

APPENDIX C

Air Quality Model Performance Evaluation: Evaluation at VISTAS and Nearby Class I Areas

C.1 OVERVIEW

The discussion of model performance in this Appendix focuses on the comparison of observational data from the Interagency **M**onitoring of **PRO**TECTED **V**isual **E**nvironments (IMPROVE) monitors and model output data from the 2002 VISTAS BaseG2 Actual annual air quality modeling. The evaluation will primarily focus on the air quality model's performance with respect to individual components of fine particulate matter (PM_{2.5}), as good model performance of the component species will dictate good model performance of total or reconstituted fine particulate matter from which visibility is constructed. Model performance of the total fine particulate matter and the resulting total light extinction will also be provided as a means to discuss the overall model performance for this Implementation Plan.

C.1.1 IMPROVE Monitoring Sites

There are eighteen (18) Class I areas within the VISTAS States (VISTAS region) as shown in Figure C-1. There are also several Class I areas adjacent to the VISTAS region where we also project future-year visibility conditions. Figure C-2 displays the IMPROVE monitoring sites within and nearby the VISTAS region. The 18 VISTAS Class I areas and nearby Class I areas where the CMAQ Base G2 modeling results are evaluated in this Appendix are as follows:

VISTAS Class I Areas

- Sipsey Wilderness Area (SIPS), Alabama
- Chassahowitzka Wildlife Refuge (CHAS), Florida
- Everglades National Park (EVER), Florida
- St. Marks Wildlife Refuge (SAMA), Florida
- Cohutta Wilderness Area (COHU), Georgia
- Wolf Island Wildlife Refuge (WOIS), Georgia
- Okefenokee Wildlife Refuge (OKEF), Georgia
- Mammoth Cave National Park (MACA), Kentucky
- Linville Gorge Wilderness Area (LIGO), North Carolina
- Shining Rock Wilderness Area (SHRO), North Carolina
- Swanquarter Wildlife Refuge (SWAN), North Carolina
- Joyce Kilmer-Slickrock Wilderness Area (JKSR), North Carolina
- Cape Romain Wildlife Refuge (ROMA), South Carolina
- Great Smoky Mountains National Park (GRSM), Tennessee-North Carolina
- James River Face Wilderness Area (JARI), Virginia
- Shenandoah National Park (SHEN), Virginia
- Dolly Sods Wilderness Area (DOSD), West Virginia
- Otter Creek Wilderness Area (OTCR), West Virginia

Nearby Class I Areas

- Breton Island Wildlife Refuge (BRET), Louisiana
- Caney Creek Wilderness Area (CACR), Arkansas
- Upper Buffalo Wilderness Area (UPBU), Arkansas
- Mingo Wildlife Refuge (MING), Missouri
- Hercules Glade Wilderness Area (HEGL), Missouri
- Brigantine Wildlife Refuge (BRIG), New Jersey

Note that not all Class I areas have their own IMPROVE monitor. The Wolf Island Class I area shares the Okefenokee IMPROVE monitor in Georgia and in West Virginia, the Otter Creek Class I area shares the Dolly Sods IMPROVE monitor and the Joyce Kilmer-Slickrock Class I area shares the IMPROVE monitor at Great Smokey Mountains National Park. So when presenting model performance evaluation and visibility projections for Okefenokee, Dolly Sods and Great Smokey Mountains IMPROVE monitors they are also represented of, respectively, Wolf Island, Otter Creek and Joyce Kilmer-Slickrock Class I areas, respectively. Also note that there are some IMPROVE sites not located in Class I areas. Although data at these sites are used in the regional evaluation discussed in Appendix B, the performance at the individual IMPROVE monitors not located at a Class I area are not discussed in this section. For the VISTAS region, the Cadiz (CADI) site is one such IMPROVE monitor.



Figure C-1. Class I areas within the VISTAS region.

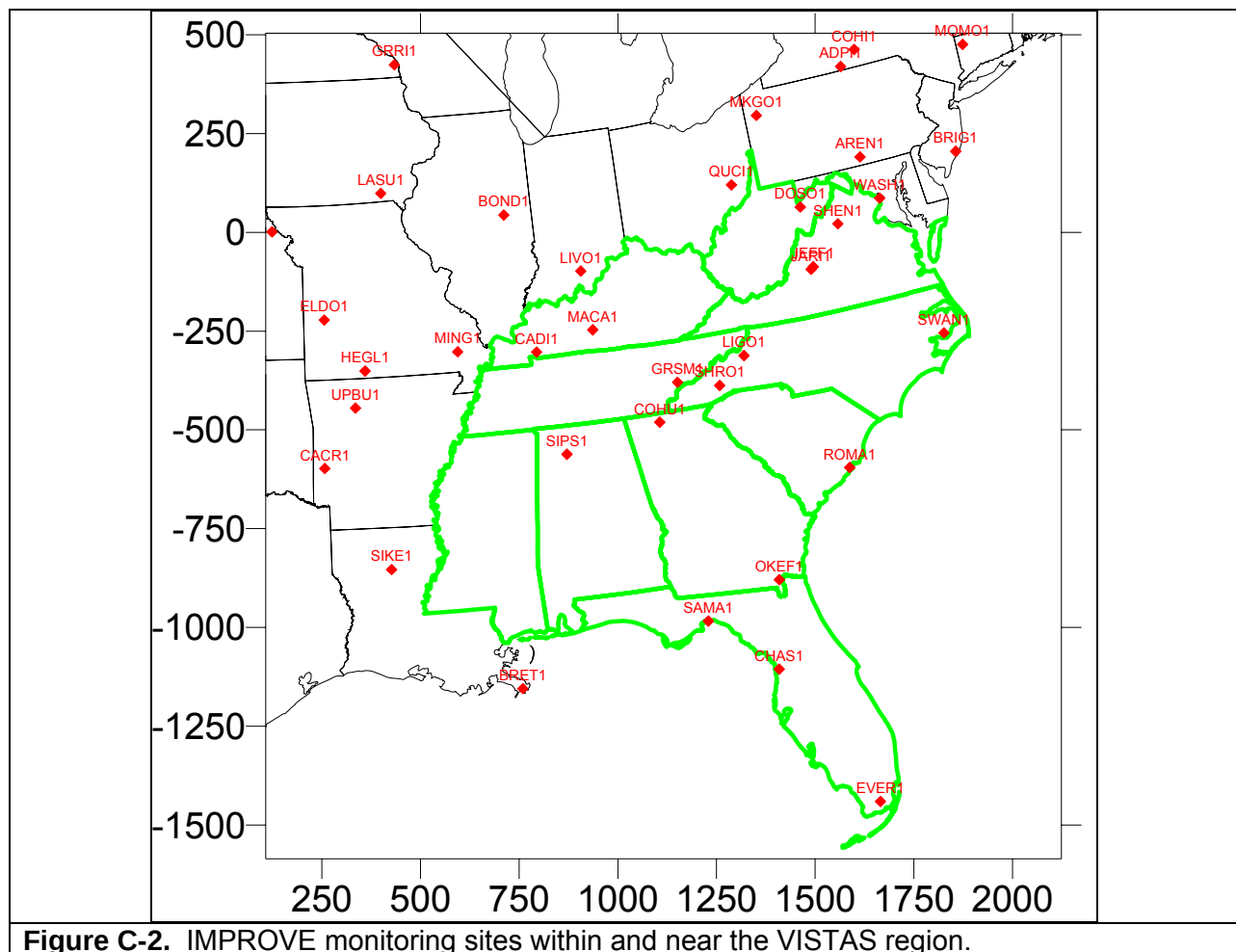


Figure C-2. IMPROVE monitoring sites within and near the VISTAS region.

C.1.2 Particulate Matter and Component Species

Regional haze is calculated by estimating light scattering and absorption by components of $PM_{2.5}$. Regional haze is measured by an extinction coefficient (b_{ext}), which represents the light attenuation resulting from scattering and absorption of light from ambient particulate matter plus scattering of light due to gas molecules in the air (i.e., Rayleigh scattering).

Some scattering does occur from air molecules; however, the bulk of light extinction is caused by the presence of suspended particles, particularly fine particles (aerodynamic mass $<2.5 \mu m$). Fine particulate matter can be composed of varying amounts of several different species, including:

- Sulfates
- Nitrates
- Ammonium
- Organic carbon (OC)

- Elemental carbon (EC)
- Coarse particulate matter (i.e., PM₁₀ - PM_{2.5})
- Soil (also known as crustal material, fine soil, major metal oxides, inorganic particulates, or other PM)
- Sea Salt (NaCl) [new IMPROVE equation]

The composition of particulate matter can vary from day-to-day, allowing a day with a large concentration of sulfates to be closely followed by a day dominated by organic carbon. This is an important fact as some of the components of fine particulate matter are more effective at light scattering than others. Since there can be such a large variability in the concentrations of the component species, the model will actually be evaluated on a per species basis, followed by an evaluation of total reconstructed fine particle mass. This is also a more stringent test of the model, as simply looking at particle pollution performance may provide good results, even though the underlying constituent concentrations are incorrect. Only a brief overview of total fine particles after component evaluation is necessary, since the accuracy of the model in predicting the component species will dictate the accuracy of the total fine particulate mass prediction.

C.1.3 20% Best and Worst Days

Projections of light extinction for the evaluation of regional haze are based on a subset of days for which there is monitored data. IMPROVE monitors collect 24-hour PM samples every third day. Observations of component species on these days are used to calculate light extinction, which is the basis on which these days are ranked. These rankings are then used to identify the 20% most impaired days, or “worst days”, and the 20% least impaired days, or “best days”, for use in visibility projections. Table C-1 lists of the 20% best and worst days for all of Class I areas within and nearby of the VISTAS region. .

Since the ultimate future year projections are based on these 20% best and worst days, the following performance evaluation of the model has mainly focused on the best and worst days for VISTAS and nearby Class I areas.

Date	Julian Day	SIPS	CHAS	EVER	SAMA	COHU	OKEF	MACA	LIGO	SHRO	SWAN	ROMA	GRSM	JARI	SHEN	DOSO	BRET	CACR	UPBU	MING	HEGL	BRIG1
01/05/02	5		W	W					B	B	W				B	B					W	
01/08/02	8								B	B			B	B			B					
01/11/02	11	B			B		B		B	B			B	B				B				
01/14/02	14	B			B			B			B	B	B		B	B	B	B	B	B	B	
01/17/02	17		W				W					W										
01/20/02	20				B		B										B			W		W
01/23/02	23			B		B	W	B	B			B	B	B	B	B						
01/26/02	26	B	W			B			B	B	B			B	B	B		B	B		B	
01/29/02	29			B								W										
02/01/02	32	B		B	B	B		B					B				B			B		B
02/04/02	35			W	W			B						B								
02/07/02	38		B		B	B	B		B	B			B		B		B					
02/10/02	41		W																			
02/13/02	44		W	W	W	B	W	B				W		B			W			B	B	
02/16/02	47		W		W							W					W		B			
02/19/02	50									B			B		B	B						
02/22/02	53										W	W										
02/25/02	56		W	W	W	W	W				W		W									
02/28/02	59	B					B						B	B	W							
03/03/02	62			W		B	B	B	B			B	B		B					B		
03/06/02	65											B										
03/09/02	68		B		B			B		B	B	B	B	B	B	B	B		B		B	B
03/12/02	71		B	B						B											B	
03/15/02	74			W													W					W
03/18/02	77	B				B			B					B	B					W		B
03/21/02	80	W		B	B												B	W				
03/24/02	83							B														
03/27/02	86							W		B												
03/30/02	89	B	W		W	B	W	B	B	B			B			B		B	B		B	
04/02/02	92											B										
04/05/02	95			W	W		W														W	
04/08/02	98			W	W													B	B			
04/11/02	101													B			B					
04/14/02	104		B	B			B		B	B	B	B		B		B						
04/17/02	107				W							B										W
04/20/02	110										W	W										

Date	Julian Day	SIPS	CHAS	EVER	SAMA	COHU	OKEF	MACA	LIGO	SHRO	SWAN	ROMA	GRSM	JARI	SHEN	DOSO	BRET	CACR	UPBU	MING	HEGL	BRIG1
04/23/02	113	B		W		B		B						B							B	B
04/26/02	116	B	W		W	B		B	B				B	B				B	B	B	B	
04/29/02	119					B			B		W					B			B		B	B
05/02/02	122	W			W	W	W		W		W	W	W			W						W
05/05/02	125			W	W						B	B					W					B
05/08/02	128		W	W	W		W		W	W	W		W			W		W	W			
05/11/02	131	W			W																	
05/14/02	134			B										B						B	B	
05/17/02	137			B					W	W			W	W		W				B	B	W
05/20/02	140			B																B		
05/23/02	143	W															W	W	W			
05/26/02	146		B								W			W	W	W						
05/29/02	149							W	W						W	W	B				W	W
06/01/02	152	W		W		W		W	W	W			W	W		W					W	W
06/04/02	155	W	W		W	W	W	W		W		W		W	W	W		W				
06/07/02	158			W	B							W		B	B	B	B		W	W		B
06/10/02	161	W	B		B					W		B		W	W	W						
06/13/02	164		B	B						W			W		W	W			B	B		
06/16/02	167	B																	B	B		
06/19/02	170		B				B	W	W	W		B	W		W	W	B	W	W		W	W
06/22/02	173		B		B	B	B	W			B	B	W			W		W	W		W	
06/25/02	176	B	B	B	B		B				B	B			W	W	B		B	B		W
06/28/02	179	B			B		B										W		W		W	W
07/01/02	182		B							W		W	W	W	W	W						
07/04/02	185	W			W	W		W		W	W	W		W	W					W		W
07/07/02	188	W			W	W	W			W	W	W	W					W		W	W	W
07/10/02	191	W	B	B		W	B	W	W	W		B	W	W		W	B	W	W	W	W	W
07/13/02	194				B	B					B		B				W			W		B
07/16/02	197				W	W	W	W		W	W	W	W	W	W		W	B	W	W		W
07/19/02	200		W		W		W				W	W		W	W		W	W		B		
07/22/02	203		B					W	W	W			W	W	W			W	W			
07/25/02	206		W	B	B	W		W	W	W		W			B	W	W		W	W	W	B
07/28/02	209				B				W		W						B					W
07/31/02	212	B		B				W	W	W	W	W	W	W	W							
08/03/02	215	W				W		W	W	W			W	W	W		W	W	W	W	W	
08/06/02	218	W		W	B	W	W	W	W	W			W	W				W	W	W	W	

Date	Julian Day	SIPS	CHAS	EVER	SAMA	COHU	OKEF	MACA	LIGO	SHRO	SWAN	ROMA	GRSM	JARI	SHEN	DOSO	BRET	CACR	UPBU	MING	HEGL	BRIG1
08/09/02	221	W				W			W	W	B		W		B			W	W	W	W	B
08/12/02	224	W	B		B	W		W	W	W			W	W	W	W			W		W	W
08/15/02	227		B			W		B			B	B	W			W	B		B	B	B	
08/18/02	230	B																				W
08/21/02	233					W		W	W	W	W		W	W	W		B					
08/24/02	236		W	W			W	W	W		W	W		W	W		B					
08/27/02	239		B		B		B	W	W					W	W		W	W	W	W	W	
08/30/02	242		B	B			B				B	B						W	W	W	W	
09/02/02	245			B				W				B		B	B		B			W	W	
09/05/02	248		B	B		W			W	W		B	W				W	W	W		W	
09/08/02	251	W		B		W		W	W	W	B		W				W	W	W	W	W	B
09/11/02	254	W		B			W	W	W	W	W	W	W	W	W	W	W	W	W			
09/14/02	257	B		W		B	B			B		W	B	W	W	W	W	W	W		W	
09/17/02	260	W	W		W	W	W	W	W	W	W	W	W		W	W	W	W		W	W	
09/20/02	263	W				W	W	W			B	B		W		W	W			B		B
09/23/02	266		B		B	W	B	B		W		B		W				B	B	B	B	
09/26/02	269					B		B		B	B	B	B		B				W		W	B
09/29/02	272													W	W	W	W			W		
10/02/02	275						B							W	W	W						W
10/05/02	278		W					B			W							B	B	B	B	W
10/08/02	281		W	W		W	W	B									W		B	B	B	B
10/11/02	284	W		B			B				B	B			B	B	W	B				B
10/14/02	287			B				B									W	B	B		B	B
10/17/02	290		W	W	W						B								B	B	B	
10/20/02	293				W						W	W				B		B				
10/23/02	296	W	W	B	W		W					W						W	W	W	W	
10/26/02	299			B						B		W	B	B		B	B	B				
10/29/02	302	B		B	B			B	B	B			B	B		B	B	B	B	B	B	B
11/01/02	305			W													W					
11/04/02	308	B				B	W	B	B	B			B							B	B	
11/07/02	311			W													W	B	B		B	
11/10/02	314										B											
11/13/02	317																				B	B
11/16/02	320		B			B			B	B	B		B		B	B		W	W		W	
11/19/02	323							B										B	B			
11/22/02	326								B	B	W		B	B		B						

Date	Julian Day	SIPS	CHAS	EVER	SAMA	COHU	OKEF	MACA	LIGO	SHRO	SWAN	ROMA	GRSM	JARI	SHEN	DOSO	BRET	CACR	UPBU	MING	HEGL	BRIG1
11/25/02	329		W								W							B				W
11/28/02	332		W	W							B			B					W	W		B
12/01/02	335						B				B			B	B		B	B	B		B	B
12/04/02	338	W					W	B							B	B		B				
12/07/02	341	W	W	W	W	B	W	W	B	B	W	W	B		B	B		W		W	W	W
12/10/02	344		B		B		B			B	B				B							
12/13/02	347	B	B			B	B	B	B	B			B		B	B					W	
12/16/02	350		W	W			W															
12/19/02	353									B	B	B						B	B	B	B	
12/22/02	356	B			B	B	B	B	B				B	B	B	B	B	B		B		B
12/25/02	359	B					B		B	B	B			B	B	B	B	B				B
12/28/02	362	B		W					B	B												W
12/31/02*	365							B		B						B	B		B		B	

C.2 Model Performance Statistics

To quantify model performance, several statistical measures were calculated and evaluated for all the IMPROVE monitors within the VISTAS 12 km domain and individually for each IMPROVE monitor associated with a VISTAS or nearby Class I areas. The statistical measures selected were based on the recommendations outlined in section 18.4.1 of the USEPA's Guidance On The Use Of Models And Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM_{2.5}, and Regional Haze (EPA, 2007a).

In 2004, VISTAS established model performance goals and criteria for components of fine particle mass (Table C-2) based on previous model performance for ozone and fine particles. EPA modeling guidance for fine particulate matter at the time noted that PM models might not be able to achieve the same level of performance as ozone models. VISTAS' evaluation considered several statistical performance measures and displays.

Table C-2. Model performance goals and criteria for components of fine particle mass.

Fractional Bias	Fractional Error	Comment
≤15%	≤35%	Goal for PM model performance based on ozone model performance, considered excellent performance
≤30%	≤50%	Goal for PM model performance, considered good performance
≤60%	≤75%	Criteria for PM model performance, considered average performance. Exceeding this level of performance indicates fundamental concerns with the modeling system and triggers diagnostic evaluation.

The statistical measures were calculated for all of the component species of particulate matter responsible for light extinction, and for total light extinction. For convenience, these statistical measures or metrics, along with a variety of additional statistical measures, are summarized in Table C-3.

Table C-3. Statistical metric calculations.

Statistical Measure	Shorthand Notation	Mathematical Expression	Notes
Accuracy of Paired Peak	A_p	$\frac{P - O_{peak}}{O_{peak}}$	
Coefficient of Determination	R^2	$\frac{\left[\sum_{i=1}^N (P_i - \bar{P})(O_i - \bar{O}) \right]^2}{\sum_{i=1}^N (P_i - \bar{P})^2 \sum_{i=1}^N (O_i - \bar{O})^2}$	P_i = prediction at time and location i ; O_i = observation at time and location i ; $\bar{P}$ = arithmetic average of P_i , $i = 1, 2, \dots, N$; $\bar{O}$ = arithmetic average of O_i , $i = 1, 2, \dots, N$;
Normalized Mean Error	NME	$\frac{\sum_{i=1}^N P_i - O_i }{\sum_{i=1}^N O_i}$	Reported as %
Root Mean Square Error	RMSE	$\left[\frac{1}{N} \sum_{i=1}^N (P_i - O_i)^2 \right]^{\frac{1}{2}}$	Reported as %
Mean Fractional Error	MFE	$\frac{2}{N} \sum_{i=1}^N \frac{ P_i - O_i }{P_i + O_i}$	Reported as %
Mean Absolute Gross Error	MAGE	$\frac{1}{N} \sum_{i=1}^N P_i - O_i $	
Mean Normalized Gross Error	MNGE	$\frac{1}{N} \sum_{i=1}^N \frac{ P_i - O_i }{O_i}$	Reported as %
Mean Biased	MB	$\frac{1}{N} \sum_{i=1}^N (P_i - O_i)$	Reported as concentration
Mean Normalized Bias	MNB	$\frac{1}{N} \sum_{i=1}^N \frac{(P_i - O_i)}{O_i}$	Reported as %
Mean Fractionalized Bias (Fractional Bias)	MFB	$\frac{2}{N} \sum_{i=1}^N \left(\frac{P_i - O_i}{P_i + O_i} \right)$	Reported as %
Normalized Mean Bias	NMB	$\frac{\sum_{i=1}^N (P_i - O_i)}{\sum_{i=1}^N O_i}$	Reported as %
Bias Factor	BF	$\frac{1}{N} \sum_{i=1}^N \left(\frac{P_i}{O_i} \right)$	Reported as BF:1 or 1:BF or in fractional notation (BF/1 or 1/BF)

C.2.1 Statistical Tables

The statistical data is calculated collectively for all of the IMPROVE monitors within the VISTAS 12 km domain, as well as individually for each of the IMPROVE monitors associated with a VISTAS Class I area along with the IMPROVE monitors associated with nearby Class I areas. These statistics have been calculated separately for the 20% Best days (Section C.2.1.1) and 20% Worst days (Section C.2.1.2).

C.2.1.1 Model Performance Statistics for the 20% Best Days

Table C-4 displays the model performance statistical measures for the Best 20 percent visibility days during 2002. Table C-4a contains statistical performance metrics for the Best 20 percent days across all IMPROVE monitors in the VISTAS 12 km domain, whereas the remainder of the tables contain statistics for each individual IMPROVE monitor associated with a Class I area within and near the VISTAS region.

C.2.1.2 Model Performance Statistics for the 20% Worst Days

Statistical performance measures for the Worst 20 percent days in 2002 and the CMAQ Base G2 12 km base case are shown in Table C-5.

Table C-4a. Model performance statistics for the Best 20% Days across Class I areas in the 12 km VISTAS grid.

12km	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-115.20	-110.06	-25.88	-27.46	78.49	148.33	-81.50	-81.14
MFE (%)	122.49	132.75	57.01	55.29	114.38	184.31	104.25	88.50
A _p	2.48	1.09	2.16	1.54	1.73	4.23	-0.18	1.85
NMB (%)	-61.28	-39.82	-3.89	-12.78	213.72	551.54	-62.01	-47.74
NME (%)	75.88	86.49	55.78	52.03	266.13	711.04	70.48	59.48
MNB (%)	-61.79	-40.68	0.75	8.92	682.14	2051.72	-38.65	-48.42
MNE (%)	77.67	91.64	58.34	68.09	704.19	2147.79	78.76	60.38
MB (µg/m ³)	-9.52	-1.77	-0.18	-0.25	0.63	2.88	-1.34	-19.42
MAGE (µg/m ³)	11.79	3.84	2.64	1.02	0.78	3.71	1.52	24.20
RMSE (µg/m ³)	14.76	6.23	5.04	1.97	1.18	7.45	2.07	27.92
Obs Max (µg/m ³)	41.57	30.49	21.39	9.96	2.95	15.38	9.86	65.36
Pred Max (µg/m ³)	144.46	63.78	67.55	25.33	8.05	80.50	8.10	186.22
Mean_Obs	15.54	4.44	4.74	1.95	0.29	0.52	2.15	40.69
Mean_Pred	6.02	2.68	4.55	1.70	0.92	3.40	0.82	21.27
Std_Dev_Obs	7.06	3.93	2.50	1.09	0.32	1.78	1.68	10.12
Std_Dev_Pre	10.74	6.01	5.33	1.91	0.97	6.47	0.92	20.63
Variance	217.83	38.82	25.35	3.88	1.40	55.56	4.29	779.65
R ²	0.06	0.11	0.12	0.06	0.00	0.01	0.14	0.09
BF	0.38	0.59	1.01	1.08	7.82	4.57	0.60	0.52
N	490	490	490	490	490	490	490	490

Table C-4b. Model performance statistics for the Best 20% Days and the Breton Island Class I area.

BRET	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-152.90	-179.64	-82.67	-69.08	14.14	27.20	-80.87	-139.99
MFE (%)	152.90	181.21	83.72	69.19	126.36	166.60	91.94	139.99
A _p	-0.74	-0.69	-0.54	-0.46	-0.25	-0.47	-0.46	-0.66
NMB (%)	-86.23	-94.40	-54.53	-50.86	-14.55	-47.92	-56.39	-81.07
NME (%)	86.23	95.50	55.38	50.96	132.14	111.15	59.69	81.07
MNB (%)	-85.67	-90.70	-53.78	-48.24	454.91	-71.19	-41.48	-81.47
MNE (%)	85.67	92.44	54.89	48.36	519.05	76.78	71.91	81.47
MB (µg/m ³)	-15.48	-2.76	-1.40	-0.81	-0.05	-0.39	-1.98	-32.99
MAGE (µg/m ³)	15.48	2.80	1.43	0.82	0.43	0.90	2.10	32.99
RMSE (µg/m ³)	16.76	3.21	1.79	1.04	0.57	1.25	2.40	33.48
Obs Max (µg/m ³)	28.83	7.28	6.17	2.75	1.61	3.81	7.45	48.75
Pred Max (µg/m ³)	7.43	2.23	2.86	1.48	1.21	2.03	4.00	16.64
Mean_Obs	17.95	2.93	2.57	1.60	0.33	0.81	3.51	40.69
Mean_Pred	2.47	0.16	1.17	0.79	0.28	0.42	1.53	7.70
Std_Dev_Obs	7.00	1.50	1.40	0.76	0.41	1.00	1.66	6.09
Std_Dev_Pre	2.24	0.49	0.90	0.46	0.31	0.51	1.06	4.97
Variance	280.94	10.28	3.21	1.08	0.32	1.57	5.76	1120.72
R ²	0.12	0.04	0.34	0.25	0.08	0.05	0.31	0.22
BF	0.14	0.09	0.46	0.52	5.55	0.15	0.59	0.19
N	23	23	23	23	23	23	23	23

Table C-4c. Model performance statistics for the Best 20% Days and the Brigantine Class I area.

BRIG	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-118.49	-85.82	1.36	36.59	68.09	88.47	-126.19	-75.43
MFE (%)	126.68	116.82	57.68	75.89	107.44	176.33	126.19	94.46
A _p	0.14	0.09	7.20	4.77	2.48	-0.61	-0.70	1.14
NMB (%)	-66.46	-29.38	124.33	131.07	204.17	-11.47	-76.73	-39.27
NME (%)	75.91	76.29	157.87	159.04	240.37	164.42	76.73	67.56
MNB (%)	-65.18	-24.93	99.46	309.60	278.12	3530.32	-75.55	-35.94
MNE (%)	75.82	86.26	138.10	336.38	303.32	3647.08	75.55	69.99
MB (µg/m ³)	-10.86	-1.07	5.36	2.69	0.48	-0.23	-3.00	-17.47
MAGE (µg/m ³)	12.41	2.77	6.81	3.26	0.56	3.30	3.00	30.05
RMSE (µg/m ³)	13.51	3.51	16.44	6.75	0.74	4.55	3.49	34.13
Obs Max (µg/m ³)	27.59	11.88	8.23	4.39	0.62	12.00	8.61	52.91
Pred Max (µg/m ³)	31.45	12.90	67.55	25.33	2.17	4.65	2.62	113.43
Mean_Obs	16.35	3.63	4.31	2.05	0.23	2.00	3.90	44.48
Mean_Pred	5.48	2.56	9.67	4.74	0.71	1.77	0.91	27.01
Std_Dev_Obs	5.74	2.26	1.88	1.17	0.13	3.83	1.82	6.00
Std_Dev_Pre	7.08	3.74	16.57	6.23	0.54	1.28	0.76	28.02
Variance	182.58	12.31	270.43	45.58	0.55	20.74	12.15	1165.02
R ²	0.04	0.19	0.16	0.00	0.03	0.29	0.04	0.06
BF	0.35	0.75	1.99	3.91	3.78	14.85	0.24	0.64
N	22	22	22	22	22	22	22	22

Table C-4d. Model performance statistics for the Best 20% Days and the Caney Creek Class I area.

CACR	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-98.27	-48.24	12.50	-32.03	121.94	192.93	-80.27	-54.72
MFE (%)	115.70	107.35	51.24	50.47	127.27	192.93	89.10	68.41
A _p	0.74	0.60	-0.05	-0.05	2.68	10.90	-0.73	0.75
NMB (%)	-49.86	-8.82	17.09	-26.56	422.09	6340.14	-64.97	-32.38
NME (%)	75.74	92.86	46.05	37.07	428.84	6340.14	67.42	50.84
MNB (%)	-48.65	38.51	36.27	-15.41	2407.02	24672.54	-48.65	-32.00
MNE (%)	71.78	132.02	63.94	43.59	2411.82	24672.54	60.37	49.96
MB (µg/m ³)	-4.15	-0.52	0.77	-0.45	1.23	3.55	-1.32	-10.93
MAGE (µg/m ³)	6.30	5.44	2.07	0.63	1.25	3.55	1.37	17.16
RMSE (µg/m ³)	7.49	7.61	2.34	0.73	1.45	4.64	1.92	19.73
Obs Max (µg/m ³)	15.58	18.62	9.59	2.61	0.76	1.20	5.41	42.26
Pred Max (µg/m ³)	27.18	29.87	9.11	2.48	2.80	14.24	1.45	73.85
Mean_Obs	8.32	5.86	4.49	1.70	0.29	0.06	2.04	33.75
Mean_Pred	4.17	5.34	5.25	1.25	1.52	3.61	0.71	22.82
Std_Dev_Obs	3.75	5.22	2.15	0.67	0.20	0.25	1.41	7.14
Std_Dev_Pre	6.91	7.23	2.63	0.61	0.74	3.03	0.35	17.54
Variance	56.13	57.90	5.47	0.53	2.09	21.58	3.69	389.25
R ²	0.17	0.06	0.32	0.34	0.00	0.01	0.01	0.09
BF	0.51	1.39	1.36	0.85	25.07	45.04	0.51	0.68
N	22	22	22	22	22	22	22	22

Table C-4e. Model performance statistics for the Best 20% Days and the Chassahowitzka Class I area.

CHAS	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-97.65	-185.48	-62.20	-34.33	75.31	179.65	-77.10	-71.12
MFE (%)	117.54	185.48	67.73	48.95	85.36	190.74	79.50	77.64
A _p	1.16	-0.84	-0.23	0.11	0.30	1.00	-0.54	0.48
NMB (%)	-49.52	-95.94	-46.59	-25.06	104.88	1176.77	-58.67	-45.69
NME (%)	77.32	95.94	51.53	41.99	124.45	1297.43	59.97	53.66
MNB (%)	-46.09	-95.88	-41.14	-19.10	338.45	472.23	-51.69	-46.07
MNE (%)	79.70	95.88	47.39	43.56	346.64	522.75	54.46	53.71
MB (µg/m ³)	-8.50	-4.25	-2.65	-0.59	0.36	6.75	-2.10	-20.64
MAGE (µg/m ³)	13.27	4.25	2.94	1.00	0.43	7.45	2.15	24.23
RMSE (µg/m ³)	15.07	4.48	3.50	1.22	0.53	8.82	2.61	26.26
Obs Max (µg/m ³)	24.80	8.90	8.38	3.78	1.14	10.05	7.40	52.76
Pred Max (µg/m ³)	53.53	1.41	6.45	4.19	1.48	20.13	3.39	77.91
Mean_Obs	17.16	4.43	5.70	2.37	0.34	0.57	3.58	45.17
Mean_Pred	8.66	0.18	3.04	1.78	0.70	7.33	1.48	24.53
Std_Dev_Obs	5.32	1.45	1.58	0.59	0.29	2.15	1.49	6.38
Std_Dev_Pre	12.45	0.31	1.36	0.85	0.26	4.94	0.54	17.53
Variance	227.25	20.04	12.27	1.48	0.29	77.76	6.81	689.51
R ²	0.02	0.03	0.07	0.02	0.01	0.05	0.00	0.10
BF	0.54	0.04	0.59	0.81	4.38	0.78	0.48	0.54
N	22	22	22	22	22	22	22	22

Table C-4f. Model performance statistics for the Best 20% Days and the Cohutta Class I area.

COHU	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-87.92	-80.72	-5.85	-24.92	92.95	198.40	-43.63	-64.47
MFE (%)	106.08	104.25	41.26	44.71	108.35	198.40	89.95	70.27
A _p	0.57	-0.18	0.54	0.03	1.38	23.19	-0.88	-0.01
NMB (%)	-43.70	-38.79	8.59	-16.07	189.67	16676.44	-71.13	-41.05
NME (%)	69.09	67.47	40.33	33.25	204.65	16676.44	82.18	47.02
MNB (%)	-45.05	-35.48	8.54	-12.98	451.68	10913.35	-9.19	-41.72
MNE (%)	71.18	67.60	45.10	38.67	462.35	10913.35	84.08	48.37
MB (µg/m ³)	-7.46	-1.79	0.39	-0.30	0.51	2.40	-0.91	-16.67
MAGE (µg/m ³)	11.80	3.12	1.82	0.61	0.55	2.40	1.05	19.10
RMSE (µg/m ³)	12.95	4.15	2.32	0.70	0.73	2.97	2.24	21.31
Obs Max (µg/m ³)	24.33	14.54	6.69	3.25	0.84	0.28	8.34	51.42
Pred Max (µg/m ³)	38.12	11.93	10.33	3.34	1.99	6.75	0.99	50.69
Mean_Obs	17.08	4.62	4.52	1.84	0.27	0.01	1.27	40.62
Mean_Pred	9.62	2.83	4.91	1.55	0.78	2.41	0.37	23.94
Std_Dev_Obs	4.94	3.06	1.37	0.73	0.22	0.06	2.05	6.33
Std_Dev_Pre	10.77	3.50	2.79	0.84	0.51	1.80	0.23	14.43
Variance	167.74	17.20	5.39	0.49	0.53	8.81	5.01	453.92
R ²	0.04	0.10	0.30	0.44	0.01	0.02	0.03	0.12
BF	0.55	0.65	1.09	0.87	5.52	11.01	0.86	0.58
N	20	20	20	20	20	20	20	20

Table C-4g. Model performance statistics for the Best 20% Days and the Dolly Sods Class I area.

DOSO	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-107.37	-62.64	-78.22	-73.22	104.58	200.00	-84.35	-97.79
MFE (%)	109.37	98.95	78.34	76.44	110.05	200.00	127.36	97.79
A _p	-0.04	0.45	-0.52	-0.47	2.47	-999.00	-0.79	-0.21
NMB (%)	-62.79	-24.54	-57.40	-49.56	317.65	-999.00	-79.16	-61.85
NME (%)	65.70	64.67	57.44	51.87	321.71	-999.00	84.37	61.85
MNB (%)	-64.90	-18.19	-52.99	-48.25	926.54	-999.00	20.22	-63.26
MNE (%)	67.01	69.59	53.11	52.13	931.32	-999.00	143.07	63.26
MB (µg/m ³)	-8.23	-0.74	-2.55	-0.92	0.45	0.82	-0.56	-20.58
MAGE (µg/m ³)	8.61	1.96	2.55	0.96	0.46	0.82	0.60	20.58
RMSE (µg/m ³)	9.90	2.68	3.16	1.10	0.59	1.02	0.80	21.54
Obs Max (µg/m ³)	23.24	9.02	9.02	3.44	0.43	0.00	1.93	43.68
Pred Max (µg/m ³)	22.29	13.11	4.36	1.82	1.49	2.76	0.41	34.63
Mean_Obs	13.11	3.03	4.43	1.85	0.14	0.00	0.71	33.27
Mean_Pred	4.88	2.29	1.89	0.93	0.59	0.82	0.15	12.69
Std_Dev_Obs	5.34	2.39	2.10	0.76	0.11	0.00	0.61	7.00
Std_Dev_Pre	5.28	3.02	1.13	0.52	0.40	0.63	0.10	7.57
Variance	98.09	7.20	9.97	1.20	0.34	1.05	0.64	464.10
R ²	0.19	0.30	0.18	0.35	0.05	-999.00	0.11	0.36
BF	0.35	0.82	0.47	0.52	10.27	0.00	1.20	0.37
N	21	21	21	21	21	21	21	21

Table C-4h. Model performance statistics for the Best 20% Days and the Cohutta Class I area.

EVER	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-165.78	-199.82	-8.55	-6.99	-58.20	-10.33	-119.13	-131.93
MFE (%)	165.78	199.82	43.15	52.61	105.18	127.64	119.13	131.93
A _p	-0.61	-1.00	-0.18	-0.17	-0.85	-0.67	-0.64	-0.55
NMB (%)	-88.57	-99.95	-5.12	-12.84	-69.39	-58.59	-76.84	-78.61
NME (%)	88.57	99.95	40.75	47.33	84.41	98.24	76.84	78.61
MNB (%)	-89.70	-99.95	3.63	-2.76	-1.43	-56.94	-72.48	-78.57
MNE (%)	89.70	99.95	40.75	41.91	96.80	57.89	72.48	78.57
MB (µg/m ³)	-8.06	-2.04	-0.15	-0.12	-0.27	-0.74	-1.80	-23.62
MAGE (µg/m ³)	8.06	2.04	1.21	0.45	0.33	1.24	1.80	23.62
RMSE (µg/m ³)	8.36	2.15	1.47	0.64	0.52	1.75	2.03	23.93
Obs Max (µg/m ³)	14.39	3.74	5.72	2.89	1.84	4.83	3.91	32.94
Pred Max (µg/m ³)	5.54	0.02	4.71	2.39	0.27	1.57	1.40	14.82
Mean_Obs	9.10	2.04	2.96	0.95	0.39	1.26	2.35	30.05
Mean_Pred	1.04	0.00	2.81	0.83	0.12	0.52	0.54	6.43
Std_Dev_Obs	2.57	0.68	0.96	0.63	0.43	1.44	0.89	2.39
Std_Dev_Pre	1.26	0.00	1.05	0.60	0.06	0.39	0.30	3.22
Variance	69.82	4.61	2.16	0.41	0.27	3.07	4.13	572.47
R ²	0.23	0.00	0.01	0.22	0.12	0.14	0.00	0.00
BF	0.10	0.00	1.04	0.93	0.99	0.30	0.28	0.21
N	24	24	24	24	24	24	24	24

Table C-4i. Model performance statistics for the Best 20% Days and the Great Smoky Mountains Class I area.

GRSM	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-94.17	-85.46	4.96	-7.50	138.59	178.02	-92.16	-63.98
MFE (%)	106.13	121.52	35.87	46.24	146.55	192.47	100.92	73.86
A _p	1.26	0.42	0.48	0.80	5.01	1.79	-0.80	1.12
NMB (%)	-46.57	-28.06	17.14	5.51	631.35	909.08	-69.24	-38.72
NME (%)	73.85	89.51	44.67	47.10	648.27	1026.45	72.85	55.67
MNB (%)	-43.83	-18.32	18.89	8.54	1821.12	-1.90	-53.08	-37.82
MNE (%)	82.10	96.66	43.55	48.94	1826.58	88.88	64.36	58.76
MB (µg/m ³)	-8.72	-1.12	0.73	0.11	0.97	2.19	-0.79	-16.09
MAGE (µg/m ³)	13.83	3.57	1.91	0.96	1.00	2.48	0.83	23.13
RMSE (µg/m ³)	17.59	4.96	2.88	1.22	1.31	3.29	1.09	27.06
Obs Max (µg/m ³)	31.91	10.95	8.95	3.38	0.69	3.59	3.75	52.59
Pred Max (µg/m ³)	72.10	15.57	13.26	6.09	4.17	10.01	0.77	111.51
Mean_Obs	18.72	3.99	4.27	2.03	0.15	0.24	1.14	41.55
Mean_Pred	10.00	2.87	5.00	2.15	1.13	2.43	0.35	25.46
Std_Dev_Obs	8.30	3.09	1.77	0.72	0.17	0.84	0.78	9.77
Std_Dev_Pre	14.66	4.40	3.10	1.33	0.89	2.27	0.21	21.63
Variance	309.58	24.64	8.30	1.48	1.70	10.85	1.19	732.11
R ²	0.03	0.03	0.18	0.16	0.01	0.02	0.03	0.03
BF	0.56	0.82	1.19	1.09	19.21	0.09	0.47	0.62
N	23	23	23	23	23	23	23	23

Table C-4j. Model performance statistics for the Best 20% Days and the Hercules Glade Class I area.

HEGL	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-132.82	-81.46	-11.53	-30.28	144.10	200.00	-32.67	-47.04
MFE (%)	132.82	103.95	40.05	41.82	144.10	200.00	57.88	60.54
A _p	-0.63	1.76	0.17	-0.04	8.46	-999.00	-0.35	0.89
NMB (%)	-77.98	-20.11	-4.87	-21.83	720.14	-999.00	-28.19	-28.48
NME (%)	77.98	82.73	35.75	33.02	720.14	-999.00	48.77	46.61
MNB (%)	-78.28	-32.69	0.82	-20.20	911.74	-999.00	-11.82	-29.64
MNE (%)	78.28	78.59	39.89	33.88	911.74	-999.00	51.51	47.04
MB (µg/m ³)	-9.24	-1.15	-0.27	-0.53	2.20	8.53	-0.67	-11.19
MAGE (µg/m ³)	9.24	4.73	2.01	0.80	2.20	8.53	1.16	18.31
RMSE (µg/m ³)	9.68	7.54	2.51	0.94	2.56	10.14	1.47	20.11
Obs Max (µg/m ³)	17.95	13.33	9.21	3.73	0.57	0.00	5.14	44.20
Pred Max (µg/m ³)	6.62	36.84	10.79	3.57	5.40	22.46	3.33	83.40
Mean_Obs	11.85	5.71	5.61	2.41	0.31	0.00	2.39	39.28
Mean_Pred	2.61	4.56	5.34	1.88	2.50	8.53	1.71	28.09
Std_Dev_Obs	3.36	3.53	1.88	0.74	0.13	0.00	1.10	3.87
Std_Dev_Pre	1.80	8.16	2.56	0.86	1.32	5.60	0.81	18.23
Variance	93.67	56.85	6.31	0.88	6.57	102.75	2.15	404.22
R ²	0.23	0.13	0.14	0.27	0.02	-999.00	0.00	0.15
BF	0.22	0.67	1.01	0.80	10.12	0.00	0.88	0.70
N	23	23	23	23	23	23	23	23

Table C-4k. Model performance statistics for the Best 20% Days and the James River Face Class I area.

JARI	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-91.09	-83.18	-65.51	-65.84	84.39	199.75	-132.42	-83.60
MFE (%)	100.63	118.95	69.44	67.77	84.97	199.75	132.42	87.18
A _p	-0.09	0.75	-0.67	-0.72	0.88	330.57	-0.77	0.09
NMB (%)	-47.44	-45.84	-49.87	-54.56	146.02	291595.78	-80.40	-52.48
NME (%)	59.51	92.91	53.49	55.58	146.61	291595.78	80.40	56.50
MNB (%)	-51.16	-4.56	-44.70	-45.74	216.63	6626.39	-78.95	-52.91
MNE (%)	63.28	112.94	49.69	47.91	217.19	6626.39	78.95	57.42
MB (µg/m ³)	-10.04	-2.26	-3.11	-1.88	0.35	2.00	-1.05	-25.36
MAGE (µg/m ³)	12.59	4.59	3.34	1.91	0.35	2.00	1.05	27.30
RMSE (µg/m ³)	14.16	5.71	4.56	2.62	0.43	2.45	1.18	29.72
Obs Max (µg/m ³)	41.57	10.56	21.39	9.96	0.69	0.02	2.90	60.15
Pred Max (µg/m ³)	37.76	18.46	6.97	2.82	1.29	5.24	0.67	65.41
Mean_Obs	21.16	4.94	6.24	3.44	0.24	0.00	1.31	48.33
Mean_Pred	11.12	2.67	3.13	1.56	0.59	2.00	0.26	22.97
Std_Dev_Obs	7.70	2.48	3.83	1.96	0.15	0.00	0.61	7.18
Std_Dev_Pre	11.63	4.04	1.82	0.58	0.26	1.45	0.15	16.35
Variance	200.48	32.55	20.77	6.87	0.18	6.01	1.39	883.03
R ²	0.25	0.10	0.21	0.10	0.09	0.02	0.36	0.08
BF	0.49	0.95	0.55	0.54	3.17	2.92	0.21	0.47
N	23	23	23	23	23	23	23	23

Table C-4l. Model performance statistics for the Best 20% Days and the Linville Gorge Class I area.

LIGO	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-115.63	-95.20	-45.21	-44.22	104.52	181.01	-105.22	-97.19
MFE (%)	116.61	115.72	51.50	50.16	115.41	181.18	119.65	97.19
A _p	-0.44	-0.72	0.31	-0.09	1.23	2.10	-0.83	-0.42
NMB (%)	-69.37	-53.30	-31.24	-31.42	230.32	1115.81	-77.59	-63.14
NME (%)	69.82	71.17	42.01	38.50	251.11	1117.78	78.96	63.14
MNB (%)	-69.20	-43.30	-30.96	-29.43	510.03	884.70	-45.89	-63.32
MNE (%)	70.23	74.23	38.11	36.49	519.16	885.91	88.23	63.32
MB (µg/m ³)	-9.06	-1.22	-1.42	-0.68	0.42	0.97	-0.72	-21.62
MAGE (µg/m ³)	9.12	1.63	1.90	0.83	0.46	0.97	0.74	21.62
RMSE (µg/m ³)	10.48	2.33	2.46	1.05	0.59	1.28	1.00	22.72
Obs Max (µg/m ³)	25.33	11.62	8.77	4.76	0.70	0.98	3.43	41.91
Pred Max (µg/m ³)	14.31	3.29	11.47	4.35	1.56	3.06	0.57	24.48
Mean_Obs	13.05	2.29	4.53	2.16	0.18	0.09	0.93	34.24
Mean_Pred	4.00	1.07	3.12	1.48	0.60	1.05	0.21	12.62
Std_Dev_Obs	5.92	2.24	2.03	0.95	0.16	0.27	0.80	6.50
Std_Dev_Pre	3.72	1.15	2.65	1.07	0.42	0.82	0.14	6.37
Variance	109.79	5.41	6.07	1.10	0.35	1.65	1.01	516.35
R ²	0.20	0.19	0.41	0.46	0.02	0.00	0.43	0.14
BF	0.31	0.57	0.69	0.71	6.10	1.41	0.54	0.37
N	21	21	21	21	21	21	21	21

Table C-4m. Model performance statistics for the Best 20% Days and the Mammoth Cave Class I area.

MACA	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-121.24	-61.27	-66.90	-38.39	96.54	200.00	-53.22	-83.33
MFE (%)	121.24	98.70	67.80	46.35	106.03	200.00	106.30	83.33
A _p	-0.45	0.12	-0.29	-0.27	0.55	-999.00	-0.80	-0.04
NMB (%)	-73.51	-18.48	-47.74	-32.06	228.66	-999.00	-61.68	-53.43
NME (%)	73.51	84.20	48.54	37.77	248.33	-999.00	76.41	53.43
MNB (%)	-72.87	-13.78	-46.23	-24.86	315.06	-999.00	-6.34	-53.97
MNE (%)	72.87	81.80	47.16	34.63	322.26	-999.00	97.75	53.97
MB (µg/m ³)	-18.73	-1.78	-3.18	-0.94	0.86	3.45	-0.71	-30.58
MAGE (µg/m ³)	18.73	8.09	3.24	1.11	0.94	3.45	0.88	30.58
RMSE (µg/m ³)	20.15	10.57	3.79	1.47	1.10	4.21	1.21	34.66
Obs Max (µg/m ³)	39.05	30.49	13.25	6.05	1.41	0.00	4.08	65.36
Pred Max (µg/m ³)	21.37	34.29	9.43	4.41	2.19	8.01	0.83	63.00
Mean_Obs	25.48	9.61	6.67	2.94	0.38	0.00	1.15	57.23
Mean_Pred	6.75	7.83	3.49	2.00	1.24	3.45	0.44	26.65
Std_Dev_Obs	6.70	6.69	2.68	1.11	0.27	0.00	1.02	6.69
Std_Dev_Pre	5.16	9.91	2.19	0.90	0.60	2.47	0.25	17.74
Variance	405.94	111.65	14.33	2.17	1.22	17.73	1.47	1201.52
R ²	0.04	0.05	0.42	0.13	0.03	-999.00	0.03	0.12
BF	0.27	0.86	0.54	0.75	4.15	0.00	0.90	0.46
N	23	23	23	23	23	23	23	23

Table C-4n. Model performance statistics for the Best 20% Days and the Mingo Class I area.

MING	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-122.89	-71.02	-31.76	-7.09	138.37	197.99	24.07	-20.17
MFE (%)	122.89	108.52	46.62	37.98	138.37	197.99	58.30	47.25
A _p	-0.59	4.78	-0.27	0.22	4.57	53.62	-0.18	2.28
NMB (%)	-73.17	15.70	-26.09	-2.91	508.18	20904.07	14.53	0.62
NME (%)	73.17	124.27	39.88	37.18	508.18	20904.07	64.88	48.50
MNB (%)	-73.66	10.81	-17.69	3.48	1070.38	3119.60	89.76	-1.41
MNE (%)	73.66	118.63	38.69	38.50	1070.38	3119.60	114.86	46.76
MB (µg/m ³)	-12.68	0.74	-1.74	-0.07	2.61	21.82	0.41	0.29
MAGE (µg/m ³)	12.68	5.88	2.66	0.88	2.61	21.82	1.84	22.58
RMSE (µg/m ³)	13.73	13.02	3.40	1.10	3.11	28.77	2.72	35.59
Obs Max (µg/m ³)	32.46	11.03	12.57	3.80	1.45	1.47	9.86	56.75
Pred Max (µg/m ³)	13.20	63.78	9.23	4.66	8.05	80.50	8.10	186.22
Mean_Obs	17.33	4.73	6.68	2.38	0.51	0.10	2.83	46.57
Mean_Pred	4.65	5.48	4.93	2.31	3.12	21.93	3.24	46.86
Std_Dev_Obs	6.18	3.01	2.76	0.77	0.38	0.35	2.51	7.41
Std_Dev_Pre	3.83	13.49	2.45	1.07	1.71	19.37	1.84	38.39
Variance	188.61	169.45	11.59	1.21	9.67	827.57	7.42	1266.49
R ²	0.25	0.03	0.12	0.09	0.00	0.27	0.05	0.13
BF	0.26	1.11	0.82	1.03	11.70	2.93	1.90	0.99
Num_Points	22	22	22	22	22	22	22	22

Table C-4o. Model performance statistics for the Best 20% Days and the Okefenokee Class I area.

OKEF	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-128.51	-179.19	31.20	-51.96	15.38	151.32	-127.01	-83.50
MFE (%)	128.51	179.19	43.66	66.15	92.26	162.36	127.01	83.50
A _p	-0.57	-0.56	0.83	-0.13	-0.23	0.04	-0.71	-0.33
NMB (%)	-76.36	-92.60	53.82	-31.70	5.19	217.14	-80.36	-56.54
NME (%)	76.36	92.60	61.43	49.69	109.76	270.83	80.36	56.54
MNB (%)	-76.48	-92.69	52.43	-31.75	160.17	-8.23	-75.22	-56.79
MNE (%)	76.48	92.69	62.30	51.45	208.59	31.64	75.22	56.79
MB (µg/m ³)	-14.61	-3.72	3.79	-0.69	0.02	0.59	-1.57	-26.00
MAGE (µg/m ³)	14.61	3.72	4.33	1.09	0.41	0.74	1.57	26.00
RMSE (µg/m ³)	15.31	4.06	5.77	1.22	0.55	0.88	1.81	27.22
Obs Max (µg/m ³)	26.45	8.07	11.63	4.86	1.77	2.07	3.93	52.70
Pred Max (µg/m ³)	11.29	3.56	21.29	4.24	1.36	2.15	1.12	35.48
Mean_Obs	19.13	4.02	7.05	2.18	0.37	0.27	1.96	45.99
Mean_Pred	4.52	0.30	10.85	1.49	0.39	0.86	0.38	19.99
Std_Dev_Obs	4.27	1.56	2.04	0.85	0.39	0.61	0.94	5.57
Std_Dev_Pre	3.31	0.77	5.18	1.11	0.32	0.52	0.27	8.41
Variance	234.25	16.49	33.34	1.48	0.31	0.78	3.27	740.97
R ²	0.07	0.01	0.28	0.23	0.07	0.09	0.06	0.13
BF	0.24	0.07	1.52	0.68	2.60	0.21	0.25	0.43
Num_Points	22	22	22	22	22	22	22	22

Table C-4p. Model performance statistics for the Best 20% Days and the Cape Romain Class I area.

ROMA	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-124.88	-181.06	-94.53	-46.13	12.09	-31.75	-43.14	-122.25
MFE (%)	135.54	181.06	101.08	72.68	84.22	150.25	63.91	126.73
A _p	0.56	-0.57	0.10	-0.25	1.56	-0.80	-0.58	0.06
NMB (%)	-59.52	-93.83	-50.21	-35.42	27.07	-75.42	-45.43	-69.84
NME (%)	78.50	93.83	61.05	49.83	104.69	108.25	53.72	74.60
MNB (%)	-60.36	-93.35	-56.56	-35.41	71.98	-4.48	-19.27	-70.13
MNE (%)	87.92	93.35	64.79	46.91	115.30	120.19	52.90	76.16
MB (µg/m ³)	-8.44	-2.51	-1.72	-0.37	0.06	-2.52	-1.23	-27.68
MAGE (µg/m ³)	11.13	2.51	2.09	0.53	0.23	3.62	1.46	29.56
RMSE (µg/m ³)	12.73	2.73	2.45	0.75	0.37	5.48	2.27	30.48
Obs Max (µg/m ³)	26.12	4.50	8.19	5.01	0.65	15.38	8.77	50.02
Pred Max (µg/m ³)	40.73	1.93	9.04	3.75	1.66	3.04	3.67	53.00
Mean_Obs	14.19	2.68	3.43	1.06	0.22	3.35	2.71	39.63
Mean_Pred	5.74	0.17	1.71	0.68	0.28	0.82	1.48	11.95
Std_Dev_Obs	6.77	1.02	1.81	1.08	0.18	4.48	2.03	7.68
Std_Dev_Pre	9.02	0.43	2.23	0.93	0.37	0.88	0.88	12.36
Variance	161.99	7.47	5.98	0.56	0.13	30.00	5.16	928.75
R ²	0.07	0.00	0.40	0.63	0.05	0.23	0.09	0.05
BF	0.40	0.07	0.43	0.62	1.72	0.75	0.81	0.30
Num_Points	23	23	23	23	23	23	23	23

Table C-4q. Model performance statistics for the Best 20% Days and the St. Marks Class I area.

SAMA	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-126.89	-188.67	0.59	-14.74	1.18	160.72	-97.03	-97.60
MFE (%)	137.86	188.67	63.77	63.21	119.22	174.90	100.19	102.93
A _p	0.37	-0.80	1.33	0.82	-0.69	3.18	-0.64	0.28
NMB (%)	-68.20	-96.21	45.71	21.88	-42.60	502.57	-67.55	-57.30
NME (%)	80.63	96.21	84.58	78.78	103.88	537.83	69.19	63.73
MNB (%)	-60.48	-96.73	40.44	14.39	195.14	3985.28	-60.84	-57.58
MNE (%)	88.12	96.73	85.00	69.07	259.81	4022.29	64.66	64.99
MB (µg/m ³)	-12.62	-2.70	2.03	0.34	-0.20	0.93	-1.72	-23.78
MAGE (µg/m ³)	14.92	2.70	3.76	1.23	0.48	1.00	1.76	26.45
RMSE (µg/m ³)	15.81	2.84	5.77	1.86	0.70	1.37	2.07	28.55
Obs Max (µg/m ³)	24.51	4.76	9.53	3.98	2.05	1.13	4.89	50.25
Pred Max (µg/m ³)	33.63	0.96	22.22	7.25	0.64	4.74	1.75	64.45
Mean_Obs	18.50	2.80	4.45	1.57	0.47	0.19	2.54	41.51
Mean_Pred	5.88	0.11	6.48	1.91	0.27	1.12	0.83	17.73
Std_Dev_Obs	4.41	0.96	1.96	1.04	0.58	0.37	1.09	6.13
Std_Dev_Pre	8.14	0.25	5.95	2.16	0.19	1.16	0.45	16.11
Variance	249.94	8.05	33.28	3.45	0.49	1.87	4.27	814.88
R ²	0.02	0.14	0.14	0.25	0.23	0.26	0.00	0.03
BF	0.40	0.03	1.40	1.14	2.95	11.14	0.39	0.42
Num_Points	22	22	22	22	22	22	22	22

Table C-4r. Model performance statistics for the Best 20% Days and the Shenandoah Class I area.

SHEN	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-74.36	25.46	35.69	15.95	133.54	200.00	-62.78	-25.64
MFE (%)	93.26	75.95	50.96	36.84	133.54	200.00	73.10	53.35
A _p	5.97	1.09	5.98	4.44	3.08	-999.00	-0.54	3.27
NMB (%)	4.37	74.12	91.62	50.01	420.15	-999.00	-52.15	6.69
NME (%)	99.60	103.04	107.36	67.27	420.15	-999.00	56.76	56.93
MNB (%)	-9.26	79.51	87.61	49.86	901.25	-999.00	-39.38	2.07
MNE (%)	96.56	110.24	100.76	66.81	901.25	-999.00	54.53	57.60
MB (µg/m ³)	0.52	3.61	2.55	0.81	0.57	3.12	-0.47	2.16
MAGE (µg/m ³)	11.86	5.02	2.99	1.09	0.57	3.12	0.51	18.34
RMSE (µg/m ³)	28.13	6.76	7.50	2.78	0.65	3.91	0.61	34.08
Obs Max (µg/m ³)	20.73	11.73	5.74	2.68	0.35	0.00	1.92	42.00
Pred Max (µg/m ³)	144.46	24.52	40.06	14.58	1.41	8.41	0.89	179.34
Mean_Obs	11.90	4.87	2.78	1.62	0.14	0.00	0.90	32.21
Mean_Pred	12.42	8.48	5.33	2.43	0.71	3.12	0.43	34.37
Std_Dev_Obs	4.19	2.96	1.49	0.69	0.09	0.00	0.49	6.21
Std_Dev_Pre	29.54	6.95	7.90	2.83	0.33	2.40	0.22	36.39
Variance	791.22	45.64	56.28	7.74	0.42	15.25	0.37	1161.58
R ²	0.07	0.31	0.28	0.08	0.20	-999.00	0.37	0.12
BF	0.91	1.80	1.88	1.50	10.01	0.00	0.61	1.02
Num_Points	23	23	23	23	23	23	23	23

Table C-4s. Model performance statistics for the Best 20% Days and the Shining Rock Class I area.

SHRO	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-75.84	-81.41	13.51	27.00	123.07	194.49	-1.93	-68.69
MFE (%)	86.97	107.46	56.47	58.31	131.08	194.49	144.41	74.39
A _p	1.86	-0.12	0.39	0.57	3.68	36.95	-0.76	0.70
NMB (%)	-32.22	-52.02	30.21	41.98	483.48	9454.52	-69.54	-42.24
NME (%)	62.92	80.62	67.11	68.10	499.53	9454.52	93.21	51.49
MNB (%)	-43.15	-17.86	61.34	130.27	1099.73	1414.30	21.60	-44.28
MNE (%)	62.34	93.68	91.14	155.33	1105.94	1414.30	142.80	51.78
MB (µg/m ³)	-2.64	-0.81	0.74	0.46	0.46	0.92	-0.43	-10.14
MAGE (µg/m ³)	5.16	1.25	1.63	0.74	0.47	0.92	0.58	12.36
RMSE (µg/m ³)	7.24	1.75	2.33	1.02	0.59	1.32	0.82	14.01
Obs Max (µg/m ³)	13.73	4.65	6.13	2.31	0.28	0.10	2.87	31.05
Pred Max (µg/m ³)	39.24	4.09	8.51	3.63	1.29	3.81	0.68	52.94
Mean_Obs	8.19	1.55	2.43	1.09	0.09	0.01	0.62	24.00
Mean_Pred	5.55	0.75	3.17	1.55	0.55	0.93	0.19	13.86
Std_Dev_Obs	4.17	1.30	1.31	0.58	0.08	0.03	0.70	5.96
Std_Dev_Pre	8.28	1.00	2.05	0.98	0.38	0.97	0.14	10.91
Variance	52.35	3.08	5.44	1.05	0.35	1.75	0.68	196.33
R ²	0.31	0.00	0.02	0.14	0.02	0.00	0.00	0.19
BF	0.57	0.79	1.61	2.30	12.00	2.52	0.86	0.56
N	24	24	24	24	24	24	24	24

Table C-4t. Model performance statistics for the Best 20% Days and the Sipsey Class I area.

SIPS	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-106.85	-109.16	-9.15	-54.86	77.60	200.00	-117.27	-69.04
MFE (%)	120.51	109.41	40.17	64.97	113.99	200.00	117.27	78.81
A _p	1.69	-0.33	0.70	-0.04	-0.14	-999.00	-0.74	1.04
NMB (%)	-47.35	-56.06	8.56	-36.07	120.89	-999.00	-76.03	-41.33
NME (%)	84.16	56.35	41.07	46.35	198.21	-999.00	76.03	57.32
MNB (%)	-53.46	-61.27	2.84	-34.17	389.14	-999.00	-71.89	-42.53
MNE (%)	82.66	61.52	39.22	48.53	410.41	-999.00	71.89	57.28
MB (µg/m ³)	-9.62	-4.46	0.59	-0.98	0.65	3.74	-1.76	-21.39
MAGE (µg/m ³)	17.11	4.49	2.83	1.26	1.06	3.74	1.76	29.67
RMSE (µg/m ³)	21.62	6.66	3.79	1.53	1.30	4.54	2.07	32.63
Obs Max (µg/m ³)	36.05	21.36	11.04	4.69	2.95	0.00	4.24	61.55
Pred Max (µg/m ³)	97.08	14.24	18.78	4.49	2.52	9.09	1.12	125.72
Mean_Obs	20.32	7.96	6.89	2.72	0.54	0.00	2.31	51.75
Mean_Pred	10.70	3.50	7.48	1.74	1.19	3.74	0.55	30.36
Std_Dev_Obs	6.48	5.30	2.40	1.08	0.67	0.00	1.17	6.11
Std_Dev_Pre	20.91	4.28	5.23	1.17	0.75	2.64	0.29	26.57
Variance	467.50	44.35	14.40	2.35	1.70	20.58	4.28	1064.78
R ²	0.10	0.21	0.54	0.19	0.10	-999.00	0.08	0.11
BF	0.47	0.39	1.03	0.66	4.89	0.00	0.28	0.57
N	21	21	21	21	21	21	21	21

Table C-4u. Model performance statistics for the Best 20% Days and the Swanquarter Class I area.

SWAN	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-136.66	-161.55	-38.76	-28.09	46.67	34.79	-118.19	-118.69
MFE (%)	138.38	170.70	62.73	58.61	109.65	173.91	118.19	120.57
A _p	-0.13	1.44	2.83	1.96	0.27	-0.67	-0.60	0.18
NMB (%)	-74.90	-69.17	11.83	17.63	96.96	-46.99	-72.45	-68.09
NME (%)	77.12	92.56	65.71	77.26	189.16	134.86	72.45	70.44
MNB (%)	-76.02	-77.95	-12.66	83.61	335.71	-81.74	-73.26	-69.58
MNE (%)	77.94	92.54	56.88	146.06	375.39	81.74	73.26	71.69
MB (µg/m ³)	-9.68	-1.72	0.37	0.18	0.16	-0.66	-2.15	-24.60
MAGE (µg/m ³)	9.97	2.30	2.06	0.80	0.31	1.89	2.15	25.45
RMSE (µg/m ³)	10.90	2.57	4.25	1.71	0.42	3.11	2.37	26.66
Obs Max (µg/m ³)	21.09	4.21	6.60	2.59	0.87	11.33	6.25	42.25
Pred Max (µg/m ³)	18.25	10.24	25.28	7.65	1.11	3.69	2.53	49.97
Mean_Obs	12.93	2.48	3.14	1.04	0.16	1.40	2.97	36.13
Mean_Pred	3.24	0.77	3.51	1.22	0.32	0.74	0.82	11.53
Std_Dev_Obs	3.88	0.85	1.44	0.75	0.19	2.68	1.42	3.96
Std_Dev_Pre	4.36	2.22	5.35	1.84	0.32	1.02	0.60	11.96
Variance	118.84	6.61	18.09	2.91	0.18	9.70	5.63	710.89
R ²	0.05	0.23	0.60	0.11	0.03	0.08	0.62	0.26
BF	0.24	0.22	0.87	1.84	4.36	0.09	0.27	0.30
N	23	23	23	23	23	23	23	23

Table C-4v. Model performance statistics for the Best 20% Days and the Upper Buffalo Class I area.

UPBU	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-138.41	-121.02	-23.25	-46.69	93.32	199.90	-110.88	-88.95
MFE (%)	139.43	121.02	44.59	56.99	108.59	199.90	126.30	90.01
A _p	-0.07	-0.37	-0.11	0.36	2.20	1232.47	-0.85	0.00
NMB (%)	-77.41	-71.02	-13.97	-31.38	262.69	767627.06	-78.16	-58.54
NME (%)	79.10	71.02	36.99	43.46	275.35	767627.06	81.63	59.75
MNB (%)	-78.49	-70.21	-11.36	-29.34	1615.30	17510.96	-57.49	-57.86
MNE (%)	79.56	70.21	37.29	42.69	1625.86	17510.96	84.47	58.99
MB (µg/m ³)	-8.11	-3.62	-0.67	-0.54	0.95	3.28	-2.71	-21.59
MAGE (µg/m ³)	8.28	3.62	1.76	0.74	1.00	3.28	2.83	22.04
RMSE (µg/m ³)	9.10	4.57	2.03	0.88	1.19	4.05	3.42	23.65
Obs Max (µg/m ³)	19.65	12.68	8.70	2.65	0.81	0.01	8.94	44.16
Pred Max (µg/m ³)	18.27	7.98	7.73	3.60	2.58	11.59	1.31	44.17
Mean_Obs	10.47	5.10	4.77	1.71	0.36	0.00	3.47	36.88
Mean_Pred	2.36	1.48	4.10	1.17	1.32	3.28	0.76	15.29
Std_Dev_Obs	4.10	3.60	1.70	0.47	0.17	0.00	2.13	5.26
Std_Dev_Pre	3.75	1.87	2.09	0.74	0.63	2.44	0.33	8.88
Variance	82.79	20.90	4.14	0.78	1.41	16.42	11.68	559.29
R ²	0.18	0.38	0.23	0.12	0.20	0.02	0.00	0.01
BF	0.22	0.30	0.89	0.71	17.15	8.00	0.43	0.42
N	22	22	22	22	22	22	22	22

Table C-5a. Model performance statistics for the Worst 20% Days across Class I areas in the 12 km VISTAS grid.

12km	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-63.82	-121.18	-32.08	-63.17	22.51	188.69	-87.88	-49.58
MFE (%)	74.05	146.07	50.78	70.50	69.91	191.96	115.76	60.44
A _p	-0.50	0.44	-0.83	-0.28	-0.43	8.80	-0.65	-0.43
NMB (%)	-39.35	-18.22	-29.24	-42.51	36.38	18564.68	-69.20	-32.51
NME (%)	50.22	87.96	48.66	52.21	97.47	18666.07	74.92	44.58
MNB (%)	-38.14	-39.83	-15.63	-41.16	156.91	7919.56	-39.56	-29.87
MNE (%)	51.57	102.75	43.37	51.71	189.98	7956.43	88.73	44.15
MB (µg/m ³)	-48.14	-1.38	-6.15	-2.24	0.38	12.46	-2.26	-55.75
MAGE (µg/m ³)	61.44	6.66	10.23	2.75	1.01	12.52	2.44	76.45
RMSE (µg/m ³)	82.20	13.69	28.78	3.59	1.79	20.70	3.53	101.79
Obs Max (µg/m ³)	475.66	107.80	614.69	41.23	16.92	11.70	20.96	735.80
Pred Max (µg/m ³)	235.90	154.76	102.23	29.67	9.61	114.64	7.23	419.01
Mean_Obs	122.36	7.57	21.03	5.26	1.04	0.07	3.26	171.51
Mean_Pred	74.22	6.19	14.88	3.03	1.42	12.52	1.01	115.76
Std_Dev_Obs	68.78	14.02	31.42	3.03	1.23	0.57	2.77	72.23
Std_Dev_Pre	59.70	18.80	12.73	3.01	1.23	16.52	1.03	74.73
Variance	6757.49	187.38	828.03	12.88	3.20	428.51	12.47	10360.90
R ²	0.22	0.48	0.20	0.32	0.00	0.00	0.06	0.11
BF	0.62	0.60	0.84	0.59	2.57	4.23	0.58	0.70
N	512	512	510	510	512	512	512	512

Table C-5b. Model performance statistics for the Worst 20% Days at the Breton Island Class I area.

BRET	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-108.00	-197.37	-85.96	-103.52	-39.07	138.89	-103.81	-108.13
MFE (%)	113.52	197.37	88.07	103.52	106.38	165.39	103.81	109.77
A _p	-0.13	-0.96	-0.75	-0.68	-0.84	1.71	-0.37	-0.25
NMB (%)	-58.22	-98.65	-60.76	-69.59	-60.95	572.95	-61.85	-62.38
NME (%)	64.22	98.65	62.79	69.59	99.61	650.61	61.85	63.98
MNB (%)	-60.00	-99.31	-53.74	-66.26	39.75	76.21	-63.36	-62.99
MNE (%)	66.37	99.31	56.03	66.26	126.72	130.85	63.36	64.73
MB (µg/m ³)	-42.55	-8.04	-5.76	-3.05	-0.78	1.64	-2.74	-69.94
MAGE (µg/m ³)	46.94	8.04	5.95	3.05	1.28	1.87	2.74	71.73
RMSE (µg/m ³)	52.63	10.62	10.17	3.77	2.59	2.49	3.16	79.19
Obs Max (µg/m ³)	126.22	29.70	46.34	12.96	11.47	1.93	10.72	171.55
Pred Max (µg/m ³)	109.49	1.16	11.69	4.20	1.84	5.21	6.78	129.27
Mean_Obs	73.10	8.15	9.47	4.38	1.28	0.29	4.44	112.12
Mean_Pred	30.54	0.11	3.72	1.33	0.50	1.93	1.69	42.17
Std_Dev_Obs	18.79	7.30	10.41	2.76	2.32	0.55	2.01	19.64
Std_Dev_Pre	34.94	0.30	3.36	0.93	0.52	1.69	1.72	40.19
Variance	2770.25	112.76	103.42	14.21	6.70	6.18	9.96	6270.32
R ²	0.19	0.55	0.44	0.43	0.08	0.07	0.42	0.13
BF	0.40	0.01	0.46	0.34	1.40	0.51	0.37	0.37
N	24	24	24	24	24	24	24	24

Table C-5c. Model performance statistics for the Worst 20% Days at the Brigantine Class I area.

BRIG	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-68.36	-54.70	-42.36	-16.55	25.67	197.35	-96.66	-44.58
MFE (%)	76.35	101.20	51.78	34.66	67.60	197.35	133.02	55.90
A _p	-0.28	0.60	-0.83	-0.28	-0.44	17.73	-0.92	-0.70
NMB (%)	-44.01	58.77	-63.48	-14.87	38.85	16306.94	-81.39	-38.91
NME (%)	53.83	103.33	67.06	30.43	98.91	16306.94	84.05	48.12
MNB (%)	-43.87	-1.06	-27.55	-7.43	133.28	486.75	-76.23	-28.70
MNE (%)	54.42	87.49	40.23	34.29	162.56	486.75	76.23	42.52
MB (µg/m ³)	-53.74	7.87	-31.03	-1.17	0.43	8.35	-3.53	-81.61
MAGE (µg/m ³)	65.73	13.84	32.78	2.40	1.08	8.35	3.64	100.93
RMSE (µg/m ³)	77.68	25.55	110.38	3.47	1.68	9.45	5.34	154.13
Obs Max (µg/m ³)	275.18	71.94	614.69	41.23	6.83	1.13	20.65	735.80
Pred Max (µg/m ³)	197.92	115.45	102.23	29.67	3.80	21.08	1.62	223.13
Mean_Obs	122.10	13.40	48.89	7.88	1.10	0.05	4.34	209.75
Mean_Pred	68.36	21.27	17.86	6.71	1.52	8.40	0.81	128.14
Std_Dev_Obs	60.77	16.68	127.43	7.80	1.30	0.24	4.16	133.57
Std_Dev_Pre	52.55	37.68	20.47	5.76	1.05	4.52	0.31	56.24
Variance	6034.93	652.70	12184.42	12.05	2.83	89.35	28.56	23754.77
R ²	0.24	0.74	0.88	0.85	0.00	0.01	0.04	0.04
BF	0.56	0.99	0.72	0.93	2.33	0.27	0.22	0.71
N	22	22	22	22	22	22	22	22

Table C-5d. Model performance statistics for the Worst 20% Days at the Caney Creek Class I area.

CACR	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-69.34	-45.08	-7.66	-68.17	31.62	190.50	-113.64	-43.67
MFE (%)	73.49	94.78	32.17	68.17	57.31	190.50	122.51	52.94
A _p	-0.46	0.69	-0.12	-0.34	-0.26	20.76	-0.81	-0.25
NMB (%)	-46.53	23.99	-3.37	-49.45	29.65	24425.54	-79.04	-30.60
NME (%)	50.44	86.91	28.24	49.45	81.70	24425.54	79.74	40.54
MNB (%)	-45.19	17.81	0.41	-48.37	140.50	1964.48	-61.55	-26.81
MNE (%)	50.01	99.08	30.62	48.37	158.09	1964.48	79.67	40.75
MB (µg/m ³)	-50.95	2.45	-0.66	-2.16	0.42	14.33	-3.40	-49.12
MAGE (µg/m ³)	55.22	8.88	5.55	2.16	1.16	14.33	3.43	65.08
RMSE (µg/m ³)	78.07	23.14	7.96	2.46	1.88	16.37	3.94	92.23
Obs Max (µg/m ³)	281.03	70.57	51.07	7.26	6.70	1.35	7.89	324.07
Pred Max (µg/m ³)	151.79	119.16	44.88	4.82	4.98	29.35	1.46	244.51
Mean_Obs	109.50	10.22	19.65	4.38	1.43	0.06	4.30	160.52
Mean_Pred	58.54	12.67	18.99	2.21	1.85	14.38	0.90	111.40
Std_Dev_Obs	61.21	17.65	10.63	1.38	1.34	0.28	1.98	59.45
Std_Dev_Pre	44.67	27.86	10.96	1.04	1.01	8.19	0.32	65.64
Variance	6095.27	535.44	63.35	6.06	3.54	267.87	15.53	8506.03
R ²	0.15	0.30	0.52	0.29	0.07	0.13	0.01	0.04
BF	0.55	1.18	1.00	0.52	2.41	0.90	0.38	0.73
N	23	23	23	23	23	23	23	23

Table C-5e. Model performance statistics for the Worst 20% Days at the Chassahowitzka Class I area.

CHAS	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-56.60	-120.68	-35.75	-30.28	103.28	200.00	-20.70	-16.94
MFE (%)	65.36	143.24	47.42	50.30	115.65	200.00	41.49	34.42
A _p	0.63	1.18	-0.34	0.35	0.04	-999.00	-0.48	0.51
NMB (%)	-30.52	-46.96	-29.64	-18.68	199.83	-999.00	-24.95	-9.49
NME (%)	45.19	90.60	40.89	44.17	239.31	-999.00	41.42	31.54
MNB (%)	-36.55	-38.40	-24.84	-16.13	522.15	-999.00	-9.21	-10.29
MNE (%)	47.47	100.64	38.58	45.44	531.13	-999.00	37.57	31.36
MB (µg/m ³)	-23.98	-2.50	-6.10	-1.16	1.31	28.97	-0.67	-11.87
MAGE (µg/m ³)	35.52	4.83	8.42	2.73	1.57	28.97	1.11	39.44
RMSE (µg/m ³)	40.90	6.12	11.22	3.14	1.84	30.72	1.65	44.81
Obs Max (µg/m ³)	121.53	9.87	71.19	10.37	3.58	0.00	6.40	169.84
Pred Max (µg/m ³)	198.53	21.47	46.83	14.02	3.71	58.76	3.31	256.55
Mean_Obs	78.59	5.33	20.60	6.19	0.66	0.00	2.69	125.05
Mean_Pred	54.61	2.83	14.49	5.03	1.97	28.97	2.02	113.18
Std_Dev_Obs	22.96	2.23	14.55	1.97	0.74	0.00	1.34	19.06
Std_Dev_Pre	46.76	5.23	10.49	3.27	0.87	10.47	0.50	50.42
Variance	1673.04	37.40	125.95	9.83	3.38	943.77	2.73	2007.87
R ²	0.53	0.00	0.56	0.19	0.11	-999.00	0.07	0.25
BF	0.63	0.62	0.75	0.84	6.22	0.00	0.91	0.90
N	23	23	23	23	23	23	23	23

Table C-5f. Model performance statistics for the Worst 20% Days at the Cohutta Class I area.

COHU	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-64.44	-114.37	-8.34	-64.29	4.78	190.48	45.44	-51.06
MFE (%)	73.26	131.32	41.25	76.94	46.01	190.48	141.50	59.52
A _p	-0.48	1.00	-0.17	-0.03	-0.15	-999.00	-0.85	-0.44
NMB (%)	-48.01	-40.98	-3.97	-41.16	6.48	-999.00	-65.26	-39.23
NME (%)	54.69	87.80	50.87	57.36	50.78	-999.00	100.69	46.26
MNB (%)	-40.29	-55.39	9.05	-38.89	40.67	-999.00	-25.45	-33.00
MNE (%)	50.79	83.95	45.41	58.09	72.18	-999.00	70.16	42.53
MB (µg/m ³)	-88.61	-1.87	-1.03	-2.07	0.07	10.91	-1.11	-91.72
MAGE (µg/m ³)	100.93	4.01	13.15	2.88	0.56	10.91	1.71	108.16
RMSE (µg/m ³)	126.52	5.37	21.92	3.25	0.81	12.79	3.03	138.10
Obs Max (µg/m ³)	376.51	16.47	96.66	9.78	3.19	0.00	9.23	507.89
Pred Max (µg/m ³)	194.78	32.90	80.36	9.48	2.69	29.03	1.37	282.09
Mean_Obs	184.56	4.57	25.85	5.03	1.10	0.00	1.70	233.80
Mean_Pred	95.95	2.70	24.83	2.96	1.17	10.91	0.59	142.08
Std_Dev_Obs	81.83	3.53	18.12	1.51	0.59	0.00	2.77	91.26
Std_Dev_Pre	52.37	7.17	17.61	2.35	0.55	6.84	0.28	66.55
Variance	16006.81	28.82	480.69	10.57	0.66	163.56	9.17	19072.43
R ²	0.01	0.54	0.04	0.03	0.00	-999.00	0.13	0.02
BF	0.60	0.45	1.09	0.61	1.41	0.00	0.43	0.67
N	21	21	21	21	21	21	21	21

Table C-5g. Model performance statistics for the Worst 20% Days at the Dolly Sods Class I area.

DOSO	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-72.68	-116.04	-46.04	-106.64	-18.55	191.30	-133.53	-70.32
MFE (%)	79.52	127.19	65.52	106.64	42.44	191.30	133.53	75.20
A _p	-0.45	0.19	-0.37	-0.73	-0.37	-999.00	-0.93	-0.46
NMB (%)	-47.87	-60.19	-34.19	-69.89	-17.51	-999.00	-86.58	-47.83
NME (%)	54.04	77.85	49.85	69.89	34.44	-999.00	86.58	52.21
MNB (%)	-45.39	-58.71	-26.38	-68.33	3.88	-999.00	-77.99	-45.29
MNE (%)	53.23	75.27	50.74	68.33	49.74	-999.00	77.99	50.65
MB (µg/m ³)	-73.37	-1.72	-4.04	-2.89	-0.14	3.03	-1.36	-88.24
MAGE (µg/m ³)	82.83	2.23	5.89	2.89	0.28	3.03	1.36	96.32
RMSE (µg/m ³)	113.35	2.55	6.91	3.11	0.38	3.37	1.78	129.42
Obs Max (µg/m ³)	404.99	5.69	26.51	7.50	1.78	0.00	4.85	451.54
Pred Max (µg/m ³)	223.28	6.78	16.74	2.06	1.11	5.67	0.34	243.89
Mean_Obs	153.28	2.86	11.82	4.14	0.82	0.00	1.57	184.51
Mean_Pred	79.91	1.14	7.78	1.25	0.68	3.03	0.21	96.26
Std_Dev_Obs	78.10	1.10	5.71	1.22	0.32	0.00	1.21	80.44
Std_Dev_Pre	63.83	1.73	4.41	0.43	0.29	1.51	0.07	68.63
Variance	12847.43	6.53	47.69	9.70	0.14	11.38	3.18	16750.30
R ²	0.06	0.02	0.15	0.07	0.10	-999.00	0.32	0.03
BF	0.55	0.41	0.74	0.32	1.04	0.00	0.22	0.55
Num_Points	23	23	23	23	23	23	23	23

Table C-5h. Model performance statistics for the Worst 20% Days at the Everglades Class I area.

EVER	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-78.63	-193.20	-20.53	-23.81	-1.47	146.26	-106.69	-72.38
MFE (%)	92.21	193.20	60.07	60.39	102.54	182.68	106.69	81.65
A _p	0.30	-0.92	-0.77	0.09	-0.84	0.02	-0.77	-0.24
NMB (%)	-34.44	-97.70	-40.91	-20.12	-37.65	365.97	-75.50	-42.18
NME (%)	56.66	97.70	68.37	46.07	111.98	526.54	75.50	54.59
MNB (%)	-42.02	-98.16	3.60	-16.04	116.22	27.90	-66.00	-41.14
MNE (%)	60.29	98.16	52.64	41.20	179.95	127.20	66.00	52.69
MB (µg/m ³)	-13.47	-3.75	-7.39	-0.95	-0.50	2.67	-2.44	-34.61
MAGE (µg/m ³)	22.15	3.75	12.35	2.18	1.50	3.84	2.44	44.79
RMSE (µg/m ³)	26.53	4.08	29.80	3.20	3.59	5.05	3.57	58.45
Obs Max (µg/m ³)	79.12	8.02	134.42	10.81	16.92	11.70	13.75	196.06
Pred Max (µg/m ³)	103.14	0.67	31.29	11.74	2.74	11.92	3.18	149.58
Mean_Obs	39.10	3.84	18.06	4.74	1.34	0.73	3.23	82.04
Mean_Pred	25.63	0.09	10.67	3.79	0.84	3.40	0.79	47.43
Std_Dev_Obs	17.43	1.72	27.39	2.70	3.37	2.41	2.64	28.80
Std_Dev_Pre	28.94	0.17	8.82	3.09	0.81	3.01	0.63	42.20
Variance	704.09	16.68	887.81	10.22	12.91	25.47	12.75	3416.20
R ²	0.35	0.19	0.01	0.18	0.05	0.09	0.01	0.01
BF	0.58	0.02	1.04	0.80	2.16	0.27	0.34	0.59
N	24	24	24	24	24	24	24	24

Table C-5i. Model performance statistics for the Worst 20% Days at the Great Smokey Mountains Class I area.

GRSM	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-63.76	-163.78	-1.34	-63.89	1.23	200.00	-100.86	-52.84
MFE (%)	65.31	197.12	37.84	64.35	43.61	200.00	124.35	54.90
A _p	-0.31	-0.85	0.42	-0.25	0.74	-999.00	-0.83	-0.20
NMB (%)	-43.46	-97.29	-0.61	-46.94	5.71	-999.00	-80.08	-38.18
NME (%)	44.65	97.64	39.61	47.41	43.59	-999.00	83.61	39.87
MNB (%)	-43.44	-99.12	13.10	-46.37	48.53	-999.00	-27.41	-37.69
MNE (%)	45.09	99.12	44.16	46.84	80.70	-999.00	107.85	39.86
MB (µg/m ³)	-73.15	-2.67	-0.11	-2.25	0.06	7.32	-1.63	-79.67
MAGE (µg/m ³)	75.14	2.68	7.46	2.28	0.42	7.32	1.70	83.20
RMSE (µg/m ³)	92.01	3.23	10.13	2.54	0.57	8.15	2.15	100.92
Obs Max (µg/m ³)	308.51	10.16	33.88	7.71	1.52	0.00	4.89	347.18
Pred Max (µg/m ³)	212.34	1.54	47.97	5.81	2.66	17.08	0.82	277.94
Mean_Obs	168.29	2.75	18.83	4.80	0.97	0.00	2.03	208.67
Mean_Pred	95.15	0.07	18.71	2.55	1.02	7.32	0.40	129.00
Std_Dev_Obs	64.74	2.07	7.77	1.29	0.37	0.00	1.42	65.71
Std_Dev_Pre	58.12	0.31	8.98	1.16	0.53	3.68	0.15	66.87
Variance	8466.67	10.42	102.61	6.47	0.32	66.48	4.61	10185.05
R ²	0.33	0.56	0.06	0.27	0.04	-999.00	0.00	0.30
BF	0.57	0.01	1.13	0.54	1.49	0.00	0.73	0.62
N	24	24	24	24	24	24	24	24

Table C-5j. Model performance statistics for the Worst 20% Days at the Hercules Glade Class I area.

HEGL	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-62.64	-64.72	-31.35	-67.72	88.94	192.00	-37.50	-27.40
MFE (%)	73.75	95.79	40.17	67.72	93.38	192.00	51.55	43.36
A _p	-0.54	-0.19	-0.33	-0.31	0.80	-999.00	-0.58	-0.45
NMB (%)	-39.63	-21.48	-26.27	-48.11	176.06	-999.00	-36.57	-19.99
NME (%)	52.05	55.67	35.45	48.11	190.77	-999.00	47.96	36.40
MNB (%)	-37.25	-18.60	-22.76	-48.54	330.59	-999.00	-23.65	-14.88
MNE (%)	52.07	75.95	33.30	48.54	334.07	-999.00	40.40	34.41
MB (µg/m ³)	-41.28	-3.14	-4.77	-2.39	1.84	28.38	-1.05	-31.35
MAGE (µg/m ³)	54.21	8.13	6.44	2.39	1.99	28.38	1.38	57.08
RMSE (µg/m ³)	82.66	16.53	8.68	2.63	2.53	30.85	1.93	90.89
Obs Max (µg/m ³)	339.47	99.26	42.42	9.36	4.42	0.00	8.18	377.55
Pred Max (µg/m ³)	155.36	80.27	28.32	6.45	7.97	47.45	3.41	207.61
Mean_Obs	104.15	14.60	18.16	4.96	1.04	0.00	2.88	156.80
Mean_Pred	62.87	11.47	13.39	2.57	2.88	28.38	1.83	125.46
Std_Dev_Obs	61.34	27.70	8.58	1.45	0.82	0.00	1.57	52.29
Std_Dev_Pre	49.77	22.81	6.10	1.33	1.52	12.33	0.63	59.02
Variance	6832.22	273.09	75.41	6.90	6.43	951.43	3.74	8260.55
R ²	0.02	0.64	0.29	0.46	0.01	-999.00	0.00	0.05
BF	0.63	0.81	0.77	0.51	4.31	0.00	0.76	0.85
N	25	25	25	25	25	25	25	25

Table C-5k. Model performance statistics for the Worst 20% Days at the James Rover Face Class I area.

JARI	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-44.05	-161.63	-45.20	-99.63	-17.57	200.00	-151.62	-46.37
MFE (%)	55.27	173.62	50.38	99.63	35.59	200.00	151.62	52.93
A _p	-0.23	0.64	-0.74	-0.70	-0.76	-999.00	-0.96	-0.27
NMB (%)	-29.70	-72.08	-45.42	-66.94	-25.82	-999.00	-88.49	-33.54
NME (%)	40.79	96.06	47.83	66.94	36.46	-999.00	88.49	39.47
MNB (%)	-27.68	-77.76	-32.72	-65.82	-5.07	-999.00	-85.78	-32.04
MNE (%)	41.58	96.60	38.51	65.82	36.00	-999.00	85.78	39.68
MB (µg/m ³)	-48.04	-3.12	-11.73	-4.71	-0.28	6.09	-2.62	-71.76
MAGE (µg/m ³)	65.98	4.16	12.36	4.71	0.39	6.09	2.62	84.45
RMSE (µg/m ³)	78.63	4.57	23.32	5.01	0.79	6.47	3.13	97.61
Obs Max (µg/m ³)	274.58	8.70	119.43	11.72	4.58	0.00	10.28	324.44
Pred Max (µg/m ³)	212.68	14.24	30.79	3.53	1.11	9.46	0.44	237.97
Mean_Obs	161.76	4.33	25.83	7.03	1.07	0.00	2.96	213.98
Mean_Pred	113.71	1.21	14.10	2.32	0.79	6.09	0.34	142.22
Std_Dev_Obs	44.65	1.96	23.46	1.98	0.80	0.00	1.76	52.76
Std_Dev_Pre	62.85	3.39	6.34	0.64	0.21	2.23	0.07	65.78
Variance	6182.14	20.87	543.67	25.14	0.62	41.85	9.82	9528.45
R ²	0.11	0.08	0.31	0.22	0.13	-999.00	0.00	0.13
BF	0.72	0.22	0.67	0.34	0.95	0.00	0.14	0.68
N	24	24	24	24	24	24	24	24

Table C-5l. Model performance statistics for the Worst 20% Days at the Linville Gorge Class I area.

LIGO	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-62.93	-150.69	-30.70	-87.63	-18.24	196.89	-153.13	-57.00
MFE (%)	67.74	159.27	40.91	87.63	31.41	196.89	153.13	60.02
A _p	-0.19	-0.02	0.15	-0.33	0.08	3.84	-0.82	-0.23
NMB (%)	-39.98	-71.27	-23.15	-59.18	-15.85	5689.19	-86.95	-38.66
NME (%)	44.99	82.09	32.56	59.18	28.30	5689.19	86.95	41.53
MNB (%)	-41.43	-74.75	-21.29	-59.63	-11.88	384.10	-86.53	-39.51
MNE (%)	46.79	85.40	33.45	59.63	27.35	384.10	86.53	42.81
MB (µg/m ³)	-58.86	-1.63	-3.65	-2.69	-0.13	5.25	-2.09	-71.19
MAGE (µg/m ³)	66.23	1.88	5.14	2.69	0.23	5.25	2.09	76.47
RMSE (µg/m ³)	75.30	2.08	6.40	2.81	0.29	5.68	2.19	87.22
Obs Max (µg/m ³)	290.29	4.53	31.89	6.06	1.27	2.03	4.03	343.89
Pred Max (µg/m ³)	235.90	4.41	36.79	4.06	1.37	9.82	0.75	266.44
Mean_Obs	147.22	2.29	15.77	4.55	0.81	0.09	2.40	184.14
Mean_Pred	88.35	0.66	12.12	1.86	0.68	5.34	0.31	112.95
Std_Dev_Obs	49.16	0.94	6.92	0.97	0.26	0.43	0.74	52.20
Std_Dev_Pre	60.94	1.28	7.33	0.84	0.30	2.38	0.14	65.76
Variance	5669.60	4.34	41.00	7.88	0.09	32.28	4.81	7607.62
R ²	0.41	0.10	0.51	0.36	0.29	0.18	0.29	0.41
BF	0.59	0.25	0.79	0.40	0.88	0.22	0.13	0.60
N	22	22	22	22	22	22	22	22

Table C-5m. Model performance statistics for the Worst 20% Days at the Mammoth Cave Class I area.

MACA	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-65.12	-134.11	-64.77	-68.22	37.17	183.33	73.57	-57.57
MFE (%)	68.90	147.55	66.39	68.22	55.41	183.33	156.43	60.57
A _p	-0.38	-0.37	0.07	-0.25	-0.53	-999.00	-0.69	-0.39
NMB (%)	-46.69	-57.44	-44.40	-49.42	22.76	-999.00	-28.66	-42.27
NME (%)	49.96	65.21	46.28	49.42	72.16	-999.00	117.76	44.92
MNB (%)	-41.05	-64.03	-45.70	-48.73	103.82	-999.00	23.87	-37.74
MNE (%)	45.22	84.58	47.41	48.73	117.45	-999.00	124.55	41.05
MB (µg/m ³)	-83.29	-5.79	-9.61	-2.75	0.29	13.40	-0.32	-96.83
MAGE (µg/m ³)	89.11	6.58	10.02	2.75	0.93	13.40	1.31	102.89
RMSE (µg/m ³)	120.48	10.17	11.30	3.15	1.58	15.17	1.60	136.14
Obs Max (µg/m ³)	347.31	107.80	40.53	9.05	8.22	0.00	4.63	405.74
Pred Max (µg/m ³)	216.80	68.26	43.56	6.76	3.90	25.46	1.41	246.32
Mean_Obs	178.37	10.09	21.64	5.57	1.28	0.00	1.11	229.07
Mean_Pred	95.08	4.29	12.03	2.82	1.58	13.40	0.79	132.24
Std_Dev_Obs	68.00	21.11	7.98	1.75	1.55	0.00	1.56	65.54
Std_Dev_Pre	56.54	13.85	8.66	1.42	0.69	7.28	0.27	65.53
Variance	14514.27	103.51269	127.72	9.90	2.51	230.24	2.55	18532.89
R ²	0.00	0.93	0.54	0.29	0.03	-999.00	0.00	0.01
BF	0.59	0.36	0.54	0.51	2.04	0.00	0.62	0.62
N	24	24	24	24	24	24	24	24

Table C-5n. Model performance statistics for the Worst 20% Days at the Mingo Class I area.

MING	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-20.59	-53.58	-22.20	-18.82	107.61	190.54	-13.23	20.38
MFE (%)	66.65	111.83	49.34	43.70	113.87	190.54	37.67	54.93
A _p	-0.13	0.07	-0.22	-0.25	0.45	72.50	-0.38	0.46
NMB (%)	4.74	30.45	-27.80	-22.91	206.49	87137.63	-21.72	40.81
NME (%)	59.76	64.63	44.49	40.91	227.86	87137.63	36.98	65.30
MNB (%)	6.00	58.25	5.73	1.02	587.75	13729.83	-3.73	47.74
MNE (%)	65.16	150.88	56.28	48.24	592.40	13729.83	36.45	69.83
MB (µg/m ³)	5.35	6.29	-4.29	-1.12	2.99	69.04	-1.12	69.50
MAGE (µg/m ³)	67.43	13.36	6.87	2.00	3.30	69.04	1.91	111.22
RMSE (µg/m ³)	83.82	21.83	9.85	2.64	3.77	76.00	2.60	136.16
Obs Max (µg/m ³)	263.55	105.09	40.46	10.36	6.65	1.56	11.69	287.91
Pred Max (µg/m ³)	228.22	112.07	31.38	7.75	9.61	114.64	7.23	419.01
Mean_Obs	112.84	20.67	15.43	4.89	1.45	0.08	5.15	170.33
Mean_Pred	118.19	26.96	11.14	3.77	4.44	69.12	4.03	239.83
Std_Dev_Obs	63.96	30.73	10.19	2.42	1.37	0.33	2.83	43.37
Std_Dev_Pre	88.99	38.04	6.24	1.47	1.73	32.57	1.04	111.15
Variance	7025.62	476.67	97.08	6.99	14.18	5776.49	6.75	18538.89
R ²	0.17	0.68	0.22	0.08	0.02	0.03	0.32	0.00
BF	1.06	1.58	1.06	1.01	6.88	12.57	0.96	1.48
N	22	22	20	20	22	22	22	22

Table C-5o. Model performance statistics for the Worst 20% Days at the Okefenokee Class I area.

OKEF	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-79.19	-151.20	-7.49	-66.68	18.36	193.37	-117.48	-60.64
MFE (%)	79.72	153.54	42.51	78.30	75.40	193.37	121.37	60.64
A _p	-0.23	-0.62	-0.49	-0.21	0.42	5.42	-0.71	-0.10
NMB (%)	-49.55	-78.69	-18.89	-42.37	30.38	6970.71	-79.40	-43.75
NME (%)	50.03	80.92	50.95	62.56	90.15	6970.71	80.10	43.75
MNB (%)	-52.76	-80.49	6.44	-39.32	296.99	62.41	-68.22	-42.38
MNE (%)	53.31	83.19	39.20	60.73	338.55	62.41	72.60	42.38
MB (µg/m ³)	-47.55	-4.38	-6.64	-3.20	0.24	4.11	-2.14	-69.45
MAGE (µg/m ³)	48.02	4.51	17.90	4.72	0.72	4.11	2.16	69.45
RMSE (µg/m ³)	57.10	5.46	37.27	7.22	0.93	4.49	2.47	88.19
Obs Max (µg/m ³)	271.57	15.83	156.35	29.54	1.57	1.36	4.79	341.01
Pred Max (µg/m ³)	208.50	6.03	80.47	23.21	2.23	8.70	1.41	308.25
Mean_Obs	95.97	5.57	35.14	7.54	0.79	0.06	2.69	158.76
Mean_Pred	48.41	1.19	28.50	4.35	1.04	4.17	0.55	89.30
Std_Dev_Obs	57.98	3.49	32.48	6.19	0.45	0.28	1.33	60.33
Std_Dev_Pre	44.25	1.86	19.09	5.04	0.59	1.75	0.33	57.69
Variance	3260.75	29.83	1388.71	52.15	0.86	20.15	6.12	7777.06
R ²	0.69	0.12	0.00	0.10	0.30	0.06	0.09	0.31
BF	0.47	0.20	1.06	0.61	3.97	0.07	0.32	0.58
N	23	23	23	23	23	23	23	23

Table C-5p. Model performance statistics for the Worst 20% Days at the Cape Romain Class I area.

ROMA	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-56.37	-143.06	-55.60	-71.38	19.21	200.00	-17.45	-51.44
MFE (%)	73.61	169.89	59.90	73.52	93.27	200.00	88.22	62.26
A _p	-0.31	3.18	-0.25	-0.08	0.66	-999.00	-0.16	-0.30
NMB (%)	-38.82	-13.25	-36.31	-41.50	54.48	-999.00	-35.45	-35.48
NME (%)	57.49	135.58	44.40	46.11	122.86	-999.00	63.08	47.16
MNB (%)	-29.54	-30.23	-36.69	-48.41	204.20	-999.00	327.16	-30.91
MNE (%)	53.90	131.34	42.01	50.87	254.18	-999.00	396.06	45.14
MB (µg/m ³)	-33.72	-0.69	-7.33	-2.27	0.38	6.16	-0.91	-47.20
MAGE (µg/m ³)	49.93	7.06	8.97	2.53	0.85	6.16	1.62	62.73
RMSE (µg/m ³)	67.15	12.07	14.36	2.93	1.06	7.11	2.10	79.95
Obs Max (µg/m ³)	234.53	13.18	70.65	14.42	1.77	0.00	7.17	270.34
Pred Max (µg/m ³)	162.03	55.10	52.73	13.30	2.93	13.62	6.04	189.41
Mean_Obs	86.86	5.21	20.20	5.48	0.69	0.00	2.57	133.01
Mean_Pred	53.14	4.52	12.86	3.21	1.07	6.16	1.66	85.82
Std_Dev_Obs	49.18	2.74	15.93	3.04	0.40	0.00	1.72	46.84
Std_Dev_Pre	39.67	12.76	12.71	3.08	0.82	3.62	1.15	49.11
Variance	4508.59	145.67	206.27	8.57	1.12	50.58	4.39	6392.06
R ²	0.01	0.07	0.40	0.66	0.08	-999.00	0.02	0.00
BF	0.70	0.70	0.63	0.52	3.04	0.00	4.27	0.69
N	24	24	24	24	24	24	24	24

Table C-5q. Model performance statistics for the Worst 20% Days at the St. Marks Class I area.

SAMA	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-65.33	-155.89	-5.70	-36.19	7.23	199.98	-92.52	-53.12
MFE (%)	69.16	155.89	53.89	56.79	89.12	199.98	97.18	56.84
A _p	-0.06	-0.53	0.24	0.61	-0.16	1920.06	-0.34	-0.03
NMB (%)	-40.40	-74.41	0.20	-4.63	26.17	1762079.63	-62.69	-34.34
NME (%)	45.02	74.41	50.55	56.59	110.11	1762079.63	64.18	38.46
MNB (%)	-42.17	-83.45	18.88	-10.13	268.57	113272.12	-57.20	-35.23
MNE (%)	46.35	83.45	58.03	56.61	322.15	113272.12	62.93	39.24
MB (µg/m ³)	-37.22	-3.58	0.04	-0.28	0.23	6.90	-1.93	-47.55
MAGE (µg/m ³)	41.48	3.58	10.40	3.39	0.98	6.90	1.98	53.27
RMSE (µg/m ³)	51.84	4.16	14.75	5.69	1.33	7.80	2.30	65.75
Obs Max (µg/m ³)	174.11	17.40	76.59	17.16	4.06	0.01	7.80	207.54
Pred Max (µg/m ³)	162.80	8.26	95.29	27.58	3.41	17.29	5.13	200.98
Mean_Obs	92.14	4.81	20.59	5.99	0.89	0.00	3.08	138.50
Mean_Pred	54.92	1.23	20.63	5.71	1.12	6.90	1.15	90.94
Std_Dev_Obs	34.96	3.53	18.04	3.86	0.76	0.00	1.60	30.80
Std_Dev_Pre	40.81	2.25	20.11	7.30	0.89	3.73	1.14	51.92
Variance	2687.22	17.32	217.69	32.39	1.76	60.83	5.31	4323.43
R ²	0.29	0.65	0.48	0.37	0.09	0.04	0.37	0.22
BF	0.58	0.17	1.19	0.90	3.69	49.29	0.43	0.65
N	23	23	23	23	23	23	23	23

Table C-5r. Model performance statistics for the Worst 20% Days at the Shenandoah Class I area.

SHEN	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-76.03	12.44	-21.00	-77.27	13.36	175.00	-119.18	-69.71
MFE (%)	84.20	97.89	50.51	78.63	50.24	175.00	119.18	77.03
A _p	-0.46	-0.13	-0.84	-0.60	-0.75	-999.00	-0.94	-0.36
NMB (%)	-49.46	51.63	-43.57	-57.04	-16.01	-999.00	-80.94	-44.97
NME (%)	56.28	129.69	59.35	58.47	50.78	-999.00	80.94	51.51
MNB (%)	-45.12	149.15	-2.40	-52.83	59.10	-999.00	-72.31	-41.96
MNE (%)	55.84	198.87	48.56	54.30	86.79	-999.00	72.31	50.86
MB (µg/m ³)	-86.47	3.04	-8.89	-3.12	-0.18	8.24	-2.65	-99.38
MAGE (µg/m ³)	98.39	7.64	12.11	3.20	0.57	8.24	2.65	113.84
RMSE (µg/m ³)	117.52	10.84	31.39	4.09	1.17	9.41	3.88	135.13
Obs Max (µg/m ³)	354.08	32.37	150.90	15.51	6.59	0.00	15.30	375.09
Pred Max (µg/m ³)	192.70	28.15	24.29	6.22	1.63	16.00	0.91	240.70
Mean_Obs	174.83	5.89	20.40	5.48	1.12	0.00	3.27	221.00
Mean_Pred	88.37	8.93	11.51	2.35	0.94	8.24	0.62	121.62
Std_Dev_Obs	74.90	6.47	29.56	2.49	1.30	0.00	2.91	66.32
Std_Dev_Pre	63.95	8.06	6.22	1.10	0.33	4.63	0.18	79.02
Variance	13811.26	117.59460	985.14	16.77	1.37	88.53	15.09	18260.59
R ²	0.10	0.00	0.01	0.00	0.23	-999.00	0.01	0.03
BF	0.55	2.49	0.98	0.47	1.59	0.00	0.28	0.58
N	24	24	24	24	24	24	24	24

Table C-5s. Model performance statistics for the Worst 20% Days at the Shining Rock Class I area.

SHRO	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-64.10	-187.59	-31.54	-28.66	-29.64	199.31	-132.94	-57.06
MFE (%)	68.47	187.59	39.71	36.19	41.93	199.31	132.94	59.79
A _p	-0.55	-0.85	0.57	0.14	-0.39	151.98	-0.86	-0.52
NMB (%)	-44.23	-96.56	-20.83	-23.28	-29.58	50992.11	-83.16	-41.26
NME (%)	48.75	96.56	33.83	31.40	38.94	50992.11	83.16	44.09
MNB (%)	-42.37	-96.50	-21.93	-21.05	-19.64	12340.48	-78.61	-39.81
MNE (%)	47.60	96.50	33.53	29.33	33.81	12340.48	78.61	42.98
MB (µg/m ³)	-71.73	-3.00	-3.26	-0.57	-0.31	5.56	-1.51	-80.99
MAGE (µg/m ³)	79.06	3.00	5.30	0.77	0.41	5.56	1.51	86.54
RMSE (µg/m ³)	106.33	3.22	6.88	0.95	0.57	5.84	1.73	114.15
Obs Max (µg/m ³)	475.66	6.49	23.94	3.86	2.55	0.06	3.68	518.88
Pred Max (µg/m ³)	214.07	0.96	37.53	4.41	1.56	8.90	0.50	250.07
Mean_Obs	162.18	3.11	15.66	2.45	1.05	0.01	1.82	196.28
Mean_Pred	90.45	0.11	12.40	1.88	0.74	5.57	0.31	115.28
Std_Dev_Obs	77.95	1.22	4.55	0.73	0.51	0.02	0.88	80.56
Std_Dev_Pre	56.81	0.21	7.07	0.80	0.28	1.82	0.08	61.81
Variance	11306.41	10.38869	47.33	0.90	0.33	34.06	2.98	13029.82
R ²	0.11	0.03	0.26	0.24	0.11	0.09	0.21	0.13
BF	0.58	0.03	0.78	0.79	0.80	24.88	0.21	0.60
N	25	25	25	25	25	25	25	25

Table C-5t. Model performance statistics for the Worst 20% Days at the Sipsey Class I area.

SIPS	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-70.46	-117.95	-10.05	-80.92	22.60	199.72	-129.72	-48.58
MFE (%)	80.31	143.41	59.66	83.49	59.52	199.72	129.72	60.40
A _p	-0.26	-0.05	0.81	-0.45	0.37	919.30	-0.72	-0.12
NMB (%)	-39.82	-33.47	14.40	-55.11	43.23	738981.75	-79.24	-28.95
NME (%)	49.60	93.13	62.85	57.44	76.60	738981.75	79.24	41.90
MNB (%)	-41.83	-47.12	12.97	-54.30	71.45	6291.68	-77.36	-29.54
MNE (%)	53.89	95.39	63.20	57.30	99.81	6291.68	77.36	44.20
MB (µg/m ³)	-51.76	-3.37	3.35	-3.26	0.43	11.39	-2.45	-53.35
MAGE (µg/m ³)	64.47	9.37	14.63	3.40	0.76	11.39	2.45	77.22
RMSE (µg/m ³)	76.05	17.21	18.18	3.72	0.99	13.95	2.68	90.66
Obs Max (µg/m ³)	279.55	63.69	41.03	11.07	2.28	0.03	5.08	325.68
Pred Max (µg/m ³)	208.05	60.69	74.21	6.10	3.12	31.20	1.41	286.87
Mean_Obs	129.97	10.07	23.28	5.92	0.99	0.00	3.09	184.32
Mean_Pred	78.21	6.70	26.63	2.66	1.42	11.39	0.64	130.96
Std_Dev_Obs	65.73	16.76	8.98	1.85	0.45	0.01	1.08	62.72
Std_Dev_Pre	64.39	15.57	20.92	1.40	0.82	8.24	0.33	87.85
Variance	5783.50	296.22	330.57	13.84	0.98	194.58	7.16	8218.50
R ²	0.38	0.19	0.24	0.16	0.00	0.06	0.01	0.30
BF	0.58	0.53	1.13	0.46	1.71	2.91	0.23	0.70
N	22	22	22	22	22	22	22	22

Table C-5u. Model performance statistics for the Worst 20% Days at the Swanquarter Class I area.

SWAN	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-56.96	-122.20	-58.99	-76.45	31.37	187.73	-131.45	-49.02
MFE (%)	81.41	156.01	58.99	79.31	74.32	194.88	131.45	62.35
A _p	0.03	0.45	-0.79	0.21	1.01	6.38	-0.74	0.00
NMB (%)	-24.66	3.84	-52.47	-50.51	50.46	7507.01	-80.76	-31.38
NME (%)	57.70	93.70	52.47	55.29	100.20	7623.59	80.76	46.10
MNB (%)	-28.04	-19.11	-41.81	-51.65	183.63	-58.29	-77.44	-29.30
MNE (%)	59.96	125.41	41.81	55.08	214.89	58.29	77.44	45.20
MB (µg/m ³)	-20.67	0.29	-12.17	-2.42	0.31	3.93	-2.95	-42.55
MAGE (µg/m ³)	48.38	6.98	12.17	2.65	0.62	3.99	2.95	62.51
RMSE (µg/m ³)	58.52	10.49	24.00	2.90	0.87	4.51	3.25	76.28
Obs Max (µg/m ³)	209.85	45.16	128.63	7.73	1.34	1.20	7.26	243.51
Pred Max (µg/m ³)	216.04	65.32	26.40	9.32	2.68	8.88	1.89	244.55
Mean_Obs	83.84	7.44	23.19	4.79	0.62	0.05	3.65	135.60
Mean_Pred	63.17	7.73	11.02	2.37	0.93	3.98	0.70	93.05
Std_Dev_Obs	43.76	9.31	24.50	1.68	0.34	0.25	1.34	39.17
Std_Dev_Pre	60.46	16.51	6.37	1.92	0.62	2.16	0.41	60.38
Variance	3425.07	110.06	576.21	8.44	0.75	20.33	10.56	5818.45
R ²	0.21	0.63	0.38	0.35	0.19	0.12	0.00	0.04
BF	0.72	0.81	0.58	0.48	2.84	0.02	0.23	0.71
N	23	23	23	23	23	23	23	23

Table C-5v. Model performance statistics for the Worst 20% Days at the Upper Buffalo Class I area.

UPBU	bextSO4	bextNO3	bextOC	bextEC	bextSOIL	bextSS	bextCM	totalBEXT
MFB (%)	-63.22	-94.84	-21.14	-69.02	52.35	191.67	-150.24	-45.58
MFE (%)	70.32	123.99	27.94	69.02	70.13	191.67	150.24	52.57
A _p	-0.40	-0.20	-0.56	-0.30	0.18	-999.00	-0.92	-0.34
NMB (%)	-39.96	-21.91	-20.56	-50.26	75.18	-999.00	-89.44	-32.00
NME (%)	47.24	99.30	27.44	50.26	110.32	-999.00	89.44	39.01
MNB (%)	-39.30	-4.26	-15.33	-48.75	150.41	-999.00	-84.89	-29.86
MNE (%)	47.64	119.52	22.99	48.75	162.88	-999.00	84.89	37.75
MB (µg/m ³)	-40.13	-2.13	-3.40	-2.13	0.87	15.10	-7.97	-48.64
MAGE (µg/m ³)	47.45	9.67	4.53	2.13	1.27	15.10	7.97	59.30
RMSE (µg/m ³)	71.44	20.14	8.32	2.49	1.81	17.18	9.76	84.24
Obs Max (µg/m ³)	273.55	98.02	52.31	7.21	5.34	0.00	20.96	311.47
Pred Max (µg/m ³)	163.12	78.69	23.01	5.03	6.32	29.04	1.68	204.34
Mean_Obs	100.43	9.74	16.53	4.24	1.15	0.00	8.91	152.01
Mean_Pred	60.30	7.61	13.13	2.11	2.02	15.10	0.94	103.37
Std_Dev_Obs	57.29	21.23	9.64	1.24	0.96	0.00	5.76	53.33
Std_Dev_Pre	47.58	18.03	5.84	0.95	1.15	8.38	0.31	57.74
Variance	5103.16	405.65	69.21	6.20	3.27	295.24	95.35	7097.14
R ²	0.12	0.22	0.35	0.09	0.03	-999.00	0.00	0.04
BF	0.61	0.96	0.85	0.51	2.50	0.00	0.15	0.70
N	24	24	24	24	24	24	24	24

C.2.3 Class I Area Model Performance Evaluation

Below we summarize the CMAQ 2002 Base G2 12 km Actual base case model performance at each of the Class I area within and nearby the VISTAS region for the best and worst 20% days and then for all days during 2002.

C.2.3.1 Sipsey Wilderness Area (SIPS), Alabama

C.2.3.1.1 SIPS Best 20 Percent Days

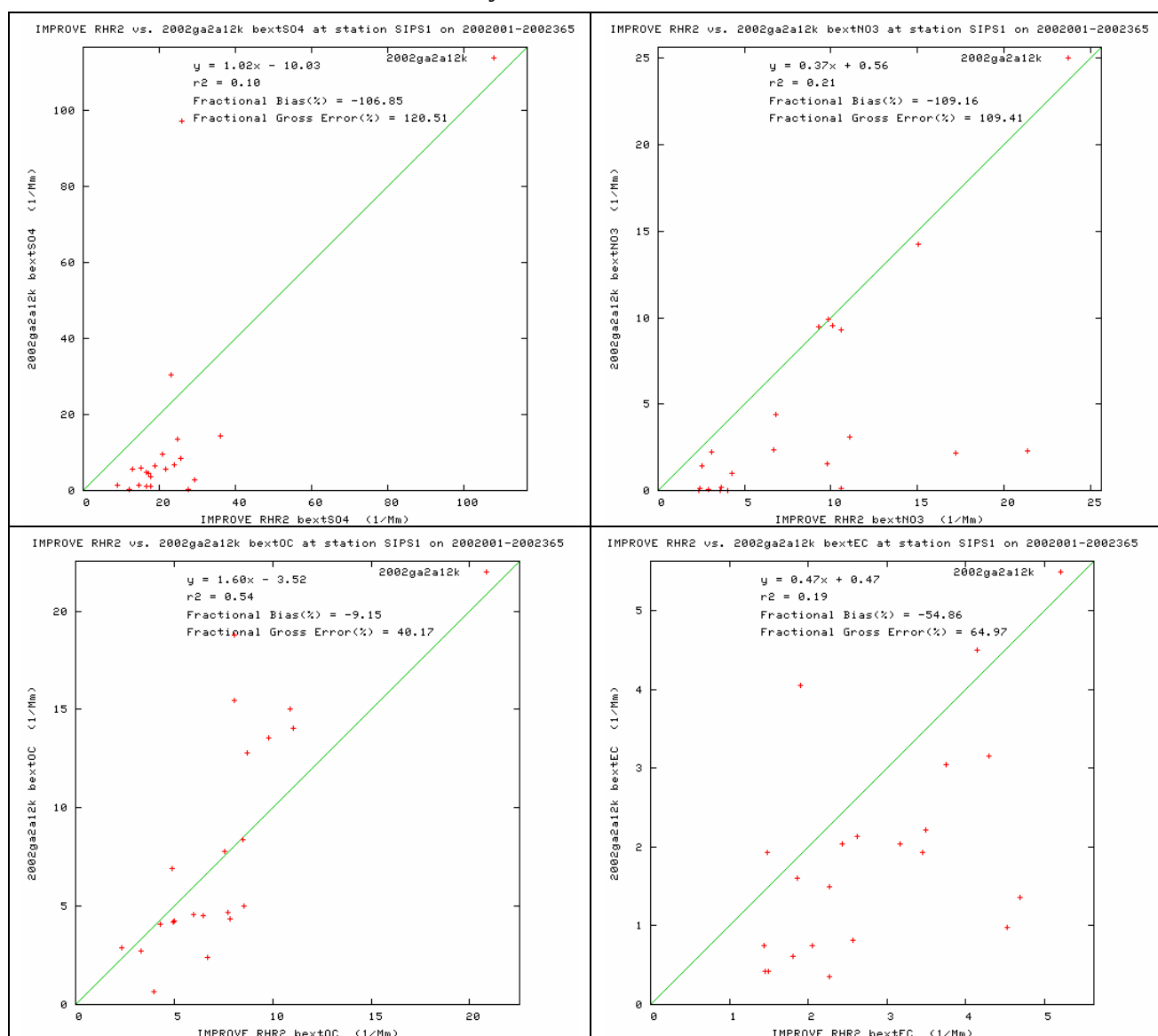


Figure C-3a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Sipsey (SIPS), Alabama for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).

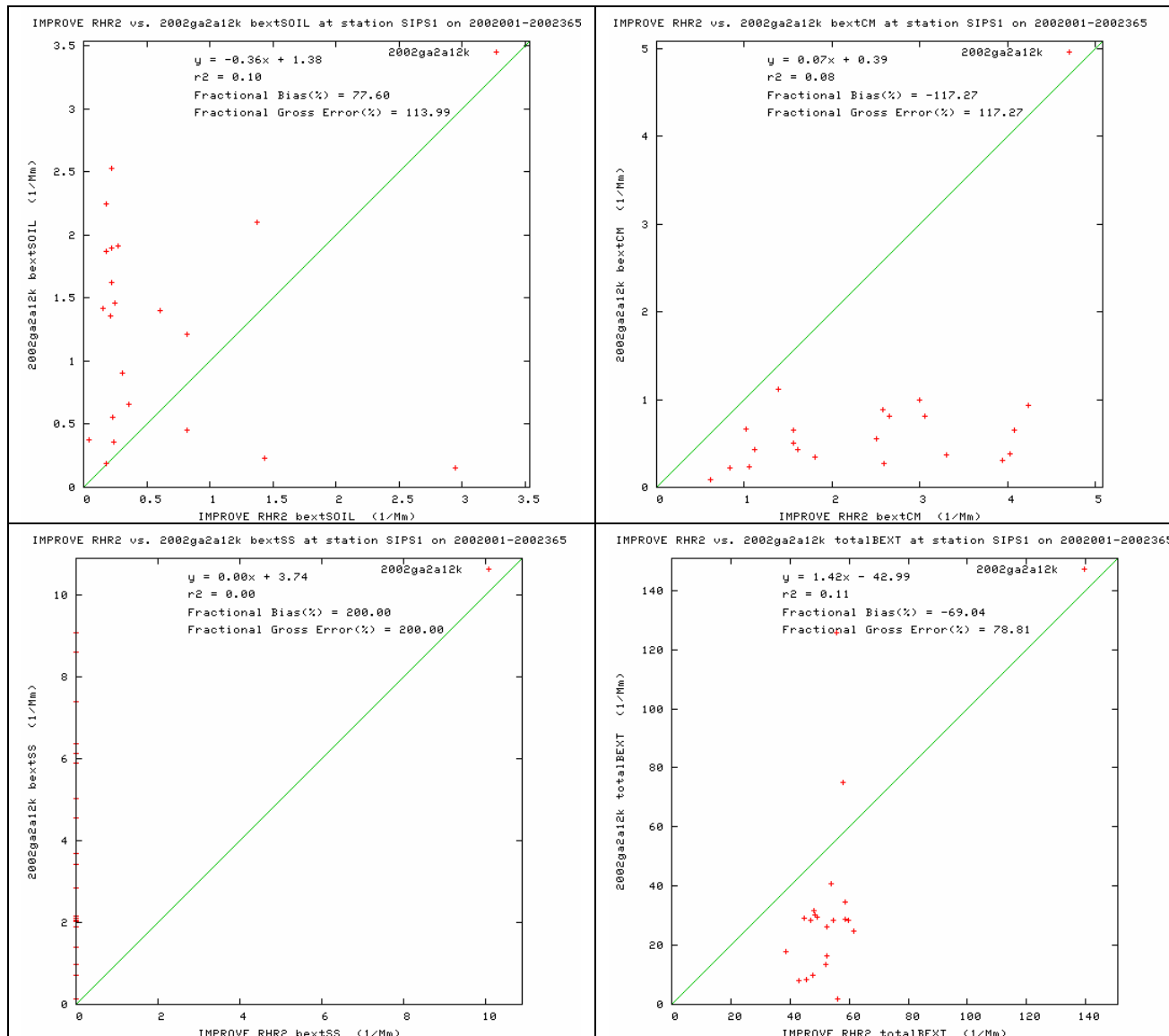


Figure C-3b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Sipsey (SIPS), Alabama for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; B20

SIPS1

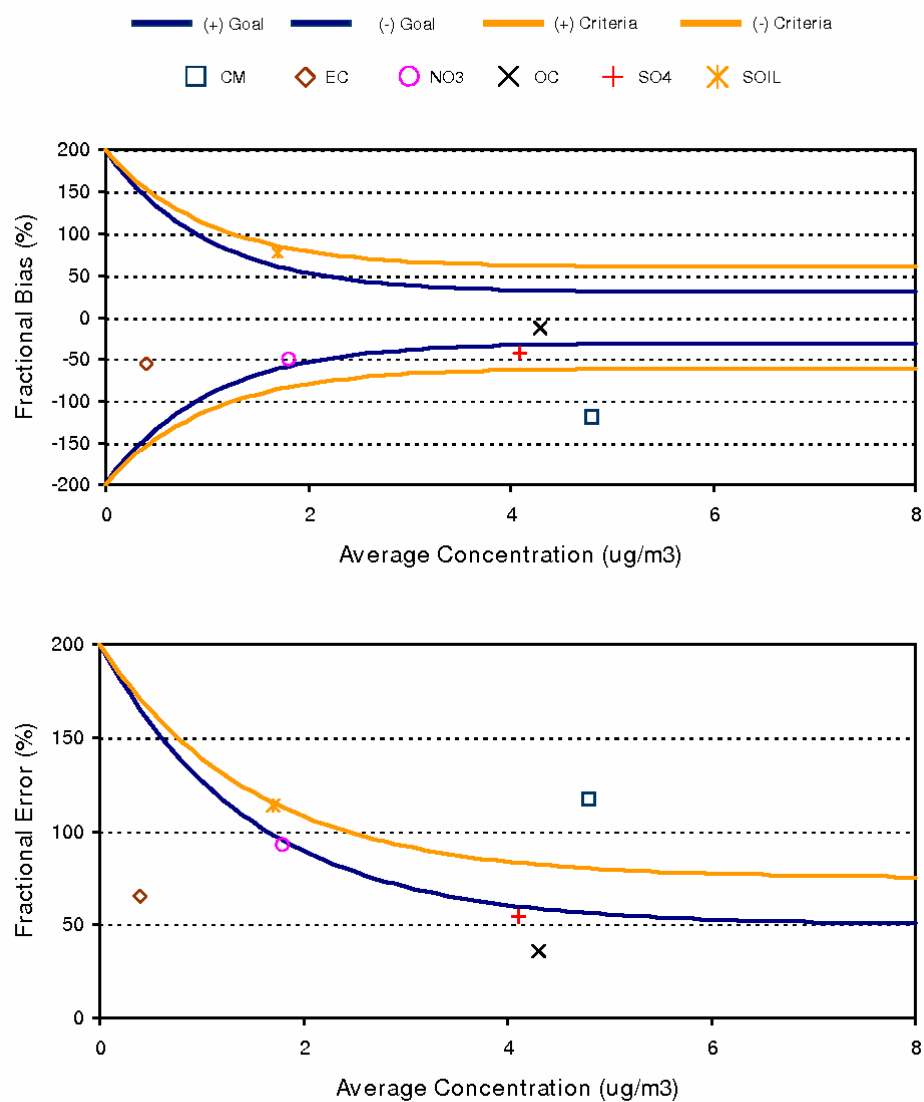


Figure C-4. Bugle Plots of Fractional Bias and Fractional Gross Error for Sipsey, Alabama and the Best 20 Percent Days.

2.3.1.2 SIPS Worst 20 Percent Days

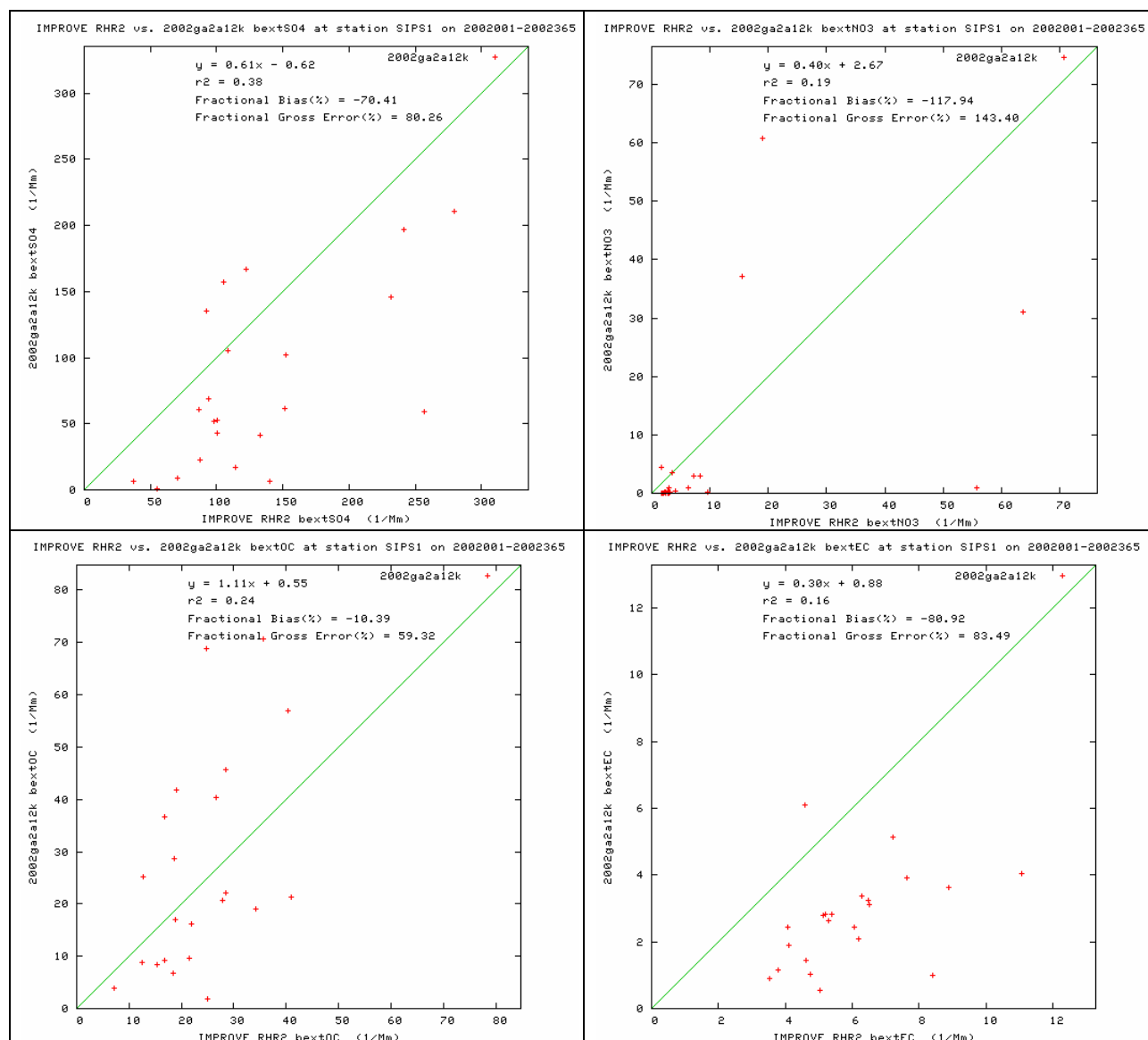


Figure C-5a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Sipsey (SIPS), Alabama for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).

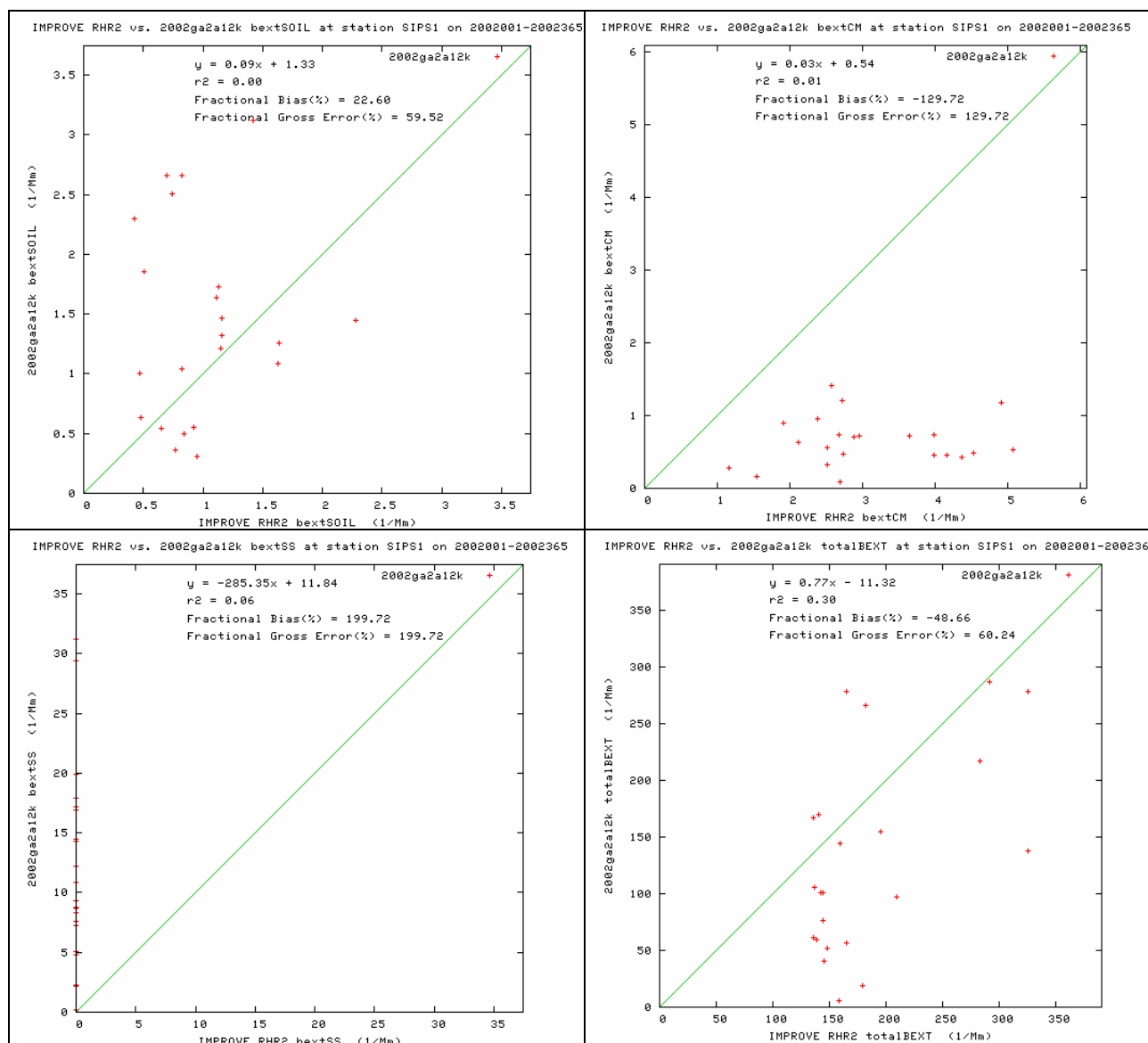


Figure C-5b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Sipsey (SIPS), Alabama for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; W20

SIPS1

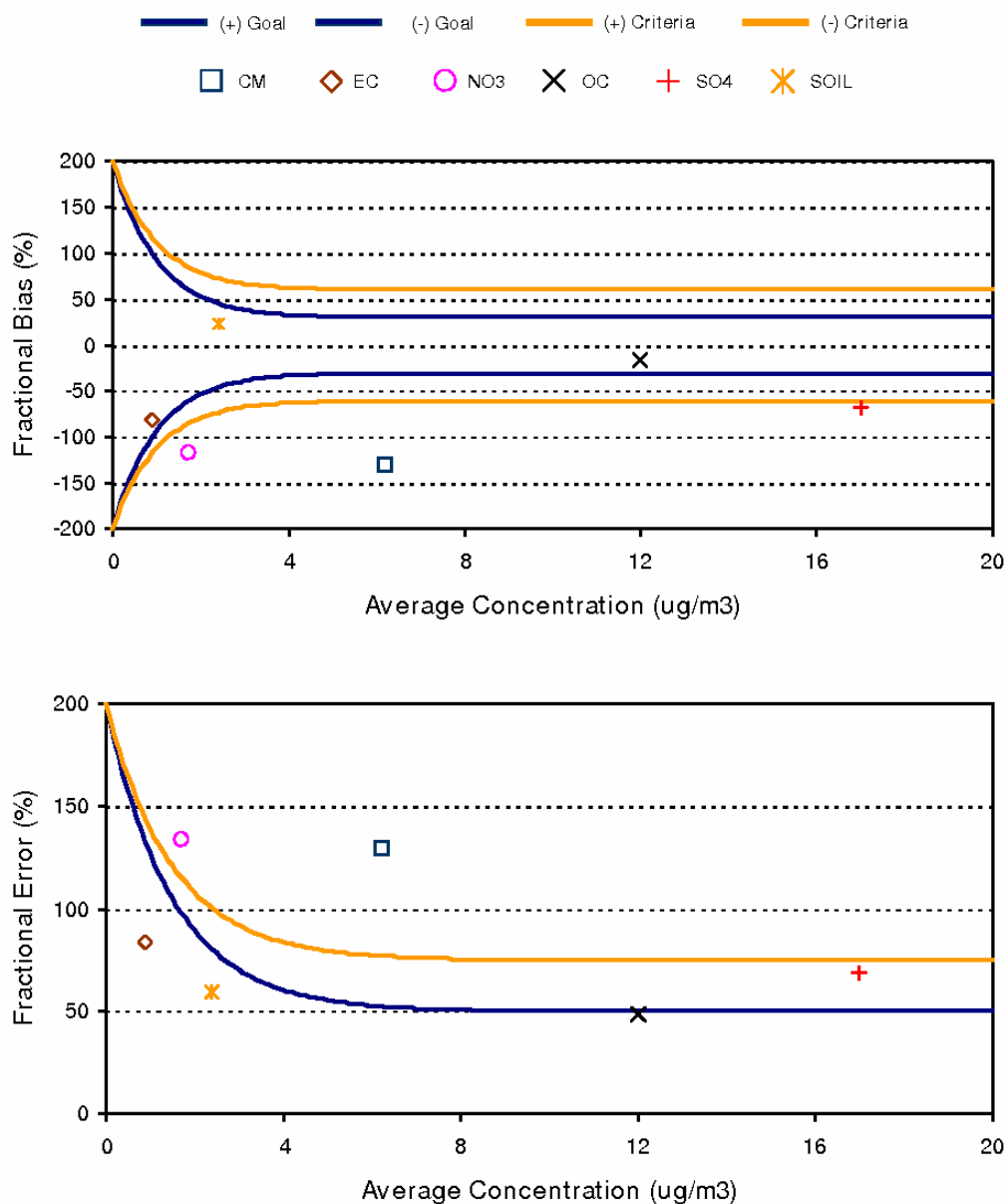
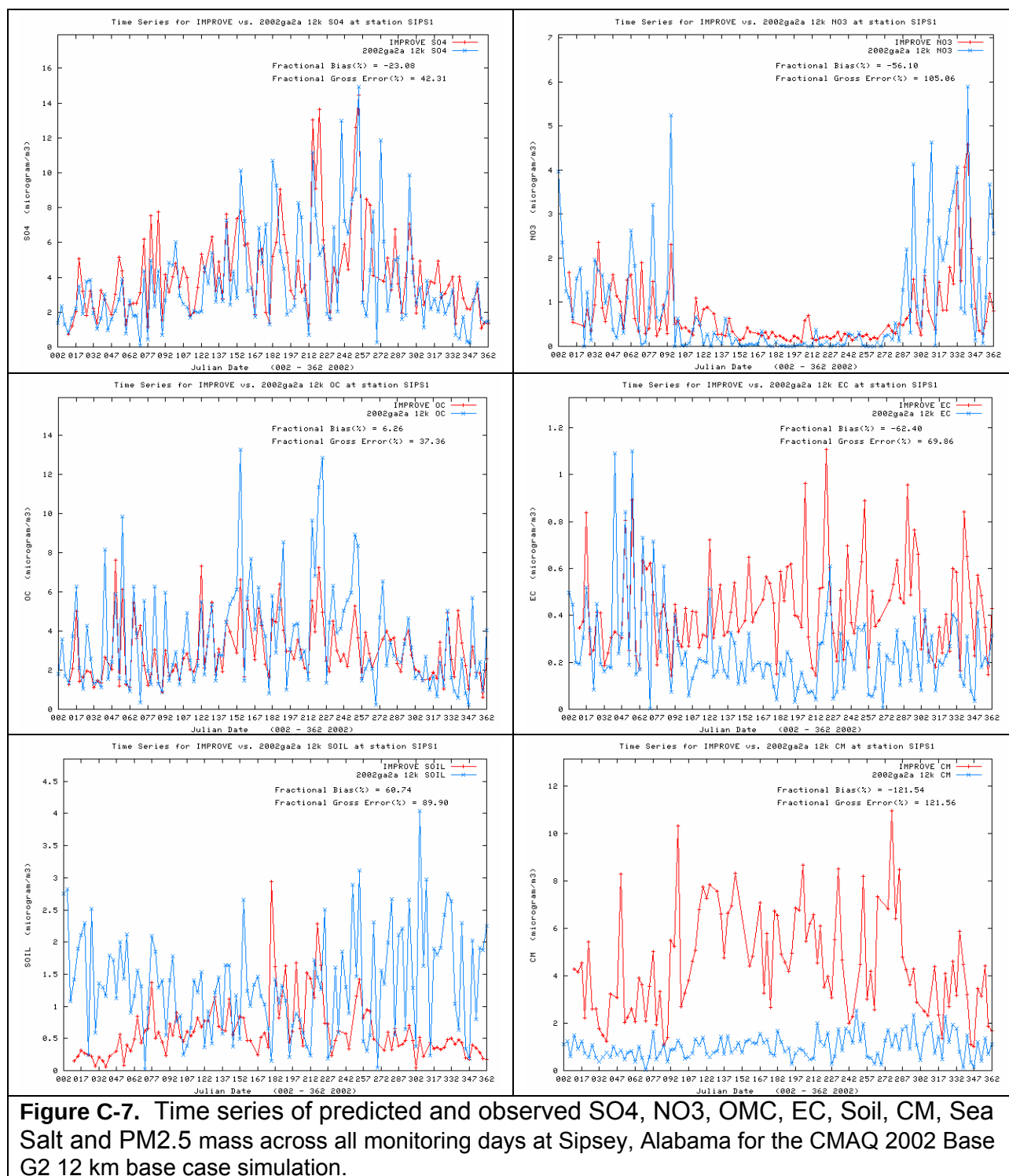
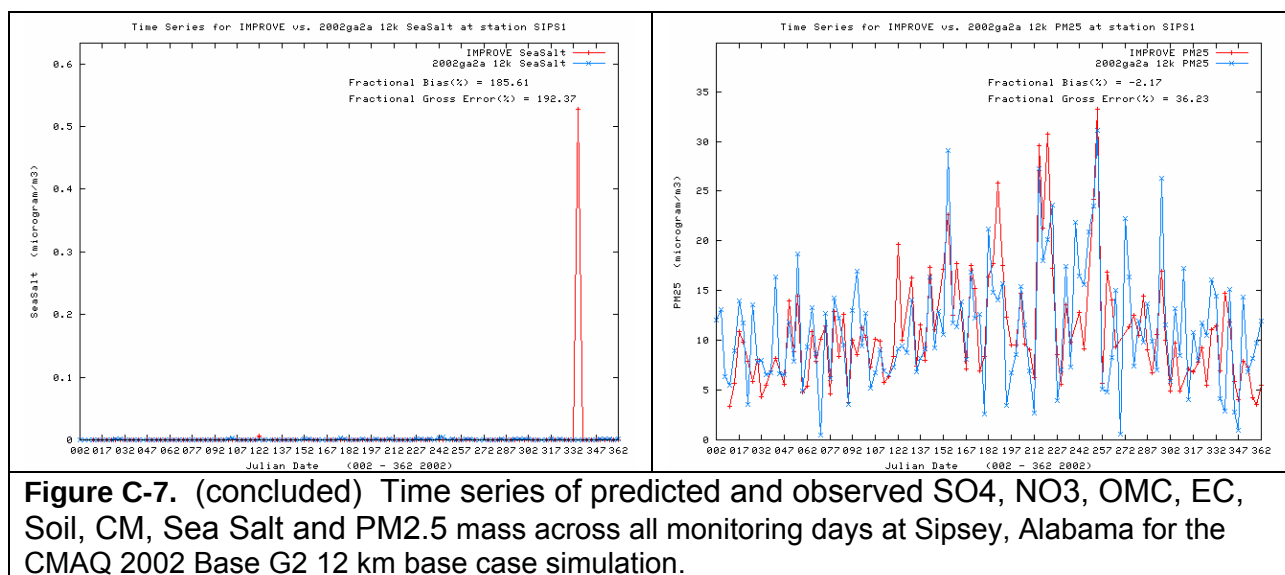


Figure C-6. Bugle Plots of Fractional Bias and Fractional Gross Error for Sipsy, Alabama and the Worst 20 Percent Days.

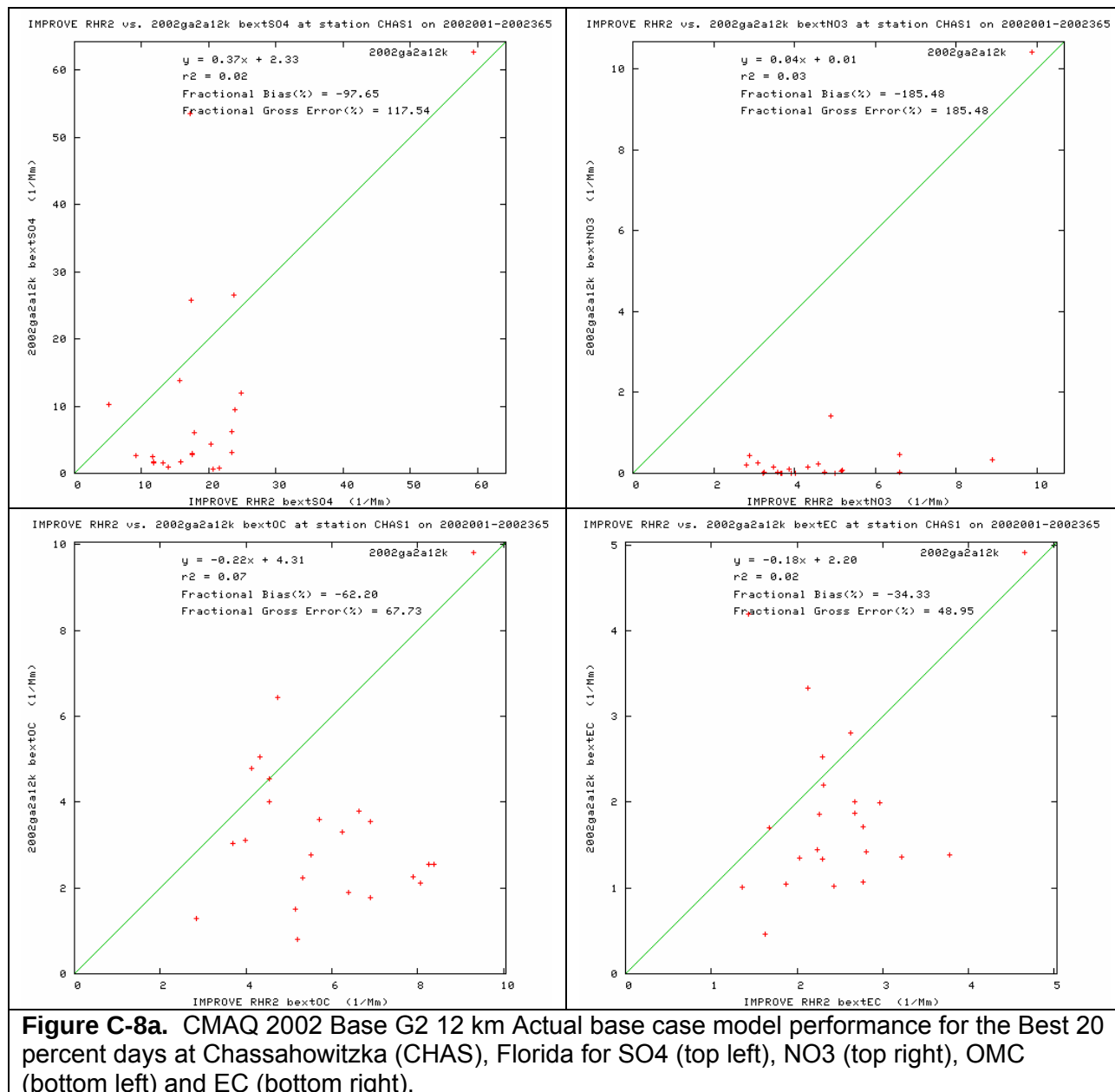
2.3.1.3 SIPS for All Days





2.3.2 Chassahowitzka Wildlife Refuge (CHAS), Florida

2.3.2.1 CHAS Best 20 Percent Days



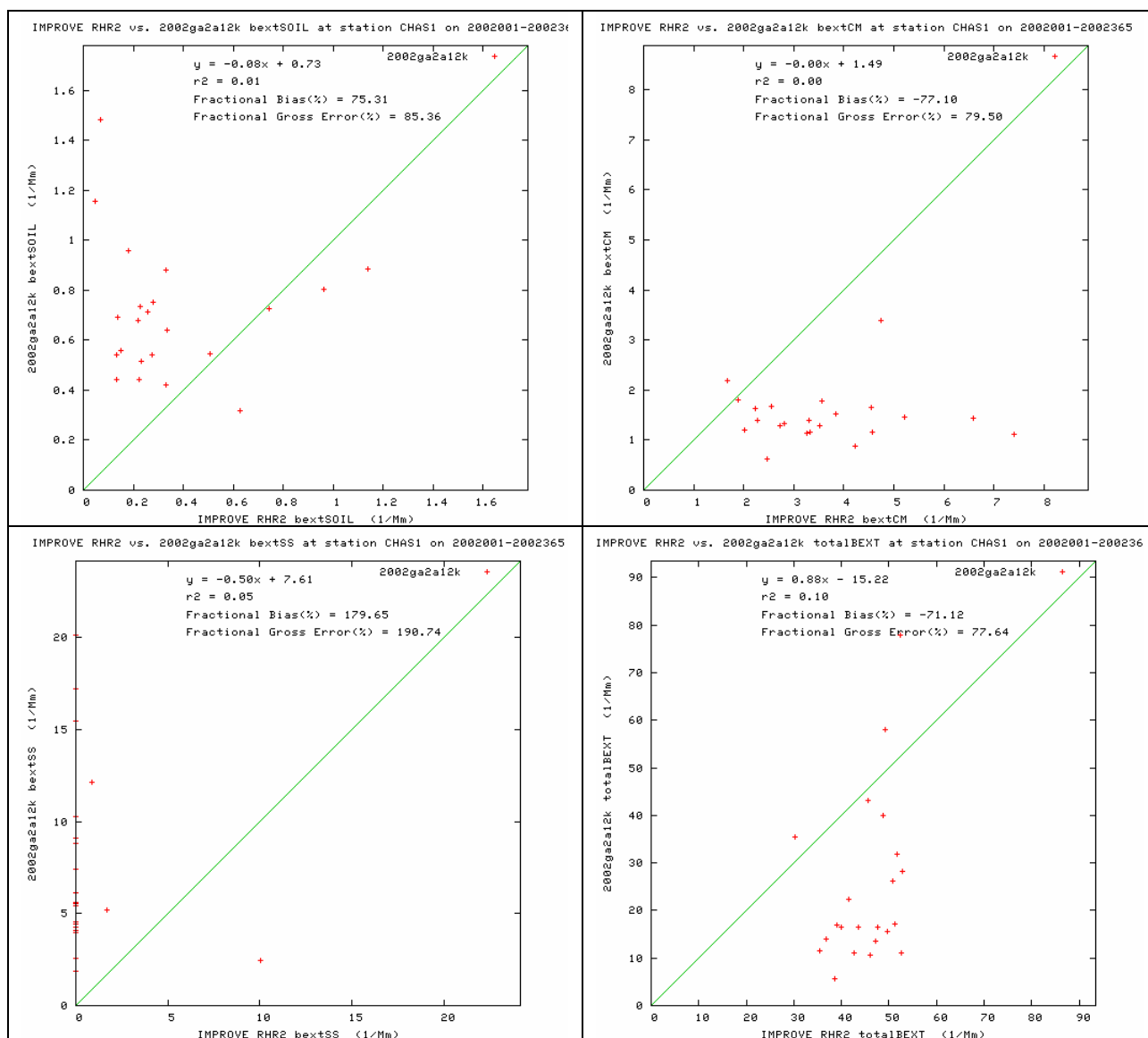


Figure C-8b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Chassahowitzka (CHAS), Florida for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; B20

CHAS1

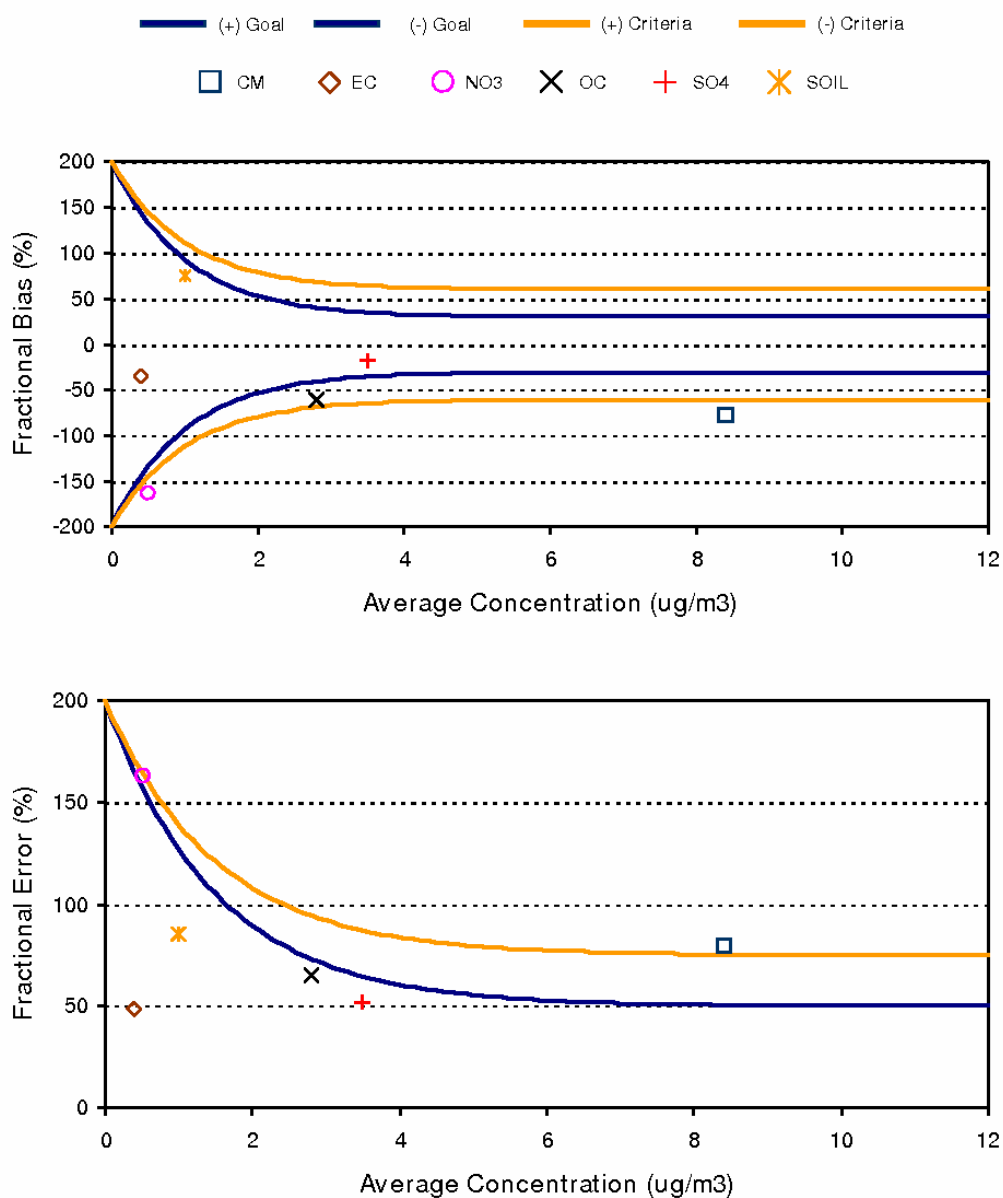
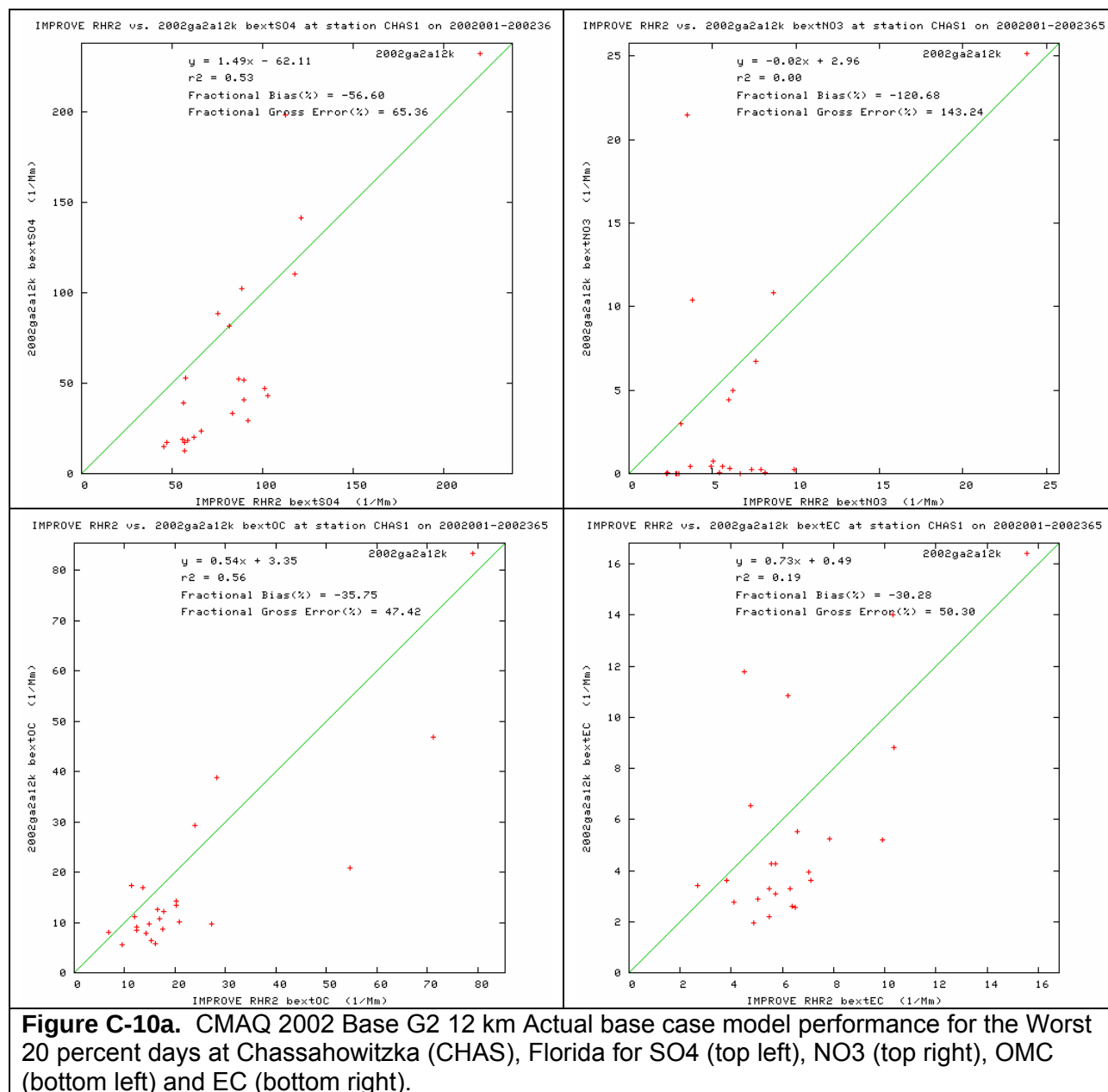


Figure C-9. Bugle Plots of Fractional Bias and Fractional Gross Error for CHAS and the Best 20 Percent Days.

2.3.2.2 CHAS Worst 20 Percent Days



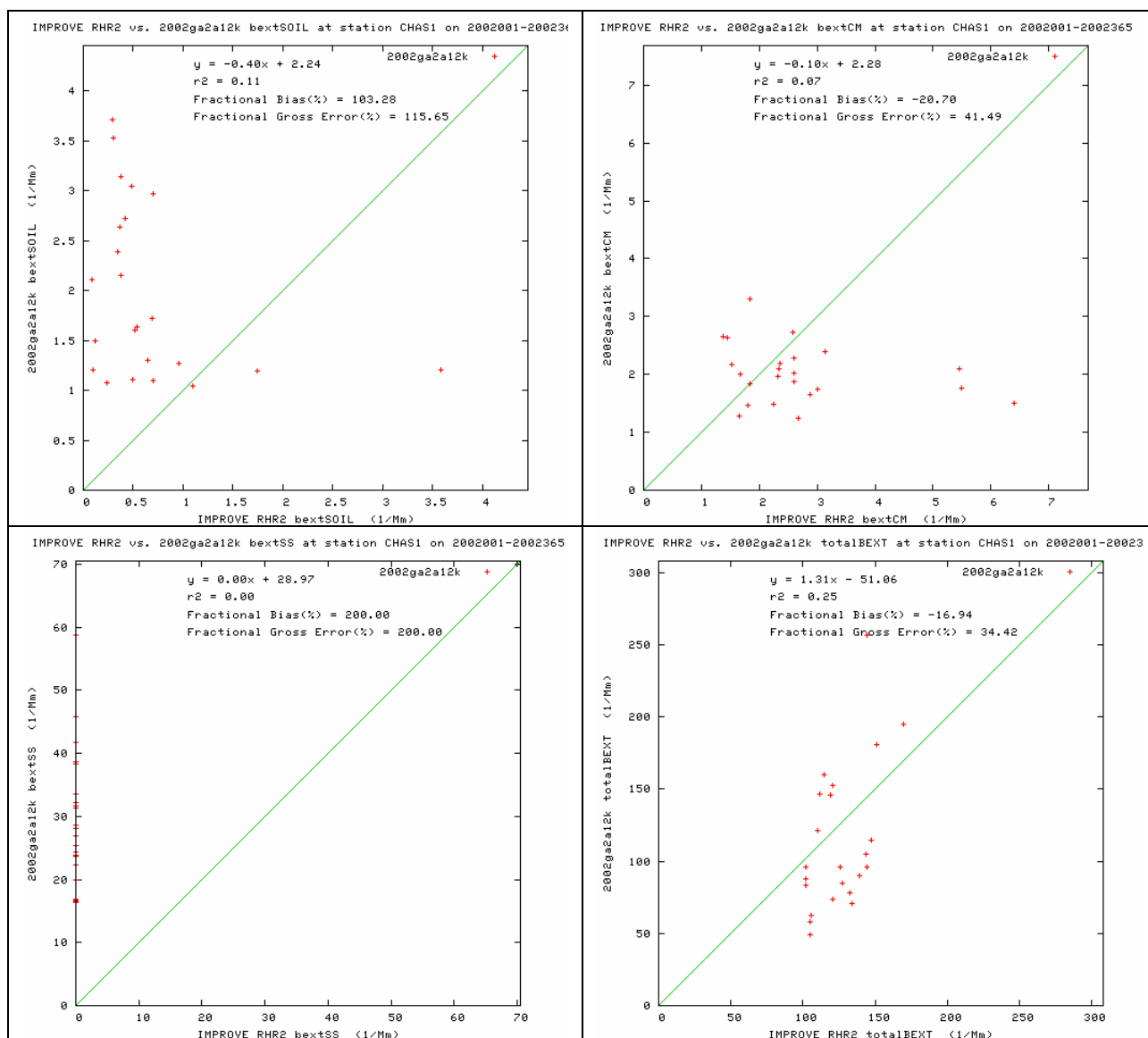


Figure C-10b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Chassahowitzka (CHAS), Florida for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; W20

CHAS1

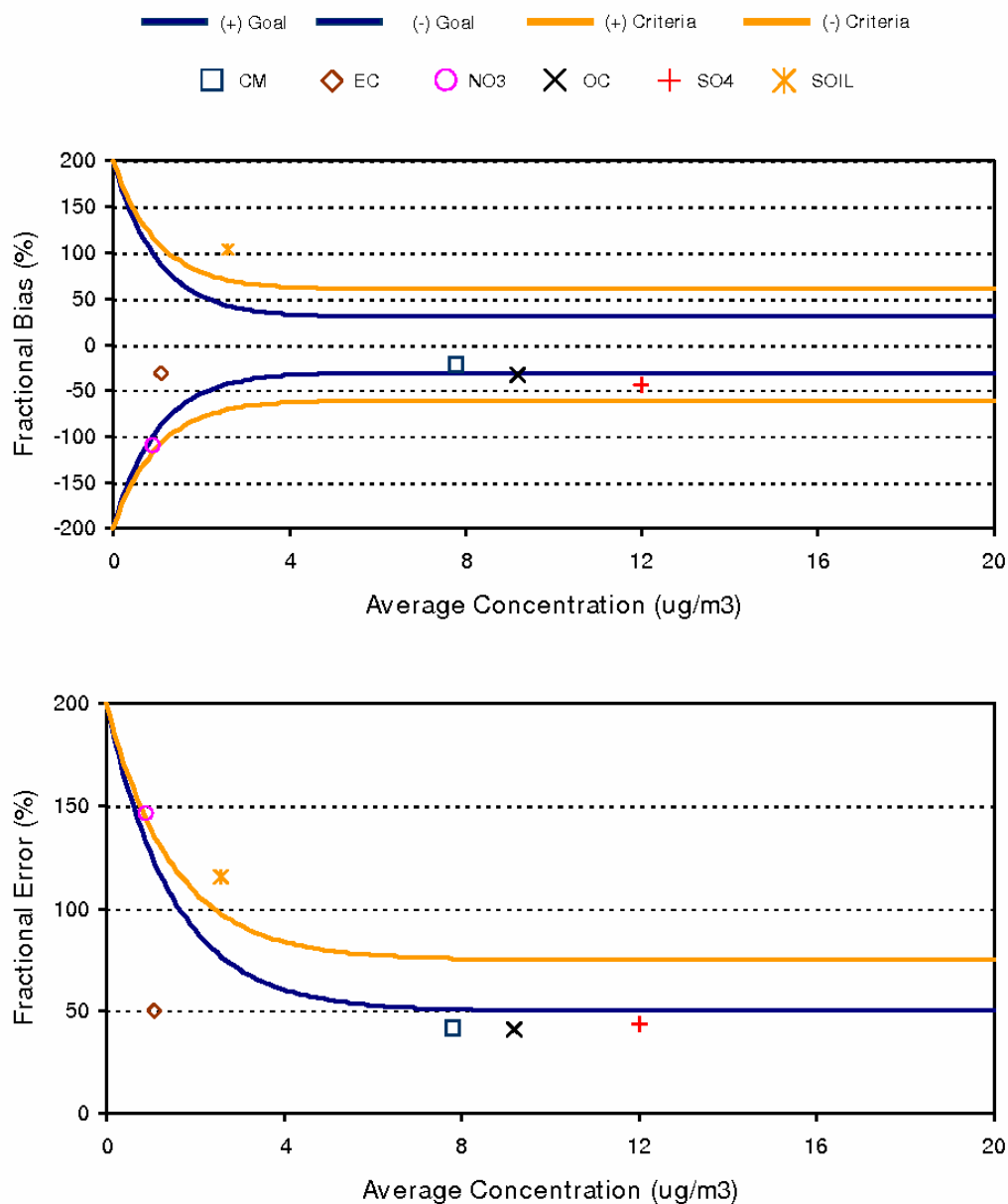


Figure C-11. Bugle Plots of Fractional Bias and Fractional Gross Error for CHAS and the Worst 20 Percent Days.

2.3.2.3 CHAS for All Days

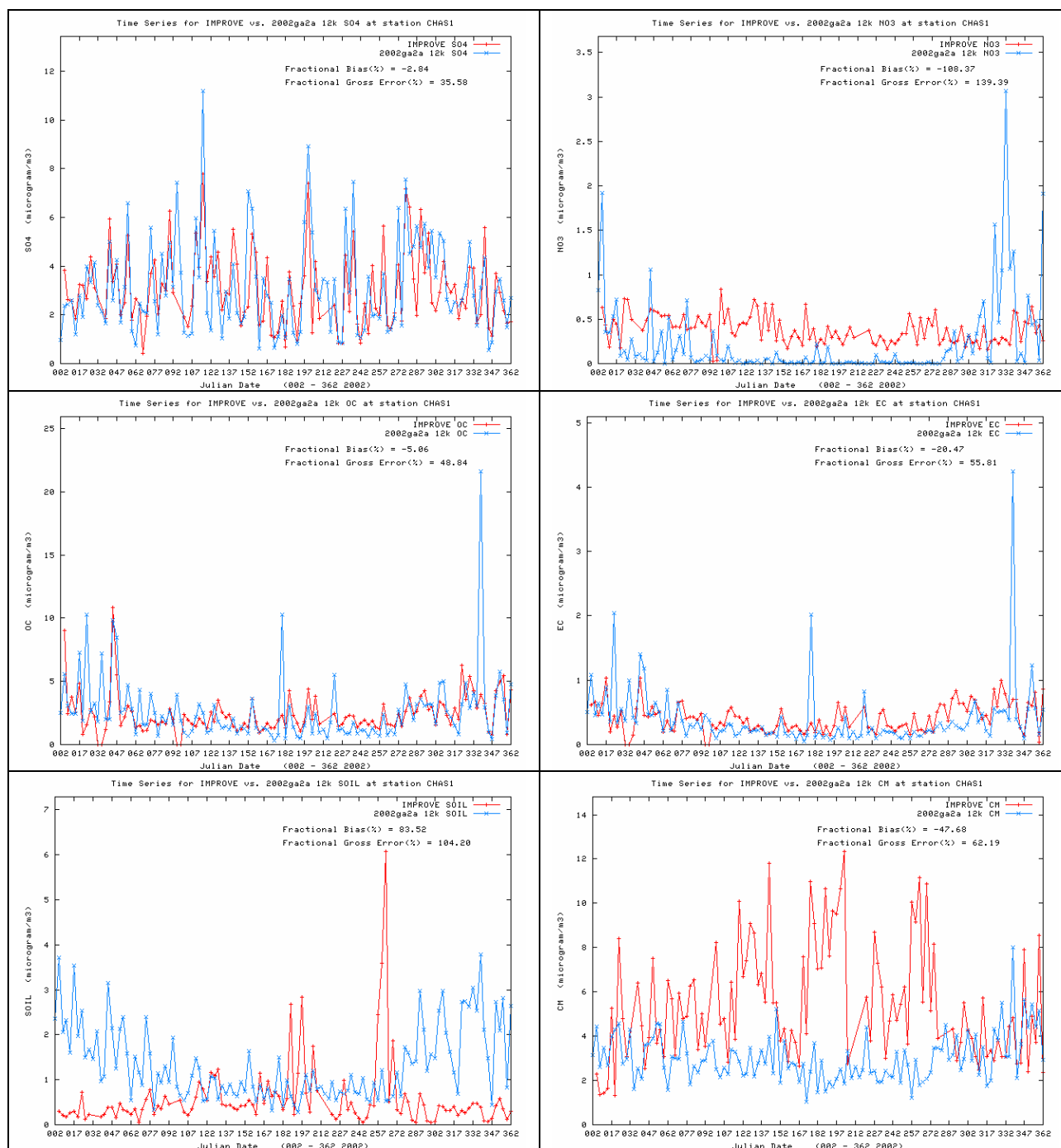
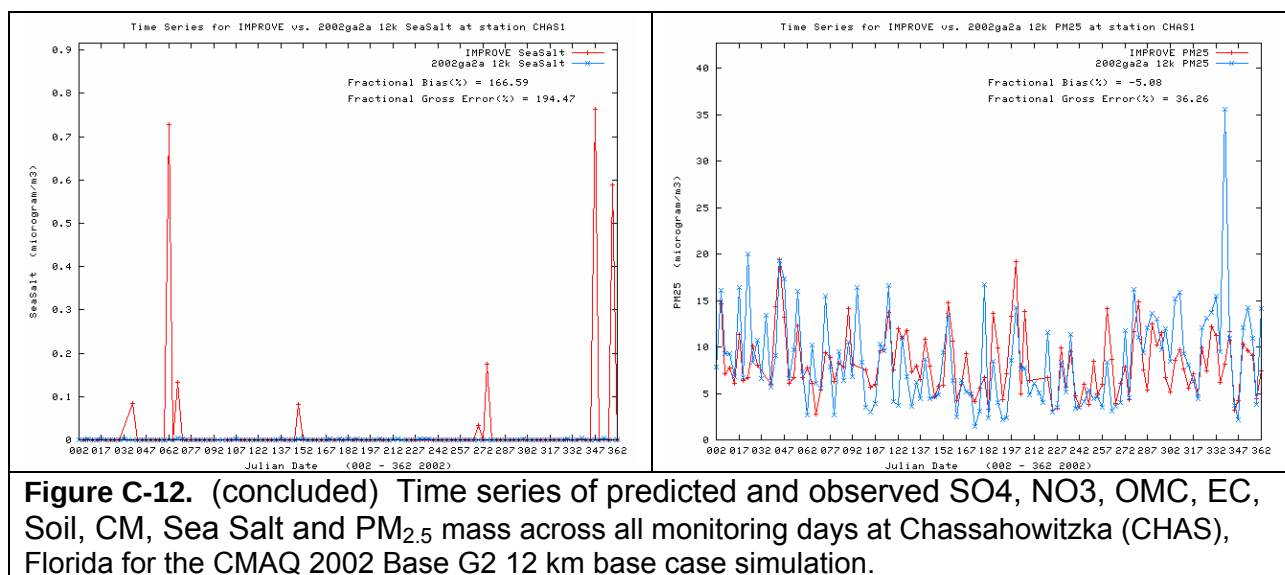


Figure C-12. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Chassahowitzka (CHAS), Florida for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.3 Everglades National Park (EVER), Florida

2.3.3.1 EVER Best 20 Percent Days

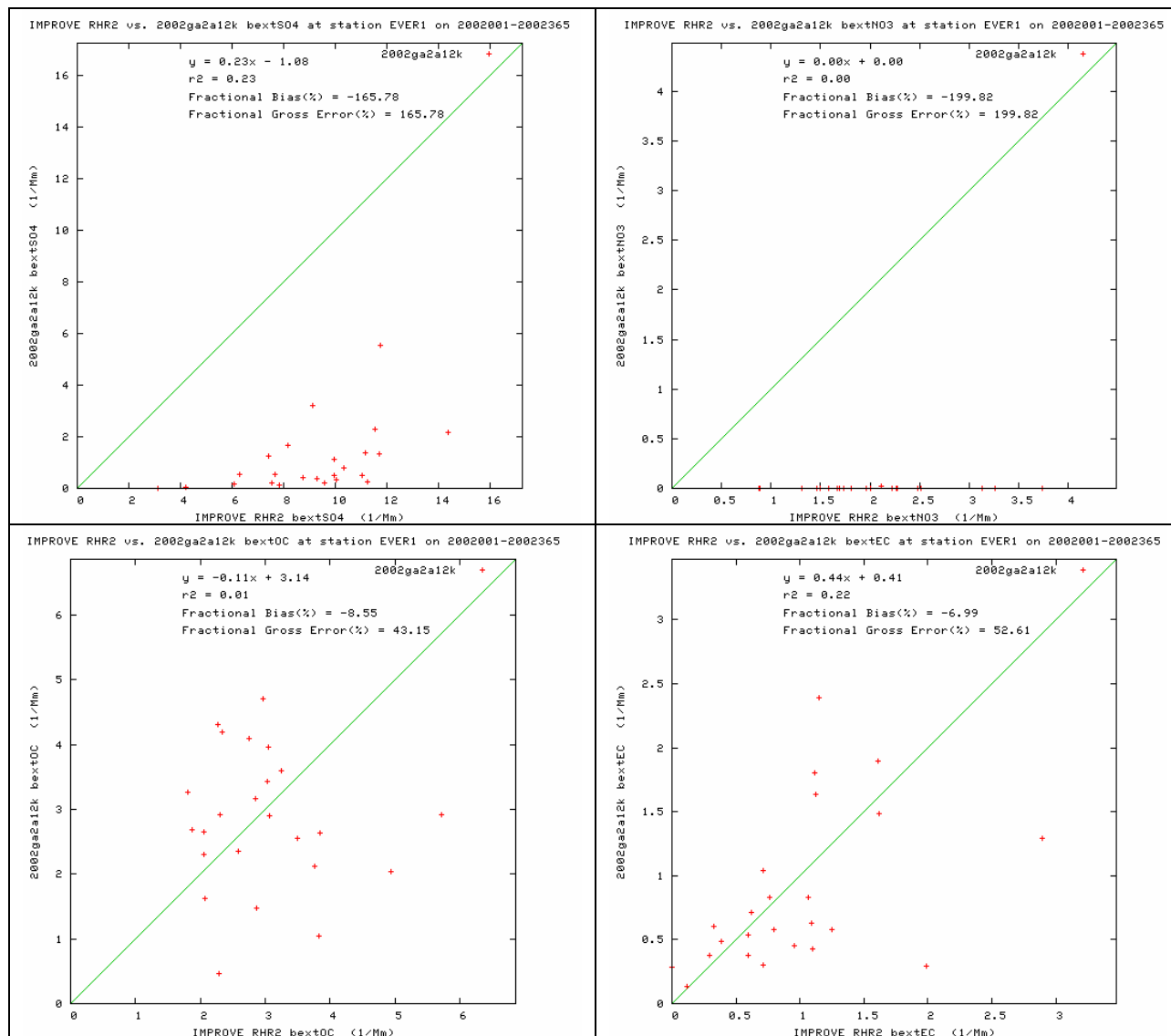
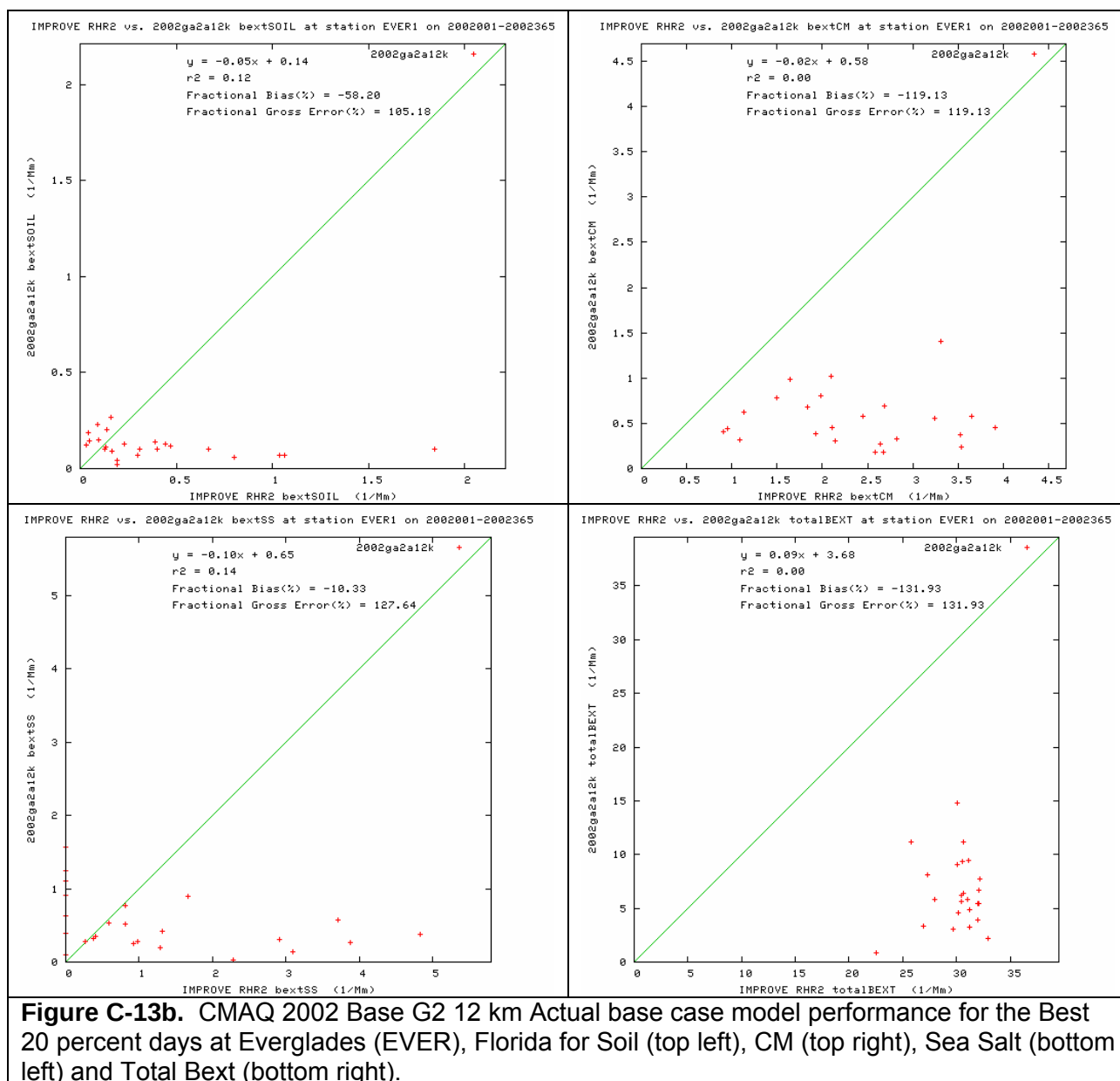


Figure C-13a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Everglades (EVER), Florida for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

EVER1

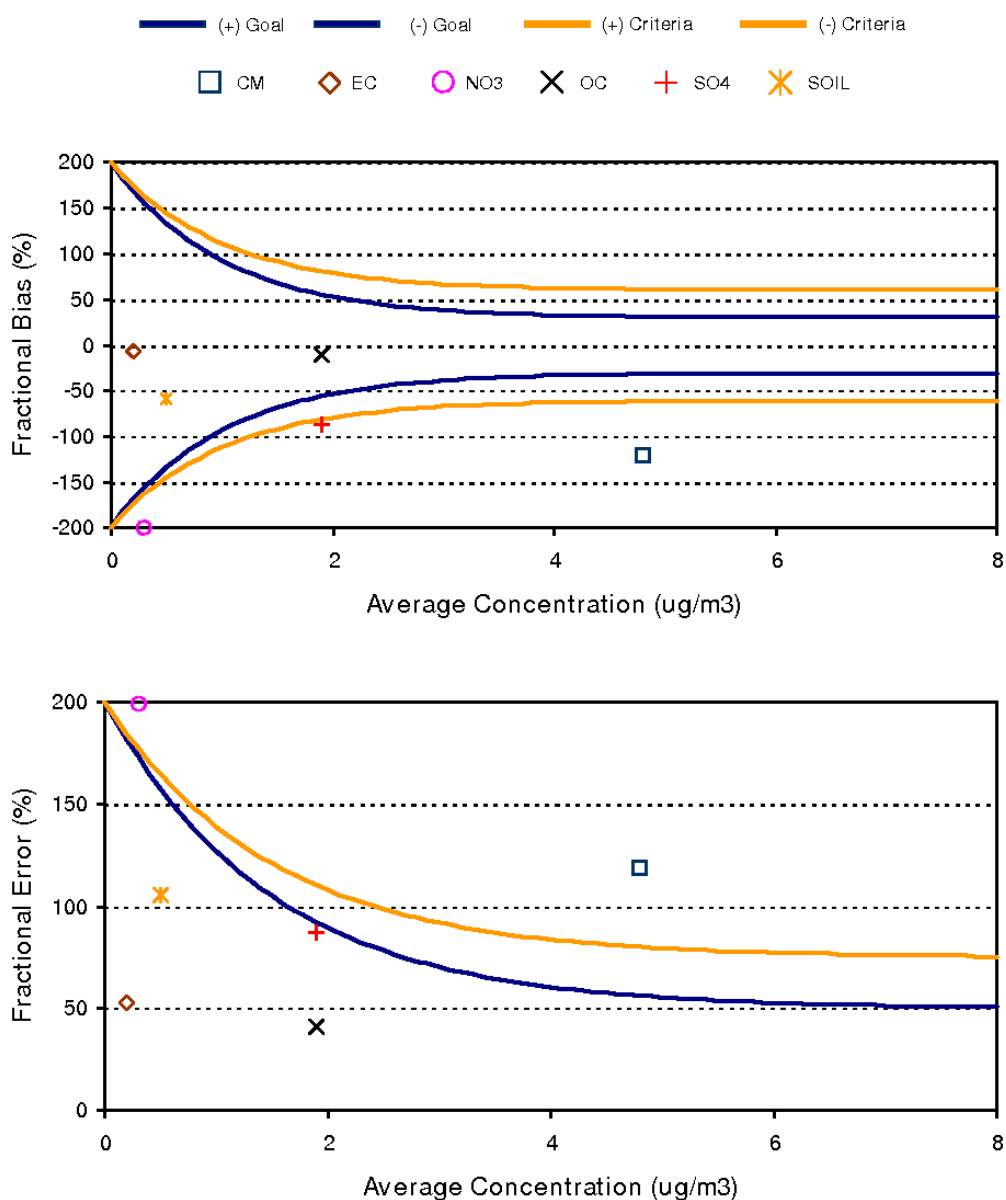


Figure C-14. Bugle Plots of Fractional Bias and Fractional Gross Error for EVER and the Best 20 Percent Days.

2.3.3.2 EVER Worst 20 Percent Days

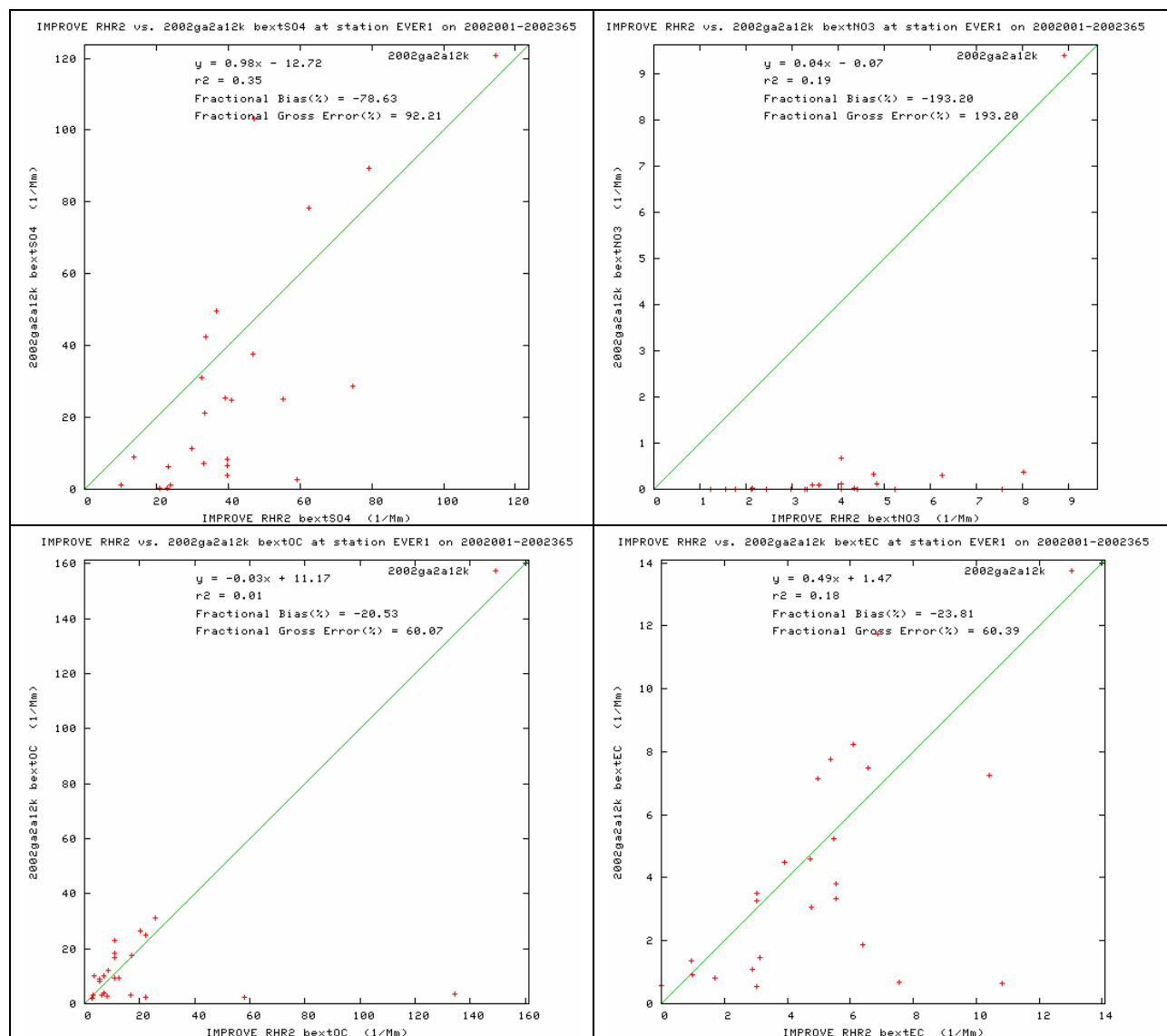
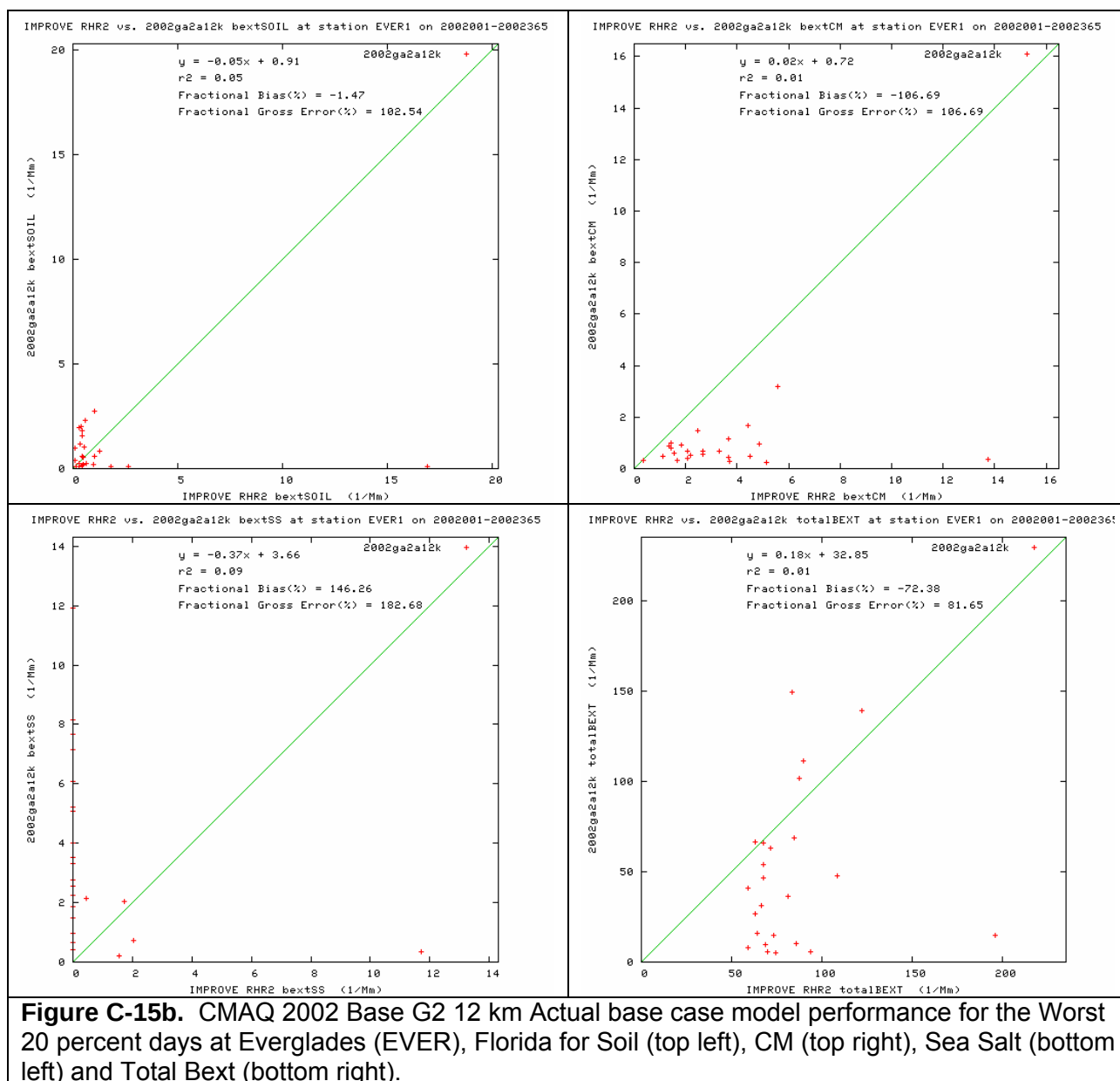


Figure C-15a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Everglades (EVER), Florida for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

EVER1

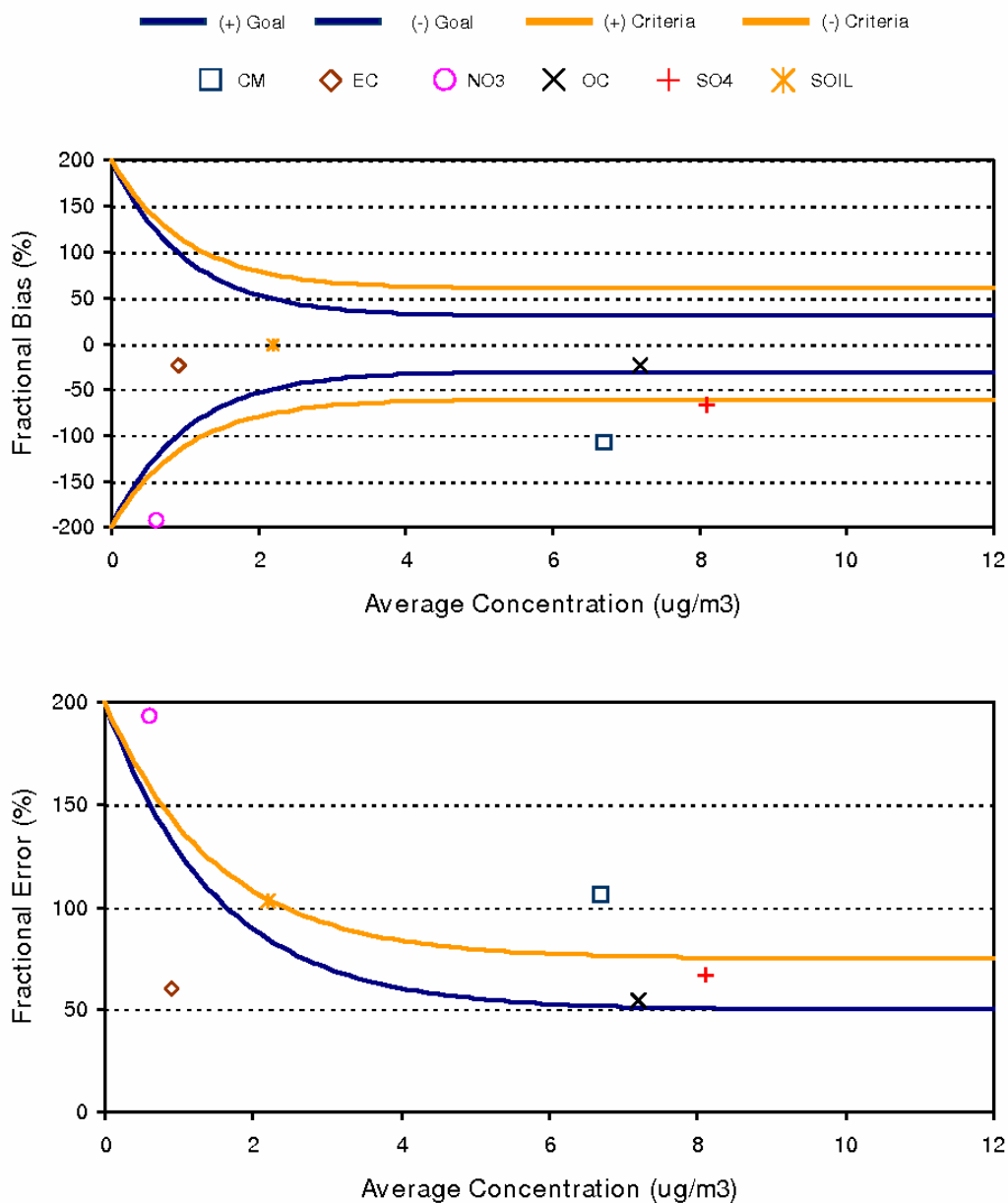
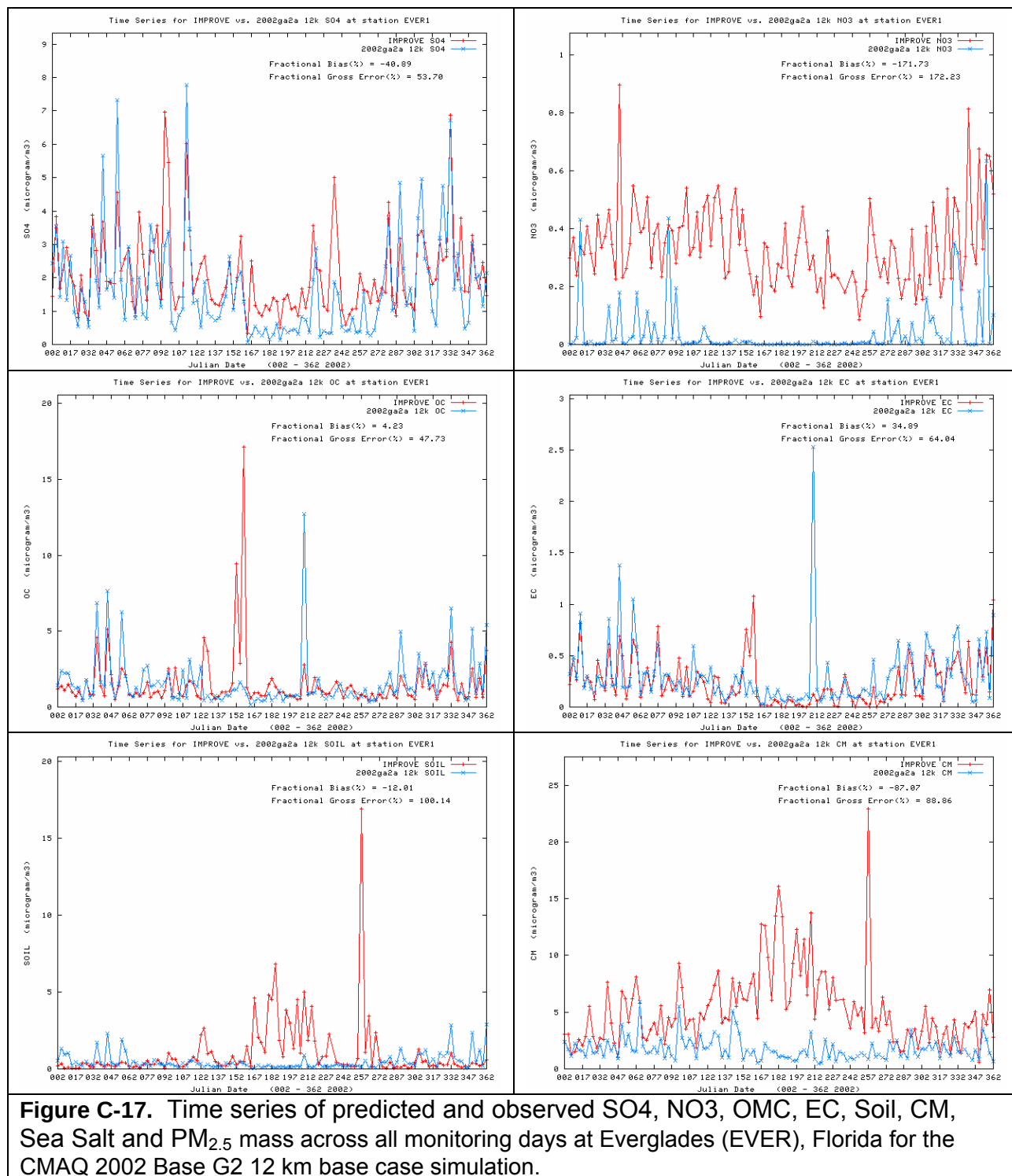
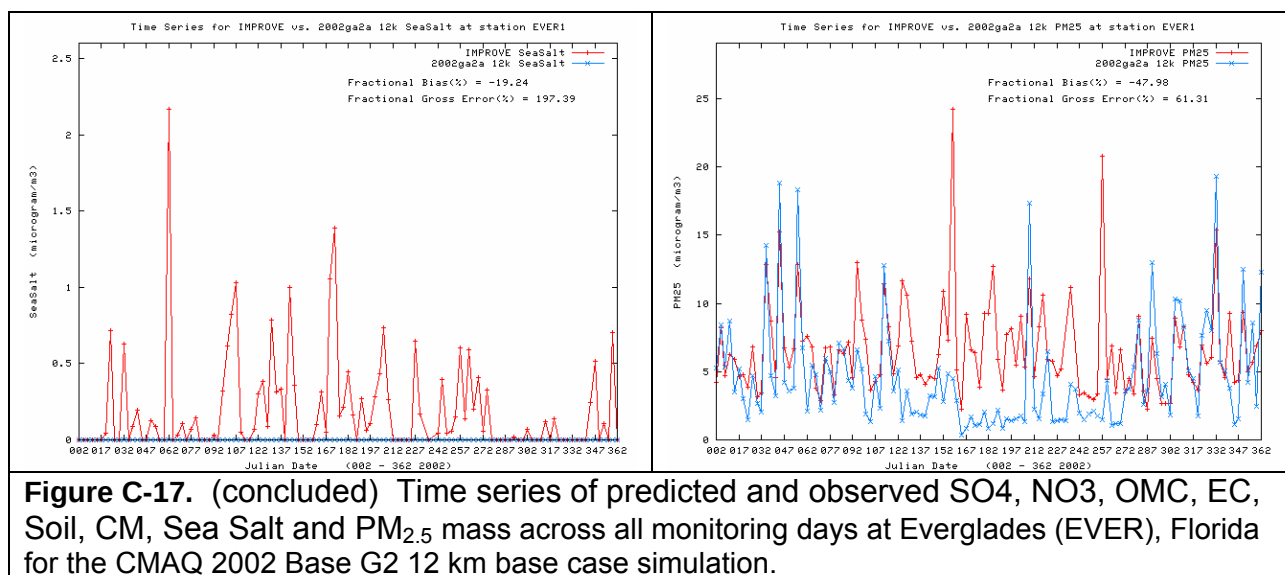


Figure C-16. Bugle Plots of Fractional Bias and Fractional Gross Error for EVER and the Worst 20 Percent Days.

2.3.3.3 EVER for All Days





2.3.4 St. Marks Wildlife Refuge (SAMA), Florida

2.3.4.1 SAMA Best 20 Percent Days

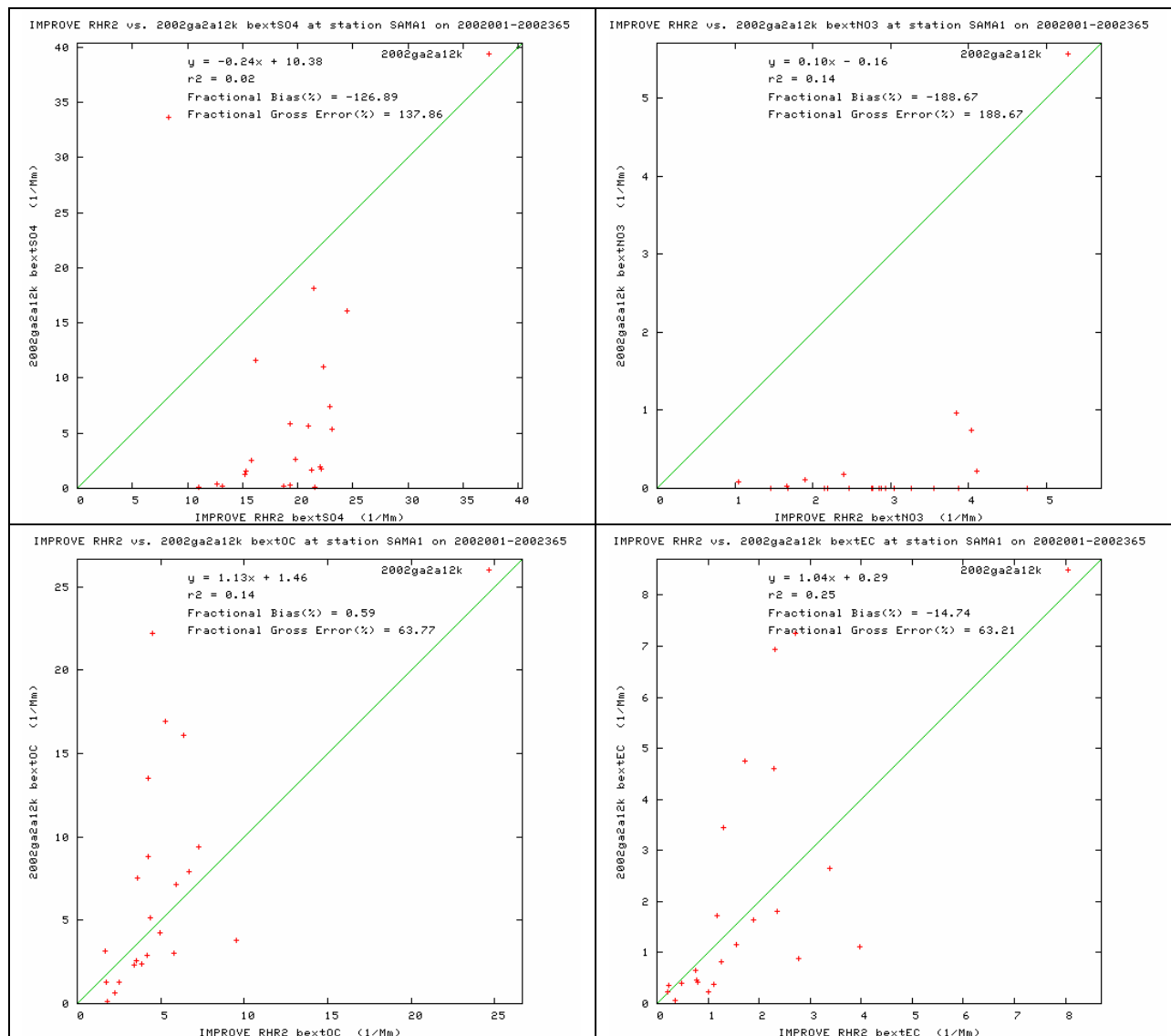
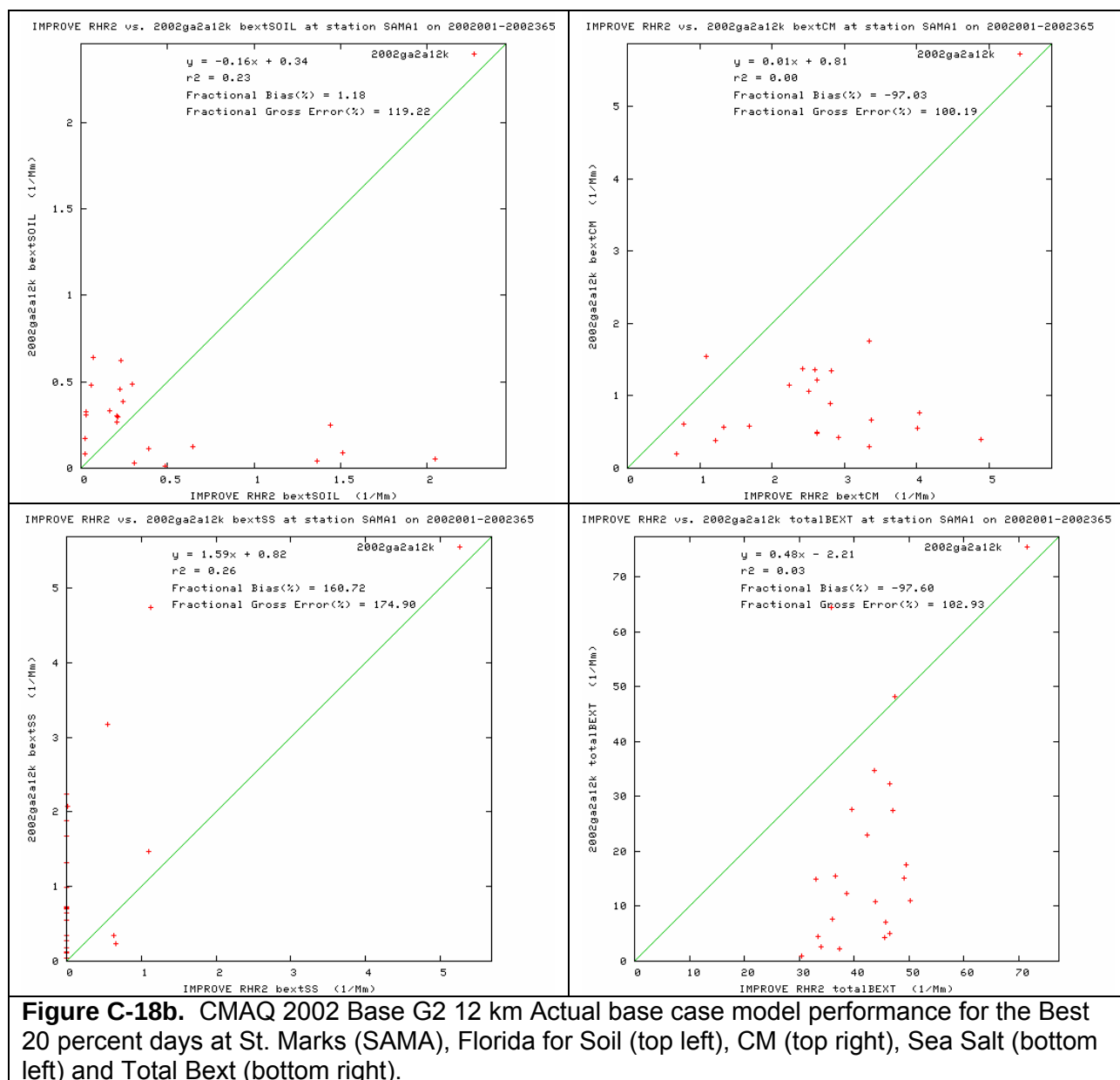


Figure C-18a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at St. Marks (SAMA), Florida for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

SAMA1

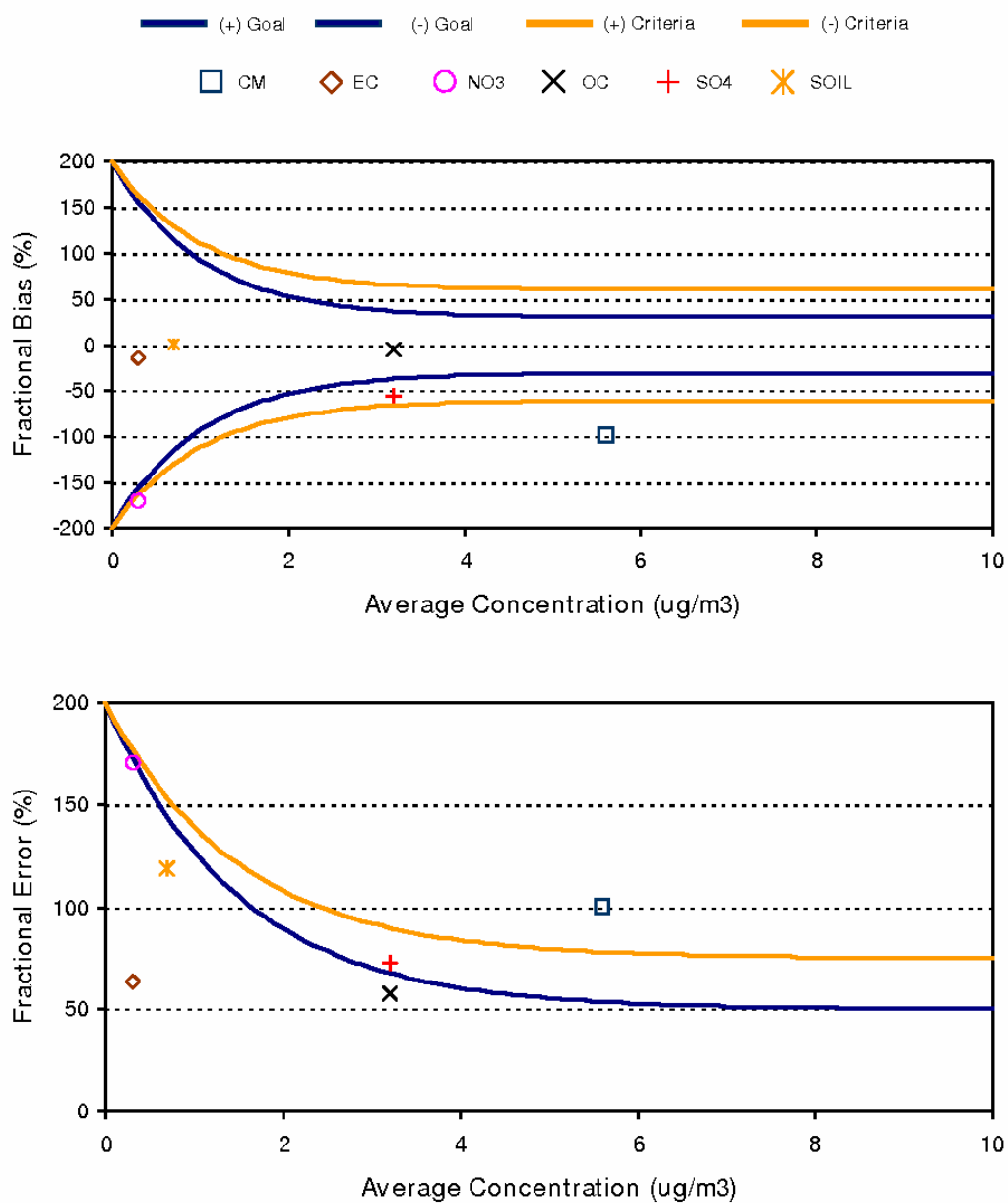


Figure C-19. Bugle Plots of Fractional Bias and Fractional Gross Error for SAMA and the Best 20 Percent Days.

2.3.4.2 SAMA Worst 20 Percent Days

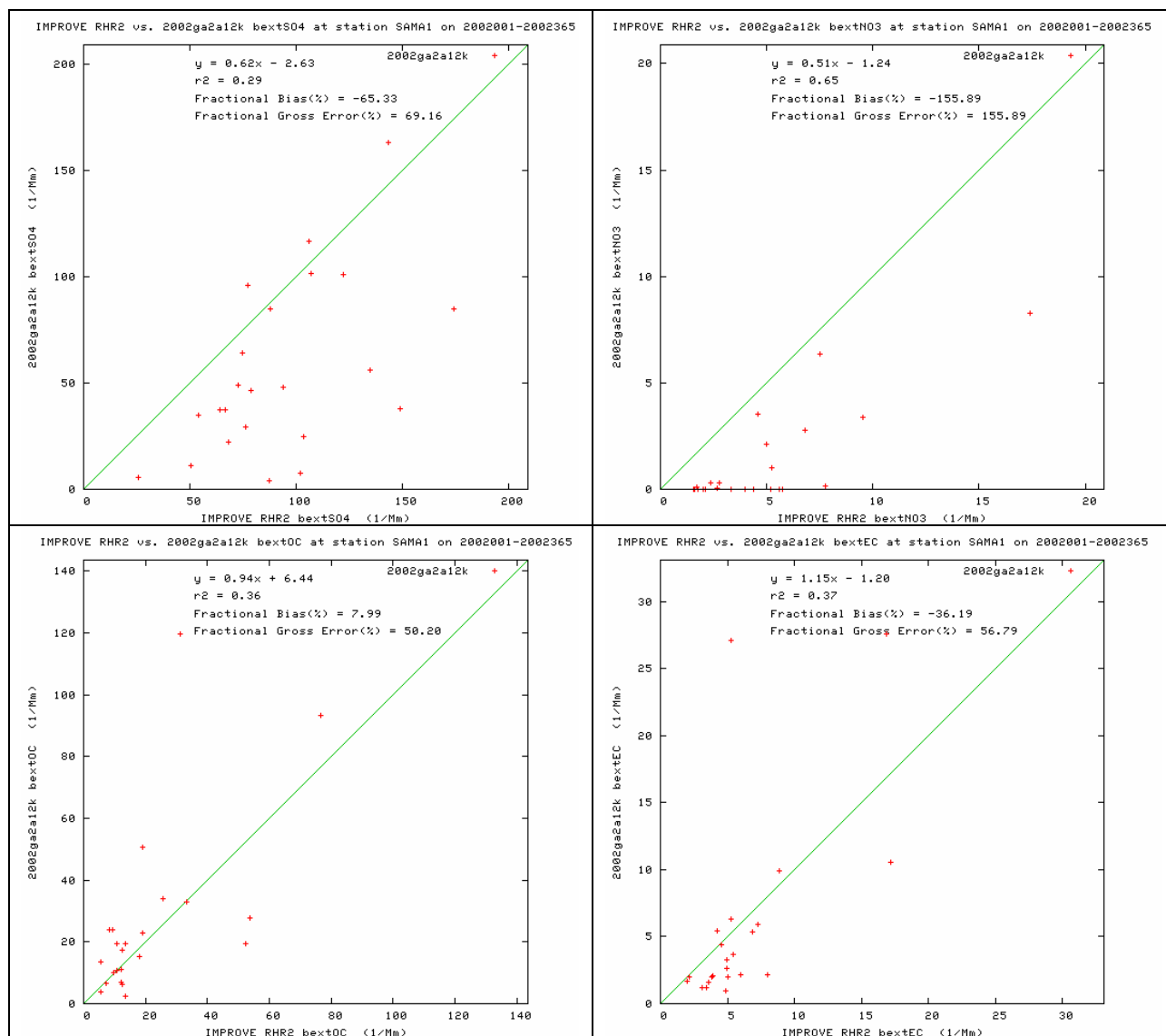
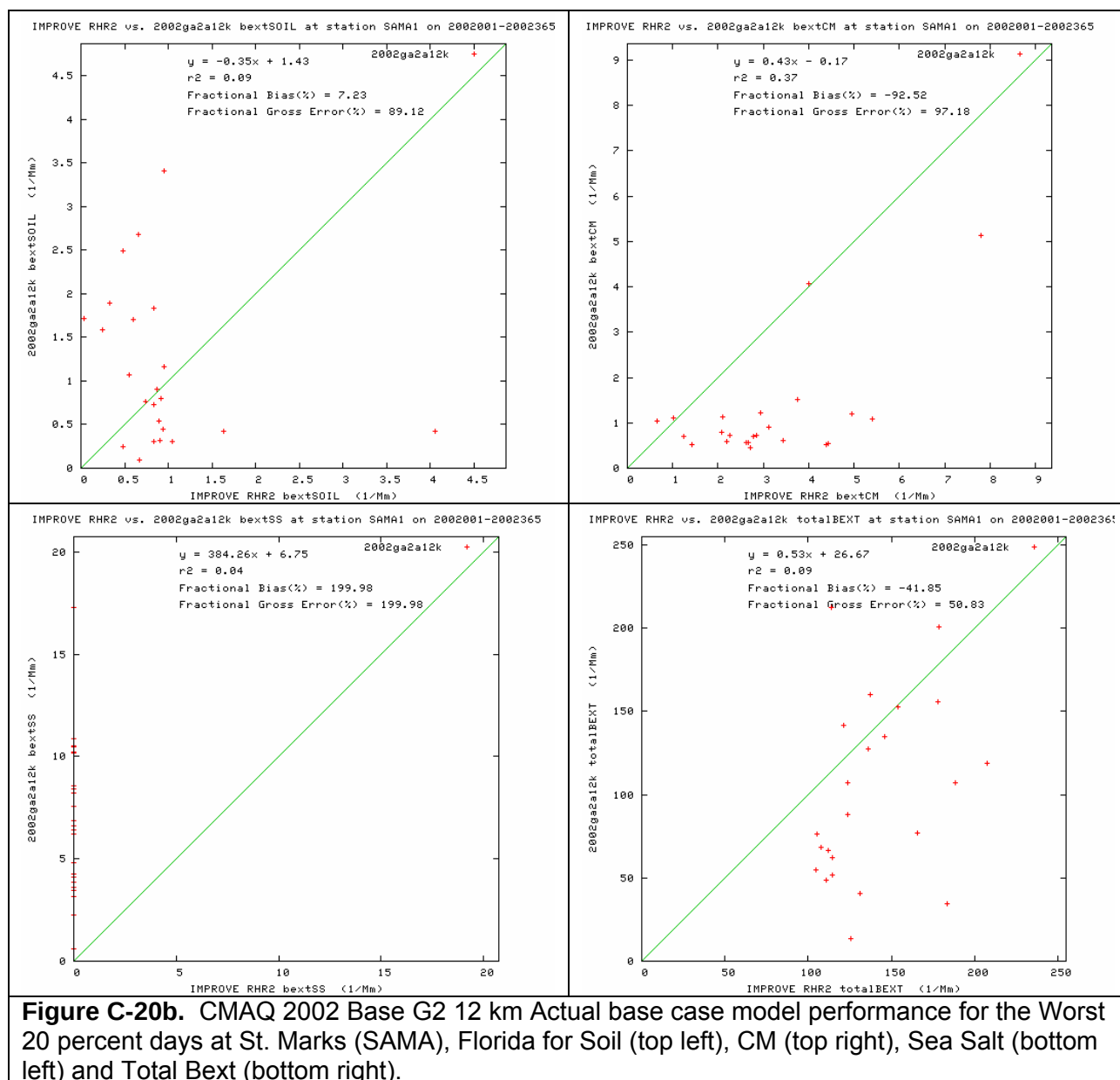


Figure C-20a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at St. Marks (SAMA), Florida for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

SAMA1

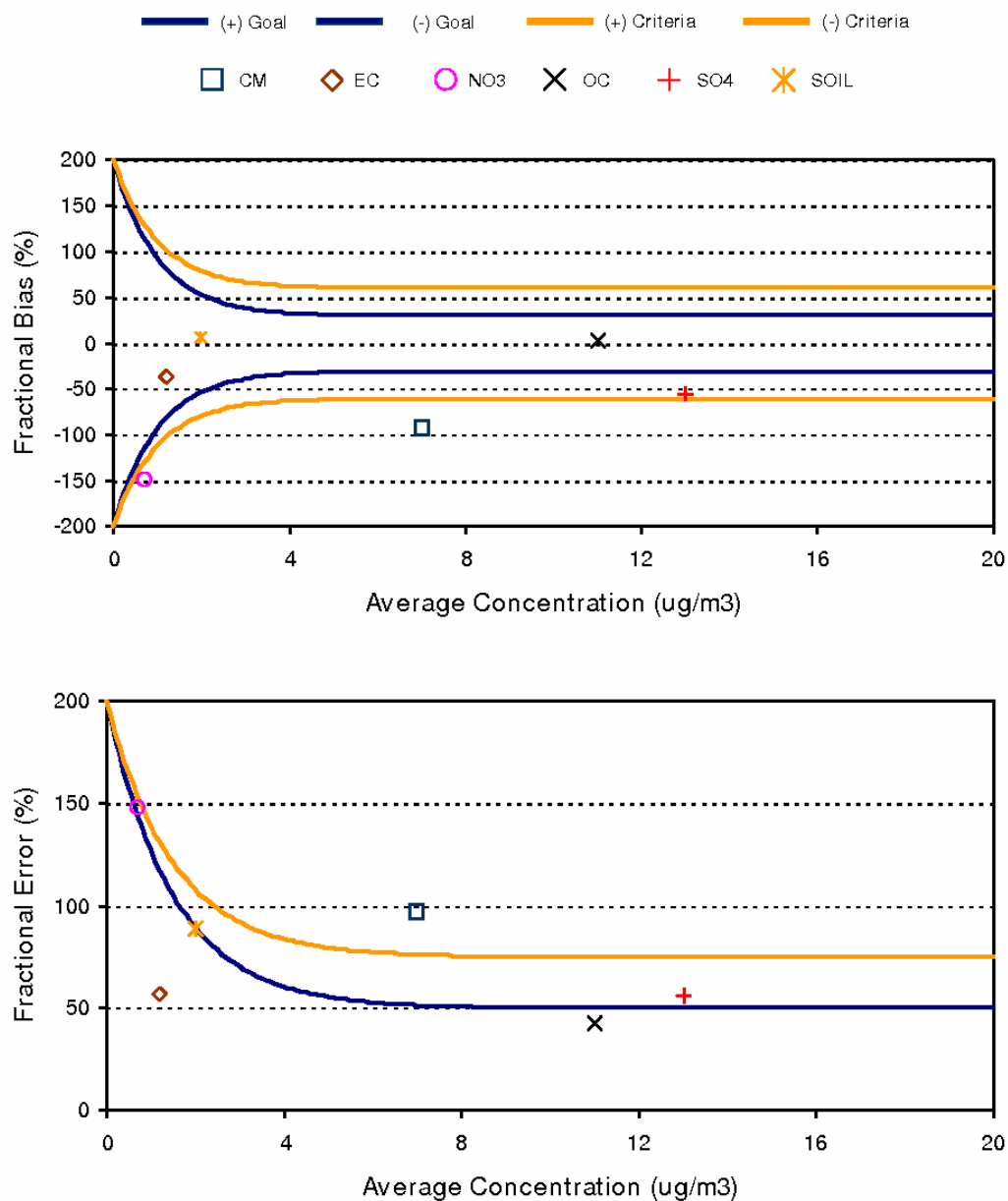


Figure C-21. Bugle Plots of Fractional Bias and Fractional Gross Error for SAMA and the Worst 20 Percent Days.

2.3.4.3 SAMA for All Days

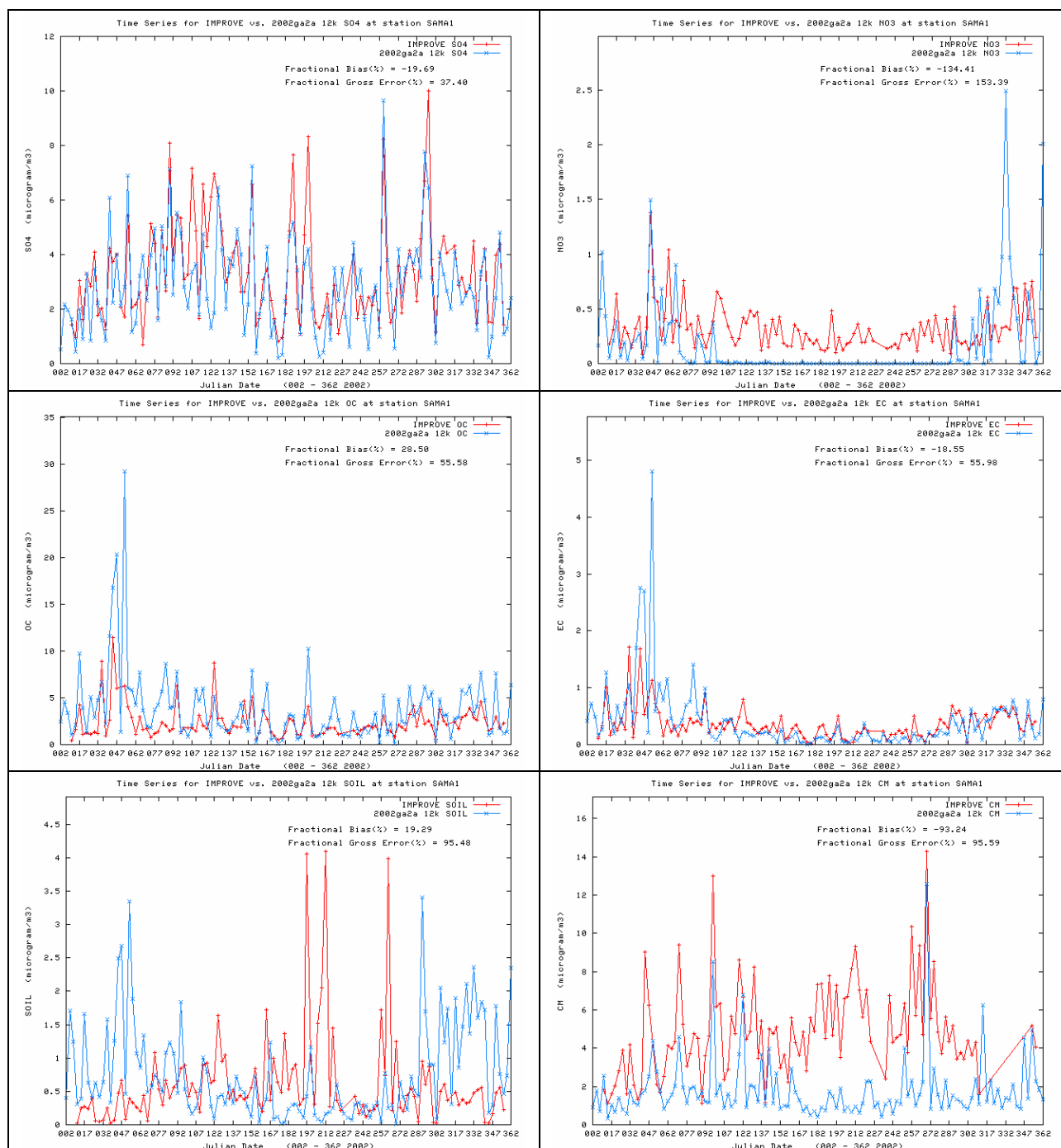
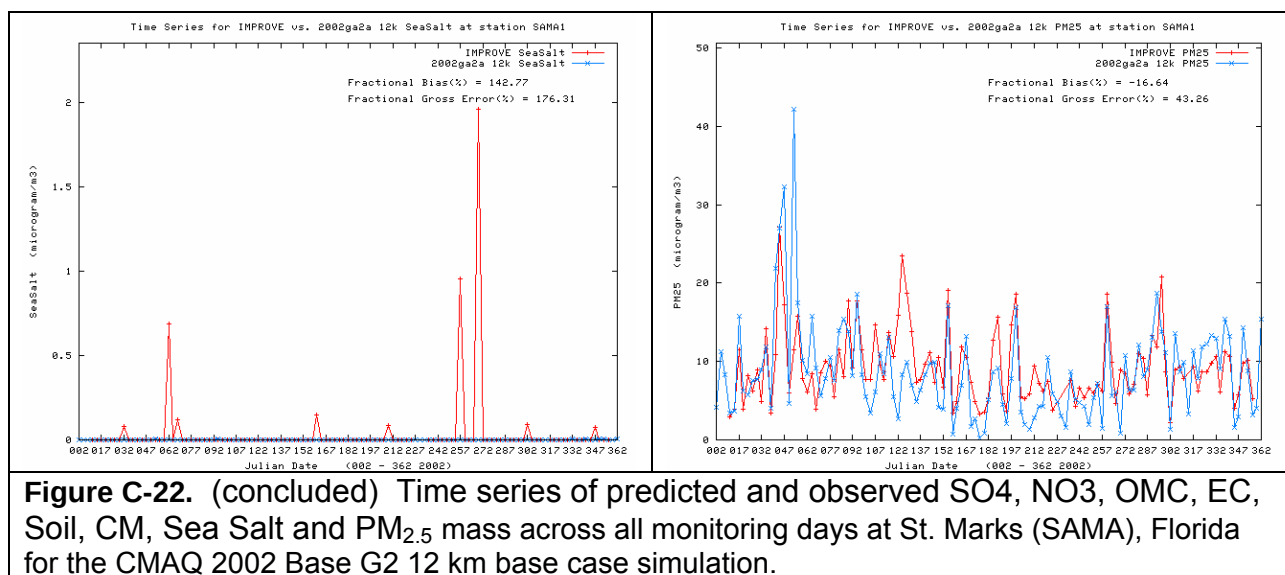
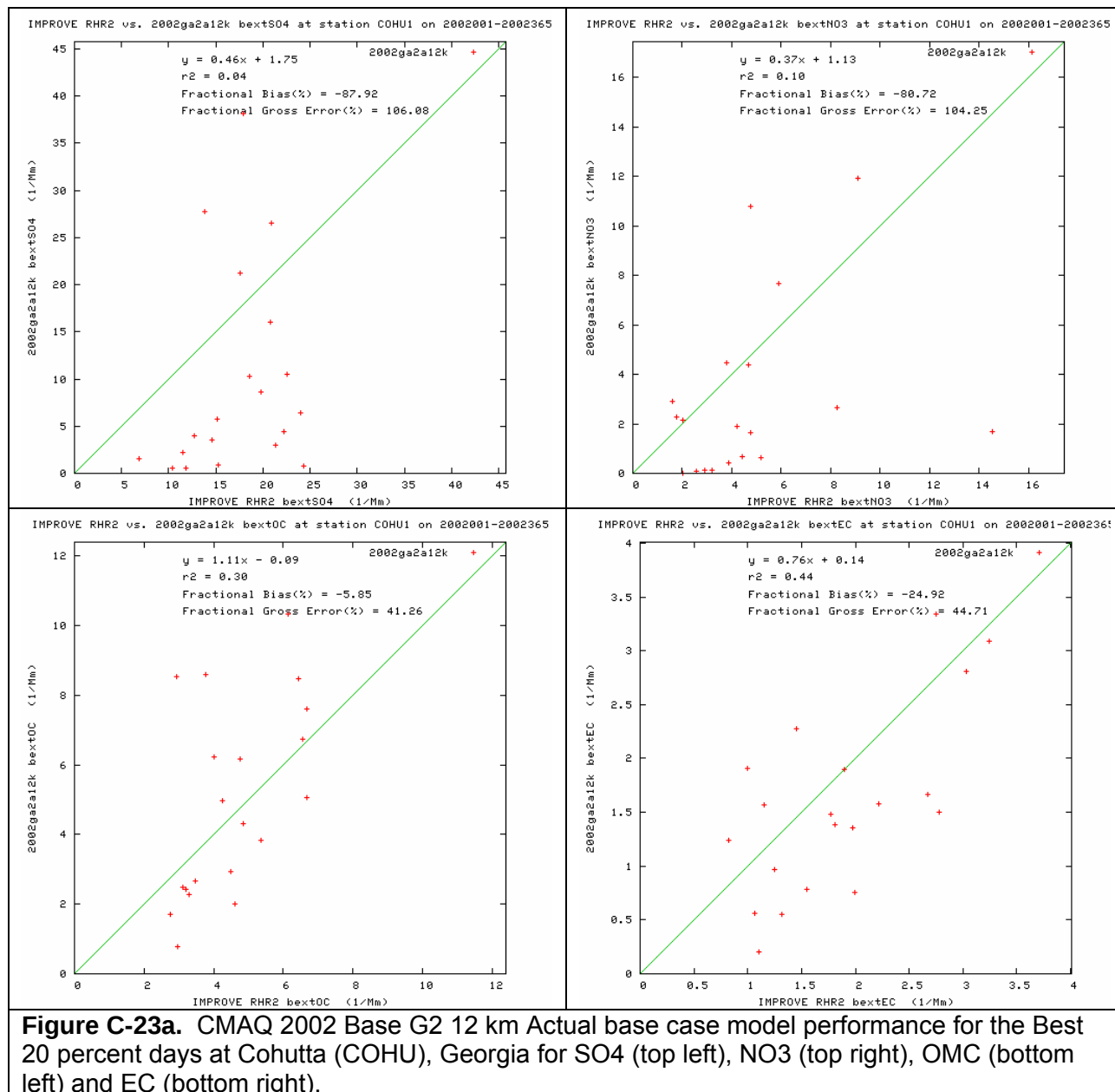


Figure C-22. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at St. Marks (SAMA), Florida for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.5 Cohutta Wilderness Area (COHU), Georgia

2.3.5.1 COHU Best 20 Percent Days



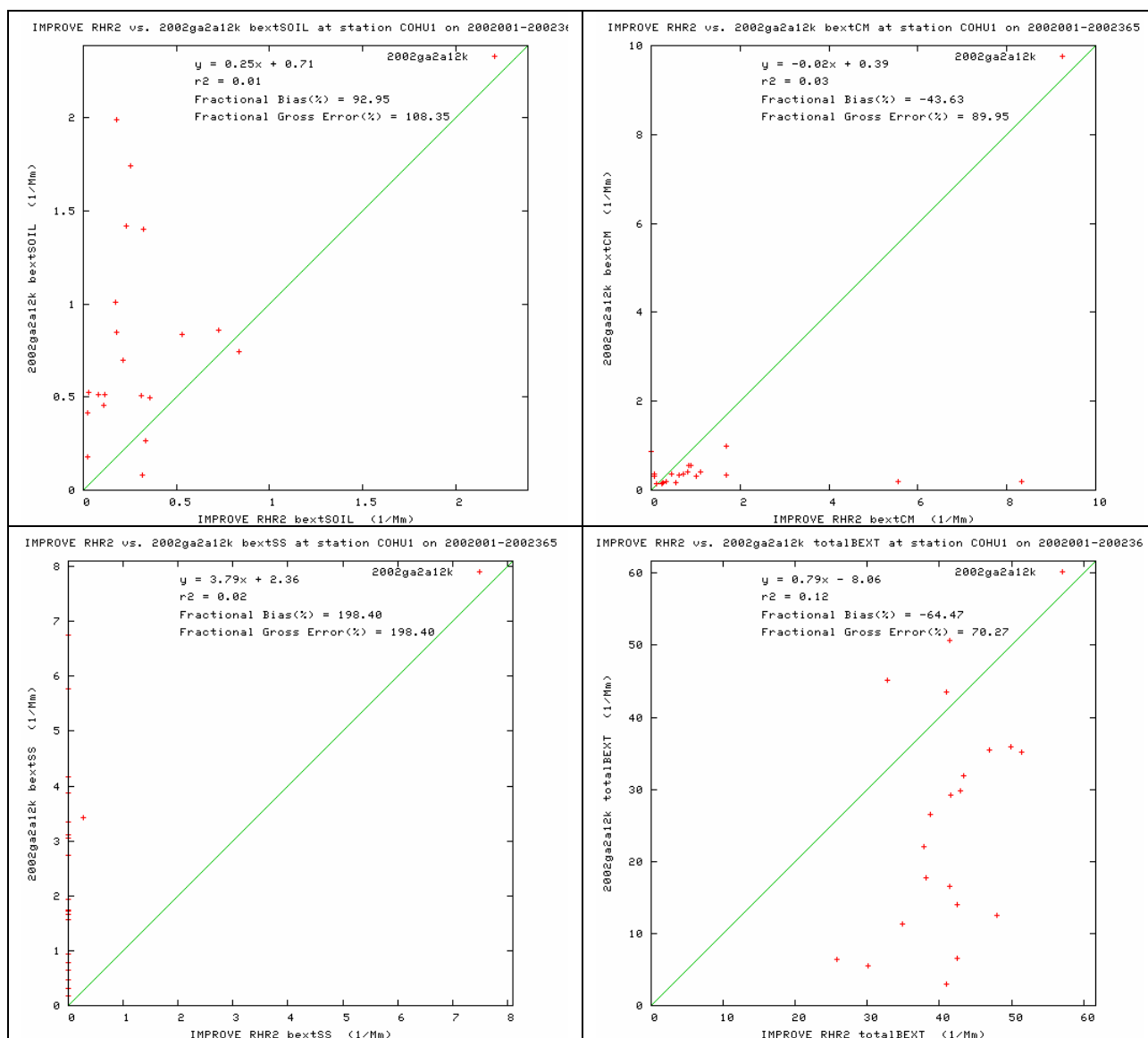


Figure C-23b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Cohutta (COHU), Georgia for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; B20

COHU1

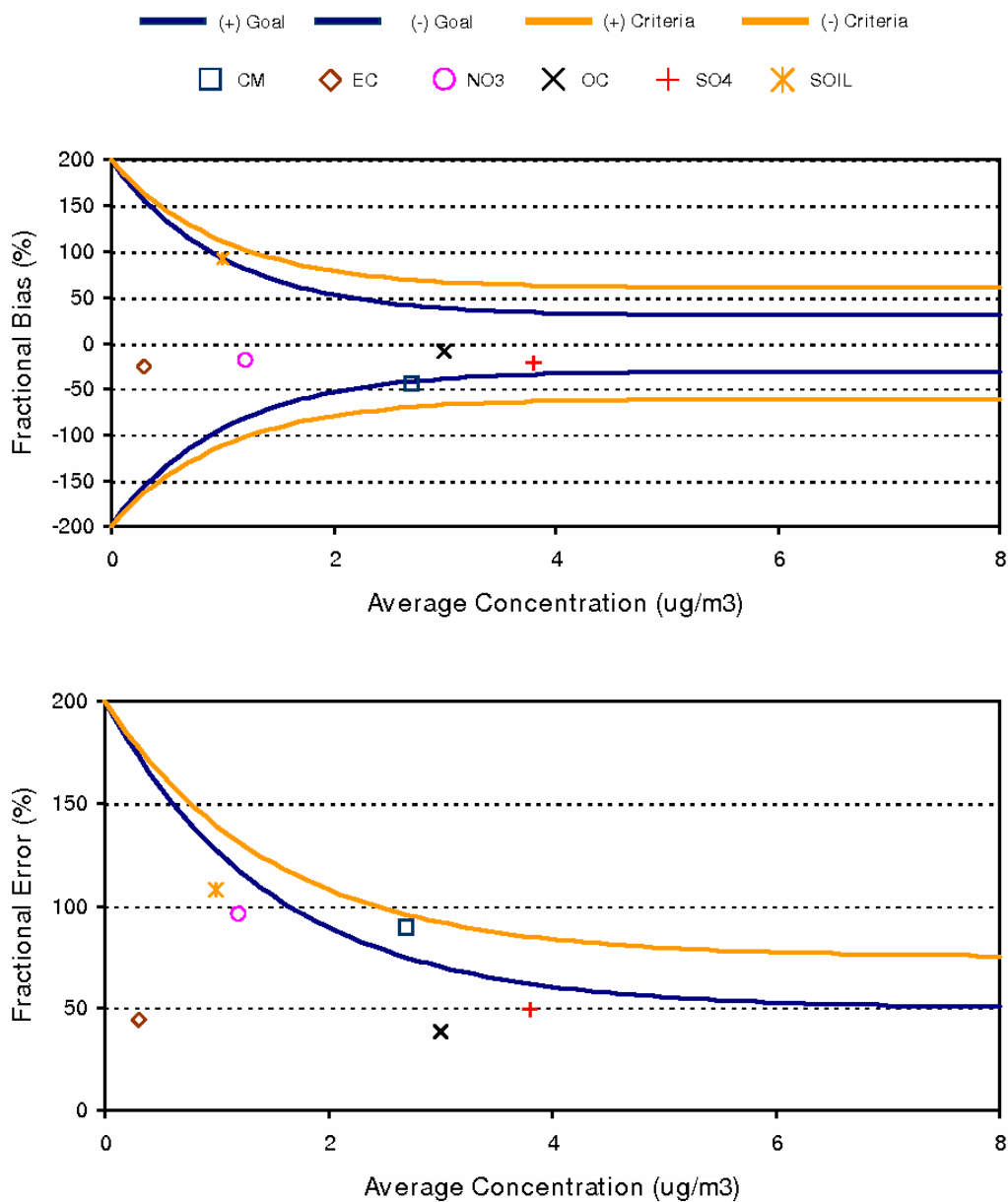


Figure C-24. Bugle Plots of Fractional Bias and Fractional Gross Error for COHU and the Best 20 Percent Days.

2.3.5.2 COHU Worst 20 Percent Days

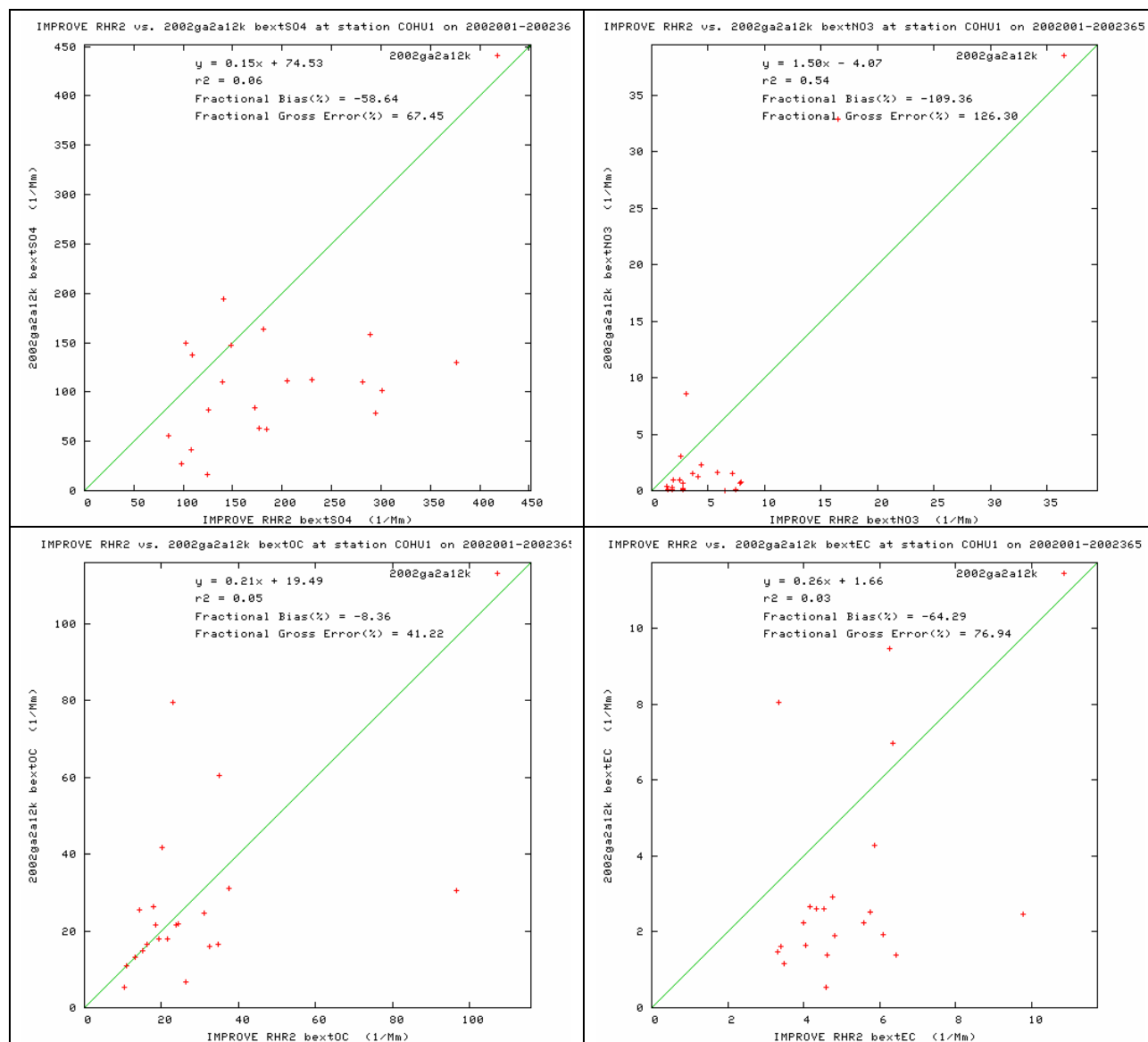


Figure C-25a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Cohutta (COHU), Georgia for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).

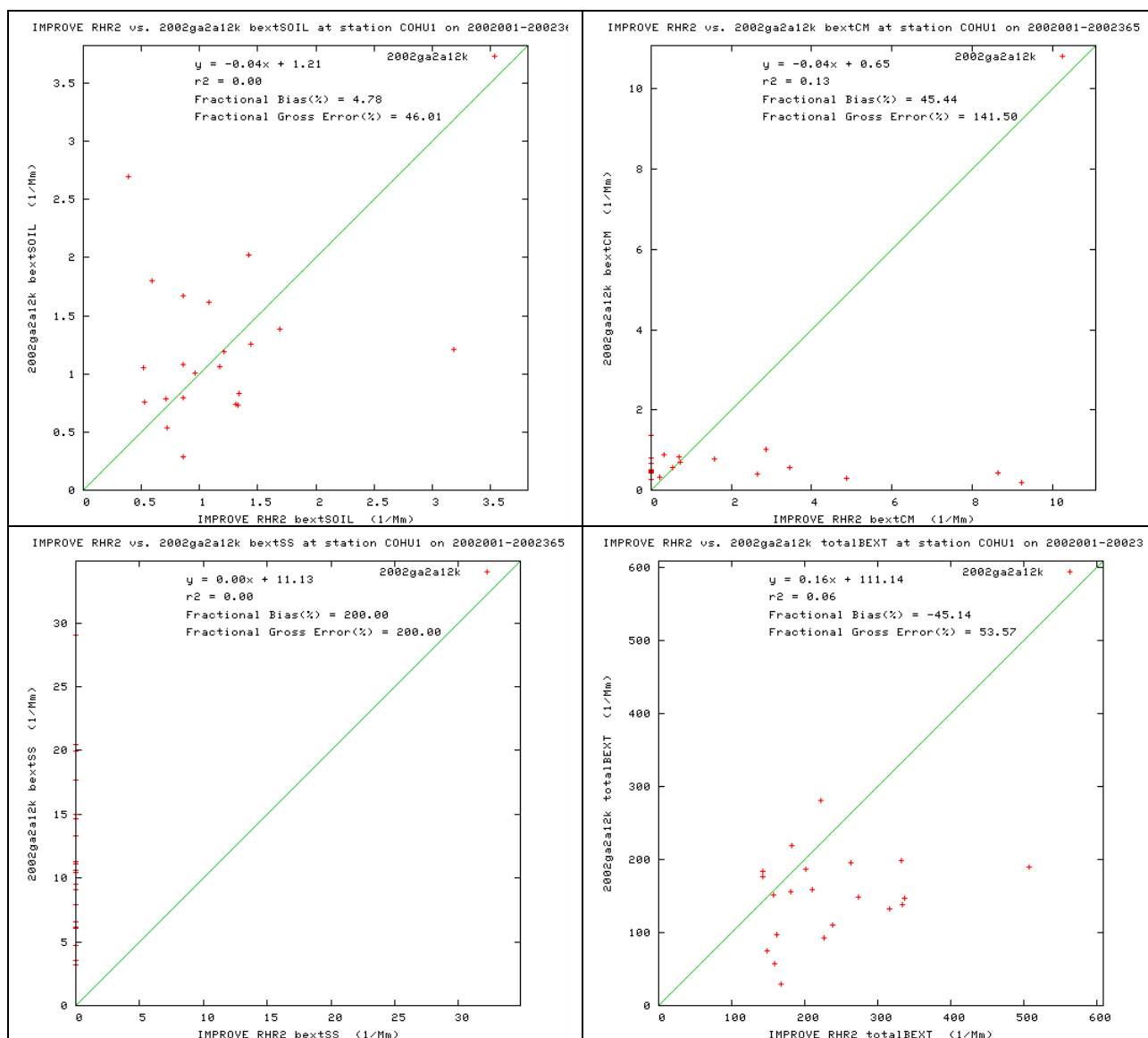


Figure C-25b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Cohutta (COHU), Georgia for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; W20

COHU1

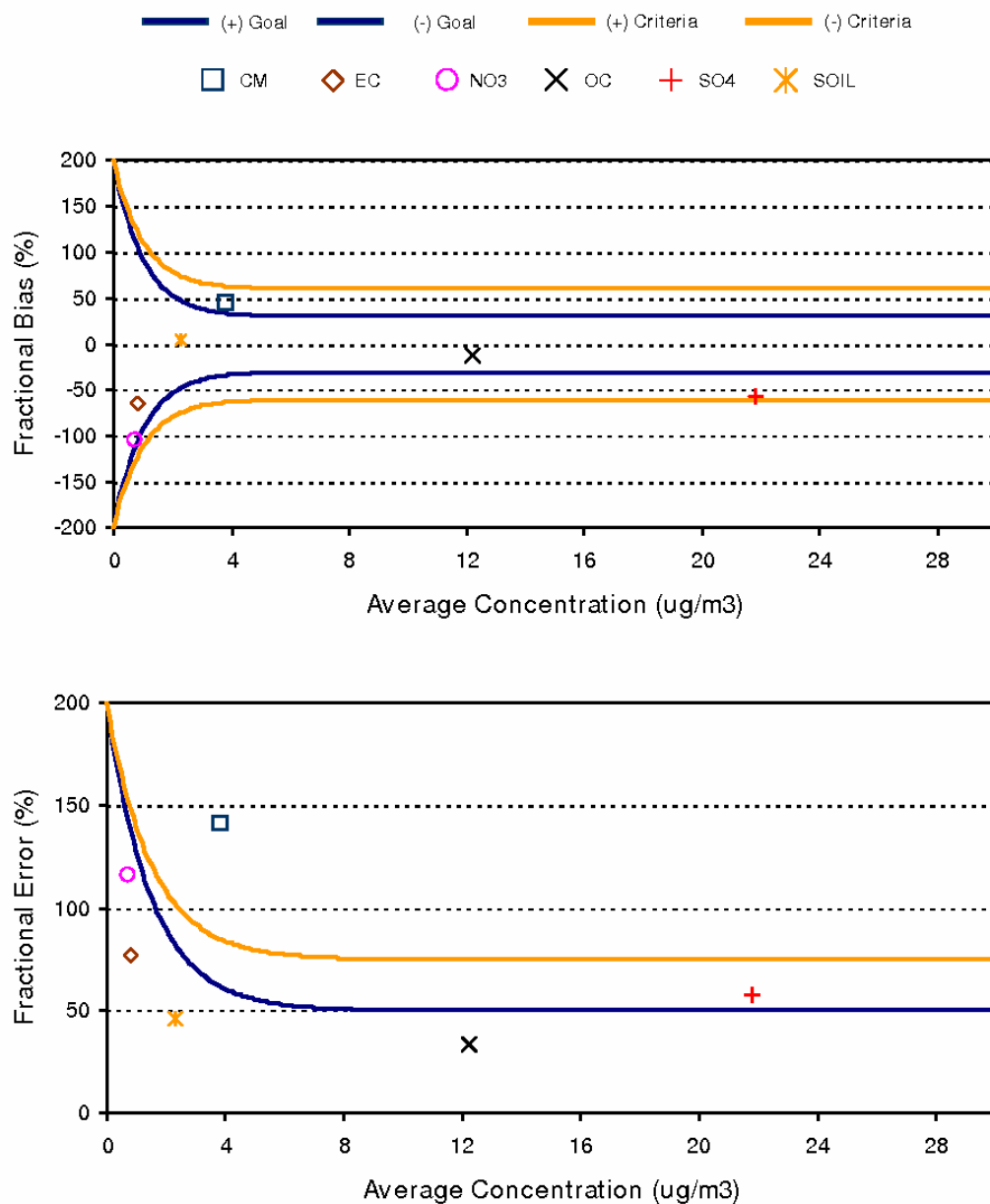


Figure C-26. Bugle Plots of Fractional Bias and Fractional Gross Error for COHU and the Worst 20 Percent Days.

2.3.5.3 COHU for All Days

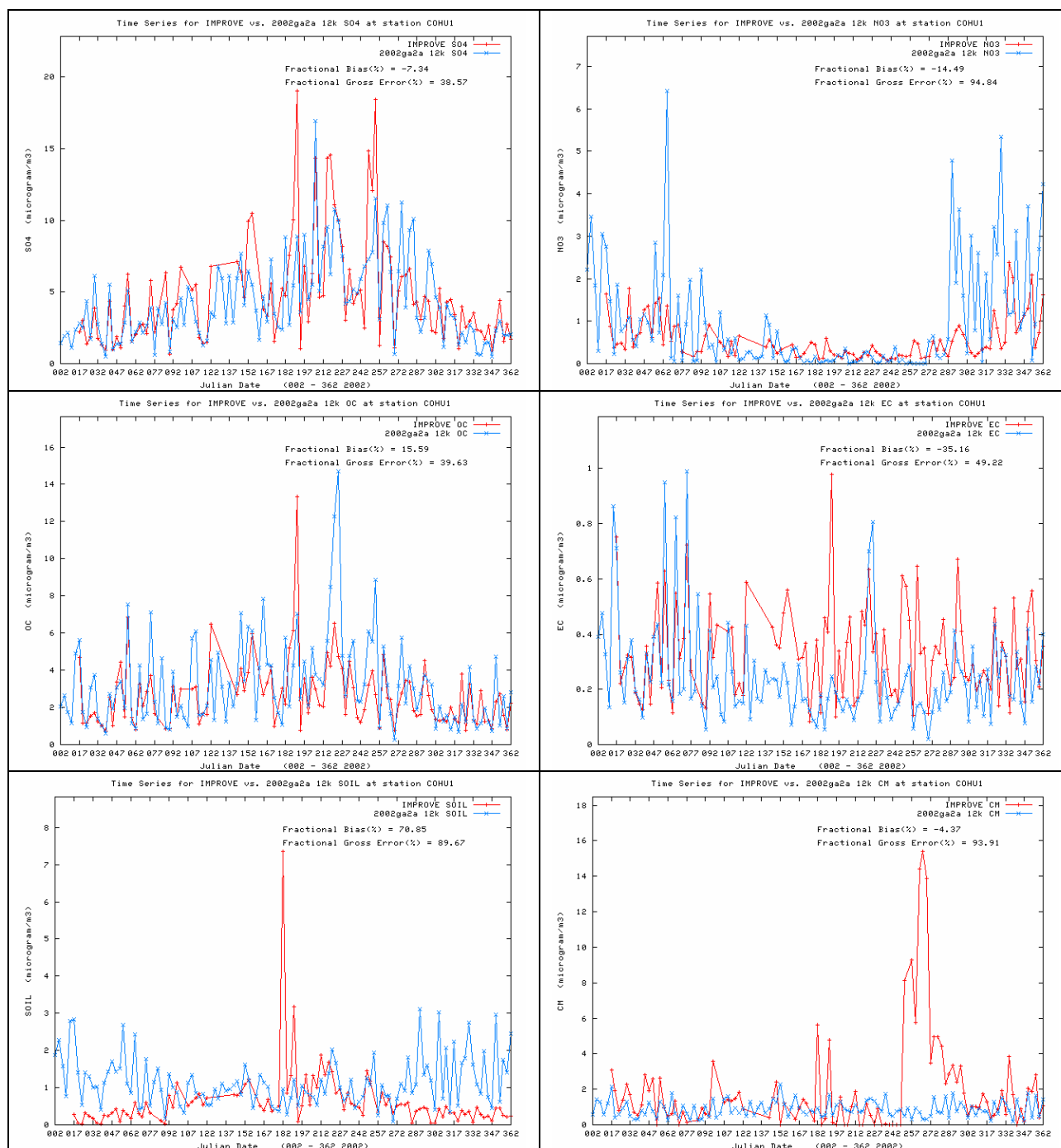
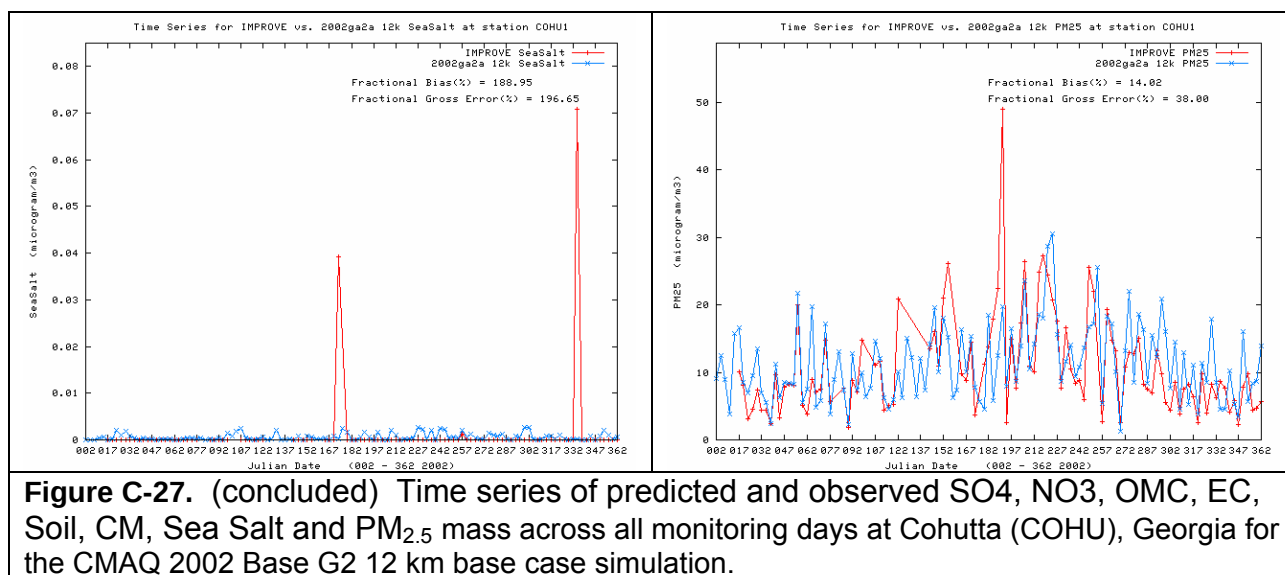
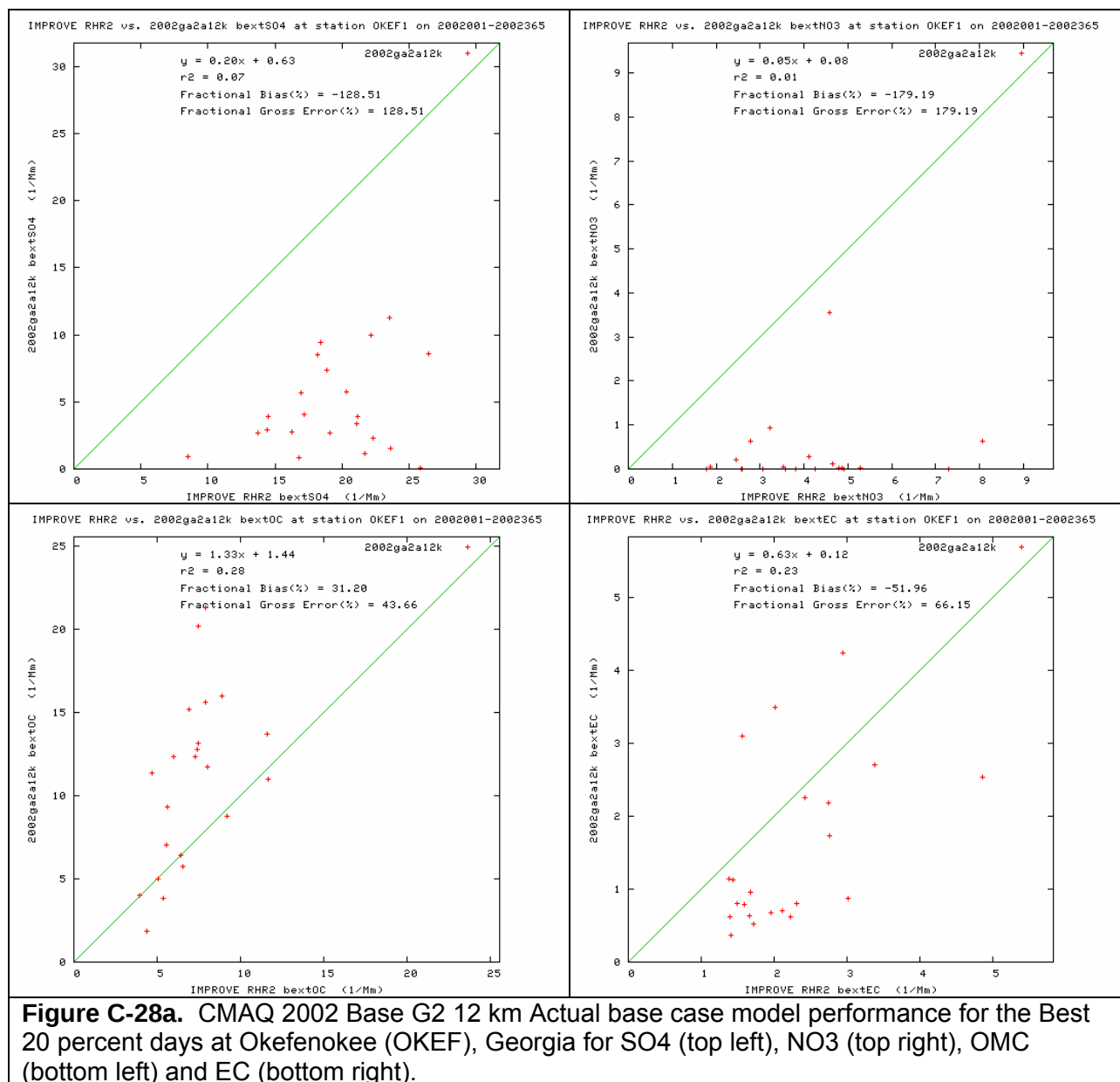


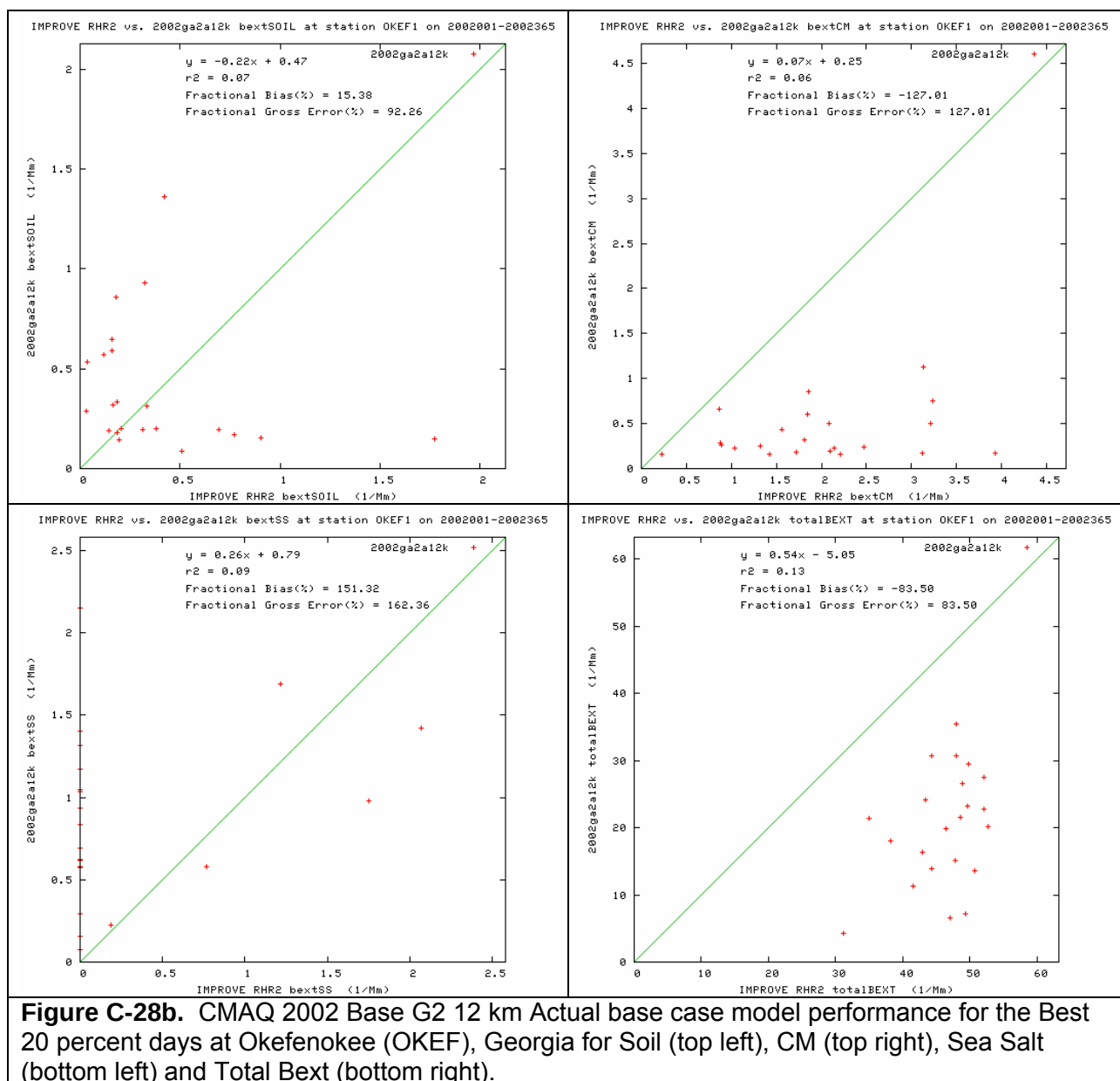
Figure C-27. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Cohutta (COHU), Georgia for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.6 Okefenokee Wildlife Refuge (OKEF), Georgia

2.3.6.1 OKEF Best 20 Percent Days





VISTAS CMAQ 2002 Actual Base G2 12k; B20

OKEF1

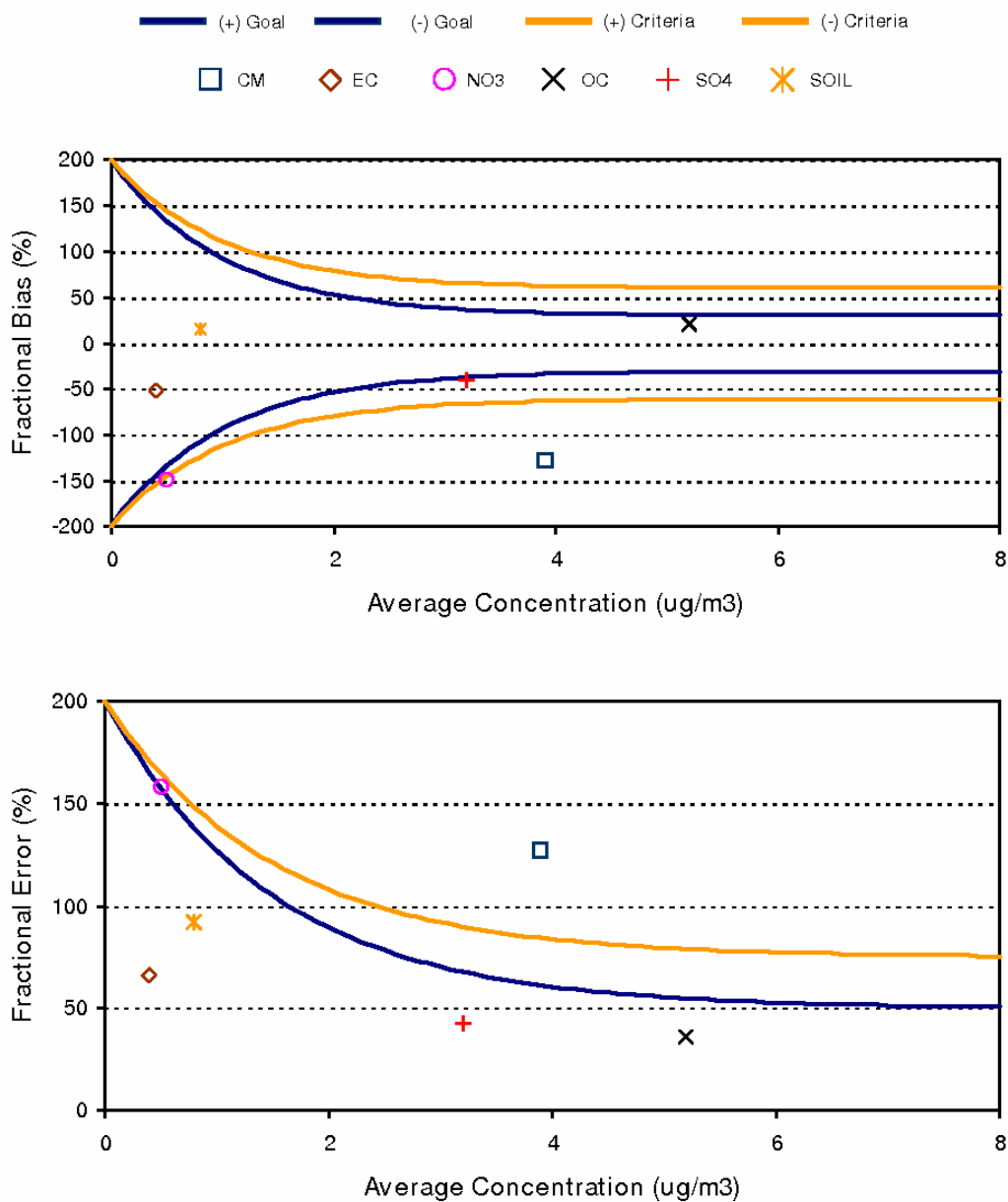


Figure C-29. Bugle Plots of Fractional Bias and Fractional Gross Error for OKEF and the Best 20 Percent Days.

2.3.6.2 OKEF Worst 20 Percent Days

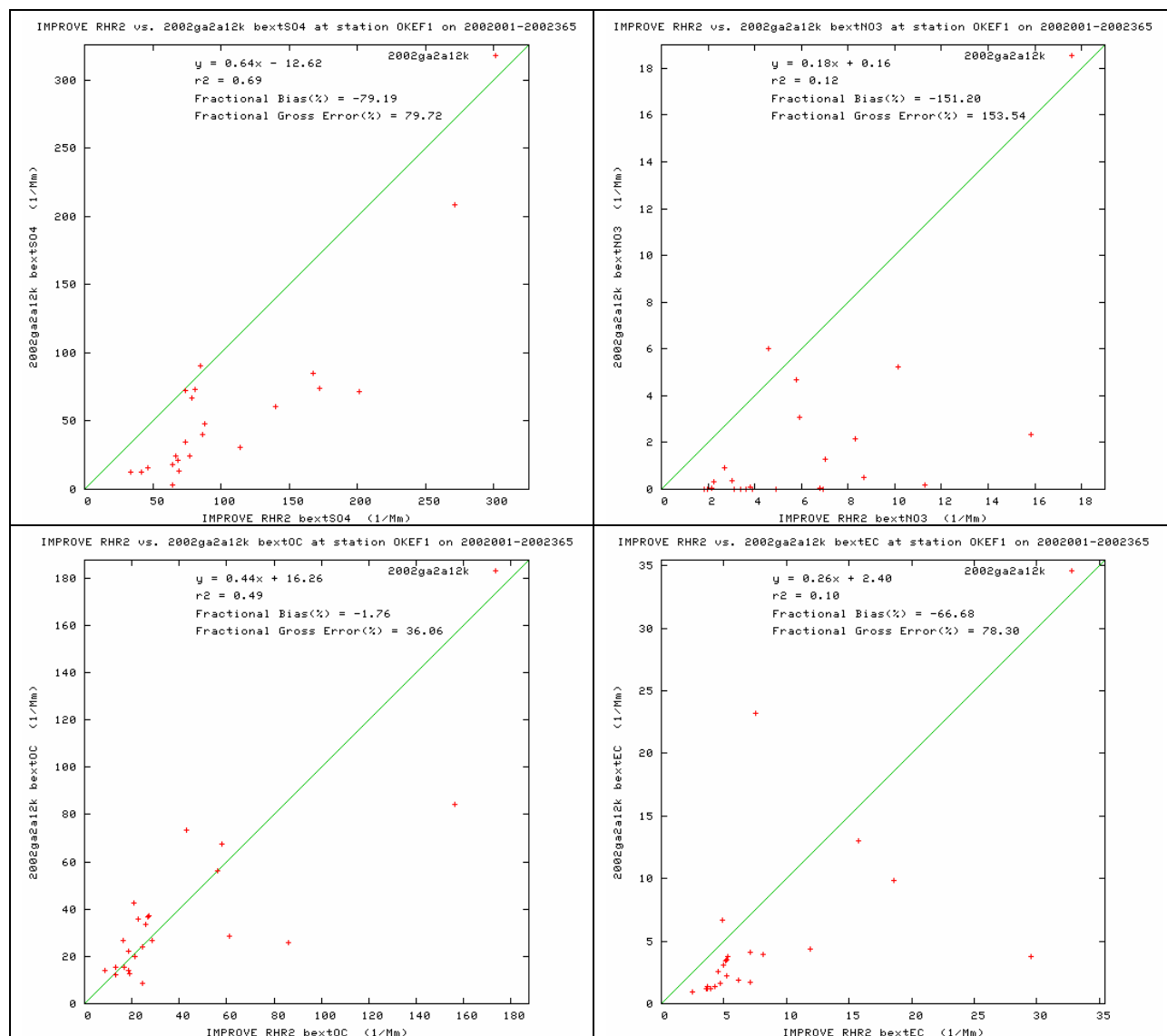
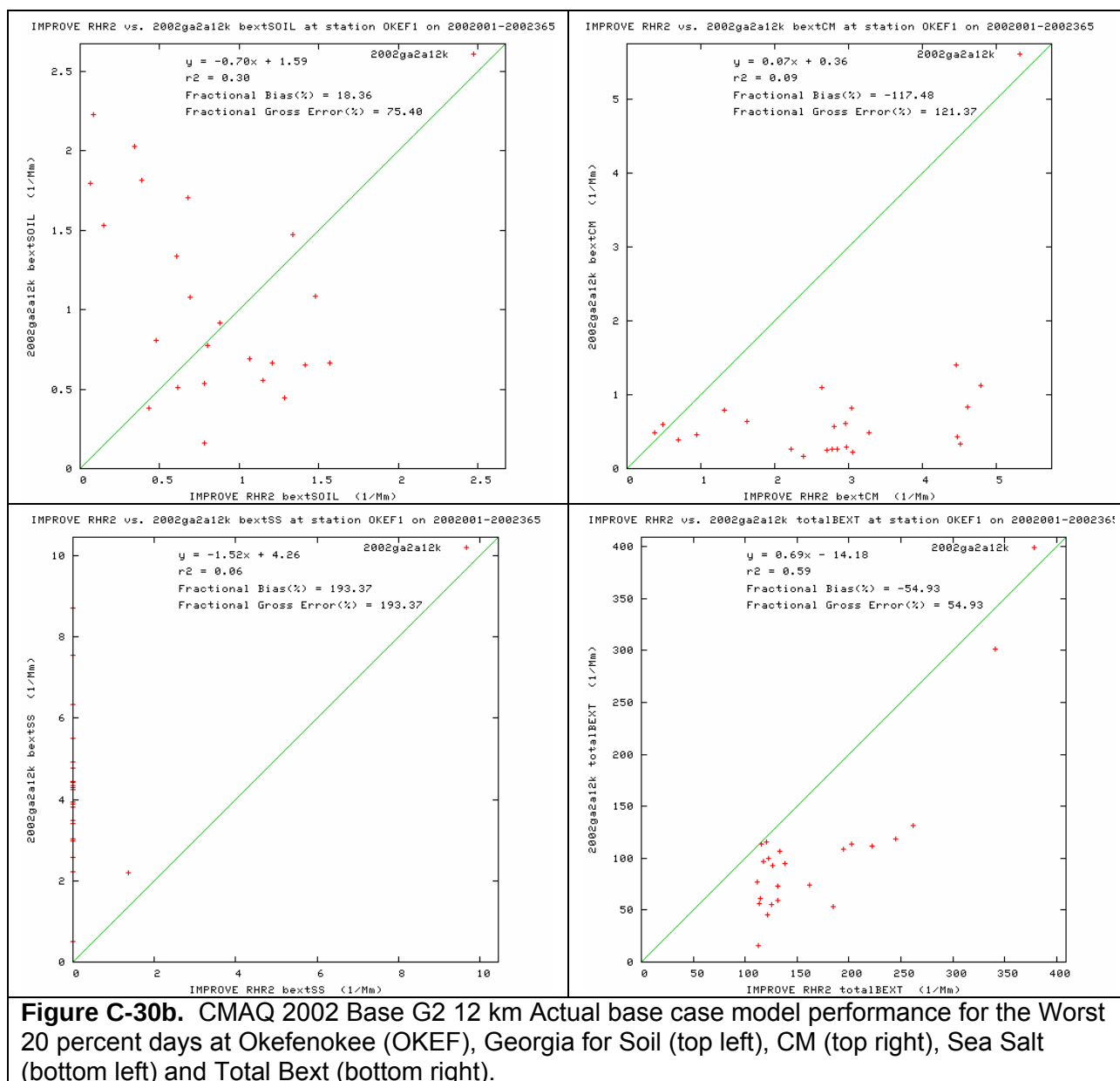


Figure C-30a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Okefenokee (OKEF), Georgia for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

OKEF1

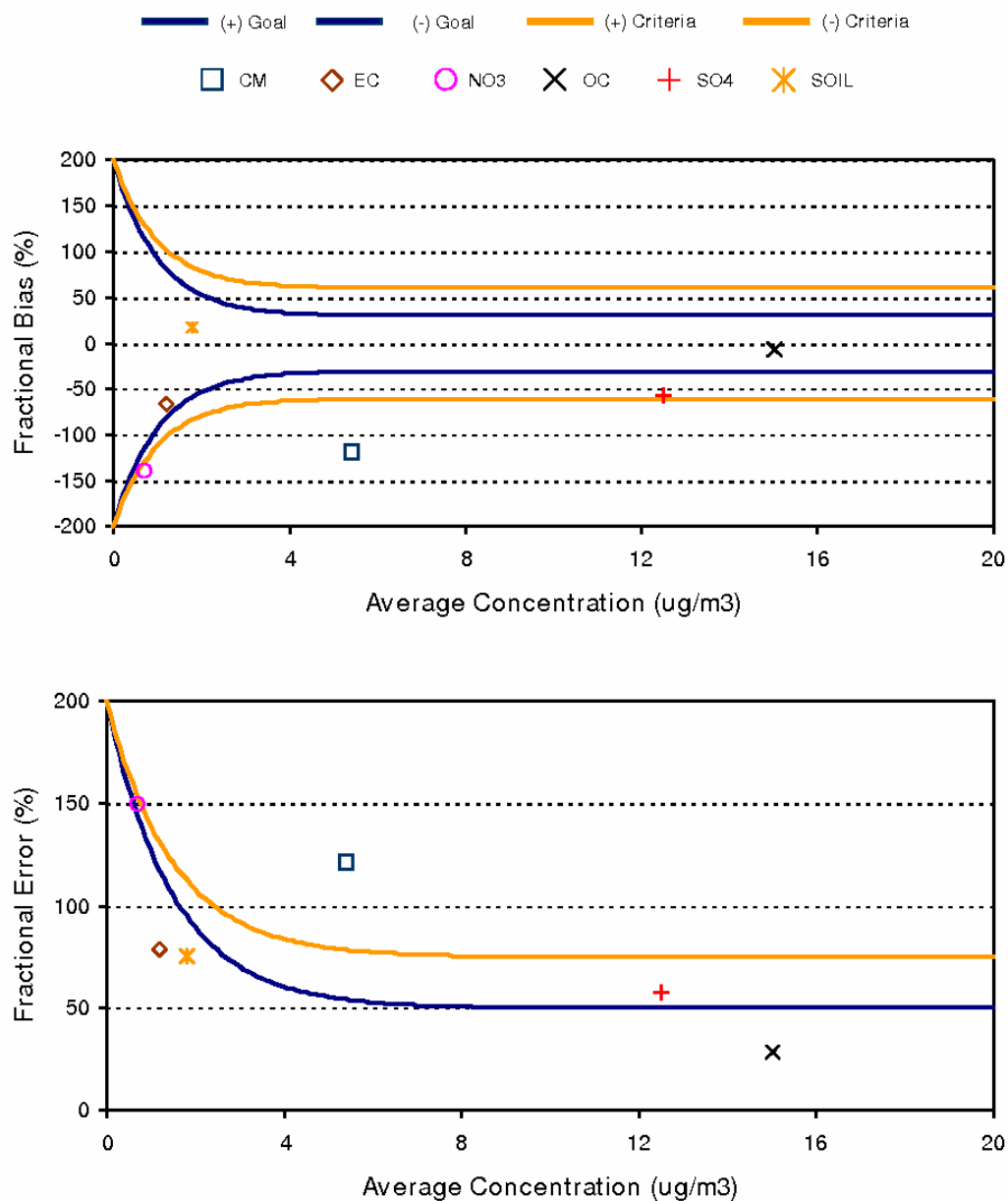
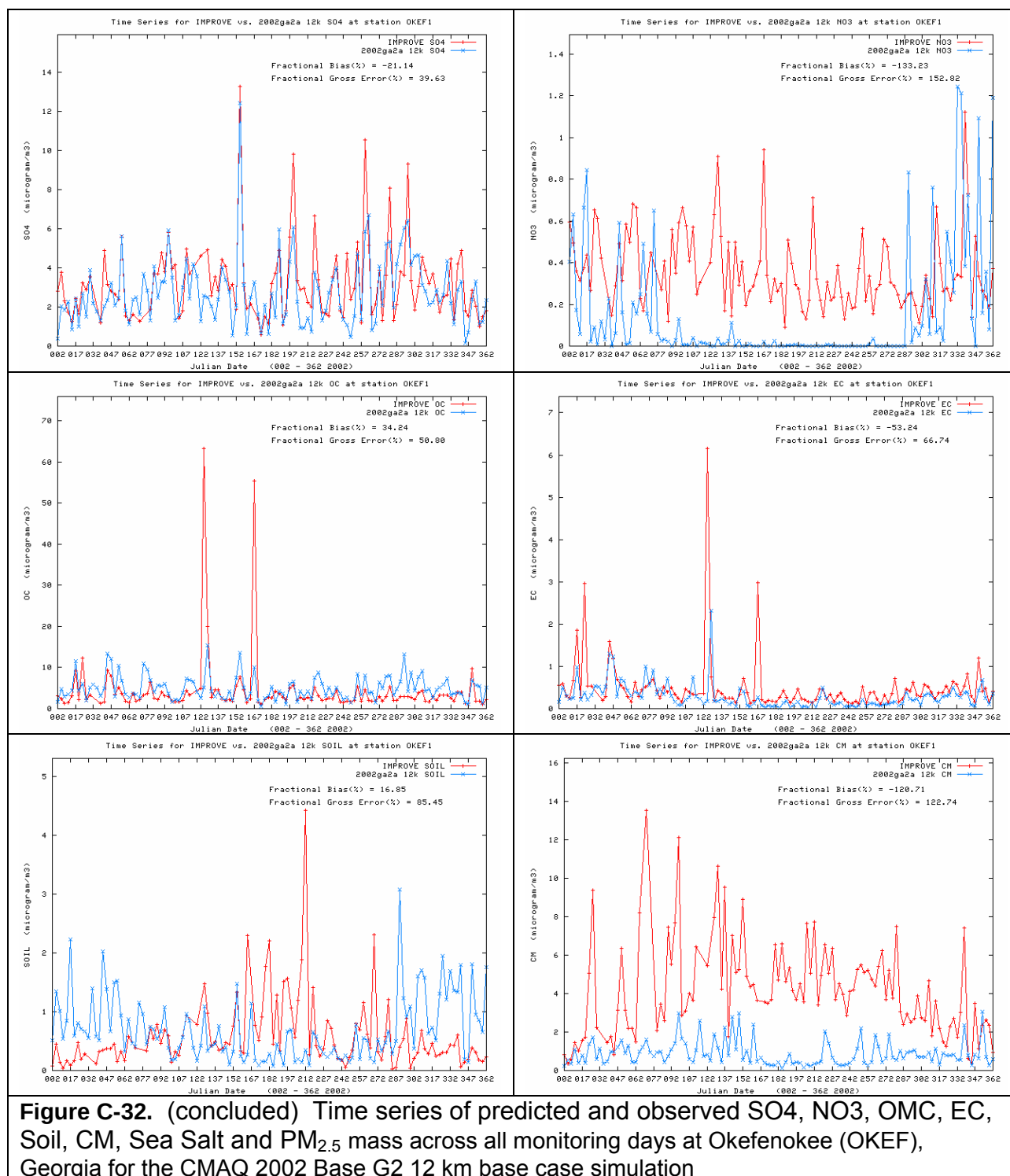
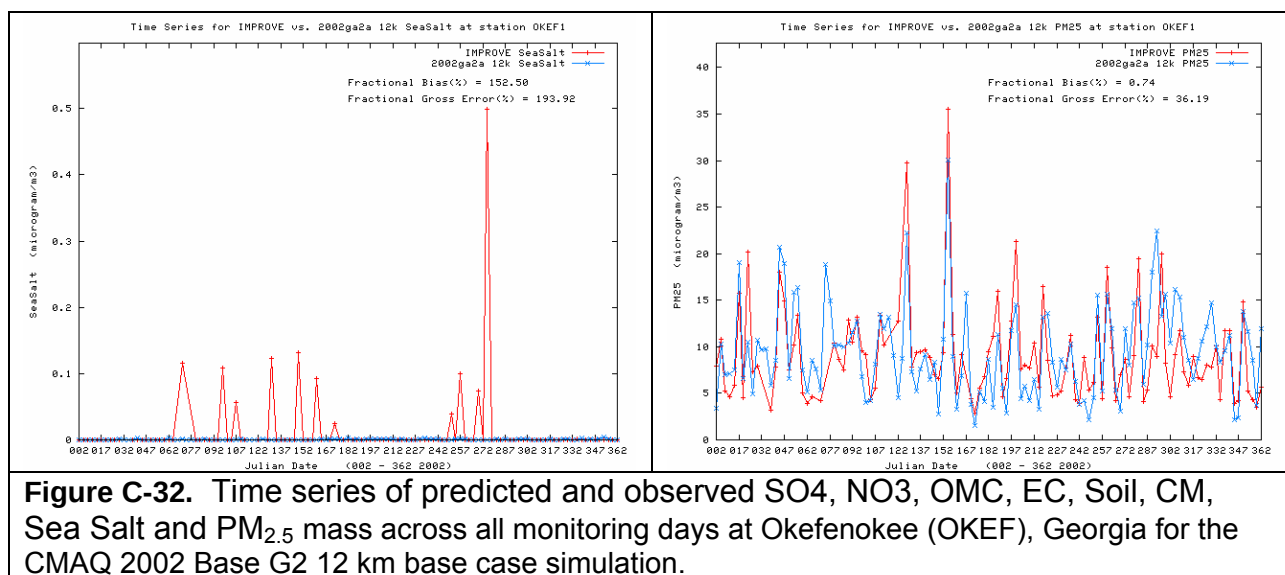


Figure C-31. Bugle Plots of Fractional Bias and Fractional Gross Error for OKEF and the Worst 20 Percent Days.

2.3.6.3 OKEF for All Days





2.3.7 Mammoth Cave National Park (MACA), Kentucky

2.3.7.1 MACA Best 20 Percent Days

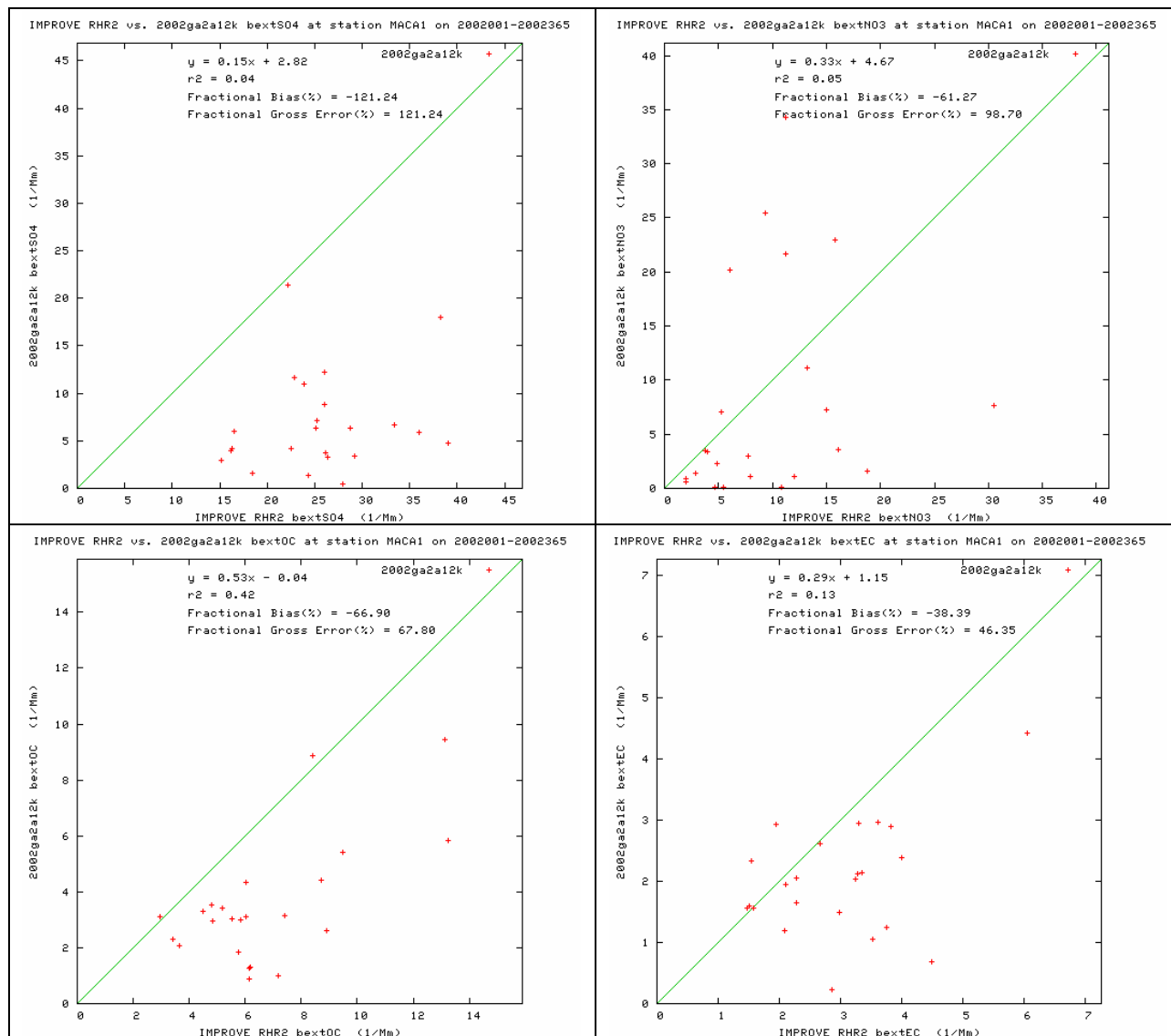
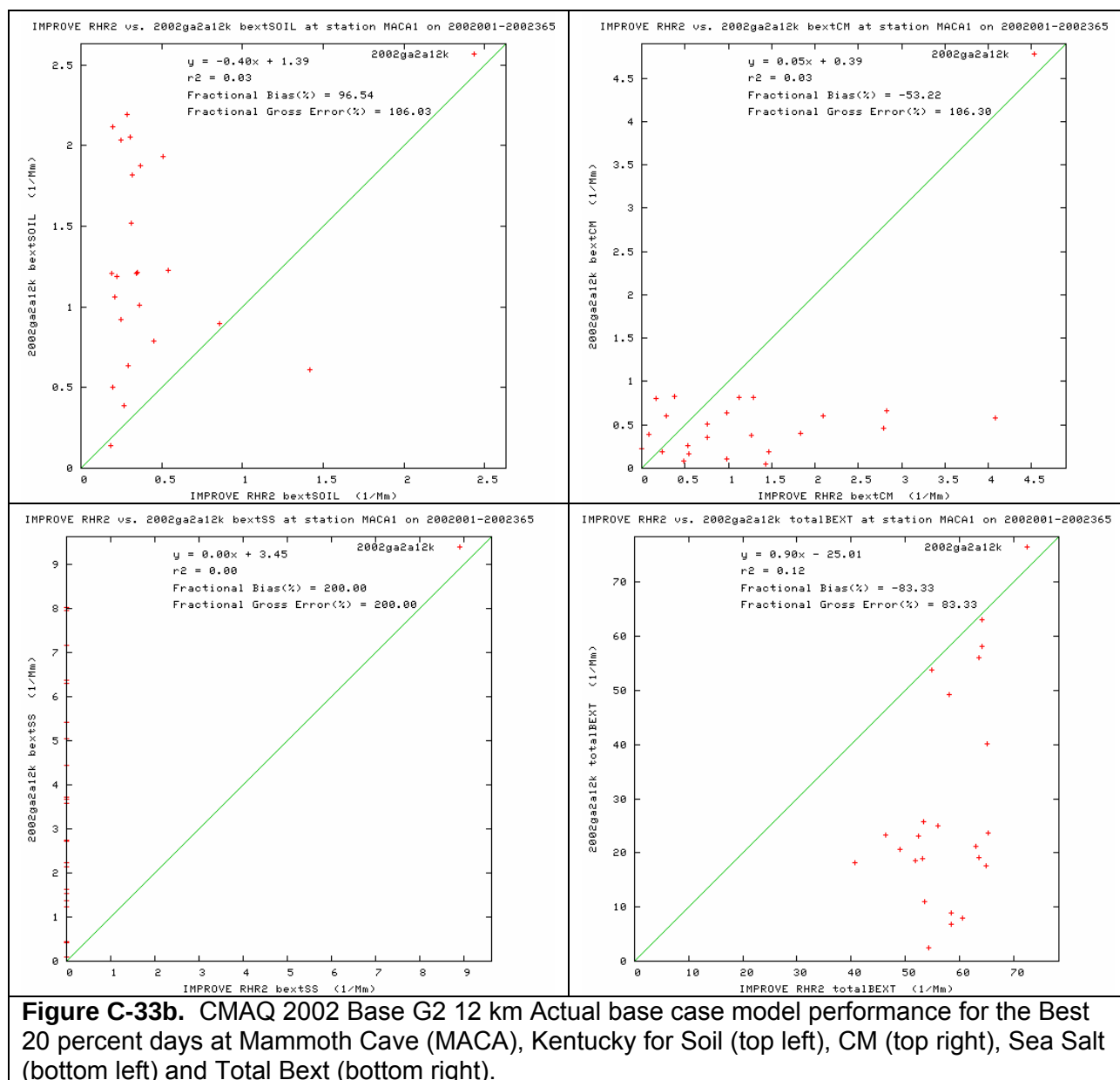


Figure C-33a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Mammoth Cave (MACA), Kentucky for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

MACA1

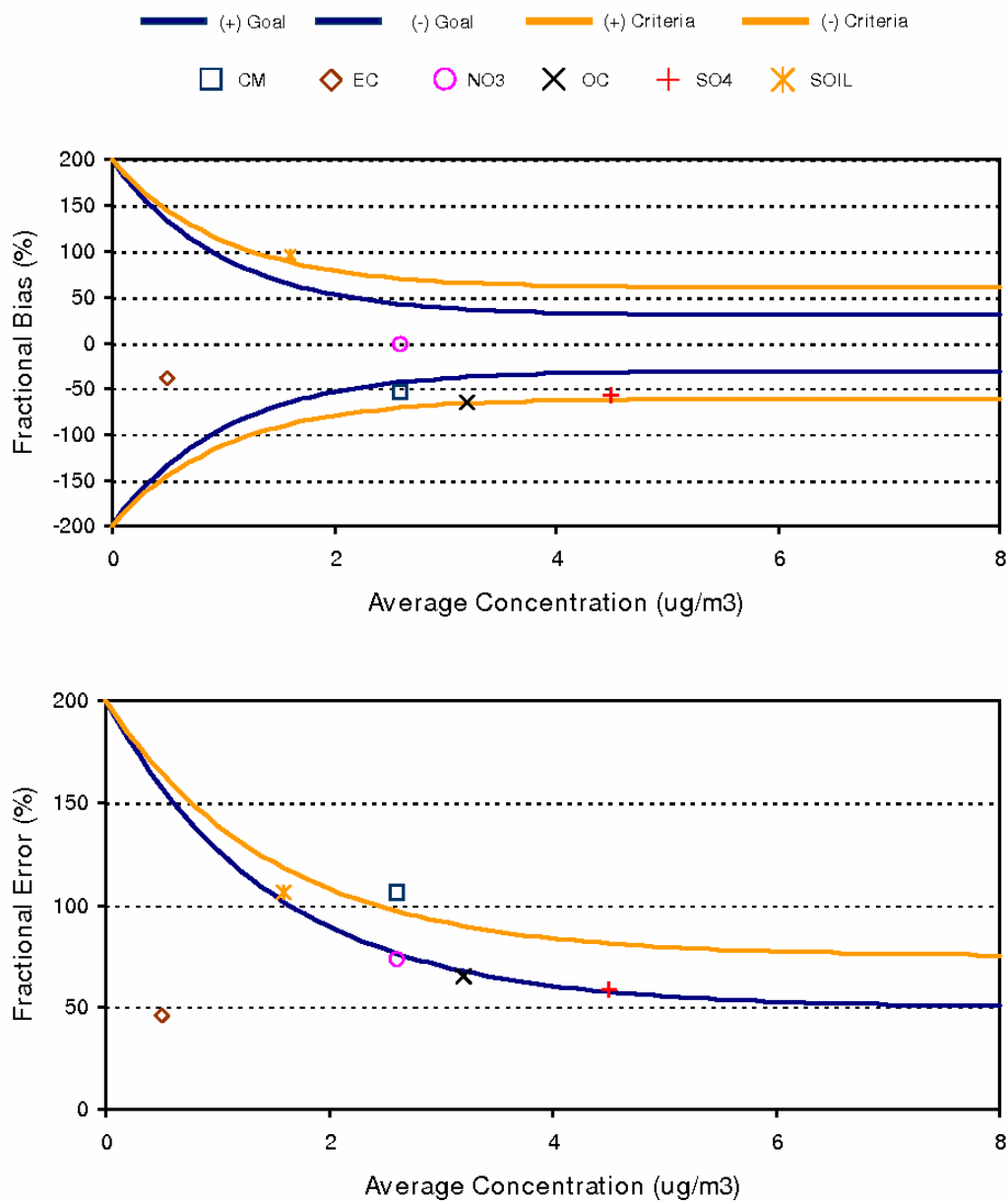


Figure C-34. Bugle Plots of Fractional Bias and Fractional Gross Error for MACA and the Best 20 Percent Days.

2.3.7.2 MACA Worst 20 Percent Days

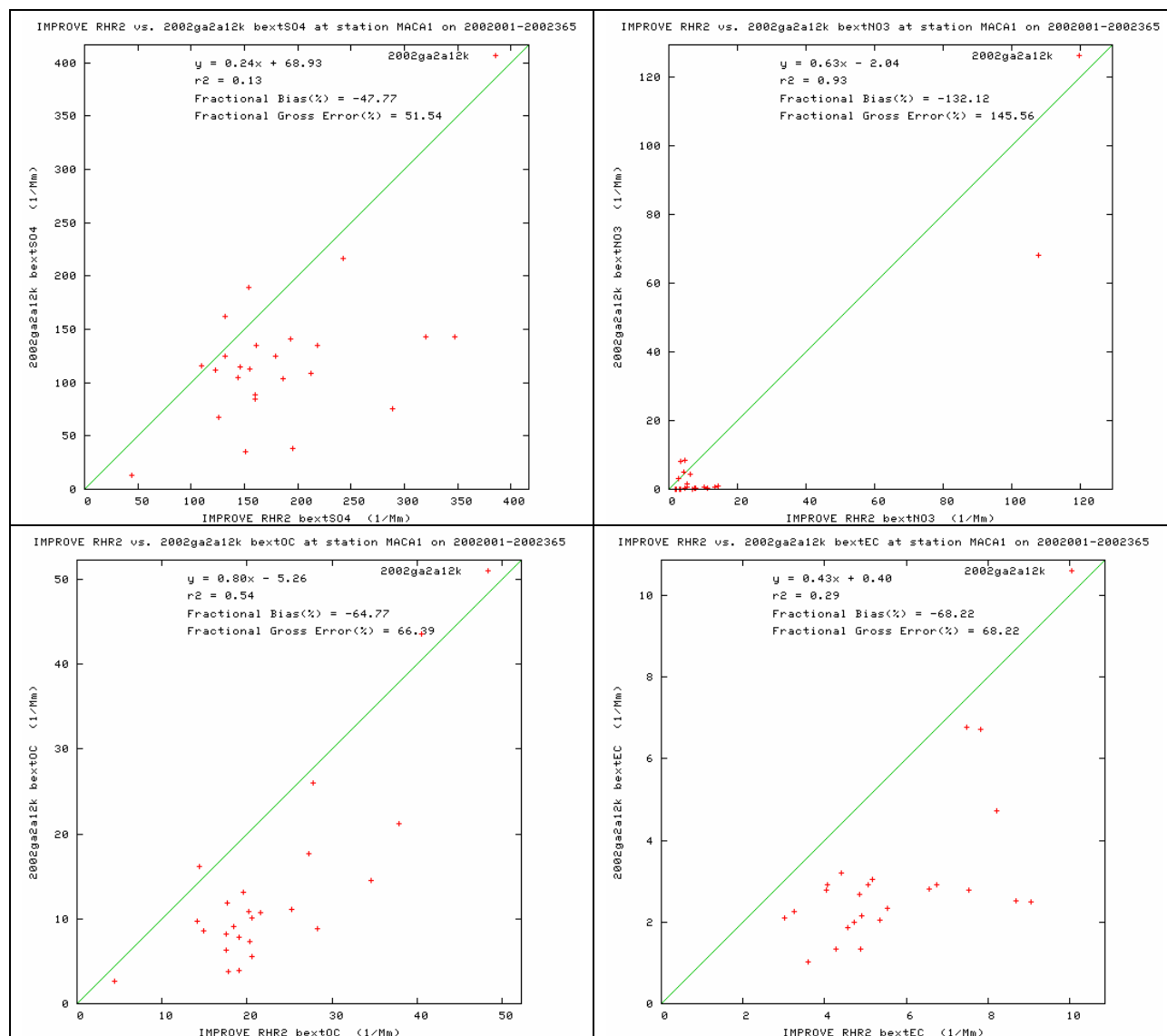
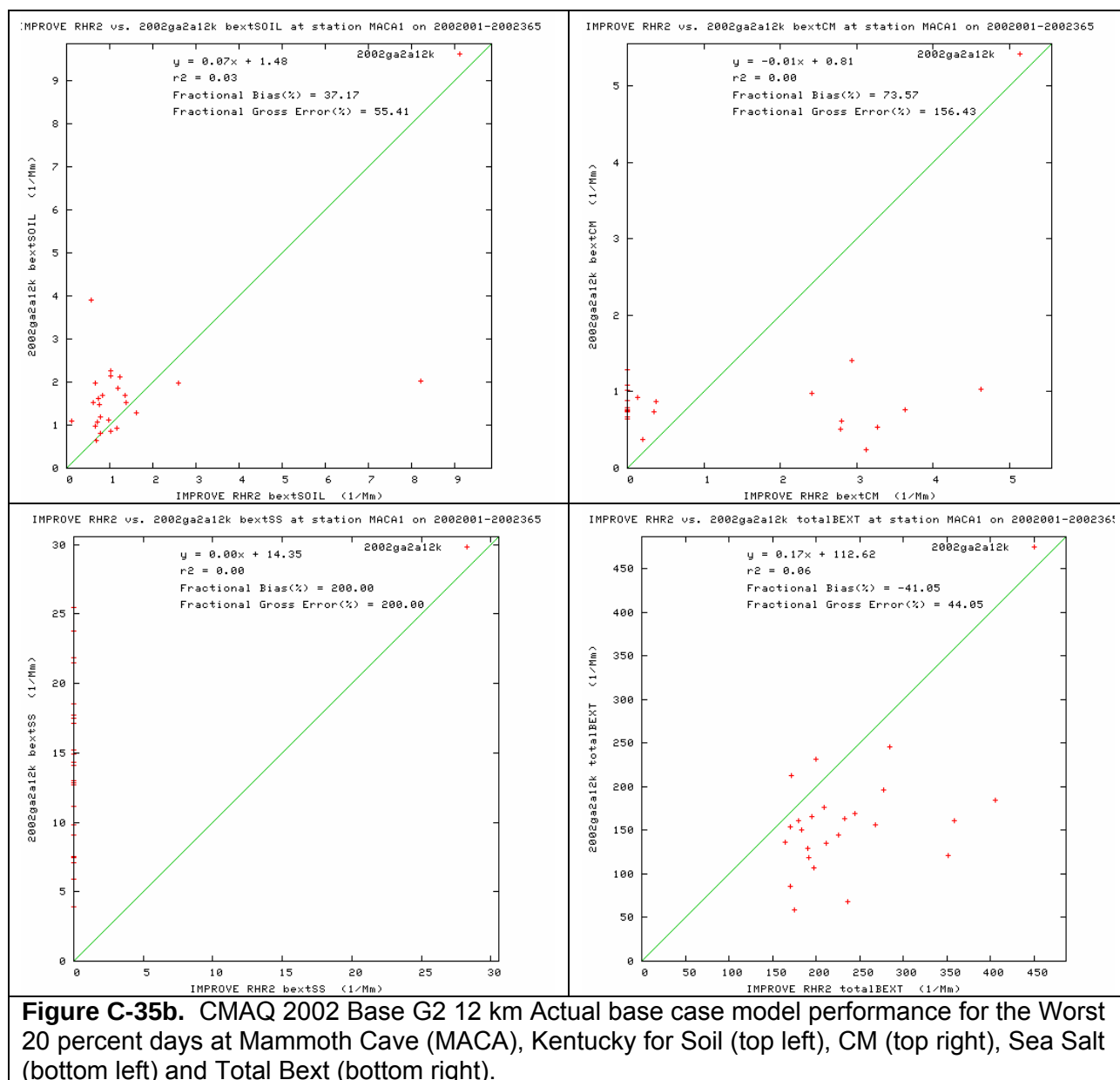


Figure C-35a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Mammoth Cave (MACA), Kentucky for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

MACA1

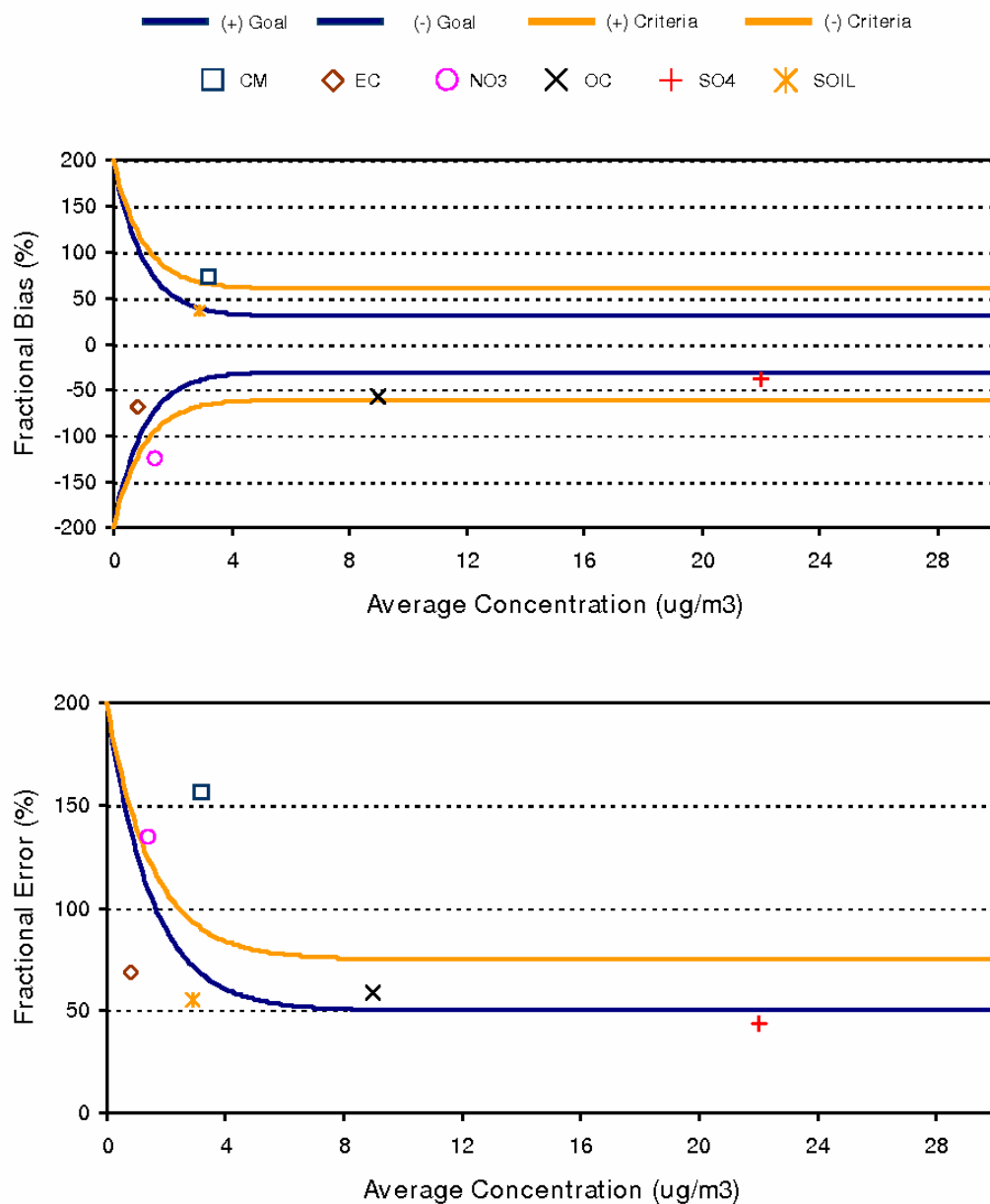


Figure C-36. Bugle Plots of Fractional Bias and Fractional Gross Error for MACA and the Worst 20 Percent Days.

2.3.7.3 MACA for All Days

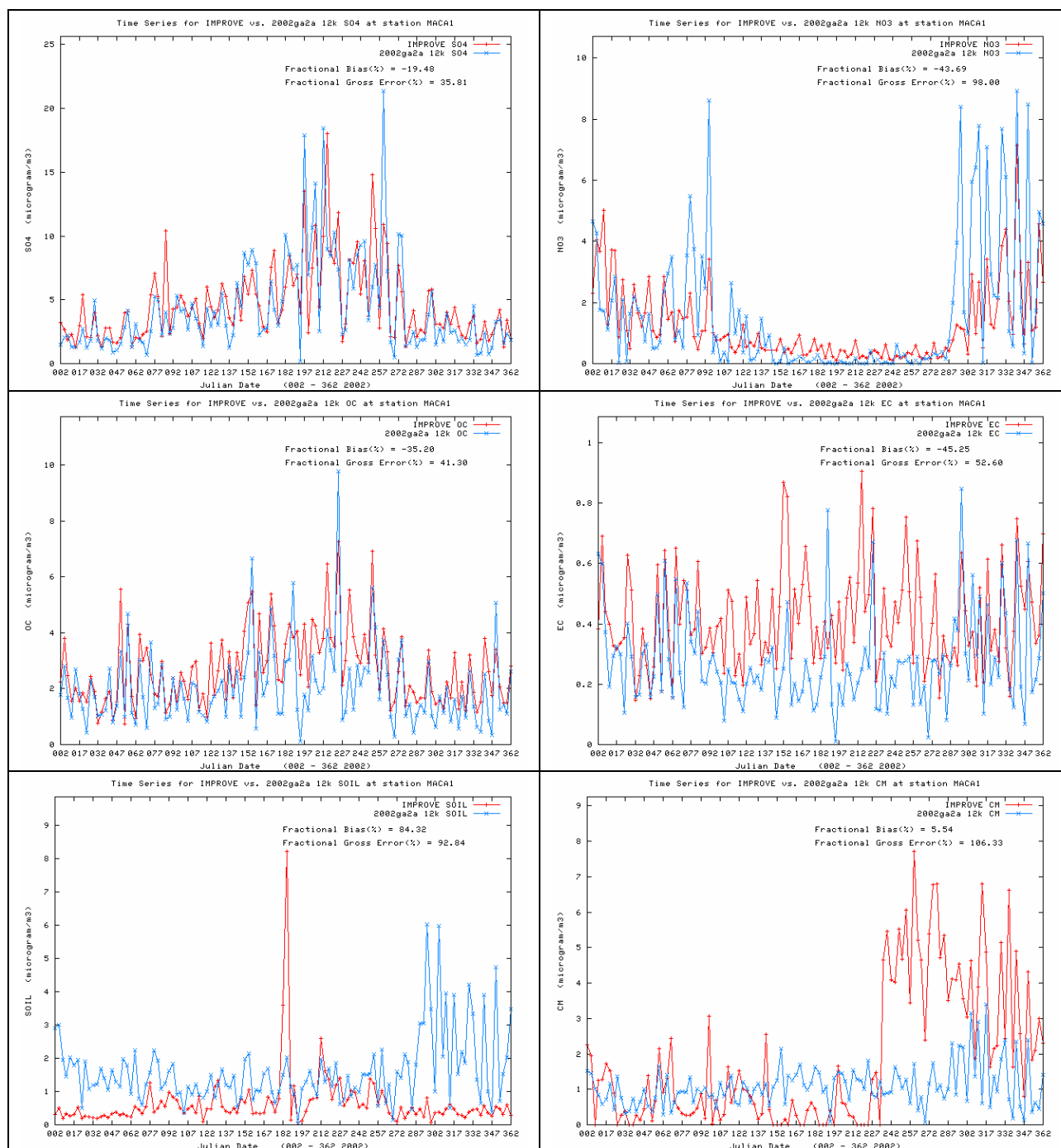
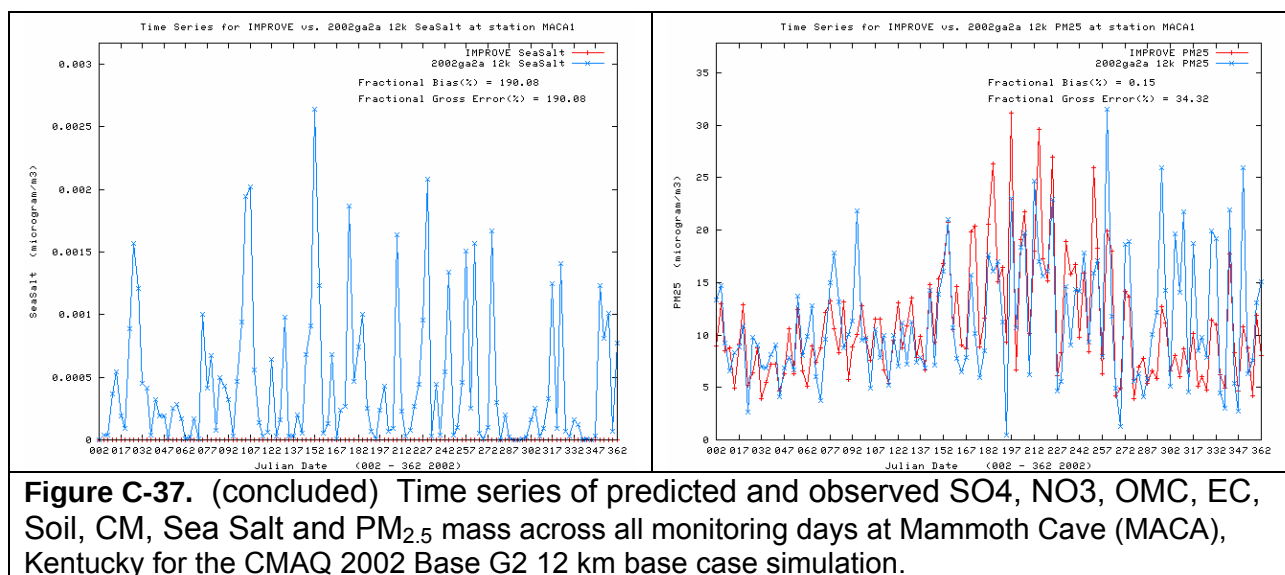


Figure C-37. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Mammoth Cave (MACA), Kentucky for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.8 Linville Gorge Wilderness Area (LIGO), North Carolina

2.3.8.1 LIGO Best 20 Percent Days

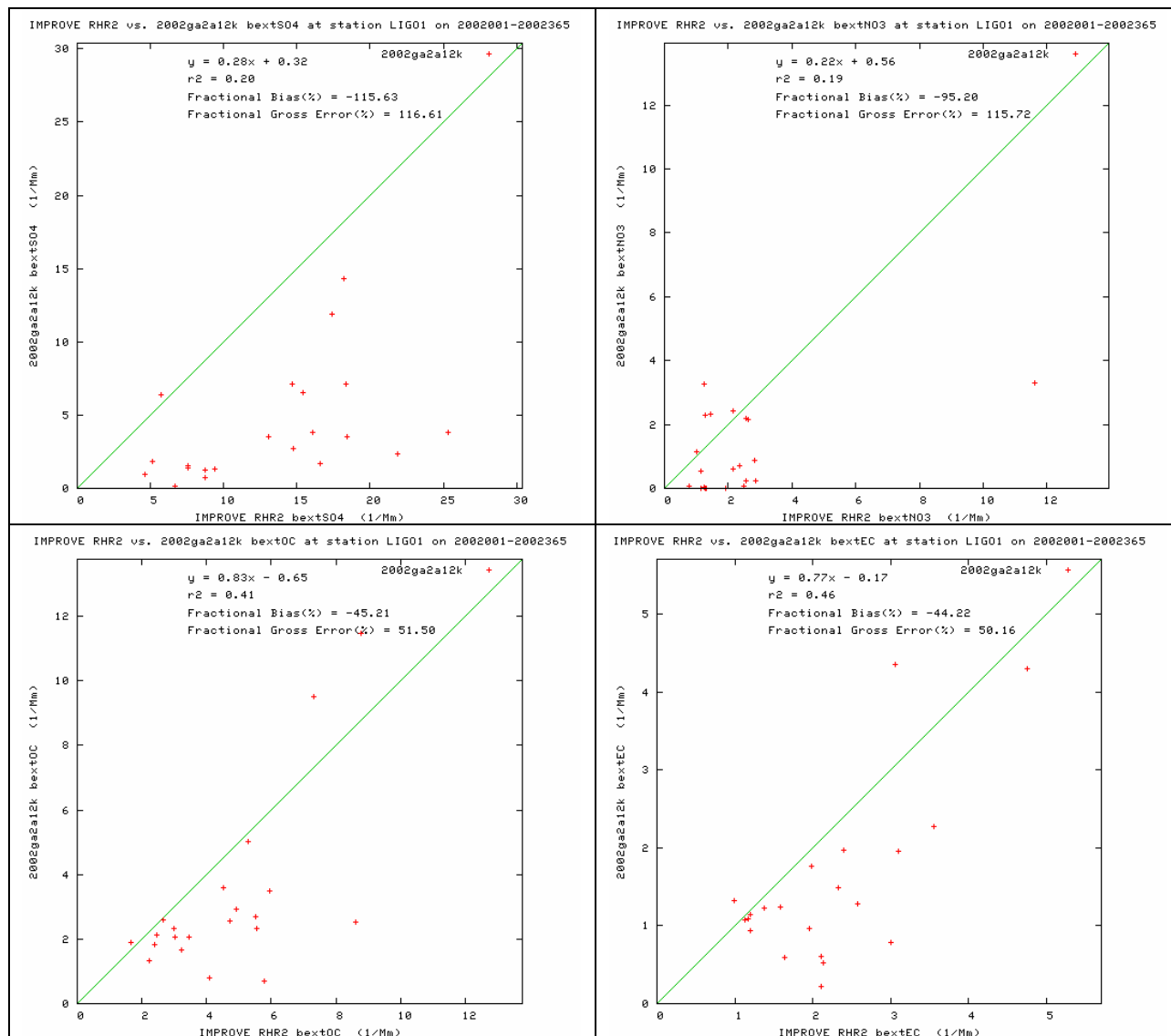
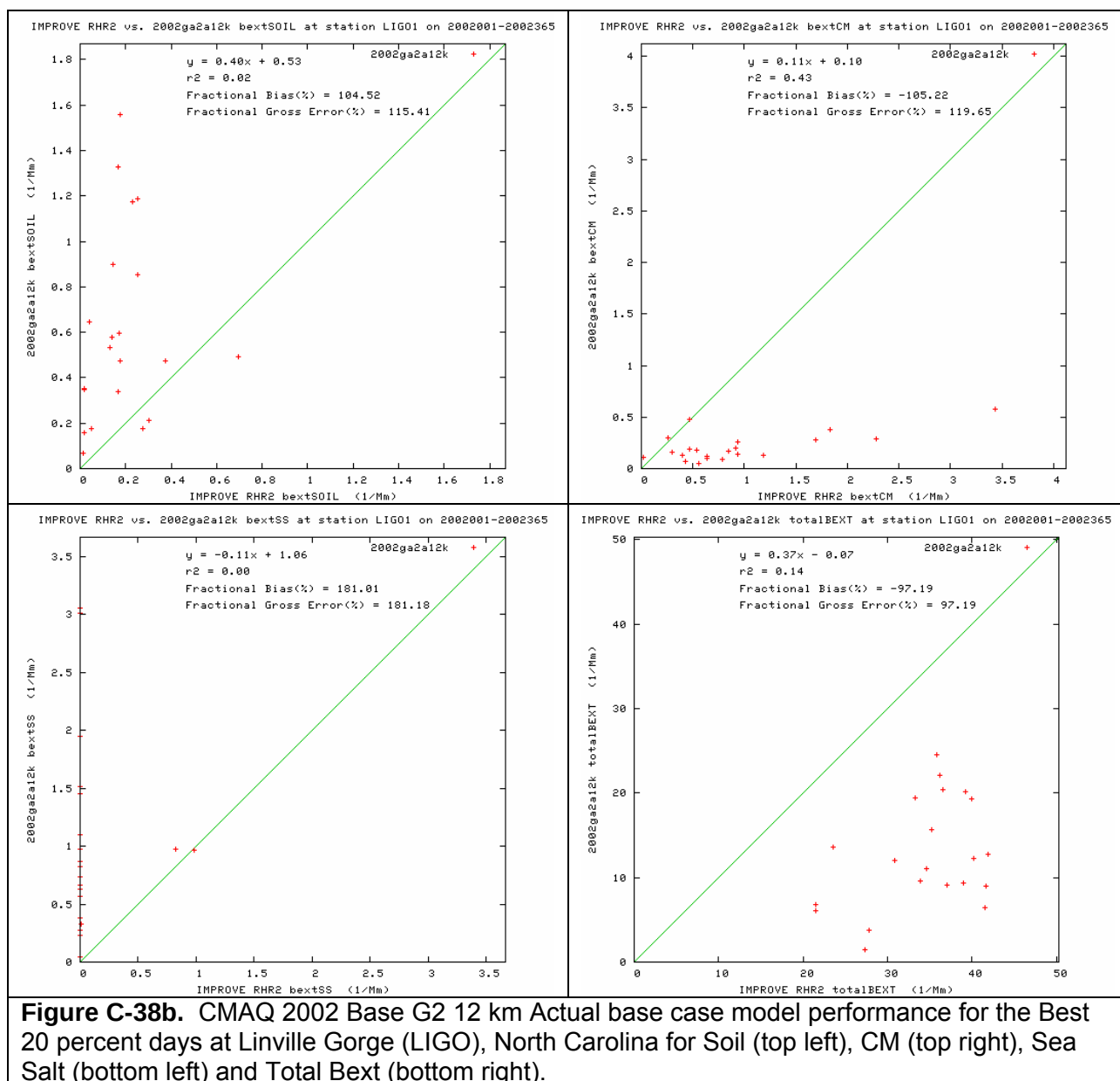


Figure C-38a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Linville Gorge (LIGO), North Carolina for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

LIGO1

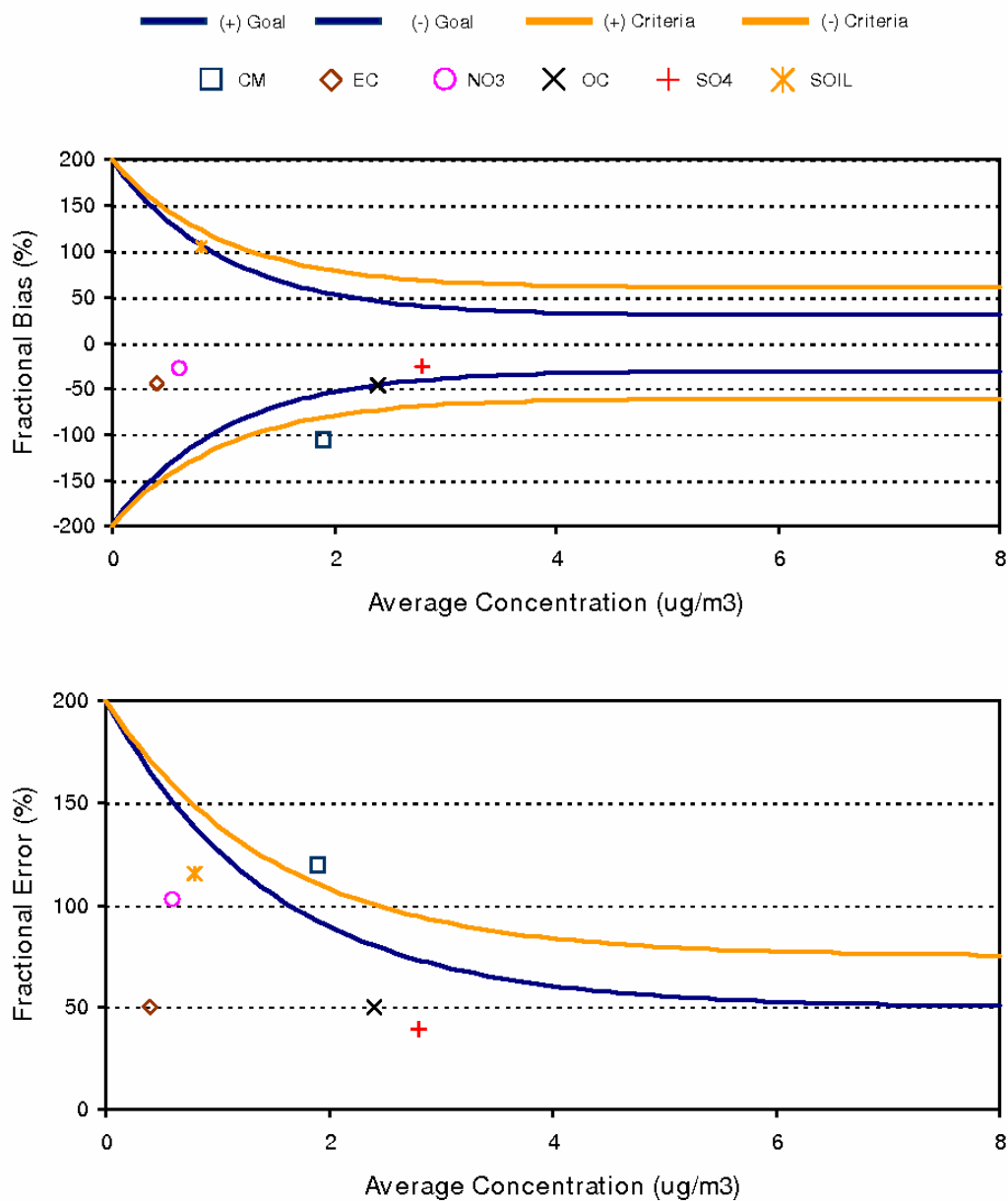


Figure C-39. Bugle Plots of Fractional Bias and Fractional Gross Error for LIGO and the Best 20 Percent Days.

2.3.8.2 LIGO Worst 20 Percent Days

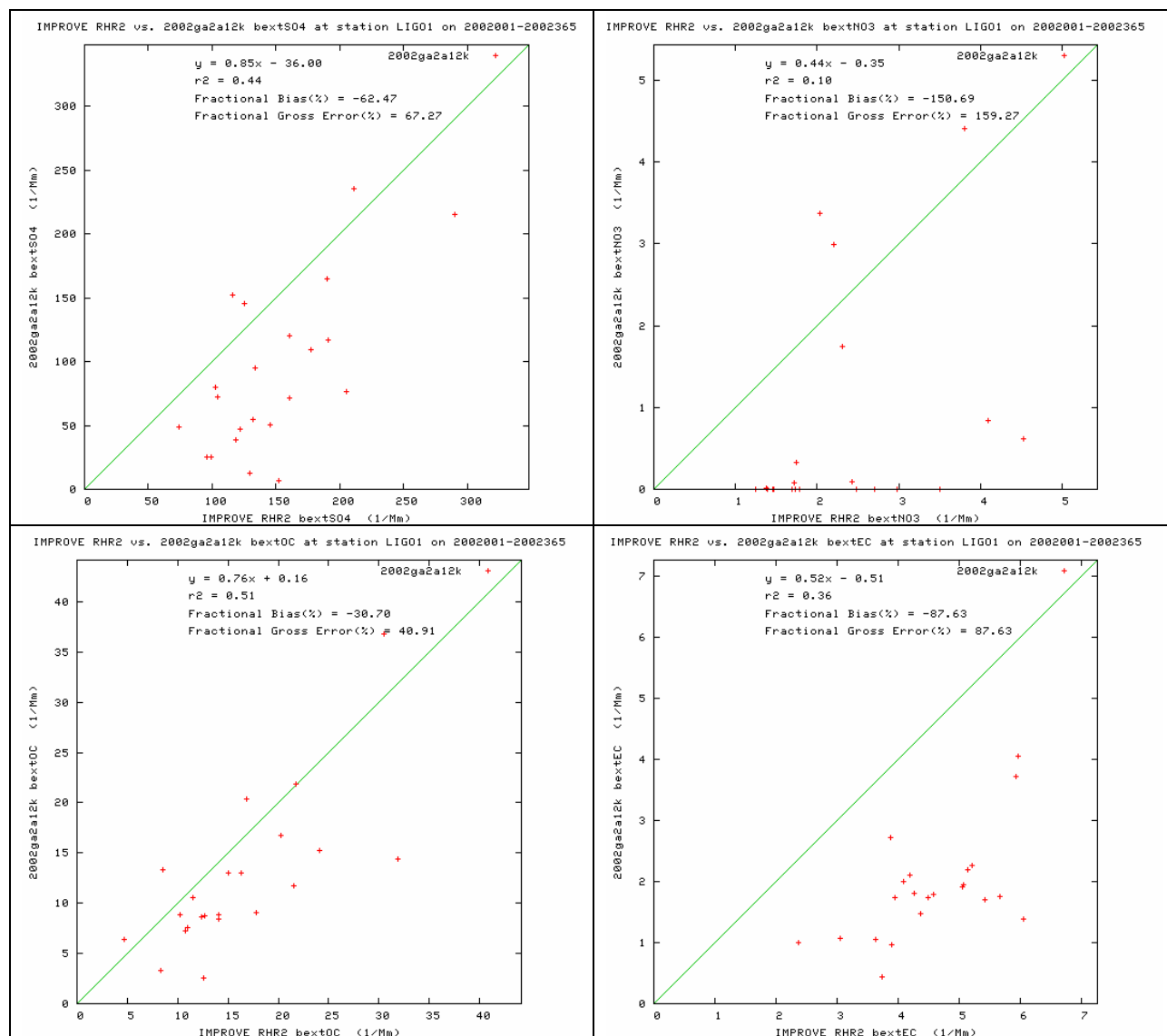
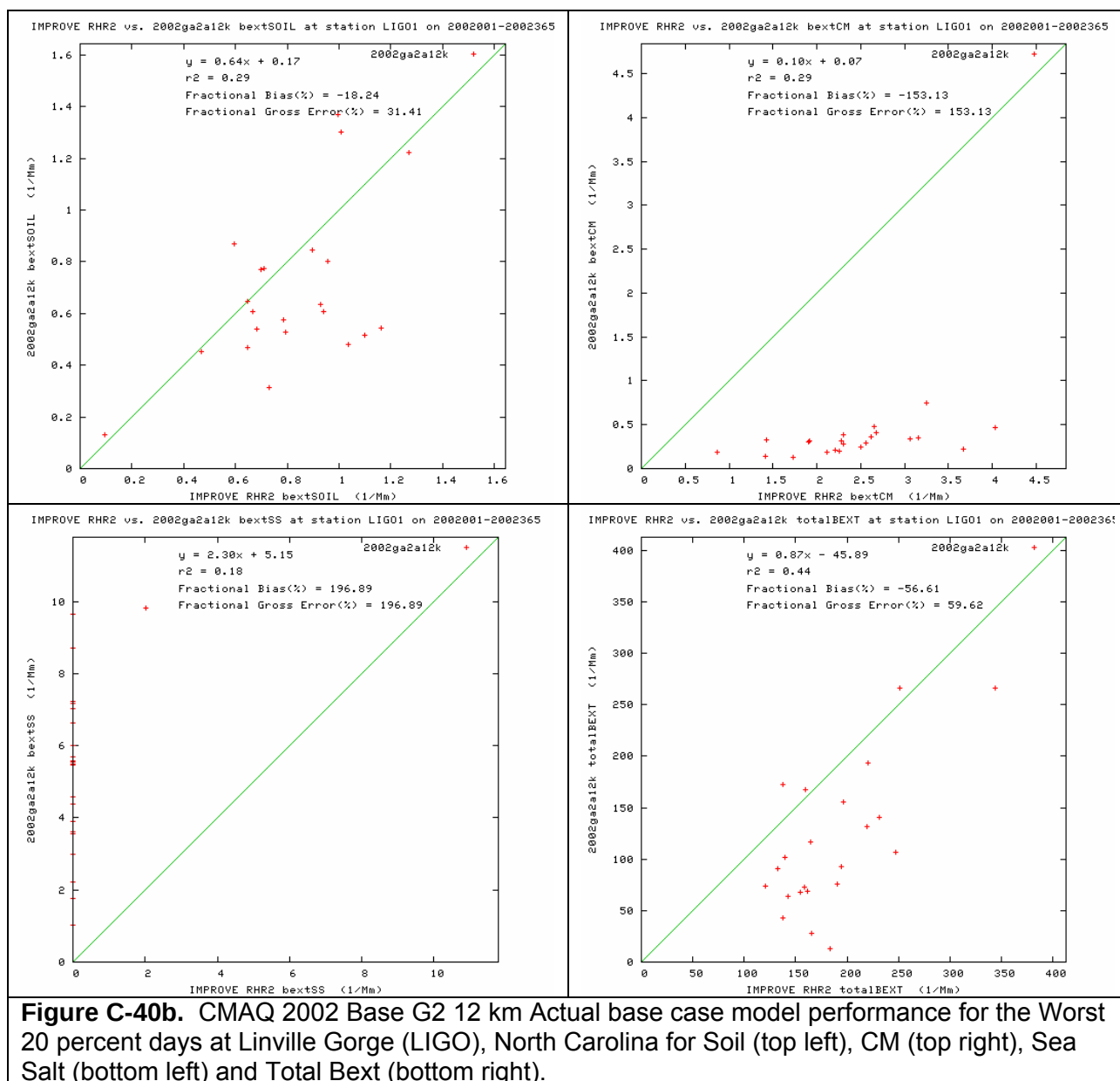


Figure C-40a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Linville Gorge (LIGO), North Carolina for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

LIGO1

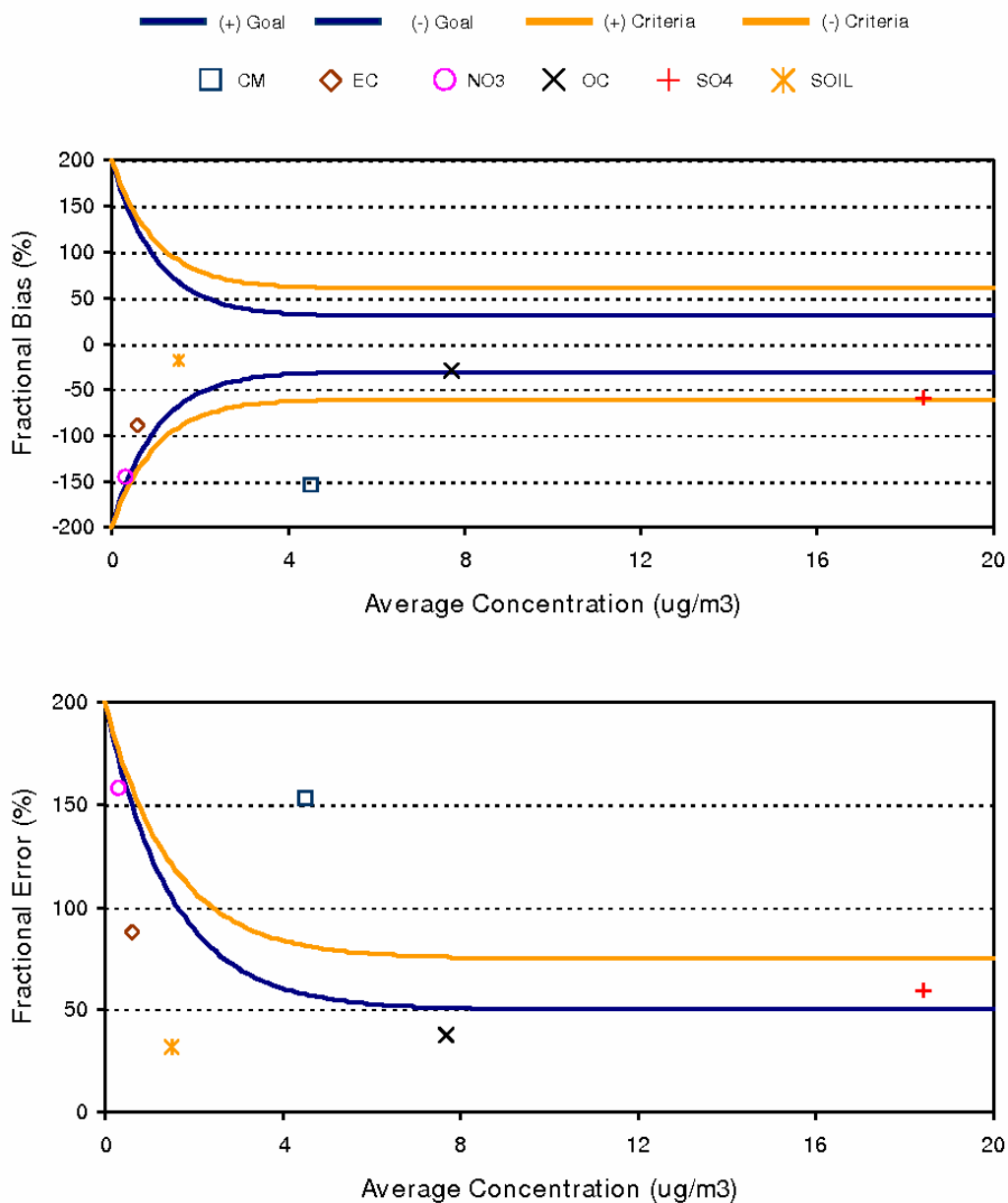


Figure C-41. Bugle Plots of Fractional Bias and Fractional Gross Error for LIGO and the Worst 20 Percent Days.

2.3.8.3 LIGO for All Days

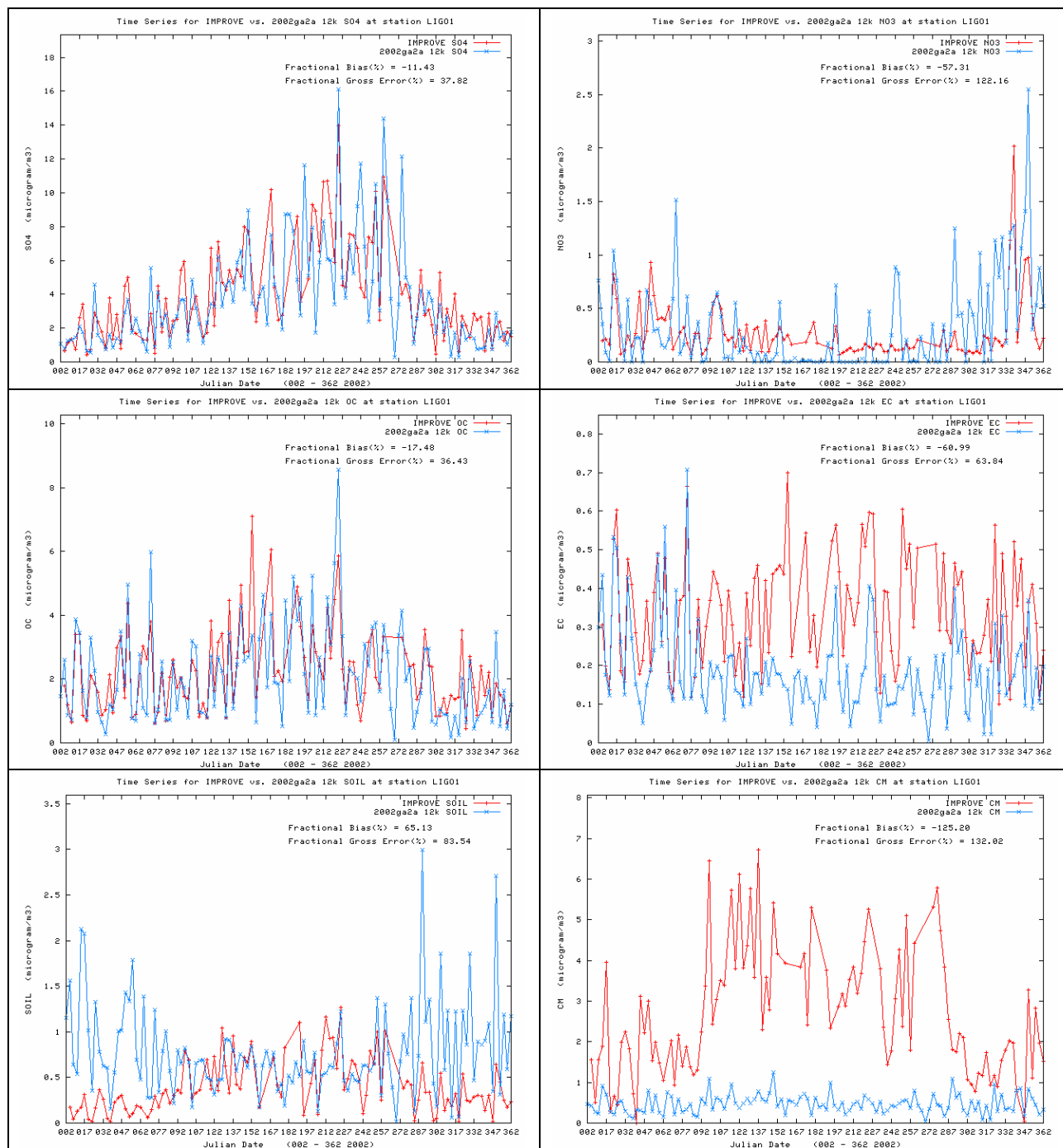
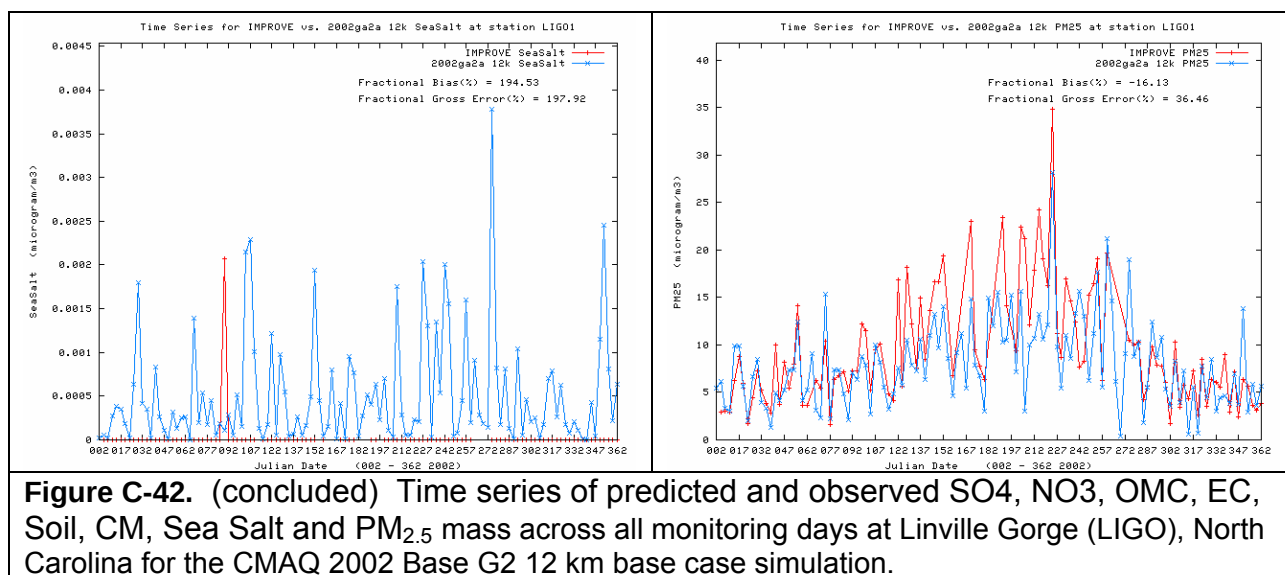


Figure C-42. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Linville Gorge (LIGO), North Carolina for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.9 Shining Rock Wilderness Area (SHRO), North Carolina

2.3.9.1 SHRO Best 20 Percent Days

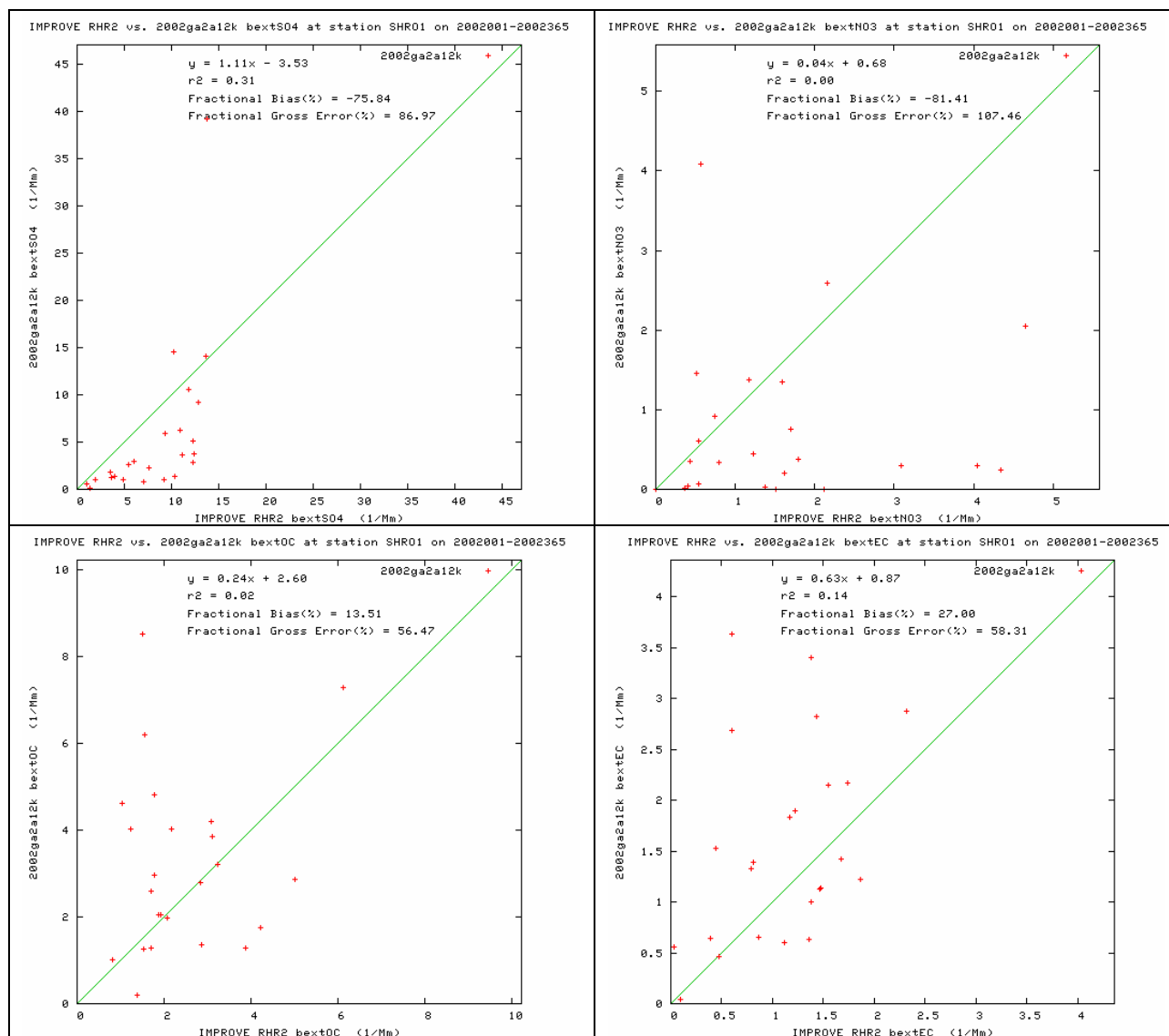
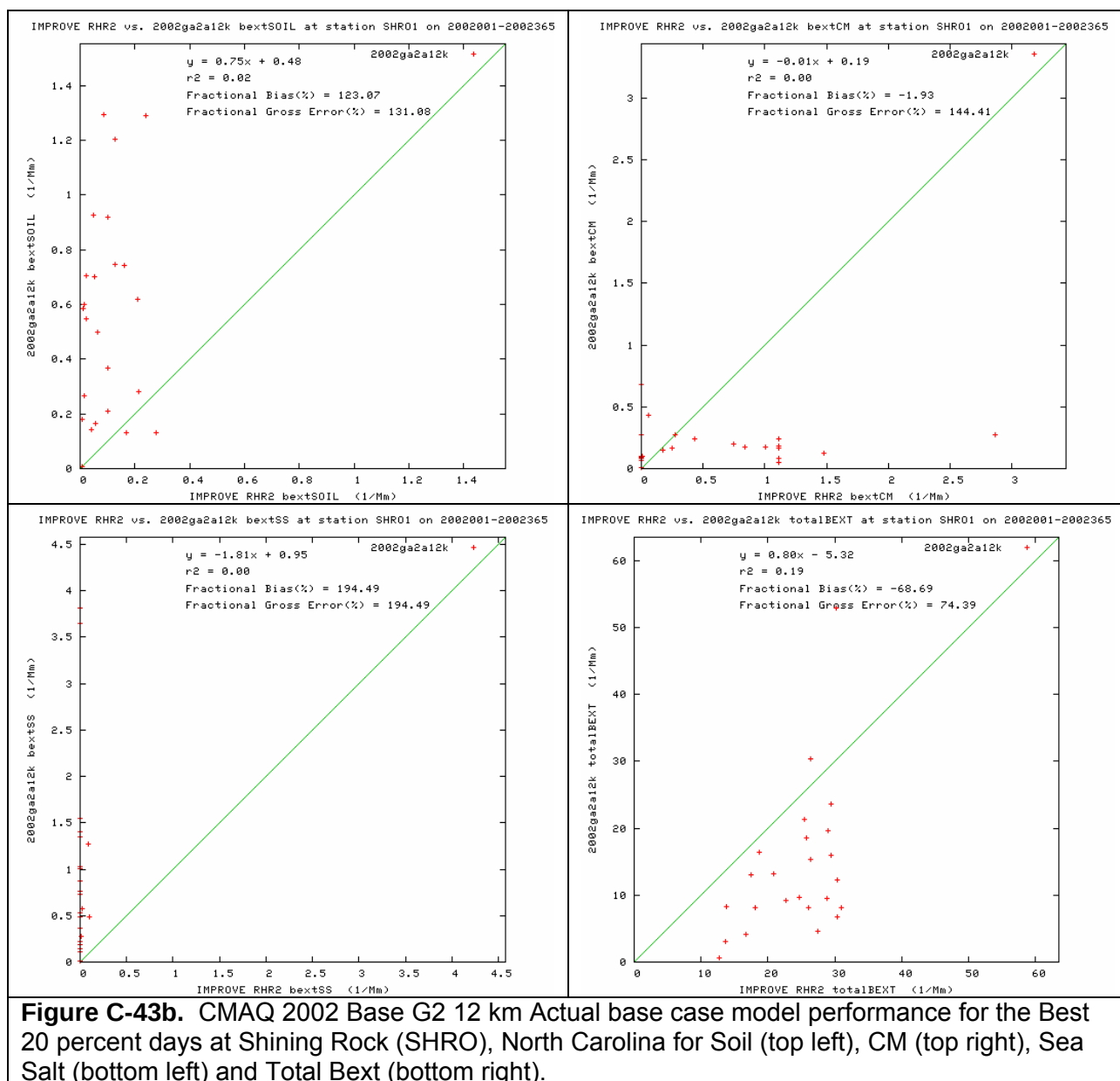


Figure C-43a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Shining Rock (SHRO), North Carolina for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

SHRO1

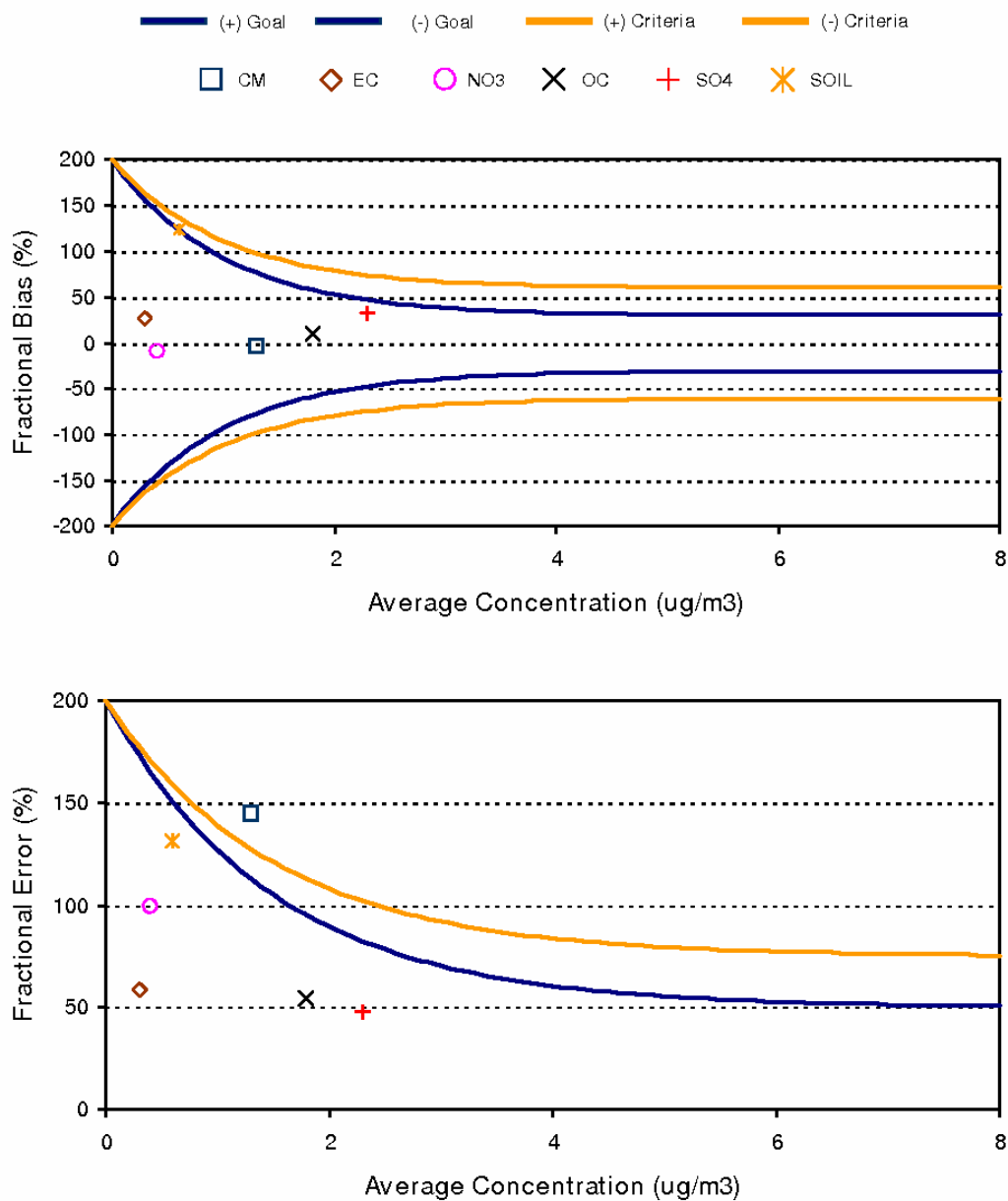


Figure C-44. Bugle Plots of Fractional Bias and Fractional Gross Error for SHRO and the Best 20 Percent Days.

2.3.9.2 SHRO Worst 20 Percent Days

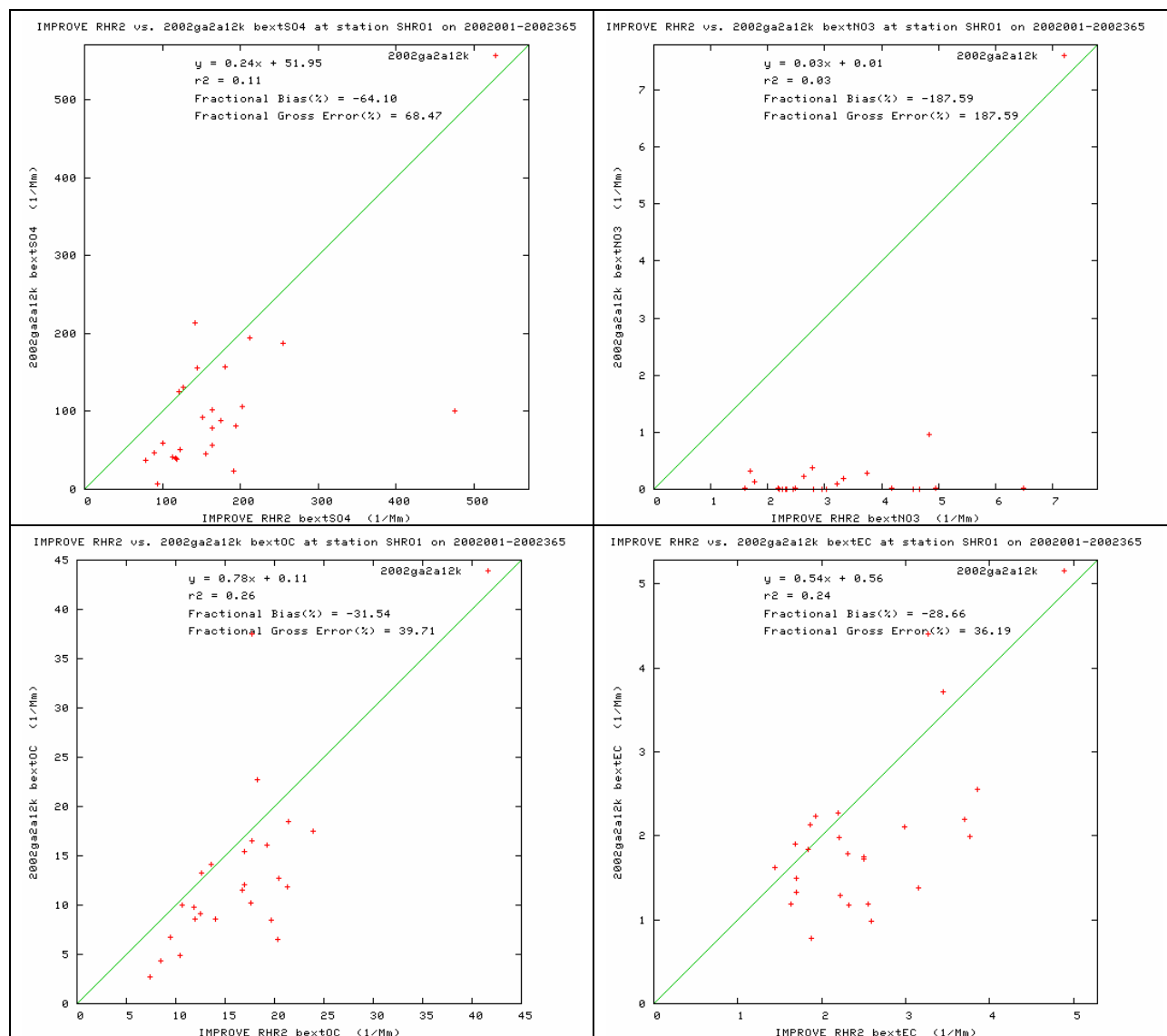
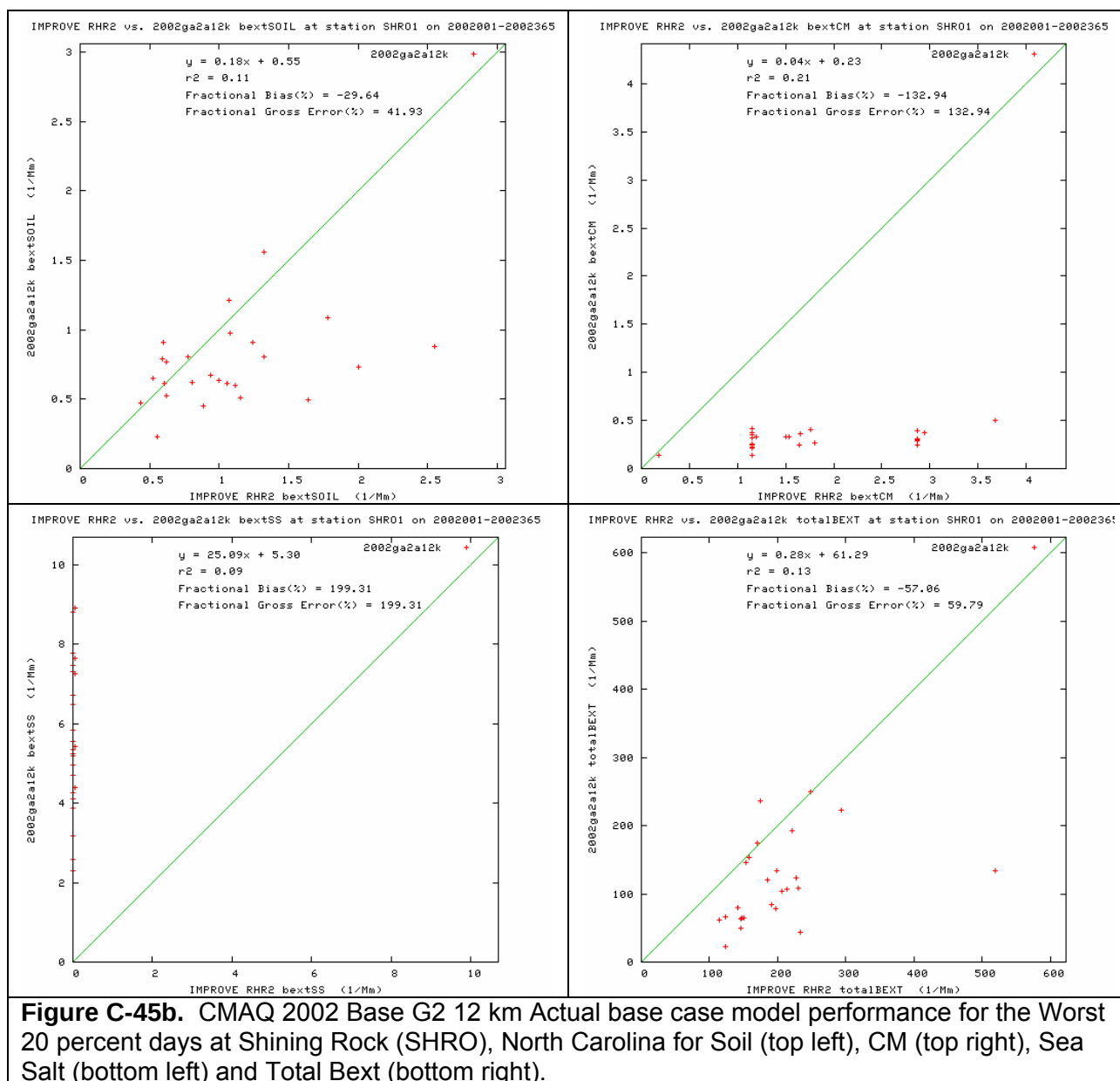


Figure C-45a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Shining Rock (SHRO), North Carolina for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

SHRO1

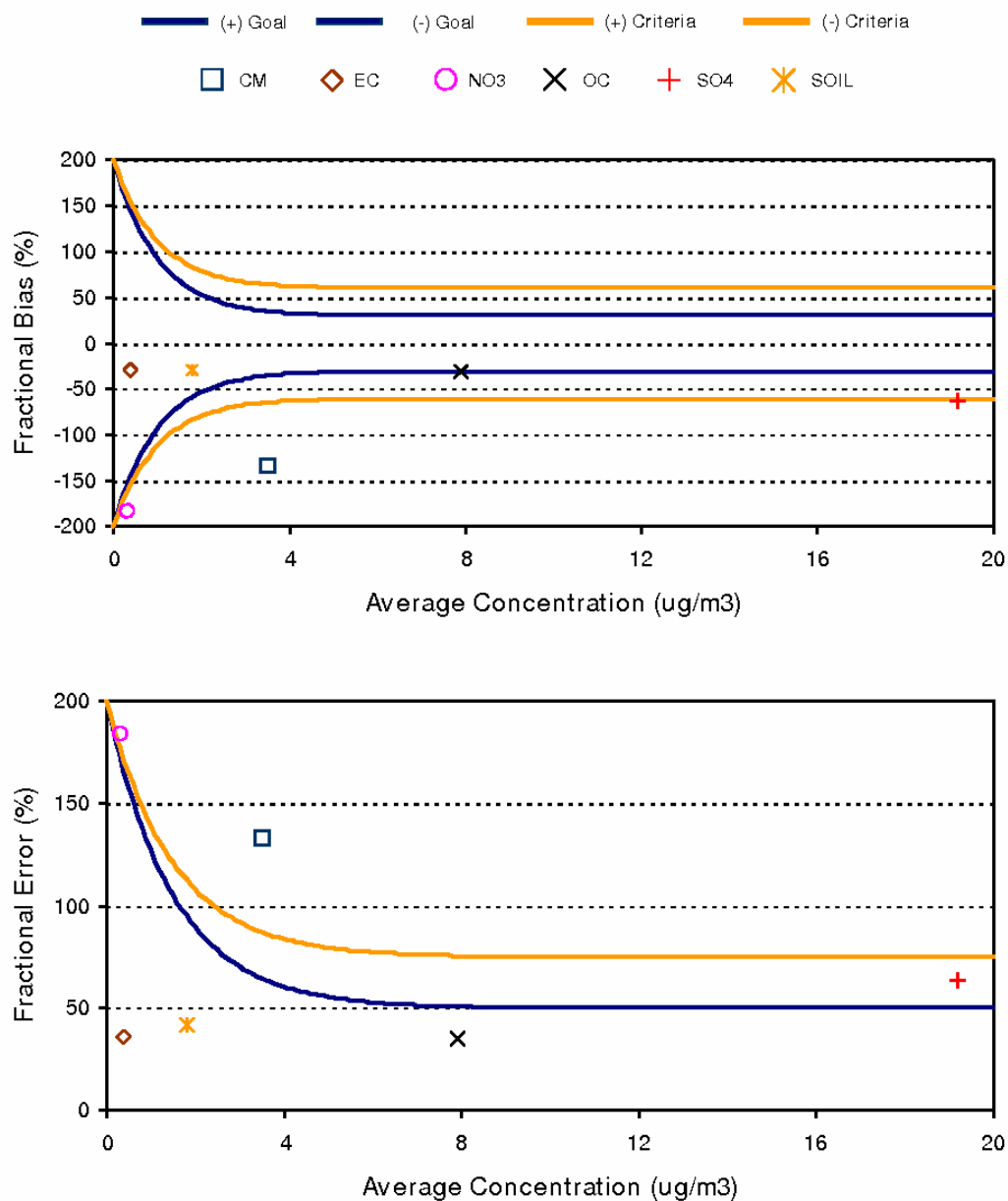


Figure C-46. Bugle Plots of Fractional Bias and Fractional Gross Error for SHRO and the Worst 20 Percent Days.

2.3.9.3 SHRO for All Days

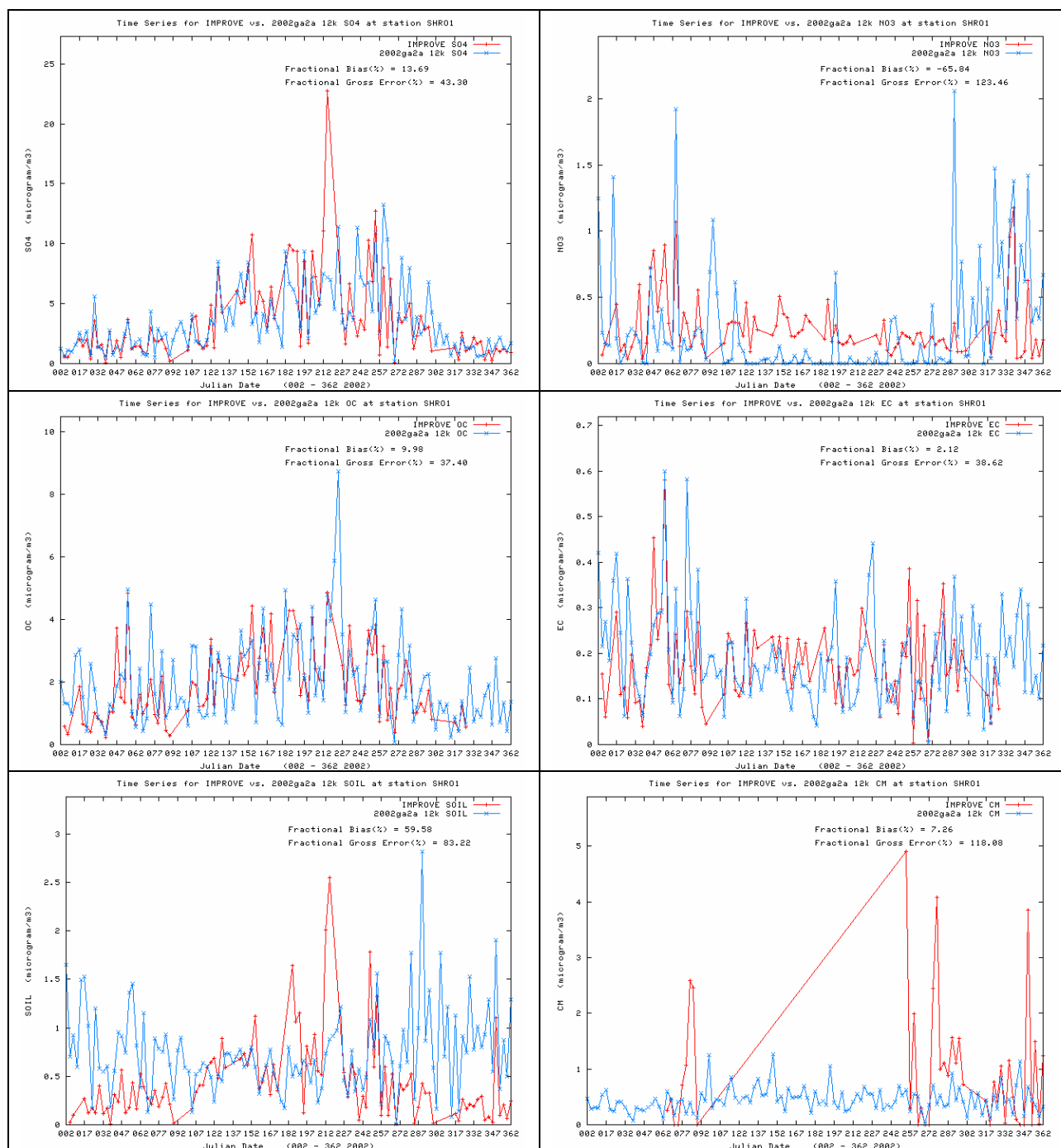
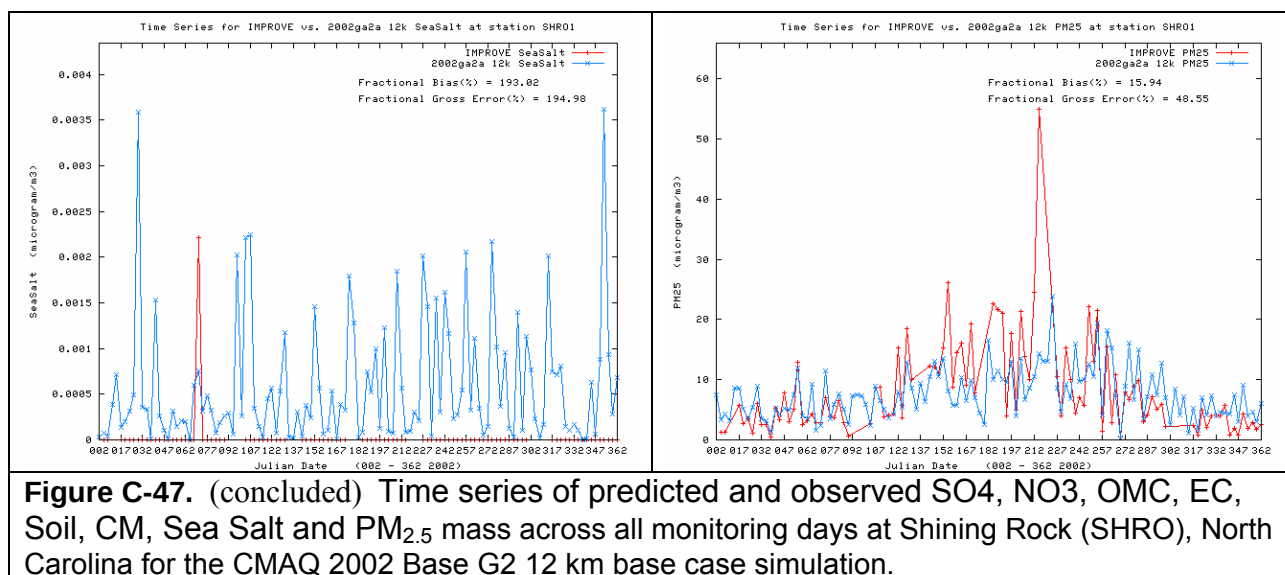


Figure C-47. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Shining Rock (SHRO), North Carolina for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.10 Swanquarter Wildlife Refuge (SWAN), North Carolina

2.3.10.1 SWAN Best 20 Percent Days

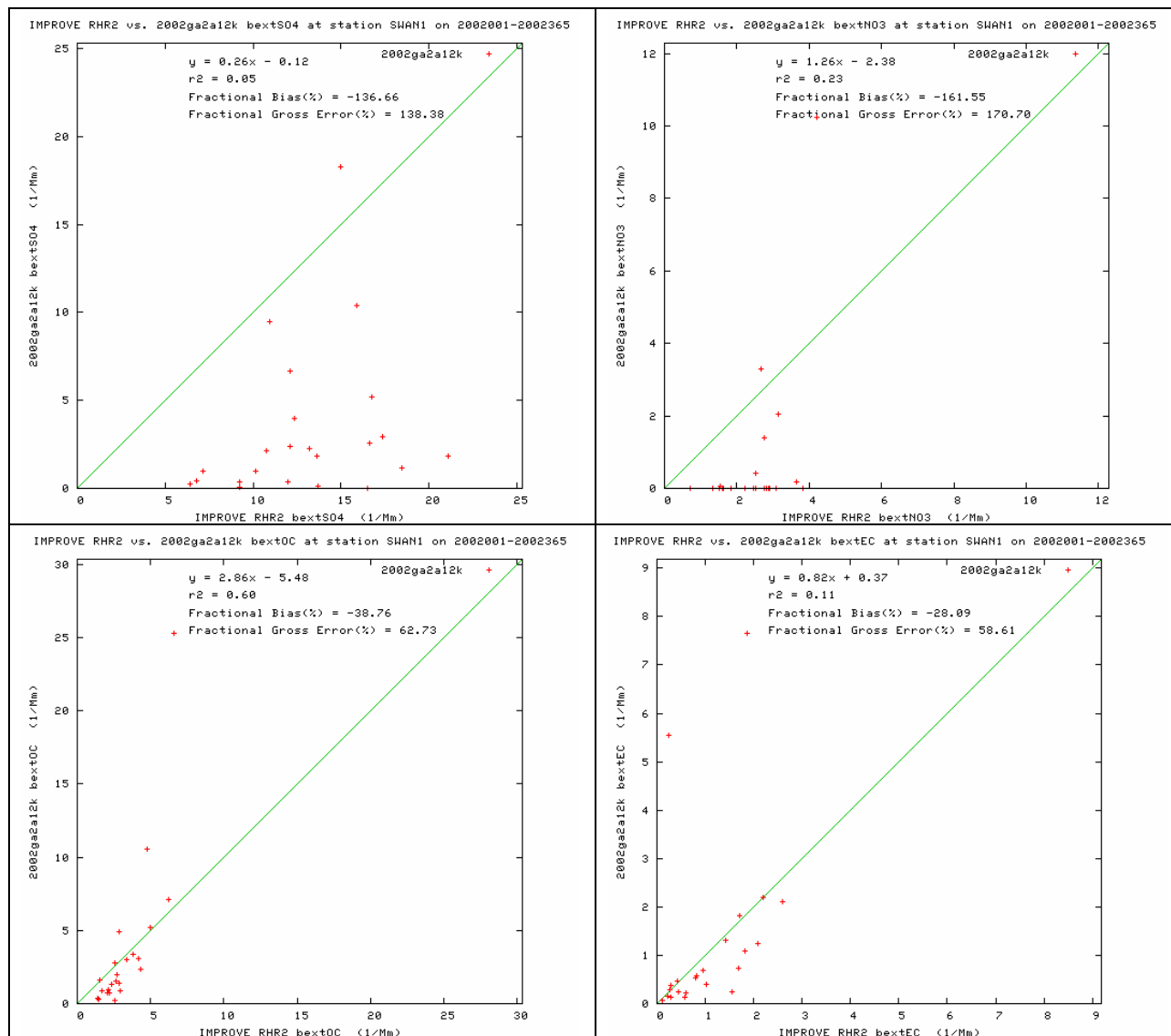
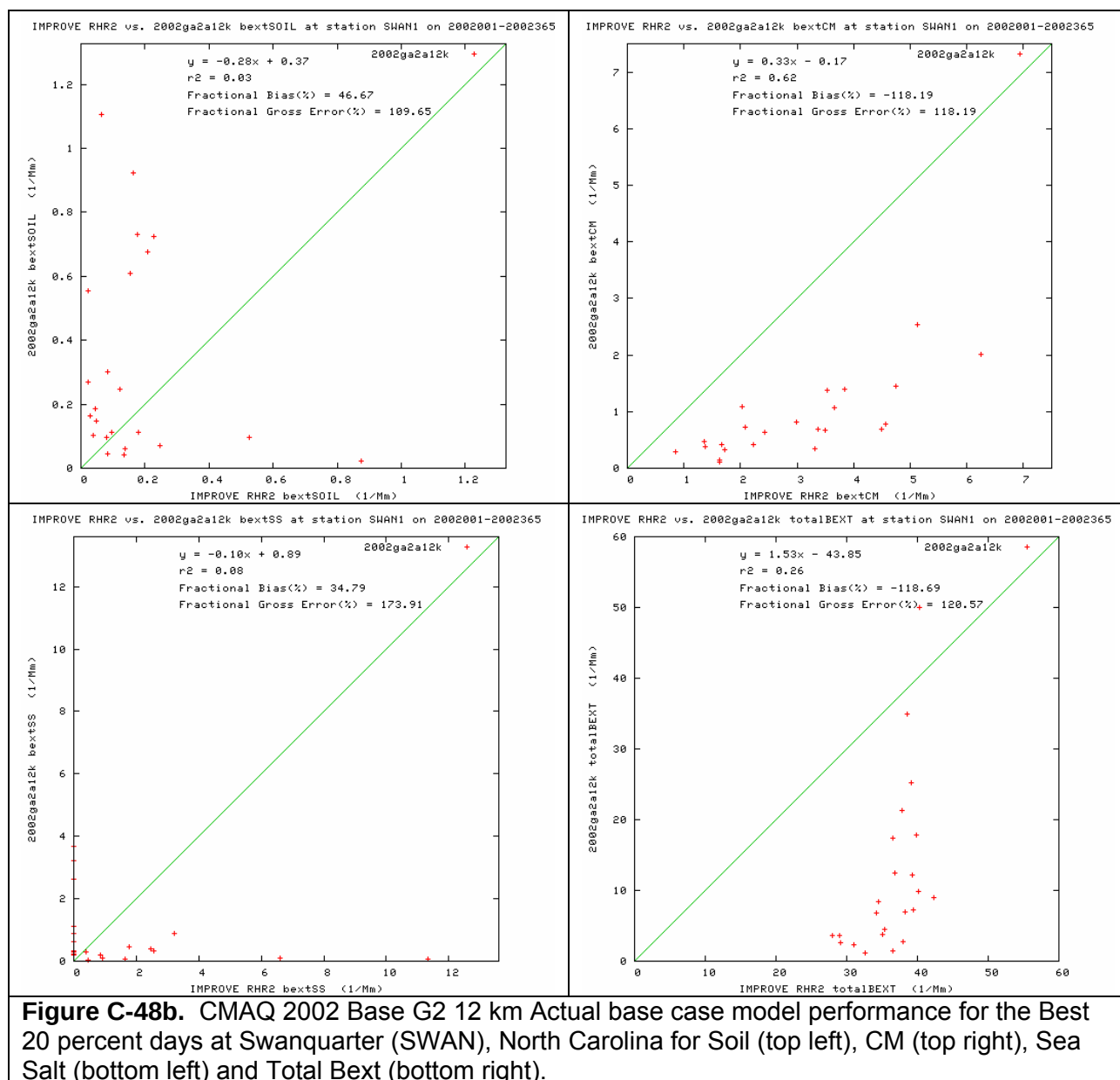


Figure C-48a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Swanquarter (SWAN), North Carolina for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

SWAN1

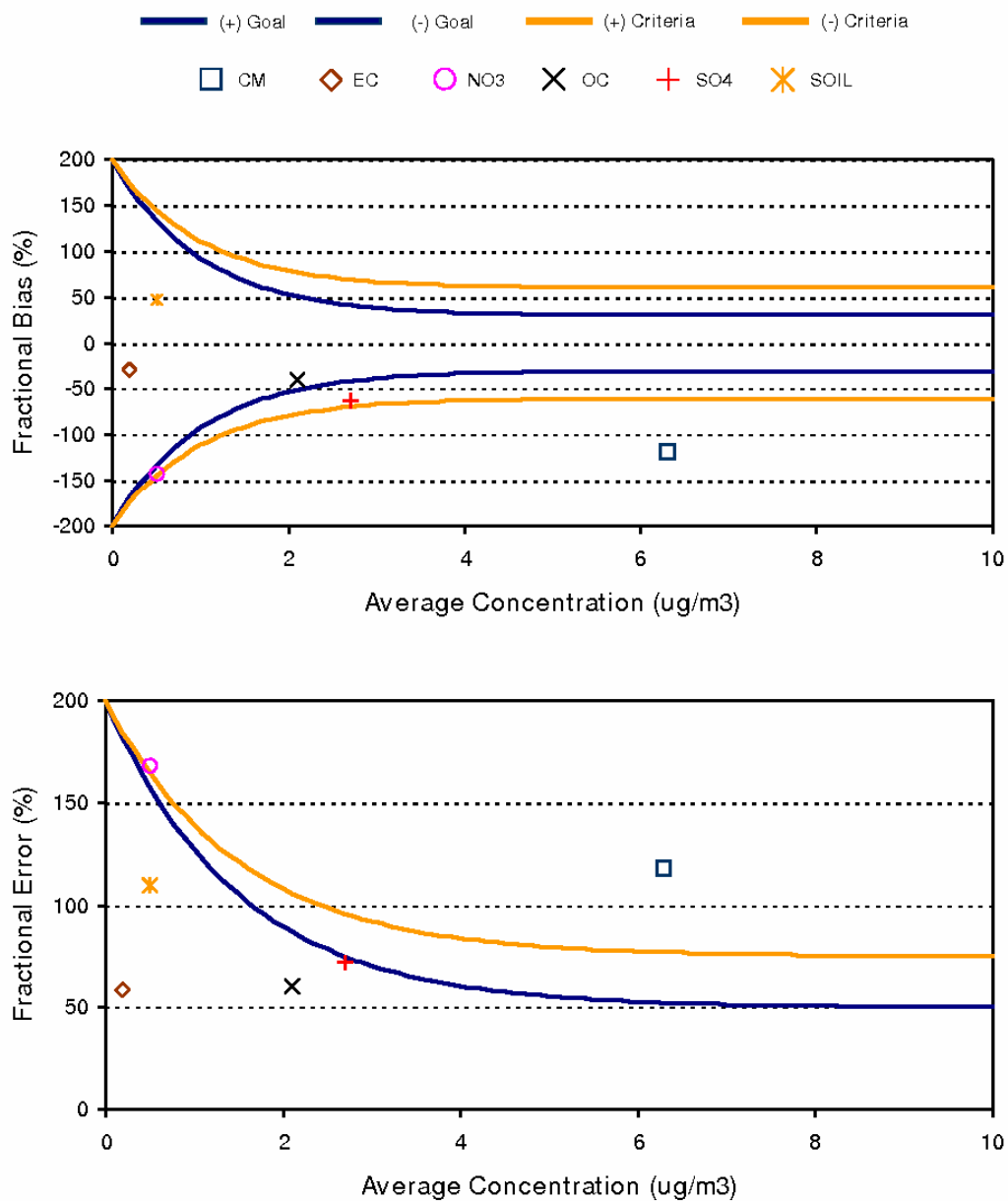


Figure C-49. Bugle Plots of Fractional Bias and Fractional Gross Error for SWAN and the Best 20 Percent Days.

2.3.10.2 SWAN Worst 20 Percent Days

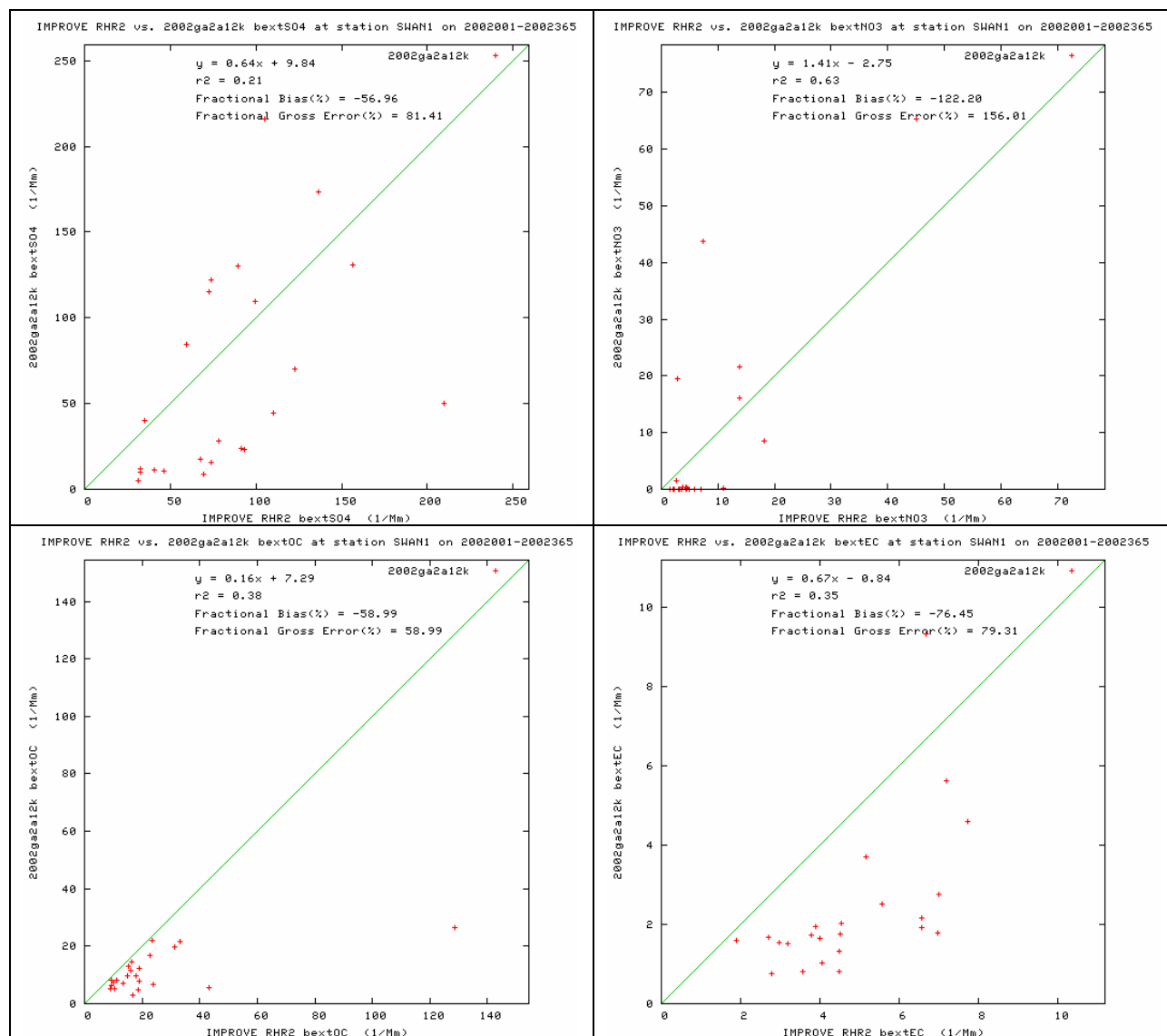
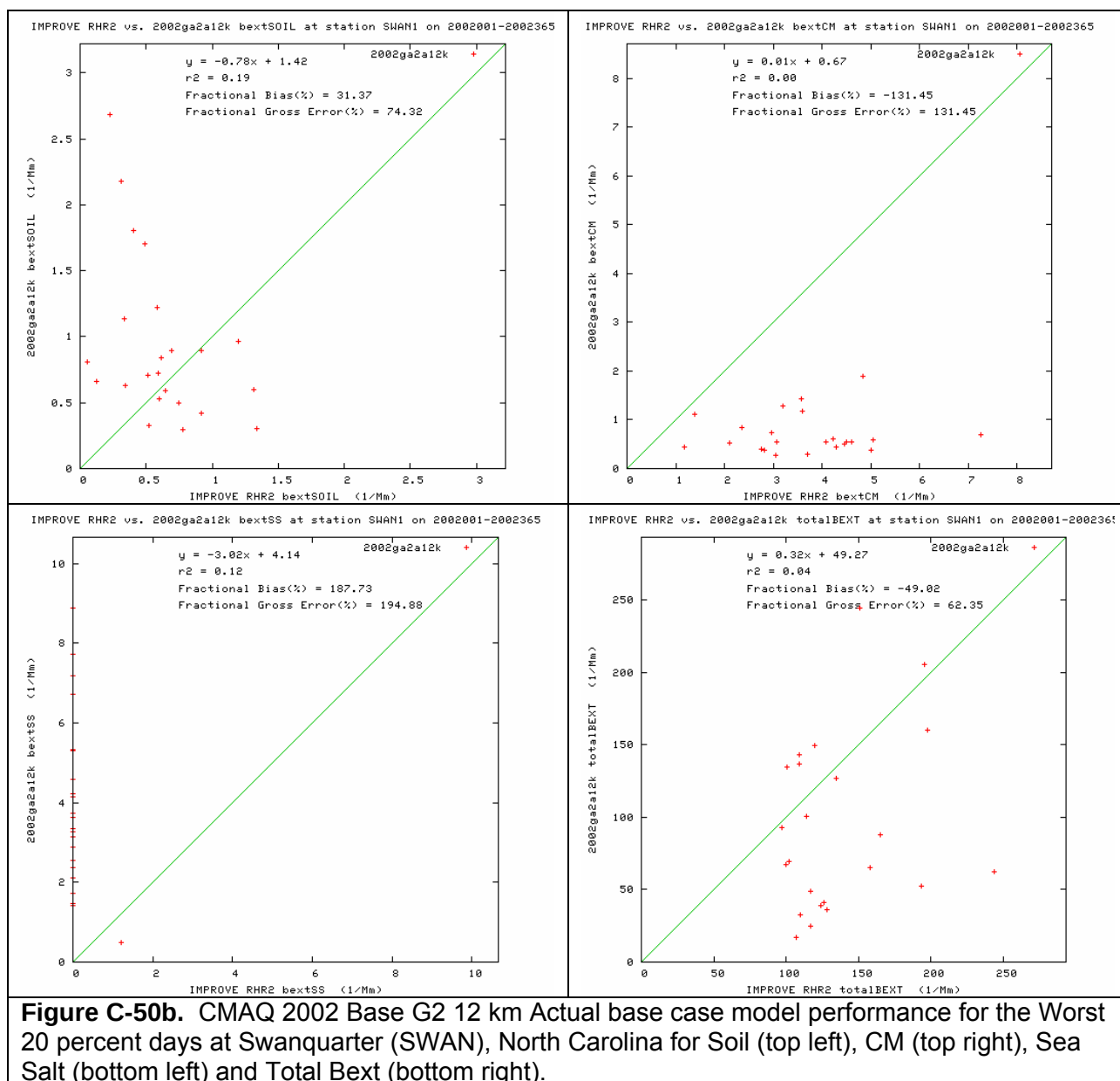


Figure C-50a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Swanquarter (SWAN), North Carolina for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

SWAN1

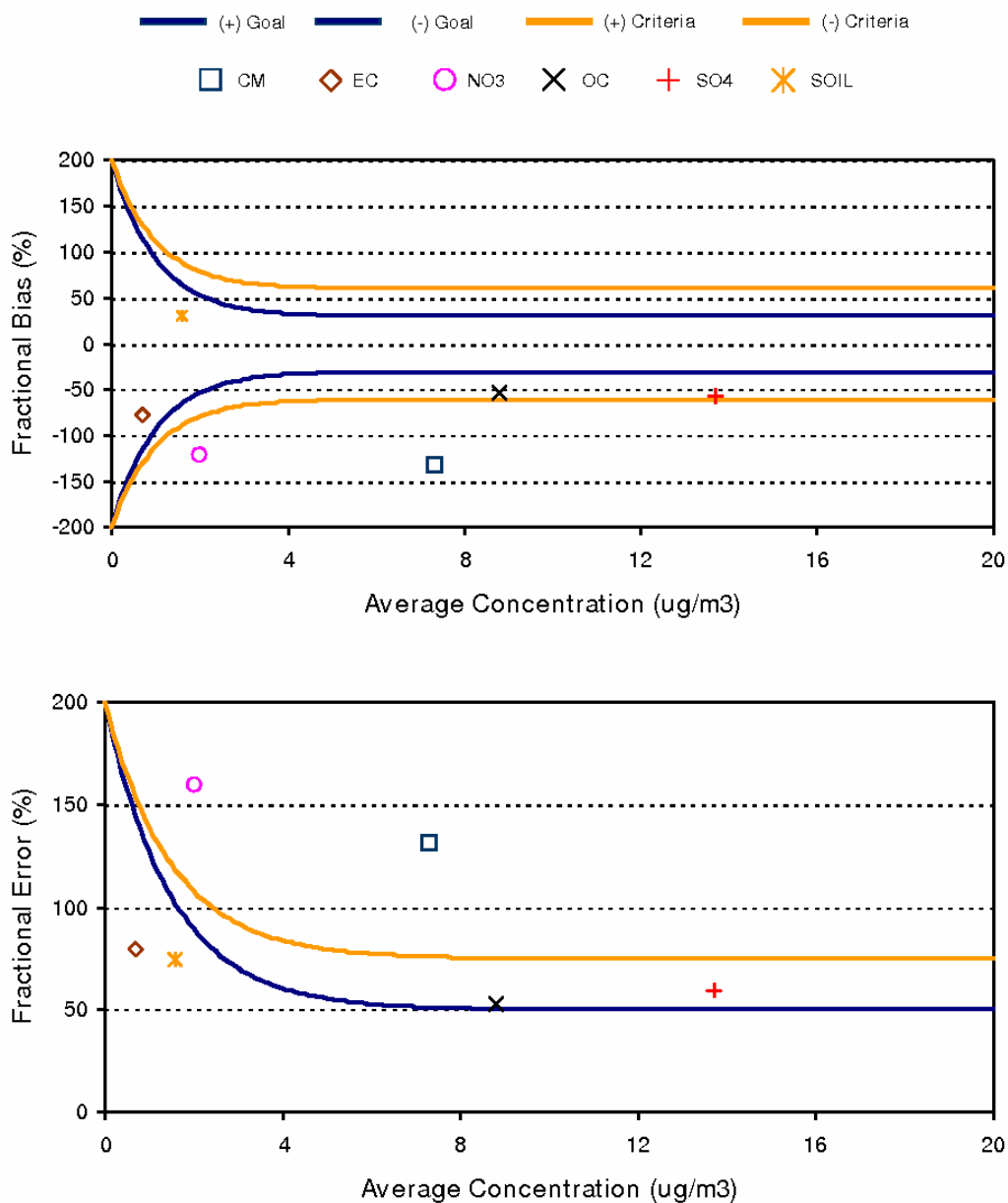


Figure C-51. Bugle Plots of Fractional Bias and Fractional Gross Error for SWAN and the Worst 20 Percent Days.

2.3.10.3 SWAN for All Days

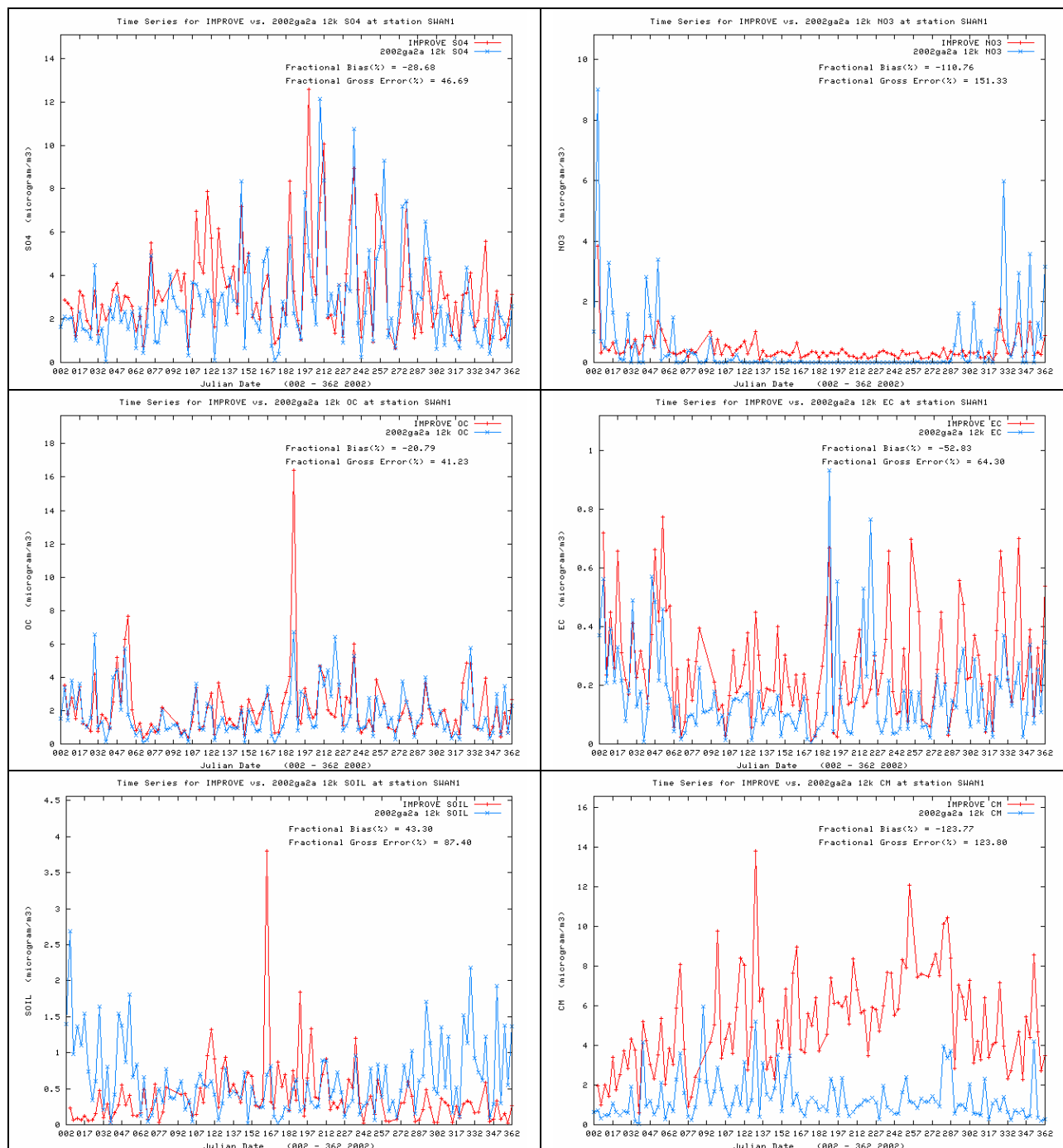
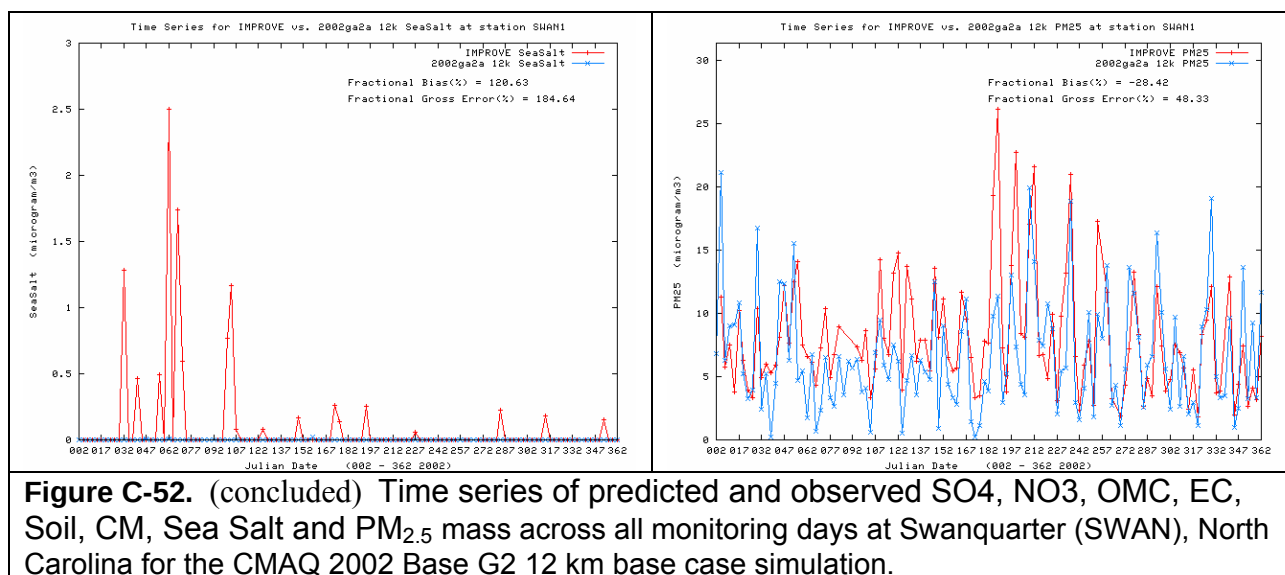


Figure C-52. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Swanquarter (SWAN), North Carolina for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.11 Cape Romain Wildlife Refuge (ROMA), South Carolina

2.3.11.1 ROMA Best 20 Percent Days

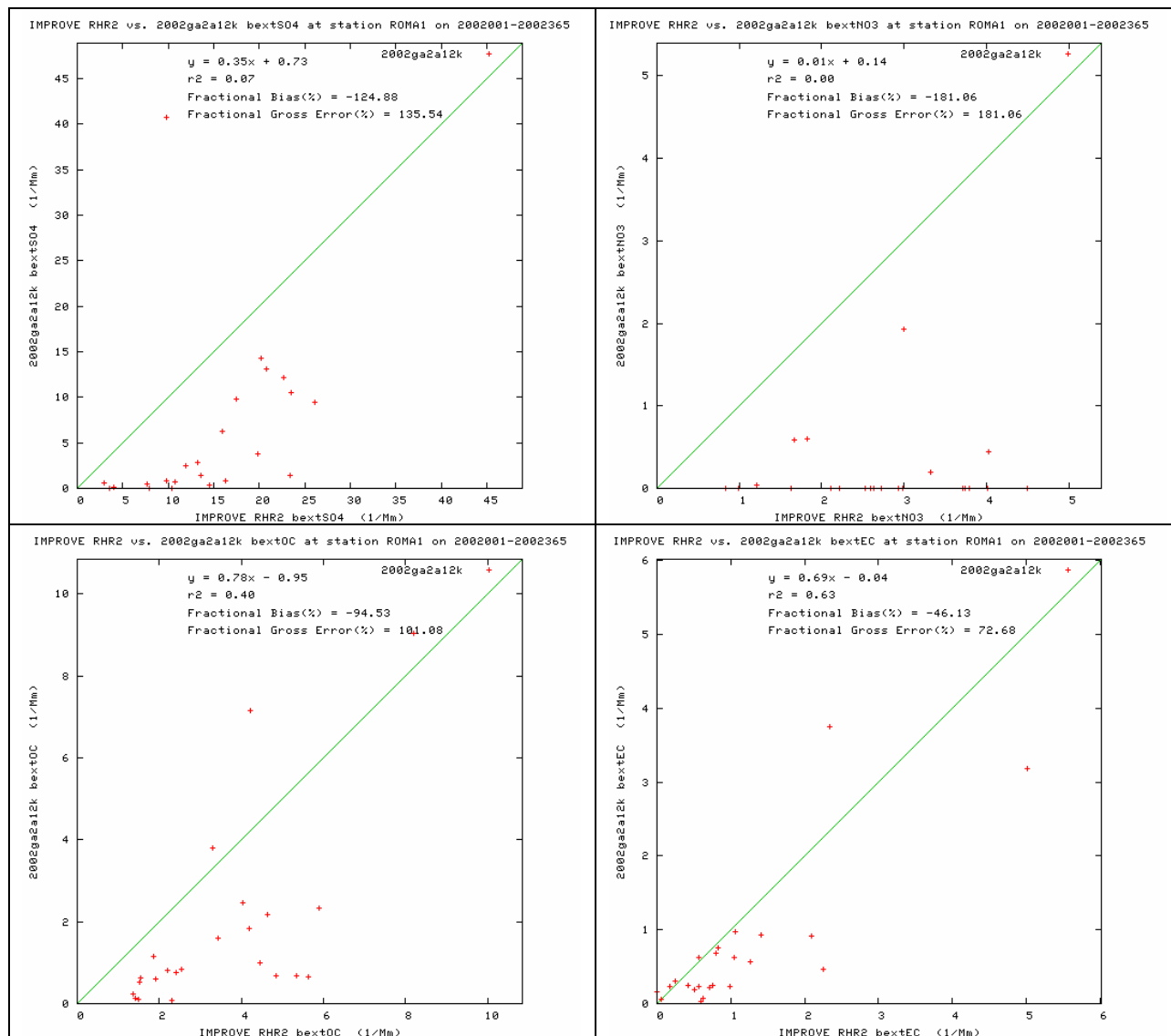
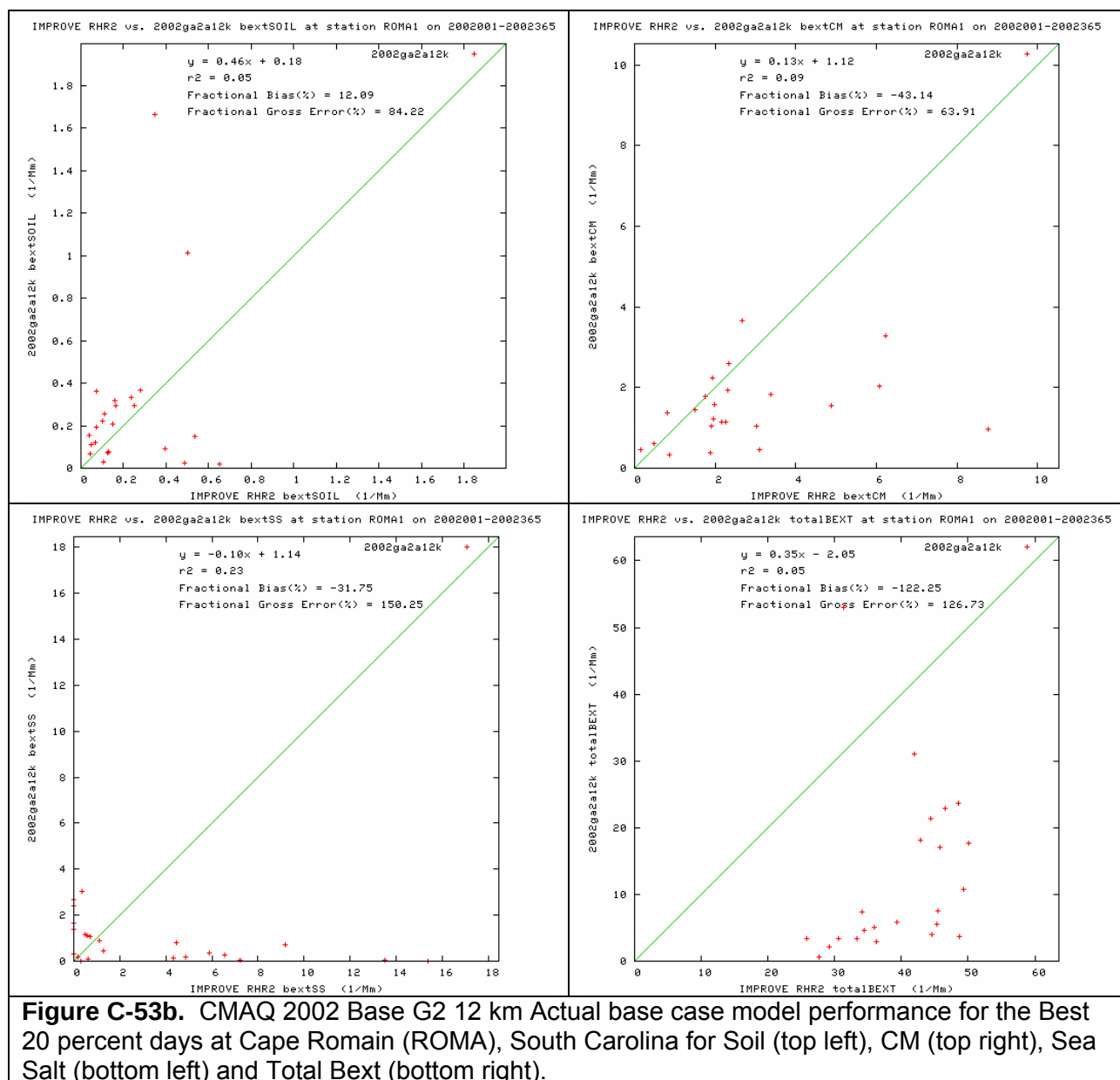


Figure C-53a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Cape Romain (ROMA), South Carolina for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

ROMA1

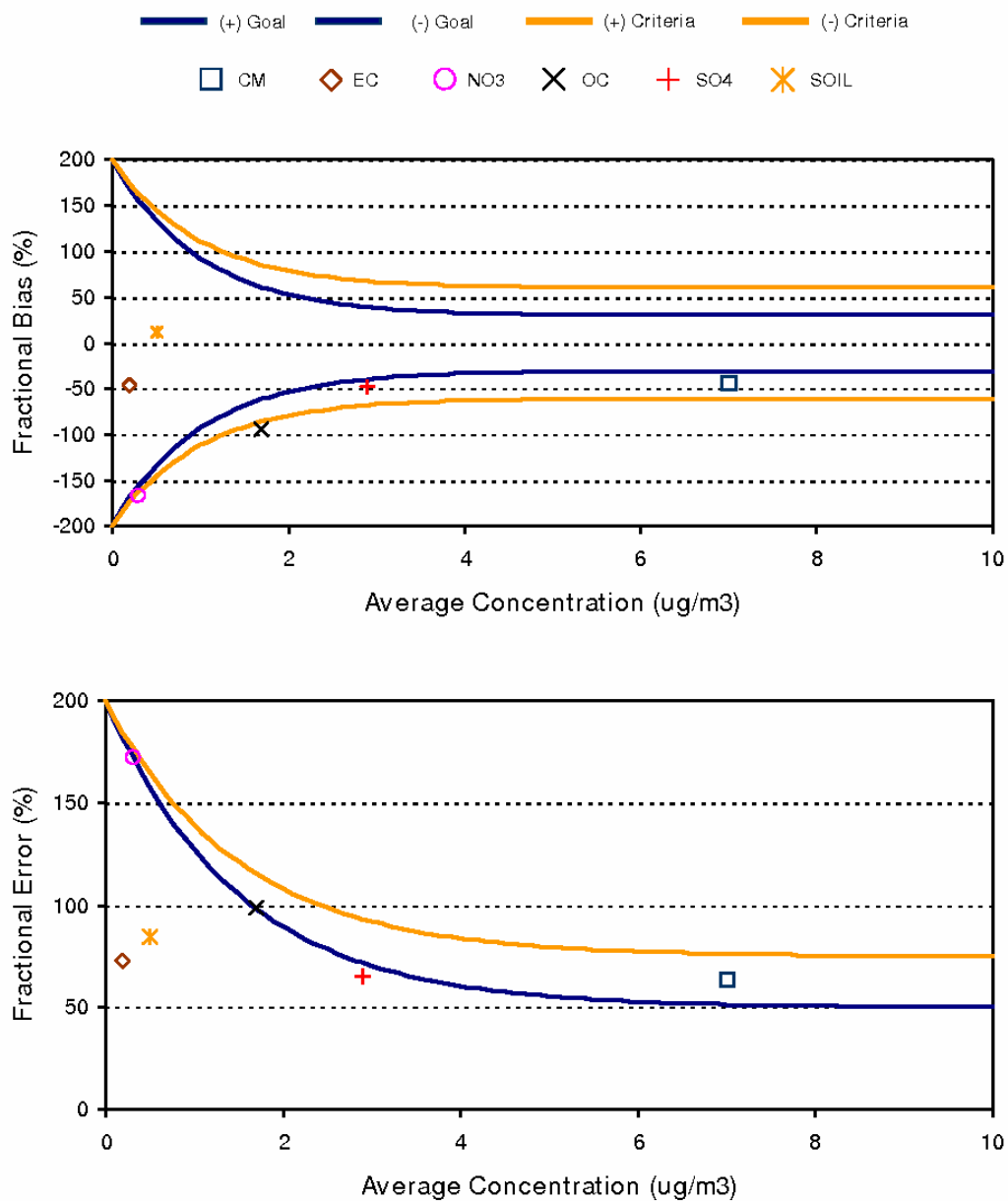


Figure C-54. Bugle Plots of Fractional Bias and Fractional Gross Error for ROMA and the Best 20 Percent Days.

2.3.11.2 ROMA Worst 20 Percent Days

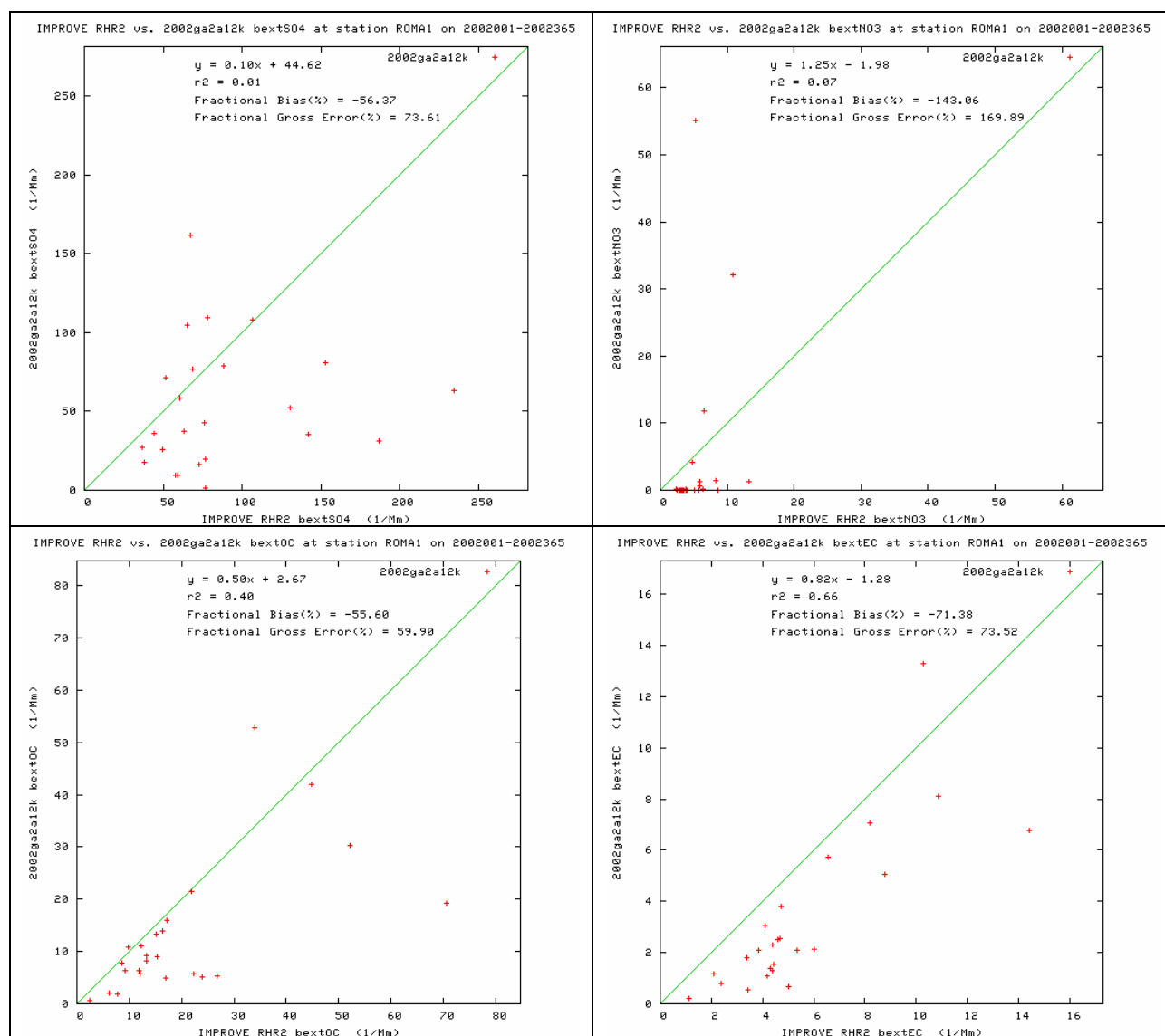
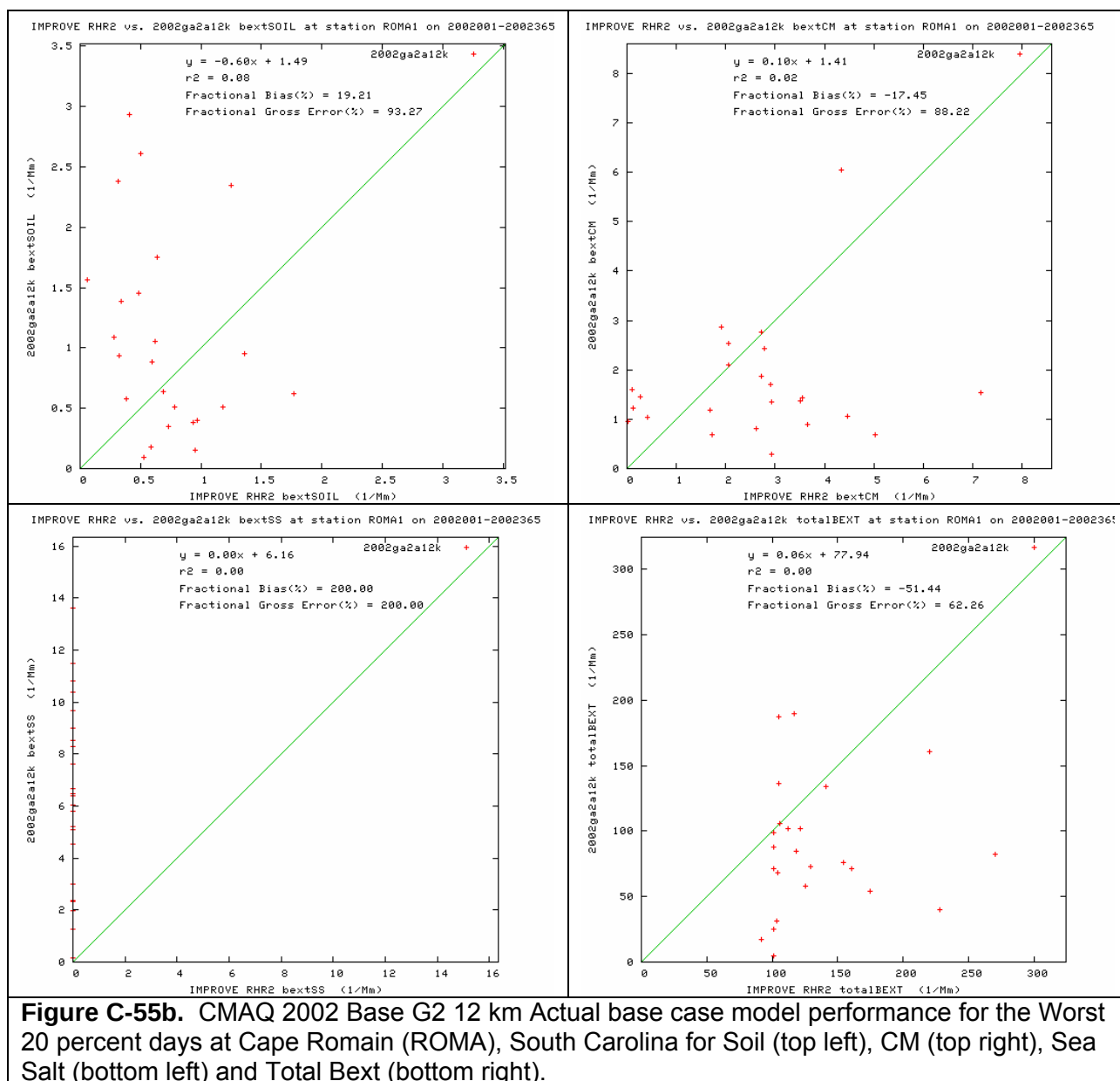


Figure C-55a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Cape Romain (ROMA), South Carolina for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

ROMA1

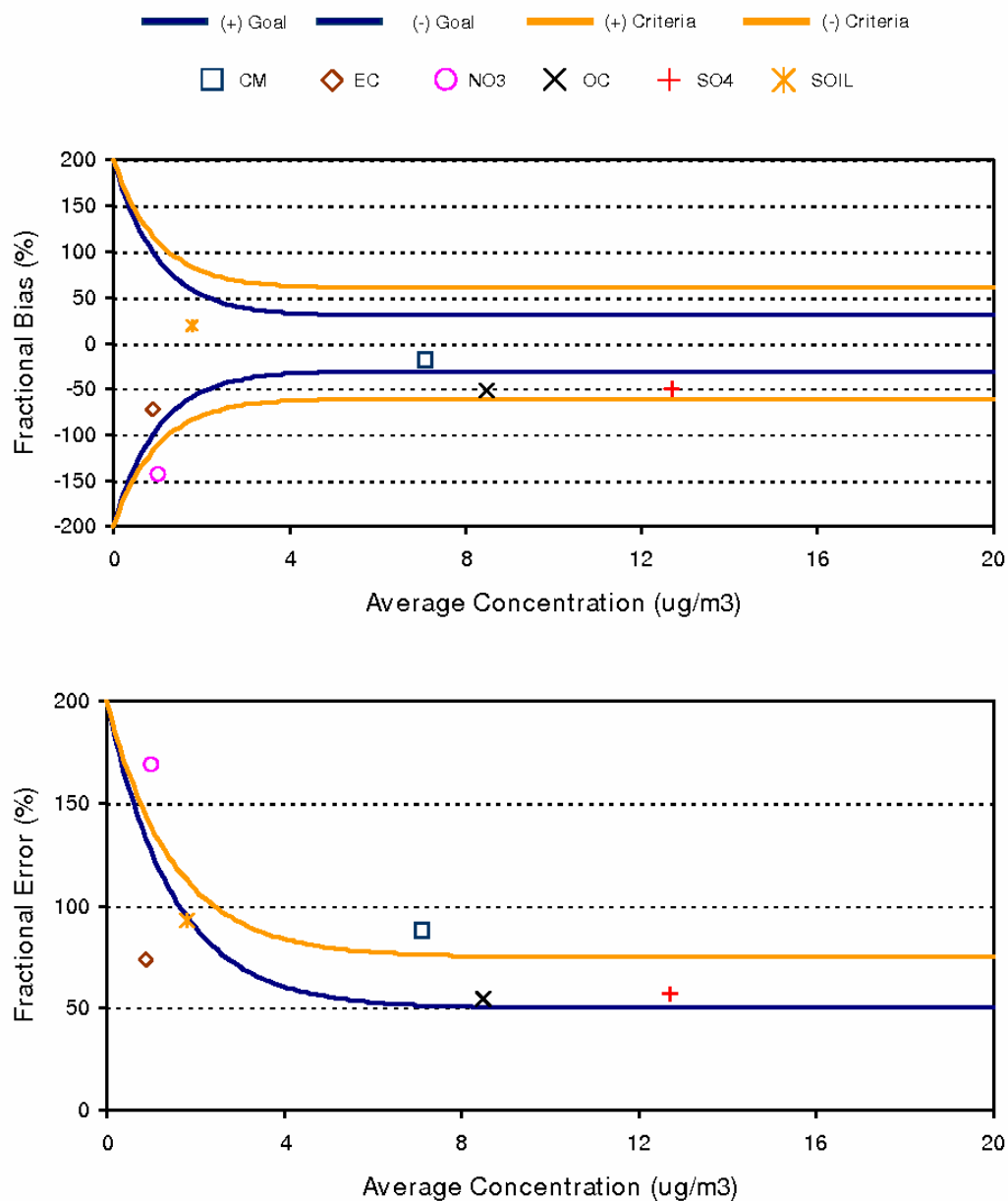


Figure C-56. Bugle Plots of Fractional Bias and Fractional Gross Error for ROMA and the Worst 20 Percent Days.

2.3.11.3 ROMA for All Days

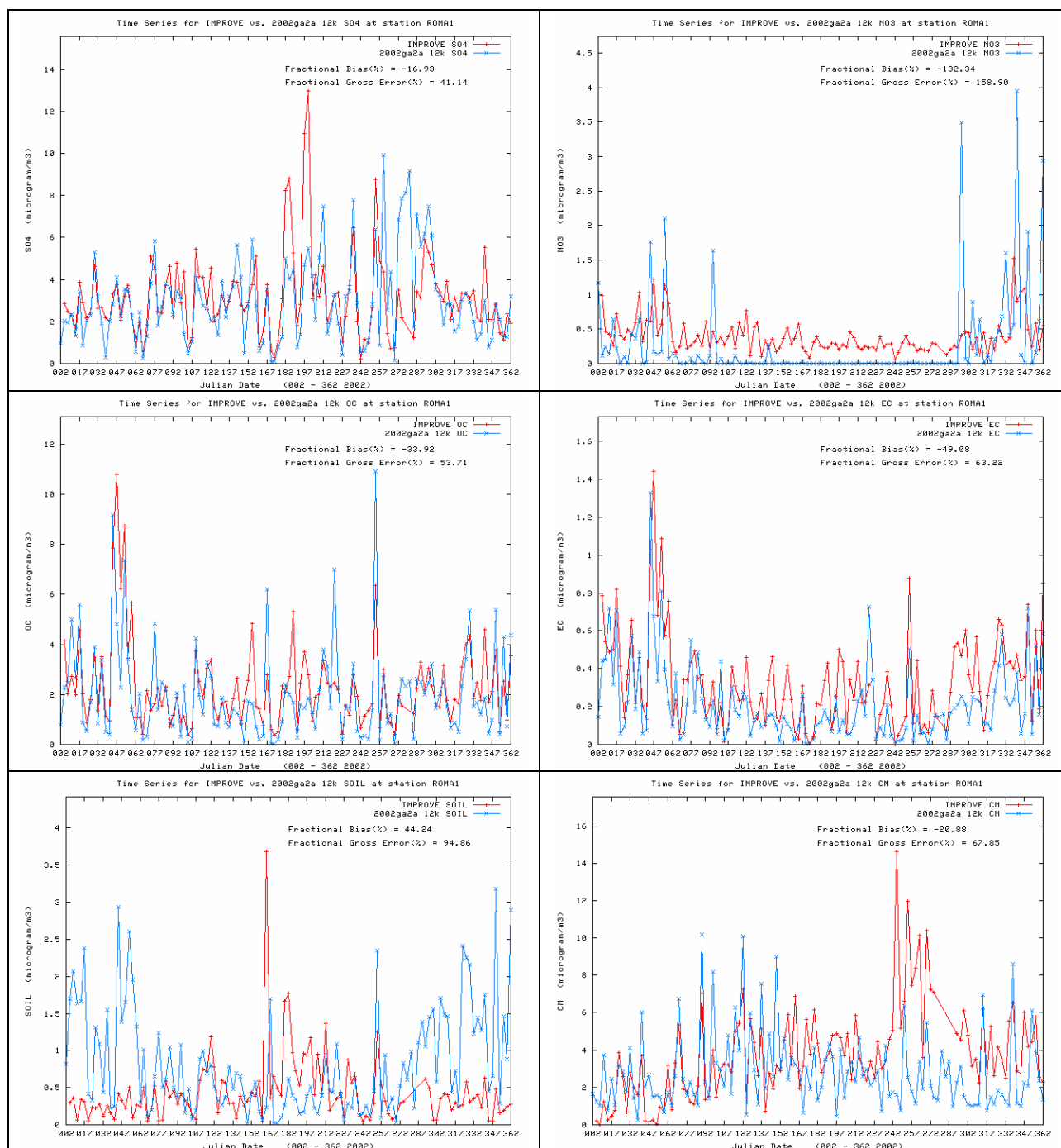
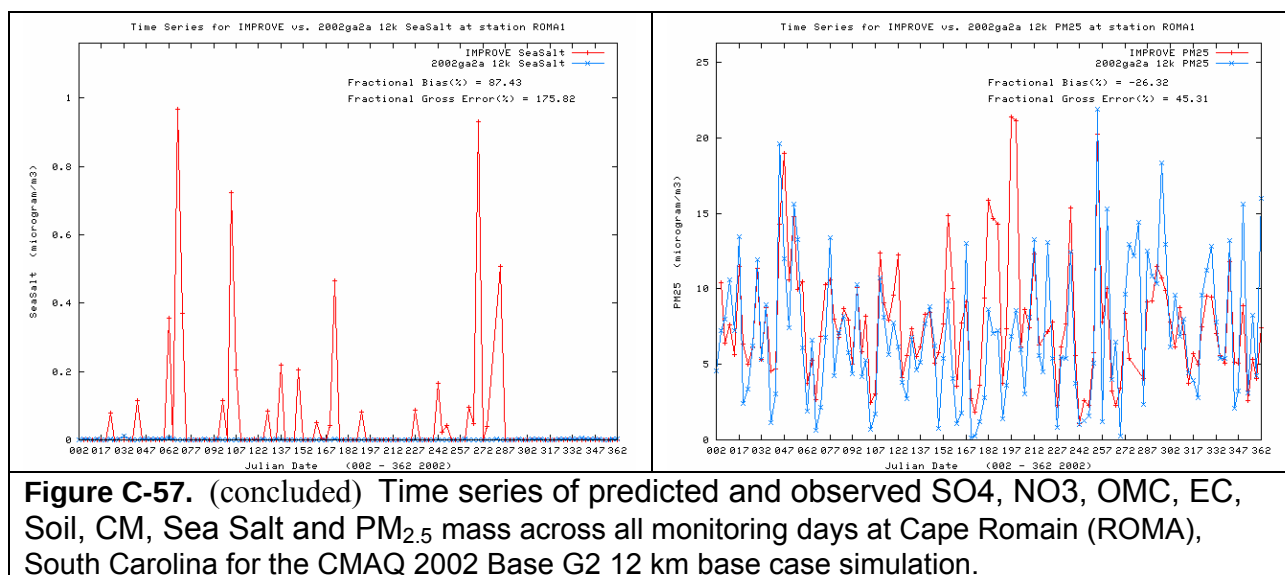


Figure C-57. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Cape Romain (ROMA), South Carolina for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.12 Great Smoky Mountains National Park (GRSM), Tennessee-North Carolina

2.3.12.1 GRSM Best 20 Percent Days

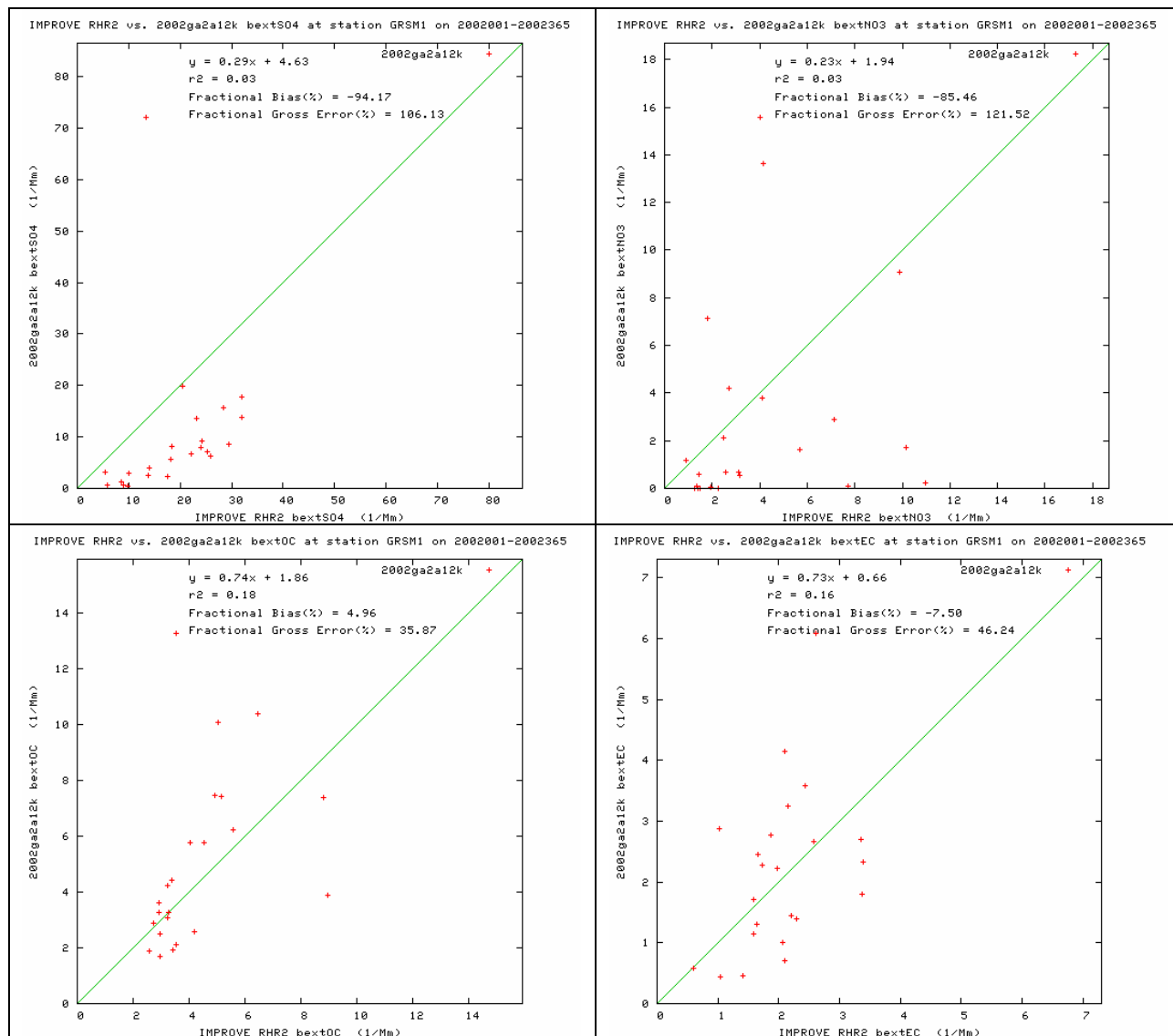


Figure C-58a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Great Smoky Mountains (GRSM), Tennessee-North Carolina for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).

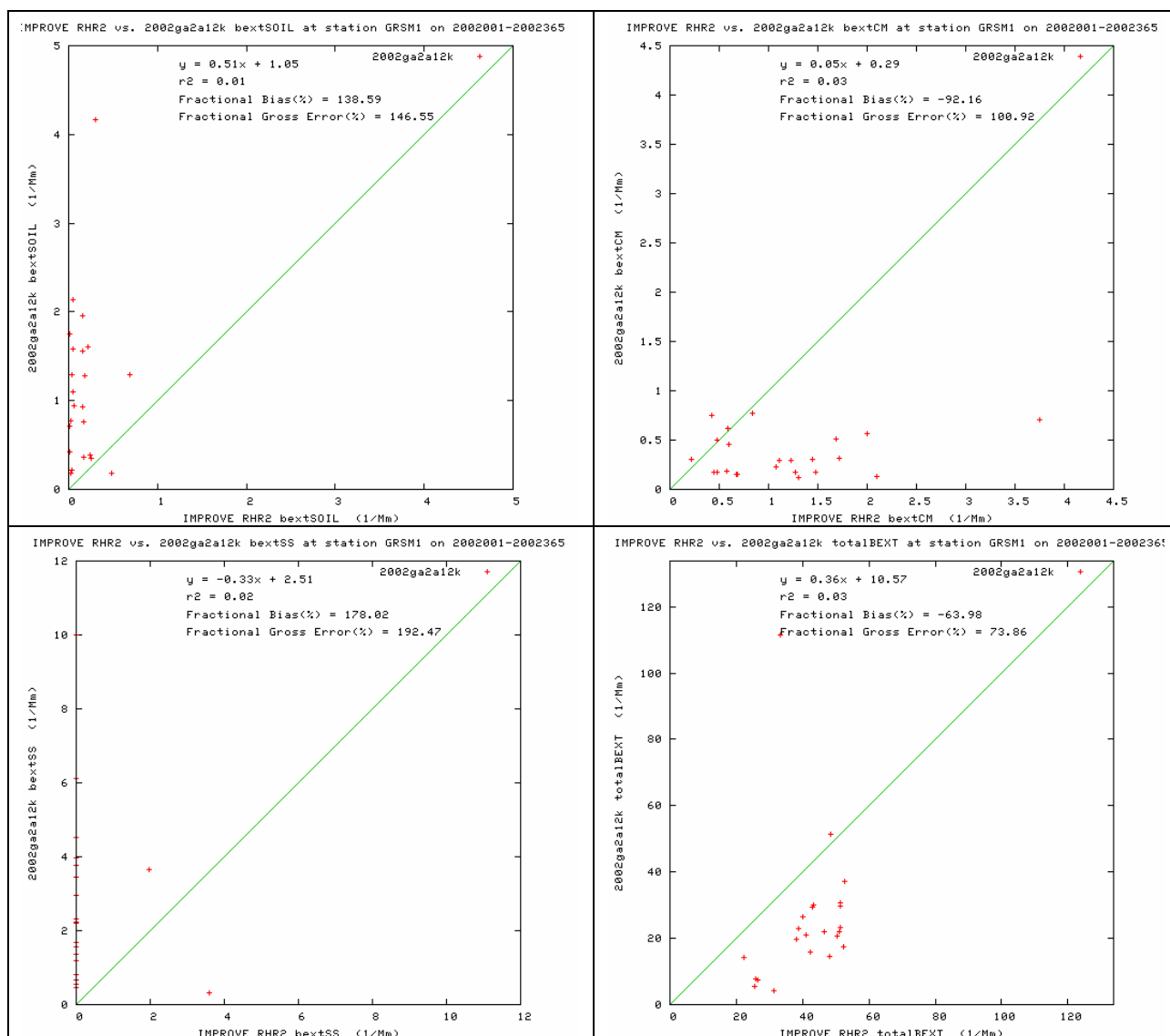


Figure C-58b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Great Smoky Mountains (GRSM), Tennessee-North Carolina for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; B20

GRSM1

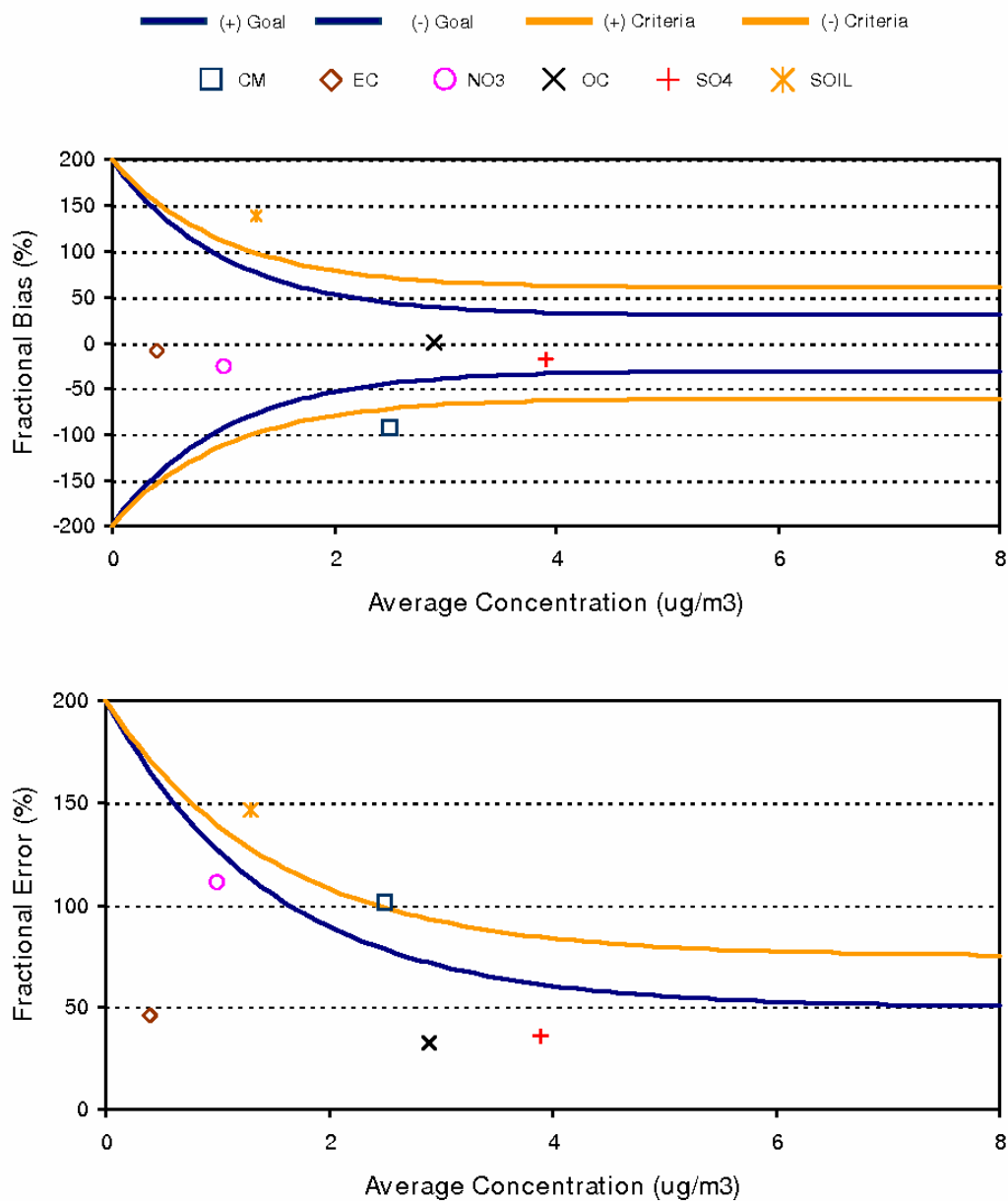


Figure C-59. Bugle Plots of Fractional Bias and Fractional Gross Error for GRSM and the Best 20 Percent Days.

2.3.12.2 GRSM Worst 20 Percent Days

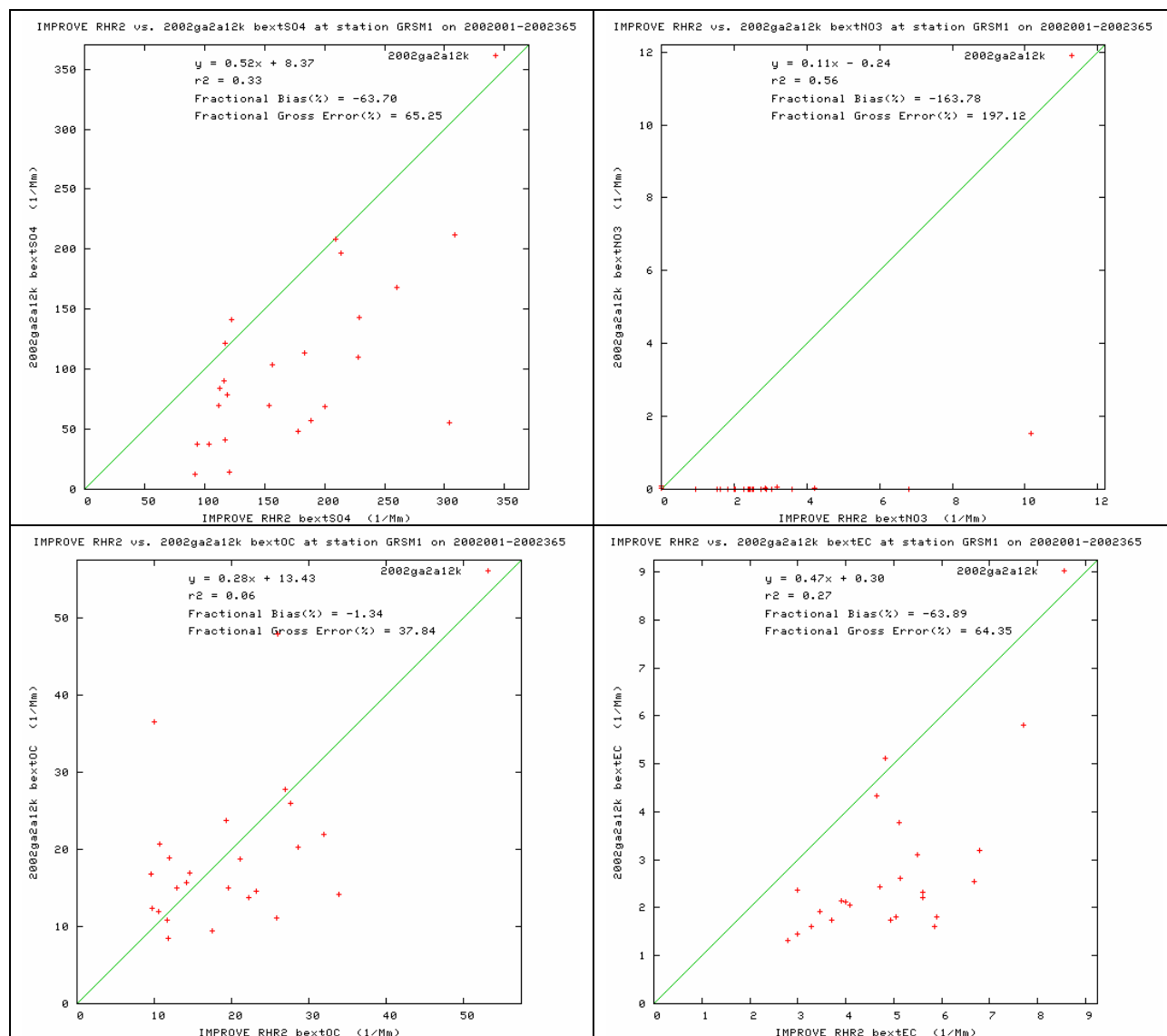
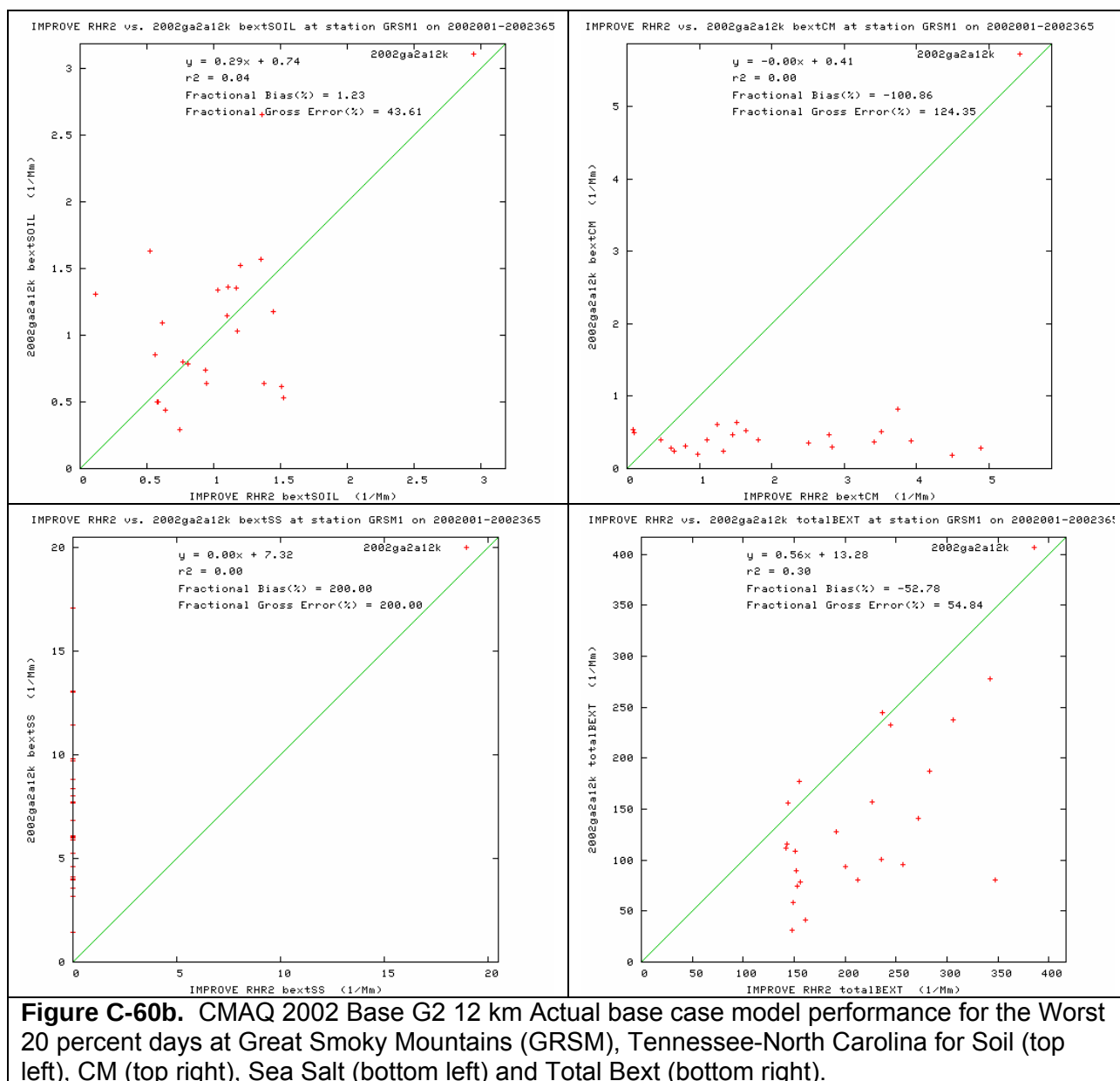


Figure C-60a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Great Smoky Mountains (GRSM), Tennessee-North Carolina for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

GRSM1

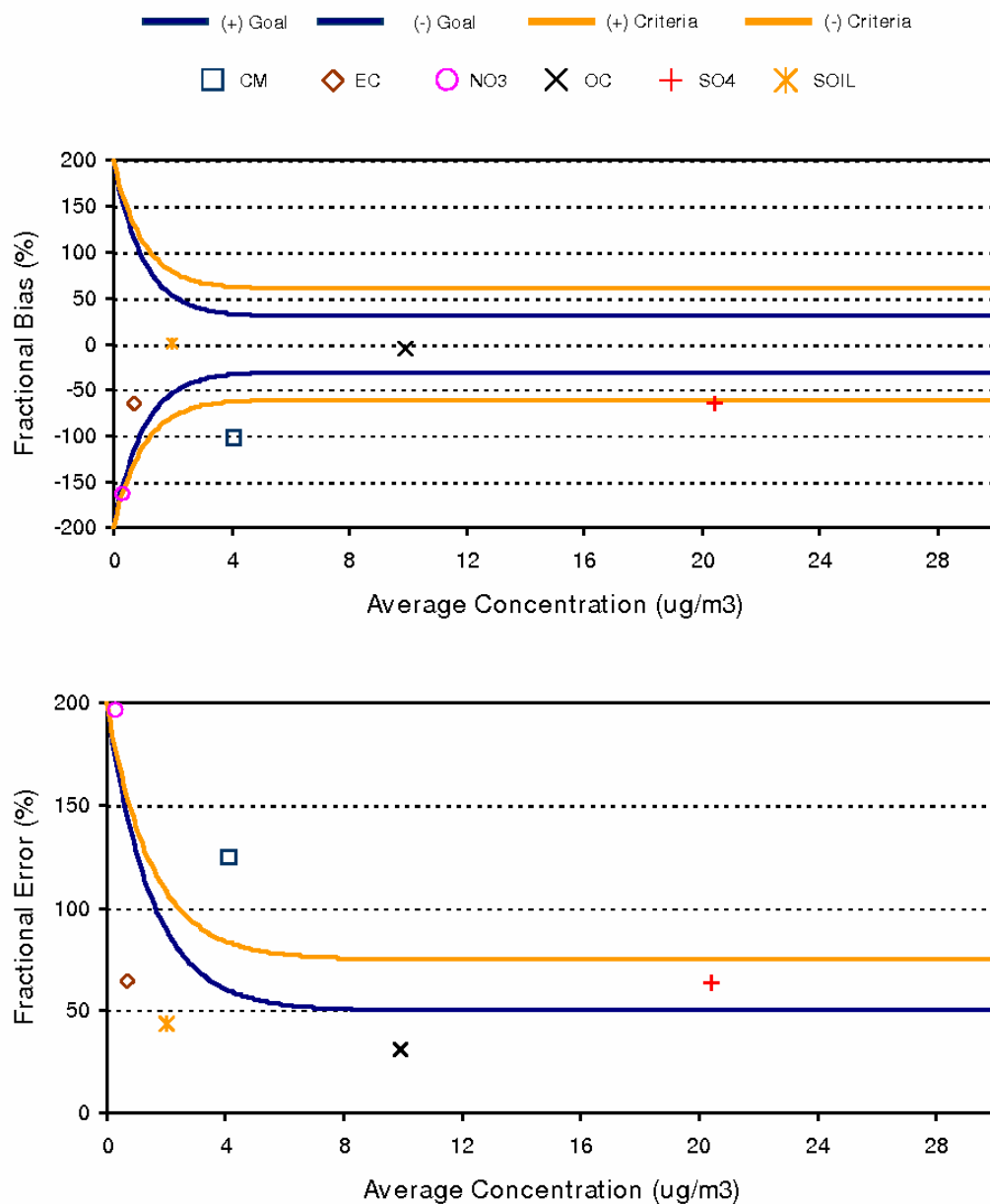


Figure C-61. Bugle Plots of Fractional Bias and Fractional Gross Error for GRSM and the Worst 20 Percent Days.

2.3.12.3 GRSM for All Days

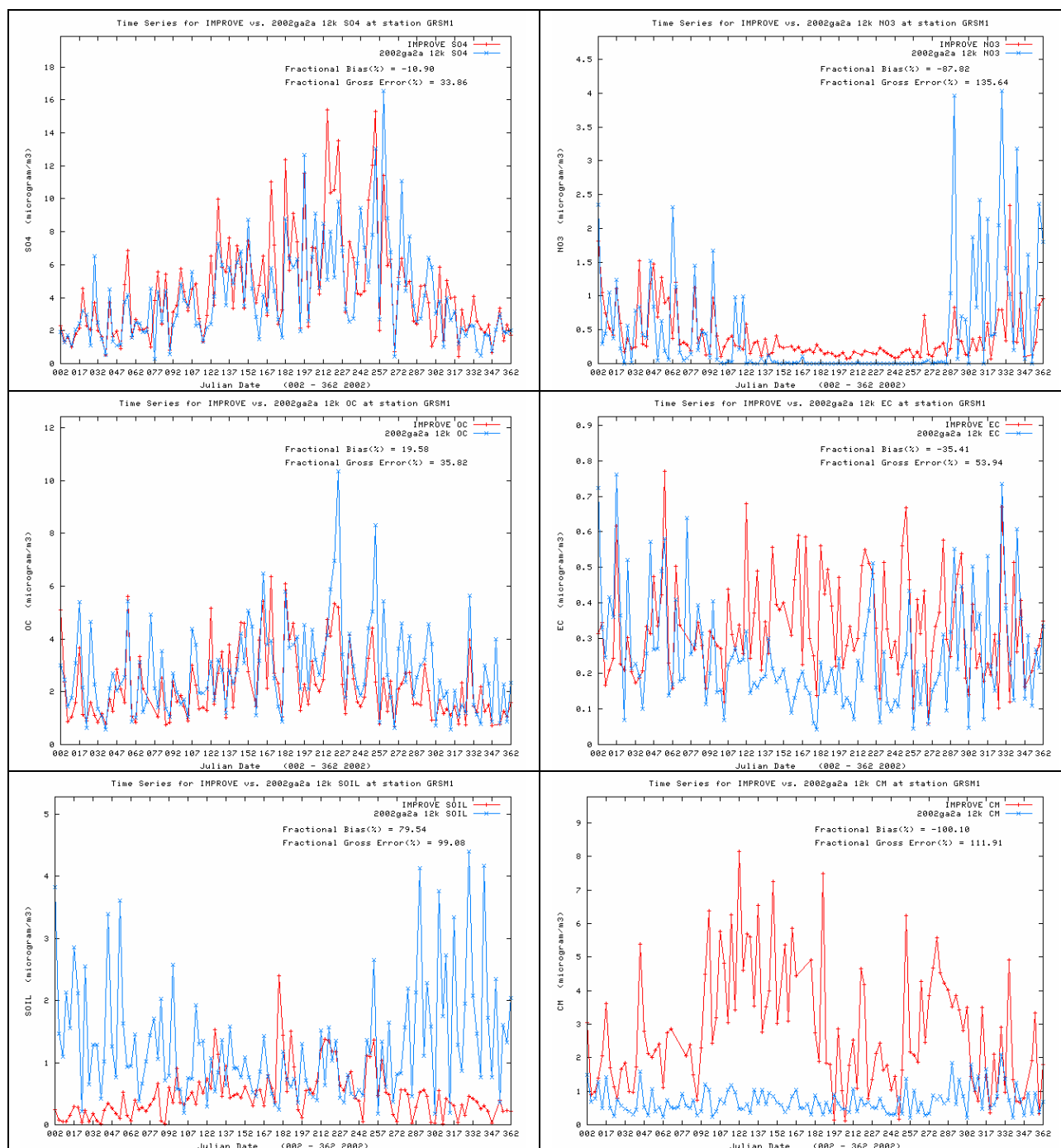
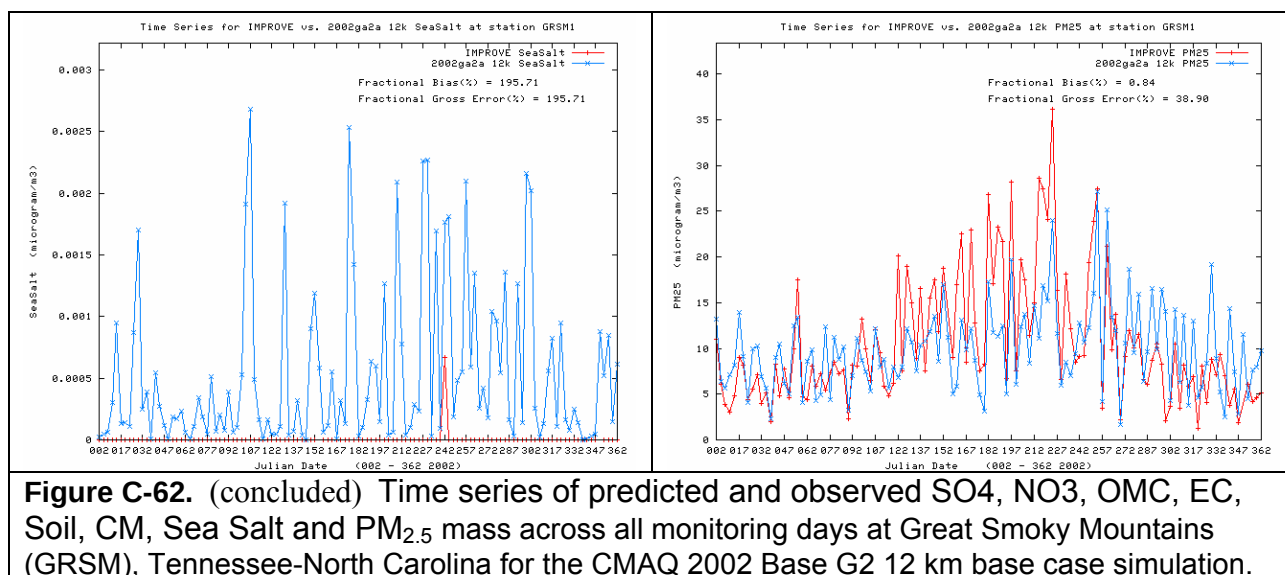


Figure C-62. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Great Smoky Mountains (GRSM), Tennessee-North Carolina for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.13 James River Face Wilderness Area (JARI), Virginia

2.3.13.1 JARI Best 20 Percent Days

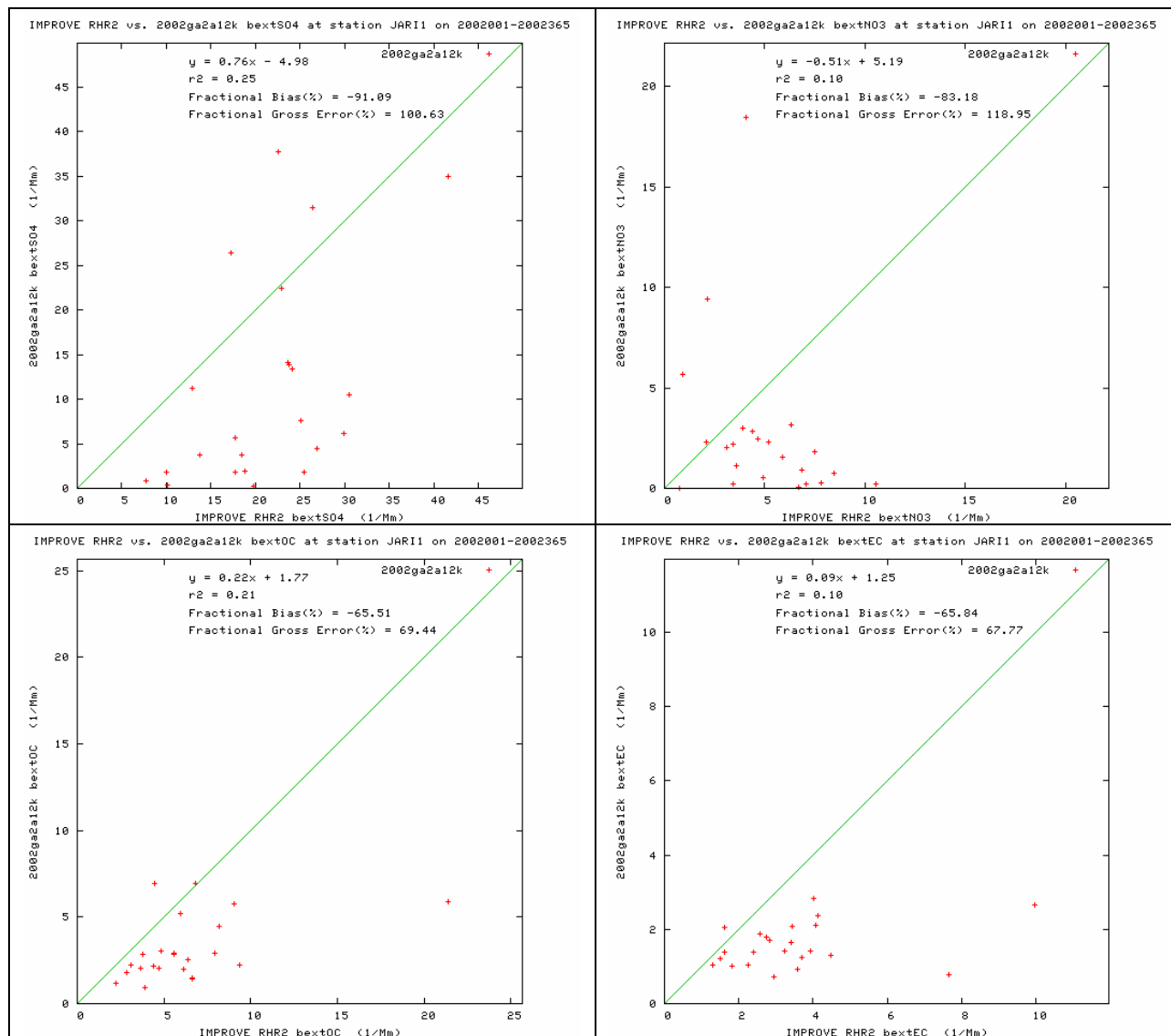
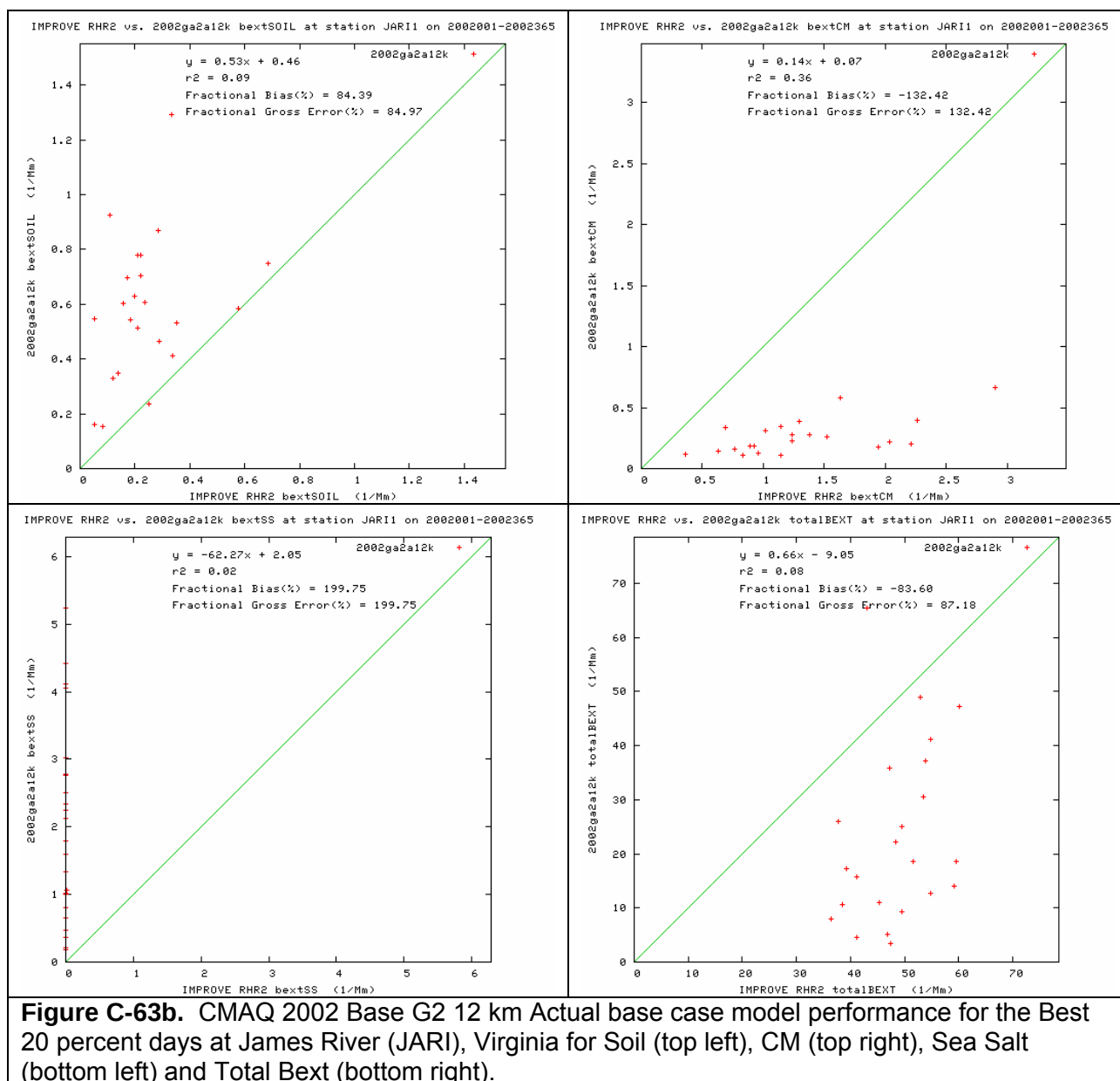


Figure C-63a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at James River (JARI), Virginia for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

JARI1

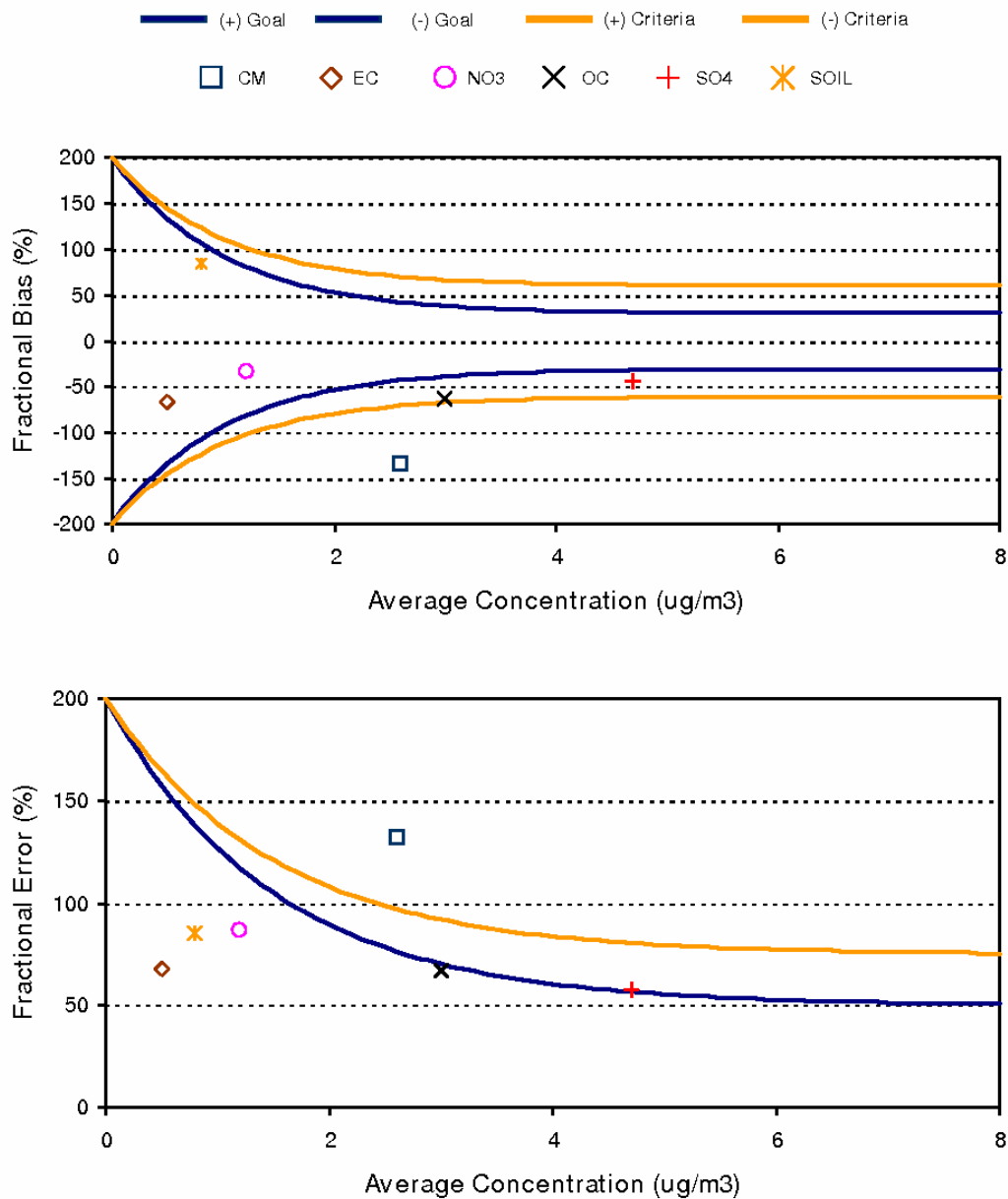


Figure C-64. Bugle Plots of Fractional Bias and Fractional Gross Error for JARI and the Best 20 Percent Days.

2.3.13.2 JARI Worst 20 Percent Days

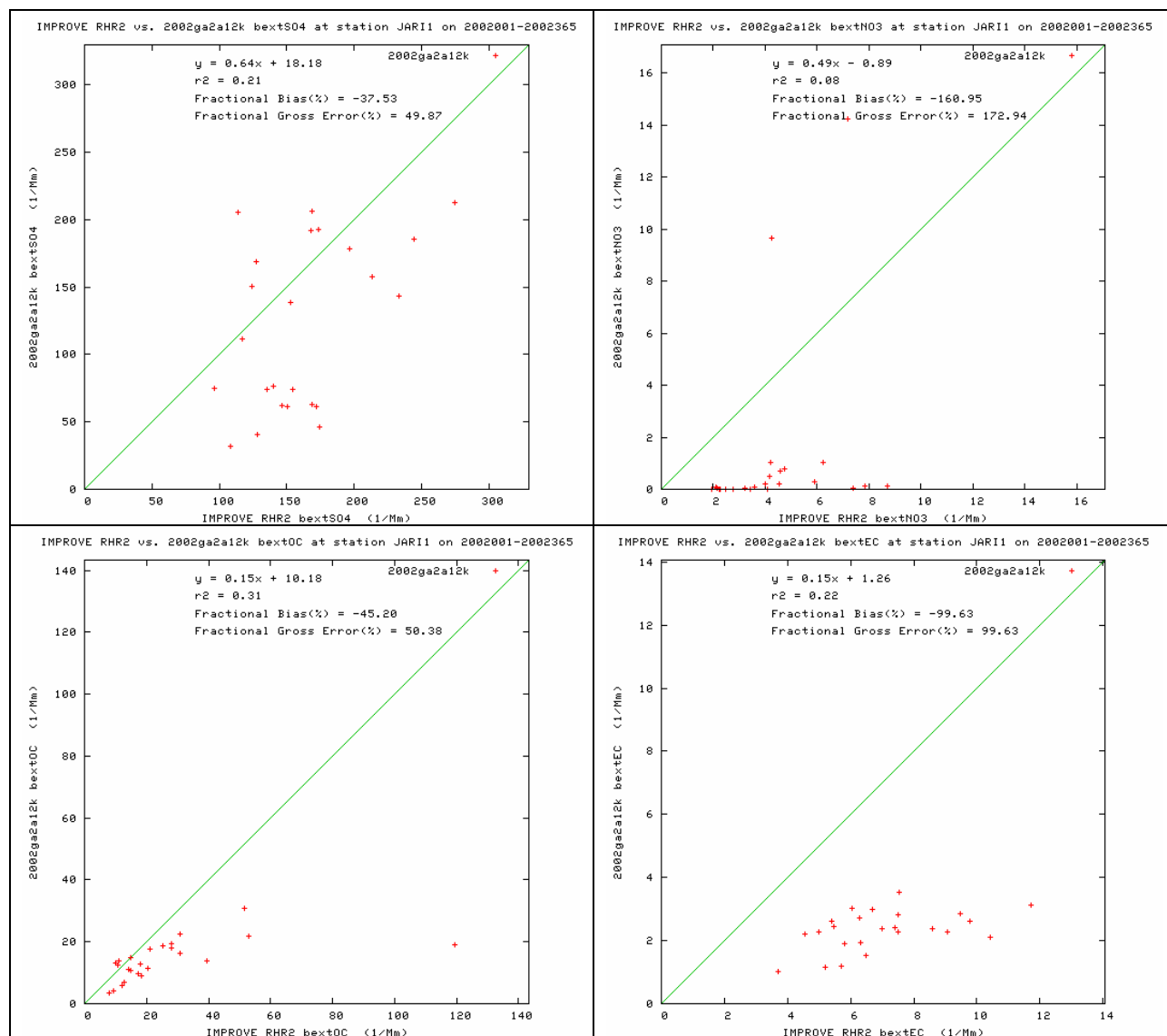
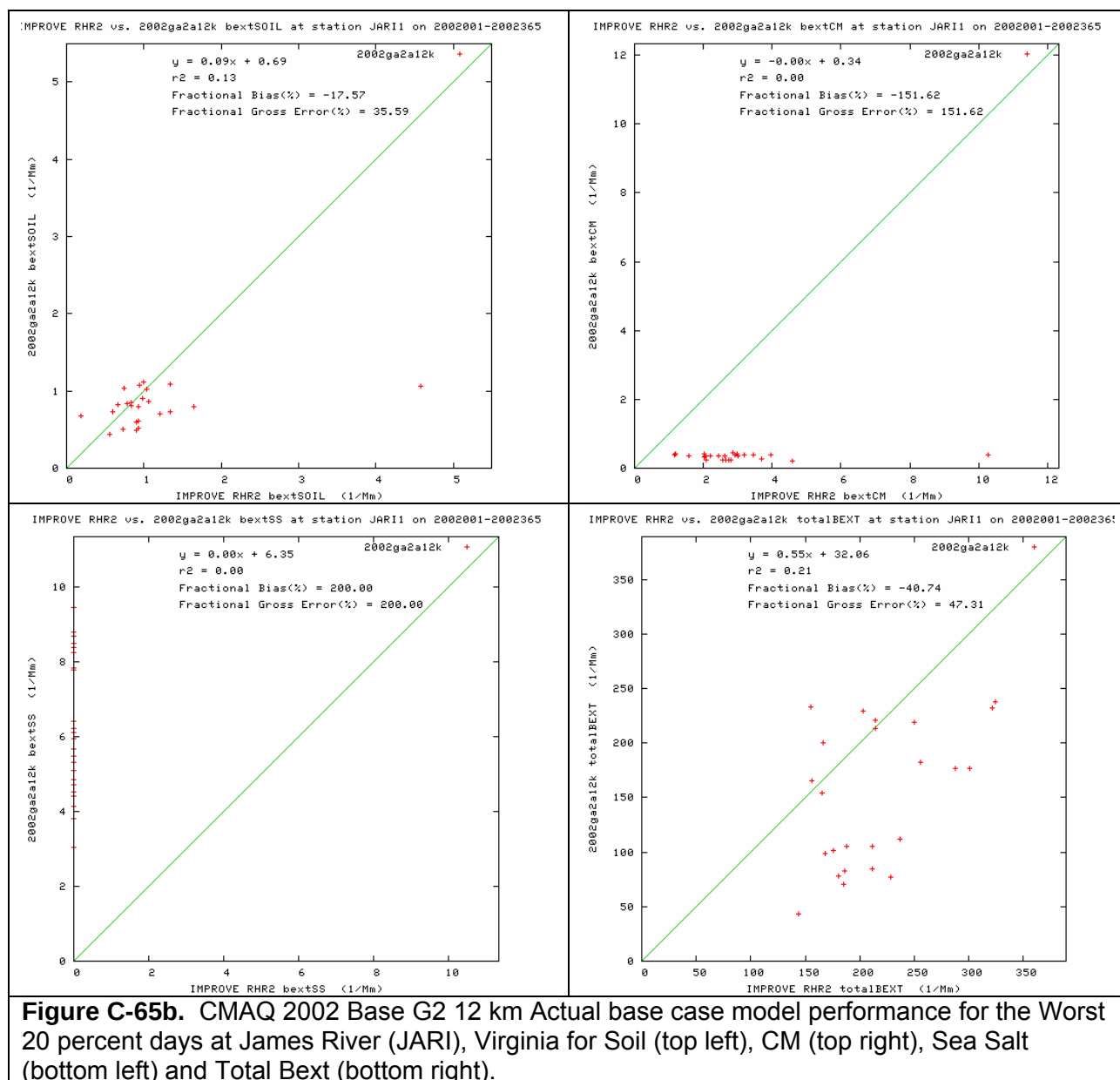


Figure C-65a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at James River (JARI), Virginia for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

JARI1

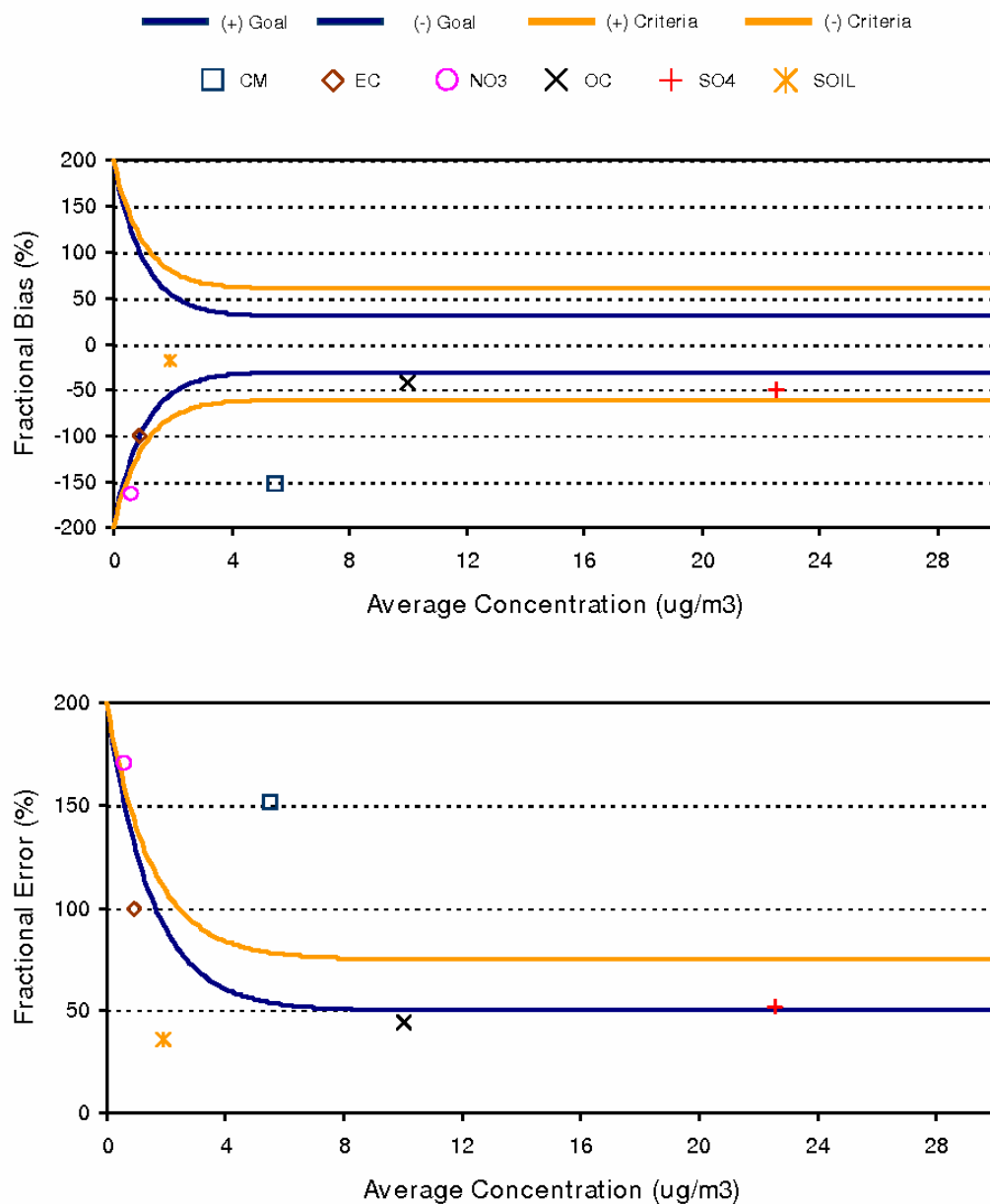
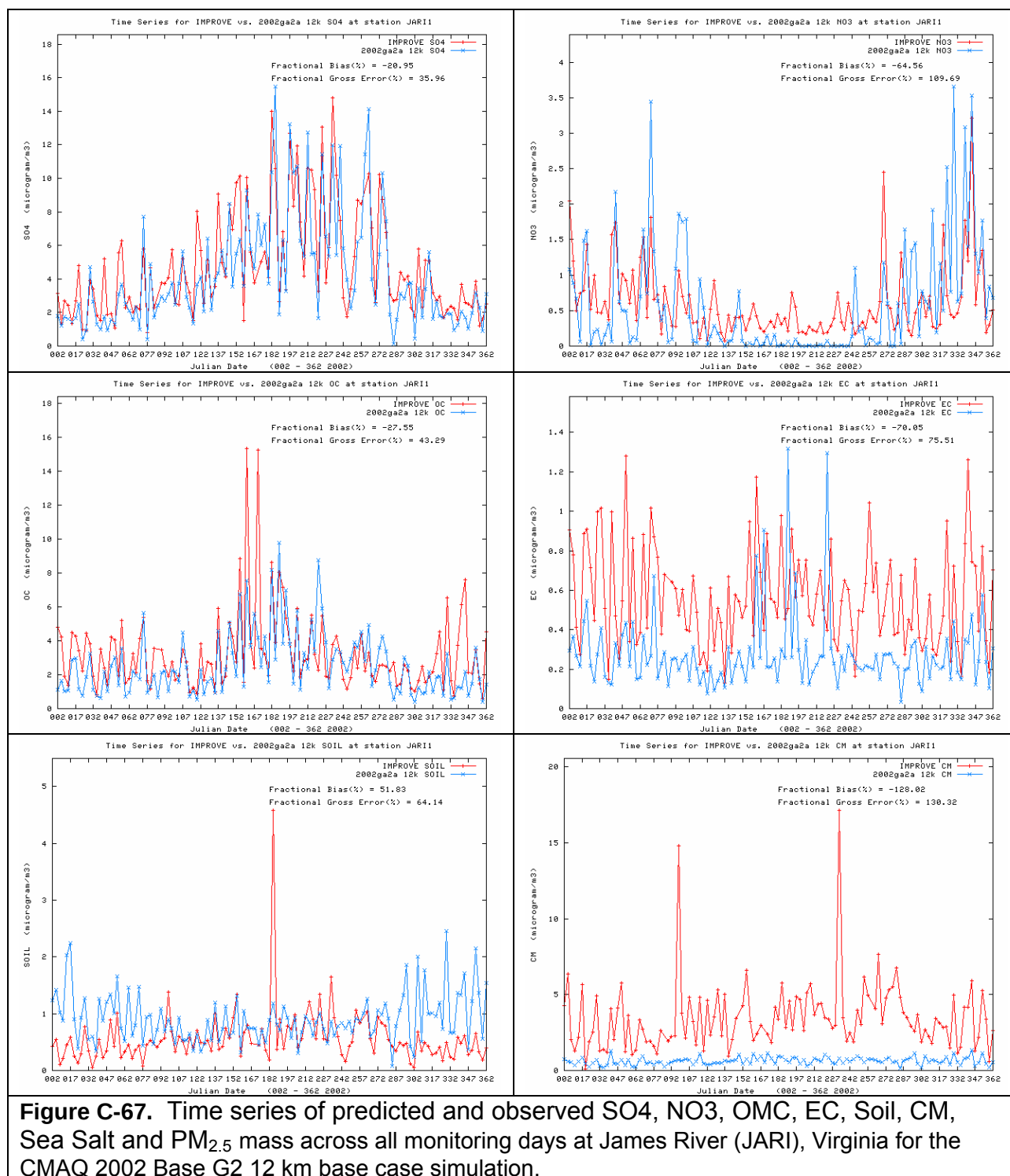
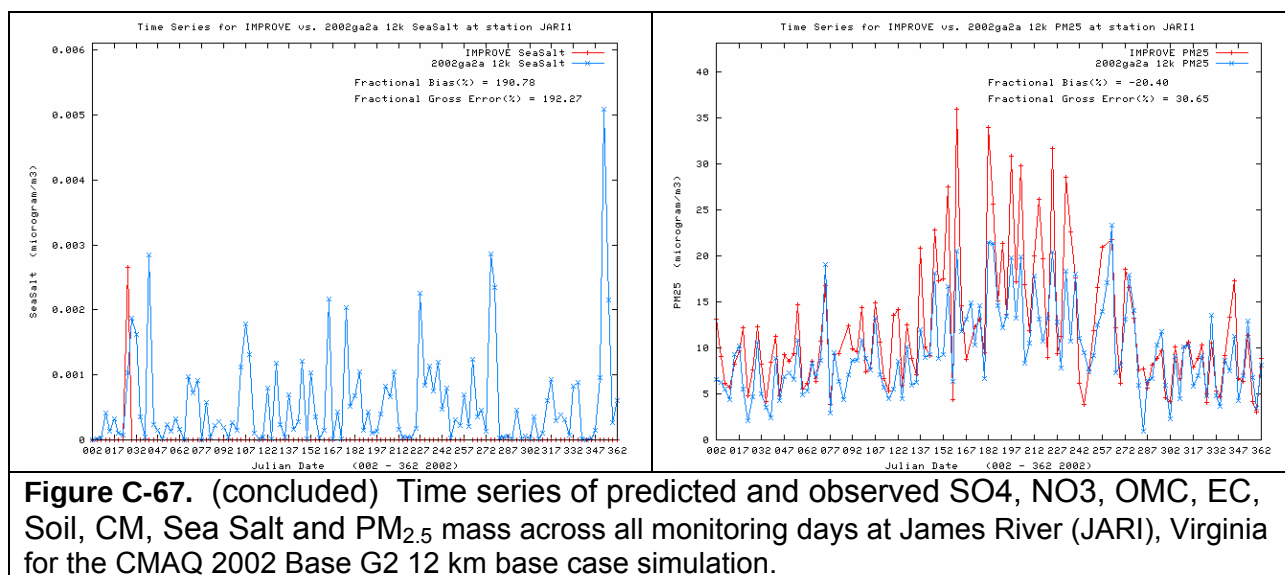


Figure C-66. Bugle Plots of Fractional Bias and Fractional Gross Error for JARI and the Worst 20 Percent Days.

2.3.13.3 JARI for All Days





2.3.14 Shenandoah National Park (SHEN), Virginia

2.3.14.1 SHEN Best 20 Percent Days

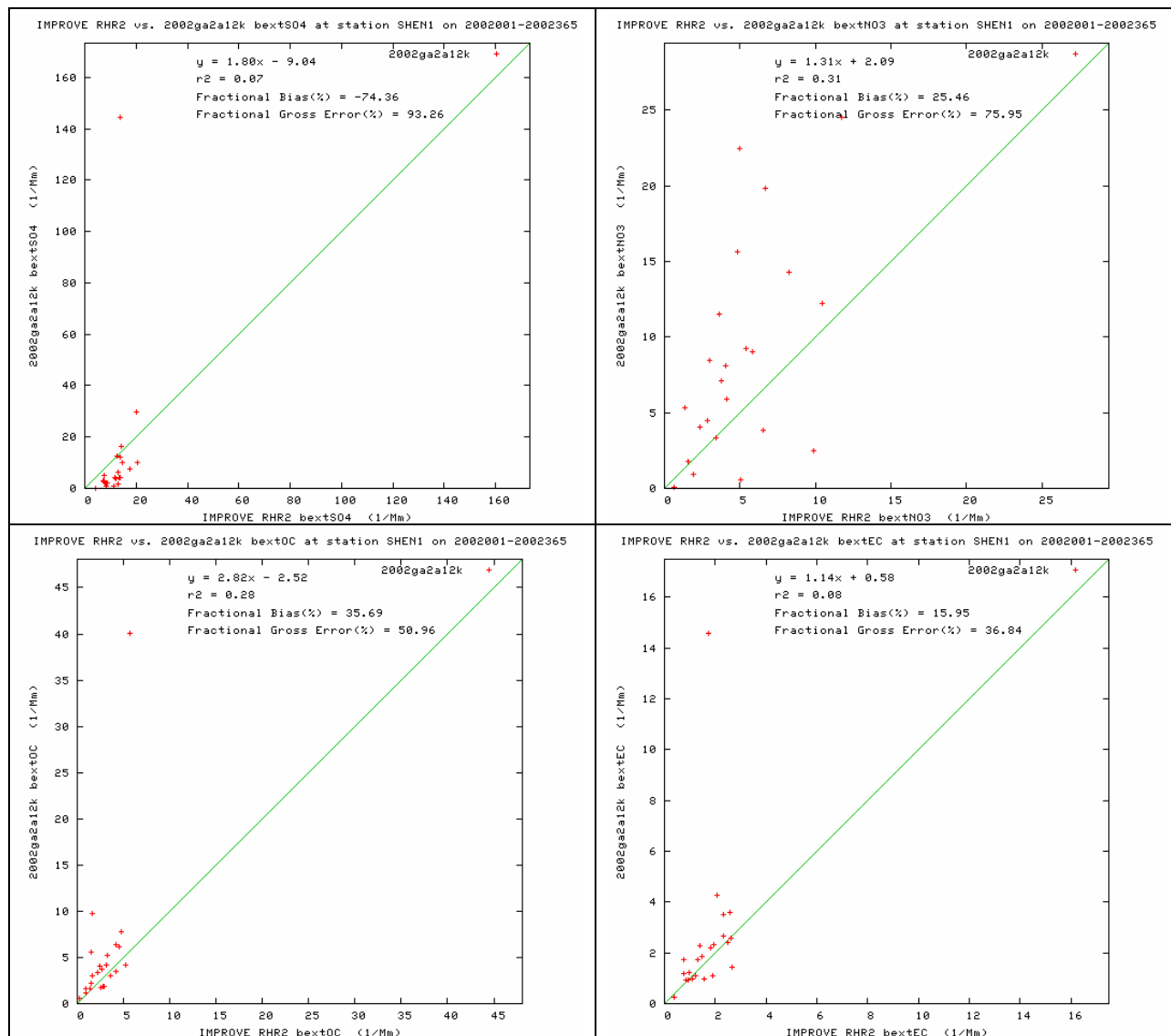


Figure C-68a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Shenandoah (SHEN), Virginia for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).

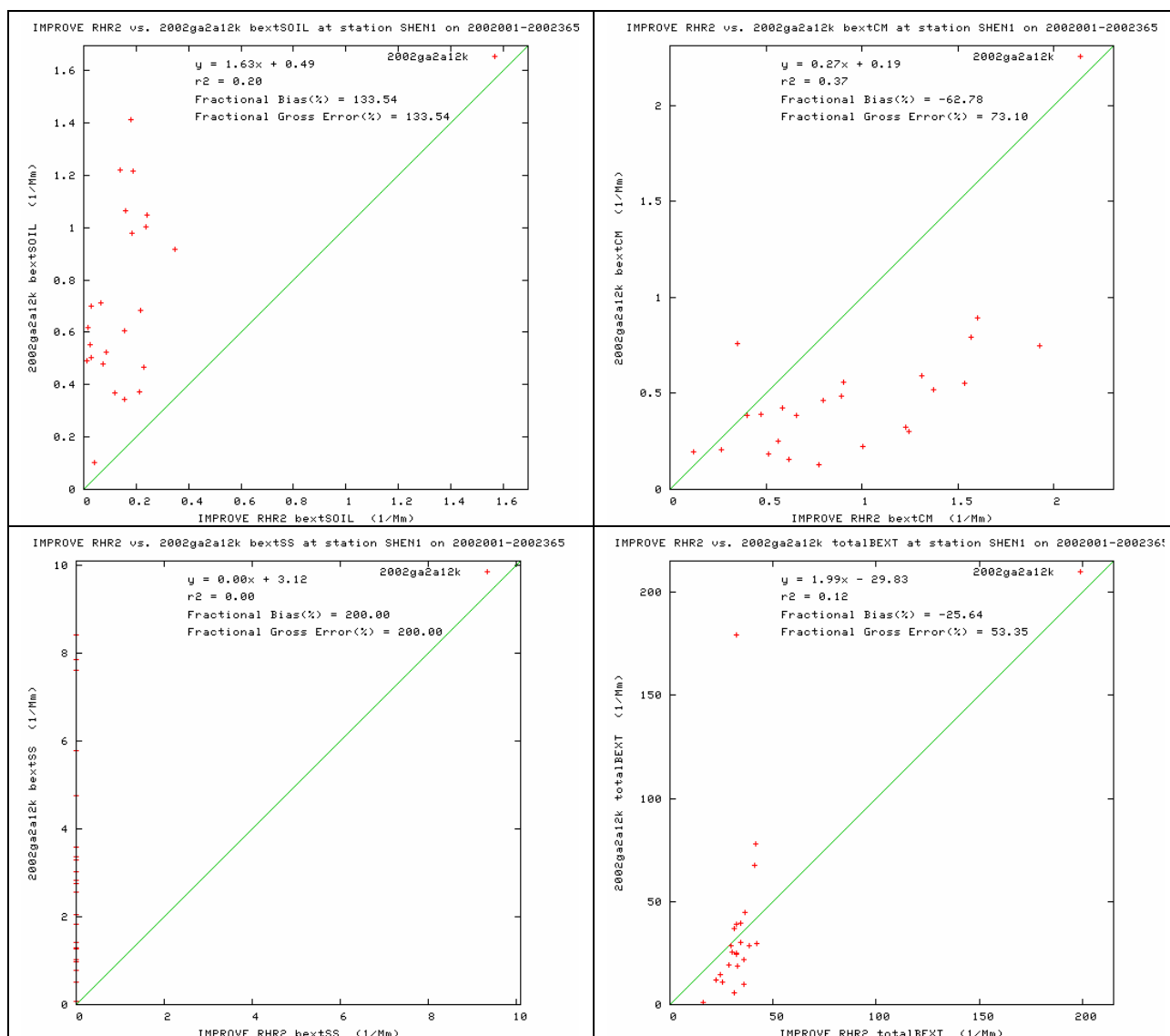


Figure C-68b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Shenandoah (SHEN), Virginia for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; B20

SHEN1

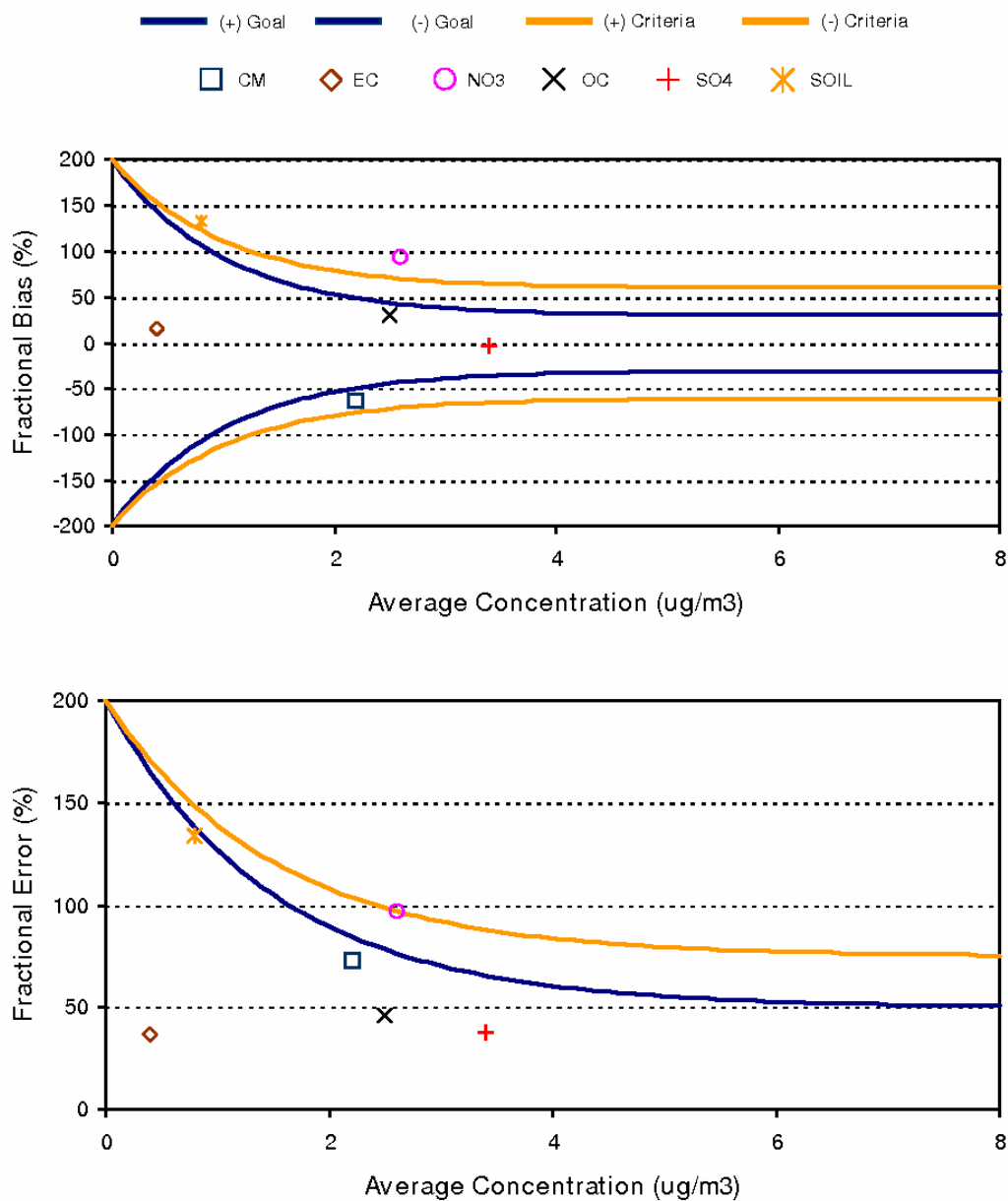


Figure C-69. Bugle Plots of Fractional Bias and Fractional Gross Error for SHEN and the Best 20 Percent Days.

2.3.14.2 SHEN Worst 20 Percent Days

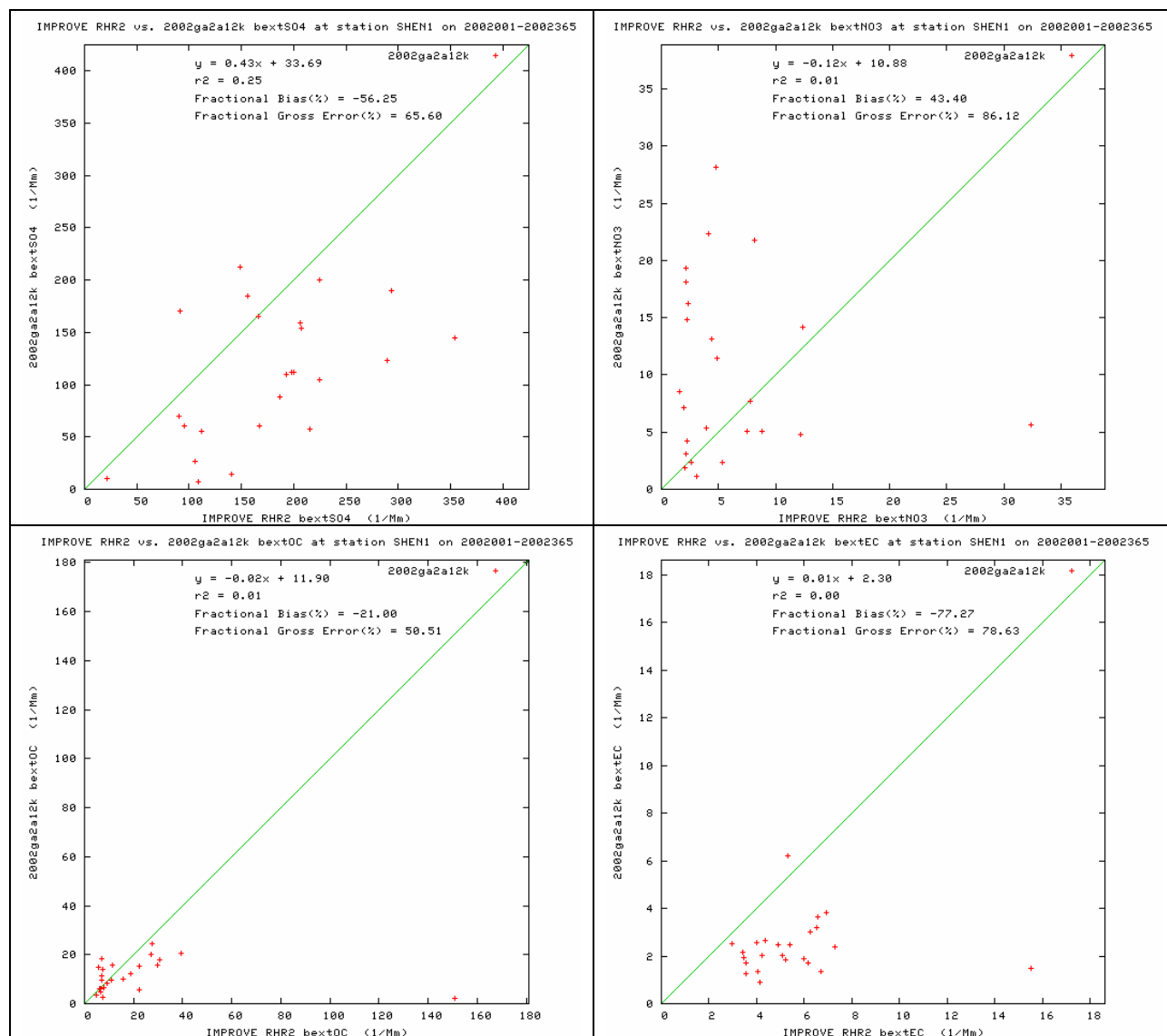
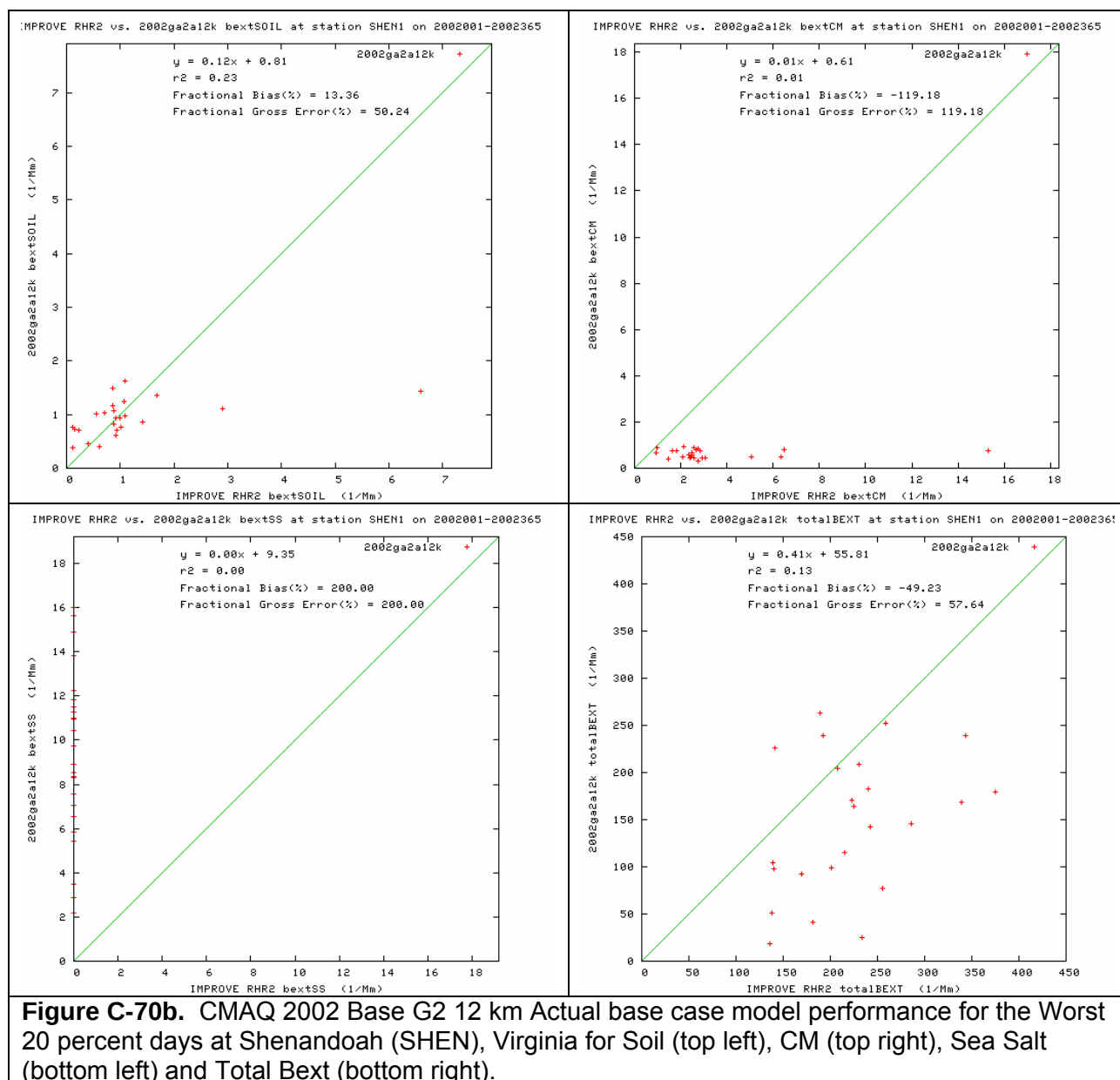


Figure C-70a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Shenandoah (SHEN), Virginia for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

SHEN1

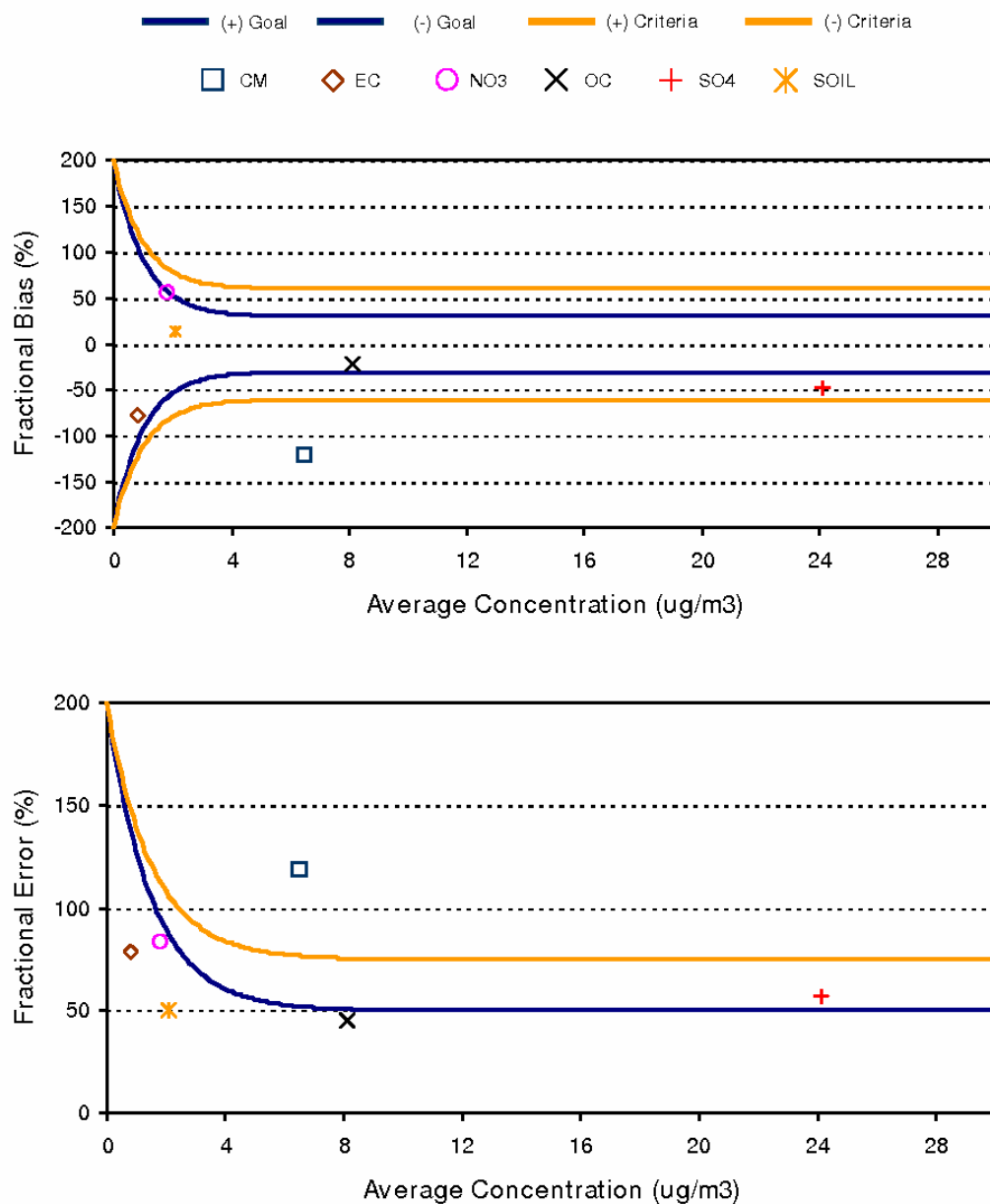


Figure C-71. Bugle Plots of Fractional Bias and Fractional Gross Error for SHEN and the Worst 20 Percent Days.

2.3.14.3 SHEN for All Days

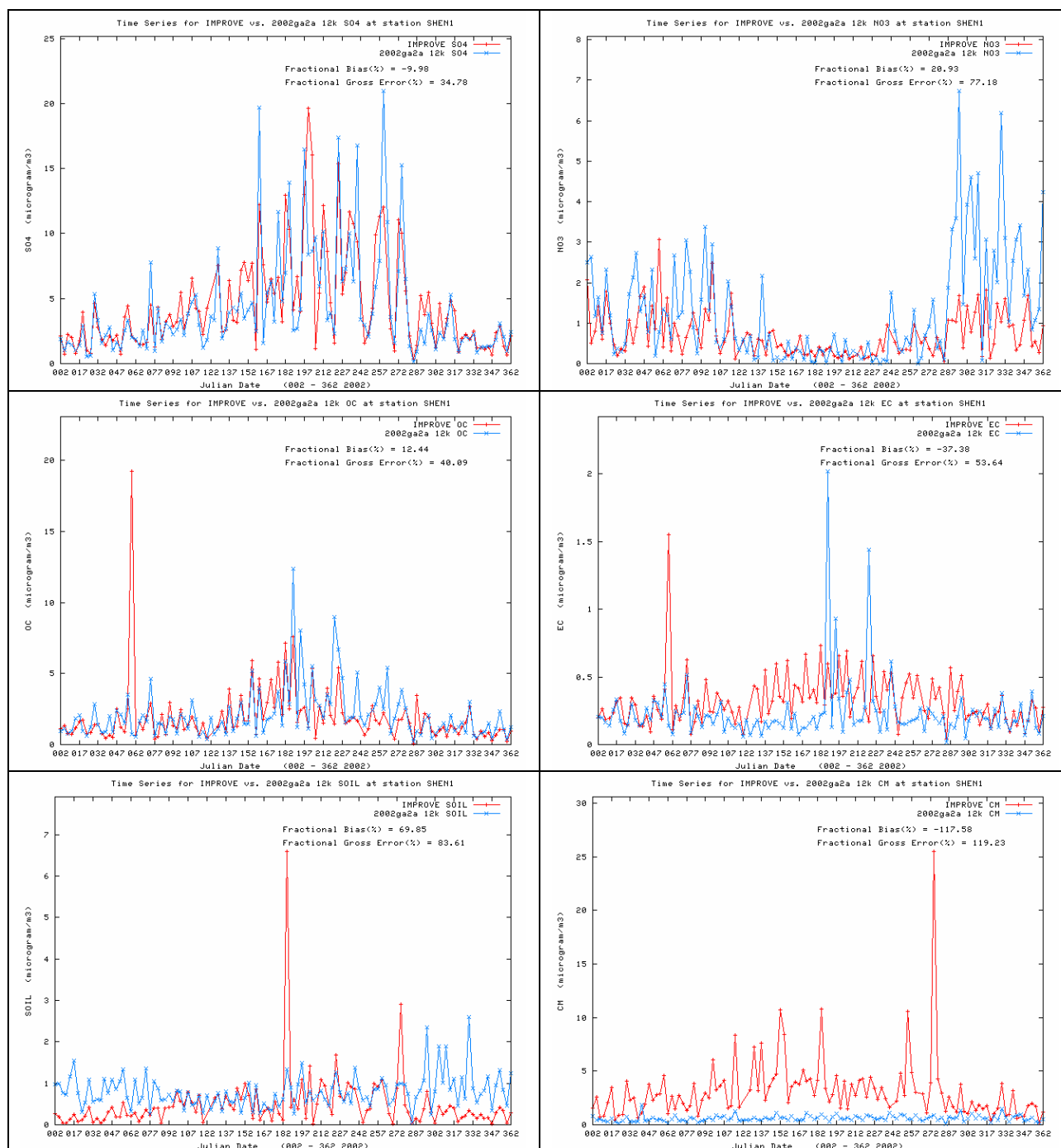
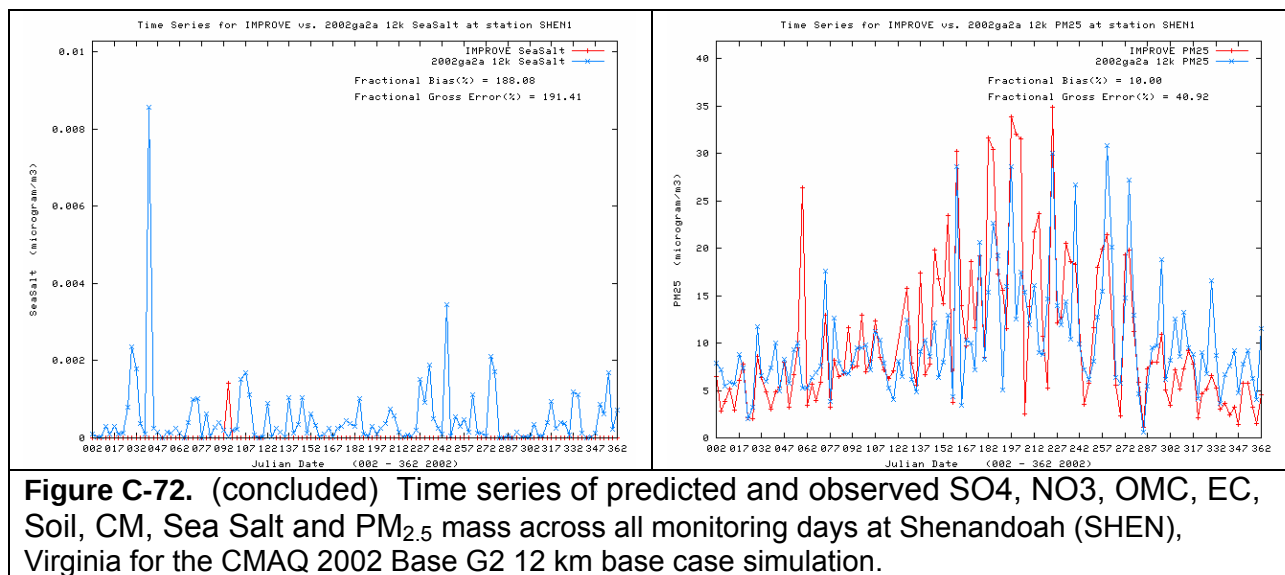
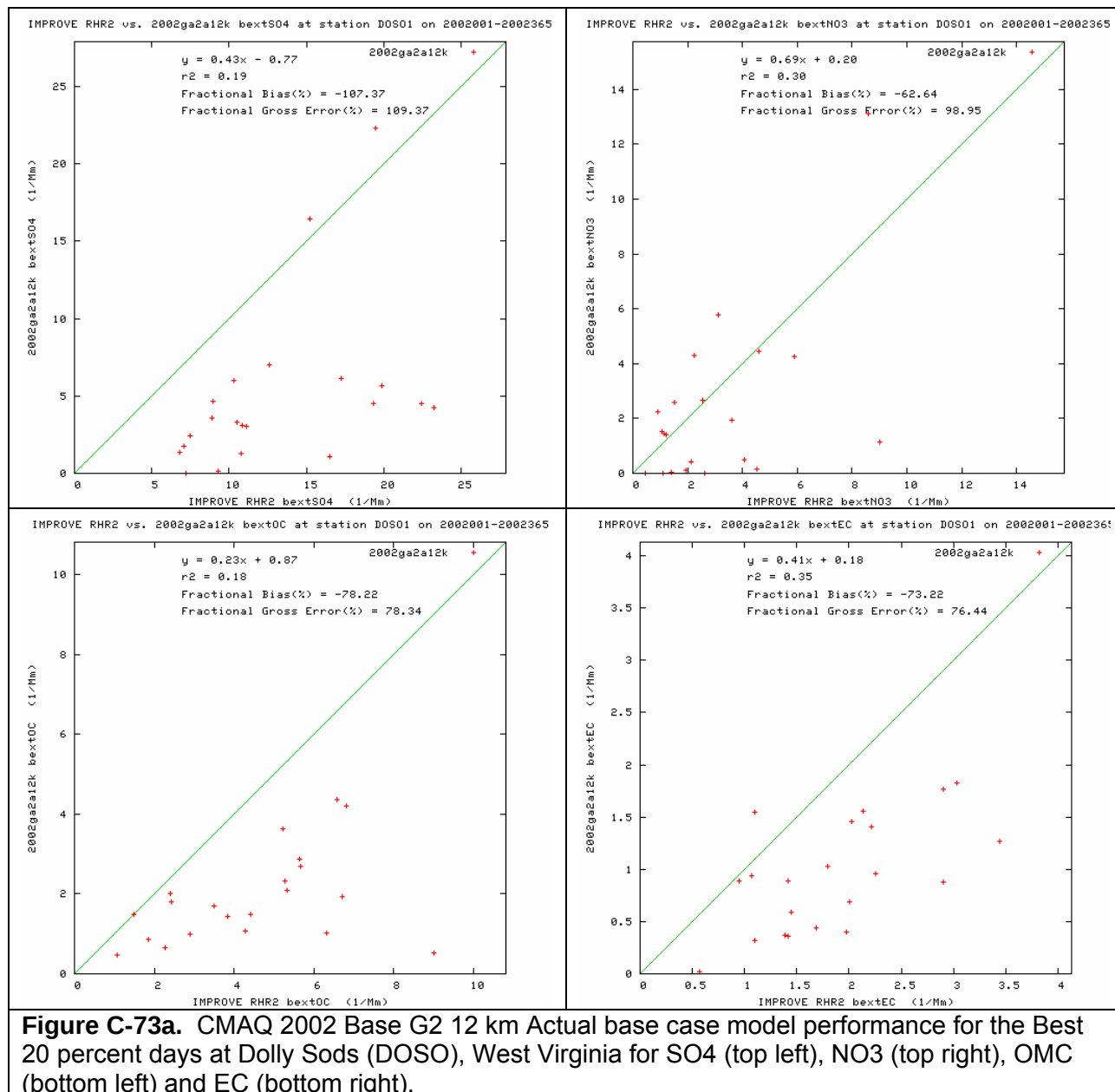


Figure C-72. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Shenandoah (SHEN), Virginia for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.15 Dolly Sods Wilderness Area (DOSO), West Virginia

2.3.15.1 DOSO Best 20 Percent Days



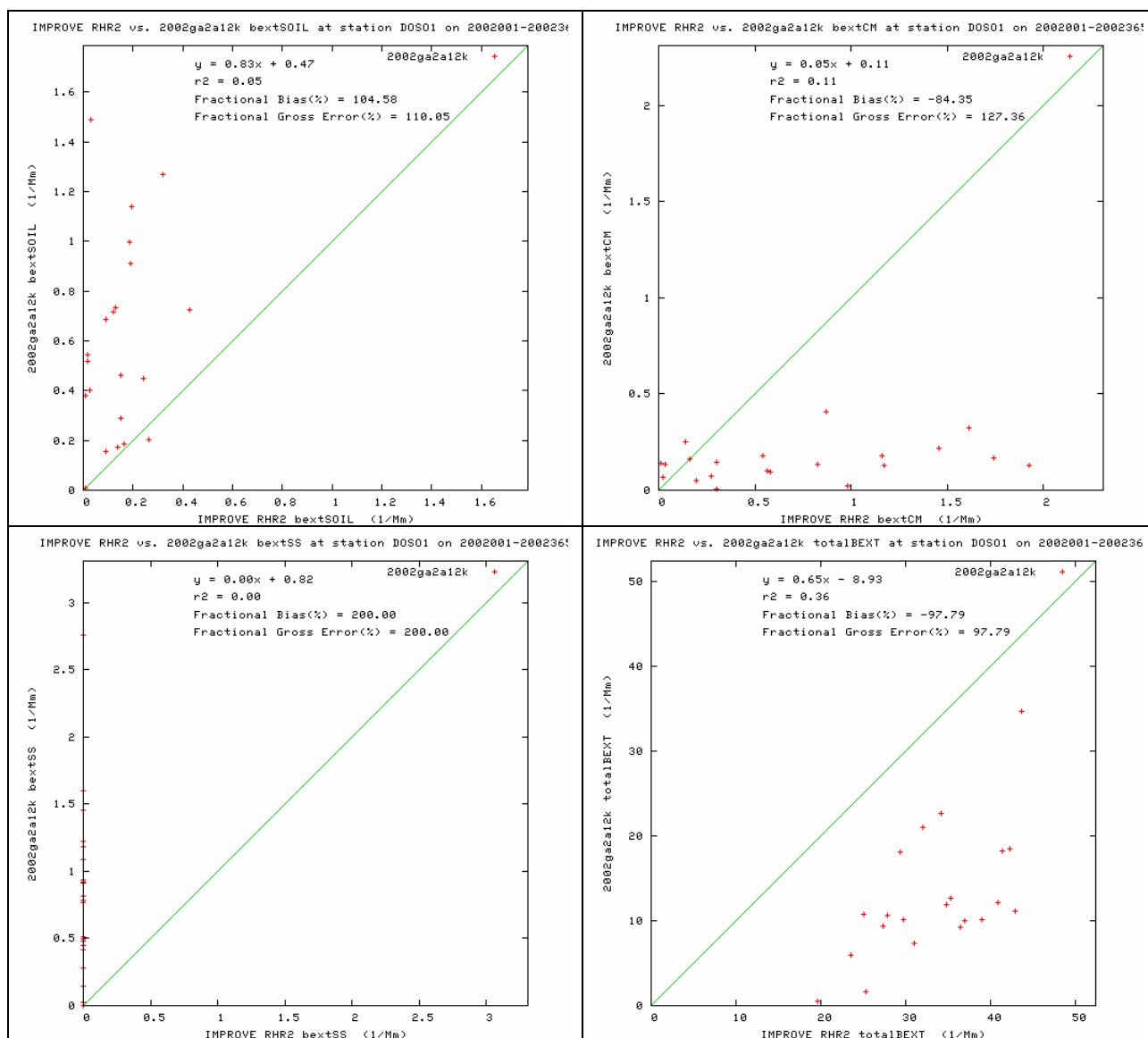


Figure C-73b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Dolly Sods (DOS0), West Virginia for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; B20

DOSO1

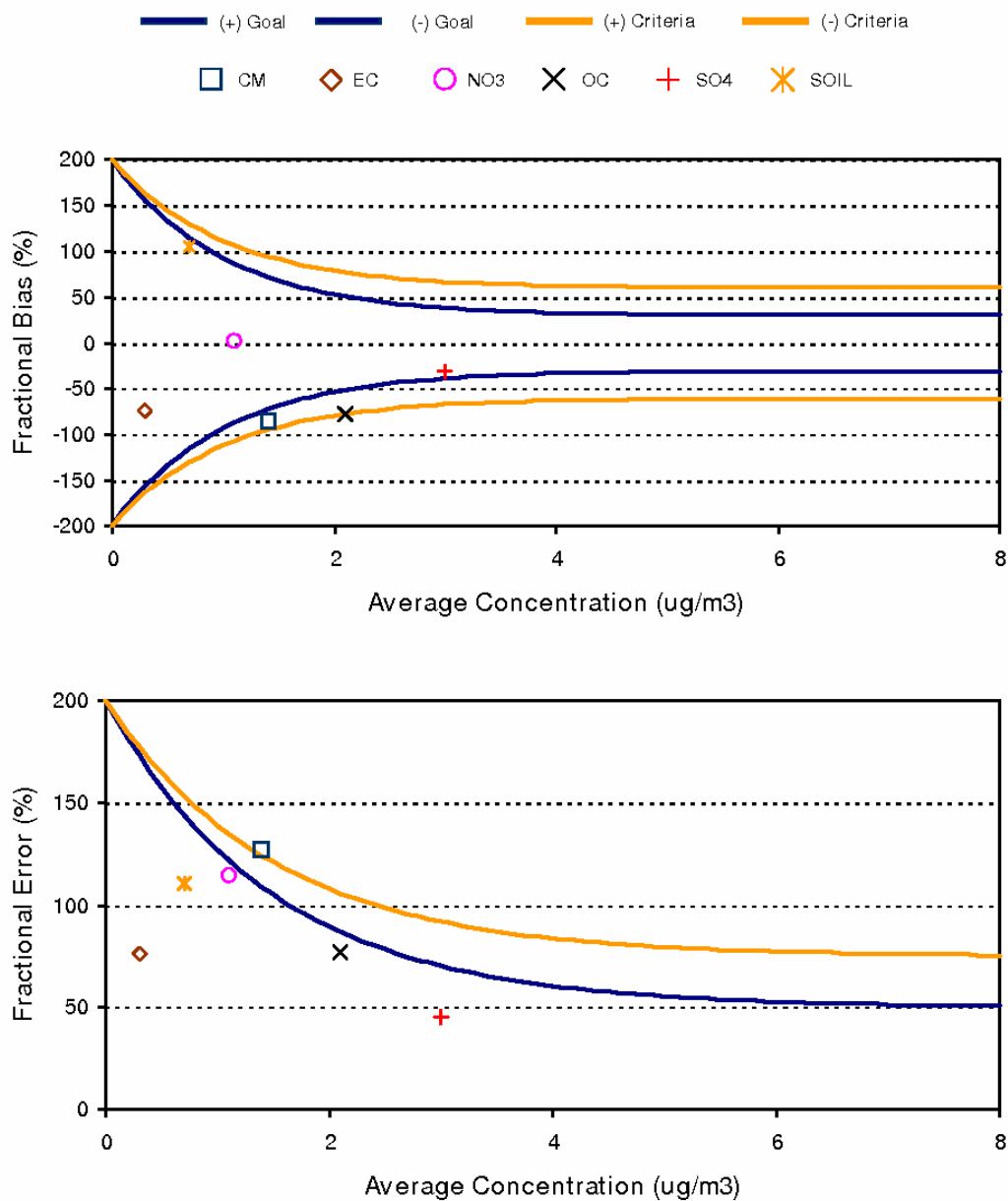
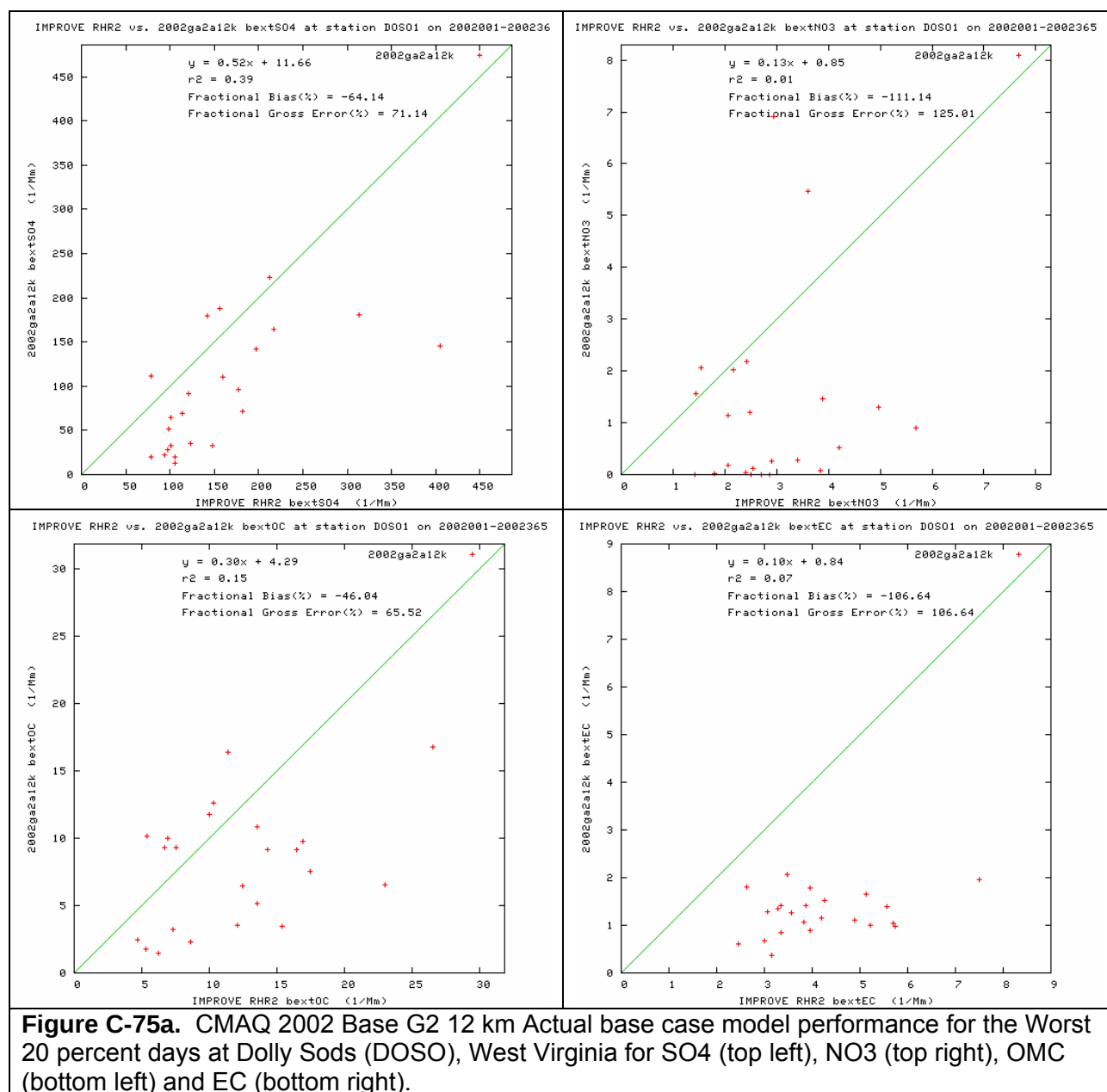


Figure C-74. Bugle Plots of Fractional Bias and Fractional Gross Error for DOSO and the Best 20 Percent Days.

2.3.15.2 DOSO Worst 20 Percent Days



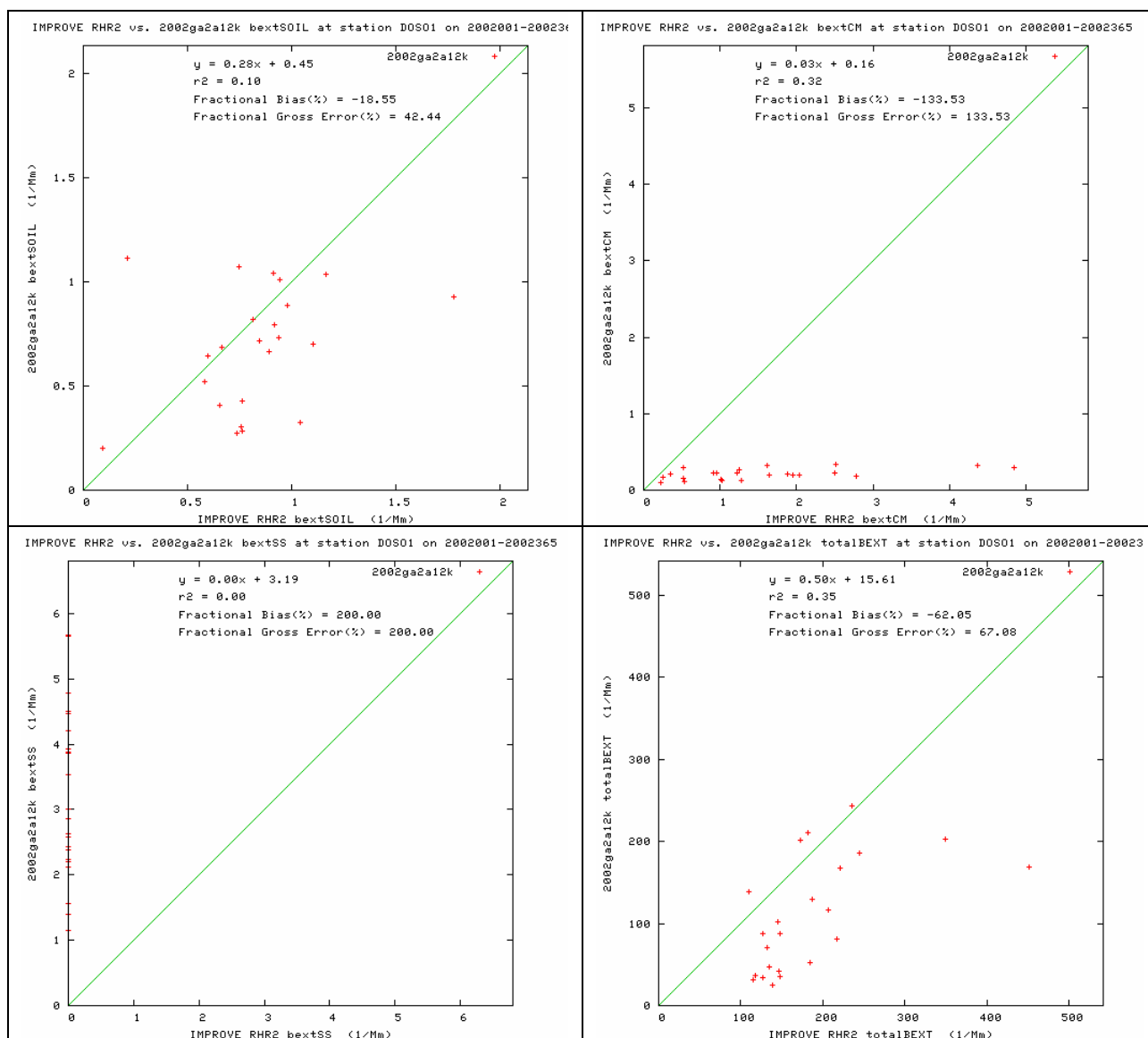


Figure C-75b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Dolly Sods (DOS0), West Virginia for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; W20

DOSO1

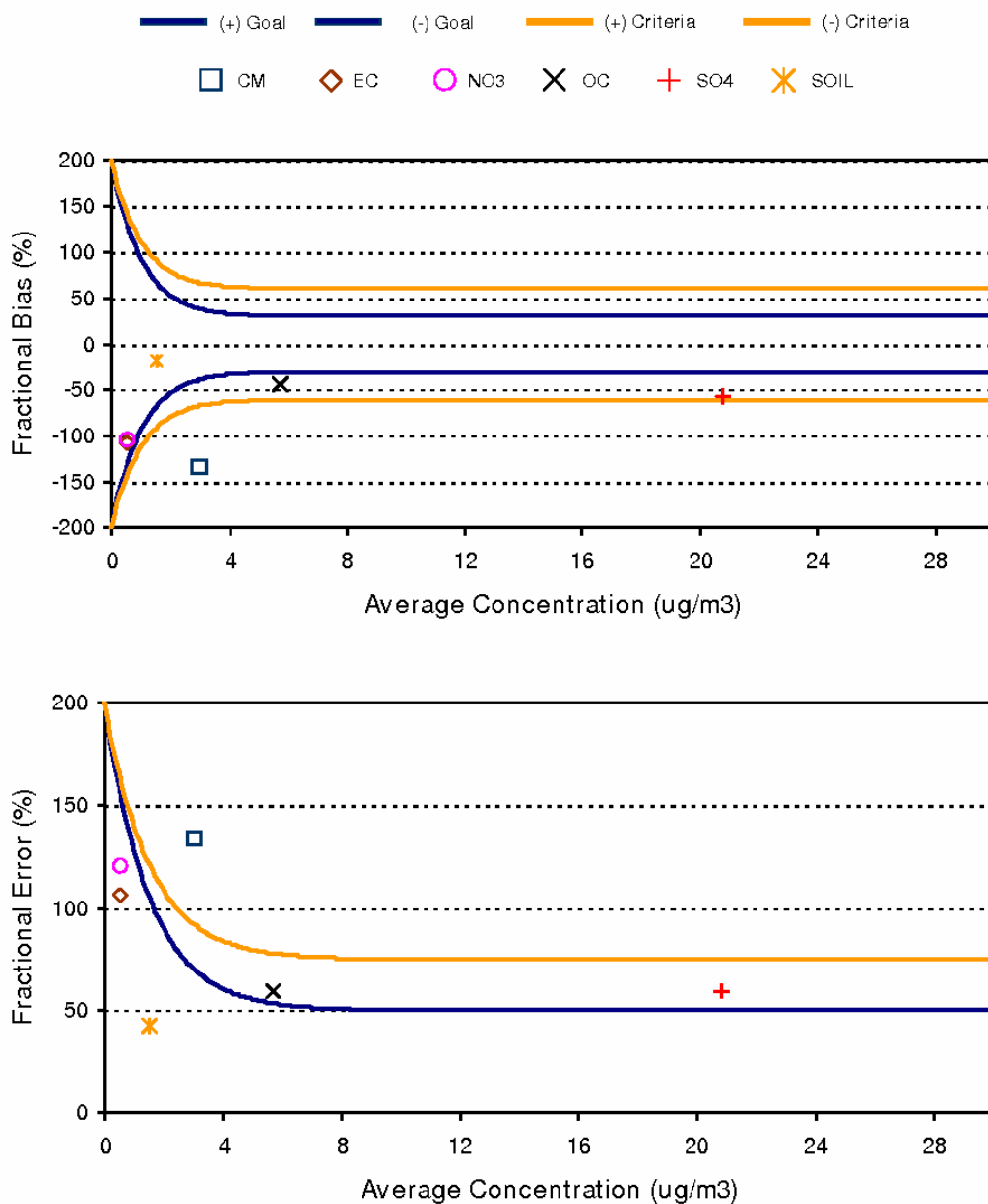


Figure C-76. Bugle Plots of Fractional Bias and Fractional Gross Error for DOSO and the Worst 20 Percent Days.

2.3.15.3 DOSO for All Days

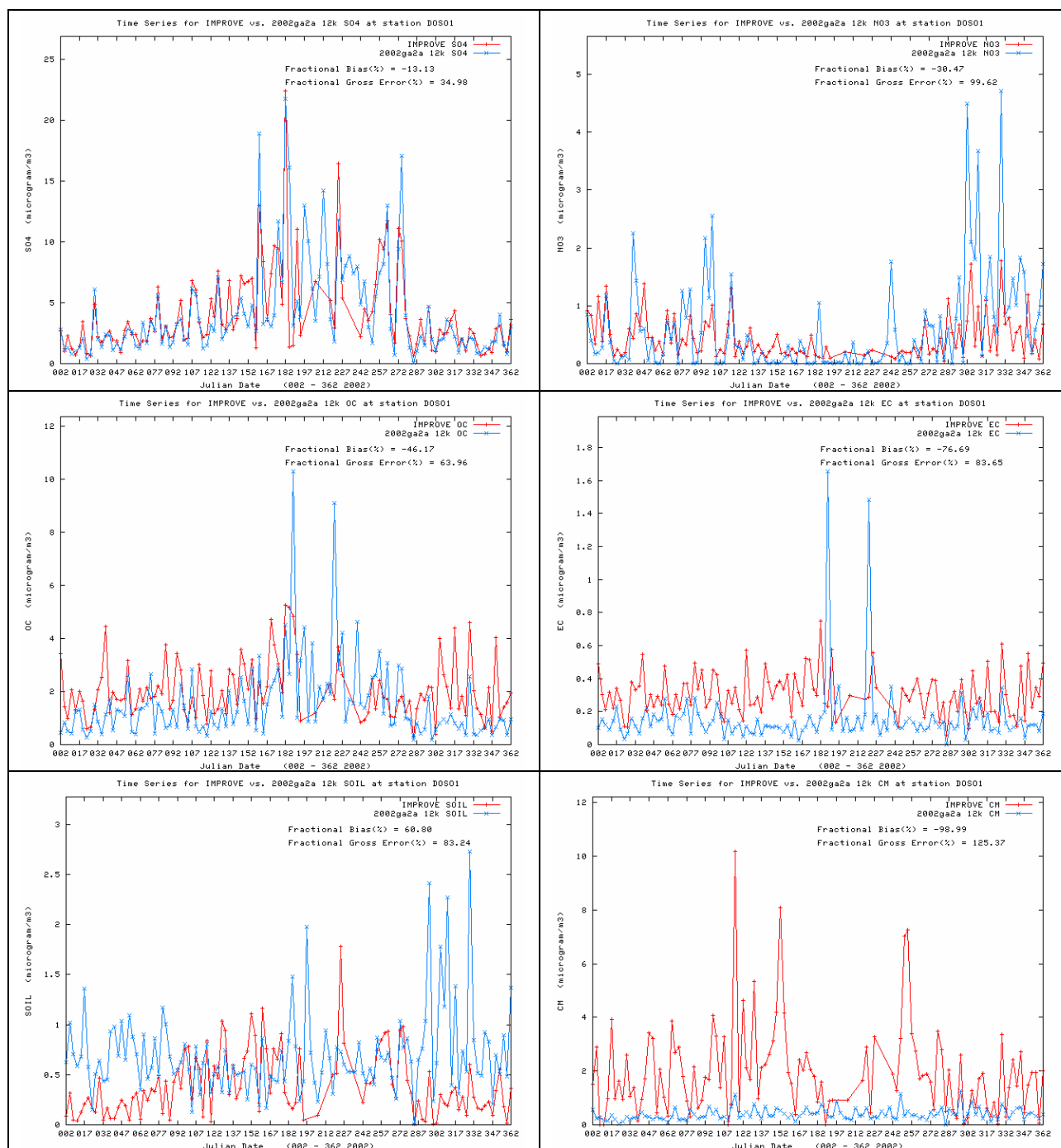
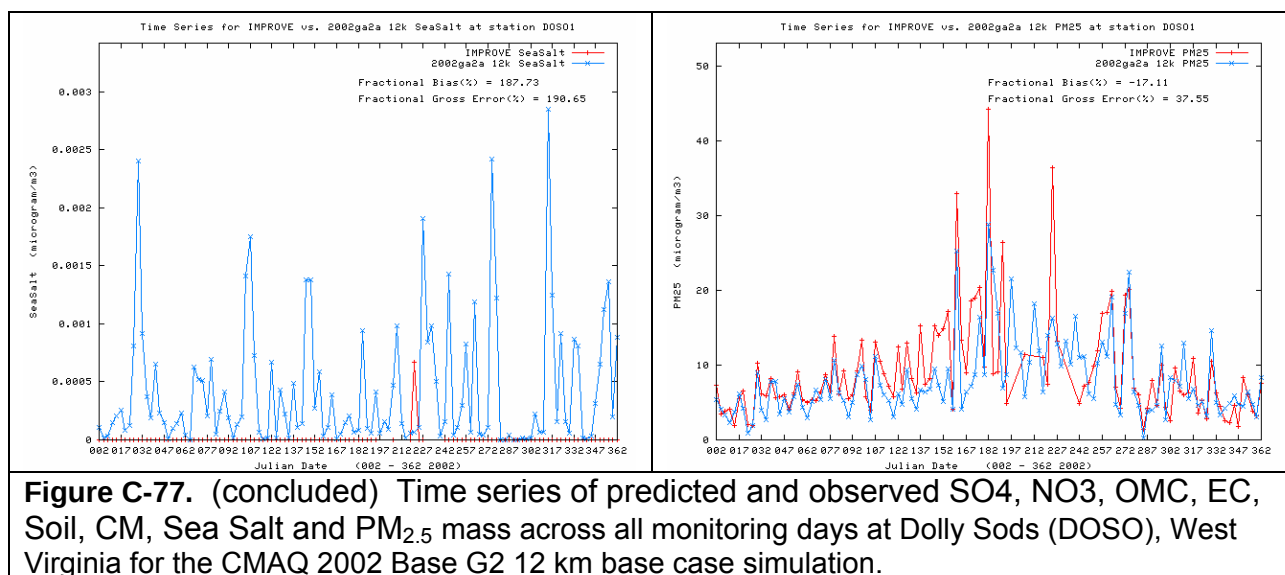
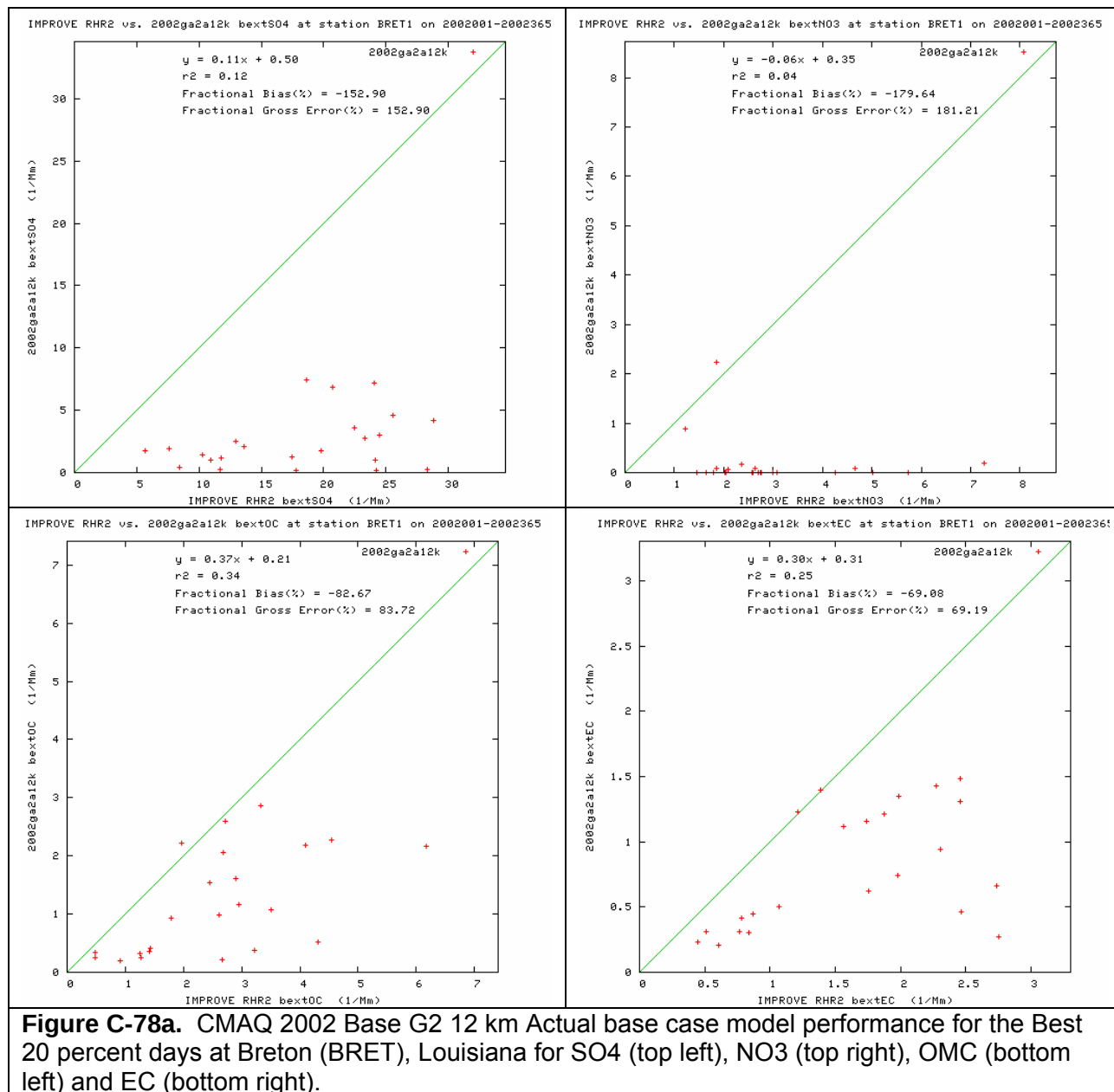


Figure C-77. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Dolly Sods (DOSO), West Virginia for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.16 Breton Island Wildlife Refuge (BRET), Louisiana

2.3.16.1 BRET Best 20 Percent Days



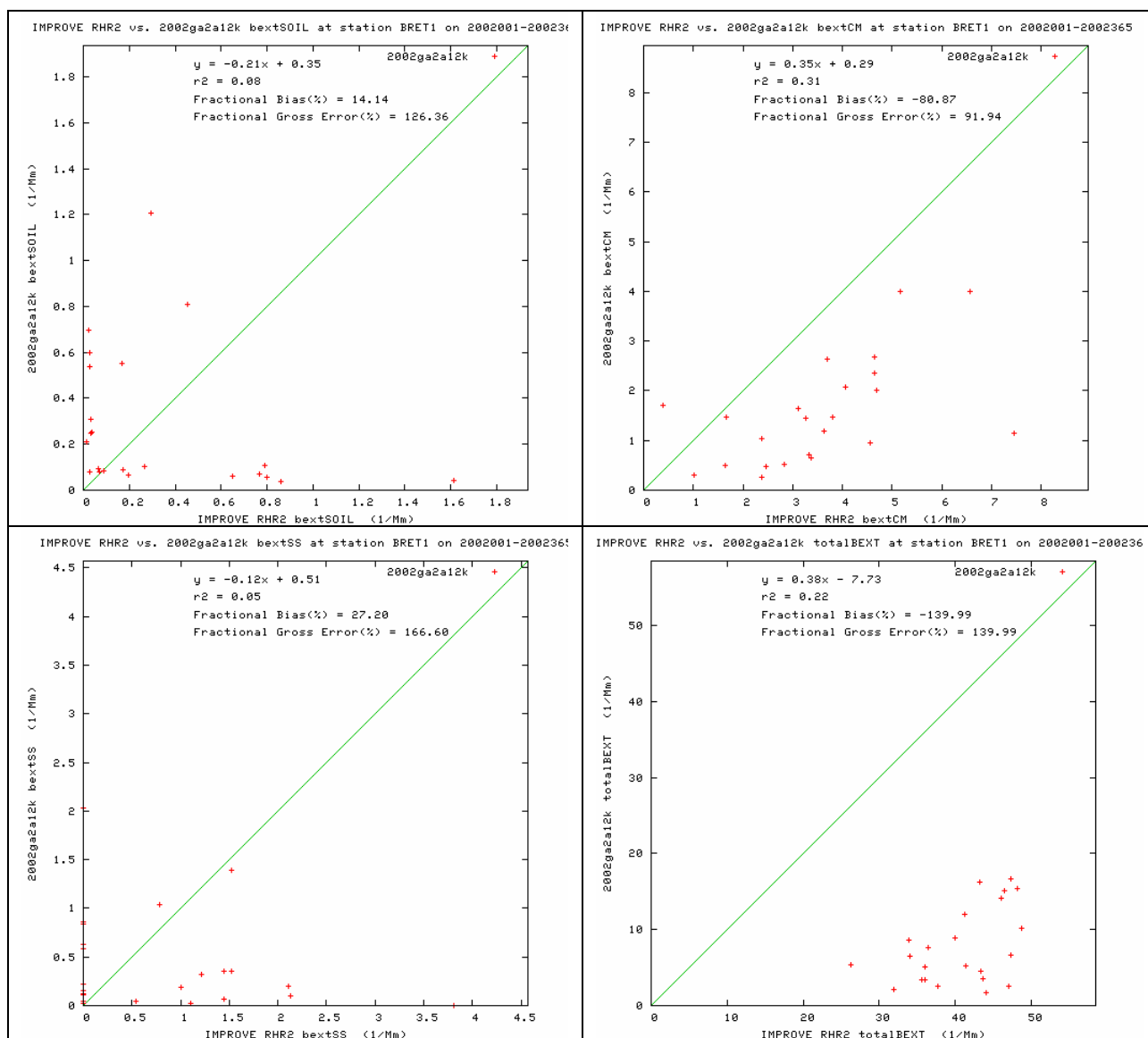


Figure C-78b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Breton (BRET), Louisiana for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; B20

BRET1

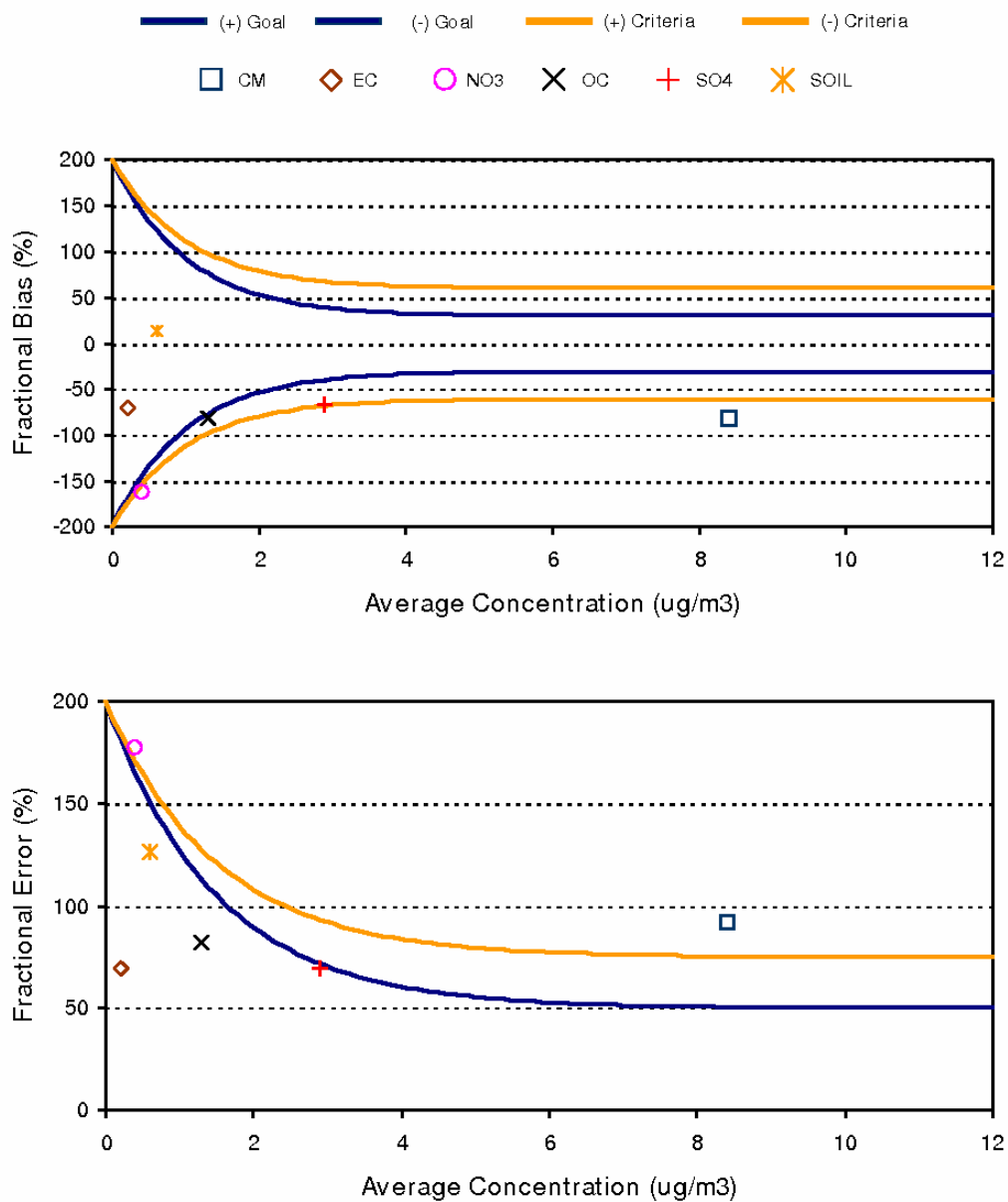


Figure C-79. Bugle Plots of Fractional Bias and Fractional Gross Error for BRET and the Best 20 Percent Days.

2.3.16.2 BRET Worst 20 Percent Days

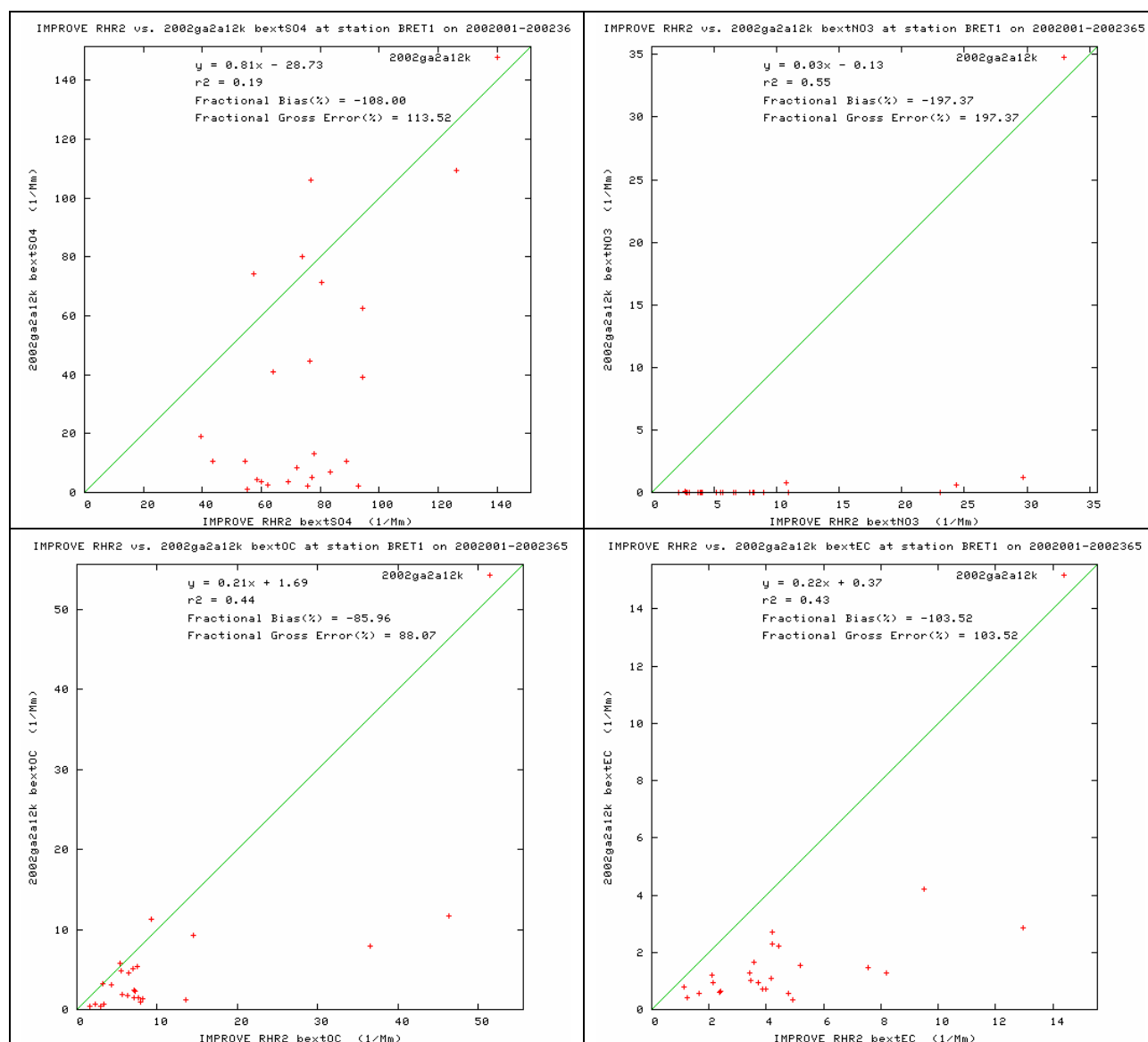


Figure C-80a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Breton (BRET), Louisiana for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).

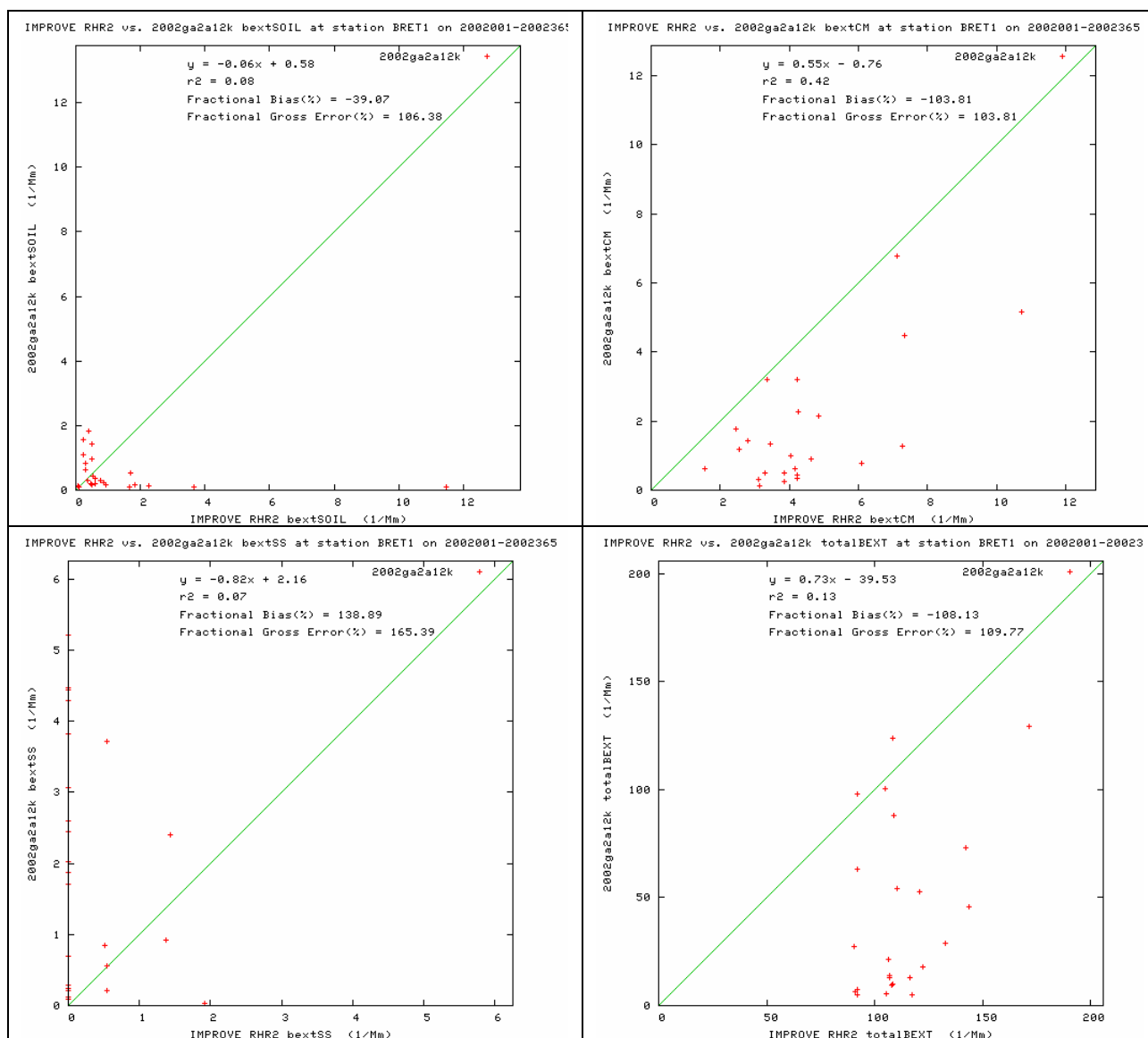


Figure C-80b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Breton (BRET), Louisiana for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; W20

BRET1

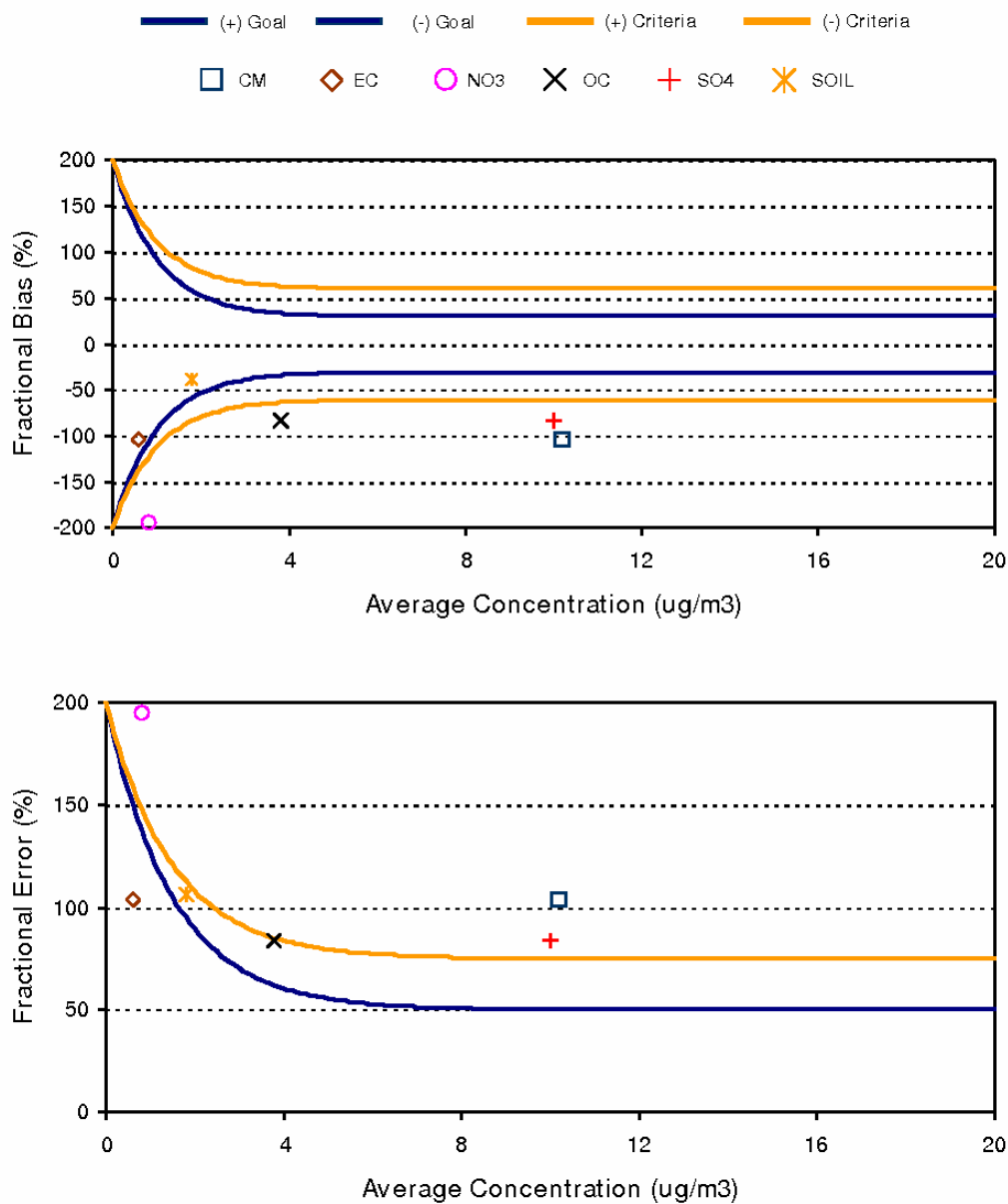
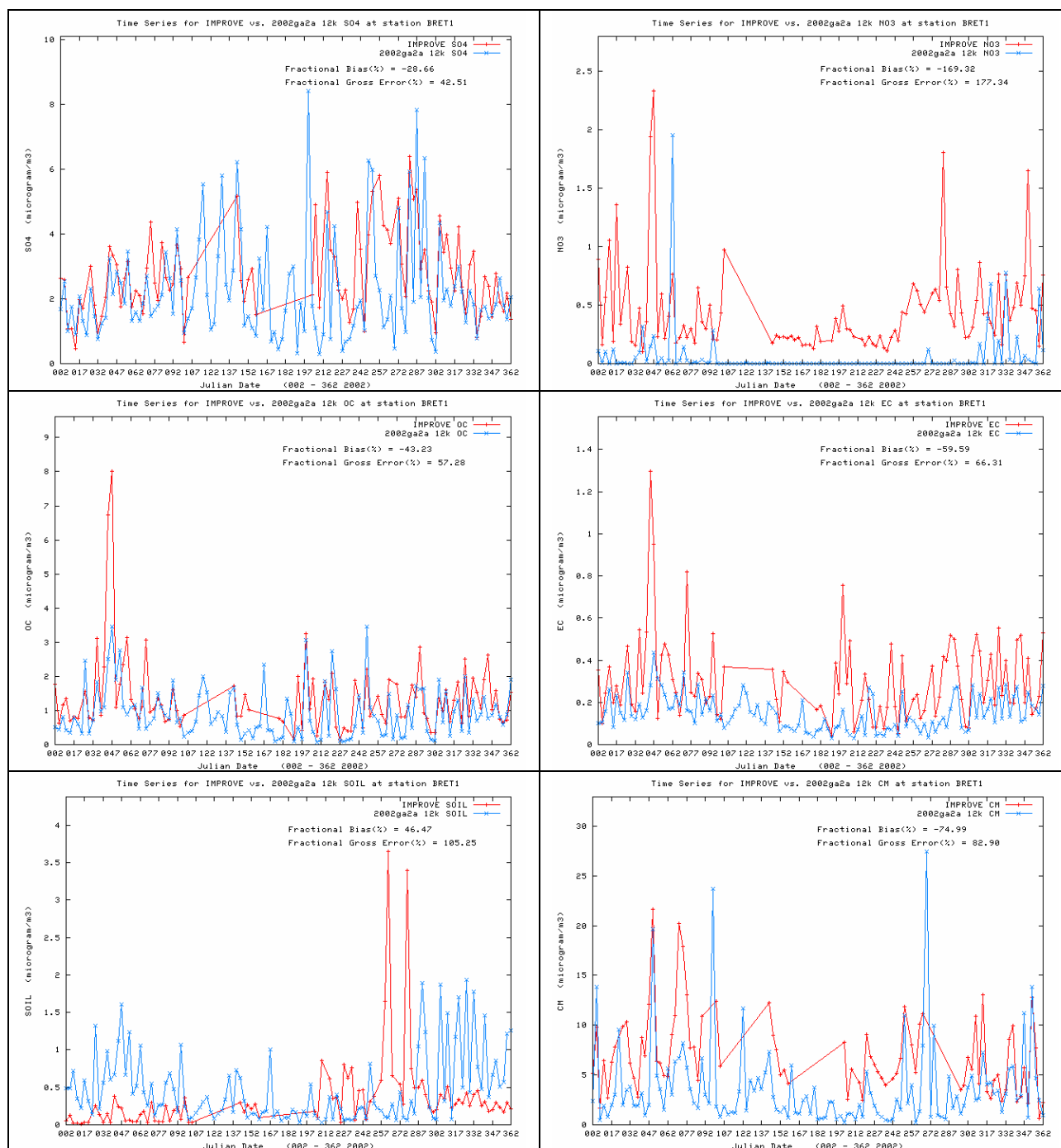
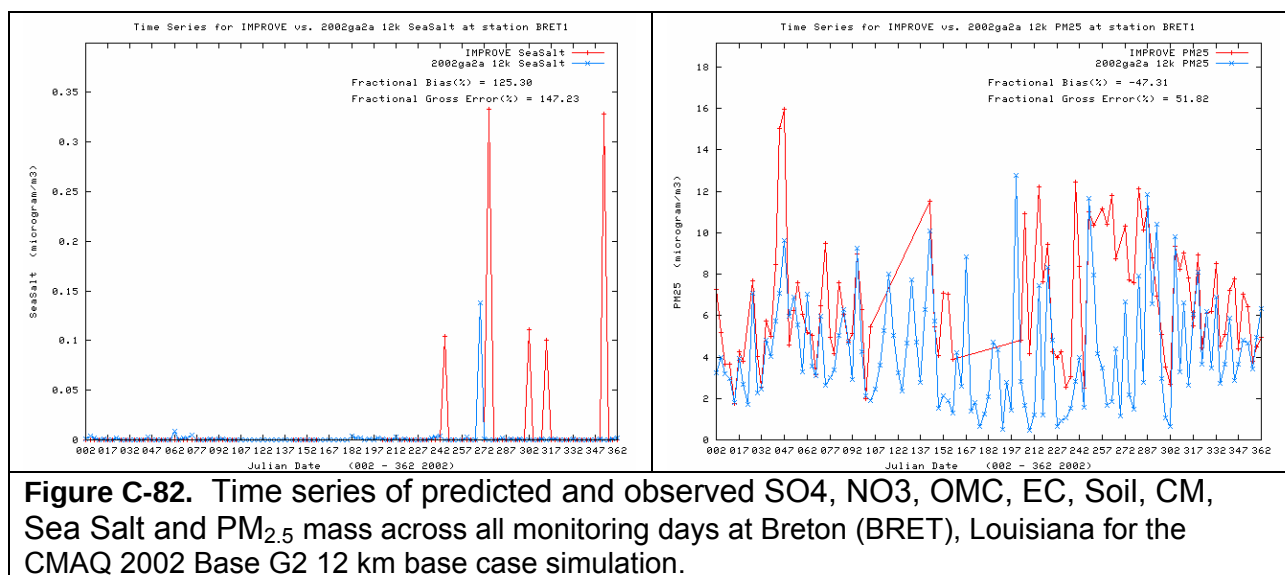


Figure C-81. Bugle Plots of Fractional Bias and Fractional Gross Error for BRET and the Worst 20 Percent Days.

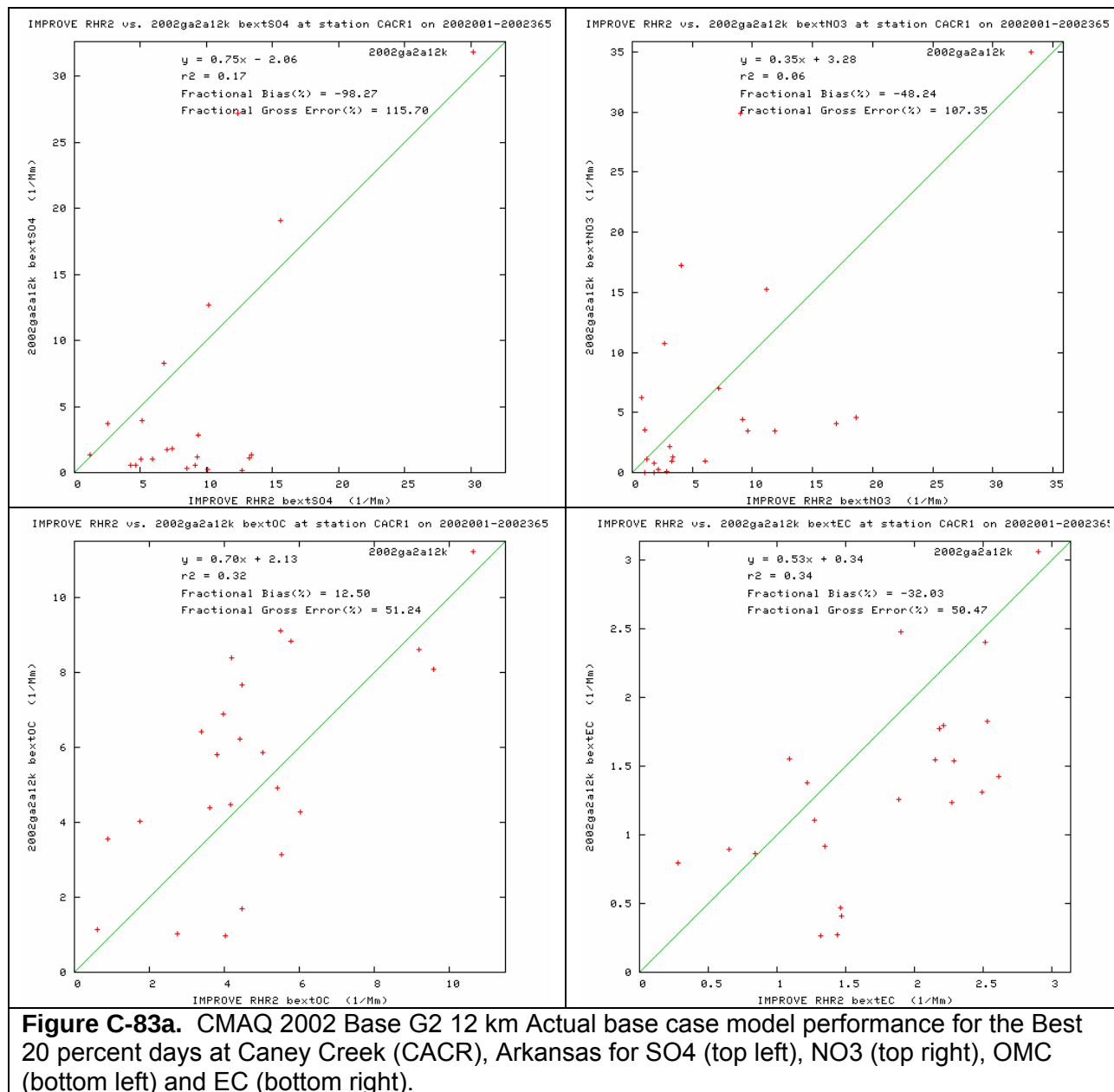
2.3.16.3 BRET for All Days





2.3.17 Caney Creek Wilderness Area (CACR), Arkansas

2.3.17.1 CACR Best 20 Percent Days



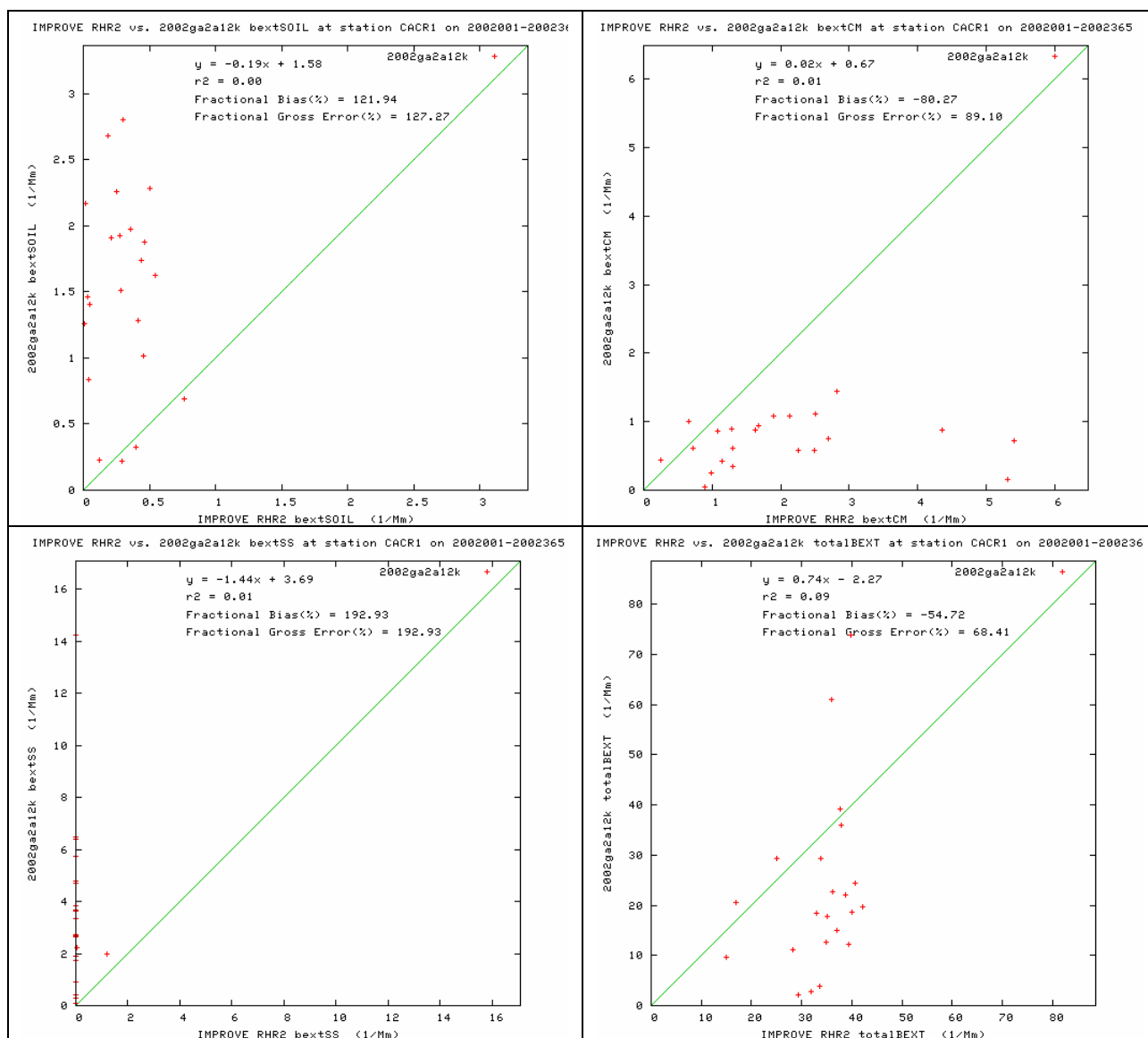


Figure C-83b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Caney Creek (CACR), Arkansas for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; B20

CACR1

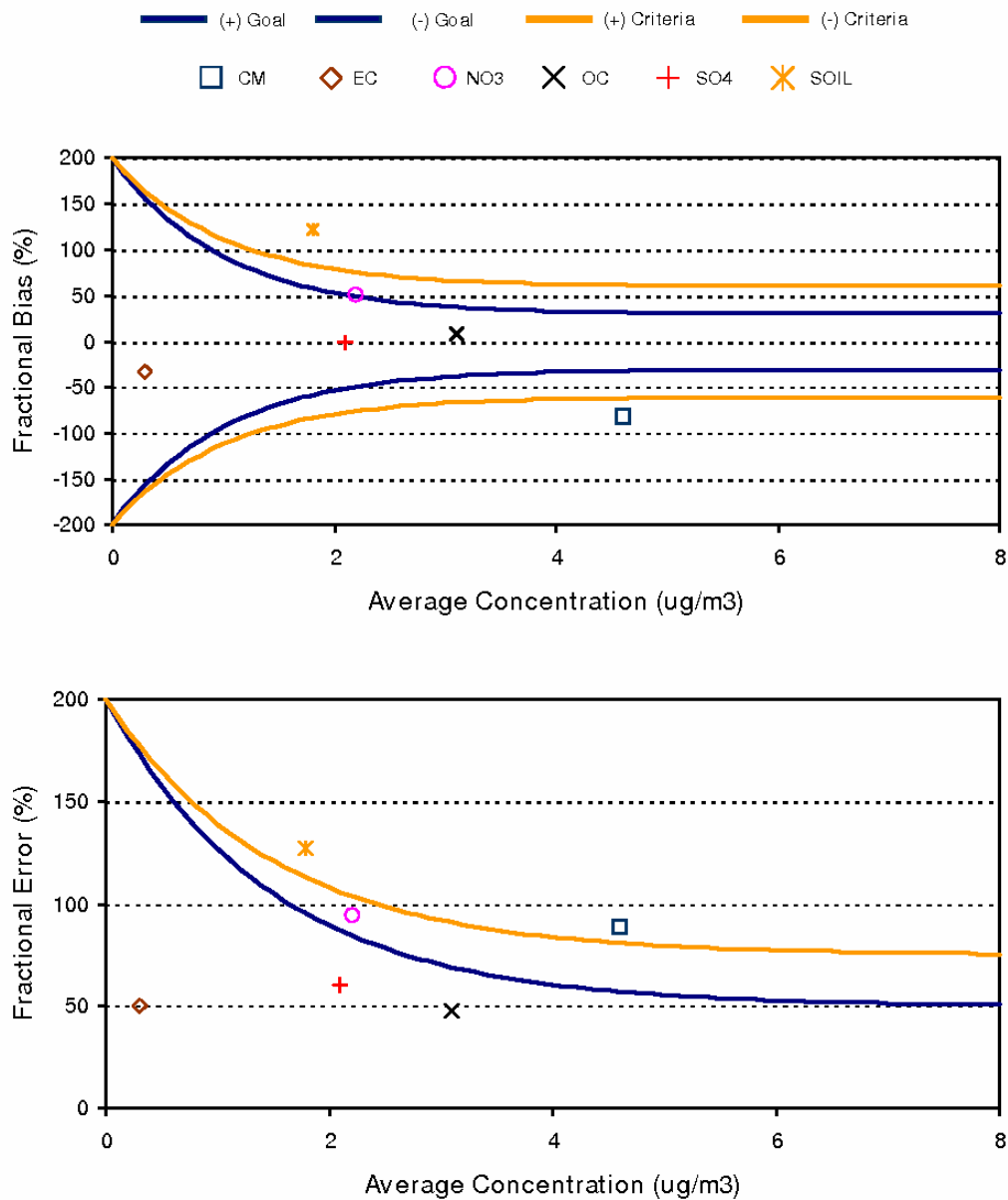


Figure C-84. Bugle Plots of Fractional Bias and Fractional Gross Error for CACR and the Best 20 Percent Days.

2.3.17.2 CACR Worst 20 Percent Days

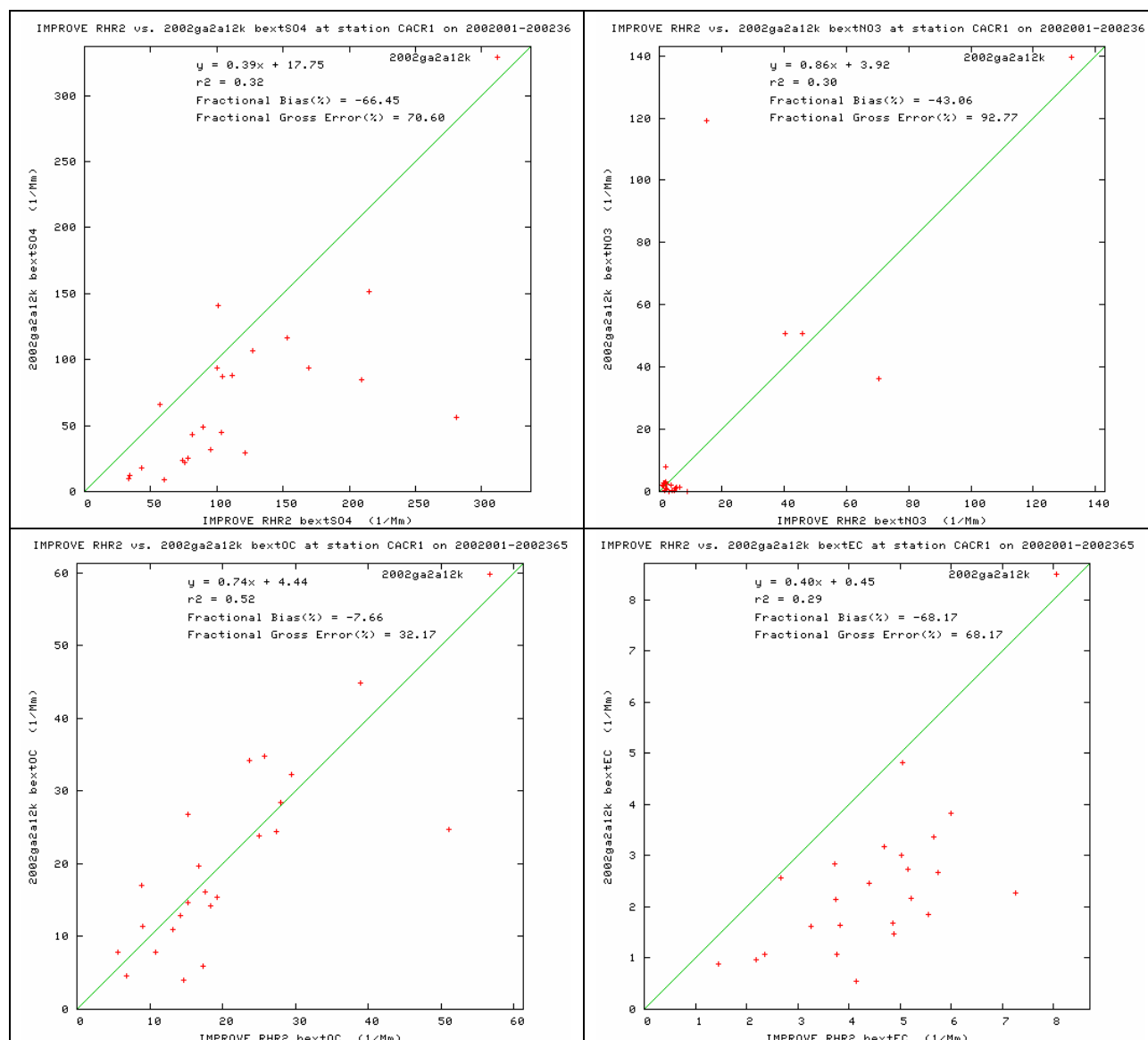


Figure C-85a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Caney Creek (CACR), Arkansas for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).

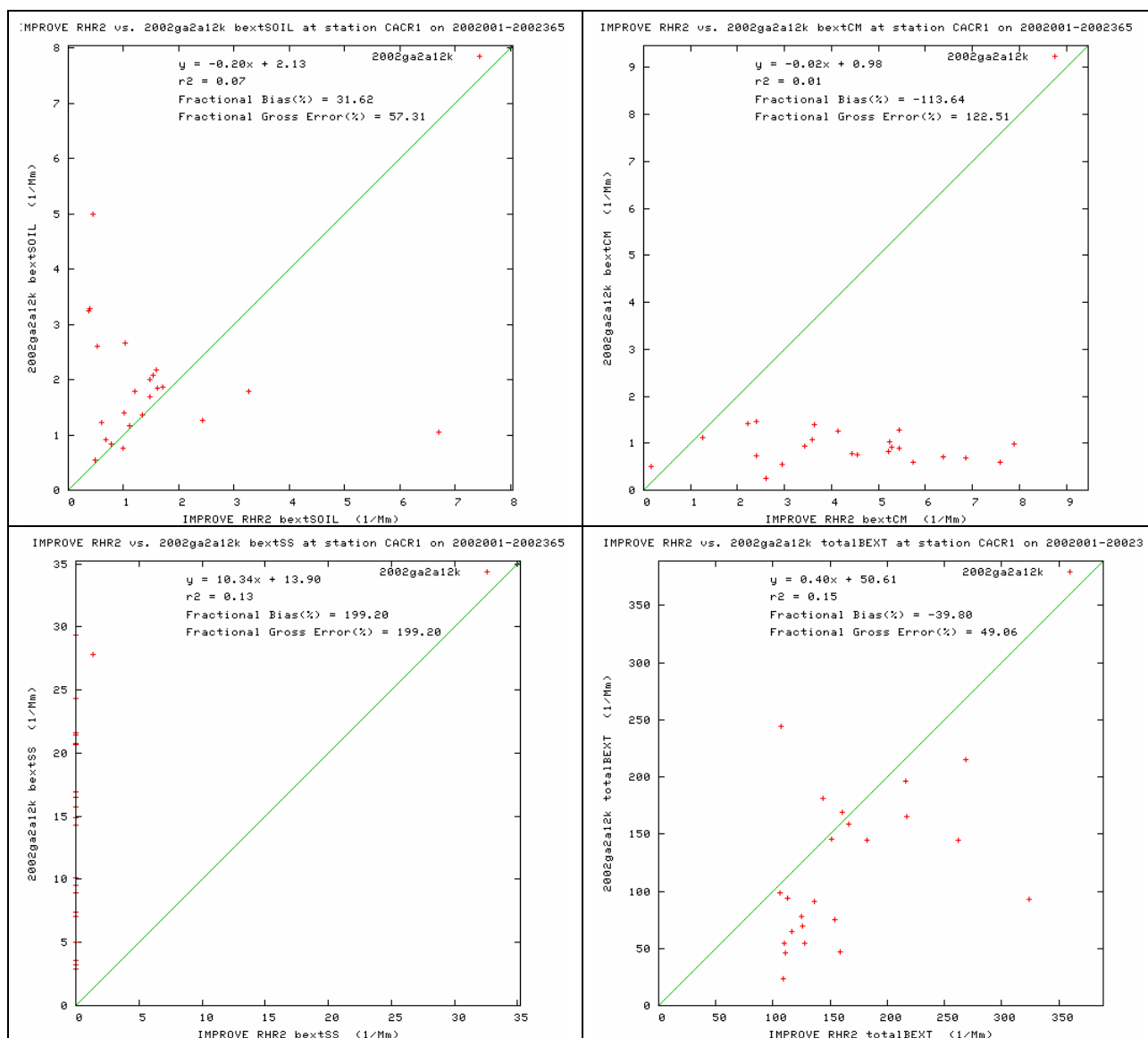


Figure C-85b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Caney Creek (CACR), Arkansas for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; W20

CACR1

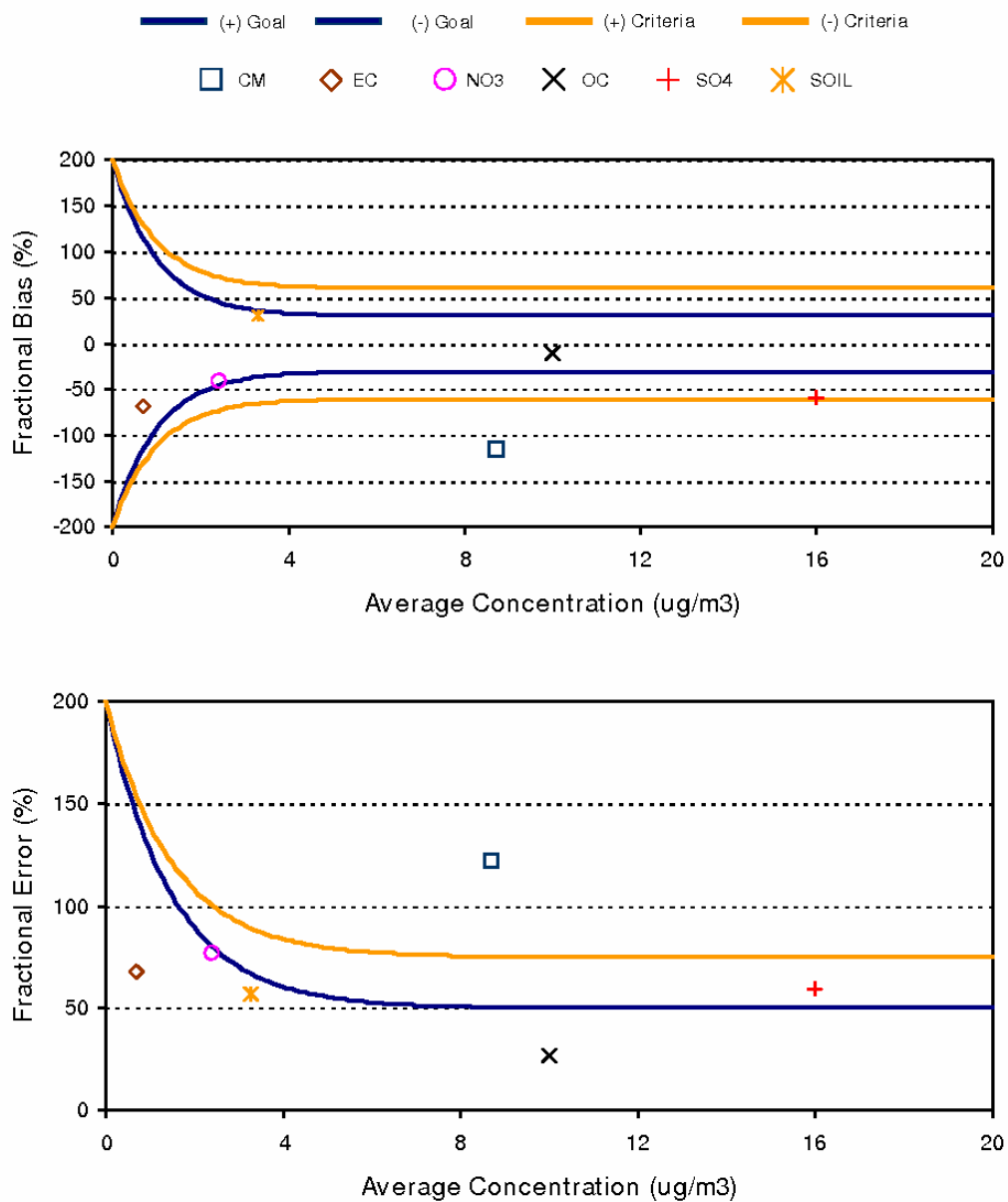
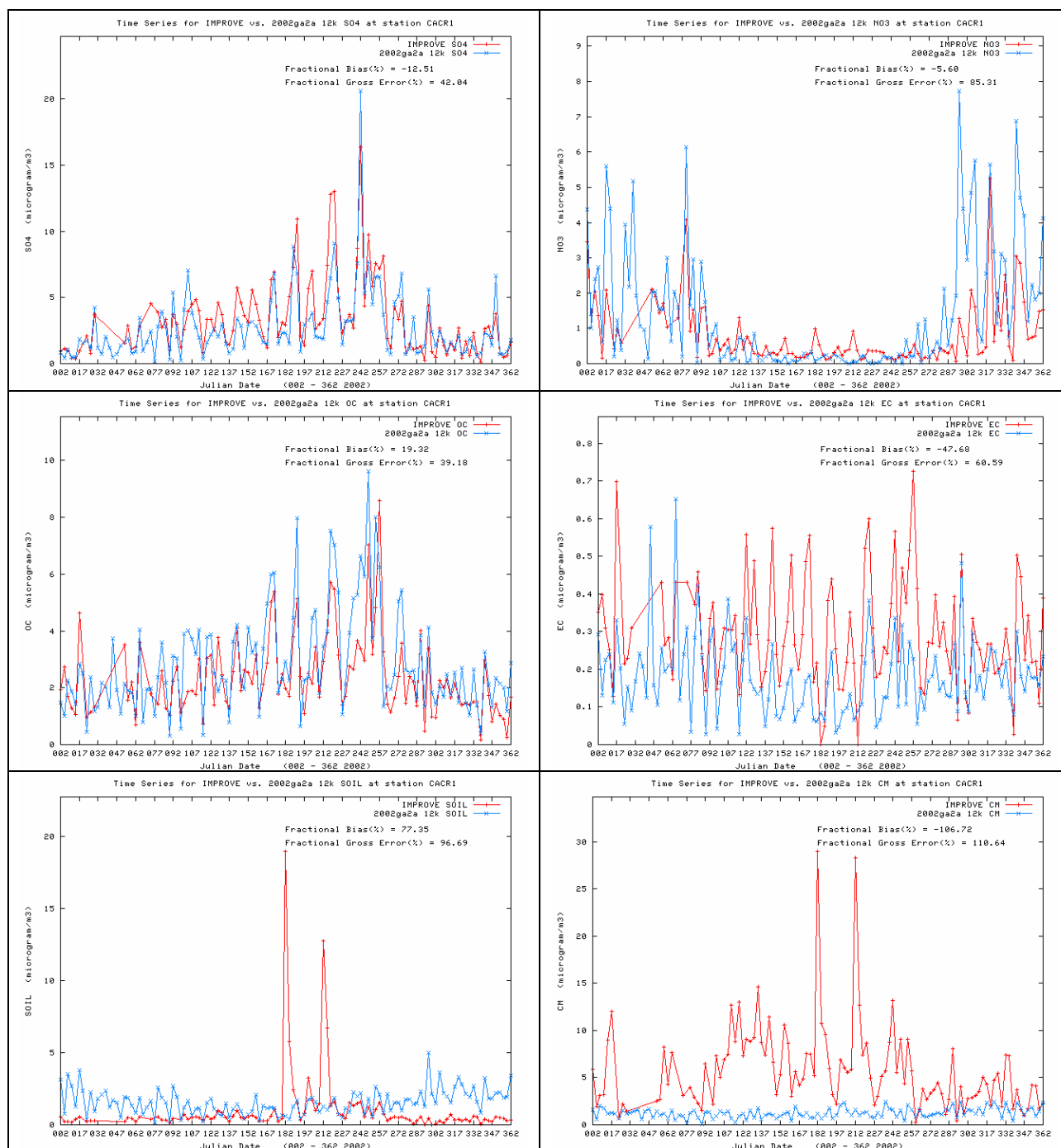
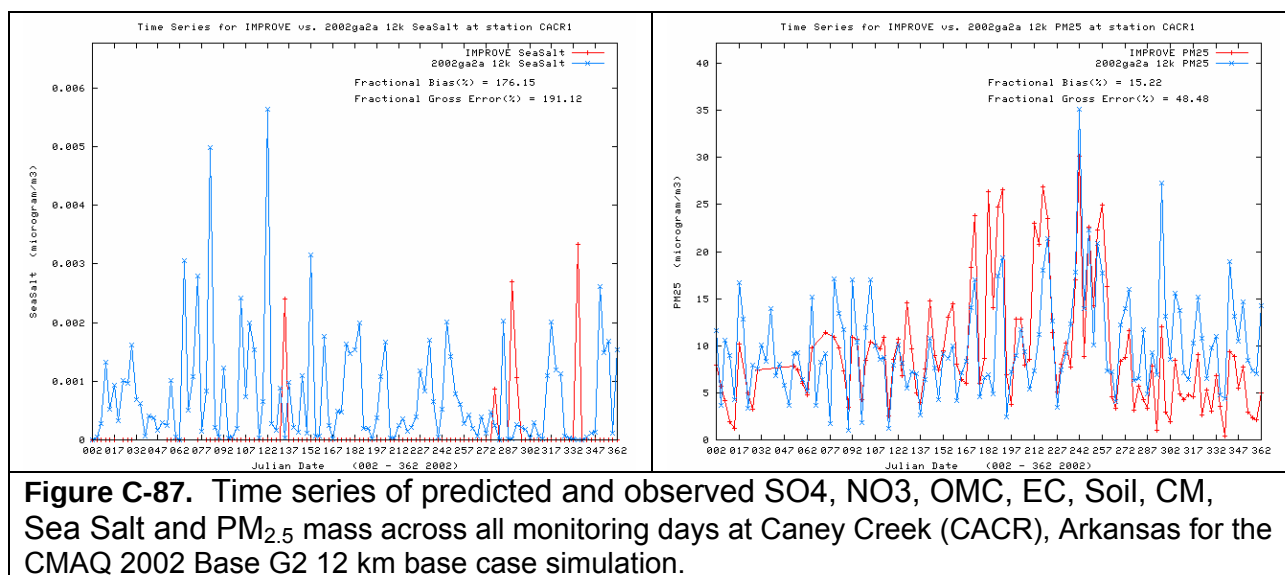


Figure C-86. Bugle Plots of Fractional Bias and Fractional Gross Error for CACR and the Worst 20 Percent Days.

2.3.17.3 CACR for All Days





2.3.18 Upper Buffalo Wilderness Area (UPBU), Arkansas

2.3.18.1 UPBU Best 20 Percent Days

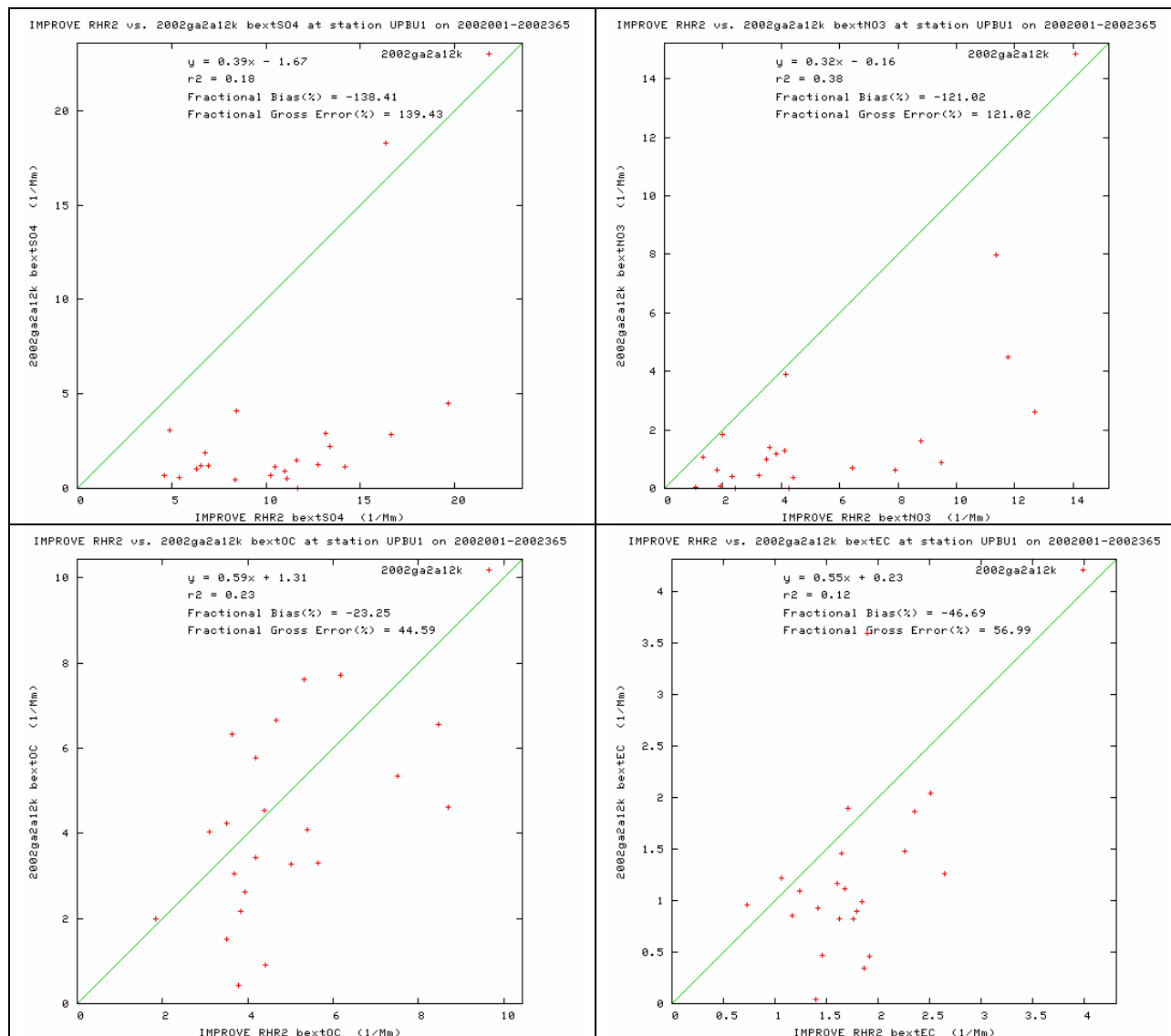
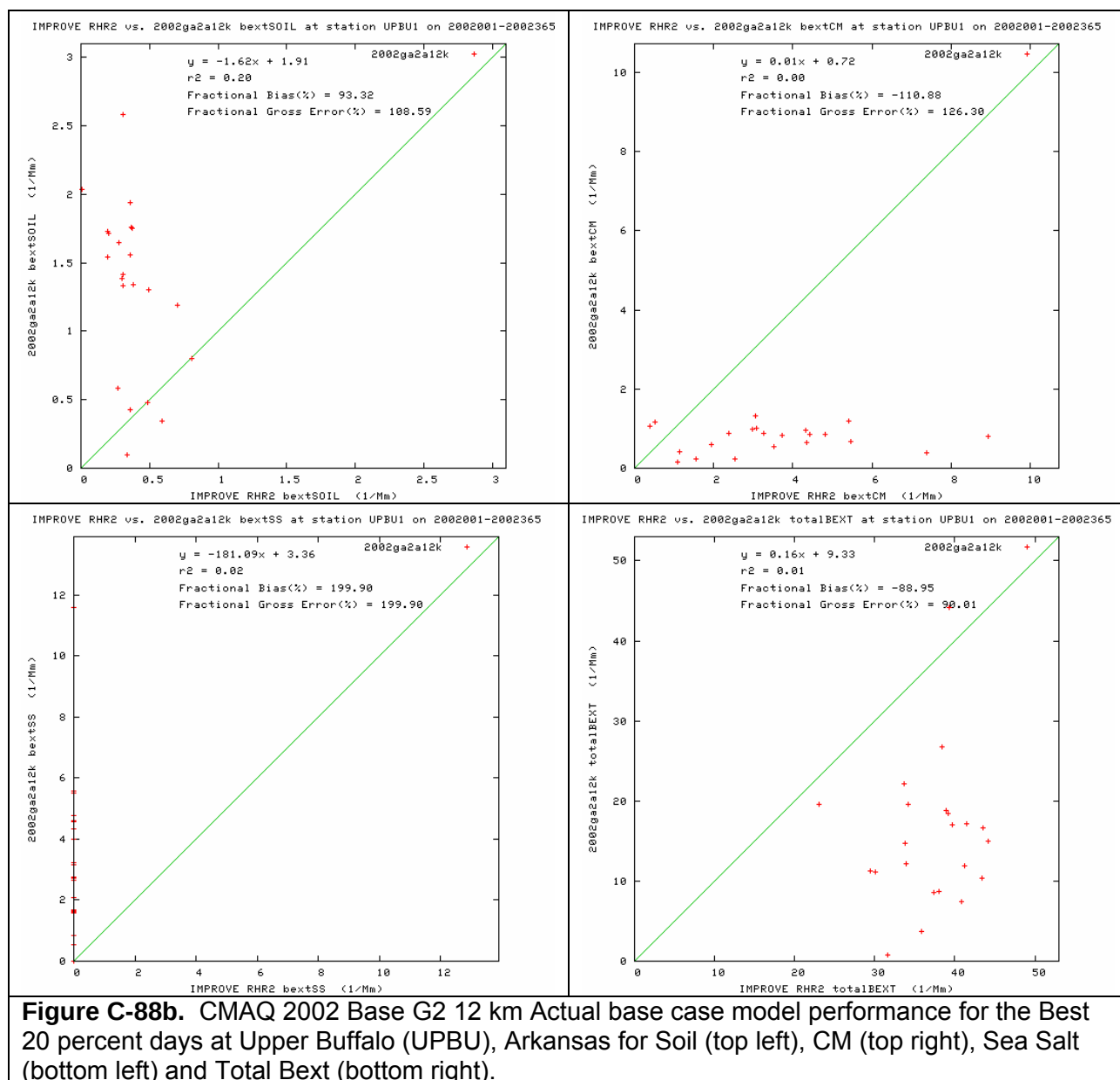


Figure C-88a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Upper Buffalo (UPBU), Arkansas for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

UPBU1

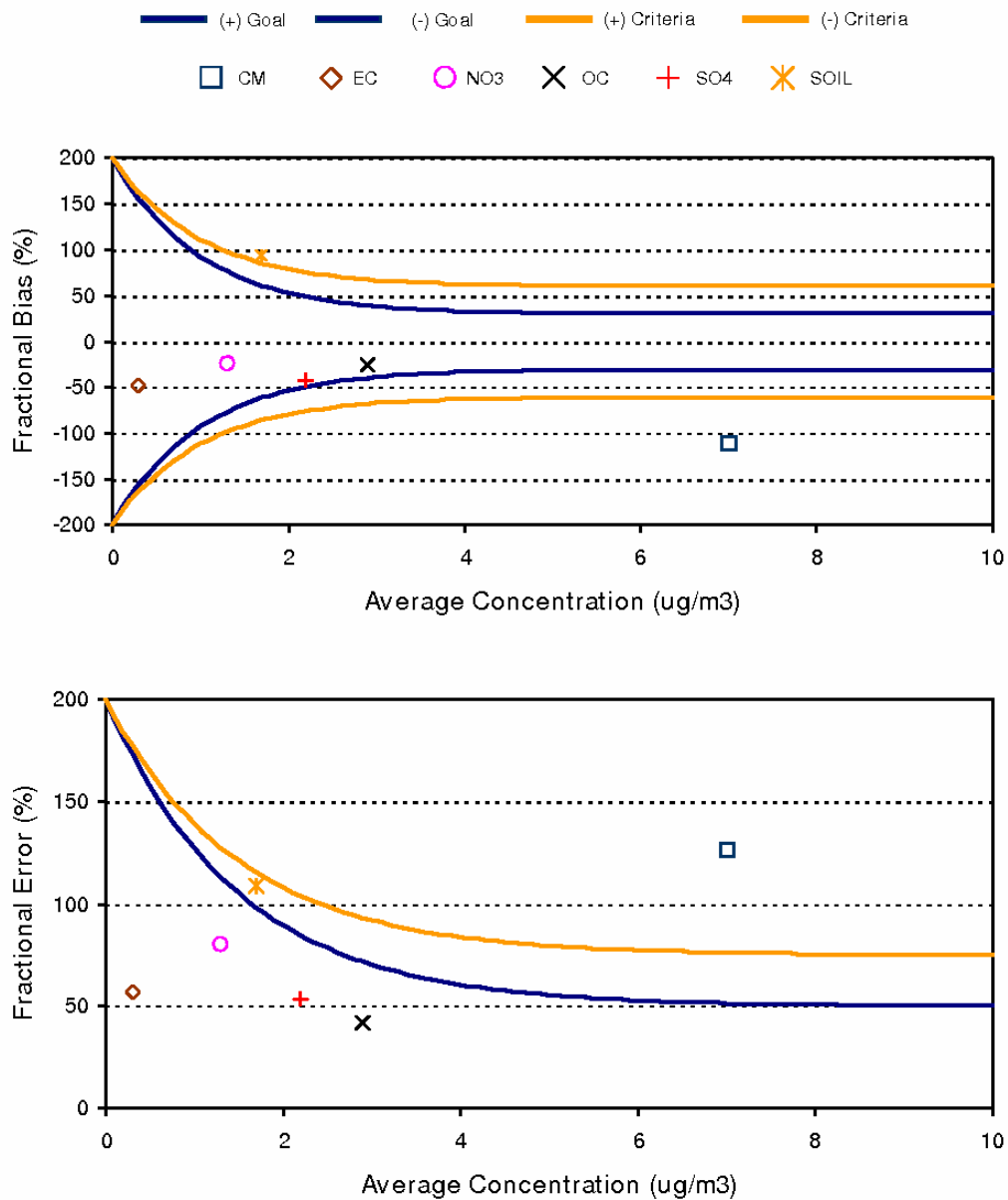


Figure C-89. Bugle Plots of Fractional Bias and Fractional Gross Error for UPBU and the Best 20 Percent Days.

2.3.18.2 UPBU Worst 20 Percent Days

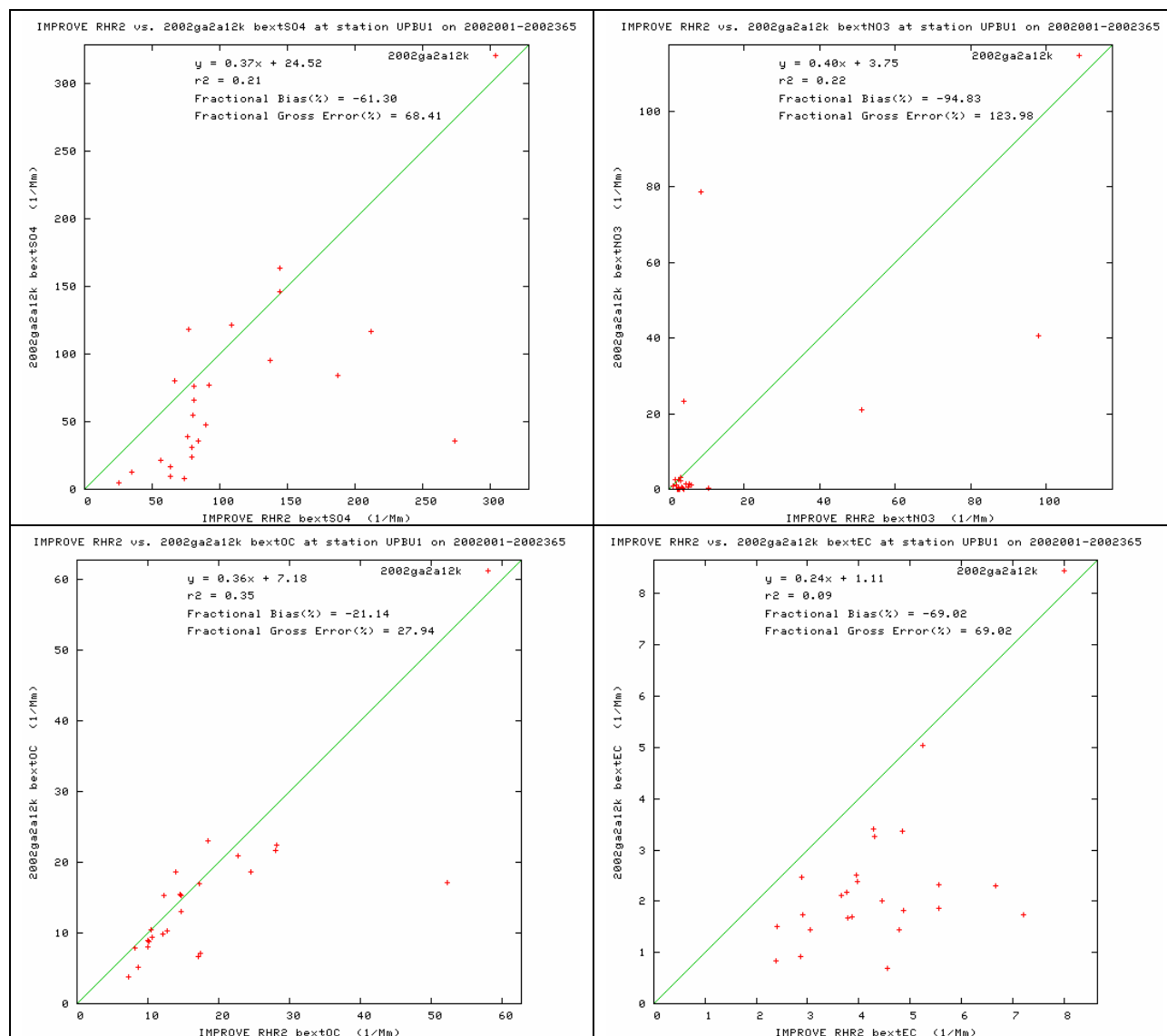
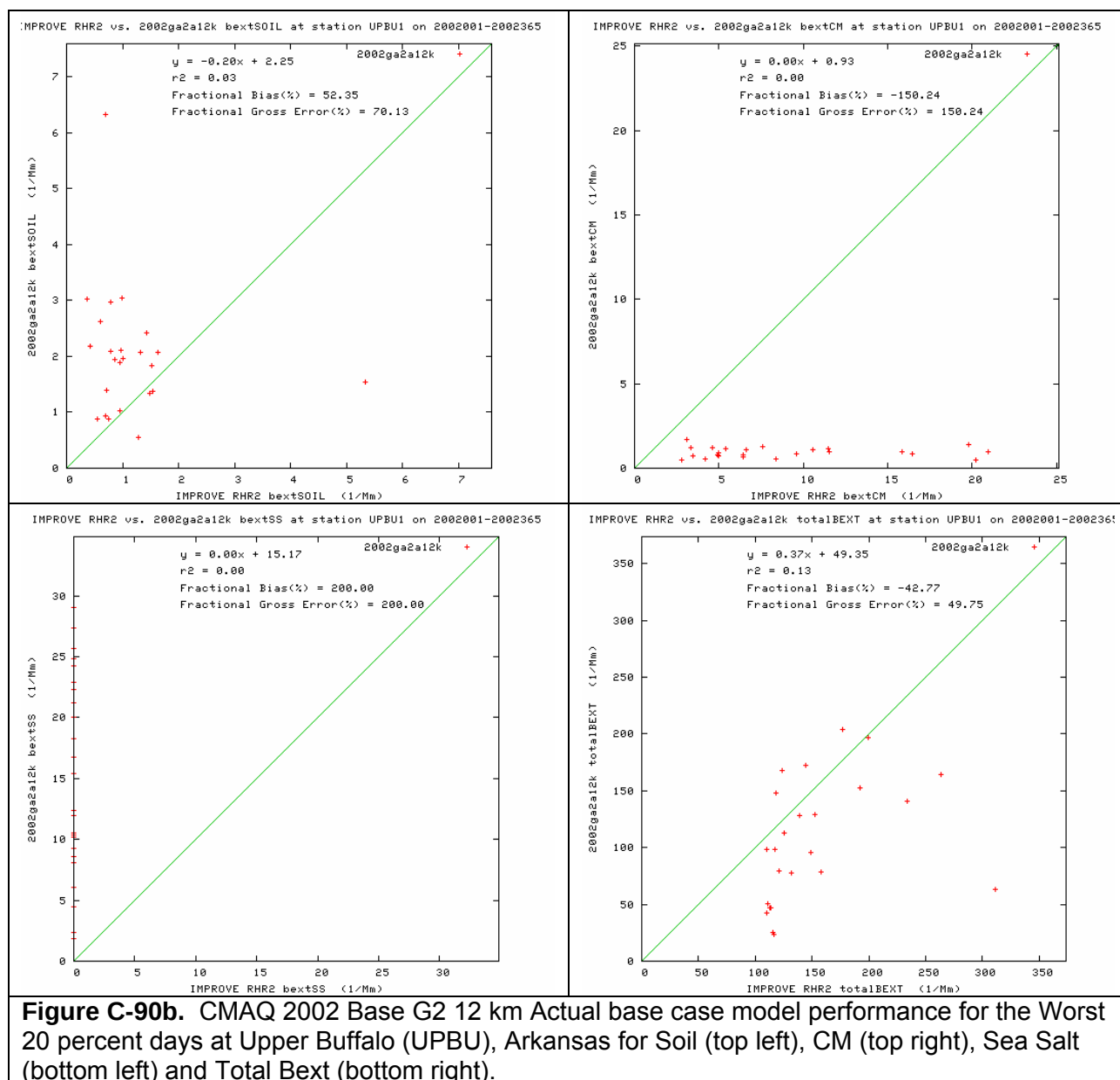


Figure C-90a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Upper Buffalo (UPBU), Arkansas for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

UPBU1

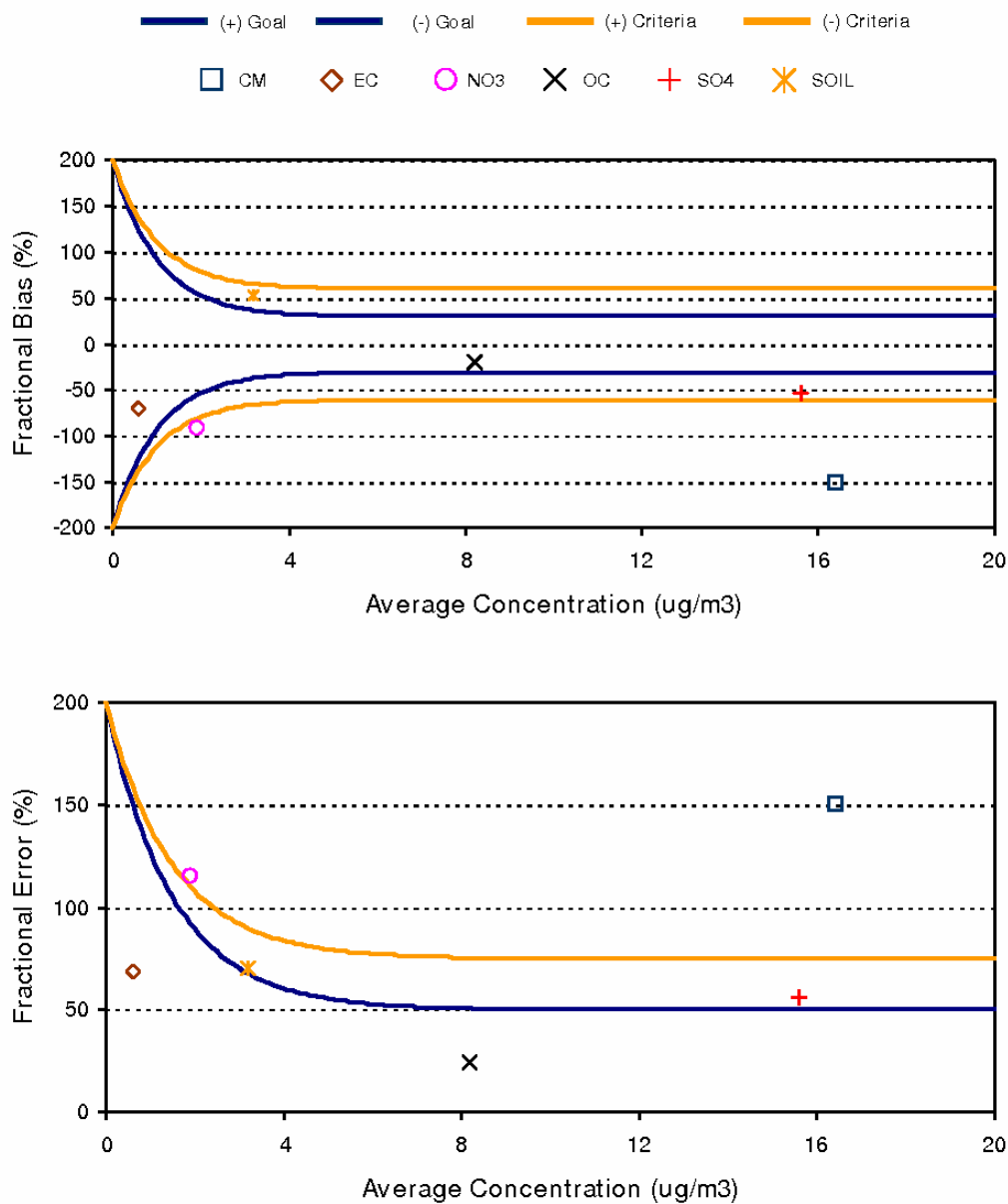


Figure C-91. Bugle Plots of Fractional Bias and Fractional Gross Error for UPBU and the Worst 20 Percent Days.

2.3.18.3 UPBU for All Days

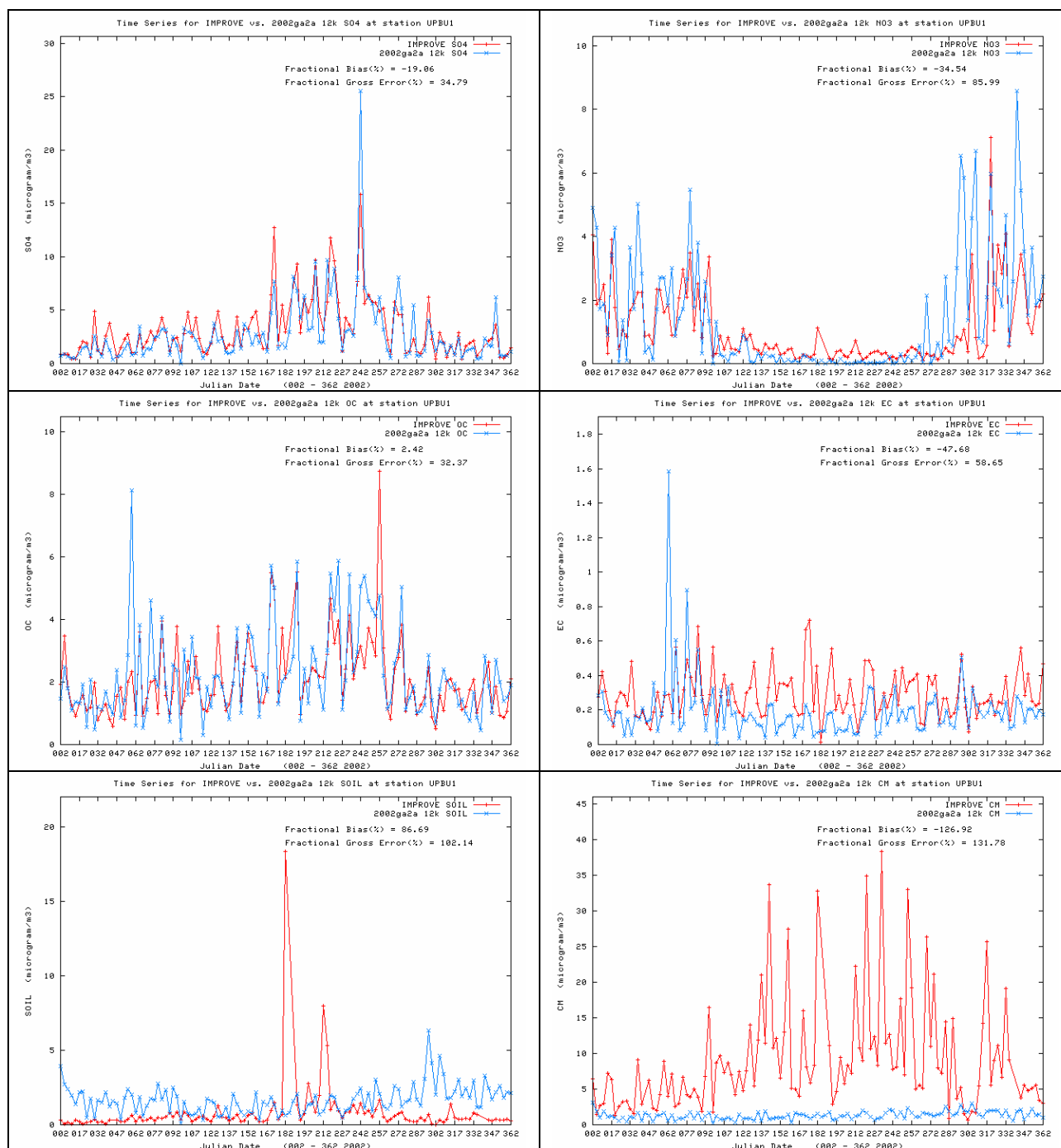
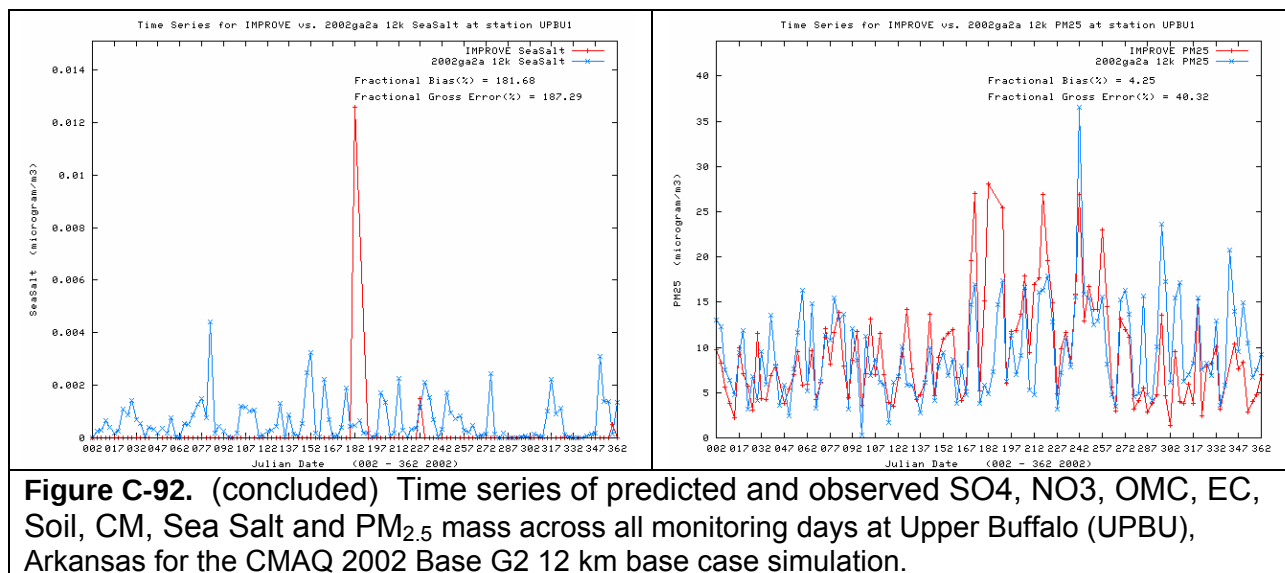


Figure C-92. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Upper Buffalo (UPBU), Arkansas for the CMAQ 2002 Base G2 12 km base case simulation.

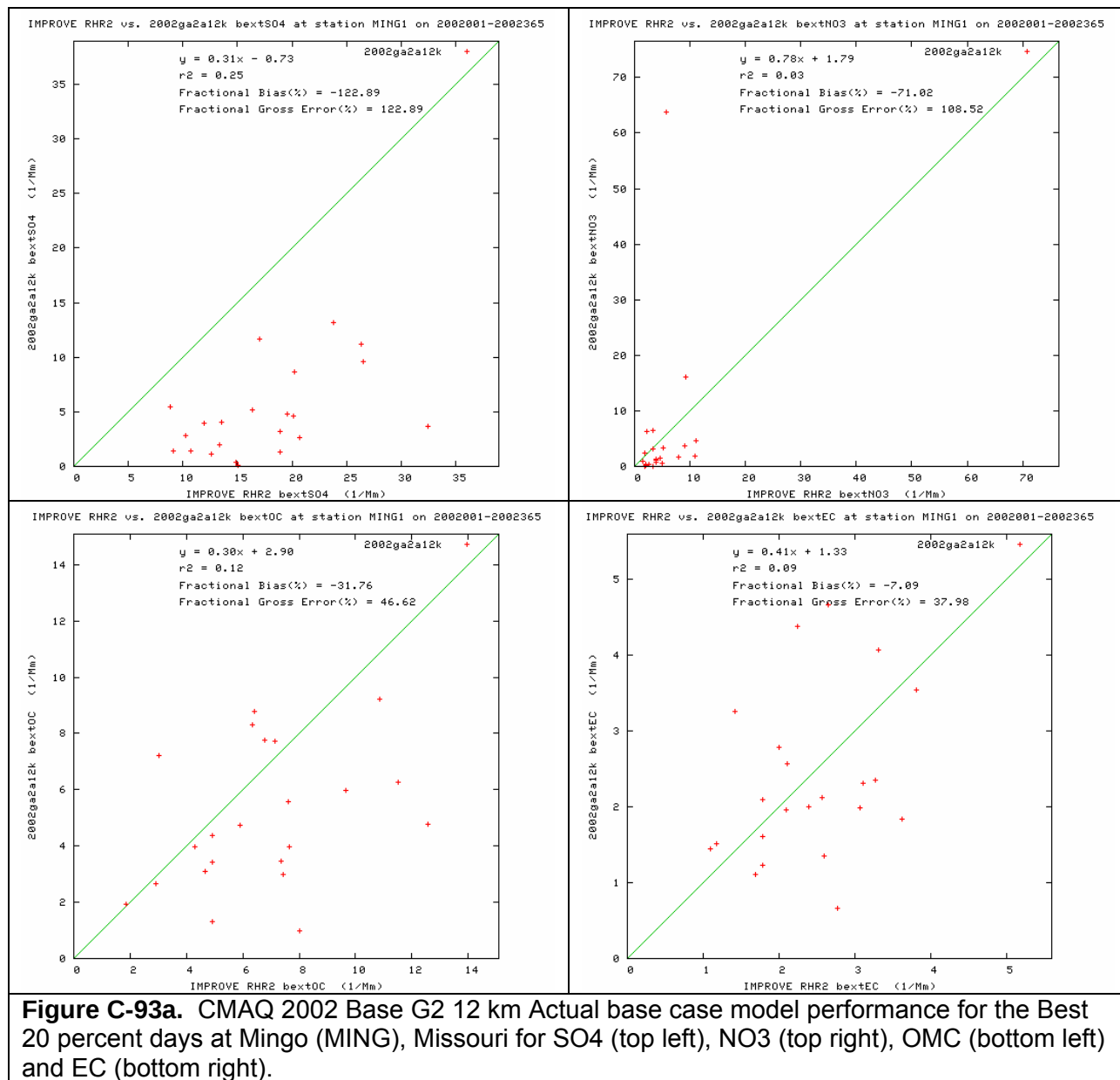


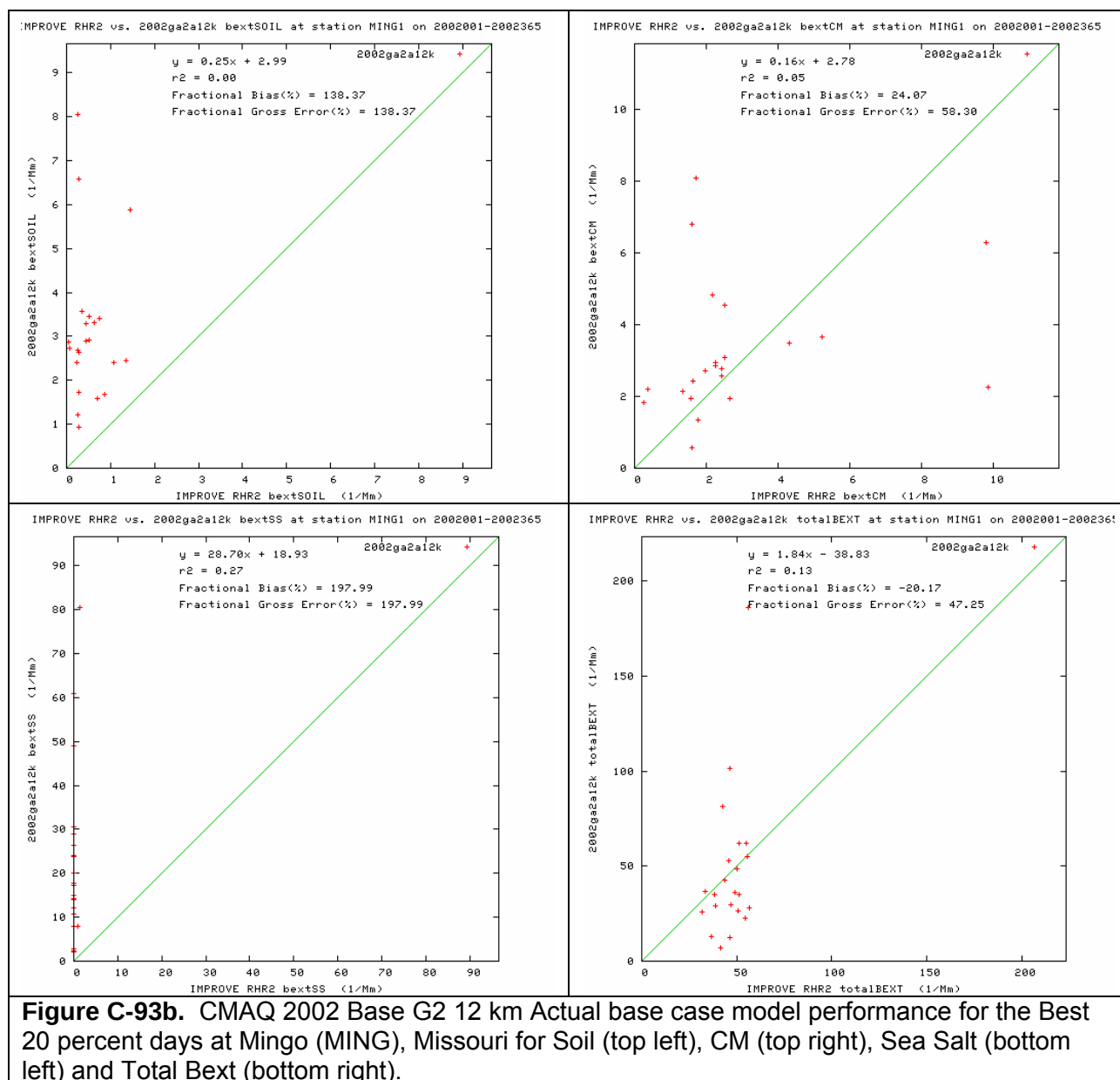
2.3.19 Mingo Wildlife Refuge (MING), Missouri

Figure C-96...

Figure C-96...

MING Best 20 Percent Days





VISTAS CMAQ 2002 Actual Base G2 12k; B20

MING1

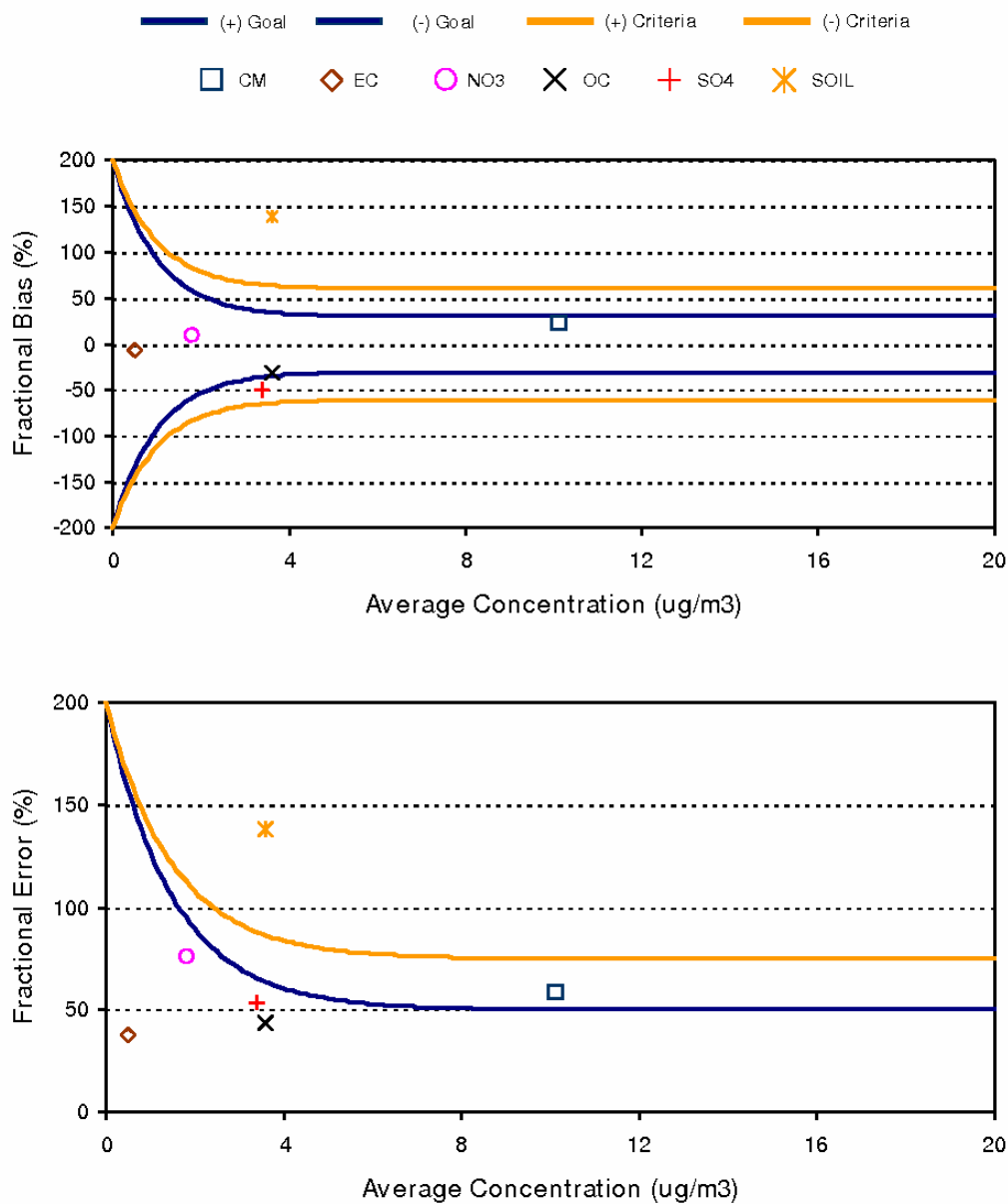


Figure C-94. Bugle Plots of Fractional Bias and Fractional Gross Error for MING and the Best 20 Percent Days.

2.3.19.2 MING Worst 20 Percent Days

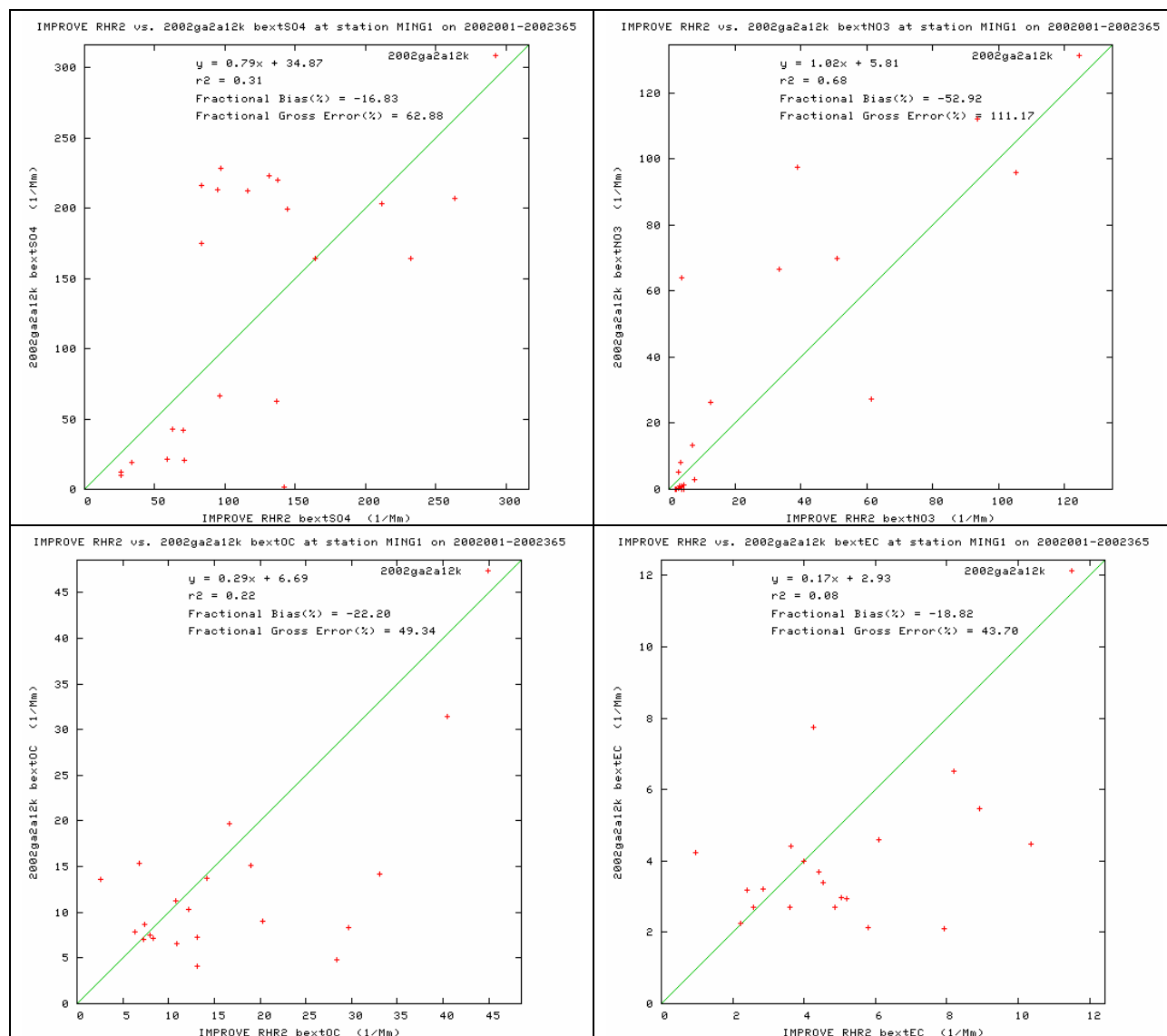
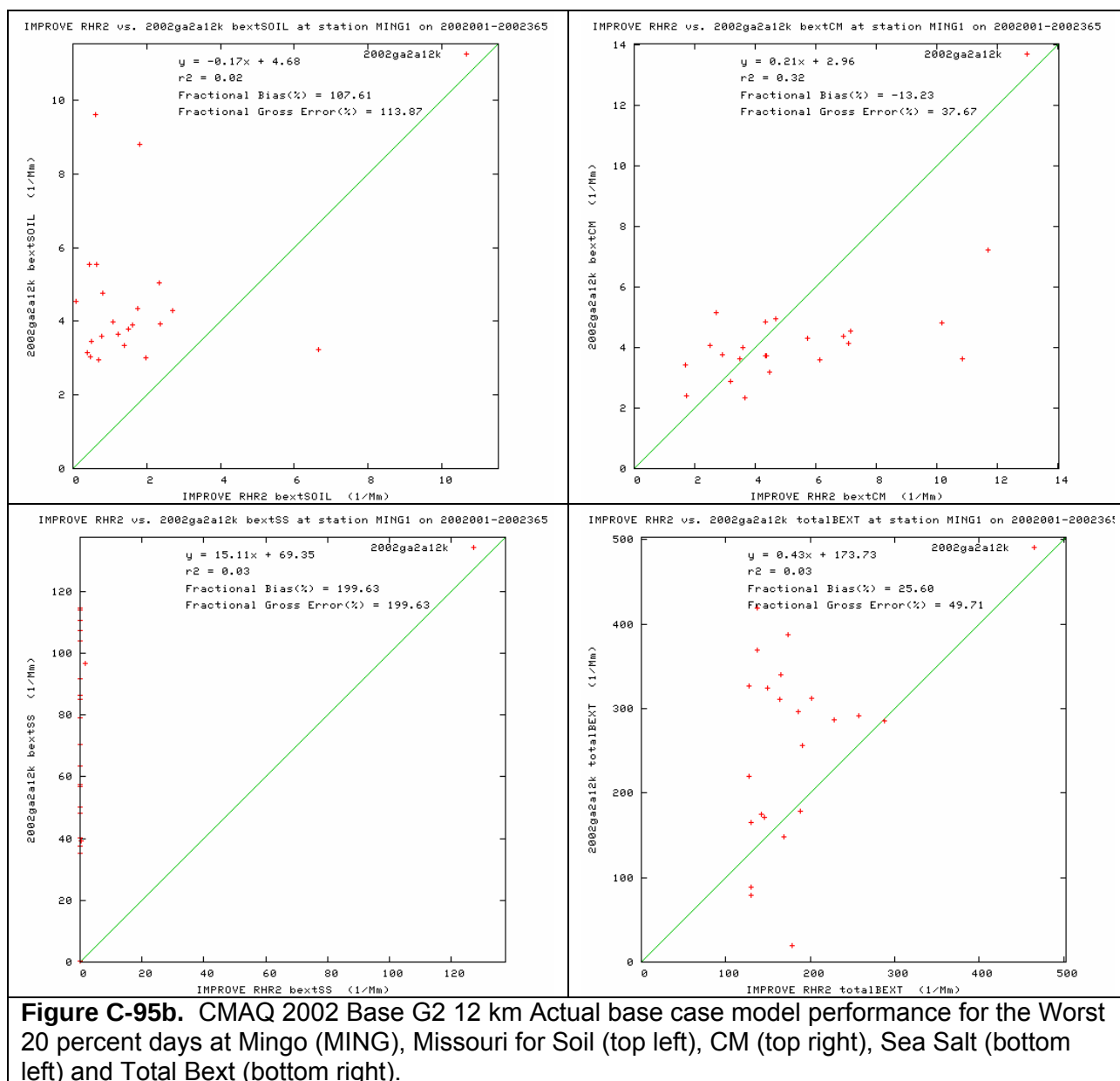


Figure C-95a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Mingo (MING), Missouri for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; W20

MING1

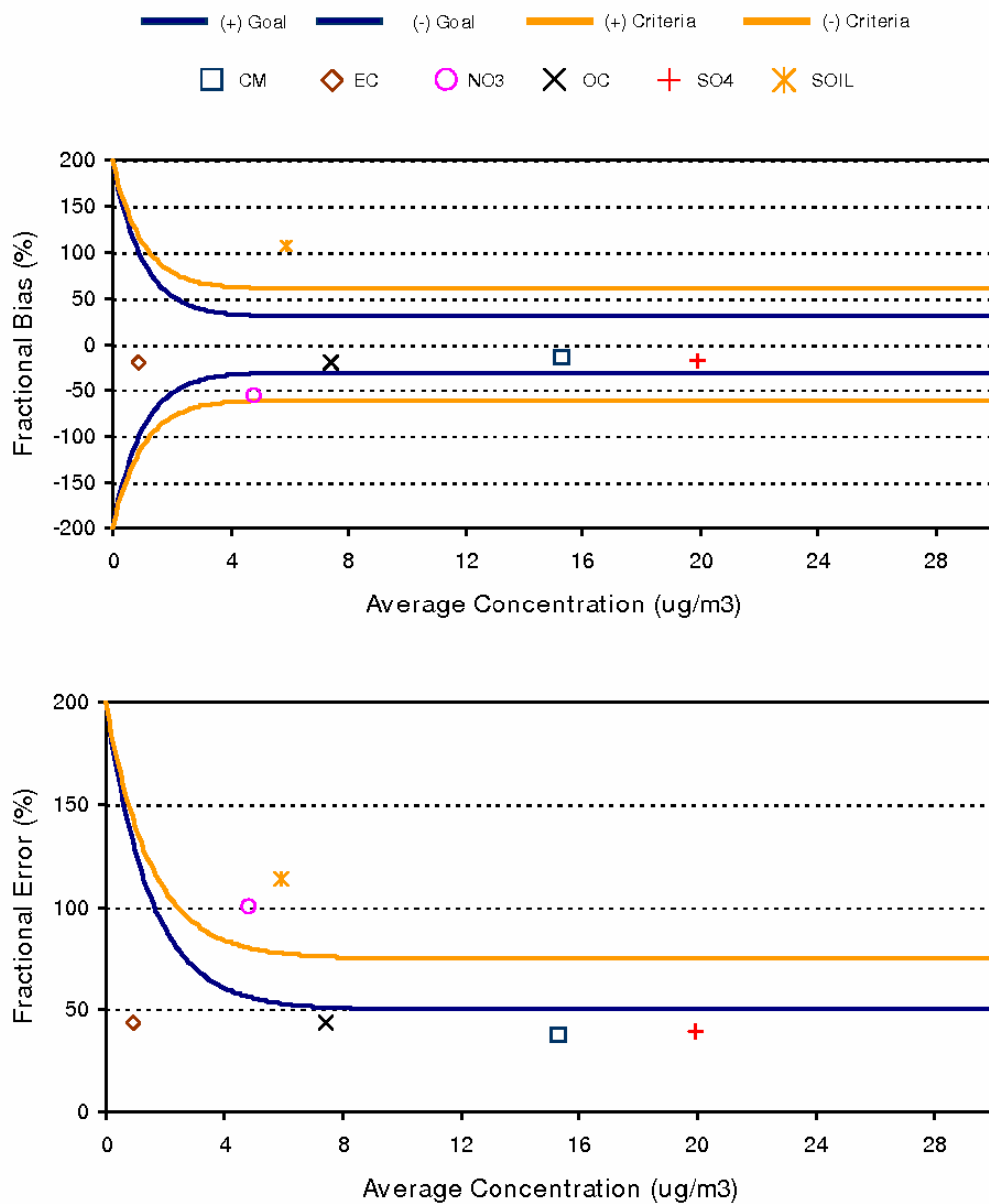


Figure C-96. Bugle Plots of Fractional Bias and Fractional Gross Error for MING and the Worst 20 Percent Days.

2.3.19.3 MING for All Days

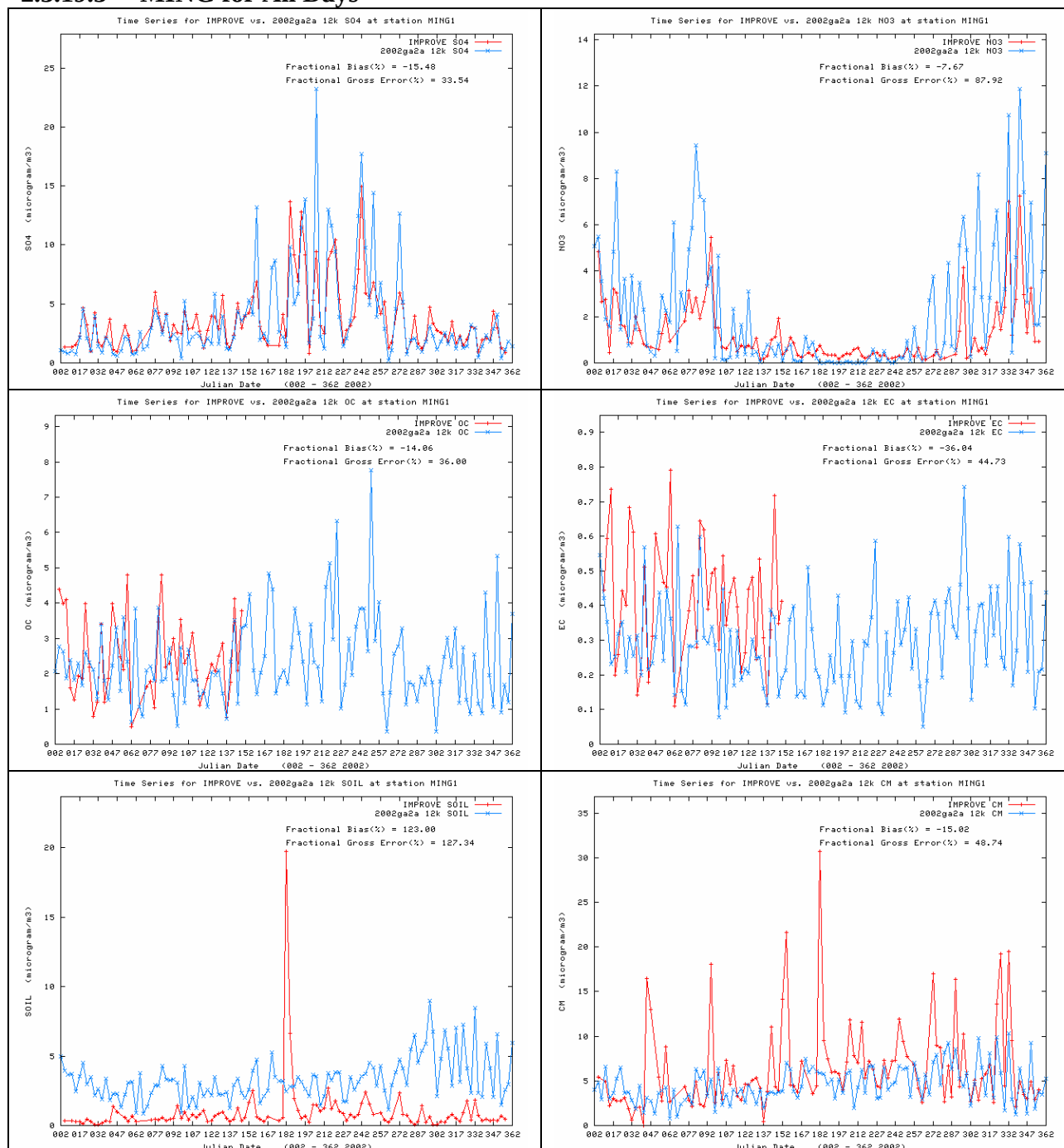


Figure C-97. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Mingo (MING), Missouri for the CMAQ 2002 Base G2 12 km base case simulation.

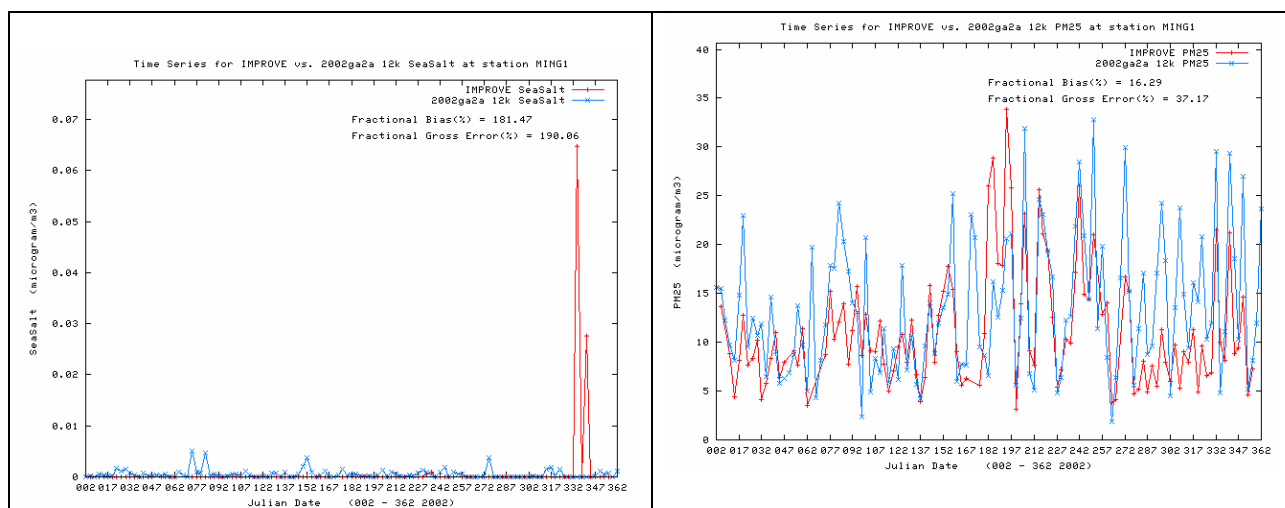


Figure C-97. (concluded) Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Mingo (MING), Missouri for the CMAQ 2002 Base G2 12 km base case simulation.

2.3.20 Hercules Glade Wilderness Area (HEGL), Missouri

2.3.20.1 HEGL Best 20 Percent Days

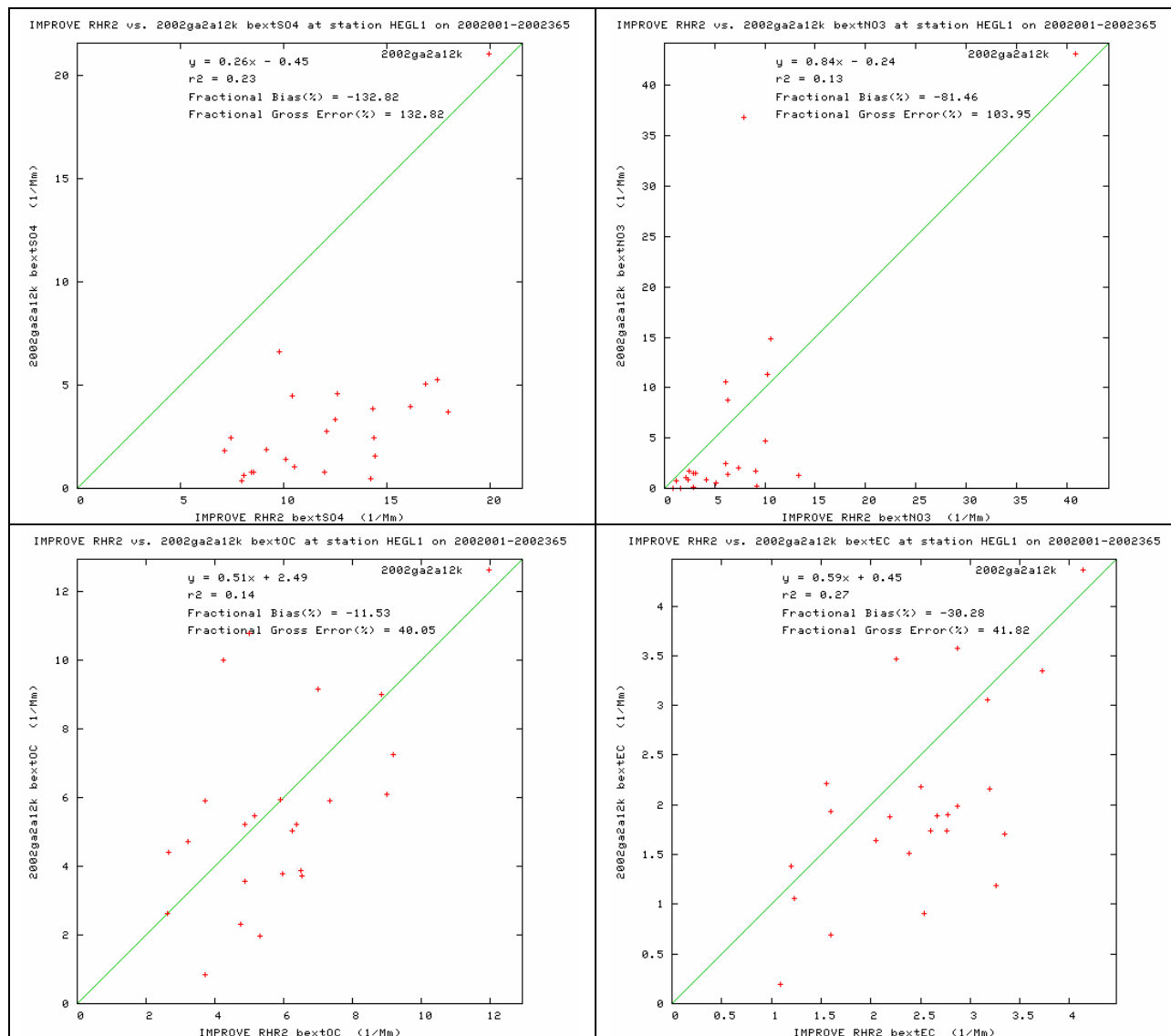
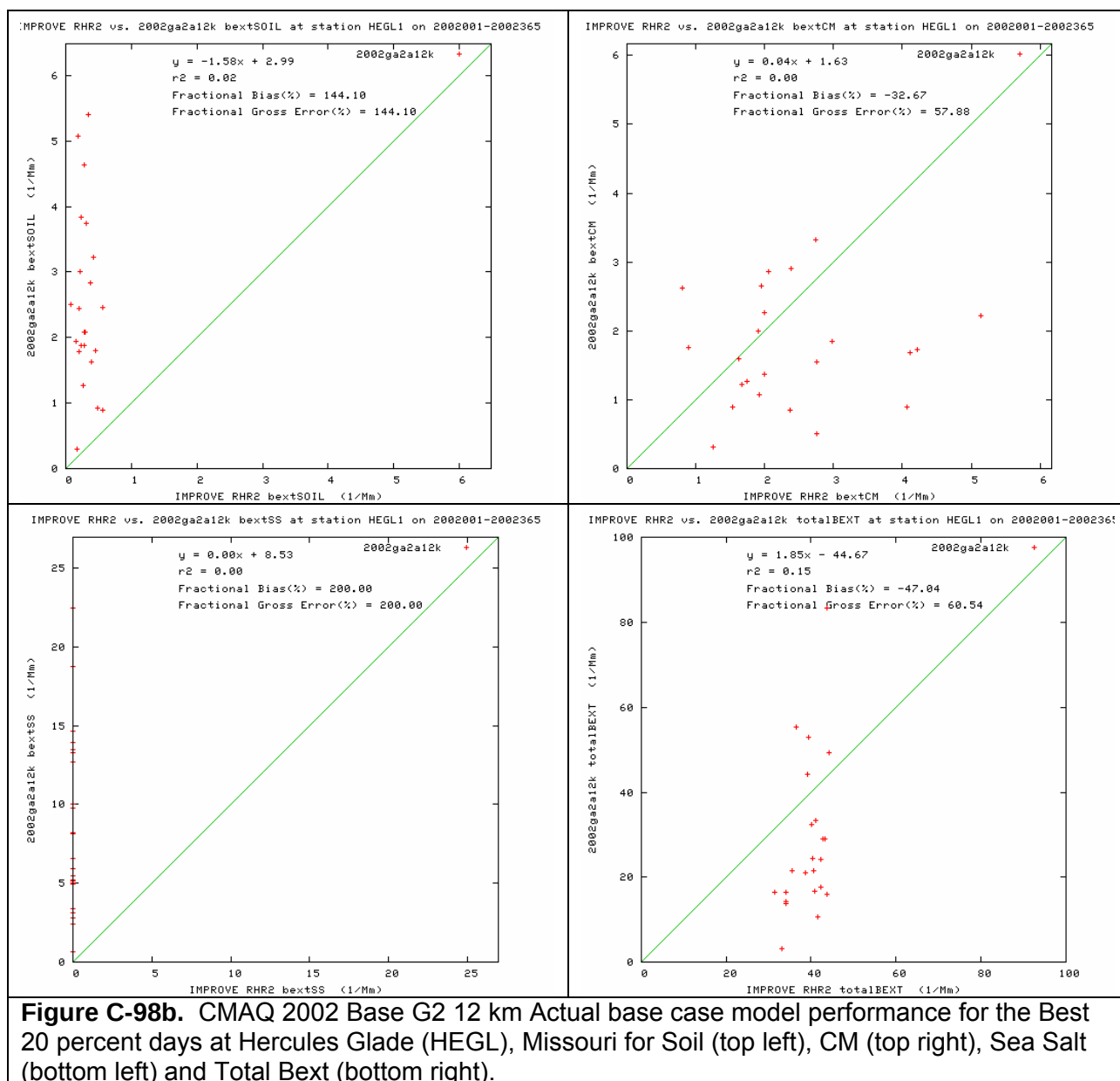


Figure C-98a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Hercules Glade (HEGL), Missouri for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).



VISTAS CMAQ 2002 Actual Base G2 12k; B20

HEGL1

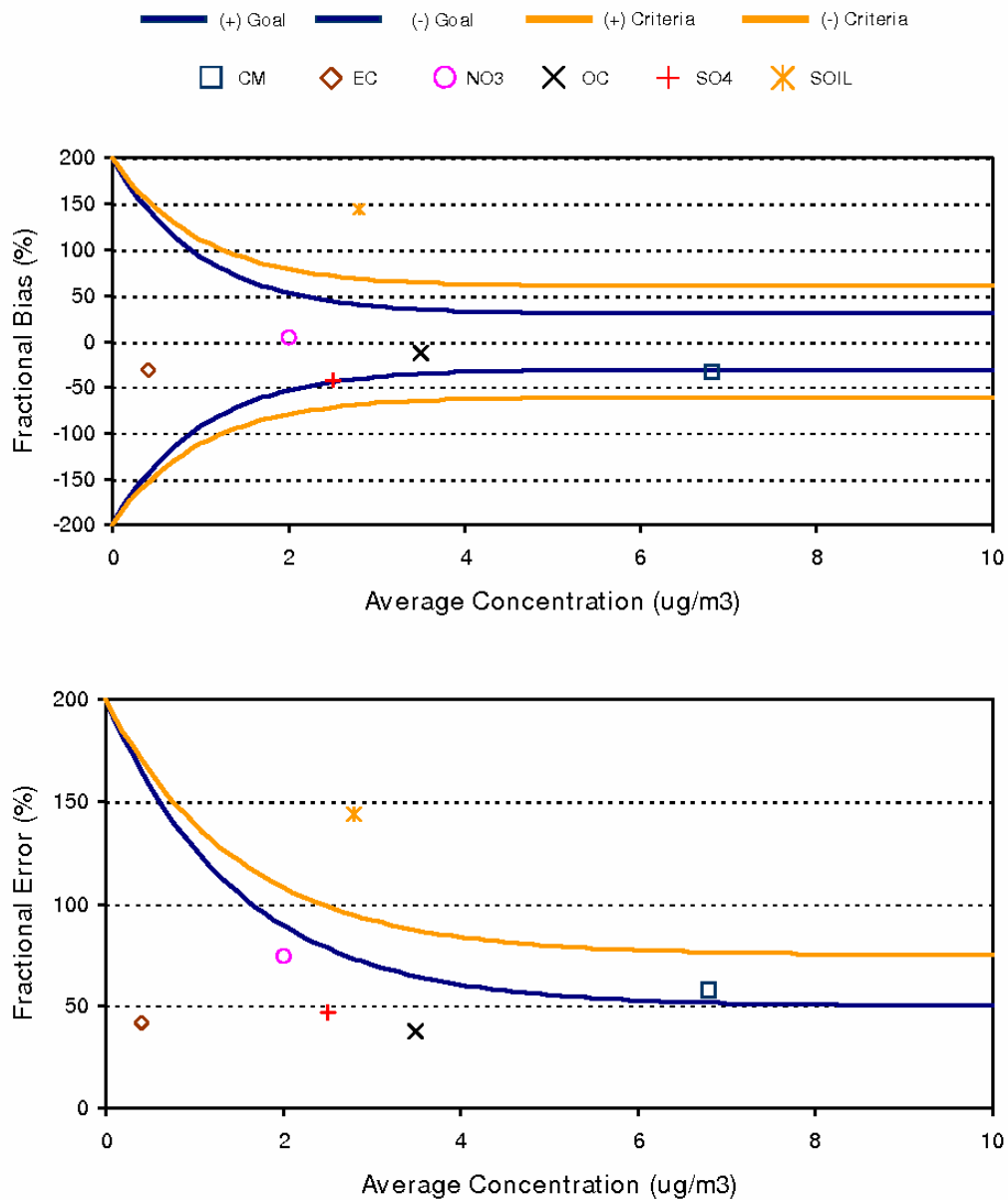


Figure C-99. Bugle Plots of Fractional Bias and Fractional Gross Error for HEGL and the Best 20 Percent Days.

2.3.20.2 HEGL Worst 20 Percent Days

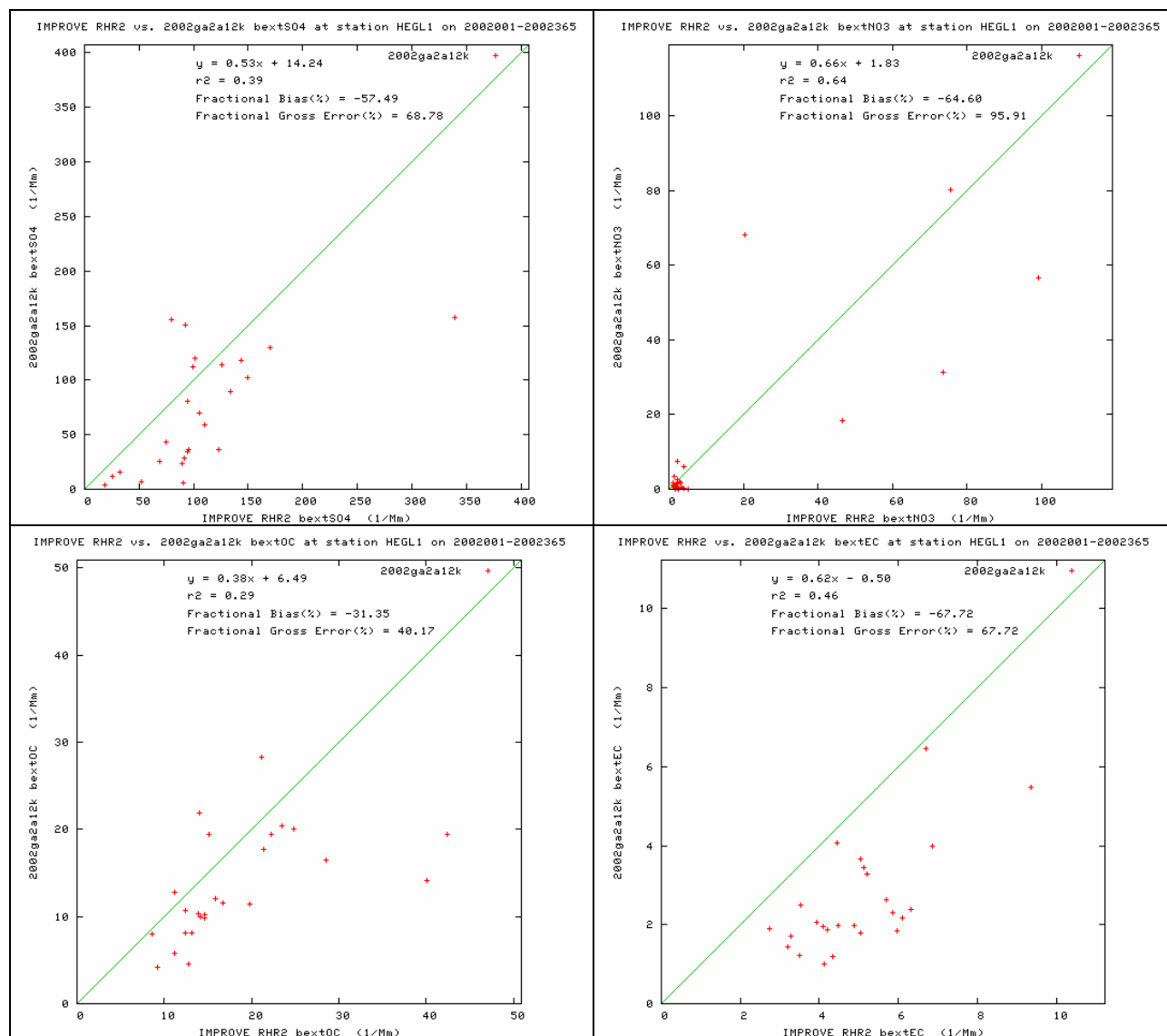


Figure C-100a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Hercules Glade (HEGL), Missouri for SO₄ (top left), NO₃ (top right), OMC (bottom left) and EC (bottom right).

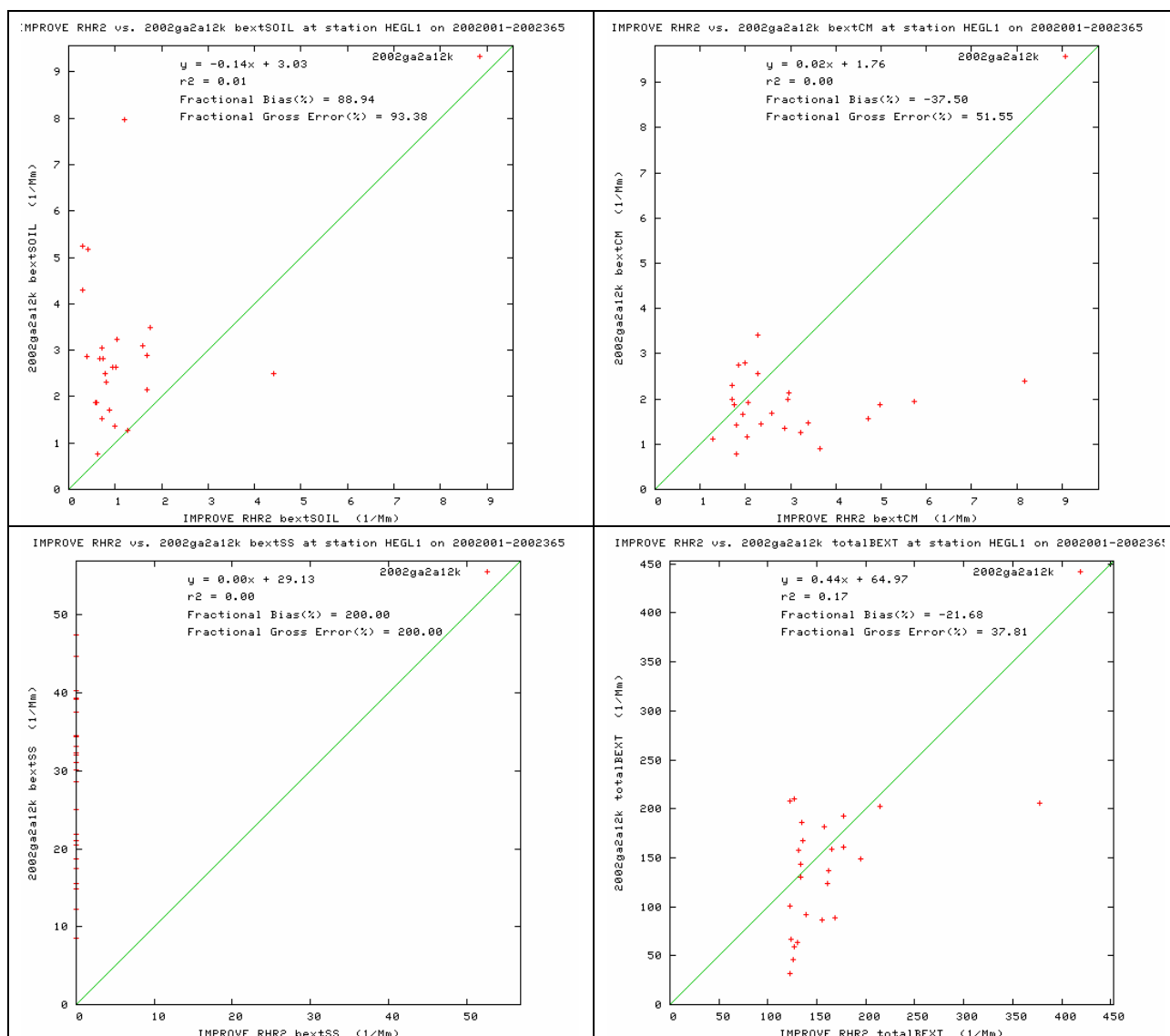


Figure C-100b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Hercules Glade (HEGL), Missouri for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; W20

HEGL1

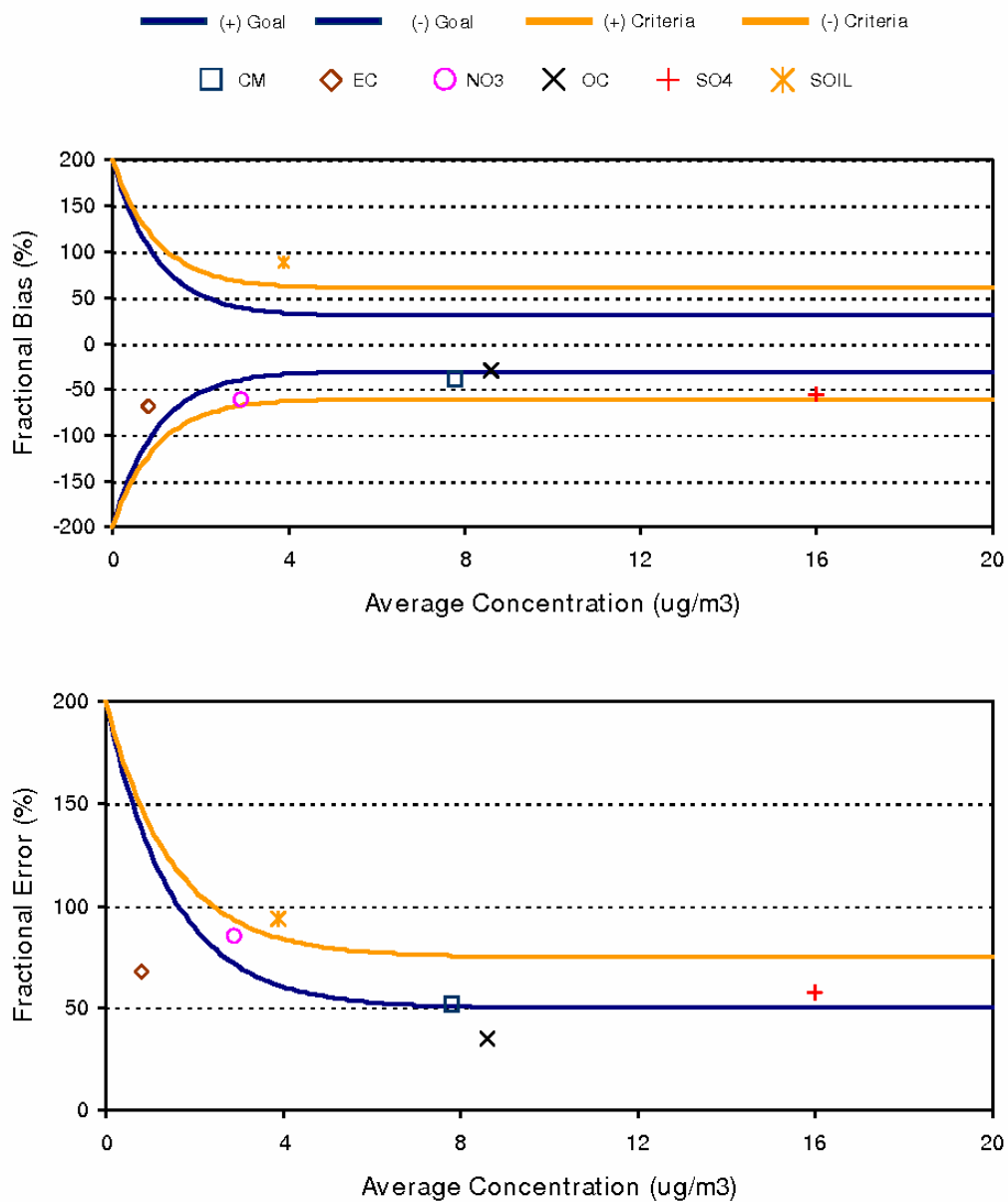


Figure C-101. Bugle Plots of Fractional Bias and Fractional Gross Error for HEGL and the Worst 20 Percent Days.

2.3.20.3 HEGL for All Days

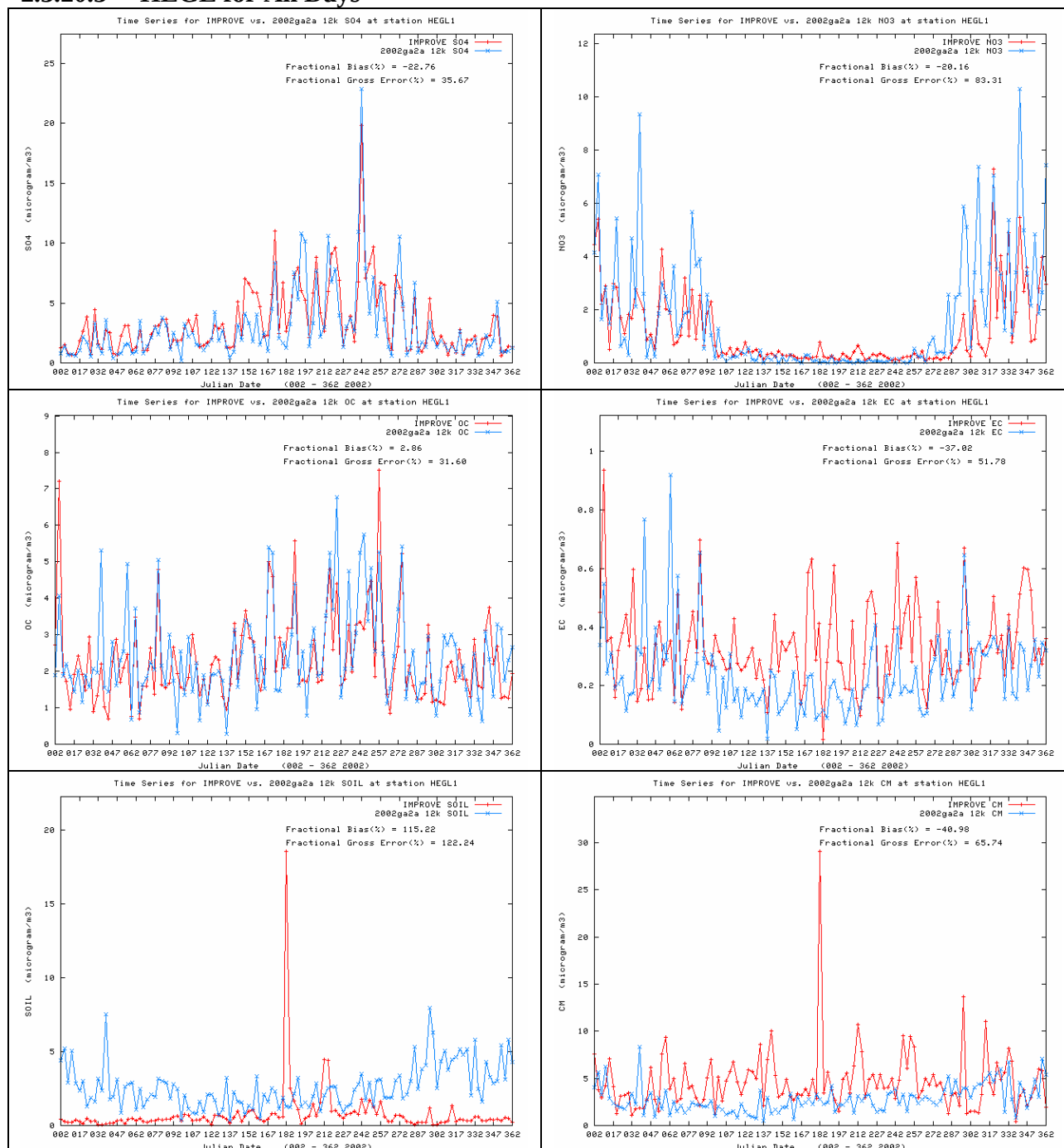
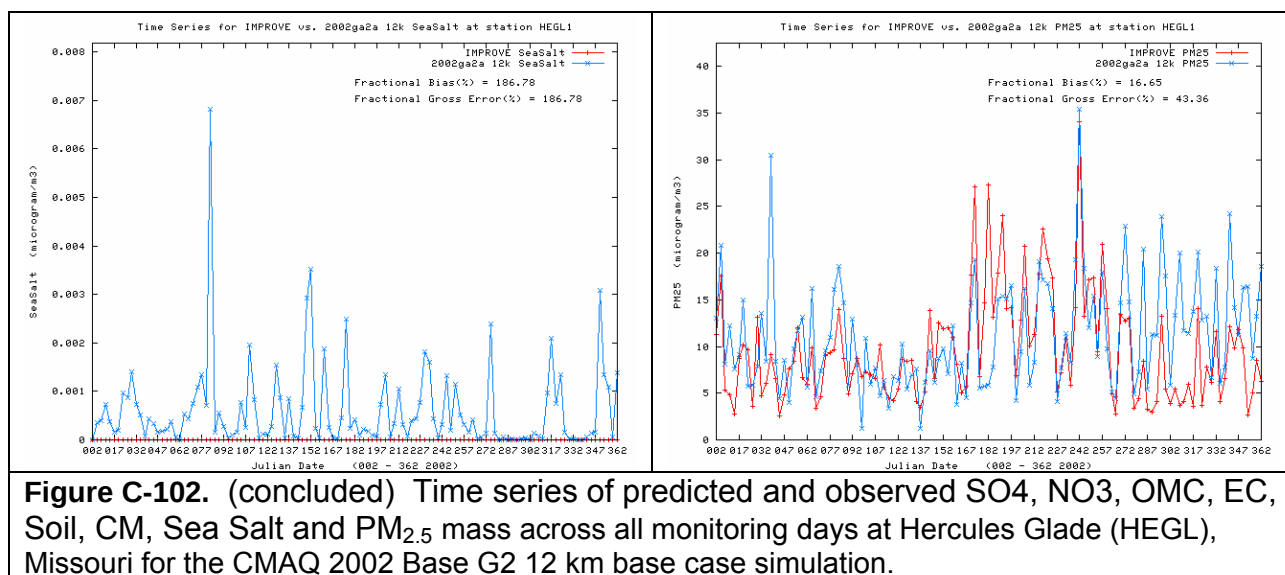
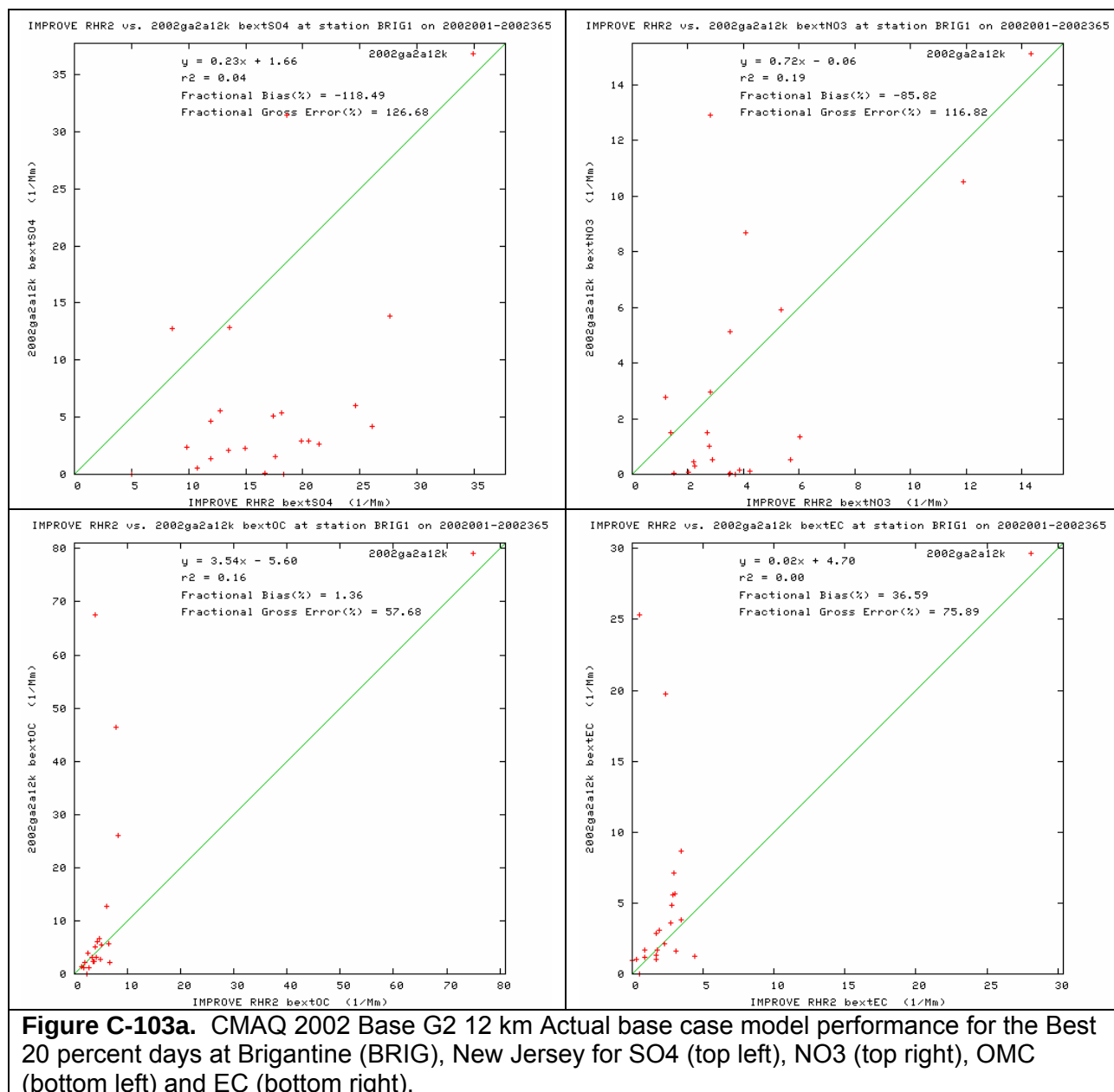


Figure C-102. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Hercules Glade (HEGL), Missouri for the CMAQ 2002 Base G2 12 km base case simulation.



2.3.21 Brigantine Wildlife Refuge (BRIG), New Jersey

2.3.21.1 BRIG Best 20 Percent Days



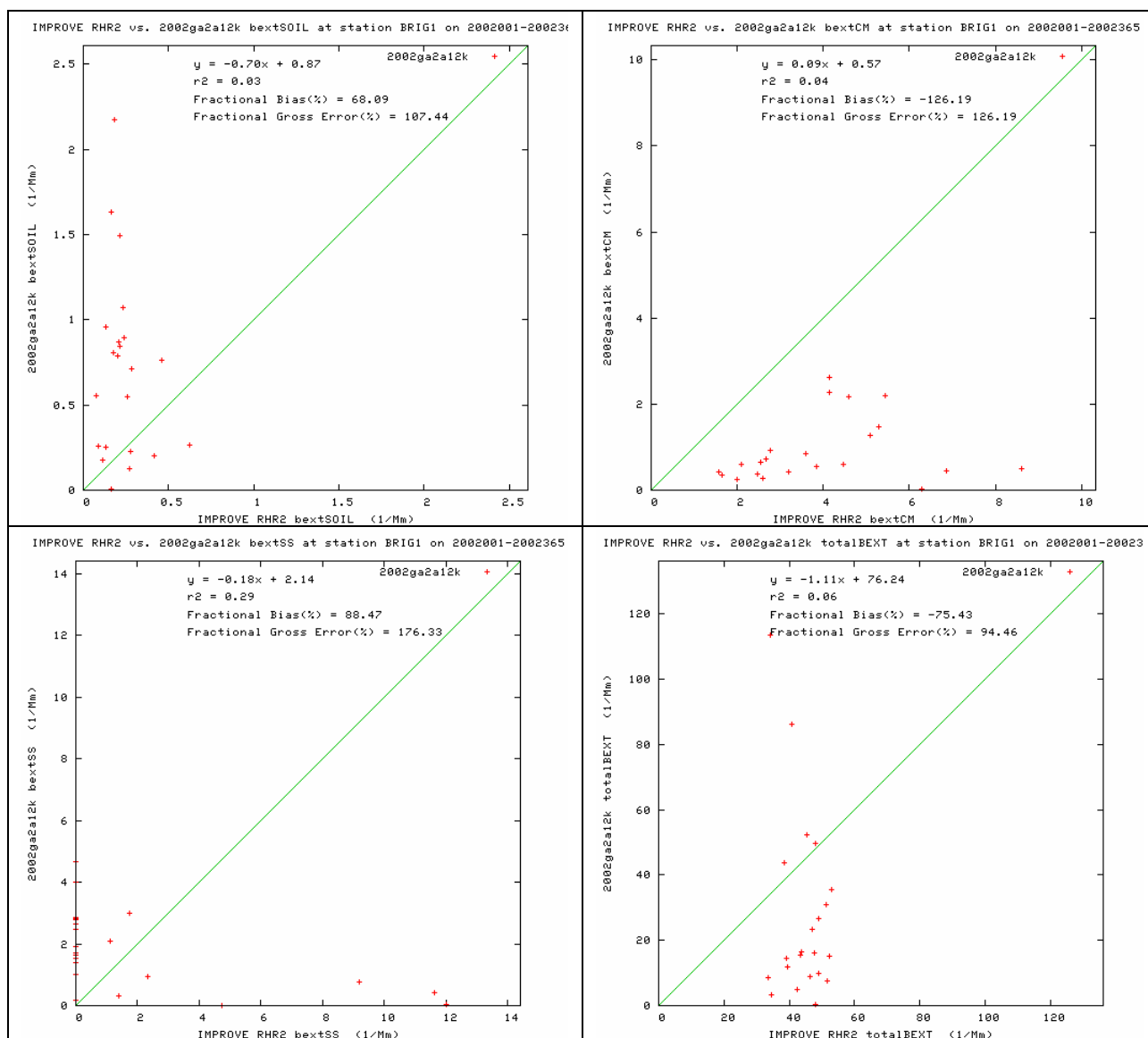


Figure C-103b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Best 20 percent days at Brigantine (BRIG), New Jersey for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; B20

BRIG1

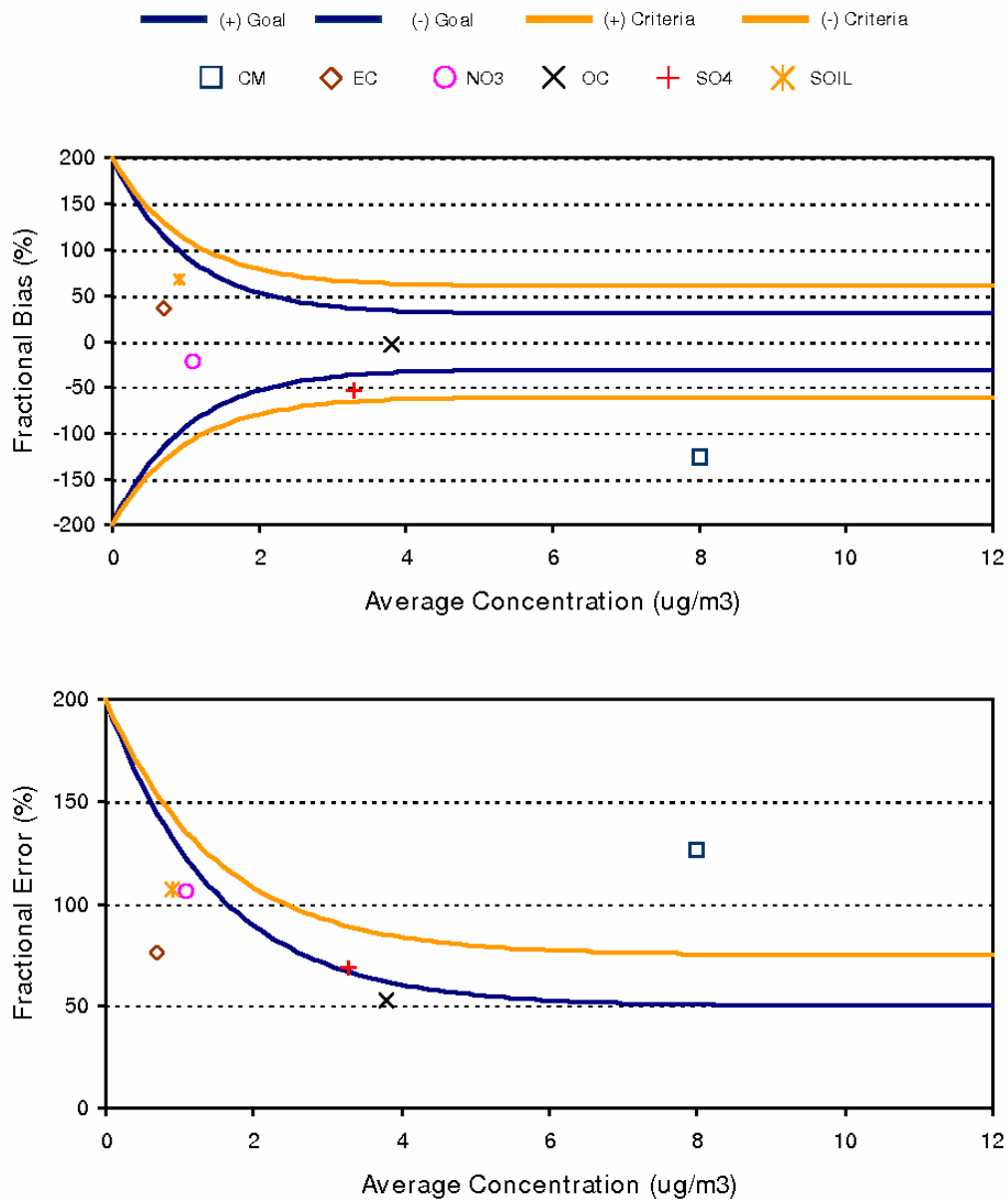


Figure C-104. Bugle Plots of Fractional Bias and Fractional Gross Error for BRIG and the Best 20 Percent Days.

2.3.21.2 BRIG Worst 20 Percent Days

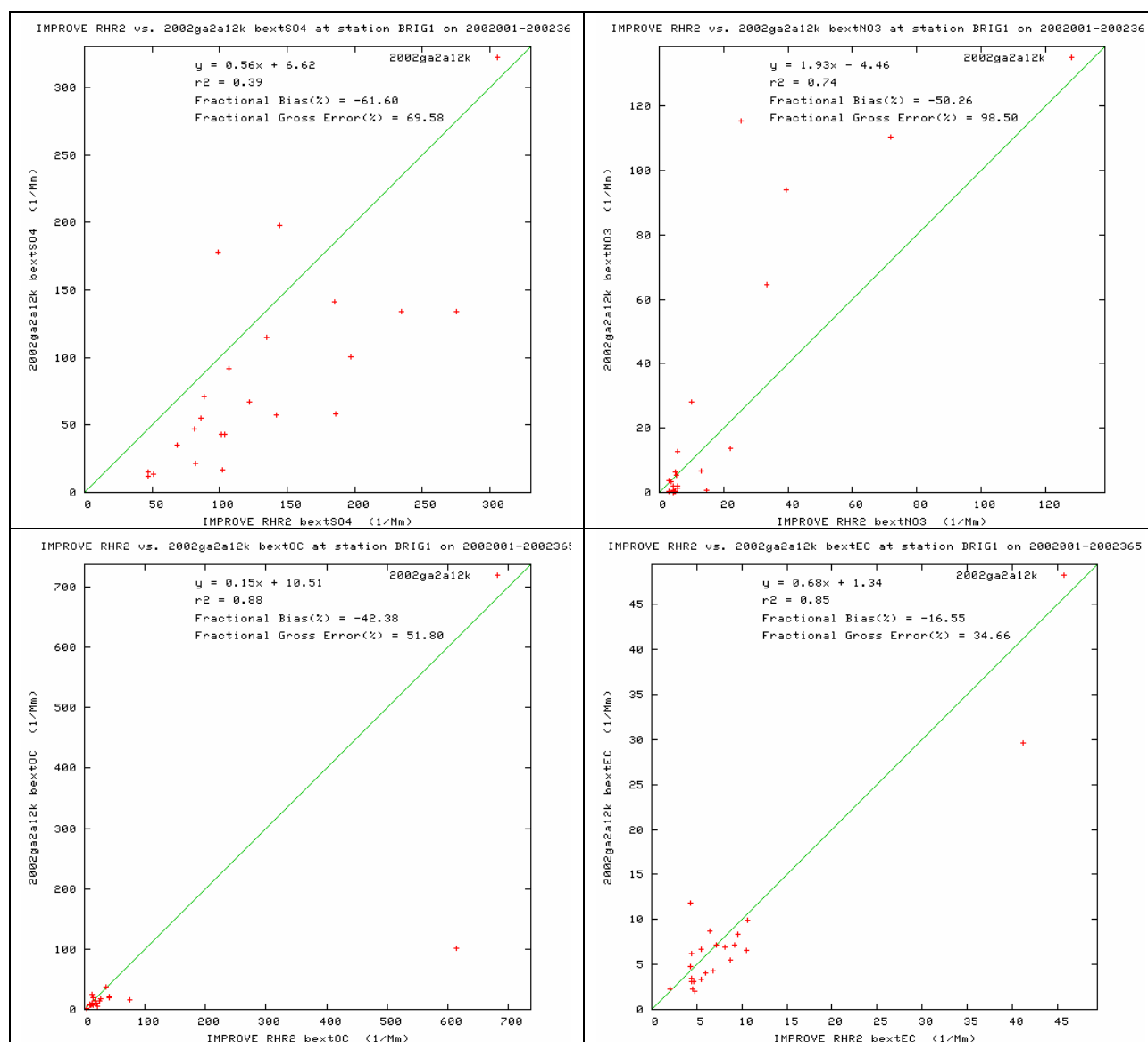


Figure C-105a. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Brigantine (BRIG), New Jersey for SO4 (top left), NO3 (top right), OMC (bottom left) and EC (bottom right).

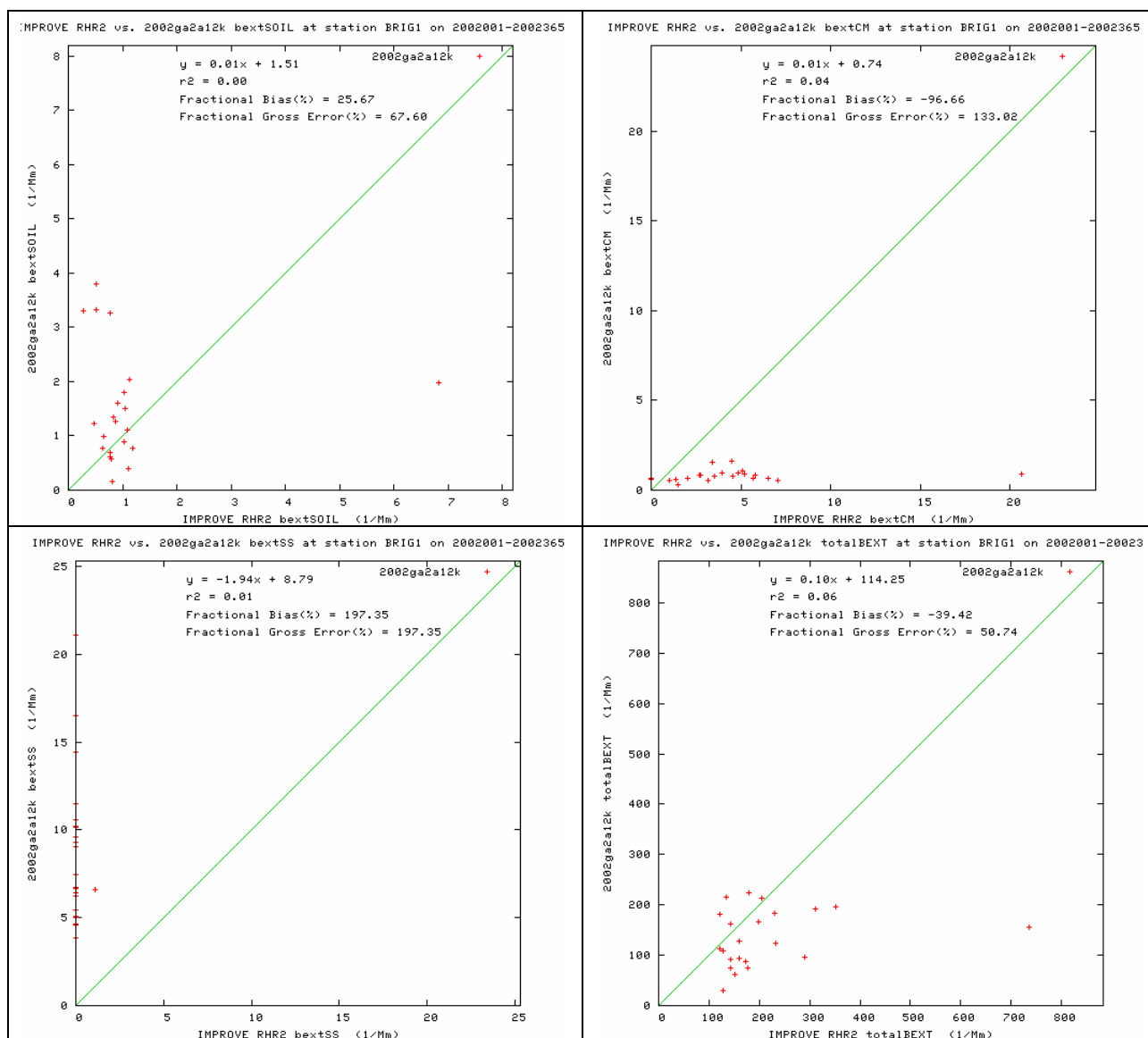


Figure C-105b. CMAQ 2002 Base G2 12 km Actual base case model performance for the Worst 20 percent days at Brigantine (BRIG), New Jersey for Soil (top left), CM (top right), Sea Salt (bottom left) and Total Bext (bottom right).

VISTAS CMAQ 2002 Actual Base G2 12k; W20

BRIG1

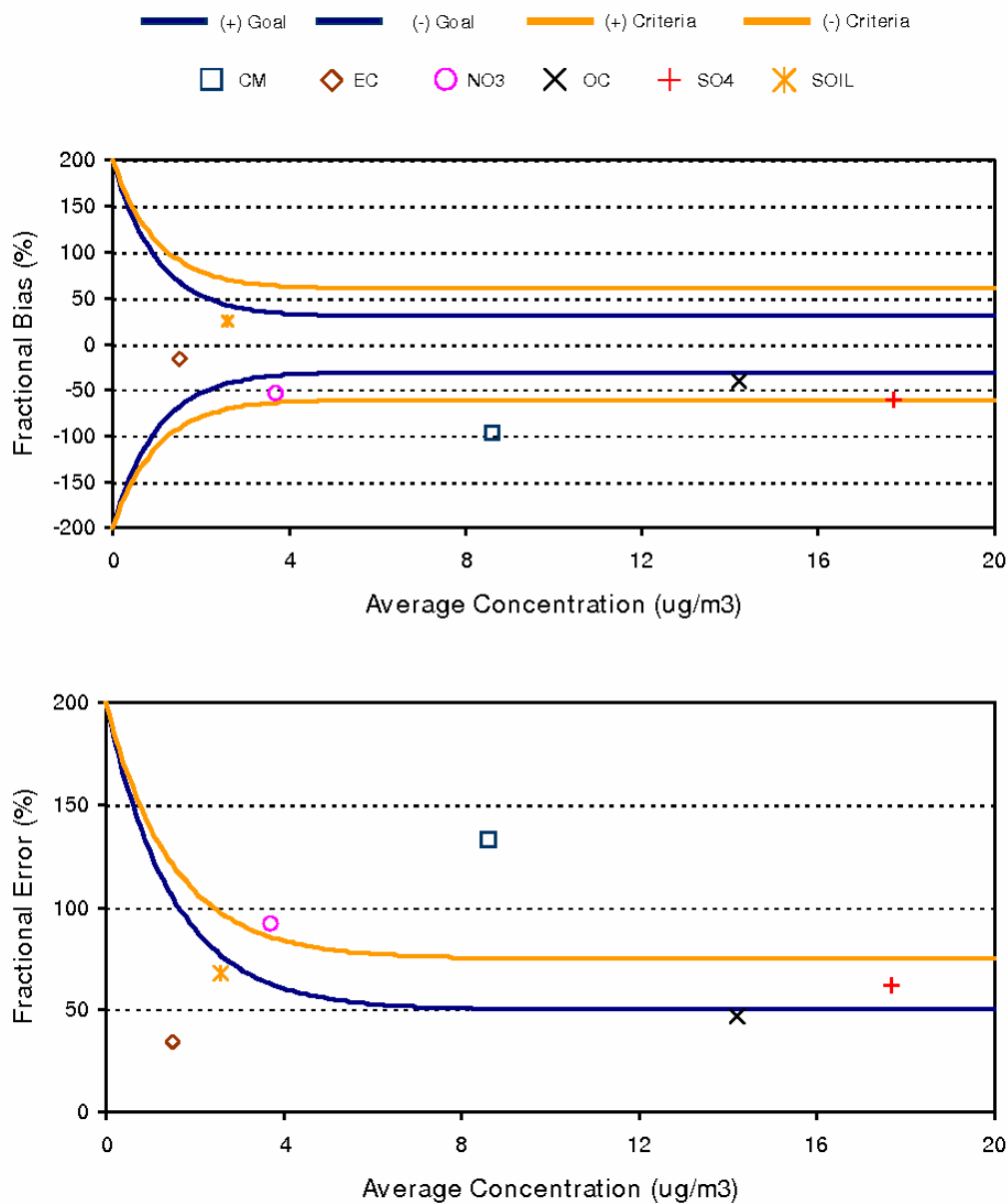


Figure C-106. Bugle Plots of Fractional Bias and Fractional Gross Error for BGIG and the Worst 20 Percent Days.

2.3.21.3 BRIG for All Days

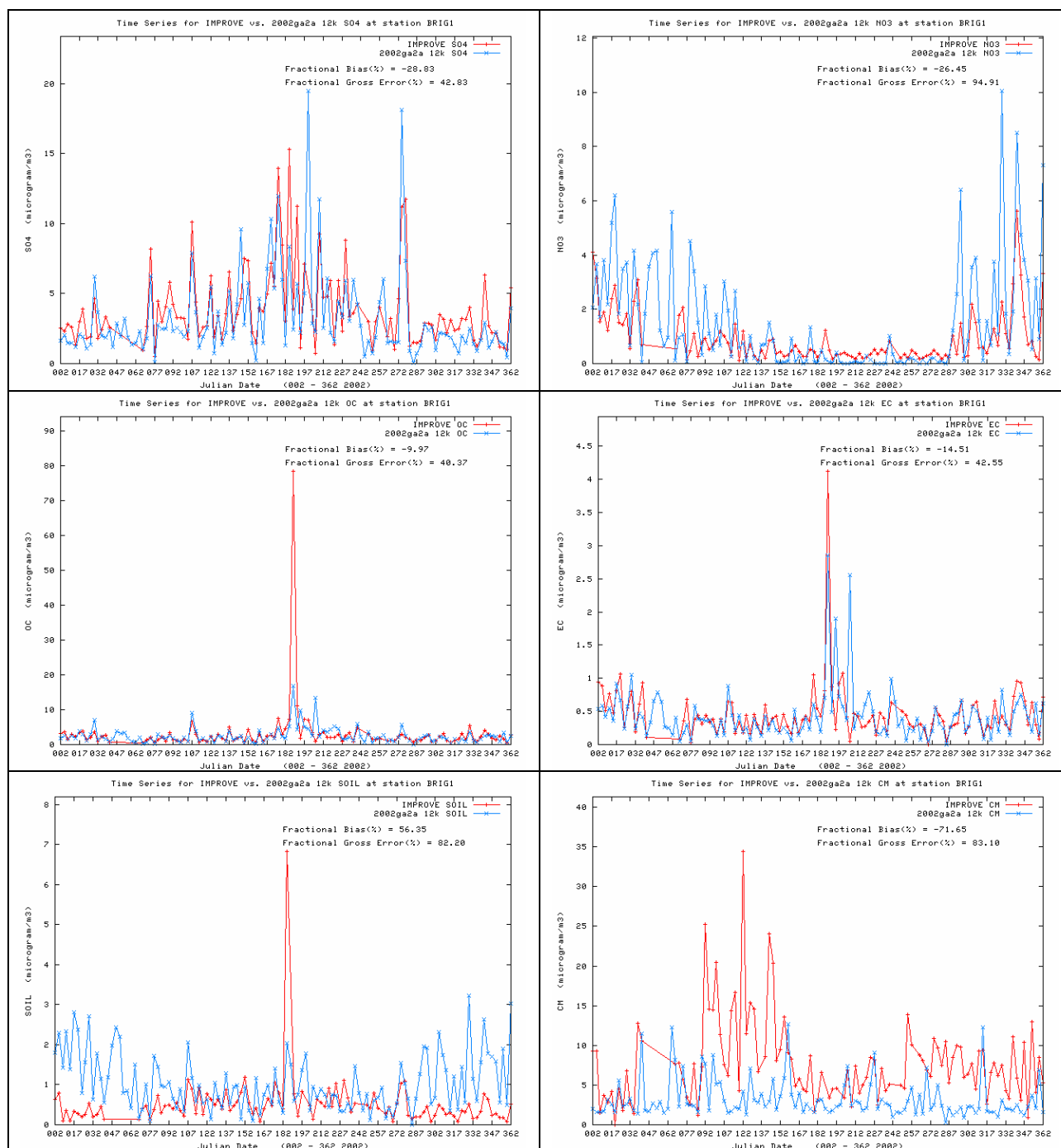


Figure C-107. Time series of predicted and observed SO₄, NO₃, OMC, EC, Soil, CM, Sea Salt and PM_{2.5} mass across all monitoring days at Brigantine (BRIG), New Jersey for the CMAQ 2002 Base G2 12 km base case simulation.

