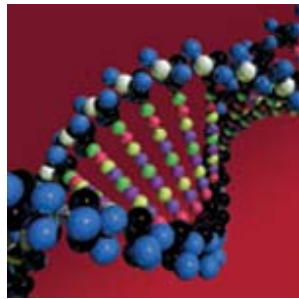


Ozone Transport Analysis



Presentation to the NETAC Technical Committee

March 12, 2010

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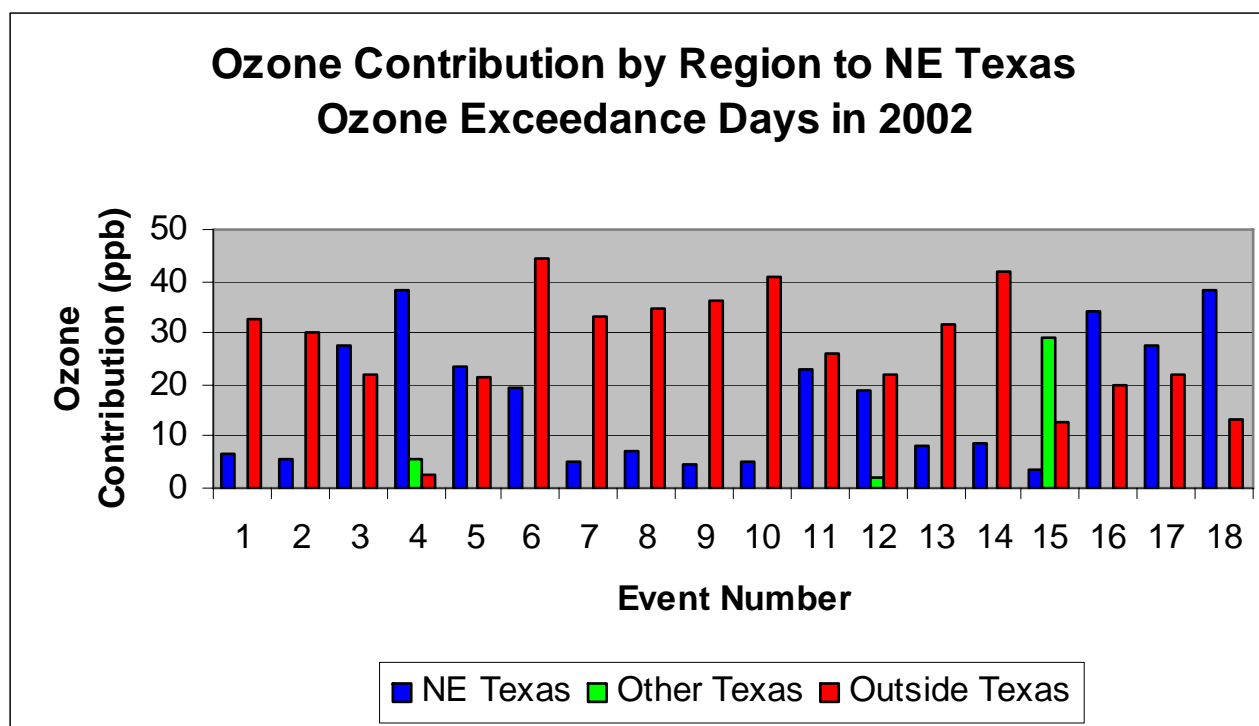


Background

- NETAC analyses (e.g. aircraft flights, modeling) have shown that the area can be brought to the brink of an exceedance of the 75 ppb standard through transport alone
 - Revised lower standard will enhance importance of transported background ozone
 - How helpful are local control strategies in achieving attainment of the ozone standard?
- Assess role of transport of ozone and precursors from regions outside of Northeast Texas on high ozone days
- Compare previous NETAC 2002 model results with new 2005/2012 model results



Previous 2002 Ozone Transport Analysis



- NETAC May-September 2002 Seasonal Model, 36/12 km grid
- In 11 of 18 events, sources outside TX contributed more to high NE TX ozone than local sources
 - Both local sources and transport are important
 - Transport usually from outside Texas



New 2005/2012 Ozone Transport Analysis

- Use CAMx APCA source apportionment tool
- Investigate relative contributions of local emissions and transported ozone
 - Examine high ozone days in May-June 2005 episode
 - How does source apportionment change from 2005 to 2012?
- Look at all days where 8-hour ozone exceeds a certain threshold in both 2005 and 2012
 - 75 ppb (2008 standard), 65 ppb (mid-range for proposed new standard)
 - Determine relative importance of sources within and outside the 5-County area over entire high ozone period

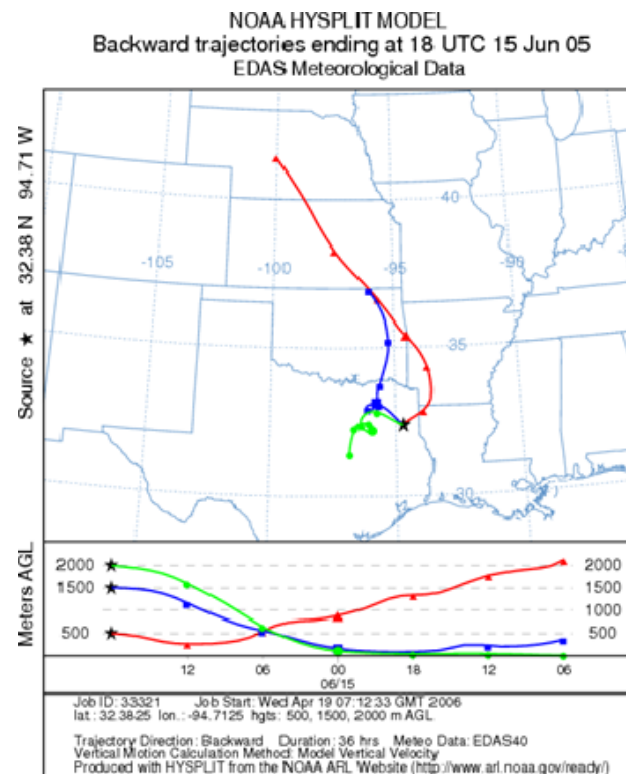
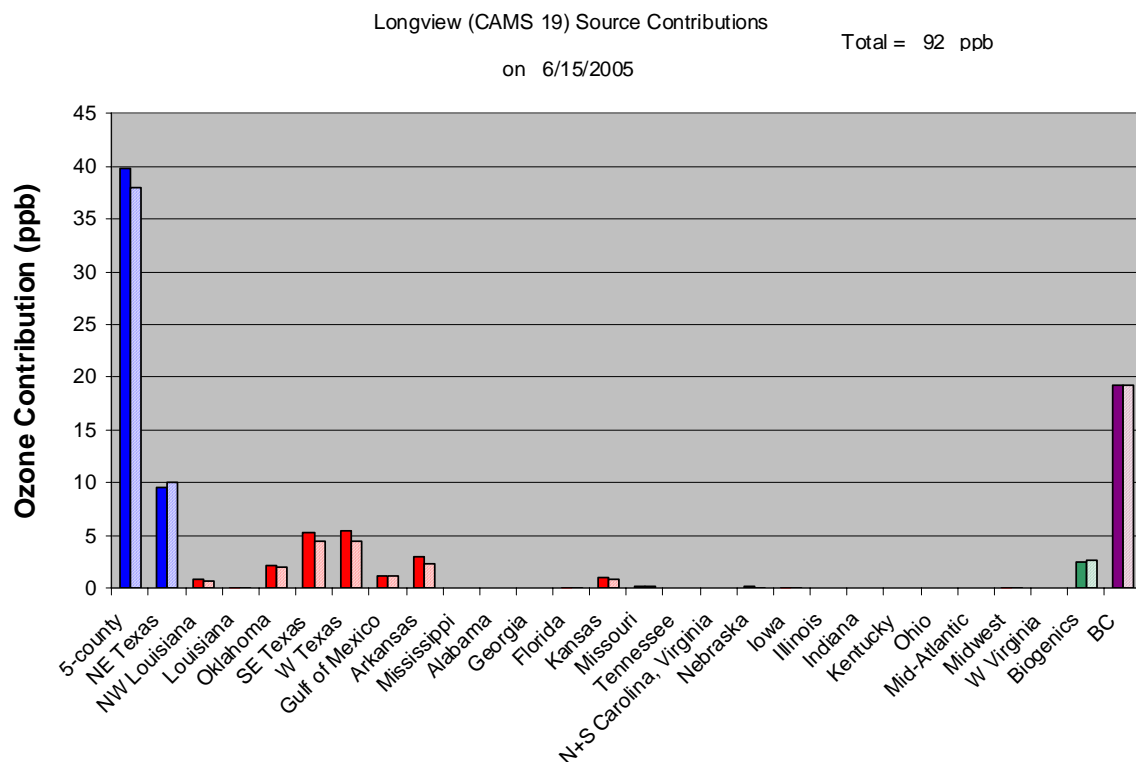


May-June 2005 High Ozone Days

- For May-June episode days that had highest ozone at each Northeast Texas monitor in 2005:
 - Source Apportionment
 - What regions contributed to high ozone in Northeast Texas?
 - Is the contribution of transport from outside Texas and/or from other regions of Texas larger than the contribution from Northeast Texas?
 - Compare with HYSPLIT model back trajectories
 - Is the CAMx source apportionment consistent with the HYSPLIT results?



Source Apportionment Example: June 15, 2005

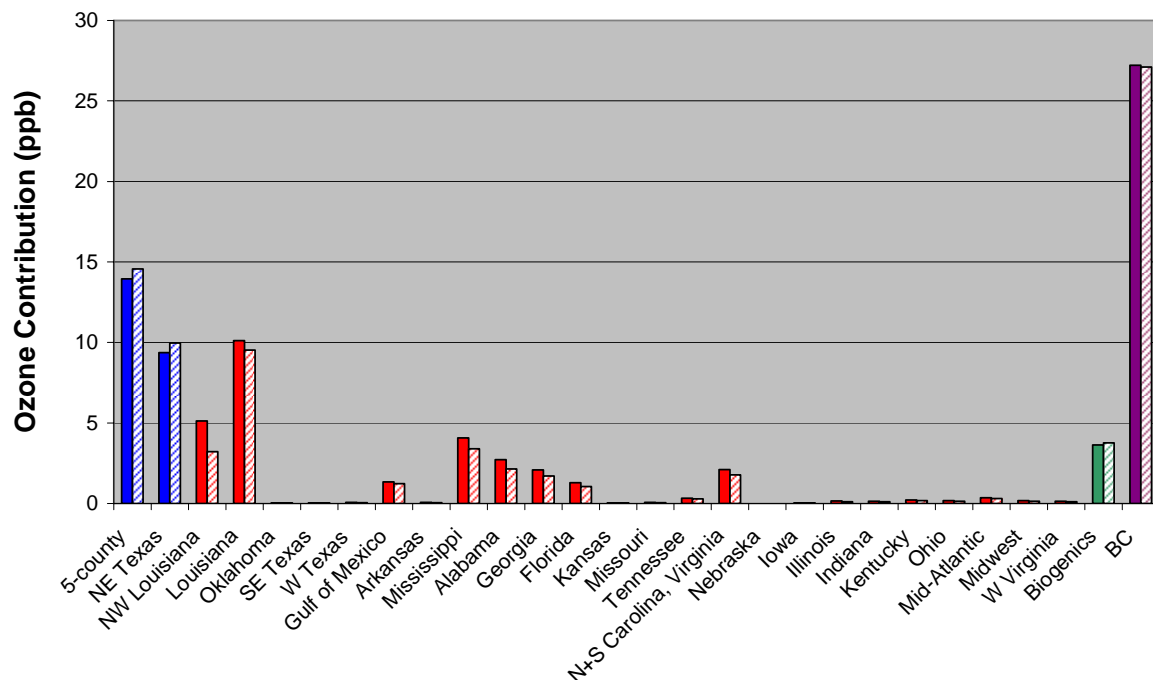


- High ozone day at Longview, light winds, local sources make significant contribution
- Source apportionment results are consistent with HYSPLIT back trajectories
 - Nearby states make largest contribution



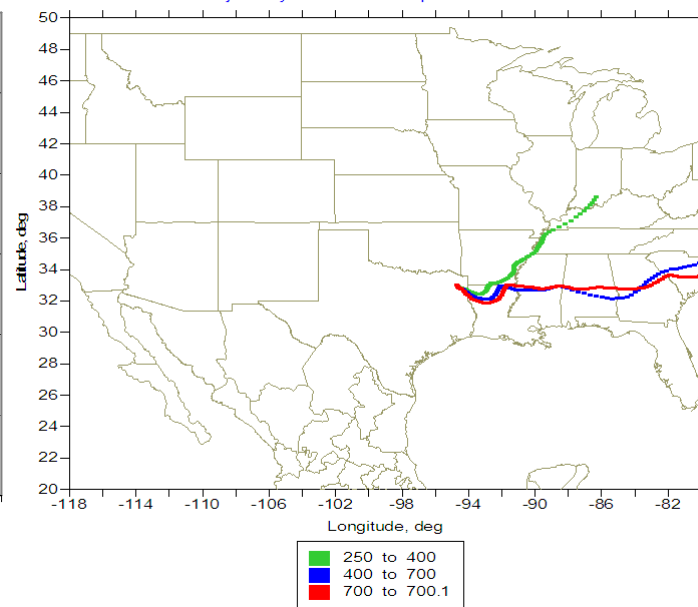
Source Apportionment Example: June 22

Longview (CAM5 19) source contributions
 Modeled 86 ppb
 on 6/22/2005



Four Day Back Trajectory of Longview

Start Date(yyyymmdd): 20050622
 Trajectory Starts at 3:00pm Local Time

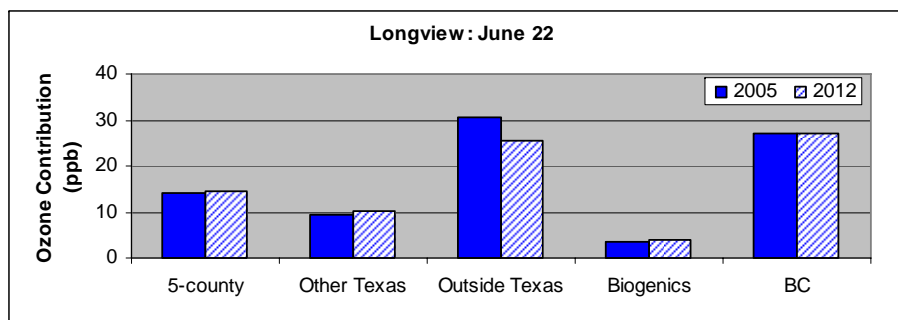
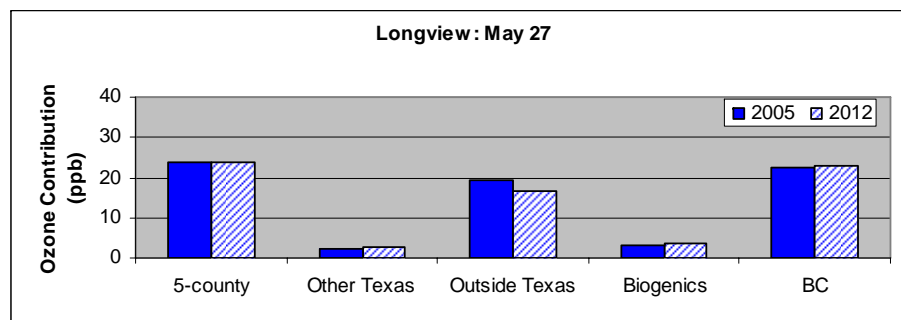
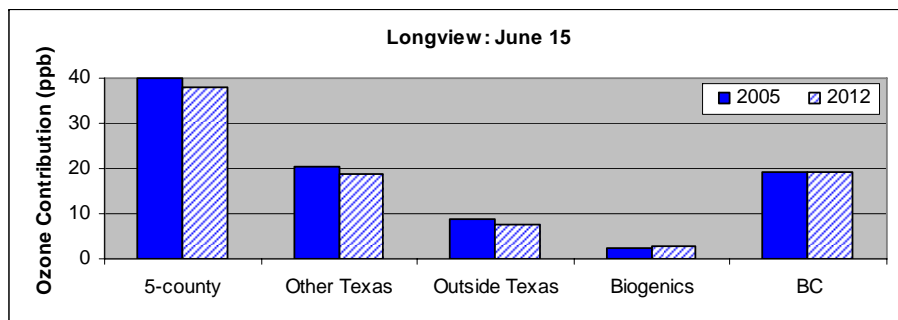
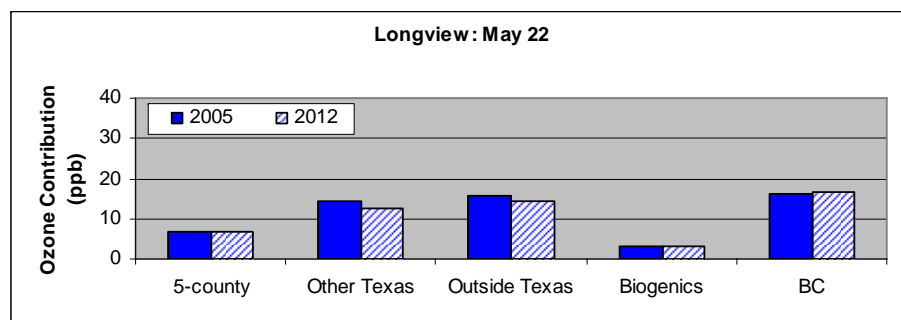


Source: TCEQ Data Analysis / HYSPLIT Model / Created on Test 22 Sep 2009 - Ver 1

- Long range transport from Ohio Valley and Southeast
- High ozone day at Longview, transport and local sources are important-total transport contribution is larger than local
- Source apportionment results are consistent with HYSPLIT back trajectories



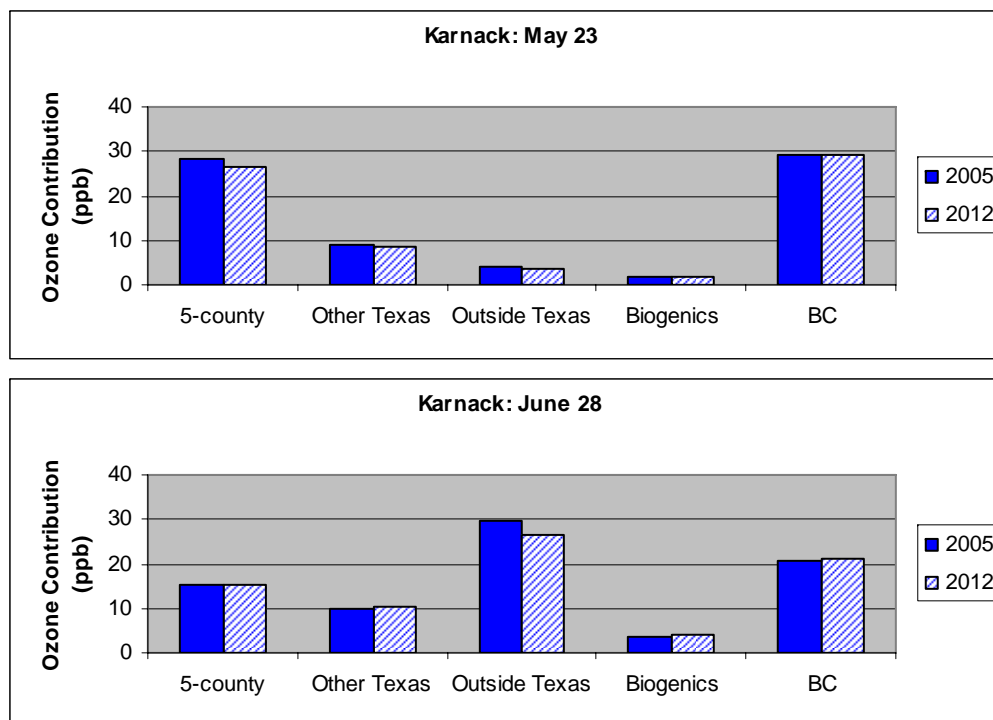
Longview High Ozone Days



- Relative importance of local sources and transport varies by day
 - Both are important
- Transported contribution from outside Texas decreases on all days in 2012
- Local contribution lower in 2012 than 2005 on some days, higher on others (without Haynesville Shale)



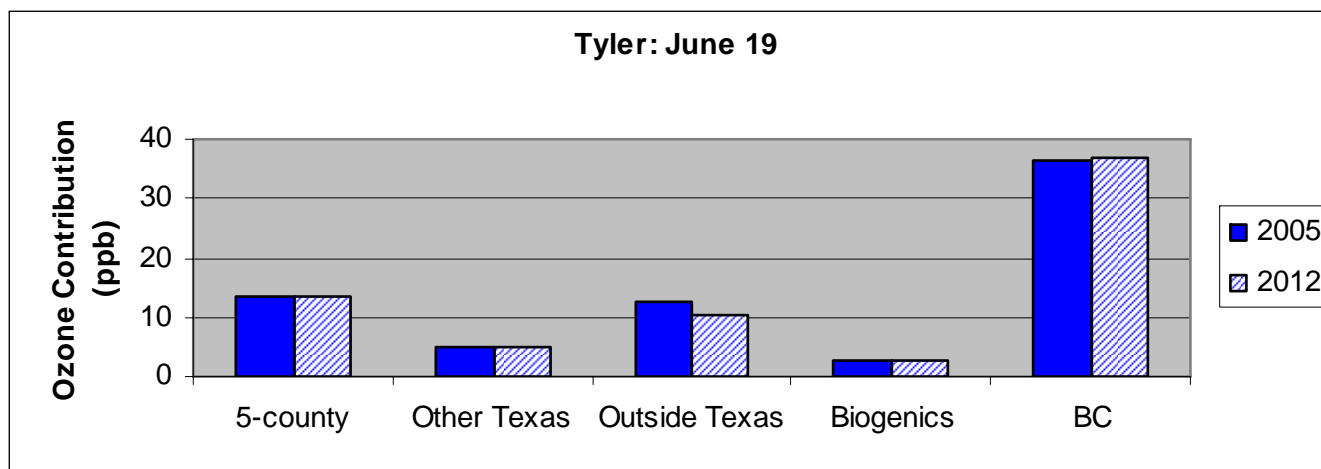
Karnack High Ozone Days



- Relative importance of local sources and transport varies by day
 - Both are important
- Transported contribution from outside Texas decreases on both days in 2012
- 2012 local contribution lower than or comparable to 2005



Tyler High Ozone Day



- 3 of 4 highest days in 2005 at Tyler occurred outside the May-June episode, which was selected to focus on Longview
- Both local sources and transport contributed to high ozone on this day
- Transported contribution from outside Texas decreases in 2012
- Little change in local contribution from 2005 to 2012



Summary of High Ozone Days

- On highest ozone days in 2005 episode:
 - Both local sources and transport made significant contributions to high ozone at the monitors
 - Relative contributions varied by day, influenced by meteorology
 - Transported contribution from outside Texas always decreased in 2012 relative to 2005
 - 5-County area contribution decreased in 2012 on some days, increased on others



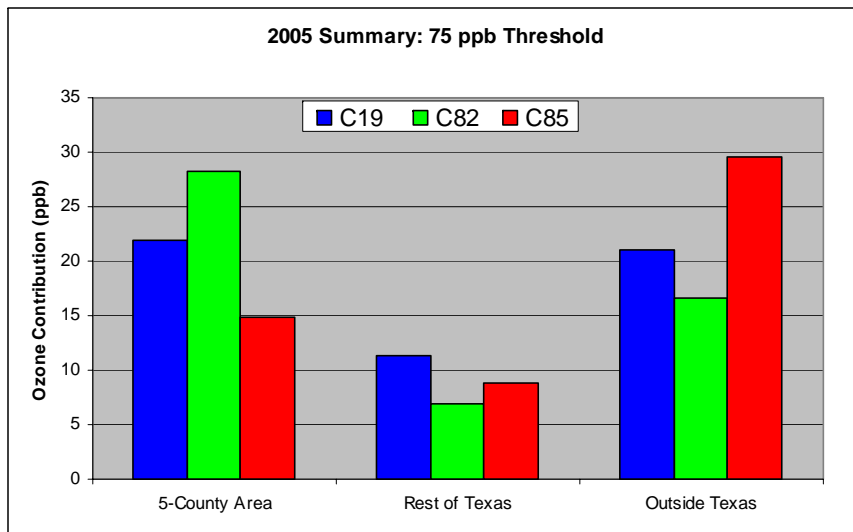
Source Apportionment for High Ozone Hours For Entire Episode

- Now consider entire episode and all three monitors
- Examine all episode days with 8-hour average ozone exceeding 75 ppb and 65 ppb thresholds
 - 2008 standard and mid-range of proposed standard
- Over whole episode, what are the relative contributions or local sources and transport?
 - How do these contributions change from 2005 to 2012?
 - How does the change in threshold affect the source apportionment?

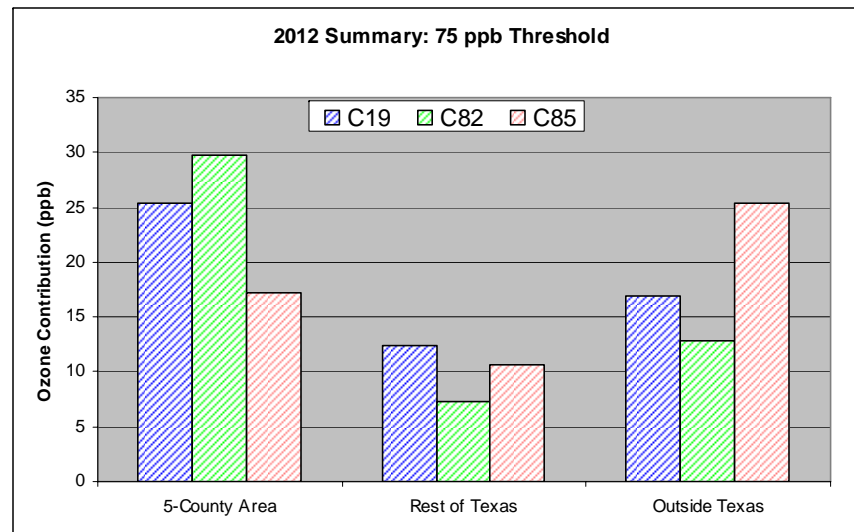


Contributions to Ozone at Monitors When Ozone > 75 ppb

2005



2012



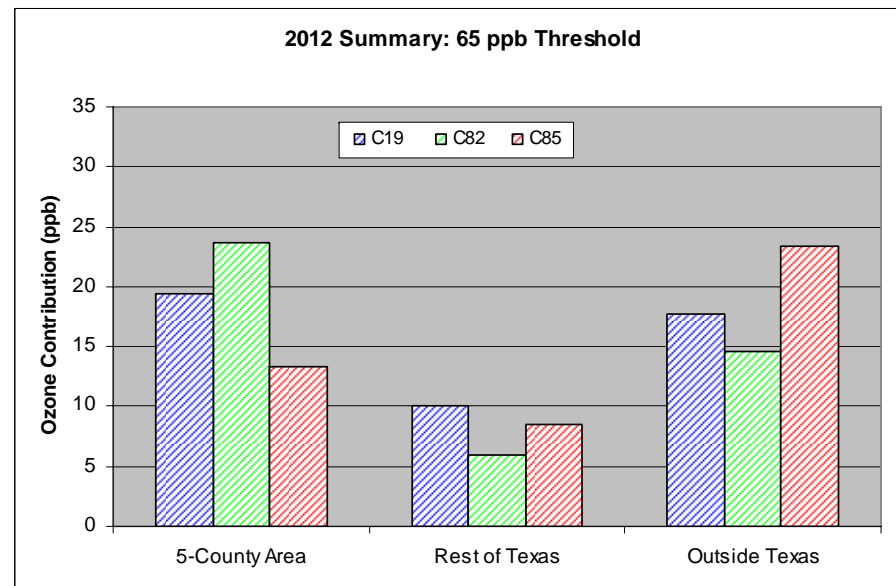
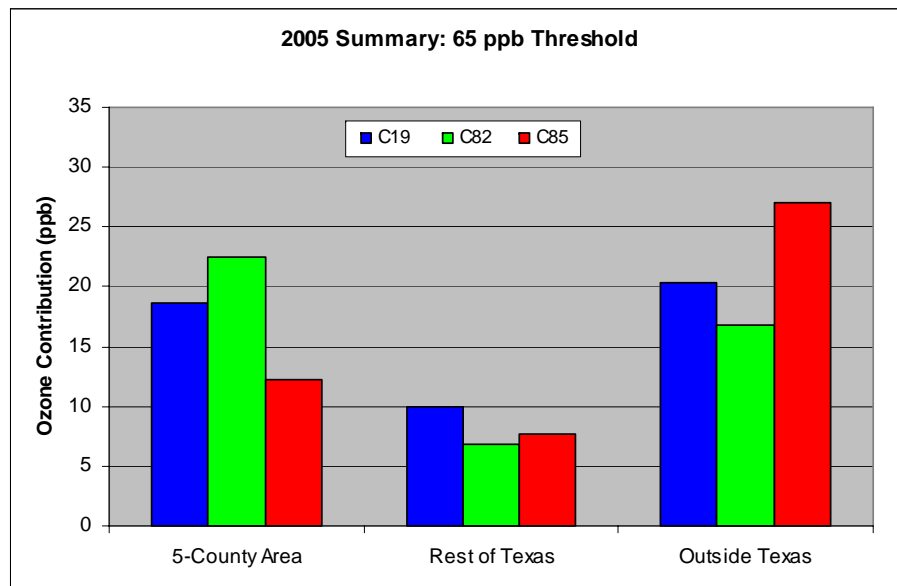
- Local sources and transport both important
- Transport from outside Texas decreases at all three monitors going from 2005 to 2012
- Transport contributions larger at Karnack and Longview than Tyler
- Local sources make largest contribution at Tyler
 - Tyler tends to be downwind of more of the 5-County area on high ozone days
- Local contributions increase from 2005 to 2012 at all three monitors



Contributions to Ozone at Monitors When Ozone > 65 ppb

2005

2012



- Transport from outside Texas decreases going from 2005 to 2012, but decrease is smaller with lower threshold
- Little change in transport from within Texas-less change than for 75 ppb threshold
- Local source contributions show small increases at all three monitors
 - Increases smaller than with 75 ppb threshold



Summary of Ozone Transport Analysis

- Transported background from outside Texas decreases going from 2005 to 2012 on high ozone days and across entire episode
- On average, local contribution increased slightly going from 2005 to 2012
- 2005/2012 results consistent with 2002: both transport and local sources are important
 - Local controls can be effective, but regional strategies also required



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