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Gulf of Mexico Air Quality Study, Final Report

Volume II: Data Analysis, Appendices A-M

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APPENDIX A

LIST OF SURFACE AND UPPER-AIR SITES AND THE PARAMETERS MEASURED AT THESE SITES

This appendix lists the surface and upper-air monitoring sites and the parameters measured at these sites, which were used in the data analysis. Table A-1 lists the locations and parameters measured at surface air quality and meteorological sites in the southeast Texas, Louisiana, and Gulf of Mexico regions. These sites were operated by GMAQS contractors, state air quality agencies, private monitoring networks, and the National Weather Service. Table A-2 lists the upper-air monitoring sites and the parameters measured by these instruments. The upper-air instruments included radar profilers and Radio Acoustic Sounding Systems (RASS), rawinsondes, and sodars, which were operated by GMAQS contractors, state air quality agencies, and the National Weather Service.

Table A-1. Lists the locations and parameters measured at surface air quality and meteorological sites in the southeast Texas, Louisiana, and Gulf of Mexico Regions.

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SITE ID	AIRS ID	State	Site Name, County/Parish	Parameters Measured										
				WS	WD	T	TD	RH	P	SR	Pcp	O3	NO/NO_x	VOC
DPIA	N/A	AL	UPHINE ISLAND	X	X	X			X					
NCD7	N/A	AL	MOBILE (NWS)	X	X	X	X	X	X					
BURL	N/A	LA	SOUTHEAST PASS	X	X	X			X					
COC	N/A	LA	COCODRIE	X	X	X	X		X			X	X	X
GDIL	N/A	LA	GRAND ISLE	X	X	X			X					
LO1	220870002	LA	MEHLE AVE., ARABI									X		
LO2	220331001	LA	HIGHWAY 964, E. BATON ROUGE									X	X	
LO3	220330009	LA	CAPITOL, E. BATON ROUGE									X	X	
LO4	220330003	LA	ASTER LANE, E. BATON ROUGE									X	X	
LO5	220190002	LA	HIGHWAY 27/108, CALCASIEU									X		
LO6	220470002	LA	HIGHWAY 75, IBERVILLE									X	X	
LO7	220930002	LA	HWY44&CANAPEL, ST. JAMES									X	X	
LO8	220170001	LA	HAGOOD ROAD, CADDO									X		
LO9	220050004	LA	DUTCHTOWN, ASCENSION									X		
LO10	220630002	LA	FRENCH SETTLEMENT, LIVINGSTON									X	X	
LO11	220950002	LA	AZALEA & S. APRICOT, ST. JOHN THE BAPTIST									X		
LO12	220470007	LA	HIGHWAY 77/GROSS TETE, IBERVILLE									X	X	
LO13	220890003	LA	1 RIVER PARK DRIVE, ST. CHARLES									X		
LO14	220511001	LA	WEST TEMPLE PL, JEFFERSON									X	X	
LO15	220550004	LA	LAFAYETTE, LAFAYETTE									X		
LO16	220190007	LA	LEBLEU,CALCASIEU										X	
LO17	220730002	LA	4709 CONSTRUCTION AVENUE, OUACHITA									X	X	
LO18	221010003	LA	MORGAN CITY, ST. MARY									X	X	
LO19	220710012	LA	FLORIDA & ORLEANS AVE, ORLEANS									X	X	
LO21	220770001	LA	TED DAVIS & HIGHWAY 415, POINTE CUPEE									X	X	
LO22	221210001	LA	HIGHWAY 1, WEST BATON ROUGE									X	X	
LO23	220330008	LA	PRIDE PORT HUDSON ROAD, E. BATON ROUGE									X	X	
LO24	220110002	LA	HWY 171 & HWY 190, BEAUREGARD									X	X	
LO25	220150008	LA	SHREVEPORT MUNI AIRPORT, BOSSIER									X	X	
LO26	220570002	LA	MADEWOOD DR & ARDOYNE ST, LAFOURCHE									X		
LO27	220190009	LA	VINTON, CALCASIEU									X	X	
LO28	220190008	LA	WESTLAKE, CALCASIEU									X		
LSU	N/A	LA	LOUISIANA STATE UNIVERSITY	X	X	X	X	X	X	X	X			
NCD1	N/A	LA	LAKE CHARLES (NWS)	X	X	X	X	X	X					
NCD3	N/A	LA	NEW ORLEANS (NWS)	X	X	X	X	X	X					
NCD8	N/A	LA	BATON ROUGE (NWS)	X	X	X	X	X	X					
SSP	N/A	LA	SHIP SHOAL 178A PLATFORM	X	X	X	X	X	X	X	X			
34ST	N/A	TX	34TH STREET									X	X	
BLOG	N/A	TX	BLOOMINGTON (GLDN CRES 84?)	X	X	X								
CRSC	N/A	TX	CROSBY AQ/MET	X	X	X				X		X	X	
GAL	N/A	TX	GALVESTON	X	X	X	X	X	X	X	X			
GALC	N/A	TX	GALVESTON AS SITE	X	X	X				X		X	X	
GILC	N/A	TX	GILCHRIST	X	X	X						X	X	X
GLRC	N/A	TX	GALLERIA CGC SITE	X	X	X				X		X	X	
HIP	N/A	TX	HIGH ISLAND 199 PLATFORM	X	X	X	X	X	X	X	X			
HM01	482010801	TX	HRM SITE 001, HARRIS	X	X	X				X		X	X	
HM03	482010803	TX	HRM SITE 003, HARRIS	X	X	X				X		X	X	
HM04	482010804	TX	HRM SITE 004, HARRIS	X	X	X				X		X	X	
HM07	482010807	TX	HRM SITE 007, HARRIS	X	X	X				X		X	X	
HM08	482010808	TX	HRM SITE 008, HARRIS	X	X	X				X		X	X	
HM10	480710900	TX	HRM SITE 010, CHAMBERS	X	X	X				X		X	X	
HM11	480710901	TX	HRM SITE 011, CHAMBERS	X	X	X				X		X	X	
HTCC	N/A	TX	TEXAS COMMERCE TOWER	X	X	X				X		X	X	
ME5T	N/A	TX	MET 5	X	X	X		X	X		X			
MOBT	N/A	TX	MOBILE	X	X									
NCD2	N/A	TX	VICTORIA (NWS)	X	X	X	X	X	X					
NCD4	N/A	TX	PORT ARTHUR (NWS)	X	X	X	X	X	X					

Table A-1. Lists the locations and parameters measured at surface air quality and meteorological sites in the southeast Texas, Louisiana, and Gulf of Mexico Regions.

Page 2 of 2

SITE ID	AIRS ID	State	Site Name, County/Parish	Parameters Measured										
				WS	WD	T	TD	RH	P	SR	Pcp	O3	NO/NO_x	VOC
NCD5	N/A	TX	CORPUS CHRISTI (NWS)	X	X	X	X	X	X					
NCD6	N/A	TX	HOUSTON (NWS)	X	X	X	X	X	X					
PCOG	N/A	TX	POINT COMFORT (GLDN CRES 84?)	X	X	X								
PTAT	N/A	TX	PORT ARANSAS	X	X	X								
S40S	N/A	TX	Sabine Pass (SETRPC SITE 40)	X	X	X						X	X	
S41S	N/A	TX	West Orange (SETRPC SITE 41)	X	X	X								
S42S	N/A	TX	Orange Co. (SETRPC SITE 42)	X	X	X						X	X	
S43S	N/A	TX	Beaumont (SETRPC SITE 43)	X	X	X						X	X	
SBRC	N/A	TX	SEABROOK C20	X	X	X				X		X	X	
SDRG	N/A	TX	SEA DRIFT (GLEN CRES 82)	X	X	X								
SEH	N/A	TX	SOUTHEAST HOUSTON	X	X	X	X	X	X	X	X			
SPTC	N/A	TX	SMITH POINT AQ/MET	X	X	X				X		X	X	
SRST	N/A	TX	SABINE	X	X	X			X					
STWC	N/A	TX	STOWELL (WINNIE) AQ/MET	X	X	X				X		X	X	
SWLT	N/A	TX	SEAWALL	X	X								X	
TN1	482011053	TX	CLINTON, HARRIS											X
TN2	482011037	TX	CRAWFORD, HARRIS	X	X	X						X	X	
TN3	482010046	TX	N WAYSIDE, HARRIS	X	X	X						X		
TN4	482010047	TX	LANG, HARRIS	X	X	X						X	X	
TN5	482010051	TX	CROQUET, HARRIS	X	X	X						X		
TN6	482010062	TX	SWISS&MONROE, HARRIS	X	X	X						X		
TN8	482450009	TX	BEAUMONT C02, JEFFERSON	X								X	X	
TN9	483550025	TX	WEST C04, NUECES	X	X	X						X		
TN10	482010024	TX	ALDINE C08, HARRIS	X	X	X						X	X	
TN11	483611001	TX	WEST ORANGE C09, ORANGE	X	X	X						X	X	
TN12	481671002	TX	TEXAS CITY C10, GALVESTON	X	X	X						X		
TN13	480391003	TX	CLUTE C11, BRAZORIA	X	X	X						X		
TN14	482011003	TX	DEER PARK C18, HARRIS	X	X	X								
TN15	483550026	TX	TULOSA C21, NUECES	X	X	X						X		
TN16	482010004	TX	BAYTOWN C24, HARRIS	X	X	X								
TN17	482010029	TX	NW HARRIS C26, HARRIS	X	X	X						X		
TN18	481990002	TX	KOUNTZE C85, HARDIN	X	X	X						X		
TN19	484690003	TX	VICTORIA	X	X	X						X		
TN20	482010059	TX	MANCHESTER C22, HARRIS	X	X	X						X		
TN21	481830001	TX	LONGVIEW C19, GREGG	X	X	X						X		
TN22	482450011	TX	PORT ARTHUR C28, JEFFERSON	X	X	X						X		
VICG	N/A	TX	VICTORIA	X	X	X								
BUO1	N/A	-	BUOY 42001	X	X	X			X					
BUO2	N/A	-	BUOY 42002	X	X	X			X					
BUO3	N/A	-	BUOY 42003	X	X	X			X					
BUO4	N/A	-	BUOY 42007	X	X	X			X					
01TN	N/A	-	NWS platform	X	X	X	X		X					
5R0N	N/A	-	NWS platform	X	X	X	X		X					
7R8N	N/A	-	NWS platform	X	X	X	X		X					

Table A-2. List of upper-air monitoring sites and the parameters measured by these instruments.

SITE ID	State	Site Name	Instrument*			Parameters measured					
			RP	S	RWN	WS	WD	T_v	T	T_d	P
SSP	-	Ship Shoal 178A Platform	X			X	X	X			
HIP	-	High Island 199 Platform	X			X	X	X			
COC	LA	Cocodrie	X			X	X	X			
LSU	LA	Louisiana State University	X			X	X	X			
GAL	TX	Galveston RP site	X			X	X	X			
SEH	TX	Southeast Houston	X			X	X	X			
JCA	TX	Jefferson County Airport	X	X		X	X	X			
SPS	TX	Sabine Pass		X		X	X				
NHS	TX	Nortwest Houston		X		X	X				
GALC	TX	Galveston		X		X	X				
GAR	-	Garden Banks 236 Platform			X	X	X		X	X	X
LKCH	LA	Lake Charles			X	X	X		X	X	X
SLID	LA	Slidell			X	X	X		X	X	X
CORP	TX	Corpus Christi			X	X	X		X	X	X

* RP= 915 MHz radar profiler S=Doppler sodar RWN=Rawinsonde

APPENDIX B

SURFACE HYDROCARBON AND CARBONYL COMPOUND SPECIES LISTS AND DATA

Because of the large number of hydrocarbon samples collected (52 valid surface and 278 valid aircraft) and the large number of individual species (73 hydrocarbon and 10 carbonyl compounds), many plots and tables were prepared for the analyses which were not included in the main report. This appendix contains figures and tables concerning the surface hydrocarbon and carbonyl compound data including the following:

- Table listing the target species reported by Biospherics for the surface canisters.
- Table listing the target species reported by Radian for the surface continuous gas chromatograph (GC) data.
- Table listing the species group assignments for the Clinton continuous GC data plots.
- Table of statistics for species group totals by site and by site and time of day at the Cocodrie and Gilchrist surface sites.
- Table of the frequency distributions of NMHC, NMOC, NO_x, and ratios at Cocodrie and Gilchrist.
- Table of invalid hydrocarbon and carbonyl compound samples at Cocodrie and Gilchrist.
- Plots of statistics (minimum, maximum, average, median, and 25th, 75th, and 90th percentile concentrations) for species and species groups by hour at Clinton for the month of August, 1993.
- Diurnal plots of species and species groups for August 17-21, 1993 at Clinton.

The following terms are used in the three appendices which show surface and aircraft hydrocarbon and carbonyl compound data:

NMHC	nonmethane hydrocarbon. These data are the sum of identified species peaks and unidentified mass by gas chromatography-flame ionization detection (GC-FID). Samples at Gilchrist, Cocodrie, and in the aircraft were collected in canisters and 73 species were identified. Samples at Clinton were measured by continuous GC and 52 species were identified. All data were reported in ppbC.
Carbonyl Compounds	Sum of ten carbonyl compounds collected in C18-bonded silica gel cartridges coated with dinitro phenylhydrazine (DNPH). Aldehydes and ketones react with the DNPH to form hydrazones which are identified and quantified using high pressure liquid chromatography. Data were reported in ppb and converted to ppbC.
NMOC	nonmethane organic compounds. Sum of the NMHC and carbonyl compound concentrations. Hydrocarbon and carbonyl compound samples were matched by sampling time and location. Reported in ppbC.

List of Target Species Reported by Biospherics (Surface and Aircraft Canisters)

Ethane	1	24Mhexa	50
Ethene	2	234Mpenta	51
Acetylene	3	Toluene	52
Propane	4	23Mhexa	53
Propene	5	2Mhepta	54
iButane	6	3Ehex/3Mhep	55
iButene	7	22Mhepta	56
1Butene	8	224Mhexa	57
13Butad	9	Octane	58
Butane	10	Ecyhexa	59
t2Butene	11	Etbenz	60
22mpropa	12	m&pXylene	61
c2Butene	13	Styrene	62
3M1bute	14	oXylene	63
iPentane	15	Nonane	64
1Pentene	16	iPropbenz	65
2M1bute	17	Propbenz	66
Pentane	18	pEtol	67
Isoprene	19	mEtol	68
t2Pente	20	135TMB	69
c2Pente	21	oEtol	70
2M2bute	22	124TMB/sBB	71
22Mbuta	23	Decane	73
Cypente	24		
4M1pente	25		
Cypenta	26		
23Mbuta	27		
c4M2pente	28		
2Mpenta	29		
3Mpenta	30		
2M1pente	31		
1Hexene	32		
Hexane	33		
t2Hexene	34		
2M2pente	35		
c2Hexene	36		
Mcypenta	37		
24Mpenta	38		
Benzene	39		
Cyhexane	40		
2Mhexa	41		
23Mpenta	42		
3Mhexa	43		
224Mpenta	44		
Heptane	45		
244M1pente	46		
Mcyhexa	47		
244M2pente	48		
25Mhexa	49		

Target Species Reported by the Continuous GC

Species	Species Name
1	Ethane
2	Ethene
3	Propane
4	Propene
5	Isobutane
6	n-Butane
7	Acetylene
8	trans-2-Butene
9	1-Butene&i-Butylene
10	cis-2-Butene
11	Isopentane&Cyclopentane
12	n-Pentane
13	2-Methyl-2-Butene
14	Cyclopentene
15	trans-2-Pentene
16	3-Methyl-1-Butene
17	1-Pentene
18	cis-2-Pentene
19	2,2-Dimethylbutane
20	2,3-Dimethylbutane
21	2-Methylpentane
22	3-Methylpentane
23	Isoprene
24	4-Methyl-1-Pentene
25	2-Methyl-1-Pentene
26	n-Hexane
27	trans-2-Hexene
28	cis-2-Hexene
29	Methylcyclopentane
30	2,4-Dimethylpentane
31	Benzene
32	Cyclohexane
33	2-Methylhexane
34	2,3-Dimethylpentane
35	3-Methylhexane
36	2,2,4-Trimethylpentane
37	n-Heptane
38	Methylcyclohexane
39	2,3,4-Trimethylpentane
40	Toluene
41	2-Methylheptane
42	3-Methylheptane
43	n-Octane
44	Ethylbenzane
45	m/p-Xylene
46	Styrene
47	o-Xylene
48	n-Nonane
49	Isopropylbenzene
50	n-Propylbenzene
51	unknown #1
52	1,3,5-Trimethylbenzene
53	1,2,4-Trimethylbenzene
54	unknown #2

LIST OF SPECIES GROUPS USED IN CONTINUOUS GC PLOTS

Species and Species Group	Species
Ethane	Ethane
Ethene	Ethene
Propane	Propane
Propene	Propene
C4	iso-Butane, n-Butane
Acetylene	Acetylene
C4ole_2	Trans-2-Butene, Cis-2-Butene
C4ole_1	1-Butene, iso-Butylene
C5	iso-Pentane, Cyclopentane, n-Pentane
C5ole_2	Trans-2-Pentene, Cis-2-Pentene, 2-Methyl-2-Butene
CYCC5ole	Cyclopentene
C5ole_1	3-Methyl-1-Butene, 1-Pentene
C6	2-Methylpentane, 3-Methylpentane, 2,2-Dimethlybutane, 2,3-Dimethylbutane, n-Hexane
Isoprene	Isoprene
C6ole_1	4-Methyl-1-Pentene, 2-Methyl-1-Pentene
C6ole_2	Trans-2-Hexene, Cis-2-Hexene
CYCC6	Methylcyclopentane, Cyclohexane
C7	2-Methylhexane, 2,3-Dimethylpentane, 2,4-Dimethylpentane, 3-Methylhexane, n-Heptane
Benzene	Benzene
C8	2,2,4-Trimethylpentane, 2,3,4-Trimethylpentane, 2-Methylheptane, 3-Methylheptane, n-Octane
CYCC7	Cycloheptane
Toluene	Toluene
BenzC8	Ethylbenzene
Xylenes	o-,m-, and p-Xylenes
Styrene	Styrene
C9	n-nonane
BenzC9	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, isopropylbenzene, n-Propylbenzene

STATISTICS FOR SPECIES GROUP TOTALS BY SITE AND BY SITE AND TIME OF DAY AT COCODRIE AND GILCHRIST

DATE	Begin Time	End Time	CO	ID	PAR	OLE	AROM	UNID	TCarby	NMHC	NMOC	NOx	NMHC/ NOx	NMOC/ NOx
Cocodrie		min	85.0	27.8	22.0	1.6	1.2	2.6	14.3	37.0	61.4	0.8	7.9	11.9
23 NMHC samples		max	236.0	244.0	232.1	11.2	20.0	22.9	45.1	261.0	294.4	7.0	157.2	177.3
19 carbonyl samples		avg	137.4	83.2	72.1	4.6	6.5	9.5	30.0	92.7	122.7	4.0	32.9	43.3
		median	145.0	63.0	56.4	4.3	4.2	8.0	30.5	70.0	101.1	3.9	22.6	29.9
		25th%	107.0	47.1	39.3	2.8	3.3	6.4	25.2	52.1	83.9	2.4	11.3	17.3
		75th%	161.5	100.3	84.7	5.7	8.8	12.3	35.5	109.5	147.1	5.7	36.9	45.0
Gilchrist		min	65.0	9.5	5.2	1.8	1.4	3.4	12.0	13.0	29.8	1.4	1.9	3.7
28 NMHC samples		max	262.0	575.2	388.2	140.4	46.6	81.4	102.1	615.8	675.6	24.5	187.1	209.9
28 carbonyl samples		avg	118.2	82.4	62.1	13.0	7.2	14.4	37.6	96.8	134.3	5.8	23.8	35.6
		median	104.0	33.2	27.3	4.3	3.0	9.5	35.6	51.2	82.4	4.0	11.4	22.3
		25th%	104.0	33.2	27.3	4.3	3.0	9.5	35.6	51.2	82.4	4.0	11.4	22.3
		75th%	118.0	67.9	56.4	7.2	6.2	12.5	45.4	77.2	119.7	6.8	21.1	37.0
Cocodrie	0700-0900	min	85.0	52.4	47.0	1.6	3.8	3.1	15.9	55.5	81.7	0.8	12.4	17.5
6 NMHC samples		max	170.0	158.3	140.5	11.2	16.9	22.9	39.8	173.0	201.3	7.0	69.4	102.2
6 carbonyl samples		avg	136.3	104.9	90.7	6.0	8.2	10.9	27.8	115.8	143.6	4.5	33.5	43.6
		median	145.0	95.6	82.4	6.1	7.5	10.0	28.4	105.6	143.3	5.1	30.1	35.7
		25th%	114.0	77.5	70.1	2.4	4.2	7.1	20.6	84.6	105.4	3.0	23.3	28.4
		75th%	163.3	140.9	115.2	8.7	9.8	12.4	34.4	159.4	184.9	6.5	36.0	42.5
Cocodrie	1200-1400	min	92.0	34.4	30.1	1.9	2.4	2.6	27.2	37.0	66.6	2.5	7.9	11.9
5 NMHC samples		max	165.0	63.0	56.4	6.4	4.1	6.6	45.1	69.4	102.1	6.7	22.1	40.0
5 carbonyl samples		avg	125.2	48.2	41.4	3.7	3.1	5.1	34.7	53.3	88.0	4.6	13.3	22.6
		median	110.0	48.3	41.5	2.8	2.8	6.3	32.7	52.4	90.7	3.9	10.8	17.1
		25th%	97.0	45.8	37.0	2.7	2.4	3.5	29.6	51.8	79.6	3.2	9.5	15.9
		75th%	162.0	49.7	42.0	4.9	3.8	6.4	38.9	56.0	101.1	6.4	16.0	27.9
Cocodrie	1700-1900	min	92.0	27.8	22.0	1.9	1.2	4.1	14.3	37.3	61.4	1.4	9.0	15.1
8 NMHC samples		max	236.0	244.0	232.1	6.3	20.0	17.0	44.5	261.0	294.4	5.9	157.2	177.3
8 carbonyl samples		avg	145.8	88.8	77.3	4.2	7.3	11.3	28.7	100.1	128.8	3.2	44.7	56.0
		median	148.5	66.5	54.5	4.4	6.7	11.8	30.4	78.3	101.1	2.6	32.4	45.0
		25th%	114.3	40.3	33.7	3.6	3.6	8.1	22.5	46.7	84.8	1.9	11.4	20.3
		75th%	155.0	101.9	85.8	4.7	8.6	14.7	33.9	111.0	141.1	4.3	50.1	62.5
Gilchrist	0700-0900	min	65.0	28.7	19.3	1.8	3.1	6.3	12.7	38.0	50.7	1.4	3.9	4.7
6 NMHC samples		max	241.0	575.2	388.2	140.4	46.6	81.4	59.8	615.8	675.6	24.5	187.1	209.9
6 carbonyl samples		avg	127.8	181.8	137.3	30.0	14.6	22.8	31.0	204.6	235.6	8.3	47.1	57.2
		median	104.0	87.1	60.5	6.5	6.0	12.1	33.1	94.4	115.3	4.1	21.1	22.8
		25th%	86.0	53.7	41.2	2.6	4.2	9.3	20.9	65.8	82.7	1.9	16.0	19.9
		75th%	156.0	339.4	242.6	18.4	20.4	22.6	37.5	362.0	406.2	9.0	68.2	74.8
Gilchrist	1200-1400	min	69.0	14.4	5.6	2.5	1.6	3.4	12.0	17.8	29.8	1.6	6.6	11.6
10 NMHC samples		max	201.0	105.4	82.0	11.9	11.5	31.1	102.1	115.1	217.2	7.0	51.6	97.4
10 carbonyl samples		avg	105.4	40.8	31.0	5.9	3.9	10.4	43.8	51.2	95.0	3.8	16.5	31.0
		median	103.0	34.7	25.7	6.0	2.4	8.3	41.7	54.2	89.1	2.9	11.2	23.5
		25th%	80.8	21.4	16.1	4.2	1.7	7.3	28.1	31.3	66.9	2.2	10.2	18.0
		75th%	111.3	50.4	40.7	7.1	5.1	10.0	52.3	55.9	109.9	5.5	17.5	27.8
Gilchrist	1700-1900	min	80.0	9.5	5.2	1.9	1.4	3.5	14.5	13.0	34.7	1.5	1.9	3.7
9 NMHC samples		max	262.0	104.8	76.8	12.5	15.5	26.9	79.1	131.7	172.8	12.6	21.0	45.7
9 carbonyl samples		avg	122.8	29.1	21.6	3.9	3.6	10.4	37.2	39.5	76.8	5.5	8.7	19.0
		median	112.0	21.0	16.8	2.9	2.3	9.2	38.2	30.0	67.0	3.9	8.8	15.2
		25th%	95.0	14.8	10.3	2.1	2.0	7.5	23.1	24.0	46.4	3.4	4.3	9.2
		75th%	117.0	25.3	19.9	3.7	2.4	11.5	41.1	32.8	82.1	5.4	11.6	23.0

Frequency Distribution
Updated 2/22/95
Cochodrie

Bins	NMOC/ NOx	NMHC/ NOx	Bins	NOx	Bins	NMOC	NMHC
0-5	0	0	0-1	1	0-25	0	0
5-10	0	3	1-2	3	25-50	0	4
10-15	1	5	2-3	4	50-75	2	7
15-20	5	1	3-4	4	75-100	7	5
20-25	1	3	4-5	4	100-125	4	1
25-30	3	2	5-6	3	125-150	1	0
30-35	0	1	6-7	4	150-175	1	3
35-40	1	2	>7	0	175-200	2	2
40-45	3	2	Total	23	200-225	1	0
45-50	1	1			225-250	0	0
>50	4	3			250-275	0	1
Total	19	23			>275	1	0
					Total	19	23

Gilchrist

Bins	NMHC/ NOx	Bins	NMOC/ NOx	Bins	NOx	Bins	NMOC	NMHC
0-2	1	0-5	2	0-4	16	0-25	0	6
2-4	2	5-10	3	4-8	9	25-50	4	9
4-6	2	10-15	2	8-12	2	50-75	7	7
6-8	3	15-20	6	12-16	1	75-100	6	1
8-10	2	20-25	5	16-20	0	100-125	5	2
10-12	7	25-30	2	20-24	1	125-150	1	1
12-14	1	30-35	1	>24	1	150-175	1	0
14-16	1	35-40	0	Total	30	175-200	0	0
16-18	1	40-45	0			200-225	1	0
18-20	1	45-50	2			225-250	0	0
>20	9	>50	6			250-275	0	0
Total	30	Total	29			>275	4	4
						Total	29	30

NOx concentrations in ppb. NMOC, NMHC concentrations in ppbC.

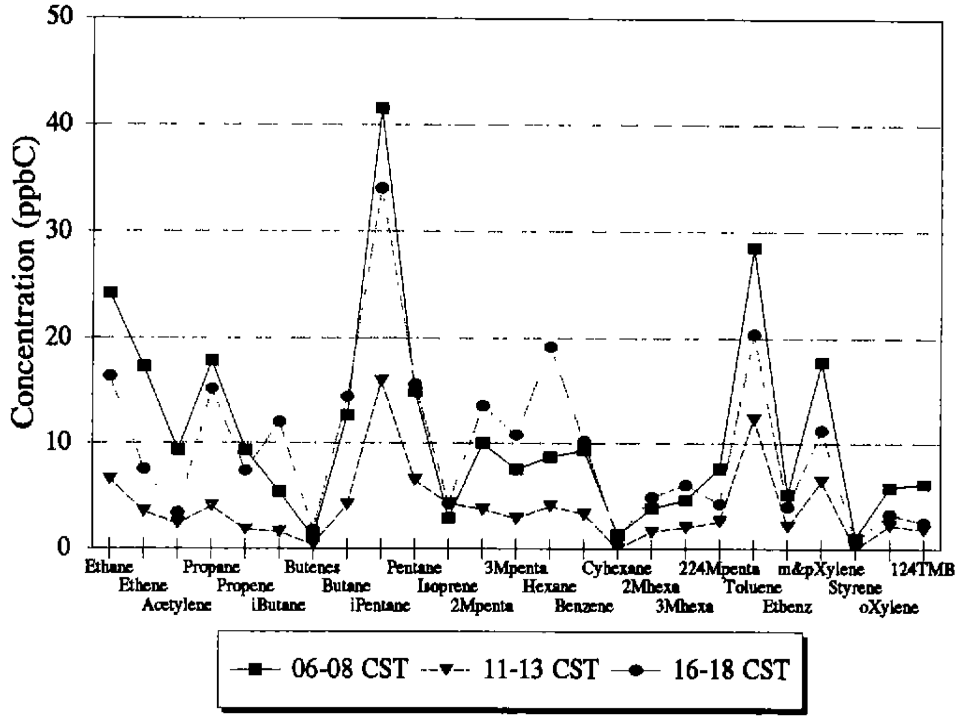
<u>**List of Invalid Surface VOC Samples**</u>

Surface NMOC

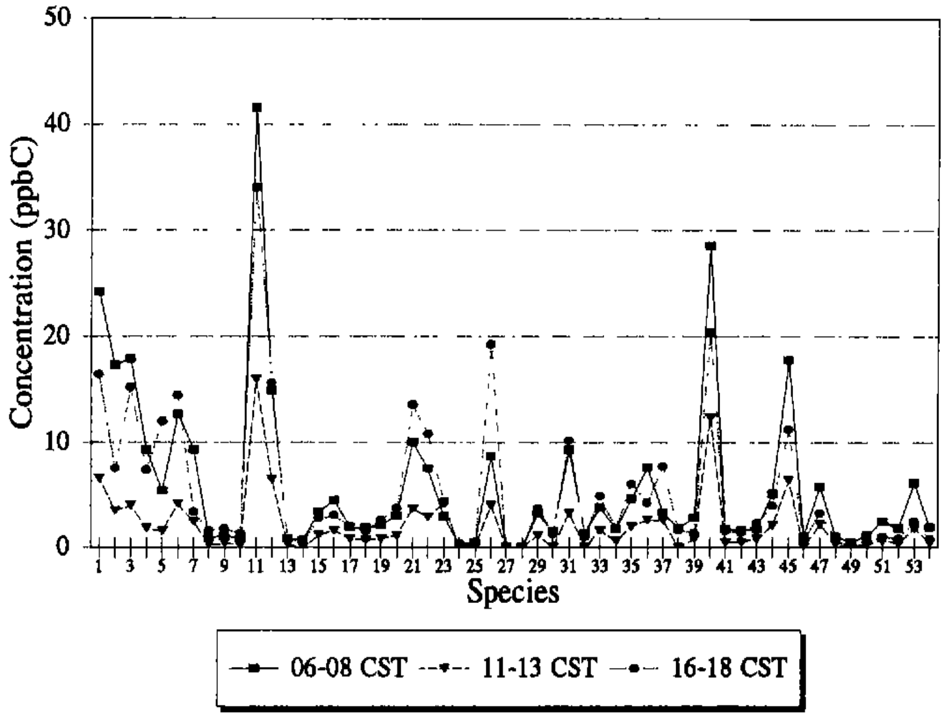
Concentrations are ppbC
Below detection are listed as 0.0

LOCN	SAMPL	CAN	DATE	Begin Time	Comments	Remarks	Valid VOC	Valid Carby
COCODRIE,LA	1	LAC-01	31-Jul-93	7		Not an exposed sample	V	I
COCODRIE,LA	2	LAC-06	31-Jul-93	12		Not an exposed sample	V	I
COCODRIE,LA	4	LAC-08	01-Aug-93	7		Exposed for 7.7 min., not valid.	V	I
COCODRIE,LA	5	LAC-07	01-Aug-93	12		Cartridge might not have been exposed.	V	I
GILCHRIST,TX	27	MXC-27	20-Aug-93	17		haze, cartridge sampled same period from 8/20-22 (6 hr	V	I
GILCHRIST,TX	28	MXC-28	25-Aug-93	7	high unid		I	V

Clinton - Median Composition
August, 1993

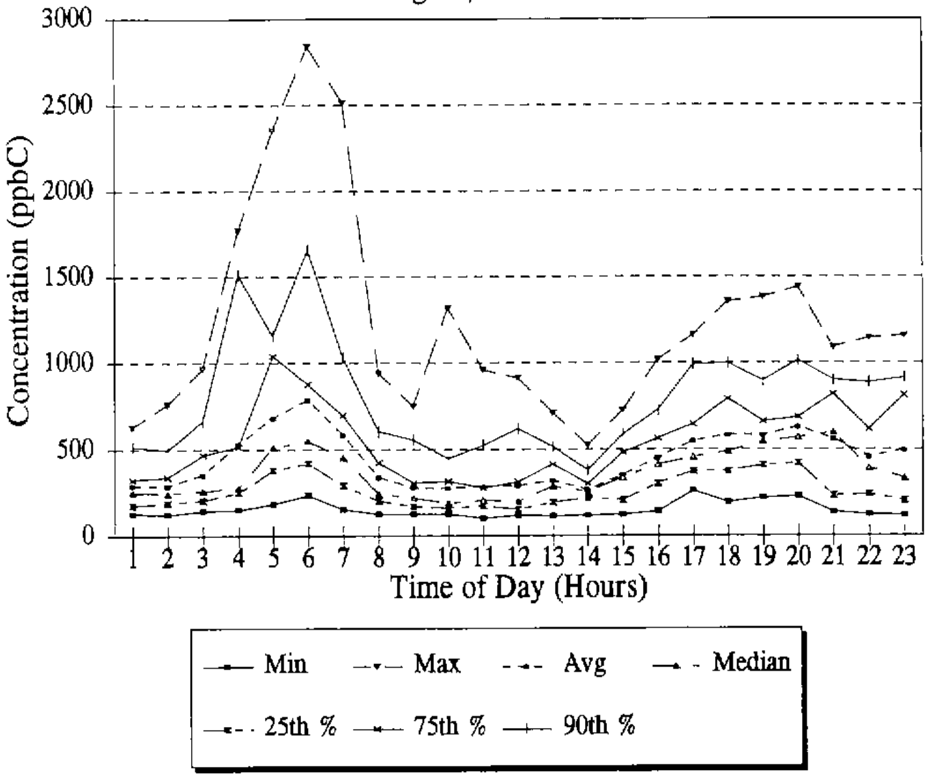


Clinton - Median Composition
August, 1993



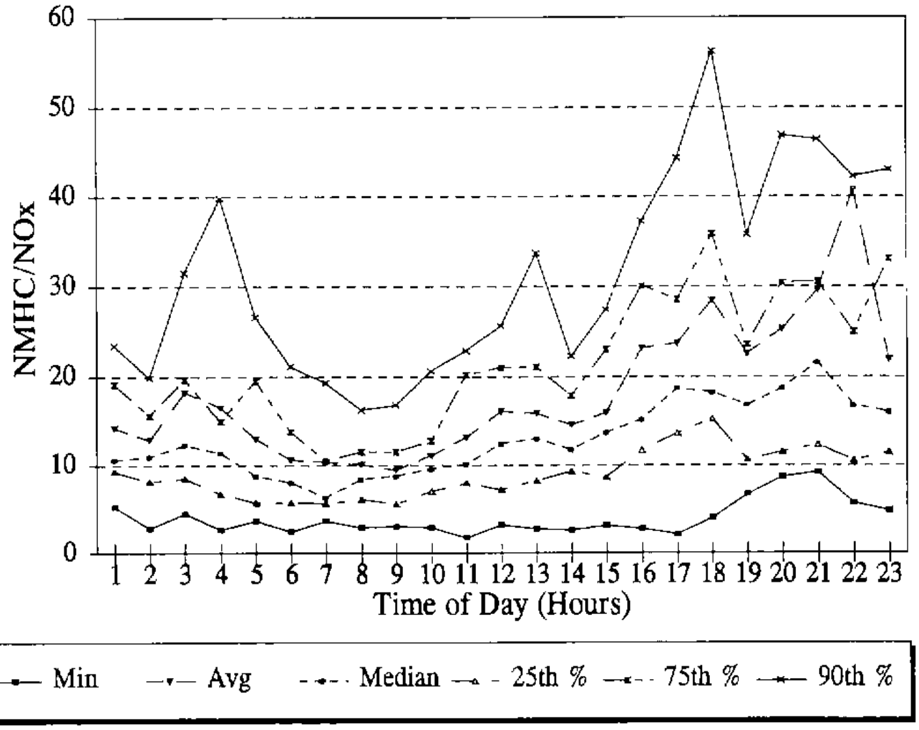
NMHC

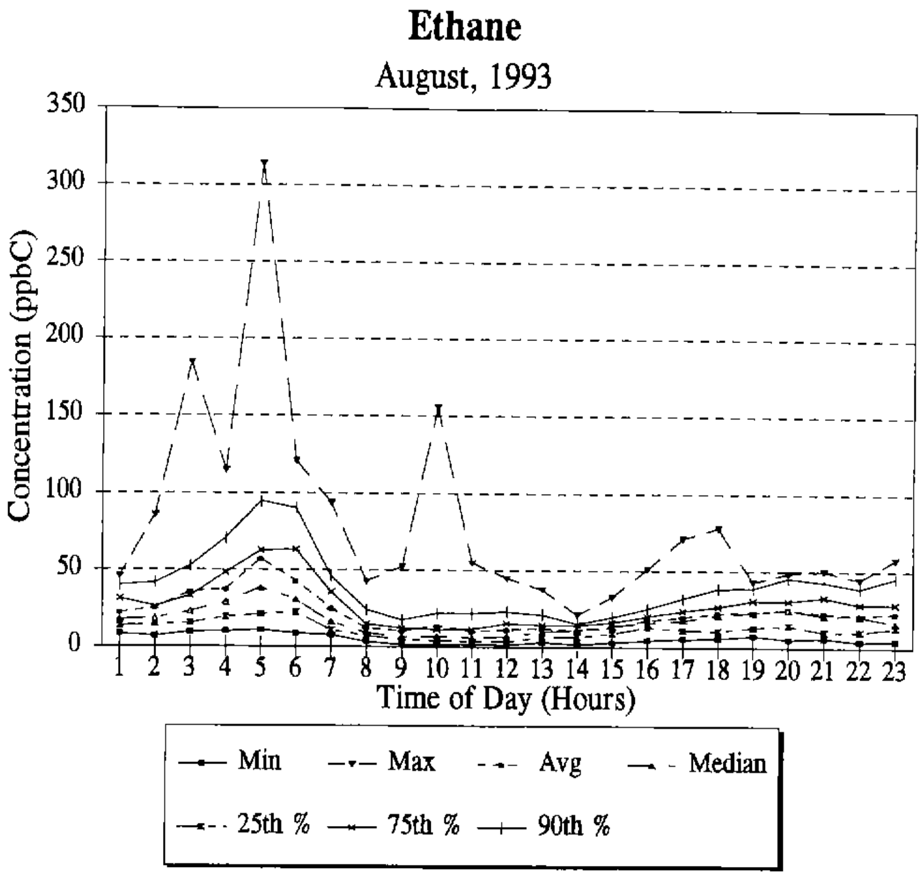
August, 1993

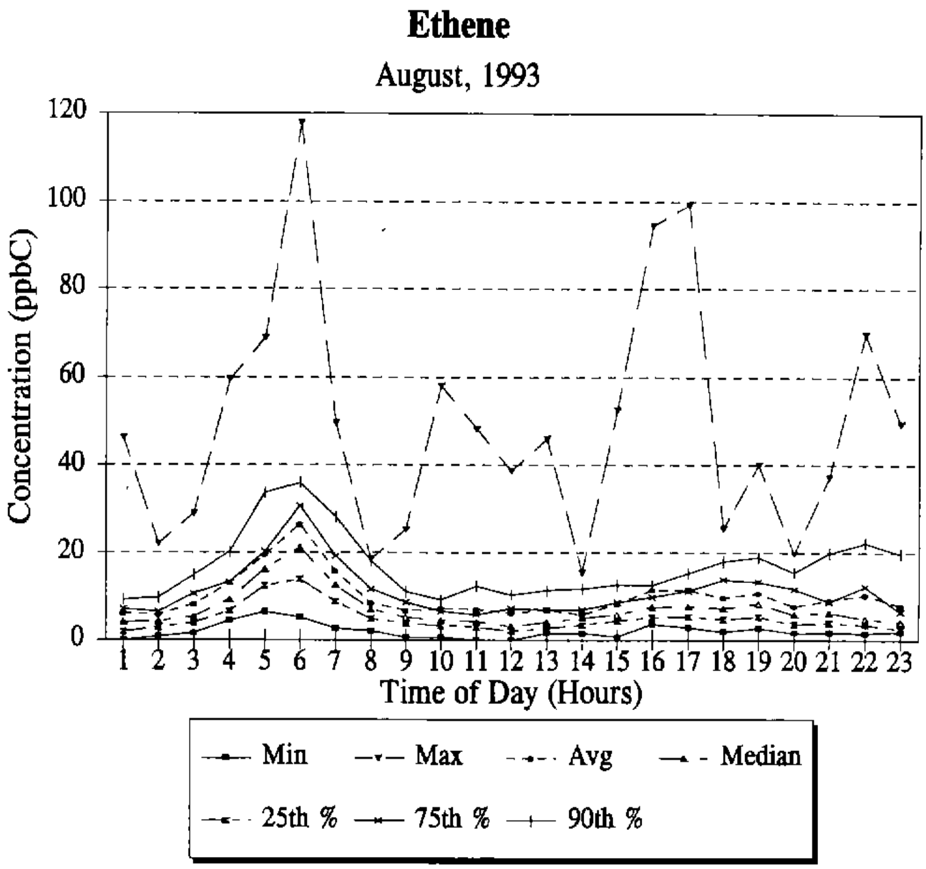


NMHC/NOx

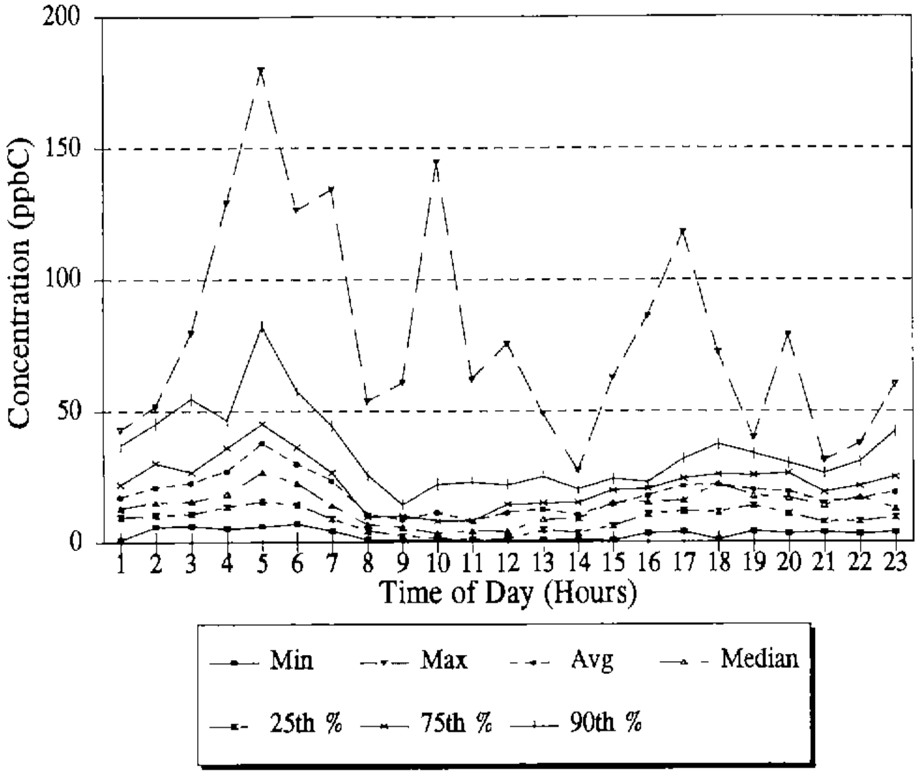
August, 1993



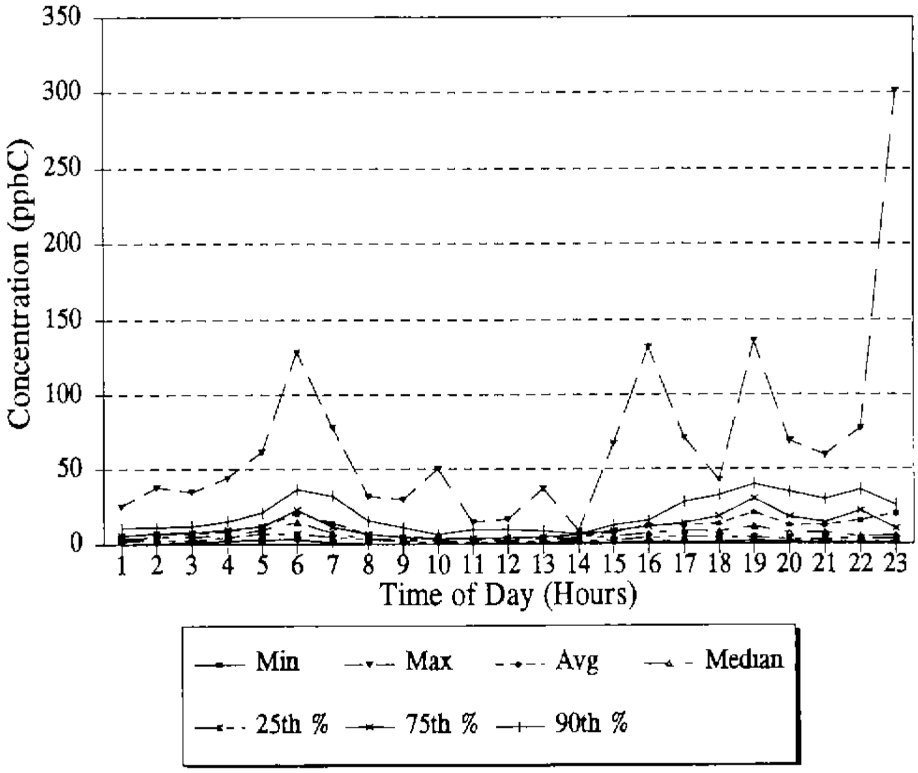

Ethane
August, 1993
Concentration (ppbC)
350
300
250
200
150
100
50
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

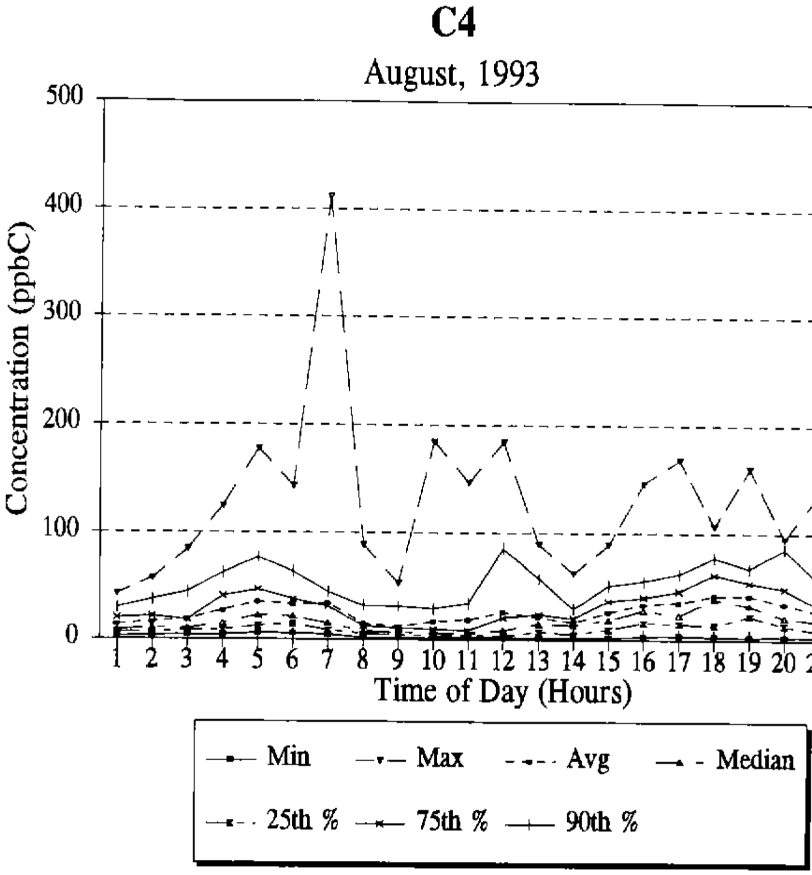

Ethene
August, 1993
Concentration (ppbC)
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

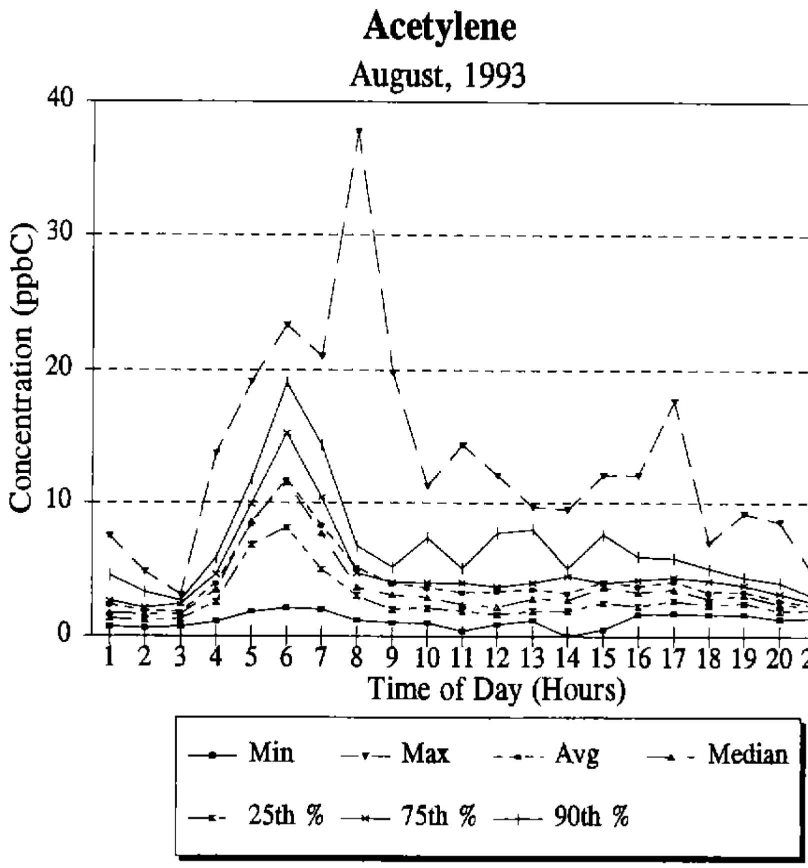
Propane
August, 1993



Propene
August, 1993

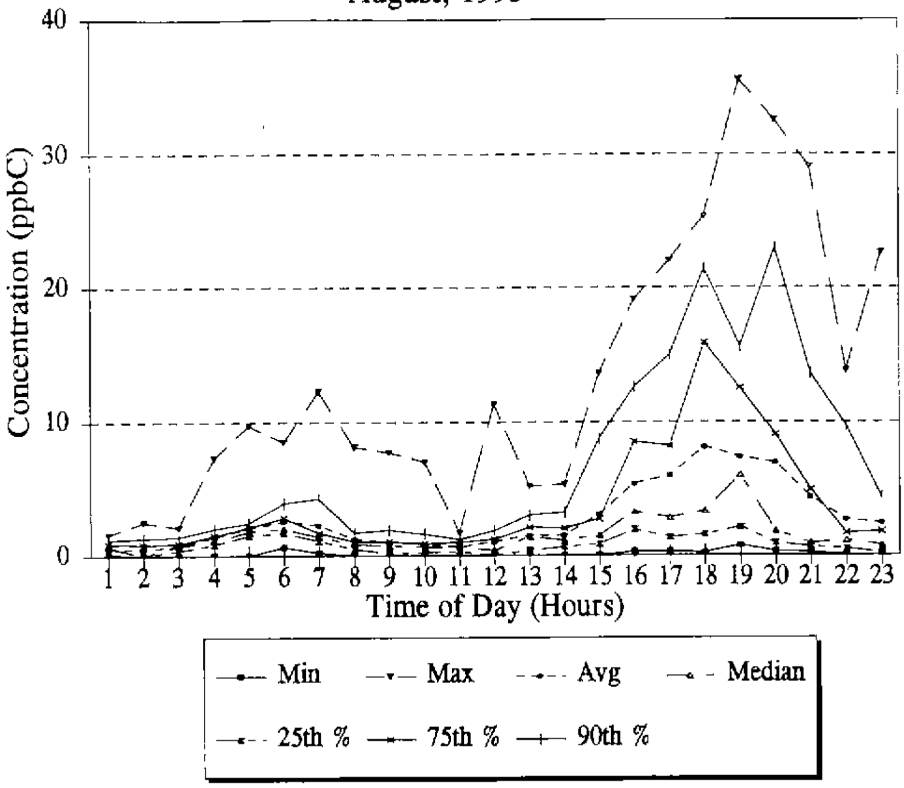



C4
August, 1993
Concentration (ppbC)
500
400
300
200
100
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %


Acetylene
August, 1993
Concentration (ppbC)
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

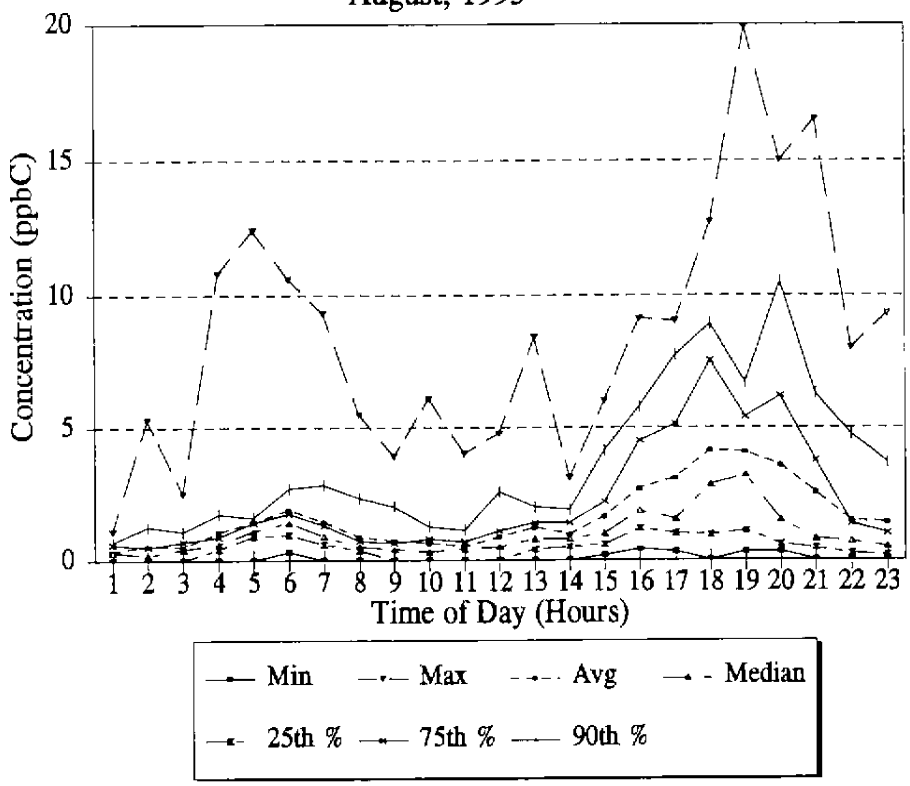
C4ole_2

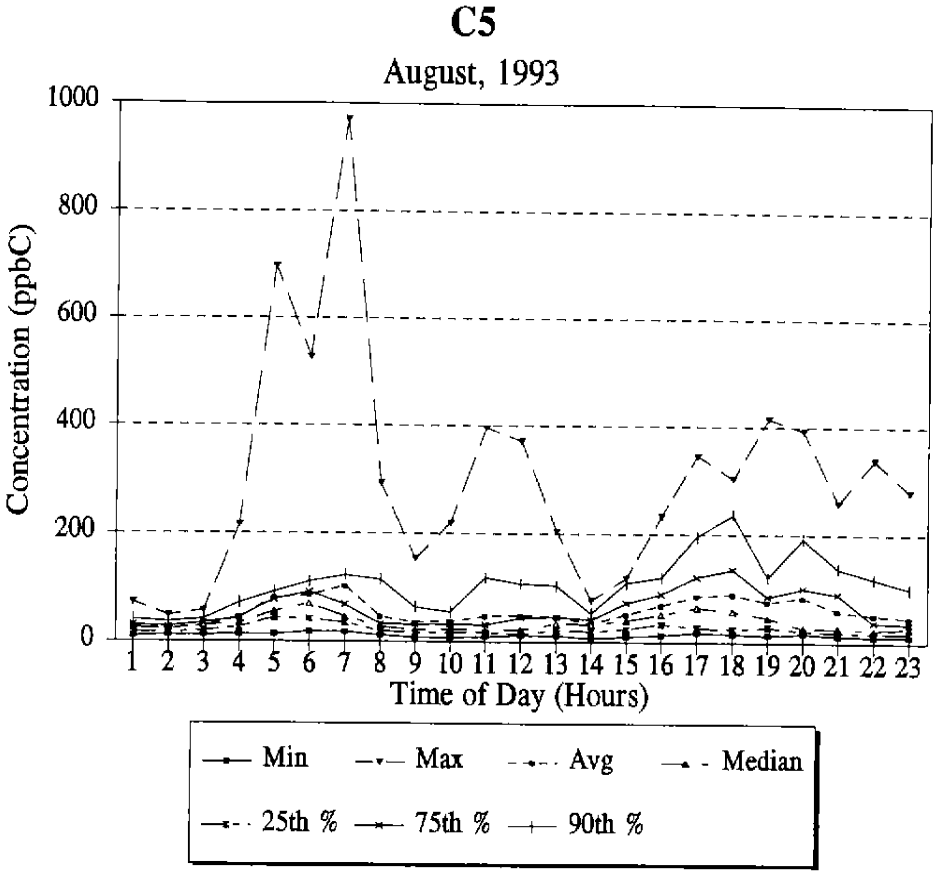
August, 1993

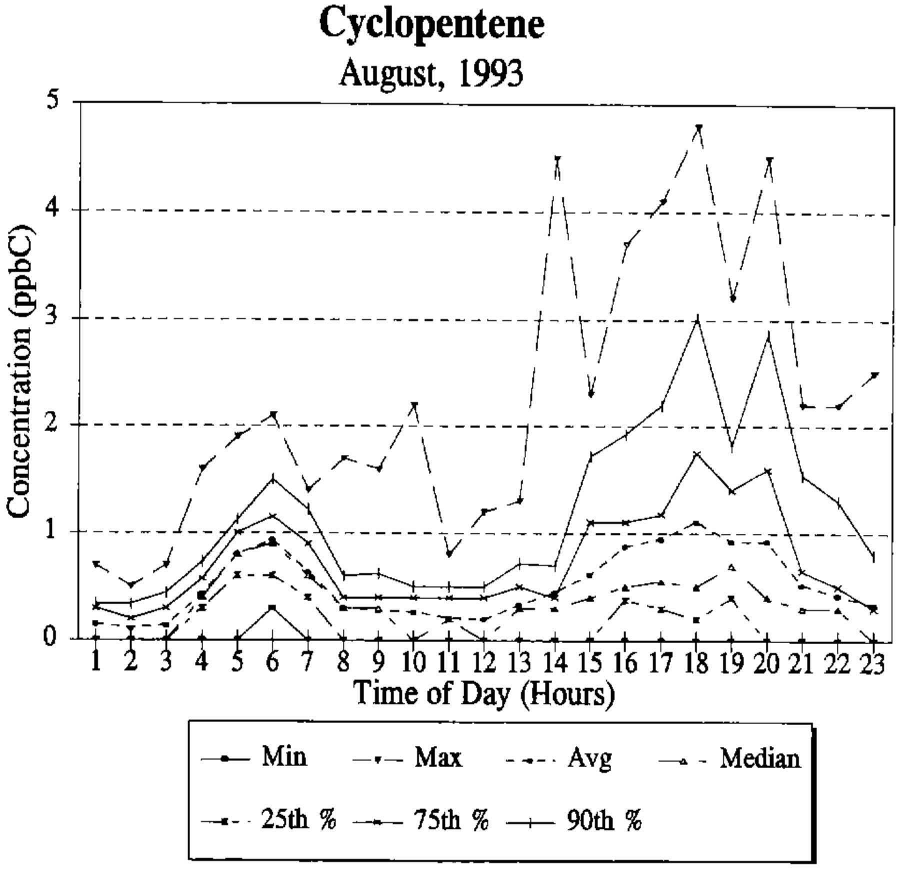


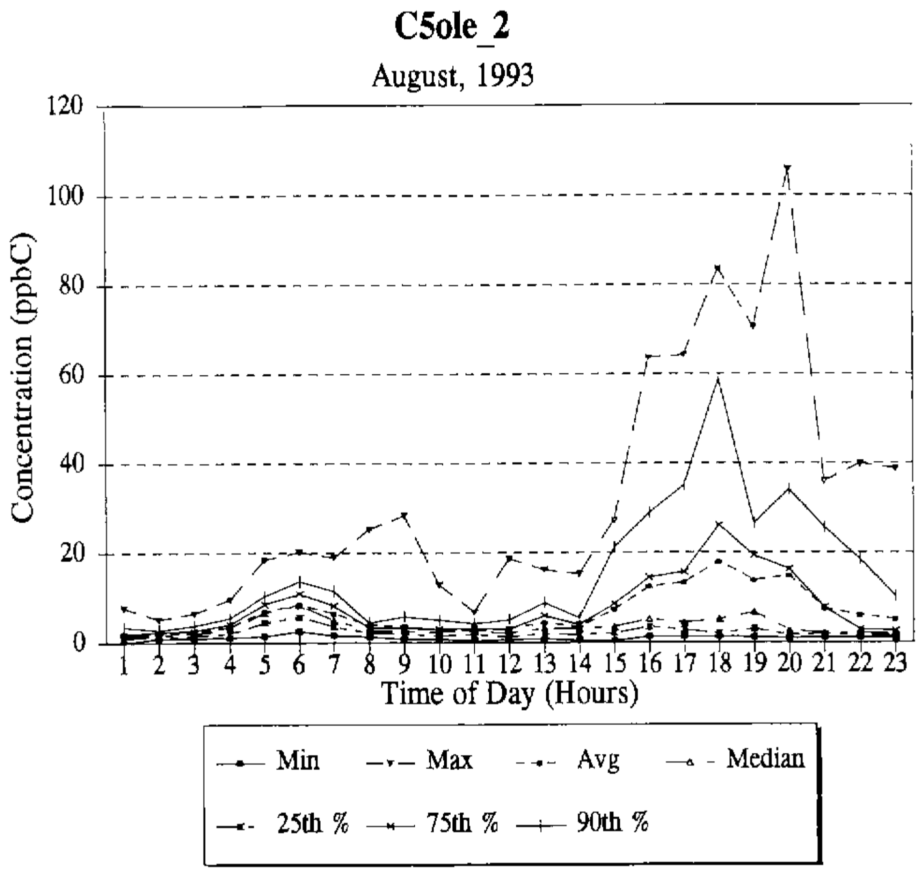
C4ole_1

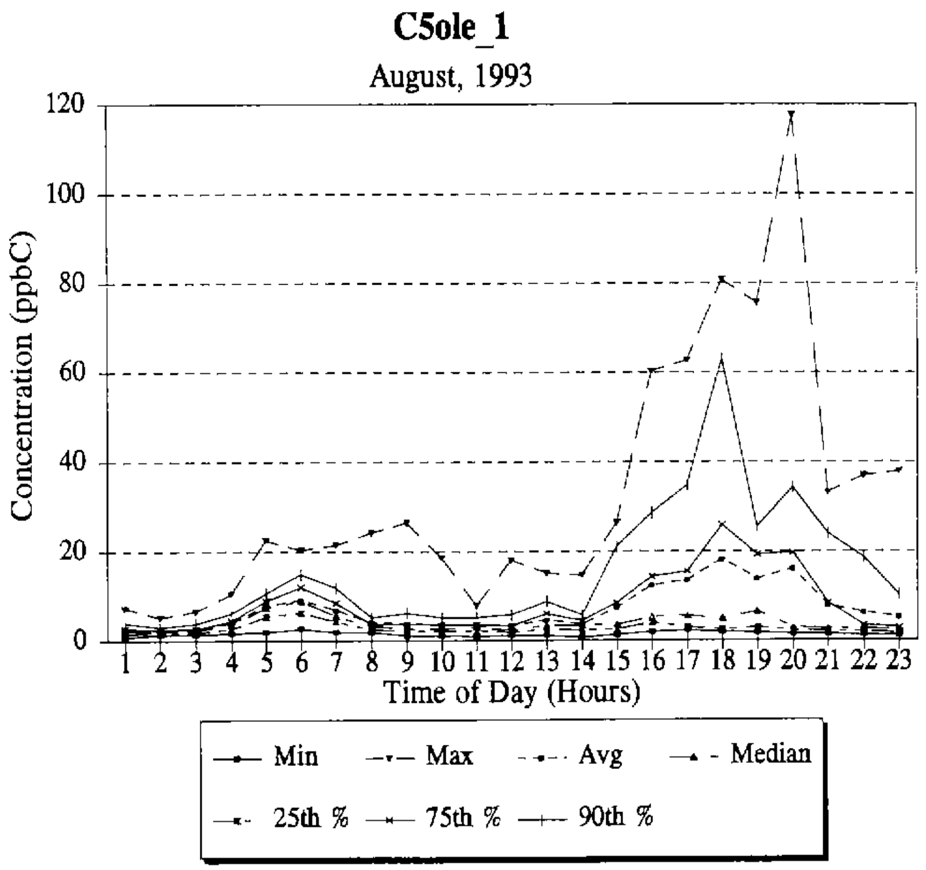
August, 1993

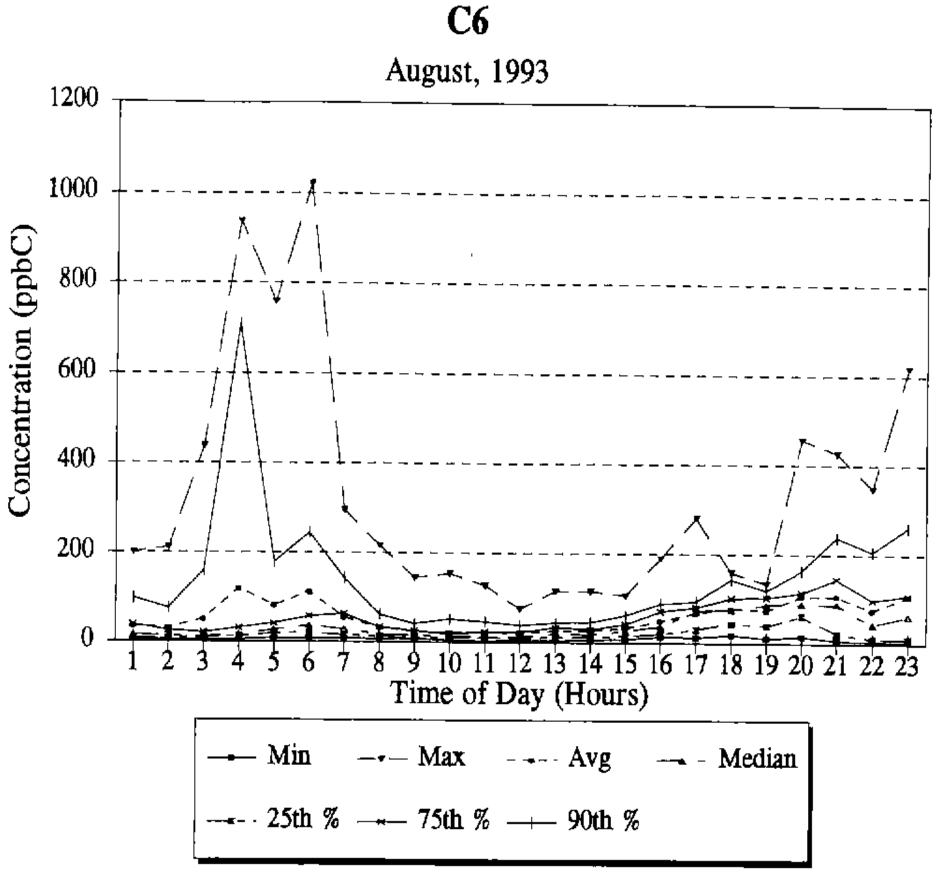


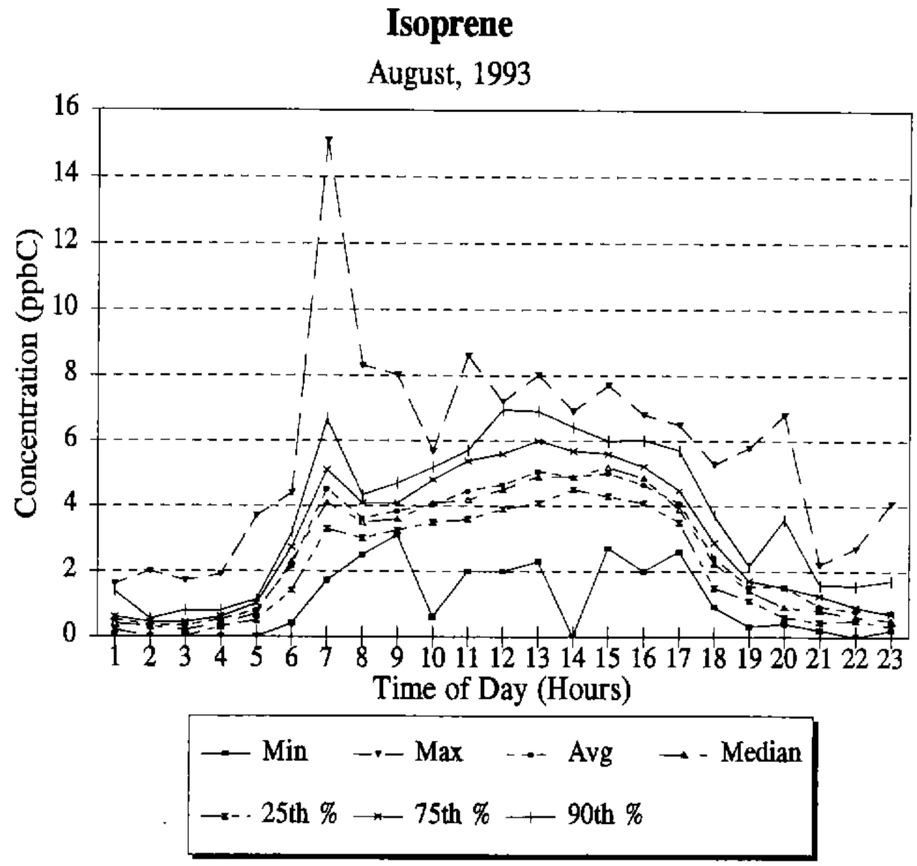

C5
August, 1993
Concentration (ppbC)
1000
800
600
400
200
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %


Cyclopentene
August, 1993
Concentration (ppbC)
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %


C5ole_2
August, 1993
120
100
80
60
40
20
0
Concentration (ppbC)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

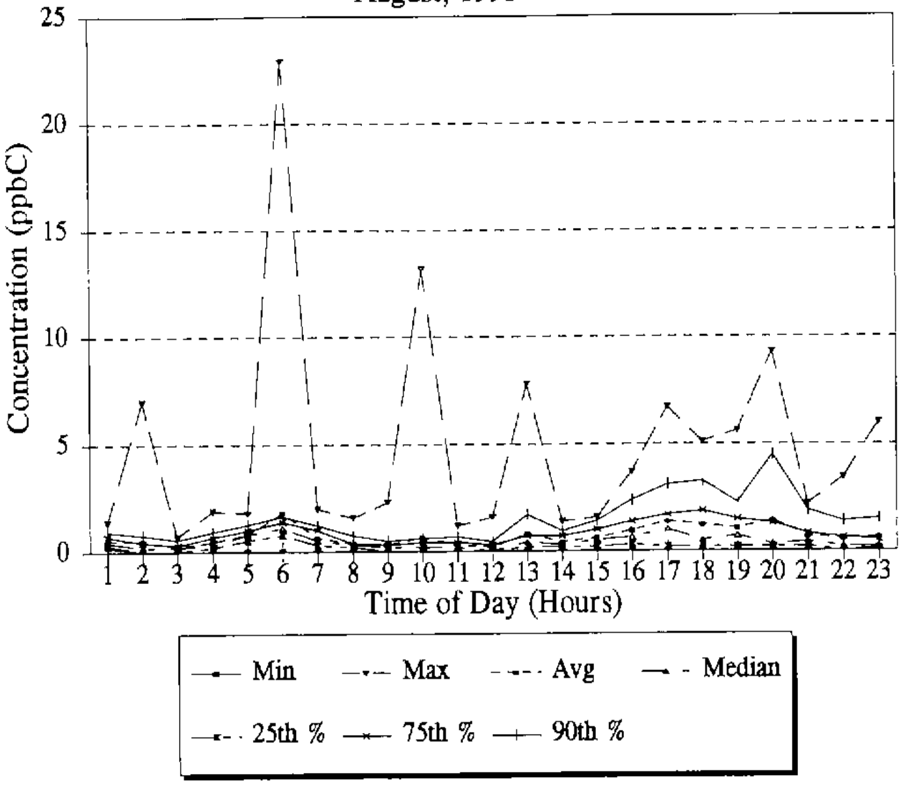

C5ole_1
August, 1993
120
100
80
60
40
20
0
Concentration (ppbC)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %


C6
August, 1993
Concentration (ppbC)
1200
1000
800
600
400
200
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %


Isoprene
August, 1993
Concentration (ppbC)
16
14
12
10
8
6
4
2
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

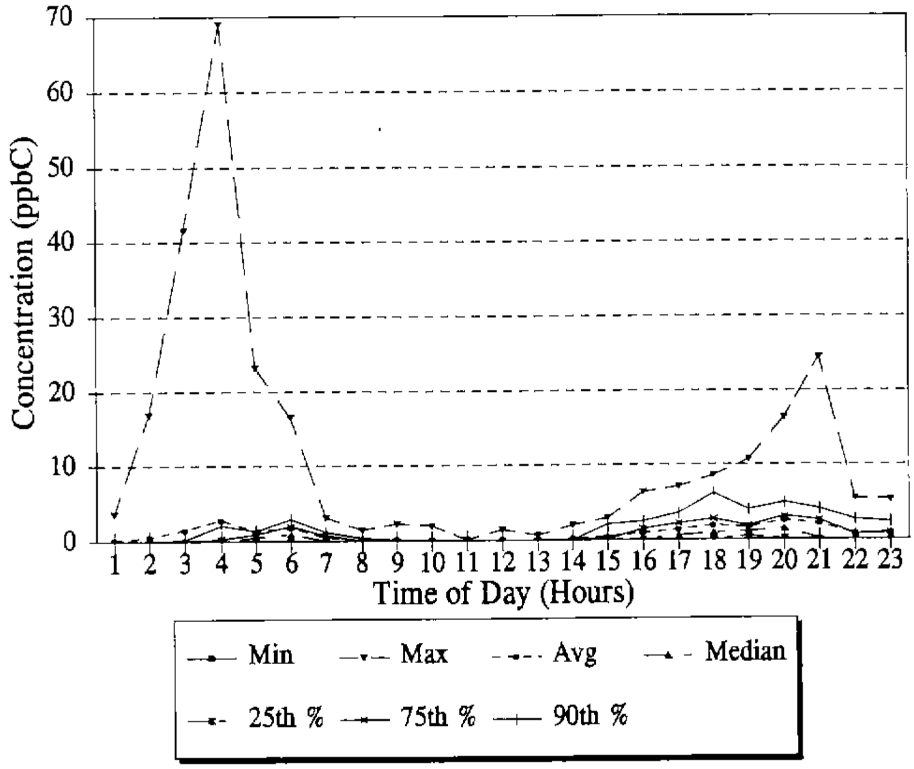
C6ole_1

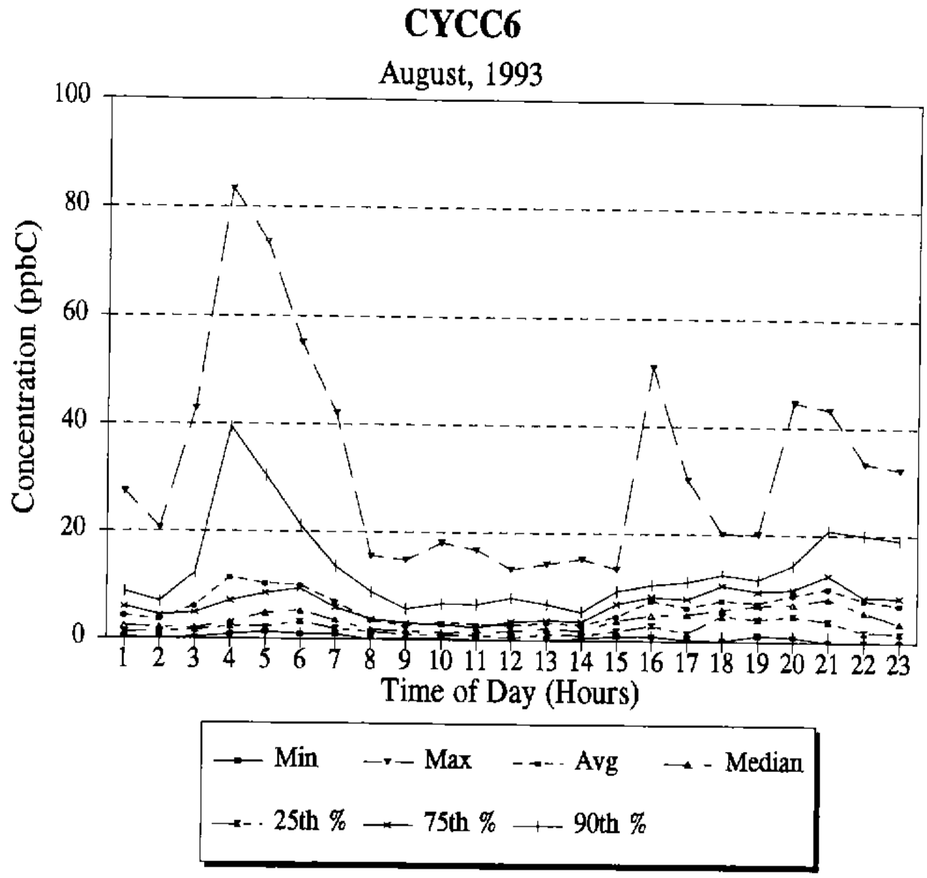
August, 1993

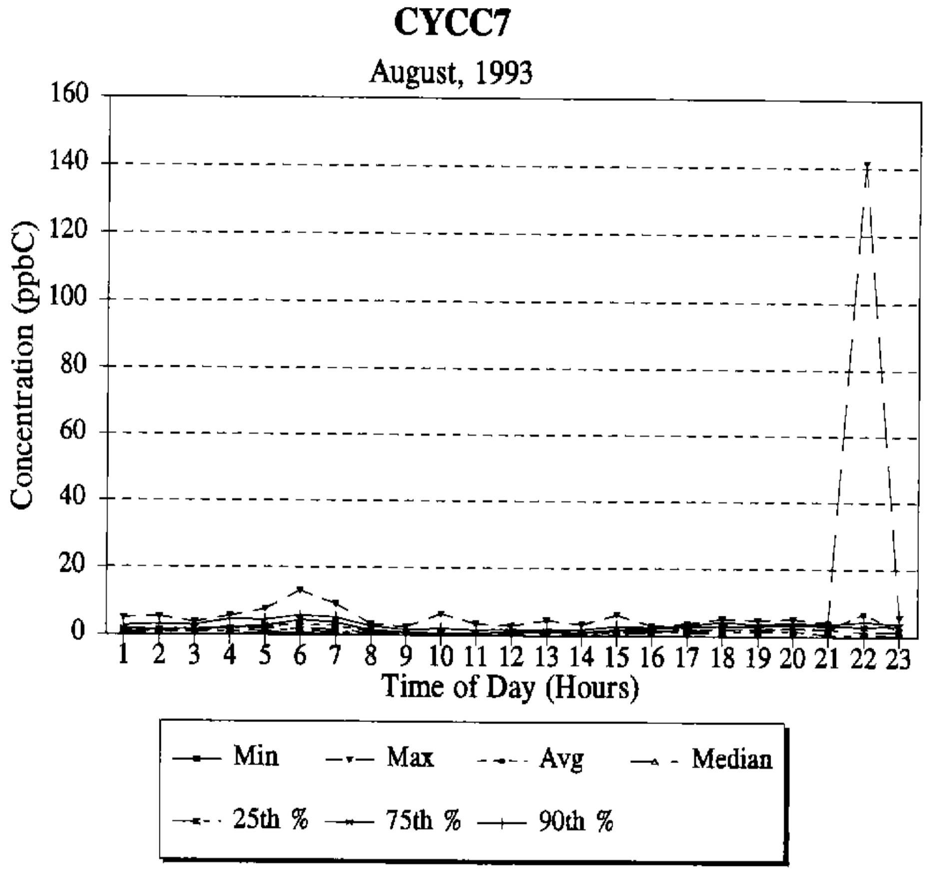


C6ole_2

August, 1993

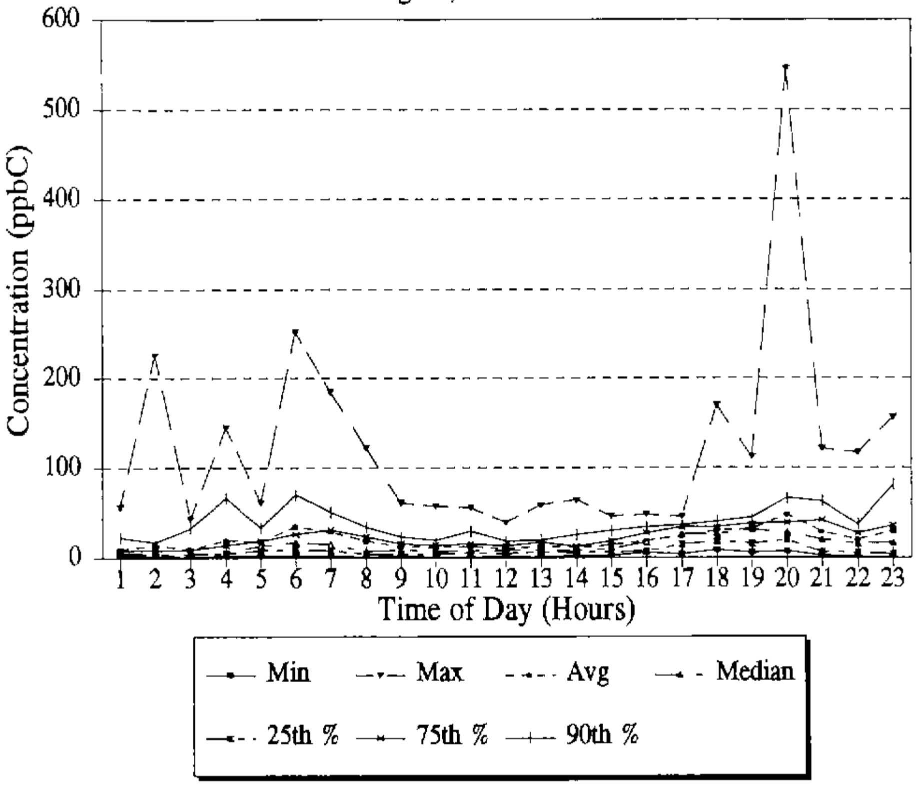



CYCC6
August, 1993
Concentration (ppbC)
0
20
40
60
80
100
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %


CYCC7
August, 1993
Concentration (ppbC)
0
20
40
60
80
100
120
140
160
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

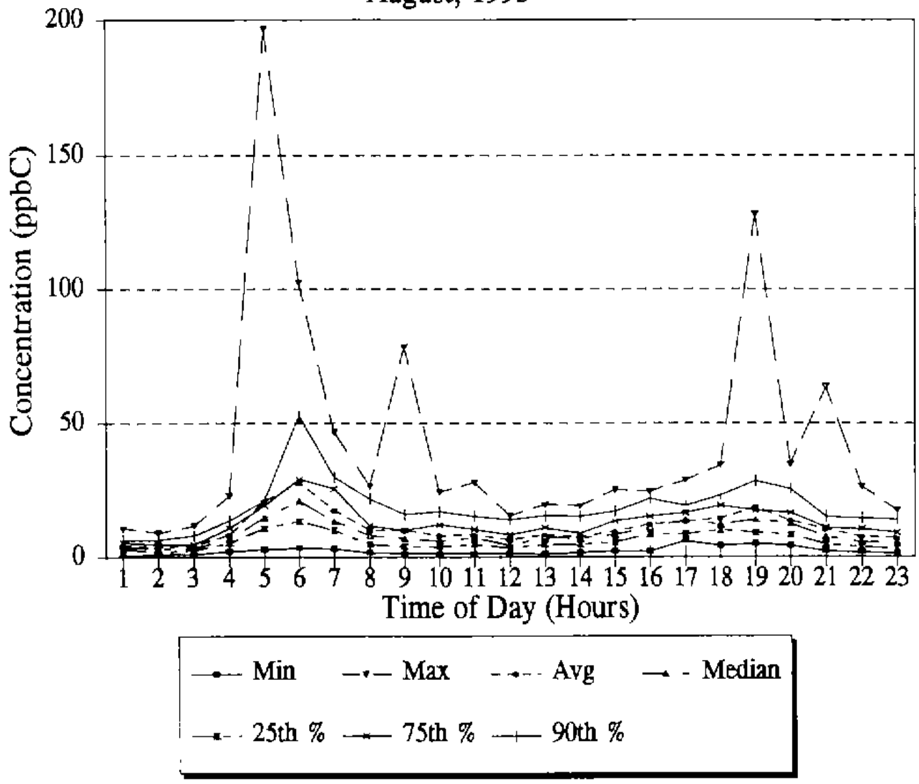
C7

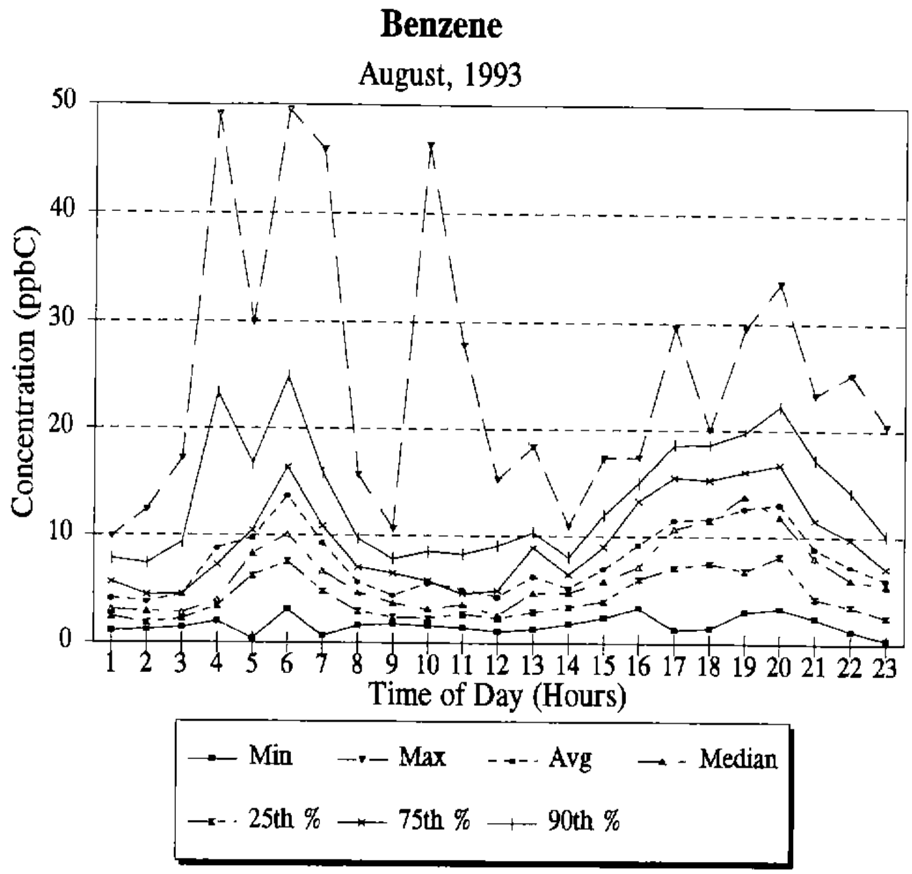
August, 1993

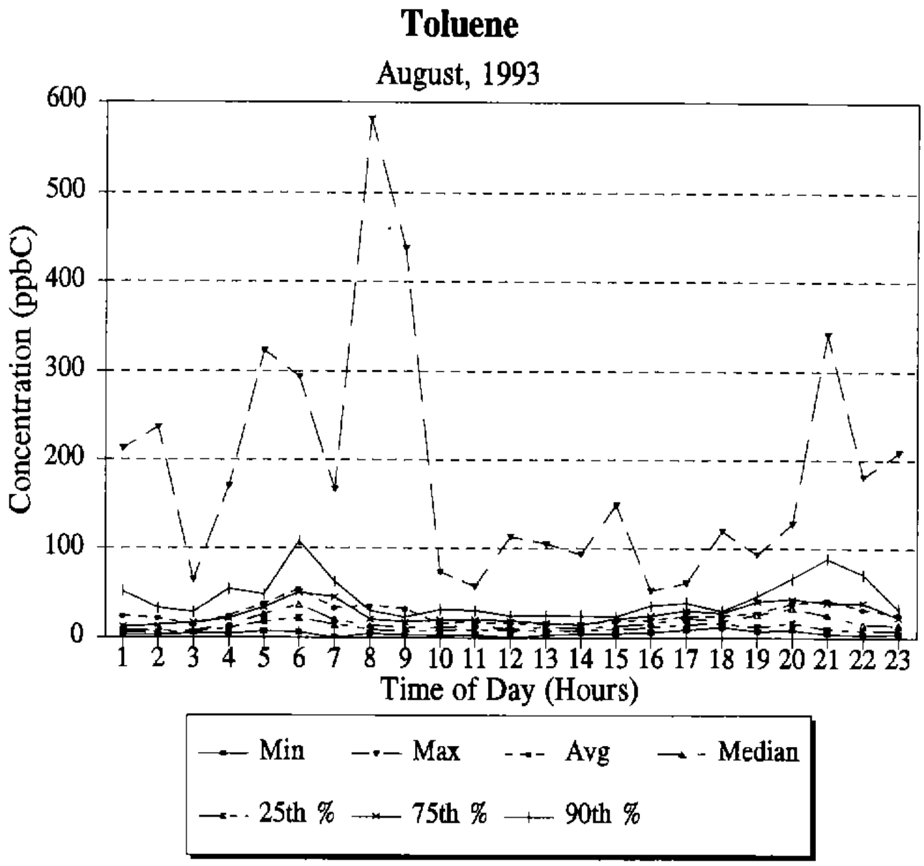


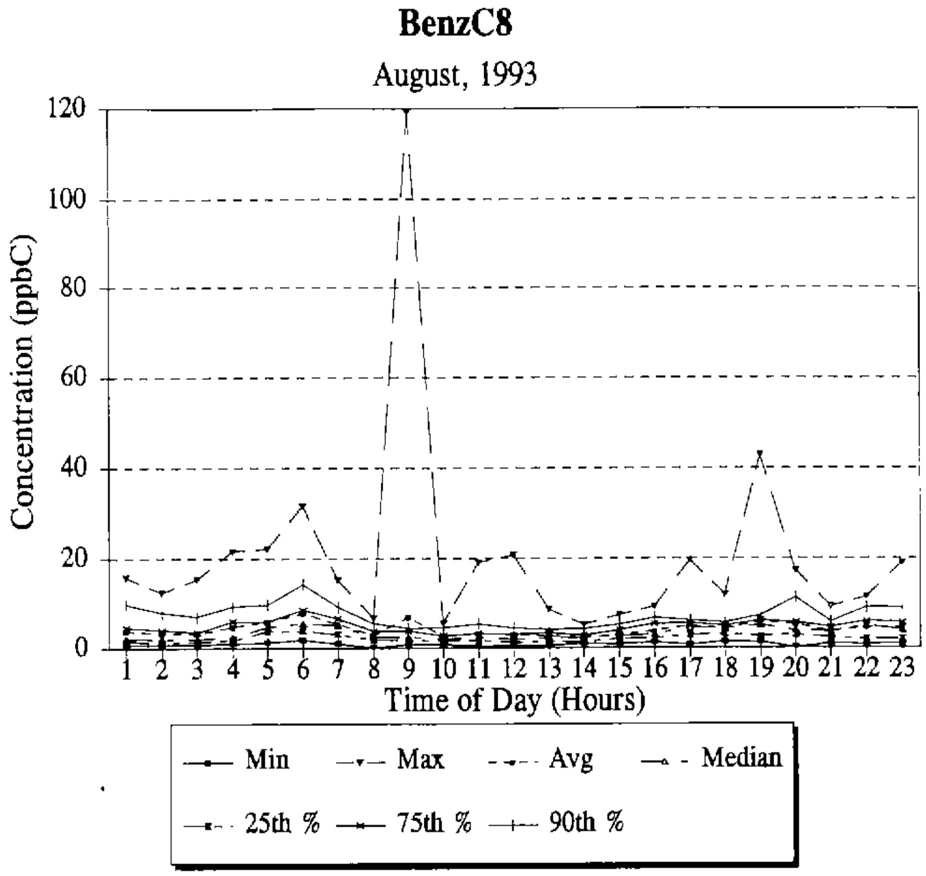
C8

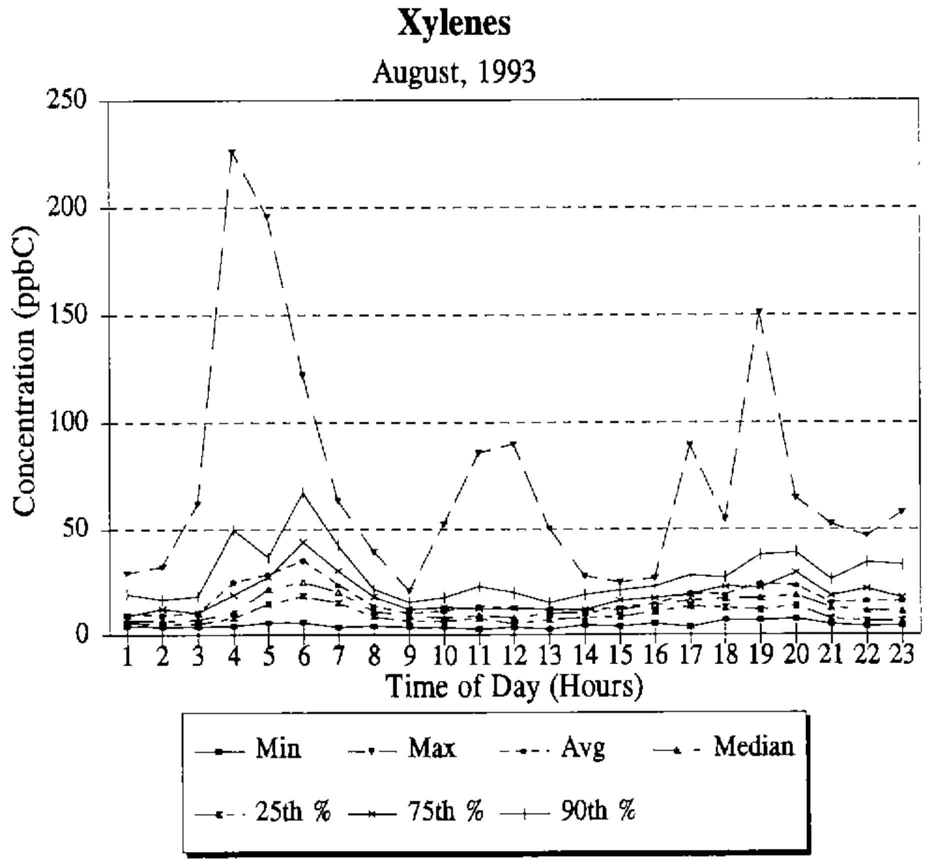
August, 1993

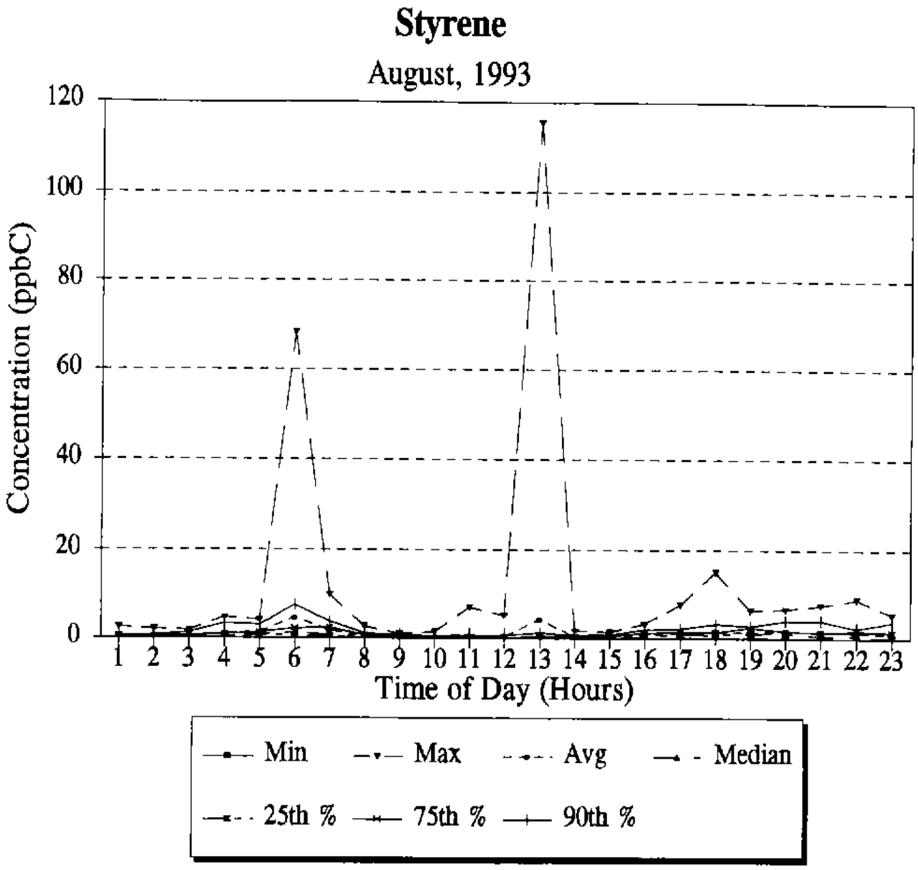



Benzene
August, 1993
Concentration (ppbC)
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

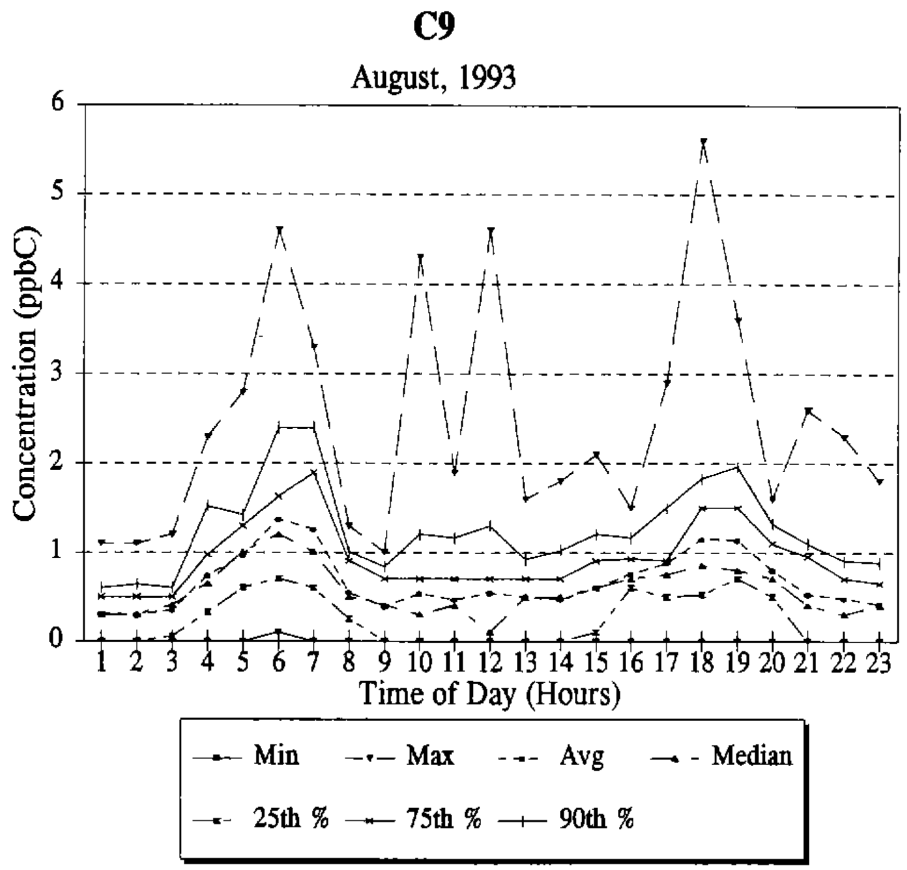

Toluene
August, 1993
Concentration (ppbC)
600
500
400
300
200
100
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %


BenzC8
August, 1993
120
100
80
60
40
20
0
Concentration (ppbC)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

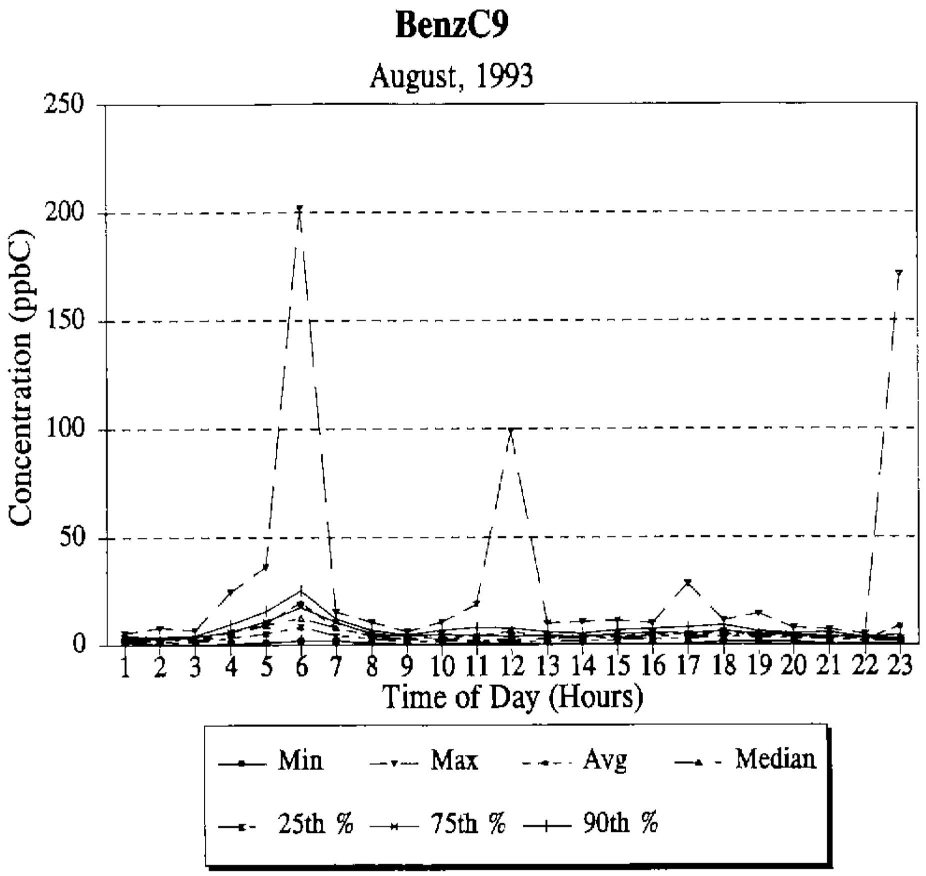

Xylenes
August, 1993
250
200
150
100
50
0
Concentration (ppbC)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

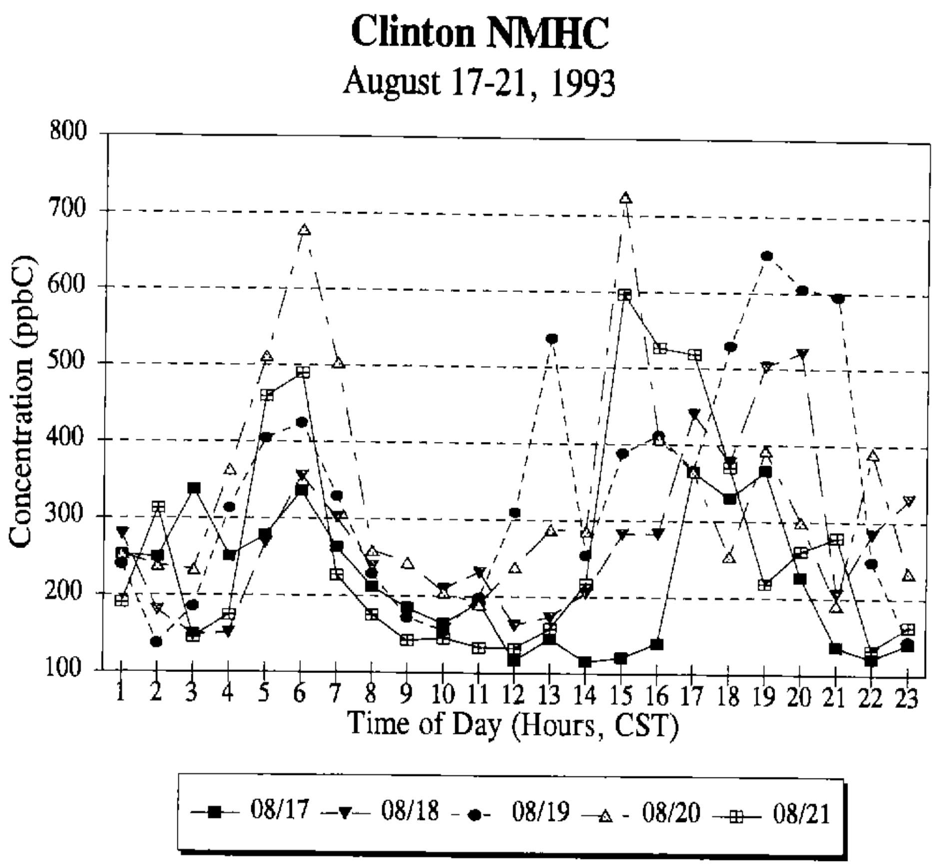


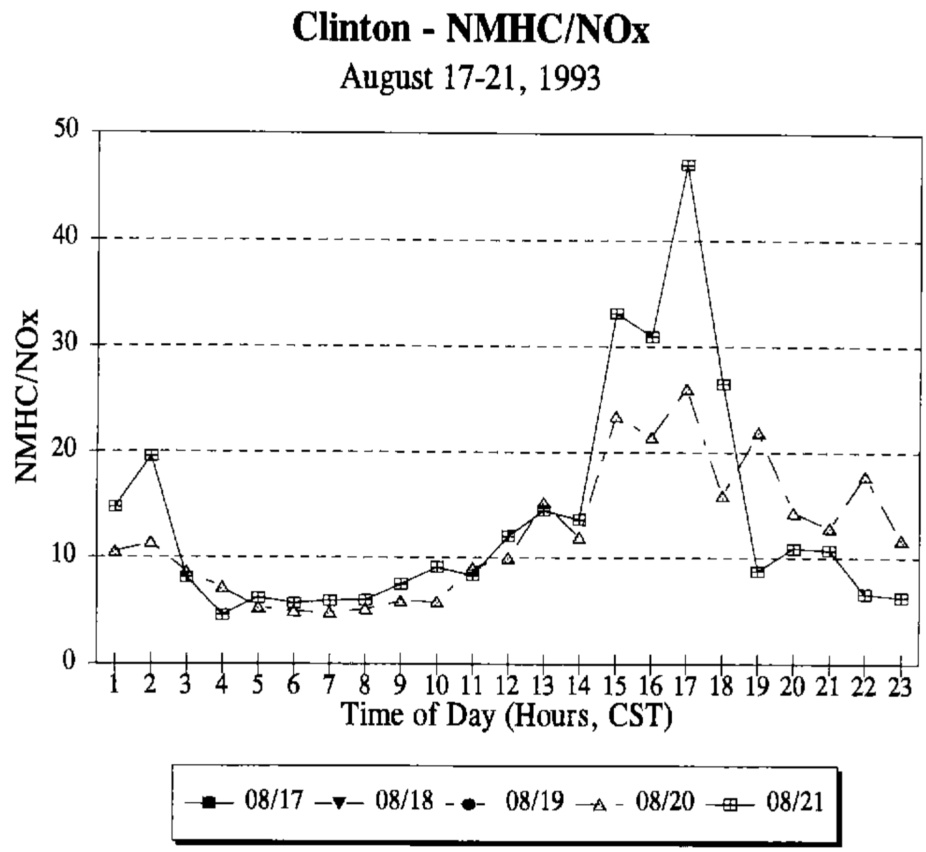
Styrene
August, 1993
Concentration (ppbC)
0
20
40
60
80
100
120
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %



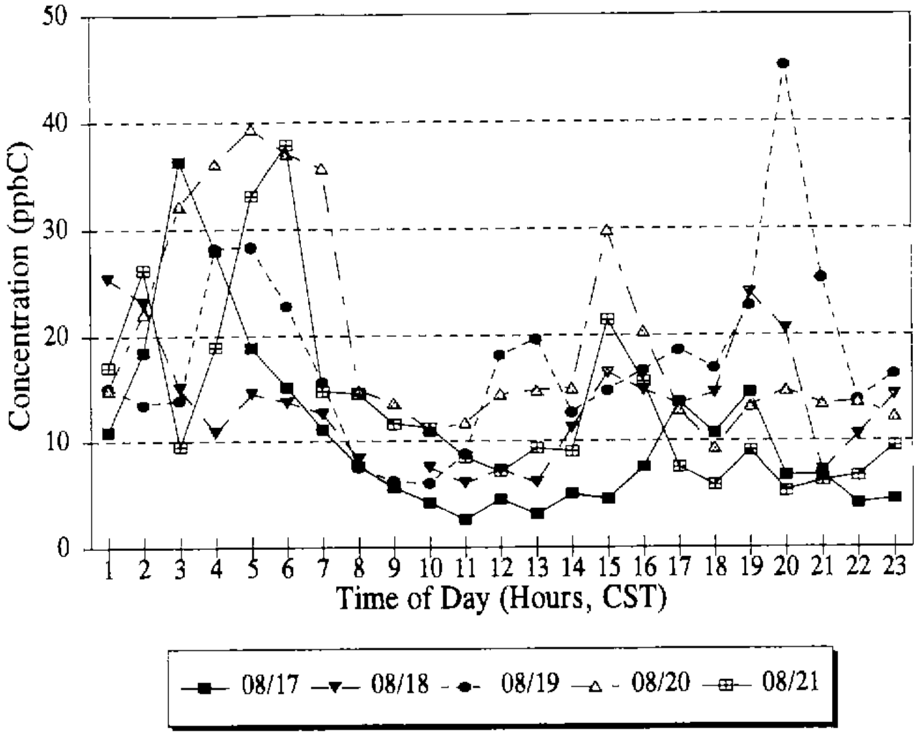
C9
August, 1993
Concentration (ppbC)
0
1
2
3
4
5
6
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %


BenzC9
August, 1993
250
200
150
100
50
0
Concentration (ppbC)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours)
Min
Max
Avg
Median
25th %
75th %
90th %

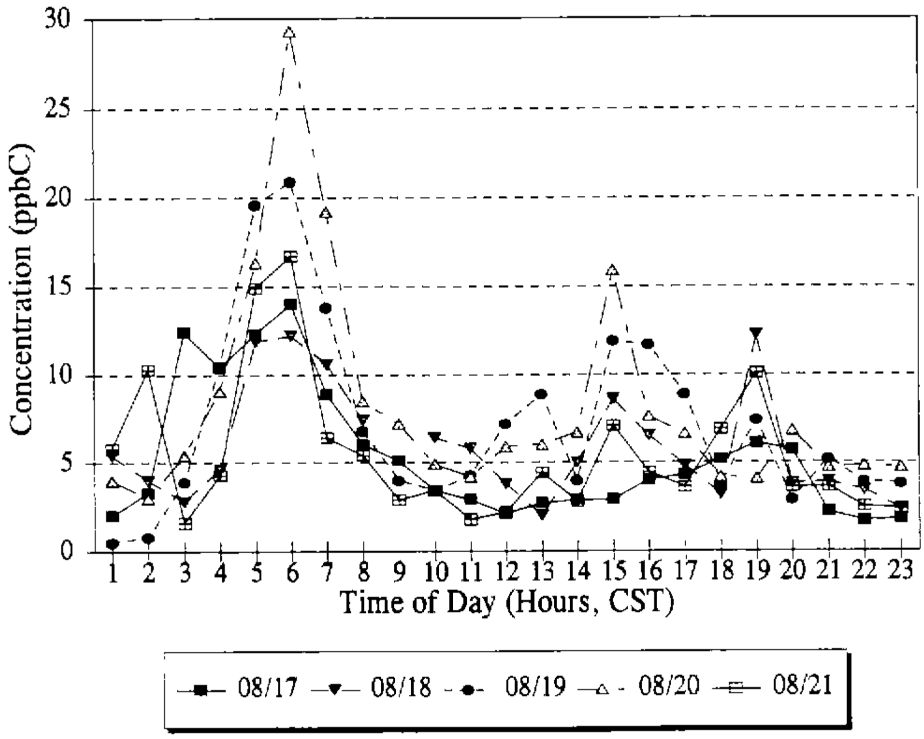

Clinton NMHC
August 17-21, 1993
Concentration (ppbC)
800
700
600
500
400
300
200
100
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17 08/18 08/19 08/20 08/21


Clinton - NMHC/NOx
August 17-21, 1993
NMHC/NOx
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17 08/18 08/19 08/20 08/21

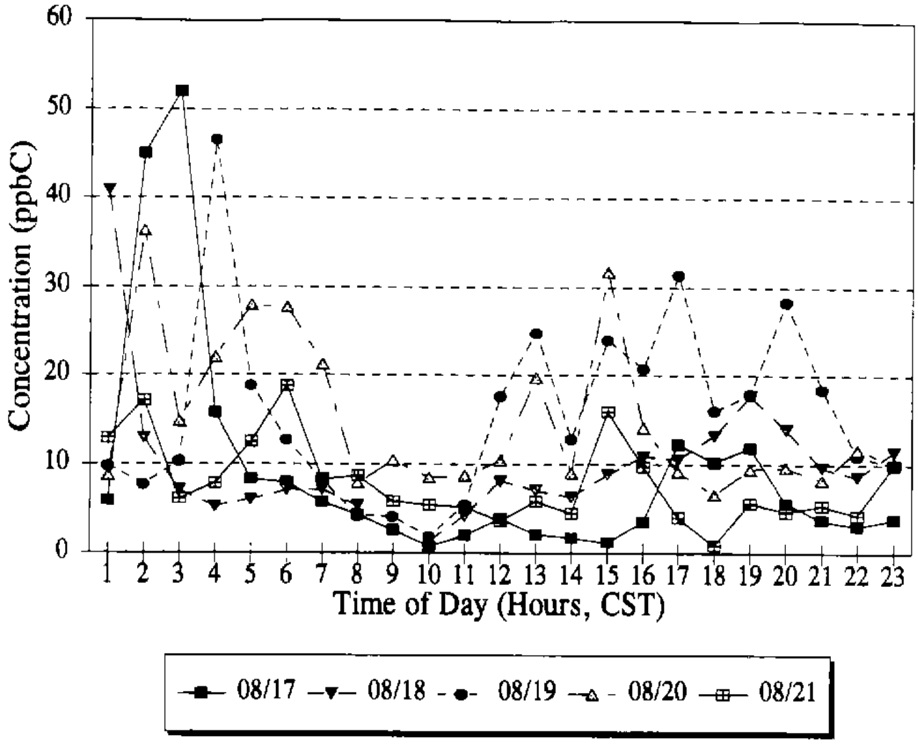
Clinton - Ethane
August 17-21, 1993



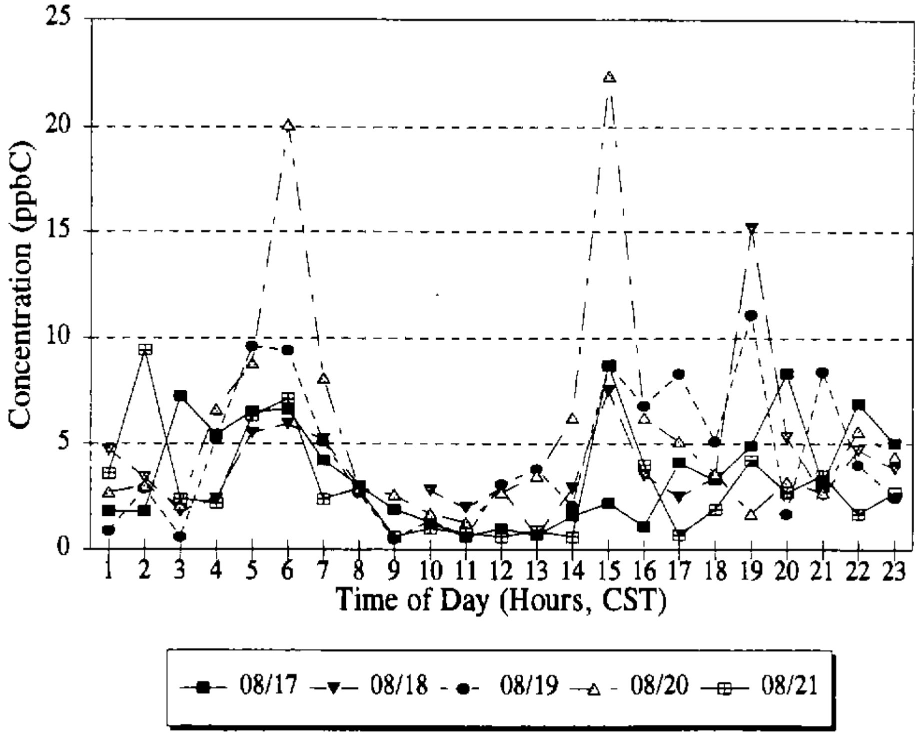
Clinton - Ethene
August 17-21, 1993



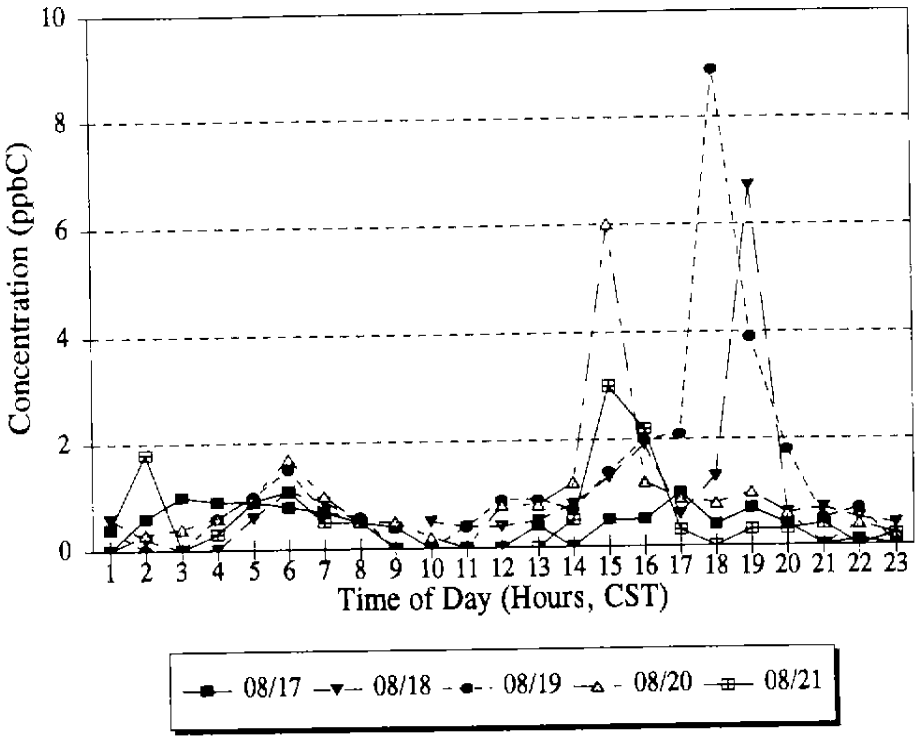
Clinton - Propane
August 17-21, 1993



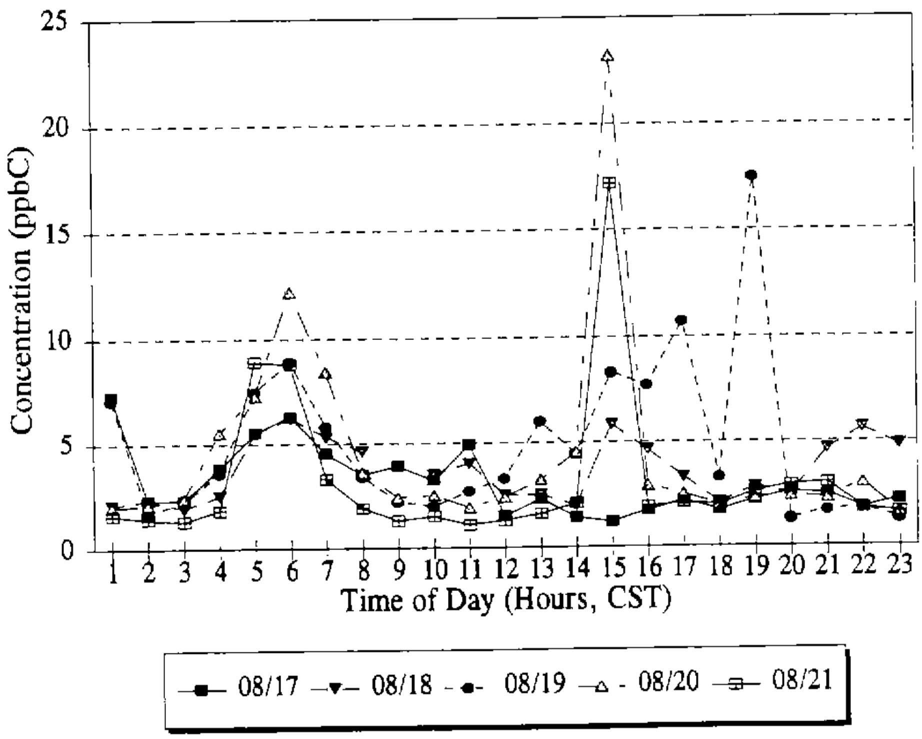
Clinton - Propene
August 17-21, 1993



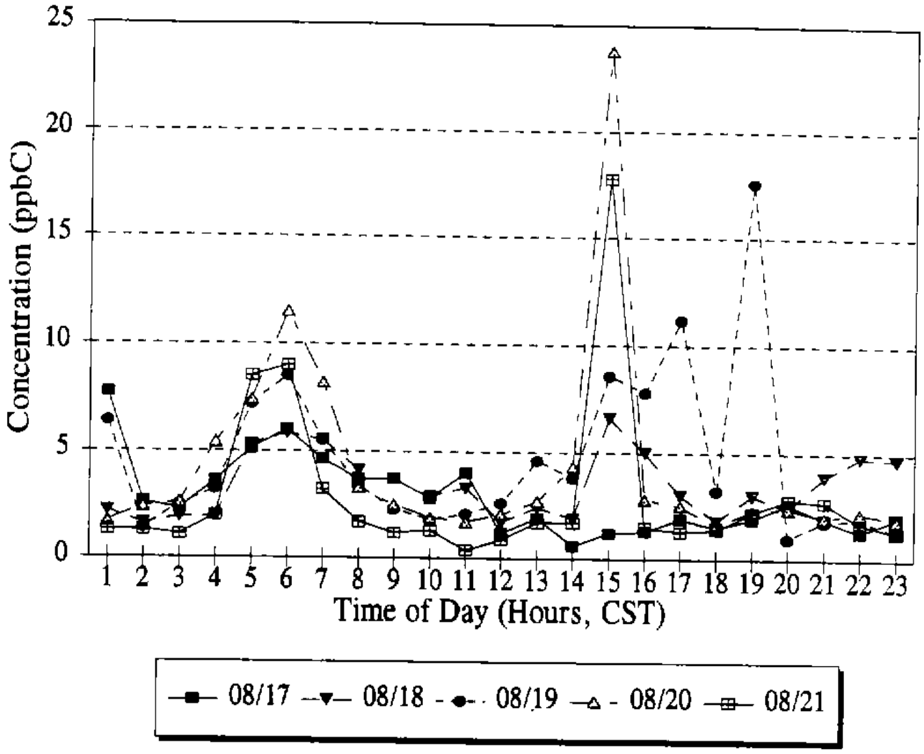
Clinton - C4ole_1
August 17-21, 1993



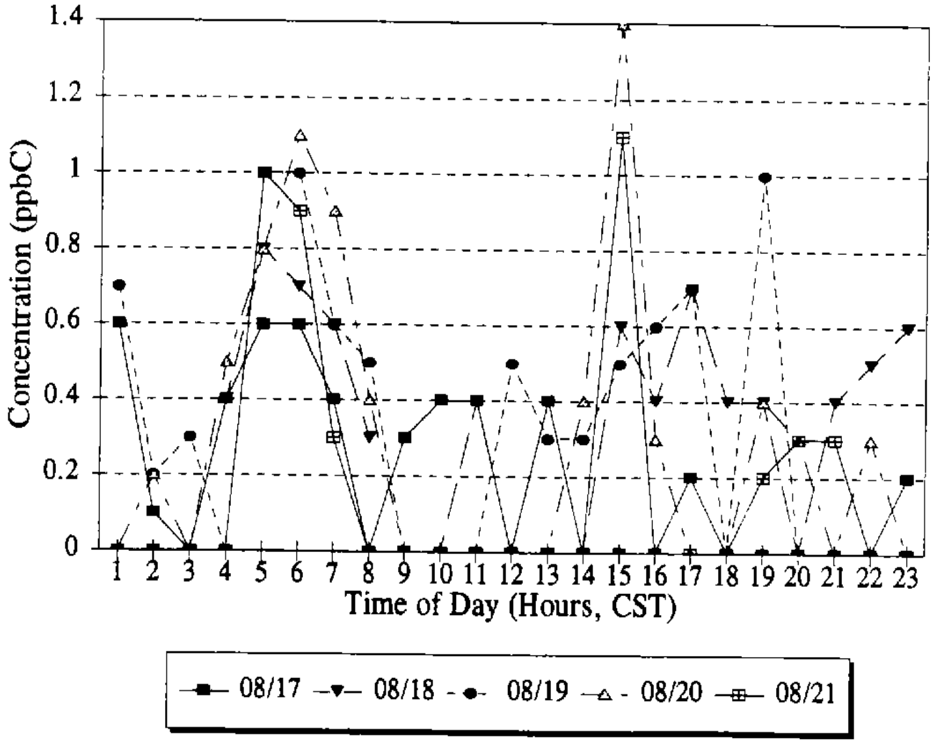
Clinton - C5ole_1
August 17-21, 1993

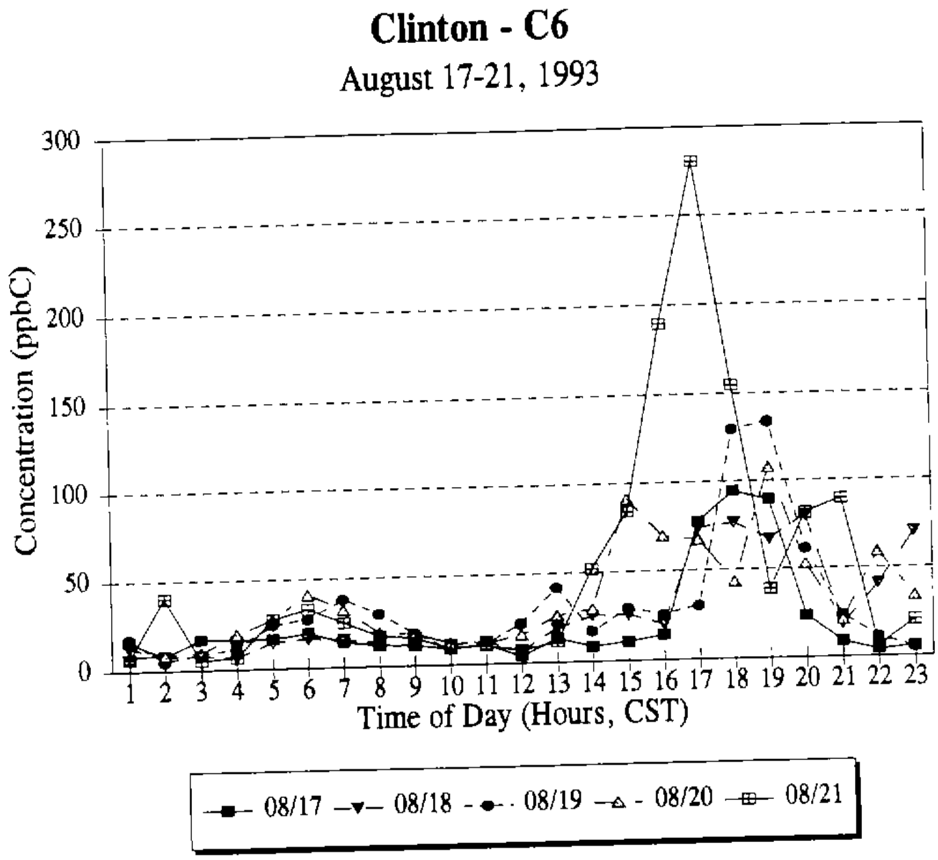


Clinton - C5ole_2
August 17-21, 1993

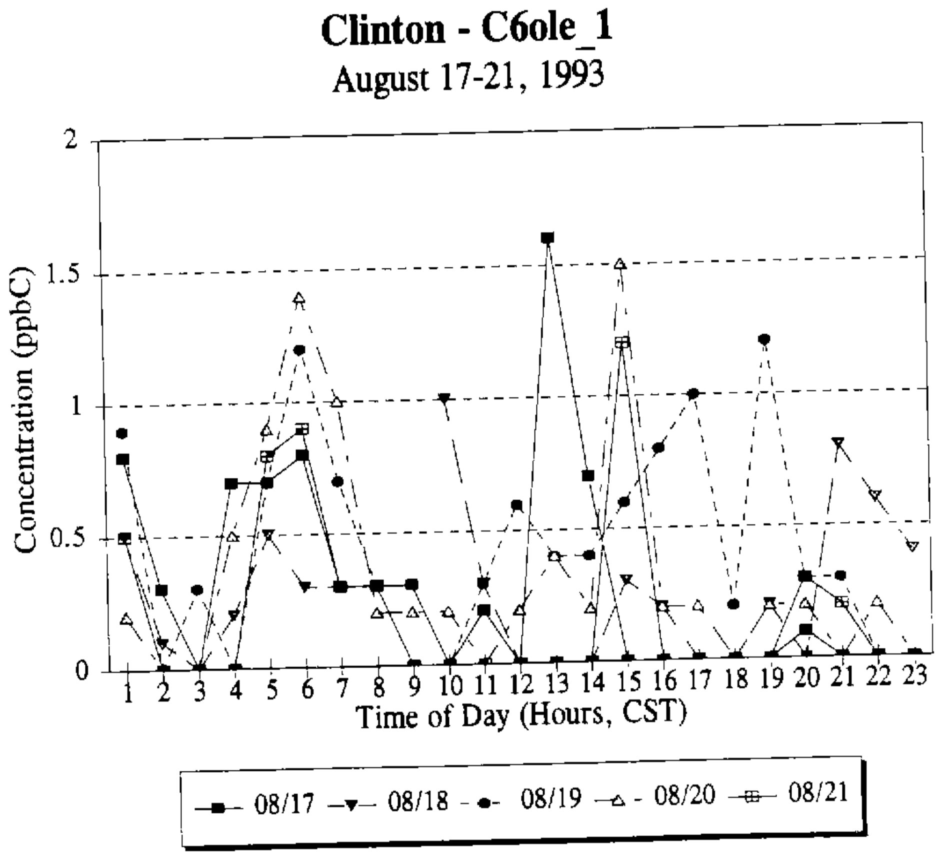


Clinton - CYCC5ole
August 17-21, 1993





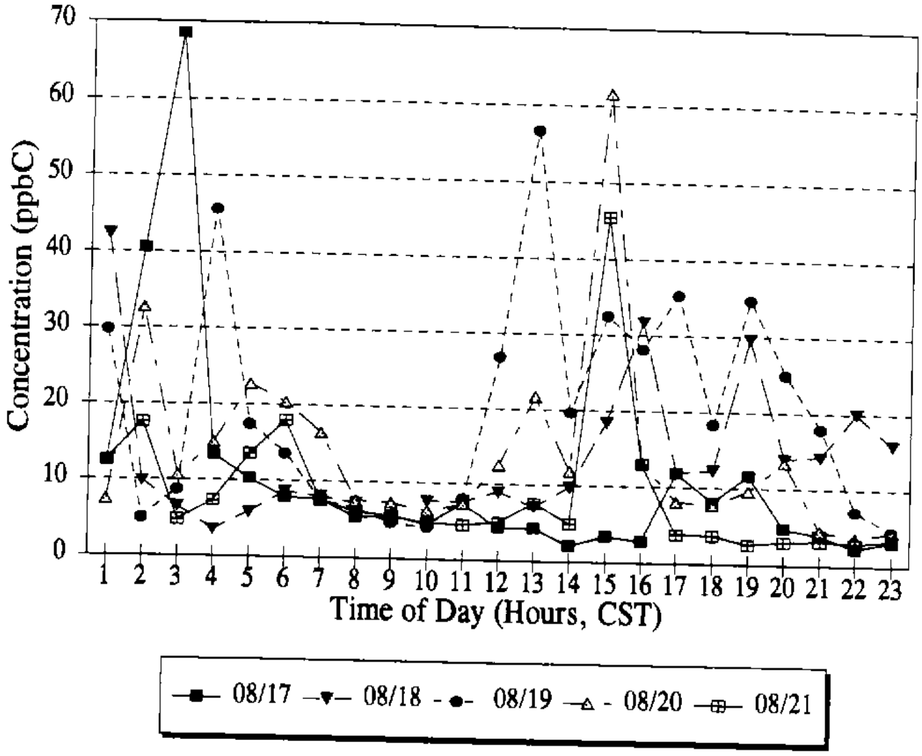
Clinton - C6
August 17-21, 1993
300
250
200
150
100
50
0
Concentration (ppbC)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17 08/18 08/19 08/20 08/21



Clinton - C6ole_1
August 17-21, 1993
2
1.5
1
0.5
0
Concentration (ppbC)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17 08/18 08/19 08/20 08/21

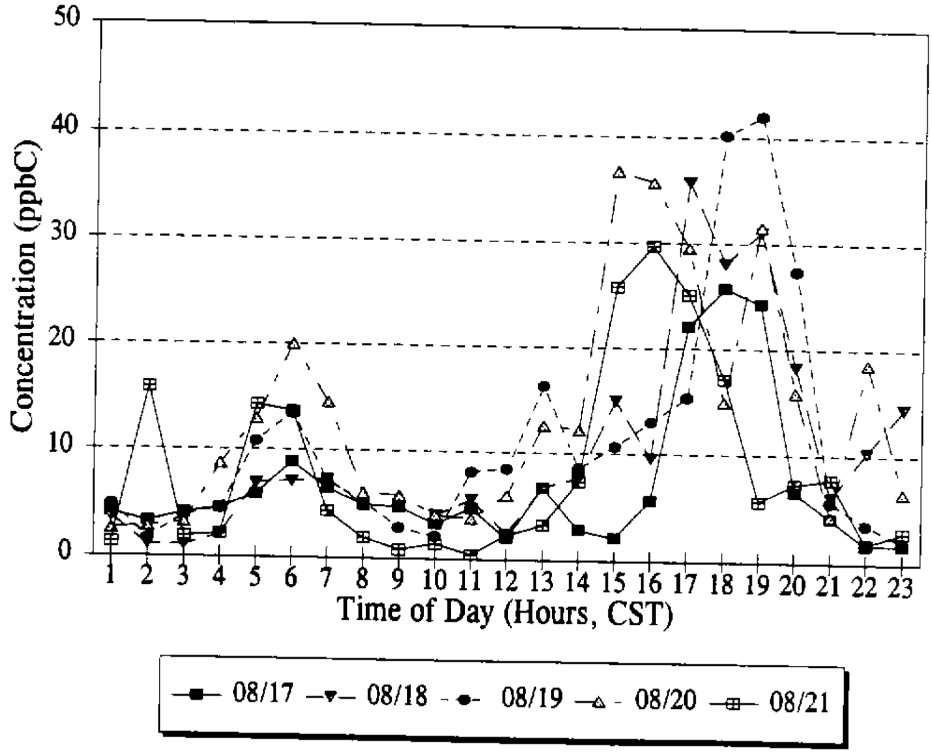
Clinton - C4

August 17-21, 1993

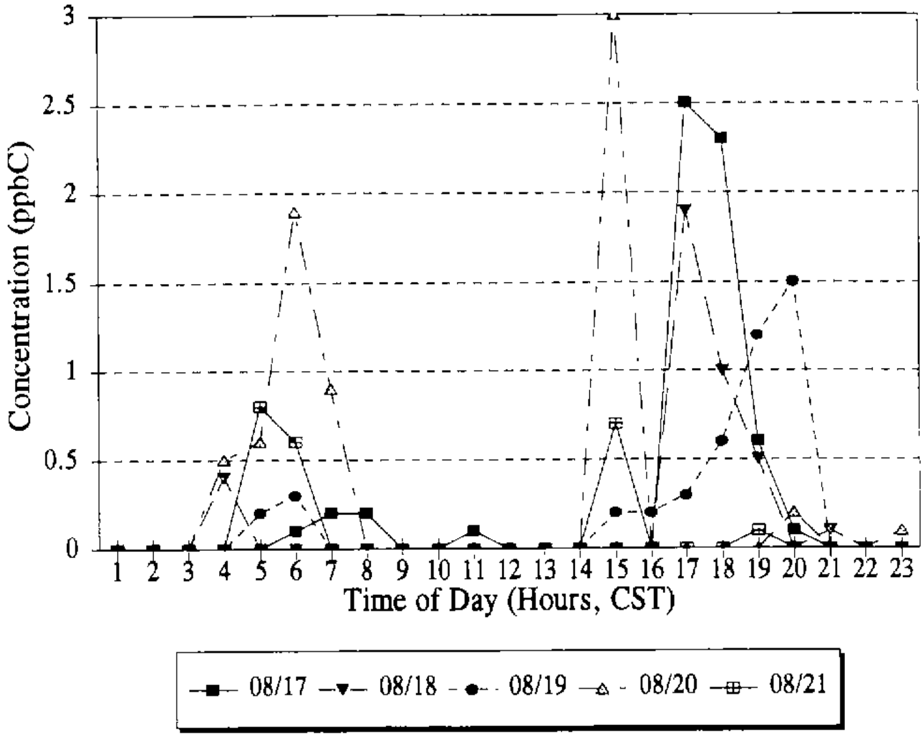


Clinton - C7

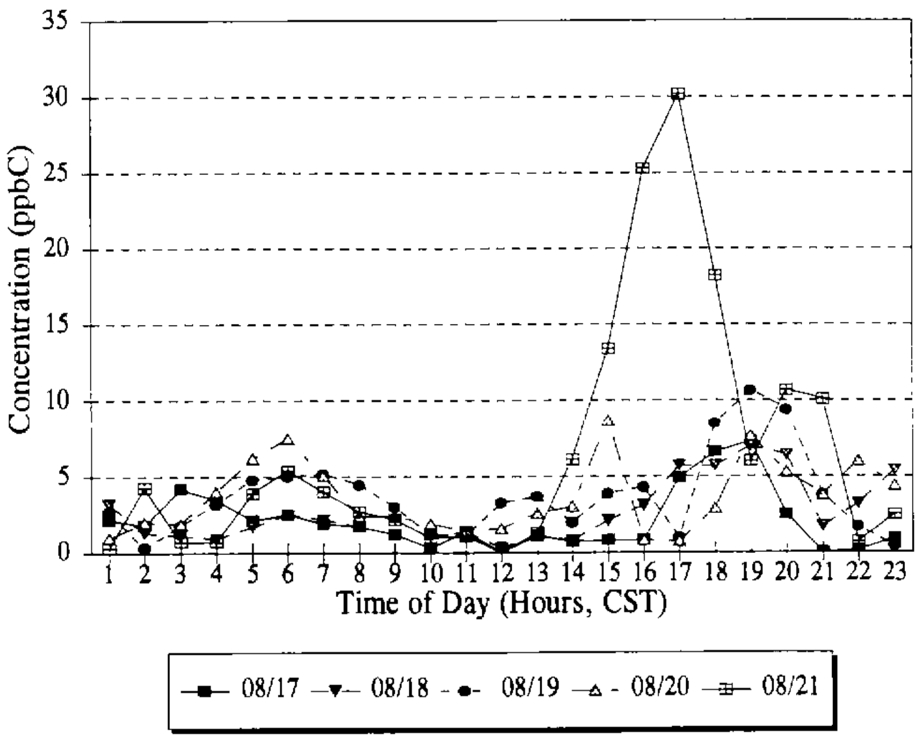
August 17-21, 1993

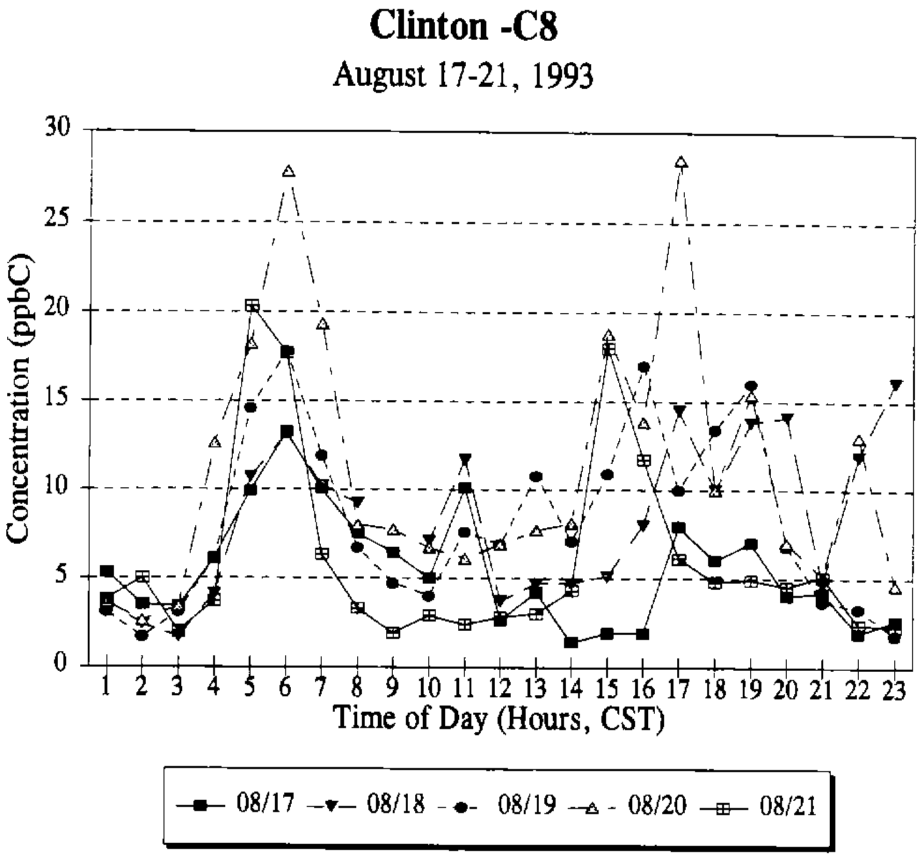


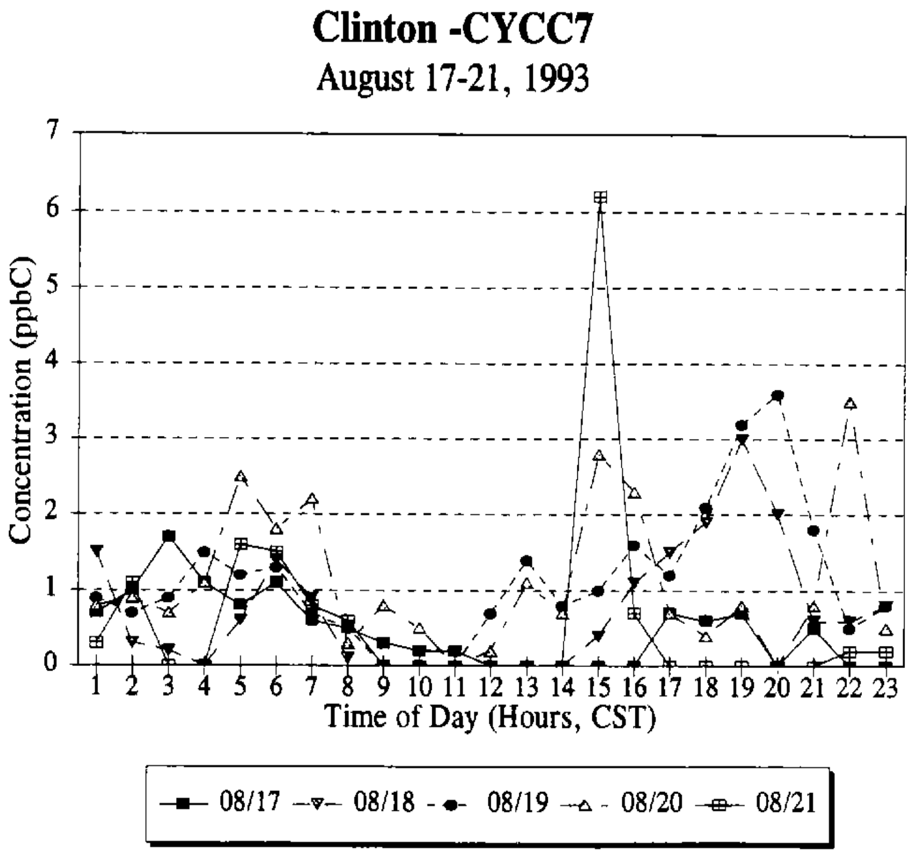
Clinton - C6ole_2
August 17-21, 1993

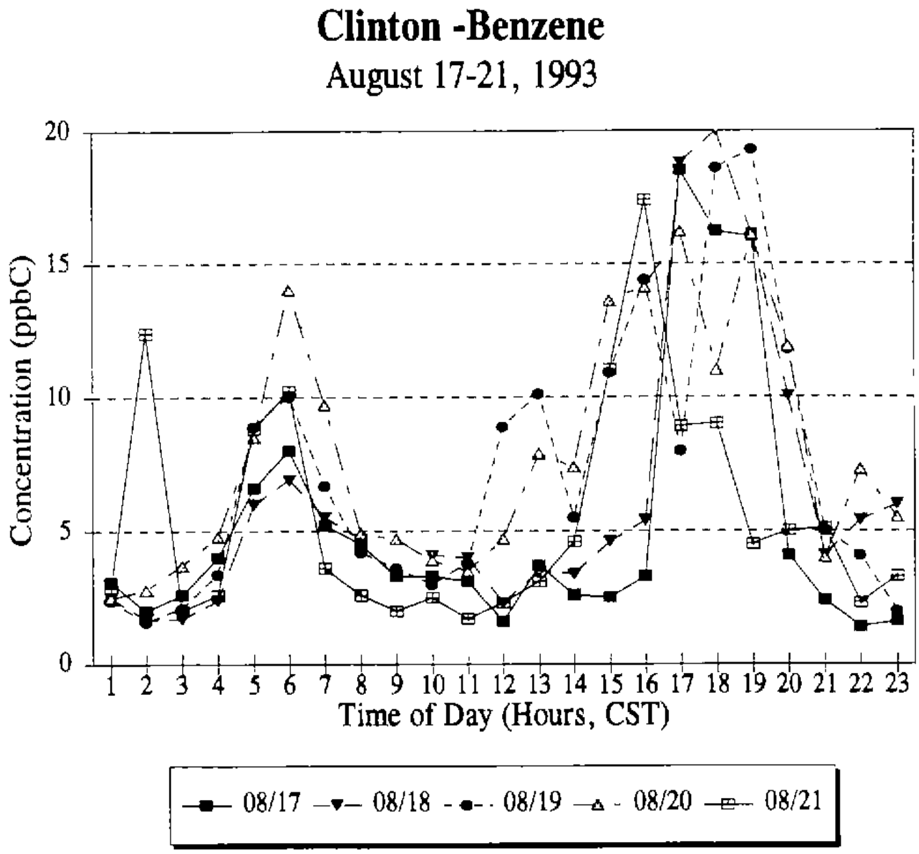


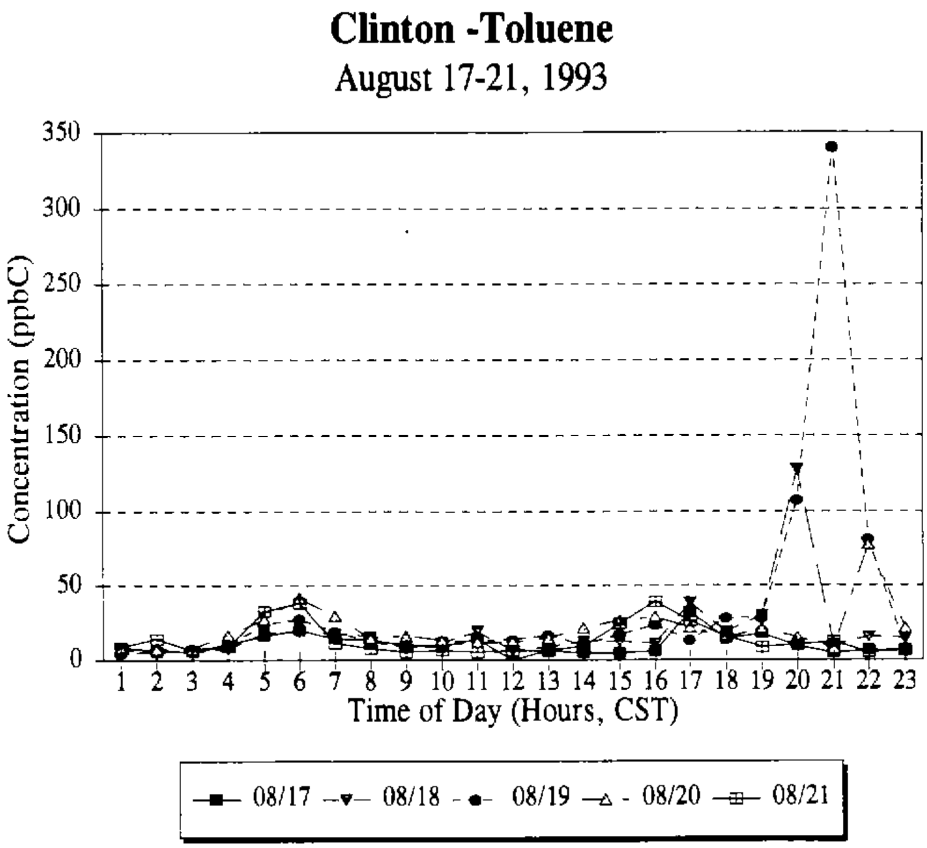
Clinton - CYCC6
August 17-21, 1993

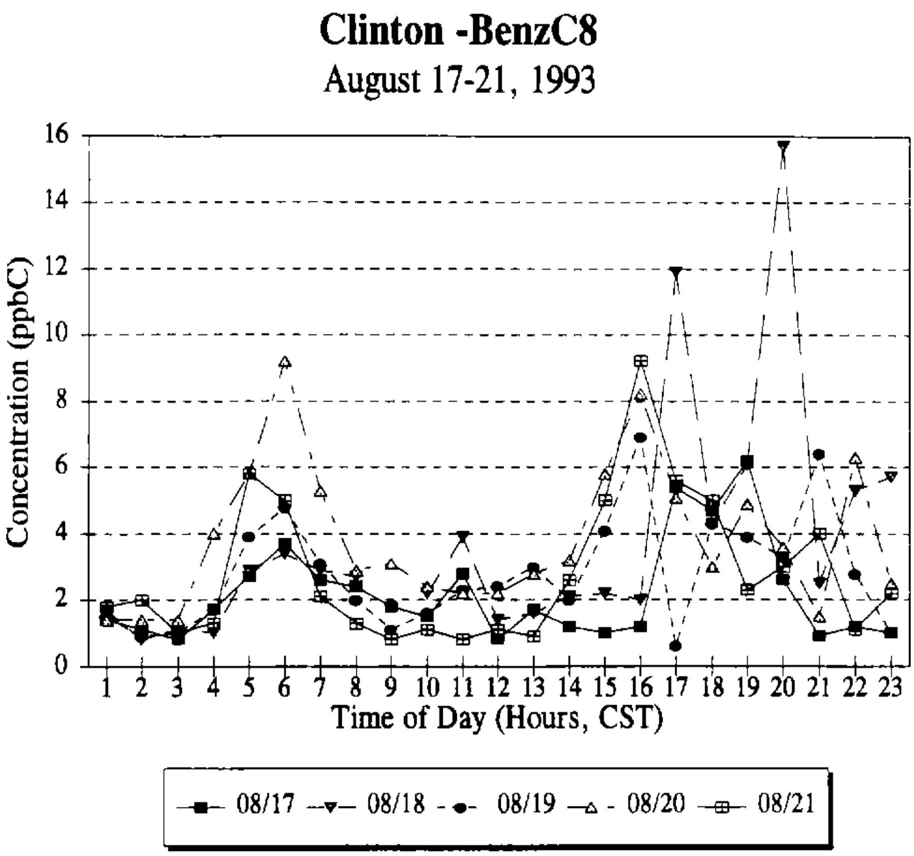


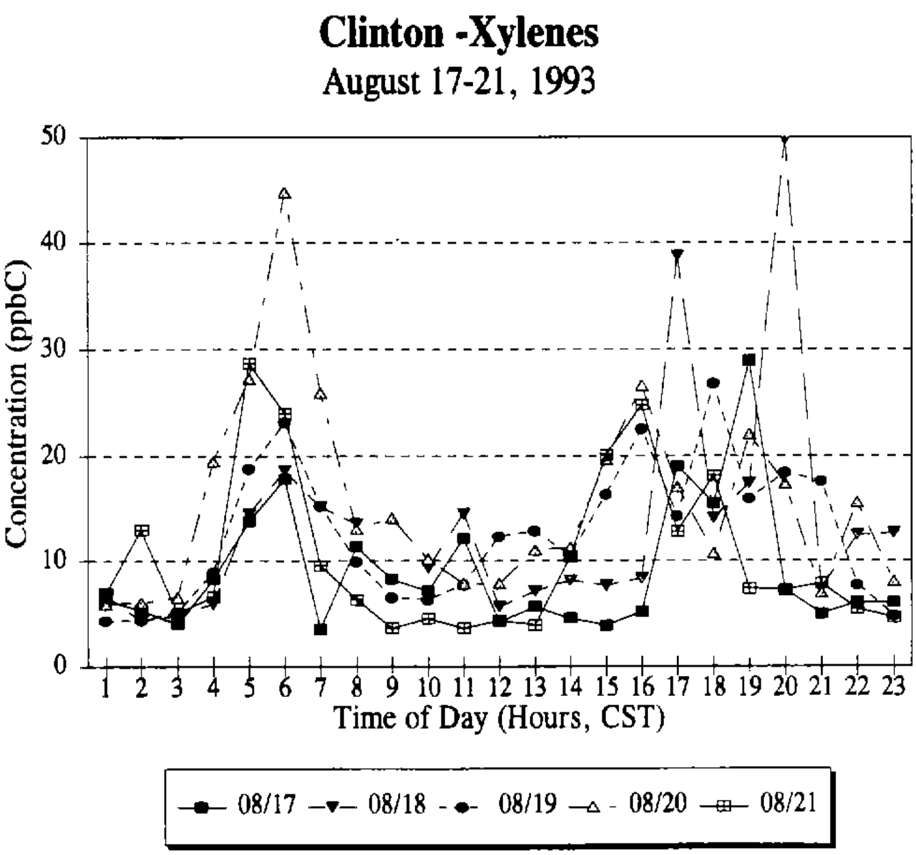

Clinton -C8
August 17-21, 1993
Concentration (ppbC)
30
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17
08/18
08/19
08/20
08/21


Clinton -CYCC7
August 17-21, 1993
Concentration (ppbC)
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17
08/18
08/19
08/20
08/21

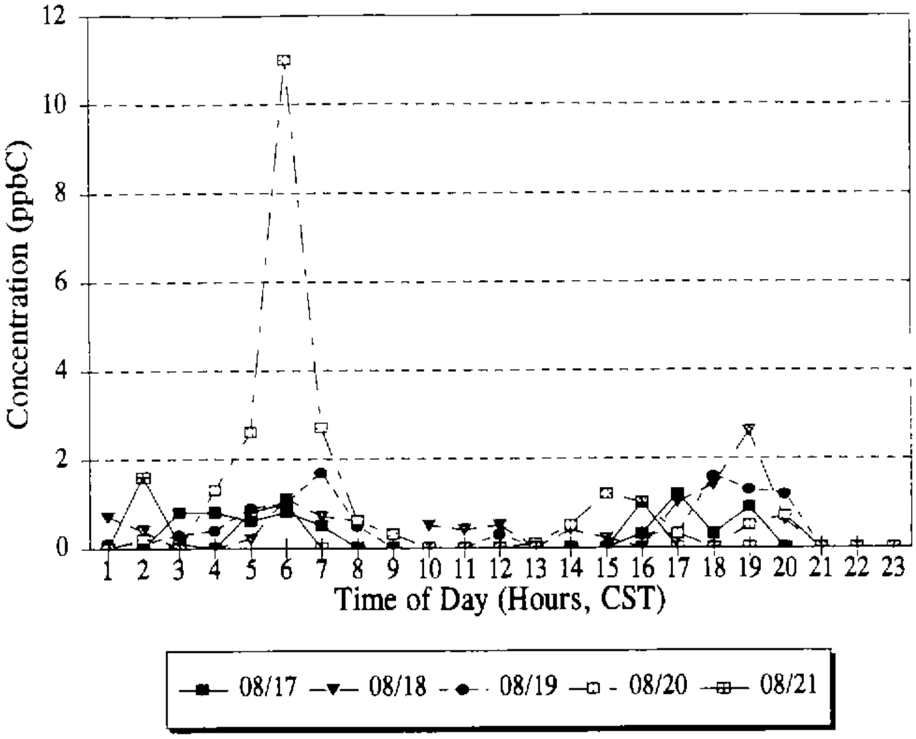

Clinton -Benzene
August 17-21, 1993
Concentration (ppbC)
0
5
10
15
20
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17 08/18 08/19 08/20 08/21


Clinton -Toluene
August 17-21, 1993
Concentration (ppbC)
0
50
100
150
200
250
300
350
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17 08/18 08/19 08/20 08/21

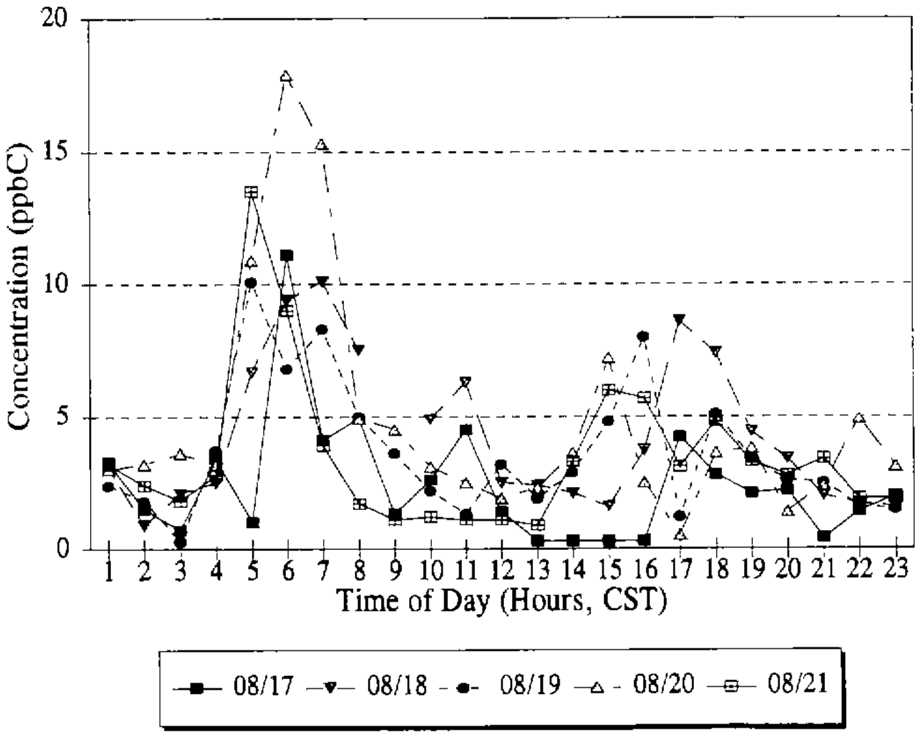

Clinton -BenzC8
August 17-21, 1993
Concentration (ppbC)
0
2
4
6
8
10
12
14
16
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17 08/18 08/19 08/20 08/21

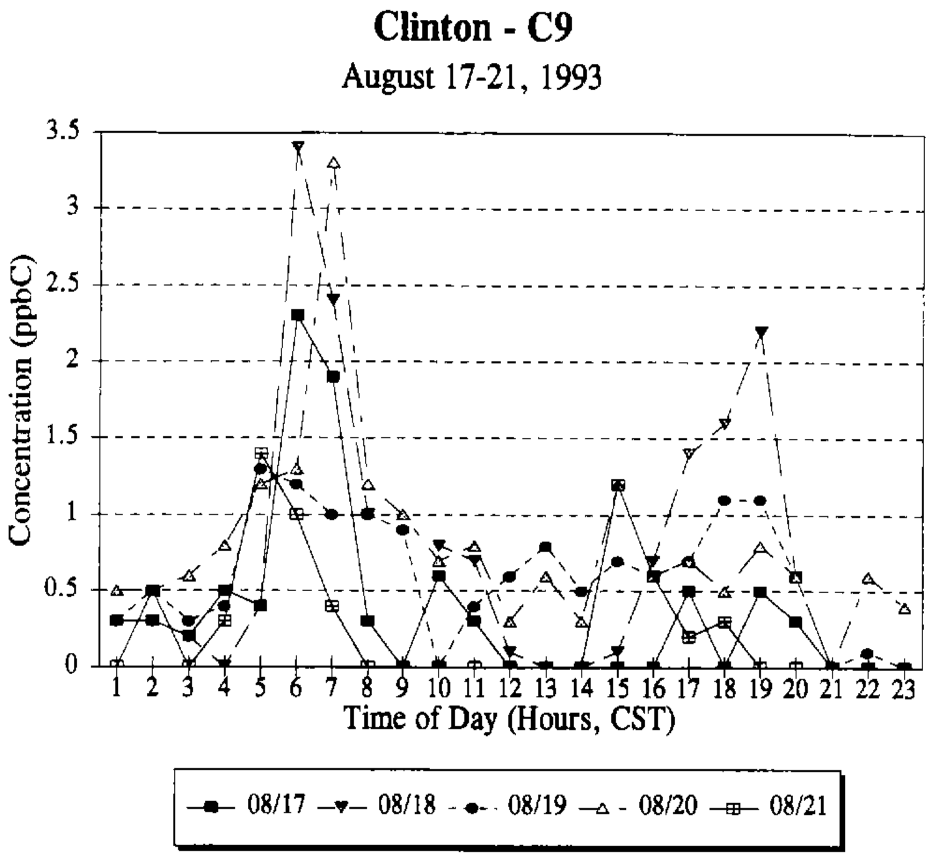

Clinton -Xylenes
August 17-21, 1993
Concentration (ppbC)
0
10
20
30
40
50
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17 08/18 08/19 08/20 08/21

Clinton -Styrene
August 17-21, 1993



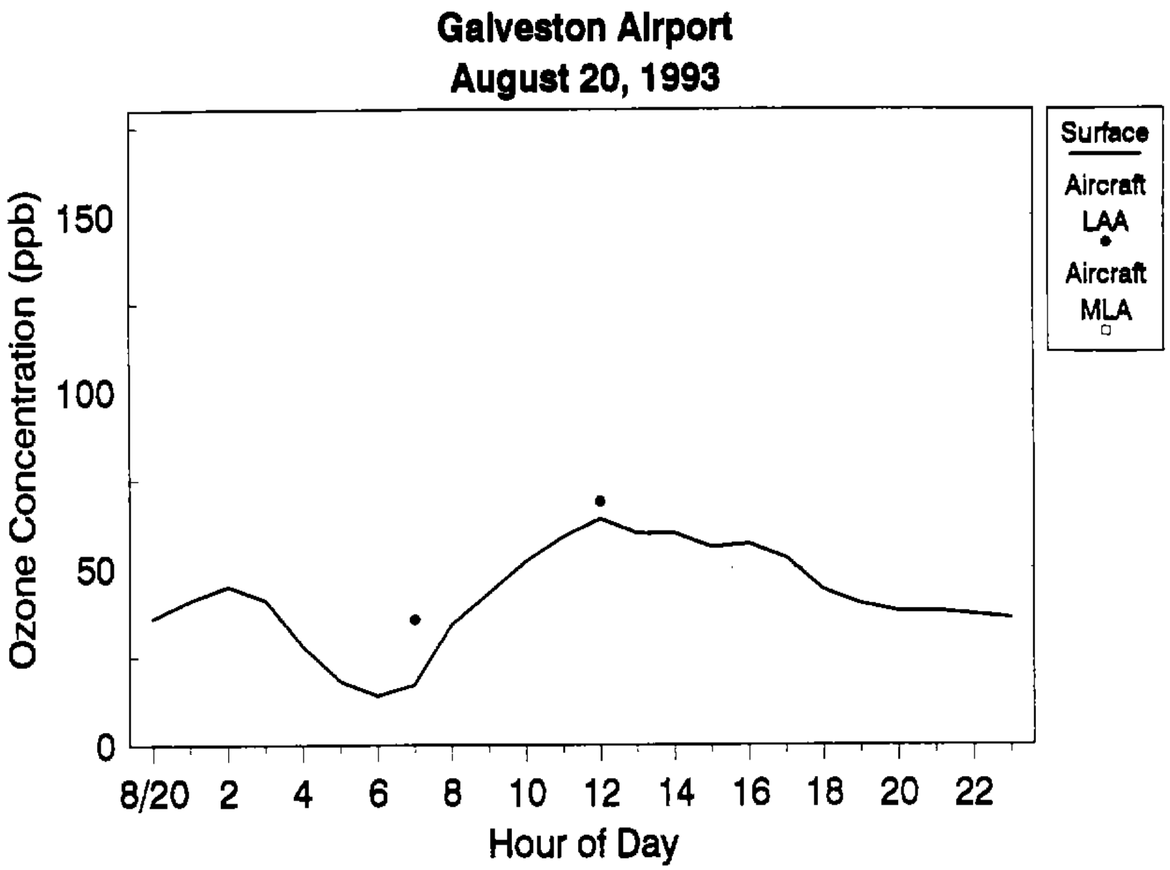
Clinton - BenzC9
August 17-21, 1993

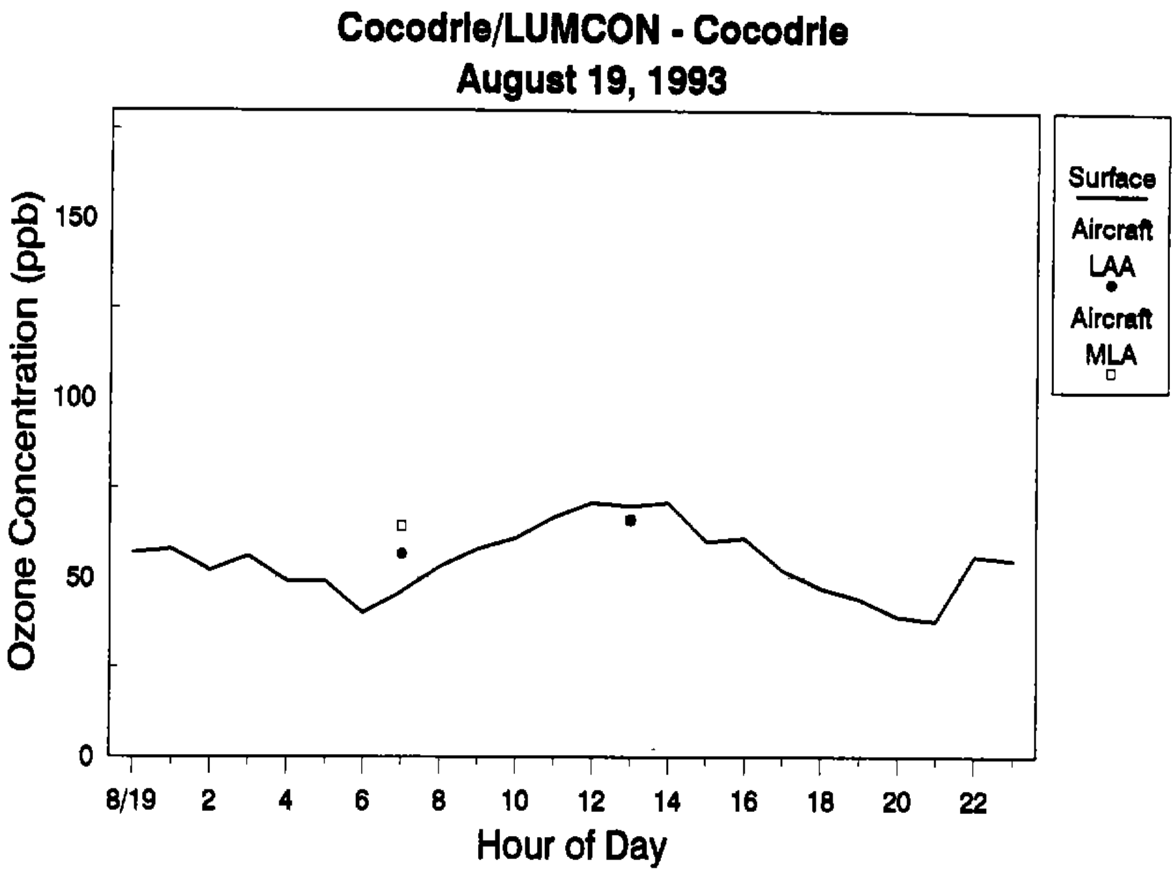


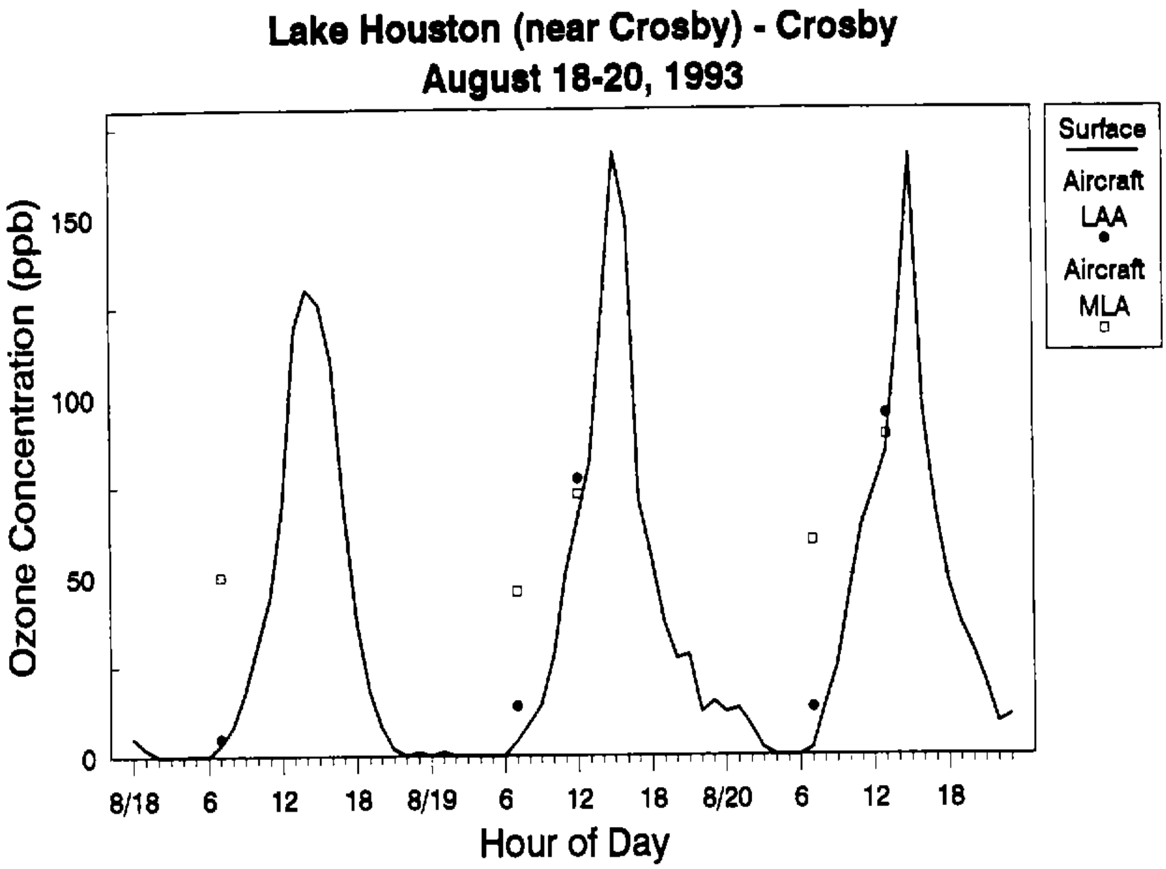

Clinton - C9
August 17-21, 1993
Concentration (ppbC)
3.5
3
2.5
2
1.5
1
0.5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Time of Day (Hours, CST)
08/17
08/18
08/19
08/20
08/21

APPENDIX C

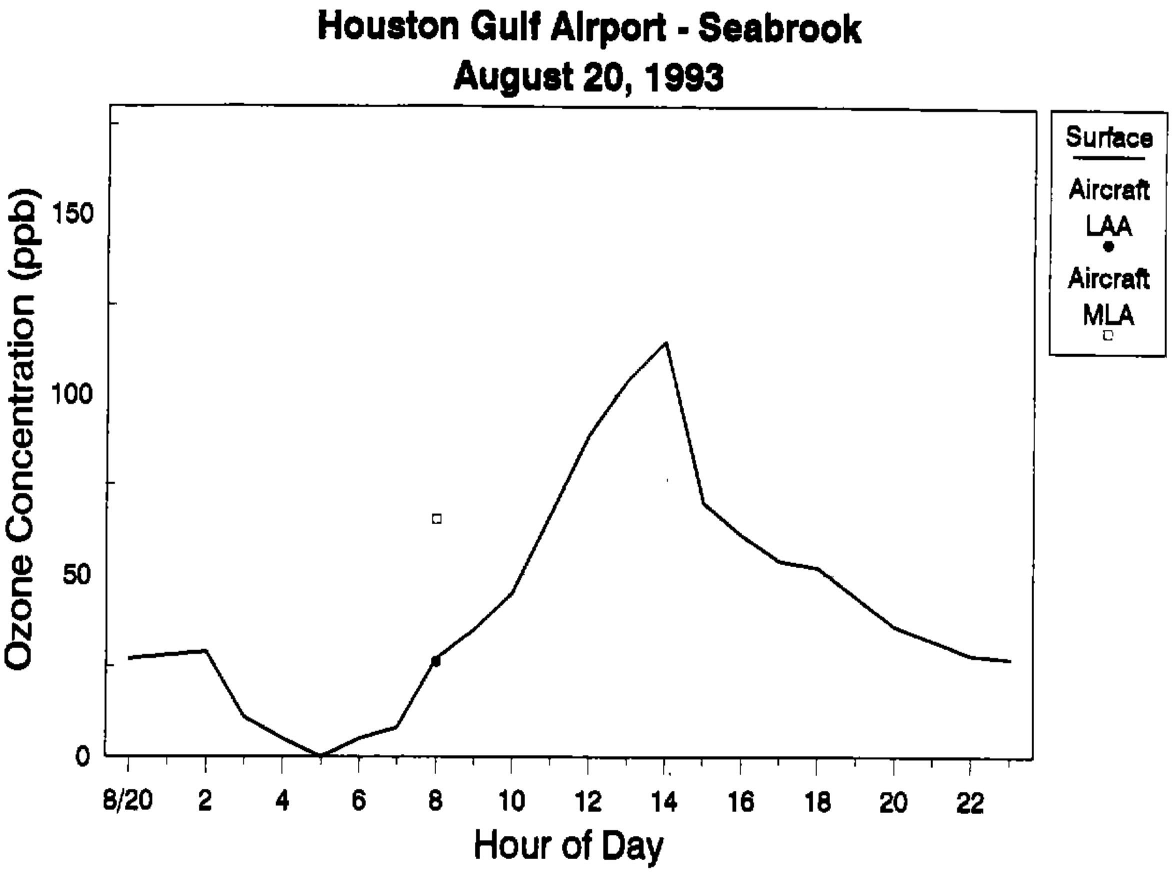
COMPARISONS BETWEEN SURFACE AND AIRCRAFT OZONE MEASUREMENTS DURING THE AUGUST 17-21, 1993 EPISODE


Galveston Airport
August 20, 1993
Ozone Concentration (ppb)
0
50
100
150
8/20
2
4
6
8
10
12
14
16
18
20
22
Hour of Day
Surface
Aircraft
LAA
Aircraft
MLA

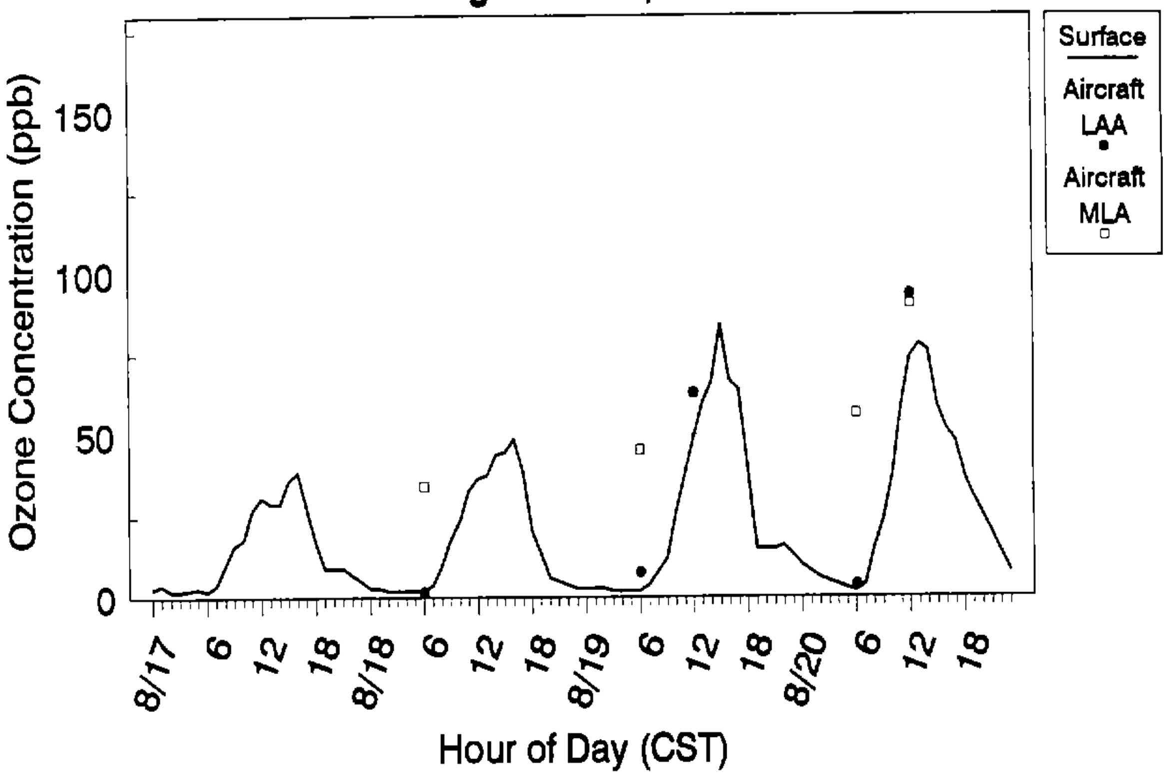

Cocodrie/LUMCON - Cocodrie
August 19, 1993
Ozone Concentration (ppb)
150
100
50
0
8/19
2
4
6
8
10
12
14
16
18
20
22
Hour of Day
Surface
Aircraft
LAA
Aircraft
MLA

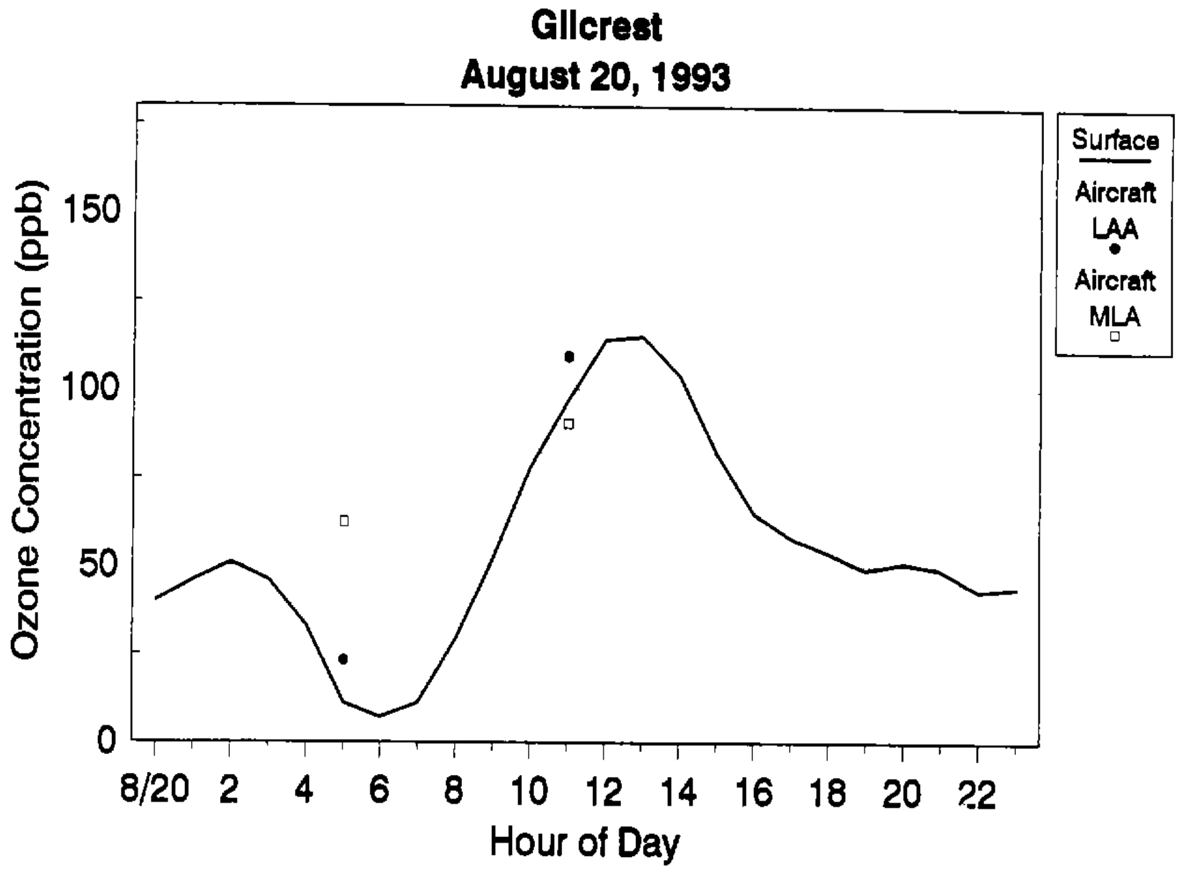


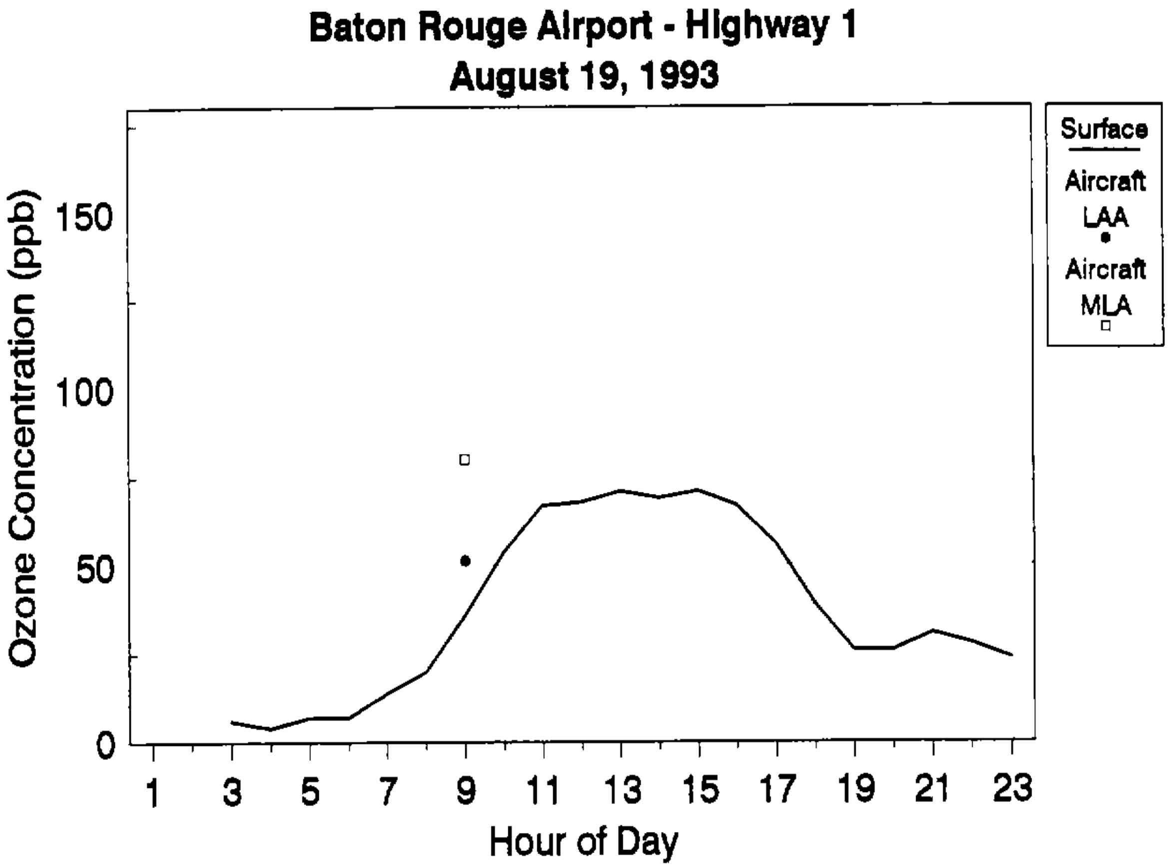
Lake Houston (near Crosby) - Crosby
August 18-20, 1993
Surface
Aircraft
LAA
Aircraft
MLA
Ozone Concentration (ppb)
0
50
100
150
8/18
6
12
18
8/19
6
12
18
8/20
6
12
18
Hour of Day

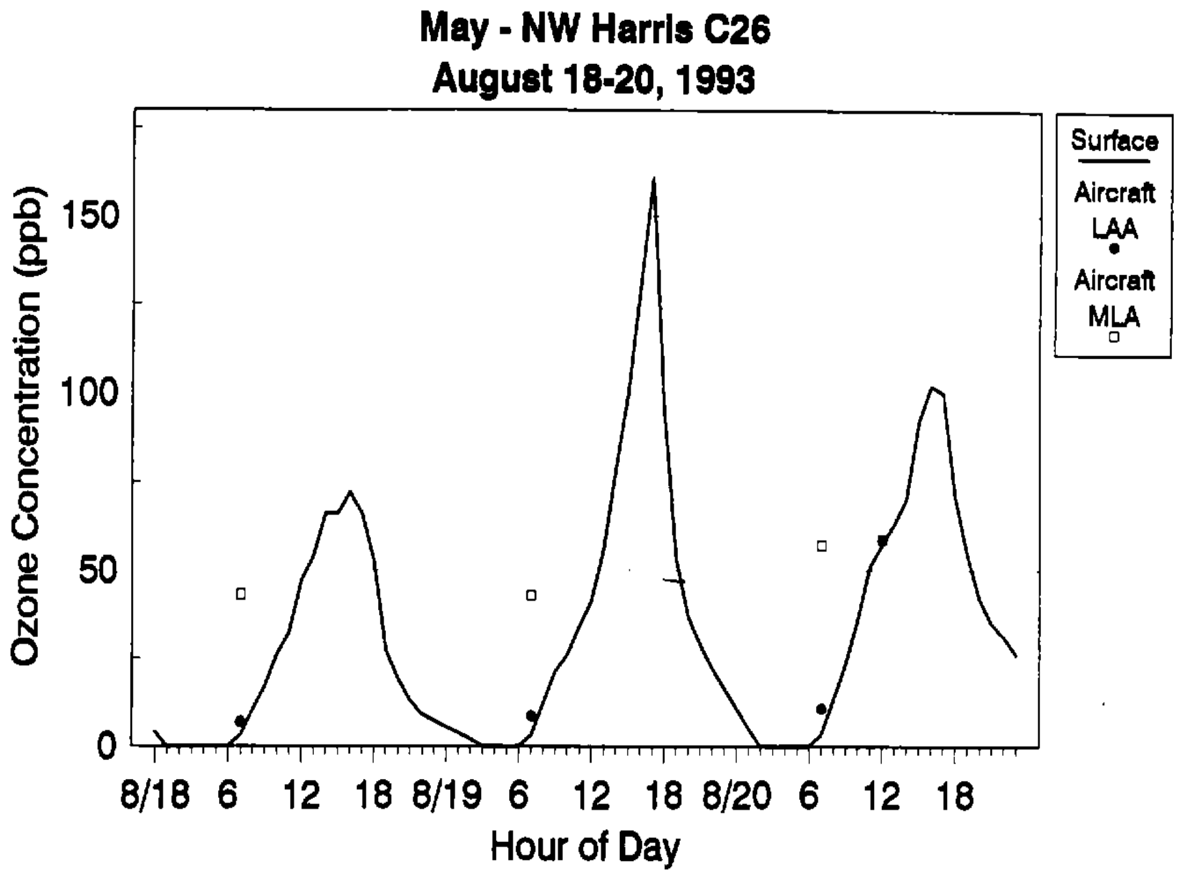

Houston Gulf Airport - Seabrook
August 20, 1993
Ozone Concentration (ppb)
0
50
100
150
8/20
2
4
6
8
10
12
14
16
18
20
22
Hour of Day
Surface
Aircraft
LAA
Aircraft
MLA

Houston Hobby - Swiss&Monroe
August 17-20, 1993

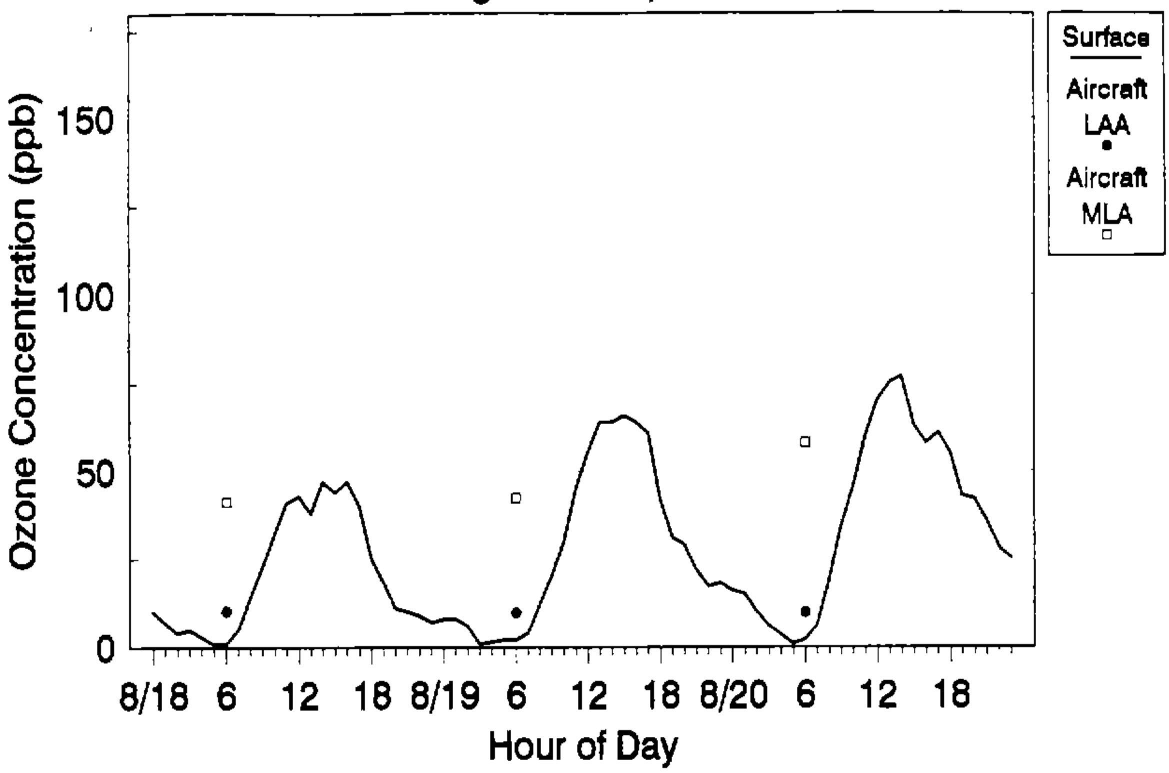


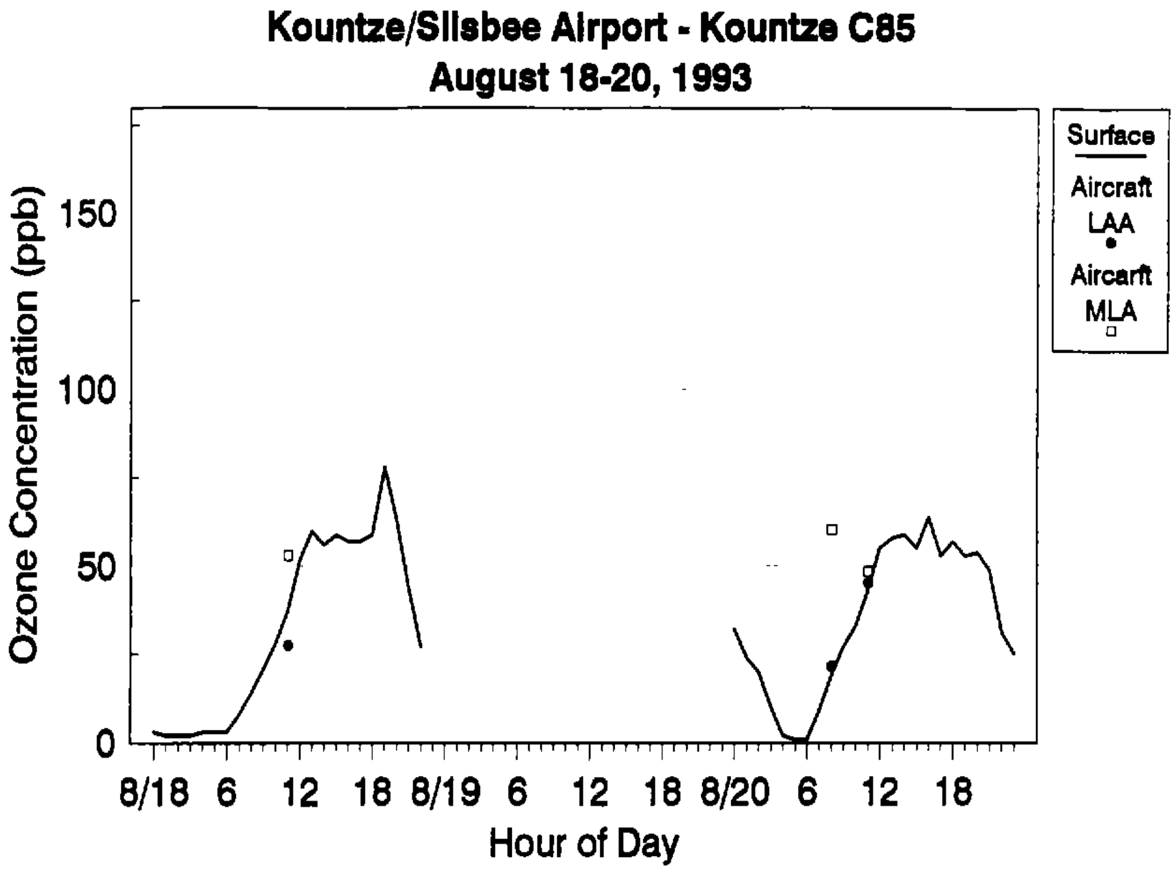

Gilcrest
August 20, 1993
Ozone Concentration (ppb)
150
100
50
0
8/20
2
4
6
8
10
12
14
16
18
20
22
Hour of Day
Surface
Aircraft LAA
Aircraft MLA


Baton Rouge Airport - Highway 1
August 19, 1993
Ozone Concentration (ppb)
0
50
100
150
1
3
5
7
9
11
13
15
17
19
21
23
Hour of Day
Surface
Aircraft
LAA
Aircraft
MLA


May - NW Harris C26
August 18-20, 1993
Ozone Concentration (ppb)
0
50
100
150
8/18
6
12
18
8/19
6
12
18
8/20
6
12
18
Hour of Day
Surface
Aircraft
LAA
Aircraft
MLA

Houston Southwest - Croquet
August 18-20, 1993




Kountze/Silsbee Airport - Kountze C85
August 18-20, 1993
Ozone Concentration (ppb)
150
100
50
0
8/18
6
12
18
8/19
6
12
18
8/20
6
12
18
Hour of Day
Surface
Aircraft
LAA
Aircarft
MLA

APPENDIX D

LIST OF SITES THAT EXCEEDED THE NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS) FOR OZONE DURING 1993 EPISODES

This appendix lists all exceedances of the NAAQS for ozone for the August 9-11, 1993, August 17-21, 1993, September 7-11, 1993 episodes in southeast Texas and the August 17-19, 1993 episode in Louisiana. Each table lists the dates, sites and their locations, maximum ozone concentrations, and the time that the maxima were measured for all sites that exceeded the NAAQS for ozone of 125 ppb.

August 9-11, 1993 Episode in southeast Texas

Date	Site ID	Location	Maximum Ozone Concentration (ppb)	Time of Maximum (CST)
8/10/93	GLRC	Galleria Cgc Site	170	14
8/10/93	HM01	HRM Site 1	170	13
8/10/93	TN20	Manchester C22, Harris	169	13
8/10/93	TN2	Crawford, Harris	165	13
8/10/93	TN4	Lang, Harris	159	14
8/10/93	TN17	NW Harris C26, Harris	146	15
8/10/93	HTCC	Texas Commerce Tower	143	13
8/11/93	TN17	NW Harris C26, Harris	145	15

August 17-21, 1993 Episode in southeast Texas

Date	Site ID	Location	Maximum Ozone Concentration (ppb)	Time of Maximum (CST)
8/18/93	STWC	Stowell (Winnie) Aq/Met	139	13
8/18/93	HM04	HRM Site 4	134	14
8/18/93	CRSC	Crosby Aq/Met Sites	130	14
8/18/93	HM10	HRM Site 10	130	14
8/18/93	TN10	Aldine C08, Harris	125	15
8/19/93	TN10	Aldine C08, Harris	231	16
8/19/93	TN3	N Wayside, Harris	177	15
8/19/93	HM03	HRM Site 3	170	16
8/19/93	CRSC	Crosby Aq/Met Sites	168	15
8/19/93	TN17	NW Harris C26, Harris	161	17
8/19/93	HM04	HRM Site 4	161	15
8/19/93	HM10	HRM Site 10	141	14
8/19/93	HM11	HRM Site 11	140	15
8/19/93	S42S	Orange Co.	125	16
8/20/93	HM11	HRM Site 11	187	14
8/20/93	HM10	HRM Site 10	185	15
8/20/93	HM07	HRM Site 7	184	14
8/20/93	HM04	HRM Site 4	179	15
8/20/93	CRSC	Crosby Aq/Met Sites	167	15
8/20/93	TN10	Aldine C08, Harris	146	14
8/20/93	HM03	HRM Site 3	132	14
8/20/93	HM08	HRM Site 8	129	13
8/21/93	HM11	HRM Site 11	142	14
8/21/93	HM10	HRM Site 10	141	15

September 7-11, 1993 Episode in southeast Texas

Date	Site ID	Location	Maximum Ozone Concentration (ppb)	Time of Maximum (CST)
9/8/93	SPTC	Smith Point Aq/Met Site	214	14
9/8/93	SBRC	Seabrook C20	208	14
9/8/93	TN12	Texas City C10, Galveston	176	13
9/8/93	HM11	HRM Site 11	157	15
9/8/93	HM07	HRM Site 7	142	13
9/8/93	HM04	HRM Site 4	141	18
9/8/93	TN15	Tulosa C21, Nueces	137	14
9/8/93	TN6	Swiss&monroe, Harris	135	16
9/8/93	HM01	HRM Site 1	134	13
9/8/93	GILC	Gilcrest	126	13
9/9/93	SPTC	Smith Point Aq/Met Site	195	12
9/9/93	GILC	Gilcrest	189	17
9/9/93	TN12	Texas City C10, Galveston	184	16
9/9/93	SBRC	Seabrook C20	159	14
9/9/93	TN13	Clute C11, Brazoria	140	15
9/9/93	HM07	HRM Site 7	139	12
9/9/93	GALC	Galveston As Site	126	12
9/10/93	GALC	Galveston As Site	162	14
9/10/93	SPTC	Smith Point Aq/Met Site	148	17
9/10/93	S40S	Sabine Pass	141	14
9/10/93	TN12	Texas City C10, Galveston	140	12
9/10/93	TN5	Croquet, Harris	137	16
9/10/93	GLRC	Galleria Cgc Site	136	18
9/10/93	SBRC	Seabrook C20	134	12
9/10/93	S43S	Beaumont	129	17
9/10/93	HM01	HRM Site 1	129	19
9/10/93	GILC	Gilcrest	128	14
9/10/93	TN6	Swiss&monroe, Harris	125	18
9/11/93	HM01	HRM Site 1	189	13
9/11/93	TN20	Manchester C22, Harris	180	12
9/11/93	TN3	N Wayside, Harris	164	13
9/11/93	TN2	Crawford, Harris	163	12
9/11/93	HM03	HRM Site 3	158	13
9/11/93	TN4	Lang, Harris	147	13
9/11/93	HM07	HRM Site 7	146	12
9/11/93	HM04	HRM Site 4	138	13
9/11/93	HTCC	Texas Commerce Tower	136	12
9/11/93	SBRC	Seabrook C20	131	11
9/11/93	CRSC	Crosby Aq/Met Sites	126	13

August 17-19, 1993 Episode in Louisiana

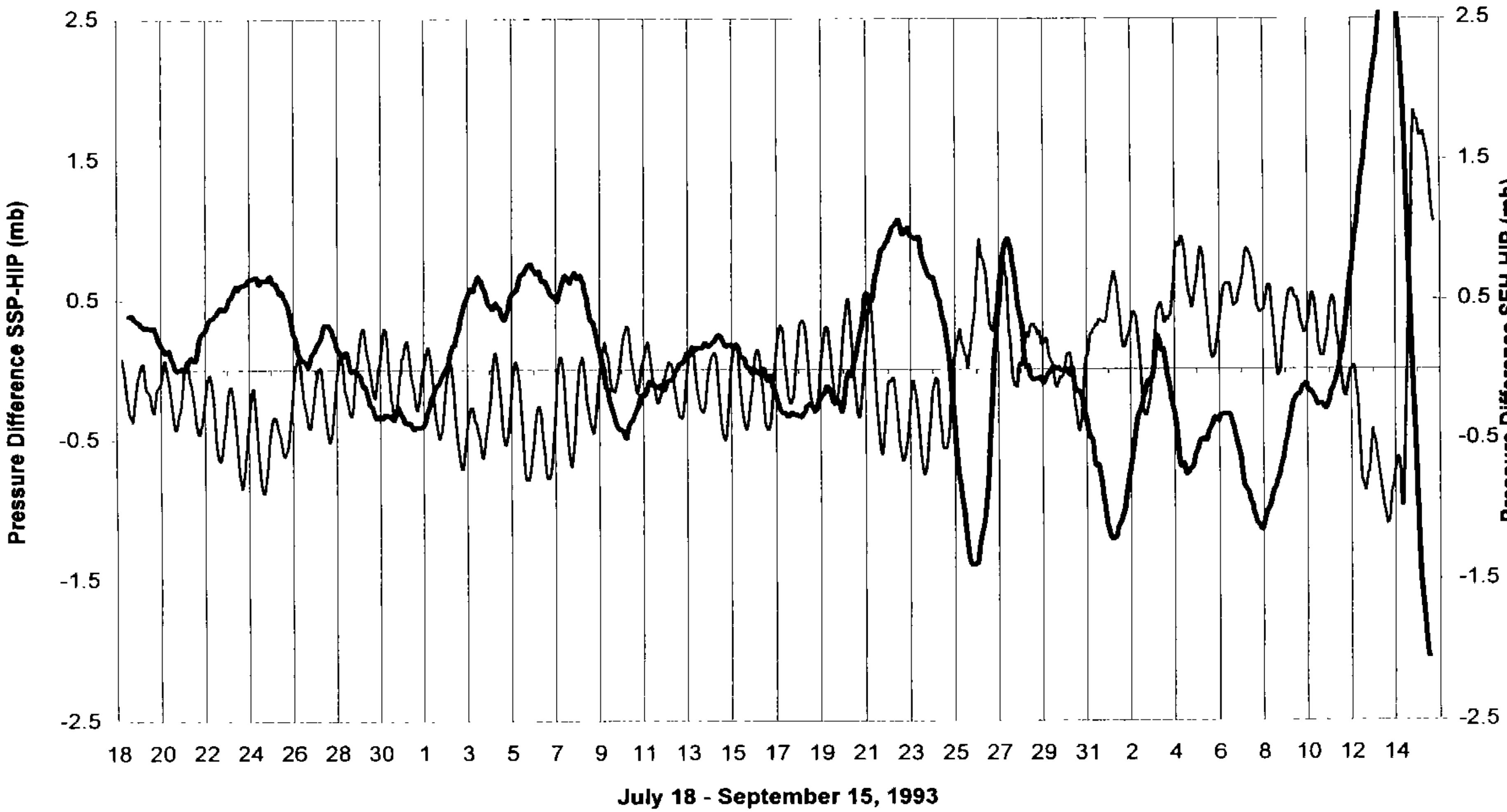
Date	Site ID	Location	Maximum Ozone Concentration (ppb)	Time of Maximum (CST)
8/18	LO2	East Baton Rouge, Highway 964	127	14
8/18	LO9	Ascension Par	127	15
8/19	LO9	Ascension Par	126	14

APPENDIX E

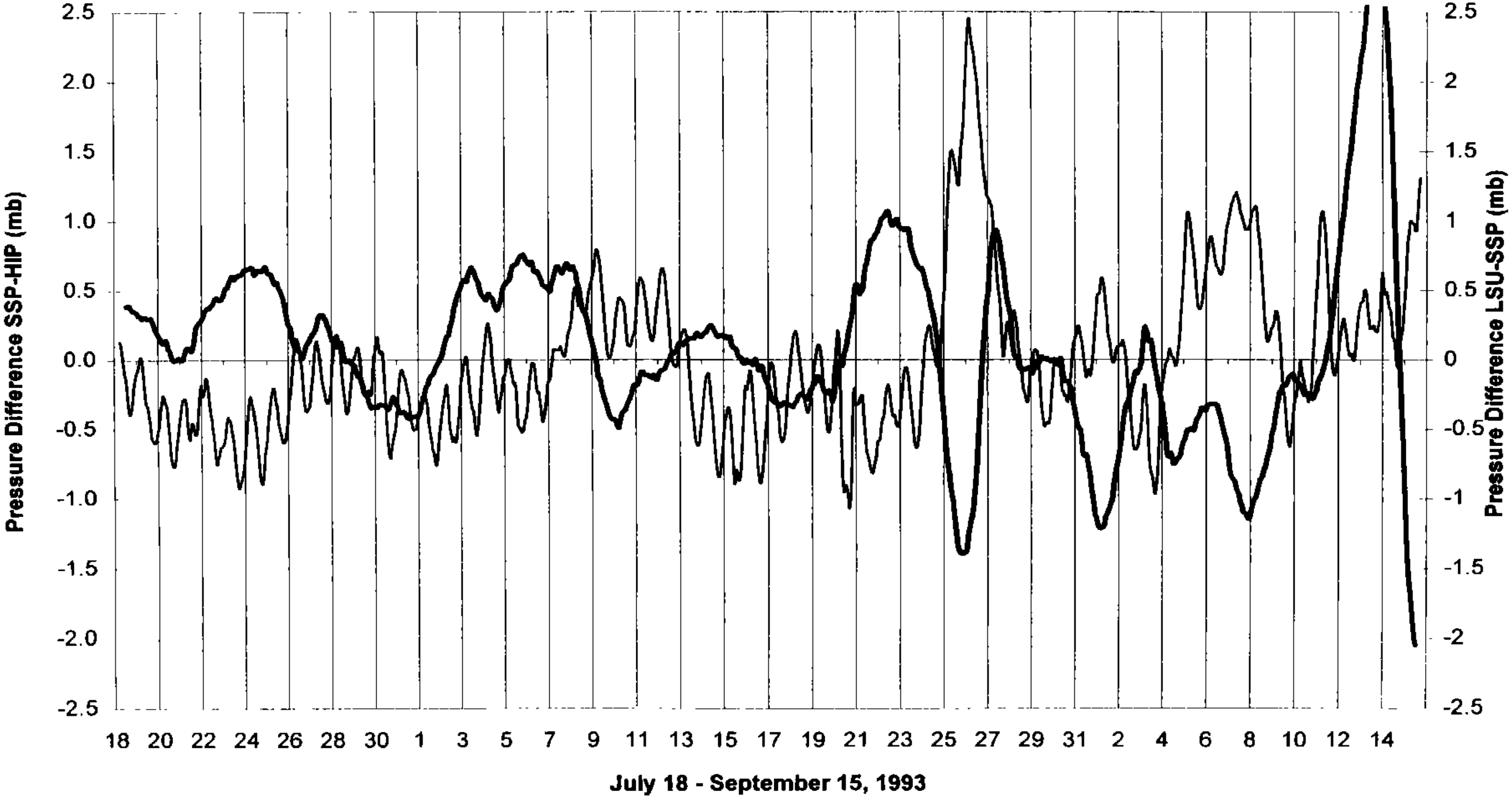
ANALYSES OF PRESSURE GRADIENTS AND ONSHORE-OFFSHORE WINDS IN SOUTHEAST TEXAS AND LOUISIANA

The figures in this appendix present additional analyses of synoptic-scale and mesoscale pressure gradients, and onshore-offshore wind components, in the southeast Texas and Louisiana areas of the GMAQS study region. Included with these figures are analyses of sea-level pressure differences (mb) across the Gulf of Mexico between the High Island and Ship Shoal Platform radar profiler sites, and onshore-offshore pressure differences between the LSU and Ship Shoal Platform profiler sites. Also included in this appendix are analyses of the onshore-offshore sea-level pressure (mb) and temperature (°C) differences between the Southeast Houston and High Island Platform radar profiler sites, and the component of the surface wind perpendicular to the coastline (V_n, m/s) at Southeast Houston and High Island, TX, for August 17 - August 21, 1993, and for September 7-11, 1993. Similar analyses are given for the profiler sites located in Louisiana during the August 19, 1993 ozone episode.

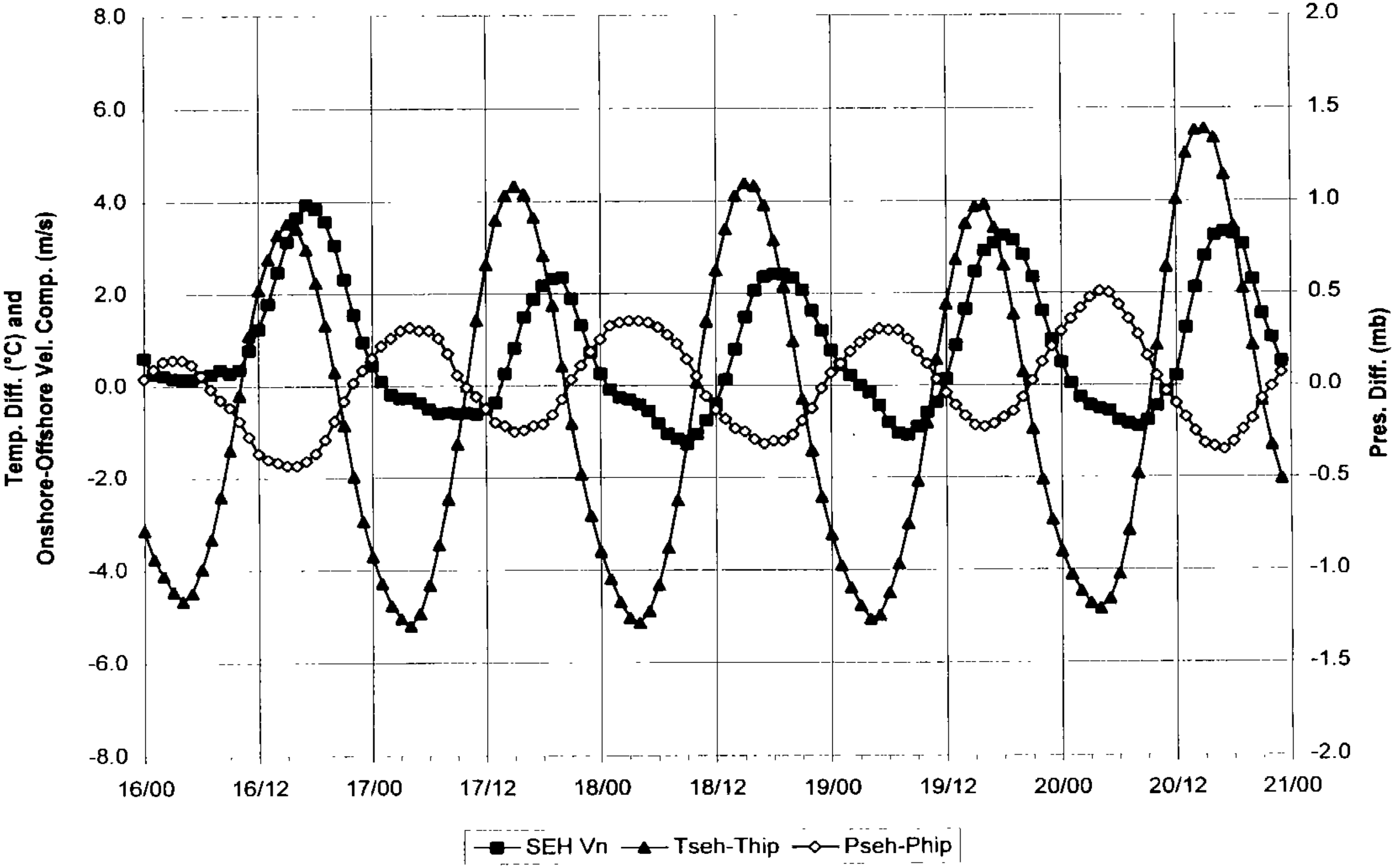
Sea Level Pressure Difference Between Ship Shoal (SSP) and High Island Platforms (HIP), and Between Southeast Houston (SEH) and HIP, July 18 - September 15, 1993



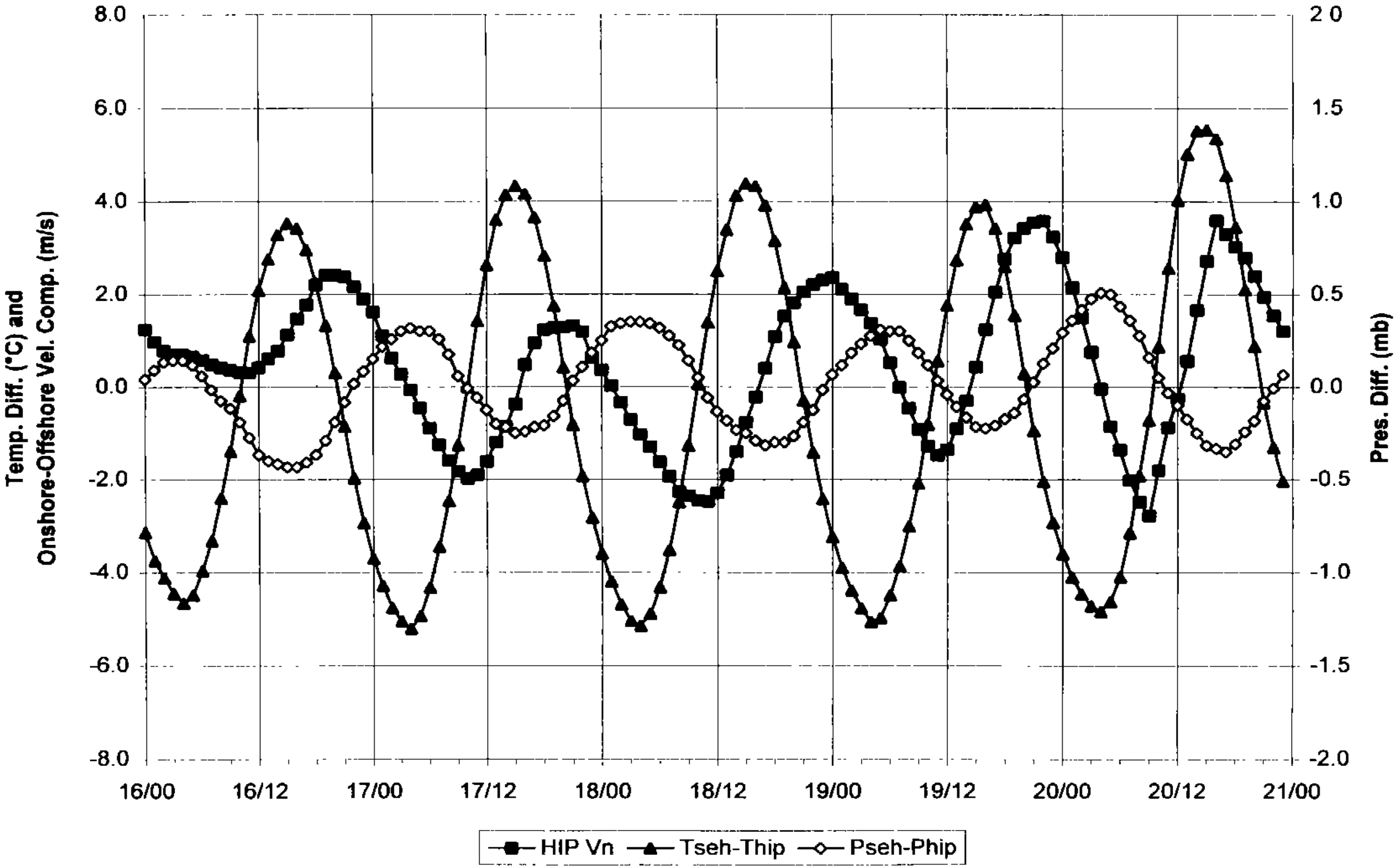
Sea-Level Pressure Difference Between Ship Shoal (SSP) and High Island Platforms (HIP), and Between LSU and SSP, July 18 - September 15, 1993



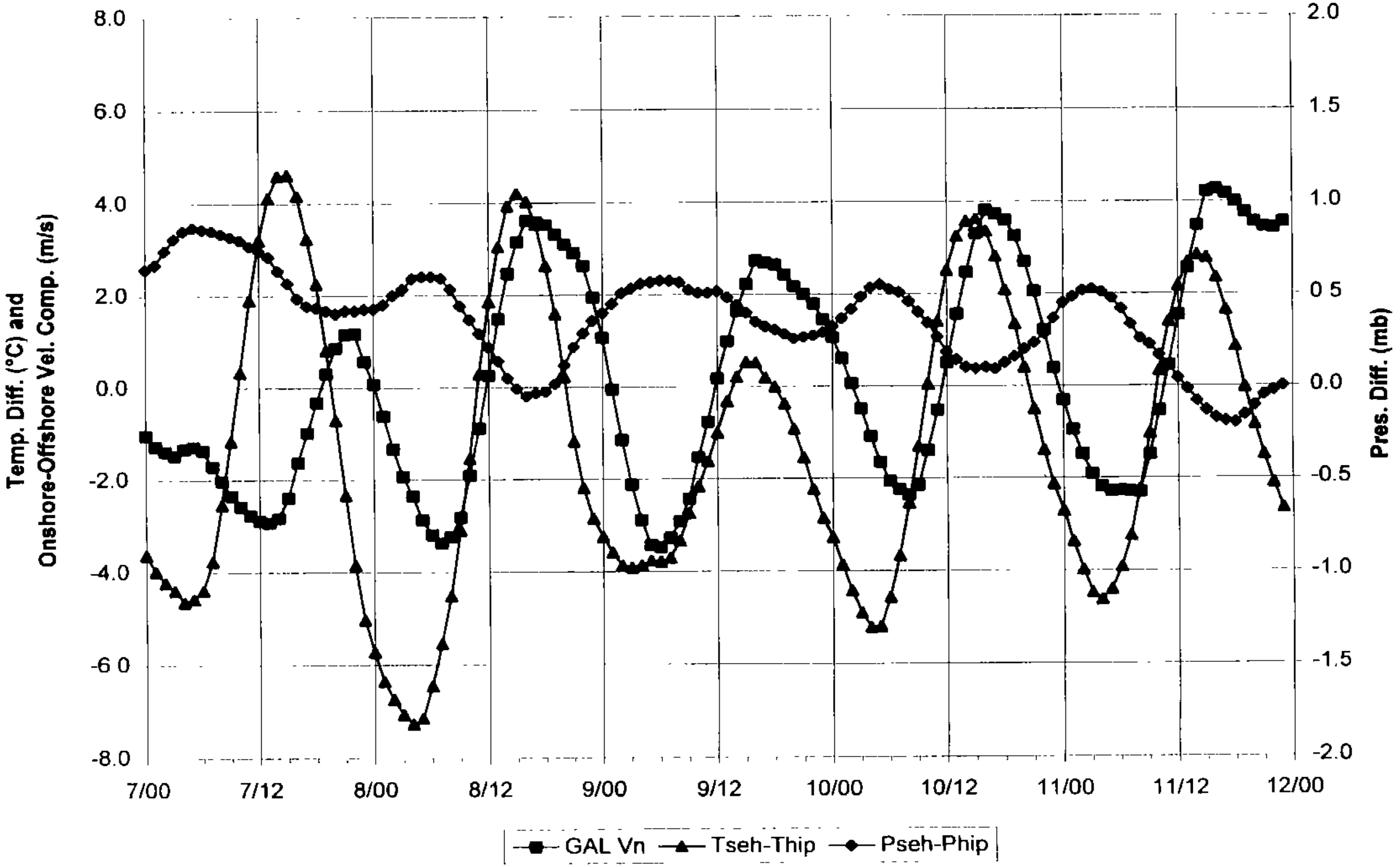
Onshore-Offshore Velocity Component (V_n) at Southeast Houston, and Temperature and Pressure Gradients Between Southeast Houston and High Island Platform, Aug. 16-20, 1993



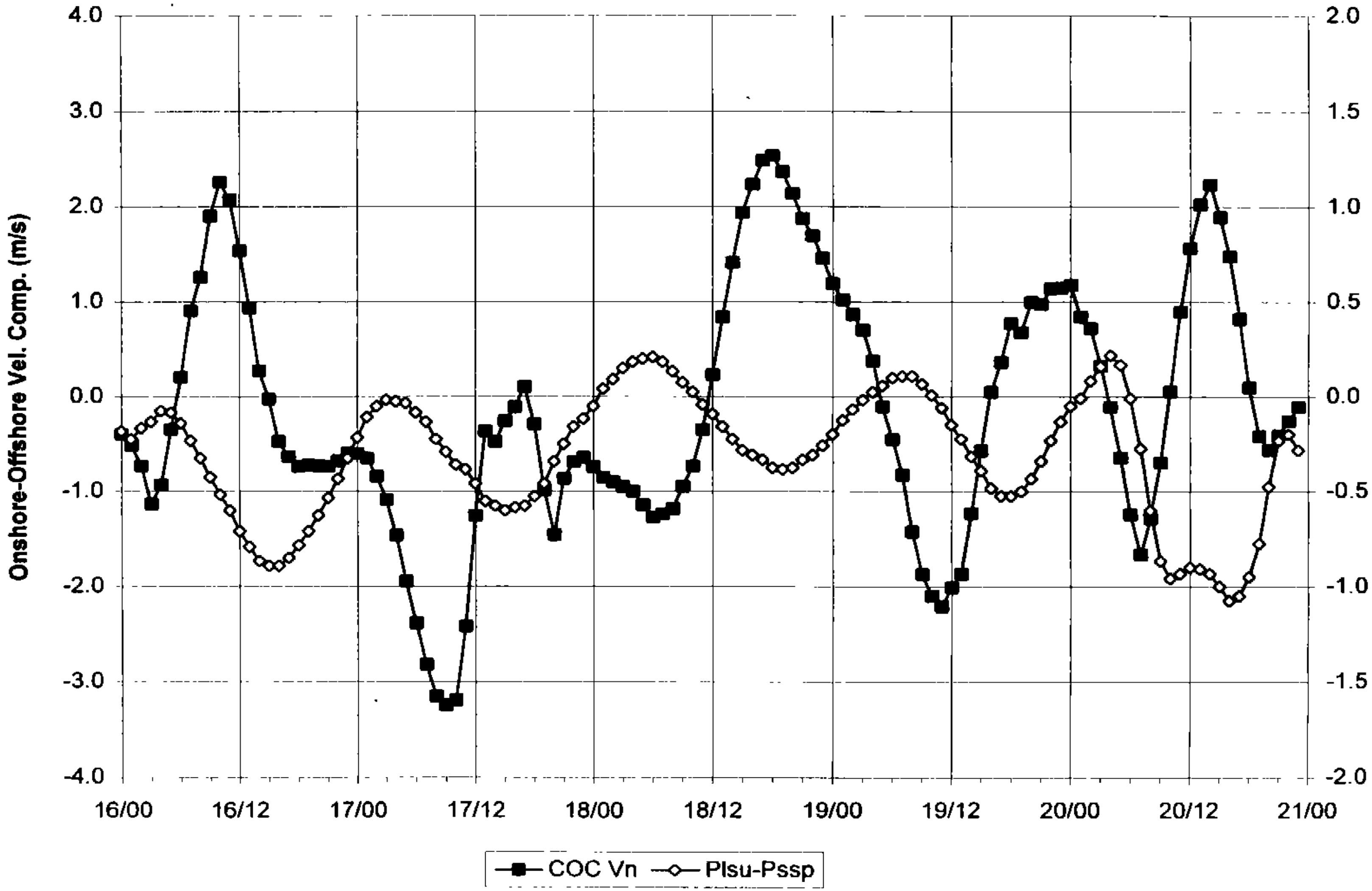
Onshore-Offshore Velocity Component (V_n) at High Island Platform, and Temperature and Pressure Gradients Between Southeast Houston and High Island Platform, Aug. 16-20, 1993



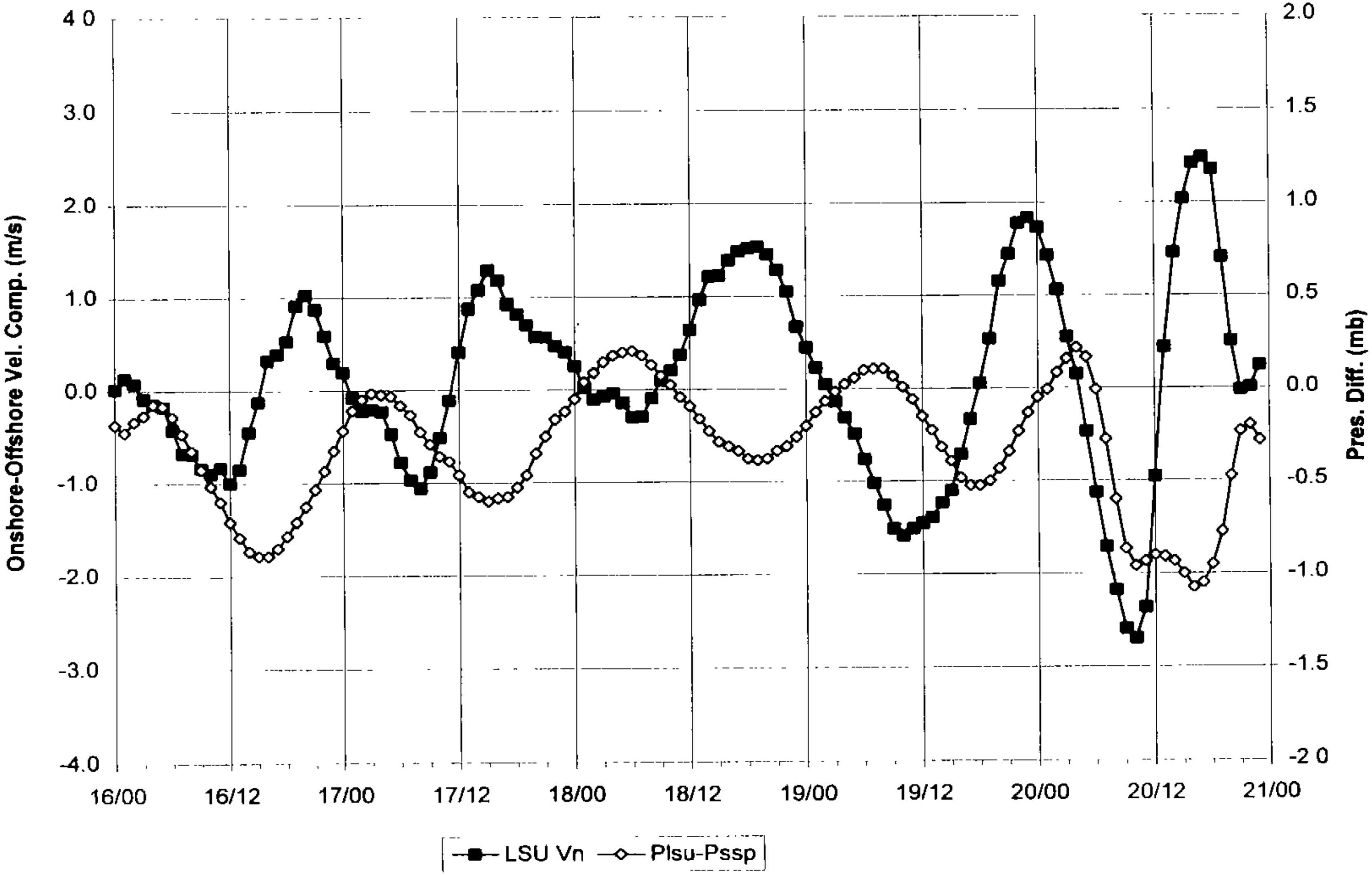
Onshore-Offshore Velocity Component (Galveston), Temperature Gradient, and Pressure Gradient Between SE Houston and High Island Platform Sept. 7-11, 1993

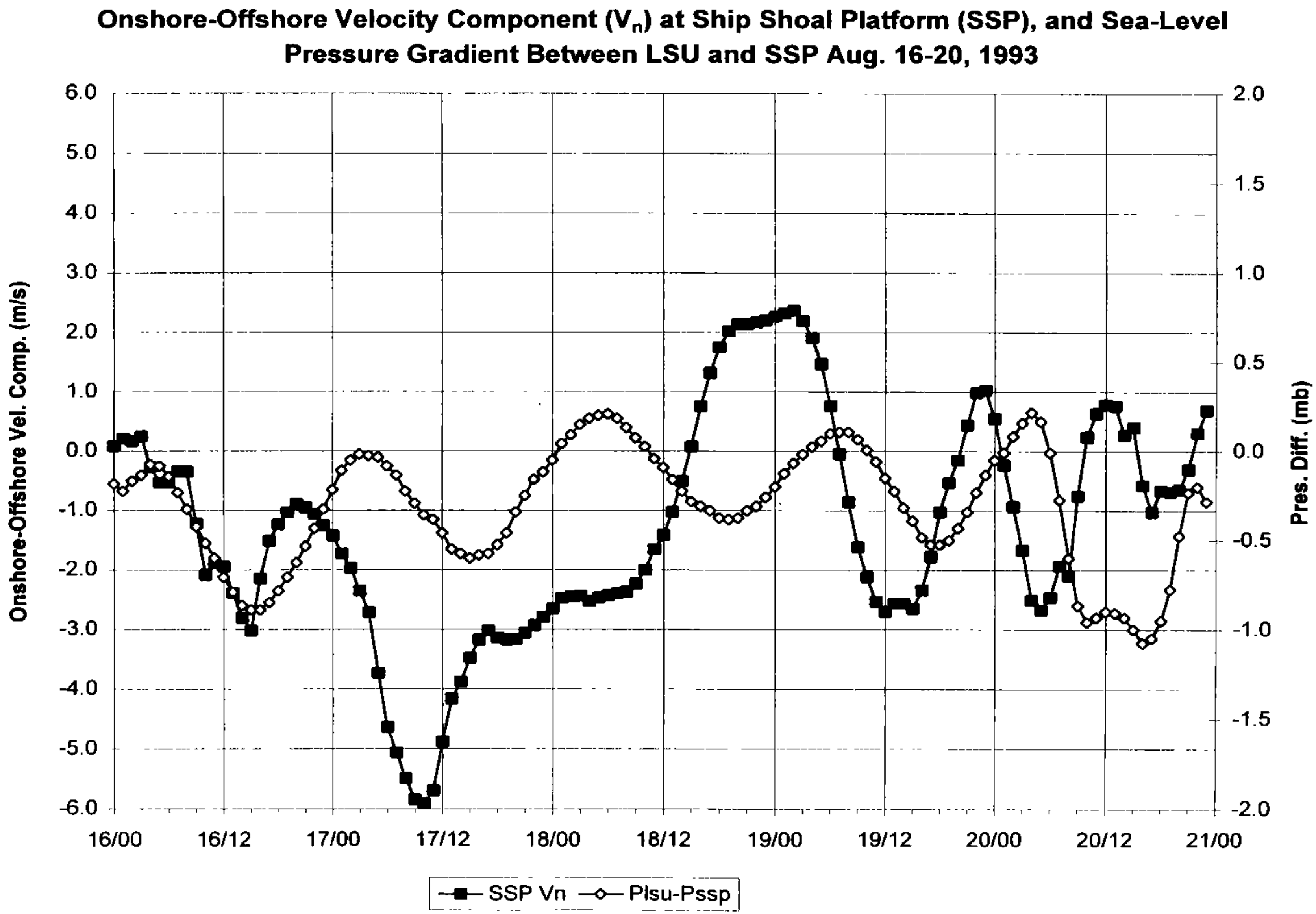


Onshore-Offshore Velocity Component (V_n) at Cocodrie, and Sea-Level Pressure Gradient Between LSU and Ship Shoal Platform Aug. 16-20, 1993



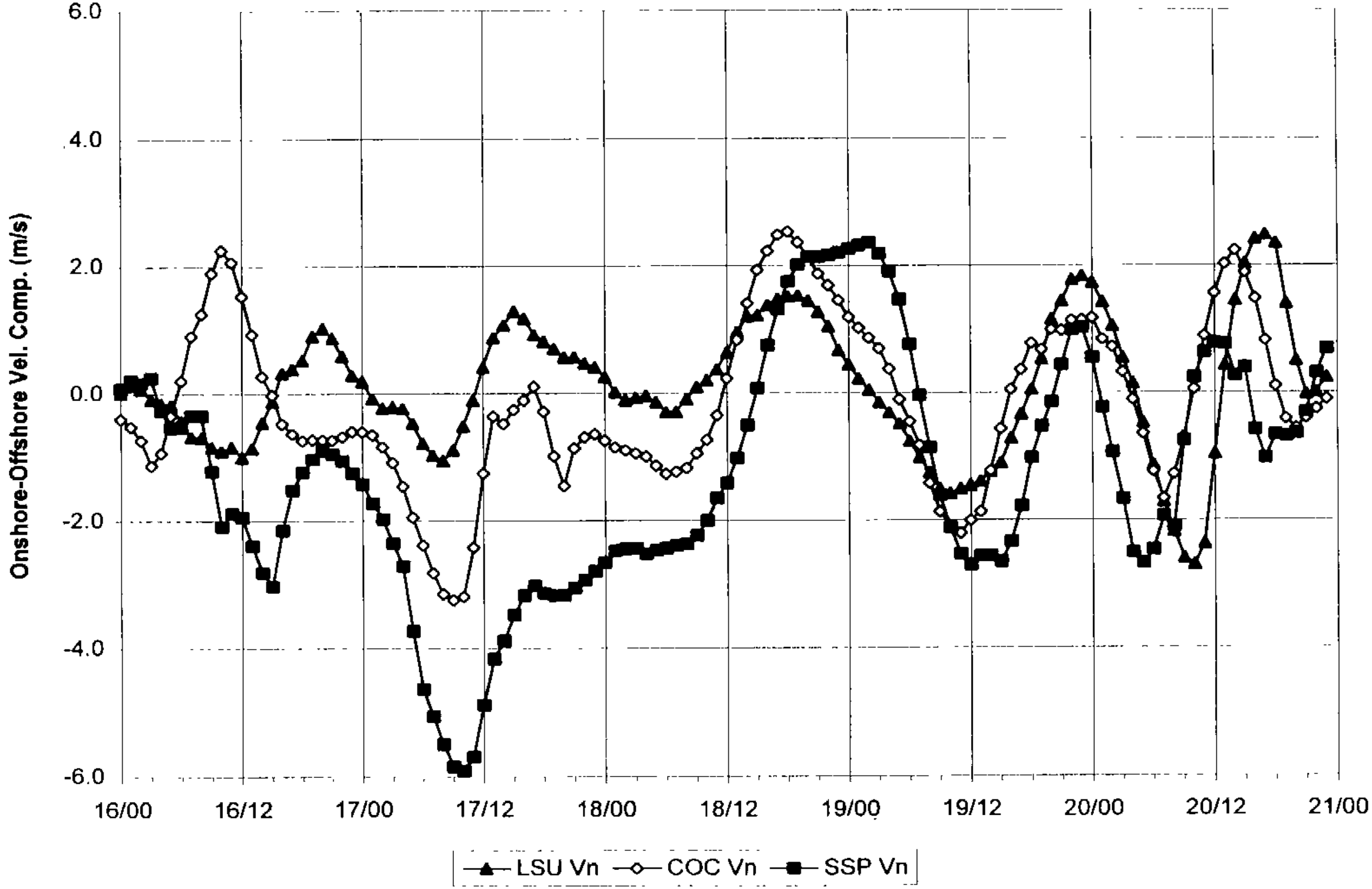
Onshore-Offshore Velocity Component (V_n) at LSU, and Sea-Level Pressure Gradient Between LSU and Ship Shoal Platform Aug. 16-20, 1993





Onshore-Offshore Velocity Component (V_n) at Ship Shoal Platform (SSP), and Sea-Level Pressure Gradient Between LSU and SSP Aug. 16-20, 1993
Onshore-Offshore Vel. Comp. (m/s)
Pres. Diff. (mb)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
16/00
16/12
17/00
17/12
18/00
18/12
19/00
19/12
20/00
20/12
21/00
SSP Vn
Plsu-Pssp

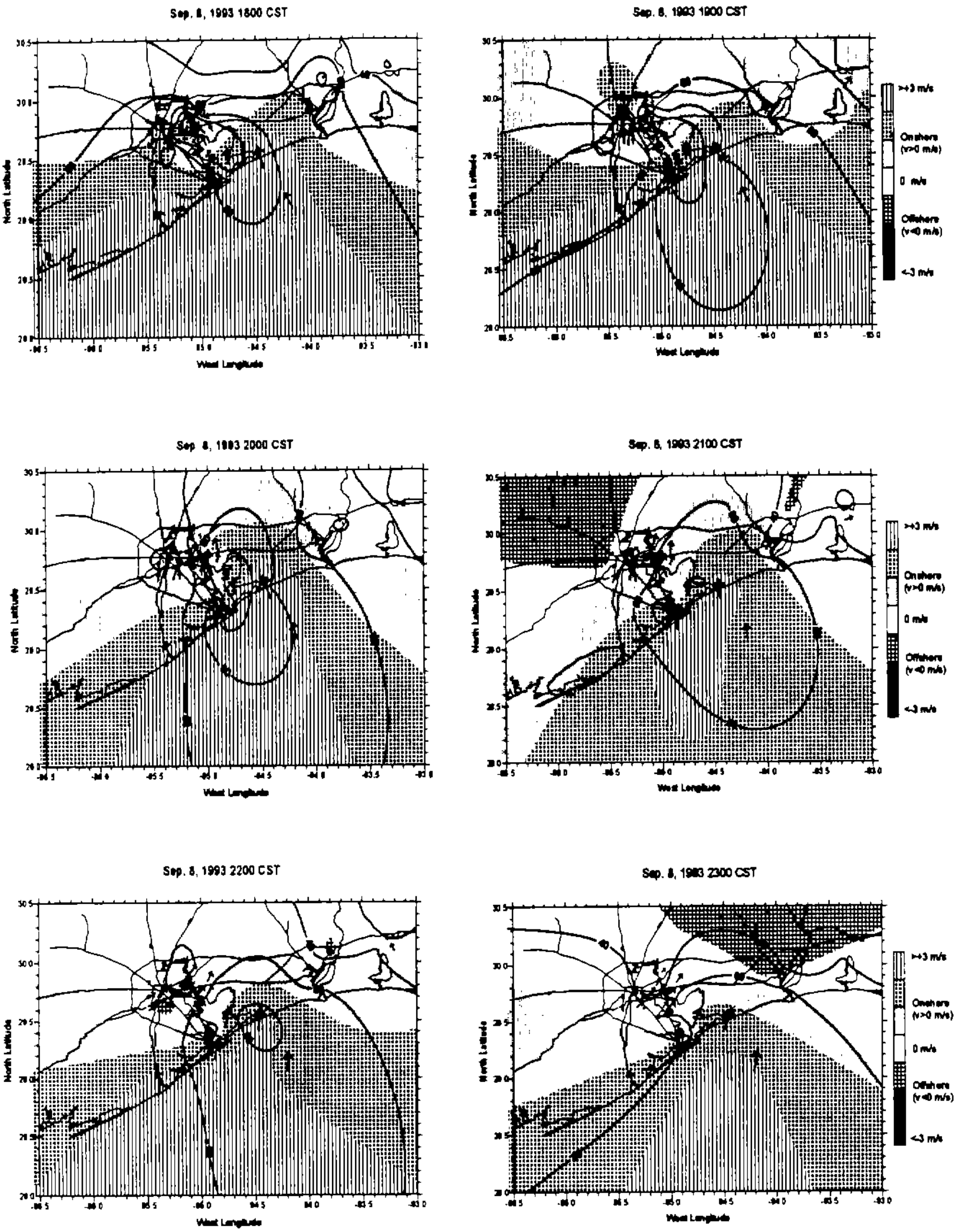
Onshore-Offshore Velocity Component (V_n) at LSU, Cocodrie, and Ship Shoal Platform
Aug. 16-20, 1993

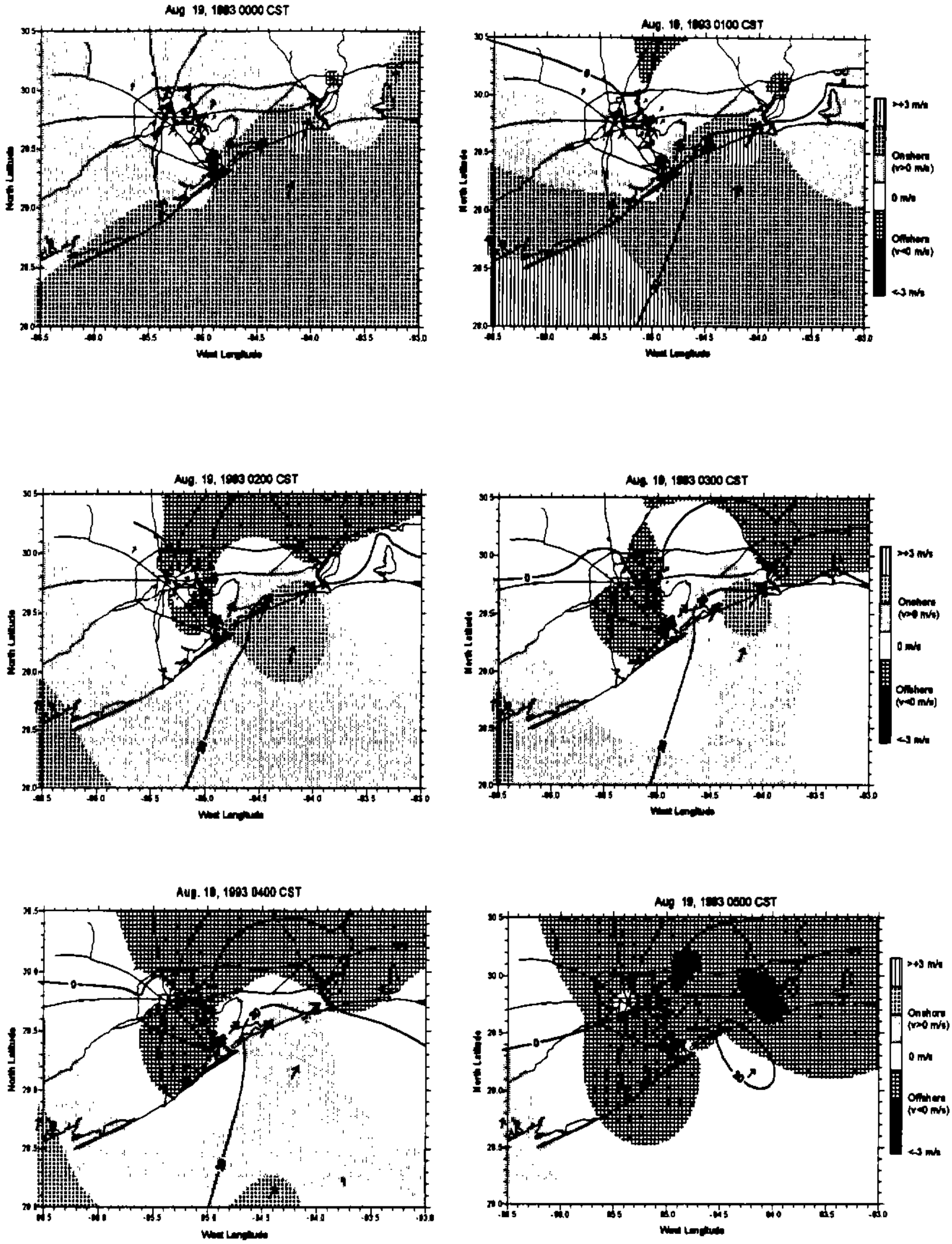


APPENDIX F

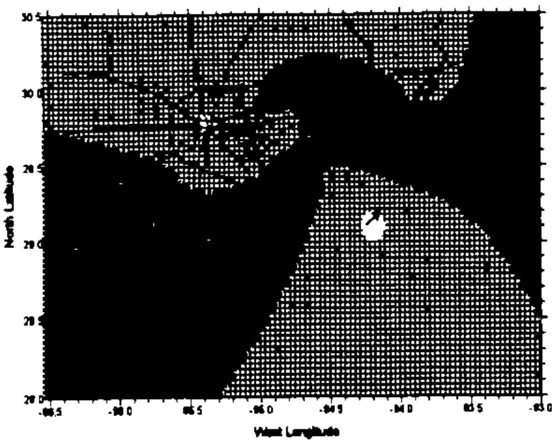
ANALYSES OF HOURLY SURFACE OZONE CONCENTRATIONS, ONSHORE-OFFSHORE VELOCITY COMPONENTS, AND SURFACE WINDS IN SOUTHEAST TEXAS ON AUGUST 19, 1993 AND SEPTEMBER 8, 1993

This appendix contains additional analyses of surface ozone, surface winds, and the onshore-offshore component of the airflow perpendicular to the coastline in southeast Texas for August 19, 1993 and September 8, 1993. These figures show isopleths of ozone concentrations (ppb), the onshore-offshore component of the surface wind perpendicular to the shoreline (V_n, m/s), and surface winds for each hour on August 19 and September 8.

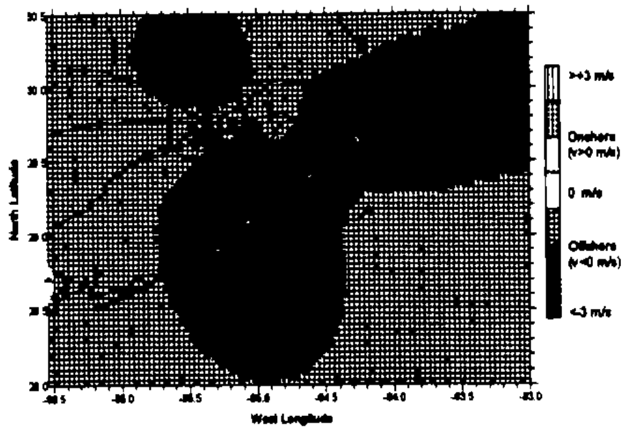

Sep. 8, 1993 1800 CST
Sep. 8, 1993 1900 CST
Sep. 8, 1993 2000 CST
Sep. 8, 1993 2100 CST
Sep. 8, 1993 2200 CST
Sep. 8, 1993 2300 CST
North Latitude
West Longitude
>+3 m/s
Onshore (v>0 m/s)
0 m/s
Offshore (v<0 m/s)
<-3 m/s


Aug 19, 1993 0000 CST
Aug. 19, 1993 0100 CST
Aug. 19, 1993 0200 CST
Aug. 19, 1993 0300 CST
Aug. 19, 1993 0400 CST
Aug 19, 1993 0500 CST
North Latitude
West Longitude
>+3 m/s
Onshore (v>0 m/s)
0 m/s
Offshore (v<0 m/s)
<-3 m/s

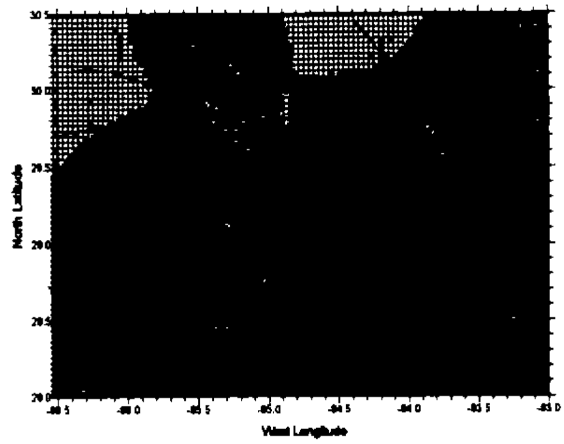
Aug. 19, 1993 0600 CST



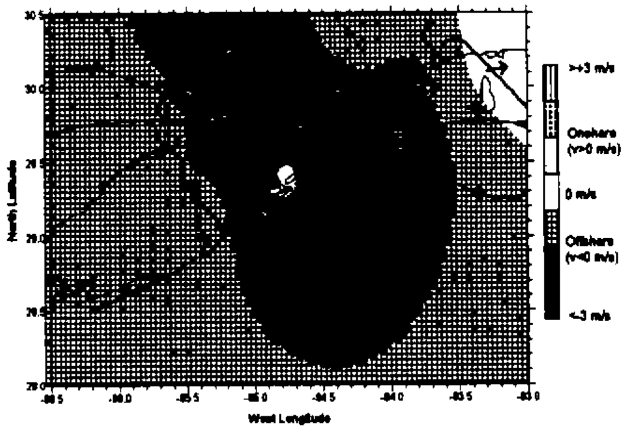
Aug. 19, 1993 0700 CST



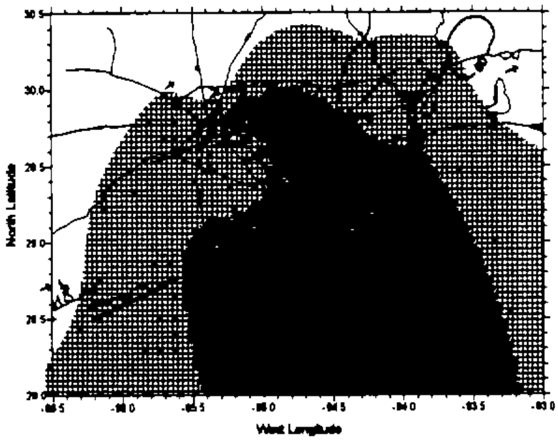
Aug. 19, 1993 0800 CST



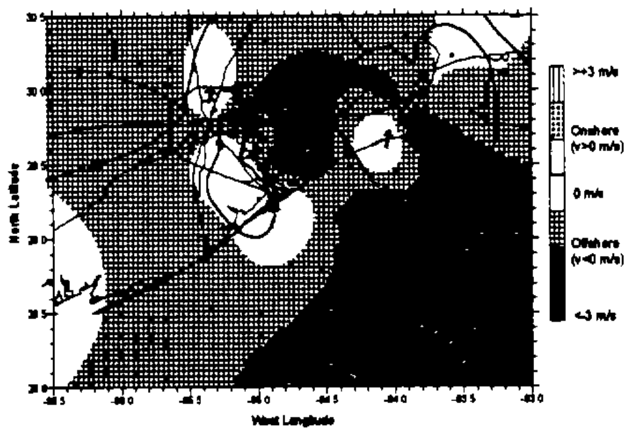
Aug. 19, 1993 0900 CST

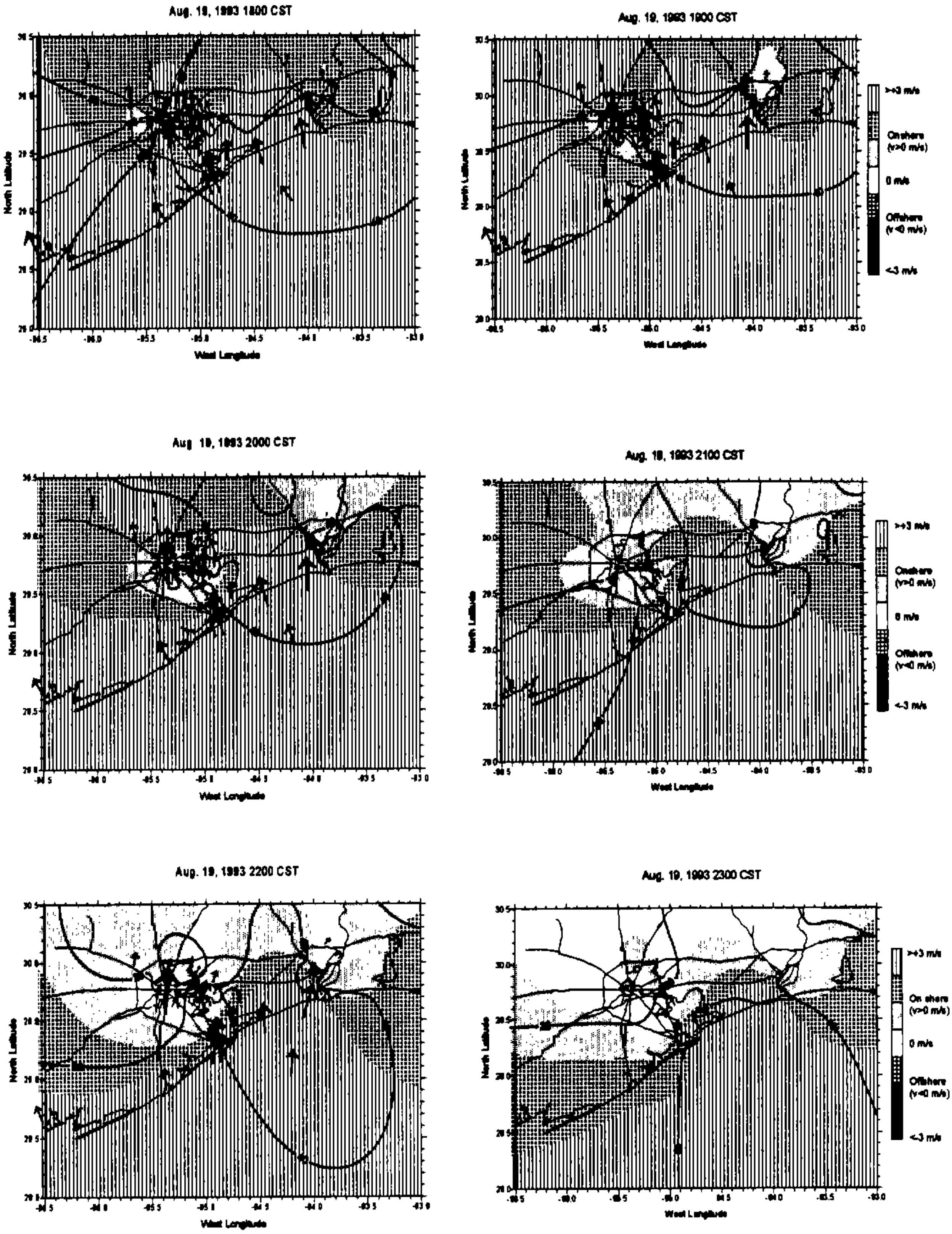


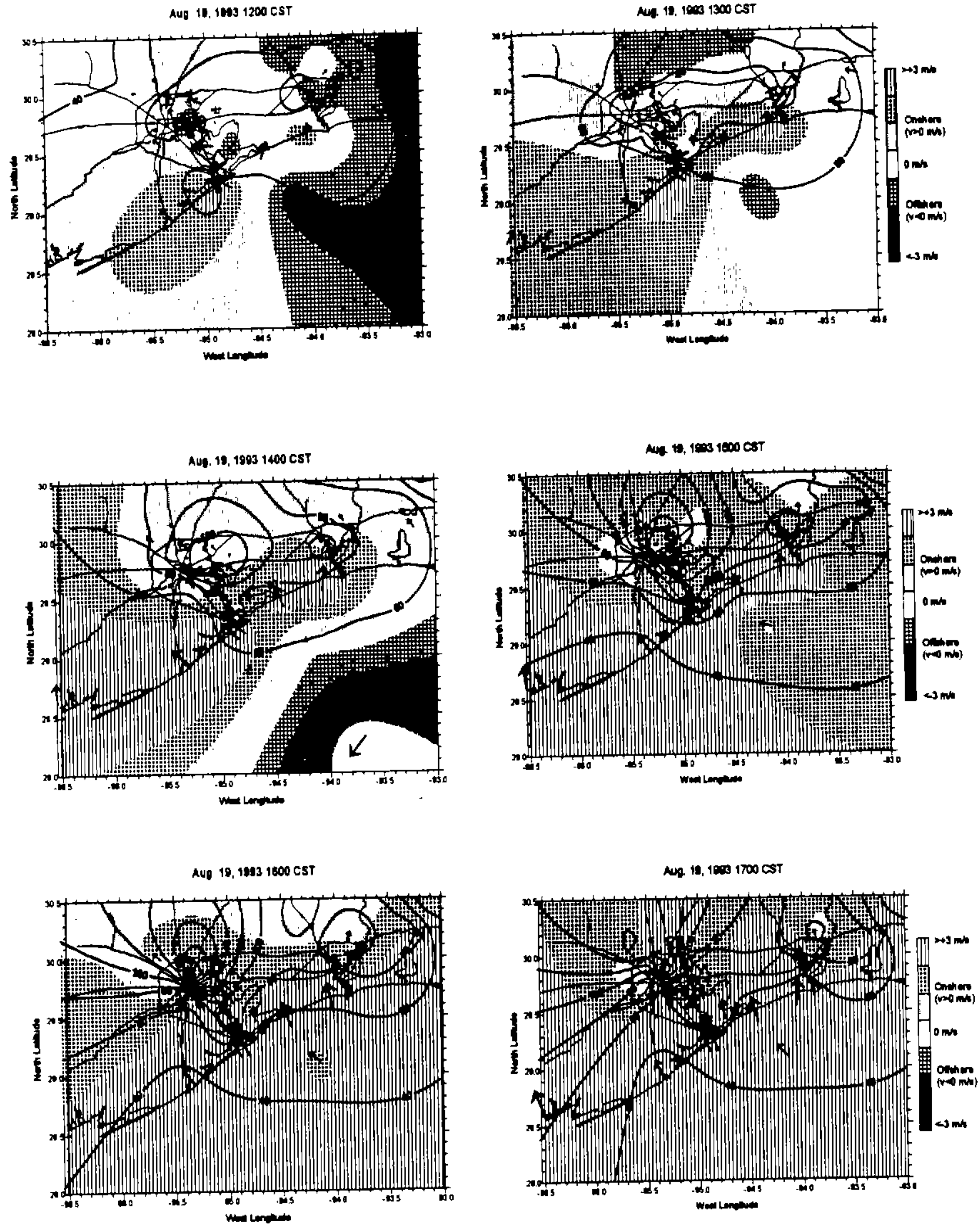
Aug. 19, 1993 1000 CST



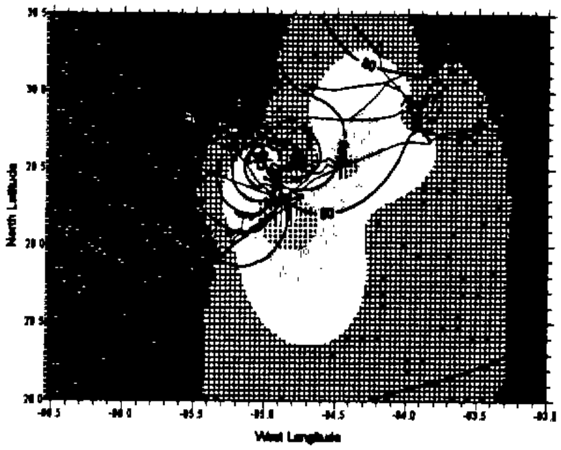
Aug. 19, 1993 1100 CST



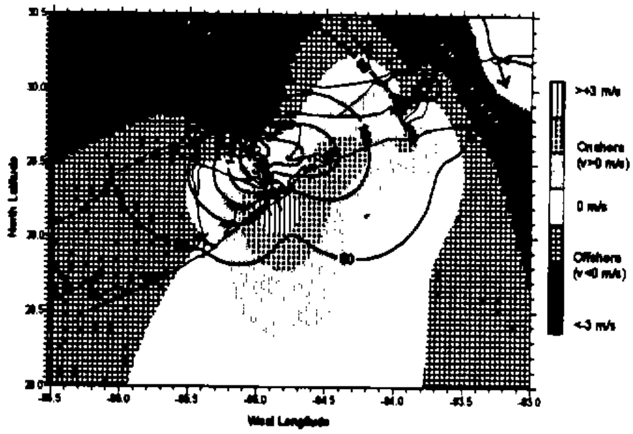

Aug. 19, 1993 1800 CST
Aug. 19, 1993 1900 CST
Aug. 19, 1993 2000 CST
Aug. 19, 1993 2100 CST
Aug. 19, 1993 2200 CST
Aug. 19, 1993 2300 CST
North Latitude
West Longitude
>+3 m/s
Onshore (v>0 m/s)
0 m/s
Offshore (v<0 m/s)
<-3 m/s


Aug. 19, 1993 1200 CST
Aug. 19, 1993 1300 CST
Aug. 19, 1993 1400 CST
Aug. 19, 1993 1500 CST
Aug. 19, 1993 1600 CST
Aug. 19, 1993 1700 CST
North Latitude
West Longitude
>+3 m/s
Onshore (v>0 m/s)
0 m/s
Offshore (v<0 m/s)
<-3 m/s

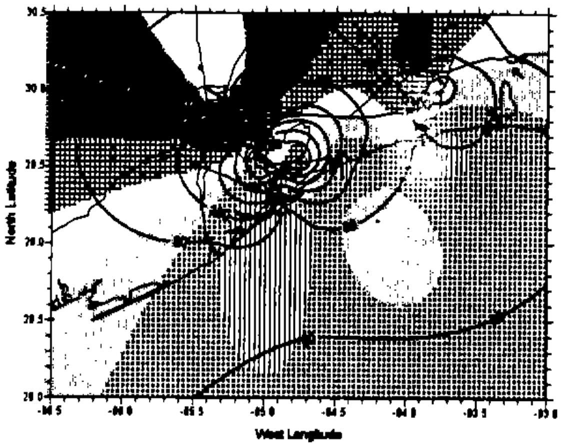
Sep. 8, 1993 1200 CST



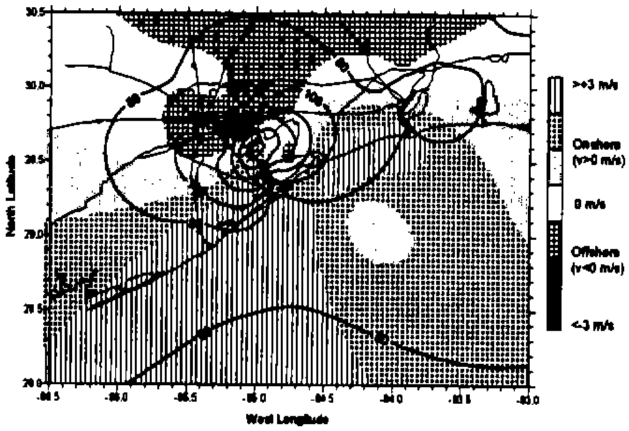
Sep. 8, 1993 1300 CST



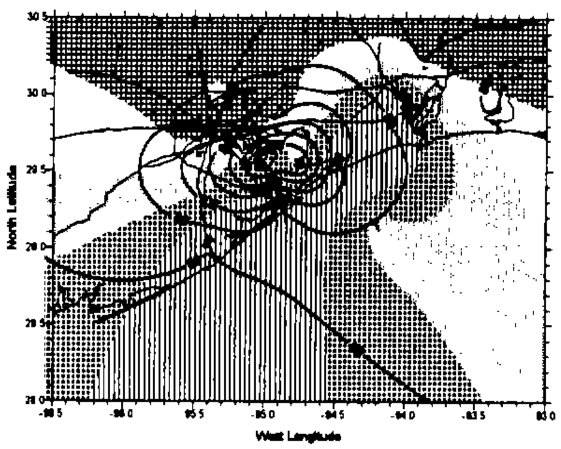
Sep. 8, 1993 1400 CST



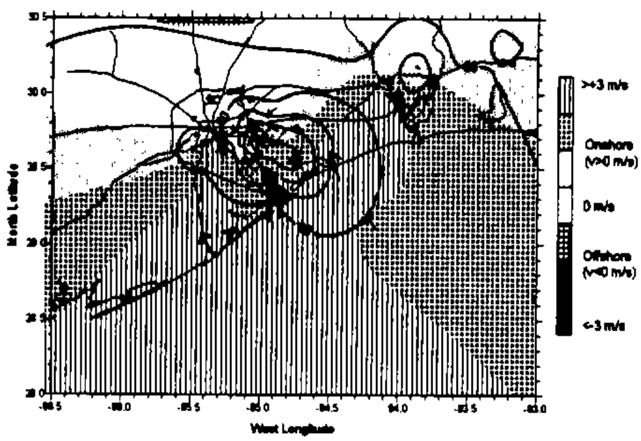
Sep. 8, 1993 1500 CST

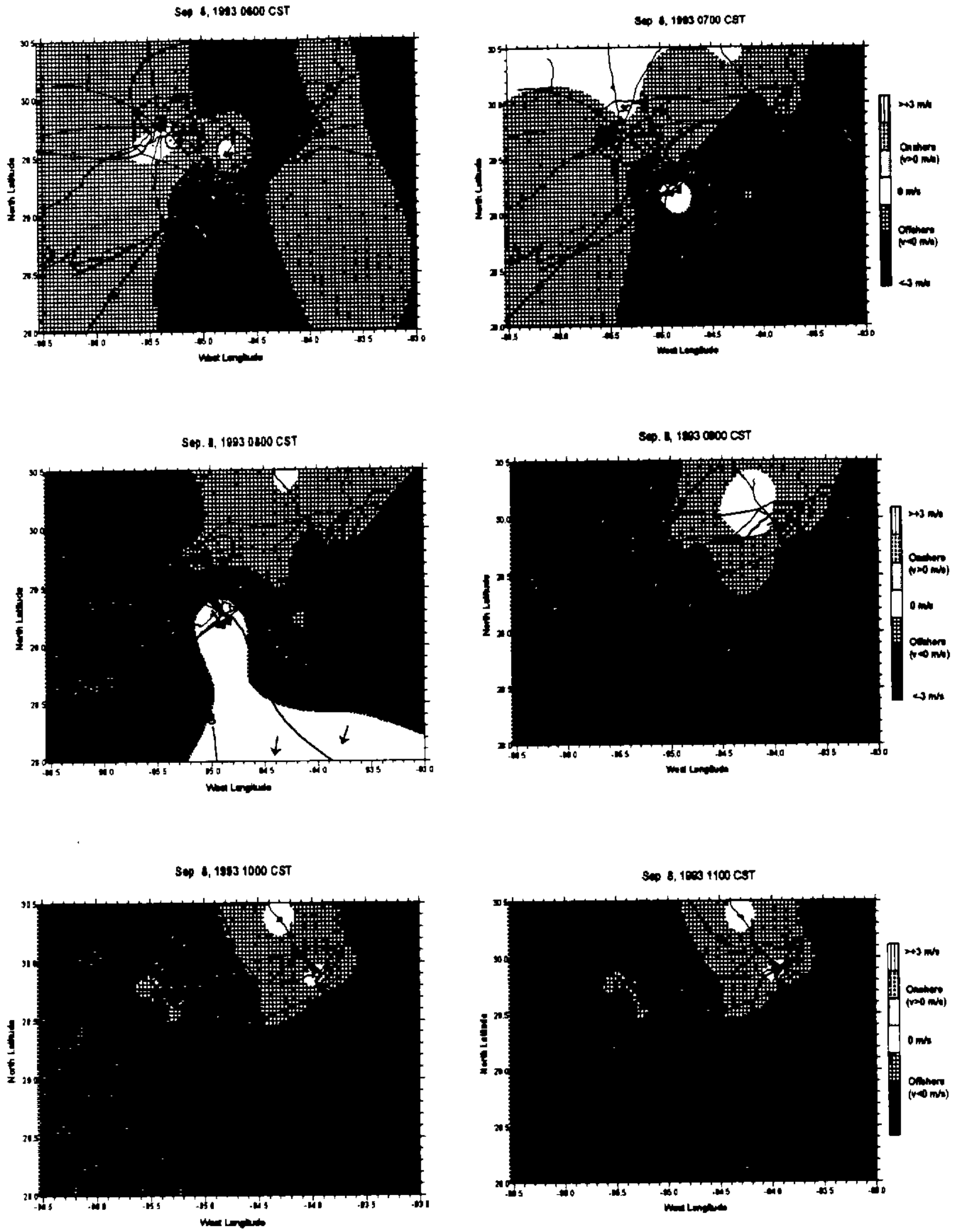


Sep. 8, 1993 1600 CST

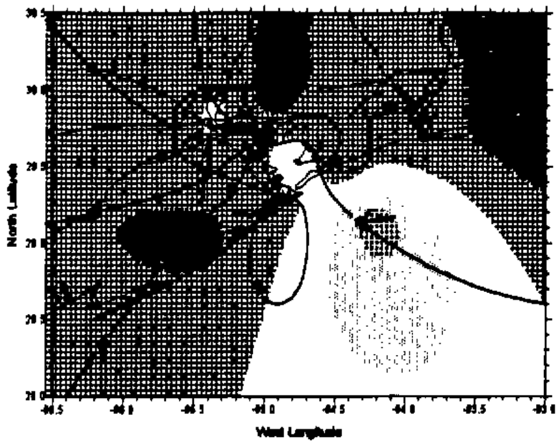


Sep. 8, 1993 1700 CST

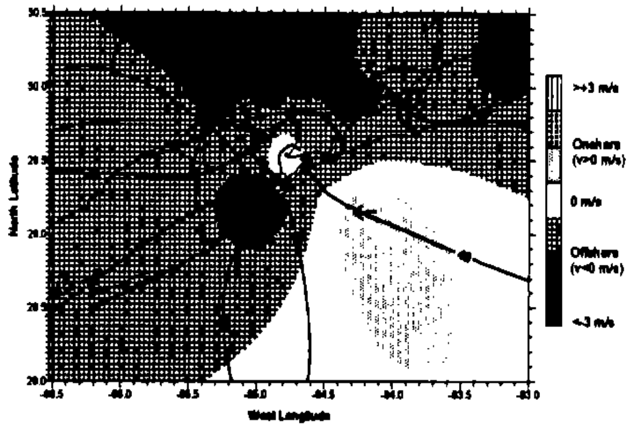



Sep 8, 1993 0600 CST
North Latitude
West Longitude
Sep 8, 1993 0700 CST
>+3 m/s
Onshore (v>0 m/s)
0 m/s
Offshore (v<0 m/s)
<-3 m/s
Sep. 8, 1993 0800 CST
Sep. 8, 1993 0900 CST
Sep 8, 1993 1000 CST
Sep 8, 1993 1100 CST

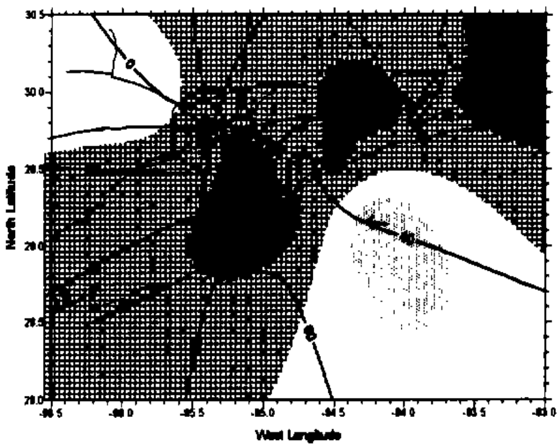
Sep. 8, 1993 0000 CST



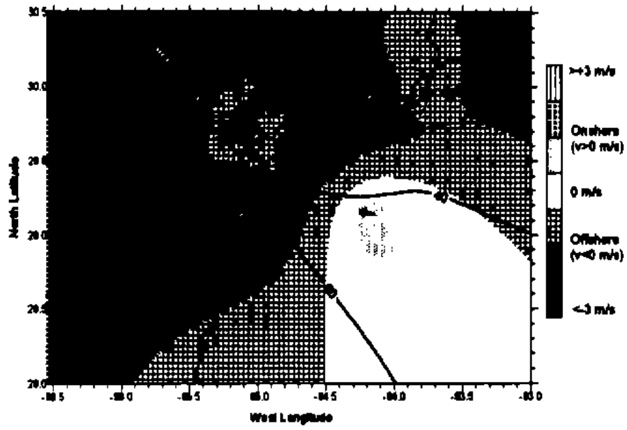
Sep. 8, 1993 0100 CST



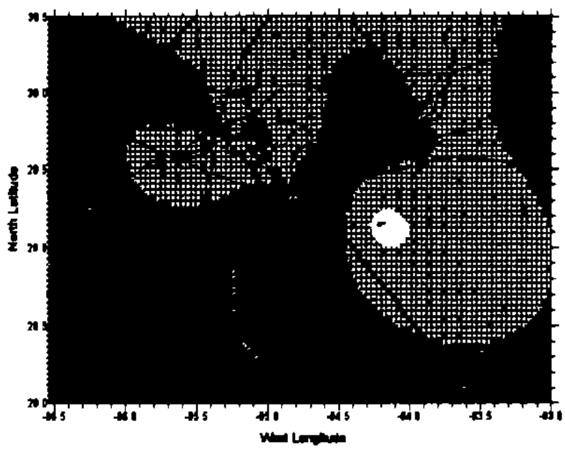
Sep. 8, 1993 0200 CST



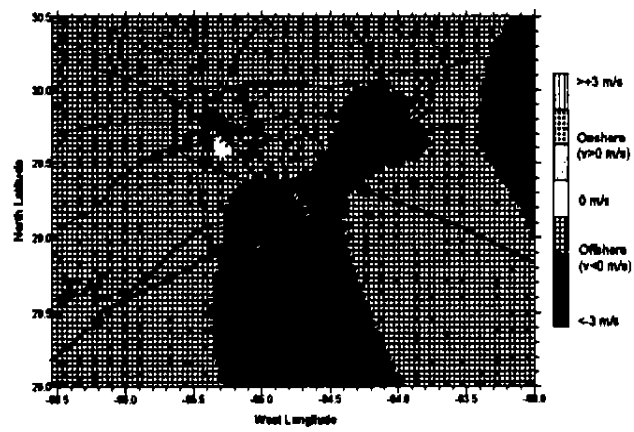
Sep. 8, 1993 0300 CST



Sep. 8, 1993 0400 CST



Sep. 8, 1993 0500 CST

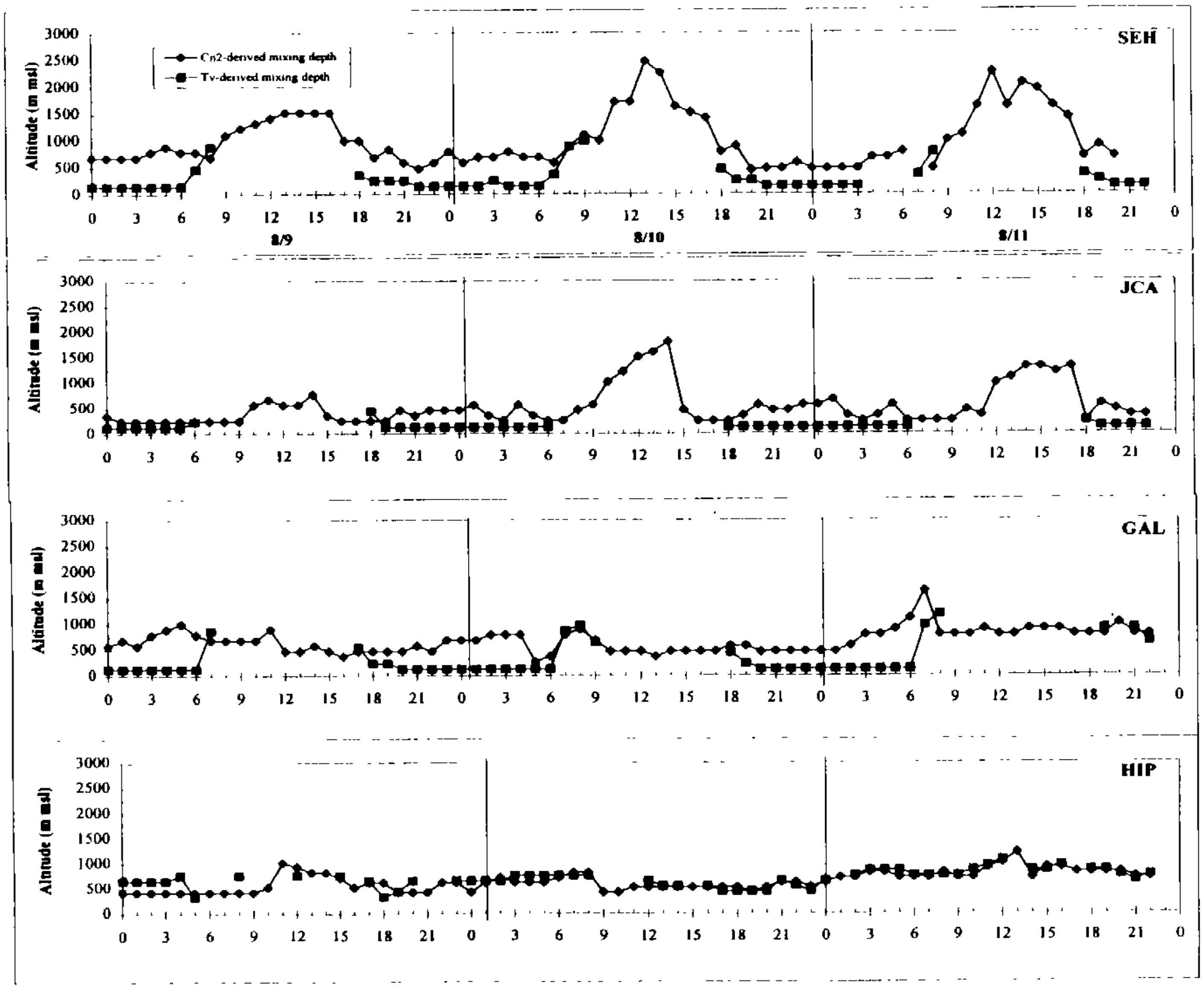


APPENDIX G

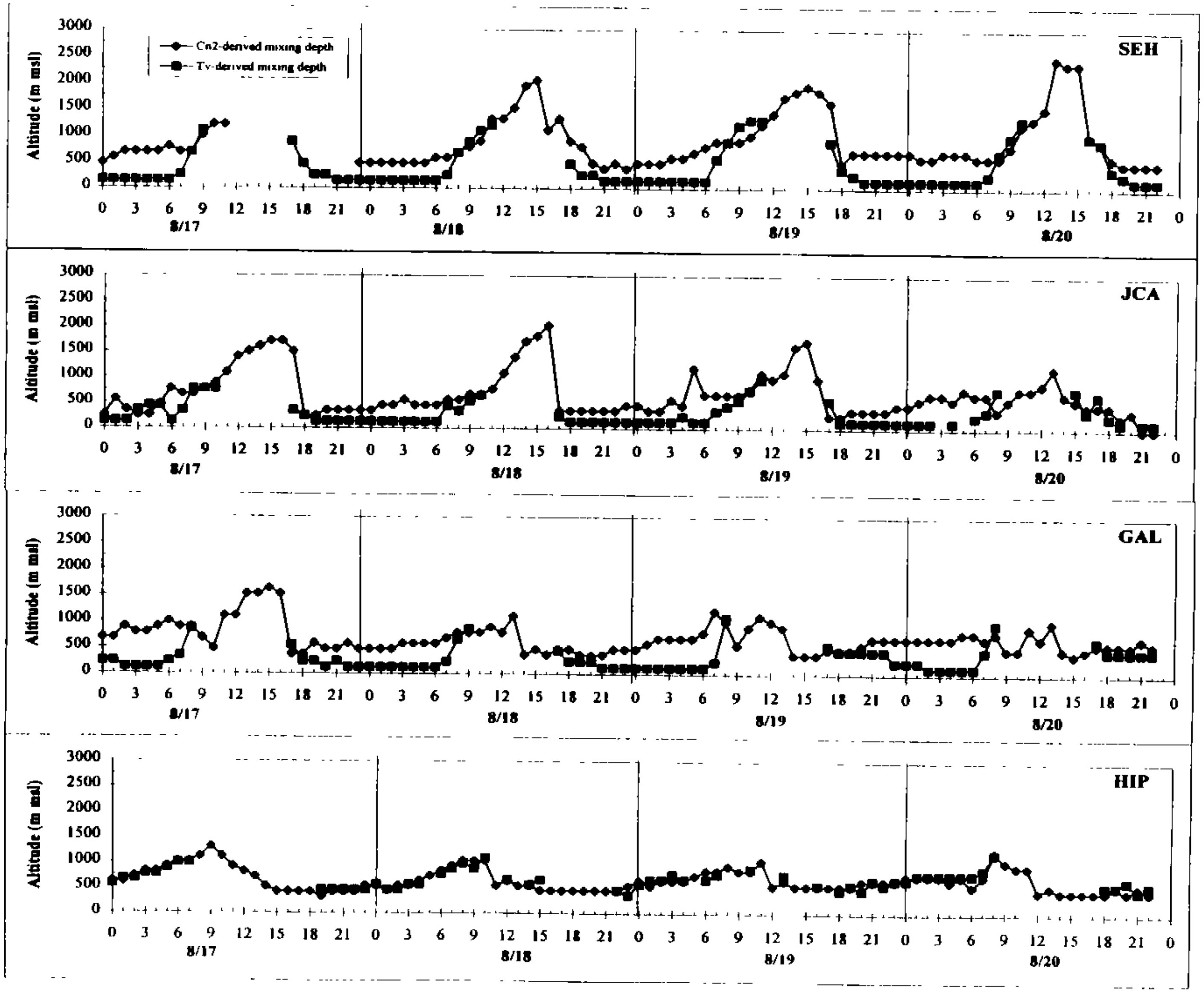
PLOTS OF MIXING DEPTH DERIVED FROM C_n^2 AND VIRTUAL TEMPERATURE DATA

This appendix contains time-series plots of mixing depth at each profiler site for the four ozone episodes discussed in this report. The time-series plot shows mixing depths at each site for all days in the episode. These mixing depths were estimated using C_n^2 and virtual temperature data as described in the section on Analyses of Mixing Depths and Boundary Layer Development. At night the mixing depth computed from the virtual temperature data provides a better estimate of surface-based mixing while the C_n^2-derived mixing depths during the daytime provide an estimate of the mixing in the convective boundary layer. Mixing depths are reported in meters above mean sea level and the time standard is Central Standard Time (CST).

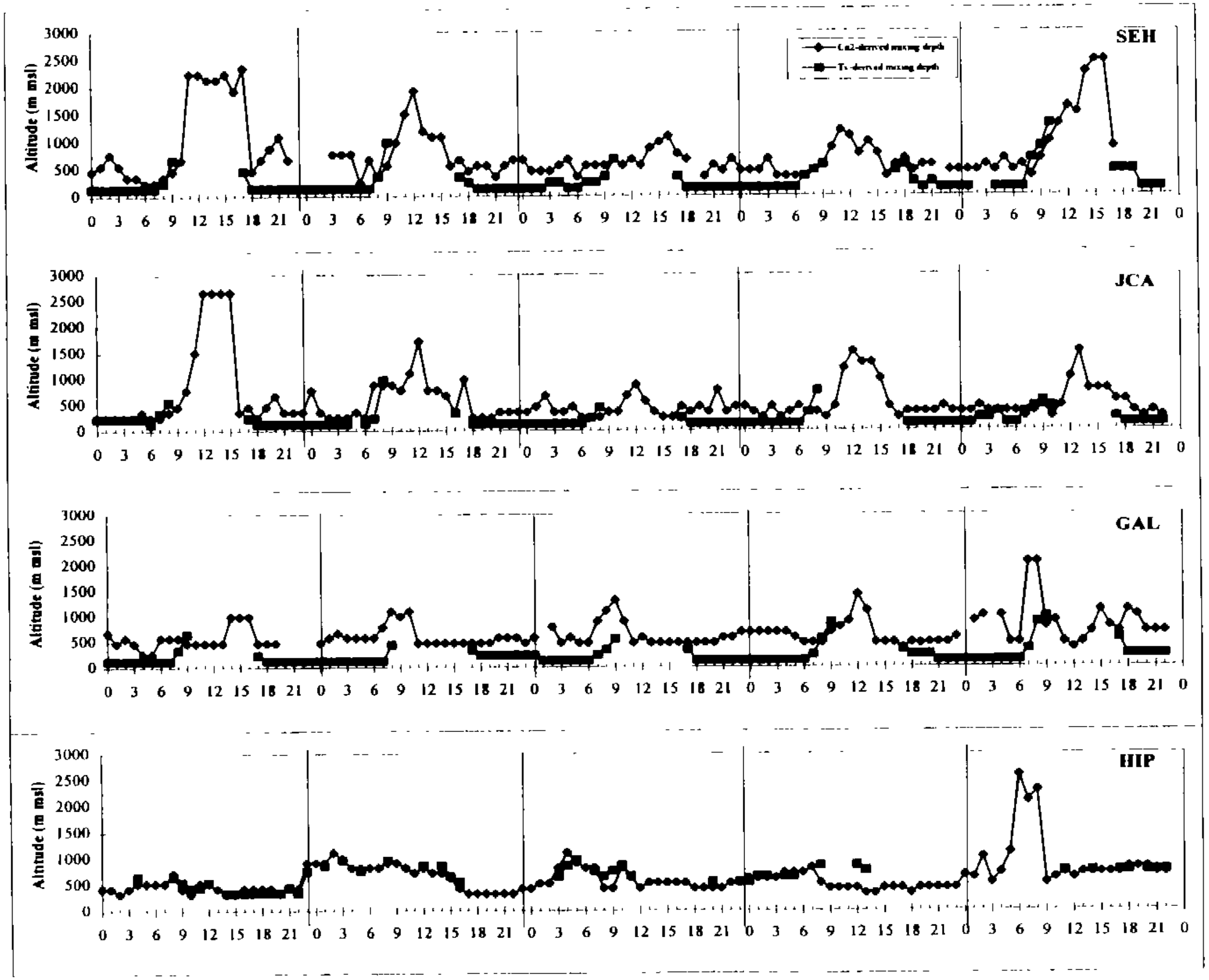
Gulf of Mexico Air Quality Study
Mixing Depth Analysis
August 9-11, 1993



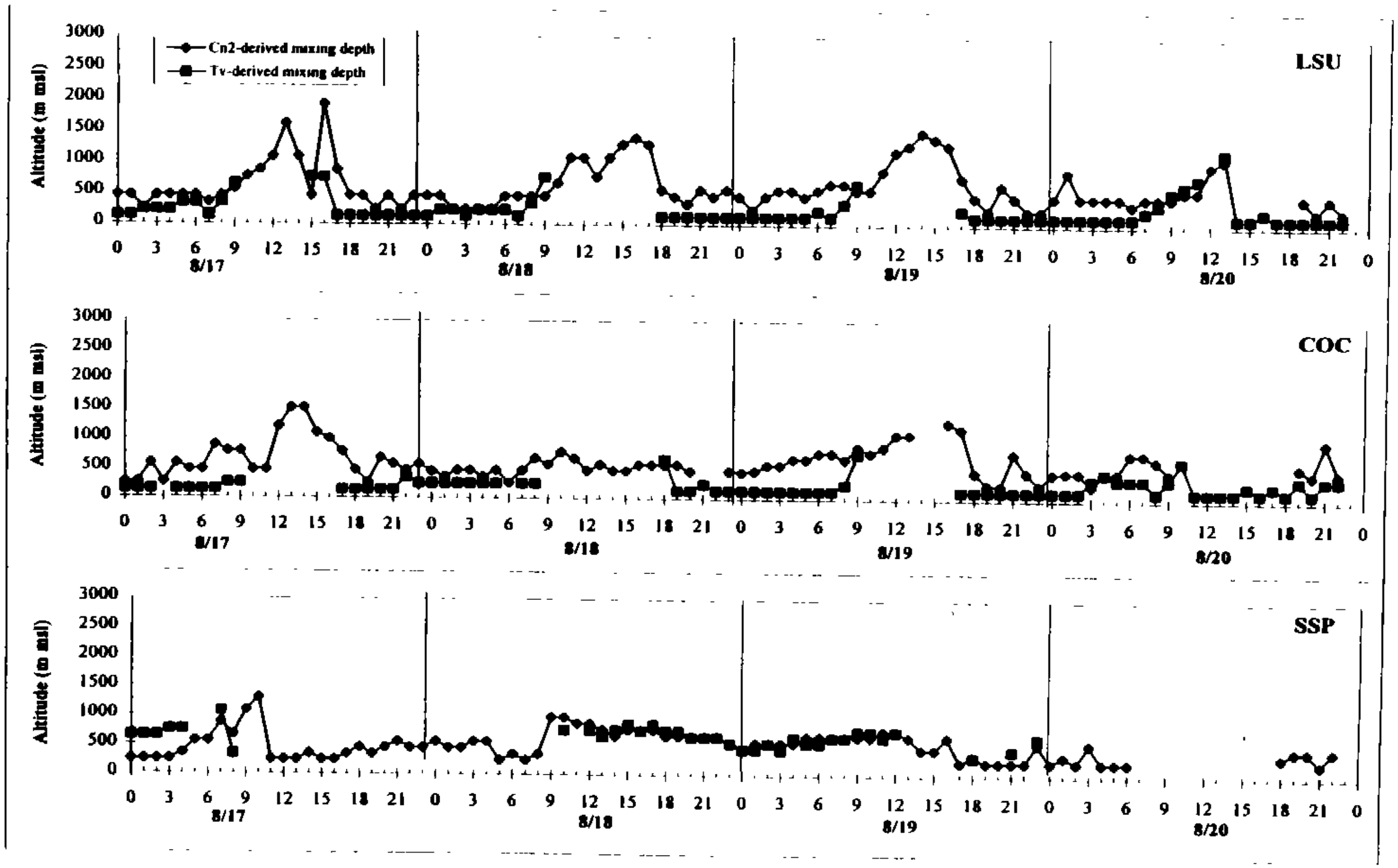
Gulf of Mexico Air Quality Study
Mixing Depth Analysis
August 17-20, 1993



Gulf of Mexico Air Quality Study
Mixing Depth Analysis
September 7-11, 1993



Gulf of Mexico Air Quality Study
Mixing Depth Analysis
August 17-20, 1993



APPENDIX H

AIRCRAFT HYDROCARBON AND CARBONYL COMPOUND DATA

Many plots and tables were prepared for the analyses which were not included in the main report. Appendix B included a table listing the target species reported by Biospherics for the surface and aircraft canisters. This appendix contains figures and tables concerning the aircraft hydrocarbon and carbonyl compound data including the following:

- Table of statistics for species group totals as measured by the aircraft. Statistics are presented by site and by site and time of day.
- Table of the frequency distributions of NMHC, NMOC, NO_x, and ratios measured by the aircraft.
- Table of outliers and invalid aircraft hydrocarbon and carbonyl compound samples.
- Line plots of the abundant species and carbonyl compounds measured by aircraft near Baytown, all samples. Species are shown in roughly chromatographic order.

Aircraft sampling location abbreviations may be found in Anderson et al., 1993.

Updated 2/28/95

Site Statistics

Total 293 samples
278 validated NMHC samples
281 validated carbonyl samples

Results for Texas Sampling Locations

Site Statistics

AAP, BMT (high altitude), OW5, OW2, OW1 had only one sample.

Results for Louisiana Sampling Locations

Site Statistics

BTR (high altitude), HUM (midday) had only one sample.

	stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
Overall	**min**	49.0	3.8	2.0	0.9	0.2	2.5	15.7	2.2
	max	400.0	492 3	349.6	226.5	70.1	107.5	572.2	114.2
	average	128.7	76.0	51.8	15.3	9.0	27.0	103.1	47.1
	median	115.0	51.5	37.3	7.4	5.5	23.4	76.1	43.3
	25th %	78.0	21.2	16.1	2.5	2.4	15.9	39.4	30.1
	75th %	162.0	93.0	62.9	14.9	10.3	33.6	126.3	58.8

Results for Texas Sampling Locations

	stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
45R	**min**	101.0	45.9	32.8	7.0	2.1	16.6	63.1	23.9
2 NMHC samples	**max**	115.0	46.5	35.0	11.6	3.9	17.6	63 5	40.4
2 carbonyl samples	**average**	108.0	46.2	33.9	9.3	3.0	17.1	63.3	32.2
	median	108.0	46.2	33.9	9.3	3.0	17.1	63.3	32.2
	25th %	104.5	46.1	33.4	8.2	2.6	16.9	63.2	28.0
	75th %	111.5	46.4	34.5	10.5	3.5	17.4	63.4	36.3
AXH	**min**	76.0	48.4	34.8	6.1	5.9	28.1	81.4	26.6
2 NMHC samples	**max**	92.0	56.2	44.2	7.6	6.0	33.0	84.3	47.4
2 carbonyl samples	**average**	84.0	52.3	39.5	6.9	6.0	30.6	82.9	37.0
	median	84.0	52.3	39.5	6.9	6.0	30.6	82.9	37.0
	25th %	80.0	50.4	37.2	6.5	5.9	29.3	82.1	31.8
	75th %	88.0	54.3	41.9	7.2	6.0	31.8	83.6	42.2
BMT-LOW	**min**	68.0	27.9	18.5	2.6	2.0	12.3	40.2	17.7
9 NMHC samples	**max**	228.0	250.1	183.8	53.1	36.1	55.1	284.8	101.1
10 carbonyl samples	**average**	109.9	83.6	56.9	18.0	8.7	24.5	108.1	46.5
	median	99.5	63.4	47.2	9.9	6.8	19.8	91.5	38.4
	25th %	76.3	37.7	31.9	4.5	2.6	15.1	53.2	30.1
	75th %	122.8	95.7	55.8	22.8	9.0	32.2	136.2	59.8
CRY	**min**	92.0	22.3	15.6	2.3	2.6	12.5	38.6	9.8
25 NMHC samples	**max**	230.0	492.3	349.6	112.2	31.5	79.9	572.2	114.2
26 carbonyl samples	**average**	155.0	95.0	63.3	19.1	12.5	27.4	122.4	52.0
	median	155.0	76.3	50.4	14.5	9.4	20.3	102.8	50.7
	25th %	118.5	38.8	22.4	9.2	5.7	16.8	56.2	33.5
	75th %	176.5	109.6	71.9	21.9	18.7	31.3	142.7	65.4
GIL	**min**	61.0	8.9	5.7	1.3	1.1	7.2	22.2	20.0
15 NMHC samples	**max**	181.0	102.3	78.6	39.1	13.7	51.7	126.4	79.1
15 carbonyl samples	**average**	102.1	46.3	33.7	7.8	4.8	21.8	68.1	41.2
	median	84.0	40.7	33.2	5.5	4.0	19.0	64.0	39.8
	25th %	68.0	18.9	15.6	1.8	1.8	14.7	41.2	29.2
	75th %	121.5	66.8	46.9	8.8	7.5	26.9	94.9	51.6
GLS	**min**	64.0	6.3	4.1	0.9	0.9	7.5	15.7	25.6
14 NMHC samples	**max**	151.0	163.1	135.6	24.3	14.2	35.9	199.0	104.1
15 carbonyl samples	**average**	88.4	38.1	28.5	6.0	3.6	16 9	55.0	41.9
	median	79.5	22.9	16.9	2.9	2.5	15.4	39.6	37.3
	25th %	66 5	15.0	10.9	1.4	1.6	10.0	27.4	31.4
	75th %	97.0	34.2	25.2	6.1	3.9	20.8	52.8	46.4

	stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
HIP	min	59.0	6.9	5.0	1.0	0.7	7.1	20.9	9.4
11 NMHC samples	max	132.0	36.0	26.5	6.6	2.9	33.5	61.9	63.4
12 carbonyl samples	average	84.2	18.5	14.7	2.3	1.5	16.1	34.6	34.0
	median	74.5	16.0	13.0	2.1	1.1	14.0	32.5	30.8
	25th %	64.8	11.4	9.4	1.2	0.9	10.0	25.2	24.1
	75th %	97.5	22.6	18.3	2.3	1.8	18.8	37.3	44.5
HOU-LOW	min	70.0	12.1	8.0	2.6	1.2	12.5	26.2	13.9
28 NMHC samples	max	400.0	311.1	170.7	91 4	49.0	79.3	367 3	112.9
26 carbonyl samples	average	173.0	76.7	50.8	12.2	13.7	31.3	108.1	44.2
	median	154.0	57.7	37.8	7.7	9.5	29.5	84.7	44.2
	25th %	103.8	32.1	21.7	5.1	5.1	21.9	65.1	24.2
	75th %	207.5	98.2	60.7	12.0	18.7	35.4	133.1	57.1
HOU-HIGH	min	49.0	3.8	2.0	1.1	0.2	2.5	15.8	2.2
27 NMHC samples	max	172.0	47.6	27.9	20.4	7 9	31.8	79.4	81.0
28 carbonyl samples	average	79.6	15.1	8.9	3.5	2.7	21.1	36.2	35.2
	median	69.5	12.5	7.7	2.4	2.4	20.4	35.0	33.5
	25th %	63.0	7.9	3.9	1.6	1.4	15.2	23.1	26.9
	75th %	81.5	15.9	9.3	3.2	3.4	26.9	37 8	41.4
HPY	min	87.0	55.5	41.9	4.7	6.0	12.9	76.1	23.4
27 NMHC samples	max	374.0	459.4	268.8	226.5	51.6	69.5	496.0	102.3
25 carbonyl samples	average	152.1	194.5	122.4	52.2	19.9	36.5	231.0	55 2
	median	138.0	157.9	106.0	32.0	18.2	36.0	188.6	50.5
	25th %	107.5	111.1	72.8	20.1	10.7	26.3	136.5	33.5
	75th %	174.5	247.6	146.0	63.5	24.8	45.3	282.7	70.3
MAT	min	61.0	9.8	5.3	1.4	2 2	7.9	17.7	18.0
2 NMHC samples	max	63.0	12.2	8.6	1.4	3.1	32.7	44.9	58 8
2 carbonyl samples	average	62.0	11.0	7 0	1.4	2.7	20.3	31.3	38.4
	median	62.0	11.0	7.0	1.4	2.7	20.3	31.3	38.4
	25th %	61.5	10.4	6.1	1.4	2.4	14.1	24.5	28.2
	75th %	62.5	11.6	7.8	1.4	2.9	26.5	38.1	48.6
MAY	min	74.0	18.4	12.2	3.7	2.4	20.9	39.5	27.0
6 NMHC samples	max	262.0	82.8	63.3	10.4	13.8	38.9	121.5	61.9
7 carbonyl samples	average	147.7	51.3	36.1	7.0	8.2	30.0	81.3	44.8
	median	112.5	53.0	34.1	7.1	9.0	30.3	81.2	44.5
	25th %	75.5	19.5	12.9	3 8	2.9	21.0	42.6	36.6
	75th %	188.0	70.4	49.1	8.8	10.6	37.1	107.6	53.4
NUN	min	121 0	51.8	34.7	5.8	11.3	39.4	93.1	29.2
2 NMHC samples	max	168.0	79.2	52.7	8.4	18.1	41.3	118.6	45 4
2 carbonyl samples	average	144.5	65.5	43.7	7.1	14.7	40.4	105.9	37.3
	median	144.5	65.5	43.7	7.1	14.7	40 4	105 9	37.3
	25th %	132.8	58.7	39.2	6.5	13.0	39.9	99 5	33 3
	75th %	156.3	72.4	48.2	7.8	16.4	40.8	112 2	41.4

	stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
OW4	min								26.0
0 NMHC samples	max								34.9
2 carbonyl samples	average								30.5
	median								30.5
	25th %								28.2
	75th %								32.7
SAB	min	62.0	10.2	8.1	1.0	0.8	7.2	25.8	17.8
13 NMHC samples	max	152.0	98.3	60.2	26.0	12.1	36.7	135.0	71.9
13 carbonyl samples	average	101.3	35.3	26.3	5.8	3.2	20.4	55.7	42.4
	median	96.0	24.1	20.2	3.0	2.0	16.8	48.6	43.3
	25th %	78.0	19.4	16.5	1.7	1.1	13.6	37.0	24.1
	75th %	129.0	35.3	29.4	3.7	2.9	27.9	60.6	53.1
SPT	min	139.0	39.4	25.3	5.7	8.0	25.4	64.8	42.5
3 NMHC samples	max	217.0	196.1	120.4	50.8	24.9	57.3	253.4	79.3
2 carbonyl samples	average	186.0	99.4	59.7	26.0	13.8	39.2	138.6	60.9
	median	202.0	62.8	33.4	21.4	8.4	34.8	97.6	60.9
	25th %	170.5	51.1	29.4	13.6	8.2	30.1	81.2	21.2
	75th %	209.5	129.5	76.9	36.1	16.7	46.1	175.5	60.9
SPX	min	73.0	18.2	11.9	2.1	2.2	10.9	31.7	13.1
6 NMHC samples	max	225.0	53.1	38.2	6.0	8.9	33.2	86.3	95.6
6 carbonyl samples	average	110.0	30.9	22.4	3.9	4.5	17.3	48.2	40.9
	median	85.0	23.8	17.1	3.8	3.6	14.9	36.5	29.6
	25th %	80.3	21.3	15.4	2.7	3.2	12.6	35.1	26.2
	75th %	106.3	40.4	30.9	5.1	5.3	17.3	56.7	46.8
T00	min	153.0	75.1	62.9	8.4	3.8	19.5	94.9	39.7
3 NMHC samples	max	248.0	163.7	95.4	51.4	16.9	21.5	183.2	84.0
3 carbonyl samples	average	187.3	115.3	78.8	24.6	11.9	20.3	135.6	63.3
	median	161.0	107.1	78.0	14.1	15.0	19.8	128.6	66.3
	25th %	157.0	91.1	70.5	11.3	9.4	19.7	111.8	53.0
	75th %	204.5	135.4	86.7	32.8	16.0	20.7	155.9	75.1
T78	min	88.0	30.2	17.0	6.9	2.5	16.5	46.7	17.1
12 NMHC samples	max	206.0	386.4	229.4	144.3	68.4	107.5	486.5	80.2
11 carbonyl samples	average	120.8	119.8	76.3	28.8	14.6	35.4	156.1	47.5
	median	110.0	66.0	49.3	12.5	6.1	29.5	102.1	42.6
	25th %	102.5	39.1	24.4	8.6	4.6	17.9	66.0	31.6
	75th %	122.3	117.8	90.2	18.3	10.7	38.0	148.1	55.4

Results for Louisiana Sampling Locations

	stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
BTR-LOW	**min**	168.0	35.1	19.8	9.6	3.8	16.5	51.6	52.6
11 NMHC samples	**max**	232.0	217.6	184.1	27.0	19.6	52.0	246.1	101.0
12 carbonyl samples	**average**	192.4	118.2	89.2	17.9	11.2	29.5	147.7	76.0
	median	186.0	101.6	76.5	17.6	11.4	26.1	137.5	67.3
	25th %	172.0	83.4	55.2	13.9	7.5	23.5	107.1	62.0
	75th %	205.0	155.7	115.7	21.4	15.1	32.1	199.2	97.0
CAN	**min**	104.0	36.1	27.7	5.0	3.4	15.1	63.6	32.3
10 NMHC samples	**max**	225.0	184.0	89.0	76.3	21.3	56.0	240.0	80.8
11 carbonyl samples	**average**	173.1	85.3	61.1	15.3	8.9	37.7	122.9	62.7
	median	177.0	78.9	63.8	8.0	6.6	42.7	121.2	63.3
	25th %	137.0	52.1	42.2	5.6	4.3	18.8	69.3	52.9
	75th %	195.5	101.3	78.4	10.2	9.7	50.1	145.7	76.1
COC	**min**	83.0	27.6	20.4	1.4	1.8	13.5	52.3	31.6
14 NMHC samples	**max**	215.0	173.9	140.2	17.9	24.9	59.3	213.1	91.9
14 carbonyl samples	**average**	142.0	67.6	55.6	5.7	6.3	31.2	98.7	52.8
	median	151.5	54.8	45.6	4.6	3.7	28.4	85.8	50.4
	25th %	102.3	46.5	39.0	3.4	3.0	20.4	72.7	41.2
	75th %	169.5	68.5	61.0	6.9	5.5	39.1	107.5	63.0
HUM	**min**	112.0	63.7	35.3	3.7	5.7	11.1	74.8	34.8
7 NMHC samples	**max**	211.0	145.0	71.9	70.9	12.1	56.6	182.5	69.2
8 carbonyl samples	**average**	156.4	88.7	59.3	21.9	7.5	32.7	121.4	49.3
	median	148.0	82.4	62.3	8.4	7.2	37.5	113.1	45.3
	25th %	116.5	69.7	45.9	5.5	5.9	18.5	96.2	40.1
	75th %	182.3	87.3	67.0	20.8	7.6	40.1	127.1	59.6
SSP	**min**	70.0	14.7	9.3	1.2	1.2	10.2	36.4	25.7
14 NMHC samples	**max**	153.0	278.3	165.2	43.0	70.1	64.6	342.9	92.3
13 carbonyl samples	**average**	105.9	60.6	47.7	5.5	7.4	28.3	88.9	52.9
	median	102.0	39.1	34.5	2.5	2.5	21.8	65.7	54.5
	25th %	77.5	28.7	24.8	1.7	1.8	13.9	49.1	33.7
	75th %	128.5	47.5	42.4	3.4	3.5	38.2	76.2	59.7
VEN	**min**	110.0	30.6	23.8	4.1	2.7	16.3	46.9	33.9
2 NMHC samples	**max**	203.0	55.8	36.5	15.7	3.6	17.8	73.6	33.9
2 carbonyl samples	**average**	156.5	43.2	30.2	9.9	3.2	17.1	60.3	33.9
	median	156.5	43.2	30.2	9.9	3.2	17.1	60.3	33.9
	25th %	133.3	36.9	27.0	7.0	2.9	16.7	53.6	33.9
	75th %	179.8	49.5	33.3	12.8	3.4	17.4	66.9	33.9

Time statistics

Total 293 samples

278 validated NMHC samples

281 validated carbonyl samples

Results for Texas Sampling Locations

Time Statistics by Site

AAP, BMT (high altitude), OW5, OW2, OW1, NUN, T00 and 45R had only one sample per time period.

Results for Louisiana Sampling Locations

Time Statistics by Site

BTR (high altitude), HUM (midday), and VEN, had only one sample per time period.

		stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
Overall	**0600-0900**	**min**	50.0	6.3	3.9	1.0	0.7	2.5	15.7	2.2
	125 NMHC samples	**max**	400.0	492.3	349.6	226.5	51.6	79.9	572.2	114.2
	130 carbonyl samples	**avg**	117.4	87.8	57.7	20.1	9.9	28.5	116.3	40.2
		median	101.0	56.2	42.6	7.8	6.0	22.3	84.6	35.7
		25th %	73.0	16.8	13.0	2.3	2.0	15.6	36.4	27.1
		75th %	138.0	97.8	66.4	15.6	12.1	36.7	139.1	50.5
	0900-1200	**min**	66.0	22.8	18.6	2.0	2.1	11.1	39.0	22.0
	22 NMHC samples	**max**	232.0	250.1	184.1	50.8	36.1	57.3	284.8	101.0
	25 carbonyl samples	**avg**	148.2	115.0	84.0	20.0	10.9	28.8	143.7	53.2
		median	117.0	77.8	55.0	13.7	7.4	23.6	97.6	41.4
		25th %	96.0	33.0	24.8	3.2	2.3	15.8	54.1	32.4
		75th %	195.0	105.3	79.4	20.2	11.4	30.2	143.0	68.6
	1200-1700	**min**	49.0	3.8	2.0	0.9	0.2	7.2	17.7	16.7
	131 NMHC samples	**max**	374.0	379.0	229.4	81.2	70.1	107.5	486.5	112.9
	126 carbonyl samples	**avg**	136.4	61.2	42.8	10.5	7.9	25.7	86.9	53.0
		median	128.0	45.5	32.8	6.4	4.7	23.8	68.6	51.0
		25th %	89.0	22.1	17.6	2.9	2.5	16.4	45.1	37.3
		75th %	167.0	76.0	53.4	12.5	9.0	31.1	107.1	62.7

Results for Texas Sampling Locations

			CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
BMT Low	**0600-0900**	**min**	68.0	56.8	33.5	5.0	4.5	15.2	79.5	17.7
	9 NMHC samples	**max**	162.0	171.7	107.9	53.1	21.2	55.1	207.1	101.1
	10 carbonyl samples	**avg**	98.1	97.0	63.2	23.8	10.0	29.8	126.8	38.8
		median	90.0	80.7	53.6	16.6	8.9	31.8	135.8	31.2
		25th %	73.3	63.0	46.4	9.6	6.4	15.9	90.9	24.3
		75th %	106.3	119.6	73.1	32.2	9.1	34.9	148.2	40.6
	0900-1200	**min**	77.0	32.6	27.2	2.6	2.1	14.9	47.5	22.0
	5 NMHC samples	**max**	228.0	250.1	183.8	41.7	36.1	34.7	284.8	88.1
	5 carbonyl samples	**avg**	123.8	85.7	62.2	14.6	8.8	20.0	105.7	50.0
		median	101.5	51.9	39.3	5.3	3.4	17.0	70.1	46.7
		25th %	85.5	39.9	34.7	2.9	2.5	15.4	56.9	35.2
		75th %	141.5	81.8	47.8	24.5	5.2	20.5	99.3	60.3
	1200-1400	**min**	103.0	27.9	18.5	6.1	2.0	12.3	40.2	36.7
	4 NMHC samples	**max**	129.0	60.0	41.7	8.2	10.1	26.6	86.6	94.2
	5 carbonyl samples	**avg**	117.7	39.2	27.0	7.2	4.9	17.9	57.1	60.2
		median	121.0	29.7	20.9	7.4	2.7	14.7	44.4	55.0
		25th %	77.3	20.9	13.9	4.6	1.5	9.2	30.2	44.7
		75th %	123.0	37.3	26.1	7.6	4.6	17.7	55.0	70.5
CRY	**0600-0900**	**min**	92.0	22.3	15.6	2.3	2.6	15.9	38.6	9.8
	13 NMHC samples	**max**	230.0	492.3	349.6	112.2	30.5	79.9	572.2	114.2
	14 carbonyl samples	**avg**	138.6	108.6	74.5	21.1	13.1	30.8	139.4	42.1
		median	124.0	61.6	44.1	13.6	9.4	22.3	91.9	37.4
		25th %	107.0	29.3	19.4	6.2	4.5	16.6	48.1	28.3
		75th %	134.0	116.1	78.4	17.2	19.2	36.8	151.6	47.4
	1200-1500	**min**	122.0	31.9	18.7	9.7	3.5	12.5	48.1	33.8
	12 NMHC samples	**max**	226.0	122.3	83.1	25.8	31.5	50.9	155.9	92.5
	12 carbonyl samples	**avg**	172.8	80.2	51.3	17.1	11.9	23.8	104.0	63.6
		median	164.0	84.6	54.5	15.4	10.1	19.1	107.2	65.3

		stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
		25th %	155.8	56.5	32.2	11.5	6.0	18.0	78.5	54.6
		75th %	187.3	107.3	70.3	22.1	14.0	27.6	130.4	73.0
GIL	0600-0900	min	61.0	8.9	5.7	1.8	1.2	9.3	22.5	20.0
	8 NMHC samples	max	115.0	94.5	53.6	39.1	13.7	51.7	113.5	51.4
	8 carbonyl samples	avg	78.9	45.1	31.4	9.0	4.8	24.2	69.3	33.3
		median	73.5	40.8	32.7	4.8	3.1	18.5	73.6	32.6
		25th %	66.0	20.4	16.5	1.8	1.4	15.7	36.0	25.9
		75th %	83.0	67.6	47.0	8.8	5.8	31.7	99.3	40.2
	1200-1500	min	67.0	13.8	9.5	1.3	1.1	7.2	22.2	22.7
	7 NMHC samples	max	181.0	102.3	78.6	15.4	8.3	29.6	126.4	79.1
	7 carbonyl samples	avg	128.6	47.6	36.3	6.5	4.9	19.1	66.8	50.2
		median	128.0	40.7	33.2	5.5	4.4	23.2	64.0	51.8
		25th %	95.0	26.7	21.5	2.3	2.7	13.3	46.5	41.0
		75th %	167.0	61.6	44.9	9.2	7.5	23.7	80.9	58.0
GLS	0600-0900	min	64.0	6.3	4.1	1.2	1.0	9.4	15.7	25.6
	7 NMHC samples	max	115.0	163.1	135.6	24.3	14.2	35.9	199.0	104.1
	8 carbonyl samples	avg	80.6	50.9	37.5	8.9	4.5	20.8	71.7	43.6
		median	68.0	24.5	15.9	3.5	2.5	22.0	43.2	36.5
		25th %	64.8	16.5	11.7	1.7	1.5	9.6	29.5	30.9
		75th %	87.8	47.5	31.2	11.6	4.1	23.5	73.3	41.4
	1200-1500	min	70.0	8.2	6.3	0.9	0.9	7.5	25.6	28.2
	7 NMHC samples	max	151.0	54.5	38.8	10.4	5.3	18.8	69.7	50.7
	7 carbonyl samples	avg	96.1	25.3	19.4	3.1	2.7	13.0	38.3	39.9
		median	88.0	21.0	17.7	1.6	2.3	12.9	33.9	43.9
		25th %	76.0	15.2	11.9	1.3	1.7	10.6	27.4	31.6
		75th %	106.0	31.5	24.8	3.2	3.6	15.4	42.1	46.5
HIP	0600-0900	min	59.0	6.9	5.0	1.0	0.7	7.1	20.9	9.4
	6 NMHC samples	max	132.0	24.0	19.9	2.3	1.8	21.7	40.5	56.9
	6 carbonyl samples	avg	75.8	14.4	11.7	1.7	1.1	15.4	29.9	30.4
		median	66.0	13.9	11.1	1.7	1.0	15.3	29.2	29.6
		25th %	60.3	12.2	10.3	1.1	0.8	13.0	23.8	26.5
		75th %	71.8	15.6	12.6	2.3	1.2	19.7	35.3	30.9
	1200-1500	min	66.0	10.0	7.4	1.4	1.0	8.9	28.1	16.7
	5 NMHC samples	max	129.0	36.0	26.5	6.6	2.9	33.5	61.9	63.4
	6 carbonyl samples	avg	92.5	23.3	18.4	3.0	1.9	17.0	40.3	37.7
		median	89.0	22.1	17.7	2.1	1.9	14.0	32.5	38.5
		25th %	78.5	12.6	9.8	1.5	1.0	9.3	28.4	23.1
		75th %	102.5	26.8	22.1	3.0	2.6	17.1	45.6	48.0
HOU LOW	0600-0900	min	70.0	12.1	8.3	2.6	1.2	13.7	33.1	13.9
	14 NMHC samples	max	400.0	311.1	170.7	91.4	49.0	79.3	367.3	60.5
	13 carbonyl samples	avg	178.3	95.5	60.8	16.3	18.4	35.1	130.5	38.9
		median	184.0	79.0	51.9	8.6	17.4	33.3	118.9	31.6
		25th %	105.8	39.7	27.6	7.4	6.6	21.3	70.7	21.9
		75th %	214.5	126.2	80.1	15.1	24.0	43.9	160.3	56.2
	1200-1700	min	79.0	13.7	8.0	2.8	2.9	12.5	26.2	18.4
	14 NMHC samples	max	328.0	210.9	164.7	26.4	19.8	35.4	246.3	112.9
	13 carbonyl samples	avg	167.7	58.0	40.9	8.2	9.0	27.5	85.6	49.6
		median	133.0	44.2	30.1	5.8	8.0	29.0	70.1	44.5

		stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
		25th %	105.8	31.2	21.2	4.5	4.8	24.7	61.6	34.9
		75th %	202.0	59.1	38.6	10.7	11.8	31.2	86 0	55.3
HOU HIGH	0600-0900	min	50.0	7.1	3.9	1.1	0.7	2.5	15.8	2.2
	14 NMHC samples	max	141.0	31.6	20.6	8.1	7.9	31.2	62.8	46.4
	15 carbonyl samples	avg	79.9	13.5	8 0	3.0	2.5	19.3	32.8	29.2
		median	70.0	12.4	7.6	2.4	2.2	20.3	32.2	30.1
		25th %	64.3	9.0	4.0	1.6	1.2	12.3	19.9	23.4
		75th %	81.5	15.7	8.7	2.7	2.6	20.9	37.1	35.1
	1200-1700	min	49.0	3.8	2.0	1.3	0.2	12.0	22.3	24.5
	13 NMHC samples	max	172.0	47.6	27.9	20.4	7.1	31.8	79.4	81.0
	13 carbonyl samples	avg	79.2	16.9	9.9	4.1	2.9	23.0	39.9	42.1
		median	69.0	13.5	8.7	2.7	2.6	24.9	36.0	38.8
		25th %	63.0	7.6	3.6	1.7	1.8	17.0	26.7	29.7
		75th %	81.5	18.1	11.0	3.3	3.6	27.1	38.9	48.6
HPY	0600-0900	min	87.0	73.8	56.0	10.0	6.3	12.9	86.7	23.4
	14 NMHC samples	max	210.0	459.4	268.8	226.5	51.6	69.5	496.0	102.3
	14 carbonyl samples	avg	136.7	254.5	154.5	76.0	24.0	37.9	292.4	44.2
		median	121.0	237.1	139.1	63.5	23.9	39.9	281.4	35.8
		25th %	102.3	147.6	101.4	21.9	14.4	27.3	173.7	29.8
		75th %	173 0	398.8	227.8	117.6	27.4	49.8	447.7	49.5
	1200-1600	min	102.0	55.5	41.9	4.7	6.0	16.2	76.1	39.4
	13 NMHC samples	max	374.0	218.1	147.5	50.7	35.1	57.8	244.1	93.8
	11 carbonyl samples	avg	168.7	129.8	87.8	26.6	15.4	35.0	164.8	69.2
		median	145.0	130.4	90.8	23.6	14.0	35.2	170.1	65.7
		25th %	126.0	108.3	71.9	20.6	8.9	26.0	127.0	46.9
		75th %	172.0	162.7	109.4	32.7	19.1	44.6	197.9	83.7
MAT	1200-1600	min	61.0	9.8	5.3	1.4	2.2	7.9	17.7	18.0
	2 NMHC samples	max	63.0	12.2	8.6	1.4	3.1	32.7	44.9	58.8
	2 carbonyl samples	avg	62.0	11.0	7.0	1.4	2.7	20.3	31.3	38.4
		median	62.0	11.0	7.0	1.4	2.7	20.3	31.3	38.4
		25th %	61.5	10.4	6.1	1.4	2.4	14.1	24.5	28.2
		75th %	62.5	11.6	7.8	1.4	2.9	26.5	38.1	48.6
MAY	0600-0900	min	74.0	61.0	38.9	7.8	8.6	35.5	96.5	27.0
	2 NMHC samples	max	97.0	79.7	63.3	10.4	11.7	38.9	118.6	44.5
	3 carbonyl samples	avg	85.5	70.4	51.1	9.1	10.2	37.2	107.6	34.4
		median	85.5	70.4	51.1	9.1	10.2	37.2	107.6	31.6
		25th %	37.0	30.5	19.5	3.9	4.3	17.8	48.3	29.3
		75th %	85.5	70.4	51.1	9.1	10.2	37.2	107.6	38.1
MAY	1200-1600	min	77.0	18.4	12.2	3.7	2.4	20.9	39.5	41.5
	4 NMHC samples	max	262.0	82.8	59.2	9 8	13.8	38.7	121.5	61.9
	4 carbonyl samples	avg	178.8	41.7	28.6	5.9	7.3	26.5	68.2	52.6
		median	188.0	32.8	21.4	5.1	6.4	23.1	55.8	53.4
		25th %	115.3	20.1	13 2	3.8	3.2	21.1	44.2	49 0
		75th %	251.5	54.5	36 8	7.2	10.5	28 5	79.8	57 0
OW4	0900-1200	min								26.0
	2 NMHC samples	max								34.9
	2 carbonyl samples	avg								30.5
		median								30.5

		stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
		25th %								28.2
		75th %								32.7
SAB	**0600-0900**	**min**	62.0	10.2	8.1	1.0	0.8	12.9	25.8	17.8
	6 NMHC samples	**max**	152.0	98.3	60.2	26.0	12.1	36.7	135.0	71.9
	6 carbonyl samples	**avg**	86.7	34.6	25.1	6.1	3.4	18.8	53.4	36.9
		median	77.0	26.7	22.1	2.4	1.8	16.0	41.5	32.8
		25th %	66.3	14.0	11.4	1.3	1.1	14.0	30.0	23.0
		75th %	86.3	33.8	28.3	3.5	2.8	17.3	48.2	42.8
	1200-1600	**min**	78.0	19.2	15.7	1.7	1.0	7.2	32.2	18.4
	7 NMHC samples	**max**	145.0	66.3	53.3	7.2	5.8	32.3	73.5	60.7
	7 carbonyl samples	**avg**	116.8	30.4	24.9	3.1	2.4	22.6	53.0	46.7
		median	123.0	23.0	18.9	2.6	1.9	27.3	52.4	49.9
		25th %	104.3	20.1	16.8	1.8	1.5	16.3	47.5	43.7
		75th %	131.3	29.8	24.7	3.1	2.4	28.6	59.5	57.2
SPT	**1200-1600**	**min**	139.0	39.4	25.3	5.7	8.0	25.4	64.8	42.5
	2 NMHC samples	**max**	217.0	62.8	33.4	21.4	8.4	34.8	97.6	42.5
	1 carbonyl sample	**avg**	178.0	51.1	29.4	13.6	8.2	30.1	81.2	42.5
		median	178.0	51.1	29.4	13.6	8.2	30.1	81.2	42.5
		25th %	158.5	45.3	27.3	9.6	8.1	27.8	73.0	10.6
		75th %	197.5	57.0	31.4	17.5	8.3	32.5	89.4	31.9
SPX	**0600-0900**	**min**	73.0	18.2	11.9	2.1	2.2	10.9	31.7	13.1
	5 NMHC samples	**max**	113.0	53.1	38.2	6.0	8.9	33.2	86.3	52.4
	5 carbonyl samples	**avg**	87.0	27.9	19.8	3.8	4.3	17.3	45.2	30.0
		median	84.0	22.6	16.7	3.2	3.4	12.9	35.5	29.1
		25th %	79.0	20.8	15.0	2.5	3.1	12.5	35.0	25.3
		75th %	86.0	24.9	17.4	5.3	3.7	16.8	37.4	30.0
T00	**1200-1500**	**min**	153.0	75.1	62.9	8.4	3.8	19.8	94.9	66.3
	2 NMHC samples	**max**	248.0	107.1	78.0	14.1	15.0	21.5	128.6	84.0
	2 carbonyl samples	**avg**	200.5	91.1	70.5	11.3	9.4	20.7	111.8	75.1
		median	200.5	91.1	70.5	11.3	9.4	20.7	111.8	75.1
		25th %	176.8	83.1	66.7	9.8	6.6	20.2	103.3	70.7
		75th %	224.3	99.1	74.2	12.7	12.2	21.1	120.2	79.6
T78	**0600-0900**	**min**	105.0	35.4	22.7	7.9	4.8	18.0	53.4	17.1
	2 NMHC samples	**max**	120.0	386.4	198.1	144.3	44.0	51.6	438.0	34.0
	2 carbonyl samples	**avg**	112.5	210.9	110.4	76.1	24.4	34.8	245.7	25.5
		median	112.5	210.9	110.4	76.1	24.4	34.8	245.7	25.5
		25th %	108.8	123.2	66.6	42.0	14.6	26.4	149.6	21.3
		75th %	116.3	298.7	154.3	110.2	34.2	43.2	341.9	29.8
	1200-1300	**min**	88.0	30.2	17.0	6.9	2.5	16.5	46.7	24.3
	10 NMHC samples	**max**	206.0	379.0	229.4	81.2	68.4	107.5	486.5	80.2
	9 carbonyl samples	**avg**	122.5	101.5	69.5	19.4	12.7	35.5	137.0	52.4
		median	110.0	66.0	49.3	12.5	6.1	29.5	102.1	43.3
		25th %	101.5	41.9	26.6	9.2	4.4	19.2	68.9	38.1
		75th %	126.8	105.1	79.0	16.4	10.0	37.0	134.5	69.4
	0900-1200	**min**	168.0	35.1	19.8	9.6	3.8	16.5	51.6	52.6
	11 NMHC samples	**max**	232.0	217.6	184.1	27.0	19.6	52.0	246.1	101.0
	10 Carbonyl samples	**avg**	192.4	118.2	89.2	17.9	11.2	29.5	147.7	76.0

stat	CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
median	186.0	101.6	76.5	17.6	11.4	26.1	137.5	67.3
25th %	172.0	83.4	55.2	13.9	7.5	23.5	107.1	62.0
75th %	205.0	155.7	115.7	21.4	15.1	32.1	199.2	97.0

Results for Louisiana Sampling Locations

			CO	ID	PAR	OLE	AROM	UNID	NMHC	Carbonyl
CAN	**0600-0900**	**min**	62.0	3.9	2.1	1.0	0.8	14.0	17.9	32.3
	5 NMHC samples	**max**	210.0	184.0	89.0	76.3	18.7	56.0	240.0	78.2
	6 carbonyl samples	**avg**	155.2	91.4	62.6	20.3	8.5	39.8	131.2	60.0
		median	177.0	90.1	71.5	10.2	8.5	47.9	138.0	58.5
		25th %	88.5	38.5	31 7	4.2	2.7	16.1	54.6	55.6
		75th %	183.5	101.3	78.4	13.7	9.7	53.6	150.7	70.0
	1200-1300	**min**	104.0	36.1	27.7	5.0	3.4	15.1	63.6	51.6
	5 NMHC samples	**max**	225.0	110.5	80.6	8.6	21.3	48.0	152.2	80.8
	5 carbonyl samples	**avg**	172.4	61.7	47.5	6.4	7.7	30.3	92.0	65.4
		median	173.0	54.2	44.0	5.6	4.7	27.5	73.5	66.5
		25th %	159.0	50.0	40.4	5.5	4.0	19.3	65.1	52.8
		75th %	201.0	57 6	45.0	7.3	5.3	41.7	105.6	75.5
COC	**0600-0900**	**min**	83.0	27.6	20.4	1.4	1.8	13.5	52.3	31.6
	7 NMHC samples	**max**	215.0	107.9	82.5	6.5	18.9	59.3	167.2	65.4
	7 carbonyl samples	**avg**	135.0	56.5	47.2	3.7	5.5	33.2	89.7	47.9
		median	108.0	50.6	44.7	3.8	3.5	30.9	84.6	40.5
		25th %	101.5	40.3	35.4	2.5	2.4	23.6	62.7	36.4
		75th %	168.0	64.4	56.2	4.6	4.9	40.8	99.1	62.4
	1200-1400	**min**	91.0	45.5	38.8	3.3	3.0	19.1	68.6	43.3
	7 NMHC samples	**max**	208 0	173.9	140.2	17.9	24.9	50.2	213.1	91.9
	7 carbonyl samples	**avg**	149.0	78.6	64.0	7.6	7.0	29.2	107.8	57.7
		median	162.0	56.8	45.6	7.0	3.8	24.9	86.9	51.3
		25th %	122.0	51.1	42.6	4.3	3.3	20.2	76.8	47.5
		75th %	169.0	86.0	69.2	8.3	5.4	34.9	116.2	61.0
HUM	**0600-0900**	**min**	112.0	63.7	49.4	3.7	5.7	11.1	74.8	34.8
	6 NMHC samples	**max**	211.0	145.0	71.9	70.9	12.1	56.6	182.5	69.2
	7 carbonyl samples	**avg**	157.8	89.2	63.3	18.2	7.7	34.5	123.8	49.9
		median	160.0	81.3	64 4	7.8	7.4	38.6	116.5	45.2
		25th %	115.0	67.7	55.3	4.9	5.9	16.0	89.1	38.9
		75th %	183.5	87.4	67.6	10 8	7.7	40.5	134.4	61.2
SSP	**0600-0900**	**min**	70.0	14.7	9.3	1.2	1.5	10.2	36.4	30.6
	7 NMHC samples	**max**	131.0	129.1	123.4	3.5	4.4	38.7	146.7	92.3
	6 carbonyl samples	**avg**	94.9	48.6	43.6	2.3	2 6	21.7	70.3	52.1
		median	96.0	39.5	35.5	2.3	2 6	19 8	64.2	49.7
		25th %	75.0	32.5	28.1	1.5	2.1	15.2	49.5	32.3
		75th %	108.5	45.9	40.5	3.2	2.8	26.5	72.8	55.4
	1200-1500	**min**	75.0	15.8	12.3	1.5	1.2	11.5	38 6	25.7
	7 NMHC samples	**max**	153.0	278.3	165.2	43.0	70.1	64.6	342 9	84.6
	7 carbonyl samples	**avg**	116.9	72.5	51 9	8.6	12.1	34.9	107.5	53.6
		median	117.0	36.2	31.7	2.6	2 4	36.5	67.1	58.9
		25th %	93.5	29.1	24.1	2.0	1.7	17 4	52.4	39.5
		75th %	143.0	59 7	52.9	4 5	3.9	48.6	99.5	63.6

Frequency Distribution of NMHC/NOx ratios
All Aloft Samples

Texas

Bins	NMOC/ NOx	NMHC/ NOx	Bins	NOx	Bins	NMHC	NMOC
0-10	6	28	<0	1	0-50	78	10
10-20	50	103	0-2	60	50-100	65	78
20-30	60	33	2-4	55	100-150	35	52
30-40	23	19	4-6	27	150-200	18	36
40-50	25	5	6-8	13	200-250	8	16
50-60	12	5	8-10	16	250-300	2	9
60-70	5	6	10-12	10	300-350	3	3
70-80	7	5	12-14	9	350-400	1	5
80-90	7	3	14-16	5	400-450	2	1
90-100	1	0	16-18	5	450-500	5	2
>100	19	8	18-20	4	>500	1	6
Total	215	215	>20	11	Total	218	218
			Total	216			

Louisiana

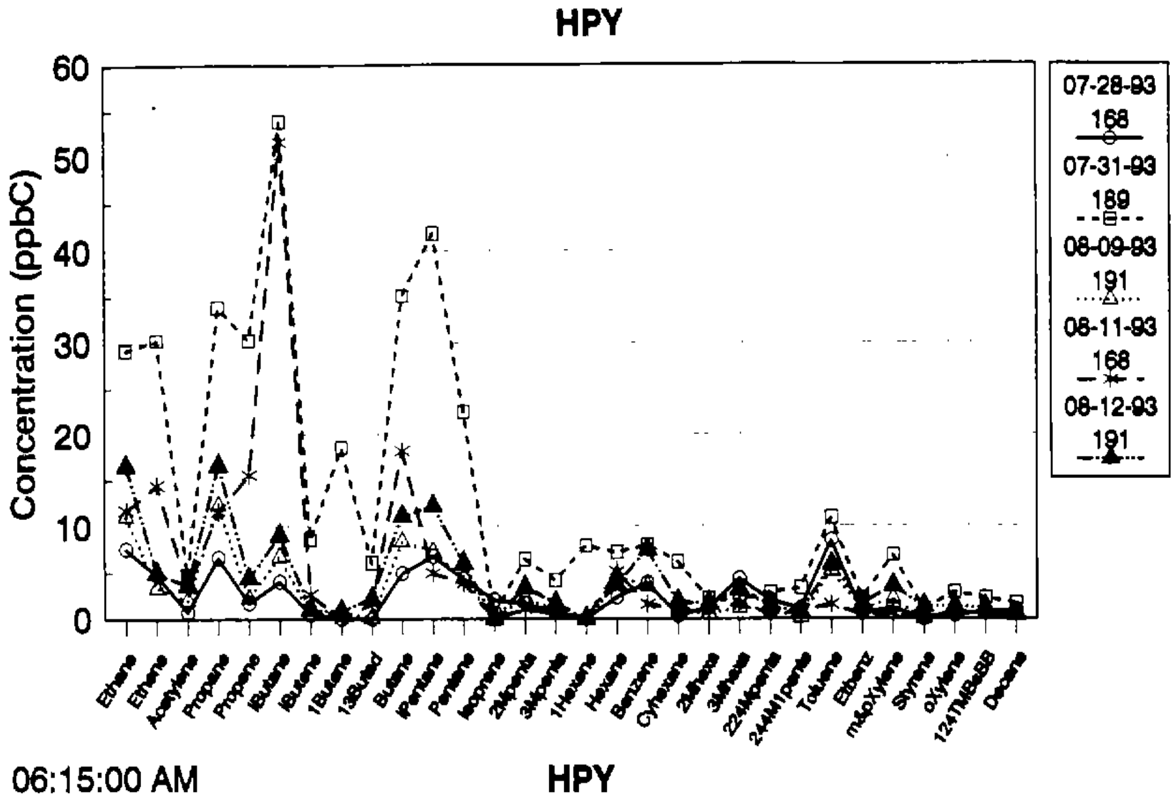
Bins	NMOC/ NOx	NMHC/ NOx	Bins	NOx	Bins	NMHC	NMOC
0-10	2	5	0-2	1	0-50	5	0
10-20	5	19	2-4	27	50-100	20	6
20-30	16	18	4-6	12	100-150	10	22
30-40	10	8	6-8	4	150-200	4	13
40-50	9	3	8-10	6	200-250	2	10
50-60	9	0	10-12	5	250-300	0	2
60-70	0	1	12-14	0	300-350	1	3
70-80	1	1	14-16	0	350-400	0	0
80-90	0	0	16-18	0	400-450	0	1
90-100	1	0	18-20	1	450-500	0	0
>100	2	1	>20	0	>500	0	0
Total	55	56	Total	56	Total	42	57

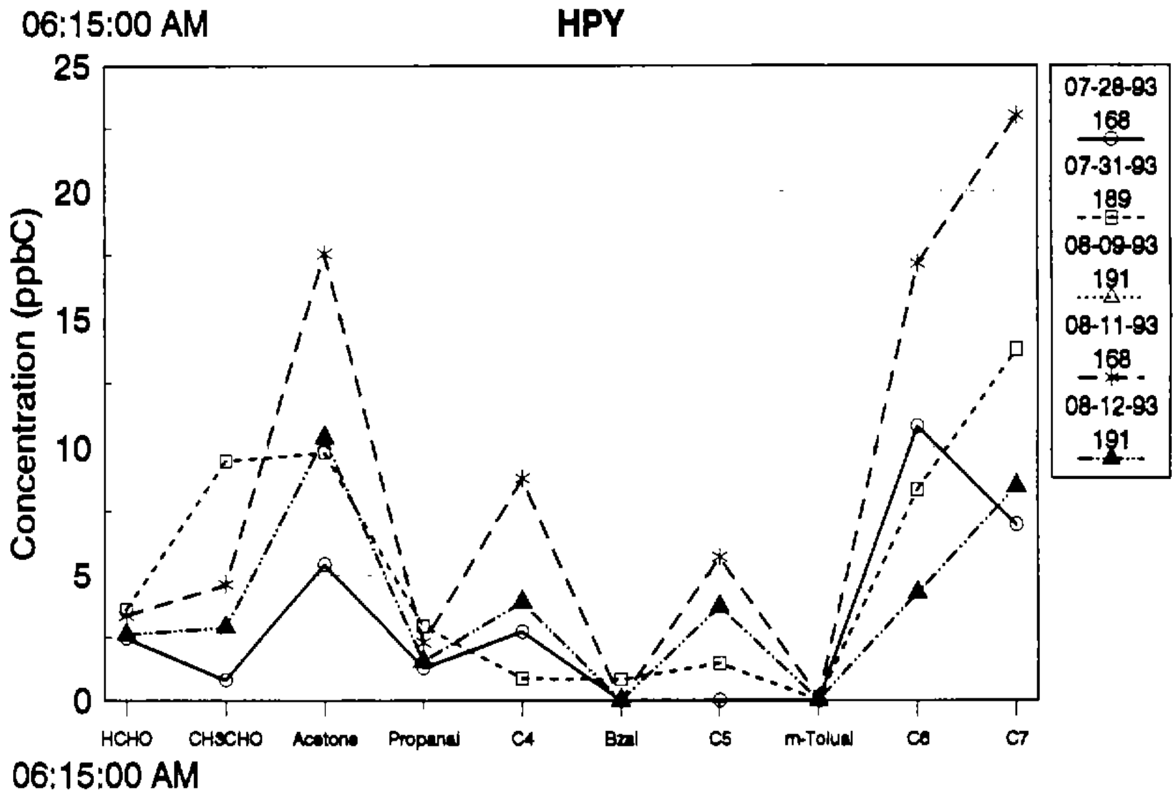
LIST OF SUSPECT AND INVALID VOC SAMPLES COLLECTED BY THE AIRCARFT

CAN	DATE	Location	RTime_1	altavg	VOC_Comments	RValid	CValid	Carby_Comments
MS-001	02-Aug-93	HUM	08:13:00	235		I	V	
MS-007	02-Aug-93	CAN	08:35:00	253		I	V	
MS-010	01-Aug-93	BMT	12:59:00	157		I	V	
MS-014	10-Aug-93	BTR	09:18:00	229		V	S	High total
MS-026	01-Aug-93	SSP	07:19:00	259		V	S	Don't agree with this match/high c5 carby
MS-028	01-Aug-93	GLS	08:04:00	162		V	S	High acetone, high total
MS-031	10-Aug-93	SSP	13:30:00	259	High toluene and ethene	S	V	
MS-040	10-Aug-93	HOU	07:05:20	168	high toluene	S	V	
MS-049	10-Aug-93	HOU	13:44:00	305	high butane	S	S	most likely 389, but was read and recorded as 369/high total
MS-054	31-Jul-93	HIP	12:58:00	183	high unide	S	V	
MS-066	31-Jul-93	BTR	09:22:00	183	Low toluene	S	V	
MS-083	11-Aug-93	CRY	08:57:00	183		V	S	High C6, high total
MS-084	11-Aug-93	HOU	06:59:09	2972	high ethene, isoprene	S	V	
MS-091	11-Aug-93	CAN	08:53:00	241	high propene	S	V	
MS-093	11-Aug-93	COC	13:19:00	259	high toluene	S	V	
MS-102	19-Aug-93	SSP	08:01:00	183		V	S	High C5 carby
MS-108	19-Aug-93	COC	14:06:00	183		V	S	High C5 carby
MS-119	24-Aug-93	HUM	12:08:31	259	high ethene	S	V	
MS-124	24-Aug-93	OW5	09:37:01	107	high unide	S	V	
SPO E-3	24-Aug-93	OW4	09:15:00	107		I	V	
SPO E-4	24-Aug-93	OW4	10:08:30	305		I	V	
TX-001	01-Aug-93	T78	12:13:00	195		V	S	Suspect match of data
TX-002	01-Aug-93	T78	06:43:00	192	high propene (looks contaminated)	S	V	
TX-013	31-Jul-93	BMT	05:54:56	183		I	V	
TX-020	28-Jul-93	HPY	12:31:00	192		V	S	appears to be ok match of data
TX-028	01-Aug-93	HOU	12:48:28	2256	Low toluene	S	V	
TX-031	09-Aug-93	HOU	07:25:00	191		V	S	Suspect data, double exposure?
TX-034	09-Aug-93	HPY	06:44:00	191		V	S	most likely 369 but was read and recorded as 389
TX-044	11-Aug-93	AAP	14:41:35	198		V	I	
TX-049	12-Aug-93	BMT	06:16:50	183	high ethene	S	S	appears to be ok match of data
TX-050	12-Aug-93	CRY	08:57:45	210	high ethane	S	V	
TX-070	19-Aug-93	HOU	13:15:20	244		V	I	
TX-088	14-Aug-93	HPY	12:43:25	244		V	S	appears to be ok match of data
TX-093	16-Aug-93	HOU	07:28:50	241		V	I	
TX-094	15-Aug-93	HPY	06:57:20	244	High propene	S	V	
TX-098	14-Aug-93	HOU	13:00:37	3429			I	
TX-105	18-Aug-93	BMT	06:07:37	157		V	S	High C7 fraction, high total
TX-106	18-Aug-93	HOU	07:06:57	3429	contaminated	I	V	
TX-108	18-Aug-93	SPT	13:16:00	183	High 244m1pente	S	V	
TX-114	18-Aug-93	HPY	06:45:03	792		V	S	High C7, high total
TX-121	19-Aug-93	HOU	12:54:16	3429	high olefins	S	V	
TX-124	18-Aug-93	BMT	14:21:00	3658		V	I	
TX-127	13-Aug-93	CRY	09:10:55	210		I	I	
TX-130	13-Aug-93	HPY	07:11:20	188	high ethene	S	V	
TX-131	12-Aug-93	HOU	13:04:15	3429		V	S	most likely 396, but reported as 376
TX-136	13-Aug-93	HOU	07:29:17	3429			I	
TX-137	12-Aug-93	T78	12:25:50	180	High toluene	S	V	

LIST OF SUSPECT AND INVALID VOC SAMPLES COLLECTED BY THE AIRCARFT

CAN	DATE	Location	RTime_1	altavg	VOC_Comments	RValid	CValid	Carby_Comments
TX-146	12-Aug-93	GLS	07:08:35	241		I	V	
TX-154	26-Aug-93	BMT	06:09:35	259	High 224tmp,22dmhept	S	V	
TX-158	26-Aug-93	HOU	07:33:51	168	high propene	S	V	
TX-165	25-Aug-93	MAY	08:23:45	244		I	V	
TX-179	25-Aug-93	CRY	08:47:55	259		I	V	
TX-181	20-Aug-93	SPT	13:42:17	274		V		





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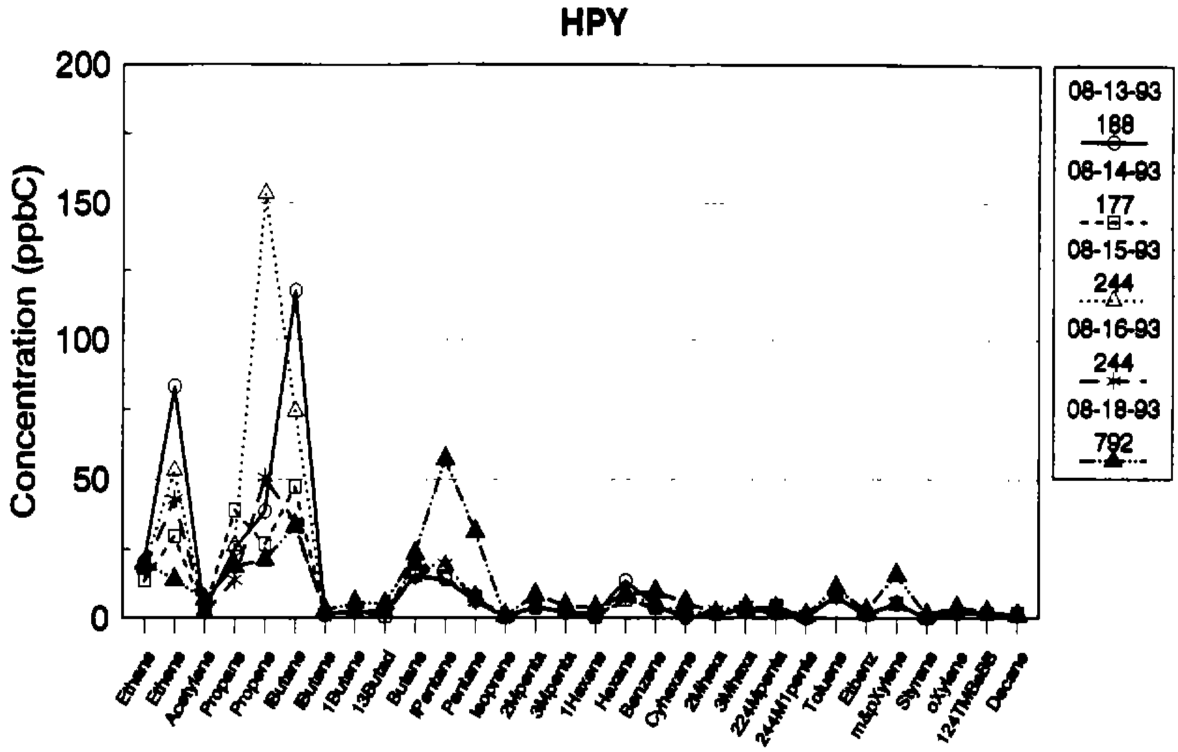

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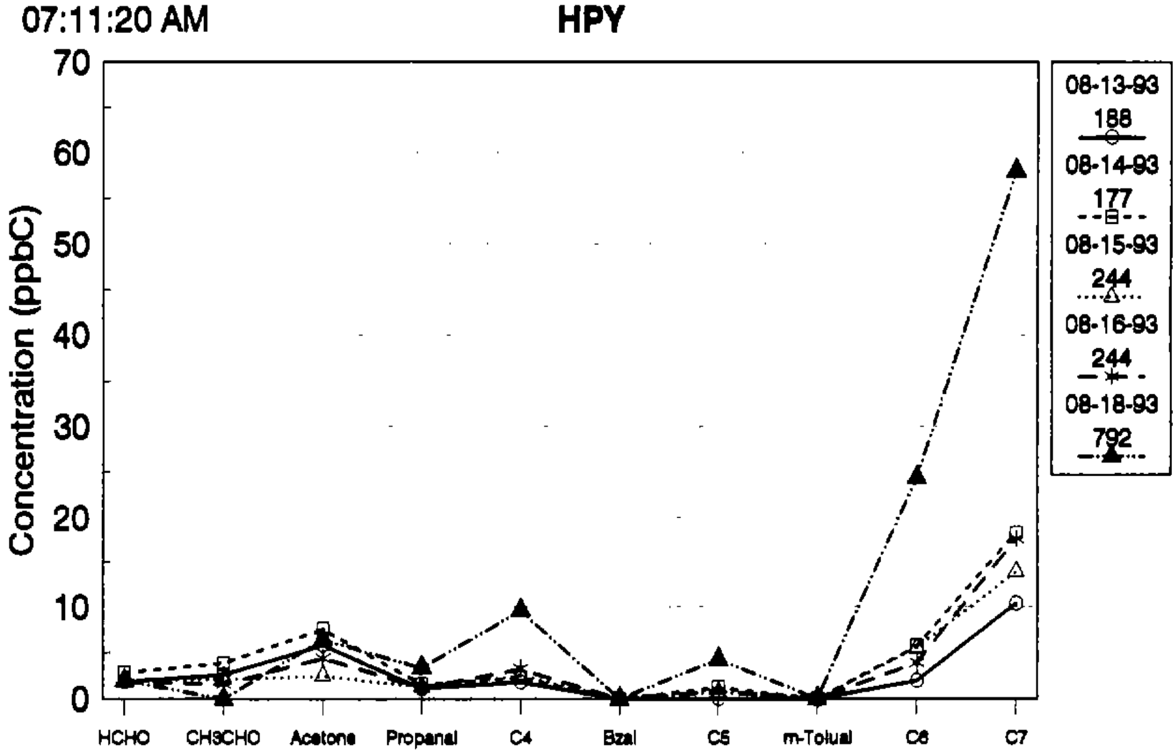

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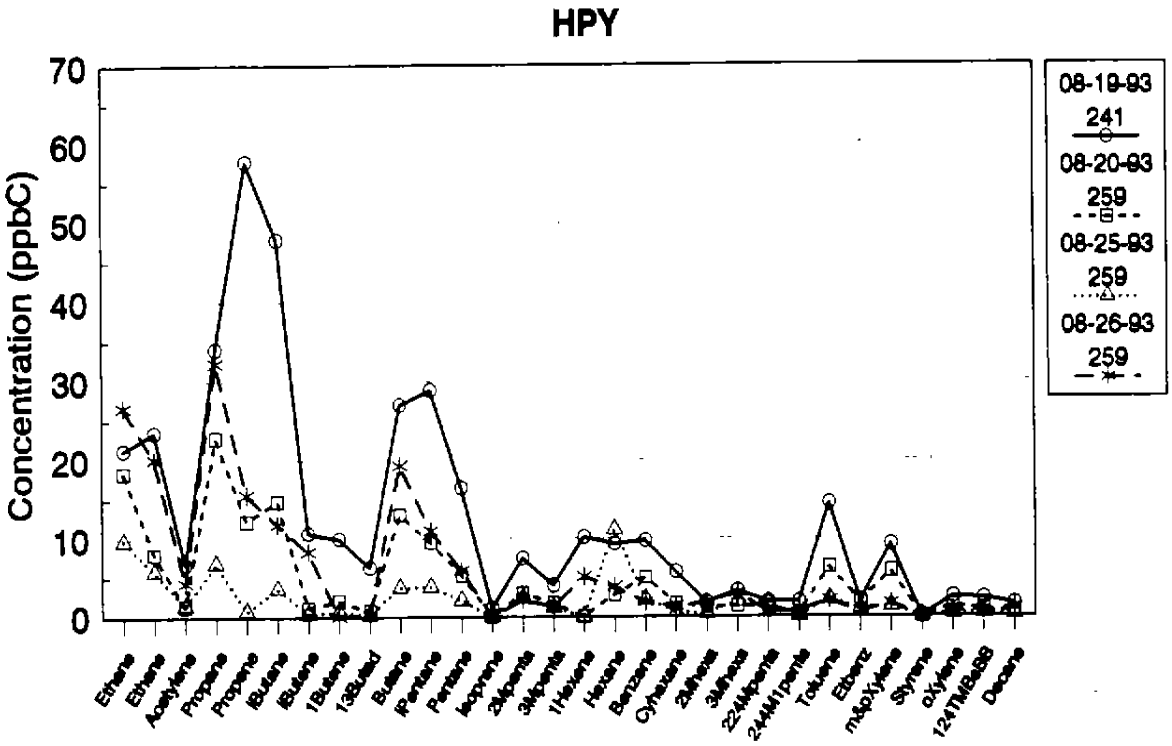

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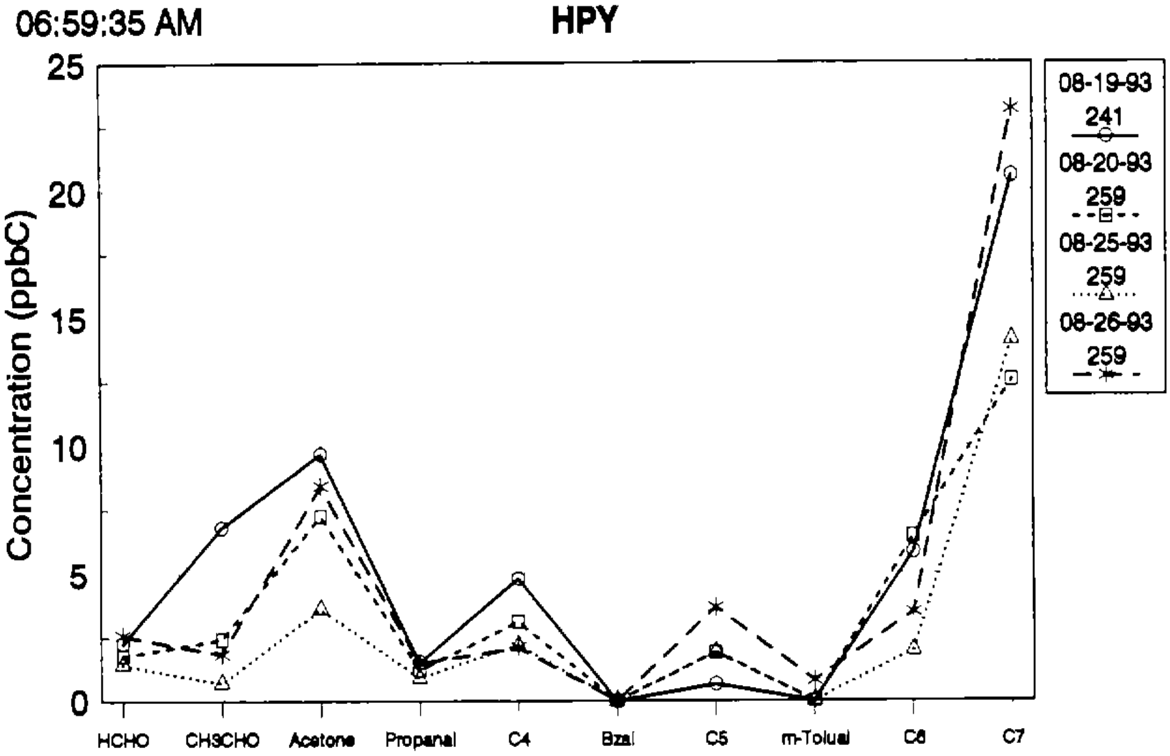

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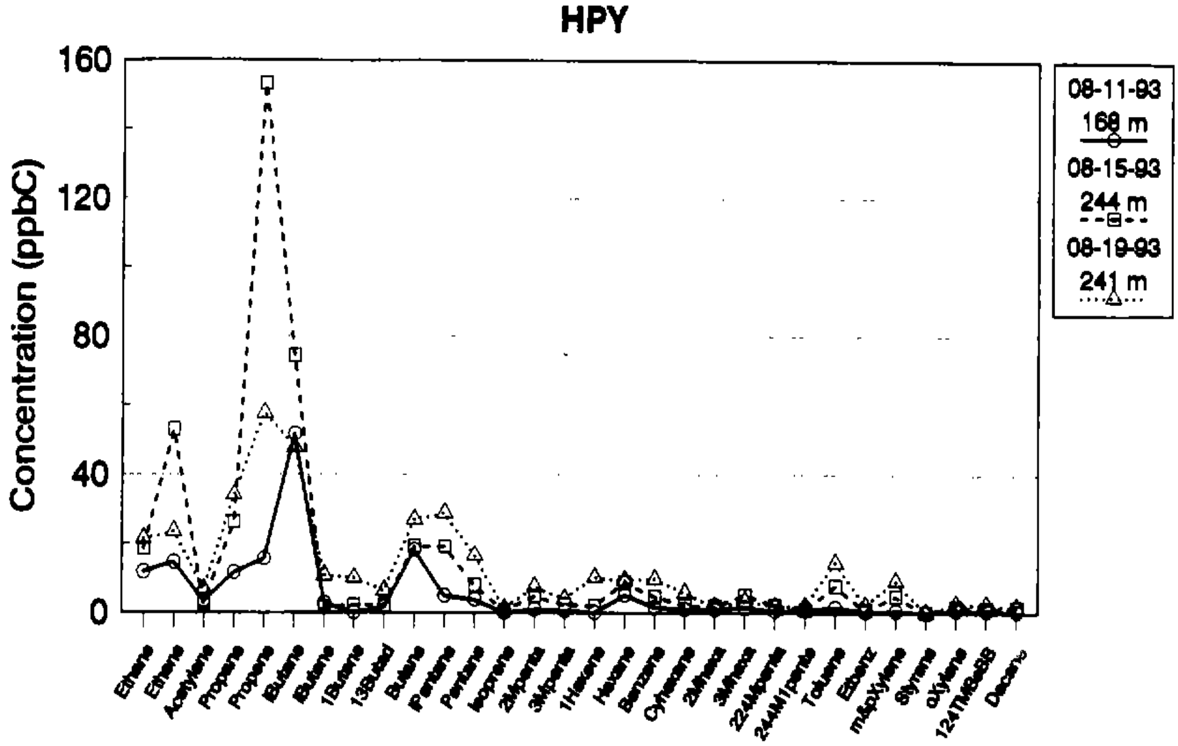
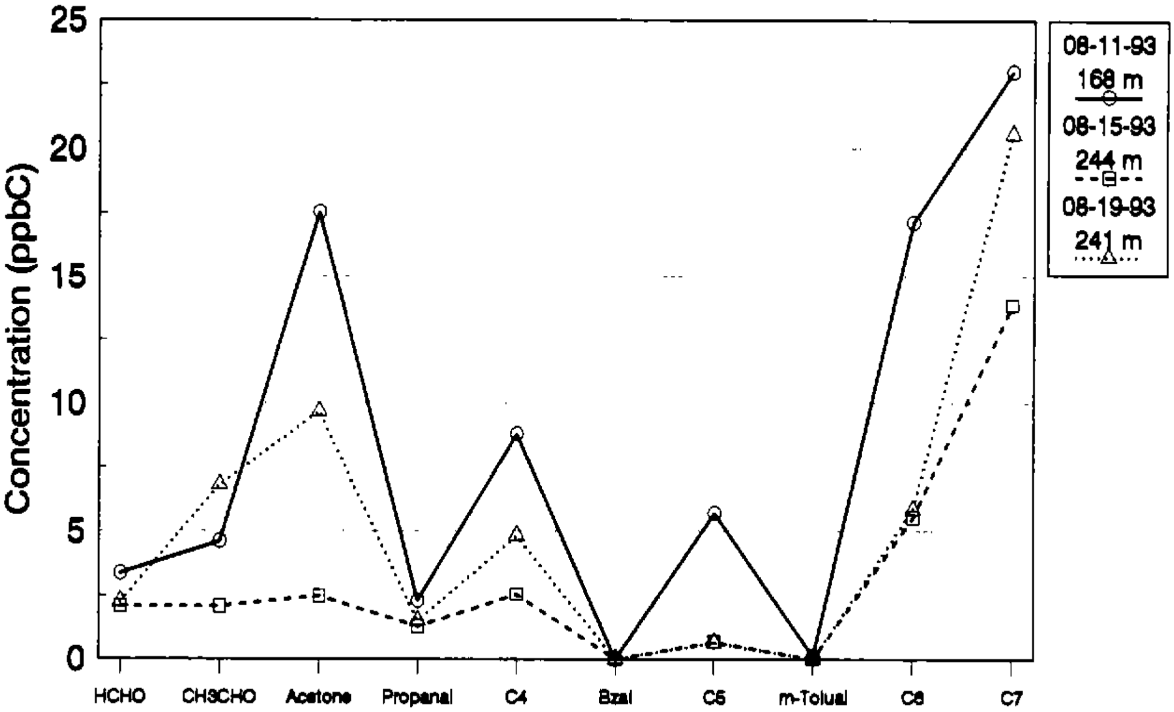
1-19-95



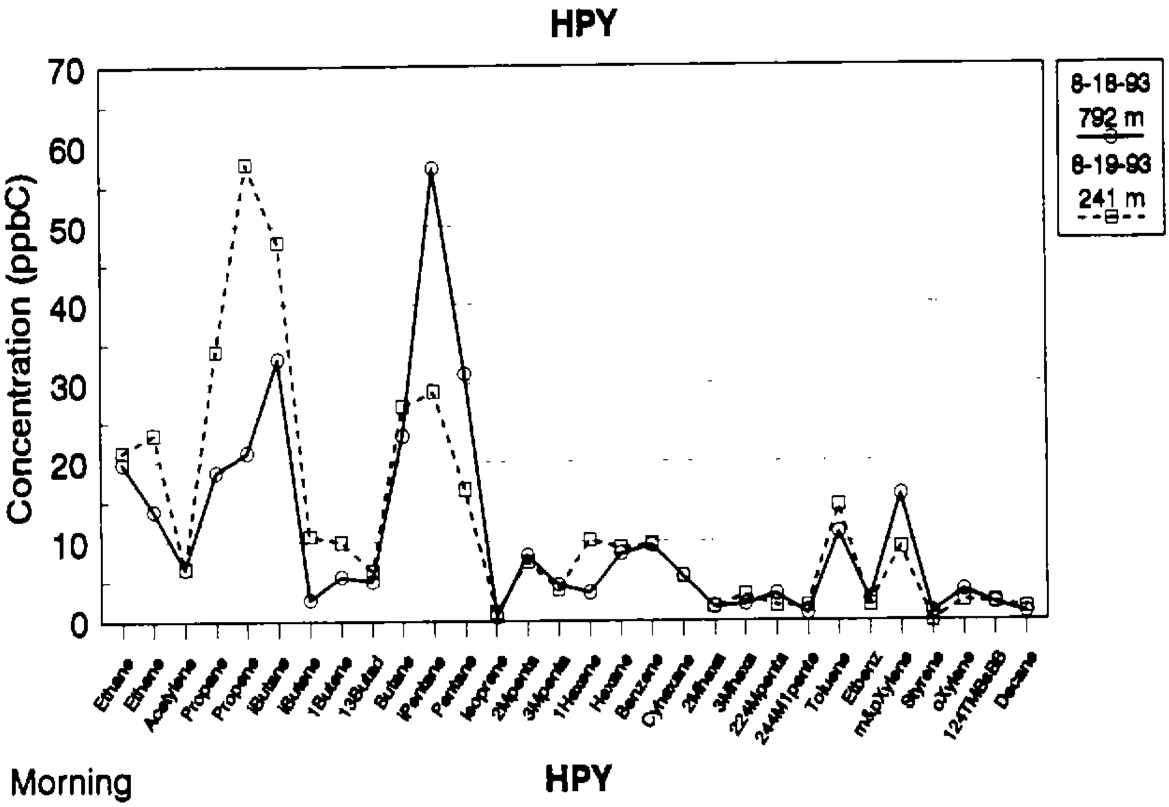
Morning

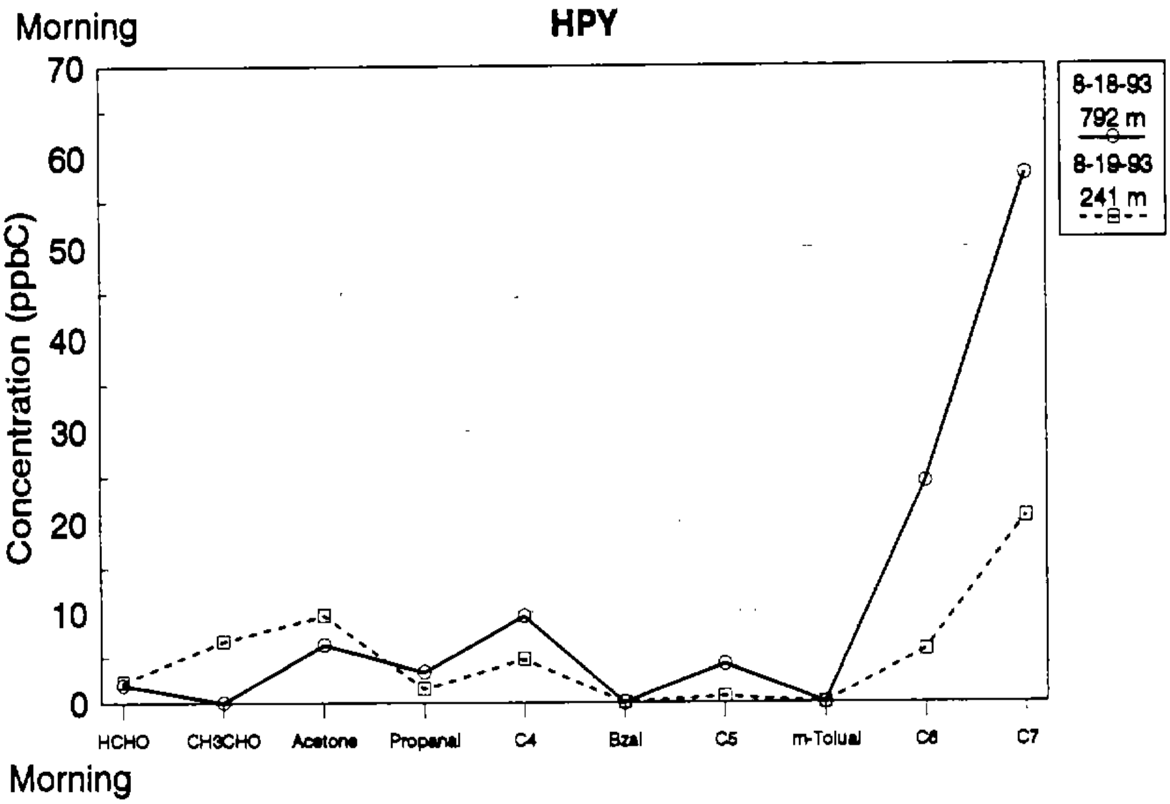
HPY



Morning

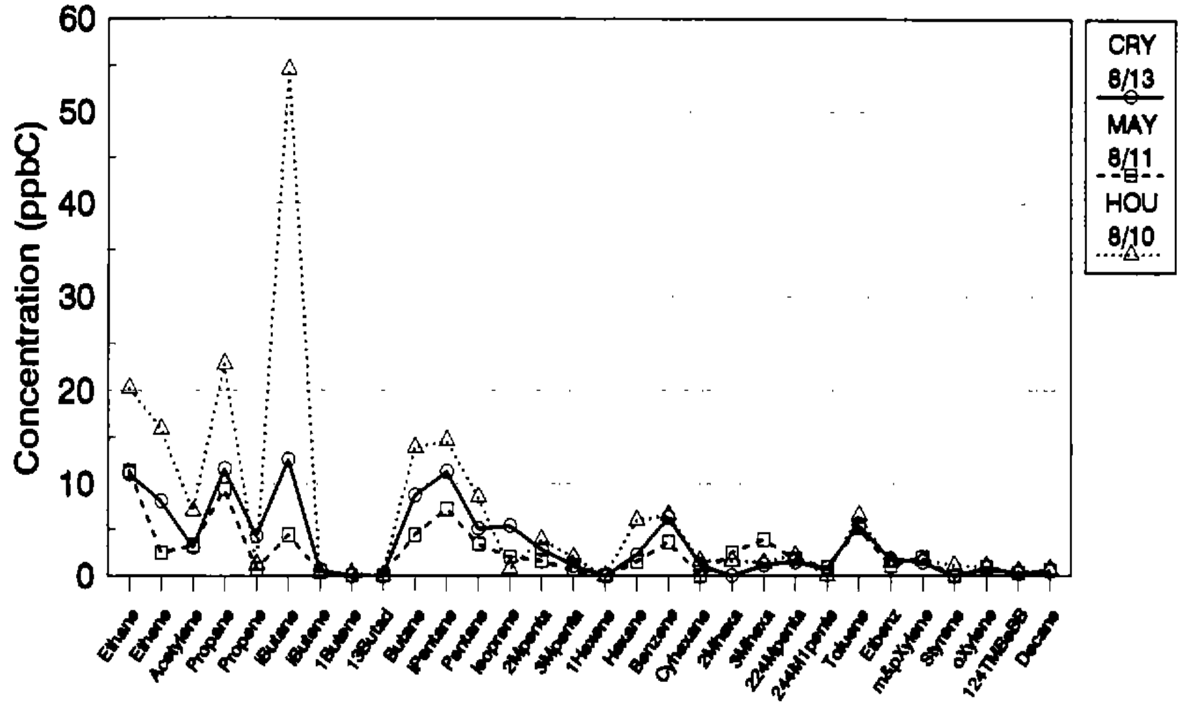
hpyam4.drw
1-19-95





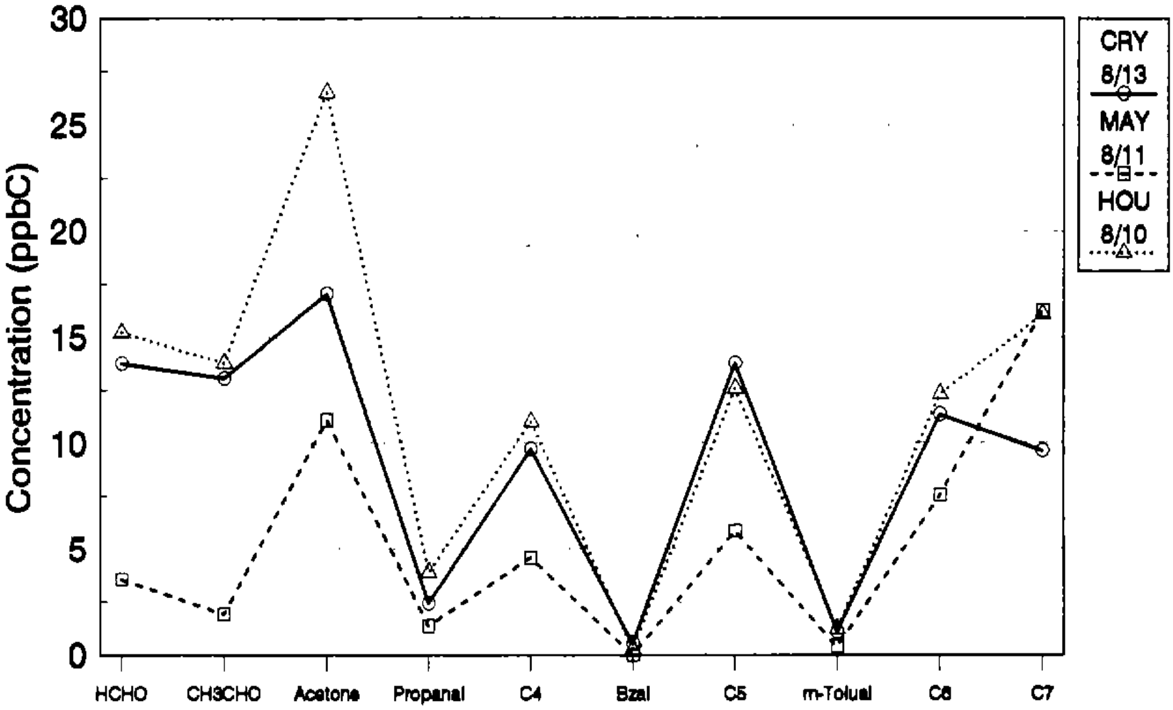
hpyam5.drw
1-19-95

Samples with High Ozone



Afternoon

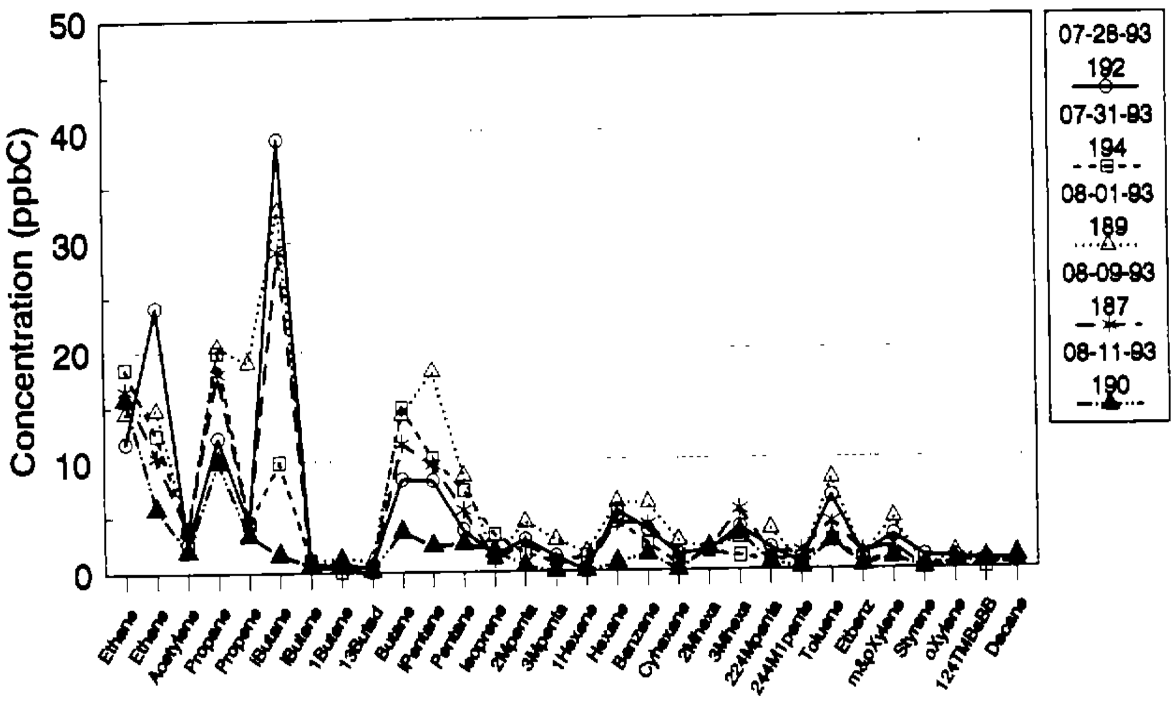
Samples with High Ozone



Afternoon

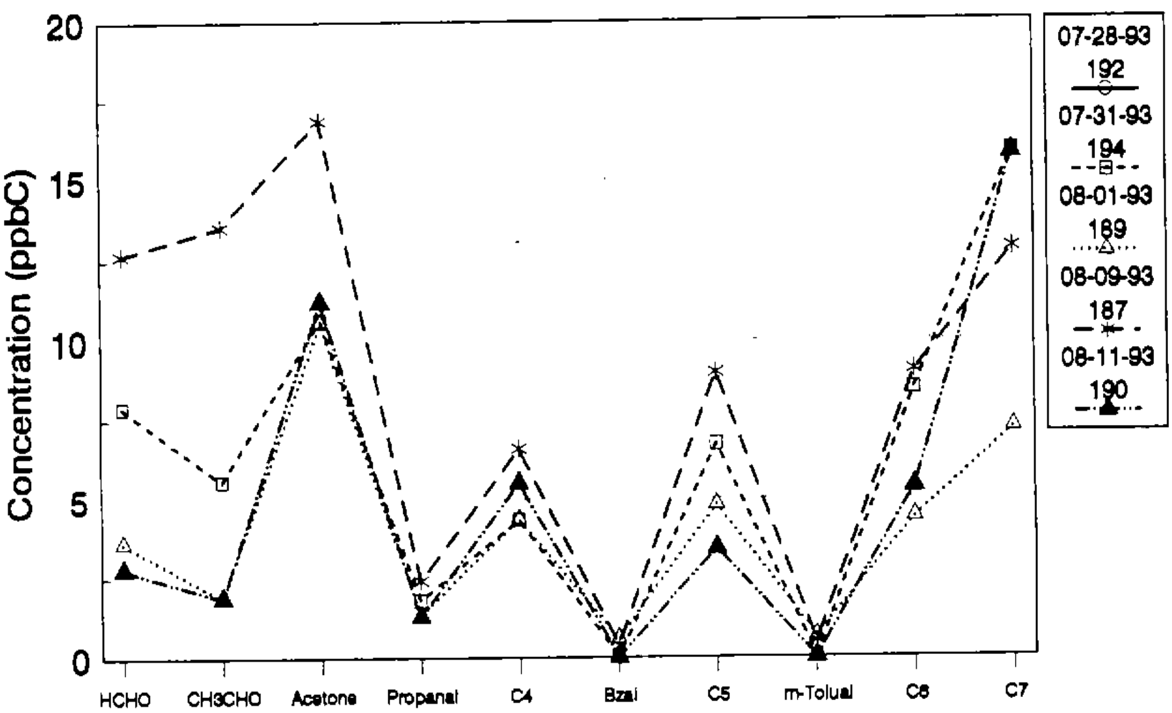
hpyam6.drw
1-19-95

HPY



12:31:00 AM

HPY



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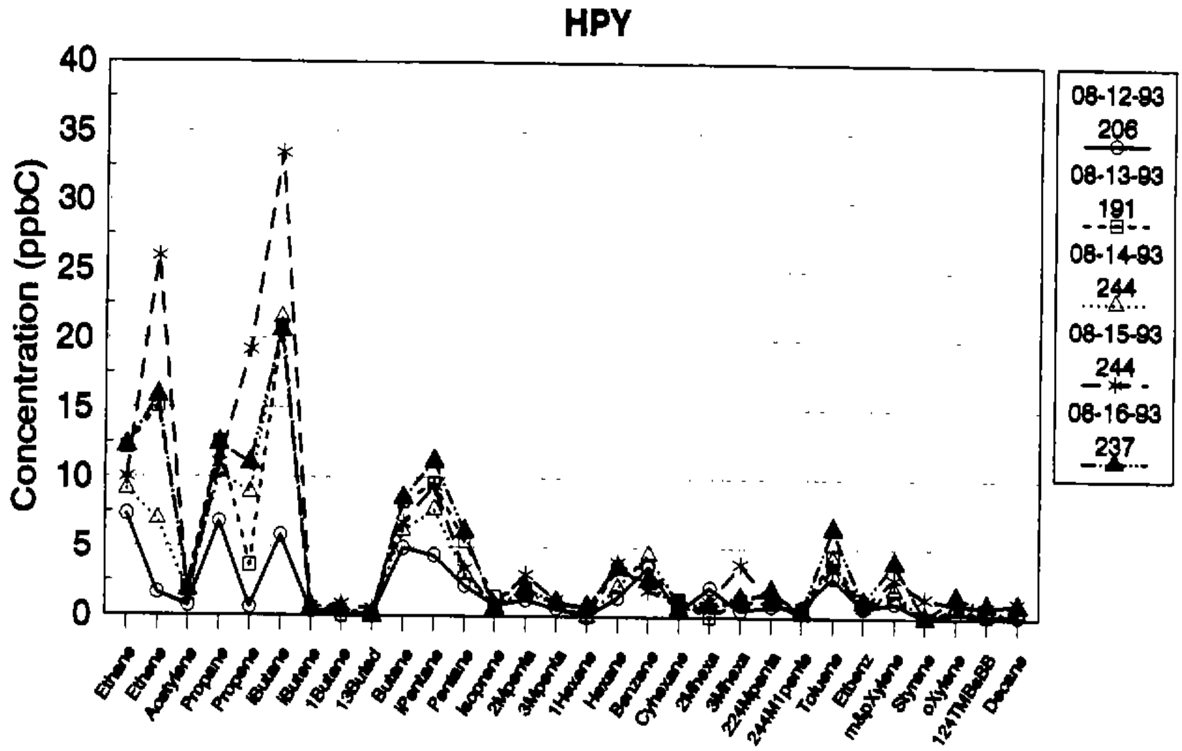
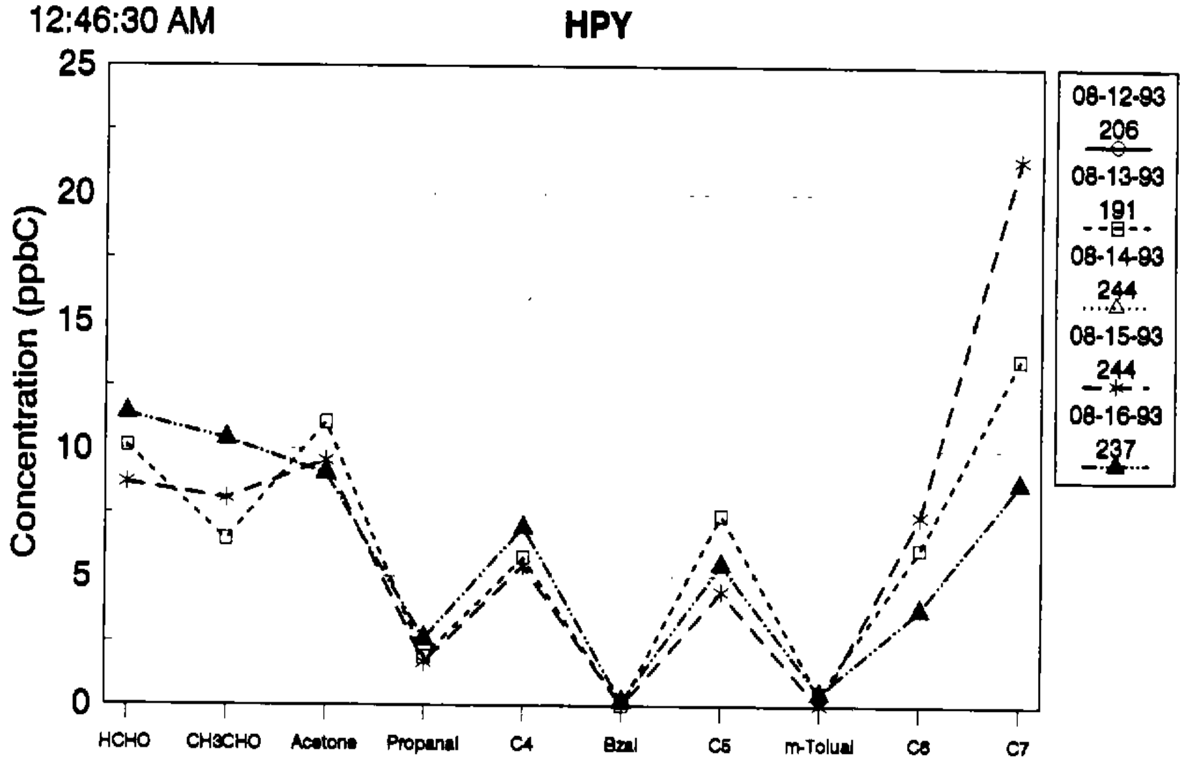
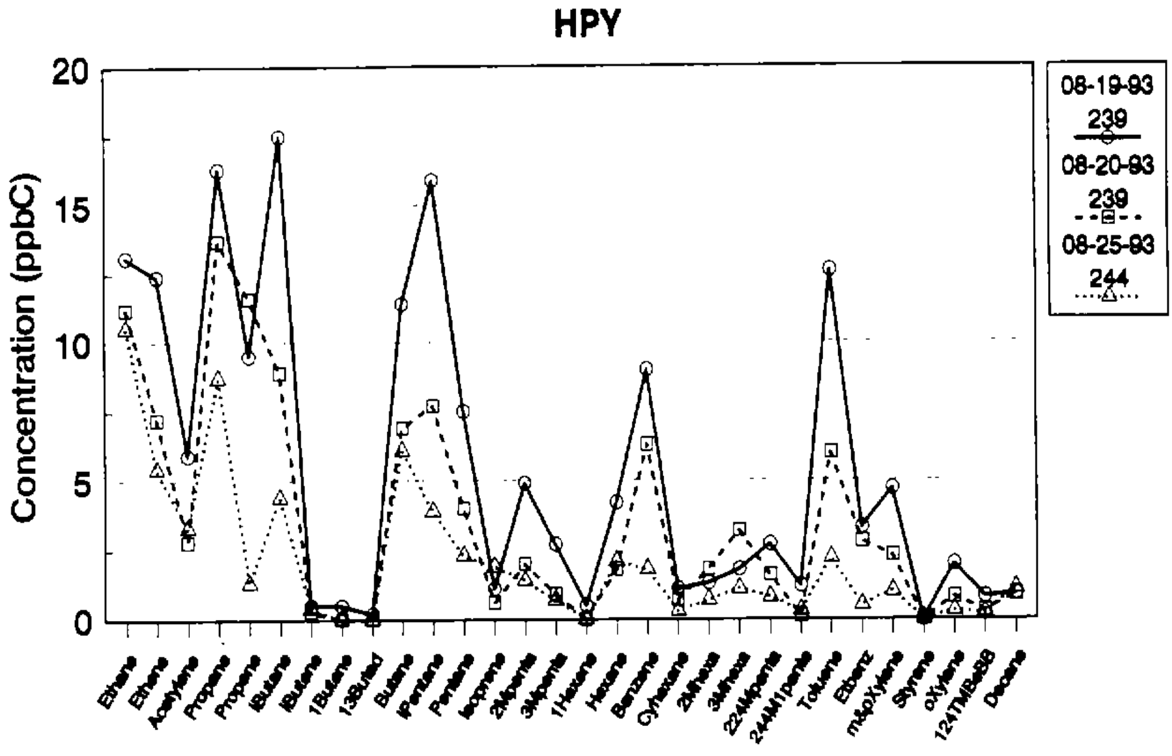
hpypm1.drw

1-19-95





hpypm2.drw
1-19-95



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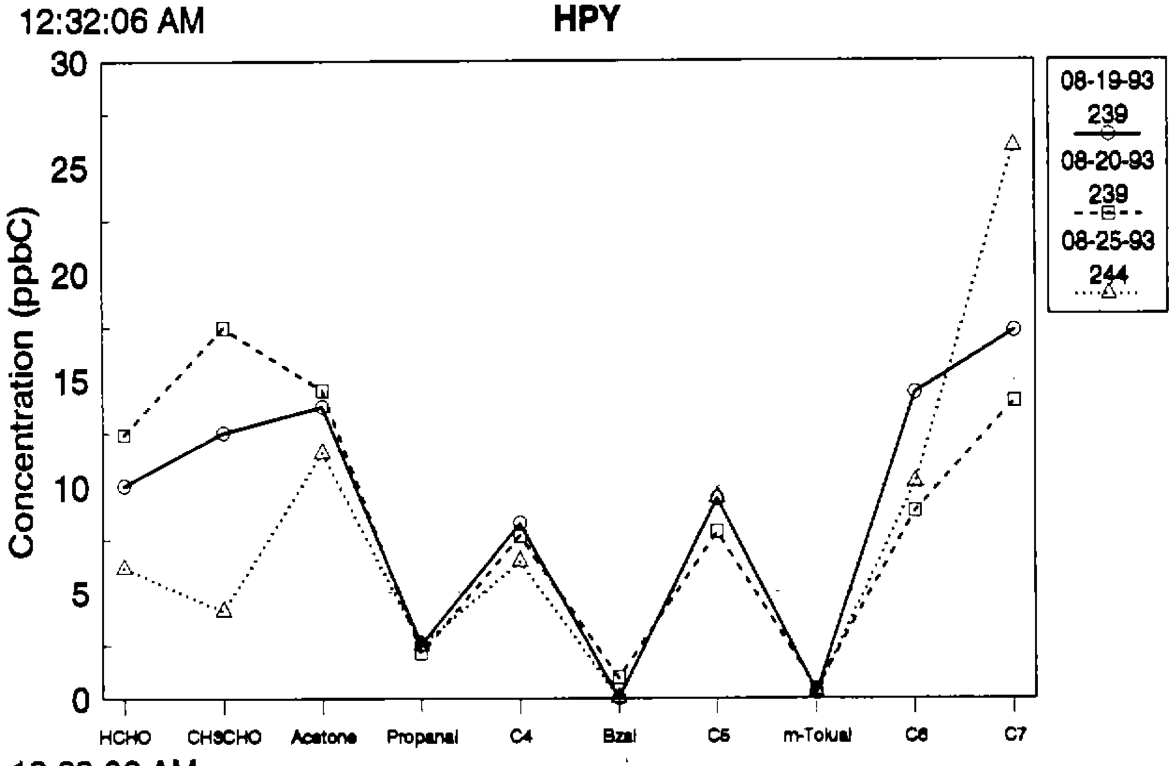

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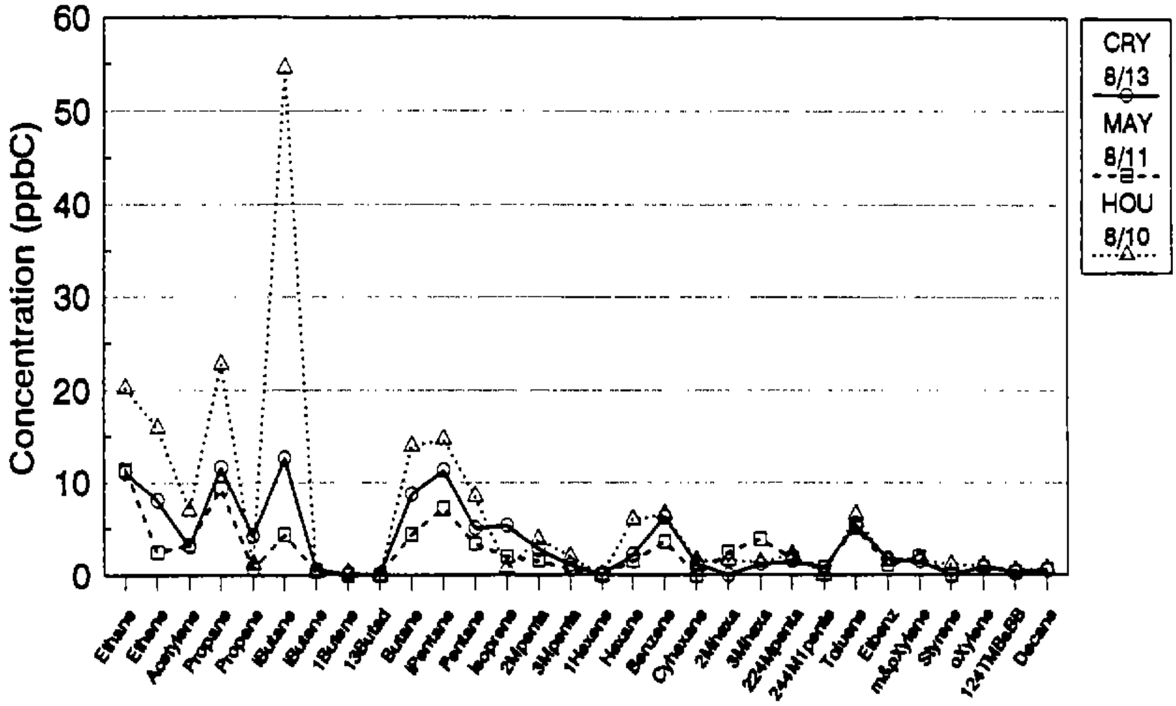
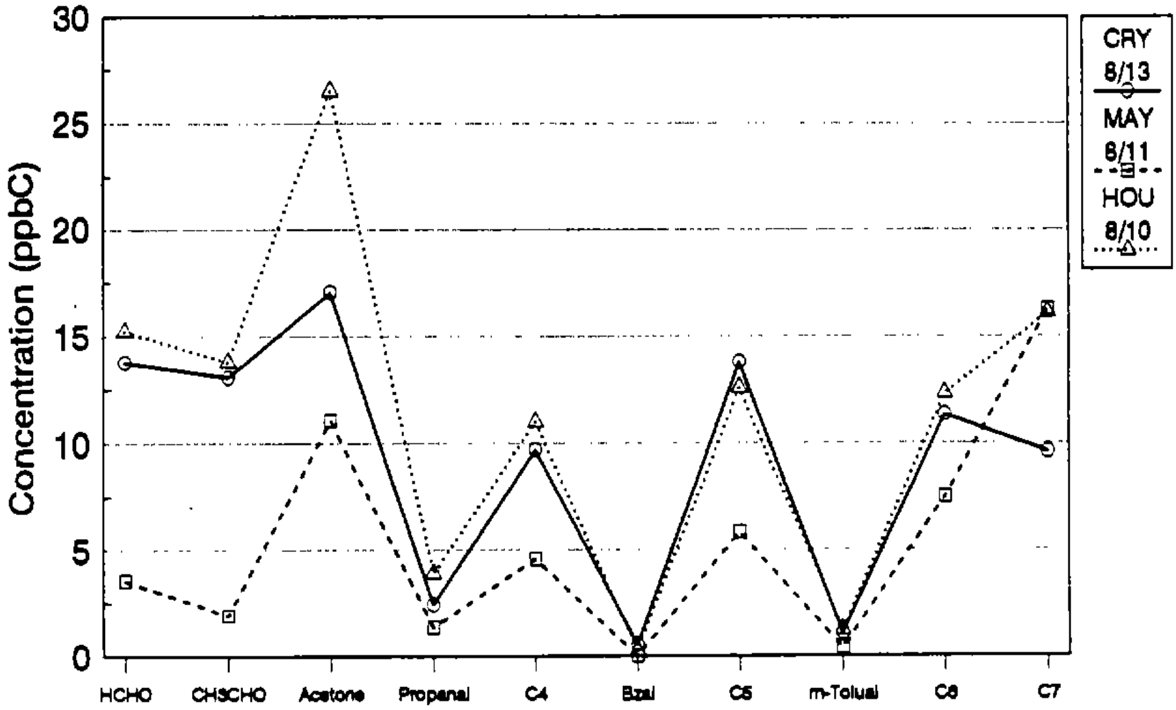
hpypm3.drw
1-19-95

Samples with High Ozone



Afternoon

Samples with High Ozone

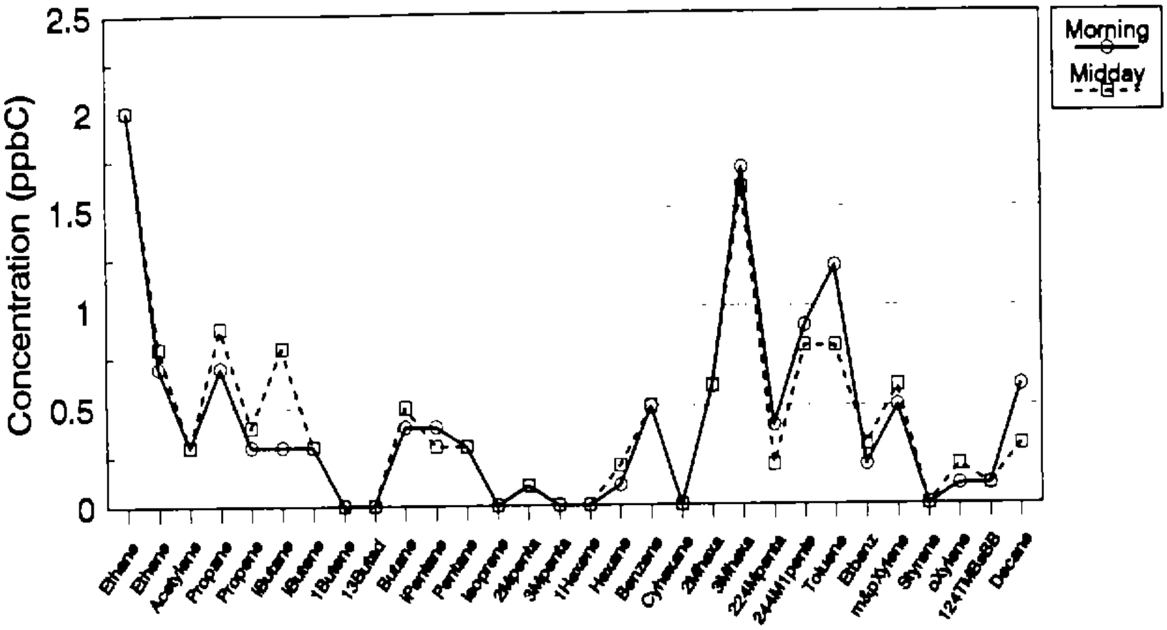


Afternoon

hpyam6.drw

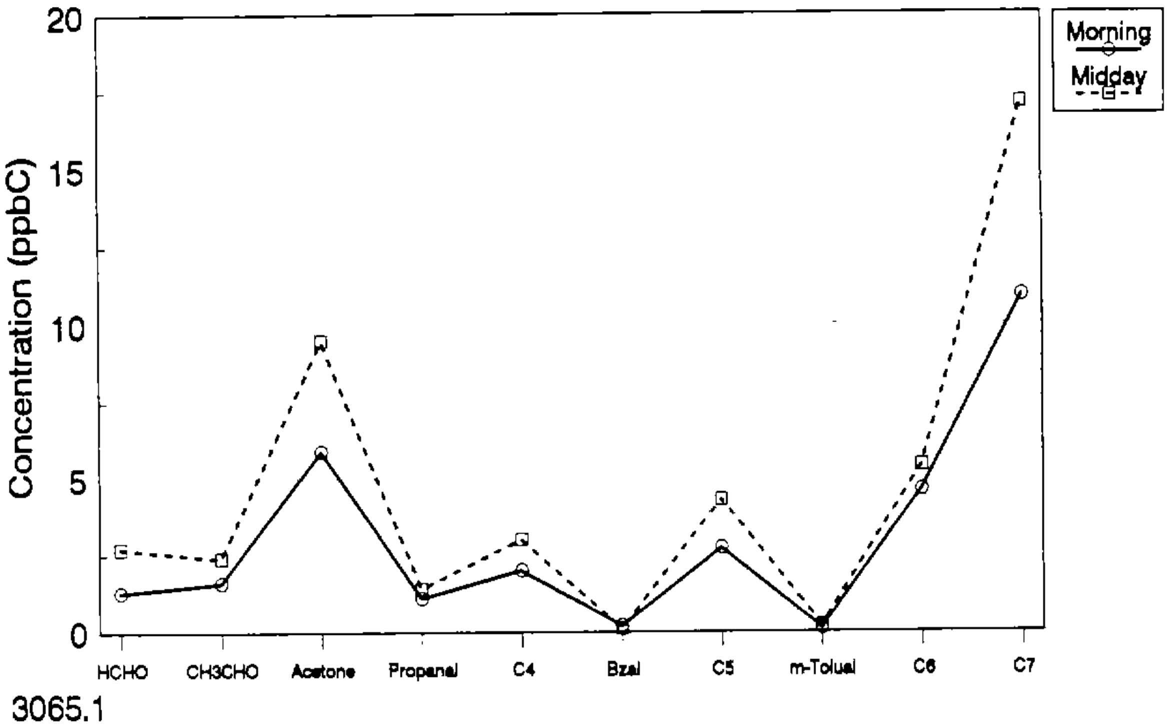
F-19-95

Average Aircraft Hydrocarbon Composition
Higher Altitude Samples



3065.1

Average Aircraft Carbonyl Compound Composition



3065.1

achavg.drw
2-24-95

APPENDIX I

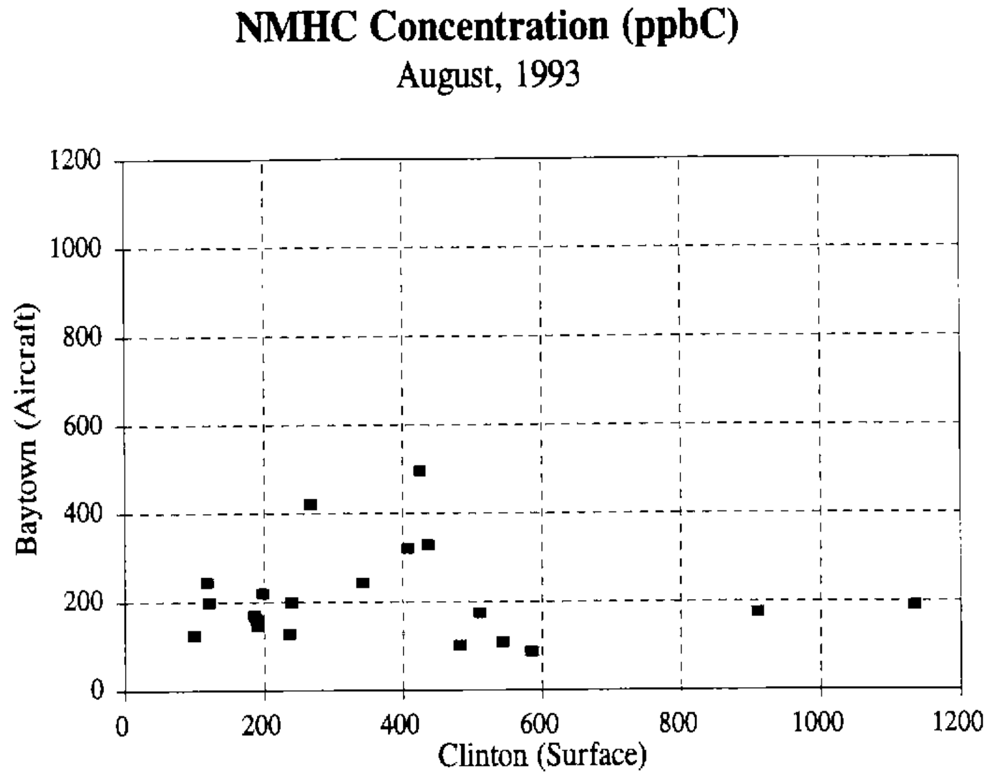
COMPARISONS OF SURFACE AND AIRCRAFT HYDROCARBON AND CARBONYL COMPOUND DATA

Many plots and tables were prepared for the analyses which were not included in the main report. Appendix B included a table listing the target species reported by Biospherics for the surface and aircraft canisters. This appendix contains figures comparing the surface and aircraft hydrocarbons and carbonyl compound data including the following:

- Line plots of hydrocarbon species and species group concentrations measured at the surface at Clinton and by aircraft near Baytown. Plots for all matching samples collected during August 1993.

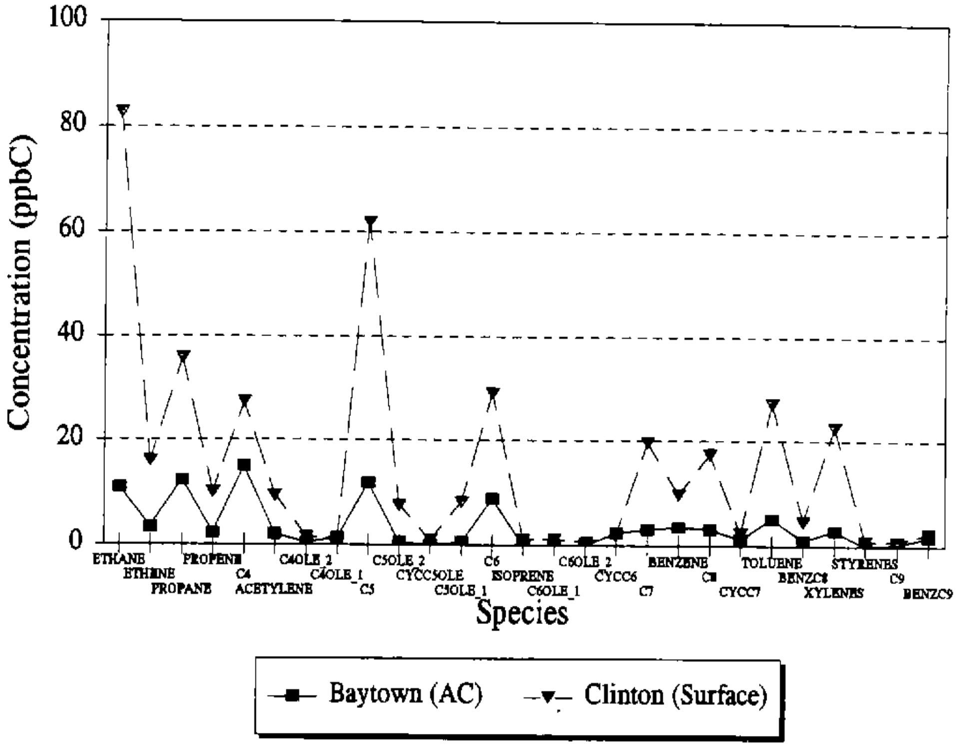
- Line plots of abundant hydrocarbon species and carbonyl compounds measured at the surface at Gilchrist and by aircraft near High Island Platform. Plots are provided for both the concentration and the weight percent of NMOC.

- Line plots of abundant hydrocarbon species and carbonyl compounds measured at the surface of Cocodrie and by aircraft near Ship Shoal Platform. Plots are provided for both the concentration and the weight percent of NMOC.


NMHC Concentration (ppbC)
August, 1993
Baytown (Aircraft)
Clinton (Surface)
0
200
400
600
800
1000
1200

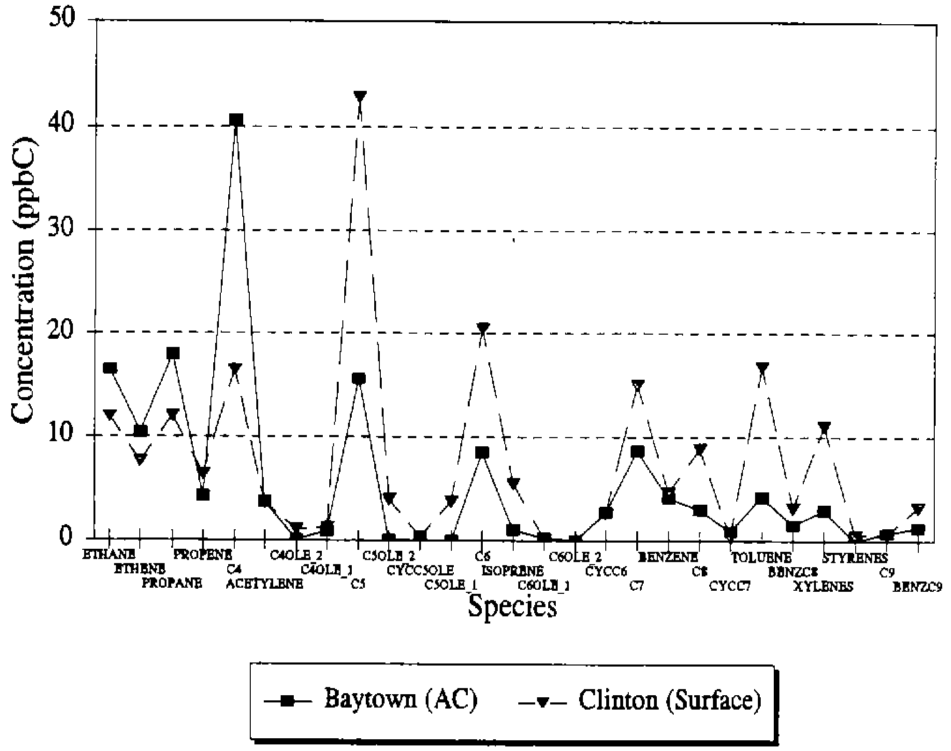
Aircraft - Surface NMHC Comp.

August 9, 1993 05 CST



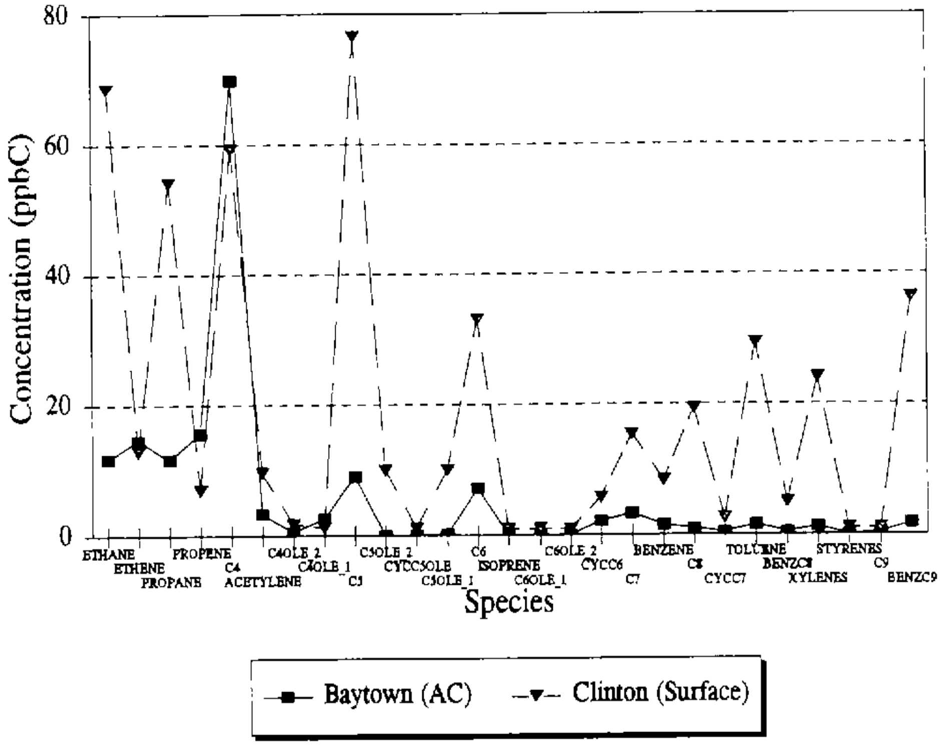
Aircraft - Surface NMHC Comp.

August 9, 1993 11 CST



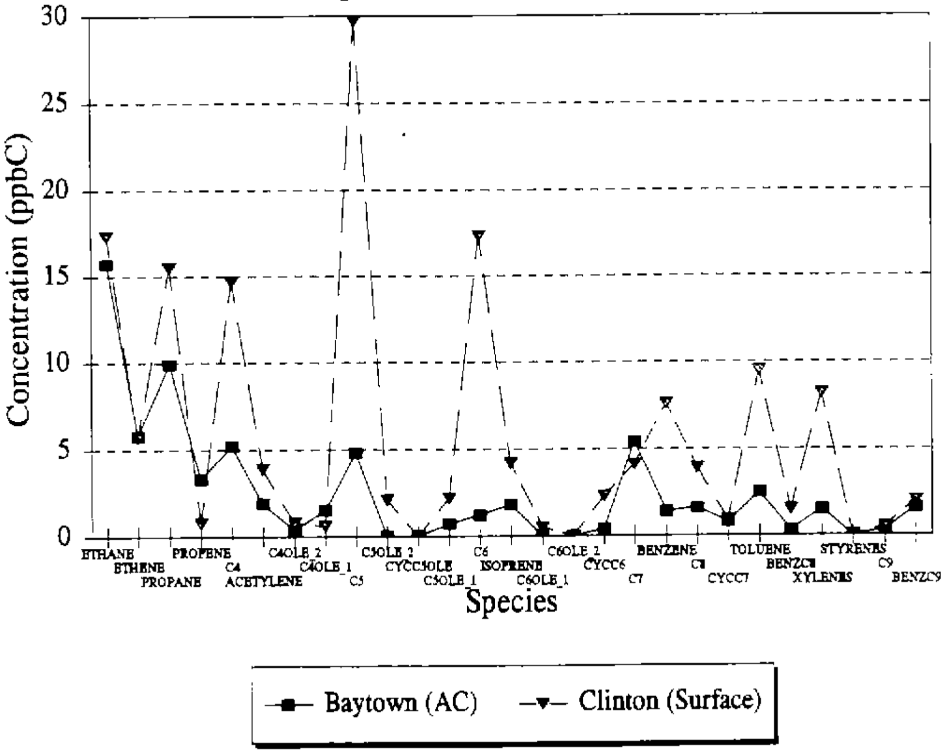
Aircraft - Surface NMHC Comp.

August 11, 1993 05 CST



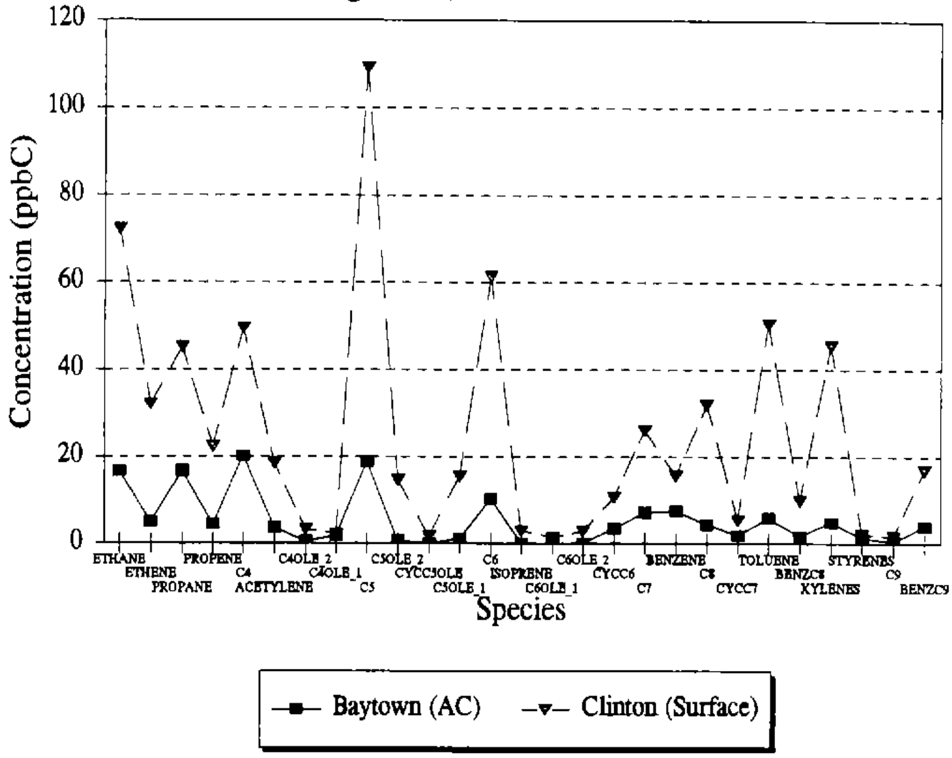
Aircraft - Surface NMHC Comp.

August 11, 1993 15 CST



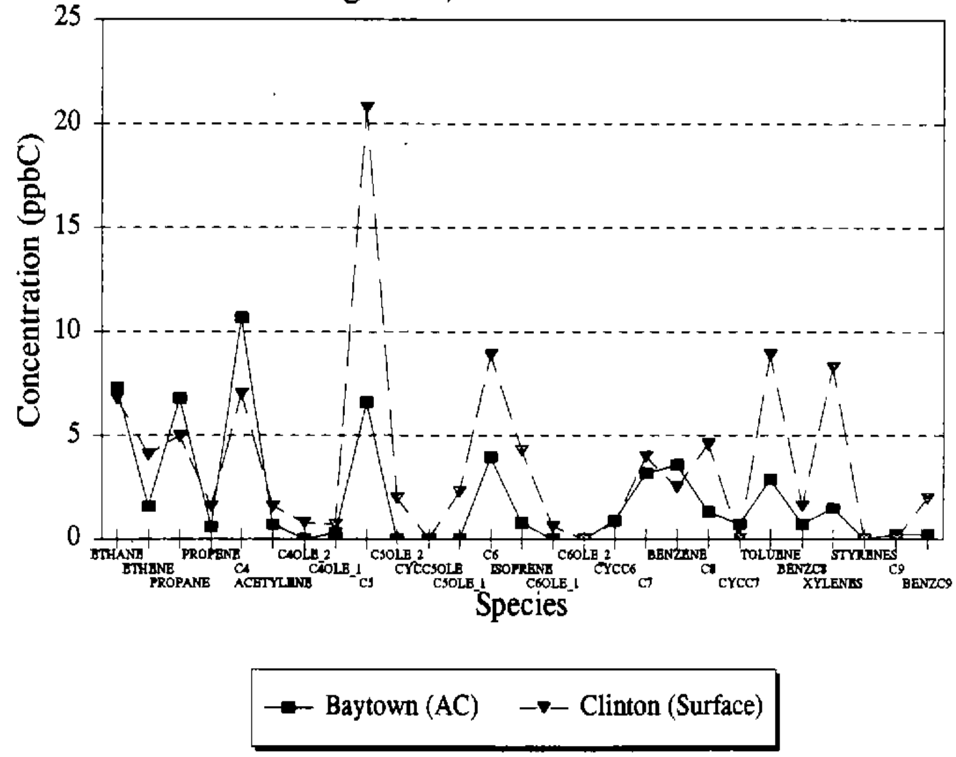
Aircraft - Surface NMHC Comp.

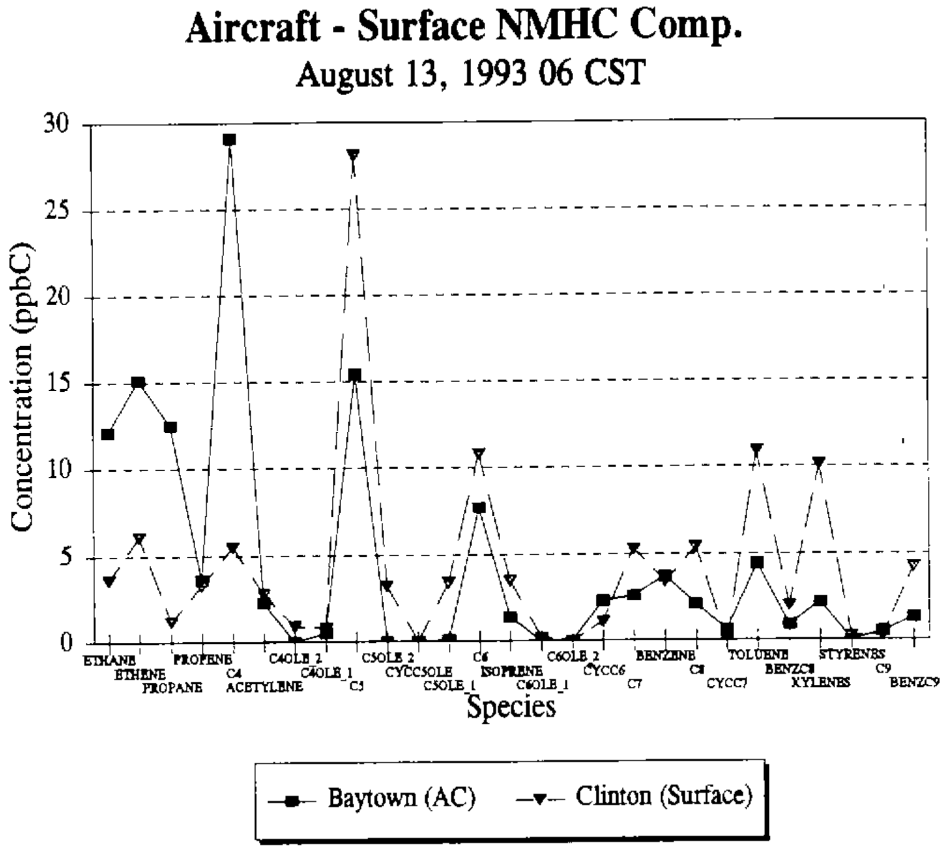
August 12, 1993 06 CST

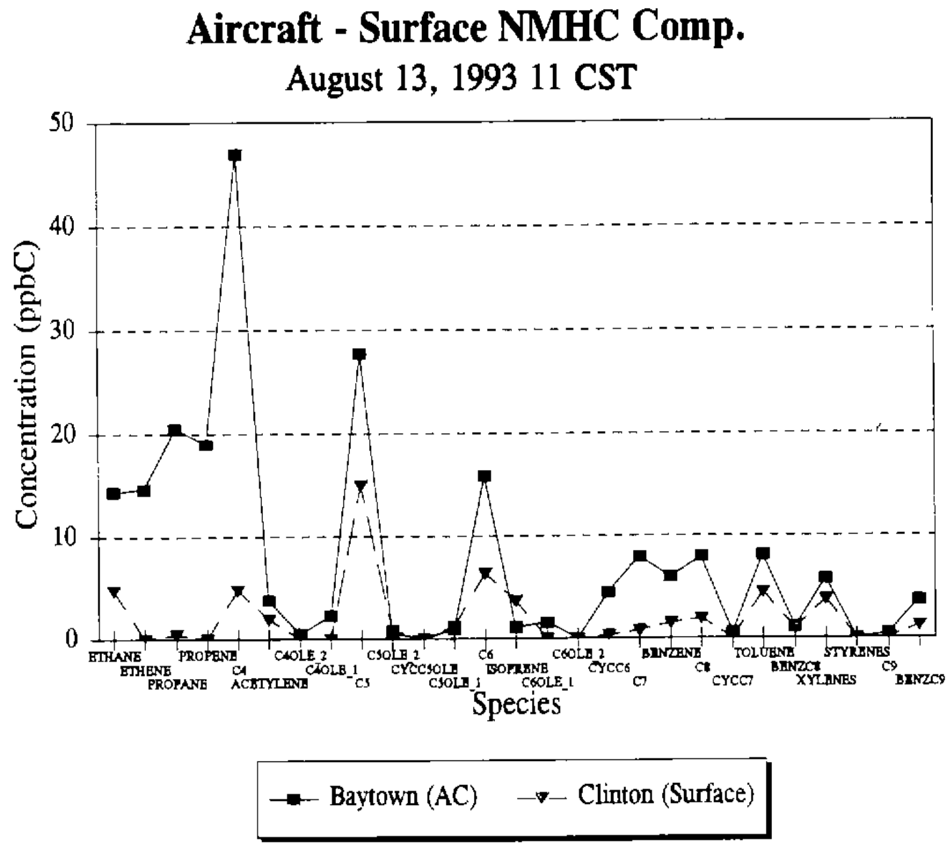


Aircraft - Surface NMHC Comp.

August 12, 1993 11 CST

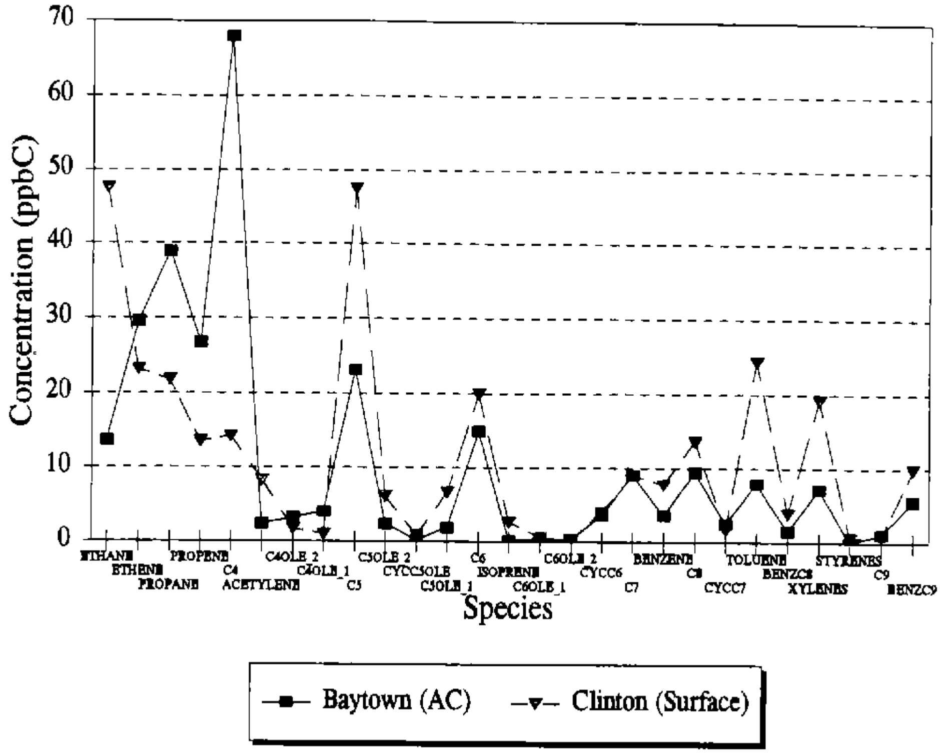



Aircraft - Surface NMHC Comp.
August 13, 1993 06 CST
Concentration (ppbC)
Species
ETHANE
ETHENE
PROPANE
PROPENE
C4
ACETYLENE
C4OLE_2
C4OLE_1
C5
C5OLE_2
CYCC5OLE
C5OLE_1
C6
ISOPRENE
C6OLE_1
C6OLE_2
CYCC6
C7
BENZENE
C8
CYCC7
TOLUENE
BENZC8
XYLENES
STYRENES
C9
BENZC9
Baytown (AC)
Clinton (Surface)


Aircraft - Surface NMHC Comp.
August 13, 1993 11 CST
Concentration (ppbC)
Species
ETHANE
ETHENE
PROPANE
PROPENE
C4
ACETYLENE
C4OLE_2
C4OLE_1
C5
C5OLE_2
CYCC5OLE
C5OLE_1
C6
ISOPRENE
C6OLE_1
C6OLE_2
CYCC6
C7
BENZENE
C8
CYCC7
TOLUENE
BENZC8
XYLENES
STYRENES
C9
BENZC9
Baytown (AC)
Clinton (Surface)

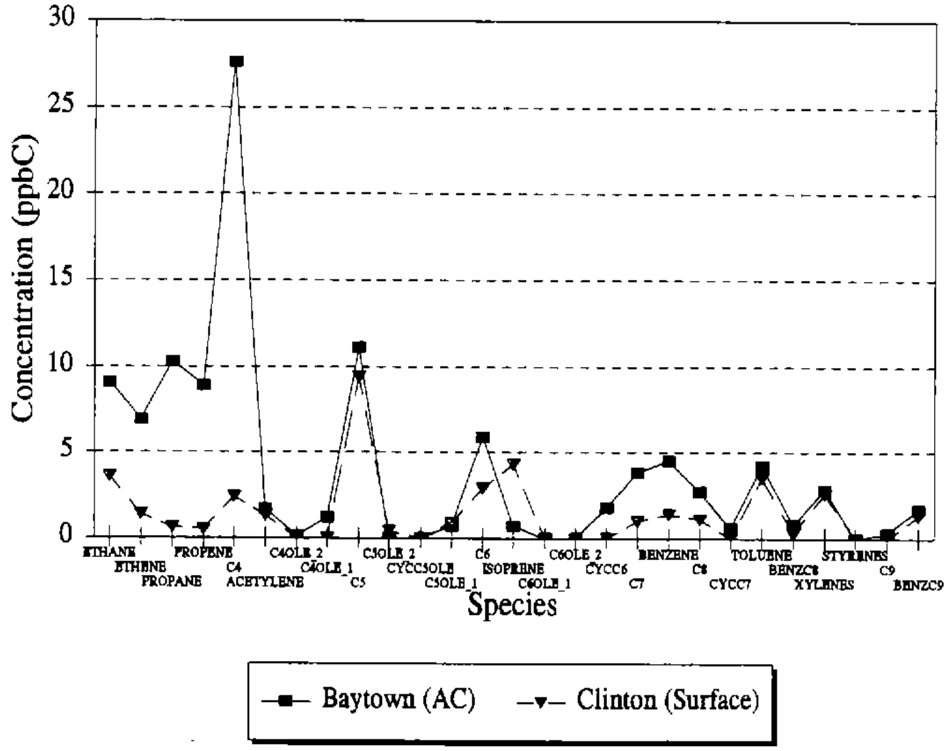
Aircraft - Surface NMHC Comp.

August 14, 1993 06 CST

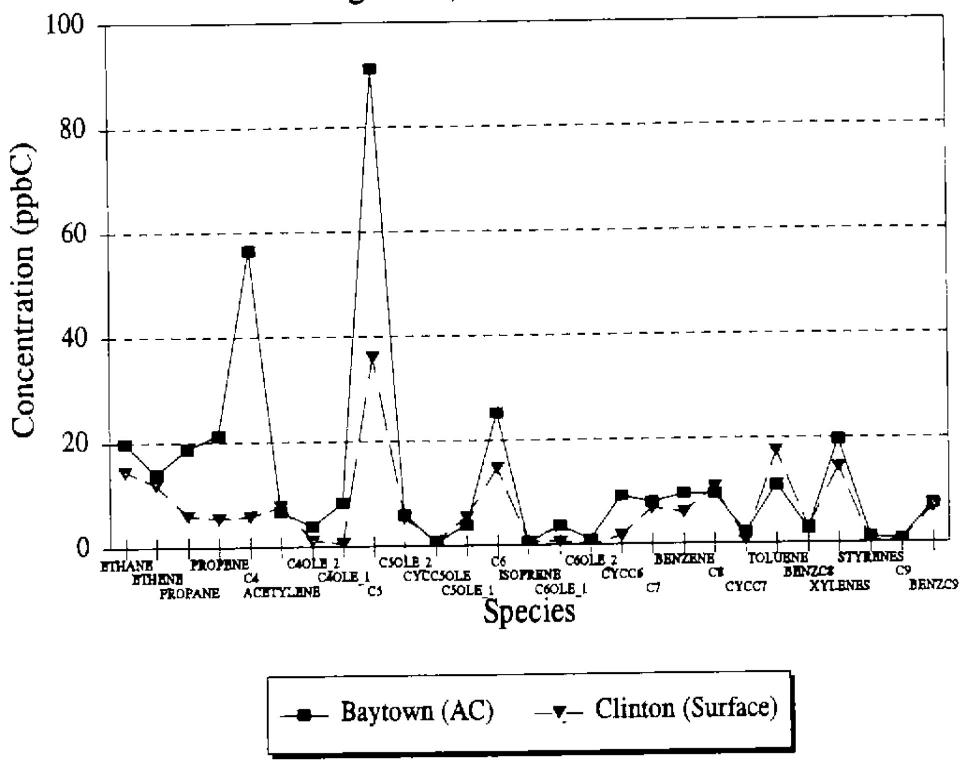


Aircraft - Surface NMHC Comp.

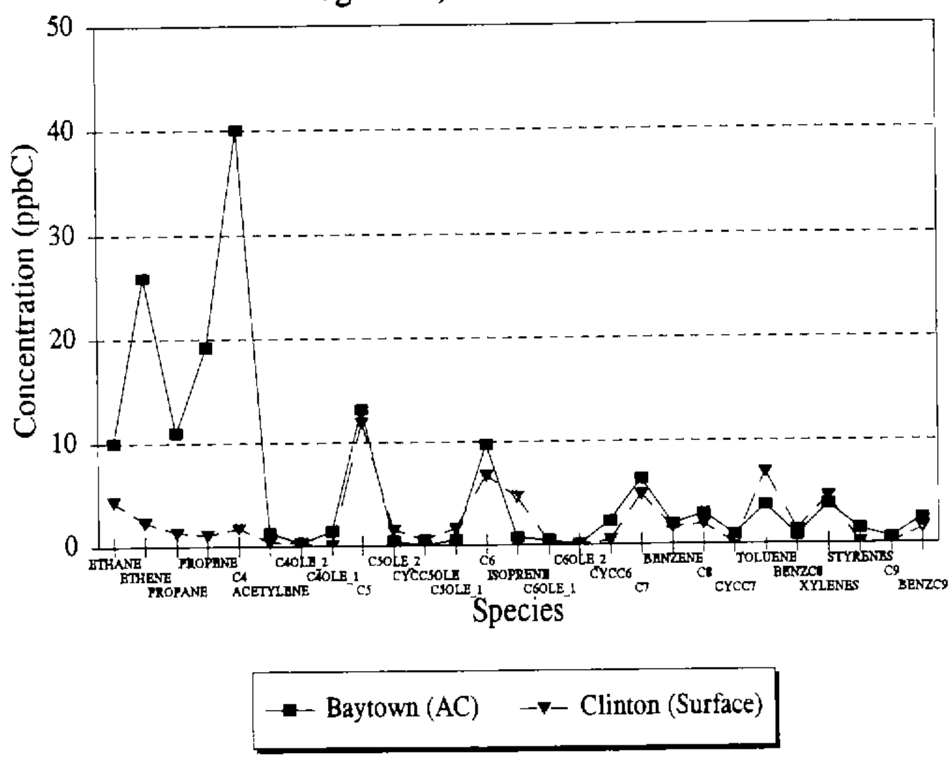
August 14, 1993 11 CST



Aircraft - Surface NMHC
August 15, 1993 05 CST

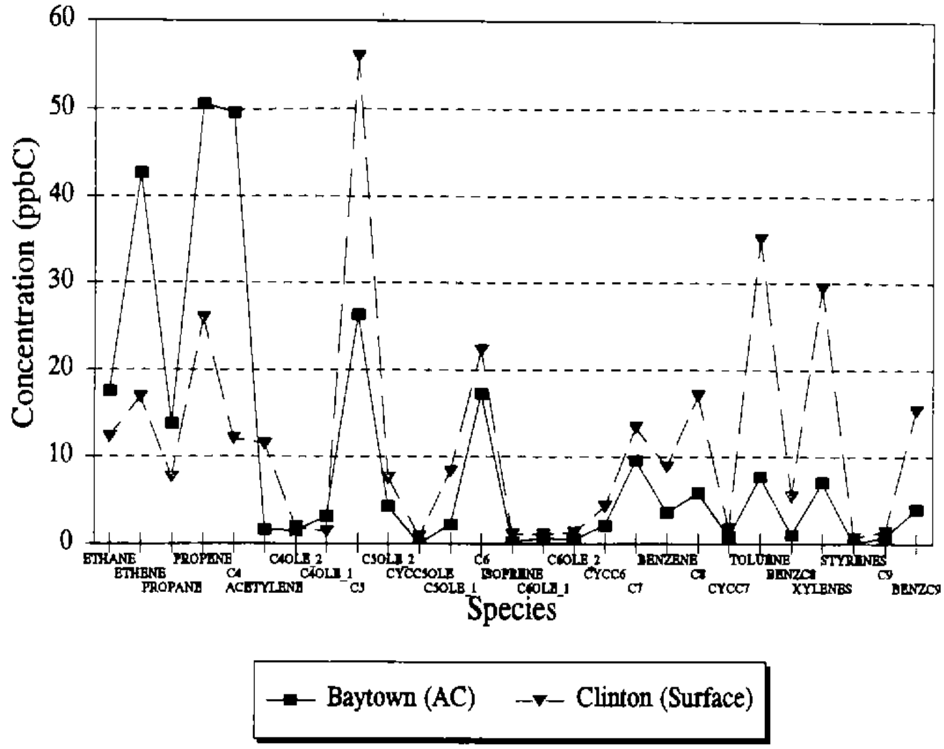


Aircraft - Surface NMHC Comp.
August 15, 1993 11 CST



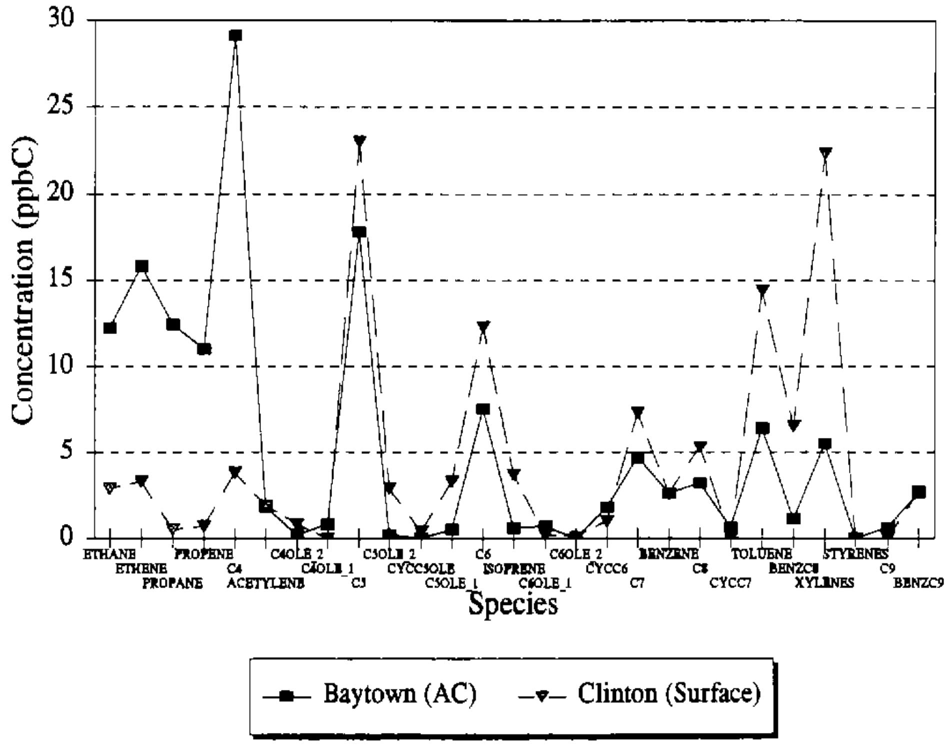
Aircraft - Surface NMHC Comp.

August 16, 1993 06 CST



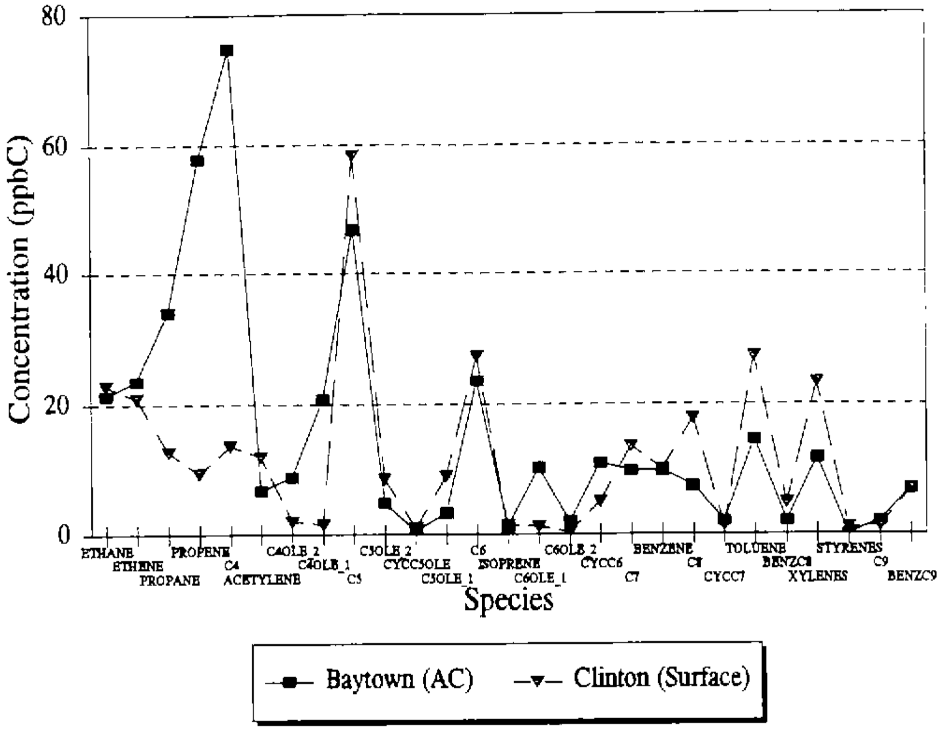
Aircraft - Surface NMHC Comp.

August 16, 1993 11 CST



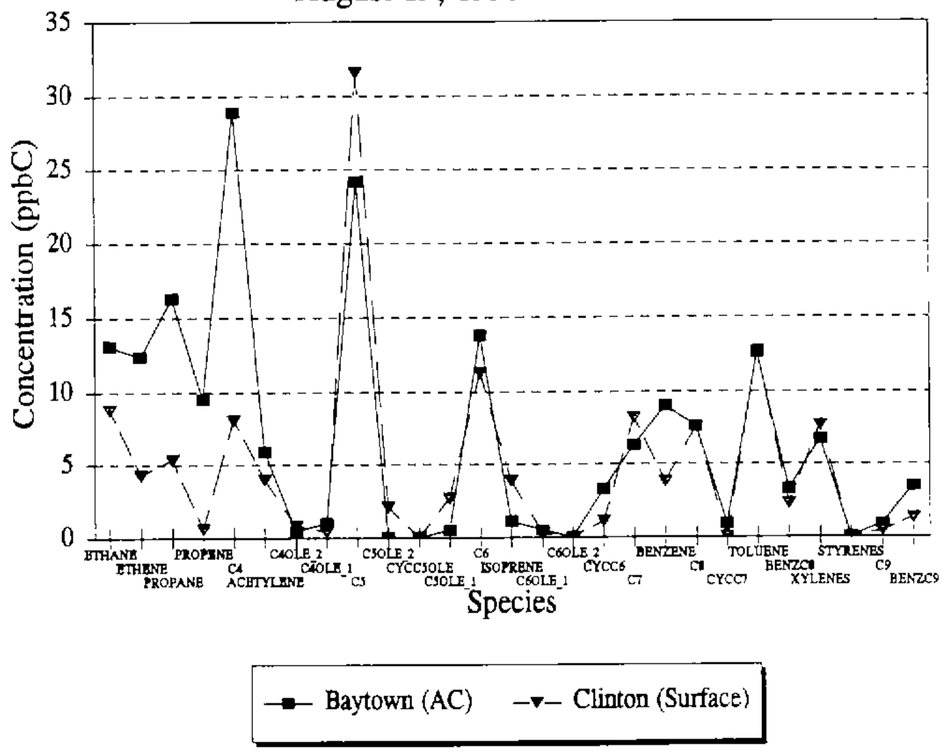
Aircraft - Surface NMHC

August 19, 1993 06 CST



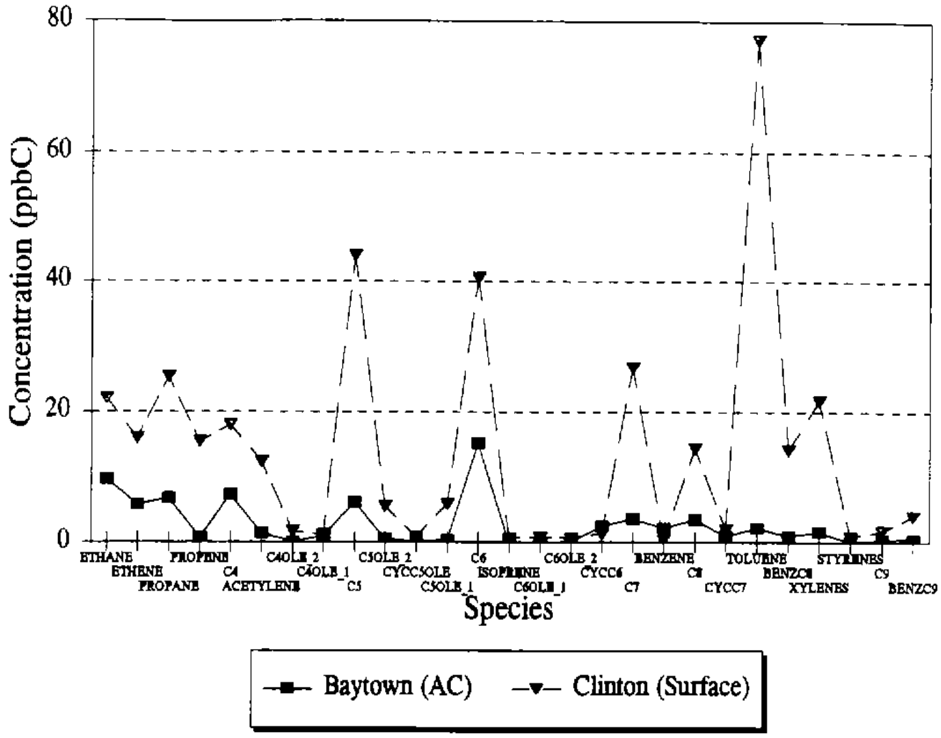
Aircraft - Surface NMHC

August 19, 1993 11 CST



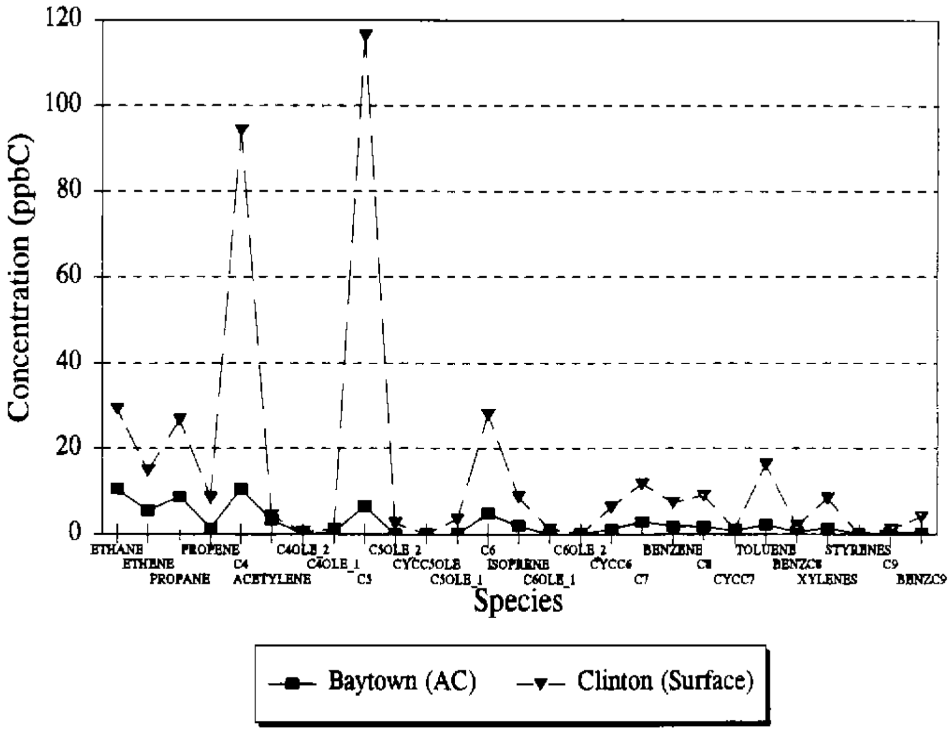
Aircraft - Surface NMHC Comp.

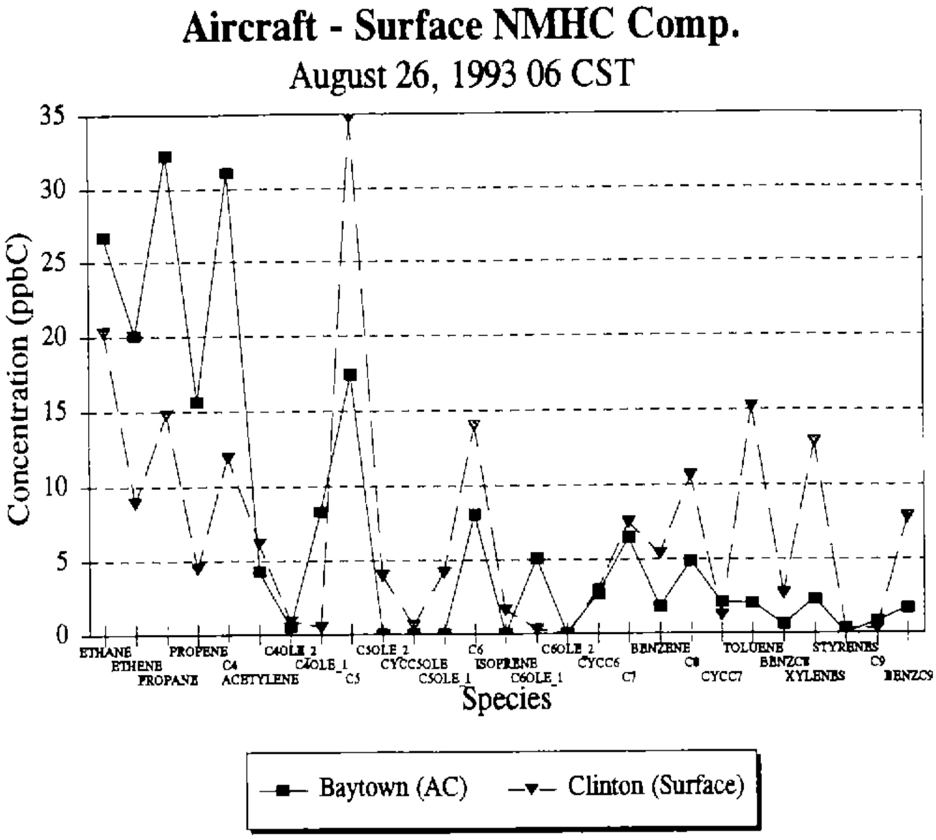
August 25, 1993 05 CST



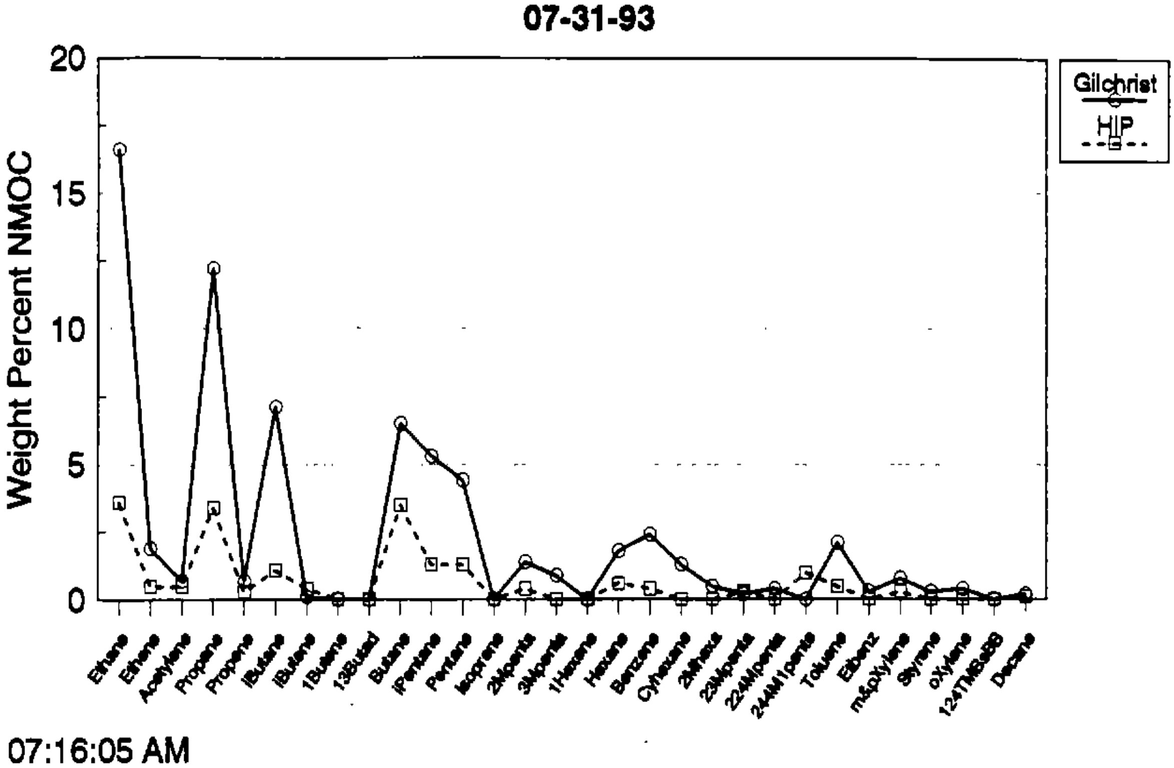
Aircraft - Surface NMHC Comp.

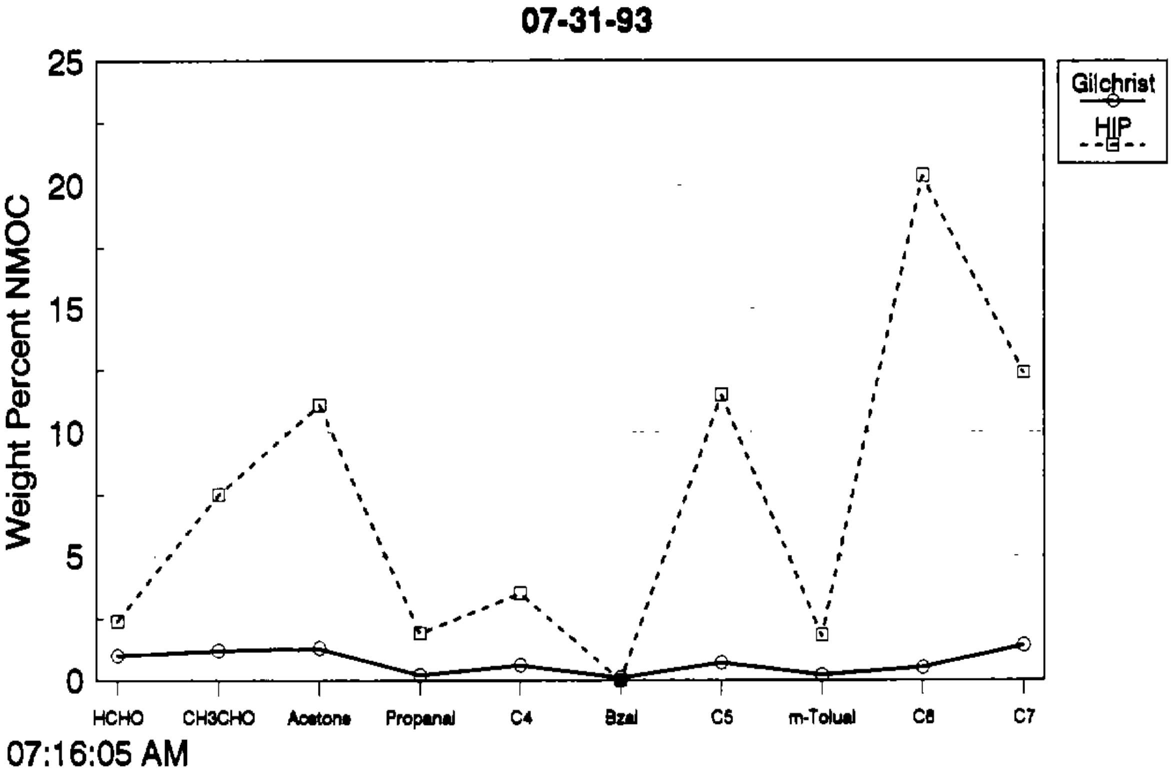
August 25, 1993 11 CST





Aircraft - Surface NMHC Comp.
August 26, 1993 06 CST
Concentration (ppbC)
35
30
25
20
15
10
5
0
ETHANE
ETHENE
PROPANE
PROPENE
C4
ACETYLENE
C4OLE_2
C4OLE_1
C5
C5OLE_2
CYCC5OLE
C5OLE_1
C6
ISOPRENE
C6OLE_1
C6OLE_2
CYCC6
C7
BENZENE
C8
CYCC7
TOLUENE
BENZC8
XYLENES
STYRENES
C9
BENZC9
Species
Baytown (AC)
Clinton (Surface)





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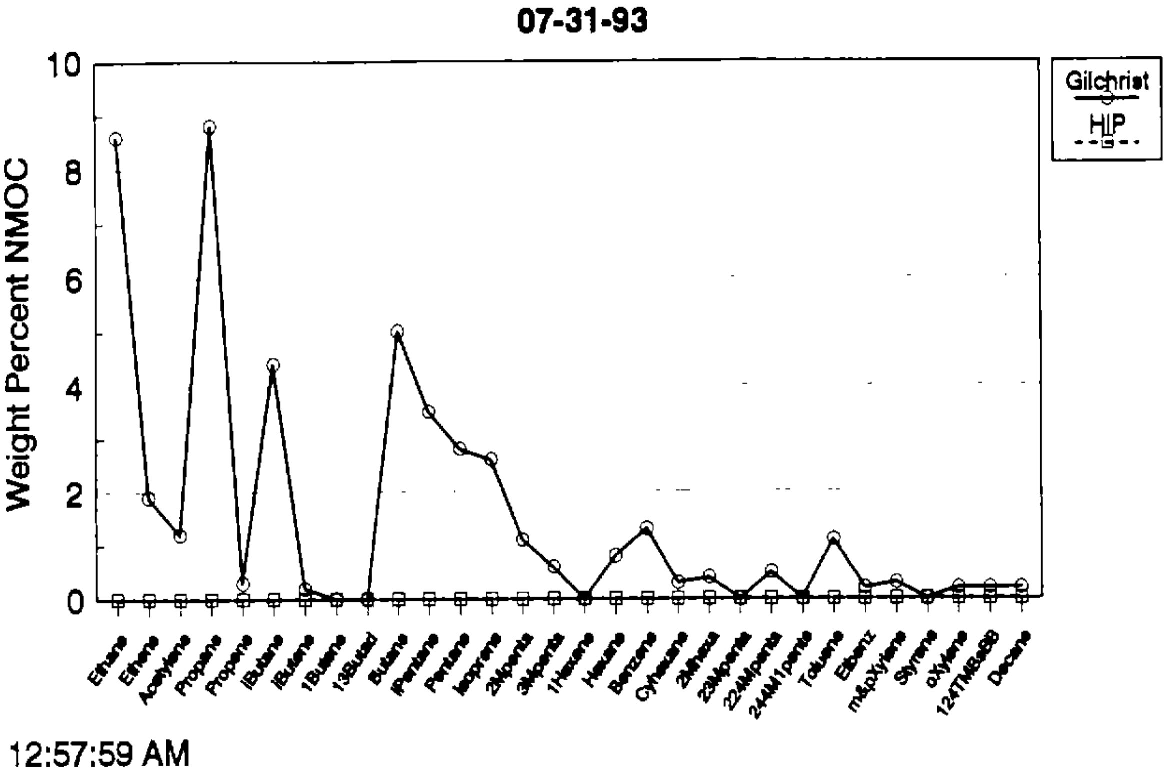
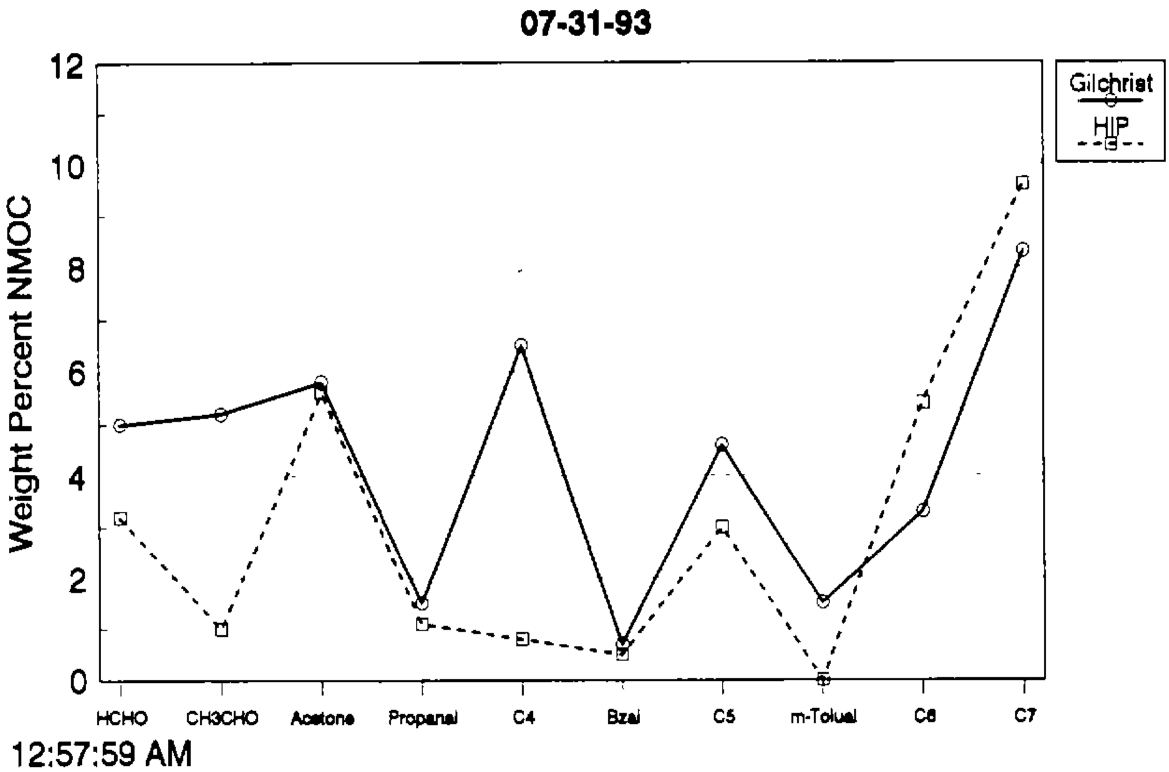
1-19-95





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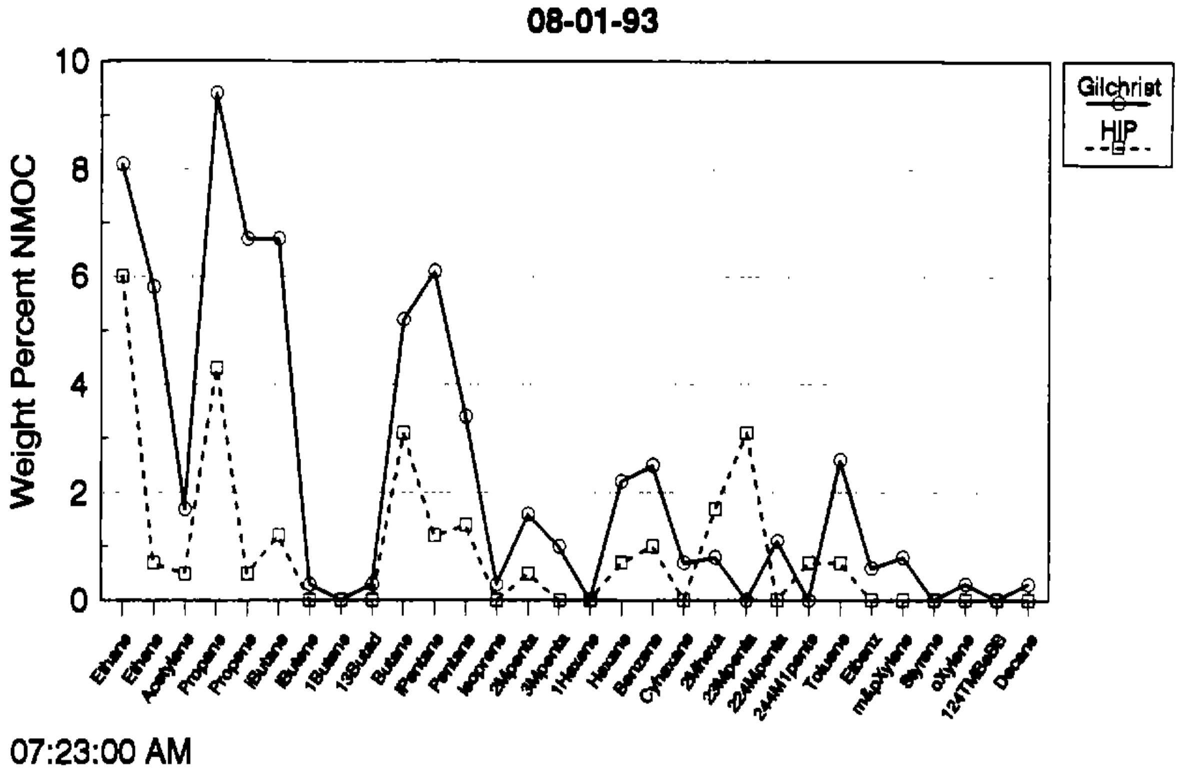

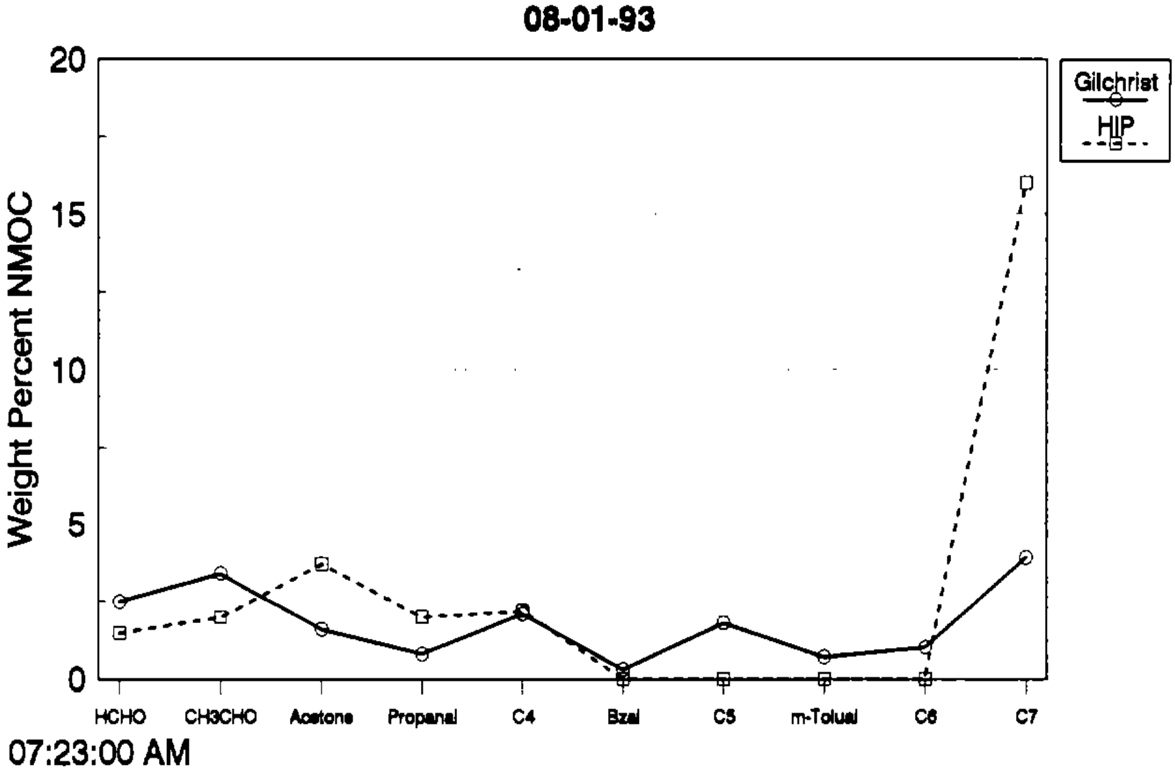

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1-19-95

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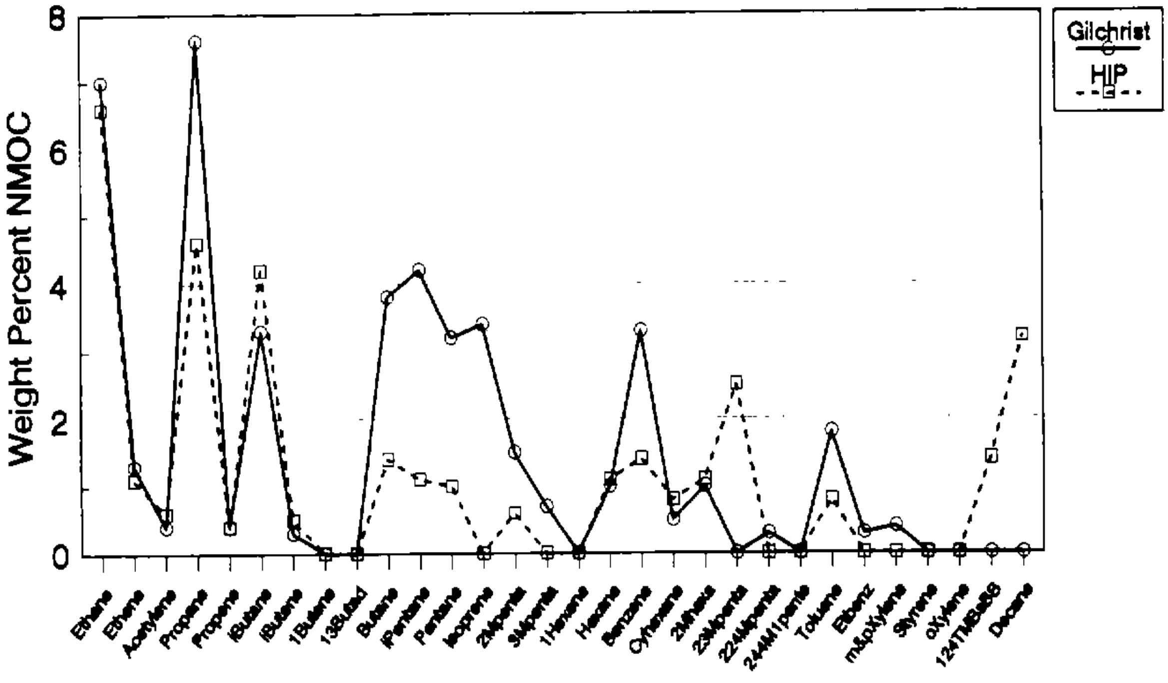

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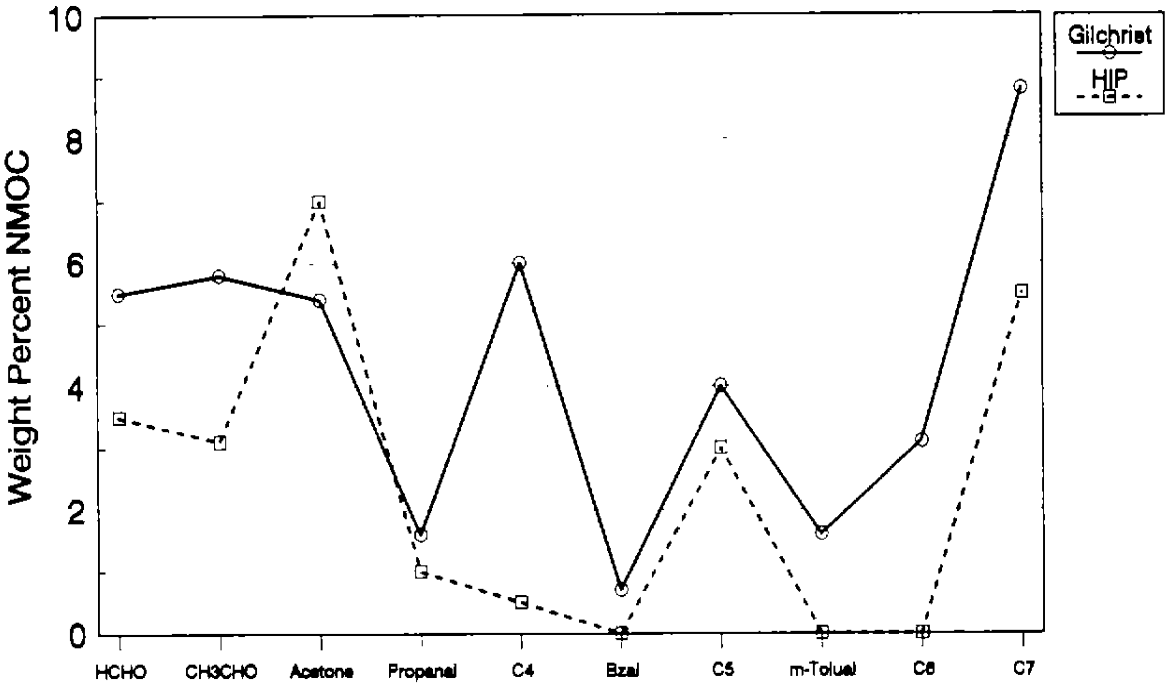

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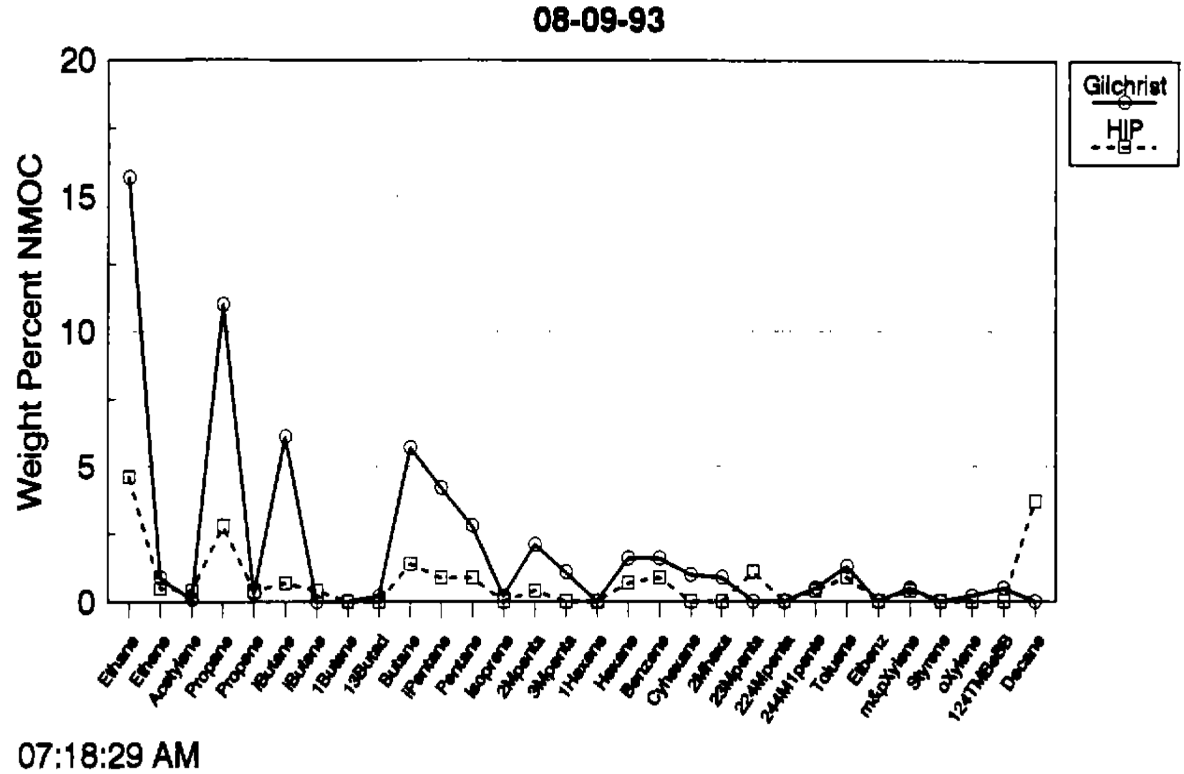

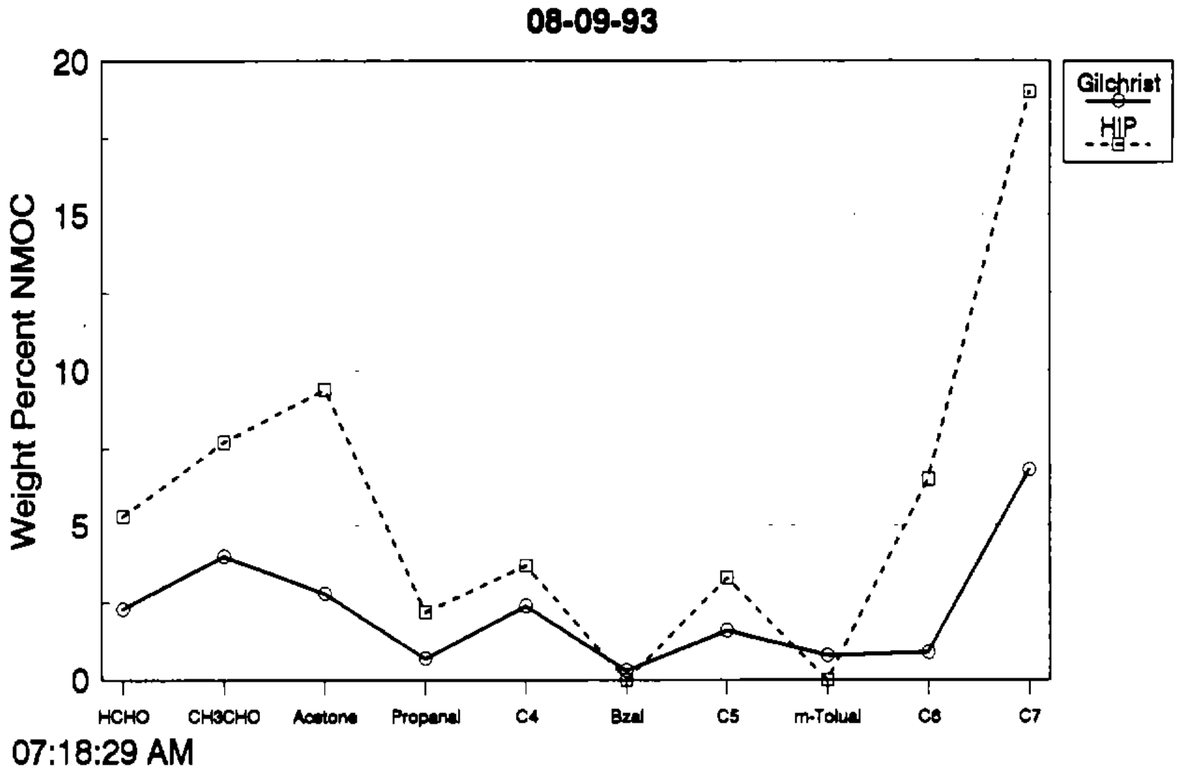

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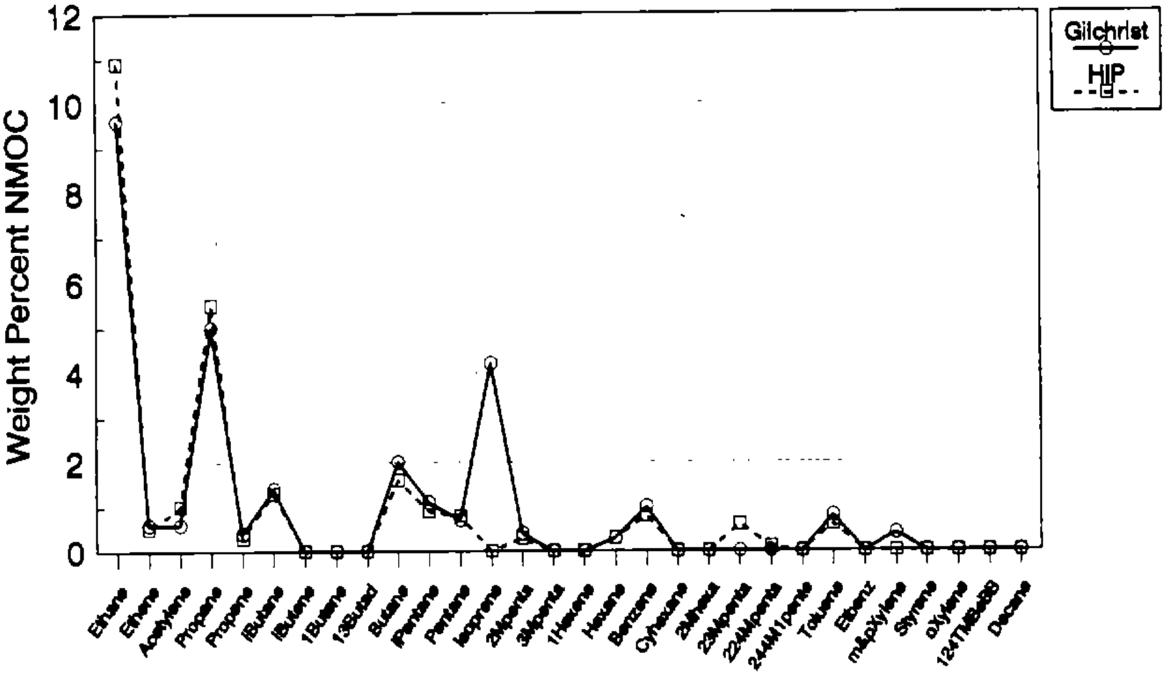
1-19-95

08-11-93



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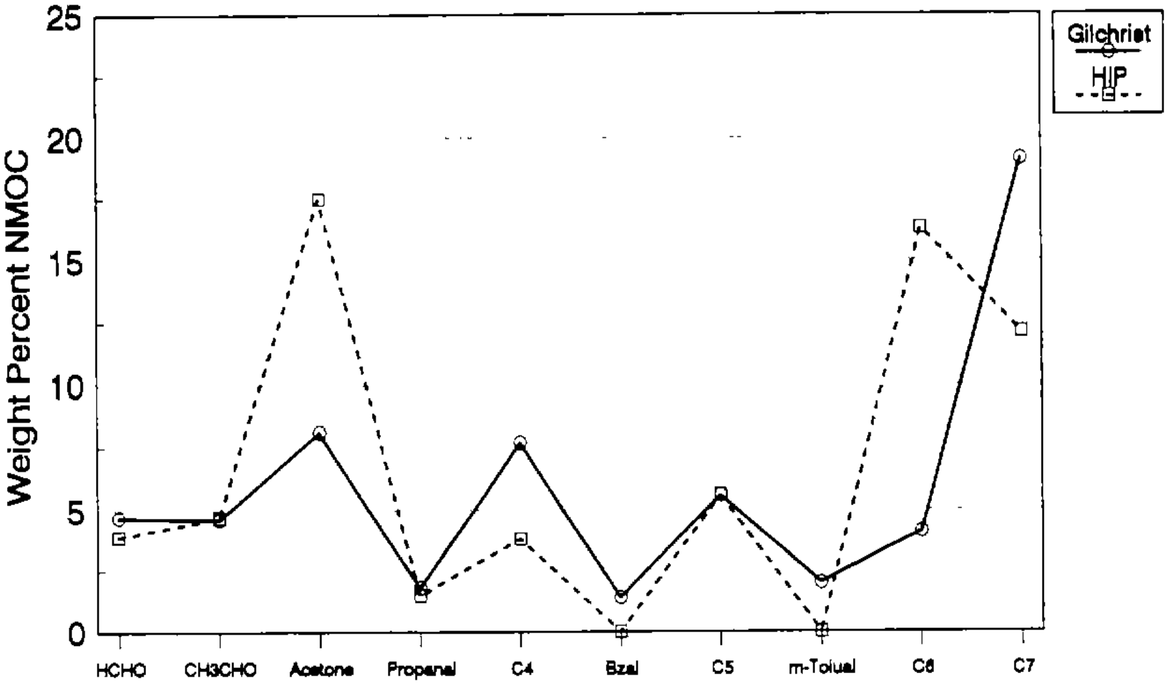

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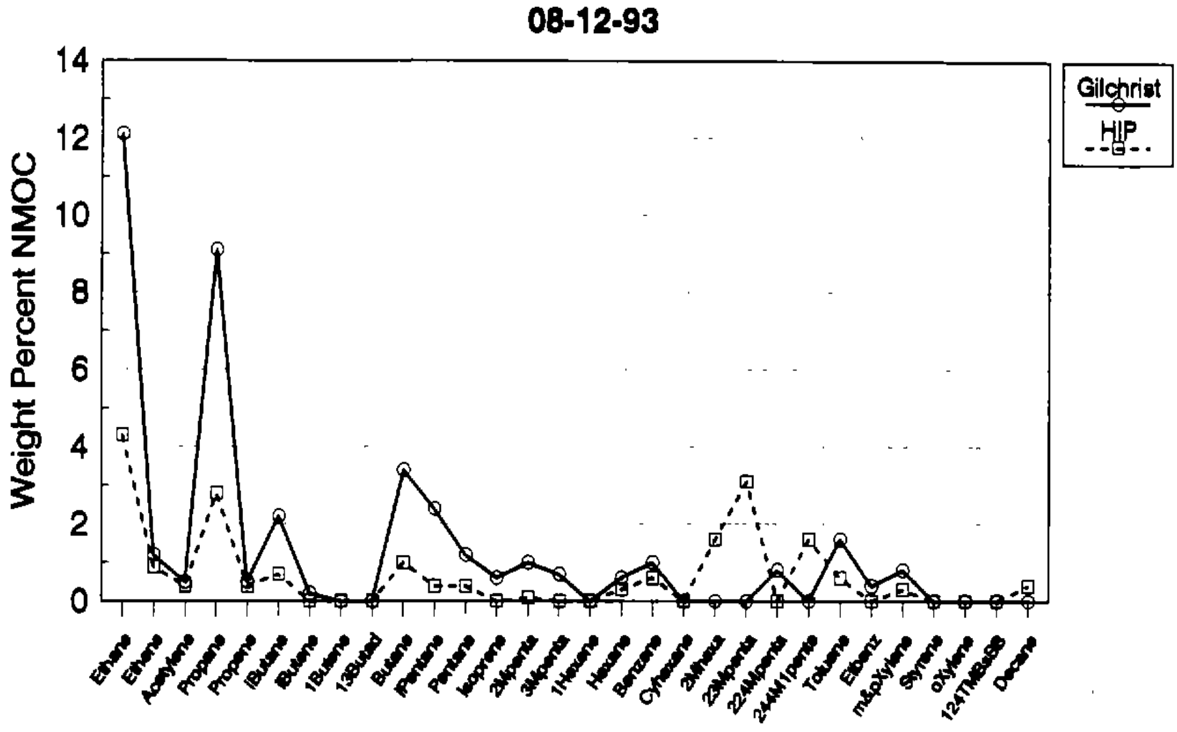
gilhipf6.drw

1-19-95



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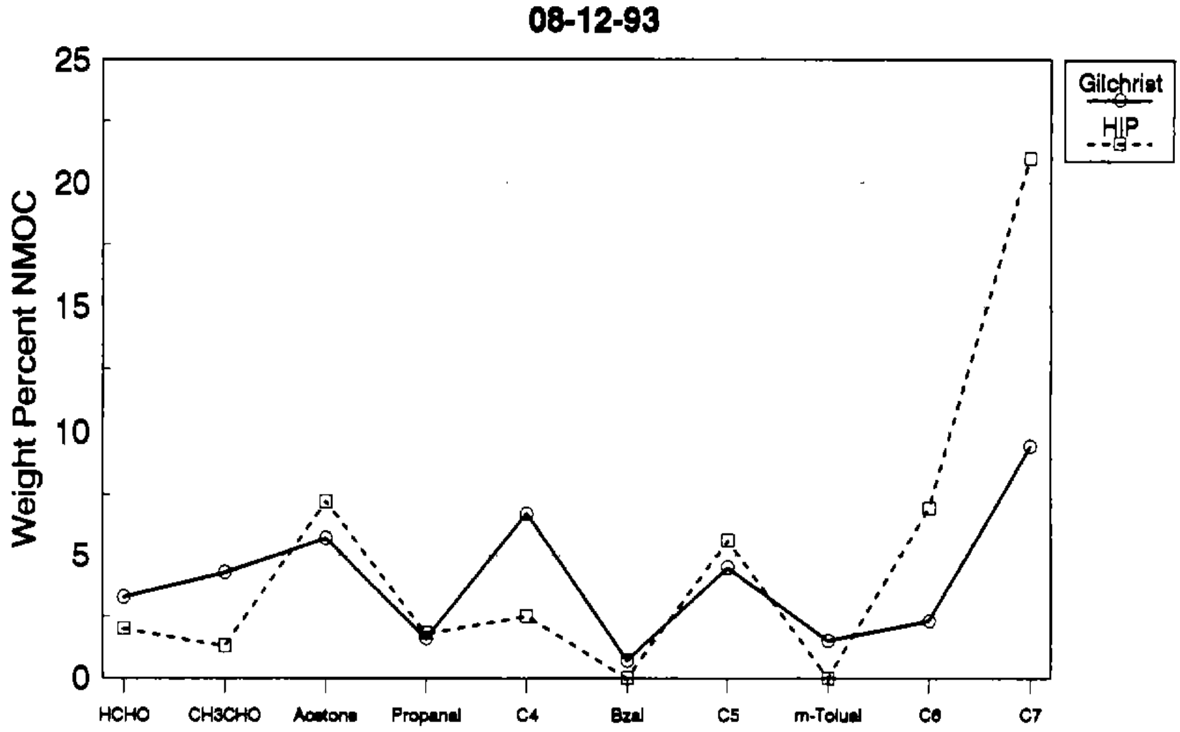

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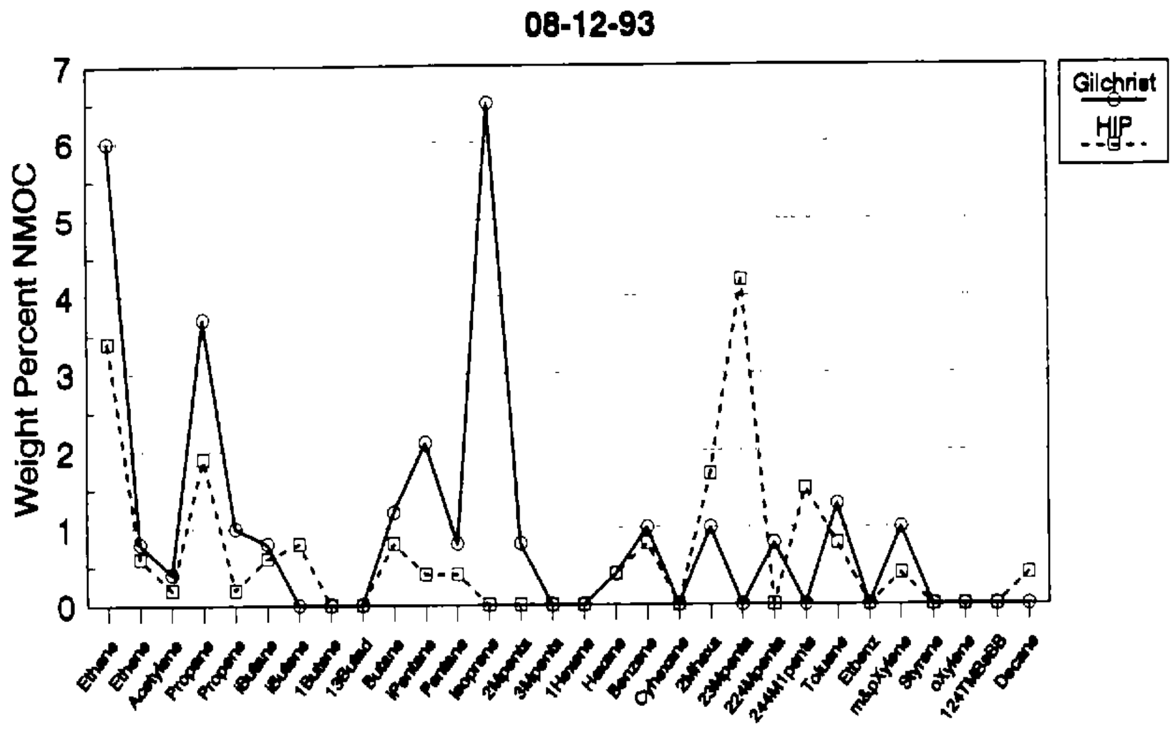

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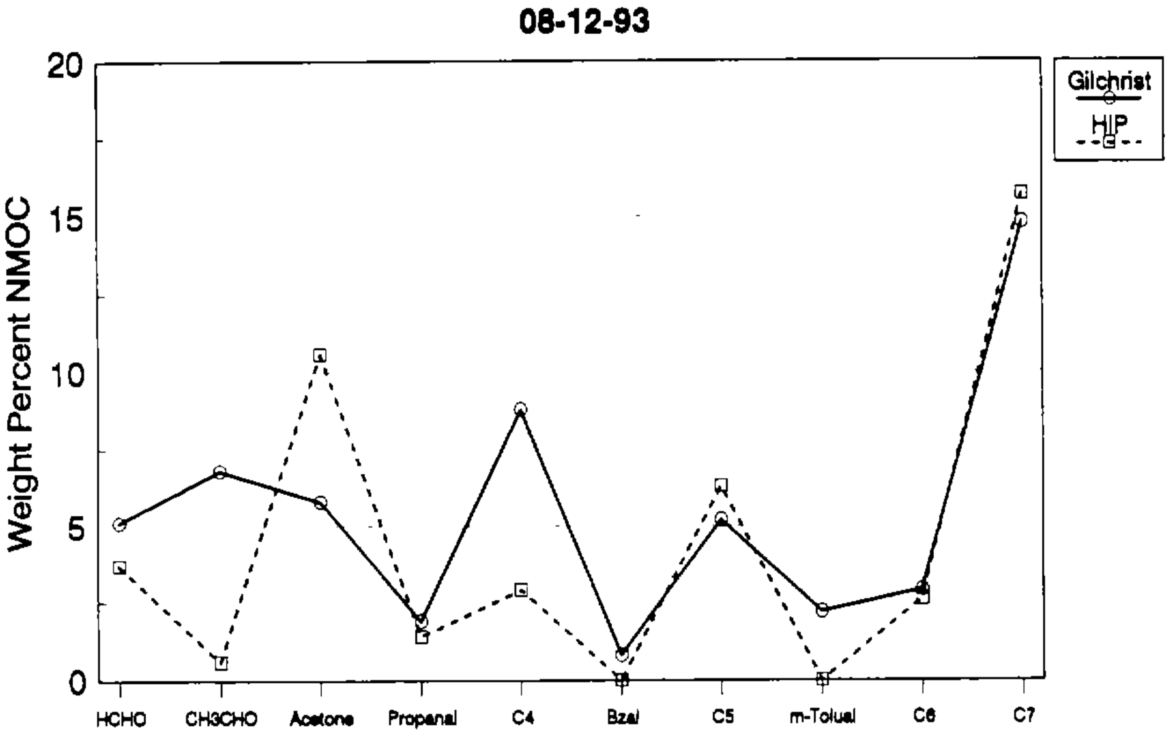

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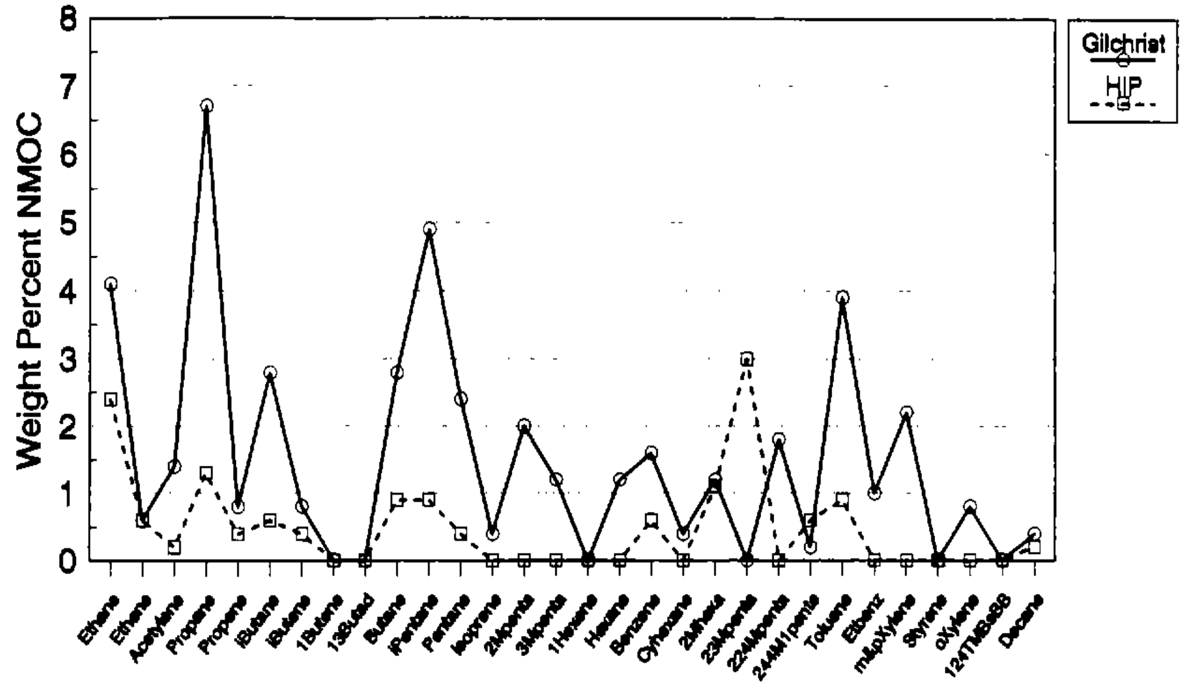
gilhipf8.drw
1-19-95

08-15-93



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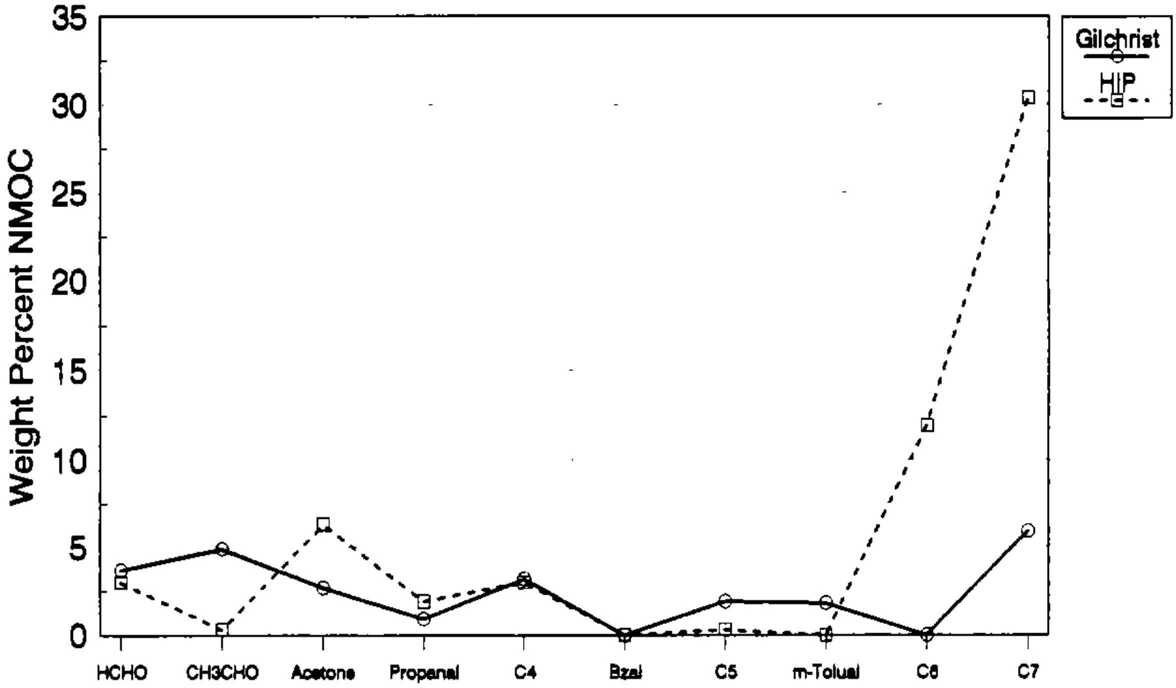

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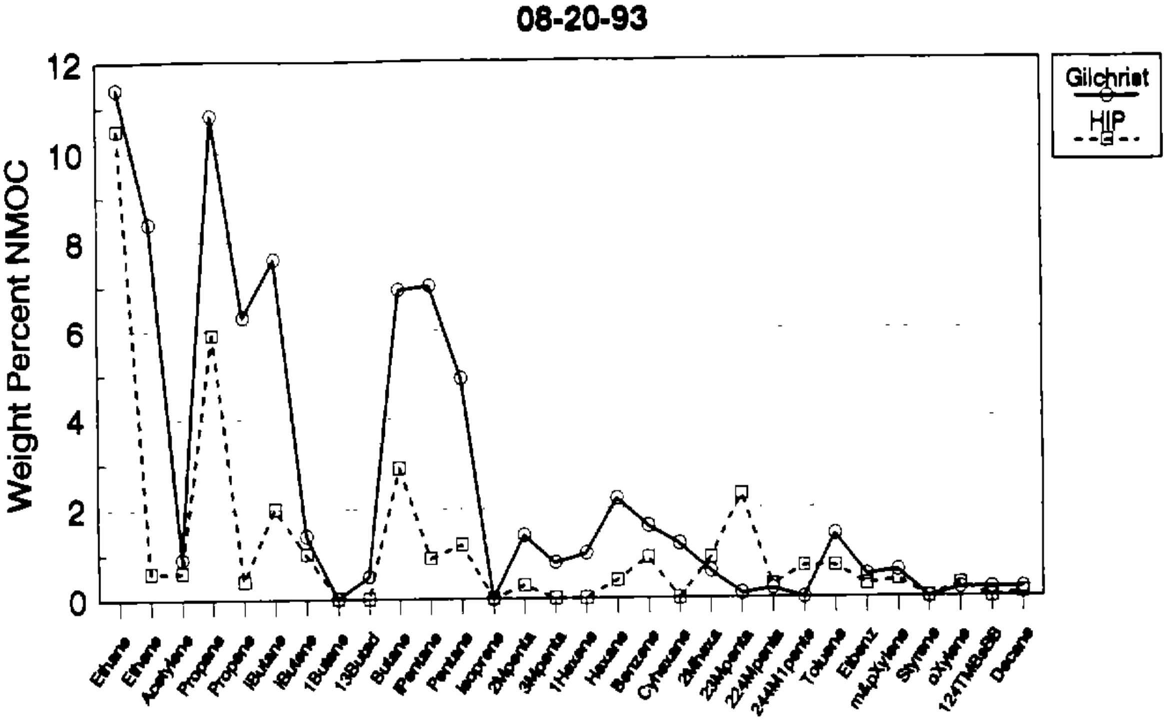
gilhipf9.drw

1-19-95



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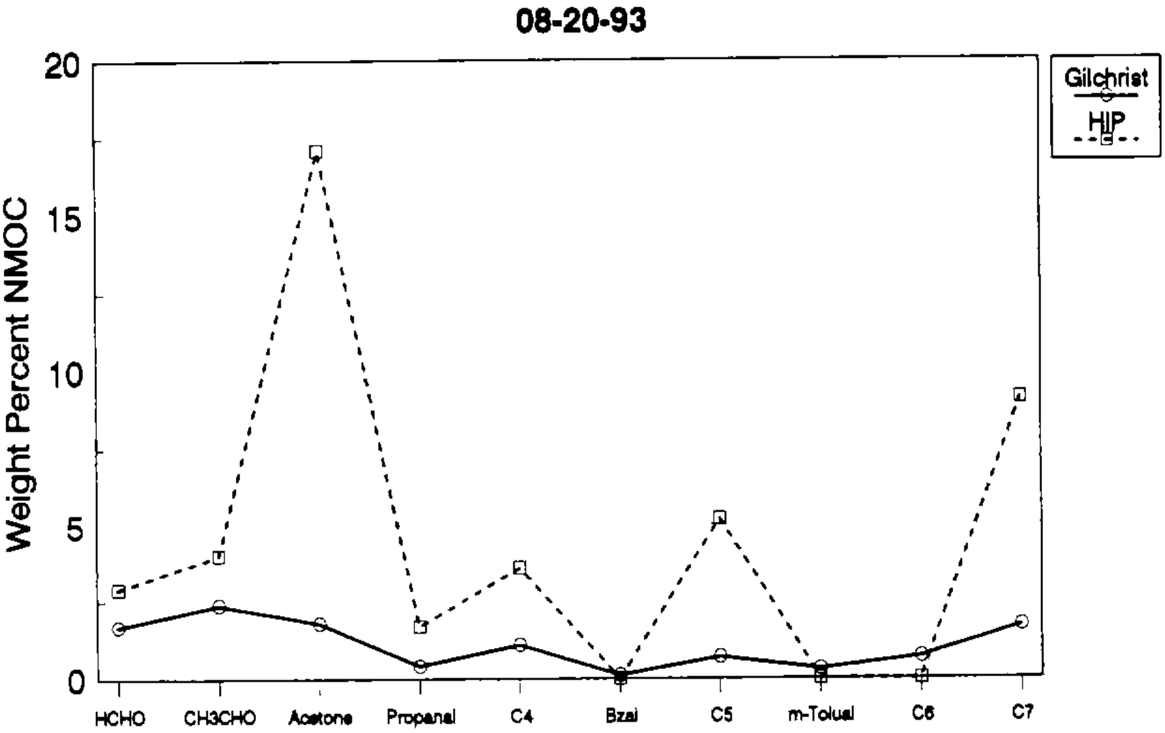

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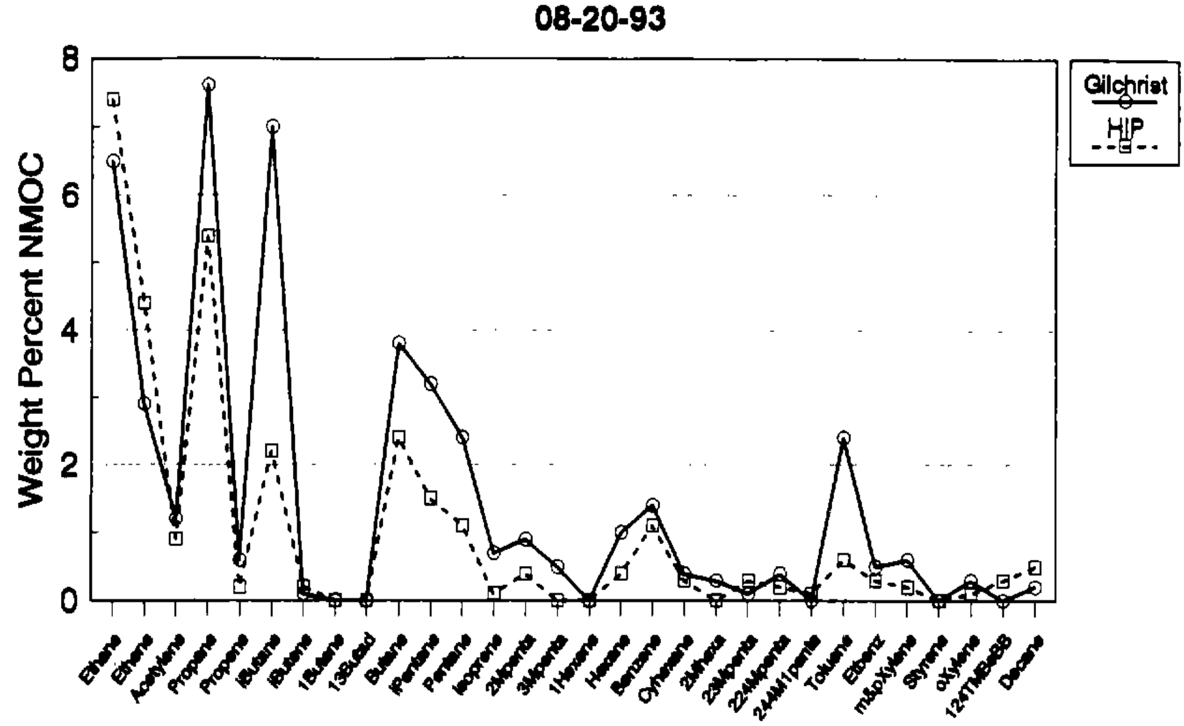
gilhpf10.drw

1-19-95



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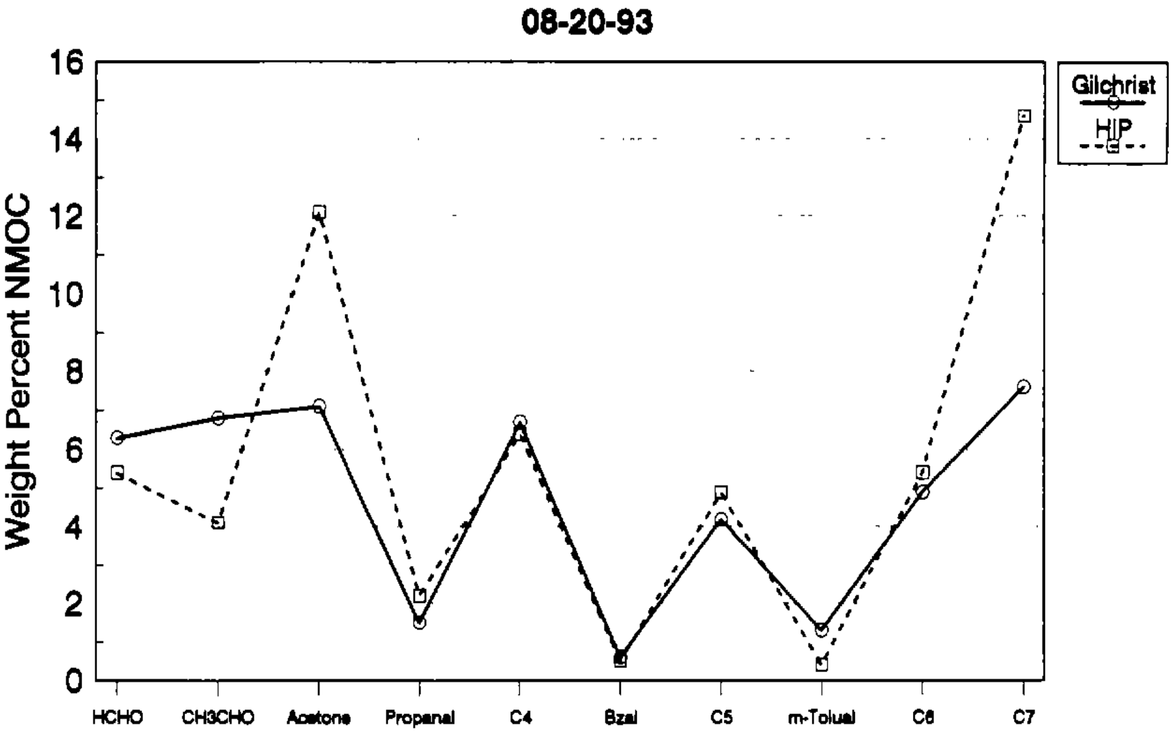

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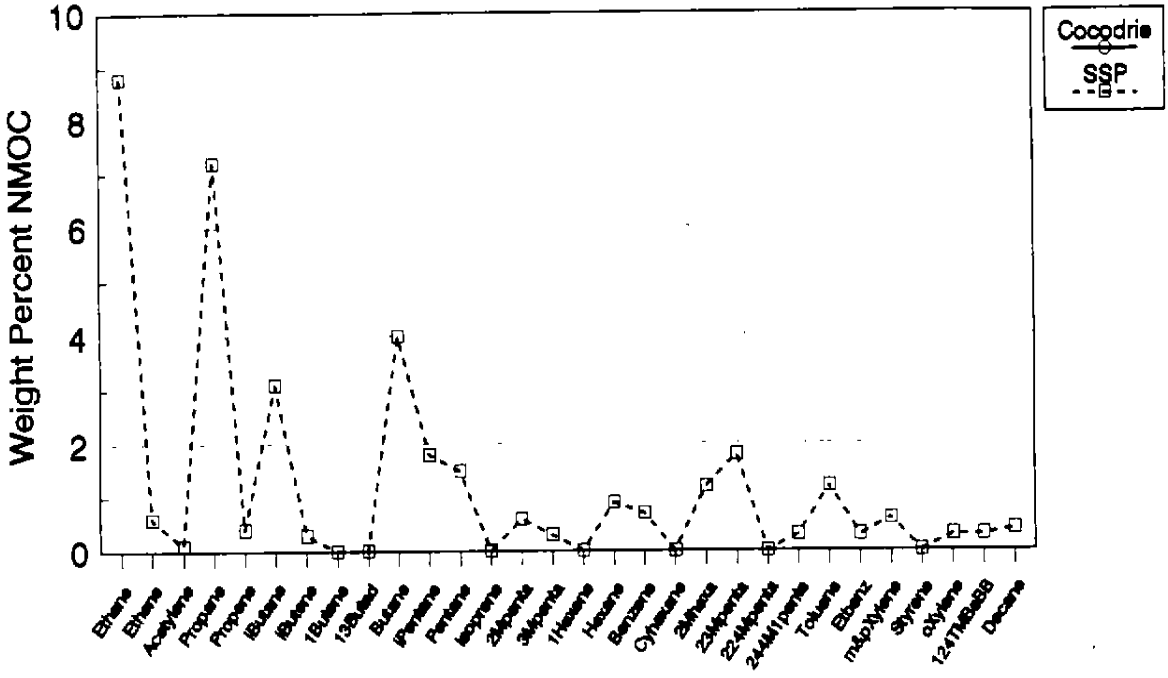
gilhpf11.drw
1-19-95

07-31-93



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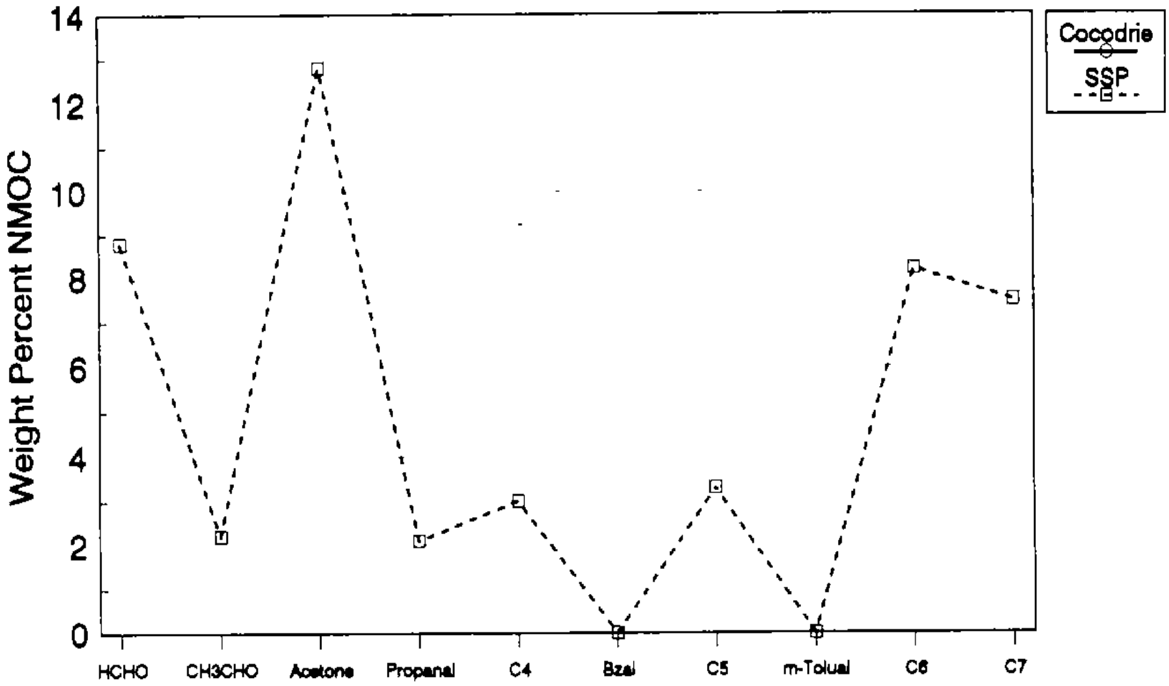
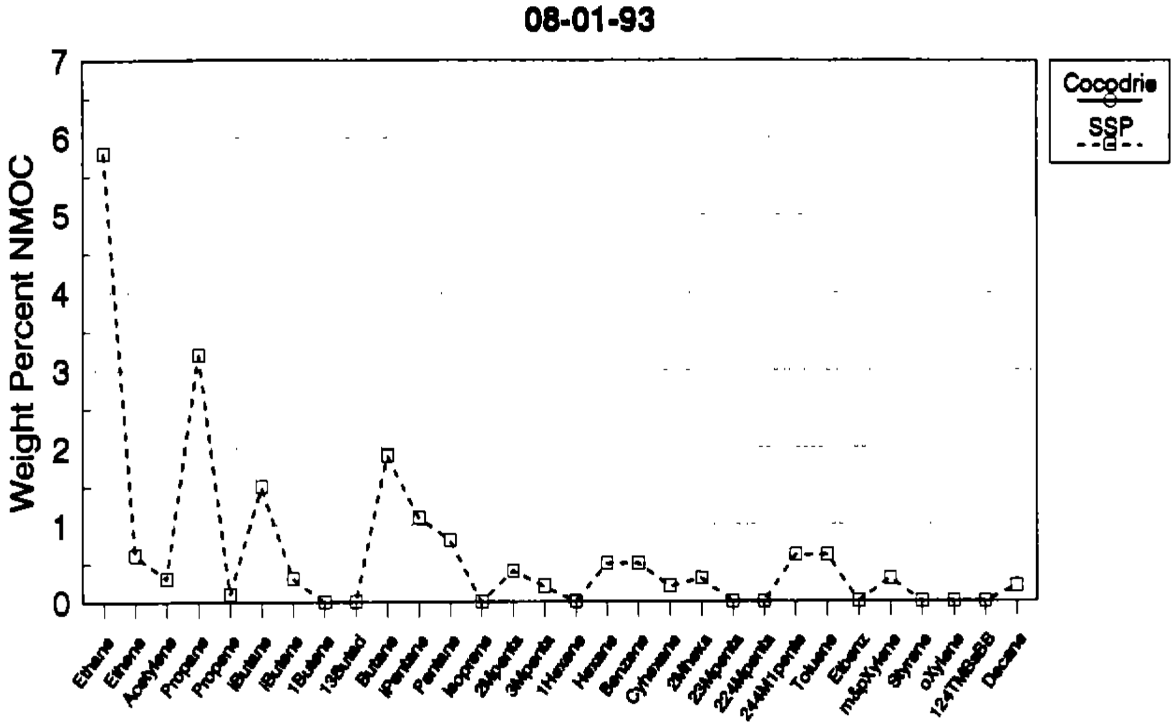


07:13:00 AM

cocsspf1.drw
1-20-95



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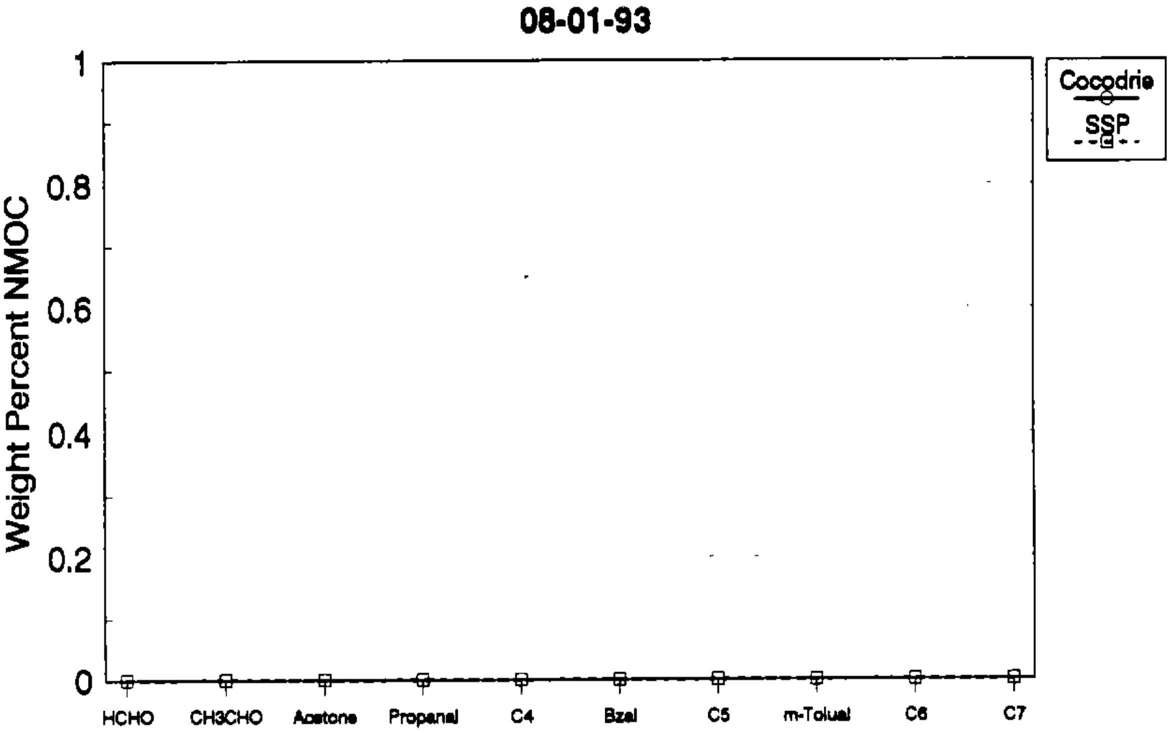

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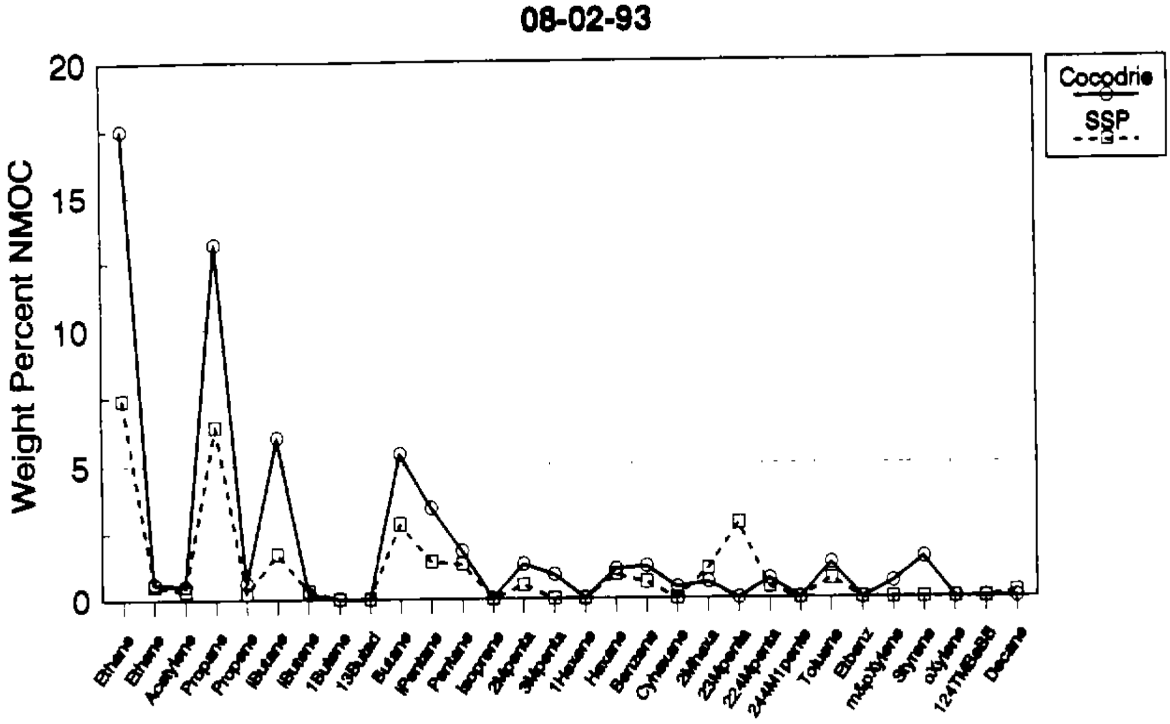

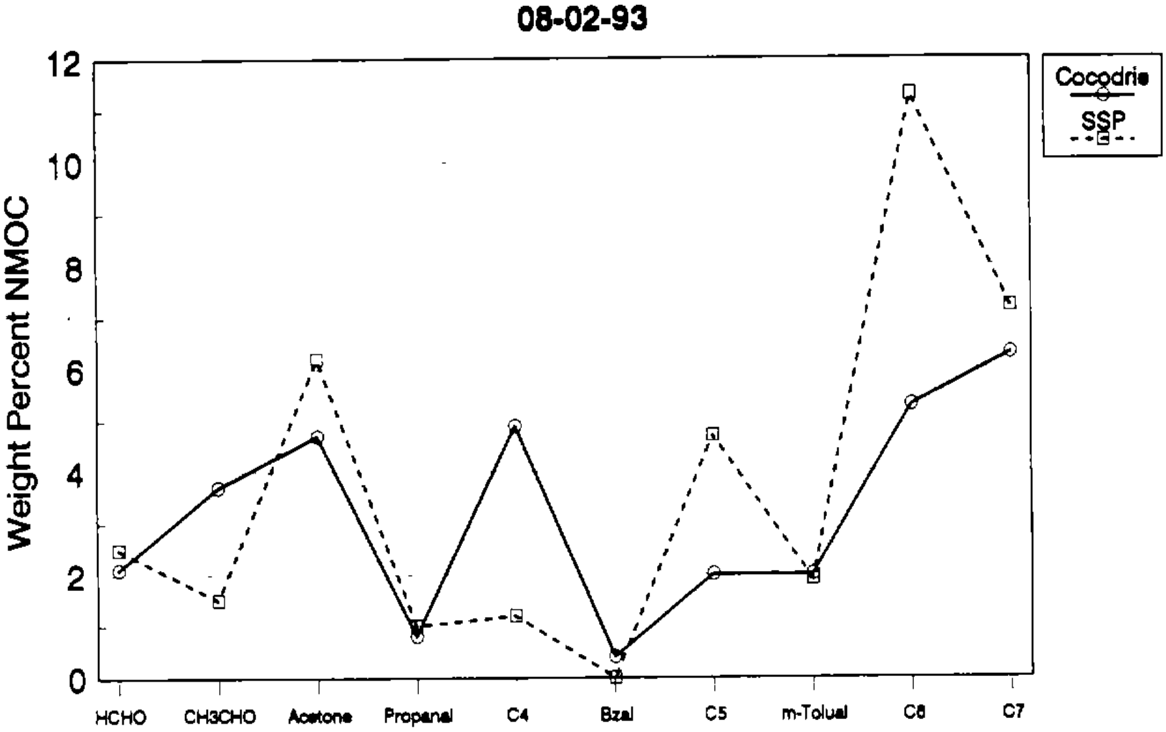

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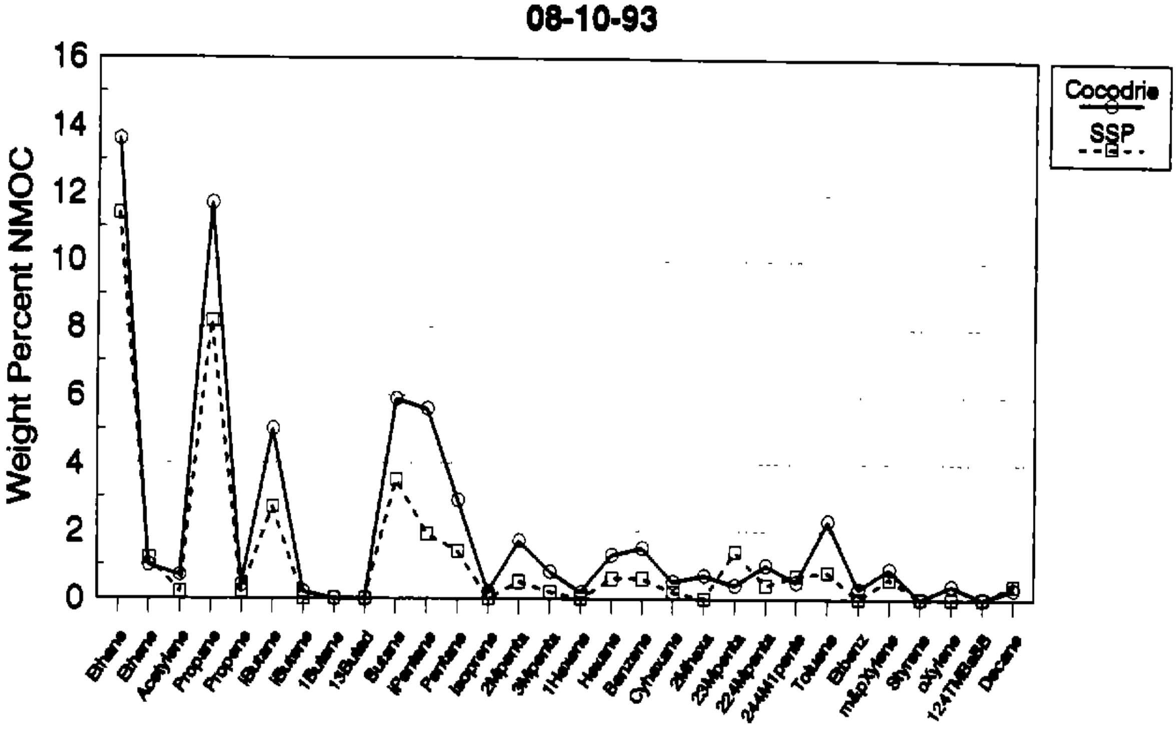

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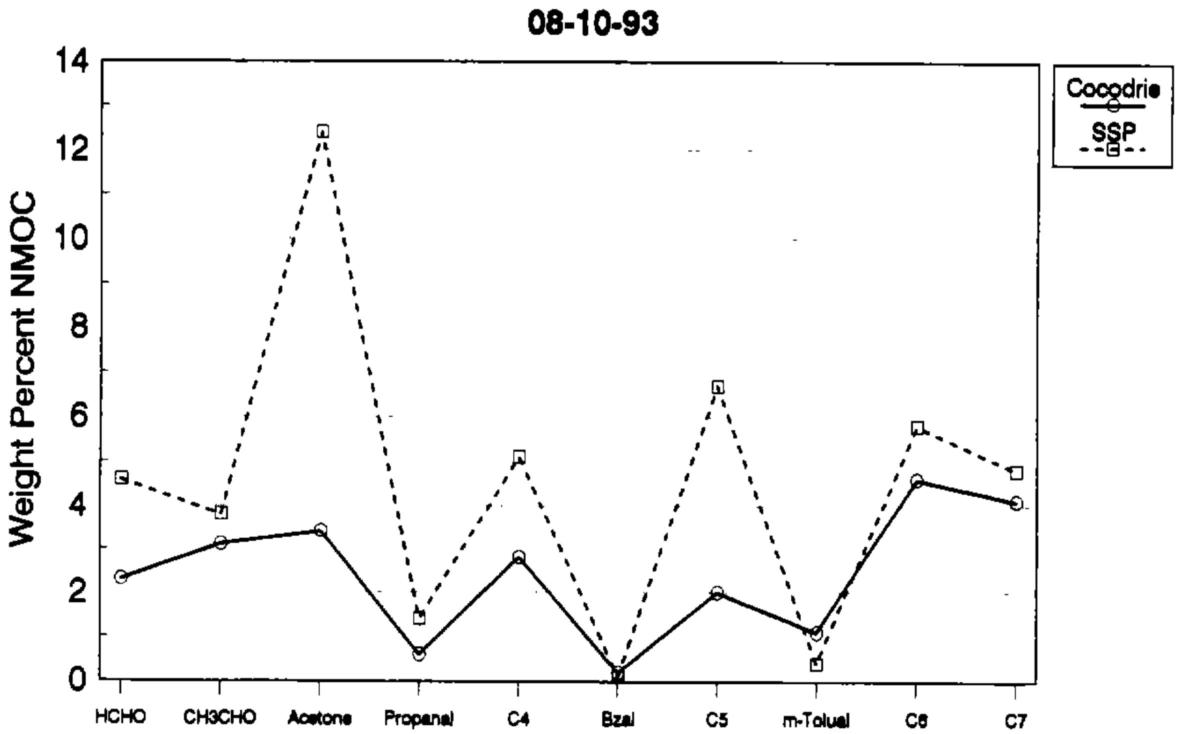

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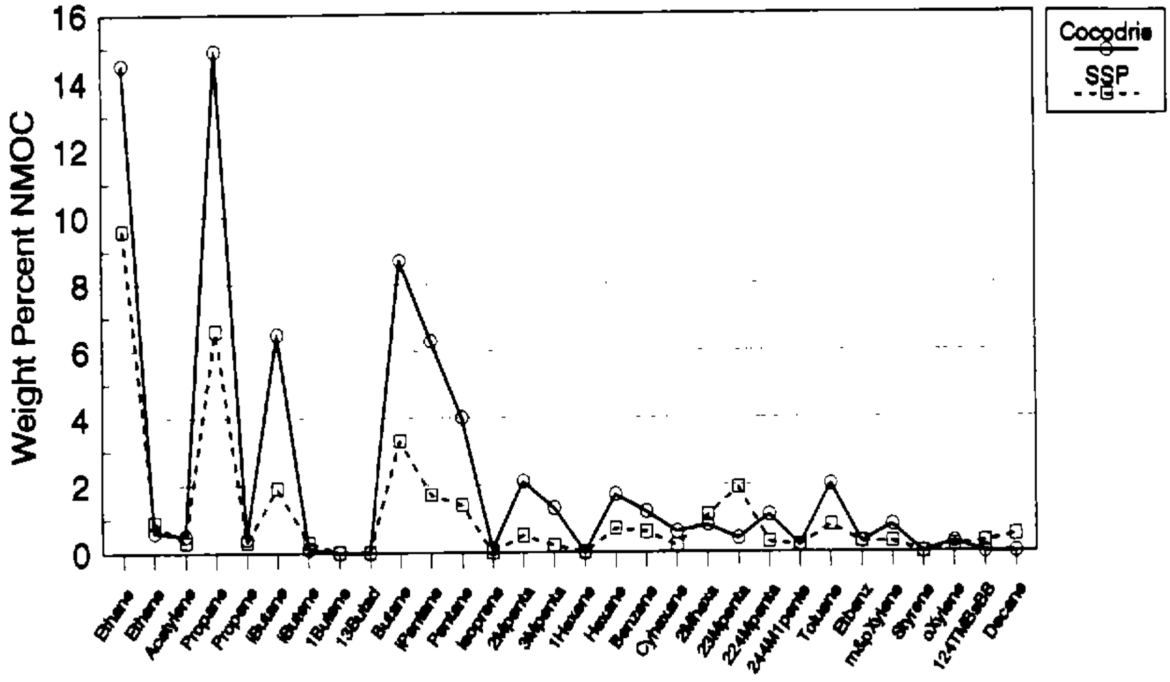

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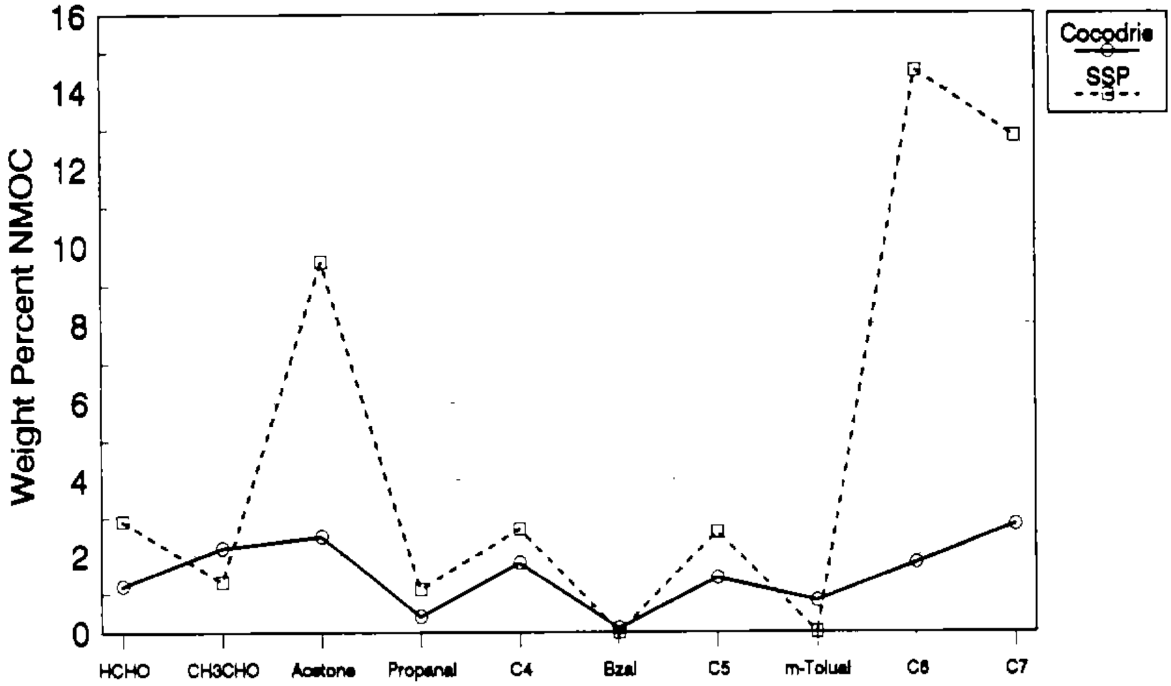

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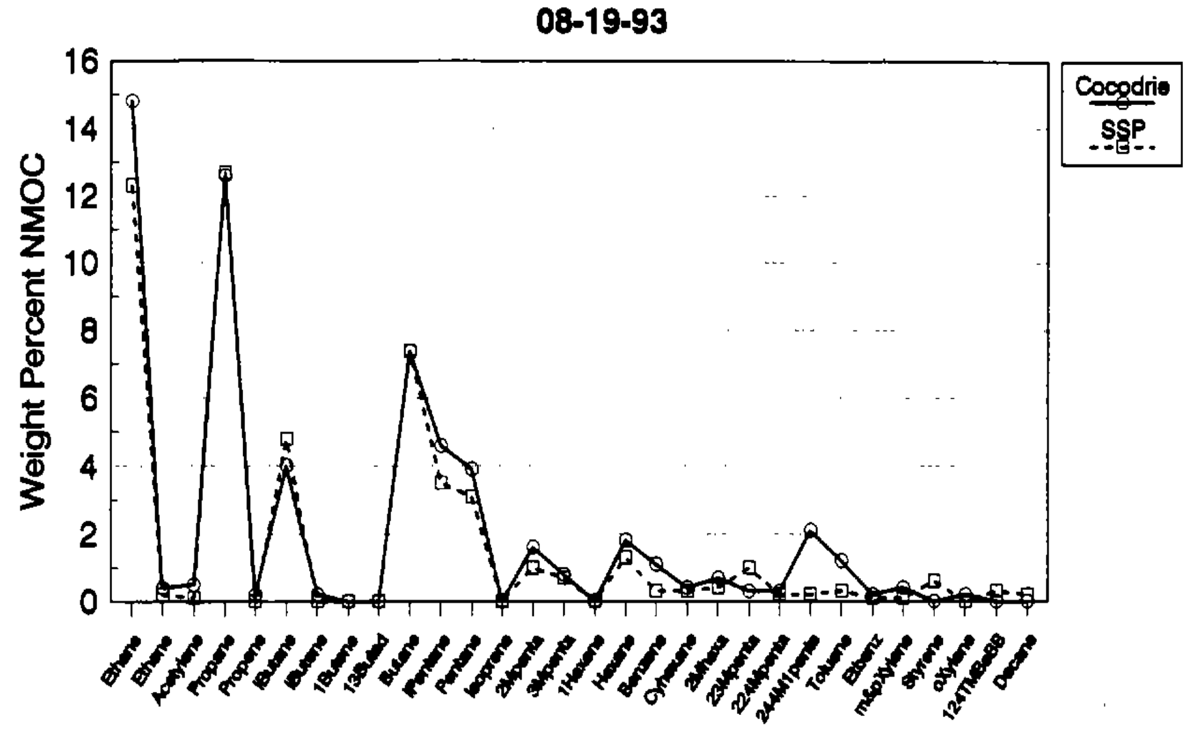

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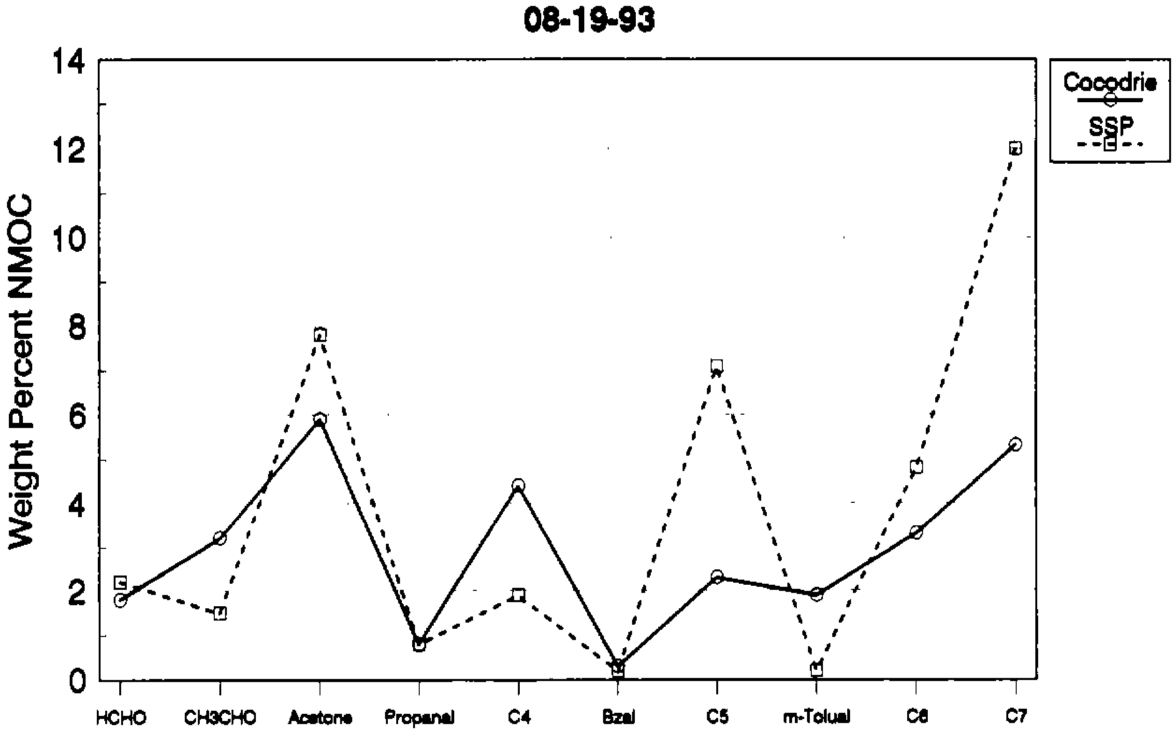

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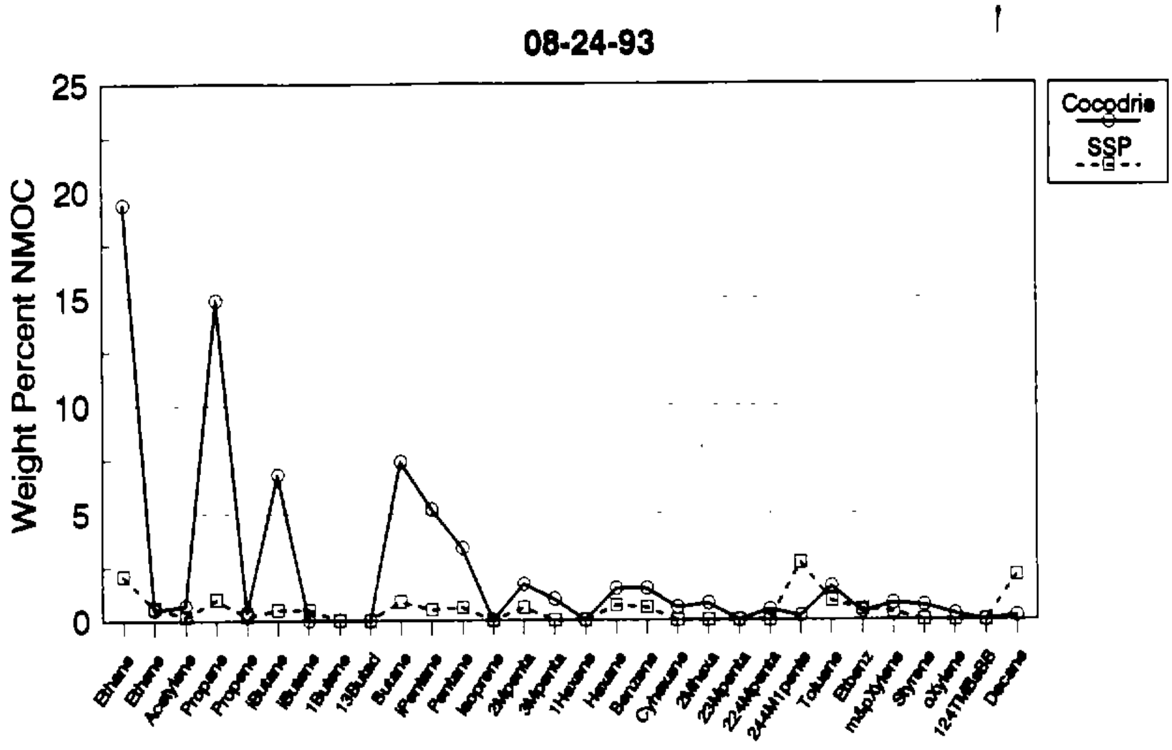

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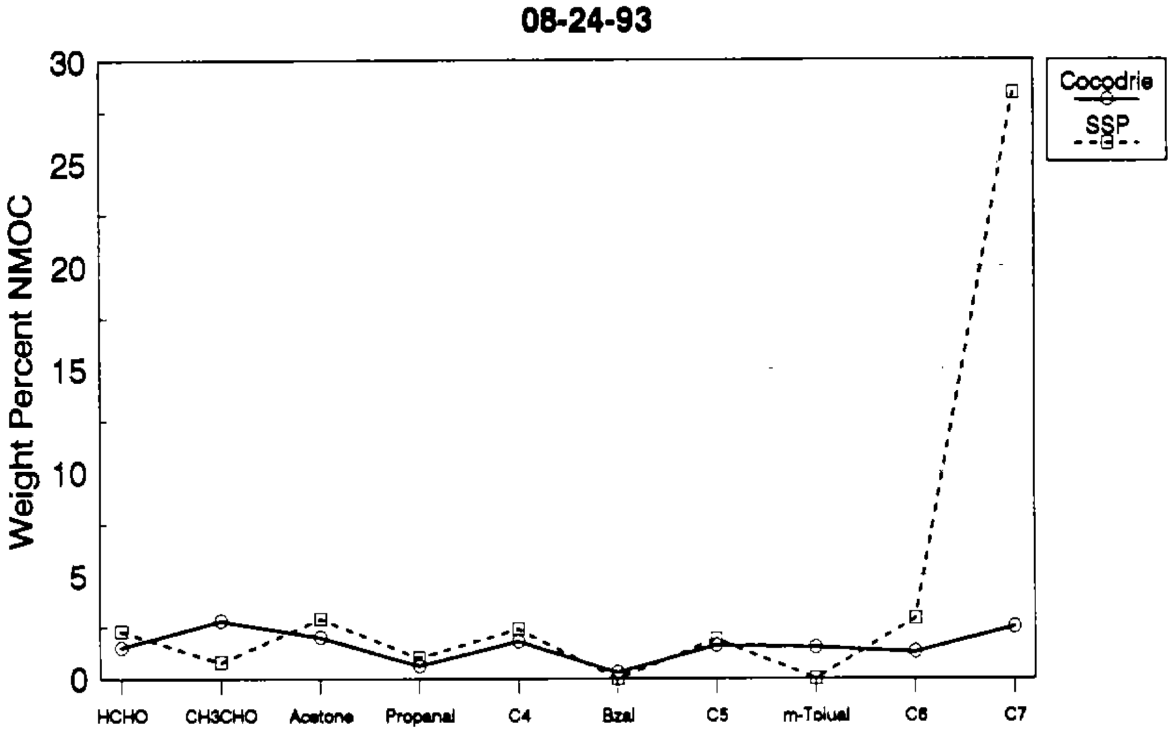

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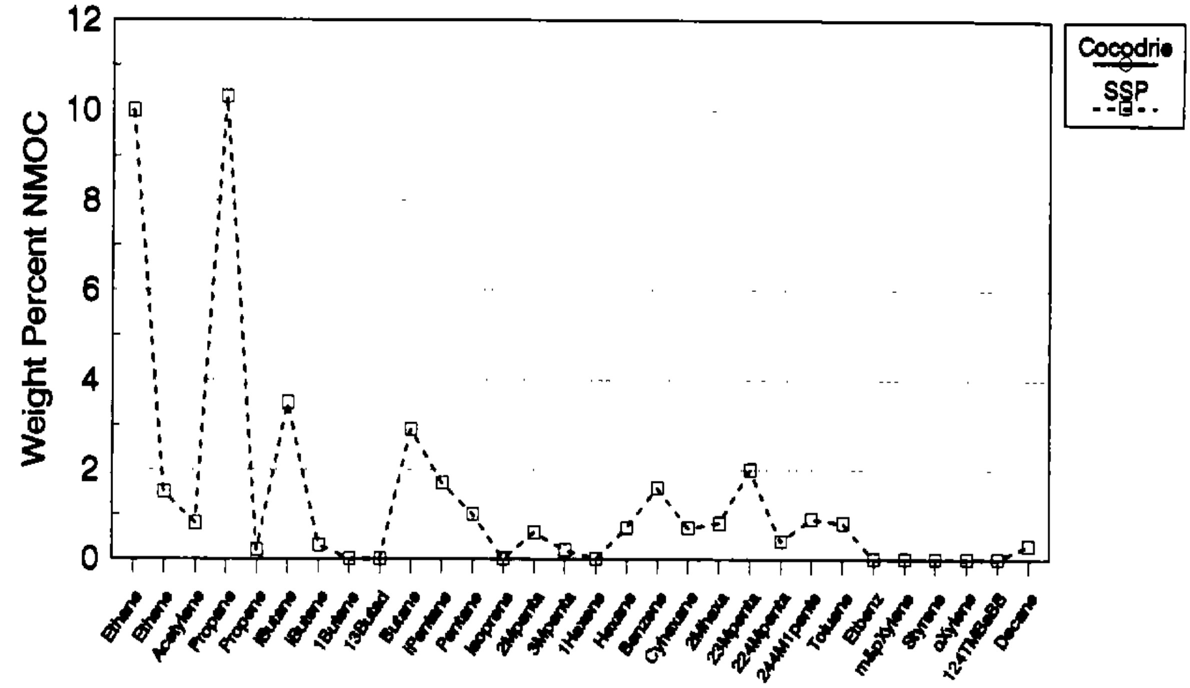

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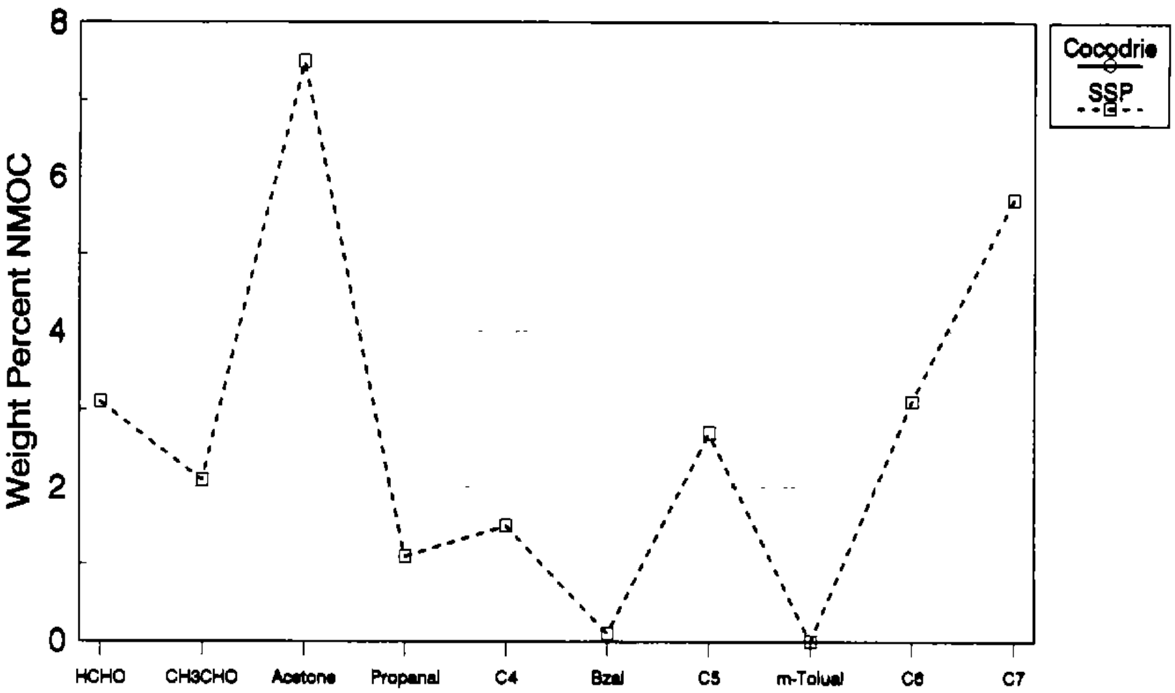

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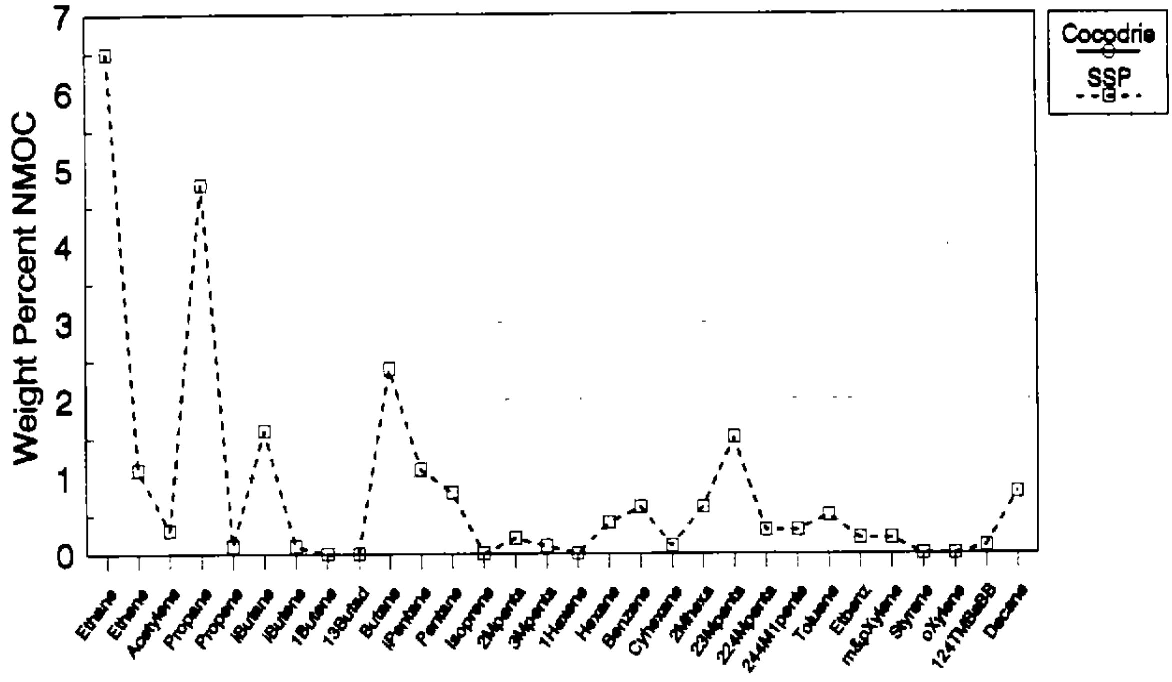

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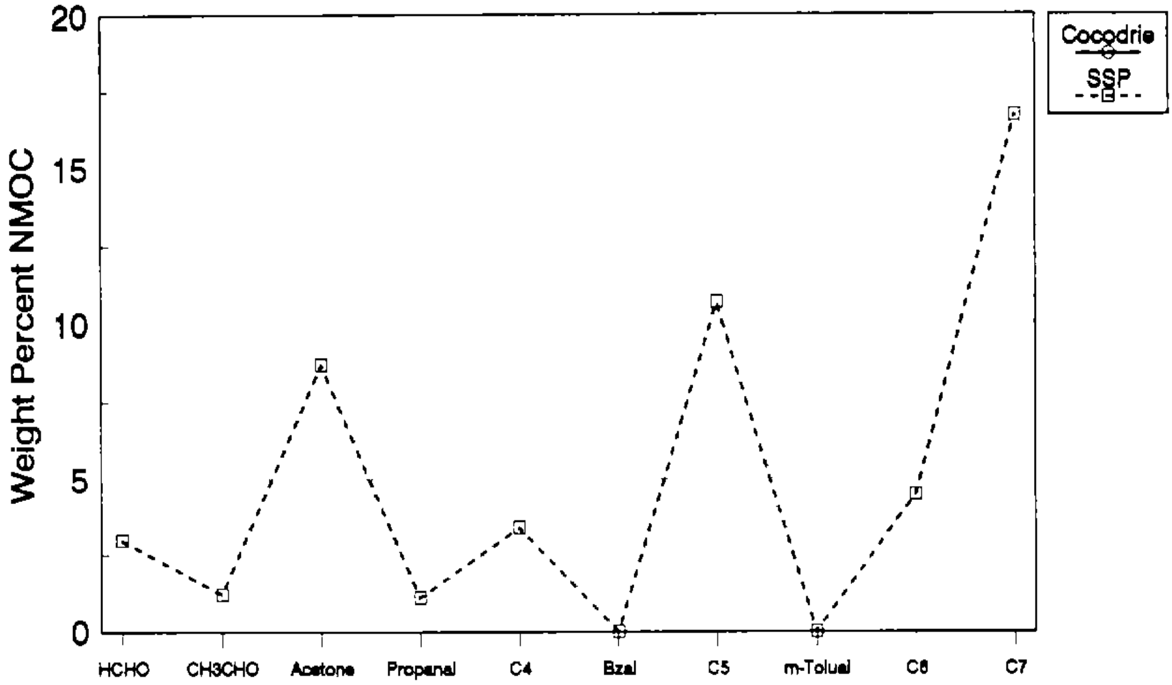

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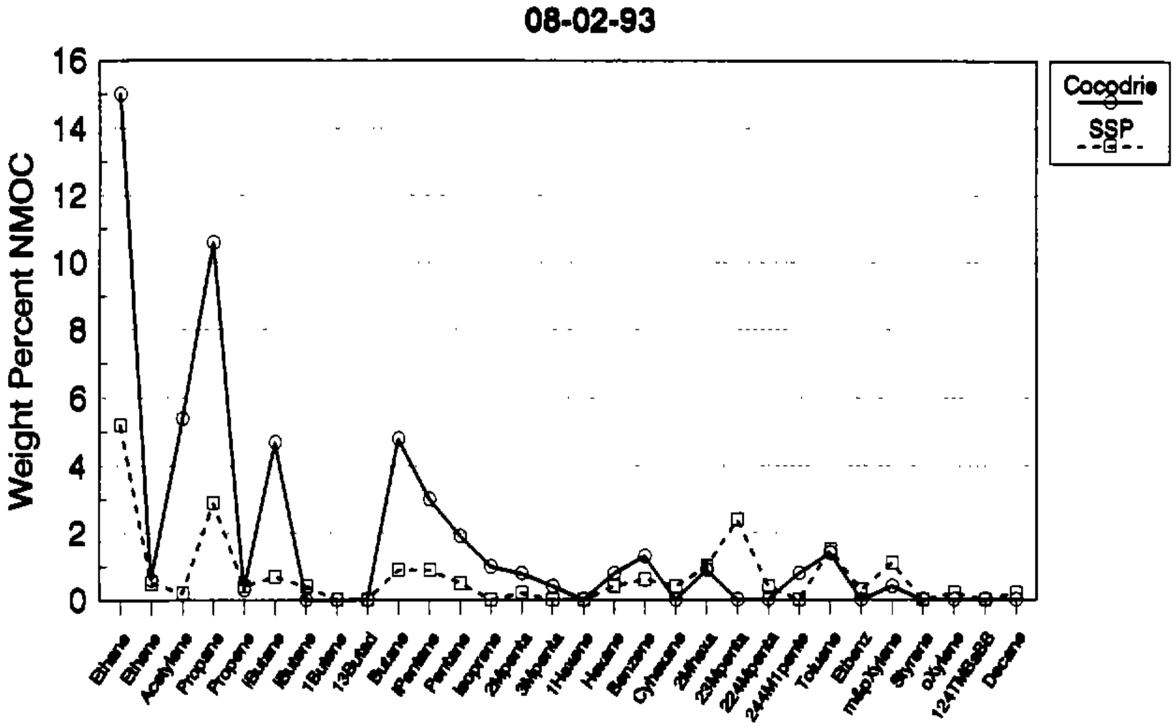

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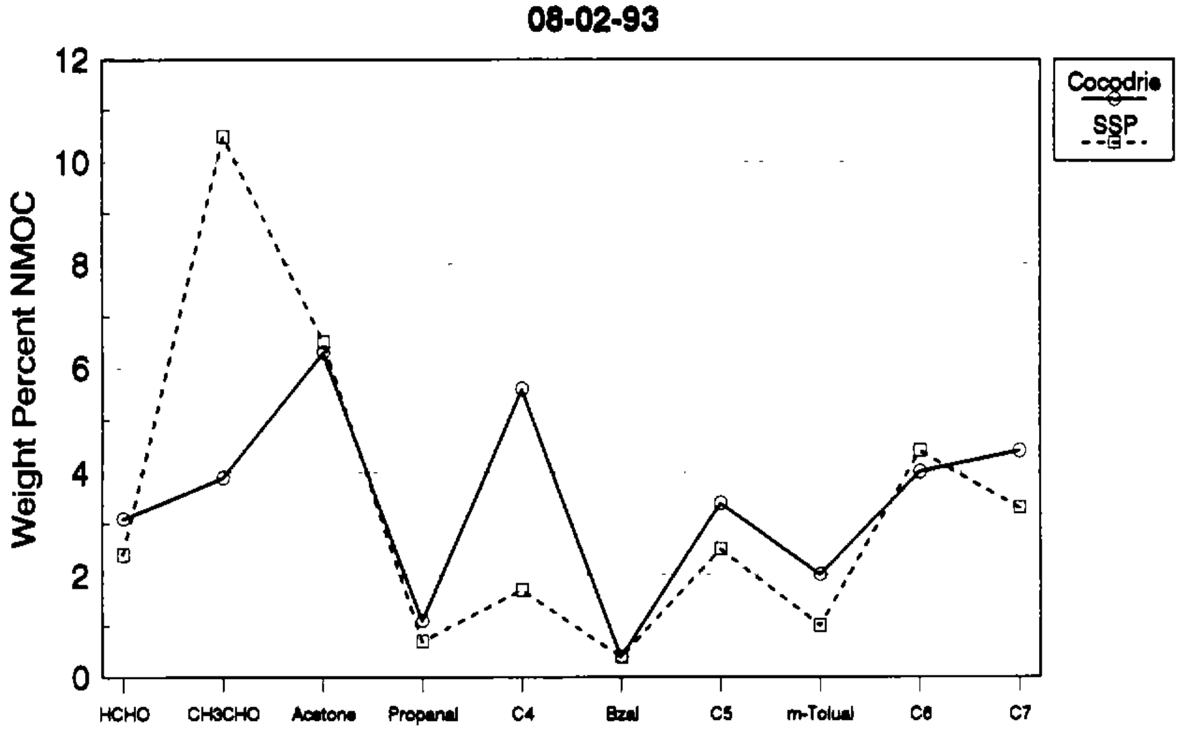

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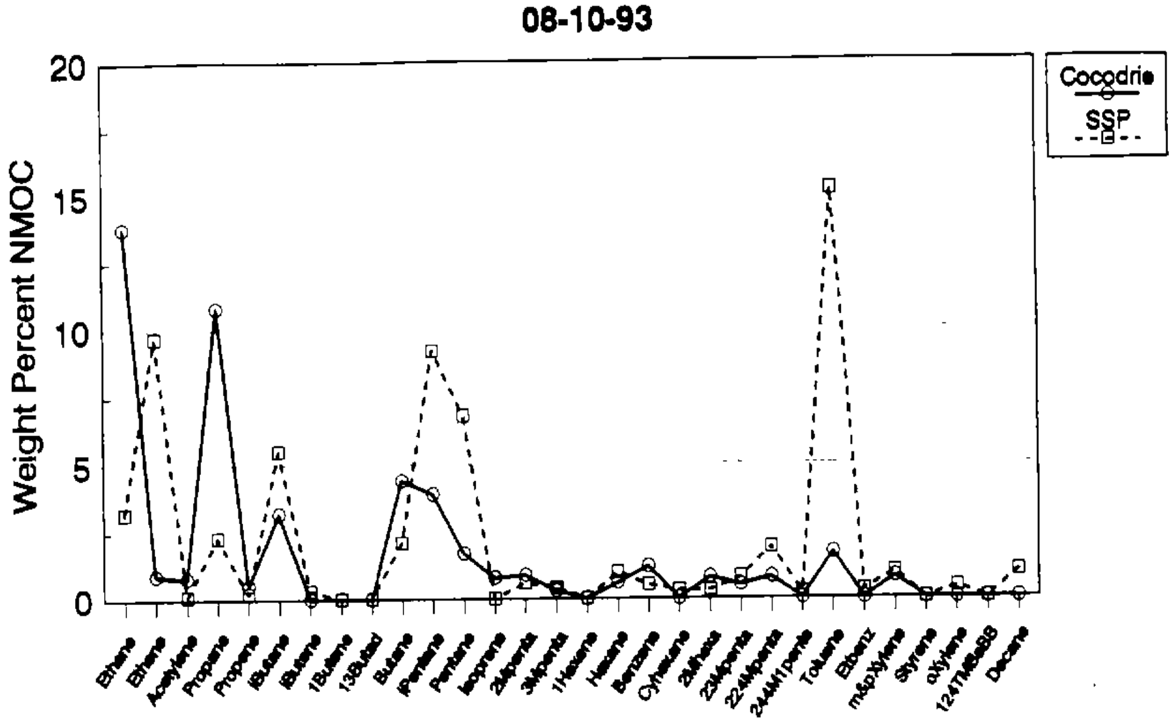

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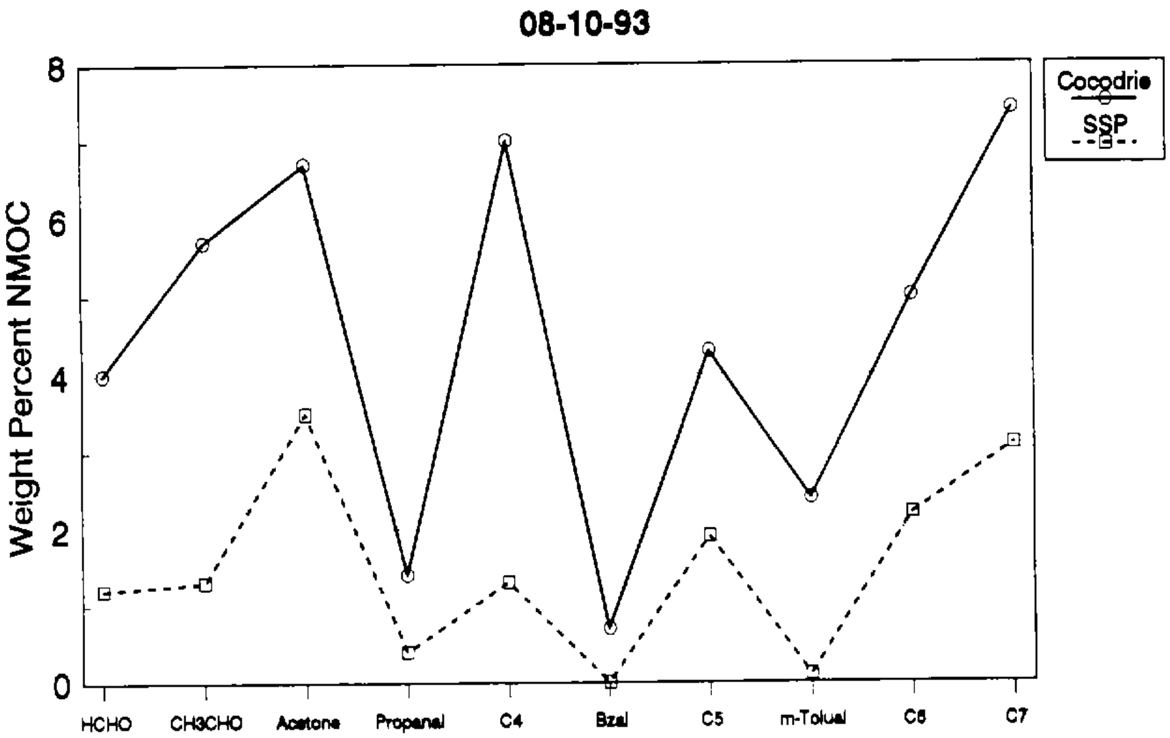

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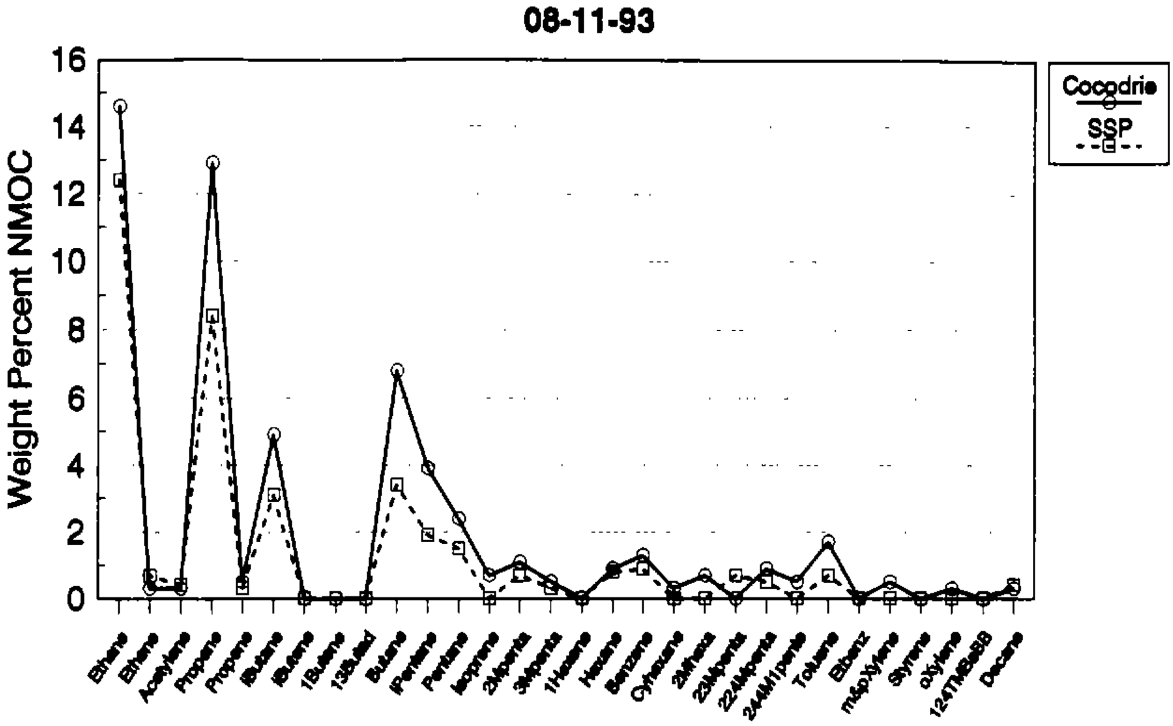

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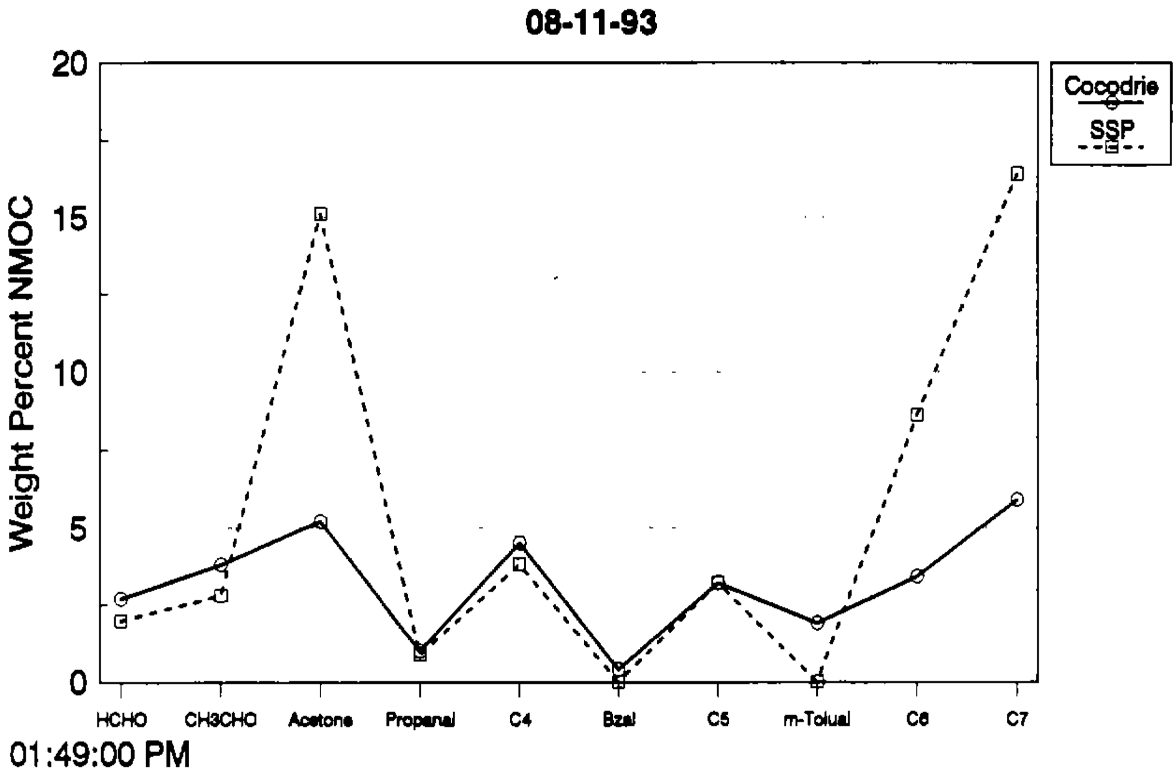

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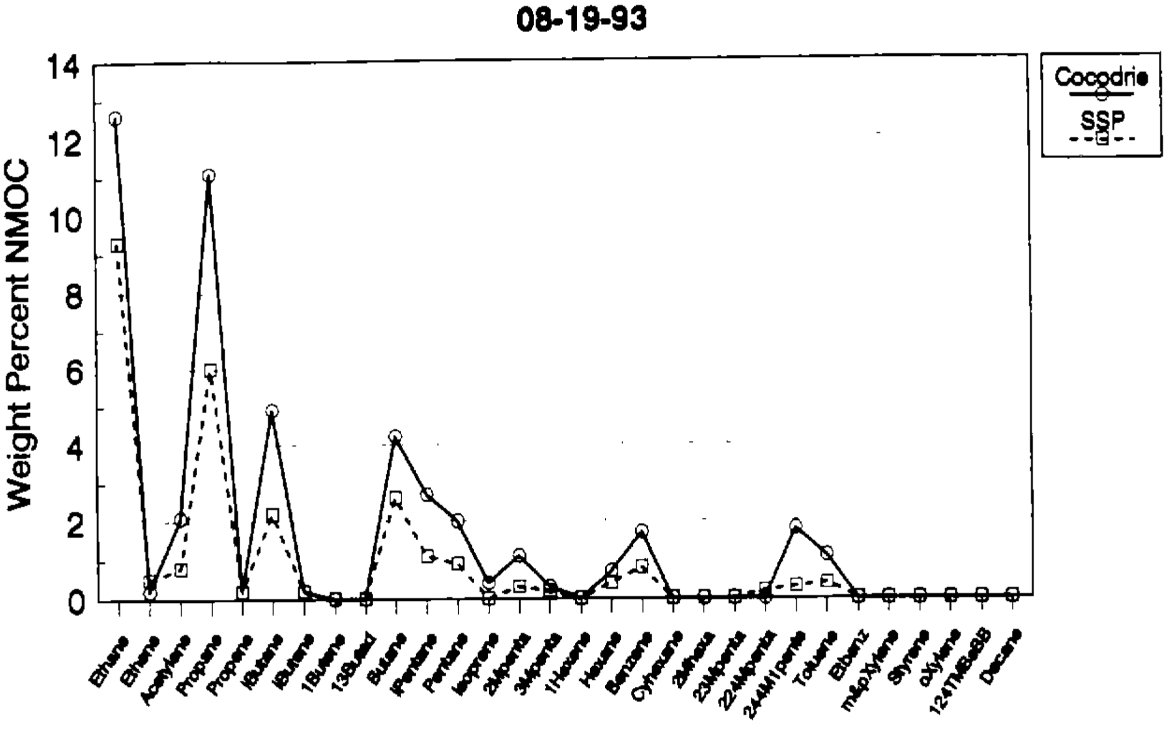

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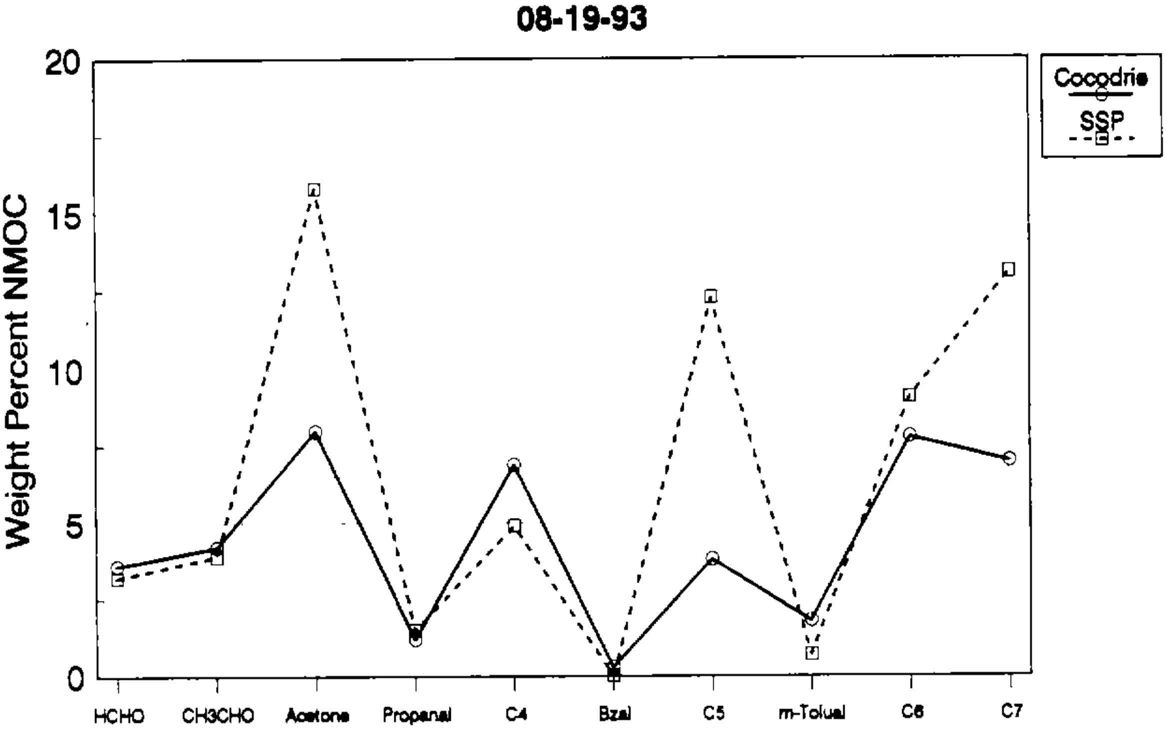

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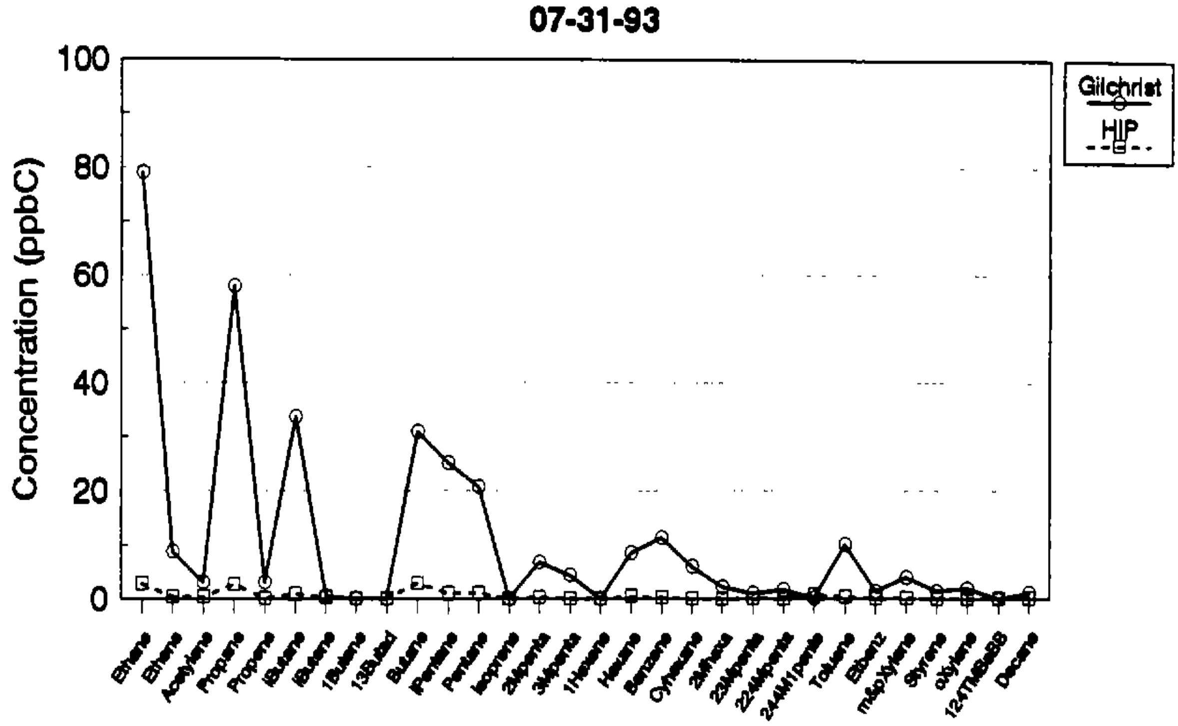

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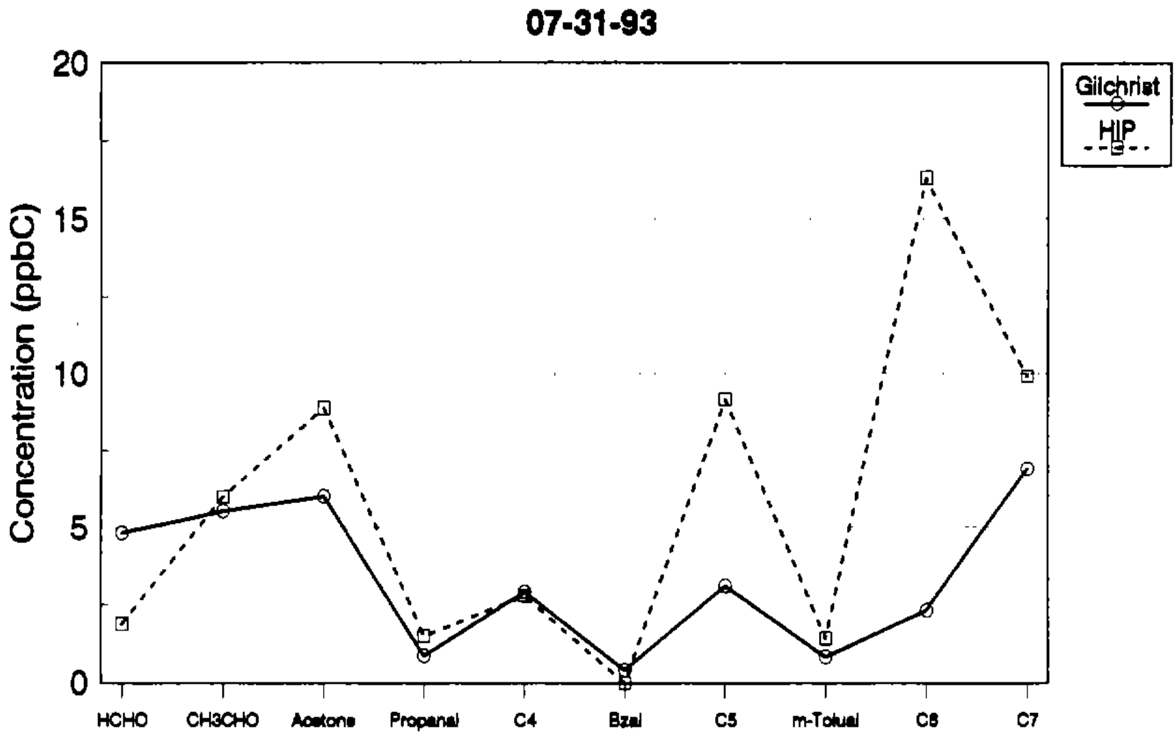

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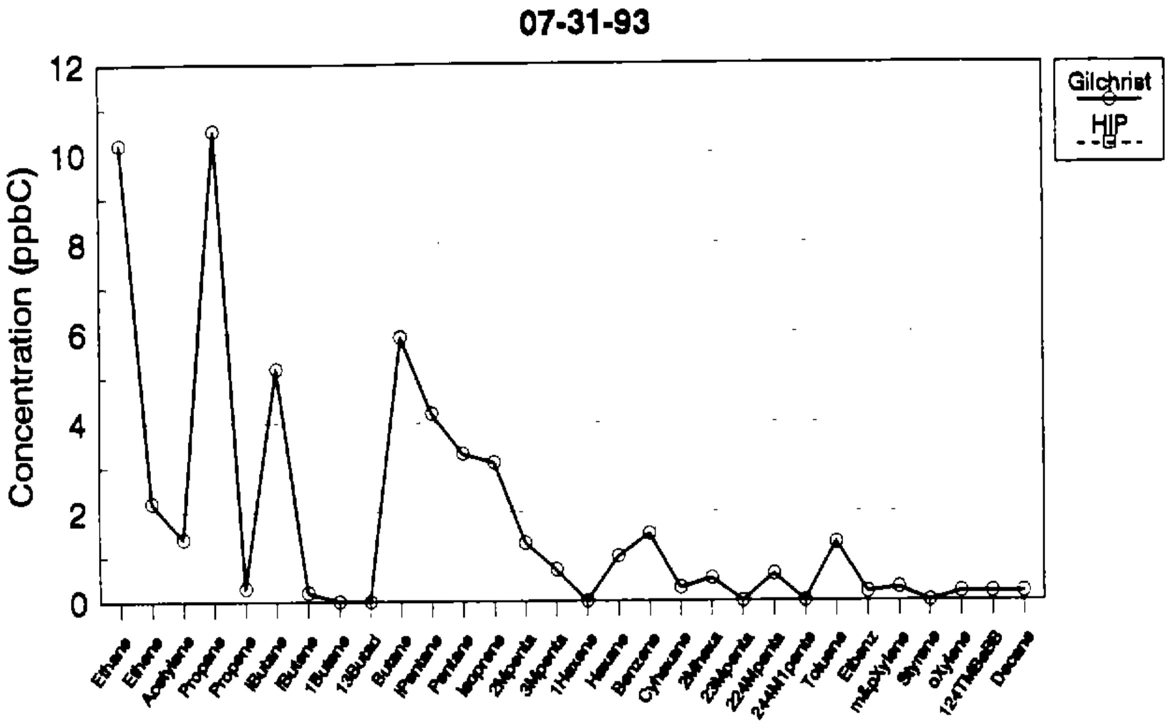
1-19-95



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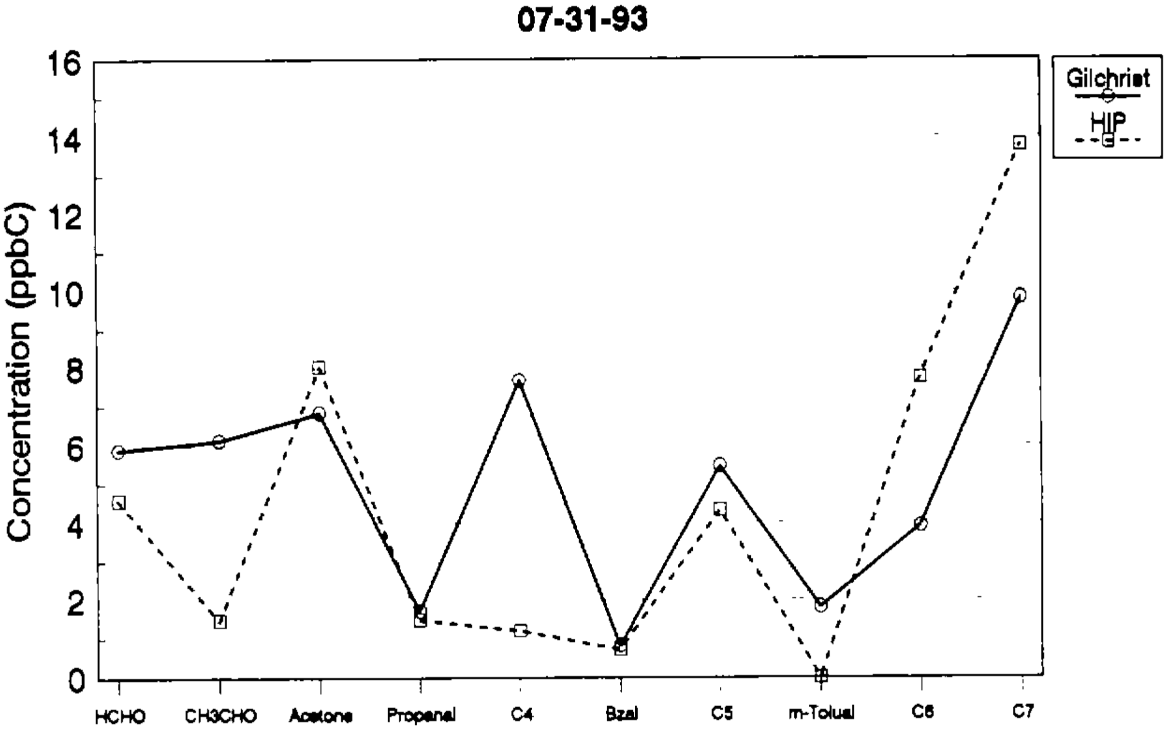

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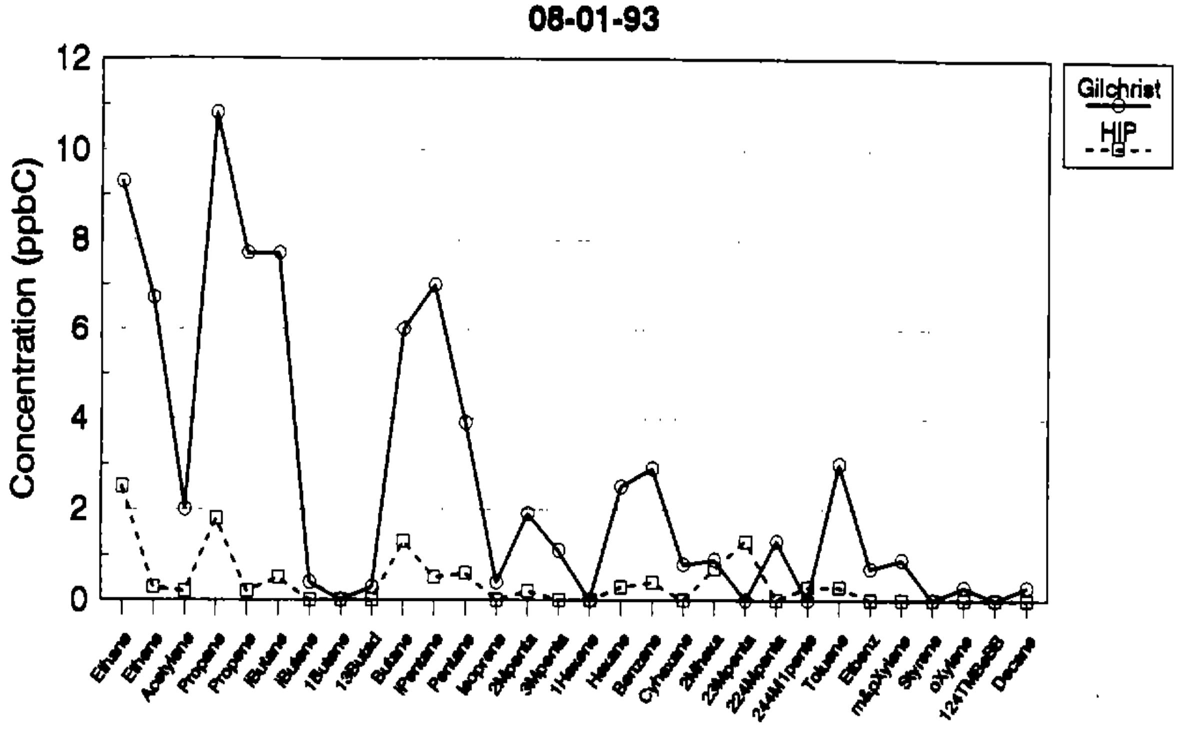

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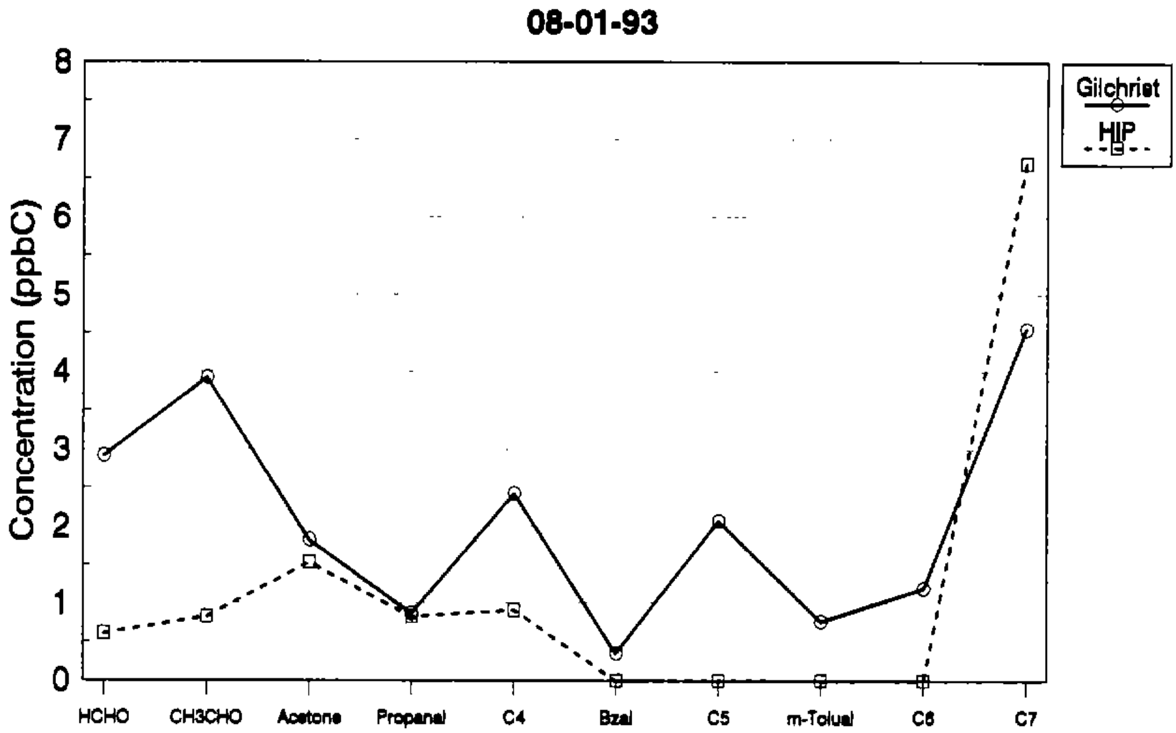

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T/along-shore

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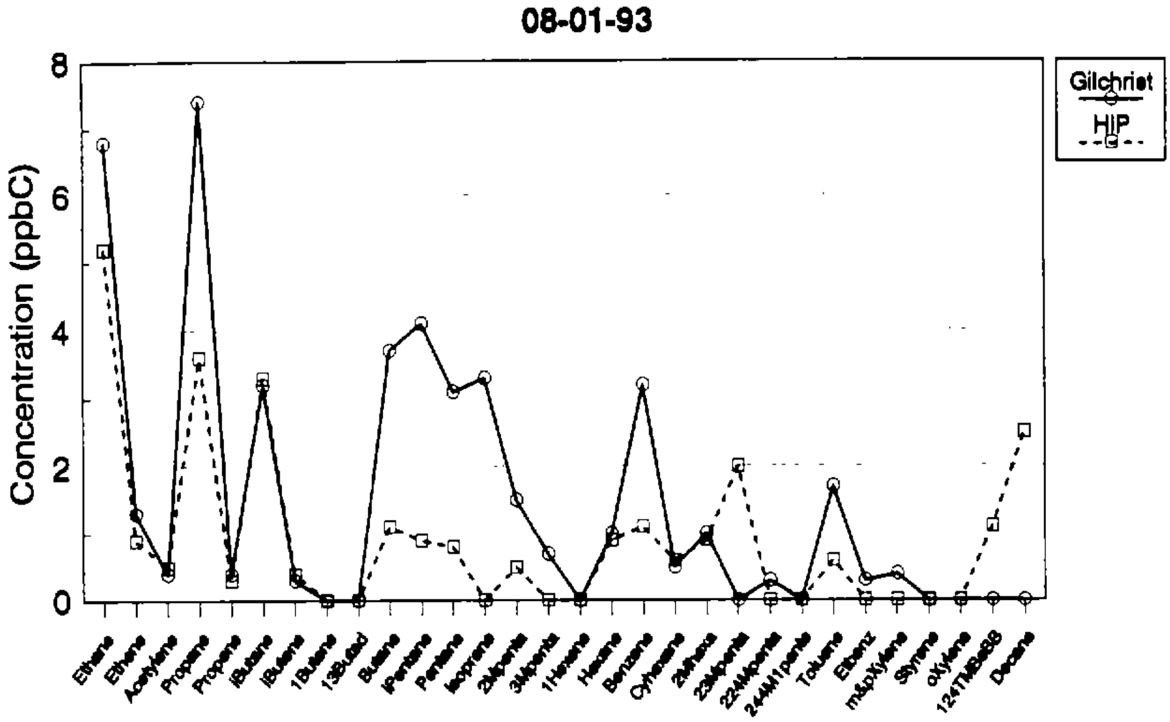

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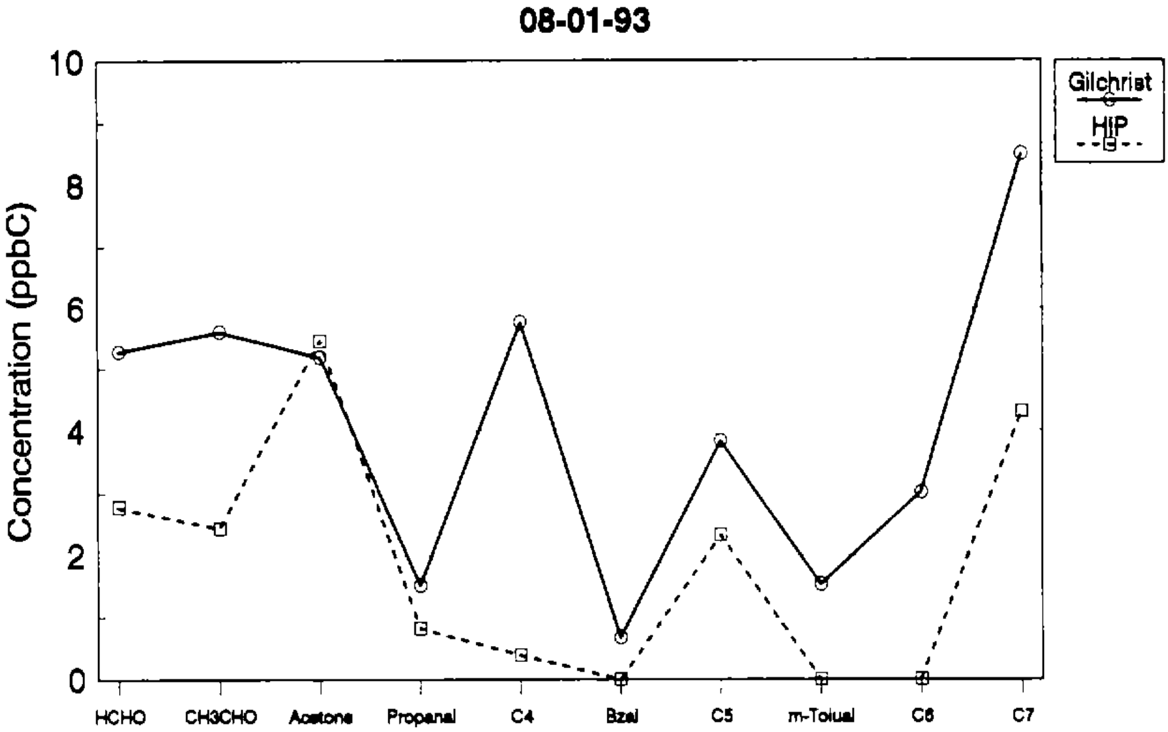

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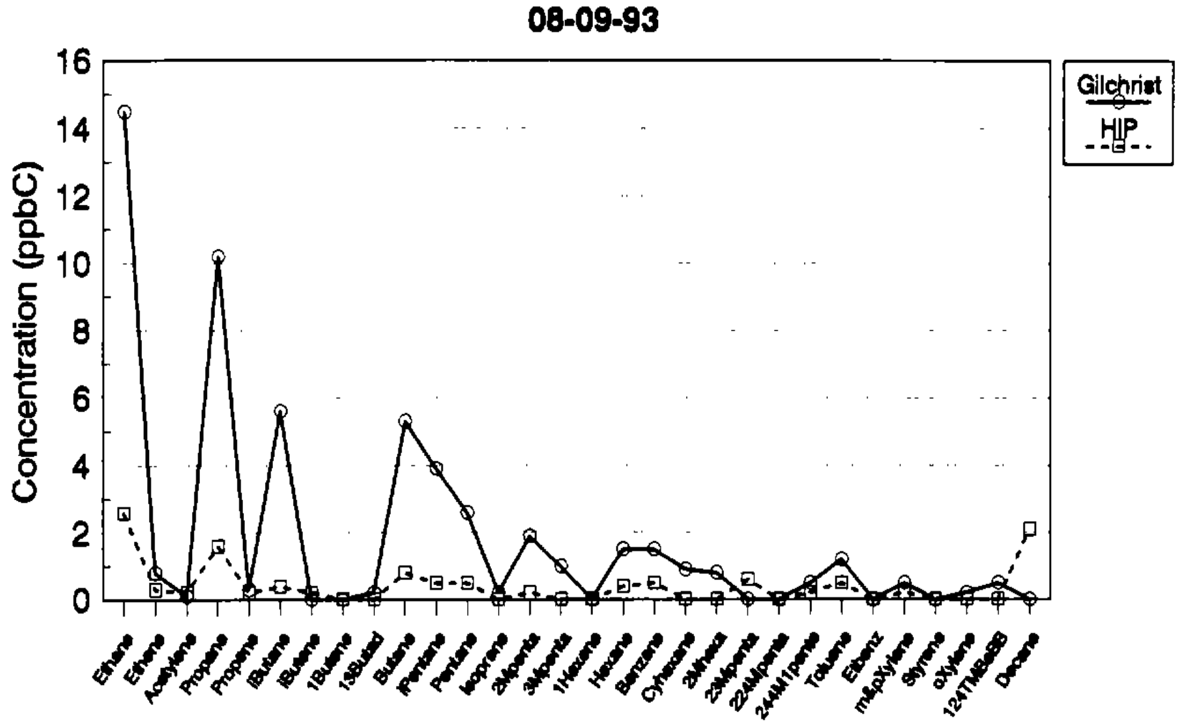

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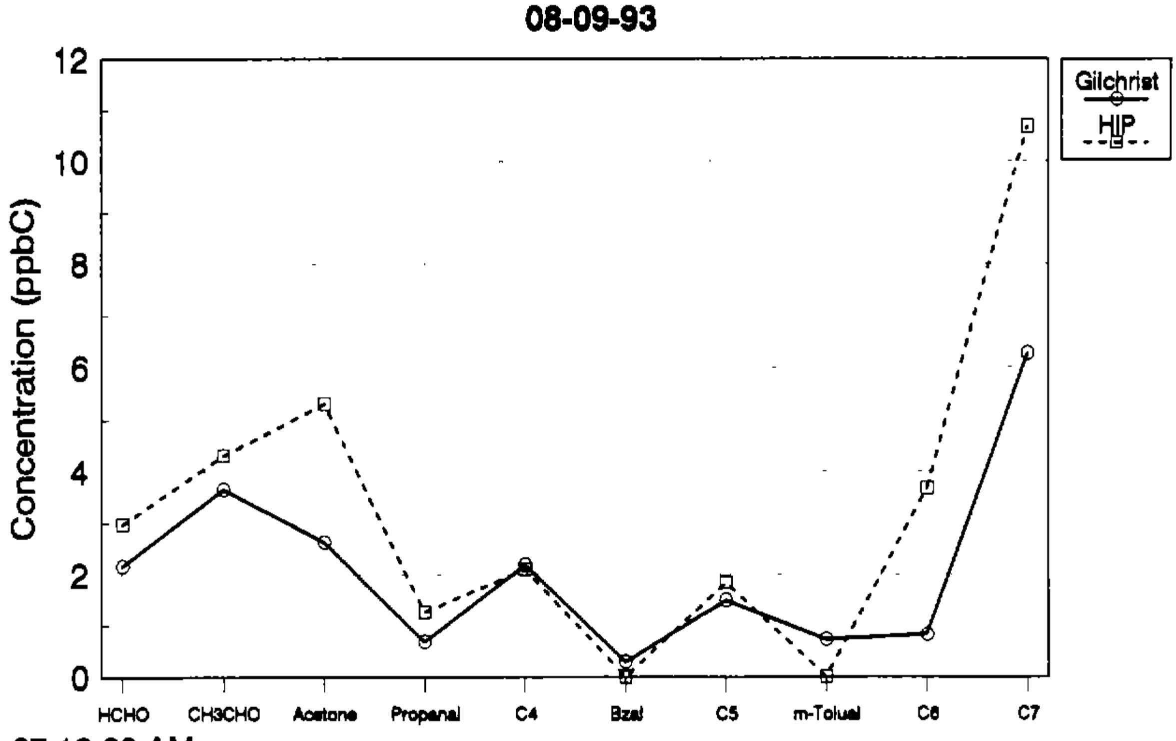

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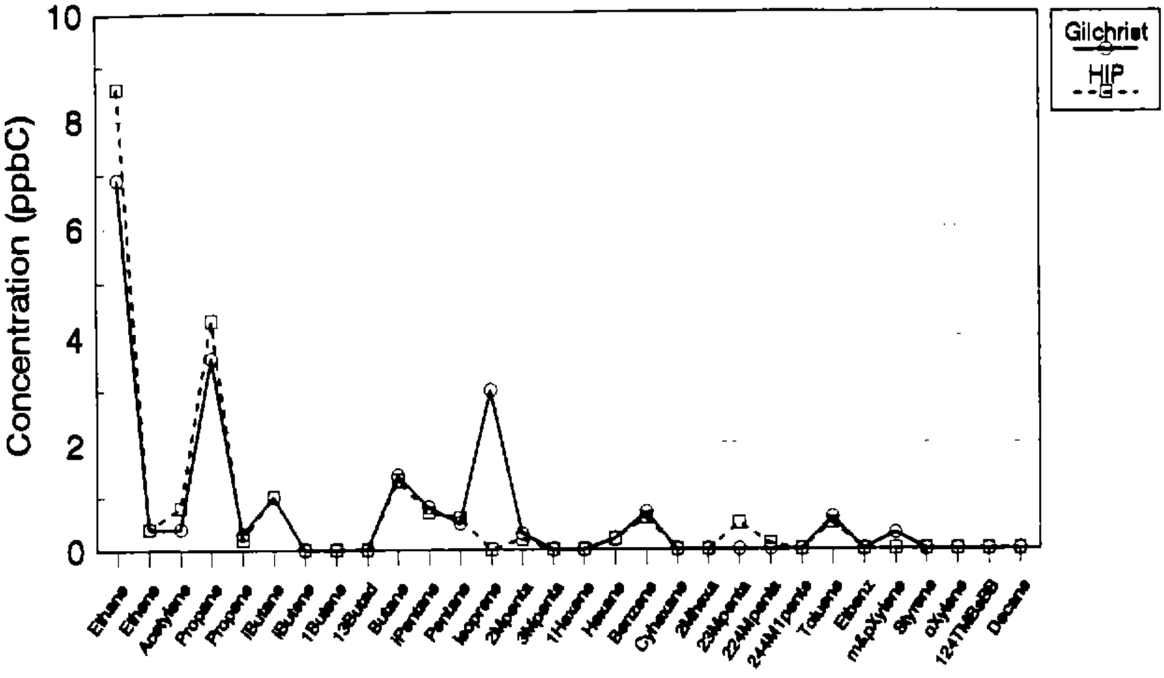
08-11-93



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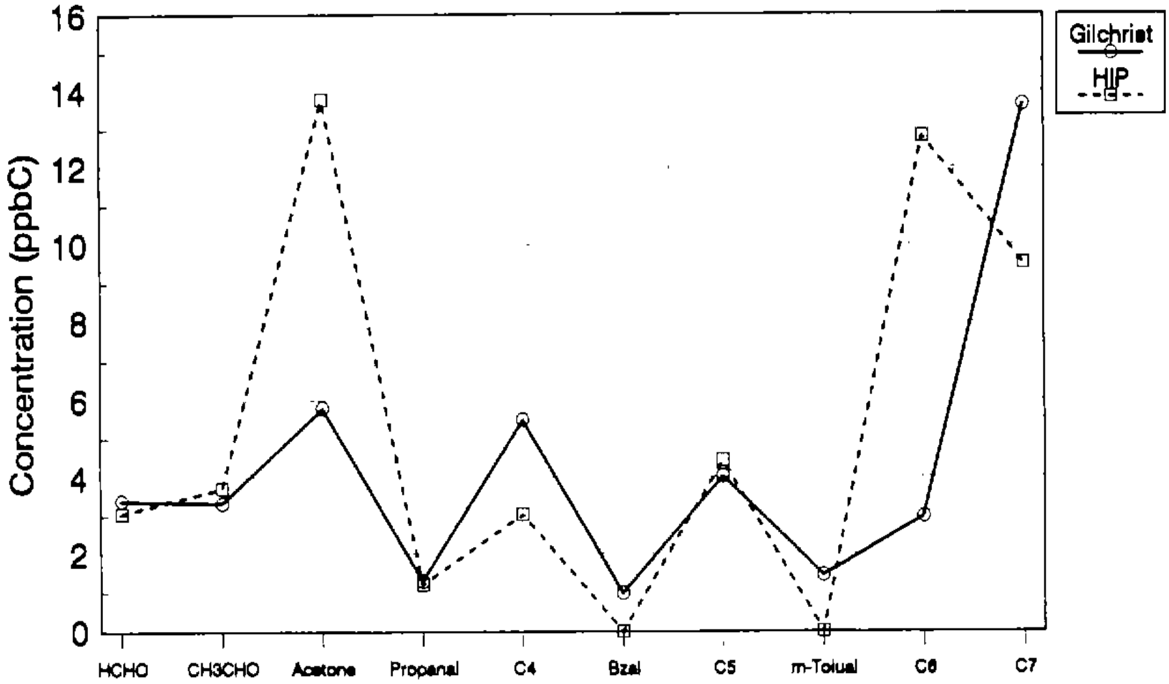

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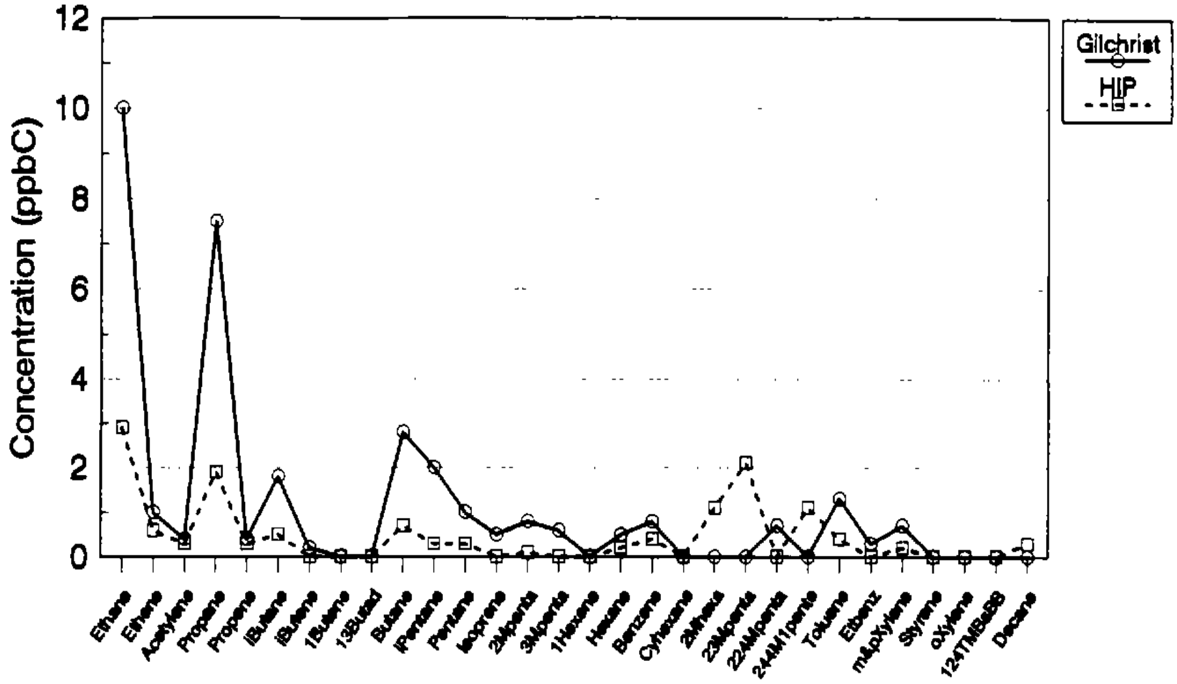

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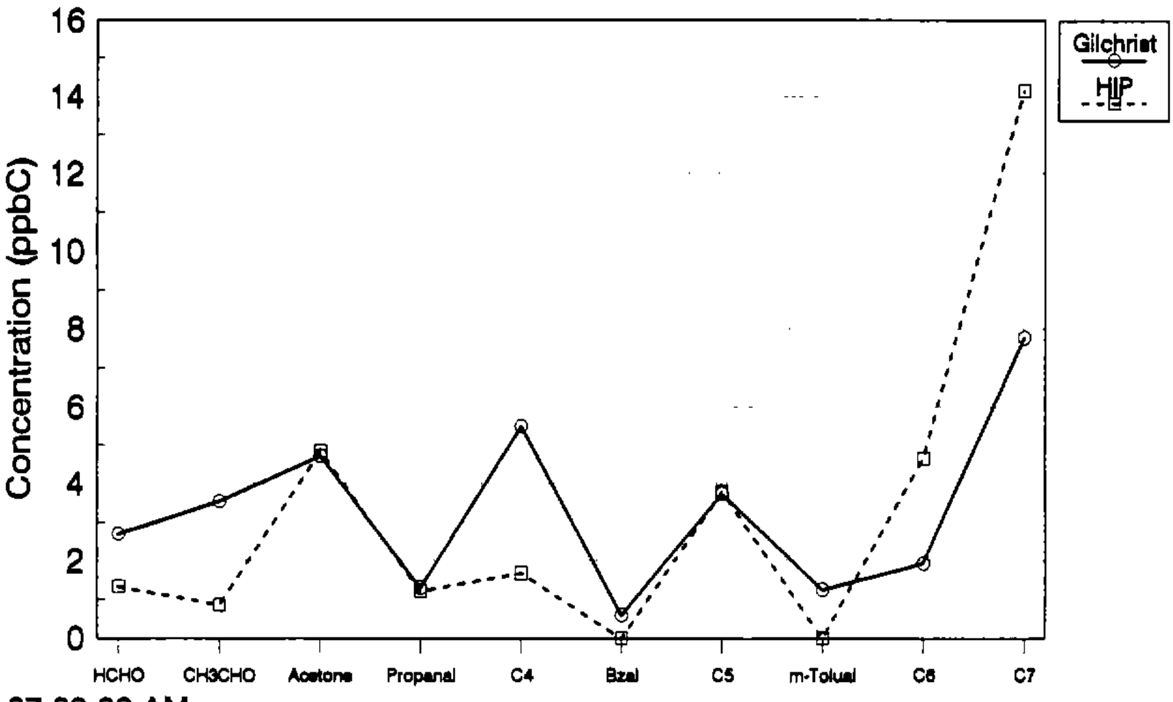

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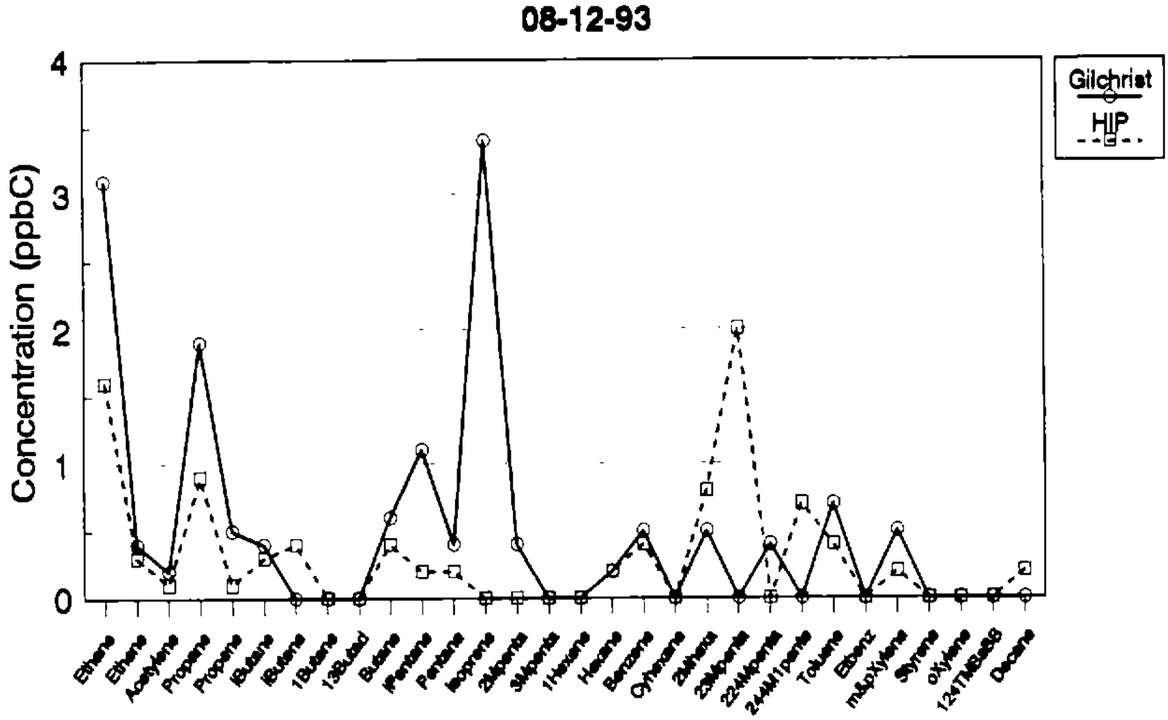

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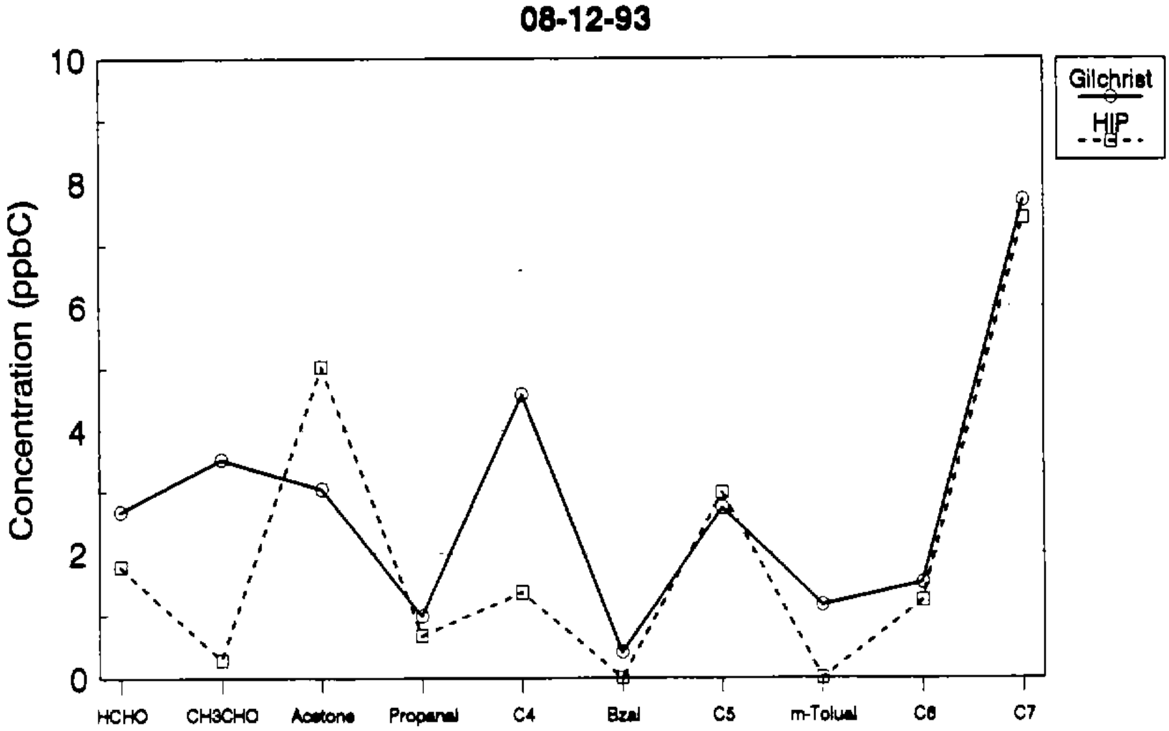

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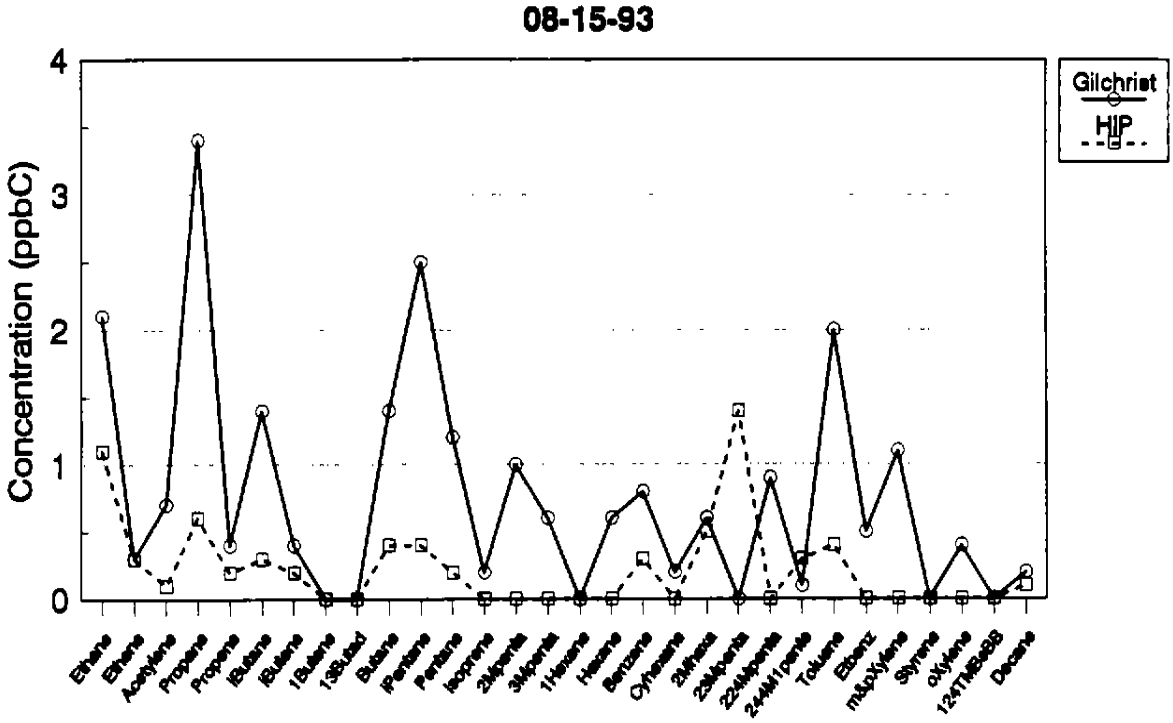

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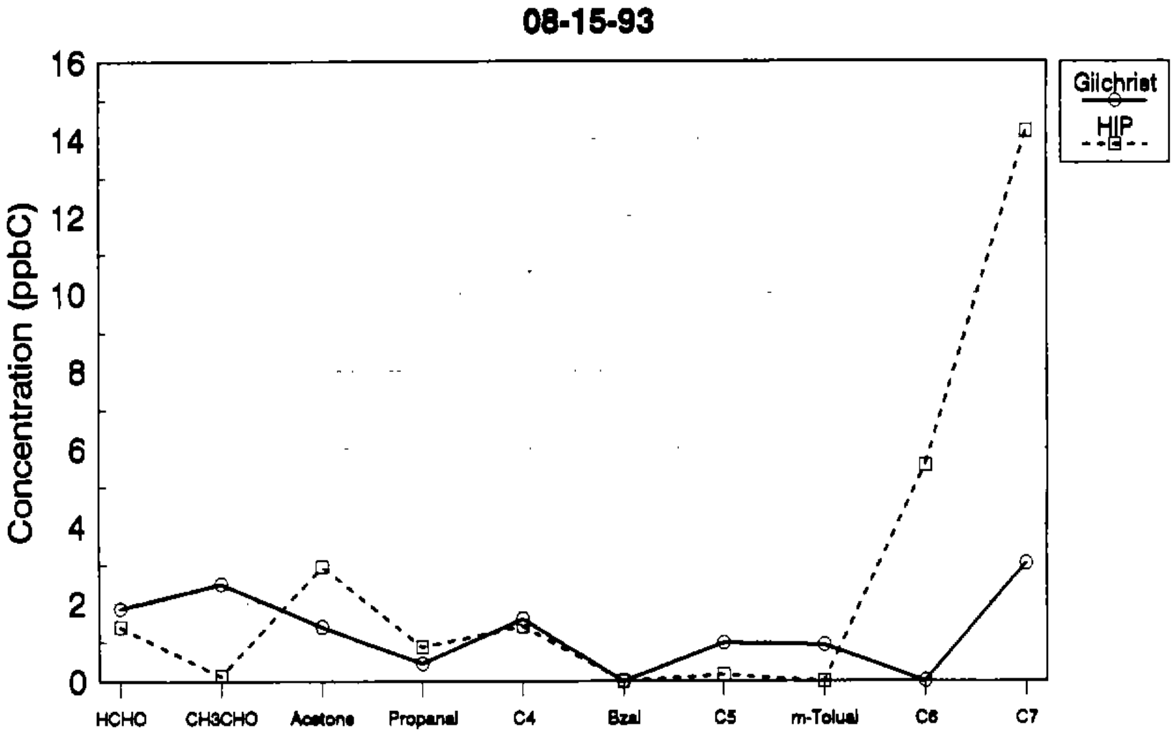

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T/onshore

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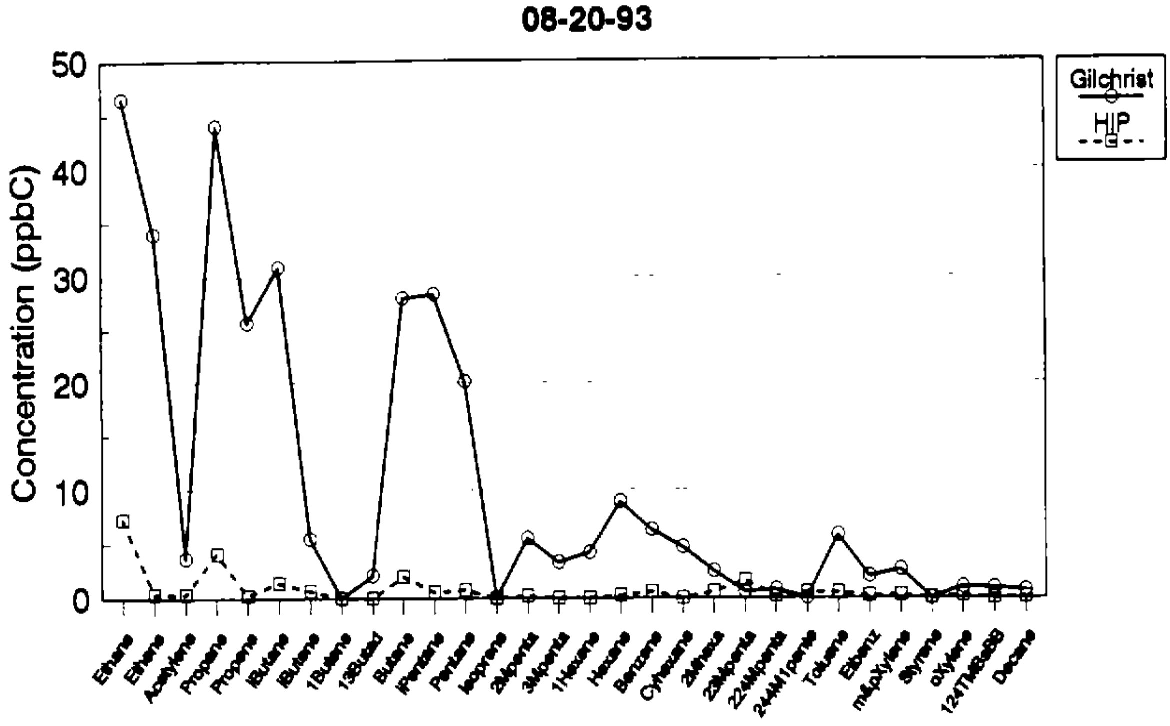

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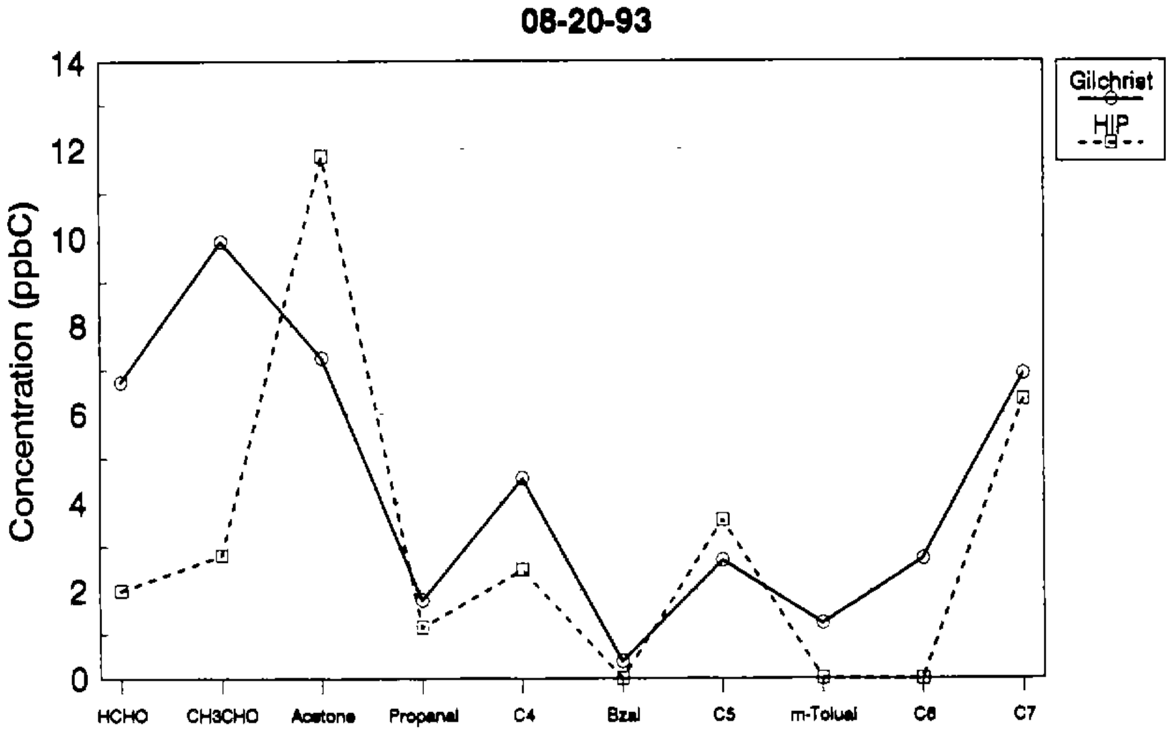

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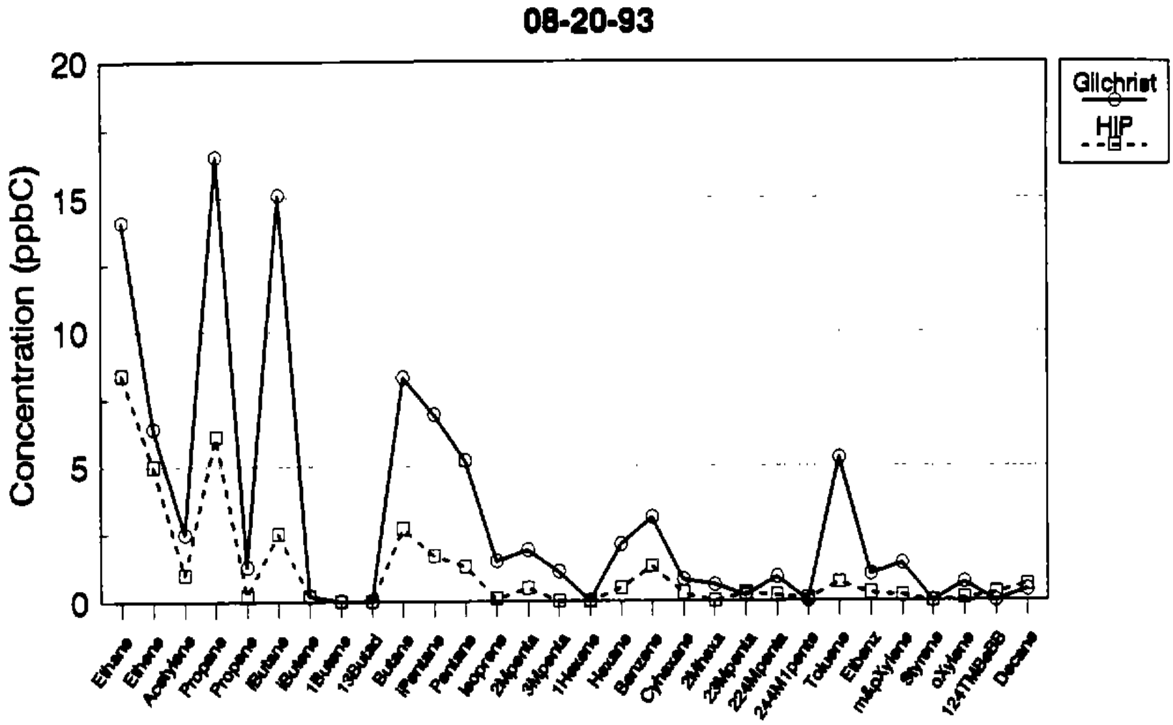

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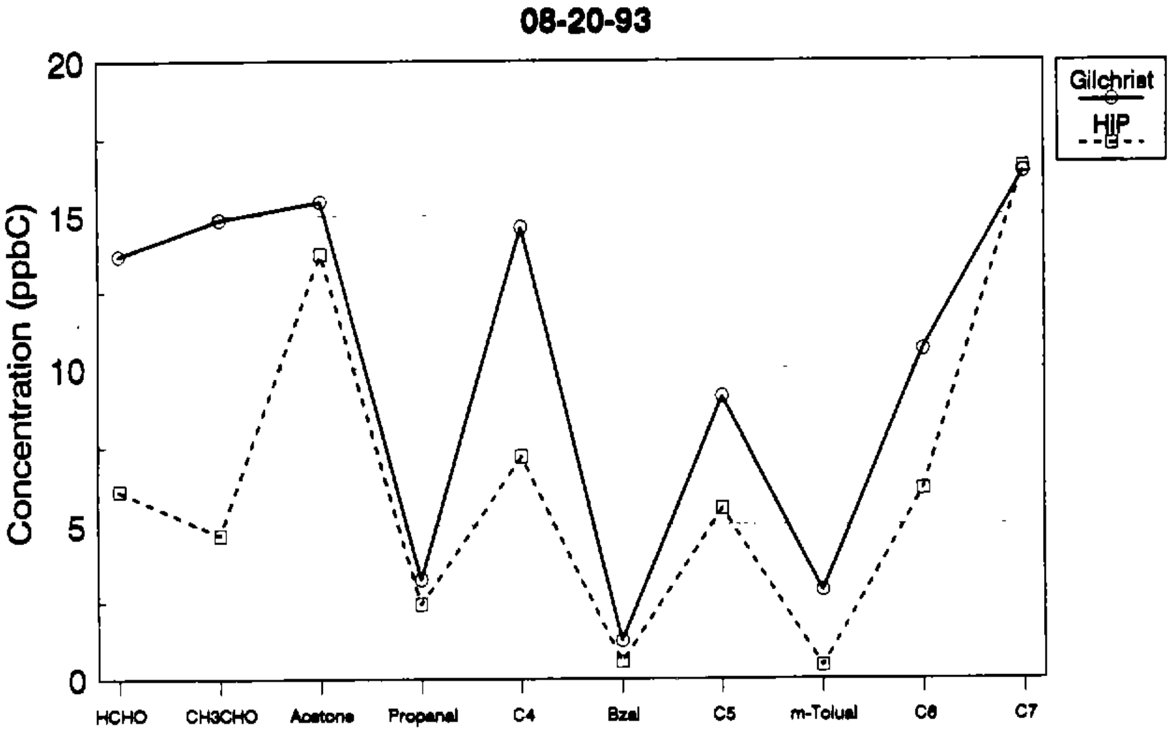

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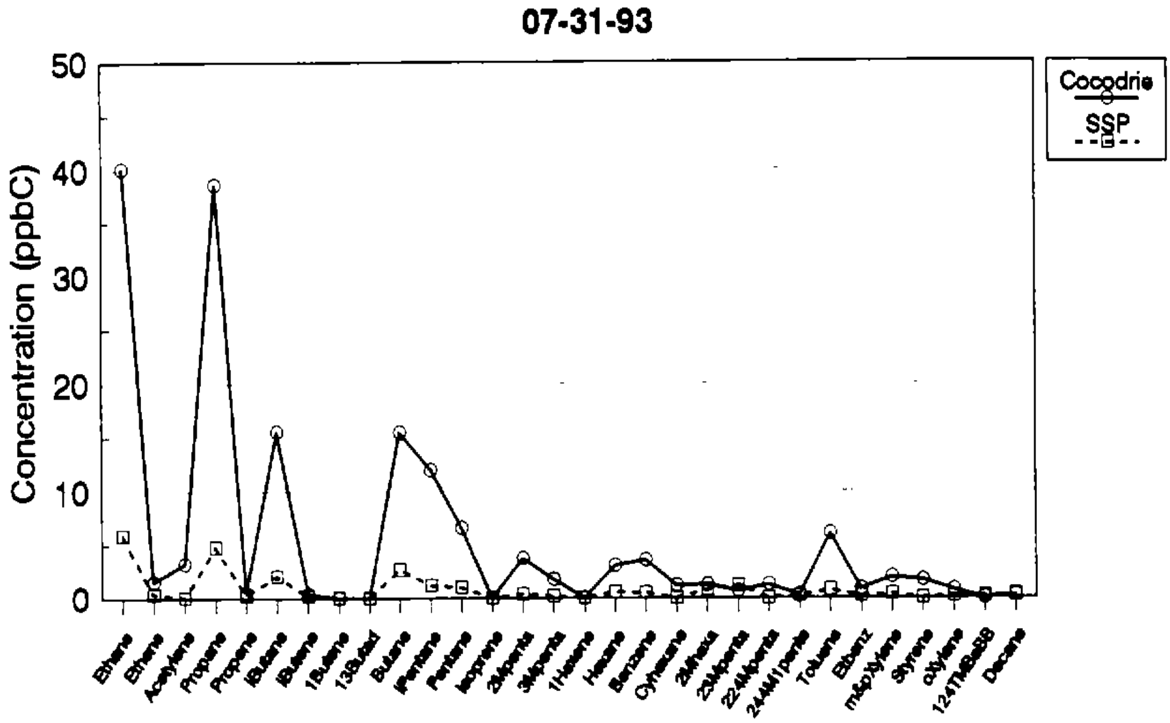

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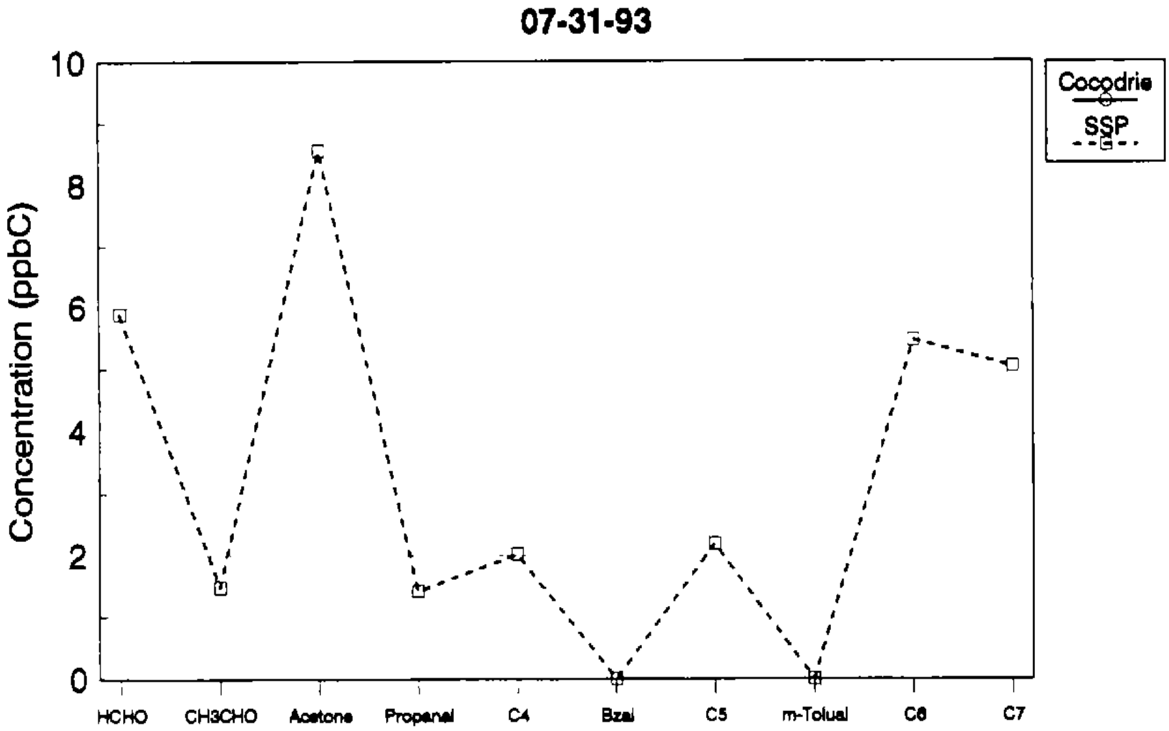

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offshore

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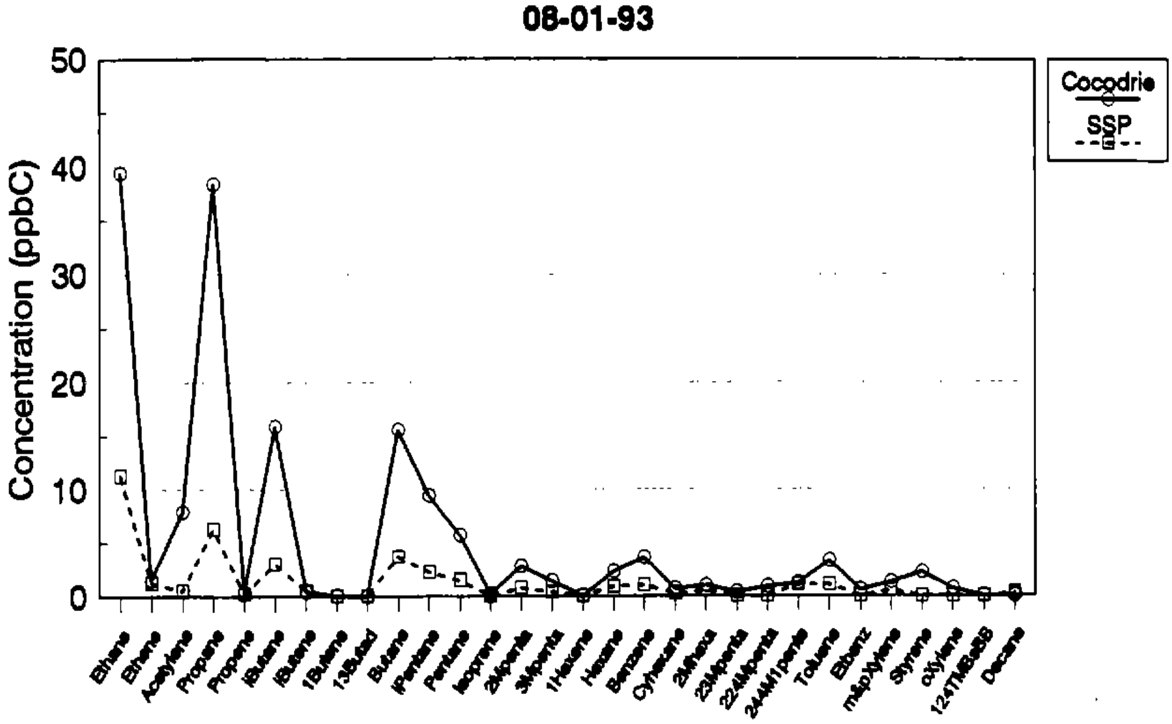
1-20-95



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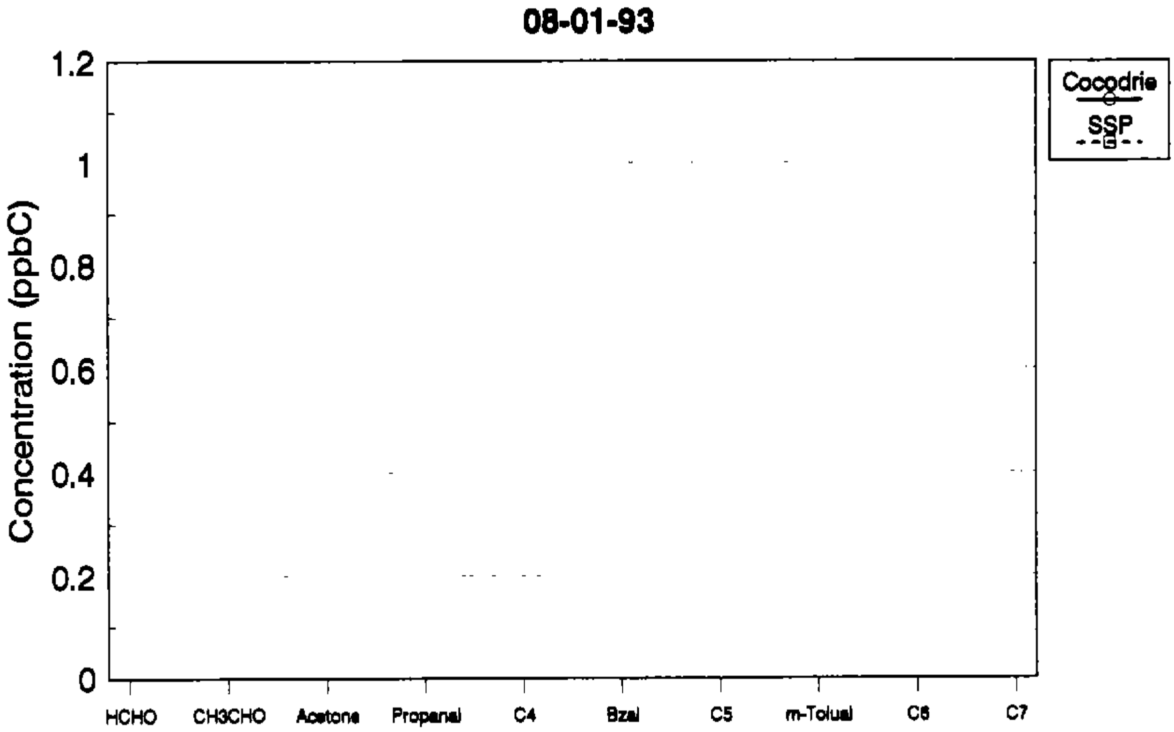

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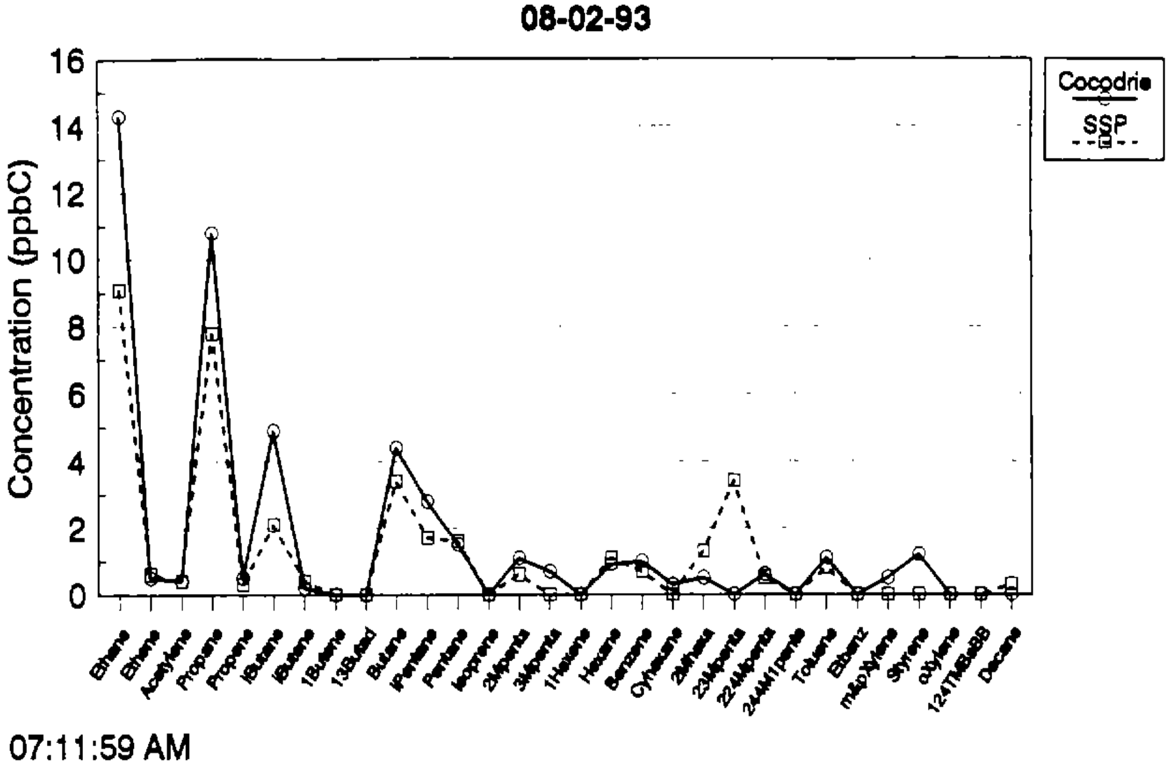

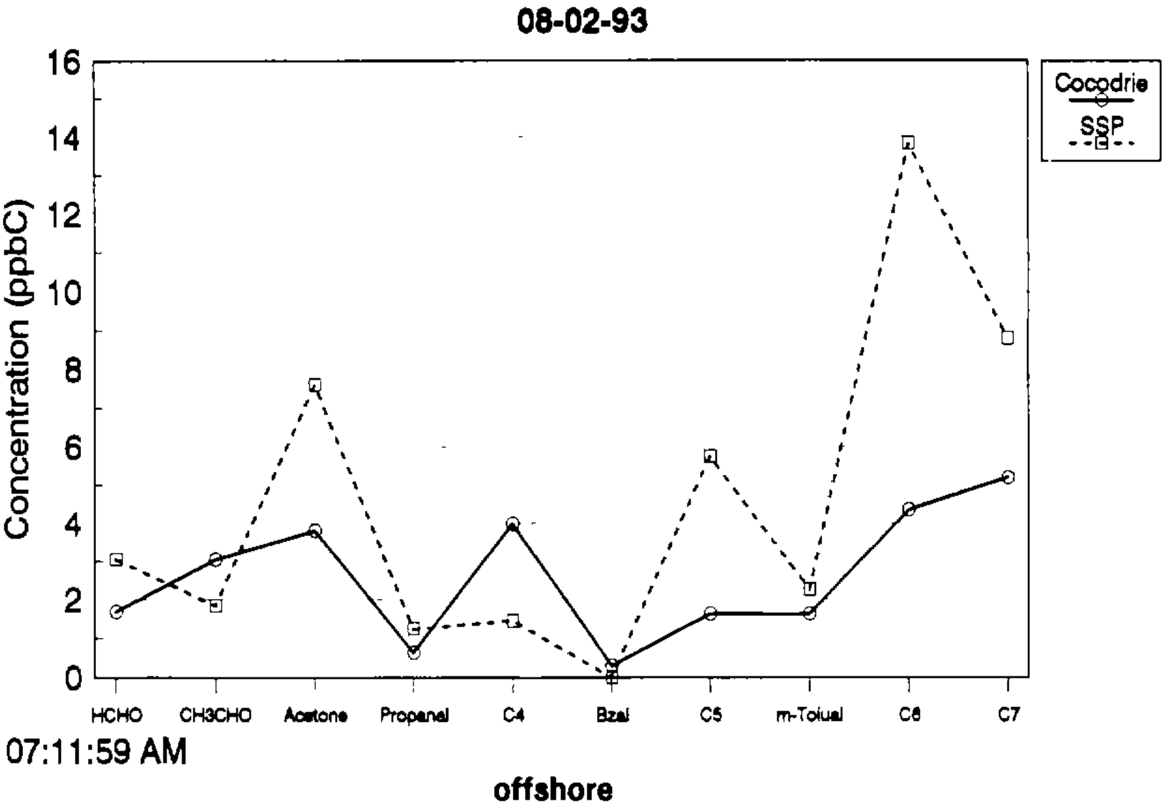

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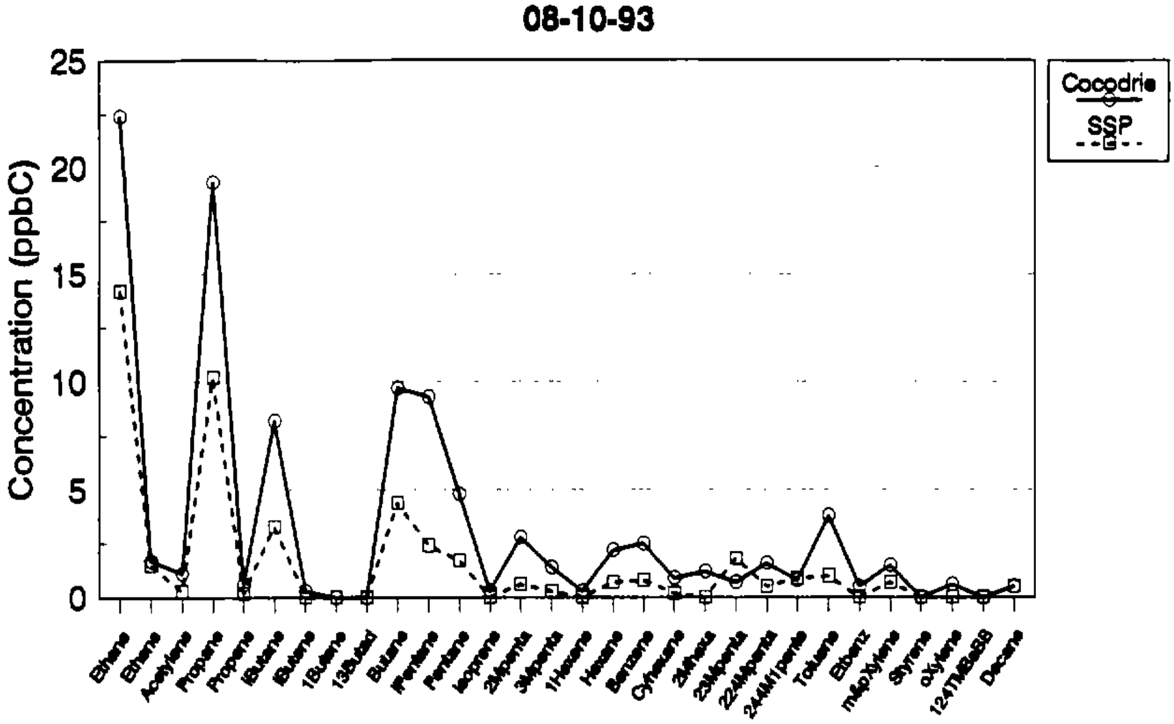

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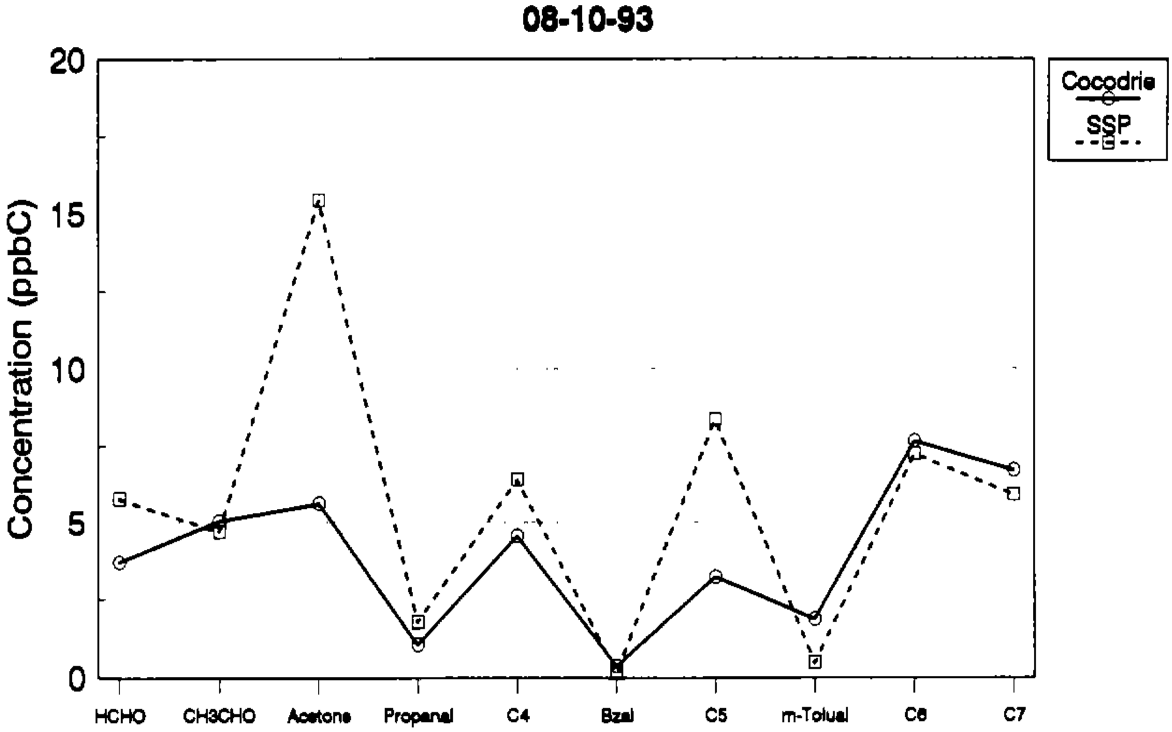

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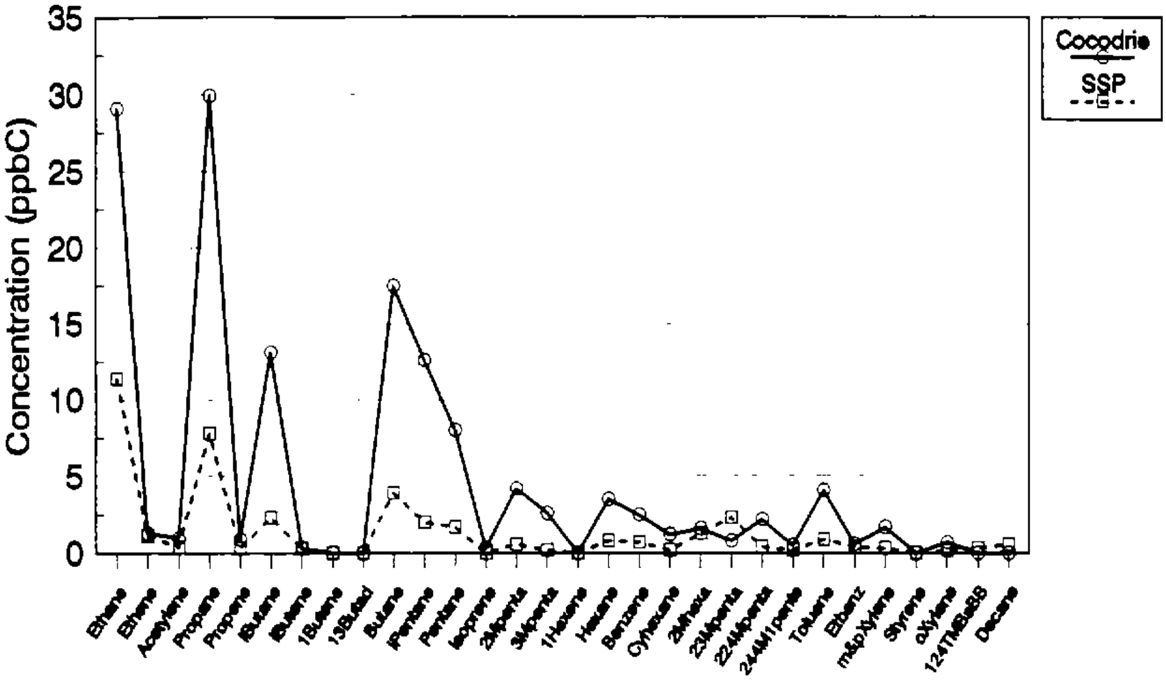

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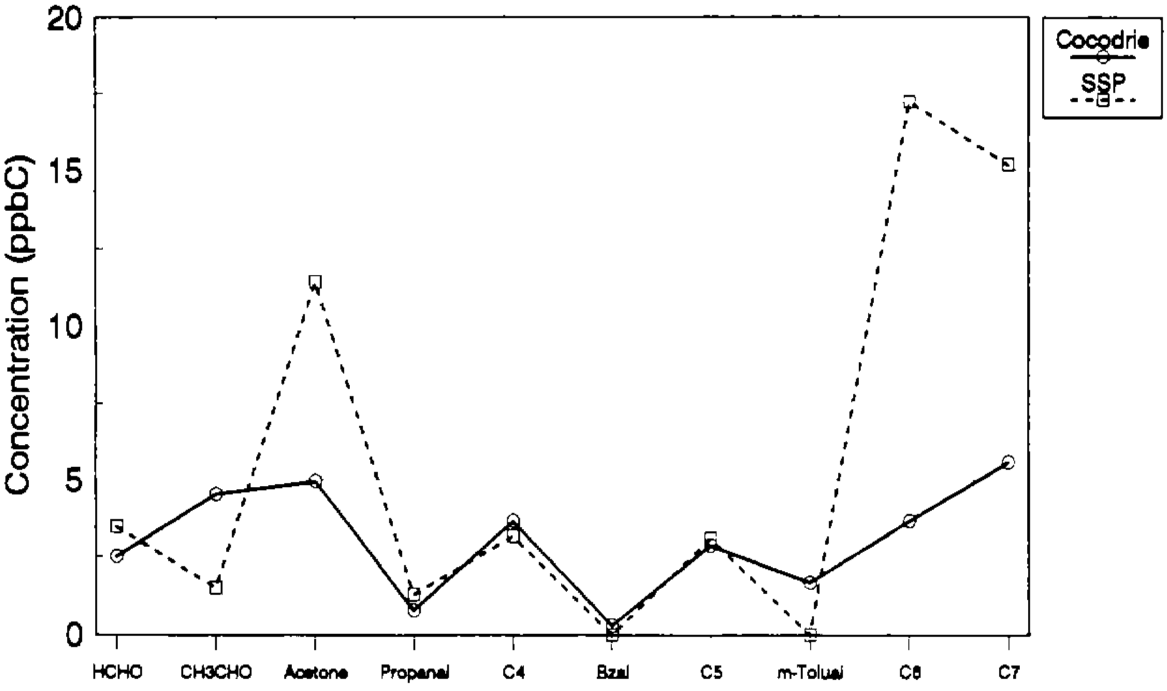

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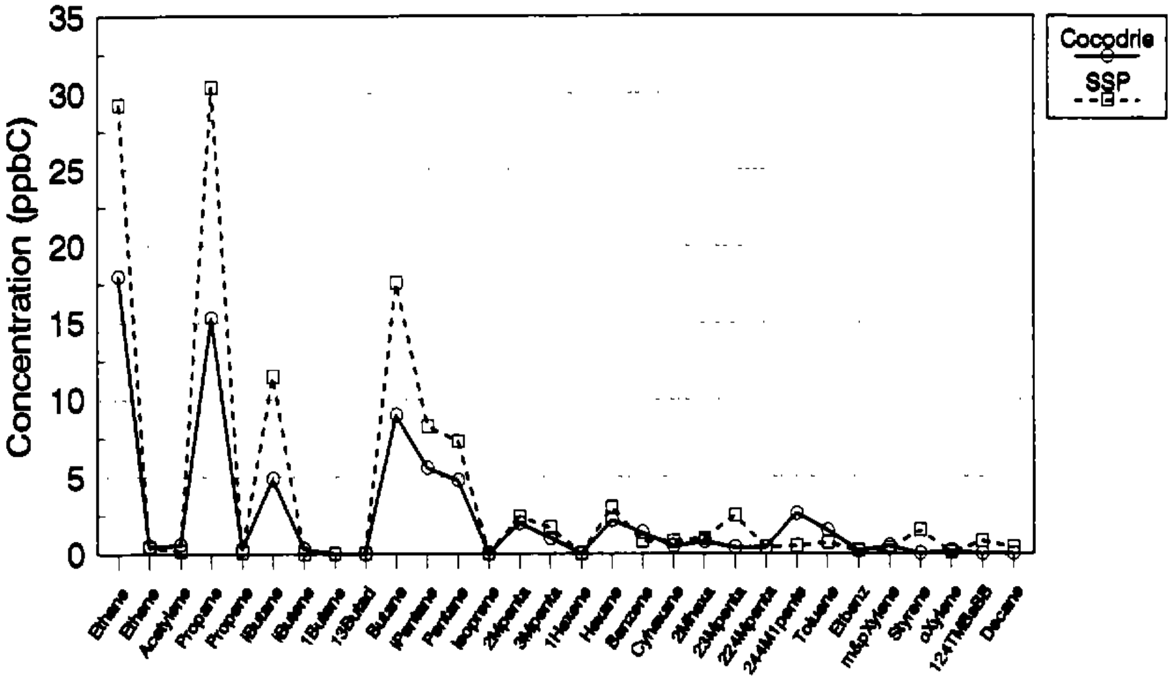

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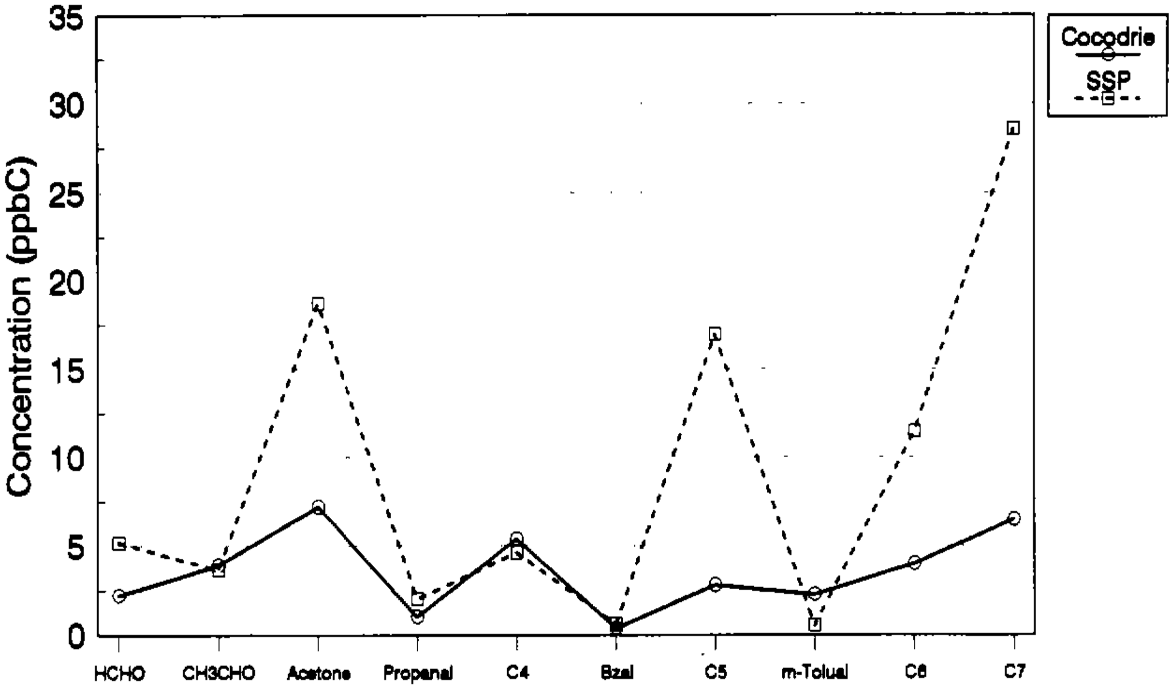

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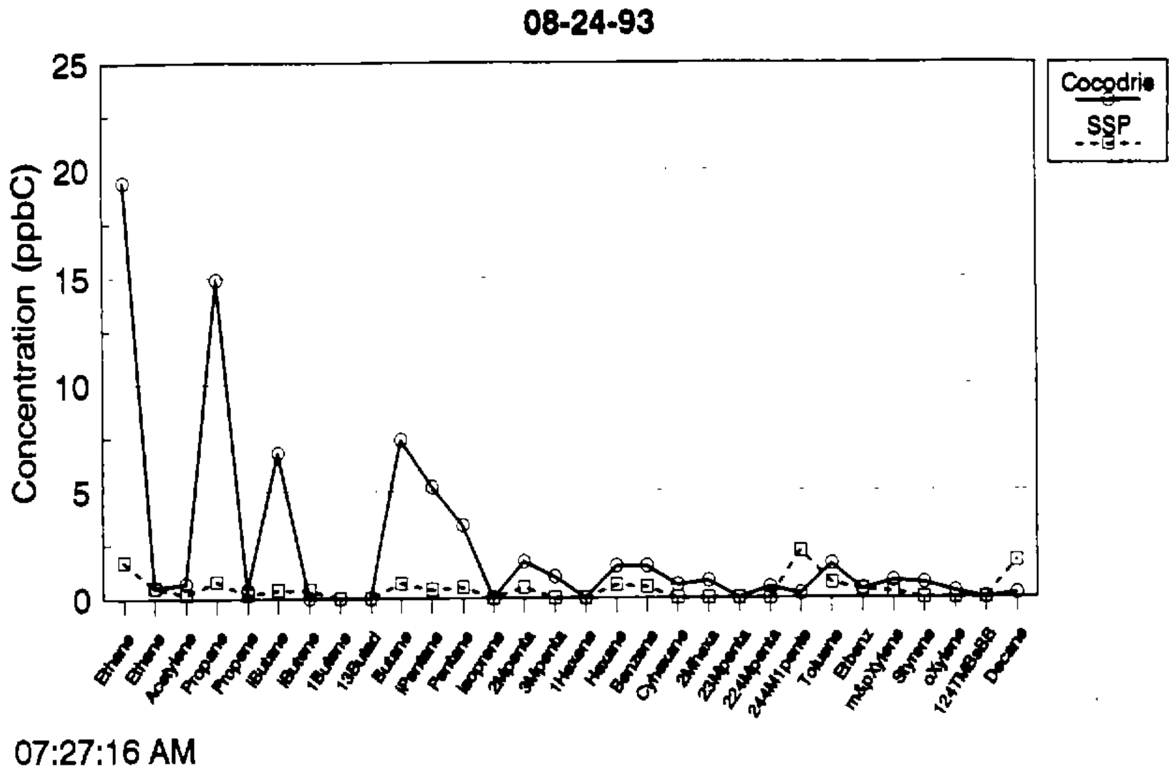

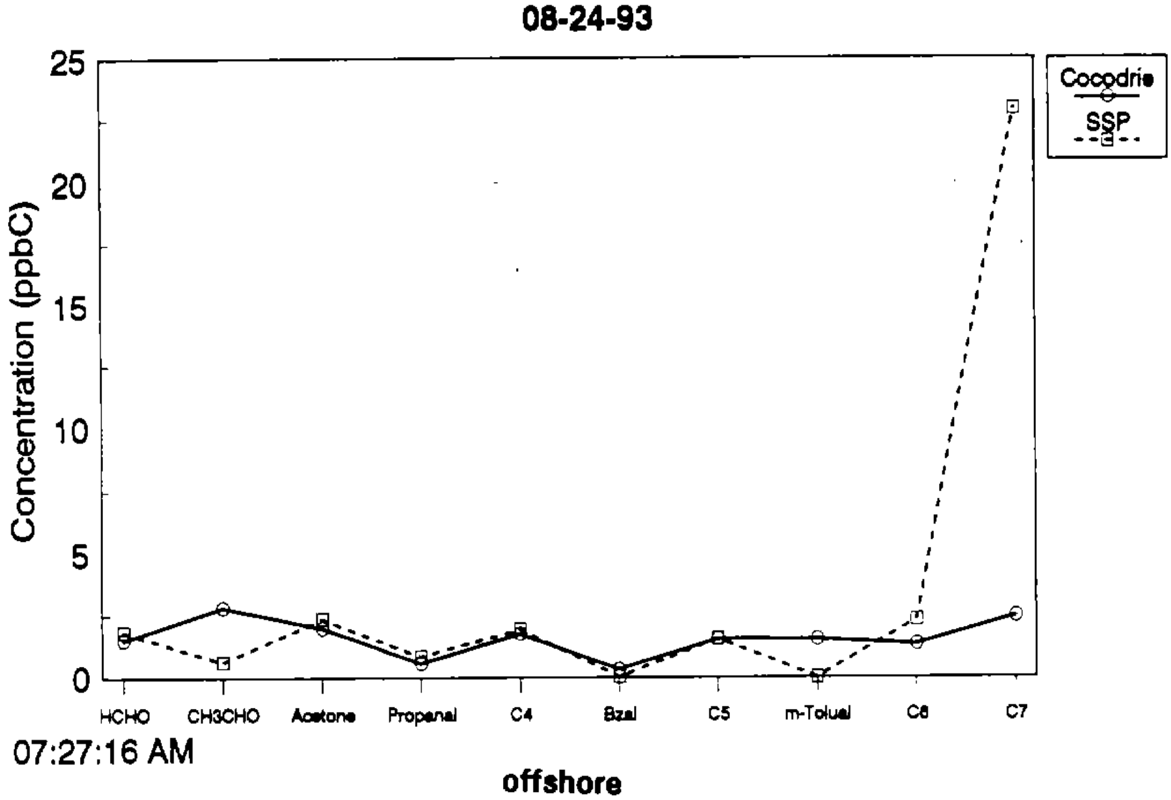

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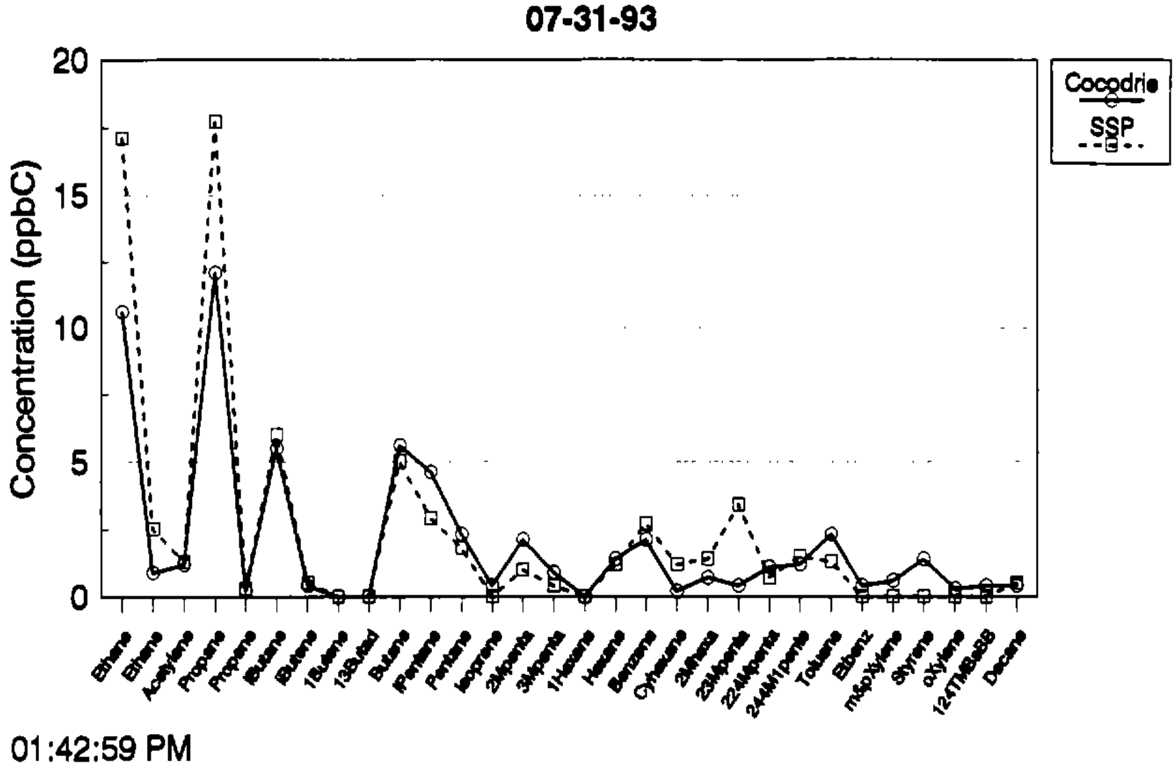

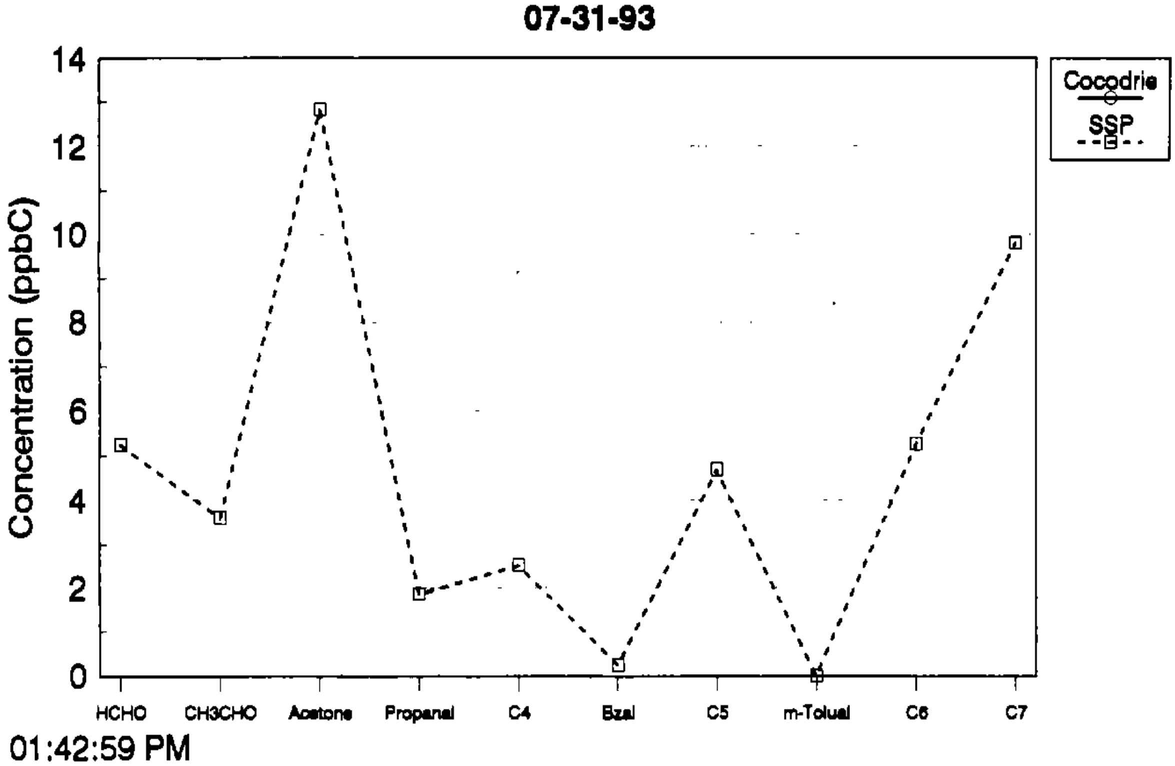

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1-20-95

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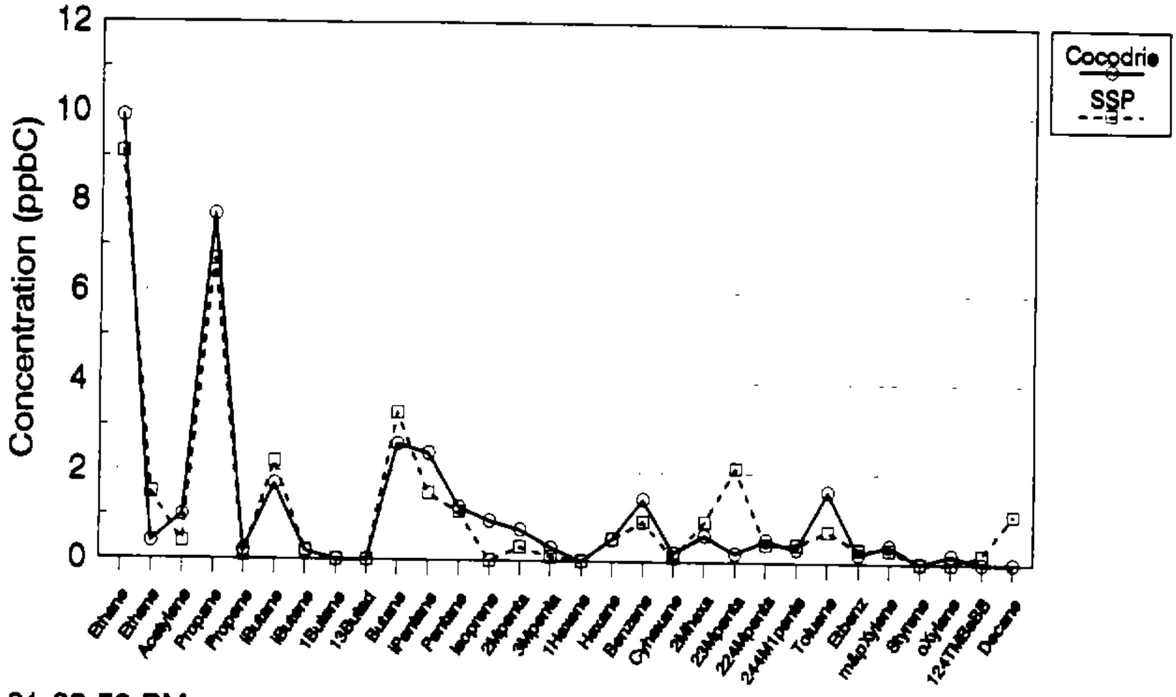

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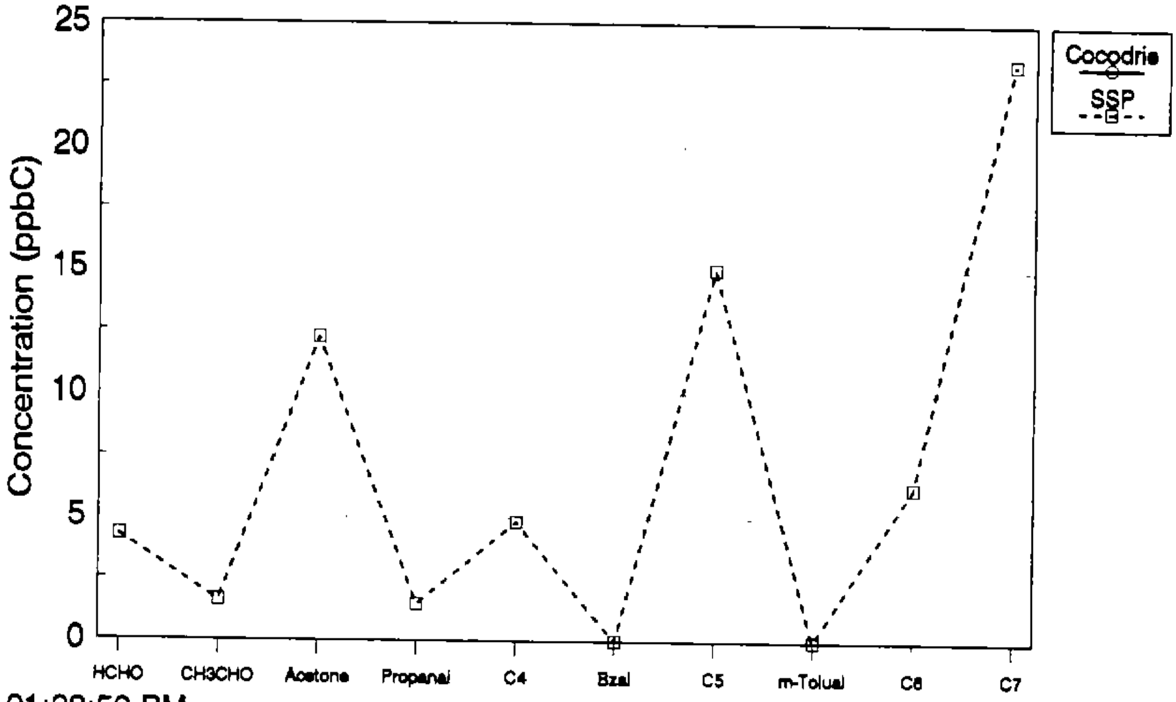

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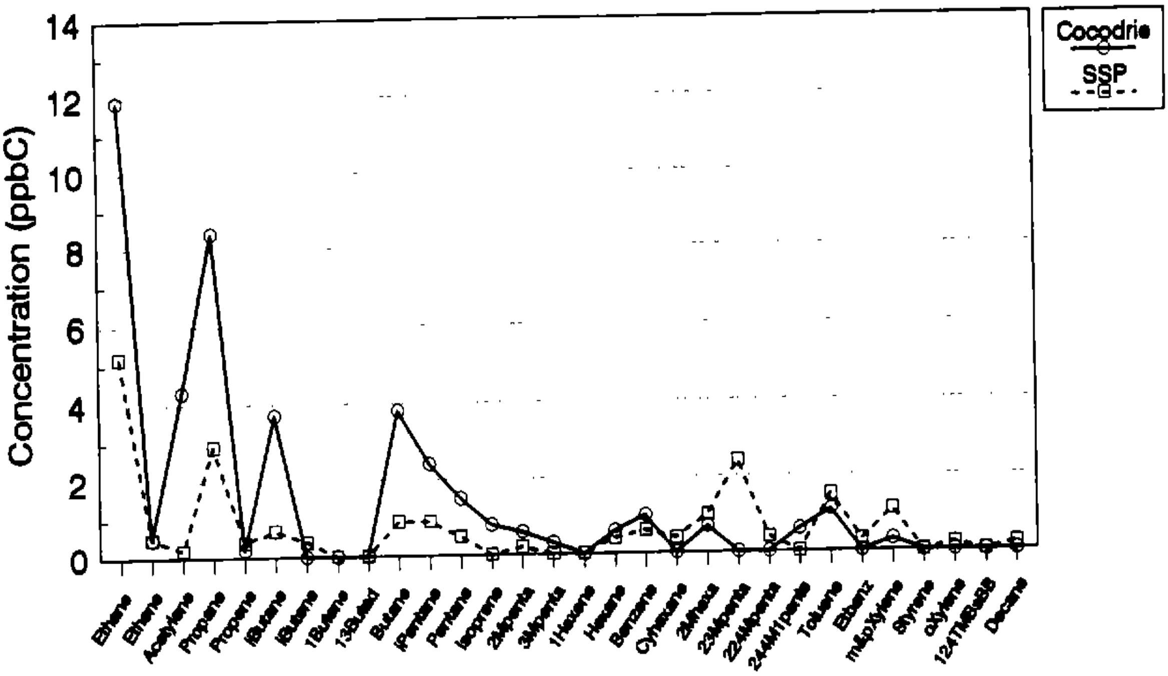

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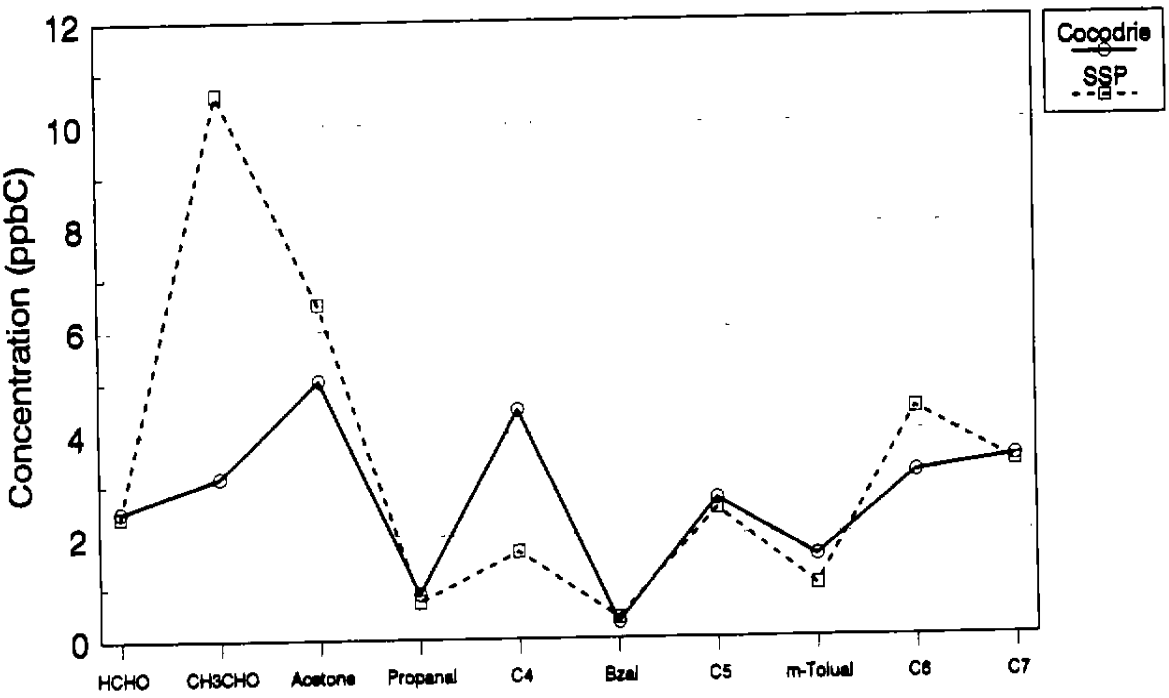

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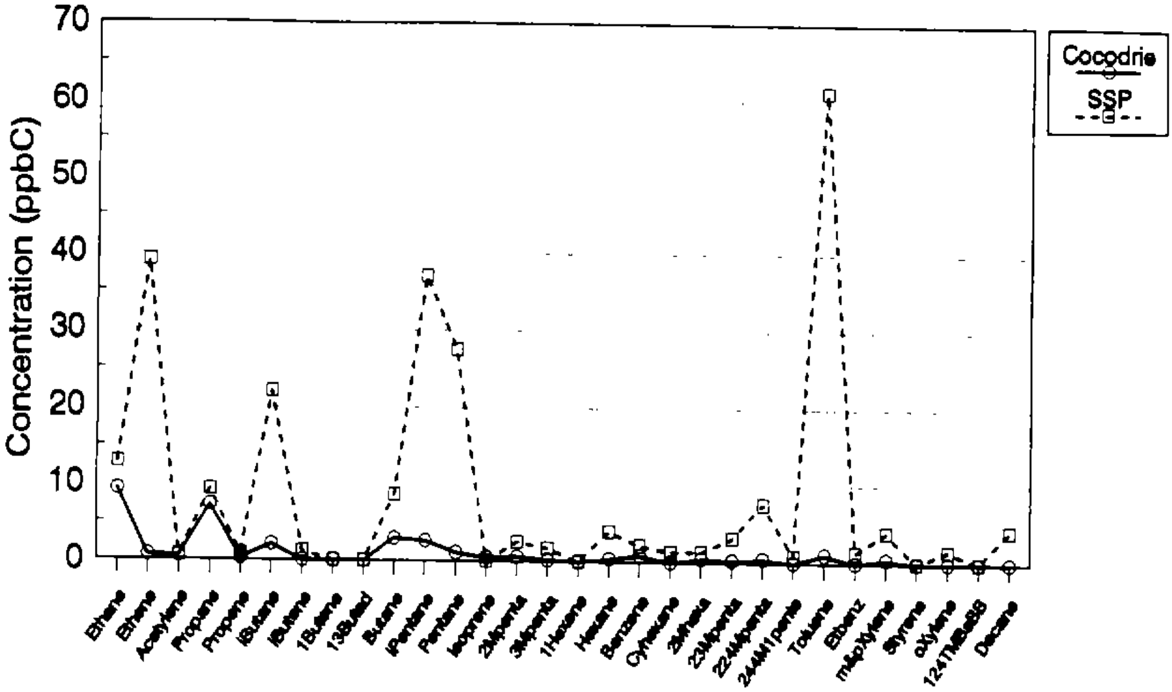

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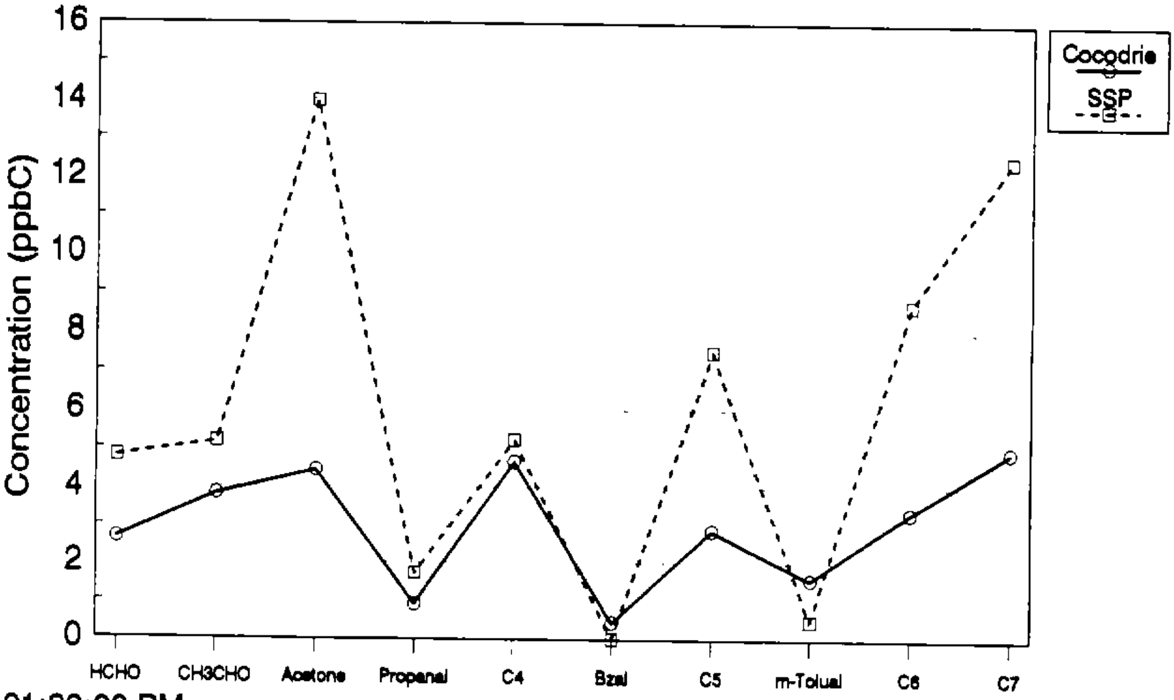
08-10-93



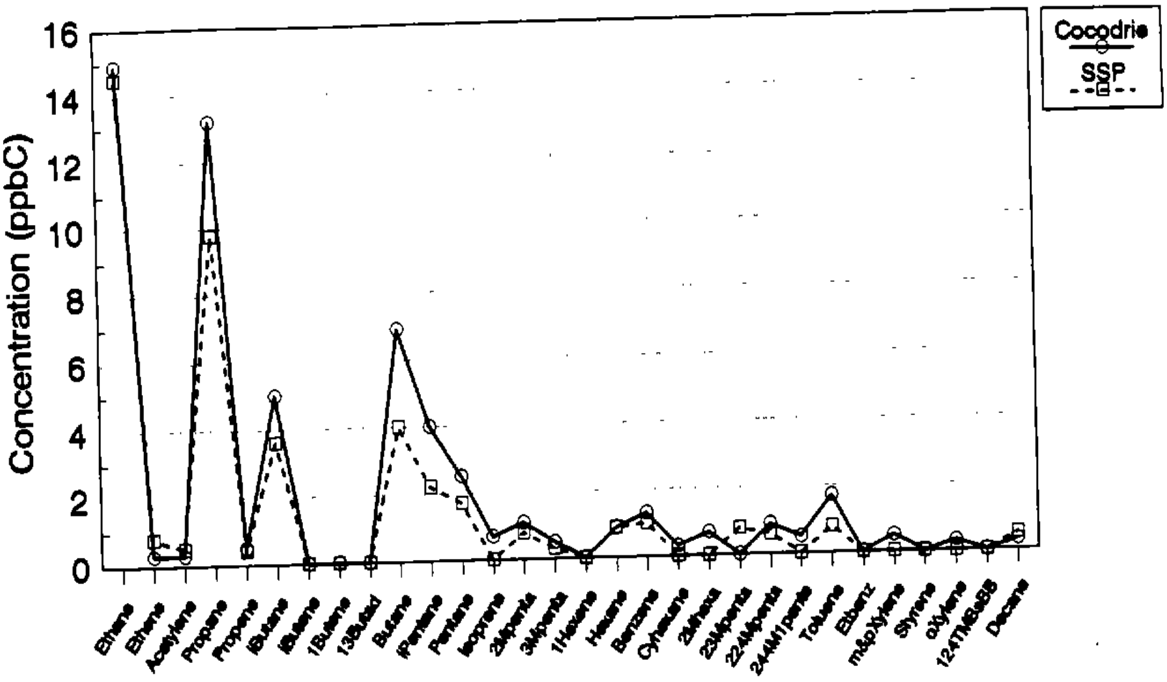
01:30:00 PM

onshore

cocssp11.drw

1-20-95

08-11-93



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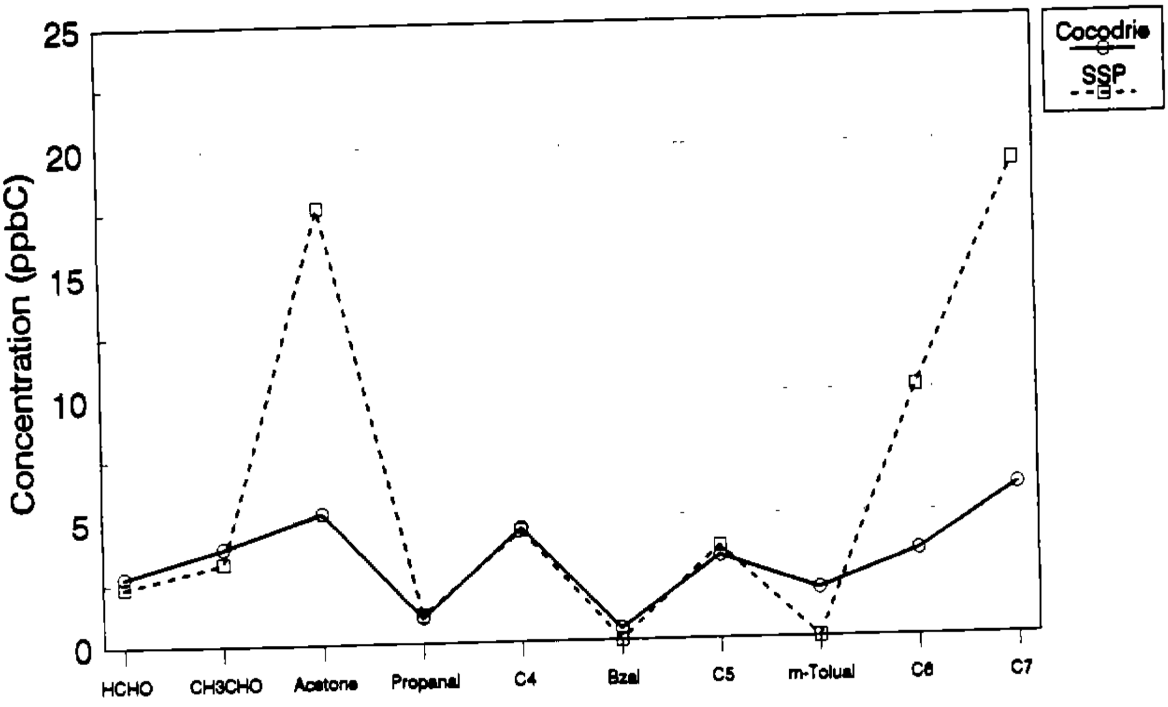

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onshore

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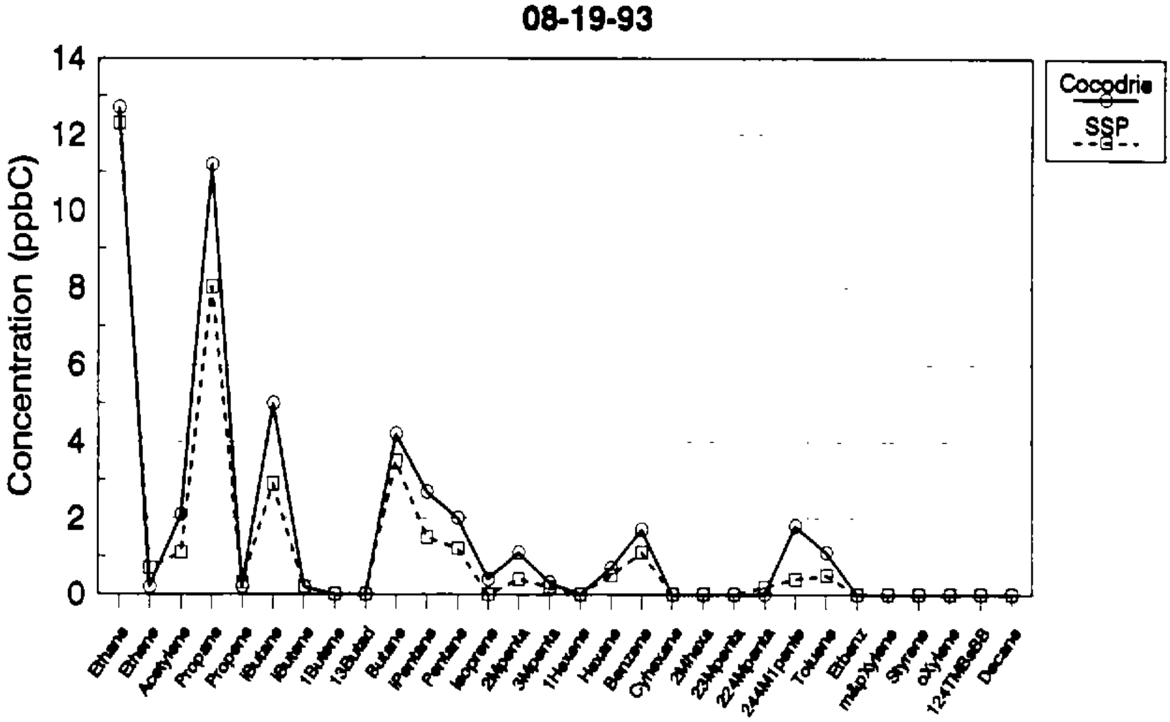

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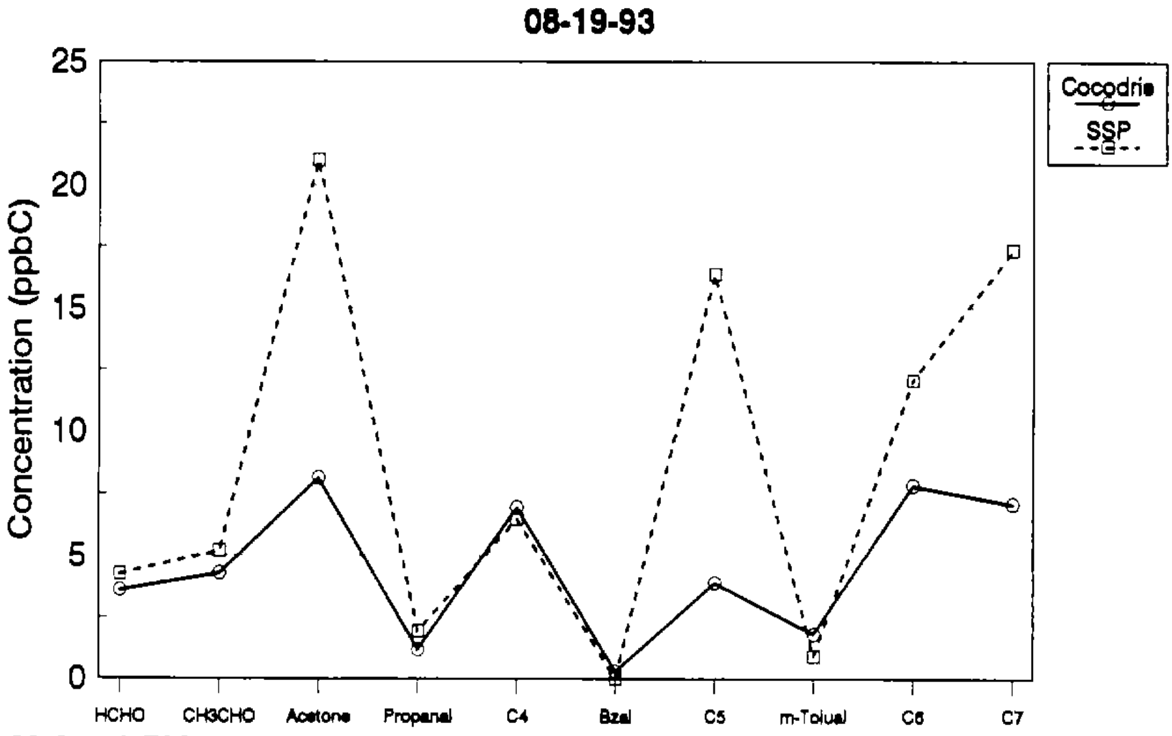


02:34:59 PM

offshore

cocssp13.drw

1-20-95

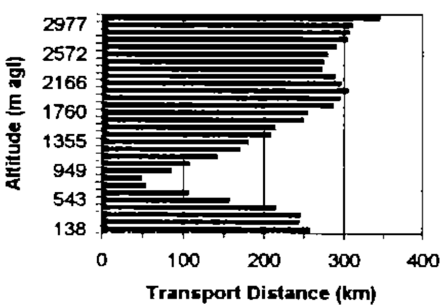
APPENDIX J

ANALYSES OF INTEGRAL TRANSPORT QUANTITIES FOR THE RADAR PROFILER STATIONS IN SOUTHEAST TEXAS AND LOUISIANA

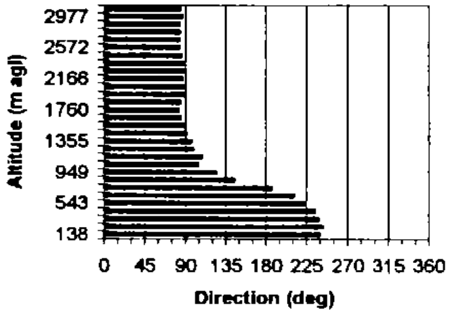
This appendix contains additional results from the analyses of the integral transport quantities discussed in Section 3 of the report. The first figure uses a bar chart format to show the vertical distribution of the integrated wind direction, resultant transport distance (L), and the recirculation factor (R) computed from the hourly-averaged wind data collected at the LSU, Cocodrie, and Ship Shoal Platform radar profiler sites. These results were computed for an 18-hour period beginning August 8, 1993 at 1200 CDT and continuing through 0500 CDT August 19. The remaining figures show the results of the ventilation analysis in a time-height cross-section format for all the upper-air data collected at the profiler sites for the period July 18-September 15, 1993. The three panels show contours of the recirculation factor, resultant (vector) transport distance, and the mean wind direction, respectively. The 12-hour integration periods used for the analyses were the same as those described in the report, i.e., 0600-1700 CDT and 1800-0500 CDT each day. Time is plotted along the horizontal axis in Julian day format.

Ventilation Analysis
8/18/93 1200 CDT through 8/19/93 0500 CDT

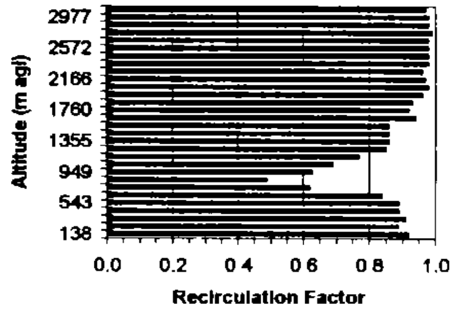
LSU



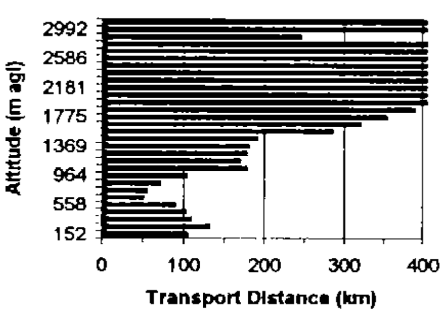
LSU



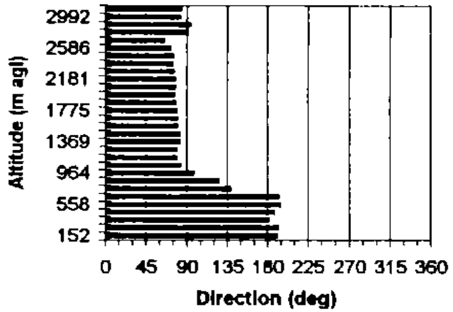
LSU



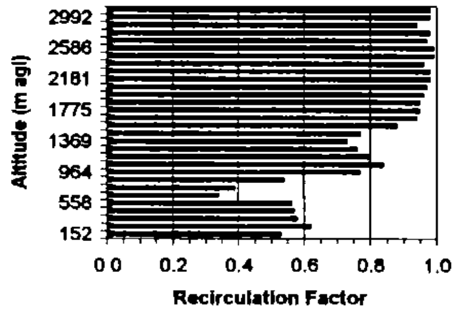
Cocodrie



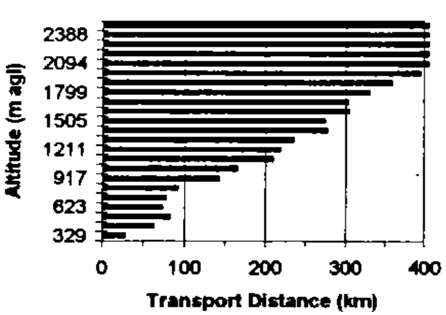
Cocodrie



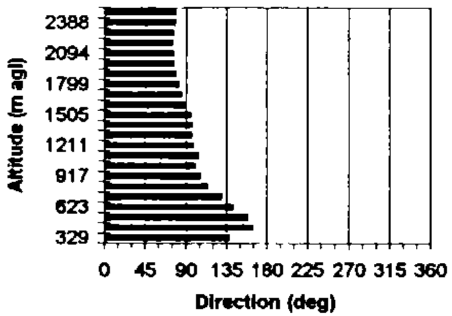
Cocodrie



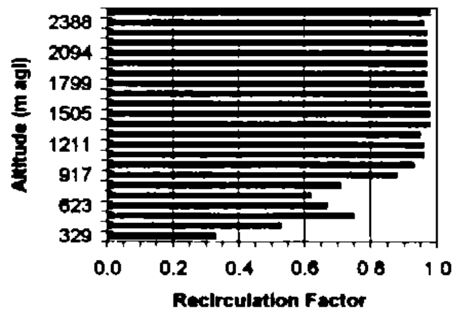
Ship Shoal

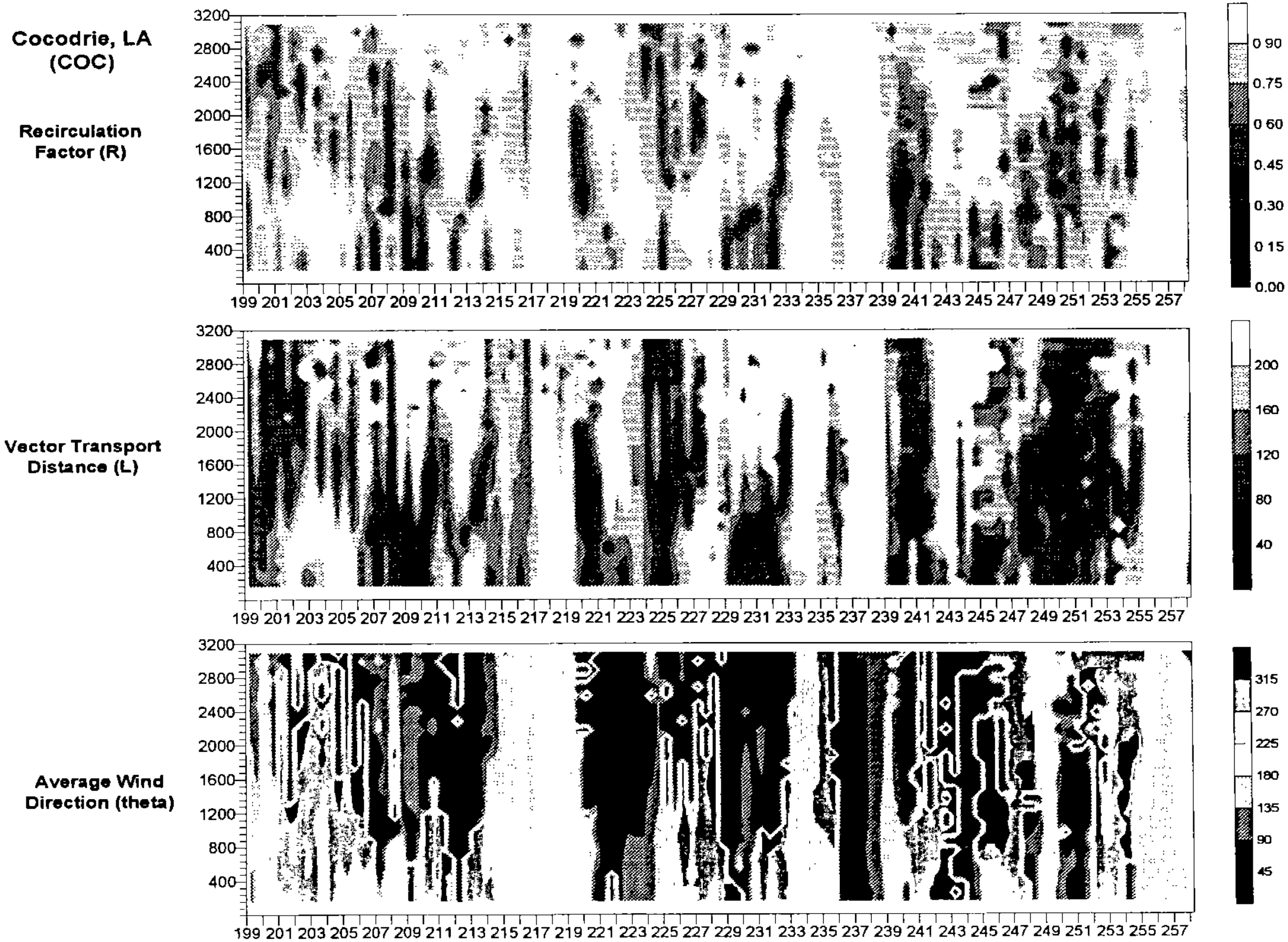


Ship Shoal



Ship Shoal



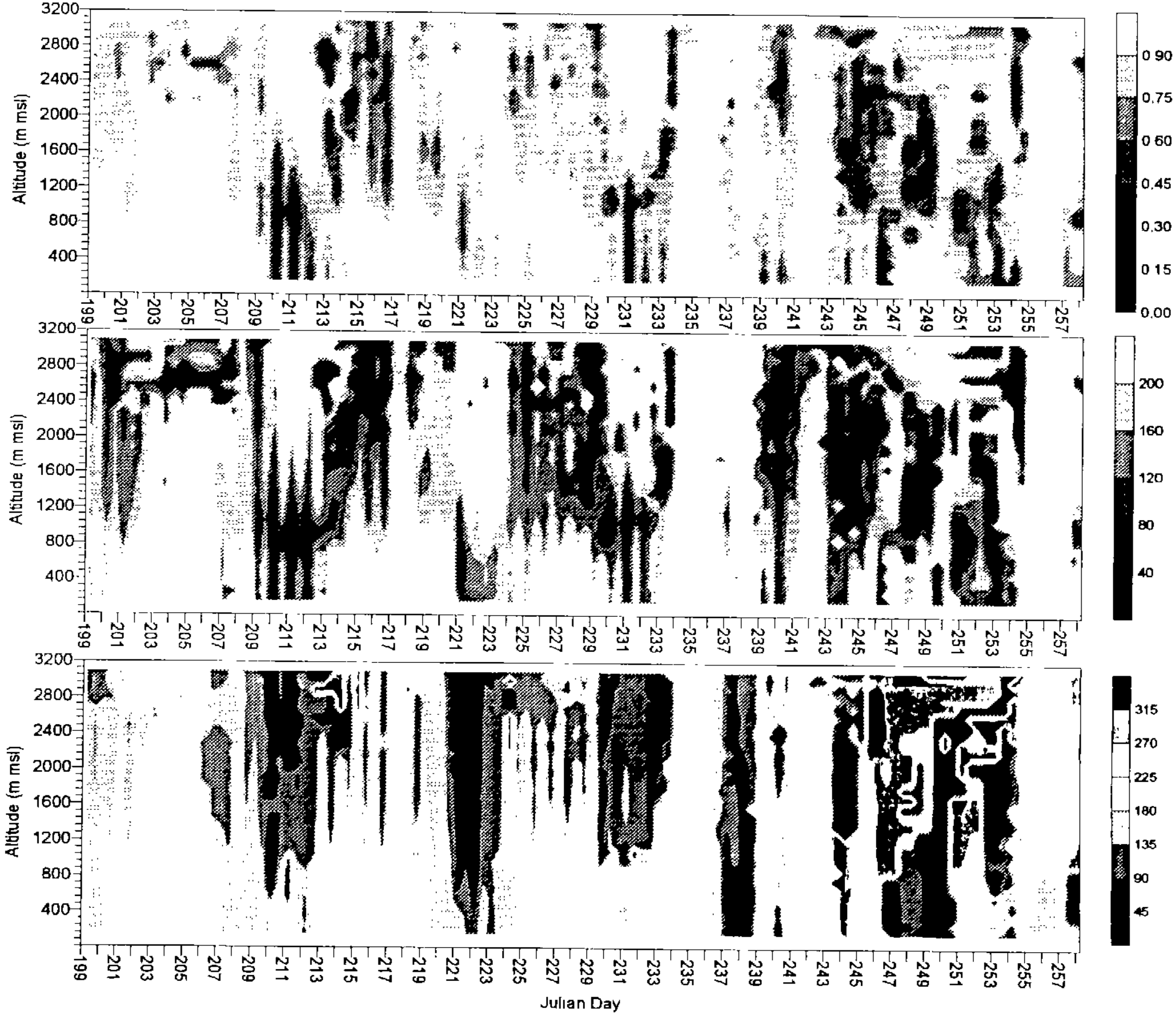

Cocodrie, LA
(COC)
Recirculation
Factor (R)
0.90
0.75
0.60
0.45
0.30
0.15
0.00
Vector Transport
Distance (L)
200
160
120
80
40
Average Wind
Direction (theta)
315
270
225
180
135
90
45
3200
2800
2400
2000
1600
1200
800
400
199 201 203 205 207 209 211 213 215 217 219 221 223 225 227 229 231 233 235 237 239 241 243 245 247 249 251 253 255 257

Galveston, TX (GAL)

Recirculation Factor (R)

Vector Transport Distance (L)

Average Wind Direction (theta)

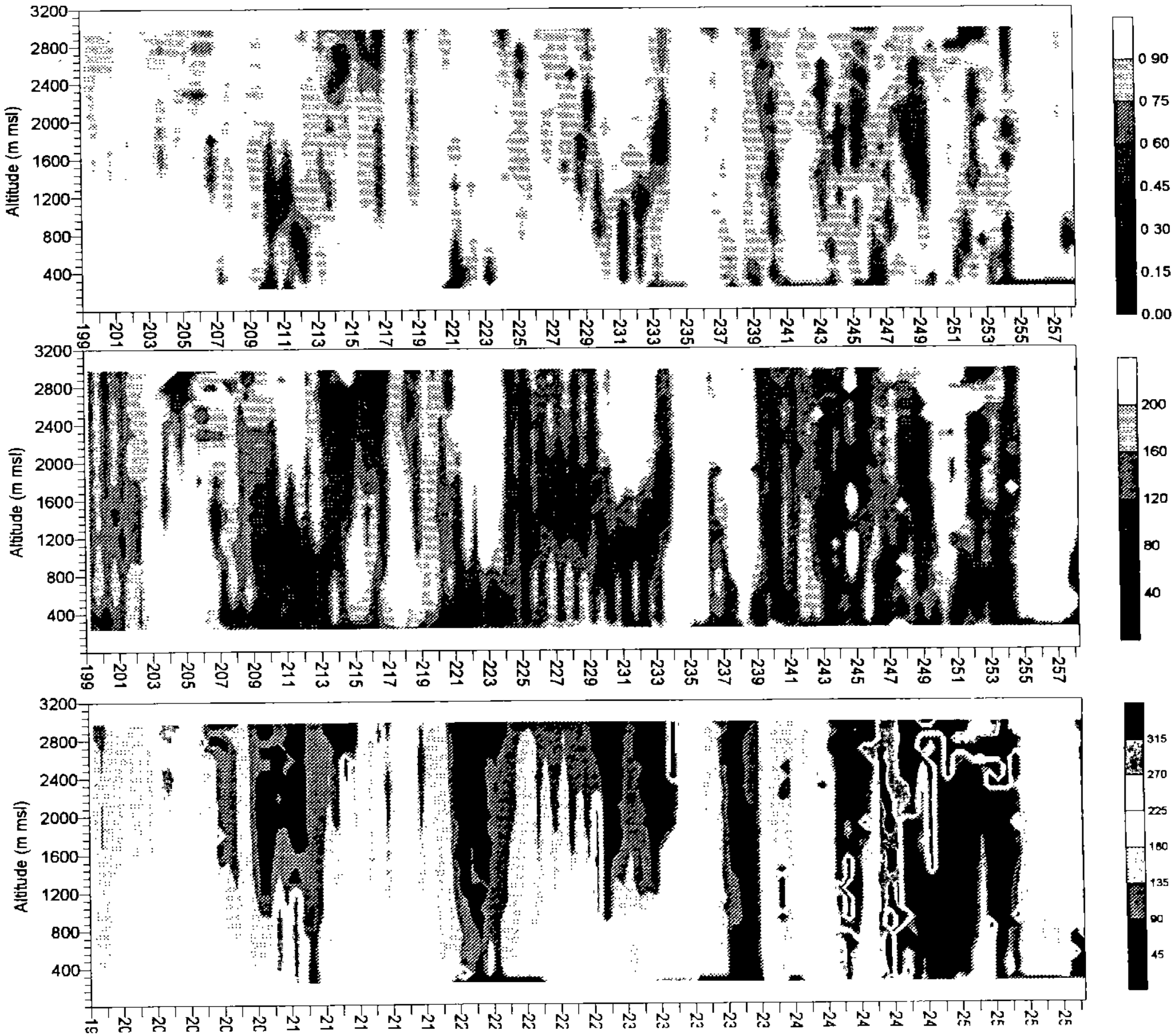


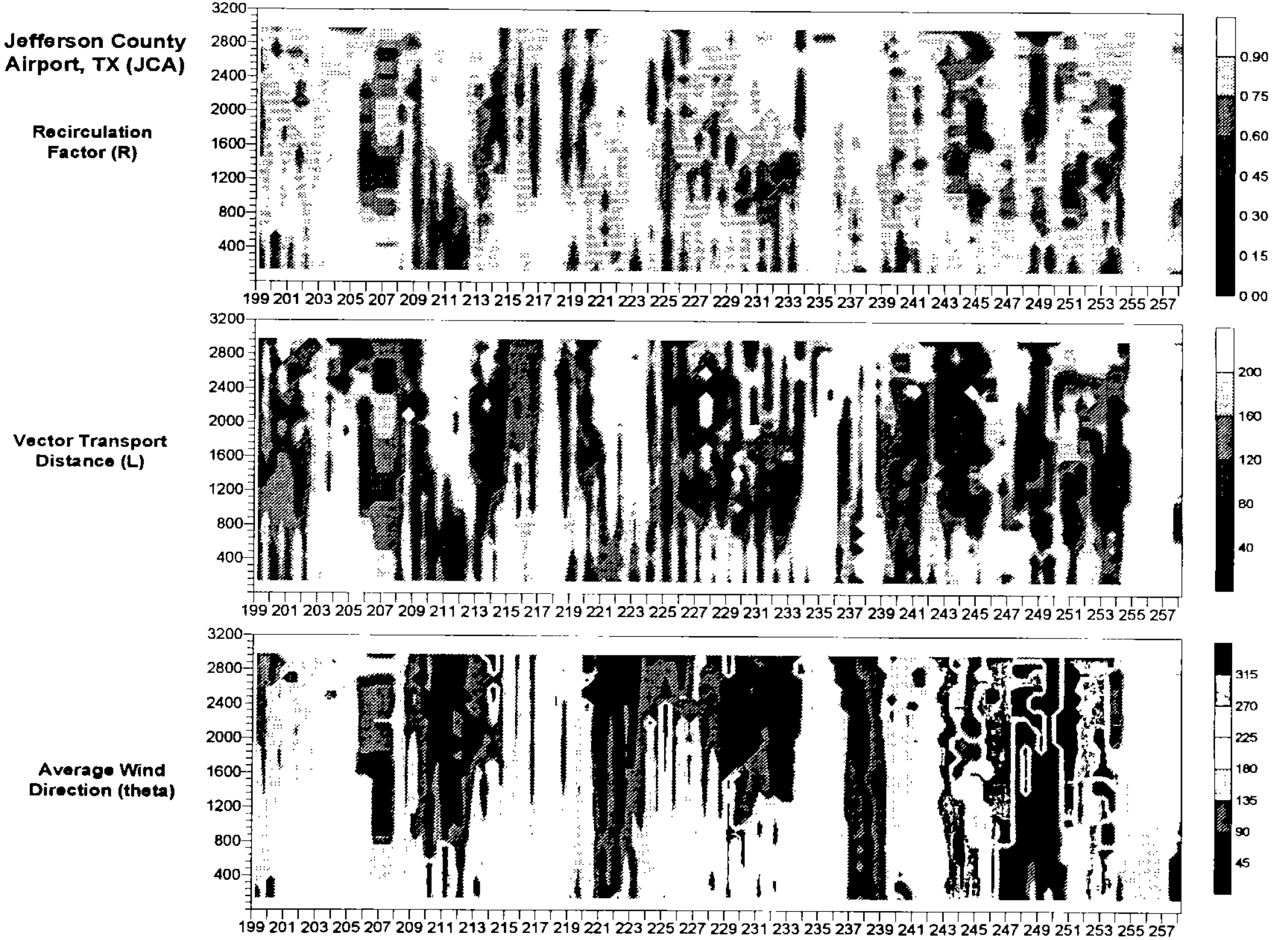
High Island Platform, TX (HIP)

Recirculation Factor (R)

Vector Transport Distance (L)

Average Wind Direction (theta)



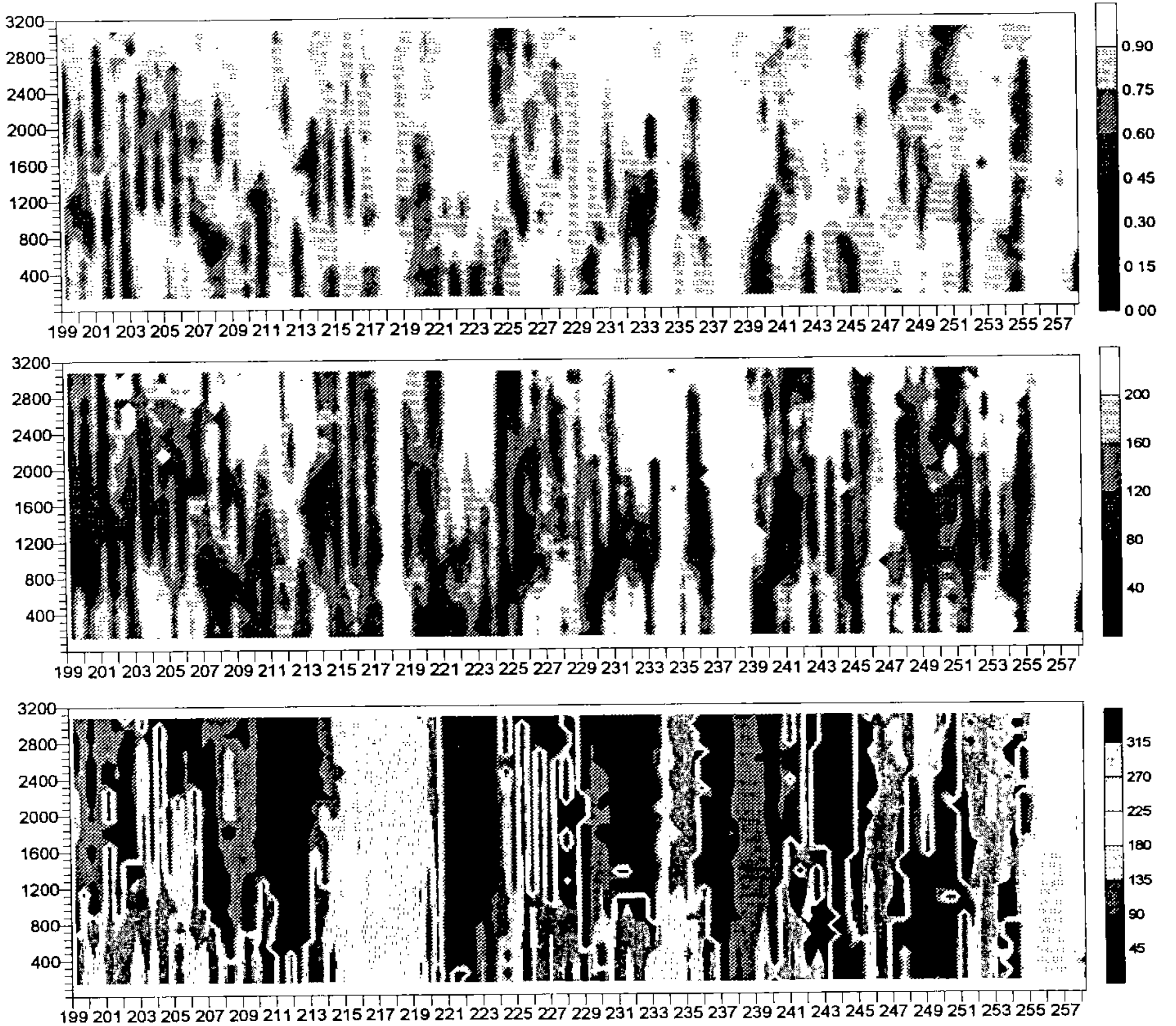

Jefferson County Airport, TX (JCA)
Recirculation Factor (R)
Vector Transport Distance (L)
Average Wind Direction (theta)
0.90
0.75
0.60
0.45
0.30
0.15
0.00
200
160
120
80
40
315
270
225
180
135
90
45
3200
2800
2400
2000
1600
1200
800
400
199 201 203 205 207 209 211 213 215 217 219 221 223 225 227 229 231 233 235 237 239 241 243 245 247 249 251 253 255 257

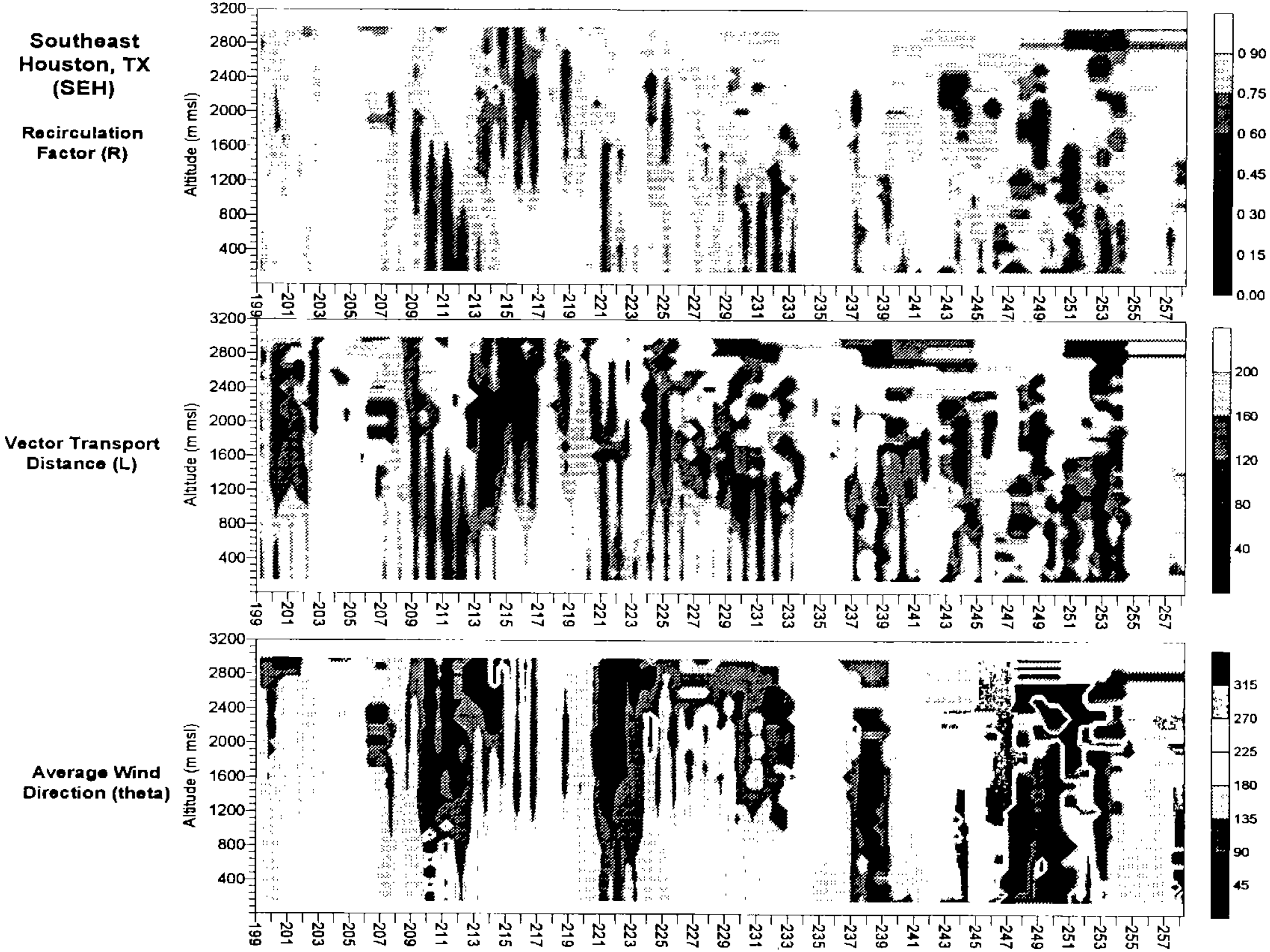
Louisiana State Univ. (LSU)

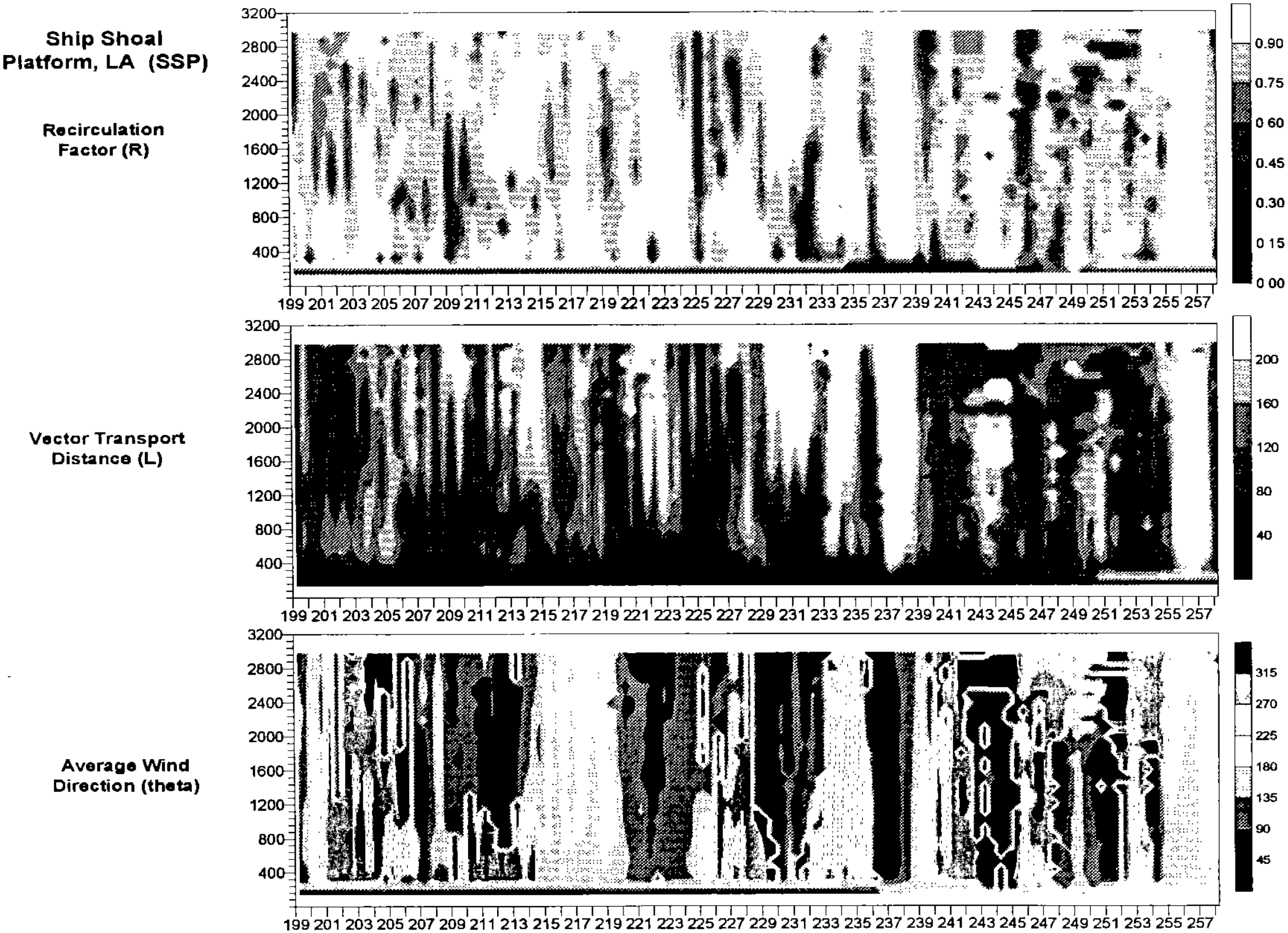
Recirculation Factor (R)

Vector Transport Distance (L)

Average Wind Direction (theta)




Southeast Houston, TX (SEH)
Recirculation Factor (R)
Vector Transport Distance (L)
Average Wind Direction (theta)
Altitude (m msl)
3200
2800
2400
2000
1600
1200
800
400
199
201
203
205
207
209
211
213
215
217
219
221
223
225
227
229
231
233
235
237
239
241
243
245
247
249
251
253
255
257
0.90
0.75
0.60
0.45
0.30
0.15
0.00
200
160
120
80
40
315
270
225
180
135
90
45


Ship Shoal Platform, LA (SSP)
Recirculation Factor (R)
Vector Transport Distance (L)
Average Wind Direction (theta)
3200
2800
2400
2000
1600
1200
800
400
199 201 203 205 207 209 211 213 215 217 219 221 223 225 227 229 231 233 235 237 239 241 243 245 247 249 251 253 255 257
0.90
0.75
0.60
0.45
0.30
0.15
0.00
200
160
120
80
40
315
270
225
180
135
90
45

APPENDIX K

TRAJECTORY ANALYSES

Many plots and tables were prepared for the trajectory analyses which were not included in the main report. This appendix contains figures and tables concerning the following:

- Table of the 48 surface sites and the 13 upper-air sites from which hourly averaged data were used by the 2D and 3D wind field models.
- 300 m msl forward trajectories starting from Cocodrie, Louisiana, for every hour of August 18 and 19, 1993.
- 300 m msl forward trajectories starting from the radar profiler site on Ship Shoal Platform, for every hour of August 18 and 19, 1993.

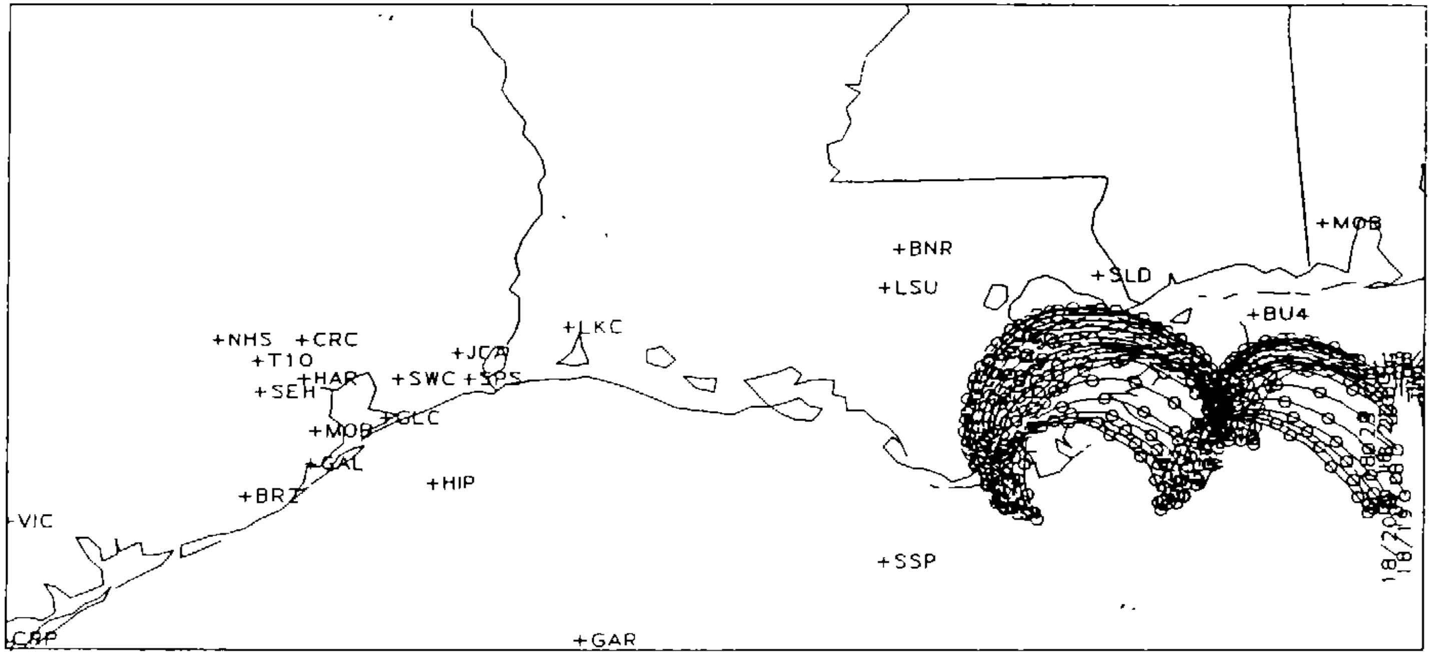
Surface Sites used by 2D Wind Model

Site ID	Latitude	Longitude	Site Name	State
BUO4	30.09	88.77	Buoy 42007	
COC	29.25	90.65	Cocodrie	LA
CRSC	29.95	95.07	Crosby aq/met	TX
GAL	29.23	94.93	Galveston	TX
GALC	29.26	94.86	Galveston as site	TX
GILC	29.52	94.46	Gilchrist	TX
GLRC	29.72	95.46	Galleria CGC site	TX
HIP	29.15	94.20	High island 199 platform	
HM01	29.71	95.26	HRM site 001	TX
HM03	29.77	95.18	HRM site 003	TX
HM04	29.85	95.12	HRM site 004	TX
HM07	29.77	95.02	HRM site 007	TX
HM08	29.65	95.06	HRM site 008	TX
HM10	29.88	94.92	HRM site 010	TX
HM11	29.77	94.91	HRM site 011	TX
HTCC	29.76	95.36	Texas Commerce Tower	TX
LSU	30.36	91.18	Louisiana State University	LA
ME5T	29.38	94.91	Met 5	TX
MOBT	29.39	94.89	Mobile	TX
NCD2	28.85	96.92	Victoria	TX
NCD7	30.68	88.25	Mobile	AL
NCD1	30.12	93.22	Lake Charles (NWS)	LA
NCD3	29.98	90.25	New Orleans (NWS)	LA
NCD6	29.97	95.35	Houston (NWS)	TX
NCD8	30.53	91.13	Baton Rouge (NWS)	LA
S40S	29.72	93.89	Sabine Pass (setrpc site 40)	TX
S42S	30.18	93.87	Orange Co. (setrpc site 42)	TX
S43S	29.94	94.00	Beaumont (setrpc site 43)	TX
SBRC	29.57	95.02	Seabrook C20	TX
SEH	29.65	95.30	Southeast Houston	TX
SPTC	29.53	94.76	Smith Point aq/met	TX
SRST	29.67	94.05	Sabine	TX
SSP	28.60	91.21	Ship Shoal 178a Platform	
STWC	29.79	94.41	Stowell (Winnie) aq/met	TX
SWLT	29.39	94.89	Seawall	TX
TN10	29.86	95.32	Aldine C08	TX
TN11	30.05	93.75	West Orange C09	TX
TN12	29.38	94.93	Texas City C10	TX
TN13	29.00	95.38	Clute C11	TX
TN16	29.76	95.00	Baytown C24	TX
TN17	30.03	95.66	NW Harris C26	TX
TN18	30.36	94.30	Kountze C85	TX
TN19	28.83	97.00	Victoria	TX
TN2	29.75	95.35	Crawford	TX
TN3	29.81	95.28	N wayside	TX
TN4	29.83	95.48	Lang	TX
TN5	29.61	95.46	Croquet	TX
TN6	29.62	95.26	Swiss&monroe	TX

Upper Air Sites used by the 3D Wind Model

Site ID	Latitude	Longitude	Site Name	State
Radar Profilers				
HIP	29.15	94.20	High Island Platform	
SEH	29.65	95.30	TX Southeast houston	TX
JCA	29.96	94.02	Jefferson County Airport	TX
GAL	29.26	94.86	Galveston	TX
COC	29.25	90.68	Cocodrie	LA
LSU	30.36	91.18	Louisiana State University	LA
SSP	28.57	91.31	Ship Shoal Platform #178A	
Rawinsondes				
LKCH	30.12	93.22	Lake Charles	TX
CORP	27.77	97.50	Corpus Christi	TX
SLID	30.35	89.81	Slidell	TX
GAR	27.79	93.14	Garden Banks	
Sodars				
NHS	29.95	95.54	North West Houston	TX
SPS	29.70	93.94	Sabine Pass	TX

1993 GULF OF MEXICO AIR QUALITY STUDY

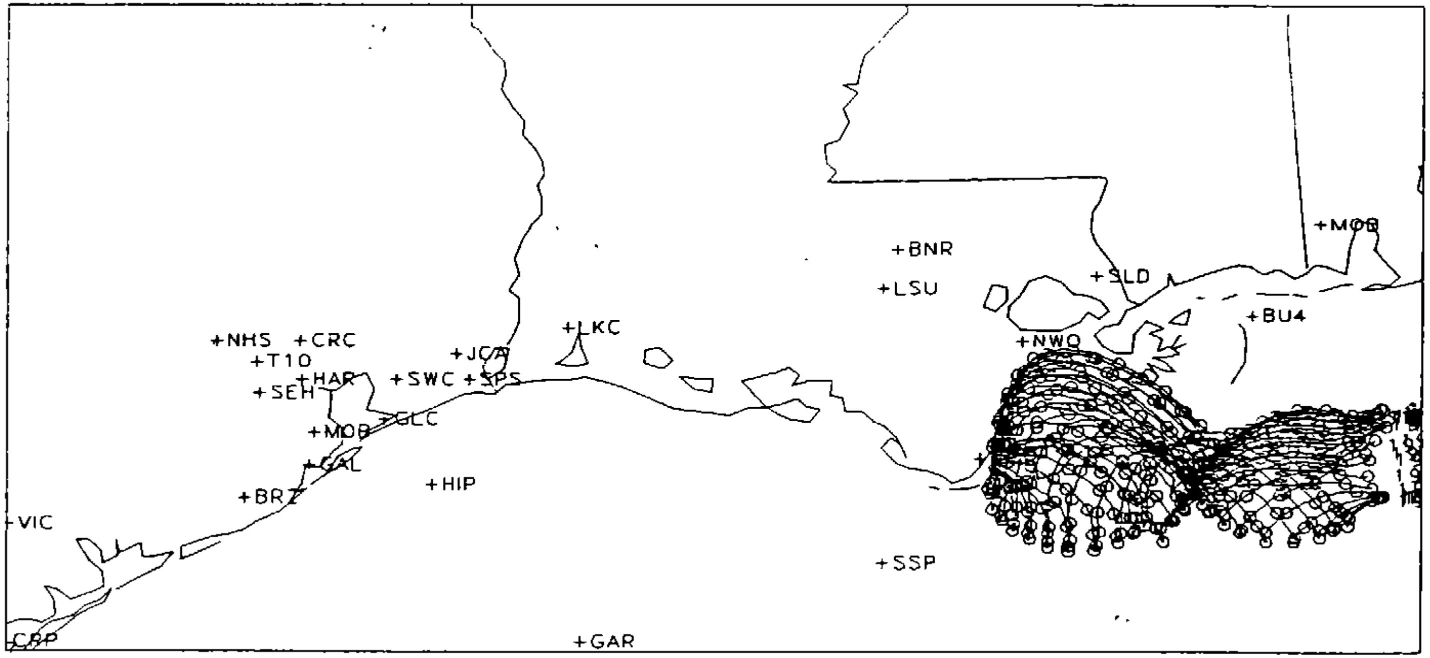


Forward Trajectory From Cocodrie

AUG 18, 1993 (01 CST) – AUG 18, 1993 (23 CST) 300 M AGL

2 HOUR INTERVALS

1993 GULF OF MEXICO AIR QUALITY STUDY

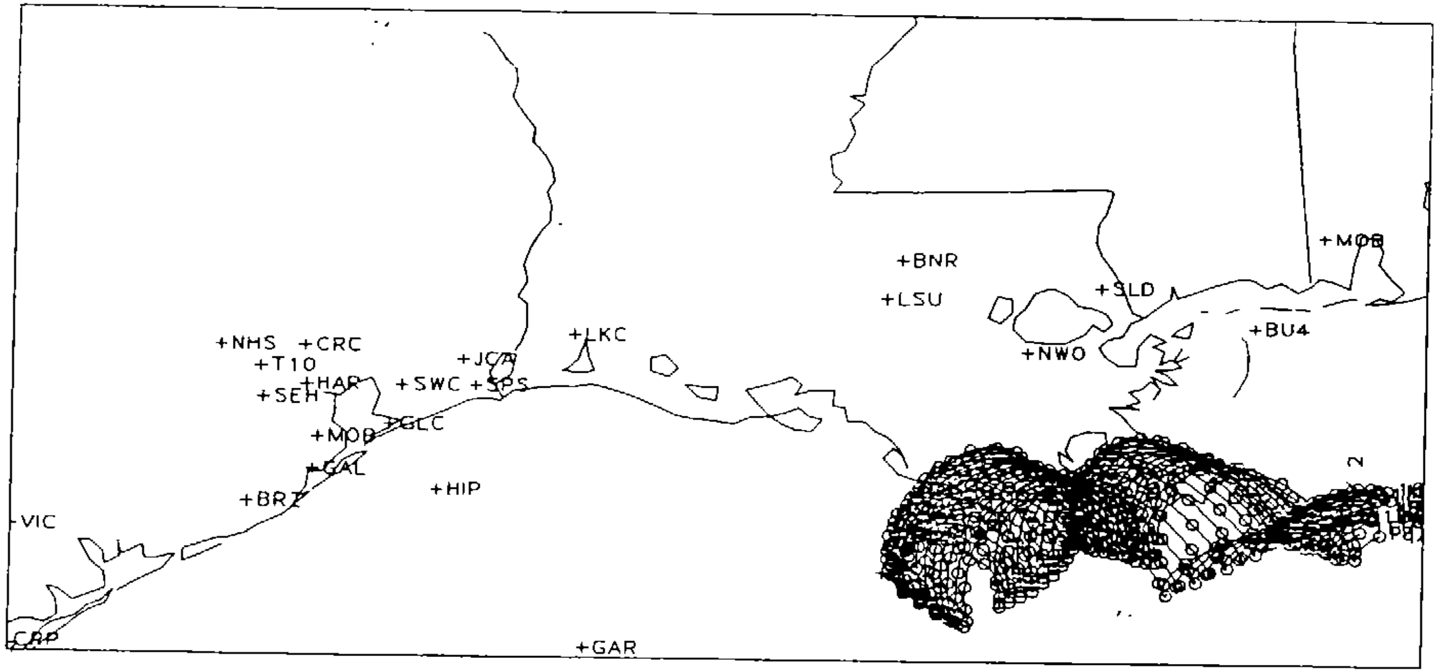


Forward Trajectory From Cocodrie

AUG 19, 1993 (01 CST) - AUG 19, 1993 (23 CST) 300 M AGL

2 HOUR INTERVALS

1993 GULF OF MEXICO AIR QUALITY STUDY

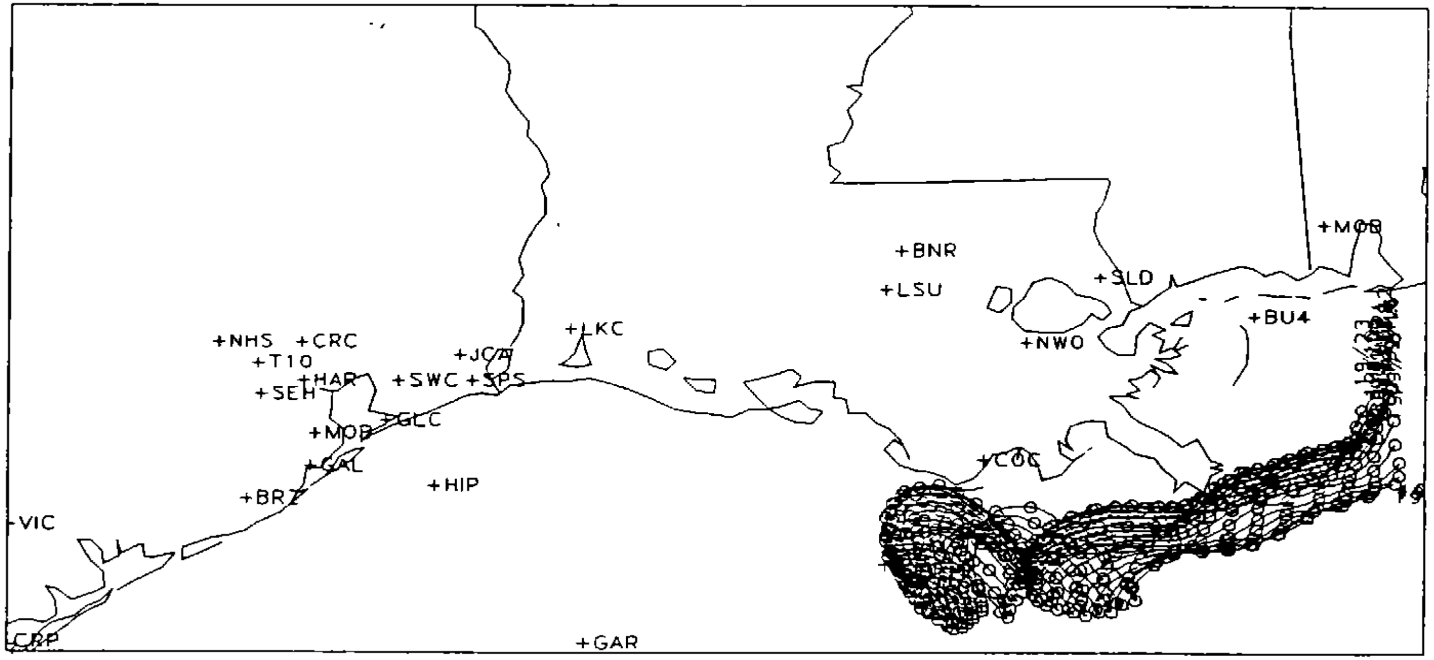


Forward Trajectory From Ship Shoal Platform

AUG 18, 1993 (01 CST) – AUG 18, 1993 (23 CST) 300 M AGL

2 HOUR INTERVALS

1993 GULF OF MEXICO AIR QUALITY STUDY



Forward Trajectory From Ship Shoal Platform

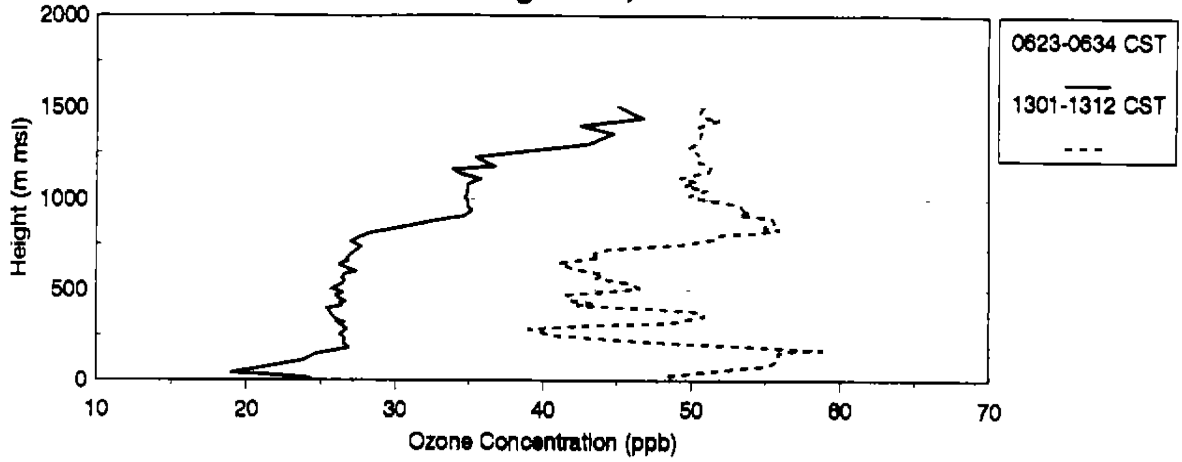
AUG 19, 1993 (01 CST) - AUG 19, 1993 (23 CST) 300 M AGL

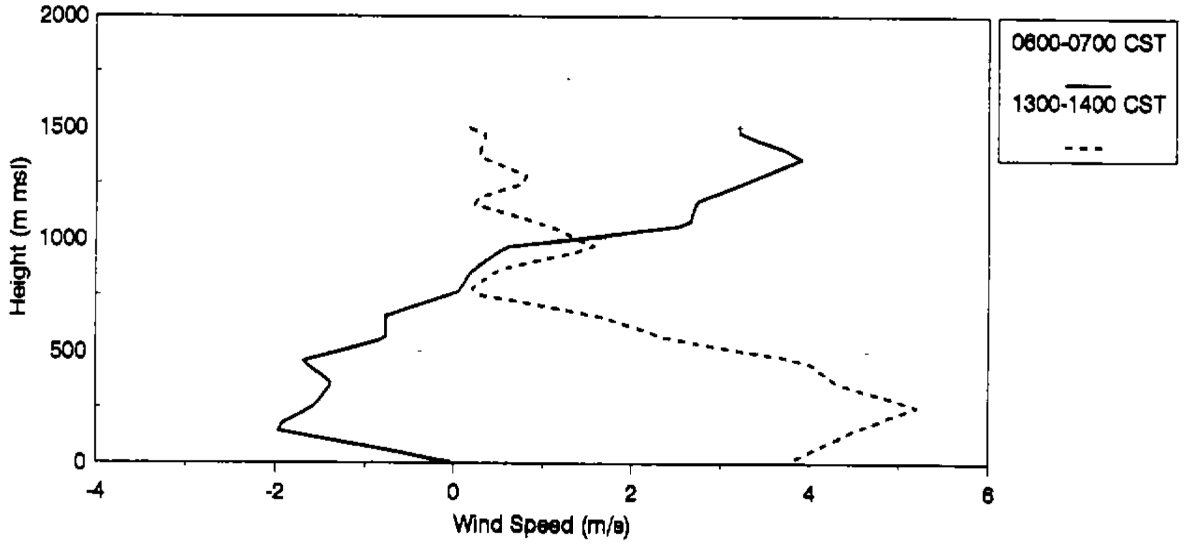
2 HOUR INTERVALS

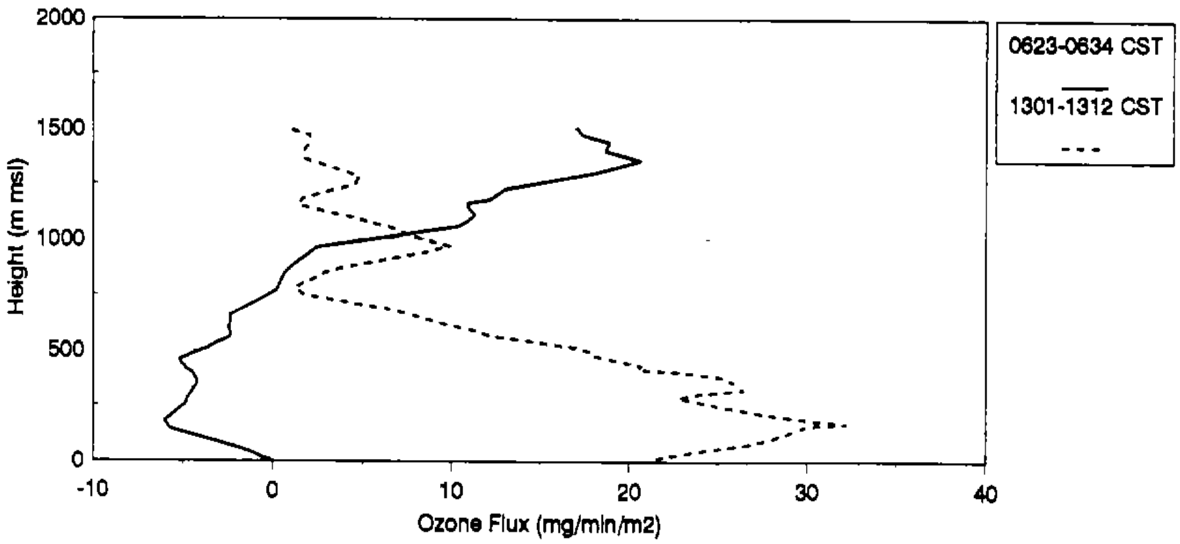
APPENDIX L

PROFILE PLOTS OF OZONE AND NO_x CONCENTRATIONS, SOUTHWESTERLY COMPONENT OF THE WIND SPEED, AND OZONE AND NO_x FLUX AT GALVESTON ON AUGUST 10, 1993

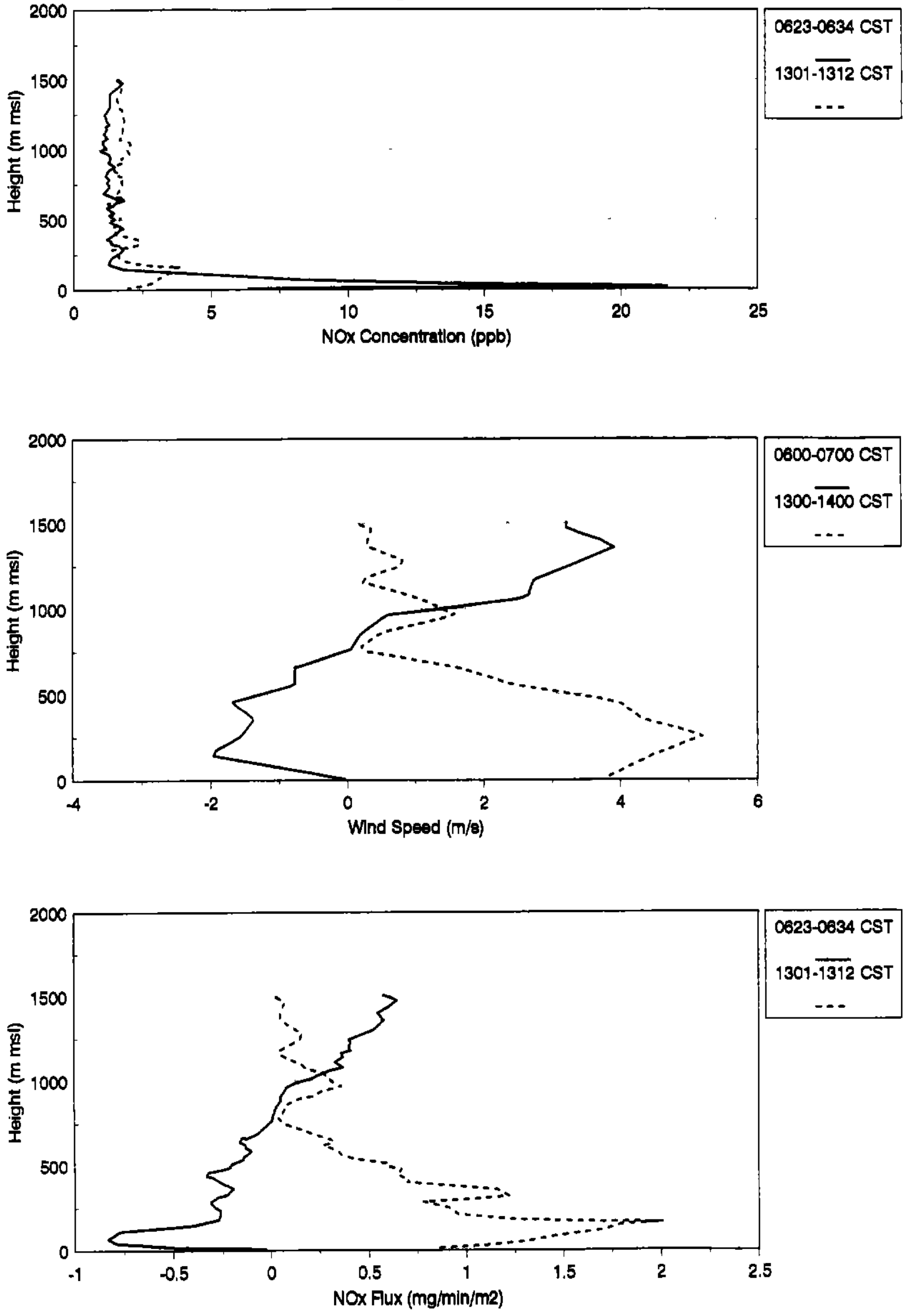
Galveston Airport
August 10, 1993





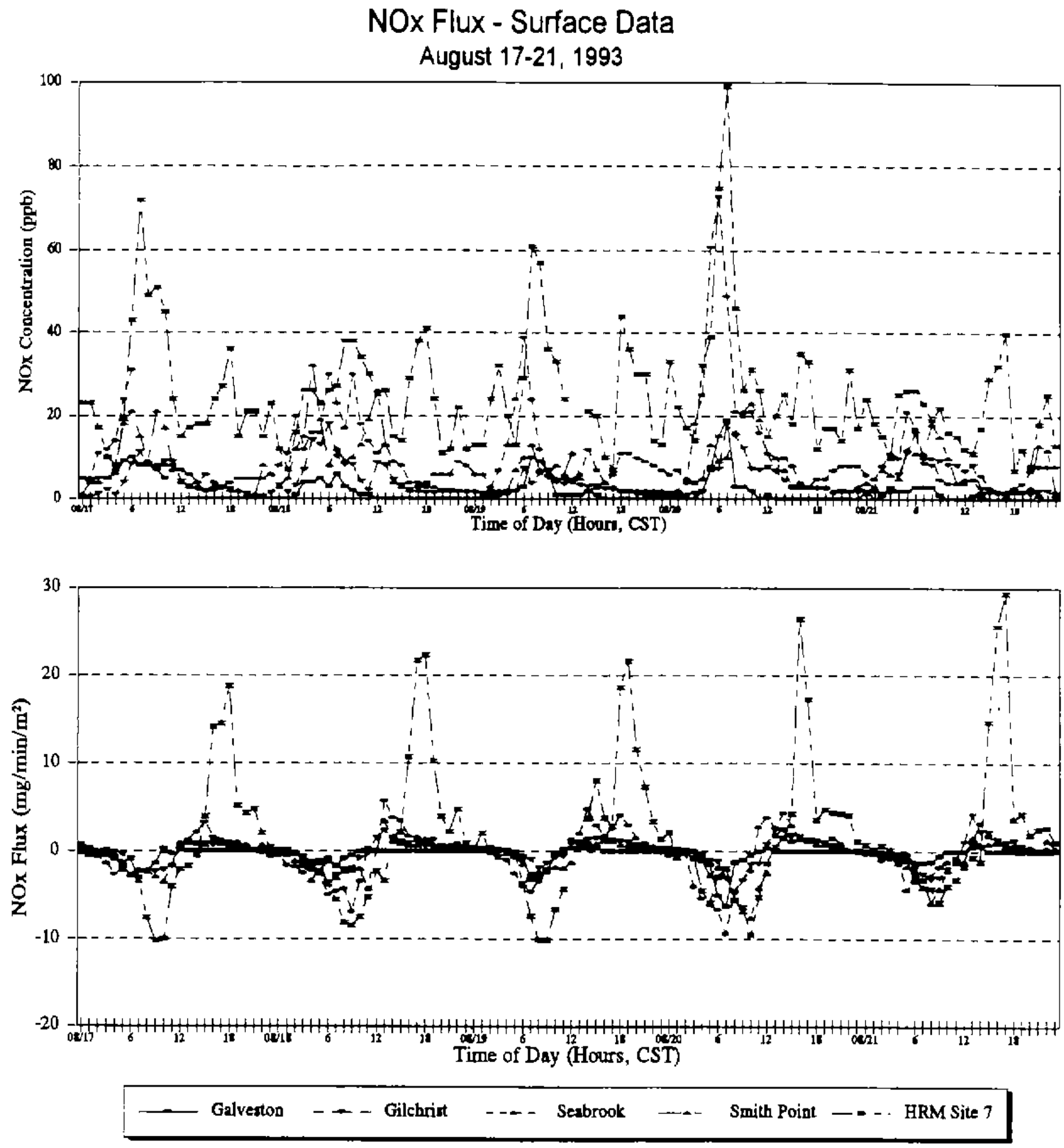


Galveston Airport
August 10, 1993

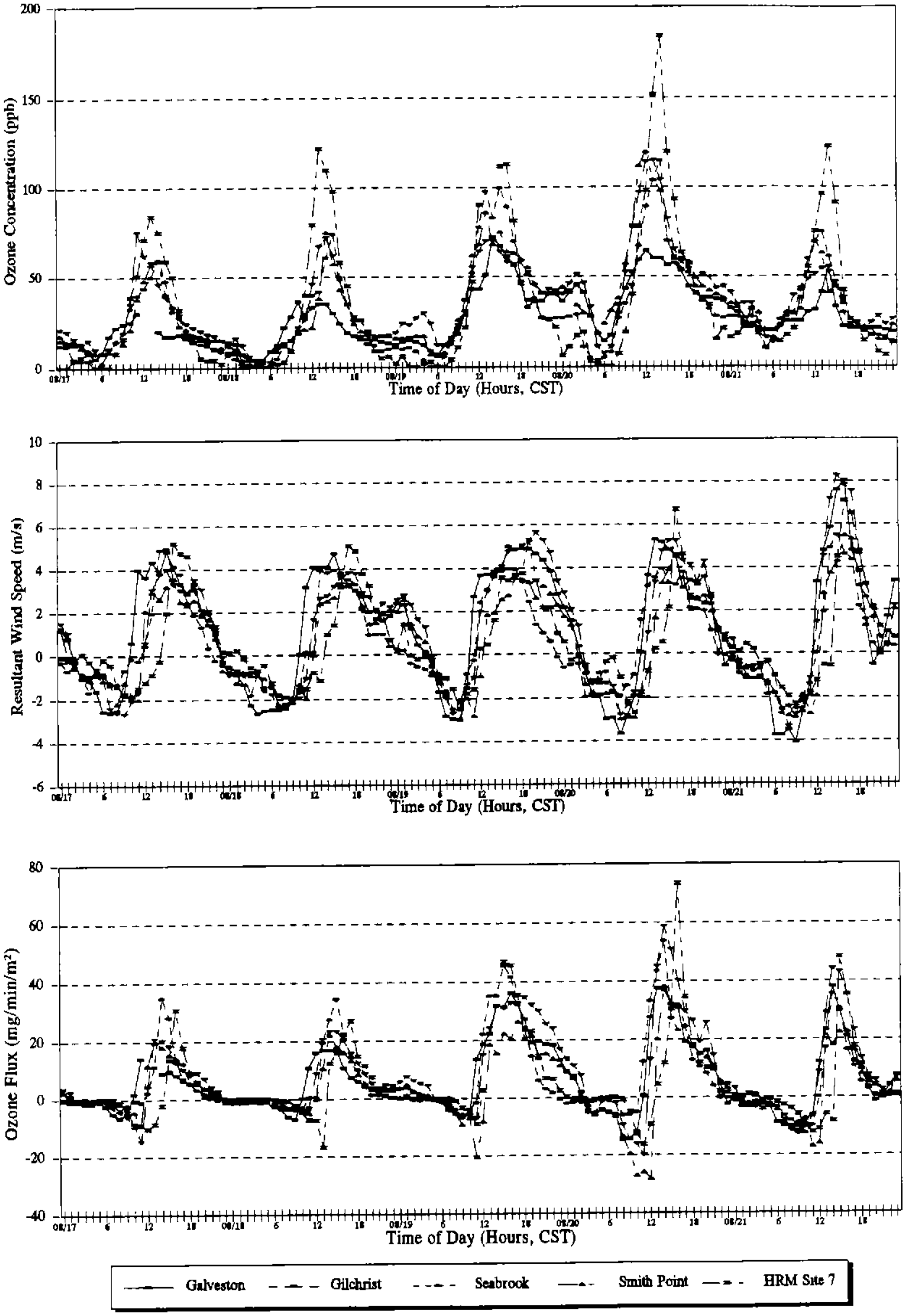


APPENDIX M

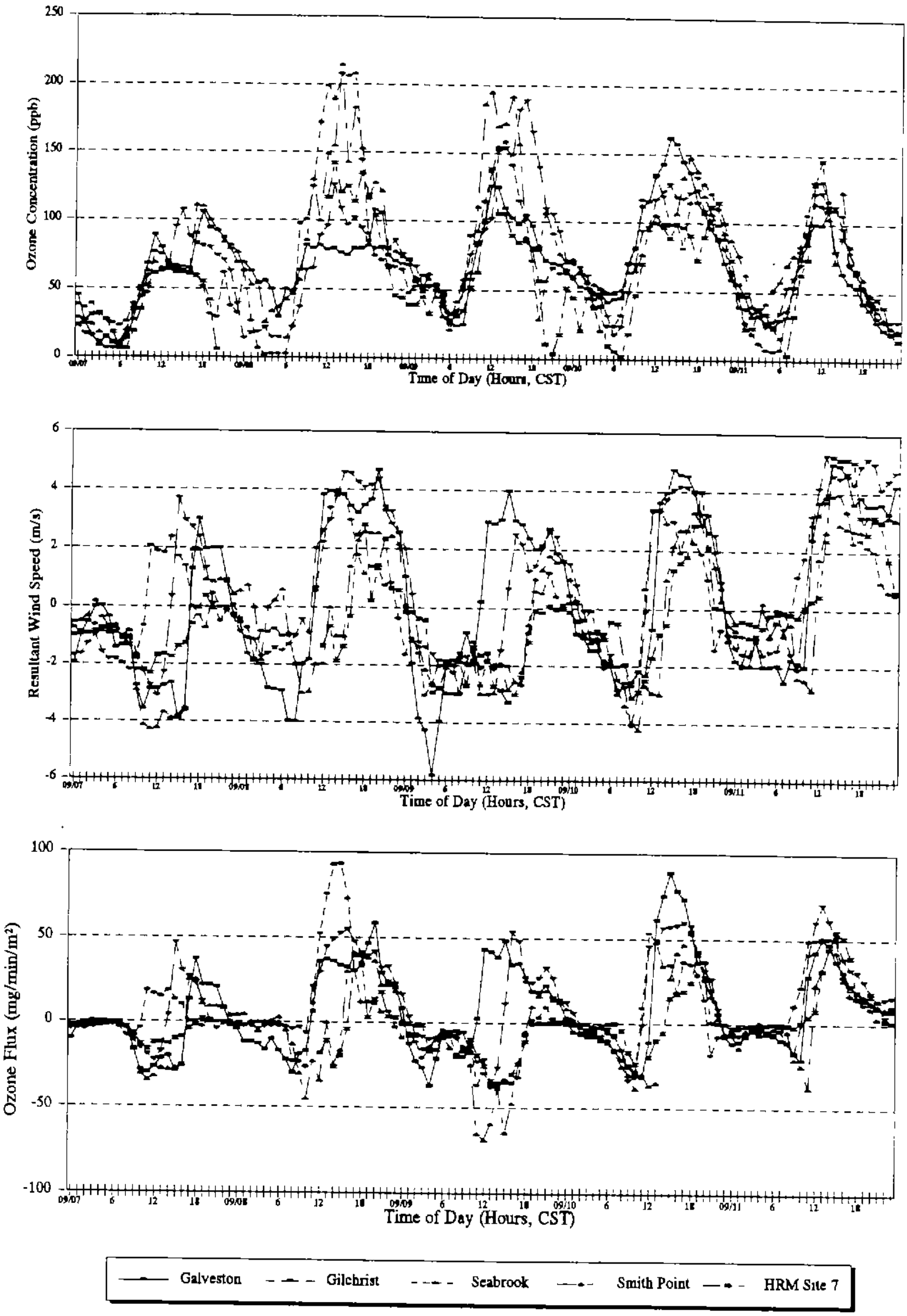
TIME SERIES PLOTS OF SURFACE OZONE AND NO_x CONCENTRATIONS, SURFACE SOUTHWESTERLY COMPONENT OF THE WIND SPEED, AND OZONE AND NO_x FLUXES FOR GALVESTON, GILCHRIST, SEABROOK, SMITH POINT, AND HRM SITE 7 FOR AUGUST 17-21 AND SEPTEMBER 7-11, 1993


NOx Flux - Surface Data
August 17-21, 1993
NOx Concentration (ppb)
Time of Day (Hours, CST)
NOx Flux (mg/min/m²)
Time of Day (Hours, CST)
Galveston
Gilchrist
Seabrook
Smith Point
HRM Site 7

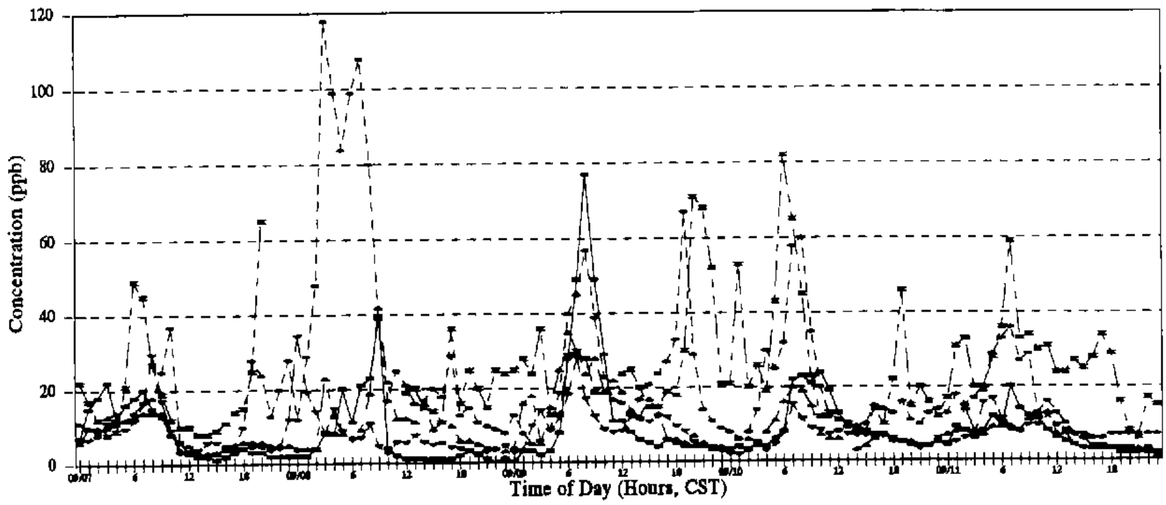
Ozone Flux - Surface Data
August 17-21, 1993

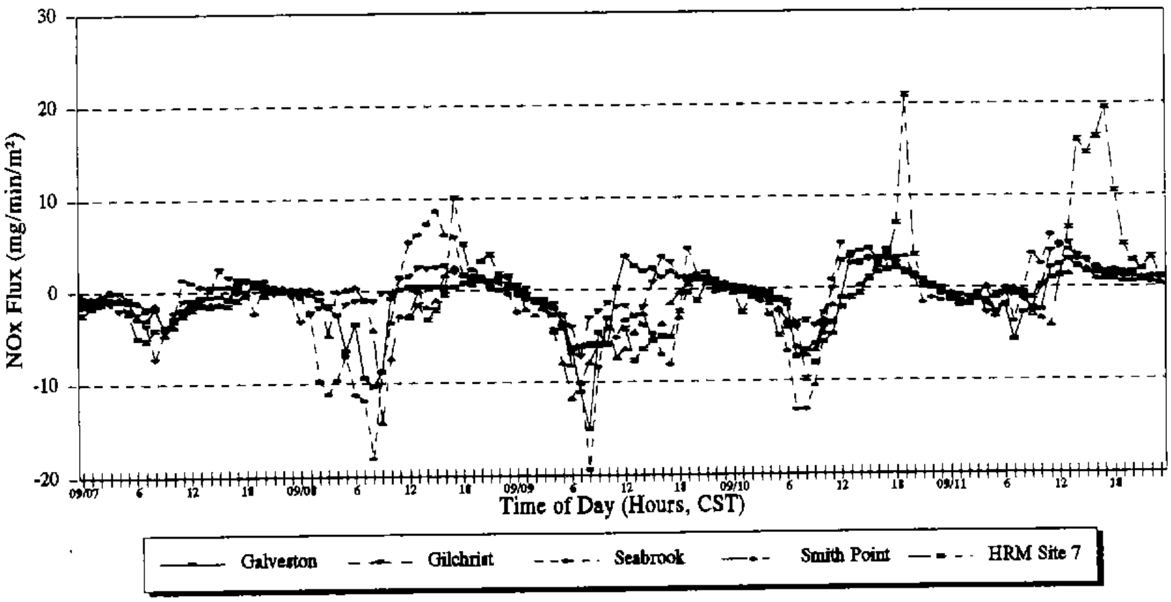


Ozone Flux - Surface Data
September 7 - 11, 1993



NOx Flux - Surface Data
September 7 - 11, 1993





The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.