

Dr. Louis J. Wicker  
Curriculum Vitae  
Updated 10/02/18

**Present Position (June 1999 – present)**

Senior research meteorologist specializing in severe storm dynamics, convective-scale data assimilation, storm-scale prediction, and computational physics at the NOAA National Severe Storms Laboratory in Norman, Oklahoma.

**Current Professional Activities**

- Chief Scientist for the NOAA/NSSL Warn on Forecast Program (June 2016 - present)
- Editor, AMS Journal of Atmospheric Sciences (January 2018 – present)
- Member of the Science Advisory Board, Developmental Test Center (March 2018 – present)
- Weather Research and Forecasting Model's Science Advisory Board (2012 - present)
- Affiliate Professor, School of Meteorology, University of Oklahoma (2000 - present).
- CIMMS Fellow, Cooperative Institute for Mesoscale Meteorological Studies, University of Oklahoma (1999 - present)

**Previous Professional Activities**

- Project Manager, NOAA/NSSL Warn on Forecast Project (August 2012 - May 2016)
- Chief Scientist for the NOAA/NSSL Warn on Forecast Project (2011 - July 2012)
- Member of the scientific steering committee for the second Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX-II, 2007-2010).
- Associate Adjunct Professor, Department of Meteorology, Texas A&M University (1999-2005)
- Associate Professor, Texas A&M Meteorology Department, August 1998 through May 1999
- Visiting Scientist, Deutsche Wetterdienst, Frankfurt Germany, October 1997
- Assistant Professor, Texas A&M Meteorology Department, August 1992 through July 1998
- Visiting Associate Research Scientist, National Center for Supercomputer Applications and the Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign. August 1990 through August 1992.

**Invited Talks (15)**

NOAA's Warn on Forecast Program: Probabilistic Prediction of Severe Weather using High-Resolution Models. *Texas Weather Conference*. Dallas TX. 21 September 2018.

NOAA's Warn on Forecast Program: An Update on the Progress Toward Ensemble Prediction of Convective Weather Threats, *W. John and Gail M. Hussey Commemorative Lectureship in Meteorology*, Department of Meteorology and Atmospheric Sciences, Penn State University, 5 April 2017.

NOAA's Warn on Forecast Program: An Update on the Progress Toward Ensemble Prediction of Convective Weather Threats, Department of Earth, Atmospheric and Planetary Sciences, Purdue University, 2 March 2017.

Severe Storm NWP: the Good, the Bad, and a Possible Future, co-presentation with Dr. Morris Weisman (NCAR). *27<sup>th</sup> Conference on Severe Local Storms*, Madison WI, 3 November, 2014

Toward Developing a Storm-scale Prediction System for Hazardous Weather: An Update. *2013 European Conference on Severe Storms*, Helsinki, Finland. 4 June 2013.

The Warn-on-Forecast Project: NOAA's Vision for Severe Weather Prediction. *17th Annual Severe Storms and Doppler Radar Conference*, Ankeny, IA, 4 April 2013.

Toward a Storm-scale Prediction System for Hazardous Weather: Current Status and Challenges for "Warn-on-Forecast". *International Symposium on Data Assimilation, Deutsche Wetterdienst*, Offenbach Germany. 8 October 2012.

A Brief History of Convective Storm Research and Its Current Challenges, *Ogura Lecture*, University of Illinois Department of Atmospheric Sciences, April 2011.

VORTEX2 2009 & 2010: An overview and some of the early results. *Steamboat Weather Summit*, Steamboat Colorado, January 2011.

VORTEX2: Verification of the Origins of Rotation. *Norman Science Café*, May 2009

Improving Scientific Productivity using Python: An example from an Ensemble Data Assimilation System in Meteorology. *OU Supercomputing Symposium*, University of Oklahoma, October 2006.

Tornado Prediction: Has its time come? *Summer Advanced Study Program*, National Center for Atmospheric Research, Boulder Colorado, July 2006.

Severe Local Storms and Computational Science: What's Next? *Symposium on the Challenges of Severe Convective Storms*, American Meteorological Society Annual Meeting, Atlanta GA, January 2006.

The Role of Technology in Storm Science, Forecasts, and Warnings: the Past, Present, and a Possible Future, *Texas Severe Storm Association*, February 2005.

Numerical Modeling of Severe Storms, *Golden Jubilee Symposium on Tornado Forecasting*, University of Oklahoma, March 1998.

#### **Refereed Publications (bold number indicates current NOAA 2019 FY-year publication)**

71. Skinner, P. S., **L. J. Wicker**, C. K. Potvin, E. R. Mansell, and P. L. Heinselman, 2017: Impacts of observation density and model bias on high-resolution ensemble forecasts of low-level rotation in the 31 May 2013 El Reno, Oklahoma supercell. *Mon. Wea. Rev.*, In preparation.

70. **Wicker, L. J.**, 2018: Improving the efficiency of storm-scale NWP models using an vertically implicit-explicit adaptive advection scheme. To be submitted to *Mon. Wea. Rev.* in November 2018.
69. Poterjoy, J., **L. J. Wicker**, and M. Buehner 2018: Progress in the development of a nonlinear data assimilation strategy for high-dimensional systems. Accepted to *Mon. Wea. Rev.* 20 September 2018.
68. Skinner, P. S., D. M. Wheatley, K. H. Knopfmeier, A. E. Reinhart, J. J. Choate, T. A. Jones, G. J. Creager, D. C. Dowell, C. R. Alexander, T. T. Ladwig, **L. J. Wicker**, P. L. Heinselman, P. Minnis, and R. Palikonda, 2018: Object-based verification of a prototype Warn-on-Forecast system. In press. **33**, 1225-1250. *Wea. Forecasting*. [PDF](#)
67. Weinhoff, Z. B., H. B. Bluestein, **L. J. Wicker**, J. C. Snyder, A. Shapiro, C. K. Potvin, J. B. Houser, D. W. Reif, 2018: Applications of a spatially variable advection correction technique for temporal correction of dual-Doppler analyses of tornadic supercells. *Mon. Wea. Rev.*, **146**, 2949-2971. [PDF](#)
66. Clark A., and co-authors, 2018: The Community Leveraged Unified Ensemble (CLUE) in the 2016 NOAA/Hazardous Weather Testbed Spring Forecasting Experiment. *Bull. Amer. Meteor. Soc.*, **99**, 1433-1448. [PDF](#).
65. Flora, M. L., C. Potvin, **L. J. Wicker**, 2018: Practical Predictability of Supercells: Exploring Ensemble Forecast Sensitivity to Initial Condition Spread. *Mon. Wea. Rev.*, **146**, 2361-2379. [PDF](#)
64. Stratman, D. R., C. Potvin, and **L. J. Wicker**, 2018: Correcting storm displacement errors in ensembles using the feature alignment technique (FAT). *Mon. Wea. Rev.*, **145**, 2125-2145. [PDF](#)
63. Coffey, B., M. D. Parker, J. M. Dahl, **L. J. Wicker**, and A. J. Clark, 2017: Volatility of tornadogenesis: An ensemble of simulated nontornadic and tornadic supercells in VORTEX2 environments. *Mon. Wea. Rev.*, **145**, 4605-4625. [PDF](#).
62. Betten, D. P., M. I. Biggerstaff, and **L. J. Wicker**, 2017: A trajectory mapping technique for the visualization and analysis of three-dimensional flows in supercell storms. *J. Atmos. Ocea. Tech.*, **34**, 33-49. [PDF](#)
61. Flyer, N. G. A. Barnett, and **L. J. Wicker**, 2016: Enhancing finite differences with radial basis functions: Experiments on the Navier-Stokes equations. *J. Comp. Physics*. **316**, 39-62. [PDF](#).
60. Skinner, P. S, **L. J. Wicker**, D. M. Wheatley, and K. H. Knopfmeier, 2016: Application of two spatial verification methods to ensemble forecasts of low-level rotation. *Wea. Forecasting*, **31**, 713-735. [PDF](#).
59. Orf, L., R. Wilhelmson, **L. J. Wicker**, 2016: Visualization of a simulated long-track EF5 tornado embedded within a supercell thunderstorm. *Para. Comp.*, **55**, 28-34. [PDF](#)

58. Skinner, P. S., C. C. Weiss, **L. J. Wicker**, C. K. Potvin, D. C. Dowell, 2015: Forcing mechanisms for an internal rear-flank downdraft momentum surge in the 18 May 2010 Dumas, Texas supercell. *Mon. Wea. Rev.*, **143**, 4305–4330. [PDF](#)
57. Sobash, R. A. and **L. J. Wicker**, 2015: On the impact of additive noise in storm-scale EnKF experiments. *Mon. Wea. Rev.*, **143**, 3067-3086. [PDF](#)
56. Yussouf, N., D. C. Dowell, **L. J. Wicker**, K. Knopfmeier, and D. M. Wheatley, 2015: Storm-scale data assimilation and ensemble forecasts for the 27 April 2011 severe weather outbreak in Alabama. *Mon. Wea. Rev.* **143**, 3044-3066. [PDF](#).
55. French, M. M., P. S. Skinner, **L. J. Wicker**, 2015: Documenting a rare tornado merger observed in the 24 May 2011 El Reno, Oklahoma, supercell. *Mon. Wea. Rev.*, **143**, 3025-3043. [PDF](#)
54. Thompson, T. E., **L. J. Wicker**, and X. Wang, 2015: A comparison between the local ensemble transform filter (LETKF) and the ensemble square-root filter (EnSRF) for the assimilation of Doppler radar data in convective-scale models. *Q. J. Roy. Meteor. Soc.*, **141**, 1163-1176. [PDF](#)
53. Johnson, A., X. Wang, J. Carley, **L. J. Wicker**, and C. Karstens, 2015: A comparison of multi-scale GSI-based EnKF and 3DVar data assimilation for mid-latitude convective scale precipitation forecasts. *Mon. Wea. Rev.*, **143**, 3087-3108, [PDF](#)
52. Tanamachi, R., P. L. Heinselman, and **L. J. Wicker**, 2015: Impacts of a storm merger on the 24 May 2011 El Reno, Oklahoma tornadic supercell. *Wea. Forecasting*. **30**, 501-524, [PDF](#)
51. Jones, T., D. Stensrud, **L. Wicker**, P. Minnis, and R. Palikonda, 2015: Simultaneous radar and satellite data storm-scale assimilation using an ensemble Kalman filter approach for 24 May 2011. *Mon. Wea. Rev.* **143**, 165–194, [PDF](#)
50. French, M., D. Burgess, E. Mansell, and **L. J. Wicker**, 2015: Bulk hook echo raindrop sizes retrieved using mobile, polarimetric Doppler radar observations. *J. Appl. Meteor. Climatology*, **54**, 423–450, [PDF](#)
49. Dahl, J., M. D. Parker and **L. J. Wicker**, 2014: The roles of ambient and storm-generated vorticity in the development of near-ground rotation in a simulated supercell. *J. Atmos. Sci.*, **71**, 3027-3051. [PDF](#)
48. Crowell, S., L. White, and **L. J. Wicker**, 2014: Estimation of near surface wind speeds in strongly rotating flows. *Appl. Math. Comp.*, **235C**, 201-211.
47. Dawson II, D. T., E. R. Mansell, Y. Jungsun, **L. J. Wicker**, M. R. Kumjian, and M. Xue 2014: Low-level Zdr signatures in supercell forward flanks: The role of size sorting and melting hail. *J. Atmos. Sci.*, **71**, 276-299. [PDF](#)
46. Dawson II, D. T., **L. J. Wicker**, E. R. Mansell, and M. Xue 2013: Low-level polarimetric radar signatures in EnKF analyses and forecasts of the 8 May 2003 Oklahoma City tornadic supercell:

Impact of multi-moment microphysics and comparisons with observations. *Advances In Meteorology*, Article ID 818394, 13 pp. [PDF](#)

45. Potvin, C. K., and **L. J. Wicker**, 2013: Correcting fast-mode pressure errors in storm-scale ensemble Kalman filter analyses. *Advances In Meteorology*, Article ID 624931, 14 pp. [PDF](#)
44. Yussouf N., E. R. Mansell, **L. J. Wicker**, D. M. Wheatley, D. C. Dowell, M. C. Coniglio and D. J. Stensrud, 2013: The ensemble Kalman filter analyses and forecasts of the 8 May 2003 Oklahoma city tornadic supercell storm using single and double moment microphysics schemes. *Mon. Wea. Rev.*, **141**, 3388-3412. [PDF](#)
43. Potvin, C. K., and **L. J. Wicker**, 2013: Assessing ensemble forecasts of low-level supercell rotation within an OSSE framework. *Wea. Forecasting*, **28**, 940–960, [PDF](#).
42. Potvin, C. K., **L. J. Wicker**, D. Betten, M. I. Biggerstaff, and A. Shapiro, 2013: Comparison between storm-scale dual-Doppler and EnKF wind analyses: The 29-30 May 2004 Geary, Oklahoma, supercell thunderstorm. *Mon. Wea. Rev.*, **141**, 1612-1628, [PDF](#).
41. Stensrud, D. J., **L. J. Wicker**, M. Xue, D. T. Dawson II, N. Yussouf, D. M. Wheatley, T. E. Thompson, N. A. Snook, T. M. Smith, A. D. Schenkman, C. K. Potvin, E. R. Mansell, T. Lei, K. M. Kuhlman, Y. Jung, T. A. Jones, J. Gao, M. C. Coniglio, H. E. Brooks, K. A. Brewster, 2013: Progress and Challenges with Warn-on-Forecast. *Atmospheric Research*. **123**, 2-16, [PDF](#)
40. Tanamachi, R., **L. J. Wicker**, D. C. Dowell, H. B. Bluestein, and M. Xue, 2013: Assimilation of high-resolution, mobile Doppler radar data into EnKF analyses of the 4 May 2007 Greensburg, Kansas supercell storm. *Mon. Wea. Rev.*, **141**, 625-648, [PDF](#)
39. Potvin, C. K., **L. J. Wicker**, 2012: Comparison between dual-Doppler and EnKF storm-scale wind analyses: Observing system simulation experiments with a supercell thunderstorm. *Mon. Wea. Rev.*, **140**, 3972–3991, [PDF](#).
38. Potvin, C. K., D. Betten, **L. J. Wicker**, M. I. Biggerstaff, K. Elmore, 2012: 3DVAR versus traditional dual-Doppler wind retrieval of a simulated supercell thunderstorm. **140**, 3847–3494. *Mon. Wea. Rev.*, [PDF](#)
37. Dahl, J., M. Parker and **L. J. Wicker**, 2012: Uncertainties in trajectory analyses within near-surface mesocyclones of simulated supercells. *Mon. Wea. Rev.*, **140**, 2959–2966. [PDF](#)
36. Thompson, T. E., **L. J. Wicker**, and X. Wang, 2012: Impact from a volumetric radar-sampling operator for radar velocity observations within EnKF supercell assimilation. *J. Atmos. Ocea. Tech.*, **29**, 1417-1427. [PDF](#)
35. Wurman, J., D.C. Dowell, Y. Richardson, P. Markowski, E. Rasmussen, D. Burgess, **L. J. Wicker**, and H.B. Bluestein, 2012: Verification of the Origins of Rotation in Tornadoes Experiment 2: VORTEX2. *Bull. Amer. Meteor. Soc.*, 1147-1170. [PDF](#)

34. Potvin, C. K., **L. J. Wicker**, and A. Shapiro, 2012: Assessing dual-Doppler kinematical and dynamical retrieval errors in supercell thunderstorms using OSS experiments. *J. Atmos. Ocea. Tech.*, **29**, 1009-1025. [PDF](#)
33. Dawson II, D. T., **L. J. Wicker**, E. R. Mansell, and R. L. Tanamachi, 2012: Impact from the environmental wind profile on ensemble forecasts of the 4 May 2007 Greensburg tornado and its associated mesocyclones. *Mon. Wea. Rev.* **140**, 696-712. [PDF](#)
32. Skinner, P. S., C. C. Weiss, J. L. Schroeder, **L. J. Wicker**, and M. I. Biggerstaff, 2011: Observations of the surface boundary structure within the 23 May, 2007 Perryton, Texas supercell. *Mon. Wea. Rev.*, **139**, 3730–3749. [PDF](#)
31. Dowell, D. C., **L. J. Wicker**, C. Snyder, 2011: Ensemble Kalman filter assimilation of radar observations of the 8 May 2003 Oklahoma City supercell: Influences of reflectivity observations on storm-scale analyses. *Mon. Wea. Rev.*, **139**, 272–294. [PDF](#)
30. Wandishin, M., D. Stensrud, S. Mullen, and **L. J. Wicker**, 2010: On the predictability of mesoscale convective systems: Three-dimensional simulations. *Mon. Wea. Rev.*, **138**, 863-885. [PDF](#).
29. Stensrud, D., M. Xue, **L. J. Wicker**, K. E. Kelleher, M. P. Foster, J. T. Schaefer, R. S. Schneider, S. G. Benjamin, S. S. Weygandt, J. T. Ferree, and J. P. Tuell, 2009: Convective-scale Warn on Forecast: A Vision for 2020. *Bull. Amer. Meteor. Soc.*, **90**, 1487–1499. [PDF](#)
28. **Wicker, L. J.**, 2009: A two-step Adams-Bashforth-Moulton split-explicit integrator for compressible atmospheric models. *Mon. Wea. Rev.*, **137**, 3588-3595. [PDF](#)
27. Crowell, S., D. Williams, C. Mavriplis, and **L. J. Wicker**, 2009: Comparison of Traditional and Novel Discretization Methods for Advection Models in Numerical Weather Prediction, G. Allen et al. (Eds.): ICCS 2009, Part II, Lecture Notes in Computational Science 5545, 263–272.
26. Dowell, D. C., and **L. J. Wicker**, 2009: Additive noise for storm-scale ensemble forecasting and data assimilation. *J. Atmos. Ocea. Tech.*, **26**, 911-927. [PDF](#)
25. French, M., H. B. Bluestein, D. C. Dowell, **L. J. Wicker**, M. R. Kramer, and A. L. Pazmany, 2009: An example of the use of mobile, Doppler radar data in tornado verification. *Wea. Forecasting*, **24**, 884–891. [PDF](#)
24. French, M., H. B. Bluestein, D. C. Dowell, **L. J. Wicker**, M. R. Kramer, and A. L. Pazmany, 2008: High-resolution, mobile, Doppler observations of cyclic mesocyclogenesis in a supercell. *Mon. Wea. Rev.*, **136**, 4997–5016. [PDF](#)
23. Wandishin, M., D. Stensrud, S. Mullen, and **L. J. Wicker**, 2008: On the predictability of mesoscale convective systems: Two-dimensional simulations. *Wea. Forecasting*, **23**, 773–785. [PDF](#)

22. Fierro, A. O, M. S. Gilmore, **L. J. Wicker**, E. R. Mansell, and J. M. Straka, 2006: Electrification and lightning in an idealized boundary-crossing supercell simulation of 2 June 1995. *Mon. Wea. Rev.*, **134**, 3149-3171.
21. Coniglio, M. C., D. J. Stensrud, and **L. J. Wicker**, 2006: Role of upper-level shear on the structure and maintenance of strong quasi-linear mesoscale convective systems. *J. Atmos. Sci.*, **63**, 1231–1252.
20. Biggerstaff, M. I., **L. J. Wicker**, J. Guynes, C. Ziegler, J. M. Straka, E. N. Rasmussen, A. Doggett IV, L. D. Carey, and J. L. Schroeder, 2005: The shared mobile atmospheric research and teaching (SMART) radar: A collaboration to enhance research and teaching. *Bull. Amer. Meteor. Soc.*, **86**, 1263-1274.
19. Dowell, D. C., C. R. Alexander, J. M. Wurman, and **L. J. Wicker**, 2005: Reflectivity patterns and wind-measurement errors in high-resolution radar observations of tornadoes. *Mon. Wea. Rev.*, **133**, 1501–1524.
18. Dowell, D. C., F. Zhang, **L. J. Wicker**, C. Snyder, and N. A. Crook, 2004: Wind and thermodynamic retrievals in the 17 May 1981 Arcadia, Oklahoma supercell: Ensemble Kalman filter experiments. *Mon. Wea. Rev.*, **132**, 1982-2005.
17. Peckham, Steven E., R. B. Wilhelmson, **L. J. Wicker**, and Conrad L. Ziegler, 2004: Numerical simulation of the interaction between the dryline and horizontal convective rolls. *Mon. Wea. Rev.*, **132**, 1792–1812.
16. Brooks, H., C. Doswell III, D. Dowell, R. Holle, B. Johns, D. Jorgensen, D. Schultz, D. Stensrud, S. Weiss, **L. J. Wicker**, and D. Zaras, 2003: Severe thunderstorms and tornadoes. Handbook of Weather, Climate, and Water: Dynamics, Climate, Physical Meteorology, Weather Systems, and Measurements. T. D. Potter and B. R. Colman, Eds., Wiley-Interscience, 575-619.
15. Gilmore, M. S., and **L. J. Wicker**, 2002: Influences of the local environment on supercell cloud-to-ground lightning, radar characteristics, and severe weather on 2 June 1995. *Mon. Wea. Rev.*, **130**, 2349-2372.
14. **Wicker, L. J.**, and W. C. Skamarock, 2002: Time-splitting methods for elastic models using forward time schemes. *Mon. Wea. Rev.* **130**, 2088–2097.
13. Wilhelmson, R. B, and **L. J. Wicker**, 2002: Numerical modeling of severe storms. *Meteor. Monogr.* C. A. Doswell III, Ed., American Meteorological Society, 123-166.
12. Peckham, S. E. and **L. J. Wicker**, 2000: The influence of topography and lower-tropospheric winds on dryline evolution. *Mon. Wea. Rev.*, **128**, 2165-2189.
11. Atkins, N. T., M. L. Weisman, **L. J. Wicker**, 1999: The influence of preexisting boundaries on supercell evolution. *Mon. Wea. Rev.*, **127**, 2910–2927.

10. **Wicker, L. J.**, and W. C. Skamarock, 1998: A time splitting scheme for the elastic equations incorporating second-order Runge-Kutta time differencing. *Mon. Wea. Rev.*, **126**, 1992–1999.
9. Gilmore, M., and **L. J. Wicker**, 1998: The influence of midtropospheric dryness on supercell morphology and evolution. *Mon. Wea. Rev.*, **126**, 943-958.
8. **Wicker, L. J.**, M. P. Kay, and M. P. Foster, 1997: STORMTIPE-95: A convective storm forecast experiment. *Wea. Forecasting*, **12**, 427-436.
7. Perez, A., **L. J. Wicker**, and R. E. Orville, 1997: Characteristics of cloud-to-ground lightning associated with violent tornadoes. *Weather and Forecasting*, **12**, 401-410.
6. Nielsen-Gammon, J. W., M. I. Biggerstaff, M. E. Alcorn, D. Austin, K. B. Bowman, D. Djuric, J. Guynes, R. White, and **L. J. Wicker**, 1996: Texas A&M university's laboratory for the exploration of atmospheric processes - TAMU's LEAP. *Bull. Amer. Meteor. Soc.*, **77**, 2907-2918.
5. **Wicker, L. J.**, and R. B. Wilhelmson, 1995: Simulation and analysis of tornado development and decay within a three-dimensional supercell thunderstorm. *J. Atmos. Sci.*, **52**, 2675-2703.
4. **Wicker, L. J.**, and R. B. Wilhelmson, 1993: Numerical simulation of tornadogenesis within a supercell thunderstorm. *The tornado: Its structure, dynamics, prediction, and hazards*. AGU Monograph Series, C. R. Church (Ed.). **79**, 75-88.
3. H. E. Brooks, **L. J. Wicker**, and C. A. Doswell III, 1993: STORMTIPE: A forecasting experiment using a three-dimensional cloud model. *Wea. Forecasting*, **8**, 352-362.
2. Straka, J. M., R. B. Wilhelmson, **L. J. Wicker**, J. A. Anderson, K. K. Droegemeier, 1993: Numerical solutions of a non-linear density current: A benchmark solution and comparisons. *International Journal of Numerical Methods in Fluids*, **17**, 1-22.
1. Wilhelmson, R. B., B. Jewett, C. Shaw, **L. J. Wicker**, M. Arrott, C. Bushnell, M. Bajuk, and J. Yost, 1990: A study of a numerically model severe storm. *International Journal of Supercomputing Applications*. **4**, **2**. Video Edition, 20-36.

## Service and Awards

- 2018: Editor for Journal of Atmospheric Sciences, American Meteorological Society.
- 2013: Guest editor for the special issue of Storm-Scale Radar Data Assimilation and High Resolution NWP, Advances in Meteorology
- 2002: Office of Oceanic and Atmospheric Research Outstanding Scientific Paper Award for the review article "Numerical modeling of severe local storms", by R. Wilhelmson and L. Wicker.



- 1989: “Study of a Numerically Modeled Severe Storm” received the First Place Visualization Award at “The Computer Graphics Film Festival 1989” held in London, England and subsequently was submitted for an Academy Award.

## External Funding History

NSF: VORTEX-II: Multiscale Analyses of Tornadic Storms Using Multiparameter Mobile Radar, Co-PI, (PI: Mike Biggerstaff), 2008-2011, \$902,000.

NSF: Development of C-band Mobile Polarimetric Radar, Co-PI, (PI: Mike Biggerstaff), 2007-2010, \$441,000 (with \$700,000 matching from NSSL and OU).

NSF: Collaborative Research: CMG: Adaptive High-Order Methods for Nonhydrostatic Numerical Weather Prediction, PI, 2005-2009 \$431,000.

NSF: Ensemble Kalman Filter Assimilation of Multisensor Observations from Convection for Storm-Scale Analysis, PI, 2003-2006 \$249,000.

NSF: Numerical and Observational Studies of Tornadic Supercells, PI, 1997-2000, \$351,000.

NSF: A Numerical Study of Parameters Controlling Tornado Longevity and Intensity in Supercells, PI, 1994-1997, \$305,000.

## Major collaborations and students supervised

- (i) Co-founded the Shared Mobile Atmospheric Research and Teaching (SMART) radar program, beginning at TAMU with Dr. Biggerstaff (TAMU) and Conrad Zeigler (NSSL) in 1998 and continued on at NSSL through the completion of the development of a dual-polarized C-band radar as well as organizing the development of a mobile polarized X-band radar system. (1998-2010).
- (ii) Was a Co-PI and on the steering committee for the NSF and NOAA sponsored field program, the second Verifications of the Origins of Tornadoes Experiment (VORTEX2). (2007-2010).
- (iii) *Current outside collaborators:* David Dowell (NOAA ESRL), Xuguang Wang (OU), Amy McGovern (OU), Howard Bluestein (OU), Bob Wilhelmson (University of Illinois), Leigh Orf (C. Michigan), George Bryan (NCAR), Johannes Dahl (N.C. State), William Skamarock (NCAR).
- (iv) *Thesis advisor for completed TAMU students:* Ph.D. (2) Steven Peckham, Mathew Gilmore. M.S. (5) Anthony Perez, Mathew Gilmore, Louis Cantrell, Michael Kay, San-Ok Han. *Thesis advisor for completed OU students:* Ph.D. (3) Sean Crowell (co-advised, OU Mathematics), Terra Thompson-Ladwig, Greg Barnett (co-advised with Colorado Univ. Applied Math) M.S. (4) Robert Carver, Alex Fierro, Dustin Williams, Terra Thompson-Ladwig. Total graduate students supervised through to their degree: 5 doctoral students and 9 masters students.
- (v) *Thesis advisor current:* None currently.
- (vi) *Post-doctoral researchers supervised:* (2) Dr. Daniel Dawson (2009-2011), Dr. Corey Potvin, (2010-2012), Dr. Michael French (2012-2014), Dr. Patrick Skinner (2013-2015)

## Synergistic Activities

- (i) Service at the Department of Atmospheric Sciences at Texas A&M University: Graduate Studies Committee (member 1993-1996), Undergraduate Advisor (1994-1999), Departmental Infrastructure Committee (1993-1999, chair for 1996-), Member of University Committee for Supercomputing (1993-1999), taught courses in atmospheric dynamics and modeling at both graduate and undergraduate levels, courses included, Special Topics in Non-hydrostatic Modeling, Quantitative Methods for the Atmospheric Sciences, Dynamic Meteorology, Introduction to Atmospheric Science, Convection. Developed the Quantitative Methods and Convection courses. Chaired 8 Ph.D. and M.S. committees, also served on another 13 graduate student committees while at TAMU.
- (ii) Professional Service: Member of the Severe Local Storms Committee for the American Meteorological Society 1993-1995, Co-Chaired the AMS 18th Conference on Severe Local Storms held in San Francisco CA, Feb. 1996, Member of the NCSA/Pittsburgh NSF Supercomputing Peer Review Allocation Committee, 1993 –1994. Participated with the NSF field experiment on the Verification of the Origins of Rotation in Tornadoes EXperiment (VORTEX) conducted during the springs of 1994-1995.
- (iii) Community Service: More than 3 dozen talks given to area public schools on severe storms and severe storm safety, over 80 interviews given to local, regional and national media on severe storms and tornadoes
- (iv) Other Activities: Invited visiting scientist at the Mesoscale and Microscale Meteorology division of the National Center for Atmospheric Research in Boulder, Colorado. Summer 1993-1998, invited visiting scientist to the German Meteorological Institute (DWD, Frankfurt) in October 1997.

## Education

- Ph.D. in Atmospheric Sciences  
*University of Illinois, August 1990*  
"A Numerical Study of a Tornado-Scale Vortex in a Three-Dimensional Cloud Model"  
Dissertation Advisor: Dr. Robert Wilhelmson
- M.S. in Meteorology  
*University of Oklahoma, June 1986*  
"A Simulation Study of a Data Assimilation Scheme Designed for VAS Temperature Soundings"  
Thesis Advisor: Dr. Tzvi Gal-Chen
- B.S. in Meteorology  
*University of Oklahoma, December 1984*

## Conference Papers and Abstracts (105)

1. Orf, L., R. B. Wilhelmson, L. J. Wicker, 2014: Visualization of a Simulated Long-Track EF5 Tornado Embedded Within a Supercell Thunderstorm. *J. Parallel Computing*, submitted April 30, 2015.
2. Orf, L., R. B. Wilhelmson, L. J. Wicker, 2014: Visualization of a Simulated Long-Track EF5 Tornado Embedded Within a Supercell Thunderstorm. *Supercomputing 2014*, New Orleans, LA, Nov 16-21, 2014.
3. Orf, L., R. B. Wilhelmson, L. J. Wicker, B. D. Lee, and C. A. Finley, 2014: Genesis and maintenance of a long-track EF5 tornado embedded within a simulated supercell, *27th Conf. on Severe Local Storms*, Madison, WI, Amer. Meteor. Soc.
4. Potvin, C. K., L. J. Wicker, 2014: Impact of Gaussian anamorphosis on EnKF analyses and forecasts of the 24 May 2011 Oklahoma tornadic supercells. *27th Conf. on Severe Local Storms*, Madison, WI, Amer. Meteor. Soc.
5. Thompson, T., G. Romine, L. Wicker, X. Wang, 2014: Multi-Scale Data Assimilation of the June 13, 2010 Tornadic Supercell Storm Environment during VORTEX2. *27th Conf. on Severe Local Storms*, Madison, WI, Amer. Meteor. Soc.
6. Skinner, P. S., L. J. Wicker, C. K. Potvin, P. L. Heinselman, 2014: High-resolution Ensemble Prediction of the 31 May 2013 El Reno, Oklahoma Supercell. *27th Conf. on Severe Local Storms*, Madison, WI, Amer. Meteor. Soc.
7. Potvin, C. K., L. J. Wicker, M. M. French, D. Burgess, 2014: Warn-on-Forecast sensitivity experiments with the 19 May 2013 Norman-Shawnee, OK, tornadic supercell, *27th Conf. on Severe Local Storms*, Madison, WI, Amer. Meteor. Soc.
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10. Yussouf, N. and L. J. Wicker, 2014: The Ensemble Kalman Filter Analyses and Forecasts of the 24 May 2011 Oklahoma Tornadic Supercell Storms. *Special Symposium on Severe Local Storms: The Current State of the Science and Understanding Impacts, Atlanta GA.*, Paper 233114
11. Cintineo, R., J. A. Otkin, T. A. Jones, S. Koch, L. J. Wicker, and D. J. Stensrud, 2014: Assimilation of satellite and radar observations in a convection-resolving Observing System

Simulation Experiment. *26th Conference on Weather Analysis and Forecasting & 22nd Conference on Numerical Weather Prediction, Atlanta GA.*, Poster 235400.

12. Dahl, B. A., C. K. Potvin, L. J. Wicker, R. A. Brown, A. McGovern, 2014: Dependence of Vortex Characteristics on Grid Resolution in Simulated Supercells. *12th Conference on Artificial and Computational Intelligence and its Applications to the Environmental Sciences, Atlanta GA.*, Paper 4.3
13. Potvin, C. K., L. J. Wicker, 2014: Sensitivity of simulated ensemble Kalman filter analyses and forecasts of low-level supercell rotation to environmental and physics parameterization errors. *26th Conference on Weather Analysis and Forecasting & 22nd Conference on Numerical Weather Prediction, Atlanta GA.*, Poster 235400.
14. Wicker, L. J., C. K. Potvin, T. E. Ladwig, D. J. Stensrud, and P. L. Heinselman, 2014: Improved Convective Scale Prediction from the Assimilation of Rapid-Scan Phased Array Radar Data. *26th Conference on Weather Analysis and Forecasting & 22nd Conference on Numerical Weather Prediction, Atlanta GA.*
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16. Orf, L., R. Wilhelmson, and L. J. Wicker, 2014: A Numerical Simulation of a Long-Track EF5 Tornado Embedded Within a Supercell. *Special Symposium on Severe Local Storms: The Current State of the Science and Understanding Impacts, Atlanta GA.*, Poster 242579.
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