

CURRICULUM VITAE

Stan Trier

PERSONAL

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EDUCATION

1997 Ph.D., Atmospheric Science, Colorado State University
1987 M.S., Meteorology, Pennsylvania State University
1984 B.S., Meteorology, Florida State University

PROFESSIONAL RECORD

6/02-present Project Scientist II, Prediction Diagnostics Group, NCAR/MMM
1/99-6/02 Project Scientist I, Mesoscale Dynamics Group, NCAR/MMM
6/95-1/99 Associate Scientist III, Mesoscale Analysis Group, NCAR/MMM
6/91-5/95 Associate Scientist II, Mesoscale Prediction Section,
NCAR/MMM/ATD
1/88-5/91 Associate Scientist I, Mesoscale Prediction Section,
NCAR/MMM

PROFESSIONAL ACTIVITIES

2005-present American Meteorological Society Severe Local Storms Committee

2001-present Bow-Echo and MCV Experiment (BAMEX) Steering
Committee

1998-2001,
2005-2007 Associate Editor, Monthly Weather Review

Honors and Awards

- 2000 MMM outstanding publication and nominee for NCAR outstanding publication award
- 2002 NCAR outstanding publication award

PUBLICATIONS-Refereed

Reviewed Articles

- Trier, S. B., D. B. Parsons, and T. J. Matejka, 1990: Observations of a subtropical cold front in a region of complex terrain. *Mon. Wea. Rev.*, 118, 2449-2470.
- Trier, S. B., D. B. Parsons, and J. H. E. Clark, 1991: Environment and evolution of a cold-frontal mesoscale convective system. *Mon. Wea. Rev.*, 119, 2429-2455.
- Trier, S. B. and D. B. Parsons, 1993: Evolution of environmental conditions preceding the development of a nocturnal mesoscale convective complex. *Mon. Wea. Rev.*, 121, 1078-1098.
- Trier, S. B. and D. B. Parsons, 1995: Updraft dynamics within a numerically simulated subtropical rainband. *Mon. Wea. Rev.*, 123, 39-58.
- Trier, S. B., W. C. Skamarock, M. A. LeMone, D. B. Parsons, and D. P. Jorgensen, 1996: Structure and evolution of the 22 February 1993 TOGA-COARE squall line: Numerical simulations. *J. Atmos. Sci.*, 53, 2861-2886.
- Trier, S. B., W. C. Skamarock, and M. A. LeMone, 1997: Structure and evolution of the 22 February 1993 TOGA-COARE squall line: Organization mechanisms inferred from numerical simulation. *J. Atmos. Sci.*, 54, 386-407.
- Jorgensen, D. P., M. A. LeMone, and S. B. Trier, 1997: Structure and evolution of the 22 February 1993 TOGA-COARE squall line: Aircraft observations of precipitation, circulation, and surface energy fluxes. *J. Atmos. Sci.*, 54, 1961-1985.
- Trier, S. B., M. A. LeMone, and W. C. Skamarock, 1998: Effect of three-dimensional structure on the stormwide horizontal accelerations and momentum budget of a simulated squall line. *Mon. Wea. Rev.*, 126, 2580-2598.
- LeMone, M. A., E. J. Zipser, and S. B. Trier, 1998: The role of environmental shear and thermodynamic conditions in determining the structure and evolution of mesoscale convective systems during TOGA COARE. *J. Atmos. Sci.*, 55, 3493-3518.

- Trier, S. B., C. A. Davis, and J. Tuttle, 2000: Long-lived mesoconvective vortices and their environment. Part I: Observations from the Central United States during the 1998 warm season. *Mon. Wea. Rev.*, 128, 3376-3395.
- Trier, S. B., C. A. Davis, and W. C. Skamarock, 2000: Long-lived mesoconvective vortices and their environment. Part II: Induced thermodynamic destabilization in idealized simulations. *Mon. Wea. Rev.*, 128, 3396-3412.
- Davis, C.A., D. A. Ahijevych, and S. B. Trier, 2002: Detection and prediction of warm season midtropospheric vortices by the rapid update cycle. *Mon. Wea. Rev.*, 130, 24-42.
- Trier, S. B., and C. A. Davis, 2002: Influence of balanced motions on heavy precipitation within a long lived convectively generated vortex. *Mon. Wea. Rev.*, 130, 877-899.
- Carbone, R. E., J. D. Tuttle, D. A. Ahijevych, and S. B. Trier, 2002: Inferences of predictability associated with warm season precipitation episodes. *J. Atmos. Sci.*, 59, 2033-2056.
- Davis, C. A., and S. B. Trier, 2002: Cloud resolving simulations of mesoscale vortex intensification and its effect on a serial mesoscale convective system. *Mon. Wea. Rev.*, 130, 2839-2858.
- Trier, S. B., 2003: Convective Storms: Convection Initiation. *Encyclopedia of Atmospheric Sciences*, Academic Press, 560-570.
- Snyder, C., T. M. Hamill, and S. B. Trier, 2003: Linear evolution of error covariances in a quasigeostrophic model. *Mon. Wea. Rev.*, 131, 189-205.
- Davis, C. A., K. W. Manning, R. E. Carbone, S. B. Trier, and J. D. Tuttle, 2003: Coherence of warm-season continental rainfall in numerical prediction models. *Mon. Wea. Rev.*, 131, 2667-2679.
- Trier, S. B., F. Chen, and K. W. Manning, 2004: A study of convection initiation in mesoscale model using high-resolution land surface initial conditions. *Mon. Wea. Rev.*, 132, 2954-2976.
- 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 experiment: Observations and opportunities. *Bull. Amer. Meteor. Soc.*, 85, 1075-1093.
- Trier, S. B., C. A. Davis, D. A. Ahijevych, M. L. Weisman, and G. H. Bryan, 2006: Mechanisms supporting long-lived episodes of propagating nocturnal convection within a 7-day WRF model simulation. *J. Atmos. Sci.*, **63**, 2437-2461.
- Chen, F., K. W. Manning, M. A. LeMone, S. B. Trier, J. G. Alfieri, R. Roberts, J. Wilson, M. Tewari, D. Niyogi, T. W. Horst, S. P. Oncley, J. Basara, and P. Blanken, 2007: Evaluation

- of the characteristics of the NCAR high-resolution land data assimilation system. *J. Appl. Meteor. Clim.*, **46**, 694-713.
- Davis, C. A., and S. B. Trier, 2007: Mesoscale convective vortices observed during BAMEX. Part I: Kinematic and thermodynamic structure. *Mon. Wea. Rev.*, **135**, 2029-2049.
- Trier, S. B., and C. A. Davis, 2007: Mesoscale convective vortices observed during BAMEX. Part II: Influences on secondary deep convection. *Mon. Wea. Rev.*, **135**, 2051-2075.
- Trier, S. B., F. Chen, K. W. Manning, M. A. LeMone, and C. A. Davis, 2008: Sensitivity of the simulated PBL and precipitation to land surface conditions for a 12-day warm-season convection period. *Mon. Wea. Rev.*, **136**, 2321-2343.
- Trier, S. B. and R. D. Sharman, 2009: Convection-permitting simulations of the environment supporting widespread turbulence within the upper-level outflow of a mesoscale convective system. *Mon. Wea. Rev.*, **137**, 1972-1990.
- Trier, S. B., C. A. Davis, and D. A. Ahijevych, 2009: Environmental controls on the diurnal cycle of warm-season precipitation in the continental United States. *J. Atmos. Sci.*, submitted.

PUBLICATIONS-Reports

- Parsons, D. B. and S. B. Trier, 1989: Taiwan Area Mesoscale Experiment: Doppler Radar Operations Summary. NCAR/TN-315+STR, *NCAR Tech. Note*, National Center for
- Trier, S. B., 1990: Taiwan Area Mesoscale Experiment: A Guide to Precipitation Patterns during the 1987 Field Phase. NCAR/TN-350+STR, *NCAR Tech. Note*, National Center
- Trier, S.B., 1997: Multiscale analysis of a simulated oceanic mesoscale convective system and its environmental impact. NCAR/CT-162. NCAR Cooperative Thesis, National Center for Atmospheric Research, Boulder, CO.
- Ahijevych, D. A., R. E. Carbone, J. D. Tuttle, and S. B. Trier, 2001: Radar Data and Climatological Statistics Associated with Warm Season Episodes Over the Continental United States. NCAR/TN-448+STR, *NCAR Tech. Note*, National Center for Atmospheric Research, Boulder, CO, 81 pp.
- Davis, C., M. Biggerstaff, G. Bryan, D. Dowell, R. Johns, D. Jorgensen, B. Klimowski, K. Knupp, R. Przybylinski, G. Schmocker, J. Trapp, S. Trier, M. Weisman, and C. Ziegler, 2002: Science Overview of the Bow Echo and MCV Experiment (BAMEX), <http://www.atd.ucar.edu/bamex/science.html>
- Mueller, C., S. Trier, D. Megenhardt, D. Ahijevych, N. Rehak, and G. Cuning, 2004: Description of the National Convective Weather Forecast (NCWF-2). Submitted to The Federal Aviation Administration.

PUBLICATIONS-Nonrefereed Conference

Proceedings

- Trier, S. B., 1986: Mesoscale frontal waves during the June 26 PRE-STORM event. San Francisco, CA, *American Geophysical Union Annual Conference*.
- Trier, S. B., D. B. Parsons, and T. J. Matejka, 1989: An observational and numerical study of a subtropical cold front during TAMEX. Preprints, *24th Conference on Radar Meteorology*, Tallahassee, FL, Amer. Meteor. Soc., 561-564.
- Trier, S. B., D. B. Parsons, and T. J. Matejka, 1989: Observations of a cold front during TAMEX. *Proc. Workshop on TAMEX Preliminary Scientific Results*, Taipei, R.O.C., National Science Council/National Science Foundation, 186-195.
- Parsons, D. B., S. B. Trier, and J. B. Klemp, 1989: Numerical simulations of frontal updrafts observed in subtropical and middle latitudes. *Proc. Workshop on TAMEX Preliminary Scientific Results*, Taipei, R.O.C., National Science Council/National Science Foundation, 6-13.
- Trier, S. B. and D. B. Parsons, 1990: Numerical simulation of a subtropical prefrontal squall line. Extended Abstracts, *Fourth Conference on Mesoscale Processes*, Boulder, CO, Amer. Meteor. Soc., 180-181.
- Trier, S. B. and D. B. Parsons, 1990: Numerical simulation of a prefrontal squall line during TAMEX IOP 8. *Proc. Workshop on TAMEX Scientific Results*, Boulder, CO., National Science Foundation/ National Science Council/ National Center for Atmospheric Research, 62-67.
- Trier, S. B. and D. B. Parsons, 1990: Observations and numerical simulations of a subtropical prefrontal squall line. Preprints, *16th Conference on Severe Local Storms*, Kananaskis Park, Alta., Canada, Amer. Meteor. Soc., 675-680.
- Parsons, D. B. and S. B. Trier, 1992: The initiation and structure of a nocturnal mesoscale convective complex. Preprints, *Fifth Conference on Mesoscale Processes*, Atlanta, GA Amer. Meteor. Soc., 327-332.
- Trier, S. B. and D. B. Parsons, 1993: Long-lived convective cells in a three-dimensional simulation of a subtropical rainband. Preprints, *17th Conference on Severe Local Storms*, St. Louis, MO, Amer. Meteor. Soc., 470-475.
- LeMone, M. A., S. B. Trier, E. J. Zipser, K. I. Mohr, G. B. McGaughey, K. A. Caesar, M. Restivo, D. P. Jorgensen, and B. F. Smull, 1993: The relationship of convective-band structure and

- life cycle to environmental soundings. San Francisco, CA, *American Geophysical Union Annual Conference*.
- Trier, S. B., D. B. Parsons, and M. A. LeMone, 1994: A three-dimensional numerical simulation of tropical squall line observed during TOGA-COARE. Preprints, *Sixth Conference on Mesoscale Processes*, Portland, OR, Amer. Meteor. Soc., 45-48.
- Trier, S. B., W. C. Skamarock, M. A. LeMone, and D. B. Parsons, 1995: Numerical Simulations of the 22 February 1993 TOGA-COARE squall line. Preprints, *21st Conference on Hurricanes and Tropical Meteorology*, Miami, FL, Amer. Meteor. Soc., 576578.
- Trier, S. B., W. C. Skamarock, and M. A. LeMone, 1996: Convective organization mechanisms within a TOGA-COARE squall line. Preprints, *Seventh Conference on Mesoscale Processes*, Reading, UK, Amer. Meteor. Soc. and Royal Meteor. Soc., 149151.
- Skamarock, W. C., S. B. Trier, and M. A. LeMone, 1996: The dynamics of slow- and fast-moving convective lines in TOGA COARE. Preprints, *Seventh Conference on Mesoscale Processes*, Reading, UK, Amer. Meteor. Soc. and Royal Meteor. Soc., 301-303.
- LeMone, M. A., S. B. Trier, W. C. Skamarock, D. P. Jorgensen, and B. F. Smull, 1996: Boundary layer structure beneath tropical mesoscale convective system with leading convective bands: Effects of band orientation to the wind profile. Preprints, *Seventh Conference on Mesoscale Processes*, Reading, UK, Amer. Meteor. Soc. and Royal Meteor. Soc., 292-294.
- Trier, S. B., C. A. Davis, and W. C. Skamarock, 1998: Influence of mesoconvective vortices on the environment of deep convection. Preprints, *19th Conference on Severe Local Storms*, Minneapolis, MN, Amer. Meteor. Soc., 36-39.
- Trier, S. B., C. A. Davis, W. C. Skamarock, and J. D. Tuttle, 1999: Long-lived mesoconvective vortices and their environment. Preprints, *Eighth Conference on Mesoscale Processes*, Boulder, CO, Amer. Meteor. Soc., 20-25.
- Carbone, R. E., J. D. Tuttle, L. J. Miller, and S. B. Trier, 1999: Large domain studies of warm season precipitation episodes. Preprints, *29th Conference on Radar Meteorology*, Montreal, Quebec, Canada, Amer. Meteor. Soc., 595-599.
- Davis, C. A., S. B. Trier, J. D. Tuttle, R. E. Carbone, L. J. Miller, and R. Oye, 2000: A multi-dataset analysis of the morphology of mesoscale convective vortices. Preprints, *Fourth Symposium on Integrated Observing Systems*, Long Beach, CA, Amer. Meteor. Soc., 78-83.
- Trier, S. B., C. A. Davis, and J. D. Tuttle, 2000: A long-lived convectively generated mesoscale vortex associated with heavy rainfall. Preprints, *20th Conference on Severe Local Storms*, Orlando, FL, Amer. Meteor. Soc., 327-330.

- Davis, C. A., S. B. Trier, D. A. Ahijevych, and R. E. Carbone, 2001: Predictability of heavy precipitation induced by mesoscale convective vortices. Preprints, *Symposium on Precipitation Extremes: Prediction, Impacts, and Responses*, Amer. Meteor. Soc., Albuquerque, NM, 143-146.
- Trier, S. B., and C. A. Davis, 2001: Observations and numerical simulations of a long-lived convectively generated mesoscale vortex. Preprints, *Ninth Conference on Mesoscale Processes*, Amer. Meteor. Soc., Ft. Lauderdale, FL, 308-312.
- Carbone, R. E., J. D. Tuttle, D. A. Ahijevych, and S. B. Trier, 2001: Inferences of predictability associated with warm season precipitation episodes. Preprints, *Ninth Conference on Mesoscale Processes*, Amer. Meteor. Soc., Ft. Lauderdale, FL, 276-278.
- Trier, S. B., C. A. Davis, and W. Wang, 2002: Testing and verification of the Weather Research and Forecast (WRF) model. Preprints, *15th Conference on Numerical Weather Prediction*, Amer. Meteor. Soc., San Antonio, TX, 252-255.
- Trier, S. B., D. Ahijevych, C. Davis, D. Megenhardt, C. Mueller, and N. Rehak, 2002: Enhancement of 0-3 h forecasts of deep convection using mesoscale diagnostics derived from operational model analysis and forecasts. Abstracts, *International Conference on Quantitative Precipitation Forecasting*, Reading, UK, Vol. 1, p. 47.
- Carbone, R. E., L. J. Miller, J. D. Tuttle, C. A. Davis, S. B. Trier, D. A. Ahijevych, 2002: Warm season precipitation episodes in the United States: Case Studies. Abstracts, *International Conference on Quantitative Precipitation Forecasting*, Reading, UK, Vol. 1, p. 50.
- Trier, S. B., F. Chen, and K. W. Manning, 2003: Convection initiation along a dryline under conditions of weak synoptic forcing. *Workshop on moist convection, mesoscale processes and convective transport*, EGS-AGU-EUG Joint Assembly. Nice, France, p. 244.
- Trier, S. B., C. A. Davis, and D. A. Ahijevych, 2003: Mesoscale convective vortices during BAMEX. *12th Cyclone Workshop*. Val-Morin, Quebec Canada.
- Trier, S. B., C. A. Davis, R. E. Carbone, and S. Fredrick, 2004: WRF simulations of rainfall coherence over the continental United States. *16th Conference on Numerical Weather Prediction*, Amer. Meteor. Soc., Seattle, WA. CD-ROM, 17.1
- Chen, F., K. W. Manning, D. N. Yates, M. A. LeMone, S. B. Trier, R. Cuenca, and D. Niyogi, 2004: Development of a high-resolution land data assimilation system and its application to WRF. *16th Conference on Numerical Weather Prediction*, Amer. Meteor. Soc. Seattle, WA. CD-ROM, 22.3
- Trier, S. B., C. A. Davis, R. E. Carbone, and S. Frederick, 2004: WRF simulations of rainfall coherence over the continental United States. *Proceedings, 14th International Conference on Clouds and Precipitation*, Bologna, Italy, 1852-1854.

Davis, C. A., and S. B. Trier, 2004: Mesoscale convective vortices observed during BAMEX. Part I: Kinematic and thermodynamic structure. *22nd Conference on Severe Local Storms*, Amer. Meteor. Soc., Hyannis, MA., CD-ROM 5.1

Trier, S. B., and C. A. Davis, 2004: Mesoscale convective vortices observed during BAMEX. Part II: Influences on convection initiation. *22nd Conference on Severe Local Storms*, Amer. Meteor. Soc., Hyannis, MA., CD-ROM 5.2

Ahijevych, D. A., G. Bryan, C. A. Davis, J. C. Knievel, S. B. Trier, and M. Weisman, 2004: System-relative distribution of atmospheric soundings observed during BAMEX. *22nd Conference on Severe Local Storms*, Amer. Meteor. Soc., Hyannis, MA., CD-ROM 5.1

Megenhardt, D. L., C. Mueller, S. Trier, D. Ahijevych, and N. Rehak, 2004: NCWF-2 probabilistic forecasts. *11th Conference on Aviation, Range and Aerospace Meteorology*. Hyannis, MA., CD-ROM 5.2.

Saxen, T. R., C. Mueller, J. Wilson, R. Roberts, E. Nelson, D. Ahijevych, and S. Trier, 2004: Updates to the NCAR Auto-nowcaster for the 2004 convective weather season. *11th Conference on Aviation, Range and Aerospace Meteorology*. Hyannis, MA., CD-ROM 5.2.

INVITED TALKS AND SEMINARS

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| 1988 | National Central University, Chung-Li, Taiwan, R.O.C. |
| 1989 | National Taiwan University, Taipei, Taiwan, R.O.C. |
| 1991 | MMM Seminar, National Center for Atmospheric Research, Boulder, Colorado. |
| 1992 | MMM Seminar, National Center for Atmospheric Research, Boulder, Colorado |
| 1992 | Colorado State University, Fort Collins, Colorado |
| 1994 | MMM Seminar, National Center for Atmospheric Research, Boulder, Colorado |
| 1996 | Weekly seminar, Woods Hole Oceanographic Institute, Woods Hole, Massachusetts |
| 1997 | MMM Seminar, National Center for Atmospheric Research, Boulder, Colorado |
| 2001 | <i>Long-lived mesoconvective vortices and their environment</i> , Invited Presentation for MMM Outstanding Publication of 2000., Boulder, Colorado |
| 2002 | <i>Frontiers of Deep, Precipitating Convection</i> , MMM Retreat, Estes Park, Colorado |
| 2004 | <i>MCVs and the convective forecast problem</i> . Invited presentation for National Weather Service Spring Severe Weather Workshop. Burlington, VT. WSFO |
| 2004 | <i>MCVs and the convective forecast problem</i> . Invited presentation for National Weather Service Spring Severe Weather Workshop. Albany, NY. WSFO |

2007

Mesoscale Convective Vortices Observed during BAMEX. Invited seminar at National Severe Storms Laboratory, Norman, Oklahoma.

GRANTS AND PROPOSALS

Davis, C. A. (PI), W. C. Skamarock (Co-I), S. B. Trier (Co-I), and R. H. Johnson (Collaborator), NASA Grant "Mesoscale convective vortices as precursors of organized, heavy precipitation," 2/1/98 – 4/30/01.

Carbone, R. (PI), C. Davis (Co-PI), M. Moncrieff (Co-PI), S. Trier (Co-PI), D. Ahijevych (Co-I), C. Liu (Co-I), L. J. Miller (Co-I), and J. Tuttle (Co-I), "Predictability and Prediction of Heavy Warm-Season Rainfall," 7/1/01 – 9/30/03. USWRP.

Chen, F. (PI), E. Brandes (Co-PI), J. Coen (Co-PI), M. LeMone (Co-PI), L. Mearns (Co-PI), D. Parsons (Co-PI), S. Trier (Co-PI), T. Warner (Co-PI), M. Xu (Co-PI), and D. Yates (Co-PI), "Land Surface/Atmosphere Interactions and its Relationship to Improving Quantitative Precipitation Forecasting of Deep Convection in the Southern Great Plains," 7/1/01 – 9/30/03. USWRP.

Moncrieff, M. (PI), R. Carbone (Co-PI), C. Davis (Co-PI), C. Liu (Co-I), and S. Trier (Co-I), "Organized Convective Precipitation over the US Continent and Applications to Stochastic Hydrology," 3/15/03 - . NSF Global Energy and Water Cycle Experiment.

Chen, F. (PI), D. Gochis (Co-PI), M. LeMone (Co-PI), K. Manning (Co-PI), S. Trier (Co-PI), D. Yates (Co-PI), R. Wakimoto (Collaborator), and D. Niyogi (Collaborator), "Land-Surface/Atmosphere Interactions and their Impacts on the Quantitative Precipitation Forecasting in the Southern Great Plains," 10/1/03 - . USWRP

Chen, F. (PI), M. A. LeMone (Co-I), and S. B. Trier (Co-I), "Atmospheric Responses to Land-Surface Forcing and their Impact on Precipitation Processes in the Southern Great Plains. NASA.

Trier, S. B. (PI), and C. A. Davis (Co-PI), D. A. Ahijevych, and J. D. Tuttle, "Contribution of Mesoscale Processes Above the PBL on Lifecycles of Deep Convection", NCAR STEP/USWRP Science Program. 10/1/08 - .

Chen, F (PI), M. LeMone, S. Trier, M. Barlage, and K. Manning, "Impacts of Land/PBL Interactions on Short-term Prediction of Precipitation: A Focused Study over the IHOP_2002 Region. NCAR STEP/USWRP Science Program. 10/1/08 - .