David C. Dowell

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PROFESSIONAL EXPERIENCE

National Center for Atmospheric Research, Boulder, CO
Scientist I; MMM, RAL, and IMAGE; 2006-

Cooperative Institute for Mesoscale Meteorological Studies, Norman, OK
Research Scientist, 2004-2006

National Center for Atmospheric Research, Boulder, CO
Postdoctoral Fellow, ASP and MMM, 2001-2004

National Severe Storms Laboratory, Norman, OK
Postdoctoral Fellow, 2000-2001

University of Oklahoma, Norman, OK
Research and Teaching Assistant, 1991-1999

Motorola, Inc., Fort Worth, TX
Software Engineer, 1989-1991 (summers)

EDUCATION

University of Oklahoma, 2000
Ph.D. in Meteorology

University of Oklahoma, 1994
M.S. in Meteorology

Texas A&M University, 1991
B.S. in Computer Science (minor in Meteorology), summa cum laude

FORMAL PUBLICATIONS

Dowell, D. C., and L. J. Wicker, 2009: Additive noise for storm-scale ensemble data assimilation. *J. Atmos. Oceanic Technol*., **26**, 911-927.

Aksoy, A., D. C. Dowell, and C. Snyder, 2009: A multi-case comparative assessment of the

ensemble Kalman filter for assimilation of radar observations. Part I: Storm-scale analyses. *Mon. Wea. Rev*., in press.

Aksoy, A., D. C. Dowell, and C. Snyder, 2009: A multi-case comparative assessment of the ensemble Kalman filter for assimilation of radar observations. Part II: Short-range ensemble forecasts. *Mon. Wea. Rev*., in review.

Stensrud, D. J., N. Yussouf, D. C. Dowell, and M. C. Coniglio, 2009: Assimilating surface data into a mesoscale model ensemble: Cold pool analyses from spring 2007. *Atmospheric Research*, in press.

French, M. M., H. B. Bluestein, L. J. Wicker, D. C. Dowell, and M. R. Kramar, 2009: An example of the use of mobile, Doppler radar data for tornado verification. *Wea. Forecasting*, **24**, 883-890.

Wood, V. T., R. A. Brown, and D. C. Dowell, 2009: Simulated WSR-88D velocity and reflectivity signatures of numerically-modeled tornadoes. *J. Atmos. Oceanic Technol*., in press.

Macjen, M., P. Markowski, Y. Richardson, D. Dowell, and J. Wurman, 2008: Multipass objective analyses of Doppler radar data. *J. Atmos. Oceanic Technol*., **25**, 1845-1858.

Fujita, T., D. J. Stensrud, and D. C. Dowell, 2008: Using precipitation observations in a mesoscale short-range ensemble analysis and forecasting system. *Wea. Forecasting*, **23**, 357-372.

French, M. M., H. B. Bluestein, D. C. Dowell, L. J. Wicker, M. R. Kramar, and A. L. Pazmany, 2008: High-resolution, mobile, Doppler radar observations of cyclic mesocyclogenesis in a supercell. *Mon. Wea. Rev*., **136**, 4997-5016.

Fujita, T., D. J. Stensrud, and D. C. Dowell, 2007: Surface data assimilation using an ensemble Kalman filter approach with initial condition and model physics uncertainties. *Mon. Wea. Rev.*, **135**, 1846-1868.

Dowell, D. C., C. R. Alexander, J. M. Wurman, and L. J. Wicker, 2005: Centrifuging of hydrometeors and debris in tornadoes: Radar-reflectivity patterns and wind-measurement errors. *Mon. Wea. Rev.*, **133**, 1501-1524.

Dowell, D. C., F. Zhang, L. J. Wicker, C. Snyder, and N. A. Crook, 2004: Wind and temperature retrievals in the 17 May 1981 Arcadia, Oklahoma supercell: Ensemble Kalman filter experiments. *Mon. Wea. Rev.*, **132**, 1982-2005.

Davis, C. A., N. Atkins, D. Bartels, L. Bosart, M. Coniglio, G. Bryan, W. Cotton, D. Dowell, B. Jewett, R. Johns, D. Jorgensen, J. Knievel, K. Knupp, W.-C. Lee, G. McFarquhar, J. Moore, R. Przybylinski, R. Rauber, B. Smull, R. Trapp, S. Trier, R. Wakimoto, M. Weisman, and C. Ziegler, 2004: The Bow-Echo and MCV Experimement (BAMEX): Observations and opportunities. *Bull. Amer. Meteor. Soc*., **85**, 1075-1093.

Dowell, D. C., and A. Shapiro, 2003: Stability of an iterative dual-Doppler wind synthesis in Cartesian coordinates. *J. Atmos. Oceanic Technol*., **20**, 1552–1559.

Dowell, D. C., 2003: Tornadoes. *Handbook of Weather, Climate, and Water: Dynamics, Climate, Physical Meteorology, Weather Systems, and Measurements*, Wiley-Interscience, 597-604.

Wakimoto, R. M., H. Murphey, D. C. Dowell, and H. B. Bluestein, 2003: The Kellerville tornado during VORTEX: Damage survey and Doppler radar analyses. *Mon. Wea. Rev.,* **131**, 2197-2221.

Burgess, D. W., M. Magsig, J. Wurman, D. Dowell, and Y. Richardson, 2002: Radar observations of the 3 May 1999 Oklahoma City tornado. *Wea. Forecasting*, **17**, 456-471.

Dowell, D. C., and H. B. Bluestein, 2002: The 8 June 1995 McLean, Texas storm. Part I: Observations of cyclic tornadogenesis. *Mon. Wea. Rev.*, **130**, 2626-2648.

Dowell, D. C., and H. B. Bluestein, 2002: The 8 June 1995 McLean, Texas storm. Part II: Cyclic tornado formation, maintenance, and dissipation. *Mon. Wea. Rev.*, **130**, 2649-2670.

Markowski, P. M., E. N. Rasmussen, J. M. Straka, and D. C. Dowell, 1998: Observations of low-level baroclinity generated by anvil shadows. *Mon. Wea. Rev*., **126**, 2942-2958.

Bluestein, H. B., W. P. Unruh, D. C. Dowell, T. A. Hutchinson, T. M. Crawford, A. C. Wood, and H. Stein, 1997: Doppler-radar analysis of the Northfield, Texas tornado of 25 May 1994. *Mon. Wea. Rev*., **125**, 212-230.

Dowell, D. C., and H. B. Bluestein, 1997: The Arcadia, Oklahoma, storm of 17 May 1981: Analysis of a supercell during tornadogenesis. *Mon. Wea. Rev.,* **125**, 2562-2582.

Dowell, D. C., H. B. Bluestein, and D. P. Jorgensen, 1997: Airborne Doppler radar analysis of supercells during COPS-91. *Mon. Wea. Rev*., **125**, 365-383.

CONFERENCE PUBLICATIONS

Brown, R. A., V. T. Wood, and D. C. Dowell, 2008: Impact of a tornado's low-reflectivity eye on distorting the associated peak Doppler velocity measurements: A simulation study. *24th Conf. on Severe Local Storms*, Savannah, Georgia, Amer. Meteor. Soc., paper P3.5.

Marquis, J. N., Y. Richardson, J. Wurman, P. Markowski, and D. C. Dowell, 2008: Mobile radar observations of tornadic supercells with multiple rear-flank gust fronts. *24th Conf. on Severe Local Storms*, Savannah, Georgia, Amer. Meteor. Soc., paper 19.3.

Majcen, M., P. Markowski, Y. Richardson, D. Dowell, and J. Wurman, 2007: Multi-pass objective analyses of radar data: Preliminary results. *33rd Conf. on Radar Meteorology*, Cairns, Australia, Amer. Meteor. Soc., paper P13A.7.

Baldwin, M. E., K. L. Elmore, D. C. Dowell, T. Fujita, L. J. Wicker, and D. J. Stensrud, 2006: Challenges in comparing realistic, high-resolution spatial fields from convective-scale grids. *Symposium on the Challenges of Severe Convective Storms*, Atlanta, Georgia, Amer. Meteor. Soc., paper P1.28.

Wood, V. T., R. A. Brown, and D. C. Dowell, 2005: Simulated WSR-88D measurements of low-reflectivity eyes associated with tornadoes. *32nd Conf. on Radar Meteorology*, Albuquerque, New Mexico, Amer. Meteor. Soc., paper P15R.6.

French, M. M., H. B. Bluestein, D. C. Dowell, L. J. Wicker, M. R. Kramar, and A. L. Pazmany, 2005: The 15 May 2003 Shamrock, Texas supercell: A dual-Doppler analysis and EnKF data-assimilation experiment. *32nd Conf. on Radar Meteorology*, Albuquerque, New Mexico, Amer. Meteor. Soc., paper 10R.2.

Burgess, D. W., D. C. Dowell, L. J. Wicker, and A. Witt, 2005: Detailed comparison of observed and modeled tornadogenesis. *32nd Conf. on Radar Meteorology*, Albuquerque, New Mexico, Amer. Meteor. Soc., paper 10R.4.

Fujita, T., D. J. Stensrud, and D. C. Dowell, 2005: Surface data assimilation using an ensemble Kalman filter approach with initial condition and model physics uncertainties. *11th Conf. on Mesoscale Processes*, Albuquerque, New Mexico, Amer. Meteor. Soc., paper 1M.3.

Dowell, D. C., L. J. Wicker, and David J. Stensrud, 2004: High resolution analyses of the 8 May 2003 Oklahoma City storm. Part II: EnKF data assimilation and forecast experiments. *22nd Conf. on Severe Local Storms*, Hyannis, Massachusetts, paper 12.5.

Wicker, L. J., and D. C. Dowell, 2004: High resolution analyses of the 8 May 2003 Oklahoma

City storm. Part III: An ultra-high resolution forecast experiment. *22nd Conf. on Severe Local Storms*, Hyannis, Massachusetts, paper 12.6.
French, M. M., H. B. Bluestein, D. C. Dowell, L. J. Wicker, M. R. Kramar, and A. L. Pazmany, 2004: Mobile, dual-Doppler analysis of tornadogenesis: The 15 May 2003 supercell in Shamrock, Texas. *22nd Conf. on Severe Local Storms*, Hyannis, Massachusetts, paper P10.3.
Magsig, M. A., and D. C. Dowell, 2004: Evolution of the hook echo and low-level rotation in the 17 May 2000 Brady, NE supercell. *22nd Conf. on Severe Local Storms*, Hyannis, Massachusetts, paper 14.3.
Crook, N. A., D. C. Dowell, J. Sun, and Y. Zhang, 2004: Assimilation of radar observations of a supercell storm using 4DVar: Parameter retrieval experiments. *22nd Conf. on Severe Local Storms*, Hyannis, Massachusetts, paper 8A.2.
Wood, V. T., D. C. Dowell, and R. A. Brown, 2004: Simulated WSR-88D measurements of a tornado having a weak reflectivity center. *22nd Conf. on Severe Local Storms*, Hyannis, Massachusetts, paper P7.4.
Dowell, D., F. Zhang, L. Wicker, C. Snyder, W. Skamarock, and A. Crook, 2002: Wind and thermodynamic retrievals in a supercell thunderstorm: Ensemble Kalman filter results. *Preprints, 15th Conf. on Numerical Weather Prediction*, San Antonio, Texas, 375-378.
Dowell, D. C., Y. P. Richardson, and J. M. Wurman, 2002: Observations of the formation of low-level rotation: The 5 June 2001 Sumner County, Kansas tornado. *Preprints, 21st Conf. on Severe Local Storms*, San Antonio, Texas, 465-468.
Dowell, D. C., L. J. Wicker, and A. Shapiro, 2001: Thermodynamic retrieval experiments with a 2-D model. *Preprints, 30th Conf. on Radar Meteorology*, Munich, Germany, 191-193.
Dowell, D. C., J. Wurman, and L. J. Wicker, 2001: Centrifuging of scatterers in tornadoes. *Preprints, 30th Conf. on Radar Meteorology*, Munich, Germany, 307-309.
Dowell, D. C., and H. B. Bluestein, 2000: Conceptual models of cyclic supercell tornadogenesis. *Preprints, 20th Conf. on Severe Local Storms*, Orlando, Florida, 259-262.
Dowell, D. C., and H. B. Bluestein, 1999: Dual-Doppler analysis of non-simultaneous observations. *Preprints, 29th Conf. on Radar Meteorology*, Montreal, Quebec, 529-532.
Dowell, D. C., and H. B. Bluestein, 1997: Cyclic tornadogenesis observed. *Preprints, 28th Conf. on Radar Meteorology,* Austin, Texas, 524-525.
Dowell, D. C., and H. B. Bluestein, 1996: Dual-Doppler analysis of a tornadic supercell: The Arcadia, OK storm of 17 May 1981. *Preprints, 18th Conf. on Severe Local Storms*, San Francisco, California, 413-417.
Dowell, D. C., and H. B. Bluestein, 1993: A comparative study of two supercells: Airborne Doppler analyses. *Preprints, 17th Conf. on Severe Local Storms*, St. Louis, Missouri, 262-266.
Dowell, D. C., H. B. Bluestein, D. O. Blanchard, and D. P. Jorgensen, 1993: Airborne Doppler radar analysis of an Oklahoma supercell. *Preprints, 26th Conf. on Radar Meteorology*, Norman, Oklahoma, 212-214.

PRESENTATIONS

"Thunderstorm simulations verified with dual-polarization, dual-Doppler radar data and total-lightning observations", National Weather Center, Norman, OK, 29 April 2009
"Simulation of real thunderstorms and verification with dual-polarization, dual-Doppler radar

data and total-lightning observations", Cloud Physics Across Scales happy hour, NCAR, Boulder, CO, 10 April 2009

"Ensemble Forecasts of Severe Convective Storms", 24th Conf. on Severe Local Storms, Savannah, GA, 29 October 2008

"Influences of Surface-Data Assimilation on Ensemble Forecasts of Convection Initiation", 3rd Ensemble Data Assimilation Workshop, Marble Falls, TX, 7 April 2008

"WRF Mesoscale and Storm-Scale Ensemble Analyses and Forecasts for Severe Weather Cases in 2007", National Weather Center, Norman, OK, 1 April 2008

"Adventures with Ensemble Forecasting of Convection Initiation", STEP-IHOP Retrospective Workshop, NCAR, Boulder, CO, 6 March 2008

"Mesoscale WRF Surface-Data Assimilation: Spring 2007 Experiments at the National Severe Storms Laboratory", WRF Users' Workshop, NCAR, Boulder, CO, 2007

"The Severe Weather Analysis and Prediction Group at NSSL: An Overview and Some Critical Issues", National Severe Storms Laboratory, Norman, OK, 2006

"Numerical Analysis and Prediction of Thunderstorms", National Center for Atmospheric Research, Boulder, CO, 2005

"Assimilating Reflectivity Observations of Convective Storms into Convection-Permitting NWP Models", WWRP Symposium on Nowcasting and Very Short Range Forecasting, Toulouse, France, 2005

"Three Presentations on 8 May 2003", National Severe Storms Laboratory, Norman, OK, 2004

22nd Conf. on Severe Local Storms, Hyannis, Massachusetts, 2004

"Reflectivity Patterns and Wind-Measurement Errors in High-Resolution Radar Observations of Tornadoes", National Severe Storms Laboratory, Norman, OK, 2004

"EnKF Data Assimilation for Storm-Scale Analysis", National Center for Atmospheric Research, Boulder, CO, 2004

"Supercell Tornadogenesis: Observations", COMET Mesoscale Analysis and Prediction course, Boulder, CO, 2003

"Retrievals of Wind and Temperature Fields within Convective Scale Phenomena from Doppler Radar Observations", National Severe Storms Laboratory, Norman, OK, 2002

"Retrievals of Wind and Temperature Fields within Convective Scale Phenomena from Doppler Radar Observations", Texas A&M University, College Station, TX, 2002

"Observations of Tornadogenesis", COMET Mesoscale Analysis and Prediction course, Boulder, CO, 2002

21st Conf. on Severe Local Storms, San Antonio, TX, 2002

15th Conf. on Numerical Weather Prediction, San Antonio, TX, 2002

"Weather", University of Colorado, Boulder, CO, 2001

21st Conf. on Radar Meteorology, Munich, Germany, 2001

20th Conf. on Severe Local Storms, Orlando, FL, 2000

"Cyclic Tornadogenesis", National Center for Atmospheric Research, Boulder, CO, 2000

29th Conf. on Radar Meteorology, Montreal, Quebec, 1999

"A Pseudo-Dual-Doppler Analysis of Cyclic Tornadogenesis", Texas A&M University, 1999

19th Conf. on Severe Local Storms, Minneapolis, MN, 1998

28th Conf. on Radar Meteorology, Austin, TX, 1997

18th Conf. on Severe Local Storms, San Francisco, CA, 1996

"A Tale of Two Supercells", University of Oklahoma, Norman, OK, 1993

17th Conf. on Severe Local Storms, St. Louis, MO, 1993

26th Conf. on Radar Meteorology, Norman, OK, 1993

LEADERSHIP, SERVICE, AND AWARDS

Verification of the Origins of Rotation in Tornadoes Experiment 2 (VORTEX2) 2009-10

- Description: a multi-agency $10 million field program to investigate tornado genesis, maintenance, and demise; near-ground winds in tornadoes; relationships between tornadic storms and their environments; and numerical prediction of supercells and tornadoes
- Steering Committee member
  - co-wrote NSF proposals: Scientific Program Overview, Experiment Design Overview, and Facility Request
  - co-wrote Operations Plan
  - coordinated project planning
  - organized all-PI 2-day planning meeting (Boulder, CO, February 2009)
  - organized student-led mission reviews, involving approximately 30 students
- Field Coordinator
  - selected target storms and coordinated deployment of approximately 40 mobile platforms

Consolidated Storm Prediction for Aviation (CoSPA)

- organized NCAR/RAL and NOAA/ESRL/GSD collaborative meetings

Co-Chair, 24th AMS Severe Local Storms Conference, Savannah, GA (2008)

AMS Severe Local Storms Program Committee (2002-present)

Co-Chair, 3rd Ensemble Data Assimilation Workshop, Marble Falls, TX (2008)

Associate Editor, *Monthly Weather Review* (2008-)

Subject Matter Editor, *Bulletin of the American Meteorological Society* (2005-2008)

Advisory committee member: 4 PhD students, 1 MS student

National Collegiate Weather Forecasting Contest (3rd place overall in 1996-97)

PROPOSALS AND GRANTS

"Project VORTEX2: Investigation of storm-scale baroclinity using fine-scale observations and numerical models", C. Weiss PI (Texas Tech University), D. Dowell Co-PI, $645 K, approved by the National Science Foundation April 2008.

"Real-time 0-6 hour convective precipitation forecasting with a WRF ensemble" (original title) / "Retrospective 0-6 hour convective precipitation forecasting with a WRF ensemble" (revised title), submitted to USWRP/STEP. Status: $32 K awarded November 2007.

"Improved mesoscale initialization through ensemble Kalman filter assimilation of surface observations", submitted to Air Force Weather Agency. Status: $49 K awarded August 2007.

"Verification of the Origins of Rotation in Tornadoes Experiment: VORTEX2", Science Program Overview and Experiment Design Overview, Co-PI, submitted to the National Science Foundation. Status: approved July 2007.

"Collaborative Research: Study of the Genesis, Evolution, Structure, and Dynamic Climatology of Tornadoes and their Environments", PI (University of Oklahoma), submitted to the National Science Foundation. Status: $265 K awarded 2005-2007.