"The Collaborative Science, Technology, and Applied Research (CSTAR) Program"

Title:

"Cooperative Research with the National Weather Service on Cool- and Warm-Season Precipitation Forecasting over the Northeastern United States"

University: University at Albany

Name of University Researchers Preparing Report: Lance F. Bosart and Daniel Keyser

NWS/AFWA/Navy Office: National Weather Service, Albany, New York

Name of NWS/AFWA/Navy Researcher Preparing Report: Raymond O'Keefe

National Oceanic and Atmospheric Administration Award Number: NA07NWS4680001

Date: 26 May 2010

SECTION 1: Summary of Graduate Student Research Activities

(a) High Wind/Winter Severe Convective Events (Jonas Asuma)

(Focal Points: John Quinlan, National Weather Service, Albany, NY

Tom Wasula, National Weather Service, Albany, NY

Hugh Johnson, National Weather Service, Albany, NY

Kevin Lipton, National Weather Service, Albany, NY

Warren Snyder, National Weather Service, Albany, NY)

Research Summary (1 November 2009 – 30 April 2010):

1. This CSTAR-III six-month report describes research that continued from fall 2009 and currently is in progress. The climatology and composite analyses derived from the NCDC storm reports was presented at the Eleventh Northeast Region Operational Workshop in Albany, NY, on 4–5 November 2009. During the winter, the historic 17 February 2006 case was analyzed and the composite analysis was further refined in preparation for the 35th Annual Northeastern Storm Conference (NESC) on 5–7 March 2010 in Saratoga Springs, NY. The hybrid composite analysis and case study of the 17 February 2006 were presented at NESC.

It was determined that, for the pure gradient and hybrid events, compositing should be done based upon where the initial storm report occurred relative to the surface cyclone, because it is hypothesized that different high-wind-producing mechanisms are at work in the different quadrants (northeast, northwest, southwest, and southeast) of the cyclone. It was found that the initial reports for the hybrid and pure gradient composites occur most frequently in the southeast (N = 77) and southwest (N = 55) quadrants, respectively. A conceptual model was constructed based upon the 17 Feb case and common mechanisms depicted in the southeast and southwest composites (Fig. 1). The conceptual model depicts the strongest low-level flow to be located ahead of and immediately behind the cold front. For the hybrid composite, potential instability develops along the front as dry air descends from aloft producing a kata-cold front, while the dry intrusion is slightly further to the rear of the front in the pure gradient composite indicating more of an ana-cold front (Fig. 2). Ascent forced by the front as well as synoptic-scale processes allows for the release of the potential instability and the formation of thunderstorms along the front. In both cases subsidence persists behind the front associated with tropospheric-deep cold air advection. Steep lapse rates were present which allows for enhanced turbulent momentum transport and high winds at the surface. The pure convective events were composited based upon whether or not an upper-level trough or ridge was in the vicinity of the initial report.

The 17 February 2006 high wind case is exceptional because it highlights the key mechanisms responsible for high-wind production in the southeast and southwest composites. Descent of dry air from aloft associated with a rapidly deepening cyclone impinges upon a cold front leading to potential instability that, through frontogenesis processes, is released producing a line of convection (Fig. 3a, b, c, Fig. 4). Downdrafts and the formation of bow segments associated with the convection enhance the downward transport of momentum (Fig. 4). Strong low-level flow associated with the warm and cold conveyor belts leads to pre- and post-frontal

turbulent momentum transport (Fig. 4a). Turbulent momentum transport is enhanced behind the cold front due to forced subsidence due to tropospheric-deep cold air advection in the presence of steep low-level lapse rates (Fig. 3). Two regimes of high wind occur with this event. Strong gradient winds are associated with the warm and cold conveyor belts. The former is likely associated with turbulent mixing and destabilization due to strong low-level advections of warm, moist air in the presence of large shear. Embedded within the strong pressure gradient, evaporatively cooled thunderstorm downdrafts likely led to localized enhancement of the winds. The "broken-S" pattern in the radar imagery (Fig. 4a) suggests the presence of mesovortices embedded in the convective line, which locally enhance the winds. Along and in the wake of the cold front, tropospheric-deep cold air advection and subsidence in the presence of strong low-level flow and steep low-level lapse rates promote turbulent transport behind the cold front.

The climatological spatial distribution has also been updated to depict the percent chance that a given day from October through April will experience severe high wind (Fig. 5). The greatest chance for gradient winds occurs along the Atlantic coast, the shores of the Great Lakes, and in the lee of the Appalachians. The greatest threat for thunderstorm winds is in the Ohio Valley and east of the Appalachians. The relative minimum along the Appalachians and in West Virginia is consistent with previous work.

2. John, Tom and Kevin were able to meet with Jonas just before the start of the Northeast Storm Conference on March 5, 2010. During that meeting Tom was able to provide Jonas with water vapor, visible and radar loops of the February 17, 2006 High Wind Event. John also met with Jonas on March 24, 2010 to discuss how best to handle lightning data and to discuss having SUNY Albany Internship Student Katherine Linnenbach look at either the lightning data for all cases or work on a case study. After much discussion it was decided that it would be best for Kate to work with Jonas on one of the case studies. As for the lightning data it was decided that any cases which had lightning strikes within 1 degree radius and 1 hour of any pure gradient wind report would be changed to a hybrid case. During the Spring CSTAR meeting, the forecast suggested a possible hybrid high wind event. John Quinlan and Brian Montgomery consulted the conceptual model Jonas constructed to assist in issuing thunderstorm and high wind warnings. John, Jonas, Kevin, and Tom scheduled meeting times to develop the online training module.

3. The only real problem that persists is normalizing the spatial distribution of high wind days by population density; however, previous literature has suggested that carefully smoothing the data can alleviate the bias.

4. This research was presented at the 35th Annual Northeastern Storm Conference (NESC) on 5–7 March 2010 in Saratoga Springs, NY.

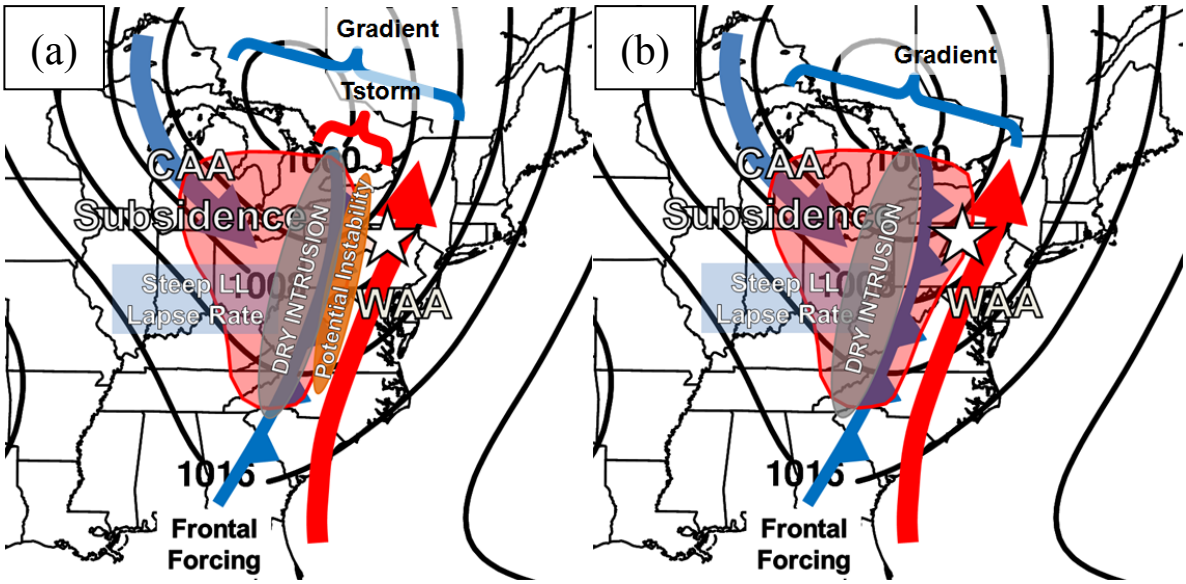


Fig. 1. Shows the conceptual for the southeast and southwest quadrants for the (a) hybrid and (b) pure gradient events. The star indicates the approximate location of the initial storm report. The shaded red area is the threat area for the strongest winds.

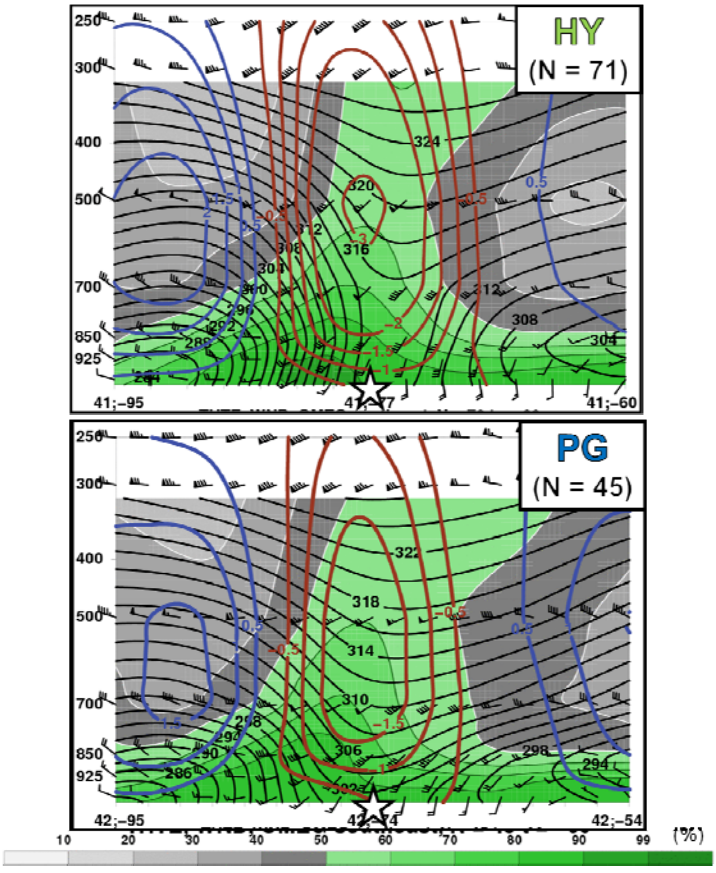


Fig. 2. Shows the composite cross section through the cold front from the previous conceptual models for the (a) hybrid and (b) pure gradient composites. Depicted is the initial NE report (star); relative humidity (%, shaded), vertical motion (μb s^{-1}; red-upward, blue-downward), equivalent potential temperature (K, black), and total wind (kt, barbs).

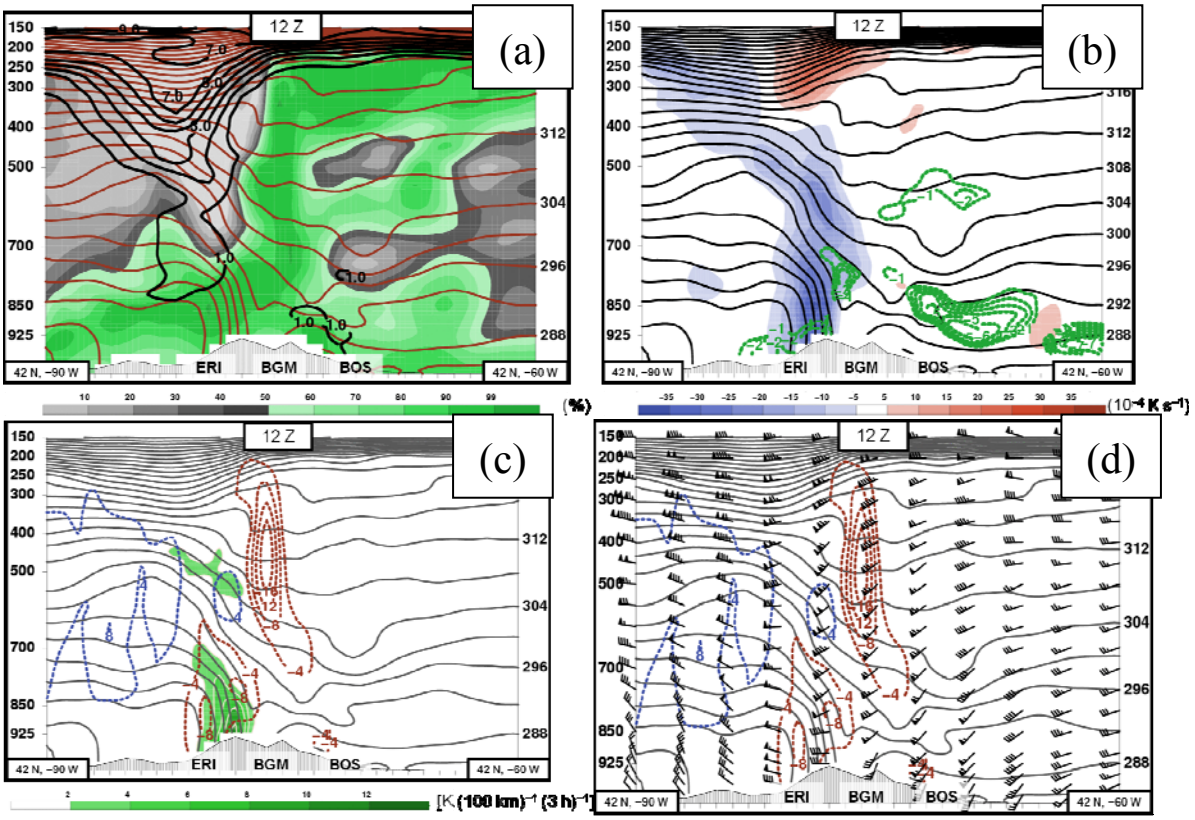


Fig. 3. Shows a cross section analysis through the cold front at 12Z 17 February 2006 of (a) relative humidity (%, shaded), potential vorticity (PVU, black), and potential temperature (K, red); (b) advection of equivalent potential temperature (10^{-4} K s^{-1}, shaded), potential instability [K $(km)^{-1}$, dashed], and potential temperature (K, solid); (c) Petterssen frontogenesis [K (100 km)$^{-1}$ (3 h)$^{-1}$, shaded], vertical motion (μb s^{-1}, dashed; red-upward, blue-downward), and potential temperature (K, solid); and (d) same as (c) except without Petterssen frontogenesis and with the total wind (kt, barbs).

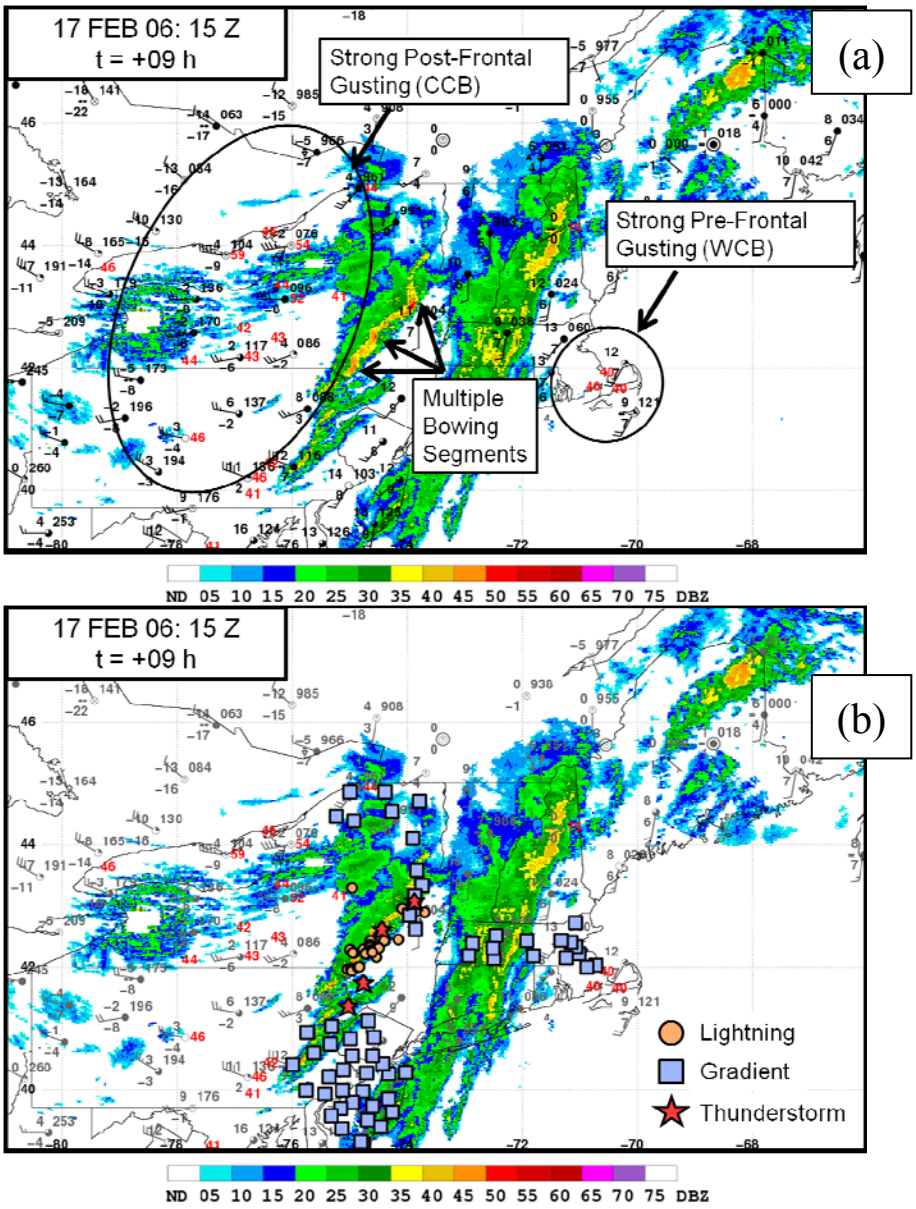


Fig. 4. Shows the (a) composite radar reflectivity (dBZ, shaded), surface observations (black) with wind gusts ≥ 40 kts (red) at 15Z 17 February 2006; and (b) same is in (a) except with the storm reports (red stars-thunderstorm wind reports, blue squares-gradient wind reports) and lightning strikes overlaid (orange circles).

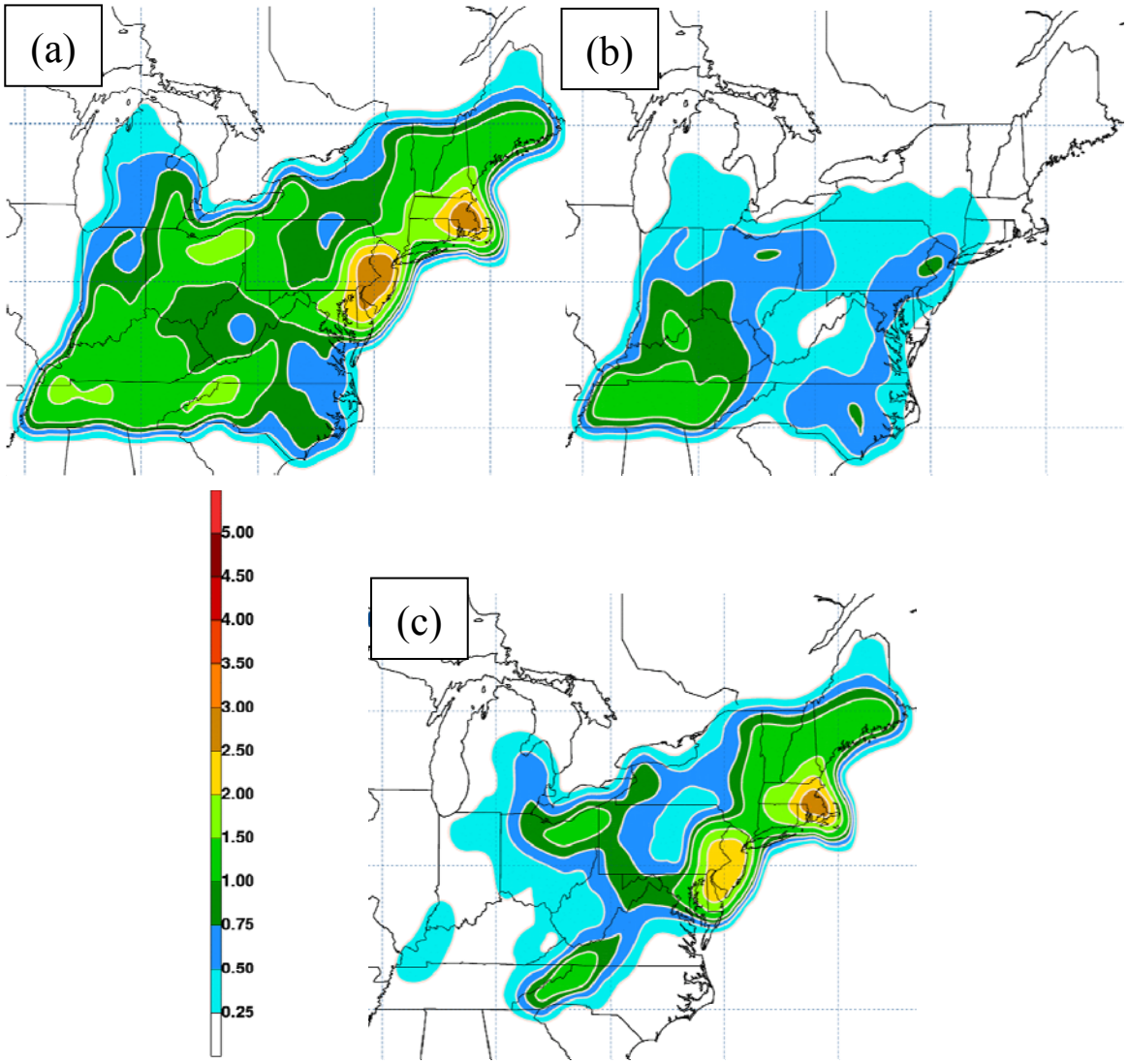


Fig. 5. Shows, on a given day from October through April, the percent chance (shaded according to color bar) that severe high wind will occur within a 40 km radius of a 0.5 degree grid point for (a) all wind reports, (b) thunderstorm wind reports, and (c) gradient wind reports.

SECTION 1: Summary of Graduate Student Research Activities

(b) Predecessor Rain Events Associated with Landfalling Tropical Cyclones (Benjamin Moore)

(Focal Point: Michael Jurewicz, National Weather Service, Binghamton, NY)

Research Summary (1 November 2009– 30 April 2010):

Recent work on the predecessor rainfall event (PRE) CSTAR project has been focused on the development of a dynamically-based classification scheme in order to identify distinct, favorable synoptic-scale flow patterns within which PREs develop ahead of tropical cyclones (TCs). The objective of this task is ultimately to develop, with the assistance of Mike Jurewicz, an updated forecast methodology and companion conceptual models to improve operational forecasts of PREs. The scheme was developed by analyzing synoptic charts for each individual event and grouping them based upon the middle-/upper-tropospheric flow within which the PRE developed. Key considerations during this procedure were: 1) the orientation and position of the 200 hPa jet streak relative to the TC, 2) the position of the main troughs and ridges relative to the TC location, and 3) the amplitude of the synoptic-scale flow. The result of the process was the establishment of three distinct synoptic patterns: "jet in ridge" (JIR), "southwesterly jet" (SWJ), and "downstream confluence" (DC). Owing to dynamical importance of the upper-tropospheric jet streak for PREs, the classification scheme is largely based upon the jet's orientation and position.

Schematic illustrations of the 200 hPa flow configuration characterizing each PRE pattern are shown in Fig. 1. For each category there are pronounced differences with respect to: 1) the TC's position relative to the jet streak and the poleward trough, 2) the scale and structure of the jet streak, and 3) the location of the PRE relative to the jet core and the trough axis. For the JIR configuration, an elongated anticyclonically curved jet streak is situated on the poleward flank of a broad ridge within which the TC is embedded. The PRE develops within the equatorward entrance region of the jet streak typically well downstream of the axis of positively-tilted trough axis. The SWJ category is typically associated with the interaction of the TC with an approaching shortwave trough. Consequently, the southwesterly jet streak is situated within a strong geopotential height gradient between the trough and the ridge overlying the TC. The PRE tends to be situated closer to the trough axis and further from the jet core in the SWJ pattern and develops much closer to the TC. The DC pattern is distinguished by the jet streak situated within a trough-over-ridge pattern downstream of the TC. The PRE tends to develop on the anticyclonic side of the confluent zone, further upstream from the jet core than for the other two patterns. The flow upstream from the TC is typically relatively weak, suggesting slower TC movement and less sharp recurvature. The smaller curvature of the TC track agrees with the fact that the DC pattern tends to be associated with the greatest proportion of PREs forming along the TC track.

Composites were generated using the 2.5^{o} NCEP–NCAR Reanalysis dataset in a PRE-relative coordinate system in order to elucidate the salient features and physical processes contributing to PRE development. The results of this exercise are displayed in Fig. 2, which

shows the conditions at 200 hPa and 925 hPa at the time of PRE initiation for each category. For the JIR pattern (Figs. 2a,b), the PRE develops within the equatorward entrance region of a 200 hPa jet streak and along a zonally-oriented low-level baroclinic zone. Strong poleward geostrophic flow on the western flank of a 925 hPa anticyclone is instrumental in transporting moisture from the TC environment poleward to the PRE region and in the provision of lift associated with maximized warm air advection and frontogenesis along the baroclinic zone. The SWJ pattern (Figs. 2c,d) involves a much more direct influence of the TC. Specifically, the focus for PRE development is a region of deformation frontogenesis and moisture flux associated with the TC circulation impinging upon the approaching 925 hPa baroclinic zone. At 200 hPa, diabatically-generated anticyclonic outflow associated with the TC is likely important in strengthening the height gradient downstream of the trough leading to a strengthened jet streak and enhanced synoptic-scale forcing for ascent. The DC pattern (Figs. 2e,f) involves the interaction between the poleward-moving TC and a weak, quasi-stationary low-level baroclinic zone. The focus for PRE development, as in the SWJ pattern, is typically warm air advection and frontogenesis resulting from the interaction of the outer TC circulation with the baroclinic zone.

Case analyses of representative PREs from each category are also being conducted to further elucidate physical processes associated with PRE development. The focus of these studies is threefold: 1) to diagnose the dynamic and hydrodynamic role of the TC, 2) to assess synoptic and mesoscale mechanisms leading to PRE development, and 3) to examine mesoscale processes resulting in quasi-stationary regions of heavy rainfall associated with PREs. This multiscale, ingredients-based methodology will be instrumental in an eventual forecast methodology that will ensue from this research.

A challenge arising during this research has been the issue of how to deal with the 5 unclassified PREs, which did not fit into the three categories. Preliminary analysis of the 5 cases suggests that they each developed in the absence of strong dynamical support and that they were most likely triggered by mesoscale boundaries or orographic features. Three of these events exhibit similar patterns in which the PRE develops along the East Coast in response to deep moisture plume from the TC associated with strong onshore southeasterly flow between the TC and an anticyclone to its north. Further work is required to investigate the physical mechanisms driving these events.

Publications and Workshop Submissions:

Preliminary compositing results and a comparative analysis of the PREs associated with TC Frances (2004) and TC Rita (2005) were presented at the 11th Northeast Regional Operational Workshop, held 4–5 November 2009 in Albany, NY. The PRE-relative composite results detailed above, along with a multiscale examination of the PRE associated with TC Rita (2005), were presented at the 35th Annual Northeastern Storm Conference, held 5–7 March 2010 in Saratoga Springs, NY.

Figures

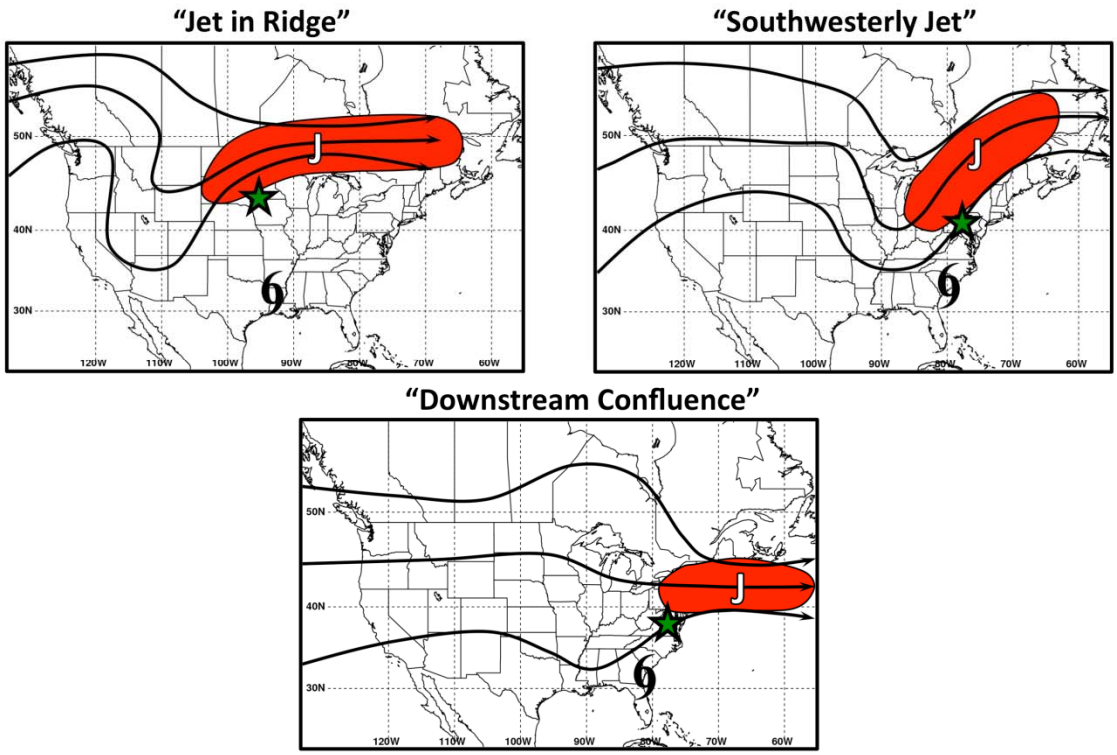


Figure 1: Schematic illustration of the 200 hPa flow configuration for the three synoptic patterns associated with PREs. The PRE and TC locations are marked with the green star and the tropical storm symbol, respectively. Schematic streamlines are shown in black and the red shaded area represents the jet streak.

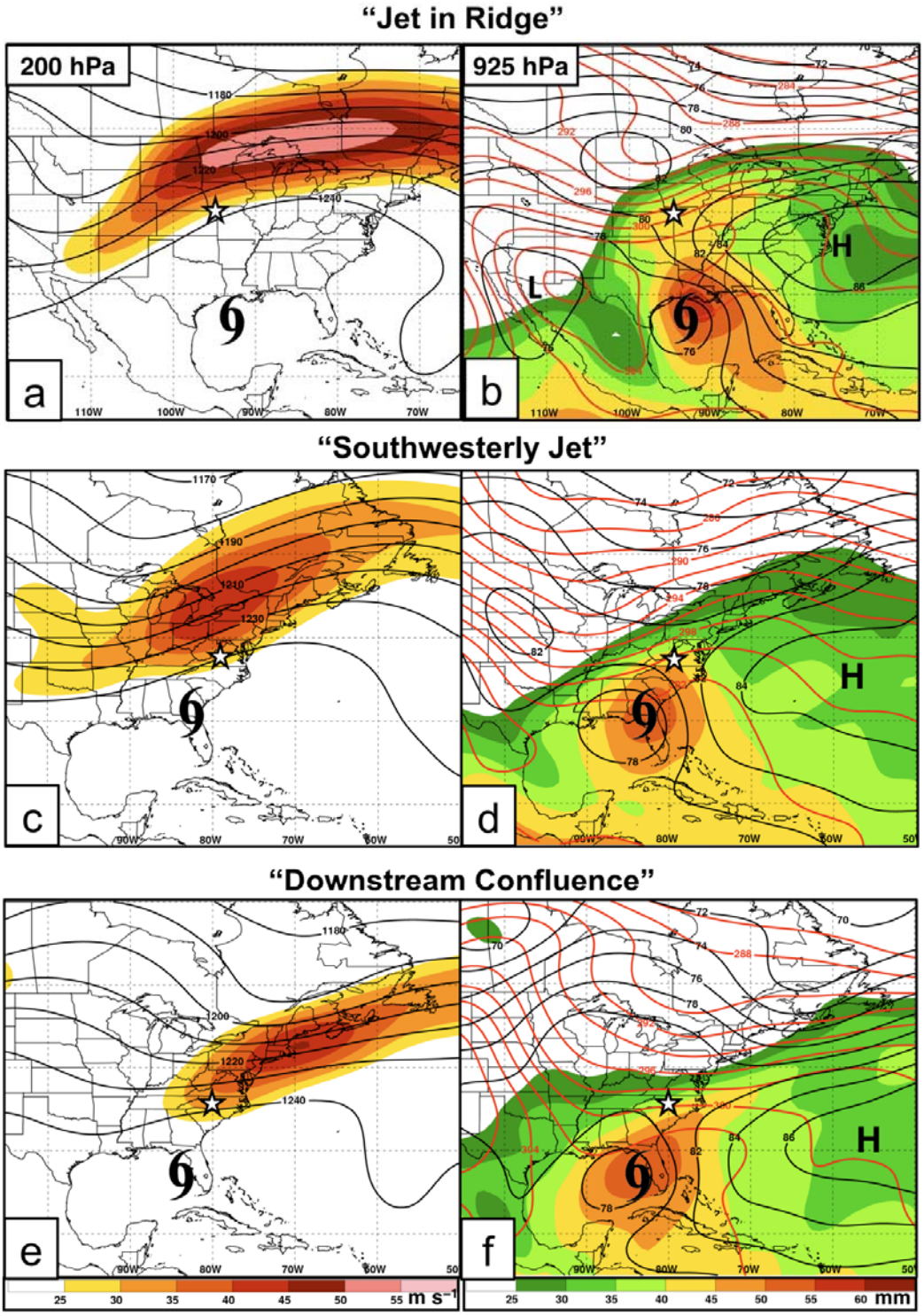


Figure 2: PRE-relative composites for the three PRE synoptic patterns. Panels (a), (c), and (e) show 200 hPa wind speeds (values greater than 25 m s^{-1} shaded every 5 m s^{-1}) and geopotential height (contoured in black ever 10 dam). Panels (b), (d), and (f) show total precipitable water (values greater than 25 mm shaded every 5 mm), 925 hPa geopotential height (contoured in black every 2 dam), and 925 hPa potential temperature (contoured in red every 2 K). The mean locations of the PRE and the TC are indicated by the star and the tropical storm symbol, respectively.

SECTION 1: Summary of Graduate Student Research Activities

(c) Precipitation Distributions Associated with Cool-Season 500 hPa Cutoffs (Melissa Payer)

(Focal Points: Neil Stuart, National Weather Service, Albany, NY

Tom Wasula, National Weather Service, Albany, NY)

Research Summary (1 November 2009 – 30 April 2010):

This CSTAR-III six-month report describes research that started in spring 2009 and is currently in progress. The ongoing objectives of this research are to determine how synoptic and mesoscale features associated with 500-hPa cutoff cyclones affect precipitation distributions in the Northeast through several case studies of cool-season (1 October–30 April) cutoff cyclones and to identify key signatures differentiating between various precipitation distributions by compositing cutoff cyclones with similar tilt, structure, and precipitation amount.

Case studies were chosen for cutoff cyclones that were associated with difficult-to-forecast precipitation distributions as well as cutoff cyclones that had varying precipitation distributions throughout their lifetime in the Northeast domain (Figure 1). For each case, conventional synoptic and mesoscale fields were examined using 0.5° GFS analyses, and standardized anomalies of fields such as precipitable water and 250-hPa winds were created from the 1.0° GFS analyses with respect to climatologies created from 2.5° NCEP–NCAR reanalysis data. Two additional cases associated with difficult-to-forecast precipitation distributions have been examined in depth up to this point: 1–4 January 2010 and 12–16 March 2010.

The 1–4 January 2010 cutoff cyclone was a long-duration event associated with varying precipitation distributions throughout its lifetime. Throughout this event, a highly amplified ridge associated with a large-scale blocking pattern and the negative phase of the North Atlantic Oscillation was in place over Greenland. The highly amplified ridge caused the cutoff cyclone to stall over the Gulf of Maine by 0000 UTC on 3 January and to retrograde into eastern Canada and northern New England before exiting the Northeast region by 1800 UTC on 4 January (Figure 2). Leading up to the event, numerical models showed considerable variability in forecasting the precipitation distribution; however, just prior to the event the NAM seemed to capture the terrain enhancement best but QPF amounts were too high.

On 1 January 2010 light precipitation (5–10 mm) occurred throughout New England (Figure 3). Weak easterly low-level flow and low precipitable water values likely contributed to the low precipitation amounts observed on this day. Heavier precipitation occurred on 2 January with two main regions of moderate precipitation (Figure 4). The heavy precipitation (15–30 mm) in Maine was enhanced by (1) favorable forcing for ascent at upper levels in the equatorward exit region of an easterly jet situated poleward of the cutoff cyclone, (2) quasi-geostrophic forcing for ascent in a region of strong Q-vector convergence, and (3) a region of frontogenesis along a southwestward-moving warm front. Moderate precipitation (10–15 mm) observed in northern New York, Vermont, and New Hampshire was associated with (1) cyclonic vorticity advection ahead of an elongated absolute vorticity maximum west of the cutoff cyclone, (2) upslope flow

along the western slopes of the Green Mountains and the Berkshires, and (3) northeasterly low-level flow which advected anomalous (+1 to +2 σ) moisture into the region. Finally, on 3 January there were three main regions of light precipitation (5–10 mm) (Figure 5). Precipitation in southern New England occurred in a region of cyclonic vorticity advection ahead of a second absolute vorticity maximum and in a region of persistent frontogenesis associated with a stalled warm front over southern New Hampshire. The precipitation in western New York was primarily due to northwesterly low-level flow which resulted in lake-effect snow bands off of Lakes Erie and Ontario. Finally, the precipitation along the border of New York and Vermont was associated with low-level channeling flow through the Champlain Valley which provided favorable conditions for the continued support of a lake-effect snow band off of Lake Champlain.

The 12–16 March 2010 cutoff cyclone was a long-duration event associated with widespread flooding across southern New England (Figure 6). Leading up to the event, numerical models did well forecasting precipitation would occur; however, the forecasted amounts were lower than observed and the models did poorly in capturing the terrain influences. On 13 March the heaviest precipitation (≥100 mm) occurred in northern New Jersey and southern New England (Figure 7). Heavy precipitation on this day was supported by (1) favorable forcing for ascent at upper levels in the poleward entrance region of an easterly jet located poleward of the cutoff cyclone, (2) weak Q-vector convergence, and (3) a strong (≥70 kt) low-level southeasterly jet which advected anomalous (+1 to +3 σ) Atlantic moisture into the region. On 14 March, heavy precipitation (≥80 mm) was observed in northern Massachusetts and coastal New Hampshire (Figure 8). Several factors contributed to heavy precipitation on this day including (1) continued forcing for ascent within the entrance and exit regions of an easterly jet situated poleward of the cutoff cyclone, (2) cyclonic vorticity advection ahead of a westward-moving absolute vorticity maximum, (3) persistent advection of Atlantic moisture into the region by a strong low-level jet, and (4) a quasi-stationary region of frontogenesis that developed along coastal New England. Terrain influences also played an important role throughout this event with downslope flow in the Hudson Valley contributing to suppressed precipitation in eastern New York.

In addition to case studies, this research has recently focused on creating composites of 500-hPa cutoff cyclones. For each day that a 500-hPa cutoff cyclone was present in the Northeast domain during the cool seasons of 2004/05 through 2008/09 the precipitation amount was determined and days were divided into heavy precipitation (HP), light precipitation (LP), and no precipitation (NP) cutoff cyclone days. HP cutoff cyclone days were defined as days where at least one percent of the precipitation domain (Figure 1) received 25 mm of precipitation or more, LP cutoff cyclone days were those days where precipitation was observed but did not meet the HP criteria, and NP cutoff cyclone days were days in which a cutoff cyclone was present in the Northeast domain, however, precipitation was not observed at any location in the precipitation domain. Cutoff cyclone days were further categorized by the tilt (positive, negative, or neutral) of the 500-hPa trough and embedded cutoff, using similar methodology to Scalora (2009). Finally, cutoff cyclone days were even further subdivided into cutoff cyclones that were purely cutoff from the background steering flow ("cutoff") versus those that were closed lows within large scale troughs ("trough"). For a system to be purely cutoff it had to have a 250-hPa zonal wind standardized anomaly of −2.0 σ or below on the poleward side of the cyclone. The resulting categories can be seen in Figure 9. Composites were created for each category using 6-h 2.5° NCEP-NCAR reanalysis data. In order to create the composites, the grids for each cutoff

cyclone day were centered on the location of the 500-hPa cutoff cyclone at the time (0000, 0600, 1200, 1800 UTC) preceding the 6-hourly maximum precipitation. The grids for each cutoff cyclone day in a specific category were then averaged and centered on the centroid of all of the 500-hPa cutoff cyclones, thus creating cyclone-relative composites.

The primary difference between the composites separated by precipitation amount is in the location of the 500-hPa cutoff cyclone (Figure 10). For HP, LP, and NP cutoff cyclone days the average location of the 500-hPa cutoff cyclone is over the eastern Great Lakes, over northern New England, and east of the precipitation domain, respectively. These relative locations suggest that the lifecycle of the cutoff cyclone may play a role determining when precipitation of various amounts will occur, for instance HP cutoff cyclone days seem to occur earlier in the lifecycle when the cutoff cyclone is west of the precipitation domain. In comparing composites within precipitation amount categories, there is a major difference in the location of heaviest precipitation between cutoff and trough categories for HP cutoff cyclone days which holds true for all tilts (Figure 11). For the cutoff composites the heaviest precipitation is located in the northeast quadrant of the cyclone ahead of the warm front, while for the trough composites the heaviest precipitation is located in the southeast quadrant within the warm sector where vorticity advection may play a more important role in forcing for ascent. The position of the upper-level jet streak is crucial for all HP tilt and structure categories with the heaviest precipitation occurring where there is favorable forcing for ascent within the poleward exit region of the jet. In comparison, composites for all categories within the LP classification were fairly similar, regardless of tilt or structure (Figure 12). For these cutoff cyclone days, the heaviest precipitation is observed in the southwest quadrant of the cyclone, low-level flow is northwesterly or westerly, and in some of the composites the precipitation occurs in the vicinity of a surface cold front. Finally, for the NP composites several factors contribute to the suppression of precipitation: the cutoff cyclone and associated features are located too far east to support precipitation in the Northeast, northwesterly low-level flow advects cold, dry air from southern Canada into the precipitation domain, and there is little or no moisture present throughout the region (Figure 13). The eventual goal of this research is to incorporate these composite conceptual models into operations in the hopes of providing situational awareness to forecasters.

NWS Interactions:

Neil Stuart and Tom Wasula of the WFO in Albany, NY, have been in contact throughout the last six months through emails and meetings. During meetings on 16 December 2009 and 23 April 2010, they were provided updates of new case studies and composite results and asked for any input on the results from an operational perspective. Dan St. Jean of the WFO in Gray, ME also provided valuable insight into the case studies via email. Various NWS personnel from several Northeast WFOs provided feedback on 6 November 2009 at the Fall CSTAR Meeting during a discussion of this research up to that point.

Publications and Workshop Submissions:

The results from this project have been presented at NROW XI in Albany, NY on 4–5 November 2009 and at the 35th Annual Northeastern Storm Conference in Saratoga Springs, NY

on 5–7 March 2010. This research will also be presented at the Eastern Region Flash Flood Conference in Wilkes-Barre, PA on 2–4 June 2010. No formal publications have been produced yet. The writing of an M.S. thesis based on this research is currently in progress with completion expected by August 2010.

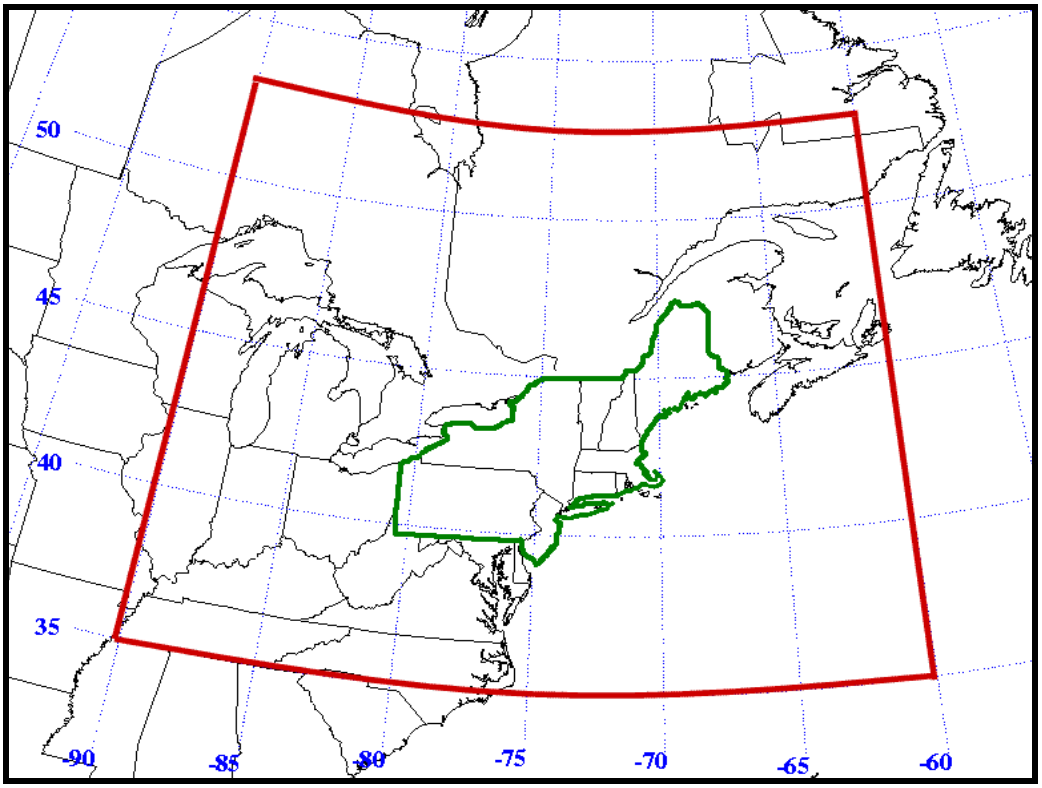


Figure 1: Northeast cutoff cyclone domain (red outline) and precipitation domain (green outline).

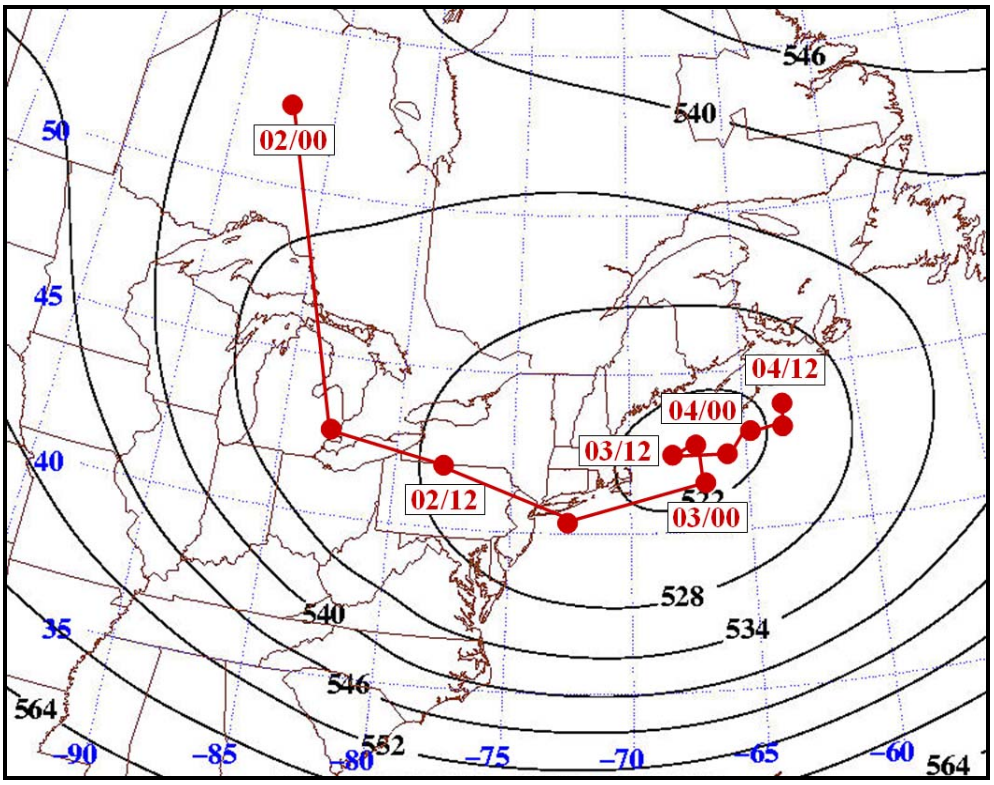


Figure 2: 1–4 January 2010 500-hPa mean geopotential heights (dam) and track of cutoff cyclone every 6 h.

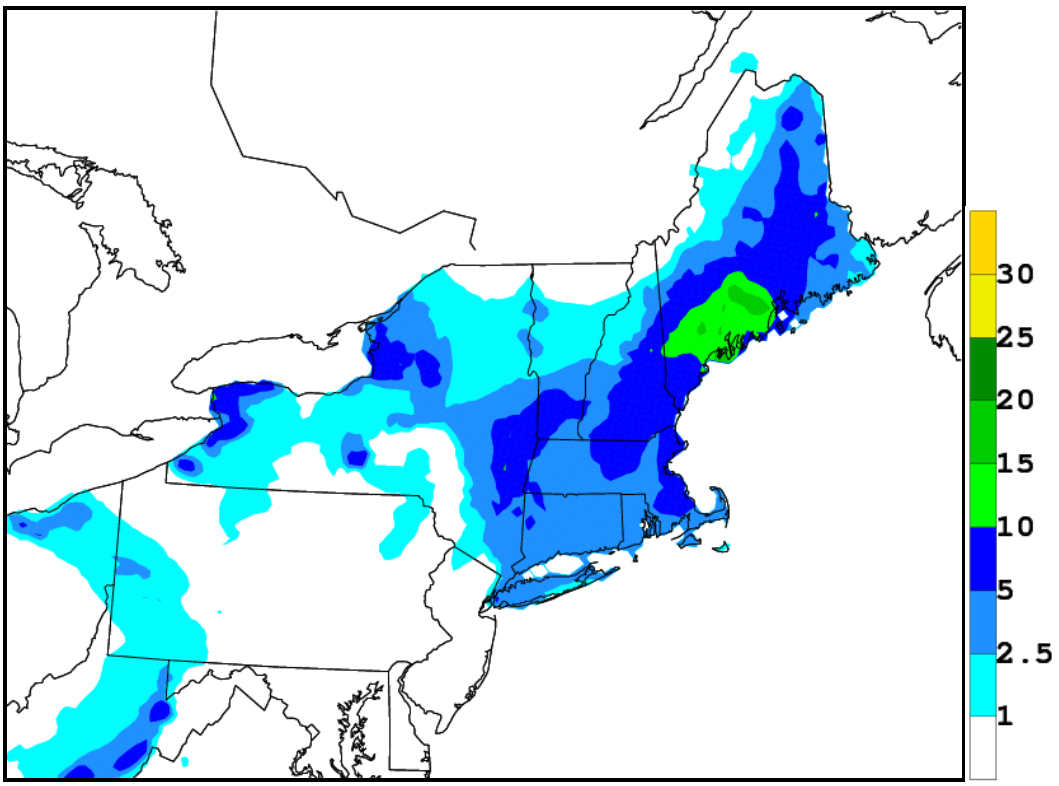


Figure 3: 24-h NPVU QPE (mm) ending 1200 UTC 2 January 2010.

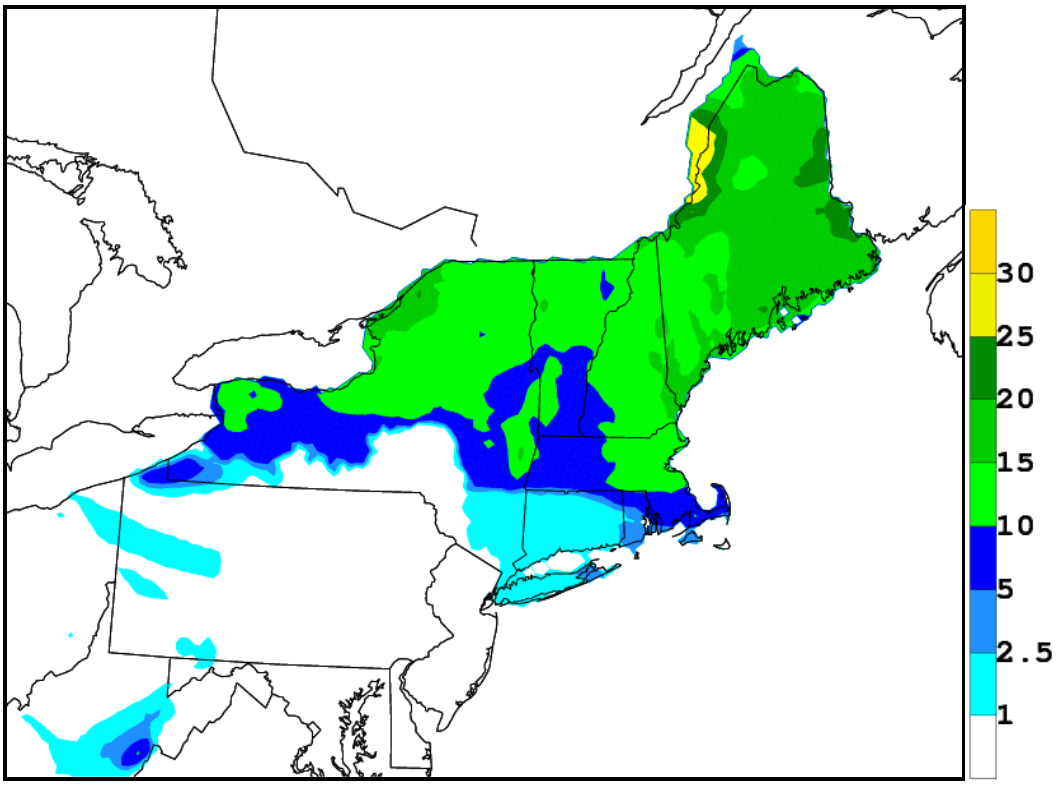


Figure 4: 24-h NPVU QPE (mm) ending 1200 UTC 3 January 2010.

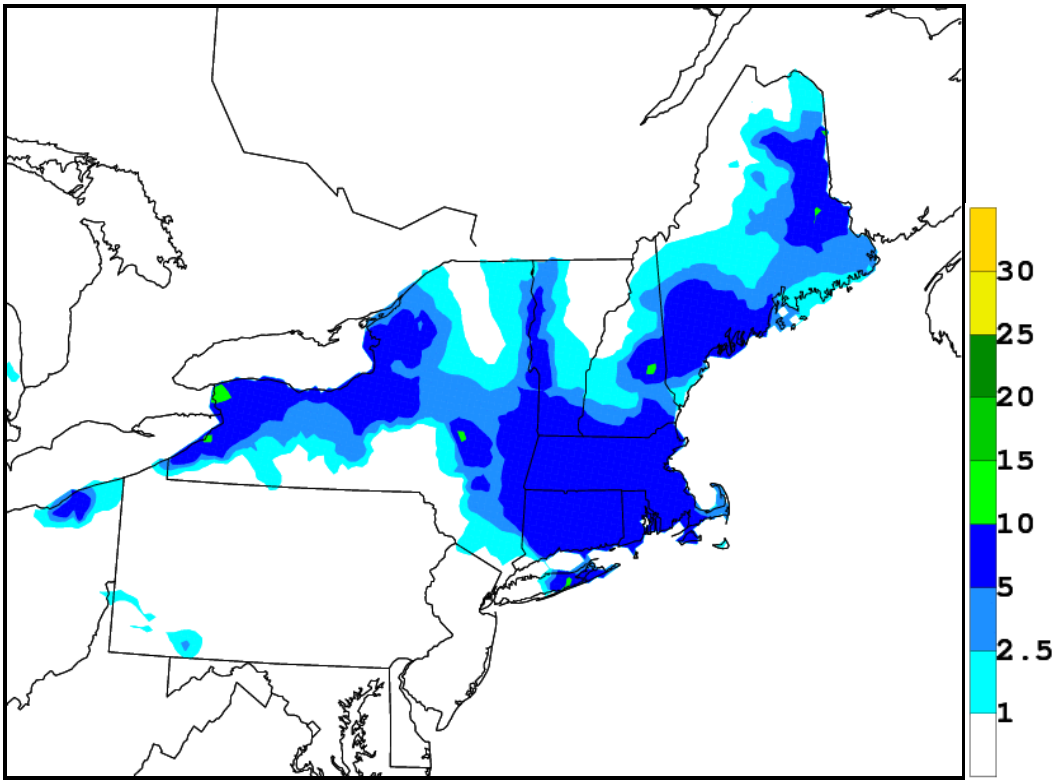


Figure 5: 24-h NPVU QPE (mm) ending 1200 UTC 4 January 2010.

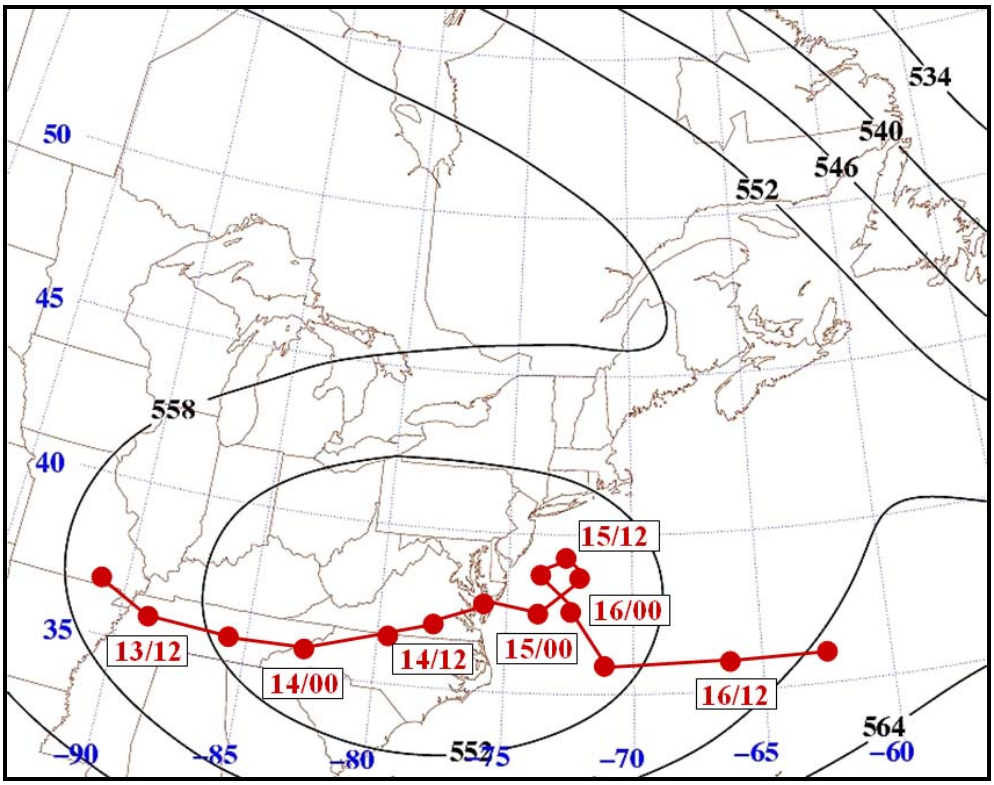


Figure 6: 12–16 March 2010 500-hPa mean geopotential heights (dam) and track of cutoff cyclone every 6 h.

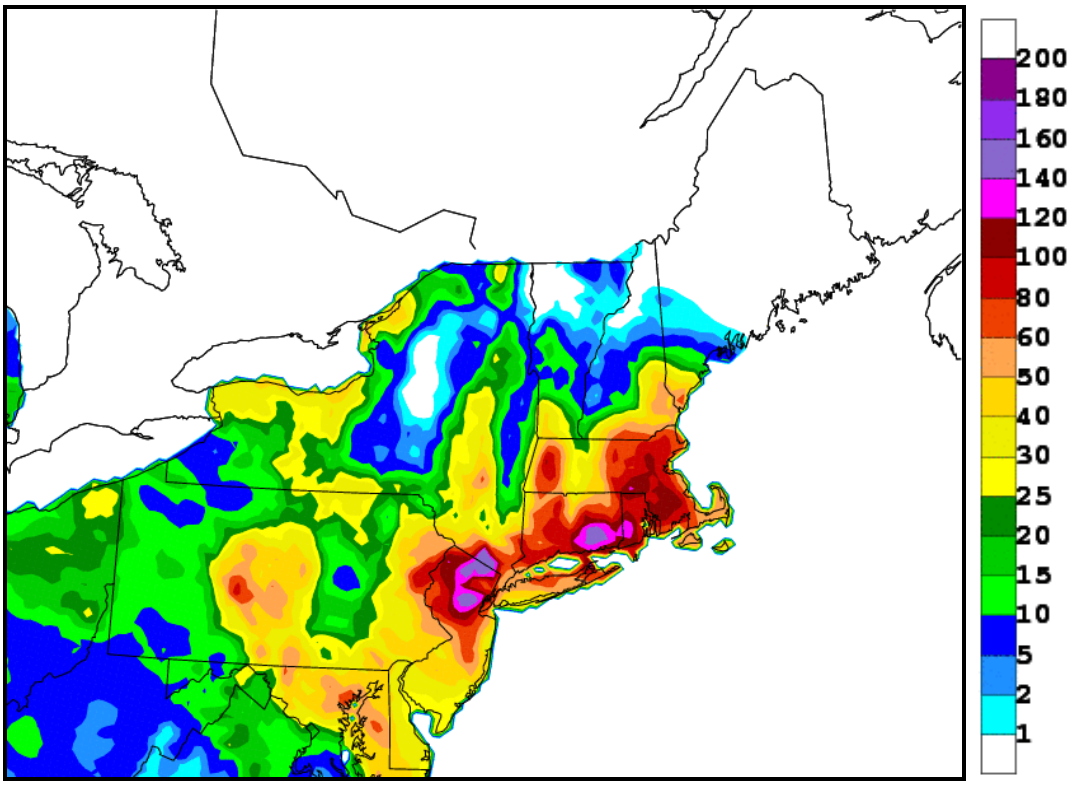


Figure 7: 24-h NPVU QPE (mm) ending 1200 UTC 14 March 2010.

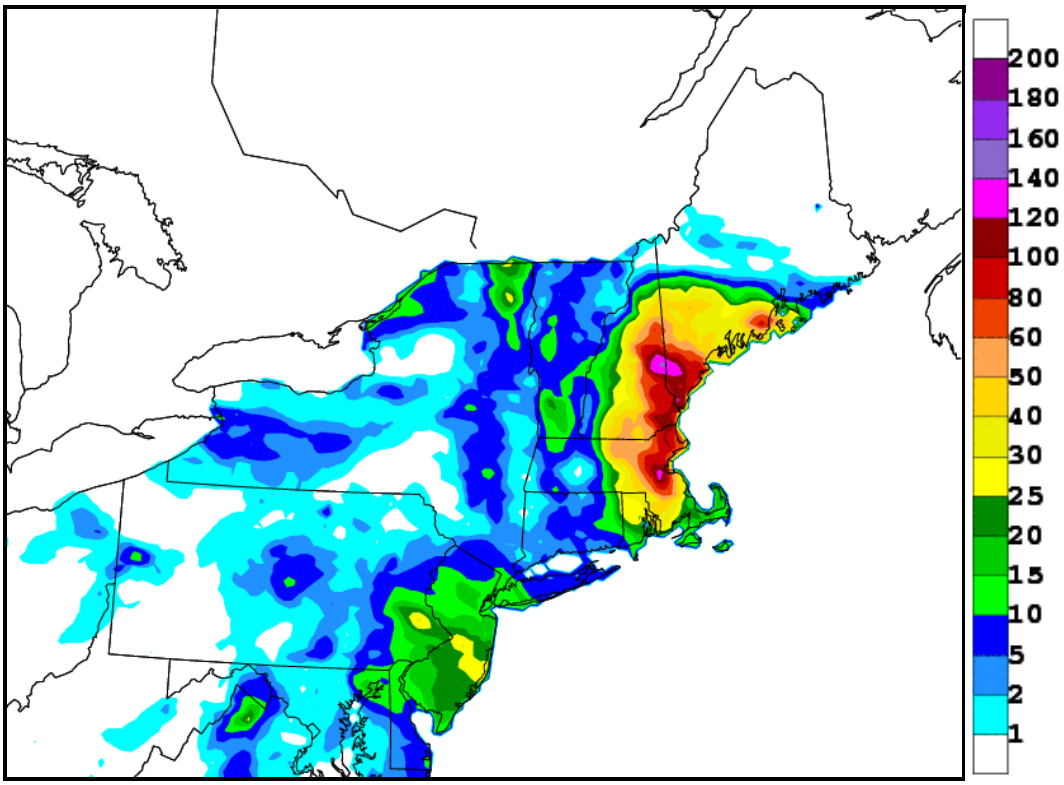


Figure 8: 24-h NPVU QPE (mm) ending 1200 UTC 15 March 2010.

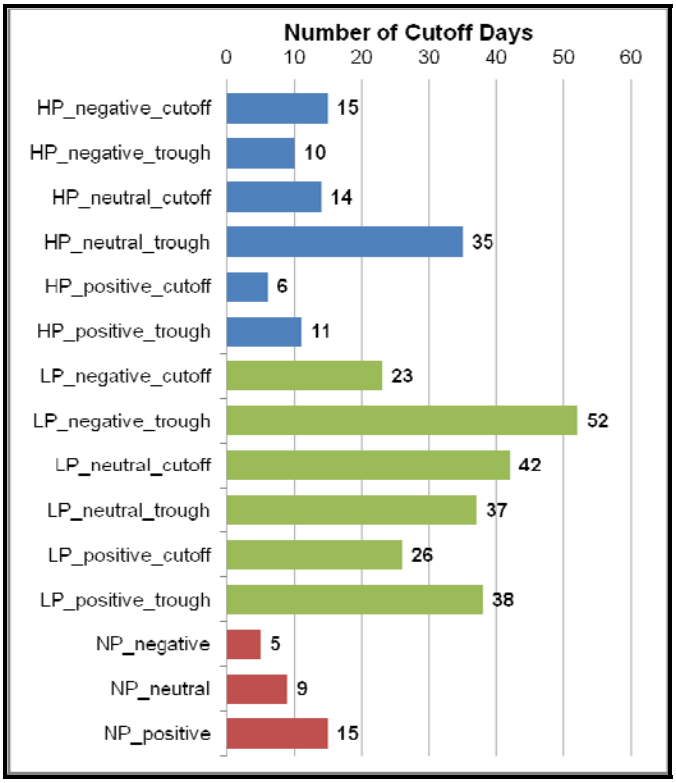


Figure 9: The number of cutoff cyclone days in each composite category.

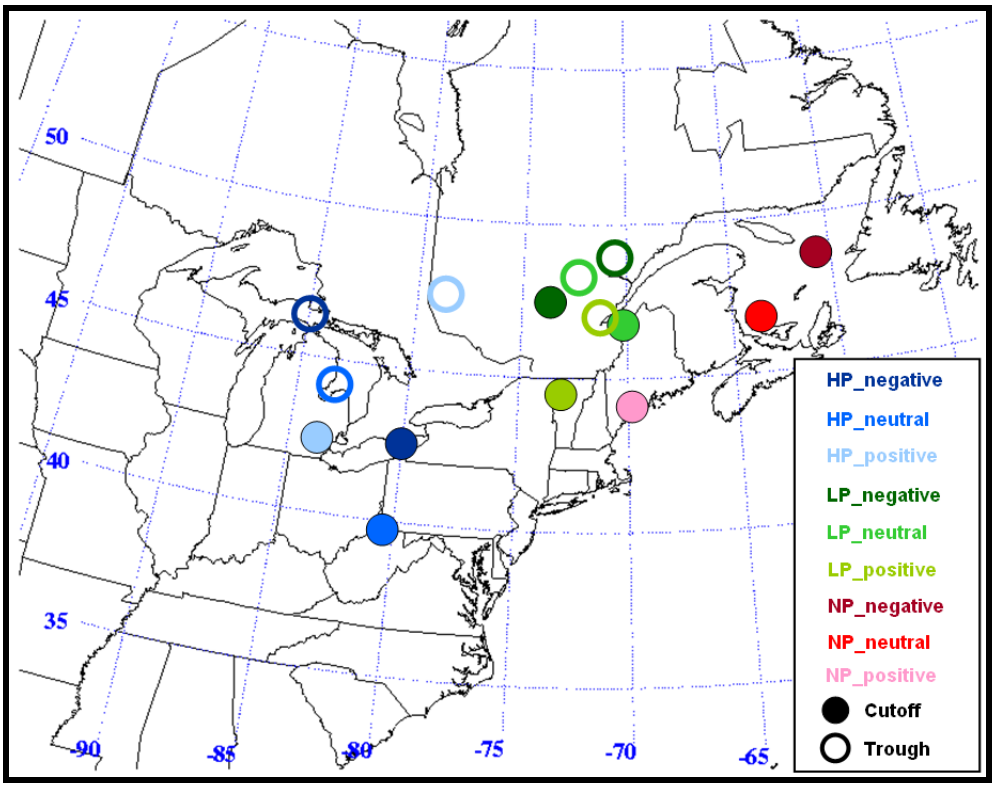
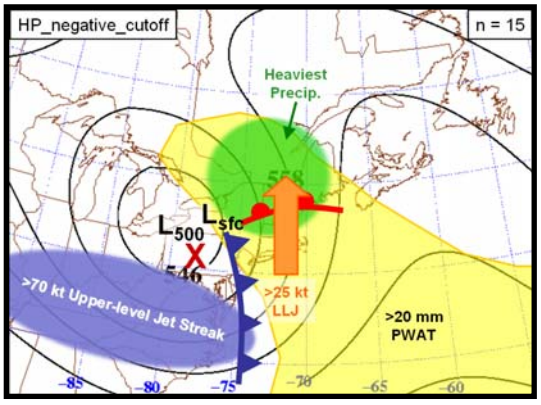
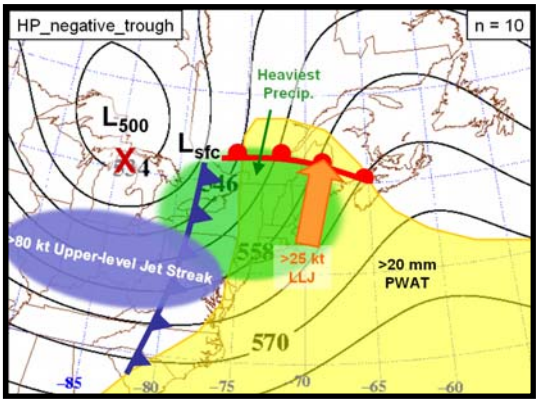


Figure 10: Average location of the 500-hPa cutoff cyclone for each composite category.

a)



b)



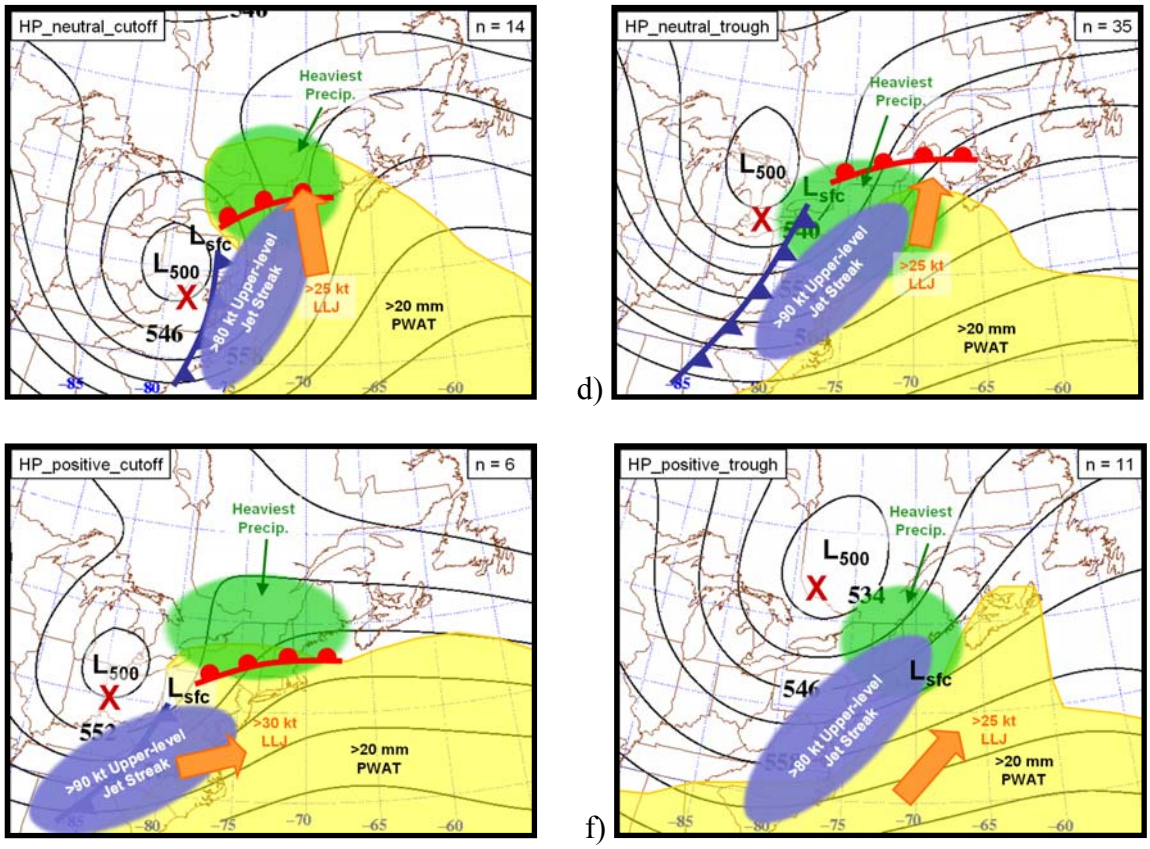
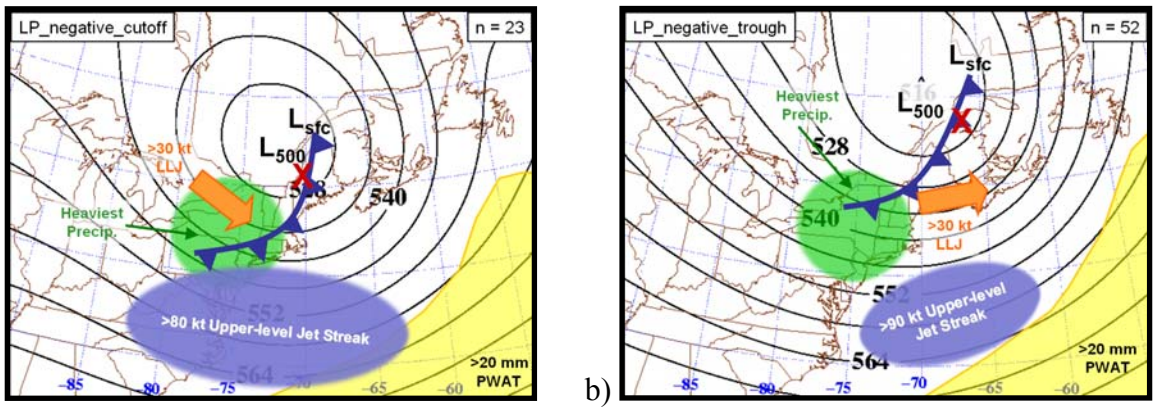


Figure 11: Composite conceptual summaries for HP categories.



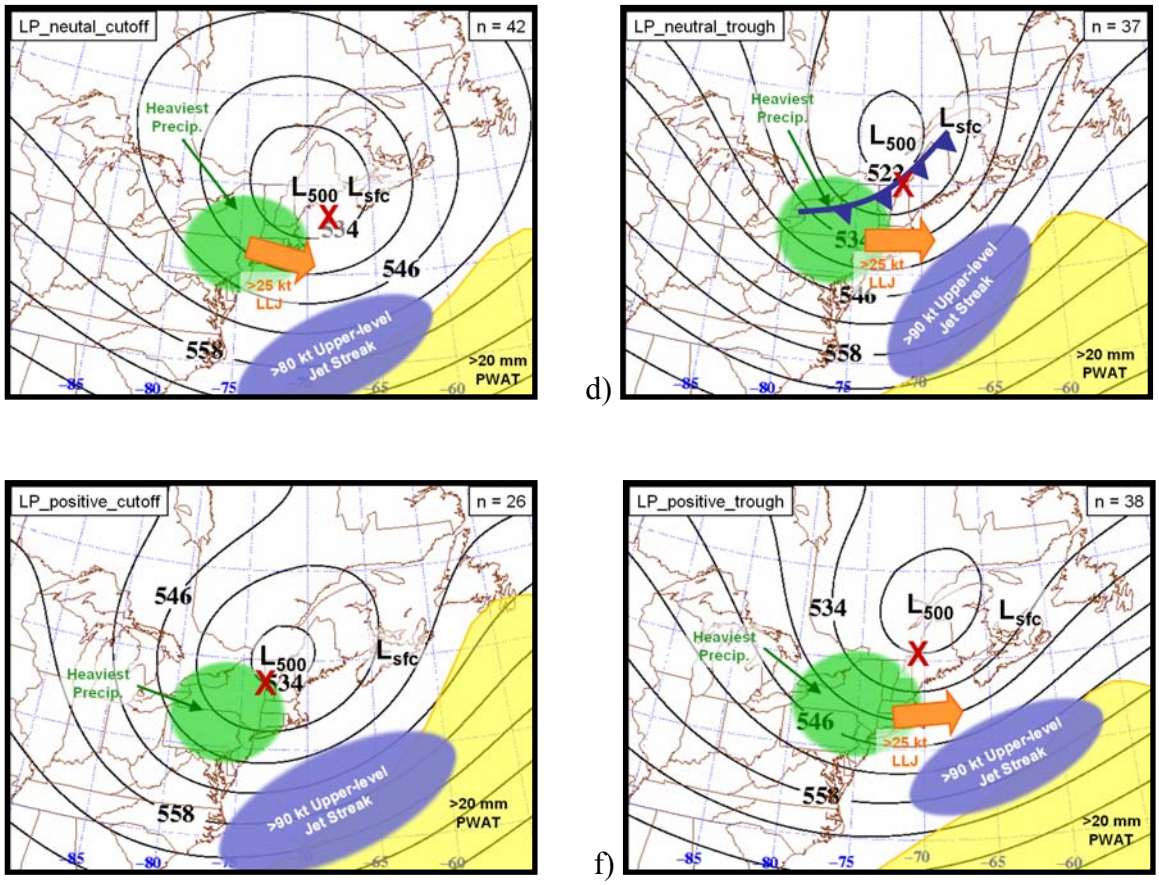
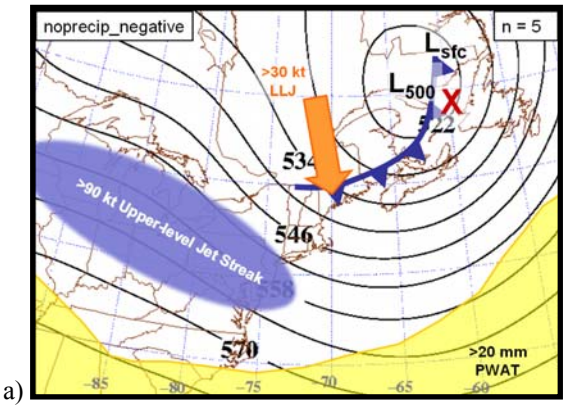
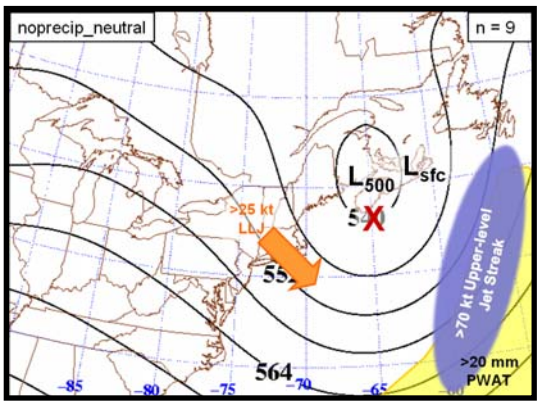


Figure 12: Composite conceptual summaries for LP categories.



b)



c)

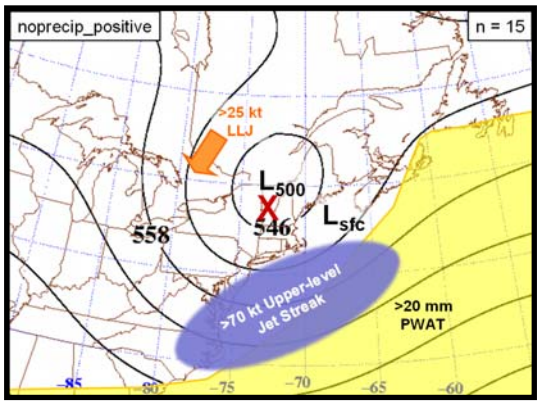


Figure 13: Composite conceptual summaries for NP categories.

SECTION 2: Cumulative CSTAR Project Publications

a) Theses completed:

Groenert, D., 2002: Large-scale circulation anomaly indices in relation to cool-season precipitation events in the Northeastern United States. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 144 pp.

Novak, D., 2002: A climatological and composite study of cold season banded precipitation in the Northeast United States. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 182 pp.

Smith, B. A., 2003: Cutoff cyclones: A global and regional climatology and two case studies. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 165 pp.

DeLuca, D., 2004: The distribution of precipitation over the northeast accompanying landfalling and transitioning tropical cyclones. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 178 pp.

Fracasso, A., 2004: Case studies of cold season 500 hPa cutoff cyclone precipitation distribution. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 121 pp.

Najuch, J. S., 2004: Case studies of warm season cutoff cyclone precipitation distribution. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 108 pp.

Archambault, H., 2005: Cool-season regime transition and its impact on precipitation in the northeastern United States. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 163 pp.

Wasula, A. C., 2005: A comprehensive study of cool season tornadoes in the southeast United States. Ph.D. Dissertation, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 222 pp.

Wagner, K. R., 2006: Cool-season moderate precipitation events in the Northeastern United States. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 134 pp.

Greenstein, M. D., 2006: Mesoscale structure of precipitation regions in northeast winter storms. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 128 pp.

Cote, M. R., 2007: Predecessor rain events in advance of tropical cyclones. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 200 pp.

Klein, J. R., 2007: Mesoscale precipitation structures accompanying landfalling and transitioning tropical cyclones in the Northeast United States. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 155 pp.

Wilson, P. H., 2008: Warm-season lake-/sea-breeze severe weather in the Northeast. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 115 pp.

Scalora, M. A., 2009: Forecasting distributions of warm-season precipitation associated with 500-hPa cutoff cyclones. Master of Science Thesis, Department of Atmospheric and Environmental Sciences, University at Albany/SUNY, Albany, NY, 186 pp.

b) Preprints:

Groenert, D., L. F. Bosart, D. Keyser, and R. H. Grumm, 2002: Large-scale circulation anomaly indices in relation to cool-season precipitation events in the northeastern United States. Preprints, 19th Conference on Weather Analysis and Forecasting, American Meteorological Society, 12-16 August 2002, San Antonio, TX, pp 168–171.

Grumm, R. H., N. W. Junker, R. Hart, and L. F. Bosart, 2002: Can possible heavy rainfall events be identified by comparing various parameters to the climatological norms? Preprints, 19th Conference on Weather Analysis and Forecasting, American Meteorological Society, 12-16 August 2002, San Antonio, TX, pp 160–163.

Junker, N. W., R. Hart, R. H. Grumm, and L. F. Bosart, 2002: Establishing a 10 Year climatology of 101.6 mm (4 inch) rainfall days, Part I. Preprints, 19th Conference on Weather Analysis and Forecasting, American Meteorological Society, 12-16 August 2002, San Antonio, TX, pp 156–159.

Novak, D. R., and R. S. Horwood, 2002: Analysis of mesoscale banded features in the 5–6 February 2001 New England snowstorm. Preprints, 19th Conference on Weather Analysis and Forecasting, American Meteorological Society, 12-16 August 2002, San Antonio, TX, pp J103–J105.

Novak, D. R., L. F. Bosart, D. Keyser, and J. S. Waldstreicher, 2002: A climatological and composite study of cold season banded precipitation in the northeast United States. Preprints, 19th Conference on Weather Analysis and Forecasting, American Meteorological Society, 12-16 August 2002, San Antonio, TX, pp 164–167.

Novak, M. J., L. F. Bosart, D. Keyser, T. A. Wasula, and K. D. LaPenta, 2002: Climatology of warm season 500 hPa cutoff cyclones and a case study diagnosis of 14-17 July 2000. Preprints, 19th Conference on Weather Analysis and Forecasting, American Meteorological Society, 12-16 August 2002, San Antonio, TX, pp 68–71.

Smith, B. A., L. F. Bosart, D. Keyser, and D. St. Jean, 2002: A global 500 hPa cutoff cyclone climatology: 1953-1999. Preprints, 19th Conference on Weather Analysis and Forecasting, American Meteorological Society, 12-16 August 2002, San Antonio, TX, pp 74–77.

Wasula, A. C., L. F. Bosart, R. Schneider, S. J. Weiss, and R. H. Johns, 2003: Mesoscale aspects of the rapid intensification of a tornadic squall line across central Florida: 22-23 February 1998. Preprint CD-ROM, 10th Conference on Mesoscale Processes, American Meteorological Society, 23-27 June 2003, Portland, OR.

Bosart, L. F., W. Drag, and A. C. Wasula, 2003: The unusually intense coastal front passage of 17-18 April 2002 in eastern New England. Preprints, Fifth Conference on Coastal Atmospheric and Oceanic Prediction and Processes, American Meteorological Society, 6-12 August 2003, Seattle, WA, pp 169–174.

Novak, D. R., J. S. Waldstreicher, L. F. Bosart, and D. Keyser, 2003: An observational study of cold season mesoscale band formation in the Northeast United States. Preprints, 31st Conference on Radar Meteorology, American Meteorological Society, 6-12 August 2003, Seattle, WA, pp 969–972.

Archambault, H. M., L. F. Bosart, D. Keyser, and R. Grumm, 2004: Large scale regime transition and its relationship to significant cool season precipitation events in the Northeast. Preprint CD-ROM, 20th Conference on Weather Analysis and Forecasting, 11-15 January 2004, Seattle, WA.

DeLuca, D. P., L. F. Bosart, D. Keyser, and D. R. Vallee, 2004: The distribution of precipitation over the Northeast accompanying landfalling and transitioning tropical cyclones. Preprint CD-ROM, 20th Conference on Weather Analysis and Forecasting, 11-15 January 2004, Seattle, WA.

Fracasso, A. R., 2004: Cold season 500 hPa cutoff cyclone precipitation distribution and a case study. Preprint CD-ROM, 20th Conference on Weather Analysis and Forecasting, 11-15 January 2004, Seattle, WA.

Junker, N. W., R. H. Grumm, R. Hart, and L. F. Bosart, 2004: A climatological study of 100 mm or greater days in northern California. Preprint CD-ROM, 20th Conference on Weather Analysis and Forecasting, 11-15 January 2004, Seattle, WA.

Najuch, J. S., L. F. Bosart, D. Keyser, T. Wasula, and K. D. LaPenta, 2004: Case studies of warm season cutoff cyclone precipitation distribution. Preprint CD-ROM, 20th Conference on Weather Analysis and Forecasting, 11-15 January 2004, Seattle, WA.

Novak, D. R., J. S. Waldstreicher, L. F. Bosart, and D. Keyser, 2004: A forecast strategy for anticipating cold season mesoscale band formation within developing extratropical cyclones. Preprint CD-ROM, 20th Conference on Weather Analysis and Forecasting, 11-15 January 2004, Seattle, WA.

St. Jean, D. P., P. A. Sisson, L. F. Bosart, D. Keyser, and B. Smith, 2004: Characteristics of upslope snowfall events in Northern New York State and Northern Vermont: Diagnostics and model simulations of several Northwest-flow cases. Preprint CD-ROM, 20th Conference on Weather Analysis and Forecasting, 11-15 January 2004, Seattle, WA.

Wasula, T. A., A. C. Wasula, and L. F. Bosart, 2004: A multi-scale analysis of the end of the millennium snowstorm. Preprint CD-ROM, 20th Conference on Weather Analysis and Forecasting, 11-15 January 2004, Seattle, WA.

Wasula, A. C., L. F. Bosart, R Schneider, S. J. Weiss, and R. H. Johns, 2004: Cool season tornadoes in the southeast United States: A climatological and case study perspective. Preprint CD-ROM, 20th Conference on Weather Analysis and Forecasting, 11-15 January 2004, Seattle, WA.

Bosart, L. F., K. LaPenta, A. Seimon, M. Dickinson, and T. J. Galarneau, Jr., 2004: Terrain-influenced tornadogenesis in the northeastern United States. Preprint CD-ROM, 11th Conference on Mountain Meteorology, 21-25 June 2004, Bartlett, NH.

Sisson, P. A., D. St. Jean, E. Evenson, W. E. Murray, S. F. Hogan, L. F. Bosart, D. Keyser, and B. Smith, 2004: Applying local research to National Weather Service operations: Forecasting heavy mountain snowfalls in Vermont and Northern New York. Preprint CD-ROM, 11th Conference on Mountain Meteorology, 21-25 June 2004, Bartlett, NH.

Bosart, L. F., K. D. LaPenta, A. Seimon, and M. J. Dickinson, 2004: Terrain-influenced tornadogenesis in the northeastern United States: An examination of the 29 May 1995 Great Barrington, Massachusetts, Tornado. Preprint CD-ROM, 22nd Conference on Severe Local Storms, 4-8 October 2004, Hyannis, MA.

LaPenta, K. D., L. F. Bosart, T. J. Galarneau, Jr., and M. J. Dickinson, 2004: A multiscale examination of the 31 May 1998 Mechanicville, New York, Tornado. Preprint CD-ROM, 22nd Conference on Severe Local Storms, 4-8 October 2004, Hyannis, MA.

Novak, D., and A. Aiyyer, 2004: The 2004 April fool's New England flooding event: Analysis of three heavy precipitation episodes associated with a slow moving cutoff cyclone. Preprint CD-ROM, 22nd Conference on Severe Local Storms, 4-8 October 2004, Hyannis, MA.

Seimon A., and L. F. Bosart, 2004: An observationally based hypothesis for significant tornadogenesis in mountain environments. Preprint CD-ROM, 22nd Conference on Severe Local Storms, 4-8 October 2004, Hyannis, MA.

Wasula, A. C., L. F. Bosart, R Schneider, S. J. Weiss, R. H. Johns, G. S. Manikin, and P. Welch, 2004: The structure and climatology of boundary layer winds in the southeast United States and its relationship to nocturnal tornado episodes. Preprint CD-ROM, 22nd Conference on Severe Local Storms, 4-8 October 2004, Hyannis, MA.

Archambault, H. M., D. Keyser, L. F. Bosart, and A. Aiyyer, 2004: Cool-season regime transition and its impact on precipitation in the northeast United States. Preprint, The First THORPEX International Science Symposium, 6-10 December, Montréal, Québec, Canada.

Wasula, T. A., P. H. Wilson, L. F. Bosart, D. Keyser, and R. L. Tracey, 2008: A comparison of two lake breeze severe events with a threat checklist application. Preprint CD-ROM, 24th Conference on Severe Local Storms, 27-31 October 2008, Savannah, GA.

Wasula, T. A., N. A. Stuart, and A. C. Wasula, 2008: The 17 February 2006 severe weather and high wind event across Eastern New York and New England. Preprint CD-ROM, 24th Conference on Severe Local Storms, 27-31 October 2008, Savannah, GA.

c) PI and/or student presentations:

Bosart, L. F., 2001: Scientific and operational lessons from the 25 Jan ‘00 and 30 Dec ‘00 snowstorms. Oral presentation at the 26th Annual Northeastern Storm Conference, 9-11 March 2001, Saratoga Springs, NY.

Bosart, L. F., 2001: An overview of derechos and their environments. Oral presentation at the CSTAR Conference and Albany Weather Forecasting Office Spring Meeting, 25-26 April 2001, Albany, NY.

Bosart, L. F., 2001: Death by 1000 Cuts? Oral presentation at the Third Northeast Regional Operational Workshop, 6-7 November 2001, Albany, NY.

Groenert, D., L. F. Bosart, D. Keyser, and R. Grumm, 2001: Large-scale circulation anomaly indices in relation to cool-season precipitation events in the northeastern United States. Oral presentation at the Third Northeast Regional Operational Workshop, 6-7 November 2001, Albany, NY.

Novak, D., L. F. Bosart, D. Keyser, and J. Waldstreicher, 2001: A climatology of cold season banded precipitation in the northeast United States. Oral presentation at the Third Northeast Regional Operational Workshop, 6-7 November 2001, Albany, NY.

Smith, B. A., L. F. Bosart, D. Keyser, and D. St. Jean, 2001: A climatology of 500 hPa cutoff cyclones. Oral presentation at the Third Northeast Regional Operational Workshop, 6-7 November 2001, Albany, NY.

Bosart, L. F., 2002: Dynamic tropopause and PV maps: A user's guide. Oral presentation at the 27th Annual Northeastern Storm Conference, 8-10 March 2002, Saratoga Springs, NY.

Groenert, D., L. F. Bosart, and D. Keyser, 2002: Large-scale circulation anomaly indices in relation to cool-season precipitation events in the northeastern United States. Oral presentation at the 27th Annual Northeastern Storm Conference, 8-10 March 2002, Saratoga Springs, NY.

Novak, D., L. F. Bosart, D. Keyser, and J. Waldstreicher 2002: A climatological and composite study of cold season banded precipitation in the northeast United States. Oral presentation at the 27th Annual Northeastern Storm Conference, 8-10 March 2002, Saratoga Springs, NY.

Bosart, L. F., 2002: Mesoscale boundaries, organized deep convection and forecast derailments. Oral presentation at the Northeast Regional Operational Workshop, 5 November 2002, Albany, NY.

Novak, D., J. Waldstreicher, L. F. Bosart, and D. Keyser, 2002: Anticipating mesoscale band formation in winter storms. Oral presentation at the Northeast Regional Operational Workshop, 5 November 2002, Albany, NY.

Novak, M. J., L. F. Bosart, D. Keyser, T. A. Wasula, and K. D. LaPenta, 2002: A climatology of warm season 500 hPa cutoff cyclones and case study. Oral presentation at the Northeast Regional Operational Workshop, 5 November 2002, Albany, NY.

Smith, B. A., L. F. Bosart, D. Keyser, and D. St. Jean, 2002: Cutoff cyclones: A global and regional climatology (1948–2001) and two case studies. Oral presentation at the Northeast Regional Operational Workshop, 5 November 2002, Albany, NY.

Atallah, E. H., and L. F. Bosart, 2003: Tropical cyclone extratropical transition evolutions: Forecast vs. observed. Oral presentation at the 28th Annual Northeastern Storm Conference, 7-9 March 2003, Saratoga Springs, NY.

Atallah, E. H., A. Aiyyer, and L. F. Bosart, 2003: Teleconnections, 1000-500 hPa thickness and storm tracks in the Northern Hemisphere. Oral presentation at the 28th Annual Northeastern Storm Conference, 7-9 March 2003, Saratoga Springs, NY.

Brewster, J., and M. Evans, 2003: Forecasting the Christmas Day 2002 Snowstorm using modernized National Weather Service tools, training and technology. Oral presentation at the 28th Annual Northeastern Storm Conference, 7-9 March 2003, Saratoga Springs, NY.

Bosart, L. F., and M. J. Dickinson, 2003: The double transition of Hurricane Michael (2000): Baroclinic to tropical to baroclinic. Oral presentation at the 28th Annual Northeastern Storm Conference, 7-9 March 2003, Saratoga Springs, NY.

Novak, M. J., A. Aiyyer, L. F. Bosart, D. Keyser, T. A. Wasula, and K. D. LaPenta, 2003: Climatology of warm season 500 hPa cutoff cyclones and case study diagnosis of 14–17 July 2000. Oral presentation at the 28th Annual Northeastern Storm Conference, 7-9 March 2003, Saratoga Springs, NY.

Smith, B. A., L. F. Bosart, D. Keyser, and D. St. Jean, 2003: Cutoff cyclones: A global and regional climatology (1948–2001) and two case studies. Oral presentation at the 28th Annual Northeastern Storm Conference, 7-9 March 2003, Saratoga Springs, NY.

Archambault, H. M., 2003: Large-scale regime transition and its relationship to significant cool season precipitation events in the Northeast. Oral presentation at the NWS/UAlbany/NCSU CSTAR Workshop, 9-10 July 2003, Silver Spring, MD.

DeLuca, D. P., L. F. Bosart, D. Keyser, and D. Vallee, 2003: The distribution of precipitation over the Northeast accompanying landfalling and transitioning tropical cyclones. Oral presentation at the NWS/UAlbany/NCSU CSTAR Workshop, 9-10 July 2003, Silver Spring, MD.

Fracasso, A., A. Aiyyer, L. F. Bosart, D. Keyser, and M. Evans, 2003: Case studies of cold season cutoff cyclone precipitation distribution. Oral presentation at the NWS/UAlbany/NCSU CSTAR Workshop, 9-10 July 2003, Silver Spring, MD.

Najuch, J. S., A. Aiyyer, L. F. Bosart, D. Keyser, T. A. Wasula, and K. D. LaPenta, 2003: Case studies of warm season cutoff cyclone precipitation distribution. Oral presentation at the NWS/UAlbany/NCSU CSTAR Workshop, 9-10 July 2003, Silver Spring, MD.

Novak, M. J., A. Aiyyer, L. F. Bosart, D. Keyser, T. A. Wasula, and K. D. LaPenta, 2003: Climatology of warm season 500 hPa cutoff cyclones and case study. Oral presentation at the NWS/UAlbany/NCSU CSTAR Workshop, 9-10 July 2003, Silver Spring, MD.

Novak, D., J. Waldstreicher, L. F. Bosart, and D. Keyser, 2003: Anticipating mesoscale band formation in Winter storms using radar and model guidance. Invited speaker at the 28th Annual National Weather Association Meeting, 18-23 October 2003, Jacksonville, FL.

Archambault, H. M., L. F. Bosart, D. Keyser, and R. Grumm, 2003: Large-scale regime transition and its relationship to significant cool season precipitation events in the Northeast. Oral presentation at the Northeast Regional Operational Workshop, Albany, NY, 4-5 November 2003.

Bosart, L. F., W. Drag, and A. C. Wasula, 2003: The unusually intense coastal front passage of 17-18 April 2002 in Eastern New England. Oral presentation at the Northeast Regional Operational Workshop, Albany, NY, 4-5 November 2003.

DeLuca, D. P., L. F. Bosart, D. Keyser, and D. R. Vallee, 2003: The distribution of precipitation over the northeast accompanying landfalling and transitioning tropical cyclones. Oral

presentation at the Northeast Regional Operational Workshop, Albany, NY, 4-5 November 2003.

Fracasso, A., L. F. Bosart, D. Keyser, and M. Evans, 2003: Cold season 500 hPa cutoff cyclone precipitation distribution and a case study. Oral presentation at the Northeast Regional Operational Workshop, Albany, NY, 4-5 November 2003.

LaPenta, K. D., 2003: The Eastern New York and Western New England F2 Tornado of 21 July. Oral presentation at the Northeast Regional Operational Workshop, Albany, NY, 4-5 November 2003.

Najuch, J. S., L. F. Bosart, D. Keyser, T. A. Wasula, and K. D. LaPenta, 2003: Case studies of warm season cutoff cyclone precipitation distribution. Oral presentation at the Northeast Regional Operational Workshop, Albany, NY, 4-5 November 2003.

Waldstreicher, J. S., 2003: Assessing the impact of collaborative research projects on NWS Warning performance. Oral presentation at the Northeast Regional Operational Workshop, Albany, NY, 4-5 November 2003.

Wasula, A. C., L. F. Bosart, R. Schneider, S. Weiss, and R. Johns, 2003: A study of cool season tornadoes in the Southeast United States. Oral presentation at the Northeast Regional Operational Workshop, Albany, NY, 4-5 November 2003.

Archambault, H. M., L. F. Bosart, and D. Keyser, 2004: Large-scale regime transition and its relationship to significant precipitation events in the Northeast. Oral presentation 29th Annual Northeastern Storm Conference, 12-14 March 2004, Saratoga Springs, NY.

Bosart, L. F., 2004: Coastal fronts, cold air damming, and fronts adjacent to higher terrain. Oral presentation 29th Annual Northeastern Storm Conference, 12-14 March 2004, Saratoga Springs, NY.

Cannon, J., 2004: Environmental flow regimes and heavy rainfall distribution associated with tropical cyclones in the northeast United States. Oral presentation 29th Annual Northeastern Storm Conference, 12-14 March 2004, Saratoga Springs, NY.

DeLuca, D. P., L. F. Bosart, D. Keyser, and D. R. Vallee, 2004: The distribution of precipitation over the Northeast accompanying landfalling and transitioning tropical cyclones. Oral presentation 29th Annual Northeastern Storm Conference, 12-14 March 2004, Saratoga Springs, NY.

Fracasso, A., L. F. Bosart, D. Keyser, and M. Evans, 2004: Cold season 500 hPa cutoff cyclone precipitation distribution and a case study. Oral presentation 29th Annual Northeastern Storm Conference, 12-14 March 2004, Saratoga Springs, NY.

Najuch, J. S., L. F. Bosart, D. Keyser, T. A. Wasula, and K. D. LaPenta, 2004: Case studies of warm season cutoff cyclone precipitation distribution. Oral presentation 29th Annual Northeastern Storm Conference, 12-14 March 2004, Saratoga Springs, NY.

Sisson, P. A., D. St. Jean, E. Evenson, W. E. Murray, S. F. Hogan, L. F. Bosart, D. Keyser, and B. Smith, 2004: Application of local research results to National Weather Service Operational Forecast Challenges – A success story forecasting heavy mountain snowfalls in Vermont and Northern New York. Oral presentation 29th Annual Northeastern Storm Conference, 12-14 March 2004, Saratoga Springs, NY.

Bosart, L. F., K. D. LaPenta, A. Seimon, and M. J. Dickinson, 2004: Terrain-influenced tornadogenesis in the northeastern United States: An examination of the 29 May 1995 Great Barrington, Massachusetts, Tornado. Oral presentation, 22nd Conference on Severe Local Storms, 4-8 October 2004, Hyannis, MA.

LaPenta, K. D., L. F. Bosart, T. J. Galarneau Jr., and M. J. Dickinson, 2004: A multiscale examination of the 31 May 1998 Mechanicville, New York, Tornado. Oral presentation, 22nd Conference on Severe Local Storms, 4-8 October 2004, Hyannis, MA.

Seimon A., and L. F. Bosart, 2004: An observationally based hypothesis for significant tornadogenesis in mountain environments. Oral presentation, 22nd Conference on Severe Local Storms, 4-8 October 2004, Hyannis, MA.

Wasula, A. C., L. F. Bosart, R Schneider, S. J. Weiss, R. H. Johns, G. S. Manikin, and P. Welch, 2004: The structure and climatology of boundary layer winds in the southeast United States and its relationship to nocturnal tornado episodes. Oral presentation, 22nd Conference on Severe Local Storms, 4-8 October 2004, Hyannis, MA.

Archambault, H. M., L. F. Bosart, D. Keyser, A. Aiyyer, and R. Grumm, 2004: Cool-season regime transition and its impact on precipitation in the northeast. Oral presentation at the Sixth Northeast Regional Operational Workshop (NROW), 2-3 November 2004, Albany, NY

Bosart, L. F., 2004: A long-lived intense continental-scale front: 28 February-4 March 1972. Oral presentation at the Sixth Northeast Regional Operational Workshop (NROW), 2-3 November 2004, Albany, NY.

Fracasso, A., L. F. Bosart, and D. Keyser, 2004: Cool season 500 hPa cutoff cyclones: Precipitation distribution and a case study. Oral presentation at the Sixth Northeast Regional Operational Workshop (NROW), 2-3 November 2004, Albany, NY.

Novak, D., B. Colle, and D. Keyser, 2004: High-resolution simulations of the 25 December 2002 banded snowstorm using Eta, MM5, and WRF. Oral presentation at the Sixth Northeast Regional Operational Workshop (NROW), 2-3 November 2004, Albany, NY.

Runyon, S. C., and L. F. Bosart, 2004: A statistical and synoptic climatological analysis of U.S. heat waves. Oral presentation at the Sixth Northeast Regional Operational Workshop (NROW), 2-3 November 2004, Albany, NY.

Wagner, K., L. F. Bosart, and D. Keyser, 2004: Cyclogenesis and upper-level jet streaks and their influence on the low-level Jet. Oral presentation at the Sixth Northeast Regional Operational Workshop (NROW), 2-3 November 2004, Albany, NY.

Wasula, A. C., L. F. Bosart, R. S. Schneider, S. Weiss, R. H. Johns, G. S. Manikin, and P. Welsh, 2004: The structure and climatology of boundary layer winds in the southeast United States and its relationship to nocturnal tornado episodes. Oral presentation at the Sixth Northeast Regional Operational Workshop (NROW), 2-3 November 2004, Albany, NY.

Bosart, L. F., W. Drag, and A. Wasula, 2004: Backdoor and sidedoor cold fronts: A continual forecast challenge. Invited presenter, 5th Southern New England Weather Conference, 6 November 2004, Brookline, MA.

Archambault, H. M., L. F. Bosart, D. Keyser, A. Aiyyer, and R. Grumm, 2005: Cool-season regime transition and its impact on precipitation in the northeast. Oral presentation at the 30th Annual Northeastern Storm Conference, 18-20 March 2005, Burlington, VT.

Runyon, S. C., and L. F. Bosart, 2005: A statistical analysis and synoptic climatology of heat waves over the United States. Oral presentation at the 30th Annual Northeastern Storm Conference, 18-20 March 2005, Burlington, VT.

Wagner, K., L. F. Bosart, and D. Keyser, 2005: Moderate precipitation events in the Northeastern United States. Oral presentation at the 30th Annual Northeastern Storm Conference, 18-20 March 2005, Burlington, VT.

Archambault, H. M., L. F. Bosart, D. Keyser, A. Aiyyer and R. H. Grumm, 2005: Cool-season regime transition and its impact on precipitation in the Northeast. Oral presentation, 21st Conference on Weather Analysis and Forecasting/17th Conference on Numerical Weather Prediction, American Meteorological Society, 1-5 August 2005, Washington, DC.

Greenstein, M. D., L. F. Bosart, D. Keyser, and D. J. Nicosia, 2005: Examining the role of mesoscale features in the structure and evolution of precipitation regions in northeast winter storms. Poster presentation, 21st Conference on Weather Analysis and

Forecasting/17th Conference on Numerical Weather Prediction, American Meteorological Society, 1-5 August 2005, Washington, DC.

Junker, N., R. Grumm, R. Hart, L. F. Bosart, K. M. Bell and F. J. Pereira, 2005: Forecasting extreme wintertime precipitation events in northern California. Oral presentation, 21st Conference on Weather Analysis and Forecasting/17th Conference on Numerical Weather Prediction, American Meteorological Society, 1-5 August 2005, Washington, DC.

Novak, D. R., B. A. Colle, and D. Keyser, 2005: High-resolution modeling of the 25 December 2002 Northeast U.S. banded snowstorm. Oral presentation, 21st Conference on Weather Analysis and Forecasting/17th Conference on Numerical Weather Prediction, American Meteorological Society, 1-5 August 2005, Washington, DC.

Runyon, S. C., and L. F. Bosart, 2005: A Statistical analysis and synoptic climatology of heat waves over the United States. Oral presentation, 21st Conference on Weather Analysis and Forecasting/17th Conference on Numerical Weather Prediction, American Meteorological Society, 1-5 August 2005, Washington, DC.

Wagner, K. R., L. F. Bosart, D. Keyser, and M. S. Evans, 2005: Cool-season moderate precipitation events in the Northeastern United States. Poster presentation, 21st Conference on Weather Analysis and Forecasting/17th Conference on Numerical Weather Prediction, American Meteorological Society, 1-5 August 2005, Washington, DC.

Archambault, H., L. F. Bosart, D. Keyser and R. Grumm, 2005: Cool-season regime transition and its impact on precipitation in the Northeast. Poster presentation, NOAA 30th Annual Climate Diagnostics and Prediction Workshop, 24-28 October 2005, University Park, PA.

Archambault, H., L. F. Bosart, D. Keyser and R. Grumm, 2005: Cool-season regime transition and its impact on precipitation in the Northeastern United States. Oral presentation, The 6th Southern New England Weather Conference, 5 November 2005, Brookline, MA.

Archambault, H., L. F. Bosart, D. Keyser and R. Grumm, 2005: Cool-season regime transition and its impact on precipitation in the Northeast. Oral presentation at the Seventh Northeast Regional Operational Workshop (NROW), 1-2 November 2005, Albany, NY.

Novak, D., B. Colle, and D. Keyser, 2005: An investigation of model-simulated band placement and evolution in the 25 December 2002 Northeast U.S. Banded Snowstorm. Oral presentation at the Seventh Northeast Regional Operational Workshop (NROW), 1-2 November 2005, Albany, NY.

Greenstein, M. D., L. F. Bosart, D. Keyser, and D. J. Nicosia, 2005: Examining the role of mesoscale features in the structure and evolution of precipitation regions in northeast winter storms. Oral presentation at the Seventh Northeast Regional Operational Workshop (NROW), 1-2 November 2005, Albany, NY.

Wagner, K., L. F. Bosart, D. Keyser, and M. S. Evans, 2005: Cool-season moderate precipitation events in the Northeastern United States. Oral presentation at the Seventh Northeast Regional Operational Workshop (NROW), 1-2 November 2005, Albany, NY.

Runyon, S. C., and L. F. Bosart, 2005: A statistical analysis and synoptic climatology of heat waves over the Northeast United States. Oral presentation at the Seventh Northeast Regional Operational Workshop (NROW), 1-2 November 2005, Albany, NY.

Wasula, A. C., 2005: A multiscale snalysis of the 23-24 November 2004 Southeast United States tornado outbreak. Oral presentation at the Seventh Northeast Regional Operational Workshop (NROW), 1-2 November 2005, Albany, NY.

Archambault, H., L. F. Bosart, D. Keyser, A. Aiyyer, and R. Grumm, 2006: Cool-season regime transition and its impact on precipitation in the Northeast. Oral presentation 31st Annual Northeastern Storm Conference, 10-12 March 2006, Saratoga Springs, NY.

Bosart, L. F., 2006: The small-scale New England coastal bomb of 9 December 2005: A near-miss Hurricane Zeta? Oral presentation 31st Annual Northeastern Storm Conference, 10-12 March 2006, Saratoga Springs, NY.

Greenstein, M. D., L. F. Bosart, D. Keyser, and D. J. Nicosia, 2006: Mesoscale structure of precipitation regions in northeast winter storms. Oral presentation 31st Annual Northeastern Storm Conference, 10-12 March 2006, Saratoga Springs, NY.

Wagner, K., L. F. Bosart, and D. Keyser, 2006: Cool-season moderate precipitation events in the Northeastern United States. Oral presentation 31st Annual Northeastern Storm Conference, 10-12 March 2006, Saratoga Springs, NY.

Wasula, A. C., 2006: The diurnal variation of synoptic scale structure of cool season tornado episodes in the Southeast United States. Oral presentation 31st Annual Northeastern Storm Conference, 10-12 March 2006, Saratoga Springs, NY.

Wasula, T. A., 2006: The Thanksgiving 2004 severe weather event across upstate New York and New England. Oral presentation 31st Annual Northeastern Storm Conference, 10-12 March 2006, Saratoga Springs, NY.

Bosart, L. F. (with contributions from A. Wasula, W. Drag, and K. Meier), 2006: Strong surface fronts over sloping terrain and coastal plains. Oral presentation, St. Louis (LSX) National Weather Service Forecast Office, 15 March 2006, St. Louis, MO.

Bosart, L. F, 2006: Modern weather forecasting: A scientific and operational perspective. Guest speaker, Eastern Region MIC Conference, 28 March 2006, Raleigh, NC.

Archambault, H. M., D. Keyser, and L. F. Bosart, 2006: Cool-season regime transition and its impact on northeast precipitation. Seminar (presented by D. Keyser), Program in Atmospheres, Oceans, and Climate, Massachusetts Institute of Technology, 8 May 2006, Cambridge, MA.

Archambault, H. M., D. Keyser, and L. F. Bosart, 2006: Cool-season regime transition and its impact on major northeast precipitation events. Oral presentation, Second Annual Eastern US Weather Conference, 8 July 2006, Baltimore, MD.

Archambault, H. M., D. Keyser, L. F. Bosart, and A. Aiyyer, 2006: Cool-season regime transition and its impact on Northeast precipitation. Seminar (presented by H. Archambault), NCEP/Climate Prediction Center, 6 September 2006, Camp Springs, MD.

Grumm, R., and L. F. Bosart, 2006: Model jumpiness and the need for ensembles. Oral presentation, 31st Annual Meeting, National Weather Association, 14-19 October 2006, Cleveland, OH.

Cote, M. R., L. F. Bosart, D. Keyser, and M. L. Jurewicz, Sr., 2006: Heavy rainfall events preceding the arrival of tropical cyclones. Oral presentation at the Eighth Northeast Regional Operational Workshop (NROW), 1-2 November 2006, Albany, NY.

Wilson, P., L. F. Bosart, D. Keyser, and T. Wasula, 2006: Warm-season lake-/sea-breeze severe weather in the Northeast. Oral presentation at the Eighth Northeast Regional Operational Workshop (NROW), 1-2 November 2006, Albany, NY.

Klein, J. R., L. F. Bosart, D. Keyser, and D. Vallee, 2006: Mesoscale precipitation structures accompanying landfalling and transitioning tropical cyclones in the northeast United States. Oral presentation at the Eighth Northeast Regional Operational Workshop (NROW), 1-2 November 2006, Albany, NY.

Cote, M. R., L. F. Bosart, D. Keyser, and M. L. Jurewicz, Sr., 2007: Heavy rainfall events preceding the arrival of tropical cyclones. Oral presentation, 32nd Annual Northeastern Storm Conference, 9-11 March 2007, Springfield, MA.

Klein, J. R., L. F. Bosart, D. Keyser, and D. Vallee, 2007: Mesoscale precipitation structures accompanying landfalling and transitioning tropical cyclones in the Northeast United States. Oral presentation, 32nd Annual Northeastern Storm Conference, 9-11 March 2007, Springfield, MA.

Wilson, P., L. F. Bosart, D. Keyser, and T. A. Wasula, 2007: Warm-season lake-/sea-breeze severe weather in the Northeast. Oral presentation, 32nd Annual Northeastern Storm Conference, 9-11 March 2007, Springfield, MA.

Cote, M. R., L. F. Bosart, D. Keyser, and M. L. Jurewicz, Sr., 2007: Heavy rainfall events preceding the arrival of tropical cyclones. Oral presentation, National Weather Service Spring Workshop, Binghamton, NY, 27 March 2007, Binghamton, NY.

Klein, J. R., L. F. Bosart, D. Keyser and D. Vallee, 2007: Mesoscale precipitation structures accompanying landfalling and transitioning tropical cyclones in the Northeast United States. Oral presentation, 22nd Conference on Weather Analysis and Forecasting/18th Conference on Numerical Weather Prediction, American Meteorological Society, 25-29 June 2007 Park City, UT.

Cote, M. R., L. F. Bosart, D. Keyser, and M. L. Jurewicz Sr., 2007: Heavy rainfall events preceding the arrival of Tropical Cyclones. Oral presentation, 22nd Conference on Weather Analysis and Forecasting/18th Conference on Numerical Weather Prediction, American Meteorological Society, 25-29 June 2007 Park City, UT.

Wilson, P., L. F. Bosart, D. Keyser, and T. Wasula, 2007: Warm-season lake-/sea-breeze severe Weather in the Northeast. Oral presentation, 22nd Conference on Weather Analysis and Forecasting/18th Conference on Numerical Weather Prediction, American Meteorological Society, 25-29 June 2007 Park City, UT.

Cote, M. R., L. F. Bosart, D. Keyser, and M. L. Jurewicz, 2007: Predecessor rain events in tropical cyclones. Oral presentation, 12th Conf. on Mesoscale Processes, American Meteorological Society, 9 August 2007, Waterville Valley, NH.

Klein, J. R., L. F. Bosart, D. Keyser, and D. Vallee, 2007: Mesoscale precipitation structures accompanying landfalling and transitioning tropical cyclones in the Northeast United States. Oral presentation, 12th Conf. on Mesoscale Processes, American Meteorological Society, 9 August 2007, Waterville Valley, NH.

Wilson, P. H., L. F. Bosart, D. Keyser, and T. A. Wasula, 2007: Warm-season lake-/sea-breeze severe weather in the Northeast. Oral presentation at the 32nd Annual National Weather Association Meeting, 13-18 October 2007, Reno, NV.

Bosart, L. F., D. Keyser, S. Weiss, R. Schneider, M. Cote, D. DeLuca, T. Fracasso, J. Klein, and A. C. Wasula, 2007: Lessons learned from CSTAR/COMET-sponsored research on convective storms and heavy rains. Invited speaker at the 32nd Annual National Weather Association Meeting, 13-18 October 2007, Reno, NV.

Wilson, P., L. F. Bosart, D. Keyser, and T. Wasula, 2007: Warm-season lake-/sea-breeze severe weather in the Northeast. Oral presentation at the Ninth Northeast Regional Operational Workshop (NROW), 7-8 November 2007, Albany, NY.

Cote, M. R., L. F. Bosart, D. Keyser, and M. L. Jurewicz, Sr., 2007: Predecessor rain events in tropical cyclones. Oral presentation at the Ninth Northeast Regional Operational Workshop (NROW), 7-8 November 2007, Albany, NY.

Bosart, L. F., D. Keyser, M. R. Cote, J. Klein, and D. DeLuca, 2007: CSTAR tropical cyclone-related research at the University at Albany/SUNY. Invited presentation at the National Centers for Environmental Prediction, 5 December 2007, Washington, DC.

Bosart, L. F., K. Corbosiero, M. R. Cote, and T. J. Galarneau, Jr., 2008: Mesoscale structures within transient synoptic-scale systems: Science and forecast challenges. Invited presentation at the First US-China Symposium on Meteorology: Mesoscale Meteorology and Data Assimilation, 27 February 2008, National Weather Center, Norman, OK.

Bosart, L. F., T. J. Galarneau, Jr., and A. C. Wasula, 2008: Modern weather forecasting: Where do we stand and where do we need to go? Invited presentation, 33rd Annual Northeastern Storm Conference, 14-16 March 2008, Springfield, MA.

Augustyniak, M., and L. F. Bosart, 2008: Flow channeling in the Mohawk and Hudson Valleys: A multiscale case study of surface flow convergence. Oral presentation, 33rd Annual Northeastern Storm Conference, 14-16 March 2008, Springfield, MA.

Bosart, L. F., T. J. Galarneau, Jr., and A. C. Wasula, 2008: Modern weather forecasting: Where do we stand and where do we need to go? Invited presentation, 12th Annual Russell L.

DeSouza Banquet, Department of Earth Sciences, Millersville University, 16 April 2008, Millersville, PA.

Cote, M. R., L. F. Bosart, and D. Keyser, 2008: Predecessor rain events in tropical cyclones. Oral presentation, 28th Conference on Hurricanes and Tropical Meteorology, American Meteorological Society, 27 April - 2 May 2008, Orlando, FL.

Bosart, L. F., and K. Meier, 2008: Front-mountain interactions in the long-lived, intense surface front of 28 February through 4 March 1972 over the United States. Oral Presentation, 13th Conference on Mountain Meteorology, American Meteorological Society, 11-15 August 2008, Whistler, Canada.

Bosart, L. F., M. Cote, T. J. Galarneau, Jr., and A. Srock, 2008: Troublesome precipitation events: A challenge for models and humans alike. Invited seminar, Earth System Research Laboratory, ESRL/PSD Seminar Series, 5 June 2008, Boulder, CO.

Bosart, L. F., J. C. Cordeira, and T. J. Galarneau, Jr., 2008: Modern weather forecasting: A status report and scientific opportunities." Invited seminar at GERT Joint Program in Applied Mathematics and Earth and Environmental Sciences, Columbia University, 9 October 2008, New York, NY.

Keyser, D., H. M. Archambault, and L. F. Bosart, 2008: Relationships between large-scale regime transitions and major cool-season precipitation events in the Northeast U.S. Oral presentation at the 14th Cyclone Workshop, 21-26 September 2008, Hôtel Mont Gabriel, Sainte-Adèle, Quebec, Canada.

Wasula, T. A., P. H. Wilson, L. F. Bosart, D. Keyser, and R. L. Tracey, 2008: A comparison of two lake breeze severe events with a threat checklist application. Poster presentation at the American Meteorological Society 24th Conference on Severe Local Storms, American Meteorological Society, 27-31 October 2008, Savannah, GA.

Wasula, T. A., N. A. Stuart, and A. C. Wasula, 2008: The 17 February 2006 severe weather and high wind event across Eastern New York and New England. Oral presentation at the 24th Conference on Severe Local Storms, American Meteorological Society, 27-31 October 2008, Savannah, GA.

Galarneau, T. J. Jr., and D. Keyser, 2008: Use of the nondivergent wind for diagnosing banded precipitation systems. Oral presentation at the Tenth Northeast Regional Operational Workshop (NROW), 5-6 November 2008, Albany, NY.

Scalora, M. A., L. F. Bosart, D. Keyser, N. A. Stuart, and T. A. Wasula, 2008: A diagnostic analysis of a difficult-to-forecast cutoff cyclone from the 2008 warm season. Oral presentation at the Tenth Northeast Regional Operational Workshop (NROW), 5-6 November 2008, Albany, NY.

Bosart, L. F., 2008: The "spin" on the active part of the 2008 North Atlantic hurricane season: Large-scale storm interations and mesoscale forecast challenges posed by inland flooding. Oral presentation (invited) at the NOAA/AOML/HRD, 15 December 2008, Miami, FL.

Bosart, L. F., 2009: Just how good are weather forecasts these days: Challenges and opportunities. Oral presentation (invited) at the AMS Southeastern Coastal and Atmospheric Processes Symposium (SeCAPS), 27-28 February 2009, Mobile, AL.

Bosart, L. F., T. J. Galarneau, Jr., and J. M. Cordeira, 2009: Storm-storm and storm-environment interations during the 2008 North Atlantic hurricane season. Oral presentation at the 34th Annual Northeastern Storm Conference, 6-8 March 2009, Springfield, MA.

Scalora, M. A., L. F. Bosart, and D. Keyser, 2009: An analysis of a high impact 500-hPa cutoff cyclone from the 2008 warm season. Oral presentation at the 34th Annual Northeastern Storm Conference, 6-8 March 2009, Springfield, MA.

Bosart, L. F., H. M. Archambault, T. J. Galarneau, Jr., and J. M. Cordeira: 2009: Modern weather forecasting: Scientific opportunities and operational challenges. The Robert D. Cess lecture (invited), 1 April 2009, University at Stony Brook, SUNY, Stony Brook, NY.

Galarneau, T. J., Jr., L. F. Bosart, D. Keyser, and R. S. Schumacher, 2009: A review of recent UAlbany CSTAR research on warm-season precipitation systems including predecessor rain events ahead of tropical cyclones. Oral presentation at the 1st NOAA Testbed USWRP Workshop, 28-29 April 2009, Boulder, CO.

Asuma, J. V., L. F. Bosart, and D. Keyser, 2009: Cool-season severe weather in the northeast U.S. Poster presentation at the 23rd Conference on Weather Analysis and Forecasting/19th Conference on Numerical Weather Prediction, 1-5 June 2009, Omaha, NE.

Bosart, L. F., H. Archambault, and J. M. Cordeira, 2009: Linked extreme weather events: Severe cold and record-breaking rains in Mexico and disruptive wildfires in California in late October 2007. Oral presentation at the 23rd Conference on Weather Analysis and Forecasting/19th Conference on Numerical Weather Prediction, 1-5 June 2009, Omaha, NE.

Galarneau, T. J., Jr., L. F. Bosart, and R. S. Schumacher, 2009: The life-cycle of tropical storm Erin (2007): Genesis, postlandfall reintensification, and widespread heavy rain. Oral presentation at the 23rd Conference on Weather Analysis and Forecasting/19th Conference on Numerical Weather Prediction, 1-5 June 2009, Omaha, NE.

Moore, B. J., L. F. Bosart, and D. Keyser, 2009: A predecessor rain event over the Upper Midwest associated with Tropical Cyclone Rita (2005). Poster presentation at the 23rd Conference on Weather Analysis and Forecasting/19th Conference on Numerical Weather Prediction, 1-5 June 2009, Omaha, NE.

Scalora, M. A., L. F. Bosart, and D. Keyser, 2009: An analysis of a high impact 500-hPa cutoff cyclone from the 2008 warm season. Oral presentation at the 23rd Conference on Weather Analysis and Forecasting/19th Conference on Numerical Weather Prediction, 1-5 June 2009, Omaha, NE.

Bosart, L. F., and T. J. Galarneau, Jr., 2009: An overview of predecessor heavy rain events associated with landfalling tropical cyclones. Oral presentation at the Conference on the Inland Impacts of Tropical Cyclones, 10-12 June 2009, Atlanta, GA.

Jurewicz, M. L. Sr., M. Cote, L. F. Bosart, and D. Keyser, 2009: A study of predecessor rainfall events (PRE) in advance of tropical cyclones. Oral presentation at the Conference on the Inland Impacts of Tropical Cyclones, 10-12 June 2009, Atlanta, GA.

Moore, B. J., L. F. Bosart, and D. Keyser, 2009: A comparison of significant predecessor rain events associated with Tropical Cyclone Rita (2005) and Tropical Cyclone Erin (2007). Oral presentation at the Conference on the Inland Impacts of Tropical Cyclones, 10-12 June 2009, Atlanta, GA.

Bosart, L. F., 2009: An overview of predecessor heavy rain events associated with landfalling tropical cyclones. Invited seminar, Department of Atmospheric and Oceanic Sciences, University of Wisconsin at Madison, 21 September 2009, Madison, WI.

Asuma, J. V., L. F. Bosart, D. Keyser, J. S. Quinlan, T. A. Wasula, H. W. Johnson, and K. S. Lipton, 2009: Cool-season high wind events in the northeast. Oral presentation at the Northeast Regional Operational Workshop XI (NROW), 4-5 November 2009, Albany, NY.

Bosart, L. F., T. J. Galarneau, Jr., J. M. Cordeira, and B. J. Moore, 2009: Predecessor rain events ahead of TC Ike and TC Lowell on 11-14 September 2008. Oral presentation at the Northeast Regional Operational Workshop XI (NROW), 4-5 November 2009, Albany, NY.

Moore, B. J., L. F. Bosart, D. Keyser, M. L. Jurewicz, Sr., 2009: Synoptic environments associated with predecessor rain events in advance of landfalling tropical cyclones. Oral presentation at the Northeast Regional Operational Workshop XI (NROW), 4-5 November 2009, Albany, NY.

Payer, M., L. F. Bosart, D. Keyser, N. A. Stuart, and T. A. Wasula, 2009: Analysis of precipitation distributions associated with two cool-season cutoff cyclones. Oral presentation at the Northeast Regional Operational Workshop XI (NROW), 4-5 November 2009, Albany, NY.

Bosart, L. F., H. M. Archambault, and J. M. Cordeira, 2010: Upstream North Pacific "mischief"

and downstream extreme weather during December 2009 and January 2010. Oral presentation at the 35th Annual Northeastern Storm Conference, 5-7 March 2010, Saratoga Springs, NY.

Moore, B., L. F. Bosart, D. Keyser and M. L. Jurewicz, Sr., 2010: Mechanisms for the development of predecessor rain events in advance of landfalling tropical cyclones. Oral presentation at the 35th Annual Northeastern Storm Conference, 5-7 March 2010, Saratoga Springs, NY.

Asuma, J. V., L. F. Bosart, D. Keyser, J. S. Quinlan, T. A. Wasula, H. W. Johnson, and K. S. Lipton, 2010: Cool-season high wind events in the Northeast. Oral presentation at the 35th Annual Northeastern Storm Conference, 5-7 March 2010, Saratoga Springs, NY.

Payer, M., L. F. Bosart, D. Keyser, N. A. Stuart, and T. A. Wasula, 2010: Analysis of the precipitation distribution associated with the 1-4 January 2010 hPa cutoff cyclone. Oral presentation at the 35th Annual Northeastern Storm Conference, 5-7 March 2010, Saratoga Springs, NY.

Moore, B., L. F. Bosart, and D. Keyser, 2010: Mechanisms for predecessor rain events ahead of tropical cyclones. Oral presentation at the 2nd NOAA Testbed USWRP Workshop, 4-5 May 2010, Boulder, CO.

d) CSTAR/COMET related refereed publications:

Wasula, A. C., L. F. Bosart, and K. D. LaPenta, 2002: The influence of terrain on the severe weather distribution across interior Eastern New York and Western New England. *Wea. Forecasting*, **17**, 1277–1289.

Weisman, R. A., K. G. McGregor, D. R. Novak, J. L. Selzler, M. L. Spinar, B. C. Thomas, and P. N. Schumacher, 2002: Precipitation regimes during cold-season central U.S. inverted trough cases. Part I: Synoptic climatology and composite study. *Wea. Forecasting*, **17**, 1173–1193.

Bosart, L. F., 2003: Whither the weather analysis and forecasting process? *Wea. Forecasting*, **18**, 520–529.

Novak, D. R., L. F. Bosart, D. Keyser, and J. S. Waldstreicher, 2004: An observational study of cold season-banded precipitation in northeast U.S. cyclones. *Wea. Forecasting*, **19**, 993–1010.

LaPenta, K. D., L. F. Bosart, T. J. Galarneau Jr., and M. J. Dickinson, 2005: A multiscale examination of the 31 May 1998 Mechanicville, New York, F3 tornado. *Wea. Forecasting*, **20**, 494–516.

Novak, D. R., J. S. Waldstreicher, D. Keyser, and L. F. Bosart, 2006: A forecast strategy for anticipating cold season mesoscale band formation within eastern U.S. cyclones. *Wea. Forecasting*, **21**, 3–23.

Bosart, L. F., A. Seimon, K. D. LaPenta, and M. J. Dickinson, 2006: Supercell tornadogenesis over complex terrain: The Great Barrington, Massachusetts, tornado on 29 May 1995. *Wea. Forecasting*, **21**, 897–922.

Wasula, A. C., L. F. Bosart, R. S. Schneider, S. J. Weiss, G. S. Manikin, and P. Welch, 2007: Mesoscale aspects of the rapid intensification of a tornadic convective line across central Florida: 22-23 February 1998. *Wea. Forecasting*, **22,** 223–243.

Junker, N. W., R. H. Grumm, R. Hart, L. F. Bosart, K. M. Bell, and F. J. Pereira, 2008: Use of anomalous fields to anticipate extreme rainfall in the mountains of northern California. *Wea. Forecasting,* **23**, 313–335.

Archambault, H. M., L. F. Bosart, D. Keyser, and A. R. Aiyyer, 2008: Influence of large-scale flow regimes on cool-season precipitation in the northeastern United States. *Mon. Wea. Rev.*, **136**, 2945–2963.

Bosart, L. F., A. C. Wasula, W. H. Drag, and K. W. Meier, 2008: Strong surface fronts over sloping terrain and coastal plains. *Fred Sanders Monograph,* L. F. Bosart and H. B. Bluestein, Eds., *Meteor. Monogr*., **33,** No. 55, Amer. Meteor. Soc., 35–85.

Archambault, H. M., D. Keyser, and L. F. Bosart, 2010: Relationships between large-scale regime transitions and major cool-season precipitation events in the Northeastern United States. *Mon Wea. Rev.,* **138** (in press).

Galarneau, T. J., Jr., L. F. Bosart, and R. S. Schumacher, 2010: Predecessor rain events ahead of tropical cyclones. *Mon Wea. Rev.,* **138** (in press).

SECTION 3: Report by Warren R. Snyder (NWS Perspective)

CSTAR: 1 November 2009 – 30 April 2010

National Weather Service Perspective

Warren R. Snyder, Science & Operations Officer

Acting Meteorologist in Charge

WFO Albany, New York

The CSTAR III project "***The Cooperative Research with the National Weather Service on Cool and Warm-Season Precipitation Forecasting over the Northeastern United States***" continues to provide a large payback to the NWS. Examples include: Research and results focused on current operational challenges, providing the NWS with top quality applicants as several former CSTAR students are now NOAA employees, enabling the involvement of dozens of operational meteorologists in applied research at numerous offices and conferences, leveraging the CSTAR resources into NWS Collaborative and Associate Projects, and the involvement of UAlbany undergraduates in support of the CSTAR and NWS research. Results from several past and present projects have been rapidly integrated into operations, as demonstrated by the PRE, Mesoscale Banding, Heavy Precipitation in Land Falling Tropical Cyclones, and 500hPa Cut Off Lows in both the warm and cold seasons to name just a few.

The CSTAR III project is wrapping up, as preparations are beginning to start CSTAR IV. The Major Foci project's graduate students are set to finish their thesis work and graduate. The last of the ongoing Collaborating projects have been completed or will be ongoing into CSTAR IV.

The Spring CSTAR meeting was hosted at WFO Albany, New York on May 7, 2010. The meeting was attended by 12 NWS staff members, the three CSTAR Principal Investigators, and the CSTAR graduate students. Three of the NWS staff that attended, did so from other offices via GoTo Meeting. Project results were presented. New ideas for integrating CSTAR results into NWS operations and documenting them were discussed. With the focus on Articulate Teletraining development, ideas such as counting web hits on this training, making it available in MetEd and COMET will be pursued. Reporting procedures were reviewed, with plans and timelines for CSTAR IV discussed. Recent challenges of running the WRF on the UAlbany RIT system were also discussed.

The High Wind/Winter and Severe Convective events project has moved forward quickly in the little over a year since it began. NWS project participants meet with Jonas in early March, and Jonas was provided data including water vapor and visible satellite images, and radar loops of the February 17, 2006 High Wind Event. John Quinlan met with Jonas in late March 2010 to discuss how best to handle lightning data, and having SUNY Albany Intern Katherine Linnenbach look at either the lightning data for all the cases, or work on a case study. It was decided that it would be best for Kate to work with Jonas on a case study.

The project is now in the final stages and the results to date hold potential operational applications. Most of the research that has been completed on this project to date can be found at Jonas Asuma's web page: http://www.atmos.albany.edu/student/jasuma/

The CSTAR III project "Distribution of Precipitation Associated with 500 hPa Cutoff Cyclones" led by focal points Neil Stuart and Tom Wasula was active. Presentations of this work were made at NROW XI and the Fall CSTAR Meeting. Tom and Neil obtained Matthew

A. Scalora's thesis entitled "Forecasting Distributions of Warm-Season Precipitation and Severe Weather Associated with 500-hPa Cutoff Cyclones", and are continuing to work on a potential publication and development of teletraining from this work. Tom and Neil met with graduate student Melissa Payer in early December on developing composites for the cutoff low cases and pursue development of conceptual models based on the tilt of the cutoff. Tom and Neil met with Melissa in late April to review the composites of cool season cutoff lows. The composites have resulted in development of various configurations of cutoff low organization. Her website with research results is located at http://www.atmos.albany.edu/student/mpayer/research.html.

Neil and Tom also helped Melissa identify cases to analyze. Tom provided Melissa with NWS data from the Burlington, Vermont office, including Public Information Statements, Winter Weather Statements, and Area Forecast Discussions to assist with the case review. Neil completed post mortems on several cases. Melissa will present a case study on one of these cases at the June Flash Flood Workshop in Scranton, PA. Neil's Post Mortem work is located at the following web-site: http://cstar.cestm.albany.edu/PostMortems/CSTARPostMortems/alypostmortemindex.html.

Pete Banacos and Paul Sisson of Burlington, Vermont are working on a potential NWA e-journal publication on the 1-4 January 2010 case that was presented at the Northeastern Storm Conference.

Most of the Collaborating and Associate projects have been completed with the remaining active projects covered in the separate document. These projects often have served as a testbed for future material for Major Foci projects, plus involve numerous local and nearby office NWS staff in operational research who otherwise would not be part of this endeavor.

The 11th Northeast Regional Operational Workshop (NROW) was held November 4-5, 2009 and attended by over 100 people. The fall CSTAR Meeting was held on November 6, 2009 and as previously noted the Spring CSTAR Meeting was held on May 7, 2010. All the current project results were presented at one or more of these meetings.

In the first year of the new NWS-UAlbany Internship full year format, the undergraduate students spent a full academic year at the WFO, and participated in both local research and CSTAR projects. This will be a significant leveraging of the CSTAR project to both expand the scale of the projects, increase NWS interactions with students and provide the students with involvement in CSTAR IV research.

SECTION 4: NWS Semi-Annual Reports

(a) CSTAR III Research (1 November 2009 – 30 April 2010)

Focal Point Leader(s): Neil A. Stuart

Thomas A. Wasula, NWS Albany, NY

Paul Sisson, NWS Burlington, VT

Pete Banacos, Burlington, VT

Dr. Lance Bosart, University at Albany

Dr. Daniel Keyser, University at Albany

Warren Snyder, NWS Albany, NY

Research Focus: Distribution of Warm Season/Cold Season precipitation associated with 500 hPa cutoff cyclones. It will include the development of conceptual models and forecast methodologies to delineate cutoffs which produce significant precipitation events and those that do not.

Project Activities and Work Done

- Neil and Tom presented talks related to warm and cool season cutoff lows at the 11th Northeast Regional Operational Workshop (NROW) 4-5 November 2009. Tom's talk focused on a case 29 June to 2 July 2009 applying the pattern recognition conceptual models from Matt's Scalora's warm season cutoff low work completed in August 2009. The 5 patterns with the cutoffs were: Neutral Tilt – Type A, Neutral Tilt Type B, Positive Tilt Type A, Positive Tilt Type B, and Negative Tilt. Tom showed an application of the Neutral Tilt –Type A conceptual model with the first few days of the case. Neil's talk focused on predictability issues with a pair of cool season cases that is similar to Melissa Payers work.

- Tom and Neil attended the 6 November 2009 CSTAR meeting. Melissa gave a condensed presentation on a comparison of two cool season cutoff low cases on 8-9 March 2008 and the 2-3 February 2009. It was a comprehensive comparative analysis of the two cases. The March case was: a fast-moving cutoff, had widespread precipitation, rapid cyclogenesis occurred over NY, dual jet streaks aloft were over the Northeast, anomalous moisture advected in with a low-level jet (precipitable water anomalies were 2 to 5 standard deviations above normal), and forecast issues arose due to the rapid cyclogenesis. The February 2009 case had: a cutoff stalled over the Great Lakes, precipitation confined to the coast, cyclogenesis occurred off the East Coast, dual jet streaks were off the East Coast, little moisture was present in the potential impact region (precipitable water anomalies less than 1 standard deviation above normal), and significant forecast issues arose due to phase and intensity errors.

- Tom and Neil have a copy of Matt's M.S. thesis entitled "Forecasting Distributions of Warm-Season Precipitation and Severe Weather Associated with 500-hPa Cutoff Cyclones". Tom and Neil are continuing to work on a potential publication and a teletraining session for later in 2010

pertaining to the CSTAR results. Currently, rough drafts are being created for both the powerpoint for the teletraining and the possible publication.

- Tom and Neil attended a meeting with Melissa in early December to discuss making composites for the cutoff low days in the 5 cool seasons starting from 2004-05. It was decided to make composites and conceptual models similar to Matt's warm season cutoff work (analyzing the strength and orientation of the lower and upper level jet (u and v wind anomalies), precipitable water anomalies, and the location of the area of heaviest precipitation). The goal would be to have conceptual models based on the tilt of the cutoff.

- Tom and Neil participated in an April 23, 2010 meeting with Melissa to review her composites on the cool season cutoff lows. She has come up with a definition for Heavy Precipitation Cutoff Cyclones Day (> 25 mm in 1% of the domain), Low Precipitation Cutoff Days (< 25mm in 1% of the domain), and No Precipitation Cutoff Days. The Heavy Precipitation and Low Precipitation Cutoffs were divided in Negative, Neutral, and Positive Tilt conceptual models for pure cutoffs, and closed lows within longwave troughs. Her website with research results is located at http://www.atmos.albany.edu/student/mpayer/research.html.

- Neil and Tom also helped Melissa identify 3-4 cases to analyze. She showed the 1-4 January 2010 cool cutoff season case at the 5-7 March 2010 Northeastern Storm Conference. Tom provided Melissa with website information from Burlington, Public Information Statements, Winter Weather Statements, and Area Forecast Discussions to assist with the case review. Neil did a Post Mortem on this case. He also has done a Post Mortem analysis on the 13-15 March 2010 case. Melissa will show this case at the June Flash Flood Workshop in Scranton, PA. Neil's Post Mortem work is located at the following web-site: http://cstar.cestm.albany.edu/PostMortems/CSTARPostMortems/alypostmortemindex.html.

- Pete Banacos and Paul Sisson attended the 6 November 2009 Fall CSTAR meeting. Paul and Pete are working on a potential NWA e-journal publication on the 1-4 January 2010 case that he showed at the Northeastern Storm Conference.

II. Presentations on CSTAR III Related Research (OCT 2009 – APR 2010)

Payer, M., L.F. Bosart, D. Keyser, N.A. Stuart and T.A. Wasula, 2010. Analysis of the Precipitation Distribution Associated with the 1-4 January 2010 500 hPa Cutoff Cyclone. 35th Northeast Storms Conference, Saratoga Springs, NY, March 5-7, 2010.

Payer, M., L.F. Bosart, D. Keyser, N.A. Stuart, T.A. Wasula, 2010. Analysis of the Precipitation Distributions Associated with Two Cool-Season Cutoff Cyclone. 35th Northeast Storms Conference, Saratoga Springs, NY, March 5-7, 2010.

Sisson, P.A., P. Banacos, B. Taber, 2010. Champlain Powder: The Historic Burlington Vermont Snowfall of 2-3 January 2010, 35th Northeast Storms Conference, Saratoga Springs, NY, March 5-7, 2010.

Stuart, N.A., 2010. Evaluating Predictability and Communicating Uncertainty with Winter Storms, 35th Northeast Storms Conference, Saratoga Springs, NY, March 5-7, 2010.

Stuart, N.A., 2009. Lessons in Predictability: The Post Groundhog Day 2009 Storm and the March 2009 "Megastorm", 11th Northeast Operational Workshop, Albany, NY, November 4-5, 2009.

Wasula, T.A., 2009. An Application of a Cutoff Low Forecaster Pattern Recognition Model to the 30 June -2 July 2009 Significant Event for the Northeast, 11th Northeast Operational Workshop, Albany, NY, November 4-5, 2009.

Wasula, T.A., N.A. Stuart, 2009. Complex Forecast Issues with the Elevation Snowstorm of 28 October 2008 in the Northeastern US, 34th National Weather Association Meeting, Norfolk, VA, October 18-22, 2009.

(b) **Semi-annual Report**

CSTAR III Research (1 November 2009 – 30 April 2010)

Focal Point Leader: John S. Quinlan, NWS Albany, NY

NWS Contributor: Tom Wasula, NWS Albany, NY

NWS Contributor: Hugh Johnson, NWS Albany, NY

NWS Contributor: Kevin Lipton, NWS Albany, NY

Dr. Lance Bosart, University at Albany

Dr. Daniel Keyser, University at Albany

Warren Snyder, NWS Albany, NY

Research Focus: High Wind/Winter Severe Convective Events - Identify the structure of and environments in which high wind events occur. These events have occurred with and without embedded convection and also have resulted from channeled wind flow. Some of the more recent and more memorable events include: February 17, 2006, January 17 & 21, 2006, September 9, 2005, February 22, 1997, February 24-25, 1996, November 12-13, 1992, November 20, 1989, December 28, 1988 and November 25, 1950. These and many other high wind events have produced widespread damage and power outages and sometimes have embedded convection which results in localized enhancement of the winds producing more concentrated damage.

I. Project Activities and Work Done

- John, Tom, Hugh and Kevin attended the annual Fall CSTAR meeting, which was held on November 6, 2009. Jonas Asuma gave a presentation on "Cool-Season Severe Weather and High Winds in the Northeast U.S." One of the major outcomes of the meeting was to stratify the cases into quadrants base on the location of the initial damage report relative to the location of the surface cyclone. Jonas was thus able to create four quadrants (NE, SE, SW and NW) for the Pure Gradient (PG) and Hybrid (HY) cases.

- While it was difficult to meet during the winter months due to frequent storms, rotating shifts, numerous leadership courses and winter break; John, Tom and Kevin were able to meet with Jonas just before the start of the Northeast Storm Conference on March 5, 2010. During that meeting Tom was able to provide Jonas with water vapor, visible and radar loops of the February 17, 2006 High Wind Event. John also met with Jonas on March 24, 2010 to discuss how best to handle lightning data and to discuss having SUNY Albany Internship Student Katherine Linnenbach look at either the lightning data for all cases or work on a case study. After much discussion it was decided that it would be best for Kate to work with Jonas on one of the case studies. As for the lightning data it was decided that any cases which had lightning strikes within 1 degree radius and 1 hour of

any pure gradient wind report would be changed to a hybrid case.

- Jonas gave an oral presentation at the Eleventh Northeast Regional Operational Workshop and the 35th Annual Northeastern Storm Conference on 5-7 March 2010 in Saratoga Springs, NY. The title of the presentations was "Cool-Season High Wind Events in the Northeast."

- The project is now in the final stages and some of the results seem as though they hold great promise especially on the technology transfer end of getting the research into operations. Conceptual models have been created for each of the four quadrants with greatest number of HY cases falling within the southeast quadrant. Some of the key parameters that have been identified during this study include: strong isallobaric couplets, decent of dry intrusion coupled with steep lapse rates resulting in strong subsidence in the wake of cold frontal passage, the existence of a theta-e minimum in the low to mid levels of the atmosphere as well as potential vorticity descending through the atmosphere. Most of the research that has been completed on this project to date can be found at Jonas Asuma's web page: http://www.atmos.albany.edu/student/jasuma/

(c) Semi-annual Report

CSTAR III Research on Southerly Mohawk Cases (SMHC)

1 November 2009 – 30 April 2010

Compled by: Hugh Johnson and Kimberly Sutkevich, NWS Albany, NY

During the past 6 months we have established a variety of dates to examine possible cases from 2004 to the present. We picked cases where "thunder" was observed at the airport. There are probably many other days where possible SMHC ensued, in absence of thunder reported at the airport.

We considered a possible SMHC when a cell or a cluster of cells (30 DBZ) develops in Hudson Valley south of Glens Falls, and north of Poughkeepsie, well ahead of the main forcing feature (i.e. cold front, warm front, or even outflow boundary).

VERY preliminary findings indicate that the possibility of SMHC increases if there is large SBCAPE in the Hudson Valley (over 500 J/KG)…combined with relatively weak winds (under 50kts through the H850 level) and a jet max well to the north of the region. In addition, a south to southeast surface wind exits in the Hudson Valley, while a southwest to west wind is found over the Mohawk Valley and Catskills. In these cases, cells can develop well ahead of the main forcing feature, or become "enhanced" as they move into the Hudson Valley. By enhanced we mean increasing substantially (by more than 10 DBZ) and possibly become a strong to severe thunderstorm (or even super cell).

When the wind between the boundary layer through the H850 MB level were stronger (closer or more than 50kts) and or the upper level jet was further south, much closer to the Mohawk/Hudson apex region, early indications are that SMHC might not take place in these cases, even during times of high SBCAPE, southerly winds in the Hudson Valley and southwest winds to the west of the Hudson Valley.

Again, this is the result of VERY preliminary results involving just a handful of cases. A lot more events need to be examined. We created an excel spreadsheet that included parameters like the surface wind/925 MB wind/H850 wind/ and 250 MB winds. In addition we included SBCAPEs in the Hudson Valley.

The impacts of SMHC are important to the Albany International Airport, since many of these thunderstorms form in the vicinity of the airport, which could significantly impact oncoming flights or departing ones. Also, we might be able to determine if these key ingredients could intensify an existing storm. If certain parameters can be quantified well enough, it might be possible for forecasters to identify possible SMHC conditions. Eventually a decision tree would be developed that would be very beneficial in making a decision whether or not SMHC would ensue.

I wished we had examined more cases, but both Kim and myself are involved in many other office projects. We could definitely utilize a SUNY student at this time to assist us in this endeavor.

(d) Semi-annual Report

CSTAR III Six Month Report from Michael L. Jurewicz, Sr. (NWS/NOAA, Binghamton, NY)

1 November, 2009 to 30 April, 2010

Major Foci Project – Landfalling and Transitioning Tropical Cyclones, understanding the relationships between heavy precipitation and coastal/inland flooding.

My main area of contribution within this project for the last several years has involved the study of Predecessor Rainfall Events (PRE).

Part A – Accomplishments

For this six month time frame, Ben Moore (SUNY Albany graduate student) has worked diligently to both expand the climatology of this phenomenon, and also to further categorize patterns favorable for their formation.

Ben lengthened the climatology of PRE from 10 years (1998-2008) to 20 years (1988-2008). For each individual PRE in the database, many statistics were tabulated, including rainfall totals, dates/times of initiation, maturity, and dissipation, and positions relative to their parent tropical cyclones (TC), among many other parameters.

Building on the initial work of Matt Cote, Ben also further stratified PRE, especially with regards to the upper-tropospheric patterns they tend to develop within (Jet in Ridge, Southwesterly Jet, Downstream Confluence, and Miscellaneous Categories). For each of these categories, both TC-relative and PRE-relative composites were developed.

Part B – NWS/UAlbany Interactions

Ben, myself, Lance Bosart, Dan Keyser, and Mike Evans collaborate regularly on the latest state of our research, areas to focus on, and upcoming workshops/conferences.

Part C – Successes

This project has "hit the ground running," with numerous publications, webinars, and conference presentations already to its credit, since this research began in CSTAR II. During this six month period, the cumulative work of Matt Cote, Ben Moore, Lance Bosart, Dan Keyser, myself, and others helped lay the groundwork for the acceptance of a forthcoming Monthly Weather Review article entitled "Predecessor Rain Events Ahead of Tropical Cyclones" (Galarneau et al. 2010).

Part D – Publications and Workshop Submissions

- November, 2009 – NROW (3 presentations by Moore, Jurewicz, and Bosart)
- Also November, 2009 (acceptance of eventual MWR article for sometime in 2010 by Galarneau, et al)
- March, 2010 - NESC (presentation by Moore)

(e) Status of "Snyder Proposal" Projects

Department of Commerce
NOAA, National Weather Service
251 Fuller Rd. Suite B-300
Albany, NY 12203-3640

May 11, 2010

MEMORANDUM FOR: Lance F. Bosart

FROM: Warren R. Snyder
SOO, WFO, Albany, NY
(w/Input from Project Focal Points)

SUBJECT: Status of Collaborative and Associate Projects in CSTAR III

I. Collaborating Projects

a. Regional WRF/WRF Ensemble

i. New-

1. The WRF package at WFO Albany was at last upgraded to full version 3.1 This version continues to result in some setbacks, mainly lack of BUFKIT data, removal of the Maine web graphics and limitations on the ability to distribute the CPU load across a cluster. Workarounds to the CPU issue were developed which has resulted in reduction to 2 runs per day. In addition there are many new physics and configuration options in ver 3.1 that while likely improving the output have slowed model run times.
2. During the late Spring an early Summer of 2010 a reconfiguration of the WRF runs is being considered. This may result in a domain, physics, and run time changes. This has been avoided in the past to minimize the impacts on the numerous WFOs and CWSU's that utilize the data in real-time, but in preparation for CSTAR IV, and as a result of both RIT system changes, and the model's functional features, is needed.

ii. Ongoing –

1. The SOO/STRC WRF is being run on the UAlbany Research IT Unix System with a 15 km resolution outer domain which covers much of the Eastern United States and Southeastern Canada, and a 5km inner nest that covers the area bounded by Indiana to New Hampshire, and from Northern New York to Maryland, with a separate nest over Maine.
2. This data is posted on the web, distributed via the Eastern Region LAN to the CAR, GYX and OKX NWS offices, and is posted in AWIPS and GFE at WFO Albany.
3. The Data is used both in research and in support of operations. The Maine data fed to the Grey and Caribou offices is being used in GFE and in a Maine

ensemble. .

4. WRF Runs are provided as available (usually twice a day) for CWSU's Oberlin and Nashua.
5. Model runs are also available to DEAS in real time

iii. Focal Points – Warren Snyder (ALY), Mike Evans (BGM),

1. PI – David Knight
2. NWS Contributors – Robert LaPlante (CLE), Paul Sisson (BTV), Mark McKinley (ZOB), Scott Reynolds (ZBW), Nelson Vaz (OKX), Robert Rozumolski (STRC), Jeff Tongue (OKX), Christopher Mello (CLE)

b. Hydrometeorological Ingredients Which Enhance Widespread Harmful Algae Blooms (HAB) in the Gulf of Maine and Massachusetts Bay Watersheds

i. This project has been completed, and was included in a prior report. Project Participants

1. Focal Point– Dave Valle (NERFC)
2. Team - Alison Gillis (NERFC), Joseph Dellicarpini (BOX)

c. Discrimination between Marginal Severe Convective Weather (excluding Pulse storms), and No Warning Decision events

i. This project has been discontinued due to the passing of the project organizer and lead. The work was largely to be done in his office and had not gone beyond basic organizing of the project at the time of his passing.

ii. Project Participants

1. Lead - John DiStefano (ILN-SOO) (Deceased)
2. Team - Allen Randall (ILN), Stephen Hrebenach (ILN), Daniel Hawblitzel (ILN), Neil Stuart (ALY)

d. Correlations between Observed Snowfall and NAM Model Parameters

i. This project has been completed, and was included in a prior report.

ii. Project Particpants

1. Team – Mike Jurewicz (BGM) & Mike Evans (BGM)
2. PIs – Lance Bosart, Dan Keyser

e. Northeast Convective Flash Flood Events

i. Continued to work with University of Albany student Derek Mallia in compiling more cases to complete a comprehensive and detailed Flash Flood database for convective flash flood events that occurred in the Albany forecast area during the warm seasons of 2003-2009. Since October 2009, almost 20 more cases have been investigated from the 2003-2005 time-frame. Overall, 39 convective flash flood events have been analyzed with full documentation, including a spreadsheet with various computed parameters. In recent months, focus has shifted to also include determining differences between days with isolated vs. widespread flash flooding.

ii. Preliminary results and a case study were presented at the Northeast Regional Operational Workshop in Albany, NY in November 2009. Additional presentations with updated results are planned for the upcoming Eastern Region Flash Flood Workshop in Scranton, PA in June 2010

iii. In the near future, a flash flood checklist will be developed from the results of this research to help operational forecasters at the Albany National Weather Service office to better forecast the potential for flash flooding and anticipating when flash flooding might

be isolated vs. widespread.

iv. This project has been upgraded in the recently approved CSTAR IV Project and will become a major focus project.

v. Project Participants

1. Lead – Joe Villani (ALY)
2. Team – Alan Cope (PHI), Mike Evans and Mike Jurewicz (BGM)

f. Northern New England Inverted Coastal Trough - (NORLUND Trough

i. This project has been completed, and was included in a prior report.

ii. Project Participants

a. Team – Dan St. Jean (GYX), John Cannon (GYX), Mike Fitzsimmons (CAR), Todd Lericos (CAR)

II. Associate Projects

a. Integration of Research Into Operations - Capitalize on scientific and technological advances that result from CSTAR research.

i. CSTAR webpage maintenance items included adding thesis material and articulate presentations.

ii. Plans are in progress to produce articulate presentations for the three just completed CSTAR III Projects.

iii. WFO Albany Senior Forecaster Neil Stuart creates post mortem pages based on past

events related to CSTAR projects.

iv. Project Participants

a. Lead – Vasil Koleci (ALY)
b. Team - Josh Korotky (PIT), Warren Snyder (ALY) Tom Wasula (ALY), Michael Jurewicz (BGM), Mike Evans (BGM), Justin Arnott (BGM)

b. Upslope Localized Snow Events (Albany Convergence Zone) Study these events and attempt to develop methods to better forecast them.

i. This project was completed on cold season cases by the collaborator, Micheal Augustyniak, with his MS Thesis, with several case studies presented by NWS participants. One of the outcomes of this work was an operationally useful decision tree for forecasting the MHC events.

ii. Hugh W. Johnson will continue this work in CSTAR IV, investigating "null", hybrid, warm, and southerly MHC flow cases. Kim Sutekvich has joined the project. The project will attempt to develop operationally useful conceptual models or forecasting guidelines.

iii. Project Participants

a. Leads – Hugh W. Johnson IV (ALY), Kim Sutkevich (ALY)

c. ***Developing Probabilistic Forecasts using Ensembles, and placing the data on the Web***

i. This project was completed***.***

ii. Project Participants

1. Team - Josh Korotky (PIT) and Richard Grumm (CTP)

d. Transition of ensembles of mesoscale models to operational forecasting - Explore use of multiple runs of mesoscale models and their utility to forecasting. Working with SUNY at Stonybrook

i. This project has been completed, and was included in a prior report.

ii. Project Participants

1. Lead - Jeff Tongue (OKX)
2. Participants – Nelson Vaz (OKX)

e. An Investigation by Multiple Doppler Radars of Sea Breeze Circulations in and Around the New York Bight.

i. This project has been completed, and was included in a prior report.

ii. Project Participants

1. Lead – Jeff Tongue (OKX)

SECTION 5: Computer and Technology Transfer Issues (David Knight)

Computing infrastructure continues to play an important part in this collaborative effort. Students are exposed to NWS facilities and software, and NWS staff have access to capabilities not available in the local office. Both groups benefit from this interaction and sharing of facilities. Several Sun workstations and PCs are available for use by CSTAR participants. Approximately 230 GB of disk space on the UAlbany Department of Atmospheric and Environmental Sciences (DAES) Sun servers is dedicated to storing CSTAR related data and software. This disk space is available on all DAES workstations and provides a central location where both UAlbany and NWS personnel can store, process, and exchange large datasets. Each CSTAR student has a PC or Mac laptop, which enables them to take familiar computers with them when visiting NWS staff, and provides them ready access to the DAES UNIX machines. Email lists created on the DAES computers at the beginning of the project continue to be important conduits for exchange of scientific ideas, results, and information between CSTAR participants. There are email lists for all the CSTAR participants, as well as focused lists for those involved in specific projects. WFO Albany staff took the lead in maintaining content for the CSTAR webpage at http://cstar.cestm.albany.edu. The web page provides an additional means for exchanging information and ideas. The DAES web server (http://www.atmos.albany.edu) and ftp server (ftp://ftp.atmos.albany.edu) are being used to facilitate exchange of large datasets between CSTAR collaborators. The DAES computing resources that are available for CSTAR related research include a Sun server (with 8 CPUs and 16GB RAM and a large (20 TB usable space) disk storage array. While these machines were not bought specifically for CSTAR use, they nonetheless directly benefit the CSTAR research by providing much faster servers for computation and storage space for commonly used datasets.

In addition to DAES and NWS computing facilities, the formal CSTAR collaborative effort has allowed access to University Research Information Technology (RIT) services. In particular, Warren Snyder (SOO WFO Albany) is using the RIT 96 CPU Linux cluster for Weather Research and Forecasting (WRF) model simulations. This computing facility allows him to perform computations not possible at the local office. The facility will be used to generate additional members for the collaborative ensemble, and to generate higher resolution runs for research purposes. So far this facility has been made available at no cost to the CSTAR project.

SECTION 6: Selected Documentation of CSTAR Project Activities:

From keyser@atmos.albany.edu Tue Nov 24 15:58:57 2009
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=1.0 required=8.0 tests=AWL,UPPERCASE_75_100
autolearn=no version=3.2.5
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id nAOFwuj12628;
Tue, 24 Nov 2009 15:58:56 GMT
Received: (from keyser@localhost)
by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id nAOFwuK26626;
Tue, 24 Nov 2009 15:58:56 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200911241558.nAOFwuK26626@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Tues. 11/24/09
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Tue, 24 Nov 2009 15:58:56 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Tuesday 24 November 2009

Barbara,

For possible incorporation into the next six-month CSTAR report.

CSTAR research on cool-season cutoff lows is mentioned in the first and second paragraphs of the long-term section of this morning's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 241132
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
633 AM EST TUE NOV 24 2009

.SYNOPSIS...
WEAK HIGH PRESSURE WILL BUILD IN FROM EASTERN CANADA
TODAY...POSSIBLY BRINGING SOME BREAKS OF SUNSHINE FOR THE AFTERNOON.
THIS HIGH PRESSURE WILL HOLD INTO WEDNESDAY BEFORE DRIFTING OFFSHORE
BY THANKSGIVING. A FEW DISTURBANCES WILL SPREAD SOME CLOUDS OUR WAY
WITH ONLY MINIMAL CHANCES OF RAIN SHOWERS.

&&

.LONG TERM /THURSDAY NIGHT THROUGH MONDAY/...

...CONSIDERABLE UNCERTAINTY REMAINS WITH DEVELOPING NOR-EASTER...

UNLIKE THIS TIME YESTERDAY...THE GFS AND ASSOCIATED INTERNATIONAL

GLOBAL MODELS HAVE DIVERGED ONCE AGAIN. THE GFS AND RELATED ENSEMBLE DATA ARE IN A CLOSE CLUSTER WITH LOW STANDARD DEVIATIONS ALOFT AND AT THE SURFACE WHICH FAVORS AN IMPRESSIVE NOR-EASTER FOR THE REGION. HOWEVER...THE GGEM/ECMWF AND EVEN THE 18Z/23 DGEX POINT TOWARD A FURTHER OFFSHORE SURFACE CYCLONE WITH THE MAIN IMPACT FOR
THE REGION FROM THE UPPER LOW. BASED ON CLOSE COLLABORATION WITH NEIGHBORING OFFICES AND HPC...WE WILL FAVOR THE 00Z ECMWF AT THE SURFACE AND BLEND THE 500MB FIELDS WHICH POINTS US TOWARD ANOTHER SCENARIO. BASED ON CSTAR RESEARCH OF COOL SEASON CUTOFF UPPER LOWS...WE WILL HAVE TO MONITOR THE HIGHER TERRAIN AS THESE SYSTEMS CAN PRODUCE A BIT MORE QPF WHICH SEEMS TO MAXIMIZE DURING THIS MONTH.

WITH THE FURTHER OFFSHORE SURFACE WAVE...UPPER LOW SHOULD BECOME THE
MORE DOMINANT PLAYER HEADING INTO FRIDAY AND HAVE ADJUST POPS DOWNWARD INTO THE LIKELY RANGE TO AVOID A LARGE SWING FROM THE PREVIOUS FORECAST. BASED ON THE AFOREMENTIONED CSTAR RESEARCH...WILL GO TOWARD THE HIGHER END OF LIKELY WITH REGARD TO POPS AND RAISE THE QPF ROUGHLY A TENTH OF AN INCH PER 1K FEET. THE QUESTION NEXT BECOMES THE THERMAL PROFILE AS COLD ADVECTION IS EXPECTED TO PURSUE THROUGH THE DAY. THIS IS EXPECTED TO BE AN ELEVATION DEPENDENT RAIN/SNOW LINE AS WE HAVE ATTEMPTED TO REFLECT THIS NOTION IN THE GRIDS/FORECAST THROUGH FRIDAY. EVENTUALLY...THE COLDER AIR WILL PENETRATE THE ENTIRE COLUMN FRIDAY NIGHT WITH MOST PRECIP IN THE FROZEN VARIETY. WE WILL CONTINUE TO MONITOR THE POTENTIAL FOR A DEFORMATION AXIS AS THE UPPER LOW SLOWLY LIFTS NORTHEAST OVERNIGHT.

THE NEXT CONCERN WILL BE WINDS FRIDAY NIGHT INTO SATURDAY AS 30-50KT WINDS AT 925MB AND 850MB RESPECTFULLY ARE EXPECTED WITH TIGHT SURFACE PRESSURE GRADIENT AS DEEP SURFACE LOW OVER THE CANADIAN

MARITIMES. COINCIDING WITH THE COLD ADVECTION THIS MAY JUSTIFY THE POTENTIAL FOR ADDITIONAL HEADLINES WITH RESPECT TO THE WIND.

THESE HAZARDS WILL BE ADDRESSED IN THE HWO THIS MORNING.

QUIETER WEATHER EXPECTED FOR THE SECOND HALF OF THE WEEKEND AS SUBSIDENCE UNFOLDS WITH ASSOCIATED HEIGHT AND SURFACE PRESSURE RISES. A LIGHT OVERRUNNING EVENT...PER THE ECMWF...MAY BRING A LIGHT WINTRY MIX TO THE REGION OVERNIGHT SUNDAY INTO MONDAY. CONFIDENCE IN THIS SCENARIO IS QUITE LOW AND WILL ONLY PLACE 20 POPS AT THIS TIME.

TEMPERATURES THROUGH THE PERIOD WERE A BLEND OF HPC AND ECMWF.

&&
$$

SYNOPSIS...HWJIV
LONG TERM...BGM

From keyser@atmos.albany.edu Wed Nov 25 15:15:06 2009
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on

cypress.atmos.albany.edu
X-Spam-Level: *
X-Spam-Status: No, score=1.2 required=8.0 tests=AWL,UPPERCASE_75_100
autolearn=no version=3.2.5
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id nAPFF6j06680;
Wed, 25 Nov 2009 15:15:06 GMT
Received: (from keyser@localhost)
by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id nAPFF6V26870;
Wed, 25 Nov 2009 15:15:06 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200911251515.nAPFF6V26870@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Wed. 11/25/09
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Wed, 25 Nov 2009 15:15:06 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Wednesday 25 November 2009

Barbara,

For possible incorporation into the next six-month CSTAR report.

CSTAR research on cool-season cutoff lows is mentioned in the ninth
paragraph (starting with "FOR THE ABOVE REASONS") of the short-term
section of this morning's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 251119
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
620 AM EST WED NOV 25 2009

.SYNOPSIS...
WEAK HIGH PRESSURE WILL DRIFT TO THE GULF OF MAINE TODAY WHILE A VERY WEAK DISTURBANCE BRINGS A FEW VERY LIGHT SHOWERS TO SOME SPOTS
BY AFTERNOON. OUR REGION WILL BE BETWEEN TWO STORM SYSTEMS ON THANKSGIVING DAY WHICH WILL YIELD A DRY MILD DAY. AN STRONG UPPER LEVEL STORM SYSTEM WILL ACROSS THE REGION ON FRIDAY BRINGING UNSETTLED WEATHER.

&&

.SHORT TERM /6 PM THIS EVENING THROUGH FRIDAY NIGHT/...
THE REASON THE OHIO STORM WILL MAINLY MISS US (EXCEPT FOR THE VORTICITY PIECE) IS BECAUSE ANOTHER SYSTEM WAS DIVING SOUTH FROM MANITOBA CANADA. THIS SYSTEM IS FORCING THE FIRST ONE TO EJECT NORTHWARD INTO ONTARIO. THIS SECOND SYSTEM IS THE ONE THAT WILL LIKELY IMPACT OUR REGION ON FRIDAY. HOWEVER...BEFORE THEN...OUR AREA WILL BE SANDWICHED BETWEEN A DEVELOPING OCEAN STORM WELL TO OUR EAST...AND THE IMPENDING UPPER AIR LOW SYSTEM TO OUR WEST ON THANKSGIVING DAY.

THE AFOREMENTIONED WEAK DISTURBANCE MIGHT STILL BRING A SHOWER OR

TWO THIS EVENING BEFORE LIFTING TO OUR NORTHEAST OVERNIGHT. BEHIND IT...WITH NO REAL HIGH PRESSURE IN PLACE...CLOUDS COULD BE SLOW TO BREAK UP (IF AT ALL). WITH DRYING IN THE MID LEVELS BUT MOISTURE POSSIBLY INCREASING IN THE LOWER LEVELS...A LITTLE PATCHY DRIZZLE MIGHT ENSUE OVERNIGHT TONIGHT.

THEN ON THANKSGIVING DAY...THE BIGGEST CHALLENGE WILL BE PREDICTING THE SKY COVER. OTHERWISE...IT SHOULD BE A DRY DAY. OUR THINKING IS THE DAY WILL START OFF CLOUDY (OR MOSTLY CLOUDY) WITH SOME MIDDAY BREAKS BEFORE CLOUDS REDEVELOP AGAIN LATE IN THE DAY. THROUGH IT ALL...WE WILL ENJOY ONE MORE MILD DAY AS H850 TEMPERATURES REMAIN IN THE 1C-3C WITH AN OPPORTUNITY FOR LITTLE MORE MIXING COMPARED TO PREVIOUS DAYS. EVEN WITH MORE CLOUDS THAN SUNSHINE...TEMPERATURES WILL GENERALLY TOP OUT IN THE 50-55 RANGE...EXCEPT 45-50 IN MOUNTAIN AREAS. THESE VALUES ARE A GOOD 5-7 DEGS ABOVE SEASONAL AVERAGES. IT LOOKS AS IF NO THANKSGIVING WEATHER RECORDS WILL BE THREATEN IN THE ALBANY (RAINFALL/SNOWFALL/TEMPERATURES ETC.). IT WILL BE CONSIDERABLY MILDER THAN LAST YEAR WHEN THE HIGH WAS ONLY 43 DEGREES
IN ALBANY.

BY THANKSGIVING NIGHT...THE NEW UPPER AIR LOW WILL BE APPROACHING WESTERN NEW YORK STATE. AT THE SAME TIME...THE DEVELOPING COASTAL STORM...A SPIN OFF FROM THE SOUTHERN SUBTROPICAL JET WILL BE TO OUR EAST. THE HUGE WEATHER PROBLEM IS WHETHER OR NOT ENERGY FROM THE OCEAN STORM WILL PHASE WITH THE ENERGY FROM THE NORTHERN BRANCH (UPPER AIR LOW). IF IT WERE...A SIGNIFICANT PRE WINTER STORM WOULD ENSUE. HOWEVER...THE SIGNALS ARE NOT CLEAR THAT A FULL PHASING WILL HAPPEN.

THE GFS/EUROPEAN/CANADIAN MODELS SUGGEST THAT A FULL PHASING WILL NOT OCCUR...UNTIL BOTH SYSTEM ARE NORTH AND EAST OF OUR REGION. THAT IS NOT TO SAY WE WILL ESCAPE PRECIPITATION. THERE IS A LOT OF

MOISTURE WITH THE SOUTHERN STORM NOTED ON THE WATER VAPOR LOOP. IT DOES APPEARS THAT SOME OF THIS MOISTURE WILL BE EJECTED INTO THE UPPER LEVEL SYSTEM...WITH OR WITHOUT THE SURFACE STORM.

THE NAM CONTINUES TO MORE OF AN OUTLIER...SUGGESTING MOISTURE WILL BE VERY LIMIT WITH THE UPPER AIR LOW...AS THE SURFACE LOW IS EVEN A LITTLE FURTHER AWAY FROM THE UPPER AIR STORM.

THEE IS STILL A BIT SPREAD OF THE SURFACE TRACK ON THE GFS ENSEMBLES.

BOTTOM LINE...A LOT UNCERTAINTY STILL CONTINUES WITH THE EVOLUTION OF THIS UPCOMING STORM. THE FIRST OHIO VALLEY STORM...THE ONE THAT WILL GET EJECTED NORTHWARD...MIGHT HAVE ENOUGH PUSH TO DISPLACE THE
BAROCLINIC ZONE FURTHER SOUTH AND EAST WHICH WOULD FORCE THE COASTAL
STORM TO STAY FURTHER TO OUR EAST. THUS FAR...THIS BAROCLINIC ZONE IS NOT IMPRESSIVE...BUT WILL BECOME MORE SO BY THURSDAY NIGHT.

FOR THE ABOVE REASONS...WILL CONTINUE WITH LIKELY POPS LATE THANKSGIVING NIGHT AND FRIDAY (AS OPPOSED TO CATEGORICAL). MOST MODELS ARE PICKING UP ON SOME ELEVATION DIFFERENCE IN QPF...WHICH SEEMS VERY REASONABLE GIVEN PAST CSTAR RESEARCH ON THE MATTER OF COLD CUTOFF LOWS. THE STUDIES HAVE INDICATE HIGHER TERRAIN COULD RECEIVE UP TO SEVERAL TIMES MORE PRECIPITATION THAN THE VALLEY AREAS.

THE 00Z EUROPEAN DEVELOPS A DEFORMATION ZONE TO THE EAST OF THE HUDSON VALLEY WHILE THE 00Z GFS DEVELOPED IT TO THE WEST. EITHER WAY...IT WILL TAKE MORE TO DETERMINE WHERE ANY PRECIPITATION MAXIMA WOULD TAKE PLACE.

PRECIPITATION IS LIKELY TO OVERSPREAD THE REGION LATE THURSDAY NIGHT INTO FRIDAY. INITIALLY THE AIR LOOKS WARM ENOUGH FOR ALL RAIN...EVEN IN THE MOUNTAINS. HOWEVER...WITH TIME...THE COLUMN WILL COOL ENOUGH FOR A CHANGEOVER TO SNOW ACROSS THE HIGHER TERRAIN. IT MIGHT TAKE MOST OF THE DAY FRIDAY FOR THIS TO HAPPEN. HOWEVER...IF PRECIPITATION AMOUNTS ARE HEAVIER THAN WHAT WE ARE CURRENTLY FORECASTING...COOLING FROM MELTING SNOWFLAKES COULD COOL THE COLUMN
DOWN MUCH FASTER. RIGHT THOUGH...THE PROBABILITY OF A 24-HR ONE INCH PRECIPITATION AMOUNTS LOOKED SMALL ON THE 00Z MREFS AND EVEN SMALLER
ON THE SREFS.

OVERNIGHT LOW TEMPERATURES THANKSGIVING NIGHT LOOKS TO BE IN 30S BUT ABOVE FREEZING. THEN...THEY PROBABLY WILL NOT RISE MUCH ON FRIDAY...AND IN SOME CASES MIGHT ACTUALLY FALL...AS THE WIND TURNS NORTH TO NORTHWESTERLY AND THE H850 TEMPERATURE COOL BELOW 0C...WHILE H925 TEMPERATURES APPROACH ZERO IN THE MOUNTAINS.

LEFT-OVER "WRAP AROUND" MAINLY UPSLOPE PRECIPITATION LOOKS TO LINGER
INTO FRIDAY NIGHT. BY THIS TIME...TEMPERATURES WILL DROP AROUND THE FREEZING MARK IN VALLEY LOCATIONS....20S OVER THE MOUNTAINS. THERE IS A POTENTIAL FOR DUSTING OF SNOW EVEN IN VALLEY LOCATIONS...AND PERHAPS SEVERAL INCHES OVER THE HIGHER TERRAIN. THE OCEAN STORM SHOULD BE A FULL BLOWN NOR'EASTER BY FRIDAY NIGHT...SITTING OVER THE GULF OF MAINE. AS IT BEGINS TO PULL AWAY...A GUSTY NORTHWEST WIND WILL KICK IN. MORE ABOUT THAT WILL FOLLOW IN THE LONG TERM DISCUSSION.

&&
$$

SYNOPSIS...HWJIV

SHORT TERM...HWJIV

From keyser@ginkgo.atmos.albany.edu Thu Nov 26 14:26:32 2009

Return-Path: <keyser@ginkgo.atmos.albany.edu>

X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
cypress.atmos.albany.edu

X-Spam-Level: *

X-Spam-Status: No, score=1.4 required=8.0 tests=AWL,UPPERCASE_75_100
autolearn=no version=3.2.5

Received: from ginkgo.atmos.albany.edu (ginkgo [169.226.43.50])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id nAQEQQj19407;
Thu, 26 Nov 2009 14:26:26 GMT

Received: from ginkgo.atmos.albany.edu (localhost [127.0.0.1])
by ginkgo.atmos.albany.edu (8.13.8+Sun/8.13.8) with ESMTP id nAQEQQxn000303;
Thu, 26 Nov 2009 14:26:26 GMT

Received: (from keyser@localhost)
by ginkgo.atmos.albany.edu (8.13.8+Sun/8.13.8/Submit) id nAQEQQ9m000301;
Thu, 26 Nov 2009 14:26:26 GMT

From: Dan Keyser <keyser@atmos.albany.edu>

Message-Id: <200911261426.nAQEQQ9m000301@ginkgo.atmos.albany.edu>

Subject: Input for next CSTAR 6-month report: Th. 11/26/09

To: BZampella@uamail.albany.edu (Barbara Zampella)

Date: Thu, 26 Nov 2009 14:26:26 +0000 (GMT)

Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu

X-Mailer: ELM [version 2.4ME+ PL39 (25)]

MIME-Version: 1.0

Content-Type: text/plain; charset=US-ASCII

Content-Transfer-Encoding: 7bit

Status: RO

Thursday 26 November 2009

Barbara,

For possible incorporation into the next six-month CSTAR report.

CSTAR research on cool-season high wind events over the Northeast
is mentioned in the fourth paragraph of the short-term section of
this morning's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 261129
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
630 AM EST THU NOV 26 2009

.SYNOPSIS...
A WEAK AREA OF HIGH PRESSURE WILL BE OVER OUR REGION TODAY
WITH RELATIVELY MILD...CLOUDY...AND DRY CONDITIONS. A COMPLEX STORM
SYSTEM WILL IMPACT THE NORTHEAST TONIGHT INTO SATURDAY WITH
UNSETTLED WEATHER INCLUDING RAIN...AND SNOW...ESPECIALLY ACROSS THE
HIGHER ELEVATIONS...AND BLUSTERY WINDS.

&&

.SHORT TERM /6 PM THIS EVENING THROUGH SATURDAY NIGHT/...
FOR TONIGHT...THE MODEL AND ENSEMBLE GUIDANCE CONTINUES TO HAVE

DISCREPANCIES ON THE HANDLING OF THE COASTAL LOW AS WELL AS THE GREAT LAKES LOW AND ASSOCIATED CLOSED/CUTOFF UPPER LOW. AGREE WITH
THE PMDHMD THAT THE GEM GLOBAL AND ECMWF HAVE THE BEST HANDLE ON THE COASTAL SYSTEM THROUGH FRIDAY NIGHT. INITIALLY THE PARTIAL THICKNESS VALUES AND H8 TEMPS ARE WARM ENOUGH TO SUPPORT ALL RAIN WITH ONSET OF PCPN THIS EVENING...BUT LATER TONIGHT AS H8 0C ISOTHERM MOVES INTO WESTERN ADIRONDACKS AND WESTERN PORTIONS OF EASTERN CATSKILLS EXPECT THAT A CHANGEOVER TO SNOW WILL START TO OCCUR. EXPECT LOWS TO BE IN THE MID 30S TO LOWER 40S.

FOR FRIDAY...STRONG CYCLOGENESIS CONTINUES FROM EAST OF CAPE COD INTO THE GULF OF MAINE...BUT THE EXACT POSITION OF THE SYSTEM WILL BE CRITICAL IN TERMS OF QPF...PCPN TYPE AND TEMPS AND THAT IS THE DIFFICULT PART OF THE FORECAST AS AT 12Z FRI THE LOW IS EXPECTED TO BE BTWN 990N AND 996 HPA WITH THE GFS FARTHEST W AND ECMWF FARTHEST NE. MEANWHILE THE THE PLACEMENT OF THE H500 CLOSED CIRCULATION IS CRITICAL FOR WHERE SNOW LEVELS FALL DURING THE DAY WITH THE GFS FARTHEST SOUTH AND EAST IN THE EASTERN GREAT LAKES NEAR THE WEST END OF LAKE ONTARIO WITH THE OTHER MODELS FARTHER NORTH AND WEST. PROVIDED THAT THE MODELS WHICH HAVE THE CLOSED LOW
FARTHER NORTH AND WEST ARE CORRECT THEN THE H8-H7 DEFORMATION AXIS SHOULD PIVOT ACROSS THE WESTERN ADIRONDACKS AND EASTERN CATSKILLS FRIDAY AFTERNOON WHICH WOULD BE THE MOST FAVORABLE PERIOD FOR HEAVIER QPF. HAVE ACCUMULATING SNOW IN THE GRIDS MAINLY AT ELEVATIONS ABOVE 1500 FEET AS FREEZING LEVEL WILL BE LOWERING DURING THE DAY ON FRIDAY. THE HIGHEST ACCUMULATIONS LOOK TO BE IN THE WESTERN ADIRONDACKS WITH 2 TO 4 INCHES AND 1 TO 3 INCHES ACROSS THE HIGHER TERRAIN OF THE EASTERN CATSKILLS WITH UP TO AN INCH ACROSS THE HIGHEST TERRAIN OF THE SOUTHERN GREEN MOUNTAINS AND BERKSHIRES. THE REMAINDER OF FA WILL HAVE RAIN OR A MIXTURE OF RAIN AND SNOW WITH LITTLE IF ANY ACCUMULATION AS TEMPS HOVER IN

THE UPPER 30S TO LOWER 40S.

FOR FRIDAY NIGHT THE FREEZING LEVEL CONTINUES TO LOWER AND MOST IF NOT ALL OF THE FA WILL SEE A CHANGEOVER TO SNOW AS LOW DEEPENS TO BETWEEN 974 AND 979 HPA SOMEWHERE BTWN DOWNEAST MAINE AND NORTHEAST PORTIONS OF THE CANADIAN MARITIMES...BUT BY THIS TIME THERE IS EVEN MORE UNCERTAINTY IN THE AMOUNT OF QPF THAT WILL REMAIN AND THE EXACT TRACK OF THE SYSTEM. THE ECMWF HAS LESS THAN A QUARTER OF AN INCH OF QPF ACROSS FA BTWN 00Z AND 12Z SAT WHILE THE GFS STILL HAS UP A QUARTER TO A HALF INCH ACROSS THE WESTERN ADIRONDACKS...SOUTHERN VERMONT AND THE NORTHERN BERKS. WHILE STILL SIDING WITH THE ECMWF WILL INCLUDE THE POSSIBILITY OF HIGHER AMOUNTS IN HWO AND HAVE SEPARATED OUT WESTERN ADIRONDACKS FROM THE OTHER MOUNTAIN ZONES AS WESTERN ADIRONDACKS MAY NEED A LATER ISSUANCE OF A WINTER STORM WATCH...WINTER STORM WARNING AND OR WINTER WEATHER ADVISORY...BUT JUST TOO MUCH UNCERTAINTY AT THIS TIME. OTHER MOUNTAIN ZONES INCLUDING EASTERN CATSKILLS...SOUTHERN GREEN MOUNTAINS AND BERKSHIRES DO NOT SEEM TO HAVE ENOUGH QPF AS SNOW...ALTHOUGH A WINTER WEATHER ADVISORY MAY BE NEEDED IN THESE AREAS. DO TO THE UNCERTAINTY IN TRACK AND QPF DID NOT ISSUE ANY HEADLINES AT THIS TIME.

THE ONE CERTAINTY FOR FRIDAY NIGHT IS THAT CONDITIONS WILL BECOME VERY WINDY ACROSS FA AND ECMWF POSITION OF SURFACE LOW IS IN LINE WITH COMPOSITE SURFACE ANALYSIS OF CURRENT CSTAR COOL SEASON HIGH WIND STUDY. ISALLOBARIC COUPLET ALSO IMPRESSIVE AS +4 TO -10 TRANSITIONS TO +7 TO -11. IN ADDITION 0-30 MB AGL WINDS HAVE FLAGS ABOVE 50 KTS ACRS PARTS OF THE EASTERN CATSKILLS AT 06Z SAT AND ACROSS THE EASTERN CATSKILLS AND SOUTHERN VERMONT AT 12Z SAT. IT LOOKS AS THOUGH MUCH OF HIGHER TERRAIN WILL SEE GUSTS OVER 45 MPH

AS WELL AS CHANNELED FLOW IN E-W ORIENTED VALLEYS SUCH AS THE MOHAWK. HAVE THUS CONTINUED TO INCLUDE IN HWO AS TOO EARLY FOR HEADLINE BEING FRIDAY NIGHT INTO SATURDAY MORNING. A WIND ADVISORY OR HIGH WIND WARNING MAY BE NEEDED WHICH MAY BE PRECEDED BY A HIGH WIND WATCH.

ON SATURDAY...THE LOW BECOMES VERTICALLY STACKED AND OCCLUDED OVER
NORTHERN PORTIONS OF THE CANADIAN MARITIMES. ANY LINGERING PCPN WILL BE TAPERING OFF BY AFTERNOON. LOW LEVEL WIND FIELDS WILL STILL BE STRONG ESPECIALLY DURING THE MORNING...BUT EXPECT SOME SUBSIDENCE/DOWN SLOPING DURING THE AFTERNOON. ANY UPSLOPE SNOW LOOKS TO BE CONFINED TO THE NORTHERN PORTIONS OF THE SOUTHERN ADIRONDACKS AND THE SOUTHERN GREEN MOUNTAINS. HIGHS WILL BE IN THE MID 30S TO MID 40S.

ON SATURDAY NIGHT...ANY LINGERING SNOW SHOWERS EXPECTED TO BE CONFINED TO THE NORTHERN HALF OF THE FA WITH THE SNOW ENDING LAST ACROSS THE WESTERN ADIRONDACKS WHERE A LITTLE LAKE ENHANCEMENT IS POSSIBLE. FOR NOW WILL JUST GO WITH CHANCE POPS. LOWS SATURDAY NIGHT EXPECTED TO BE IN THE MID 20S TO AROUND 30.

&&
$$

SYNOPSIS...11
SHORT TERM...11

From keyser@ginkgo.atmos.albany.edu Thu Nov 26 22:11:22 2009
Return-Path: <keyser@ginkgo.atmos.albany.edu>

X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
cypress.atmos.albany.edu
X-Spam-Level: *
X-Spam-Status: No, score=1.4 required=8.0 tests=AWL,UPPERCASE_75_100
autolearn=no version=3.2.5
Received: from ginkgo.atmos.albany.edu (ginkgo [169.226.43.50])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id nAQMB8j13250;
Thu, 26 Nov 2009 22:11:08 GMT
Received: from ginkgo.atmos.albany.edu (localhost [127.0.0.1])
by ginkgo.atmos.albany.edu (8.13.8+Sun/8.13.8) with ESMTP id nAQMB8l7006728;
Thu, 26 Nov 2009 22:11:08 GMT
Received: (from keyser@localhost)
by ginkgo.atmos.albany.edu (8.13.8+Sun/8.13.8/Submit) id nAQMB72n006727;
Thu, 26 Nov 2009 22:11:07 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200911262211.nAQMB72n006727@ginkgo.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Th. 11/26/09
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Thu, 26 Nov 2009 22:11:07 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Thursday 26 November 2009

Barbara,

For possible incorporation into the next six-month CSTAR report.

CSTAR research on cool-season high wind events over the Northeast

is mentioned in the third paragraph of the short-term section of
this afternoon's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 262128
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
428 PM EST THU NOV 26 2009

.SYNOPSIS...
A COMPLEX STORM SYSTEM WILL IMPACT THE NORTHEAST TONIGHT
INTO SATURDAY WITH UNSETTLED WEATHER INCLUDING RAIN...AND SOME
SNOW...ESPECIALLY ACROSS THE HIGHER ELEVATIONS...AND BLUSTERY WINDS.
THE STORM WILL MOVE INTO THE CANADIAN MARITIMES SATURDAY NIGHT INTO
SUNDAY...WITH HIGH PRESSURE BUILDING IN FROM THE SOUTHEAST WITH
DIMINISHING WINDS AND TRANQUIL WEATHER.

&&

.SHORT TERM /6 AM FRIDAY MORNING THROUGH SUNDAY/...
TOMORROW...RAPID CYCLOGENESIS OCCURS WITH THE COASTAL LOW PASSING
EAST OF CAPE COD AND INTO THE GULF OF MAINE. THE LOW DEEPENS AND
INTENSIFIES TO 975-980 HPA. MOST OF THE FCST AREA GETS INTO THE
STRONG DEFORMATION ZONE OF THE CYCLONE. THE H850 TEMPS COOL DOWN
BELOW ZERO QUICKLY IN THE MORNING...BUT IT IS UNCERTAIN HOW COLD
THE BOUNDARY LAYER TEMPS WILL GET. WE ARE EXPECTING SOME WET SNOW

OVER THE ADIRONDACKS PRIOR TO NOONTIME DUE TO THE STRONG DYNAMICAL LIFT...AND LATENT HEAT OF FUSION /MELTING EFFECTS COOLING DOWN THE COLUMN DUE TO THE MODERATE TO HVY PCPN/. HOWEVER...THIS WILL LIKELY AMOUNT TO AN INCH OR TWO. ELSEWHERE...WE ARE EXPECTING PERIODS OF RAIN FOCUSED BY THE LOW-MID LEVEL DEFORMATION ZONE. THE H850-700 PARTIAL THICKNESSES ARE BELOW 1540 METERS DURING THE DAY...BUT THE 1000-850 VALUES ARE STILL ABOVE 1310 METERS. THEREFORE...THE PREDOMINANT PTYPE DURING THE DAY WILL BE RAIN. WE FOLLOWED A GFS/GEFS/ECMWF SCENARIO HERE AND THROUGHOUT. THE QPF IS MUCH LOWER WITH A DRY SLOT IMPACTING THE HUDSON RIVER VALLEY VIA THE GFS/NAM.

THE WINDS WILL SHIFT TO THE W/NW DURING THE AFTERNOON AND WILL INCREASE BY THE EARLY EVENING...AS THE LOW LEVEL HORIZONTAL PRESSURE GRADIENT INCREASES BETWEEN THE CYCLONE...AND HIGH PRESSURE NEAR THE LOWER MS RIVER VALLEY. THE PCPN WILL START TO TRANSITION TO SNOW AT ALL LOCATIONS AT 1500 FT AGL AND GREATER BY 00Z. TEMPS WILL SLIGHTLY FALL...OR BE STEADY THROUGHOUT THE DAY...WITH PEAK READINGS IN THE M30S TO M40S.

FRIDAY NIGHT...WE HAVE WAITED TO ISSUE A POSSIBLE WIND ADVISORY HERE...SINCE THEY ARE NOT ISSUED BEYOND THE FIRST TWO PERIODS. THANKS FOR THE COLLABORATION WITH THE NEIGHBORING OFFICES. THE LOW LEVEL WIND FIELDS STRENGTHEN WITH H925 WINDS VIA THE GFS OF 35-45 KTS. THE NAM IS A LITTLE WEAKER WITH 30-40 KTS. THE H850 WINDS ARE 45-60 KTS AS THE LOW BEGINS TO OCCLUDE NEAR THE MAINE COAST. THE BEST MOMENTUM TRANSFER AT NIGHT OFF THE GFS/NAM BUFKIT SOUNDINGS WOULD BE 35-40 KTS FROM 2.5 KFT AGL. FOR NOW...WE HAVE GUSTS MENTIONED TO 39 KTS /45 MPH/ JUST SHY OF MARGINAL WIND ADVISORY CRITERIA. THE SITUATION IS SOMEWHAT SIMILAR TO CASES IN THE CURRENT COOL SEASON HIGH WIND STUDY IN CSTAR...BUT THE SYSTEM LOCATION...AND MORE IMPORTANTLY THE TIMING OF THE MIXING OF THE STRONG WINDS TO SFC IS NOT IDEAL.

IN TERMS OF THE SNOWFALL...WE CONCUR WITH THE HPC GRAPHICS...AND HAVE 1-3 INCHES OCCURRING OVER THE SRN ADIRONDACKS...SRN GREENS...AND BERKSHIRES OVERNIGHT.
AN INCH OR SO OVER THE HELDERBERGS...ERN CATSKILLS...AND TACONICS. THE CAPITAL REGION...LAKE GEORGE REGION...MOHAWK RIVER VALLEY...MAY RECEIVE A COATING TO POSSIBLY AN INCH. TOTAL SNOW ACCUMULATIONS OVER THE SRN GREENS AND DACKS WILL BE IN THE 2-4 INCH RANGE.

SATURDAY...WIND WILL BE THE MAIN CONCERN. BLUSTERY CONDITIONS WILL CONTINUE...AND BETTER MIXING MAY OCCUR FROM 2-3 KFT AGL...WITH WIND GUSTS MARGINALLY APPROACHING ADVISORY CRITERIA OF 46-57 MPH. THE WIND FIELDS START TO WEAKEN BY 18Z WITH THE STACKED OCCLUDED CYCLONE MEANDERING OVER THE GULF OF ST LAWRENCE. THE BETTER CHANCE
OF VERY STRONG WINDS MAY BE EAST OF THE REGION OVER ERN NEW ENGLAND. SCT UPSLOPE SNOW SHOWERS WILL LIKELY CONTINUE THROUGH THE
MORNING AND DIMINISH BY THE AFTERNOON WITH THE LOW-LEVEL FLOW MORE
NW...AND THE H500 CIRCULATION WELL NE OF THE REGION. IT WILL BE A CHILLY DAY WITH MAX TEMPS IN THE MID 30S TO L40S IN THE MTNS...AND L40S TO MID40S IN THE VALLEYS.

SATURDAY NIGHT INTO SUNDAY...HIGH PRESSURE WILL NUDGE IN FROM THE SOUTHEAST WITH THE MID LEVEL FLOW BECOMING FLATTER AND ZONAL AHEAD
OF THE NEXT WEAK DISTURBANCE APPROACHING FROM THE GREAT LAKES REGION. WE DON/T SEE ANY LAKE EFFECT ISSUES SATURDAY NIGHT...AND HAVE GONE WITH A RELATIVELY DRY FCST DURING THIS TIME FRAME WITH JUST A SLIGHT CHANCE OF A SNOW SHOWER OR FLURRY WELL WEST OF THE HUDSON RIVER VALLEY SAT NIGHT...AND A SLIGHT CHANCE OF SHOWERS ON SUNDAY WITH AN APPROACHING TROUGH OF LOW PRESSURE...AND A COLD

FRONT. TEMPS MODERATE ABOVE NORMAL TO CLOSE THE HOLIDAY WEEKEND WITH HIGHS 5-10 DEGREES ABOVE NORMAL.

&&
$$

SYNOPSIS...WASULA
SHORT TERM...WASULA

From keyser@atmos.albany.edu Mon Dec 7 23:01:49 2009
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
cypress.atmos.albany.edu
X-Spam-Level: *
X-Spam-Status: No, score=1.1 required=8.0 tests=AWL,UPPERCASE_75_100
autolearn=no version=3.2.5
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id nB7N1mj04698;
Mon, 7 Dec 2009 23:01:48 GMT
Received: (from keyser@localhost)
by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id nB7N1mF01404;
Mon, 7 Dec 2009 23:01:48 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200912072301.nB7N1mF01404@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Mon. 12/7/09
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Mon, 7 Dec 2009 23:01:48 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu

X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Monday 7 December 2009

Barbara,

For possible incorporation into the next six-month CSTAR report.

Ongoing CSTAR research is cited in connection with the possibility of
lake-effect snowbands extending into the Albany forecast area in the
second paragraph of the long-term section of this afternoon's AFD
issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 072229
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
530 PM EST MON DEC 7 2009

.SYNOPSIS...
A WEAK LOW PRESSURE SYSTEM WILL EXIT THE REGION EARLY TONIGHT. AFTER
THAT...A WEAK RIDGE OF HIGH PRESSURE WILL BUILD EASTWARD ACROSS THE

REGION LATER TONIGHT AND TUESDAY...ACCOMPANIED BY GENERALLY FAIR AND
SEASONABLY COLD CONDITIONS. A STRONG STORM SYSTEM WILL APPROACH FROM
THE GREAT LAKES FOR WEDNESDAY...BRINGING SNOW TO THE REGION VERY LATE TUESDAY NIGHT...WHICH WILL LIKELY CHANGE TO MIXED PRECIPITATION AND EVENTUALLY TO RAIN ON WEDNESDAY.

&&

.LONG TERM /THURSDAY THROUGH MONDAY/...
AN EXTENDED PERIOD OF COLD WEATHER IS ANTICIPATED ACROSS MUCH OF THE LONG TERM PERIOD. THIS MAKES SENSE BASED ON ENSEMBLE FORECASTS WHICH SHOWS A NEGATIVE NAO ALONG WITH RIDGING ACROSS PORTIONS OF ALASKA...AND AN MJO AROUND PHASE 8 OR NEUTRAL....WHICH FAVORS COLD AND POTENTIALLY STORMY WEATHER ACROSS THE EASTERN CONUS.

THE START OF THE EXTENDED PERIOD WILL FEATURE A PERIOD OF LAKE EFFECT FOR PARTS OF HERKIMER AND HAMILTON COUNTIES. LAKE TEMPS ARE STILL AROUND 5-8 DEGREES C...AND EXPECTED 850 HPA TEMPS OF -16 TO -18 DEGREES C /BASED OFF THE 12 UTC GFS/...SHOULD LEAD TO A LONG DURATION PERIOD OF MODERATE TO EXTREME INSTABILITY BASED ON THE NIZIOL LAKE EFFECT SCALE. WITH A LONG FETCH ACROSS LAKE ONTARIO...AND A POSSIBILITY OF SOME MULTI-LAKE ENHANCEMENT OFF THE UPSTREAM LAKES SUPERIOR AND HURON...HAVE FORECASTED LIKELY POPS ACROSS THE WESTERN DACKS FOR THURSDAY INTO FRIDAY. THE INLAND EXTENT
OF THE LAKE BANDS IS STILL YET TO BE DETERMINED...ALTHOUGH THE MUTLI-LAKE CONNECTION AND LOW SHEAR IN THE LOWEST FEW THOUSAND METERS OF THE COLUMN COULD FAVOR THE SIGNIFICANT LAKE EFFECT ENTERING OUR AREA...BASED ON CURRENT ONGOING CSTAR RESEARCH.

MEANWHILE...THE REMAINDER OF THE CWA WILL BE MAINLY CLOUDY

WITH SOME LINGERING FLURRIES DUE TO THE LARGE SCALE TROUGH SITUATED OVER THE NORTHEAST...ALTHOUGH SOME MORE SUNNY BREAKS ARE POSSIBLE ACROSS THE MID HUDSON VALLEY WHERE DOWNSLOPING SHOULD HELP KEEP SKIES PARTLY SUNNY DOWN THERE. THE OTHER ISSUE WILL BE THE WIND FOR THURSDAY INTO EARLY FRIDAY WHICH WILL BE QUITE GUSTY AS THE PRESSURE
GRADIENT BETWEEN THE BUILDING HIGH AND DEPARTING LOW REMAINS STRONG.
TEMPS WILL SOMEWHAT SEASONABLE ON THURSDAY DUE TO DECENT MIXING...BUT WILL BE HELD QUITE CHILLY FOR FRIDAY AS THE COLD AIR REALLY SETTLES IN AND MOST AREAS WILL LIKELY NOT REACH FREEZING.
THE LAKE EFFECT WILL DIE DOWN ON SATURDAY AS A STRONG /1034 HPA/ HIGH PRESSURE MOVES JUST SOUTH OF THE REGION. THIS SHOULD HELP LOWER THE INVERSION HEIGHT AND PUT AN END TO THE LAKE RESPONSE BY THE AFTN HOURS. STILL...TEMPS WILL REMAIN COLD ON SATURDAY AND SUNDAY AS 850 HPA REMAINS IN THE -14 TO -18 DEGREES C RANGE...KEEPING MAX TEMPS BELOW FREEZING FOR MUCH OF THE AREA.

MEANWHILE...LOW PRESSURE WILL BE ORGANIZING ACROSS THE CAROLINA COAST FOR SAT NIGHT AND MOVING NORTHEASTWARD FOR SUNDAY. AT THIS POINT...BOTH THE 12 UTC GFS/ECMWF SHOW THIS SYSTEM STAYING TO OUR SOUTH...ALTHOUGH HAVE INCLUDED CHC POPS FOR SOUTHERN AREAS IN CASE THIS SYSTEM BEGINS TO TREND NORTHWARD. WITH TEMPS SUFFICIENTLY COLD...THIS SYSTEM WOULD BE ALL SNOW FOR OUR AREA IF IT WHERE TO COME FURTHER NORTH THAN CURRENTLY PROGGED.

ANOTHER REINFORCING SURGE OF BITTER AIR WILL HEAD TOWARDS OUR AREA ON SUNDAY NIGHT AS AN ARCTIC FRONT MOVES TOWARDS THE REGION. COULD EVEN HAVE SOME SQUALLS ALONG THIS BOUNDARY AS IT CROSSES THE LAKES AND PASSES THROUGH THE REGION. SINCE THIS IS DAY 7 TO 8...WILL NOT GO MORE THAN LOW CHC/SLIGHT CHC POPS FOR NOW...BUT WILL CONTINUE TO WATCH THE EVOLUTION OF THE FRONT. THE COLDEST AIR /850 HPA TEMPS TO -20 TO -30 DEGREES C/ REMAIN ACROSS QUEBEC WITH THE UPPER LEVEL

LOW...ALTHOUGH CONTINUED COLD AIR OF -12 TO -16 DEGREE C AIR AT 850 HPA WILL KEEP MAX/MIN TEMPS BELOW NORMAL RIGHT INTO EARLY NEXT WEEK.

&&

$$

SYNOPSIS...GJM

LONG TERM...BJF

From keyser@atmos.albany.edu Tue Dec 8 23:06:25 2009

Return-Path: <keyser@atmos.albany.edu>

X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
cypress.atmos.albany.edu

X-Spam-Level: *

X-Spam-Status: No, score=1.1 required=8.0 tests=AWL,UPPERCASE_75_100
autolearn=no version=3.2.5

Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id nB8N6Oj07170;
Tue, 8 Dec 2009 23:06:24 GMT

Received: (from keyser@localhost)
by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id nB8N6Ob01908;
Tue, 8 Dec 2009 23:06:24 GMT

From: Dan Keyser <keyser@atmos.albany.edu>

Message-Id: <200912082306.nB8N6Ob01908@tigger.atmos.albany.edu>

Subject: Input for next CSTAR 6-month report: Tues. 12/8/09

To: BZampella@uamail.albany.edu (Barbara Zampella)

Date: Tue, 8 Dec 2009 23:06:24 +0000 (GMT)

Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu

X-Mailer: ELM [version 2.4ME+ PL39 (25)]

MIME-Version: 1.0

Content-Type: text/plain; charset=US-ASCII

Content-Transfer-Encoding: 7bit

Status: RO

Tuesday 8 December 2009

Barbara,

For possible incorporation into the next six-month CSTAR report.

Ongoing CSTAR research is cited in connection with the inland
extension of lake-induced snowbands in the first paragraph of the
long-term section of this afternoon's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 082201
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
501 PM EST TUE DEC 8 2009

.SYNOPSIS...
HIGH PRESSURE WILL SLIDE INTO THE MARITIMES TONIGHT. ONE STORM
WILL RIDE ACROSS MICHIGAN AS A SECOND STORM GETS GOING OVER THE
MID ATLANTIC. THE COMBINATION OF THESE TWO STORMS WILL SPREAD A
VARIETY OF WINTER WEATHER INTO THE REGION FOR WEDNESDAY. AS THE
LOW PRESSURE SYSTEM TRACKS INTO CANADA ON THURSDAY A BRISK FLOW
OF
COLDER AIR WILL FOLLOW IN ITS WAKE.

&&

.LONG TERM /FRIDAY THROUGH TUESDAY/...
LAKE EFFECT WILL BE ONGOING AT THE START OF THE EXTENDED PERIOD ACROSS THE WESTERN DACKS AS BOTH THE 12 UTC NAM/GFS SHOW A 270 DEGREE MEAN WIND IN THE 0-3 KM AGL LAYER. ALONG WITH 850 HPA TEMPS OF -16 TO -18 DEGREES C...AND LAKE TEMPS REMAINING ABOVE 5 DEGREES C....MODERATE TO EXTREME INSTABILITY ON THE NIZIOL LAKE EFFECT SCALE SHOULD ALLOW FOR A FAIRLY INTENSE SINGLE BAND OF LAKE EFFECT SNOW. HAVE CONTINUED WITH LIKELY POPS FOR FRIDAY INTO FRIDAY NIGHT FOR MUCH OF NORTHERN HERKIMER AND WESTERN HAMILTON COUNTIES...ALTHOUGH
IT/S YET TO BE SEEN JUST HOW FAR THE HIGHEST ACCUMULATING SNOW CAN PROPAGATE INLAND. AS THE UPPER LEVEL AND ASSOCIATED SFC LOW CONTINUE
TO MOVE EASTWARD ACROSS CANADA ON FRIDAY...WE LOSE THE BEST FLOW FOR
A MULTI-LAKE CONNECTION...WHICH SIGNIFICANTLY DECREASES THE CHC FOR FAR INLAND PROPAGATION...BASED ON CURRENT ONGOING CSTAR RESEARCH. ELSEWHERE ACROSS THE CWA...SOME LAKE EFFECT FLURRIES MAY MAKE THEIR
WAY TOWARDS THE CAPITAL...SARATOGA...OR LAKE GEORGE REGIONS...SO WILL KEEP LOW CHC/SLIGHT CHC POPS FOR THESE AREAS. THE WESTERLY FLOW
MAY ALSO UPSLOPE THE BERKSHIRES/GREENS...SO SOME LIGHT SNOW WILL BE POSSIBLE IN THOSE AREAS AS WELL. WITH THE VERY COLD AIR ALOFT /ABOUT 1-3 STD BELOW NORMAL BASED ON THE 12 UTC GEFS/...MAX TEMPS WILL BE HELD BELOW FREEZING IN MANY AREAS.

IT WILL REMAIN COLD THROUGH THE WEEKEND AS THE UPPER LEVEL COLD AIR SLOWLY MODERATES...WITH LOW TEMPS IN THE SINGLE DIGITS TO TEENS AND HIGHS IN THE 20S TO LOWER 30S. THE MODELS CONTINUE TO SHOW A SOUTHERN STREAM SYSTEM REMAINING TO OUR SOUTH SAT NIGHT INTO SUNDAY...ALTHOUGH WILL KEEP CHC POPS IN THE FORECAST FOR SUNDAY...AS

SOME MOISTURE IN THE FORM OF SNOW MAY MAKE ITS WAY THIS FAR NORTH ON
SUNDAY...ESP IF THE MODELS TREND NORTHWARD AT ALL. IN ADDITION...AN ARCTIC BOUNDARY WITH ANOTHER REINFORCING SHOT OF COLD AIR WILL APPROACH FOR LATE SUNDAY...BRINGING A CHC FOR SNOW SHOWERS AND SQUALLS WITH THE SFC FRONT.

BEHIND THIS SYSTEM...IT WILL REMAIN RATHER COLD TO START THE UPCOMING WORK WEEK...WITH THE -14 TO -18 DEGREE AIR RETURNING AT 850 HPA. THE LATEST OPERATIONAL 12 UTC GFS SHOWS A POTENT STORM MOVING UP THE EASTERN SEABOARD ON LATE TUESDAY INTO NEXT WED. ALTHOUGH MANY
OF THE ENSEMBLE MEMBERS DO HAVE A STORM SOMEWHERE...THERE IS CONSIDERABLE SPREAD REGARDING THIS SYSTEM /AS WOULD BE EXPECTED SINCE IT/S SO FAR OUT/...AND THE OPERATIONAL SEEMS THE MOST EXTREME WITH IT/S SOLUTION FOR QPF AND STORM INTENSITY. WILL ADD LOW CHC POPS TO FORECAST FOR TUES NIGHT FOR NOW AND WILL CONTINUE TO MONITOR.

&&
$$

SYNOPSIS...OKEEFE
LONG TERM...FRUGIS

From keyser@atmos.albany.edu Fri Jan 8 21:28:14 2010
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=1.0 required=8.0 tests=AWL,UPPERCASE_75_100

autolearn=no version=3.2.5
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id o08LSEm03968;
Fri, 8 Jan 2010 21:28:14 GMT
Received: (from keyser@localhost)
by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id o08LSDp03014;
Fri, 8 Jan 2010 21:28:13 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <201001082128.o08LSDp03014@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Fri. 1/8/10
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Fri, 8 Jan 2010 21:28:13 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Friday 8 January 2010

Barbara,

For possible incorporation into the next six-month CSTAR report.

The Hudson-Mohawk convergence zone is cited in the near-term section
of this afternoon's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 082103
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
403 PM EST FRI JAN 8 2010

.SYNOPSIS...
AN ARCTIC AIR MASS WILL SETTLE ACROSS THE COUNTRY AND INTO THE NORTHEAST THIS WEEKEND. A FLURRY OR SNOW SHOWER IS POSSIBLE...ESPECIALLY CLOSER TO THE GREAT LAKES...THROUGH THE WEEKEND.

&&

.NEAR TERM /UNTIL MIDNIGHT TONIGHT/...
UPPER LEVEL DEFORMATION AXIS ALONG WITH ENHANCED LOW LEVEL CONVERGENCE AND FAVORABLE UPSLOPE CONTINUES WITH AN OCCASIONAL INCREASE IN RADAR REFLECTIVITIES. LATEST RUC13 AND RADAR/RTMA ANALYSIS REVEALS A BAND OF SNOW ALONG THE HUDSON RIVER VALLEY WITH
THE BEST CONVERGENCE WITHIN THE CAPITAL REGION /MIGHT BE A CASE OF CSTAR MOHAWK VALLEY CONVERGENCE/. HOWEVER...THERE WILL BE A DECREASING TREND AS THE COMBINATION OF THE UPPER LOW...SITUATED OVER SOUTHERN NEW ENGLAND...AND SURFACE WAVE OFFSHORE OF THE NEW ENGLAND SHORELINE TRACKS EAST THIS EVENING PER HOURLY RUC13 TRENDS. SO WILL CARRY POPS FOR MOST OF THE REGION.

&&
$$

SYNOPSIS...BGM
NEAR TERM...BGM

From keyser@atmos.albany.edu Mon Jan 18 18:06:16 2010
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
cypress.atmos.albany.edu
X-Spam-Level: *
X-Spam-Status: No, score=1.0 required=8.0 tests=AWL,UPPERCASE_75_100
autolearn=no version=3.2.5
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id o0II6Fm04318;
Mon, 18 Jan 2010 18:06:15 GMT
Received: (from keyser@localhost)
by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id o0II6FQ06936;
Mon, 18 Jan 2010 18:06:15 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <201001181806.o0II6FQ06936@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Mon. 1/18/10
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Mon, 18 Jan 2010 18:06:15 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Monday 18 January 2010

Barbara,

For possible incorporation into the next six-month CSTAR report.

CSTAR research on cool-season banded precipitation systems is cited by Tom Wasula in the first paragraph of the near-term section of this morning's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 180855
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
355 AM EST MON JAN 18 2010

.SYNOPSIS...
LOW PRESSURE WILL MOVE EAST OF CAPE COD TODAY WITH THE SNOW AND MIXED PRECIPITATION ENDING. AN UPPER LEVEL LOW SOUTH OF HUDSON BAY WILL KEEP THE WEATHER UNSETTLED INTO THE MID WEEK WITH ISOLATED TO SCATTERED SNOW SHOWERS. HIGH PRESSURE WILL BUILD IN FROM THE NORTHERN GREAT LAKES REGION WEDNESDAY NIGHT WITH DRIER WEATHER TO CLOSE THE WEEK.

&&

.NEAR TERM /TODAY/...
AS OF 300 AM EST...AN EXTREMELY CHALLENGING FORECAST EVENT /YET ANOTHER THIS WINTER!/ IS ENTERING ITS WANING STAGES WITH LOW PRESSURE BASED ON THE RUC40 MOVING SOUTH OF LONG ISLAND. THE LOW IS STILL DEEPENING BASED ON THE MSAS...WITH MSLP FALLS OF 6-7

HPA/3-HRS EAST OF CAPE COD. THE STRONG LOW-MID LEVEL DEFORMATION ZONE THAT SET UP OVER THE REGION PRODUCED SOME STRONG REFLECTIVITY BANDLETS /CSTAR II WINTER DEFINITION OF SNOW-RADAR TYPES/ THAT YIELDED SOME POCKETS OF MOD-HVY SNOW ESPECIALLY WEST OF THE CAPITAL REGION...OVER THE NRN CATSKILLS...AND HELDERBERGS...WHERE SOME 2-5" TOTALS CAME IN PRIOR TO MIDNIGHT. HOWEVER...EASTERLY WINDS IN AND JUST ABOVE THE BOUNDARY LAYER HAVE YIELDED MAINLY A MIX OF RAIN AND SNOW...WITH SOME SLEET OVER THE BERKS AND PARTS OF SRN VT /KDDH...KPSF...AND KAQW OBS SINCE 00Z/. A NICE CONVERGENT ZONE SET UP OVER THE CAPITAL REGION...WITH NRLY FLOW AT KALB AND KGFL...AND EASTERLY FLOW FROM KPSF...KAQW AND KDDH.

THE LATEST KENX RADAR IMAGERY SHOWS A WEAKENING OF THE RETURNS OVER THE WARNING AND ADVISORY AREAS. DUE TO THE LACK OF OBSERVATIONS IN THE OVERNIGHT PERIOD WE WILL BE KEEPING THE WARNINGS AND ADVISORIES GOING. IT IS NOT LOOKING GOOD FOR WARNING LEVEL SNOWFALL IN THE ERN CATSKILLS...DUE TO THE ROBUST DRY SLOT THAT MOVES IN PRIOR TO 03Z. WE WILL WAIT FOR ALL THE OBSERVATIONS. ALSO...THE NAM BUFKIT SOUNDINGS DEPICT MORE ICE IN THE CLOUDS THAN PREVIOUS RUNS...SO THE THREAT OF PATCHY -FZDZ OR -FZRA LOOKS LESS. HOWEVER...WE KEPT A SLIGHT CHANCE IN UNTIL 15Z OR SO. THIS ALSO MAKES IT PRUDENT TO KEEP THE ADVISORIES/WARNINGS UP. THE PREDOMINANT PTYPE HAS BEEN A WET GLOPPY SNOW MIXED WITH SOME SLEET AND RAIN.

BASED ON THE NAM/CAN REG/GFS/ECMWF THE BACK EDGE OF THE PCPN SHIELD IS EAST OF THE REGION BY NOONTIME. SUBSIDENCE IN THE WAKE OF THE SFC WAVE ZIPPING EAST OF CAPE COD WILL ALLOW FOR SOME BREAKS OF SUN. H850 TEMPS WILL STILL BE MILD AT -1C TO -3C RANGE. EXPECT HIGHS TO BE ABOVE NORMAL FOR JAN WITH GENERALLY MID 30S TO L40S OVER THE FCST AREA.

&& $$

SYNOPSIS...WASULA

NEAR TERM...WASULA

From keyser@atmos.albany.edu Wed Feb 3 00:13:36 2010
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-1.0 required=8.0 tests=AWL,BAYES_00,UPPERCASE_75_100
autolearn=no version=3.2.5
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id o130DZ407358;
Wed, 3 Feb 2010 00:13:35 GMT
Received: (from keyser@localhost)
by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id o130DZ814405;
Wed, 3 Feb 2010 00:13:35 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <201002030013.o130DZ814405@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Tues. 2/2/10
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Wed, 3 Feb 2010 00:13:35 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Tuesday 2 February 2010

Barbara,

For possible incorporation into the next six-month CSTAR report.

CSTAR research is cited in connection with the possibility of the extension of lake-effect snowbands into the ALY CWA in the second paragraph of the short-term section of this afternoon's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 022059
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
358 PM EST TUE FEB 2 2010

.SYNOPSIS...
AN UPPER LEVEL DISTURBANCE WILL PASS JUST SOUTH OF THE REGION...BRINGING A PERIOD OF LIGHT SNOW TO THE AREA TONIGHT INTO WEDNESDAY MORNING. HIGH PRESSURE WILL RETURN TO DOMINATE THE WEATHER FOR THURSDAY INTO FRIDAY WITH NEAR SEASONABLE TEMPERATURES. ANOTHER STORM SYSTEM WILL PASS TO THE SOUTH OF THE AREA FOR OVER THE WEEKEND.

&&

.SHORT TERM /WEDNESDAY THROUGH THURSDAY NIGHT/...
THE UPPER LEVEL SHORTWAVE WILL BE PASSING JUST SOUTH OF THE AREA AT THE START OF THE SHORT TERM PERIOD...SO WILL CONTINUE TO ALLOW FOR LIGHT SNOW ACROSS THE CWA THROUGH MUCH OF THE MORNING HOURS.

BY AFTN...THE SHORTWAVE WILL BE EAST OF THE REGION ACROSS NEW ENGLAND...WHICH WOULD PUT AN END TO THE SNOW THREAT...EXCEPT PERHAPS
IN FAVORED UPSLOPE AREAS OF THE GREENS AND WESTERN DACKS WHERE ON AND OFF LIGHT SNOW MAY CONTINUE AT TIMES INTO THE AFTN HOURS. ADDITIONAL ACCUM WOULD BE ABOUT ANOTHER DUSTING TO HALF INCH ACROSS
THE CWA. THIS FITS WELL WITH THE 09Z SREF/12Z GEFS QPF AMOUNTS FOR THE EVENT...AS THE PROBABILITIES ON BOTH SHOW LESS THAN A TENTH OF AN INCH LIKELY FOR MOST AREAS. AS FOR TEMPS...HAVE GENERALLY SIDED WITH THE COOLER MET GUIDANCE...CONSIDERING THE FORECASTED CLOUD COVER AND PRECIP. STILL...KALB HAS A SHOT AT BREAKING FREEZING FOR THE FIRST TIME SINCE JAN 28TH.

SOME CAA WILL TAKE PLACE IN THE WAKE OF THE SYSTEM FOR WED EVENING/NIGHT. WITH A SFC-700 MB MEAN WIND DIRECTION OF 290 DEGREES...SOME LAKE EFFECT WITH A MULTI BAND STRUCTURE LOOKS TO OCCUR OFF LK ONTARIO. THIS COULD GET INTO THE WESTERN MOHAWK VALLEY BEGINNING WITH THE WED EVENING TIMEFRAME. HAVE GONE WITH HIGH CHC POPS FOR THE PERIOD FOR WESTERN PARTS OF THE CWA. THE LOCATION OF WEAK LOW PRESSURE OVER QUEBEC COULD BE FAVORABLE FOR A
MULTI-LAKE CONNECTION WITH LK HURON...AND CSTAR RESEARCH HAS SHOWN THAT THIS MULTI-LAKE CONNECTION ALONG WITH CONDITIONAL NIZIOL INSTABILITY RANKING IS FAVORABLE FOR ACCUMULATING LAKE EFFECT TO REACH INLAND INTO OUR ZONES. WILL CONTINUE TO MONITOR TRENDS REGARDING THIS POSSIBILITY. THE REMAINDER OF THE CWA WILL BE DRY FOR WED NIGHT WITH NEAR SEASONABLE TEMPS...HAVE GONE CLOSE TO A MAV/MET BLEND.

HIGH PRESSURE WILL MOVE FROM THE GREAT LAKES TOWARDS UPSTATE NY FOR THURS INTO THURS NIGHT. THIS WILL LOWER THE INVERSION HEIGHT AND PUT AN END TO ANY LAKE EFFECT BY THURS MORNING. THE RESULT SHOULD

BE DRY AND SEASONABLE WEATHER ACROSS THE ENTIRE PERIOD...WITH NEARLY CLEAR SKIES ARE MUCH OF THE CWA.

&&
$$

SYNOPSIS...FRUGIS
SHORT TERM...FRUGIS

From keyser@atmos.albany.edu Fri Mar 12 15:29:27 2010
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
    cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=1.0 required=8.0 tests=AWL,UPPERCASE_75_100
    autolearn=no version=3.2.5
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
    by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id o2CFTR423195;
    Fri, 12 Mar 2010 15:29:27 GMT
Received: (from keyser@localhost)
    by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id o2CFTRb29548;
    Fri, 12 Mar 2010 15:29:27 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <201003121529.o2CFTRb29548@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Fri. 3/12/10
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Fri, 12 Mar 2010 15:29:27 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII

Content-Transfer-Encoding: 7bit
Status: RO

Friday 12 March 2010

Barbara,

For possible incorporation into the next six-month CSTAR report.

CSTAR cool-season cutoff low research is mentioned by Tom Wasula in
the first paragraph of the short-term section of this morning's AFD
issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 121134
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
634 AM EST FRI MAR 12 2010

.SYNOPSIS...
A COMPLEX...SLOW MOVING STORM SYSTEM NEAR THE TENNESSEE VALLEY...AND THE MID ATLANTIC REGION WILL IMPACT EASTERN NEW YORK AND WESTERN NEW ENGLAND TODAY THROUGH THE WEEKEND. ISOLATED TO SCATTERED SHOWERS TODAY WILL TRANSITION TO A STEADIER LIGHT RAIN FROM THE CAPITAL REGION SOUTH TONIGHT...WITH PERHAPS A LIGHT MIXTURE OF RAIN...FREEZING RAIN...AND SLEET NORTH AND EAST. THE

MAIN LOW PRESSURE CENTER WILL SHIFT SLOWLY NORTHEAST OF THE DELMARVA
REGION SATURDAY INTO SUNDAY WITH RAIN...HEAVY AT TIMES...SOUTH AND EAST OF THE CAPITAL DISTRICT.

&&

.SHORT TERM /SATURDAY THROUGH SUNDAY/...
FRIDAY NIGHT...THIS IS THE PERIOD WHERE THE MASSIVE CUTOFF BEGINS TO BE TROUBLESOME WITH ITS INTERACTION WITH THE STRONG SFC HIGH SHIFTING TOWARDS THE GULF OF SAINT LAWRENCE AND NEW BRUNSWICK. CSTAR RESEARCH HAS SHOWN THE PROBLEMS COOL SEASON CUTOFFS CAN YIELD. THE FIRST ISSUE GOING INTO THE WEEKEND IS THE POSSIBILITY OF SOME SPOTTY LIGHT MIXED PCPN. THE NAM/GFS 925 HPA AGEOSTROPHIC WINDS ARE NORTH OR NORTHEAST AT 25-40 KTS. SHALLOW COLD AIR WILL FUNNEL INTO THE REGION IN THE NORTHEASTERN ZONES OF THE CAPITAL REGION /LAKE GEORGE REGION...SRN VT...NRN BERKS...SRN DACKS/. SOME MOISTURE ASSOCIATED WITH THE LEAD SHORT WAVE AND THE ISENTROPIC LIFT WILL BE SLOWLY LIFTING NORTHWARD ACROSS THE REGION AFTER MIDNIGHT. WE ARE LEANING TOWARD A NAM/ECMWF SCENARIO FOR THE NEXT FEW PERIODS...AS THE GFS HAS BECOME TOO AGGRESSIVE WITH THE MOVEMENT
OF THE CUTOFF DURING THE WEEKEND. COORDINATION WAS DONE WITH HPC AND NEIGHBORING WFOS.

WE FOLLOWED THE NAM THERMAL PROFILES WHICH SHOWS A WEDGE OF -1 TO -3C AIR AT 925 HPA OVER NRN PORTIONS OF THE REGION /GFS WAS ACTUALLY SIMILAR HERE/. THE NAM SOUNDINGS SHOW THE POSSIBILITY OF PERSISTENT VIRGA FOR A PERIOD...BUT THEN IF SATURATION OCCURS SOME SPOTTY -FZRA OR -IP MAY OCCUR NORTH AND EAST OF KALB...ALSO IT IS POSSIBLE OVER THE HIGH PEAKS OF THE ERN CATSKILLS. WE ARE NOT SUPER CONFIDENT DUE TO THE SLOW SATURATION OF THE AIR MASS...AND THE SUPER DRY AIR BEING DAMMED IN BY THE RETREATING ANTICYCLONE. WE

KEPT A CHC -FZRA/-IP IN WITH -RA AS THE PREDOMINANT PTYPE. WE PLACED LIKELY TO CATEGORICAL POPS IN FROM THE CAPITAL DISTRICT SOUTH...AND ONLY LOW CHANCE TO THE NORTH. NOT TOO CONFIDENT THE PCPN WILL MAKE IT FARTHER NORTH OF KALB AT THIS TIME.

SATURDAY...THE LOW LEVEL JET STRENGTHENS TO 50-70 KTS AT H850 FROM THE E/SE WITH THE WARM FRONT TO THE COMPLEX SYSTEM JUST SOUTH OF LONG ISLAND AND INTO SRN NJ. THE LOW LEVEL BAROCLINIC ZONE STRENGTHENS JUST SOUTH OF THE FCST AREA...AND PERIODS OF RAIN DUE TO THE OVER RUNNING WILL PUSH INTO THE SRN ZONES OF THE FCST AREA IN THE LATE MORNING AND INTO THE AFTERNOON. THE LATEST GLOBAL ENSEMBLES SHOW H925 EASTERLY WINDS ANOMALIES OF 3 TO 5 STANDARD DEVIATIONS GREATER THAN NORMAL OVER THE SRN HALF OF THE FCST AREA. THE H850 EASTERLY ANOMALIES ARE GREATER THAN 5 STANDARD DEVIATIONS ABOVE NORMAL OVER NRN NJ...ERN PA AND SRN NY. THE -U COMPONENT ANOMALIES WILL HELP ADVECT IN ATLANTIC MOISTURE. THE NAM SHOWS TREMENDOUS DOWNSLOPING TO COMMENCE IN THE HUDSON RIVER VALLEY. THE
SHADOWING EFFECT COULD SIGNIFICANTLY DECREASE THE PCPN (WITH LESS THAN A TENTH OF AN INCH ADVERTISED BY THE NAM IN A FEW SPOTS/.

LATE SATURDAY THE THREAT STARTS TO POTENTIALLY BUILD FOR SOME WIND ADVISORY LEVEL WIND GUSTS TO MATERIALIZE OVER THE SRN GREENS/NRN BERKS/TACONICS. THE SOUNDINGS DO SHOW A LOW LEVEL INVERSION MATERIALIZING INHIBITING FULL MIXING TO THE SFC. ACTUALLY WE THINK THE BETTER CHANCE OF MIXING SOME GUSTS AT LEAST TO 40-45 MPH WILL BE IN THE EVENING PERIOD WHEN THE LOW JET SEGMENT AT H925 STRENGTHENS TO 40-50 KTS OVER THE ERN ZONES.

SATURDAY NIGHT...THE PWAT ANOMALIES ARE ONLY 1-2 STANDARD DEVIATIONS ABOVE NORMAL NOW...ESPECIALLY IN THE SOUTHERN ZONES. THE SECONDARY SFC WAVE IS NEAR THE DELMARVA REGION WITH THE BEST QG LIFT DUE TO THE STRONG DIFFERENTIAL THICKNESS ADVECTION COUPLED

WITH THE DIFFERENTIAL VORTICITY ADVECTION IMPACTING THE REGION. THE BEST LOW/MID LEVEL FRONTOGENESIS IN THE H850-700 LAYER IS SITUATED NEAR THE ERN CATSKILLS...MID HUDSON VALLEY...AND NW CT. THE STRONG THETA-E ADVECTION FOCUSED BY THE NOSE OF THE LLJ SHOULD BRING RAIN...HEAVY AT TIMES...FROM THE CAPITAL REGION SOUTH /EXCEPT WHERE DOWNSLOPING COMES INTO PLAY/. THE ECMWF SHOWS THE CONVEYOR BELT OF MOISTURE SLOWLY SHIFTING NORTHWARD THROUGH THE NIGHT ACROSS THE REGION. SOME WIND GUSTS COULD APPROACH ADVISORY LEVELS OVER THE HIGHER TERRAIN OF THE SRN GREENS...BERKS...TACONICS...AND CATSKILLS. WILL CONTINUE MENTION IN THE HWO.

THE 00Z GEFS PLUME DIAGRAM IS STRANGE FOR KALB WITH MANY SNOW MEMBERS DURING THE LATE SAT-SAT NIGHT TIME FRAME. NOT SURE WHERE ALL THE COLD AIR WILL COME FROM. ACTUALLY THE GFS WITH ITS 00Z SOLUTION WILL WRAP SOME IN FROM THE NORTH AND EAST. BOTTOM LINE HEAVIEST RAINFALL LOOKS TO FALL IN THE OVERNIGHT PERIOD. THIS COULD BRING SOME FLOOD ISSUES. WILL WAIT FOR THE DAY CREW TO COORDINATE WITH THE NERFC ON POTENTIAL LOCATIONS FOR POSSIBLE FLOOD THREAT. RIGHT NOW...THE BEST CHANCE OF 2-4 INCHES OF RAINFALL LOOKS TO BE GREENE...ULSTER...COLUMBIA...DUTCHESS...BERKSHIRE AND LITCHFIELD COUNTIES...WITH A SHARP GRADIENT NORTHWARD...WHERE AROUND AN INCH OCCURS IN THE CAPITAL REGION...MOHAWK VALLEY...AND SRN VT...AND MAYBE A HALF AN INCH TO AN INCH NORTHWARD. DOWNSLOPING COULD PRODUCE SOME VERY LOW TOTALS IN THE UPPER HUDSON/LAKE GEORGE REGION. THE EASTERN SLOPS OF THE CATSKILLS COULD GET THE HEAVIEST RAINFALL. THERE WILL ALSO BE SOME SNOW MELT...BUT LATE MODEL PROJECTIONS DO NOT HAVE DEW POINTS SURGING MUCH HIGHER THAN THE 30S.

WE FOLLOWED THE NAM THERMAL PROFILES...AND SOME COLDER AIR MAY

MOVE INTO THE BOUNDARY LAYER AFTER MIDNIGHT CHANGING THE PCPN TO SOME SLEET AND FREEZING RAIN...ESPECIALLY OVER THE WRN AND SRN ADIRONDACK REGION. WE PLACED CHANCE VALUES FOR THIS PTYPE TRANSITION.

SUNDAY...PERIODS OF RAIN TRANSITION TO SCATTERED SHOWERS IN THE AFTERNOON FROM WEST TO EAST. WE CONTINUED TO FOLLOW THE NAM THERMAL PROFILES WITH A SLIGHT MIX OVER THE NORTHWESTERN ZONES WITH MARGINAL BOUNDARY LAYER TEMPS THAT ARE SUB FREEZING.
AS BOUNDARY LAYER TEMPS WARM ABOVE FREEZING THIS WOULD CHANGE TO RAIN. IF THE BOUNDARY LAYER TEMPS COOL ENOUGH WITH COLDER AIR COMING IN ALOFT...THEN THIS COULD BE SOME WET SNOW OVER THE ERN CATSKILLS...PARTS OF THE SRN ADIRONDACKS...AND SRN GREENS AND BERKS. RIGHT NOW...WE HAVE STAYED WITH RAIN AS THE MAIN PTYPE IN THE AFTERNOON. MAX TEMPS WILL GENERALLY BE IN THE 40S...WITH SOME MID TO UPPER 30S OVER THE CATSKILLS.

OVERALL...THE HEAVIEST QPF WILL BE DICTATED BY THE TRACK OF THE CUTOFF...WHICH COULD YIELD A TREMENDOUS GRADIENT OF PCPN...WITH SHADOWING/DOWN SLOPING ALSO CUTTING DOWN ON THE PCPN.

&&
$$
SYNOPSIS...WASULA
SHORT TERM...WASULA

From keyser@atmos.albany.edu Mon Mar 15 15:50:51 2010
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
	cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=1.0 required=8.0 tests=AWL,UPPERCASE_75_100

autolearn=no version=3.2.5
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id o2FFoo409525;
Mon, 15 Mar 2010 15:50:50 GMT
Received: (from keyser@localhost)
by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id o2FFooh00682;
Mon, 15 Mar 2010 15:50:50 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <201003151550.o2FFooh00682@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Mon. 3/15/10
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Mon, 15 Mar 2010 15:50:50 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Monday 15 March 2010

Barbara,

For possible incorporation into the next six-month CSTAR report.

CSTAR cutoff low research is mentioned by Hugh Johnson in the fourth
paragraph of the near-term section of yesterday afternoon's AFD issued
by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 142113

AFDALY

AREA FORECAST DISCUSSION

NATIONAL WEATHER SERVICE ALBANY NY

510 PM EDT SUN MAR 14 2010

.SYNOPSIS...

A WEAKENING STORM OFF THE DELMARVA PENINSULA WILL VERY SLOWLY PULL

AWAY THROUGH MONDAY. BY TUESDAY...LARGE HIGH PRESSURE WILL BUILD IN

FROM THE WEST BRINGING A RETURN TO SUNNIER MILDER WEATHER FOR MUCH

OF THE REMAINDER OF THE WORKWEEK.

&&

.NEAR TERM /THROUGH MONDAY/...

THE NOR`EASTER THAT BROUGHT THE WORST OF THE WEATHER TO OUR SOUTH AND EAST OF OUR REGION...WAS JUST IN THE BEGINNING OF "DECAYING" AS THE UPPER AIR COMPONENT HAS BECOME VERTICALLY STACKED ON TOP IT OFF THE DELMARVA PENINSULA...CUTTING OFF WARM MOIST AIR TO ITS CENTER. THIS STORM WILL TAKE ITS TIME TO MOVE OFF TO THE EAST AND SOUTH THROUGH MONDAY.

THIS STORM HAS BROUGHT MARGINAL PROBLEMS TO OUR REGION...AS MUCH AS

3.50 INCHES OF RAINFALL TO NEW HARTFORD CT AND UP TO 10 INCHES OF SNOW TO THE SUMMIT OF WINDHAM MOUNTAIN. PLEASE REFER TO OUR PUBLIC STATEMENTS (PNS) FOR ALL THE COOP/WEATHER SPOTTER AND COCORAHS SURFACE OBSERVATIONS REGARDING THIS STORM. THE NOR`EASTER BROUGHT

SOME MINOR WIND DAMAGE TO THE BERKSHIRES AS WELL SOME POWER OUTAGES.

SOME MINOR RIVER FLOODING HAS BEEN NOTED ON THE HOUSATONIC BASIN.

EVEN SO...WE DODGED THE WORST BULLET AS OKX AREA GOT HIT A LOT HARDER WITH THE RAIN AND WIND.

WHILE THE MAIN WARM CONVEYOR BELT AND DEEP FRONTOGENESIS ASSOCIATED

WITH THE STORM HAS SHIFTED WELL NORTHEAST OF OUR REGION...WE STILL HAVE SCATTERED SHOWERS (OF RAIN) ON THE SCOPE. A SIGNIFICANT DRY SLOT HAS WRAPPED INTO THE STORM CENTER. HAVING SAID THAT... LOOKING AT THE H20 WATER LOOP...ANOTHER IMPRESSIVE VORTICITY SPOKE (OR SHORT WAVE) IS SPINNING AROUND THE UPPER AIR LOW...TAKING AIM AT SOUTHERN NEW ENGLAND. THIS DISTURBANCE HAS SOME CLOUD TO GROUND LIGHTNING STRIKES ASSOCIATED WITH IT. AS THIS DISTURBANCE MOVES INTO OUR REGION...ANY CONVECTION WILL LIKELY DISSIPATE AS IT ENCOUNTERS A LOWERING SUN ANGLE AND THEREFORE MORE STABLE AIR. ALSO...THIS DISTURBANCE IS MOVING AWAY FROM THE STRONG UPPER LEVEL JET. CSTAR RESEARCH HAD INDICATED THE SPOKES OF VORTICITY...ROTATING AROUND A CLOSED LOW...DELIVER THE BEST PUNCH WHEN ASSOCIATED WITH THE LEFT FRONT QUAD OF A SPEED MAX...BUT AGAIN THIS DISTURBANCE IS MOVING AWAY FROM THE JET SOURCE.

ALSO...SINCE THE MID LEVEL FLOW REMAINS FROM AN ESE DIRECTION...DOWNSLOPING WILL CONTINUE TO MITIGATE THE AMOUNTS OF SHOWERS WORKING INTO THE HUDSON VALLEY INTO THE EVENING . HOWEVER...WITH TIME...AS THE FLOW BACKS TO MORE OF THE NORTHEAST AND EVEN NORTHERLY DIRECTION...THIS DOWNSLOPING FACTOR WILL WEAKEN. A WEAK DEFORMATION ZONE WILL LIKELY SET UP...PROBABLY JUST NORTH AND WEST OF ALBANY WHICH COULD PRODUCE MORE NUMEROUS/WIDESPREAD SHOWERS

BACK INTO THE REGION TONIGHT. REST ASSURE...THESE SHOWERS WILL BE A

LOT LIGHTER THAN THE HEAVY RAINFALL OF LAST NIGHT SINCE WE HAVE LOST THE DEEP SURGE OF MOISTURE. WE ARE FORECASTING ADDITIONAL QPF AMOUNTS OF GENERALLY UNDER A QUARTER INCH OR LESS...LOWEST IN THE VALLEY AREAS.

TEMPERATURES ARE WELL ABOVE FREEZING EVERYWHERE SO WHAT IS FALLING
IS RAIN. TONIGHT...AS TEMPERATURES COOL DUE TO RADIATIONAL COOLING AND COLD AIR ADVECTION...AS THE FLOW TURNS MORE NORTHERLY...TEMPERATURES WILL BECOME COLD ENOUGH FOR SNOW AGAIN...MAINLY ACROSS THE HIGHER ELEVATIONS. WE EXPECT AN INCH OR TWO OF SNOW ACROSS PORTIONS OF THE HIGHER ELEVATIONS...NOT ENOUGH FOR ANY ADDITIONAL HEADLINES. THE VALLEYS WILL LITTLE IF ANY SNOW ACCUMULATION.

WE WILL STILL BE DEALING WITH THIS SYSTEM ON MONDAY...BUT FINALLY AN UPSTREAM KICKER OVER THE FOUR CORNERS WILL BEGIN SENDING IT PACKING.
THE FLOW WILL TURN MORE NORTHERLY WHICH WILL ALLOW A FEW MORE DISTURBANCES PINWHEELING AROUND IT...TO BRING MORE SCATTERED SHOWERS
ACROSS THE REGION. AGAIN THESE WILL BE LIGHT.

WENT WITH THE WARMER MET NOS TONIGHT. MAV NUMBERS JUST LOOK TOO COLD. LOW TEMPERATURES WILL BE 35-40 VALLEY LOCATIONS...30-35 HIGHER TERRAIN. MONDAY...WENT WITH A BLEND OF THE WARMER METS/COOLER MAV NOS. LOOK FOR HIGHS GENERALLY 40-45 VALLEY LOCATIONS...ONLY 35-40 ACROSS THE HILLTOWNS AND MOUNTAINS. THESE VALUES ARE ACTUALLY CLOSE
TO NORMAL FOR MID MARCH.

&&
$$

SYNOPSIS...HWJIV

NEAR TERM...HWJIV

From keyser@atmos.albany.edu Mon Mar 22 17:46:00 2010

Return-Path: <keyser@atmos.albany.edu>

X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on

cypress.atmos.albany.edu

X-Spam-Level:

X-Spam-Status: No, score=1.0 required=8.0 tests=AWL,UPPERCASE_75_100

autolearn=no version=3.2.5

Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])

by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id o2MHk0424843;

Mon, 22 Mar 2010 17:46:00 GMT

Received: (from keyser@localhost)

by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id o2MHk0P03761;

Mon, 22 Mar 2010 17:46:00 GMT

From: Dan Keyser <keyser@atmos.albany.edu>

Message-Id: <201003221746.o2MHk0P03761@tigger.atmos.albany.edu>

Subject: Input for next CSTAR 6-month report: Mon. 3/22/10

To: BZampella@uamail.albany.edu (Barbara Zampella)

Date: Mon, 22 Mar 2010 17:45:59 +0000 (GMT)

Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu

X-Mailer: ELM [version 2.4ME+ PL39 (25)]

MIME-Version: 1.0

Content-Type: text/plain; charset=US-ASCII

Content-Transfer-Encoding: 7bit

Status: RO

Monday 22 March 2010

Barbara,

For possible incorporation into the next six-month CSTAR report.

The Hudson-Mohawk convergence zone is cited in the last paragraph of
the short-term section of yesterday afternoon's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 212012
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
412 PM EDT SUN MAR 21 2010

.SYNOPSIS...
OUR SPRING WARM UP AND DRY WEATHER THE PAST SEVERAL DAYS WILL DEPART AND ALLOW FOR A STORM SYSTEM TO APPROACH FROM THE SOUTHWEST. RAINFALL WILL OVERSPREAD THE REGION MONDAY AND BECOME STEADY DURING THE AFTERNOON AND NIGHTTIME HOURS. THE STORM WILL TRACK SLOWLY AND DEPART THE REGION ON WEDNESDAY WITH SOMEWHAT COOLER AIR FOR A LITTLE SNOW INTO THE HIGHER TERRAIN.

&&

SHORT TERM /MONDAY THROUGH TUESDAY NIGHT/...
...POTENTIAL FOR FLOODING FROM RAINFALL AND SNOWMELT REMAINS...
LATEST NCEP MODEL SUITE AND INTERNATIONAL GUIDANCE CONTINUE TO REVEAL A MODERATE RAINFALL EVENT THROUGH THE SHORT TERM PERIOD. BASED ON THE LOW FFG/S AND RESIDUAL SNOWPACK ACROSS THE CATSKILLS

AND HELDERBERGS WITH 1-2" OF RAIN EXPECTED...WILL ISSUE A FLOOD WATCH FOR THIS AREA ONLY AT THIS TIME. WE EXPECT THIS WATCH TO BE EXPANDED AND WILL AWAIT FUTURE GUIDANCE...TRENDS AND TIMING.

WITH THE APPROACH OF THE SOUTHERN STREAM STORM...THIS WILL INCREASE THE F-GEN RESPONSE...DIFFLUENCE ALOFT...INCLUDING MOISTURE FOR A WIDESPREAD RAINFALL EVENT TO EVOLVE MONDAY AND BECOME MODERATE IN INTENSITY LATE MONDAY INTO MONDAY NIGHT. WITH A EAST-SOUTHEAST TRAJECTORY ALONG WITH MOISTURE ENTRAINMENT FROM THE ATLANTIC...THE HIGHER TERRAIN COULD EXPERIENCE THE HIGHER RAINFALL AMOUNTS...HENCE THE FLOOD WATCH. IN ADDITION...THE 850MB U-COMPONENT OF WIND STANDARD DEVIATION FORECAST POINTS TOWARD -3 WITH PWATS NEAR +2 AS VALUES ARE EXPECTED AROUND 1". THE RAIN WILL DECREASE IN COVERAGE AND INTENSITY ON TUESDAY AS MID LEVEL DRY SLOT ROTATES NORTHWARD AROUND THE PERIPHERY OF THE UPPER LOW EXPECTED TO BE OVER THE MID ATLANTIC TUESDAY MORNING. THIS WILL LIKELY RESULT IN PERIODS OF VERY LIGHT RAIN/DRIZZLE WITH A HIGHER CONCENTRATION OF PRECIP INTO THE TERRAIN.

AS THIS STORM DEPARTS OFF THE MID ATLANTIC COAST...THE COMBINATION OF DEFORMATION DYNAMICS AND POTENTIAL FOR MOHAWK VALLEY CONVERGENCE PER CSTAR RESEARCH LINGERS TUESDAY NIGHT. IN FACT...BOUNDARY LAYER TEMPS COOL OFF TO A POINT FOR RAIN/SNOW MIXTURE FOR ELEVATIONS ABOVE 1000 FEET.

&&

$$

SYNOPSIS...BGM

SHORT TERM...BGM

From keyser@atmos.albany.edu Mon Mar 22 17:53:13 2010
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.5 (2008-06-10) on
        cypress.atmos.albany.edu
X-Spam-Level: *
X-Spam-Status: No, score=1.2 required=8.0 tests=AWL,UPPERCASE_75_100
        autolearn=no version=3.2.5
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
        by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id o2MHrC425554;
        Mon, 22 Mar 2010 17:53:12 GMT
Received: (from keyser@localhost)
        by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id o2MHrCd03775;
        Mon, 22 Mar 2010 17:53:12 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <201003221753.o2MHrCd03775@tigger.atmos.albany.edu>
Subject: Additional input for next CSTAR 6-month report: Mon. 3/22/10
To: BZampella@uamail.albany.edu (Barbara Zampella)
Date: Mon, 22 Mar 2010 17:53:12 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Monday 22 March 2010

Barbara,

For possible incorporation into the next six-month CSTAR report.

CSTAR cutoff low research is mentioned by Tom Wasula in the second line of the third paragraph of the short-term section of this morning's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 220851
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
450 AM EDT MON MAR 22 2010

.SYNOPSIS...
A STORM SYSTEM WILL SLOWLY MOVE INTO THE UPPER MID ATLANTIC REGION TODAY...BRINGING PERIODS OF RAIN THAT WILL BECOME HEAVY AT TIMES TONIGHT. THE SURFACE LOW WILL PASS OVER SOUTHERN NEW ENGLAND ON TUESDAY WITH CONTINUED SCATTERED SHOWERS. COLDER AIR WILL FILTER IN TUESDAY NIGHT INTO WEDNESDAY WITH A LITTLE WET SNOW OVER THE HIGHER TERRAIN...ESPECIALLY NORTH OF THE GREATER CAPITAL REGION.

&&

SHORT TERM /TONIGHT THROUGH WEDNESDAY NIGHT/...
...FLOOD WATCH CONTINUES FOR THE EASTERN CATSKILL REGION...HELDERBERGS...AND THE SCHOHARIE VALLEY THROUGH TUESDAY NIGHT...

SOME SNOW MELT IS LIKELY OVER THE CATSKILL REGION WITH TEMPS IN THE U40S TO NEAR 50S...AND DEWPOINTS IN THE LOWER TO MID 40S DURING THE DAY. WE ARE EXPECTING THE HEAVIEST RAINFALL TO BE IN THE OVERNIGHT PERIOD...AS ENHANCED QG LIFT OCCURS IN THE NORTHEAST QUADRANT OF THE SFC LOW ASSOCIATED WITH THE CUTOFF. THE GLOBAL ENSEMBLES SHOW AN EASTERLY H850 LOW LEVEL WIND ANOMALY OF 1-3 STANDARD DEVIATIONS ABOVE NORMAL. THIS -U COMPONENT ANOMALY IS A FAR CRY FROM LAST WEEKS SIGNIFICANT STORM...BUT IT SHOULD STILL TAP ATLANTIC MOISTURE WITH OROGRAPHIC ENHANCEMENT ALONG THE ERN SPINE OF THE CATSKILLS...AND THE ADIRONDACKS. ACTUALLY...THE ANOMALY STRENGTHENS FURTHER NORTH OVER NRN NY TOWARDS 12Z TUE...AND WE BELIEVE THIS IS WHY THE OPERATIONAL GFS RUN HAS THE HEAVIEST QPF OVER NRN AND CNTRL NY. ALSO...THE SFC WAVE IS INITIALIZED FURTHER NORTH THAN THE NAM. THE NAM IS PUZZLING WITH A FEW CONVECTIVE BULLSEYES OF QPF OVER PORTIONS OF CT. WE BELIEVE THE 00Z NAM IS SUFFERING WITH SOME CONVECTIVE FEEDBACK ISSUES. THE SHOWALTER VALUES NEVER FALL BELOW ZERO IN THE AT AREA. NONETHELESS...STRONG LOW LEVEL THETA-E ADVECTION WILL OCCUR IN THE BOUNDARY LAYER TO WARRANT PERIODS OF RAIN...HEAVY AT TIMES.

THE BIGGEST CHALLENGE IN THE OVERNIGHT PERIOD WITH THIS PESKY CUTOFF LOWS PER CSTAR RESEARCH...IS WHERE THE HEAVIEST QPF WILL FALL. THE
NAM IS THE WETTEST...AND THE GFS...CAN GGEM...AND THE LATEST ECMWF ARE LESS IMPRESSIVE WITH A HALF AN INCH TO AN INCH AND HALF OVER THE AREA. WE ARE GOING TO STICK WITH 1-2 INCHES OF RAIN...WITH THE HEAVIEST TOTALS SOUTH OF THE CAPITAL DISTRICT...AND ALONG THE EASTERN SIDE OF THE CATSKILLS. BASED ON THE COLLABORATION WITH BOX...AND OKX...WE ARE NOT CERTAIN AND CONFIDENT ABOUT THE FLOOD POTENTIAL FOR NW CT. SOME GUIDANCE SHOWS AN INCH OF RAIN...AND THE NAM SHOWS CLOSER TO 3 INCHES. THERE IS NO SNOW LEFT TO MELT /EXCEPT IN ISOLD PATCHES/ SOUTH OF THE NRN BERKSHIRES.

WE WILL LOOK FOR MORE CONSISTENCY BEFORE ADDING THIS AREA TO A WATCH. WE WILL BE ADDING ERN ULSTER AND ERN GREENE COUNTIES TO THE WATCH. THESE AREAS HAVE THE BEST CHANCE OF SNOW MELT...HIGH FLOWS...AND THE RUNOFF FROM THE RAINFALL TO POTENTIALLY CAUSE SOME MINOR FLOODING. SEE THE HYDRO SECTIONS FOR EVEN FURTHER DETAILS.

TUESDAY...THE STRONG PV ANOMALY WITH THE CUTOFF WHICH LOWERS THE THE DYNAMIC TROPOPAUSE TO ABOUT 400 HPA ACCORDING TO THE GFS SHIFTS OFF THE MID ATLANTIC COAST. THE SFC REFLECTION OF THE CUTOFF MOVES OVER SRN NEW ENGLAND. WE LOSE THE WARM CONVEYOR BELT
TO THE SYSTEM. MUCH OF THE FORECAST AREA WILL SEE THE STEADY RAIN TRANSITION TO SCATTERED SHOWERS AND DRIZZLE. COOL AND DANK CONDITIONS WILL PREVAIL...WITH THE LOW AND MID LEVEL DEFORMATION ZONE DRIVING THE LIFT FOR THE CONTINUED PCPN THROUGH THE DAY.

TUESDAY NIGHT INTO WEDNESDAY... THE CUTOFF IS SOUTHEAST OF CAPE COD INITIALLY WITH THE SFC LOW EAST OF THE GULF OF MAINE. THE COLD CONVEYOR BELT TO THE SYSTEM WILL ALLOW COLDER AIR TO SEEP IN AND TRANSITION THE LEFTOVER QPF TO SNOW OVER THE HIGHER TERRAIN. RIGHT NOW...SNOW LEVELS MAY FALL TO 1000 FEET. THE BEST CHANCE OF ACCUMULATING A FEW INCHES OF WET SNOW WILL BE OVER THE SRN GREEN MTNS...AND THE SRN ADIRONDACKS. THE COLDER TEMPS WILL SLOW DOWN THE RUNOFF. THE LOWS WILL BE IN THE U20S TO M30S IN THE VALLEYS...AND 20S TO NEAR 30 OVER THE HILLS AND MTNS. W/NW FLOW ALOFT WILL GRIP THE REGION ON WED WITH LINGERING FLURRIES AND SNOW SHOWERS OVER THE MTNS NORTH AND WEST OF KALB. MOST VALLEY LOCATIONS WILL EXPERIENCE DOWNSLOPING. BLUSTERY AND COLDER CONDITIONS WILL DOMINATE WITH H850 TEMPS IN THE -3C TO -6C RANGE.

WEDNESDAY NIGHT...WEAK HIGH PRESSURE BUILDS IN FROM SRN QUEBEC...AND THE ERN GREAT LAKES REGION WITH DRY AND COLD WEATHER. EXPECT LOWS TO FALL BELOW FREEZING EVERYWHERE...WITH SOME TEENS

AND 20S NORTH OF THE CAPITAL DISTRICT AND MOHAWK VALLEY.

&&

$$

SYNOPSIS...WASULA

SHORT TERM...WASULA