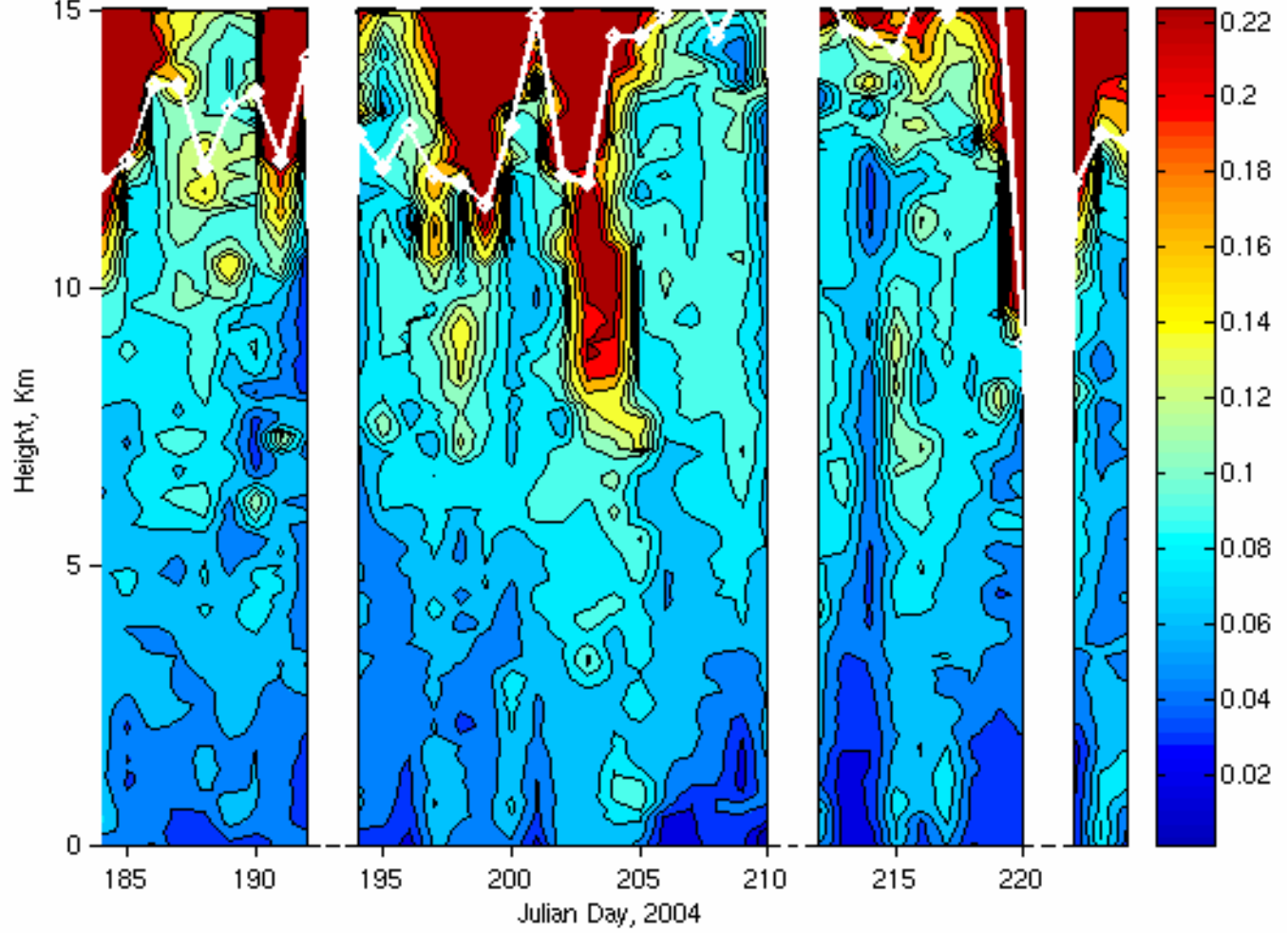


Ozonesonde Profiles From IONS: Characterization and Opportunities for Analysis

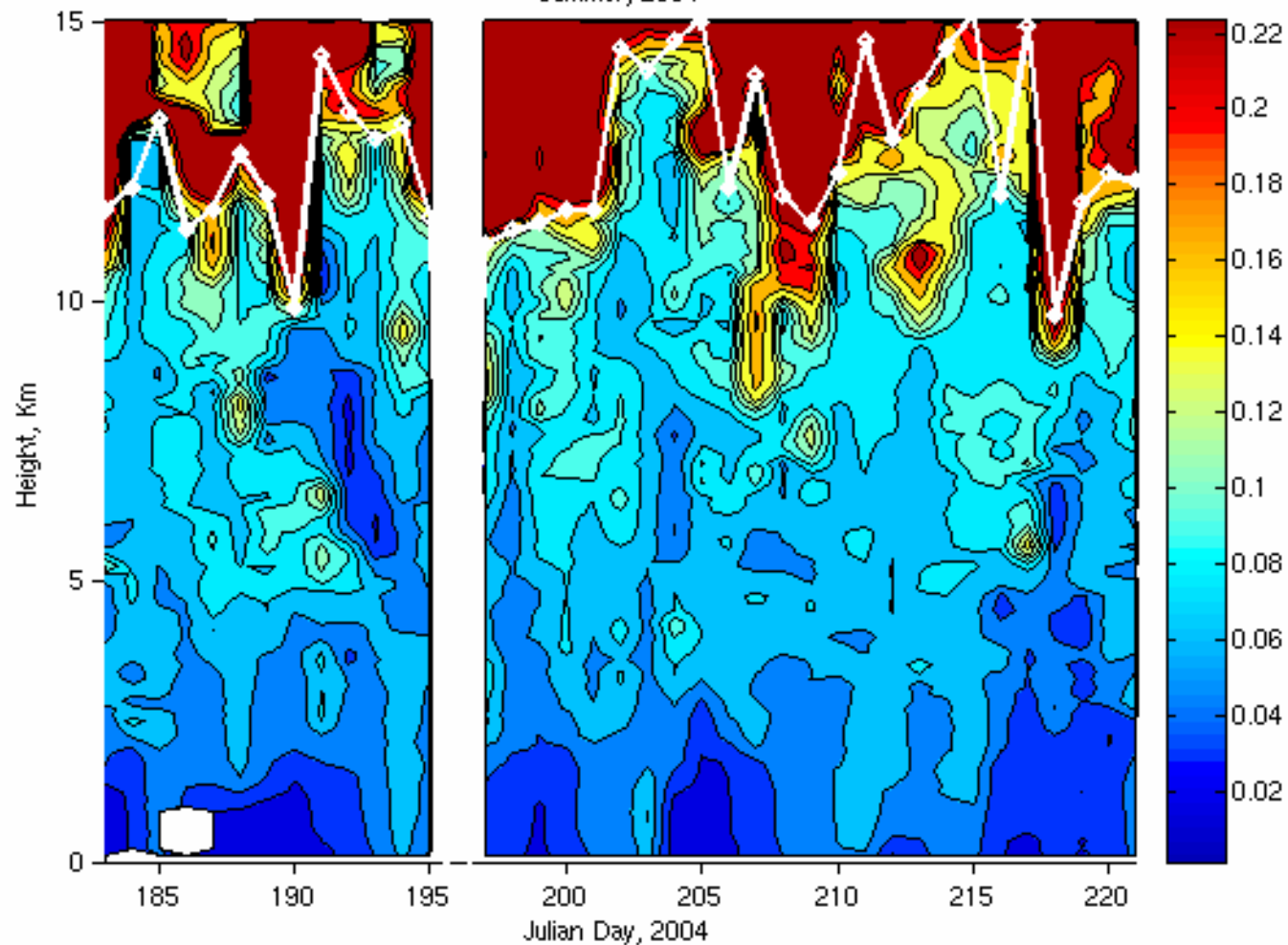
John Merrill

University of Rhode Island

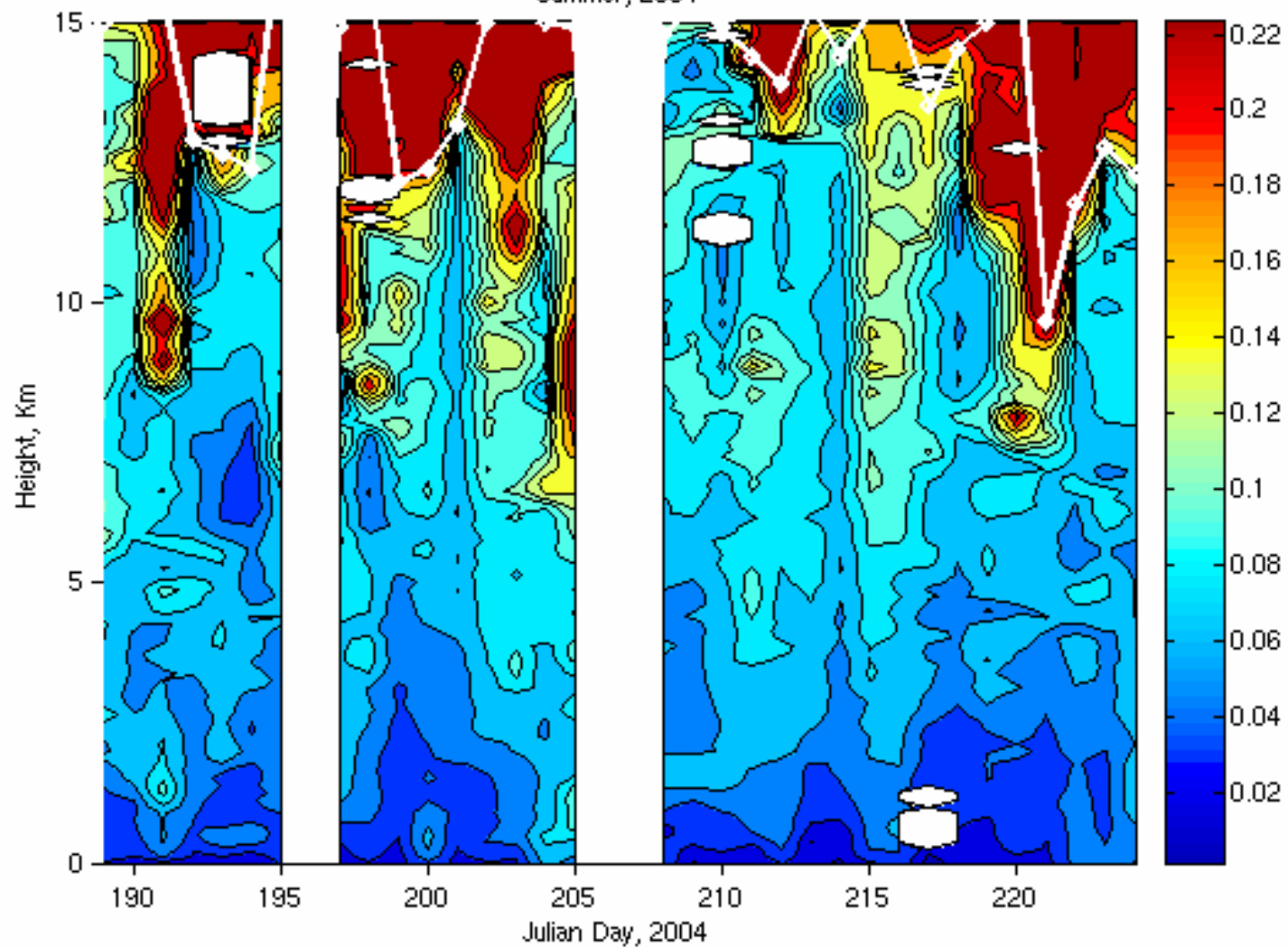
Narragansett Ozone Mixing Ratio, ppmv
Summer, 2004



Pellston Ozone Mxing Ratio, ppmv
Summer, 2004



R/V Ron Brown Ozone Mixing Ratio, ppmv
Summer, 2004



Narragansett, RI Ozone Profile Data - PPBV

Height	10%	25%	50%	75%	90%
15 km	124	140	237	325	438
12 km	72	80	94	120	237
9 km	68	75	85	101	107
6 km	62	69	79	82	92
3 km	49	56	63	69	71
875 m	36	41	54	67	81

Pellston, MI Ozone Profile Data - PPBV

Height	10%	25%	50%	75%	90%
15 km	181	243	290	427	539
12 km	77	111	128	254	356
9 km	63	68	80	93	101
6 km	50	61	67	77	88
3 km	48	52	58	65	68
875 m	27	31	39	53	62

Site Profile Contrasts

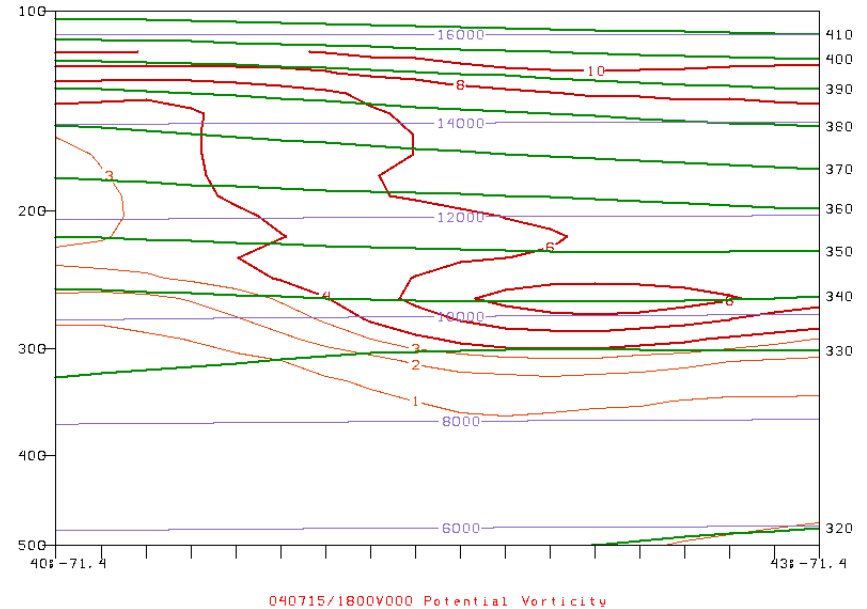
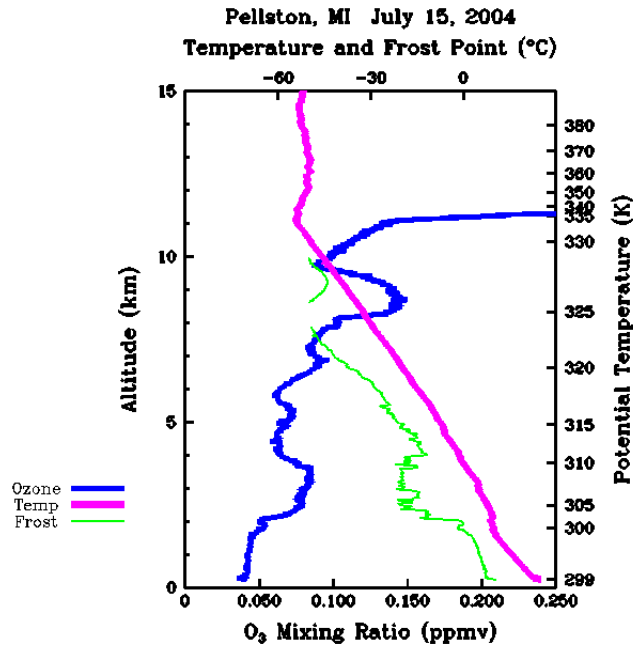
- Median boundary layer mixing ratio, inter-quartile range and 10%-90% ordered thus:
Narragansett > Ron Brown > Pellston
- Variability higher above 6 km than below
- Median mixing ratio > 100 PPBV above 12 km at Narragansett, below 11 km at Pellston

One Focus for Analysis:

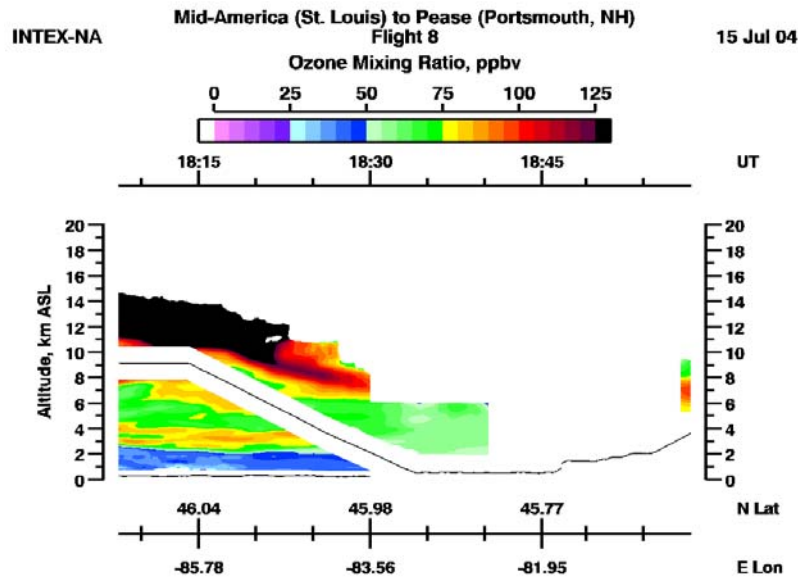
Characterization of Stratospheric
Intrusions.

Multiple encounters of several
intrusions with multiple platforms

July 15 Pellston, MI Profile

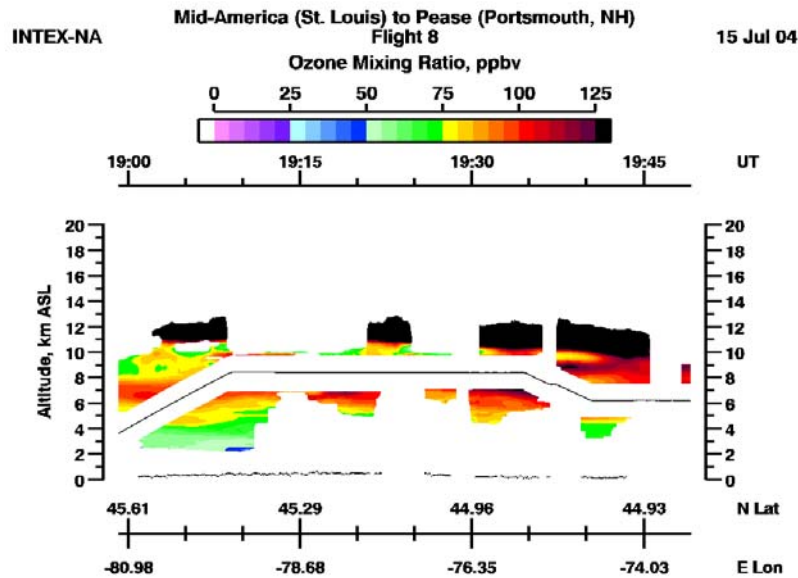


- UT peak in O₃ below 330 K, below peak in Potential Vorticity. Cross section from RUC analysis, 20 km grid. Composition data from DC-8 reveal a productive environment.



- DC-8 profiles over Wisconsin and Michigan - polluted lower troposphere.
- In vicinity of O₃ maximum in Pellston profile, CO ~ 200 ppb.

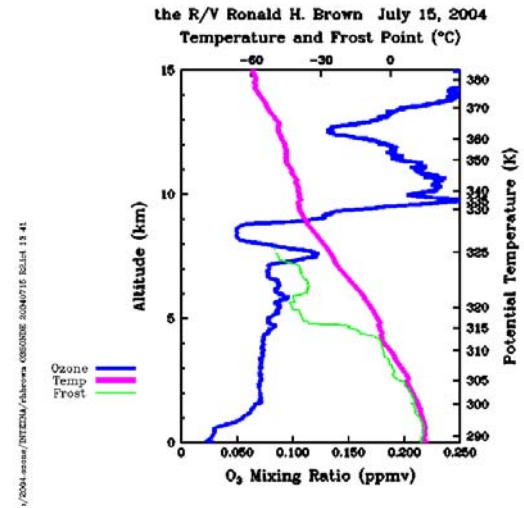
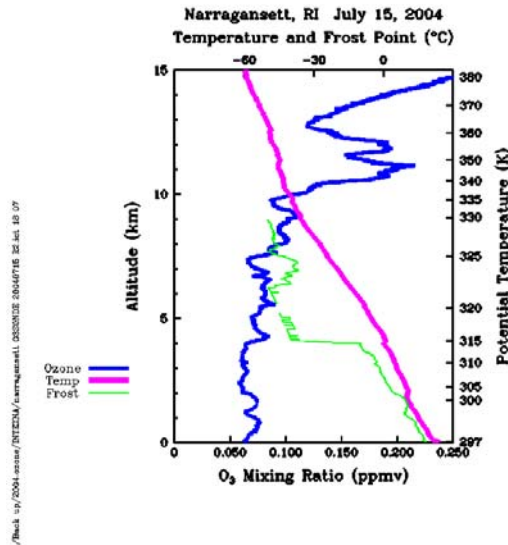
DC-8 Flight 8 July 15, 2004



- These profiles upstream of surface low over upstate NY.
- DIAL O₃ data from transit leg reveal an extended layer in the middle to upper troposphere with elevated ozone

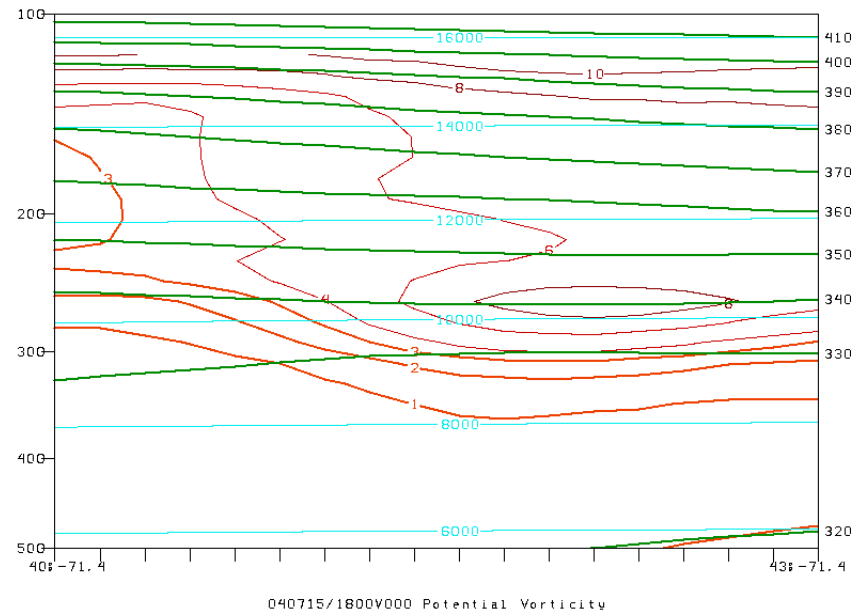
DC-8 Flight 8 July 15, 2004

Sonde profiles from Narragansett and Ron Brown, July 15

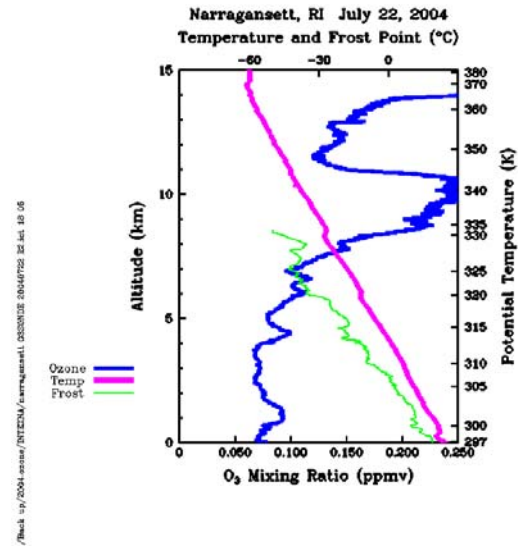
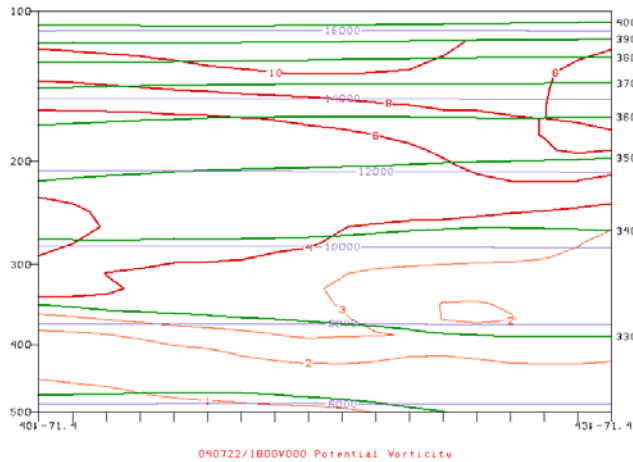


Upper tropospheric cross section over Narragansett reveals PV maximum.

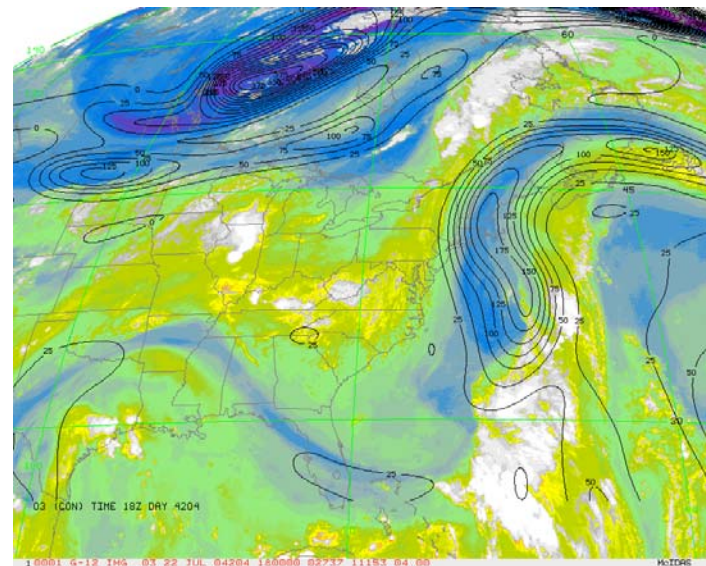
Conformation similar to O₃ profile.

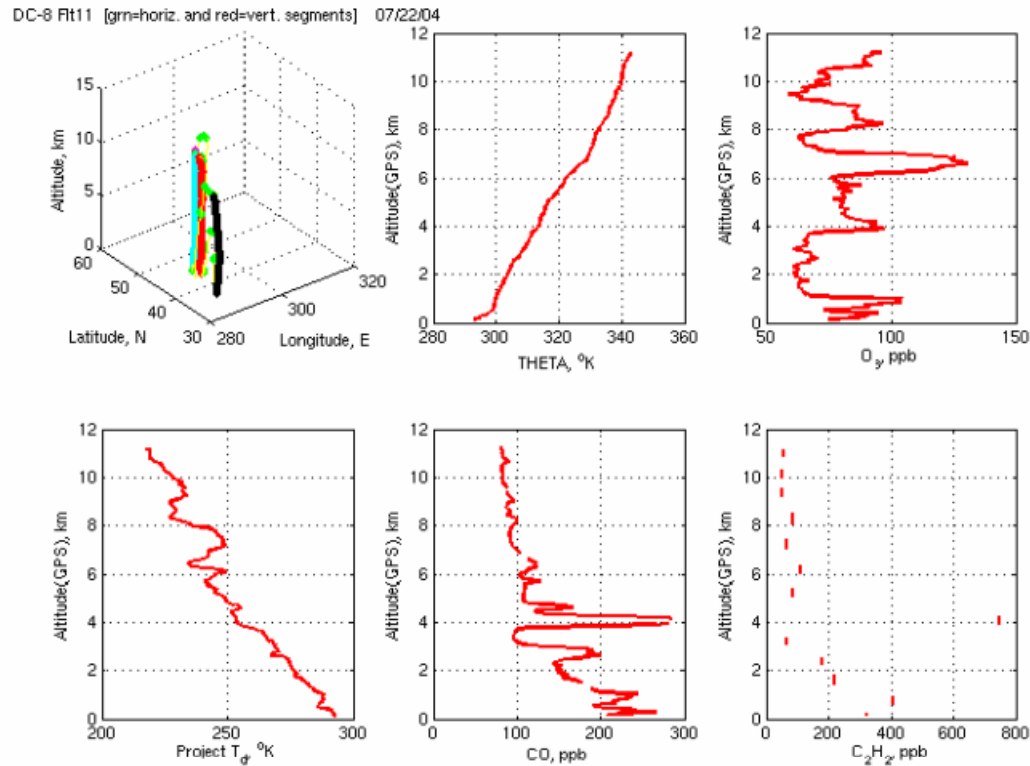


July 22 sonde profile, cross section and GLASH image



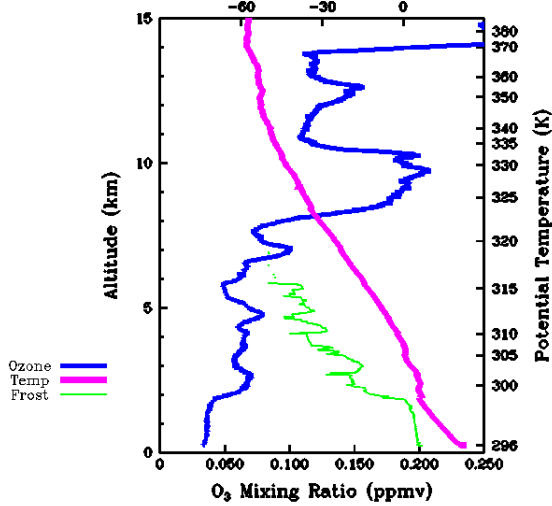
GOES Layer Average Specific Humidity and FLEXPART stratospheric tracer. Complex situation: sheared advection of moist, pollutant-rich air.



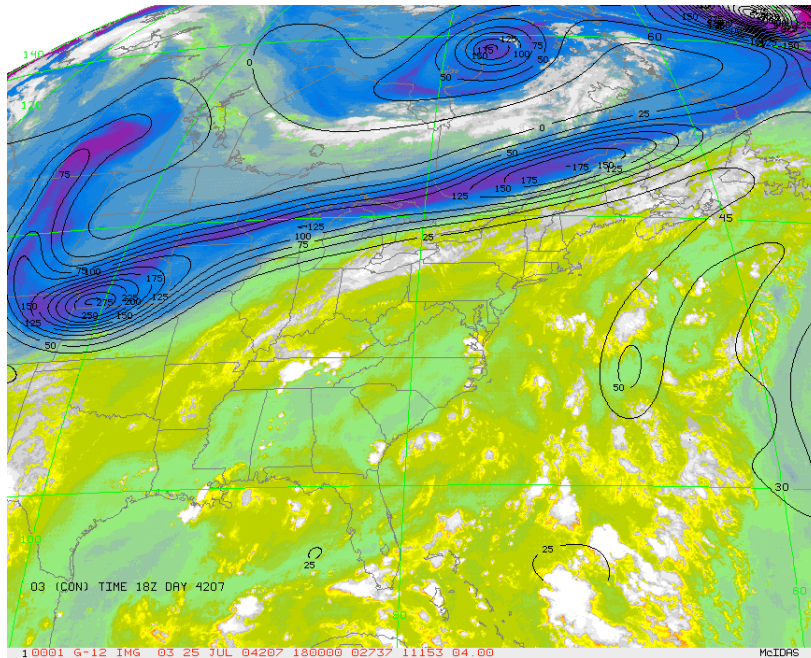


- DC-8 vertical profile data, NE of sonde profile, July 22. Moist, polluted air, here primarily below ozone-rich layer.

Pellston, MI July 25, 2004
Temperature and Frost Point (°C)



/Back up/2004-ozone/NTEKNA/pellston CSRONDE 20040725 RE:at 17 60



- STE event at Pellston, July 25.
- GLASH, with FLEXPART stratospheric tracer, ppbv superposed
- Impact over extended area

Acknowledgments

- Jennie Moody, UVa, for GLASH images
- Brian Heikes, URI, for DC-8 data figures
- Sam Oltmans and Bryan Johnson, NOAA-CMDL for ozonesonde support
- Anne Thompson, Penn State
- Owen Cooper, NOAA for FLEXPART results
- NASA for support