Supplementary Information

Potential sources and processes affecting speciated atmospheric mercury at Kejimkujik National Park, Canada

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Contents

Table S1. Emission of Hg and other pollutants reported in NPRI within 150 Km of the sampling site (Data source: Environmental Canada, 2016).

Facility	Location (lat, long)	Distance to KEJ/direction	Hg (Kg)		SO_2 (Tonnes)		NO_2 (Tonnes)		NH_3 (Tonnes)	
			2009	2010	2009	2010	2009	2010	2009	2010
Brooklyn Power	Brooklyn (44°N, 64°W)	50 Km southeast	0	0	9.9	26	309	259	0	0
Michelin North America (Canada)	Bridgewater (44°N, 64°W)	53 Km east	0	0	195	184	68	63	0	0
High Liner Foods INC.	Lunenburg (44°N, 64°W)	72 Km east	0	0	27	27	0	0	0	0
Department of National Defence	Greenwood (44°N, 65°W)	75 Km north	0	0	55	68	19	18	0	0
Louisiana-Pacific Canada LTD.	East River (44°N, 64°W)	88 Km northeast	0	0	122	102	100	99	0	0
Maple Leaf Foods/Larsen Packers Limiter	Berwick (45°N, 64°W)	89 Km northeast	0	0	51	38	0	0	0	0
Michelin North America (Canada)	Waterville (45°N, 64°W)	92 Km northeast	0	0	162	182	57	62	0	0
Acadia University/Acadia Campus	Wolfville (45°N, 64°W)	108 Km northeast	0	0	77	73	27	26	0	0
CKF INC.	Hantsport (45°N, 64°W)	116 Km northeast	0	0	66	57	21	0	0	0
Minas Basin Pulp and Power Company Limited	Hantsport (45°N, 64°W)	116 Km northeast	0	0	225	260	66	76	0	0
Mount Saint Vincent University	Halifax (44°N, 63°W)	129 Km northeast	0	0	27	13	7.2	3.9	0	0
Department of National Defence – CFB Halifax – Canadian Forces Ammunition Depot Bedford	Bedford (44°N, 63°W)	131 Km northeast	0	0	56	50	0	0	0	0
Department of National Defence – CFB Halifax – Windsor Park	Halifax (44°N, 63°W)	132 Km northeast	0	0	59	44	36	30	0	0

Dalhousie University	Halifax (44°N, 63°W)	133 Km northeast	0.18	0.15	253	260	89	72	0	0
Department of National Defence/CFB Halifax -Stadacona/Dockyard	Halifax (44°N, 63°W)	133 Km northeast	0	0	211	177	58	51	0	0
Capital Health – Camp Hill Site Central Heating Plant	Halifax (44°N, 63°W)	133 Km northeast	0	0	15	12	14	20	0	0
Saint Mary's University - Halifax	Halifax (44N, 63W)	133 Km northeast	0	0	1.2	0	3	0	0	0
Oland Brewery/Main Plant	Halifax (44°N, 63°W)	133 Km northeast	0	0	31	0	0	0	0	0
Nova Scotia Power Incorporated/Tufts Cove Generating Station	Dartmouth (44°N, 63°W)	134 Km northeast	0	0	2205	2205	3054	3054	0	0
Nova Scotia Power Incorporated – Burnside Combustion Turbines	Dartmouth (44°N, 63°W)	134 Km northeast	0	0	0	0	60	40	0	0
Maritime Paper Products LTD.	Dartmouth (44°N, 63°W)	134 Km northeast	0	0	7.2	0.868	3.1	2.1	0	0
Capital Health – Victoria General Hospital Central Heating Plant	Halifax (44°N, 63°W)	134 Km northeast	0	0	215	7.6	60	19	0	0
Capital Health – Nova Scotia Hospital Central Heating Plant	Halifax (44°N, 63°W)	136 Km northeast	0	0	3.3	1.1	9.3	8.7	0	0
Imperial oil-Darthmouth Refinery	Dartmouth (44°N, 63°W)	137Km northeast	2.6	2.9	4231	3073	1543	1251	0.593	2.2
Department of National Defence – 12 Wing Shearwater	Shearwater (44°N, 63°W)	138 Km northeast	0	0	150	127	43	38	0	0
Total emission			2.78	3.05	8,455	6,988	5,647	5,193	0.593	2.2
Provincial total emission			147.5	90.3	108,961	70,336	22,235	22,157	45.7	48.5

Table S2. Coefficients of cross-correlation among all variables in 2009 (bold numbers are significant at $p<0.05$).

	GOM	PBM	PM	O_3	SO_2	HNO_3	Ca^{2+}	K^+	Na^+	Mg^{2+}	Cl^-	NO_3^-	NH_4^+	SO_4^{2-}	Temperature	Relative humidity	Wind speed	Precipitation
GEM	**0.37**	**0.28**	0.15	**0.48**	0.11	**0.18**	0.13	0.01	0.06	0.07	-0.01	0.14	**0.18**	**0.24**	0.03	0.06	**0.24**	**0.17**
GOM		0.10	**0.31**	**0.27**	**0.21**	**0.45**	**0.39**	**0.17**	-0.09	-0.02	**-0.18**	**0.17**	**0.28**	**0.27**	**0.46**	**-0.38**	-0.01	-0.09
PBM			**0.47**	**0.56**	**0.63**	**0.42**	**0.28**	0.11	**0.20**	**0.23**	0.06	**0.50**	**0.53**	**0.54**	**-0.43**	**-0.38**	-0.09	-0.15
PM				**0.52**	**0.64**	**0.70**	**0.68**	**0.43**	**0.37**	**0.44**	**0.19**	**0.66**	**0.80**	**0.79**	**0.17**	**-0.36**	-0.05	**-0.18**
O_3					**0.49**	**0.52**	**0.51**	0.05	**0.21**	**0.26**	0.09	**0.36**	**0.50**	**0.58**	**-0.17**	**-0.49**	**0.20**	-0.09
SO_2						**0.80**	**0.52**	**0.29**	**0.29**	**0.34**	0.09	**0.71**	**0.74**	**0.70**	**-0.21**	**-0.31**	-0.10	**-0.19**
HNO_3							**0.67**	**0.33**	0.16	**0.23**	-0.05	**0.61**	**0.80**	**0.77**	**0.16**	**-0.37**	-0.13	**-0.16**
Ca^{2+}								**0.47**	**0.44**	**0.53**	**0.31**	**0.59**	**0.57**	**0.58**	**0.23**	**-0.37**	0.05	-0.09
K^+									**0.64**	**0.66**	**0.57**	**0.53**	**0.34**	**0.41**	**0.37**	-0.04	0.14	0.03
Na^+										**0.99**	**0.96**	**0.61**	**0.24**	**0.39**	-0.10	0.00	**0.25**	-0.10
Mg^{2+}											**0.93**	**0.64**	**0.30**	**0.45**	-0.06	-0.06	**0.25**	-0.11
Cl^-												**0.38**	0.02	**0.18**	-0.12	0.07	**0.29**	-0.07
NO_3^-													**0.72**	**0.68**	-0.02	**-0.17**	-0.01	-0.13
NH_4^+														**0.94**	0.12	**-0.31**	-0.09	-0.13
SO_4^{2-}															0.08	**-0.31**	0.01	-0.13
Temperature																-0.11	0.11	0.09
Relative humidity																	**0.26**	**0.39**
Wind speed																		**0.39**

Table S3. Coefficients of cross-correlation among all variables in 2010 (bold numbers are significant at $p<0.05$).

	GOM	PBM	O_3	SO_2	HNO_3	Ca^{2+}	K^+	Na^+	Mg^{2+}	Cl^-	NO_3^-	NH_4^+	SO_4^{2-}	Temperature	Relative humidity	Wind speed	Precipitation
GEM	**0.31**	0.11	**0.70**	0.02	-0.11	-0.01	**-0.13**	0.09	0.08	0.10	-0.01	-0.10	-0.11	**-0.48**	-0.02	**0.38**	**0.18**
GOM		**0.29**	**0.55**	**0.30**	**0.24**	0.07	0.07	-0.03	-0.01	-0.10	**0.18**	0.06	0.06	-0.04	**-0.66**	-0.06	**-0.18**
PBM			**0.32**	0.06	0.04	-0.02	-0.03	-0.07	-0.07	-0.08	0.03	0.01	0.00	**-0.16**	**-0.39**	**-0.15**	**-0.22**
O_3				**0.18**	0.11	0.02	-0.07	0.05	0.05	0.01	0.06	0.00	0.02	**-0.29**	**-0.39**	**0.31**	0.01
SO_2					**0.63**	**0.13**	**0.16**	0.05	0.09	-0.04	**0.25**	**0.26**	**0.31**	-0.03	**-0.31**	-0.10	**-0.13**
HNO_3						**0.25**	**0.34**	-0.11	0.00	**-0.24**	**0.28**	**0.48**	**0.53**	**0.33**	**-0.25**	**-0.23**	**-0.13**
Ca^{2+}							**0.57**	0.01	**0.38**	0.00	**0.70**	**0.78**	**0.71**	**0.19**	-0.10	-0.05	-0.02
K^+								0.09	**0.33**	0.06	**0.55**	**0.68**	**0.67**	**0.32**	**-0.16**	-0.08	-0.07
Na^+									**0.92**	**0.96**	**0.21**	-0.09	0.02	**-0.16**	0.08	**0.28**	-0.01
Mg^{2+}										**0.89**	**0.45**	**0.21**	**0.28**	-0.08	0.04	**0.24**	-0.01
Cl^-											0.08	**-0.13**	-0.06	**-0.20**	**0.15**	**0.32**	0.03
NO_3^-												**0.68**	**0.64**	0.10	**-0.23**	-0.05	-0.11
NH_4^+													**0.97**	**0.28**	**-0.15**	**-0.14**	-0.09
SO_4^{2-}														**0.29**	**-0.15**	**-0.13**	-0.10
Temperature															-0.10	**-0.19**	0.03
Relative humidity																**0.24**	**0.41**
Wind speed																	**0.47**

Table S4. PMF factor contributions to speciated Hg and ratios of predicted to observed annual Hg concentrations in 2009.

a) Case 2009

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	20	56	97	97
	Average	4	6	77	14
	Median	2	3	83	9
Ratio of predicted to observed annual mean:					0.97
GOM (%)	Min	0	0	0	0
	Max	100	0	100	0
	Average	25	0	70	0
	Median	19	0	78	0
Ratio of predicted to observed annual mean:					0.86
PBM (%)	Min	0	0	0	0
	Max	0	93	100	92
	Average	0	21	69	9
	Median	0	14	74	5
Ratio of predicted to observed annual mean:					1.03

b) Case 09+mean

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	79	34	98	99
	Average	5	4	78	13
	Median	3	2	83	7
Ratio of predicted to observed annual mean:					0.94
GOM (%)	Min	0	0	0	0
	Max	97	0	100	0
	Average	17	0	83	0
	Median	12	0	88	0
Ratio of predicted to observed annual mean:					1.19
PBM (%)	Min	0	0	0	0
	Max	0	87	100	94
	Average	0	23	67	10
	Median	0	19	71	5
Ratio of predicted to observed annual mean:					1.19

c) Case 09+median

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	89	28	98	99
	Average	6	3	79	13
	Median	3	1	83	7

Ratio of predicted to observed annual mean:					0.93
GOM (%)	Min	0	0	0	0
	Max	95	100	100	0
	Average	14	1	85	0
	Median	10	0	90	0
Ratio of predicted to observed annual mean:					1.20
PBM (%)	Min	0	0	0	0
	Max	0	86	100	96
	Average	0	20	70	10
	Median	0	15	75	6
Ratio of predicted to observed annual mean:					1.14

d) Case 09+RM

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	16	54	98	97
	Average	3	5	78	13
	Median	2	2	83	9
Ratio of predicted to observed annual mean:					0.97
RM (%)	Min	0	0	0	0
	Max	37	83	100	18
	Average	10	16	73	1
	Median	7	11	78	0
Ratio of predicted to observed annual mean:					1.04

e) Case 09-RM

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	34	15	98	96
	Average	7	1	79	13
	Median	4	1	84	9
Ratio of predicted to observed annual mean:					0.97

f) Case 09ScaleRM

Factor name		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	0	65	100	99
	Average	0	7	78	15
	Median	0	4	83	10
Ratio of predicted to observed annual mean:					0.97
GOM (%)	Min	0	0	0	0
	Max	97	0	100	67
	Average	23	0	75	2
	Median	18	0	81	1
Ratio of predicted to observed annual mean:					0.75

PBM (%)	Min	0	0	0	0
	Max	0	88	100	96
	Average	0	16	74	10
	Median	0	10	80	6
Ratio of predicted to observed annual mean:					0.94

Table S5. PMF factor contributions to speciated Hg and ratios of predicted to observed annual Hg concentrations in 2010.

a) Case 2010

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	100	9	99	100
	Average	11	1	79	9
	Median	7	1	85	4
Ratio of predicted to observed annual mean:					0.98
GOM (%)	Min	0	0	0	0
	Max	100	100	100	0
	Average	5	29	67	0
	Median	2	28	68	0
Ratio of predicted to observed annual mean:					1.34
PBM (%)	Min	0	0	0	0
	Max	100	28	98	99
	Average	11	4	80	5
	Median	6	3	86	2
Ratio of predicted to observed annual mean:					1.00

b) Case 10+mean

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	28	70	98	100
	Average	3	6	83	8
	Median	2	3	88	4
Ratio of predicted to observed annual mean:					0.96
GOM (%)	Min	0	0	0	0
	Max	22	100	100	0
	Average	2	28	70	0
	Median	1	22	76	0
Ratio of predicted to observed annual mean:					1.35
PBM (%)	Min	0	0	0	0
	Max	0	85	100	99
	Average	0	4	93	2
	Median	0	2	97	1
Ratio of predicted to observed annual mean:					0.87

c) Case 10+median

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	39	0	100	100
	Average	3	0	88	8
	Median	2	0	93	4

Ratio of predicted to observed annual mean:					0.97
GOM (%)	Min	0	0	0	0
	Max	0	100	100	0
	Average	0	36	64	0
	Median	0	38	62	0
Ratio of predicted to observed annual mean:					1.32
PBM (%)	Min	0	0	0	0
	Max	0	0	100	100
	Average	0	0	97	3
	Median	0	0	99	1
Ratio of predicted to observed annual mean:					0.88

d) Case 10+RM

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	100	9	99	100
	Average	11	1	79	9
	Median	7	1	85	4
Ratio of predicted to observed annual mean:					0.98
RM (%)	Min	0	0	0	0
	Max	100	47	98	96
	Average	9	8	80	3
	Median	5	6	86	1
Ratio of predicted to observed annual mean:					1.16

e) Case 10-RM

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	100	10	99	100
	Average	11	1	78	9
	Median	7	1	85	4
Ratio of predicted to observed annual mean:					0.98

f) Case 10ScaleRM

Factor		Combustion emission	Industrial sulfur	Photochemistry & re-emission	Sea salt
GEM (%)	Min	0	0	0	0
	Max	100	10	99	100
	Average	11	1	78	9
	Median	7	1	85	4
Ratio of predicted to observed annual mean:					0.98
GOM (%)	Min	0	0	0	0
	Max	100	69	99	75
	Average	8	14	77	1
	Median	4	11	80	0
Ratio of predicted to observed annual mean:					1.23

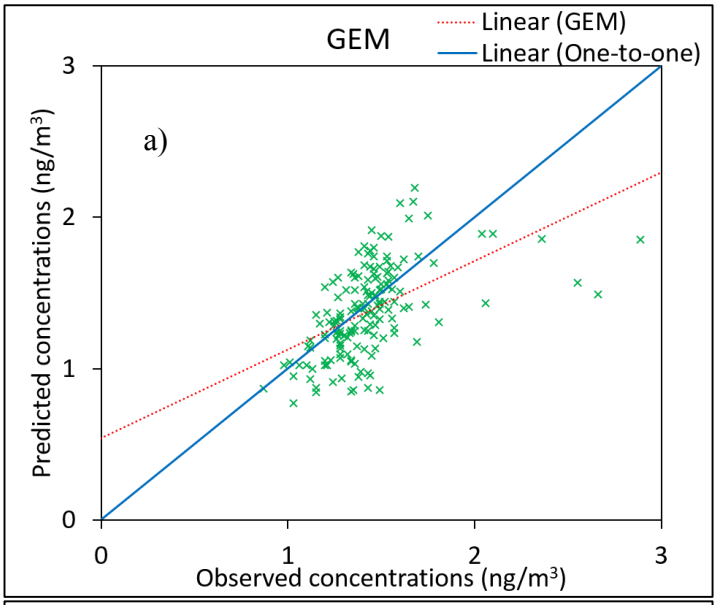
PBM (%)	Min	0	0	0	0
	Max	100	40	97	98
	Average	12	6	76	6
	Median	7	4	82	2
Ratio of predicted to observed annual mean:					0.88

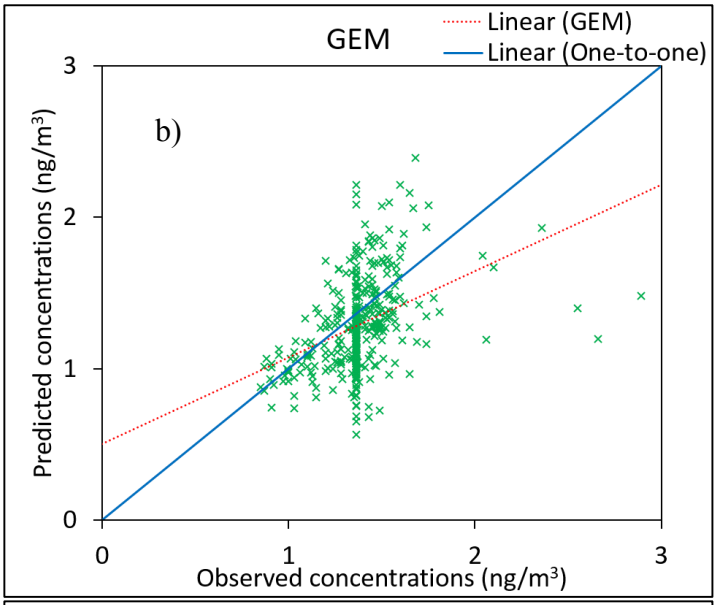
Table S6. Pearson correlation coefficients between Hg forms and other compounds in Case 2009, Case 09+mean, and Case 09+median (bold numbers are significant at <0.05).

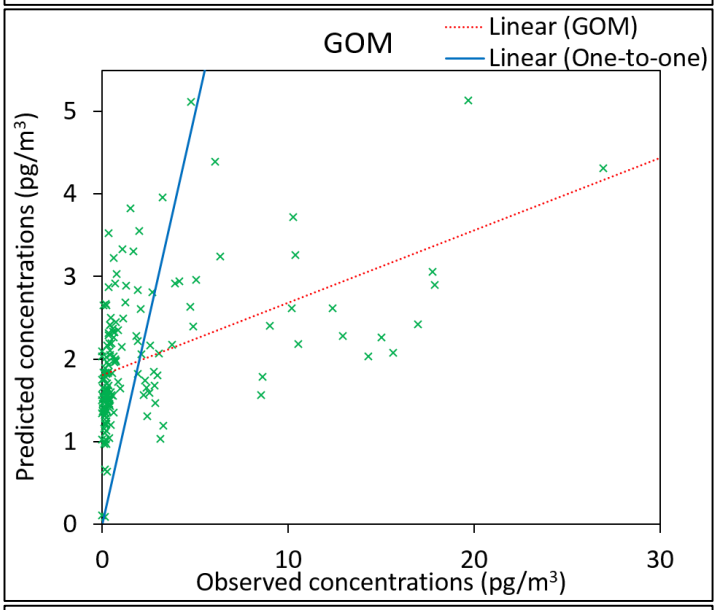
	GEM2009	GEM09+mean	GEM09+medain	GOM2009	GOM09+mean	GOM09+median	PBM2009	PBM09+mean	PBM09+median
GEM	1.00	1.00	1.00	**0.37**	**0.37**	**0.35**	**0.28**	**0.35**	**0.35**
GOM	**0.37**	**0.37**	**0.35**	1.00	1.00	1.00	0.11	**0.20**	**0.19**
PBM	**0.28**	**0.35**	**0.35**	0.11	**0.20**	**0.19**	1.00	1.00	1.00
PM	0.15	**0.11**	**0.12**	**0.31**	**0.19**	**0.18**	**0.48**	**0.30**	**0.31**
O_3	**0.48**	**0.52**	**0.50**	**0.28**	**0.24**	**0.25**	**0.56**	**0.44**	**0.45**
SO_2	0.11	**0.16**	**0.16**	**0.21**	**0.19**	**0.19**	**0.63**	**0.51**	**0.52**
HNO_3	**0.18**	**0.14**	**0.16**	**0.45**	**0.27**	**0.27**	**0.42**	**0.27**	**0.29**
Ca^{2+}	0.13	0.10	0.09	**0.39**	**0.36**	**0.36**	**0.28**	**0.26**	**0.26**
K^+	0.01	0.03	0.02	**0.17**	**0.17**	**0.17**	0.11	**0.14**	**0.13**
Na^+	0.06	**0.12**	0.10	-0.09	-0.03	-0.02	**0.20**	**0.22**	**0.21**
Mg^{2+}	0.07	**0.12**	**0.10**	-0.01	0.03	0.04	**0.23**	**0.24**	**0.23**
Cl^-	-0.01	0.06	0.04	**-0.18**	-0.09	-0.08	0.06	**0.11**	0.10
NO_3^-	0.14	**0.15**	**0.13**	**0.17**	**0.15**	**0.15**	**0.49**	**0.41**	**0.41**
NH_4^+	**0.18**	**0.12**	**0.14**	**0.28**	0.10	0.09	**0.53**	**0.22**	**0.24**
SO_4^{2-}	**0.24**	**0.13**	**0.15**	**0.27**	0.06	0.05	**0.53**	**0.17**	**0.19**

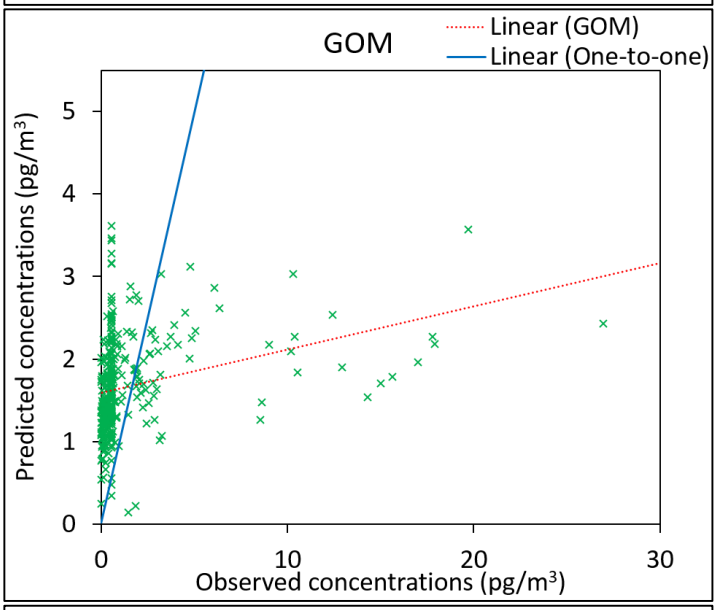
Table S7. Pearson correlation coefficients between Hg forms and other compounds in Case 2010, Case 10+mean, and Case 10+median (bold numbers are significant at <0.05).

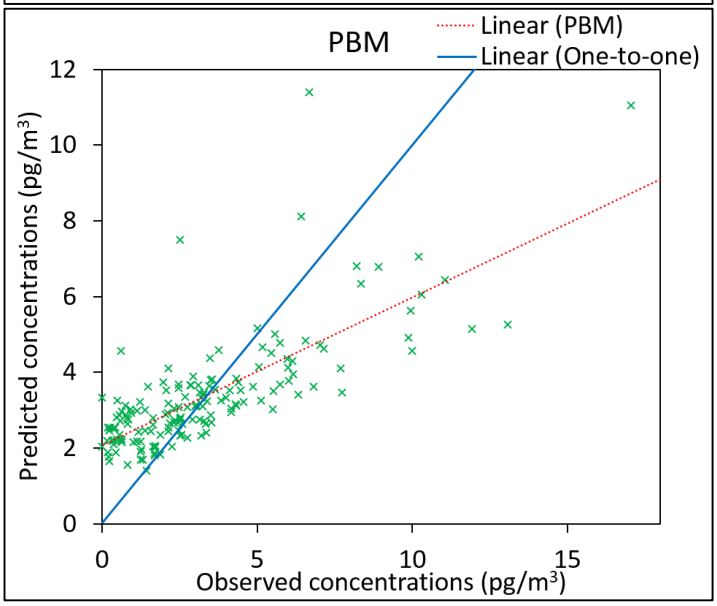
	GEM2010	GEM10+mean	GEM10+median	GOM2010	GOM10+mean	GOM10+median	PBM2010	PBM10+mean	PBM10+median
GEM	1.00	1.00	1.00	**0.32**	**0.29**	**0.29**	0.11	**0.19**	**0.19**
GOM	**0.32**	**0.29**	**0.29**	1.00	1.00	1.00	**0.29**	**0.15**	**0.15**
PBM	0.11	**0.19**	**0.19**	**0.29**	**0.15**	**0.15**	1.00	1.00	1.00
O_3	**0.70**	**0.68**	**0.68**	**0.56**	**0.51**	**0.51**	**0.32**	**0.29**	**0.29**
SO_2	0.01	0.00	0.00	**0.29**	**0.29**	**0.29**	0.05	-0.04	-0.03
HNO_3	**-0.12**	**-0.11**	**-0.11**	**0.23**	**0.24**	**0.24**	0.04	-0.04	-0.04
Ca^{2+}	-0.01	-0.02	-0.02	0.07	0.08	0.09	-0.02	-0.05	-0.05
K^+	**-0.13**	**-0.12**	**-0.13**	0.07	0.09	0.10	-0.03	-0.07	-0.08
Na^+	0.08	0.07	0.06	-0.03	0.00	-0.01	-0.07	**-0.10**	-0.09
Mg^{2+}	0.07	0.06	0.06	-0.01	0.02	0.02	-0.07	-0.10	-0.09
Cl^-	0.09	0.07	0.07	-0.10	-0.07	-0.07	-0.07	**-0.11**	**-0.11**
NO_3^-	-0.02	-0.02	-0.03	**0.18**	**0.19**	**0.20**	0.03	-0.03	-0.04
NH_4^+	-0.11	-0.10	**-0.10**	0.06	0.08	0.08	0.01	-0.04	-0.04
SO_4^{2-}	-0.11	-0.10	**-0.11**	0.06	0.08	0.08	0.00	-0.05	-0.05

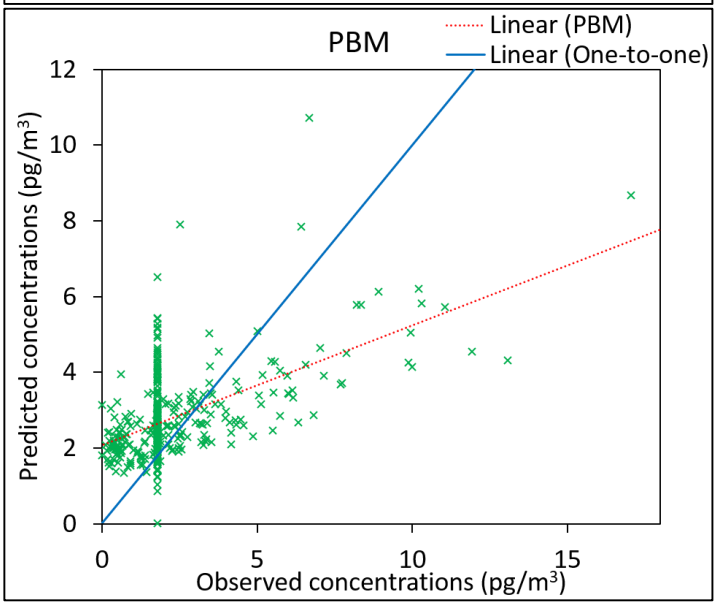

GEM
Linear (GEM)
Linear (One-to-one)
a)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3

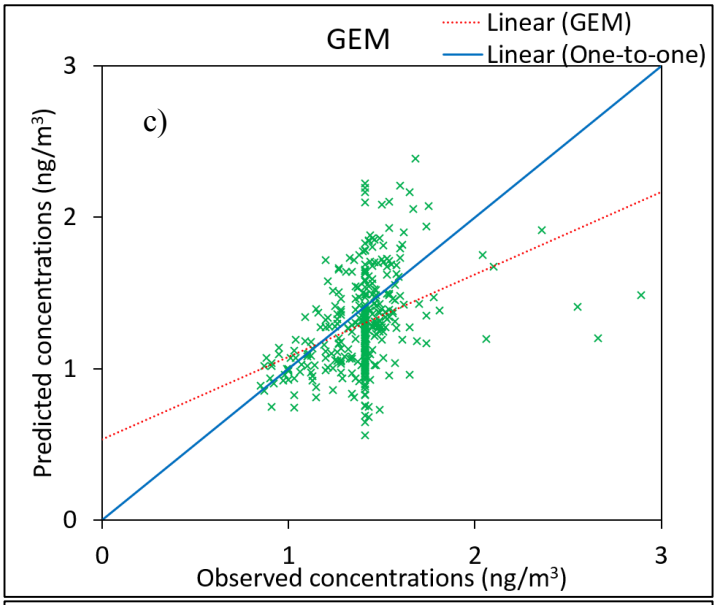

GEM
Linear (GEM)
Linear (One-to-one)
b)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3

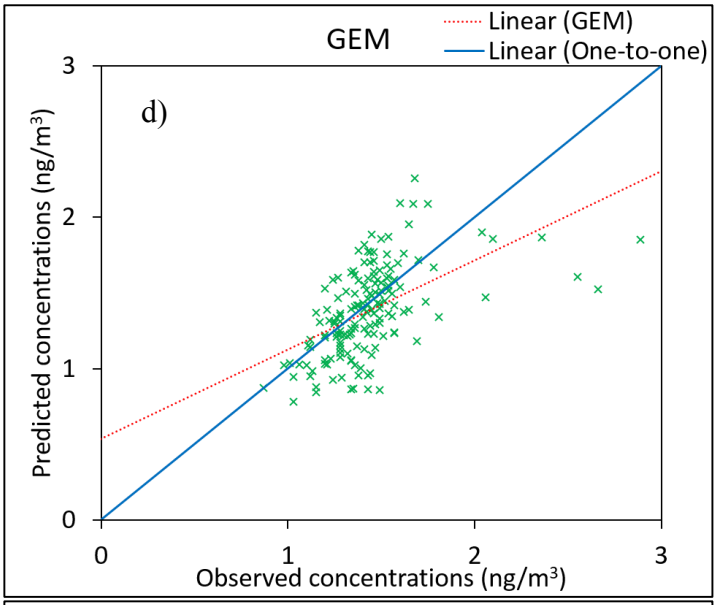

GOM
Linear (GOM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
10
20
30

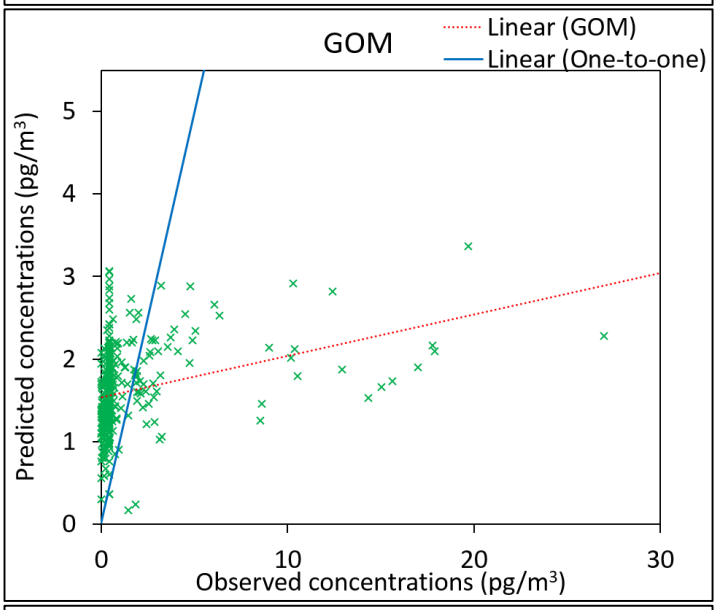

GOM
Linear (GOM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
10
20
30

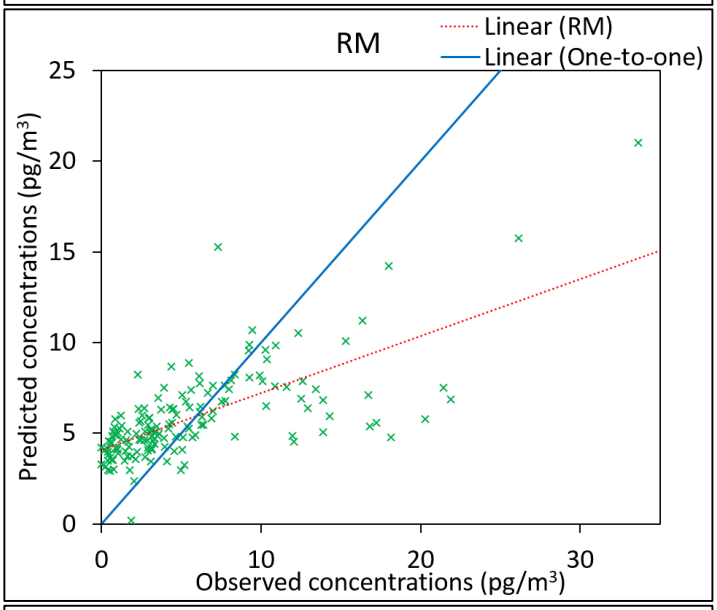

PBM
Linear (PBM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
5
10
15

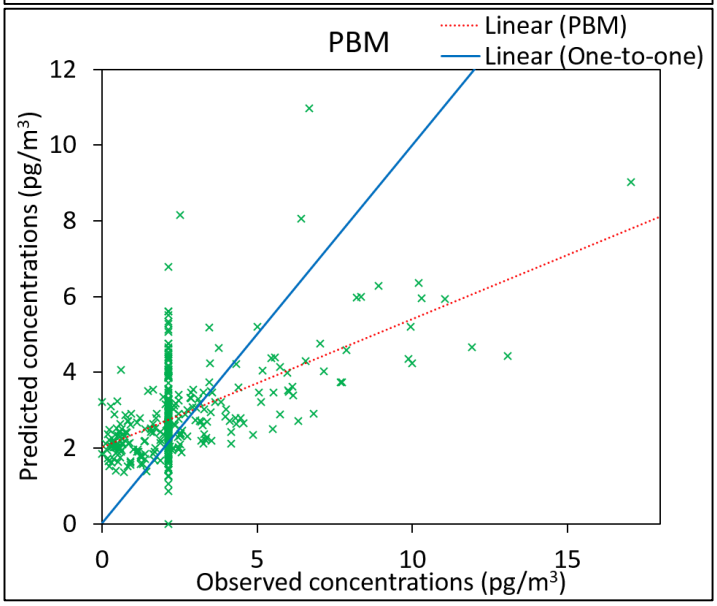

PBM
Linear (PBM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
5
10
15

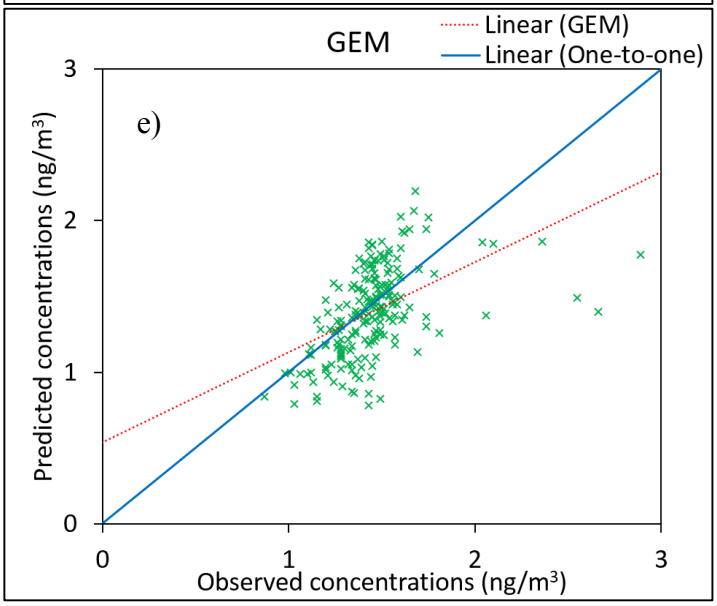

GEM
Linear (GEM)
Linear (One-to-one)
c)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3


GEM
Linear (GEM)
Linear (One-to-one)
d)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3


GOM
Linear (GOM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
10
20
30
1
2
3
4
5


RM
Linear (RM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
5
10
15
20
25
30


PBM
Linear (PBM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
5
10
15
2
4
6
8
10
12


GEM
Linear (GEM)
Linear (One-to-one)
e)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3

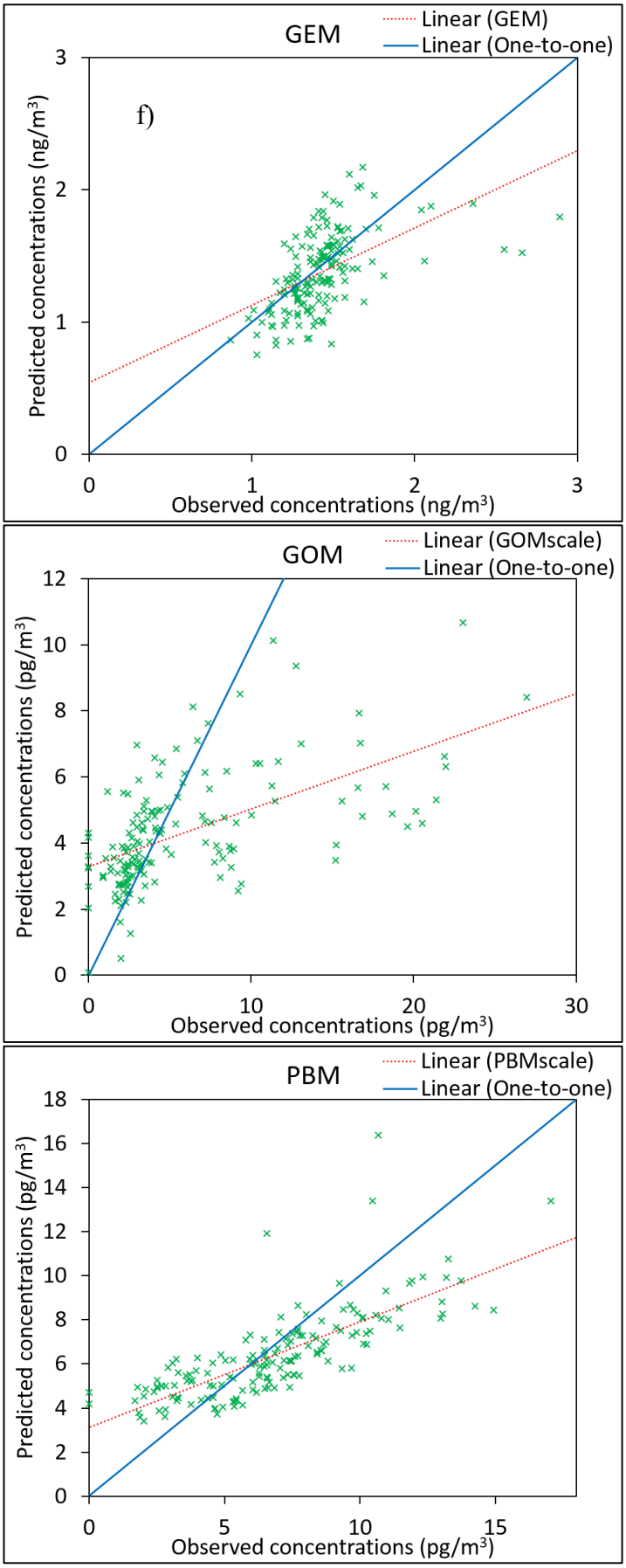
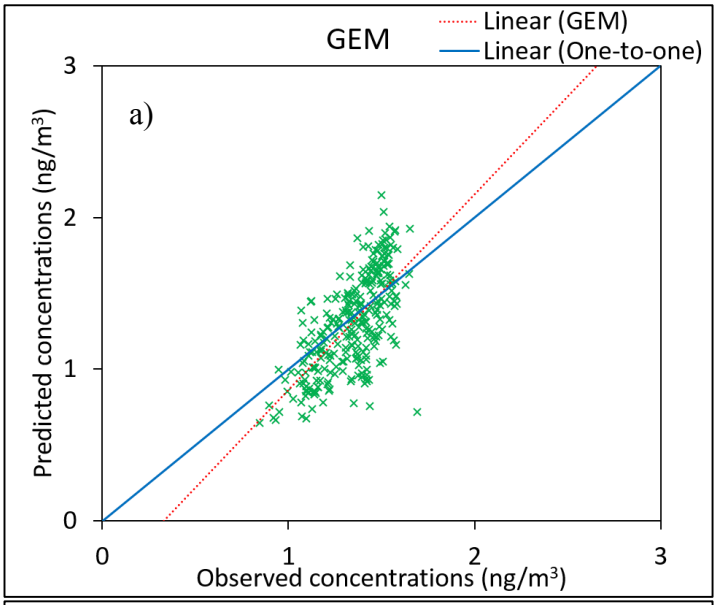
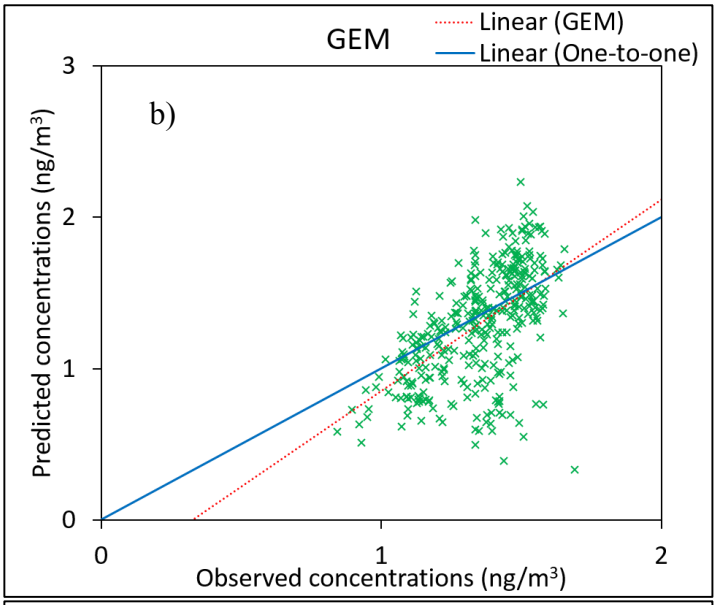
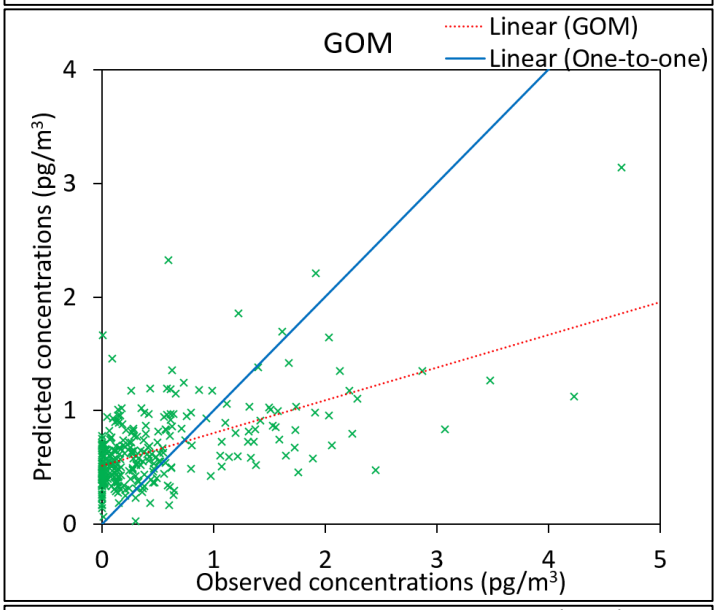
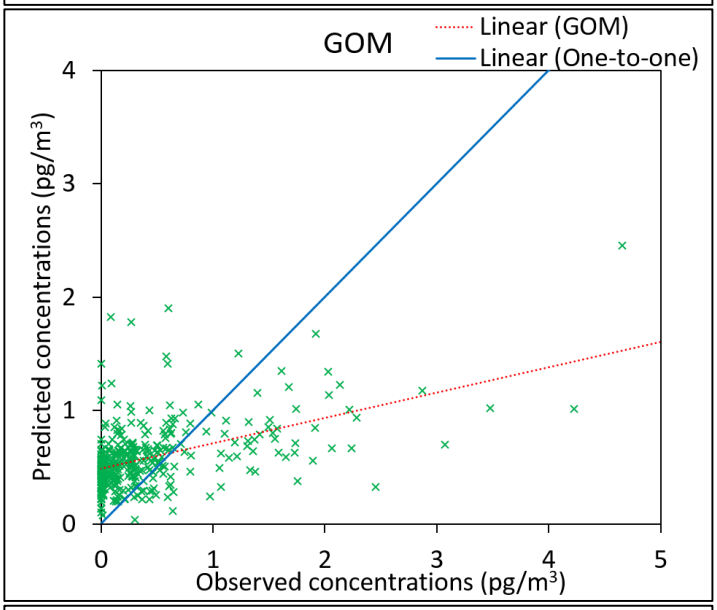


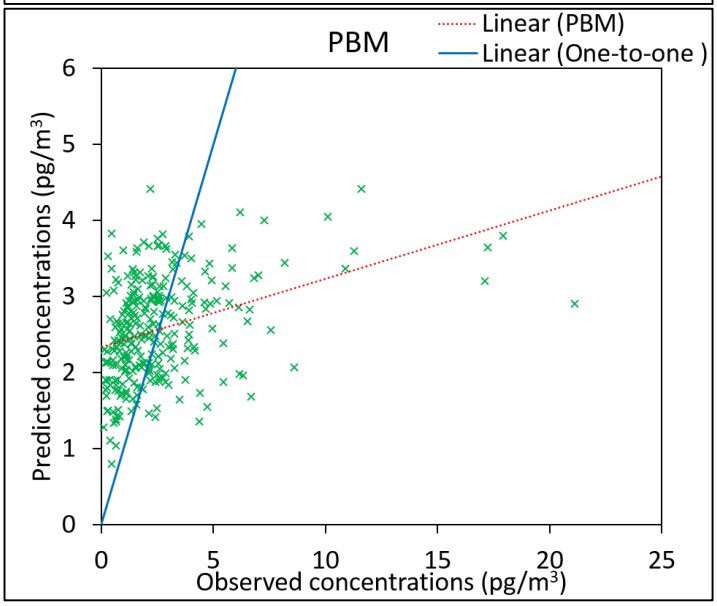
Figure S1. Obs/Pred scatter plot in 2009. a) Case 2009, b) Case 09+mean, c) Case 09+median, d) Case 09+RM, e) Case 09-RM, and f) Case 09ScaleRM, observed GOM and PBM have been scaled.

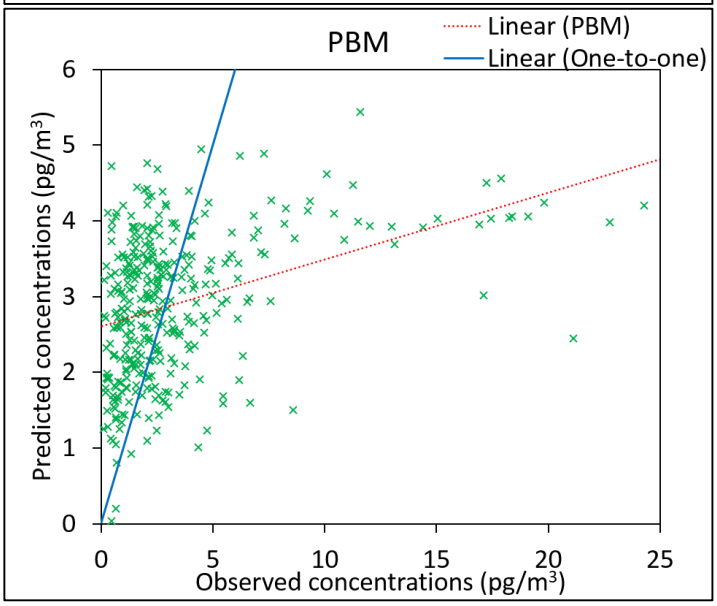

GEM
Linear (GEM)
Linear (One-to-one)
a)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3

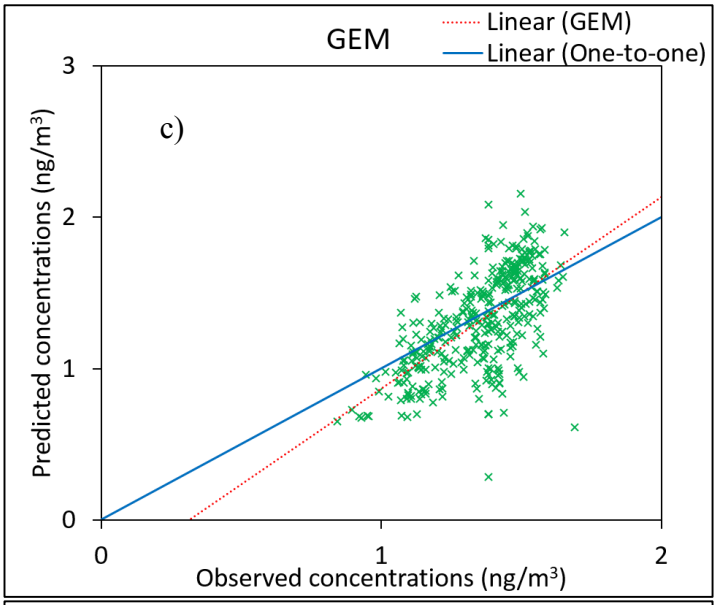

GEM
Linear (GEM)
Linear (One-to-one)
b)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3

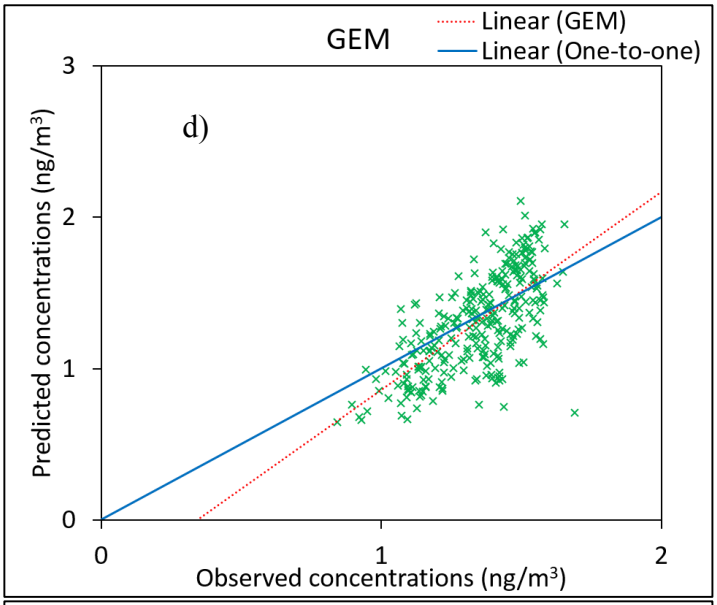

GOM
Linear (GOM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
1
2
3
4
5

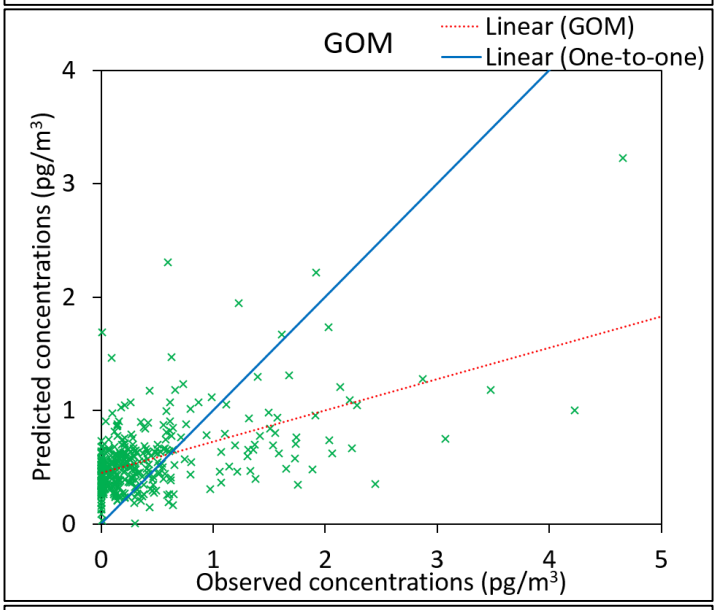

GOM
Linear (GOM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
1
2
3
4
5

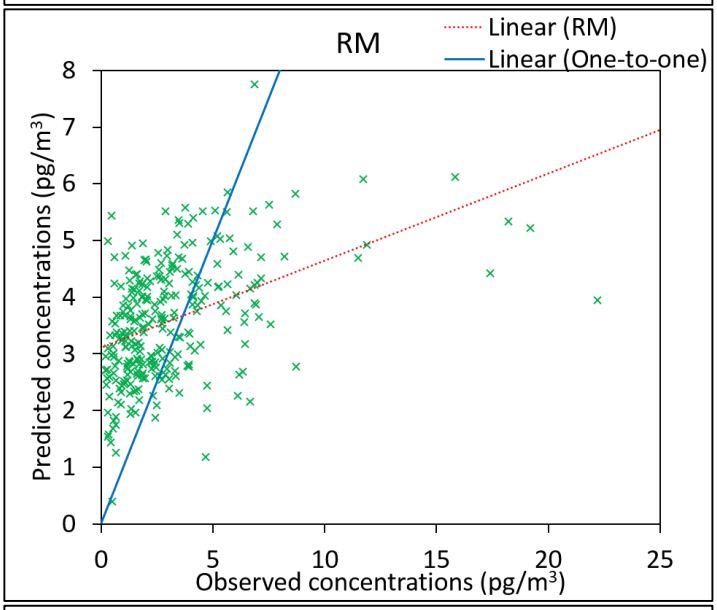

PBM
Linear (PBM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
5
10
15
20
25

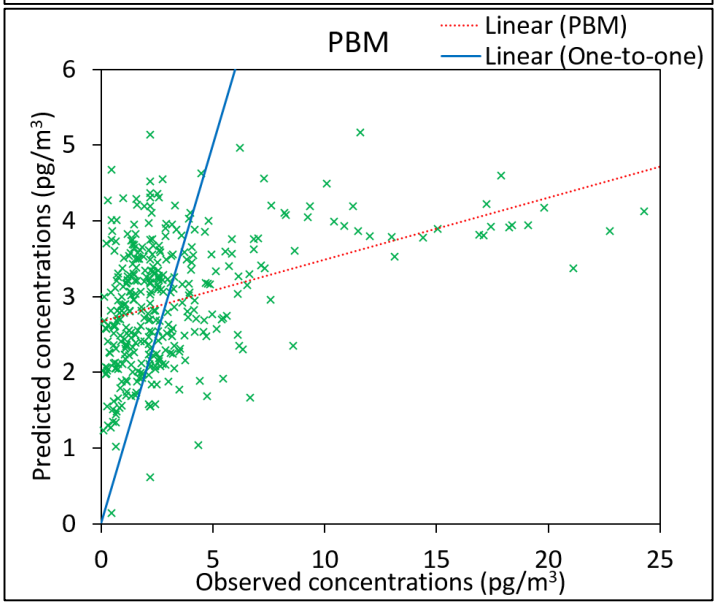

PBM
Linear (PBM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
5
10
15
20
25

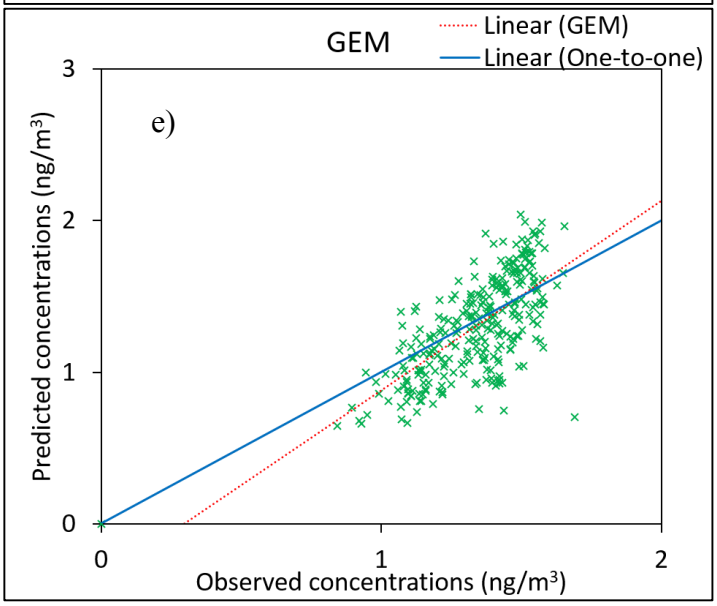

GEM
Linear (GEM)
Linear (One-to-one)
c)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3


GEM
Linear (GEM)
Linear (One-to-one)
d)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3


GOM
Linear (GOM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
1
2
3
4
5


RM
Linear (RM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
5
10
15
20
25


PBM
Linear (PBM)
Linear (One-to-one)
Predicted concentrations (pg/m³)
Observed concentrations (pg/m³)
0
5
10
15
20
25


GEM
Linear (GEM)
Linear (One-to-one)
e)
Predicted concentrations (ng/m³)
Observed concentrations (ng/m³)
0
1
2
3

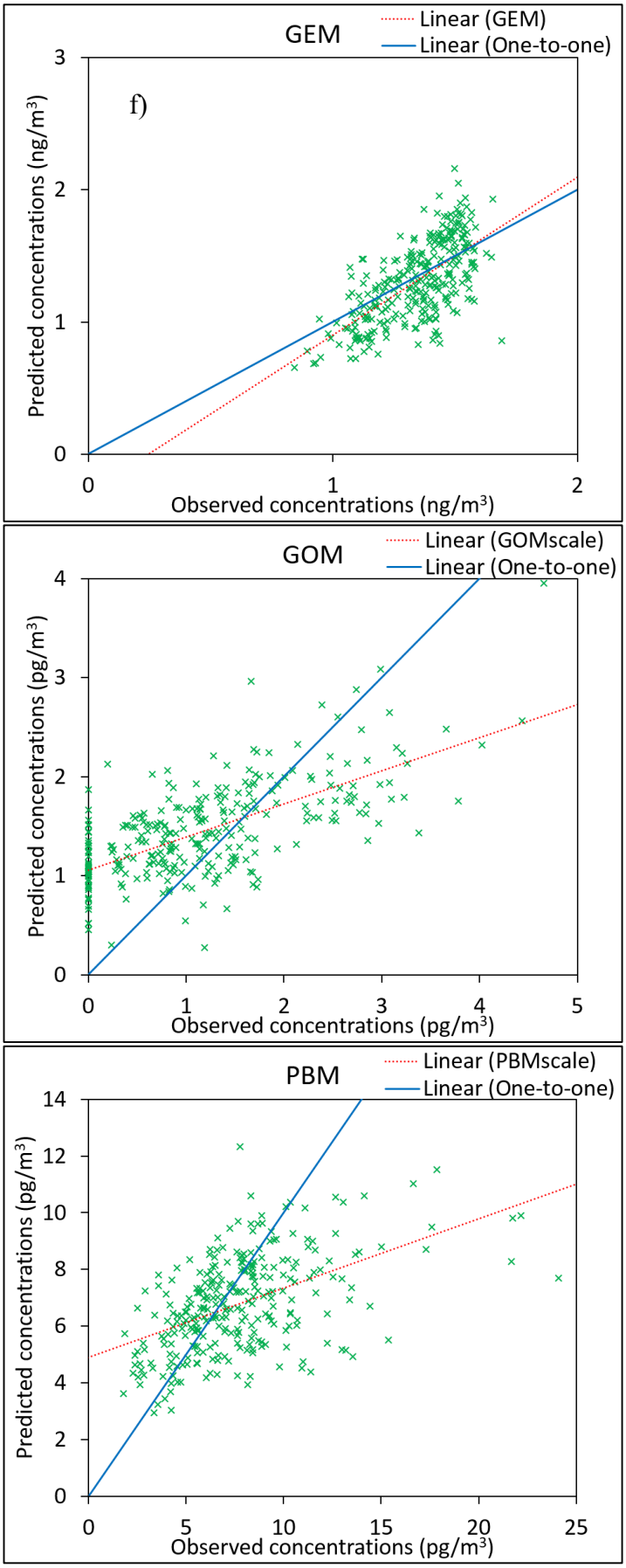
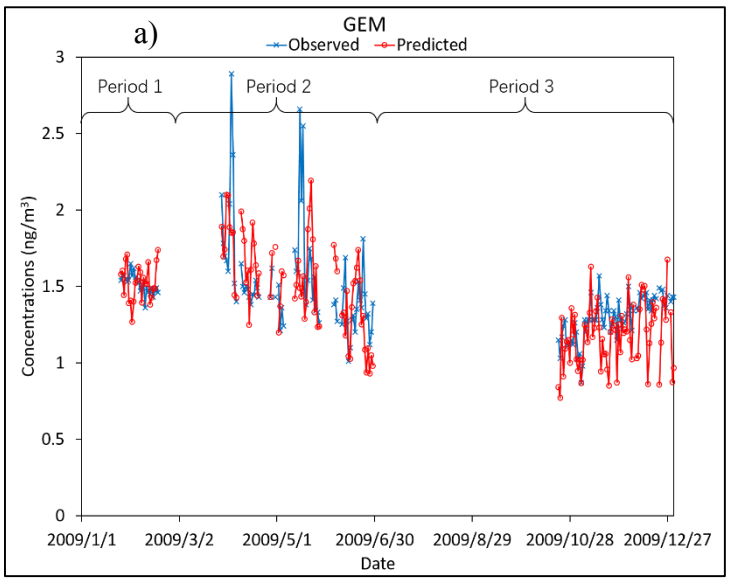
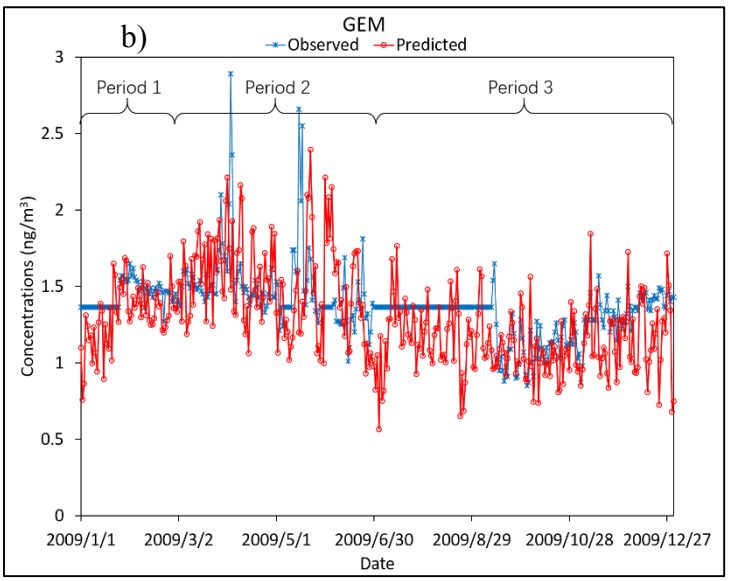
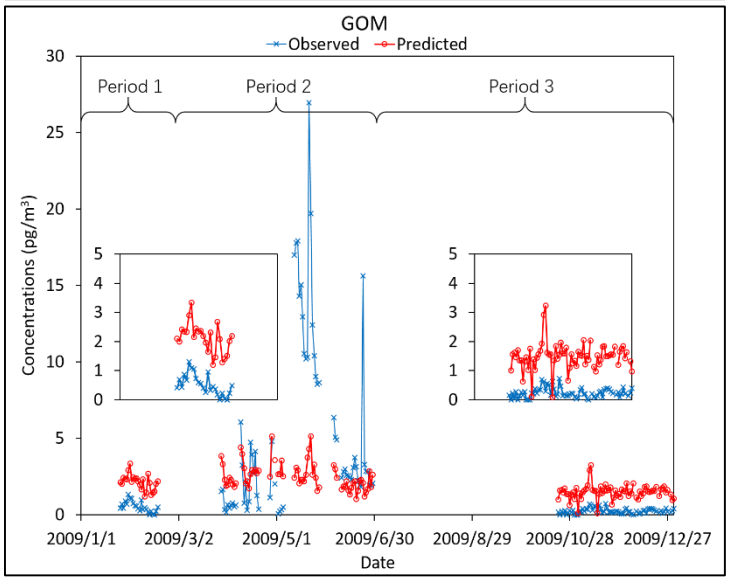
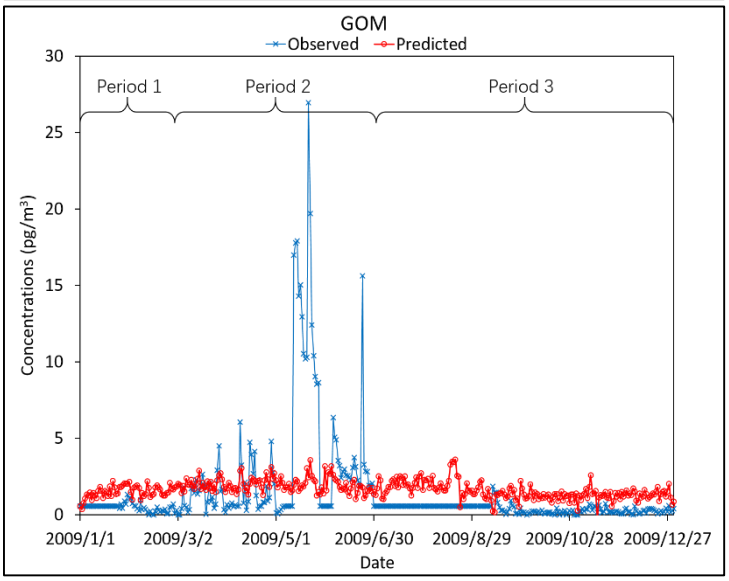


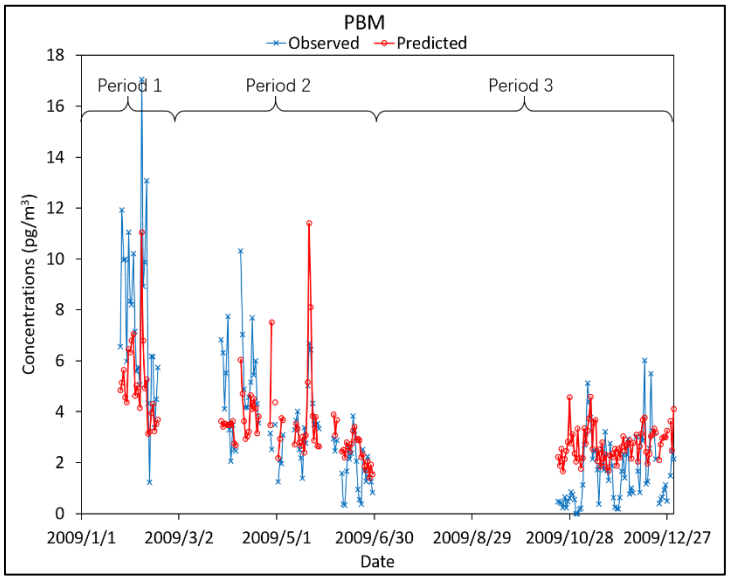
Figure S2. Obs/Pred scatter plot in 2010. a) Case 2010, b) Case 10+mean, c) Case 10+median, d) Case 10+RM, e) Case 10-RM, and f) Case 10ScaleRM, observed GOM and PBM have been scaled.

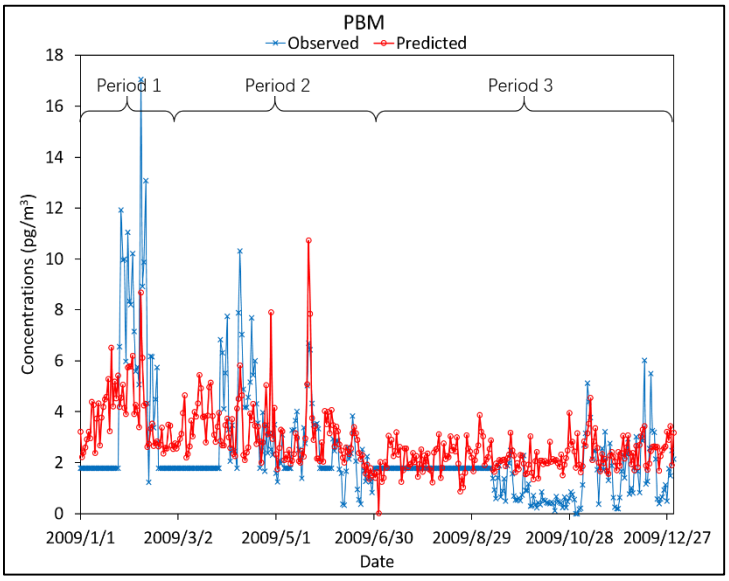

a)
GEM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (ng/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27

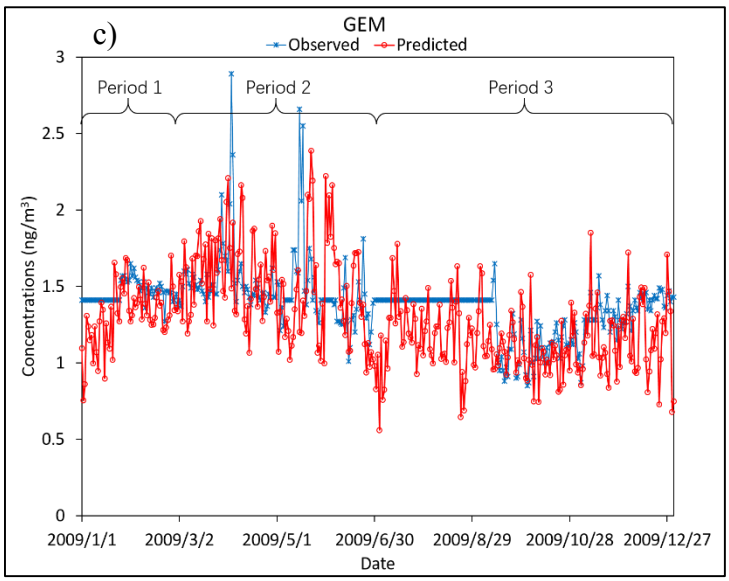

b)
GEM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (ng/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27

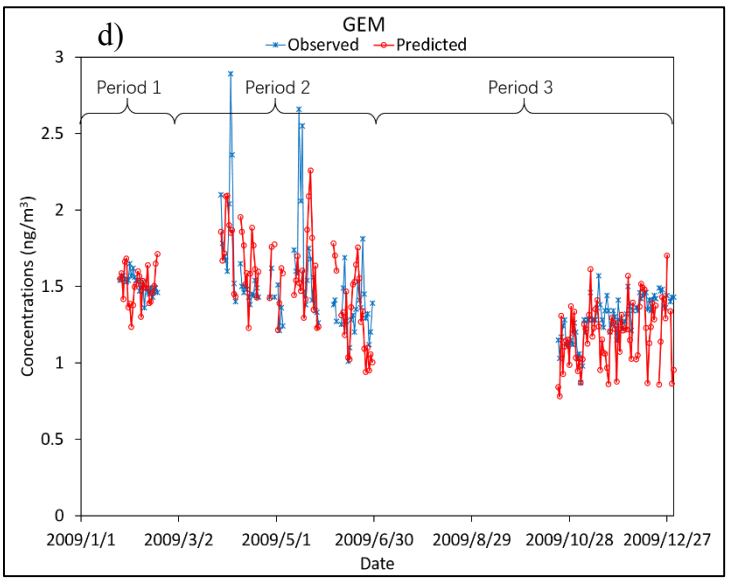

GOM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (pg/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27

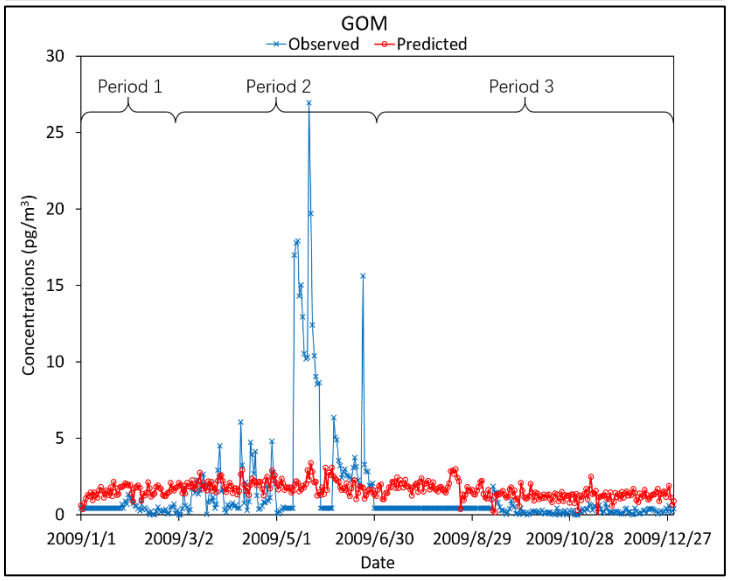

GOM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (pg/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27

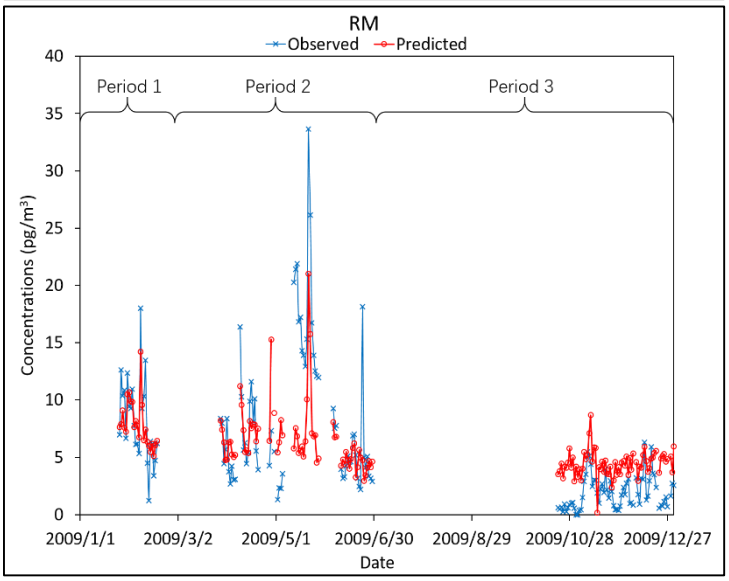

PBM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (pg/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27

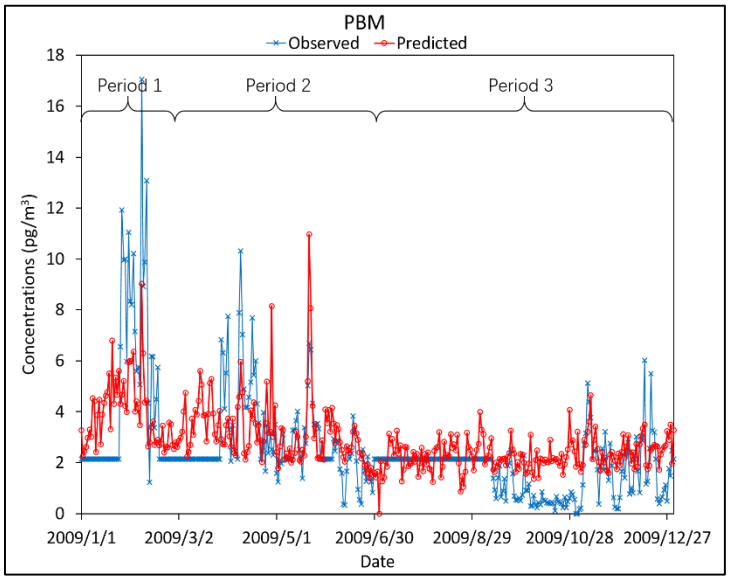

PBM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (pg/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27

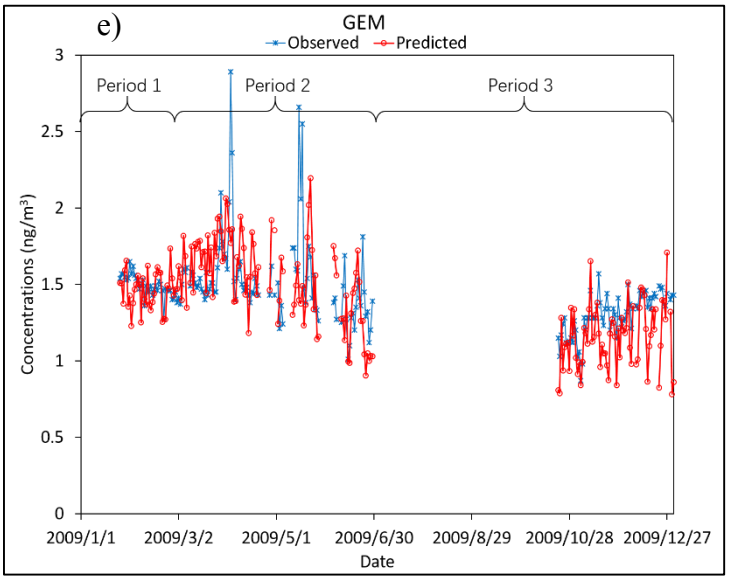

c)
GEM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (ng/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27


d)
GEM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (ng/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27


GOM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (pg/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27


RM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (pg/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27


PBM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (pg/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27


e)
GEM
Observed
Predicted
Period 1
Period 2
Period 3
Concentrations (ng/m³)
Date
2009/1/1
2009/3/2
2009/5/1
2009/6/30
2009/8/29
2009/10/28
2009/12/27

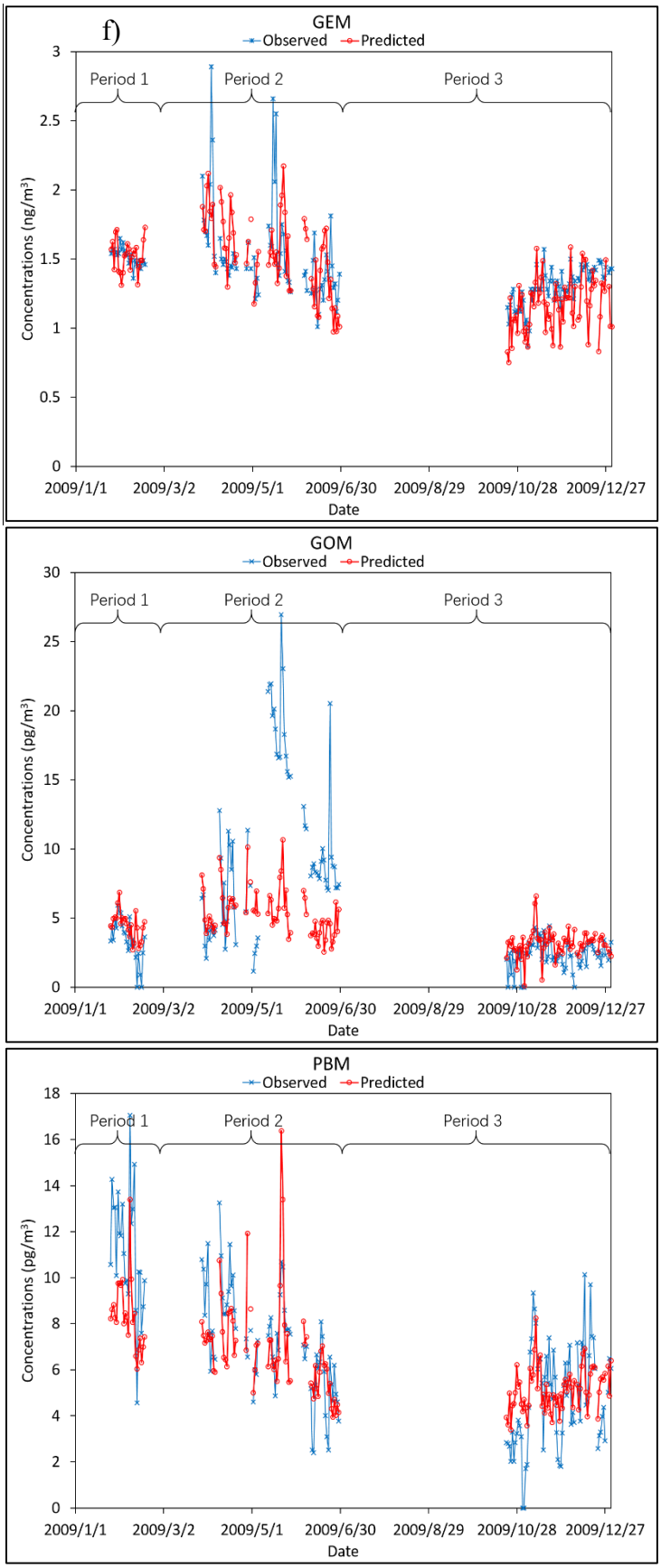
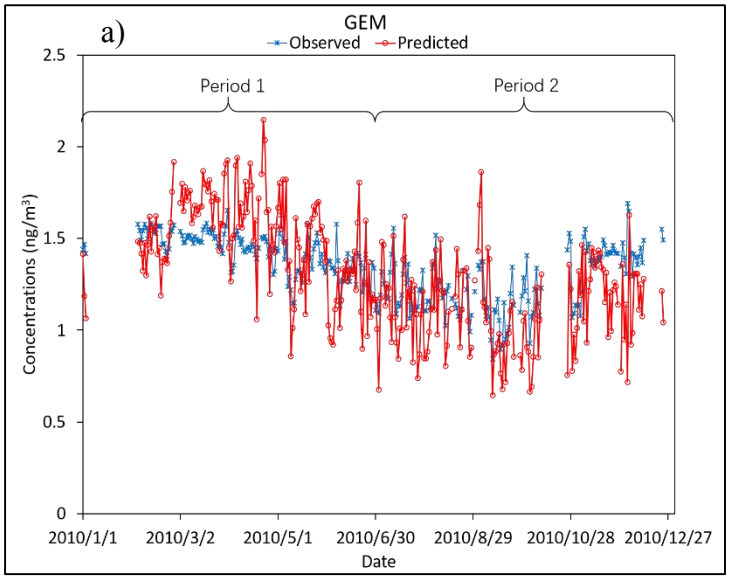
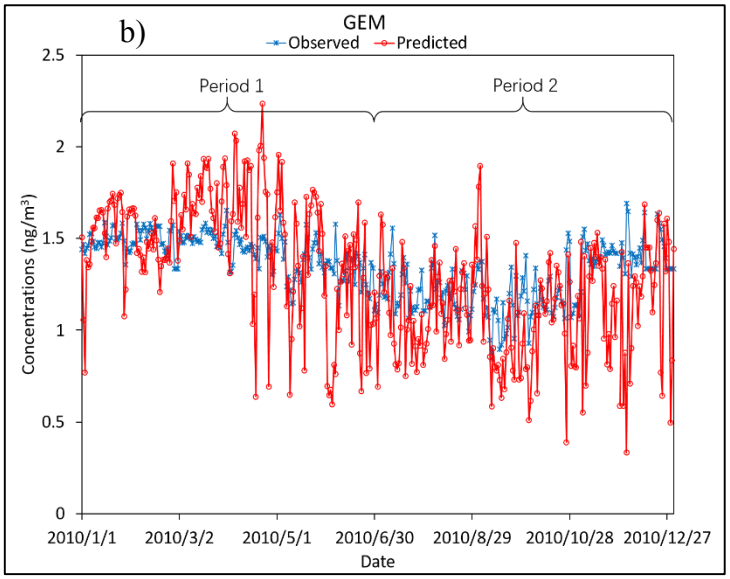
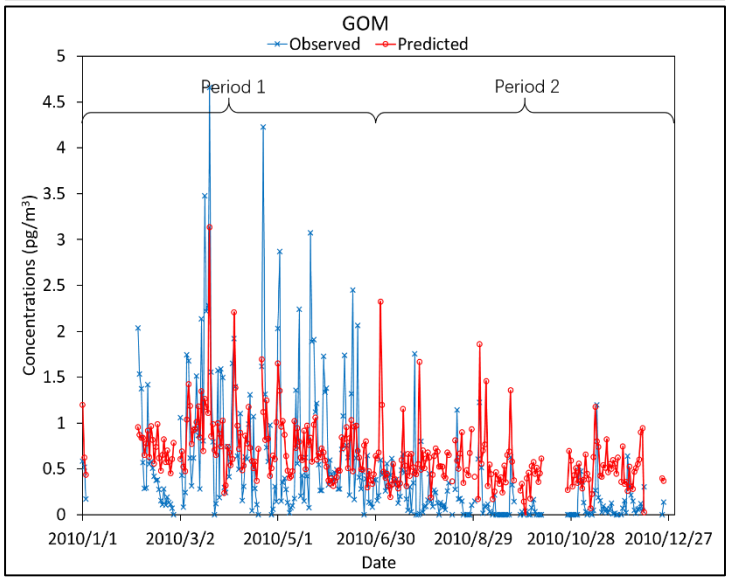
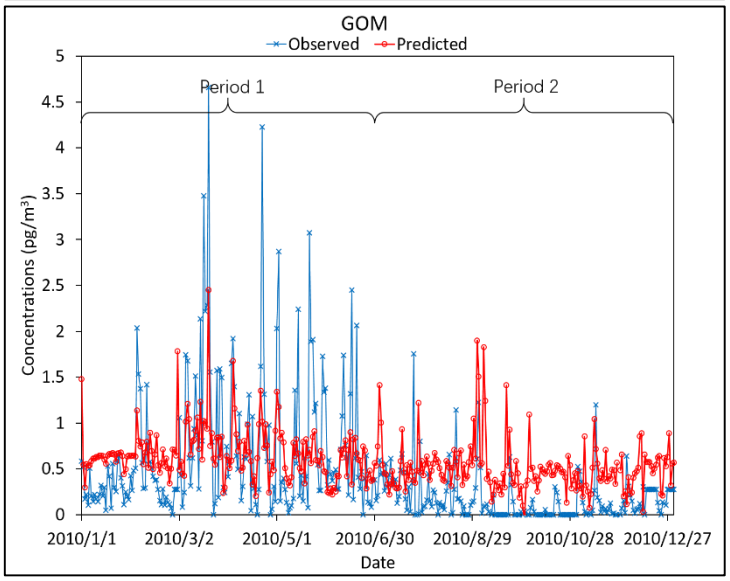


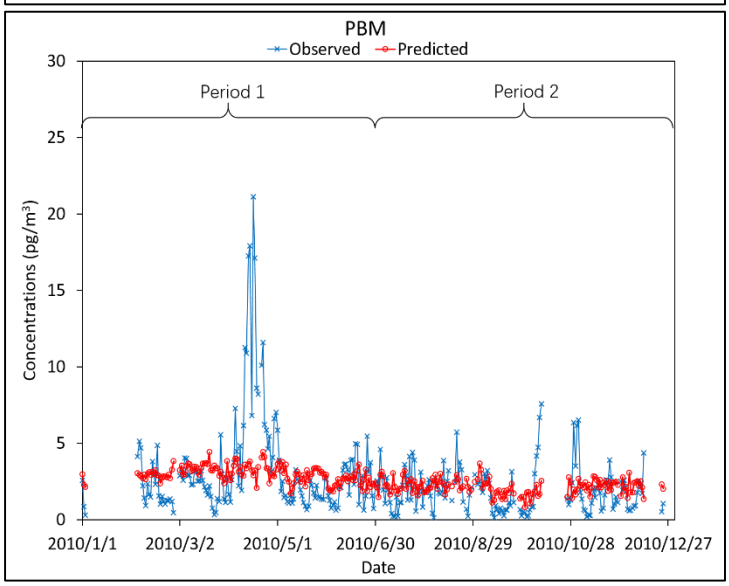
Figure S3. Obs/Pred time series in 2009. a) Case 2009, b) Case 09+mean, c) Case 09+median, d) Case 09+RM, e) Case 09-RM, and f) Case 09ScaleRM, observed GOM and PBM have been scaled.

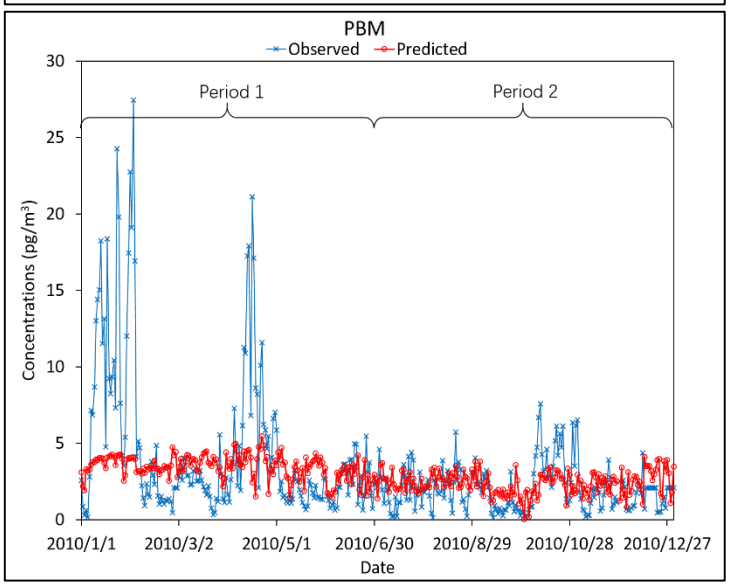

a)
GEM
Observed
Predicted
Period 1
Period 2
Concentrations (ng/m³)
2.5
2
1.5
1
0.5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date

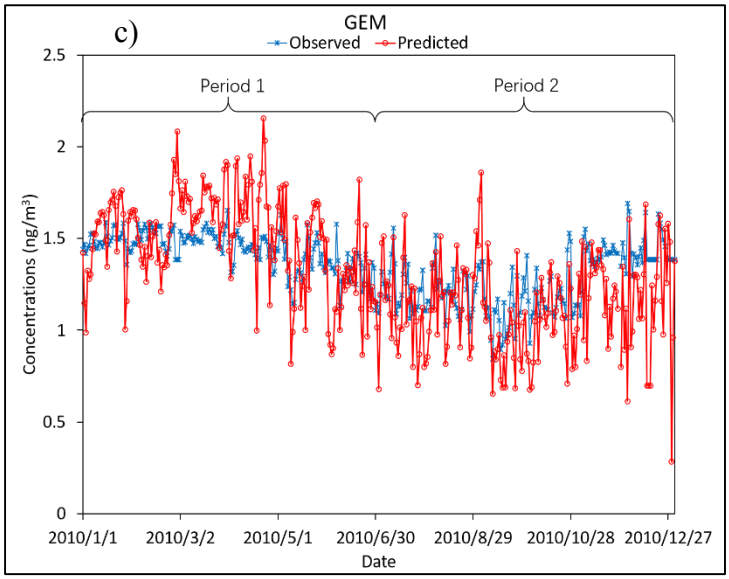

b)
GEM
Observed
Predicted
Period 1
Period 2
Concentrations (ng/m³)
2.5
2
1.5
1
0.5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date

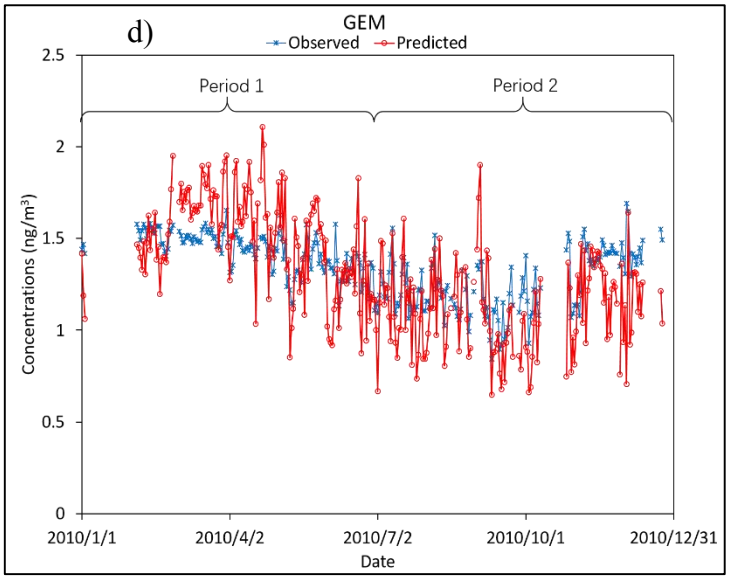

GOM
Observed
Predicted
Period 1
Period 2
Concentrations (pg/m³)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date

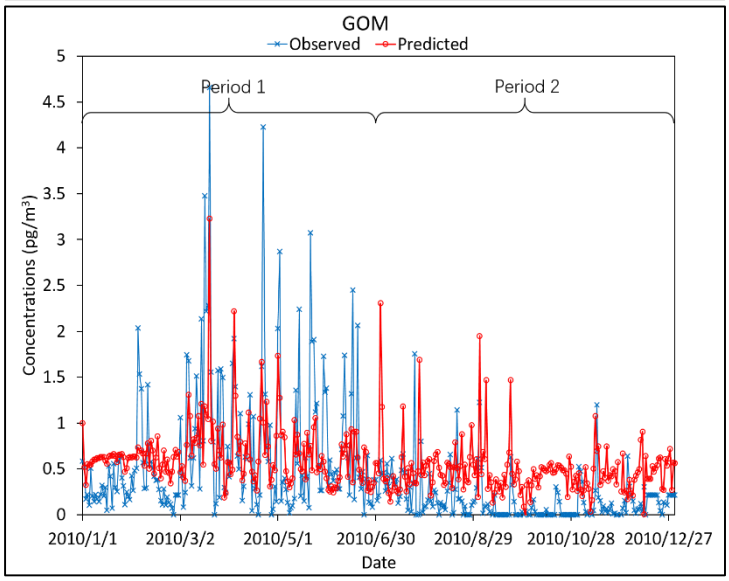

GOM
Observed
Predicted
Period 1
Period 2
Concentrations (pg/m³)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date

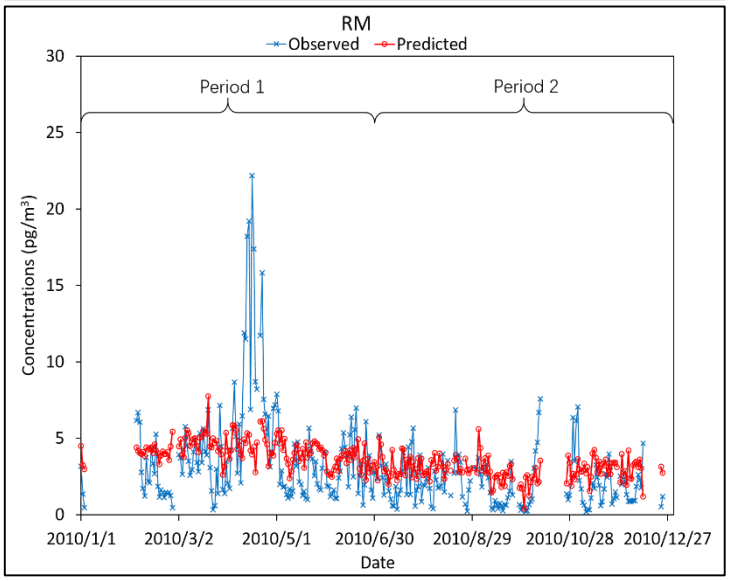

PBM
Observed
Predicted
Period 1
Period 2
Concentrations (pg/m³)
30
25
20
15
10
5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date

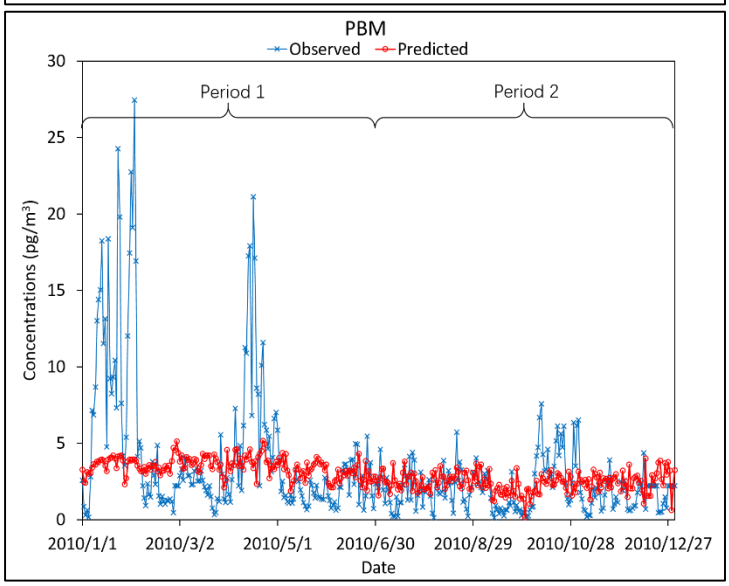

PBM
Observed
Predicted
Period 1
Period 2
Concentrations (pg/m³)
30
25
20
15
10
5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date

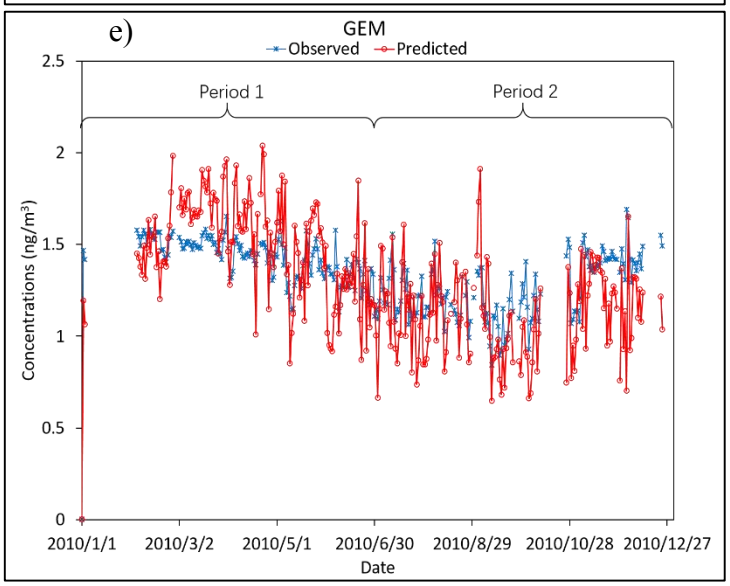

c)
GEM
Observed
Predicted
Period 1
Period 2
Concentrations (ng/m³)
2.5
2
1.5
1
0.5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date


d)
GEM
Observed
Predicted
Period 1
Period 2
Concentrations (ng/m³)
2.5
2
1.5
1
0.5
0
2010/1/1
2010/4/2
2010/7/2
2010/10/1
2010/12/31
Date


GOM
Observed
Predicted
Period 1
Period 2
Concentrations (pg/m³)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date


RM
Observed
Predicted
Period 1
Period 2
Concentrations (pg/m³)
30
25
20
15
10
5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date


PBM
Observed
Predicted
Period 1
Period 2
Concentrations (pg/m³)
30
25
20
15
10
5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date


e)
GEM
Observed
Predicted
Period 1
Period 2
Concentrations (ng/m³)
2.5
2
1.5
1
0.5
0
2010/1/1
2010/3/2
2010/5/1
2010/6/30
2010/8/29
2010/10/28
2010/12/27
Date

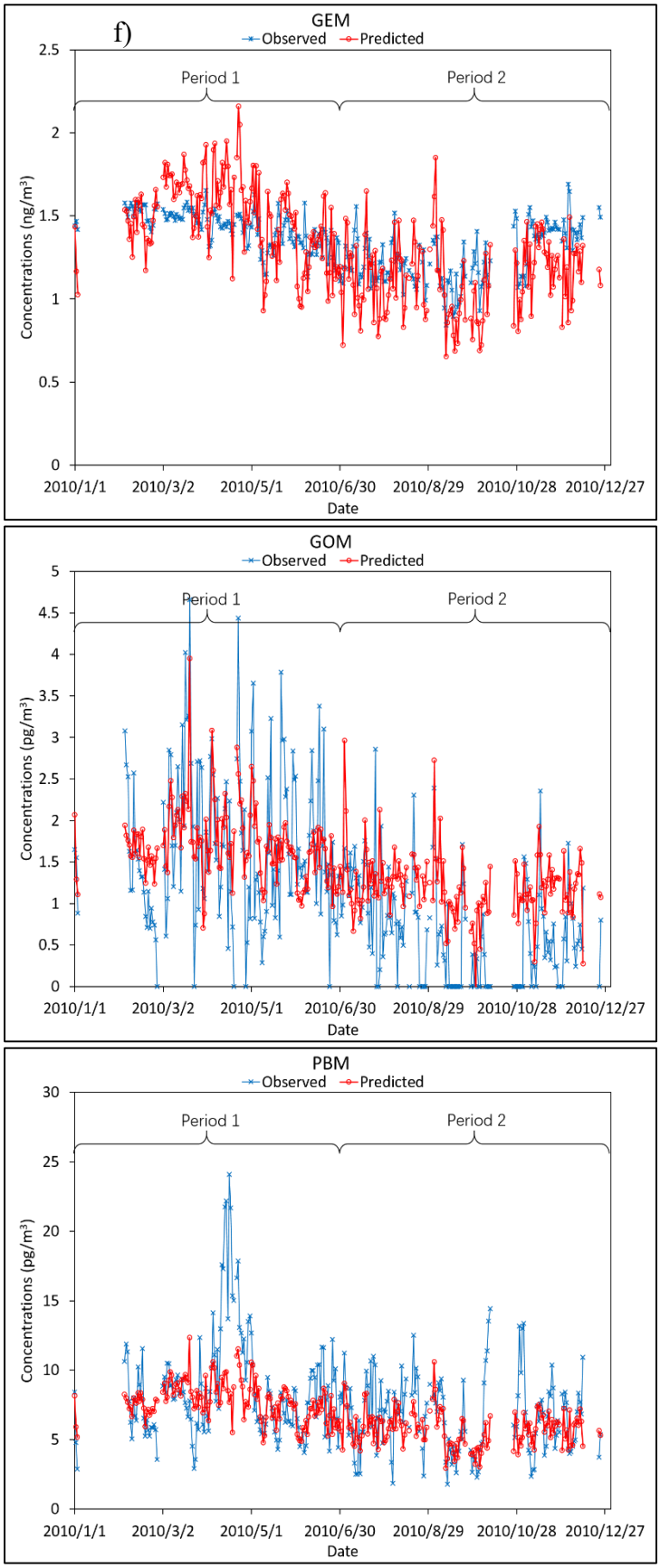


Figure S4. Obs/Pred time series in 2010. a) Case 2010, b) Case 10+mean, c) Case 10+median, d) Case 10+RM, e) Case 10-RM, and f) Case 10ScaleRM, observed GOM and PBM have been scaled.