

DISCOVER-AQ Outlook for Monday, July 4, 2011

Strong thunderstorms rolled through the study area early this morning in response to the passage of the surface trough. These storms caused venting the boundary layer. High clouds have persisted over much of the region during the day, which combined with the venting, has led to much lower ozone than was recorded yesterday. A frontal passage will occur this evening with more thunderstorms likely in the region. The front will stall just to the southeast of the study area tomorrow, keeping the likelihood of clouds relatively high. The NAM model output statistics keep >50% cloud cover of the region much of the day tomorrow. The front is projected to push just far enough south to allow some clearing overnight Monday night into Tuesday. Some low to mid level clouds may develop Tuesday afternoon. We will take another look at this tomorrow. With more solar radiation available on Tuesday, ozone may return to near Code Orange levels at some sites. The smoke aerosol enhancement passing over today will be past us tomorrow, and aerosol conditions will be cleaner on Tuesday with sulfate being the predominant component. Due to the cloud situation tomorrow, we recommend not to fly the DISCOVER-AQ aircraft. The next opportunity appears to be early in the day on Tuesday.

Recommendations for July 4nd-July 7th:

Mon., July 4: **No Fly, Clouds, Tstorms**

Tues., July 5: **Fly, but keep eye on clouds for afternoon; probably best to go relatively early**

Wed., July 6: **Perhaps No Fly (but, early AM might be OK)**

Thurs., July 7: **Perhaps No Fly**

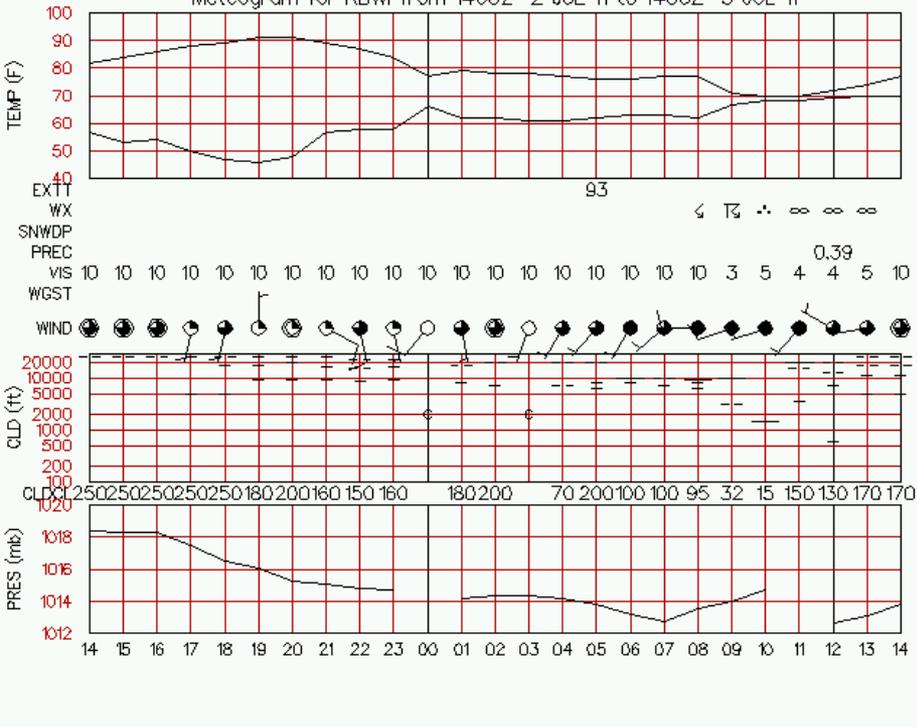
Clare Flynn

July 3, 2011

Current Conditions

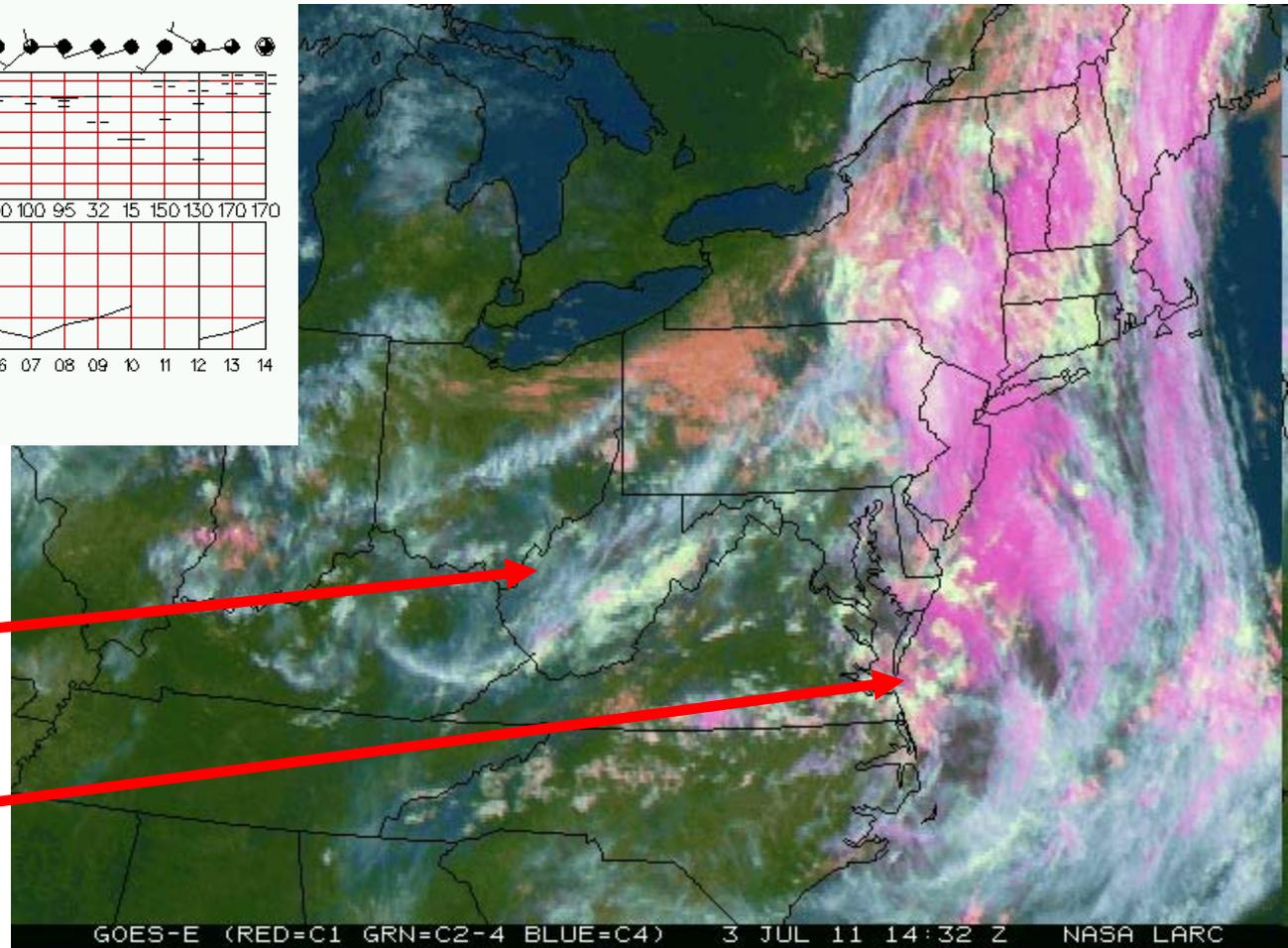
Plymouth State Weather Center

Meteogram for KBWI from 1400Z 2 JUL 11 to 1400Z 3 JUL 11



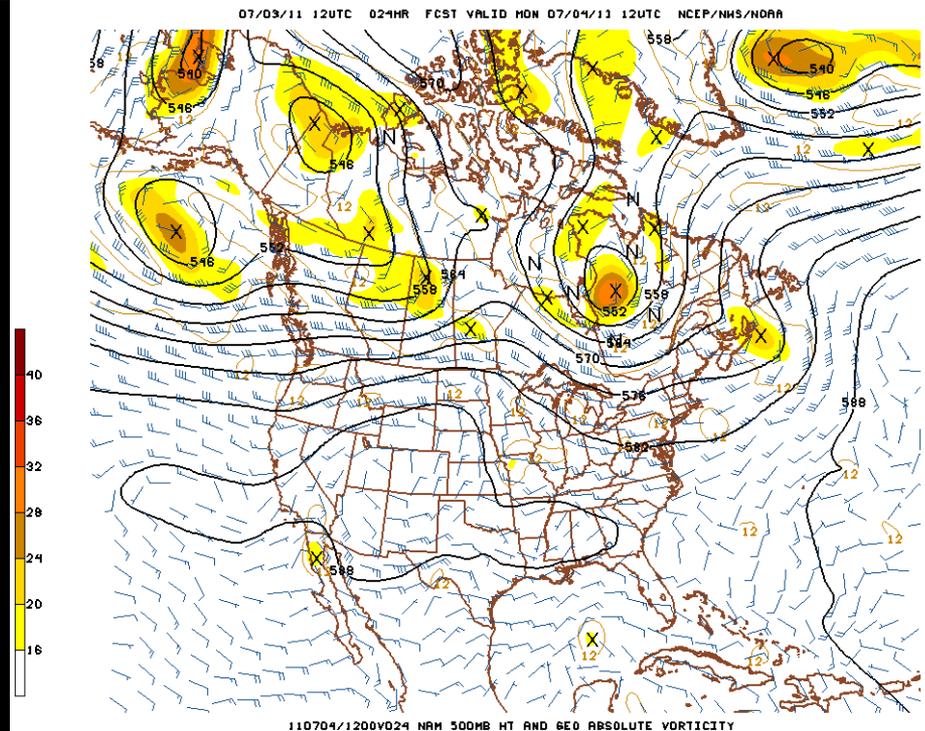
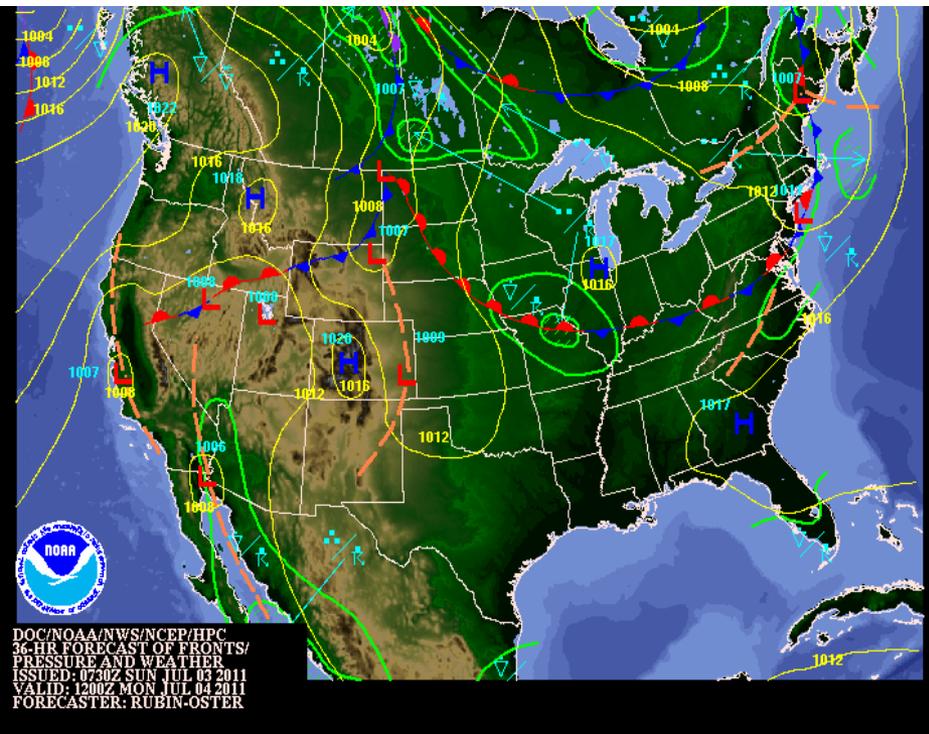
- T-storm with moderate rain early this morning, followed by haze and low visibility.
- Light / variable winds with overcast.

- Front that will push through this afternoon
- Sfc. trough leading the front acted as storm trigger this morning

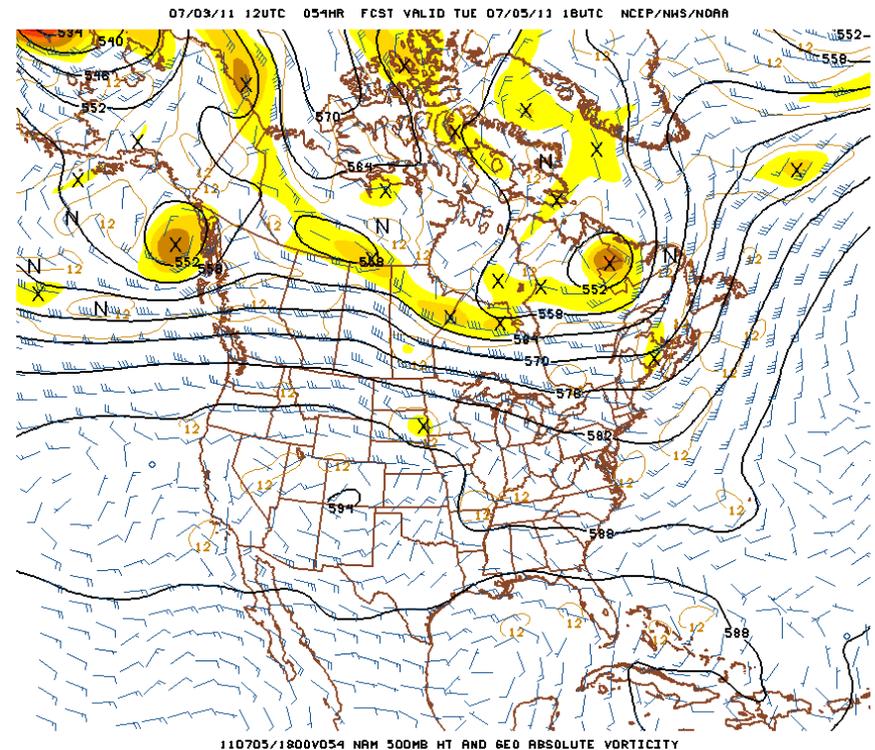
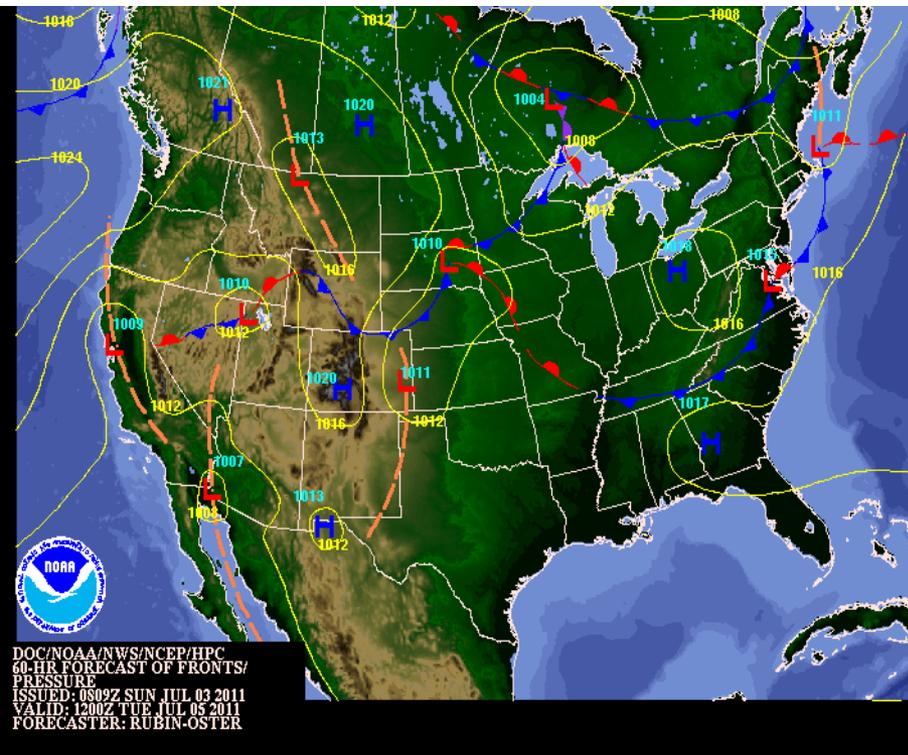


- Current conditions at 3 PM
 - Current air quality in MD is Good-Moderate range
 - BWI: Broken clouds (>50%) at 17000 and 25000 ft., 89 F temp, 69 F dewpoint
 - Tstorms firing up in southern PA, eastern OH

Monday: Front stalls just south of region of interest by Monday night. Slightly drier behind the front. Upper disturbance also passes through.

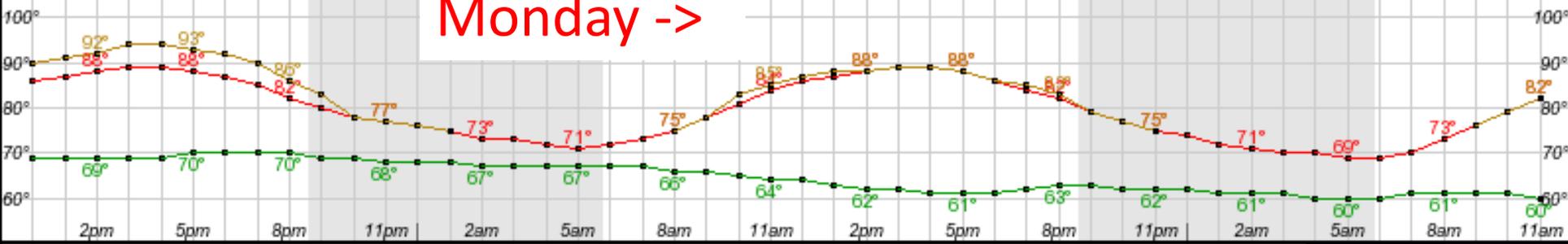


Tuesday: Front remains stalled just south of region.
By Wednesday it may begin moving northward as warm front.



Monday ->

Heat Index (°F) Dewpoint (°F) Temperature (°F)

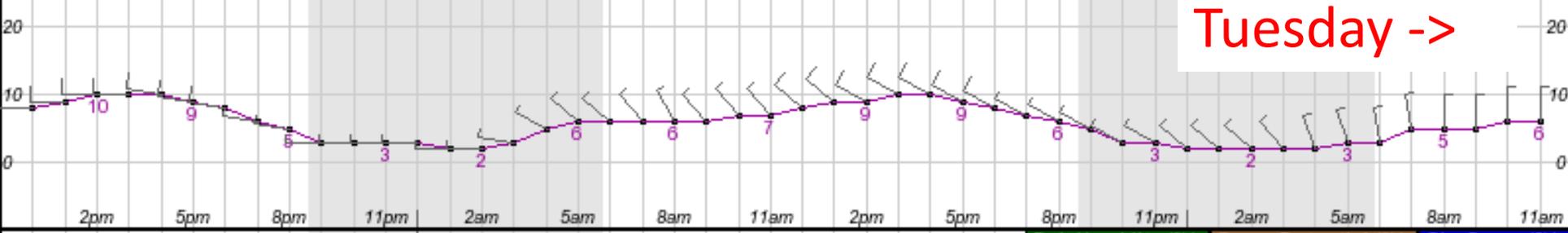


Mon, Jul 4 2011

Tue, Jul 5 2011

Gusts (mph) Wind (mph)

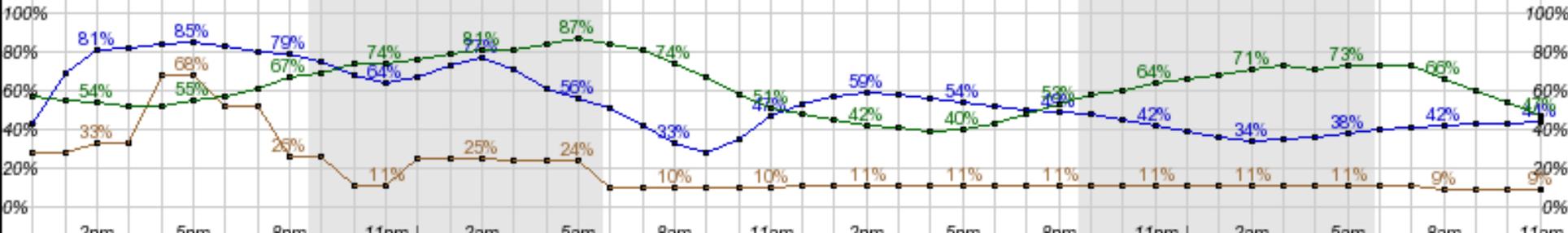
Tuesday ->



Mon, Jul 4 2011

Tue, Jul 5 2011

Rel. Humidity (%) Pcpn. Potential (%) Sky Cover (%)



Mon, Jul 4 2011

Tue, Jul 5 2011

Thunder



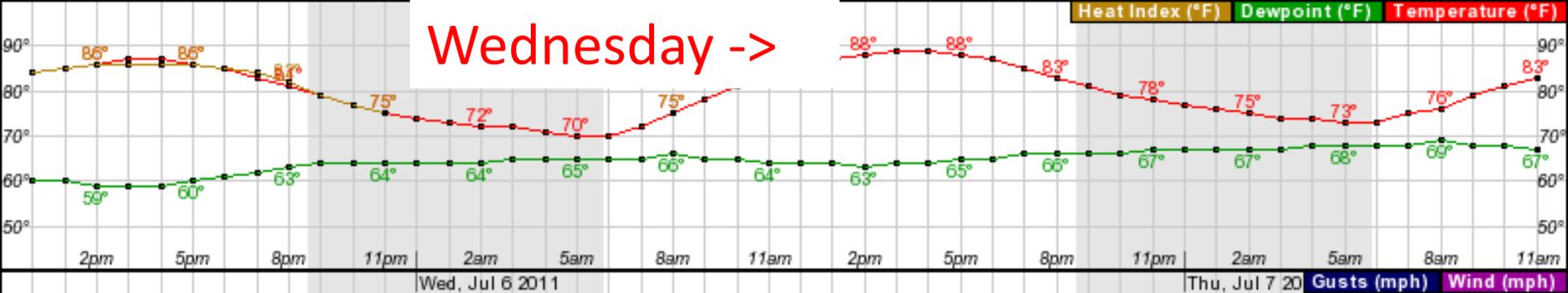
Mon, Jul 4 2011

Tue, Jul 5 2011

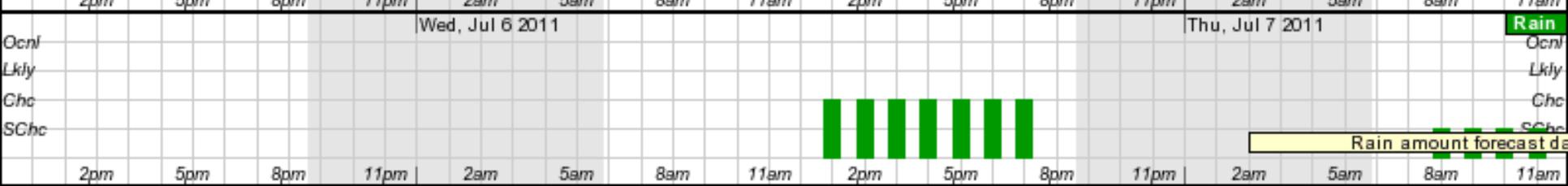
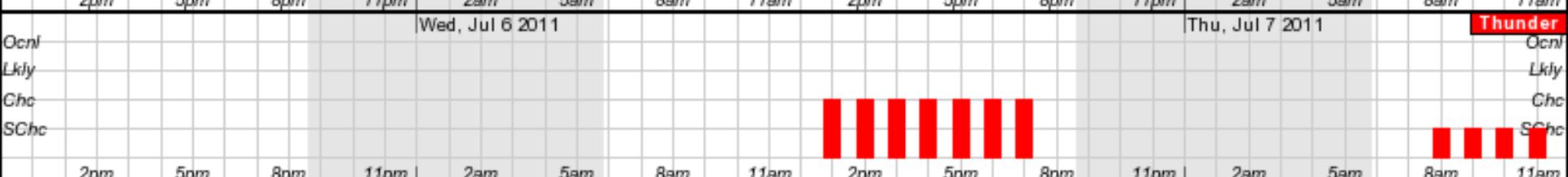
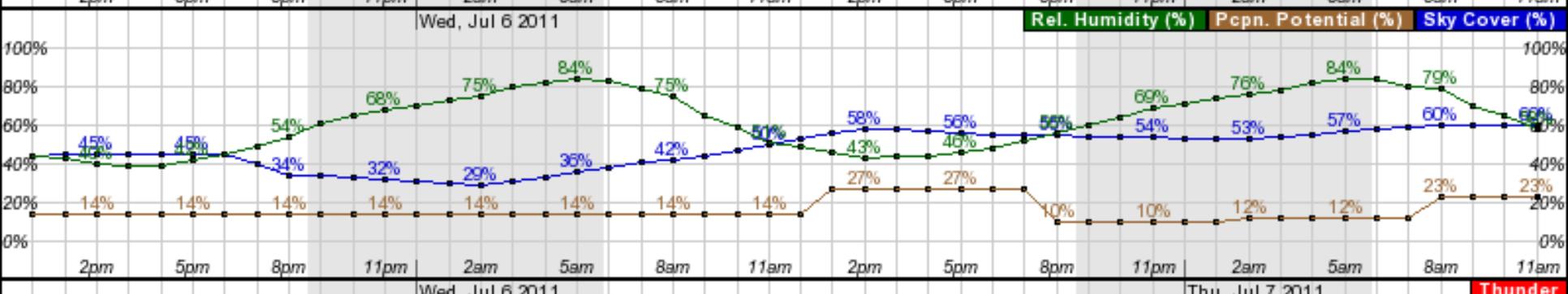
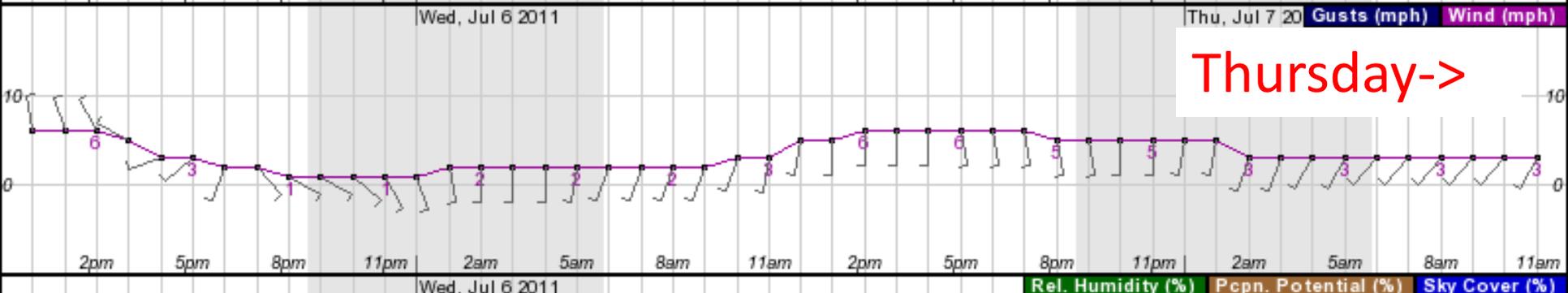
Rain



Wednesday ->

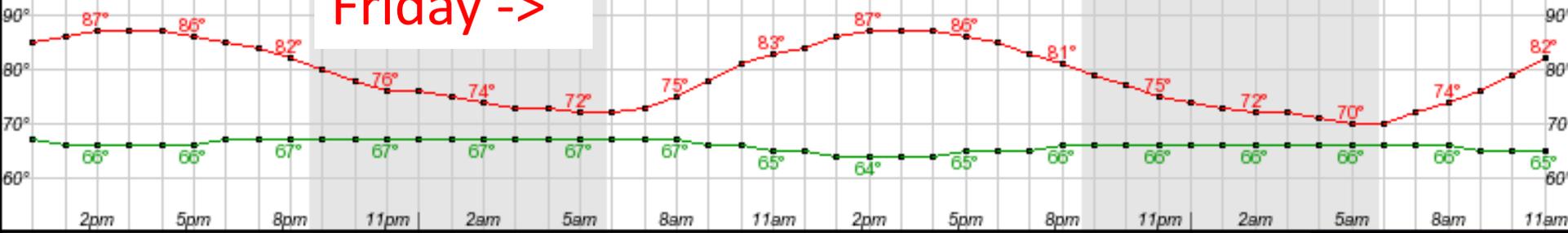


Thursday ->



Friday ->

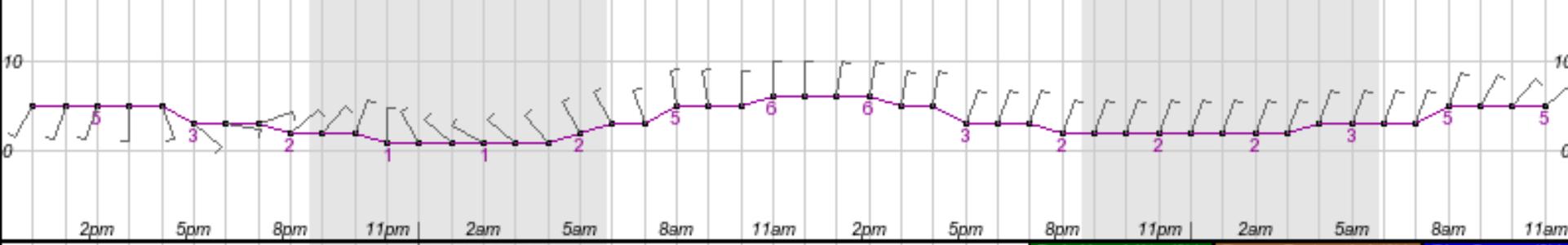
Heat Index (°F) Dewpoint (°F) Temperature (°F)



Fri, Jul 8 2011

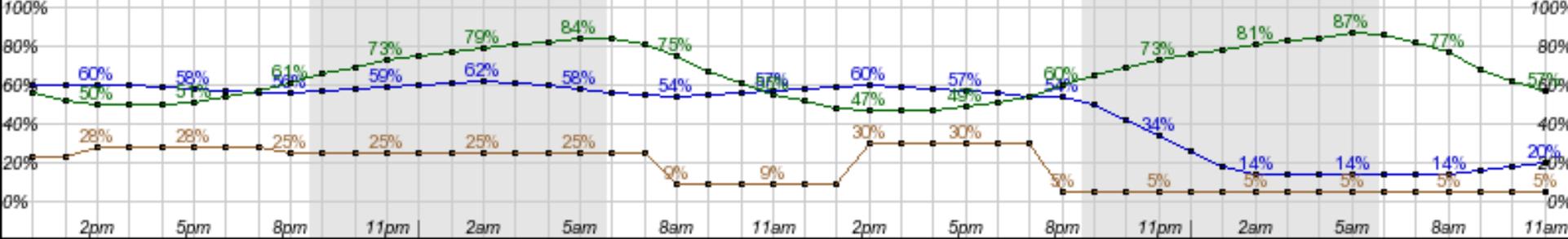
Sat, Jul 9 2011

Gusts (mph) Wind (mph)



Fri, Jul 8 2011

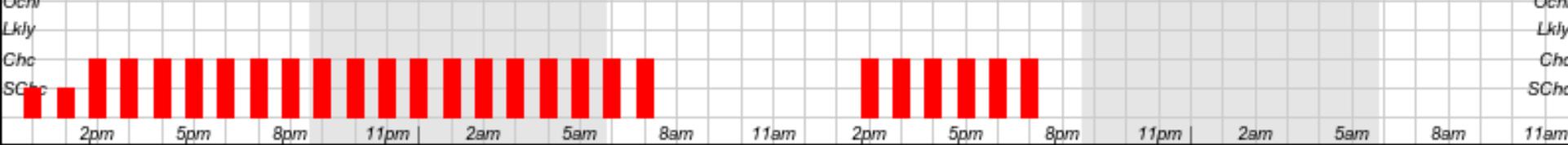
Rel. Humidity (%) Pcpn. Potential (%) Sky Cover (%)



Fri, Jul 8 2011

Sat, Jul 9 2011

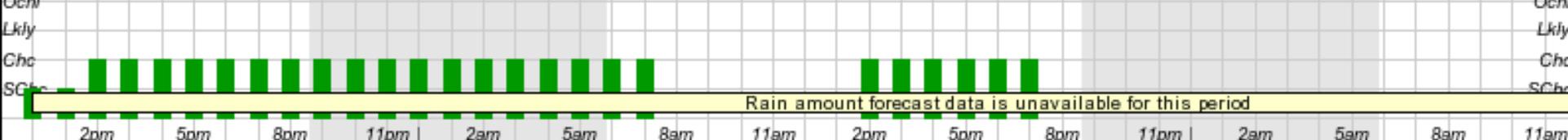
Thunder



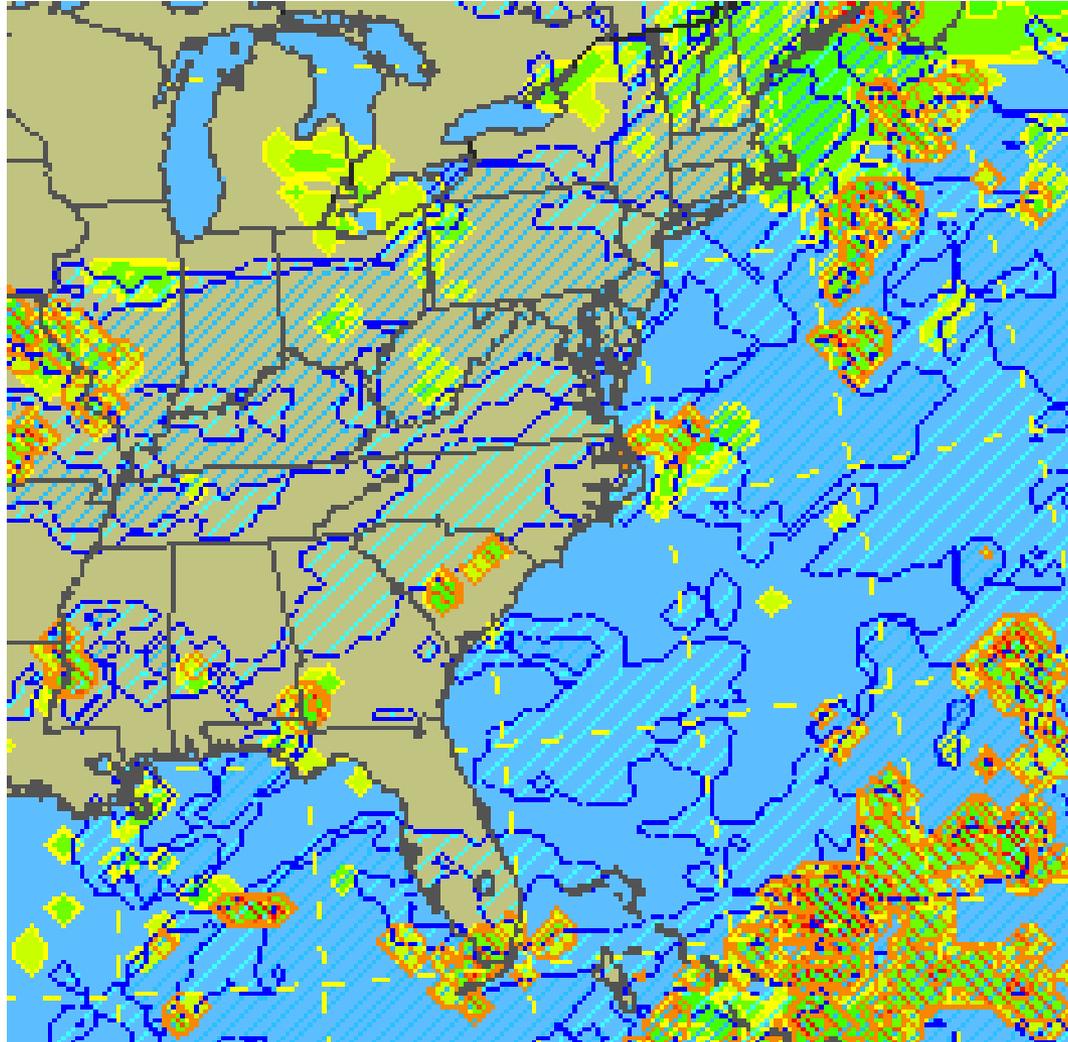
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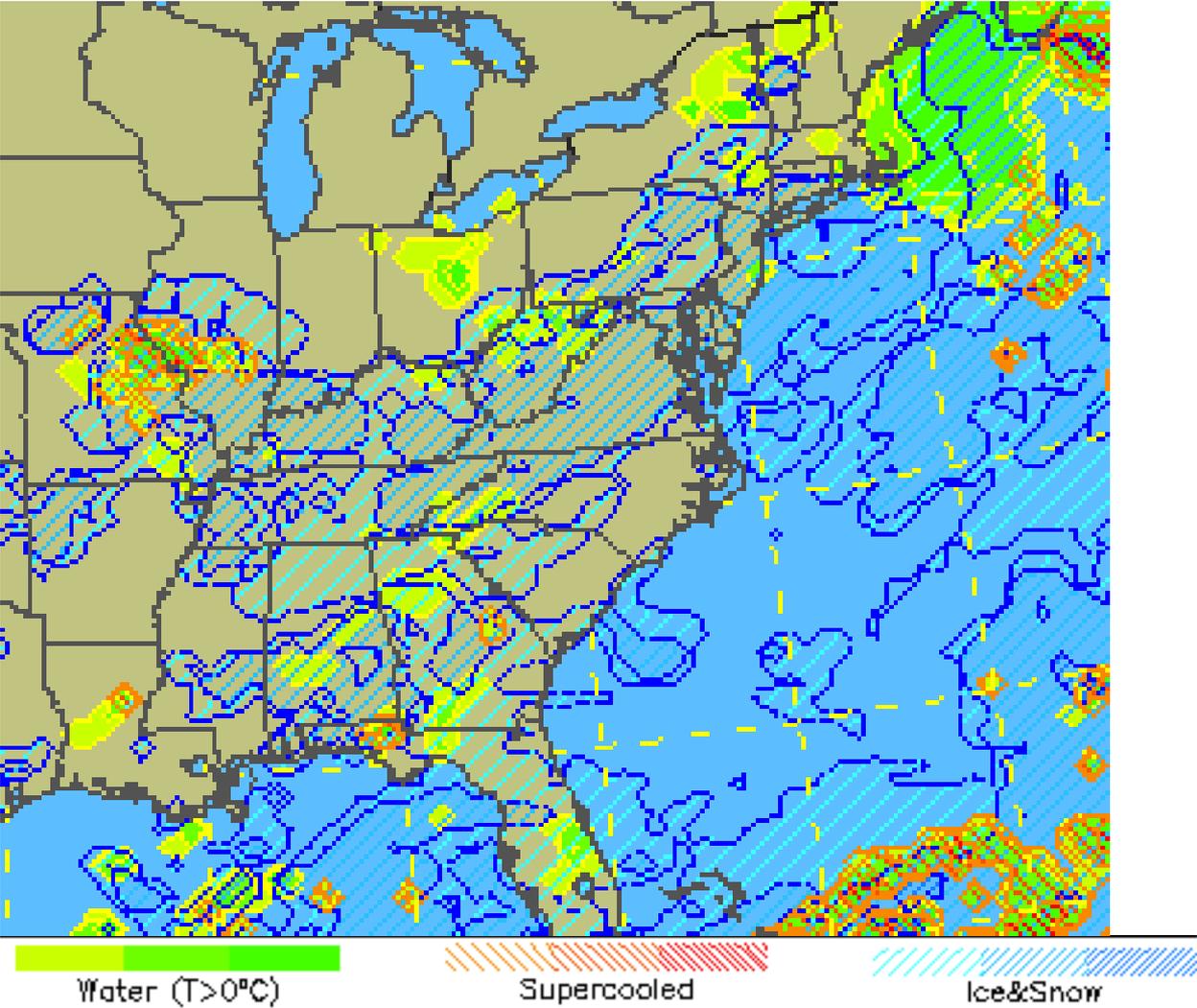
Rain



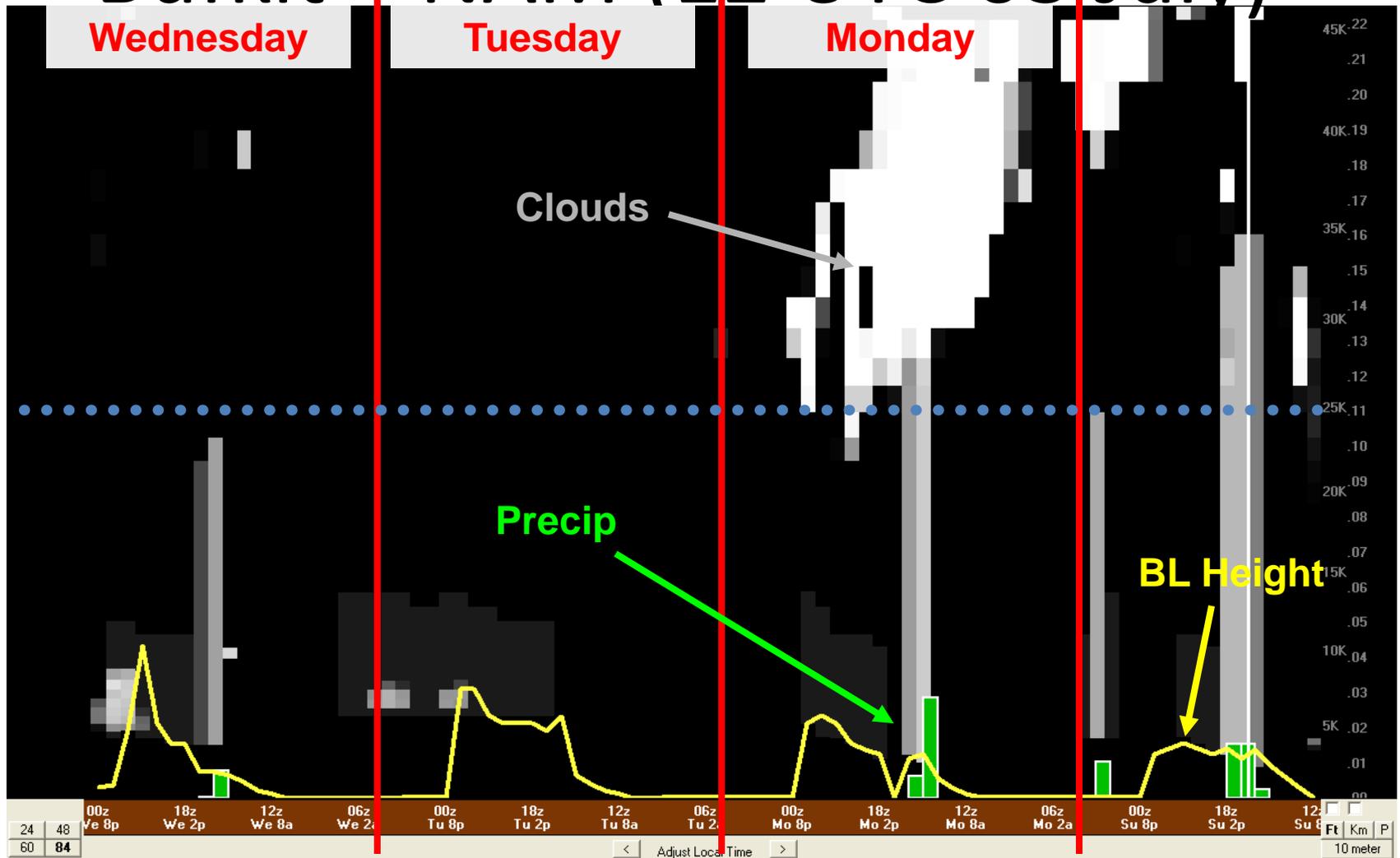
Monday 8am: Presence of high clouds (above 18,000ft) in NAM



Monday 2pm: High clouds persist over region



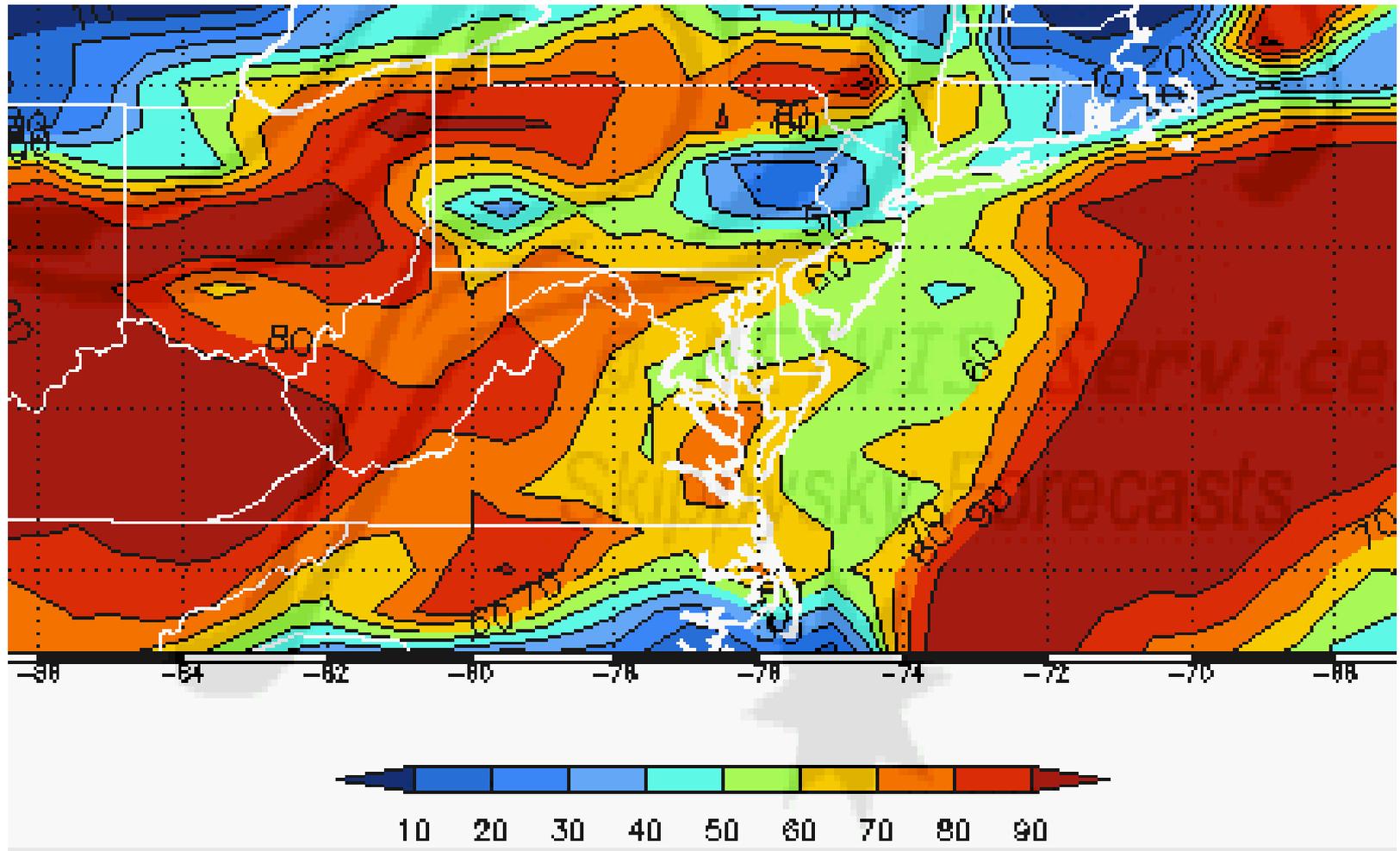
Bufkit – NAM (12 UTC 03 July)



- High clouds on Monday morning, dropping below 25,000 ft by 1200 EDT
- Slight chance of precipitation.

- Tuesday looks cloud free through the morning.
- Thin low clouds by 1300 EDT, increasing by 2000 EDT.

Monday 2pm: GFS places 60-70% cloud cover over most of Maryland morning-afternoon

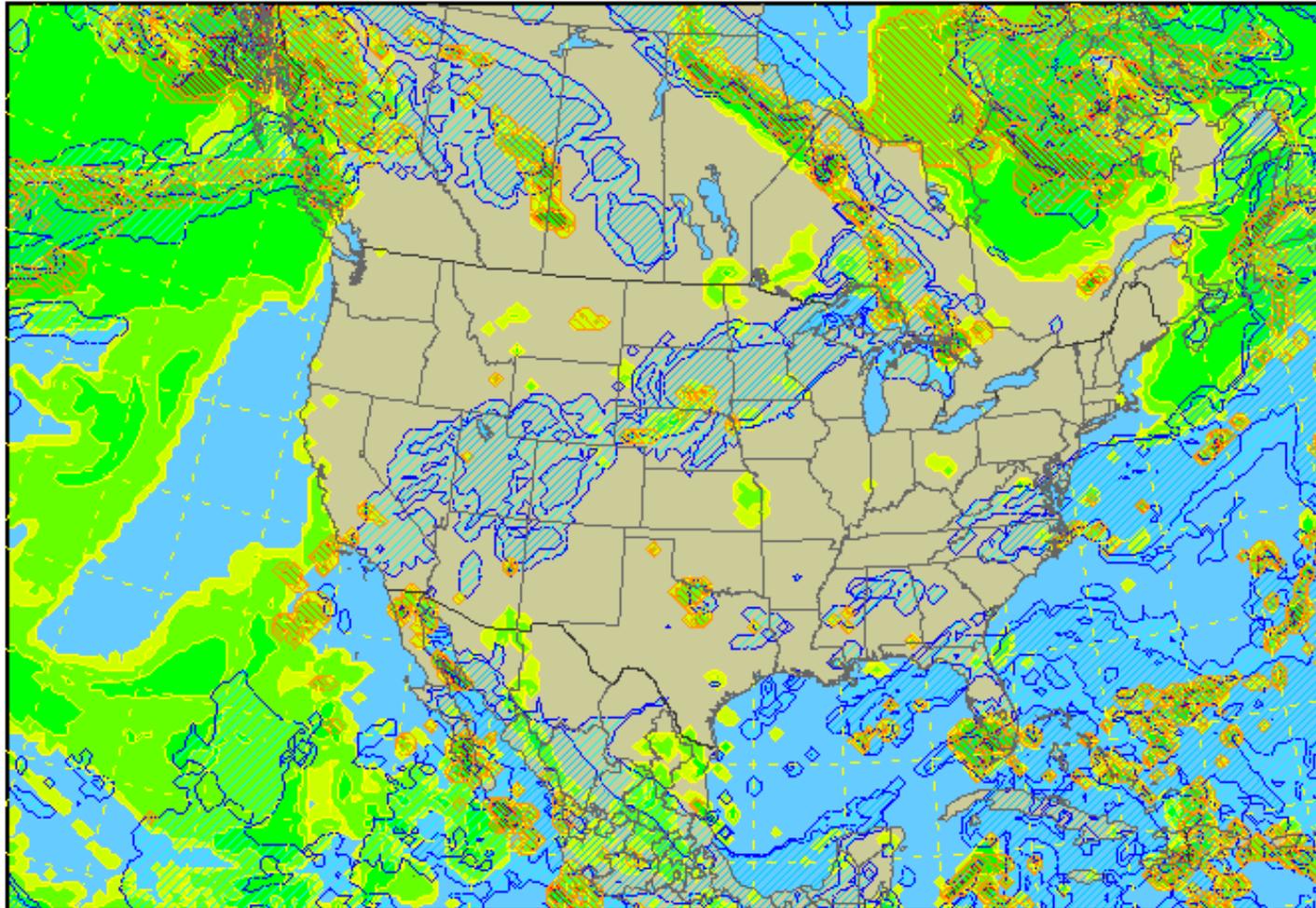


Tuesday: Better cloud outlook than Monday, still some uncertainty among forecast products

Integrated liquid and frozen hydrometeors (all levels)

60-hour forecast valid 1200 UTC Tue 05 Jul 2011

NAM (WRF-NMM) (00z 03 Jul)



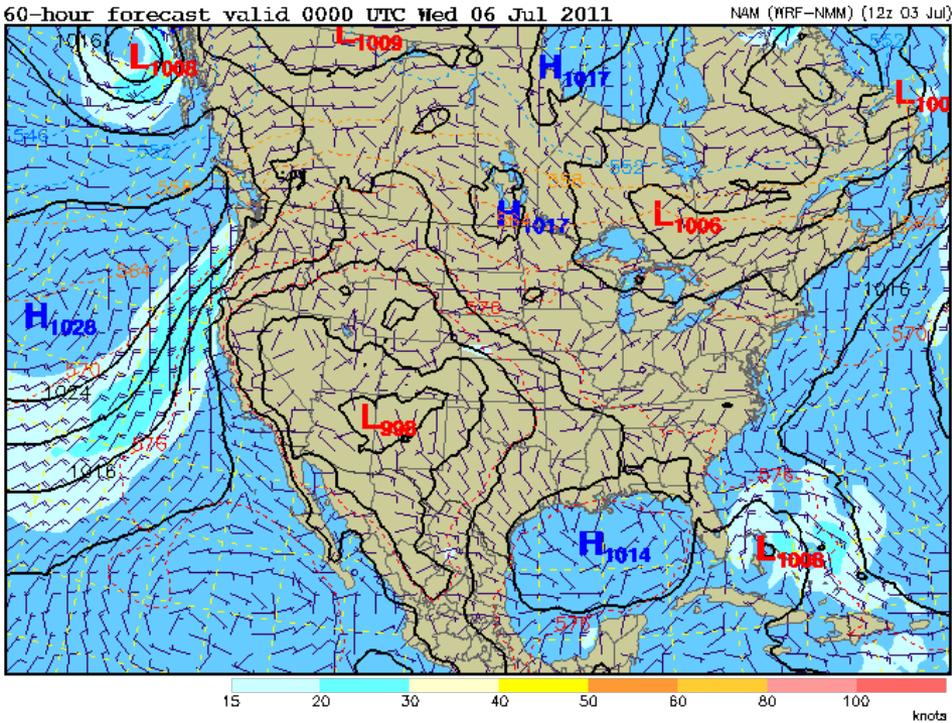
Water ($T > 0^{\circ}\text{C}$)

Supercooled

Ice&Snow

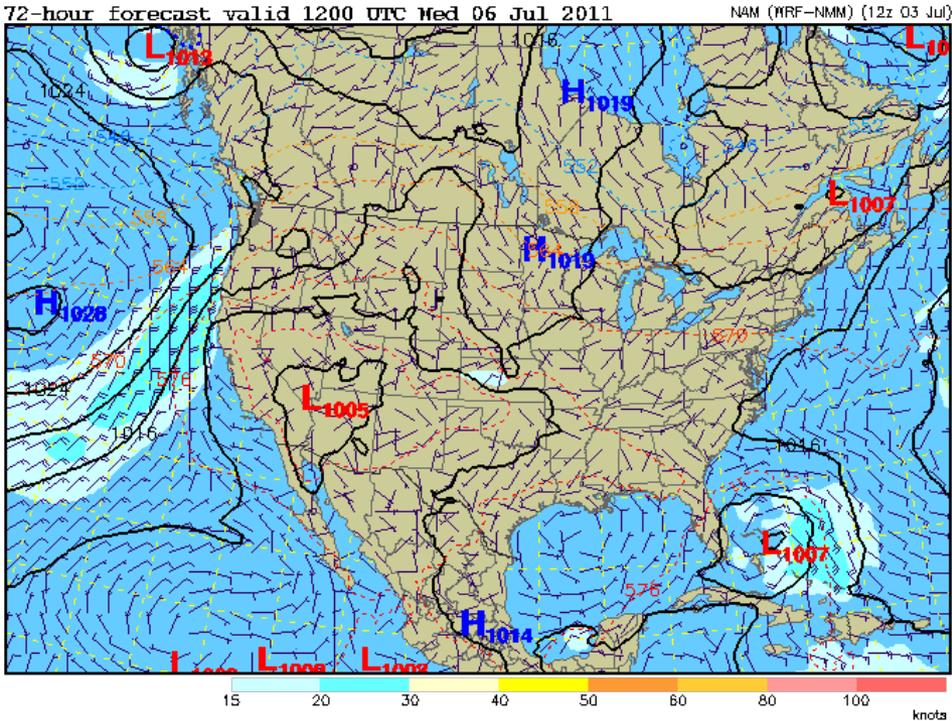
NAM – MSLP and Clouds Tuesday Evening

Surface (10m) Wind Speed (knots) / MSLP (mb)

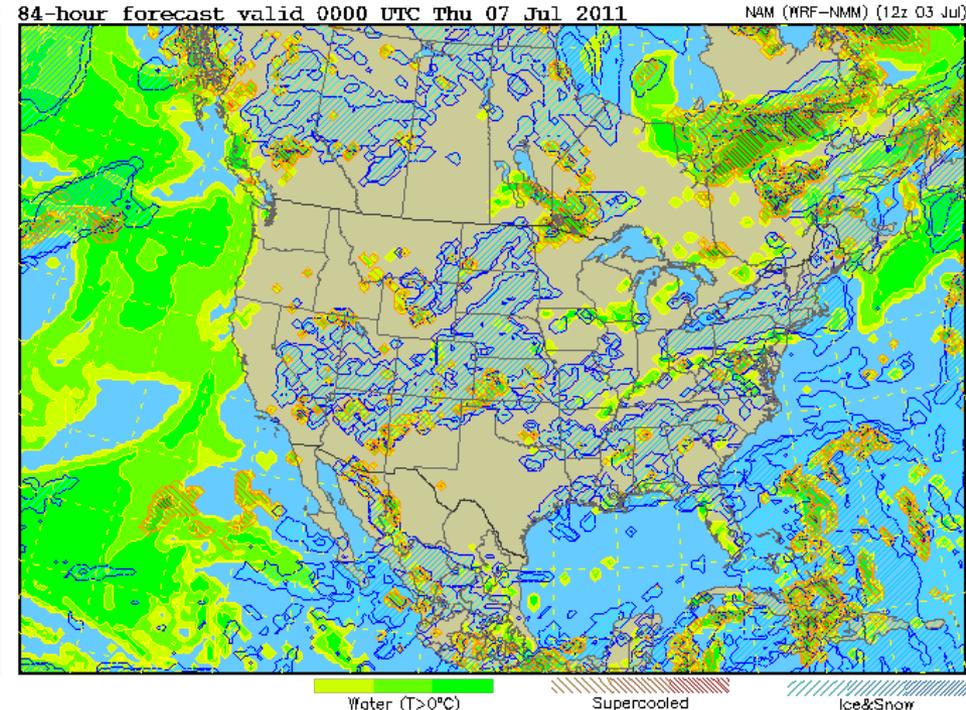


NAM – MSLP and Clouds Wednesday Morning

Surface (10m) Wind Speed (knots) / MSLP (mb)



Integrated liquid and frozen hydrometeors (all levels)

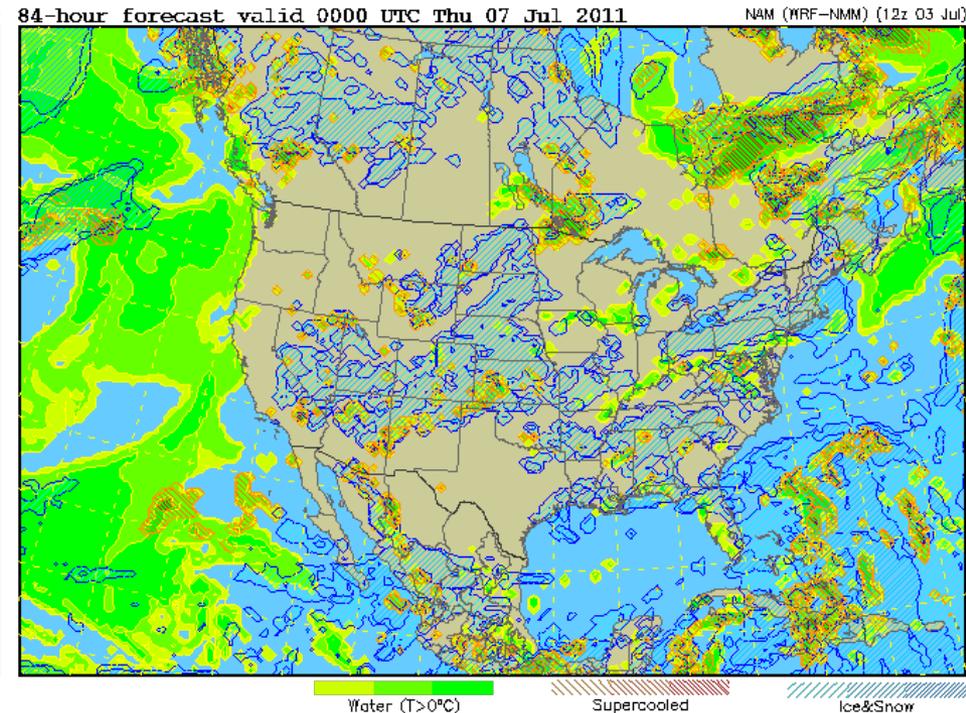
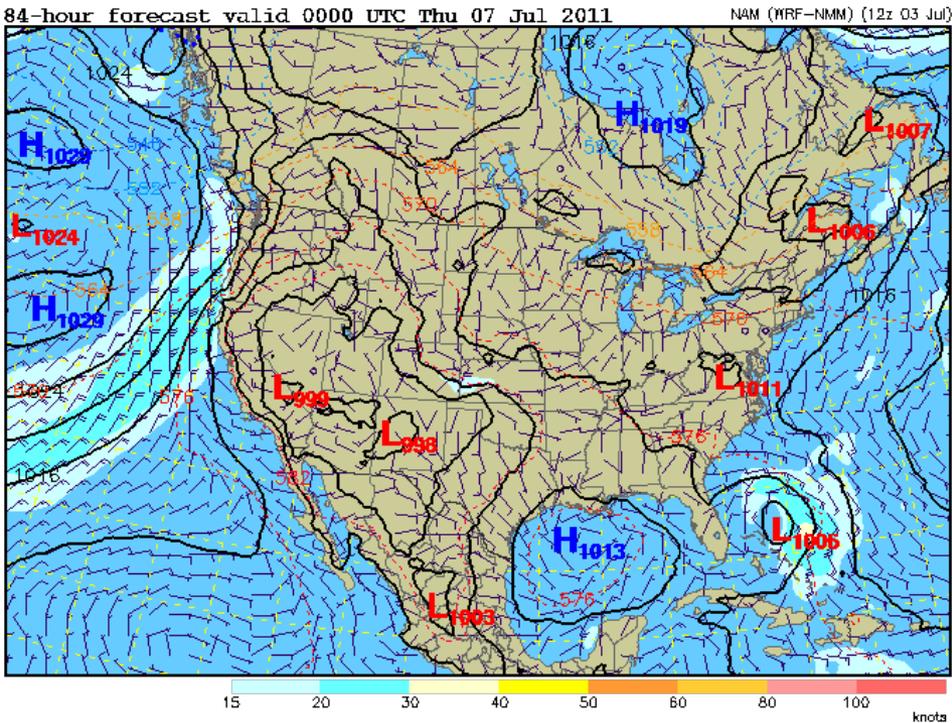


- High pressure remains in place producing light and variable winds
- Cloud cover at multiple levels.

NAM – MSLP and Clouds Wednesday Evening

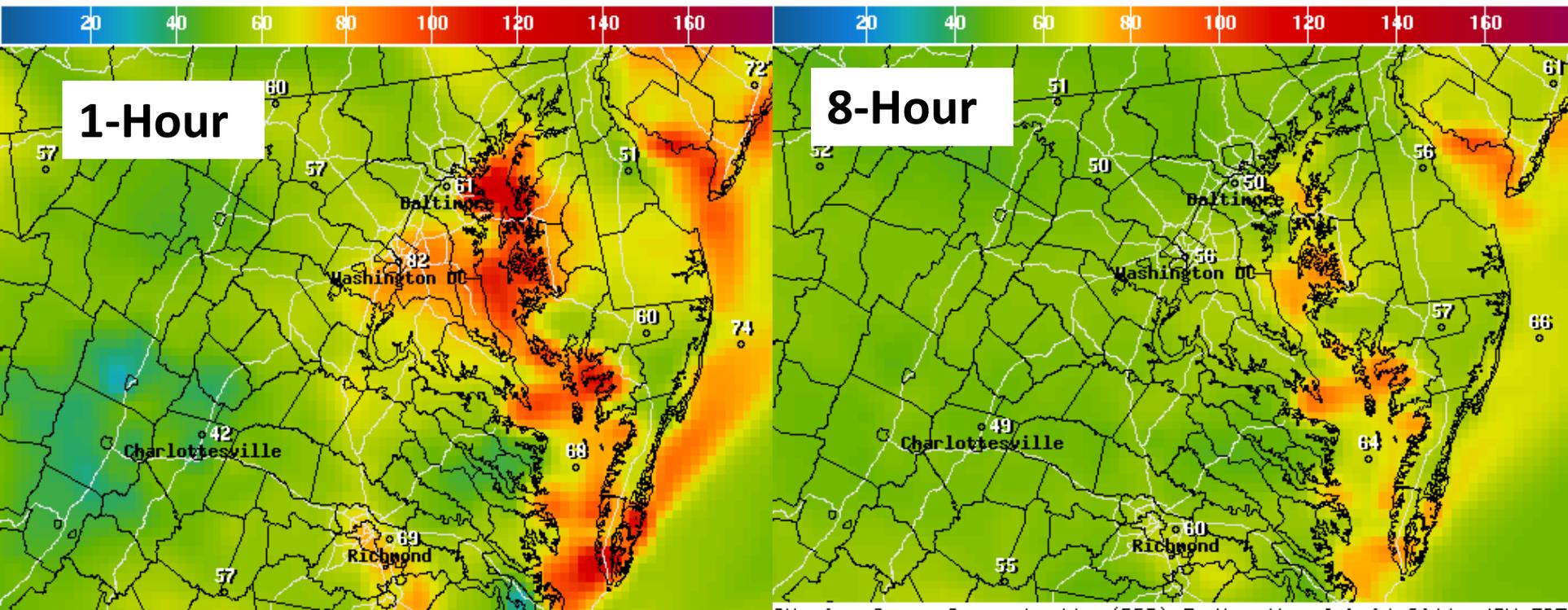
Surface (10m) Wind Speed (knots) / MSLP (mb)

Integrated liquid and frozen hydrometeors (all levels)



- Weak large-scale flow and warm surface temps produce a weak heat-low.
- Scattered opaque clouds at multiple levels.

Monday (4pm): Ozone production increases after passage of the cold front Sunday by ~20-30 ppbv; less than Saturday however.



1Hr Avg Ozone Concentration (PPB) Ending Mon Jul 04 2011 4PM EDT 8Hr Avg Ozone Concentration (PPB) Ending Mon Jul 04 2011 4PM EDT

(Mon Jul 04 2011 20Z)

(Mon Jul 04 2011 20Z)



National Digital Guidance Database

06z model run Graphic created-Jul 03 8:30AM EDT



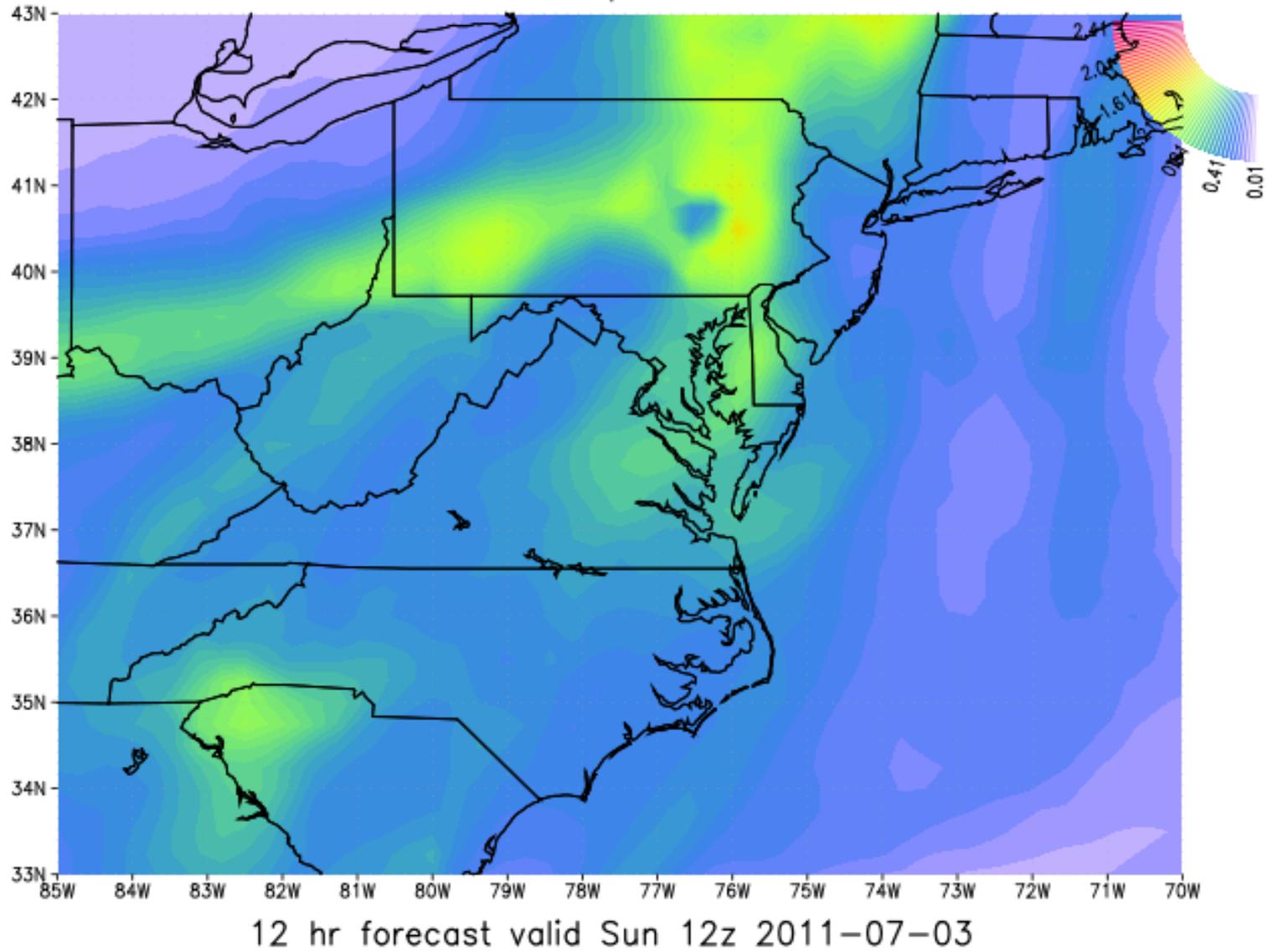
National Digital Guidance Database

06z model run Graphic created-Jul 03 7:43AM EDT



Today's AOT forecast, significant impact of Canadian fires

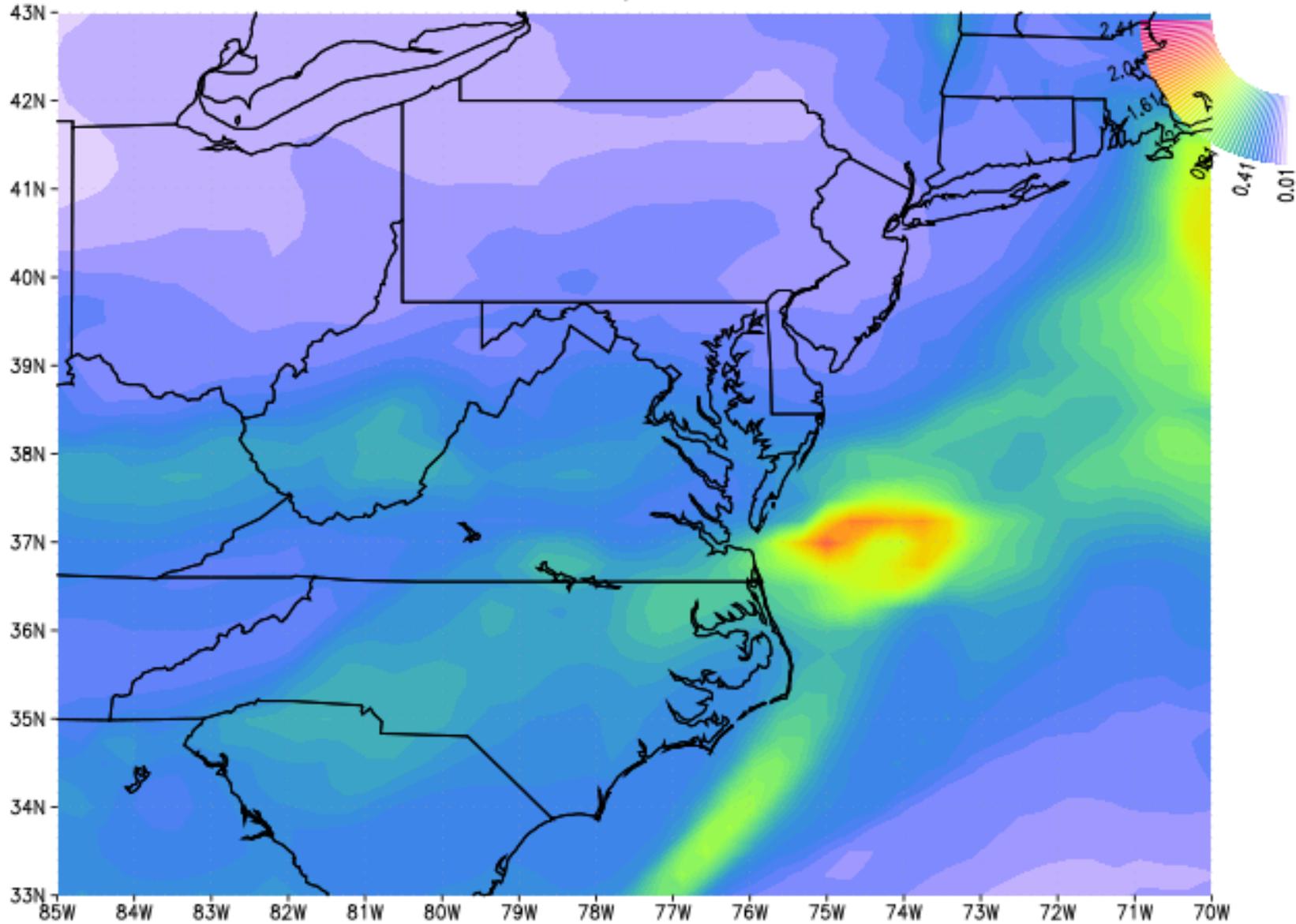
NASA/GMAO – GEOS-5 Forecast Initialized on 00z 2011-07-03
Total Aerosol Optical Thickness



Early Monday morning smoke moving offshore, small impact

NASA/GMAO - GEOS-5 Forecast Initialized on 00z 2011-07-03

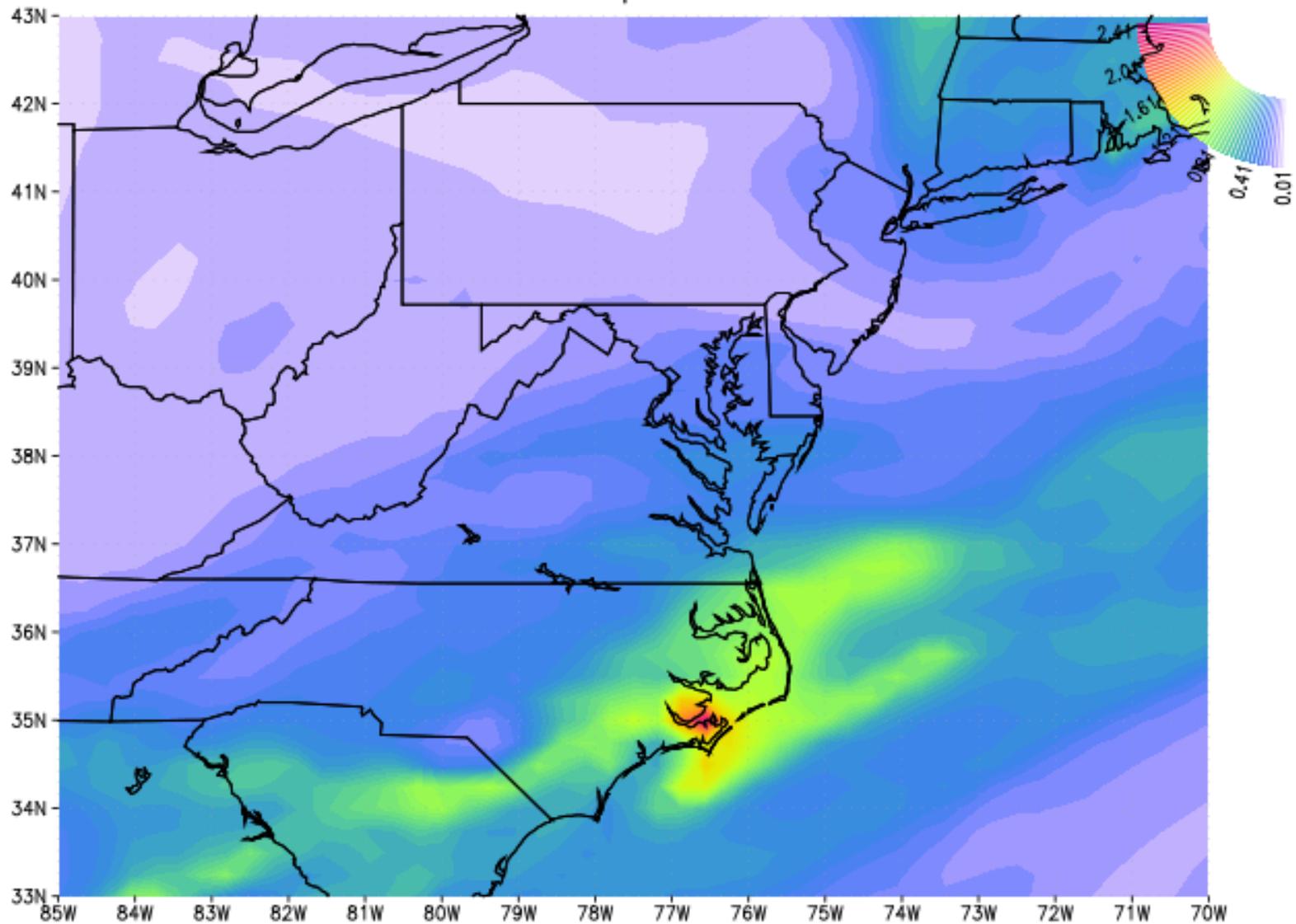
Total Aerosol Optical Thickness



30 hr forecast valid Mon 06z 2011-07-04

By Tuesday only a minor impact of smoke remains

NASA/GMAO – GEOS-5 Forecast Initialized on 00z 2011-07-03
Total Aerosol Optical Thickness



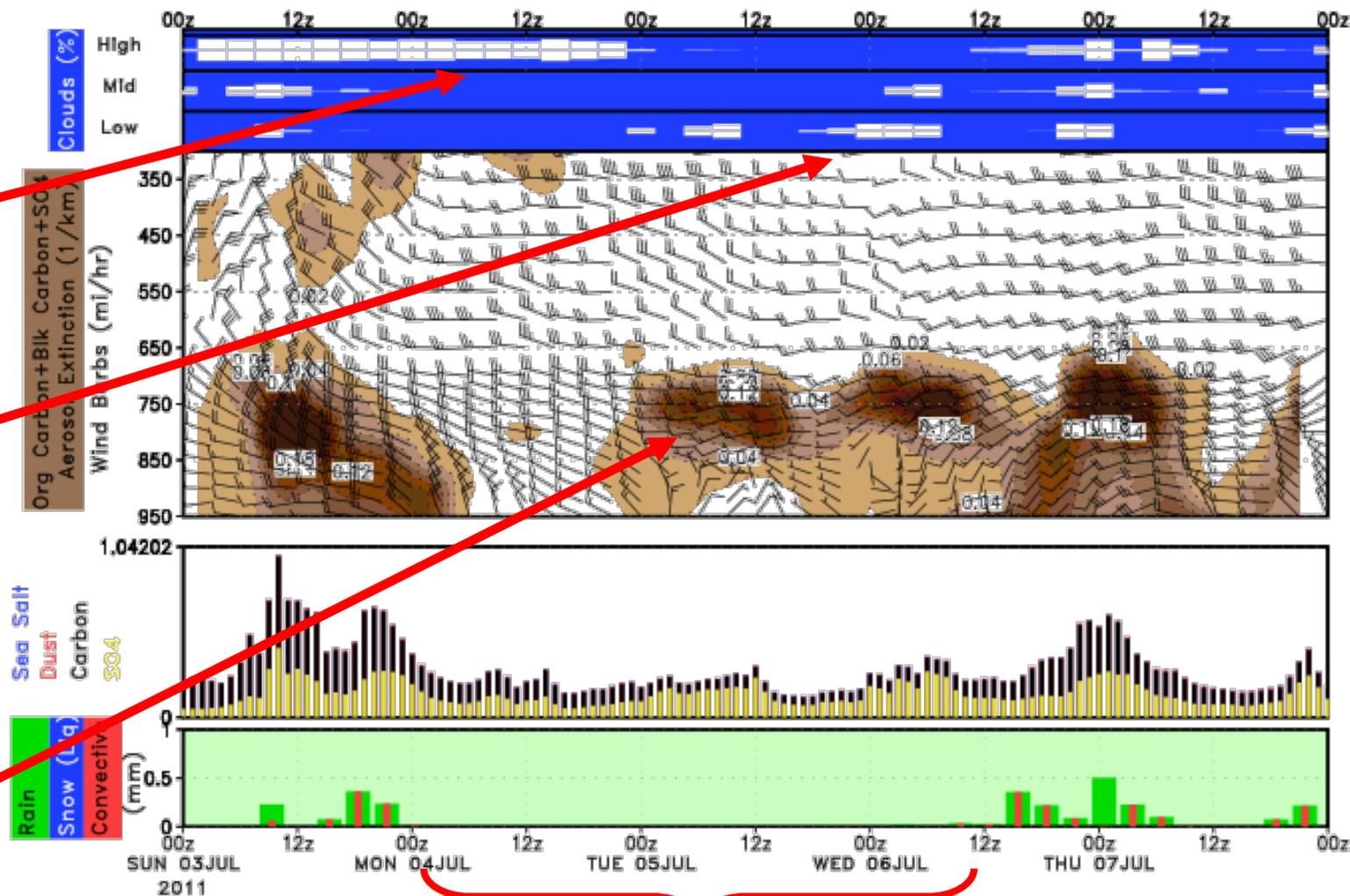
54 hr forecast valid Tue 06z 2011-07-05

GEOS-5 Envirogram through 07 July Beltsville

Opaque high-level clouds on Monday.

Increasing low and mid-level clouds on Tuesday afternoon

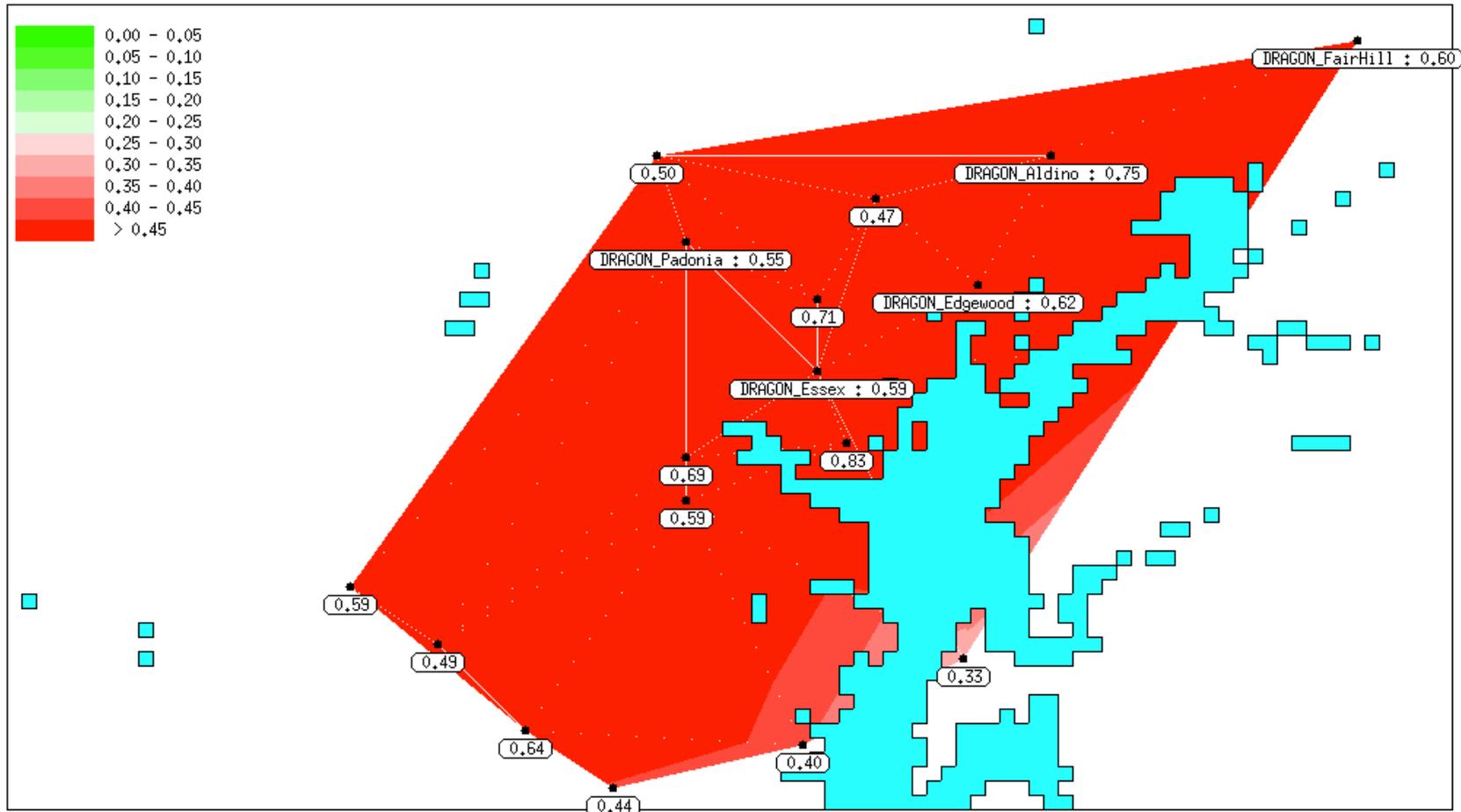
Elevated peak of aerosol extinction Tuesday morning



Precip-free through to Wednesday Morning

(N 39.7400, W 77.4000)

(N 39.7400, W 75.7500)



(N 38.7950, W 77.4000)

(N 38.7950, W 75.7500)

Profile Sites:

Site	Aot(500)	SDA(fine)	Angstrom	SSA(400)	Reff
DRAGON_FairHill	0.60	0.46	1.29	N/A	N/A
DRAGON_Aldino	0.75	0.60	1.33	N/A	N/A
DRAGON_Edgewood	0.62	0.53	1.63	N/A	N/A
DRAGON_Padonia	0.55	0.44	1.55	N/A	N/A
DRAGON_Essex	0.59	0.52	1.53	N/A	N/A
Easton_Airport	0.71	0.46	1.12	N/A	N/A
DRAGON_WileyFord	0.56	0.39	1.30	N/A	N/A