

DONNA F. TUCKER

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Education

Ph.D. Atmospheric Science, Colorado State University, 1987.
Dissertation: The Anatomy of Heavy Rainfall Over
Complex Terrain: A Modeling Approach.

M.S. Atmospheric Science, Colorado State University, 1982.
Thesis: April Circulation over the Tibetan Plateau:
Studies with a Primitive Equation Model.

B.S. Atmospheric Science, Cornell University, 1980.

Professional Experience

Associate Professor, Department of Geography, University of
Kansas, 2003- present

Associate Professor, Department of Physics and Astronomy,
University of Kansas, 2000-2003.

Assistant Professor, Department of Physics and Astronomy,
University of Kansas, 1994-2000

Lecturer, Department of Physics and Astronomy, University
of Kansas, 1993-1994

Assistant Professor, Department of Atmospheric Sciences,
Creighton University, 1990-1994.

Research Meteorologist, U.S. Army Atmospheric Sciences Laboratory, White Sands Missile Range, 1988-1990.

College Assistant Professor, Department of Earth Sciences, New Mexico State University, 1989.

Instructor, Department of Earth Sciences, New Mexico State University, 1988.

Postdoctoral, Center for Cybernetic Communications Research, Colorado State University, 1987-1988.

Teaching Experience:

Introductory	Advanced Undergraduate/Graduate
Severe and Unusual Weather	Cloud Physics and Dynamics
Computer Programming in Atmospheric Sciences	Boundary Layer Meteorology
Mountain Meteorology	Dynamic Meteorology I
Introduction to Atmospheric Science	Dynamic Meteorology II
Introduction to Meteorology	Advanced Synoptic Meteorology
	Synoptic Meteorology
	Microclimatology
	Aviation Meteorology (Internet)

Graduate

Atmospheric Dynamics
Mountain Meteorology
Numerical Weather Prediction
General Circulation, Colorado State University, TA, 1983

Professional Affiliations

American Meteorological Society
American Geophysical Union
National Weather Association
Association of American Geographers

Sigma Xi
Sigma Pi Sigma

Professional Service

President, El Paso-Las Cruces Chapter of the American Meteorological Society, 1989-1990

Geophysical group member, 1991, Chair 1992,1995,1997 of the National Defense Science and Engineering Graduate Fellowship Evaluation Panel

Nominating Committee, 1992-1994, National Weather Association

Board of Meteorological and Oceanographic Education in the Universities of the American Meteorological Society, since 1994; Chair of committee on the bachelor's degree in meteorology or atmospheric science 1997-1999.

National Science Foundation, Lower Atmosphere Division, Committee of Visitors, 1995

National Science Foundation, Evaluation panel for Unidata, 1998.

Committee of Judges for Undergraduate Awards, American Meteorological Society, 2001-2005, currently chair

Unidata Users Committee, 2002-2005

NSF Review Panel, IGERT, Dec. 2003.

Selection committee, Unidata Equipment Awards, 2003, 2004

National Weather Association Aviation Meteorology Committee 2006-present

NSF Review Panel, Unidata, June 2008

Grants Received:

NSF, "Expansion of a PC McIDAS network for enhanced teaching and research.", 8/92 - 2/94, \$14,300.

K*STAR NSF EPSCoR, "Numerical modeling of mesoscale convective systems", 6/94 - 9/94, \$3500.

COMET/UCAR, "Eta model performance for warm season heavy rainfall events across the Central United States", 8/94 - 8/95, \$4909.

NSF, "Development of a computer-based synoptic and mesoscale meteorology laboratory", 10/94 - 9/95, \$20,000 (matched by KU).

University of Kansas/GRF "Initiation of Mesoscale Convective Complexes", 1/1/95 - 6/30/96, \$5000.

National Center for Atmospheric Research, Initiation of Mesoscale Convective Systems, 3/1/92 - 5/31/96. 50 GAU of computer time.

University of Kansas/GRF "Effect of a Local Moisture Source on the Precipitation Produced by Convective Systems", 7/1/96-6/30/97, \$9,000.

National Center for Atmospheric Research, Orographic Mesoscale Convective Systems, 7/1/96-8/31/98, 175 GAU of computer time

NSF, "Summer Plateau Circulation Systems of Western North America", 5/1/96-11/30/97, \$75,000.

University of Kansas/GRF "Effect of Wind Regimes on the Initiation Point of Large Convective Systems", 7/1/97-6/30/98, \$4,281.

Wolf Creek Nuclear Operating Corporation, Compilation of a Set of Site-Specific Screening Criteria to be Used for Meteorological Data Verification and Validation, 7/15/97-1/1/98, \$3,783.

University of Kansas/GRF, Aviation Weather Hazard
Characterization and Verification, 7/1/99-6/30/00, \$5000.

NSF, "Favored Regions of Convective Initiation", 6/1/99-
11/30/05, \$170,000.

COMET/UCAR, "Terminal Area Forecasts for Kansas City",
7/1/99-6/30/01, \$60,888.

NSF, "New Directions for a Meteorology Laboratory in
Research and Education", 11/1/99-10/31/00, \$10,500 (matched
by KU).

Sprint-Nextel, "Robust Millimeter Wave Metropolitan Mesh
Network" 3/23/2007-3/31/2008, \$198,850.

Sprint-Nextel, "Robust Wireless Mesh Networking Research:
Extension to 23GHz" 10/15/2007-10/14/2008, \$140,000

Invited Presentations

"Numerical Model Forecasts of Convective Orographic
Precipitation" seminar presented at the Program for
Regional Observing and Forecasting Services (PROFS), on 22
October 1986.

"Moisture Convergence and Convective Storms in Complex
Terrain" seminar presented at New Mexico Institute of
Mining and Technology, Socorro, NM, 25 January 1990.

"Orographic Effects on Precipitation", presented to the
Omaha-Offut chapter of the American Meteorological Society,
Oct. 18, 1990.

"Women in Science" presented jointly with Holly Harris and
Janet Seger to the Philosophy and History of Science Forum
at the University of Nebraska at Omaha, April 3, 1992.

"Orographic Influence on Precipitation in South Central New
Mexico" presented to Geography Department, University of
Kansas, Feb. 2, 1994.

"Using GEMPAK for the Analysis of Mesoscale Data in Complex Terrain" at workshop on Teaching Meteorology in the Age of Modernized Weather Services sponsored by NSF and COMET in Boulder CO, June 15, 1994.

"New Trends in Meteorological Education", presented to the Kansas City chapter of the American Meteorological Society, Oct. 25, 1995.

"Forecasting Heavy Precipitation using the ETA Model and GEMPAK", presented to the COMET Cooperative Regional Workshop, St. Louis. MO Nov. 12, 1996.

"Nonhydrostatic Atmospheric Numerical Modeling in Complex Terrain", presented to the Kansas Center for Advanced Scientific Computing, University of Kansas, August 23, 1997.

"The Development of a Mesoscale Convective System to the East of the Rocky Mountains" presented at the National Center for Atmospheric Research, Boulder, CO, June 13, 1997.

"Will El-Nino Bring Floods to Kansas this Spring?" Presented to the Kansas Society of Civil Engineers, Emporia, KS, Jan. 8, 1998

"The Bachelor's Degree in Atmospheric Science", Presented at the 11th Meeting of the Heads and Chairs of Atmospheric Sciences Programs

"What is a Monsoon?" Presented at Indian Institute of Technology, Kanpur, India, Jan. 4, 1999.

"Great Plains Thunderstorms: The Rocky Mountain Connection, Presented at Grinnell College, April 4, 2000.

"Summer Convective Precipitation Patterns in the Western United States", Presented at CSIRO, Aspendale, Australia, May 29, 2000

"High Plains Thunderstorms: The Rocky Mountain Connection"
Presented at the University of Missouri - Columbia, March
14, 2001

"Initiation of Thunderstorms in the Rocky Mountains".
Presented at Western Michigan University, April 8, 2004

"Initiation of Convective Precipitation in Complex Terrain
Under Reduced Moisture Conditions", Fall Meeting, American
Geophysical Union, San Francisco, CA, Dec. 9, 2005.

"Thunderstorm Initiation in the Rocky Mountains: A Case
Study". Expanding the Use of Models as Educational Tools
in the Atmospheric and Related Sciences, Unidata, UCAR,
Boulder CO, Jul. 10-14, 2006

"Causes of preferred places for thunderstorm initiation in
the mountainous regions" presented at State Key Laboratory
of Severe Weather, Chinese Academy of Meteorological
Sciences, Beijing, China, May 21, 2007.

"Thunderstorm Initiation in the Rocky Mountain Region"
presented to the Department of Geography, University of
Oklahoma, Feb. 27, 2008.

Panel discussion **Preparing the Next Generation to Meet New
Demands on Science and Services** (Joint between the 19th
Symposium on Education and the Fifth Symposium on Policy
and Socio-economic Research), Atlanta, GA, Jan. 17-21,
2010.

Refereed Publications

Reiter, E.R., B. Macdonald, and D.F. Tucker 1987: Decision
support architecture for the Portable Interactive Weather
Prediction System (PIWPS). In: Emrich, M.L., Sudlowe,
A.R., Arrowood, L.F. (eds): *Expert Systems and Advanced
Data Processing*, New York: North Holland, pp. 316-330.

Tucker, D.F. and E.R. Reiter 1988: Modeling heavy precipitation
in complex terrain. *Meteorology and Atmospheric Physics*,
39, 119-131.

- Tucker, D.F., P.W. Mielke, and E.R. Reiter 1989: The verification of numerical models with multivariate randomized block permutation procedures. *Meteorology and Atmospheric Physics*. **40**, 181-88.
- Tucker, D.F. and E.R. Reiter 1989: Heavy rainfall in complex terrain: insights from a numerical model. *Meteorology and Atmospheric Physics*. **40**, 194-210.
- Tucker, D.F., 1993: Diurnal precipitation variations in South Central New Mexico, *Mon. Wea. Rev.*, **121**, 1979-1991.
- Winkler, J.A., D.F. Tucker, and A.K. Smith, 1996: Salaries and advancement of women faculty in atmospheric science: some reasons for concern. *Bull. Amer. Meteor. Soc.*, **77**, 473-490.
- Tucker, D.F., 1997: Surface mesonets of the western United States. *Bull. Amer. Meteor. Soc.*, **78**, 1485-1495.
- Tucker, D.F., 1998: Comments on "Rainfall and climate variation over a sloping New Mexico Plateau during the North American Monsoon". *J. Climate*, **11**, 292-293.
- Tucker, D.F., 1999: The summer plateau low pressure system of Mexico, *J. Climate*, **12**, 1002-1015.
- Tucker, D.F. and N.A. Crook, 1999: The generation of a mesoscale convective system from mountain convection. *Mon. Wea. Rev.*, **127**, 1259-1273.
- Tucker, D.F., G.A. Marotz, and G.F. Frazier, 1999: Elements of a CERCLA action at a former army ammunition plant. *92nd Annual Meeting of the Air and Waste Management Association*, Paper 99-355, St. Louis, 15 pp.
- Tucker, D.F. and K. S. Zentmire, 1999: On the forecasting of orogenic mesoscale convective systems. *Wea. Forecast.*, **14**, 1017-1022.
- Marotz, G.A., R.W. Baldauf, D.F. Tucker, D.D. Lane, and R.E. Carter, 2000: Mesoscale atmospheric conditions and their

relationship to temporal, spatial distribution of $PM_{2.5}$ and metals in a rural setting. *Proceedings, AWMA International Specialty Conference PM-2000: Particulate Matter and Health*, Charleston, S.C..

Marotz, G.A., R.W. Baldauf, D.F. Tucker, D.D. Lane, and R.E. Carter, 2000: Distributions of $PM_{2.5}$ and selected metal constituents in a rural area containing several hazardous waste incinerators. *93rd Annual Meeting of the Air and Waste Management Association*, Salt Lake City, UT.

Tucker, D.F., 2005: Precipitation, *Encyclopedia of World Climates*, J. Oliver, Ed., Kluwer, 552-555.

Tucker, D.F., 2005: Orographic Precipitation, *Encyclopedia of World Climates*, J. Oliver, Ed., Kluwer, 574-576.

Crook, N.A. and D.F. Tucker, 2005: Flow over heated terrain. Part I: Linear theory and idealized numerical simulations. *Mon. Wea. Rev.*, **133**, 2552-2564.

Tucker, D.F. and N.A. Crook, 2005: Flow over heated terrain. Part II: Generation of convective precipitation. *Mon. Wea. Rev.*, **133**, 2565-2582.

Tucker, D.F. and X. Li, 2009: Characteristics of warm season precipitating storms in the Arkansas-Red River basin. *J. Geophys. Res.*, 114, D13108, doi:10.1029/2008JD011093

Tucker, D.F., D. K. Ginther, and J. A. Winkler, 2009: Gender issues among academic AMS members: Comparisons with the 1993 membership survey. *Bull. Amer. Meteor. Soc.*, **90**, 1180-1191.

Tucker, D.F., 2009: Precipitation, *Encyclopedia of Snow, Ice and Glaciers*, Springer, in press.

Other Publications

Tucker, D.F. and E.R. Reiter 1986: A numerical model for forecasting topographically induced rainfall. Preprints,

Eleventh Conference on Weather Forecasting and Analysis,
Kansas City, Missouri 17-20 June, 1986. pp. 375-378.

Bresch, J.F., D.F. Tucker and E.R. Reiter 1986: Forecast of the
1 August Cheyenne Flood, using a numerical model.
Preprints, Eleventh Conference on Weather Forecasting and
Analysis, Kansas City, Missouri, 17-20 June, 1986. pp.
126-30.

Tucker, D.F. and E.R. Reiter 1986: Orographic precipitation
model forecast of the Big Thompson Flood. Proceedings of
the Symposium on the Big Thompson Flood, Boulder, Colorado,
17-19 July, 1986. pp. 119-126.

Bresch, J.F., E.R. Reiter, D.F. Tucker, and Luiz Teixeira 1986:
Limited area modeling with a desktop computer. Proceedings
of the International Symposium on Short and Medium Range
Numerical Weather Prediction, Tokyo, Japan, 4-8 August,
1986.

Tucker, D.F. and E.R. Reiter 1987: Treatment of orographic
effects in a numerical model. Preprints, Fourth Conference
on Mountain Meteorology, Seattle, Washington, 25-28 August,
1987. pp. 156-157.

Klitch, M.A. and D.F. Tucker 1987: Using satellite data to
verify a numerical model that employs realistic terrain
details. Preprints, Fourth Conference on Mountain
Meteorology, Seattle, Washington 25-28 August, 1987. pp.
158-159.

Reiter, E.R. and D.F. Tucker 1988: Integration of weather
prediction and decision support for specific user
environments. Preprints, Fourth International Conference
on Interactive Information and Processing Systems for
Meteorology, Oceanography, and Hydrology, Anaheim,
California, 31 January-5 February, 1988.

Tucker, D.F. and E.R. Reiter 1988: Precipitation forecasting
for flash flood events. Proceedings of the American

Geophysical Union's Eighth Annual Hydrology Days, Fort Collins, Colorado, 19-21 April 1988.

Tucker, D.F. 1988: Response of a diagnostic wind model to various initial conditions. Proceedings of the 9th Annual EOSAEL/TWI Conference, 29 November-1 December 1988, Physical Science Laboratory, Las Cruces, New Mexico. pp. 417-426.

Tucker, D.F. 1989: Obtaining divergent surface winds in complex terrain. Preprints, Twelfth Conference on Weather Analysis and Forecasting, 2-6 October, Monterey, California. pp. 547-550.

Tucker, D.F. 1989: Precipitation forecasting on tactical computers with a numerical model. Proceedings of the 10th Annual EOSAEL/TWI Conference 28-30 November, 1989, Physical Science Laboratory, Las Cruces, New Mexico. pp. 92-97.

Tucker, D.F. 1990: Operational prediction of mesoscale precipitation with a numerical model on a portable computer. Preprints, Conference on Operational Precipitation Estimation and Prediction, February 7-8, 1990, Anaheim, California. pp. 13-15.

Tucker, D.F. and T. Henmi 1990: Usefulness of diagnostic models for real time analysis of the wind field. Technical Report, TR-0274, U.S. Army Atmospheric Sciences Laboratory. 30 pp.

Tucker, D.F. and R. Bonner 1990: Surface and rawinsonde observations taken by the U.S. Army Atmospheric Sciences Laboratory. Internal Report, U.S. Army Atmospheric Sciences Laboratory. 24 pp.

Tucker, D.F., 1990: Orographic influence on summer diurnal precipitation pattern in south central New Mexico. Proceedings of the 11th EOSAEL/TWI Conference, 27-30 November 1990. Physical Science Laboratory, Las Cruces, New Mexico. pp. 514-522.

Tucker, D.F., 1992: The use of cumulant methods to delineate diurnal precipitation regimes. Preprints, 12th Conference

- on Probability and Statistics in the Atmospheric Sciences, June 22-26, 1992, Toronto, Ontario, Canada. pp. 44-49.
- Tucker, D.F., 1993: GEMPAK on a personal computer, Preprints, Ninth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology. January 17-22, 1993, Anaheim, CA, pp. 309-311.
- Tucker, D.F., 1994: Accuracy of finite differencing techniques, Preprints, Tenth Conference on Numerical Weather Prediction, July 18-22, 1994, Portland, OR. American Meteorological Society, pp. 374-375.
- Denton, A. W. and D.F. Tucker, 1995: Evidence for a local anthropogenic climate change. Preprints, Ninth Conference on Applied Climatology, Jan. 15-20, 1995, Dallas, TX, American Meteorological Society, pp. 308-312.
- Tucker, D.F., G. Phillips, and P.A. Castleberry, 1996: HPGEM: A series of GEMPAK scripts for forecasting heavy precipitation. Preprints, 12th International Conference on Interactive Information and Processing Systems, Jan. 28-Feb. 2, 1996, Atlanta, GA, American Meteorological Society. pp. 502-505.
- Castleberry, P.A., D.F. Tucker, G. Phillips and B. Wallewender, 1996: The identification and verification of precipitation fields in the ETA model using Multivariate Randomized Block Permutation Procedures (MRBP). Preprints, 18th Conference on Severe Local Storms, Feb. 19-23, 1996, San Francisco, CA, American Meteorological Society
- Castleberry, P.A., D.F. Tucker and L. Pease, 1996: The use of a possible vortex signature in the ETA model to predict the onset of heavy precipitation. Preprints, 18th Conference on Severe Local Storms, Feb. 19-23, 1996, San Francisco, CA, American Meteorological Society
- Tucker, D.F. 1996: Mesoscale convective system initiation near complex terrain. Preprints, Seventh Conference on Mesoscale Processes, Sept. 9-13, 1996 Reading, United Kingdom, American Meteorological Society. pp. 255-256.

- Tucker, D.F. 1997: Western United States surface mesonets, Preprints, First Symposium on Integrated Observing Systems, Feb. 3-7, 1997 Long Beach, CA, American Meteorological Society.
- Jia, Y. and D.F. Tucker 1998: Environmental conditions for the development of mesoscale convective systems: diagnostic study and numerical simulation. Preprints, 16th Conference on Weather Analysis and Forecasting, Jan. 11-16, 1998, Phoenix AZ, American Meteorological Society. pp. 112-114.
- Weeks-Hulecki, R., M.L. Bentley, and D.F. Tucker, 1998: Mesoscale circulations within a Kansas mesoscale convective system 31 May 1996-1 June 1996. Preprints, 16th Conference on Weather Analysis and Forecasting, Jan. 11-16, 1998, Phoenix AZ, American Meteorological Society. pp. 155-157.
- Tucker, D.F., 1998: Genesis of mesoscale convective systems near the Rocky Mountains. Preprints, 16th Conference on Weather Analysis and Forecasting, Jan. 11-16, 1998, Phoenix AZ, American Meteorological Society. pp. 193-195.
- Jezewski, M.C. and D.F. Tucker, 1998: Large hail distribution on the High Plains. Preprints, 16th Conference on Weather Analysis and Forecasting, Jan. 11-16, 1998, Phoenix AZ, American Meteorological Society. pp. 329-331.
- Tucker, D.F., 1998: Interannual variability of the North American plateau circulation system, 8th Conference on Mountain Meteorology, Aug. 3-7, 1998, Flagstaff, AZ, American Meteorological Society, pp. 60-65.
- Tucker, D.F., 1999: The bachelor's degree in atmospheric science - revision of the 1995 AMS statement. 8th Symposium on Education, Jan. 10-12, 1999, Dallas, TX, American Meteorological Society
- Tucker, D.F. and N.A. Crook, 2000: Rocky Mountain convective activity under various flow regimes. 9th Conference on Mountain Meteorology, Aug. 7-11, 2000, Aspen, CO, American Meteorological Society, pp. 355-358.

- Braaten, D.A., I. Jirak, D.F. Tucker, C. Pan, P.A. Browning, 2000: Key parameters in forecasting IFR conditions: Two case studies., 9th Conference on Aviation, Range and Aerospace Meteorology, Sept. 11-15, 2000. Orlando, FL, American Meteorological Society, pp. 165-166.
- Tucker, D.F., D.M. Crnkovich, D.W. McCann, and D.A. Braaten, 2000: An investigation of clear air versus in cloud turbulence. 9th Conference on Aviation, Range and Aerospace Meteorology, Sept. 11-15, 2000. Orlando, FL, American Meteorological Society, pp. 212.
- Pan, C., I. Jirak, D.F. Tucker, D.A. Braaten, P.A. Browning, and D. Beusterien, 2000: Improvement of terminal area forecasts. 9th Conference on Aviation, Range and Aerospace Meteorology, Sept. 11-15, 2000. Orlando, FL, American Meteorological Society, pp. 377-380.
- Tucker, D.F. and N.A. Crook, 2001: Favored regions of convective initiation in the Rocky Mountains. 9th Conference on Mesoscale Processes, Jul. 30-Aug. 2, 2001, Ft. Lauderdale, FL, American Meteorological Society,
- Tucker, D.F., 2002: Characteristics of severe hail events in eastern Australia. 21st Conference on Severe Local Storms, 12-16 August 2002, San Antonio, TX, American Meteorological Society. pp. 91-94.
- Tucker, D.F. and N.A. Crook, 2004: Initiation of precipitating convection in mountainous regions. 18th Conference on Hydrology, 11-15 Jan. 2004, Seattle, WA, American Meteorological Society.
- Tucker, D.F. and N.A. Crook, 2005: Initiation of Convective Precipitation in Complex Terrain Under Reduced Moisture Conditions. EOS Trans. AGU, 86(52), Fall Meet. Suppl., Abstract H53J-03
- Tucker, D.F. D.W. Smith, D. Depardo, T. Euler, P. Youngberg and H.W. Johnson, 2008: Effect of atmospheric hydrometeors on

millimeter wave transmissions. Preprints, 12th Conference on IOAS-AOLS, New Orleans, LA, Amer. Meteor. Soc., P2.4

Tucker, D.F. and J.A. Winkler, 2008: Statistical analysis of survey data related to gender issues among academic AMS members. Preprints, 19th Conference on Probability and Statistics, New Orleans, LA, Amer. Meteor. Soc., P5.2

Tucker, D.F. and X. Li, 2008: Distribution of Warm Season Precipitating Storms in the Southern Great Plains, Abstracts, AGU Fall Meeting. Dec. 15-19, 2008, San Francisco, CA.

Tucker, D.F. and X. Li, 2009: Climatology of warm season precipitating storms in the Southern Great Plains., Preprints, 21st Conference on Climate Variability and Change, Phoenix, AZ, Amer. Meteor. Soc., 12A.4

Tucker, D.F. 2010: An internet based aviation meteorology course. Preprints, 19th Symposium on Education, Atlanta, GA, Amer. Meteor. Soc., J5.2