Appendix D
Retrospective Data

TABLES

D.1. Annual maximum one-hour average ozone, 1992-2000
D.2. Annual maximum eight-hour average ozone, 1992-2000
D.3. Number of annual exceedance days for one-hour ozone, 1992-2000
D.4. Number of annual exceedance days for eight-hour ozone, 1992–2000
D5. Regression equations for correlation analysis of one-hour vs. eight-hour
D6. Climatological equivalency (S: Standard, E: Equivalency calculated with standard)
D7. Regression Equation for Correlation Analysis between 1hr CO and 8hr CO
D8. Climatological equivalency (S: Standard, E: Equivalency calculated with standard)
D9. Regional analysis of ozone exceeding days for Cincinnati, Dayton, Toledo, Columbus (Maple Canyon), Cleveland, Akron, Marietta and Columbus (Chesapeake): 1992-2000 in ppb
D10. High Concentration and High Frequency in Correlation With Wind Direction.

FIGURES

D1. High ozone days exceeding 1-hour threshold level, 1992-2000
D2 (a&b). 24-hour averaged PM_{10} levels: (a) Cincinnati urban site, 1992-1999 (b) Maple Canyon suburban site
D2 (c&d). 24-hour averaged PM_{10} levels 1992-2000: (c) Columbus (Chesapeake) suburban site, (d) Cleveland suburban
D2 (e). 24-hour averaged PM_{10} levels in 1992-2000: (e) Steubenville urban Site
D3. 2nd Highest 1hr Averaged CO in 1992-20
D4-1 (a & b). Hourly CO distribution: (a) Cincinnati and (b) Dayton
D4-1 (c & d). Hourly CO distribution: (c) Columbus (Chesapeake) and (d) Columbus (Maple Canyon)
D4-1 (e & F). Hourly CO distribution: (e) Akron and (f) Cleveland
D4-2 (a & b). Hourly SO_2 distribution: (a) Cincinnati and (b) Dayton
D4-2 (c & d). Hourly SO_2 distribution in: (c) Chesapeake and (d) Cleveland
D4-2 (e & f). Hourly SO_2 distribution: (e) Akron and (f) Steubenville
D4-3 (a & b). Hourly NO_2 distribution: (a) Cincinnati and (b) Cleveland
D4-3 (c). Hourly NO_2 distribution: (c) Steubenville
D5-1 (a&b). Correlation between CO and Ozone Concentration in 1992-2000: (a) Cincinnati and (b) Dayton
D5-1 (c&d). Correlation between CO and Ozone Concentration: (c) Columbus (Chesapeake), 1992-2000 and (d) Columbus (Maple Canyon), 1993-2000
D5-2 (a&b). Correlation between SO_2 and Ozone Concentration in 1992-2000: (a) Cincinnati and (b) Dayton
D6-1. Spatial Coordination plots of PM_{10}, 1992-2000

D6-2. Spatial Coordination plots of CO, 1992-2000
D6-3. . Spatial Coordination plots of SO_2 , 1992-2000
D6-3. Spatial Coordination plots of SO_2, 1992-2000
D6-4. Spatial Coordination plots of NO_2, 1992-2000
D7 (a & b). KZ Filter of ozone levels in (a) Cincinnati and (b) Dayton, 1992-2000
D7 (c & d). KZ Filter of ozone levels in (c) Columbus (Maple Canyon) and (d) Columbus (Chesapeake), 1992-2000
D7 (e & f). KZ Filter of ozone levels in (e) Akron and (f) Cleveland, 1992-2000
D7 (g & h). KZ Filter of ozone levels in (g) Marietta and (h) Toledo, 1992-2000
D7 (i). KZ Filter of ozone levels in (i) Steubenville, 1992-2000
D8 (a & b). KZ Filter of PM_{10} levels in (a) Cincinnati, 1992-1999 and (b) Maple Canyon, 1992-2000
D8 (c & d). KZ Filter of PM_{10} levels in (c) Columbus (Chesapeake) and (d) Cleveland, 1992-2000
D8 (e). KZ Filter of PM_{10} levels in (e) Steubenville, 1992-2000
D9 (a & b). KZ Filter of CO levels in (a) Cincinnati and (b) Dayton, 1992-2000
D9 (c & d). KZ Filter of CO levels in (c) Columbus (Chesapeake) and (d) Columbus (Maple Canyon), 1993-2000
D9 (e & f). KZ Filter of CO levels in (e) Akron and (f) Cleveland, 1992-2000
D10 (a & b). KZ Filter of SO_2 levels in (a) Cincinnati and (b) Dayton, 1992-2000
D10 (c & d) KZ Filter of SO_2 levels in (c) Columbus (Chesapeake) and (d) Cleveland, 1992-2000
D10 (e & f) KZ Filter of SO_2 levels in (e) Akron and (f) Steubenville, 1992-2000
D11 (a & b) KZ Filter of NO_2 levels in (a) Cincinnati, 1992-2000 and (b) Cleveland, 1992-1999
D11 (c) KZ Filter of NO_2 at (c) Steubenville, 1992-1997
D12. Co-relational plots of maximum eight-hour vs. one-hour ozone concentrations at the six monitoring site, 1992-2000
D13. Co-relational plots of maximum eight-hour vs. one-hour ozone concentrations at the six monitoring site, 1992-2000
D14. Correlation between 1 Hour and 8 Hour CO1992-2000: (a) Cincinnati, (b) Dayton, (c) Columbus (Chesapeake), (d) Columbus (Maple Canyon), (e) Akron and (f) Cleveland
D15 (a & b). Correlations between PM_{10} and weather components at Columbus (Maple Canyon), Ohio in 1992-2000: (a) PM_{10} vs. wind speed and (b) PM_{10} vs. wind direction
D15 (c). Correlations between PM_{10} and weather components at Columbus (Maple Canyon), Ohio in 1992-1999: (c) PM_{10} vs. temperature
D16 (a & b). Correlations between PM_{10} and weather components at Columbus (Chesapeake), Ohio in 1992-1999: (a) PM_{10} vs. wind speed and : (b) PM_{10} and wind direction.
D16 (c). Correlations between PM_{10} and weather components at Columbus (Chesapeake), Ohio in 1992-2000 and (c) PM_{10} vs. temperature
D17 (a & b). Correlations between PM_{10} and weather components at Cleveland, Ohio in 1992-2000: (a) PM_{10} vs. wind speed and (b) PM_{10} vs. wind direction
D17 (c). Correlations between PM_{10} and weather components at Cleveland, Ohio in 1992-2000: (c) PM_{10} vs. temperature.

D18 (a & b). Correlations between PM_{10} and weather components at Steubenville, Ohio in 1992-2000: (a) PM_{10} vs. wind speed and (b) PM_{10} vs. wind direction

D18 (c). Correlations between PM_{10} and weather components at Steubenville, Ohio in 1992-2000: and (c) PM_{10} vs temperature.

D19. Correlations between CO and weather components at Cincinnati, Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction

D20. Correlations between CO and weather components at Dayton, Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction

D21. Correlations between CO and weather components at Columbus (Chesapeake), Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction

D22. Correlations between CO and weather components at Columbus (Maple Canyon), Ohio in 1993-2000 (a) CO vs. wind speed and (b) CO vs. wind direction

D23. Correlations between CO and weather components at Akron, Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction

D24. Correlations between CO and weather components at Cleveland, Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction

D25. Correlations between SO_2 and weather components at Cincinnati, Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction

D26. Correlations between SO_2 and weather components at Dayton, Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction

D27. Correlations between SO_2 and weather components at Columbus (Chesapeake), Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction

D28. Correlations between SO_2 and weather components at Cleveland, Ohio in 1992-2000 (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction

D29. Correlations between SO_2 and weather components at Akron, Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction

D30. Correlations between SO_2 and weather components at Steubenville, Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction

D31. orrelations between NO_2 and weather components at Cincinnati, Ohio in 1995-2000: (a) NO_2 vs. wind speed and (b) NO_2 vs. wind direction

D32. orrelations between NO_2 and weather components at Dayton, Ohio in 1992-1999: (a) NO_2 vs. wind speed and (b) NO_2 vs. wind direction

D33. orrelations between NO_2 and weather components at Steubenville, Ohio in 1992-1997: (a) NO_2 vs. wind speed and (b) NO_2 vs. wind direction

D34 (a & b). Back trajectories for high CO days at the monitoring sites selected in Ohio, 1992-2000: (a) Cincinnati and (b) Dayton

D34 (c & d). Back trajectories for high CO days at the monitoring sites selected in Ohio: (c) Columbus (Chesapeake), 1992-2000 and (d) Columbus (Maple Canyon), 1993-2000

D34 (e & f). Back trajectories for high CO days at the monitoring sites selected in Ohio, 1992-2000: (e) Akron and (f) Cleveland

D35. (a) Cluster plot at Cincinnati, 1992-2000 (b) Frequencies and average CO concentrations by cluster at Cincinnati, 1992-2000

D36. (a) Cluster plot at Dayton, 1992-2000 (b) Frequencies and average CO concentrations by cluster at Dayton, 1992-2000

D37. (a) Cluster plot at Columbus (Chesapeake), 1992-2000 (b) Frequencies and average CO concentrations by cluster at Columbus (Chesapeake), 1992-2000

D38. (a) Cluster plot at Columbus (Maple Canyon), 1993-2000 (b) Frequencies and average CO concentrations by cluster at Columbus (Maple Canyon), 1993-2000

D39. (a) Cluster plot at Akron 1992-2000 (b) Frequencies and average CO concentrations by cluster at Akron, 1992-2000

D40. (a) Cluster plot at Cleveland, 1992-2000 (b) Frequencies and average CO concentrations by cluster at Cleveland, 1992-2000

D41 (a & b). Back trajectories for high SO_2 days at the monitoring sites selected in Ohio, 1992-2000: (a) Cincinnati and (b) Dayton

D41 (c & d). Back trajectories for high SO_2 days at the monitoring sites selected in Ohio, 1992-2000: (c) Columbus (Chesapeake) and (d) Cleveland.

D41 (e & f). Back trajectories for high SO_2 days at the monitoring sites selected in Ohio, 1992-2000: (e) Akron and (f) Steubenville

D42. (a) Cluster plot at Cincinnati, 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Cincinnati, 1992-2000

D43. (a) Cluster plot at Dayton, 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Dayton, 1992-2000

D44. (a) Cluster plot at Columbus (Chesapeake), 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Columbus (Chesapeake), 1992-2000

D45. (a) Cluster plot at Cleveland, 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Cleveland, 1992-2000

D46. (a) Cluster plot at Akron 1992-2000 (b) Frequencies and average SO2 concentrations by cluster at Akron, 1992-2000

D47. (a) Cluster plot at Steubenville, 1992-2000 (b) Frequencies and average SO2 concentrations by cluster at Steubenville, 1992-2000

D48. Back trajectories for high NO_2 days at the monitoring sites selected in Ohio: Cleveland, 1992-1999

D49. Back trajectories for high NO_2 days at the monitoring sites selected in Ohio: Steubenville, 1992-1997

D50. (a) Cluster plot at Cincinnati, 1995-2000 (b) Frequencies and average NO_2 concentrations by cluster at Cincinnati, 1995-2000

D51. a) Cluster plot at Cleveland, 1995-2000 (b) Frequencies and average NO_2 concentrations by cluster at Cleveland, 1995-2000

D52. (a) Cluster plot at Steubenville, 1992-1997 (b) Frequencies and average NO_2 concentrations by cluster at Steubenville, 1992-1997

Table D.1. Annual maximum one-hour average ozone, 1992-2000

	Cincinnati	Dayton	Columbus (Maple Canyon)	Columbus (Chesapeake	Akron	Cleveland	Marietta	Toledo	Steubenville
1992	87	99	89	**130**	117	109	105	96	113
1993	110	**125**	108	109	110	**126**	**137**	**131**	110
1994	109	118	98	106	110	**127**	**126**	113	**153**
1995	**128**	115	104	**130**	124	113	112	**130**	118
1996	115	117	98	118	113	110	113	108	100
1997	117	**130**	98	101	112	97	110	118	106
1998	115	116	122	113	**128**	112	**125**	116	93
1999	104	**128**	118	123	115	99	**125**	122	113
2000	109	112	111	-	110	94	113	97	103

Table D.2. Annual maximum eight-hour average ozone, 1992-2000

	Cincinnati	Dayton	Columbus (Maple Canyon)	Columbus (Chesapeake)	Akron	Cleveland	Marietta	Toledo	Steubenville
1992	78	83	79	**114**	**99**	87	**116**	**88**	**87**
1993	**88**	**99**	**94**	**95**	**100**	**103**	**108**	**101**	**101**
1994	**87**	**106**	**88**	**94**	**88**	**104**	**106**	**93**	**136**
1995	**115**	**104**	**96**	**108**	**99**	**91**	**99**	**115**	**102**
1996	**101**	**113**	**91**	**114**	**99**	**103**	**100**	**97**	**92**
1997	**98**	**106**	**90**	**97**	**99**	81	**97**	**95**	**94**
1998	**97**	**97**	**112**	**104**	**114**	**100**	**106**	**101**	83
1999	**95**	**113**	**107**	**110**	**95**	**92**	**118**	**101**	**102**
2000	**98**	**102**	**97**		**100**	**89**	**98**	**88**	**96**

Table D.3. Number of annual exceedance days for one-hour ozone, 1992-2000

	Cincinnati	Dayton	Columbus (Maple Canyon)	Columbus (Chesapeake)	Akron	Cleveland	Marietta	Toledo	Steubenville
1992	0	0	0	0	0	0	2	0	0
1993	0	1	0	0	0	1	1	1	0
1994	0	0	0	0	0	2	1	0	1
1995	1	0	0	1	0	0	0	1	0
1996	0	0	0	0	0	0	0	0	0
1997	0	1	0	0	0	0	0	0	0
1998	0	0	0	0	1	0	1	0	0
1999	0	2	0	0	0	0	1	0	0
2000	0	0	0		0	0	0	0	0

Table D.4. Number of annual exceedance days for eight-hour ozone, 1992–2000

	Cincinnati	Dayton	Columbus (Maple Canyon)	Columbus (Chesapeake)	Akron	Cleveland	Marietta	Toledo	Steubenville
1992	0	0	0	0	5	1	4	1	1
1993	2	**10**	6	5	**10**	7	**18**	3	1
1994	1	9	1	6	5	2	**13**	5	3
1995	4	7	7	5	**10**	3	9	7	**11**
1996	5	**14**	4	**10**	9	4	4	8	2
1997	4	4	3	4	5	0	3	5	1
1998	6	8	**12**	**14**	**14**	1	**12**	6	0
1999	7	**11**	11	**13**	**12**	1	**12**	3	6
2000	4	3	1		3	1	3	1	3

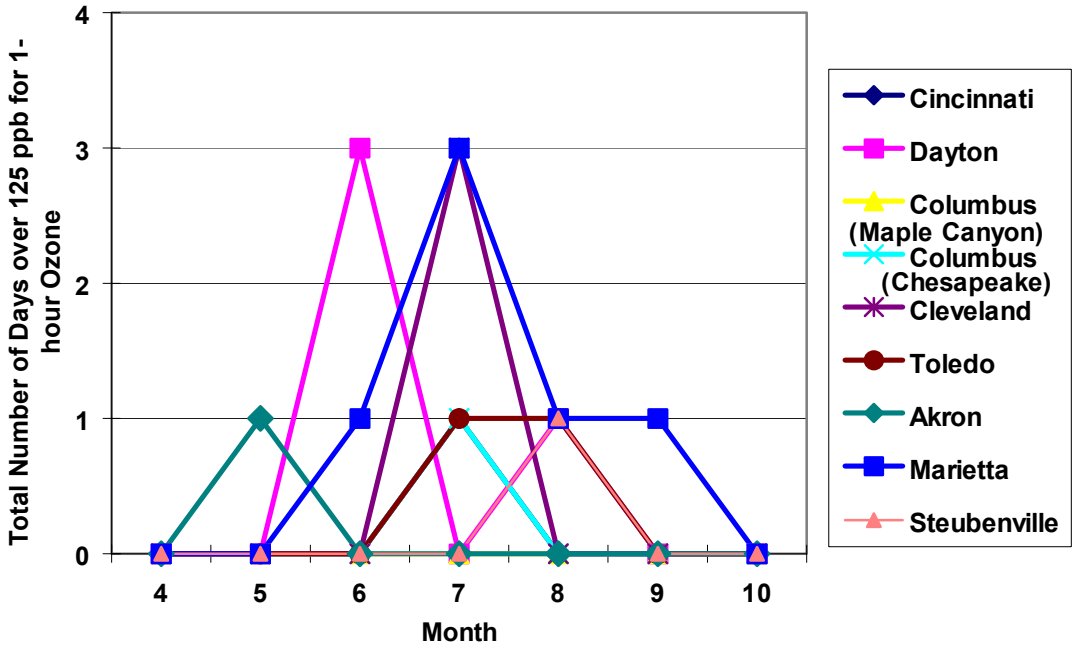


Figure D.1. High ozone days exceeding 1-hour threshold level, 1992-2000

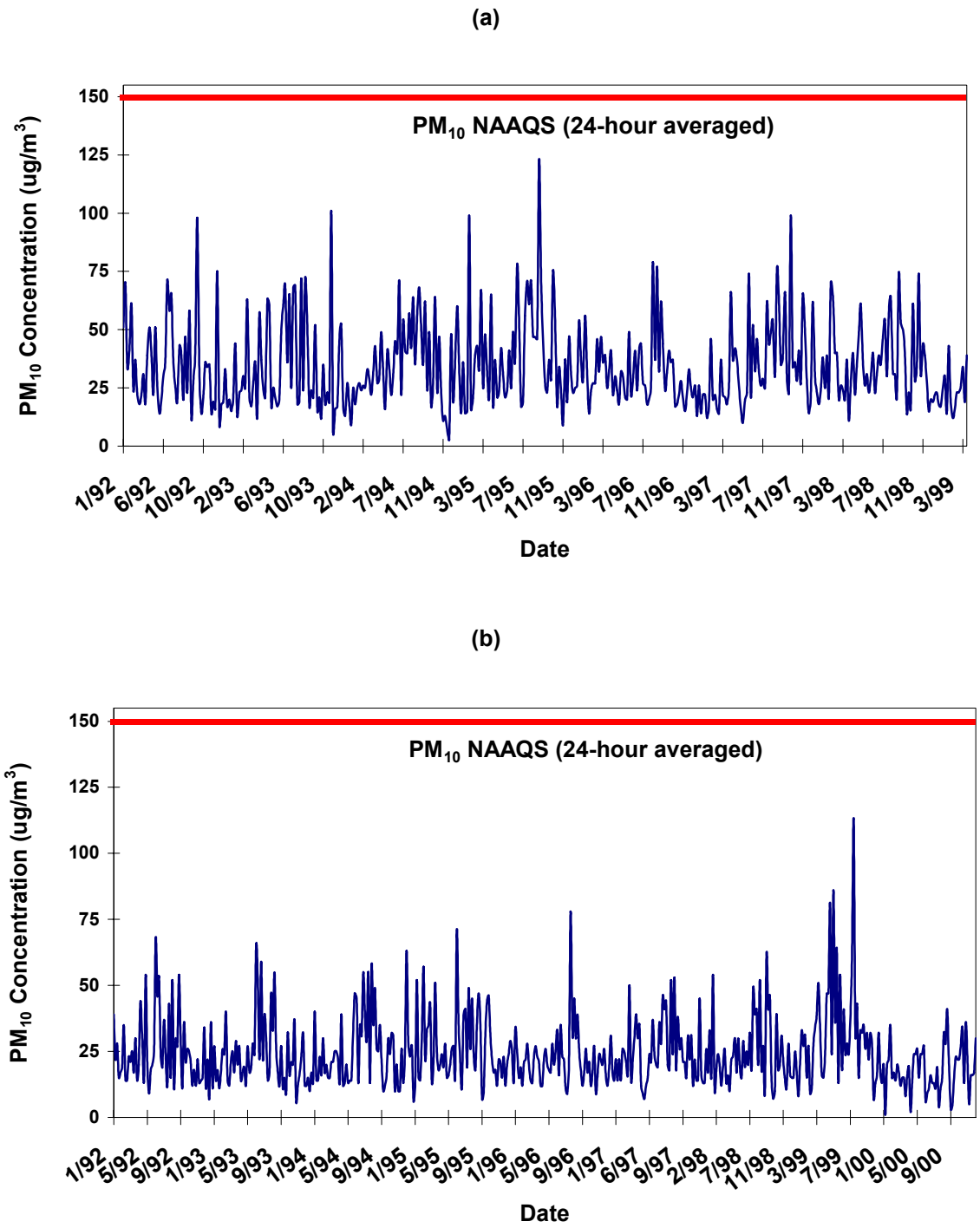
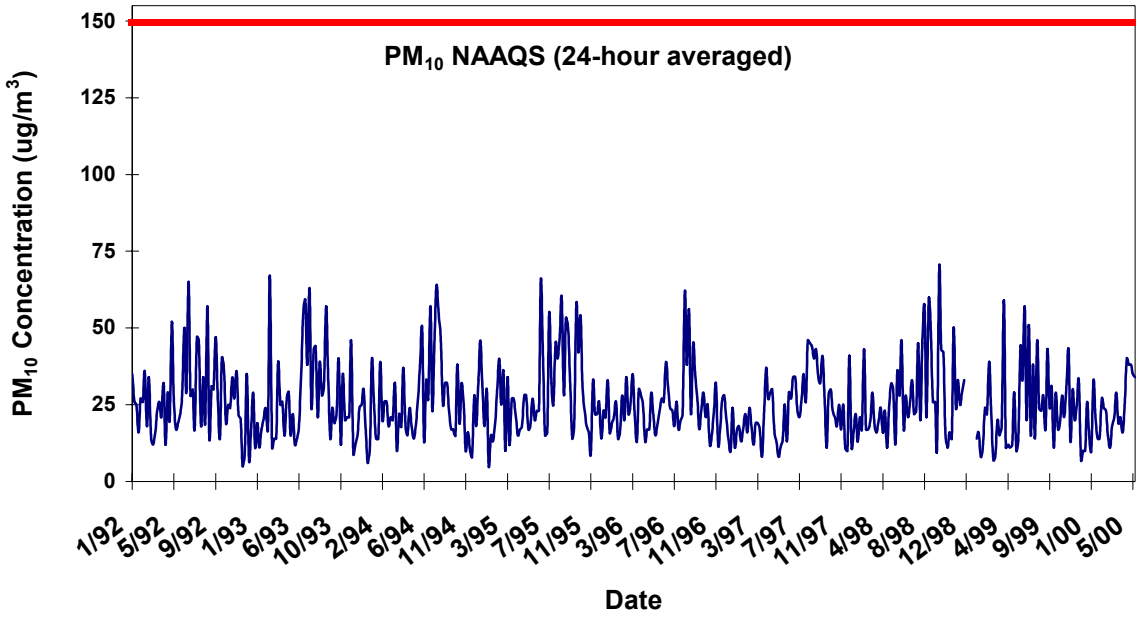


Figure D.2. 24-hour averaged PM_{10} levels: (a) Cincinnati urban site, 1992-1999 (b) Columbus (Maple Canyon) suburban site.

(c)



(d)

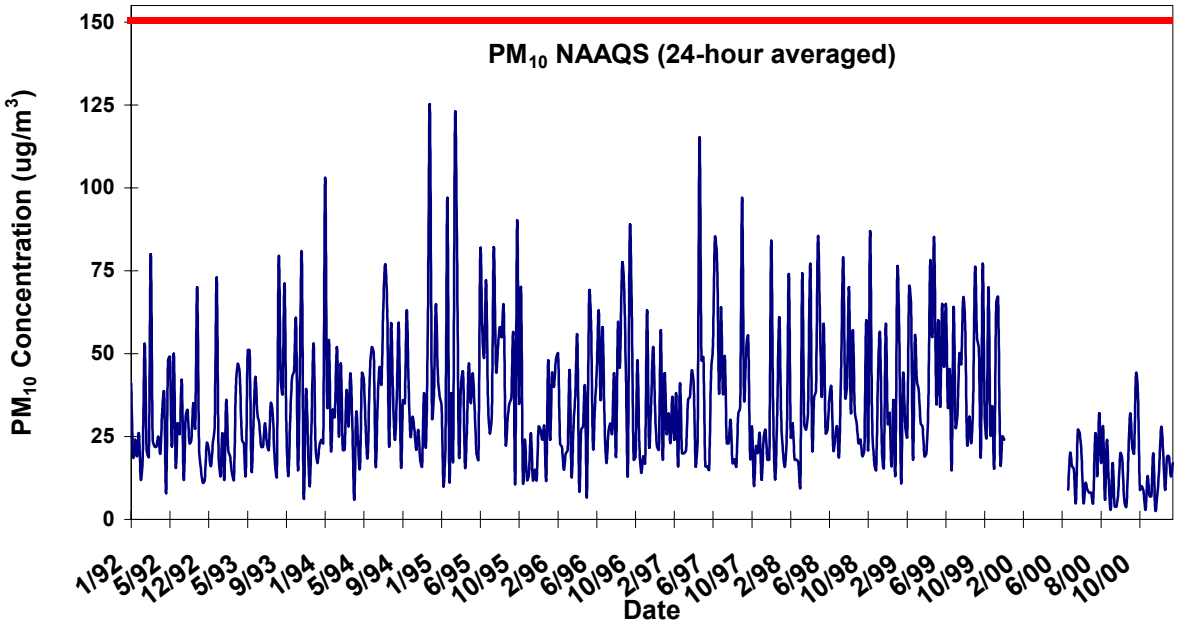


Figure D.2. 24-hour averaged PM_{10} levels 1992-2000: (c) Columbus (Chesapeake) suburban site, (d) Cleveland suburban

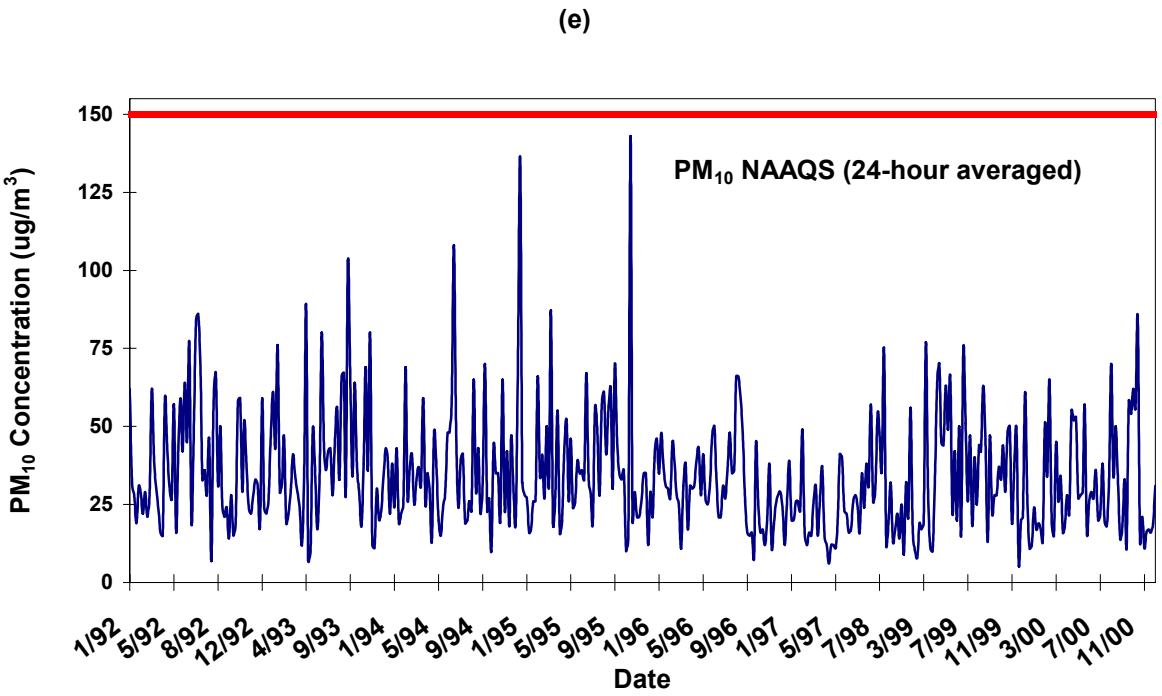


Figure D.2. 24-hour averaged PM_{10} levels in 1992-2000: (e) Steubenville urban Site

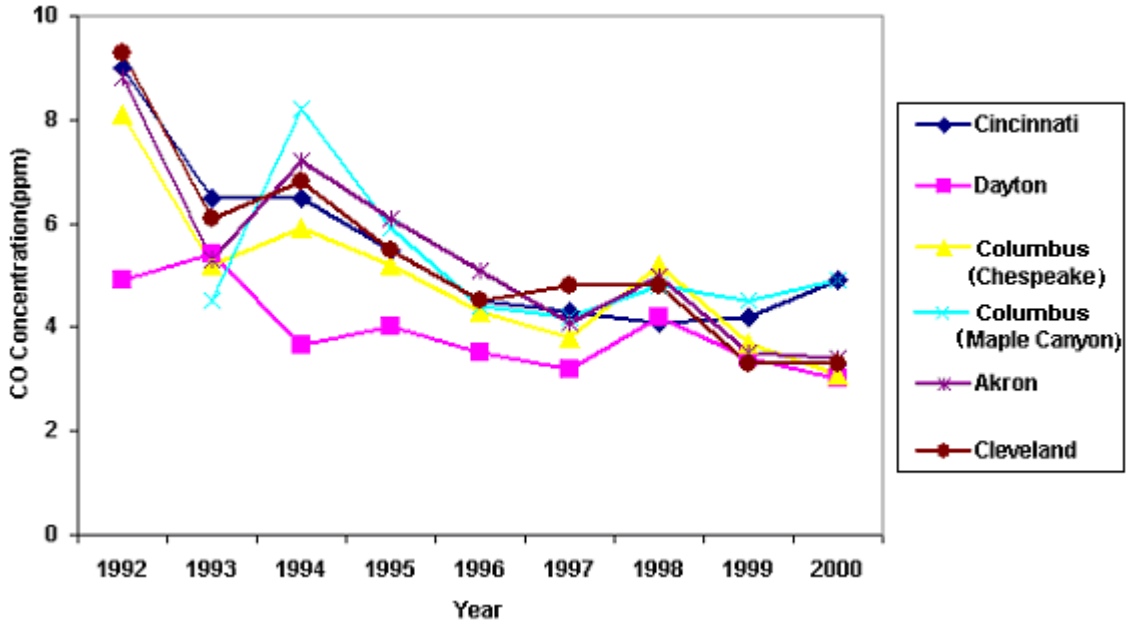


Figure D.3. 2nd Highest 1hr Averaged CO in 1992-2000

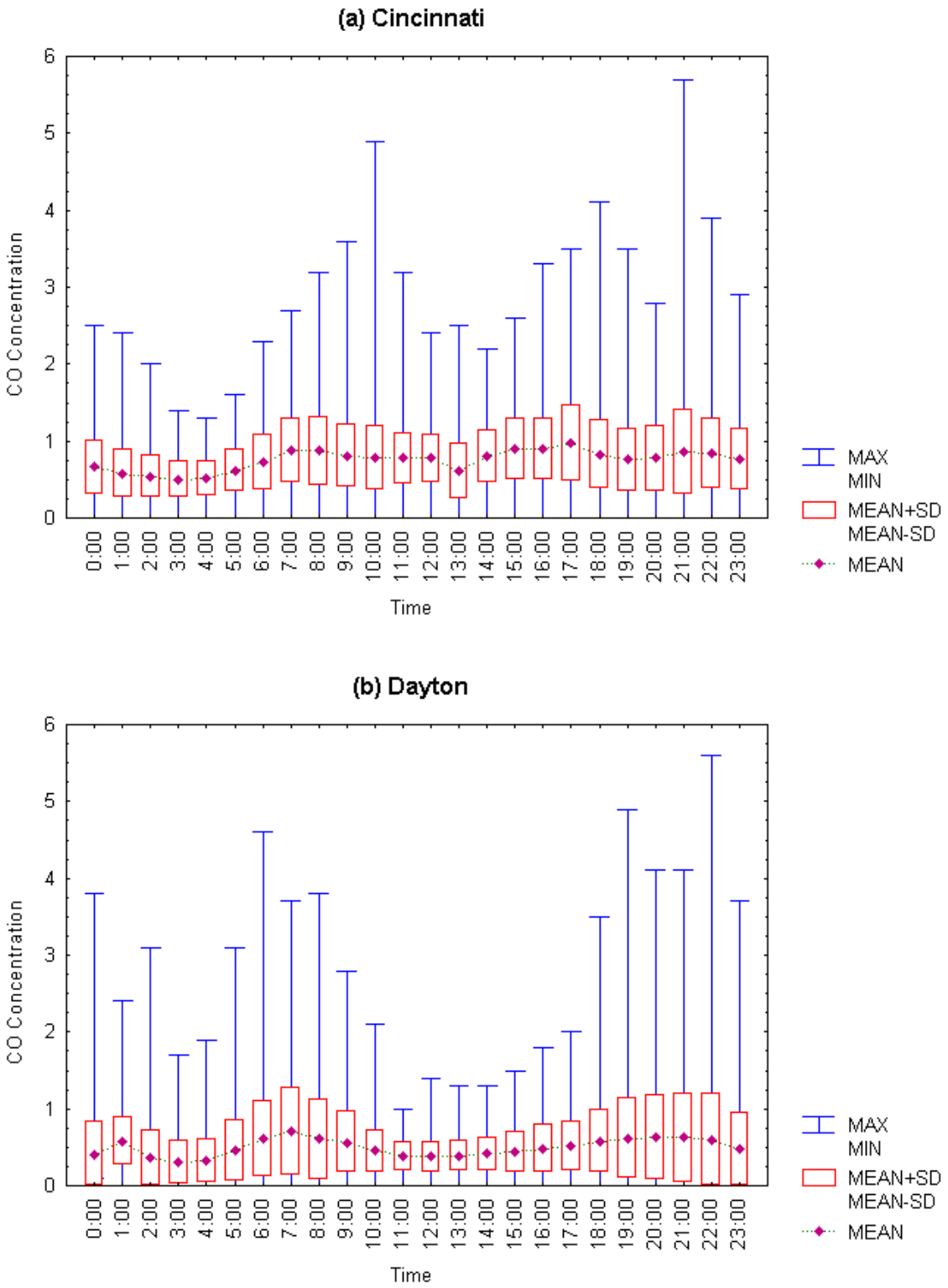


Figure D4-1. Hourly CO distribution: (a) Cincinnati and (b) Dayton

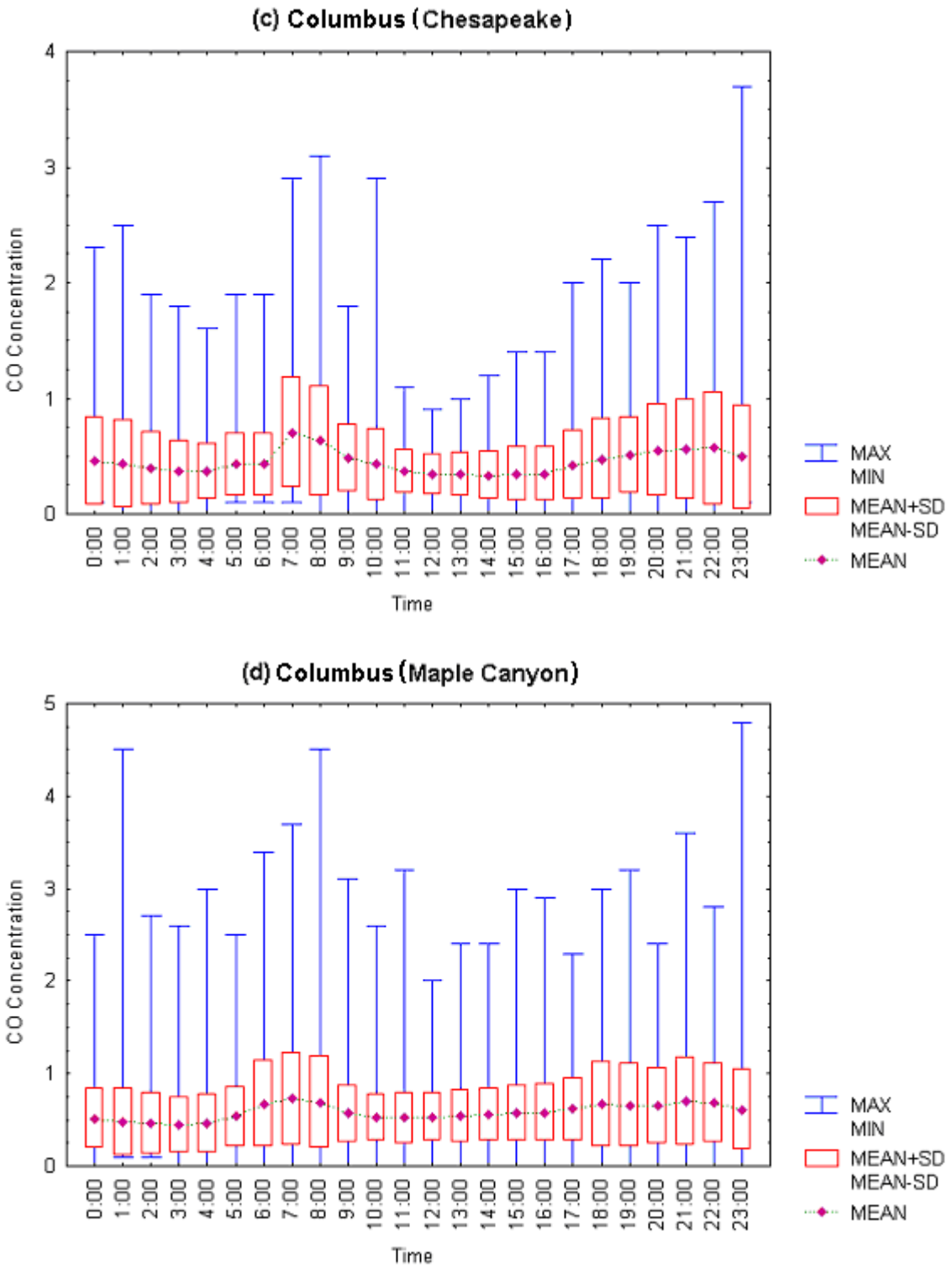
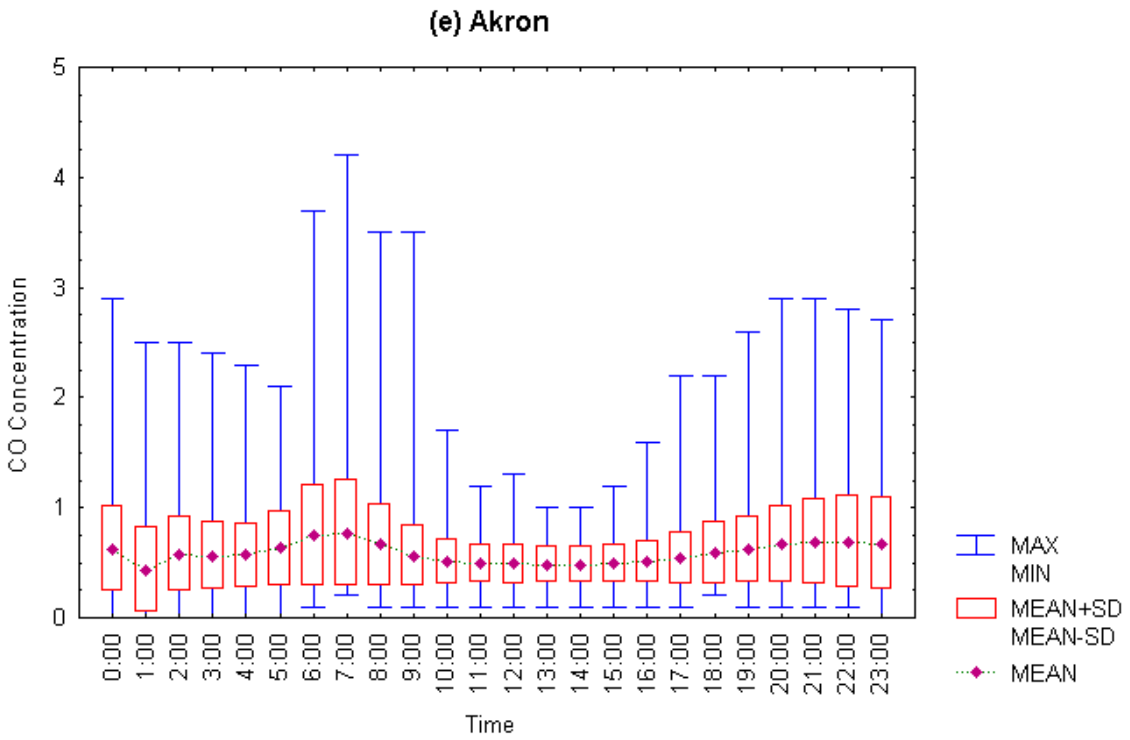


Figure D4-1. Hourly CO distribution: (c) Columbus (Chesapeake) and (d) Columbus (Maple Canyon)



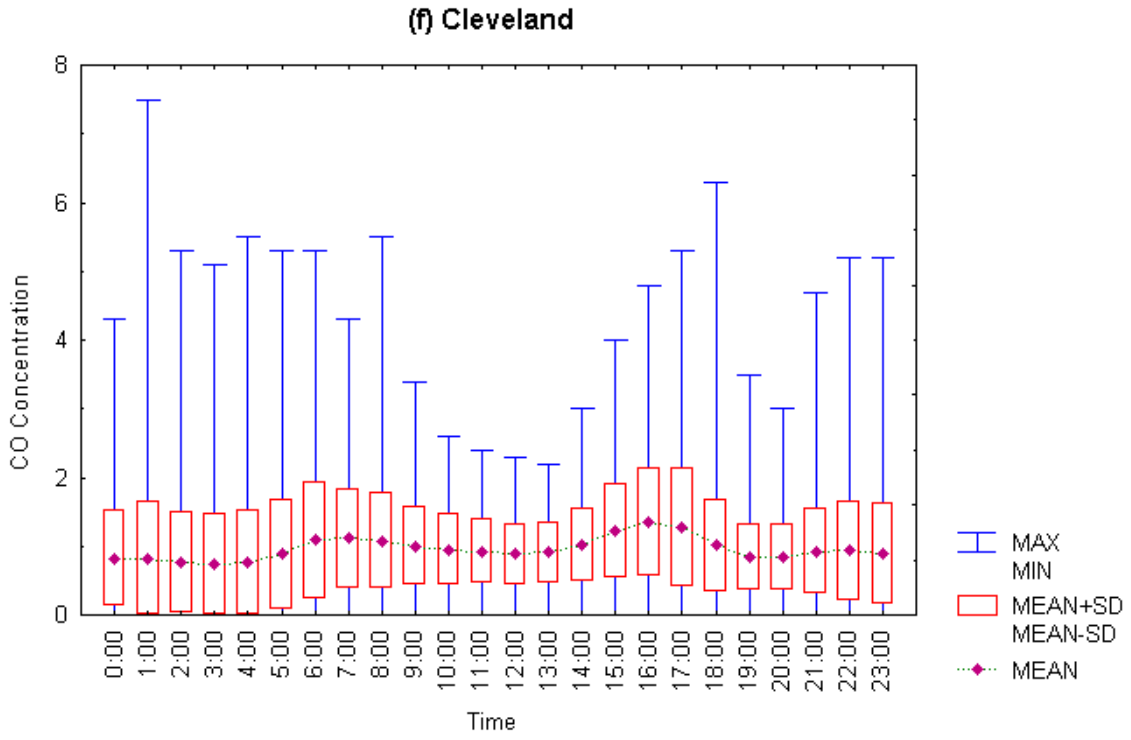


Figure D4-1. Hourly CO distribution: (e) Akron and (f) Cleveland

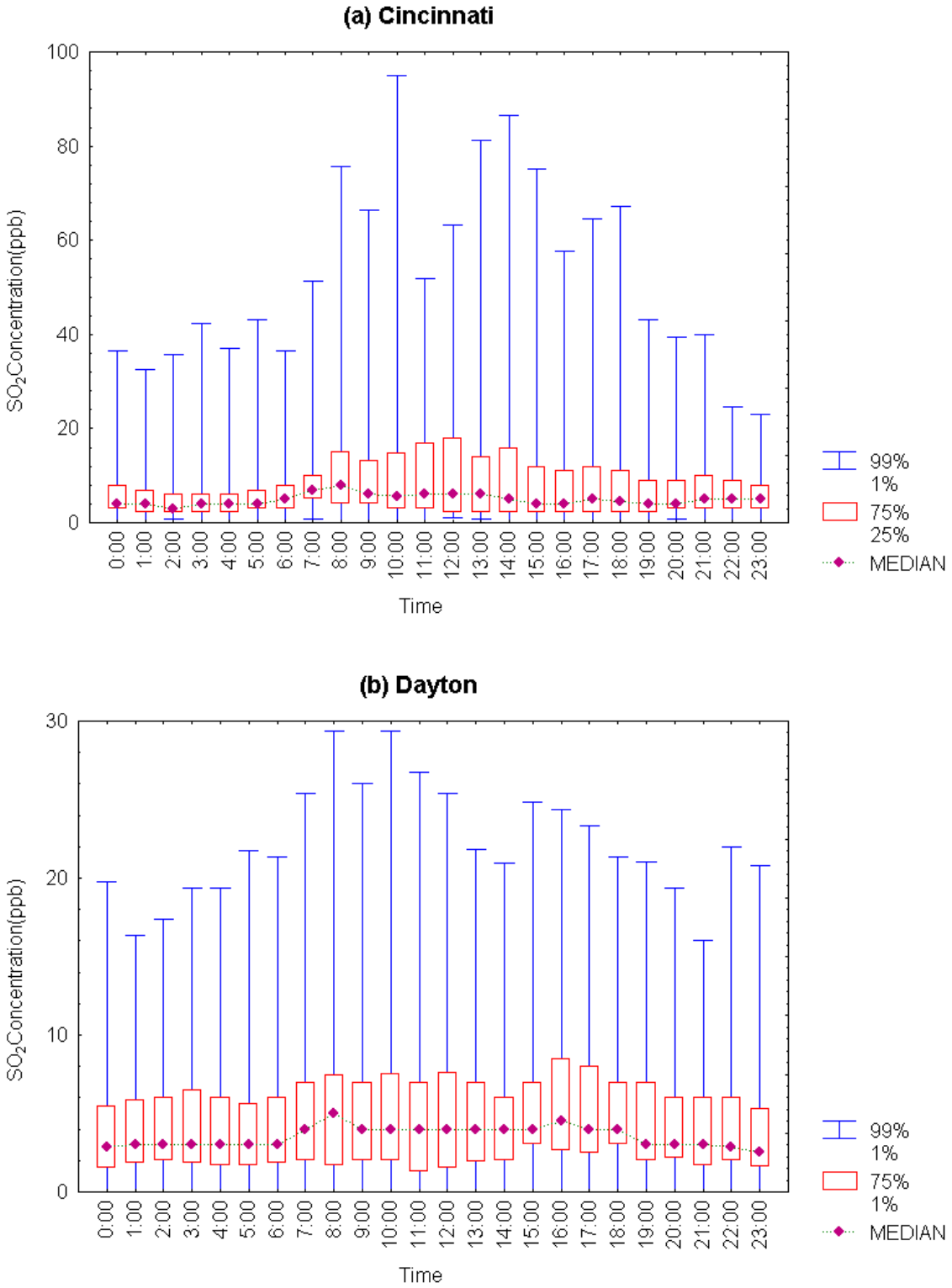
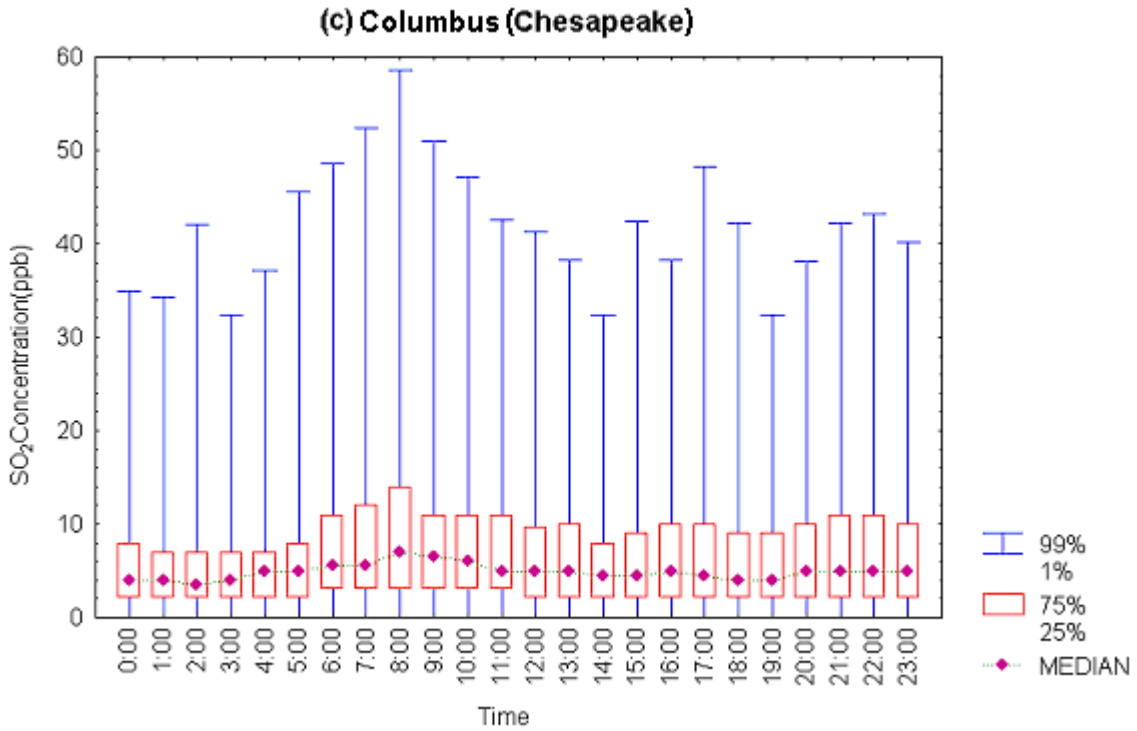


Figure D4-2. Hourly SO_2 distribution: (a) Cincinnati and (b) Dayton



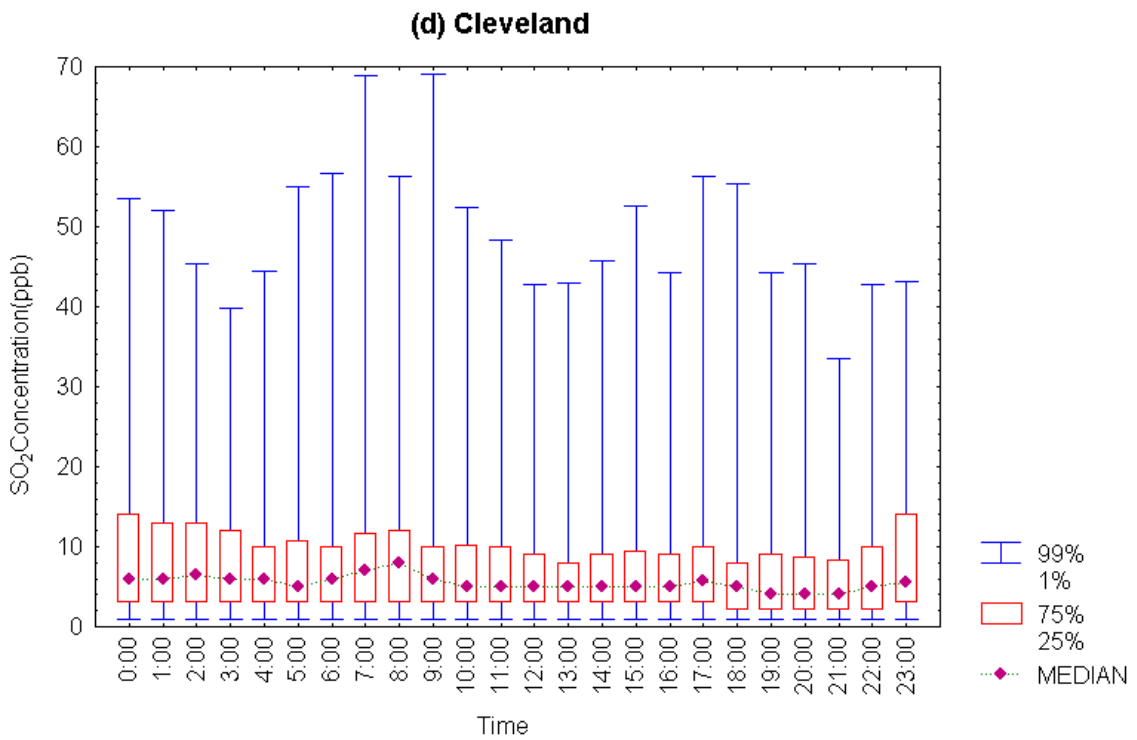


Figure D4-2. Hourly SO_2 distribution in: (c) Columbus (Chesapeake) and (d) Cleveland

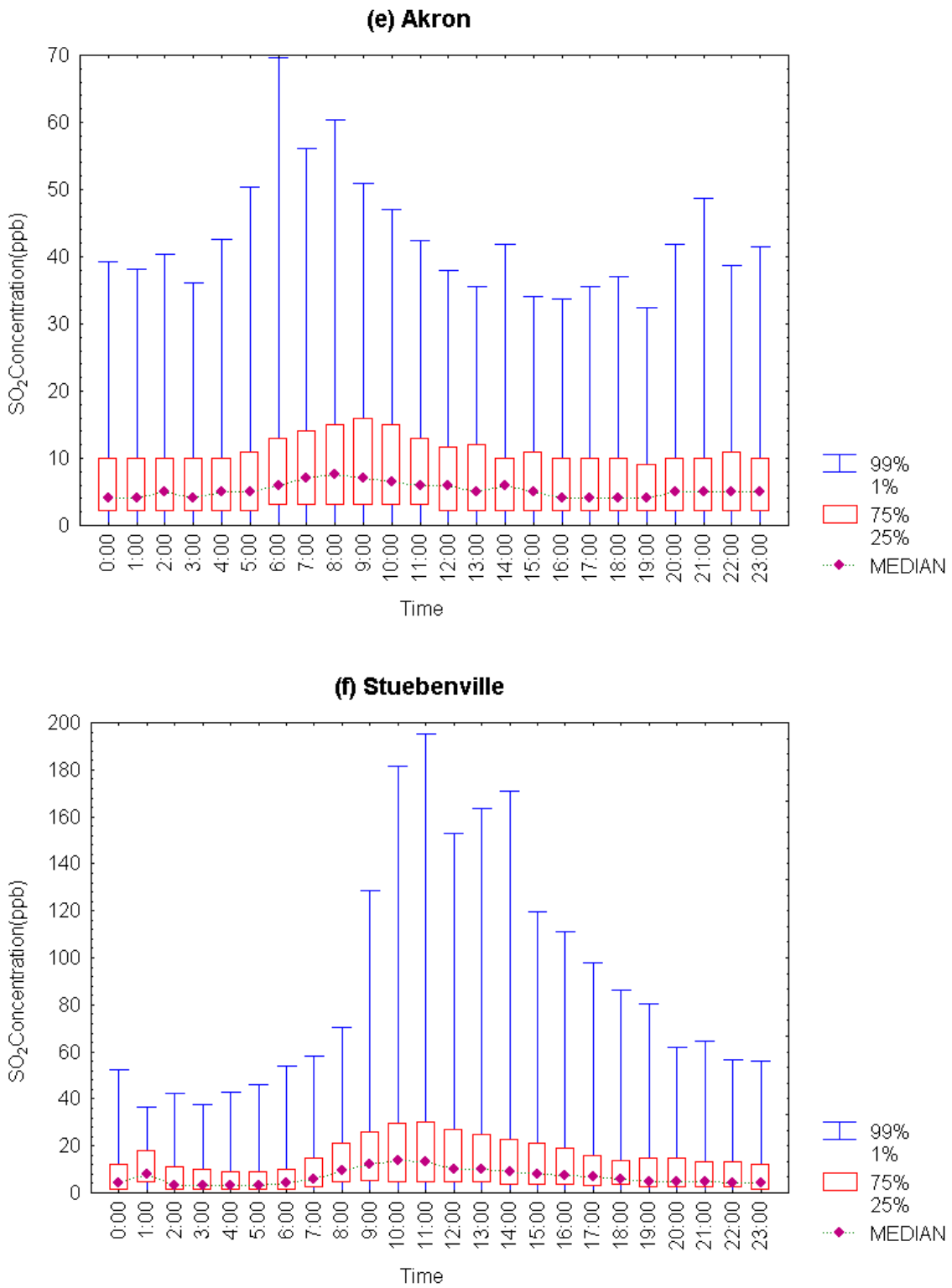


Figure D4-2. Hourly SO_2 distribution: (e) Akron and (f) Steubenville

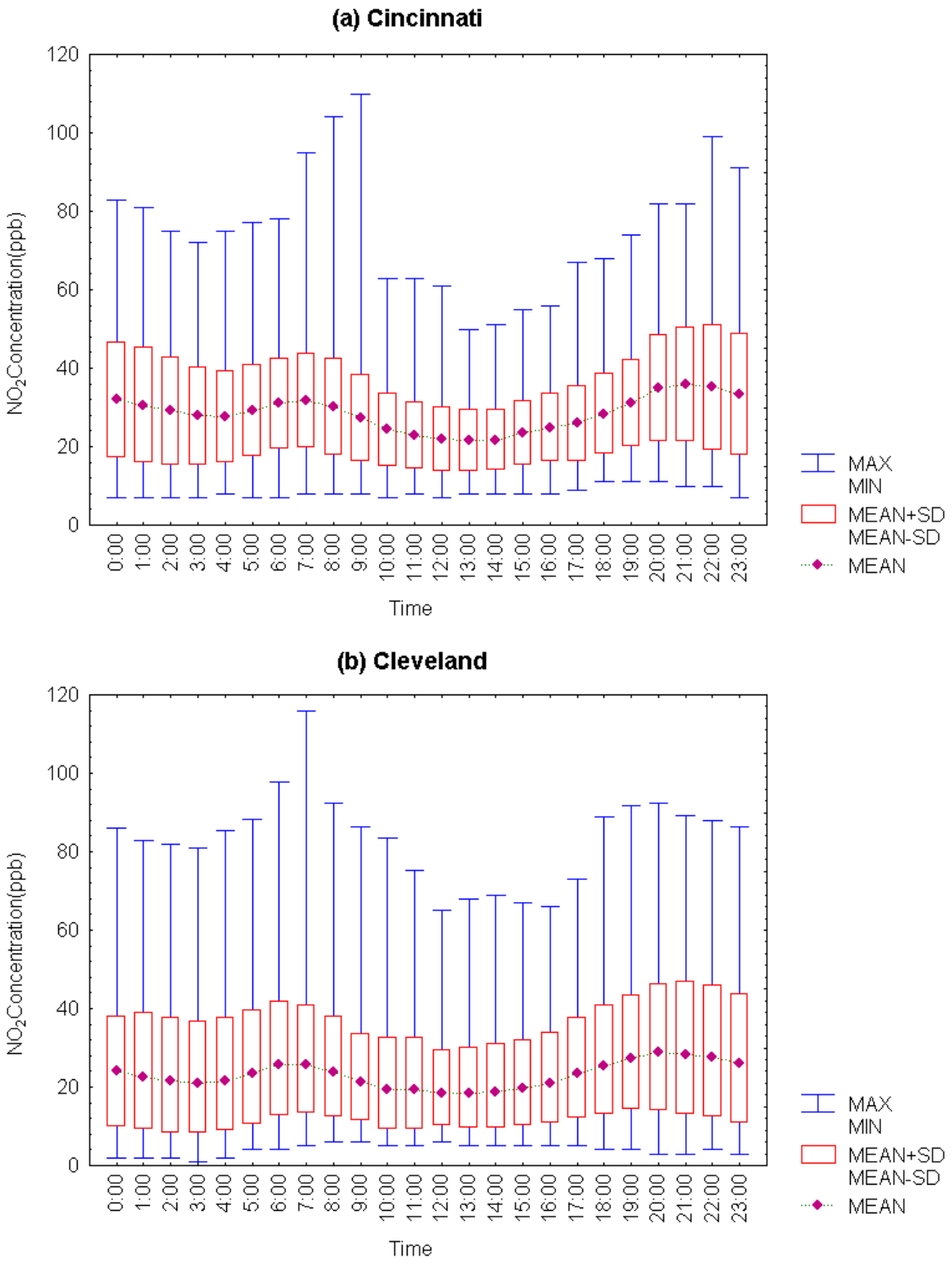


Figure D4-3. Hourly NO_2 distribution: (a) Cincinnati and (b) Cleveland

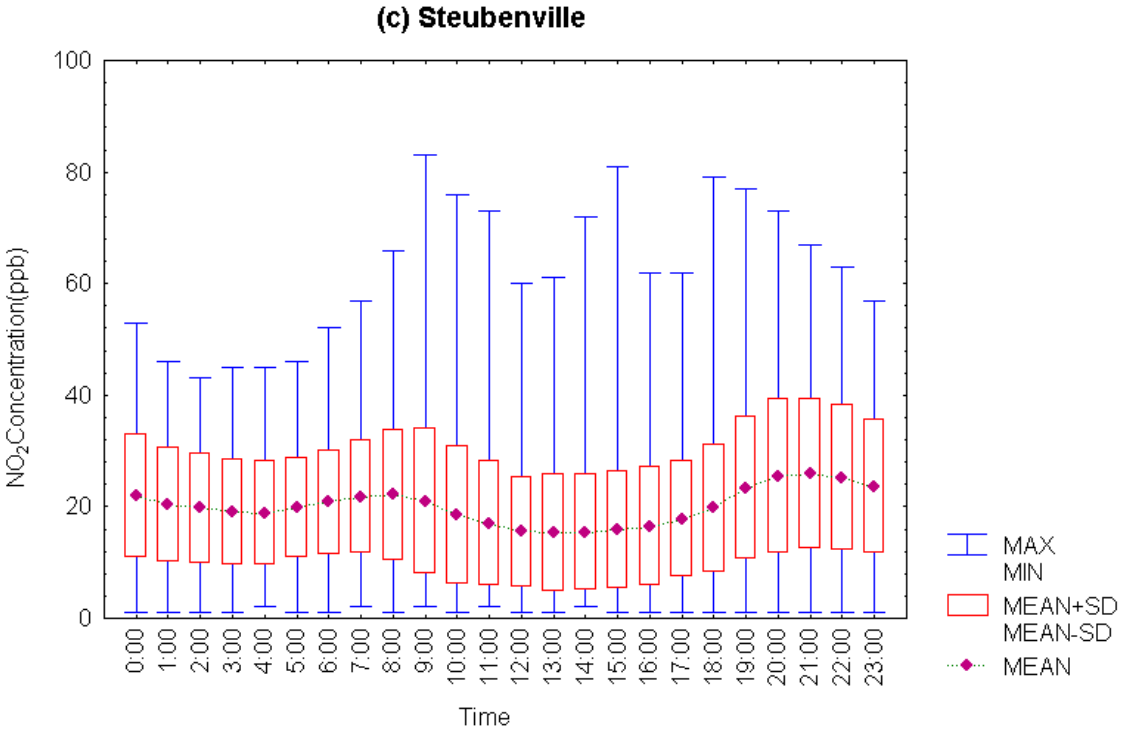
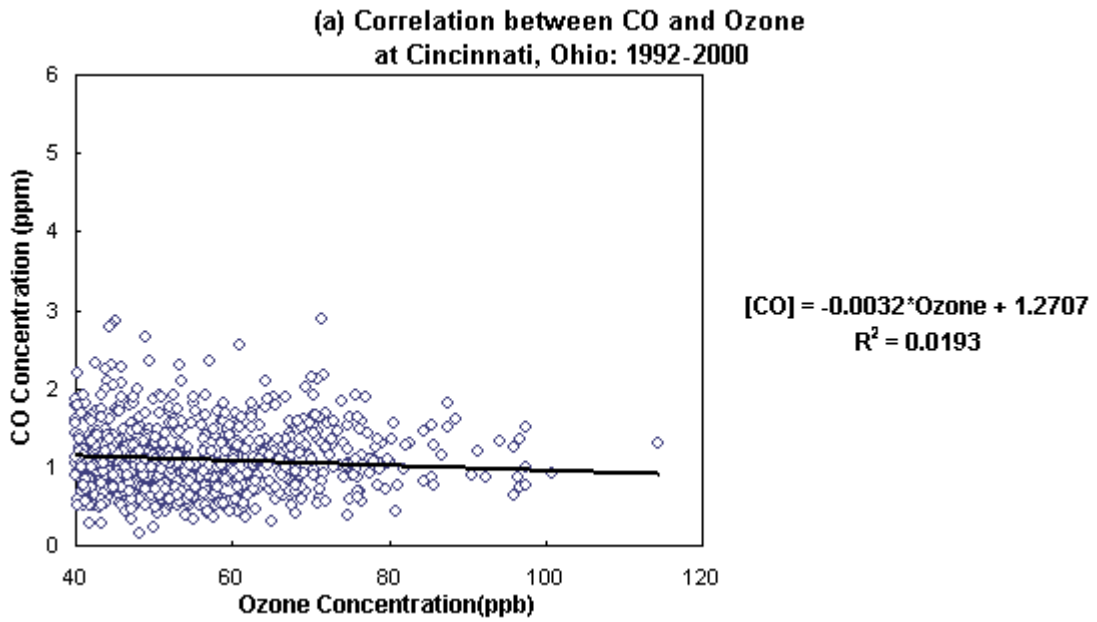


Figure D4-3. Hourly NO_2 distribution: (c) Steubenville



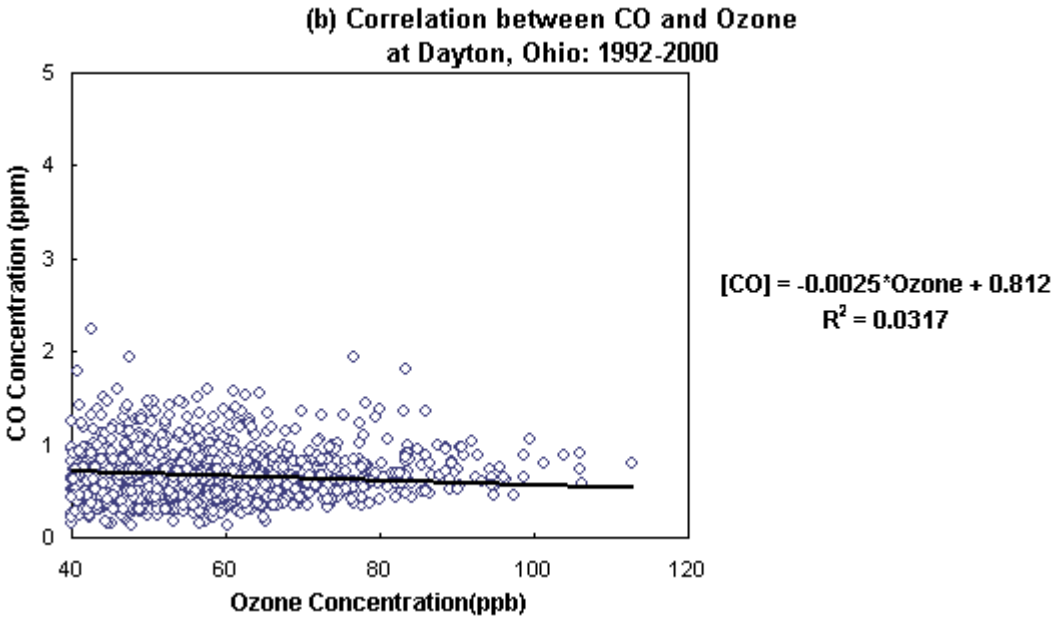
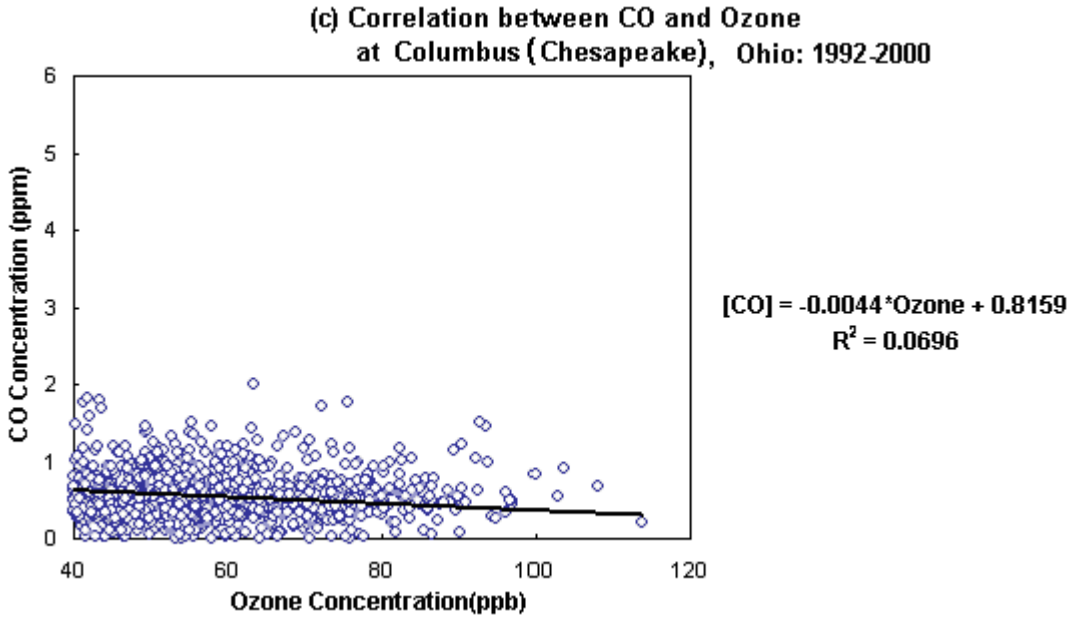


Figure D5-1. Correlation between CO and Ozone Concentration in 1992-2000: (a) Cincinnati and (b) Dayton.



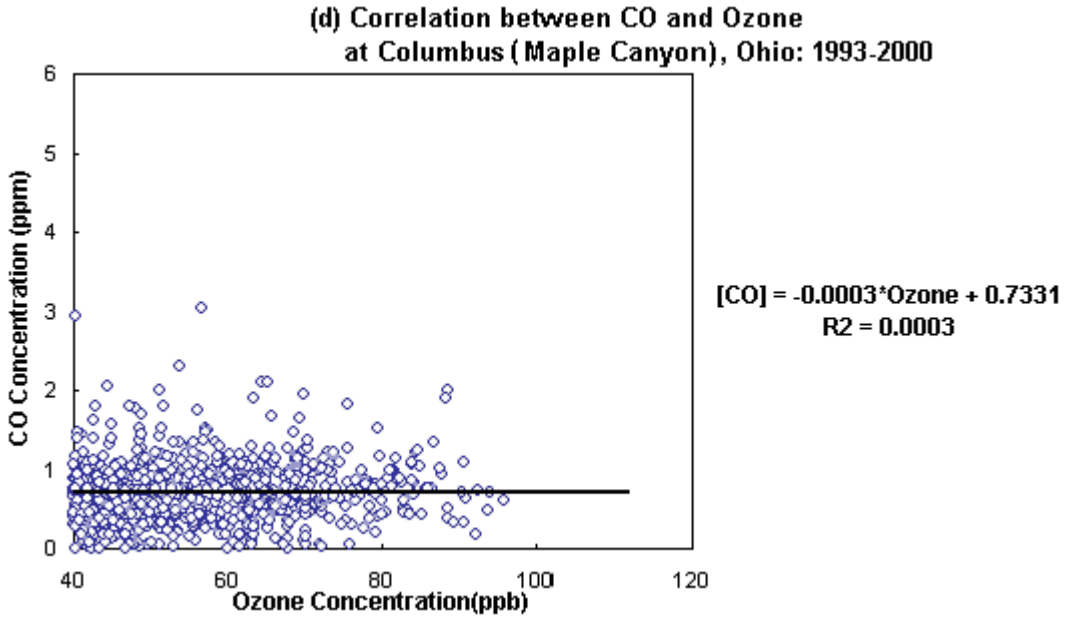
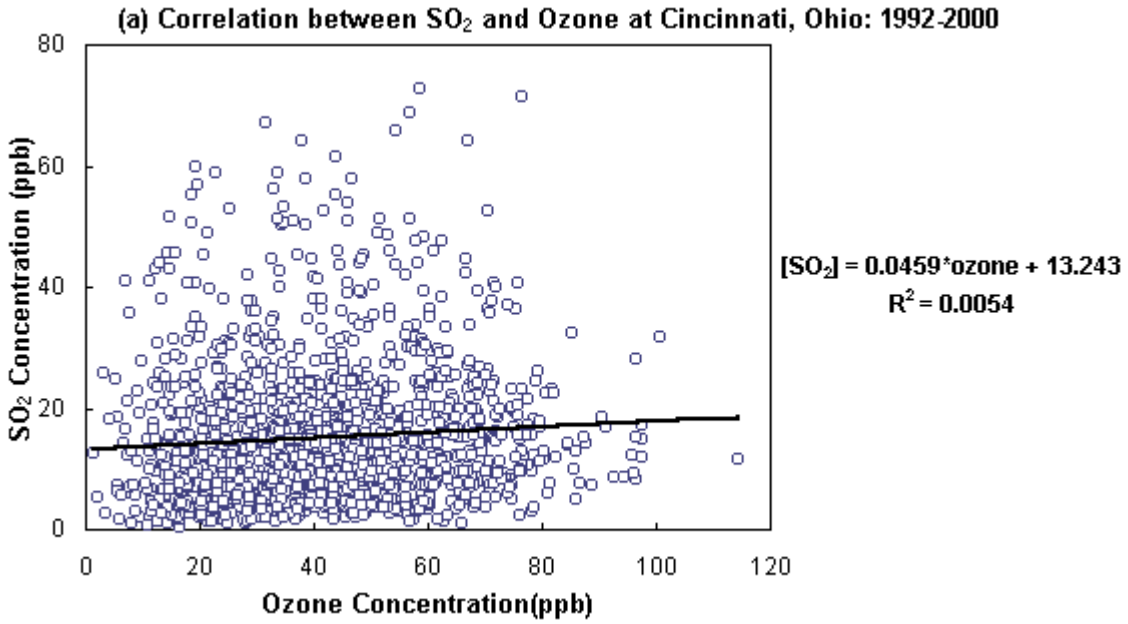


Figure D5-1. Correlation between CO and Ozone Concentration: (c) Columbus (Chesapeake), 1992-2000 and (d) Columbus (Maple Canyon), 1993-2000.



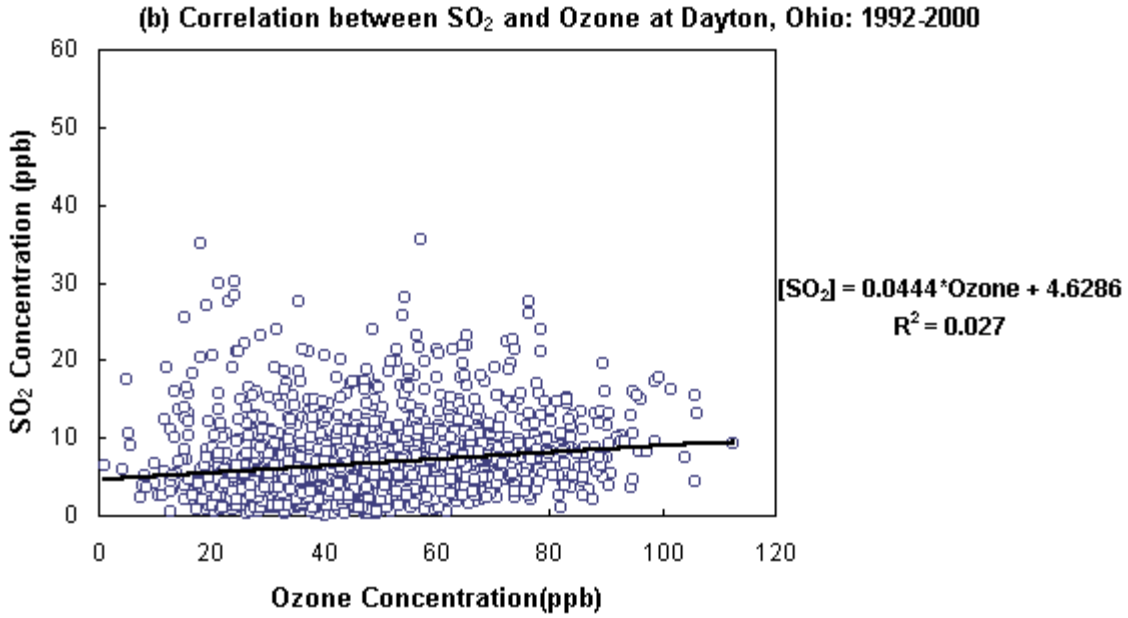


Figure D5-2. Correlation between SO_2 and Ozone Concentration in 1992-2000: (a) Cincinnati and (b) Dayton.

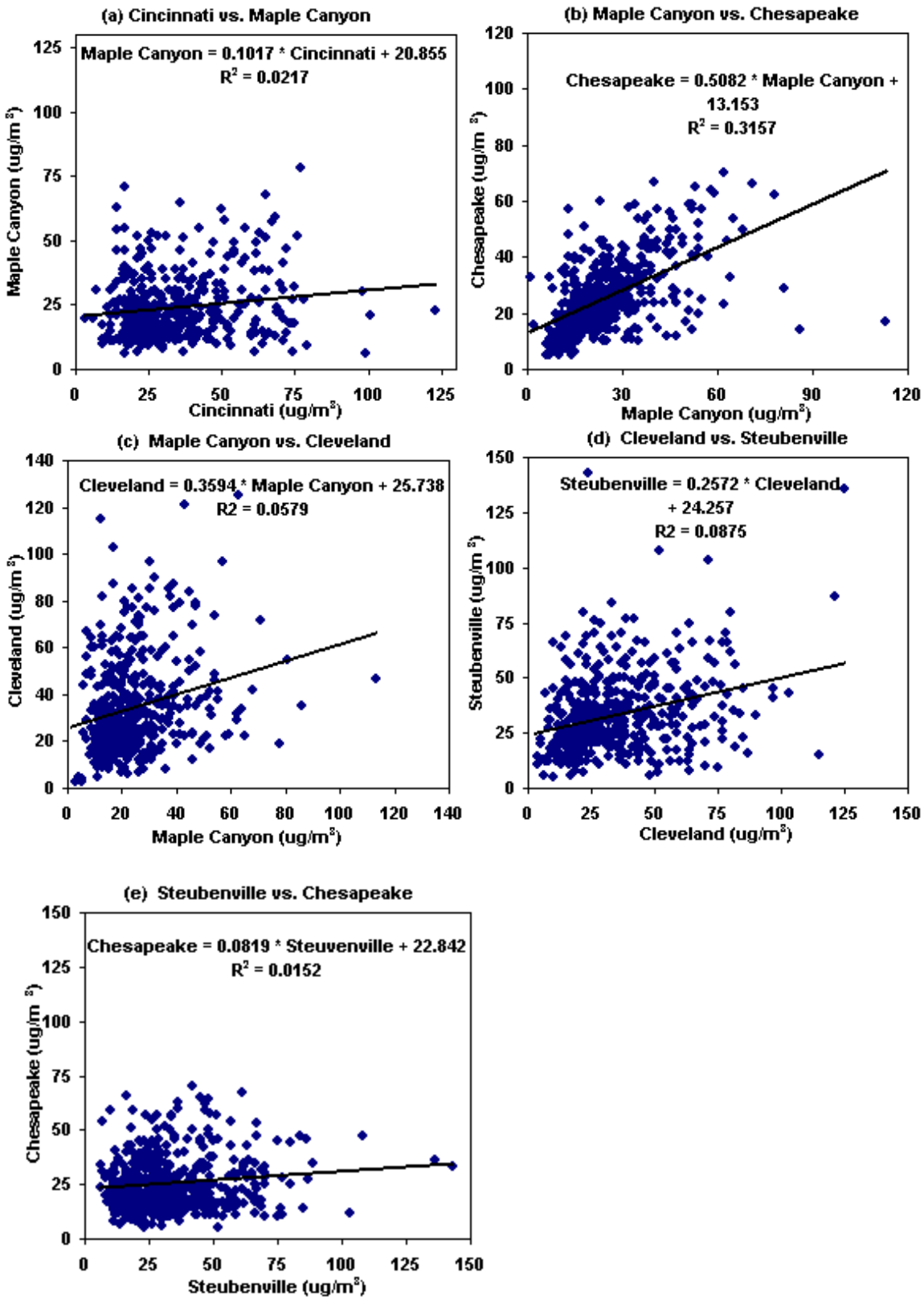


Figure D**6-1.** Spatial Coordination plots of PM_{10}, 1992-2000

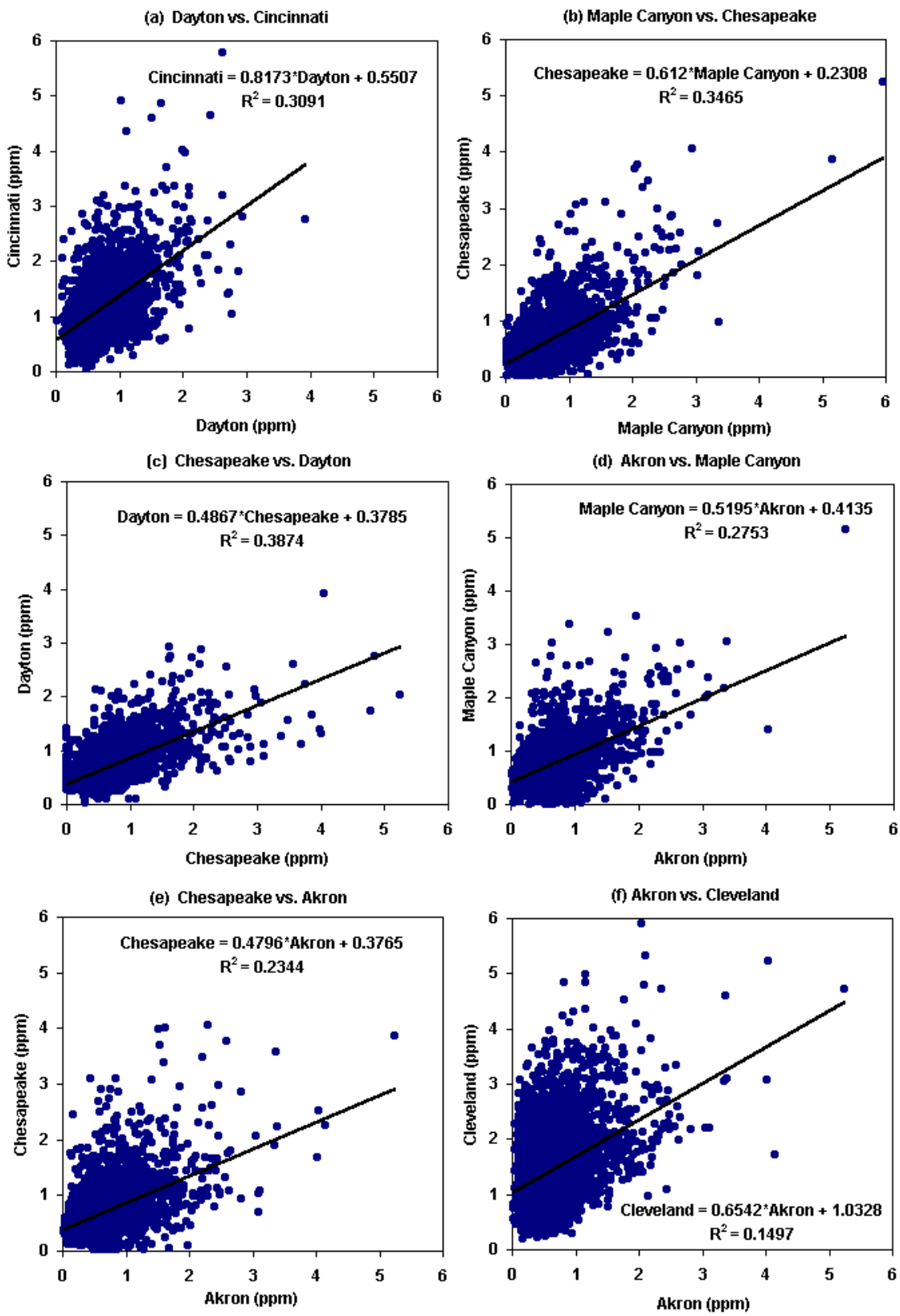


Figure D6-2. Spatial Coordination plots of CO, 1992-2000

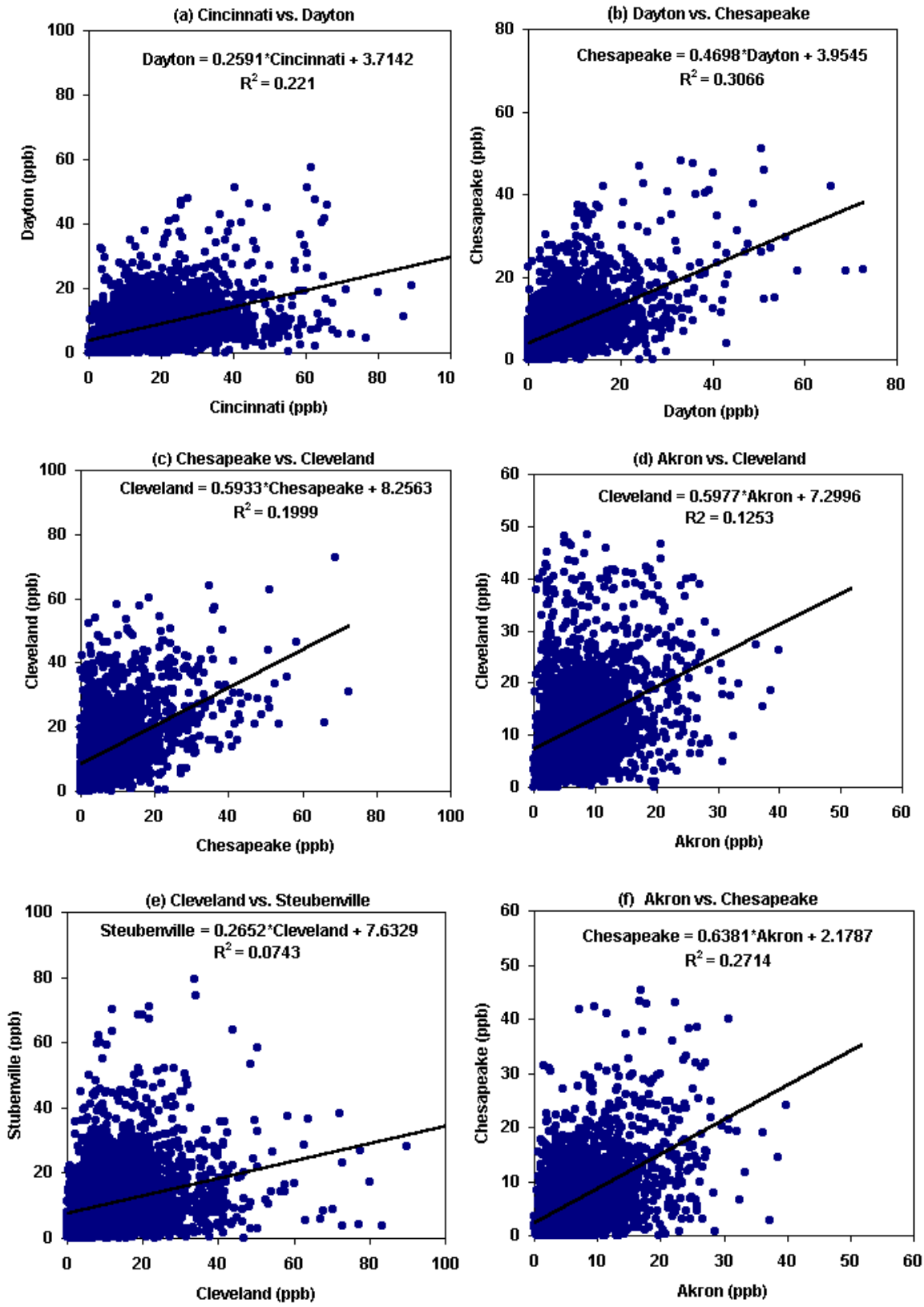


Figure D6-3. Spatial Coordination plots of SO_2 , 1992-2000

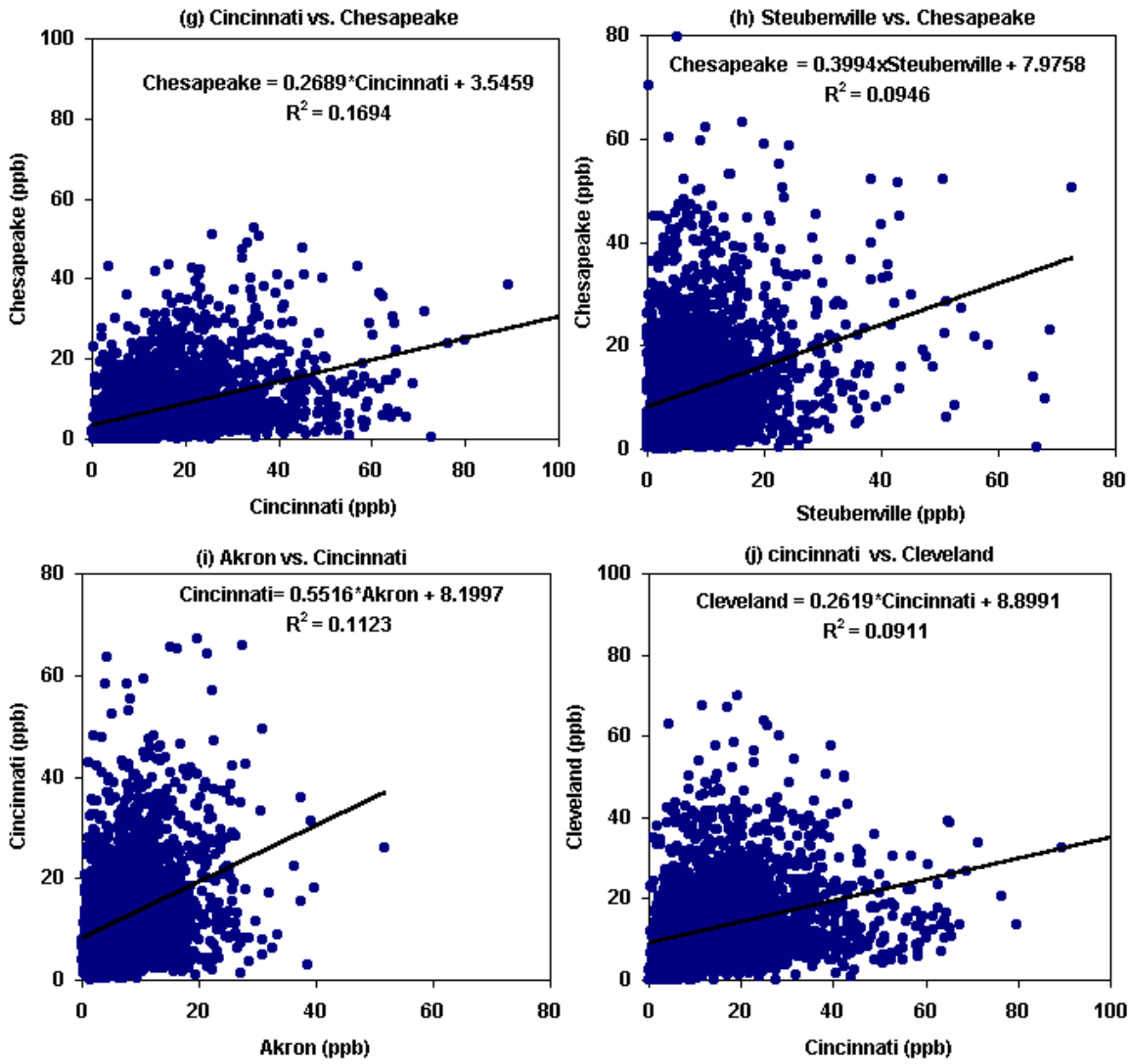


Figure D6-3. Spatial Coordination plots of SO_2, 1992-2000

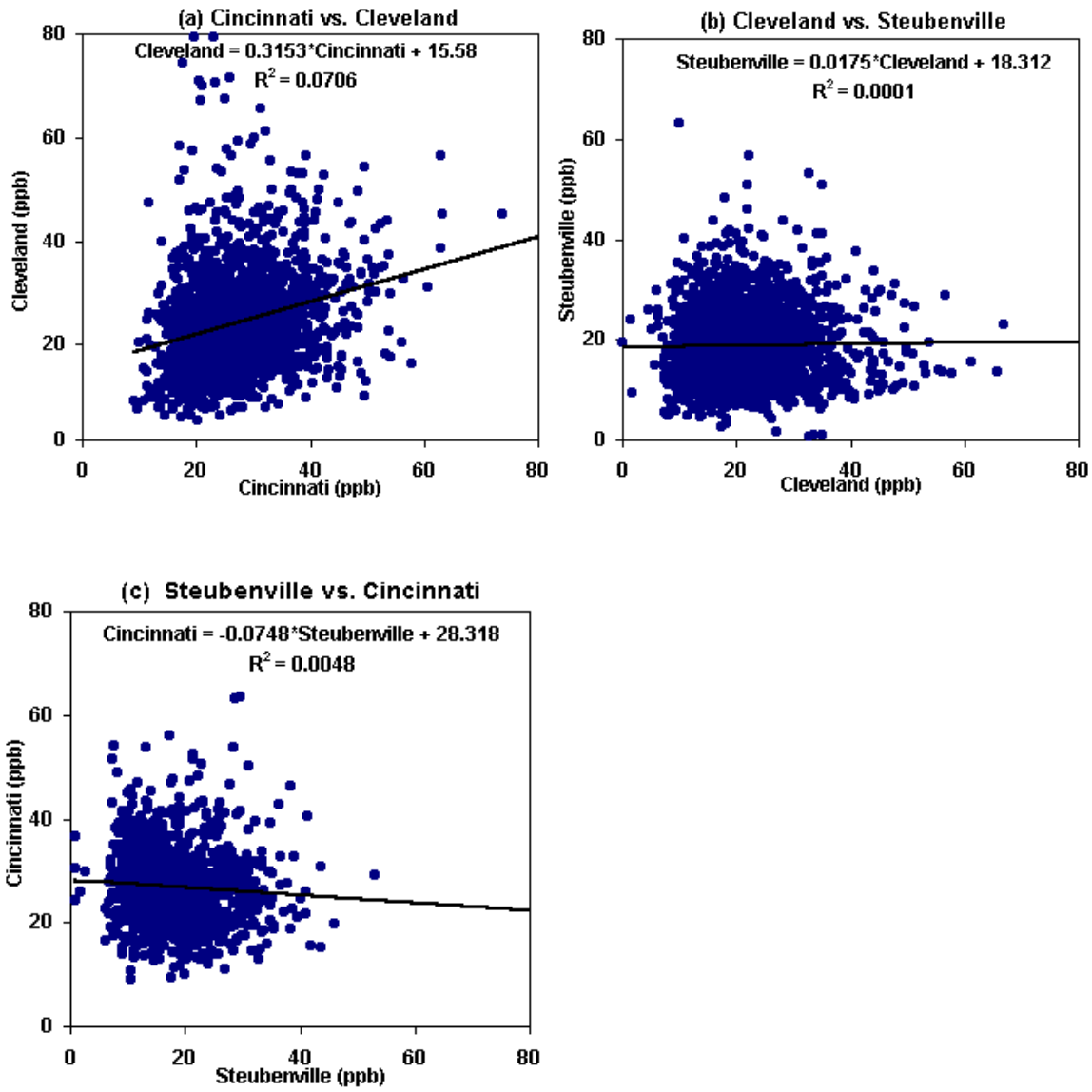


Figure D6-4. Spatial Coordination plots of NO_2, 1992-2000

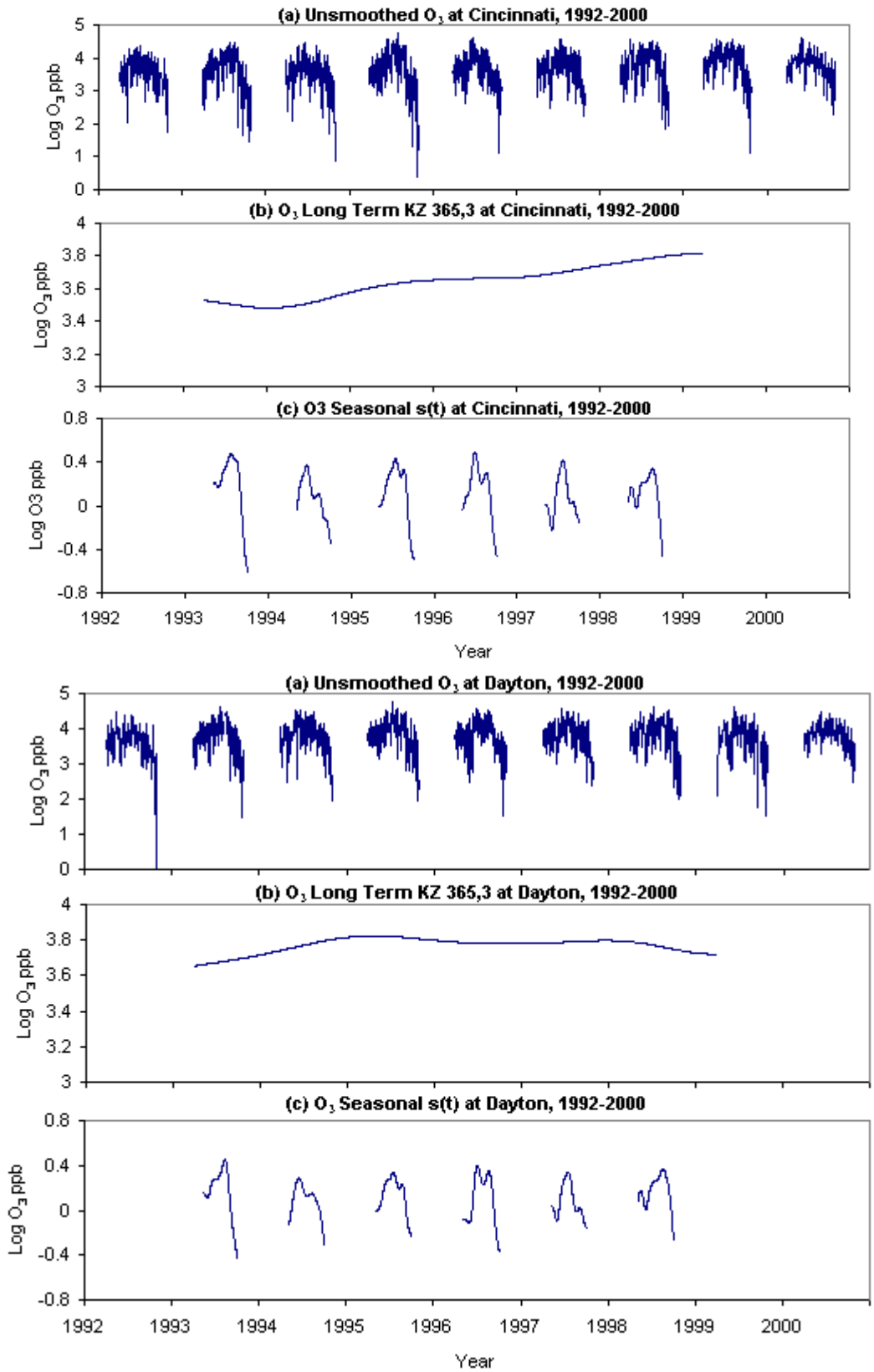


Figure D7. KZ Filter of ozone levels in (a) Cincinnati and (b) Dayton, 1992-2000

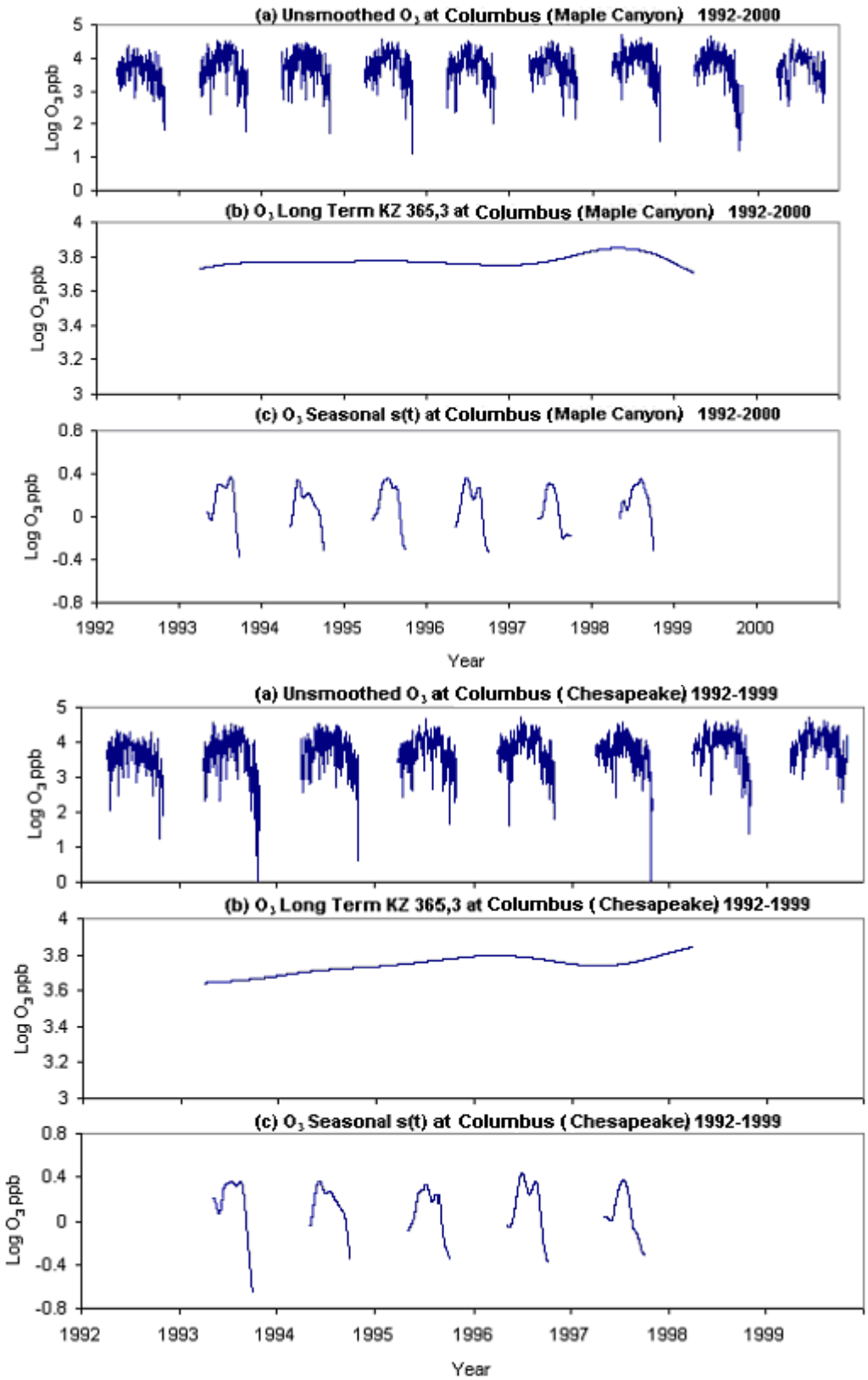


Figure D7. KZ Filter of ozone levels in (c) Columbus (Maple Canyon) and (d) Columbus (Chesapeake), 1992-2000

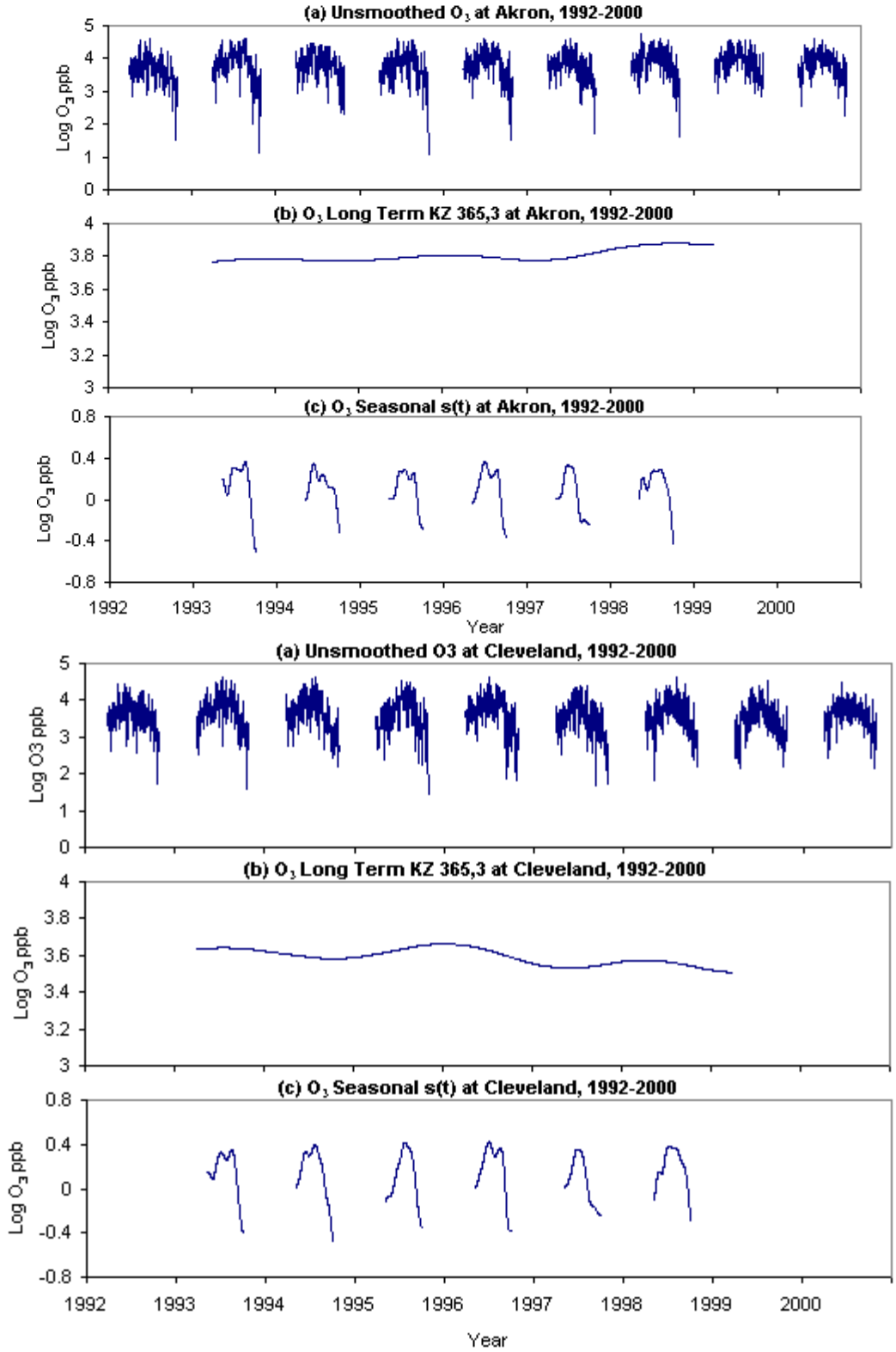


Figure D7. KZ Filter of ozone levels in (e) Akron and (f) Cleveland, 1992-2000

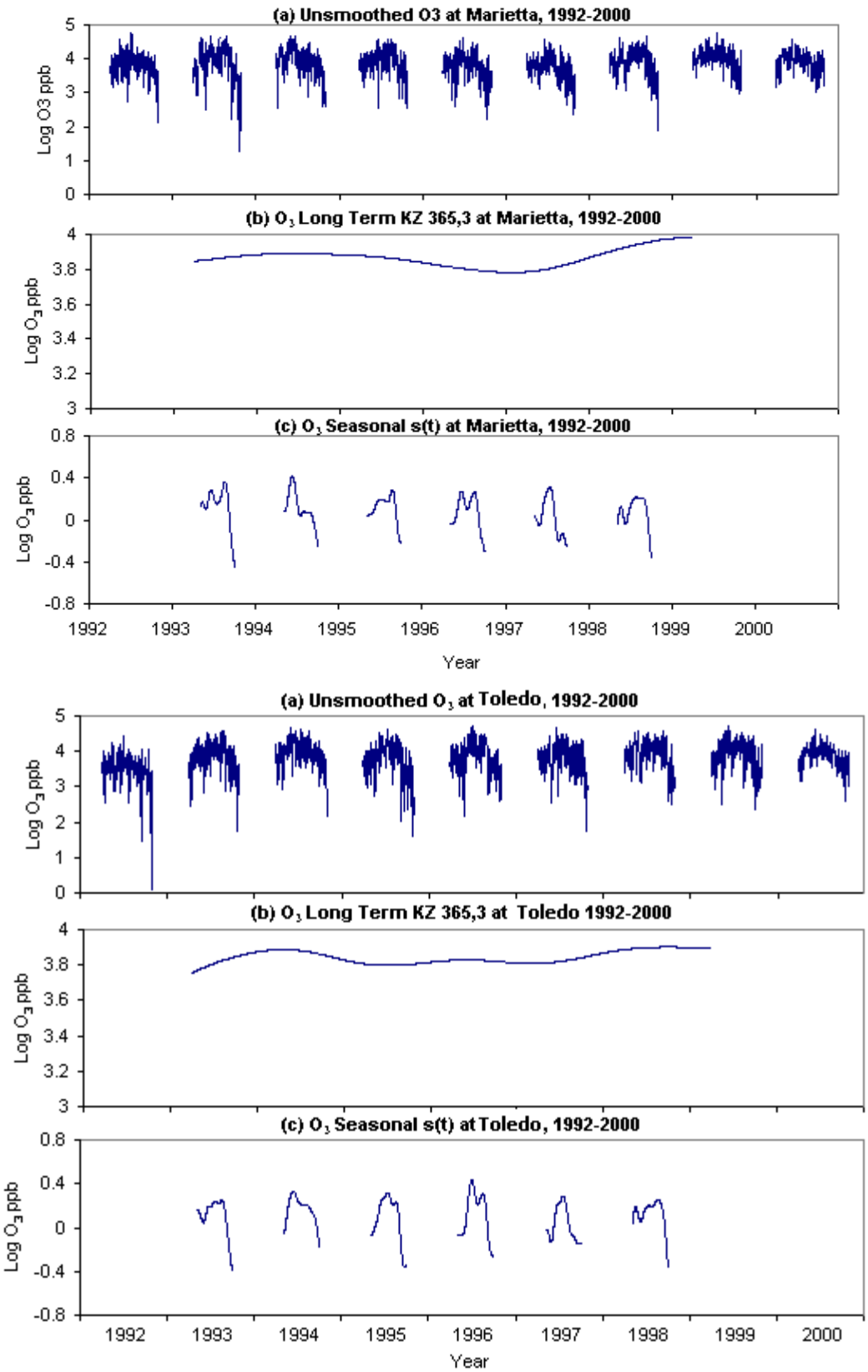


Figure D7. KZ Filter of ozone levels in (g) Marietta and (h) Toledo, 1992-2000

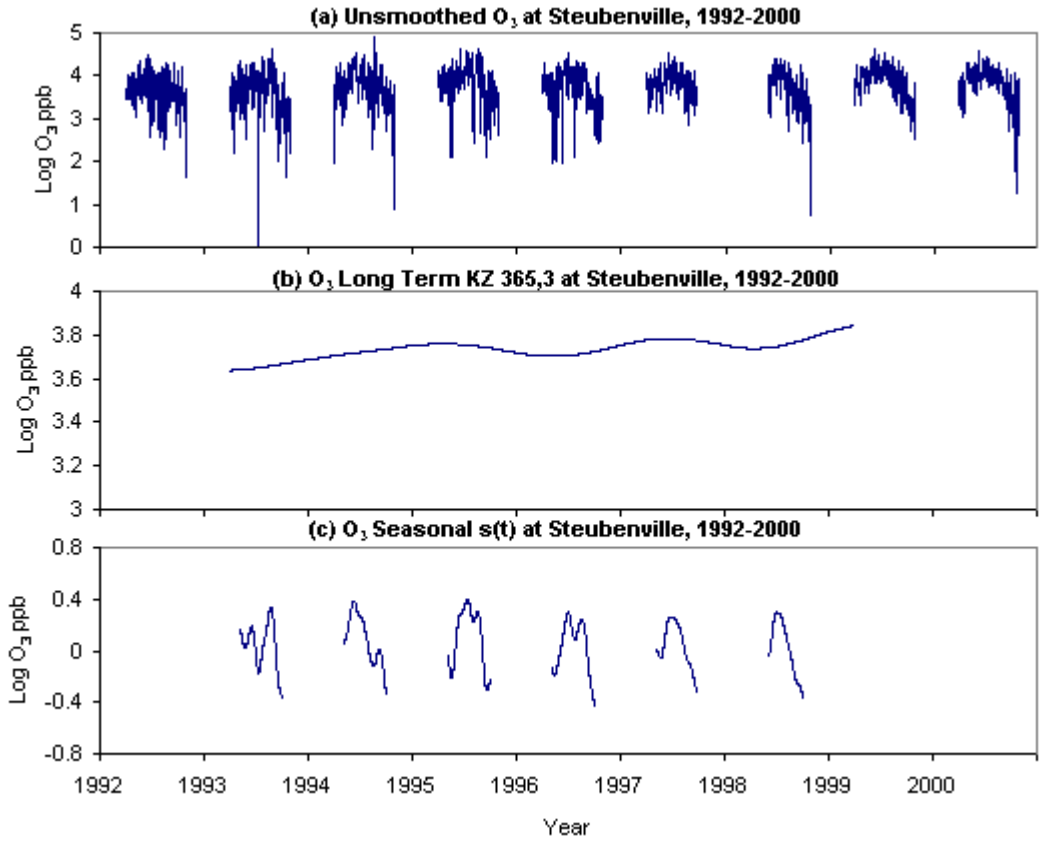


Figure D7. KZ Filter of ozone levels in (i) Steubenville, 1992-2000

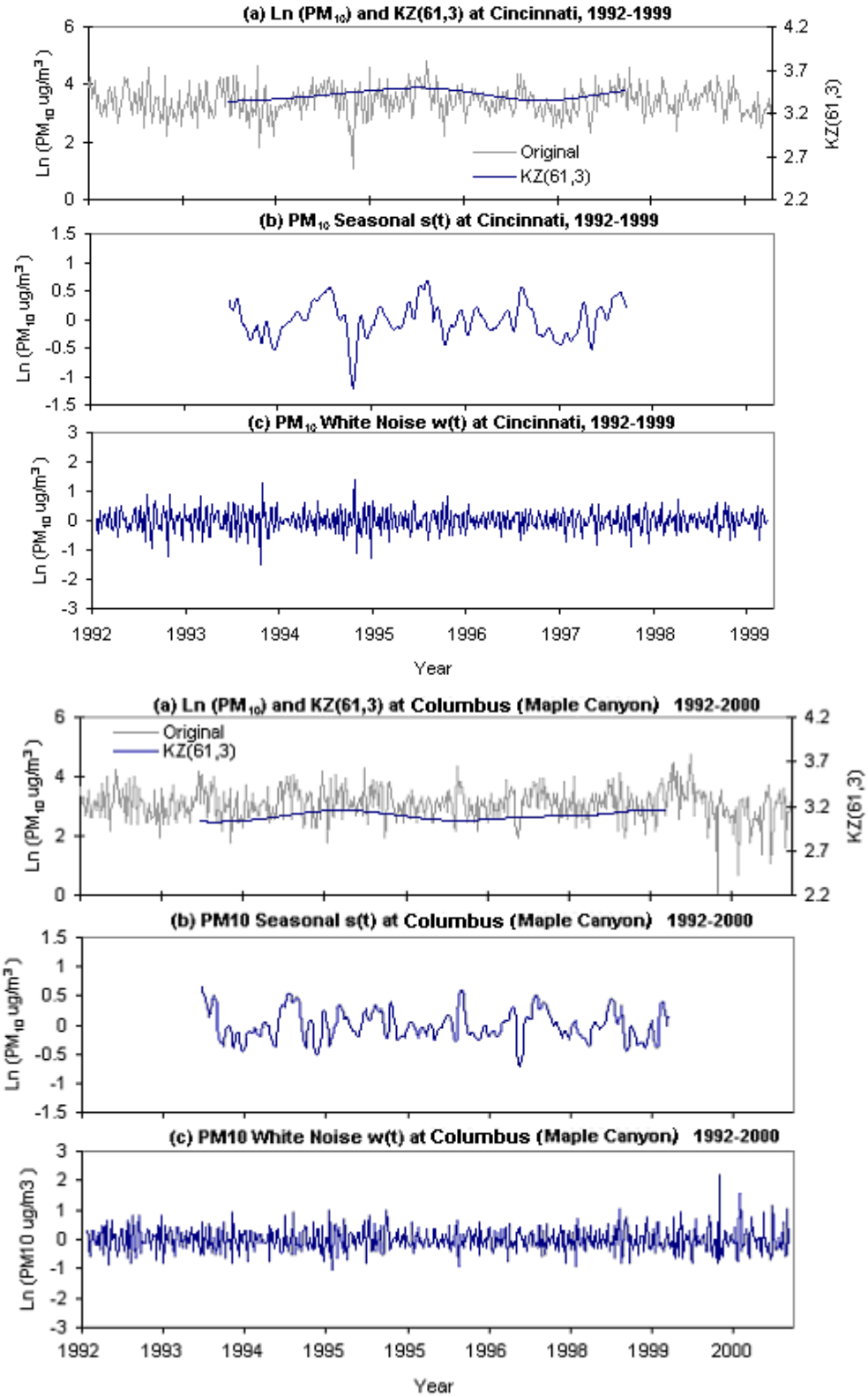


Figure D8. KZ Filter of PM_{10} levels in (a) Cincinnati, 1992-1999 and (b) Columbus (Maple Canyon), 1992-2000

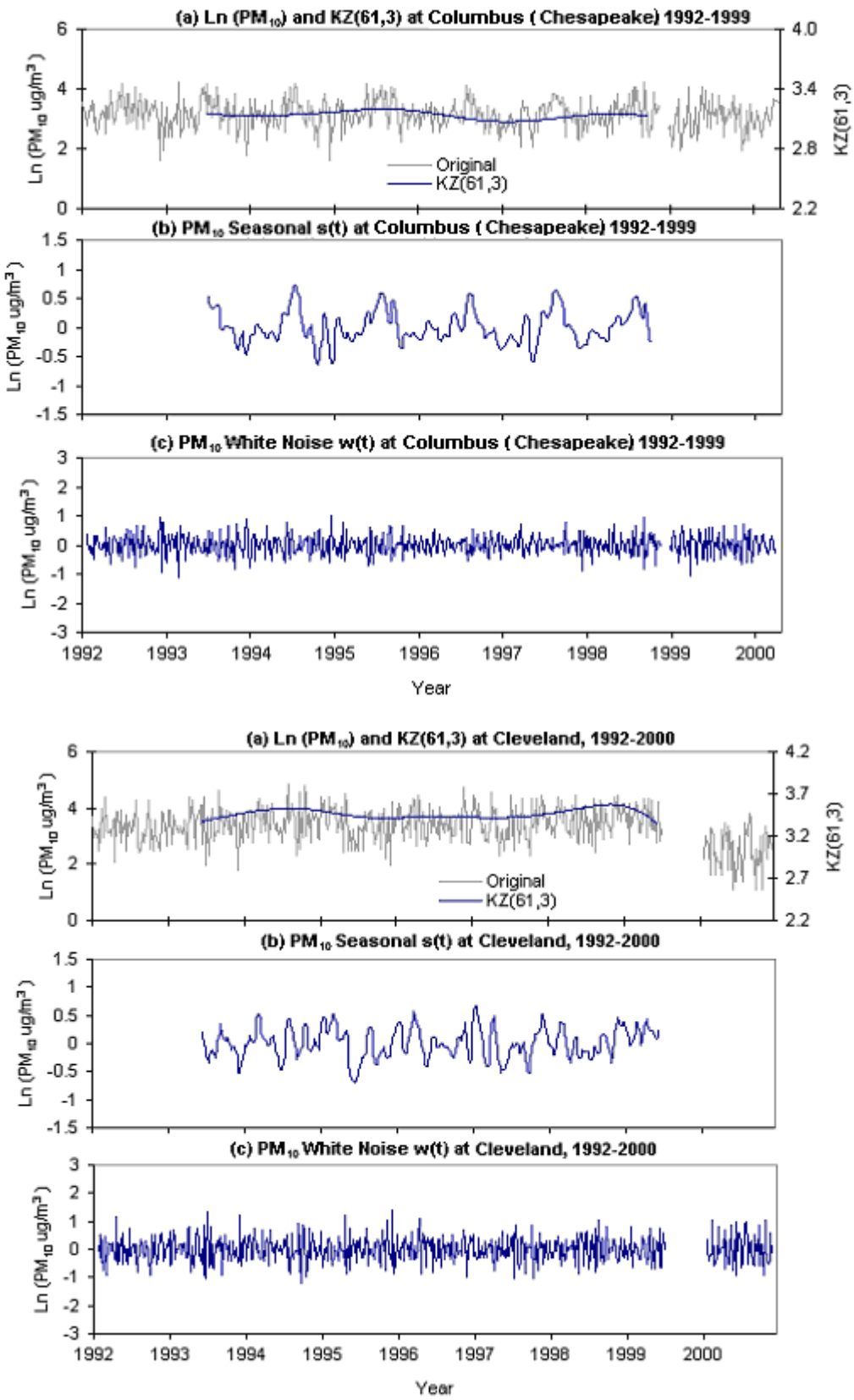


Figure D8. KZ Filter of PM_{10} levels in (c) Columbus (Chesapeake) and (d) Cleveland, 1992-2000

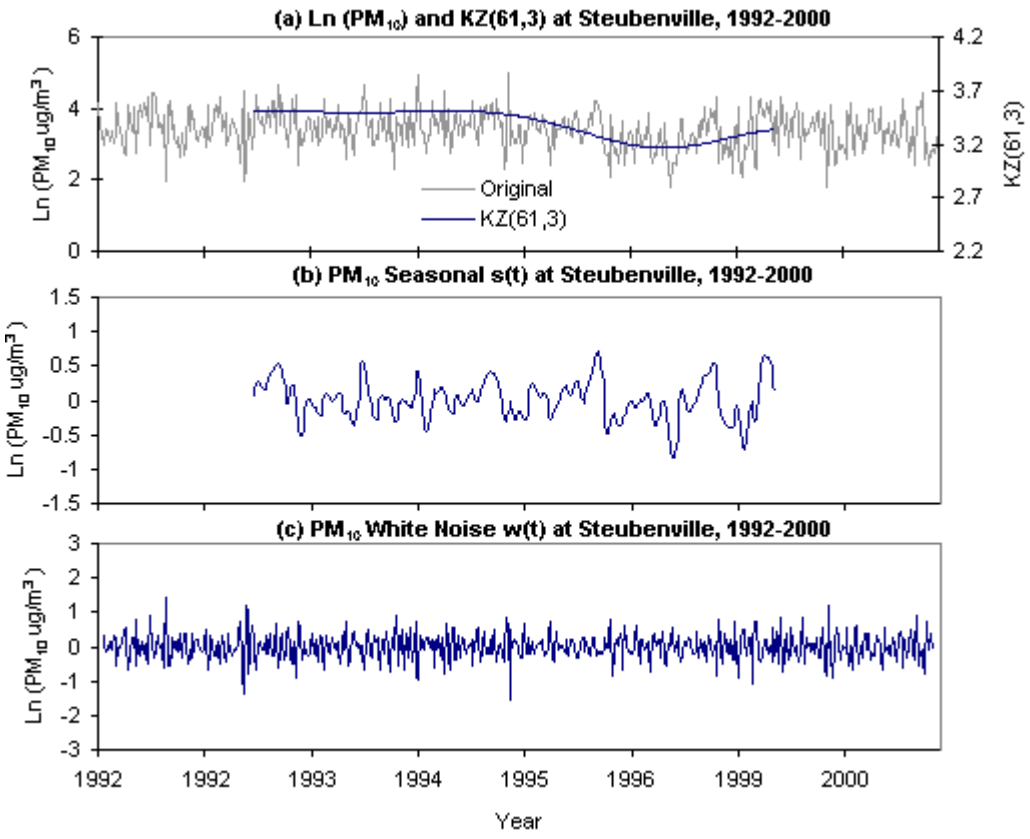


Figure D8. KZ Filter of PM_{10} levels in (e) Steubenville, 1992-2000

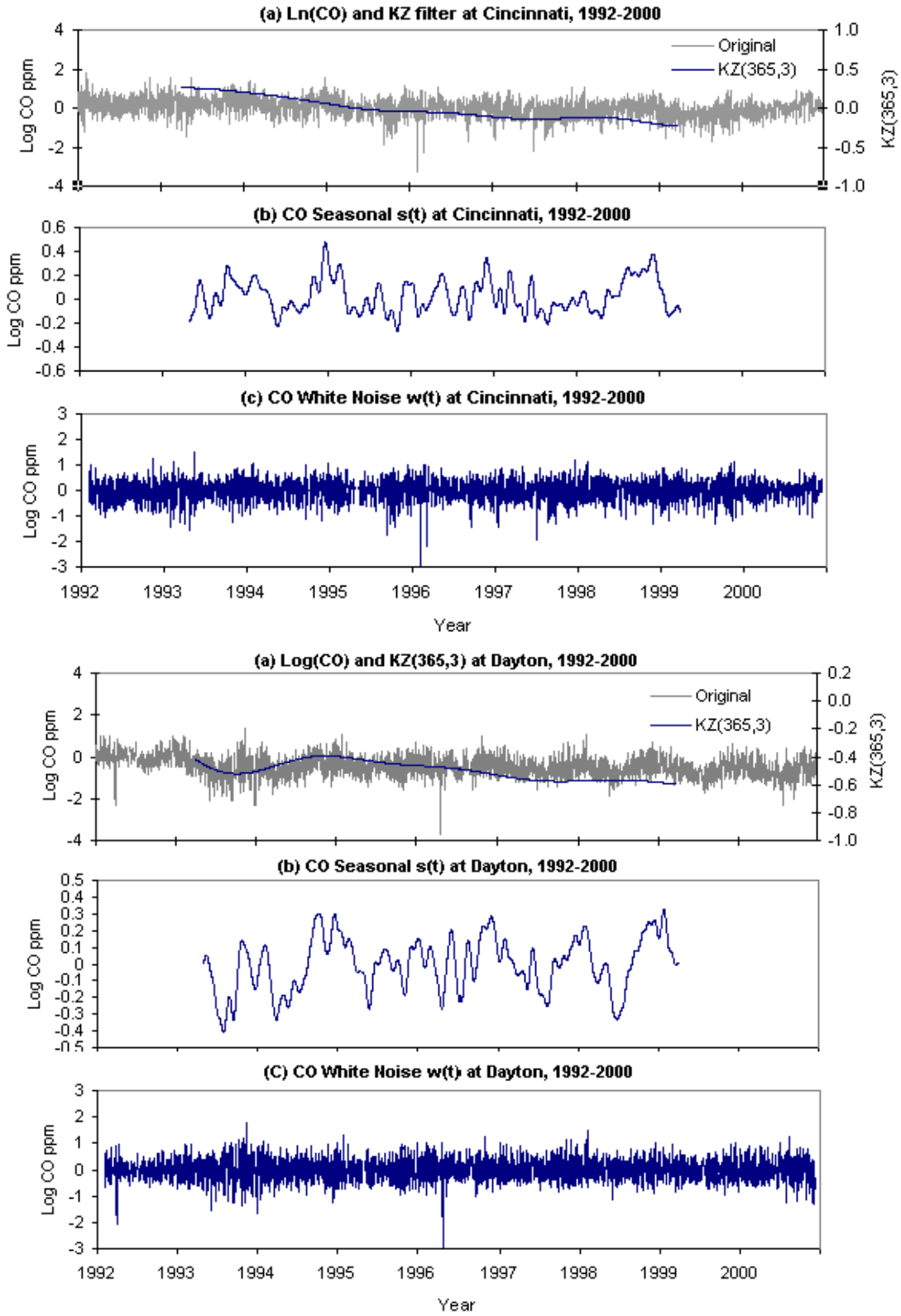


Figure D9. KZ Filter of CO levels in (a) Cincinnati and (b) Dayton, 1992-2000

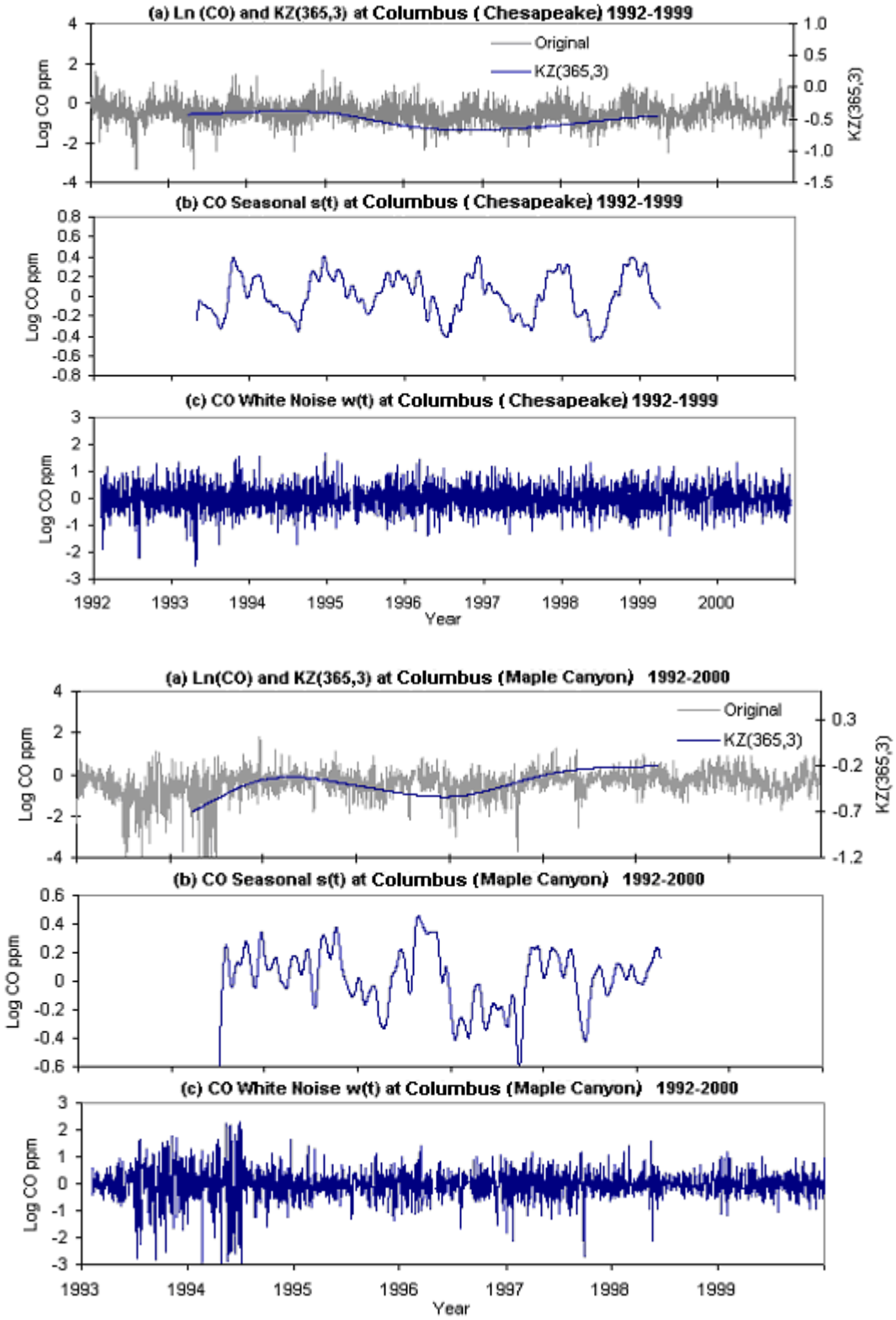


Figure D9. KZ Filter of CO levels in (c) Columbus (Chesapeake) and (d) Columbus (Maple Canyon), 1993-2000

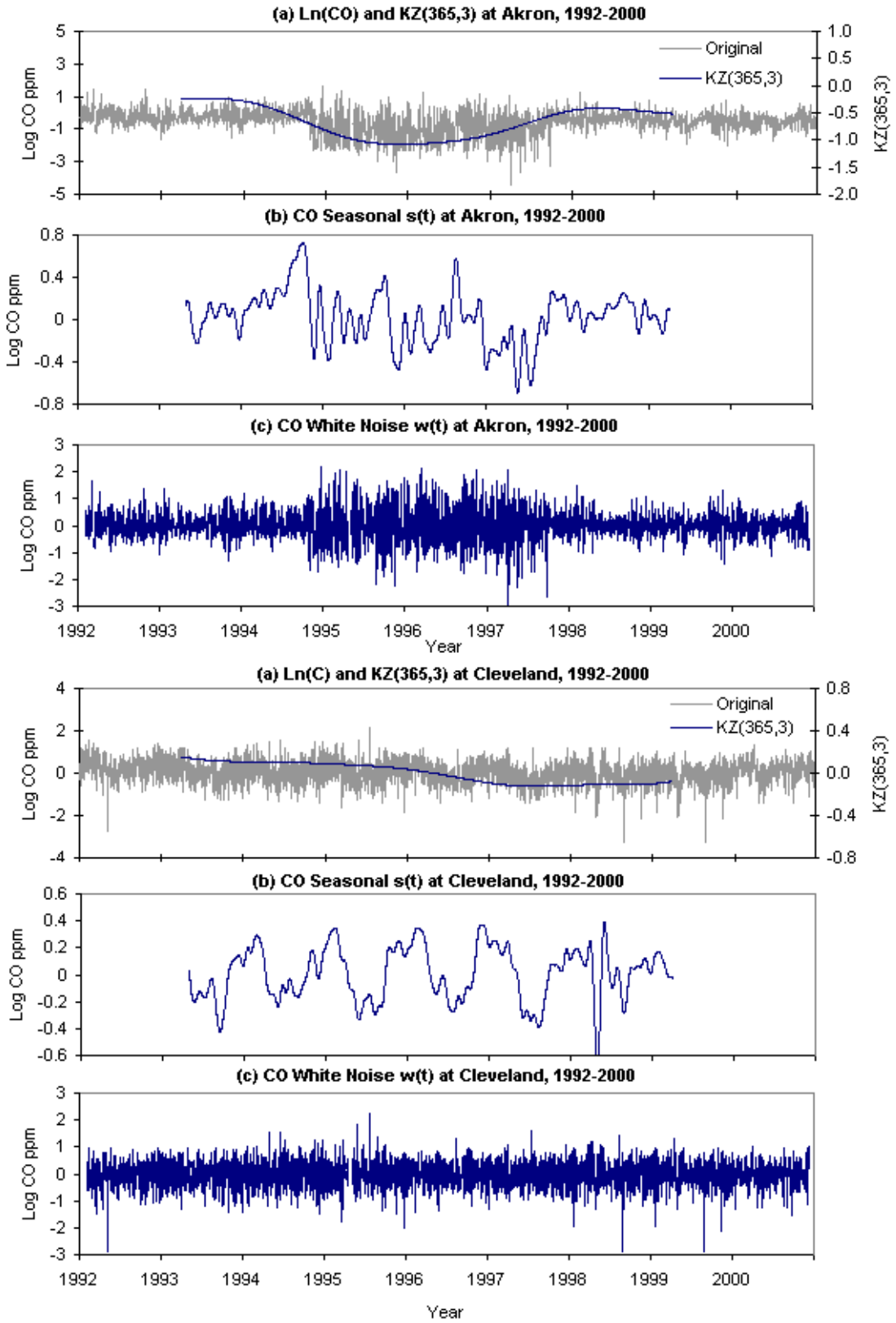


Figure D9. KZ Filter of CO levels in (e) Akron and (f) Cleveland, 1992-2000

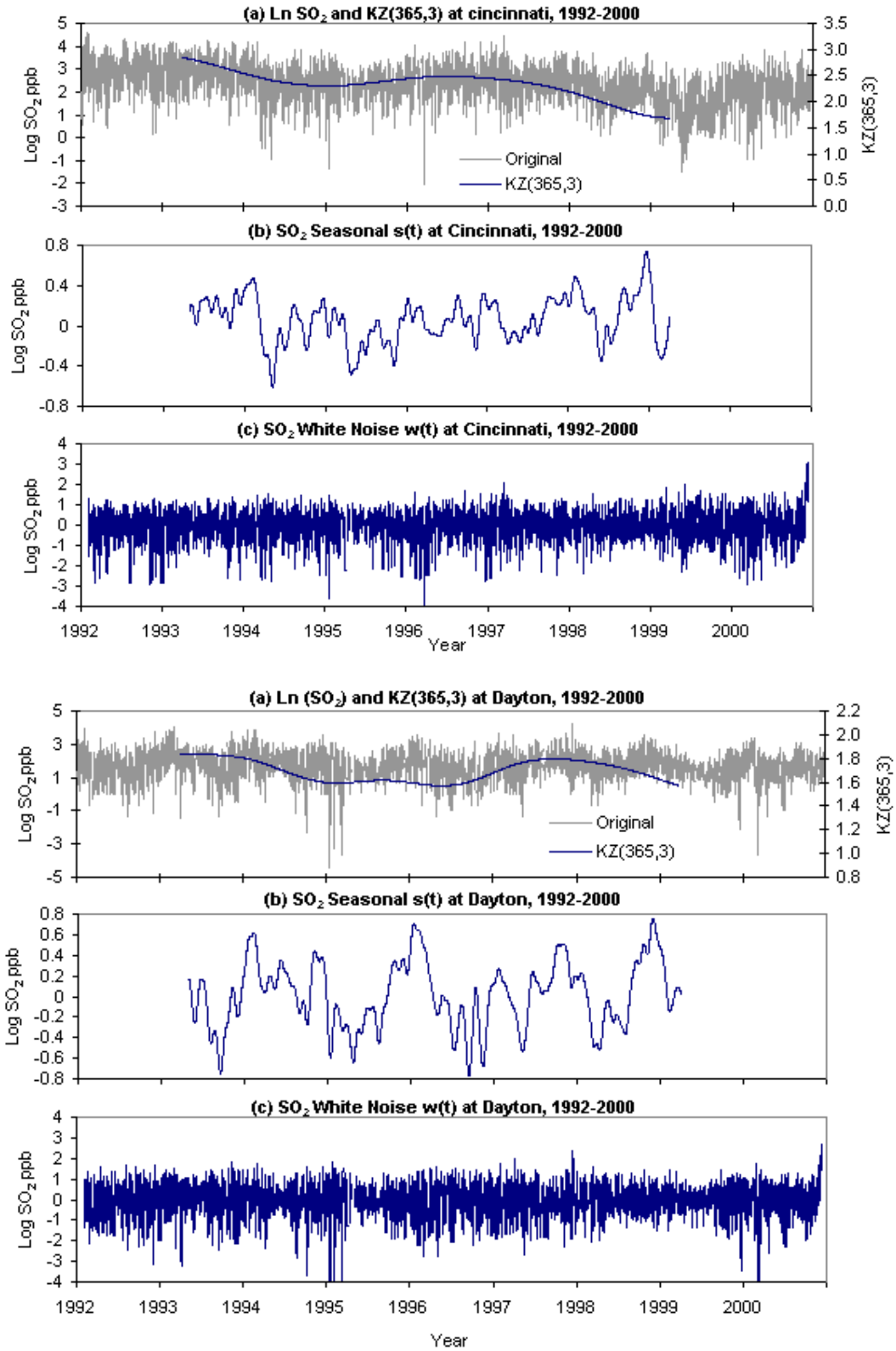


Figure D10. KZ Filter of SO_2 levels in (a) Cincinnati and (b) Dayton, 1992-2000

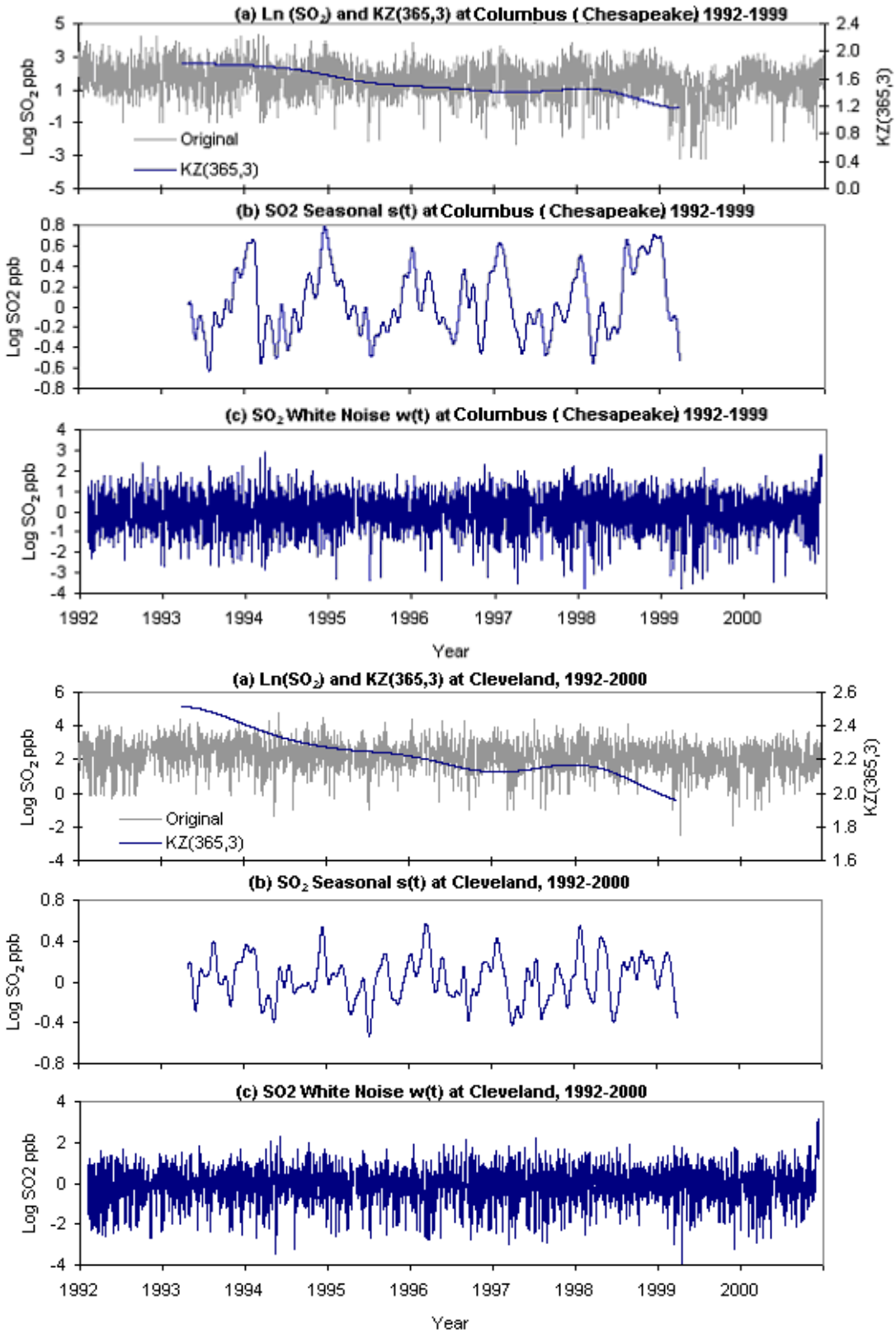


Figure D10. KZ Filter of SO_2 levels in (c) Columbus (Chesapeake) and (d) Cleveland, 1992-2000

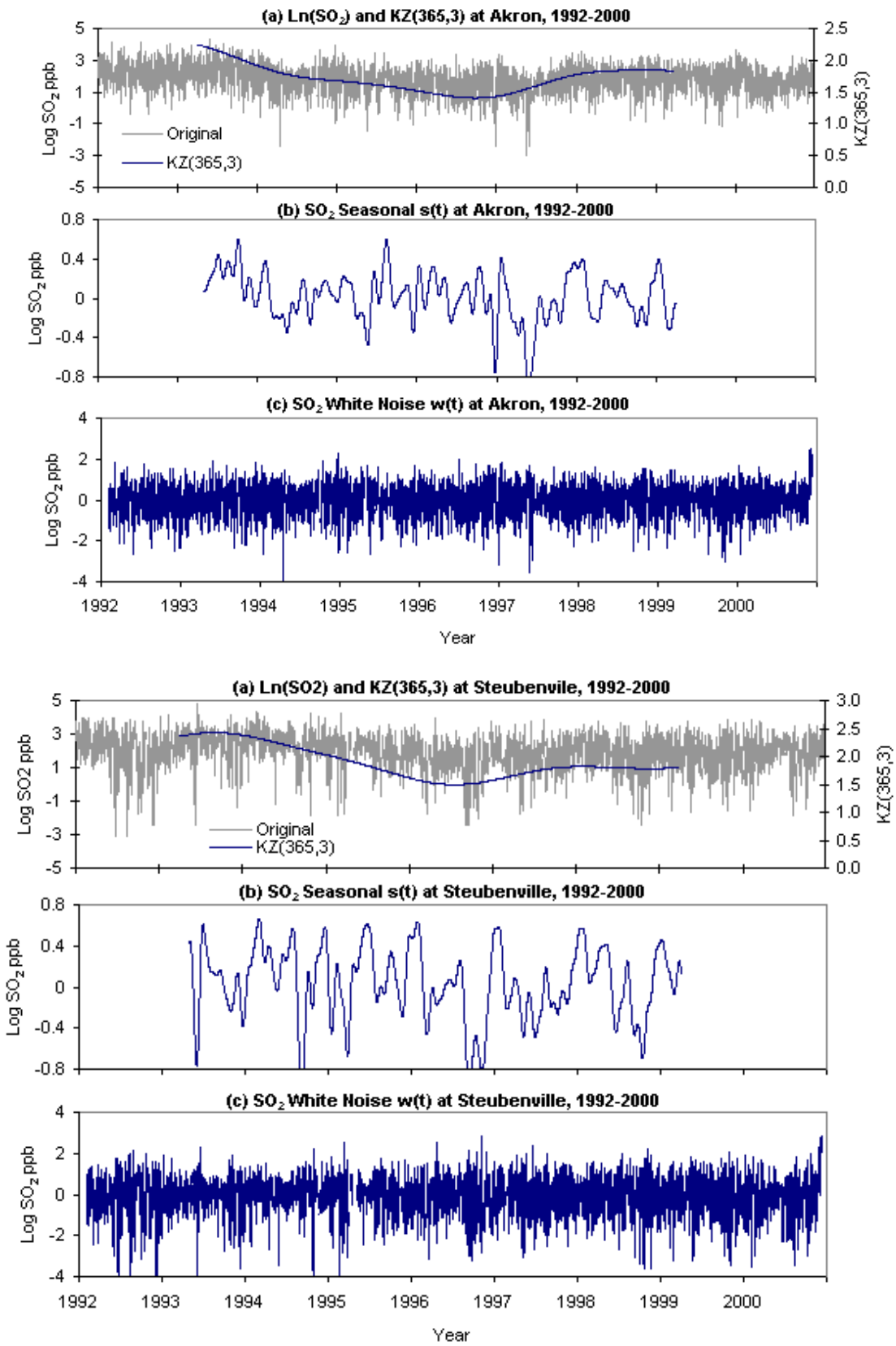


Figure D10. KZ Filter of SO_2 levels in (e) Akron and (f) Steubenville, 1992-2000

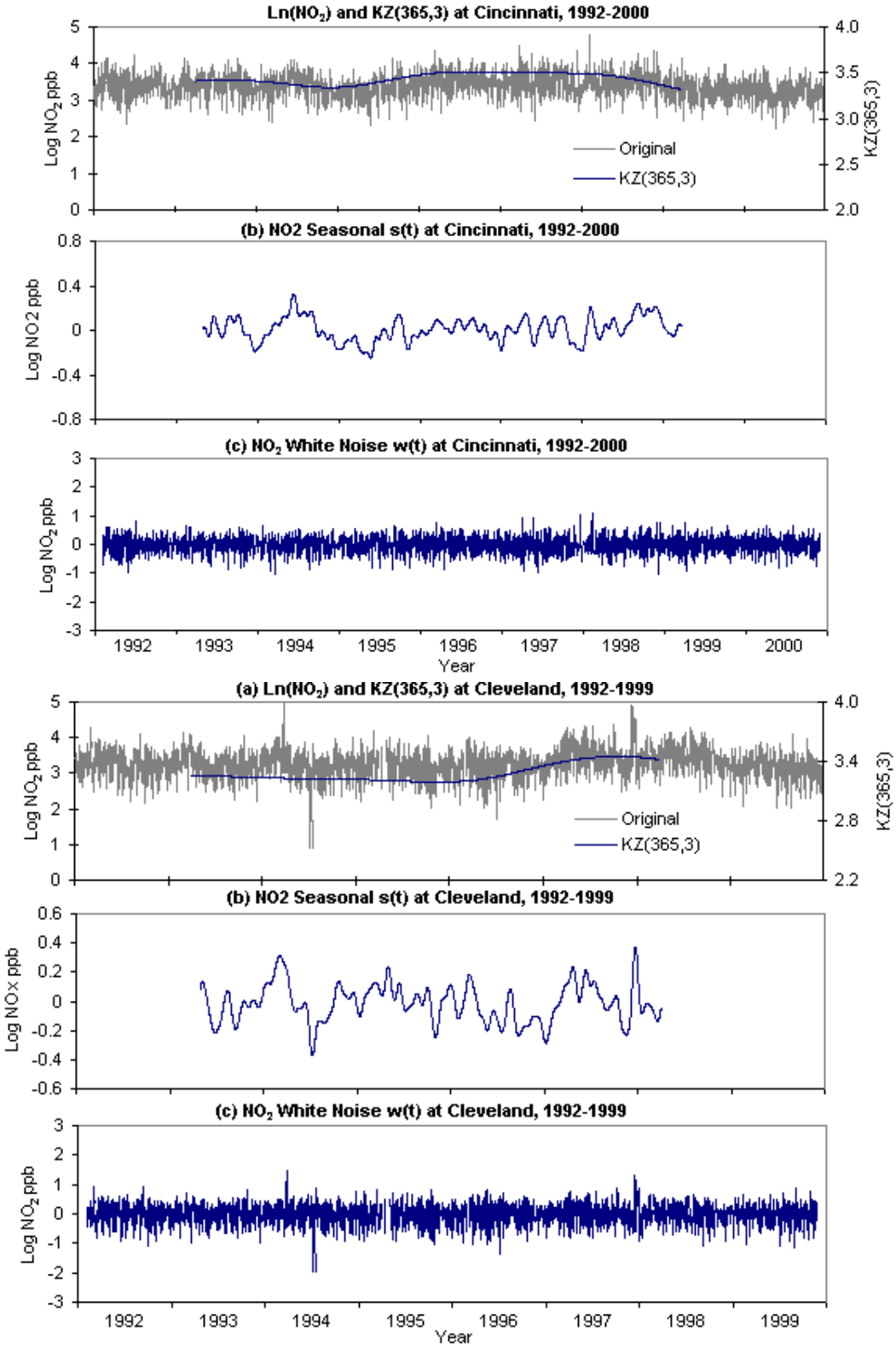


Figure D11. KZ Filter of NO_2 levels in (a) Cincinnati, 1992-2000 and (b) Cleveland, 1992-1999

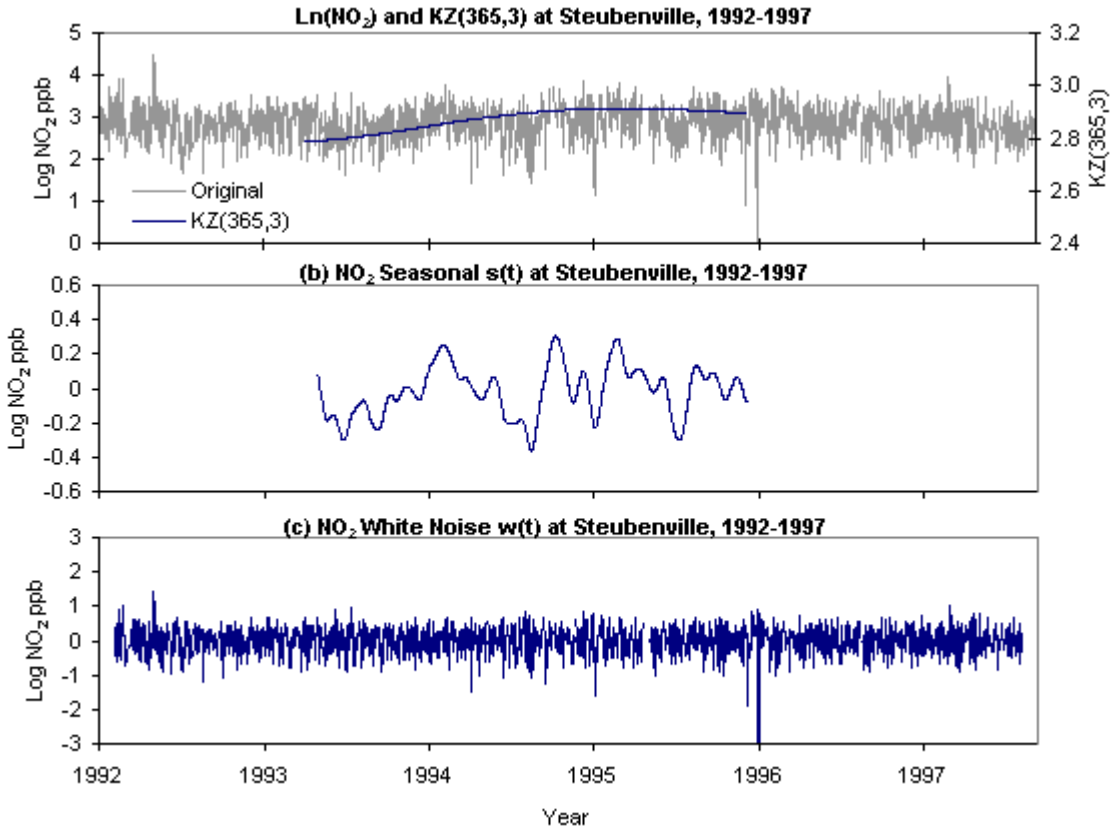


Figure D11. KZ Filter of NO_2 at (c) Steubenville, 1992-1997

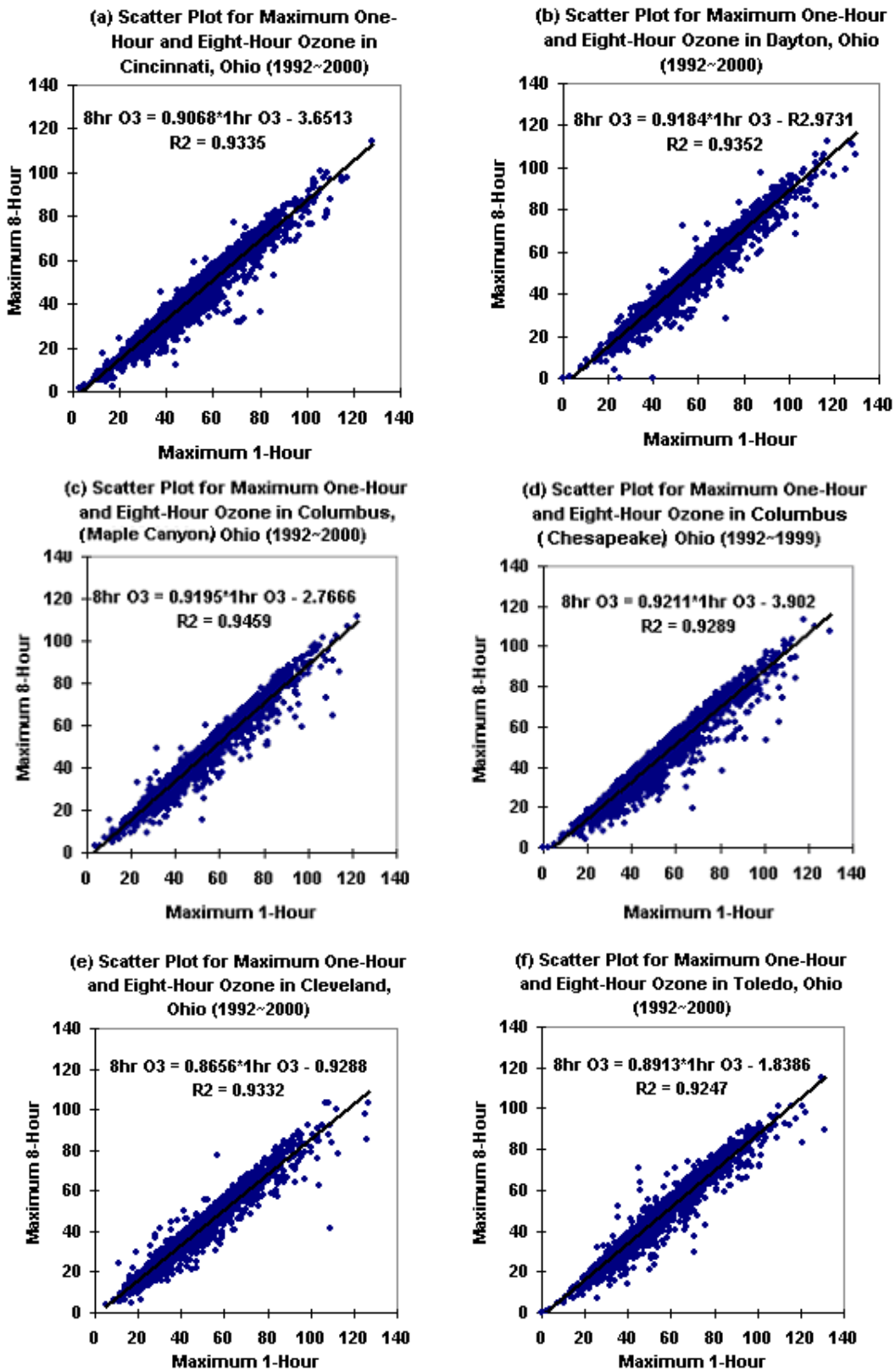


Figure D12. Co-relational plots of maximum eight-hour vs. one-hour ozone concentrations at the six monitoring site, 1992-2000

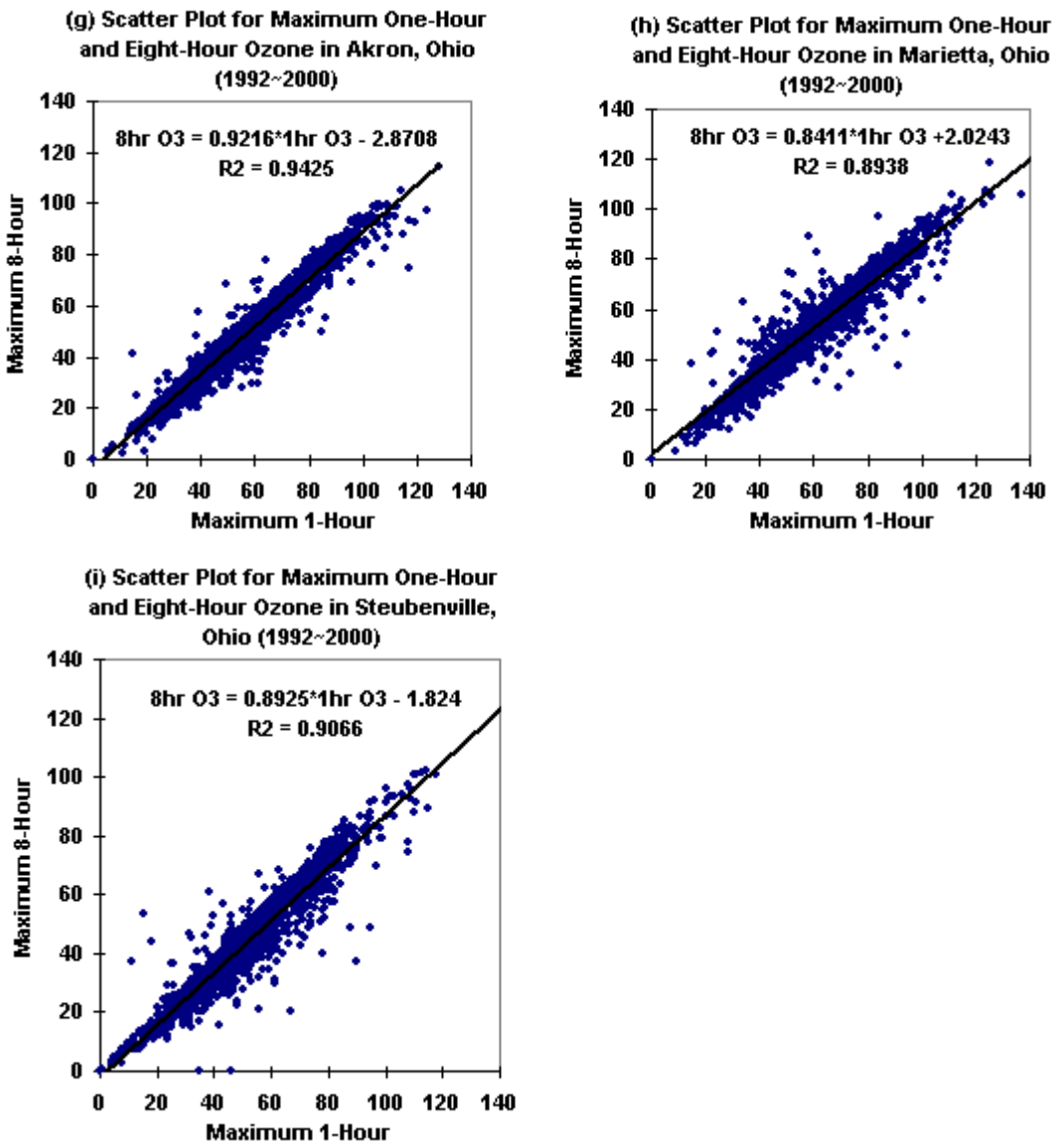


Figure D13. Co-relational plots of maximum eight-hour vs. one-hour ozone concentrations at the six monitoring site, 1992-2000

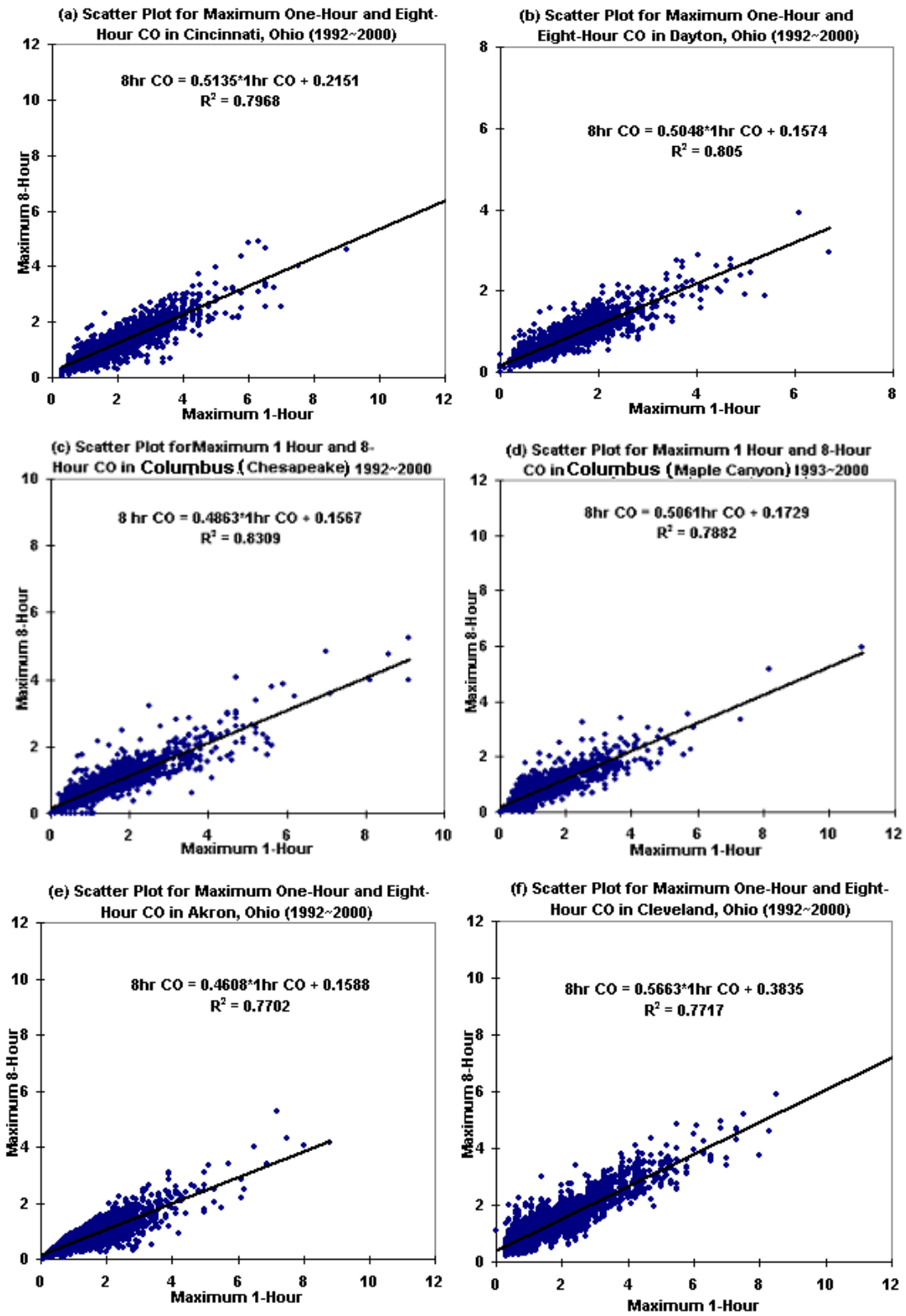


Figure D14. Correlation between 1 Hour and 8 Hour CO1992-2000: (a) Cincinnati, (b) Dayton, (c) Chesapeake, (d) Maple Canyon, (e) Akron and (f) Cleveland

Table D5. Regression equations for correlation analysis of one-hour vs. eight-hour

Monitoring Site	Regression Equation	R-value
Cincinnati	8hr O_3 = 0.9686 * 1hr O_3 – 3.6513	R^2 = 0.93
Dayton	8hr O_3 = 0.9184 * 1hr O_3 – 2.9731	R^2 = 0.94
Columbus (Maple Canyon)	8hr O_3 = 0.9195 * 1hr O_3 – 2.7666	R^2 = 0.95
Columbus (Chesapeake)	8hr O_3 = 0.9211 * 1hr O_3 - 3.902	R^2 = 0.93
Cleveland	8hr O_3 = 0.8651 * 1hr O_3 – 0.9288	R^2 = 0.93
Toledo	8hr O_3 = 0.8913 * 1hr O_3 – 1.8386	R^2 = 0.92
Akron	8hr O_3 = 0.9216 * 1hr O_3 –2.8708	R^2 = 0.94
Marietta	8hr O_3 = 0.8411 * 1hr O_3 + 2.0243	R^2 = 0.89
Steubenville	8hr O_3 = 0.8925 * 1hr O_3 – 1.824	R^2 = 0.91

Table D6. Climatological equivalency (S: Standard, E: Equivalency calculated with standard)

Monitoring Site	Basis	Maximum 1-hour Ozone (ppb)	Maximum 8-hour Ozone (ppb)
Cincinnati	1-hour	125 (S)	117.42 (E)
	8-hour	91.52 (E)	85 (S)
Dayton	1-hour	125 (S)	111.83 (E)
	8-hour	95.79 (E)	85 (S)
Columbus (Maple Canyon)	1-hour	125 (S)	111.61 (E)
	8-hour	95.45 (E)	85 (S)
Columbus (Chesapeake)	1-hour	125 (S)	111.24 (E)
	8-hour	96.52 (E)	85 (S)
Cleveland	1-hour	125 (S)	107.21 (E)
	8-hour	99.32 (E)	85 (S)
Toledo	1-hour	125 (S)	100.55 (E)
	8-hour	97.42(E)	85 (S)
Akron	1-hour	125 (S)	112.33 (E)
	8-hour	95.35(E)	85 (S)
Marietta	1-hour	125 (S)	107.16 (E)
	8-hour	98.65 (E)	85 (S)
Steubenville	1-hour	125 (S)	109.74 (E)
	8-hour	97.28 (E)	85 (S)

Table D7. Regression Equation for Correlation Analysis between 1hr CO and 8hr CO

Monitoring Site	Regression Equation	R-value
Cincinnati	8hr CO = 0.5135 * 1hr CO + 0.2151	$R^2 = 0.7968$
Dayton	8hr CO = 0.5048 * 1hr CO + 0.1574	$R^2 = 0.805$
Columbus (Chesapeake)	8hr CO = 0.4863 * 1hr CO + 0.1567	$R^2 = 0.8309$
Columbus (Maple Canyon)	8hr CO = 0.5061 * 1hr CO + 0.1729	$R^2 = 0.7882$
Akron	8hr CO = 0.4608 * 1hr CO + 0.1588	$R^2 = 0.7702$
Cleveland	8hr CO = 0.5663 * 1hr CO + 0.3835	$R^2 = 0.7717$

Table D8. Climatological equivalency (S: Standard, E: Equivalency calculated with standard)

Monitoring Site	Basis	Maximum 1-hour CO (ppm)	Maximum 8-hour CO (ppm)
Cincinnati	1-hour	35 (S)	18.19 (E)
	8-hour	17.11 (E)	9 (S)
Dayton	1-hour	35 (S)	17.83 (E)
	8-hour	17.52 (E)	9 (S)
Columbus (Chesapeake)	1-hour	35 (S)	17.18 (E)
	8-hour	18.19 (E)	9 (S)
Columbus (Maple Canyon)	1-hour	35 (S)	17.89 (E)
	8-hour	17.44 (E)	9 (S)
Akron	1-hour	35 (S)	16.29 (E)
	8-hour	19.19(E)	9 (S)
Cleveland	1-hour	35 (S)	20.2 (E)
	8-hour	15.22 (E)	9 (S)

Table D9. Regional analysis of ozone exceeding days for Cincinnati, Dayton, Toledo, Columbus (Maple Canyon), Cleveland, Akron, Marietta and Columbus (Chesapeake), 1992-2000 in ppb

Date	Cincinnati		Dayton		Columbus (Maple Canyon)		Columbus (Chesapeake)		Cleveland		Toledo		Akron		Marietta		Steubenville	
	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max
5/9/92	56	50	52	41	39	32	43	39	31	27	62	40	41	32	41	29	38	33
5/10/92	67	57	57	54	69	63	68	62	49	41	70	63	84	71	63	59	64	58
5/11/92	78	71	72	70	64	62	72	64	103	**87**	96	**88**	80	77	84	77	72	66
5/12/92	75	52	74	58	78	71	82	76	83	80	88	63	88	81	93	**87**	70	59
5/13/92	52	46	49	44	45	37	47	38	59	38	53	47	53	43	62	54	67	60
6/16/93	71	62	83	75	69	63	82	73	43	34	94	79	77	67	103	**95**	76	72
6/17/93	69	63	100	**93**	101	**94**	86	82	92	**87**	85	78	104	**95**	124	108	31	30
6/18/93	87	70	77	68	89	71	92	76	73	63	76	65	90	80	93	82	27	25
6/19/93	81	72	105	**88**	91	78	103	**89**	85	74	88	79	84	80	93	77	33	30
6/20/93	41	33	42	38	67	61	66	55	69	59	32	27	72	60	91	81	59	54
6/21/93	44	41	50	45	45	37	46	39	55	48	52	45	47	39	44	36	45	26
6/22/93	84	67	62	59	73	57	58	43	66	52	80	64	77	65	75	70	77	73
6/23/93	68	61	83	75	62	56	80	75	51	42	80	73	70	62	86	57	74	66
6/24/93	68	60	103	**88**	94	**89**	91	75	103	**87**	89	80	98	**92**	92	82	49	40
6/25/93	30	27	57	46	81	73	58	53	65	57	42	37	76	66	91	**86**	69	64
7/22/93	68	61	72	60	60	36	70	57	39	35	74	63	65	50	40	36	84	73
7/23/93	80	75	65	56	96	70	73	60	50	39	77	71	96	69	40	38	82	62
7/24/93	95	77	105	**89**	95	**91**	81	70	66	55	121	**101**	102	**93**	110	**86**	76	69
7/25/93	97	**85**	95	82	97	**92**	91	77	105	**92**	103	84	106	**92**	124	**106**	55	52
7/26/93	75	63	62	56	70	62	60	53	72	59	76	43	73	60	*	*	94	83
8/13/93	53	43	63	58	83	66	71	61	85	57	*	*	78	68	87	81	43	37
8/14/93	87	72	77	71	108	**91**	84	78	70	60	94	80	108	**92**	90	**85**	86	82
8/15/93	110	**88**	101	**95**	98	**89**	93	82	109	**92**	95	**88**	105	**100**	100	**95**	84	71
8/16/93	72	45	66	57	72	65	65	61	65	59	*	*	65	60	106	84	72	64
8/17/93	44	37	60	56	73	68	62	56	71	65	*	*	74	70	59	48	74	62
8/18/93	75	69	84	74	57	53	62	41	59	47	*	*	62	51	78	70	70	64
8/19/93	89	76	**125**	**99**	85	78	86	81	84	70	**131**	**89**	79	72	91	80	54	46
8/20/93	48	44	60	58	69	60	65	53	70	57	54	47	82	68	60	57	84	64

Table D1. Continued.

Date	Cincinnati		Dayton		Columbus (Maple Canyon)		Columbus (Chesapeake)		Cleveland		Toledo		Akron		Marietta		Steubenville	
	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max
6/3/94	38	34	72	67	60	53	58	53	34	30	78	69	58	48	68	64	83	82
6/4/94	54	49	87	83	94	83	92	**85**	62	50	84	79	101	**86**	100	**94**	78	74
6/5/94	48	45	116	**106**	85	83	100	**94**	84	67	101	**92**	88	**86**	111	**106**	66	63
6/6/94	63	45	66	57	81	74	76	71	77	61	55	44	71	68	77	70	50	40
6/7/94	62	41	80	71	87	79	80	63	70	64	32	13	91	84	104	78	71	57
6/8/94	45	31	37	27	61	38	35	19	42	30	30	23	61	35	68	48	73	68
6/9/94	60	45	63	58	75	65	67	58	54	44	62	51	64	59	78	70	97	83
6/10/94	76	68	97	**89**	82	69	98	**92**	60	51	95	**87**	70	64	101	**95**	69	64
6/11/94	45	43	90	84	89	84	90	**86**	103	85	82	78	89	**85**	91	80	80	71
6/12/94	36	29	82	73	67	62	79	77	61	56	65	57	66	61	108	**93**	73	64
6/13/94	55	48	83	76	72	69	66	61	69	59	66	60	75	67	80	72	82	69
6/14/94	51	46	85	76	76	70	66	38	57	45	66	60	78	72	79	70	90	80
6/15/94	68	57	76	71	78	72	62	45	58	46	73	67	78	64	109	83	98	83
6/16/94	61	37	78	69	81	51	101	53	80	69	68	57	88	72	102	**89**	109	**93**
6/17/94	87	71	96	84	72	68	85	77	69	63	92	79	92	**85**	112	**93**	82	73
6/18/94	109	83	89	76	87	65	86	79	92	84	98	77	86	74	90	78	80	73
6/19/94	89	78	94	**90**	82	68	80	74	69	56	88	81	110	**88**	110	**90**	71	55
6/20/94	82	69	98	78	85	72	102	75	93	72	92	77	95	78	**126**	**105**	68	62
6/21/94	62	52	97	80	68	63	85	74	83	78	75	68	87	77	87	79	72	59
6/22/94	98	**87**	103	**95**	81	70	89	83	40	35	113	**93**	78	62	85	66	43	38
6/23/94	66	57	67	53	89	83	58	42	46	30	72	56	78	69	100	83	30	29
7/11/94	62	52	76	67	55	48	55	51	58	51	87	69	65	52	49	45	88	81
7/12/94	66	59	118	**101**	76	73	87	83	**125**	**98**	103	**87**	81	79	73	67	45	32
7/13/94	21	14	45	34	94	**88**	*	*	93	64	37	26	96	84	41	34	60	49
7/14/94	33	24	61	57	62	51	62	55	66	52	50	44	56	47	29	25	56	54
7/15/94	24	16	65	59	52	16	61	47	68	61	43	34	67	62	54	43	77	68

Date	Cincinnati		Dayton		Columbus (Maple Canyon)		Columbus (Chesapeake)		Cleveland		Toledo		Akron		Marietta		Steubenville	
	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max
6/16/95	75	64	76	52	69	65	95	80	34	30	97	84	89	75	86	77	114	**102**
6/17/95	84	75	87	83	100	**94**	91	81	46	43	115	**92**	109	**99**	95	85	100	**91**
6/18/95	103	**97**	90	**86**	104	**96**	87	83	50	48	97	**90**	96	**93**	94	91	72	62
6/19/95	103	**94**	87	83	98	**93**	95	87	65	53	96	**87**	100	**92**	109	98	78	40
6/20/95	59	41	87	70	90	80	76	58	86	67	59	49	92	78	110	99	87	71
6/21/95	86	53	82	57	92	81	94	70	70	59	95	66	83	70	25	13	62	52
6/22/95	78	57	89	74	83	76	76	68	67	62	90	75	119	**92**	76	63	53	50
6/23/95	55	50	71	52	77	70	71	62	91	77	73	61	72	66	52	38	60	47
6/24/95	54	44	62	52	62	47	51	46	50	42	73	54	63	48	67	58	78	62
6/25/95	89	76	93	**85**	61	49	65	56	60	51	66	58	67	51	71	62	62	50
6/26/95	56	45	67	51	73	59	70	61	58	44	68	50	59	36	100	64	53	45
7/11/95	93	69	78	72	90	80	90	72	65	59	91	79	97	80	86	49	108	**98**
7/12/95	101	**91**	115	**104**	87	84	130	**108**	78	66	**130**	**115**	96	**89**	83	80	109	**96**
7/13/95	86	76	101	**93**	91	**88**	95	**85**	103	**91**	91	78	90	**86**	*	*	100	**87**
7/14/95	86	79	93	**90**	93	83	101	**97**	88	76	87	67	89	82	108	79	79	74
7/15/95	101	76	103	69	98	84	107	80	91	82	101	72	101	84	91	38	60	47
7/29/95	74	66	67	63	63	62	64	59	77	67	79	71	68	66	64	60	86	82
7/30/95	87	80	94	78	100	**87**	86	77	64	57	99	**88**	87	80	78	73	102	**93**
7/31/95	**128**	**115**	109	85	92	85	76	72	79	65	109	**97**	87	84	112	**99**	111	**91**
8/1/95	58	42	95	75	91	**89**	97	81	96	**87**	71	55	95	**89**	111	**94**	70	65
8/2/95	78	62	80	67	87	78	74	71	65	56	96	82	77	73	95	81	17	15
8/18/95	65	36	60	45	78	63	53	45	62	50	54	43	85	50	93	69	118	**101**
8/19/95	74	50	74	61	89	81	93	79	101	**87**	70	60	105	**87**	69	61	83	72
8/20/95	71	64	70	63	83	72	83	76	88	75	78	71	117	**94**	85	76	44	42
8/21/95	82	64	76	65	76	63	108	74	89	66	65	59	78	70	88	83	80	59
8/22/95	57	52	49	38	46	39	46	36	40	28	59	52	41	39	56	52	88	82
8/23/95	81	68	78	69	68	56	81	67	47	39	79	73	70	63	74	62	68	57
8/24/95	109	81	79	61	67	55	101	83	40	28	93	81	58	52	83	44	108	78
8/25/95	83	68	62	53	68	54	54	50	41	39	86	72	59	47	84	70	101	**93**
8/26/95	83	71	81	71	101	**88**	98	81	83	69	88	76	124	**98**	110	**90**	90	37
8/27/95	65	58	94	84	90	84	90	85	74	67	70	57	88	71	96	84	15	14

Table D9. Continued.

Date	Cincinnati		Dayton		Columbus (Maple Canyon)		Columbus (Chesapeake)		Cleveland		Toledo		Akron		Marietta		Steubenville	
	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max
6/15/96	83	77	84	81	90	79	92	84	67	59	70	64	93	84	85	71	82	79
6/16/96	106	**93**	93	**90**	89	84	94	**89**	84	73	88	84	92	**87**	105	**93**	69	63
6/17/96	80	64	85	78	84	76	97	73	71	54	84	68	82	67	79	72	71	59
6/18/96	60	41	62	54	70	57	68	55	51	47	65	50	60	46	67	62	70	64
6/19/96	71	63	69	56	78	70	79	71	77	67	62	55	71	67	61	44	72	63
6/20/96	58	56	67	55	65	62	63	60	71	64	56	53	74	66	79	62	68	65
6/21/96	102	77	84	77	79	70	83	75	65	59	69	54	81	77	67	62	56	49
6/22/96	70	66	79	70	68	63	76	71	72	63	79	72	71	67	76	70	66	46
6/23/96	115	**96**	98	**87**	66	62	76	74	40	26	92	78	70	64	65	63	41	35
6/24/96	51	38	66	63	59	43	68	50	83	69	71	56	60	48	76	58	47	40
6/25/96	60	51	55	51	44	39	55	38	51	39	56	51	50	42	54	50	57	44
6/26/96	78	67	68	62	58	48	68	62	38	34	74	65	62	52	61	55	78	75
6/27/96	103	**96**	98	**86**	95	75	101	91	85	64	106	**97**	79	72	78	74	86	80
6/28/96	107	**98**	112	**106**	92	**86**	100	91	110	84	96	**91**	113	**99**	113	**100**	85	69
6/29/96	106	**101**	101	**95**	94	**91**	118	114	92	82	107	**96**	96	**93**	99	**92**	71	64
6/30/96	72	67	86	79	81	70	89	81	88	85	78	74	84	76	83	79	80	71
7/1/96	75	65	97	**90**	74	69	77	75	49	43	98	**86**	84	71	75	67	40	32
7/2/96	82	74	91	**86**	85	78	91	73	87	82	91	82	98	**91**	79	67	51	45
7/3/96	52	44	52	48	43	32	55	51	40	35	49	42	43	38	43	35	69	59
7/4/96	73	66	65	60	51	44	56	52	59	54	62	56	57	51	27	25	100	**92**
7/5/96	84	72	87	84	72	68	89	84	76	68	88	78	76	73	50	45	94	**86**
7/6/96	90	85	117	**113**	89	**85**	101	97	94	**88**	108	**92**	98	**91**	67	61	63	59
7/7/96	81	69	107	**99**	98	**89**	104	95	108	**103**	90	74	103	**96**	46	43	47	47
7/8/96	77	61	77	70	70	63	80	71	72	48	76	65	66	62	33	31	53	47
8/3/96	72	67	88	84	74	69	76	68	85	78	82	75	79	74	75	70	77	61
8/4/96	85	76	87	75	72	68	92	86	91	**85**	88	83	86	75	84	76	78	72
8/5/96	74	65	106	**89**	90	81	85	79	94	82	91	75	94	82	85	75	87	75
8/6/96	97	71	*	*	84	80	96	88	100	81	90	80	94	**89**	97	82	82	58
8/7/96	76	69	107	**89**	88	79	89	70	86	81	84	80	87	80	97	87	41	35
8/8/96	40	20	67	60	71	52	65	46	62	57	56	43	63	49	76	51	42	34

Table D9. Continued.

Date	Cincinnati		Dayton		Columbus (Maple Canyon)		Columbus (Chesapeake)		Cleveland		Toledo		Akron		Marietta		Steubenville	
	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max
8/24/96	54	46	51	47	59	51	59	51	51	46	59	50	57	52	38	33	74	49
8/25/96	72	66	69	64	77	67	73	61	68	66	76	68	76	72	62	58	78	62
8/26/96	85	69	99	**90**	91	80	92	79	72	65	106	**90**	80	74	88	75	71	61
8/27/96	33	19	93	79	80	75	107	62	85	71	65	47	98	**87**	94	85	74	69
8/28/96	74	63	77	70	82	69	82	75	61	55	86	74	85	76	79	70	70	57
8/29/96	75	68	75	71	68	63	71	68	50	43	85	59	68	60	74	65	71	67
6/21/97	62	56	79	69	74	69	75	66	70	65	72	62	83	74	70	64	87	83
6/22/97	64	60	63	59	69	59	64	61	50	46	57	55	78	67	57	52	53	42
6/23/97	87	74	77	74	77	70	97	82	66	54	118	**95**	79	76	106	**97**	62	55
6/24/97	87	72	**130**	**106**	87	**86**	100	**91**	82	76	96	84	99	**95**	110	**90**	75	67
6/25/97	77	71	82	73	85	76	81	38	65	56	76	73	76	69	76	70	75	70
6/26/97	57	52	66	57	75	54	59	54	64	56	58	47	88	69	52	44	51	44
7/10/97	58	54	52	46	50	47	54	51	34	29	66	59	52	45	58	44	81	77
7/11/97	96	**86**	85	78	93	82	92	**85**	59	51	94	84	109	**91**	86	77	80	69
7/12/97	115	**98**	95	**89**	98	**90**	101	**97**	87	76	100	**88**	112	**99**	79	75	64	60
7/13/97	110	**97**	88	84	89	**86**	91	**89**	86	81	78	76	97	**94**	80	77	71	57
7/14/97	58	48	71	49	83	78	93	81	70	62	68	46	84	78	97	90	78	61
7/15/97	63	53	68	59	62	53	61	59	67	55	64	55	68	59	68	64	54	48
7/16/97	75	65	70	64	74	63	67	62	69	60	68	63	76	65	66	62	68	55
7/17/97	75	70	87	80	61	51	74	65	60	52	74	70	72	65	80	71	80	73
7/18/97	83	77	96	**90**	81	74	79	75	87	79	101	**90**	85	80	89	82	48	41
7/19/97	93	75	54	50	54	49	58	50	38	34	68	61	55	50	77	68	43	39
7/20/97	117	**98**	85	74	69	60	84	76	60	54	84	75	90	76	77	74	42	32
7/21/97	93	80	93	71	75	66	93	76	46	36	101	73	73	60	90	**85**	68	57

Table D9. Continued.

Date	Cincinnati		Dayton		Columbus (Maple Canyon)		Columbus (Chesapeake)		Cleveland		Toledo		Akron		Marietta		Steubenville	
	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max
5/13/98	76	72	96	77	55	49	68	59	40	29	92	73	59	47	80	68	*	*
5/14/98	88	74	95	**86**	101	**90**	105	**94**	85	73	87	78	110	**98**	80	73	*	*
5/15/98	97	76	102	**91**	122	**112**	104	**93**	73	69	105	**89**	**128**	**114**	115	**103**	*	*
5/16/98	73	68	70	67	77	67	75	69	63	53	64	61	82	77	62	59	*	*
5/17/98	82	76	80	74	75	72	77	74	58	53	69	67	79	78	78	74	*	*
5/18/98	75	62	82	77	79	73	73	52	57	52	83	70	84	80	85	77	*	*
5/19/98	115	**97**	101	**95**	102	**97**	109	**103**	72	68	109	**85**	114	**105**	103	**92**	*	*
5/20/98	60	54	69	61	74	70	77	72	55	51	57	33	98	**88**	79	63	*	*
5/21/98	70	63	65	60	57	51	57	55	35	32	70	61	64	58	61	58	*	*
6/22/98	65	52	71	63	82	78	82	70	65	57	67	57	86	82	53	52	74	66
6/23/98	56	48	66	61	57	49	56	50	67	60	58	53	55	46	47	38	51	45
6/24/98	87	75	93	79	98	85	82	74	98	83	93	83	104	**89**	89	74	85	75
6/25/98	100	**86**	94	78	100	**89**	105	**96**	86	76	86	80	96	**87**	97	81	89	83
6/26/98	63	58	75	70	77	59	81	70	81	73	68	63	84	79	85	79	86	70
6/27/98	57	51	53	49	65	59	64	61	47	36	55	49	67	55	66	56	53	43
6/28/98	62	56	55	49	68	58	76	64	80	65	51	46	68	58	61	50	68	57
7/11/98	64	62	55	53	62	53	59	56	37	36	65	60	61	53	61	52	63	50
7/12/98	87	81	77	73	67	61	82	76	61	56	79	77	83	75	70	65	79	69
7/13/98	85	77	97	**93**	97	**92**	100	**91**	88	69	116	**101**	105	**98**	103	**90**	72	55
7/14/98	25	18	52	43	88	85	61	52	84	82	49	40	92	85	83	72	93	82
7/15/98	39	27	56	41	71	63	66	59	59	53	43	31	70	55	61	53	41	32
8/2/98	81	72	75	72	84	77	80	76	61	56	79	73	74	70	71	66	66	59
8/3/98	72	65	73	67	107	**93**	84	75	75	65	74	69	98	**91**	95	**87**	62	58
8/4/98	65	54	70	44	102	**90**	82	62	74	65	*	*	96	**89**	93	**87**	66	60
8/5/98	74	66	63	39	106	**88**	71	53	76	52	47	29	60	55	89	**85**	62	57
8/6/98	81	68	112	82	107	**102**	98	**89**	84	79	88	69	99	**94**	104	**93**	50	41
8/7/98	101	**89**	92	83	113	**103**	107	**96**	112	**100**	102	77	107	**99**	88	83	55	47
8/8/98	74	66	106	**89**	82	74	103	**93**	88	79	93	66	85	75	49	47	41	36
8/9/98	45	41	59	51	77	66	61	54	49	38	53	44	69	58	78	56	39	32

Table D9. Continued.

Date	Cincinnati		Dayton		Columbus (Maple Canyon)		Columbus (Chesapeake)		Cleveland		Toledo		Akron		Marietta		Steubenville	
	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max
9/11/98	65	56	77	68	74	67	85	76	60	55	82	71	76	71	78	71	48	43
9/12/98	85	76	93	84	92	84	109	**100**	76	66	95	**85**	87	82	97	**90**	64	55
9/13/98	101	**88**	102	**96**	98	**89**	113	**104**	96	84	102	**91**	102	**94**	**125**	**106**	58	48
9/14/98	74	61	96	74	114	**85**	108	**91**	87	79	79	65	101	83	100	81	50	35
9/15/98	51	41	58	53	78	67	61	56	50	38	57	51	60	53	84	80	38	36
5/28/99	89	78	85	80	80	75	79	75	43	38	42	40	84	81	87	81	88	81
5/29/99	103	**95**	106	**98**	109	**95**	99	**93**	40	38	43	40	79	75	93	**90**	77	75
5/30/99	83	80	100	**96**	103	**98**	**101**	**96**	63	58	53	49	98	**90**	99	**96**	92	82
5/31/99	55	47	64	51	59	52	63	58	37	33	26	23	77	70	72	67	83	79
6/1/99	46	38	44	34	39	34	49	44	32	28	20	18	38	33	41	44	50	55
6/8/99	86	79	79	74	71	68	74	72	79	74	40	27	93	83	79	72	79	74
6/9/99	85	68	107	**85**	111	**99**	112	**94**	60	48	69	54	112	**95**	89	83	74	56
6/10/99	103	**93**	**127**	**113**	118	**107**	123	**110**	77	70	122	**98**	102	**95**	123	**102**	111	**101**
6/11/99	93	**86**	**128**	**111**	102	**94**	98	**92**	94	74	110	**101**	103	**92**	97	**86**	113	**102**
6/12/99	95	69	96	73	111	**91**	114	**95**	96	78	85	72	101	**93**	75	65	94	87
6/13/99	89	82	91	77	104	**95**	98	**92**	72	68	73	60	86	80	83	70	63	68
6/14/99	56	54	58	55	54	47	54	51	50	40	52	50	61	49	46	53	53	46
6/20/99	87	83	84	81	89	83	89	84	67	62	81	77	78	73	83	73	79	77
6/21/99	84	79	94	**89**	92	**86**	86	82	59	49	77	73	63	58	82	73	73	67
6/22/99	102	**88**	84	78	86	78	88	79	61	55	90	80	85	76	60	65	79	73
6/23/99	83	69	110	**96**	97	**91**	104	**97**	72	64	93	**88**	93	**86**	82	78	77	64
6/24/99	44	33	42	38	56	52	57	52	49	43	57	48	68	65	74	69	72	64
7/13/99	63	54	75	69	81	73	78	72	64	58	54	32	81	71	69	61	75	55
7/14/99	91	72	91	81	96	**87**	88	82	91	80	*	*	98	85	76	60	62	56
7/15/99	95	**88**	95	83	86	76	89	83	68	66	*	*	88	84	107	**98**	85	83
7/16/99	78	72	97	**89**	76	72	82	79	72	65	83	80	102	**95**	**125**	**118**	96	92
7/17/99	82	66	72	67	80	74	89	80	64	59	75	68	80	79	84	**97**	86	81

Table D9. Continued.

Date	Cincinnati		Dayton		Columbus (Maple Canyon)		Columbus (Chesapeake)		Cleveland		Toledo		Akron		Marietta		Steubenville	
	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	1hr Max	8hr Max	8hr Max	1hr Max
8/14/99	26	20	25	20	24	18	31	25	30	21	45	40	44	26	23	43	45	43
8/15/99	55	51	51	45	50	45	57	52	31	27	42	40	54	47	33	29	37	33
8/16/99	75	67	83	75	78	69	88	76	99	**92**	68	62	78	67	85	78	65	55
8/17/99	93	80	96	84	98	**85**	110	**98**	97	66	66	61	105	**94**	103	**97**	86	85
8/18/99	64	51	48	39	50	44	59	54	37	33	37	33	43	38	58	**89**	43	57
8/19/99	46	42	54	41	50	37	53	39	29	25	35	25	40	36	61	50	38	31
6/1/00	109	**100**	86	83	88	83			66	56	87	78	82	74	80	74	70	67
6/2/00	69	77	78	**84**	79	78			67	58	68	74	76	71	81	76	76	70
6/3/00	64	57	53	50	54	49			35	33	49	46	38	48	41	52	39	49
6/8/00	90	84	87	84	81	76			78	72	89	84	88	84	74	72	73	71
6/9/00	107	**98**	112	**102**	105	**97**			94	**89**	91	**88**	106	**100**	103	**94**	100	**96**
6/10/00	85	80	88	**97**	84	80			92	85	85	81	103	**96**	113	**98**	103	**93**
6/11/00	86	75	64	73	69	58			57	77	46	60	64	78	68	69	79	78
6/12/00	92	**86**	71	58	111	65			11	25	30	26	27	34	45	56	45	47
6/13/00	90	77	50	46	64	63			53	35	62	51	66	61	68	58	76	70
6/14/00	51	51	61	52	94	64			75	61	76	56	85	73	73	63	79	62
7/8/00	92	76	74	70	72	69			52	47	59	55	59	53	76	68	60	52
7/9/00	103	**86**	84	75	88	82			67	63	70	64	86	82	87	82	95	**86**
7/10/00	74	75	69	70	94	76			42	39	48	52	61	66	64	69	74	76
7/11/00	48	42	53	51	66	62			37	31	49	47	54	50	54	50	66	57
7/12/00	65	59	68	60	76	72			39	38	68	61	61	54	71	64	76	68
7/13/00	77	67	70	69	77	74			61	55	97	84	110	**95**	78	73	86	80

Table D10. High Concentration and High Frequency in Correlation With Wind Direction.

	Cincinnati	Dayton	Columbus (Maple Canyon)	Columbus (Chesapeake)	Akron	Cleveland	Marietta	Toledo	Steubenville
PM_{10}	*E/SW	-	S/SW	E/SW		S/SW	-	-	S/SW
CO	E/SW	SW/SW	SE/SW	E/SW	N/SW	NW/SW	-	-	-
SO_2	SW/SW	S/SW	-	W/SW	W/SW	NE/SW	-	-	S/SW
NO_2	S/SW	-	-	-	-	SE/SW	-	-	NW/SW

* E/SW means East High Directional Concentration / Southwest High Directional Frequency of Wind.

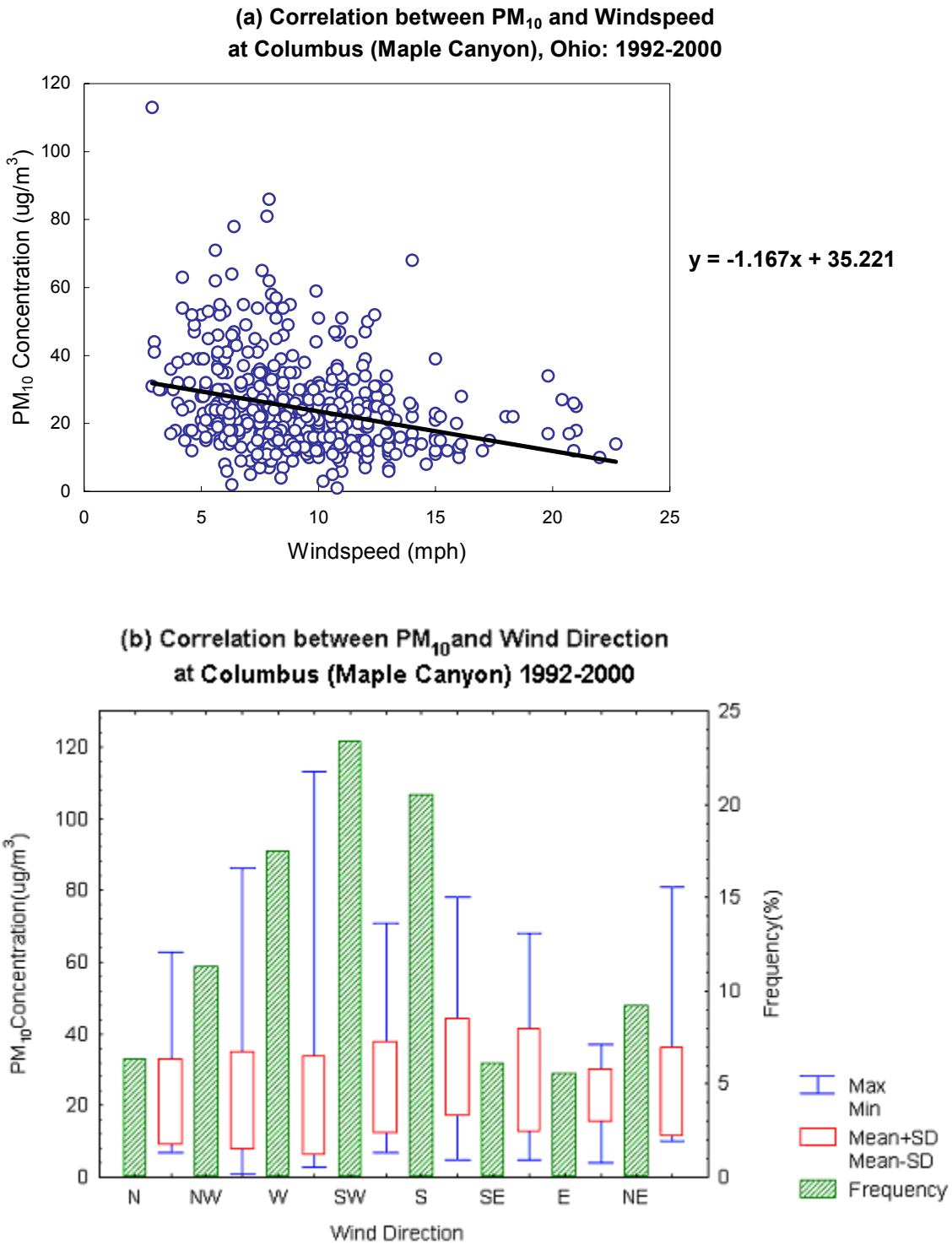


Figure D15. Correlations between PM_{10} and weather components at Columbus (Maple Canyon), Ohio in 1992-2000: (a) PM_{10} vs. wind speed and (b) PM_{10} vs. wind direction

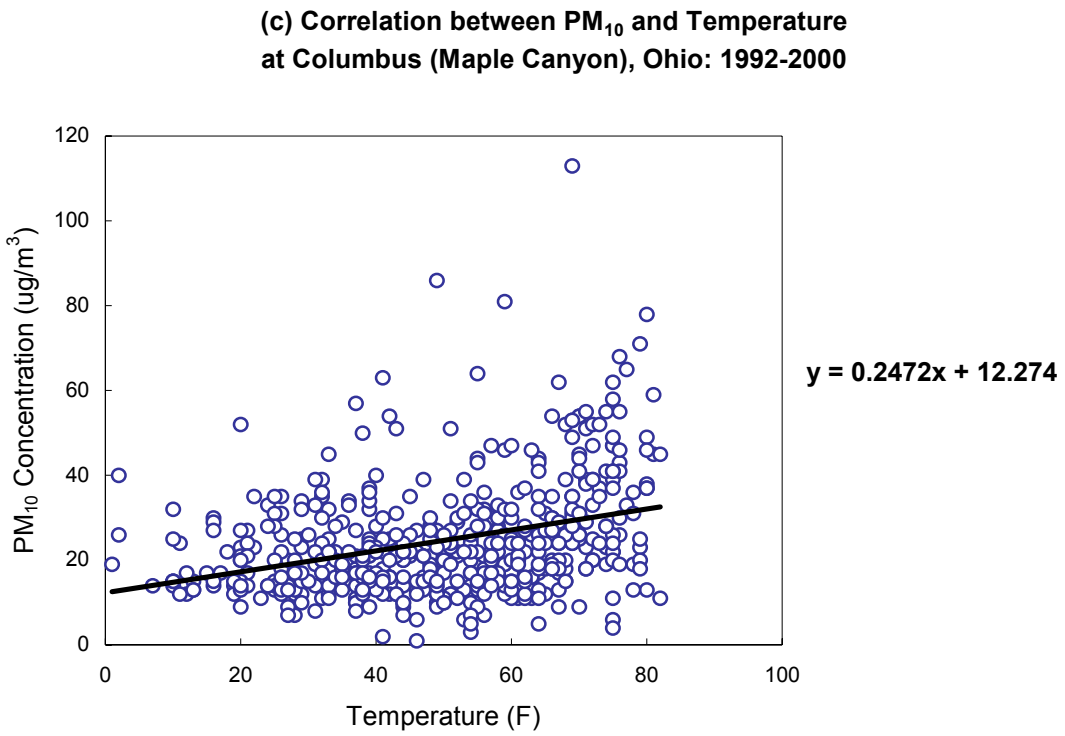
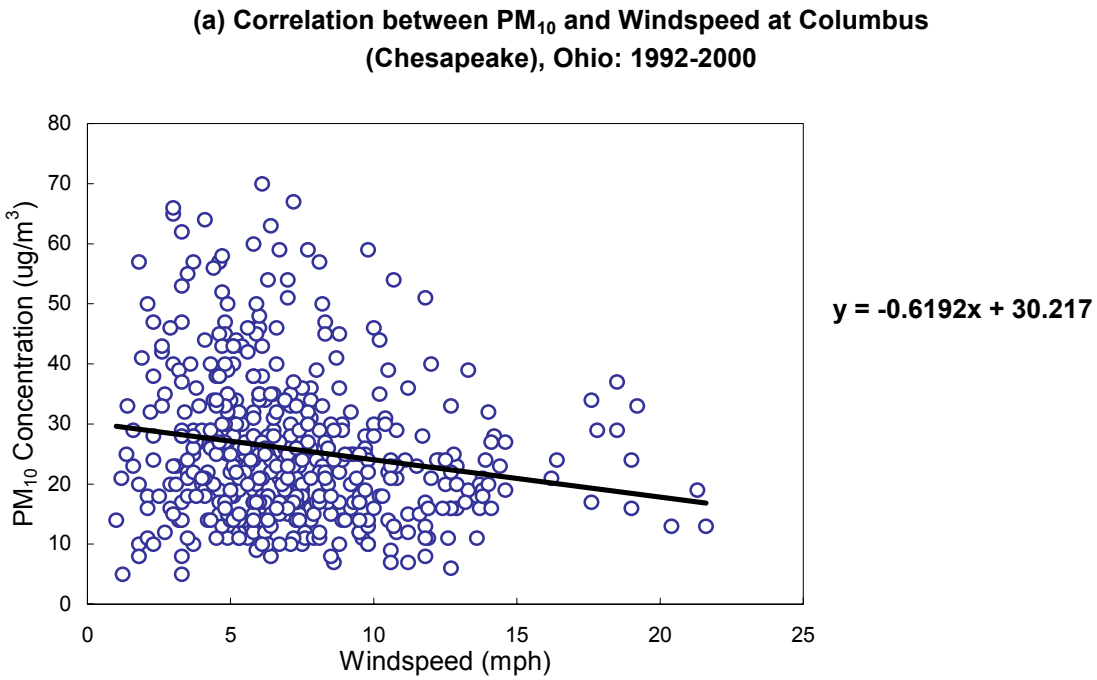


Figure D15. Correlations between PM_{10} and weather components at Columbus (Maple Canyon), Ohio in 1992-1999: (c) PM_{10} vs. temperature



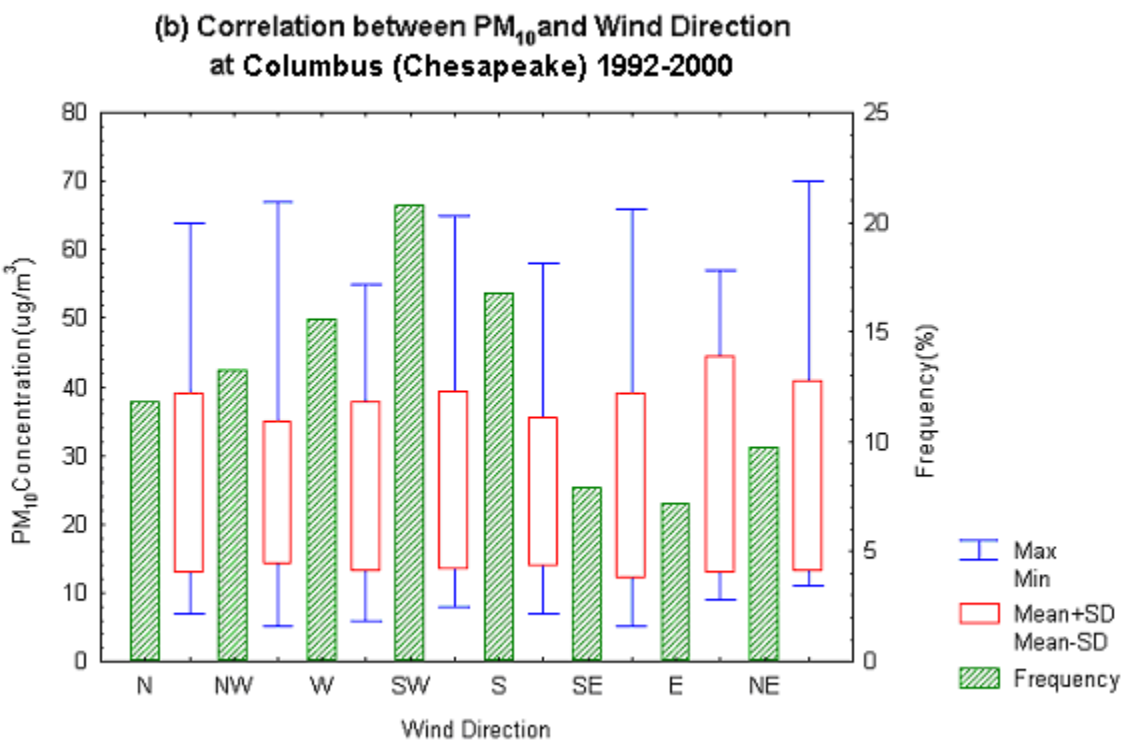


Figure D16. Correlations between PM_{10} and weather components at Columbus (Chesapeake), Ohio in 1992-1999: (a) PM_{10} vs. wind speed and: (b) PM_{10} and wind direction.

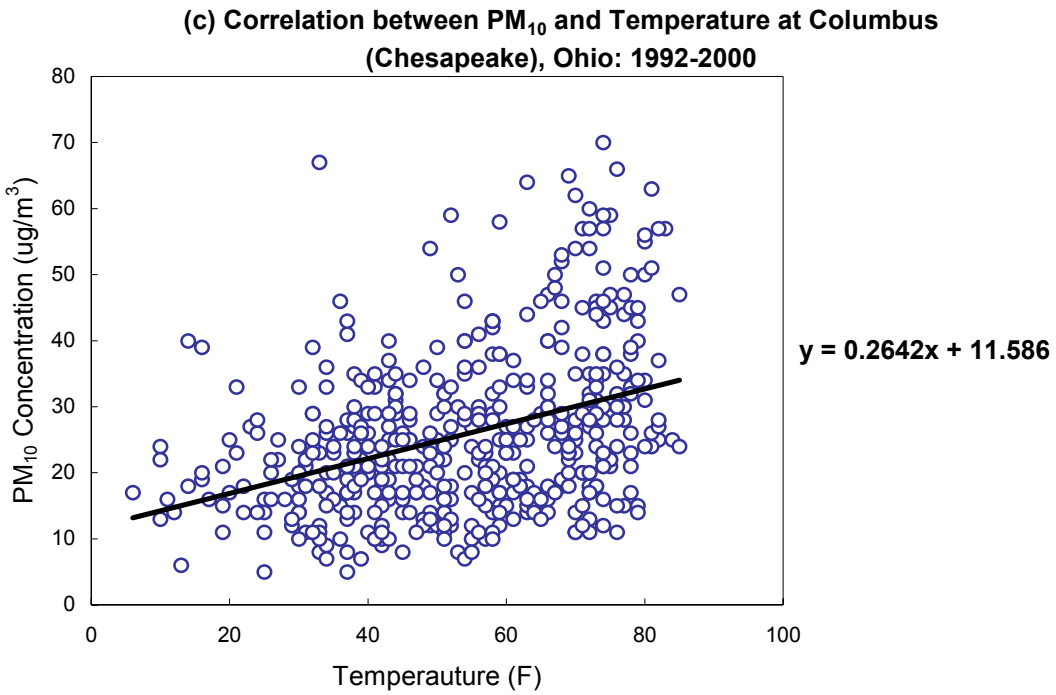
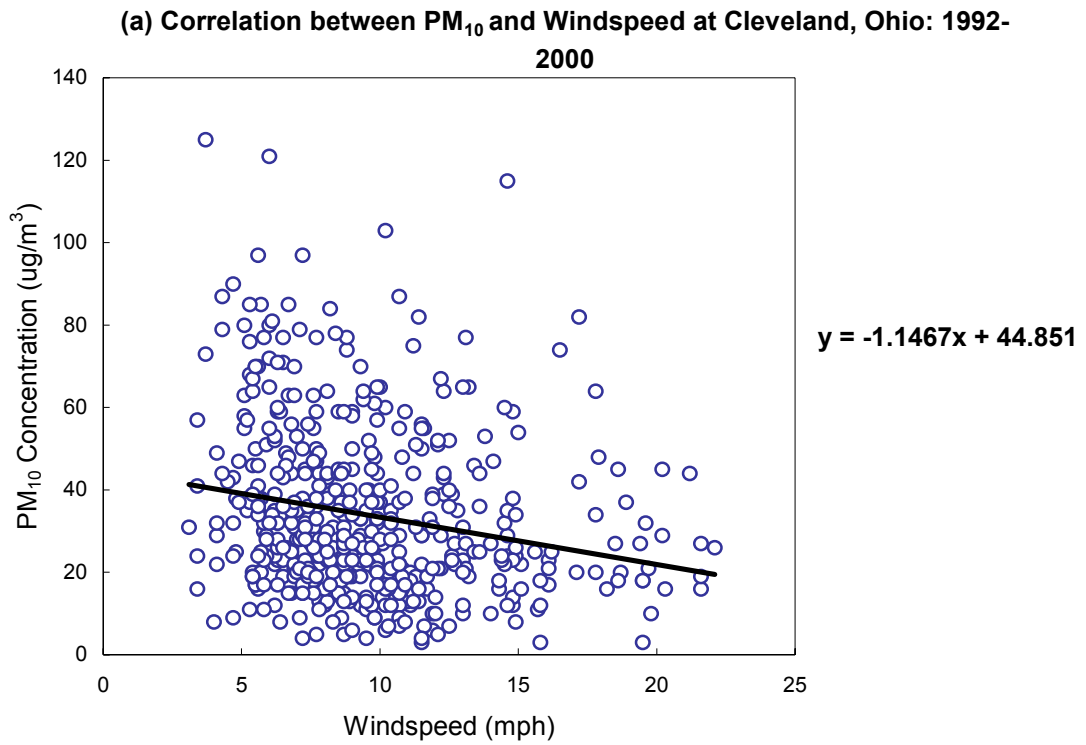


Figure D16. Correlations between PM_{10} and weather components at Columbus (Chesapeake), Ohio in 1992-2000 and (c) PM_{10} vs. temperature



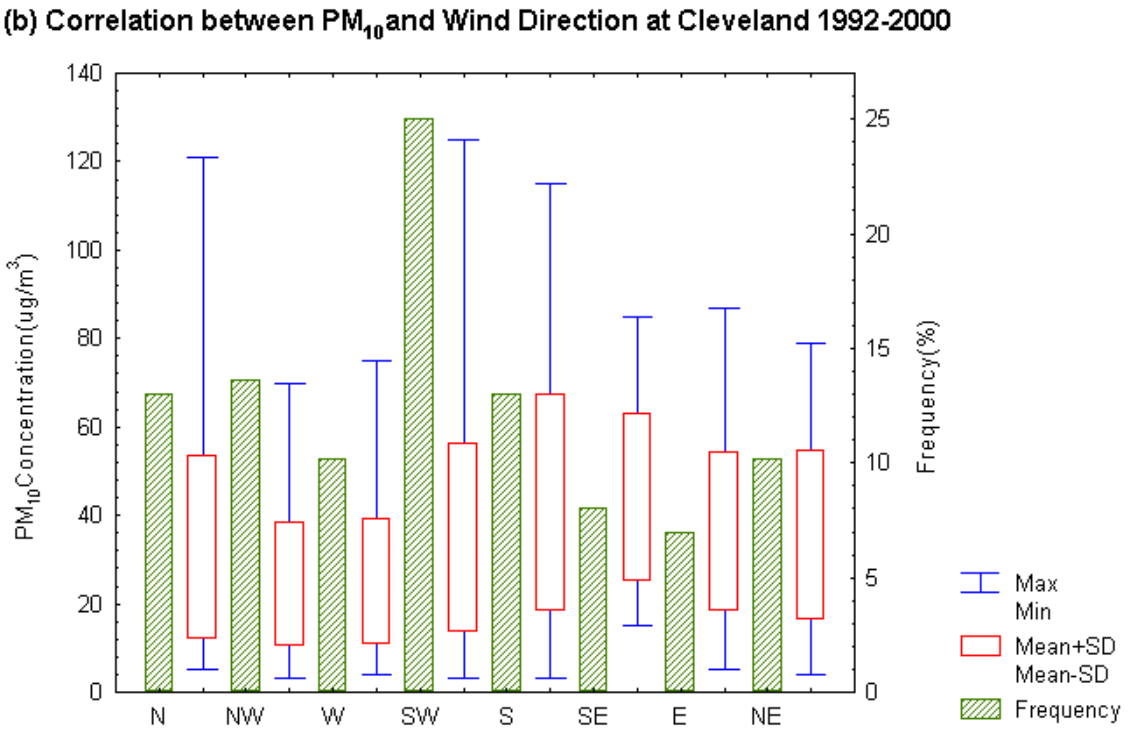


Figure D17. Correlations between PM_{10} and weather components at Cleveland, Ohio in 1992-2000: (a) PM_{10} vs. wind speed and (b) PM_{10} vs. wind direction

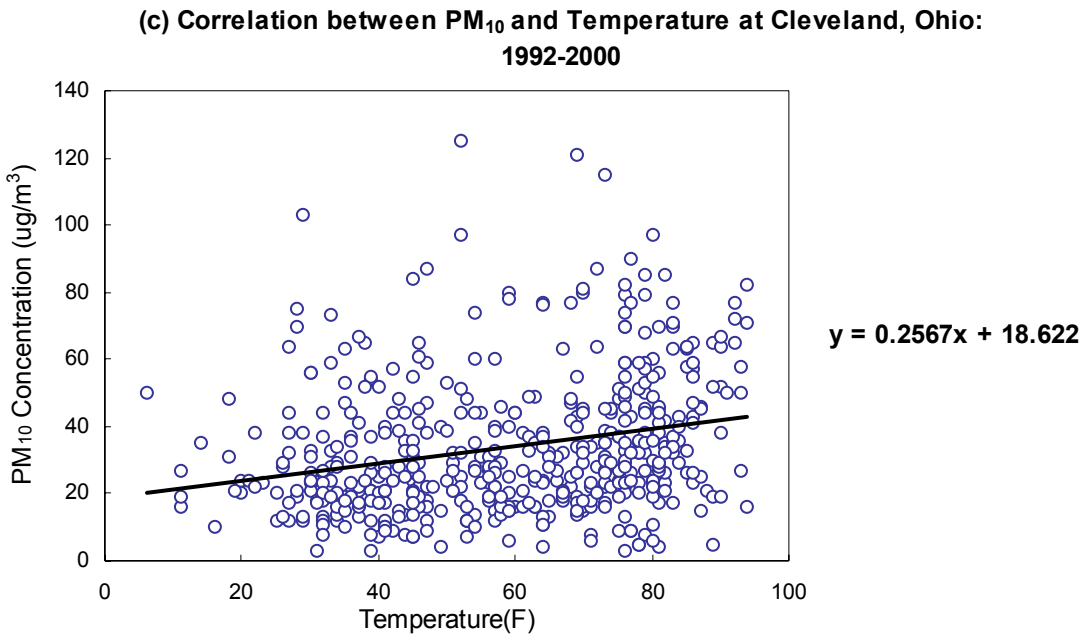


Figure D17. Correlations between PM_{10} and weather components at Cleveland, Ohio in 1992-2000: (c) PM_{10} vs. temperature.

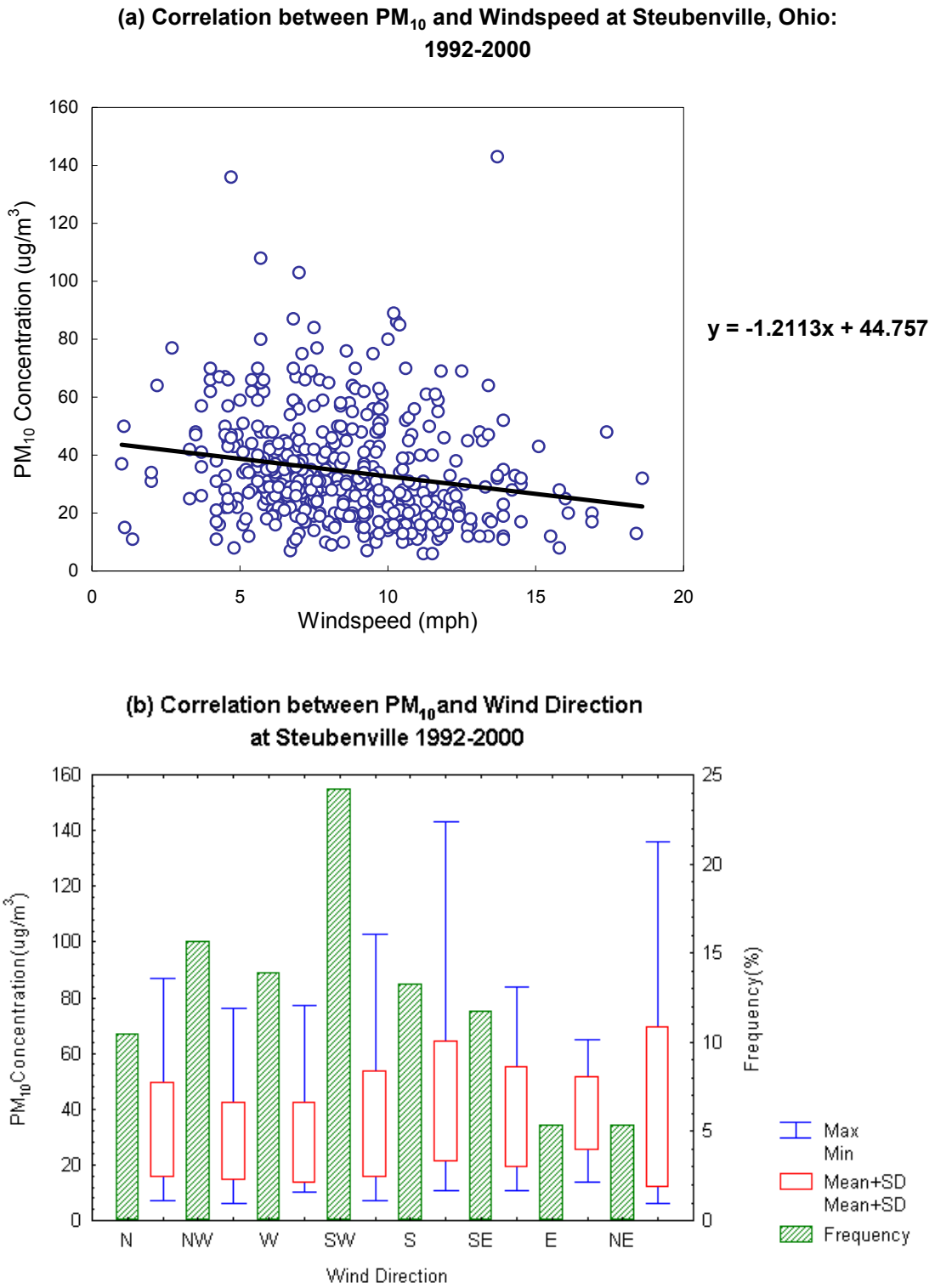


Figure D18. Correlations between PM_{10} and weather components at Steubenville, Ohio in 1992-2000: (a) PM_{10} vs. wind speed and (b) PM_{10} vs. wind direction

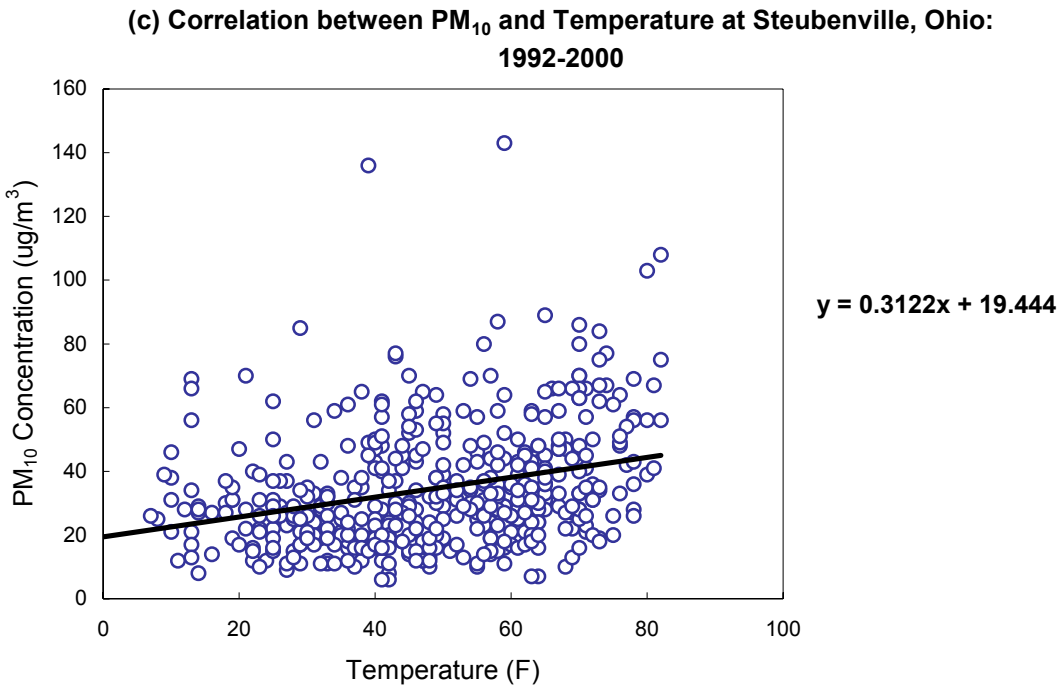


Figure D18. Correlations between PM_{10} and weather components at Steubenville, Ohio in 1992-2000: and (c) PM_{10} vs temperature

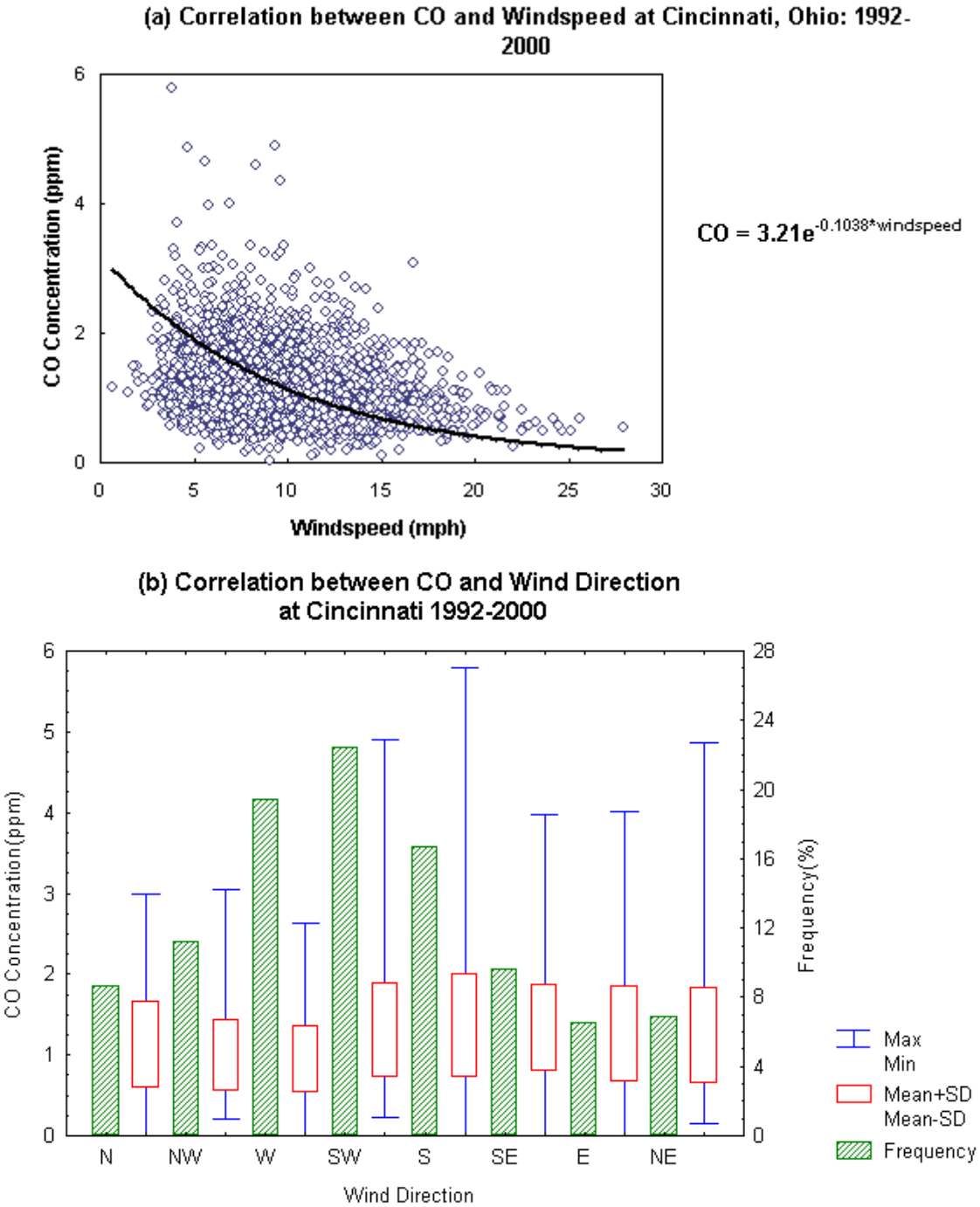


Figure D19. Correlations between CO and weather components at Cincinnati, Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction

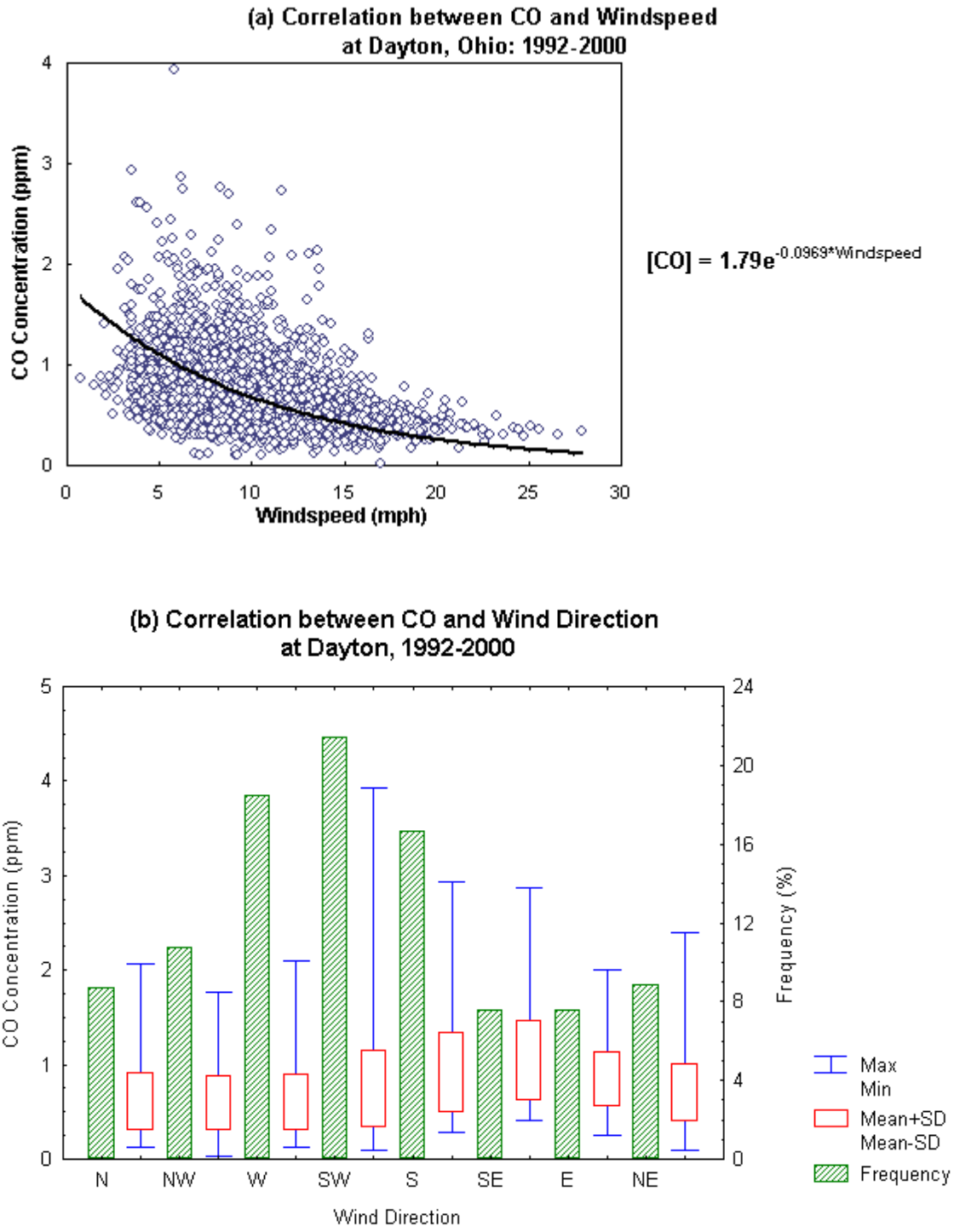


Figure D20. Correlations between CO and weather components at Dayton, Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction

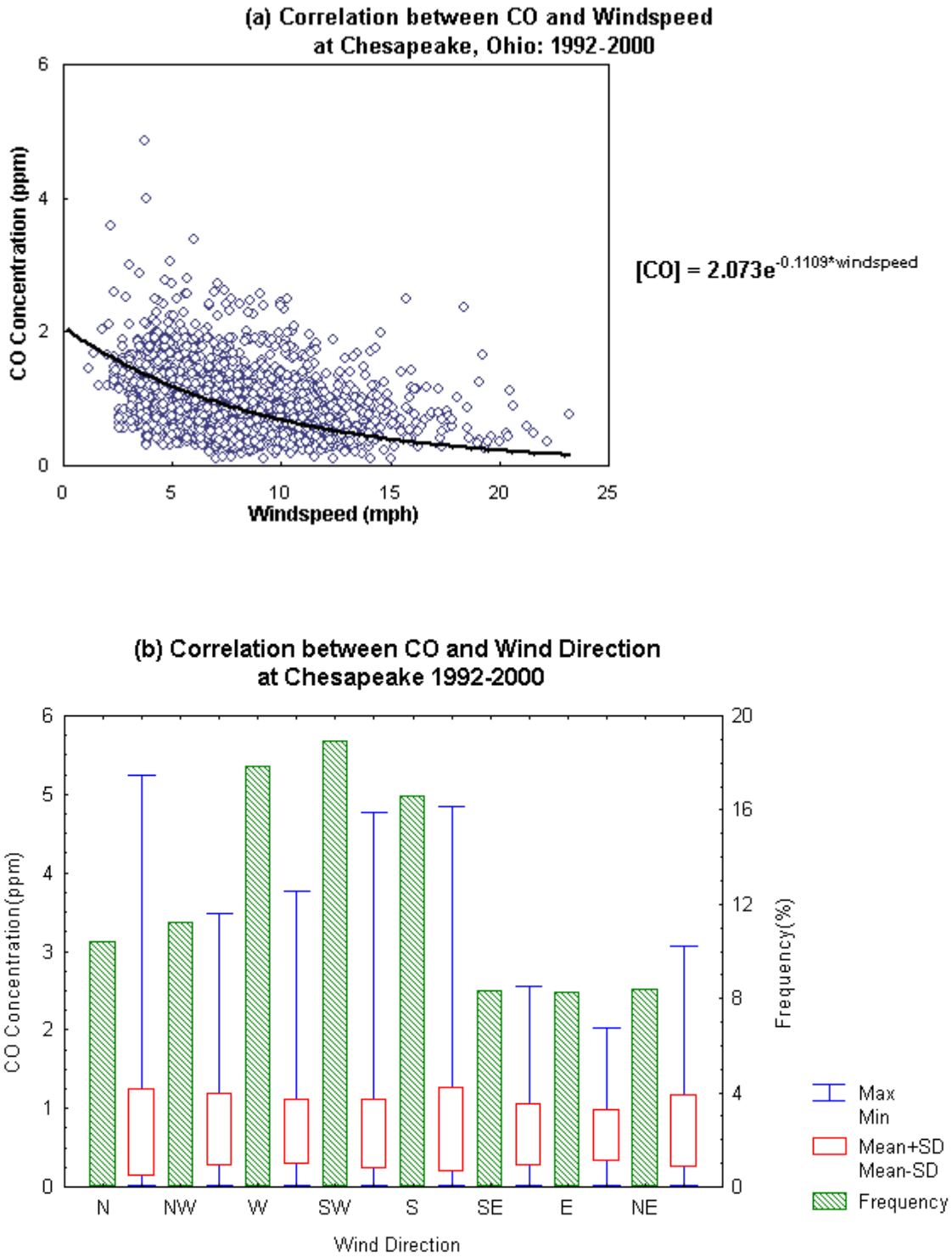


Figure D21. Correlations between CO and weather components at Chesapeake, Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction

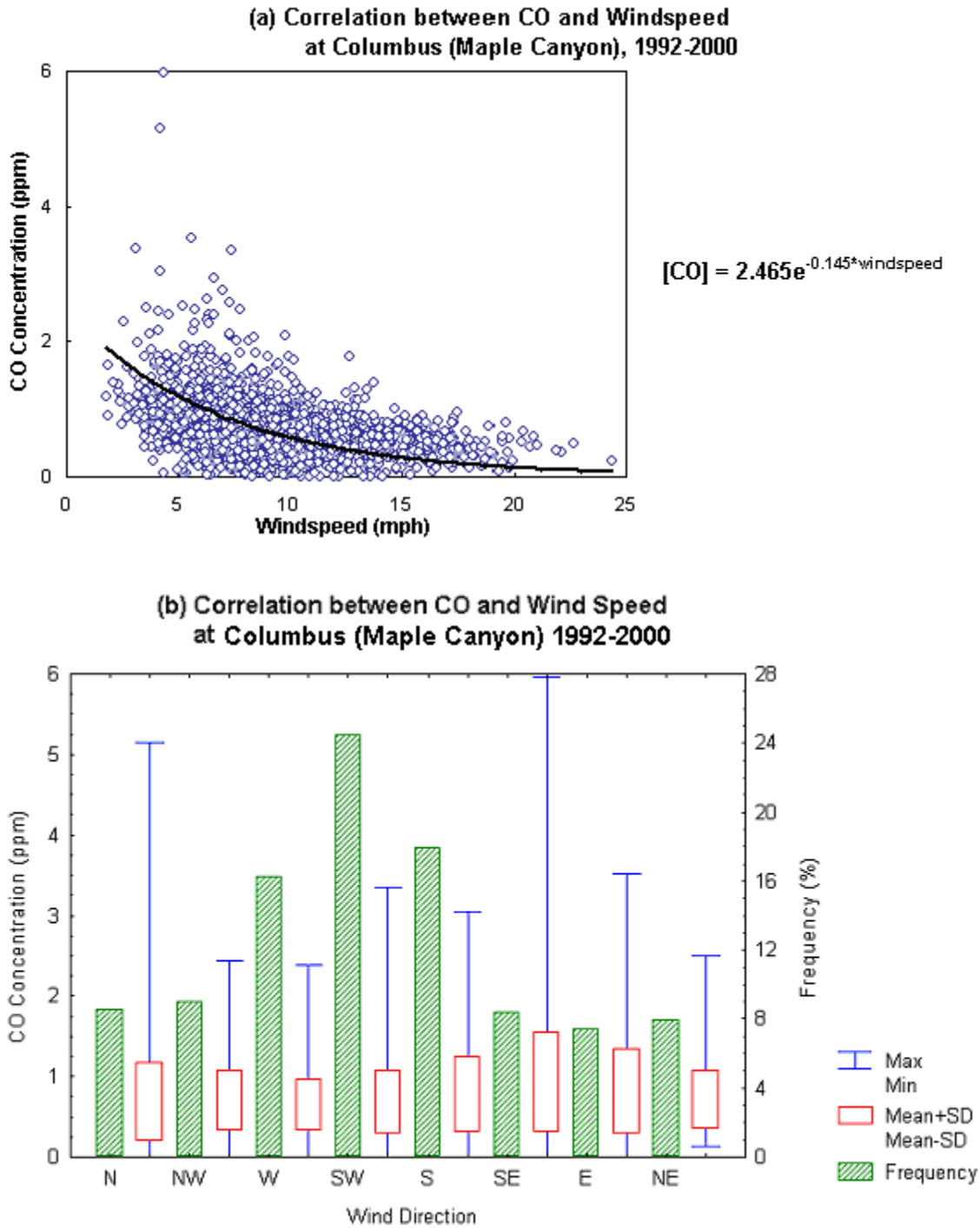


Figure D22. Correlations between CO and weather components at Columbus (Maple Canyon), Ohio in 1993-2000 (a) CO vs. wind speed and (b) CO vs. wind direction

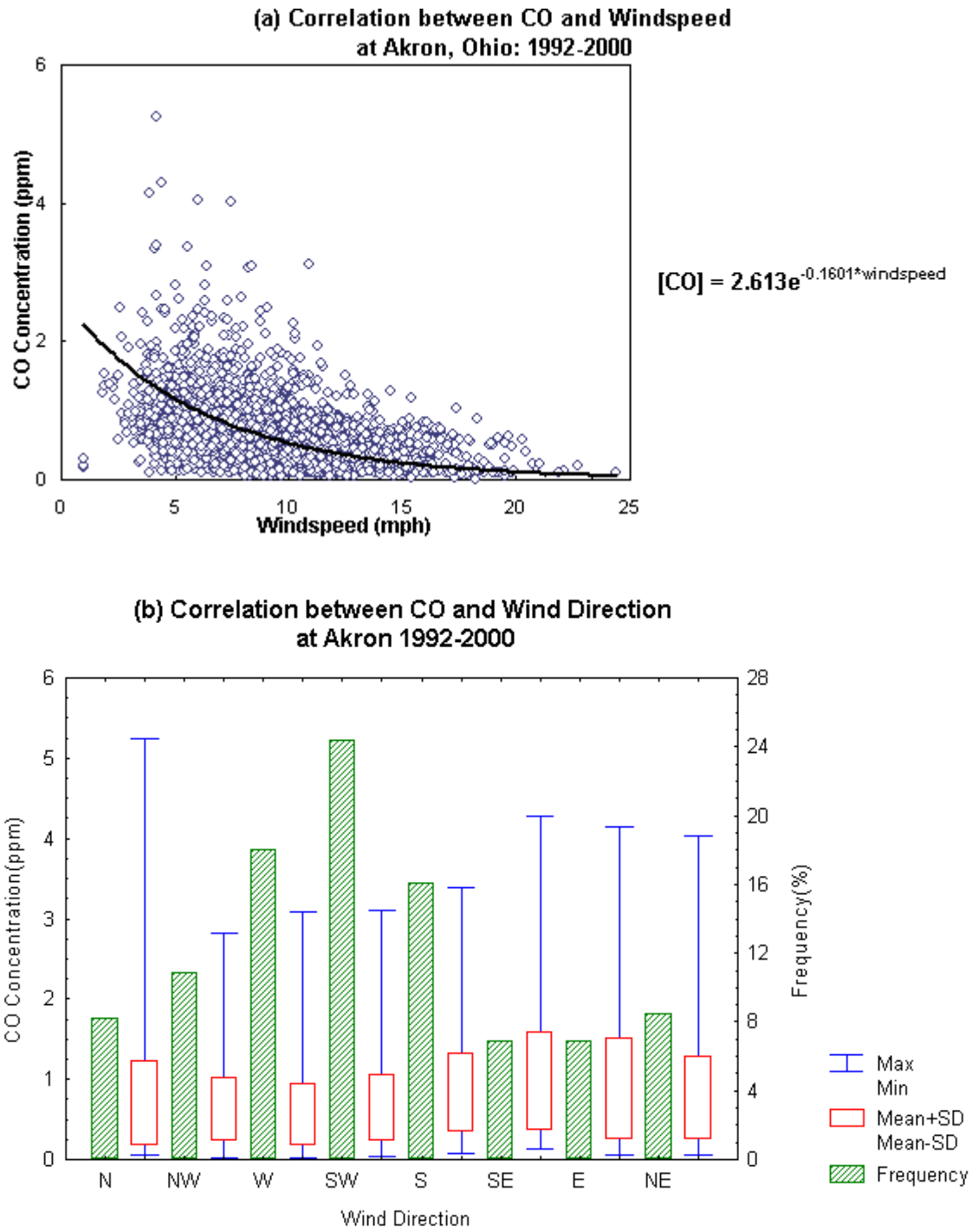


Figure D23. Correlations between CO and weather components at Akron, Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction

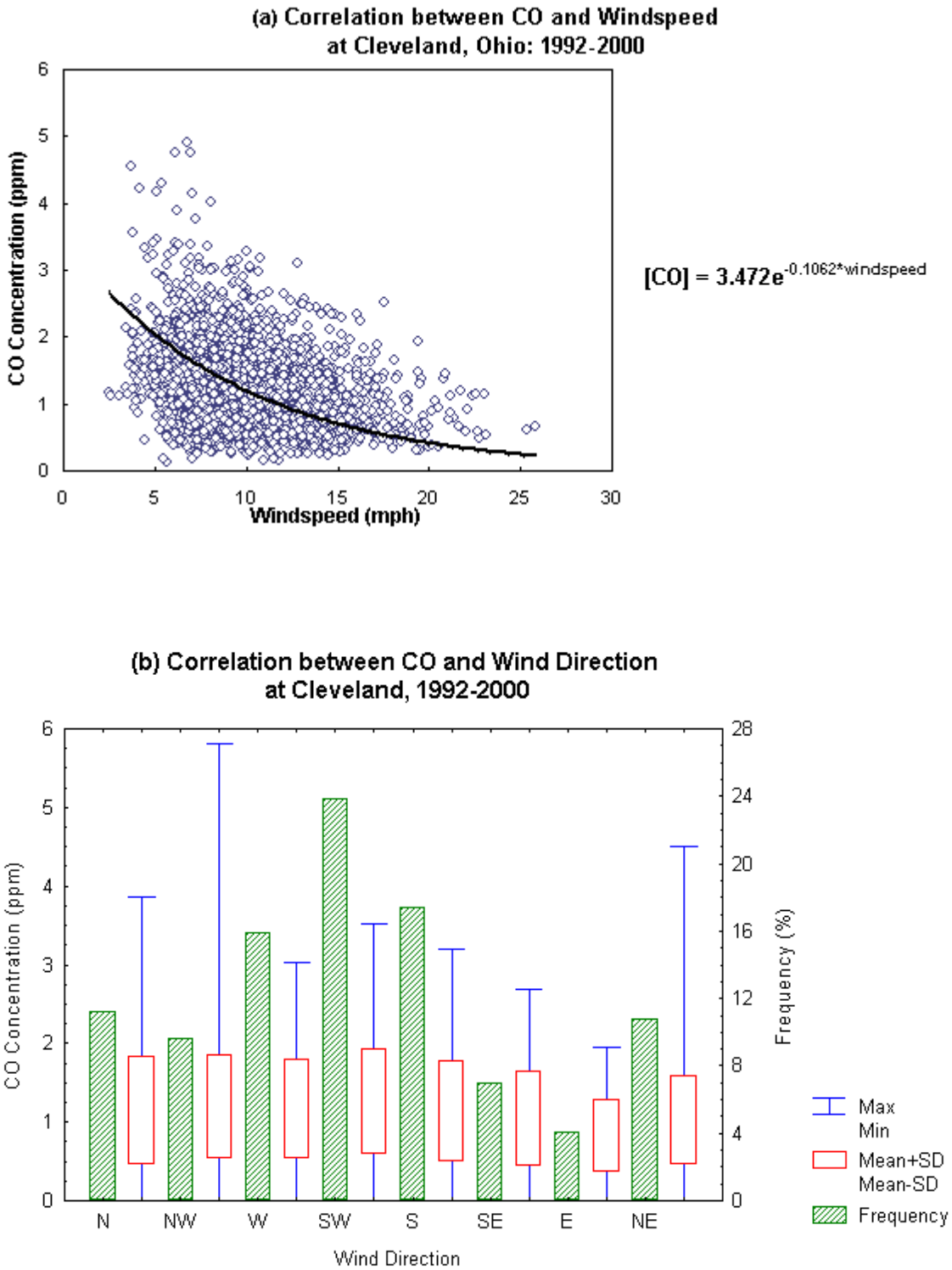
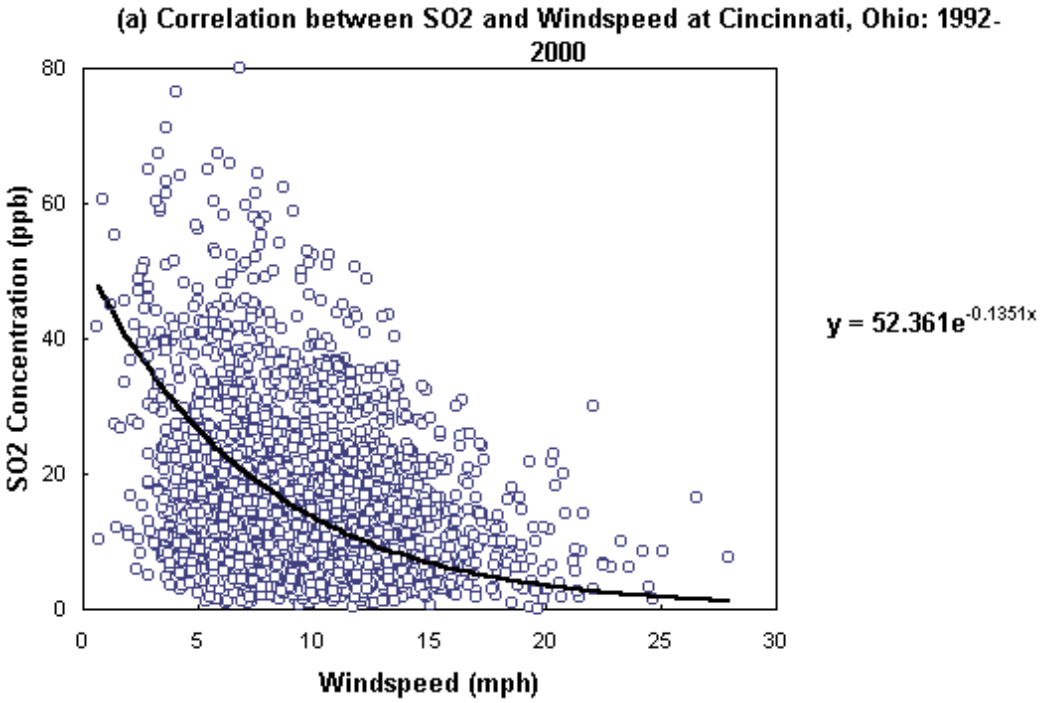


Figure D24. Correlations between CO and weather components at Cleveland, Ohio in 1992-2000: (a) CO vs. wind speed and (b) CO vs. wind direction



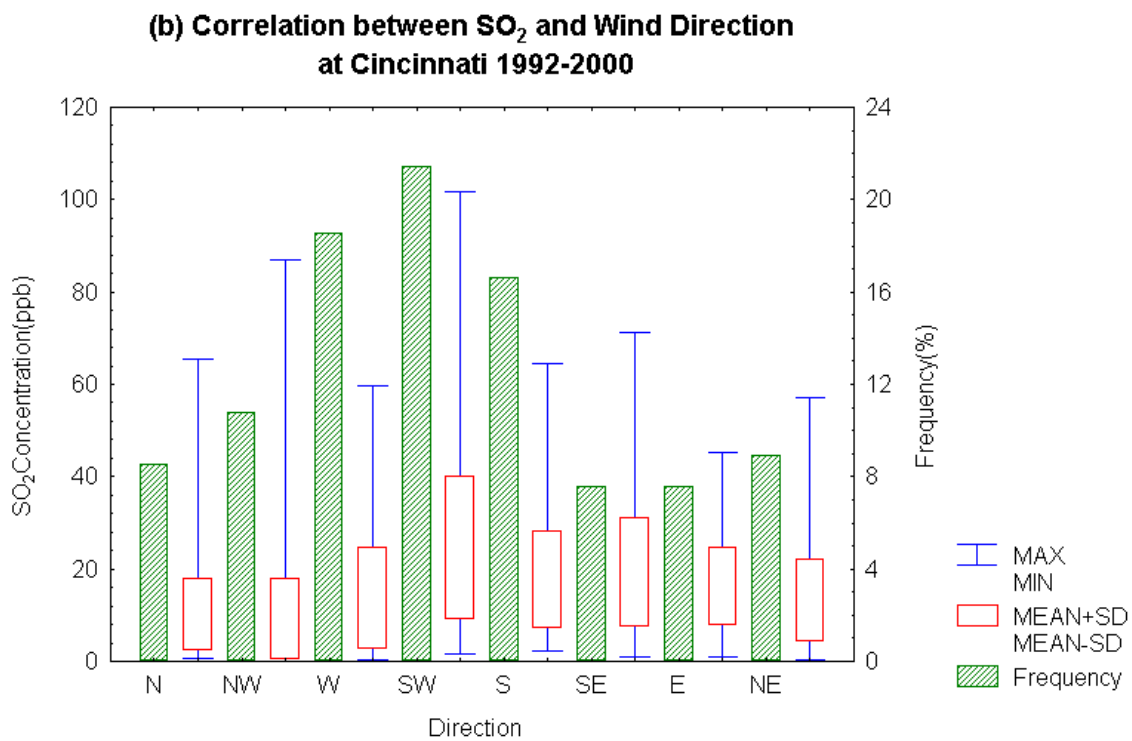


Figure D25. Correlations between SO_2 and weather components at Cincinnati, Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction

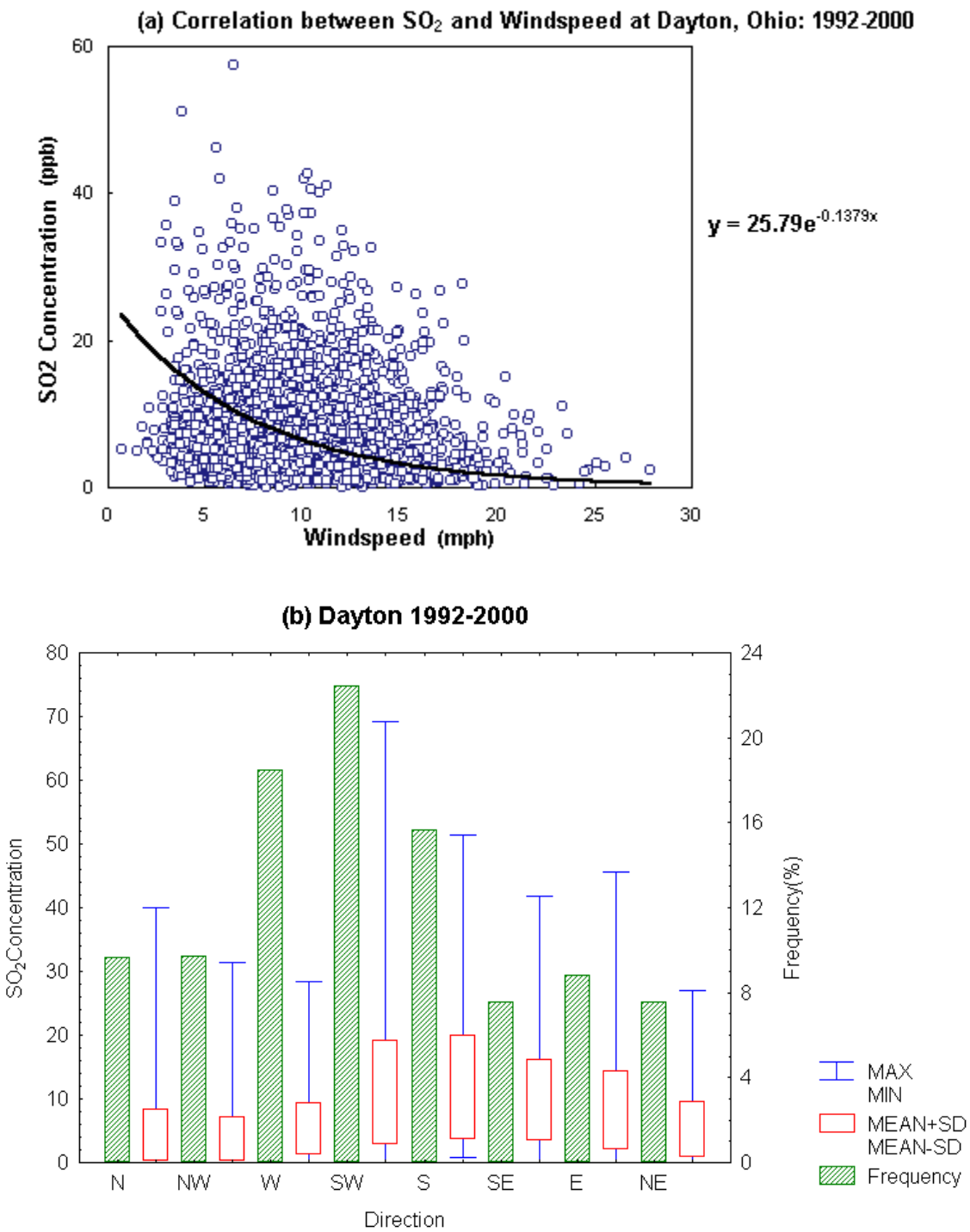
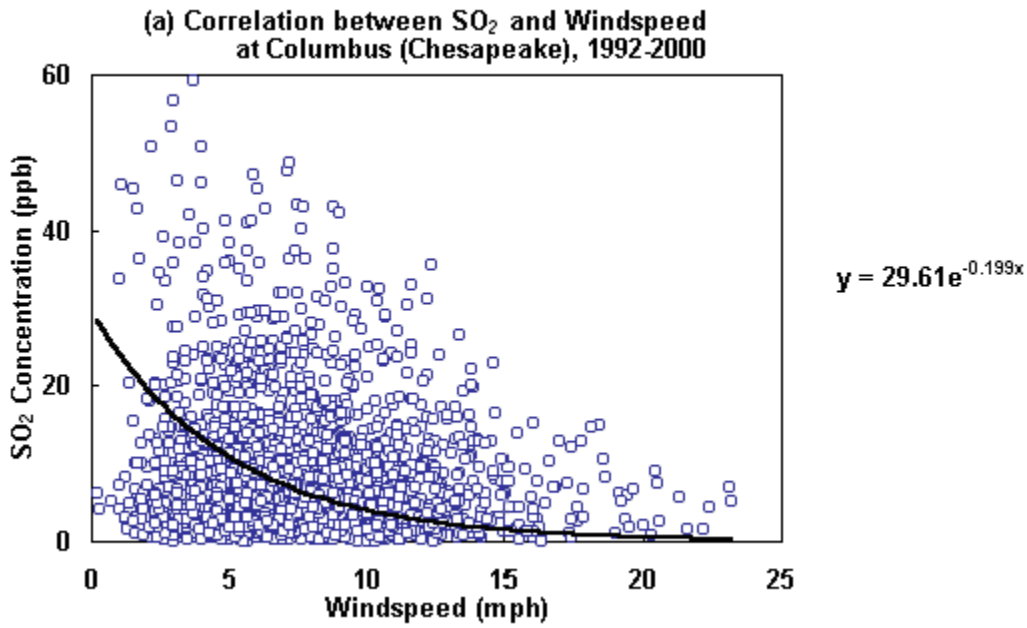


Figure D26. Correlations between SO_2 and weather components at Dayton, Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction



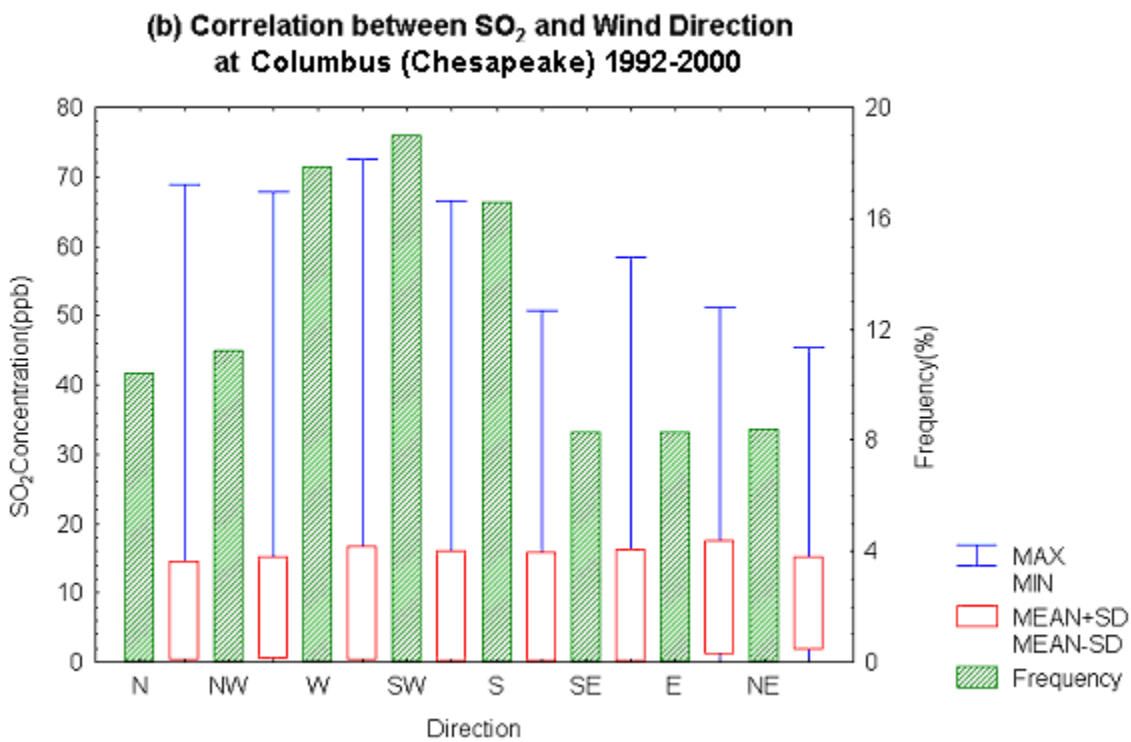
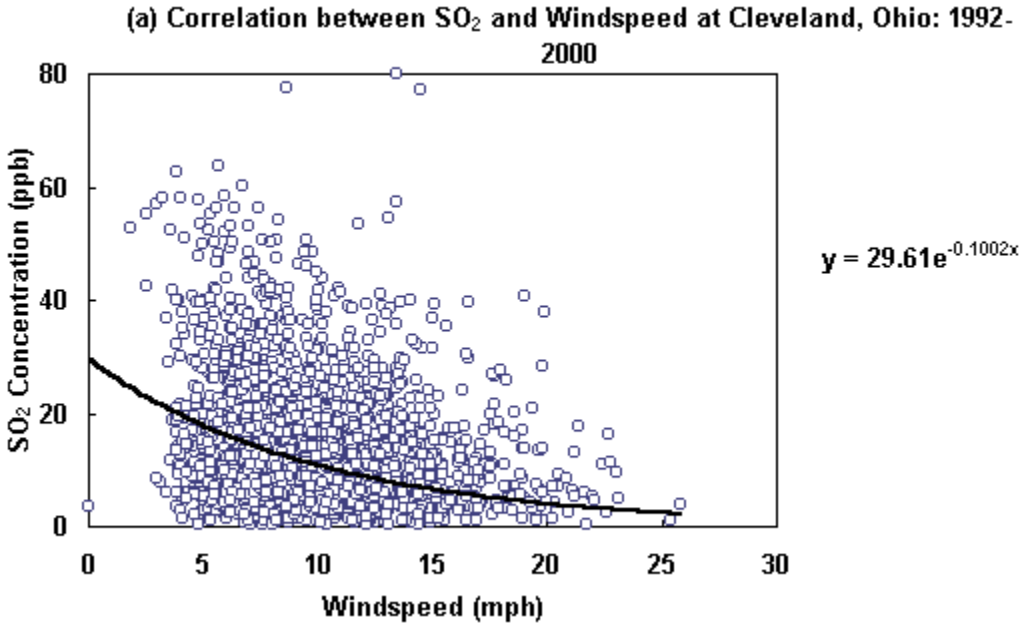


Figure D27. Correlations between SO_2 and weather components at Columbus (Chesapeake), Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction



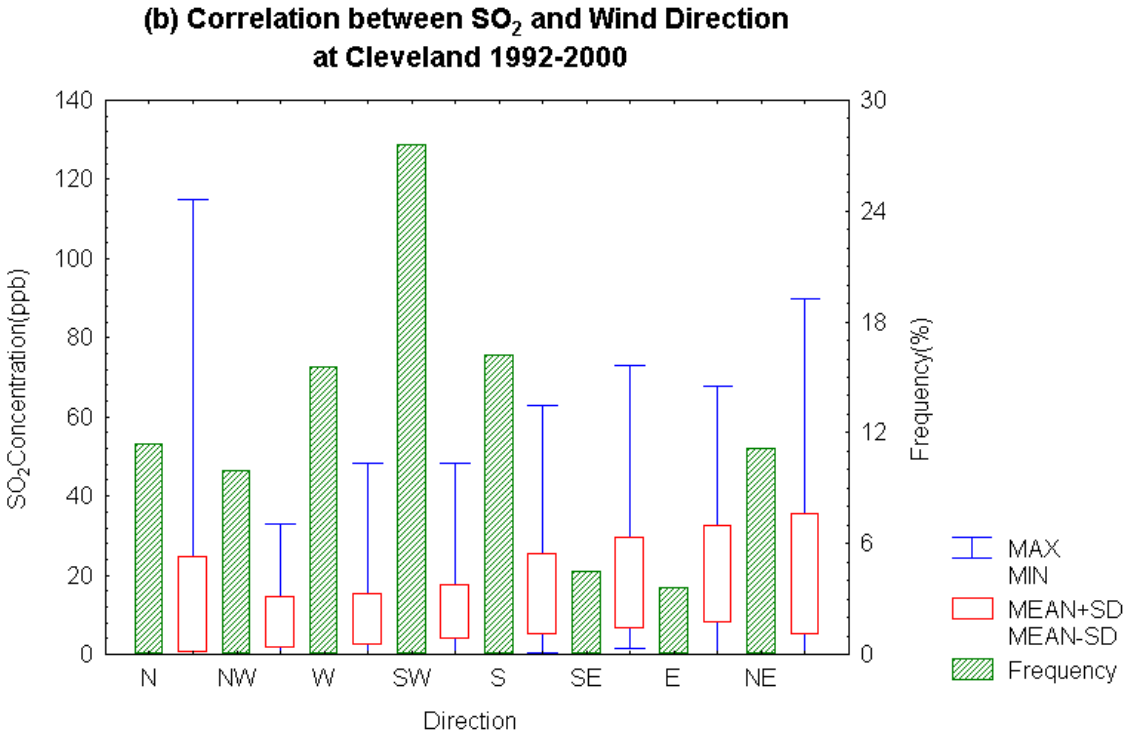


Figure D28. Correlations between SO_2 and weather components at Cleveland, Ohio in 1992-2000 (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction

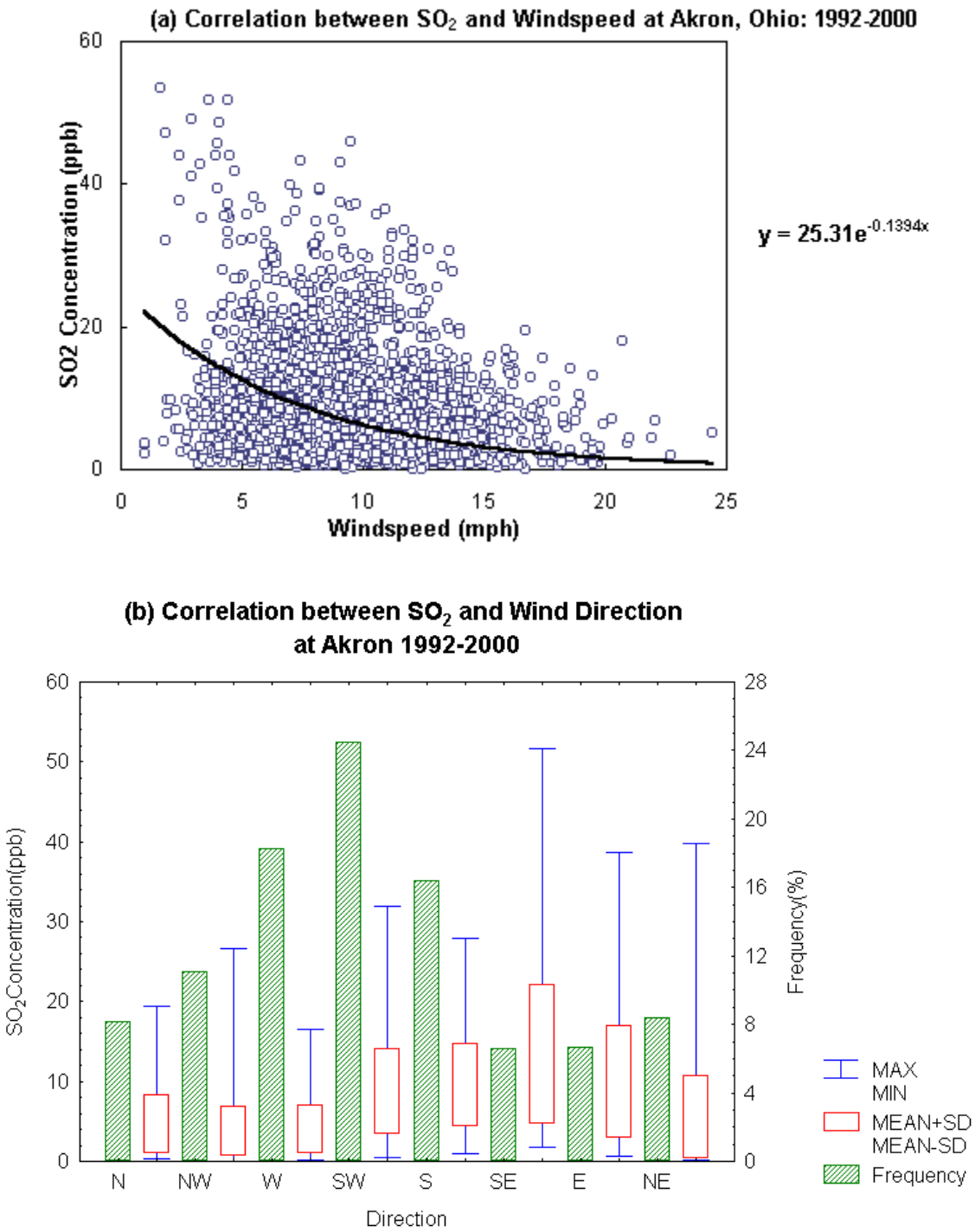
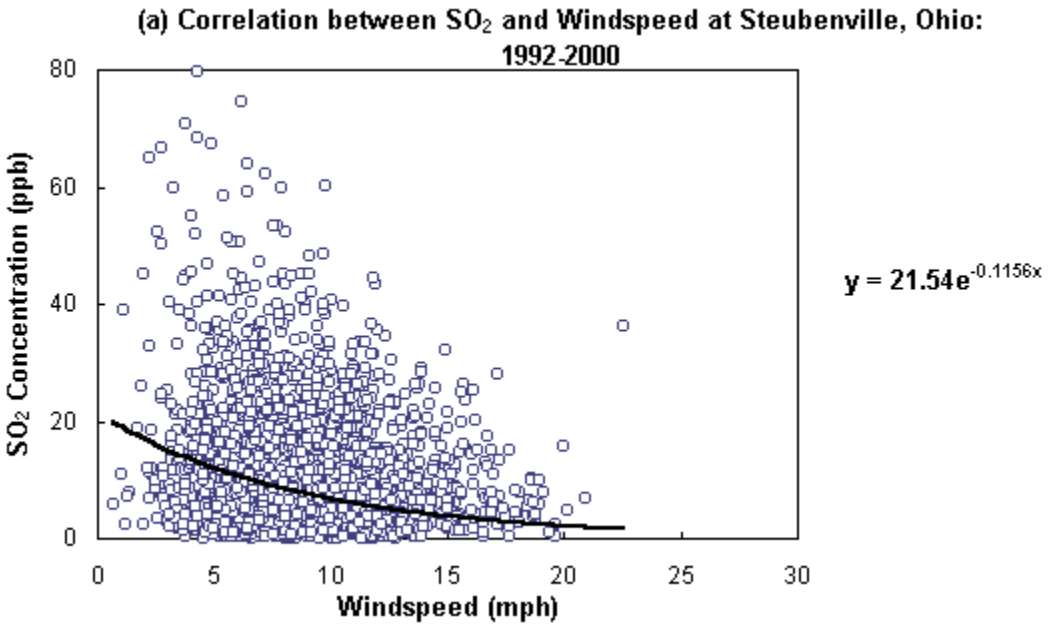


Figure D29. Correlations between SO_2 and weather components at Akron, Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction



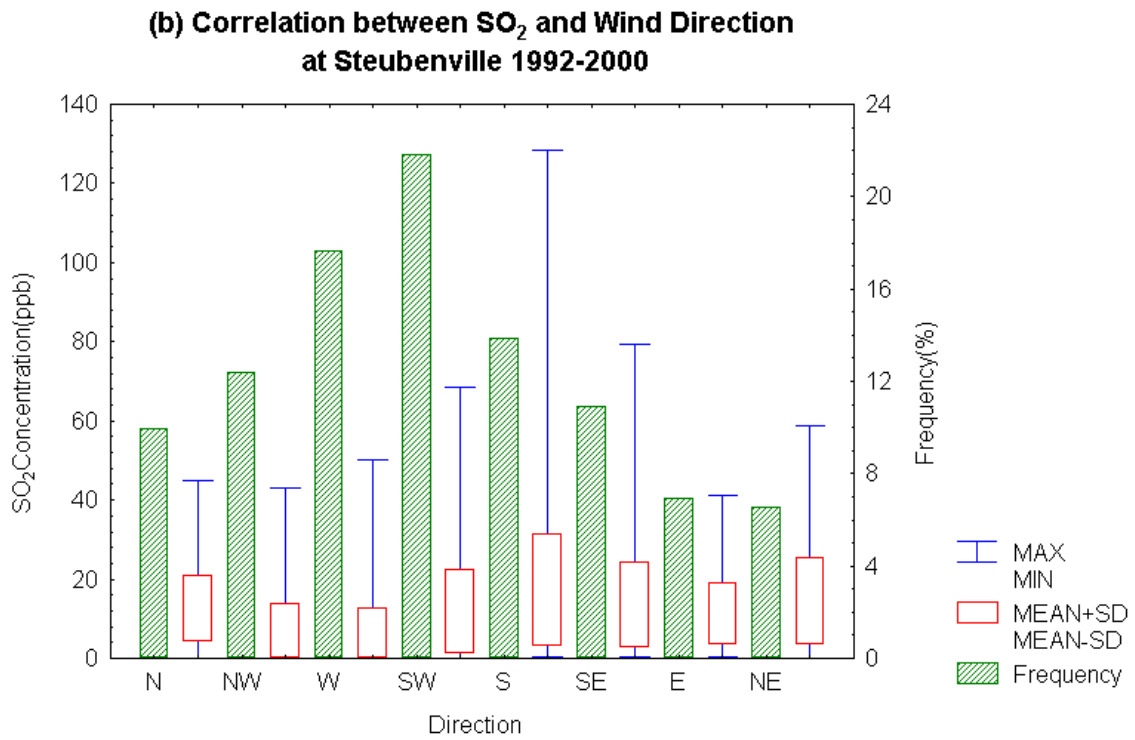
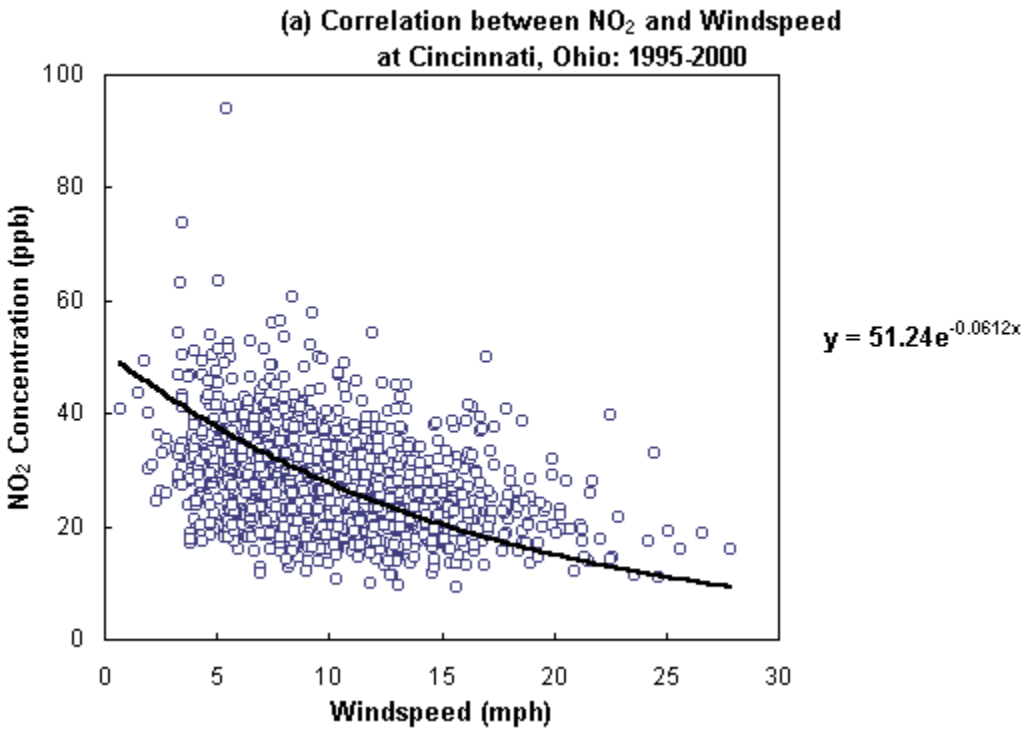


Figure D30. Correlations between SO_2 and weather components at Steubenville, Ohio in 1992-2000: (a) SO_2 vs. wind speed and (b) SO_2 vs. wind direction



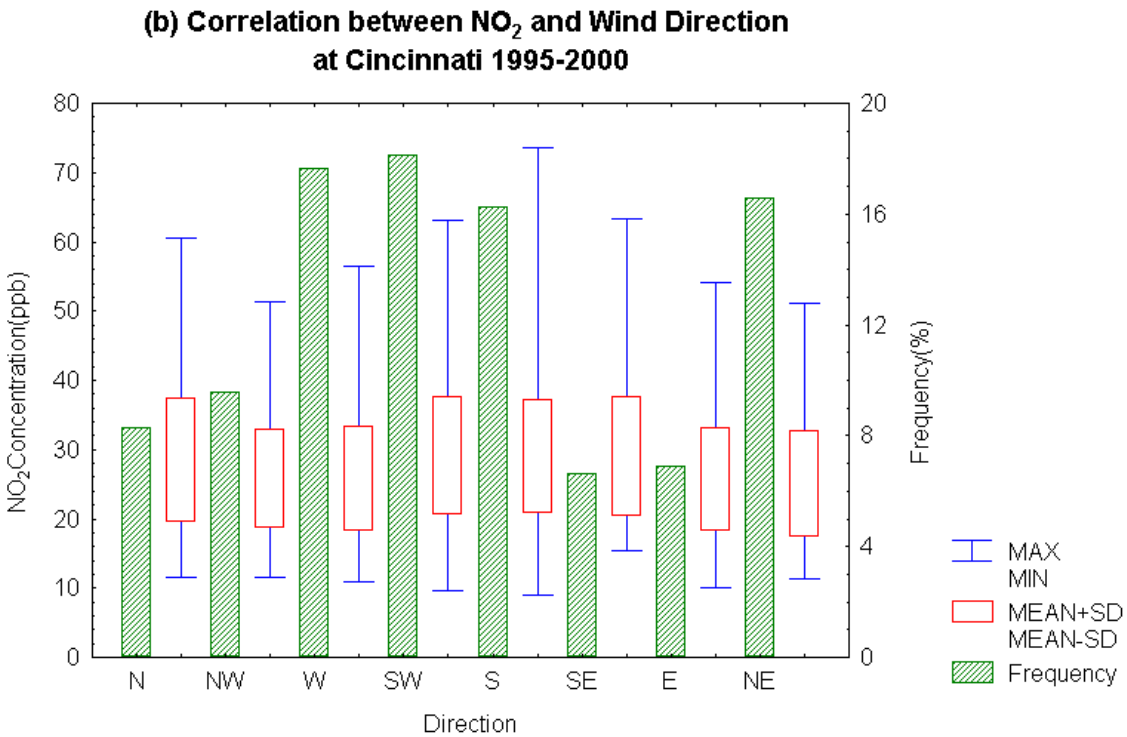


Figure D31. Correlations between NO_2 and weather components at Cincinnati, Ohio in 1995-2000: (a) NO_2 vs. wind speed and (b) NO_2 vs. wind direction

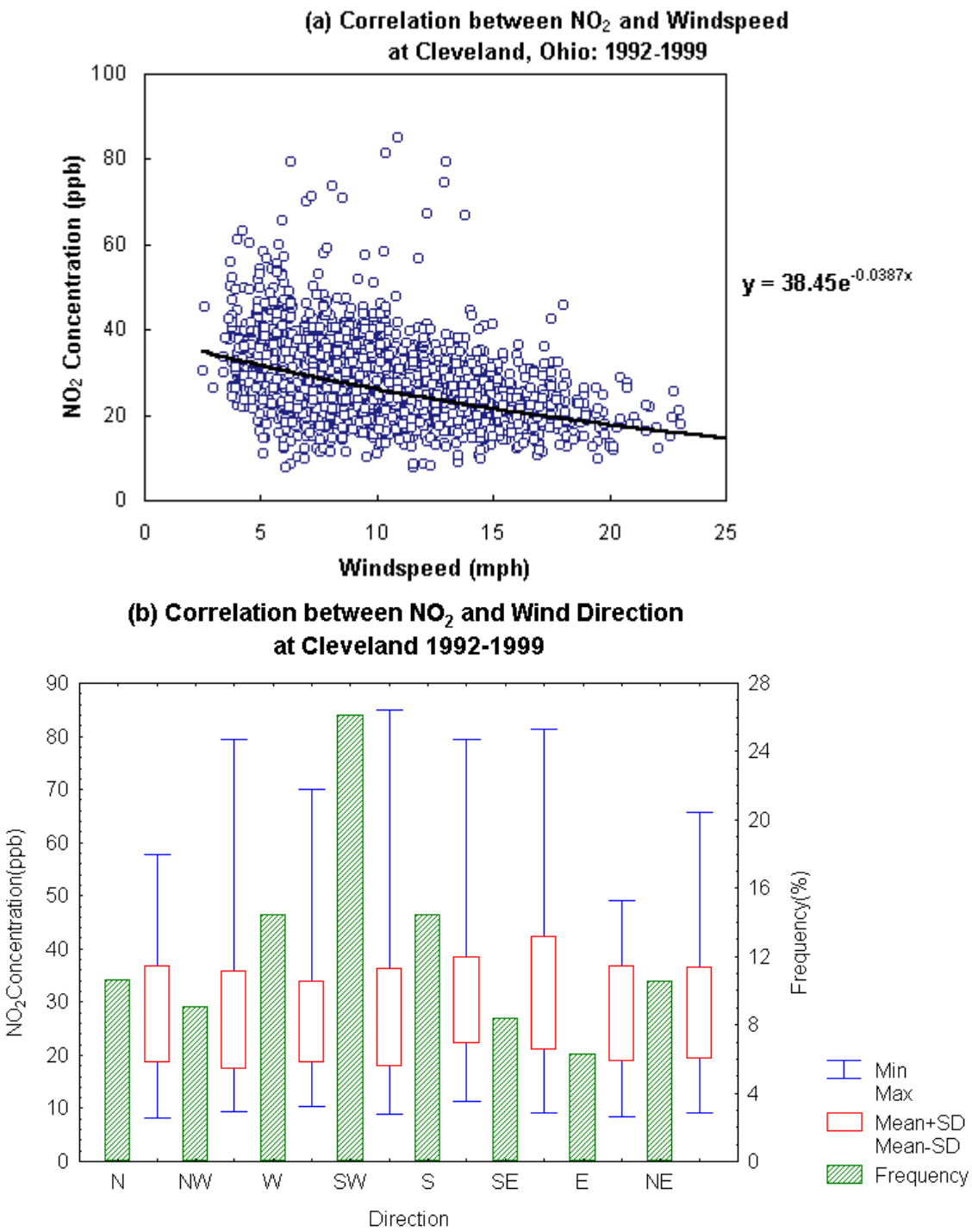
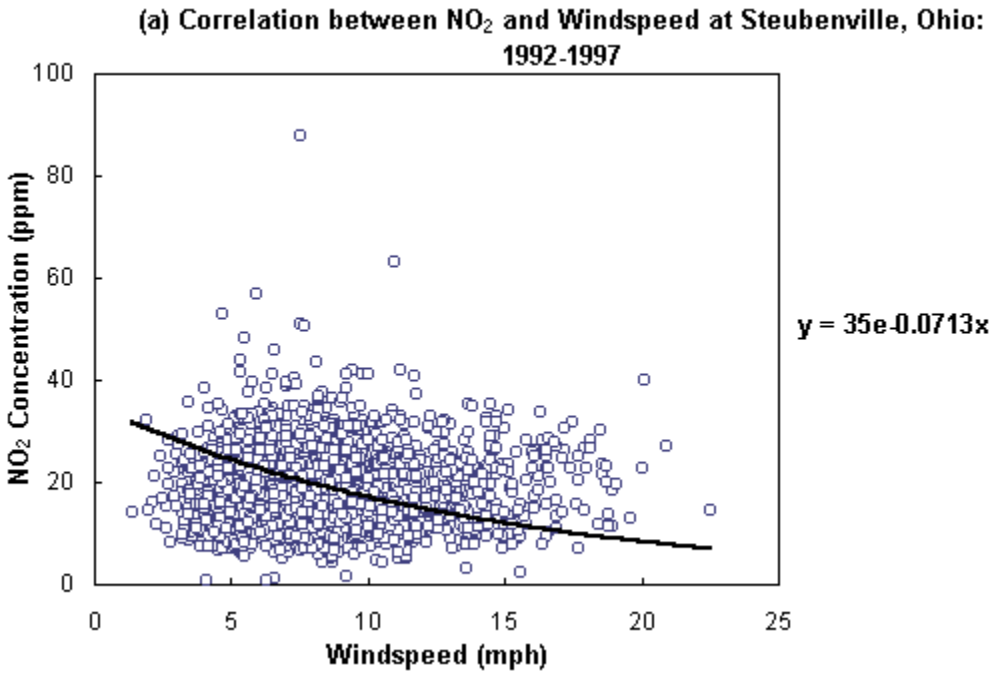


Figure D32. Correlations between NO_2 and weather components at Dayton, Ohio in 1992-1999: (a) NO_2 vs. wind speed and (b) NO_2 vs. wind direction



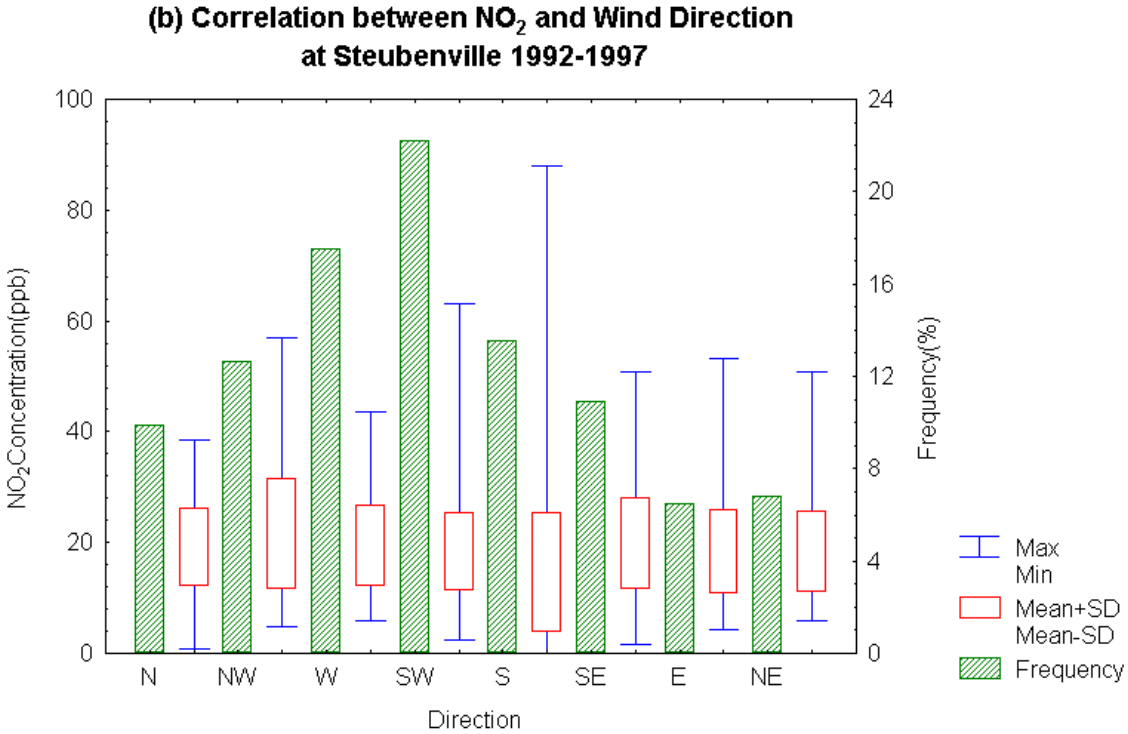


Figure D33. Correlations between NO_2 and weather components at Steubenville, Ohio in 1992-1997: (a) NO_2 vs. wind speed and (b) NO_2 vs. wind direction

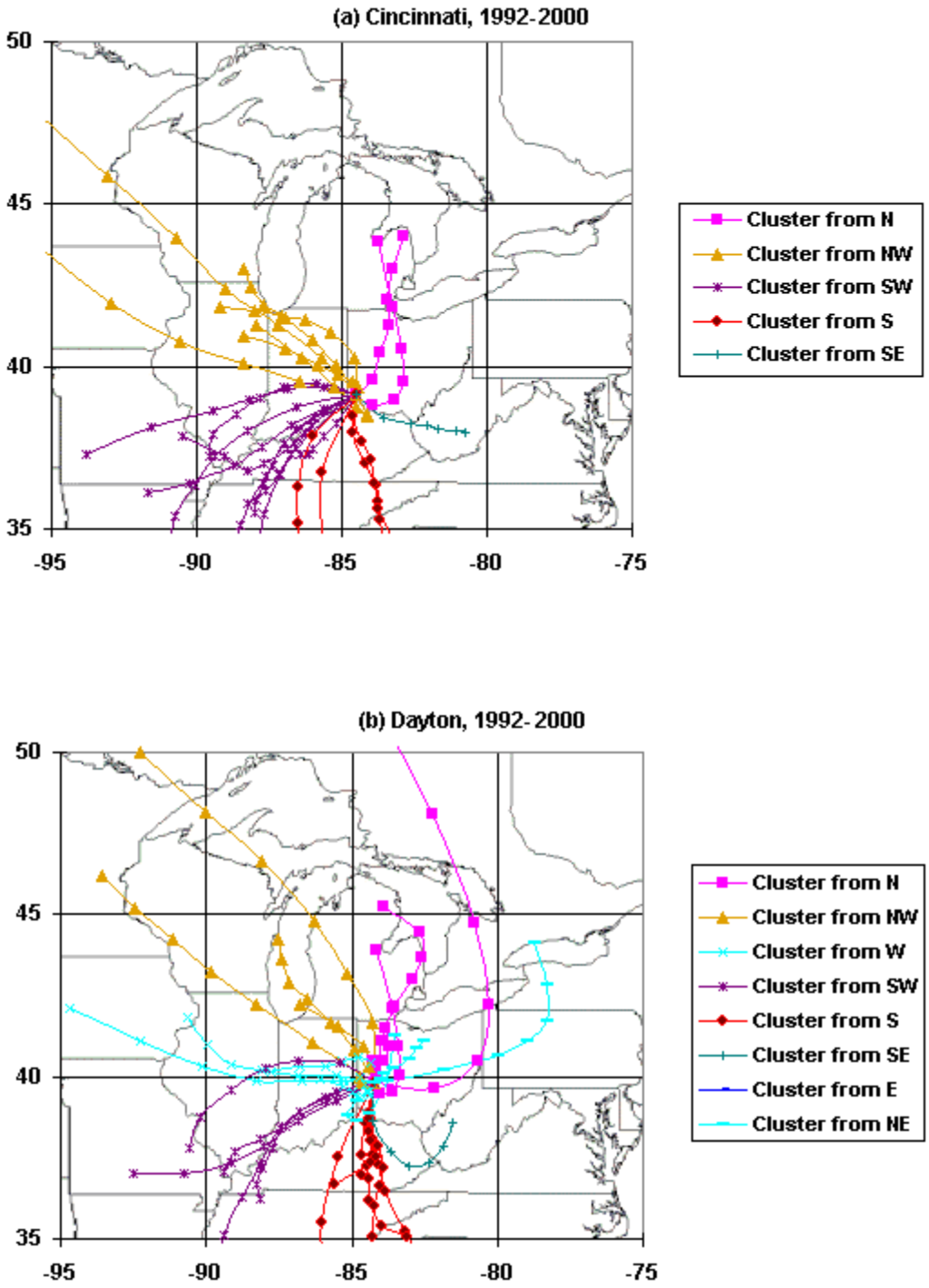
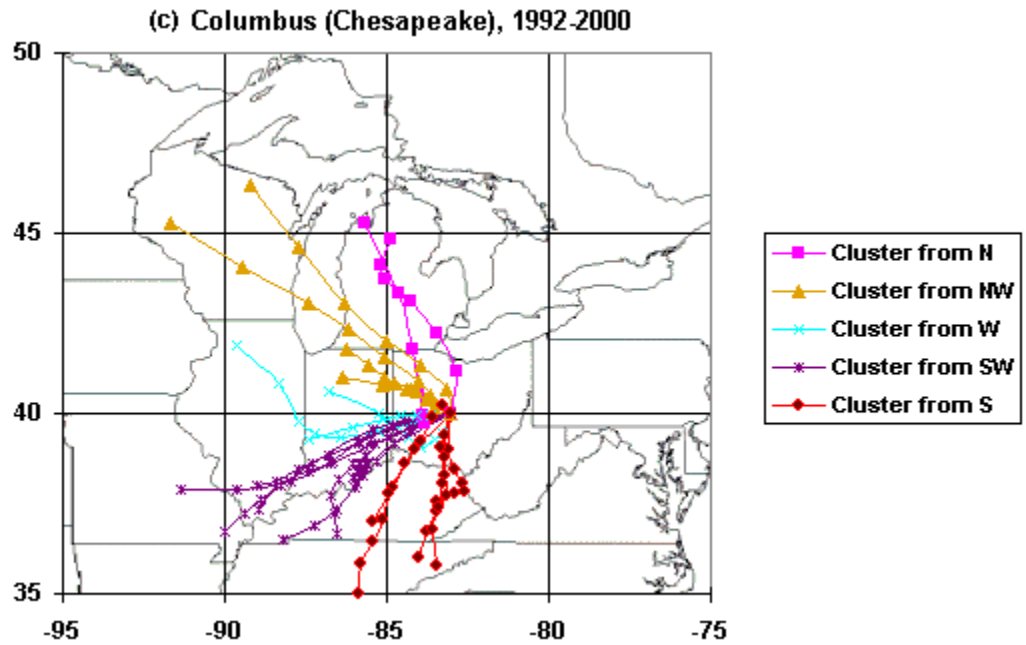


Figure D34. Back trajectories for high CO days at the monitoring sites selected in Ohio, 1992-2000: (a) Cincinnati and (b) Dayton



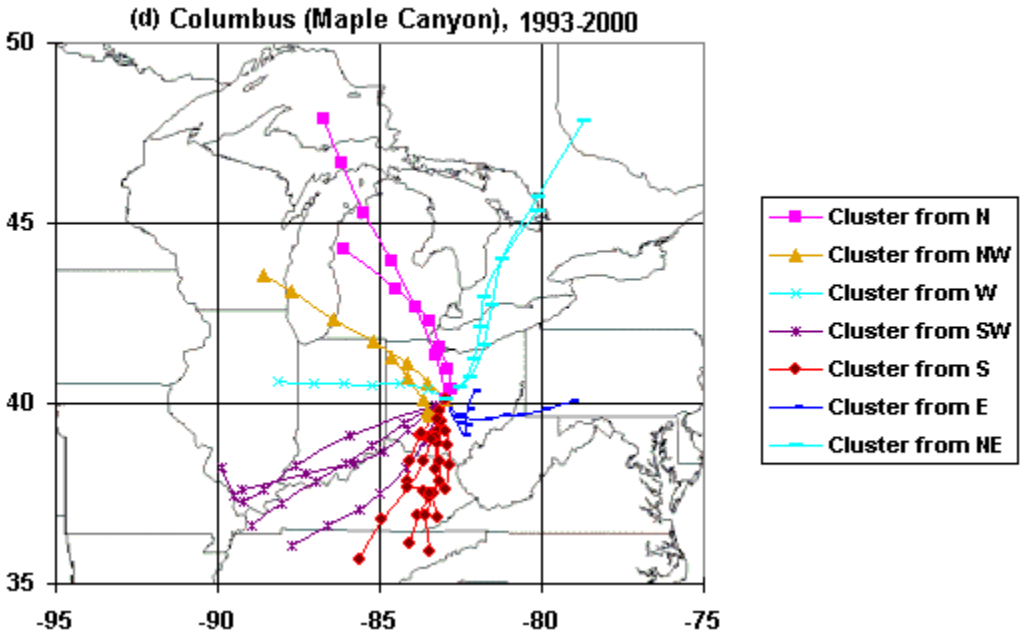


Figure D34. Back trajectories for high CO days at the monitoring sites selected in Ohio: (c) Columbus (Chesapeake), 1992-2000 and (d) Columbus (Maple Canyon), 1993-2000

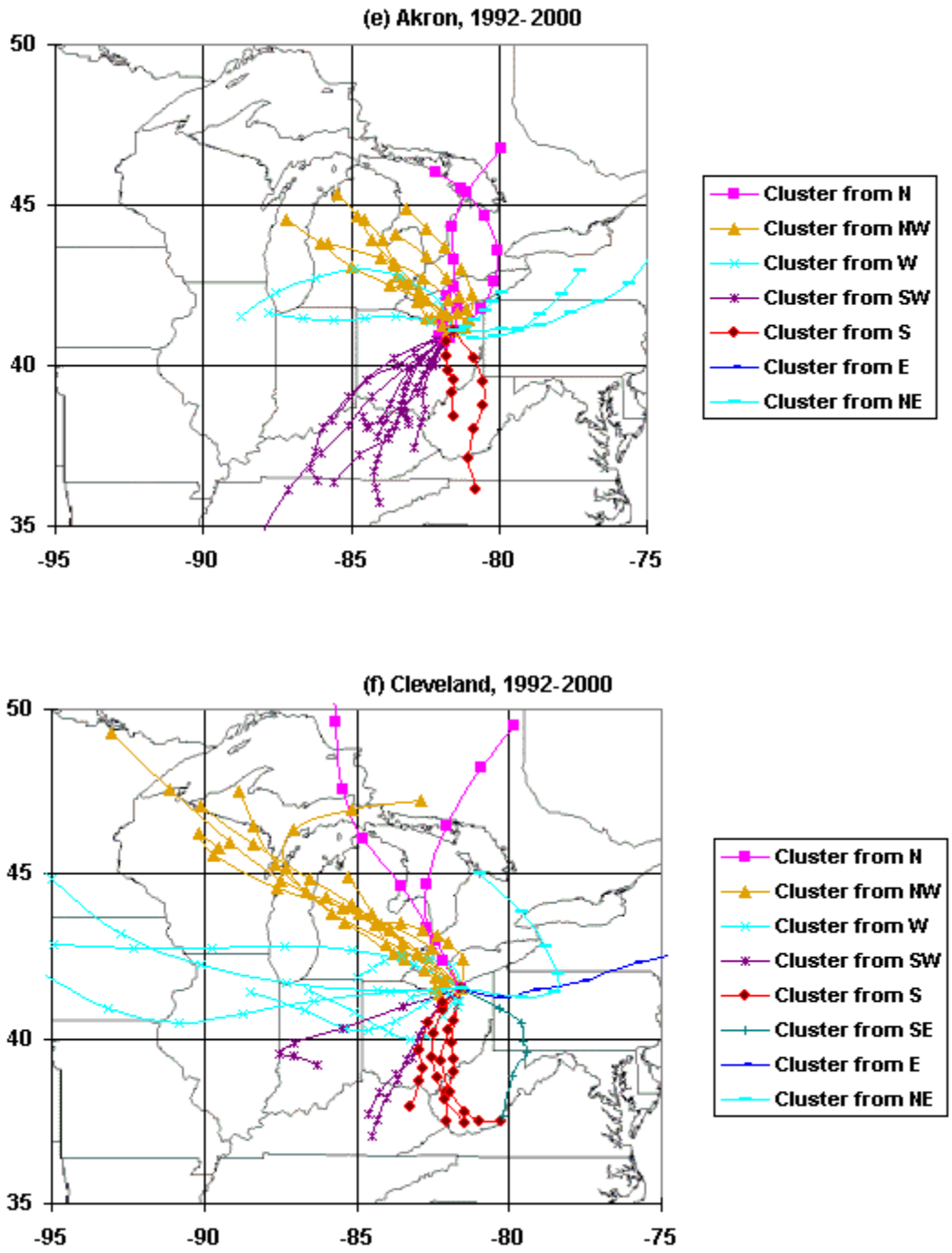


Figure D34. Back trajectories for high CO days at the monitoring sites selected in Ohio, 1992-2000: (e) Akron and (f) Cleveland

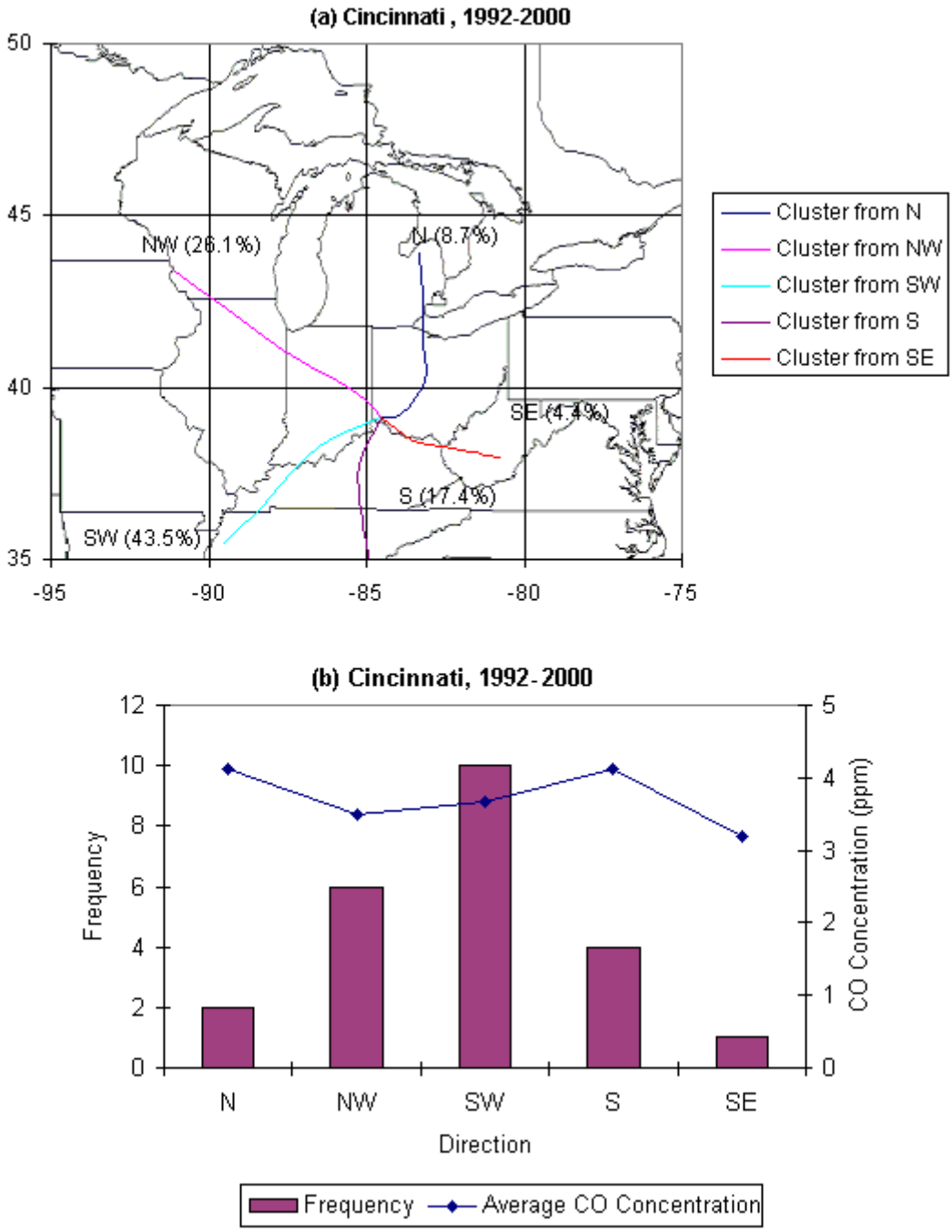


Figure D35. (a) Cluster plot at Cincinnati, 1992-2000 (b) Frequencies and average CO concentrations by cluster at Cincinnati, 1992-2000

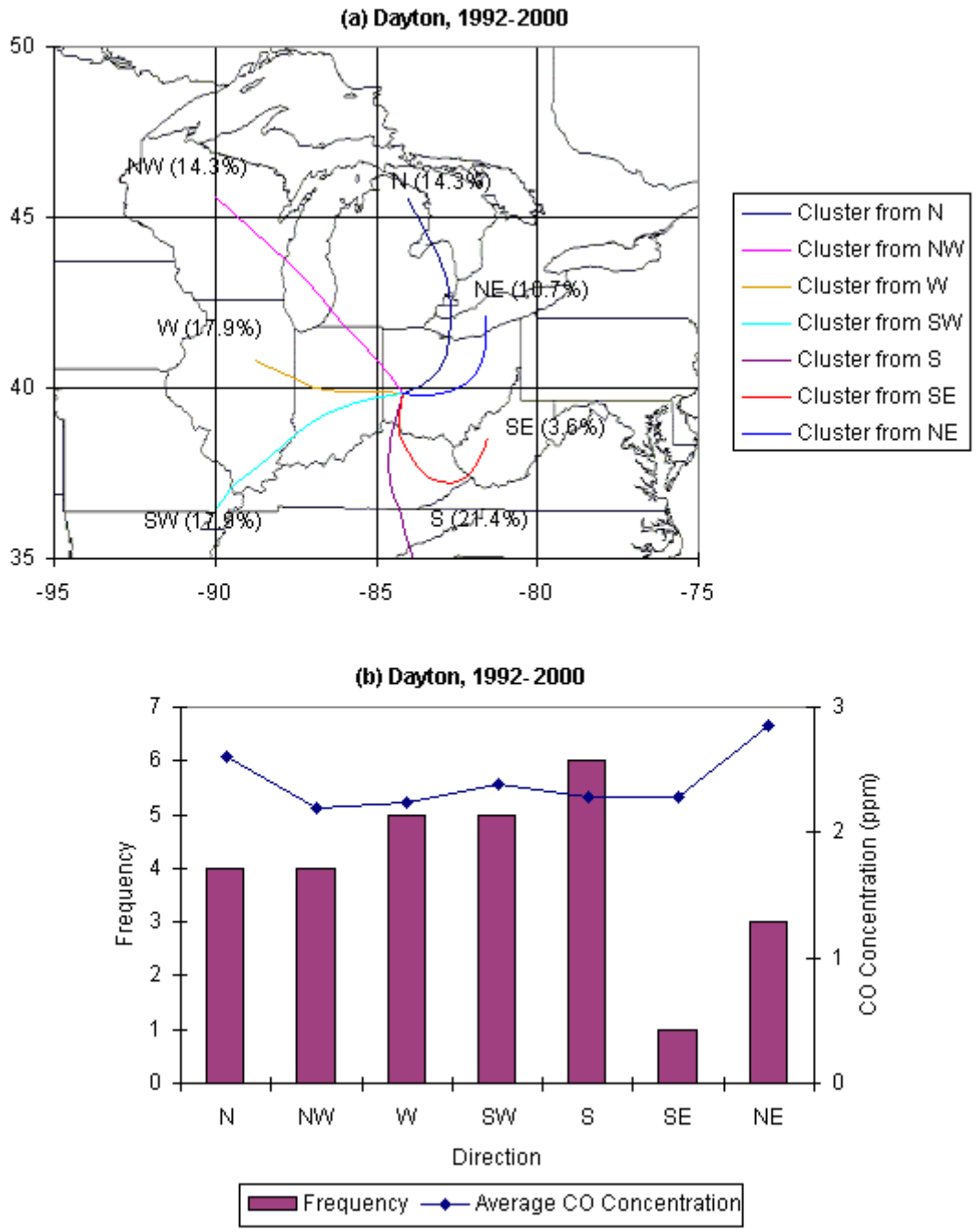


Figure D36. (a) Cluster plot at Dayton, 1992-2000 (b) Frequencies and average CO concentrations by cluster at Dayton, 1992-2000

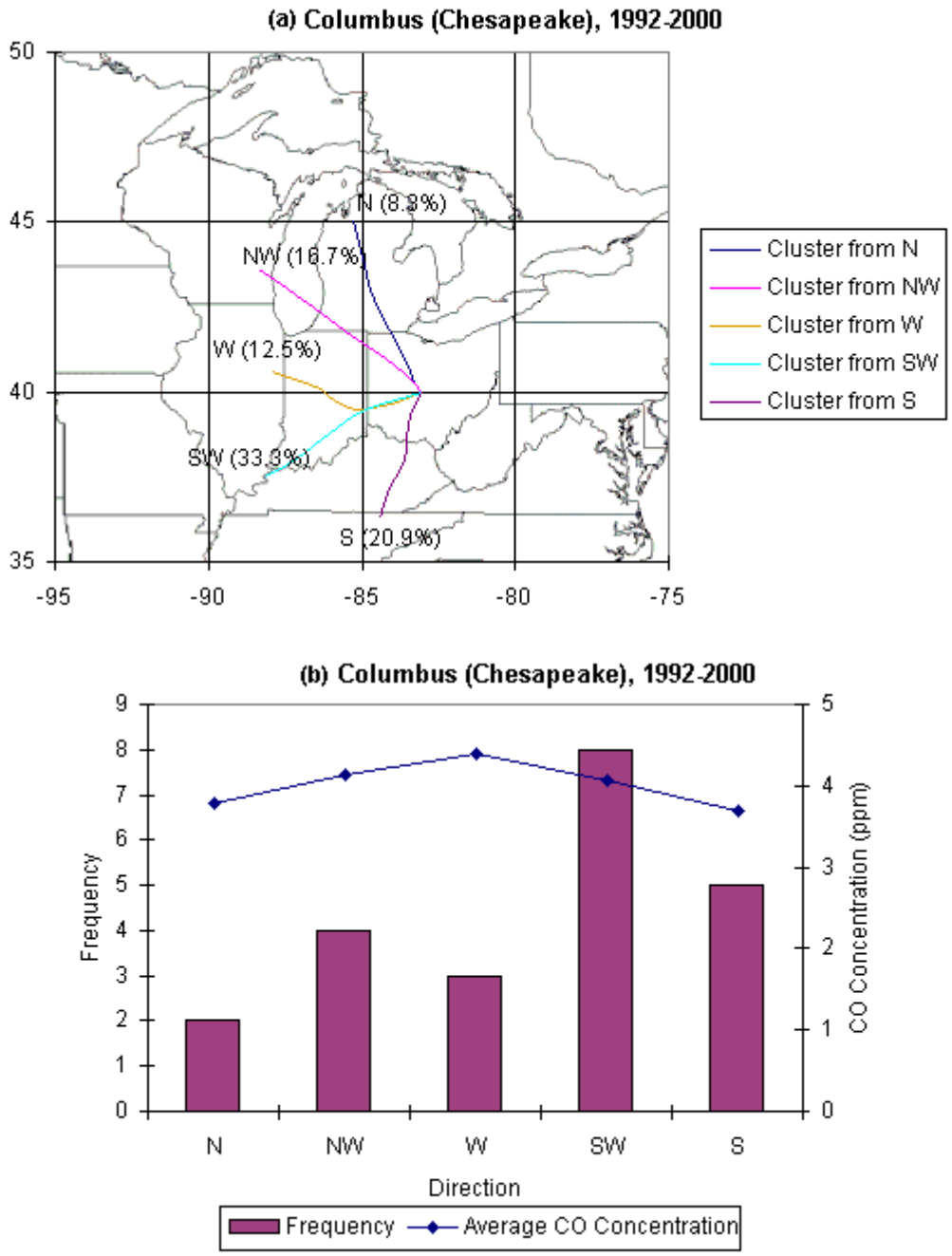


Figure D37. (a) Cluster plot at Columbus (Chesapeake), 1992-2000 (b) Frequencies and average CO concentrations by cluster at Columbus (Chesapeake), 1992-2000

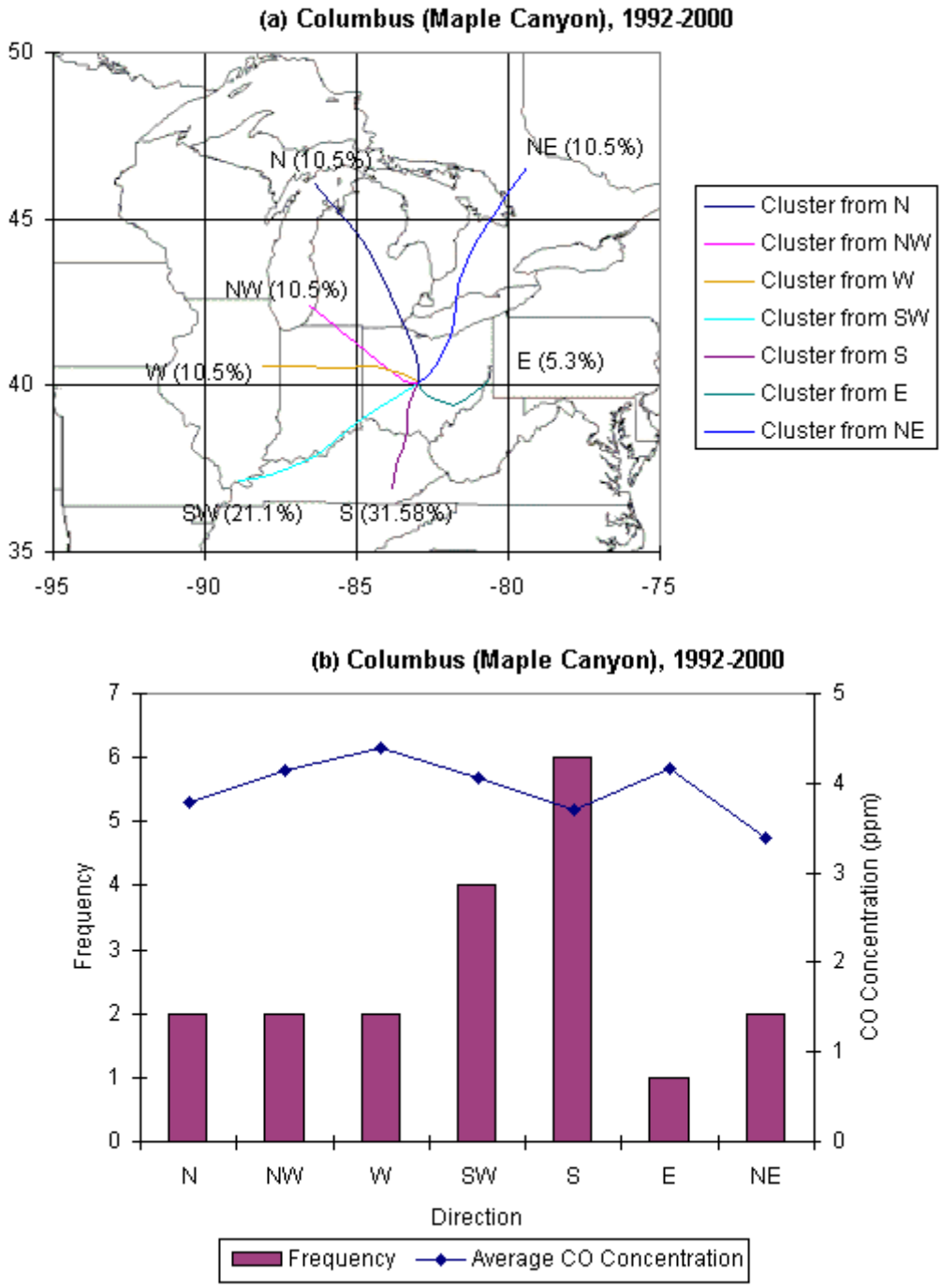


Figure D38. (a) Cluster plot at Columbus (Maple Canyon), 1993-2000 (b) Frequencies and average CO concentrations by cluster at Columbus (Maple Canyon), 1993-2000

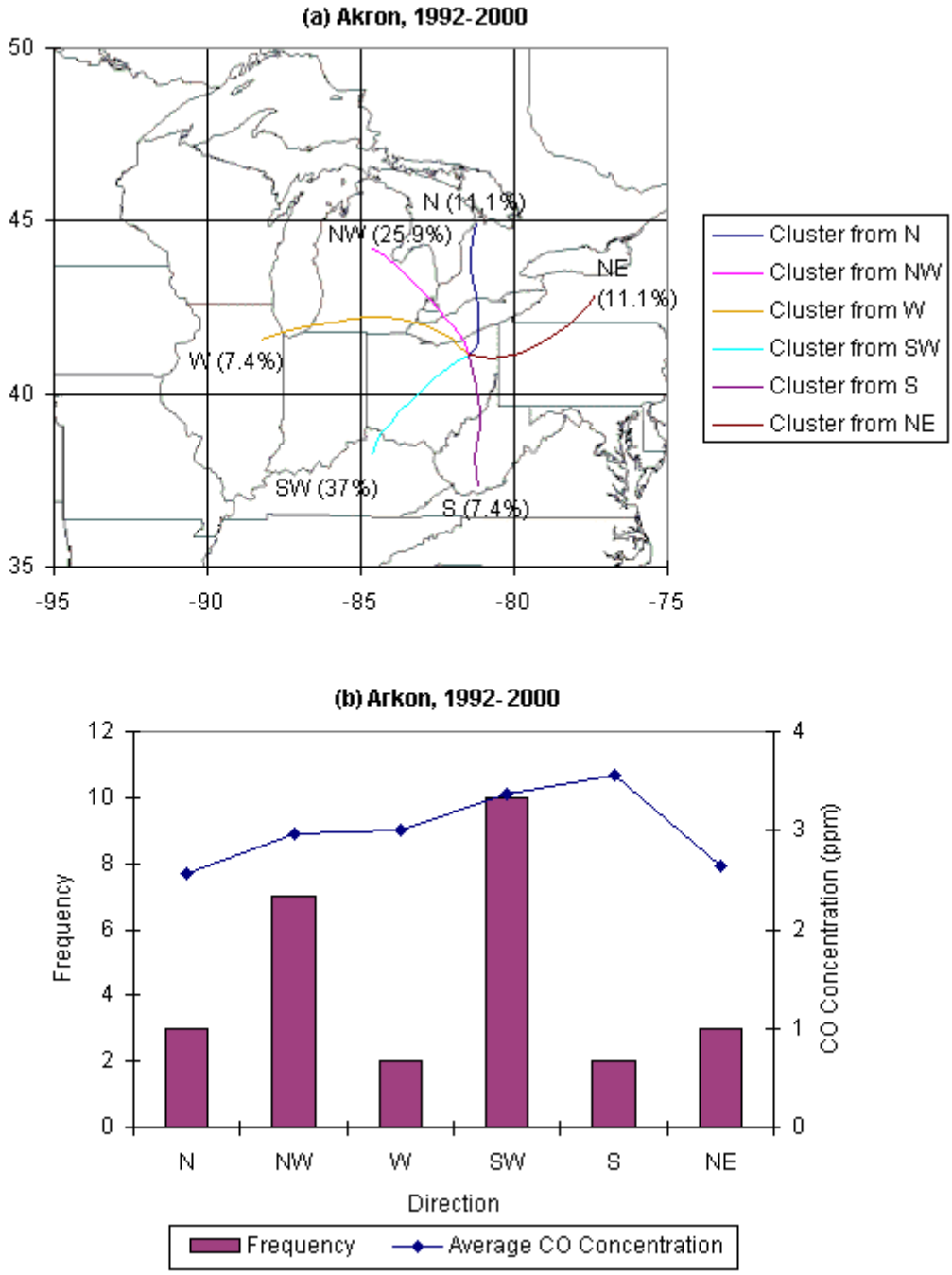


Figure D39. (a) Cluster plot at Akron 1992-2000 (b) Frequencies and average CO concentrations by cluster at Akron, 1992-2000

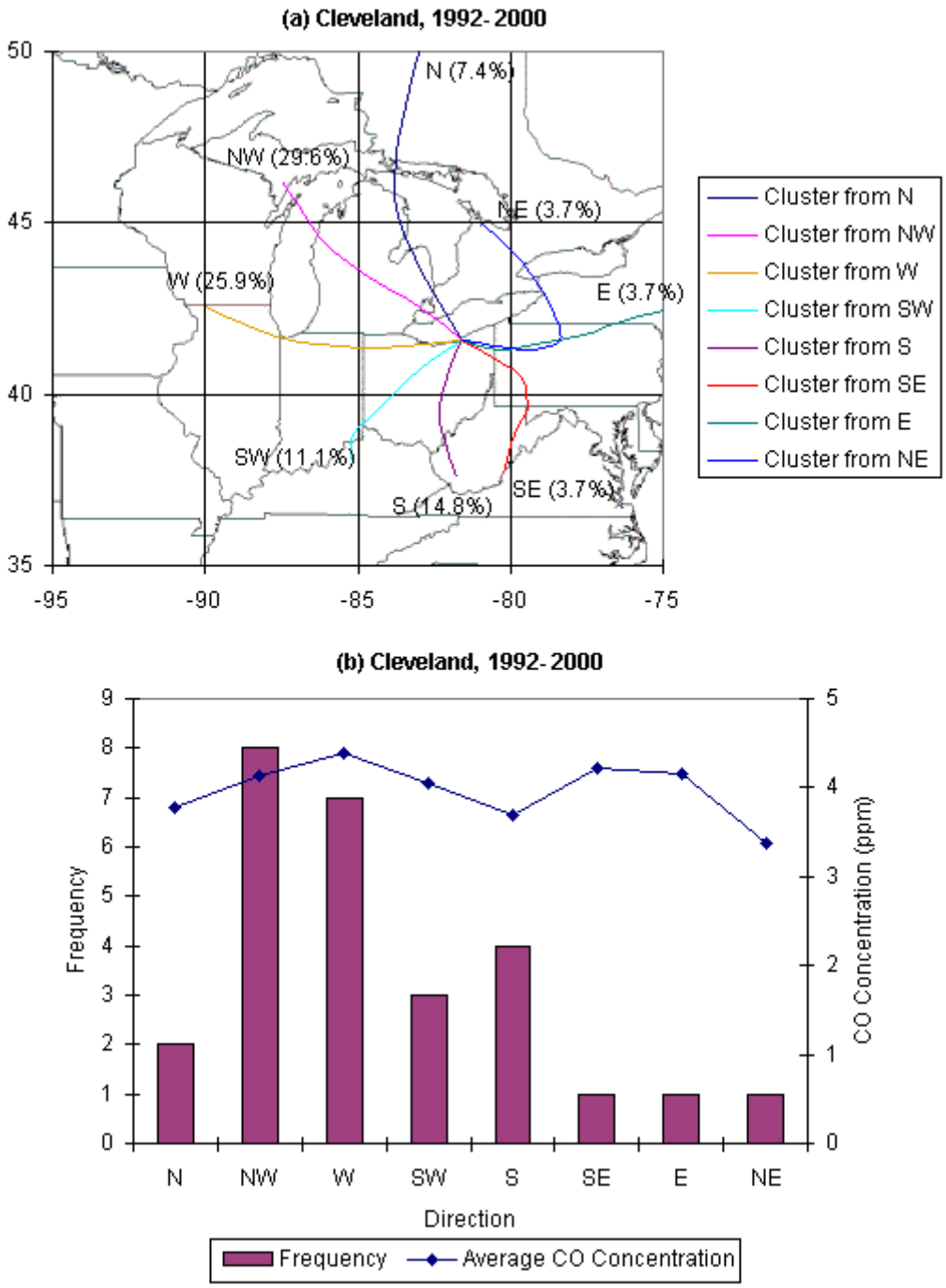


Figure D40. (a) Cluster plot at Cleveland, 1992-2000 (b) Frequencies and average CO concentrations by cluster at Cleveland, 1992-2000

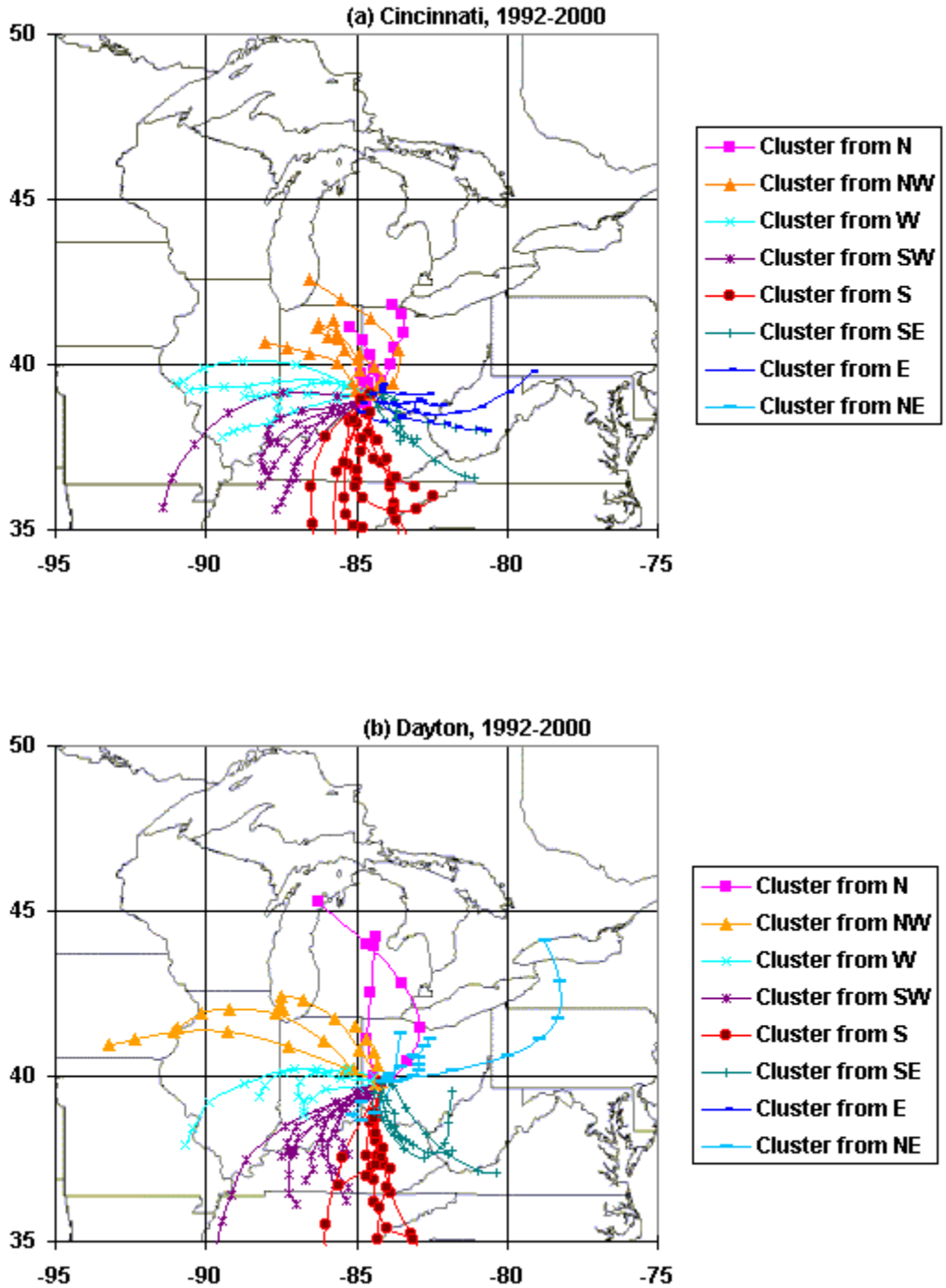
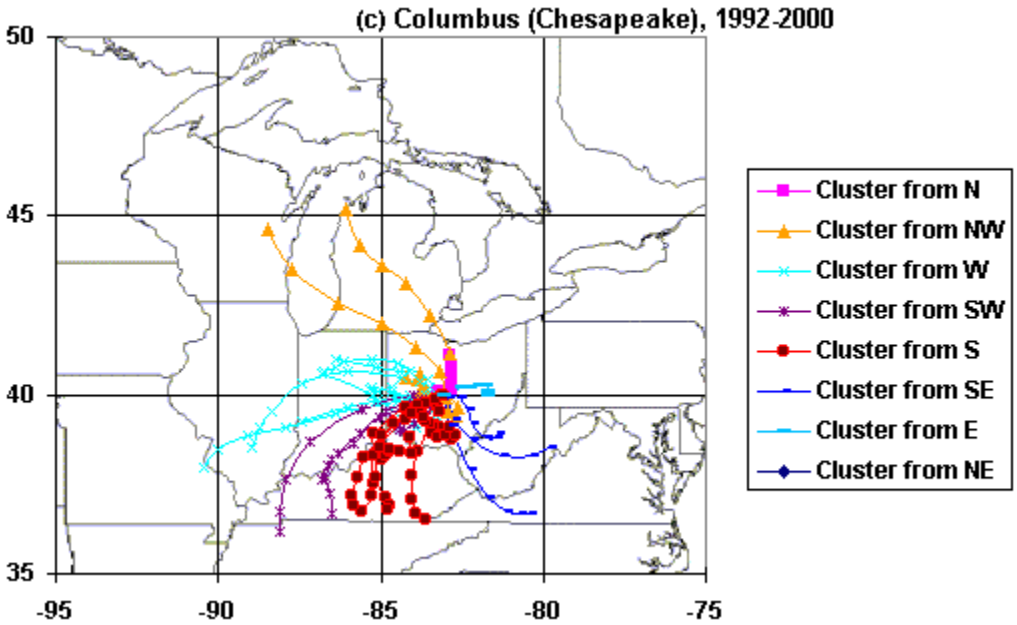


Figure D41. Back trajectories for high SO_2 days at the monitoring sites selected in Ohio, 1992-2000: (a) Cincinnati and (b) Dayton



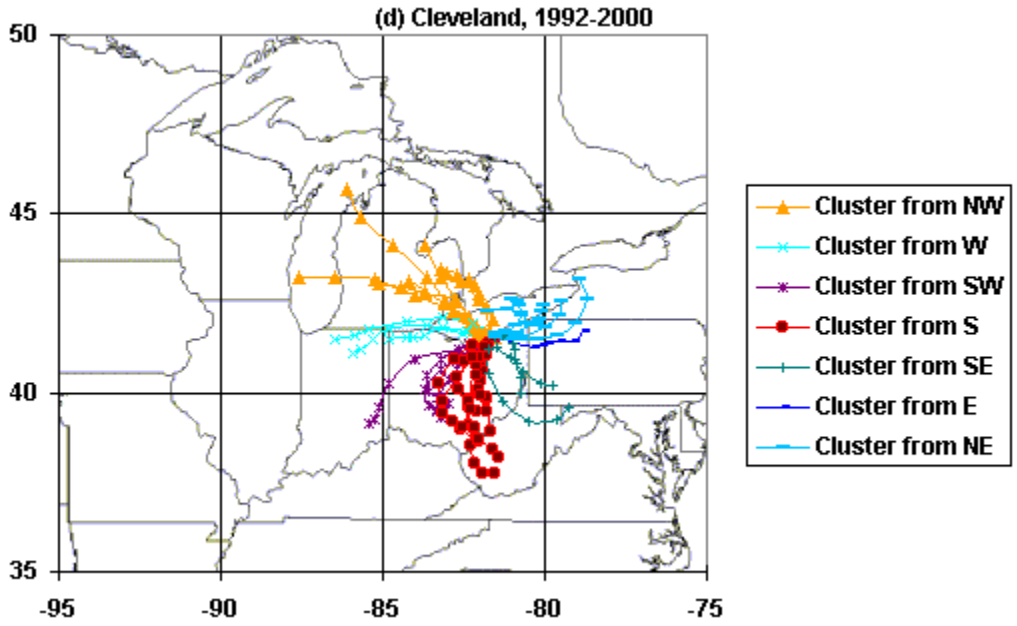
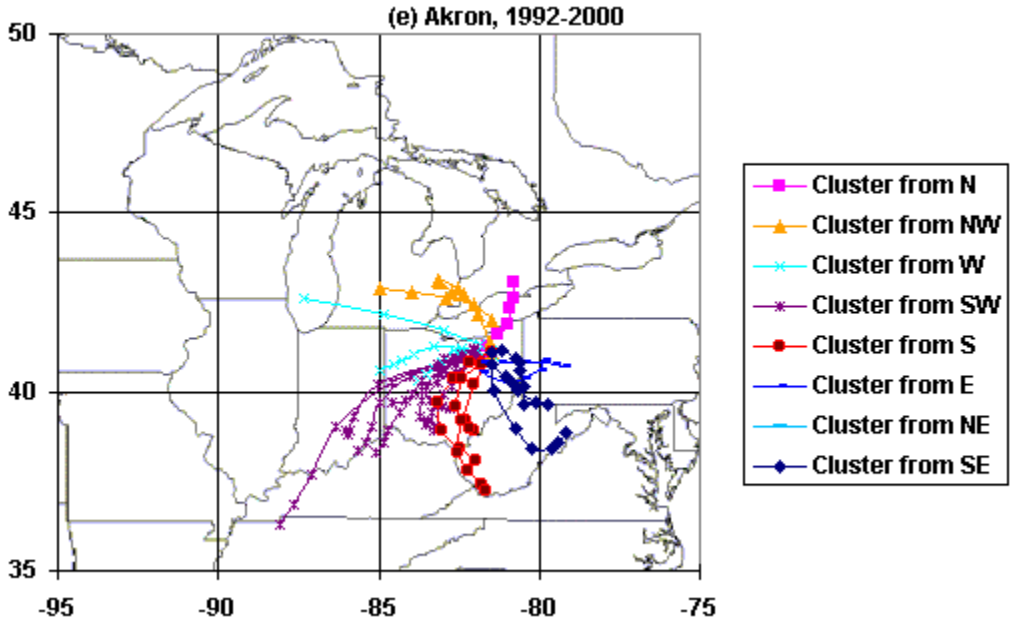


Figure D41 Back trajectories for high SO_2 days at the monitoring sites selected in Ohio, 1992-2000: (c) Columbus (Chesapeake) and (d) Cleveland.



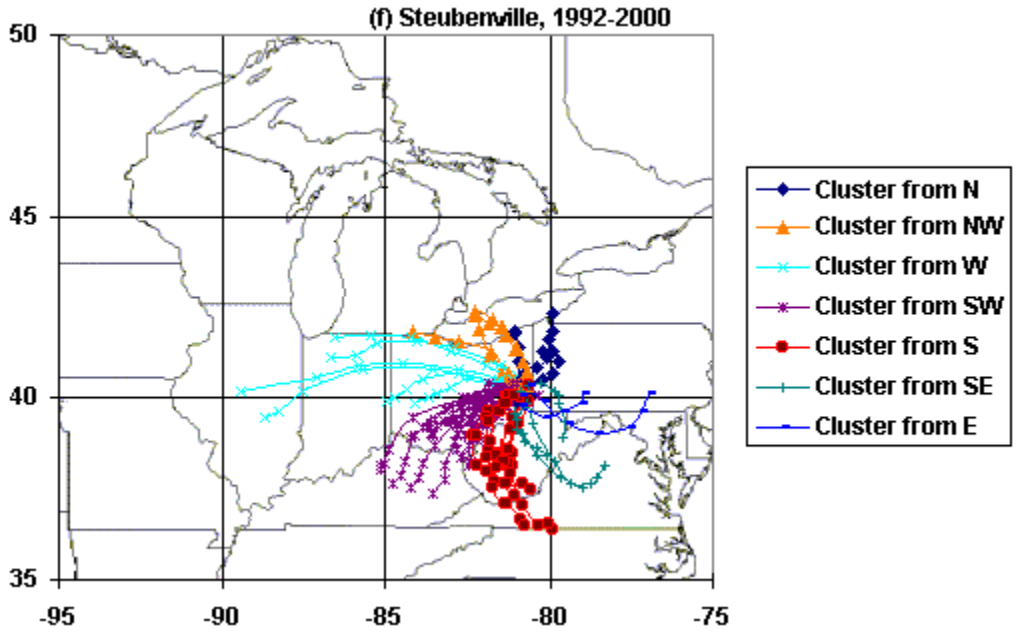


Figure D41. Back trajectories for high SO_2 days at the monitoring sites selected in Ohio, 1992-2000: (e) Akron and (f) Steubenville

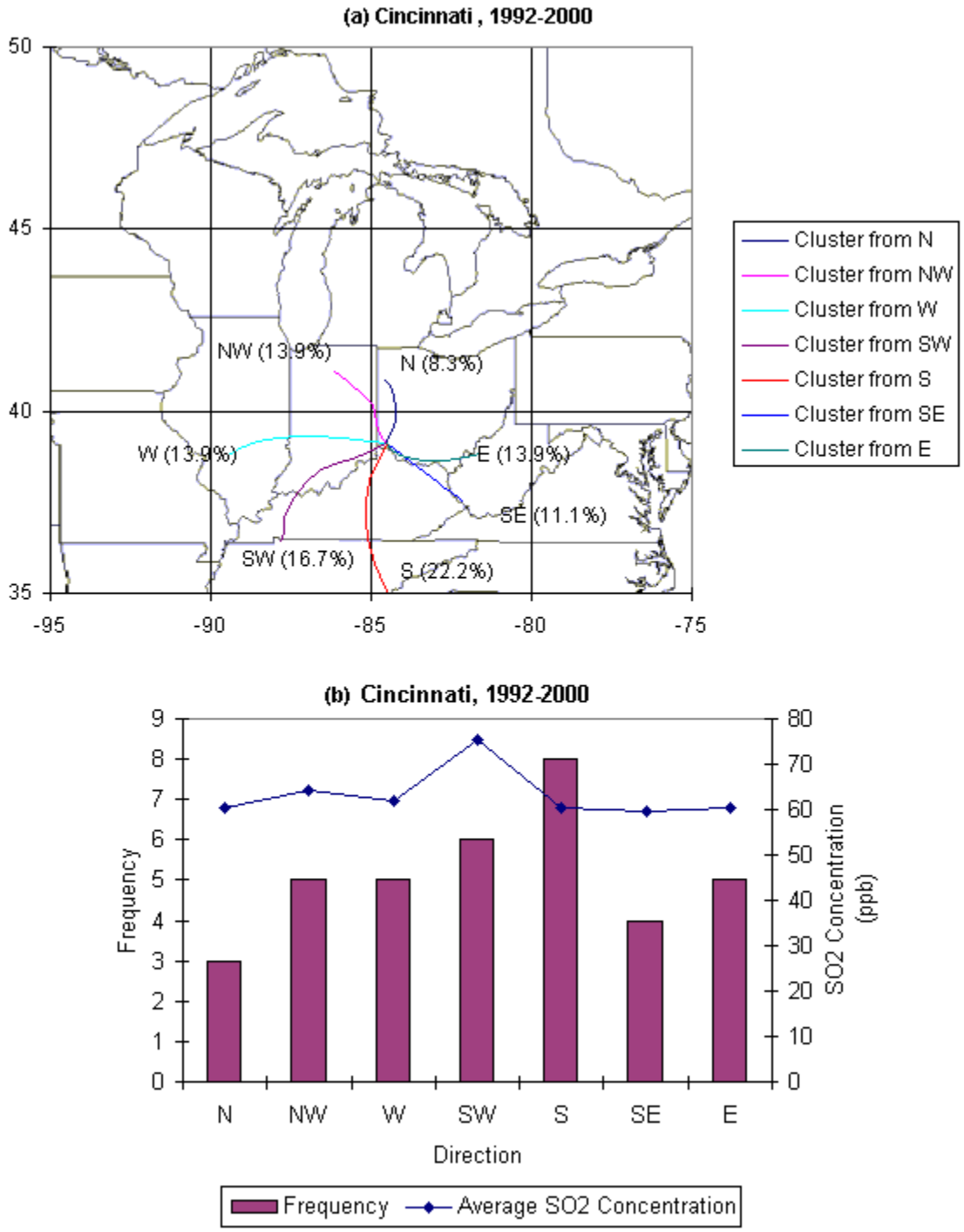


Figure D42. (a) Cluster plot at Cincinnati, 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Cincinnati, 1992-2000

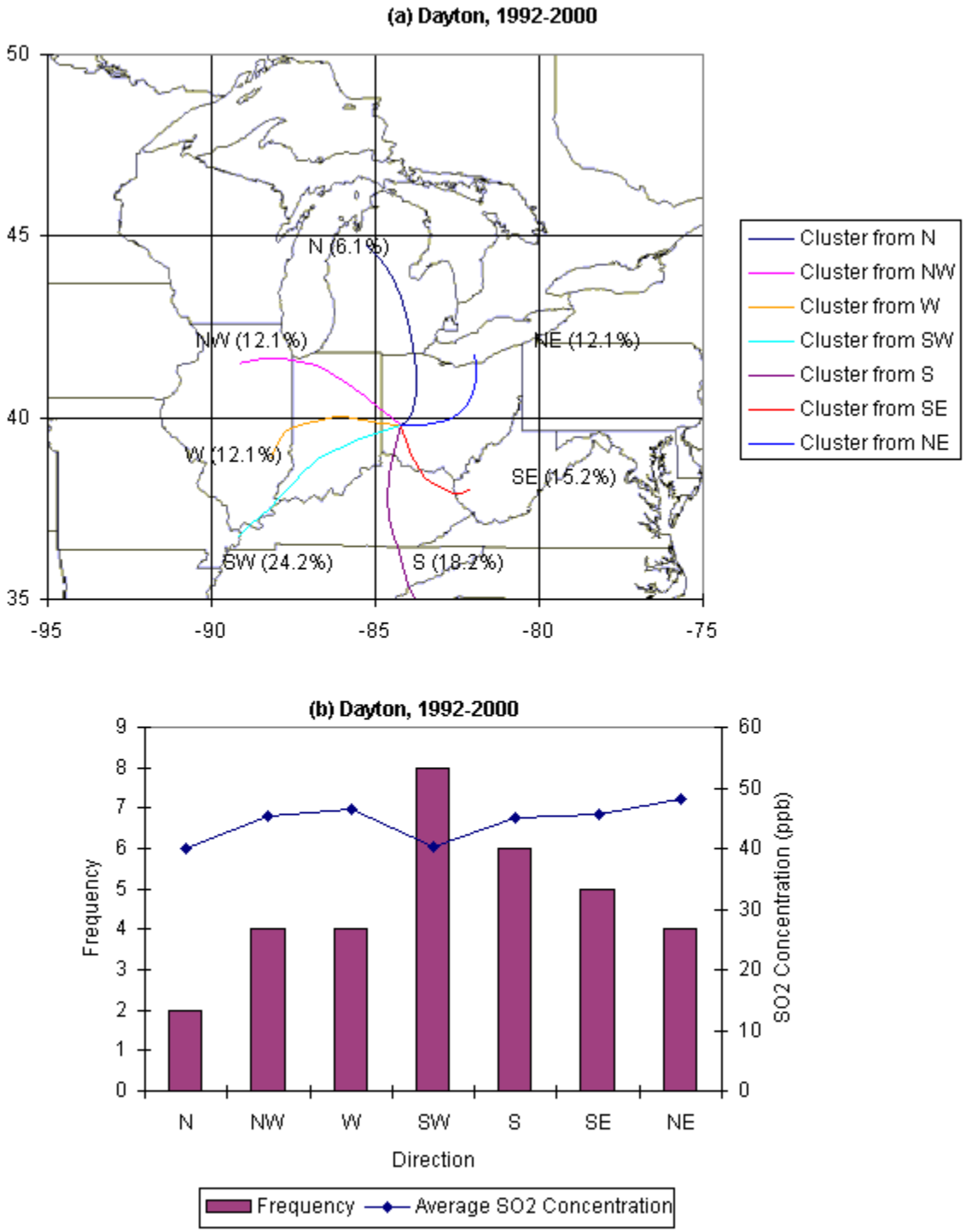


Figure D43. (a) Cluster plot at Dayton, 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Dayton, 1992-2000

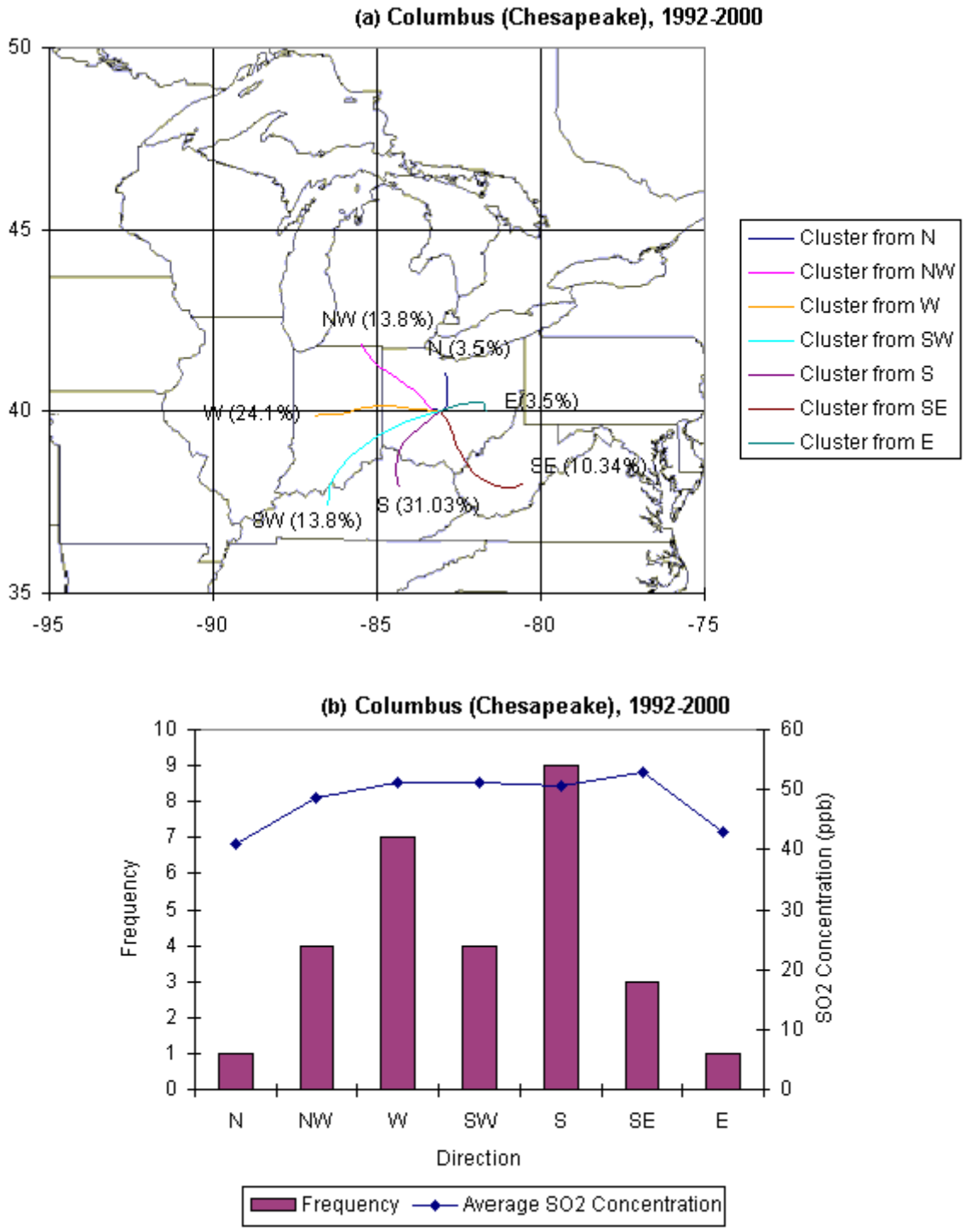


Figure D44. (a) Cluster plot at Columbus (Chesapeake), 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Columbus (Chesapeake), 1992-2000

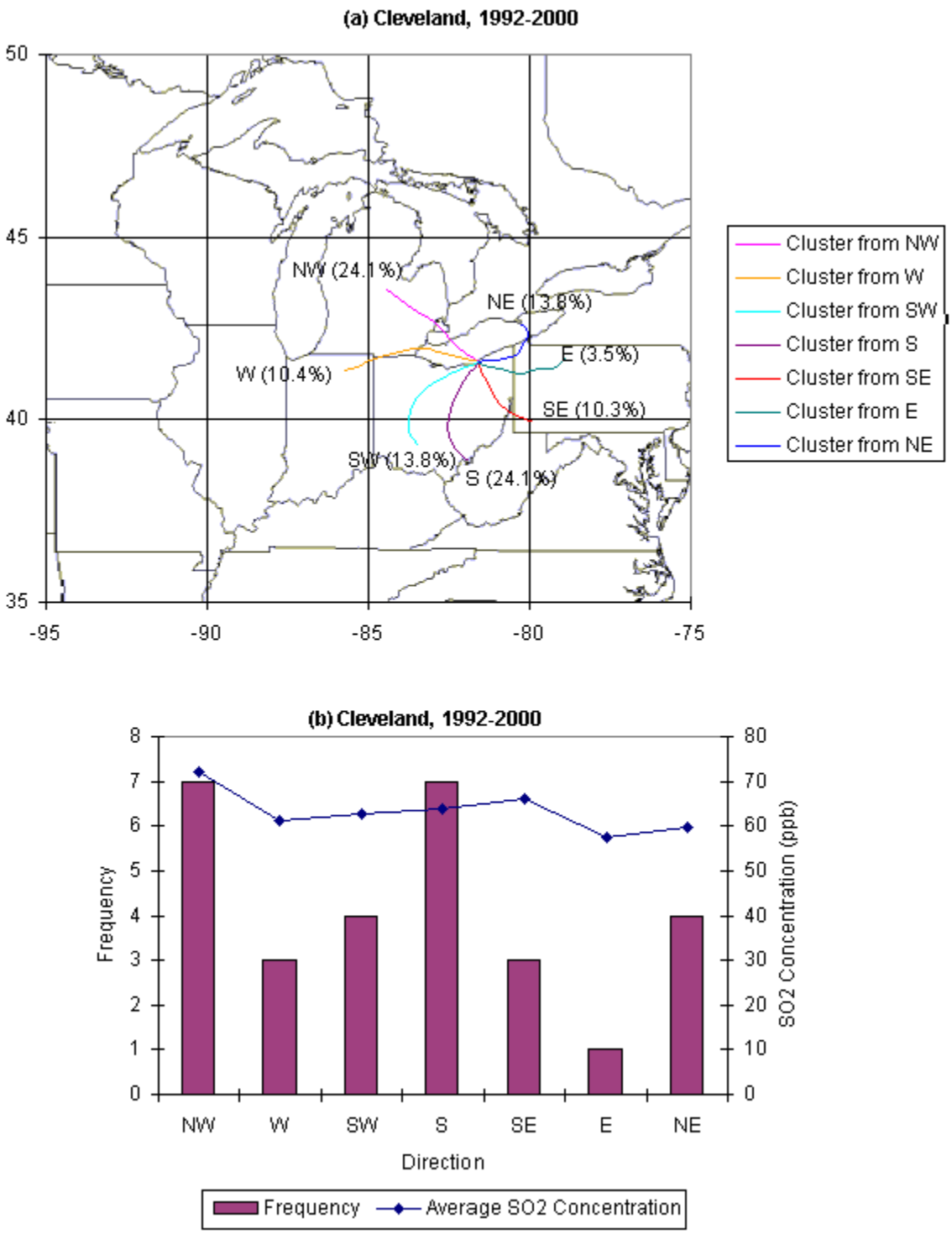


Figure D45. (a) Cluster plot at Cleveland, 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Cleveland, 1992-2000

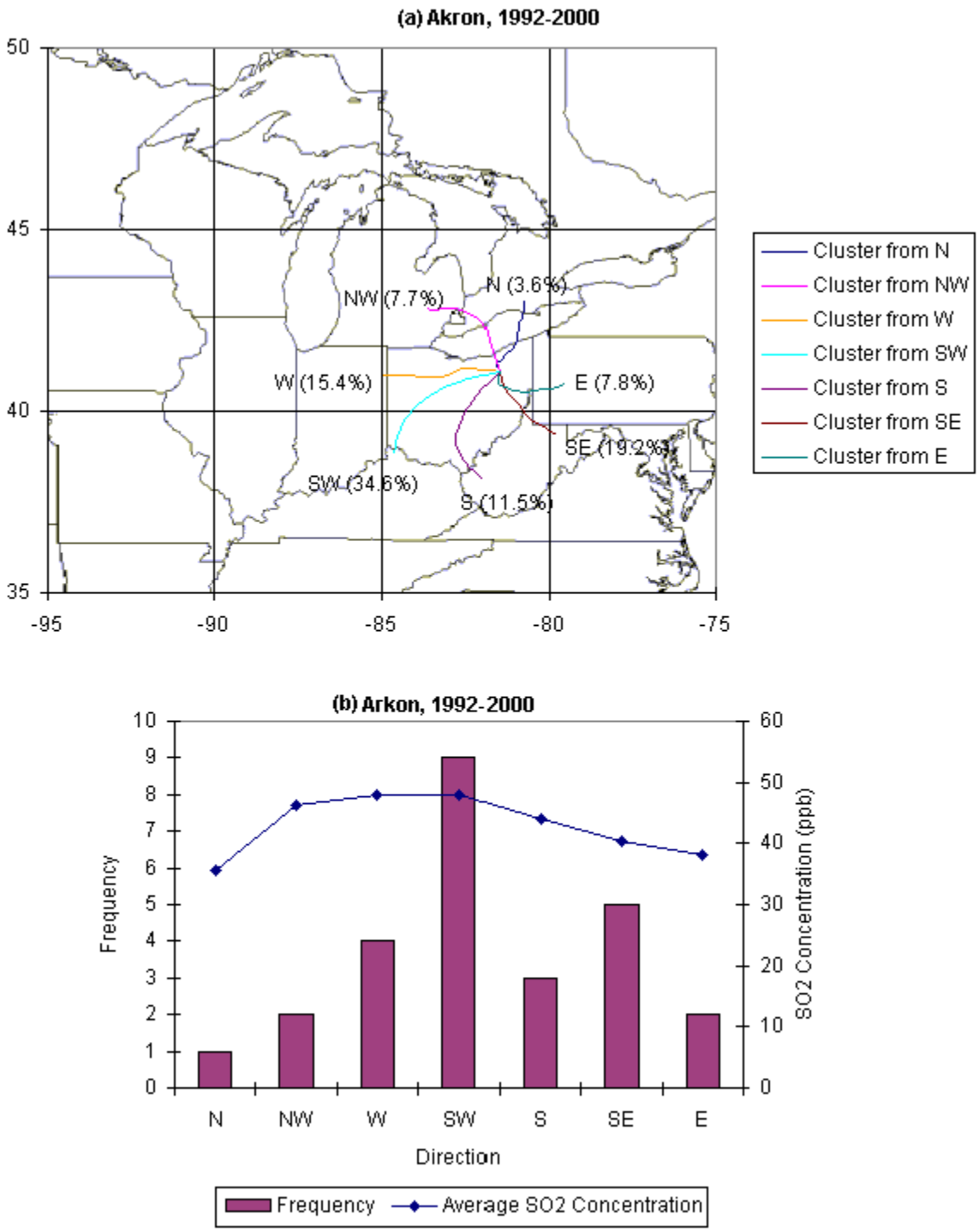


Figure D46. (a) Cluster plot at Akron 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Akron, 1992-2000

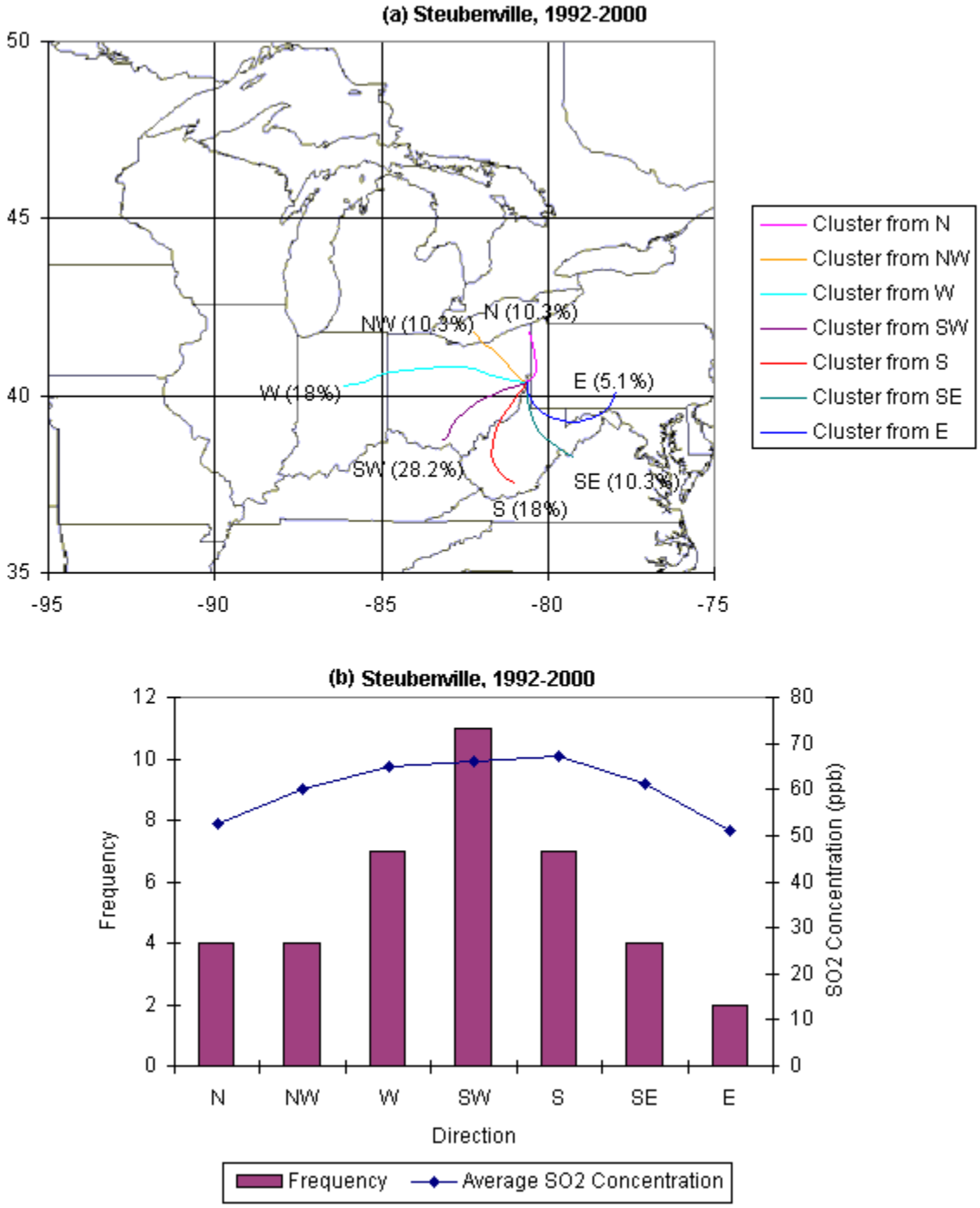


Figure D47. (a) Cluster plot at Steubenville, 1992-2000 (b) Frequencies and average SO_2 concentrations by cluster at Steubenville, 1992-2000

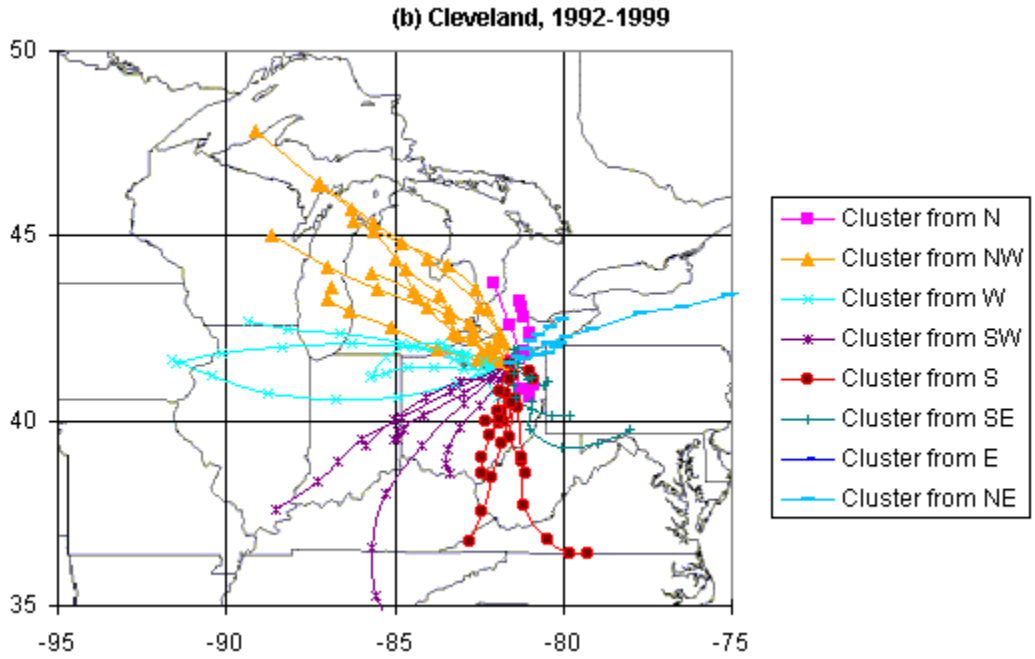


Figure D48. Back trajectories for high NO_2 days at the monitoring sites selected in Ohio: Cleveland, 1992-1999

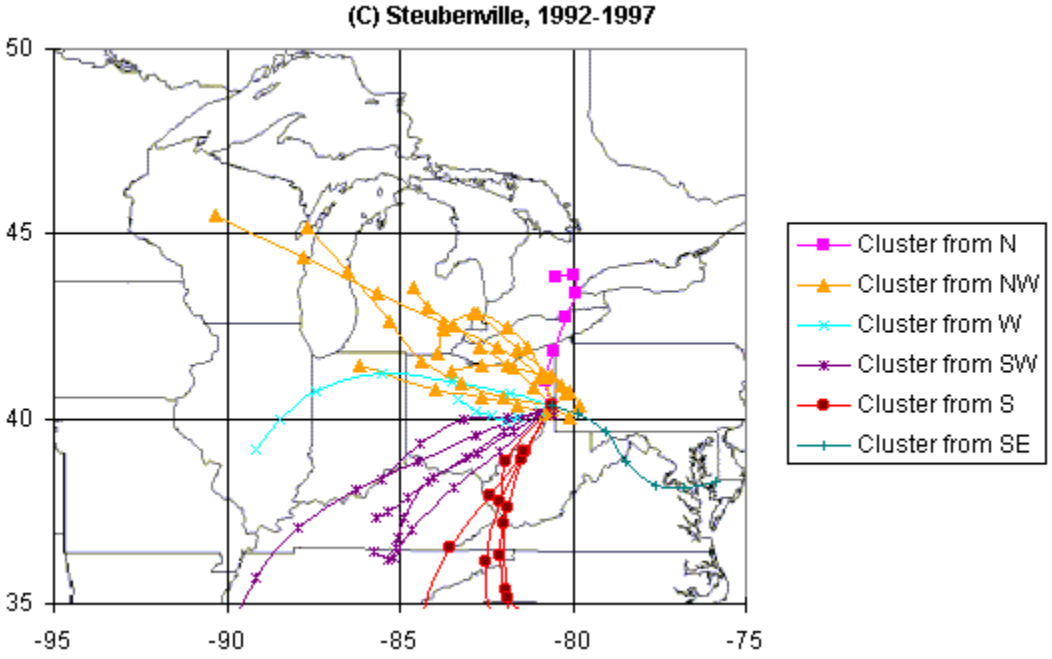


Figure D49. Back trajectories for high NO_2 days at the monitoring sites selected in Ohio: Steubenville, 1992-1997

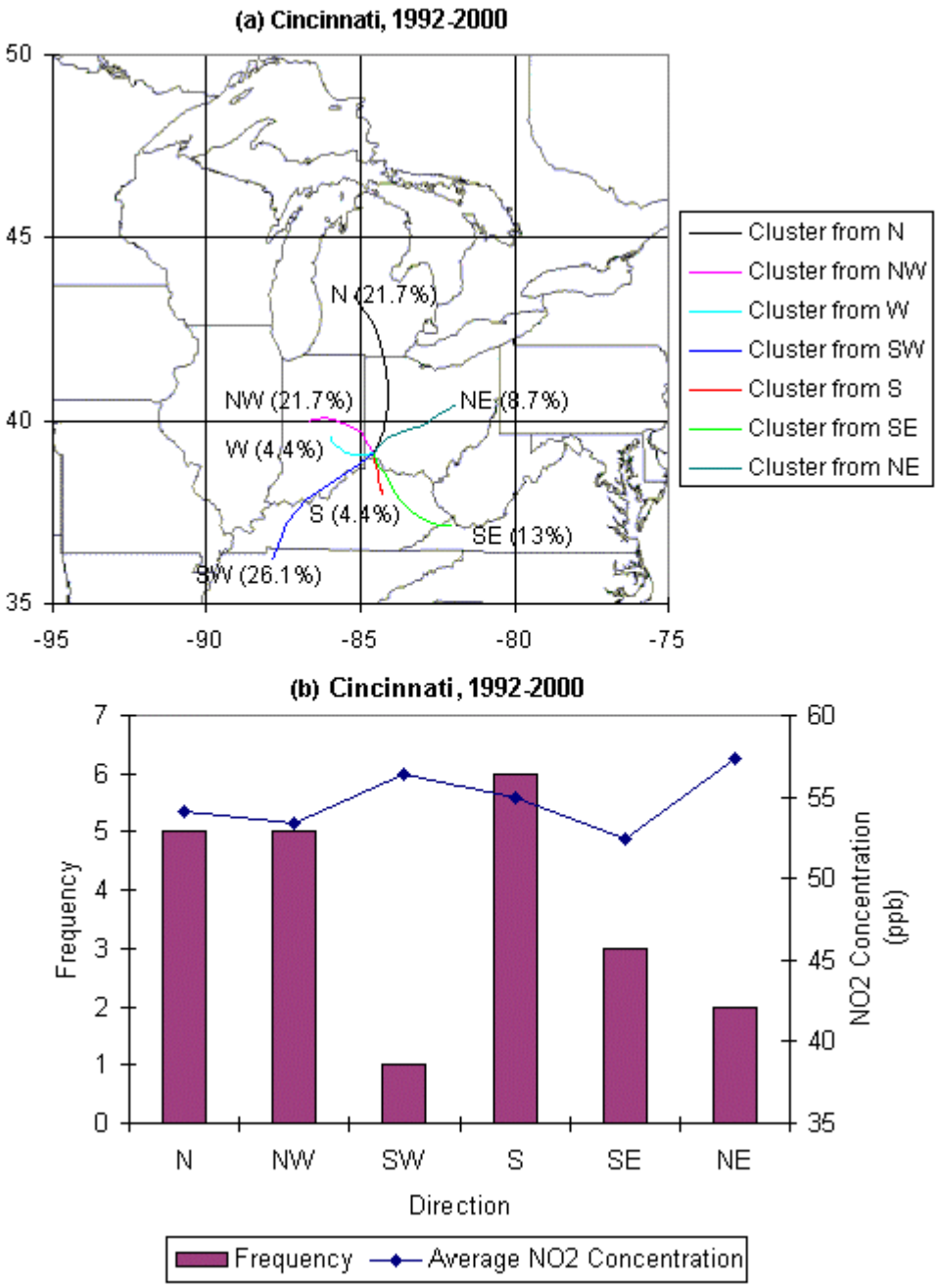
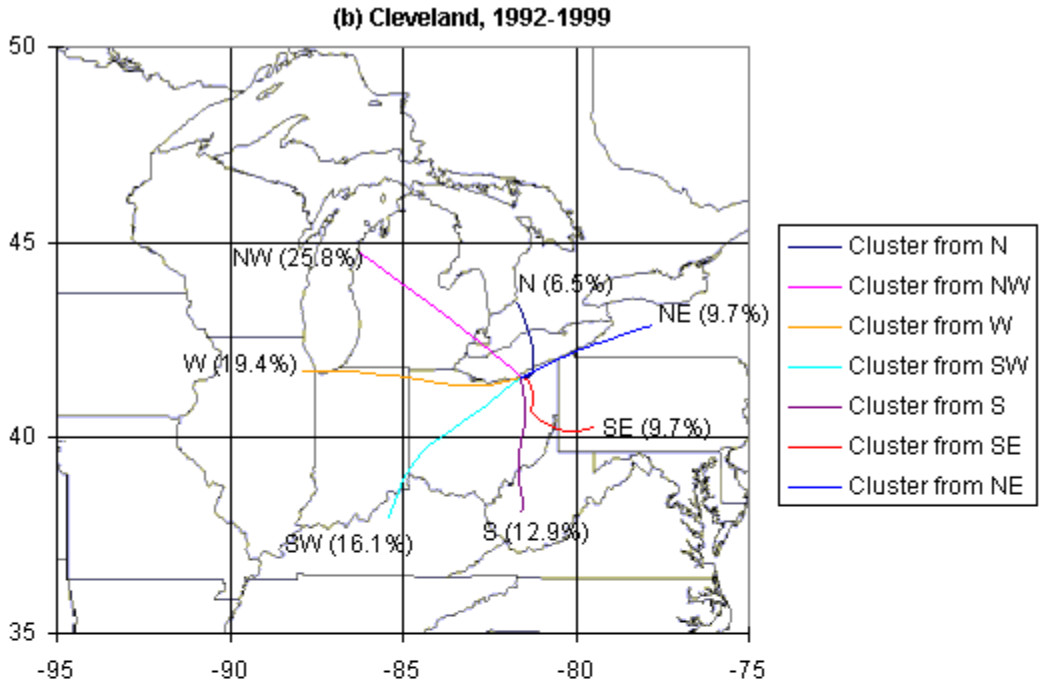


Figure D50. (a) Cluster plot at Cincinnati, 1995-2000 (b) Frequencies and average NO_2 concentrations by cluster at Cincinnati, 1995-2000



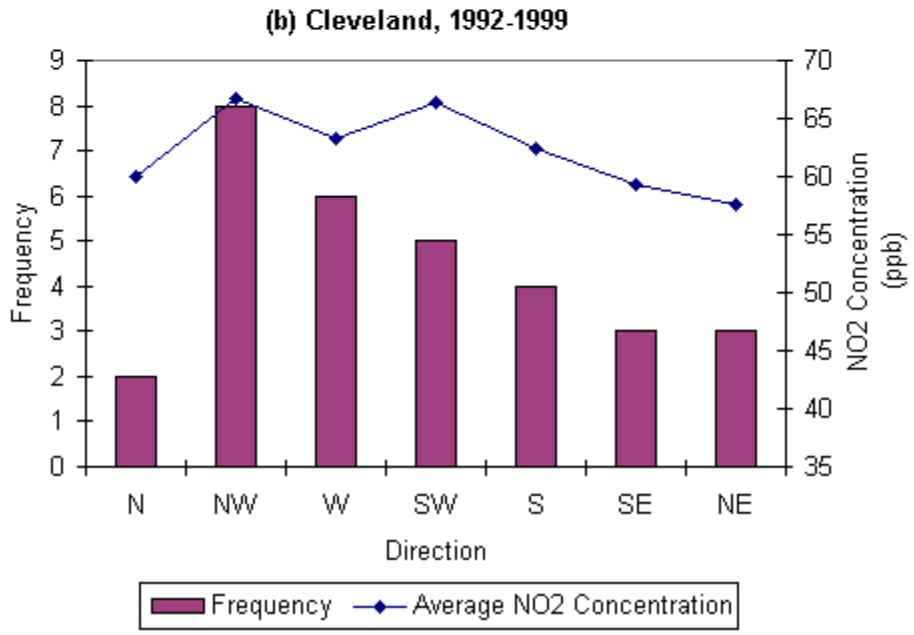


Figure D51. (a) Cluster plot at Cleveland, 1995-2000 (b) Frequencies and average NO_2 concentrations by cluster at Clevland, 1995-2000

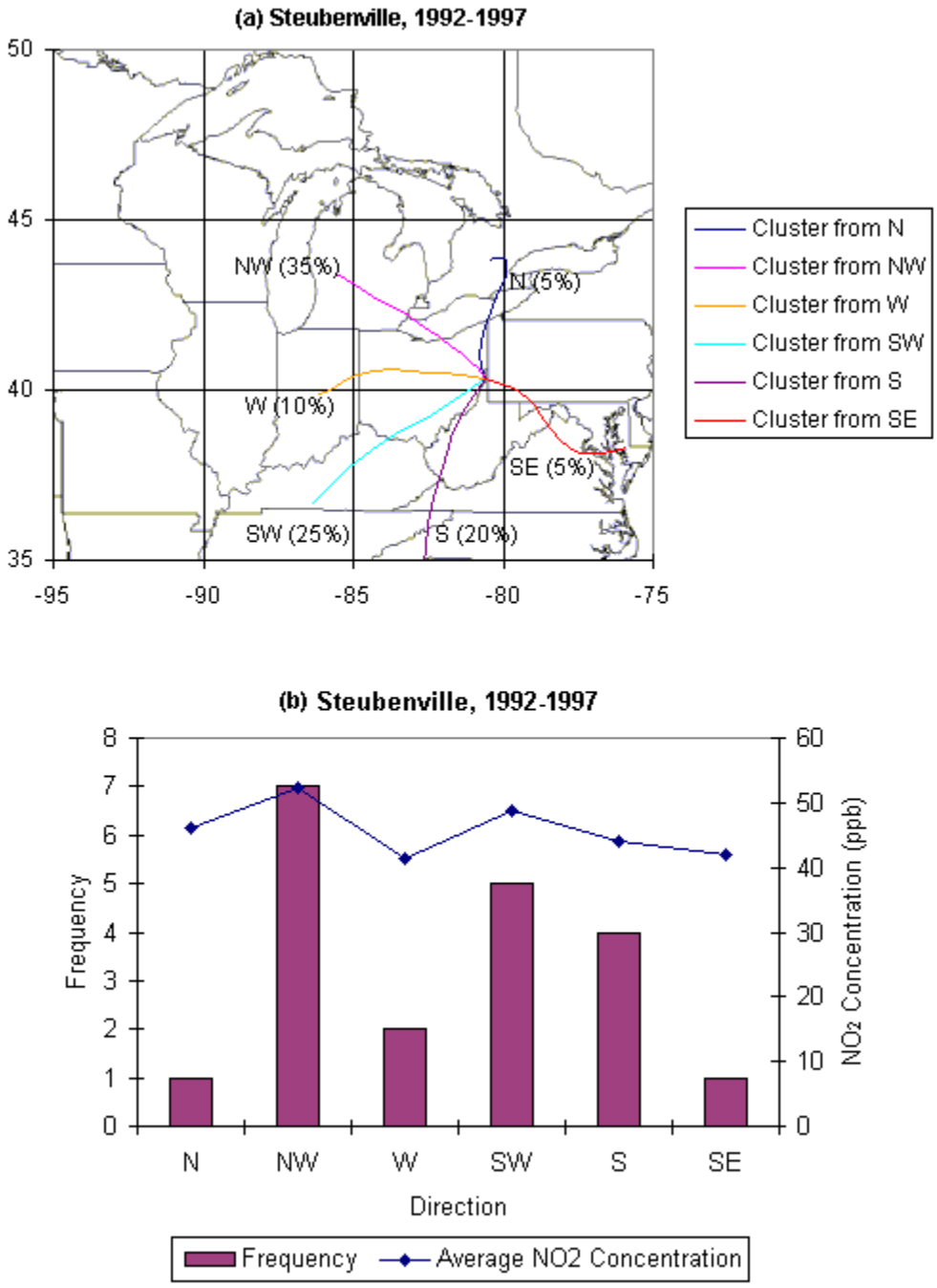


Figure D52. (a) Cluster plot at Steubenville, 1992-1997 (b) Frequencies and average NO_2 concentrations by cluster at Steubenville, 1992-1997