PERFORMANCE OF NOAA-EPA AIR QUALITY FORECASTS, 2007 – 2008

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Experimental 8-h Ozone Prediction

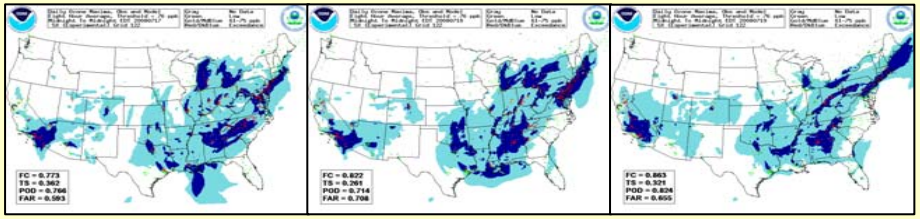


Fig. 1. Daily maximum 8-h ozone predictions and observations, July 17 - 19, 2008. The predicted exceedances are shown in dark blue and the observed exceedances as red points. Except for northern California, predicted exceedances match observations.

Developmental 1-h Aerosol Prediction

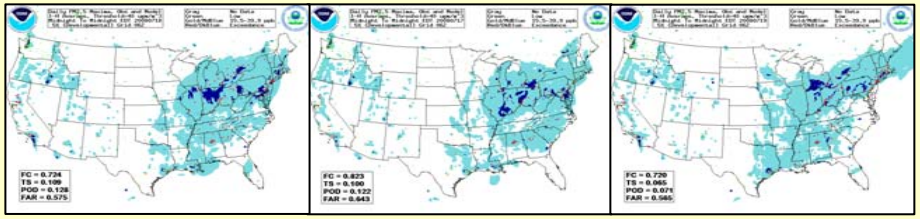


Fig. 2. Daily maximum 1-h aerosol predictions and observations, July 17 - 19, 2008. The predicted exceedances are shown in dark blue and the observed exceedances as red points. The maps show consistent under-prediction for this aerosol outbreak.

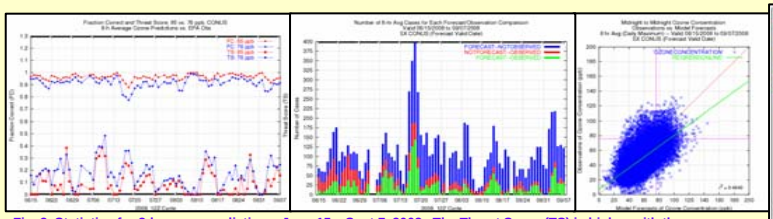


Fig. 3. Statistics for 8-h ozone predictions, June 15 – Sept 7, 2008. The Threat Score (TS) is higher with the lower threshold of 76 ppb. The number of correct exceedance predictions is high. The scatterplot shows a slight tendency for over-prediction.

Fig. 5. Map of U.S. showing six regions, used in regional analysis below.

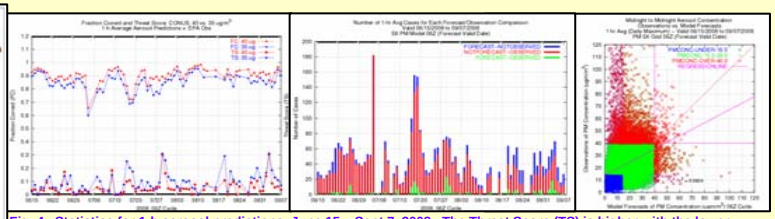


Fig. 4. Statistics for 1-h aerosol predictions, June 15 – Sept 7, 2008. The Threat Score (TS) is higher with the lower threshold of 35 ug/m^3. The number of correct exceedance predictions is low. The scatterplot shows consistent under-prediction.

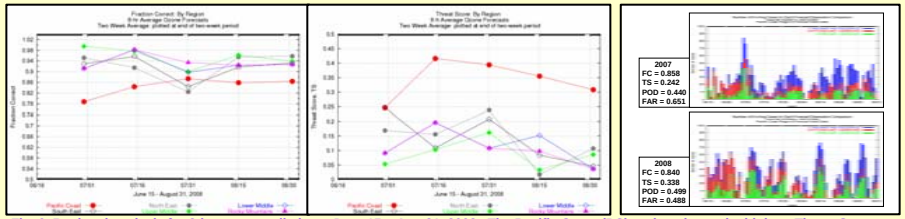


Fig. 6. Regional analysis for 8-h ozone predictions, June 15 – Aug 31, 2008. The Pacific Coast (PC) region shows the highest Threat Score (TS) and lowest mean bias. The TS for the PC region was higher in 2008 than in 2007.

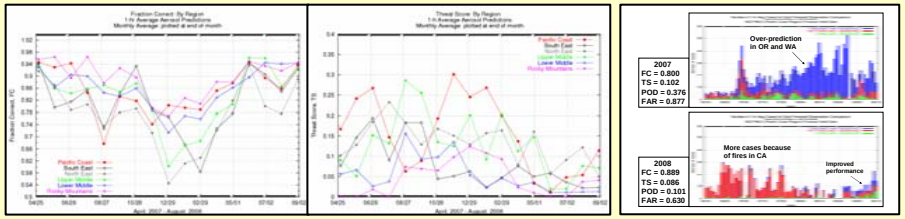
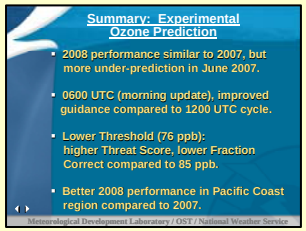


Fig. 7. Regional analysis for 1-h aerosol predictions, Apr 2007 - Aug 2008. The decrease in the Fraction Correct (FC) in Dec 2007 and subsequent increase in May 2008 is associated with a change in the model from over-prediction to under-prediction.



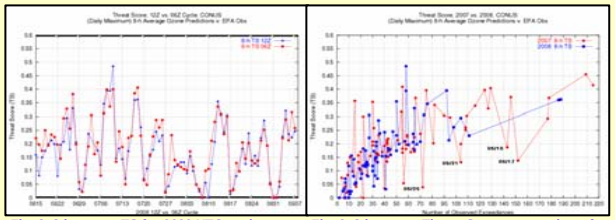


Fig. 8. 8-h ozone, TS for 0600 UTC cycle is slightly better than 1200 UTC in 2008.

Fig. 9. 8-h ozone, Threat Score vs. number of observed exceedances, 2008 vs. 2007, more under-prediction in June, 2007.

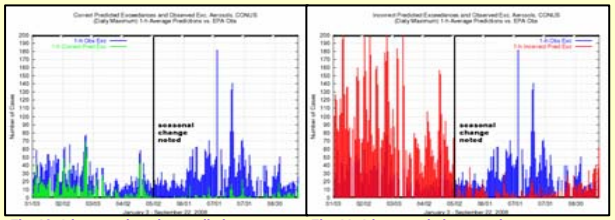
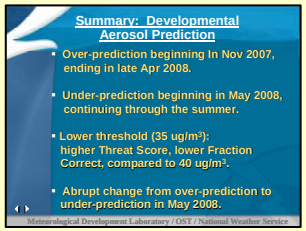


Fig. 10. 1-h aerosol, under-prediction amplified beginning in May 2008.

Fig. 11. 1-h aerosol, decrease in over-prediction beginning in May 2008.



National Air Quality Forecasting Capability (NAQFC)

Congress has directed NWS to develop, test and implement into operations a National Air Quality Forecast Capability (NAQFC), beginning in FY 2003. NOAA has been building this capability in partnership with EPA and state and local air quality forecasters. In September 2004, NWS implemented an initial operational ozone forecast capability for the northeastern U.S. In the initial capability, the NWS/National Centers for Environmental Prediction (NCEP) NAM model was used to drive the EPA Community Multi-scale Air Quality (CMAQ) model to produce next-day ozone predictions at 12 km grid resolution. The NAQFC has been expanded via a program of phased development and testing with implementations of ozone predictions over the entire Eastern US in 2005, and to the lower 48 states (CONUS) in 2007. Further goals for the NAQFC included providing quantitative Particulate Matter (PM) predictions, which together with ozone are the two leading causes of poor air quality in the U.S. As a step toward building particulate matter prediction capabilities, NOAA has been testing a version of the CMAQ model that includes an aerosol prediction module that incorporates contributions to PM from the EPA's National Emissions Inventory.