UNIVERSITY AT ALBANY
State University of New York

Department of Atmospheric and Environmental Sciences
College of Arts and Sciences

27 November 2013

Dr. Christopher Hedge
1325 East-West Highway
SSMC2; Mailcode W/OST12
Room 15360
Silver Spring, MD 20910

Dear Dr. Hedge:

We are transmitting a summary of our CSTAR IV project activities for the six-month period ending 31 October 2013. Research conducted during this period has continued to address both cool- and warm-season heavy precipitation events and forecasting problems over the Northeast U.S.

Two graduate students who have been funded by the CSTAR IV project continued to perform research leading to their M.S. theses during the present reporting period: Jaymes Kenyon and Kyle Meier. Their respective research projects and NWS focal points are: 1) Mesoscale substructure in winter storms (Michael Evans, WFO BGM; section 1a), and 2) Thundersnow in conjunction with heavy snowfall events (Michael Jurewicz, WFO BGM; section 1b). During the present reporting period, second-year UAlbany graduate student Adrian Mitchell began working on his M.S. thesis on the topic of synoptic and mesoscale features in cool-season cyclones associated with significant upper-level easterly wind anomalies (NWS focal points: John Quinlan and Neil Stuart, WFO ALY; section 1c).

During the present reporting period, UAlbany Co-PIs, graduate students, and NWS personnel had planned to participate in the Fall 2013 CSTAR meeting and NROW-XIV, which were to be held in Albany, NY, during late October 2013, but were postponed until 9-11 December 2013 because of the government shutdown. CSTAR-related research was presented at the 15th American Meteorological Society Conference on Mesoscale Processes, held in Portland, OR, on 6-9 August 2013, and at the 16th Cyclone Workshop, held in Sainte-Adele, Quebec, Canada, on 22-27 September 2013 (see section 2c).

Documentation of CSTAR-related refereed publications is provided in section 2d. An NWS perspective on CSTAR IV project activities is provided by Warren Snyder in section 3, where it is concluded that the CSTAR IV project continues to contribute to the CSTAR legacy of completing operationally focused research, engaging the academic community at a high level, providing the NWS with top-quality applicants, and enabling the involvement of dozens of operational meteorologists from numerous NWS offices in applied research and conferences. In addition to these benefits to the NWS that accrue from CSTAR research, there is the rapid

Earth Sciences 351
Albany, New York 12222
PH: 518-442-4466 or 4556 FX: 518-442-5825
Email: Chair@atmos.albany.edu
www.atmos.albany.edu

transfer of emerging project results into operational forecasting practice. Examples documented in this report include warm-season cutoff lows, predecessor rain events, warm-season precipitation forecasting, inland extent of lake-effect precipitation bands, and high-wind research.

Section 4 follows with summaries of project activities and work performed during the present reporting period by NWS personnel at WFO ALY and participating WFOs in the Northeast (section 4a). Section 4b contains a comprehensive status and progress report on the "Snyder Plan," which continues to provide a robust and sustainable governing framework for NWS participation in cooperative research and technology transfer. Section 5 describes activities performed by David Knight that address various computing and technology transfer issues. Finally, examples of UAlbany CSTAR project research that has transitioned into NWS forecast operations are documented chronologically in section 6 in the form of AFDs that explicitly refer to UAlbany CSTAR project research during the present reporting period. These examples have been cited in the closing sentence of the previous paragraph.

The longstanding CSTAR research partnership between the NWS and the UAlbany Department of Atmospheric and Environmental Sciences recently has been recognized and publicized by the UAlbany administration on the occasion of the start-up of the CSTAR V project through the following press release: http://www.albany.edu/news/44499.php.

In closing, the UAlbany CSTAR IV project continues to address research on high-impact cool- and warm-season forecasting problems in the Northeast that leverages the activities of the UAlbany Co-PIs and graduate students for the benefit of NWS forecast operations in the ER and other NWS regions.

Sincerely,

Lance F. Bosart
Professor

Daniel Keyser
Professor

cc: Raymond O'Keefe
Warren Snyder
Ken Johnson
Jeff Waldstreicher
Kristen Corbosiero
David Knight
Jaymes Kenyon
Kyle Meier
Adrian Mitchell

"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: NA01NWS4680002

Date: 27 November 2013

SECTION 1: Summary of Graduate Student Research Activities

(a) Mesoscale Substructure in Winter Storms (Jaymes Kenyon)
Focal Point: Mike Evans, National Weather Service, Binghamton, NY

Research Summary (1 May 2013 – 31 October 2013):

The distribution of snowfall accumulation attending winter storms is a product of both precipitation intensity and duration. Many heavy snowfall events are associated with distinct mesoscale snowbands which strongly modulate snowfall accumulation. Mesoscale snowbands are known to be favored within environments characterized by frontogenetical forcing in the presence of weak moist symmetric or gravitational stabilities. Although the development of mesoscale snowbands often can be successfully anticipated at 24−36 h forecast ranges, anticipating band duration at a fixed location remains a forecasting challenge. However, given that snowband duration is closely related to attributes of snowband motion, improved understanding of band motion presents an opportunity to improve snowfall accumulation forecasts, which is the objective of this research.

A classification scheme for snowband motion has been developed and utilized to categorize snowband events that were observed across 70 study cases. The intent of this scheme was to classify a large population of banded events within relatively few categories while making operationally meaningful distinctions concerning snowband motion. Four categories of snowband motion are described in this scheme:

- *Laterally translating* snowbands exhibit predominantly cross-axis motion, thereby favoring uniform snowfall accumulation within the regions they traverse.
- *Laterally quasi-stationary* snowbands exhibit near-zero cross-axis motion, favoring heavy snowfall accumulation along a narrow, along-axis corridor.
- *Hybrid* snowbands are dominated by along-axis motion, but with a concurrent cross-axis component of motion, favoring snowfall accumulation on an intermediate spatial scale.
- *Pivoting* snowbands exhibit pronounced rotation such that a segment of the band near the center of rotation exhibits near-zero cross-axis motion. This segment of the band is termed the *pivot zone*, where heavy snowfall accumulation is particularly favored.

These snowband motion categories within the hierarchy of study cases and banded events are shown by the flowchart in Fig. 1. For the banded events identified, a motion category was assigned using animated radar reflectivity mosaics in accordance with the geometric relationships shown in Fig. 2. The resulting distribution of banded events by motion category is summarized in Fig. 3.

Recent work has focused on generalizing the results of earlier case studies through the use of composite analysis. An event-centered compositing algorithm was applied to banded events within the laterally translating, laterally quasi-stationary, and pivoting categories. Only those banded events whose band azimuthal orientations were within 20° of the category mean were retained in the respective composites. This restriction ensured that along- and across-band variations in the diagnostic fields would not become overly smoothed in the composite field due to large differences in member band orientations. Fortunately, relatively few banded events were excluded from composite calculations: the composite retention rate was lowest for the pivoting category, with 18 of 26 events (69%) retained in the composite. This event-centered compositing approach facilitated the identification of common environmental attributes

associated with a given category. Results are available for viewing at the following URL: http://www.atmos.albany.edu/student/jkenyon/composite_browser.htm. Specific to each composited category, the following environmental characteristics have been found to occur generally:

(i) Laterally translating snowbands are associated with midlevel diffluent frontogenetical flow, often to the east or northeast of surface cyclones and beneath the equatorward entrance region of west–east-oriented upper-level jet streaks. Midlevel warm advection occurs along the band axis, with a warm advection maximum immediately to the warm side of the band. Consistent with warm advection, hodographs near the centroids of laterally translating snowbands often exhibit veering winds with height, with clockwise hodograph curvature often present below 2 km MSL. Q_n vectors are frontogenetical and convergent along the band axis, while the largest Q_s vectors are found near the upshear and downshear flanks of the band, where they are oppositely directed and convergent on the band. The conceptual model for laterally translating snowbands is shown in Fig. 4 (top panel).

(ii) In contrast, laterally quasi-stationary snowbands are associated with midlevel confluent frontogenetical flow, often to the north of relatively weak surface cyclones and beneath the equatorward entrance region of southwest–northeast-oriented upper-level jet streaks. Weak to neutral midlevel temperature advection occurs along the band axis, with midlevel temperature advection tending to exhibit a sign reversal across the band axis, with warm (cold) advection on the warm (cold) side of the band. Consequently, hodographs near the centroids of laterally quasi-stationary snowbands are often approximately straight and radially parallel, and may pass near the origin (indicating weak flow) at some level above the surface. Q_n vectors are frontogenetical and convergent along the band axis, while Q_s vectors and Q_s-vector convergence are both small in magnitude along and near the band. The conceptual model for laterally quasi-stationary snowbands is shown in Fig. 4 (middle panel).

(iii) Finally, pivoting snowbands are associated with midlevel frontogenesis in the northwest quadrant of cyclones, often adjacent to the dry slot–comma head interface. Midlevel temperature advection typically exhibits a pronounced warm–cold dipole oriented approximately parallel to the band, with pronounced midlevel warm advection found within the pivot zone. Hodographs near the pivot zones of pivoting snowbands often exhibit strongly veering winds with height and clockwise hodograph curvature. Q_n vectors are convergent along the band axis. However, this Q_n-vector convergence has contributions from both frontogenetical Q_n vectors (mainly downshear of the pivot zone) and frontolytical Q_n vectors (upshear of the pivot zone). Q_s vectors are downshear-directed and convergent along a majority of the band axis, with the largest Q_s vectors located upshear of the pivot zone. The conceptual model for pivoting snowbands is shown in Fig. 4 (bottom panel).

The foregoing considerations suggest that forecast diagnostic fields that are routinely available in operational centers can be utilized to ascertain snowband motion characteristics. Explicit consideration of band motion and its effect on snowfall accumulation may help to inform warning decisions and may also aid in the identification of meteorological situations that are particularly prone to errors in precipitation accumulation forecasts.

This research project is nearing completion, and work is ongoing to complete a written thesis. Later publication of this work in a peer-reviewed journal is a goal.

National Weather Service Interactions:

Correspondence between Jaymes Kenyon (UAlbany), Mike Evans (WFO Binghamton), Pete Banacos (WFO Burlington), Stacie Hanes (WFO Gray), and Frank Nocera (WFO Taunton) has been frequent. In keeping with the research-to-operations objective of this CSTAR project, Jaymes Kenyon will present this research as part of the Winter Weather Workshops conducted by WFOs Binghamton, Burlington, and Gray during November and December 2013.

Publications and Workshop Submissions:

Oral presentations of this research were delivered at the 15th Conference on Mesoscale Processes (8 August 2013, Portland, OR) and the 16th Cyclone Workshop (24 September 2013, Sainte-Adèle, QC). An oral presentation at the Northeast Regional Operational Workshop (December 2013) is also scheduled.

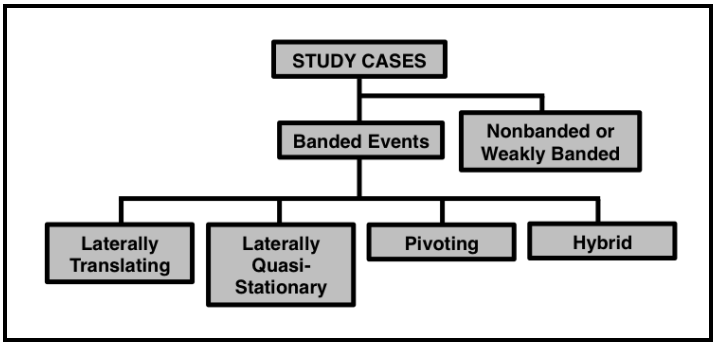

Fig. 1. Flowchart of the snowband motion classification scheme used in this study.

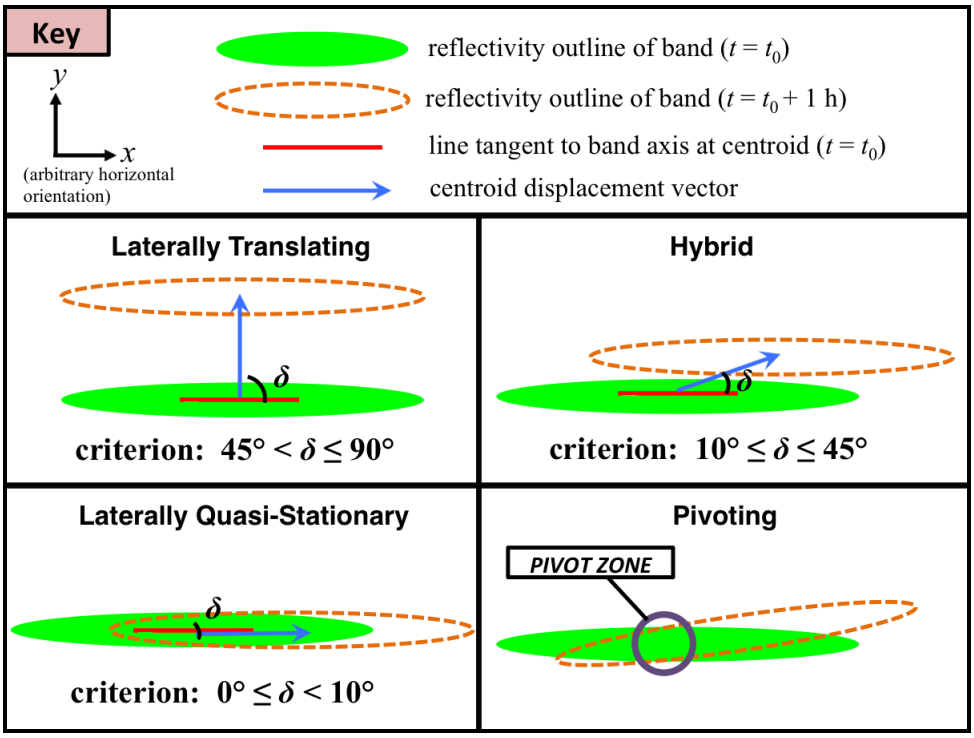

Fig. 2. Schematic representations of the four snowband motion categories and their defining criteria. The start of the 1-h period during which band motion is evaluated is denoted by t_0. Typically, the 20-dBZ reflectivity level is used to construct a band outline.

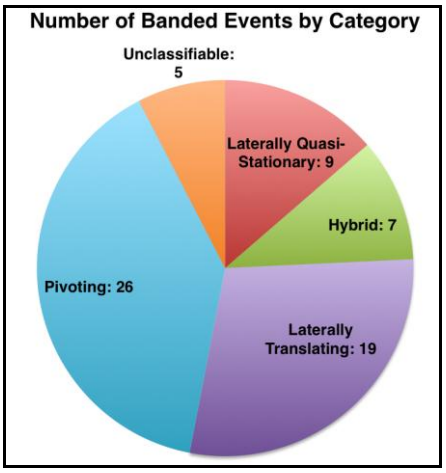

Fig. 3. Distribution of banded events by motion category. Events were deemed *unclassifiable* if significant spatial or temporal gaps in radar coverage precluded satisfactory band tracking.

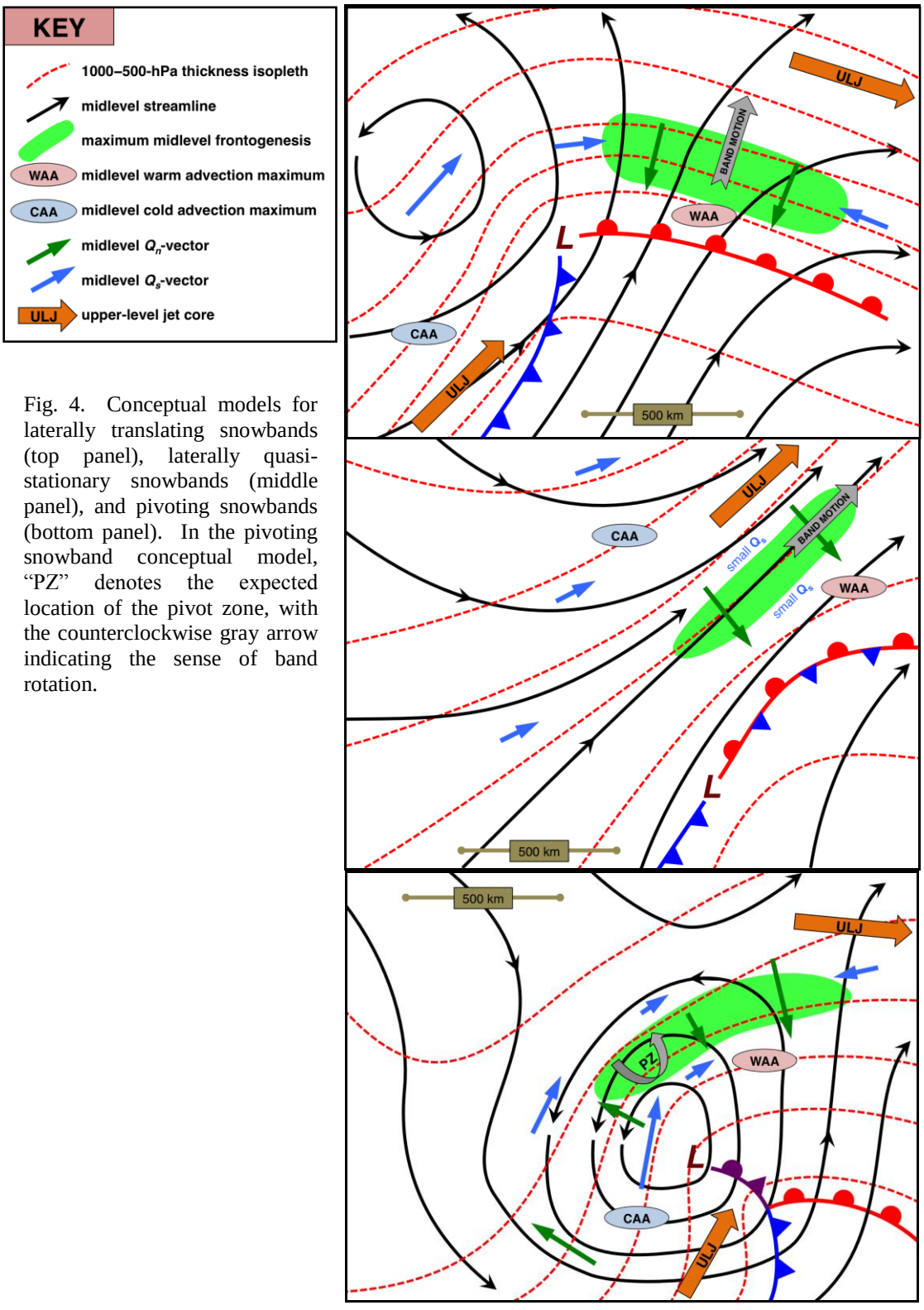

Fig. 4. Conceptual models for laterally translating snowbands (top panel), laterally quasi-stationary snowbands (middle panel), and pivoting snowbands (bottom panel). In the pivoting snowband conceptual model, "PZ" denotes the expected location of the pivot zone, with the counterclockwise gray arrow indicating the sense of band rotation.

(b) Regional Variability and Frequency of Thundersnow Events over the U.S. (Kyle Meier)
Focal Point: Michael L. Jurewicz, National Weather Service, Binghamton, NY

Research Summary (1 May 2013 – 31 October 2013):

A contiguous U.S. thundersnow climatology (1994–2012) was recently completed as a component of this CSTAR project. A starting year of 1994 was chosen due to limitations in archived WSR-88D data prior to that time, which makes it difficult to discern between different types of thundersnow events (e.g., lake-effect, orographic, associated with a cyclone). Over the summer of 2013, a dataset of archived weather information was purchased from Weather Graphics Technologies. The dataset contained hourly and off-hourly (i.e., SPECI) METAR surface observations from all ASOS and AWOS stations across the country. The surface observations were then scanned for all instances of TSSN, TSPL, and TSGS during the cool season months (October–March). After manually validating the data and eliminating false positives, a computer program was used to plot the reports on a map of the U.S. (Fig. 1). The sample size of reports was N = 2667 and the Intermountain West, central U.S., and Northeast/Great Lakes regions showed up as preferred regions for thundersnow to occur. Additionally, March was revealed as the preferred month for thundersnow to occur, with an upward trend in reports each month from October through March. These results agree closely with a coarser (N = 229 reports) thundersnow climatology constructed previously using 3-hourly observations for the period 1961–1990 (Market et al. 2002).

In an event-driven climatology, gaps in the results are inevitable due to the fact that there is varying coverage of ASOS/AWOS stations across the country. Thus an additional component of this research is to take advantage of National Lightning Detection Network (NLDN) data in order to fill in those gaps. An example of this utilization is shown in Fig. 2 for a thundersnow event that occurred across the Northeast U.S. on 12 February 2006. Six thundersnow reports were recorded and 27 lightning flashes were observed over the region where frozen precipitation occurred. The benefits of supplementing the surface observations with NLDN data were apparent in this event. First of all, the six METAR reports were verified due to the fact that one or more lightning flashes occurred in the near vicinity of each report. Secondly, NLDN data revealed locations where frozen precipitation and lightning occurred simultaneously (e.g., north of Baltimore, MD, west of Philadelphia, PA, south of Hartford, CT) but failed to be reported in a METAR report. In some cases, human forecasters may have failed to see lighting or hear thunder, an issue particularly relevant in wintertime thunderstorms where the frequency of lightning is lower and thunder may be damped due to falling snow. In other instances, the nearest ASOS/AWOS station may have been too far away from where lightning occurred to have been detected.

A future component of this research will seek to determine the dynamical and thermodynamic processes that contribute to regional thundersnow frequency and variability. Gridded datasets from the 0.5° resolution NCEP Climate Forecast System Reanalysis (CFSR) will be used to generate constant-pressure and vertical-profile composites of the environment preceding and during the occurrence of thundersnow across different regions of the U.S. Representative case studies also will be conducted to illustrate the various pathways in which thundersnow can occur. Additionally, the reasons as to why certain scenarios produce thundersnow while other similar-looking systems do not will be investigated. Analogous to summertime thunderstorm development, the three main ingredients for thundersnow are

moisture, instability, and a lifting mechanism. Instability is arguably the most important ingredient since it appears to be the chief factor that differentiates thundersnow from ordinary winter precipitation. Therefore, an emphasis will be placed on which instability regimes contribute to thundersnow frequency and variability over the U.S.

National Weather Service and Scientific Interactions:

Communication with Michael Jurewicz (WFO Binghamton) has occurred via email correspondence and will continue at the 2013 Fall CSTAR meeting. The author has been updating Chris Melick (CIMMS Research Associate) on his research progress via email. Additional discussion of thundersnow research ideas occurred with Dr. David Schultz (Professor of Synoptic Meteorology at the University of Manchester) at the 16th Cyclone Workshop in Quebec, Canada.

Publications and Workshop Submissions:

At the AMS 15th Conference on Mesoscale Processes on 6–9 August 2013, analyses of two thundersnow events from the 2012–2013 winter season were presented. On 8–9 February 2013, a historic blizzard associated with a deep cyclone (Fig. 3a) produced widespread snowfall totals of 20–40 in. across parts of New England. Thundersnow was reported in five states: NY, CT, MA, RI, and NH. On 16–17 February 2013, a strong cold front moved across the Carolinas on the morning of 16 February (Fig. 3b). Later in the afternoon, the main upper-level trough moved across the Carolinas, resulting in a second round of precipitation. Thundersnow was reported across several locations in NC and SC. Despite the contrasting synoptic-scale environments in which thundersnow occurred, similarities among the events included near-saturated conditions, weak moist symmetric stability, and strong updrafts in the lower-to-middle troposphere over the range of temperatures corresponding to the mixed-phase region of a thundercloud (Figs. 4 and 5).

Abstracts have been accepted to the rescheduled NROW XIV conference on 10–11 December 2013 and the AMS Annual Meeting on 2–6 February 2014. Additional results will be presented as they become available.

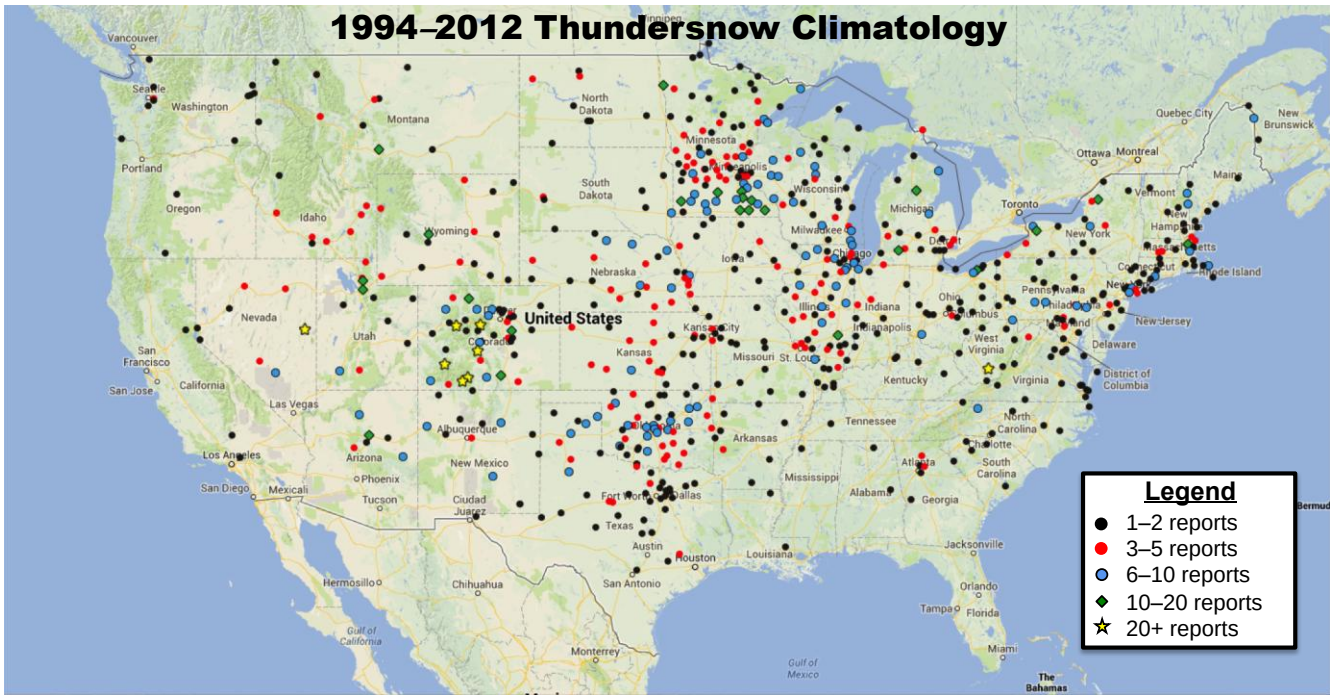

Fig. 1. Thundersnow climatology for the contiguous U.S. during 1994–2012. Each marker represents a range of thundersnow reports according to the legend given in the lower right corner.

Fig. 2. Thundersnow METAR reports (black stars) and NLDN lightning flashes (red dots) for a thundersnow event on 12 February 2006.

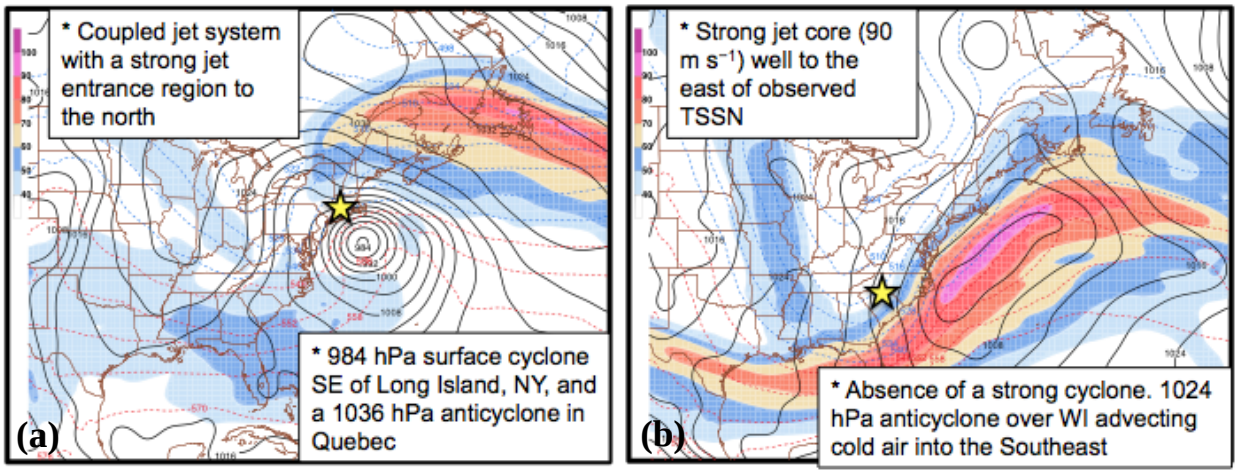

Fig. 3. 1000–500-hPa thickness (dashed, every 6 dam), mean sea level pressure (black, every 4 hPa), and 250-hPa wind speed (filled, every 10 m s^{-1} starting at 40 m s^{-1}) for (a) 0000 UTC 9 February and (b) 0000 UTC 17 February 2013. Yellow star denotes approximate position of TSSN.

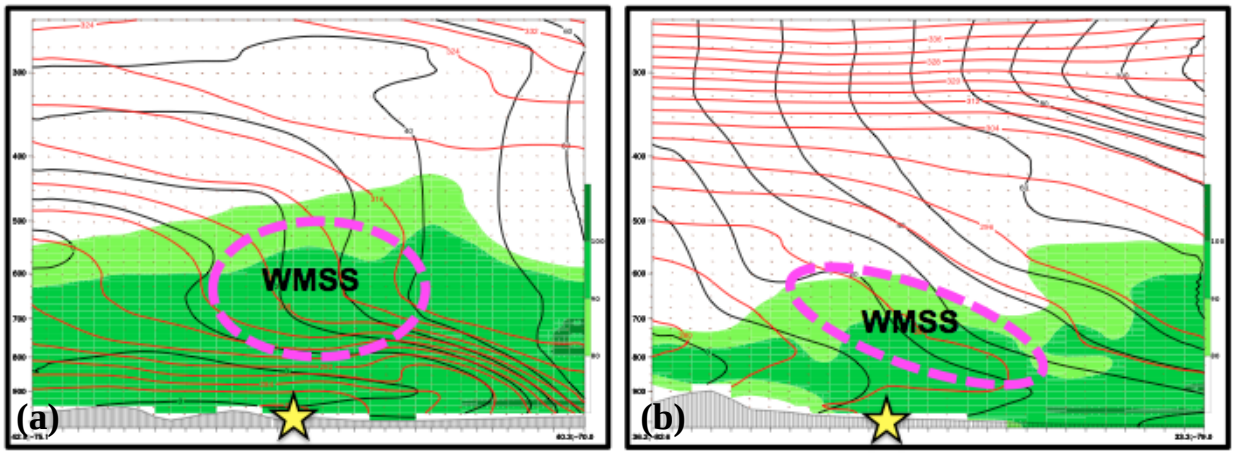

Fig. 4. Cross sections of θ_e (red, every 4 K), absolute geostrophic momentum (black, every 10 m s^{-1}), and relative humidity (filled, every 10% starting at 80%) for (a) 0300 UTC 9 February and (b) 2100 UTC 16 February 2013. Yellow star denotes approximate position of TSSN.

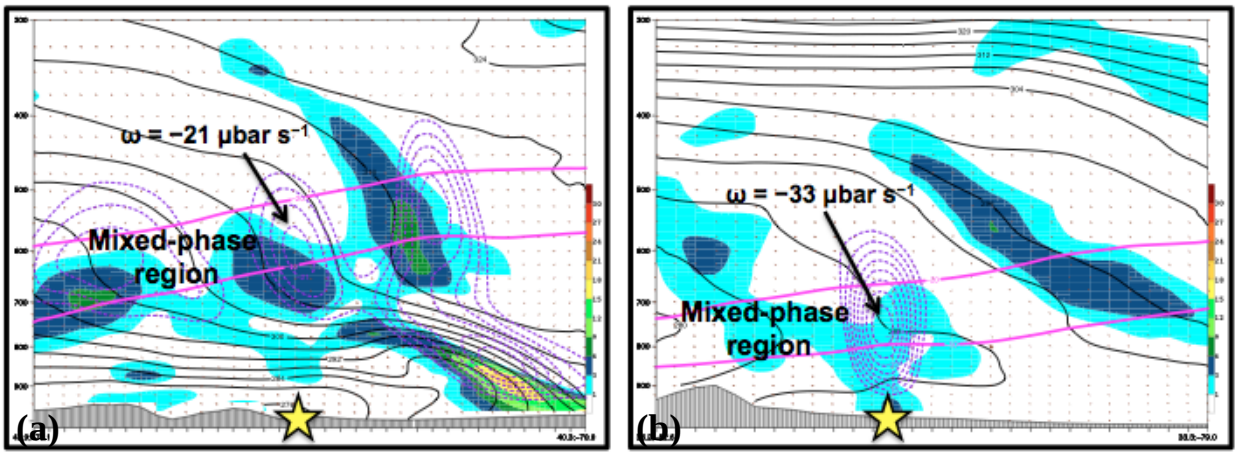

Fig. 5. Cross sections of θ_{es} (black, every 4 K), negative ω (dashed, every 3 μbar s^{-1} starting at −12 μbar s^{-1}), frontogenesis [filled, every 2 K (100 km)$^{-1}$ (3 h)$^{-1}$], and the −10°C and −20°C isotherms for (a) 0300 UTC 9 February and (b) 2100 UTC 16 February 2013. Yellow star denotes approximate position of TSSN.

(c) Synoptic and Mesoscale Features in Cool Season Cyclones Associated with Significant Upper Level Easterly Wind Anomalies (Adrian Mitchell)
Focal Points: John Quinlan and Neil Stuart, National Weather Service, Albany, NY

Research Summary (1 May 2013 – 31 October 2013):

Northeast cool season cyclones can vary in track, duration, intensity and predictability. A category of these cyclones can be defined as those associated with strong (< -20 m s^{-1}) upper level easterly wind anomalies poleward of the primary surface low (< 1000 hPa). These events tend to feature an upper level cutoff circulation with a deep, slow moving surface low. In many cases prolonged low-level northwesterly flow can interact with the complex topography of the Northeast U.S. creating mesoscale orographic forcing for ascent. During the beginning of 2010 two of these events, both associated with upper level easterly jet streaks and low-level northerly warm-air advection, impacted the Northeast U.S. These cyclones produced historic snowfall amounts as a result of orographic enhancement and were poorly forecast. The anomalous nature of these types of events can lead to a decrease in predictability and a lack of situational awareness from a forecasting perspective. This presents an opportunity to develop a better understanding of the genesis, life cycle and structure of these types of cyclones with a concentration on mesoscale orographic forcing mechanisms.

Recent work has dealt with gathering and analyzing individual events that met the criteria for inclusion in this study. A total of 78 cyclone events have been identified spanning the years 1949-2010 using the NCEP/NCAR Reanalysis dataset. These events display significant variability, so categorizing events based on prominent synoptic scale features is a useful method. Cases were first categorized based on the presence of both a 300-hPa easterly jet streak poleward of the surface low and 850-hPa northerly warm-air advection west of the surface low (similar to the two events in 2010). These conditions were met in 31 of the 78 cases in the study. The remaining 47 cases contain varying synoptic structures, and work is currently ongoing to categorize them. The 31 cases that were successfully categorized have since been split up by season for compositing purposes. This left 20 winter (DJF) events and 11 early (Oct, Nov) and late (Mar, Apr) season events.

Figure 1 shows the earth relative composite mean and anomaly 500 hPa heights (a), and the earth relative composite mean and anomaly 850-hPa temperatures (b) associated with winter events. A highly amplified long-wave pattern is apparent, with anomalous ridging over the North Atlantic Ocean into northern Canada, and troughing over the East Pacific Ocean and over the eastern U.S. This pattern of 500-hPa height and 850-hPa temperature anomalies is consistent with the negative phase of the Arctic Oscillation (AO), and the positive phase of the Pacific North American (PNA) index. Lag composites reveal that this signal is present as far as 8 days prior to the composite mean event. Inspection of daily AO values valid for each of the 78 events reveals a significantly negative mean value with a tendency toward extreme negative values for the 31 categorized cases. The opportunity may exist for enhanced predictability of these events by utilizing the signal provided by these teleconnections, but that has yet to be seen.

To investigate the structure of these cyclone events over the Northeast U.S., compositing using a cyclone relative framework is the optimal method. When performing this method, the composite cyclone is shifted to the centroid of all cyclone centers. The synoptic structure of the 20 aforementioned winter events is illustrated in Fig. 2. The composite mean cyclone is located off the New Hampshire coast and has a mean SLP of 984 hPa. The equatorward exit region of a

300-hPa easterly jet streak is located poleward of the cyclone center over northern New England. This is a region favorable for quasi-geostrophic forcing for ascent.

The bent-back configuration of the 1000-500 hPa thickness field is indicative of strong warm-air advection to the north and west of the cyclone center. An analysis of 850-hPa heights, temperature and temperature advection in Fig. 3 confirms this indication. Warm-air advection is maximized to the northwest of the cyclone center in a region of northeasterly winds. Northerly and northwesterly winds to the west of the cyclone center are favorable for orographic enhancement over parts of New York and Vermont. Figure 4 shows the 700-hPa Q-vectors and Q-vector forcing associated with the composite event. Strong quasi-geostrophic forcing ascent is seen in the region of warm-air advection collocated with the equatorward exit region of the upper level easterly jet streak to the west of the cyclone center. This structure is representative of the cases that are included in the composite, yet retains the variation that is present in individual cases.

Future work will include categorizing and compositing the remaining events using the cyclone relative framework. Conceptual models will be developed for operational use once the composites are finalized. The preliminary climatology that has been developed will be built upon in the future to include all cyclone events. Cyclone events that typify each category will be chosen for a case study. The mesoscale forcing mechanisms that are relevant from an operational perspective will be explored using WRF-ARW simulations.

National Weather Service Interactions:

Communication between Adrian Mitchell (UAlbany) and John Quinlan (WFO Albany) has been primarily through email. Future plans are for increased communication through emails and meetings to facilitate the development of conceptual models and to optimize case study results.

Publications and Workshop Submissions:

A poster devoted to a case study from a cyclone event (3 January 2010) was presented at the 15th Conference on Mesoscale Processes on 7 August 2013. The feedback received at this conference helped facilitate improvements to the WRF simulation process. An oral presentation of this research was presented at the 16th Cyclone Workshop on 22 September 2013. Feedback received at this conference prompted inspection of cyclone deepening rates and AO trends associated with these events. An additional oral presentation is planned for the 14th Northeast Regional Operation Workshop (December 2013) and an additional poster presentation is planned for the 94th Annual Meeting of the American Meteorological Society (February 2014).

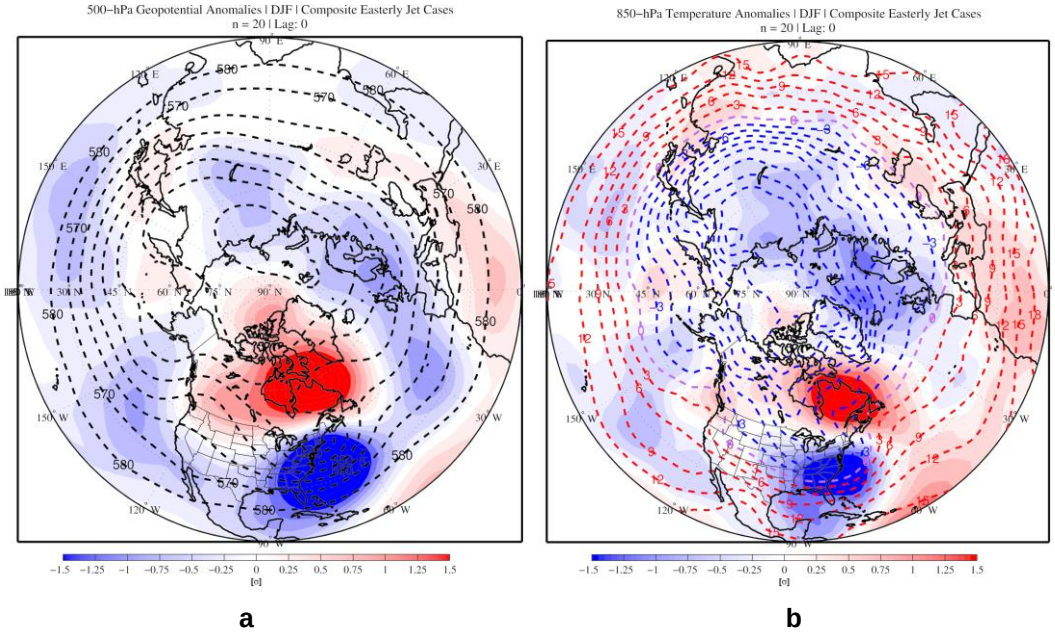

Fig. 1. 500-hPa composite mean geo. height (dam, solid contours), composite anomaly (σ, shaded) for (a) and 850-hPa composite mean temperature (C, dashed), composite anomaly (σ, shaded) for (b).

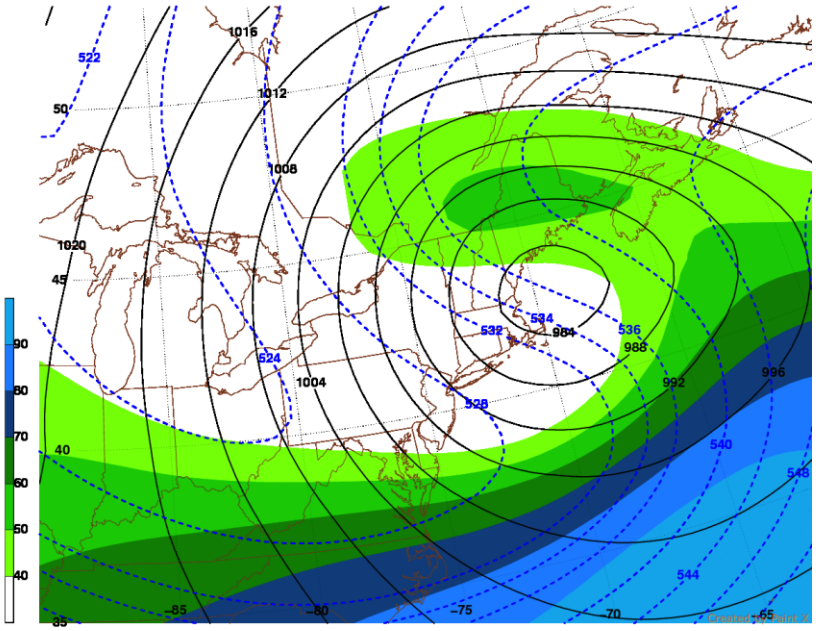

Fig. 2. Cyclone relative composite MSLP (hPa, solid contours), 1000-500 hPa thickness (dam, dashed), and 300-hPa wind (kt, shaded) for 20 winter cases.

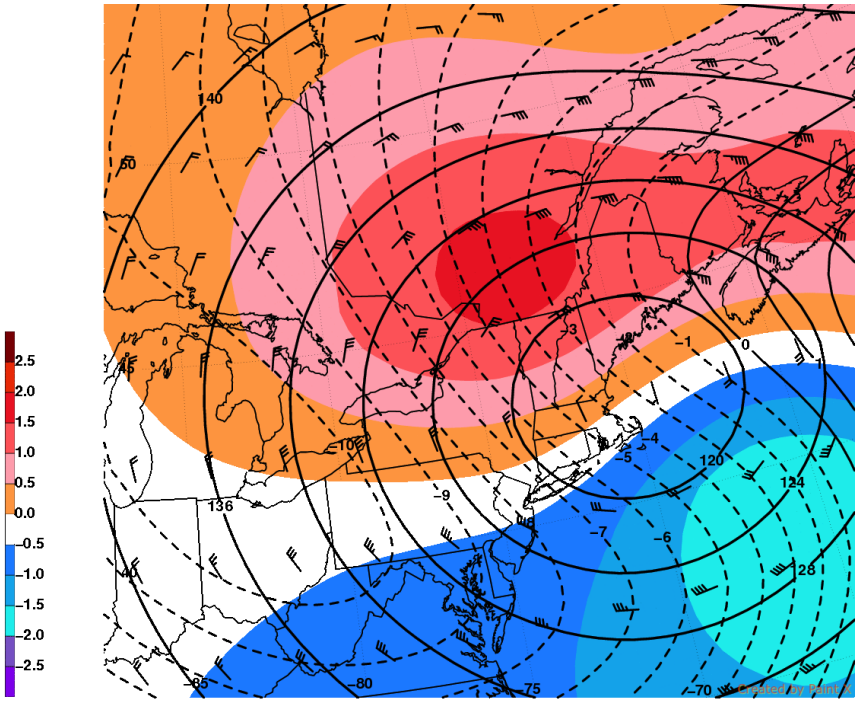

Fig. 3. Cyclone relative composite 850-hPa geo. height (dam, solid contours), temperature (C, dashed), wind (kt, barbs), and temperature advection (K h^{-1}, shaded) for 20 winter cases.

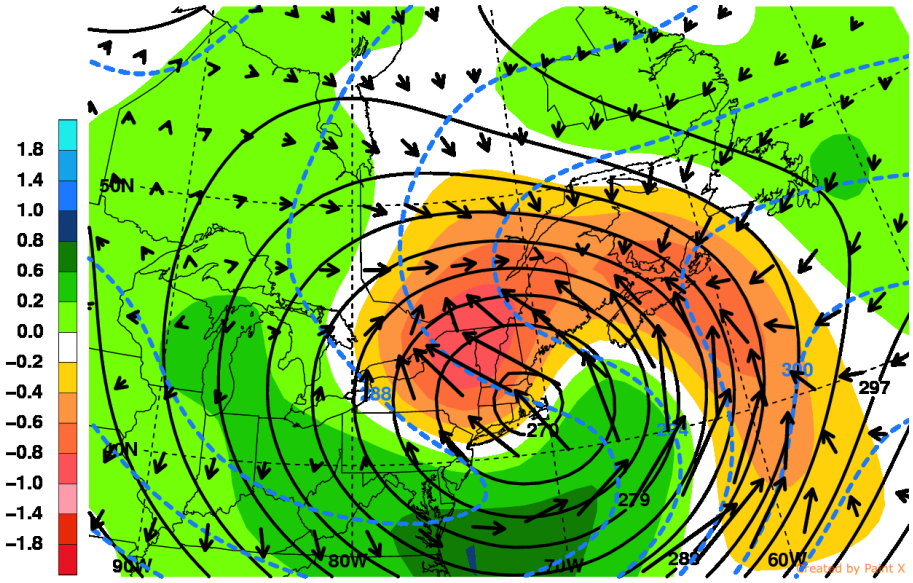

Fig. 4. Cyclone relative composite 700-hPa geo. height (dam, solid), potential temperature (K, dashed), Q-vectors (Pa m^{-1} s^{-1}, arrows), Q-vector forcing (Pa m^{-2} s^{-1}, shaded) for 20 winter cases.

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.

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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.

Payer, M., 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. Oral presentation at the 35th Annual Northeastern Storm Conference, 5-7 March 2010, Saratoga Springs, NY.

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

Moore, B. J., L. F. Bosart, D. Keyser, and M. L. Jurewicz, 2010: Mechanisms for predecessor rain events in advance of tropical cyclones. Oral presentation at the NOAA/NWS Eastern Region Flash Flood Conference, 2-4 June 2010, Wilkes-Barre, PA.

Payer, M., L. F. Bosart, D. Keyser, N. A. Stuart, and T. A. Wasula, 2010: Forecasting heavy precipitation associated with cool-season 500-hPa cutoff cyclones in the Northeast. Oral presentation at the NOAA/NWS Eastern Region Flash Flood Conference, 2-4 June 2010, Wilkes-Barre, PA.

Wasula, T. A., N. A. Stuart, M. A. Scalora, L. F. Bosart, and D. Keyser, 2010: An application of a cutoff low forecaster pattern recognition model in the 30 June – 2 July 2009 significant event for the Northeast. Poster presentation at the American Meteorological Society 25th Conference on Severe Local Storms, 11-15 October 2010, Denver, CO.

Moore, B. J., L. F. Bosart, D. Keyser, and M. L. Jurweicz, Sr., 2010: Synoptic-scale environments and dynamical processes associated with predecessor rain events ahead of tropical cyclones. Oral presentation at Cooperative Institute for Research in the Environmental Sciences, University of Colorado, Boulder, CO, 25 October 2010.

Moore, B. J., L. F. Bosart, D. Keyser, and M. L. Jurewicz, Sr., 2010: Synoptic and mesoscale process associated with predecessor rain events ahead of tropical cyclones. Oral presentation at The Twelfth Northeast Regional Operational Workshop (NROW) 3-5 November 2010, Albany, NY.

Moore, B. J., L. F. Bosart, D. Keyser, and M. L. Jurewicz, Sr. 2011: Synoptic-scale environments and dynamical mechanisms associated with predecessor rain events ahead of tropical cyclones. Oral presentation at the 24th American Meteorological Society Weather Analysis and Forecasting Conference at the 91st American Meteorological Society Annual Meeting, 23-27 January 2011, Seattle, WA.

Bosart, L. F., 2011: Briefing on Winter Wonderland: Extremes, hazards, and blackouts – What gives? Invited oral presentation at the briefing sponsored by the University Corporation for Atmospheric Research, the American Geophysical Union, and The Weather Coalition, 2 March 2011 at the Senate Office Building, Capitol Hill, DC.

Bosart, L. F., 2011: Modern weather forecasting: a personal perspective. Invited keynote speaker at the 2nd Great Lakes Atmospheric Science Symposium (GLASS), 16 April 2011, SUNY-Oswego, Oswego, NY.

Bosart, L. F., 2011: Snowstorms and ice storms – mechanistic perspective. Oral presentation at the National Climatic Data Center Extreme Storms Workshop 25-27 July 2011, Asheville, NC.

Potter, M., L. F. Bosart, and D. Keyser, 2011. A multiscale analysis of the inland reintensification of Tropical Cyclone Danny (1997) within an equatorward jet-entrance region. Oral presentation at the American Meteorological Society 14th Conference on Mesoscale Processes, 1–4 August 2011, Los Angeles, CA.

Castellano, C. M., L. F. Bosart, D. Keyser, and J. Quinlan, 2011: Climatological aspects of freezing rain in the eastern United States. Poster presentation at the American Meteorological Society, 14th Conference on Mesoscale Processes, 1–4 August 2011, Los Angeles, CA.

Thompson, D. B., L. F. Bosart, D. Wasula, T. A. Wasula, and M. Kramar, 2011: Characteristics and climatology of Appalachian lee troughs. Poster presentation at the American Meteorological Society, 14th Conference on Mesoscale Processes, 1–4 August 2011, Los Angeles, CA.

Bosart, L. F., 2011: What's up with recent "cold" winters? Oral presentation at the 30th Annual STANYS Siena Conference, 14 October 2011, Saratoga, NY.

Thompson, D. B., L. F. Bosart, D. Keyser, T. A. Wasula, and M. Kramar, 2011: Characteristics and climatology of Appalachian lee troughs. Oral presentation at the Thirteenth Northeast Regional Operational Workshop (NROW), 2-3 November 2011, Albany, NY.

Potter, M., L. F. Bosart, and D. Keyser, 2011: A multiscale analysis of the inland reintensification of Tropical Cyclone Danny (1997) within an equatorward jet-entrance region. Oral presentation at the Thirteenth Northeast Regional Operational Workshop (NROW), 2-3 November 2011, Albany, NY.

Castellano, C. M., L. F. Bosart, D. Keyser, and J. Quinlan, 2011: Climatological aspects of freezing rain in the eastern United States. Oral presentation at the Thirteenth Northeast Regional Operational Workshop (NROW), 2-3 November 2011, Albany, NY.

Potter, M., L. F. Bosart, and D. Keyser, 2012: A multiscale analysis of the inland reintensification of Tropical Cyclone Danny (1997) within an equatorward jet-entrance region. Oral presentation at the 37th Annual Northeastern Storm Conference, 2-4 March 2012, Rutland, VT.

Castellano, C. M., L. F. Bosart, D. Keyser, and J. Quinlan, 2012: Climatological aspects of freezing rain in the Eastern United States. Oral presentation at the 37th Annual Northeastern Storm Conference, 2-4 March 2012, Rutland, VT.

Thompson, D. B., L. F. Bosart, D. Keyser, T. A. Wasula, and M. Kramar, 2012: Appalachian lee troughs and their association with severe thunderstorms. Oral presentation at the 37th Annual Northeastern Storm Conference, 2-4 March 2012, Rutland, VT.

Humphrey, T. W., and L. F. Bosart, 2012: Results of a preliminary evaluation of CAPE tendency. Oral presentation at the 37th Annual Northeastern Storm Conference, 2-4 March 2012, Rutland, VT.

Humphrey, T. W., and M. Evans, 2012: A study on convective modes associated with tornadoes in central New York and northeast Pennsylvania. Poster presentation at the 37th Annual Northeastern Storm Conference, 2-4 March 2012, Rutland, VT.

Potter, M. S., L. F. Bosart, and D. Keyser, 2012: Multiscale analyses of inland tropical cyclone-midlatitude jet interactions: Camille (1969) and Danny (1997). Oral presentation at the American Meteorological Society 30th Conference on Hurricanes and Tropical Meteorology 16-20 April 2012, Ponte Vedra Beach, FL.

Potter, M. S., L. F. Bosart, and D. Keyser, 2012: Multiscale analyses of inland tropical cyclone-midlatitude jet interactions: Camille (1969) and Danny (1997). Oral presentation at the American Meteorological Society 25th Conference on Weather Analysis and Forecasting, 29 May-1 June 2012, Montreal, Quebec, Canada.

Castellano, C. M., L. F. Bosart, D. Keyser, J. Quinlan, and K. Lipton, 2012: Climatological aspects of ice storms in the Northeastern United States. Oral presentation at the 25th American Meteorological Society Conference on Weather Analysis and Forecasting, 29 May-1 June 2012, Montreal, Quebec, Canada.

Thompson, D. B., L. F. Bosart, D. Keyser, T. A. Wasula, and M. Kramar, 2012: Appalachian lee troughs and their association with severe thunderstorms. Oral presentation at the American Meteorological Society 25th Conference on Weather Analysis and Forecasting, 29 May-1 June 2012, Montreal, Quebec, Canada.

Thompson, D. B., L. F. Bosart, D. Keyser, T. A. Wasula, and M. Kramar, 2012: Appalachian lee troughs and their association with severe thunderstorms. Poster presentation at the American Meteorological Society 26th Conference on Severe Local Storms, 5-8 November 2012, Nashville, TN.

Castellano, C. M., L. F. Bosart, D. Keyser, J. Quinlan, and K. Lipton, 2012. Synoptic and mesoscale aspects of ice storms in the Northeastern United States. Oral presentation at the American Geophysical Union Fall Meeting, 3-7 December 2012, San Francisco, CA.

Kenyon, J. S., D. Keyser, L. F. Bosart, and M. S. Evans, 2013. The motion of mesoscale snow bands in Northeast U. S. winter storms. Poster presentation at the 93rd American Meteorological Society Annual Meeting, 6-10 January 2013, Austin, TX.

Kenyon, J. S., D. Keyser, L. F. Bosart, and M. S. Evans, 2013. The motion of mesoscale snow bands in Northeast U. S. winter storms. Oral presentation at 38th Annual Northeastern Storm Conference, 8-10 March 2013, Rutland, VT.

Kenyon, J. S., D. Keyser, L. F. Bosart, and M. S. Evans, 2013. The motion of mesoscale snow bands in Northeast U. S. winter storms. Oral presentation at the American Meteorological Society 15th Conference on Mesoscale Processes, 6-9 August 2013, Portland, OR.

Meier, K. J., L. F. Bosart, D. Keyser, and M. L. Jurewicz, Sr., 2013. Thundersnow in conjunction with heavy snowfall events over the Northeast United States. Poster presentation at the American Meteorological Society 15th Conference on Mesoscale Processes, 6-9 August 2013, Portland, OR.

Mitchell, A. N., L. F. Bosart, K. L. Corbosiero, and J. R. Minder, 2013. The effects of orography in northern Vermont during the 2-3 January 2012 winter storm. Oral presentation at the American Meteorological Society 15th Conference on Mesoscale Processes, 6-9 August 2013, Portland, OR.

Mitchell, A. N., L. F. Bosart, K. L. Corbosiero, and J. R. Minder, 2013. Characteristics of Northeast winter cyclones associated with significant upper level westerly wind anomalies. Oral presentation at the 16th Cyclone Workshop, 22-27 September 2013, Sainte-Adele, Quebec, Canada.

Kenyon, J. S., D. Keyser, L. F. Bosart, and M. S. Evans, 2013. The motion of mesoscale snow bands in Northeast U. S. winter storms. Oral presentation at the 16th Cyclone Workshop, 22-27 September 2013, Sainte-Adele, Quebec, Canada.

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.

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SECTION 3: CSTAR: May 2013-November 2013

National Weather Service Perspective

Warren R. Snyder, Science & Operations Officer

Science & Operations Officer

WFO Albany, New York

The CSTAR IV project "***The Cooperative Research with the National Weather Service on Cool and Warm-Season Precipitation Forecasting over the Northeastern United States***" has been a success as we transition from CSTAR IV to CSTAR V. The major CSTAR IV projects have reached conclusions and thesis publication. The level of interaction between the graduate students and NWS Focal Points was generally excellent and frequent. CSTAR V received funding in mid-September 2013. A planning meeting was scheduled for October 21, but was postponed till December 9, as a result of the Government Shutdown. We are looking forward to focusing and working on our new list of operational forecast challenges.

Unfortunately the disruption resulting from the government shutdown also resulted in NROW XIV in its original format being cancelled where much of the CSTAR IV work would have been presented. However we have planned a limited and significantly virtual NROW XIV December 10-11, 2013. As of this date twenty eight of the original presenters plan to participate in person or virtually.

The Collaborative and Associate projects from CSTAR IV have been concluded. Work has begun on the following Collaborative and Associate projects related to CSTAR V:

1. Development of Improved WSR88D Warning Criteria – (Part 1) Identifying New Capabilities of Dual Pol Data- How well do Dual-Pol Parameters perform in identifying large hail and hail size distribution.
2. Establish Modern Vr-shear Tornado Warning Thresholds for the Northeast.
3. Improvement of Forecasts of IFR Ceilings and Visibility in TAFs. An extensive database related to boundary layer and stability characteristics has been developed.
4. Using and Assessing New Technology to Provide Decision Support Service to a Variety of Customers as part of Weather Ready Nation Initiative. The thin client hardware has been received at the Albany NWS, and a training package has developed for individuals providing on site DSS support.

This work will be outlined in a separate report for the Collaborative and Associate Projects for CSTAR V.

CSTAR continues to provide a large payback to the NWS for the modest amounts expended. This grant's projects continue to build on CSTAR's legacy of completing operationally focused research, engaging the academic community at a high level, providing the NWS with top quality applicants, and enabling the involvement of dozens of operational meteorologists in applied research and conferences from numerous NWS offices across the Northeast United States. CSTAR resources in the NWS Collaborative and Associate Projects of this grant also raise the level and sophistication of involvement by UAlbany undergraduates in support of the CSTAR research.

SECTION 4:

a) Semi-annual Report

CSTAR IV Research (May 1, 2013 – October 30, 2013)

Focal Point Leader(s): Thomas A. Wasula, NOAA/ NWS Albany, NY
Matt Kramar, NOAA/NWS Sterling, VA
Contributors: Brian Frugis, NWS Albany, NY
Mike Evans and Mike Jurewicz, NWS Binghamton, NY
Joe Dellicarpini, NOAA/NWS Taunton, MA
Dr. Lance Bosart and Dr. Daniel Keyser, SUNYA at Albany
Warren Snyder, NOAA/NWS Albany, NY

Research Focus: ***Deep Convection, Severe Weather, and Appalachian Lee Troughs***

a. Understanding the role of Appalachian lee troughs in the organization of convection and its severity. Develop methodologies and conceptual models to identify and forecast regionally, specific significant events.
b. Utilize new 8bit products and Dual Polarization (Dual Pol) WSR88D datasets after the April 2012 installation, in the development of warning criteria for 1 inch hail, and update V/R shear criteria developed by LaPenta et al. in identifying tornadic thunderstorms.

I. Project Activities and Work Done

- Dan Thompson, SUNYA Master's CSTAR student, completed his thesis in the summer (August 2012). He is now currently employed at the White Lake (Detroit), MI NWS office as of April 2013.

- Tom has continued to work on a rough draft of a teletraining presentation on Dan's M.S. thesis work on "Appalachian Lee Troughs and their Association with Severe Convection Storms". It is hoped that this teletraining will be ready by the late spring of 2014.

- Results have been completed from the rotational velocity (Vr)-Shear study for a May 14, 2013 WFO at Albany station meeting presentation given by Brian Frugis. It was titled "Best Practices for Issuing Tornado Warnings at the WFO at Albany: Lessons Learned from the 2012 Convective Season". Brian also gave a similar presentation for a WFO at BTV June Station meeting presentation.

- Three abstracts either lead-authored or co-authored by Tom Wasula were submitted to the 12-17 October 2013 National Weather Association Conference in Charleston, SC. The two abstracts lead authored by Tom were "The June 1, 2011 Hail Monster Event across Eastern New York and Western New England", and "A Storm-Scale Analysis of the 29 May 2012 Null tornado Watch across Eastern New York and Western New England". Tom co-authored with Brian one other abstract. The abstract Brian lead-authored was: "An Updated Version of the V-R Shear Technique for Issuing Tornado Warnings Using 8 bit High Resolution Radar Data". All these presentations were posters. Tom and Brian

have their posters on the NWA conference web-site. Also, Tom and Brian have a "drafted" conference preprint publication that will be submitted for review by Eastern Region SSD before the December 9th 2013 deadline. **Unfortunately, travel funds were denied in October for this conference by NOAA/NWS due to the government shutdown. Brian was selected to represent the WFO Albany.**

II. Presentations on CSTAR IV Related Research (NOV 2010 – October 2013)

Dellicarpini, J. W., 2011. The Massachusetts Tornado Outbreak of June 1, 2011, 13th Northeast Operational Workshop, Albany, NY, November 2-3, 2011.

Evans, M., 2011. The April 28, 2011 Early-morning Tornado and Flash Flood Event in Central New York and Northeast Pennsylvania, 13th Northeast Operational Workshop, Albany, NY, November 2-3, 2011.

Frugis, B. J., 2011. The 4 September 2011 Tornado in Eastern New York: An Example for Updating Tornado Warning Strategies, Albany, NY, November 2-3, 2011.

Frugis, B.J., 2013. Best Practices for Issuing Tornado Warnings at the WFO at Albany: Lessons Learned from the 2012 Convective Season, Albany, NY, May 14, 2013.

Frugis, B.J., and T.A. Wasula, 2013: An Updated Version of the V-R Shear Technique for Issuing Tornado Warnings Using 8-bit High Resolution Radar Data for the WFO BTV Station Meeting, June 2, 2013.

Frugis, B.J., and T.A. Wasula, 2013: Use of the Albany Hail Study to Predict Large Hail during the 16 May 2012 and 29 May 2012 Severe Weather Episodes, Eastern Region Virtual Conference, March 8, 2013.

Frugis, B.J., and T.A. Wasula, 2013: The 4 September 2011Tornado in Eastern NY, An Example for Updating Tornado Strategies, Eastern Region Virtual Conference, March 8, 2013

Kramar, M. R., 2011. Applying Conceptual Models for Non-mesocyclonic Tornadoes in QLCS's to NWS Damage Surveys 13th Northeast Operational Workshop, Albany, NY, November 2-3, 2011.

Meccariello, L.F., B.J. Frugis, and T.A. Wasula, 2012. Tornado Climatology across New York and New England with Specific Case Studies, 37th Northeastern Storms Conference, Rutland, VT March 2-4, 2012.

Meccariello, L.F., B.J. Frugis, and T.A. Wasula, 2012. Tornado Climatology and Vr-Shear Study across New York and New England, Albany WFO Spring Meeting, May 3, 2012.

Wasula, T.A., 2011. The June 1, 2011 Hail Monster Event across Eastern New York and Western New England, 13th Northeast Operational Workshop, Albany, NY November 2-3, 2011.

Wasula, T.A., 2012. The June 1, 2011 Hail Monster Event across Eastern New York and Western New England, 37th Northeastern Storms Conference, Rutland, VT March 2-4, 2012.

Wasula, T.A., B.J. Frugis, and N. A. Stuart, 2013: The 26-27, May 2010 Eastern NY and Western New England Backdoor Cold Front Severe Weather Event. Eastern Region Virtual Conference. March 8, 2013.

Wasula, T.A., B.J. Frugis, and N.A. Stuart, 2013: The June 1, 2011 Hail Monster Event across Eastern NY and Western New England. Eastern Region Virtual Conference, March 8, 2013.

III. Publications and Preprints on CSTAR IV Related Research (MAY 2011 – OCT 2013)

Frugis, B.J., T. A. Wasula, 2011. Development of Warning Thresholds for One Inch or Greater Hail in the Albany New York County Warning Area, *Eastern Region Tech Attachment*, **No 2011-05**, National Weather Service, NOAA, Department of Commerce, 24 pp., Bohemia, NY.

Frugis, B.J., and T.A. Wasula, 2013: An Updated Version of the V-R Shear Technique for Issuing Tornado Warnings Using 8-bit High Resolution Radar Data, *Extended Abstract, 38th Natl. Wea. Assoc. Annual Meeting*, Charleston, SC, **P1.28**.

Frugis, B.J., and T.A. Wasula, 2012: Use of the Albany Hail Study to Predict Large Hail during the 16 May 2012 and 29 May 2012 Severe Weather Episodes, *Preprints, 26th Conf. on Severe Local Storms*, Nashville, TN, Amer. Meteor. Soc., **P2.23**.

Wasula, T.A., B.J. Frugis, and N.A. Stuart, 2012: The May 26-27, 2010 Eastern New York and Western New England Backdoor Cold Front Severe Weather Event, *Preprints, 26th Conf. on Severe Local Storms*, Nashville, TN, Amer. Meteor. Soc., **P1.15**.

(b) Status of "Snyder Proposal" Projects

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

October 31, 2013

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.

1. **Overview**
   a. CSTAR IV Projects have been concluded and were covered in prior reports
   b. This report addresses preliminary work on CSTAR V projects. CSTAR V just began October 1.
   c. The project descriptions are available in the grant, and have been omitted to conserve space.

2. **CSTAR V Collaborating Projects**
   a. ***Development of Improved WSR88D Warning Criteria***
      i. ***(Part 1) Identifying New Capabilities of Dual Pol Data***
         1. Case studies have been examined from the summer of 2012 and 2013 that using legacy and dual pol radar data. The May 29, 2012 event, where 30 out of 66 of the WFO ALY's 2012 large hail events were successful warned with greater confidence using 1" Hail study criteria (Frugis and Wasula, 2011). Dual Pol ZDR columns were shown to increase confidence in issuance of these warnings in conjunction with the legacy/traditional radar data and hail study criteria. It remains difficult to identify the actual size of hail with Dual Pol data, but hail identification has definitely improved. This event and these methods served as the basis for an Eastern Region Dual Pol Brown Bag seminar on October 11, 2012. Brian Frugis also presented this event at the TV Meteorology meeting at Albany. A poster was submitted on this case to the NWA Conference in Charleston, SC. Another case study was done using these methods on the May 21, 2013 event by Ian Lee. This method has also been shown to improve lead times, with lead times of up to 45 minutes possible depending on storm severity.
         2. A presentation will be given at the December NROW XIV entitled "A Storm-scale Analysis of the 29 May 2013 Tornado Event across East-Central NY". This presentation will focus on a

traditional and dual pol perspective of the tornado event including the identification of a tornadic debris signature to 6200 ft AGL. This case will also tie into new results from the updated local tornado rotational velocity (Vr)-shear study led by Brian Frugis to determine what caused the tornadoes and how they can be improved.

ii. ***(Part 2)- Establish Modern Vr-shear Tornado Warning Thresholds for the Northeast***

1. The V-R Shear method, (Lapenta et al, 2000) developed in a COMET study in collaboration with the University at Albany and NWS Albany, has been in use for many years for tornado detection. However, this method is derived from 4 bit radar data. Eight bit radar data has been available since 2003 and Super-resolution, 8 bit data has been available since 2008. With the upgrade in resolution, this method needs to be updated, and refined to take full advantage of the new capabilities of the radar, and account for the change in radar resolution and range.
2. Brian Frugis and Tom Wasula analyzed 41 tornado events from 2003-2013 on the Weather Event Simulator (WES). In addition, 11 null cases (mesocyclones that prompted tornado warnings but did not produce a tornadic event) from 2003-2012 were analyzed on the WES as well. Rotational velocity (Vr) and Maximum Rotational values for the mesocyclones (Vm) were calculated for each storm. Due to the increased resolution, the diameter (D) for calculating shear changed from the previous study, as gate-to-gate pixels remained gate-to-gate further away from radar (up to 60 n mi) due to the increased radar resolution. Based off the new results, a nomogram for operational use was created and incorporated into the local Severe Weather and Radar binder and on the local intranet to complement the information from the previous study.
3. In addition 82 tornadic events and 25 null cases from 2003-2013 were also examined using the GR2Analyst software. The maximum Normalized Rotation (NROT) value was calculated for each storm for the time of tornadic development and up to 3 scans before the tornado formed. For the null cases, the NROT value was calculated at the time of tornado warning issuance and up to three scans before the warning. Average and median values were calculated; as well as box and whisker plots.
4. This research was shared via remote presentation at the ER Virtual Workshop in March 2013. A conference pre-print on the updated tornado study was written and is awaiting peer review at this time.
5. Future work in this project will expand the domain and test this methodology across much of the Northeast. Also publications and training formalizing this work will be developed.

iii. Team – Thomas Wasula (ALY) *, Ian Lee (ALY) Brian Frugis (ALY), Luigi Mecarriello (ALY) Robert LaPlante (CLE),Sarah Jameson (CLE), Mark McKinley (ZOB)

b. ***Applications of Mesoscale Modeling*** (This project has not begun yet)
   i. ***(Part 1) Development and Verification of High Resolution local WRF data*** –
   ii. ***(Part 2) Use/Asses High Resolution Models (possibly Ensembles) for Short Term Forecasting of Banded Heavy Snowfall***.
   iii. Team –Warren Snyder (ALY)*, Ian Lee (ALY) , Mark McKinley(ZOB), Vasil Koleci (ALY), Mike Evans (BGM), PI - David Knight

c. **Probabilistic QPF (**This project has not begun yet)
   i. Team - Neil Stuart (ALY)*, Vasil Koleci (ALY)

d. ***Improvement of Forecasts of IFR Ceilings and Visibility in TAFs - Develop methods to improve IFR forecasts of TAFs and improve accuracy in forecasting Flight Categories***.
      1. An extensive database has been developed by Ian Lee, in support of a study to improve TAF forecasting of IFR ceilings and visibilities for the four TAF sites in the WFO ALY CWA. This database is based on the theory that boundary layer variability plays a critical role in the occurrence of IFR ceilings and visibilities through fluctuations in the static stability, moisture, and momentum profiles. This database consists of several hundred events in which the boundary layer has been reconstructed from available soundings in order to further assess and test the validity of several boundary layer meteorology principles. In addition, a synoptic climatology is also being developed using NCAR Reanalysis tools to further aid in the forecasting of IFR occurrences. The ultimate goal of this research is to develop a forecast matrix that utilizes conceptual models of the boundary layer, synoptic composites, and a new threat index, in order to improve TAF forecasting of IFR ceilings and visibilities.
   ii. Team – Kevin Lipton* (ALY), Ian Lee (ALY) Hugh Johnson (ALY) , Mike Evans (BGM)
   iii. Atmospheric Sciences Research Center – David Fitzjarrald

e. ***Graphical TAF Verification of Ceiling and Visibility Forecasts at Taunton, Massachusetts –*** (This project has not begun yet)
   i. Team - Joseph Dellacapini (BOX)*, Kevin Cadima (BOX), Frank Nocera (BOX)

f. Us***ing and Assessing New Technology to Provide Decision Support Service to a Variety of Customers as part of Weather Ready Nation Initiative-***
      1. DSS continues to expand with excellent partnerships fostered

during deployment in July 2013 for Southern Herkimer County flooding.

2. Required training plan for meteorologists/staff (a companion to the rewritten SDM chapter) has been developed for those interested in providing offsite DSS. An in-house workshop simulation of OEM operations is being considered for development.
3. Our future goals include:
    a. Training interested staff members for ready deployment
    b. NY OEM training that includes D-LAN software and the State Emergency Operations Course (SEOC)
    c. New laptop configurations, along with associated training, with the installation of the 'thin client' AWIPS software, BUFKIT, GR2Analyist and other software to facilitate deployments
    d. Expand our outreach with other agencies for DSS.

ii. Team – Brian Montgomery (ALY), Steve DiRienzo (ALY)

g. ***An Evaluation of Winter Weather Warning and Advisory Criteria in the NWS Eastern Region from a Scientific and Societal Impact Perspective*** –

1. This project has not started yet

ii. ***Lead***– John Quinlan (ALY)*

1. **Associate Projects** (These projects have not begun yet)
    a. ***Integration of Research Into Operations*** –
        i. Team – Vasil Koleci (ALY), Warren Snyder (ALY), NWS Focal Points
    b. ***Improving forecasts of snow along the West-facing slopes of the Appalachians*** -
        i. Lead - Matt Kramar (PIT)
    c. ***Heat Waves/Extreme Heat Events in the Northeast United States***
        i. ***Lead*** – Kevin Lipton (ALY)

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

The results described herein would not have been possible without appropriate computing infrastructure. Students are exposed to NWS facilities and software, and NWS staff has 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 2 TB of disk space on the UAlbany Department of Earth and Atmospheric Science (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 laptop, which enables them to take familiar computers with them when visiting NWS staff, and provides them ready access to the DAES UNIX machines. CSTAR Email lists originally created on the DAES computers at the beginning of the project have been superseded by the "map" list (map@listserv.albany.edu). The "map" list reaches a much larger audience (out of 410 members, roughly 1/4 are from NOAA), allowing discussion of CSTAR related research among many more people. Albany WFO staff took the lead in maintaining content for the CSTAR webpage at http://cstar.cestm.albany.edu. The web page provides an additional mechanism for exchanging information and ideas. The WFO also runs a CSTAR forum and discussion group at http://infolist.nws.noaa.gov/read/?forum=cstar_ne. 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 are available for CSTAR related research including a Sun server (with 8 CPUs and 16GB RAM), a Linux server (with 16 CPUs and 128GB RAM) and two large network attached disk storage arrays (80 TB total usable space). While CSTAR funds were not used for this purchase, and the 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 grant effort has allowed access to University Research Information Technology (RIT) services. In particular, Warren Snyder (SOO Albany WSFO) is using the RIT 144 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:

Monday 6 May 2013

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

CSTAR warm-season cutoff low research is cited in the last paragraph of the short-term section of this morning's AFD issued by NWS ALY.

FXUS61 KALY 060900
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
459 AM EDT MON MAY 6 2013

.SYNOPSIS...
HIGH PRESSURE WILL REMAIN ANCHORED OVER NEW YORK AND NEW ENGLAND INTO MID WEEK WITH DRY WEATHER FEATURING WARM AFTERNOONS AND COOL NIGHTS. LATE WEDNESDAY INTO THURSDAY LOW PRESSURE WILL MOVE UP THE MID ATLANTIC COAST AND LIKELY BRING SOME MUCH NEEDED RAINFALL.
&&
.SHORT TERM /6 PM THIS EVENING THROUGH WEDNESDAY NIGHT/... AS OF 445 AM EDT...THE H20 WATER VAPOR LOOP INDICATED A POTENT UPPER AIR LOW CENTERED NEAR ATLANTA GA...HEADING ENE. A LOT OF MID LEVEL DRY HAS BEEN ENTRAINED INTO THE SYSTEM...BUT THERE WAS STILL PLENTY OF LOW MOISTURE AND INSTABILITY TO TOUCH OFF SOME THUNDERSTORMS NEAR ITS CENTER.

THE RIDGE OF HIGH PRESSURE THAT HAS BROUGHT A STRING OF BEAUTIFUL SPRING DAYS WILL HOLD SWAY OVER THE NORTHEAST THROUGH TUESDAY. HOWEVER...IT WILL EVENTUALLY GET PINCHED TO THE EAST AND WEAKEN...ALLOWING THE LOW TO TRACK NORTHEAST.

TONIGHT WILL REMAIN BE DRY. AN INCREASING SOUTHEASTERLY FLOW WILL HOWEVER LIKELY ALLOW STRATUS TO FORM SOUTH OF LONG ISLAND ONCE MORE AND HEAD A LITTLE FURTHER INLAND...PERHAPS NORTH TO THE CAPITAL DISTRICT BY LATE TONIGHT. IF THIS WERE TO HAPPEN...TEMPERATURES WOULD NOT GET QUITE AS COOL AS PREVIOUS NIGHTS. FIGURE ON LOWS IN THE MID TO UPPER 40S FROM THE CAPITAL DISTRICT SOUTHWARD...40-45 FURTHER NORTH WITH SOME POCKETS OF UPPER 30S ACROSS THE ELEVATED TERRAIN.

TUESDAY...AS THE RIDGE SLIDE A LITTLE FURTHER EAST...H850 TEMPERATURES ACTUALLY LOOK TO RISE A COUPLE OF DEGREES FROM ABOUT +8C TO NEAR +10C AS THERMAL CENTER OF THE RIDGE MOVES TO AREAS FROM ALBANY NORTHWARD. EVEN IF WE START THE DAY CLOUDY...ONCE AGAIN THE STRONG MAY SUNSHINE SHOULD BURN THEM OFF BEFORE NOON. WITH PLENTY OF OF SUNSHINE FROM THEN ON IN...TEMPERATURES LOOK TO REACH INTO THE UPPER 70S IN VALLEY AREAS FROM ALBANY NORTHWARD...ONCE AGAIN A LITTLE LOWER OVER THE ELEVATED TERRAIN AND AREAS SOUTH OF ALBANY WHERE THEY WILL BE IN THE LOW TO MID 70S.

BY TUESDAY NIGHT...THE LOW PRESSURE WILL BE INTO WORKING INTO THE CAROLINAS...WITH SHOWERS MAKING IT NORTH OF THE MASON DIXON LINE...POSSIBLY REACHING INTO OUR EXTREME SOUTHERN AREAS BEFORE SUNRISE WEDNESDAY. MEANWHILE...THE RIDGE WILL BE TRYING TO HOLD ON BUT BEGINNING TO WEAKEN BY NIGHT/S END.

CLOUDS AHEAD OF THE SYSTEM...COMING OFF THE STILL COLD OCEAN...WILL NEVERTHELESS KEEP TEMPERATURES MILDER THIS NIGHT THAN PREVIOUS ONES...WITH LOWS IN THE LOWER 50S FROM ALBANY SOUTHWARD IN THE HUDSON VALLEY...MID TO UPPER 40S MOST OTHER AREAS.

THEN ON WEDNESDAY...THIS LOW WILL WORK INTO VIRGINIA WITH THE RIDGE RETREATING FURTHER NORTH. MOISTURE LOOKS TO STREAM NORTHWARD ACROSS THE ENTIRE REGION. NEVERTHELESS...AREAS NORTH OF CAPITAL DISTRICT COULD START OUT OF LOTS OF SUNSHINE...SLOWLY FADING BY AFTERNOON. SHOWERS LOOK TO LIKELY HAPPEN BY DAY/S END IN OUR SOUTHERN AREAS...WITH INCREASING CHANCES FURTHER NORTH. TEMPERATURES STILL LOOK TO BE ABOVE NORMAL FOR HIGHS...ESPECIALLY NORTH OF THE CAPITAL DISTRICT WHERE THEY WILL BE IN THE MID 70S...WHILE THEY WILL BE LOWER FROM ALBANY SOUTHWARD...RANGING FROM THE MID 60S TO LOWER 70S.

WEDNESDAY NIGHT...WE WENT WITH SHOWERS LIKELY ACROSS MOST OF OUR FORECAST AREA...WITH JUST CHANCES NORTHWEST OF A JOHNSTOWN/GLENS FALL LINE. THE LOW PRESSURE SYSTEM (STRONGEST IN THE MID LEVELS BUT WEAKENING) WILL MOVE SLOWLY UP NEAR THE I-95 CORRIDOR AND SHOULD BE PHILADELPHIA BY THURSDAY MORNING. WITH CLOUDS TEMPERATURES SHOULD BE QUITE MILD...MAINLY BOTTOMING OUT IN THE LOWER TO MID 50S.

PWAT VALUES LOOK TO BE AROUND AN INCH...ONLY ONE STANDARD ABOVE NORMAL...WHILE THE 250 MB +V WIND COMPONENT (SOUTH WIND) AND THE –U WIND COMPONENT H850 (EAST WIND) SHOW LITTLE OR NO DEVIATION FROM CLIMATOLOGICAL NORMALS. CSTAR STUDIES INDICATE THAT NO EXCESSIVE RAINS WILL FALL WITH SYSTEM THROUGH EARLY THURSDAY GIVEN THIS SETUP. INDEED THE SYSTEM WILL CONTINUE TO WEAKEN...BUT IT LOOKS AS IF WE COULD GET A QUARTER TO AN INCH OF RAINFALL WITH THIS SYSTEM.
&&
$$
SYNOPSIS...HWJIV
SHORT TERM...HWJIV
==========
Tuesday 4 June 2013

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

CSTAR research on predecessor rain events (PREs) is cited in the sixth paragraph of the short-term section of this afternoon's AFD issued by NWS ALY.

FXUS61 KALY 042138
AFDALY

AREA FORECAST DISCUSSION

NATIONAL WEATHER SERVICE ALBANY NY
540 PM EDT TUE JUN 4 2013

.SYNOPSIS...
HIGH PRESSURE SITUATED OVER THE GREAT LAKES AND SOUTHERN CANADA WILL ALLOW FOR A CHILLY NIGHT AND ANOTHER DRY TOMORROW WITH LESS WIND AND PERHAPS A FEW MORE FAIR WEATHER CLOUDS. A APPROACHING STORM SYSTEM WILL BRING UNSETTLED CONDITIONS TO THE REGION FOR THE REMAINDER OF THE WEEK...WITH THE POTENTIAL FOR HEAVY RAINFALL.
&&
.SHORT TERM /6 AM WEDNESDAY MORNING THROUGH FRIDAY/...THE HIGH WILL START TO SHIFT OFFSHORE FOR WEDNESDAY. IT WILL CONTINUE TO BE DRY EVEN AS A FEW WARM ADVECTION HIGH CLOUDS BEGIN TO MOVE IN. H850 TEMPS LOOK TO WARM A LITTLE TO ABOUT +8C WHICH SHOULD ALLOW FOR HIGH TEMPERATURES TO BE A LITTLE HIGHER THAN THOSE OF TODAY. HIGH CLOUDS HOWEVER...MIGHT MITIGATE ANY WARM UP. EITHER WAY...THERE WILL BE MUCH LESS WIND THAN TODAY...SO EVEN WITH A LITTLE LESS SUNSHINE IT WILL FEEL A LITTLE WARMER. LOOK FOR HIGHS LOWER TO MID 70S VALLEY LOCATIONS...65 TO 70 HIGHER TERRAIN.

HIGH PRESSURE WILL SLIDE OFFSHORE BY LATE IN THE DAY...AND THEN BECOME ANCHORED WELL TO OUR EAST.

A POTENT STORM SYSTEM...WHICH WAS OVER NORTH DAKOTA AS OF LATE TUESDAY...WILL MOVE EAST INTO THE OHIO VALLEY BY LATE WEDNESDAY. ITS ASSOCIATED WARM FRONT AND UPPER LEVEL TROUGH WILL APPROACH OUR REGION WEDNESDAY NIGHT. GOOD ISENTROPIC LIFT WILL COMMENCE AS A SOUTHERLY H850 JET INCREASES TO NEARLY 30KTS. PLENTY OF MOISTURE COURTESY OF THE HIGH PRESSURE OFFSHORE WILL ADVECT PWAT AIR OVER 1.50 INCHES INTO THE SYSTEM. THE 12Z GEFS CONTINUED TO INDICATE 850 HPA IN THE V DIRECTION TO BE 1-3 STD ABOVE NORMAL. THIS WILL ALLOW FOR PWATS TO RISE TO OVER 1.00 INCHES DURING THE DAY THURSDAY...AND PERHAPS APPROACH OR EXCEED 1.50 INCHES ON THURSDAY NIGHT.

IT LOOKS AS IF RAIN SHOWERS WILL DEVELOP FIRST IN OUR WESTERN ZONES LATE WEDNESDAY NIGHT...THEN CONGEAL INTO A STEADY RAIN BY THURSDAY. MEANWHILE...THE SHOWERS WILL SPREAD EAST...AND MOST AREAS WILL AT LEAST HAVE SHOWERS BY LATE THURSDAY...WITH STEADY RAIN ENCROACHING ON THE CAPITAL DISTRICT.

THURSDAY NIGHT INTO FRIDAY...AN UPPER LEVEL JET ENTRANCE WILL BECOME SOMEWHAT ANTICYCLONIC WELL TO OUR NORTHWEST. THIS WILL ADD BROAD ASCENT TO THE MIX. ALSO...THE WARM FRONT WILL PENETRATE A LITTLE CLOSER TO US BUT NEVER REALLY ACTUALLY INTO OUR AREA.

THE SITUATION BECOMES MORE COMPLEX AS AT THE SAME TIME THIS SYSTEM IS GOING ON...ANOTHER ONE OF POSSIBLE TROPICAL ORIGIN LOOKS TO BE WORKING INTO FLORIDA FROM THE GULF OF MEXICO. CSTAR RESEARCH POINTS TO POSSIBLE PRE WITH THIS SYSTEM THAT MIGHT TAKE PLACE IN CONJUNCTION OR ENHANCED BY THE WARM FRONT ISENTROPIC LIFT. A BROAD UPPER LEVEL TROUGH WILL STILL BE TO OUR NORTHWEST...AS WELL AS THE ANTICYCLONIC CURVE UPPER LEVEL JET. THE BEST THETA-E RIDGE WILL REMAIN JUST TO OUR EAST.

THE ONLY PROBLEM IS WILL THIS BE A TROPICAL ENTITY?

PLEASE REFER TO THE TROPICAL WEATHER OUTLOOK ISSUED BY THE NATIONAL HURRICANE CENTER ABOUT THE POTENTIAL FOR THE AREA OF LOW PRESSURE OVER THE GULF OF MEXICO TO DEVELOP INTO A SUBTROPICAL OR TROPICAL CYCLONE. THAT LINK CAN BE FOUND AT WWW.NHC.NOAA.GOV.

OVERALL MODEL GUIDANCE POINT TO INITIALLY THE HEAVIEST RAINFALL OUR NORTHWEST ZONES BUT TRANSITIONING TO OUR SOUTHEASTERN ZONES LATER FRIDAY INTO FRIDAY NIGHT. LOOK FOR 1-2+ INCHES OF RAINFALL WITH THIS FIRST BATCH OF RAINFALL.

WE CONTINUED WITH THE CHANCE OF THUNDERSTORMS AS WELL ON FRIDAY AS INSTABILITY MIGHT BE ENOUGH TO TRIGGER A FEW RUMBLES OF THUNDER. DAYTIME HIGH TEMPERATURES WILL BE HELD DOWN TO THE PROBABLE RAINFALL THURSDAY AND FRIDAY...WITH UPPER 50S TO UPPER 60S FOR BOTH DAYS...AND GENERALLY 50S AT NIGHT.
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SYNOPSIS...HWJIV
SHORT TERM...HWJIV
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Wednesday 5 June 2013

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

CSTAR research on predecessor rain events (PREs) is cited in the second paragraph of the short-term section of this afternoon's AFD issued by NWS ALY.

FXUS61 KALY 052025
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
425 PM EDT WED JUN 5 2013

.SYNOPSIS...
HIGH PRESSURE WILL MOVE WELL OFFSHORE TONIGHT. MEANWHILE...THE COMBINATION OF AN APPROACHING STORM SYSTEM FROM THE MIDWEST...ALONG WITH PLENTY OF MOISTURE MOVING UP THE EASTERN SEABOARD ASSOCIATED WITH A TROPICAL ENTITY IN THE EASTERN GULF OF MEXICO WILL BRING UNSETTLED CONDITIONS TO THE REGION FOR THE REMAINDER OF THE WEEK...WITH THE POTENTIAL FOR HEAVY RAINFALL.
&&
.SHORT TERM /6 AM THURSDAY MORNING THROUGH FRIDAY NIGHT/...NCEP MODEL SUITE AND INTERNATIONAL GUIDANCE REMAIN IN DISAGREEMENT WITH EXPECTING IMPACTS ACROSS THE REGION WITH TRENDS FAVORING THE HEAVIEST RAINFALL TO REMAIN JUST SOUTH AND EAST OF THE CAPITAL REGION.

THETA-E ADVECTION AND INCREASING LOW LEVEL JET WILL ALLOW FOR THE LOWERING OF CLOUDS AND SHOWERS DEVELOPING ACROSS MOST OF THE REGION.

THESE SHOWERS WILL BE THE INITIAL SHOT OF THIS ADVECTION AND A SHORT WAVE /OR MVC/ TRACKING NORTHEAST ACROSS THE MID MISSISSIPPI RIVER VALLEY TODAY. MEANWHILE...PLENTY OF ATTENTION ON TROPICAL ACTIVITY IN THE EASTERN GULF OF MEXICO. IN COORDINATION WITH NEIGHBORING FORECAST OFFICES AND THE NATIONAL HURRICANE CENTER...THERE IS A CHANCE FOR THIS SYSTEM TO BECOME THE FIRST NAME STORM OF THE SEASON. HURRICANE HUNTER AIRCRAFT ARE INVESTIGATING THIS SYSTEM. IN THE MEANTIME...MODELS CONTINUE TO FAVOR A TRACK OF THIS SYSTEM EAST OF I95 OR FURTHER OFFSHORE. THE LATEST ECMWF/GFDL SHOW A LITTLE CLOSER TRACK WHICH PLACES PORTIONS OF THE REGION INTO A HEAVY RAINFALL THREAT. CSTAR RESEARCH OF PRE/S SHOW SOME SIGNALS PER CONCEPTUAL MODELS BUT THE HIGHEST THETA-E RIDGE AXIS DOES APPEAR TO REMAIN SOUTHEAST OF THE CAPITAL REGION WITH THE THREAT ACROSS THE MID HUDSON VALLEY...LITCHFIELD COUNTY AND SOUTHERN BERKSHIRE COUNTY. SOUTHEAST WIND COMPONENTS PLACES PORTIONS OF THE CATSKILLS INTO AN ENHANCED REGION OF LIFT AND THIS IS WHERE WE WILL PLACE THE HIGHER QPF AMOUNTS /SEE HYDRO DISCUSSION FOR FURTHER DETAILS/. THE TIMEFRAME FOR THE HEAVIER RAINFALL APPEARS TO BE LATE FRIDAY INTO FRIDAY NIGHT. PWAT ANOMALIES REMAIN 1-2 STD ABOVE NORMAL ALONG WITH A FAVORABLE ENTRANCE REGION DYNAMICS OF AN INCREASING ANTICYCLONIC UPPER JET. GIVEN THE UNCERTAINTY...NO WATCHES AT THIS TIME AS WE AWAIT FOR ADDITIONAL GUIDANCE FROM THE NHC.

THIS TROPICAL ENTITY IS EXPECTED TO TRACK EAST AND NORTH OF THE REGION TOWARD SATURDAY MORNING WITH CONDITIONS SLOWLY IMPROVING.
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SYNOPSIS...BGM
NEAR TERM...BGM
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Friday 7 June 2013

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

CSTAR cutoff low research is cited in the fourth paragraph of the long-term section of this afternoon's AFD issued by NWS ALY.

FXUS61 KALY 072040
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
440 PM EDT FRI JUN 7 2013

.SYNOPSIS...
AS OF 400 PM...TROPICAL STORM ANDREA WAS OVER EASTERN NORTH CAROLINA TRACKING NORTHEAST AROUND 30 MPH AND WILL ACCELERATE AND BE OFF THE COAST OF CAPE COD BY SATURDAY MORNING. A BAND OF MODERATE TO HEAVY RAIN WILL WORK THROUGH AREAS MAINLY SOUTH AND EAST OF ALBANY TONIGHT. THE STORM AND ITS RAIN WILL MOVE TO OUR NORTHEAST ON SATURDAY FOLLOWED BY IMPROVING WEATHER CONDITIONS THROUGH SUNDAY.
&&

.LONG TERM /MONDAY THROUGH FRIDAY/...
THE LONG TERM PERIOD WILL START OUT UNSETTLED WITH A RENEWED THREAT FOR SHOWERS AND THUNDERSTORMS EARLY NEXT WEEK BEFORE GRADUALLY DRYING AND IMPROVING BY THE END OF NEXT WEEK.

AT THE START OF THE LONG TERM PERIOD...THERE CONTINUES TO BE SIGNIFICANT UNCERTAINTY REGARDING THE TIMING OF THE NEXT LOW PRESSURE SYSTEM APPROACHING FROM THE MIDWEST/GREAT LAKES. THE 12Z GFS CONTINUES TO SUGGEST A MORE PROGRESSIVE UPPER-LEVEL PATTERN WITH PRECIPITATION REACHING THE FORECAST AREA EARLY MONDAY WHILE THE 12Z ECMWF REMAINS SLOWER KEEPING PRECIPITATION OUT OF THE FORECAST AREA UNTIL TUESDAY. REGARDLESS...BOTH MODELS AS WELL AS OTHER MAJOR GUIDANCE/ENSEMBLE MEMBERS SUGGEST THAT THE UPPER-LEVEL PATTERN WILL DEVELOP A CLOSED LOW OUT OF THE FORMER LONGWAVE TROUGH ACROSS THE NORTHEAST FOR THE START OF NEXT WEEK...KEEPING A THREAT FOR SHOWERS/POSSIBLE THUNDERSTORMS THROUGH MIDWEEK.

FROM A PV PERSPECTIVE...A PV ANOMALY WILL EXTEND SOUTHWARD ACROSS THE UPPER MIDWEST AND EVENTUALLY CLOSE OFF AS THE JET ROUNDS THE BASE OF THE LONGWAVE TROUGH...WITH THE GFS FAVORING A FASTER EVOLUTION AND THE ECMWF THE SLOWER. GIVEN THE JET ORIENTATION DEPICTED BY BOTH MODELS...WITH THE GREATEST JET ENERGY COINCIDENT OR IMMEDIATELY DOWNSTREAM OF THE LONGWAVE TROUGH AXIS...WILL FAVOR A FASTER SOLUTION TO THE ARRIVAL OF PRECIPITATION ACROSS THE FORECAST AREA BEGINNING MONDAY AFTERNOON. HAVE INDICATED LIKELY POPS BEGINNING MONDAY AFTERNOON AND PERSISTING THROUGH TUESDAY NIGHT AS THE CLOSED LOW SLOWLY MOVES ACROSS THE NORTHEAST.

WITH SUCH A SLOW-MOVING SYSTEM AND THE 850 HPA CLOSED CIRCULATION TRACKING UP THE SAINT LAWRENCE RIVER VALLEY PER CSTAR RESEARCH...THE POTENTIAL EXISTS AGAIN FOR ANOTHER WIDESPREAD SOAKING RAINFALL WITH GUIDANCE INDICATING ANYWHERE FROM A QUARTER TO A HALF INCH OF RAINFALL POSSIBLE. SENSIBLE WEATHER WILL BEGIN TO IMPROVE WEDNESDAY WITH LINGERING SHOWERS AS WEAK RIDING BEGINS TO BUILD IN ALOFT. RIDGING WILL CONTINUE TO BUILD IN FOR THE END OF THE WEEK WITH DRY WEATHER AND DECREASING CLOUD COVER EXPECTED.

HIGH TEMPERATURES DURING THE LONG TERM PERIOD WILL GENERALLY RANGE FROM THE UPPER 60S TO UPPER 70S WITH LOW TEMPERATURES GENERALLY FROM THE UPPER 40S TO UPPER 50S.
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SYNOPSIS...HWJIV
LONG TERM...IRL
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Monday 24 June 2013

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

CSTAR warm-season cutoff low research is cited in the third and fourth paragraphs of the long-term section of this morning's AFD issued by NWS ALY.

FXUS61 KALY 240926
AFDALY
AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
526 AM EDT MON JUN 24 2013

.SYNOPSIS...
VERY WARM AND HUMID CONDITIONS WILL CONTINUE EARLY THIS WEEK WITH THE THREAT OF SHOWERS AND THUNDERSTORMS MAINLY DURING THE AFTERNOON AND EVENING HOURS. STORMS WILL HAVE THE POTENTIAL TO PRODUCE LOCALLY HEAVY RAINFALL. OUR NIGHTS WILL BE CONTINUE TO BE MUGGY WITH PATCHY FOG. MORE PERSISTENT CHANCES FOR SHOWERS AND THUNDERSTORMS ARE EXPECTED LATER IN THE WEEK INTO THE WEEKEND AS A SLOW MOVING LOW PRESSURE SYSTEM IMPACTS THE REGION.
&&
.LONG TERM /WEDNESDAY THROUGH SUNDAY/...AN UNSETTLED AND WET EXTENDED FORECAST IS LIKELY ACROSS NY AND NEW ENGLAND WITH PERSISTENT CHANCES OF SHOWERS AND THUNDERSTORMS...AS A MID AND UPPER LEVEL TROUGH WILL INITIALLY IMPACT THE REGION TO CLOSE THE WEEK...AND THEN IT MAY CLOSE OR CUT OFF NEAR THE GREAT LAKES REGION AND SRN ONTARIO FOR THE WEEKEND.

THE LATEST GFS/ECMWF/CANADIAN GGEM/ENSEMBLE GUIDANCE AND HPC GRAPHICS ARE IN PRETTY GOOD AGREEMENT FOR AN ACTIVE STRETCH OF WEATHER. THEIR ARE SOME SUBTLE DIFFERENCES FOR THE TIMING OF THE SHORT-WAVE IMPULSE ROTATING THROUGH THE UPPER LEVEL TROUGH...BUT ALL AN ALL...IT IS EXTREMELY DIFFICULT TO FIND A SUSTAINED DRY STRETCH OF WX TO CLOSE JUNE.

THU-FRI...A WAVE OF LOW PRESSURE APPROACHES THE FCST AREA FROM THE GREAT LAKES REGION WITH SOME OVER RUNNING SHOWERS AND THUNDERSTORMS AHEAD OF A WARM FRONT. THE WARM FRONT MAY BUST THROUGH PORTIONS OF THE FCST AREA FOR A POTENTIAL OF STRONG THUNDERSTORMS...IF HEATING IS REALIZED. THE DETAILS ARE NEBULOUS AND MURKY...SO WE WILL CALL IT A CHANCE OF SHOWERS AND THUNDERSTORMS...THU INTO THU NIGHT. A S/SW H850 LLJ OF 30-45 KTS WILL TRANSPORT IN SOME GULF MOISTURE...AND PWATS WILL CONTINUE TO RUN ABOVE NORMAL. THE SFC LOW BEGINS TO OCCLUDE AND CLOSE OFF JUST NORTHWEST OF LAKE ONTARIO AND NRN NY ON FRI. THE GFS CONTINUES TO PAINT MODERATE AMOUNTS OF INSTABILITY FOR THE POTENTIAL OF SHOWERS AND THUNDERSTORMS AGAIN. THE SUBTROPICAL HIGH REMAINS ANCHORED DOWNSTREAM CONTINUING A DEEP S/SW FETCH OF MOISTURE. THIS LONG DURATION STRETCH OF WX...BEGINS TO MATERIALIZE INTO POTENTIALLY A CLASSIC GREAT LAKES CSTAR CUTOFF LOW WARM SEASON EVENT. TEMPS LOOK TO RUN SLIGHTLY BELOW TO NEAR NORMAL FOR THE THESE DAYS WITH HIGHS IN THE M70S TO L80S AND LOWS IN THE U50S TO 60S.

SAT-MON...THE LONGWAVE TROUGH BEGINS TO AMPLIFY WITH THE EMBEDDED 500 HPA CLOSED CIRCULATIONS OVER THE CNTRL AND ERN GREAT LAKES. A COLD FRONT BEGINS TO STALL OUT NEAR THE ERN CONUS SEABOARD. MULTIPLE SHORT-WAVES LIFT NORTHWARD ON THE EAST SIDE OF TROUGH. PERSISTENT BANDS OF SHOWERS AND THUNDERSTORMS TIMED TO THE DIURNAL HEATING AND THE PROPAGATION OF THE IMPULSES ARE POSSIBLE FOR THE WEEKEND INTO EARLY NEXT WEEK. THEIR IS A SMALL POSSIBILITY THAT DRYING IN THE WAKE OF DISTURBANCES MAY PROMOTE MINI DRY STRETCHES. AGAIN...THIS APPEARS TO FIT A GREAT LAKES WARM SEASON

CSTAR CLOSED/CUTOFF SCENARIO FOR AN EXTENDED PERIOD OF SHOWERS AND THUNDERSTORMS. THE WEEKEND IS DOMINATED BY A POSITIVE TILT SCENARIO...PERHAPS SHIFTING NEUTRAL BY EARLY NEXT WEEK. H850 TEMPS CONTINUE TO BE IN THE +14C TO +16C RANGE WITH LIMITED HEATING EACH DAY WITH A RESIDUAL COLD POOL ALOFT...AND THE ACTIVE S/SW FLOW. EXPECT HIGHS TO CONTINUE IN THE 70S TO L80S WITH LOWS IN THE U50S TO 60S. TOO EARLY TO PINPOINT LOCATIONS...BUT SOME HYDRO PROBLEMS COULD MATERIALIZE...IF LOCATIONS GET REPEATEDLY HIT BY BANDS OF SHOWERS AND THUNDERSTORMS.
&&
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SYNOPSIS...IAA
LONG TERM...WASULA
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Monday 24 June 2013

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

CSTAR warm-season cutoff low research is cited in the second paragraph of the long-term section of this afternoon's AFD issued by NWS ALY.

FXUS61 KALY 242100
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
459 PM EDT MON JUN 24 2013

.SYNOPSIS...
WARM AND MUGGY CONDITIONS WILL PREVAIL FOR THE NEXT COUPLE OF DAYS. MAINLY AFTERNOON AND EVENING SHOWERS AND THUNDERSTORMS WILL HAVE THE POTENTIAL TO PRODUCE LOCALLY HEAVY RAINFALL. MORE PERSISTENT CHANCES FOR SHOWERS AND THUNDERSTORMS ARE EXPECTED LATER IN THE WEEK INTO THE WEEKEND AS A SLOW MOVING LOW PRESSURE SYSTEM IMPACTS THE REGION.
&&
.LONG TERM /THURSDAY THROUGH MONDAY/... THERE IS AN INCREASING THREAT FOR ADDITIONAL MODERATE TO HEAVY RAINFALL FOR THE REGION THROUGH THE LONG TERM PERIOD.

PER THE CSTAR RESEARCH OF UPPER LOWS IN THE WARM SEASON...THE POSITION OF THE UPPER LOW IN THE VICINITY OF THE GREAT LAKES AND OHIO VALLEY WITH SUBTROPICAL MOISTURE HEADING NORTHWARD COULD PROVIDE ADDITIONAL RAINFALL ON ALREADY SATURATED SOILS.

THE INITIAL THRUST OF WARM ADVECTION ARRIVES ON THURSDAY AS OUR REGION MAY BECOME WELL ENTRENCHED IN THE WARM SECTOR. INCREASING LOW LEVEL WINDS...SURFACE FOCI...DAYTIME HEATING AND SBCAPES IN EXCESS OF 2K J/KG COULD PLACE OUR REGION INTO A SEVERE THREAT. HELICITES ARE PROGED TO BE IN EXCESS OF 200 M2/S2 /ESPECIALLY IF THE WARM FRONT REMAINS IN THE VICINITY OF THE REGION/ SO CAN NOT RULE OUT ROTATING SUPERCELLS. SINCE CLOUD COVER REMAINS IN QUESTION...WE WILL HOLD TEMPS BACK SOMEWHAT WITH MAINLY MIDDLE 80S FOR VALLEY LOCATIONS.

THE REMAINDER OF THE LONG TERM WILL FEATURE THE EVOLVING POSITIVE TILTED UPPER TROUGH AXIS AND MOISTURE TRANSPORT ORIGINATING FROM THE SUBTROPICS TO BRING A STREAM OF MOISTURE WITH THE CHANCE FOR ADDITIONAL SHOWERS/THUNDERSTORMS AND PERIODS OF MODERATE TO HEAVY RAIN. WE WILL CONTINUE TO WATCH THIS SITUATION EVOLVE VERY CLOSELY.
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SYNOPSIS...BGM
LONG TERM...BGM
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Tuesday 25 June 2013

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

CSTAR warm-season cutoff low research is cited once in the third and twice in the fourth paragraphs of the long-term section of this morning's AFD issued by NWS ALY.

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FXUS61 KALY 251055
AFDALY
AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
655 AM EDT TUE JUN 25 2013

.SYNOPSIS...
OUR VERY WARM AND HUMID WEATHER WILL CONTINUE TODAY AND WEDNESDAY ALONG WITH MAINLY AFTERNOON AND EVENING SHOWERS AND THUNDERSTORMS. SOME STORMS WILL PRODUCE LOCALLY HEAVY RAINFALL. CONDITIONS ARE EXPECTED TO GET EVEN WETTER AS WE FINISH OUT THE WEEK AND HEAD INTO THE WEEKEND AS A SLOW MOVING LOW PRESSURE SYSTEM APPROACHES AND MOVES INTO THE REGION.
&&
.LONG TERM /THURSDAY THROUGH MONDAY/... THE EXTENDED FORECAST CONTINUES TO LOOK WET AND UNSETTLED THROUGH THE WEEKEND INTO EARLY NEXT WEEK FOR EASTERN NY AND WESTERN NEW ENGLAND...AS A LONGWAVE UPPER LEVEL TROUGH WILL AMPLIFY EAST OF MS RIVER VALLEY ON FRIDAY...WITH A CLOSED/CUTOFF LOW SETTLING OVER THE GREAT LAKES REGION. A SUBTROPICAL HIGH WILL REMAIN ANCHORED OVER THE WRN ATLANTIC. SEVERAL DISTURBANCE WILL ROTATE AROUND THE CUTOFF LOW FOR PERSISTENT CHANCES OF SHOWERS AND THUNDERSTORMS.

THE LATEST GFS/ECMWF/CANADIAN GGEM/GLOBAL ENSEMBLES AND WPC GRAPHICAL GUIDANCE ARE IN PRETTY GOOD AGREEMENT FOR THE ACTIVE STRETCH OF WEATHER. THEIR ARE SOME DIFFERENCES IN THE TIMING OF THE SHORT-WAVE IMPULSES ROTATING THROUGH THE UPPER LEVEL TROUGH...BUT OVERALL...IT STILL IS EXTREMELY DIFFICULT TO FIND A SUSTAINED DRY STRETCH OF WX TO CLOSE THE MONTH OF JUNE...AND OPEN JULY.

FRI-FRI NIGHT...LIKELY POPS ARE MAINTAINED IN THE FORECAST GRIDDED DATABASE...AS A WAVE OF LOW PRESSURE MOVES OVER UPSTATE NY. THE TRIPLE POINT TO THE SYSTEM...OR WHERE AN OCCLUDED FRONT SETS UP WILL FOCUS SOME SHOWERS AND SCT THUNDERSTORMS. THE LATEST GLOBAL ENSEMBLES STILL INDICATE PWATS OF 2 TO 3 STANDARD DEVIATIONS /STD DEVS/ ABOVE NORMAL

COUPLED WITH H850 +V WIND ANOMALIES 2 TO 3 STD DEVS ABOVE NORMAL. SBCAPE VALUES ON THE GFS ARE IN THE 500-1500
J/KG RANGE. SOME STRONG THUNDERSTORMS /DEPENDING ON THE AMOUNT OF SFC HEATING/ WILL BE POSSIBLE WITH HEAVY RAINFALL. THE SUBTROPICAL HIGH REMAINS DOWNSTREAM CONTINUING A DEEP S/SW FETCH OF MOISTURE. THIS LONG DURATION STRETCH OF WX...BEGINS TO MATERIALIZE INTO POTENTIALLY A CLASSIC GREAT LAKES CSTAR CUTOFF LOW WARM SEASON EVENT. TEMPS LOOK TO RUN SLIGHTLY BELOW NORMAL FOR FRI MAXES WITH U70S TO L80S IN THE VALLEYS...AND U60S TO M70S OVER THE HILLS AND MTNS. LOWS WILL STILL BE A ON THE MUGGY SIDE WITH MID AND U60S IN THE VALLEYS...AND LOWER TO MID 60S OVER THE HIGHER TERRAIN.

SAT-SUN...THE 500 HPA LONGWAVE TROUGH BEGINS TO AMPLIFY WITH THE EMBEDDED 500 HPA CLOSED CIRCULATION OVER THE CNTRL-ERN GREAT LAKES AND SRN ONTARIO. A COLD FRONT BEGINS TO STALL OUT NEAR THE ERN CONUS SEABOARD AND NEW ENGLAND. MULTIPLE SHORT-WAVES LIFT NORTHWARD ON THE EAST SIDE OF TROUGH. THE CUTOFF LOW TAKES ON A POSITIVE TILT WITHIN THE EMBEDDED LONGWAVE TROUGH WITH CSTAR RESEARCH INDICATING STRATIFORM AND CONVECTIVE RAINFALL POSSIBLE. SAT NIGHT INTO SUNDAY THE FORECAST AREA IS NEAR THE RIGHT ENTRANCE REGION OF AN 80-100 KT JET STREAK. PWAT VALUES CONTINUE TO BE 1 TO 2 STD DEVS ABOVE NORMAL. SFC DEW PTS WELL INTO THE 60S. PERSISTENT BANDS OF SHOWERS AND THUNDERSTORMS TIMED TO THE DIURNAL HEATING AND THE PROPAGATION OF THE IMPULSES ARE POSSIBLE FOR BOTH SATURDAY AND SUNDAY. AGAIN...THIS SET-UP APPEARS TO FIT A GREAT LAKES WARM SEASON CSTAR CLOSED/CUTOFF SCENARIO FOR AN EXTENDED PERIOD OF SHOWERS AND THUNDERSTORMS. H850 TEMPS CONTINUE TO BE IN THE +15C TO +17C RANGE WITH LIMITED HEATING EACH DAY WITH A RESIDUAL COLD POOL ALOFT...AND THE ACTIVE S/SW FLOW. EXPECT HIGHS TO CONTINUE IN THE 70S TO L80S WITH LOWS IN THE U50S TO 60S.

MONDAY...THE FRONTAL BOUNDARY CONTINUES TO BE STATIONARY ALONG THE EAST COAST WITH THE CLOSED UPPER LEVEL LOW SAGGING S/SE OVER THE MIDWEST...AND THE LONGWAVE TROUGH TAKING ON A MORE NEUTRAL TILT. A WAVE MAY MOVE ALONG THE BOUNDARY BRINGING WIDESPREAD CHANCES OF SHOWERS AGAIN...AS SOME GULF MOISTURE IS TAPPED. A VERY WET AND SOGGY SCENARIO. IT IS TOO EARLY TO PINPOINT EXACT LOCATIONS...BUT SOME HYDRO PROBLEMS COULD MATERIALIZE /FLOODING/...IF LOCATIONS GET REPEATEDLY HIT BY BANDS OF SHOWERS AND THUNDERSTORMS.

OVERALL...TEMPS LOOK NEAR NORMAL WITH PCPN WELL ABOVE NORMAL.
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SYNOPSIS...IAA
LONG TERM...WASULA
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Tuesday 25 June 2013

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

CSTAR warm-season cutoff low research in the fourth paragraph of the short-term section of this afternoon's AFD issued by NWS ALY.

FXUS61 KALY 252101
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
501 PM EDT TUE JUN 25 2013

.SYNOPSIS...
OUR ACTIVE WEATHER PATTERN WILL CONTINUE WITH ADDITIONAL SHOWERS AND THUNDERSTORMS THROUGH THE END OF THIS WEEK. A POTENTIAL POTENT STORM SYSTEM MAY IMPACT THE AREA THURSDAY THROUGH FRIDAY WITH THE THREAT FOR HEAVY RAINFALL AND SEVERE WEATHER.
&&
.SHORT TERM /6 AM WEDNESDAY MORNING THROUGH THURSDAY NIGHT/... AN ACTIVE PERIOD OF WEATHER EXPECTED THURSDAY INTO THURSDAY NIGHT...

WEDNESDAY... THE AFOREMENTIONED SHORT WAVE POSITIVELY TILTED TROUGH AXIS WILL MOVE ACROSS THE CWFA. TIMING DIFFERENCES ARE MINIMIZING WITH THE PASSAGE EXPECTED TO BE BETWEEN 18Z-21Z. CLOUD COVER IS EXPECTED TO REMAIN MORE IN PLACE THAN PREVIOUS WHICH WOULD CUT DOWN ON SURFACE HEATING. WITH THAT SAID...THIS SHOULD TOO ALLOW FOR A REDUCTION OF SEVERE WEATHER. SPC CONTINUES TO PLACE THE REGION IN A SLIGHT RISK AS ANY BREAKS IN THE CLOUD COVER /ESPECIALLY SOUTH OF THE CAPITAL REGION/ WOULD ALLOW FOR QUICK DEVELOPMENT OF CONVECTION. BULK SHEAR VALUES ARE FORECAST TO BE AT OR GREATER THAN 30KTS SO SOME ORGANIZATION IS EXPECTED. WITH THE CLOUD COVER WE WILL HOLD BACK TEMPERATURES INTO THE LOW-MID 80S FOR VALLEY LOCATIONS AND NEAR 80F FOR THE HIGHER TERRAIN. SUBSIDENCE AND MID LEVEL DRY SLOT APPROACH AFTER 21Z FOR A REDUCTION IN POPS/WX AND EVEN SOME BREAKS OF SUNSHINE FOR THE END OF THE DAY.

WEDNESDAY NIGHT... A PERIOD OF TRANQUIL WX CONDITIONS IS EXPECTED AS A SHORT WAVE RIDGE AXIS CRESTS OVER THE REGION. THERE COULD BE A FAIR AMOUNT OF FOG DEVELOPMENT AND/OR LOW STRATUS DUE TO THE SATURATED MOISTURE CONDITIONS OF LATE. THEN WE WATCH THE APPROACH OF AN UPSTREAM WAVE /CURRENTLY OVER THE WESTERN HIGH PLAINS/ THAT WILL HAVE DOWNSTREAM IMPACTS WITH A RETURN OF A FRONTAL BOUNDARY. ISENTROPIC LIFT AND MAGNITUDES REMAIN UPSTREAM SO WE WILL KEEP POPS MAINLY LOW FOR MOST OF THE REGION. WE WILL INCREASE POPS ALONG THE SOUTHERN 1/3RD OF THE REGION OVERNIGHT AS THAT FRONT LIFTS NORTH AS A WARM FRONT. MOS GUIDANCE DIVERGES WITH THE SLIGHT COOLER VALUES ON MAV THAN THE MET. FOR NOW...A BLENDED APPROACH WAS UTILIZED.

THURSDAY INTO THURSDAY NIGHT... NCEP MODEL SUITE ALONG WITH INTERNATIONAL GUIDANCE POINT TOWARD AN ANOMALOUS DEEPENING SURFACE LOW OVER NY STATE LATE THURSDAY INTO THURSDAY NIGHT. PWATS ARE PROGED TO CLIMB AT OR ABOVE 2 INCHES...INCREASING LOW LEVEL JET AND SURFACE INSTABILITY CLIMBING FOR THE POTENTIAL WITH SEVERE WEATHER AND HEAVY RAINFALL. AS HAS BEEN MENTIONED IN SEVERAL DISCUSSIONS...EXTENSIVE CSTAR RESEARCH POINTS TOWARD A PROBLEMATIC FLOODING CONCERNS. FURTHERMORE...WITH LOWERING LCL/S AND SURFACE BASED INSTABILITY WITH 0-

3KM HELICITIES AT OR ABOVE 200 M/S2...ROTATING UPDRAFTS WITH DISCRETE HP SUPERCELLS IS A POSSIBILITY. AT THIS TIME...IF SEVERE WEATHER WERE TO OCCUR...IT WOULD BE ALONG AND SOUTH OF I90 PER THE WARM FRONTAL SURFACE PLACEMENT.

GUIDANCE TEMPERATURES CONTINUE TO SHOW A DECREASING TREND AS THIS WILL BE REFLECTED IN THE FORECAST/GRIDS.
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SYNOPSIS...BGM
SHORT TERM...BGM
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Thursday 27 June 2013

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

CSTAR warm-season cutoff low research is cited in the fifth paragraph of the short-term section of this morning's AFD issued by NWS ALY.

FXUS61 KALY 270831
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
431 AM EDT THU JUN 27 2013

.SYNOPSIS...
LOW PRESSURE WILL APPROACH FROM THE OHIO VALLEY AND THE LOWER GREAT LAKES REGION TODAY...AS THE WARM FRONT WILL INITIALLY FOCUS SCATTERED SHOWERS AND THUNDERSTORMS. THE CYCLONE WILL MOVE ACROSS PENNSYLVANIA AND NEW YORK TONIGHT WITH PERIODS OF VERY HEAVY
RAINFALL...AND THUNDERSTORMS WITH FLOODING POSSIBLE. THE LOW PRESSURE SYSTEM WILL MOVE SLOWLY NORTHEAST TOWARDS SOUTHERN QUEBEC FRIDAY INTO SATURDAY WITH HUMID CONDITIONS...AND CONTINUED CHANCES OF SHOWERS AND THUNDERSTORMS.
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.SHORT TERM /6 PM THIS EVENING THROUGH SATURDAY/...TONIGHT...THE GLOBAL ENSEMBLES AND DETERMINISTIC GUIDANCE CONVERGE FOR THE HEAVIEST RAINFALL TO OCCUR FROM 22Z TO ABOUT 16Z FRI. STRONG QG LIFT OCCURS AHEAD OF THE WARM FRONT AND WITH THE CYCLONE. IT IS NOT TYPICAL TO HAVE SUB-1000 HPA CYCLONES IN LATE JUNE. THE GEFS MSLP ANOMALY IS 3 TO 4 STANDARD DEVIATIONS /STD DEVS/ BELOW NORMAL BTWN 00Z TO 12Z. PWATS OF 2 TO 3 STD DEVS ABOVE NORMAL WILL BE OVER THE FCST AREA /1.25-2.00 INCHES OR SO/ WITH AN ANOMALOUS S/SE LOW LEVEL JET WHERE THE V-WIND ANOMALIES /SOUTHERLIES/ INCREASE TO 3 TO 5 STD DEVS ABOVE NORMAL OVER THE REGION. THE U-WIND ANOMALIES /EASTERLIES/ ARE STRONGEST OVER W-CNTRL NY AT 3 TO 5 STD DEVS ABOVE NORMAL. THE ANOMALIES AND TRAJECTORIES INDICATE A GOOD TRANSPORT OF MOISTURE FROM THE GULF AND THE WRN ATLANTIC.

THE SOUNDINGS INDICATE HIGH FREEZING LEVELS AND HIGH WARM CLOUD LAYER DEPTHS FOR INCREASED WARM CLOUD COLLISION COALESCENCE... HENCE EXCELLENT PCPN EFFICIENCY. THE HIGH PWATS WILL PROMOTE RAINFALL RATES OF A HALF AN

INCH TO AN INCH AN HOUR OR SO...AT LEAST. THEIR IS A CONCERN FOR FLASH FLOODING AND GENERAL FLOODING. THE QG LIFT LOOKS VERY IMPRESSIVE AHEAD OF THE SFC WAVE...AND THERE ARE HINTS OF A COUPLED DUAL JET STRUCTURE WITH ONE UPPER LEVEL JET STREAK MOVING IN FROM THE OHIO VALLEY...AND ONE LIFTING OUR FROM SRN QUEBEC AND THE ST LAWRENCE RIVER VALLEY.

PERIODS OF HVY RAINFALL LOOK LIKELY WITH OROGRAPHIC ENHANCEMENT OFF THE E/SE SLOPES OF THE CATSKILLS...DACKS...SRN GREENS...BERKSHIRES AND LITCHFIELD HILLS. THE GUIDANCE DOES VARY A BIT ON THE EXACT PLACEMENT OF THE QPF...BUT THE ECMWF/GFS/NAM DO AGREE ON A 1.5-3" MAXIMA OVER THE MOHAWK RIVER VALLEY...SRN DACKS...AND CATSKILLS WITH THE GFS ALSO SLAMMING SRN VT WITH 1.5-3". INTERESTING THAT BOTH THE NAM AND GFS SHOWS DOWNSLOPING DAMPENING THE RAINFALL IN THE CAPITAL REGION...AND A LARGE PORTION OF THE HUDSON RIVER VALLEY LIKE WITH WINTER TIME SYNOPTIC SYSTEMS.

MIN TEMPS WILL BE OF THE WET BULB COOLING VARIETY IN THE RAINSHIELD WITH EMBEDDED THUNDERSTORMS. THE NAM MOS MINS LOOKED WAY TOO COOL...AND OUR FORECAST FOLLOWS CLOSELY THE GFSMOS VALUES OF MAINLY MID AND U60S IN THE VALLEYS...AND U50S TO M60S OVER THE HILLS AND MTNS.

FRIDAY...THE HEAVIEST OF THE RAINFALL SHOULD BLAST THROUGH THE REGION BY THE LATE MORNING OR NOONTIME. MAIN STEM RIVERS COULD BE A PROBLEM WITH ALL THE HEAVY RAIN...HIGH RESERVOIRS...AND SATURATED SOILS. THE FLOOD WATCH CONTINUES THROUGH MOST OF THE DAY. THE UPPER LOW LEVEL CLOSES OFF AND SETS UP AS A CLASSIC GREAT LAKES CUTOFF OR CLOSED LOW TO FINISH THE WEEK AND OPEN THE WEEKEND. THIS LOOKS A LIKE A POSITIVELY TILTED CUTOFF FROM THE CSTAR WARM SEASON RESEARCH OVER THE PAST DECADE. THE STRATIFORM \RAIN SHIELD WITH EMBEDDED CONVECTION WILL BE GONE INTO CANADA...BUT TRAILING CONVECTIVE BANDS WILL HAVE TO BE MONITORED. IT CAN NOT BE RULED OUT THAT A DRY SLOT WILL BE BRIEFLY OVER THE REGION FRI LATE MORNING INTO THE PM. FURTHER HYDRO ISSUES WILL HAVE TO BE MONITORED...AS THE SYSTEMS COLD FRONT STALLS NEAR THE I-95 CORRIDOR...AND WEAK IMPULSES ROTATE AROUND THE BROADER LONGWAVE TROUGH THAT THE CLOSED LOW IS EMBEDDED IN. CHANCES OF SHOWERS AND THUNDERSTORMS WERE CONTINUED IN THE AFTERNOON. THERE COULD BE A FEW BREAKS OF SUN IN THE DRY SLOT. TEMPS OVER THE SRN DACKS WILL ONLY BE IN THE U60S TO M70S WITH LITTLE OR NO SUN. U70S TO L80S WILL BE COMMON OVER THE REST OF THE FCST AREA.

FRI NIGHT INTO SATURDAY...THE POSITIVELY TILTED LONGWAVE TROUGH REMAINS OVER THE ERN CONUS WITH A BROAD S/SW FLOW OF WARM AND HUMID AIR PERSISTING. THE CLOSED/CUTOFF H50O LOW OVER SE ONTARIO/SW QUEBEC. A WEAK SFC WAVE MAY MOVE ALONG THE FRONTAL BOUNDARY AND GRAZE THE S/SE ZONES LATE FRI NIGHT INTO SATURDAY MORNING. A CHANCE OF SHOWERS WITH ISOLD-SCT THUNDERSTORMS WAS CONTINUED HERE. SATURDAY
MAY HAVE A BRIEF DRY PERIOD...BUT A VORT MAX IN THE SW FLOW WILL LIKELY REKINDLE A CHANCE OF SHOWERS AND THUNDERSTORMS FOR MOST OF THE REGION IN THE CYCLONIC MID AND UPPER FLOW. LOWS WILL BE IN THE MID 50S OVER THE NW ZONES TO MID 60S OVER THE SOUTHEAST. HIGHS WILL RANGE FROM THE 70S OVER THE SRN DACKS AND SRN GREENS TO LOWER TO M80S FOR THE REST OF THE REGION ON SATURDAY.
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SYNOPSIS...WASULA
SHORT TERM...WASULA
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Monday 1 July 2013

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

CSTAR research on warm-season precipitation forecasting over the northeastern U.S. is cited in the fourth paragraph of the short-term section of yesterday morning's AFD issued by NWS ALY.

FXUS61 KALY 300852
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
452 AM EDT SUN JUN 30 2013

.SYNOPSIS...
AN ELONGATED TROUGH IN THE MID LEVELS OF THE ATMOSPHERE AND A DIFFUSE STATIONARY FRONT REMAIN ACROSS THE NORTHEAST. WEAK UPPER IMPULSES SHOULD RIDE UP ALONG IT TO PRODUCE BOUTS OF SHOWERS AND THUNDERSTORMS AGAIN THIS AFTERNOON. SLIGHTLY STRONGER IMPULSES LOOK TO BRING MORE IN THE WAY OF SHOWERS AND STORMS MONDAY AND TUESDAY WHICH COULD CONTAIN LOCALLY HEAVY RAINFALL. WITH TIME...THIS TROUGH WILL ACTUALLY MOVE WEST AS HIGH PRESSURE BUILDS IN FROM THE ATLANTIC OCEAN WHICH SHOULD SUPPRESS CONVECTION A LITTLE.
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.SHORT TERM /6 PM THIS EVENING THROUGH TUESDAY/...ONCE AGAIN...AS WE LOOSE THE HEATING OF THE DAY WE INITIALLY SHOULD SEE CONVECTION DECREASE. HOWEVER...THE DIFFERENCE TONIGHT IS THAT CLOUDS AHEAD OF THE AFOREMENTIONED MID LEVEL DISTURBANCE (CURRENTLY OVER SW MISSOURI) WILL MOVE IN ALONG WITH A GRADUAL INCREASE IN PWATS APPROACHING 2 INCHES...3-4 STANDARD DEVIATIONS ABOVE NORMAL.

THE SHOWER THREAT LOOKS TO CONTINUE THROUGHOUT THE NIGHT ALONG WITH A CHANCE OF A THUNDERSTORM. CLOUDS AND THE SURGE IN HUMIDITY WILL KEEP IT MUGGY WITH LOWS IN THE 60S.

THE SOUTHERLY WIND COMPONENT (-U) OFF THE 06Z GEFS LOOKS TO REACH 2-3 STANDARD DEVIATIONS ABOVE NORMAL...BUT NOT REALLY UNTIL TUESDAY.

THE FIRST MID LEVEL DISTURBANCE LOOKS TO MOVE ON BY LATE MONDAY FOLLOWED THE SECOND FOR TUESDAY. THERE ARE CONFLICTING SIGNALS WHICH ONE WOULD BE THE HEAVIEST RAINFALL...WITH THE EUROPEAN AND GFS MODELS HITTING HARDER WITH THE FIRST ONE ON MONDAY DESPITE THE FACT THE ANOMALIES FOR QPF (PER CSTAR RESEARCH) INDICATED TUESDAY COULD HAVE THE HEAVIER RAINFALL.

EITHER WAY...THE SHORTWAVES WILL PRODUCE A STRONG STRIP OF VORTICITY WHICH IN TURN WILL PRODUCE PRETTY GOOD UPWARD MOTION FOCUSED ALONG THE STALLED OUT BOUNDARY...WHICH WILL STILL BE CLOSE OR RIGHT OVER THE HUDSON VALLEY.

WE EXPECTED LIKELY SHOWERS AND THUNDERSTORMS BY MONDAY AFTERNOON. FOR NOW...CAPPED POPS AT 54 PERCENT ON TUESDAY. SHOWERS AND THUNDERSTORMS EACH DAY COULD PRODUCE LOCALIZED TORRENTIAL RAINFALL. WITH THIS TYPE OF SETUP THERE WILL LIKELY BE A PERIOD OF CONCENTRATED SHOWERS/THUNDERSTORMS FOLLOWED BY A BREAK THEN MORE ACTIVITY.

ONCE AGAIN SEVERE PARAMETERS ARE NOT REALLY THERE AS INSTABILITY LOOKS LIMITED (UNDER 1000 J/KG) AND MID-LEVEL LAPSE RATES REMAIN AROUND 5.5 C/KM. FOR NOW...WE WILL JUST MENTION THUNDERSTORMS COULD CONTAIN HEAVY RAIN.

WITH MORE CLOUDS AND THE ANTICIPATED SHOWERS AND STORMS...WENT ON THE LOW SIDE OF GUIDANCE WHICH PUTS MOST OF OUR REGION IN THE 75-80 RANGE BOTH MONDAY AND TUESDAY.

SINCE THERE IS STILL PLENTY OF UNCERTAINTY WHERE THE HEAVIEST RAIN WILL FALL AND WHEN (MONDAY OR TUESDAY) WE DECIDED NOT TO ISSUE A FLOOD WATCH JUST YET. MORE ABOUT THE POTENTIAL FOR HEAVY RAINFALL CAN BE FOUND IN OUR HYDRO DISCUSSION.
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SYNOPSIS...HWJIV
SHORT TERM...HWJIV
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Tuesday 22 October 2013

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

CSTAR research on the inland extent of lake-effect precipitation bands is cited in the fifth paragraph of the short-term section of this morning's AFD issued by NWS ALY.

FXUS61 KALY 220849
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
449 AM EDT TUE OCT 22 2013

.SYNOPSIS...
A COLD FRONT WILL CROSS OUR REGION TODAY WITH SOME RAIN SHOWERS..., MAINLY DURING THE MORNING HOURS. A MUCH CHILLIER AIRMASS WILL FOLLOW IN THE WAKE OF THE COLD FRONT OVER THE NEXT SEVERAL DAYS WITH LAKE EFFECT RAIN AND SNOW SHOWERS ACROSS THE ADIRONDACKS AND MOHAWK VALLEY. WITH OVERNIGHT LOWS IN THE 30S...SOME FROST WILL OCCUR FOR THE FIRST TIME THIS SEASON FOR THE CAPITAL REGION AND MID HUDSON VALLEY.
&&

.SHORT TERM /6 PM THIS EVENING THROUGH THURSDAY NIGHT/... WITH MAINLY CLEAR SKIES AND DECREASING WIND THIS EVENING...TEMPS WILL FALL QUICKLY. WITH TEMPS FALLING INTO THE 30S...AREAS OF FROST WILL DEVELOP OVERNIGHT. SINCE THE GROWING SEASON IS STILL TECHNICALLY ONGOING ACROSS THE HUDSON VALLEY BETWEEN ALBANY/TROY AND ULSTER/DUTCHESS COUNTIES...A FROST ADVISORY HAS BEEN ISSUED FOR THESE AREAS. MIN TEMPS LOOK TO BE IN THE MID 30S FOR VALLEY AREAS...WITH MID 20S TO LOW 30S ACROSS THE HIGH TERRAIN. CLOUDS WILL BE INCREASING LATE TONIGHT...AND IF THEY INCREASE QUICKER THAN CURRENTLY ANTICIPATED...FROST MAY NOT BE AS WIDESPREAD AS CURRENTLY FORECASTED.

A FAST MOVING SHORTWAVE ROTATING AROUND THE LARGE UPPER LOW OVER SOUTHERN CANADA WILL BE MOVING ACROSS THE OHIO VALLEY FOR TONIGHT. THIS WILL ALLOW FOR A SFC LOW TO DEVELOP OFF THE MID ATLANTIC COAST. THIS LOW WILL BE DEVELOPING TOO FAR EAST OF OUR AREA TO HAVE ANY DIRECT IMPACT ON OUR WEATHER. HOWEVER...IT WILL ALIGN THE WINDS IN THE LOW AND MID LEVELS TO ALLOW FOR SOME LAKE EFFECT PRECIPITATION OFF LAKE ONTARIO. THIS MAY REACH INTO FAR NORTHERN PORTIONS OF HERKIMER COUNTY TONIGHT INTO WEDNESDAY WITH RAIN AND SNOW SHOWERS. THE LAKE EFFECT WILL BE DISRUPTED DURING THE DAY WEDNESDAY AS THE UPPER LEVEL SHORTWAVE MOVES ACROSS THE REGION.

WITH THE UPPER LEVEL SHORTWAVE MOVING ACROSS THE REGION ON WEDNESDAY... THERE IS A SLIGHT CHC TO LOW CHC OF A RAIN SHOWER...ESP IN PLACES WHERE UPSLOPE OR LAKE ENHANCEMENT CAN OCCUR. POPS ARE ALSO SLIGHTLY HIGHER ACROSS NW CT IN CASE THE COASTAL STORM NUDGES WESTWARD...ALTHOUGH RECENT MODEL RUNS HAVE SUGGESTED THIS WON/T BE IN THE CASE. MAX TEMPS ON WED WILL BE MUCH COOLER THAN RECENT DAYS...WITH 40S TO LOW 50S OVER THE AREA AND A COOL WESTERLY BREEZE.

ANOTHER CHILLY NIGHT IS IN STORE FOR WED NIGHT...AND ADDITIONAL FROST/FREEZE HEADLINES MAY BE NEEDED AGAIN. MIN TEMPS WILL BE IN THE 20S TO LOW 30S ONCE AGAIN.

BEHIND THE DEPARTING SHORTWAVE...THE FLOW SHOULD ALIGN FOR MORE ORGANIZED LAKE EFFECT ACTIVITY ONCE AGAIN FOR WED NIGHT INTO THURSDAY AND THURSDAY NIGHT. WITH CAA ONGOING...850 HPA TEMPS TUMBLE TO -4 TO -6 DEGREES C OVER THE AREA. WITH LAKE WATER TEMPS STILL AROUND 15 DEGREES C...THIS DIFFERENTIAL EQUATES TO SEVERE INSTABILITY ON THE NIZIOL INSTABILITY SCALE. WHILE THIS CERTAINLY WILL ALLOW A STRONG BAND OF LAKE EFFECT TO DEVELOP...CSTAR RESEARCH HAS SHOWN THAT THESE CASES TEND TO BE LIMITED TO CLOSER TO THE LAKESHORE. SO...DESPITE A POSSIBLE MULTI-LAKE CONNECTION...THE EXTENT OF THE LAKE EFFECT PAST THE THE TUG HILL AND INTO THE WESTERN ADIRONDACKS IS UNCLEAR AT THIS TIME. ALSO...P TYPE WILL BE IN QUESTION...AS TIME OF DAY/ELEVATION WILL PLAY A ROLE IN RAIN VS SNOW. AT THIS TIME...SOME LAKE EFFECT LOOKS LIKE IT MAY REACH OUR FAR WESTERN AREAS FROM TIME TO TIME...WITH SNOW THE PREDOMINATE P-TYPE AT NIGHT AND AT ELEVATIONS OVER 2000 FT. SOME LIGHT ACCUMULATION OF AN INCH OR TWO WILL BE POSSIBLE FOR THESE LOCATIONS...WITH LITTLE TO NO ACCUMULATION FOR VALLEY AREAS. THE BAND LOOKS TO SHIFT SLIGHTLY FROM THE WESTERN ADKS TOWARDS THE WESTERN MOHAWK VALLEY BETWEEN WEDNESDAY NIGHT AND THURSDAY.

MEANWHILE...THE REMAINDER OF THE AREA WILL STAY COOL AND DRY FORTHURS INTO THURSDAY NIGHT ...WITH OCCASIONAL CLOUDS FROM LAKE EFFECT ACTIVITY MOVING OVER THE AREA. MAX TEMPS ON THURSDAY WILL BE SIMILAR TO WEDNESDAY WITH 40S TO NEAR 50...AND MIN TEMPS ON THURSDAY NIGHT WILL ONCE AGAIN BE IN THE 20S TO LOW 30S.
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SYNOPSIS...FRUGIS
SHORT TERM...FRUGIS
==========Tuesday 22 October 2013

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

CSTAR research on the inland extent of lake-effect precipitation bands is cited twice in the fourth paragraph of the short-term section of this afternoon's AFD issued by NWS ALY.

FXUS61 KALY 222100
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
500 PM EDT TUE OCT 22 2013

.SYNOPSIS...
A MUCH CHILLIER AIRMASS WILL FOLLOW IN THE WAKE OF A COLD FRONT OVER THE NEXT SEVERAL DAYS WITH LAKE EFFECT RAIN AND SNOW SHOWERS ACROSS THE ADIRONDACKS AND MOHAWK VALLEY. WITH OVERNIGHT LOWS IN THE LOWER TO MID 30S TONIGHT...SOME FROST WILL OCCUR FOR THE FIRST TIME THIS SEASON FOR THE CAPITAL REGION AND MID HUDSON VALLEY.
&&
.SHORT TERM /6 AM WEDNESDAY MORNING THROUGH FRIDAY/...

THE AFOREMENTIONED FAST MOVING SHORTWAVE ROTATING AROUND A LARGE UPPER LOW OVER SOUTHERN CANADA WILL BE MOVING ACROSS THE OHIO VALLEY EARLY ON WEDNESDAY. THIS WILL ALLOW FOR A SURFACE LOW PRESSURE AREA TO DEVELOP OFF THE MID ATLANTIC COAST. THIS LOW STILL LOOKS TO BE DEVELOPING TOO FAR EAST OF OUR AREA TO HAVE ANY DIRECT IMPACT ON OUR WEATHER. HOWEVER...IT WILL EVENTUALLY ALIGN THE WINDS IN THE LOW AND MID LEVELS TO ALLOW FOR SOME POTENTIALLY MORE SIGNIFICANT LAKE EFFECT PRECIPITATION OFF LAKE ONTARIO LATER ON WEDNESDAY.

THIS BAND LOOKS TO REACH INTO FAR NORTHERN PORTIONS OF HERKIMER BY EARLY WEDNESDAY WITH RAIN AND SNOW SHOWERS. THE LAKE EFFECT WILL BE DISRUPTED DURING THE DAY WEDNESDAY AS THE UPPER LEVEL SHORTWAVE MOVES ACROSS THE REGION AND ALSO DUE TO A MORE VERTICAL INSTABILITY (AS OPPOSED TO SLANTWISE) GENERATE BY SOME DIURNAL HEATING.

WITH THE UPPER LEVEL SHORTWAVE MOVING ACROSS THE REGION ON WEDNESDAY...THERE IS A SLIGHT TO LOW CHANCE OF A RAIN SHOWER...ESPECIALLY IN PLACES WHERE UPSLOPE OR LAKE ENHANCEMENT CAN OCCUR. WE KEPT SLIGHTLY

HIGHER POPS ACROSS NW CT IN THE UNLIKELY EVENT THE THE COASTAL STORM NUDGES WESTWARD...ALTHOUGH MODEL RUNS HAVE SUGGESTED THIS WILL NOT BE THE CASE.

THE KVIE CSTAR EXPERIMENTAL LAKE EFFECT PROGRAM DOES INDICATE EXTREME INSTABILITY WITH H850 TEMPERATURES COOLING TO ABOUT -5C AND THE SURFACE LAKE TEMPERATURES IN THE MID 50S. CSTAR STUDIES HAVE INDICATED THAT EXTREME LAKE EFFECT ACTUALLY KEEP THE LAKE EFFECT BAND FROM REACHING AS FAR INLAND. BOTH THE NAM AND GFS MODELS CONTINUE TO INDICATE SOME INITIAL SHEAR THE WIND FIELD FROM THE SURFACE TO 10,000 FEET (MORE WSW NEAR THE SURFACE) BACKING TO THE WNW HIGHER UP IN THE COLUMN.

THESE TWO FACTORS MIGHT INITIALLY HOLD BACK POTENTIAL SIGNIFICANT SNOW ACCUMULATIONS ACROSS NORTHERN HERKIMER AND NORTHERN HAMILTON COUNTIES. ALSO THE THERMAL PROFILE INITIALLY IS ONLY MARGINALLY COLD ENOUGH TO SUPPORT ALL SNOW...BUT OF COURSE HEAVIER PRECIPITATION WOULD COOL THE COLUMN DOWN MORE.

THAT SAID...THE OVERALL FLOW LOOKS TO BECOME A LITTLE MORE CONDUCIVE FOR THE BAND TO POSSIBLY EXTEND A LITTLE FURTHER INLAND LATER WEDNESDAY NIGHT INTO EARLY THURSDAY. THIS IS WHEN WE HAVE THE POTENTIAL TO SEE A BIT MORE ACCUMULATING SNOW. FOR NOW...NO HEADLINES...BUT WILL MENTION THE POSSIBILITY OF ACCUMULATION SNOWFALL ACROSS THESE AREA THAT COULD REACH ADVISORY OR EVEN WARNING THRESHOLDS.

AS WE HEAD INTO FRIDAY AND FRIDAY NIGHT...WHILE THE AIRMASS LOOKS TO CHILL DOWN EVEN MORE (WITH H850 TEMPERATURES COOLING AS LOW AS -8C ACROSS OUR NW ZONES TO EVEN ABOUT -5C IN OUR SE ZONES)...IT LOOKS AS THE SUBSIDENCE BEGINS TO LOWER AS RIDGING BUILDS INTO THE REGION. MEANWHILE...THE VAST MAJORITY OF THE AREA AWAY FROM THE SOUTHWESTERN ADIRONDACKS AND CENTRAL MOHAWK VALLEY...WILL STAY COOL AND MAINLY DRY FOR THURS INTO THURSDAY NIGHT ...WITH OCCASIONAL CLOUDS FROM LAKE EFFECT ACTIVITY MOVING OVER THE AREA. SOME FLURRIES OR SPRINKLES MIGHT WORK DOWN THE MOHAWK VALLEY INTO THE CAPITAL REGION AND EVEN INTO THE NORTHERN BERKSHIRES BUT NO ACCUMULATIONS OF SNOW EXPECTED.

HIGH TEMPERATURES WILL RANGE FROM THE MID 40S TO LOWER 50S REGION WIDE ON WEDNESDAY...LOWER TO 40S NORTHWEST TO MID 50S SOUTHEAST ON THURSDAY...AND ONLY IN THE UPPER 30S NORTHWEST TO LOWER 50S ON FRIDAY.

BY SATURDAY...AS THE LARGE ARCTIC HIGH PRESSURE RESPONSIBLE FOR THE CHILL DOWN FINALLY BEGINS TO PUSH OFFSHORE...A SOUTHERLY FLOW WILL BRING A LITTLE MODERATION TO THE AREA...WITH HIGHS A COUPLE POINTS HIGHER THAN FRIDAY. THE SKY WILL START OUT PARTLY CLOUDY...WITH CLOUDS INCREASING AS THE NEXT SYSTEM APPROACHES FROM THE WEST.
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SYNOPSIS...FRUGIS/HWJIV
SHORT TERM...FRUGIS/HWJIV
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Wednesday 23 October 2013

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

CSTAR research on the inland extent of lake-effect precipitation bands is cited in the first paragraph of the short-term section of this morning's AFD issued by NWS ALY.

FXUS61 KALY 230855
AFDALY
AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
455 AM EDT WED OCT 23 2013

.SYNOPSIS...
COLDER AIR WILL CONTINUE TO MOVE INTO THE REGION OVER THE NEXT FEW DAYS WITH LAKE EFFECT RAIN AND SNOW SHOWERS OFF LAKE ONTARIO AFFECTING THE WESTERN ADIRONDACKS AND WESTERN MOHAWK VALLEY. AREAS OF FROST WILL OCCUR ACROSS THE REGION OVER THE NEXT FEW NIGHTS...AND THE HUDSON VALLEY WILL SEE IT/S FIRST KILLING FREEZE OF THE FALL SEASON THIS WEEK.
&&
.SHORT TERM /6 PM THIS EVENING THROUGH FRIDAY NIGHT/... LAKE EFFECT WILL GET GOING ONCE AGAIN TONIGHT OFF LAKE ONTARIO AS THE FLOW ALIGNS IN THE WAKE OF THE SHORTWAVE. WITH 850 HPA TEMPS DROPPING TO -6 DEGREES C...SEVERE INSTABILITY WILL KEEP THE WORST OF THE LAKE ACTIVITY WEST OF OUR CWA...AS SHOWN IN LOCAL CSTAR RESEARCH. AT TIMES...THE LAKE EFFECT MAY REACH INTO THE FAR NORTHWESTERN PARTS OF OUR REGION BETWEEN TONIGHT AND THURSDAY NIGHT. CONSIDERING ITS STILL LATE OCTOBER...THE BOUNDARY LAYER WILL BE WARM ENOUGH TO SUPPORT RAIN AS THE PTYPE DURING THE DAY...ESP WHEN INTENSITY LIGHTENS UP. HOWEVER...PERIODS OF SNOW SHOWERS WILL OCCUR THROUGH THE PERIOD...WITH 1 TO POSSIBLY 4 OUNTS WILL OCCUR AT THE HIGHER ELEVATIONS...WITH HIGH MOUNTAIN VALLEY TOWNS SUCH AS OLD FORGE AND INLET LIMITED TO JUST AROUND AN INCH OR SO OF WET SNOW. THE BAND MAY SHIFT INTO THE WESTERN MOHAWK VALLEY DURING THURSDAY NIGHT...BUT JUST A COATING IS EXPECTED FOR THE MOHAWK VALLEY CITIES OF HERKIMER COUNTY. BY FRIDAY...ANOTHER WEAK SHORTWAVE WILL DISRUPT THE FLOW AND LOWER THE THREAT FOR LAKE EFFECT PRECIP. HOWEVER...THESE FIRST FLAKES OF THE YEAR WILL REMIND EVERYONE THAT THE VERY LONG AND COLD UPSTATE NY/ADIRONDACK WINTER HAS ARRIVED...AND ISN/T GOING AWAY FROM A LONG LONG WHILE.

ELSEWHERE...SKIES WILL RANGE FROM PARTLY TO MOSTLY CLOUDY FOR TONIGHT THROUGH FRIDAY NIGHT...WITH THE MOST CLOUDS UP NORTH DOWNWIND OF THE LAKE. BELOW NORMAL TEMPS ARE EXPECTED WITH UPPER 20S TO MID 30S AT NIGHT...AND 40S TO LOW 50S DURING THE DAYTIME. AREAS OF FROST WILL OCCUR...AND ADDITIONAL FROST/FREEZE HEADLINES MAY BE NEEDED FOR THE HUDSON VALLEY DEPENDING ON JUST HOW CHILLY THIS MORNING/S LOW ARE /TO DETERMINE IF THE GROWING SEASON HAS ENDED IN ANY ZONES OR NOT/.
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SYNOPSIS...FRUGIS
SHORT TERM...FRUGIS
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Wednesday 23 October 2013

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

CSTAR research on the inland extent of lake-effect precipitation bands is cited in the first paragraph of the short-term section of this afternoon's AFD issued by NWS ALY.

FXUS61 KALY 232111
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
511 PM EDT WED OCT 23 2013

.SYNOPSIS...
COLDER AIR WILL CONTINUE TO MOVE INTO THE REGION OVER THE NEXT FEW DAYS WITH LAKE EFFECT RAIN AND SNOW SHOWERS OFF LAKE ONTARIO AFFECTING THE WESTERN ADIRONDACKS AND WESTERN MOHAWK VALLEY. AREAS OF FROST WILL OCCUR ACROSS THE REGION OVER THE NEXT FEW NIGHTS...AND THE HUDSON VALLEY WILL SEE THE FIRST KILLING FREEZE OF THE FALL SEASON THIS WEEK.
&&
.SHORT TERM /6 AM THURSDAY MORNING THROUGH FRIDAY NIGHT/... THURSDAY/THURSDAY NIGHT...A W/NW LOW LEVEL FLOW WILL CONTINUE TO FOCUS LAKE EFFECT CLOUDS AND SNOW SHOWERS ACROSS THE SOUTHWEST ADIRONDACKS DURING THE MORNING...BEFORE DRIFTING SLOWLY SOUTHWARD IN THE AFTERNOON AND EVENING HOURS AS LOW LEVEL WINDS VEER WITH THE APPROACH OF ANOTHER SFC TROUGH. TAKING A LOOK AT LAKE EFFECT POTENTIAL...UTILIZING TECHNIQUES DERIVED FROM CSTAR RESEARCH...ALTHOUGH INSTABILITY WILL BE STRONG AND THE INVERSION LEVEL WILL BE QUITE HIGH...FAVORABLE FOR LAKE EFFECT SNOWBAND DEVELOPMENT...WIND SHEAR WITHIN THE LOW LEVELS APPEARS TO BE SOMEWHAT STRONG...AND WOULD TEND TO FAVOR MORE MULTIBAND SNOWBANDS...WITH AN INLAND EXTENT OF AROUND 60-70 MILES FROM THE EASTERN SHORE OF LAKE ONTARIO. SO...BASED ON THIS...AND THE POSSIBILITY THAT SOME RAIN/GRAUPEL MAY MIX IN AT TIMES DURING THURSDAY AFTERNOON...HAVE RAISED A LAKE EFFECT SNOW ADVISORY FOR NORTHERN HERKIMER CO...THROUGH THURSDAY EVENING. WE EXPECT 3-6 INCHES OF SNOWFALL TO OCCUR IN THIS REGION...WITH THE HIGHEST AMTS ACROSS HIGHER ELEVATIONS WHERE THE BANDS REMAIN MOST PERSISTENT. AS THIS BAND SHIFTS FURTHER SOUTH IN THE AFTERNOON/EVENING...SHOWERS OF RAIN/SNOW WILL LIKELY EXTEND INTO THE MOHAWK VALLEY REGION...AND EVENTUALLY INTO THE VALLEY AREAS THU EVENING. BOUNDARY LAYER TEMPS SHOULD BE WARM ENOUGH TO PREVENT ANY ACCUMS IN THESE AREAS...BUT SOME SNOWFLAKES AND/OR GRAUPEL WILL CERTAINLY BE POSSIBLE WITHIN ANY TALLER SHOWERS...INCLUDING INTO THE CAPITAL REGION...THURSDAY EVENING. THE BANDS OF LAKE EFFECT RAIN/SNOW SHOWERS SHOULD THEN SHIFT FURTHER SOUTH INTO THE SCHOHARIE VALLEY/EASTERN CATSKILLS REGION BY LATE THU NT. SOME BREAKS IN THE CLOUDS MAY DEVELOP LATE NORTH OF THIS BAND...BEFORE ADDITIONAL CLOUDS REDEVELOP UNDER A LOWERING INVERSION BY FRI AM. EXPECT TEMPS ON THU TO REACH THE MID 40S TO LOWER 50S IN VALLEYS...AND UPPER 30S TO MID 40S ACROSS HIGHER ELEVATIONS. THU NT MINS SHOULD FALL INTO THE LOWER/MID 30S IN VALLEYS...AND 20S ACROSS HIGHER ELEVATIONS.

FRI-FRI NT...THE LOW/MID LEVEL COLD POOL WILL MOVE ACROSS DURING FRIDAY. A LOWERING SUBSIDENCE INVERSION SHOULD TRAP SOME LAKE MOISTURE BENEATH...RESULTING IN MOSTLY CLOUDY SKIES FOR MANY AREAS FROM THE CAPITAL REGION AND AREAS TO THE NORTH AND EAST. WILL THEREFORE SIDE ON THE COOLER SIDE OF GUIDANCE...WITH MAX TEMPS ONLY REACHING THE MID/UPPER 40S IN MOST VALLEY AREAS...WITH MID 30S TO LOWER 40S ACROSS THE HIGHER ELEVATIONS ACROSS THE SOUTHERN ADIRONDACKS...AND LOWER/MID 40S ACROSS MUCH OF WESTERN NEW ENGLAND. BACKING LOW LEVEL WINDS COULD SUPPORT ADDITIONAL LAKE EFFECT RAIN/SNOW SHOWERS ACROSS THE WESTERN ADIRONDACKS LATE FRI OR EARLY FRI NT. OTHERWISE...CLEARING SKIES FURTHER S AND E FROM THE ADIRONDACKS SHOULD ALLOW FOR TEMPS TO FALL TO THE LOWEST LEVELS OF THE FALL SEASON THUS FAR...WITH WIDESPREAD 20S TO LOWER 30S EXPECTED.
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SYNOPSIS...KL/FRUGIS
SHORT TERM...KL
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Thursday 24 October 2013

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

CSTAR research on the inland extent of lake-effect snowbands is cited in the second paragraph of the near-term section of this morning's AFD issued by NWS ALY.

FXUS61 KALY 240930
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
529 AM EDT THU OCT 24 2013

.SYNOPSIS...
COLDER AIR WILL CONTINUE TO MOVE INTO THE REGION WITH LAKE EFFECT RAIN AND SNOW SHOWERS OFF LAKE ONTARIO AFFECTING THE WESTERN ADIRONDACKS AND WESTERN MOHAWK VALLEY AS WE HEAD INTO THE WEEKEND. WIDESPREAD CHANCES FOR SHOWERS ARE EXPECTED MAINLY SATURDAY NIGHT AS A LOW PRESSURE SYSTEM APPROACHES AND CROSS THE REGION. BELOW NORMAL TEMPERATURES WILL CONTINUE INTO EARLY NEXT WEEK.
&&
.NEAR TERM /THROUGH TONIGHT/...
LAKE EFFECT SNOW ADVISORY REMAINS IN EFFECT FOR NORTHERN HERKIMER COUNTY...HOWEVER IT IS NOW ONLY IN EFFECT THROUGH NOONTIME TODAY. LAKE EFFECT SNOW BANDS HAVE DEVELOPED AND DO EXTEND INTO NORTHERN HERKIMER COUNTY EARLY THIS MORNING. THE ADVISORY WENT INTO EFFECT AT 4 AM. THE LAKE ONTARIO WATER TEMPERATURE IS WARM AT 57 DEGREES FAHRENHEIT/14 DEGREES CELSIUS AND WE HAVE AROUND -4 DEGREE CELSIUS AIR AT 850 MB MOVING ACROSS THE LAKE...PLENTY OF TEMPERATURE DIFFERENTIAL FOR LAKE EFFECT. HOWEVER INSTABILITY IS HIGH WHICH FAVORS MULTIPLE SNOW BANDS AND NOT A CONCENTRATED SINGLE BAND. USING CSTAR RESEARCH ON INLAND EXTENT BY KREKELER AND VILLANI THE FARTHEST INLAND THE SNOWBANDS SHOULD EXTEND IS 65 TO 70 MILES FROM THE LAKESHORE WHICH IS ALONG THE HERKIMER-HAMILTON

COUNTY BORDER AND THIS WILL BE THROUGH THE MORNING HOURS. AS THE MORNING PROGRESSES AND TEMPERATURES RISE INTO AND THROUGH THE 30S RAIN WILL MIX WITH THE SNOW WITH A EVENTUAL CHANGE OVER TO RAIN EXPECTED BY AROUND NOONTIME. THESE ARE THE REASONS FOR THE CHANGE IN END OF THE ADVISORY. AS FOR SNOWFALL ACCUMULATIONS...UP TO INCHES 4 INCHES ACROSS THE HIGHER TERRAIN.

THE SNOWBANDS WILL SHIFT SOUTHWARD THIS AFTERNOON INTO THE EVENING AS A SHORT WAVE PASSES AND THE FLOW VEERS. SHOWERS MAINLY RAIN WILL IMPACT THE WESTERN MOHAWK VALLEY THIS EVENING EVENTUALLY SHIFTING EVEN FARTHER SOUTH OVERNIGHT. CONDITIONS WILL BECOME LESS FAVORABLE AND AFTER MIDNIGHT POPS ARE DROPPED BELOW LIKELY.

IN ADDITION TO THE LAKE EFFECT SOME UPSLOPE SHOWERS WILL POSSIBLE ACROSS SOUTHERN VERMONT...THE TACONICS AND BERKSHIRES MAINLY THIS EVENING.

THE PRESSURE GRADIENT WILL TIGHTEN TODAY AND WESTERLY FLOW WILL BECOME BRISK AND GUSTY. GUSTS UP TO 25 TO 30 MPH ARE EXPECTED ESPECIALLY DOWN THE MOHAWK VALLEY AND ACROSS THE CAPITAL DISTRICT.

THE FROST ADVISORY REMAINS IN EFFECT UNTIL 9 AM THIS MORNING. HAVE NOT ISSUED NEW HEADLINES FOR TONIGHT AT THIS TIME BUT THEY WILL BE NEEDED. THE GROWING SEASON WILL COME AN END FOR THE HUDSON VALLEY FRIDAY MORNING EVEN IF TEMPERATURES DO NOT FALL TO FREEZING OR BELOW AS IT WILL BE 2 WEEK BEYOND THE NORMAL AVERAGE FREEZE DATES FOR THE AREA WHICH WILL BRING AN OFFICIAL END TO THE GROWING SEASON.
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SYNOPSIS...IAA
NEAR TERM...IAA
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Wednesday 30 October 2013

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

CSTAR high-wind research is cited in the third paragraph of the short-term section of this afternoon's AFD issued by NWS ALY.

FXUS61 KALY 302059
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
459 PM EDT WED OCT 30 2013

.SYNOPSIS...
A SIGNIFICANT STORM SYSTEM WILL IMPACT THE REGION THURSDAY INTO FRIDAY...AS A STRONG AREA OF LOW PRESSURE TRACKS ACROSS THE WEST CENTRAL GREAT LAKES AND SOUTHERN CANADA...BRINGING WIDESPREAD SHOWERS AND GUSTY WINDS TO THE AREA THURSDAY NIGHT INTO FRIDAY. COOLER AIR WILL FILTER INTO

THE REGION IN THE WAKE OF THE STORM SYSTEM FOR THIS WEEKEND...WITH SOME SHOWERS POSSIBLE.
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.SHORT TERM /6 AM THURSDAY MORNING THROUGH FRIDAY NIGHT/... THURSDAY...EXPECT THICKENING MID LEVEL CLOUDS ACROSS MUCH OF THE REGION DURING THE MORNING...WITH MAINLY CLOUDS SKIES EXPECTED THROUGH THE AFTERNOON. SCATTERED SHOWERS WILL LIKELY DEVELOP FROM SOUTHWEST TO NORTHEAST IN THE AFTERNOON HOURS...WITH THE BEST CHANCE FOR AREAS MAINLY N AND W OF ALBANY. AT THIS TIME...IT DOES NOT APPEAR TO BE A WASHOUT THURSDAY AFTERNOON...BUT THERE WILL BE AT LEAST SOME SHOWERS AROUND FROM TIME TO TIME...WITH THE MOST PERSISTENT SHOWERS EXPECTED ACROSS THE SOUTHWEST ADIRONDACKS...WESTERN MOHAWK VALLEY REGION...WHERE SUSTAINED AND STRONGER ISENTROPIC LIFT ALONG THE 295 K SFC IS EXPECTED. IT WILL BECOME BREEZY BY AFTERNOON...PARTICULARLY WITHIN N/S ORIENTED VALLEYS DUE TO CHANNELED FLOW...WITH SOME GUSTS OF 25-35 MPH POSSIBLE.

THURSDAY NIGHT...SEVERAL WAVES OF SHOWERS WILL MOVE ACROSS THE REGION AHEAD OF THE APPROACHING FRONTAL SYSTEM. AGAIN...THE MOST PERSISTENT SHOWERS ARE EXPECTED ACROSS THE WESTERN ADIRONDACKS AND MOHAWK VALLEY...WHICH ARE FAVORED LOCATIONS FOR LOCALLY HEAVIER RAINFALL WITHIN A STRONG SOUTHWEST FLOW. WINDS WILL BE GUSTY AT TIMES...ESP FOR HIGHER ELEVATIONS ACROSS THE WESTERN ADIRONDACKS...WHERE SOME GUSTS COULD REACH OR SURPASS 50 MPH LATE. WE HAVE ISSUED A HIGH WIND WATCH FOR A PORTION OF THE WESTERN ADIRONDACKS/MOHAWK VALLEY FOR LATE THU NT INTO FRI...WHERE THE POTENTIAL FOR STRONGEST WINDS WILL EXIST. ELSEWHERE...DESPITE A VERY STRONG LOW LEVEL JET TRANSLATING ACROSS THE REGION...A RELATIVELY STABLE BOUNDARY LAYER SHOULD LIMIT THE POTENTIAL TO MIX WINDS DOWN TO THE SFC...AND THEREFORE CURRENTLY EXPECT WIND GUSTS MAINLY BELOW 45 MPH. THE POSSIBLE EXCEPTIONS WILL BE IN HIGHLY LOCALIZED AREAS...WHERE HIGHER TERRAIN/DUCTING COULD BRING SOME BRIEF STRONG WIND GUSTS DOWNWARD...AND ALSO WITHIN ANY HEAVIER SHOWERS. SINCE THIS POTENTIAL LOOKS ISOLATED...HAVE NOT INCLUDED ANY ADDITIONAL AREAS IN A HIGH WIND WATCH AT THIS TIME. EXPECT A MILD NIGHT...WITH MIN TEMPS FAIRLY UNIFORM...MAINLY FALLING INTO THE 50S IN MOST AREAS.

FRIDAY...THE POTENTIAL FOR STRONG WIND GUSTS WILL EXIST THROUGH EARLY AFTERNOON...GREATEST ACROSS THE WESTERN ADIRONDACKS/MOHAWK VALLEY REGION...ESPECIALLY WITH AND IMMEDIATELY BEHIND THE COLD FRONT...WHICH IS CURRENTLY EXPECTED TO SWIFTLY MOVE FROM WEST TO EAST ACROSS THE REGION BEFORE NOONTIME. WE WILL HAVE TO CLOSELY MONITOR THE POTENTIAL FOR LOW TOPPED CONVECTION ACCOMPANYING THIS FRONTAL BOUNDARY...WHICH COULD INDUCE A BRIEF PERIOD OF STRONG WINDS ACROSS THE REGION...ESPECIALLY SHOULD MID LEVEL DRY AIR OUTRUN THE SFC BOUNDARY...GREATLY DECREASING LOW LEVEL STATIC STABILITY AND ALLOWING FOR GREATER POTENTIAL TO MIX DOWN STRONGER WINDS FROM ALOFT. AGAIN...BASED PREVIOUS CSTAR RESEARCH...GIVEN THE CURRENT SCENARIO OF A STRONG SFC LOW MOVING NORTHEAST...MAINLY N AND W OF THE ST LAWRENCE RIVER VALLEY...THE PORTIONS OF OUR REGION MOST FAVORED FOR STRONG WINDS WOULD BE THE WESTERN ADIRONDACKS. BEHIND THE FRONT...STRONG SUBSIDENCE MAY LEAD TO A PERIOD OF CLEARING FOR FRI AFTERNOON. DEEPER MIXING MAY ALLOW FOR TEMPS TO SOAR INTO THE UPPER 60S TO LOWER 70S IN VALLEY AREAS DURING THIS TIME...WITH MAINLY 50S AND LOWER 60S

ACROSS MOST HIGHER ELEVATIONS. SOME LAKE ENHANCED/EFFECT CLOUDS AND RAIN SHOWERS MAY SPREAD ACROSS PORTIONS OF THE WESTERN ADIRONDACKS LATE IN THE DAY.

FRIDAY NIGHT...EXPECT CLEAR TO PARTLY CLOUDY CONDITIONS IN VALLEYS...WITH MOSTLY CLOUDY SKIES ACROSS THE SOUTHERN ADIRONDACKS... ALONG WITH THE POSSIBILITY OF SOME LAKE EFFECT RAIN/SNOW SHOWERS. EXPECT MIN TEMPS TO FALL INTO THE UPPER 30S TO LOWER 40S IN MOST AREAS.
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SYNOPSIS...KL/JPV
SHORT TERM...KL
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