

# Review of Northeast Texas High Ozone Events in 2008

Presentation to the NETAC  
Technical Committee

November 7, 2008

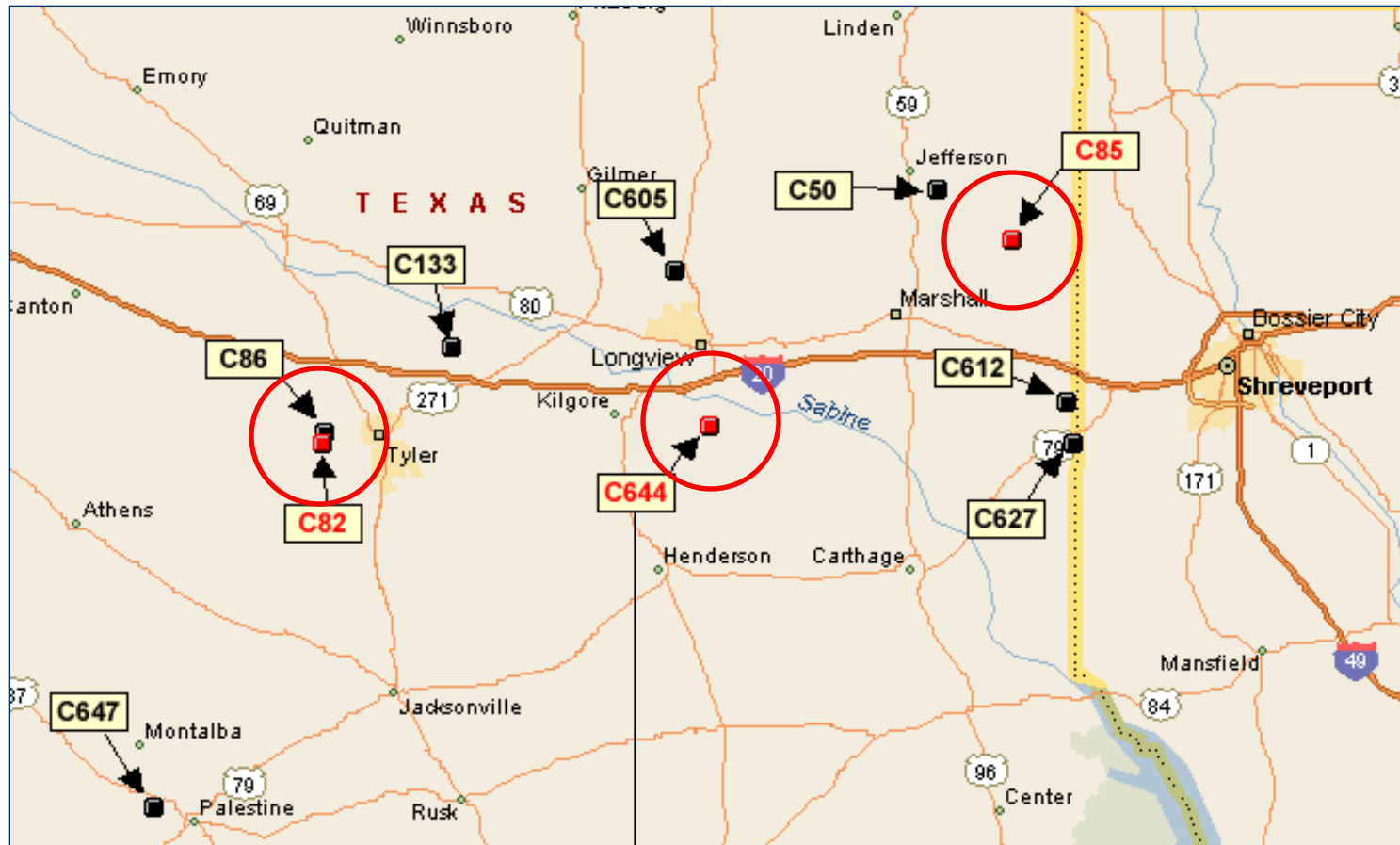
Greg Yarwood, Susan Kemball-Cook, and Piti Piyachaturawat  
ENVIRON

[gyarwood@environcorp.com](mailto:gyarwood@environcorp.com)

# Today's Presentation

- Review Northeast Texas high ozone days in 2008
  - 8 hr > 75 ppb or 1-hr > 85 ppb
- Update on ozone Design Values and trends
- Implications for attainment under the new 8-hour ozone standard of 75 ppb
- Day-by-day review of 2008 high ozone days

# Continuous Air Monitoring Stations (CAMS)



**CAMS644 = CAMS19**

**Active CAMS are in RED**

# High Ozone Days in 2008

Day	Maximum 8-hour Ozone (ppb)		
	Longview	Tyler	Karnack
May 28, 2008	70 (1-hr=101)	54	35
June 18, 2008	71 (1-hr=98)	67	55
July 16, 2008	71	74 (1-hr=87)	55
August 4, 2008	82	101 (1-hr=111)	63
September 19, 2008	66 (1-hr=93)	58	40
September 28, 2008	70 (1-hr=104)	66	50
<b>4<sup>th</sup> high value</b>	<b>71</b>	<b>72</b>	<b>68</b>

- 2008 data have been quality assured by the TCEQ
- Shading shows monitor with highest ozone on that day

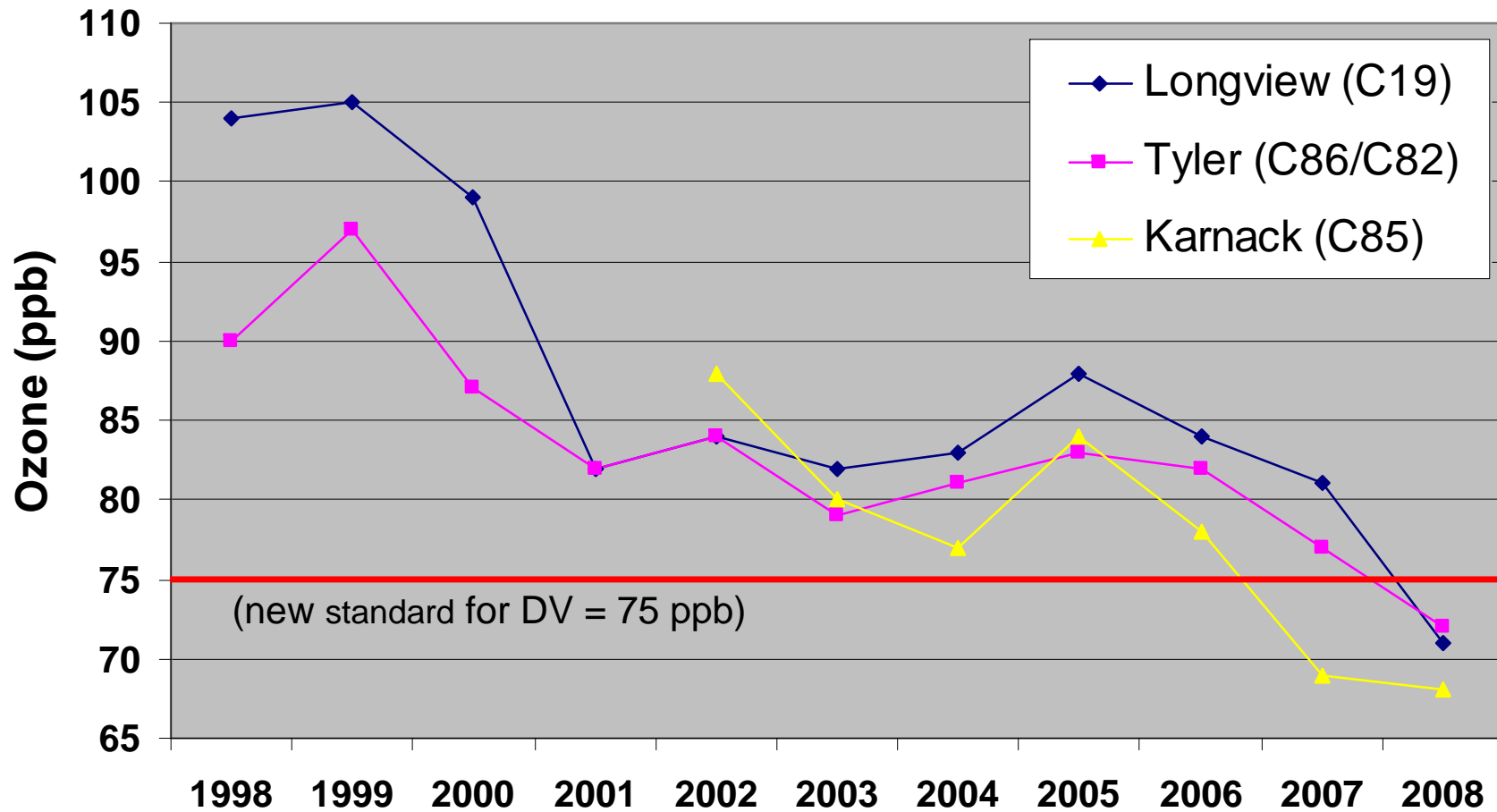
# Overview of 2008 High Ozone Days

Day	Comments based on analyses later in presentation (Gray = max ozone at Longview; White = max ozone at Tyler)
May 28, 2008	Power plant and possible HRVOC impacts Regional 8-hr ozone background ~ 40 ppb
June 18, 2008	Power plant impact Regional 8-hr ozone background ~ 60 ppb
July 16, 2008	Power plant impact Regional 8-hr ozone background ~ 60 ppb
August 4, 2008	Power plant and Tyler urban impacts? Regional 8-hr ozone background ~ 70 ppb
September 19, 2008	HRVOC and power plant impacts Regional 8-hr ozone background ~ 50 ppb
September 28, 2008	HRVOC and power plant impacts Regional 8-hr ozone background ~ 60 ppb

# Annual 4<sup>th</sup> High 8-hour Ozone (ppb)

Year	Longview	Tyler	Karnack
2002	84	84	88
2003	82	79	80
2004	83	81	77
2005	88	83	84
2006	84	82	78
2007	81	77	69
2008	71 ↓	72 ↓	68 ↓

# Annual 4<sup>th</sup> High 8-hour Ozone Trends

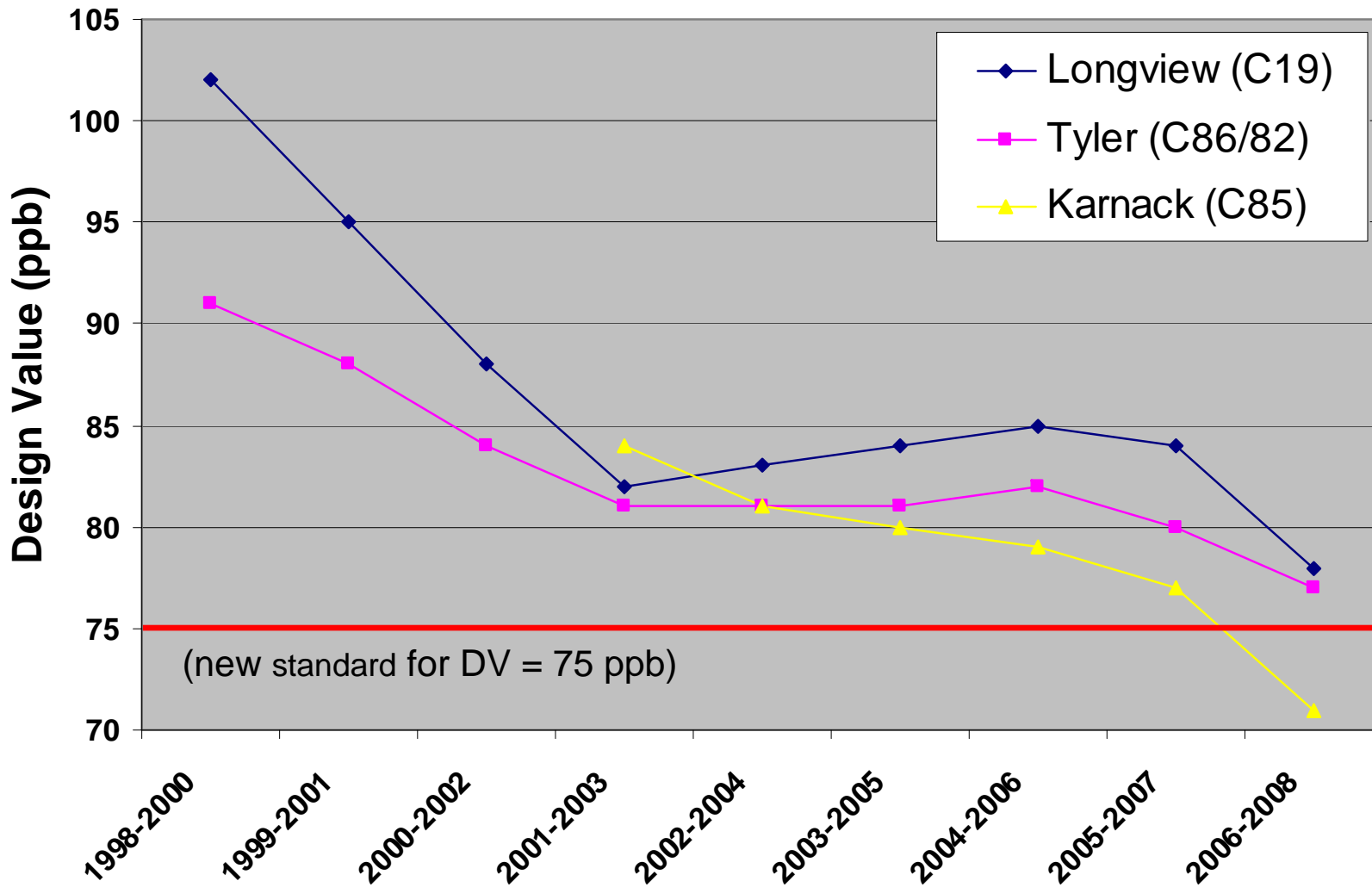


# 8-hour Ozone Design Values

Years	Longview	Tyler	Karnack
2002-2004	83	81	81
2003-2005	84	81	80
2004-2006	85	82	79
2005-2007	84	80	77
2006-2008	78	77	71

- 2008 data have been validated by the TCEQ

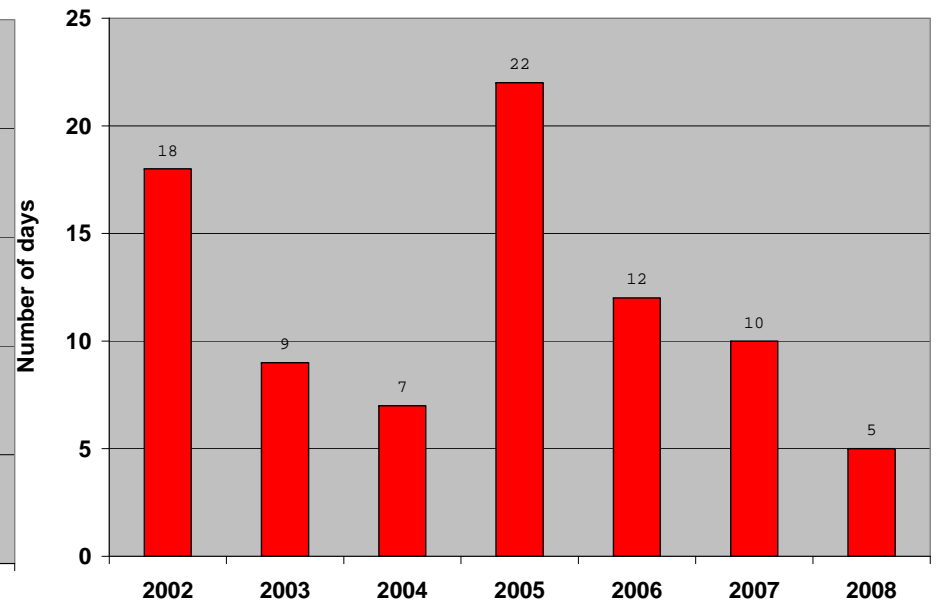
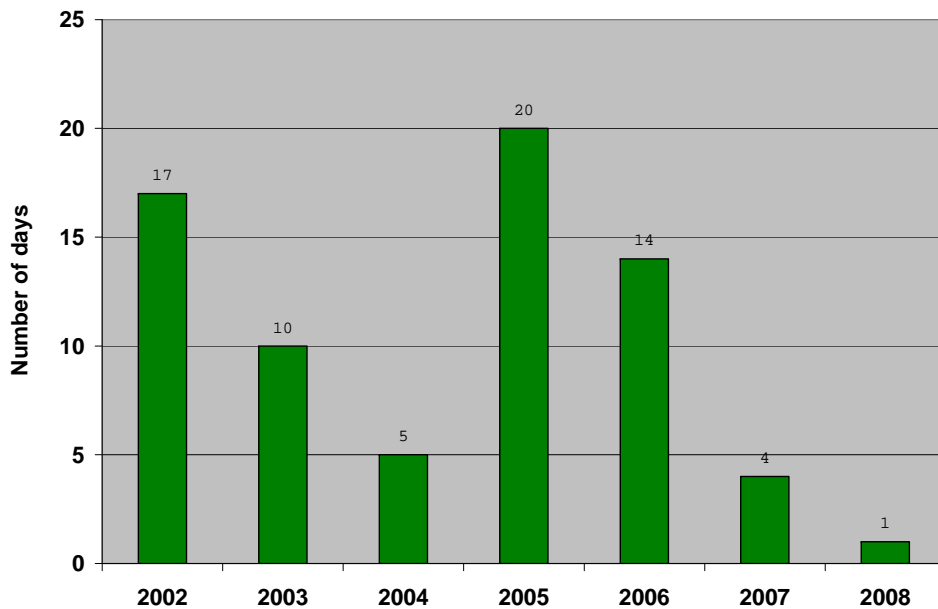
# 8-hour Ozone Design Value Trends



# Strong Relationship Between High Ozone and Weather Conditions

Number of Days at CAMS 19  
With 8-Hour Ozone > 75 ppb

Number of Days at CAMS 19  
With  $T > 90^{\circ}\text{F}$  and 10 am-3 pm  
Average Wind Direction Between  
 $0^{\circ}$  and  $120^{\circ}$  (North to Southeast)



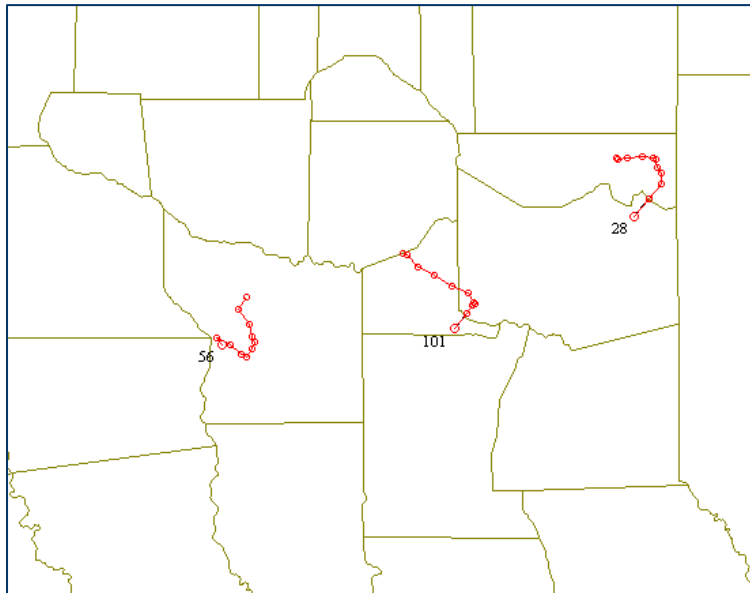
# Implications for 8-hr Ozone Attainment

- Decreasing design value at Longview
  - Currently 78 ppb (84 ppb for 2005-2007 period)
  - Nonattainment under the revised standard of 75 ppb
  - Meteorology plays a key role in recent decline in Longview design values
- Design values also decreasing at Tyler and Karnack
  - Declining regional transport of ozone into Northeast Texas
  - Regional NO<sub>x</sub> reductions have been effective
    - NO<sub>x</sub> SIP Call
    - Mobile source reductions
  - Implications of CAIR vacatur for future reductions

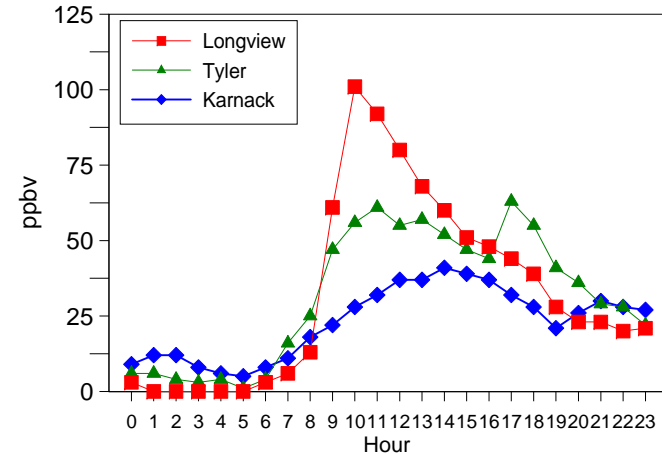
# Day-by-Day Review

# May 28: 70 ppb at Longview

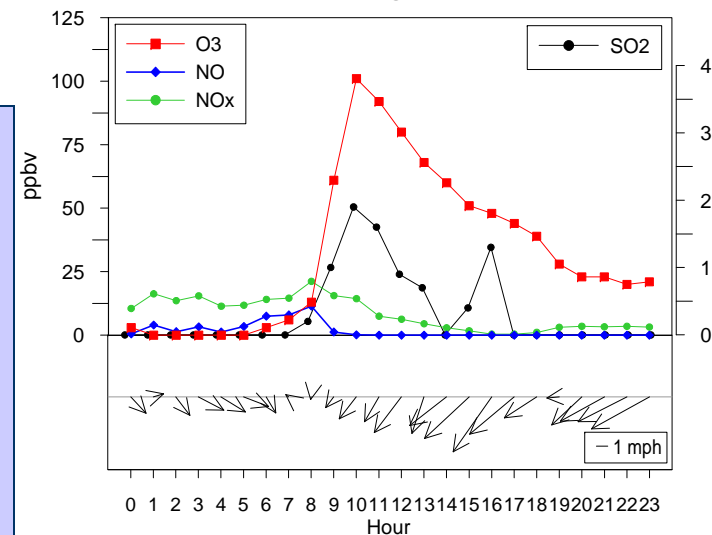
10-Hour Back Trajectories for May 28, 2008, 10am



1-hour Ozone



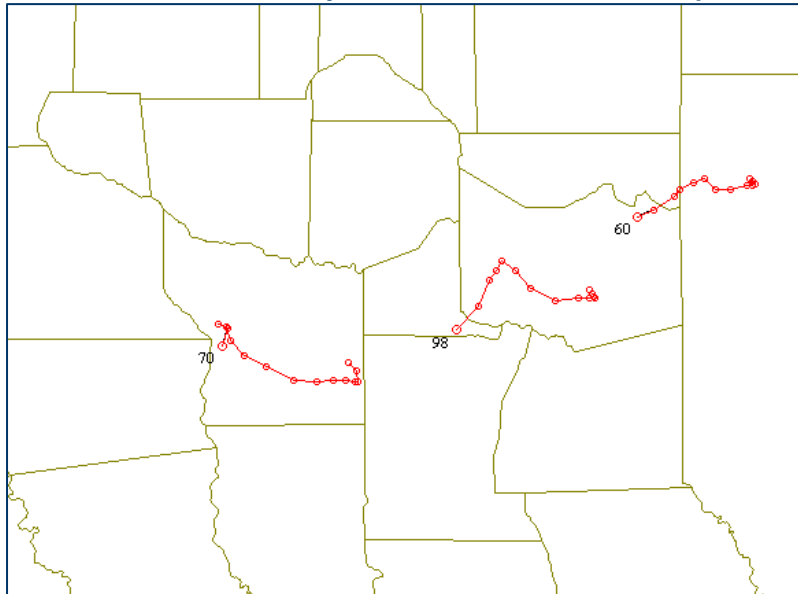
Longview



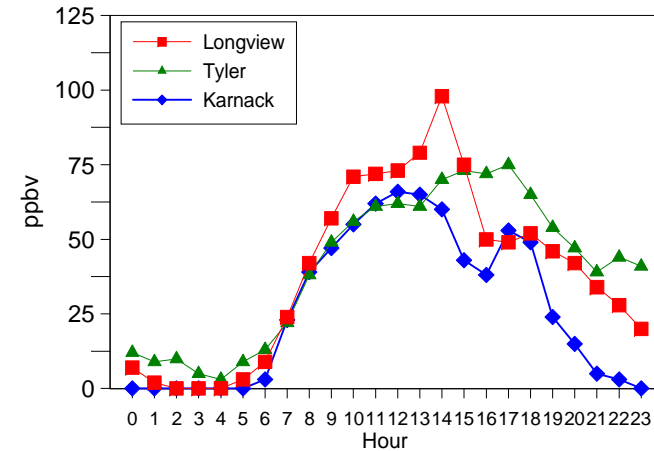
- Longview peak ~ 60 ppb higher than background of ~ 40 ppb
- SO<sub>2</sub> peaks at 10 am, 4 pm from power plant plumes, but origin of the SO<sub>2</sub> is unclear
- Rapid ozone rise from 8-10 am with northeast winds suggests HRVOC impact combined with power plant NO<sub>x</sub>

# June 18: 71 ppb at Longview

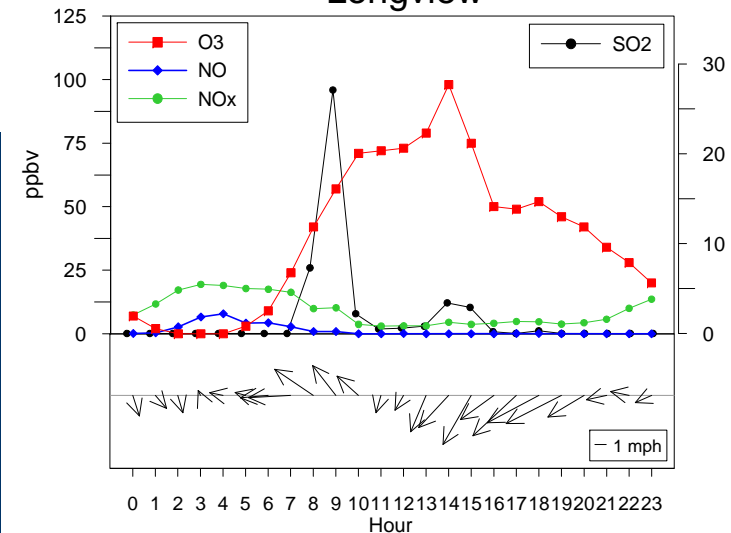
14-Hour Back Trajectories for June 18, 2008, 2 pm



1-hour Ozone



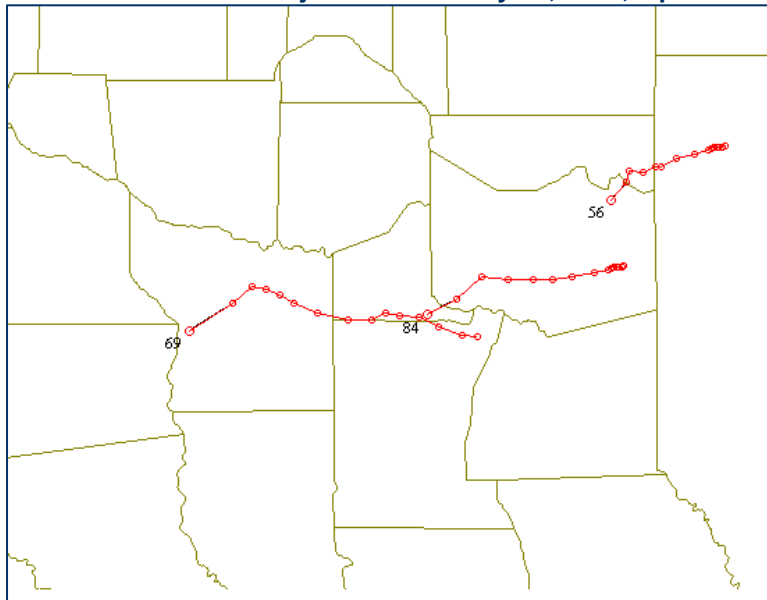
Longview



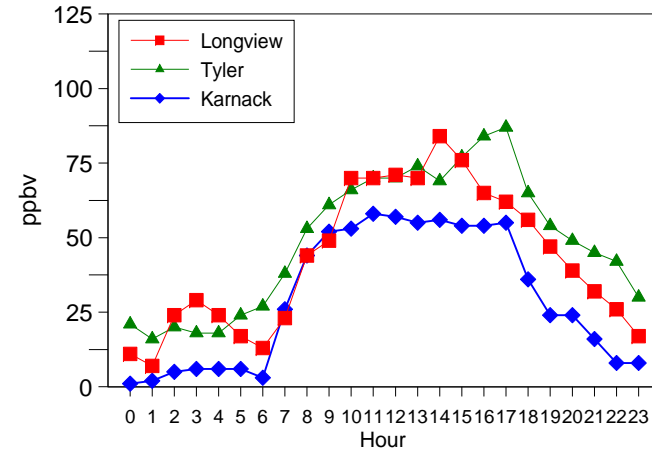
- Longview peak ~ 40 ppb higher than background of ~ 60 ppb
- Winds from northeast during Longview ozone peak at 2 pm
- SO<sub>2</sub> and northeast winds at 2 pm suggest ozone peak due to Pirkey

# July 16: 71 ppb at Longview (Tyler 74 ppb)

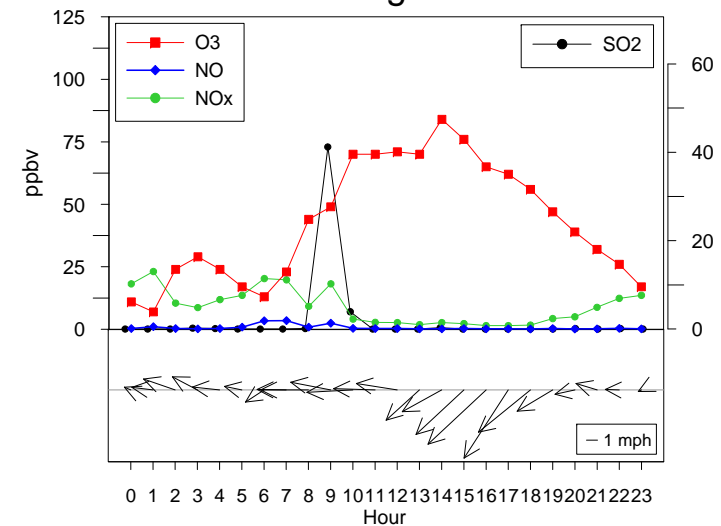
14-Hour Back Trajectories for July 16, 2008, 2 pm



1-hour Ozone



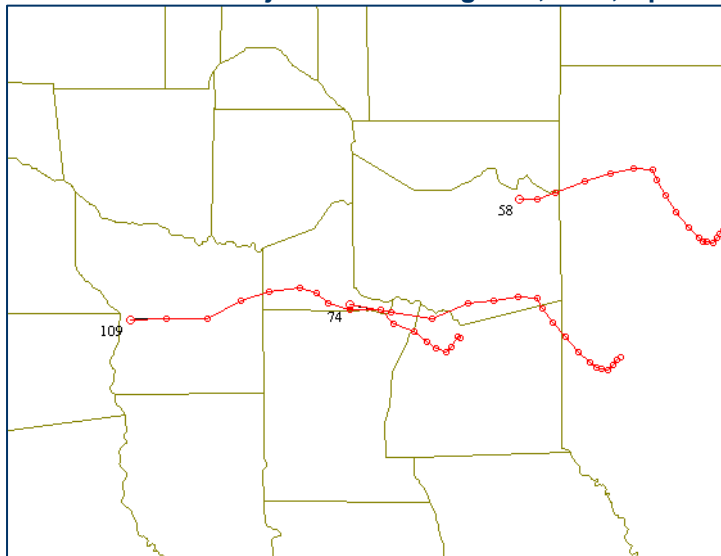
Longview



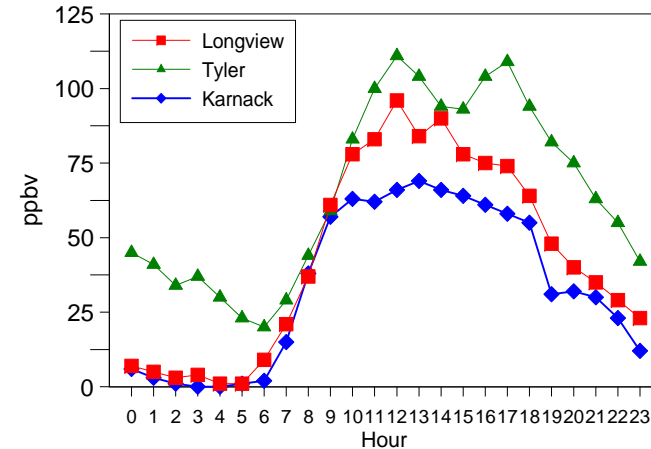
- Longview and Tyler peaks ~ 25 ppb higher than background of ~ 60 ppb
- Morning east winds shift to northeast in the afternoon
- No clear explanation for Longview peak at 2 pm
- Tyler peak probably Tyler urban plume

# August 4: 101 ppb at Tyler

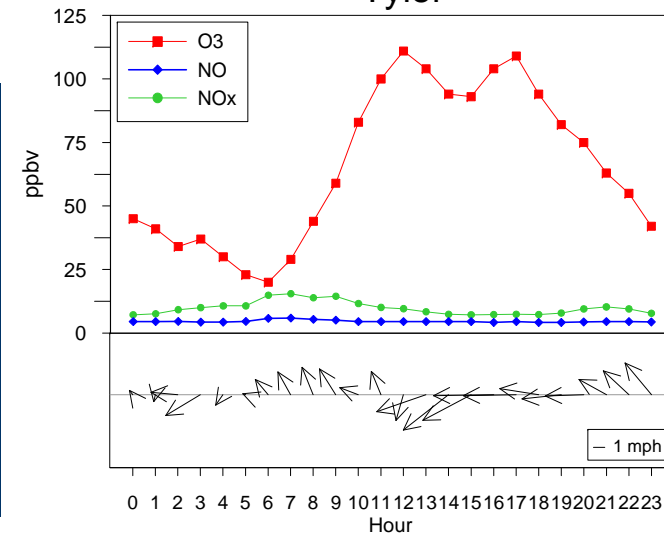
17-Hour Back Trajectories for August 4, 2008, 5 pm



1-hour Ozone



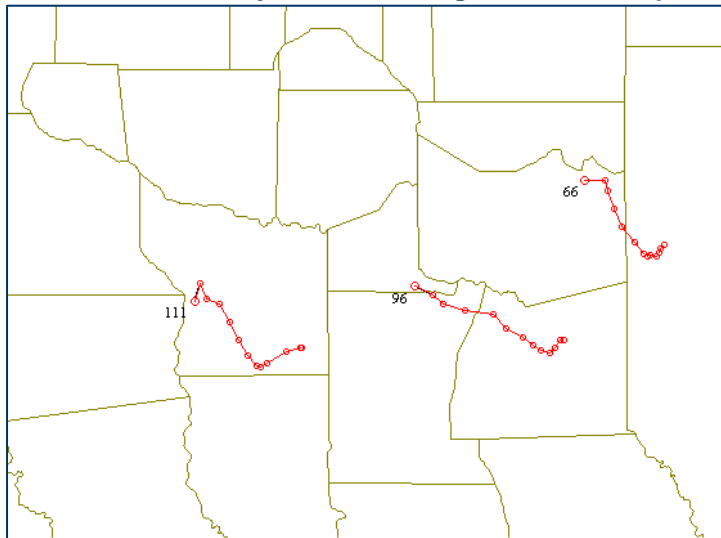
Tyler



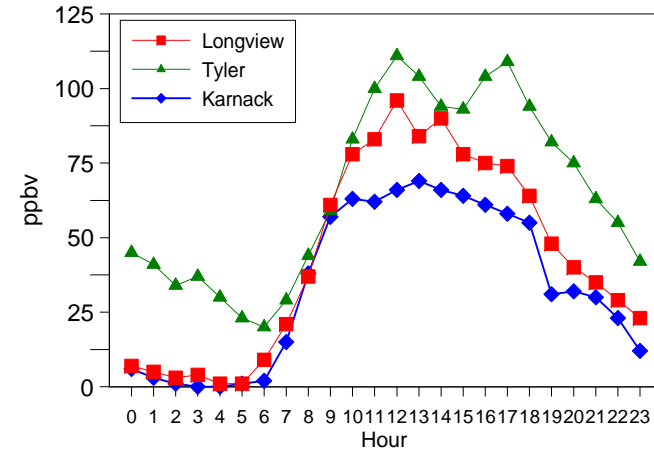
- Tyler peaks ~40 ppb higher than background of ~70 ppb
- Southeasterly am winds and easterly winds during Tyler ozone peaks
- Double peak at Tyler causes 8-hour exceedance-first peak from source(s) to southeast, second peak probably Tyler urban plume

# August 4: 82 ppb at Longview

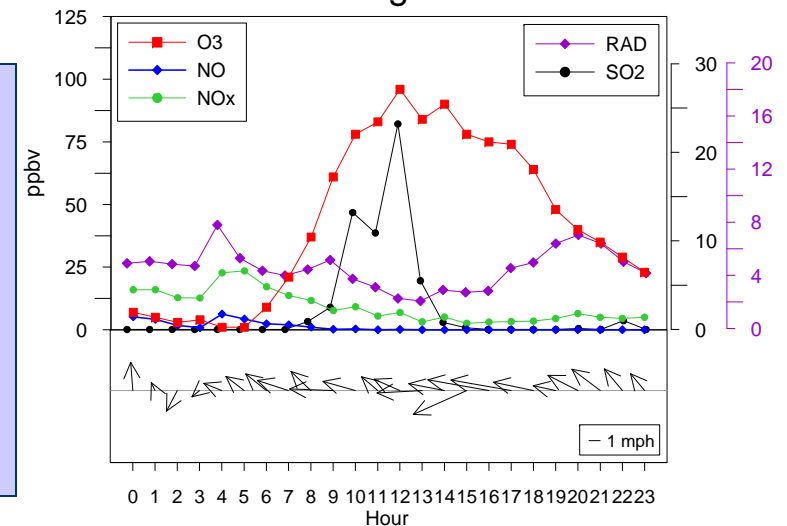
12-Hour Back Trajectories for August 4, 2008, 12 pm



1-hour Ozone



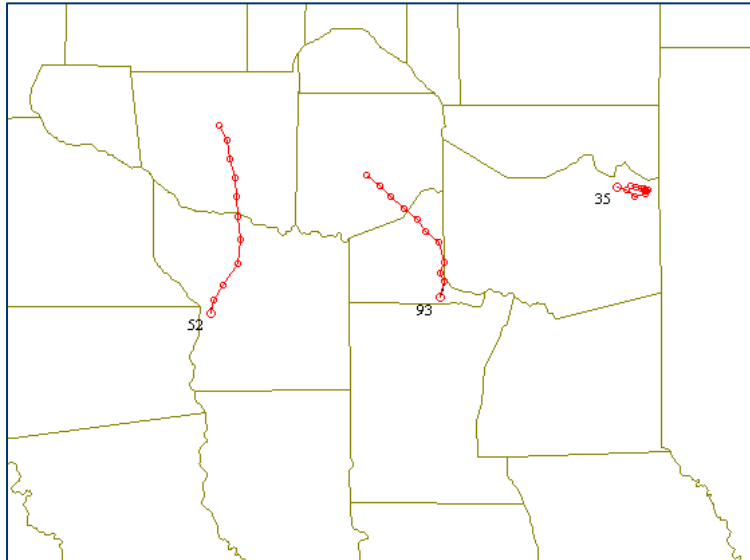
Longview



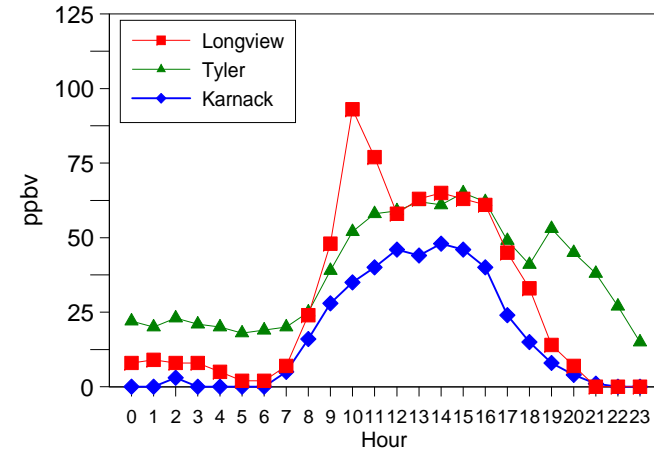
- Longview peak ~ 30 ppb higher than background of ~ 70 ppb
- Southeasterly winds during Longview ozone peak
- SO<sub>2</sub> coincident with peak ozone at Longview and wind direction suggest Martin Lake impact

# September 19: 66 ppb (8-hr) at Longview

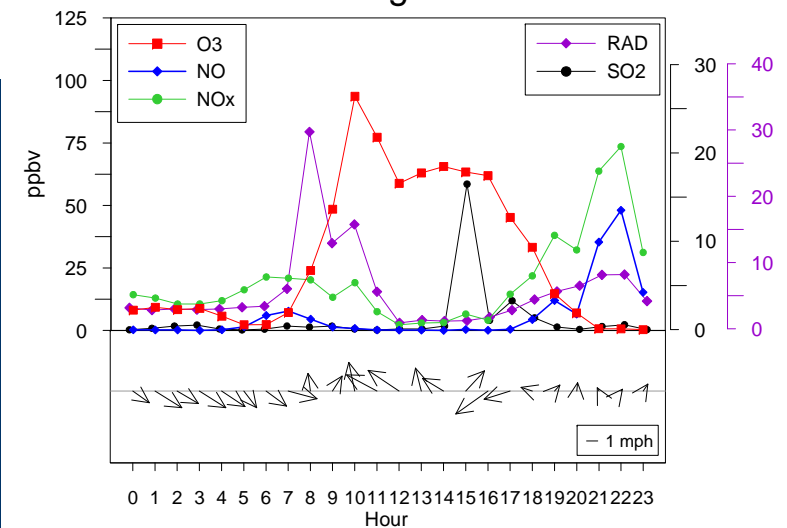
10-Hour Back Trajectories for September 19, 2008, 10am



1-hour Ozone



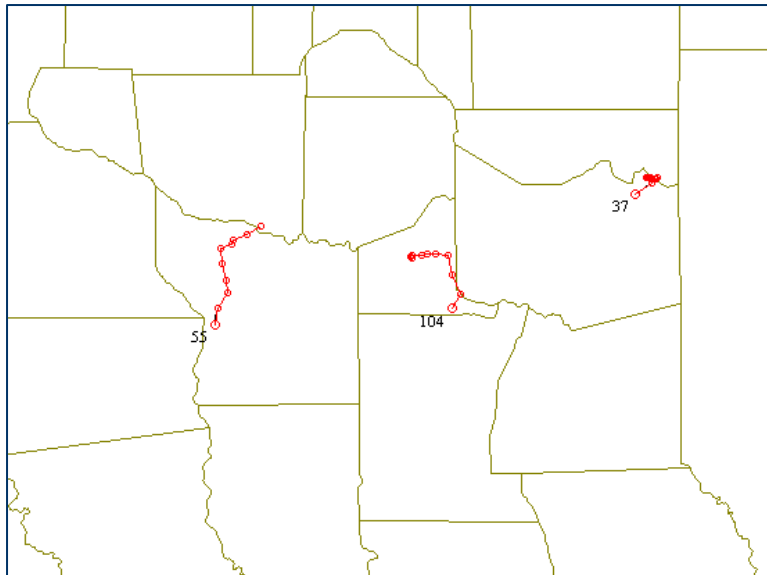
Longview



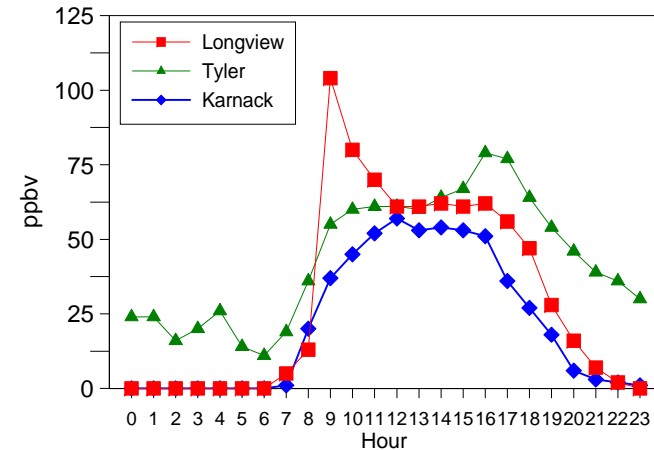
- Longview peak ~ 40 ppb higher than background of ~ 50 ppb, 93 ppb 1-hour ozone
- Alkenes present just before and during peak ozone along with north winds suggest Eastman HRVOC impact
- Morning ozone peak at Longview due to HRVOCs from Eastman Complex

# September 28 : 70 ppb (8-hr) at Longview

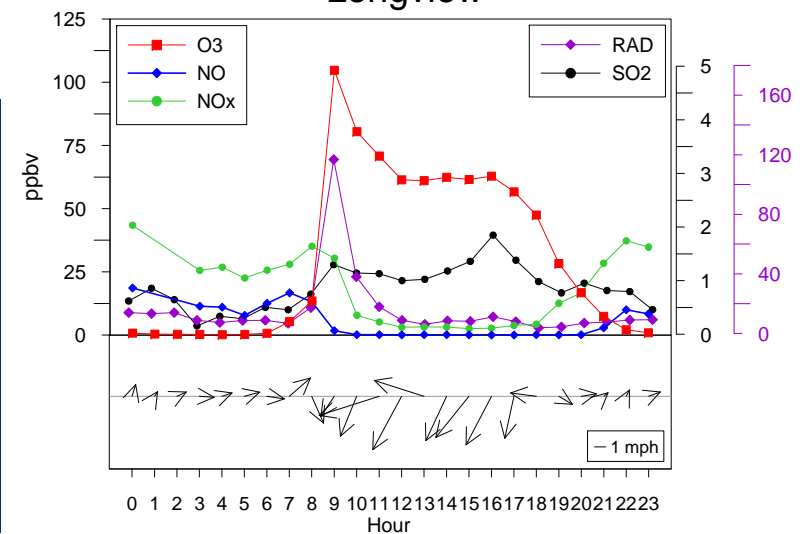
9-Hour Back Trajectories for September 28, 2008, 9am



1-hour Ozone



Longview



- Longview peak ~ 40 ppb higher than background of ~ 60 ppb, 104 ppb 1-hr ozone
- Wind shifts from west to northeast at 8 am
- Ozone and HRVOC concentrations rise together abruptly at 8 am then fall off rapidly from their peaks
- Morning ozone peak at Longview due to HRVOCs from Eastman Complex

End