Brian F. Jewett

Research Scientist, Department of Atmospheric Sciences
202 ATMS SCI BLDG, 105 S. Gregory St., Urbana, IL 61801
Phone: (217) 333-3957 Email: bjewett@illinois.edu

Education

Ph.D in Atmospheric Sciences, University of Illinois at Urbana-Champaign, Feb. 1996.
Dissertation title: "The Initiation and Mature Structure of Strongly-Forced Squall-Line Thunderstorms."
Dissertation advisor: Robert B. Wilhelmson

M.S. in Meteorology, University of Oklahoma, Norman, OK, May 1986
Thesis title: "Momentum and Kinetic Energy Budgets of Simulated Thunderstorms."
Thesis advisor: Douglas K. Lilly

B.S. in Meteorology, University of Oklahoma, Norman, OK, May 1981

Appointments

• 2001-present	Research Scientist, University of Illinois
• 2008-present	Weather Research and Forecasting model (WRF) *Research Applications Board* (NCAR)
• 2008-2010	Editorial board, *Monthly Weather Review*
• 2007-2010	American Meteorological Society (AMS) *Scientific and Technological Activities Committee* (STAC)
• 2004	USWRP committee on cool-season precipitation forecasting
• 1996-2000	Post-Doctoral/Research Associate, University of Illinois
• 1997	Visiting Instructor, University of Illinois
• 1988-1996	Research Assistant, University of Illinois
• 1986-1988	Programmer / Meteorologist, NOAA Forecast Systems Laboratory, Boulder, CO

Research Interests

Jewett has used numerical modeling to study atmospheric phenomena for over 20 years.

- He carries out research on and mentors graduate students in their studies of thunderstorms and tornadoes (energetics, formation, organization, and storm cell interaction), mesoscale processes (frontogenesis, the relationship between fronts and deep convection, and winter precipitation accompanying mid-latitude cyclones), tropical cyclones (track and intensity forecasting, and rapid intensification), and numerical weather prediction
- He has overseen a local real-time ensemble numerical prediction system since 2003[1]
- He has experience with the Klemp/Wilhelmson cloud model, NCOMMAS, MM5, RAMS, and the Weather Research and Forecasting (WRF) model.

[1] http://rt.atmos.uiuc.edu

Teaching Experience

***ATMS 502 / CSE 566**, Numerical Fluid Dynamics*[2], University of Illinois

- Taught each Fall (2005 to present)
- Fall 2012: students from eight departments, 35 enrolled
- Topics: fluid dynamics; numerical methods for linear and nonlinear PDEs; developing, visualizing results from 3-D compressible model; supercomputer use

***ATMS 391,** Computational Problems in Atmospheric Sciences*[3]*,* University of Illinois

- Spring 2011
- Taught use of Fortran, C, Javascript and shell scripting and data formats for Atmospheric Sciences problems and weather data display and analysis.

***ATMS 305**, Computing and Data Analysis*, University of Illinois

- Spring 2012, and 2013
- MATLAB applications applied to Atmospheric Sciences problems
- Topics included trajectory analysis, reading/analyzing hurricane simulation data

ATMS 120, *Severe and Hazardous Weather*, University of Illinois.

- Taught for one summer and three spring/fall semesters
- Supervised teaching assistant
- Developed online material to support class teaching objectives

Academic Mentoring Experience

- Primary supervisor of* or co-supervising 3 M.S. and 7 Ph.D graduate students:
  - M.S. candidates: Samantha Chiu* (long-track tornadoes); Kevin Van Leer* (storm interaction, tornadoes); Amanda Schulz (tropical convection)
  - Ph.D candidates: Alexandra Jones (tropical cumulus and radiation); Jason Keeler (winter precipitation bands); Bethany Norris (nocturnal squall lines); Andrew Rosenow (winter storm dynamics); David Plummer (winter clouds and precipitation); (out of department: Hsingtzu Wu, Qiyue Lu)
- Actively supervised or sat on Ph.D committees for 4 M.S. and 3 Ph.D students:
  - Ann Syrowski (M.S., 2012); Richard Maliawco (M.S., 2012); Michelle Pitcel (M.S., 2010); Henian Zhang (Ph.D, 2008); Bryan Guarente (M.S., 2007); Mei Han (Ph.D, 2004); Bo Cui (Ph.D, 2004)

Research Field Experience

Jewett has participated in nine observational field experiments.

- *SESAME* (Severe Environmental Storm and Mesoscale Experiment, NOAA/NSSL/Univ. Oklahoma, severe storm ground intercept; 1979)
- *TOTO* (TOtable Tornado Observatory, NSSL/Univ. Oklahoma, storm ground intercept and instrument deployment; 1981-2)

[2] http://www.atmos.illinois.edu/~bjewett/atms502.html
[3] http://www.atmos.illinois.edu/~bjewett/atms391/

- *FIFE* (First ISLSCP Field Experiment, from NOAA/FSL, forecaster; 1987)
- *STORMFEST* (NOAA/USWRP STORM Fronts Experiment Systems Test, KS, radar scientist with Univ. Illinois team; 1992)
- *VORTEX-1* (Verification of Origins of Rotation in Tornadoes Experiment, OK, 1994; storm intercept and close-in film recording)
- *SNOWBAND* (Snowband Dynamics Project, MI, aircraft scientist; 1997-8)
- *BAMEX* (Bow Echo and MCV Experiment, IL, served as NOAA P-3 aircraft scientist and mission science director; 2003)
- *CLASIC* (Cloud and Land Surface Interaction Campaign, TX, NASA ER-2 flight planning/coordination; 2007)
- *PLOWS* (ProfiLing Of Winter Storms, IL, NCAR C-130 flight scientist and mission science director; 2009-10)

He also:

- provided forecast support for *Proteus* research aircraft test flights and transit to / from Darwin, Australia for a field experiment attended by Prof. G. McFarquhar
- carried out daily WRF computer forecasts for the NAMMA (NASA African Monsoon Multidisciplinary Analyses) field program (supported G. McFarquhar)
- carried out daily WRF computer forecasts for the GCPEX (GPM Cold-season precipitation) field program based in Ontario, Canada (supported S. Nesbitt)

Professional Service

- Reviews proposals to the National Science Foundation
- Reviews articles submitted to the American Meteorological Society
- Reviews articles submitted to the Quart. J. Royal Meteorological Society
- Serving on committee to select Director, National Center for Supercomputing Applications (NCSA) (Spring, 2013)

Awards / Recognition

- Recipient of the Chancellor's Academic Professional Excellence award (2008)
- Recipient of College of Liberal Arts and Sciences' LAS Staff Award (2007)
- Shared award, best M.S. thesis – School of Meteorology, Univ. Oklahoma (1986)

Memberships

- American Meteorological Society (AMS)
- American Geophysical Union (AGU)

Refereed Publications

Benjamin, S. G., K. A. Brewster, R. Brümmer, B. F. Jewett, T. W. Schlatter, T. L. Smith, and P. A. Stamus, 1991: An isentropic three-hourly data assimilation system using ACARS aircraft observations. *Mon. Wea. Rev.*, **119**, 888-906.

Cronce, M., R.M. Rauber, K.R. Knupp, B.F. Jewett, J.T. Walters, and D. Phillips, 2007: Vertical motions in precipitation bands in three winter cyclones. *J. Appl. Meteor. and Climat.*, **46**, 1523-1543.

Davis, C., N. Atkins, D. Bartels, L. Bosart, M. Coniglio, G. Bryan, W. Cotton, D. Dowell, B. Jewett, and 15 co-authors, 2004: The Bow Echo and MCV Experiment: Observations and opportunities. *Bull. Amer. Meteor. Soc.*, **85**, 1075-1093.

Grim, J. A., R. M. Rauber, M. K. Ramamurthy, B. F. Jewett and M. Han, 2007: High resolution observations of the trowal/warm frontal region of two continental winter cyclones. *Mon. Wea. Rev.*, **135**, 1629-1646.

___, G.M. McFarquhar, R.M. Rauber, A.M. Smith, and B.F. Jewett, 2009: Microphysical and thermodynamic structure and evolution of the trailing stratiform regions of mesoscale convective systems during BAMEX. Part II: Column model simulations. *Mon. Wea. Rev.*, **137**, 1186-1205.

___, R.M. Rauber, G.M. McFarquhar, B.F. Jewett, and D.P. Jorgensen, 2009: Deveclopment and forcing of the rear inflow jet in a rapidly developing and decaying squall line during BAMEX. *Mon. Wea. Rev.*, **137**, 1206-1229.

Han, M., R. M. Rauber, M. K. Ramamurthy, B. F. Jewett and J. A. Grim, 2007: Mesoscale dynamics of the trowal and warm frontal regions of two continental winter cyclones. *Mon. Wea. Rev.*, **135**, 1647-1670.

Jewett, B. F., and R. B. Wilhelmson, 2006: The role of forcing in cell morphology and evolution within midlatitude squall lines. *Mon. Wea. Rev.,* **134**, 3714-3734.

___, M. K. Ramamurthy and R. M. Rauber, 2003: Origin, evolution and fine-scale structure of the St. Valentine's Day mesoscale gravity wave observed during STORM-FEST. Part III: Gravity wave genesis and the role of evaporation. *Mon. Wea. Rev.*, **181**, 617-633.

Kristovich, D.A., and 21 co-authors, 2000: The Lake-Induced Convection Experiment and the Snowband Dynamics Project. *Bull. Amer. Meteor. Soc.*, **81**, 519-542.

Lee, B. D., B. F. Jewett, and R. B. Wilhelmson, 2006: The 19 April 1996 Illinois tornado outbreak. Part I: Cell initiation, evolution and supercell isolation. *Wea. Forecasting*, **21**, 433-448.

___, ___, and ___, 2006: The 19 April 1996 Illinois tornado outbreak. Part II: Cell mergers and associated tornado incidence. *Wea. Forecasting*, **21**, 449-464.

Lilly, D.K., and B.F. Jewett, 1990: Momentum and kinetic energy budgets of simulated supercell thunderstorms. *J. Atmos. Sci.*, **47**, 707-726.

McFarquhar, G.M., B.F. Jewett, M.S. Gilmore, S.W. Nesbitt, T.-L. Hsieh, 2012: Vertical velocity and microphysical distributions related to rapid intensification in a simulation of Hurricane Dennis (2005). *J. Atmos. Sci.*, **69**, 3515-3534.

___, M.S. Timlin, R.M. Rauber, B.F. Jewett, J.A. Grim, and D.P. Jorgensen, 2007: Vertical variability of cloud hydrometeors in the stratiform region of mesoscale convective systems and bow echoes. *Mon. Wea. Rev.*, **135**, 3405-3428.

Pasken, R., and B. Jewett, 2011: The first Regional Mesonet workshop. *Bull. Amer. Meteor. Soc.*, 92, 481-483.

Ralph, M. F., R.M. Rauber, B.F. Jewett, D.E. Kingsmill, P. Pisano, P. Pugner, R.M. Rasmussen, D.W. Reynolds, T.W. Schlatter, R.E. Stewart, J.S. Waldstricher, 2005: Improving short term (0-48 hour) cool season quantitative precipitation forecasting: recommendations from a USWRP workshop. *Bull. Amer. Meteor. Soc.,* **86**, 1619-

1632.
Ramamurthy, M.K., K.P. Bowman, B.F. Jewett, J.G. Kemp, and C. Kline, 1992 : A networked desktop synoptic laboratory. *Bull. Amer. Meteor. Soc.*, **73**, 944-950.
Rauber, R. M., M. Yang, M.K. Ramamurthy, and B.F. Jewett, 2001: Origin, evolution and fine- scale structure of the St. Valentine's Day mesoscale gravity wave observed during STORM- FEST. Part I: Origin and maintenance. *Mon. Wea. Rev.*, **129**, 198-217.
___, G.M. McFarquhar, B.F. Jewett, K.R. Knupp, D. Leon, P.S. Market, D.M. Plummer, J.M. Keeler, A. Rosenow, J. Wegman, M. Peterson, R. Wade, and K. Crandall, 2012: Rediscovering instability in winter storms. *Bull. Amer. Meteor. Soc*., in review.
Smith, A.M., G.M. McFarquhar, R.M. Rauber, J.A. Grim, M.S. Timlin, B.F. Jewett, and D.P. Jorgensen, 2009: Microphysical and thermodynamic structure and evolution of the trailing stratiform regions of mesoscale convective systems during BAMEX. Part I: Observations. *Mon. Wea. Rev.*, **137**, 1165-1185.
Van Leer, K., B.F. Jewett, and R.B. Wilhelmson, 2013: Rapid intensification, storm merging, and the Joplin tornado. Conference notebook summary, *Bull. Amer. Met. Soc.*, in press (released Feb. 2013).

Other publications / presentations: Lead author

Jewett, B.F., J. Alameda, A. Syrowski, and R. Wilhelmson, 2012: Ensemble modeling of storm interaction with XSEDE. *2012 XSEDE Conf.*, Chicago, XSEDE / ACM/SIGAPP, 'Ensemble modeling' presentation (7/18/12); link.
___, R.M. Rauber, G. McFarquhar, J.R. French, and K.R. Knupp, 2010: Profiling of Winter Storms (PLOWS): What we are learning about winter precipitation bands. *13th Conf. Cloud Physics*, Amer. Meteor. Soc., Portland, P1.74.
___ R. B. Wilhelmson, and B.D. Lee, 2008: Cell interaction, supercell behavior and tornadogenesis. *24th Conf. on Severe Local Storms*, Savannah, Amer. Meteor. Soc., P10.11.
___, R.B. Wilhelmson, J.C. Alameda, and A.L. Rossi, 2008: Using NCSA/LEAD's workflow broker to study storm interaction with WRF. *9th WRF Users' Workshop,* Boulder, NCAR, P9.32.
___, R.M. Rauber, and G. McFarquhar, 2007: The role of microphysical cooling processes in mesoscale convective system morphology. *12th Conf. on Mesoscale Processes*, Amer. Meteor. Soc., Waterville Valley, NH, P1.5.
___, R.B. Wilhelmson, J. Alameda, A. Rossi and S. Hampton, 2006: Computational science on the teragrid with LEAD. *NCSA Presentation, Supercomputing 2006*.
___, R. Przybylinski, and R. B. Wilhelmson, 2006: Numerical simulation of the 24 April, 2002 merger between a left-moving storm and supercell. *23rd Conf. on Severe Local Storms*, Amer. Meteor. Soc., St. Louis (6-10 November 2006), P11.3.
___, and R. B. Wilhelmson, 2006: Numerical simulation of cell interaction. *Presentation, 23rd Conf. on Severe Local Storms*, Amer. Meteor. Soc., St. Louis (6-10 November 2006), P11.4.
___, R. Wilhelmson, J. Alameda, S. Hampton and A. Rossi, 2006: Applying portal technologies to ensemble modeling of convection. *Presentation*, *Interactive Information and Processing Systems*, Amer. Meteor. Soc., Atlanta, 5.4.
___, R. B. Wilhelmson, M. Gilmore, J. Alameda, S. Hampton, and A. Rossi, 2004: The

WRF portal effort. *Joint WRF/MM5 User's Workshop*, NCAR/MMM, Boulder, 22-25 June 2004.

___, R. Wilhelmson, M.K. Ramamurthy, J. Alameda, S. Hampton, A.L. Rossi, and D. Tcheng, 2003: Applying portal technologies to ensemble modeling of convection on the grid. *Presentation, 19th Conf. on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology*, Amer. Meteor. Soc., Long Beach CA, P1.50.

___, R. M. Rauber, and G. M. McFarquhar, 2003: Large amplitude mesoscale gravity waves: New studies of their formation and evolution. *Preprints, Midwest Extreme and Hazardous Weather Regional Conference*, Amer. Meteor. Soc., Champaign.

___, R. B. Wilhelmson, and B. D. Lee, 2003: Cell initiation and morphology in the 1996 Illinois tornado outbreak. *Preprints, Midwest Extreme and Hazardous Weather Regional Conference*, Amer. Meteor. Soc., Champaign.

___, R. B. Wilhelmson and B. D. Lee, 2002: Numerical simulation of cell interaction. *Preprints, 21st Conf. on Severe Local Storms*, San Antonio, 316-319.

___, M.K. Ramamurthy, R.M. Rauber, J. Grim, L. Barker, and D. Smith, 2002 : Mesoscale ensemble prediction of winter precipitation in a severe winter storm. *19th Conf. On Weather Analysis and Forecasting*, Amer. Meteor. Soc., San Antonio, P1.9.

___, M.K. Ramamurthy, and H. Liu, 2001 : Ensemble methods applied to hurricane track forecasting. *14th Conf. On Numerical Weather Prediction*, Amer. Meteor. Soc., Ft. Lauderdale, P6.9.

___, M.K. Ramamurthy, and R.M. Rauber, 2001 : The role of evaporative processes in gravity wave genesis. *9th Conf. On Mesoscale Processes*, Amer. Meteor. Soc., Ft. Lauderdale, 13.6.

___, B. D. Lee and R. B. Wilhelmson, 2000: Initiation and evolution of severe convection in the 19 April 1996 Illinois tornado outbreak. *Preprints, 20th Conference on Severe Local Storms,* Amer. Meteor. Soc., Orlando.

___, M. K. Ramamurthy, and R. M. Rauber, 1999: Initiation and modeled evolution of a STORM-FEST gravity wave. *8th Conference on Mesoscale Processes*, Boulder, CO.

___, M. K. Ramamurthy and R. M. Rauber, 1998: Numerical study of the evolution of gravity waves during STORM-FEST. *16th Conf on Weather Analysis and Forecasting*, Phoenix, AZ, pp 458-459.

___, M. K. Ramamurthy, and R. M. Rauber, 1996: Numerical study of the genesis of a large amplitude gravity wave. *Proceedings of the 7th Conf. Mesoscale Processes*, Reading, England.

Other recent publications / presentations: Co-author

Alameda, J, B. Jewett, R.B. Wilhelmson, A.L. Rossi, and S.D. Hampton, 2008: How the NCSA/LEAD workflow broker manages complex workflows. *9th WRF Users' Workshop*, Boulder, NCAR, P11.1.

Chiu, S.L., B. F. Jewett and R.B. Wilhelmson, 2012: Mesoscale and stormscale ingredients of tornadic supercells producing long-track tornadoes in the 2011 Alabama Super Outbreak. *26th Conference on Severe Local Storms*, Amer. Meteor. Soc., Nashville, TN; link.

___, ___,and ___, 2011: The 2010 Mississippi Valley tornado outbreak – a mesoscale and stormscale perspective. *14th Conf. on Mesoscale Processes*, Amer. Meteor. Soc., P26A; link.

___, ___ and ___, 2011: Evaluating WRF simulations of the 24-25 April 2010 tornadic outbreak. *12th WRF Users' Workshop*, Boulder, NCAR, P34; link.

___, ___, and ___, 2011: Numerical simulations of a tornadic supercell – the Yazoo City Storm. *15th Severe Storms and Doppler Radar Conference*, Central Iowa National Weather Association, Ankeny, IA; link.

___, ___, and ___, 2011: Numerical simulations of a tornadic supercell – the Yazoo City storm. *Research Review, University of Illinois School of Earth, Society and the Environment*; link.

Jones, A., L. Di Girolamo, B. Jewett, and R. Rauber, 2012: Adapting the ARW to trade wind Cumulus studies. *13th WRF Users' Workshop*, Boulder, NCAR, P92.

Meyers, E.C., G.M. McFarquhar, B.F. Jewett, S.W. Nesbitt, and G.M. Heymsfield, 2009: Vertical velocity and microphysical distributions related to rapid intensification of hurricane Dennis (2005). *10th WRF Users' Workshop,* Boulder, NCAR, P3B.9.

Pitcel, M., B.F. Jewett, R.M. Rauber, and G.M. McFarquhar, 2011: Idealized study of the role of stability and shear on mesoscale gravity waves generated by evaporative cooling. *14th Conf. on Mesoscale Processes*, Amer. Meteor. Soc., Los Angeles, P25A.

___, B. Jewett, R. Rauber, and G. McFarquhar, 2008: Idealized modeling of the role of stability and shear on mesoscale gravity wave evolution. *9th WRF Users' Workshop*, Boulder, NCAR, P9.23.

Syrowski, A., B.F. Jewett, and R.B. Wilhelmson, 2013: Internal vs. external forcings in supercell interactions, in preparation for submission to *Monthly Weather Review*.

___, ___, and ___, 2012: An assessment of internal and external forcings in supercell interactions and their impact on storm morphology. *26th Conf. on Severe Local Storms*. Amer. Meteor. Soc., Denver, link.

___, ___, and ___, 2012: New paths to understanding severe storm intensification: A numerical modeling study. XSEDE12. Chicago, IL; poster link.

___, ___, and ___, 2012: Assessment of supercell mesocyclogenesis in a suite of idealized WRF simulations of storm interaction. *13th WRF Users' Workshop,* Boulder, NCAR, P78.

___, ___, and ___, 2012: New paths to understanding severe storm intensification: A numerical modeling study. *XSEDE '12*, Chicago, XSEDE, poster link.

___, ___, and ___, 2011: Evaluation of Morrison, Milbrandt and Yau, and Thompson microphysics schemes in a suite of high-resolution, idealized supercell simulations. *12th WRF Users' Workshop*, NCAR, Boulder.

___, ___, and ___, 2011: Evaluating the contribution of storm-scale dynamic and microphysical processes to the intensification and longevity of interacting cells. *14th Conf. on Mesoscale Processes*, Amer. Meteor. Soc., Los Angeles, 7.2.

___, ___, and ___, 2010: Impacts of cell interaction on storm intensification: A dynamical and microphysical perspective. *25th Conf. on Severe Local Storms*, Amer. Meteor. Soc., Denver, P8.17.

Van Leer, K.W., B.F. Jewett, and R.B. Wilhelmson, 2012: Investigating the role of storm mergers and rapid storm intensification mechanisms in the 22 May 2011 Joplin, MO tornado storm. *13th WRF Users' Workshop*, Boulder, NCAR, P79, link.

___, ___, and ___, 2012: Rapid intensification mechanisms including the role of storm mergers in the 22 May 2011 Joplin, MO tornadic Storm. *26th Conference on Severe Local Storms*, Amer. Meteor. Soc., Nashville, TN; link.

___, ___, and ___, 2013: Rapid intensification, storm merging, and the Joplin tornado. Conference notebook summary, *Bull. Amet. Met. Soc.*, in press (Feb. 2013).

Outreach

- Interviewed/featured for a Champaign-Urbana News-Gazette story on the tenth anniversary of the 1996 IL tornado outbreak (April 2006)
- Presented a talk on tornadoes to a local forum hosted by the UIUC student chapter of the League of Women Voters entitled "If the Worst Happens" (April 2006)
- Produced tornado video segment for annual tornado show by Edward Kieser of WILL-AM/TV (2005-2011)
- Sent conference preprint and radar images for 4/1996 tornado outbreak in response to request from public (March 2006);
- Gave several talks on severe weather at Prairie Elementary School (Urbana, IL);
- "Understanding Midwest Winter Weather" talk at Parkland College (Fall 2001)
- Contributed to Atmospheric Sciences Department *ww2010* online weather resource

Collaborators and Co-Authors

Dr. Jewett's project collaborators and co-authors include:

- U. Illinois Atms. Sciences: G. McFarquhar, R. Rauber, L. Di Girolamo, S. Nesbitt
- U. Illinois - NCSA: R. Wilhelmson, J. Alameda
- University of Alabama – Huntsville: K. Knupp
- WindLogics, Inc.: B. Lee *(severe storms)*
- National Weather Service: L. Barker (Lincoln, IL) *(weather forecasts – IL)*;
  R. Pryzbylinski (St. Louis) *(severe storms research)*