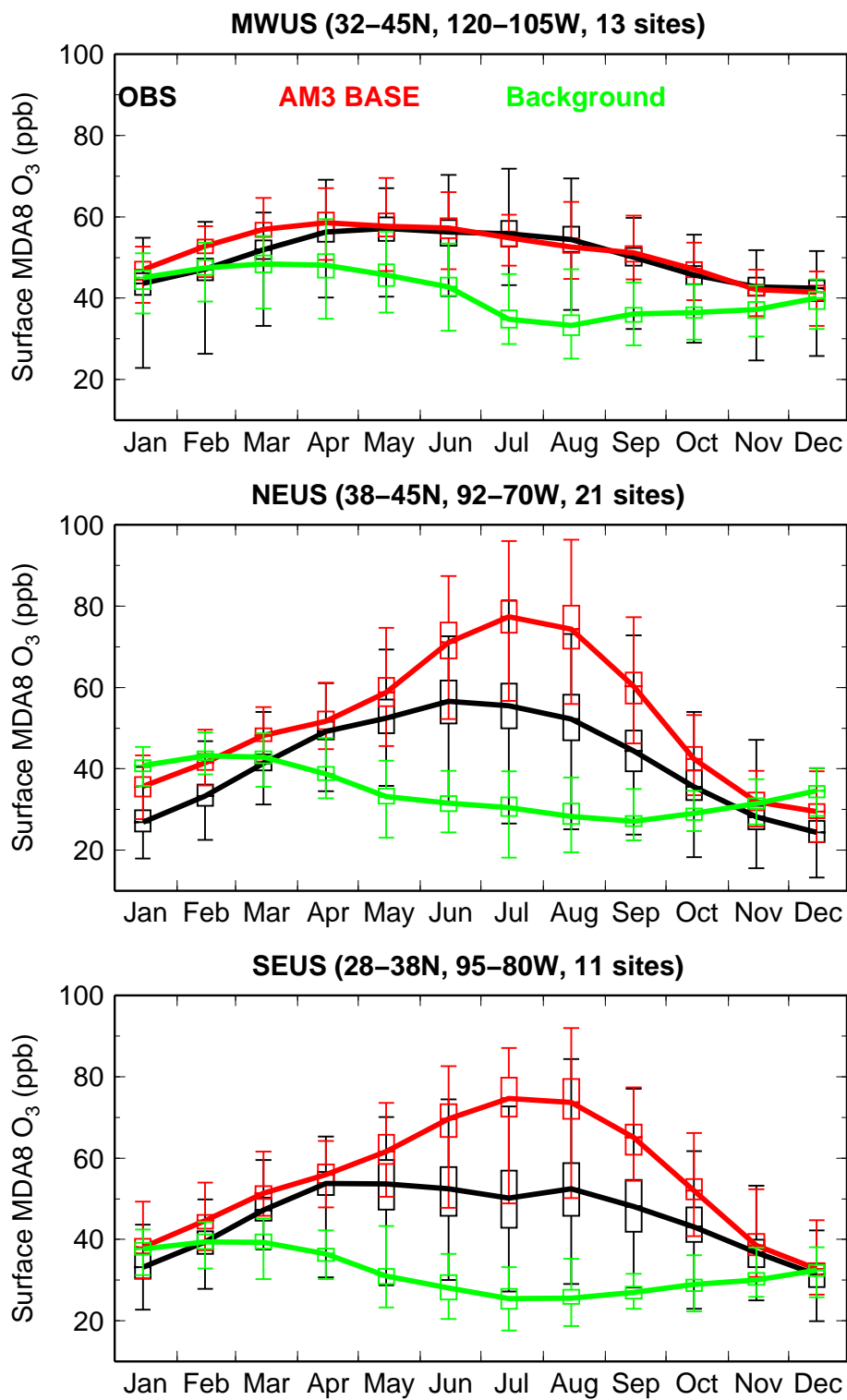


Figure S5. Monthly mean surface MDA8 O₃ concentrations for 1988–2014 as observed (black) and simulated (red) in AM3 BASE. Also shown is simulated background O₃ (green). The box-and-whisker plots represent minimum, 25th, 50th, 75th, and maximum values for all years across the sites falling within the given latitude, longitude, and altitude boundaries.

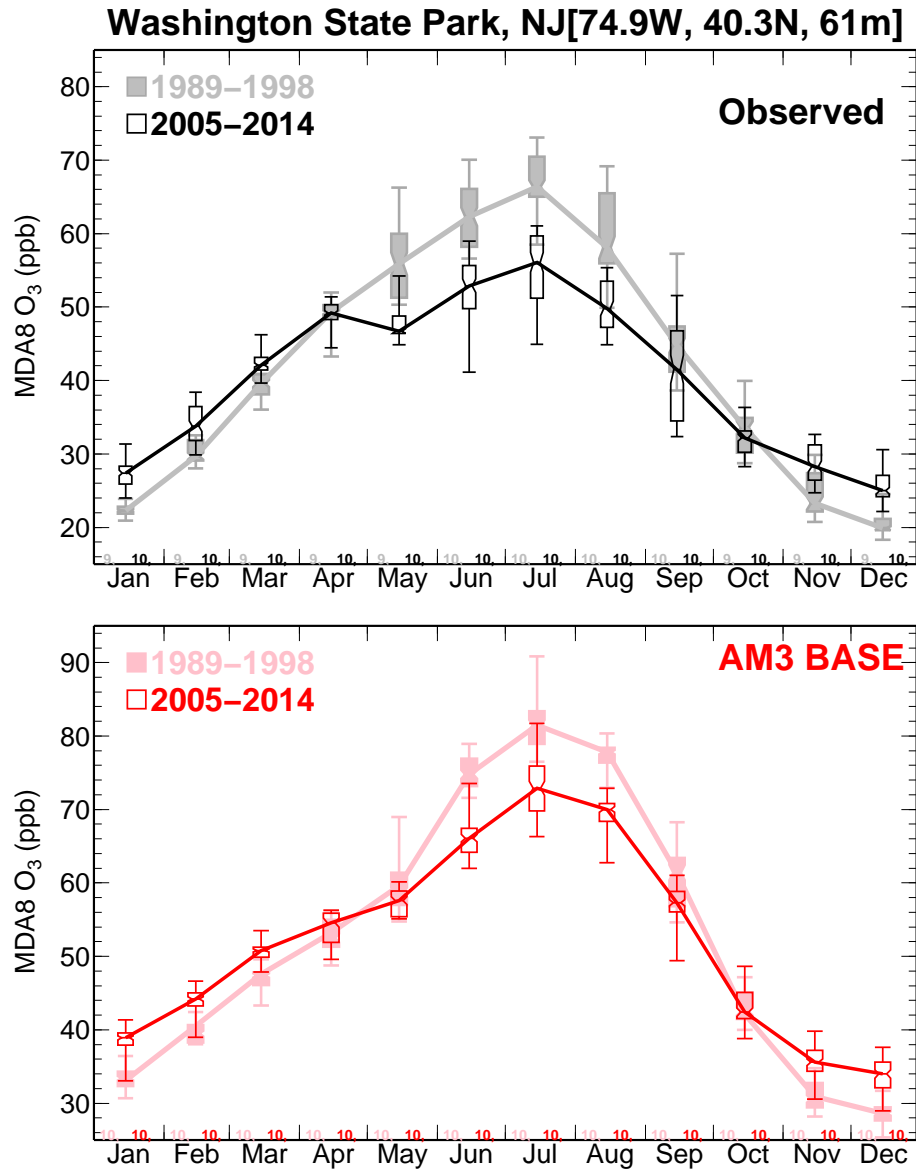


Figure S6. The changing O₃ seasonal cycle from 1989-1998 (closed boxes) to 2005-2014 (open boxes) at Washington State Park in New Jersey as observed (top) and simulated (bottom) in the GFDL-AM3 model. The box-and-whisker plots represent the minimum, 25th, 50th, 75th, and maximum moonthly values across the years.

2003-2012 minus 1981-1990

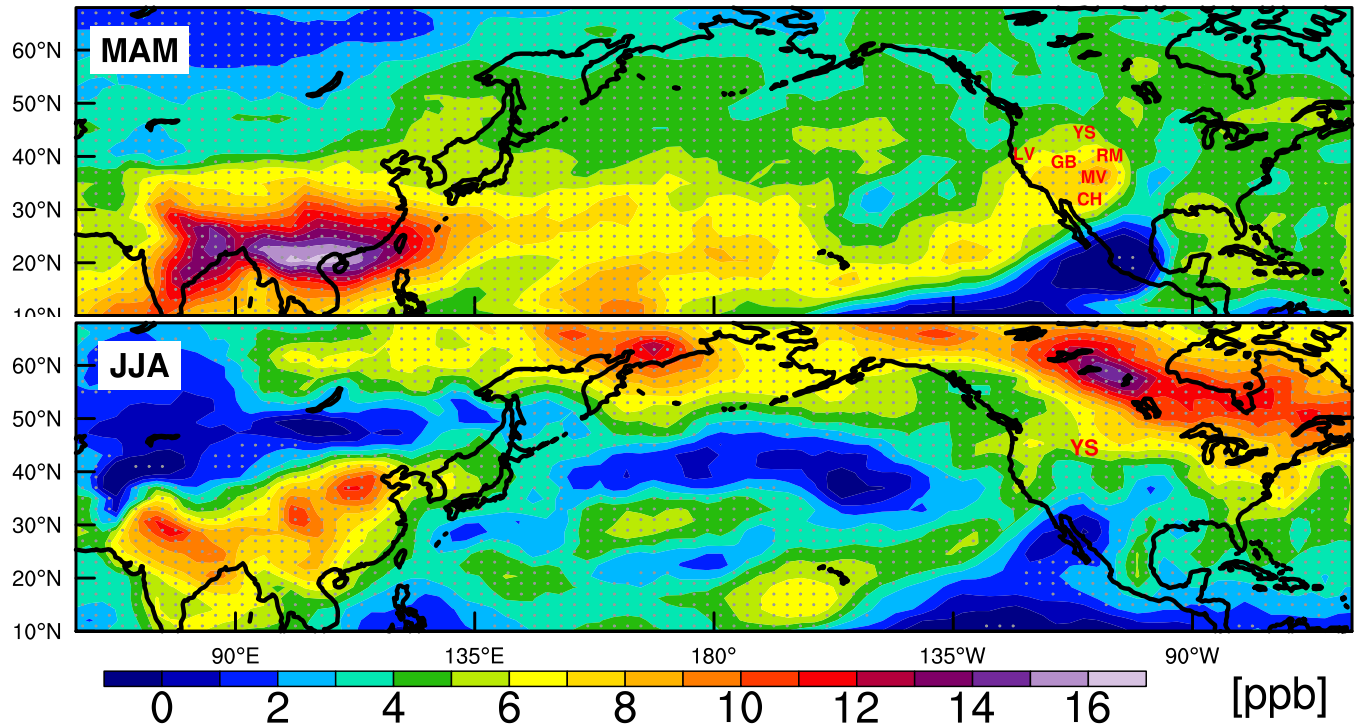


Figure S7. Maps of changes in decadal mean O₃ at 700 hPa from 1981-1990 to 2003-2012 from the Background simulation for spring versus summer. Stippling denotes areas where the change is statistically significant based on Student's *t*-test ($p < 0.05$). Letters in red denote the WUS CASTNet sites where significant ozone increases have been observed.

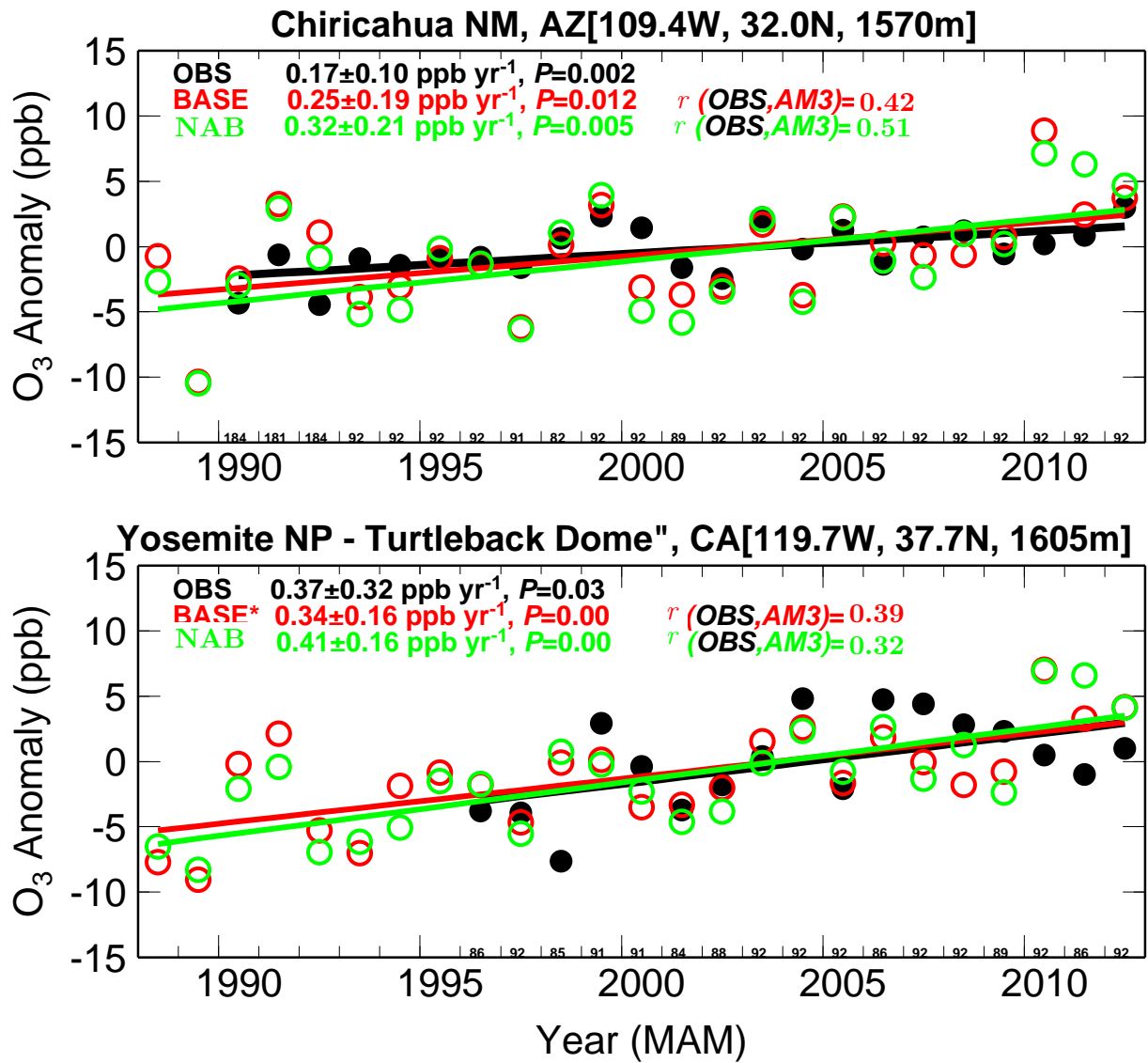


Figure S8. Same as Figure 13 in the main text, but for Yosemite and Chiricahua.