

# An Observational Analysis of O<sub>3</sub> and CO

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We thank the AIRMAP staff at UNH that made the observational data available to us.

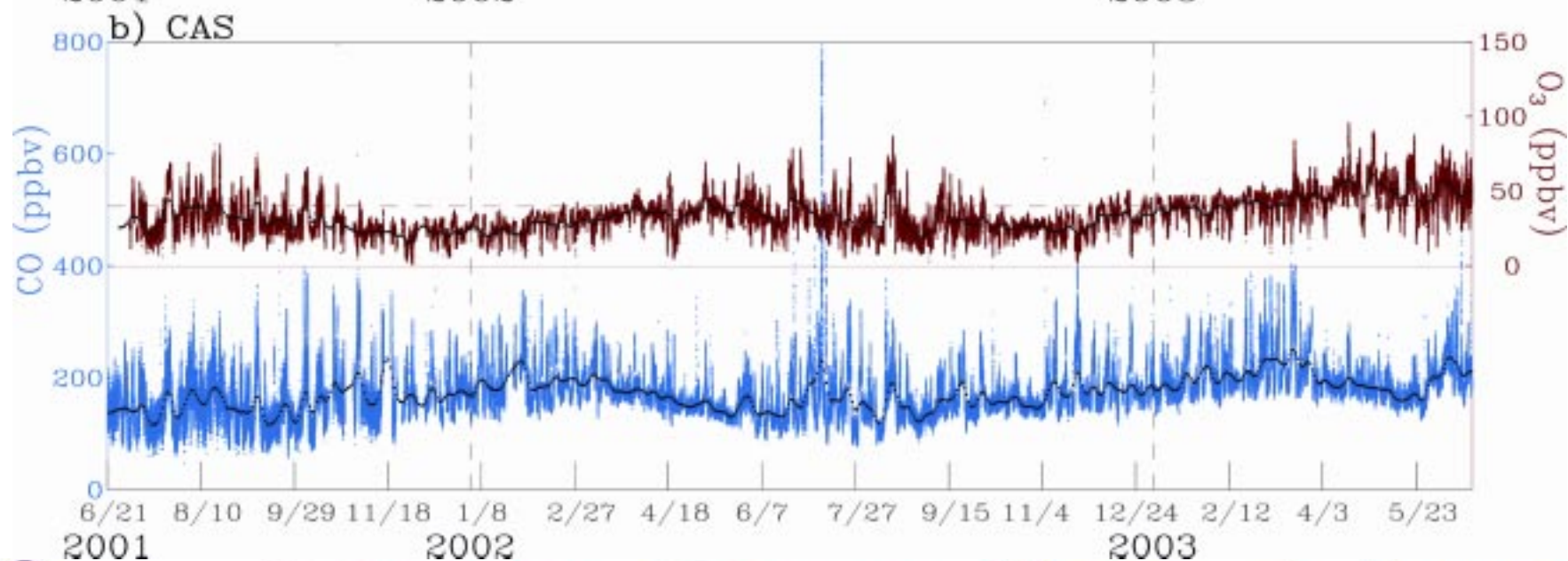
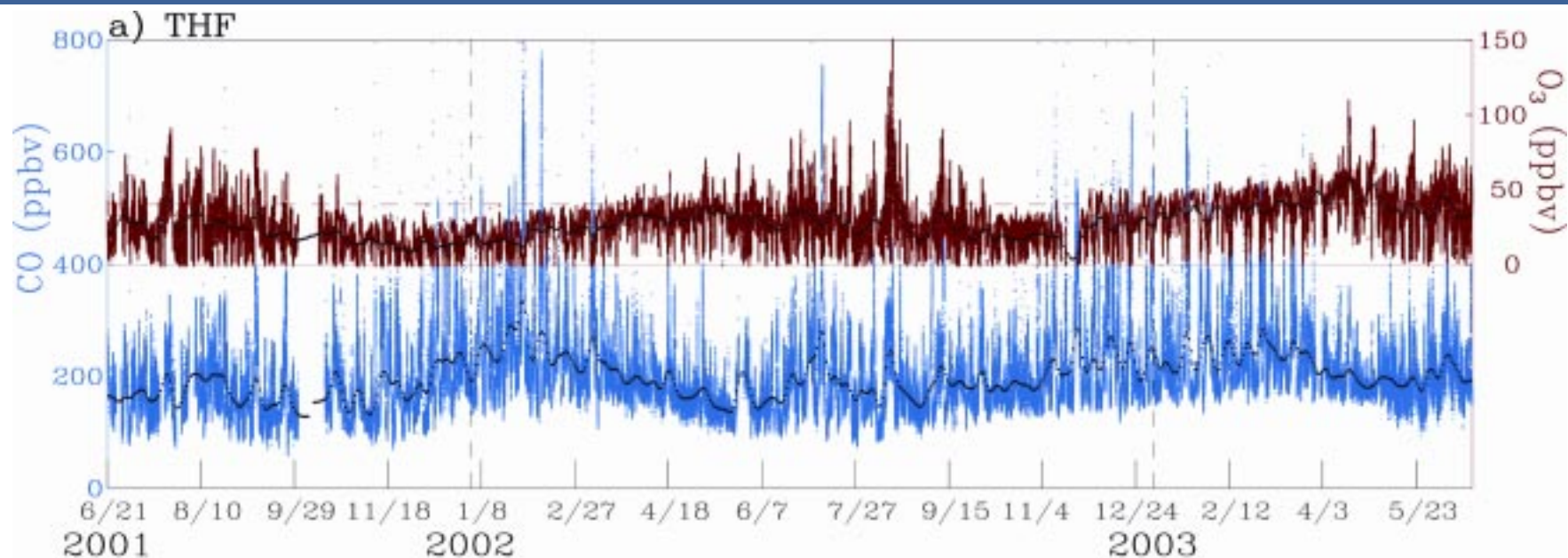


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# Measurements and Methodology

- Data record: June 21 2001 – June 20 2003
- AIRMAP ambient one minute  $O_3$  and CO from Thompson Farm (THF) and Castle Springs (CAS)
- NO and  $NO_y$  measurements at THF and CAS
- Standard meteorological measurements
- CO- $O_3$  relationship under different wind conditions and different time periods of the day
- Analysis using NO/ $NO_y$  and  $NO_y$

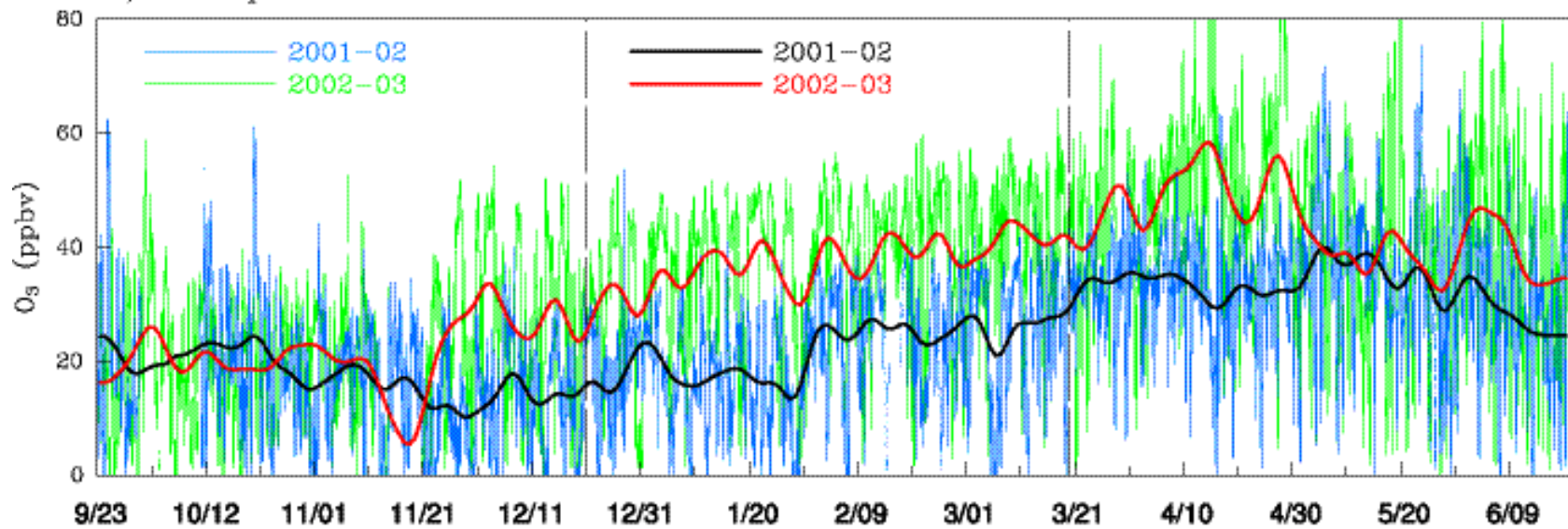


**Table 1. The 0.1-quantiles and medians of O<sub>3</sub> and CO mixing ratios (ppbv) at Thompson Farm (THF) and Castle Springs (CAS).**

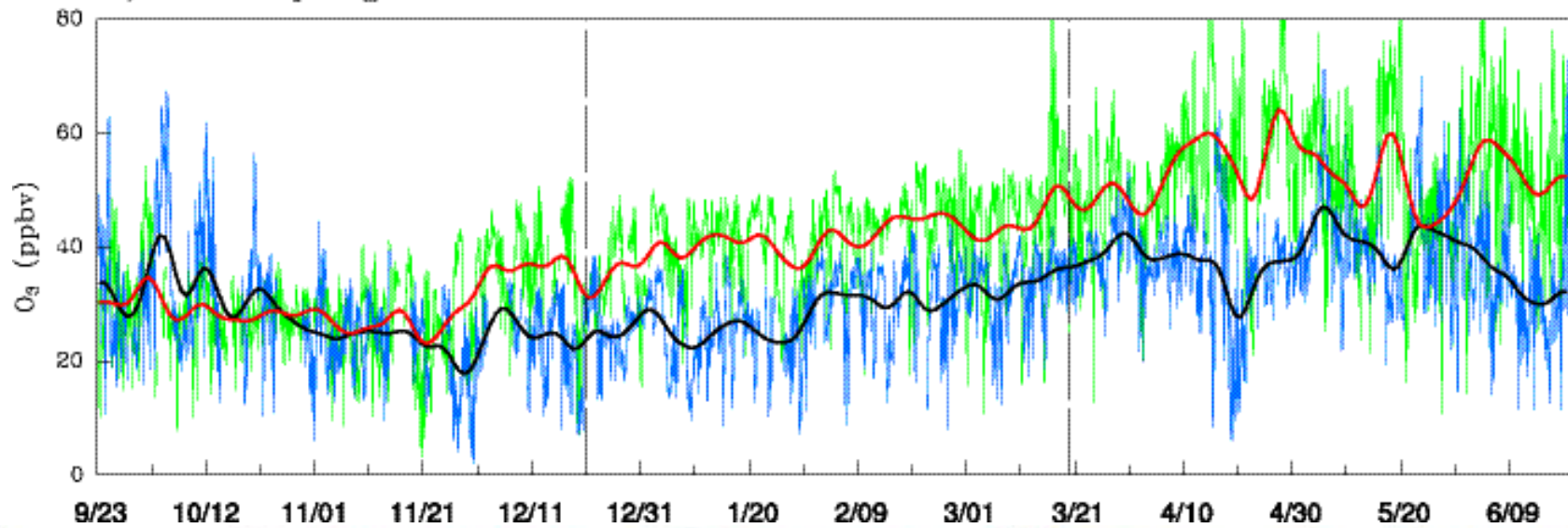
	O <sub>3</sub>				CO			
	THF		CAS		THF		CAS	
	10%	Med	10%	Med	10%	Med	10%	Med
All	8	28	21	33	135	191	127	170
<b>01</b> Summer	7	27	23	34	119	170	107	145
Fall	2	17	16	26	<b>115</b>	<b>167</b>	<b>120</b>	161
<b>02</b> Winter	6	23	20	30	172	223	<b>155</b>	<b>186</b>
Spring	17	34	27	38	130	170	128	158
Summer	8	29	20	32	128	181	116	153
Fall	6	23	20	29	<b>153</b>	<b>190</b>	<b>145</b>	163
<b>03</b> Winter	19	41	30	43	175	216	<b>172</b>	<b>197</b>
Spring	19	45	38	53	166	195	162	185



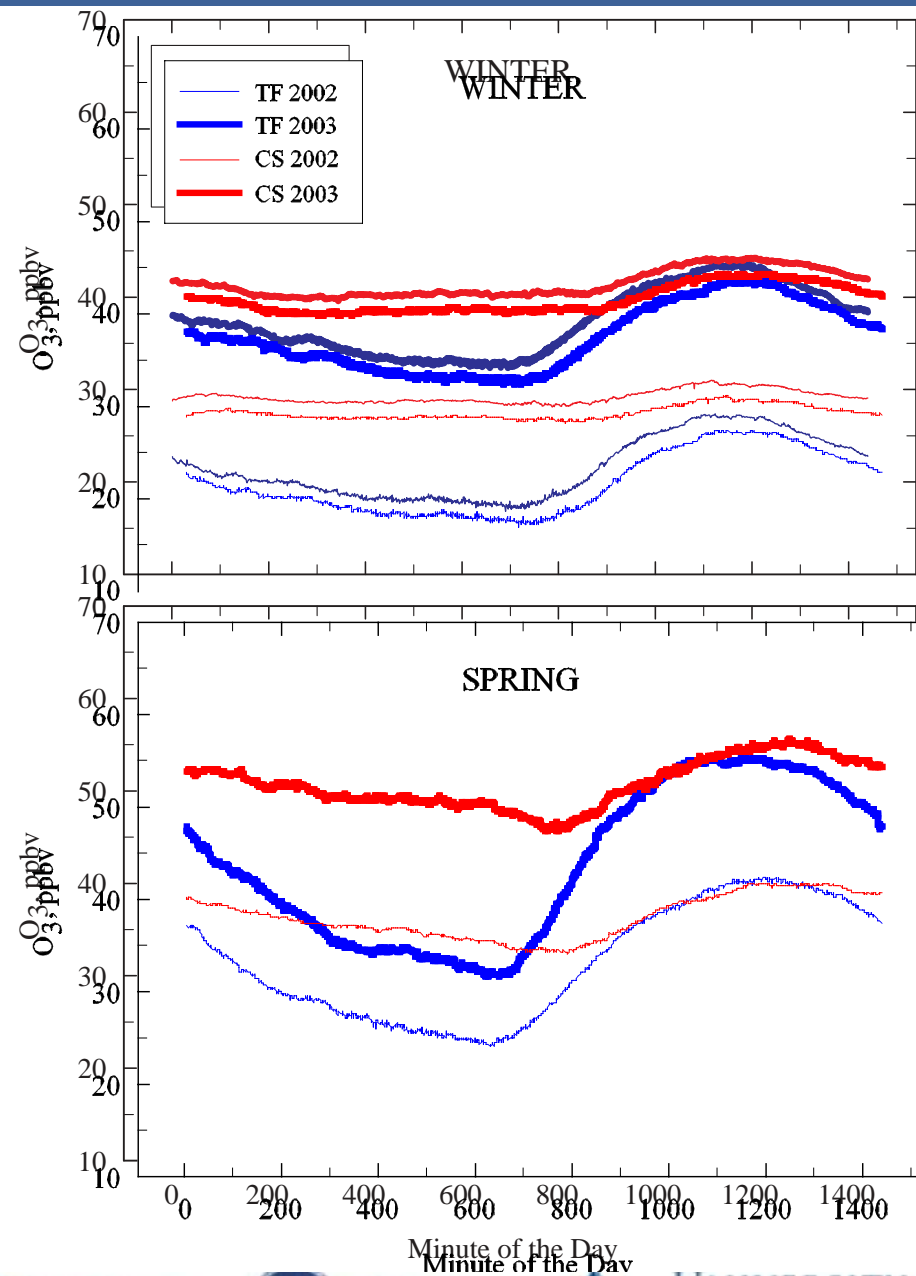
a) Thompson Farm



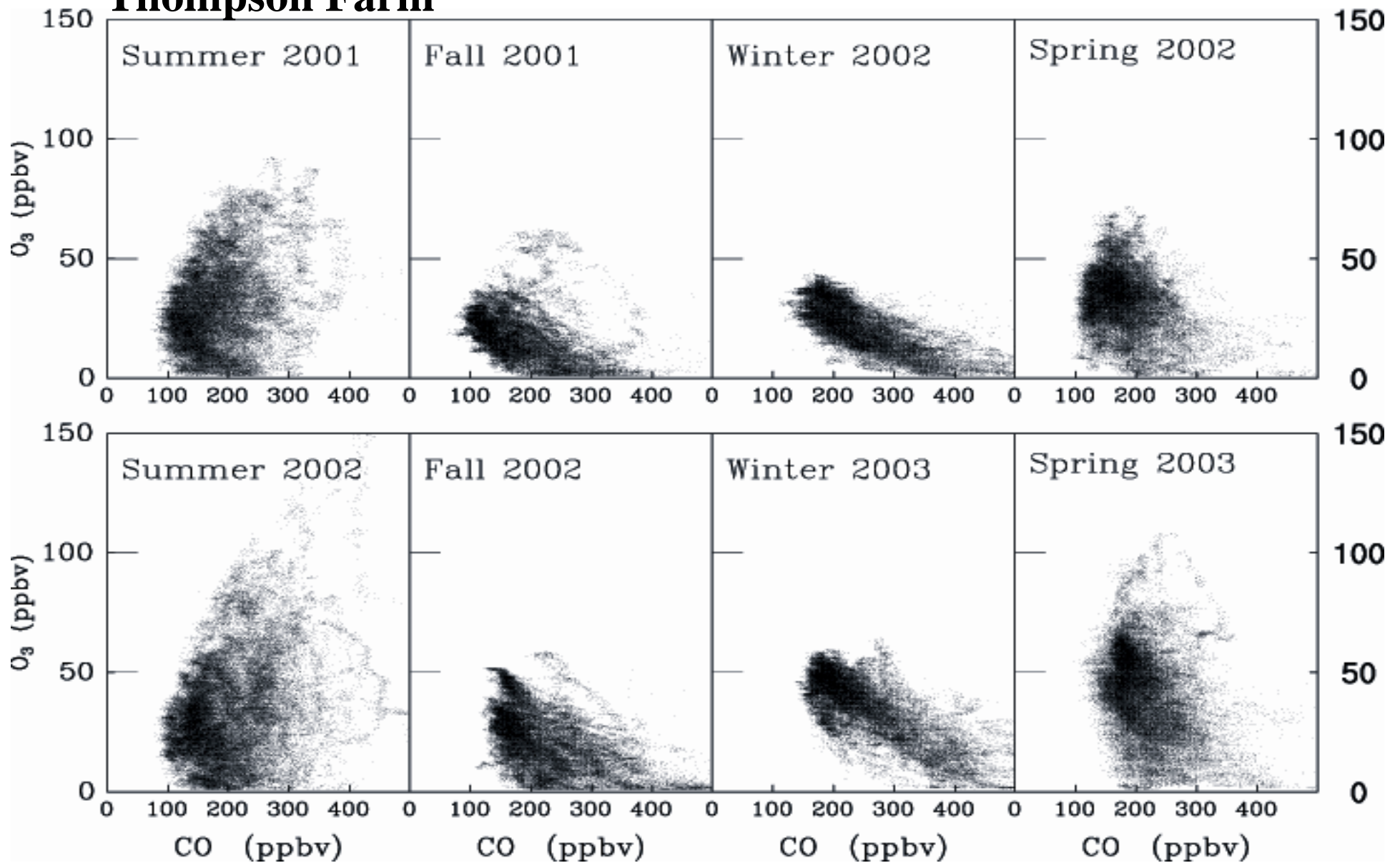
b) Castle Springs



- **Constant offsets of 16 and 10 ppbv at THF and CAS in Winter 03**
- **Enhancement in Spring, larger during the day at THF**



# Thompson Farm





**THE**

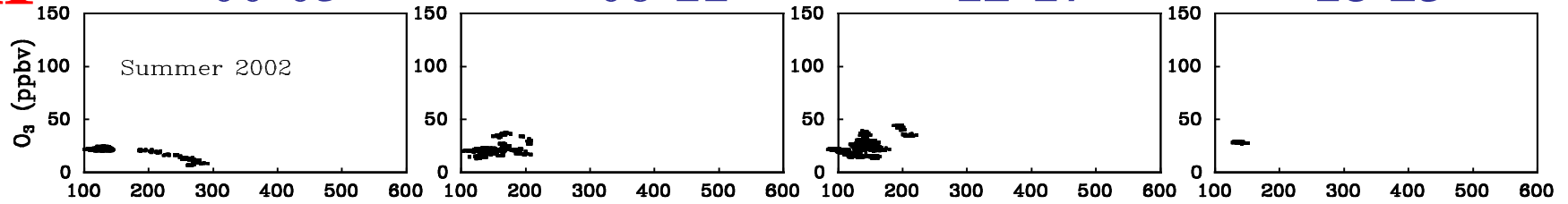
**00-05**

**06-11**

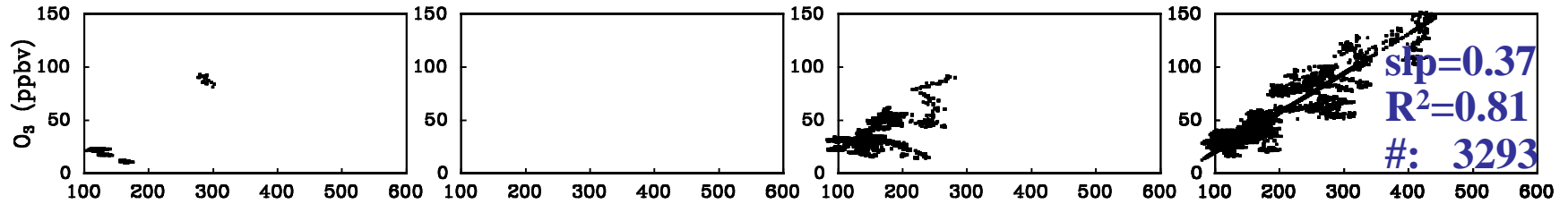
**12-17**

**18-23**

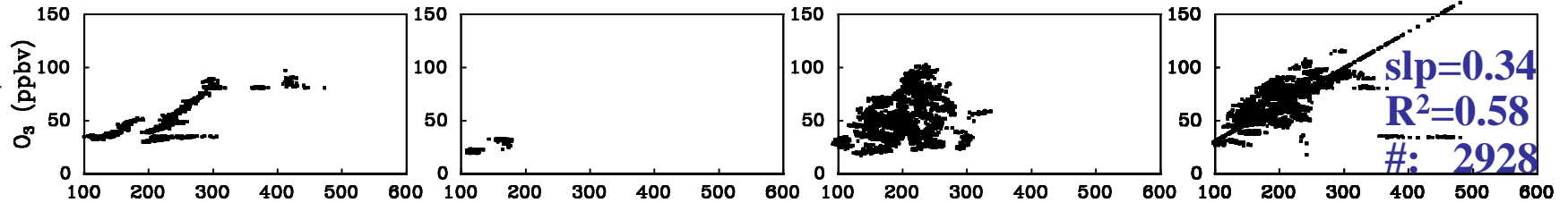
**N-E**



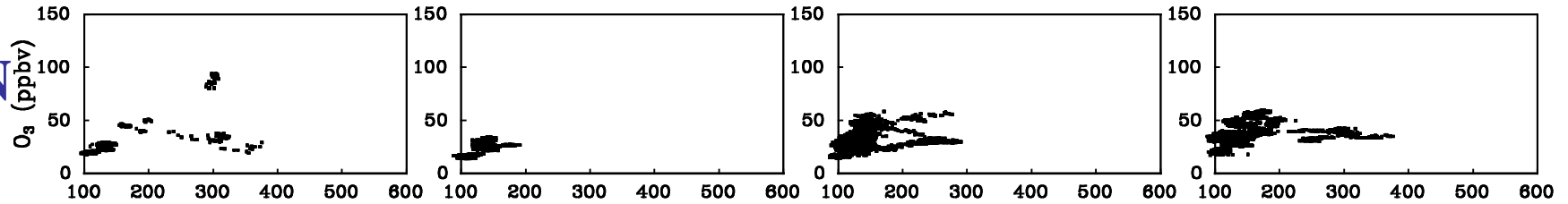
**E-S**



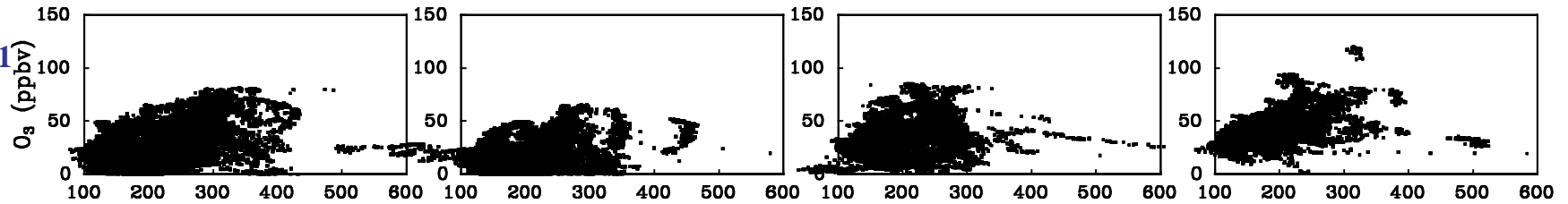
**S-W**



**W-N**



**<2 ms<sup>-1</sup>**



CO (ppbv)

CO (ppbv)

CO (ppbv)

CO (ppbv)



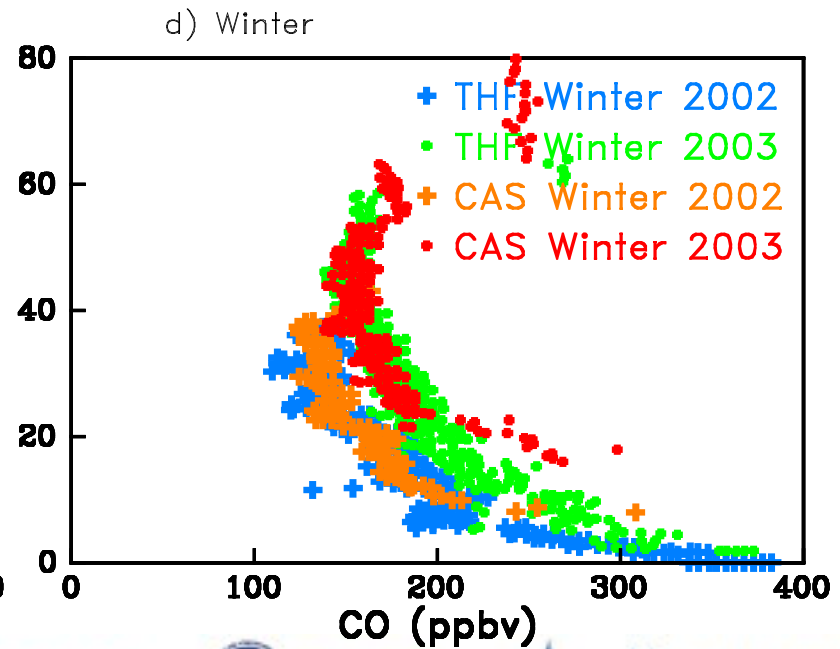
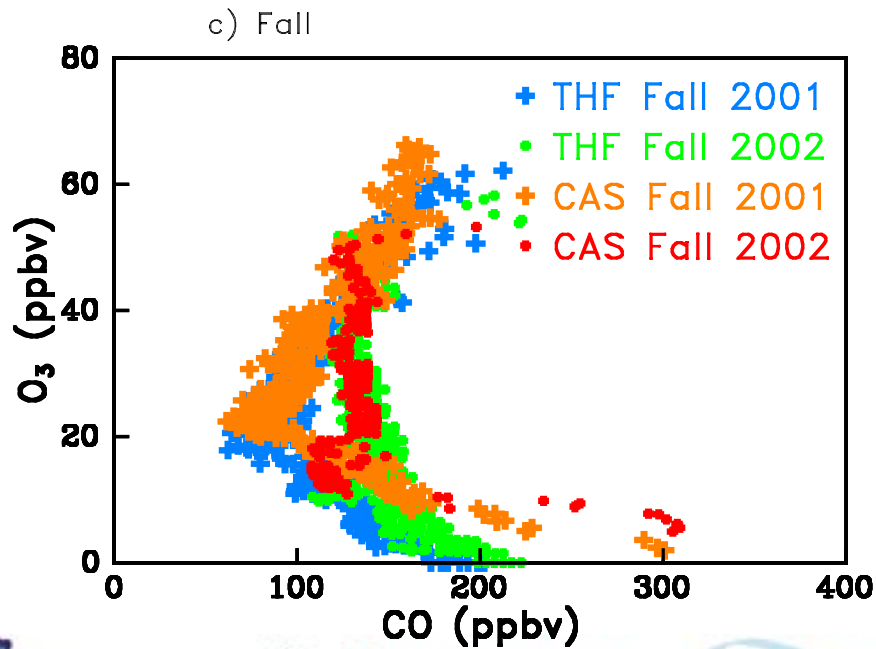
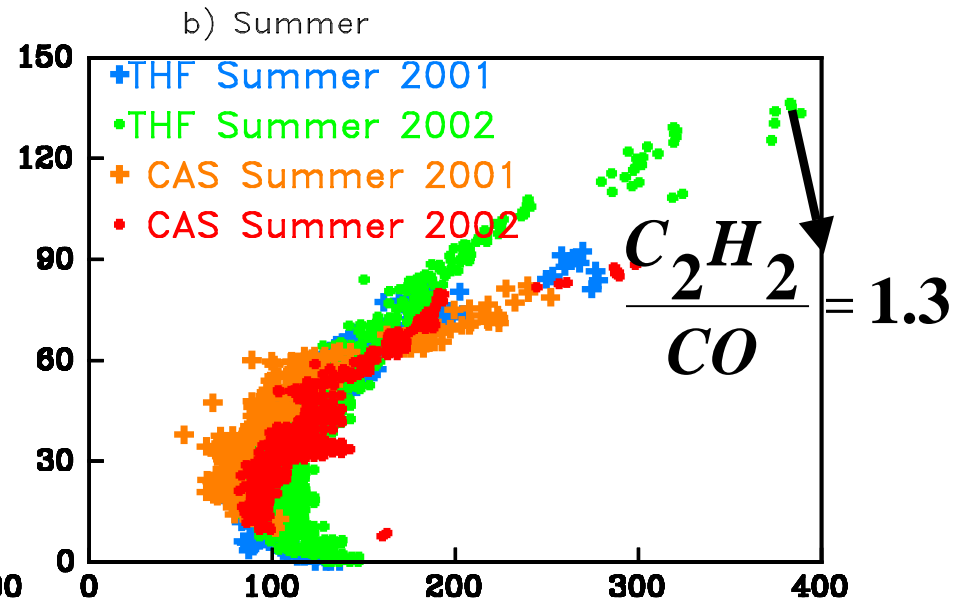
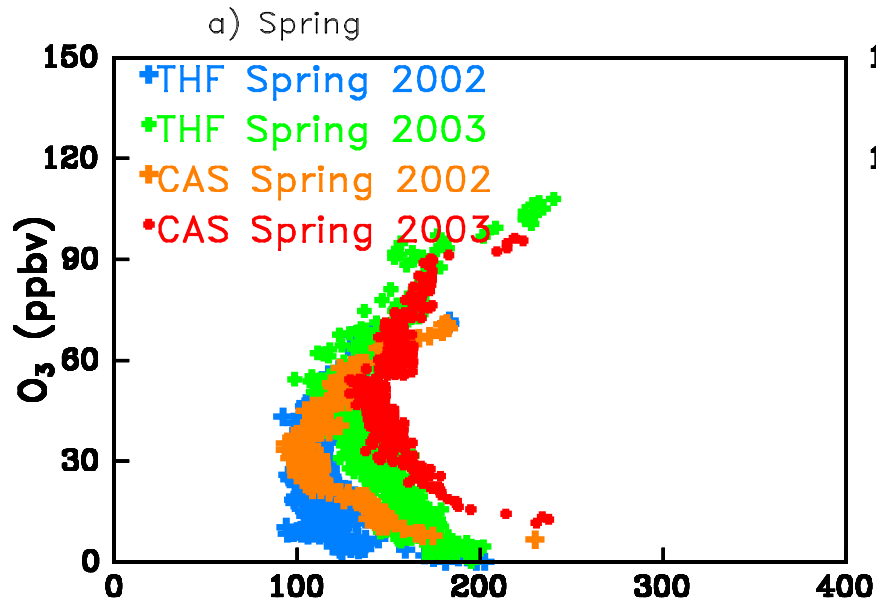
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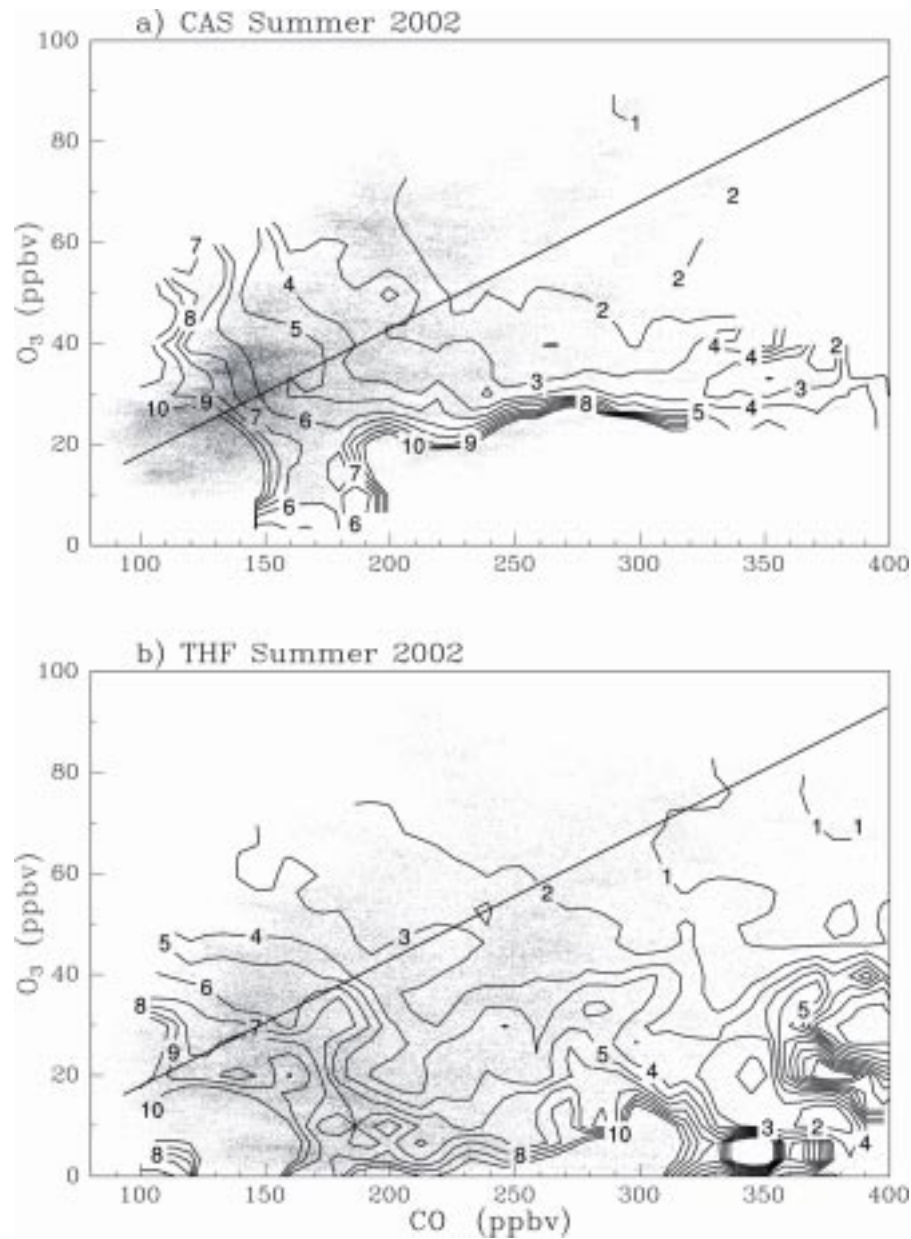


**Export flux of  $O_3 = 370$  million moles  
During the 6 hours on a summer afternoon**

Caveats:

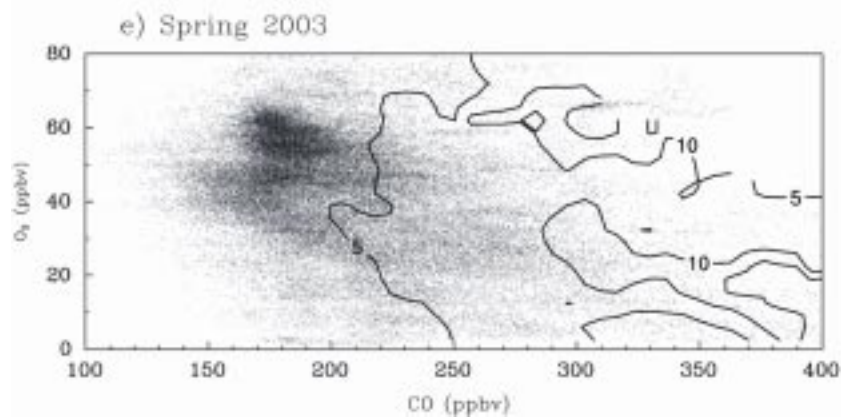
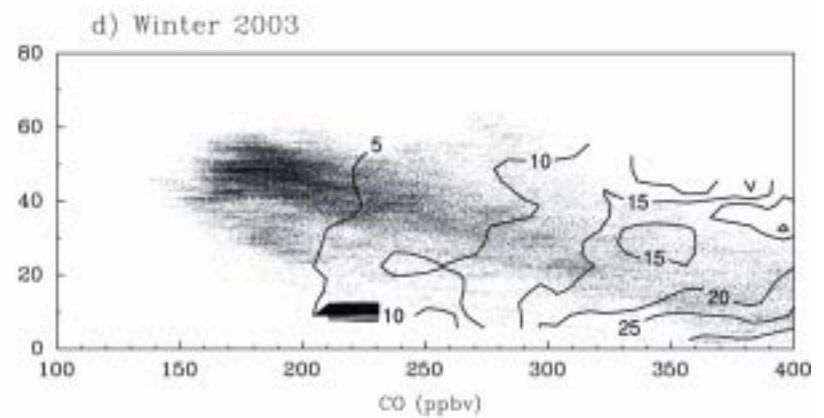
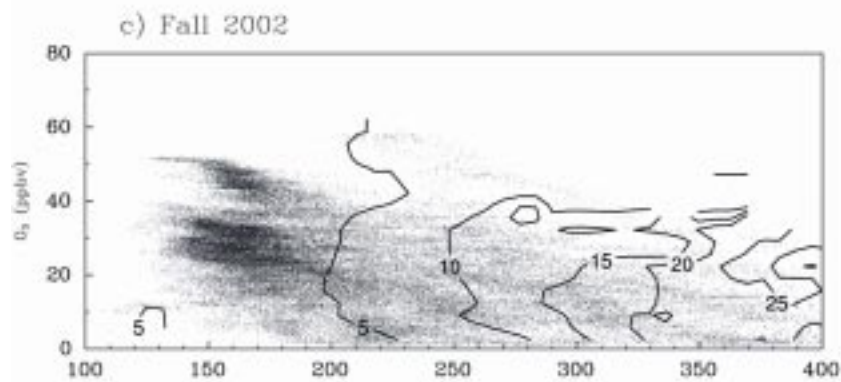
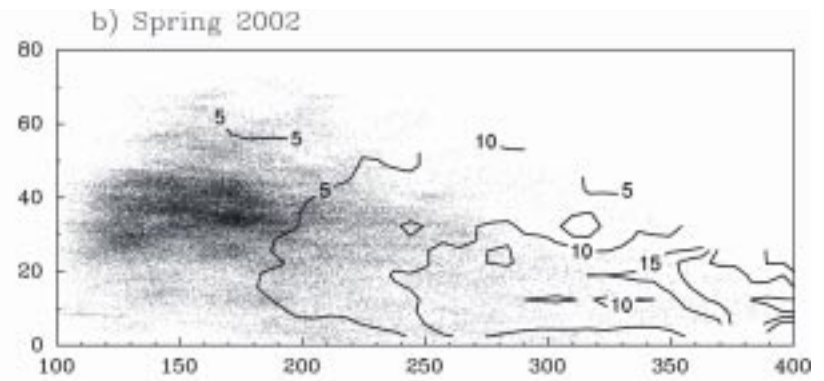
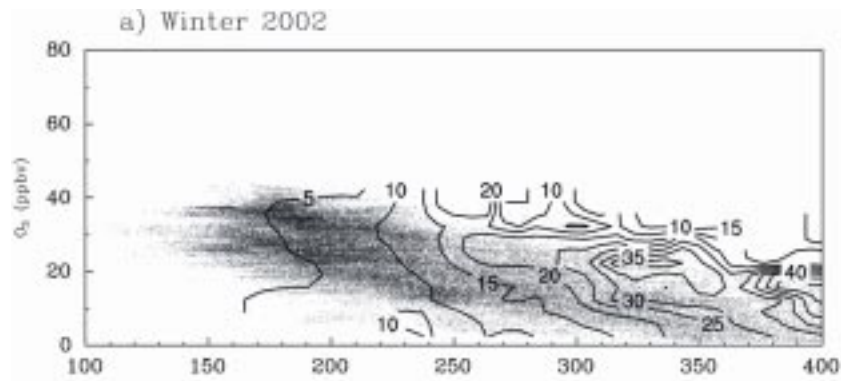
1. No significant amount of data for AM
2. Nighttime surface wind very different from aloft and hence not applicable for such estimates





$$R_1 = NO/NO_y$$





$\text{NO}_y$