"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: Eugene P. Auciello

National Oceanic and Atmospheric Administration Award Number: NA07NWS4680001

Date: 30 November 2008

SECTION 1: Summary of Graduate Student Research Activities

(a) Distribution of Warm/Cool Season Precipitation Associated with 500 hPa Cutoff Cyclones (Matthew Scalora)

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

Tom Wasula, National Weather Service, Albany, NY)

Research Summary (1 May 2008–31 October 2008):

This CSTAR-III six-month report describes research that started in spring 2008 and currently is in progress. The first part of this research involved updating the 500 hPa cutoff low climatology performed by Smith (2003). The 6-h 2.5° x 2.5° NCEP–NCAR reanalysis grids and FORTRAN programs were used to extend this global and regional climatology. Figure 1 shows the total number of cutoff low events per grid point for 1948–2007. Maxima of cutoff low activity include the North Pacific Ocean, Hudson Bay, Canadian Maritimes, and off the coast of southeast Greenland. This climatology will be updated through 2008 after the conclusion of this year.

Another important component of this project is to study several warm season cases of cutoff lows in the CSTAR domain using 6-h 0.5° x 0.5° GFS grids. These case studies will focus on the precipitation patterns of various cutoffs. Consistent with this focus, cases will be chosen that illustrate various problems with forecasting heavy precipitation and severe weather associated with cutoffs. Common synoptic-dynamic features throughout the troposphere will be composited along with selected parameters used in convective weather forecasting. Null cases, in which only nonsevere thunderstorms or light precipitation amounts occurred, also will be considered. Precipitation plots will be created from 6-h analyses obtained from the NWS National Precipitation Verification Unit Quantitative Precipitation Estimates.

One aspect of these systems that has not been previously studied in UAlbany CSTAR research is categorizing cutoff lows by standardized anomalies of different fields. Climatologies were created using the 6-h 2.5° x 2.5° NCEP–NCAR reanalysis by computing monthly averaged data for 1992–2007. This period is felt to be long enough to establish accurate means and standard deviations. Standardized anomalies of the 0.5° x 0.5° GFS analyses were computed for parameters such as 500 hPa geopotential heights, 700–500 hPa lapse rates, 925–700 hPa wind shear, 850 hPa jet strength, and precipitable water.

One cutoff low case that already has been studied in depth is the 22–25 July 2008 case. This cutoff low developed from a positively tilted preexisting trough over eastern Canada. The complete track of the cutoff low, as well as the mean 500 hPa geopotential height field over the 72-h period during which the low was cutoff, is shown in Fig. 2. The storm total precipitation is shown in Fig. 3. Widespread rain amounts of 7–9 cm are found over eastern New York and Massachusetts. There are also some clear orographic signals of enhanced precipitation (e.g., Pocono, Catskill, and Green Mountains). Figure 4 shows the cutoff low centered between Lakes Huron and Ontario at 1800 UTC 23 July 2008. An elongated 500 hPa absolute vorticity lobe and associated cyclonic vorticity advection contributed to the development of severe weather over western New York and Pennsylvania, whereas surface boundaries and +2 to +3 standard deviation (SD) 925–700 hPa vertical wind shear anomalies contributed to the development of severe weather over New Jersey and southern New England. Precipitable anomalies of +2 to +3 SD yielded flash flooding over the Northeast (Fig. 5). Severe weather on 24 July, including a tornado, was associated with positive low-level equivalent potential temperature advection and a +4 to +5 SD 850 hPa jet (Fig. 6). These features contributed to the rapid transport of moisture from the Gulf of Mexico and western North Atlantic and to the convergence of this moisture over the Northeast. Figure 7 shows a radar image over the Northeast at 1549 UTC 24 July, about 11 minutes after an EF2 tornado touched down over southeast New Hampshire. Figure 8 shows a surface plot of potential temperature at 1500 UTC 24 July. Apparent surface boundaries include a warm front in central New England and a sea

breeze front along the New Hampshire and southern Maine coasts. These boundaries helped to maintain and enhance the convective line over eastern New England on 24 July.

NWS Interactions:

Neil Stuart and Tom Wasula from the National Weather Service in Albany, NY, have been in contact throughout the last six months through emails and a personal meeting on 24 October 2008. They have offered an operational perspective on the results obtained so far for this research.

Publications and Workshop Submissions:

The results from this project have been presented at the 10th Northeast Regional Operational Workshop in Albany, NY, on 5–6 November 2008, and at the CSTAR meeting on 7 November 2008. This research also will be presented at the 34th Annual Northeastern Storm Conference in Springfield, MA, on 6–8 March 2009. No formal publications have been produced yet. An M.S. thesis based on this research will be written starting in spring 2009.

Reference:

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

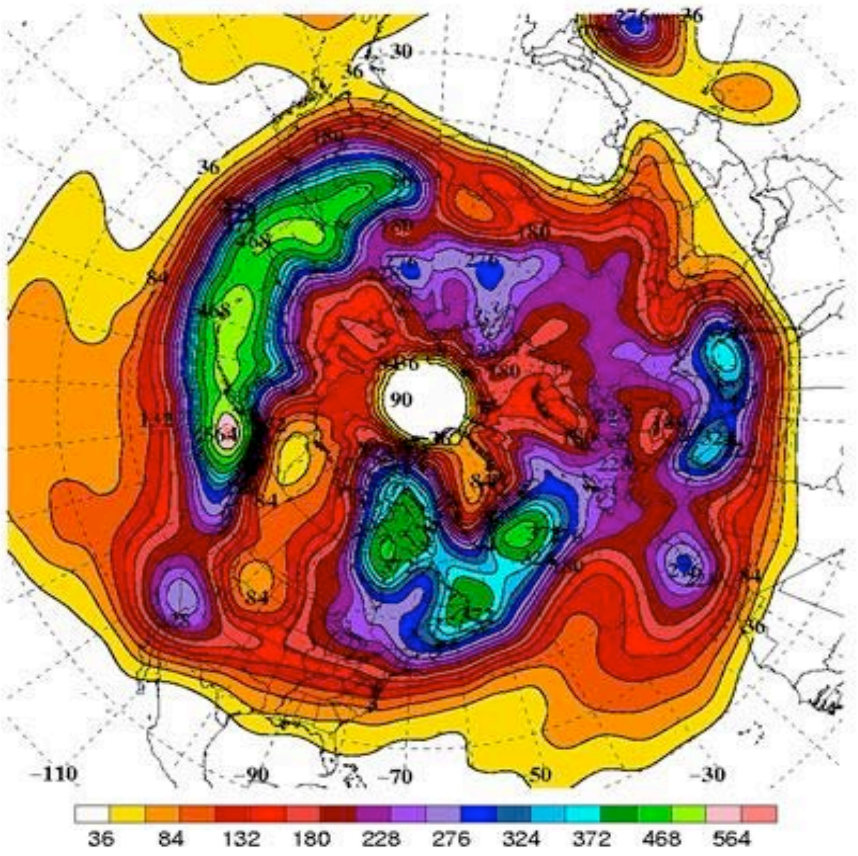

Fig. 1: Total number of 500 hPa cutoff cyclone events per grid point for 1948–2007

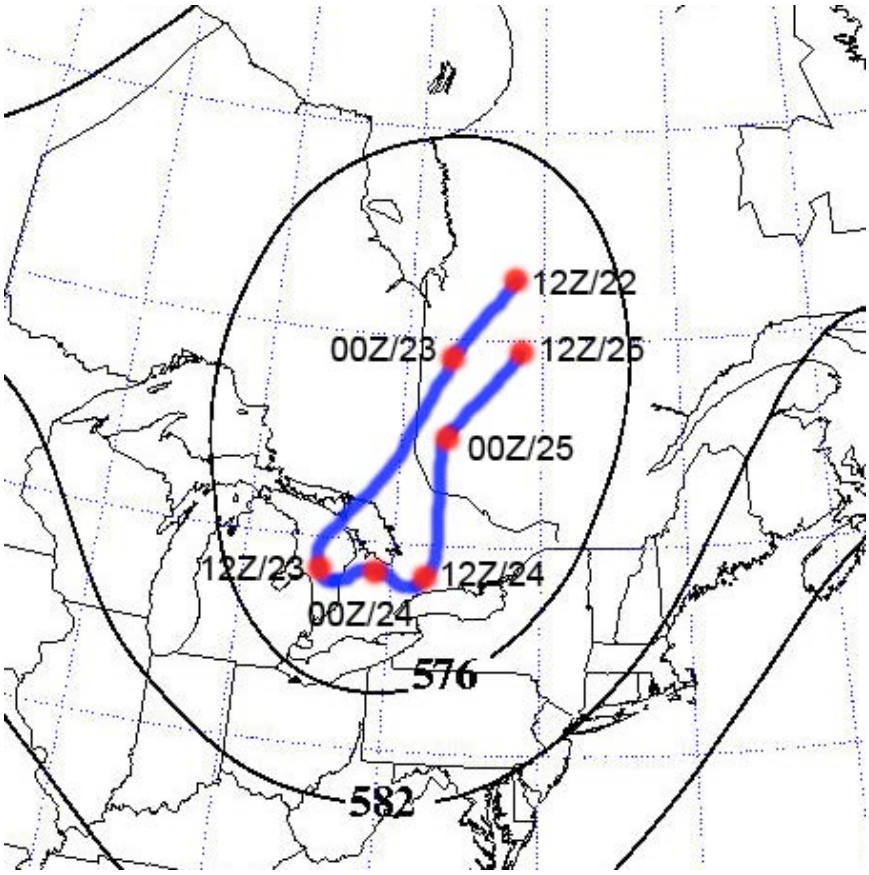

Fig. 2: Mean 500 hPa geopotential height (dam) and track of 500 hPa cutoff low center for 22–25 July 2008

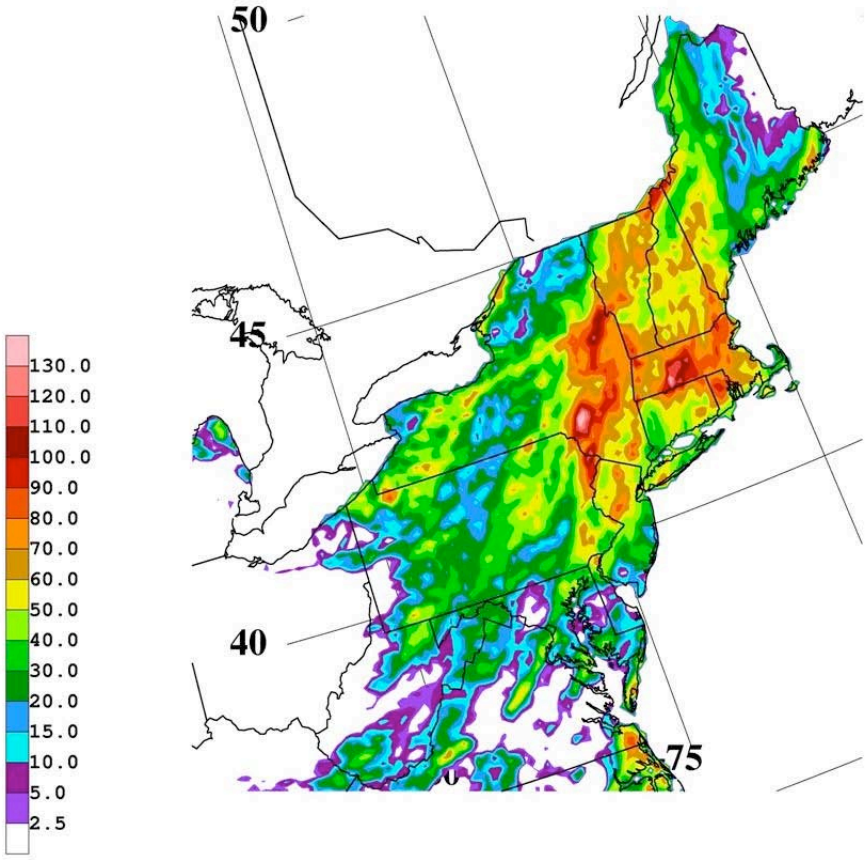

Fig. 3: National Precipitation Verification Unit 3-day Quantitative Precipitation Estimates (mm) ending 1200 UTC 25 July 2008

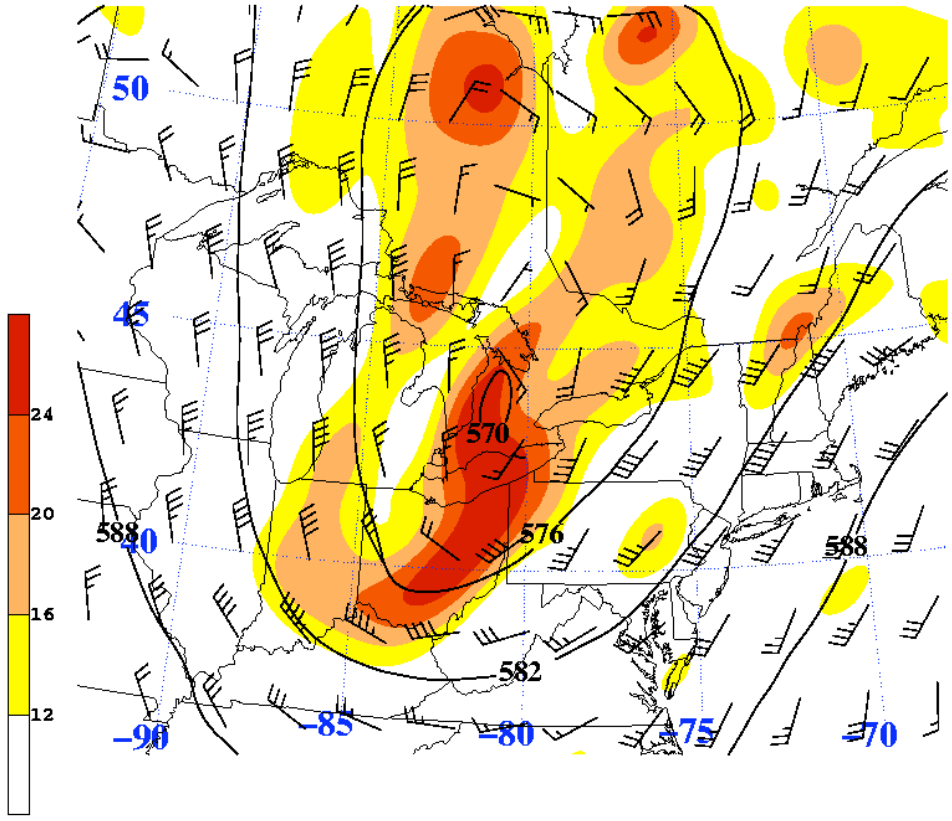

Fig. 4: 500 hPa geopotential height contoured every 6 dam, wind (kt), and absolute vorticity shaded according to the color bar every 4 x 10^{-5} s^{-1} for values above 12 x 10^{-5} s^{-1} at 1800 UTC 23 July 2008

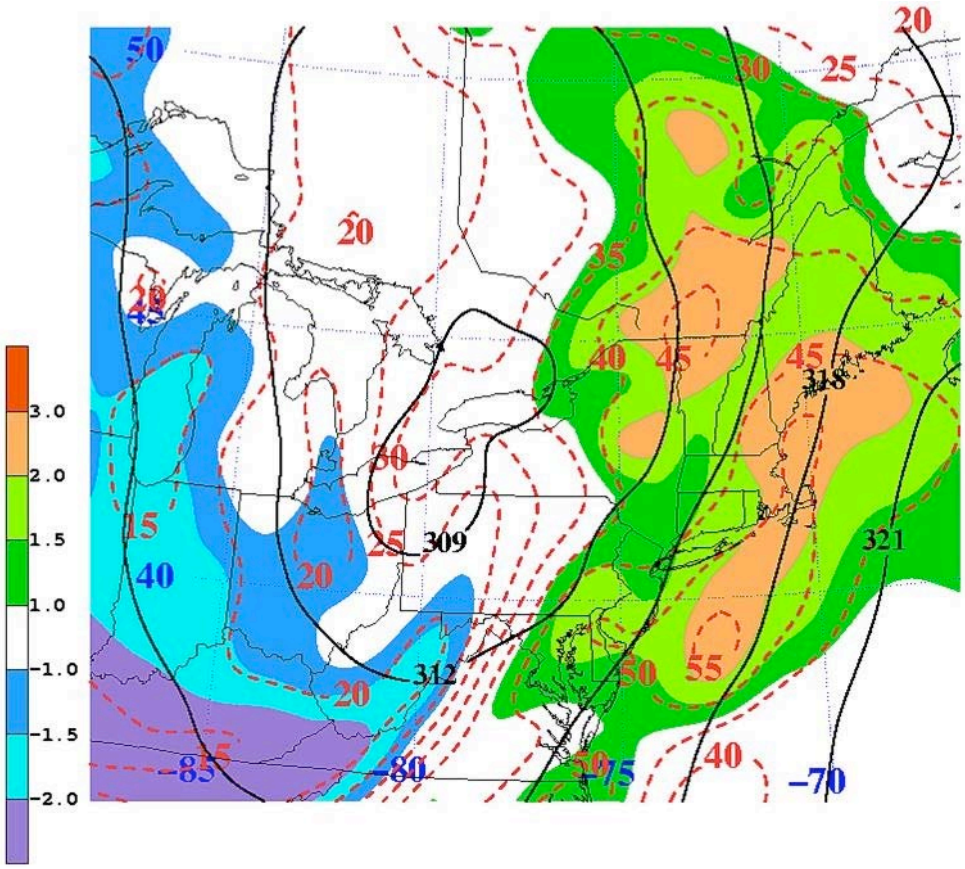

Fig. 5: 700 hPa geopotential height contoured every 3 dam in black, precipitable water contoured in dashed orange every 5 mm, and standardized anomalies of precipitable water shaded according to the color bar at 0000 UTC 24 July 2008

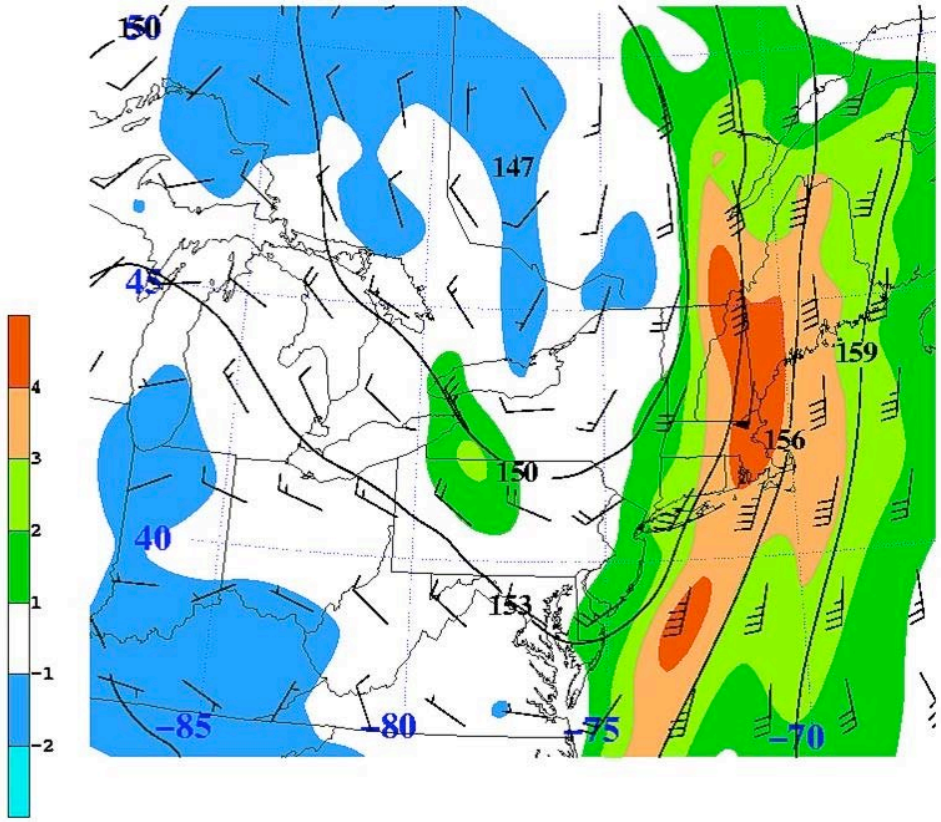

Fig. 6: 850 hPa geopotential height contoured every 3 dam, wind (kt), and standardized anomalies of precipitable water shaded according to the color bar at 1800 UTC 24 July 2008

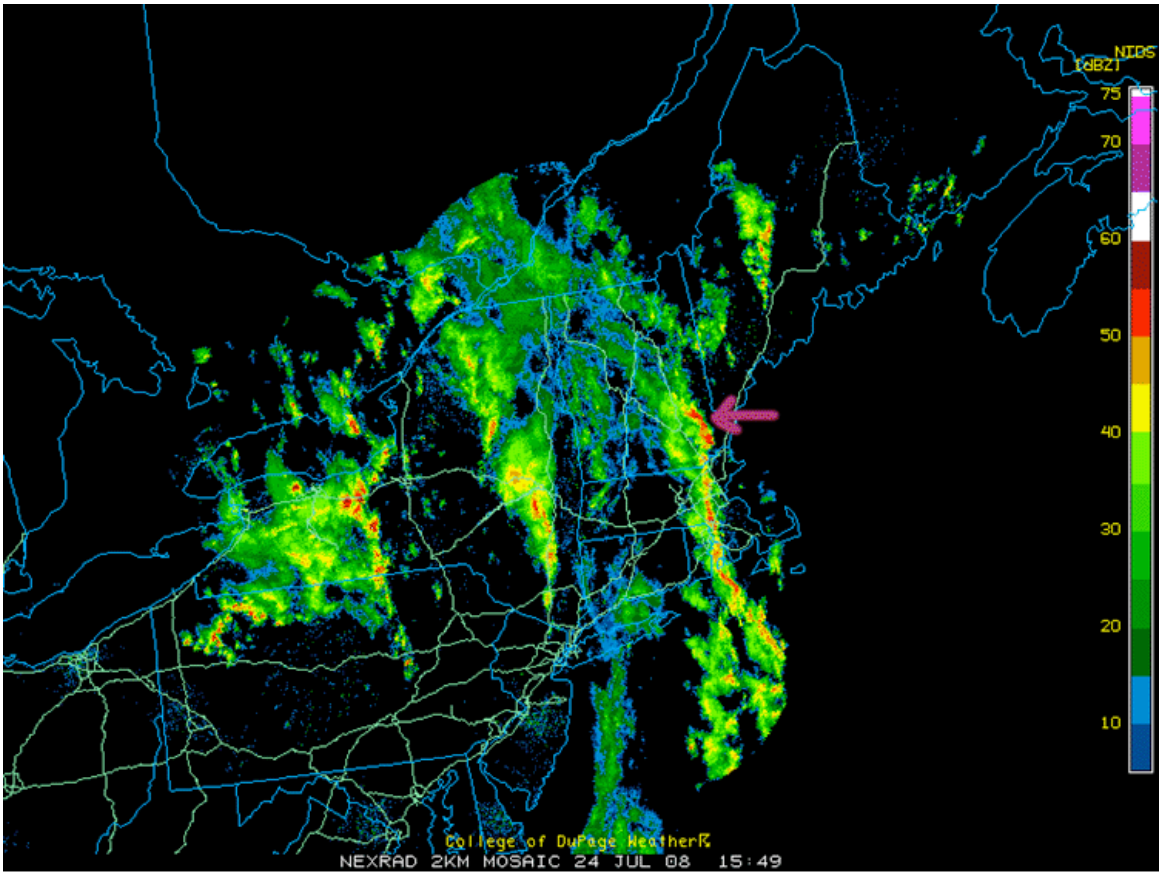

Fig. 7: NEXRAD base reflectivity shaded according to the color bar every 10 dB*Z* at 1549 UTC 24 July 2008. Location of tornado corresponds to tip of purple arrow.

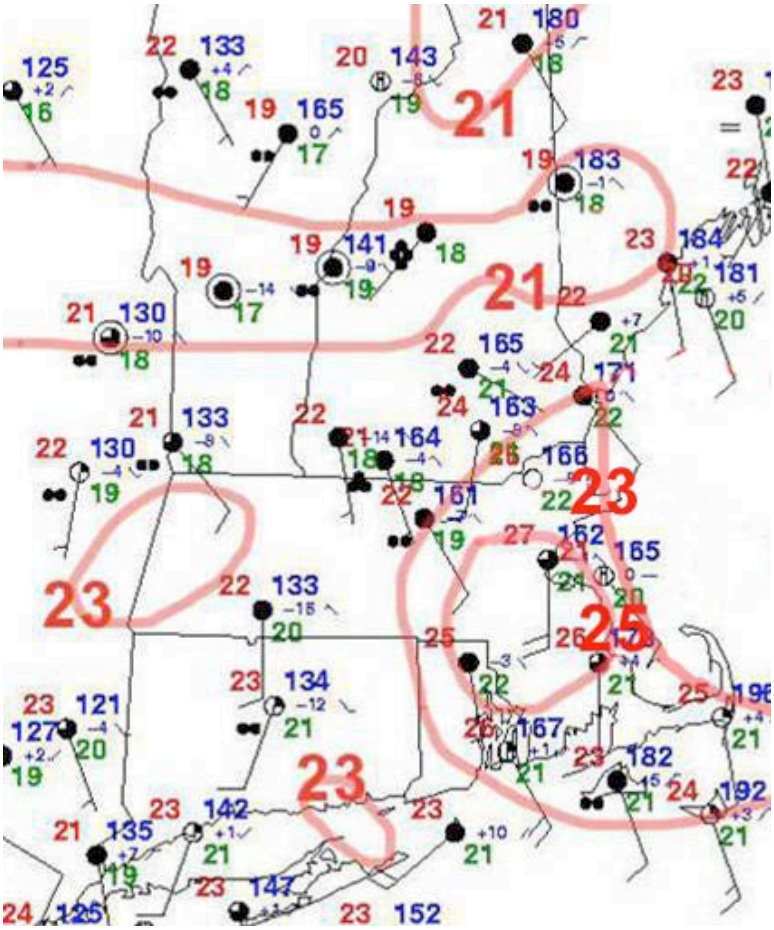

Fig. 8: Surface station plot with potential temperature contoured in pink every 2°C at 1500 UTC 24 July 2008

SECTION 2: Cumulative CSTAR Project Publications

a) Theses completed:

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

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

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

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

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

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

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

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

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

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

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

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

Wilson, P. H., 2008: Warm-Season Lake-/Sea-Breeze Severe Weather in the Northeast. Master of Science Thesis, Department of Earth and Atmospheric Sciences, University at Albany/SUNY, Albany, NY, 115 pp.

b) Preprints:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

c) PI and/or student presentations:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

DeLuca, D. P., L. F. Bosart, D. Keyser, and D. R. Vallee, 2003: The distribution of precipitation over the northeast accompanying landfalling and transitioning tropical cyclones. Oral presentation at the Northeast Regional Operational Workshop, Albany, NY, 4-5 November 2003.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Greenstein, M. D., L. F. Bosart, D. Keyser, and D. J. Nicosia, 2005: Examining the role of mesoscale features in the structure and evolution of precipitation regions in northeast winter storms. Poster presentation, 21st Conference on Weather Analysis and Forecasting/17th Conference on Numerical Weather Prediction, American Meteorological Society, 1-5 August 2005, Washington, DC.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Bosart, L. F., T. J. Galarneau, Jr., and A. C. Wasula, 2008: Modern weather forecasting: Where do we stand and where do we need to go? Invited presentation, 12th Annual Russell L. DeSouza Banquet, Department of Earth Sciences, Millersville University, 16 April 2008, Millersville, PA.

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

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

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

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

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

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

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

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

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

d) CSTAR/COMET related refereed publications:

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

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

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

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

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

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

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

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

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

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

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

Greenstein, M. D., L. F. Bosart, and D. Keyser, 2008: Mesoscale structure of precipitation regions in northeastern U.S. winter storms. *Wea. Forecasting*, **23**, submitted.

SECTION 3: Report by Warren R. Snyder and Eugene P. Auciello, (NWS Perspective)

Warren R. Snyder, Science & Operations Officer

Eugene P. Auciello, Meteorologist in Charge

WFO Albany, NY

CSTAR: April-October 2008

National Weather Service Perspective

The CSTAR III Project, "*The Cooperative Research with the National Weather Service on Cool and Warm-Season Precipitation Forecasting over the Northeastern United States,*" is entering its second year. Progress has been satisfactory in the major foci projects. Two projects were brought to completion, as their work began in CSTAR II. The paper, "A Comparison of Two Lake Sea Breeze Severe Events with a Threat Chart Application," will be presented at the AMS Severe Storms Conference in October. The CSTAR III Project, "Distribution of Precipitation Associated with 500 hPa Cutoff Cyclones," led by focal point Tom Wasula, WFO Albany, NY, has made considerable progress. The High Wind/Winter and Severe Convective Projects have not begun. However, two new CSTAR graduate students began work in September. A case study of one of these events is being presented at the AMS Severe Storms Conference.

Considerable progress has been made in several of the collaborating projects. Details are covered in a separate report. Among the highlights:

- During the summer of 2008, Hollings Scholar Zachary Taylor, North Carolina State University, worked on the Norlund Trof Project;
- The CSTAR bulletin board was created and several lively discussions have occurred among the participants;
- WRF model output for WFOs and Center Weather Service Units (CWSU) are produced on University at Albany Research IT Center Resources. In addition to WFO Albany, NY, the data was provided to WFOs Caribou, ME; Gray, ME; Upton, NY; CWSUs Oberlin, OH, and Nashua, NH; and the Great Lakes Ensemble Project. CWSU graphics are provided via the internet;
- The Harmful Algae Bloom Project was completed; and
- Research Forecaster Joseph Villani began work on the Northeast Convective Flood Project.

The Spring CSTAR meeting was held on May 9, 2008, and attended by a dozen participants. The AMS sponsored 10th Northeast Regional Operational Workshop, and CSTAR meetings, are scheduled for early November 2008 where much of the work of the past year will be presented.

One of the major thrusts for the CSTAR Project has been the development of teletraining, or technical attachments to improve documentation of CSTAR research for the operational community. Improvements of scientific transfer have resulted in Articulate-based teletraining being developed and presented on the Cool Season Moderate Precipitation Events Project by SOO Michael Evans, WFO Binghamton, NY. Articulate teletraining has been also been

developed based on the work on Warm Season 500hPa Cut Offs by Research Forecaster Thomas Wasula, WFO Albany, NY, currently in review at Scientific Services Division, Eastern Region Headquarters. Development of teletraining from the Mesoscale Structure of Precipitation Regions in Northeast Winter Storms Project is currently in development, and additional topics from prior projects are being pursued.

CSTAR III graduate student Mathew Scalora began his project, "Distribution of Warm/Cold Season Precipitation Associated with 500 hPa Cutoff Cyclones," in collaboration with Thomas Wasula, WFO Albany, NY. Real-time cut-off cases were identified and archived from April to September 2008. There were an unusual number of upper cut-off low events during the summer which will provide the project with a significant case history.

SECTION 4: NWS Semi-Annual Reports

(a)

Semi-annual Report
CSTAR III Research (April 2008 - October 2008)

Focal Point Leader(s): Neil A. Stuart

Thomas A. Wasula, NWS Albany, NY

Paul Sisson, NWS Burlington, VT

Pete Banacos, Burlington, VT

Dr. Lance Bosart, University at Albany

Dr. Daniel Keyser, University at Albany

Warren Snyder, NWS Albany, NY

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

Project Activities and Work Done

- A meeting took place on April 25, 2008 with Tom, Neil, Warren, Lance, Dan, and graduate student Matt Scalora, who chose this topic for his Master's of Science work. At the meeting, it was determined that Matt would work with Tom and Neil to identify active and null cases. Also, additional forecasting parameters and atmospheric features were identified for further research into the variety of sensible weather hazards that accompany upper cut-off lows. These additional parameters include but are not limited to 850 hPa jet, boundary layer thermal gradients, upper jet (250 hPa or 300 hPa) structure, and layer precipitable water.
- Tom and Neil attended the annual Spring CSTAR meeting, which was May 9, 2007. This project was discussed, in terms of what is in the proposal. Some of the details of the April 25, 2008 meeting were also discussed.
- Tom met with Matt on October 24, 2008 for an hour to review his work on the 16-18 June 2008 cutoff case compared to the 22-25 July 2008 case. He will show a presentation at the 5-6 November 2008 Northeast Regional Operational Workshop entitled "A Diagnostic Analysis of a Difficult-to-Forecast Cutoff Cyclone from the 2008 Warm Season". Matt will focus on the 22-25 July 2008 case due to time constraints on the talks at the conference.

- Real-time cut-off cases were identified and data saved during the time period of April-October 2008. There were a series of upper cut-off lows that produced a variety of hazardous weather, including multiple modes of severe weather, and flooding. These will be included in the overall dataset for the study. Aspects of some of the recent upper cut-offs were discussed on the CSTAR e-mail list.
- Tom continues to work with Warren on a teletraining session entitled "Warm Season Cutoff Lows in the Northeast – A Climatology and Case Studies". The teletraining is in the review process with Eastern Region Scientific Services Division (ER SSD). The teletraining session is based on Tom's work with former SUNYA graduate student Jessica Najuch. Her Master thesis was completed in the Fall of 2004 entitled "Case Studies of Warm Season Cutoff Cyclone Precipitation Distribution". The review process has been very comprehensive. Dave Novak from SSD would like the finalized version out for March 2009. We hope the recorded version will be on the LMS.
- Tom has 170 warm season cutoff/closed low cases selected from the former study covering May to September 1980-2000. A more comprehensive case list is currently being compiled for 2001-08, which will include the additional cases between April and October 2008. Tom was able to give Matt a case-list from 2001 and 2002 at the October 24, 2008 meeting.
- Neils' research and formal presentations and/or publications have been on the usage of ensemble anomaly date during cool and warm season heavy precipitation events. Some examples are the 13-16 May 2006 New England record rainstorm and 14 February 2007 Snowstorm. It is hoped some of this research will be included in the CSTAR research.
- Tom will give an NROW 10 presentation entitled "A Storm-Scale Analysis of the 16 June 2008 Significant Severe Weather Event Across New York and Western New England". The severe weather occurred in advance of a warm season cutoff near the northern Great Lakes Region.

(b)

Semi-annual Report
CSTAR III Research (April 2008 – October 2008)

NWS Contributor: Thomas A. Wasula

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

Dr. Lance Bosart, University at Albany

Dr. Daniel Keyser, University at Albany

Warren Snyder, NWS Albany, NY

I. Project Activities and Work Done

- Tom attended the annual Spring CSTAR meeting, which was May 9, 2008. This project was discussed, in terms of what is in the proposal. No graduate students were assigned at the time.
- Tom attended the AMS Severe Local Storms Conference, October 27-31, 2008 in Savannah, GA. He gave an oral presentation on the February 17, 2006 severe weather and high wind event across New York and New England. This event was very unique where widespread wind damage occurred across eastern NY and western New England in mid-February. It was a classic high shear and low instability environment with impressive jet dynamics. Tom wrote a conference preprint publication on the case.
- Tom has identified over two dozen high wind and/or cool season severe weather case events for the study from approximately 1994 to 2008. Right now, cool season events are being selected from September to March. Tom will continue to focus on the severe weather aspect of the research.
- Tom would like to analyze more cases beyond 25 November 2004, 17 Feb 2006, and 1 December 2006 to develop some rules of thumb and pattern recognition techniques for operational forecasters. A cool season severe weather climatology will need to be developed from the cases. A collection of storm reports in the Northeast to identify more cases over the past few decades might be a good approach to define the synoptic and mesoscale common features for these events. Currently, CAPE and shear profiles, anomalously strong jet dynamics, and potent mid level troughs seem to help trigger these cool season severe weather events. This work will continue through 2009.
- It is hoped a graduate student will be assigned to the cool season high wind and severe weather project before the end of 2008.

II. Presentations on CSTAR II-III Related Research (APR 2008 – OCT 2008)

Wasula, T.A., N. A. Stuart, A.C. Wasula, 2008. The 17 February 2006 Severe Weather and High Wind Event across Eastern New York and New England, 24th Severe Local Storms Conference, Savannah, GA, October 27-31, 2008.

Wasula, T.A., N. A. Stuart, A.C. Wasula, 2007. The 1 December 2006 Anomalous Severe Weather Event across the Northeast, 33rd Northeast Storms Conference, Springfield, MA, March 14-16, 2007.

Wasula, T.A., N. A. Stuart, A.C. Wasula, 2007. The 1 December 2006 Anomalous Severe Weather Event across the Northeast, 2nd Annual Lake Effect Conference, Oswego, NY, October 20-21, 2007.

********************Presentations Prior to October 2007***************************

Wasula, T.A., N. A. Stuart, A.C. Wasula, 2007. The 17 February 2006 Severe Weather and High Wind Event across Eastern New York and New England, 32nd Northeast Storms Conference, Springfield, MA, March 9-11, 2007.

Wasula, T.A., N. A. Stuart, A.C. Wasula, 2006. The 17 February 2006 Severe Weather and High Wind Event across Eastern New York and New England, 8th Northeast Operational Workshop, Albany, NY, November 1-2, 2006.

Wasula, T. A., K. D. LaPenta, 2006. The Thanksgiving 2004 Severe Weather Event across Upstate New York and New England, 31st Northeast Storm Conference, Saratoga Springs, NY, March 10-12, 2006.

Wasula, T. A., K. D. LaPenta, 2005. The Thanksgiving 2004 Severe Weather Event across Upstate New York and New England, 7th Northeast Operational Workshop, Albany, NY, November 1-2, 2005.

III. Publications and Preprints (October 2006 – October 2008)

Wasula, T.A., N. A. Stuart, A.C. Wasula, 2008. The 17 February 2006 Severe Weather and High Wind Event across Eastern New York and New England, *Preprints, 24th Conf. on Severe Local Storms*, Savannah, GA, Amer. Meteor. Soc., 13.B.3.

Wasula, T. A., K. D. LaPenta, 2006: The Thanksgiving 2004 Severe Weather Event across Upstate New York and New England. *Preprints, 23rd Conf. on Severe Local Storms*, St. Louis, MO, Amer. Meteor. Soc., P12.9.

(c) NWS Albany, NY

Semi-annual Report

CSTAR III Research (April 2008 – October 2008)

Focal Point Leader: Thomas A. Wasula, NWS Albany, NY

Robert LaPlante, NWS Cleveland, OH

Michael Ekster, NWS Upton, NY

Dr. Lance Bosart, University at Albany

Dr. Daniel Keyser, University at Albany

Warren Snyder, NWS Albany, NY

I. Project Activities and Work Done

- Tom attended the mid-year CSTAR meeting on May 9, 2008 at the NWS at Albany. Patrick Wilson gave a short presentation on possible operational applications of his "Lake/Sea-Breeze Convection in the Northeast". The applications included flow charts and checklists based on Pure and Mixed cases.

- Patrick gave his Master's thesis presentation on the lake and sea breeze convection research on July 1, 2008. Tom attended the presentation.

- The key research findings from eleven cases were as follows:
    1) A classification of two key case categories (Pure vs. Mixed cases)
    2) Pure cases typically lack significant synoptic-scale forcing with the following features: a ridge axis at the surface and aloft, temperatures and dewpoints of at least 30ºC and 20ºC in the boundary layer with an abundance of low-level moisture and instability and weak flow in the troposphere with fairly weak low to mid-level vertical shear.
    3) Mixed Cases have the following key features: a trough either at the surface or aloft, boundary layer temperatures in the 20ºC-30ºC range with dewpoints generally less than 20ºC, and stronger mid and upper level flow coupled with deeper shear below 500 hPa.
    4) Synoptic and mesoscale boundaries interaction heavily influence the organization and development of deep convection

- Tom received a copy of Patrick's M.S. thesis in late August. Tom will be using the results for a potential NWS teletraining in Spring of 2009.

- Tom wrote a technical preprint publication on his work with Patrick and Robert Tracey for the AMS Severe Local Storms Conference October 27-31, 2008 in Savannah, GA. The preprint was reviewed by ER SSD. Tom gave a poster presentation comparing the August 9, 2001 lake breeze

case to the April 19, 2002 case analyzed by former SUNYA undergraduate student Robert Tracey at the conference. He also incorporated the results from Patrick's research. The preprint is sourced below.

- There are no new items to report from Bob LaPlante (SOO at Cleveland) over the past 6 months. Mike Evans, the BGM SOO, expressed interest in continuing research on this topic beyond 2008.

II. Presentations on CSTAR II-III Related Research (OCT 2004 – OCT 2008)

Ekster, M. L., T. A. Wasula 2005. The August 5, 2005 Long Island Sea Breeze Severe Weather, 7th Northeast Operational Workshop, Albany, NY, October 31, 2004.

Tracey, R.L., T.A. Wasula, 2006. The 19 April 2002 Supercell initiated by a Lake Breeze in Northwestern Ohio, 8th Northeast Operational Workshop, Albany, NY, November 1-2, 2006.

Wasula, T. A., P. H. Wilson, L.F Bosart, D. Keyser, R. L. Tracey, 2008: A Comparison of Two Lake Breeze Severe Events with a Threat Checklist Application. 24th Conference on Severe Local Storms, Savannah, GA, October 27-31, 2008.

Wasula, T.A., N. A. Stuart, A.C. Wasula, 2007. The 17 February 2006 Severe Weather and High Wind Event across Eastern New York and New England, 32nd Northeast Storms Conference, Springfield, MA, March 9-11, 2007.

Wasula, T.A., N. A. Stuart, A.C. Wasula, 2006. The 17 February 2006 Severe Weather and High Wind Event across Eastern New York and New England, 8th Northeast Operational Workshop, Albany, NY, November 1-2, 2006.

Wasula, T. A., K. D. LaPenta, 2006. The Thanksgiving 2004 Severe Weather Event across Upstate New York and New England, 31st Northeast Storm Conference, Saratoga Springs, NY, March 10-12, 2006.

Wasula, T. A., K. D. LaPenta, 2005. The Thanksgiving 2004 Severe Weather Event across Upstate New York and New England, 7th Northeast Operational Workshop, Albany, NY, November 1-2, 2005.

Wasula, T. A., 2004. The August 9, 2001 Lake Breeze Severe Weather Event across New York and Western New England, 6th Northeast Operational Workshop, Albany, NY, November 2, 2004.

Wilson, P., L.F. Bosart, D. Keyser, and T.A. Wasula, 2007. Warm-Season Lake-/Sea-Breeze Weather in the Northeast, 9th Northeast Operational Workshop, Albany, NY, November 7-8, 2007

Wilson, P., L.F. Bosart, D. Keyser, and T.A. Wasula, 2007. Warm-Season Lake-/Sea-Breeze Weather in the Northeast, 32nd National Weather Association Conference, Reno, NV, October 13-18, 2006.

Wilson, P., L.F. Bosart, D. Keyser, and T.A. Wasula, 2007. Warm-Season Lake-/Sea-Breeze Weather in the Northeast, 22nd AMS Weather and Forecasting Conference, Park City, UT, June 25-29, 2007.

Wilson, P., L.F. Bosart, D. Keyser, and T.A. Wasula, 2007. Warm-Season Lake-/Sea-Breeze Weather in the Northeast, 32nd Northeast Storms Conference, Springfield, MA, March 9-11, 2007.

Wilson, P., L.F. Bosart, D. Keyser, and T.A. Wasula, 2006. Warm-Season Lake-/Sea-Breeze Weather in the Northeast, 8th Northeast Operational Workshop, Albany, NY, November 1-2, 2006.

III. Publications and Preprints (October 2005 – October 2008)

Wasula, T. A., P. H. Wilson, L.F Bosart, D. Keyser, R. L. Tracey, 2008: A Comparison of Two Lake Breeze Severe Events with a Threat Checklist Application. *Preprints, 24th Conf. on Severe Local Storms*, Savannah, GA, Amer. Meteor. Soc., P9.3.

Wasula, T. A., K. D. LaPenta, 2006**:** The Role of a Squall-line and Boundary Interaction in the Development of the Long-lived 21-22, July 2003 Tornadic Supercell across Eastern New York and Western New England. *Preprints, 23rd Conf. on Severe Local Storms*, St. Louis, MO, Amer. Meteor. Soc., 18.6.

(d) Status of "Snyder Proposal" Projects

Warren Snyder, Albany, NY

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

November 12, 2008

MEMORANDUM FOR: Lance F. Bosart

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

SUBJECT: Status of Collaborative and Associate Projects in CSTAR III

I. Collaborating Projects

a. Regional WRF/WRF Ensemble

i. The SOO/STRC WRF is being run on the UAlbany Research IT Unix System with a 15 km resolution outer domain which covers much of the Eastern United States and Southeastern Canada, and a 5km inner nest that covers the area bounded by Indiana to New Hampshire, and from Northern New York to Maryland, with a separate nest over Maine.

ii. This data is posted on the web, distributed via the Eastern Region LAN to the CAR, GYX and OKX NWS offices, and is posted in AWIPS and GFE at WFO Albany.

iii. The Data is used both in research and in support of operations. The Maine data fed to the Grey and Caribou offices is being used in GFE and in a Maine ensemble. RFC Taunton has expressed interest in obtaining this data.

iv. A separate 12km run is produced 4 times a day covering much of the Northeast United states to support the Great Lakes Ensemble Project. Albany is one of 6 offices contributing members to the ensembles. Data is sent to Cleveland where it is being

compiled into the ensemble grids, which are being redistributed through the LDM to AWIPS.

v. The WRF runs in sections i. to iv. above will be reconfigured to one non-nested ARW run initialized with the GFS when the upgrade is available at years end. A review of current literature is in progress to determine if an NMM run is a better alternative to the ARW. A high resolution nest may be attempted in the Hudson Valley for TAF forecasts and RFC use.

vi. Justin Arnott (journeyman forecaster at BGM) has been working on verification of the Great Lakes ensemble. Based on case studies, Justin has discovered a southward bias with the forecasts of single Lake Effect bands east of Lake Ontario in the ARW members of the ensemble. He found that this southward bias may be due to an over-forecast of boundary layer wind speeds downstream of the lakes, particularly in ARW versions of the model. Justin has been in contact with WRF developers, and has learned that the new version of the ARW WRF may provide less biased results. These results were presented at the U.S. / Canadian Great Lakes Workshop, and the NWA meeting in October, and at NROW in early November. BGM will also be changing their model run to the latest version of the ARW.

vii. WRF Runs are provided twice a day for CWSU's Oberlin and Nashua. Nashua began a routine assessment and evaluation of the model output in their operations.

1. CWSU Nashua evaluated the WRF nearly everyday for sea breeze potential, especially from April-October, and its use by forecasters is encouraged for daily use. Sea Breeze (SB) assessment is the main emphasis at Nashua. Antidotal evidence on convective forecasts are not as favorable as what has been seen at CWSU Oberlin. From two years of data SB events have been broken into seven synoptic scale categories.
2. Events which NEVER result in a SB (easy forecast), and 1 is the "catch all" category requiring further study. Jen Thorp at Plymouth is pursuing further work on this.
3. A technique was developed with Plymouth State University that uses 3 criteria, which if all 3 are positive, identify it as a potential SB day. The most important criteria is that the BOS wind at 12UTC must start between 0190-030, a.k.a. as a land breeze. The other two are no ceiling below 18 thousand feet between 12-15UTC, and no precipitation expected/observed between 09z-03UTC. Days are then stratified into the 7 synoptic classes...
    i. Surface high to west with anti-cyclonic isobaric curvature.
    ii. Surface high to west and a low to the north with neutral isobaric curvature.
    iii. Low to north with cyclonic isobaric curvature; (SB rare)
    iv. Low to the northwest and high to south
    v. Low to west but BOS in post-frontal W-WSW flow; (NEVER yields a SB!)
    vi. High to the west with low to Southeast and East with surface wind gradient North to Northeast.
    vii. Leftovers.

b. The following results have been noted
    i. The straight yes/no criteria beats ALL NWP guidance including WRF in classes 1, 4, 6 and 7. SB tends to occur 75+% of the time in the 7 categories. In the past 2 years, with the WRF lagging in POD by about 20%.
    ii. For class 3 events the 09z run and both 06z/09z runs for class 2, WRF beats our technique handily. Overall, our technique only beats WRF (total correct forecasts, both SB and no SB forecasts) by about 10%.

iii. Improvement upon this might be made by looking at more fields above surface level to catch potential days that the surface forecast misses. It has also been observed that when 2-3 thousand foot winds are below 10 knots in a favorable SB environment day, SB will occur. The full suite of WRF model data will help here and Nashua is working on ftp issues to make this happen.
iv. The WRF definitely provides value to the SB forecast in at least 2 of the 6 classes that produce sea breezes.
v. Haven't really looked at timing of SB onset a lot, but WRF averages 2-2.5 hours which is manageable.

viii. Model runs are also available to DEAS in real time
ix. Several of the project participants are members of the Eastern Region Local Modeling Team, which began work during this period.
x. Project Participants
1. Focal Points – Warren Snyder (ALY), Mike Evans (BGM),
2. PI – David Knight
3. NWS Contributors – Rich Grumm (CTP), Robert LaPlante (CLE), Paul Sisson (BTV), Mark McKinley (ZOB), Scott Reynolds (ZBW), Robert Rozumolski (STRC), Jeff Tongue (OKX), Christopher Mello (CLE), Daniel Liens (CLE), Justin Arnott (BGM)

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

i. This project has been completed, and was included in the prior report. Project Participants
1. Focal Point– Dave Valle (NERFC)
2. Team - Alison Gillis (NERFC), Joseph Dellicarpini (BOX)

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

i. No new work has been done on this project.
ii. Project Participants
1. Lead - John DiStefano (ILN-SOO)
2. Team - Allen Randall (ILN), Stephen Hrebenach (ILN), Daniel Hawblitzel (ILN), Neil Stuart (ALY)

d. Correlations between Observed Snowfall and NAM Model Parameters

i. This project is wrapping up. The manuscript based on the research, (Mike Evans, Mike Jurewicz) has been accepted to Weather and Forecasting as a note. A recorded version of teletraining given on this work last winter is complete, and in review at ER SSD.
ii. Project Particpants
1. Team – Mike Jurewicz (BGM) & Mike Evans (BGM)
2. PIs – Lance Bosart, Dan Keyser

e. Northeast Convective Flash Flood Events

i. The project team members have focused on the overall climatology of warm season convective flash floods, and identifying events in their respective areas for study.
ii. Flash Flood Events in the WFO Albany, Binghamton and Mount Holly forecast areas from 2003 to 2008 have been identified. This period coincides with local AWIPS

archived data for detailed analysis. There is a sufficiently large enough sample of cases to develop conclusions and identify similarities among events.

iii. Future work will focus on investigating case data for individual events and learning more about mesoscale features associated with convective flash flooding in the Northeast.

iv. Graphs of hourly, monthly and yearly frequencies from 1986 to 2007 were then plotted using National Weather Service (NWS) Storm Data. Composite plots of synoptic scale features were created using NCAR/NCEP Reanalysis data from the Climate Diagnostic Center website. Plots include mid and upper level zonal wind, low level meridional wind, 500 hPa heights, columnar precipitable water, mean sea level pressure, and 850 hPa temperatures. Both means and anomalies of these features have been plotted.

v. The project principals agreed late last year that the main focus would be on the meteorological conditions associated with flash flooding, limiting the study to the warm season, and excluding flooding from organized tropical systems.

vi. Justin Arnott of BGM developed a parameter called "maximum potential precipitable water" to help forecasters diagnose the potential for flash flooding. The idea is that the value of this parameter should be more stable in model forecasts prior to and during onset of convection in the model. The utility of this parameter could be tested in upcoming portions of the study. The parameter was introduced to CSTAR researchers at the CSTAR meeting in May, 2008.

vii. Project Participants
   1. Lead – Joe Villani (ALY)
   2. Team – John Goff (BTV), Alan Cope (PHI), Justin Arnot (BGM)

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

i. The goal of this project was to build upon previous research (Lundstedt et al 1994, Bosart 1996, Cobb 2003 and others) which examined the moisture, instability and lift associated inverted troughs that produced heavy snows in the Northeast, hereafter called "Norlun Troughs". The objectives of the project are;
   1. Create a robust Norlun Climatology: 1950-present
   2. Further describe and understand these rare, but high impact events
   3. Create a conceptual model to make readily available to operational forecasters for reference once the research is completed
   4. Transfer knowledge learned into forecast operations by developing a Weather Event Simulator (WES) training case study.

ii. An all inclusive training package and WES case was developed from this work and provided to the staff at WFO Gray, Maine. Conceptual models were also created which described Norlun troughs.

iii. During the summer of 2008, Zachary Taylor, NOAA Hollings Scholar Intern from North Carolina State University was assigned to this project. Zachary was provided a detailed history and outline of the project, along with project goals. He identified Norlun events for study, using an extensive climatic database. Plots of these storms were developed. Mr. Taylor successfully completed his internship with the National Weather Service by formally presenting this material at National Weather Service Headquarters in Washington, D.C.

iv. Collaboration occurred with Dr. Lance Bosart as an email thread was created prior to recent winter weather events. Active discussion occurred with television meteorologist Joe Cupo (a former student of Dr. Bosart) during this period as media attention focused on the "Norlun" phenomenon during this storm. Collaboration continued with modelers from the AER group, which runs the University of New Hampshire WRF mesoscale model in support of NWS operations.

v. Recent publications and workshop submissions:

1. Norlun Troughs - abstract, Northeast Storm Conference by forecaster John Cannon
2. Norlun Troughs – workshop submission and presentation at National Weather Service Headquarters, Washington, D.C. by student Zackary Taylor

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

II. Associate Projects

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

i. Articulate Tele-training was developed on the CSTAR work "Cool Season Moderate Precipitation Events in the Northeast" by the NWS focal point Mike Evans. Work is in progress to develop tele-training on the CSTAR projects "Mesoscale Structure of Precipitation Regions in Northeast Winter Storms".
ii. The CSTAR bulletin board has up and active.
iii. Thomas Wasula developed Articulate Teletraining session on "Warm Season Closed Lows" from his CSTAR work. This teletraining has been reviewed by SSD, and has been finalized and will be resubmitted for final review shortly.
iv. Data from CSTAR Master Projects were added to an external hard drive on the CSTAR server.
v. WFO Albany Senior Forecaster Neil Stuart created post mortem pages based on past events related to CSTAR projects.
vi. **Future Project Plans include, c**reate conceptual model pages from past CSTAR cases and development of new Applications for operational staff.
vii. Project Participants
   a. Lead – Vasil Koleci (ALY)
   b. Team - Josh Korotky (PIT), Warren Snyder (ALY) Tom Wasula (ALY), Michael Jurewicz (BGM), Mike Evans (BGM), Justin Arnott (BGM)

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

i. The initial work on cold season cases was completed by the collaborator, Micheal Augustyniak as his MS Thesis. One of the outcomes of this work was an operationally useful decision tree for forecasting the MHC events.
ii. Hugh W. Johnson is continuing this work, investigating "null", hybrid, warm, and southerly MHC flow cases. He is attempting to develop either a conceptual model or forecasting guidelines that are operationally useful. He worked with UAlbany student Kyle MacRitchie to investigate and document several warm season cases for study .
iii. Project Participants
   a. Team – Hugh W. Johnson IV (ALY) and Mike Augustyniak

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

i. ***No new work was completed on this project***

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

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

i. This project has been funded by COMET as a Collaborative Project.
ii. The Upton WRF is now running on a cluster of two, dual 2.4 GHz Xeon processor Linux workstations with 1 GB RAM each. The local WRF run performance has increased by 42%. The WS WRF is now being run 4 times a day at 4 km resolution out 24 hrs and initialized with GFS with the following physics: No convective parameterization, The New Ferrier Microphysics Scheme, The Mellor-Yamada-Janjic Boundary Layer scheme, The NMM Land surface scheme and the GFDL long and short wave radiation schemes. Output is currently only available on the web...but will soon be available in AWIPS/GFE. The next step is to incorporate hot-start LAPS initialization. CLE-Ensemble has been installed and successfully tested by running a mock ensemble using OKX data.
iii. Work to be presented at NROW by three Stonybrook Students.
iv. Project Participants
    1. Lead - Jeff Tongue (OKX)

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

i. This work is ongoing, and recent findings are being presented at NROW X.
ii. Project Participants
    1. Lead – Jeff Tongue (OKX)

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

Computing infrastructure continues to play an important part in this collaborative effort. Students are exposed to NWS facilities and software, and NWS staff have access to capabilities not available in the local office. Both groups benefit from this interaction and sharing of facilities. Several Sun workstations and PCs are available for use by CSTAR participants. Approximately 200 GB of disk space on the UAlbany Department of Earth and Atmospheric Science (DEAS) Sun servers is dedicated to storing CSTAR related data and software. This disk space is available on all DEAS 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 DEAS UNIX machines. Email lists created on the DEAS computers at the beginning of the project continue to be important conduits for exchange of scientific ideas, results, and information between CSTAR participants. There are email lists for all the CSTAR participants, as well as focused lists for those involved in specific projects. Albany WSFO 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 DEAS 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. Recently PI's in the DEAS were awarded a large NSF grant for equipment upgrades. Among these is a new Sun server (with 8 CPUs and 16GB RAM) and a large (16 TB usable space) disk storage array, which have recently been put into service. While CSTAR money was not used for this, 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 DEAS, 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) has begun using the RIT 64 CPU Linux cluster for Weather Research and Forecasting (WRF) model simulations. This computing facility will allow 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.

SECTION 6: Selected Documentation of CSTAR Project Activities:

From bosart@atmos.albany.edu Sat May 31 21:08:29 2008
Date: Sat, 31 May 2008 21:08:26 +0000
To: celeste@atmos.albany.edu
From: Lance Bosart <bosart@atmos.albany.edu>
Subject: Item for the Oct'08 6-month CSTAR report
Cc: keyser@atmos.albany.edu, bosart@atmos.albany.edu

Hi Celeste,

Please save the below text so that it can be included in the Oct'08 6-month CSTAR report.

(Dan: Under the discussion for the Northeast the SPC specifically mentions a possible severe weather threat this afternoon in the Hudson Valley where stronger (channeled) low-level southerly flow will be found. Since this reference to earlier COMET-funded research here it will be good to include it in the next 6-month CSTAR report as evidence that past technology transfer to operations from Albany is having a continuing positive impact at the national level.)

Thanks.

Lance

SPC AC 311625

DAY 1 CONVECTIVE OUTLOOK
NWS STORM PREDICTION CENTER NORMAN OK
1125 AM CDT SAT MAY 31 2008

VALID 311630Z - 011200Z

...THERE IS A MDT RISK OF SVR TSTMS FROM PORTIONS OF ERN WV/SRN PA INTO NJ/VA/DE/MD...

...THERE IS A MDT RISK OF SVR TSTMS OVER PARTS OF NRN OK/SRN KS...

...THERE IS A SLGT RISK OF SVR TSTMS FROM THE SRN PLAINS/TN VALLEY TOWARDS THE ATLANTIC SEABOARD...

...THERE IS A SLGT RISK OF SVR TSTMS ACROSS PART OF THE NRN MS RIVER VALLEY...

...CENTRAL APPALACHIANS TO THE MID ATLANTIC COAST...

HEIGHT FALLS AND STRONGEST MID LEVEL JET ASSOCIATED WITH PROGRESSIVE SHORTWAVE TROUGH MOVING INTO THE NORTHEAST WILL OVERSPREAD THE CENTRAL APPALACHIANS AND THE MID ATLANTIC/CHESAPEAKE REGIONS TODAY. EARLY DAY CLOUDS/CONVECTION HAS HINDERED DESTABILIZATION ACROSS A LARGE PART OF NY AND WRN/CENTRAL PA LATE THIS MORNING...BUT MODERATE MLCAPE AXIS IS ALREADY BECOMING ESTABLISHED NNEWD OUT OF CENTRAL VA AT 16Z. THIS SHOULD CONTINUE BUILDING/EXPANDING UP THE MID ATLANTIC COAST/REST OF VA AS HEATING AND FURTHER MOISTENING OF THE BOUNDARY LAYER OCCURS. STRENGTHENING LARGE SCALE ASCENT WILL ENHANCE THUNDERSTORM COVERAGE ACROSS THIS REGION THROUGH THE EARLY TO MID EVENING WHEN MOST STORMS WILL BEGIN MOVING OFFSHORE. SHEAR PROFILES AND LOW LEVEL THERMODYNAMIC PROFILES WILL FAVOR STORM-SCALE ORGANIZATION INTO LINES AND SUPERCELLS...PRODUCING A MYRIAD OF SEVERE THREATS INCLUDING POTENTIAL FOR WIDESPREAD DAMAGING WINDS AND A FEW TORNADOES.

...NORTHEAST...

SEVERE THREAT IS MORE PROBLEMATIC INTO THE LOWER GREAT LAKES EWD INTO THE WRN NEW ENGLAND GIVEN AMOUNT OF CLOUDS/STABILIZATION IN PLACE LATE THIS MORNING. HOWEVER...STRONG HEIGHT FALLS/DEEP ASCENT AHEAD OF APPROACHING SHORTWAVE TROUGH WILL MAINTAIN A THREAT OF DEEP MOIST CONVECTION THROUGH THE DAY. I**N ADDITION...SHEAR WILL BE MORE THAN ADEQUATE FOR ORGANIZATION INTO LINES/CLUSTERS AND EVEN A FEW SUPERCELLS...PARTICULARLY INTO THE HUDSON RIVER VALLEY WHERE STRONGER SLY LOW LEVEL FLOW WILL BE FOUND.** THEREFORE...BREAKS IN CLOUDS OVER WRN NY AT 16Z AHEAD OF UPPER TROUGH AND ASSOCIATED SURFACE COLD FRONT MAY BE INDICATIVE OF SUFFICIENT INSTABILITY DEVELOPING FOR THREAT OF SEVERE STORMS. HOWEVER...CONFIDENCE IS LOWER THAN AREAS IMMEDIATELY SOUTH OVER VA/MID ATLANTIC.

...SRN KS/NRN OK TOWARDS THE MID SOUTH INTO TN/KY... COMPLEX MCS...COMPOSED OF SEVERAL STRONG CLUSTERS/LINES...OVER NERN OK/SERN KS/SWRN MO HAS BEEN AIDED BY LLJ THROUGH MUCH OF THE MORNING. HOWEVER...LLJ WILL DIMINISH AND RE-FOCUS INTO WRN OK/SWRN KS THROUGH THE DAY WHICH WILL AGAIN INTENSIFY LATER TONIGHT INTO SRN KS. ALTHOUGH ONGOING ACTIVITY WILL LOSE LLJ FOCUS...ACTIVITY WILL BECOME FED BY A VERY UNSTABLE AIR MASS WITH STEEP LOW/MID LEVEL LAPSE RATES. THIS SHOULD TEND TO SUSTAIN INTENSE CORES/MCS ESEWD THIS AFTERNOON AND MAINTAIN THREATS OF VERY LARGE HAIL AND ISOLATED

DAMAGING WINDS. NOT OUT OF THE QUESTION THIS ACTIVITY COULD EVOLVE INTO A BOWING MCS MOVING ACROSS NRN AR/FAR SRN MO GIVEN MODERATE WNWLY FLOW ALOFT EVIDENT ON AREA VWPS. HOWEVER...LACK OF WELL DEFINED SURFACE BOUNDARY AND LARGE SCALE ASCENT TENDS TO LOWER CONFIDENCE IN THIS SCENARIO.

ADDITIONALLY...ISOLATED THUNDERSTORMS SHOULD DEVELOP AND POSSIBLY BECOME SEVERE AS AIR MASS DESTABILIZES OVER PORTIONS OF TN/KY WHERE 35-45 KT EFFECTIVE SHEAR WILL REMAIN IN PLACE.

FARTHER WEST...CAP WILL WEAKEN ALONG SURFACE LOW/FRONT NEAR THE OK/KS BORDER AND ISOLATED SEVERE/SUPERCELLS REMAIN POSSIBLE LATER TODAY OVER THIS AREA. ACTIVITY WILL BECOME MORE WIDESPREAD/INTENSE AND EVOLVE INTO ANOTHER SEVERE MCS LATER TONIGHT ALONG NOSE OF LLJ WITH VERY LARGE HAIL ONCE AGAIN POSSIBLE THROUGH EARLY SUNDAY MORNING.

...NRN MS RIVER VALLEY...

STALLED SURFACE FRONT WILL PERSIST OVER CENTRAL MN INTO SRN WI TODAY WITH WARM...RELATIVELY MOIST BOUNDARY LAYER TO ITS WEST. GIVEN VERY COLD AIR ALOFT AND WEAK LARGE SCALE ASCENT OVERSPREADING THE REGION AS SECONDARY SHORTWAVE TROUGH DEVELOPS SEWD INTO NRN MN...LOW-TOPPED STORMS ARE EXPECTED LATER TODAY. INSTABILITY WILL BE MARGINAL...BUT STILL SUFFICIENT FOR ANOTHER ROUND OF STRONG/SEVERE THUNDERSTORMS OVER THIS REGION. LARGE HAIL WILL BE PRIMARY SEVERE THREAT.

...CENTRAL HIGH PLAINS...

LOW LEVEL FLOW WILL BECOME INCREASINGLY UPSLOPE INTO THE CENTRAL HIGH PLAINS THIS AFTERNOON...ALTHOUGH MOISTURE RETURN WILL BE RETARDED BY SURFACE LOW/FRONT LINGERING OVER NWRN OK/SRN KS. STILL...VERY STEEP LAPSE RATES AND WEAK INSTABILITY WILL DEVELOP DURING THE DAY AND SUPPORT HIGH-BASED THUNDERSTORMS OVER HIGHER TERRAIN/NEAR LEE TROUGH. THIS ACTIVITY WILL OCCUR WITHIN SUFFICIENT SHEAR FOR LP-SUPERCELLS...ALTHOUGH LIMITED INSTABILITY/MOISTURE SHOULD KEEP ANY ENSUING SEVERE THREAT MARGINAL/ISOLATED THROUGH THE EARLY EVENING.

..EVANS/SMITH.. 05/31/2008

From keyser@atmos.albany.edu Tue Jun 3 16:21:23 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
	cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-2.4 required=8.0 tests=AWL,BAYES_00
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	by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id
m53GLM822870;
	Tue, 3 Jun 2008 16:21:22 GMT
Received: (from keyser@localhost)
	by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m53GLMa22701;
	Tue, 3 Jun 2008 16:21:22 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200806031621.m53GLMa22701@tigger.atmos.albany.edu>
Subject: PRE e-mail Discussion (fwd): Tues. 6/3/08
To: celeste@atmos.albany.edu
Date: Tue, 3 Jun 2008 16:21:22 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Tuesday 3 June 2008

Celeste,

I am forwarding an e-mail from Matt Cote documenting the rapid
acceptance of PREs in NWS forecast operations nationwide for inclusion
in the next CSTAR six-month report.

Dan

cc: Lance

>From stormrunner126@gmail.com Tue Jun 3 00:54:44 2008

Date: Mon, 2 Jun 2008 20:54:41 -0400
From: "Matt Cote" <stormrunner126@gmail.com>
To: "Lance Bosart" <bosart@atmos.albany.edu>,
"Dan Keyser" <keyser@atmos.albany.edu>,
"Michael Jurewicz" <Michael.Jurewicz@noaa.gov>
Subject: PRE e-mail Discussion

Hi everyone,

I'm forwarding an e-mail discussion that took place between David Roth and many others, mainly on the topic of PREs, while I was on vacation. I thought I would share it with you. Looks like designation of PRE rainfall may be coming to the TC rainfall images that David produces...

Matt

****

David.Roth@noaa.gov wrote:

Hi all. A few weeks ago I got access to tropical depression information from NHC concerning the 1980-1987 time period...a time when they weren't writing annual articles on Atlantic tropical systems (depressions) and weren't including this information within their annual tropical cyclone reports. I've been going back and adding the numbered TDs prior to 1985...and am almost done with 1981 (working backwards in time) which was an active year for depression landfalls, particularly for the western Gulf of Mexico. Once I get back to 1972 TD-wise, I'll add the named TCs and numbered TDs in a more logical sequence.

One thing I've been considering for the rainfall pages is including information as to whether or not a certain rainfall pattern is mainly due to a PRE event (forced by a nearby synoptic scale feature with a fairly distant tropical connection to a tropical cyclone) or a more direct impact (CDO and outer rain bands of a tropical cyclone). This problem is particularly severe in the West, where climatologies include PRE events as a direct impact (and I have as well), whereas out East this has not been done.

I don't want to continue the process of excluding certain rainfall cases (like Lili of 1996) that some consider related to a tropical cyclone and others don't. This database is meant to be used by the widest available audience possible. Let me know if you think including labeling of PRE events

is a good idea or not. If I do this, expect the TC rainfall site to link to the SUNY-Albany paper on PRE events through its main page, so users can get a sense of what PRE rainfall means. Some PRE information is already in the TC QPF presentation linked to through the main TC rainfall page. As usual, I take my cues from you all when changes to the procedure used appear to be required, so comments are welcomed, positive or negative.

DR

Robert Rogers wrote:

Hi David,

I think it would certainly be helpful to include information on whether rainfall is closely associated with the TC circulation or driven primarily by "external" factors like frontal boundaries. Some of the work Tim, Manuel, and I have done in evaluating numerical model TC rainfall forecasts and developing TC rainfall parametric models is concerned with this distinction, so having that distinction in the data would help us.

Rob

From: Erik Pytlak [*mailto:Erik.Pytlak@noaa.gov* <Erik.Pytlak@noaa.gov>]

Hey, Dave! I agree with your assessment on "PRE" events out here. For an intact E Pac TC to strike AZ/CA/NM, it has to be recurving and moving pretty fast -- which strongly implies a synoptic feature in the mix.

Thus I think labeling PRE events is a good idea. If nothing else, it'll illustrate the importance of synoptic interaction and ET transition in heavy rain distribution in the SW U.S. Just guessing, over 70% of our TC heavy rain events here are probably PREs.

-Erik

SOO NWS Tucson

David.Roth@noaa.gov wrote:

There have been several done over the years for the eastern half United States, and one for Mexico that I'm aware of. The American Southwest numbers appear to vary depending upon who you reference. For example, Art Douglas came up with a very low percentage for the Sonoran Desert, but numbers by

Ritchie show a number that is three times higher.

Again, it depends what you consider rainfall directly or indirectly responsible to tropical cyclones. In the Southwest, they include impacts of nearby upper lows if there is a tropical cyclone well upstream within the moisture plume/atmospheric river. We're less likely to count that type rainfall east of the Rockies (I've avoided it when I could and I know most others do as well), or the 10-20" of rain that fell across Wisconsin/Minnesota last August would need to be associated with Erin, in a PRE sense. A radius approach isn't the best, because storms come in all shapes and sizes and when they connect into a frontal boundary or a nearby upper low (and undergo ET and baroclinically forced size expansion), the distinction between core/outer band rainfall, frontal rainfall poleward of the cyclone, and the moisture plume surrounding the upper low becomes nearly impossible. This comes into play from the Mid-Atlantic states/Midwest northeast into Canada, as well as across the West. This could be why no one had tried a storm-by-storm TC rainfall survey between 1955 and 1998. I, and many others, can't think of an objective way of determining it.

For a North American version of this graphic, someone would need to complete a tally of tropical cyclone events for Canada and Mexico. I'm fairly far into the Mexico extension of the project right now and either me or someone using my database could accomplish such a task, once a large enough time frame were considered complete. Data for Mexico within my project remains fragmentary since so many systems have impacted that country, and isohyetal analyses take a bit longer for that country due to their more rugged, near-coastal topography. I purposely went ahead and documented the more extreme cases first, like I have for the United States, before continuing to march back chronologically in time.

The NCEP reanalysis data could be used to accomplish the task you suggest as well. Especially for Canada, some source other than HURDAT will need to be referenced, since tracks length included within HURDAT for periods of extratropical transition and extratropical portions of TC tracks have varied over the years. I can think of systems that were considered extratropical for political, rather than meteorological reasons.

DR

From: Chris Fogarty [Halifax]
[*mailto:hurricane@hfx.eastlink.ca*<hurricane@hfx.eastlink.ca>]

I think this work is very important Dave, and quite interesting. Changes in the proportion of precipitation related to extratropics versus tropical cyclones could help chart changes in climate. I know that Eyad Atallah of McGill University (with John Gyakum) did some work on TC-related rainfalls in Canada. Maybe you can contact him for some exchange of information or ideas.

Cheers,
Chris

Matthew Cote wrote:

David and others,

Thanks for including me on this e-mail string. My apologies for not having replied with my thoughts sooner, but I've been on vacation.

Having done extensive research on PREs, I am definitely a big proponent of seeing the rainfall associated with PREs labeled on the TC rainfall images. I think this practice would greatly help in understanding how a particular rainfall distribution came about.

I've put a copy of my Master's thesis presentation on the SUNY Albany web site if anyone would like to look at it. David, feel free to include a link to it on the TC rainfall page if you see fit. Here's the link: *
http://www.atmos.albany.edu/student/mcote/PPT/Cote_Thesis.ppt*<http://www.atmos.albany.edu/student/mcote/PPT/Cote_Thesis.ppt>.
Also, let me know if there are any other pertinent resource I might be able to make available to you.

I'd also like to share the latest happenings on PRE research. Lance Bosart, Dan Keyser, myself, and Mike Jurewicz from the NWS Binghamton, NY office are currently in the process of preparing a journal article on the topic. Also, Mike is in the process of putting together a NWS teletraining.

Any other thoughts or comments, just let me know.

Matt

[*mailto:hurricane@hfx.eastlink.ca*<hurricane@hfx.eastlink.ca>]

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Any other thoughts or comments, just let me know.

Matt

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X-Spam-Status: No, score=-1.6 required=8.0
tests=AWL,BAYES_00,UPPERCASE_75_100
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     Thu, 12 Jun 2008 16:07:26 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200806121607.m5CG7QA27487@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report:  Th. 6/12/08
To: celeste@atmos.albany.edu
Date: Thu, 12 Jun 2008 16:07:26 +0000 (GMT)
Cc: bosart@atmos.albany.edu, scalora@atmos.albany.edu,
keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Thursday 12 June 2008


Celeste,

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

CSTAR cutoff low research is mentioned by Warren Snyder in the
last
sentence of the long-term section of this morning's AFD issued
by NWS
ALY.

Dan
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cc: Lance, Matt S.

FXUS61 KALY 121505
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
1105 AM EDT THU JUN 12 2008

.LONG TERM /SATURDAY THROUGH WEDNESDAY/...
MODELS HAVE BEEN IN AGREEMENT WITH PROGRESSION OF CDFNT SAT. HWVR
THEY HAVE ALL ALSO SLOWED ITS EWARD MOVEMENT SATURDAY. 12UTC ITS BARELY CLEARED CLE OH...ABOUT BUF/ROC 18UTC...REACHES HUD VLY 03-06UTC SUN. FCA WILL SPEND SATURDAY IN THE WARM SECTOR WITH 1000/500HPA THICKNESS ABV 570...850 HPA TEMPS 17C. HAZY WARM CONDS. CLOUDS PROBABLY OVERDONE IN MDLS AHEAD OF FRONT....SO MAIN
VARIABLE HERE FOR BOTH HI TEMPS AND MAGNITUDE OF TSTMS IS AMOUNT OF CLOUDS THAT MAKE IT EAST MIDDAY AND DURING AFTN. FCST WENT WITH
NEW NAM/GFS BIAS CORRECTED BOIVER GRIDS WITH HIGHS MAINLY 80S AN ISOLD 90 POSSIBLE. REGARDLESS -SHRA/TSTMS FIRING ALONG AND AHEAD OF THE THE CDFNT AS IT CROSSES THE REGION IN THE AFTN AND EVENING...AND DIMINISH OVERNIGHT. THIS SHIFT IN TIMING FURTHER INCR THE RISK THAT A SVR TSTMS MAY BE PART OF THE PICTURE...WITH CAPES IN GFS OF 2000-2500J/KG AND SIMILAR VALUES IN NAM. RGN IS IN
RIGHT ENTRANCE REGION OF 250 HPA JET...BUT 850HPA JET ONLY 25KTS.
EHI OF 1-2.

SUN MRNG THE FRONT IS OFFSHORE...OTHER THAN A LINGERING -SHRA...SKIES SHOULD CLEAR. THE FIRST PART OF NEXT WEEK WILL USHER
A LONG WAVE PATTERN CHANGE. THE MASSIVE 500HPA CUTOFF LOW JUST SOUTH OF HUDSON'S BAY FIRST DRIFTS EAST...ALLOWING A WESTERLY FLOW
ACROSS THE N TIER OF USA WHICH ALLOWS HIGH PRESSURE OVER OHIO VALLEY TO BRING FAIR CONDITIONS SUNDAY AND SUNDAY NIGHT. BY MONDAY
THE FIRST IN A SERIES OF SHORT WAVES ROTATING AROUND 500HPA CUTOFF PUSH

A COLD FRONT INTO THE EASTERN GRTLKS RGN...THEN ACROSS FCA WITH MORE -SHRA/TSTMS. AFTER THIS POINT THE 00 UTC GFS AND ITS ENSEMBLES
BRING THIS POLAR VORTEX CUT OFF RIGHT SOUTHEAST INTO NEW YORK. WHILE THERE IS AGREEMENT OF A MAJOR LONG WAVE TROF IN THE EAST DURING MUCH OF THE UP COMING WEEK...THE FACT THAT SUCCESSIVE RUNS
HAVE BOUNCED THIS CUTOFF EVERYWHERE FROM JAMES BAY TO VIRGINIA SUGGESTS ALLOT OF UNCERTAINTY IN THE DETAILS. HWVR WHAT IS CERTAIN
IS WE WONT BE ISSUING ANY HEAT ADVISORIES FOR THIS PERIOD...WITH AN APRIL LIKE UA PATTERN WHICH WILL FEATURE VARIABLE CLOUDS...BLO
NORMAL TEMPS. OUTBREAKS OF -SHRA/TSTMS WILL BE TIED TO DIURNAL CYCLE...COMBINED WITH SHORT WAVES ROTATING AROUND IN THE CUT OFF LOW. IT SHOULD PROVIDE GREAT CASES FOR ONE OF THE CSTAR PROJECTS IF THIS SCENARIO PANS OUT.

&&

$$

LONG TERM...SNYDER

From keyser@atmos.albany.edu Fri Jun 13 15:24:50 2008
Return-Path: <keyser@atmos.albany.edu>
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X-Spam-Level:
X-Spam-Status: No, score=-1.6 required=8.0 tests=AWL,BAYES_00,UPPERCASE_75_100
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From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200806131524.m5DFOo627823@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Fri. 6/13/08
To: celeste@atmos.albany.edu
Date: Fri, 13 Jun 2008 15:24:49 +0000 (GMT)
Cc: bosart@atmos.albany.edu, scalora@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Friday 13 June 2008

Celeste,

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

CSTAR cutoff low research project is acknowledged by Warren Snyder in
the third-to-last sentence of the long-term section of this morning's

AFD issued by NWS ALY.

Dan

cc: Lance, Matt S.

FXUS61 KALY 131147
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
747 AM EDT FRI JUN 13 2008

.LONG TERM /MONDAY THROUGH THURSDAY/...
DURING MONDAY THE HUDSON'S BAY 500HPA CUT OFF BEGINS DESCENDING SOUTH. YET ANOTHER SHORT WAVE ROTATING AROUND IT...PUSHES A SURFACE LOW AND ITS FRONTS THROUGH FCA. GFS IS PRODUCING A MUCH MORE SIGNIFICANT RESPONSE FROM THE WAA COMPONENT WITH THE BULK OF RN OVER BY MIDDAY MONDAY...WHILE THE NAM TIES MOST OF THE QPF TO THE CDFNT AND IS MORE CONVECTIVE. WILL GO WITH A GENERIC CHC -SHRA/TSTMS. MOST OF MONDAY FCA WILL BE IN WARM SECTOR AHEAD OF CDFNT. AFTER THAT FOR THE REST OF THE EFP A MAJOR PATTERN CHANGE OCCURS WITH THE COLLAPSE OF THE EASTERN RIDGE AND ITS REPLACEMENT WITH A MAJOR TROF OR CUTOFF AT 500HPA. INITIALLY THE 500 HPA CUT OFF FROM HUDSON'S BAY DRIFTS SLOWLY SOUTH...AND IT INTERACTS WITH A SERIES OF SHORT WAVES FOR THE REST OF THE WEEK. THE GFS IS THE MOST PESSIMISTIC WITH A 500 HPA CUTOFF MEANDERING AROUND THE EASTERN GRTLKS/NY/NEW ENGLAND FOR A WEEK IN A PATTERN MORE REMINISCENT OF APRIL...NOT JUNE. THE RESULT WILL BE VARIABLE CLOUDINESS AND BOUTS OF SHOWERS AND TSTMS TIED TO THE DIURAL CYCLE AND OR THE PASSAGE OF SHORT WAVES ROTATING AROUND THE LARGER CUTOFF. THE GFS ENSEMBLE MEAN WASN'T MUCH MORE OPTIMISTIC...BUT EVEN SO ONLY ABOUT

A THIRD OF THE MEMBERS RESEMBLE THE OPERATIONAL RUN. THE REST OF THE MEMBERS HAVE THE CUTOFF WEAKER AND FURTHER N. MEANWHILE THE 00 UTC CANADIAN GEM SOLUTION IS IN LINE WITH SEVERAL PVS RUNS OF THE GFS...IN THAT A LARGE CUTOFF REMAINS NORTH OF THE REGION...ANCHORED IN ONTARIO AND QUEBEC. WHILE THIS STILL LEAVES THE AREA EXPOSED TO PERIODS OF -SHRA/TSTMS THE IMPACT IS LESSER..AND WITH WARMER TEMPS. THE NEXT WEEK SHOULD PROVIDE SOME POSSIBILITIES FOR CSTAR PROJECT CASES. IN SUMMARY...EFP IS A VERY UNSETTLED PERIOD. MODELS ARE HAVING DIFFICULTY RESOLVING HOW NUMEROUS SHORT WAVES ARE GOING TO INTERACT WITH AN ANOMALOUSLY DEEP CUTOFF...AND ALL THAT THEN FOLLOWS. USED GMOS WITH SLIGHT MODIFICATIONS.

&&

$$

LONG TERM...SNYDER

From keyser@atmos.albany.edu Wed Jun 18 15:15:25 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
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X-Spam-Level:
X-Spam-Status: No, score=-1.6 required=8.0 tests=AWL,BAYES_00,UPPERCASE_75_100
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  Wed, 18 Jun 2008 15:15:25 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200806181515.m5IFFP901635@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Wed. 6/18/08
To: celeste@atmos.albany.edu
Date: Wed, 18 Jun 2008 15:15:25 +0000 (GMT)
Cc: bosart@atmos.albany.edu, scalora@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Wednesday 18 June 2008

Celeste,

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

CSTAR cutoff low research project is mentioned by Warren Snyder in the
last line of the first paragraph of the short-term section of this

morning's AFD issued by NWS ALY.

Dan

cc: Lance, Matt S.

FXUS61 KALY 181053
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
653 AM EDT WED JUN 18 2008

.SHORT TERM /THURSDAY THROUGH SATURDAY NIGHT/...
THROUGH THIS PERIOD SENSIBLE WEATHER CONDITIONS WILL BE DICTATED BY THE STRUCTURE OF A GRADUALLY DECAYING 500HPA CUT OFF LOW OVC THE NORTHEAST AND QUEBEC. IN A GENERAL SENSE LEVEL OF CLOUDINESS AND THREAT OF -SHRA OR TSTMS WILL BE DICTATED BY THE PASSAGE OF SHORT WAVES...OFTEN THEIR ASSOCIATED SURFACE TROFS AND THE DIURNAL CYCLE. MEANWHILE DURING THIS PERIOD THE THERMAL STRUCTURE IS WARMING IN RESPONSE TO THE POWERFUL JUNE SUN...AND THE CUTOFF LOW IS GRADUALLY LIFTING AWAY FROM REGION. SO THE FORECAST WILL FOCUS ON THOSE AS WELL AS THE GENERAL STRUCTURE OF THIS CUTOFF VIS-VIS CSTAR DEVELOPED CONCEPTUAL MODEL.

THURSDAY MORNING CUTOFF CENTER HAS LIFTED TO SOUTHWEST QUEBEC PROVENCE. THE MOST RECENT SHORT WAVE AXIS IS FM BTV TO BGM AND LIFTING NE OUT OF FCA. DURING THURSDAY HEIGHTS HAVE RISEN 60DM AT 500 HPA ACROSS REGION. MEANWHILE WHAT CAPE THERE IS IS EAST OF REGION AND 850-700 LAPSE RATE IS A RESPECTABLE 6C. AS SUCH WILL SEE MORE SUN THAN WEDNESDAY AND THREAT OF -SHRA WILL BE SLIGHT CHC SE TO CHC NW WHICH IS STILL BEING BRIEFLY CLIPPED BY DEPARTING SHORT WAVE. THURSDAY NIGHT WILL SEE A GENERAL CONTINUATION OF

THESE FEATURES BUT ANOTHER SHORT WAVE WILL APPROACH LATE AT NIGHT.

FRIDAY WILL SEE LESS CLOUDS AT FIRST ASSOC WITH THE CUTOFF CENTER WHICH HAS RETREATED NORTH INTO CENTRAL QUEBEC...BUT A STRONGER 500HPA PA SHORT WAVE WILL PASS THROUGH THE REGION...ALONG WITH ANOTHER SFC TROF...AND WITH STEEPING LAPSE RATE THE BEST CHC OF -SHRA/TSTMS WILL BE AFTN. THIS ACTIVITY WILL BE A BIT MORE VIGOROUS THAN THURSDAY.

SATURDAY WILL FIND CUTOFF MIGRATING EVEN FURTHER N...WITH HEIGHTS HAVING RISEN ANOTHER 60DM SINCE THURSDAY...AND THE REGION FREE OF SIGNIFICANT 500HPA SHORT WAVES. WILL BODE WELL FOR MORE SUN AT LEAST AT FIRST. 850HPA TEMPS WILL RISE TO 8-12C ALLOWING WARMING TO NEAR SEASONABLE LEVELS. 500HPA TEMPS WILL RISE TO -15 TO -17. THESE ARE STILL SUFFICIENTLY STEEP LAPSE RATES FOR INCRG AFTN CLOUDS. THERE ARE TWO RATHER CONVECTIVE FEEDBACK LOOKING VORT MAXES IN THE GFS WHICH APPEAR OUT OF NOWHERE AT 18UTC SAT. SUSPECT THEY...THE HI RH AND THE QPF IN THE GFS ARE ALL RELATED. THIS IS ALSO NOTED IN THE LAPSE RATES WITH THE NAM FROM 700-850 HPA THROUGH THE DAY DROP TO 4C...BUT THE GFS LESS SO AND STILL HAS 7C IN THE SE. GFS ALSO PRODUCES CAPES OF 1000-1500 WITH PASSAGE OF THIS FEATURE. HAVE DISCOUNTED GFS HANDING OF THIS FEATURE FOR NOW...AND KEEP WITH PVS THINKING AND KEEP POPS SLIGHT CHC OR OUT OF FCST. SATURDAY NIGHT A SERIES OF 500HPA SHORT WAVES DIVING INTO A NEW 500HPA TROFF OVER THE EASTERN GRTLKS START CARVING OUT OUR NEXT WX SYSTEM WITH THE GFS PRODUCING SFC CYCLOGENESIS ALONG THE NJ COAST. HWVR THERE REMAIN SEVERAL ISSUES WITH HOW THIS SYSTEM DEVELOPS THAT REMAIN IN QUESTION. IN LOOKING AT 1.5PVU SURFACES THIS CUT OFFS ORIGIN LIES IN THE EJECTION OF SEVERAL SHORT WAVES FROM THE SAME 500HPA CUTOFF WHICH IS CURRENTLY IN THE NORTHEAST PACIFIC OCEAN OFF BRITISH COLUMBIA. THESE SHORT WAVES TAKE DIFFERENT PATHS AND FIND EACH OTHER OVER THE EASTERN LAKES.

&&
$$

SHORT TERM...SNYDER

From keyser@atmos.albany.edu Fri Jun 20 21:52:51 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-1.6 required=8.0 tests=AWL,BAYES_00,UPPERCASE_75_100
  autolearn=no version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m5KLqpq27574;
  Fri, 20 Jun 2008 21:52:51 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m5KLqp402853;
  Fri, 20 Jun 2008 21:52:51 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200806202152.m5KLqp402853@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Fri. 6/20/08
To: celeste@atmos.albany.edu
Date: Fri, 20 Jun 2008 21:52:51 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Friday 20 June 2008

Celeste,

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

CSTAR research on favorable regions for convective initiation in the
ALY CWA is mentioned by Hugh Johnson in the third paragraph of the

near-term section of this afternoon's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 202004
AFDALY

AREA FORECAST DISCUSSION...AMENDED
NATIONAL WEATHER SERVICE ALBANY NY
359 PM EDT FRI JUN 20 2008

.SYNOPSIS...
THE VERY LAST IN THE SERIES OF DISTURBANCES...ASSOCIATED WITH THE UPPER AIR LOW...WILL PUSH ON BY TO OUR EAST TONIGHT. WEAK HIGH PRESSURE WILL BUILD IN FOR SATURDAY. A POTENT COLD FRONT WILL SLOWLY APPROACH ON SUNDAY...NOT CLEARING OUR AREA TO THE EAST UNTIL LATE MONDAY.

&&

.NEAR TERM /UNTIL 6 AM SATURDAY MORNING/...
INTERESTING FEATURES DEVELOPED EARLY THIS AFTERNOON. UNLIKE THE PAST COUPLE OF DAYS...THUS FAR...TWO OF TODAY'S "POP-UP" SHOWERS BRIEFLY DEVELOPED INTO LOW-TOPPED SUPER CELLS! ONE OF THE TWO SIGNATURES...LOCATED IN THE EASTERN MOHAWK VALLEY...HAD A BWER...INFLOW NOTCH AND EVEN LOOKING AS IF THERE WAS A HOOK! GATE TO GATE ROTATION WAS VERY WEAK AND ALSO SINCE THERE WAS NO GROUND TRUTH OF ANYTHING OUT OF THE ORDINARY NO TRIGGER WAS RELEASED (OTHER THAN A SPECIAL WEATHER STATEMENT). AT THE TIME OF THE MOST INTERESTING FEATURE...THERE WAS NO CLOUD TO GROUND LIGHTNING DETECTED WITH THESE STORMS. NOW THERE IS. RADAR HAS ESTIMATED UP TO

AN INCH OF RAIN COULD HAVE FALLEN IN A FEW SPOTS.

MORE CELLS HAVE ERUPTED AND SOME OF THESE NOW CONTAIN CLOUD TO GROUND LIGHTNING. WE DID ISSUE ONE SVR RENSSELAER COUNTY.

THE OVERALL ENVIRONMENT WHILE SOMEWHAT UNSTABLE...WAS NOT SUGGESTIVE OF SUPER CELLS WITH RELATIVELY WEAK WINDS AND LIMITED SHEAR. LOCAL CSTAR STUDIES HAVE INVESTIGATED THESE TYPE OF STORMS...AND HOW THE LOW LEVEL SHEAR CAN BE MARKEDLY INCREASED AT THE APEX OF THE MOHAWK AND HUDSON VALLEY...AS THAT WAS EXACTLY WHERE THIS STORM LOOKED IT STRONGEST.

IT APPEARS THAT YET ANOTHER SHORT WAVE...ENHANCED BY A DISTINCT MID LEVEL DRYING IS WHAT IS TRIGGER THIS HOPEFULLY LAST ROUND OF CONVECTION. MORE SHOWERS ARE POPPING UP UPSTREAM AS WELL.

THE WRF SEEMS TO HAVE A PRETTY GOOD HANDLE ON THE CONVECTION...AND IT APPEARS THAT CONVECTION WILL LAST UNTIL AROUND OR SHORTLY AFTER SUNDOWN. AFTER THAT...IT SHOULD DIMINISH AS THE DISTURBANCE MOVES ON BY TO THE EAST AND WE LOOSE THE HEATING OF THE DAY.

AFTER THAT...WE WILL BE LEFT WITH THINNING CLOUDS AND LIGHT WIND. THE STAGE COULD BE SET FOR SOME HEFTY FOG DEVELOPING OVERNIGHT. FOR NOW...JUST CALL IT PATCHY FOG IN THE VALLEYS. IT IS AFTER ALL THE SHORTEST NIGHT OF THE YEAR...SO THE LENGTH OF NIGHT (OR LACK OF IT) IS A MITIGATING FACTOR FOR FOG FORMATION.

WENT WITH A BLEND OF THE MACHINES NOS FOR OVERNIGHT LOWS.
&&

$$
SYNOPSIS...HWJIV
NEAR TERM...HWJIV

From keyser@atmos.albany.edu Wed Jun 25 13:58:26 2008
Return-Path: <keyser@atmos.albany.edu>
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  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-1.6 required=8.0 tests=AWL,BAYES_00,UPPERCASE_75_100
  autolearn=no version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m5PDwQq19782;
  Wed, 25 Jun 2008 13:58:26 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m5PDwQ304107;
  Wed, 25 Jun 2008 13:58:26 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200806251358.m5PDwQ304107@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Wed. 6/25/08
To: celeste@atmos.albany.edu
Date: Wed, 25 Jun 2008 13:58:26 +0000 (GMT)
Cc: bosart@atmos.albany.edu, scalora@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Wednesday 25 June 2008

Celeste,

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

CSTAR warm-season cutoff-low research is mentioned by Tom Wasula in

the next-to-last paragraph of the long-term section of this morning's
AFD issued by NWS ALY.

Dan

cc: Lance, Matt S.

FXUS61 KALY 251047
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
647 AM EDT WED JUN 25 2008

.LONG TERM /FRIDAY NIGHT THROUGH TUESDAY/...
THE EXTENDED FCST LOOKS VERY UNSETTLED WITH YET ANOTHER CUTOFF LOW MOVING INTO THE UPPER MIDWEST AND THE GREAT LAKES REGION BY THE WEEKEND. THE MEAN LONGWAVE TROUGH RETURNS FOR THE NORTHEAST TO CLOSE THE WEEKEND...AND PERSISTS INTO THE MIDDLE OF NEXT WEEK.
TEMPERATURES START OUT ABOVE NORMAL INTO SATURDAY...AS PORTIONS OF THE FCST AREA WILL LIKELY BE IN WARM SECTOR WITH THE GEFS YIELDING TEMPS 1-2 STANDARD DEVIATIONS ABOVE NORMAL AT 850 HPA ON SATURDAY /+15-+16C TEMPS/...HOWEVER TEMPS WILL TUMBLE BACK BELOW NORMAL AFTER THE WEEKEND. PRECIPITATION LOOKS ABOVE NORMAL IN THE EXTENDED WITH CHANCES OF SHOWERS AND THUNDERSTORMS THROUGHOUT IN AN ACTIVE WEST/SOUTHWESTERLY FLOW ALOFT.

FRIDAY NIGHT INTO SATURDAY...THE PLACEMENT OF THE WARM FRONT IS KEY TO POTENTIAL SEVERE WEATHER. HPC/GFS LIKE A BACKDOOR FRONT SCENARIO...WHERE THE WARM FRONT STALLS NEAR THE MOHAWK VALLEY/CNTRL

NEW ENGLAND. THE GEFS/ECMWF LIFT THE BOUNDARY NORTH DURING THE DAY WITH THE DOWNSTREAM ANTICYCLONE SHIFTING E/NE. CAN/T DISAGREE HERE WITH THE ONLY CHALLENGE FOR CONVECTION BEING THE AMOUNT OF INSTABILITY FOR POSSIBLE SEVERE. OLD DAY 5 EXTENDED GRAPHIC FROM SPC HAD US IN A SLIGHT RISK. ELEVATED CONVECTION MAY TRANSITION TO SURFACE BASED CONVECTION ON THIS DAY.

SATURDAY NIGHT THRU SUNDAY NIGHT...OCCLUDED/COLD FRONT SLOWLY MOVES ACROSS THE REGION WITH POTENTIAL SFC WAVE MOVING ALONG THE BOUNDARY FROM THE MID ATLANTIC REGION. PWATS RISE TO 1-2 STANDARD DEVIATIONS ABOVE NORMAL. GENERAL SYNOPTIC RAINFALL POSSIBLE. WE ACTUALLY STUCK WITH LIKELY VALUES ON SUNDAY FOR POPS.

MONDAY THROUGH TUESDAY...COLD POOL WITH CUTOFF LOW MIGRATING THROUGH GREAT LAKES REGION SETTLES OVER NY/NEW ENGLAND. STEEP LAPSE RATES COUPLED WITH LOW TO MODERATE CAPE VALUES WARRANTS CHANCES OF SHOWERS AND THUNDERSTORMS AGAIN. WARM SEASON CSTAR RESEARCH HAS SHOWN SOME SVR WX CAN OCCUR IN THESE SITUATIONS WHEN APPRECIABLE SFC HEATING/DESTABILIZATION HAPPENS ON EAST SIDE OF CUTOFF.

OVERALL...ACTIVE PATTERN WITH NO SUSTAINED DRY STRETCH FORESEEN IN DAYS 4-7.

&&

$$

LONG TERM...WASULA_____

From keyser@atmos.albany.edu Thu Jun 26 16:59:16 2008
Date: Thu, 26 Jun 2008 16:59:05 +0000 (GMT)
From: Dan Keyser <keyser@atmos.albany.edu>
To: Celeste Iovinella <celeste@atmos.albany.edu>
cc: "Lance F. Bosart" <bosart@atmos.albany.edu>,
Dan Keyser <keyser@atmos.albany.edu>
Subject: Re: [Tropical-storms] Erin vs Alma/Arthur Moisture...Was Alma/Arthur a "Pre" (fwd)

Thursday 26 June 2008

Celeste,

A post by Tom Galarneau, demonstrating the proliferation of UAlbany CSTAR PRE research into the wider tropical meteorology community, for possible incorporation into the next six-month CSTAR report.

Dan

cc: Lance

Professor Daniel Keyser
Department of Earth and Atmospheric Sciences, ES-351
University at Albany
State University of New York
1400 Washington Avenue
Albany, NY 12222
518-442-4559 (office)
518-442-4494 (fax)

keyser@atmos.albany.edu

---------- Forwarded message ----------
Date: Thu, 26 Jun 2008 10:32:44 -0400
From: "Tom Galarneau, Jr." <tomjr@atmos.albany.edu>
To: Sheldon Kusselson <Sheldon.Kusselson@noaa.gov>,
Gregory J. Tripoli <tripoli@aos.wisc.edu>, tropical-storms@tstorms.org
Cc: rschumac@atmos.colostate.edu, bosart@atmos.albany.edu,
mcote@atmos.albany.edu, keyser@atmos.albany.edu
Subject: Re: [Tropical-storms] Erin vs Alma/Arthur Moisture...Was
Alma/Arthur a "Pre"

Hi Sheldon,

As defined in Matt Cote's (2007) M.S. Thesis [found on the Collaborative Science, Technology, and Applied Research (CSTAR) Program webpage at URL http://cstar.cestm.albany.edu/CAP_Projects/Project10/index.htm], predecessor rain events (PREs) are coherent mesoscale regions of heavy rainfall (> 100 mm in 24 h) that can occur ~1000 km poleward and eastward of recurving tropical cyclones (TCs). A distinguishing feature of a PRE is that it is sustained on the large-scale by ascent in the equatorward-entrance region of a downstream upper-level jet in many cases in the presence of deep tropical moisture directly associated with the TC that is transported poleward ahead of the TC. Low-level baroclinic zones can also act as a mesoscale focusing mechanism within the favorable large-scale environment in some cases. As you pointed out, a clear example of a PRE occurred with Tropical Storm (TS) Erin during August 2007. A subset of slides from a presentation given by our group at the First US-China Symposium on Meteorology last February (also from a forthcoming presentation at the 24th Conf. on Severe Local Storms this October) can be found here [http://www.atmos.albany.edu/student/tomjr/images/temp/erin_pre.pdf]. The series of precipitable water images, and representative air

parcel trajectory, shows clearly the poleward advection of deep tropical moisture that was directly associated with Erin during 16-19 August (note slides 3-6 in particular). The Erin moisture subsequently interacted with a low-level baroclinic zone over the southern Great Lakes region, resulting in rainfall totals > 200 mm over parts of southern Wisconsin. Lance Bosart, Russ Schumacher, and I are currently investigating the importance, if any, of (1) Erin's reintensification to TS strength while over Oklahoma during 00-12Z/19 Aug and (2) the presence of an upper-tropospheric trough over the central Plains on 18-19 Aug, in facilitating the poleward advection of Erin's deep tropical moisture.

The Alma/Arthur case seems less certain than the Erin case. Air parcel trajectories (attached) indicate that air in the lower part of the troposphere over southern Wisconsin at 0600 UTC 9 June seemed to have a source region in the tropics just south of Cuba. This result establishes that boundary layer air had origins over the tropics, which suggests that deep tropical moisture was likely present. The question remains as to whether deep moisture from Alma/Arthur *directly* impacted the precipitation region over Wisconsin. To aid in the discussion, I have generated a loop (from the 0.5 degree GFS analyses) of precipitable water (mm; shaded), 250 hPa geopotential height (dam; black contours every 6 dam), 700 hPa relative vorticity (white contours every 2.0x10-5 s-1 beginning at 2.0x10-5 s-1), and 850-500 hPa layer-averaged wind (kt; barbs). that can be found at the following URL: [http://www.atmos.albany.edu/student/tomjr/images/temp/res.html].

The PW loop suggests the existence of a few furtive poleward PW surges from Alma/Arthur that are mostly wide right of the upper Midwest. For example, one short-lived surge reaches Louisiana between 18Z/4 and 00Z/5. A second surge looks as though it is approaching the HOU-BPT area between 18Z/5 and 00Z/6. Of interest is

what is (or is not) going on at 12Z/6. One could make a partial case that the opportunity exists for leftover Alma/Arthur moisture in SE TX to connect with a narrow band of front-related tropical moisture from N TX to WI. A similar argument, perhaps slightly stronger, can be made at 18Z/6. To be sure one way or the other would require computing a trajectory that passes through the PSX-LFK-TXK-FVY corridor near this time.

That said, there is little question that local lifting along and ahead of the strong frontal boundaries is further adding to the moisture that is available for precipitation. It seems as though, as was discussed in one of the Storm Prediction Center forecasts ~3 weeks ago, that it's been a "combination of early spring dynamics with late spring thermodynamics." Are the dewpoints/PW in the upper Midwest a lot higher than usual for this time of year, or is it just a matter of there being so much more forcing than usual to create convection and turn the available water vapor into rain on the ground? May be a bit of both. Attached is the PW anomaly (and climo) for 1-14 June. The PW anomalies in the WI area from 1-14 June come in at around 3-4 kg/m^2, with the climatology being 20-25 kg/m^2, so somewhere around 120% of normal PW. But the elevated PW values are evident pretty much everywhere east of the Mississippi, so again that seems difficult to make a connection to one particular TC. Whatever the source may be of high PW values, add that to the (seemingly) above normal cyclone activity and it adds up to a lot of rain and severe weather.

Cheers,

Tom Galarneau (with contributions from Russ Schumacher and Lance Bosart)

At 11:58 AM -0400 6/24/08, Sheldon Kusselson wrote:
>Dr Tripoli and others interested in tropical moisture that may help

>produce large amounts of rain in the middle latitudes. I put
>together a comparison powerpoint slide at:
>ftp://gp16.ssd.nesdis.noaa.gov/pub/volcano/Kusselson/Erin vs Arthur
>WI Comparison.ppt
>of Erin's moisture from August, 2007 over the middle of the United
>States and that of Alma/Arthur's moisture from a few weeks ago. The
>patterns are striking and results similar. Would like to hear from
>the experts at SUNY Albany if they think this may be a "pre" this
>early in the tropical season. Sorry about taking so long with this
>as I have been dealing operationally on shift with the heavy rains
>and flooding in the Mississippi Valley the past few weeks.
>Sheldon Kusselson
>NOAA/NESDIS
>Satellite Analysis Branch
>
>Gregory Tripoli said the following on 6/9/2008 6:16 PM:
>All:
>
>It appears that Alma/Arthur, as Erin did last August 19, produced a
>moisture plume, and quite possibly an outflow dynamics coupling
>that resulted in the extremely unusual precipitation over Wisconsin
>this past weekend. Attached is the radar estimated precipitation
>from Green Bay, that you can see exceeds 12 inches in some places.
>This is not a normal flood at any time of the year in this area! We
>made an IR and water vapor loop of the past 10 days that you can
>view at:
>
>http://www.aos.wisc.edu/loops.html
>
>where the coupling of the remnants of Arthur/Alma with the polar jet
>seems to stand out. I hesitate to call this a "pre", simply based
>on these loops, without some further investigation. On the other
>hand, I can guarantee that this moisture didn't come from the corn!

>----------

>----------

>_____

>Tropical-storms mailing list

>Tropical-storms@tstorms.org

>http://www.tstorms.org/tropical-storms/

>Please do not forward this message to non-qualified individuals.

>_____

>Tropical-storms mailing list

>Tropical-storms@tstorms.org

>http://www.tstorms.org/tropical-storms/

Please do not forward this message to non-qualified individuals.

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Thomas J. Galarneau, Jr.

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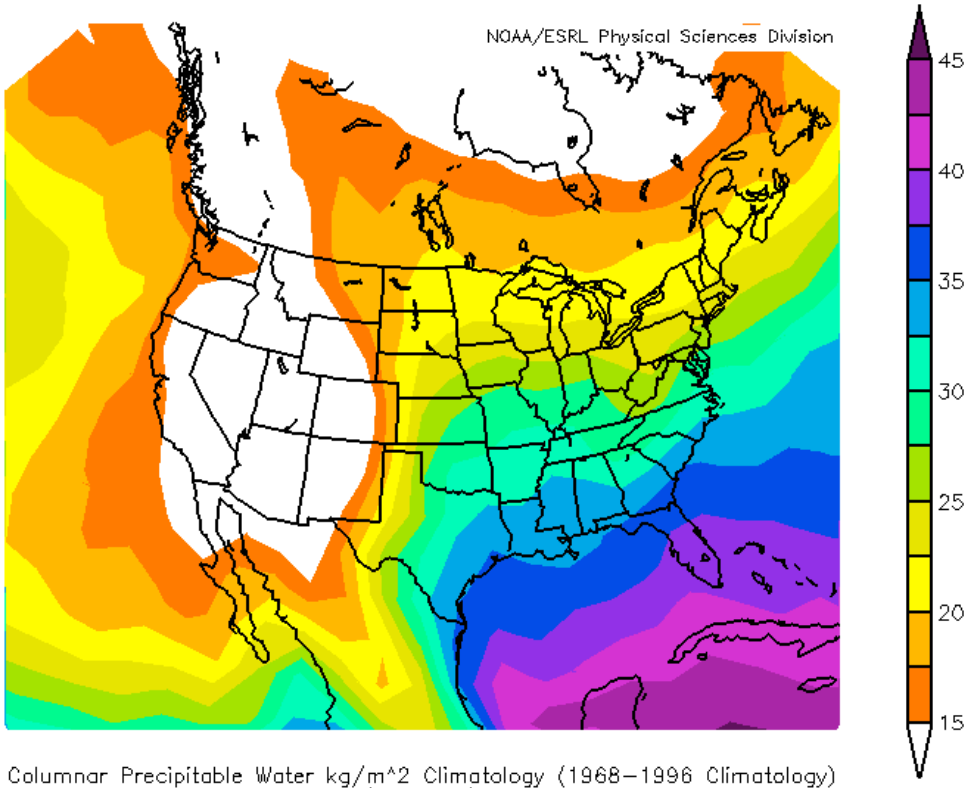
Albany, NY 12222

PH: (518) 442-4515

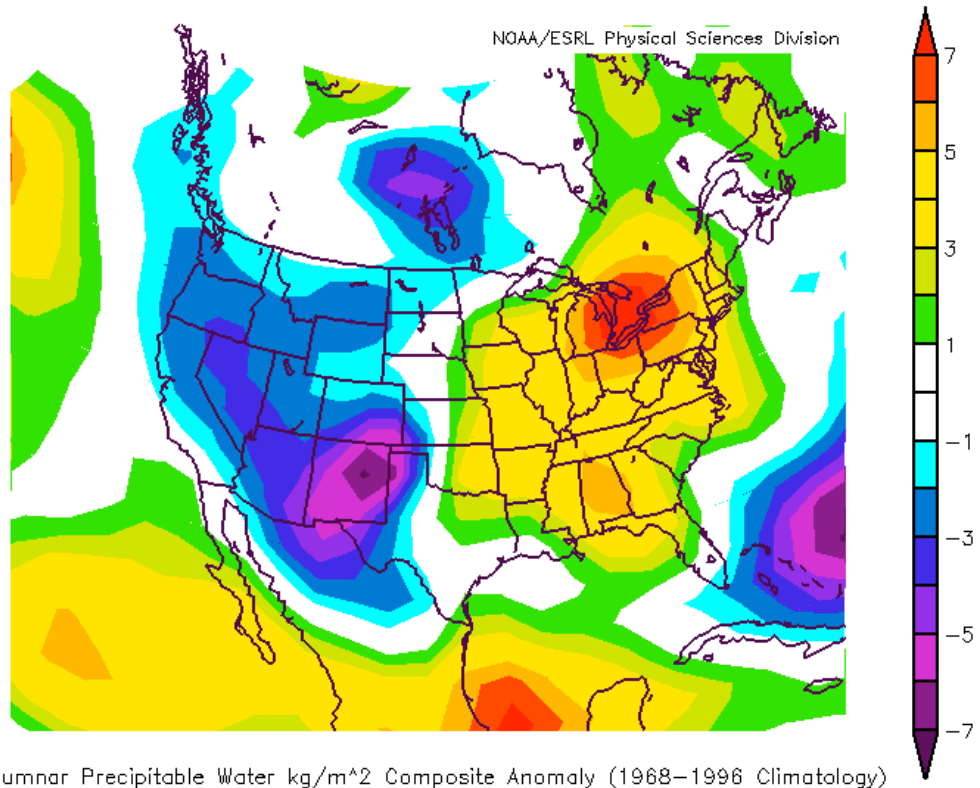
Email: tomjr@atmos.albany.edu

Web: http://www.atmos.albany.edu/student/tomjr/index.htm

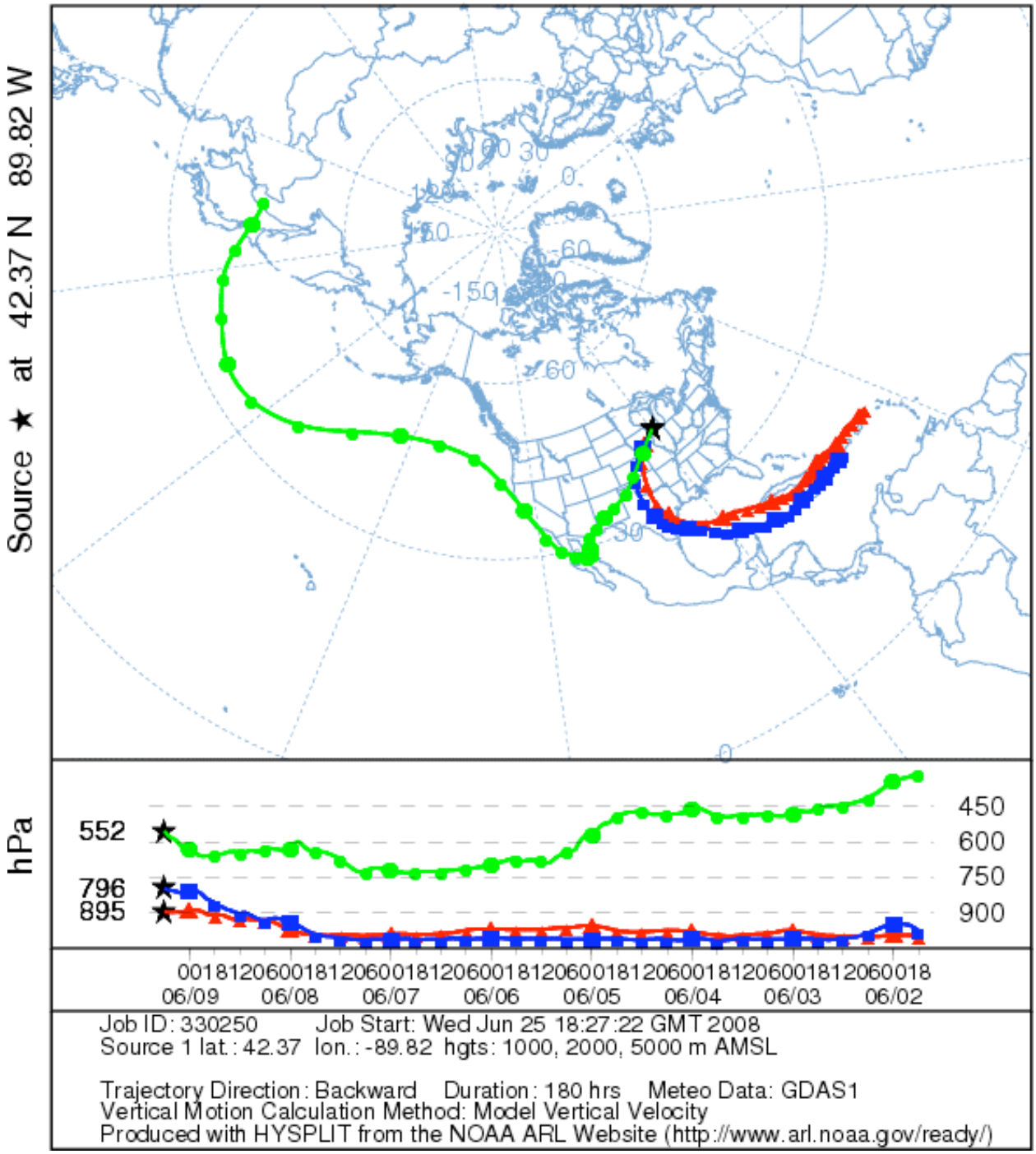
****



Columnar Precipitable Water kg/m^2 Climatology (1968–1996 Climatology)
6/1 to 6/14
NCEP/NCAR Reanalysis



Columnar Precipitable Water kg/m^2 Composite Anomaly (1968–1996 Climatology)
6/1/08 to 6/14/08
NCEP/NCAR Reanalysis


NOAA HYSPLIT MODEL
Backward trajectories ending at 06 UTC 09 Jun 08
GDAS Meteorological Data
Source ★ at 42.37 N 89.82 W
hPa
552
796
895
450
600
750
900
06/09
06/08
06/07
06/06
06/05
06/04
06/03
06/02
Job ID: 330250 Job Start: Wed Jun 25 18:27:22 GMT 2008
Source 1 lat.: 42.37 lon.: -89.82 hgts: 1000, 2000, 5000 m AMSL
Trajectory Direction: Backward Duration: 180 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

From bosart@atmos.albany.edu Sun Jul 20 19:43:45 2008
Return-Path: <bosart@atmos.albany.edu>
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  cypress.atmos.albany.edu
X-Spam-Level: ****
X-Spam-Status: No, score=4.2 required=8.0 tests=RCVD_IN_PBL,RCVD_IN_SORBS_DUL,
  RDNS_DYNAMIC,UPPERCASE_75_100 autolearn=no version=3.2.4
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  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m6KJhij21017;
  Sun, 20 Jul 2008 19:43:44 GMT
Mime-Version: 1.0
X-Sender: bosart@pop.atmos.albany.edu
Message-Id: <p06020402c4a943640884@[192.168.0.6]>
Date: Sun, 20 Jul 2008 19:43:41 +0000
To: celeste@atmos.albany.edu
From: Lance Bosart <bosart@atmos.albany.edu>
Subject: Input for Oct'08 CSTAR-III 6-month report (PREs)
Cc: keyser@atmos.albany.edu, bosart@atmos.albany.edu
Content-Type: text/plain; charset="us-ascii" ; format="flowed"
Status: RO

Hi Celeste,

  Appended below is material for our next (Oct'08) 6-month
CSTAR-III report that pertains to the mention of CSTAR research on
predecessor heavy rain events (PREs) in area forecast discussions
(AFDs) issued by WFO ALB on 19-20 July 2008.

  Thanks.

Lance

cc: Dan

.....

AREA FORECAST DISCUSSION...CORRECTED ISSUANCE TIME

NATIONAL WEATHER SERVICE ALBANY NY

756 PM EDT SAT JUL 19 2008

.SYNOPSIS...

A WEAKENING COLD FRONT WILL MOVE INTO OUR REGION AND BECOME NEARLY STATIONARY TONIGHT. A WAVE OF LOW PRESSURE WILL MOVE EASTWARD ALONG BOUNDARY...PASSING OVER THE AREA SUNDAY NIGHT. WIDESPREAD SHOWERS AND THUNDERSTORMS ARE EXPECTED WITH STORMS PRODUCING VERY HEAVY RAINFALL.

&&

.NEAR TERM /UNTIL 6 AM SUNDAY MORNING/...

DROPPING SEVERE THUNDERSTORM WATCH #702. ISOLATED CONVECTION OVER OUR AREA WEAKENING AND STORMS OVER CENTRAL NY WILL WEAKEN ALSO WITH LOSS OF DAYTIME HEATING. WILL KEEP CHANCE/SCATTERED THROUGH THIS EVENING TO HANDLE APPROACHING STORMS FOR THIS EVENING.

&&

.SHORT TERM /6 AM SUNDAY MORNING THROUGH TUESDAY NIGHT/...

FRONTAL BOUNDARY BECOME NEARLY STATIONARY ACROSS FORECAST AREA AND A WAVE OF LOW PRESSURE FROM THE GREAT LAKES REGION MOVES EASTWARD ALONG THE BOUNDARY. THE GFS IS DEEPER AND SLOWER WITH THE LOW THAN THE NAM. THE 12Z/SAT ECMWF INITIALLY IS SIMILAR TO THE GFS BUT IS QUICKER HAVING THE LOW DEPART THE REGION MONDAY. LOOKING AT A WET PERIOD WITH WIDESPREAD CONVECTION DEVELOPING BY SUNDAY AFTERNOON AND CONTINUING THROUGH SUNDAY NIGHT. PRECIPITABLE WATER VALUES ARE EXPECTED TO RISE TO AROUND 2 INCHES SUNDAY AND REMAIN HIGH SUNDAY NIGHT...SO VERY HEAVY DOWNPOURS EXPECTED WITH STORMS. BASED ON CSTAR II RESEARCH PROJECTS...THERE IS THE POTENTIAL FOR A PRE-EVENT

...HEAVY RAINFALL EVENTS PRECEDING TROPICAL SYSTEMS...AS TROPICAL

STORM CRISTOBAL HEADS NORTHEAST SUNDAY. REFER TO THE NATIONAL HURRICANE CENTER PRODUCTS FOR DETAILS ABOUT CRISTOBAL. THE HEAVY RAINFALL IS DEPENDENT ON THE POSITION OF THE FRONTAL BOUNDARY. NOT CONFIDENT ENOUGH AT THIS TIME TO ISSUE ANY TYPE OF FLOOD WATCH. THERE IS ALSO A THREAT FOR SEVERE THUNDERSTORMS SUNDAY...SPC HAS AREA IN SLIGHT RISK. THERE WILL BE MODEST UNIDIRECTIONAL WESTERLY FLOW. LOW LEVEL JET WILL INCREASE AHEAD OF THE APPROACHING LOW AND UPPER LEVEL JET DYNAMICS WILL BE FAVORABLE. PRIMARY THREAT WILL BE FOR DAMAGING WIND.

LONGWAVE TROUGH WILL MOVE IN WITH AN UPPER LOW CUTTING OFF OVER EASTERN CANADA MONDAY THEN SLOWING MOVING NORTHEAST THROUGH TUESDAY.

THIS WILL KEEP US UNSETTLED WITH THE CONTINUED THREAT FOR SCATTERED CONVECTION TO START TO THE WEEK.

&&

.LONG TERM /WEDNESDAY THROUGH SATURDAY/...

OVERALL UNSETTLED WEATHER WITH UPPER LEVEL TROUGH/LOW OVER THE REGION. MODELS ARE IN BETTER AGREEMENT WILL LARGE SCALE FLOW WITH STRONG RIDGE OVER CENTRAL NORTH AMERICA AND LONGWAVE TROUGH OVER THE

PACIFIC/NORTHWESTERN AMERICA AND CLOSED OFF UPPER LOW OVER EASTERN CANADA AND THE GREAT LAKES REGION/NORTHEAST. THE ECMWF CONTINUES TO MAINTAIN LONGWAVE TROUGH OVER REGION. THE GFS HAD BEEN MORE PROGRESSIVE BEGINNING TO LIFT THE TROUGH NORTHWARD....HOWEVER THE 12Z/SAT RUN INDICATES RIDGING GETS DAMPENED AND LONGWAVE TROUGH REMAINS IN PLACE BUT ITS LESS AMPLIFIED THAN THE ECMWF. AGAIN FOLLOWED HPC LEAD FOR EXTENDED MAINTAINING CONSISTENCY IN THE FORECAST. SURFACE FRONTAL BOUNDARY BECOMING NEARLY STATIONARY ALONG/JUST OFF THE MID ATLANTIC/NEW ENGLAND COAST WITH TEMPS AT OR JUST BELOW SEASONABLE LEVELS.

&&

.AVIATION /00Z SUNDAY THROUGH THURSDAY/...

ISOLATED CONVECTION WEAKENING WITH LOST OF DAYTIME HEATING. STARTING

OUT HAZY THIS EVENING...EXPECT MVFR FOG TO DEVELOP. HIGHER CIRRUS

LEVEL CLOUDS WILL OVERSPREAD THE REGION OVERNIGHT. DID HIT FOG

HARDER AT KGFL FOR OVERNIGHT SINCE THEY HAD A SHOWER MOVE THROUGH

EARLY THIS EVENING WETTING THE GROUND. WIDESPREAD SHOWERS AND

THUNDERSTORMS WILL MOVE INTO THE AREA FROM THE WEST SUNDAY AS AN

AREA OF LOW PRESSURE APPROACHES....CONDITIONS ARE EXPECTED TO LOWER

TO WIDESPREAD MVFR DURING THE AFTERNOON. HAVE ADDRESS THUNDERSTORM

THREAT WITH CB IN TAFS.

OUTLOOK...

SUN NIGHT...MVFR POSSIBILITY IFR AT TIMES IN SHRA/TSRA.

MON NIGHT-WED ...OVERALL WITH MVFR WITH SCT SHRA/TSRA.

THU...VFR...NO SIG WX.

&&

.FIRE WEATHER...

A WEAKENING COLD FRONT WILL MOVE INTO OUR REGION AND BECOME NEARLY

STATIONARY TONIGHT. A WAVE OF LOW PRESSURE WILL MOVE EASTWARD ALONG

BOUNDARY...PASSING OVER THE AREA SUNDAY NIGHT. WIDESPREAD SHOWERS

AND THUNDERSTORMS ARE EXPECTED WITH STORMS PRODUCING VERY HEAVY

RAINFALL. RELATIVE HUMIDITY VALUES WILL RECOVER TO NEAR 100 PERCENT

TONIGHT...THEN ONLY DROP TO 60 TO 70 PERCENT SUNDAY AFTERNOON WITH

50 TO 60 PERCENT ACROSS THE MID HUDSON VALLEY.

&&

.HYDROLOGY...

RIVER LEVELS AND FLOWS ARE LOW WHICH IS TYPICAL OF MID TO LATE

SUMMER. WEAK FRONTAL BOUNDARY WILL MOVE ACROSS AREA TODAY AND WILL

BECOME NEARLY STATIONARY THEN A LOW OF LOW PRESSURE WILL MOVE ALONG

BOUNDARY BRINGING MORE WIDESPREAD CONVECTION TO AREA SUNDAY INTO

MONDAY. PRECIPITABLE WATER VALUES ARE EXPECTED TO RISE TO AROUND 2

INCHES SUNDAY AND REMAIN HIGH SUNDAY NIGHT...SO VERY HEAVY DOWNPOURS

EXPECTED WITH SOME STORMS. BASED ON CSTAR II RESEARCH PROJECTS...

THERE IS THE POTENTIAL FOR A PRE-EVENT ...HEAVY RAINFALL EVENTS

PRECEDING TROPICAL SYSTEMS...AS TROPICAL STORM CRISTOBAL HEADS

NORTHEAST SUNDAY. REFER TO THE NATIONAL HURRICANE CENTER PRODUCTS

FOR DETAILS ABOUT CRISTOBAL. THE HEAVY RAINFALL IS DEPENDENT ON THE

POSITION OF THE FRONTAL BOUNDARY. NOT CONFIDENT ENOUGH AT THIS TIME

TO ISSUE ANY TYPE OF FLOOD WATCH.

&&

.ALY WATCHES/WARNINGS/ADVISORIES...

CT...NONE.

NY...NONE.

MA...NONE.

VT...NONE.

&&

$$

SYNOPSIS...IAA

NEAR TERM...IAA

SHORT TERM...IAA

LONG TERM...IAA

AVIATION...IAA

FIRE WEATHER...IAA

HYDROLOGY...IAA

AREA FORECAST DISCUSSION

NATIONAL WEATHER SERVICE ALBANY NY

940 PM EDT SAT JUL 19 2008

.SYNOPSIS...

A WEAKENING COLD FRONT WILL MOVE INTO OUR REGION AND BECOME NEARLY STATIONARY TONIGHT. A WAVE OF LOW PRESSURE WILL MOVE EASTWARD ALONG BOUNDARY...PASSING OVER THE AREA SUNDAY NIGHT. WIDESPREAD SHOWERS AND THUNDERSTORMS ARE EXPECTED WITH STORMS PRODUCING VERY HEAVY RAINFALL.

&&

.NEAR TERM /UNTIL 6 AM SUNDAY MORNING/...

CLUSTER OF SHOWERS AND EMBEDDED TSTMS OVER CENTRAL NY IS QUICKLY ENCROACHING UPON THE WESTERN MOHAWK VALLEY AS OF 940 PM EDT. THIS APPEARS TO BE ASSOCIATED WITH ANOTHER SHORTWAVE. THIS FEATURE WILL CONTINUE TRACKING E...ACROSS THE MOHAWK VALLEY BETWEEN 10 AND 11 PM...AND INTO THE CAPITAL REGION AND SARATOGA REGION BETWEEN 11 PM AND MIDNIGHT...AND ACROSS THE MID HUDS0N VALLEY...BERKS...AND SOUTHERN VT AROUND...AND JUST AFTER MIDNIGHT. ENOUGH INSTABILITY LINGERS...BASED ON 00Z/20 KALY SOUNDING...TO SUPPORT ADDITIONAL CONVECTION. STRONG GUSTY WINDS...SMALL HAIL...AND HEAVY RAIN ARE STILL POSSIBLE WITHIN THE STRONGER CORES. WILL INCLUDE HIGH CHC POPS UNTIL THE EARLY MORNING HOURS DUE TO THIS FEATURE WORKING THROUGH THE REGION. IN ADDITION...HAVE ADDED PATCHY FOG...AS MOIST BOUNDARY LAYER...COMBINED WITH LIGHT WINDS AND POSSIBLE BREAKS IN THE CLOUDS IN THE WAKE OF THIS FEATURE ALLOW FOR FOG FORMATION.

&&

.SHORT TERM /6 AM SUNDAY MORNING THROUGH TUESDAY NIGHT/...

FRONTAL BOUNDARY BECOME NEARLY STATIONARY ACROSS FORECAST AREA AND A WAVE OF LOW PRESSURE FROM THE GREAT LAKES REGION MOVES EASTWARD ALONG THE BOUNDARY. THE GFS IS DEEPER AND SLOWER WITH THE LOW THAN

THE NAM. THE 12Z/SAT ECMWF INITIALLY IS SIMILAR TO THE GFS BUT IS QUICKER HAVING THE LOW DEPART THE REGION MONDAY. LOOKING AT A WET PERIOD WITH WIDESPREAD CONVECTION DEVELOPING BY SUNDAY AFTERNOON AND CONTINUING THROUGH SUNDAY NIGHT. PRECIPITABLE WATER VALUES ARE EXPECTED TO RISE TO AROUND 2 INCHES SUNDAY AND REMAIN HIGH SUNDAY NIGHT...SO VERY HEAVY DOWNPOURS EXPECTED WITH STORMS. BASED ON CSTAR II RESEARCH PROJECTS...THERE IS THE POTENTIAL FOR A PRE-EVENT HEAVY RAINFALL EVENTS PRECEDING TROPICAL SYSTEMS...AS TROPICAL STORM CRISTOBAL HEADS NORTHEAST SUNDAY. REFER TO THE NATIONAL HURRICANE CENTER PRODUCTS FOR DETAILS ABOUT CRISTOBAL. THE HEAVY RAINFALL IS DEPENDENT ON THE POSITION OF THE FRONTAL BOUNDARY. NOT CONFIDENT ENOUGH AT THIS TIME TO ISSUE ANY TYPE OF FLOOD WATCH. THERE IS ALSO A THREAT FOR SEVERE THUNDERSTORMS SUNDAY...SPC HAS AREA IN SLIGHT RISK. THERE WILL BE MODEST UNIDIRECTIONAL WESTERLY FLOW. LOW LEVEL JET WILL INCREASE AHEAD OF THE APPROACHING LOW AND UPPER LEVEL JET DYNAMICS WILL BE FAVORABLE. PRIMARY THREAT WILL BE FOR DAMAGING WIND.

LONGWAVE TROUGH WILL MOVE IN WITH AN UPPER LOW CUTTING OFF OVER EASTERN CANADA MONDAY THEN SLOWING MOVING NORTHEAST THROUGH TUESDAY. THIS WILL KEEP US UNSETTLED WITH THE CONTINUED THREAT FOR SCATTERED CONVECTION TO START TO THE WEEK.

&&

.LONG TERM /WEDNESDAY THROUGH SATURDAY/...

OVERALL UNSETTLED WEATHER WITH UPPER LEVEL TROUGH/LOW OVER THE REGION. MODELS ARE IN BETTER AGREEMENT WILL LARGE SCALE FLOW WITH STRONG RIDGE OVER CENTRAL NORTH AMERICA AND LONGWAVE TROUGH OVER THE PACIFIC/NORTHWESTERN AMERICA AND CLOSED OFF UPPER LOW OVER EASTERN CANADA AND THE GREAT LAKES REGION/NORTHEAST. THE ECMWF CONTINUES TO MAINTAIN LONGWAVE TROUGH OVER REGION. THE GFS HAD BEEN MORE PROGRESSIVE BEGINNING TO LIFT THE TROUGH NORTHWARD....HOWEVER THE

12Z/SAT RUN INDICATES RIDGING GETS DAMPENED AND LONGWAVE TROUGH REMAINS IN PLACE BUT ITS LESS AMPLIFIED THAN THE ECMWF. AGAIN FOLLOWED HPC LEAD FOR EXTENDED MAINTAINING CONSISTENCY IN THE FORECAST. SURFACE FRONTAL BOUNDARY BECOMING NEARLY STATIONARY ALONG/JUST OFF THE MID ATLANTIC/NEW ENGLAND COAST WITH TEMPS AT OR JUST BELOW SEASONABLE LEVELS.

&&

.AVIATION /02Z SUNDAY THROUGH THURSDAY/...

ISOLATED CONVECTION WEAKENING WITH LOST OF DAYTIME HEATING. STARTING OUT HAZY THIS EVENING...EXPECT MVFR FOG TO DEVELOP. HIGHER CIRRUS LEVEL CLOUDS WILL OVERSPREAD THE REGION OVERNIGHT. DID HIT FOG HARDER AT KGFL FOR OVERNIGHT SINCE THEY HAD A SHOWER MOVE THROUGH EARLY THIS EVENING WETTING THE GROUND. WIDESPREAD SHOWERS AND THUNDERSTORMS WILL MOVE INTO THE AREA FROM THE WEST SUNDAY AS AN AREA OF LOW PRESSURE APPROACHES....CONDITIONS ARE EXPECTED TO LOWER TO WIDESPREAD MVFR DURING THE AFTERNOON. HAVE ADDRESS THUNDERSTORM THREAT WITH CB IN TAFS.

OUTLOOK...

SUN NIGHT...MVFR POSSIBILITY IFR AT TIMES IN SHRA/TSRA.

MON NIGHT-WED ...OVERALL WITH MVFR WITH SCT SHRA/TSRA.

THU...VFR...NO SIG WX.

&&

.FIRE WEATHER...

A WEAKENING COLD FRONT WILL MOVE INTO OUR REGION AND BECOME NEARLY STATIONARY TONIGHT. A WAVE OF LOW PRESSURE WILL MOVE EASTWARD ALONG BOUNDARY...PASSING OVER THE AREA SUNDAY NIGHT. WIDESPREAD SHOWERS AND THUNDERSTORMS ARE EXPECTED WITH STORMS PRODUCING VERY HEAVY RAINFALL. RELATIVE HUMIDITY VALUES WILL RECOVER TO NEAR 100 PERCENT TONIGHT...THEN ONLY DROP TO 60 TO 70 PERCENT SUNDAY AFTERNOON WITH 50 TO 60 PERCENT ACROSS THE MID HUDSON VALLEY.

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RIVER LEVELS AND FLOWS ARE LOW WHICH IS TYPICAL OF MID TO LATE

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TO ISSUE ANY TYPE OF FLOOD WATCH.

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.ALY WATCHES/WARNINGS/ADVISORIES...

CT...NONE.

NY...NONE.

MA...NONE.

VT...NONE.

&&

$$

SYNOPSIS...IAA

NEAR TERM...KL/IAA

SHORT TERM...IAA

LONG TERM...IAA

AVIATION...IAA/NAS

FIRE WEATHER...IAA

HYDROLOGY...IAA

AREA FORECAST DISCUSSION

NATIONAL WEATHER SERVICE ALBANY NY

158 AM EDT SUN JUL 20 2008

.SYNOPSIS...

A WEAKENING COLD FRONT WILL MOVE INTO OUR REGION AND BECOME NEARLY STATIONARY TONIGHT. A WAVE OF LOW PRESSURE WILL MOVE EASTWARD ALONG BOUNDARY...PASSING OVER THE AREA SUNDAY NIGHT. WIDESPREAD SHOWERS AND THUNDERSTORMS ARE EXPECTED WITH STORMS PRODUCING VERY HEAVY RAINFALL.

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&&

.SHORT TERM /6 AM THIS MORNING THROUGH TUESDAY NIGHT/...

FRONTAL BOUNDARY BECOME NEARLY STATIONARY ACROSS FORECAST AREA AND A WAVE OF LOW PRESSURE FROM THE GREAT LAKES REGION MOVES EASTWARD

ALONG THE BOUNDARY. THE GFS IS DEEPER AND SLOWER WITH THE LOW THAN THE NAM. THE 12Z/SAT ECMWF INITIALLY IS SIMILAR TO THE GFS BUT IS QUICKER HAVING THE LOW DEPART THE REGION MONDAY. LOOKING AT A WET PERIOD WITH WIDESPREAD CONVECTION DEVELOPING BY SUNDAY AFTERNOON AND CONTINUING THROUGH SUNDAY NIGHT. PRECIPITABLE WATER VALUES ARE EXPECTED TO RISE TO AROUND 2 INCHES SUNDAY AND REMAIN HIGH SUNDAY NIGHT...SO VERY HEAVY DOWNPOURS EXPECTED WITH STORMS. BASED ON CSTAR II RESEARCH PROJECTS...THERE IS THE POTENTIAL FOR A PRE-EVENT HEAVY RAINFALL EVENTS PRECEDING TROPICAL SYSTEMS...AS TROPICAL STORM CRISTOBAL HEADS NORTHEAST SUNDAY. REFER TO THE NATIONAL HURRICANE CENTER PRODUCTS FOR DETAILS ABOUT CRISTOBAL. THE HEAVY RAINFALL IS DEPENDENT ON THE POSITION OF THE FRONTAL BOUNDARY. NOT CONFIDENT ENOUGH AT THIS TIME TO ISSUE ANY TYPE OF FLOOD WATCH. THERE IS ALSO A THREAT FOR SEVERE THUNDERSTORMS SUNDAY...SPC HAS AREA IN SLIGHT RISK. THERE WILL BE MODEST UNIDIRECTIONAL WESTERLY FLOW. LOW LEVEL JET WILL INCREASE AHEAD OF THE APPROACHING LOW AND UPPER LEVEL JET DYNAMICS WILL BE FAVORABLE. PRIMARY THREAT WILL BE FOR DAMAGING WIND.

LONGWAVE TROUGH WILL MOVE IN WITH AN UPPER LOW CUTTING OFF OVER EASTERN CANADA MONDAY THEN SLOWING MOVING NORTHEAST THROUGH TUESDAY. THIS WILL KEEP US UNSETTLED WITH THE CONTINUED THREAT FOR SCATTERED CONVECTION TO START TO THE WEEK.

&&

.LONG TERM /WEDNESDAY THROUGH SATURDAY/...

OVERALL UNSETTLED WEATHER WITH UPPER LEVEL TROUGH/LOW OVER THE REGION. MODELS ARE IN BETTER AGREEMENT WILL LARGE SCALE FLOW WITH STRONG RIDGE OVER CENTRAL NORTH AMERICA AND LONGWAVE TROUGH OVER THE PACIFIC/NORTHWESTERN AMERICA AND CLOSED OFF UPPER LOW OVER EASTERN CANADA AND THE GREAT LAKES REGION/NORTHEAST. THE ECMWF CONTINUES TO MAINTAIN LONGWAVE TROUGH OVER REGION. THE GFS HAD BEEN MORE

PROGRESSIVE BEGINNING TO LIFT THE TROUGH NORTHWARD....HOWEVER THE 12Z/SAT RUN INDICATES RIDGING GETS DAMPENED AND LONGWAVE TROUGH REMAINS IN PLACE BUT ITS LESS AMPLIFIED THAN THE ECMWF. AGAIN FOLLOWED HPC LEAD FOR EXTENDED MAINTAINING CONSISTENCY IN THE FORECAST. SURFACE FRONTAL BOUNDARY BECOMING NEARLY STATIONARY ALONG/JUST OFF THE MID ATLANTIC/NEW ENGLAND COAST WITH TEMPS AT OR JUST BELOW SEASONABLE LEVELS.

&&

.AVIATION /06Z SUNDAY THROUGH THURSDAY/...

A WIDE BAND OF MOSTLY MIDLEVEL AND HIGH CLOUDS COVERED MOST OF THE FORECAST AREA LATE THIS EVENING. CEILINGS WERE VFR BUT VISIBILITIES VARIED WITH MOST OF THE METAR/TAF SITES MVFR. SOME ADDITIONAL DETERIORATION MAY TAKE PLACE OVERNIGHT PARTICULARLY AT KGFL AND KPOU WHERE THE TERRAIN FAVORS FORMATION OF VALLEY FOG. WHERE IFR CONDITIONS DEVELOP VISIBLITY WILL IMPROVE TO MVFR SHORTLY AFTER DAYBREAK...BUT HAZE MAY RESULT IN MVFR CONDITIONS PERSISTING. WIDESPREAD SHOWERS AND THUNDERSTORMS WILL MOVE INTO THE AREA FROM THE WEST TODAY AS AN AREA OF LOW PRESSURE APPROACHES....CONDITIONS ARE EXPECTED TO DETERIORATE TO WIDESPREAD MVFR DURING THE AFTERNOON

IN RAIN SHOWERS AND HAZE. HAVE ADDRESS THUNDERSTORM THREAT IN THE TAFS USING THE CB CLOUD TYPE. WINDS WILL BE NEARLY CALM IN THE PREDAWN HOURS...BECOMING SOUTHERLY 4 TO 8 KNOTS DURING THE DAY TODAY...THEN BECOMING LIGHT OR CALM TONIGHT. HIGHER GUSTS MAY BE EXPECTED IN THUNDERSTORMS. TONIGHT...AS THE AIR COOLS WITH THE HIGH MOISTURE CONTENT...MORE FOG MAY BE EXPECTED TO OCCUR.

OUTLOOK...

MONDAY MVFR WITH PERIODS OF IFR POSSIBLE IN SHRA/TSRA.

MON NIGHT-WED...VFR WITH MVFR IN SCT SHRA/TSRA.

THU...VFR...NO SIG WX.

&&

.FIRE WEATHER...

A WEAKENING COLD FRONT WILL MOVE INTO OUR REGION AND BECOME NEARLY STATIONARY TONIGHT. A WAVE OF LOW PRESSURE WILL MOVE EASTWARD ALONG BOUNDARY...PASSING OVER THE AREA SUNDAY NIGHT. WIDESPREAD SHOWERS AND THUNDERSTORMS ARE EXPECTED WITH STORMS PRODUCING VERY HEAVY RAINFALL. RELATIVE HUMIDITY VALUES WILL RECOVER TO NEAR 100 PERCENT TONIGHT...THEN ONLY DROP TO 60 TO 70 PERCENT SUNDAY AFTERNOON WITH 50 TO 60 PERCENT ACROSS THE MID HUDSON VALLEY.

&&

.HYDROLOGY...

RIVER LEVELS AND FLOWS ARE LOW WHICH IS TYPICAL OF MID TO LATE SUMMER. WEAK FRONTAL BOUNDARY WILL MOVE ACROSS AREA TODAY AND WILL BECOME NEARLY STATIONARY THEN A LOW OF LOW PRESSURE WILL MOVE ALONG BOUNDARY BRINGING MORE WIDESPREAD CONVECTION TO AREA SUNDAY INTO MONDAY. PRECIPITABLE WATER VALUES ARE EXPECTED TO RISE TO AROUND 2 INCHES SUNDAY AND REMAIN HIGH SUNDAY NIGHT...SO VERY HEAVY DOWNPOURS EXPECTED WITH SOME STORMS. BASED ON CSTAR II RESEARCH PROJECTS... THERE IS THE POTENTIAL FOR A PRE-EVENT ...HEAVY RAINFALL EVENTS PRECEDING TROPICAL SYSTEMS...AS TROPICAL STORM CRISTOBAL HEADS NORTHEAST SUNDAY. REFER TO THE NATIONAL HURRICANE CENTER PRODUCTS FOR DETAILS ABOUT CRISTOBAL. THE HEAVY RAINFALL IS DEPENDENT ON THE POSITION OF THE FRONTAL BOUNDARY. NOT CONFIDENT ENOUGH AT THIS TIME TO ISSUE ANY TYPE OF FLOOD WATCH.

&&

.ALY WATCHES/WARNINGS/ADVISORIES...

CT...NONE.

NY...NONE.

MA...NONE.

VT...NONE.

&&

$$

SYNOPSIS...IAA

NEAR TERM...KL/IAA

SHORT TERM...IAA

LONG TERM...IAA

AVIATION...RCK

FIRE WEATHER...IAA

HYDROLOGY...IAA

AREA FORECAST DISCUSSION

NATIONAL WEATHER SERVICE ALBANY NY

522 AM EDT SUN JUL 20 2008

.SYNOPSIS...

A STATIONARY FRONT ALONG THE CANADIAN BORDER EARLY THIS MORNING WILL GRADUALLY DRIFT SOUTH OVER OUR REGION TODAY AS A WAVE OF LOW PRESSURE MOVES EASTWARD ALONG IT...PASSING OVER THE AREA TONIGHT. THIS WILL RESULT IN SHOWERS AND THUNDERSTORMS BECOMING MORE NUMEROUS AND THEY ARE EXPECTED TO PRODUCE VERY HEAVY RAINFALL STARTING THIS AFTERNOON. THE FRONT WILL THEN LIFT BACK NORTH TO THE CANADIAN BORDER LATE TONIGHT WITH A SECOND LOW PRESSURE SYSTEM FINALLY DRAGGING A COLD FRONT THROUGH OUR AREA MONDAY EVENING... BRINGING MORE HEAVY RAIN TO OUR REGION.

&&

.NEAR TERM /THROUGH MONDAY/...

LEADING EDGE OF FIRST BAND OF SHOWERS AND EMBEDDED THUNDERSTORMS APPROACHING WESTERN PORTION OF FA EARLY THIS MORNING. MUCH OF THIS ACTIVITY EXPECTED TO IMPACT NORTHERN PORTION OF FA AND SET THE STAGE FOR EVEN HEAVIER CONVECTION LATER ON. SPC HAS FA OUTLOOKED FOR SLIGHT RISK TODAY AND WHILE A FEW STORMS COULD CERTAINLY BECOME SEVERE MAIN CONCERN IS FOR FLASH FLOODING. H8 WINDS INCREASE TO 30-35 KTS ACROSS NORTHERN PORTION OF FA THIS AFTERNOON...WITH SB CAPES 1000-1500 J/KG FOR A TIME THIS AFTERNOON...WITH THE MOST FAVORABLE FACTOR BEING 0-3 KM HELICITY WHICH BRIEFLY REACH 100-250 RANGE THIS AFTERNOON. THE MOST FAVORABLE FACTORS FOR FLASH FLOODING TODAY INCLUDE NEARLY STATIONARY FRONT WHICH BY AFTERNOON WILL BE PARKED THROUGH CENTRAL PORTION OF FA AS A WAVE OF LOW PRESSURE TRACKS EAST ALONG IT FROM THE EASTERN GREAT LAKES...VERY IMPRESSIVE H10-H8 THETA-E RIDGE ALSO THROUGH CENTRAL PORTION OF FA WITH PWATS MAINLY 1.50-1.75 INCHES WITH A FEW AREAS OVER 2 INCHES THROUGH THIS EVENING. HIRES

WRF COMPOSITE REFLECTIVITY HIGHLIGHTS THE POTENTIAL MAGNITUDE OF THE CONVECTIVE RAINFALL THIS AFTERNOON INTO THIS EVENING SHOWING TRAINING OF 40-60 DBZ CELLS MAINLY ACROSS FA FROM ROUTE 23 NORTH STARTING LATE MORNING INTO EARLY AFTERNOON. HAVE HIGHLIGHTED THIS POTENTIAL IN THE FLASH FLOOD WATCH AND BELIEVE THAT BETWEEN THIS AFTERNOON AND MONDAY EVENING THAT AT LEAST A FEW LOCATIONS LIKELY TO EXPERIENCE SEVERAL INCHES OR MORE OF RAIN IN 1 TO 2 HOURS TIME.

HIGHS TODAY ARE EXPECTED TO BE 5 TO 10 DEGREES LOWER THAN YESTERDAY AS MUCH MORE EXTENSIVE CLOUD COVER AND MORE NUMEROUS SHOWERS AND THUNDERSTORMS WILL KEEP A LID ON TEMPS WITH HIGHS GENERALLY IN THE MID 70S TO MID 80S.

AFTER A BRIEF LULL IN THE ACTION LATE THIS EVENING EXPECT MORE SHOWERS AND THUNDERSTORMS TO FIRE UP LATE TONIGHT THROUGH MONDAY WITH POTENTIAL FOR A PRE EVENT...A HEAVY RAINFALL EVENT THAT PRECEDES A TROPICAL STORM...BASED ON CSTAR II RESEARCH AHEAD OF TROPICAL STORM CRISTOBAL WHICH IS FORECAST TO HEAD NORTHEAST PASSING OFF DELMARVA EARLY MONDAY. REFER TO THE NATIONAL HURRICANE CENTER PRODUCTS FOR DETAILS ABOUT CRISTOBAL. THUS MONDAY WOULD BE THE TIME FRAME FOR THE PRE TO DEVELOP PROVIDED CRISTOBAL GETS CLOSE ENOUGH...WITHIN 1000 KM...TO FA. STILL FEEL THAT THE FAVORED AREA WOULD BE FROM EASTERN CATSKILLS TO WESTERN NEW ENGLAND.

PWATS INCREASE TO OVER 2 INCHES FOR A TIME MONDAY MORNING ACROSS FAR SE PORTION OF FA AS H10-H8 THETA E RIDGE BECOMES MORE FOCUSED ACROSS THIS REGION. AND THE SOUTHEAST HALF OF FA APPEARS TO BE NEAR THE MID LEVEL JET ENTRANCE REGION OF H5 WIND MAX. SB CAPES OFF NAM AND GFS ALSO EXTREMELY IMPRESSIVE OVER SE PORTION OF FA IN 2500-3200 J/KG RANGE WITH ANY HEATING AT ALL ON MONDAY EXCESSIVE RAINFALL WOULD BE LIKELY. HAVE THUS ISSUED A VERY STRONGLY WORDED FLASH FLOOD WATCH WITH CONCERNS HIGHLIGHTED IN HYDROLOGY DISCUSSION BELOW.

&&

.SHORT TERM /MONDAY NIGHT THROUGH TUESDAY NIGHT/...

SECOND WAVE OF LOW PRESSURE SHOULD FINALLY SWING COLD FRONT THROUGH

FA MONDAY NIGHT WITH PCPN EXPECTED TO TAPER OFF QUICKLY AROUND

MIDNIGHT AS DRY SLOT MOVES OVER REGION. MORE LESS NUMEROUS AND

LESS INTENSE SHOWERS AND THUNDERSTORMS POSSIBLE TUE AFTERNOON AS

UPPER TOUGH SWINGS INTO EASTERN GREAT LAKES WHILE SECONDARY LOW

REMAINS ACROSS EASTERN CANADA.

&&

.LONG TERM /WEDNESDAY THROUGH SATURDAY/...

THE MAIN FEATURE DURING THIS PERIOD IS A DEEP 500 HPA TROF

OVER SOUTHEASTERN CANADA AND THE NORTHEASTERN STATES. AGAIN

THE GFS AND ECMWF ARE IN FAIRLY CLOSE AGREEMENT ON WEDNESDAY

BUT THEN DIVERGE AS TIME GOES ON WITH THE GFS MORE PROGRESSIVE

IN MOVING OUT THE TROF. FOR THE MOST PART...HAVE USED A BLEND

OF THE PREVIOUS HPC AND THE RECENT GMOS FOR MAX AND MIN TEMPS.

A WEAK CANADIAN HIGH BUILDS IN THE OHIO VALLEY BUT SOME

QUESTION REMAINS HOW FAR EAST THE FRONTAL SYSTEM WILL MOVE

OFF SHORE AS WEAK DISTURBANCES MOVE NORTH ALONG IT. IN

ADDITION...TEMPERATURES ALOFT WILL BE FAIRLY COOL WHICH WILL

ADD TO THE INSTABILITY OF THE AIR. THEREFORE THERE IS A LOT

OF UNCERTAINTY REGARDING THE POSSIBILITY OF SHOWERS AND

MIDDAY THUNDERSTORMS. WE HAVE ADDRESSED THIS WITH LOW CHANCE

AND SLIGHT CHANCE POPS. TEMPERATURES WILL BE A BIT COOLER

AND MORE PLEASANT...HIGHS IN THE UPPER 70S AND LOW 80S...

AND LOWS AND DEWPOINTS IN THE 50S AND LOW 60S...CLOSE TO

NORMAL FOR THIS TIME OF YEAR AND MUCH MORE PLEASANT THAN

THE HEAT AND HUMIDITY OF THE LAST FEW DAYS.

&&

.AVIATION /08Z SUNDAY THROUGH THURSDAY/...

A WIDE BAND OF MOSTLY MIDLEVEL AND HIGH CLOUDS COVERED MOST OF THE

FORECAST AREA LATE THIS EVENING. CEILINGS WERE VFR BUT VISIBILITIES

VARIED WITH MOST OF THE METAR/TAF SITES MVFR. SOME ADDITIONAL DETERIORATION MAY TAKE PLACE OVERNIGHT PARTICULARLY AT KGFL AND KPOU WHERE THE TERRAIN FAVORS FORMATION OF VALLEY FOG. WHERE IFR CONDITIONS DEVELOP VISIBILITY WILL IMPROVE TO MVFR SHORTLY AFTER DAYBREAK...BUT HAZE MAY RESULT IN MVFR CONDITIONS PERSISTING. WIDESPREAD SHOWERS AND THUNDERSTORMS WILL MOVE INTO THE AREA FROM THE WEST TODAY AS AN AREA OF LOW PRESSURE APPROACHES....CONDITIONS ARE EXPECTED TO DETERIORATE TO WIDESPREAD MVFR DURING THE AFTERNOON IN RAIN SHOWERS AND HAZE. HAVE ADDRESS THUNDERSTORM THREAT IN THE TAFS USING THE CB CLOUD TYPE. WINDS WILL BE NEARLY CALM IN THE PREDAWN HOURS...BECOMING SOUTHERLY 4 TO 8 KNOTS DURING THE DAY TODAY...THEN BECOMING LIGHT OR CALM TONIGHT. HIGHER GUSTS MAY BE EXPECTED IN THUNDERSTORMS. TONIGHT...AS THE AIR COOLS WITH THE HIGH MOISTURE CONTENT...MORE FOG MAY BE EXPECTED TO OCCUR.

OUTLOOK...

MONDAY MVFR WITH PERIODS OF IFR POSSIBLE IN SHRA/TSRA.

MON NIGHT-WED...VFR WITH MVFR IN SCT SHRA/TSRA.

THU...VFR...NO SIG WX.

&&

.FIRE WEATHER...

TODAY LOOKS LIKE A WET FLAG DAY FOR VIRTUALLY ENTIRE FA.

A STATIONARY FRONT ALONG THE CANADIAN BORDER EARLY THIS MORNING WILL GRADUALLY DRIFT SOUTH OVER OUR REGION TODAY AS A WAVE OF LOW PRESSURE MOVES EASTWARD ALONG IT...PASSING OVER THE AREA TONIGHT. THIS WILL RESULT IN SHOWERS AND THUNDERSTORMS BECOMING MORE NUMEROUS AND THEY ARE EXPECTED TO PRODUCE VERY HEAVY RAINFALL STARTING THIS AFTERNOON. THE FRONT WILL THEN LIFT BACK NORTH TO THE CANADIAN BORDER LATE TONIGHT WITH A SECOND LOW PRESSURE SYSTEM FINALLY DRAGGING A COLD FRONT THROUGH OUR AREA MONDAY EVENING... BRINGING MORE HEAVY RAIN TO OUR REGION.

RELATIVE HUMIDITY VALUES WILL DROP TO 50 TO 75 PERCENT TODAY...RECOVER TO NEAR 100 PERCENT TONIGHT...AND FALL TO 55 TO 80 PERCENT ON MONDAY.

LIGHT AND VARIABLE WINDS THIS MORNING WILL BECOME EAST TO NORTHEAST AT 5 TO 10 MPH THIS AFTERNOON WITH EAST NORTHEAST WINDS AROUND 5 MPH TONIGHT AND THEN SHIFTING TO WEST TO SOUTHWEST AND INCREASING TO AROUND 10 MPH ON MONDAY.

&&

.HYDROLOGY...

RIVER LEVELS AND FLOWS ARE LOW WHICH IS TYPICAL OF MID TO LATE SUMMER. A WEAK FRONTAL BOUNDARY WILL BECOME NEARLY STATIONARY AND A WAVE OF LOW PRESSURE WILL MOVE ALONG THE BOUNDARY BRINGING MORE WIDESPREAD CONVECTION TO THE REGION TODAY INTO MONDAY. PRECIPITABLE WATER VALUES ARE EXPECTED TO RISE TO AROUND 2 INCHES TODAY AND REMAIN HIGH TONIGHT...SO SOME OF THE STORMS WILL HAVE TORRENTIAL DOWNPOURS. TERRAIN MAY ALSO PLAY A CRITICAL ROLE IN ENHANCING RAINFALL...ESPECIALLY IN THE CATSKILLS AND ALONG THE SPINE OF THE BERKSHIRE AND GREEN MOUNTAINS. SEVERAL INCHES OF RAIN ARE POSSIBLE IN A SHORT TIME...WITH RAPID RUNOFF ESPECIALLY IN MOUNTAINOUS TERRAIN. ROADS...PARKING LOTS...SHOPPING CENTERS...AND BUILT UP AREAS AREA ALSO LIKELY TO EXPERIENCE FLOODING DURING AND SHORTLY AFTER TORRENTIAL DOWNPOURS. FORECAST WINDS ALOFT SUGGEST THAT CELLS WILL BE SLOW MOVING TODAY AND THAT TRAINING AND BACK BUILDING HEAVY PRECIP CELLS WILL BE A PROBLEM TONIGHT AND EARLY MONDAY. FOR THESE REGIONS A FLASH FLOOD WATCH HAS BEEN ISSUED VALID FROM NOON TODAY UNTIL MIDNIGHT MONDAY NIGHT.

&&

.ALY WATCHES/WARNINGS/ADVISORIES...

CT...FLASH FLOOD WATCH FROM NOON EDT TODAY THROUGH MONDAY EVENING FOR CTZ001-013.

NY...FLASH FLOOD WATCH FROM NOON EDT TODAY THROUGH MONDAY EVENING FOR NYZ032-033-038>043-047>054-058>061-063>066-082>084.

MA...FLASH FLOOD WATCH FROM NOON EDT TODAY THROUGH MONDAY EVENING FOR MAZ001-025.

VT...FLASH FLOOD WATCH FROM NOON EDT TODAY THROUGH MONDAY EVENING FOR VTZ013>015.

&&

$$

SYNOPSIS...11

NEAR TERM...1

SHORT TERM...11

LONG TERM...RCK

AVIATION...RCK

FIRE WEATHER...11

HYDROLOGY...RCK

From keyser@atmos.albany.edu Tue Jul 22 21:49:18 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=1.0 required=8.0 tests=AWL,UPPERCASE_75_100
  autolearn=no version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m6MLnIj22636;
  Tue, 22 Jul 2008 21:49:18 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m6MLnIo01503;
  Tue, 22 Jul 2008 21:49:18 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200807222149.m6MLnIo01503@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Tues. 7/22/08
To: celeste@atmos.albany.edu
Date: Tue, 22 Jul 2008 21:49:18 +0000 (GMT)
Cc: bosart@atmos.albany.edu, scalora@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Tuesday 22 July 2008

Celeste,

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

CSTAR warm-season cutoff-low research is mentioned by Joe Villani in
the last sentence of the first paragraph of the short-term section of

this afternoon's AFD issued by NWS ALY.

Dan

cc: Lance, Matt S.

FXUS61 KALY 222007
FXUS61 KALY 222007
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
407 PM EDT TUE JUL 22 2008

.SYNOPSIS...
UNSETTLED WEATHER AND HUMID CONDITIONS WILL CONTINUE THROUGH MUCH OF
THE WEEK. A NEARLY STATIONARY FRONT WILL REMAIN OVER THE REGION...BRINGING SCATTERED TO NUMEROUS SHOWERS AND THUNDERSTORMS INTO THIS EVENING. WIDESPREAD HEAVY RAIN WILL OCCUR WEDNESDAY INTO THURSDAY...AS WAVES OF LOW PRESSURE MOVE ALONG THE STATIONARY FRONT...AS A DEVELOPING SOUTHERLY FLOW TRANSPORTS DEEP MOISTURE INTO OUR AREA. HIGH PRESSURE WILL BUILD IN LATE THURSDAY INTO FRIDAY.
&&
.SHORT TERM /6 AM WEDNESDAY MORNING THROUGH THURSDAY NIGHT/...
AFTER A BRIEF BREAK IN CONVECTIVE ACTIVITY EXPECTED EARLY WED MORNING...A MORE SUBSTANTIAL CHANCE FOR A WIDESPREAD HEAVY RAINFALL IS TAKING SHAPE FROM LATE MORNING WED THROUGH MUCH OF THUR. MODEL FORECASTS IN FAIRLY GOOD AGREEMENT WITH THE OVERALL SETUP OF A POSITIVELY-TILTED UPPER LEVEL LOW DROPPING SOUTHWARD ACROSS THE CENTRAL GREAT LAKES AND BECOMING NEGATIVELY-TILTED AS IT BECOMES

CUT-OFF FROM THE MAIN FLOW. AS THE UPPER PATTERN BECOMES MORE AMPLIFIED...DEEP LAYER WINDS WILL BECOME SOUTHERLY ACROSS OUR REGION AS THE STATIONARY FRONT BECOMES ORIENTED IN A MORE NORTH-SOUTH DIRECTION. MULTIPLE WAVES OF LOW PRESSURE ARE FORECAST TO RIDE NORTHWARD ALONG THE FRONT...WHICH WILL ENHANCE RAINFALL. WE WILL BE IN A PERSISTENT AREA OF UPPER LEVEL DIVERGENCE ASSOC WITH THE RIGHT REAR QUAD OF A 100+ KT 250 MB JET. CSTAR RESEARCH FOR WARM SEASON CUT-OFF LOWS HAS SHOWN THIS TYPE OF PATTERN CAN RESULT IN HEAVY RAINFALL ACROSS PORTIONS OF EASTERN NEW YORK AND/OR WESTERN NEW ENGLAND.

PWAT VALUES ARE FORECAST TO INCREASE TO BETWEEN 1.75-2.00...WITH SOME POCKETS OF GREAT THAN 2 INCHES. DEEP SOUTHERLY FLOW WILL TRANSPORT GULF AND ATLANTIC MOISTURE INTO OUR AREA. MASSIVE CONVERGENCE AT 850 MB SETTING UP WITH A STRONG SOUTHERLY JET DEVELOPING LATE WED THROUGH THUR...WITH WINDS INCREASING TO 40-55 KTS FROM ALB EASTWARD...AND LIGHT WEST-SOUTHWEST FLOW TO THE WEST. THE HEAVIEST CONCENTRATION OF RAIN WILL BE ALONG THIS CONVERGENCE ZONE...ALSO ALIGNED WITH THE DIVERGENCE AREA OF THE JET. RIGHT NOW THE NAM FOCUSES THE HEAVIEST RAINFALL ALONG THE HUDSON RIVER VALLEY...WHILE THE GFS FOCUSES THE GREATEST AMOUNTS FROM THE CAPITAL REGION WESTWARD. IT APPEARS THERE WILL BE A FAIRLY SHARP GRADIENT TO WHERE THE HEAVY QPF AXIS SETS UP...WITH THE 12Z NAM SHOWING UPWARDS OF 6-9 INCHES. HOWEVER...THE GFS HAS A MORE NARROW SWATH OF 2-5 INCHES. BASED ON A QUICK GLANCE OF THE 12Z ECMWF GUIDANCE...THE NAM APPEARS TO BE AN OUTLIER WITH THE EXTREME AMOUNTS. STILL...THERE IS THE POTENTIAL FOR A WIDESPREAD 2-4 INCHES WITH LOCALLY HIGHER AMOUNTS. THIS COULD RESULT IN FLOODING. PLEASE SEE HYDRO SECTION FOR MORE DETAILS.

WHILE FORECAST SOUNDING PROFILES LOOK MOIST...THERE WILL BE MLCAPE VALUES OF AROUND 500-1000 J/KG SO WILL KEEP MENTION OF THUNDER WED INTO THUR. THERE IS A LOT OF UNCERTAINTY AS TO IF STRONG WINDS WILL

BE ABLE TO MIX DOWN TO THE SURFACE...WITH MAIN CONCERN ACROSS EASTERN AREAS. FOR NOW WILL NOT MENTION ANY ENHANCED WORDING...AS HEAVY RAIN RAIN WILL BE THE GREATER THREAT. VERTICAL SHEAR MAGNITUDE WILL BE LARGE...BUT INSTABILITY SHOULD BE LIMITED BY CLOUDS/RAIN. TEMPS WILL BE HELD DOWN DURING THE DAY DUE TO CLOUDS/RAIN BUT WILL BE MILD AT NIGHT WITH HUMID CONDITIONS PERSISTING.

12Z NAM GUIDANCE SUGGESTS HEAVY RAINFALL PERSISTING WELL INTO THUR...AS THE UPPER TROF BECOME NEGATIVELY TILTED WHICH SLOWS ITS EASTWARD PROGRESSION. HOWEVER...THE GFS IS MORE PROGRESSIVE AND SWINGS THE UPPER TROF AXIS THROUGH DURING THE DAY. THE NAM LINGERING HEAVY RAINFALL IS CONTRIBUTING TO THE HIGHER QPF. WILL SPLIT THE DIFFERENCE FOR NOW...AND MENTION RAIN LINGERING THROUGH MUCH OF THUR MORNING...THEN GRADUALLY TAPERING FROM WEST TO EAST LATE IN THE DAY. WILL CONTINUE TO MENTION HEAVY RAIN EARLY...WITH DEEP PLUME OF MOISTURE PERSISTING BUT EVENTUALLY SHIFTING TO THE EAST. THE UPPER LOW IS FORECAST TO MOVE OVERHEAD THUR NIGHT...BUT DUE TO LACK OF HEATING DURING THE DIURNAL MIN TIME OF DAY ONLY ISOLATED TO SCATTERED LIGHT SHOWERS ARE EXPECTED OVERNIGHT.

&&

$$

SYNOPSIS...JPV

SHORT TERM...JPV

From keyser@atmos.albany.edu Wed Aug 6 15:07:15 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=0.0 required=8.0 tests=AWL,WHOIS_NETSOLPR
  autolearn=ham version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m76F76j29741;
  Wed, 6 Aug 2008 15:07:06 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m76F76705286;
  Wed, 6 Aug 2008 15:07:06 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200808061507.m76F76705286@tigger.atmos.albany.edu>
Subject: PRE Training Sessions (fwd): Wed. 8/6/08
To: keyser@atmos.albany.edu
Date: Wed, 6 Aug 2008 15:07:05 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Wednesday 6 August 2008

Celeste,

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

Dan

cc: Lance

----- Forwarded message from Michael Jurewicz -----

From Michael.Jurewicz@noaa.gov Wed Aug 6 00:58:01 2008
Date: Tue, 05 Aug 2008 20:57:58 -0400
From: Michael Jurewicz <Michael.Jurewicz@noaa.gov>
Subject: PRE Training Sessions
To: Lance Bosart <bosart@atmos.albany.edu>,
Dan Keyser <keyser@atmos.albany.edu>,
Matthew Cote <stormrunner126@gmail.com>
Cc: Michael Evans <michael.evans@noaa.gov>

Lance, Dan, and Matt,

I've pasted an invitation sent out by Dave Novak to NWS offices to participate in a training seminar on PRE (hosted by yours truly).

Refer to the message below for specifics:

All -

Mike Jurewicz (BGM) will be presenting "/Predecessor Rainfall Events (PRE) in Tropical Cyclones: Results from a recent northeastern U.S. CSTAR Project/" in two upcoming sessions:

*10 am EDT Thursday, August 21

2 pm EDT Thursday, August 28*

The session aims to raise forecaster awareness of Predecessor Rainfall

Events (PREs). These newly appreciated potential high-impact flooding events occur roughly 1000 km and 36 h in advance of the direct impacts of the tropical cyclone. The session is applicable to all areas of the region. The session is expected to last less than one hour, and will be recorded.

Please RSVP Michael.Jurewicz@noaa.gov <mailto:Michael.Jurewicz@noaa.gov> if you plan to attend.

The GOTO information for the first session is provided below:

_____

Please join my meeting, Thursday, August 21 at 10:00 AM Eastern Daylight Time at https://www2.gotomeeting.com/join/548090941

Conference Call:
866-812-0144
Pass: 740391

Obviously, if any or all of you want to join in, you're more than welcome.

Thanks and take care.

- Mike

P.S. - To Mike E., you may want to add this to the list of upcoming training sessions on the intranet page. You could also write it on the "It's Important" board, along with other upcoming meetings/training seminars.

From keyser@atmos.albany.edu Mon Aug 11 16:05:35 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-0.7 required=8.0 tests=AWL,BAYES_00,UPPERCASE_75_100
  autolearn=no version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m7BG5Yj28946;
  Mon, 11 Aug 2008 16:05:34 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m7BG5YJ06617;
  Mon, 11 Aug 2008 16:05:34 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200808111605.m7BG5YJ06617@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Mon. 8/11/08
To: celeste@atmos.albany.edu
Date: Mon, 11 Aug 2008 16:05:34 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Monday 11 August 2008

Celeste,

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

PREs are mentioned in the next-to-last line of the first paragraph of

the long-term section of this morning's AFD issued by NWS ALY.

Dan

cc: Lance

XUS61 KALY 111350
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
950 AM EDT MON AUG 11 2008

.SYNOPSIS...
THE COMBINATION OF AN UPPER LEVEL LOW PRESSURE SYSTEM TRACKING EAST ACROSS PENNSYLVANIA...AND A SURFACE LOW TRACKING NORTHEAST OFF THE NEW JERSEY COAST...WILL PRODUCE OCCASIONAL SHOWERS AND THUNDERSTORMS TODAY INTO THIS EVENING...ALONG WITH UNSEASONABLY COOL TEMPERATURES. THE UPPER LEVEL AND SURFACE LOW WILL GRADUALLY MOVE EAST OF THE REGION ON TUESDAY...WITH SLOWLY IMPROVING CONDITIONS EXPECTED. ANOTHER LOW PRESSURE SYSTEM APPROACHING FROM THE WEST WILL SPREAD MORE SHOWERS INTO THE REGION LATE WEDNESDAY INTO THURSDAY.
&&
.LONG TERM /WEDNESDAY NIGHT THROUGH SUNDAY/...
QUITE AN ACTIVE FORTHCOMING PERIOD OF THE FORECAST WITH A POTENTIAL FOR COASTAL DEVELOPMENT AND IMPACTING THE REGION WEDNESDAY NIGHT INTO THURSDAY. WITH THE ARRIVAL OF THE ECMWF...IT SOMEWHAT RESEMBLES THE DGEX AND ASSOCIATED SIGNALS FROM THE GFS. HOWEVER...CONFIDENCE OF A STRONG SURFACE LOW TRACKING ALONG THE EASTERN SEABOARD IS RATHER LOW. AS COLLABORATED WITH HPC AND

OPC...A COMPROMISE OF THE TWO GLOBAL MODELS IS IN ORDER WHICH WOULD AGREE WITH THE CANADIAN GLOBAL MODEL TAKING THIS WAVE OUT TO SEA. WOULD NEED TO WATCH FOR A POTENTIAL 'PRE' AS INCREASED BAROCLINICITY AND WEAK SURFACE TROUGH ARE EXPECTED TO BE IN THE VICINITY.

IN THE WAKE OF THESE FEATURES...SHOULD BE A TRANQUIL END OF THE WEEK WITH TEMPERATURES RETURNING TOWARD SEASONABLE LEVELS. THE WEEKEND SEEMS TO BE SHAPING UP WITH A BUILDING RIDGE ALONG THE EASTERN SEABOARD. THIS TOO WILL RESULT IN WARMER AND MORE HUMID CONDITIONS AND THE CHANCE FOR CONVECTION ALONG THE WARM FRONT AND INCREASING HUMID CONDITIONS.

&&

$$

SYNOPSIS...KL

LONG TERM...BGM

From keyser@atmos.albany.edu Tue Aug 12 15:07:24 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-0.8 required=8.0 tests=AWL,BAYES_00,UPPERCASE_75_100
  autolearn=no version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m7CF7Oj08374;
  Tue, 12 Aug 2008 15:07:24 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m7CF7Oj07025;
  Tue, 12 Aug 2008 15:07:24 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200808121507.m7CF7Oj07025@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Tues. 8/12/08
To: celeste@atmos.albany.edu
Date: Tue, 12 Aug 2008 15:07:24 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Tuesday 12 August 2008

Celeste,

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

PREs are mentioned in the third-to-last line of the third paragraph of
the short-term section of this morning's AFD issued by NWS ALY.

Dan

cc: Lance

FXUS61 KALY 121243
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
843 AM EDT TUE AUG 12 2008

.SYNOPSIS...
THE WEATHER PATTERN WILL REMAIN ACTIVE AND UNSETTLED THROUGH MOST OF THE WEEK. THIS WILL ALLOW FOR THE CHANCE OF ADDITIONAL RAINFALL. WITH THE UNSEASONABLE PATTERN...A WAVE OF LOW PRESSURE IS EXPECTED TO DEVELOP OVER THE SOUTHEAST UNITED STATES AND TRACK NORTHEAST OFF THE ATLANTIC SEABOARD TOWARD THE END OF THIS WEEK.
&&
.SHORT TERM /6 PM THIS EVENING THROUGH THURSDAY/...
RESIDUAL CONVECTION WILL DISSIPATE QUICKLY LEAVING BEHIND A PTCLOUDY TO MOCLEAR SKY. H2O VAPOR LOOP THIS MORNING SHOWS ANOTHER SHORT WAVE UPSTREAM JUST EAST OF JAMES BAY THAT WILL CONTINUE TO TRACK SOUTHWARD TONIGHT. THIS WILL HELP PROMOTE INCREASED NEAR SURFACE CONVERGENCE OVER LAKE ONTARIO AND WITH FAVORABLE THERMAL PROFILES OVER THE WATER...MIGHT SEE SOME CONVECTION DEVELOP OVERNIGHT. PREVAILING FLOW WILL BE WEST-NORTHWEST AND IF THIS CONVECTION DEVELOPS THEN IT COULD IMPACT THE WESTERN MOHAWK VALLEY. THIS IS WHERE WE WILL PLACE LOW POPS AT THIS TIME AND KEEP THE REMAINDER OF THE CWA DRY. OVERNIGHT LOWS WILL GENERALLY BE IN THE 50S.

THE UPPER LOW ATTEMPTS TO BECOME REDEFINED OVER LOWER ONTARIO/QUEBEC ON WEDNESDAY. CONSIDERABLE SPREAD SEEN IN THE ENSEMBLE DATA AND AMONG THE OPERATIONAL NCEP MODEL SUITE AND INTERNATIONAL GLOBAL MODELS. 850-700MB THERMAL SIGNALS SUGGEST AN INCREASING BAROCLINIC ZONE ACROSS UPSTATE NY AND WILL INCLUDE A LOW CHANCE POP FOR CONVECTION FROM LATE MORNING INTO THE AFTERNOON HOURS. MEANWHILE...DOWNSTREAM WILL BE ANOTHER SHORT WAVE THAT ORIGINATES FROM THE PLAINS THIS MORNING. THIS WAVE TRACKS INTO THE SOUTHEAST CONUS WHICH WILL SET THE STAGE FOR A RATHER INTERESTING AND CHALLENGING FORECAST WEDNESDAY NIGHT INTO THURSDAY.

AS THE UPPER LOW BECOMES A BIT MORE DEFINED...AND THIS SOUTHERN WAVE BECOMING ENTRENCHED IN THE EVOLVING FLOW...SURFACE PRESSURE FALLS SHOULD COMMENCE ACROSS THE SOUTHEAST COASTLINE. THE LATEST ECMWF IS IN CLOSE AGREEMENT WITH THE NAM AND SOMEWHAT WITH THE CANADIAN /WHICH IS A BIT SLOWER/ WHICH TAKES THIS LOW AND TRACKS IT OFFSHORE OF THE ATLANTIC SEABOARD. NOT TOTALLY SURE IF THIS WOULD FIT A "PRE" SCENARIO BUT THE NAM/ECMWF DO PAINT THE PICTURE WITH ITS QPF FIELDS. WE WILL CONTINUE WITH THE 30-40 PERCENT POPS AT THIS TIME AND CONTINUE TO MONITOR TRENDS.

TEMPERATURES WILL CONTINUE TO AVERAGE BELOW NORMAL THROUGH THE SHORT TERM AND PRECIPITATION AT OR ABOVE NORMAL...DEPENDING ON WHERE THE CONVECTIVE RAINFALL EVENTUALLY FALLS.
&&
$$
SYNOPSIS...BGM
SHORT TERM...BGM

From keyser@atmos.albany.edu Fri Aug 15 20:12:47 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-0.2 required=8.0 tests=AWL,BAYES_05,UPPERCASE_75_100
  autolearn=no version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m7FKClj21659;
  Fri, 15 Aug 2008 20:12:47 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m7FKClI11774;
  Fri, 15 Aug 2008 20:12:47 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200808152012.m7FKClI11774@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Fri. 8/15/08
To: celeste@atmos.albany.edu
Date: Fri, 15 Aug 2008 20:12:47 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Friday 15 August 2008

Celeste,

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

PREs are mentioned in the sixth line from the bottom of the second
paragraph of the long-term section of this afternoon's AFD issued by

NWS ALY.

Dan

cc: Lance

FXUS61 KALY 151919
AFDALY

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
315 PM EDT FRI AUG 15 2008

.SYNOPSIS...
THE UPPER AIR LOW...THE SAME ONE THAT IMPACTED OUR WEATHER MONDAY...WILL MOVE OVER OUR REGION THIS EVENING AND FINALLY OUT TO OUR EAST FOR GOOD BY LATE SATURDAY. HIGH PRESSURE WILL BUILD IN FROM THE OHIO VALLEY TO BRING DRIER AND WARMER WEATHER. STILL CANNOT RULE OUT A POP SHOWER OR STORM FOR SATURDAY...BUT SUNDAY LOOKS COMPLETELY DRY.

&&

.LONG TERM /MONDAY THROUGH FRIDAY/...
A PATTERN CHANGE IS IN THE WORKS FOR THE EXTENDED PERIOD. AT 500 MB...THE FINAL IN A SERIES OF SHORTWAVE TROUGHS WILL BE PUSHING ACROSS THE NORTHEAST FOR THE MONDAY INTO TUESDAY TIME PERIOD. THE ECMWF AND GFS ARE STILL HAVING TROUBLE ON AGREEING ON THE EXACT TIME PERIOD OF THE FRONTAL PASSAGE AT THE SURFACE. AT SOME POINT...LIKELY BETWEEN MONDAY AFTN AND TUES MORN...A FRONTAL BOUNDARY...WITH SOME SHOWERS AND THUNDERSTORMS AHEAD/ALONG IT...WILL PUSH THROUGH THE REGION. HAVE INCLUDED CHC POPS FOR TRW- THROUGH TUESDAY. BEHIND THIS

BOUNDARY...A RIDGE WILL BEGIN TO BUILD ALONG THE EAST COAST OF THE CONUS. 850 MB TEMPS WILL HAVE BOTTOMED OUT ON TUESDAY JUST BEHIND THE BOUNDARY DOWN TO 10 DEGREES C...BUT WILL STEADILY WARM THROUGHOUT THE WEEK. THIS WILL ALLOW THE WED THROUGH FRI PERIOD TO BE DRY WITH INCREASINGLY WARMER MAX TEMPS EACH DAY.

TOWARDS LATE IN THE WEEK...THE MAIN PLAYER TO WATCH WILL BE THE TROPICS. A SYSTEM CURRENTLY BEING INVESTIGATED OVER THE NORTHEASTERN LESSER ANTILLES WILL HAVE THE POTENTIAL TO ORGANIZE. THE GFS AND ECMWF HAVE HANDLED THIS SYSTEM DIFFERENTLY AS OF LATE...ALTHOUGH BOTH THE 12Z GFS/ECMWF SHOW THIS SYSTEM HEADING ACROSS THE NORTHERN CARIBBEAN AND EVENTUALLY TURNING INTO THE EASTERN GULF...WHILE SEVERAL EARLIER RUNS OF THE ECMWF HAVE SHOWN THIS SYSTEM DEEPENING NICELY IN THE WESTERN ATLANTIC OFF THE SOUTHEAST COASTLINE AND POTENTIALLY RIDING UP THE COAST. WILL HAVE TO WATCH THIS SYSTEM FOR ANY POTENTIAL DIRECT OR INDIRECT IMPACT TO OUR REGION. AT THIS POINT...WE MAY ABLE TO DISCOUNT THE POSSIBILITY OF A PRE /PREDECESSOR RAIN EVENT TO AN APPROACHING TC/ FOR THE LATE WEEK PERIOD AS PAST CSTAR RESEARCH HAS SHOWN A NECESSARY INGREDIENT IS AN APPROACHING UPSTREAM FRONTAL BOUNDARY...AND NEITHER THE GFS/ECMWF ARE SHOWING THIS CLOSE ENOUGH TO OUR REGION. OF COURSE...THIS WILL ULTIMATELY DEPEND ON THE EXACT TIMING AND SPEED OF THIS SYSTEM WHICH HAS YET TO FULLY EVEN FORM YET...SO STAY TUNED.

&&

$$

SYNOPSIS...HWJIV

LONG TERM...FRUGIS

From keyser@atmos.albany.edu Mon Aug 18 15:22:38 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-1.8 required=8.0 tests=AWL,BAYES_00 autolearn=ham
  version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m7IFMcj25627;
  Mon, 18 Aug 2008 15:22:38 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m7IFMcF12589;
  Mon, 18 Aug 2008 15:22:38 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200808181522.m7IFMcF12589@tigger.atmos.albany.edu>
Subject: More PRE stuff (fwd): Mon. 8/18/08
To: celeste@atmos.albany.edu
Date: Mon, 18 Aug 2008 15:22:38 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Monday 18 August 2008

Celeste,

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

An update follows from Mike Jurewicz concerning upcoming teletraining
sessions on PREs and the possibility of PRE formation in advance of

Fay later this week.

Dan

cc: Lance

----- Forwarded message from Michael Jurewicz -----

>From Michael.Jurewicz@noaa.gov Mon Aug 18 02:36:30 2008
Date: Sun, 17 Aug 2008 22:36:37 -0400
From: Michael Jurewicz <Michael.Jurewicz@noaa.gov>
Subject: More PRE stuff
To: Lance Bosart <bosart@atmos.albany.edu>
Cc: Dan Keyser <keyser@atmos.albany.edu>,
Matthew Cote <stormrunner126@gmail.com>,

Lance,

As you can tell from recent e-mail traffic, PRE's are catching on nicely in the NWS. So far, we have a fair amount of interest in both upcoming tele-training sessions (8/21 and 8/28); among these offices are HPC and San Juan, Puerto Rico!

Now for some current events. It appears that Fay could present interesting PRE possibilities later this week. Of course, the GFS and ECMWF show somewhat divergent scenarios. In either case, though, once the mid-level ridge that is currently "wrapped around" Fay's northern and western sides begins to re-position itself / amplify over the Northeastern states, this opens the door for a deep-layered southeast, and then southerly flow to develop from the Carolinas, up into the Tennessee/Ohio Valleys, and ultimately the Great Lakes region. The

GFS, in particular, even hints at some sort of 200 mb jet streak near the Mid-Atlantic coast around mid-week (maybe helped by Fay's outflow), that could provide some entrance region dynamics for parts of the Appalachians into the Tennessee Valley. Eventually towards the weekend, it appears that a larger-scale trough will drop into the Upper Midwest, maybe giving some additional synoptic lift and enhancing the "moisture freeway" into the Great Lakes region. All the while, it looks like the remnants of Fay will be meandering over the southeastern states. Of course, the devil will be in the details. We'll see what happens as the week unfolds.

As far as the paper writing process goes, I'll give a standing offer to help in whatever way needed, especially since it looks like Matt will be tied up with other things. Just let me know if I can be of any assistance.

We'll continue to be in touch. Take care.

- Mike

From keyser@atmos.albany.edu Tue Sep 2 15:28:20 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-2.0 required=8.0 tests=AWL,BAYES_00 autolearn=ham
  version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m82FSJ728161;
  Tue, 2 Sep 2008 15:28:19 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m82FSJU19012;
  Tue, 2 Sep 2008 15:28:19 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200809021528.m82FSJU19012@tigger.atmos.albany.edu>
Subject: PRE for Hanna/Gustav ?: Tues. 9/2/08
To: celeste@atmos.albany.edu
Date: Tue, 2 Sep 2008 15:28:19 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Tuesday 2 September 2008

Celeste,

For possible incorporation into the next six-month CSTAR report
concerning the prospect of PREs over the northeastern U.S. later this
week.
Dan

cc: Lance

>From Michael.Jurewicz@noaa.gov Tue Sep 2 14:44:11 2008
Date: Tue, 02 Sep 2008 10:44:02 -0400
From: Michael Jurewicz <Michael.Jurewicz@noaa.gov>
Subject: PRE for Hanna/Gustav ?
To: Lance Bosart <bosart@atmos.albany.edu>,
Dan Keyser <keyser@atmos.albany.edu>,
Matthew Cote <stormrunner126@gmail.com>
Cc: Michael Evans <michael.evans@noaa.gov>

Lance/Dan/Matt,

Howdy. I hope the end of your summers have been enjoyable.

First off, PRE tele-training went fairly well. The first session on 8/21 netted 8 different NWS offices, with a total of about 25 participants. The second live session on 8/28 had 16 offices on the line, with nearly 70 participants. The next step in this endeavor is for me to create a "canned version" with audio, that will be available for training purposes on NWS ER's web site. Hopefully, I'll have this done in the next month or so.

As all of you know, things are "heating up" in the tropics. With Gustav now inland, we still have Hanna, Ike, and perhaps Josephine in the pipeline. Needless to say, listening in on TPC's conference calls the last week or so has been interesting.

Regarding any possible PRE development, it looks like Gustav's moisture plume will be bottled up near the circulation center through at least Wed., as a large 700 mb ridge nearly envelops the system. This is not necessarily good for the Lower Mississippi Valley, but it should mitigate PRE formation in the near term.

Things may get more interesting by Thu., based on the latest GFS/ECMWF progs, which agree fairly well. Of course, much of this hinges on how well Hanna survives the shear currently being imparted on her by Gustav. For now, we'll go along with TPC's idea that she will survive the next 24 hours, and then re-strengthen.

Anyway, by later Thu. (at least in the model world), the above mentioned ridge is beginning to nudge eastward, while Hanna approaches the Southeast U.S. coastline. Thu. night, it appears that a southeast-southerly flow pattern will have been well established, extending from the vicinity of Hanna, through the southern/central Appalachians, and into the Ohio Valley. At the same time, a 200 mb jet streak seems to be amplifying just north of the Great Lakes region, with low-level theta-e ridging starting to build northward from the remnants of Gustav along an inverted trough/warm front across IL/IN/OH.

The combined effects of an upper-jet entrance region, tropical moisture inflow, and some low to mid-level forcing, could put the Upper Ohio Valley, the eastern Great Lakes region, and perhaps parts of NY State and northern New England at risk for PRE development ahead of Hanna's main rainfall shield, from the Thu. night to Fri. night/early Sat. period. Once again, the devil will be in the details, but some of the large-scale features resemble the SR composite charts that favor PRE development.

By Sat., TC Hanna herself may be accelerating across the Northeast U.S., no doubt providing additional rainfall. Time will certainly tell.

Take care.

- Mike

From keyser@atmos.albany.edu Wed Sep 3 17:18:39 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=0.0 required=8.0 tests=AWL,BAYES_50,UPPERCASE_75_100
  autolearn=no version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m83HId722474;
  Wed, 3 Sep 2008 17:18:39 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m83HIc219440;
  Wed, 3 Sep 2008 17:18:38 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200809031718.m83HIc219440@tigger.atmos.albany.edu>
Subject: Input for next CSTAR 6-month report: Wed. 9/3/08
To: celeste@atmos.albany.edu
Date: Wed, 3 Sep 2008 17:18:38 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Wednesday 3 September 2008

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

CSTAR research on PREs is mentioned in the the second paragraph of the
long-term section of this morning's AFD issued by NWS ALY.
Dan

cc: Lance

FXUS61 KALY 031353

AFDALY

AREA FORECAST DISCUSSION

NATIONAL WEATHER SERVICE ALBANY NY

946 AM EDT WED SEP 3 2008

.SYNOPSIS...

HIGH PRESSURE WILL PROVIDE PARTLY CLOUDY SKIES...AND UNSEASONABLY WARM TEMPERATURES THROUGH EARLY THURSDAY. AN UPPER LEVEL DISTURBANCE COULD PRODUCE ISOLATED SHOWERS AND THUNDERSTORMS ACROSS PARTS OF THE REGION THIS AFTERNOON. A WEAK COLD FRONT WILL THEN SETTLE SOUTHWARD DURING THURSDAY AFTERNOON...POSSIBLY TRIGGERING ISOLATED SHOWERS ONCE AGAIN.

&&

.LONG TERM /FRIDAY THROUGH TUESDAY/...

THE ALY FCST AREA LOOKS TO GET ITS FIRST WIDESPREAD RAINFALL IN OVER 3 WEEKS...AS THE FORMER TROPICAL SYSTEM HANNA CHUGS UP THE ERN US SEABOARD FRI NIGHT. THE QUESTION REMAINS: WHAT PARTICULAR TRACK THE CYCLONE TAKES...AND THE AMOUNT OF QPF AND TIMING OF THE SYSTEM ON THE WEEKEND. IT APPEARS THE SYSTEM GOES THROUGH ITS EXTRATROPICAL TRANSITION OVER THE MID ATLANTIC REGION EARLY SAT. THE STORM BEGINS TO SHOW SIGNS OF ACTING LIKE A MID LATITUDE NOREASTER WITH STRONG LOW/MID LEVEL DEFORMATION AND INTENSE MID LEVEL FRONTOGENESIS. WHAT THIS ALL POINTS TO...IS AN INTENSE MESOSCALE RAINBAND IMPACTING PORTIONS OF THE ALY FCST AREA SATURDAY INTO SUNDAY. IT IS A LEFT OF TRACK SYSTEM IN TERMS OF THE MODERATE TO HEAVY RAINFALL.

CSTAR RESEARCH HAS SHOWN THAT PREDECESSOR RAIN EVENTS /PRE/ CAN OCCUR WITH THESE SYSTEMS...BUT THE ENSEMBLES...GFS AND ECMWF IN OUR

ASSESSMENT ARE LEANING TOWARD HAMMERING THE REGION WITH THE MESOSCALE RAINBAND N/NE OF THE CYCLONE. WE WILL WATCH IF A PRE FORMS IN LATER NWP RUNS. THE ECMWF IS SLOWER THAN THE GFS AND GLOBAL ENSEMBLE MEAN...CAN GGEM...WITH THE HEAVIEST RAINFALL SUNDAY MORNING THROUGH THE PM. THE CAN GGEM IS THE FASTEST. THE ECMWF TAKES HANNA FROM SRN NJ AT 1200 UTC/SUN TO EAST/SE OF CAPE COD AT 0000 UTC/MON. THE TPC TRACK IS A LITTLE BIT FURTHER INLAND. THE GFS AND ENSEMBLE MEAN TRACK IS SIMILAR TO THE THE ECMWF...BUT MUCH FASTER TAKING THE STORM OVER CAPE COD BY 0600 UTC/SUN. IT APPEARS THAT MOST OF THE FCST AREA SHOULD SEE ONE TO FOUR INCHES OF RAIN...WITH SOME LOCATIONS MAYBE GETTING AROUND FIVE INCHES. HOWEVER...THE PLACEMENT OF THE HEAVY MESOSCALE RAIN BAND IS STILL VERY UNCERTAIN. THE CONSENSUS FROM THE NUMERICAL GUIDANCE IS FROM THE CAPITAL REGION SOUTH AND EAST FOR NOW.

SUNDAY AFTERNOON INTO MONDAY...HIGH PRESSURE BUILDS IN FROM THE MIDWEST AND OHIO VALLEY WITH FAIR AND DRY WEATHER. THE QUASI ZONAL FLOW ALLOWS A WAVE OF LOW PRESSURE AND ITS COLD FRONT TO QUICKLY APPROACH FROM THE ST LAWRENCE VALLEY AND THE GREAT LAKES REGION MONDAY NIGHT INTO TUESDAY WITH A CHANCE OF SHOWERS. THE FRONT MAY ACT LIKE AN ANA COLD FRONT LATE TUE LINGERING THE PCPN.

MIDWEEK...HIGH PRESSURE BUILDS IN ONCE AGAIN WITH SEASONABLE SEPT WEATHER.

OVERALL...PCPN LOOKS ABOVE NORMAL BASED ON THE REMNANTS OF HANNA ON THE WEEKEND. TEMPS WILL BE NORMAL/SLIGHTLY ABOVE NORMAL DUE TO THE WARM MIN TEMPS DURING FRI...SAT AND SUN NIGHTS.
&&
$$
SYNOPSIS...GJM/KL
LONG TERM...WASULA

From keyser@atmos.albany.edu Thu Sep 4 19:58:16 2008
Return-Path: <keyser@atmos.albany.edu>
X-Spam-Checker-Version: SpamAssassin 3.2.4 (2008-01-01) on
  cypress.atmos.albany.edu
X-Spam-Level:
X-Spam-Status: No, score=-2.0 required=8.0 tests=AWL,BAYES_00 autolearn=ham
  version=3.2.4
Received: from tigger.atmos.albany.edu (tigger [169.226.43.54])
  by atmos.albany.edu (8.11.7p3+Sun/8.11.7) with ESMTP id m84JwG726900;
  Thu, 4 Sep 2008 19:58:16 GMT
Received: (from keyser@localhost)
  by tigger.atmos.albany.edu (8.11.7p3+Sun/8.11.7) id m84JwFd20008;
  Thu, 4 Sep 2008 19:58:15 GMT
From: Dan Keyser <keyser@atmos.albany.edu>
Message-Id: <200809041958.m84JwFd20008@tigger.atmos.albany.edu>
Subject: Re: Hanna PRE update (fwd): Th. 9/4/08
To: celeste@atmos.albany.edu
Date: Thu, 4 Sep 2008 19:58:15 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu
X-Mailer: ELM [version 2.4ME+ PL39 (25)]
MIME-Version: 1.0
Content-Type: text/plain; charset=US-ASCII
Content-Transfer-Encoding: 7bit
Status: RO

Thursday 4 September 2008

Celeste,

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

A statement documenting the operational impact of UAlbany CSTAR
research on heavy precipitation associated with landfalling and

transitioning TCs and PREs in the northeastern U.S. is offered by David Vallee in the appended e-mail starting with the sentence,

"A couple of things I do wish to share - which you should be very proud of:"

Dan

cc: Lance

----- Forwarded message from David Vallee -----

>From David.Vallee@noaa.gov Thu Sep 4 18:25:51 2008
Date: Thu, 04 Sep 2008 14:26:28 -0400
From: David Vallee <David.Vallee@noaa.gov>
Subject: Re: Hanna PRE update
To: Lance Bosart <bosart@atmos.albany.edu>
Cc: "Keyser, Daniel" <keyser@atmos.albany.edu>

Lance,

And the GFS does the same. Seems both have a minor short-wave of sorts which heads ne acrs southeast New England at the time the low level punch of tropical moisture (pw ~2.67 inch) arrives. GFS does as much as tries to form a weak wave of low pressure which may be why it is so bullish with a 2-2.5 inch slug of pcpn late Fri night/early Sat morning - ie: the NYC "Jeane" Surprise type of event.

The "Pre-event" is being talked about via HPC, my office and WFO BOX and we have even taking into the discussions with the EMA community for Fri night/sat morning so they don't just plan all their actions

centered on sat night with the passage of Hanna's circulation.

I would be far more comfortable with all this if Hanna would at least make an attempt to develop at least something that resembles a CDO. She really looks (dare I use the word) "Sub-tropical".

A couple of things I do wish to share - which you should be very proud of:

1. My staff and the co-located WFO are much more in-tune thanks to CSTAR I/II with the heavy rainfall transition. I walked in Mon morning and my day team surprised me with a few NWP graphics on AWIPS - showing me the 850 Theta-/moisture convergence and the 200 MB jet & left entrance region and said - so you can say LOT heavy rainner? That was nice!

2. And Mike and Mike at BGM conducted a teletraining session to all the East Coast offices on "Pre"s just about 1 week ago. And starting yesterday - the WFO BOX staff and one of my forecasters were all over the potential. Very nice indeed!

So perhaps not as loud a chorus as the Novak snow-band work - but it sure is nice to see the forecasters leaning on the CSTAR I/II results with these tropical systems.

And then comes Mr. Ike.....

David

Lance Bosart wrote:
>
> Hi David,
>

> The 12Z/4 NAM run shows a "PRE-like" signature to the NE of Hanna
> between 48-60 h into the forecast. The PRE region is (sort of)
> located in equatorward-entrance region of the forecast 200 hPa jet
> (at 300 hPa any PRE/jet relationship is far from obvious).
>
> Thoughts?
>
> Lance
>

----- End of forwarded message from David Vallee -----

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Lance F. Bosart
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The University at Albany/SUNY/ES-227
1400 Washington Avenue
Albany, NY 12222 USA

Email: bosart@atmos.albany.edu
Phone: 518-442-4564
Fax: 518-442-4494