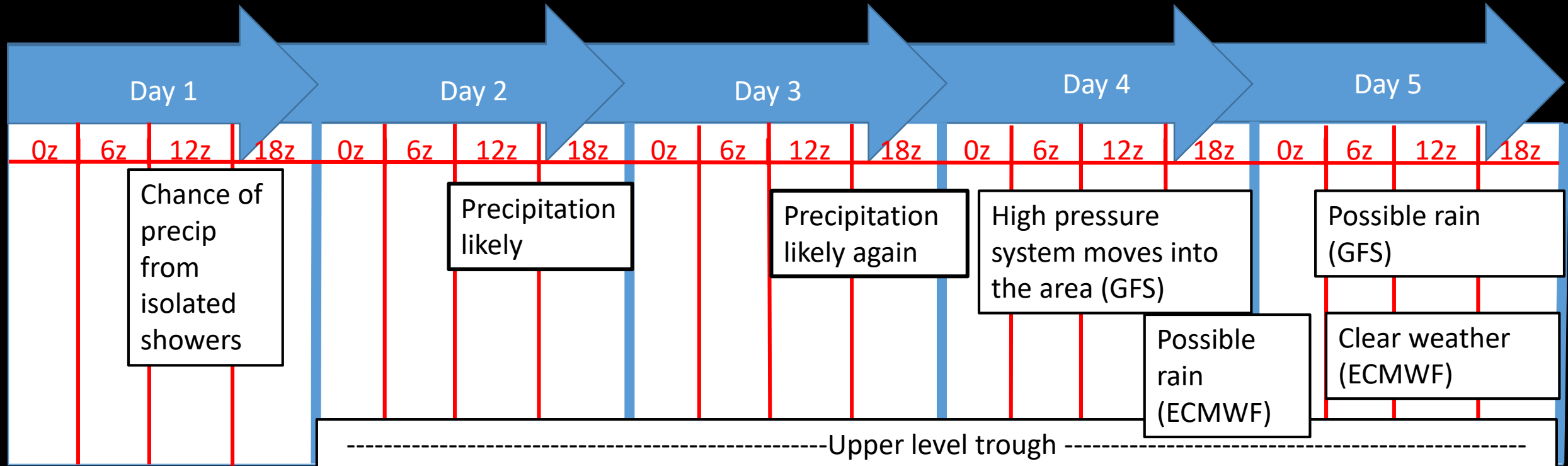


# Forecast for 7/6-7/10

Forecaster: Matthew Brewer

Forecast made: 7/5/2017

# Outlook



Day -1

Day 0

Day 1

Day 2

Day 3-5

# Overview for Day 1

- Weak upper level forcing will create isolated shower throughout the morning and daytime
- Chance for precip highest before 12z and around 18z
- Storm likely to be isolated and passing
- LCLs will likely be favorable in the morning and transition to be higher than the summit due to mixing

Day -1

Day 0

Day 1

Day 2

Day 3-5

# Overview for Day 2

- Weak frontal passage will pass through the area mid day
- Additional will come from upper level divergence
- The forcing from the frontal passage and upper levels will produce rain mid day throughout the area
- The morning may be a favorable day for measurement due to low LCLs

Day -1

Day 0

Day 1

Day 2

Day 3-5

## Overview for Day 3-5

- Rain likely on Saturday morning caused by upper level forcing
- High pressure system may move into the area Sunday and create a period of dry weather during the day with precip moving in during the evening
- Mondays forecast is extremely variable at this point with the GFS and ECMWF having large differences in the location of upper forcing and precip

Day -1

Day 0

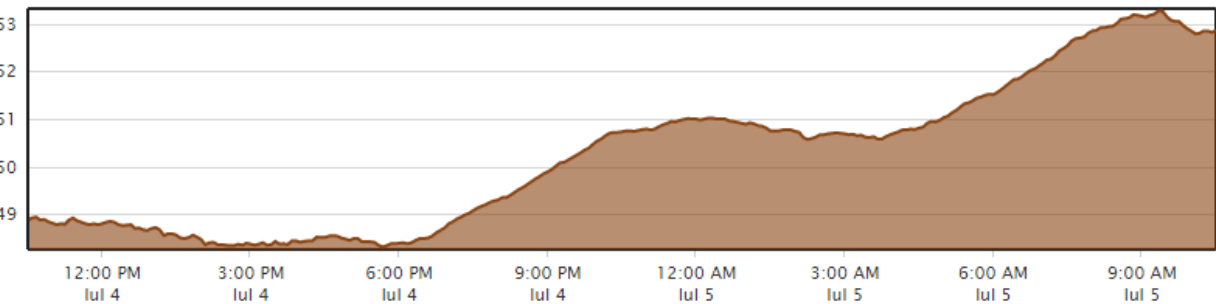
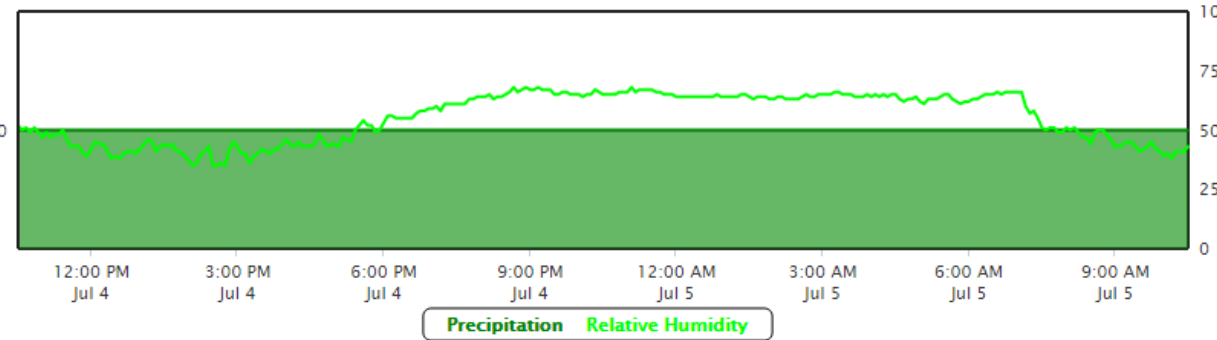
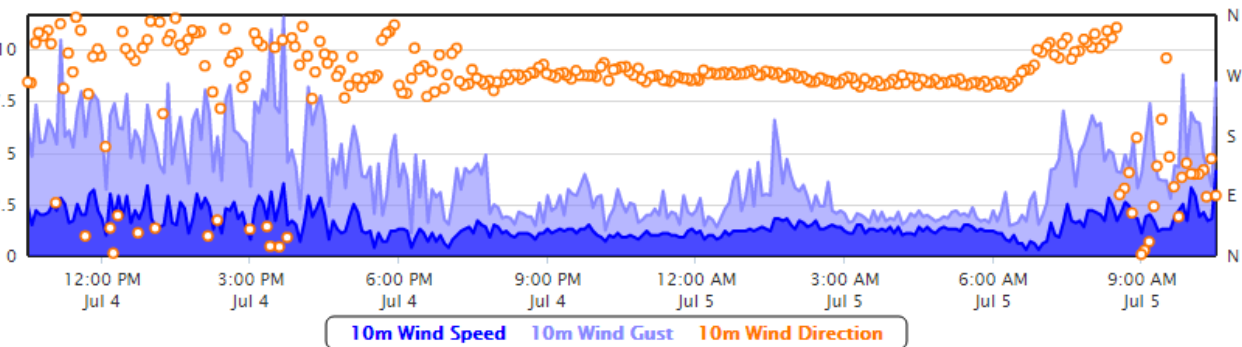
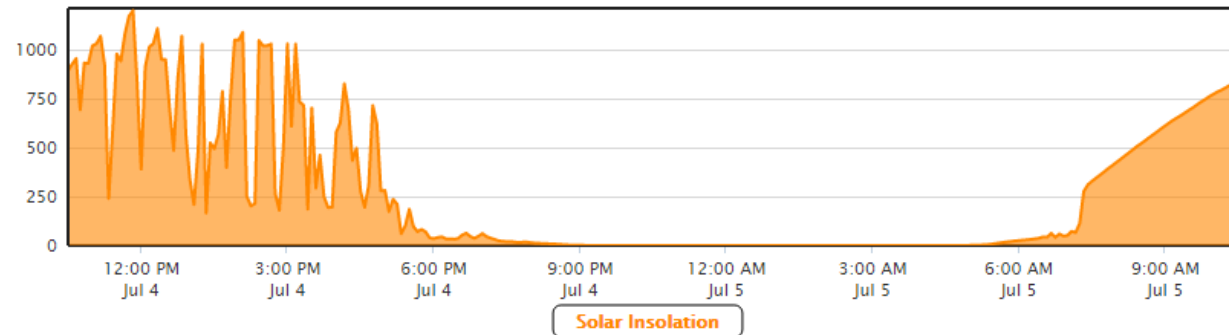
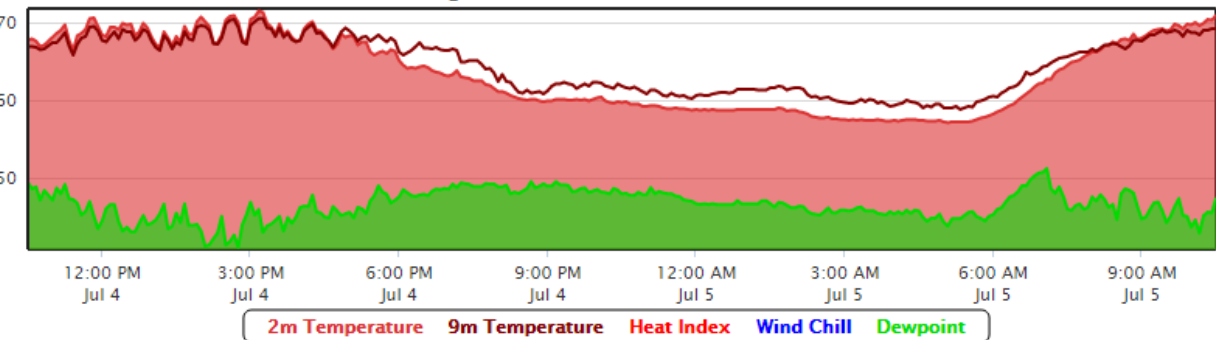
Day 1

Day 2

Day 3-5

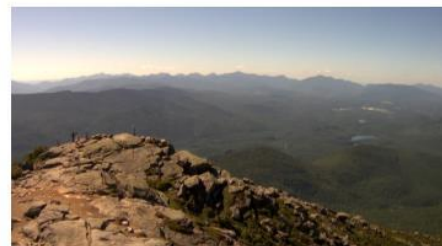
# Whiteface lodge Mesonet Meteogram for the past 24 hours

Meteogram for Whiteface Mountain Base



<http://www.nysmesonet.org/data/meteogram#?stid=WFMB>

- Whiteface Summit week long running Meteogram



Current image from Whiteface Summit

Summit Conditions

07/05 10:16

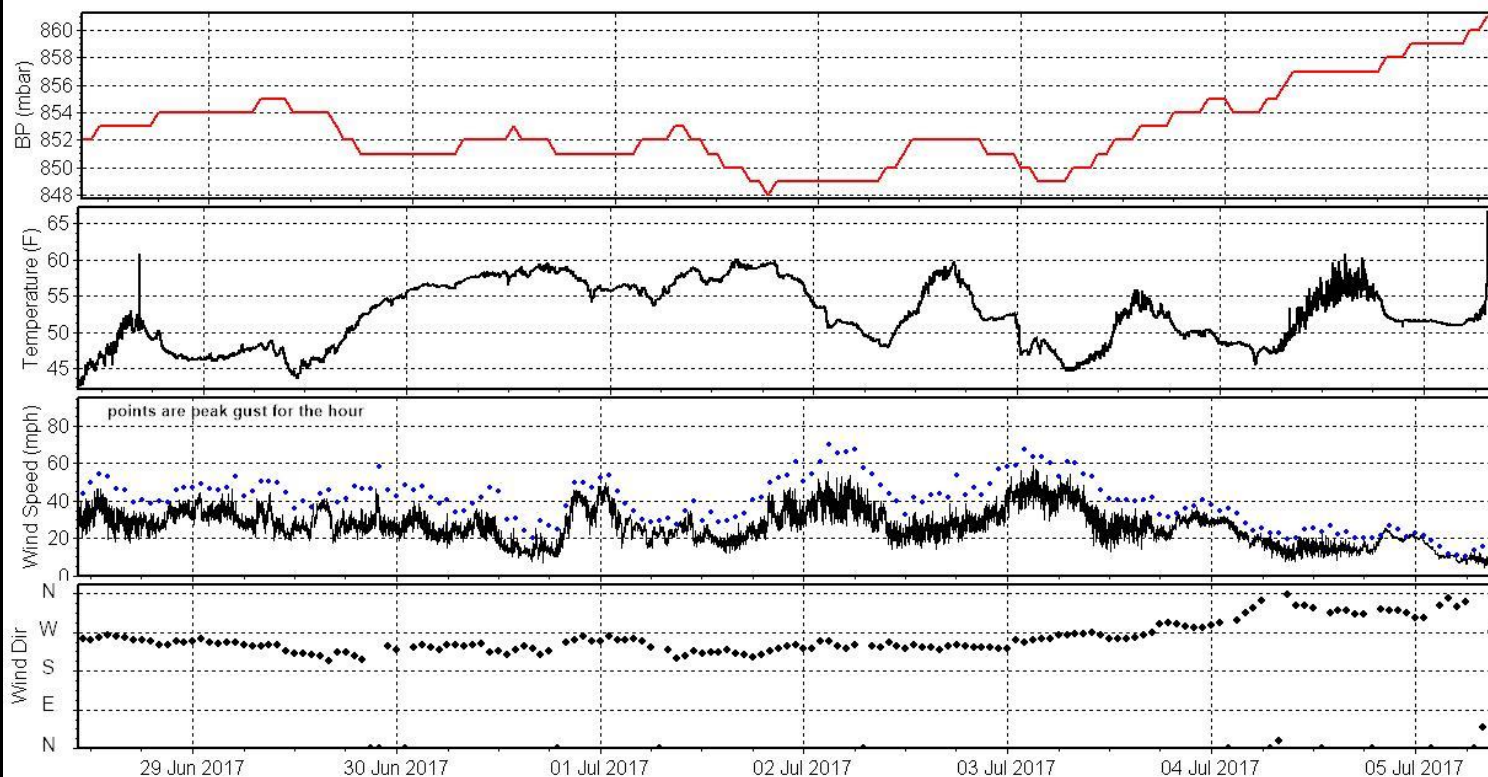
temperature 59°F / 15°C  
 humidity 62 %  
 wind speed 12 mph / 19 kph  
 gusting to 12 mph / 20kph



wind direction

*Preliminary data: Data displayed on these pages  
 are preliminary and subject to change.*

one-week time series:



Day -1

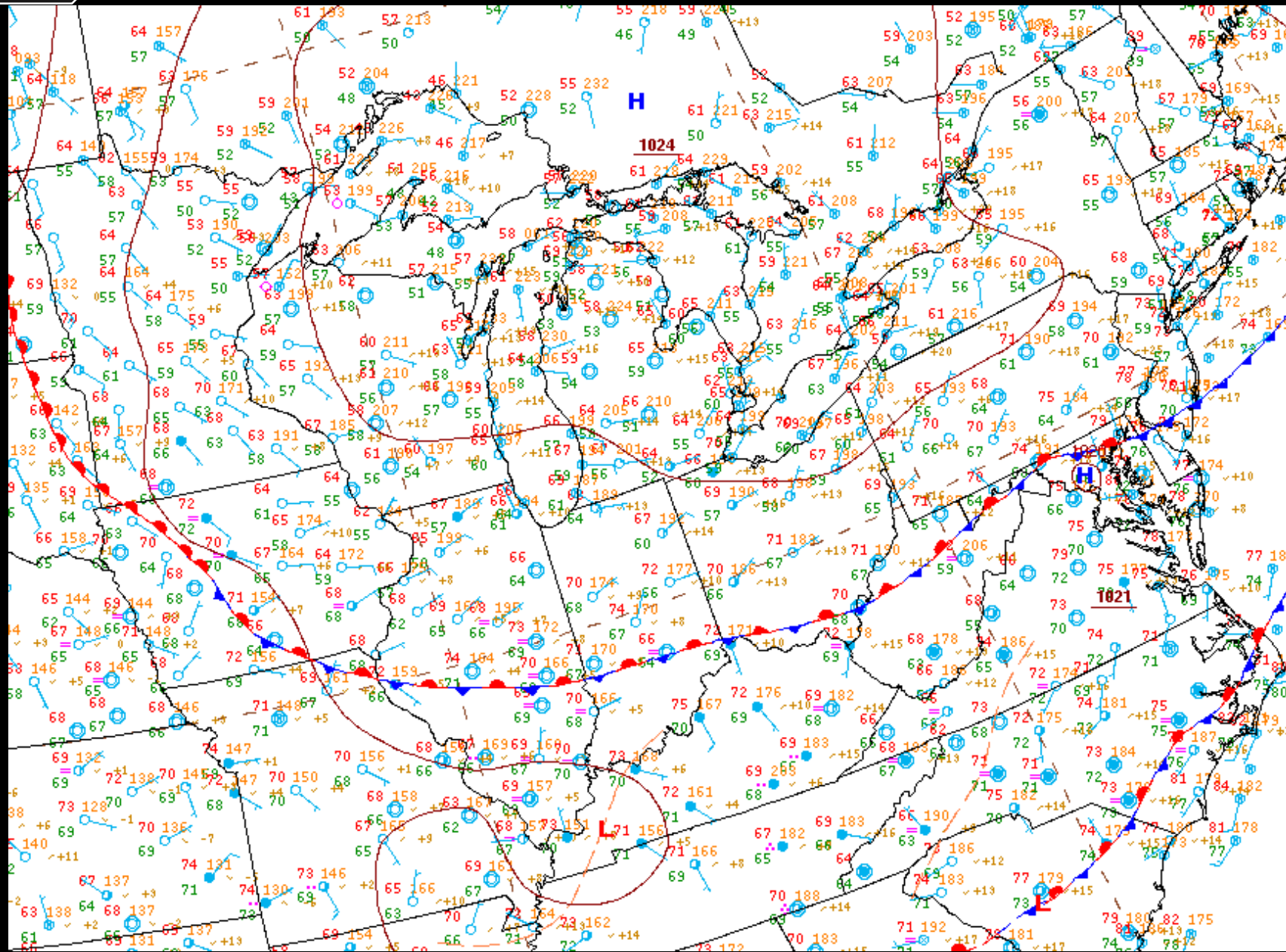
Day 0

Day 1

Day 2

Day 3-5

# 12z surface analysis from yesterday (7/4)





Day -1

Day 0

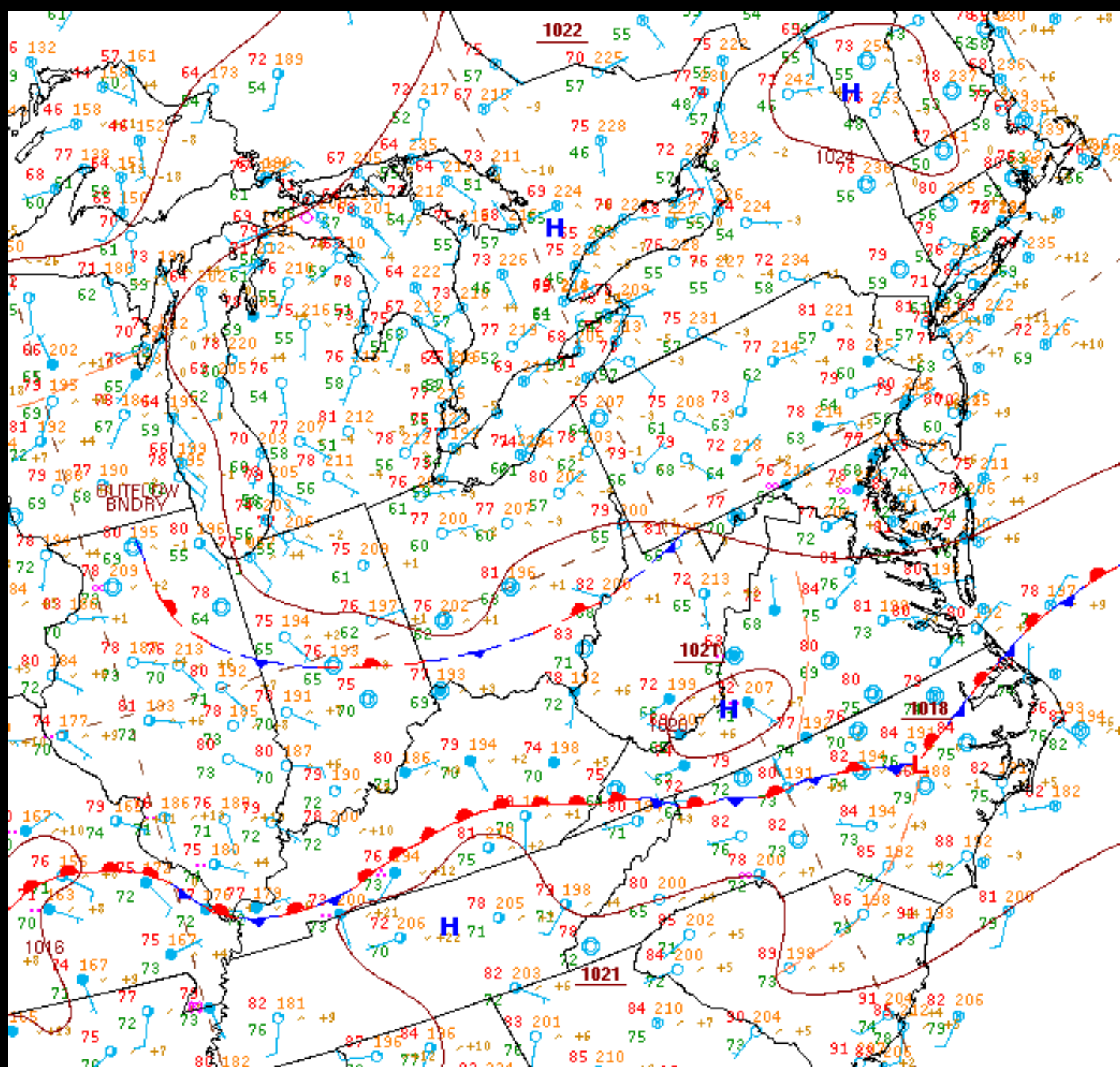
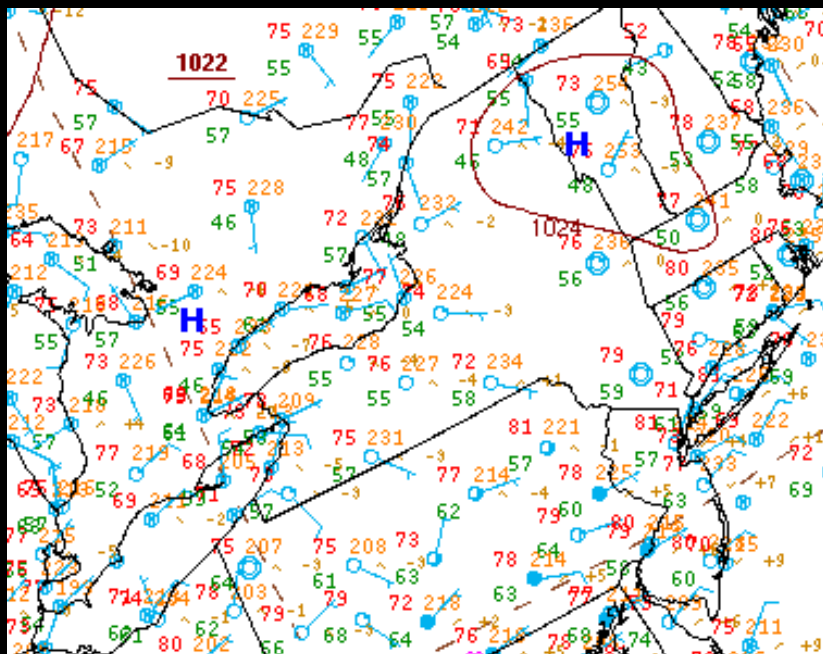
Day 1

Day 2

Day 3-5

# Current Surface Analysis

- Shown is the NOAA WPC surface analysis from 12z 7/ 5/2017
- Right: This map shows a large portion of the US helping illustrate synoptic scale winds and fronts
- Bottom: This map gives a more clear view of the surface reports in New York. Winds throughout the state are weak and variable with very little pressure gradient



Day -1

Day 0

Day 1

Day 2

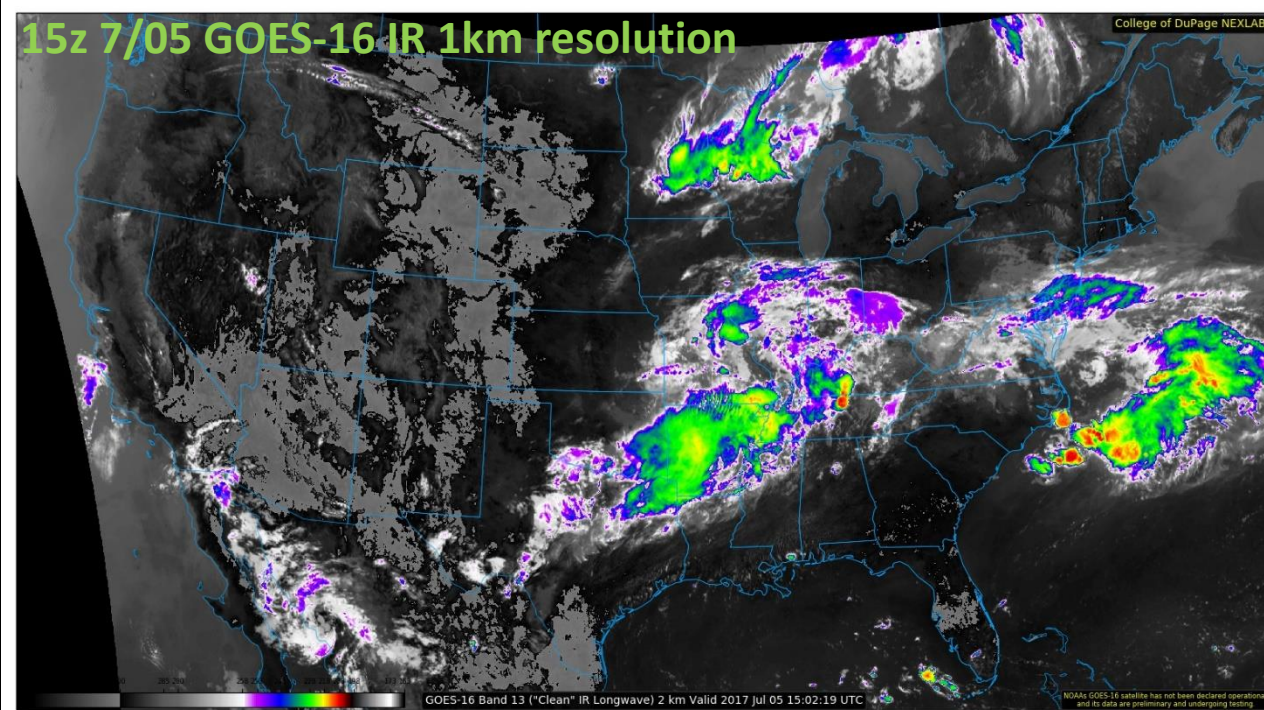
Day 3-5

# Current Satellite Imagery

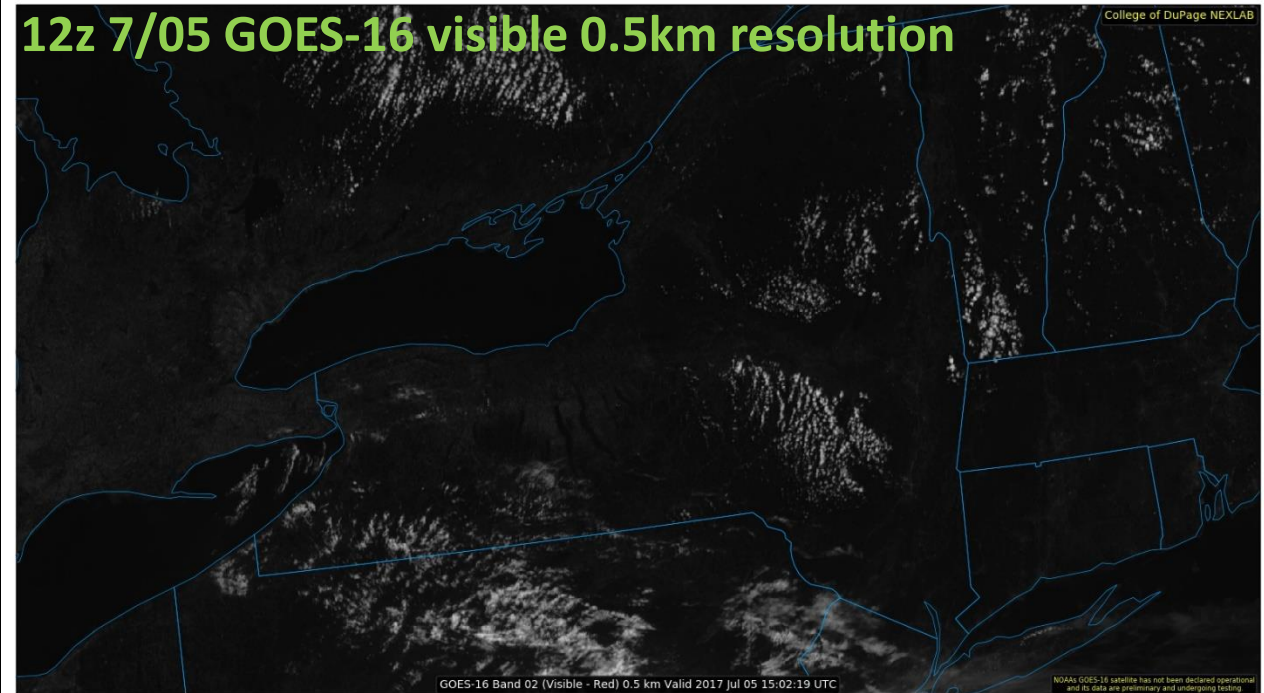
- Shown is 12z GOES-16 products
- From the IR image you are able to see the stationary front shown in the surface analysis
- From the visible image you can see clear skies, expected due to high pressure system in area

Note: If I was doing this forecast in the afternoon for the field campaign I would likely put in the image that corresponds to the latest surface analysis

15z 7/05 GOES-16 IR 1km resolution



12z 7/05 GOES-16 visible 0.5km resolution



Day -1

Day 0

Day 1

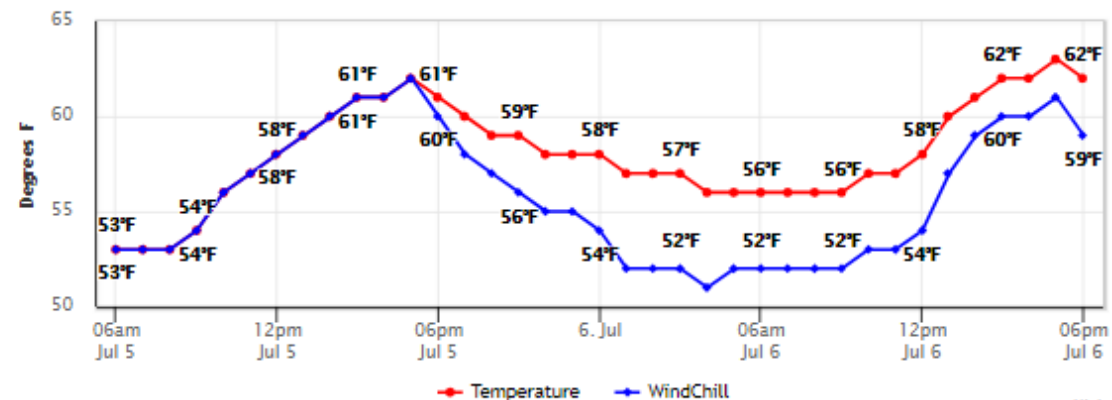
Day 2

Day 3-5

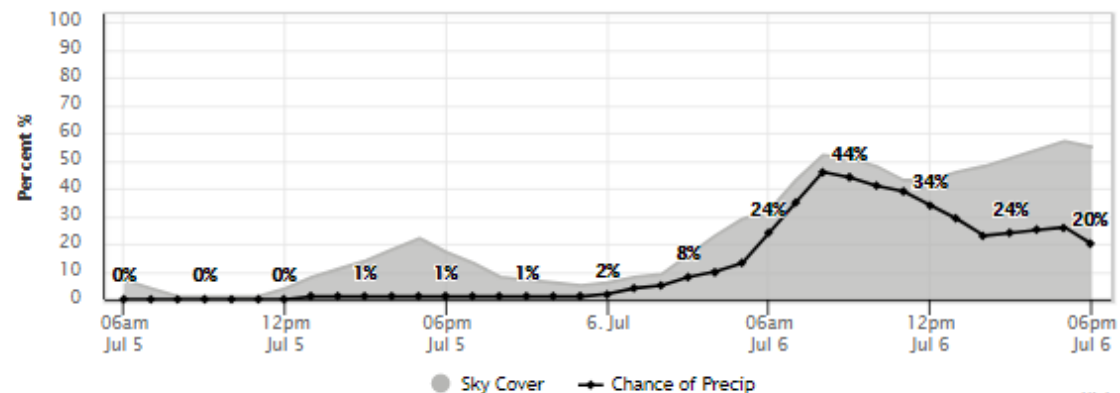
# Summit forecast

- Shown is the NWS Burlington's summit forecast
- This forecast shows an increase in chance of precip and increasing cloud cover
- This also shows that the summit will likely not be in cloud tomorrow

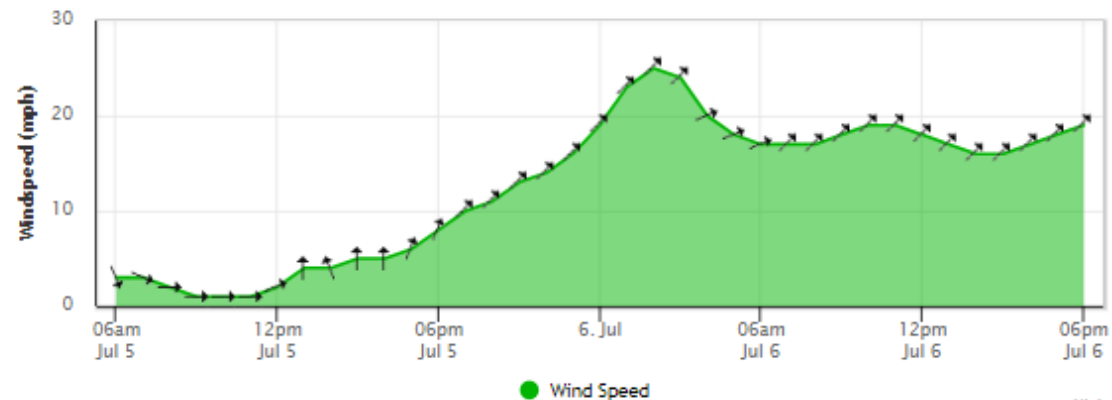
### Temperature & Wind Chill Forecasts for Whiteface Mountain, NY at 4867'



### Precipitation & Sky Cover Forecasts for Whiteface Mountain, NY at 4867'



### Wind Speed & Direction Forecasts for Whiteface Mountain, NY at 4867'



Day -1

Day 0

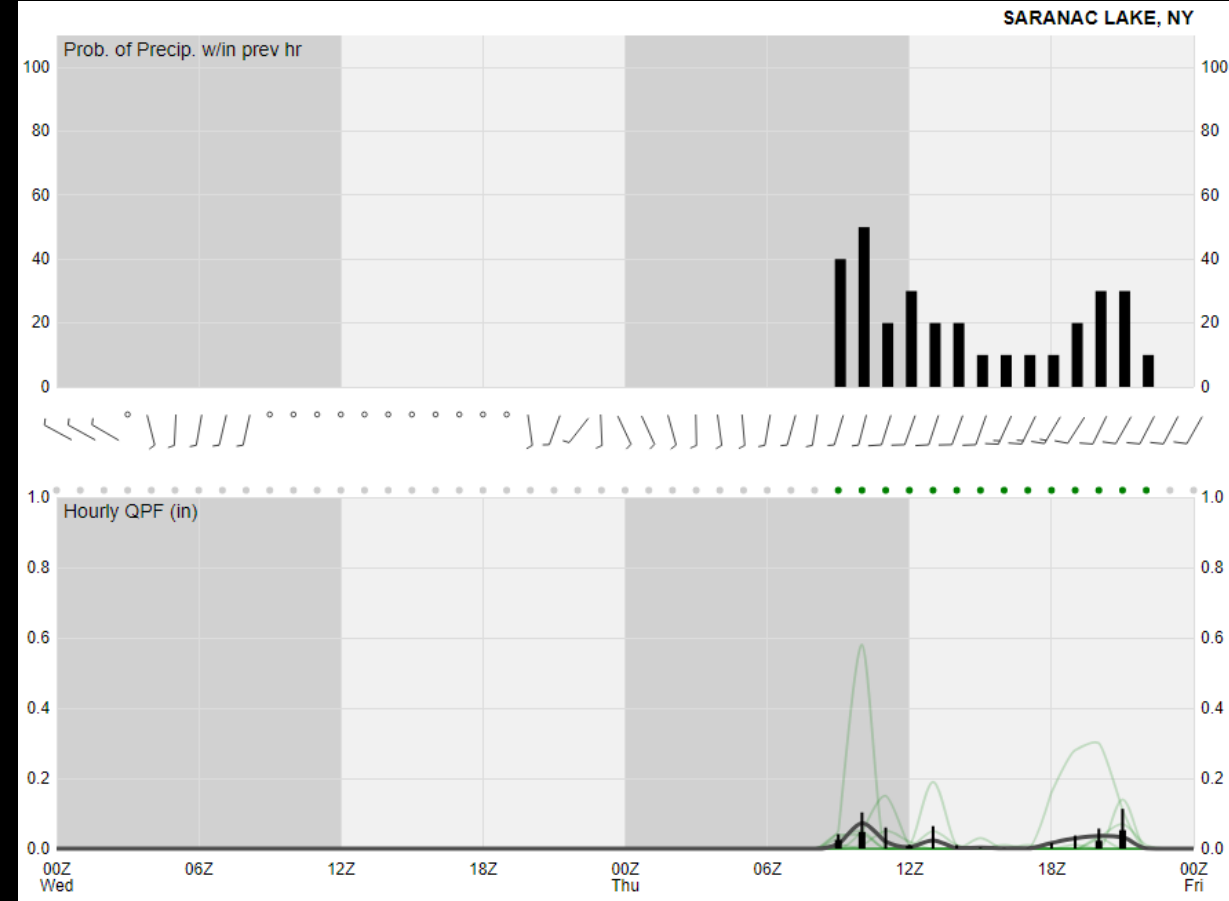
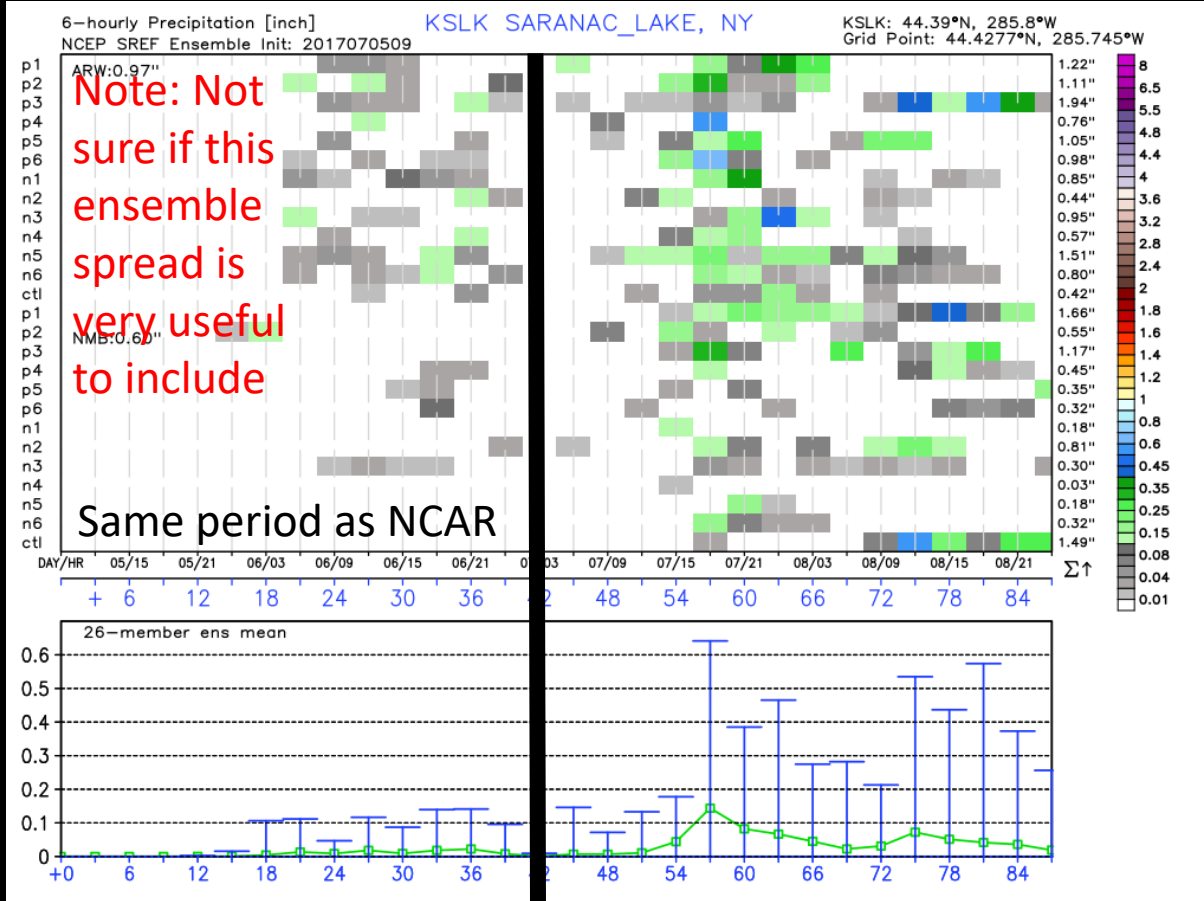
Day 1

Day 2

Day 3-5

# Precip Meteograms

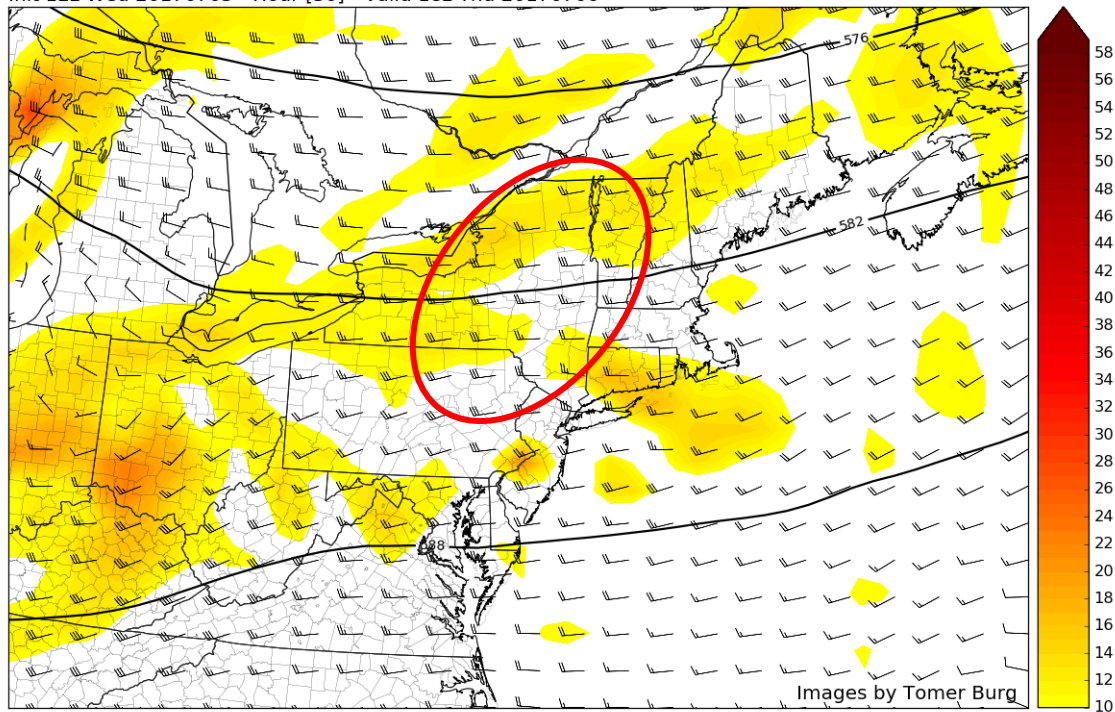
- Left: NCEP SREF 9z 7/05 run showing 6 hourly precip
- Right: NCAR ensemble 0z 7/05 run showing probability of precip and hourly QPF
- Both models indicate a chance of precip for tomorrow with highest chance before 12z and after 18z



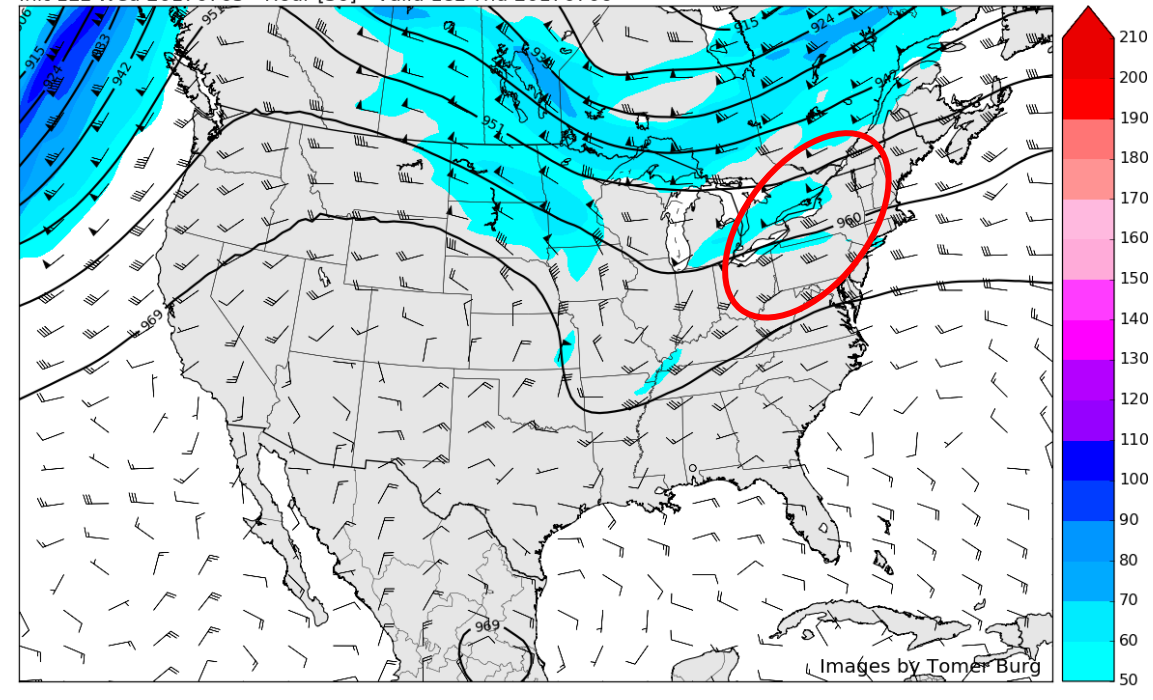
# Synoptic Forcing

- Left: 12z 7/5 GFS run valid for 18z 7/6 showing 500hPa height(contoured), wind barbs, and vorticity(filled)
- Right: 12z 7/5 GFS run valid for 18z 7/6 showing 300hPa height(contoured), wind barbs, and isotachs(filled)
- Circled area show the weak forcing that may produce precip
- The vorticity map shows weak vorticity advection, creating upward vertical motion
- The 300hPa map shows a weak jet exit region down stream of a trough axis also creating weak upward vertical motion

GFS 500 hPa Absolute Vorticity (1/s), Geopotential Heights (dam), Wind (kt)  
Init 12z Wed 20170705 - Hour [30] - Valid 18z Thu 20170706

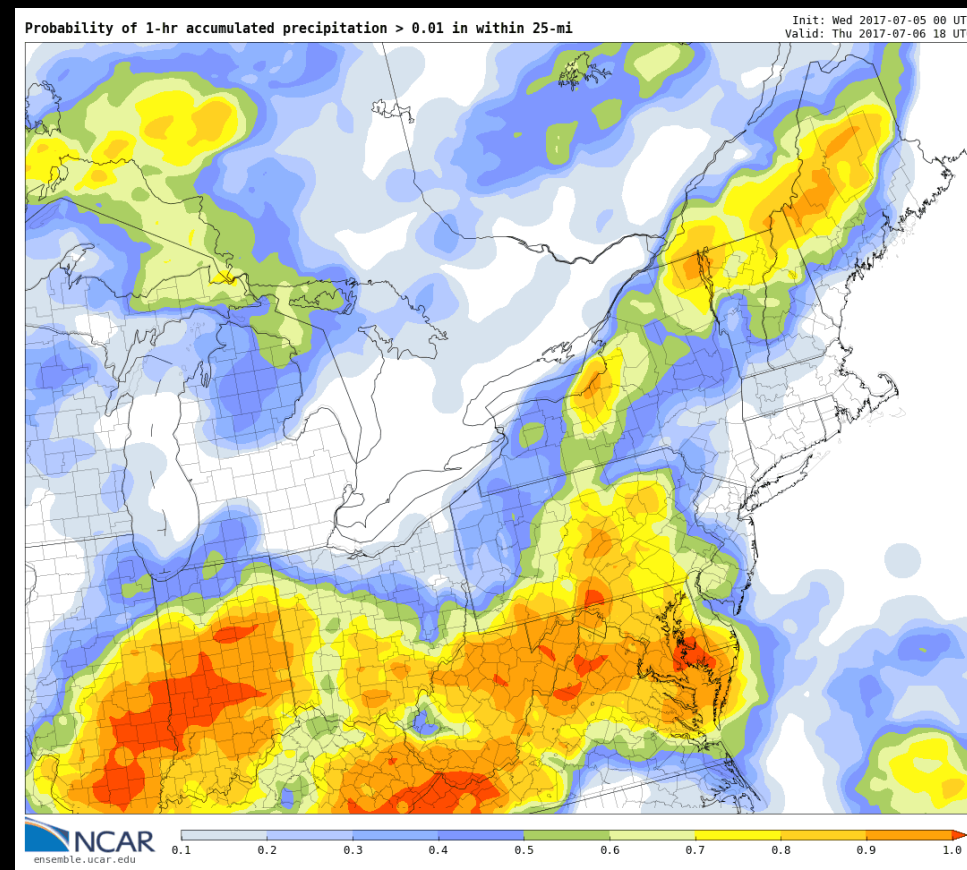
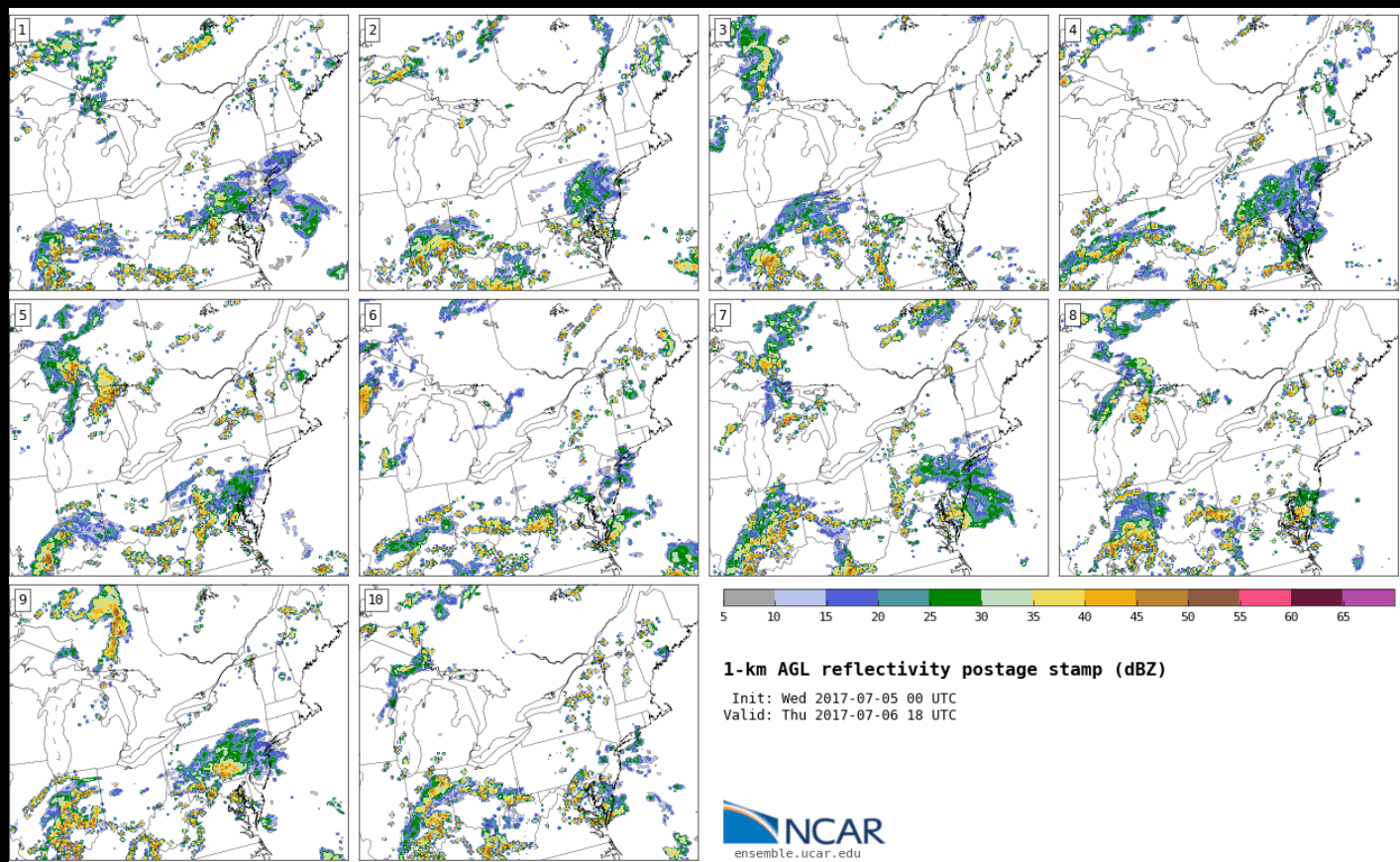


GFS 300 hPa Wind Isotachs, Geopotential Heights (dam), Wind (kt)  
Init 12z Wed 20170705 - Hour [30] - Valid 18z Thu 20170706



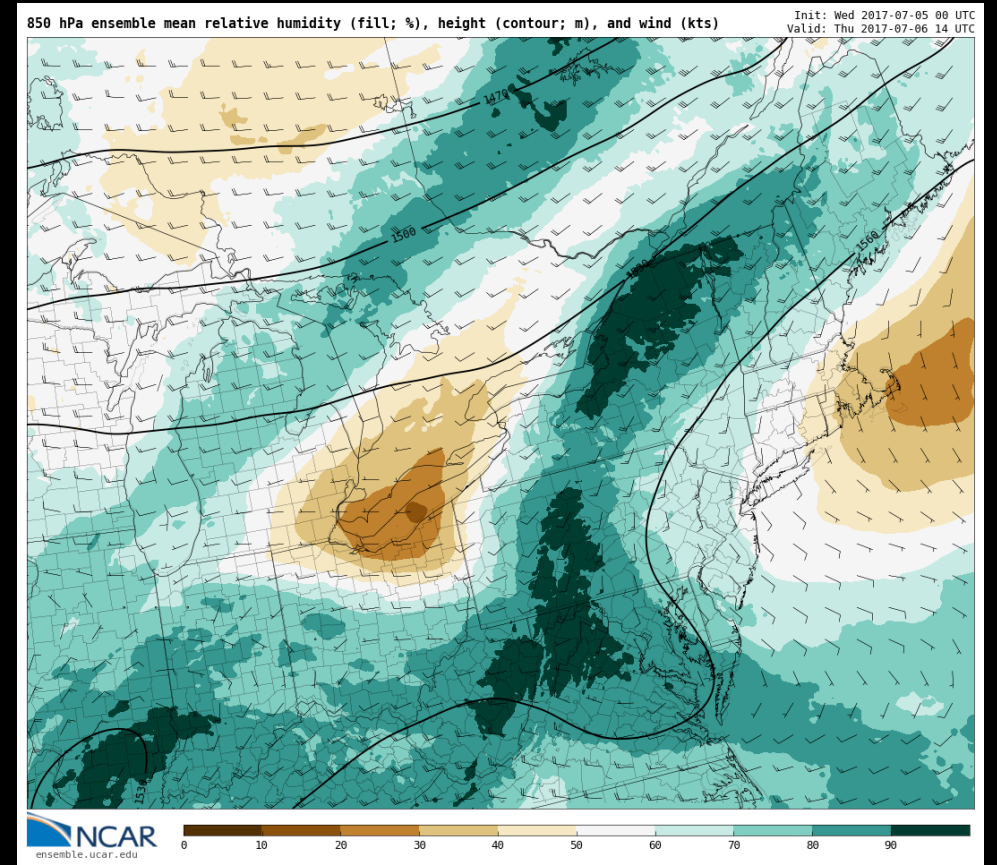
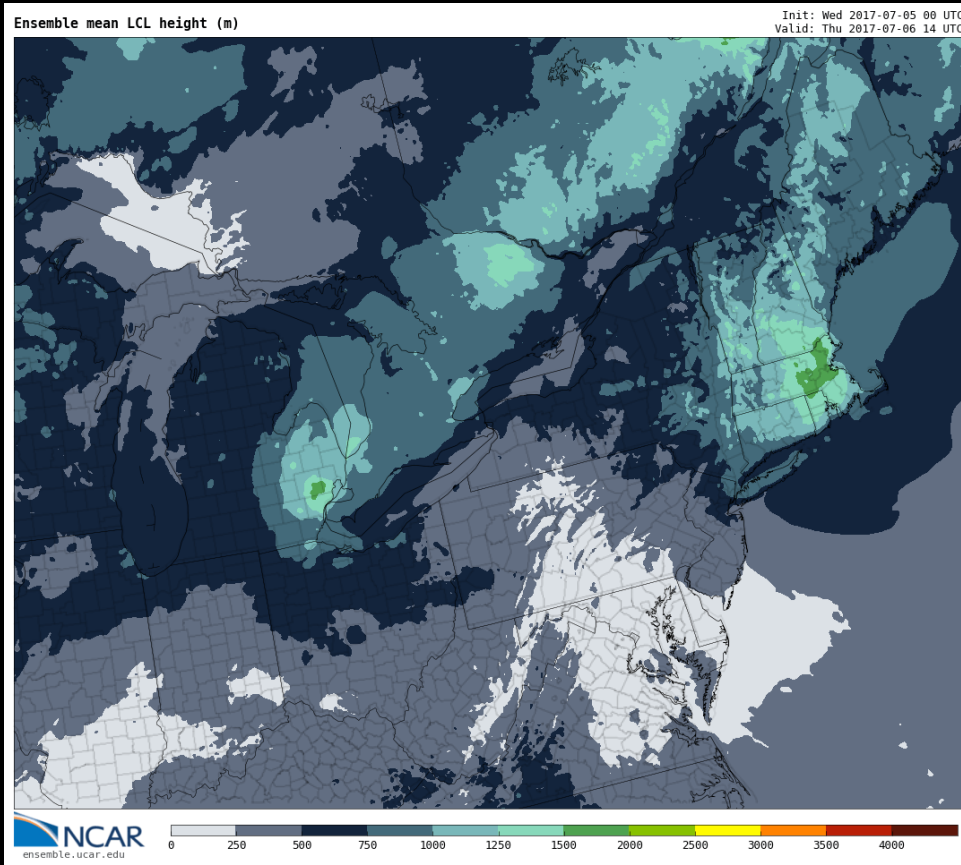
# Synoptic Forcing

- Right: 0z 7/5 NCAR ensemble run valid for 18z 7/6 showing Probability of 1hr precip >0.01" within 25miles
- Left: 0z 7/5 NCAR ensemble run valid for 18z 7/6 showing 1km AGL reflectivity postage stamps
- From the probability map there is a 70-80% chance of precip inn the area of whiteface
- The postage stamps help show the variability in the members and how storm will likely be isolated



# Synoptic Forcing

- Left: 0z 7/5 NCAR ensemble run valid for 14z 7/6 showing ensemble mean LCL height AGL
- Right: 0z 7/5 NCAR ensemble run valid for 14z 7/6 showing 850hPa ensemble mean RH(filled), height(contoured), and wind barbs
- The RH map shows that at 850hPa the area is close to saturation which is favorable for cloud formation
- However, the LCL map indicates that LCLs will be higher than the summit



Day -1

Day 0

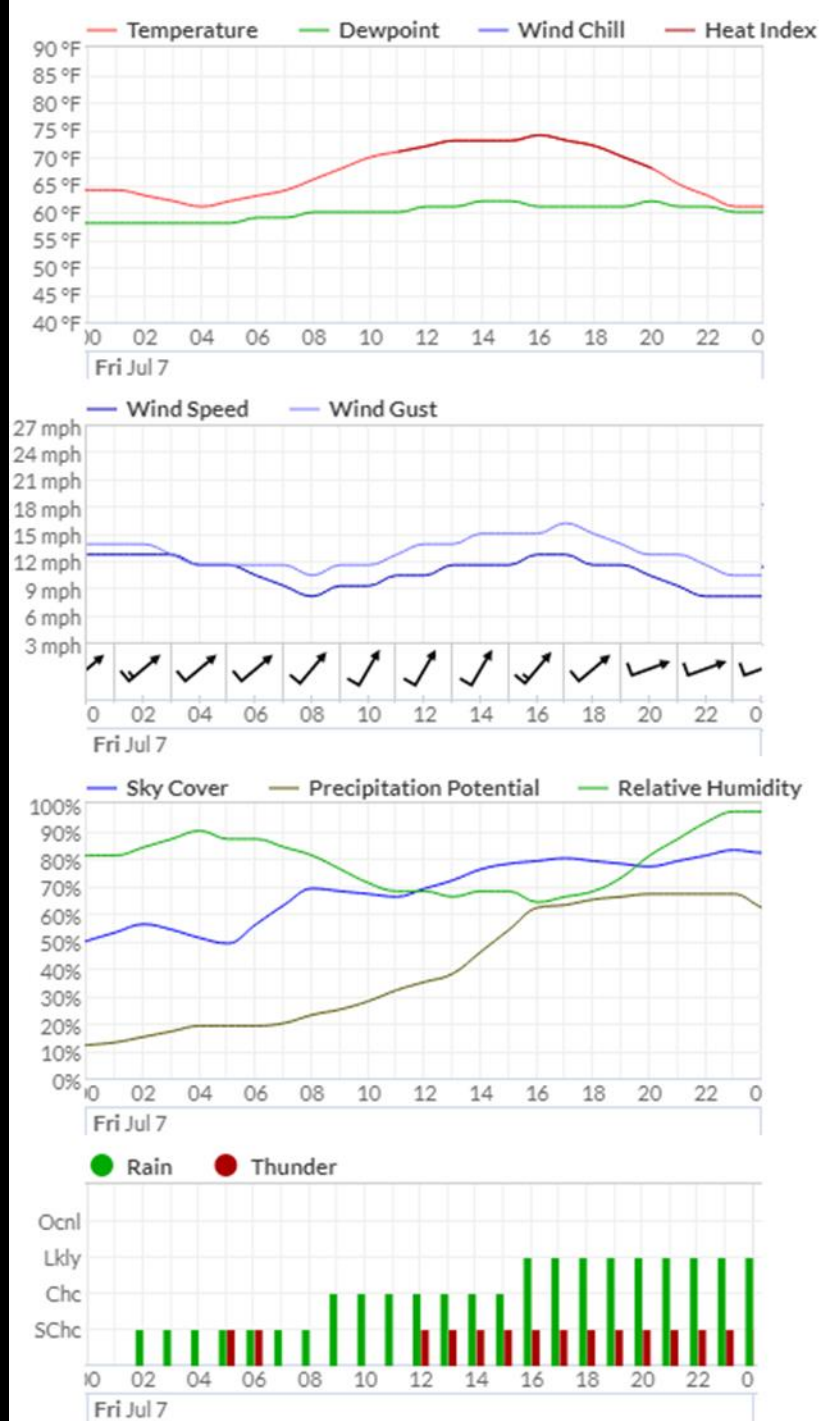
Day 1

Day 2

Day 3-5

# Base Forecast

- The NWS forecast for Whiteface lodge Mesonet site shows seasonable temps and high dew points
- Winds between 10-12mph generally from the SW
- Chance of precip and cloud cover will increase throughout the day
- This agrees with the forcing from above





Day -1

Day 0

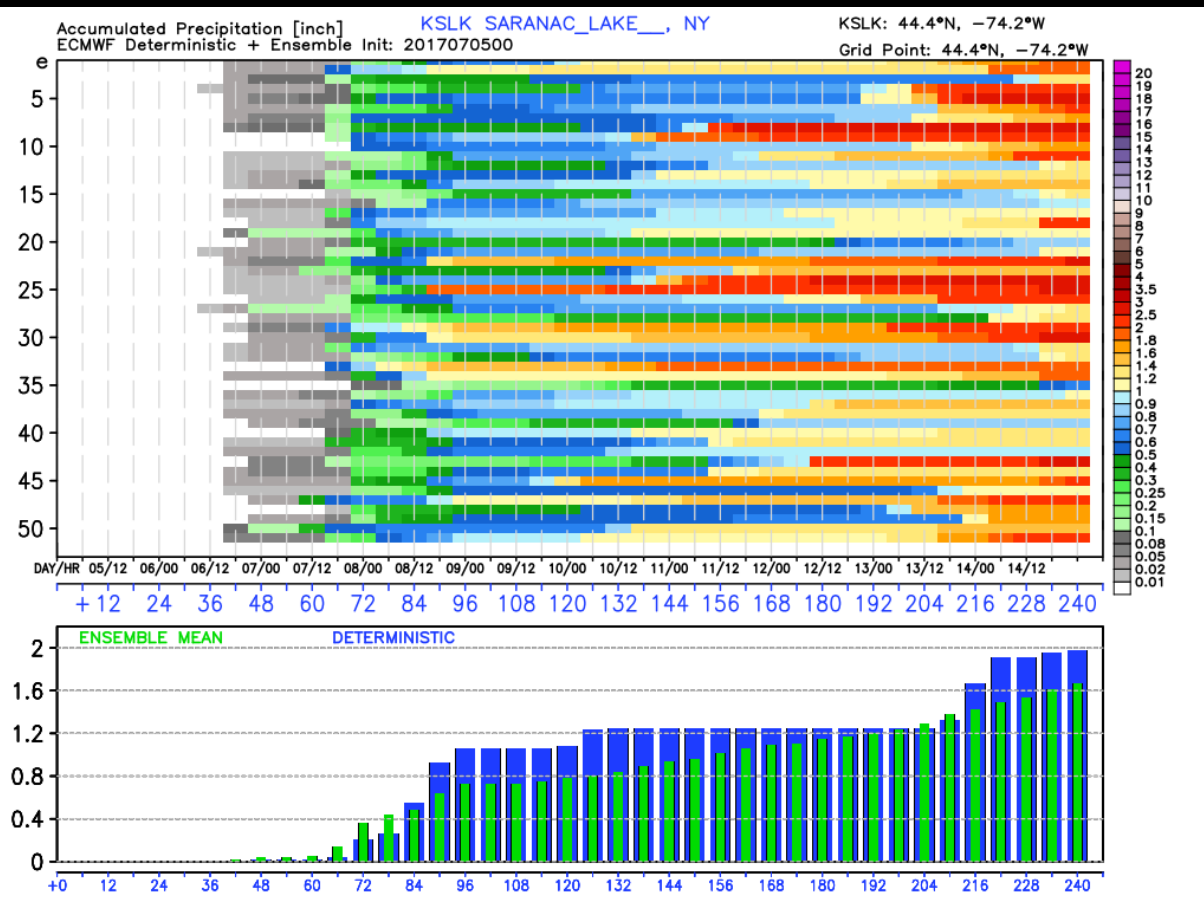
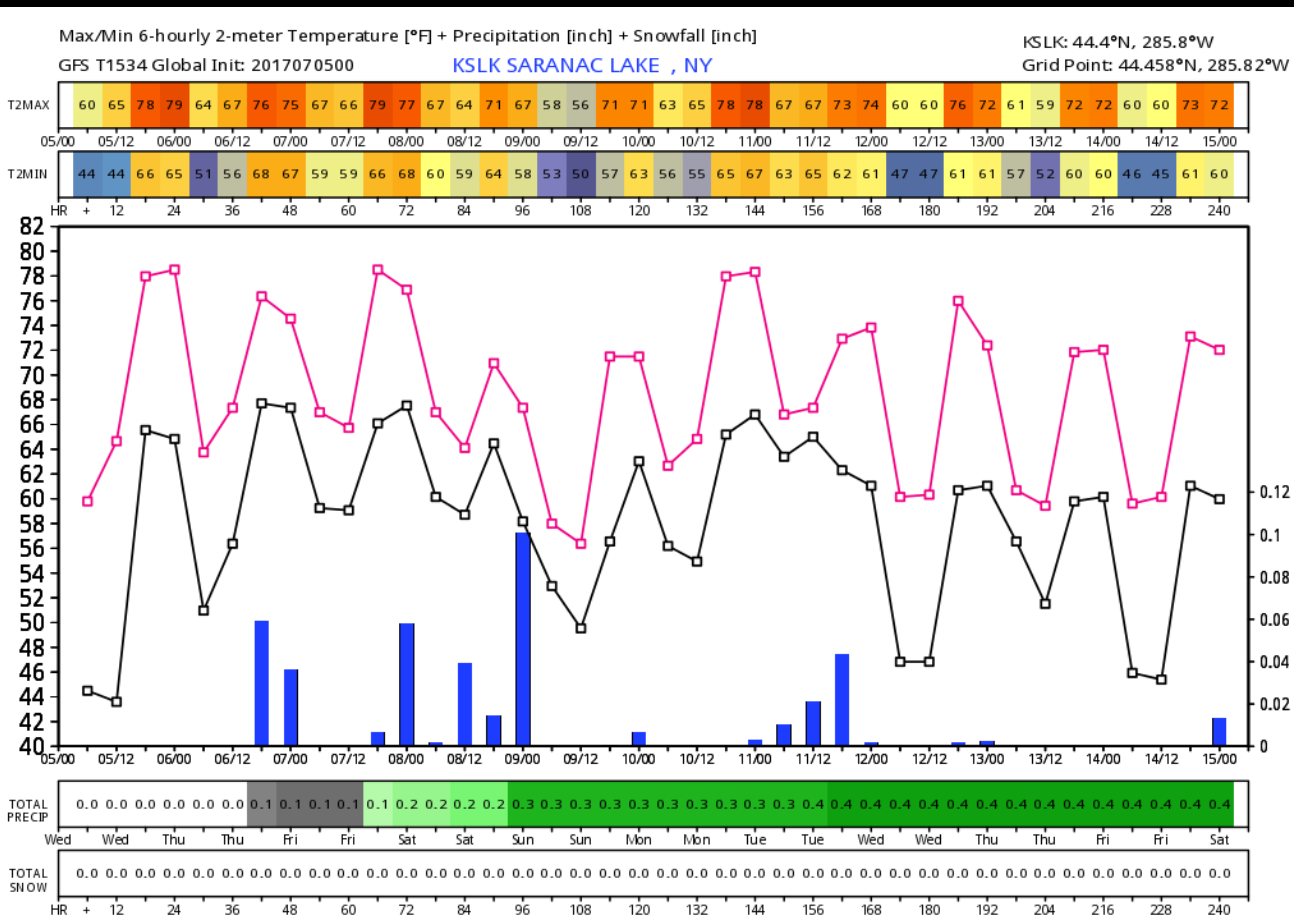
Day 1

Day 2

Day 3-5

- Left: GFS Temp max/min, 6hr precip, and total precip
- Right: ECMWF ensemble accumulated precip

Note: I think that at least the ECMWF spread is useful but I am not sure where to place it within this discussion



Day -1

Day 0

Day 1

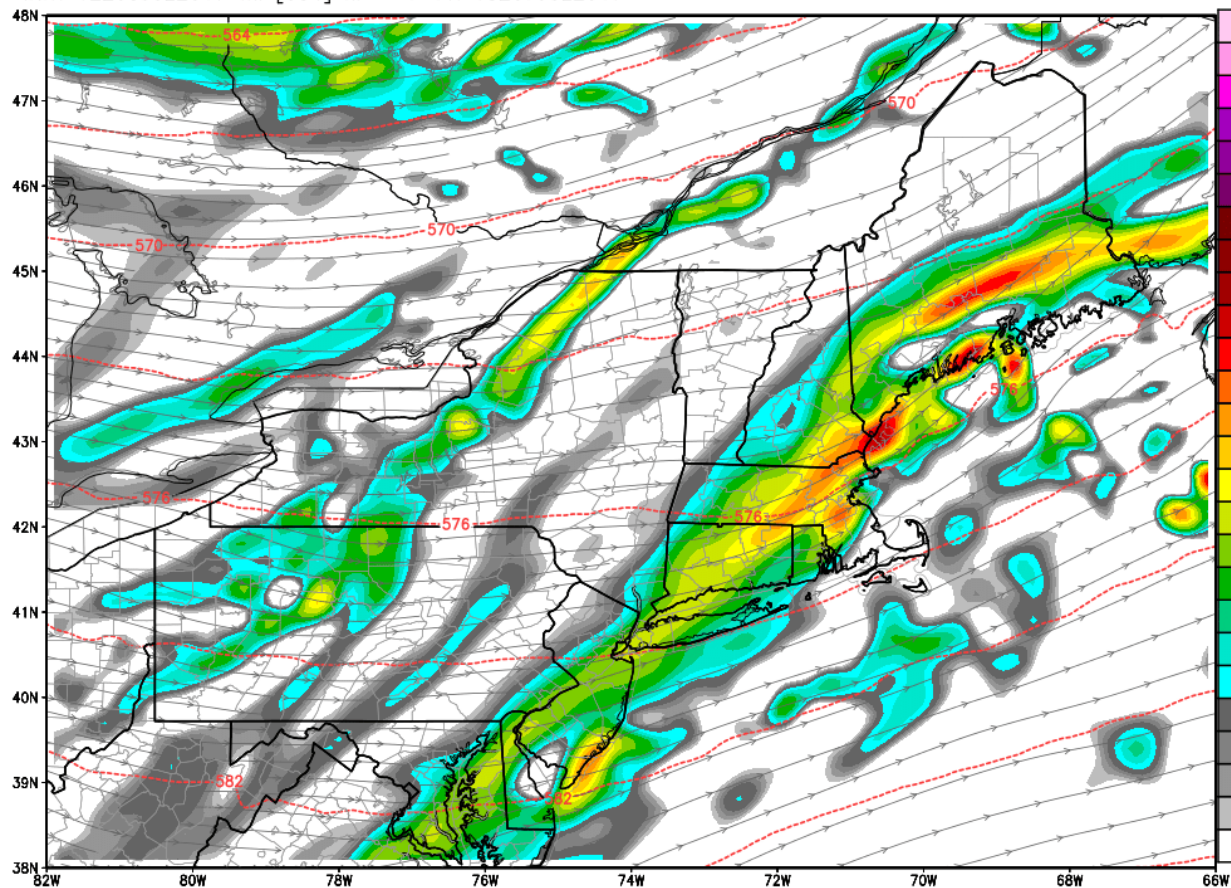
Day 2

Day 3-5

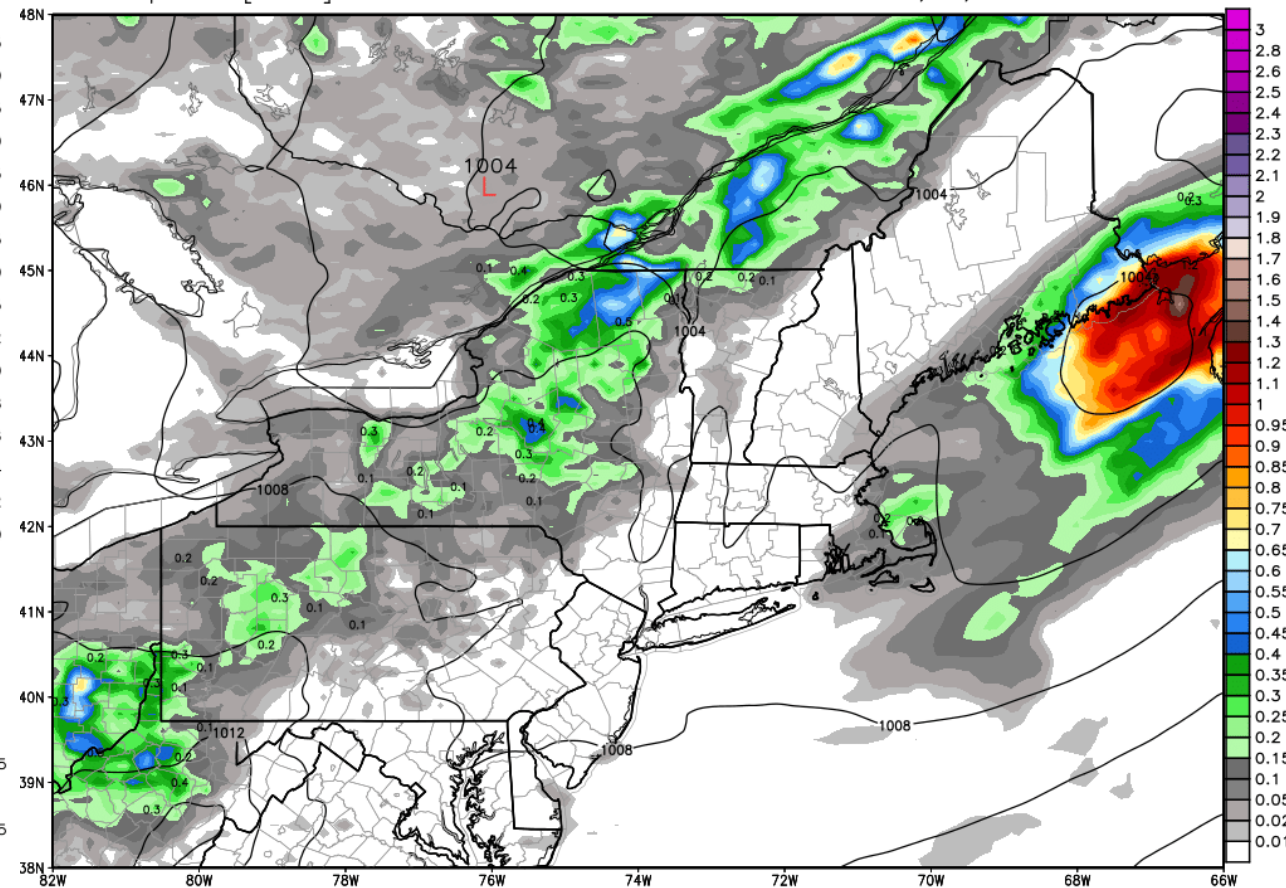
# Synoptic Forcing

- Left: 12z 7/5 ECMWF 500hPa vorticity(filled), height, and streamlines valid for 18z 7/7
- Right: 12z 7/5 ECMWF 6hr precip and MSLP valid for 18z 7/7
- The vorticity advection at 500hPa will provide forcing that will cause precip throughout the day Friday
- Friday morning may be favorable for operations before the precip starts

ECMWF 500 hPa Relative Vorticity [ $\times 10^5 \text{ s}^{-1}$ ], Height [dm], Wind Streamlines  
 INIT: 12Z05JUL2017 fx: [054] hr --> Fri 18Z07JUL2017

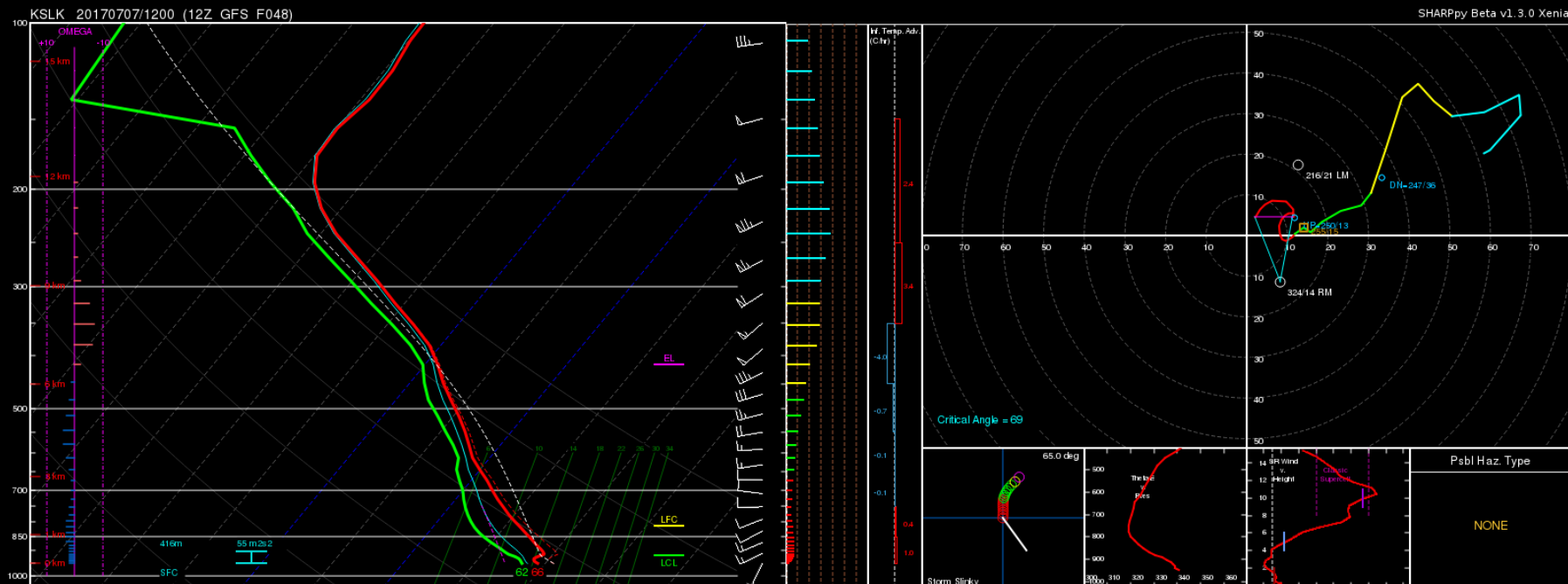


ECMWF 6-hourly Precipitation & MSLP [hPa] INIT: 12Z05JUL2017 fx: [060] hr --> Sat 00Z08JUL2017  
 Total Precipitation [inches] between 18Z07JUL2017 -- 00Z08JUL2017 + 0°,32°,35° t2m contours

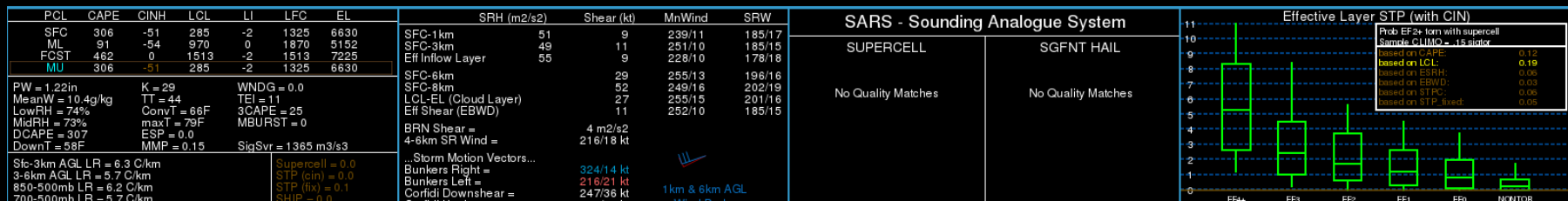


# Synoptic Forcing

- Shown is the 12z 7/5 GFS sounding at KSLK valid for 12z 7/7
- The LCLs in this sounding are low and would likely cause the summit to be in cloud
- The temp and dew point being close aloft is indicative of a possible thick cloud deck above the summit which may be precipitating



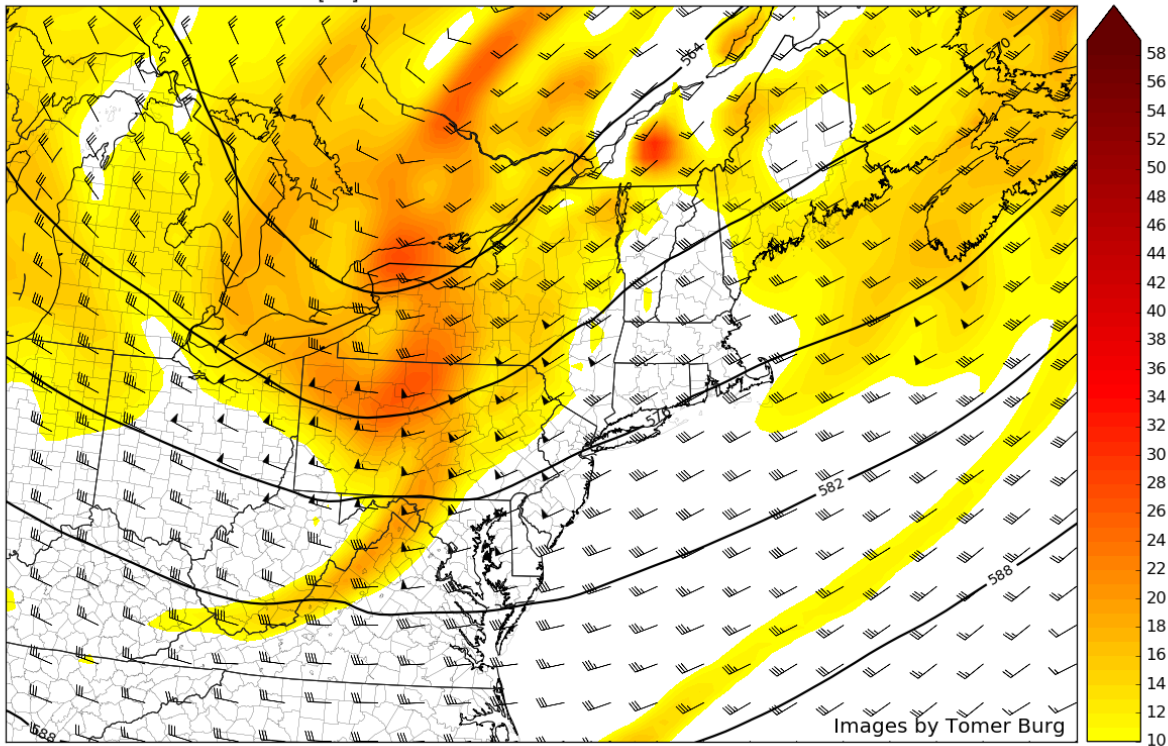
Note: include more soundings zoomed in on below 500hPa



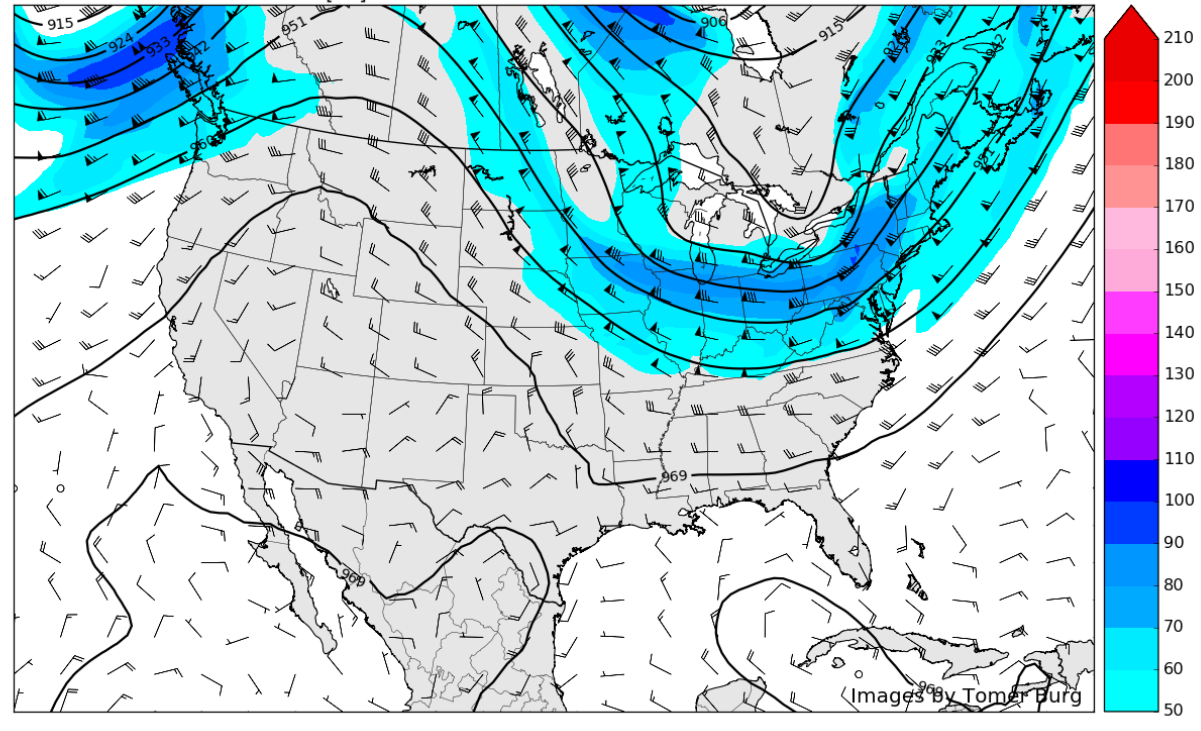
# Synoptic Forcing

- Left: 12z 7/5 GFS run valid for 12z 7/8 showing 500hPa height(contoured), wind barbs, and vorticity(filled)
- Right: 12z 7/5 GFS run valid for 12z 7/8 showing 300hPa height(contoured), wind barbs, and isotachs(filled)
- The vorticity map shows vorticity advection over central/northern NY which will create upward vertical motion forcing precip
- The 300hPa map shows a weak poleward jet exit region down stream of a trough axis also creating weak upward vertical motion
- The forcing from aloft will intensify a surface low which will produce precip

GFS 500 hPa Absolute Vorticity (1/s), Geopotential Heights (dam), Wind (kt)  
Init 12z Wed 20170705 - Hour [72] - Valid 12z Sat 20170708

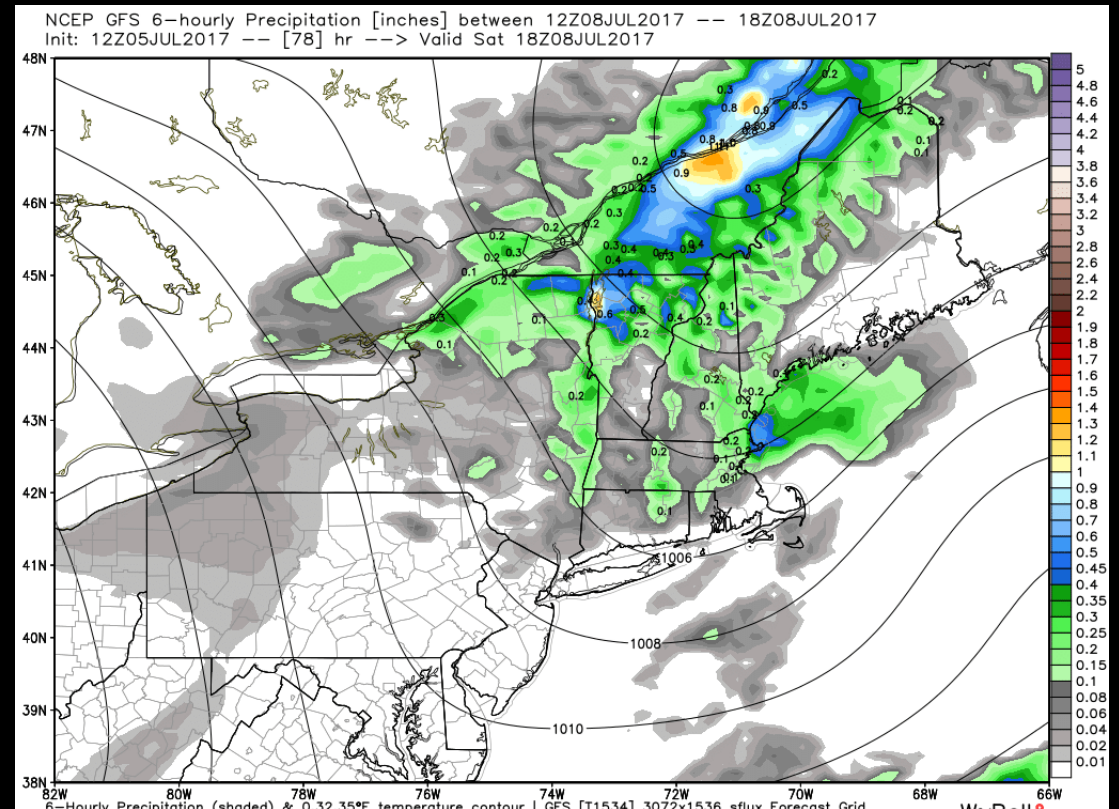
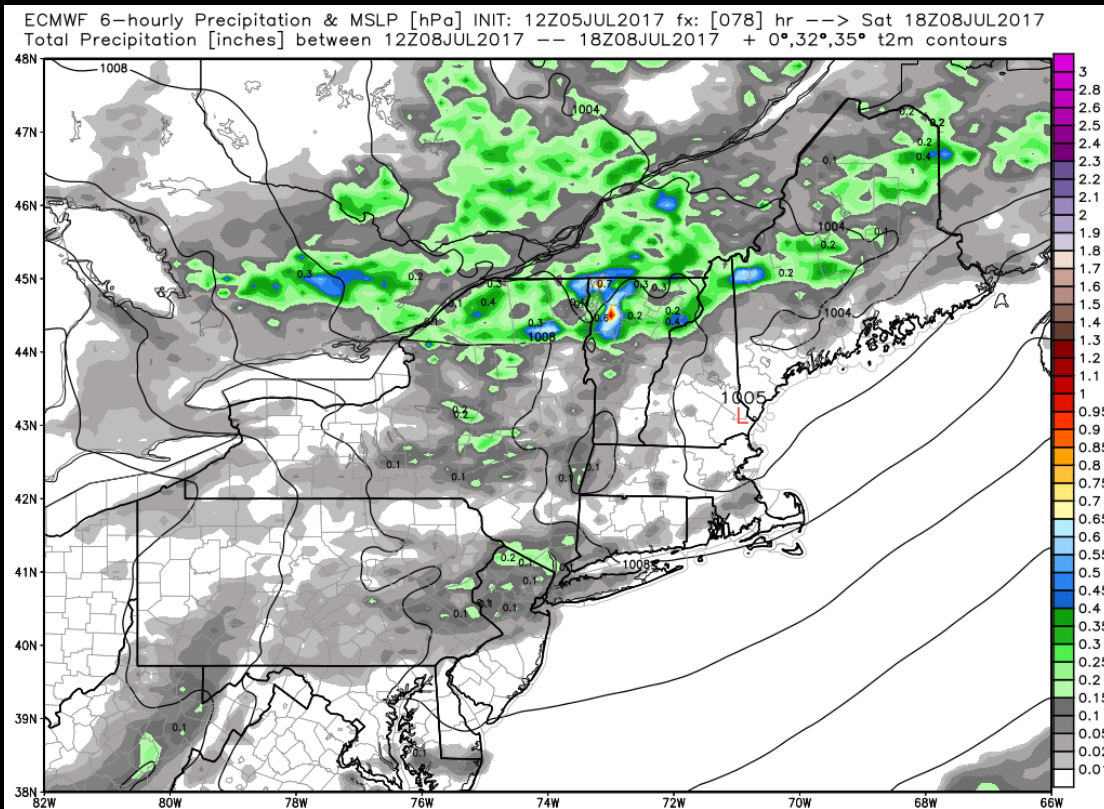


GFS 300 hPa Wind Isotachs, Geopotential Heights (dam), Wind (kt)  
Init 12z Wed 20170705 - Hour [72] - Valid 12z Sat 20170708



# Synoptic Forcing

- Left: 12z 7/5 ECMWF run valid for 18z 7/8 showing 6hr precip and MSLP
- Right: 12z 7/5 GFS run valid for 18z 7/8 showing 6hr precip and MSLP
- Both models predict precipitation for Saturday
- Intensity and location do differ, over they both give rain to the Whiteface region



Day -1

Day 0

Day 1

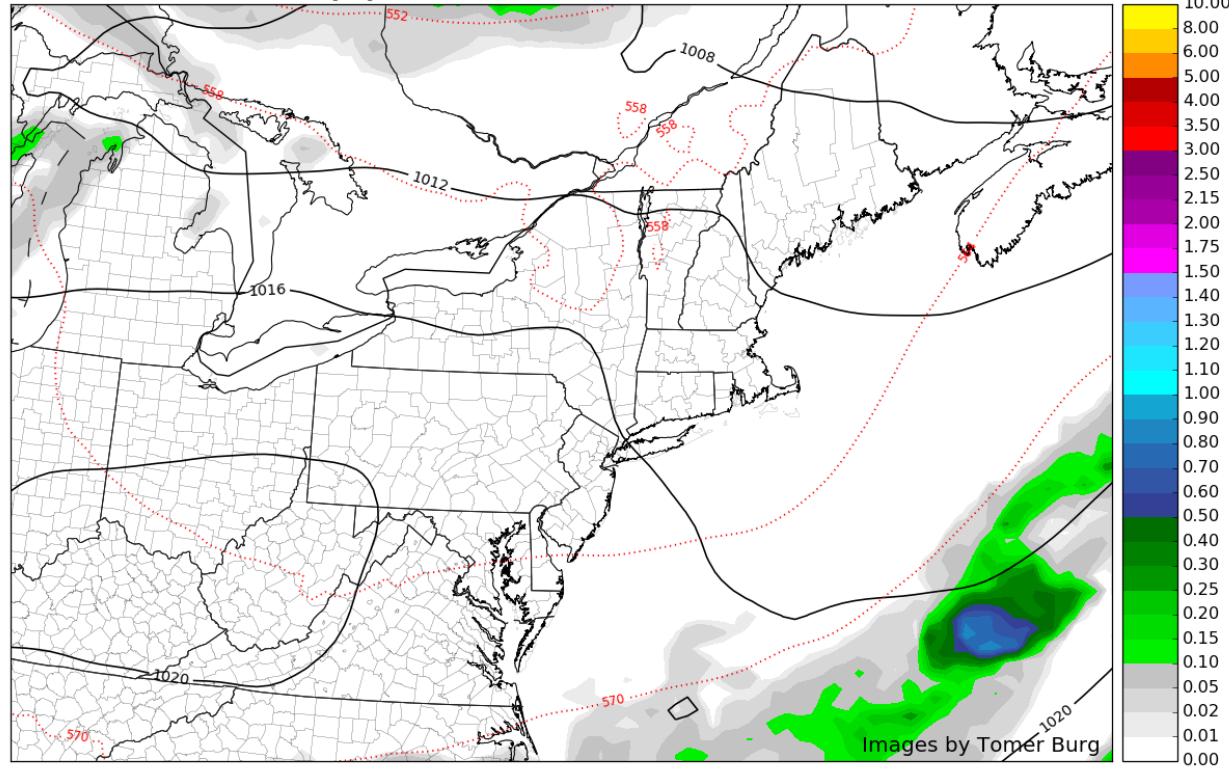
Day 2

Day 3-5

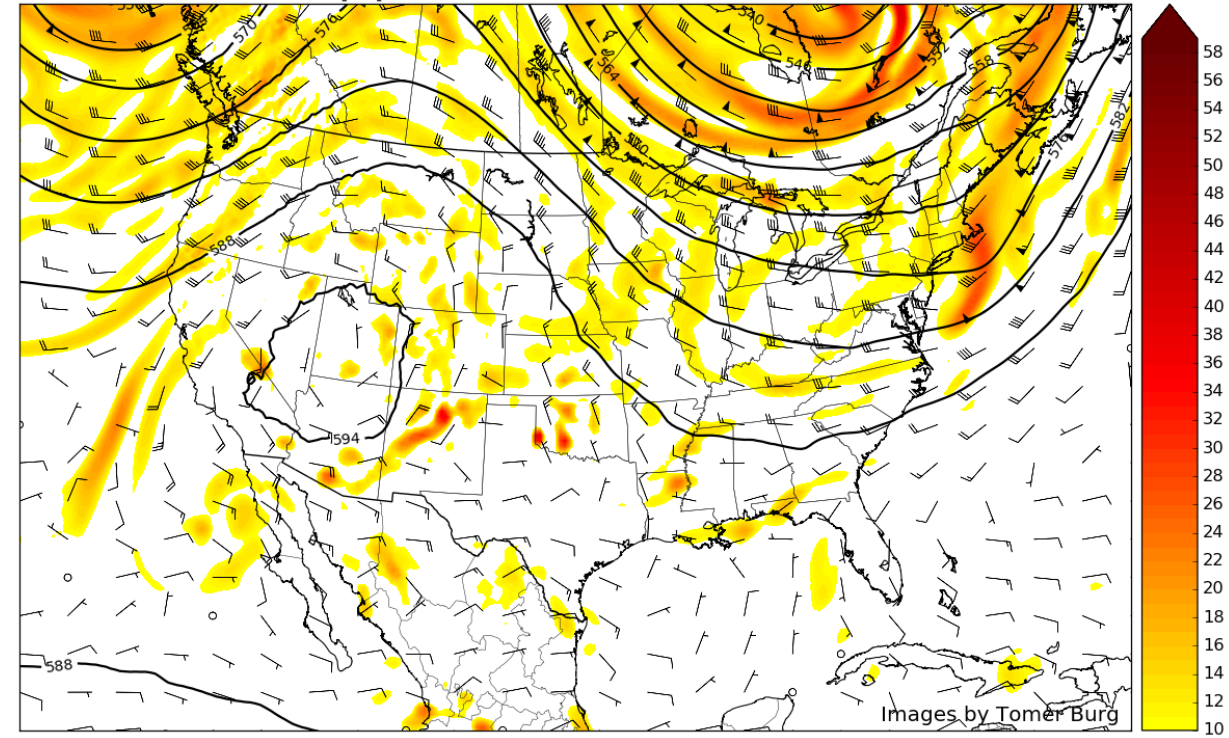
# Synoptic Forcing

- Left: 12z 7/5 GFS run valid for 12z 7/9 showing 6hr precip and MSLP
- Right: 12z 7/5 GFS run valid for 12z 7/9 showing 500hPa heights, winds, and vorticity(filled)
- High pressure moves into the area as the upper level trough moves out of the area creating convergence aloft and column subsidence
- This high pressure will create a dry weather throughout the morning Sunday

GFS MSLP (hPa), 6-Hour Precipitation (in)  
Init 12z Wed 20170705 - Hour [96] - Valid 12z Sun 20170709



GFS 500 hPa Absolute Vorticity (1/s), Geopotential Heights (dam), Wind (kt)  
Init 12z Wed 20170705 - Hour [96] - Valid 12z Sun 20170709



Day -1

Day 0

Day 1

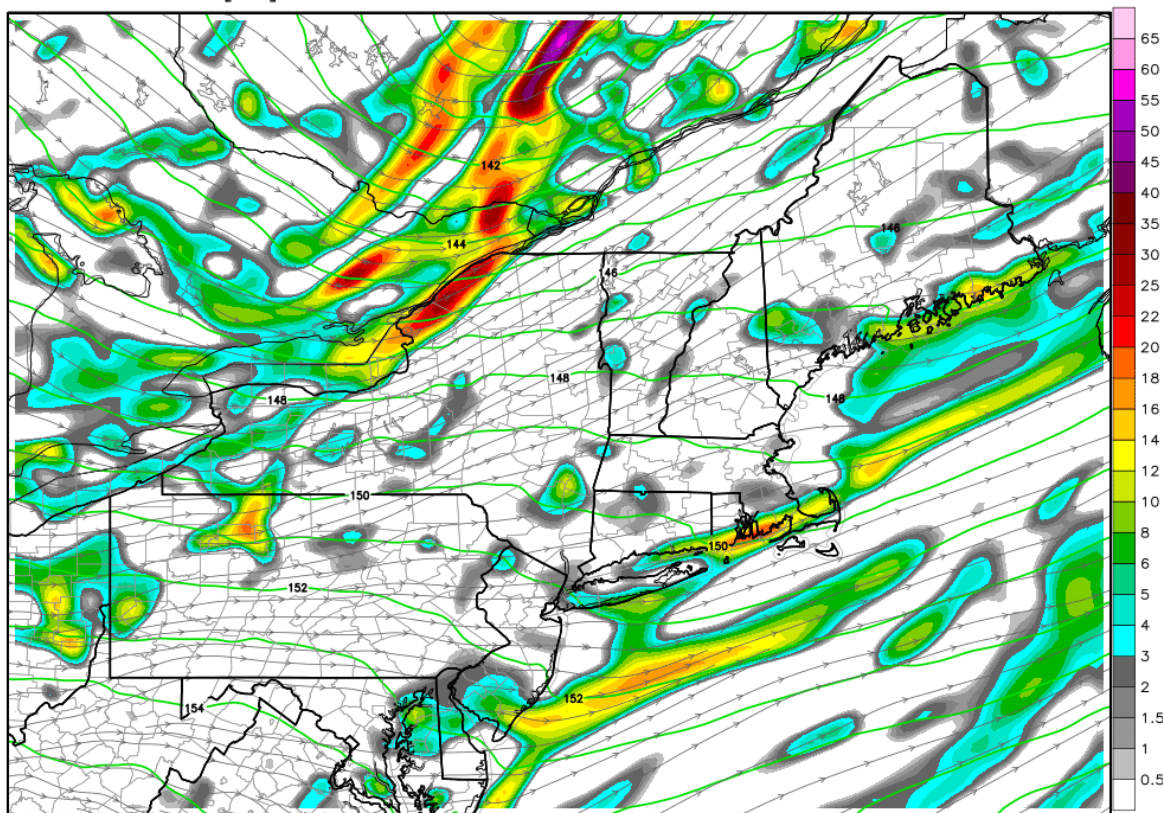
Day 2

Day 3-5

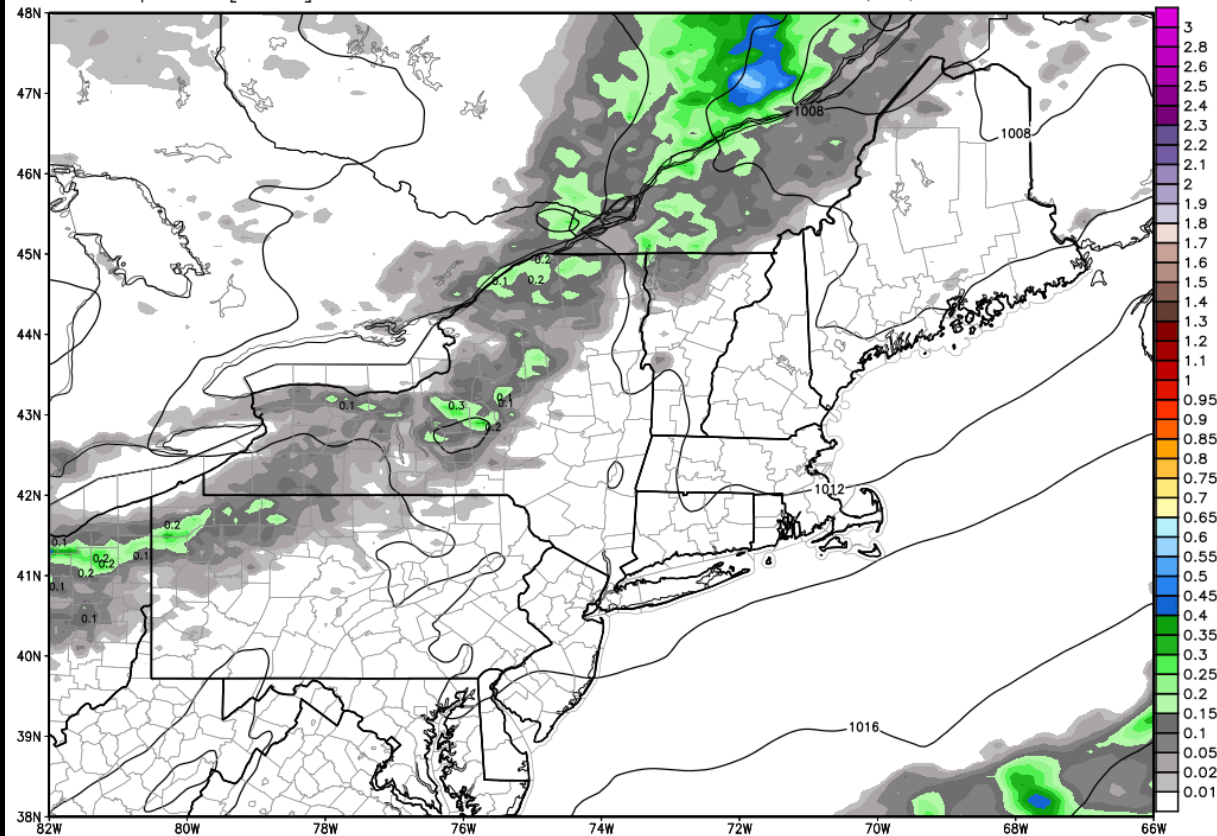
# Synoptic Forcing

- Left: 12z 7/5 ECMWF run valid for 18z 7/9 showing 500hPa heights, winds, and vorticity(filled)
- Right: 12z 7/5 ECMWF run valid for 18z-0z 7/9 showing 6hr precip and MSLP
- The euro is predicting a line of showers to sweep through the area Sunday afternoon associated with a cyclone to the north
- The forcing for this precip comes from vorticity advection as well as a weak frontal passage

ECMWF 850 hPa Relative Vorticity [ $\times 10^5 \text{ s}^{-1}$ ], Height [dm], Wind Streamlines  
 INIT: 12Z05JUL2017 fx: [102] hr --> Sun 18Z09JUL2017



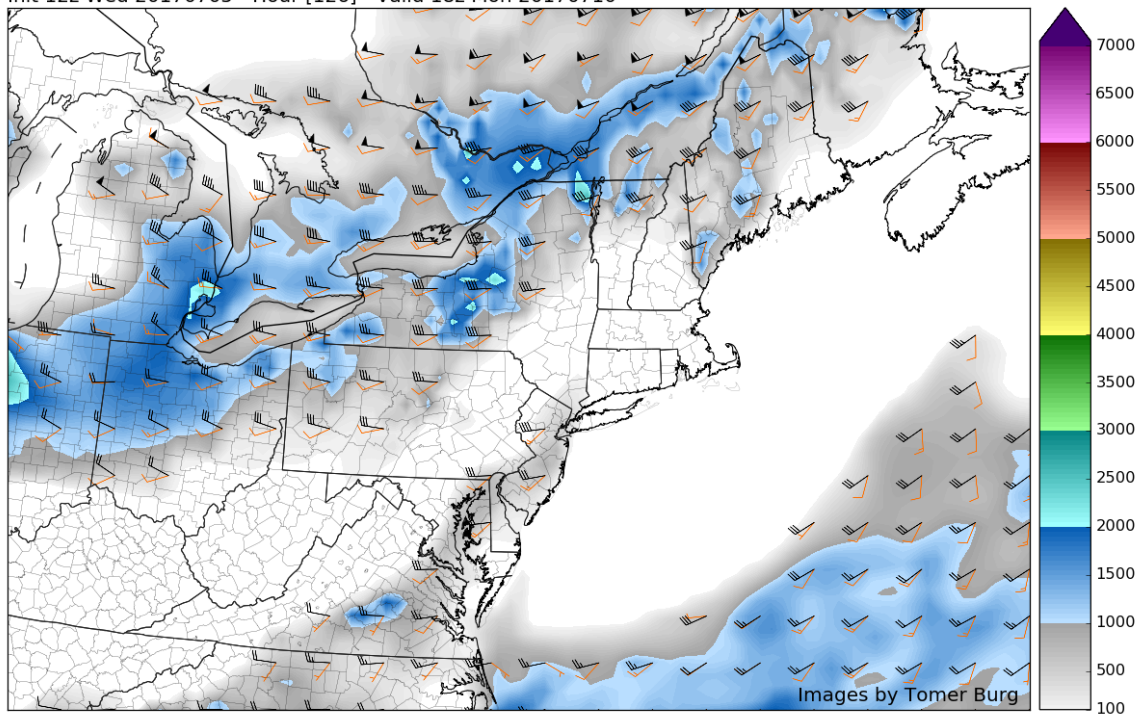
ECMWF 6-hourly Precipitation & MSLP [hPa] INIT: 12Z05JUL2017 fx: [108] hr --> Mon 00Z10JUL2017  
 Total Precipitation [inches] between 18Z09JUL2017 -- 00Z10JUL2017 + 0°,32°,35° t2m contours



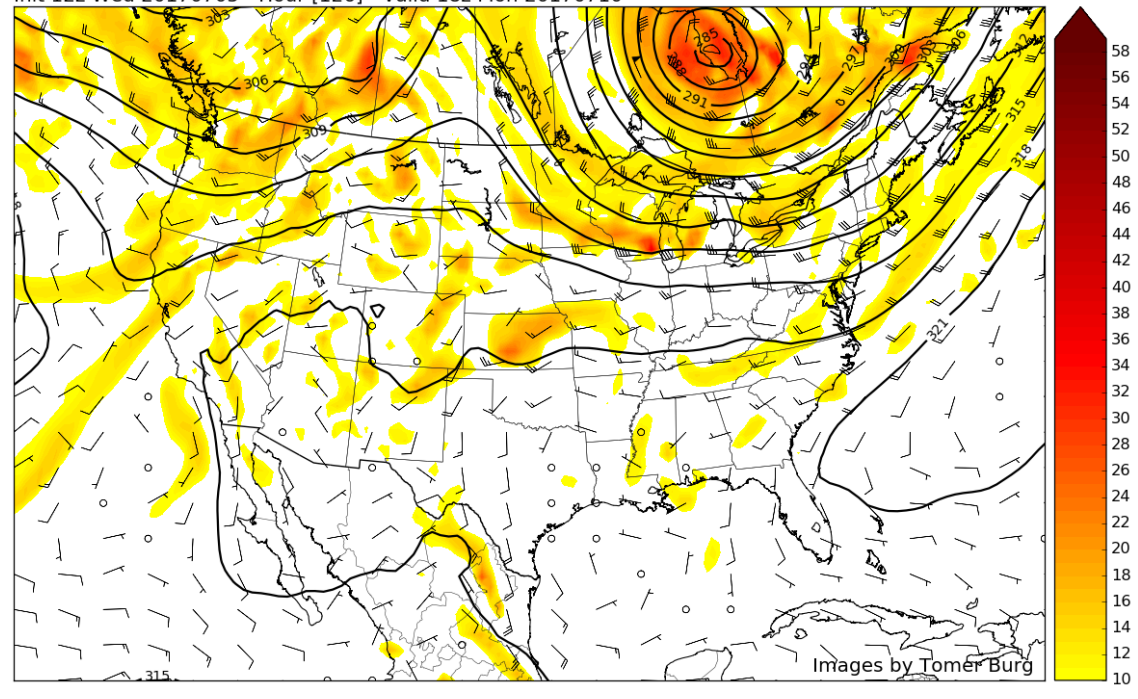
# Synoptic Forcing

- Left: 12z 7/5 GFS run valid for 18z 7/10 showing surface based CAPE and 10m + 500hPa wind barbs
- Right: 12z 7/5 GFS run valid for 18z 7/10 showing 700hPa heights, winds, and vorticity(filled)
- Advected vorticity caused by an upper level jet will create weak upper level divergence producing upward vertical motion
- Moderate-weak CAPE will likely create convection adding to the vertical motion from the upper level forcing

GFS Surface CAPE (J/kg), 10m (Orange) + 500 hPa (Black) Wind (kt)  
Init 12z Wed 20170705 - Hour [126] - Valid 18z Mon 20170710



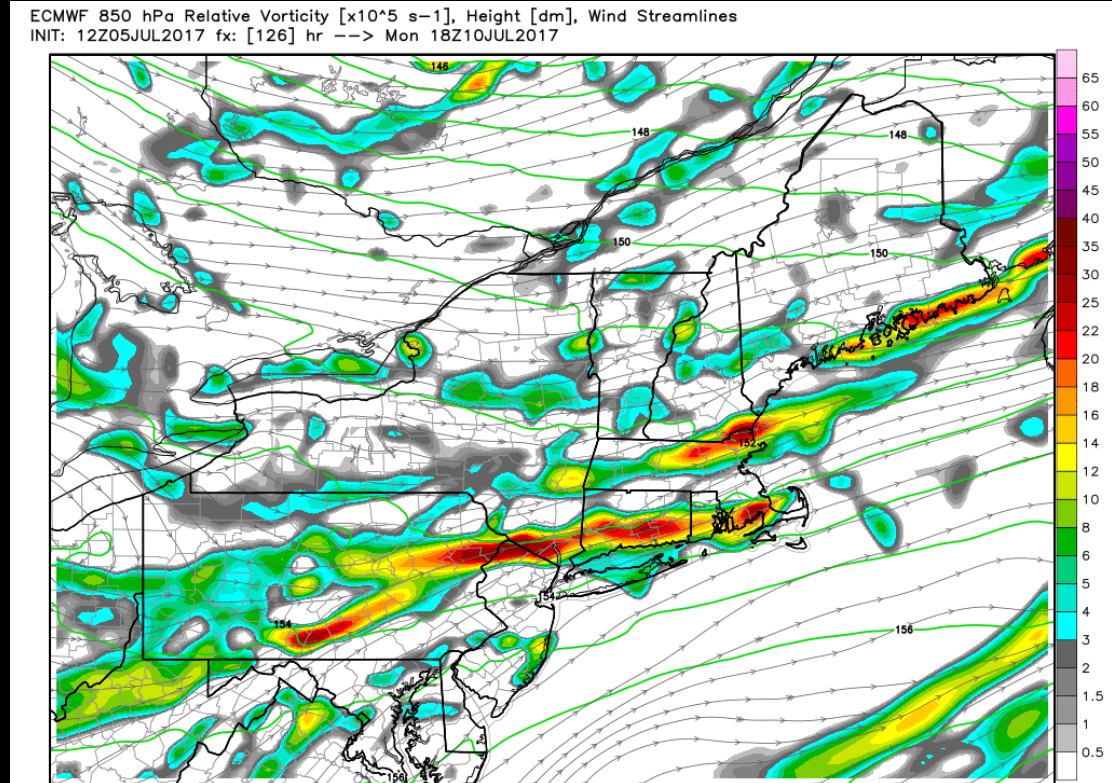
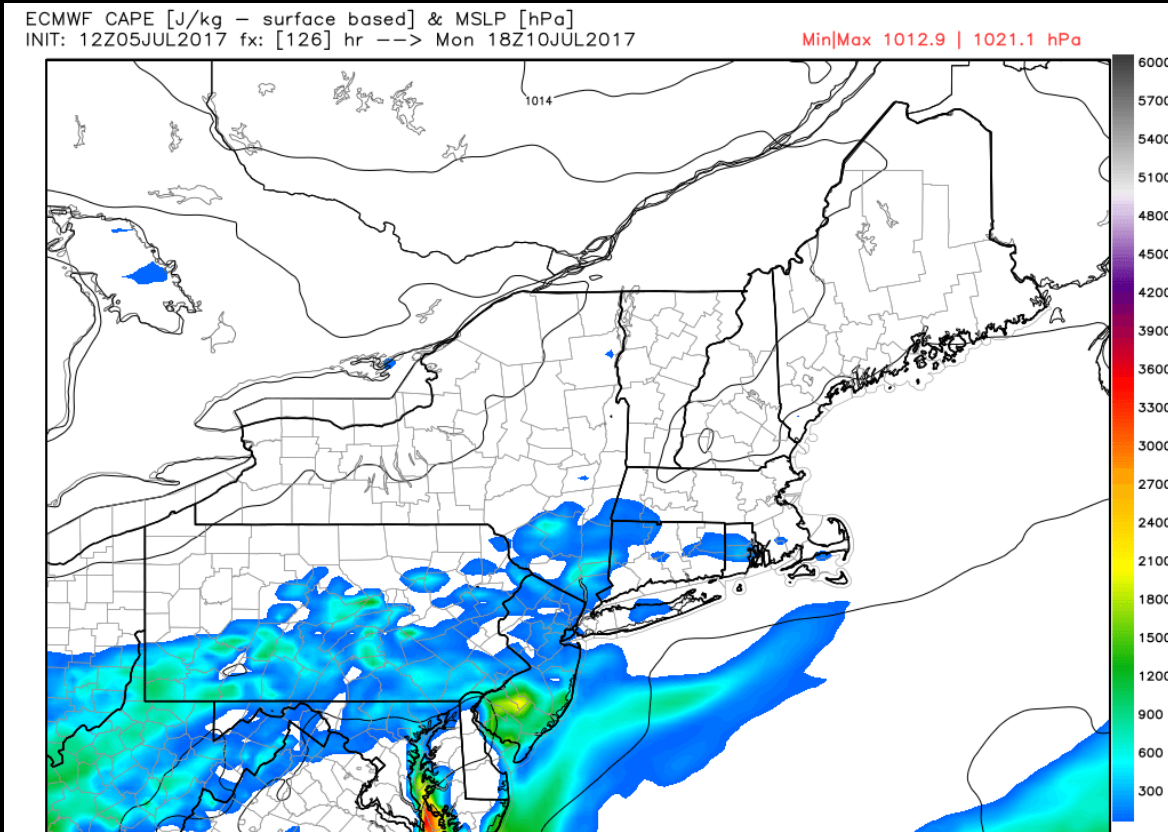
GFS 700 hPa Absolute Vorticity (1/s), Geopotential Heights (dam), Wind (kt)  
Init 12z Wed 20170705 - Hour [126] - Valid 18z Mon 20170710





# Synoptic Forcing

- Left: 12z 7/5 ECMWF run valid for 18z 7/10 showing surface based CAPE and MSLP
- Right: 12z 7/5 ECMWF run valid for 18z 7/10 showing 850hPa heights, wind streamlines, and vorticity(filled)
- The ECMWF shows a completely different picture with the forcing for precip located much farther south missing our area entirely



# Synoptic Forcing

- Left: 12z 7/5 ECMWF run valid for 18z 7/10 showing 6hr precip and MSLP
- Right: 12z 7/5 GFS run valid for 18z 7/10 showing 6hr precip and MSLP
- The location of the precip for each model matches closely to the areas forecasted for upper level forcing and weak cape
- These forecast are both very far out in the model run to be very deterministic however rain cannot be completely ruled out for Monday

