Appendix B

Phase 2 HGB Mid Course Review
Base Case Model Performance Evaluation

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Base Case Model Performance Evaluation

As is typically the case, the Base Case evolved somewhat over the time it took to complete the modeling analysis. The final base case for this SIP revision is Base 5b, but some modeling conducted with earlier base cases will be discussed in this document. All discussions of the Base Case refer to Base 5b unless otherwise noted.

Model performance is evaluated using a variety of statistical and graphical techniques. The most commonly used measures of model performance are the three statistics recommended in EPA's 1992 Modeling Guidance: Unpaired Peak Accuracy, Relative Bias, and Relative Gross Error. The first of these, Unpaired Peak Accuracy, measures the model's ability to replicate the highest ozone measured on each day of the episode. It is primarily useful in assessing whether or not the model is simulating high enough ozone concentrations, but is insensitive to the location or timing of the modeled peak. Relative Bias measures the model's ability to generate enough ozone across the monitoring network (positive bias = too much ozone, negative bias = too little), and Relative Gross Error provides a measure of how closely the modeled ozone concentrations match the observations overall. Interested readers are referred to Appendix A, the Modeling Protocol, for more discussion of how these statistics are calculated.

While statistics provide an objective measure of model performance, they in reality serve as little more than a screening tool to identify inadequate model performance. Much more important are various graphical techniques which, although somewhat subjective, provide far more insight into how well the model replicates the observations and why or why not it performs well. Time series plots comparing simulated ozone hour-by-hour with observations allow us to see how well the modeling works at a single location throughout the duration of the episode. Where precursor (e.g. ethylene) or intermediate product (e.g. formaldehyde) concentrations are available, time series plots provide a detailed look at how well the model simulates the physico-chemical processes which produce ozone. We have automated the production of time series for model runs and have developed an extensive set of these plots which is available for download by clicking the "MS Excel time-series of modeled vs observed species concentrations" link at http://www.tnrcc.state.tx.us/air/aqp/airquality_photomod.html#camx2. Some example time series are also provided in this report.

Ozone isopleth plots showing modeled ozone concentrations across the domain for each hour are also very insightful, especially when collected into animations which show the areas where ozone originates and is removed. A variant of this type of plot shows the daily peak ozone concentrations simulated across the domain. These types of plots are heavily used at TCEQ when evaluating model performance. We also study scatter plots of modeled ozone and important precursors vs. measurements.

New for this SIP revision is the inclusion of eight-hour model performance evaluation. EPA recommends a set of analyses that can be conducted to assess how well the model replicates eight-hour ozone averages. Unlike the one-hour statistics, which are based on multiple observation-prediction pairs per day (whenever the observations are ≥ 60 ppb), all the eight-hour metrics are based on comparing the daily peak observed eight-hour concentrations with peak eight-hour modeled concentrations near (i.e. within a few grid cells of) the monitors. Because these metrics are focused on only the daily peak-to-peak comparison, they are not as sensitive to some types of prediction errors as the traditional one-hour performance measures. The TCEQ feels strongly that the primary assessment of model performance should be conducted using one-hour concentrations, since eight-hour averaging can obscure many important features of the model (and of the observations as well), but at the urging of Region VI have included two eight-hour performance metrics along with the one-hour analyses:

- Bias - the tendency of the model to over- or underpredict the monitored eight-hour peaks

- Correlation - The overall correspondence between measured and modeled peaks.

Initial Base Case Model Performance Statistics

As discussed in Section 3.4 of the SIP revision, a meteorological characterization for the extended episode was developed by Environ/ATMET. While this characterization provided reasonable wind fields, the PBL depths were obviously too deep, often reaching the top of the modeling domain (6000 meters). For this reason, we did not run this meteorological characterization with the MM5-generated PBL depths; instead, the PBLs were adjusted as described in Section 3.4 of the SIP revision prior to running the photochemical model. Table 1 shows the model performance statistics when the model was run with the base (unadjusted) emissions as described in Section 3.3 of the SIP revision. Note that the three ramp-up days August 18-20 are not shown. Individual statistics that fall outside the EPA-recommended ranges are marked in red. It should be noted that the (unpaired peak) Accuracy statistic may not be applicable in cases where the model's predicted ozone peak exceeds the maximum observed peak, since this condition could occur simply because there is not a monitor in every grid cell.

Table 1 - Base Case Model Performance with Environ/ATMET meteorology and unadjusted emissions

Episode Date	Data Pair of Observation > 60.0ppb		Area-wide Maximum ozone		
	Normalized Bias	Normalized Gross Error	Accuracy	Modeled	Observed
	±(5-15)%	(30-35)%	±(15-20)%	ppb	ppb
8/21/2000	-37.3	44.5	-17.6	131.1	159.0
8/22/2000	-34.0	35.9	5.2	112.6	107.0
8/23/2000	-41.3	41.3	20.2	121.4	101.0
8/24/2000	-28.3	41.0	11.6	134.1	120.1
8/25/2000	-46.2	47.4	-39.5	117.4	194.0
8/26/2000	-26.7	36.6	-11.4	124.1	140.0
8/27/2000	25.3	25.5	51.0	131.3	87.0
8/28/2000	4.3	24.0	23.9	138.8	112.0
8/29/2000	-36.7	39.6	-12.5	128.4	146.7
8/30/2000	-19.3	30.9	-29.7	141.0	200.5
8/31/2000	-12.4	23.7	-22.8	135.5	175.5
9/1/2000	-2.0	18.1	-20.6	129.9	163.7
9/2/2000	-4.8	16.0	1.3	127.2	125.5
9/3/2000	-6.5	18.1	-3.3	123.0	127.2
9/4/2000	4.0	19.7	1.9	147.8	145.0
9/5/2000	-3.2	24.1	8.6	200.8	185.0
9/6/2000	-7.0	19.8	-7.5	144.2	156.0

The model exhibits a distinct negative bias early in the episode with the exceptions of August 27 and 28, two days with relatively low recorded ozone concentrations. By August 31 the overall bias has moderated, but the model under-predicts peak ozone on August 30 through September 1. However, reasonable statistical performance is seen for the final five days of the episode. It should be noted that while September 5 passes the statistical tests, graphical analysis of this day indicates fundamental problems on that day (more on this issue below).

The base case was next modeled using the terminal olefin-to-NO_X adjustment described in Section 3.5 of the SIP revision. The performance statistics for this run are summarized in Table 2.

Table 2 - Base Case Model Performance with Environ/ATMET meteorology and adjusted emissions

Episode Date	Data Pair of Observation > 60.0ppb		Area-wide Maximum ozone		
	Normalized Bias	Normalized Gross Error	Accuracy	Modeled	Observed
	±(5-15)%	(30-35)%	±(15-20)%	ppb	ppb
8/21/2000	-30.0	39.1	-11.1	141.3	159.0
8/22/2000	-30.6	34.3	18.2	126.5	107.0
8/23/2000	-32.4	33.1	25.9	127.2	101.0
8/24/2000	-12.4	33.0	18.2	142.0	120.1
8/25/2000	-34.0	38.2	-18.9	157.3	194.0
8/26/2000	-15.6	29.9	3.4	144.8	140.0
8/27/2000	40.0	40.0	66.7	145.0	87.0
8/28/2000	14.9	27.0	34.6	150.7	112.0
8/29/2000	-31.5	34.9	-2.9	142.5	146.7
8/30/2000	-11.5	31.9	-15.2	170.1	200.5
8/31/2000	-9.1	22.7	-16.9	145.8	175.5
9/1/2000	0.8	19.0	-12.3	143.5	163.7
9/2/2000	-2.7	17.1	21.7	152.7	125.5
9/3/2000	-3.1	19.6	10.2	140.1	127.2
9/4/2000	5.7	20.4	9.0	158.1	145.0
9/5/2000	7.0	26.6	13.4	209.9	185.0
9/6/2000	-5.1	18.9	-2.0	152.9	156.0

Model performance appears to be somewhat improved overall as a result of the terminal olefin adjustment, but the model still exhibits a notable negative bias through August 30. Adding the extra reactivity helps alleviate some of the under-predictive tendencies on August 30 - September 1, but interestingly affects the bias by a relatively small amount during early September.

GOES-Based meteorological characterization

Shortly after completing model performance evaluation of the model using the Environ/ATMET meteorological characterization, Dr. John Nielsen-Gammon at Texas A&M completed development of the GOES-based meteorological characterization for August 22 through September 1. Because this work represents a significant advance in the state of the science of air pollution meteorology, we tested this alternative meteorological formulation in the current base case, using the terminal olefin-to-NO_X adjustment. Table 3 shows model performance statistics for the base case using the GOES formulation.

Table 3 - Base Case Model Performance with GOES meteorology and adjusted emissions

Episode Date	Data Pair of Observation > 60.0ppb		Area-wide Maximum ozone		
	Normalized Bias	Normalized Gross Error	Accuracy	Modeled	Observed
	±(5-15)%	(30-35)%	±(15-20)%	ppb	ppb
8/22/2000	-37.7	39.3	0.2	107.3	107.0
8/23/2000	-48.9	48.9	-18.4	82.4	101.0
8/24/2000	-38.5	38.5	-34.8	78.4	120.1
8/25/2000	-9.9	20.9	-19.3	156.5	194.0
8/26/2000	6.3	18.5	6.7	149.4	140.0
8/27/2000	25.2	25.2	29.0	112.3	87.0
8/28/2000	22.4	24.3	17.8	132.0	112.0
8/29/2000	8.1	15.8	3.1	151.2	146.7
8/30/2000	-11.0	20.4	-31.6	137.2	200.5
8/31/2000	4.6	15.8	-1.4	173.0	175.5
9/1/2000	8.1	13.7	-16.5	136.7	163.7

As was seen previously, the model seriously under-predicts ozone on August 22-24 and over-predicts on August 27 and 28. However, a comparison of Gross Error on the important episode days of August 25, 26, 29, 30, 31, and September 1 reveals that modeling with the GOES-based meteorological characterization provides better agreement with the observations than did the original meteorological characterization. Overall bias is improved on all of these days except September 1, where it is still a reasonable 8.1%. Modeled peak ozone varies considerably between the two runs, with the GOES-based meteorological characterization the clear winner on August 27, 28, and 31, while the original characterization does a better job of replicating peak ozone concentrations on August 30 and September 1. Neither characterization shows much improvement over the other on the remaining days. Overall, based on the three recommended performance statistics, the GOES meteorological characterization is seen to do a better job of replicating the observed ozone patterns than the initial characterization for the period where the GOES data were available.

Perhaps more important than the statistical comparison is the fact that the GOES-based meteorological characterization achieved good performance without adjustment to the PBL, providing additional assurance that this characterization is successfully replicating the physical processes that occurred during this period.

The Hybrid Base Case

As was seen earlier, the model delivered inadequate statistical performance during the earlier part of the episode, generally failing to produce enough ozone. The primary day of interest during this period, August 21, showed a severe under-prediction bias of -30.0 and had a gross error of 39.9%, even after adjusting emissions of HRVOCs. These statistics indicate a systematic failure of the model to produce enough ozone on that day. Because of this disturbing feature, we elected to shelve the first four days of the extended episode (August 18-21). As future meteorological developments evolve, we plan to re-visit this period from time to time to re-evaluate model performance. At present, we have received GOES data for the September 2-6 period from Marshall Space Flight Center (MSFC), and are incorporating it into a new MM5 run. However, due to delays beyond the control of the TCEQ, the GOES data were received from MSFC too late to be incorporated into the current SIP modeling. Also, Professor Daewon Byun at the University of Houston is working on developing improved land surface characterization data for input to MM5. We plan to model this meteorological characterization in the near future, but, like the GOES data, cannot include results of this modeling in the current SIP revision.

The Hybrid Base Case thus begins on August 22, and uses the GOES-based characterization through September 1, since it performs better than the initial base case. Beginning on September 2, we revert to the initial meteorological characterization since it delivers good statistical performance for this period and because no alternative meteorological characterization is currently available. Figures 1-3 provide a graphical summary of the model performance for the Hybrid Base Case compared with the two versions of the initial base case (i.e. with and without the terminal olefin adjustment).

Figure 1: Measured vs. modeled peak ozone concentrations for three base case configurations.

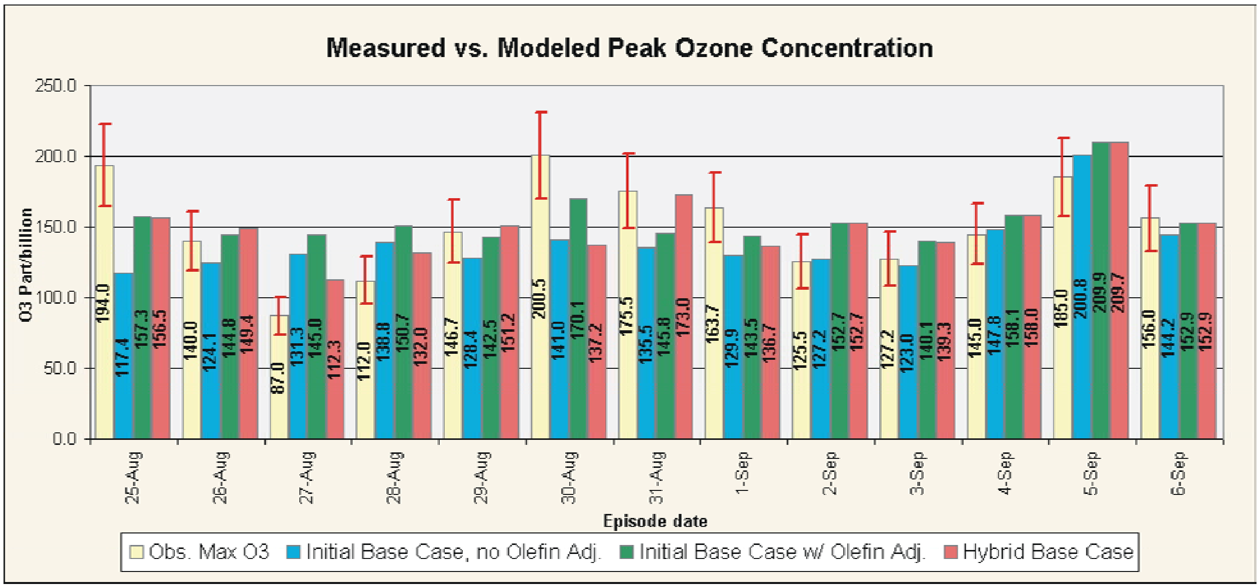


Figure 2: Relative bias for three base case configurations

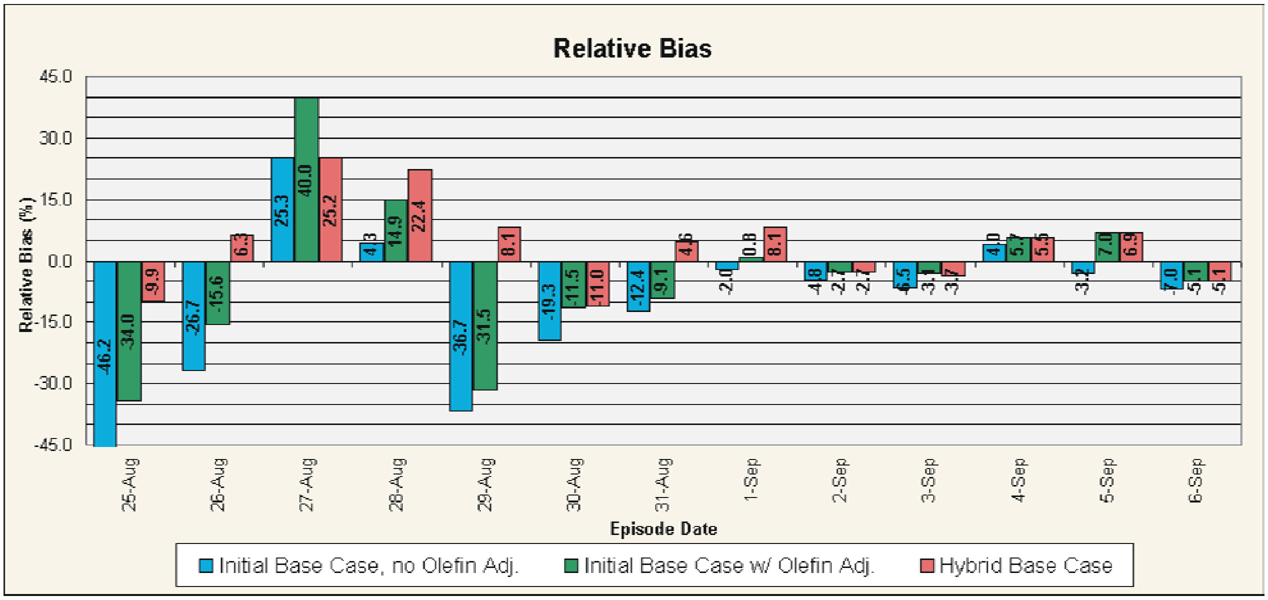
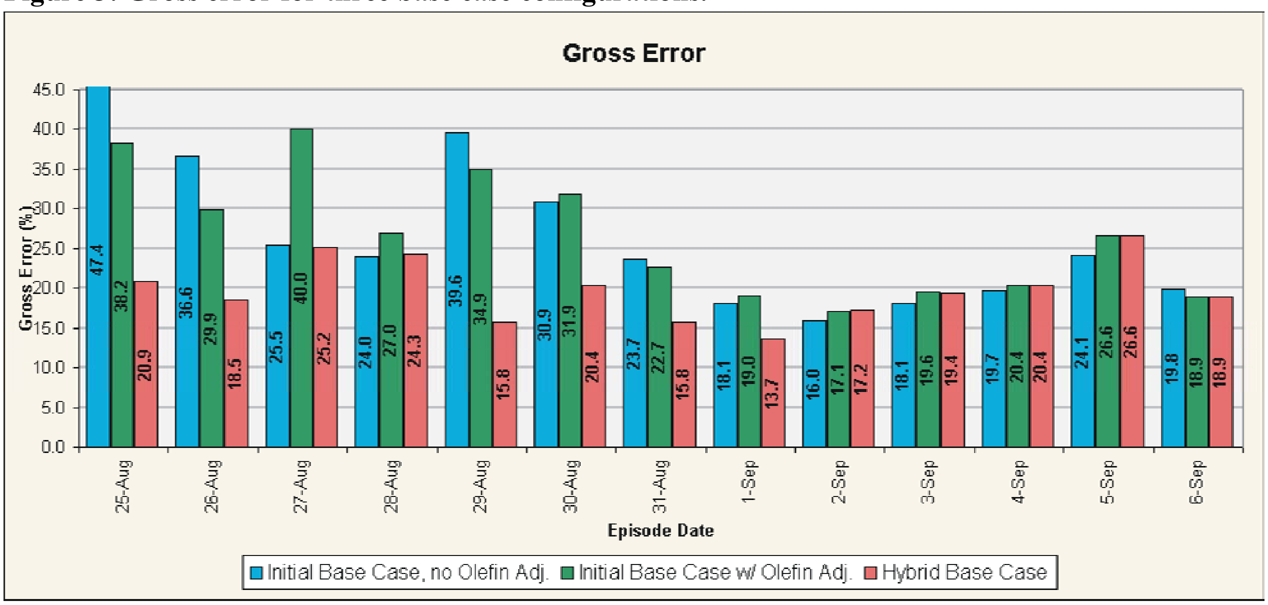


Figure 3: Gross error for three base case configurations.



Based on the statistical performance evaluation, the model delivers acceptable performance on all days of the Hybrid Base Case except August 27, 28, and 30. Model peak ozone is too low on August 30, but otherwise the model performs well. There is evidence that one or more emission events not accurately represented in the modeling inventory occurred on this day which could explain the high peak ozone recorded on that day. For this reason, we continue to include August 30 in the modeling analysis, despite its inability to replicate the very high ozone value recorded on that day.

Graphical Performance Evaluation

Statistical model performance evaluation should be regarded as the first step in assessing the model's suitability for control strategy development, but is by no means the end. It is a useful screening step, but much more insight into how the model is working can be gleaned through a variety of graphical analysis techniques.

Time Series Plots

Perhaps the most insightful assessment is provided through time series analysis of ozone and other atmospheric species. Time series plots compare every observation during the episode with the corresponding modeled concentrations and show both how well the magnitude of pollutant concentrations is simulated as well as the timing. An extensive set of time series plots for the Hybrid Base Case is provided in Appendix B.1, showing not only ozone but most of the species included in the Carbon Bond IV mechanism. Below are reproduced a few illustrative time series plots showing observed and modeled concentrations at the HRM 3 monitoring location. Both the Hybrid and initial (adjusted) base cases are shown for comparison. Note that the two series converge after September 1 since there is no GOES characterization available after that time.

From the above plot, it is clear that the GOES-based meteorological characterization reproduces the ozone trace at this location on most days. Overall, the Hybrid Base Case appears to reproduce observed ozone quite well. The following plots compare the Hybrid and initial base cases performance for NO, NO2, and CO. Additional time series plots for HRM3, as well as other sites in the HGB and BPA areas (including the LaPorte and Williams Tower supersites) are provided in Appendix B.1.

Figure 4: Time Series of Hybrid and Initial Base Case Ozone Concentrations

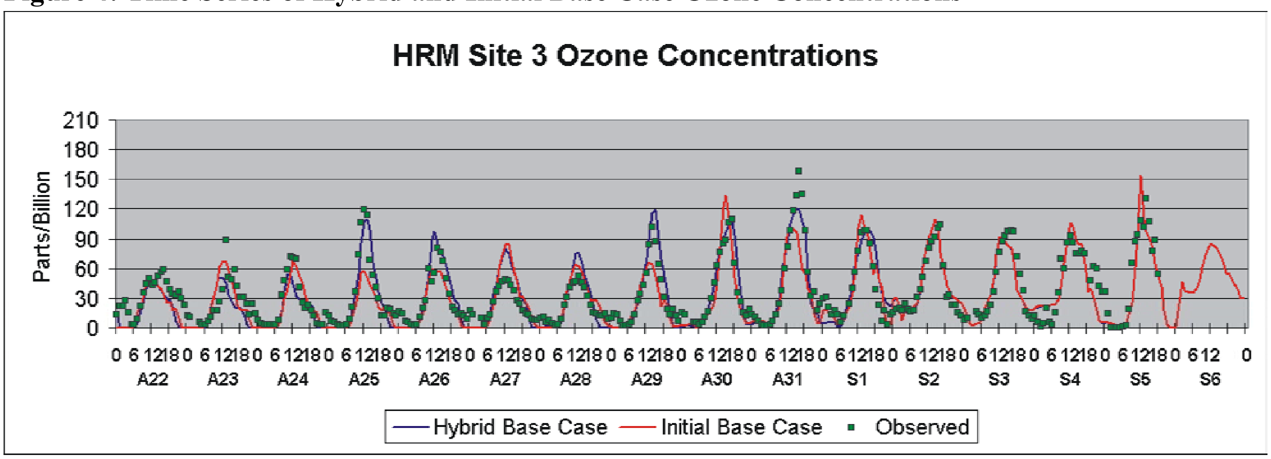


Figure 5: Time Series of Hybrid and Initial Base Case NO Concentrations

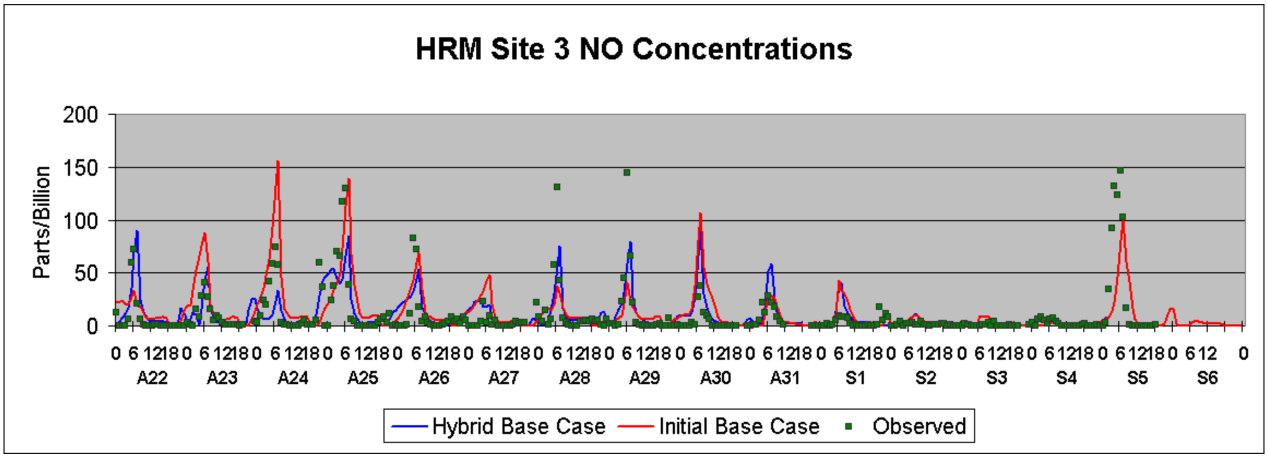
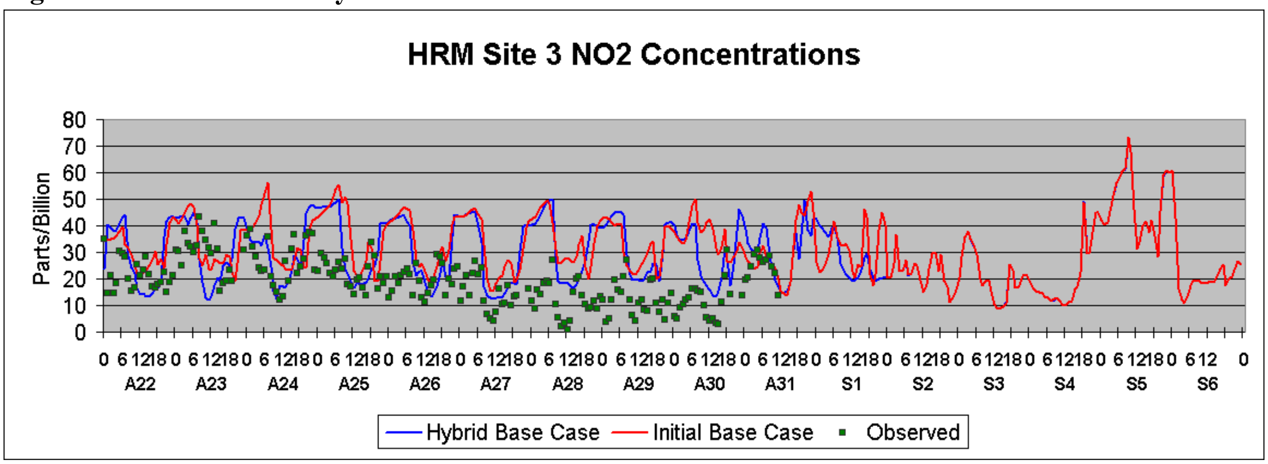
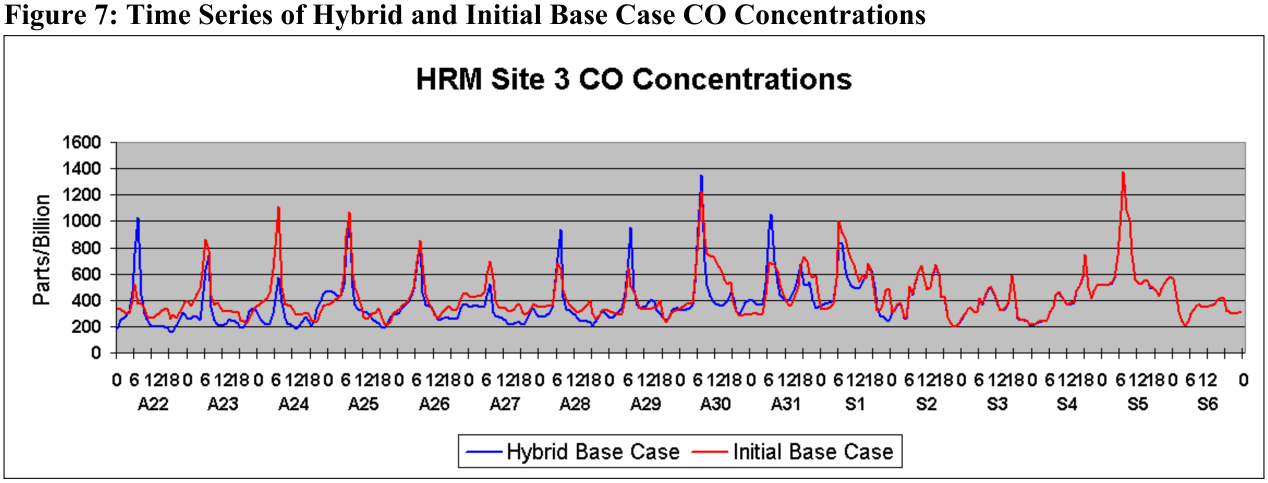


Figure 6: Time Series of Hybrid and Initial Base Case NO2 Concentrations



Both the Hybrid and Initial base cases simulate NO concentrations reasonably well at HRM3, but both have a tendency to over-predict NO_2 concentrations overnight (daytime concentrations are generally not

Figure 7: Time Series of Hybrid and Initial Base Case CO Concentrations



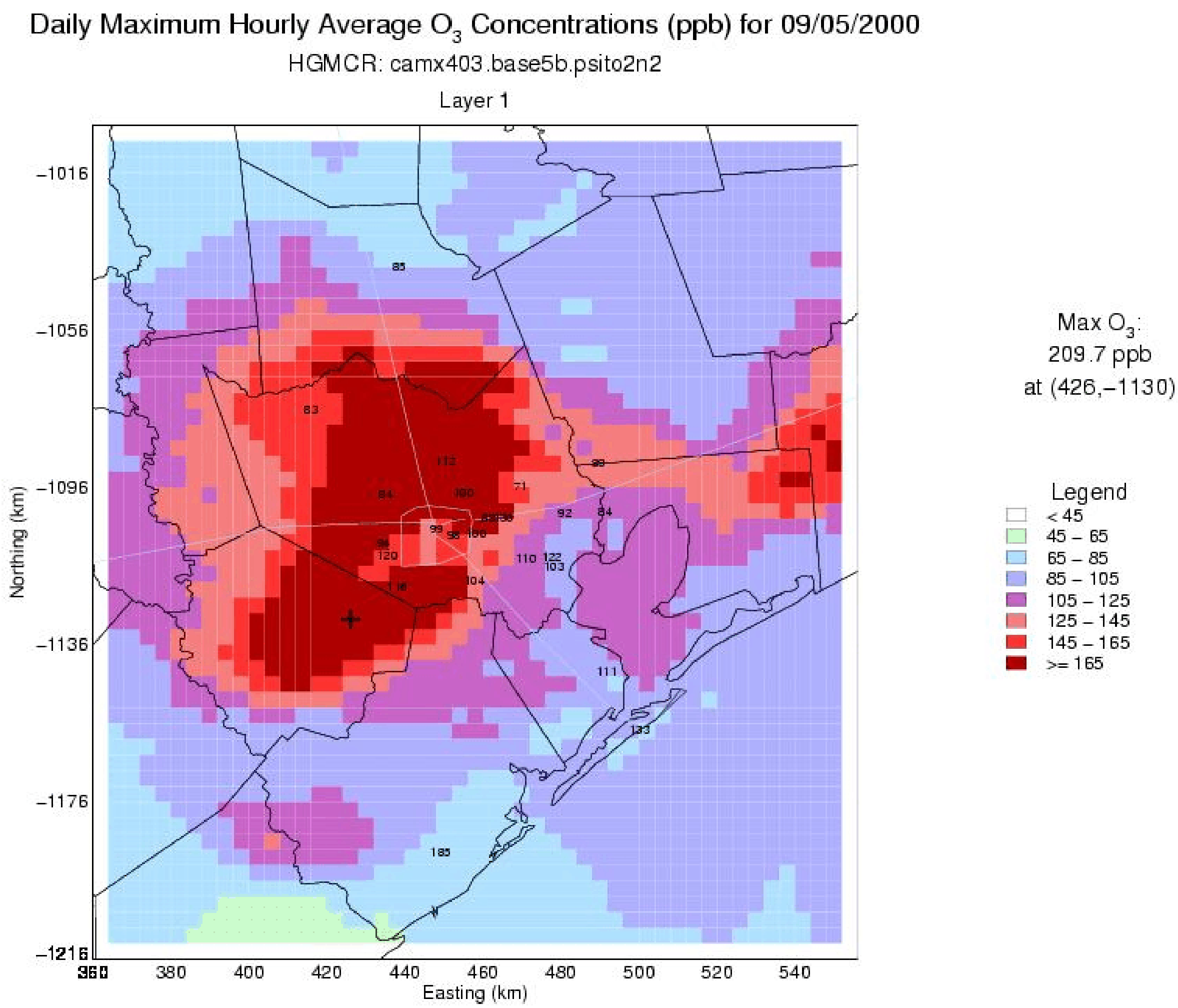
bad, though). For this site, NO_2 data was unavailable after August 31. Finally, the two characterizations produced fairly similar concentrations of CO, but there is no way to evaluate their actual performance since CO data was not collected at this site.

Isopleth Plots and Animations

Another important tool for performance evaluation is the isopleth plot, which shows concentrations of a pollutant across the domain (or subset thereof). These can either show predicted ozone concentrations for a single hour or can show the daily maximum in each location. The former can be linked together to show animations of ozone or other pollutants, and provide an excellent visualization for following the formation, transport, and removal of various atmospheric chemicals. Animations of Hybrid Base Case ozone concentrations (together with monitored concentrations) can be downloaded by clicking the "model performance evaluation" link at http://www.tnrcc.state.tx.us/air/aqp/airquality_photomod.html#camx2. Careful analysis of ozone concentrations on September 5 reveals a fundamental problem with the model's performance on that day (despite acceptable statistical performance). The highest monitored ozone concentrations were seen at Clute in southern Brazoria County, yet the model placed them west of downtown. While the model generated reasonable concentrations of ozone, it misplaced them forty or fifty kilometers inland of the actual peak locations.

Figure 8 is an isopleth plot showing daily maximum ozone concentrations simulated on September 5, along with monitored daily peak concentrations. The model simulated very high ozone concentrations across the urban areas (where only moderate concentrations were measured), yet simulated low ozone concentrations in the area where the observed maximum occurred.

Figure 8: Daily Peak Ozone Concentrations on September 5

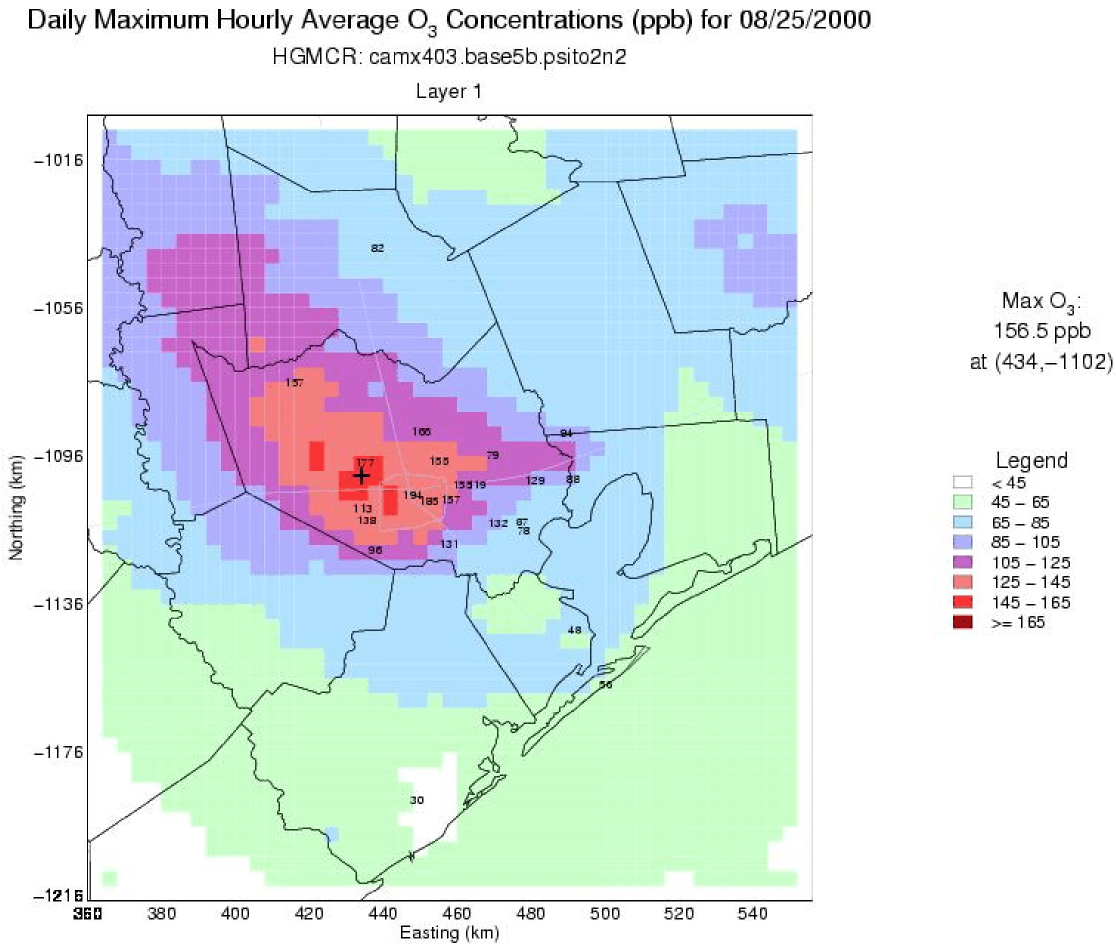


The explanation for the poor model performance on September 5 is that a convergence zone set up along the coast, causing air to be transported from the urban and industrial areas into southern Brazoria County. The stagnant conditions resulting from the convergence then allowed very high levels of ozone to build up. However, MM5 placed the convergence zone too far inland placing the modeled peak in Fort Bend County. Similar analysis for the BPA region shows that the model massively over-predicts ozone concentrations in that area.

This analysis illustrates why it is not sufficient to rely on performance statistics alone to assess model performance. In fact, the actual performance of September 5 is so poor that we have decided not to use it for control strategy evaluation. Had the peak been merely displaced downwind of the source region, the day might still have been useful for control strategy purposes. But because the peak is errantly located across the urban region, it would be impossible to accurately assess the response on that day.

Figure 9, on the other hand, shows the modeled daily peak ozone concentrations on August 25, a day where the model replicated the observed ozone concentrations very well. The pattern seen arises from the ozone "blob" moving from its origin near the Ship Channel across town in a westerly, then northwesterly direction.

Figure 9: Daily Peak Ozone Concentrations on August 25

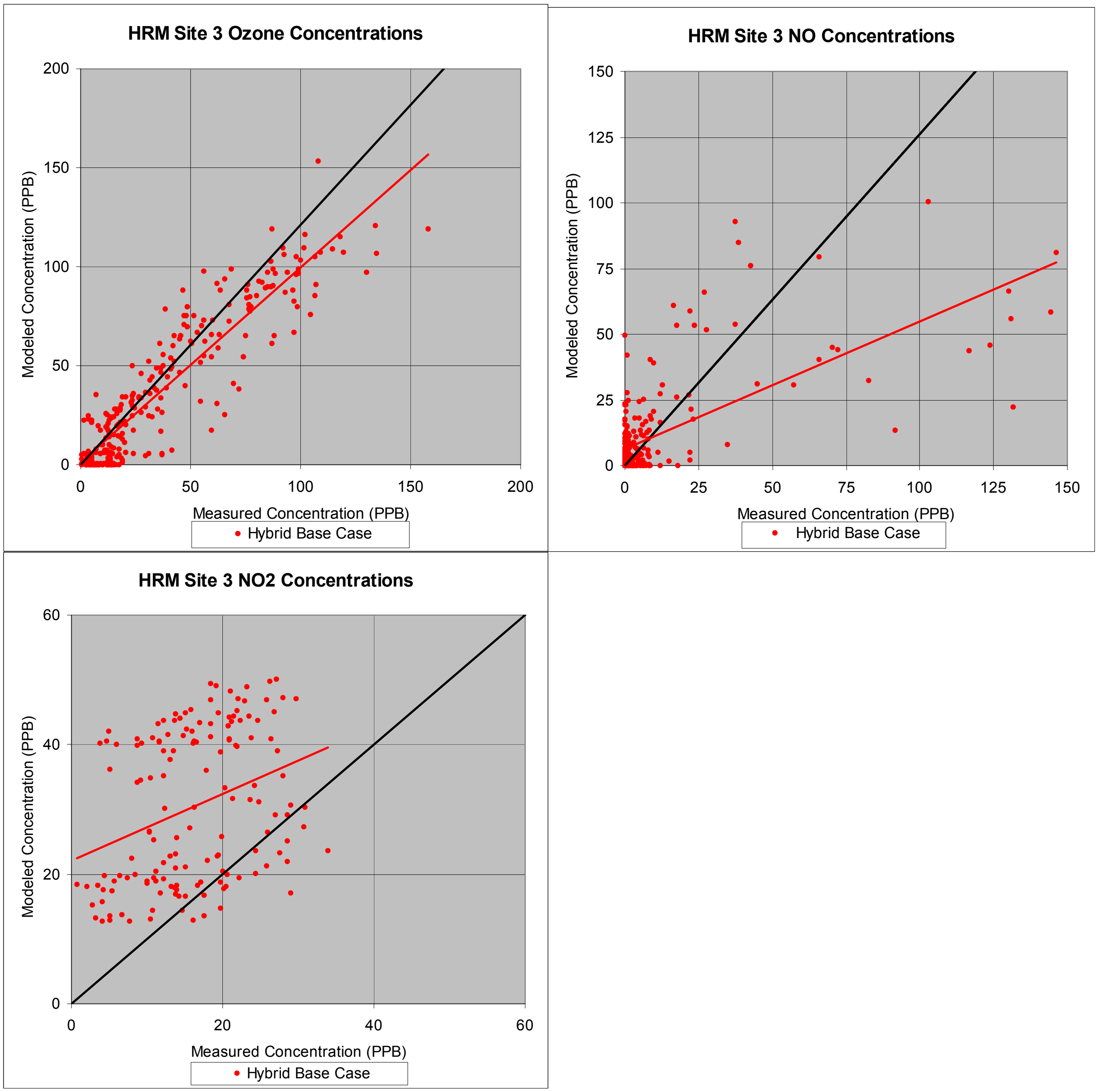


Ozone isopleth plots for all days in the Hybrid Base Case can be found in Appendix H.

Scatter Plots

Scatter plots represent the same information as seen in time series plots, but reduce the dimensionality by one (time). While time is a critically important factor in understanding model predictions, it can be instructive to just look at all the predictions at a site vs. observations. Important trends can often be identified that may be less apparent in time-series plots or in ozone isopleths. The following scatter plots from HRM3 show the same information as the time series shown in Figures 4-6 (except that the ramp-up days are removed), but plot all hours on a single X-Y plot. Unlike the above time series, there is no scatter plot for CO, since there is no observational data.

Figures 10-12: Scatter plots of ozone, NO, and NO_2 at site HRM3, August 25-September 6, Hybrid Base Case vs. Observed.



As was noted from the time series plots, at HRM3 ozone is simulated quite well, while NO appears to be simulated reasonably well (although there is much more scatter than for ozone). While some NO_2 observations are simulated well, a large group is over-predicted significantly. This is a manifestation of the night-time over-prediction seen in the time series plots above.

One-hour scatter plots comparing modeled species with all available observational data are available in Appendix B.2.

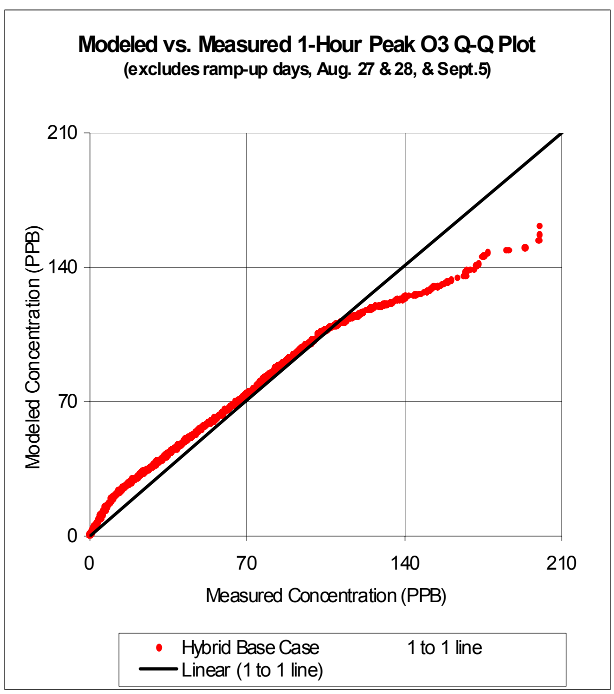
Quantile-Quantile (Q-Q) Plots

Quantile-Quantile (Q-Q) plots are scatter plots where data points from both variables are first sorted independently, then plotted smallest Y against smallest X, second smallest Y against second smallest X, ..., largest Y against largest X. Q-Q plots compare only the distribution of Y vs. that of X. All information about correlation between the two variables is lost.

Q-Q plots cannot be used to show that the model performs well. A Q-Q plot that is near the one-to-one line shows only that the distribution of modeled ozone concentrations is similar to the distribution of measured ozone concentrations. Q-Q plots that are far from the one-to-one line may be useful in pointing out tendencies in the model to over- or under-predict ozone concentrations in certain ranges. For example, models frequently tend to over-predict lower measured concentrations and under-predict higher measured concentrations.

Figure 13 is a Q-Q plot of measured & modeled 1-hour ozone concentrations for Base 5b.

Figure 13: Modeled vs. Measured 1-Hour Peak Ozone Q-Q Plot



The distribution of modeled base case ozone exceeds the observed distribution up to approximately 70 ppb. Between about 70 and 120 ppb, the Base 5b distribution is marginally higher than the measured distribution. Above 130 ppb (about the top 2% of data) the modeled distribution is below the distribution of measured values.

The distribution of 1-hour modeled ozone concentrations is relatively similar to the distribution of observed concentrations, although the modeled distribution tends to exceed the measured distribution at low concentrations and is below the measured distribution at high concentrations.

Subregional Performance Analysis

The modeling staff have not attempted to divide the modeling domain into artificial subregions for purposes of conducting a "subregional analysis", but have instead opted to study the differences among monitoring locations to look for patterns which provide insight into model behavior and performance. One conclusion that is fairly obvious from looking at the ozone scatter plots is that the model's best overall replication of ozone concentrations occurs at monitoring locations in and around the Houston Ship Channel. The primary reason for this trend is that most monitors (except Galveston) tend to register very low ozone concentrations overnight. The model replicates this tendency in the Ship Channel area, but elsewhere the model often carries too much ozone overnight. Examination of the NO_2 time series offers a clue to why this occurs, but not an explanation. In the Ship Channel area, the model's overnight concentrations of NO_2 are generally much higher than the measured concentrations (although daytime concentrations are generally reasonable). In the areas outside the Ship Channel, the modeled concentrations of NO_2 agree reasonably well with measurements all day. So the overnight sum of ozone and NO_2 concentrations is generally too high everywhere, but the equilibrium between ozone and NO_2 is different in the two areas.

Precursor and Intermediate product Performance

Before discussing precursor performance, it should be noted that CAMx is an ozone model and is primarily intended to simulate ozone concentrations. It is informative to study the concentrations of precursor and intermediate product species, but it is not appropriate to base model performance evaluation on how well the model replicates many of these species. In this section, we give a brief discussion of model performance relative to several important species. The interested reader is urged to examine for himself the various graphical products described earlier in this section.

NO and NO_2 - See the section on Subregional Performance Evaluation above.

CO - Carbon monoxide is an important tracer species since it reacts very slowly. The model tracks observed concentrations of CO reasonably well at the LaPorte Supersite, but shows much more diurnal variation than was measured at the elevated Williams Tower site. At other sites, the model tends to show less diurnal variation than was measured, somewhat over-predicting low concentrations and under-predicting high concentrations, but does not appear to have an appreciable bias.

Ethene - The model strongly over-predicts ethene concentrations at Clinton Drive, but at La Porte there is much less over-prediction. At the latter site, there is a great deal of scatter in the data. A little data was collected at Aldine during the episode, and it too has a large amount of scatter, but may indicate a slight under-prediction.

OLE - This CB-IV species is a generic olefin species, but is largely composed of propene. At Clinton Drive, like ethene the model also greatly over-predicts this species. At La Porte, the model also strongly over-predicts OLE. At Aldine, the model agrees fairly well with the observations.

PAR - This CB-IV species represents very many species, most not highly reactive. At Clinton Drive and LaPorte, there is a tendency to over-estimate slightly the lower concentrations of PAR but to under-predict the highest concentrations. The over-prediction at lower concentrations is probably due to the fact that propene and some other olefins spawn one or more units of PAR in the CB-IV mechanism.

Toluene and Xylene - Both these species appear to be slightly under-estimated in the model except for xylene at LaPorte, where the model seems to slightly over-estimate lower concentrations of xylene.

Isoprene - The model generally over-predicts isoprene at LaPorte, Clinton Drive, and Aldine.

Formaldehyde - The model agrees reasonably well with formaldehyde measurements taken at three sites - HRM 3, Williams Tower, and La Porte. The model over-predicts slightly at Williams Tower, and under-predicts slightly at LaPorte.

Nitric Acid - Modeled nitric acid concentrations at Williams Tower are considerably higher than measured, but agree reasonably well with measurements made at LaPorte.

NO_Y - At LaPorte, the model over-predicts low concentrations of NO_Y, but may slightly under-predict higher concentrations. At Williams tower there is no discernable trend. At both sites, there is considerable scatter.

PAN - At both LaPorte and Williams Tower, PAN is predicted reasonably well, although there is considerable scatter. There is a tendency to slightly under-predict the higher concentrations.

Aircraft-based Performance Analysis

It is difficult to quantitatively assess model performance using aircraft data, due to the incommensurability of the aircraft measurements and the model output. Aircraft can measure concentrations along a successive series of points, in a few seconds, whereas model output displays average concentrations of a relatively large volume, averaged over an hour. Aircraft-borne instruments measure relatively instantaneous cross-sections of spatial concentration fields; model output shows the accumulated result of many processes acting upon concentration fields over an hour within discrete volumes. TCEQ and its contractors plan to investigate more fully the best way to make quantitative comparisons between aircraft measurements and grid model output. Qualitative comparisons are useful, however.

Harvey Jeffries of University of North Carolina has done quantitative comparisons using a tool known as the "Flying Data Grabber". The Flying Data Grabber is described in detail in the document "The Effect of VOC Emission Events on the Performance of the Base Case Photochemical Modeling of the August 22-September 1, 2000 Ozone Episode in Southeast Texas" (Allen et al., 2004). The suitability of this tool for making quantitative comparisons has not been evaluated, so the results should be interpreted with caution. Data collected by aircraft flown by the Brookhaven National Lab (BNL) and by the NOAA

Aeronomy Lab/National Center for Atmospheric Research are compared to the model run base4a_pto2n2, at 4km grid cell resolution. This run includes the emission adjustment of light olefins, and includes special inventory data, as applied to the unadjusted portion of the inventory. It should be roughly comparable to the final base case, base5b, as long as the plane is flying within the boundaries of the modeled planetary boundary layer. Appendix B.4 shows the scatterplots for the predicted and observed concentrations. The pink line on the graphs is the 1:1 line; the black line is a simple linear regression line.

Predicted ozone concentrations for the NOAA flight paths tend to match the observations, up to approximately 120 ppb, but are underestimated above that level. For the DOE flight paths, a similar pattern is observed. Both scatterplots show a moderate amount of scatter. The differences in the NOAA and DOE data may be due in part to the different flight paths taken by the two aircraft. DOE tended to fly more within the city, whereas NOAA flew longer flight paths that often encompassed rural areas.

Predicted NO concentrations show different patterns relative to the two data sets. Compared to the BNL data, the predicted NO is underestimated, but compared to the NOAA data, the predicted NO is somewhat bimodal, with a large part of the data showing overestimation. These data are difficult to interpret with a scatterplot alone. They clearly indicate that the flight paths taken by the two labs differed substantially, with the NOAA flights perhaps passing through more fresh NO plumes than the BNL flights. Additional analysis needs to be done to determine if specific situations lead to under- or overestimation.

NO2 data for both the NOAA and BNL flight show a large amount of scatter. Although the slopes of the regression lines are less than one, indicating underprediction by the model, there also seem to be situations where the model is overpredicting.

Predicted NOY concentrations for the NOAA flight paths tend to match the observations relatively well. The linear least-squares regression line shows a slope of 0.98. The BNL NOY data show a larger degree of scatter. Both data sets indicate some degree of overprediction in the middle of the concentration range.

HNO3 data collected by NOAA match the predicted values very well. There appears to be a slight degree of overestimation, but the regression line seems to be parallel to the 1:1 line.

In general, the model predicts ozone better than oxides of nitrogen, with the possible exception of HNO3, which is predicted relatively well by the model.

Predicted CO concentrations show some interesting features. The predicted CO concentrations rarely drop below 100 ppb. This suggests that the background concentrations are playing an important role at the lower end of the scale. The NOAA data does not include values below about 100 ppb, but the BNL data do include them, suggesting that there are differences in either the sensitivity of the instruments used, or in the reporting criteria used by the two labs. In general, however, CO concentrations are overpredicted by a substantial amount, perhaps 20-30%.

The FORM data for both the NOAA and BNL flights show a symmetrical distribution about the 1:1 line at the low to moderate end of the observed range, but at the high end, FORM is substantially underestimated. These results are similar to the ozone distribution, not surprisingly, since FORM is usually correlated with ozone.

Predicted ETH matches the observations on the low end relatively well, but at the high end of the observed range, the model consistently underpredicts by a substantial margin. All three data sets display this pattern. Predicted OLE vs observed OLE also displays this pattern. The aircraft comparisons contrast strongly with the substantial overestimation of ETH and OLE observed on some days at the ground-level sites at Clinton and La Porte. One possible explanation for both phenomena is that the emissions from low-level point sources of ETH/OLE are overestimated, but the elevated ETH/OLE sources are underestimated. Another possible explanation is that the mixing within the planetary boundary layer is insufficient, and that increasing it would result in less ETH/OLE near the ground and more ETH/OLE at higher elevations. A third explanation is that the underestimates of elevated ETH/OLE are due to emission events, and the ground-level overestimations are due to improper placement or magnitude of the imputed ETH/OLE emissions. A fourth explanation is related to the very brief sampling time of the aircraft canisters. Shorter sampling times and lack of continuous measurements may allow the aircraft to selectively sample the heart of emission plumes, resulting in high observed concentrations. When compared to 4-km grid cell predictions, the observations could easily be much higher than the 16-km2 averages from the modeling. Hourly ground-based observations, however, average over a longer time period, and hence average out some of the highest short-term peaks. A comparison to ground-based measurement techniques with sampling times of less than one hour may allow testing of this hypothesis. Other explanations related to meteorology, emissions, sampling artifacts, grid cell resolution, the averaging methods used in the Flying Data Grabber, or combinations of all factors are possible as well. This issue deserves further scrutiny, and will be investigated further in preparation for the 8-hour ozone attainment demonstration.

Predicted ISOP matches the observations relatively well, particularly for the NOAA data set. ISOP measurements at Williams Tower match relatively well also. Again, this is somewhat in contrast to the observations at Clinton and La Porte, where ISOP seems to be overestimated in the modeling on some days. Perhaps the same factors that are affecting the ETH and OLE concentrations are also affecting the ISOP. New biogenic input data will become available soon, so a revision of the biogenic emissions estimates may shed light upon the causes of disagreement between ground-based and aircraft observations.

Predicted PAR concentrations are less than observed PAR at the higher end of the range. Many predicted PAR values fall along the 1:1 line, but a subset tends to be substantially underestimated. This pattern is again similar to those observed for other VOC species, and the same explanations may hold for PAR as well.

Predicted ALD2 tends to be overestimated relative to the BNL and NCAR observations, but seems to show a bimodal distribution relative to the NOAA observations. These patterns may be due in part to the target compounds measured by the different labs. The NOAA lab measures for more C4-C6 alkenes than the other labs. Some larger alkenes are mapped to the ALD2 CB4 species, and therefore the NOAA canisters may observe higher ALD2 concentrations than the other labs simply because of a measurement difference. These data also deserve greater scrutiny.

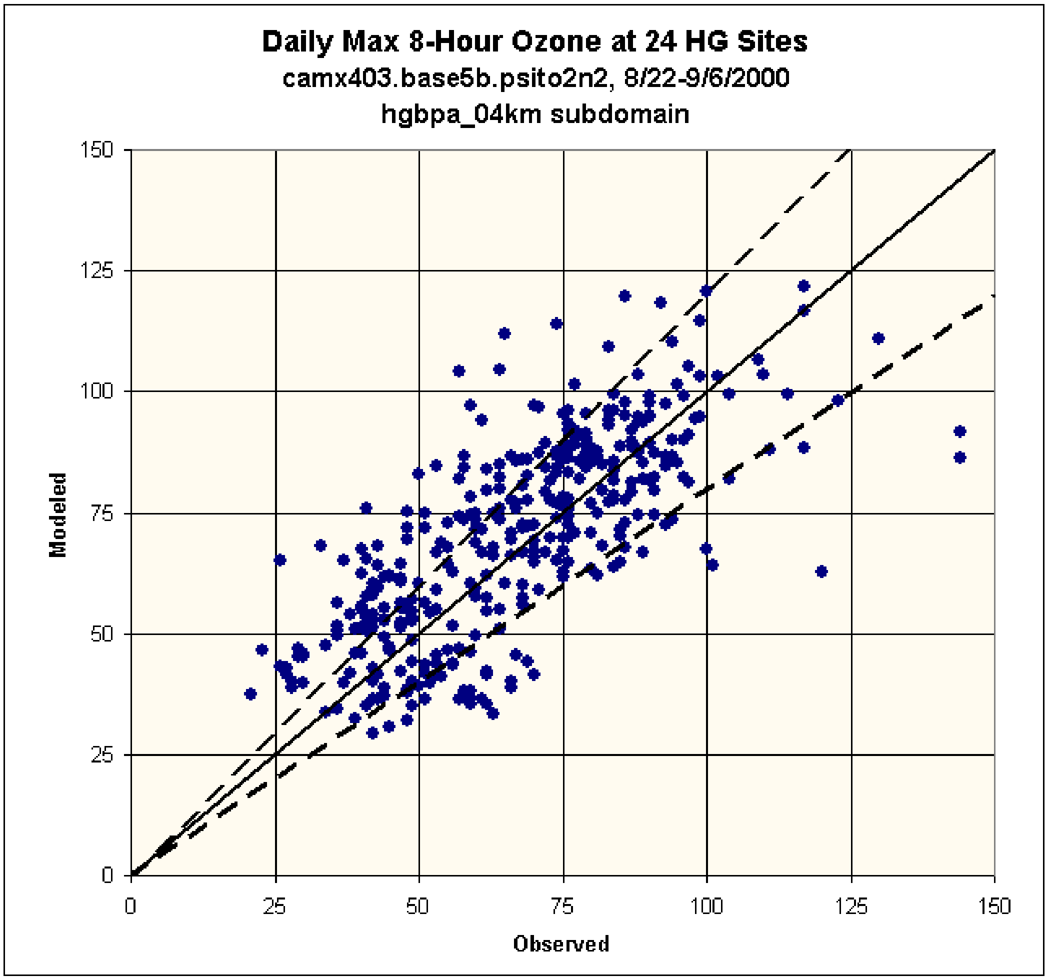
Conclusions: Aircraft observations can be useful in assessing model performance, but must be done with care, due to the incommensurability of the observations and the model output. Ozone, formaldehyde, ETH, OLE, and PAR tend to be underestimated at the high end of the observed ranges, but are well predicted at the low and moderate portions of the ranges. CO, ALD2 and nitrogen oxides tend to be overestimated to varying degrees, with CO and ALD2 having the highest degrees of overestimation. Possible explanations for the under- and overestimations are plentiful, and include factors related to meteorology, emissions, sampling artifacts, grid cell resolution, the averaging methods used in the Flying Data Grabber, or combinations of some or all factors. TCEQ will investigate these issues in preparation for an attainment demonstration for the 8-hour ozone SIP.

Eight-Hour Performance Analysis

Because the analysis in this SIP revision focuses on both one- and eight-hour ozone, we conducted a set of performance analyses specifically targeting how well the model replicates eight-hour peak ozone concentrations, as described in EPA's 1999 Draft Guidance for eight-hour attainment demonstrations. Specifically, we calculated relative bias for the entire set of daily eight-hour ozone peaks, and also on a day-by-day and monitor-by-monitor basis. We also created scatterplots comparing the measured and modeled eight-hour peaks for the same sets of data. One significant departure from the Draft Guidance, however, is that instead of using the highest modeled peak value "near" each modeling site, we have instead used the values at the actual monitoring location. The reason for this deviation is that the majority of ozone monitors in the Houston area are located in a relatively small area encompassing the Houston Ship Channel. Within this area, local NO_X sources can greatly affect ozone concentrations, creating strong concentration gradients in the space of a few grid cells. Using the values at the monitoring locations thus provides a better assessment of how well the model actually replicates ozone concentrations than would using the peak values "near" each monitoring location.

Figure 14 below shows the overall comparison of measured and modeled eight-hour ozone peaks. The solid line on the graph is the ideal; if the model perfectly replicated observed 8-hour peaks, all the data points would fall on this line. The dashed lines indicate a 20% departure from a perfect fit.

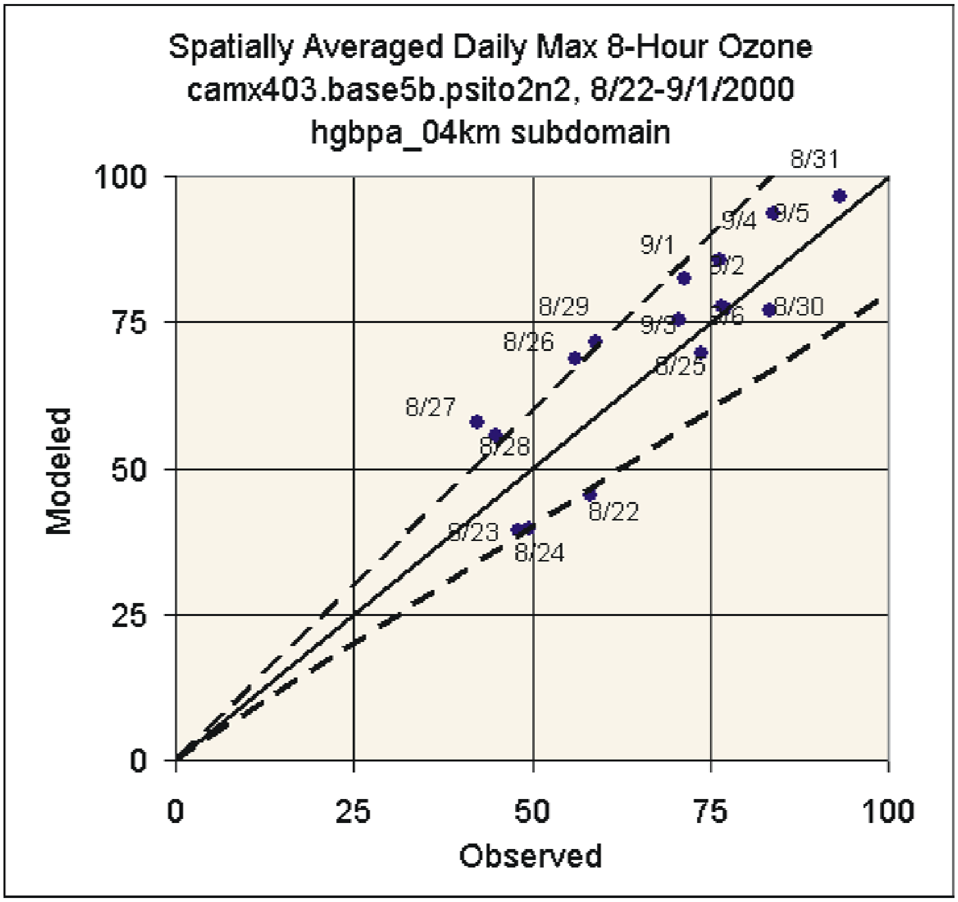
Figure 14: Daily modeled eight-hour peak ozone vs. observed peaks



While Figure 14 shows relatively good agreement between measurements and modeled concentrations, clearly there is considerable scatter in the data. Overall the model shows a modest positive bias of 3.23 parts/billion, which is less than 5% of the mean 8-hour peak across all monitors and days.

Figure 15 shows a comparison of modeled and measured daily maxima averaged across all monitors. This plot shows how well the model replicated the average eight-hour peaks for each day of the episode. Note that marginal performance is achieved on the ramp-up days and on 8/27 and 8/28, days that showed unacceptable one-hour performance. Also note that 8/26 and 8/29 also show marginal performance for eight-hour ozone, despite producing acceptable one-hour performance. Finally note that 9/5 appears to provide reasonable eight-hour performance despite the problems noted above.

Figure 15: Spatially averaged modeled vs. observed 8-hour ozone peaks.



Figures 16 and 17 show a comparison of modeled and measured eight-hour ozone concentrations at each station, averaged across all episode days. These graphics also show relatively good agreement between measurements and modeled values except for a few sites. Most notable are Clute and HRM-4 where the model tends to over-predict eight-hour ozone concentrations. A complete set of eight-hour scatterplots for Base5b can be found in Appendix B.3.

Figure 16: Average eight-hour measured vs. modeled peak ozone by site.

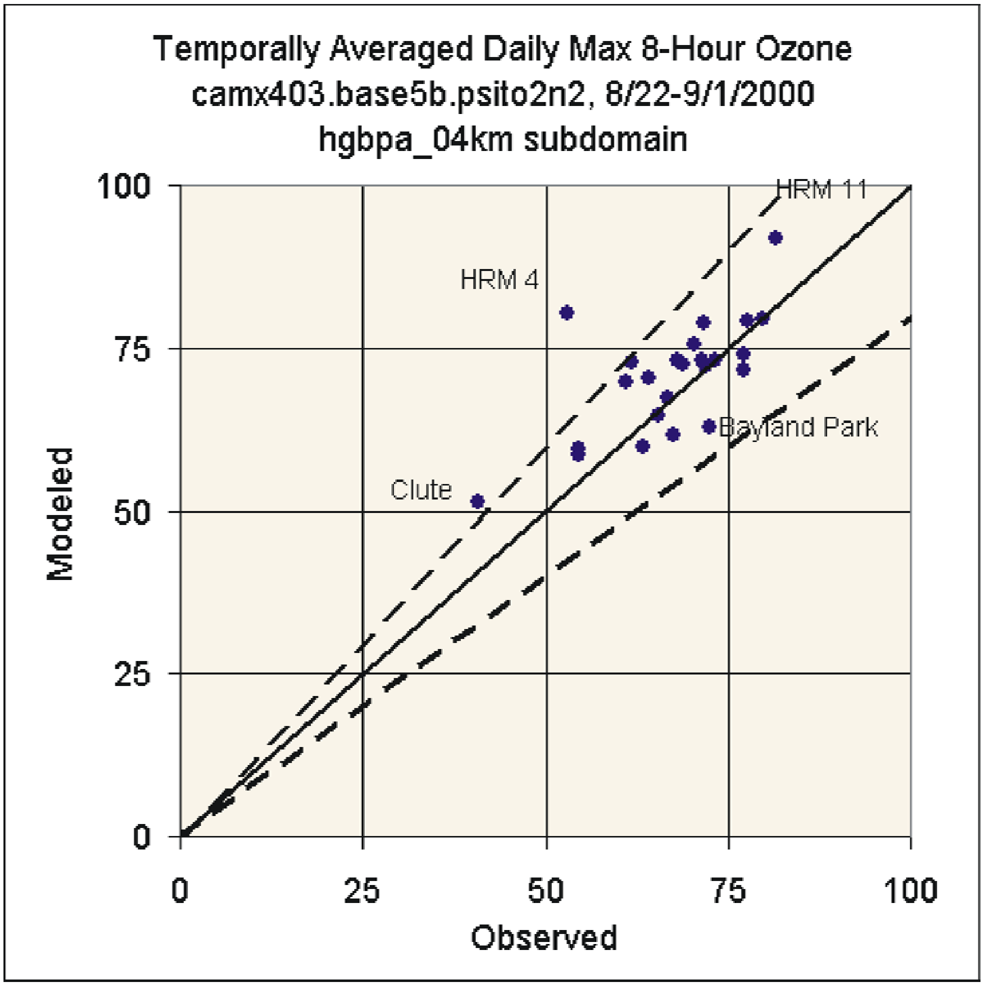
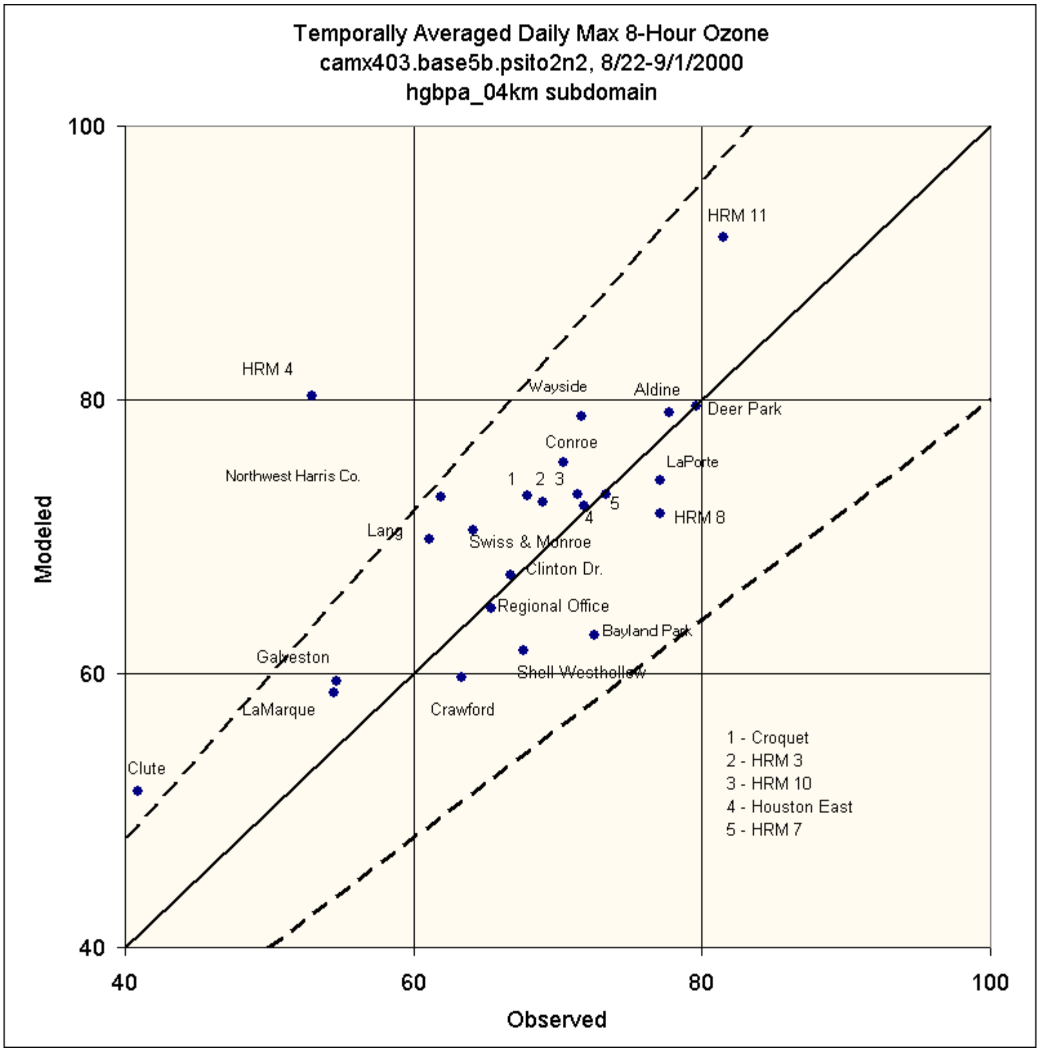
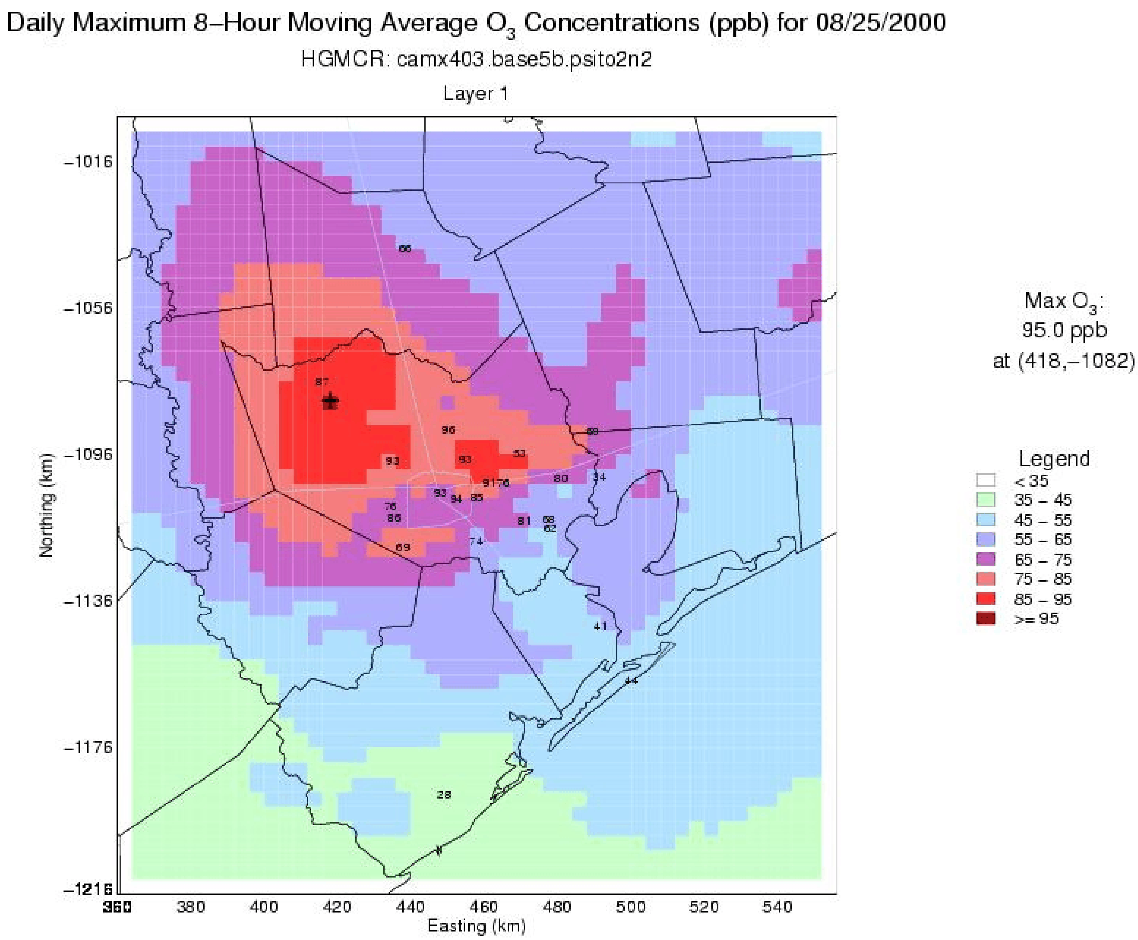


Figure 17: Detail of Figure 16.



Finally, Figure 18 shows modeled and measured eight-hour peak ozone concentrations across the HGB areas on August 25. On this day, the model shows good agreement between measured and modeled peak concentrations across the area. A complete set of eight-hour peak ozone isopleth plots can be found in Appendix H of this SIP revision.

Figure 18: Modeled daily maximum eight-hour ozone concentrations for August 25.



Base Case Model Sensitivity Analyses

The Modeling Protocol (February, 2004 draft) discusses four specific modeling sensitivity tests which were performed in conjunction with this model performance analysis:

> **Alternative meteorological characterization** - Instead of the more common (but physically unreasonable) tests, such as one-half wind speed runs, we have instead tested CAMx using a variety of meteorological characterizations. The most significant of these is the use of the GOES-based meteorology during the core episode period as described earlier in this section. We also ran a sensitivity analysis testing a profiler-based PBL adjustment applied to the GOES-based meteorology, and tested an alternative meteorological characterization on August 31 which incorporated lidar data from the LaPorte supersite. These runs are described in more detail below.
>
> **Alternative boundary conditions** - Because the area of interest is far from the lateral boundaries, it was expected that results will not exhibit a great deal of sensitivity to the values. However, Environ ran tests of alternative boundary conditions as part of its modeling for the DFW area, and

discovered a surprising level of sensitivity to the specification of boundary conditions. We then conducted similar tests for the HGB modeling, and discovered some sensitivity (though less than seen in the DFW modeling) to the boundary concentrations. Generally, the new boundary conditions improved model performance and are now included in the hybrid base case. Results for this comparison are not shown since they were performed on an earlier base case which was discovered to have an error in its meteorological characterization.

Later analysis using the Ozone Source Apportionment Technique (OSAT) showed that the influence of the lateral boundaries is actually fairly small, as was originally expected. However, about half of the total boundary condition contribution to peak ozone was discovered to be due to the concentrations at the top of the modeling domain. We plan to further investigate the physics and chemistry involved with the top boundary in future modeling.

Alternative emissions inventory assumptions - Since the completion of modeling for the Phase 1 MCR, we tested a number of different VOC adjustments using the Phase I MCR meteorology. At the urging of Region VI, we also conducted a sensitivity run with adjustments to less-highly-reactive VOCs. The model performance using this alternative emissions inventory is shown below in Table 4. Overall, adjusting the less-reactive VOCs tends to over-drive ozone production, increasing bias and gross error on most days. Time series analysis for this sensitivity also shows modeled hydrocarbon concentrations higher than measured at the few locations where measurements are available.

A discussion of the methodology used to estimate the adjustment to the less-reactive VOCs in this analysis is found in Appendix B.5, "Comparing the Emission Inventory to Ambient Data in Houston" and additional detail is in Appendix B.6.

Alternative vertical mixing - EPA Guidance has historically recommended sensitivity testing to determine the model's response to perturbations in mixing height. Newer models, including CAMx, use instead a vertical mixing coefficient commonly known as K_v. In our application, the PBL derived from MM5 is used to calculate the K_v's used by CAMx. It is possible to test alternative PBL characterizations by modifying the PBL prior to the derivation of the K_v's. As discussed above under "Alternative meteorological characterization", we tested the model with the native GOES-based PBL characterization against a version wherein the PBL was adjusted using data from the radar profilers deployed during the TexAQS. The model performance for this alternative mixing scenario (see Table 4) was generally not as good as was observed using the unadjusted GOES PBLs.

Alternative wind field characterization - As part of an extensive investigation into the model's behavior on August 31, we ran an alternative meteorological characterization developed by Dr. John Nielsen-Gammon especially for this test. This characterization used recently-available Lidar data from the LaPorte supersite to provide an additional "nudging" point for MM5. Results of this sensitivity (see Table 4) showed little change in model performance, hence this change was not incorporated into Base 5b.

In addition to the above, we have run a number of other sensitivity analyses, but many of these were conducted with an earlier meteorological characterization. Results of these runs were useful in the process of developing the SIP but will not be reported here. One run which was conducted recently using the current meteorology is reported in Table 4:

August 30 emission events - in this sensitivity, emissions events similar to those added to this day in a sensitivity run reported in the December, 2002 SIP revision were added. One event was a suspected (but unreported) release of HRVOCs in the western end of the Ship Channel, which was simulated by increasing HRVOC emissions in this location by an additional 50%. The second was the magnification by a factor of seven of propylene emissions from a smoking flare reported in the Special Inventory. Refer to the 2002 SIP revision for specific details about how these adjustments were developed. These additional emissions improved model performance on August 30, but did not produce peak concentrations as high as were measured on that day.

Table 4: Model Performance for Selected Base Case Sensitivity Analyses

		Episode Date												
		August							September					
		25	26	27	28	29	30	31	1	2	3	4	5	6
Obs. Peak		**194**	**140**	**87**	**112**	**147**	**201**	**176**	**164**	**126**	**127**	**145**	**185**	**156**
Hybrid Base Case	Mod. Peak	**157**	**149**	**112**	**132**	**151**	**137**	**173**	**137**	**153**	**139**	**158**	**210**	**153**
	Rel. Bias	**-9.9**	**6.3**	**25.2**	**22.4**	**8.1**	**-11.0**	**4.6**	**8.1**	**-2.7**	**-3.7**	**5.5**	**6.9**	**-5.1**
	Gross Error	**20.9**	**18.5**	**25.2**	**24.3**	**15.8**	**20.4**	**15.8**	**13.7**	**17.2**	**19.4**	**20.4**	**26.6**	**18.9**
Profiler-based PBL adjustment for GOES	Mod. Peak	**167**	**169**	**130**	**145**	**156**	**139**	**170**	**143**					
	Rel. Bias	**-10.4**	**5.0**	**36.9**	**26.4**	**8.4**	**-9.9**	**2.7**	**11.4**					
	Gross Error	**23.4**	**21.5**	**36.9**	**29.2**	**16.6**	**21.0**	**16.8**	**15.8**					
Adjusted Less-Highly Reactive VOCs	Mod. Peak	**200**	**167**	**120**	**143**	**171**	**166**	**192**	**148**	**165**	**152**	**166**	**236**	**158**
	Rel. Bias	**8.4**	**22.7**	**33.4**	**35.9**	**18.6**	**-4.0**	**7.6**	**9.7**	**-1.7**	**-1.6**	**6.7**	**15.4**	**-4.0**
	Gross Error	**21.0**	**26.8**	**33.4**	**36.1**	**22.8**	**17.4**	**16.5**	**14.7**	**18.0**	**20.6**	**20.9**	**30.3**	**18.7**
Incorporate LaPorte Lidar data on August 31	Mod. Peak							**170**						
	Rel. Bias							**4.2**						
	Gross Error							**16.0**						
August 30 Emission Events	Mod. Peak						**145**							
	Rel. Bias						**-8.5**							
	Gross Error						**19.3**							

Phase 2 MCR Modeling Log

For reference, the following 3 tables list the base case, future case and control strategy modeling runs that were completed during Phase 2 of the HGB MCR.

Table 5: Phase 2 MCR Modeling Log: Base Case Runs

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5, pto2n_noaapbl, 8/18-9/6, CAMx 4.02[1]	Environ/ATMET MM5 HGX_Exp3 Post-modification of Kv based on daily NOAA profiler PBL data	Area Base2a and Non-Road Base3 Area Base2a = fires now treated as point sources Non-Road Base3 = lots of updated data from the 2002a version of the NONROAD model, and diesel NOx humidity correction	PSDB extract v15b Special Inventory v19 New speciation for all point sources Flat Terminal Olefin to NOx adjustment using all 8-county negu NOx adds 205 tpd. Explicit species in extraole file.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain
base5, regular, 8/18-9/6, CAMx 4.02	Environ/ATMET MM5 HGX_Exp3	Area Base2a and Non-Road Base3 Area Base2a = fires now treated as point sources Non-Road Base3 = lots of updated data from the 2002a version of the NONROAD model, and diesel NOx humidity correction	PSDB extract v15b Special Inventory v19 New speciation for all point sources	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain

[1]Biogenic emissions note for all modeling runs unless otherwise indicated: new kriged temperature.

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5, pto2n_noaapbl_envicbc, 8/18-9/6, CAMx 4.02	Envrion/ATMET MM5 HGX_Exp3 Post-modification of Kv based on daily NOAA profiler PBL data	Area Base2a and Non-Road Base3 Area Base2a = fires now treated as point sources Non-Road Base3 = lots of updated data from the 2002a version of the NONROAD model, and diesel NOx humidity correction	PSDB extract v15b Special Inventory v19 New speciation for all point sources Flat Terminal Olefin to NOx adjustment using all 8-county negu NOx adds 205 tpd. Explicit species in extraole file.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ modified IC/BC/TC
base5, envicbc, 8/18-9/6, CAMx 4.02	Environ/ATMET MM5 HGX_Exp3	Area Base2a and Non-Road Base3 Area Base2a = fires now treated as point sources Non-Road Base3 = lots of updated data from the 2002a version of the NONROAD model, and diesel NOx humidity correction	PSDB extract v15b Special Inventory v19 New speciation for all point sources	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC
base5, pto2n_noaapbl_hg1km, 8/18-9/6, CAMx 4.02	Environ/ATMET MM5 HGX_Exp3 Post-modification of Kv based on daily NOAA profiler PBL data	Area Base2a and Non-Road Base3 Area Base2a = fires now treated as point sources Non-Road Base3 = lots of updated data from the 2002a version of the NONROAD model, and diesel NOx humidity correction	PSDB extract v15b Special Inventory v19 New speciation for all point sources Flat Terminal Olefin to NOx adjustment using all 8-county negu NOx adds 205 tpd. Explicit species in extraole file.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC flex-nest hg_01km domain (no hg_01km EI and MET inputs)

Base Case, Modification, Episode Days Modeled, CAMx Version	**Meteorology**	**Area & Non-Road Mobile Source Emissions**	**Point Source Emissions**	**Onroad Mobile Source Emissions**	**Others**
base5a, psito2n_noaapbl, 8/18-9/6, CAMx 4.02	Environ/ATMET MM5 HGX_Exp3 Post-modification of Kv based on daily NOAA profiler PBL data	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n = special inventory terminal olefin to NOx adjustment. low-level: psito2n in hgbpa_04km and pto2n in reg_36km and etx_12km.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain. Diesel NOx correction	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC flex-nest hg_01km domain (no hg_01km EI and MET inputs)
base5a, psito2nb063i_noaapbl_lumkv, 8/18-9/6, CAMx 4.02[2]	Environ/ATMET MM5 HGX_Exp3 Post-modification of Kv in hgbpa_04km based on daily NOAA profiler PBL data and minimum Kv based on land use data in all domains (kvpatch)	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n = special inventory terminal olefin to NOx adjustment. low-level: psito2n in hgbpa_04km and pto2n in reg_36km and etx_12km.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain. Diesel NOx correction	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC no hg_01km domain

[2]Biogenics emissions note: new kriged temperature + 37% isoprene reduction everywhere.

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n_goes, 8/22-9/1, CAMx 4.02	TAMU MM5: 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n = special inventory terminal olefin to NOx adjustment. low-level: psito2n in hgbpa_04km and pto2n in reg_36km and etx_12km.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain.\ Diesel NOx correction	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC flex-nest hg_01km domain (no hg_01km EI and MET inputs) run 0822-0901
base5a, psito2n_noaapbl_lumkv, 8/18-9/6, CAMx 4.02	Environ/ATMET MM5 HGX_Exp3 Post-modification of Kv in hgbpa_04km based on daily NOAA profiler PBL data and minimum Kv based on land use data in all domains (kvpatch)	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n = special inventory terminal olefin to NOx adjustment. low-level: psito2n in hgbpa_04km and pto2n in reg_36km and etx_12km.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain. Diesel NOx correction	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC rerun with flex-nest hg_01km domain: low-level EI inputs and no met inputs

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2nj_noaapbl_lumkv, 8/18-9/6, CAMx 4.02	Environ/ATMET MM5 HGX_Exp3 Post-modification of Kv in hgbpa_04km based on daily NOAA profiler PBL data and minimum Kv based on land use data in all domains (kvpatch)	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2nj = special inventory terminal olefin to NOx adjustment and John Jolly's extra lower reactivity VOCs. low-level: psito2nj in hgbpa_04km and psito2n in reg_36km and etx_12km.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in subdomain. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of subdomain. Diesel NOx correction	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC no hg_01km domain
base5a, pto2n2, 8/22-9/6, CAMx 4.02	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse ba	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.pto2n2 = terminal olefin to NOx adjustment, version 2, uses nox from sources with 10 tpy of terminal olefins as basis for adjustment, adds 155 tpd hrvoc, distributed to all in 8 co. with term oles, explicit species. Low-level: pto2n2 in hgbpa_04km	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC Part I: use goes_lumkv MET - 0822-0901 Part II: use noaapbl_lumkv MET - 0901-0906, restart from 0831 of Part I

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n2, 8/22-9/6, CAMx 4.02	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse b	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC Part I: use goes_lumkv MET - 0822-0901 Part II: use noaapbl_lumkv MET - 0901-0906, restart from 0831 of Part I
base5a, pto2n2, 8/22-9/6, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse ba	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.pto2n2 = terminal olefin to NOx adjustment, version 2, uses nox from sources with 10 tpy of terminal olefins as basis for adjustment, adds 155 tpd hrvoc, distributed to all in 8 co. with term oles, explicit species. Low-level: pto2n2 in hgbpa_04km	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC Part I: use goes_lumkv MET - 0822-0901 Part II: use noaapbl_lumkv MET - 0901-0906, restart from 0831 of Part I

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n2, 8/22-9/6, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse b	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC Part I: use goes_lumkv MET - 0822-0901 Part II: use noaapbl_lumkv MET - 0901-0906, restart from 0831 of Part I
base5a, pto2n2_hg1km, 8/22-9/6, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse ba	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.pto2n2 = terminal olefin to NOx adjustment, version 2, uses nox from sources with 10 tpy of terminal olefins as basis for adjustment, adds 155 tpd hrvoc, distributed to all in 8 co. with term oles, explicit species. Low-level: pto2n2 in hgbpa_04km	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI input Part I: use goes_lumkv MET - 0822-0901 Part II: use noaapbl_lumkv MET - 0901-0906, restart from 0831 of Part I

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n2_hg1km, 8/22-9/6, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse b	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI inputs Part I: use goes_lumkv MET - 0822-0901 Part II: use noaapbl_lumkv MET - 0901-0906, restart from 0831 of Part I
base5a, psito2n2_hg1km_pa1, 38230, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse ba	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km and hg_01km domain Environ's SOS IC/BC/TC Process Analysis (original) run for 0831, restart from 0830 of base5a.psito2n2_hg1km; PA IPR/IRR area : (5,5)->(70,70) in hg_01km

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n2_apca1, 8/22-8/31, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse ba	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain (no hg_01km) Environ's SOS IC/BC/TC APCA run for 0822-0831
base5a, psito2n2_hg1km_ut1, 8/29-8/31, CAMx 4.03ut	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse ba	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km and hg_01km domain Environ's SOS IC/BC/TC Process Analysis (UT version) run for 0829-0831, restart from 0829-0830 of base5a.psito2n2_hg1km; PA IPR/IRR area : (5,5)->(70,70) in hg_01km

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, regular, 8/22-9/6, CAMx 4.02	Part I: 0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. Part II: 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL	base5a.regular = no special adjustment	base5.regular = no special adjustment Low-level: regular in hgbpa_04km, etx_12km and reg_36km.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC Part I: use goes_lumkv MET - 0822-0901 Part II: use noaapbl_lumkv MET - 0901-0906, restart from 0831 of Part I
base5a, psito2n2_BS_hg1km, 38229, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse b	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI inputs run 0830 only, restart from 0829 of base5a.psito2n2_hg1km

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n2_BSx7_hg1km, 38229, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse b	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI inputs run 0830 only, restart from 0829 of base5a.psito2n2_hg1km
base5a, psito2n2_hg1km_stgwd, 38229, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse b	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI inputs set 'staggered wind' option to TRUE run 0830 only, restart from 0829 of base5a.psito2n2_hg1km

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n2_hg1km_newaho, 38229, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse ba	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI inputs New albedo-haze-ozone-colum (AHO) input file generated by Environ's new ahomap program New daily specific photolysis rate (photorate) input file (with new aho parematers) run 0830 only, restart from 0829 of base5a.psito2n2_hg1km

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n2_apca1_stgwd, 8/22-8/31, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse ba	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain (no hg_01km) Environ's SOS IC/BC/TC 'staggered wind' setting APCA run for 0822-0831
base5a,[3] psito2n2_b063i_hg1km, 8/22-9/6, CAMx 4.03	0822-0901 (goes_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km. 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HGX_Exp3 - modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse b	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI inputs Part I: use goes_lumkv MET - 0822-0901 Part II: use noaapbl_lumkv MET - 0901-0906, restart from 0831 of Part I

[3] Biogenic emissions note: new kriged temperature + 36% isoprene reduction in hgpba_04km and hg_01km domains.

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n2_atmet noaapbl_hg1k m, 8/18-9/6, CAMx 4.03	Environ/ATMET MM5 HGX_Exp3 - revised MM5-to-CAMx4 convertor (Kv bug fix, 2003/11/03 version); modified Kv in hgbpa_04km based on daily NOAA profiler PBL data. Landuse based minimum Kv for all domains (kvpatch)	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain and flex-nest hg_01km domain Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI inputs run 08/18-09/06
base5a, psito2n2_goes2 , 8/22-8/31, CAMx 4.03	0822-0831 (goesnoaapbl_lumk v): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km Used new MM5CAMX4 converter (2004/11/03 version, Kv bug fix) for Kv lumkv - Land-use based minimum Kv (kvpatch).	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain (no hg_01km) Environ's SOS IC/BC/TC OSAT run for 0822-0831

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5a, psito2n2_goesnoaapbl, 8/22-9/1, CAMx 4.03	0822-0901 (goesnoaapbl_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km modified Kv in hgbpa_04km based on daily NOAA profiler PBL data New MM5CAMX4 converter (2004/11/03 version, Kv bug fix) for K	Area Base2a = fires now treated as point sources Non-Road Base3a = Non-Riad Base3 with residential lawn & garden treatment	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain (no hg_01km) Environ's SOS IC/BC/TC
base5b, psito2n2, 8/22-9/6, CAMx 4.03	0822-0901 (tamu_goes2_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km (hgbpa_04km kv produced by 2004.11.03 MM5-CAMx converter - kv bug fix - GOES2). 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HG	Non-Road Base3a = Non-Road Base3 with residential lawn & garden treatment Area Base5b = forest and agriculture fires treated as elevated point sources ship in both hg (base5a) and bpa (base5b) treated as elevated point sources	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC Part I: use tamu_goes2_lumkv MET - 0822-0901 Part II: use atmet_noaapbl3_lumkv MET - 0901-0906, restart from 0831 of Part I

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5b, psito2n2_noaapbl, 8/22-9/6, CAMx 4.03	0822-0901 (tamu_goes_noaapbl3_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km and modified Kv in hgbpa_04km based on daily NOAA profiler PBL data (hgbpa_04km kv produced by 2004.11.03 MM5-CAMx conve	Non-Road Base3a = Non-Road Base3 with residential lawn & garden treatment Area Base5b = forest and agriculture fires treated as elevated point sources ship in both hg (base5a) and bpa (base5b) treated as elevated point sources	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC Part I: use tamu_goes_noaapbl3_lumkv MET - 0822-0901 Part II: use atmet_noaapbl3_lumkv MET - 0901-0906, restart from 0831 of Part I
base5b, psito2n2_atmetnoaapbl, 8/18-9/6, CAMx 4.03	Environ/ATMET MM5 HGX_Exp3 - revised MM5-CAMx4 convertor (Kv bug fix, 2003/11/03 version); new (20040212) modified Kv in hgbpa_04km based on daily NOAA profiler PBL data - GOES.noaapbl3. Landuse based minimum Kv for all domains (kvpatch)	Base5b = base5a + ship in bpa treated as elevated point sources	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain. Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI inputs run 08/18-09/06

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5b, psito2n2_tamu goeslidar, 38230, CAMx 4.03	0831 (tamu_goes_lidar_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km (hgbpa_04km kv produced by 2004.11.03 MM5-CAMx converter - kv bug fix - GOES2). Incoporated lidar profiler data for 08/31/2000 i	Non-Road Base3a = Non-Road Base3 with residential lawn & garden treatment Area Base5b = forest and agriculture fires treated as elevated point sources ship in both hg (base5a) and bpa (base5b) treated as elevated point sources	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC 0831 only with tamu_goes_lidar_lumkv MET, restart from 0830 of base5b.psito2n2.
base5b, psito2n2_825t, 38230, CAMx 4.03[4]	0831 (tamu_goes2_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km (hgbpa_04km kv produced by 2004.11.03 MM5-CAMx converter - kv bug fix - GOES2). Use 0825 temperature and humidity inputs in ext_12km	Non-Road Base3a = Non-Road Base3 with residential lawn & garden treatment Area Base5b = forest and agriculture fires treated as elevated point sources ship in both hg (base5a) and bpa (base5b) treated as elevated point sources	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC run 0831 only, restart from 0830 of base5b.psito2n2

[4] Biogenic emissions note: new kriged temperature + 0825 inputs for etx_12km and hgbpa_04km domains.

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5b, psito2n2_825te, 38230, CAMx 4.03	0831 (tamu_goes2_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km (hgbpa_04km kv produced by 2004.11.03 MM5-CAMx converter - kv bug fix - GOES2). Use 0825 temperature and humidity inputs in ext_12km	Non-Road Base3a = Non-Road Base3 with residential lawn & garden treatment Area Base5b = forest and agriculture fires treated as elevated point sources ship in both hg (base5a) and bpa (base5b) treated as elevated point sources Use 0825 mobile in hg	base5b.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC run 0831 only, restart from 0830 of base5b.psito2n2
base5b, regular_atmetnoaapbl, 8/18-9/6, CAMx 4.03	Environ/ATMET MM5 HGX_Exp3 - revised MM5-CAMx4 convertor (Kv bug fix, 2003/11/03 version); new (20040212) modified Kv in hgbpa_04km based on daily NOAA profiler PBL data - GOES.noaapbl3. Landuse based minimum Kv for all domains (kvpatch)	Base5b = base5a + ship in bpa treated as elevated point sources	base5.regular = basic EI with special inventory EI Low-level: regular in all domains.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain. Environ's SOS IC/BC/TC hg_01km flexi-nest domain with EI inputs run 08/18-09/06

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5b, psito2n2_osat1, 8/22-9/6, CAMx 4.03	0822-0901 (tamu_goes2_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km (hgbpa_04km kv produced by 2004.11.03 MM5-CAMx converter - kv bug fix - GOES2). 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HG	Non-Road Base3a = Non-Road Base3 with residential lawn & garden treatment Area Base5b = forest and agriculture fires treated as elevated point sources ship in both hg (base5a) and bpa (base5b) treated as elevated point sources	base5.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC Part I: use tamu_goes2_lumkv MET - 0822-0901 Part II: use atmet_noaapbl3_lumkv MET - 0901-0906, restart from 0831 of Part I OSAT for all days
base5b, psito2n2_nshrv , 8/22-9/6, CAMx 4.03	0822-0901 (tamu_goes2_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km (hgbpa_04km kv produced by 2004.11.03 MM5-CAMx converter - kv bug fix - GOES2). 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HG	Non-Road Base3a = Non-Road Base3 with residential lawn & garden treatment Area Base5b = forest and agriculture fires treated as elevated point sources ship in both hg (base5a) and bpa (base5b) treated as elevated point sources	base5b.psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustment factor from pto2n2 applied to special inventory sources from the pto2n2 file, pto2n2 values used for non-SI sources, explicit species, tonnage varies by day.	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC Part I: use tamu_goes2_lumkv MET - 0822-0901 Part II: use atmet_noaapbl3_lumkv MET - 0901-0906, restart from 0831 of Part I

Base Case, Modification, Episode Days Modeled, CAMx Version	Meteorology	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions	Others
base5c, psito2n2, 8/22-9/6, CAMx 4.03	0822-0901 (tamu_goes2_lumkv): TAMU MM5 - 02FEB27 GRID2 for reg_36km, 02FEB28 GRID3 for etx_12km, and GOES GRID4 for hgbpa_04km (hgbpa_04km kv produced by 2004.11.03 MM5-CAMx converter - kv bug fix - GOES2). 0901-0906 (noaapbl_lumkv): Environ/ATMET MM5 HG	Non-Road Base3a = Non-Road Base3 with residential lawn & garden treatment Area Base5b = forest and agriculture fires treated as elevated point sources ship in both hg (base5a) and bpa (base5b) treated as elevated point sources	base5c = base5b + bug fix in EPS2x's tmprl and pstpnt - now yields better diurnal and daily variation and includes a few points previously dropped by EPS2x's pstpnt psito2n2 = special inventory terminal olefin to NOx adjustment, version 2, uses adjustmen	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.	15 layers in reg_36km and etx_12km domains; 24 layers in hgbpa_04km domain Environ's SOS IC/BC/TC Part I: use tamu_goes2_lumkv MET - 0822-0901 Part II: use atmet_noaapbl3_lumkv MET - 0901-0906, restart from 0831 of Part I

Table 6: Phase 2 MCR Modeling Log: Future Case Runs

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy07c	base5a.p2o2n2	New 2002a Non-Road: no lawn and garden (L+G) time shift, added California L+G, otherwise the same as fy07b;	pto2ncap_altE = old 07 inventory from dec. 2002 sip updated with new extraole file from base5_pto2n, but with controls to equal the overall hrvoc cap totals.	Mostly Diesel NOx Correction (0824-0906), new fleet mix
fy07d	base5a	Non-Road fy07d: no gascan or CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers	cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas)	MOBILE6.2 update to 8-County HGA & 3-County BPA inventories. MOBILE6 inventory for remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Diesel NOx Correction.

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy13d	base5a	Non-Road fy13d: no gascan or CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers	cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas)	MOBILE6.2 update to 8-County HGA- includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx.

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy07e	base5a	mostly new nonroad file for hgbpa_04km all new 2007 nonroad + area for rest of TX new 2007 HDD outside TX Non-Road fy07d: no gascan or CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers elevated ships in BPA, projected to 2007 (about + 2 t/d NOx, via 17% projected growth)	cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas) accurate controls in Dallas + better cement kiln projections	MOBILE6.2 update to 8-County HGA- includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx.

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy07f	base5b	mostly new nonroad file for hgbpa_04km all new 2007 nonroad + area for rest of TX new 2007 HDD outside TX Non-Road fy07d: no gascan or CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers elevated ships in BPA, projected to 2007 (about + 2 t/d NOx, via 17% projected growth)	cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas) accurate controls in Dallas + better cement kiln projections	MOBILE6.2 update to 8-County HGA- includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx.

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy07g	base5b	mostly new nonroad file for hgbpa_04km all new 2007 nonroad + area for rest of TX new 2007 HDD outside TX Forest and agriculture fires treated as elevated point sources Non-Road fy07d: no gascan or CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers elevated ships in BPA, projected to 2007 (about + 2 t/d NOx, via 17% projected growth)	cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas) accurate controls in Dallas + better cement kiln projections	MOBILE6.2 update to 8-County HGA- includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx.

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy07i	base5b	Non-Road fy07d: no CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers fy07f: elevated ship emissions in both HG and BPA fy07i: statewide controls for gascan, LED, Calispark applied, DFW TERP (-t t/d addiontal HG TERP)	cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas) accurate controls in Dallas + better cement kiln projections	MOBILE6.2 update to 8-County HGA- includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx. fy07i: latest traffic modeling in HG 8 Co.

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy07j1	base5b	Forest and agriculture fires treated as elevated point sources Non-Road fy07d: no CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers fy07f: elevated ship emissions in both HG and BPA fy07i: statewide controls for gascan, LED, Calispark applied, DFW TERP (-t t/d addiontal HG TERP) fy07j1: VMEP reduced from 12.61 t/d NOx to 9.3 t/d NOx and 0.2 t/d VOC.	fy07j: BPA VOC growth fix cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas) accurate controls in Dallas + better cement kiln projections	MOBILE6.2 update to 8-County HGA-includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx. fy07i: latest traffic modeling in HG 8 Co. fy07j: only taking documented VMEP of 3.6 t/d NOx (vs. old 10.4) and 0.6 t/d VOC.

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy07j	base5b	Forest and agriculture fires treated as elevated point sources Non-Road fy07d: no CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers fy07f: elevated ship emissions in both HG and BPA fy07i: statewide controls for gascan, LED, Calispark applied, DFW TERP (-t t/d addiontal HG TERP) fy07j: VMEP reduced from 12.61 t/d NOx to 3.4 t/d NOx and 0.2 t/d VOC.	fy07j: BPA VOC growth fix cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas) accurate controls in Dallas + better cement kiln projections	MOBILE6.2 update to 8-County HGA- includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx. fy07i: latest traffic modeling in HG 8 Co. fy07j: only taking documented VMEP of 3.6 t/d NOx (vs. old 10.4) and 0.6 t/d VOC.
fy07j.nshrv	base5b	Same as fy07j	Same as fy07j, except apply 4.8 X adjustment factor to Not-So-Highly-Reactive VOCs, aka Other Reactive VOCs (ORVOCs)	Same as fy07j

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy07k	base5c	Forest and agriculture fires treated as elevated point sources Non-Road fy07d: no CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers fy07f: elevated ship emissions in both HG and BPA fy07i: statewide controls for gascan, LED, Calispark applied, DFW TERP (-t t/d addiontal HG TERP) fy07j: VMEP reduced from 12.61 t/d NOx to 3.4 t/d NOx and 0.2 t/d VOC.	fy07k: pstpnt bug fix fy07j: BPA VOC growth fix cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas) More accurate controls in Dallas & BPA + better cement kiln projections	MOBILE6.2 update to 8-County HGA- includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx. fy07i: latest traffic modeling in HG 8 Co. fy07j: only taking documented VMEP of 3.6 t/d NOx (vs. old 10.4) and 0.6 t/d VOC.

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy10a	base5c	Forest and agriculture fires treated as elevated point sources Non-Road fy07d: no CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers fy07f: elevated ship emissions in both HG and BPA fy07i: statewide controls for gascan, LED, Calispark applied, DFW TERP (-t t/d addiontal HG TERP) fy07j: VMEP reduced from 12.61 t/d NOx to 3.4 t/d NOx and 0.2 t/d VOC. fy10a: projected 2010 EI (over fy07j) with a little more TERP	fy10a: project 2010 EI (over fy07k EI) with: fy07k: pstpnt bug fix fy07j: BPA VOC growth fix cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas) More accurate controls in Dallas & BPA + better cement kiln projections	MOBILE6.2 update to 8-County HGA- includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx. fy07i: latest traffic modeling in HG 8 Co. fy07j: only taking documented VMEP of 3.6 t/d NOx (vs. old 10.4) and 0.6 t/d VOC. fy10a: projected 2010 EI (over fy07j) with a little more TERP

Future Case	Related Base Case/ Modification	Area & Non-Road Mobile Source Emissions	Point Source Emissions	Onroad Mobile Source Emissions
fy07l	base5c	Forest and agriculture fires treated as elevated point sources Non-Road fy07d: no CA residential lawn & garden rules, more GSE (like agreed orders), less CI_chippers fy07f: elevated ship emissions in both HG and BPA fy07i: statewide controls for gascan, LED, Calispark applied, DFW TERP (-t t/d addiontal HG TERP) fy07j: VMEP reduced from 12.61 t/d NOx to 3.4 t/d NOx and 0.2 t/d VOC.	fy07k: pstpnt bug fix fy07j: BPA VOC growth fix cap: hrvoc cap thresholds applied (harris=2416.165 lb/hr for capped sources; 7 cnty = 1340.620 lb/hr for capped sources; also applied 64% reduction to non-cap term ole sources in both areas) More accurate controls in Dallas & BPA + better cement kiln projections fy07l = weekend variation for TX, LA and regional NEGU	MOBILE6.2 update to 8-County HGA- includes 8-County I/M & Low Emission Diesel (LED) fuel. MOBILE6 inventory for 3-County BPA & remaining Texas counties in hgbpa_04km. Adjusted 1999 MOBILE6.2 NEI for Louisiana portion of hgbpa_04km. Temperature/humidity adjustment to diesel NOx emissions for HGA & BPA. Claim 10.39 tons of VMEP NOx & 0.48 tons of vehicle idling rule NOx. fy07i: latest traffic modeling in HG 8 Co. fy07j: only taking documented VMEP of 3.6 t/d NOx (vs. old 10.4) and 0.6 t/d VOC.

Table 7: Phase 2 MCR Modeling Log: Control Strategy Runs

Future Case	Control Strategy	Associated Base Case Modification	CAMx Versn	Episode Days Modeled	Area & Non-Road Mobile Source Controls	Point Source Controls	Onroad Mobile Source Controls	Notes
fy07c	pto2ncap_altE_ mixmet	base5a.pto2n2	4.02	8/22-9/6	Same as Dec. 2002 SIP proposal	Same as Dec. 2002 SIP proposal	Same as Dec. 2002 SIP proposal	
fy07d	pto2n2cap_altE	base5a.pto2n2	4.02	8/22-9/6	Same as Dec. 2002 SIP proposal	Same as Dec. 2002 SIP proposal	Same as Dec. 2002 SIP proposal	
fy07d	cs01	base5a.pto2n2	4.02	8/22-9/6	**CS01**: Same as Dec. 2002 SIP proposal, except - no lawn and garden (L+G) time shift, added California L+G	**CS01**: Same as Dec. 2002 SIP proposal	**CS01**: Same as Dec. 2002 SIP proposal except -Claim 14 tons of NOx for TERP & remove I/M from Chambers, Liberty, & Waller (adds about 0.83 NOx tons).	
fy07d	cs02	base5a.pto2n2	4.02	8/22-9/6	**CS02:** Same as CS01	**CS02:** Same as CS01	**CS02:** CS01 + Add 0.48 tons of NOx to model removal of vehicle idling rule.	
fy07d	cs03	base5a.pto2n2	4.02	8/22-9/6	**CS03**: CS02 + gascan rules (~ -5 t/d in * Co.)	**CS03:** Same as CS02	**CS03:** Same as CS02	
fy07d	cs03_phg075n075n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03 + 25% NOx and 25% VOC reduction in HG 8 counties	CS03	
fy07d	cs03_phg075n100n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03 + 25% NOx reduction in HG 8 counties	CS03	
fy07d	cs03_phg100n075n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03 + 25% VOC reduction in HG 8 counties	CS03	
fy07d	cs03_eguTXatt050n100n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03 + 50% NOx reduction TX attainment counties (outside HG, BPA, and DFW 15 nonattaiment counties)	CS03	

Future Case	Control Strategy	Associated Base Case Modification	CAMx Versn	Episode Days Modeled	Area & Non-Road Mobile Source Controls	Point Source Controls	Onroad Mobile Source Controls	Notes
fy07d	cs03_eguNonTX050n100n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03 + 50% NOx reduction everywhere outside TX	CS03	
fy07d	cs03_pbpa050n050n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03 + 50% NOx and 50% VOC reduction in BPA 3 counties	CS03	
fy07d	cs03_pbpa050n100n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03 + 50% NOx reduction in BPA 3 counties	CS03	
fy07d	cs03_pbpa100n050n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03 + 50% VOC reduction in BPA 3 counties	CS03	
fy07d	cs03_ahg075n075n	base5a.pto2n2	4.02	8/22-9/6	CS03+ 25% NOx and 25% VOC reduction in HG 8 counties including elevated ships	CS03	CS03	
fy07d	cs03_ahg075n100n	base5a.pto2n2	4.02	8/22-9/6	CS03+ 25% VOC reduction in HG 8 counties including elevated ships	CS03	CS03	
fy07d	cs03_ahg100n075n	base5a.pto2n2	4.02	8/22-9/6	CS03+ 25% NOx reduction in HG 8 counties including elevated ships	CS03CS03		
fy07d	cs03_mhg075n075n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03	CS03 + 25% NOx and 25% VOC reduction in HG 8 counties	
fy07d	cs03_mhg075n100n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03	CS03 + 25% NOx reduction in HG 8 counties	
fy07d	cs03_mhg100n075n	base5a.pto2n2	4.02	8/22-9/6	CS03	CS03	CS03 + 25% VOC reduction in HG 8 counties	
fy07d	cs04	base5a.pto2n2	4.02	8/22-9/6	**CS04** = CS03 plus no LED (Low Emission Diesel)	**CS04** = CS03	**CS04:** CS03 + Removal of Low Emission Diesel (LED) in 8-County HGA area only.	

Future Case	Control Strategy	Associated Base Case Modification	CAMx Versn	Episode Days Modeled	Area & Non-Road Mobile Source Controls	Point Source Controls	Onroad Mobile Source Controls	Notes
fy07d	cs03_apca1	base5a.pto2n2	4.03	8/22-9/6	CS03	CS03	CS03	APCA for all days
fy13d	cs03	base5a.pto2n2	4.03	8/22-9/6	CS03	CS03	CS03	
fy13d	cs04	base5a.pto2n2	4.03	8/22-9/6	CS04	CS04	CS04	
fy07d	cs04_hg1km	base5a.pto2n2_hg1km	4.03	8/25-9/6	CS04	CS04	CS04	with hg_01km subdomain and EI inputs
fy07d	cs04_phg100n075v_hg1km	base5a.pto2n2_hg1km	4.03	8/25-9/6	CS04	CS04 + 25% VOC reduction in HG 8-counties	CS04	with hg_01km subdomain and EI inputs
fy07d	cs03_osat1	base5a.pto2n2	4.03	8/22-9/6	CS03	CS03	CS04	OSAT for all days
fy07d	cs04_goesnoaapbl	base5a.psito2n2_goesnoaapbl	4.03	8/22-9/1	CS04	CS04	CS04	
fy07e	cs04	base5a.psito2n2	4.03	8/22-9/6	CS04	CS04	CS04	
fy07f	cs04	base5a.psito2n2	4.03	8/22-9/6	CS04	CS04	CS04	
fy07f	cs04_noaapbl	base5b.psito2n2_noaapbl	4.03	8/22-9/6	CS04	CS04	CS04	
fy07f	cs04_atmetnoaapbl	base5b.psito2n2_atmetnoaapbl	4.03	8/18-9/6	CS04	CS04	CS04	
fy07f	cs04_tamugoeslidar	base5b.psito2n2_tamugoeslidar	4.03	8/31	CS04	CS04	CS04	0831 only with tamu_goes_lidar_lumkv MET, restart from 0830 of fy07f.cs04.
fy07f	cs05	base5a.psito2n2	4.03	8/22-9/6	**CS05** = CS03	**CS05** = CS04 +25% VOC reduction in HG 8 counties	**CS05** = CS04	
fy07f	cs05_hg100n050v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 50% VOC reduction in HG 8 counties	CS05 + 50% VOC reduction in HG 8 counties	CS05 + 50% VOC reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_hg050n050v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 50% NOx and 50% VOC reduction in HG 8 counties	CS05 + 50% NOx and 50% VOC reduction in HG 8 counties	CS05 + 50% NOx and 50% VOC reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_hg050n100v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 50% NOx reduction in HG 8 counties	CS05 + 50% NOx reduction in HG 8 counties	CS05 + 50% NOx reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04

Future Case	Control Strategy	Associated Base Case Modification	CAMx Versn	Episode Days Modeled	Area & Non-Road Mobile Source Controls	Point Source Controls	Onroad Mobile Source Controls	Notes
fy07f	cs05_hg075n050v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 25% NOx and 50% VOC reduction in HG 8 counties	CS05 + 25% NOx and 50% VOC reduction in HG 8 counties	CS05 + 25% NOx and 50% VOC reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_hg075n075v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 25% NOx and 25% VOC reduction in HG 8 counties	CS05 + 25% NOx and 25% VOC reduction in HG 8 counties	CS05 + 25% NOx and 25% VOC reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_hg050n075v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 50% NOx and 25% VOC reduction in HG 8 counties	CS05 + 50% NOx and 25% VOC reduction in HG 8 counties	CS05 + 50% NOx and 25% VOC reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_hg100n025v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 75% VOC reduction in HG 8 counties	CS05 + 75% VOC reduction in HG 8 counties	CS05 + 75% VOC reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_hg025n100v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 75% NOx VOC reduction in HG 8 counties	CS05 + 75% NOx VOC reduction in HG 8 counties	CS05 + 75% NOx VOC reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs03	base5a.psito2n2	4.03	8/22-8/31	CS03	Same as Dec. 2002 SIP proposal	CS03	
fy07f	cs05_amhg050n050v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 50% NOx and 50% VOC reduction in HG 8 counties	fy07f.cs05	CS05 + 50% NOx and 50% VOC reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_amhg050n100v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 50% NOx reduction in HG 8 counties	fy07f.cs05	CS05 + 50% NOx reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_amhg100n050v	base5a.psito2n2	4.03	8/29-8/31	CS05 + 50% VOC reduction in HG 8 counties	fy07f.cs05	CS05 + 50% VOC reduction in HG 8 counties	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_phg050n050v	base5a.psito2n2	4.03	8/29-8/31	cs05	fy07f.cs05 + 50% NOx and 50% VOC reduction in HG 8 counties	CS05	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_phg050n100v	base5a.psito2n2	4.03	8/29-8/31	cs05	fy07f.cs05 + 50% NOx reduction in HG 8 counties	CS05	0829-0831, restart from 0828 of fy07f.cs04
fy07f	cs05_phg100n050v	base5a.psito2n2	4.03	8/29-8/31	cs05	cs05 + 50% VOC reduction in HG 8 counties	CS05	0829-0831, restart from 0828 of fy07f.cs04

Future Case	Control Strategy	Associated Base Case Modification	CAMx Versn	Episode Days Modeled	Area & Non-Road Mobile Source Controls	Point Source Controls	Onroad Mobile Source Controls	Notes
fy07f	cs05_825t	base5b.psito2n2_825t	4.03	8/31	cs05	cs05	CS05	Use 8/25 temperatures on 8/31 run 0831 only, restart from 0830 of fy07f.cs05
fy07f	cs05_825te	base5b.psito2n2_825te	4.03	8/31	cs05	cs05	CS05	Use 8/25 temperatures & emissions on 8/31 (except use 8/21 onroad mobile) run 0831 only, restart from 0830 of fy07f.cs05
fy07g	cs05	base5a.psito2n2	4.03	8/22-9/6	cs05	cs05	CS05	OSAT for all days
fy07i	cs03_regular	base5b.regular_atmetnoaapbl	4.03	8/22-9/6	CS03	cs03 (no extra OLE)	CS03	
fy07i	cs03_harCap	base5a.psito2n2	4.03	8/22-9/6	CS03	cs03 - extra 20 tpd HRVOC in Harris County	CS03	
fy07i	cs03_8coCap (Also called cs06)	base5a.psito2n2	4.03	8/24-9/6	CS03	cs03 - extra 20 tpd HRVOC in Harris County & 11 TPD HRVOC in remaining 7 counties	CS03	
fy07j1	cs03_harCap	base5a.psito2n2	4.03	8/22-9/6	CS03	CS03 - extra 20 tpd HRVOC in Harris County	CS03	Different VMEP assumption from fy07j
fy07j	cs03_harCap (Also called **cs06a**)	base5a.psito2n2	4.03	8/22-9/6	CS03	CS03 - extra 20 tpd HRVOC in Harris County	CS03	
fy07j	cs03_nonI (Also called **CS-2000**)	base5a.psito2n2	4.03	8/22-9/6	CS03, except: lawn & gardern comm time shift, construction time shift, no gascan, no TERP - 2000 SIP controls	Replace CS03 controls with "90%" NOx reductions (no HRVOC reductions)	CS03 except: mobile6 55mph adjustment - 2000 SIP controls	This is simulation of 2000 SIP EI controls. Significant GAP NOx reduction of low-level EI: 59.6 t/d GAP + 16 t/d unaccounted VMEP
fy07j	cs03_harCap_phg050n100v	base5a.psito2n2	4.03	8/24-9/6	CS03	CS03 - extra 20 tpd HRVOC in Harris County + 50% NOx reduction	CS03	

Future Case	Control Strategy	Associated Base Case Modification	CAMx Versn	Episode Days Modeled	Area & Non-Road Mobile Source Controls	Point Source Controls	Onroad Mobile Source Controls	Notes
fy07j	cs03_harCap_phg075n100v	base5a.psito2n2	4.03	8/24-9/6	CS03	CS03 - extra 20 tpd HRVOC in Harris County + 25% NOx reduction	CS03	
fy07j.nshrv	cs03_harCap_nshrv	base5b.psito2n2_nshrv	4.03	8/22-9/6	CS03	CS03 - extra 20 tpd HRVOC in Harris County.	CS03	Adjustment to Not-So-Highly-Reactive VOCs (NSHRV), also called Other Reactive VOC (ORVOCs)
fy07j.nshrv	cs03_harCap_nshrv2	base5b.psito2n2_nshrv	4.03	8/22-9/6	CS03	CS03 - extra 20 tpd HRVOC in Harris County. Apply same reduction to ORVOCs as applied to HRVOCs	CS03	Adjustment to Not-So-Highly-Reactive VOCs (NSHRV), also called Other Reactive VOC (ORVOCs)
fy07k	cs06b	base5a.psito2n2	4.03	8/22-9/6	**CS06b** = CS03	**CS06b** = CS03 - extra 20 tpd HRVOC in Harris County	**CS06b** = CS03	
fy07k	cs06c	base5a.psito2n2	4.03	8/22-9/6	**CS06c** = CS06b	**CS06c** = CS06b but no HRVOC reductions in 7 surrounding counties	**CS06c** = CS06b	
fy10a	cs06b	base5a.psito2n2	4.03	8/22-9/6	CS06b	CS06b	CS06b	Run against 2010. Same controls as previous CS06b run, except reductions are modified for 2010 date.
fy10a	cs06b_hg050n100v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 50% NOx reduction	CS06b + 50% NOx reduction	CS06b + 50% NOx reduction	
fy10a	cs06b_hg050n050v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 50% NOx reduction + 50% VOC reduction	CS06b + 50% NOx reduction + 50% VOC reduction	CS06b + 50% NOx reduction + 50% VOC reduction	
fy10a	cs06b_hg100n050v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 50% VOC reduction	CS06b + 50% VOC reduction	CS06b + 50% VOC reduction	
fy10a	cs06b_hg075n075v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 25% NOx reduction + 25% VOC reduction	CS06b + 25% NOx reduction + 25% VOC reduction	CS06b + 25% NOx reduction + 25% VOC reduction	
fy10a	cs06b_hg025n025v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 75% NOx reduction + 75% VOC reduction	CS06b + 75% NOx reduction + 75% VOC reduction	CS06b + 75% NOx reduction + 75% VOC reduction	

Future Case	Control Strategy	Associated Base Case Modification	CAMx Versn	Episode Days Modeled	Area & Non-Road Mobile Source Controls	Point Source Controls	Onroad Mobile Source Controls	Notes
fy10a	cs06b_hg015n015v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 85% NOx reduction + 85% VOC reduction	CS06b + 85% NOx reduction + 85% VOC reduction	CS06b + 85% NOx reduction + 85% VOC reduction	
fy10a	cs06b_hg025n050v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 75% NOx reduction + 50% VOC reduction	CS06b + 75% NOx reduction + 50% VOC reduction	CS06b + 75% NOx reduction + 50% VOC reduction	
fy10a	cs06b_hg025n075v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 75% NOx reduction + 25% VOC reduction	CS06b + 75% NOx reduction + 25% VOC reduction	CS06b + 75% NOx reduction + 25% VOC reduction	
fy10a	cs06b_hg000n000v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 100% NOx reduction + 100% VOC reduction	CS06b + 100% NOx reduction + 100% VOC reduction	CS06b + 100% NOx reduction + 100% VOC reduction	
fy10a	cs06b_hg015n075v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 85% NOx reduction + 25% VOC reduction	CS06b + 85% NOx reduction + 25% VOC reduction	CS06b + 85% NOx reduction + 25% VOC reduction	
fy10a	cs06b_hg075n015v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 25% NOx reduction + 85% VOC reduction	CS06b + 25% NOx reduction + 85% VOC reduction	CS06b + 25% NOx reduction + 85% VOC reduction	
fy10a	cs06b_apca1	base5a.psito2n2	4.03	8/22-9/6	CS06b	CS06b	CS06b	APCA runs for all days
fy10a	cs06b_hg015n100v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 85% NOx reduction	CS06b + 85% NOx reduction	CS06b + 85% NOx reduction	
fy10a	cs06b_hg025n100v	base5a.psito2n2	4.03	8/22-9/6	CS06b + 75% NOx reduction	CS06b + 75% NOx reduction	CS06b + 75% NOx reduction	
fy10a	cs06b_osat1	base5a.psito2n2	4.03	8/22-9/6	CS06b	CS06b	CS06b	OSAT runs for all days
fy07l	cs06b	base5a.psito2n2	4.03	8/22-9/6	CS06b	CS06b	CS06b	
fy07l	cs06b_nofires	base5a.psito2n2	4.03	8/22-9/6	CS06b except removed wildfire emissions	CS06b	CS06b	

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