Informal Mentoring Session: Developing Your Forecast Program

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AIR & WASTE MANAGEMENT ASSOCIATION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

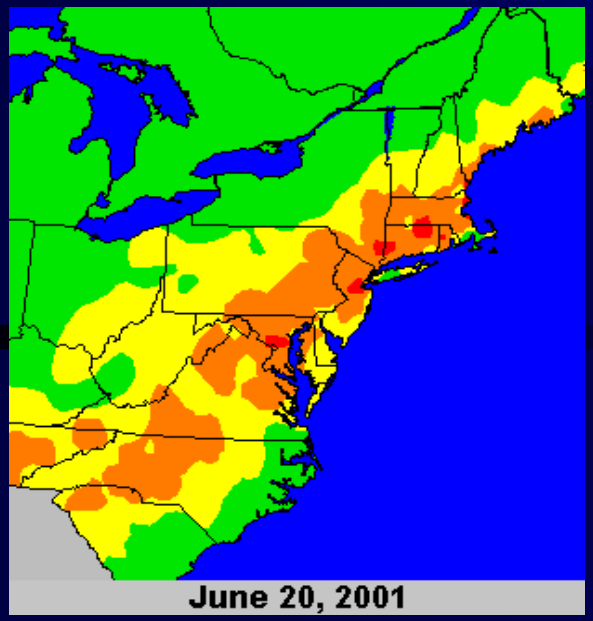
U.S. EPA National Air Quality Conference-2002

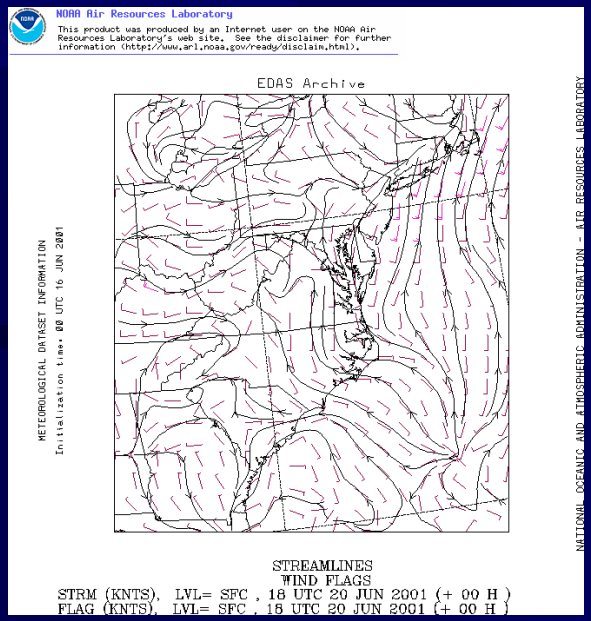
GETTING OFF THE GROUND

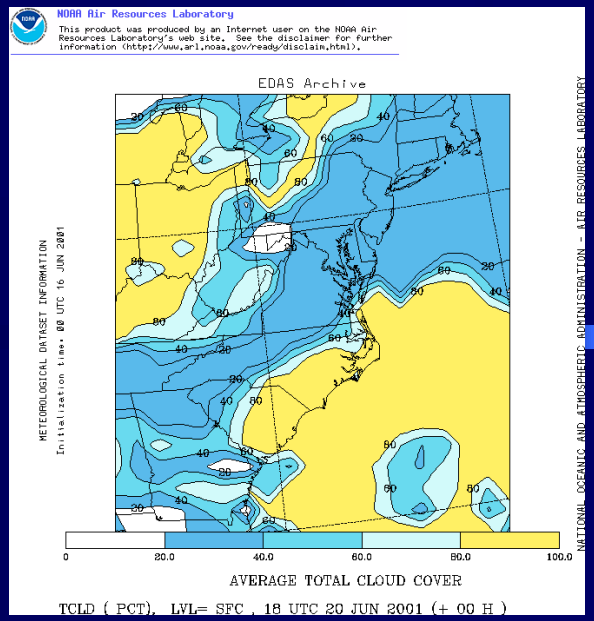
- What are you trying to accomplish?
  - Providing health based warnings.
  - Activate alert system for a regional coalition.
- Deciding basis of program.
  - Traditional ozone only.
    - Consideration of 1 hour & 8 hour ozone standards.
  - PM programs for smoke and burning management.
  - Year round multi-pollutant.
- Determining geographic delimiters.
  - Forecasts broken by regions (cities, MSA's)
- Develop realistic goals.

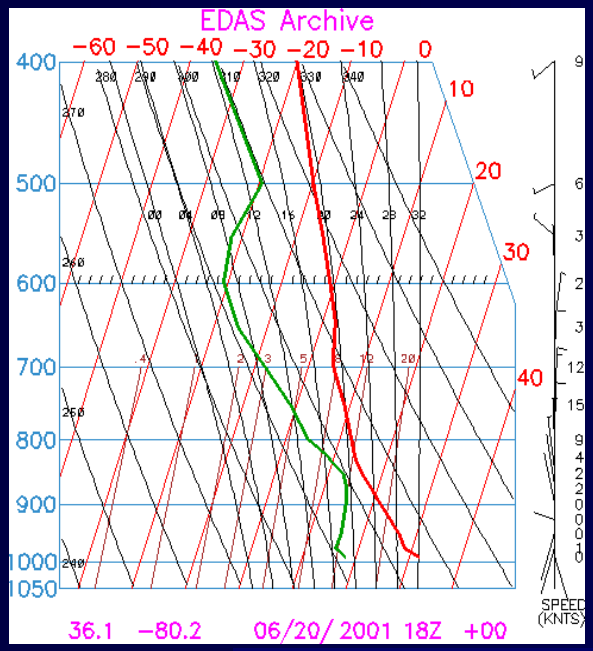
ASSEMBLING YOUR TEAM & PRODUCT

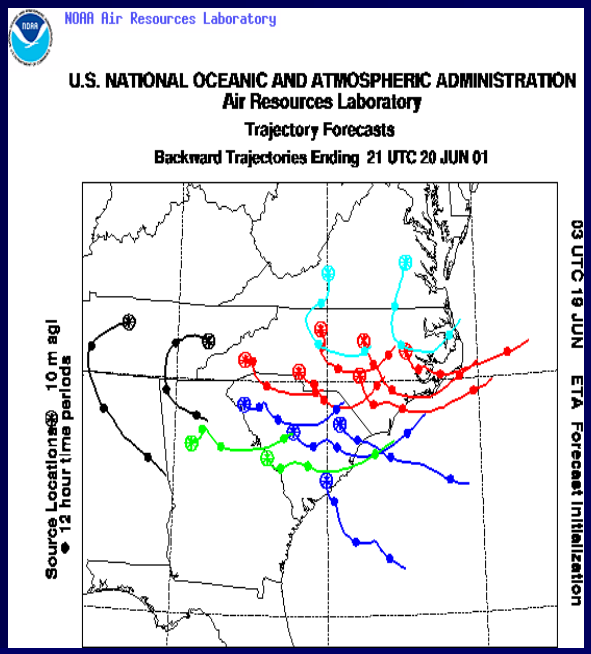
- Internal resources.
  - meteorologists, chemists, PIO's, statisticians, IT people.
- Forecast partners.
  - State-local partnerships, universities, COG's, consultants, climate offices, NWS, health departments.
- Assess financial & senior managerial support.
  - Look for funding sources like CMAQ and tag fees.
- Review EPA Forecasting Guidance Document.
- Cultivate media interest.
  - Meet individually with TV meteorologists and newspaper editors.
- Design your look.

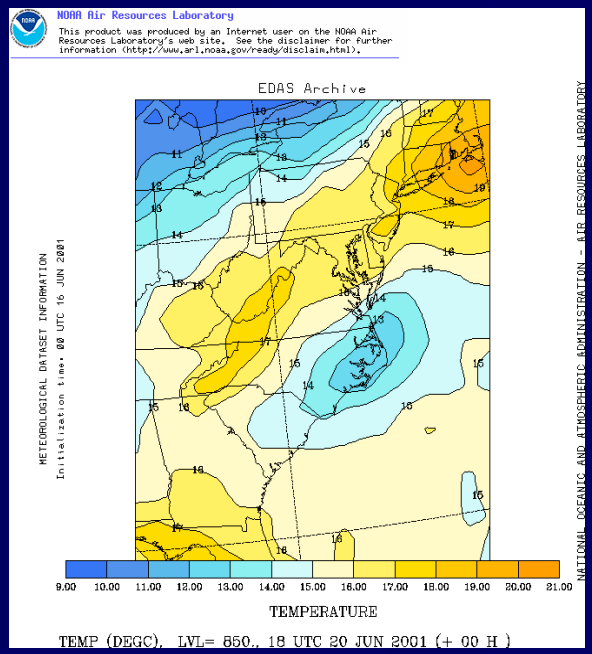












BUILDING CASE HISTORIES

DEVELOPING OZONE/MET RELATIONSHIPS

		REGRESSION INPUT DATA							
	Y	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	X1-X6
			MAX	DEWPT	WS	24HR PM10	T RANGE	WD	PREDICTED
	MAX	PREV DAY	TEMP	1300 EST	1000 EST	AT 1300 EST	MAX-MIN	1600 EST	REGRESSION
	8HR	MAX 8HR	DEGC	DEGC	MPH	µG/M3	DEG	DEG	8HR O3
31-May-99	0.068	0.086	27.4	16.8	4.8	34.5	10.5	201	0.076
01-Jun-99	0.060	0.068	26.9	16.3	8.4	25.3	11.1	205	0.068
02-Jun-99	0.072	0.060	28.4	19.5	9.2	29.8	11.3	199	0.068
03-Jun-99	0.067	0.072	29.5	19.7	3.0	30.1	10.5	339	0.073
04-Jun-99	0.076	0.067	26.4	15.8	6.4	28.7	9.8	6	0.066
05-Jun-99	0.080	0.076	27.0	16.7	3.4	33.8	11.5	60	0.075
06-Jun-99	0.082	0.080	29.0	17.8	3.3	31.8	13.9	207	0.082
07-Jun-99	**0.097**	0.082	31.7	21.3	5.4	38.1	16.0	231	**0.090**
08-Jun-99	**0.085**	0.097	32.9	20.5	4.7	43.9	13.6	217	**0.094**
09-Jun-99	**0.110**	0.085	33.5	22.3	6.0	45.2	13.5	356	**0.091**
10-Jun-99	**0.101**	0.110	34.9	18.0	6.9	46.3	15.4	86	**0.104**
11-Jun-99	0.072	0.101	23.3	16.1	8.9	41.7	4.8	59	0.063
12-Jun-99	0.077	0.072	27.2	14.1	6.0	30.6	9.4	63	0.070
13-Jun-99	0.068	0.077	28.5	18.4	3.8	21.2	10.7	214	0.070
14-Jun-99	0.077	0.068	31.2	19.5	8.3	26.4	12.9	227	0.076
15-Jun-99	0.060	0.077	23.4	12.3	6.5	25.9	5.4	69	0.057
16-Jun-99	0.043	0.060	19.5	11.9	5.4	20.0	2.4	38	0.040
17-Jun-99	0.059	0.043	23.6	16.0	4.4	13.7	7.1	26	0.047
18-Jun-99	0.068	0.059	23.1	10.4	10.7	28.4	9.4	44	0.060
19-Jun-99	0.074	0.068	23.0	12.4	10.9	18.7	11.6	54	0.061

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UNIVERSITY of LOUISVILLE

Mechanical Engineering Department

OZONE FORECASTING MODEL

SPEED SCIENTIFIC SCHOOL · UNIVERSITY OF LOUISVILLE · SS · ENGINEERING · 1925

ENTER FORECAST PARAMETERS FOR LOUISVILLE

Month: Jul	Day: 18	Thursday	Year: 2002
High temp (F): 90	Avg temp (F): 80	Low temp (F): 70	Dewpoint (F): 60
Wind speed (mph): 5	Cloudiness (10ths): 5	*Version 11* ☑ Use rounding	Trajectory: 0.2
Reset; Hybrid ◉ Standard ○ HiLo ○	Confidence (%): 0	Allowable (ppb): 120	Compute; Standard
Predicted 1-hr peak: 95.3 to 95.3 (ppb)		Chance of exceedance: 0.9 %	

Air Quality	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
1-hr peak(ppb)			125 -- 164	165 -- 204	205+
8-hr peak(ppb)	0 -- 64	65 -- 84	85 -- 104	105 -- 124	125+

Internet

REAL TIME DATA ISSUES

- Getting access to monitoring data (GA, PA, NC-Forsyth)
  - How does monitoring data flow within your agency?
  - Spatial representation: Do you have enough density?
  - Validity issues (automated QA).
  - Handling the 8 hour ozone time lag (surrogates)?
- Retrieving met and forecast data.
  - Automation and archiving issues.
  - Data availability during off-site forecasts (home PC's).
- How will AIRNOW enhancements help with these issues?
- Real time models like UAM & MAQSIP.

TOP FIVE FORECAST BLUNDERS

1. The “Knee Jerk”.
2. Playing hunches.
3. Intransigence.
4. Information overload.
5. Becoming distracted.

KEEPING ON TRACK

- Schedule out the forecast season.
- Track performance and accuracy statistics.
- Keep outreach and media people in the loop.
- Forecasters should work as a team.
  - Daily forecast discussions.
  - Interagency conference calls and coordinating the forecasting of “border” regions.
- Be prepared for mid-course corrections.
- Providing technical discussions.

KEY ISSUES AT THE CONFERENCE

- Latest O3 & PM health research.
- NOAA's air quality forecasting plans & real time modeling.
- Getting the media's perspective.
- New funding opportunities for awareness programs.
- Innovative educational programs.
- Progress in year-round forecasting programs using PM2.5.
- Handling emergency response.

http://www.co.forsyth.nc.us/EnvAffairs/

Forsyth County Environmental Affairs Department - Netscape

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Daily Air Quality Report & Forecast for the Triad, N.C.

This report will be updated by 3:00 PM each business day.

This report is valid for Forsyth, Guilford, Alamance, Davidson, Randolph, Rockingham, Caswell, Davie, & Stokes counties in North Carolina.

Forecast for Sunday, November 5, 2000

Pollutant: Particulate Matter
Value: 120
Quality: Unhealthy for Sensitive Groups

People with respiratory or heart disease, the elderly and children are the groups most at risk.

O3 = Ozone (Returns 4/1/2001) PM = Fine Particulate Matter CO= Carbon Monoxide

Forecast Summary

DOMINANT	Sat (11/04/00)	Sun (11/05/00)	Mon (11/06/00)	Tue (11/07/00)
POLLUTANT	Particulate Matter	Particulate Matter	Particulate Matter	Particulate Matter
COLOR	RED	ORANGE	YELLOW	YELLOW
AQI	158	120	60	56

Color Code Description Link

Synopsis and Discussion

Fine particle levels peaked in the Code Red during the early morning on Saturday as near calm winds limited dispersion of the smoke from nearby fires. Winds have strengthened a bit today and turned more to the north/northeast, and particle levels are beginning to decrease at the Winston-Salem monitoring station. Since health readings are based on daily average concentrations, the forecast for Sunday is Code Orange for particulate matter as ambient readings continue their improving trend. With a continuation of moderate northerly

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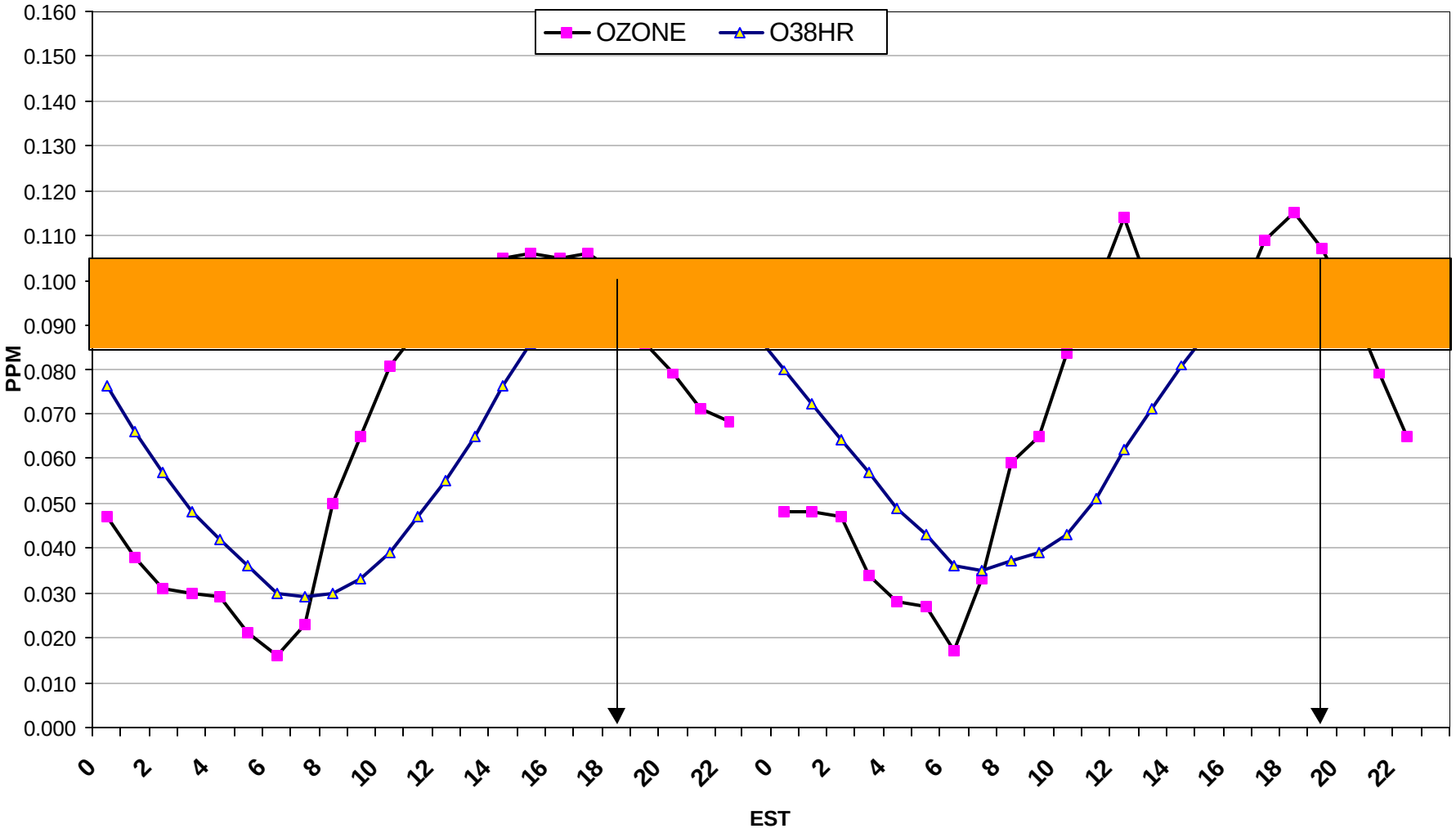
Diurnal Ozone Pattern (June 20-21,2001)

Winston-Salem, NC



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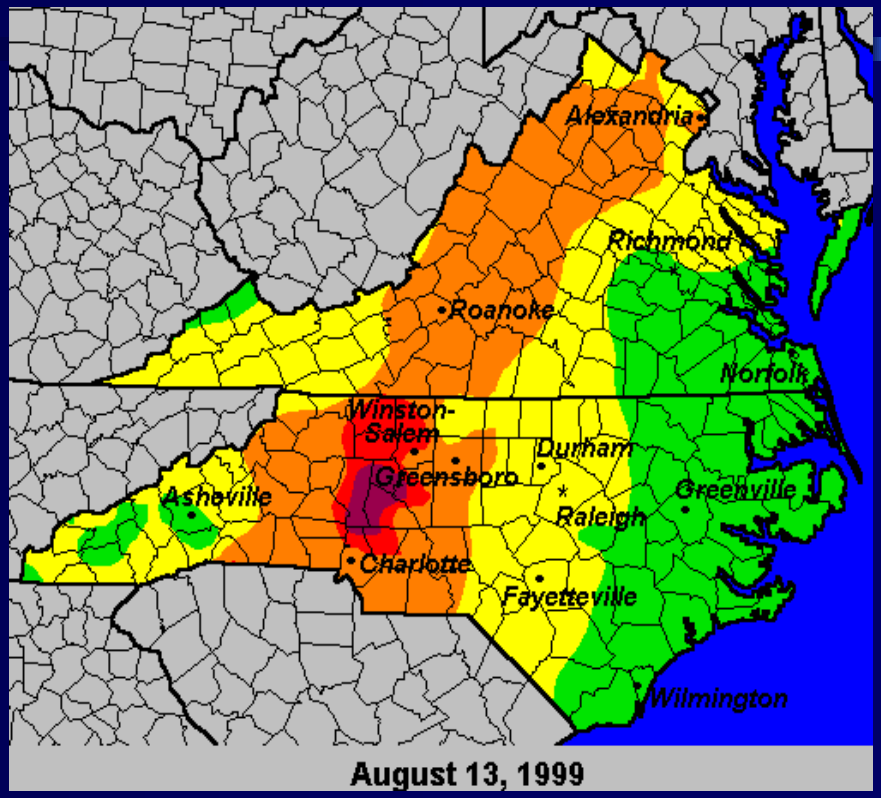

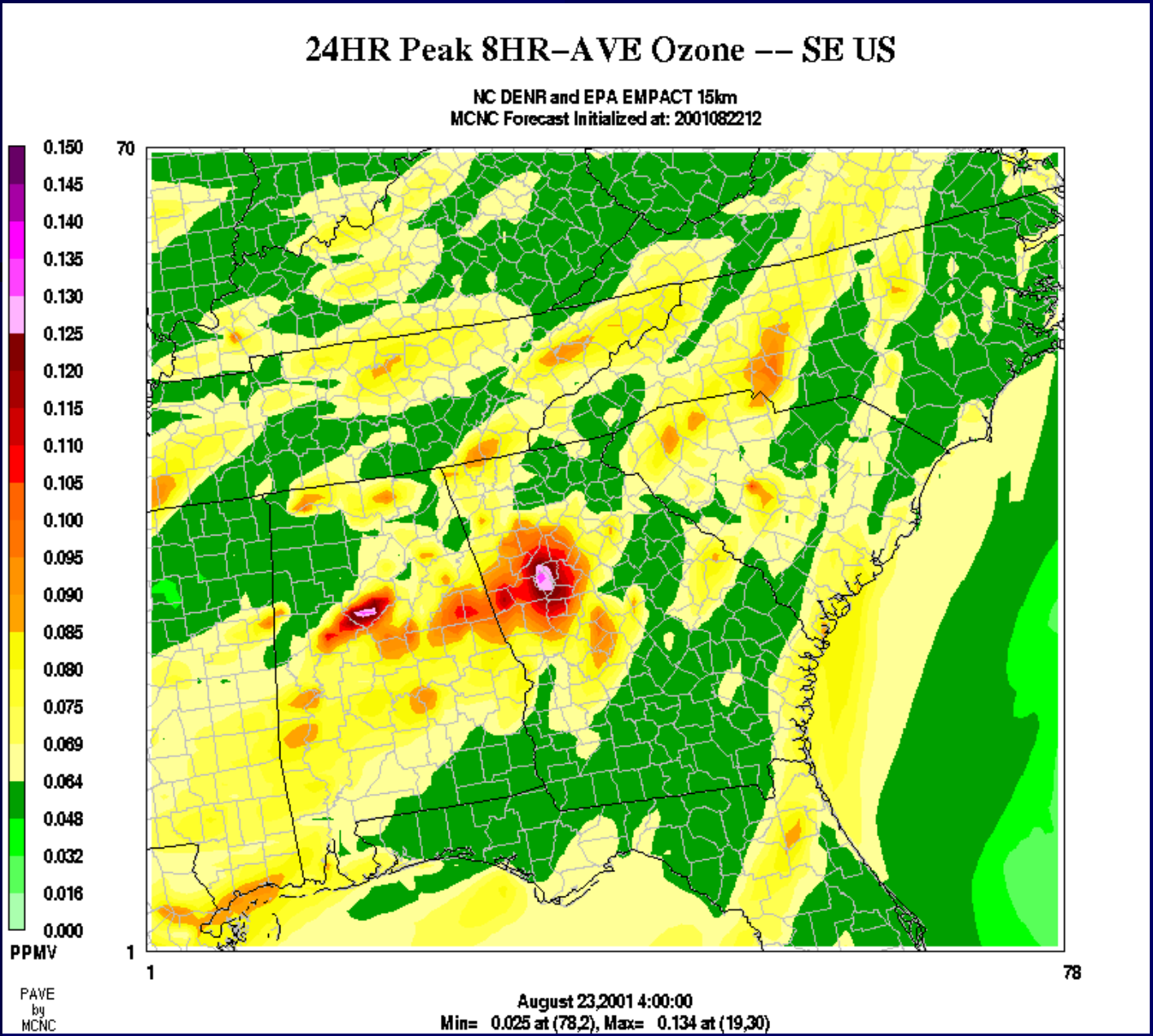

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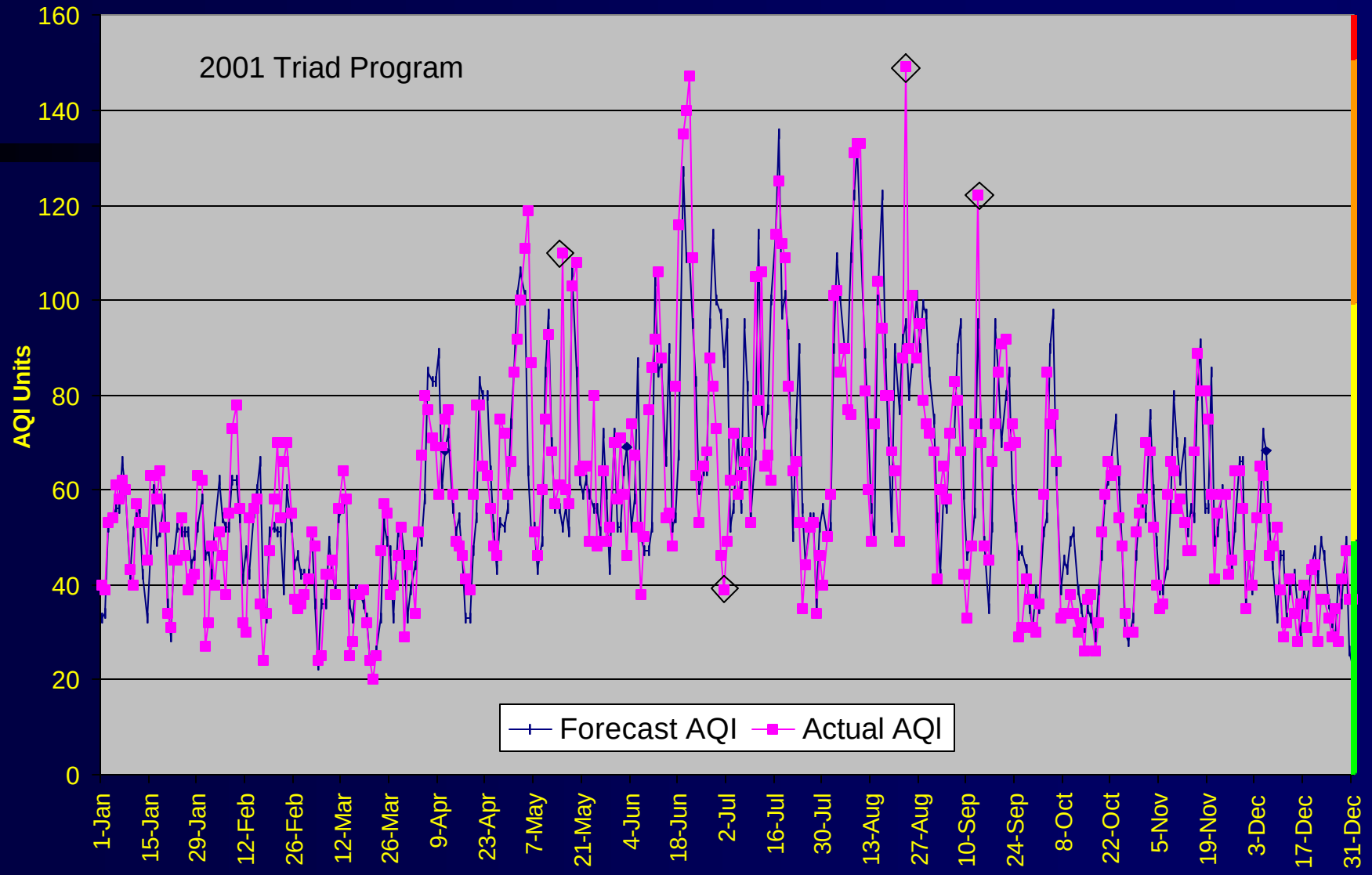
Daily Forecasting Performance