Modeling Northeast Texas Ozone for May-June 2005 and 2012

Presentation to the NETAC
Technical Committee

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Background

- Longview monitor recorded 8-hour design value (DV) of 85 ppb for 2004-2006.
- Longview 8-hour DV has increased steadily from 2002-2004 to 2004-2006.
- Tyler shows slight increase in DV.

  Karnack (regional ozone) decreasing.

Objectives for CAMx Ozone Modeling

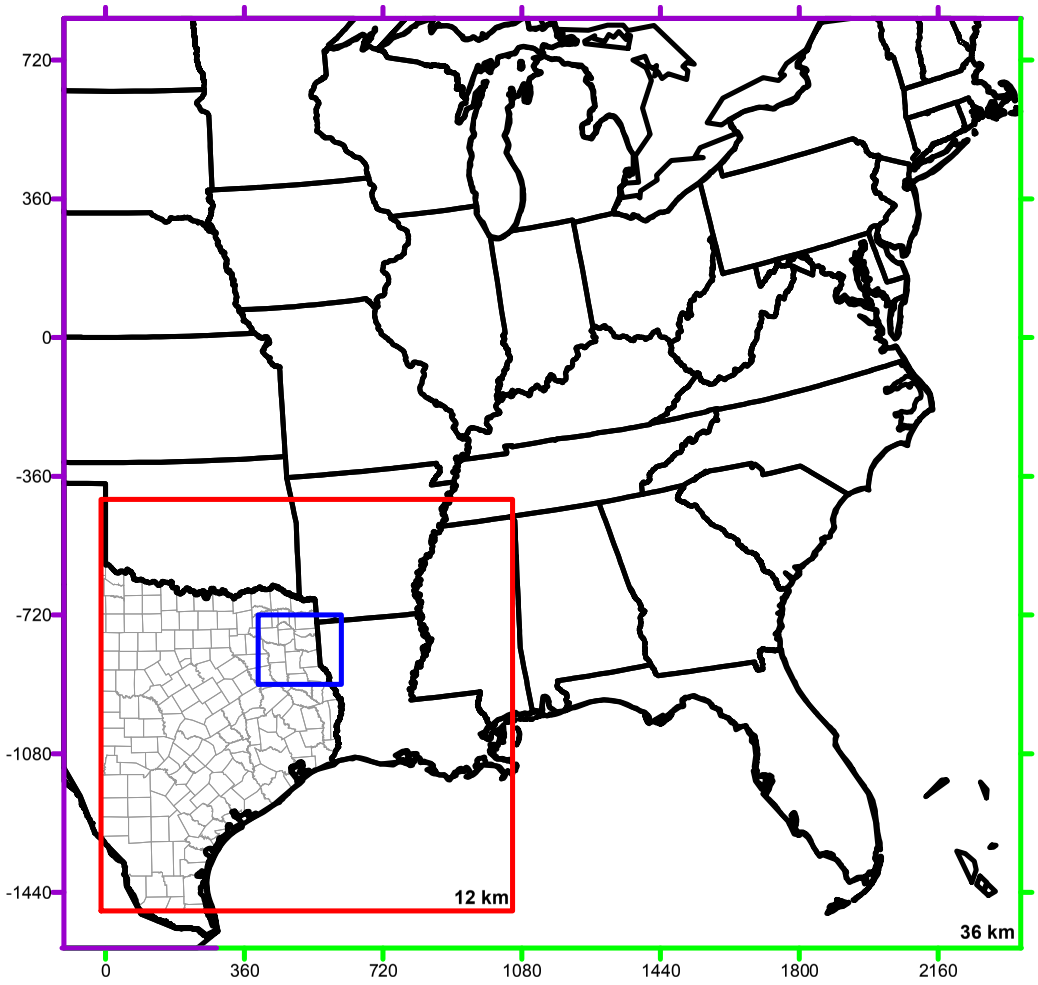
- Improve understanding of conditions leading to elevated 8-hour ozone concentrations in NE Texas in 2005.
- Focus on ozone attainment at the Longview monitor.
- Evaluate the likelihood of future exceedances of the ozone NAAQS with currently expected emissions.
- Develop emissions reduction strategies to ensure that the area does not exceed the ozone NAAQS in the future.

Modeling Recommendations (12-19-06)

- Begin by developing a Modeling Protocol

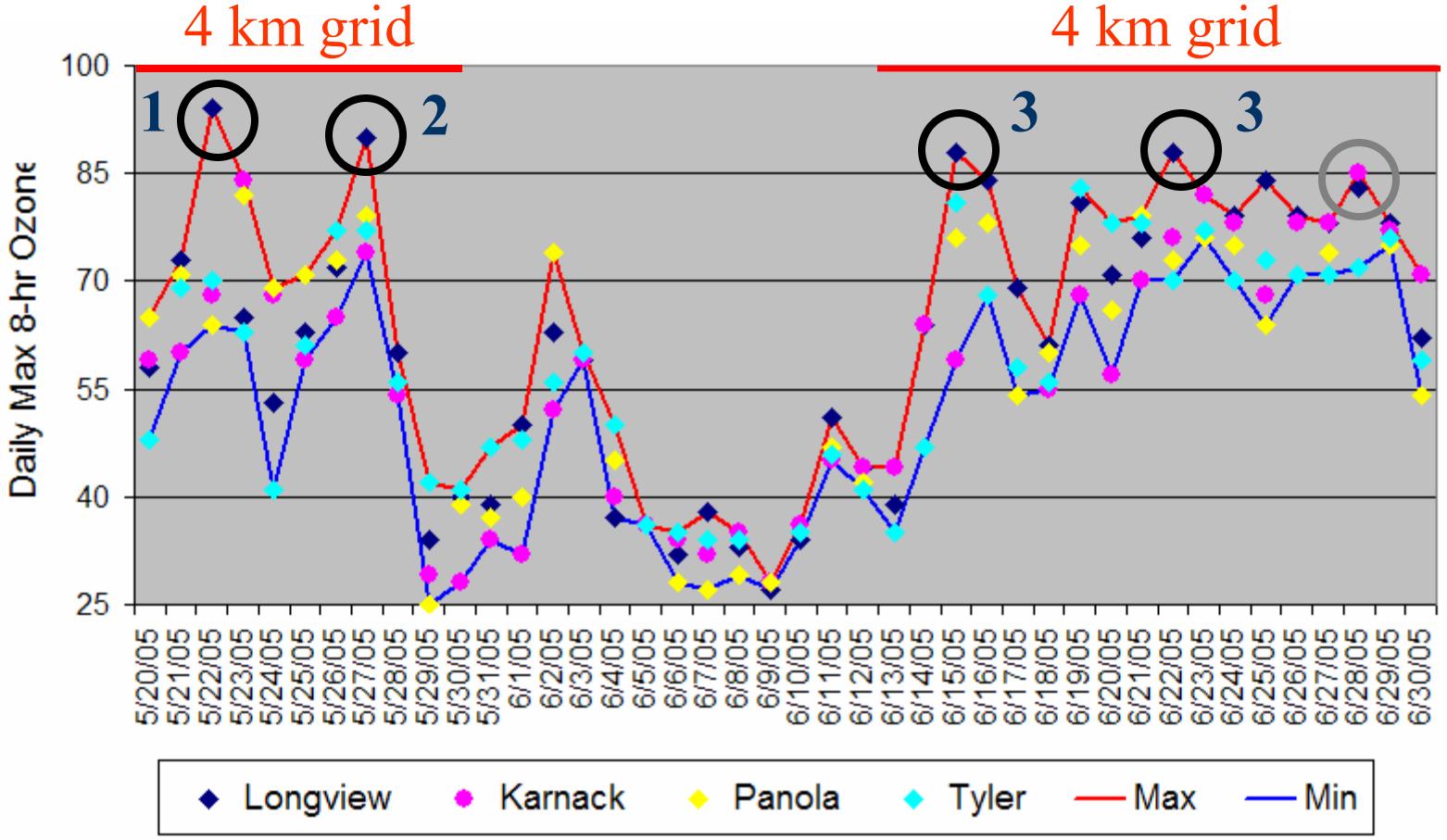
- Modeling should focus on Longview high ozone episodes
  - Develop an extended May-June "mini-seasonal" model with 36/12-km resolution
  - Add a 4-km grid for all five 8-hr exceedance days in May/June, plus other days close to 85 ppb

2005 Ozone Modeling Domain



- 36 km/12 km/4km nested grids in CAMx
- MM5 meteorology
- Refined 2005 Emissions
- Model period May 20-June 30, 2005

Daily Max 8-hr Ozone in May/June 2005



Data for May 20 to June 30, 2005

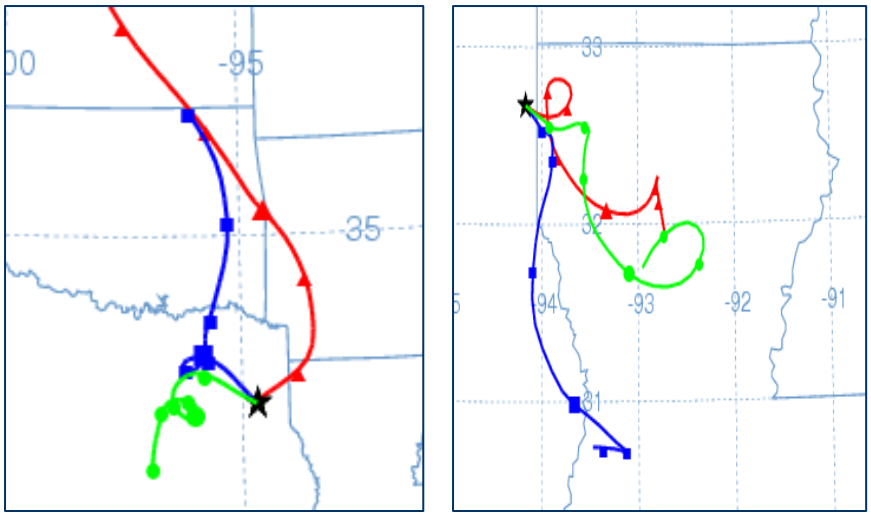
2005 Emission Inventory

- Built from 2002 National Inventory (NEI)
- Incorporate new data from TCEQ as they become available
- Day-specific point source CEM data
  - Point sources (EGUs) play an important role in ozone formation in NE Texas
- Compressor engine inventory

MM5 Meteorology

- High ozone associated with wind shifts during the modeling period
- Challenging to simulate
- Profiler data is critical to nudge model toward observed winds
- Longview profiler data available after June 15, 2005
- Start with model inputs provided by TCEQ

June 15 **June 28**



Trajectory End:
500 m
1000 m
2000 m

CAMx Model Performance Evaluation

- Compare 2005 base case predictions with CAMS observed ozone
- MPE will follow EPA guidelines
- Performance statistics, graphical displays

Future Year Modeling

- Evaluate emissions control strategies
- Perform an attainment demonstration for 2012
- CAAP requires compliance with the 8-hour ozone standard through 2012
- Supplemental analyses to corroborate attainment demonstration

Future Year 2012 Emission Inventory (1)

- Use 2005 inventory to build 2012 inventory
- Account for growth and controls
- Evaluate recent trends in gas compressor engine activity using TRRC data
- Include new power plants and offsets

Future Year 2012 Emission Inventory (2)

- Account for changes to large stationary sources under CAIR and BART.
- CAIR: cap and trade program for NOx and SO_2 for major EGUs in affected states. Aimed at reducing interstate transport of pollutants.
- BART: sets emission limits on older, grandfathered sources (EGU/non-EGU) that may affect visibility in Class I areas. Effects expected to be minor for NE Texas sources.

FY 2012 Emissions Changes under CAIR and BART

- Contacted States (TX, LA, AK, and OK).
- CAIR NOx allocations have been made for TX, LA, and AK.
- BART emissions controls still being determined.
- IPM run for 2012 made for MANE-VU available. NOx emissions at the unit level using assumed control technology.

NOx Allocations Under CAIR

Facility	Average Adjusted Heat Input*	Apparent lbs/MMBtu	2009-2014 Allocation (tons NOx)/year
Martin Lake (1)	56,177,340	0.148	4,161
Martin Lake (2)	54,590,885	0.148	4,044
Martin Lake (3)	58,921,031	0.148	4,364
HW Pirkey	46,494,182	0.148	3,444
Dolet Hills	50,462,425	0.156	3,931

***TX data is highest 3 year average from 2000-2004. LA data is average of 2002-2004.**
Apparent lbs/MMBtu = NOx / Heat Input

- Apparent lbs/MMBtu similar for TX and LA sources
- Actual emissions will be determined in cap and trade program
- Question: how to model annual cap in episodic model?

Source: TCEQ, LDEQ