Supplementary Information for:
Contributions to local and regional-scale formaldehyde concentrations

Lucas A. J. Bastien[1,2], Nancy J. Brown[2], and Robert A. Harley[1,2]

[1]Department of Civil and Environmental Engineering, University of California at Berkeley, Berkeley CA 94720
[2]Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory, 1 Cyclotron Road, Berkeley CA 94720

Correspondence: Robert A. Harley (harley@ce.berkeley.edu)

Notes on units of gas-phase mixing ratios: 1 ppb = 1 nmol/mol; 1 ppt = 1 pmol/mol.

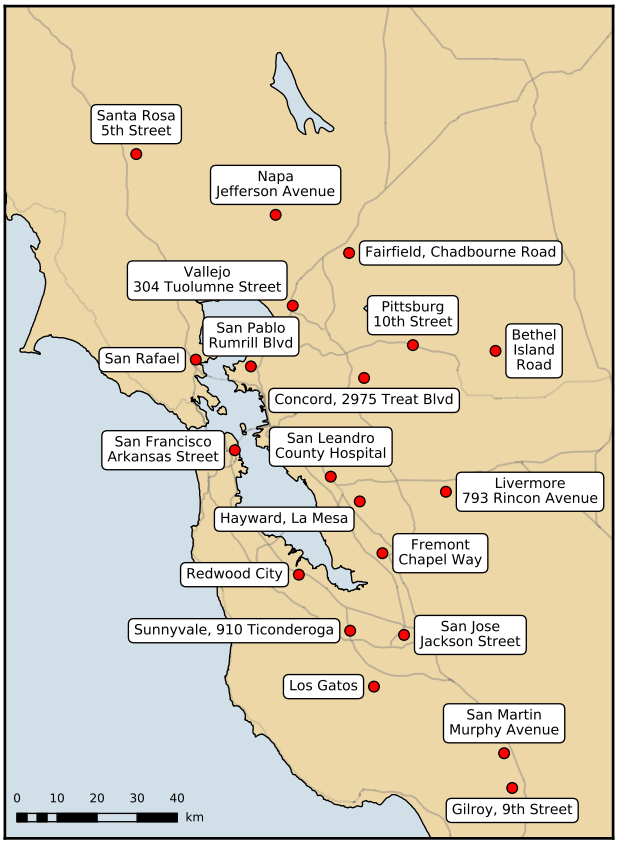

Figure S1: Measurement sites used for the evaluation of the forward model. Sites include ambient air monitoring locations from the air basin- and state-wide regulatory agencies.

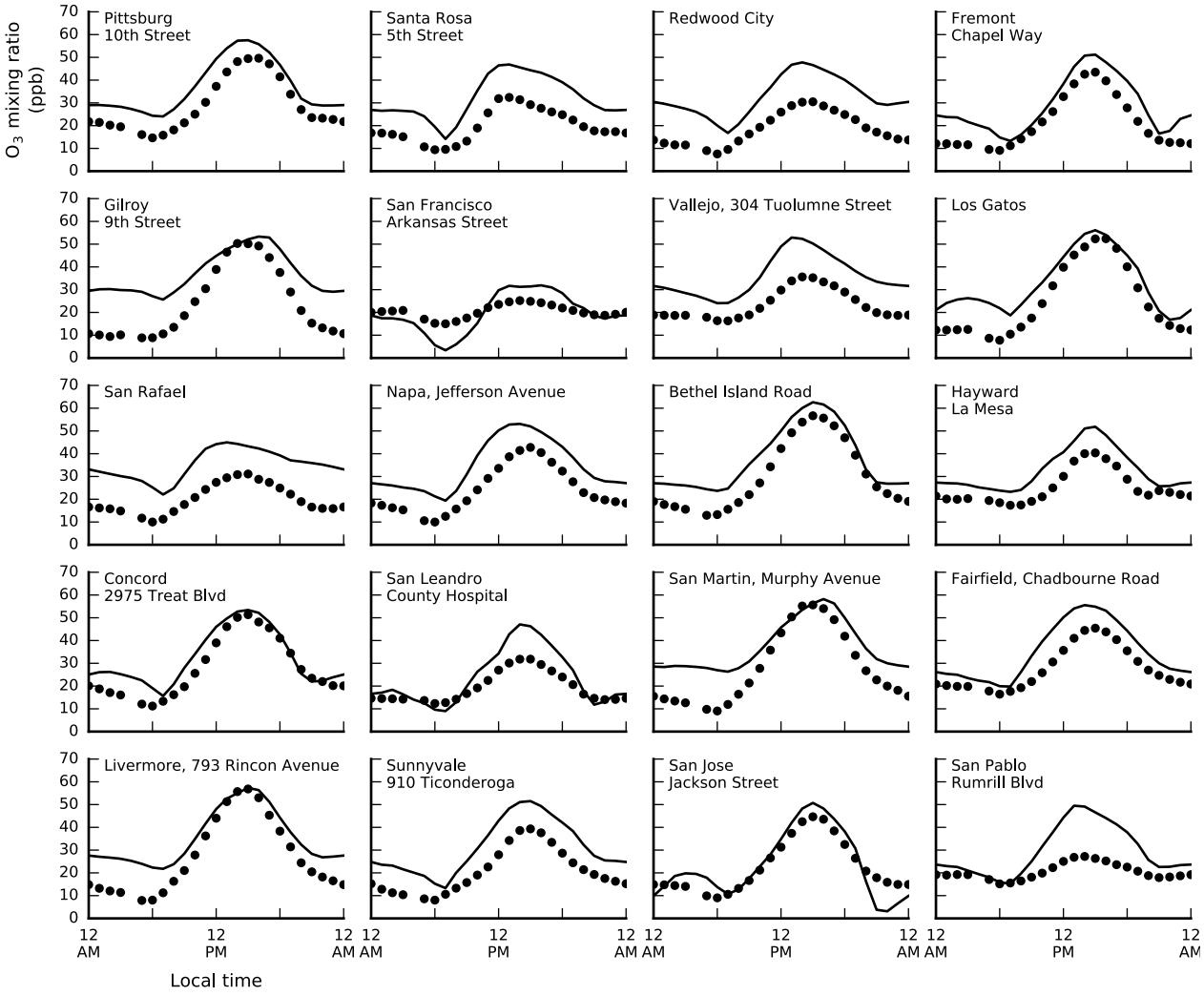

Figure S2: Observed (filled circles) and modeled (solid line) hourly ozone mixing ratios at twenty different monitoring sites in July. Observed values combine data from years 2004, 2005, and 2006, by selecting, in each of these years, the days of the year that correspond to the month-long simulation period. At each hour, the value is averaged over all the days included in the data set. The locations of the measuring sites are shown on Figure S1.

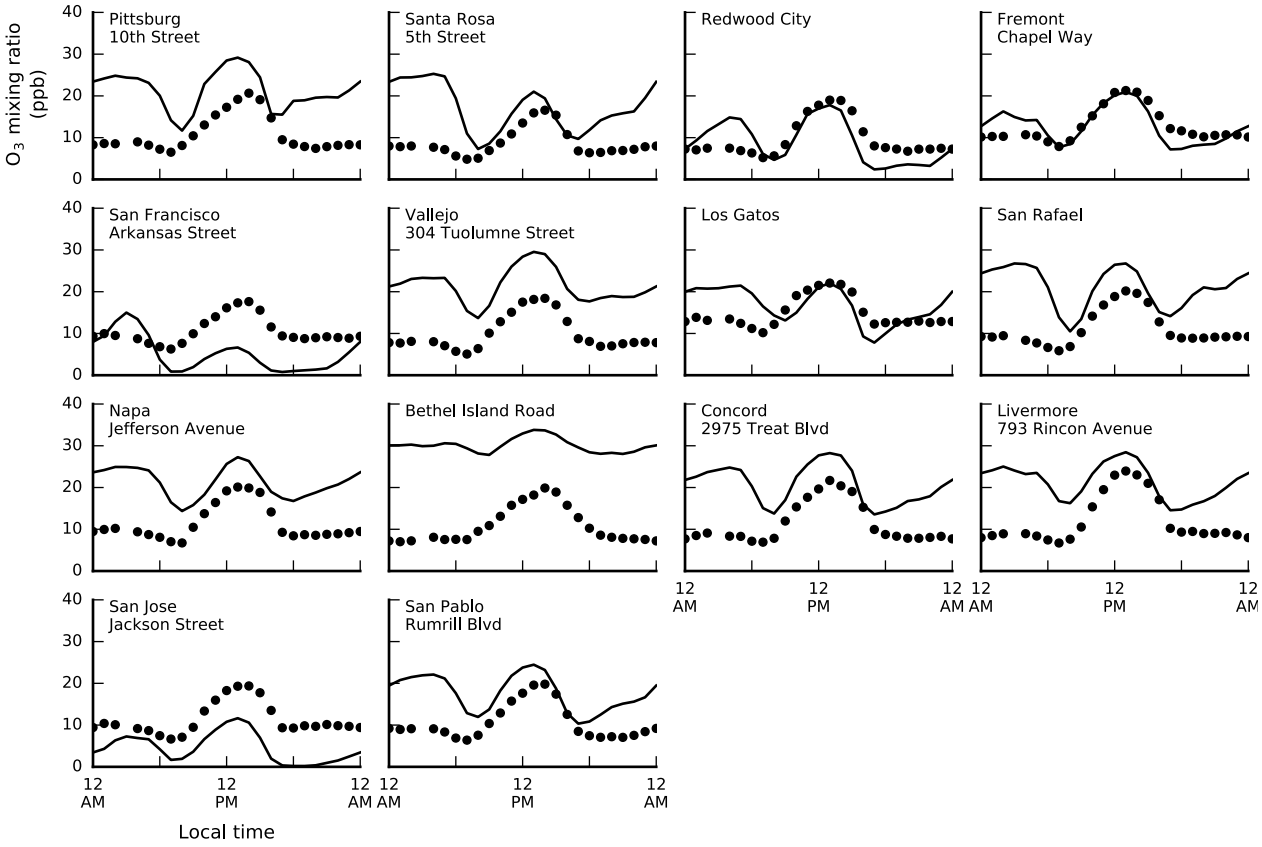

Figure S3: Observed (filled circles) and modeled (solid line) hourly ozone mixing ratios at fourteen different monitoring sites in December. Observed values combine data from years 2004, 2005, and 2006, by selecting, in each of these years, the days of the year that correspond to the month-long simulation period. At each hour, the value is averaged over all the days included in the data set. The locations of the measuring sites are shown on Figure S1.

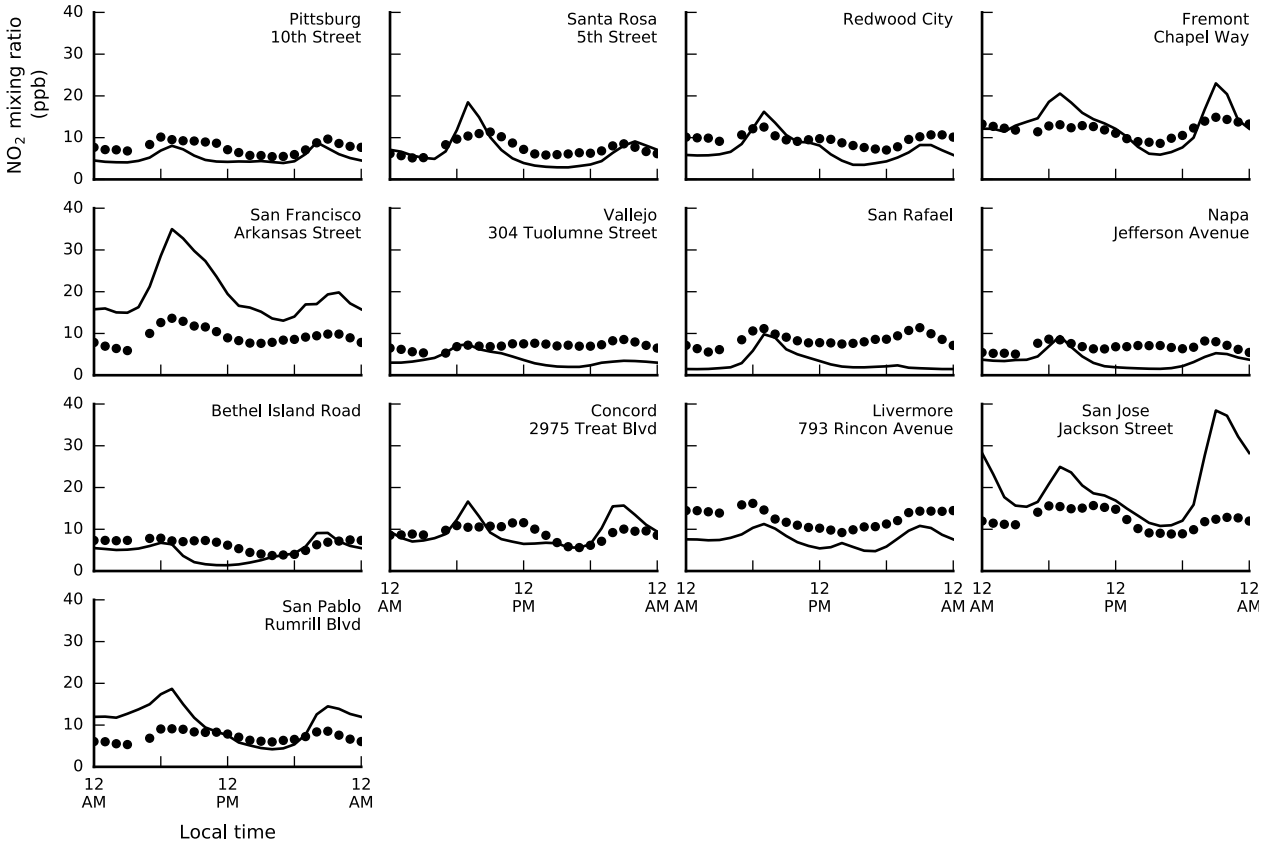

Figure S4: Observed (filled circles) and modeled (solid line) hourly NO_2 mixing ratios at thirteen different monitoring sites in July. Observed values combine data from years 2004, 2005, and 2006, by selecting, in each of these years, the days of the year that correspond to the month-long simulation period. At each hour, the value is averaged over all the days included in the data set. The locations of the measuring sites are shown on Figure S1.

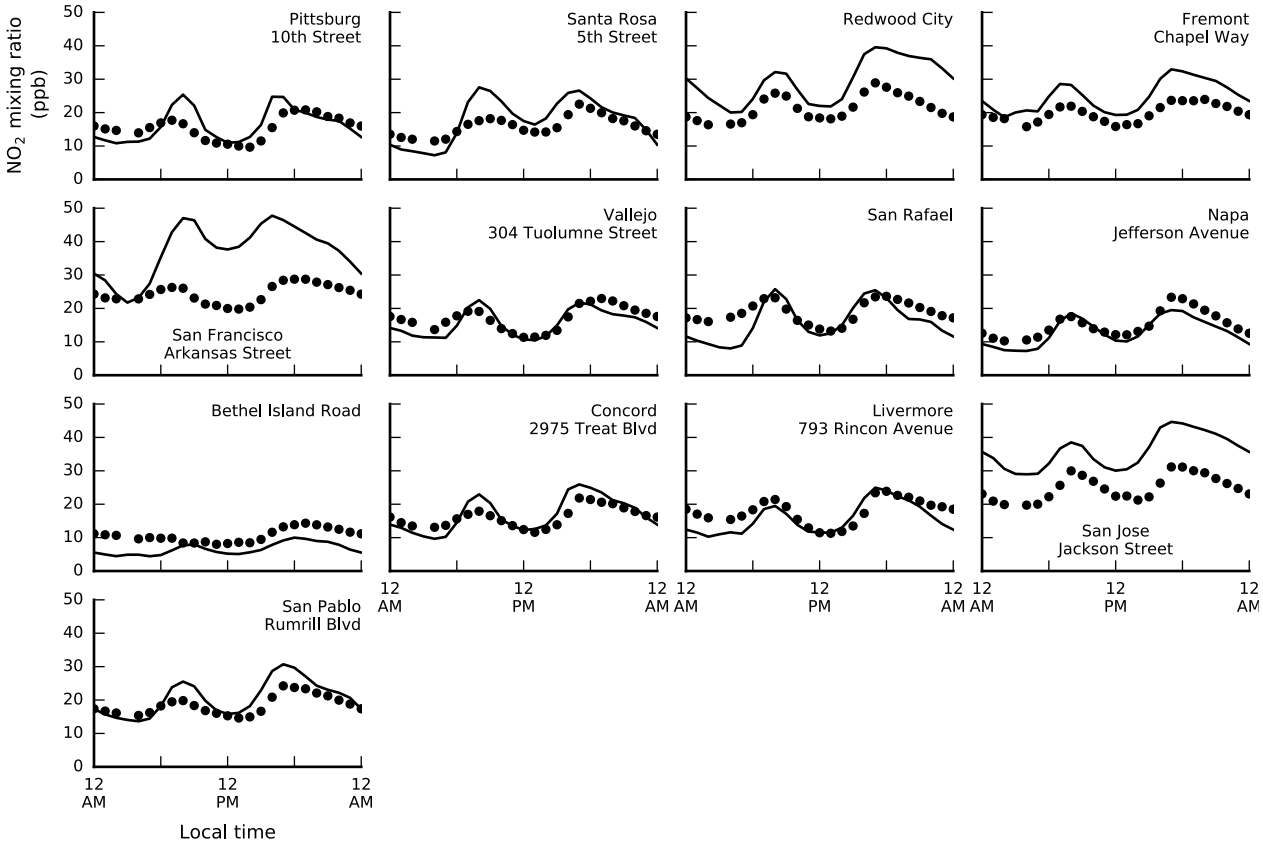

Figure S5: Observed (filled circles) and modeled (solid line) hourly NO_2 mixing ratios at thirteen different monitoring sites in December. Observed values combine data from years 2004, 2005, and 2006, by selecting, in each of these years, the days of the year that correspond to the month-long simulation period. At each hour, the value is averaged over all the days included in the data set. The locations of the measuring sites are shown on Figure S1.

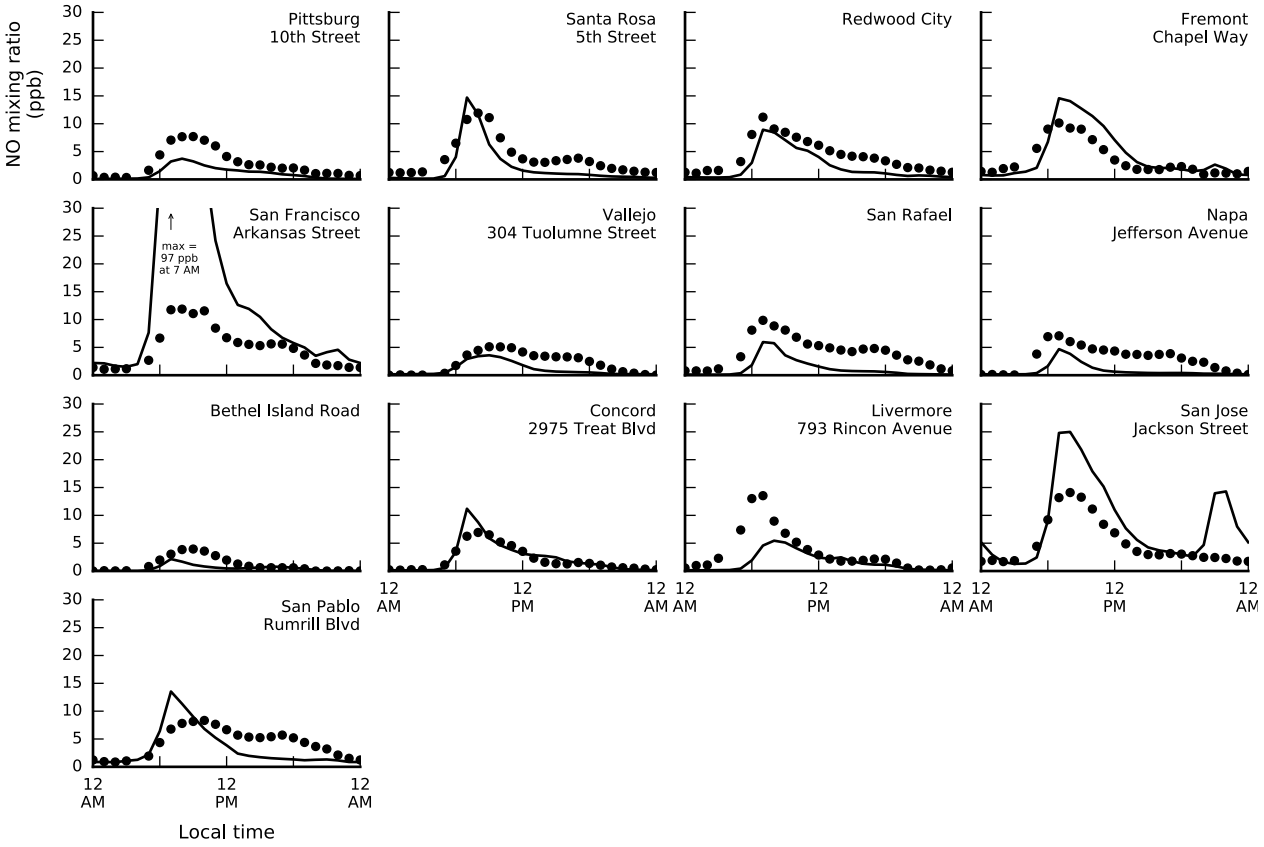

Figure S6: Observed (filled circles) and modeled (solid line) hourly NO mixing ratios at thirteen different monitoring sites in July. Observed values combine data from years 2004, 2005, and 2006, by selecting, in each of these years, the days of the year that correspond to the month-long simulation period. At each hour, the value is averaged over all the days included in the data set. The locations of the measuring sites are shown on Figure S1.

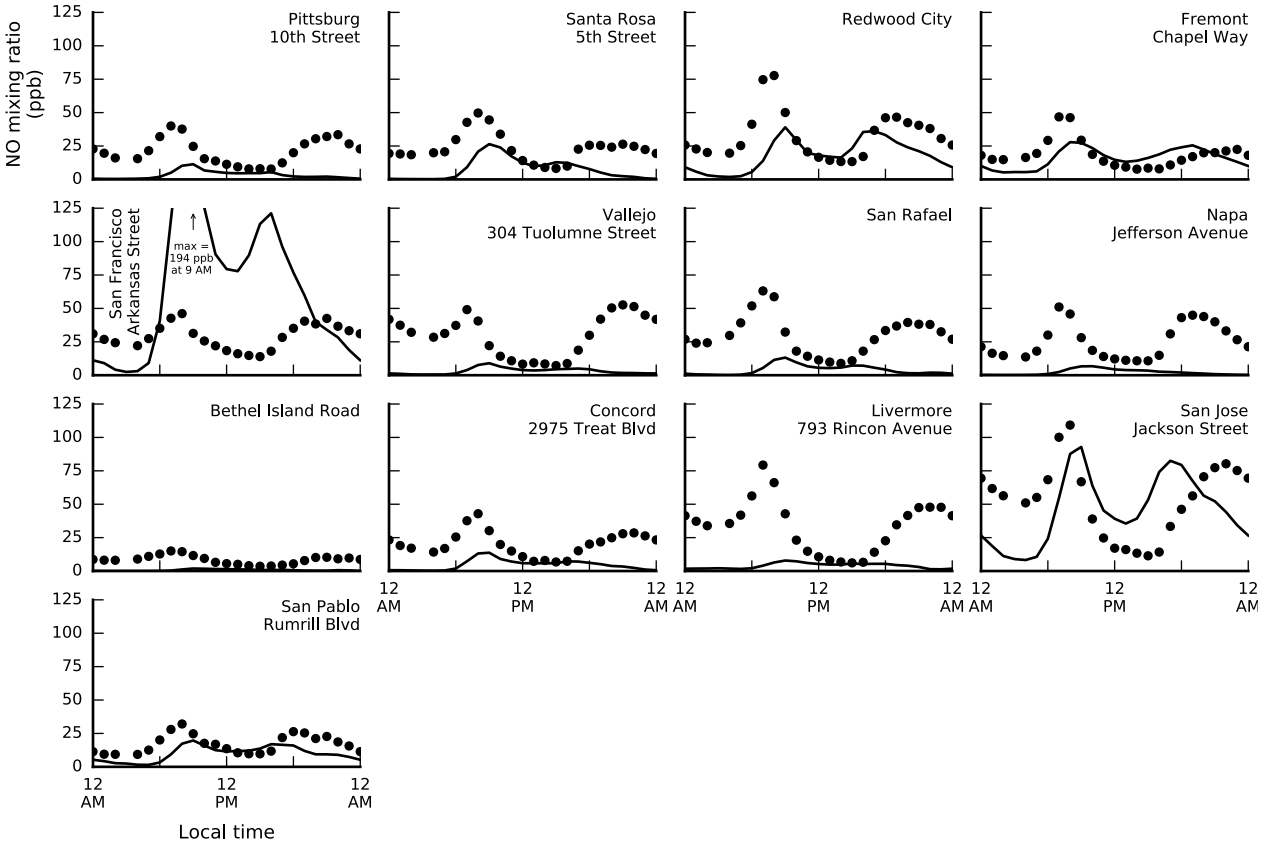

Figure S7: Observed (filled circles) and modeled (solid line) hourly NO mixing ratios at thirteen different monitoring sites in December. Observed values combine data from years 2004, 2005, and 2006, by selecting, in each of these years, the days of the year that correspond to the month-long simulation period. At each hour, the value is averaged over all the days included in the data set. The locations of the measuring sites are shown on Figure S1.

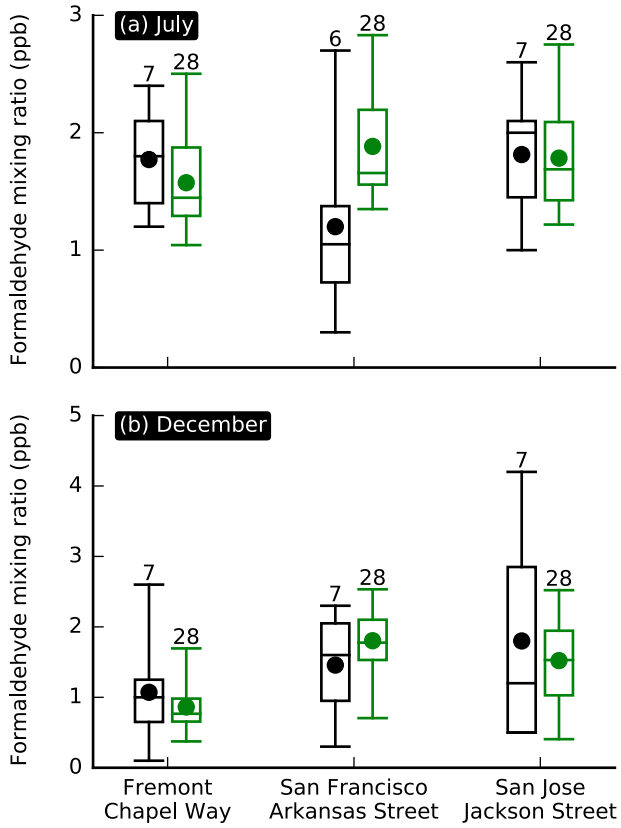

Figure S8: Observed (black, left) and modeled (green, right) 24-hour average formaldehyde mixing ratios at three different monitoring sites in (a) July and (b) December. Observed values combine data from years 2004, 2005, and 2006, by selecting, in each of these years, the days of the year that correspond to the month-long simulation period. Each box-and-whiskers plot represents, for the corresponding data set, the mean (dot), the median (central horizontal line), the first and third quartiles (bottom and top edges of the box), the minimum and maximum values (bottom and top whiskers), and the number of available data points (top number). The locations of the measuring sites are shown on Figure S1.

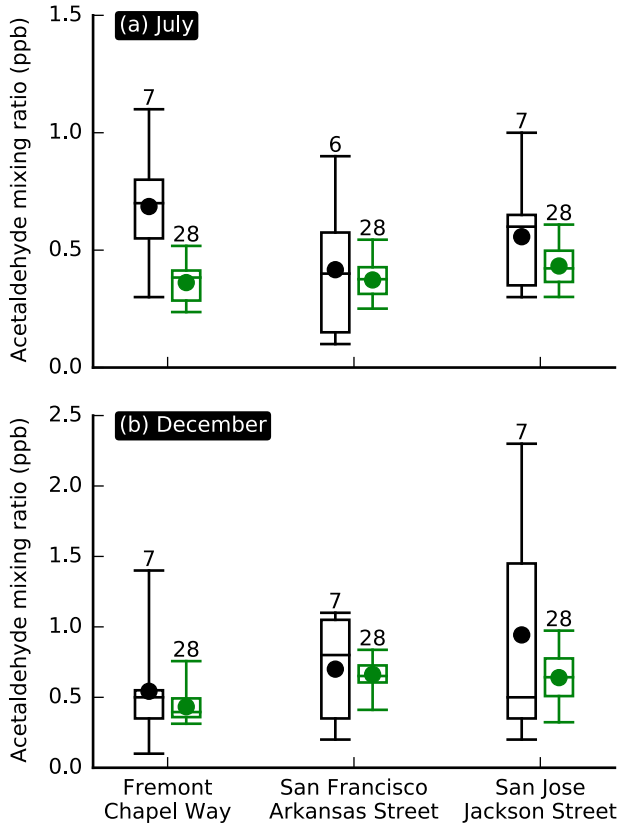

Figure S9: Observed (black, left) and modeled (green, right) 24-hour average acetaldehyde mixing ratios at three different monitoring sites in (a) July and (b) December. Observed values combine data from years 2004, 2005, and 2006, by selecting, in each of these years, the days of the year that correspond to the month-long simulation period. Each box-and-whiskers plot represents, for the corresponding data set, the mean (dot), the median (central horizontal line), the first and third quartiles (bottom and top edges of the box), the minimum and maximum values (bottom and top whiskers), and the number of available data points (top number). The locations of the measuring sites are shown on Figure S1.

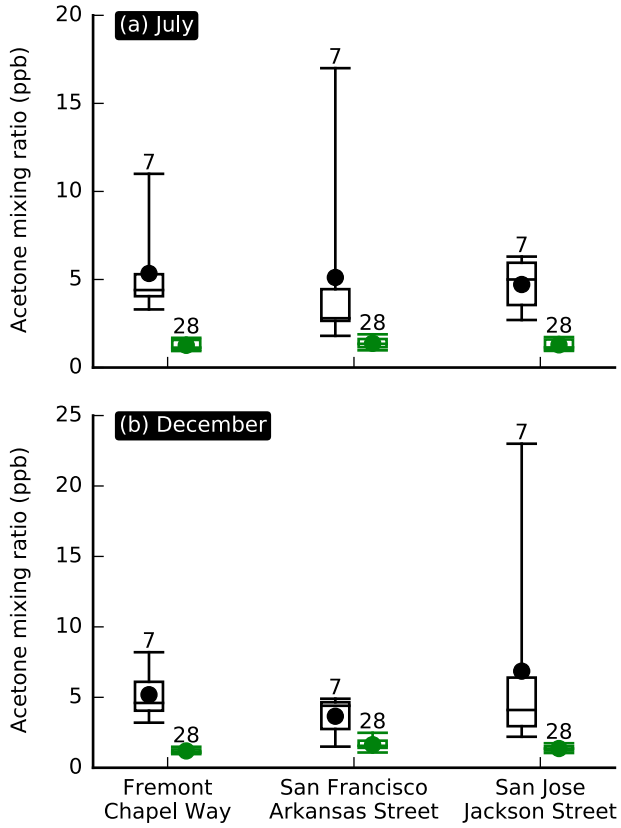

Figure S10: Observed (black, left) and modeled (green, right) 24-hour average acetone mixing ratios at three different monitoring sites in (a) July and (b) December. Observed values combine data from years 2004, 2005, and 2006, by selecting, in each of these years, the days of the year that correspond to the month-long simulation period. Each box-and-whiskers plot represents, for the corresponding data set, the mean (dot), the median (central horizontal line), the first and third quartiles (bottom and top edges of the box), the minimum and maximum values (bottom and top whiskers), and the number of available data points (top number). The locations of the measuring sites are shown on Figure S1.

Table S1: Average surface mixing ratios in the air basin-wide receptor area for each model species, separately for the July and December simulation periods. Surface mixing ratios are mixing ratios in the bottom model layer. Mixing ratios are averaged over the duration of the corresponding simulation period and over the extent of the receptor area. See Carter (2000, Appendix A, Table A-1) for a description of model species.

Model Species	July Simulation	December Simulation
NO2	4.1 ppb	10 ppb
NO	1.1 ppb	4.0 ppb
O3P	2.9×10^{-04} ppt	1.0×10^{-04} ppt
O3	36 ppb	26 ppb
NO3	1.0 ppt	2.4 ppt
N2O5	9.1 ppt	60 ppt
HNO3	650 ppt	520 ppt
O1D2	7.0×10^{-10} ppt	4.1×10^{-11} ppt
HO	0.13 ppt	0.010 ppt
HONO	13 ppt	5.8 ppt
HO2	6.3 ppt	0.79 ppt
CO	140 ppb	240 ppb
HNO4	6.0 ppt	11 ppt
HO2H	1.9 ppb	230 ppt
SO2	450 ppt	430 ppt
SULF	360 ppt	290 ppt
C_O2	2.0 ppt	0.41 ppt
HCHO	1.5 ppb	580 ppt
COOH	56 ppt	3.9 ppt
MEOH	9.0 ppb	500 ppt
RO2_R	4.7 ppt	2.9 ppt
ROOH	110 ppt	37 ppt
R2O2	5.9 ppt	6.3 ppt
RO2_N	1.8 ppt	1.9 ppt
RNO3	93 ppt	89 ppt
MEK	270 ppt	480 ppt
PROD2	190 ppt	440 ppt
CCO_O2	0.34 ppt	0.016 ppt
PAN	270 ppt	180 ppt
CCO_OOH	26 ppt	0.68 ppt
CCO_OH	27 ppt	10 ppt
RCO_O2	0.094 ppt	2.6×10^{-03} ppt
PAN2	58 ppt	20 ppt
CCHO	270 ppt	350 ppt
RCO_OOH	11 ppt	0.15 ppt
RCO_OH	22 ppt	22 ppt

Model Species	July Simulation	December Simulation
BZCO_O2	9.9×10^{-04} ppt	4.3×10^{-05} ppt
PBZN	1.1 ppt	0.57 ppt
BZ_O	6.2×10^{-04} ppt	4.2×10^{-04} ppt
MA_RCO3	0.033 ppt	5.4×10^{-04} ppt
MA_PAN	25 ppt	5.7 ppt
TBU_O	1.2×10^{-06} ppt	5.6×10^{-07} ppt
ACET	1.2 ppb	1.1 ppb
NPHE	6.9 ppt	7.7 ppt
PHEN	0.84 ppt	26 ppt
BZNO2_O	3.6×10^{-18} ppt	3.0×10^{-17} ppt
HOCOO	1.6×10^{-04} ppt	1.6×10^{-05} ppt
HCOOH	15 ppt	13 ppt
RCHO	190 ppt	180 ppt
GLY	13 ppt	16 ppt
MGLY	40 ppt	28 ppt
BACL	2.6 ppt	3.9 ppt
CRES	5.7 ppt	6.4 ppt
BALD	5.3 ppt	9.4 ppt
METHACRO	160 ppt	36 ppt
MVK	230 ppt	44 ppt
ISOPROD	52 ppt	27 ppt
DCB1	16 ppt	34 ppt
DCB2	1.2 ppt	1.9 ppt
DCB3	0.49 ppt	1.0 ppt
ETHENE	260 ppt	770 ppt
ISOPRENE	200 ppt	160 ppt
TERP	68 ppt	81 ppt
ALK1	1.2 ppb	2.4 ppb
ALK2	380 ppt	930 ppt
ALK3	710 ppt	1.9 ppb
ALK4	630 ppt	1.8 ppb
ALK5	800 ppt	2.0 ppb
ARO1	280 ppt	760 ppt
ARO2	200 ppt	860 ppt
OLE1	89 ppt	270 ppt
OLE2	75 ppt	220 ppt

Table S2: Average surface mixing ratios in the Pittsburg/Antioch receptor area for each model species, separately for the July and December simulation periods. Surface mixing ratios are mixing ratios in the bottom model layer. Mixing ratios are averaged over the duration of the corresponding simulation period and over the extent of the receptor area. See Carter (2000, Appendix A, Table A-1) for a description of model species.

Model Species	July Simulation	December Simulation
NO2	5.3 ppb	11 ppb
NO	920 ppt	1.9 ppb
O3P	3.3×10^{-04} ppt	8.6×10^{-05} ppt
O3	37 ppb	26 ppb
NO3	1.1 ppt	1.2 ppt
N2O5	9.0 ppt	51 ppt
HNO3	810 ppt	590 ppt
O1D2	7.6×10^{-10} ppt	3.8×10^{-11} ppt
HO	0.17 ppt	8.8×10^{-03} ppt
HONO	17 ppt	4.1 ppt
HO2	5.2 ppt	0.40 ppt
CO	150 ppb	250 ppb
HNO4	6.8 ppt	9.4 ppt
HO2H	1.8 ppb	220 ppt
SO2	460 ppt	430 ppt
SULF	360 ppt	290 ppt
C_O2	1.3 ppt	0.091 ppt
HCHO	1.7 ppb	540 ppt
COOH	65 ppt	3.6 ppt
MEOH	8.8 ppb	490 ppt
RO2_R	1.8 ppt	0.21 ppt
ROOH	110 ppt	27 ppt
R2O2	1.2 ppt	0.18 ppt
RO2_N	0.39 ppt	0.046 ppt
RNO3	120 ppt	72 ppt
MEK	300 ppt	490 ppt
PROD2	190 ppt	440 ppt
CCO_O2	0.23 ppt	7.7×10^{-03} ppt
PAN	270 ppt	190 ppt
CCO_OOH	35 ppt	0.59 ppt
CCO_OH	35 ppt	9.5 ppt
RCO_O2	0.087 ppt	1.1×10^{-03} ppt
PAN2	83 ppt	20 ppt
CCHO	330 ppt	340 ppt
RCO_OOH	15 ppt	0.13 ppt
RCO_OH	29 ppt	19 ppt

Model Species	July Simulation	December Simulation
BZCO_O2	1.1×10^{-03} ppt	2.8×10^{-05} ppt
PBZN	1.6 ppt	0.67 ppt
BZ_O	5.5×10^{-04} ppt	6.6×10^{-04} ppt
MA_RCO3	0.012 ppt	1.6×10^{-04} ppt
MA_PAN	26 ppt	5.2 ppt
TBU_O	1.4×10^{-06} ppt	6.5×10^{-07} ppt
ACET	1.2 ppb	1.1 ppb
NPHE	11 ppt	13 ppt
PHEN	1.4 ppt	67 ppt
BZNO2_O	3.8×10^{-18} ppt	3.9×10^{-17} ppt
HOCOO	1.1×10^{-04} ppt	1.0×10^{-05} ppt
HCOOH	19 ppt	11 ppt
RCHO	230 ppt	190 ppt
GLY	14 ppt	15 ppt
MGLY	44 ppt	28 ppt
BACL	3.1 ppt	4.0 ppt
CRES	5.9 ppt	6.4 ppt
BALD	6.7 ppt	9.6 ppt
METHACRO	130 ppt	31 ppt
MVK	190 ppt	37 ppt
ISOPROD	61 ppt	18 ppt
DCB1	18 ppt	36 ppt
DCB2	1.4 ppt	2.1 ppt
DCB3	0.65 ppt	1.2 ppt
ETHENE	290 ppt	690 ppt
ISOPRENE	110 ppt	36 ppt
TERP	76 ppt	20 ppt
ALK1	1.3 ppb	2.4 ppb
ALK2	620 ppt	1.2 ppb
ALK3	890 ppt	1.9 ppb
ALK4	900 ppt	2.1 ppb
ALK5	1.0 ppb	2.1 ppb
ARO1	330 ppt	740 ppt
ARO2	230 ppt	1.2 ppb
OLE1	100 ppt	240 ppt
OLE2	80 ppt	190 ppt

Table S3: Average surface mixing ratios in the San Jose receptor area for each model species, separately for the July and December simulation periods. Surface mixing ratios are mixing ratios in the bottom model layer. Mixing ratios are averaged over the duration of the corresponding simulation period and over the extent of the receptor area. See Carter (2000, Appendix A, Table A-1) for a description of model species.

Model Species	July Simulation	December Simulation
NO2	14 ppb	32 ppb
NO	4.6 ppb	31 ppb
O3P	6.4×10^{-04} ppt	2.7×10^{-04} ppt
O3	29 ppb	7.6 ppb
NO3	0.48 ppt	0.16 ppt
N2O5	12 ppt	13 ppt
HNO3	1.0 ppb	700 ppt
O1D2	6.2×10^{-10} ppt	1.8×10^{-11} ppt
HO	0.082 ppt	3.4×10^{-03} ppt
HONO	33 ppt	24 ppt
HO2	1.0 ppt	0.067 ppt
CO	250 ppb	610 ppb
HNO4	6.1 ppt	3.2 ppt
HO2H	1.8 ppb	210 ppt
SO2	550 ppt	770 ppt
SULF	370 ppt	270 ppt
C_O2	0.22 ppt	0.014 ppt
HCHO	1.8 ppb	1.3 ppb
COOH	50 ppt	4.9 ppt
MEOH	8.7 ppb	730 ppt
RO2_R	0.43 ppt	0.042 ppt
ROOH	96 ppt	48 ppt
R2O2	0.26 ppt	0.050 ppt
RO2_N	0.080 ppt	0.015 ppt
RNO3	150 ppt	150 ppt
MEK	320 ppt	540 ppt
PROD2	220 ppt	450 ppt
CCO_O2	0.044 ppt	1.6×10^{-03} ppt
PAN	280 ppt	160 ppt
CCO_OOH	26 ppt	0.87 ppt
CCO_OH	31 ppt	19 ppt
RCO_O2	0.014 ppt	2.2×10^{-04} ppt
PAN2	72 ppt	24 ppt
CCHO	420 ppt	580 ppt
RCO_OOH	11 ppt	0.20 ppt
RCO_OH	33 ppt	41 ppt

Model Species	July Simulation	December Simulation
BZCO_O2	2.2×10^{-04} ppt	4.3×10^{-06} ppt
PBZN	1.5 ppt	0.73 ppt
BZ_O	1.7×10^{-04} ppt	3.7×10^{-05} ppt
MA_RCO3	2.6×10^{-03} ppt	4.7×10^{-05} ppt
MA_PAN	26 ppt	6.4 ppt
TBU_O	1.7×10^{-06} ppt	5.5×10^{-07} ppt
ACET	1.3 ppb	1.3 ppb
NPHE	11 ppt	11 ppt
PHEN	1.7 ppt	86 ppt
BZNO2_O	1.3×10^{-18} ppt	1.2×10^{-18} ppt
HOCOO	2.9×10^{-05} ppt	1.8×10^{-06} ppt
HCOOH	22 ppt	22 ppt
RCHO	290 ppt	390 ppt
GLY	22 ppt	32 ppt
MGLY	54 ppt	45 ppt
BACL	4.1 ppt	5.6 ppt
CRES	11 ppt	15 ppt
BALD	10 ppt	17 ppt
METHACRO	140 ppt	39 ppt
MVK	210 ppt	48 ppt
ISOPROD	62 ppt	40 ppt
DCB1	30 ppt	56 ppt
DCB2	2.2 ppt	2.9 ppt
DCB3	0.99 ppt	1.7 ppt
ETHENE	810 ppt	2.7 ppb
ISOPRENE	190 ppt	390 ppt
TERP	79 ppt	150 ppt
ALK1	1.2 ppb	3.2 ppb
ALK2	700 ppt	2.1 ppb
ALK3	1.9 ppb	6.2 ppb
ALK4	1.7 ppb	5.7 ppb
ALK5	2.2 ppb	6.5 ppb
ARO1	840 ppt	2.6 ppb
ARO2	580 ppt	2.6 ppb
OLE1	360 ppt	1.2 ppb
OLE2	300 ppt	1.1 ppb

Table S4: Average surface mixing ratios in the East Bay receptor area for each model species, separately for the July and December simulation periods. Surface mixing ratios are mixing ratios in the bottom model layer. Mixing ratios are averaged over the duration of the corresponding simulation period and over the extent of the receptor area. See Carter (2000, Appendix A, Table A-1) for a description of model species.

Model Species	July Simulation	December Simulation
NO2	15 ppb	27 ppb
NO	7.2 ppb	23 ppb
O3P	7.2×10^{-04} ppt	2.1×10^{-04} ppt
O3	25 ppb	12 ppb
NO3	0.48 ppt	0.27 ppt
N2O5	10 ppt	22 ppt
HNO3	790 ppt	550 ppt
O1D2	5.0×10^{-10} ppt	2.1×10^{-11} ppt
HO	0.061 ppt	3.9×10^{-03} ppt
HONO	37 ppt	14 ppt
HO2	0.60 ppt	0.100 ppt
CO	220 ppb	420 ppb
HNO4	5.0 ppt	4.9 ppt
HO2H	1.7 ppb	220 ppt
SO2	1.1 ppb	1.2 ppb
SULF	360 ppt	280 ppt
C_O2	0.13 ppt	0.020 ppt
HCHO	1.6 ppb	1.0 ppb
COOH	37 ppt	3.9 ppt
MEOH	8.4 ppb	580 ppt
RO2_R	0.32 ppt	0.069 ppt
ROOH	84 ppt	33 ppt
R2O2	0.28 ppt	0.097 ppt
RO2_N	0.084 ppt	0.028 ppt
RNO3	110 ppt	100 ppt
MEK	280 ppt	500 ppt
PROD2	210 ppt	440 ppt
CCO_O2	0.022 ppt	1.8×10^{-03} ppt
PAN	260 ppt	170 ppt
CCO_OOH	18 ppt	0.67 ppt
CCO_OH	23 ppt	13 ppt
RCO_O2	5.7×10^{-03} ppt	2.4×10^{-04} ppt
PAN2	50 ppt	20 ppt
CCHO	350 ppt	470 ppt
RCO_OOH	7.1 ppt	0.14 ppt
RCO_OH	24 ppt	28 ppt

Model Species	July Simulation	December Simulation
BZCO_O2	8.8×10^{-05} ppt	3.8×10^{-06} ppt
PBZN	1.0 ppt	0.62 ppt
BZ_O	1.1×10^{-04} ppt	5.1×10^{-05} ppt
MA_RCO3	1.3×10^{-03} ppt	4.7×10^{-05} ppt
MA_PAN	22 ppt	5.5 ppt
TBU_O	1.5×10^{-06} ppt	4.6×10^{-07} ppt
ACET	1.2 ppb	1.1 ppb
NPHE	7.2 ppt	10 ppt
PHEN	1.6 ppt	61 ppt
BZNO2_O	1.0×10^{-18} ppt	2.7×10^{-18} ppt
HOCOO	2.0×10^{-05} ppt	2.9×10^{-06} ppt
HCOOH	16 ppt	15 ppt
RCHO	240 ppt	270 ppt
GLY	18 ppt	23 ppt
MGLY	47 ppt	34 ppt
BACL	3.6 ppt	4.5 ppt
CRES	11 ppt	9.9 ppt
BALD	9.0 ppt	12 ppt
METHACRO	150 ppt	35 ppt
MVK	230 ppt	42 ppt
ISOPROD	48 ppt	25 ppt
DCB1	28 ppt	40 ppt
DCB2	1.9 ppt	2.3 ppt
DCB3	0.80 ppt	1.3 ppt
ETHENE	870 ppt	2.1 ppb
ISOPRENE	130 ppt	240 ppt
TERP	61 ppt	120 ppt
ALK1	1.2 ppb	2.6 ppb
ALK2	590 ppt	1.5 ppb
ALK3	1.7 ppb	3.9 ppb
ALK4	1.5 ppb	3.6 ppb
ALK5	2.0 ppb	4.2 ppb
ARO1	730 ppt	1.6 ppb
ARO2	530 ppt	1.7 ppb
OLE1	290 ppt	710 ppt
OLE2	260 ppt	660 ppt

Table S5: Overall semi-normalized sensitivities (ppt) of formaldehyde model responses to emissions, by model species. Sensitivities are summed over the entire modeling domain and duration of the simulation period. Species are omitted if the corresponding sensitivities to emissions are negligible for all model responses. For each sensitivity $S^{\times}$, the number in parentheses is $S^{\times}/|S^{\times}_{\text{tot}}|$ where $S^{\times}_{\text{tot}}$ is the overall semi-normalized emissions sensitivity of the corresponding response, summed across all model species. See Carter (2000, Appendix A, Table A-1) for a description of model species.

Model species	Sensitivity of the Air Basin response				Sensitivity of the Pittsburg/Antioch response				Sensitivity of the San Jose response				Sensitivity of the East Bay response			
	July		December		July		December		July		December		July		December	
NO2	-3.2	(-0.99%)	-2.4	(-0.40%)	-1.9	(-0.57%)	-0.98	(-0.34%)	-6.0	(-1.3%)	-4.6	(-0.45%)	-4.9	(-1.2%)	-1.9	(-0.32%)
NO	-49	(-15%)	-76	(-13%)	-25	(-7.5%)	-28	(-9.7%)	-110	(-23%)	-150	(-14%)	-81	(-21%)	-59	(-9.9%)
CO	-0.96	(-0.30%)	0.0	(0.0%)	-1.8	(-0.54%)	0.0	(0.0%)	-0.98	(-0.21%)	0.0	(0.0%)	-0.87	(-0.22%)	0.0	(0.0%)
HCHO	170	(52%)	540	(88%)	86	(26%)	250	(85%)	270	(56%)	920	(90%)	280	(72%)	540	(90%)
MEOH	0.0	(0.0%)	0.0	(0.0%)	0.40	(0.12%)	0.0	(0.0%)	0.49	(0.10%)	0.0	(0.0%)	0.0	(0.0%)	0.0	(0.0%)
CCHO	1.7	(0.53%)	0.92	(0.15%)	1.9	(0.58%)	0.0	(0.0%)	2.8	(0.58%)	2.2	(0.21%)	2.4	(0.62%)	0.65	(0.11%)
ACET	0.0	(0.0%)	0.0	(0.0%)	0.33	(0.10%)	0.0	(0.0%)	0.51	(0.11%)	0.0	(0.0%)	0.0	(0.0%)	0.0	(0.0%)
RCHO	0.0	(0.0%)	0.0	(0.0%)	0.36	(0.11%)	0.0	(0.0%)	0.49	(0.10%)	0.0	(0.0%)	0.0	(0.0%)	0.0	(0.0%)
ETHENE	35	(11%)	20	(3.3%)	42	(13%)	10	(3.6%)	56	(12%)	36	(3.5%)	47	(12%)	16	(2.7%)
ISOPRENE	74	(23%)	30	(4.9%)	120	(35%)	10	(3.6%)	100	(22%)	46	(4.4%)	44	(11%)	23	(3.8%)
TERP	14	(4.4%)	12	(1.9%)	16	(4.9%)	3.7	(1.3%)	21	(4.4%)	19	(1.8%)	12	(3.0%)	9.5	(1.6%)
ALK1	0.50	(0.16%)	0.0	(0.0%)	0.99	(0.30%)	0.0	(0.0%)	0.98	(0.21%)	0.0	(0.0%)	0.0	(0.0%)	0.0	(0.0%)
ALK2	0.60	(0.19%)	0.0	(0.0%)	0.78	(0.24%)	0.0	(0.0%)	1.5	(0.31%)	0.0	(0.0%)	0.0	(0.0%)	0.0	(0.0%)
ALK3	5.3	(1.7%)	1.2	(0.20%)	8.3	(2.6%)	0.59	(0.20%)	9.5	(2.0%)	2.3	(0.22%)	4.6	(1.2%)	0.96	(0.16%)
ALK4	3.9	(1.2%)	0.0	(0.0%)	7.4	(2.3%)	0.0	(0.0%)	7.8	(1.6%)	0.0	(0.0%)	2.5	(0.64%)	0.0	(0.0%)
ALK5	3.7	(1.2%)	-1.6	(-0.27%)	8.3	(2.6%)	-0.67	(-0.23%)	9.1	(1.9%)	-3.1	(-0.30%)	0.0	(0.0%)	-1.2	(-0.21%)
ARO1	3.0	(0.93%)	1.0	(0.17%)	4.0	(1.2%)	0.0	(0.0%)	6.0	(1.2%)	2.3	(0.23%)	2.6	(0.67%)	0.65	(0.11%)
ARO2	9.3	(2.9%)	8.5	(1.4%)	11	(3.4%)	3.1	(1.1%)	16	(3.4%)	17	(1.7%)	11	(2.8%)	6.1	(1.0%)
OLE1	19	(6.0%)	17	(2.7%)	20	(6.0%)	8.7	(3.0%)	32	(6.7%)	30	(2.9%)	24	(6.1%)	13	(2.1%)
OLE2	34	(11%)	62	(10%)	32	(9.9%)	34	(12%)	59	(12%)	110	(10%)	43	(11%)	49	(8.3%)
Total	320		610		330		290		480		1000		390		600	
Categories:																
NO_X	-52	(-16%)	-79	(-13%)	-26	(-8.1%)	-29	(-10%)	-120	(-24%)	-150	(-15%)	-86	(-22%)	-61	(-10%)
VOCs (all)	370	(120%)	690	(110%)	350	(110%)	320	(110%)	590	(120%)	1200	(110%)	480	(120%)	660	(110%)
VOCs (antropogenic)	280	(88%)	640	(110%)	220	(67%)	300	(100%)	470	(98%)	1100	(110%)	420	(110%)	620	(100%)
VOCs (biogenic)	91	(28%)	43	(7.1%)	130	(41%)	16	(5.5%)	130	(27%)	67	(6.5%)	58	(15%)	34	(5.7%)
VOCs (on-road)	110	(35%)	220	(35%)	92	(28%)	85	(30%)	190	(40%)	400	(39%)	160	(40%)	230	(39%)

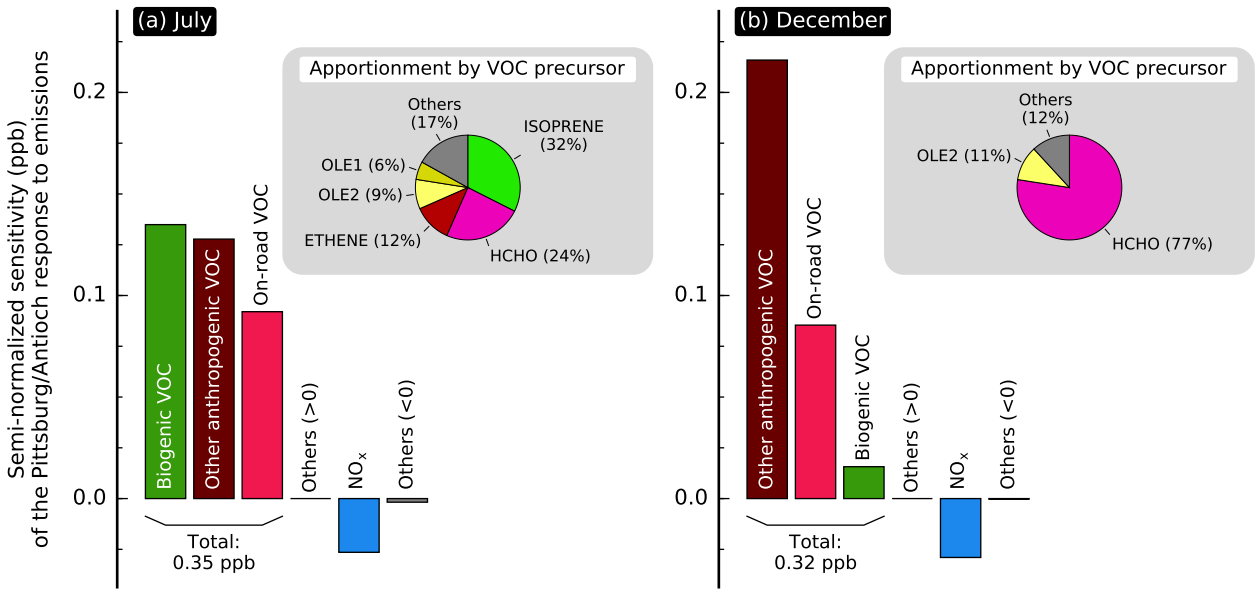

Figure S11: Semi-normalized sensitivity of the Pittsburg/Antioch population-weighted formaldehyde mixing ratio to emissions, in (a) July and (b) December. An apportionment by precursor species of the sensitivity to overall VOC emissions is shown in the pie chart insets.

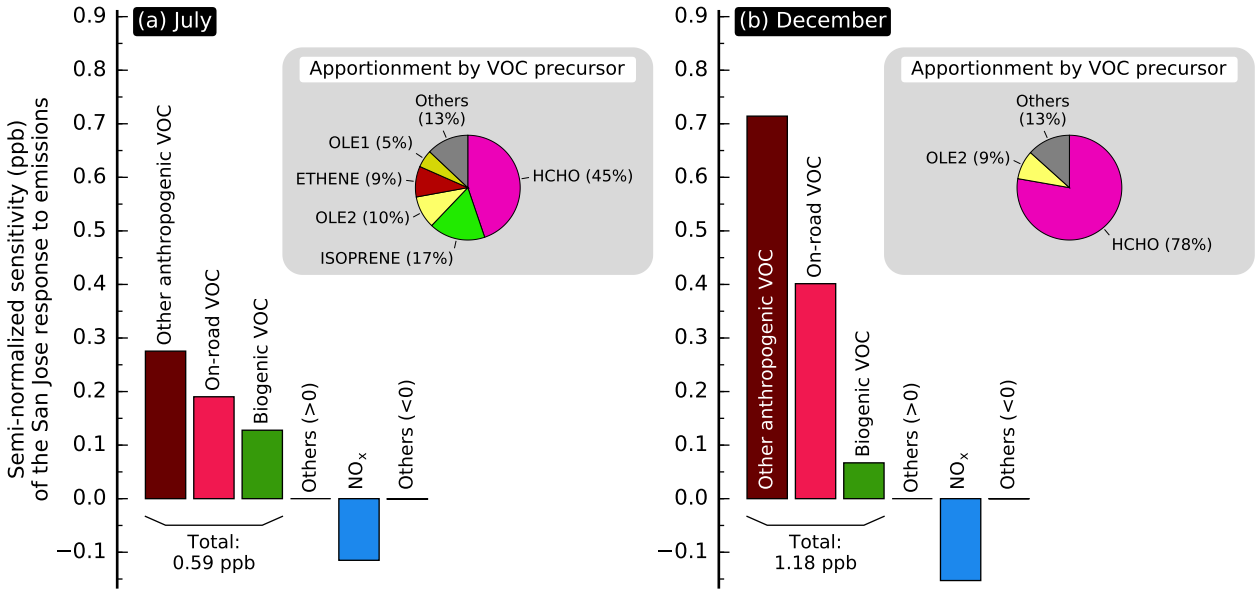

Figure S12: Semi-normalized sensitivity of the San Jose population-weighted formaldehyde mixing ratio to emissions, in (a) July and (b) December. An apportionment by precursor species of the sensitivity to overall VOC emissions is shown in the pie chart insets.

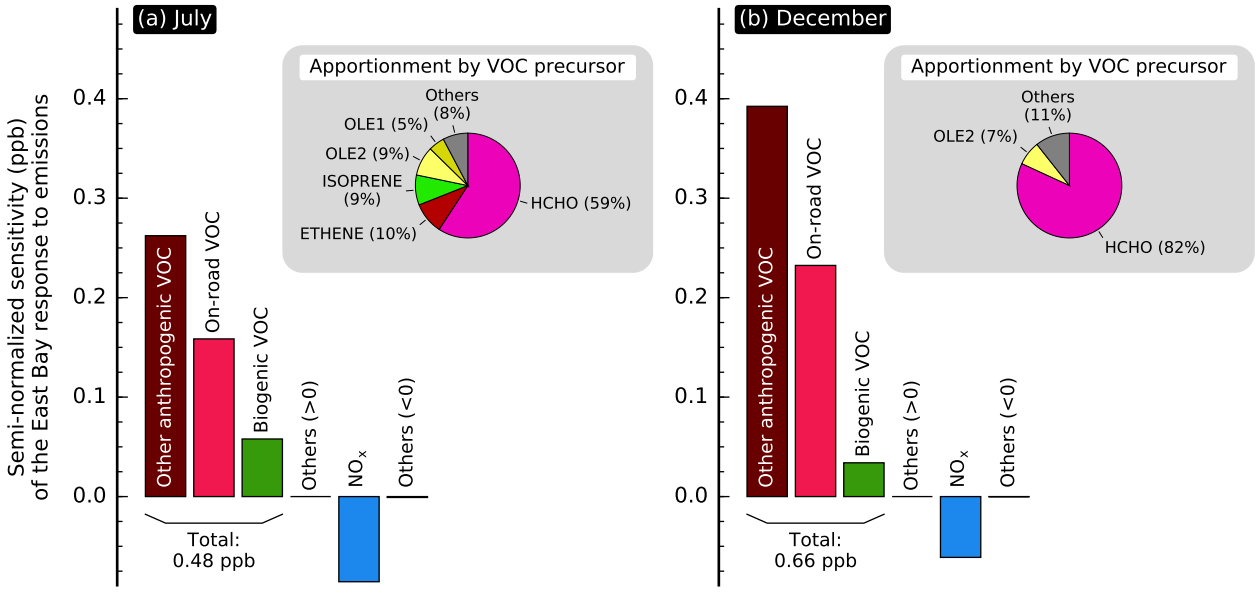

Figure S13: Semi-normalized sensitivity of the East Bay population-weighted formaldehyde mixing ratio to emissions, in (a) July and (b) December. An apportionment by precursor species of the sensitivity to overall VOC emissions is shown in the pie chart insets.

References

Carter, W. P. L.: Documentation of the SAPRC-99 Chemical Mechanism for VOC reactivity assessment. Volume 1 of 2. Documentation Text, Final Report to California Air Resources Board. Contract 92-329 and Contract 95-308. Report number 00-AP-RT17-001-FR, May 8th 2000, 2000.