Figure 1: Surface ozone in the U.K. based on UK network measurements for 6th August

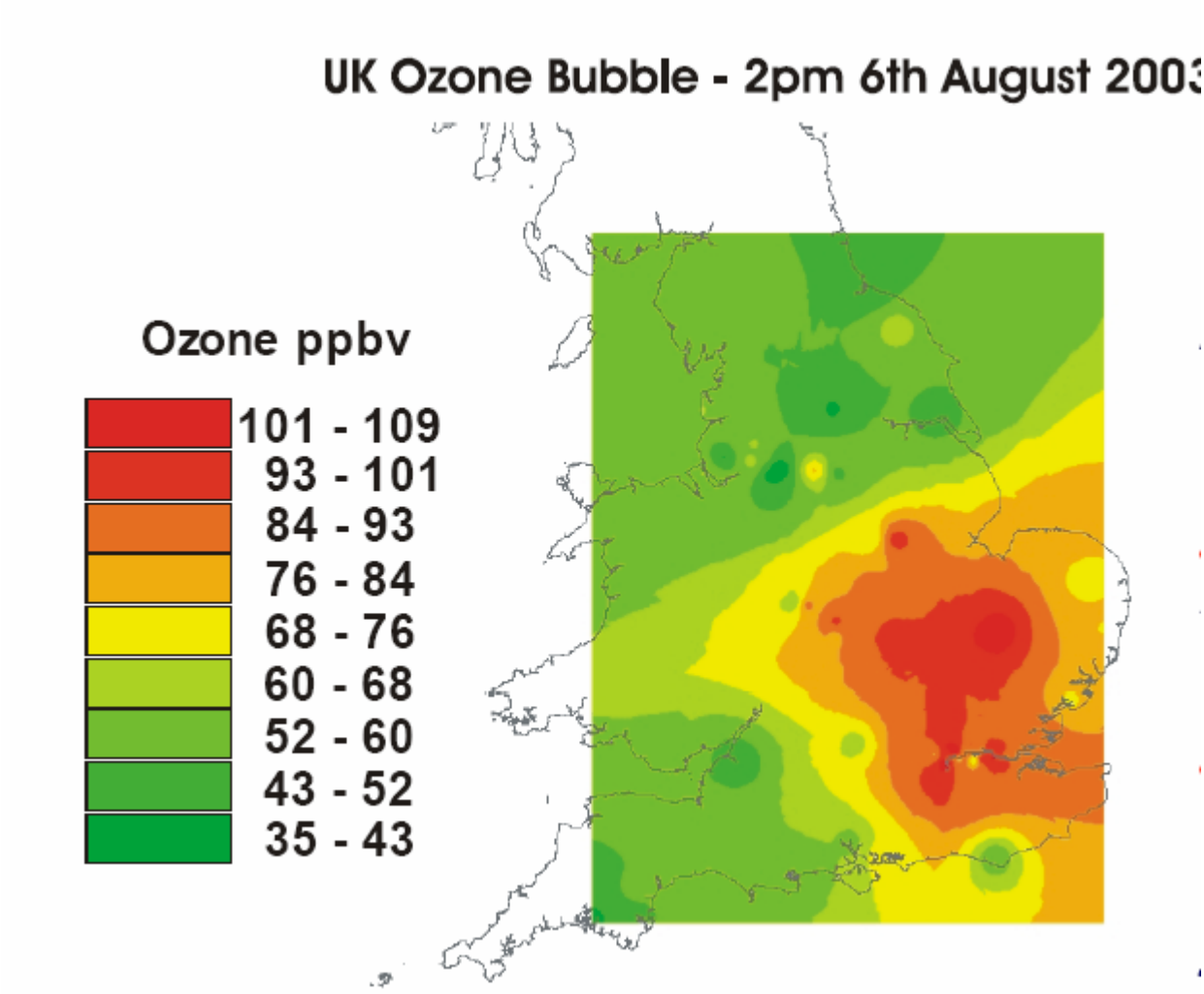


Figure 2: Time series of meteorological and gas phase measurements taken at Writtle during the TORCH campaign.

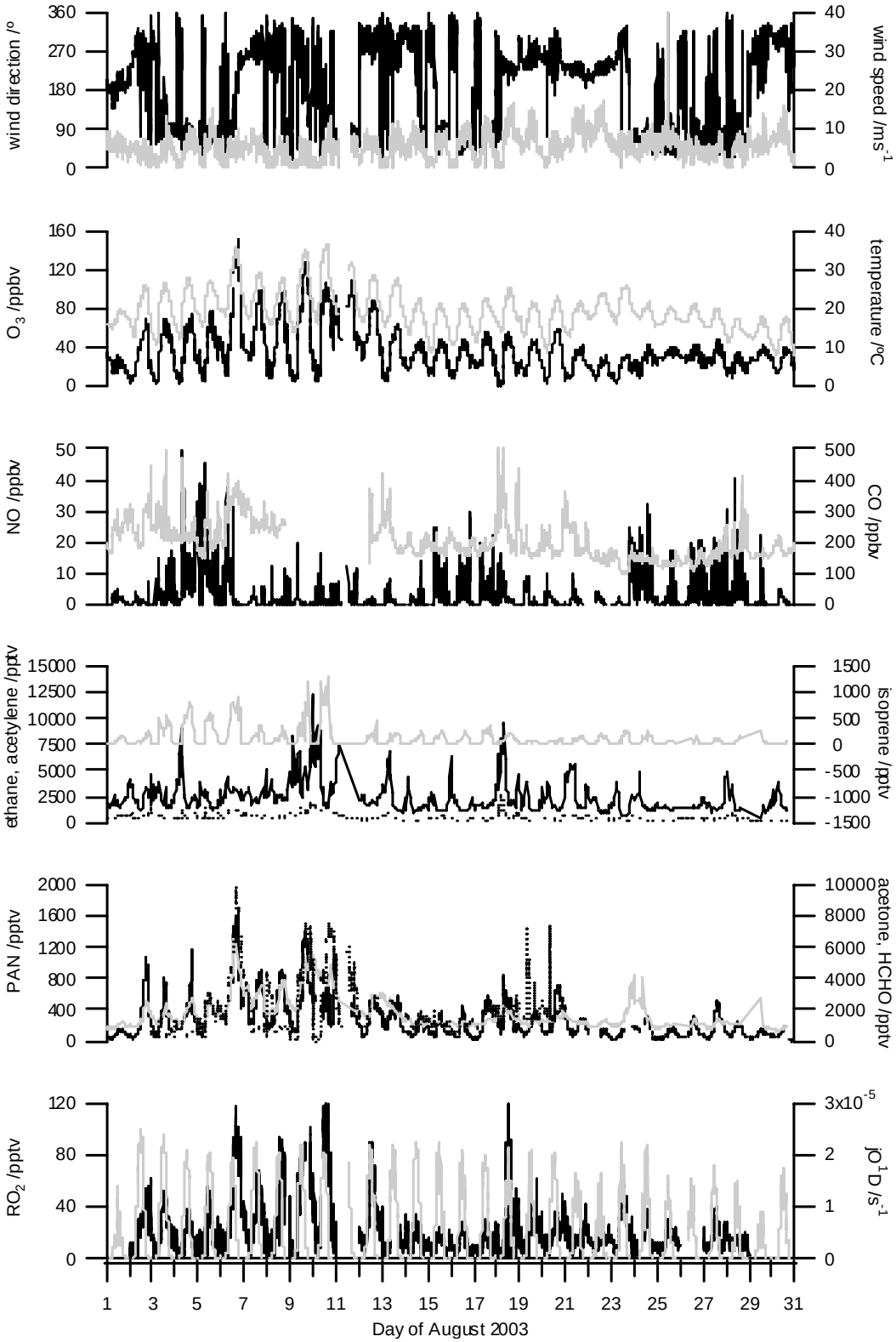


Figure 3: Average diurnal profiles of selected species during the heatwave period (6th – 10th August - dashed lines) and for the rest of the field campaign (solid lines). Data are average into hourly time periods.

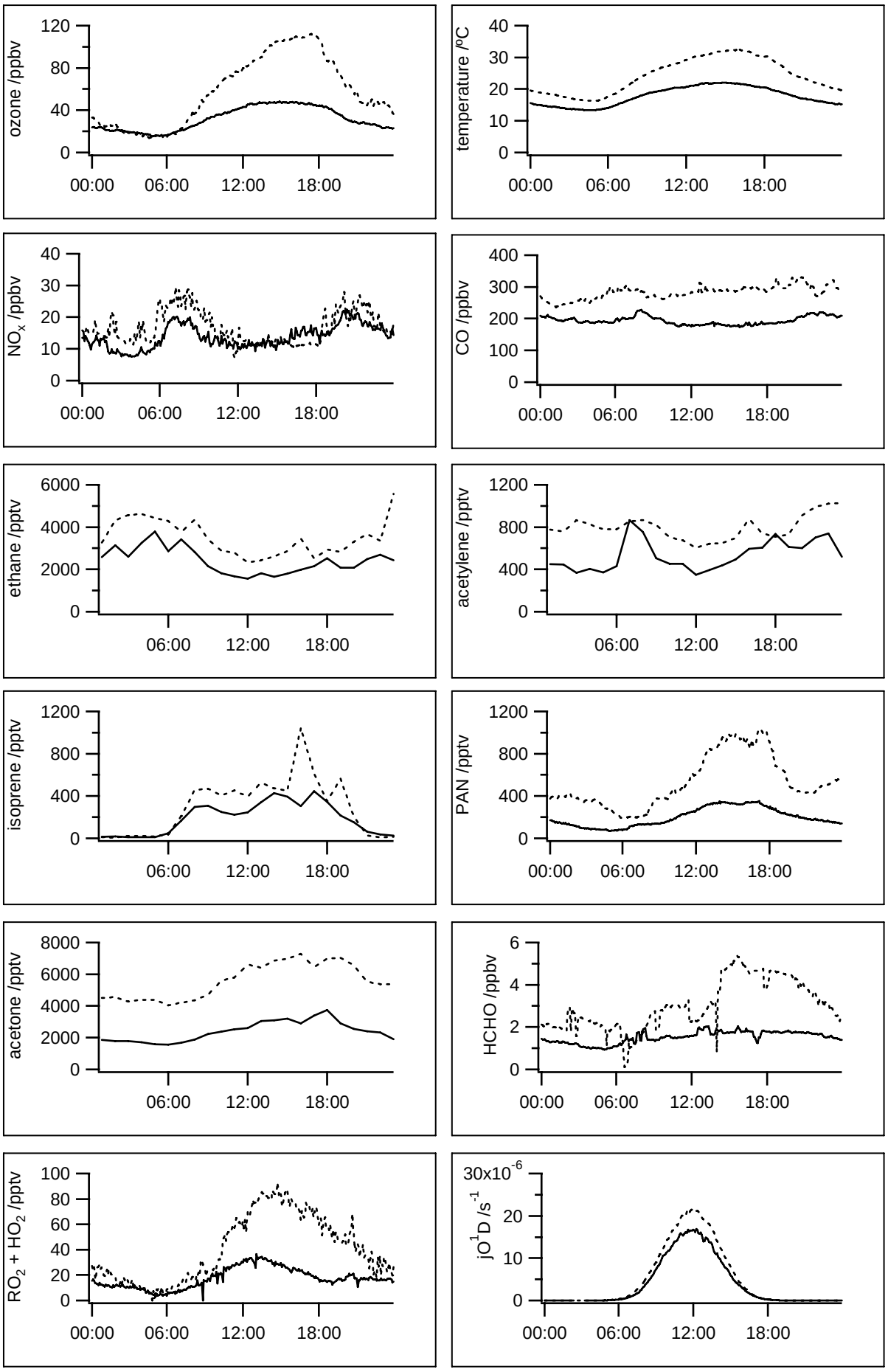


Figure 4: Ratios of benzene / toluene and benzene / 1,3,5 tmb for the TORCh campaign. Data used were taken with the GCxGC instrument.

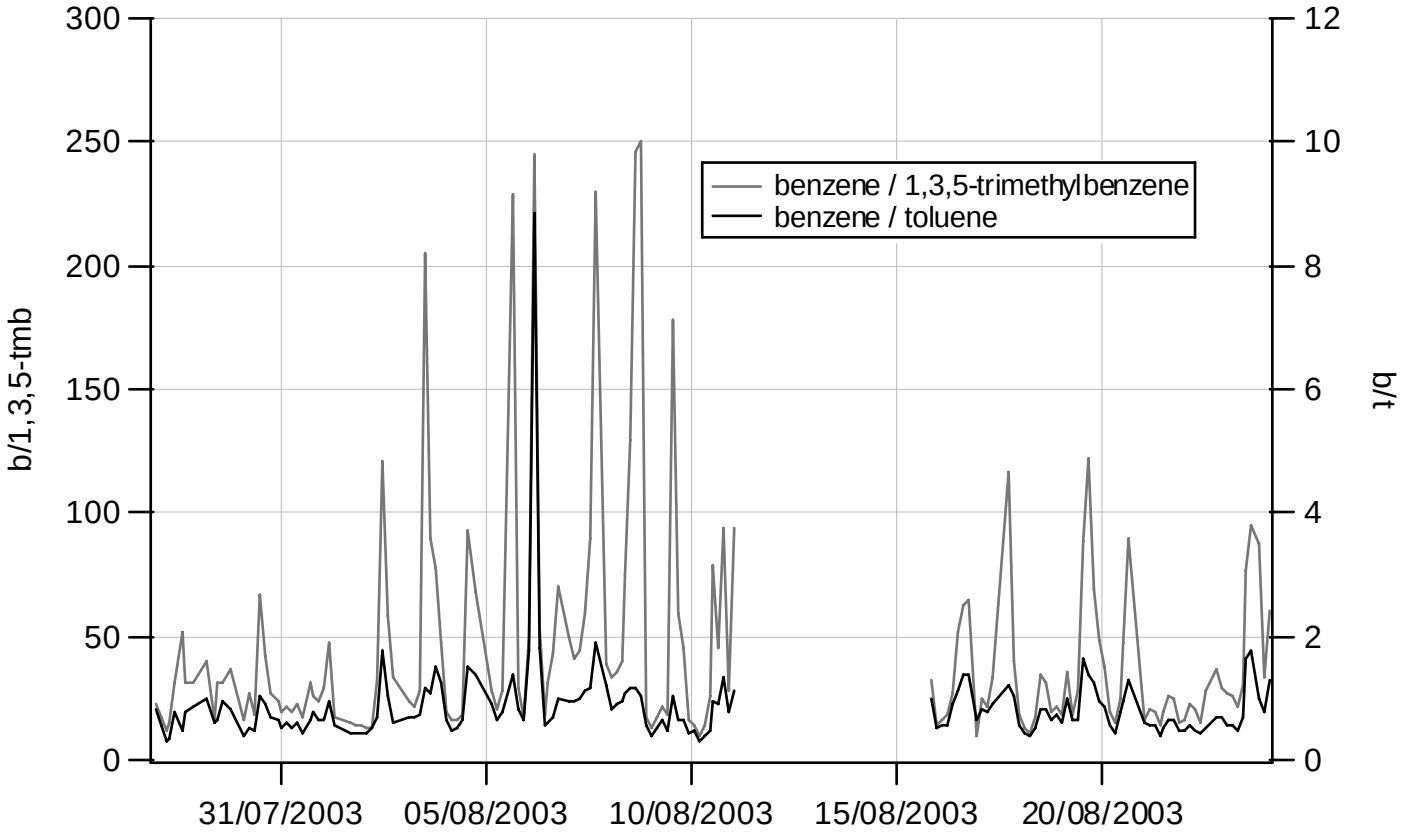
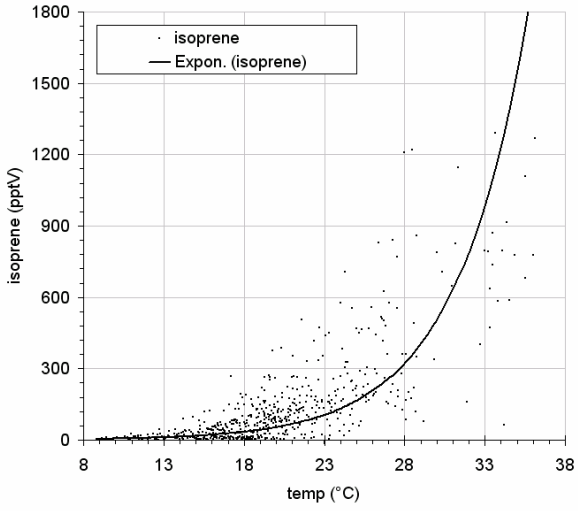
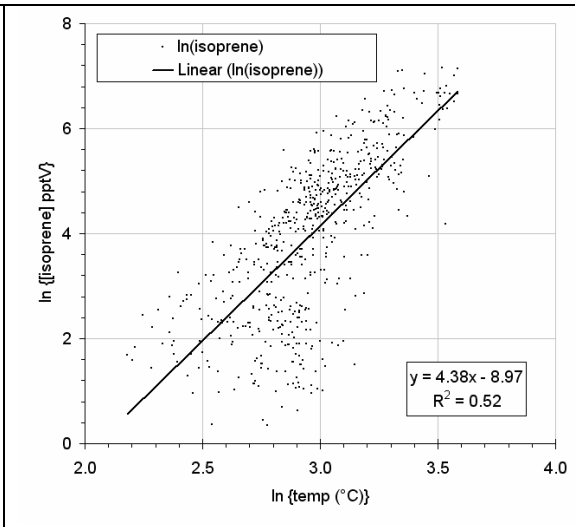


Figure 5: Plots showing the relationship between measured isoprene concentration and ambient temperature. Data shown were taken with the GC-FID instrument and are from 1st – 31st August 2003.



(a)



(b)

Figure 6: PAN mixing ratios and lifetimes over the heatwave period (6^{th} – 10^{th} August)

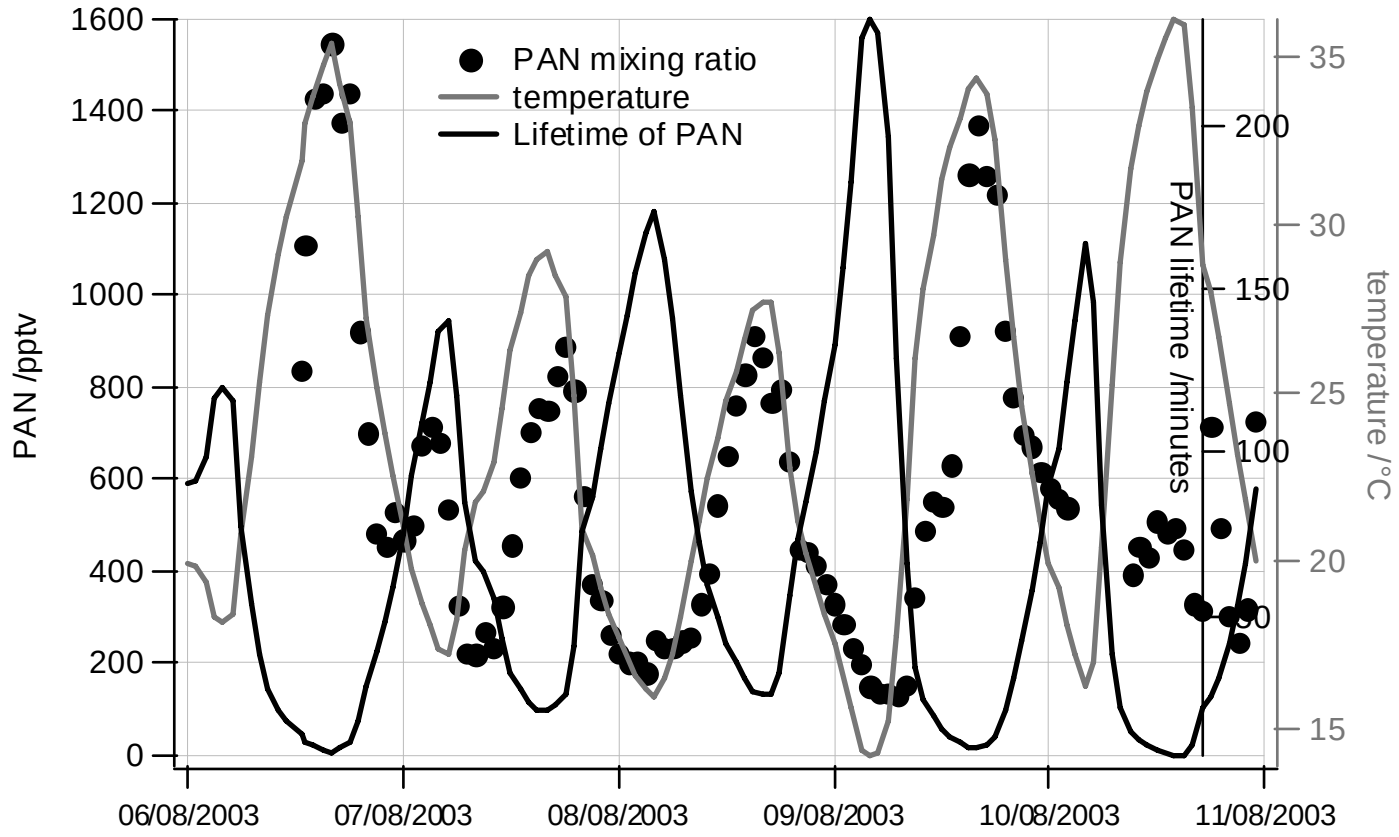


Figure 7: Relationship between isoprene mixing ratio and calculated PAN production for 12:00 – 18:00 for the heatwave period (6^{th} – 10^{th} August).

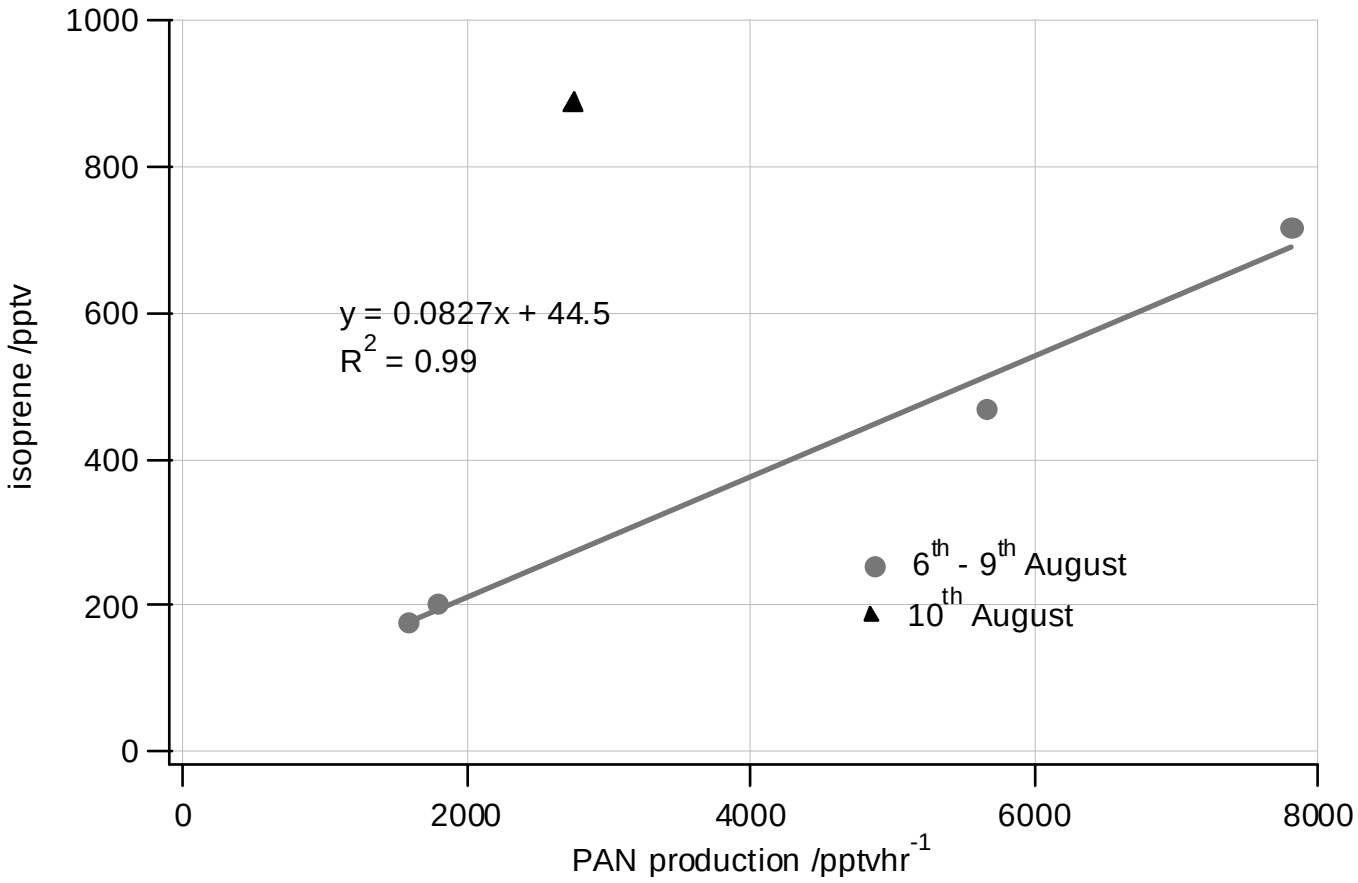


Figure 8: $P(O_3)$ for heatwave period

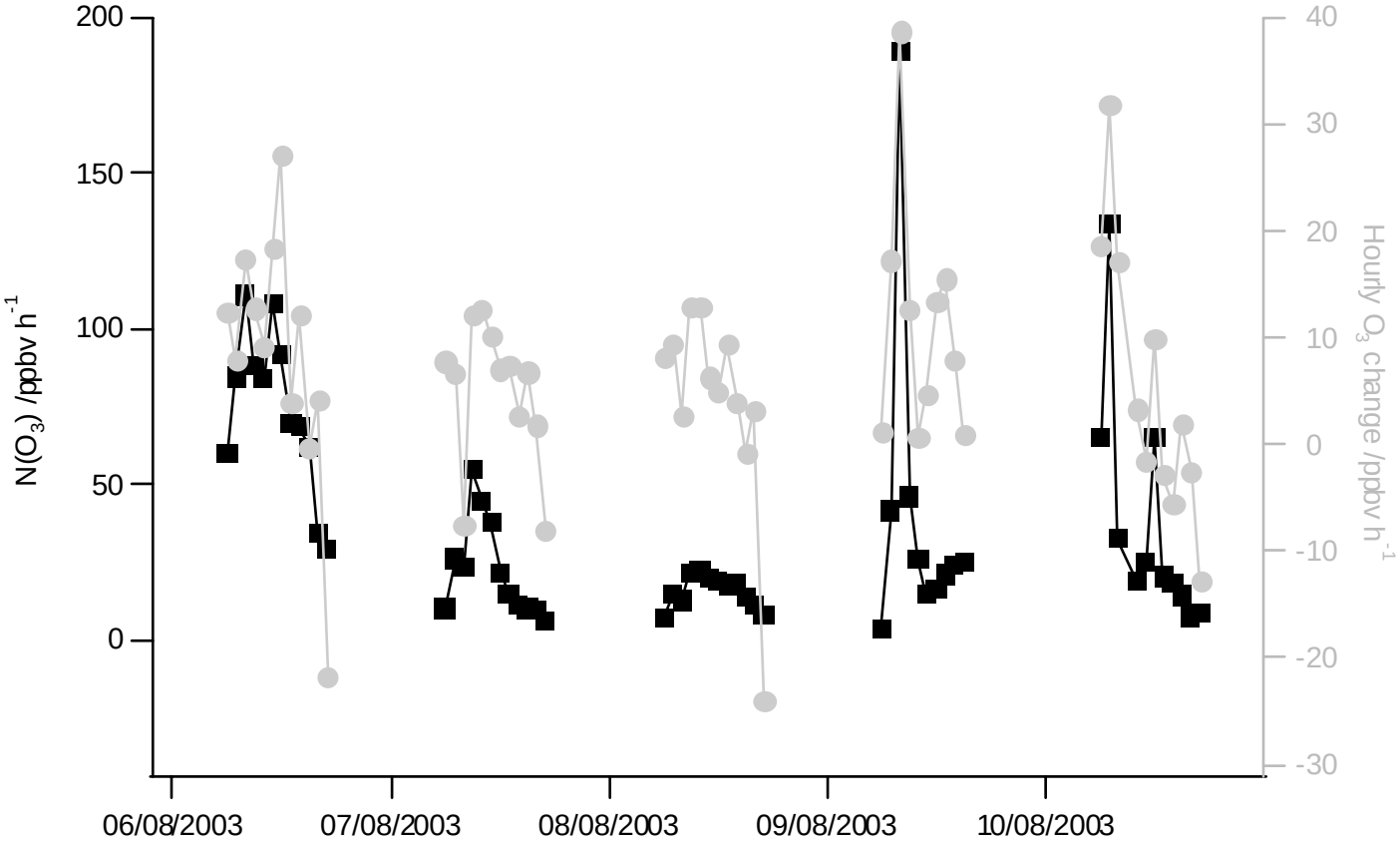


Figure 9: Peak ozone vs average $P(O_3)$ for heatwave

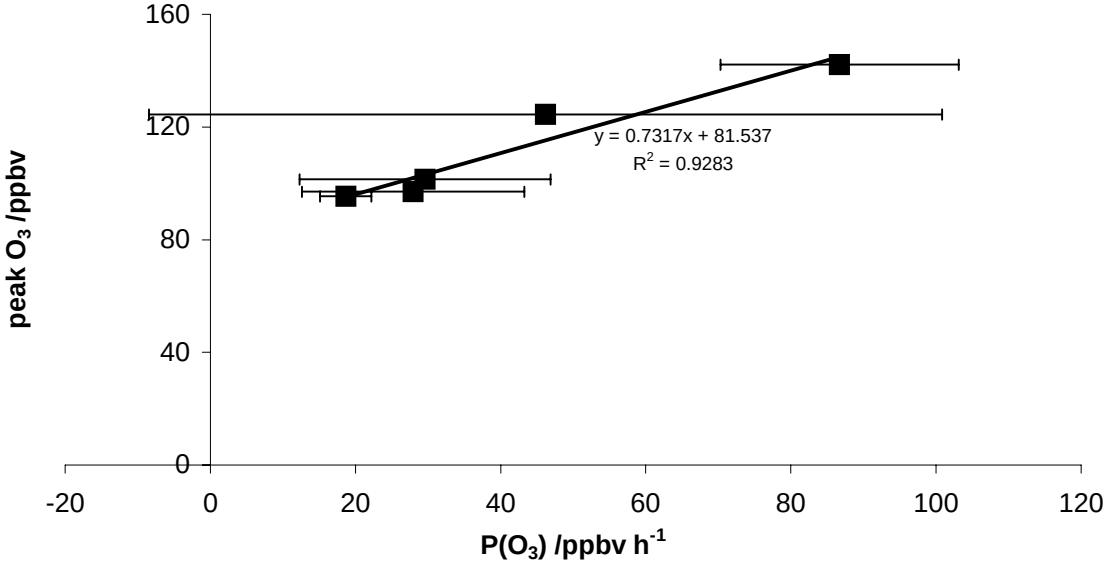


Table 1: Concentrations and calculated OH reactivity of measured hydrocarbons.

	day	night	day heatwave	night heatwave	day	day heatwave
			Concentration (ppt)		*reactivity / s^{-1}*	
ethane	2039	2344	3038	4344	0.018	0.027
ethene	469	600	865	999	0.138	0.255
propane	956	1194	1736	3000	0.002	0.004
propene	148	206	237	285	0.135	0.216
iso-butane	289	324	602	774	0.023	0.049
n-butane	546	591	1095	1413	0.048	0.096
propadiene	7	11	11	17	0.002	0.004
acetylene	395	433	699	893	0.011	0.020
trans-2-butene	11	14	13	17	0.025	0.030
1-butene	36	42	62	64	0.039	0.068
iso-butene	34	46	63	80	0.061	0.112
cis-2-butene	6	9	9	12	0.013	0.018
cyclo-pentane	29	32	45	57	0.005	0.008
iso-pentane	446	508	962	1273	0.060	0.130
n-pentane	232	367	388	561	0.032	0.053
1,2 butadiene	26	28	45	50	0.023	0.041
1,3-butadiene	14	27	17	32	0.033	0.039
propyne	9	12	16	228	0.002	0.003
cyclopentene	3	6	5	213	0.000	0.000
trans-2-pentene	7	9	8	12	0.016	0.020
1-pentene	9	7	16	16	0.022	0.037
2methyl1butene	14	18	24	32	0.015	0.027
2methyl2butene	7	9	10	14	0.015	0.020
cis-2-pentene	4	11	7	9	0.013	0.020
dimethylbutane	78	93	172	250	0.005	0.012
cyclohexane	24	29	50	65	0.006	0.013
2+3 methylpentane	189	221	370	526	0.015	0.030
n-hexane	42	47	113	157	0.008	0.022
isoprene	134	24	380	34	0.469	1.330
n-heptane	29	31	57	65	0.007	0.014
dms (nmhc)	10	13	18	20	0.002	0.003
benzene	136	162	336	524	0.006	0.015
octane	37	45	70	95	0.008	0.014
toluene	281	359	510	723	0.084	0.153
ethyl-benzene	45	56	68	95	0.011	0.017
m-xylene + p-xylene	135	184	160	252	0.089	0.105
styrene	11	13	10	14	0.021	0.021
o-xylene	49	65	63	99	0.023	0.030
i-propyl-benzene	7	8	8	14	0.002	0.002
n-propyl benzene	10	12	12	20	0.002	0.003
3-ethyltoluene	22	32	21	45	0.015	0.014
4-ethyl-toluene	6	9	6	13	0.003	0.002
1,3,5-trimethyl-benzene	8	12	10	18	0.016	0.019
t-butyl-benzene+1,2,4TMB+2-ethyl-toluene	41	67	38	93	0.031	0.029
1,2,3-trimethyl-benzene	31	38	24	36	0.036	0.027
indan	2	3	2	5	0.001	0.001
acetaldehyde	1528	1855	3059	3934	0.836	1.673
methanol	3785	4086	5135	5168	0.124	0.168
acetone	2292	2132	5174	4973	0.017	0.039
methacrolein	26	16	76	59	0.029	0.085
ethanol + mvk + mek	1214	1379	2873	2560		
methyl vinyl ketone (mvk)	40	14	162	110	0.024	0.100
propanol	100	115	215	205	0.020	0.043
butanal	109	81	55	44	0.108	0.054
butanone	135	111	135	108	0.006	0.006
2-methyl-propanal	11	13	12	15	0.010	0.011
pentanal	20	19	66	52	0.017	0.056

2-pentanone	9	7	3	1	0.001	0.000
hexanal	29	41	51	81	0.030	0.053
4-methyl-2-pentanone	5	9	2	1	0.003	0.001
PAN	236	141	649	428	0.001	0.002
HCHO	1610	1390	3320	2760	0.557	1.150
				total reactivity	**3.396**	**6.612**

Table 2: Additional RO_x production (γ) needed relative to production from ozone photolysis

Date in August	γ (no units)				Average γ 12:00 – 15:00
	12:00	13:00	14:00	15:00	
6th	2.80	3.42	4.40	7.63	5.02
7th	0.69	0.93	1.32	2.45	1.36
8th	0.59	0.90	1.39	2.15	1.38
9th	1.46	2.34	4.43	8.06	4.05
10th	2.67	2.76	3.88	5.07	3.72

Table 3: RO_x production additional to that from ozone photolysis necessary to account for observed RO_x mixing ratios

Date in August	RO_x production /molecule cm^{-3} s^{-1} (x 10^{-7})							
	12:00	13:00	14:00	15:00	16:00	17:00	18:00	Average 12 – 15
6th	6.46	5.35	5.76	6.56	6.01	5.22	2.89	6.03
7th	1.37	1.65	1.67	1.63	1.61	1.42	1.10	1.58
8th	1.48	1.72	2.03	1.93	1.46	1.41	1.81	1.79
9th	2.25	3.17	4.39	5.03				3.71
10th	3.62	3.43	3.42	2.26	1.35	1.52	1.12	3.18

Table 4: Contributions to RO_x production over the heatwave period (12:00 – 18:00)

Date in August	RO_x production /molecule cm^{-3} s^{-1} (x 10^{-7}) from:				
	O_3 photolysis	HCHO photolysis	Alkene ozonolysis	PAN thermolysis	Total
6^{th}	0.673 14.5%	0.152 3.3%	0.0576 5.4%	3.57 76.8%	4.65
7^{th}	0.464 31.7%	0.0224 1.5%	0.0592 4.1%	0.918 62.7%	1.46
8^{th}	0.514 38.2%	0.0220 1.6%	0.0513 3.8%	0.759 56.4%	1.35
9^{th}	0.525 14.5%	0.148 4.1%	0.165 4.54%	2.79 76.9%	3.63
10^{th}	0.435 22.4%	0.129 6.7%	0.168 8.7%	1.21 62.3%	1.94
Average	5.22E+06 24.3%	0.0860 3.4%	0.139 5.3%	1.85 67.0%	2.61