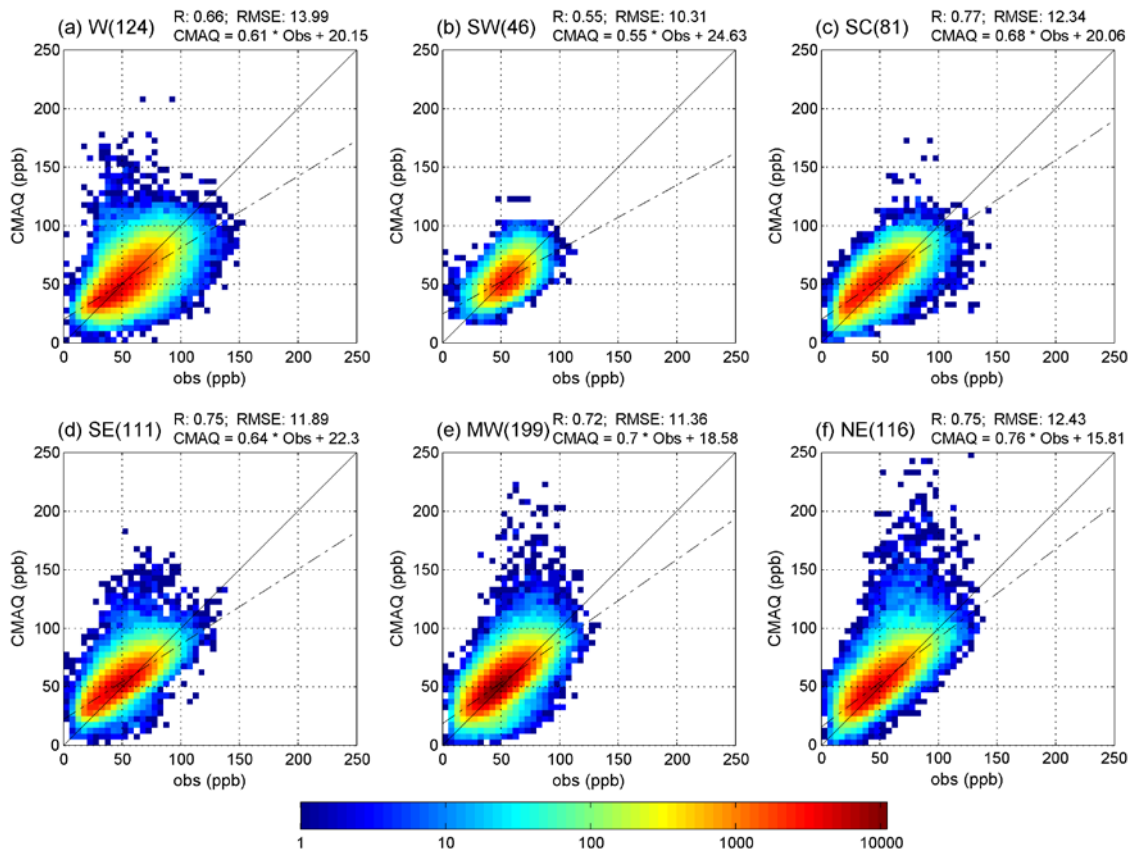


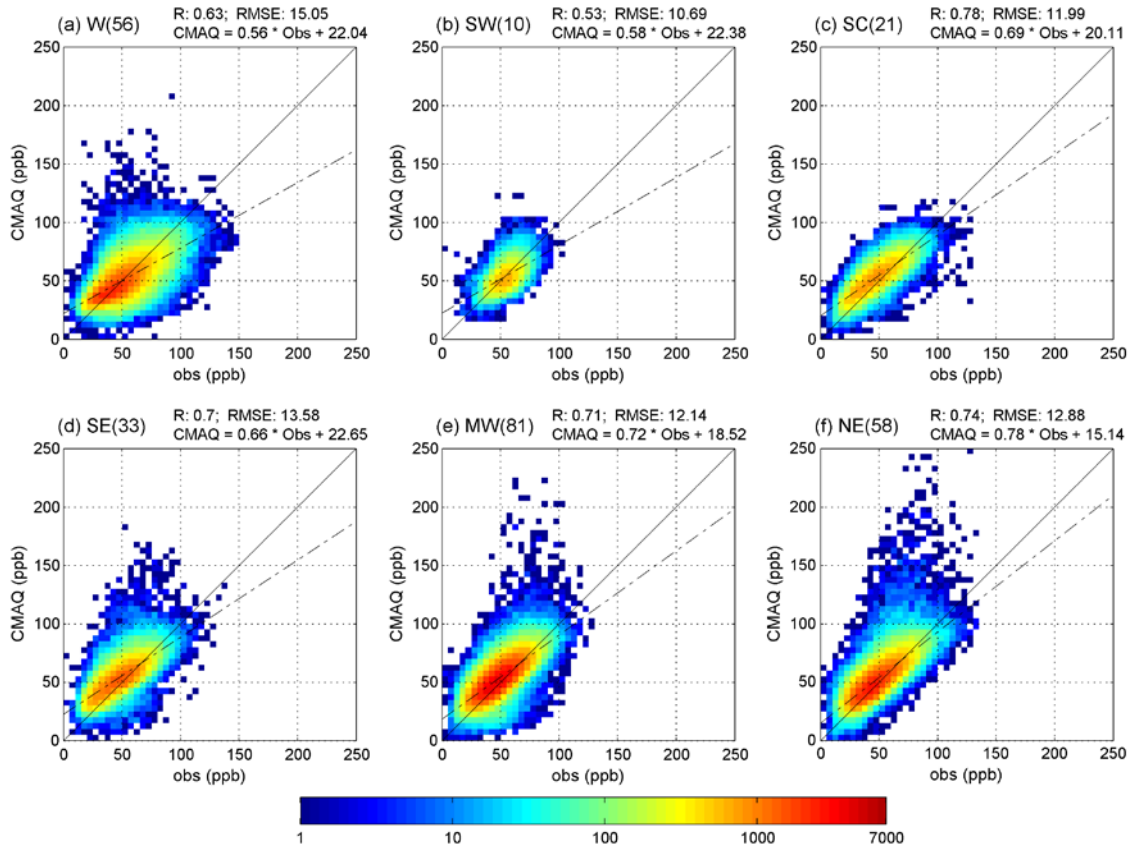
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## SUPPLEMENTAL MATERIAL



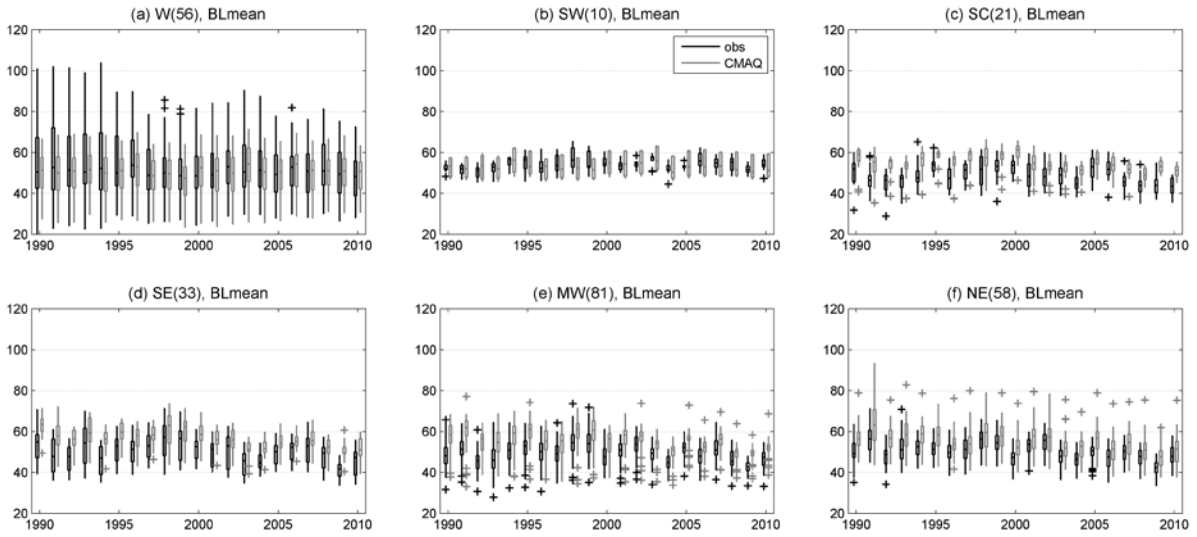
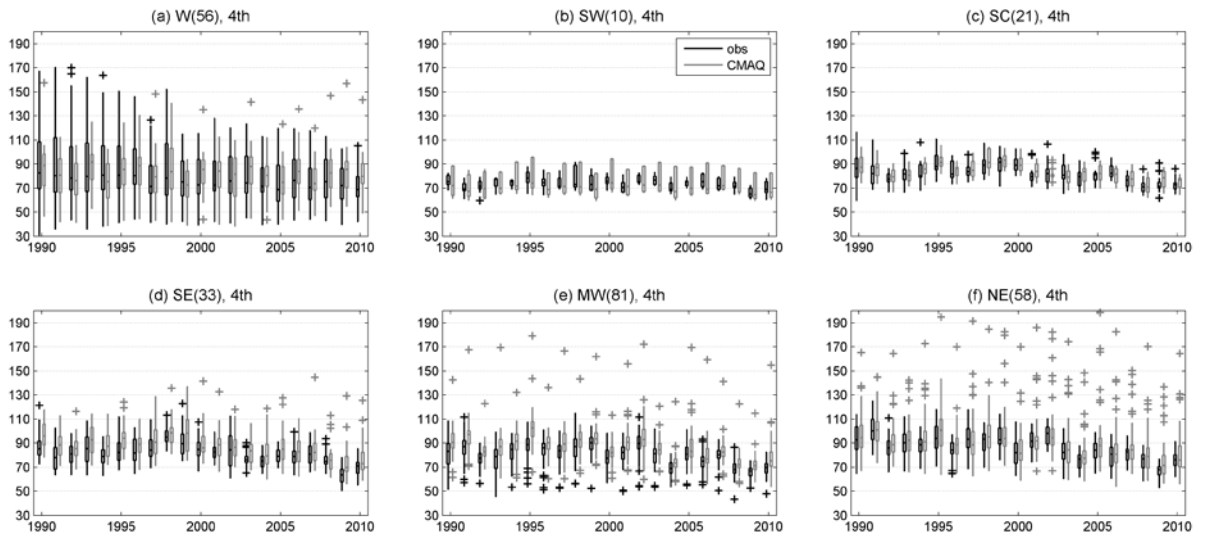
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**Figure S1.** 11-yr density scatter plots (5 ppb bins) of daily maximum 8-hr (DM8HR) ozone concentrations across each region (2000-2010): a) West (W), b) Southwest (SW), c) Southcentral (SC), d) Southeast (SE), e) Midwest (MW) and f) Northeast (NE). The values in parenthesis denote the number of sites at each region (#677 sites shown in Fig.1b).

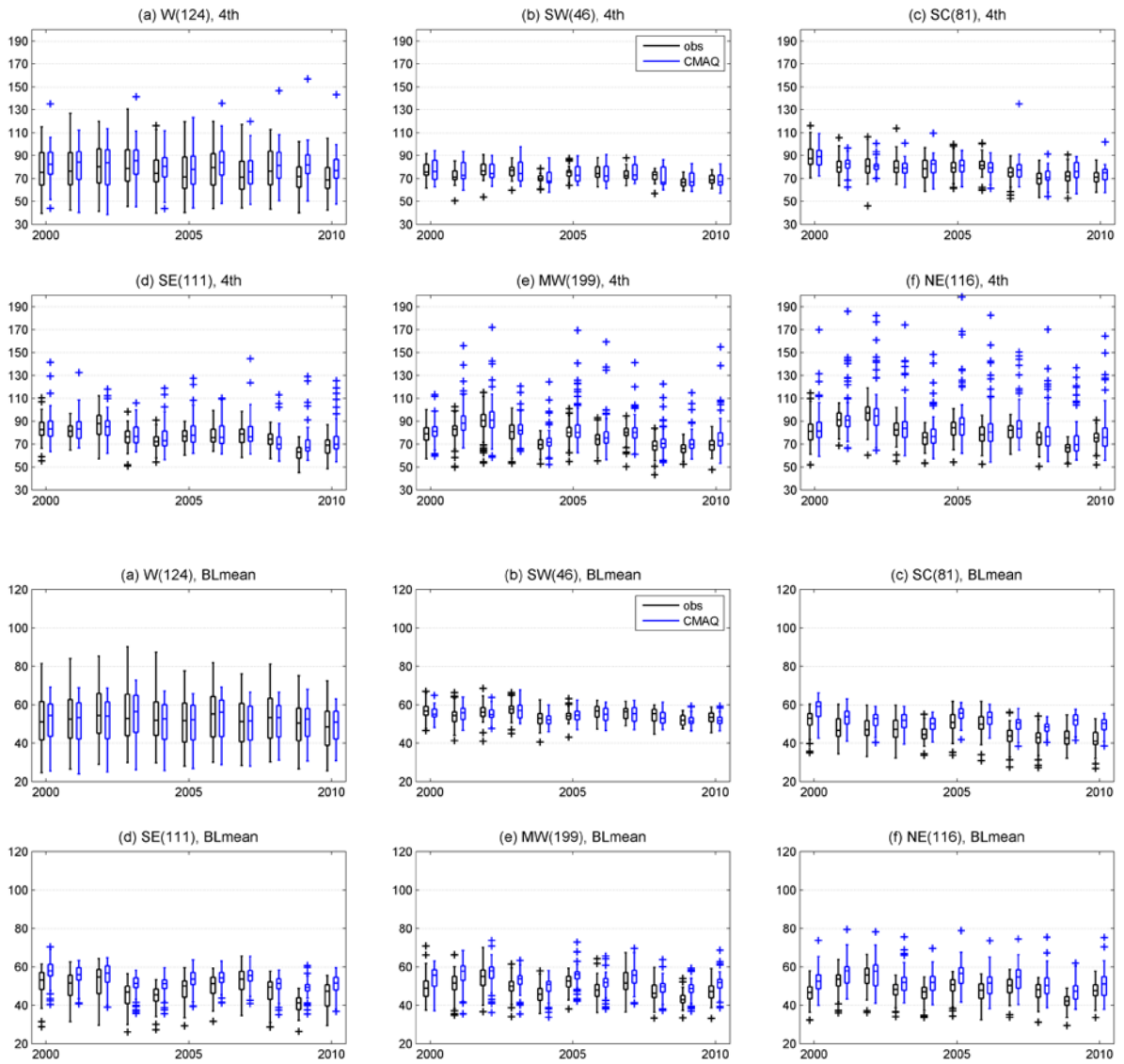


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**Figure S2.** 11-yr density scatter plot (5 ppb bins) of daily maximum 8-hr (DM8HR) ozone concentrations across each region (2000-2010): a) West (W), b) Southwest (SW), c) Southcentral (SC), d) Southeast (SE), e) Midwest (MW) and f) Northeast (NE). The values in parenthesis denote the number of sites at each region (#259 sites shown in Fig.1a).



**Figure S3.** Observed (black) and modeled (gray) 4<sup>th</sup> highest (ppb; a-f upper panels) and BLmean (ppb; a-f, lower panels) for each region (Fig. 1a) during 1990-2010 (#259 stations). The boxes indicate the 25<sup>th</sup>, 50<sup>th</sup> and 75<sup>th</sup> percentiles, while the whiskers can extend to 1.5 times the interquartile range. Data beyond those are identified as outliers and denoted by crosses. Number of stations is shown in parenthesis next to the region.

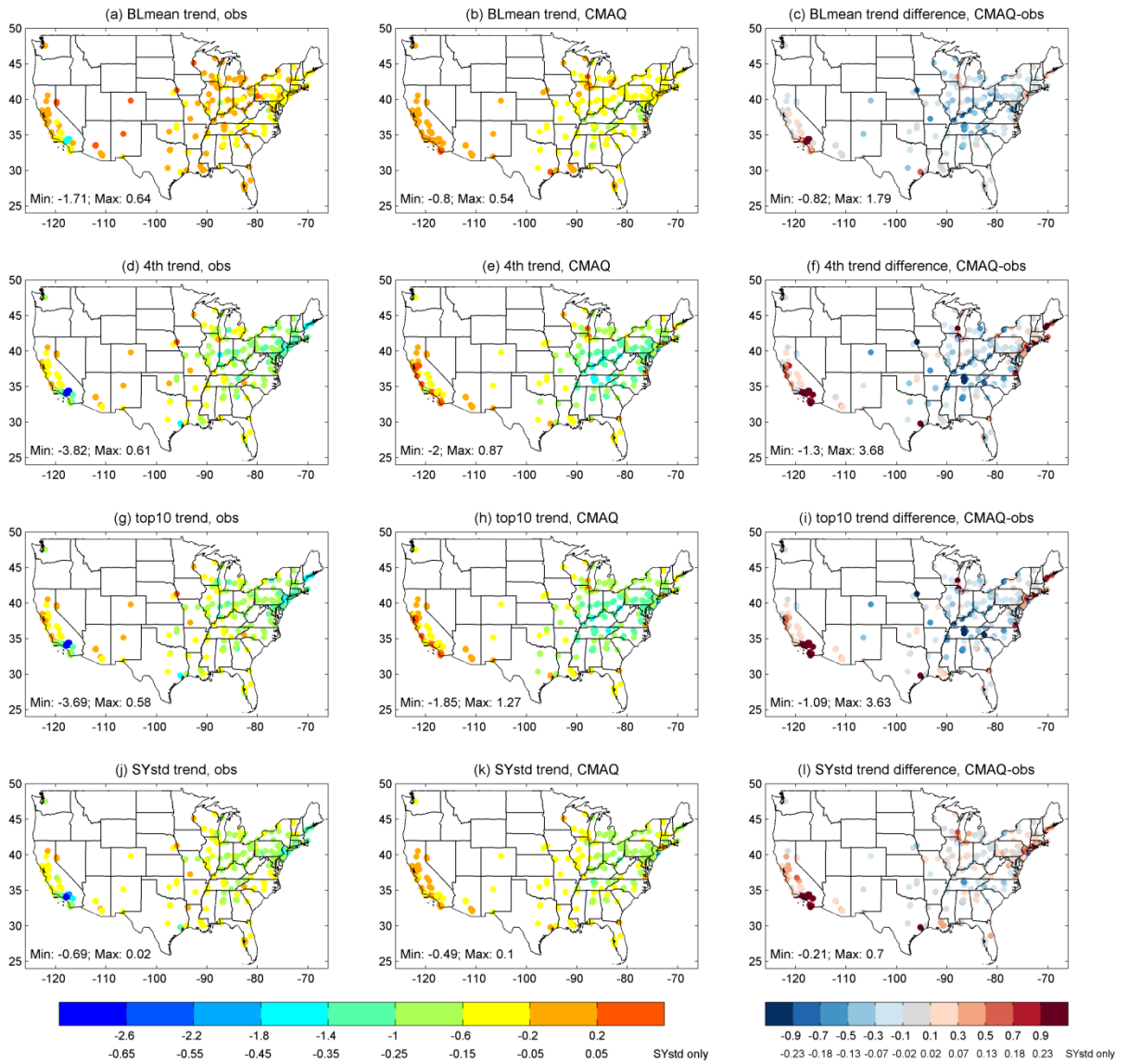


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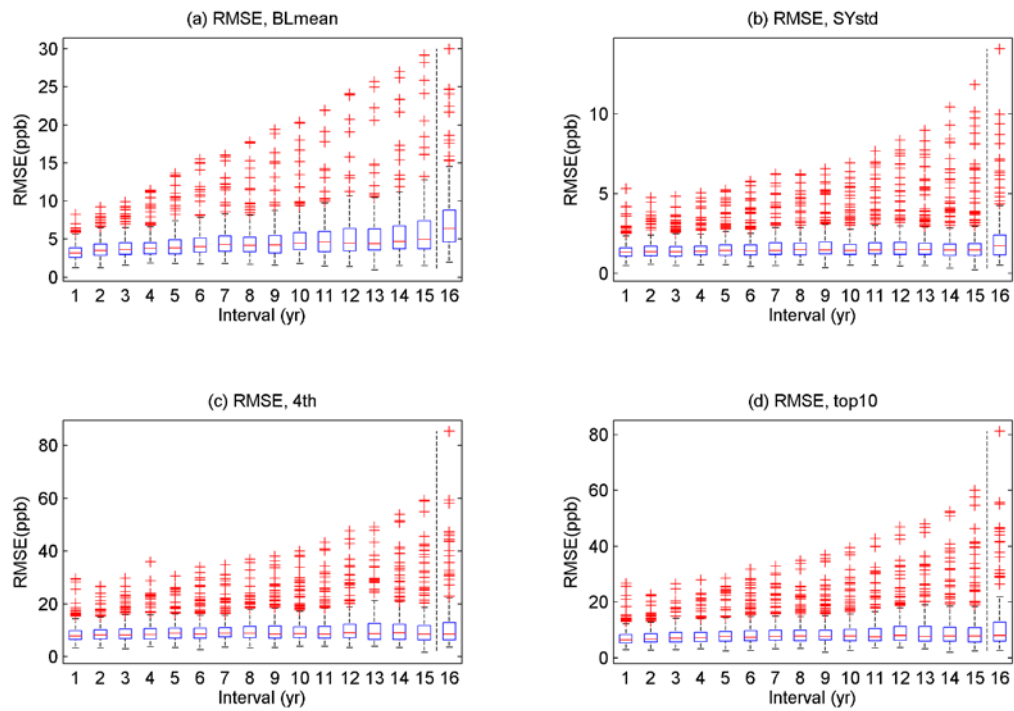
**Figure S4.** Observed (black) and modeled (blue) 4th highest (a-f upper panels) and BLmean (a-f, lower panels) for each region (Fig. 1b, #677 sites) during 2000-2010. The boxes indicate the 25th, 50th and 75th percentiles, while the whiskers extend to 1.5 times the interquartile range. Data beyond those are identified as outliers and denoted by crosses.

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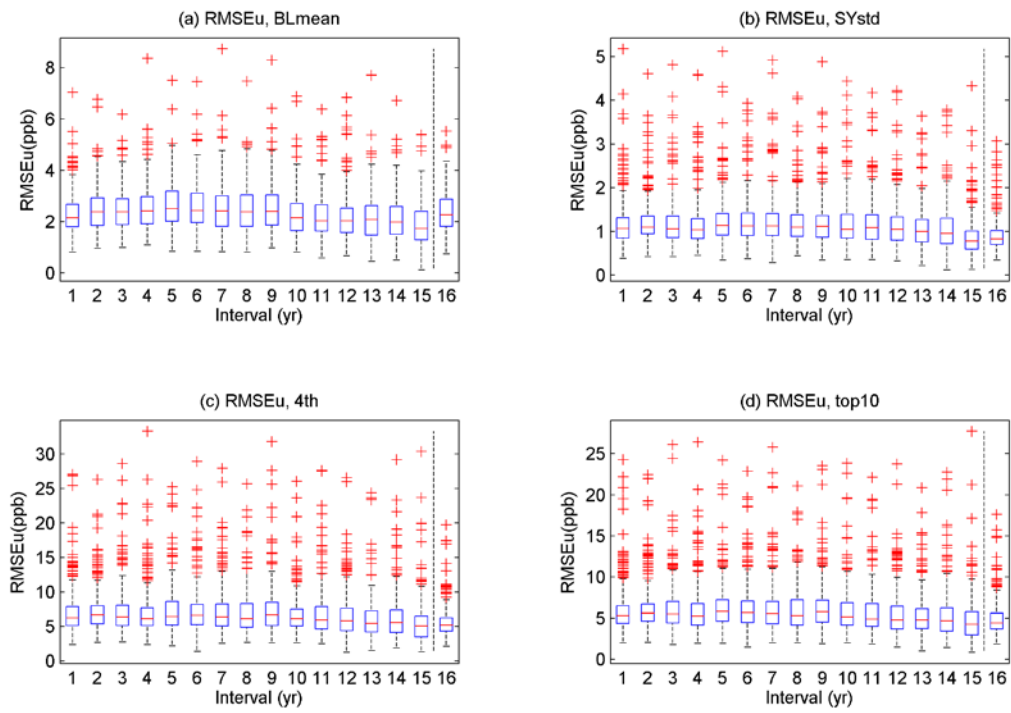
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**Figure S5.** Trends (ppb/yr) and differences between modeled and observed trends (ppb/yr) in the 4<sup>th</sup> highest, top10, BLmean and SYstd for the 21-yr period (1990-2010; #259 sites).



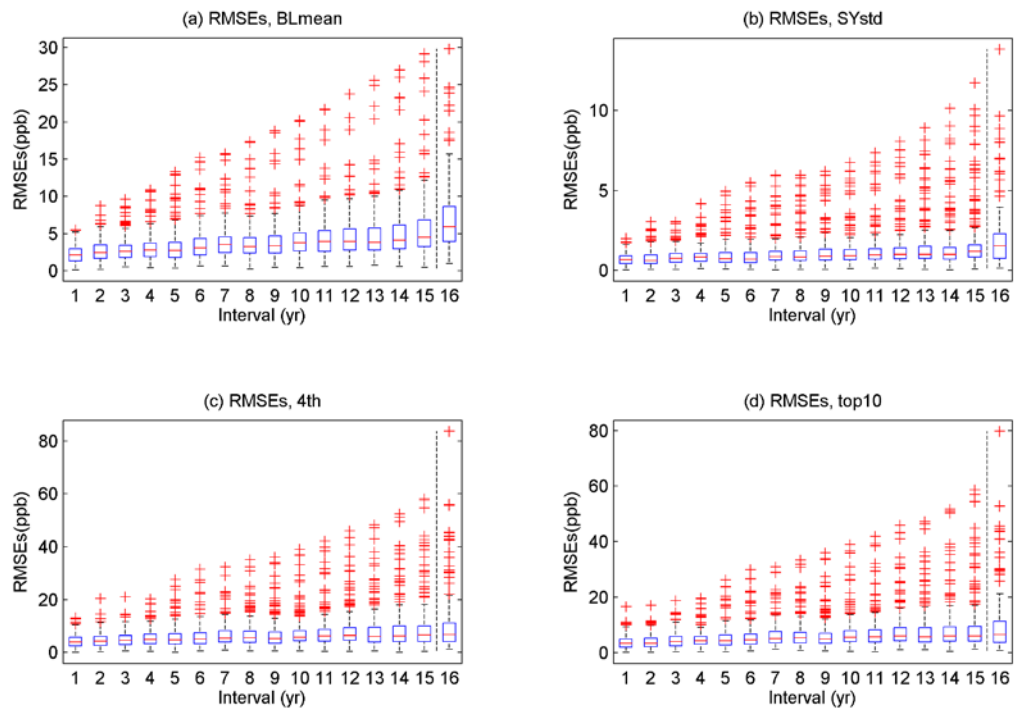
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**Figure S6.** Variation of RMSE for changes in the (a) BLmean, (b) SYstd, (c) 4<sup>th</sup> and (d) top10 ozone concentrations across CONUS and different year intervals ( $i=1, 2, 3, \dots, 15$ ). The 16<sup>th</sup> entry in the x-axis is the absolute concentration (not the change) boxplot.



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**Figure S7.** Same as in Fig. S4 but for the unsystematic component of the RMSE (RMSEu).



**Figure S8.** Same as in Fig. S4 but for the systematic component of the RMSE (RMSEs).

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