

Curriculum Vitae

ROBERT JEFFREY TRAPP

Department of Atmospheric Sciences
University of Illinois at Urbana-Champaign
1301 West Green Street
Urbana, Illinois 61801
jtrapp@illinois.edu

EDUCATION

The University of Oklahoma, Ph.D. in Meteorology, 1994
Dissertation: *Numerical Simulation of the Genesis of Tornado-Like Vortices*
Principal Advisor: Prof. Brian H. Fiedler

Texas A&M University, M.S. in Meteorology, 1989
Thesis: *The Effects of Cloud Base Rotation on Microburst Dynamics-A Numerical Investigation*
Principal Advisor: Prof. P. Das

University of Missouri-Columbia, B.S. in Agriculture/Atmospheric Science, 1985

APPOINTMENTS

Faculty Fellow, National Center for Supercomputing Applications, University of Illinois Urbana-Champaign, May 2024-current.

Scientific Visitor, Institute of Geography, and Oeschger Centre for Climate Change Research, Universität Bern, Bern, Switzerland, January 2024-August 2024.

Director, School of Earth, Society and Environment, University of Illinois Urbana-Champaign, August 2023-current.

Head, Department of Atmospheric Sciences, University of Illinois Urbana-Champaign, August 2018-August 2023.

Professor, Department of Atmospheric Sciences, University of Illinois Urbana-Champaign, August 2014-current.

Professor, Department of Earth and Atmospheric Sciences, Purdue University, August 2010-July 2014.

Scientific Visitor, School of the Environment, University of Leeds, UK, January 2010-July 2010

Associate Professor, Department of Earth and Atmospheric Sciences, Purdue University, August 2003-August 2010

Research Scientist, Cooperative Institute for Mesoscale Meteorological Studies, University of Oklahoma, and National Severe Storms Laboratory, July 1996-July 2003

Visiting Scientist, National Center for Atmospheric Research, Mesoscale and Microscale

Meteorology Division, August 1998-December 2002

National Research Council Postdoctoral Research Fellow, at the National Severe Storms Laboratory, July 1994-June 1996

GRANTS AND FUNDING

●CURRENT AND PAST

Principal Investigator: *Forcings, characteristics, and loadings of damaging winds in derechos and other high-impact thunderstorm events*, NSF-CMMI, \$399,851, 2023-2024.

Principal Investigator: *Understanding the impact of the lower stratospheric thermodynamic environment on observed overshooting top characteristics*. NASA, \$150,000, 2022-2025.

Principal Investigator: *Geospatial predictive analysis of damaging wind and hail occurrences in the lower 48 states and Canada*. Aon Inc. (Aon Risk Consultants), \$418,991, 2022-2023.

Principal Investigator: *Collaborative Research: Propagation, Evolution and Rotation in Linear Storms (PERiLS)*, NSF-AGS, \$1,759,335, 2020-2024.

Principal Investigator: *Toward an improved understanding of tornado formation within quasi-linear convective systems (QLCSs)*, NOAA, \$282,718, 2020-2022.

Principal Investigator, *Deep convective updraft populations in organized and unorganized systems across the globe*, NASA, \$507,569, 2020-2023.

Principal Investigator, *Study of Convective Hazards under Anthropogenic Climate Change using innovative approaches*, NSF-AGS, \$741,462, 2019-2022.

Principal Investigator, *Modulation of convective-draft characteristics and subsequent tornado intensity by the environmental wind and thermodynamics within the Southeast U.S*, NOAA, \$287,529, 2017-2019.

Principal Investigator, *Collaborative Research: Remote sensing of electrification, lightning, and mesoscale/microscale processes with adaptive ground observations during RELMPAGO*, NSF-AGS, \$636,947, 2017-2021.

Co-Investigator, *Remote sensing of electrification, lightning, and mesoscale/microscale processes with adaptive ground observations (RELMPAGO)*, NSF-AGS, \$23,940, 2016–2017.

Principal Investigator, *A Bottom-up Approach to Improve the Representation of Deep Convective Clouds in Weather and Climate*, DOE-ASR, \$555,802, 2015-2017.

Principal Investigator, *Collaborative Research: Improved understanding of convective-storm predictability and environment feedbacks from observations during the Mesoscale Predictability Experiment (MPEX)*, NSF 1230085-AGS, \$440,200, 2012-2015.

Co-Investigator, *Assessment and Recommendations for Using High-Resolution Weather Information to Improve Winter Maintenance Operations*. IN Department of Transportation, \$147,346, 2012-2013.

Principal Investigator, Supplement to *Collaborative Research: Multi-scale and Multi-Platform Study of Tornadoes, Supercell Thunderstorms, and their Parent Environments in VORTEX2*, NSF grant ATM-0758588, \$6032, 2009-2012.

Principal Investigator, *The DOW Radar Observations at Purdue study (DROPs)*, NSF Facilities for Education, \$21,680 (to the Center for Severe Weather Research, J. Wurman), 2009.

Co-Investigator, *The Application of a Successful Research-Based Laboratory Model to Atmospheric Science*, NSF CCLI, \$150,000, 2009-2011.

Principal Investigator, *The Response of Convective Precipitating Storms to Anthropogenically Enhanced Global Radiative Forcing*, NSF grant ATM-0756624, \$616,112, 2008-2011.

Principal Investigator, *Collaborative Research: Multi-scale and Multi-Platform Study of Tornadoes, Supercell Thunderstorms, and their Parent Environments in VORTEX2*, NSF grant ATM-0758588, \$57,769, 2008-2012.

Co-Investigator, *An experimental, real-time prediction system for high-impact convective weather events*, UCAR/COMET Cooperative Research Project, \$46,405, 2007-2008.

Principal Investigator, *Sub-daily scale extreme precipitation in future climate-change scenarios*, NSF grant ATM-0541491, \$275,075, 2006-2008.

Principal Investigator: *Equipment to Enhance the Capacity to Process and Disseminate Value-Added Weather Data at Purdue University*, Unidata/UCAR, \$7000, 2005.

Principal Investigator, *Quantification of damaging wind characteristics in tornadoes*, Purdue Research Foundation, \$13,776, 2005-2006.

Principal Investigator: *Collaborative research: Damage analysis and numerical simulation of convectively driven wind events during BAMEX*, NSF grant ATM-0233344, \$368,115, 2003-2006.

Principal Investigator: *The formation and climatological distribution of tornadoes within quasi-linear convective systems*, NSF grant ATM-0100016, \$175,204, 2001-2003.

Principal Investigator: *An evaluation of the warning utility of tornadic vortex signatures detected by WSR-88D radars*, UCAR/COMET Cooperative Research Project, Subaward UCAR S97-86995 \$26,000, 1997-1998.

●UNDER CONSIDERATION

Principal Investigator: *Multi-year to decadal variability and predictability of tornado activity in the United States*, NOAA, \$598,377, 2024-2027.

Principal Investigator: *Convective updraft modes and their interrelationships with convective system formation and evolution*, DOE, \$651,239, 2024-2027.

PROFESSIONAL ACTIVITIES

●SELECTED ACTIVITIES

Member, Honors Council, College of Liberal Arts and Sciences, University of Illinois, 2024-present

Member, Advisory Board, Institute for Sustainability, Energy, and Environment, University of Illinois, 2023-present

Co-Chair, 23rd Biennial Joint AMS/AGU Heads and Chairs Meeting, Boulder, CO, 2022

Co-Director, Extreme Weather Resilience Center (EWRC), University of Illinois, 2022-present

Co-Principal Investigator, PERiLS (Propagation, Evolution, and Rotation in Linear Storms), 2022-2023

Executive Officer, FARM (Flexible Array of Radars and Mesonets) facility, 2021-2023

Co-Chair, 22nd Biennial Joint AMS/AGU Heads and Chairs Meeting, (online) 2020.

Member, DOE ARM Science Board, 2018-2019

Member, Executive Committee, School of Earth, Society, Environment, 2017-2023

Contributing Author, 4th U.S. National Climate Assessment Report, 2016-2017

Co-Principal Investigator, RELAMPAGO (Remote sensing of electrification, lightning, and mesoscale/microscale processes with adaptive ground observations), 2018

Invited Participant, NAS Workshop on Extreme Weather Events and Climate Change Attribution, 2015

Co-Principal Investigator, MPEX (Mesoscale Predictability EXperiment), 2013

Member, Developmental Testbed Center (DTC) Science Advisory Board, 2013-2016

Invited Participant, NOAA Climate Science Challenge Workshop on Regional Climate Variability and Change, 2011

Associate Head, Department of Earth and Atmospheric Sciences, Purdue University, 2010-2013

Editor, *Monthly Weather Review*, 2008-2010

Member, University Corporation for Atmospheric Research (UCAR) President Advisory Council on University Relations, 2009-2015

Member, National Center for Atmospheric Research (NCAR) Observing Facilities Assessment Panel, 2010-2015

Invited Participant, Workshop on Progress and Priorities of US Weather Research and Research-to-Operations Activities, sponsored by the Board on Atmospheric Sciences and Climate, National Academy of Science, 2009

Contributing Author, U.S. Climate Change Science Program, Synthesis and Assessment Product 3.3, "Weather and Climate Extremes in a Changing Climate", 2007

Faculty Advisor, Purdue University Meteorological Association (PUMA), 2003-2007

Co-Principal Investigator, VORTEX2 (Verification of the Origins of Rotation in Tornadoes EXperiment-2), 2009-2010

Participant, NOAA Hazardous Weather Testbed - Experimental Forecast Program, 2005, 2007

Member, Executive Committee, Purdue Climate Change Research Center, 2007-2010.

Associate Editor, *Weather and Forecasting*, 2001-2003

Associate Editor, *Monthly Weather Review*, 2002-2003; 2006-2007

Co-Principal Investigator, BAMEX (Bow echo and MCV Experiment), 2003

Co-Principal Investigator, IPEX (Intermountain Precipitation Experiment), 2000

Chair, AMS Scientific and Technological Activities Committee on Severe Local Storms, 2001-2003; Member, 1999-2000

Chair, program committee, 20th AMS *Conference on Severe Local Storms*, 1999-2000; Member, program committees, 1998; 2002; 2004

Session chair: 18th, 19th, 20th, 22nd, 24th, 25th AMS *Conferences on Severe Local Storms*

Research mentor, SOARS (Significant Opportunities in Atmospheric Research and Science), 1999, 2000

Chair, program committee, *Golden Jubilee Symposium on Tornado Forecasting*, 1998

TEACHING

Introduction to Atmospheric Science, Geosciences in the Cinema, Science of the Atmosphere, Atmospheric Dynamics I, Atmospheric Dynamics II, Radar Meteorology, Weather Analysis and Forecasting, Climate and Extreme Weather Seminar, Mesoscale Meteorology, Meteorological Observations and Measurements, Numerical Modeling of Convective Clouds and Storms, Mesoscale Observations and Analysis, Introduction to Atmospheric Sciences Research, Spring Break Field Course, Dynamics of Convective Clouds and Storms, Professional Development, Mesoscale Dynamics, Dynamic Meteorology

PURDUE TEACHING HONOR ROLL: Spring 2004, Fall 2004, Spring 2005, Fall 2005, Spring 2006, Fall 2006, Spring 2007, Fall 2007, Spring 2008, Fall 2008, Spring 2009, Fall 2010, Spring 2011, Fall 2011, Spring 2012, Fall 2012, Spring 2013, Fall 2013, Spring 2014

UIUC LIST OF TEACHERS RANKED AS EXCELLENT: Fall 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2021, Fall 2021, Spring 2022, Fall 2022, Spring 2023

STUDENTS ADVISED

● CURRENT (GRADUATE):

Michael Sessa – Ph.D, anticipated August 2024
Songning Wang – Ph.D., anticipated May 2025

Eddie Wolff – Ph.D., anticipated May 2026 (co-advised)
Melinda Berman – Ph.D., anticipated May 2026 (co-advised)
Matthew Graber – M.S., anticipated August 2024 (co-advised)

● PAST (GRADUATE):

Elaine Godfrey – M.S., received December 2003 (co-advised, Univ. of Oklahoma)
Dustan Wheatley - M.S., received May 2004 (Purdue University)
Brooke Halvorson – M.S., received July 2006 (Purdue University)
Kent Knopfmeier – M.S., received May 2007 (Purdue University)
Dustan Wheatley – Ph.D., received December 2007 (Purdue University)
Karen Kosiba – Ph.D., received May 2009 (Purdue University)
Nathan Hitchens – Ph.D., received December 2010 (Purdue University)
Eric Robinson – Ph.D., received December 2012 (Purdue University)
Mallie Toth – M.S., received December 2012 (Purdue University)
Joe Woznicki – M.S., received August 2014 (Purdue University)
Dereka Carroll – M.S., received August 2014 (Purdue University)
Kim Hoogewind – Ph.D., received December 2016 (co-advised, Purdue University)
Geoff Marion – M.S., received May 2017
Logan Dawson – Ph.D., received August 2017 (Purdue University)
Adam Stepanek – Ph.D., received August 2017 (Purdue University)
Dereka Carroll-Smith – Ph.D., received July 2018
Jake Mulholland – Ph.D., received July 2019 (co-advised)
Devin Chehak – M.S., May 2020
Michael Sessa – M.S., May 2020
Geoff Marion – Ph.D., May 2021
Max Grover – M.S., May 2021
Matt Woods – M.S., August 2021
Seth Goodnight – M.S., May 2022
Songning Wang – M.S., May 2022
Sophie Orendorf – M.S., May 2022 (co-advised)
Melinda Berman – M.S., May 2023 (co-advised)
Eddie Wolff – M.S., August 2023 (co-advised)
Leanne Blind-Doskocil – M.S., August 2023 (co-advised)
Gabbie Christo – M.S., May 2024
Kyle Killion – M.S., May 2024

● SERVICE ON GRADUATE COMMITTEES:

Angela Lese - M.S., received December 2003 (Purdue University)
Jonathan Chamberlain – M.S., received May 2004 (Purdue University)
Hong-bing Zhang - M.S., received December 2004 (Purdue University)
Aisha Reed – M.S., received December 2005 (Purdue University)
Justin Stachnik – M.S., received August 2007 (Purdue University)
Kevin Vermeesch – M.S., received August 2007 (Purdue University)
Colleen Henry – Ph.D., received May 2008 (Purdue University)
Megan Walker – M.S., received July 2008 (Purdue University)
Dan Arthur – M.S., received May 2009 (Purdue University)
Erin Jones – M.S., received July 2009 (Purdue University)
Moetasim Ashfaq – Ph.D., received July 2009 (Purdue University)

Yi-Chi Wang – Ph.D., received May 2012 (Purdue University)
Jacob Carley – Ph.D., received May 2013 (Purdue University)
Cecille Villanueva Birriel – Ph.D., received May 2013 (Purdue University)
Daniel Moser, Ph.D., received December 2017
Emily Janssen-Schlie, Ph.D., received December 2017
Gan Zhang, Ph.D., received May 2018
Emily Hogan, Ph.D., received May 2018
Doug Miller, Ph.D., received December 2020
Piyush Garg, Ph.D., received May 2021
IT Singh, Ph.D., received May 2022
Holly Mallinson, Ph.D., received May 2023
Kevin Gray, Ph.D., received August 2023
Troy Zaremba, Ph.D., received August 2023

HONORS AND AWARDS

Gilbert F. White Distinguished Award, American Geophysical Union, 2022
Fellow, American Meteorological Society, elected 2020
Blue Waters Professor, University of Illinois at Urbana-Champaign, 2014-2022
Discovery Park Research Fellow, Purdue University, 2013
University Faculty Scholar, Purdue University, 2010
Outstanding Teacher in the College of Science, Purdue University, 2007
NOAA/Cooperative Institute for Mesoscale Meteorological Studies, Outstanding Paper Award, 2005
NOAA/Environmental Research Laboratory, Outstanding Paper Award, 2002
NOAA/Environmental Research Laboratory, Outstanding Paper Award, 2000

PROFESSIONAL SOCIETY MEMBERSHIPS

American Association for the Advancement of Science
American Meteorological Society
American Geophysical Union
Sigma Xi

PUBLICATIONS

● BOOKS

Trapp, R.J., 2013: *Mesoscale-Convective Processes in the Atmosphere*, Cambridge University Press, 346 pp.

● FORMAL, IN REVIEW:

Blind-Doskocil, L., **R. J. Trapp**, S. W. Nesbitt, M. Parker, K. A. Kosiba, J. Wurman, and J. Aikins, 2024: Characteristics of tornadic and nontornadic QLCS mesovortices observed using radar and pod Ddata from PERiLS, *Weather and Forecasting*, in review.

Killion, K. J., **R. J. Trapp**, and F. T. Lombardo, 2024: Quantification of mechanisms for damaging wind generation in simulated derecho events. *Weather and Forecasting*, in review.

Christo, G., **R. Trapp**, S. Nesbitt, L. Di Girolamo, E. C. Wolff, and C. R. Homeyer, 2024: The spatial area and other attributes of GOES-16 overshooting tops as indicators of potential hail. *Monthly Weather Review*, in revision.

Buckingham, T. J., D. M. Schultz, P. M. Markowski, and **R. J. Trapp**, 2024: Two Archetypes of Tornadic Quasilinear Convective Systems in the United Kingdom: Relevance of Horizontal Shearing Instability to Vortexgenesis and Maintenance, *Quarterly Journal of the Royal Meteorological Society*, in revision.

Wolff, E. C., **R. J. Trapp**, S. W. Nesbitt, M. D. Parker, K. A. Kosiba, and J. Wurman, 2024: On discrete convective updrafts and tornadoes in quasi-linear convective systems, *Weather and Forecasting*, in revision.

Sessa, M. F., and **R. J. Trapp**, 2023: The prediction of potential tornado intensity using machine learning. *Artificial Intelligence for the Earth Systems*, in revision

Grover, M. A., **R. J. Trapp**, S. W. Nesbitt, K. A. Kosiba, L. Di Girolamo, K. M. Bedka, and M. T. Berman, 2023: Observational support of the relationship between midlevel updraft characteristics and overshooting tops, *Journal of Geophysical Research-Atmospheres*, in revision.

● FORMAL, IN PRINT OR PRESS:

1. Gopalakrishnan, D., C. Cuervo-Lopez, J. T. Allen, R. J. Trapp, and E. Robinson 2024: A comprehensive evaluation of biases in convective-storm parameters in CMIP6 models over the Unites States. *Journal of Climate*, accepted and in press.
2. Kosiba, K. A., A. W. Lyza, **J. Trapp**, and others, 2024: The Propagation, Evolution, and Rotation in Linear Storms (PERiLS) Project. *Bulletin of the American Meteorological Society*, accepted and in press.
3. Graber, M., **R. Trapp**, and Z. Wang, 2024: The Regionality and Seasonality of Tornado Trends in the United States, *npj Climate and Atmospheric Science*, **7**.
<https://doi.org/10.1038/s41612-024-00698-y>
4. Berman, M. T., **R. J. Trapp**, S. W. Nesbitt, and L. Di Girolamo, 2024: The observed impact of the upper tropospheric/lower stratospheric thermodynamic environment on overshooting top characteristics during the RELAMPAGO-CACTI field campaign. *Journal of Geophysical Research-Atmospheres*, DOI:10.1029/2023JD040348
5. Mallinson, H., S. Lasher-Trapp, **J. Trapp**, M. Woods, and S. Orendorf, 2023: Hailfall in a future climate using a pseudo-global warming approach: Hail characteristics and mesoscale influences. *Journal of Climate*, **37**, 527-549, <https://doi.org/10.1175/JCLI-D-23-0181.1>
6. Lasher-Trapp, S., S. A. Orendorf, and **R. J. Trapp**, 2023: Investigating a derecho in a future warmer climate. *Bulletin of the American Meteorological Society*, **104**, E1831-E1852, <https://doi.org/10.1175/BAMS-D-22-0173.1>
7. Woods, M.J., **R. J. Trapp**, and H. Mallinson, 2023: The impact of human-induced climate change on future tornado intensity as revealed through multi-scale modeling. *Geophysical Research Letters*, DOI: 10.1029/2023GL104796.
8. Sessa, M. F., and **R. J. Trapp**, 2023: Environmental and radar-derived predictors of tornado intensity within ongoing convective storms. *Journal of Operational Meteorology*,

11, 49-71.

9. Hong, Y., S. W. Nesbitt, **R. J. Trapp**, and L. Di Girolamo, 2023: Near global distributions of overshooting tops derived from Terra and Aqua MODIS observations. *Atmospheric Measurement Techniques*, **16**, 1391-1406.
10. Goodnight, J. S., D. Chehak, and **R. J. Trapp**, 2022: Quantification of QLCS tornadogenesis, associated characteristics, and environments across a large sample. *Weather and Forecasting*, **37**, 2087-2105.
11. **Trapp, R. J.**, M. J. Woods, S. G. Lasher-Trapp, and M. Grover, 2021: Alternative implementations of the “pseudo-global-warming” methodology for event-based simulations. *Journal of Geophysical Research-Atmospheres*, **126**, e2021JD035017, <https://doi.org/10.1029/2021JD035017>
12. Nesbitt, S. W., and co-authors (including **R. J. Trapp**), 2021: A storm safari in subtropical South America: proyecto RELAMPAGO. *Bulletin of the American Meteorological Society*.
13. Wurman, J., K. Kosiba, B. Pereira, P. Robinson, A. Frambach, A. Gilliland, T. White, J. Aikins, **R. J. Trapp**, S. Nesbitt, M. N. Hanshaw, and J. Lutz, 2021: The FARM (Flexible Array of Radars and Mesonets). *Bulletin of the American Meteorological Society*.
14. Lasher-Trapp., S., E. Jo, L. R. Allen, B. N. Engelsen, and **R. J. Trapp**, 2021: Entrainment in a simulated supercell thunderstorm, Part I: The evolution of different entrainment mechanisms and their dilutive effects. *Journal of the Atmospheric Sciences*.
15. Marion, G. R., and **R. J. Trapp**, 2021: Controls of quasi-linear convective system tornado intensity. *Journal of the Atmospheric Sciences*, **78**, 1189-1205.
16. Schumacher, R. S., D. A. Hence, S. W. Nesbitt, **R. J. Trapp**, K. A. Kosiba, J. Wurman, P. Salio, M. Rugna, A. C. Varble, and N. R. Kelly, 2021: Convective-storm environments in subtropical South America from high-frequency soundings during RELAMPAGO-CACTI. *Monthly Weather Review*, **149**, 1439-1458.
17. Raupach, T. H., O. Martius, J. T. Allen, M. Kunz, S. Lasher-Trapp, S. Mohr, K. L. Rasmussen, **R. J. Trapp**., and Q. Zhang, 2020: The effects of climate change on hailstorms, *Nature Reviews Earth and Environment*, DOI: 10.1038/s43017-020-00133-9.
18. Carroll-Smith, D., **R. J. Trapp**, and J. Done, 2020: Exploring inland tropical cyclone rainfall and tornadoes under future climate conditions through a case study of Hurricane Ivan. *Journal of Applied Meteorology and Climatology*, DOI: 10.1175/JAMC-D-20-0090.1.
19. **Trapp, R. J.**, K. A. Kosiba, J. N. Marquis, M. R. Kumjian, S. W. Nesbitt, J. Wurman, P. Salio, M. A. Grover, P. Robinson, and D. A. Hence, 2020: Multiple-platform and multiple-Doppler radar observations of a supercell thunderstorm in South America during RELAMPAGO. *Monthly Weather Review*, **148**, 3225-3241.
20. Mulholland, J. P., S. W. Nesbitt, **R. J. Trapp**, and J. M. Peters, 2020: Terrain influences on the upscale convective growth of orographic supercells into mesoscale convective systems. *Journal of the Atmospheric Sciences*, **77**, 3929-3949.

21. Miller, D. E., Z. Wang, **R. J. Trapp**, and D. S. Harnos, 2020: Hybrid prediction of weekly tornado activity out to week 3: Utilizing weather regions. *Geophysical Research Letters*, **47**, e2020GL087253.
22. Sessa, M. F., and **R. J. Trapp**, 2020: Observed relationship between tornado intensity and pre-tornadic mesocyclone characteristics, *Weather and Forecasting*, 1243-1261.
23. Liu, X., K. Zhou, Y. Lan, X. Mao, and **R. J. Trapp**, 2020: On the use of conceptual models for severe convective weather forecasting operations in China. *Weather and Forecasting*, **35**, 299-308.
24. Borque, P., S. W. Nesbitt, **R. J. Trapp**, S. G. Lasher-Trapp, M. Oue, 2020: Observational study of the thermodynamics and morphological characteristics of a midlatitude continental cold pool event. *Monthly Weather Review*, **148**, 719–737.
25. Marion, G. R., **R. J. Trapp**, and S. W. Nesbitt, 2019: Using Overshooting Top Area to Discriminate Potential for Large, Intense Tornadoes, *Geophysical Research Letters*, 10.1029/2019GL084099.
26. Mulholland, J. P., S. W. Nesbitt, and **R. J. Trapp**, 2019: How does terrain influence upscale convective growth of orographic deep moist convection? *Monthly Weather Review*, **147**, 4305-4324.
27. **Trapp, R. J.**, K. A. Hoogewind, S. G. Lasher-Trapp, 2019: Projected increases in hail occurrences in the United States determined through convective-permitting dynamical downscaling. *Journal of Climate*, **32**, 5493-5509.
28. Carroll-Smith, D., L. C. Dawson, **R. J. Trapp**, 2019: High resolution real-data WRF modeling and verification of tropical cyclone tornadoes associated with Hurricane Ivan 2004. *Electronic Journal of Severe Storms Meteorology*, **14** (2), 1-36.
29. Marion, G. R., and **R. J. Trapp**, 2019: The dynamical coupling of convective updrafts, downdrafts, and cold pools in simulated supercell thunderstorms. *Journal of Geophysical Research-Atmospheres*, **124**, DOI: 10.1029/2018JD029055.
30. Schlie-Janssen, E. A., D. Wuebbles, S. Stevens, **R. J. Trapp**, and B. Jewett, 2019: A radar-based study of severe hail outbreaks over the contiguous United States for 2000-2011. *International Journal of Climatology*, **39**, 278-291, DOI: 10.1002/joc.5805.
31. Trapp, R.J., G.R. Marion, and S.W. Nesbitt, 2018: Reply to “Comments on ‘The regulation of tornado intensity by updraft width’”. *Journal of the Atmospheric Sciences*, **75**, 4057–4061.
32. **Trapp, R. J.**, and K. A. Hoogewind, 2018: Exploring a connection between Arctic sea ice and tornado activity. *Nature Partner Journal (npj) -Climate and Atmospheric Science*, **1**, DOI: 10.1038/s41612-018-0025-9.
33. Mulholland, J. P., S. W. Nesbitt, **R. J. Trapp**, K. L. Rasmussen, and P. V. Salio, 2018: Convective storm life cycle and environments near the Sierras De Cordoba, Argentina., *Monthly Weather Review*, **146**, 2541-2557.
34. **Trapp, R. J.**, G. R. Marion, and S. W. Nesbitt, 2017: The regulation of tornado intensity by updraft width. *Journal of the Atmospheric Sciences*, **74**, 4199–4211.

35. Hoogewind, K. A., M. E. Baldwin, and **R. J. Trapp**, 2017: The Impact of Climate Change on Hazardous Convective Storms in the United States: Insight from High-Resolution Dynamical Downscaling, *Journal of Climate*, **30**, 10081-10100.
36. Dawson, L. C., G. S. Romine, **R. J. Trapp**, and M. E. Baldwin, 2017: Verifying supercellular rotation in a convection-permitting ensemble forecasting system with radar-derived rotation track data. *Weather and Forecasting*, **32**, 781–795.
37. **Trapp, R. J.**, and J. M. Woznicki, 2017: Convectively induced stabilizations and subsequent recovery with supercell thunderstorms during the Mesoscale Predictability Experiment (MPEX). *Monthly Weather Review*, **145**, 1739–1754.
38. Wuebbles, D. J., and co-authors (including **R. J. Trapp**), 2017: Climate Science Special Report: Fourth National Climate Assessment (NCA4), Volume 1, *Agronomy Reports*, **8**.
39. **Trapp, R. J.**, and K. A. Hoogewind, 2016: The realization of extreme tornadic storm events under future anthropogenic climate change. *Journal of Climate*, **29**, 5251–5265, doi: 10.1175/JCLI-D-15-0623.1.
40. **Trapp, R. J.**, D. Stensrud, M. Coniglio, R. Schumacher, M. Baldwin, S. Waugh, and D. Conlee, 2016: Mobile radiosonde deployments during the Mesoscale Predictability Experiment (MPEX): Rapid and adaptive sampling of upscale convective feedbacks. *Bulletin of the American Meteorological Society*, **97**, 326-336.
41. Weisman, M., **R. J. Trapp**, and others, 2015: The Mesoscale Predictability Experiment (MPEX). *Bulletin of the American Meteorological Society*, **96**, 2127-2149.
42. Trier, S., G. Romine, D. Ahijevych, **R. Trapp**, R. Schumacher, M. Coniglio, and D. Stensrud, 2015: Mesoscale Thermodynamic Influences on Convection Initiation near a Surface Dryline in a Convection-Permitting Ensemble. *Monthly Weather Review*, **143**, 3726–3753.
43. Villanueva-Birriel, C. M., S. Lasher-Trapp, **R. J. Trapp**, and N. S. Diffenbaugh, 2014: Sensitivity of the Warm Rain Process in Convective Clouds to Regional Climate Change in the Contiguous U.S., *Journal of Clouds, Aerosols, and Radiation*, **1**, 1-17.
44. **Trapp, R. J.**, 2014: On the significance of multiple consecutive days of tornado activity. *Monthly Weather Review*, **142**, 1452–1459
45. Diffenbaugh, N.S., M. Scherer, and **R. Trapp**, 2013: Robust increases in severe thunderstorm environments in response to greenhouse forcing. *Proceedings, National Academy of Sciences*, doi: 10.1073/pnas.1307758110.
46. Robinson, E. D., **R. J. Trapp**, and M. E. Baldwin, 2013: The geospatial and temporal distributions of severe thunderstorms from high-resolution dynamical downscaling. *Journal of Applied Meteorology and Climatology*, **52**, 2147-2161.
47. **Trapp, R. J.**, and H. E. Brooks, 2013: Regional characterization of tornado activity. *Journal of Applied Meteorology and Climatology*, **52**, 654-659.

48. Toth, M. E., **R. J. Trapp**, K. K. Kosiba, and J. Wurman, 2012: Comparison of mobile-radar measurements of tornado intensity with corresponding WSR-88D measurements. *Weather and Forecasting*, **28**, 418-426.
49. Kunkel, K. E., and co-authors (incl. **J. Trapp**), 2012: Monitoring and understanding trends in extreme storms: State of knowledge. *Bulletin of the American Meteorological Society*, **94**, 499-514.
50. Hitchens, N., M. E. Baldwin, and **R. J. Trapp**, 2012: An object-oriented characterization of extreme precipitation-producing convective systems in the Midwestern United States. *Monthly Weather Review*, **140**, 1356-1366.
51. Carley, J. R., B. R. J. Schwedler, M. E. Baldwin, R. J. Trapp, J. Kwiatkowski, J. Logsdon, and S. J. Weiss, 2011: A proposed model-based methodology for feature-specific prediction for high impact weather. *Weather and Forecasting*, **26**, 243-249.
52. **Trapp, R. J.**, E. D. Robinson, M. E. Baldwin, N. S. Diffenbaugh, and B. R. J. Schwedler, 2010: Regional climate of hazardous convective weather through high-resolution dynamical downscaling. *Climate Dynamics*, doi: 10.1007/s00382-010-0826-y
53. Hitchens, N., **R. J. Trapp**, M. E. Baldwin, and A. Gluhovsky, 2010: Characterizing sub-diurnal extreme precipitation in the Midwestern United States. *Journal of Hydrometeorology*, **11**, 211-218.
54. Huber, M., and **J. Trapp**, 2009: A review of NEXRAD Level II: Data, Distribution, and Applications. *Journal of Terrestrial Observation*, **2**, 5-15.
55. Ashfaq, M., Y. Shi. W.-w. Tung, **R. J. Trapp**, X. Gao, J. S. Pal, and N. S. Diffenbaugh, 2009: Suppression of South Asia summer monsoon precipitation in the 21st century. *Geophysical Research Letters*, L01704, doi:10.1029/2008GL036500.
56. **Trapp, R. J.**, N. S. Diffenbaugh, and A. Gluhovsky, 2009: Transient response of severe thunderstorm forcing to elevated greenhouse gas concentrations. *Geophysical Research Letters*, **36**, L01703, doi:10.1029/2008GL036203.
57. Diffenbaugh, N.S., **R. J. Trapp**, and H. E. Brooks, 2008: Challenges in identifying influences of global warming on tornado activity. *Eos Transactions*, **89(53)**, 553-554.
58. Markowski, P., E. Rasmussen, J. Straka, R. Davies-Jones, Y. Richardson, and **J. Trapp**, 2008: Vortex lines within low-level mesocyclones obtained from pseudo-dual-Doppler radar observations. *Monthly Weather Review*, **136**, 3513-3535.
59. Wheatley, D. M., and **R. J. Trapp**, 2008: The effect of mesoscale heterogeneity on the genesis and structure of mesovortices within quasi-linear convective systems. *Monthly Weather Review*, **136**, 4220-4241.
60. Kosiba, K. A., **R. J. Trapp**, and J. Wurman, 2008: An analysis of the axisymmetric three-dimensional low level wind field in a tornado using mobile radar observations. *Geophysical Research Letters*, **35**, L05805, doi:10.1029/2007GL031851.
61. **Trapp, R. J.**, N. S. Diffenbaugh, H. E. Brooks, M. E. Baldwin, E. D. Robinson, and J. S. Pal, 2007: Changes in severe thunderstorm environment frequency during the 21st

- century caused by anthropogenically enhanced global radiative forcing. *Proceedings, National Academy of Sciences*, **104**, 19719-19723, doi: 10.1073/pnas.0705494104.
62. Moore, G. E., M. Levine, J. D. Anderson, and **R. J. Trapp**, 2007: Meteorological influence on the occurrence of gastric dilatation-volvulus in military working dogs in Texas. *International Journal of Biometeorology*, doi:10.1007/s00484-007-0115-6.
63. **Trapp, R. J.**, B. Halvorson, and N. S. Diffenbaugh, 2007: Telescoping, multimodel approaches to evaluate extreme convective weather under future climates, *Journal of Geophysical Research*, **112**, D20109, doi:10.1029/2006JD008345.
64. Schultz, D. M., K. M. Kanak, J. M. Straka, **R. J. Trapp**, B. A. Gordon, D. S. Zrnica, P. M. Kastner-Klein, C. A. Doswell III, G. H. Bryan, D. K. Lilly, and T. J. Garrett, 2006: The mysteries of mammatus clouds: Observations and formation mechanisms. *Journal of the Atmospheric Sciences*, **63**, 2409-2435.
65. **Trapp, R. J.**, D. M. Wheatley, N. T. Atkins, R. W. Przybylinski, and R. Wolf, 2006: Buyer beware: Some words of caution on the use of severe wind reports in post-event assessment and research. *Weather and Forecasting*, **21**, 408-415.
66. Wheatley, D. M., **R. J. Trapp**, and N. T. Atkins, 2006: Radar and Damage Analysis of Severe Bow Echoes Observed during BAMEX, *Monthly Weather Review*, **134**, 791-806.
67. Diffenbaugh, N. S., J. S. Pal, **R. J. Trapp**, and F. Giorgi, 2005: Interactions of large- and fine-scale processes dictate the greenhouse response of extreme daily climate events over the United States. *Proceedings, National Academy of Sciences*, **102**, 15774-15778.
68. **Trapp, R. J.**, G. J. Stumpf, and K. L. Manross, 2005: A reassessment of the percentage of tornadic mesocyclones. *Weather and Forecasting*, **20**, 680-687.
69. Atkins, N. T., C. S. Bouchard, R. W. Przybylinski, **R. J. Trapp**, and G. Schmocker, 2005: Damaging surface wind mechanisms within the 10 June 2003 Saint Louis bow echo event during BAMEX. *Monthly Weather Review*, **133**, 2275-2296.
70. **Trapp, R. J.**, S. A. Tessendorf, E. G. Savageau, and H. E. Brooks, 2005: Tornadoes in squall lines and bow echoes. Part I: Climatological distribution. *Weather and Forecasting*, **40**, 23-34.
71. Davis, C., 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. McFarquahar, J. Moore, R. Przybylinski, R. Rabuer, B. Smull, **R. Trapp**, S. Trier, R. Wakimoto, M. Weisman, and C. Ziegler, 2004: The Bow Echo and MCV Experiment: Observations and Opportunities. *Bulletin of the American Meteorological Society*, **85**, 1075-1092.
72. Weisman, M. L., and **R. J. Trapp**, 2003: Low-level mesovortices within squall lines and bow echoes: Part I. Overview and dependence on environmental shear. *Monthly Weather Review*, **131**, 2779-2803.
73. **Trapp, R. J.**, and M. L. Weisman, 2003: Low-level mesovortices within squall lines and bow echoes: Part II. Their genesis and implications. *Monthly Weather Review*, **131**, 2804-2823.
74. Schultz, D. M., and **R. J. Trapp**, 2003: Nonclassical cold-frontal structure caused by dry

subcloud air in northern Utah during the Intermountain Precipitation Experiment (IPEX), *Monthly Weather Review*, 130, 2222-2246.

75. Rust, W.D. and **R. J. Trapp**, 2002: Initial balloon soundings of the electric field in winter nimbostratus clouds in the USA, *Geophysical Research Letters*, **29**, 20-1 – 20-4.
76. Schultz, D. M., W. J. Steenburgh, **R. J. Trapp**, and co-authors, 2002: The Intermountain Precipitation Experiment, *Bulletin of the American Meteorological Society*, 83, 189-210.
77. **Trapp, R. J.**, N. T. Atkins, H. E. Fuelberg, J. G. LaDue, K. J. Pence, T. L. Smith, and G. J. Stumpf, 2001: Meeting Summary: 20th Conference on Severe Local Storms, *Bulletin of the American Meteorological Society*, **82**, 2251-2258.
78. **Trapp, R. J.**, D. M. Schultz, A. V. Ryzhkov, and R. L. Holle, 2001: Multiscale analysis of an Oklahoma winter-precipitation event. *Monthly Weather Review*, **129**, 486-501.
79. **Trapp, R. J.**, 2000: A clarification of vortex breakdown and tornadogenesis. *Monthly Weather Review*, **128**, 888-895.
80. **Trapp, R. J.** and C. A. Doswell III, 2000: Radar data objective analysis. *Journal of Atmospheric and Oceanic Technology*, 17, 105-120.
81. **Trapp, R. J.**, E. D. Mitchell, G. A. Tipton, D. A. Effertz, A. I. Watson, D. L. Andra, and M. A. Magsig, 1999: Descending and non-descending tornadic vortex signatures detected by WSR-88D's. *Weather and Forecasting*, **14**, 625-639.
82. Grice, G. K., **Trapp, R. J.**, S. F. Corfidi, R. Davies-Jones, C. C. Buononno, J. P. Craven, K. K. Droegemeier, C. Duchon, J. V. Houghton, R. A. Prentice, G. Romine, K. Schlachter, and K. K. Wagner, 1999: The golden anniversary celebration of the first tornado forecast, *Bulletin of the American Meteorological Society*, **80**, 1341-1348.
83. **Trapp, R. J.**, 1999: Observations of nontornadic low-level mesocyclones and attendant tornadogenesis failure during VORTEX. *Monthly Weather Review*, **127**, 1693-1705.
84. **Trapp, R. J.**, and R. Davies-Jones, 1997: Tornadogenesis with and without a dynamic pipe effect. *Journal of the Atmospheric Sciences*, **54**, 113-133.
85. **Trapp, R. J.** and B. H. Fiedler, 1995: Tornado-like vortexgenesis in a simplified numerical model. *Journal of the Atmospheric Sciences*, **52**, 3757-3778.
86. **Trapp, R. J.** and B. H. Fiedler, 1993: Numerical simulation of tornado-like vortices in asymmetric flow. *The Tornado: Its Structure, Dynamics, Prediction, and Hazards*. C. R. Church (Ed.), AGU Geophysical Monograph Series, Washington, 49-54.
87. Fiedler, B. H. and **R. J. Trapp**, 1993: A fast dynamic grid adaption scheme for meteorological flows. *Monthly Weather Review*, **121**, 2879-2888.

(underline indicates authorship by student advised/co-advised by R.J. Trapp)

● BOOK CHAPTERS:

Trapp, R. J., 2020: *Potential effects of anthropogenic climate change on non-synoptic wind storm hazards*. Oxford Handbook of Non-Synoptic Wind Storm Hazards, DOI: 10.1093/oxfordhb/9780190670252.103.4.

Trapp, R. J., 2018: *Formation and Development of Convective Storms*. Oxford Research Encyclopedia of Climate Science, DOI 10.1093/acrefore/9780190228620.013.61.

Trapp, R. J., 2002: *Severe Thunderstorms*. Encyl. Phys. Science and Technol., Academic Press, San Diego, 735-749.

Davies-Jones, R., **R. J. Trapp**, and H. B. Bluestein, 2001: Tornadoes and tornadic storms, *Severe Convective Storms, Meteorological Monograph*, No. 50, Amer. Meteor. Soc., 167-222.

PRESENTATIONS

●SELECTED INVITED PRESENTATIONS (LAST 12 YEARS)

University of Bern, Oeschger Centre for Climate Change Research, Bern, Switzerland:
“Hailstorms in a changing climate”

University of Bern, Institute of Geography, Bern, Switzerland, 2024: “PERiLS: A field campaign devoted to the study of hazardous mesoscale convective systems”

MeteoSwiss, Locarno Monti, Switzerland, 2024: “Satellite-based quantifications of convective updraft characteristics: Application to hail severity”

Met Office Hadley Centre, 2023: “Environment-informed, convection-permitting dynamical downscaling for climate-change projections of hazardous convective weather”

AGU Fall Meeting, Chicago, IL 2022: “Gilbert F. White Distinguished Lecture Award, Temporal and spatial changes in the risks associated with severe convective storms” (invited)

AGU Fall Meeting Chicago, IL, 2022: “The use of an event-based pseudo-global-warming modeling approach to assess changes in extreme thunderstorm event characteristics” (invited)

AGU Fall Meeting Chicago, IL, 2022: “Convection-allowing dynamical downscaling for hazardous thunderstorm risk assessment under past and future climates” (invited)

International Workshop on Cold Pools, Tagnernsee, Germany, 2022: “Coupling of Cold Pool Depth to Convective-Draft Width”

Earth System Science Interdisciplinary Center, University of Maryland, 2022: “The Use of Implicit and Explicit Approaches to Assess Future Changes in Extreme Thunderstorm Event Characteristics”

NWA Extreme Weather Symposium, 2021: “Understanding and anticipating QLCS tornado intensity” (invited)

AMS Annual Meeting, Boston, MA, 2020: “Robust observational support for hypothesized connection between rotating updraft width and tornado intensity” (invited)

MMAG Conference, St. Louis, MO, 2019: “Storm prediction, projection, and prognostication” (invited)

AGU Fall Meeting, Washington, D.C., 2018: “The dynamical coupling of convective updrafts, downdrafts, and cold pools in highly organized convective storms in midlatitudes” (invited)

Tornado Hazard Wind Assessment and Reduction Symposium (THWARTS), Champaign, IL, 2018: “Historical trends and future climate projections of tornado activity in the United States” (invited)

North American Workshop on Hail and Hailstorms, Boulder, CO, 2018: “Hail occurrence under anthropogenic climate change as investigated with convection permitting dynamical downscaling” (solicited)

Pacific Northwest National Laboratory, Richmond, WA, 2018: “The dynamical coupling of convective updrafts, downdrafts, and cold pools in highly organized convective storms in midlatitudes”

ASR/ARM Joint Meeting, 2018: “Inter-relationships between convectively generated cold pools, updraft/downdraft characteristics, and microphysical processes” (solicited)

Ninth European Conference on Severe Storms, Pula, Croatia, 2017: “The regulation of tornado intensity by updraft width” (solicited)

NCAR/MMM Distinguished Seminar Series, Boulder, CO, 2017: “The regulation of tornado intensity by updraft width”

Second European Hail Workshop, Bern, Switzerland, 2017: “Hail occurrence under anthropogenic climate change” (keynote)

Karlsruhe Institute of Technology, Karlsruhe, Germany, 2017: “Characteristics, controls, and inter-relationships of the convective components of simulated convective storms under current and future climates”

Severe Convection and Climate Workshop, Columbia University, New York, 2016: “The realization of extreme tornadic storm events under future anthropogenic global warming.” (invited)

AMS Annual Meeting, New Orleans, LA, 2016: “Extreme precipitation revealed through high-resolution dynamical downscaling” (invited)

AGU Annual Meeting, San Francisco, CA, 2015: “Pseudo-global warming controls on the intensity and morphology of extreme convective storm events.” (invited)

Earth Systems Science Center, Penn State University, PA, 2014: “Adventures in dynamical downscaling”

Department of Meteorology, Penn State University, PA, 2014: “On the possible effects of anthropogenically enhanced global radiative forcing on severe thunderstorm frequency and intensity”

American Meteorological Society, *The Special Symposium on Severe Local Storms: The Current State of the Science and Understanding Impacts*, Atlanta, GA, 2014: "Connecting tornado and extreme convective weather occurrence to climate variability and change"

Texas A&M University, 2012: "Connecting tornado and extreme convective weather occurrence to climate variability and change"

Northern Illinois University, 2012: "Vertically rotating cores in quasi-linear convective systems: formation and forecast/warning issues"

School of Earth and Environment, University of Leeds, Leeds, UK, 2010: "Regional climate of hazardous convective weather using high-resolution dynamical downscaling"

Department of Meteorology, University of Reading, Reading, UK, 2010: "Vertically rotating cores in quasi-linear convective systems: implications, formation, and influence of environmental heterogeneity"

School of Earth, Atmospheric, and Environmental Sciences, University of Manchester, Manchester, UK, 2010: "Exploring possible connections between local convective storms and anthropogenic climate change"

●LIST OF CONFERENCES, SYMPOSIA, AND WORKSHOPS (LAST 12 YEARS):

AGU Fall Meeting, San Francisco, CA, 2023

AMS 32nd AMS Conference on Weather Analysis and Forecasting, Madison, WI, 2023

AGU Fall Meeting, Chicago, IL, 2022

AMS 30th AMS Conference on Severe Local Storms, Santa Fe, NM, 2022

AMS Annual Meeting, Boston, MA, 2020

10th European Conference on Severe Storms, Krakow, Poland, 2019

Blue Waters Symposium, Sunriver, OR, 2019.

29th AMS Conference on Severe Local Storms, Vermont, 2018 (contributed)

31st Conference on Climate Variability and Change, Austin, TX, 2018

9th European Conference on Severe Storms, Pula, Croatia, 2017

38th Conference on Radar Meteorology, Chicago, IL, 2017 (contributed)

28th AMS Conference on Severe Local Storms, Portland, OR, 2016

Blue Waters Symposium, Sunriver, OR, 2016.

GWEX Symposium on Convective Permitting Model Applications, Boulder, CO, 2016.

7th European Conference on Severe Storms, Wiener Neustadt, Austria, 2015

27th AMS Conference on Severe Local Storms, Madison, WI, 2014

26th AMS Conference on Severe Local Storms, Nashville, TN, 2012

Open Science Conference, World Climate Research Programme, Denver, CO, 2011

6th European Conference on Severe Storms, Palma De Mallorca, Spain, 2011

35th AMS Conference on Radar Meteorology, Pittsburg, PA, 2011 (contributed)

25th AMS Conference on Severe Local Storms, Denver, CO, 2010

American Meteorological Society, 22nd Conference on Climate Variability and Change, Atlanta, Georgia, 2010 (contributed)

American Meteorological Society, 19th Symposium on Education, Atlanta, Georgia, 2010 (contributed)

American Meteorological Society, 9th Annual Student Conference, Atlanta, Georgia, 2010 (contributed)