

**“The Collaborative Science, Technology,
and Applied Research (CSTAR) Program”**

Title:

**“Continuing Studies of Cool- and Warm-Season Precipitation
Events over the Northeastern United States”**

and

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

University: University at Albany

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SECTION 1: Summary of Graduate Student Research Activities

(a) Warm-Season Lake-/Sea-Breeze Severe Weather in the Northeast (Patrick Wilson)

(Focal Point: Tom Wasula – National Weather Service, Albany, NY)

Research Summary (1 November 2007 – 30 April 2008):

This 6-month CSTAR-II report describes research in progress on investigating severe weather triggered by lake and sea breezes during the warm season over the Northeast. The goal of this study is to investigate the dynamical and thermodynamical processes, and their modulation by physiographic effects, that are responsible for producing severe weather from lake and sea breezes. It is hoped that this research will raise awareness and understanding of lake-/sea-breeze severe weather. Fifteen cases have been chosen for detailed analysis. Plots of various severe weather parameters, radar data, soundings, surface observations, satellite images, and other sources have been used to analyze these cases. The focal point for this research is Tom Wasula from the National Weather Service in Albany, NY.

Table 1 shows the finalized case list that was established in the previous 6-month report. The 15–case sample consists of four pure cases, ten mixed cases, and one null case. Pure cases are defined as having lake-/sea-breeze convergence zones primarily responsible for initiating convection in the apparent absence of synoptic-scale forcing, while mixed cases have synoptic-scale forcing acting in conjunction with mesoscale forcing to generate convection. A null case features suppression of convection from lake and sea breezes. One case of each type was chosen for examination with the Rapid Update Cycle gridded dataset at 20–km resolution (RUC-20), and those three cases are highlighted in Table 1.

The analyses of all the case studies have been completed since the previous six-month report. The Storm Prediction Center (SPC) preliminary storm reports were obtained from the three cases that were chosen for RUC-20 analysis to verify the observed impact and type of severe weather. On 2 August 2006 (pure case), severe convection resulted in 40 severe wind reports and five severe hail reports within the circled area depicted in Fig. 1. On 19 June 2002 (mixed case), severe convection resulted in 15 severe hail reports and one severe wind report within the circled area depicted in Fig. 2. Perhaps the biggest contribution to the synoptic-scale environment playing a role in differing types of severe weather was the 1000–500 hPa thickness. The RUC-20 analyzed a 1000–500 hPa thickness of approximately 580 dam at 1800 UTC 2 August 2006 as opposed to approximately 558 dam at 1800 UTC 19 June 2002. This 22-dam difference indicates that different synoptic-scale air masses were present for these two cases, which contributed in part to the differing modes of observed severe weather.

On 11 July 2006 (null case), however, RI, southeastern CT, and southeastern MA had no severe weather reports despite 21 severe wind reports and 33 severe hail reports just to the northwest as shown within the circled area of Fig. 3. Hail in diameter of ≥ 2 in. was observed in 5 of the 33 severe hail reports. The convection was being suppressed in RI, southeastern CT, and southeastern MA from onshore advection of marine air by a sea breeze. Furthermore, the 24-h Quantitative Precipitation Estimates from the Hydrometeorological Prediction Center (HPC) ending at 1200 UTC 12 July 2006 (to include the convective precipitation during the afternoon hours of 11 July 2006), shown in Fig. 4, reveals that the circled region of RI, southeastern CT, and southeastern MA virtually received no precipitation. This finding further suggests how strongly the advected marine air in the boundary layer from the sea breeze suppressed the severe convection.

Currently, a Master's thesis is being written on this research. The literature review section of this thesis has been completed. Tom Wasula has provided archived presentations of previously documented lake-/sea-breeze severe weather cases in the Northeast, which were referenced in the literature section of the Master's thesis. The thesis is expected to be completed by this summer.

NWS Interactions:

Tom Wasula from the National Weather Service in Albany, NY, has been in contact throughout the last six months through personal meetings and emails. Tom has offered operational input and provided feedback on the results obtained from this research. He has also provided copies of archived presentations that focus on previously documented lake-/sea-breeze severe weather cases in the Northeast, which have been referenced in the literature review of the Master's thesis.

Publications and Workshop Submissions:

This research has recently been presented at the National Weather Association's 32nd Annual Meeting in Reno, NV, on 13–18 October 2007 and the Ninth Northeast Regional Operational Workshop in Albany, NY, on 7–8 November 2007. No formal publications have been produced yet on this research. A Master's thesis is currently in preparation and is planned to be completed by this summer.

TABLE 1. The final case list of 15 lake-/sea-breeze cases with the dates, the bodies of water responsible, and the classifications for each case. Cases chosen for analysis with the RUC-20 gridded dataset are highlighted.

Date	Responsible Bodies of Water	Classification
9 April 2001	Lake Erie	Mixed Case
9 August 2001	Lake Ontario	Pure Case
19 April 2002	Lake Erie	Mixed Case
19 June 2002	Atlantic Ocean	Mixed Case
6 July 2003	Lake Erie	Pure Case
24 July 2003	Lake Erie and Lake Ontario	Mixed Case
1 August 2005	Lake Huron and Lake Ontario	Mixed Case
5 August 2005	Atlantic Ocean	Mixed Case
7 August 2005	Chesapeake Bay	Pure Case
24 April 2006	Chesapeake Bay	Mixed Case
30 June 2006	Lake Erie and Lake Ontario	Mixed Case
11 July 2006	Atlantic Ocean	Null Case
23 July 2006	Lake Erie and Lake Ontario	Mixed Case
28 July 2006	Atlantic Ocean	Mixed Case
2 August 2006	Lake Ontario	Pure Case

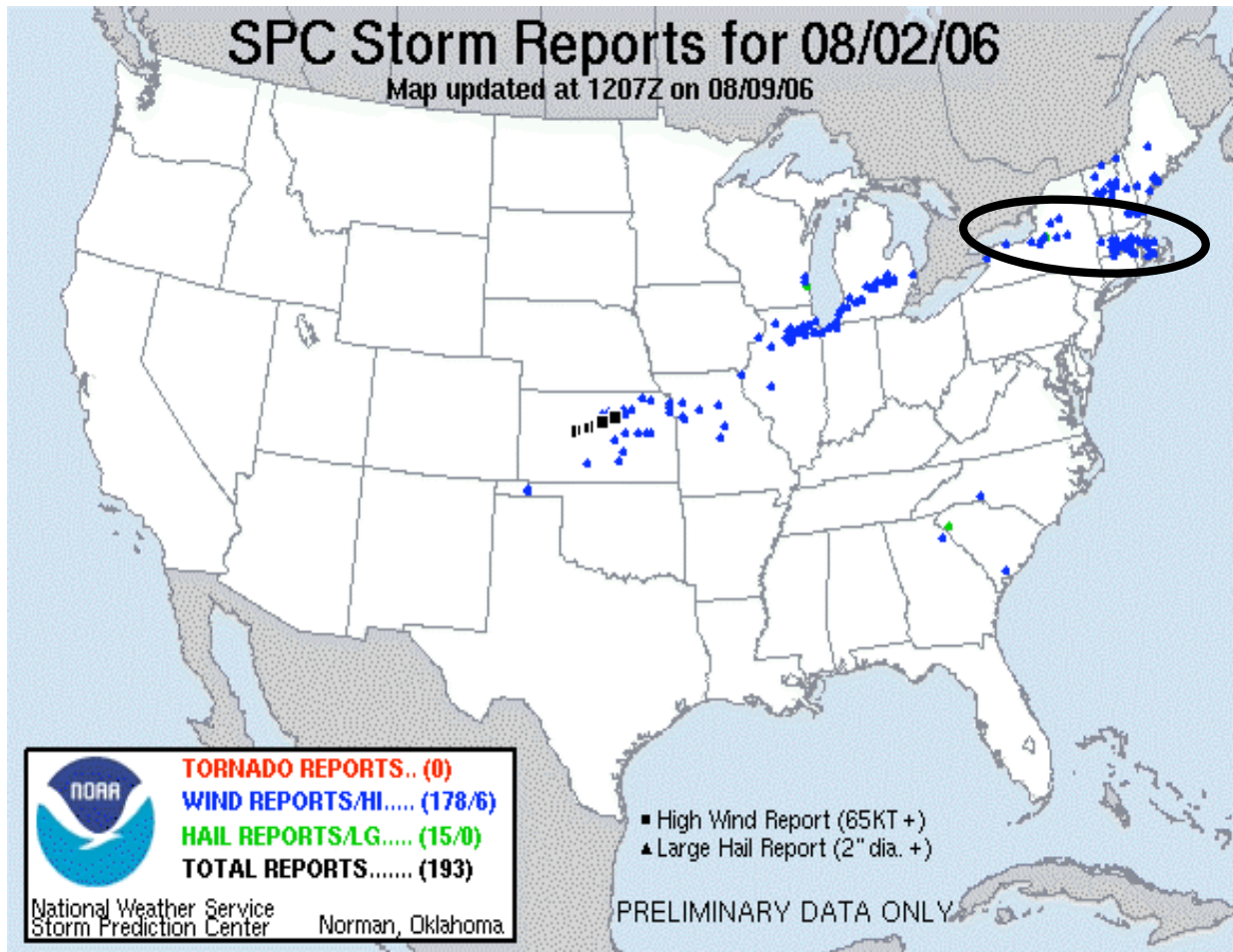


Fig. 1. SPC storm reports from 2 Aug 2006 (pure case). The black-circled area represents the storm reports related to the convection that was triggered from this case. [Available online at http://www.spc.noaa.gov/climo/reports/060802_rpts.html.]

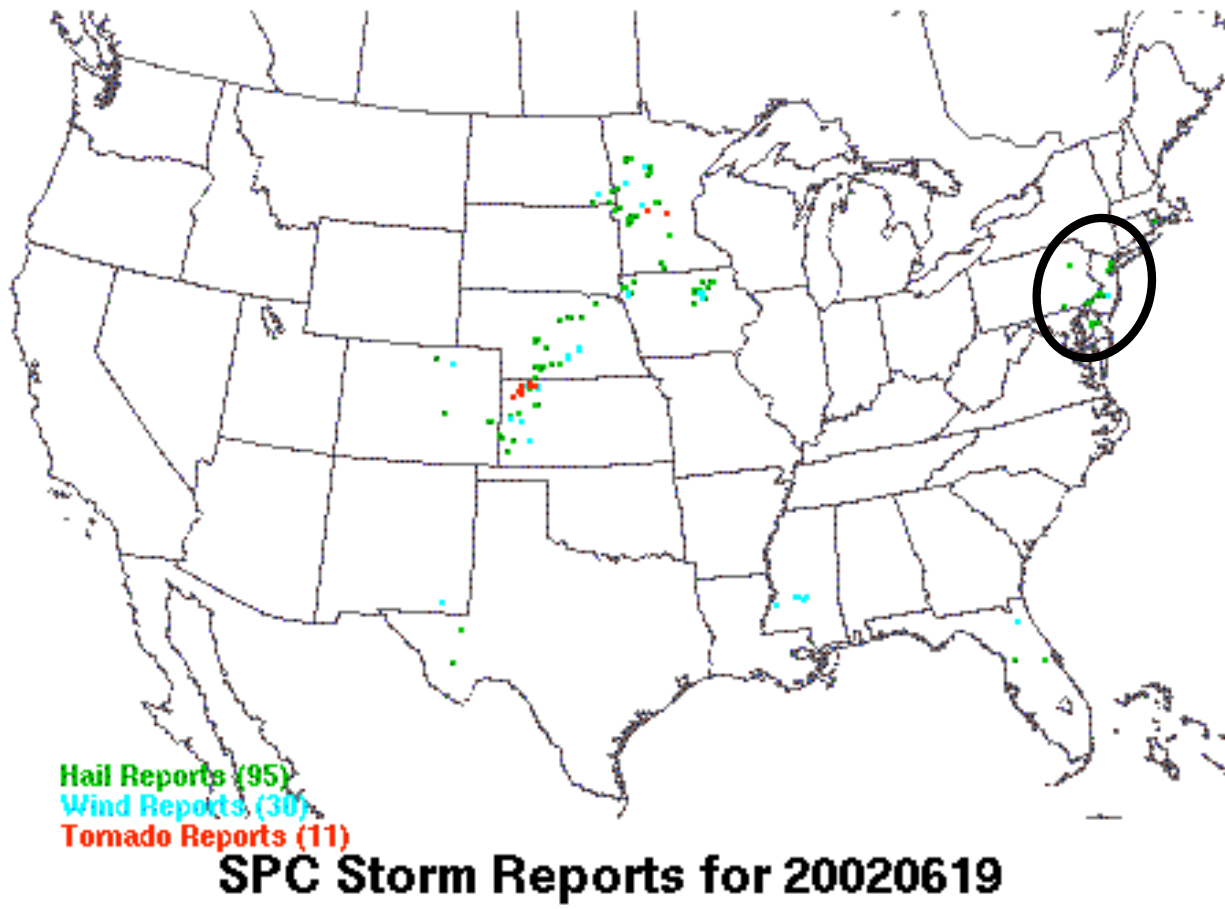


Fig. 2. Same as in Fig. 1 but from 19 Jun 2002 (mixed case). [Available online at http://www.spc.noaa.gov/climo/reports/020619_rpts.html.]

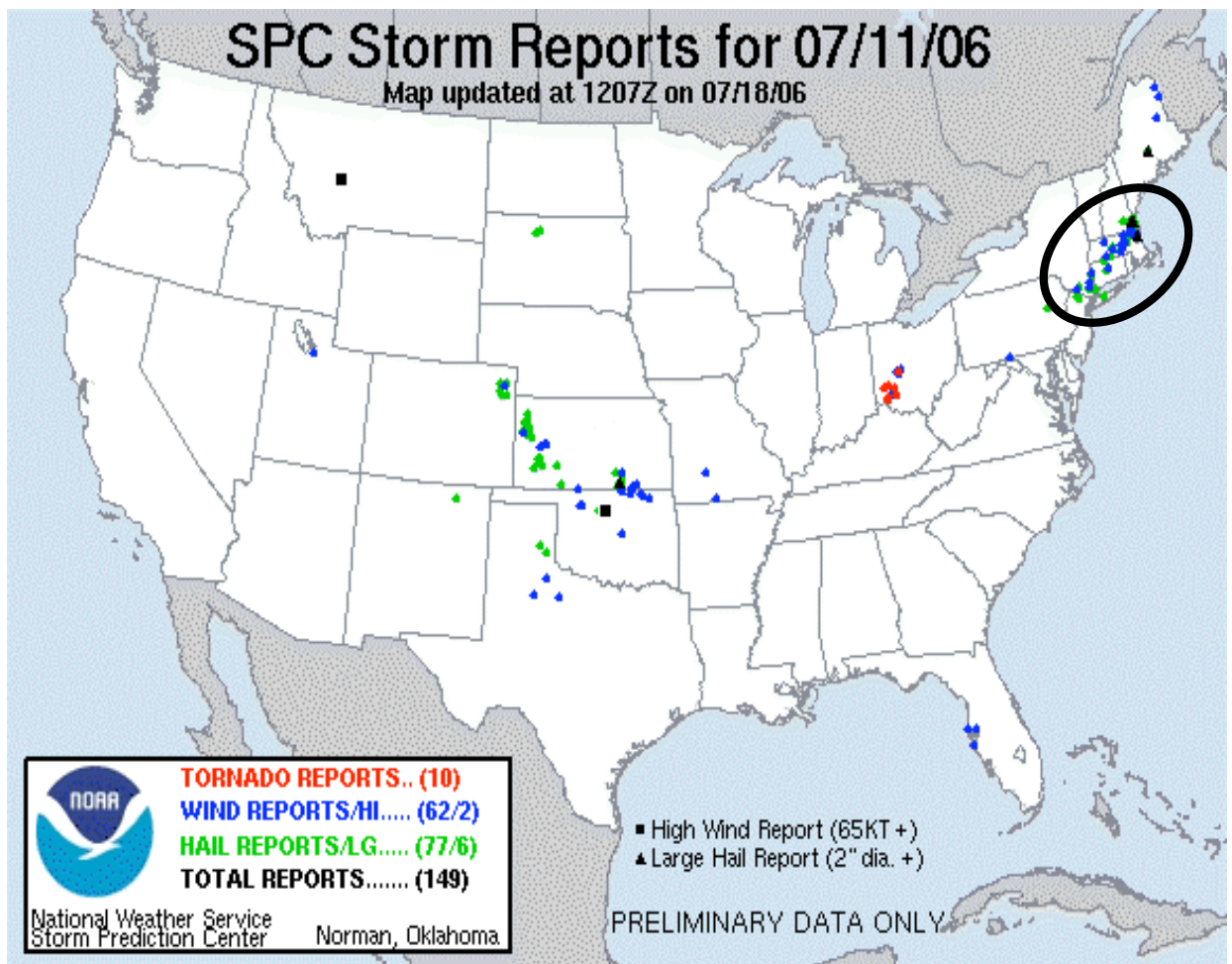


Fig. 3. Same as in Fig. 1 but from 11 Jul 2006 (null case). Preexisting convection within the black-circled area was suppressed in RI, southeastern CT, and southeastern MA from this case as indicated by the absence of storm reports in the aforementioned region. [Available online at http://www.spc.noaa.gov/climo/reports/060711_rpts.html.]

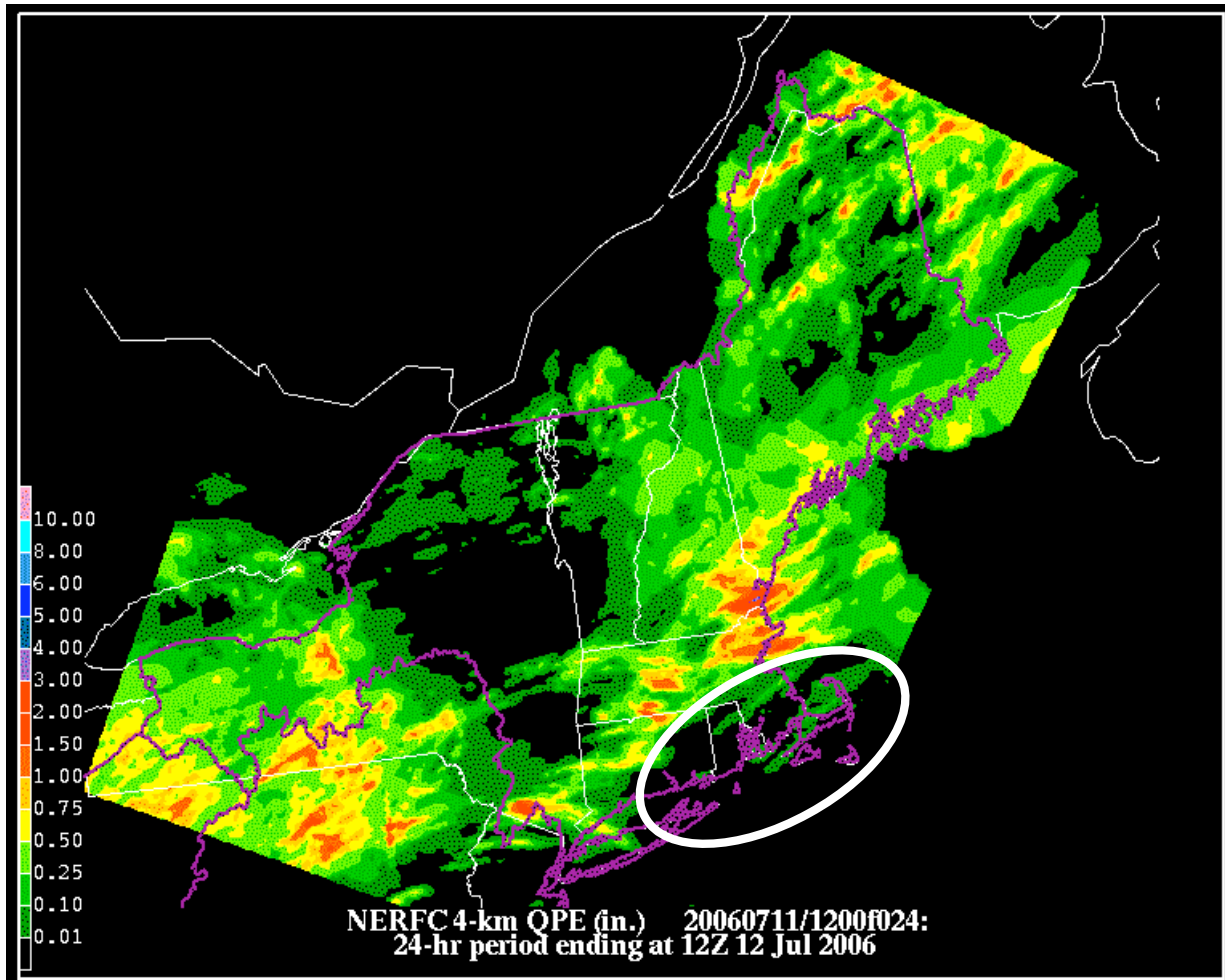


Fig. 4. 24-h Quantitative Precipitation Estimates from HPC ending at 1200 UTC 12 Jul 2006 to include the null case, which occurred during the afternoon hours of 11 July 2006. The white-circled area represents the region where convection was suppressed. [Available online at <http://www.hpc.ncep.noaa.gov/npvu/archive/rfc.shtml>.]

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.

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.
- c) PI and/or student oral 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 analysis 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.
- 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.
- Bosart, L. F., A. C. Wasula, W. Drag, and K. Meier, 2008: Strong surface fronts over sloping terrain and coastal plains. *Fred Sanders Monograph*, L. F. Bosart and H. B. Bluestein, Ed., *Meteor. Monogr.*, American Meteorological Society, (in press).

- Archambault, H. M., L. F. Bosart, D. Keyser, and A. Aiyyer, 2008: Influence of large-scale flow regimes on cool-season precipitation in the Northeast U.S. *Mon. Wea. Rev.*, **136**, (in press).
- 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**, (in press).

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: October 2007 - March 2008

National Weather Service Perspective

Warren R. Snyder, Science & Operations Officer

Eugene P. Auciello, Meteorologist in Charge

WFO Albany, NY

The CSTAR III project "***The Cooperative Research with the National Weather Service on Cool and Warm-Season Precipitation Forecasting over the Northeastern United States***" has begun. Progress has been good in both the Major Foci projects and several of the Collaborating Projects in just eight months.

In the earliest months of CSTAR III, funding supported students completing work from CSTAR II. Five CSTAR II topic papers were presented at the 9th Northeast Regional Operational Workshop in November. Two of these papers represented concluding work. Tele-training was developed and presented during February 2008 to numerous NWS offices 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" and "Warm Season 500hPa Cut Offs".

The Fall CSTAR dinner and meeting were held in early November. These were attended by over twenty participants. Two new CSTAR graduate students were introduced at the meeting. The meeting focused on project selection, review of CSTAR reporting procedures, placing all CSTAR work on the webpage, expediting CSTAR work into tele-training or Tech Attachments, and concluding project reports on several CSTAR II projects.

CSTAR III graduate student Mathew Scalora has since selected his project, "Distribution of Warm/Cold Season Precipitation Associated with 500 hPa Cutoff Cyclones". An organizational meeting for this project is scheduled April 25th between Matt, the Principal Investigators and NWS focal points.

On the Collaborative and Associate Project front, several projects have moved forward:

1. The Norlund Trof project has developed a climatology, conceptual model, and WES case. During the summer of 2008

- Hollings Scholar Zachary Taylor of NC State will work on the project. The CSTAR website was overhauled and reorganized.
2. The CSTAR bulletin board has been set up, and should become active after the Spring CSTAR meeting. <http://cstar.cestm.albany.edu>
 3. The "Correlations Between Observed Snowfall and NAM Model Parameters" project manuscript was approved for publication in WAF by Eastern Region Scientific Services Division. It will be resubmitted to WAF after final review this Spring. In addition, three regional tele-training sessions were presented by the Binghamton office on this work, reaching over 60 students.
 4. The WRF Lake Effect Snow Ensemble Project has four to six offices generating ensemble members. The data is available on the web and in AWIPS using software written by Chris Mello (ITO at CLE) and Ron Murphy (ITO at BGM). Justin Arnott at Binghamton has been working on a study to verify output from the ensemble. The study has discovered a southward bias with the forecasts of single bands east of Lake Ontario in the ARW members of the ensemble, and is testing configurations that may improve the ARW members.
 5. WFO ALY and CWSU WRF runs were converted to run on UAlbany Research IT Center Resources. WRF 5km runs were increased in aerial coverage to entire the Northeast. This data being provided to both Maine WFOs, and to Great Lakes Ensemble Project. CWSU Graphics website updated.

Beginning in CSTAR III and encouraged in CSTAR II, NWS focal points will be responsible to insure project findings make their way to either a VISIT session on Technical Attachment as part of the technology transfer process. This has borne fruit already, and several projects are in the pipeline. The Spring 2008 CSTAR meeting is scheduled at WFO Albany for May 9th.

SECTION 4: NWS Semi-Annual Reports

(a) NWS Binghamton, NY

Michael Evans (NWS WFO BGM)

1 November 2007 – 30 April 2008

CSTAR Progress Report – March 11, 2008

1. Collaborative Project - Correlations between Observed Snowfall and NAM Model Parameters- Using independent data to test the methods for forecasting moderate winter snow events developed in CSTAR II.

Lots of progress in this area during the past 6 months. A manuscript based on this research was approved for publication in WAF by ER SSD. The manuscript was submitted to WAF in December, and was returned in February as approved for publication pending major revisions. Mike Jurewicz and I have been addressing the comments on the manuscript, and expect to re-submit to WAF in April.

In addition, 3 regional teletraining sessions were done in February 2007 by Mike Jurewicz and I based on this research. The teletraining reached over 60 students.

Future work, in addition to continuing the publication process with WAF, will be to produce a recorded version of the teletraining, and to input some results from this research into a future version of winter AWOC.

2. WRF lake effect snow ensemble project. Data continues to flow from the ensemble into AWIPS, thanks primarily to Chris Mello (ITO at CLE) and Ron Murphy (ITO at BGM). Justin Arnott (journeyman forecaster at BGM) has been working on a study to verify output from the ensemble. Based on some case studies, Justin has discovered a southward bias with the forecasts of single bands east of Lake Ontario in the ARW members of the ensemble. Justin is currently experimenting with new configurations that may help to improve the ARW members of the ensemble.

3. PRE study. Mike Jurewicz gave presentations at the U.S. / Canadian Great Lakes Operational Workshop and the NROW on results from the study. Mike is planning on developing a teletraining session based on this work during the next year.

(b)

Semi-annual Report

CSTAR III Research (October 2007 - March 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

- Tom and Neil attended the annual Fall CSTAR meeting after the 9th Northeastern Regional Workshop (NROW), which was November 7-8, 2007. The meeting was on November 9th. This project was discussed, in terms of what is in the proposal. It is a continuation of CSTAR I work. No graduate students were assigned at the time.
- It was an extremely busy cool season for the WFO at Albany office and limited/little time was available to do research, since the NROW conference.
- Tom has been working with Warren on a teletraining session entitled “Warm Season Cutoff Lows in the Northeast – A Climatology and Case Studies”. 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”. Development of the teletraining session has been a slow process. It has gone through several revisions on the local WFO level. Warren and Tom are putting the presentation in Articulate software to be reviewed by the Eastern Region in the April to May time frame. It is hoped to be available for training by this summer.

- 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 2001-07.
- Matt Scalora, a SUNYA graduate student was selected for the project in March. Lance, Dan, Matt, Neil, Tom and Warren will meet on April 25th to discuss an outline for his research plans for the up coming summer.
- 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

(c)

Semi-annual Report

CSTAR III Research (October 2007 - March 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 and John attended the annual Fall CSTAR meeting after the 9th Northeastern Regional Workshop (NROW), which was November 7-8, 2007. The meeting was on November 9th. This project was discussed, in terms of what is in the proposal. No graduate students were assigned at the time.

- Tom attended two conferences in October and March, and gave case study talks on the 1 December 2006 cool season severe weather event that impacted the Northeast. This event was very unique where widespread wind damage occurred across eastern NY and western New England. There were also tornadoes in Pennsylvania. It was a classic high shear and low instability environment with impressive jet dynamics. It was a challenging event for the Albany forecast area, where the tornado signal diminished in the early evening despite the strong low-level shear and/or helicity.

- 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. The case list is attached to this report.

- 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.

- It is hoped a graduate student will be assigned to the cool season high wind and severe weather project before the end of 2008.
- Tom plans to attend the October 24th AMS Severe Local Storms Conference or the 33rd National Weather Association Conference (if office funds are available) to present some of this cool season severe weather research.

II. Presentations on CSTAR II-III Related Research (OCT 2007 – MAR 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 – MAR 2008)

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.

IV. High Wind and Cool Season Severe Events Archived at Albany [September to March (1994-2008)]

1. November 2, 1994 High Wind Event *
2. November 12-13, 1995 Flooding and High Wind Event *
3. March 9, 2002 (High Wind and Severe Event) *
4. October 15-16, 2003 High Wind Event
5. November 28-29, 2003 Heavy Rain, Snow and High Wind Event
6. November 28, 2004 Flooding and Wind Advisory Event
7. December 1, 2004 High Wind Event
8. November 24-25, 2004 Thanksgiving Severe Weather event **
9. December 23, 2004 Heavy Rain Event and High Wind Bust
10. September 29, 2005 High Wind and Severe Event
11. October 16, 2005 High Wind Event
12. November 6-7, 2005 Severe Weather Event
13. November 9-10, 2005 Convective Event (Non-severe)
14. January 21, 2006 High Wind Event (Squall line with no Lightning)
15. February 17, 2006 Historic High Wind and Severe Event **
16. March 13-14, 2006 Thunderstorms (Non-severe) and Flooding
17. September 24, 2006 Null Severe Event (high shear/low CAPE)
18. October 27-29, 2006 High Wind, Flooding and Lake Effect Event
19. November 16-17, 2006 Severe Weather (little Lightning)
20. December 1-2, 2006 Major Cool Season Severe Event **
21. October 6, 2007 Convective Event (Non-severe)
22. October 9-10, 2007 Convective Event (Severe BGM forecast area)
23. October 19-20, 2007 Null Severe Event
24. December 23, 2007 High Wind Event
25. January 9, 2007 High Wind and Non-severe event
26. February 6-7, 2007 Convective (Non-severe) event and flooding

* Radar data is only available

** Tom has done research on the following events (either formal presentations at local, regional or national conferences and/or preprint publications)

(d) NWS Albany, NY

Semi-annual Report

CSTAR III Research (October 2007 - March 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 only one meeting pertaining to this CSTAR II project that is in its final stages for CSTAR III. The meeting was the annual Fall CSTAR meeting after the 9th Northeastern Regional Workshop (NROW), which was November 7-8, 2007. The meeting was on November 9th. Patrick, the SUNYA graduate student on the project, presented the results at the NROW conference and the meeting for the “Pure” vs. “Mixed” lake/sea breeze cases in the study.
- Patrick presented our research results at the October 13-18, 2007 National Weather Association Conference in Reno, NV. He gave an oral presentation entitled “Warm-season lake-/sea breeze severe weather in the Northeast”.
- The key research findings from fifteen cases continue to be 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 30°C and 20°C 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 20°C-30°C range with dewpoints generally less than 20°C, 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

- It was an extremely busy cool season for the WFO at Albany office and limited/little time was available to do research, since the NROW conference. Tom's work has been mainly on cool season severe weather the past 6 months. More details are in the other report.
- It was decided that a teletraining session, tech attachment or journal article will be done in the future with the research results from this study (likely late 2008 or beyond). A copy of Patricks' thesis and M.S. presentation will be given to Tom when completed sometime in 2008.
- Tom is working on a possible tech attachment draft comparing the August 9, 2001 lake breeze case compared to the April 19, 2002 case analyzed by former SUNYA undergraduate student Robert Tracey. Its completion is anticipated in late 2008 or beyond.
- 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 – MAR 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., 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 – MAR 2008)

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 Tornadoic Supercell across Eastern New York and Western New England. *Preprints, 23rd Conf. on Severe Local Storms*, St. Louis, MO, Amer. Meteor. Soc., 18.6.

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.

(e) 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

April 14, 2008

MEMORANDUM FOR: Lance F. Bosart

FROM: Warren R. Snyder
SOO, WFO, Albany, NY

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 being posted on the web, being distributed via the Eastern Region Lan to Maine, and is posted in AWIPS and GFE at WFO Albany.
- iii. The Data is being used both in research and in support of operations. The Maine data fed to the Grey and Caribou offices, and 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. Software was developed by Chris Mello at WFO Cleveland that ensembles the data from the grids. Data is being transferred to Cleveland

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

- v. Justin Arnott (journeyman forecaster at BGM) is beginning a collaborative project with Penn State on Lake Effect Snow forecasting and the use of WRF ensembles that may lead to a PhD.) Has been working on a study to verify output from the ensemble. The study has discovered a southward bias with the forecasts of single bands east of Lake Ontario in the ARW members of the ensemble, and is testing configurations that may improve the ARW members. Justin is also working on developing new visualization techniques for the ensemble.
- vi. 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. Comments from CWSU Oberlin Staff members on the WRF Model data they use:
 - a. The freezing level graphics are especially useful on weekend morning shifts for icing situations when the ACARS soundings within ZOB airspace amount to very slim pickings. The boundary layer winds are helpful for finding boundaries and low-level turbulence forecasting. The forecast reflectivity's have been useful in identifying potential convection initiation, but the number of cases during recent months has not been especially large.
 - b. I use the 1-hr. pcpn loop and base reflectivity loop most often especially when forecasting potentially convective situations. The freezing level loop is useful in icing and mixed precipitation type situations. A problem I have with the display is that it's too high from top to bottom and I can't click frame-to-frame without scrolling up and down to get to the control buttons and then to see the graphic. The slowest animation speed is sometimes too fast.
- vii. Model runs are also available to DEAS in real time
- viii. 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. NERFC has completed its analysis of river flows entering the Gulf Of Maine Basin for the period 1970 to 2005. Awaiting one last batch of data from the state of Maine containing their toxicity data for their shoreline. This data will be compared to the river inflow datasets to examine relationships to large spring flow events followed by marked elevated toxicity data. A third piece to this work will include a reanalysis of the prevailing wind patterns in the Gulf of Maine. Researches do know that onshore flow is the final catalyst to a large near-shore outbreak. The Taunton WFO will be assisting with this work.

On the more global scale - David Vallee, HIC at the Northeast River Forecast Center has had recent discussions with the researchers at the Woods Hole Oceanographic Institute (WHOI) regarding plans to migrate their research modeling into an operational forecast system. We have learned that the initial groundwork has been laid for a collaboration with Dr. Rick Stumpf at NOAA/NOS based in Silver Spring, MD. He has led the transitioning of research to operations for the NOAA Harmful Algal Bloom Forecast

System in the Gulf of Mexico. Woods Hole is not sure how it will unfold for the Gulf of Maine, but there will be close collaboration to transition some of their modeling products from WHOI to NOAA NOS for public consumption. WHOI will maintain the research and development effort, as well as control over distribution of data and model forecast products. David offered his assistance as they move forward seeing opportunities to tap into the coastal WFO outreach and education programs and suggested they consider the "Advisory-Watch-Warning" method as is used in the NWS warning programs.

At this time, NERFC has begun to provide WHOI weekly updates on the state of snow depth and water equivalent across the Northeast. The potential is increasing for a large snowmelt driven flow of fresh water into the Gulf of Maine later in the spring, which is one of the triggers to a potential HAB episode. WHOI mapping of the sea floor from last fall shows an unusually high cell concentration of cysts on the ocean floor - these are the seeds that become the harmful bloom under the right conditions. Both NERFC and WFO Taunton will be collaborating with WHOI and NMFS through the spring as this potential event unfolds.

- ii. 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. The “Correlations Between Observed Snowfall and NAM Model Parameters” project manuscript was approved for publication in WAF by Eastern Region Scientific Services Division. It will be resubmitted to WAF after final review this Spring. Three regional tele-training sessions were presented by the Binghamton office on this work, reaching over 60 students.
 - ii. Project Participants
 - 1. Team – Mike Jurewicz (BGM) & Mike Evans (BGM)
 - 2. PIs – Lance Bosart, Dan Keyser

- e. ***Northeast Convective Flash Flood Events***
 - i. The three project participants met in November to discuss how to begin the project. The initial groundwork was set for defining what the main goal/objectives would be. It was agreed that the eventual goal would be to use the results of this project (composites, conceptual models, etc.) for a forecast application during the "watch" phase of potential flash flood events.
 - ii. While hydrology is certainly an important aspect of flash flooding, we will be focusing more on the meteorological conditions associated with flash flooding. It was determined that case study events will be limited to the warm season, and will not include flooding from organized tropical systems as these were heavily covered in another CSTAR project.
 - iii. At this early stage in the project potential flash flood cases from our respective forecast areas (ALY, BGM, PHI) are being compiled.

- iv. Project participants have begun a literature search and review, related to convective flash floods.
- v. Once several cases have been identified, they will be compared to events to those listed in Storm Data. At that point case data will analyzed thoroughly, to begin to identify similarities among events.
- vi. 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. Quite a bit of activity has taken place in this project over the past six months. A presentation on this project was made at NROW. During the summer of 2008 Hollings Scholar Zachary Taylor will work on this project at the Grey Maine office.
- ii. A Weather Event Simulator (WES) case of a Norlun event in December, 2007 was created at the National Weather Service (NWS) in Gray, Maine. The WES case allows operational forecasters to focus on observational and forecast model data in real-time, to diagnose a Norlun banded snow event. A conceptual of a Norlun Trough was also developed as a part of this training WES case's Powerpoint presentation.
- iii. Collaboration occurred with Dr. Lance Bosart as an email thread was created prior to the December, 2007 event. Active discussion also took place 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. Active collaboration continued with modelers from the AER group, which runs the University of New Hampshire WRF mesoscale model in support of NWS operations
- iv. The following presentations and publications were made with respect to this project:
 - 1. CSTAR/NROW Workshop, November, 2007
 - 2. Hybrid Norlun Events, NWS Gray, Maine fall meeting, October, 2007.
 - 3. Initial Verification of the NOAA-UNH Joint Center for Ocean Observing Technology Real-Time MM5/WRF forecasts, abstract, Annual Meeting Numerical Weather Prediction, New Hampshire, August, 2007.
 - 4. Norlun Troughs - abstract, Northeast Storm Conference, March, 2007
 - 5. 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. Tele-training was developed and presented during February 2008 to numerous NWS offices 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" and "Warm Season 500hPa Cut Offs"
- ii. The CSTAR website was overhauled and reorganized.
- iii. The CSTAR bulletin board has been set up, and should become active after the Spring CSTAR meeting. <http://cstar.cestm.albany.edu>
- iv. Josh Korotky of WFO Pittsburgh worked with Josh Watson and Dan Baumgardt (SOO, Lacrosse WI) to create probabilistic threshold products for GFS ensemble (wind, temp, precip). These are available on Dan Baumgardt's Volume Browser web site. Josh Korotky created AWIPS visualizations and Procedures for severe storm forecasting and were presented at NROW in November
- v. Thomas Wasula has developed a draft presentation for conversion to a VISIT

Teletraining session on “Warm Season Closed Lows from his CSTAR work. This has been reviewed twice and should be ready for creation of Articulate Teletraining in May 2008.

- vi. 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. Mike Augustyniak (UAlbany Grad Study and WRGB TV Met) presented initial work at NROW.
 - ii. Several cases for future study were identified over the 2007-8 winter season, and warm season cases are being sought.
 - 1. 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. Develop a forecast strategy which incorporates SREF and high resolution models to identify severe warm and cold season threats. Show the complimentary roles of EPS and high resolution models in the forecast process: the forecast strategy utilizes 1) ensemble data for assessing the likelihood, mode, and forecast confidence of a severe weather event; 2) climatological anomalies for evaluating the historical context of an impending event; and 3) high resolution model data for determining the magnitude of moisture, the horizontal and vertical extent of moisture, important mesoscale structures, and relevant forcing mechanisms.
 - i. Josh Korotky presented: "Using Short Range Ensemble Forecasts with Deterministic Model Guidance to Identify Severe Weather Threats" (co-authored with Rich Grumm) at SLS, NROW, and NWA Oct-Nov 2006
 - ii. Josh Korotky presented: "NWP visualization and forecast approach for severe storm forecasting" at COMAP - June 2007
 - iii. Josh Korotky will present: "Using Short Range Ensemble Forecasts with Deterministic Model Guidance to Identify Severe Weather Threats" at NROW - Nov 2007
 - iv. 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. The six month COMET Project Report completed in late February is a second attachment to this email.
 - ii. Since that time, efforts to ingest the ensemble data into AWIPS at Upton, NY continue to progress, but at a frustrating pace. A presentation at the WFO Upton, NY Spring Weather Workshop on the ensemble data set and verification statistics was accomplished by the PhD student assigned to the project.
 - iii. 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.

- iv. Initial work was presented at NROW by three Stonybrook Students.
- v. 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. The NWS WFO in Upton, NY continues to ingest base products from two FAA Terminal Doppler Weather Radars (TDWR's) covering the NY Bight. The radars have proven outstanding in observing the sea breeze circulations in the area. Integration of the base velocity and reflectivity data with the extensive amount of mesonet and high temporal ASOS data in the region has allowed for vastly improved conceptual understanding of these circulations.
 - ii. Due to the winter – no new events have been identified in the past six months. Direct feed of the TDWR data is expected in July with the installation of Supplemental Product Generators at the WFO.
 - iii. David Novak from NWS Eastern Region presented his investigation on the low level jet that forms in association with the sea breeze circulation. The "Ambrose Jet," is the thermally induced response to the sea breeze circulations over the open ocean waters in the New York Bight. Resultant wind speeds in the Ambrose Jet on the order of 10-15 ms⁻¹ present a hazard to mariners. David's analysis and simulations of this events using WRF are helping to improve forecasters comprehend and prediction capabilities.
 - iv. The investigators have interacted with students and staff at SUNY Stony Brook as well as the staff from the NWS's Warning Decision Training Branch (WDTB).
 - v. A Severe Weather case study using the TDWR data was incorporated into the Distant Learning Operations Course (DLOC) by the staff WDTB with assistance from the WFO.
 - vi. Two presentations on the use of the TDWR data in operational meteorology were presented at the 2007 NROW. One was done by SUNY Stony Brook and the other by WFO Upton, NY forecasters.
 - vii. A presentation on the use of TDWR data was done by the WFO Upton, NY SOO at WFO Taunton MA's spring weather workshop in late March.
 - viii. Project Participants
 - 1. Lead – Jeff Tongue (OKX)

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

Computing infrastructure continues to play a crucial role in this collaborative effort. Students are exposed to NWS facilities and software, and NWS staff has access to capabilities not available in the local office. Both groups benefit from this interaction and sharing of facilities. The Department of Earth and Atmospheric Sciences (DEAS) UNIX computing system presently consists of 42 Sun servers and workstations (ranging from single CPU clients with 1GB RAM to 8 CPU servers with 16 GB RAM), and a network of Linux machines (with between 2 CPU's and 2GB RAM to 8 CPU with 16GB RAM), along with Windows and Macintosh PC's. A Network Appliance FAS 3020c (Dual controller, 14 TB usable capacity dual parity protected raid array) provides our primary storage needs. This data storage server is currently filled, but allows for easy future expansion. 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 (or Mac) laptop, which enables them to take familiar computers with them when visiting NWS staff, and provides them with access to all DEAS UNIX facilities. 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 are taking 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.) The Albany WSFO also recently initiated an online discussion forum "cstar_ne" on the NOAA listserv. This might provide an additional conduit for communications, but it is too early to tell for sure right now. It is difficult to replace in person interaction, but we continue to try to find cost effective ways to augment this communication. Communication and interaction are central to this project. Another potential challenge is the transition from the current NAWIPS/GEMPAK to the future version. The DEAS in collaboration with UNIDATA and NOAA are committed to making this transition as smooth as possible.

In addition to DEAS, and NWS computing facilities, the formal CSTAR collaborative grant effort has allowed access to University Research Information Technology (RIT) services. For example, Warren Snyder (SOO Albany WSFO) is using the RIT 64 CPU Linux cluster for Weather Research and Forecasting (WRF) model simulations. This computing facility allows him to perform computations not possible at the local office. The facility is 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: Dan Keyser <keyser@atmos.albany.edu>
Subject: CSTAR banding research in ALY AFD: 4:56 p.m. Th. 13 Dec '07
To: celeste@atmos.albany.edu
Date: Thu, 13 Dec 2007 22:45:28 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu

Thursday 13 December 2007

Celeste,

Excerpts from the NWS ALY AFD issued at 4:56 p.m. EST on Thursday 13 December 2007 that refer to CSTAR banding research (refer to paragraph starting with "SUNDAY...") are included for the next CSTAR six-month report.

Dan

cc: Lance

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
456 PM EST THU DEC 13 2007

.SYNOPSIS...A LOW PRESSURE SYSTEM WILL TRACK OFF THE NEW JERSEY COAST THIS EVENING...ENDING THE STEADIER SNOW. SCATTERED SNOW SHOWERS...OR PATCHY FREEZING DRIZZLE MAY LINGER OVERNIGHT. A COLD FRONT WILL APPROACH THE REGION FROM THE NORTHWEST LATE FRIDAY...ACCOMPANIED BY SCATTERED SNOW SHOWERS OR FLURRIES. HIGH PRESSURE WILL BRING CLEAR AND COLD CONDITIONS FOR FRIDAY NIGHT AND SATURDAY. ANOTHER LOW PRESSURE SYSTEM DEVELOPING OVER THE SOUTHEAST STATES SHOULD BRING MORE SNOW OR A WINTRY MIX TO THE REGION SATURDAY NIGHT INTO SUNDAY.

LONG TERM /SATURDAY NIGHT THROUGH THURSDAY/...
THE LONG TERM BECOMES COMPLICATED WITH A SIGNIFICANT WINTER STORM POTENTIALLY IMPACTING THE FORECAST AREA SATURDAY NIGHT THROUGH SUNDAY. HOWEVER...THERE ARE SOME SUBTLE DIFFERENCES BETWEEN THE 12Z GFS...12Z CAN GGEM...AND 12Z ECMWF VS. THE NAM/WRF AND GLOBAL/MEDIUM RANGE ENSEMBLES WITH THE TRACK AND EVOLUTION OF THE STORM. HPC/S CURRENT THINKING FAVORS THE GFS AND ECMWF. WE LEANED CLOSE TO THEM AT THIS TIME. THE NAO IS SHOWING A SHIFT TO NEGATIVE VALUES WITH MERIDIONAL FLOW FAVORED /TROUGHINESS IN THE EAST/ BY MID DECEMBER WITH JIVES WELL WITH THIS POTENTIAL STORM.

SATURDAY NIGHT...LOW PRESSURE CONTINUES TO MOVES NORTHEAST OUT OF THE TN VALLEY AND INTO THE OH VALLEY...WHILE A SECONDARY LOW FORMS OVER THE CAROLINAS. OVER RUNNING SNOWFALL SHOULD BREAK OUT WELL IN ADVANCE OF THE DOUBLE BARREL LOW FORMING. BY 06Z...MOST OF THE REGION SHOULD SEE SOME LIGHT SNOW ONGOING. IT IS POSSIBLE THAT IT MAY BE VIRGA FOR A TIME NORTH OF THE MOHAWK VALLEY AND CAPITAL REGION. IT SHOULD BE NOTED THE NAM IS MUCH SLOWER WITH THE MOVEMENT OF THE PRIMARY LOW AT THIS TIME...AND BRINGS THE SNOW FROM THE THERMAL ADVECTION IN 06-12Z. WE WENT TO CATEGORICAL POPS AFTER MIDNIGHT WITH STRONG QG OMEGA LIFT CAUSED BY THE DIFFERENTIAL THICKNESS AND VORTICITY ADVECTION BASED ON THE GFS. THE SNOW SHOULD PICK UP INTENSITY WITH AN H850 E/SE LOW LEVEL JET INCREASING TO 50-65 KTS BY DAYBREAK. THE ENSEMBLES ARE SHOWING SOME LOW LEVEL WIND ANOMALIES OF 3-4 STANDARD DEVIATIONS ABOVE NORMAL...WITH A SMALL AREA OF 4-5 STANDARD DEVIATIONS ABOVE NORMAL. CRITICAL PARTIAL THICKNESSES SUPPORT A PTYPE OF MAINLY SNOW...BUT WARM AIR IN THE 850 MB TO 700 MB LAYER MAY CAUSE SOME SLEET MOVING IN SOUTH OF THE CAPITAL REGION BY ABOUT 12Z.

THE QUESTION IS WHERE THE SECONDARY LOW GOES THAT FORMS OVER THE MID ATLANTIC REGION.

SUNDAY...THE NAM WOULD CONTINUE SEVERAL INCHES OF SNOW WITH RAPID CYCLOGENESIS ONGOING...AS THE LOW MOVES JUST SOUTH OF LONG ISLAND. THE 12Z MREF ALSO SHOW THIS WITH THE LOW PASSING SOUTH OF CAPE COD. THE 18Z NAM IS A LITTLE FURTHER NORTH...BUT SLOWER...AS IT PASSES THROUGH THE LONG ISLAND SOUND. THE GFS HAS THE SECONDARY LOW MOVING NE TO RIGHT OVER NYC BY 18Z SUN...WHICH IS IN THE VICINITY OF THE LEFT FRONT QUAD OF THE SUBTROPICAL UPPER LEVEL JET STREAK AND THE RIGHT REAR QUAD OF THE POLEWARD JET STREAM. IT WILL BE RAPIDLY DEEPENING AND INTENSIFYING. GFS MODEL SOUNDINGS DO SHOW A WARM NOSE ALOFT GETTING TO THE CAPITAL REGION WITH SLEET PERHAPS MIXING THIS FAR NORTH BASED ALSO ON THE ECMWF. WE INCLUDED SLEET HERE. THIS MAY CUT INTO THE TOTAL QPF FOR THE STORM...WHICH AT THIS POINT LOOKS TO BE IN THE 1-1.5" RANGE. THE LOW LEVEL EASTERLIES MAY ALSO GENERATE A SHADOW/DOWNSLOPING EFFECT OFF THE GREEN MTNS AND BERKS. MESOSCALE DETAILS...THAT WILL IRON THEMSELVES OUT LATER. THE BEST H850-700 FRONTOGENESIS ON THE GFS IS OVER WRN-CNTRL NY NE INTO NRN NY WITH HEAVY SNOW BANDING PER CSTAR I RESEARCH POSSIBLE. THIS MAY INCLUDE OUR NW ZONES. WE FEEL THE MOST CONFIDENT THE HEAVIEST SNOW WILL FALL NORTH AND WEST OF THE CAPITAL REGION. HOWEVER...THERE IS A LOT OF UNCERTAINTY WITH THE TRACK STILL.

THE COLD CONVEYOR BELT KICKS IN AFTER 18Z...AS THE LOW MOVES NORTHEAST INTO THE GULF OF MAINE. THE BEST DEFORMATION ZONE HANGS BACK OVER THE NRN CATSKILLS...BERKSHIRES AND THE GREATER CAPITAL REGION. ANY MIXED PCPN WOULD TRANSITION BACK TO SNOW. THE CAN GGEM

HAS THE LOW PASSING NEAR ALB BEFORE MOVING NORTHEAST INTO THE GULF OF MAINE. THE LOW TRIES TO CUT OFF AT H500 BY 00Z MON...BUT IT MAY BE PROGRESSIVE ENOUGH TO SPARE MOST OF THE REGION WIDESPREAD SNOWFALL SUNDAY NIGHT.

WE COULD GET SEVERAL INCHES HERE...BUT THE TRACK UNCERTAINTY HAS LET US DECIDE TO WAIT ANOTHER MODEL CYCLE OR TWO FOR A POSSIBLE WATCH. IT WOULD BE A LATE 5TH TO 6TH PERIOD WATCH AT THIS POINT. WE ARE ALSO TRYING TO FINISH OFF THE CURRENT EVENT.

ALSO...EXCELLENT COLLABORATION WITH BUF...BGM...BTV...AND BOX WAS TO WAIT ON A WATCH. WE WILL CONTINUE TO HIGHLIGHT IN THE HWO. STAY TUNED FOR POTENTIAL HAZARD FLAGS WITH THIS WEEKEND EVENT.

SUNDAY NIGHT...BACK LASH WRAP AROUND SNOWS END NORTH AND WEST OF THE CAPITAL DISTRICT. 925 MB NW WINDS OF 30-35 KTS MAY PRODUCE QUITE A BIT OF BLOWING AND DRIFTING SNOW. SOME LAKE EFFECT MULTIBANDS MAY OCCUR JUST WEST OF THE FCST AREA.

MONDAY INTO WEDNESDAY...HIGH PRESSURE BUILDS IN SOUTH OF HUDSON BAY WITH VERY COLD AND MAINLY DRY WEATHER WITH A FRESH SNOWPACK IN PLACE. TEMPS COULD GO WELL BELOW ZERO NORTH OF THE CAPITAL REGION.

WEDNESDAY NIGHT INTO THURSDAY...A CLIPPER LOW MAY BRING SOME SCT -SNSHS HERE...AND WE ONLY INCLUDED SLIGHT CHANCE POPS IN THE GRIDS FOR THIS PERIOD.

OVERALL...THE EXTENDED LOOKS COLD WITH BELOW NORMAL TEMPS...AND PCPN ABOVE NORMAL DEPENDING ON THE LATE WEEKEND STORM.

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SYNOPSIS...KL

NEAR TERM...KL

SHORT TERM...KL/TAW

LONG TERM...TAW

AVIATION...FRUGIS

HYDROLOGY...KL/TAW

From: Dan Keyser <keyser@atmos.albany.edu>
Subject: CSTAR research cited in ALY AFD: 12:43 p.m. Wed. 1/2/08
To: celeste@atmos.albany.edu
Date: Wed, 2 Jan 2008 20:40:28 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu

Wednesday 2 January 2008

Celeste,

Excerpts from the NWS ALY AFD issued at 12:43 p.m. EST on Wednesday 2 January 2008 that refer to the Mohawk-Hudson convergence effect (refer to paragraph starting with "THE LATEST KENX RADAR") are included for the next CSTAR six-month report.

Dan

cc: Lance

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
1243 PM EST WED JAN 2 2008

.SYNOPSIS...

A STORM IN THE GULF OF MAINE WILL DRIVE THE COLDEST AIRMASS OF THE WINTER SEASON ACROSS OUR REGION TODAY INTO THURSDAY VIA A GUSTY NORTHWEST WIND AND A FEW SNOW SHOWERS OR FLURRIES ALONG THE LEADING EDGE OF THE COLD AIR. BY EARLY THURSDAY...TEMPERATURES WILL BE CLOSE TO ZERO IN MANY PLACES...EXCEPT WELL BELOW ZERO ACROSS THE HIGHER TERRAIN NORTH AND WEST OF ALBANY. ARCTIC HIGH PRESSURE WILL CREST TO OUR SOUTH BY FRIDAY MORNING. THEN...THE HIGH WILL DRIFT EAST AND BECOME PARKED OFF THE EASTERN SEABOARD.

.NEAR TERM /UNTIL 6 PM WEDNESDAY EVENING/...

THE LATEST KENX RADAR STILL SHOWS THE REMNANTS OF THE MOHAWK HUDSON CONVERGENCE EFFECT /COLLABORATIVE NWS-SUNYA CSTAR RESEARCH IS LOOKING INTO THIS/ IS ONGOING IN THE EASTERN CAPITAL DISTRICT AND THE UPPER HUDSON RIVER VALLEY. 20-25 DBZ RETURNS CONTINUE OVER EXTREME NE ALBANY COUNTY...NW RENSSELAER COUNTY AND SOUTH SARATOGA COUNTY. WE BELIEVE THIS WILL CONTINUE ANOTHER HOUR OT TWO AND DIMINISH. WE EXTENDED THE LIKELY POPS IN THESE AREAS. THE SRN GREEN MOUNTAINS MAY ALSO SEE AN ADDITIONAL BURST OF SNOW PRIOR TO NOONTIME. THE NRN TACONICS WILL STILL STILL RECEIVE AN INCH OR SO OF SNOW TOO. TEMPS ARE CONTINUING TO FALL WITH THE STRONG COLD AIR

ADVECTION TOO.

WE WILL KEEP SCT FLURRIES/LOW CHANCE OF SNOW SHOWERS IN OVER THE BULK OF THE FORECAST AREA IN THE AFTERNOON...WITH A GRADUAL CLEARING BY THE LATE AFTERNOON. THE 12Z RAOB DATA HAS THE COLDEST AIR AT 500 MB UPSTREAM OVER MI /KDTX -41C/. BRISK NW WINDS AND SLOWLY FALLING/STEADY TEMPS IN THE SINGLE DIGITS OVER THE ADIRONDACKS...TEENS OVER THE CAPITAL REGION/LAKE GEORGE AREA...LOWER TO MID 20S OVER THE MID HUDSON VALLEY DUE TO THE STRONG COLD AIR ADVECTION WILL CONTINUE. WIND CHILLS DURING THE DAYTIME WILL RANGE FROM THE SINGLE DIGITS TO 10 BELOW ZERO. WE WILL ADDRESS ANY POTENTIAL WINDCHILL HEADLINES FOR THE OVERNIGHT PERIOD WITH THE AFTERNOON UPDATE.

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NEAR TERM UPDATE...TAW
AVIATION...GJM

From: Dan Keyser <keyser@atmos.albany.edu>
Subject: CSTAR research cited in ALY AFD: 3:30 p.m. Th. 2/7/08
To: celeste@atmos.albany.edu
Date: Fri, 8 Feb 2008 15:02:06 +0000 (GMT)
Cc: bosart@atmos.albany.edu, keyser@atmos.albany.edu

Friday 8 February 2008

Celeste,

Excerpts from the NWS ALY AFD issued at 3:30 p.m. EST on Thursday 7 February 2008 that refer to the Mohawk-Hudson convergence effect (see first paragraph of the "NEAR TERM" section) are included for the next CSTAR six-month report.

Dan

cc: Lance

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ALBANY NY
330 PM EST THU FEB 7 2008

.SYNOPSIS...

LOW PRESSURE WILL MOVE OFF THE NEW ENGLAND COAST TONIGHT...AS A WEAK RIDGE OF HIGH PRESSURE BUILDS IN FROM THE WEST. SNOW SHOWERS AND FLURRIES WILL GRADUALLY DIMINISH BY FRIDAY. ANOTHER LOW PRESSURE SYSTEM WILL APPROACH FROM THE GREAT LAKES FOR SATURDAY...ACCOMPANIED BY LIGHT SNOW...POSSIBLY MIXED WITH RAIN ACROSS SOUTHERN AREAS AND WITHIN THE VALLEYS. A STRONG COLD FRONT ASSOCIATED WITH THIS LOW WILL TRAVERSE THE REGION SUNDAY...ACCOMPANIED BY MORE SNOW SHOWERS...AND FOLLOWED BY MUCH COLDER TEMPERATURES.

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

SNOW SHOWERS...ASSOCIATED WITH THE UPPER AIR LOW...NOW BEGINNING TO PIVOT TO OUR EAST...IS TAKING THE REMAIN SNOW SHOWER ACTIVITY WITH IT. IN ADDITION...A WEAK BUT SUBTLE ARCTIC FRONT HAS PASSED SOUTH OF THE CAPITAL REGION. LAST...BUT NOT LEAST...KENX RADAR INDICATES SOME MOHAWK/HUDSON SIGNATURE HAPPENING. ACCORDING TO STUDIES FROM CSTAR III...WHEN ISOBARS ARE KINKED IN AN S FASHION FROM ALBANY (ALB) TO GLENS FALLS (GFL) ALONG WITH HIGHER SURFACE AIR PRESSURES AT GLENS FALLS...ALONG WITH LOW LEVEL MOISTURE...THIS PHENOMENA CAN TAKE PLACE. THIS WILL LIKELY PERSIST INTO VERY EARLY EVENING

HOURS...BEFORE DIMINISHING TO SCATTERED FLURRIES.

FOR TONIGHT...CLOUDS WILL LIKELY HANG TOUGH UNDERNEATH AN
INVERSION...BUT THEY SHOULD PRODUCE LITTLE IF ANY PRECIPITATION.
JUST MENTION A CHANCE OF FLURRIES. DUE TO PERSISTENT CLOUD...FELT
OVERNIGHT LOWS WERE A BIT COLD IN A FEW SPOTS...SO RAISED THEM A FEW.

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SYNOPSIS...KL
NEAR TERM...HWJIV
SHORT TERM...HWJIV
LONG TERM...KL
AVIATION...KGS
HYDROLOGY...KL

Date: Tue, 04 Mar 2008 20:30:39 -0500
From: david.novak@noaa.gov
Subject: Re: Snowband over STL
In-reply-to: <p06240816c3f35b188fce@[169.226.41.56]>
To: map@atmos.albany.edu

Lance and map,

Here's the post-storm analysis in the 4 pm AFD. They mention the 10" Lambert airport snowfall total will finish in the top 5 for March. Here's a preliminary snowfall map as well:
http://www.crh.noaa.gov/crnews/display_story.php?wfo=lsx&storyid=13406&source=0

I also appended the Monday, 3 March 4 pm AFD, which testifies that a narrow snowband, with 10-12" accumulation, was expected ~18 h prior to occurrence. We've come a long way over the past 10 yrs.

Dave

NATIONAL WEATHER SERVICE ST LOUIS MO
342 PM CST TUE MAR 4 2008

.DISCUSSION...

WELL IT DIDN'T EVOLVE EXACTLY AS EXPECTED...AND THERE WERE SOME AGONIZING MOMENTS EARLY THIS MORNING...BUT EVERYTHING SYNCHED AS THE MORNING PROGRESSED AND THE MAJOR STORM MATERIALIZED MUCH AS FORECAST. THE ENTIRE SYSTEM WENT THRU A DEEPENING PHASE THIS MORNING WITH INCREASING SYNOPTIC SCALE LIFT...BUT MORE IMPORTANTLY A NICE TROWAL DEVELOPED ALONG WITH ATTENDANT STRONG MID LEVEL FRONTOGENESIS RESULTING IN A PERISTENT MODERATE-HEAVY SNOW WHICH IMPACTED THE HEART OF THE ST LOUIS AREA. EARLY ON IT APPEARED THAT THE INSTABILITY WAS SO GREAT THAT IT WAS CONTRIBUTING TO NUMEROUS DISTINCT SEPARATE MESOSCALE BANDS. THERE WERE ALSO NUMEROUS REPORTS OF THUNDER. HOWEVER AS TIME PROGRESSED AND THE INSTABILITY WAS REALIZED...A DISTINCT DEFORMATION ZONE DEVELOPED WITH A FEW DOMINANT MESOSCALE BANDS...AND THESE BANDS PRODUCED SNOWFALL RATES EXCEEDING 3 INCHES PER HOUR. THE AXIS OF THE HEAVIEST SNOWFALL WAS PRETTY CLOSE TO WHERE FORECAST DESPITE WAVERING MODEL QPF FORECASTS IN THE FINAL 36H. THERE APPEAR TO BE 2 MAIN AXIS...ONE NEAR A CARLINVILLE-GODFREY-CREVE COEUR-EUREKA-POTOSI-ELLINGTON LINE WHERE 8-10 INCHES IS COMMON AND LOCAL TOTALS ARE AROUND A FOOT. THE OTHER BAND APPEARS TO BE NEAR A STEELVILLE-UNION-NEW MELLE AXIS WITH 6-11 INCHES. THE LAMBERT SNOWFALL TOTAL WILL FINISH IN THE ALL-TIME TOP 5 FOR MARCH.

AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE ST LOUIS MO

406 PM CST MON MAR 3 2008

...STRONG SYNOPTIC SCALE FORCING ALONG WITH MESOSCALE FORCING VIA FRONTOGENESIS ALONG THE NORTHERN FRINGE OF THE TROWAL ARE STILL SUPPORTIVE OF A MAJOR DEFORMATION ZONE SNOW BAND. THIS SHOULD PUSH INTO SW MO OVERNIGHT AND INTO THE WRN PORTION OF FORECAST AREA BY DAYBREAK WITH SNOW SPREADING QUICKLY NEWD THRU THE MORNING...ENDING IN THE AFTERNOON OVER IL. PARAMETERS FOR THUNDERSNOW ARE ALL THERE WITH RELATIVELY STEEP MID LEVEL LAPSE RATES AND POS CAPE WITHIN THE TROWAL AIR STREAM OF OVER 100 J/KG. I WOULD EXPECT MULTIPLE BANDING WITHIN THE DEF ZONE WITH SNOWFALL RATES 2-3 INCHES/HR...HIGHER IN THUNDERSNOW. GUSTY NORTHERLY SFC WINDS WILL RESULT IN CONSIDERABLE BLOWING AND DRIFTING. ACCUMULATION WISE I'M STILL THINKING A SOLID 8 INCHES ALONG THE AFOREMENTIONED AXIS WITH LOCAL AMOUNTS OF 10-12 INCHES. I'M GLAD I HAVE 4 WHEEL DRIVE...I'LL NEED IT TOMORROW...
