

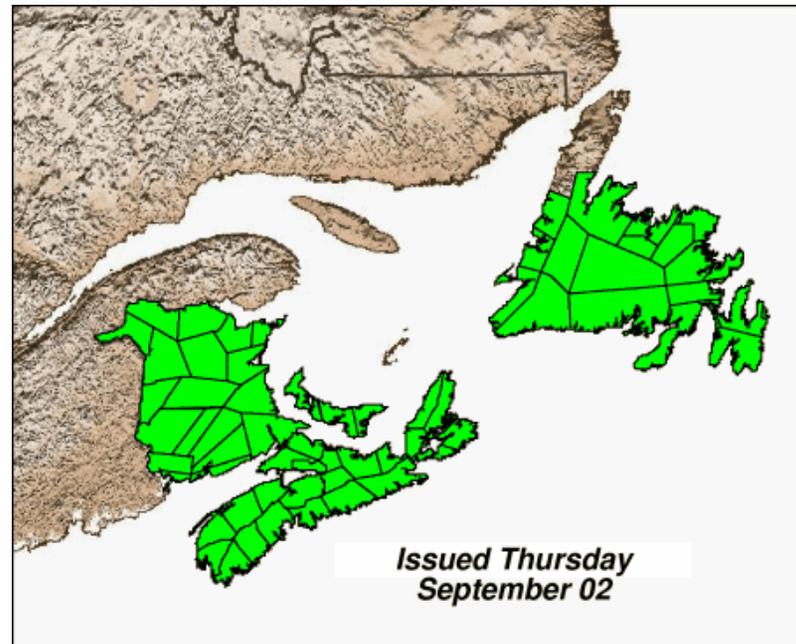
NCEP Parallel AQ Forecasts: Developmental CMAQ-ETA

Verification for the Canadian Atlantic
Provinces July - August 2005

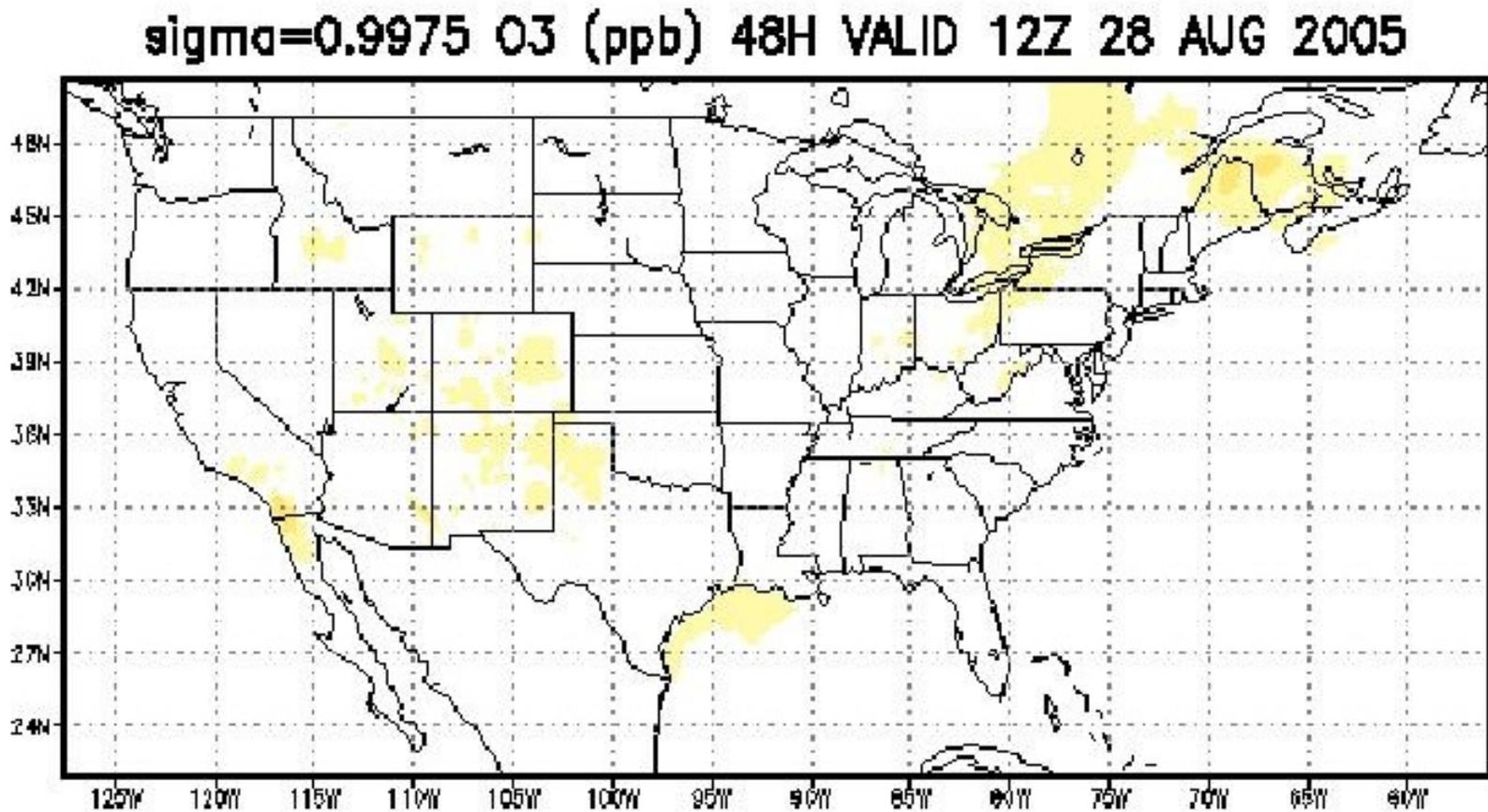
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Air Quality Forecast Regions

- Long-range transport
 - Ground-level ozone and precursors
 - Fine particulates
- Originates from heavily populated regions of eastern N.A.
 - Ontario, Quebec and the Eastern U.S. (Washington-Boston Corridor)
- Estimated that 80% of pollution originates from outside region



Lateral Boundary Conditions for the 5x Domain



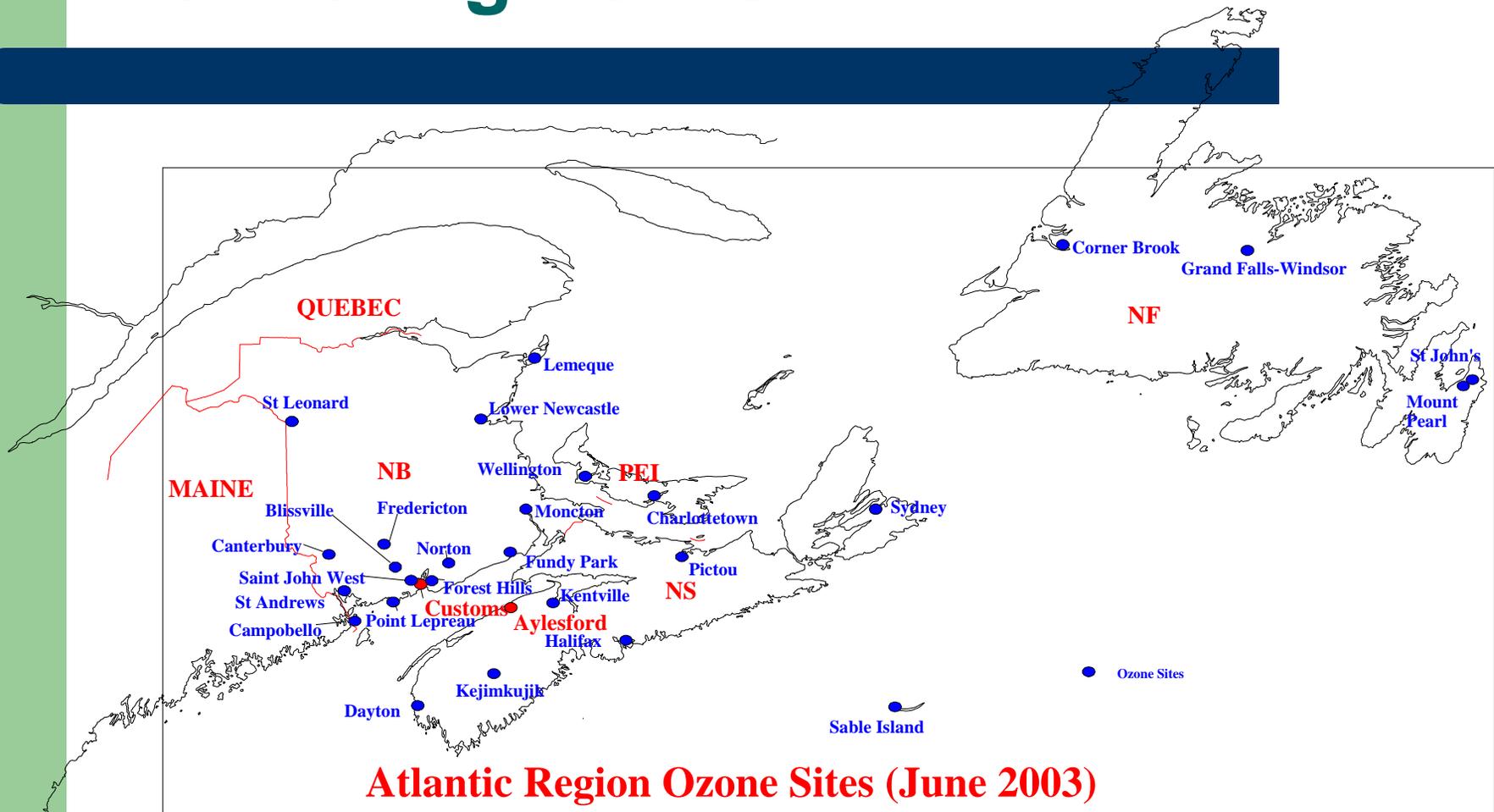
Forecast Category Criteria

- Good AQ ~ 1 hour $[O_3] = 0 - 50$ ppbv
 - Fair AQ ~ 1 hour $[O_3] = 51 - 81$ ppbv
 - Poor AQ ~ 1 hour $[O_3] = 82 - 150$ ppbv
 - Very Poor ~ 1 hour $[O_3] > 150$ ppbv
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- A Technical Synopsis is issued when the Air Quality is expected to enter the “Fair” or “Poor” categories during Day 1 or Day 2:

Methodology

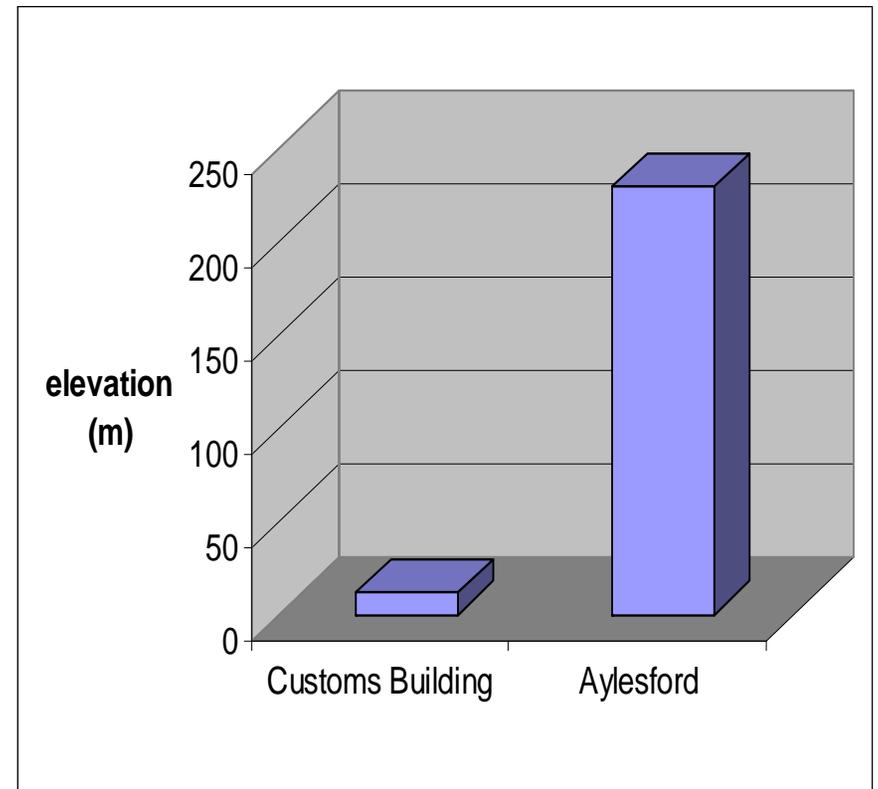
- 12Z model run was used exclusively
- Verified for two points, Aylesford NS (elev 230) and Saint John (Customs Building) NB (elev 12 m).
- Looked at cases where GLO concentrations were greater than 50 ppb or CMAQ predicted concentrations greater than 50 ppb.
- Each case was assessed subjectively as to whether it was considered a “hit”

Monitoring Network



Comparison of Two Stations

- Customs Building
 - Low elevation
 - Marine inversion
 - Urban
- Aylesford, Nova Scotia
 - High elevation
 - Unaffected by marine inversion
 - rural



Coastal vs. Inland Sites

- The marine inversion can mean a difference in ground-level concentrations of advected species between coastal and the more inland monitoring sites
- Station elevation may be inadequately represented depending on model resolution

Results

	Customs Building	Aylesford
# Forecast events	12	14
# observed events	8	16
POD	.63	.75
FAR	.58	.14

Conclusions

- 2005 was a quiet Air Quality season for Atlantic Canada. Few fair AQ events and only one poor event (June 25th). Insufficient number of events for definitive conclusions
- CMAQ performed better for higher elevation station with no marine inversion and no urban effects
- Very useful product

Recommendations

- It has been suggested that a few more colour levels could be added to the scale of the model output below 50 ppb. Otherwise the bins of 50-64, 65-84, 85-104, 105-149, and >150 work well with our existing AQ categories

Thank you!

<http://www.atl.ec.gc.ca/airquality>

Questions?

