

GREGORY JOHN STUMPF

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Current Affiliation:

Cooperative Institute for Mesoscale Meteorology
Studies, University of Oklahoma
via a memorandum of understanding through:
National Weather Service
Office of Science and Technology
Meteorological Development Laboratory
Decision Assistance Branch
Silver Springs, Maryland

Education:

B. S. Meteorology, May 1986, State University of New York College at Oswego, Oswego, New York. *Senior Meteorology Award. Grade Point Average: 3.91*

M. S. Atmospheric Science, December 1988, Colorado State University, Fort Collins, Colorado. *Grade Point Average: 4.0*

Areas of Specialty:

Radar Meteorology, Severe Local Storms, Warning Decision Making, Operational Meteorological Computer Applications, Mesoscale Meteorology.

Professional Employment:

Meteorologist Research Associate, (3/04 to present), National Weather Service (NWS) Meteorological Development Laboratory (MDL) and Cooperative Institute for Mesoscale Meteorological Studies - University of Oklahoma, Norman, Oklahoma. Liaison between the National Severe Storms Laboratory (NSSL) and the NWS severe weather warning program, via MDL, for the science and technology infusion of multiple-radar and multiple-sensor severe weather warning -decision making applications. Operations Coordinator for the Hazardous Weather Testbed – Experimental Warning Program spring experiments. Developed new multiple-radar/sensor hail warning applications. Collaborated with NSSL on development of new 3D/4D radar data display application. Installed first-ever Advanced Weather Information Processing System (AWIPS) workstation at NSSL. Facilitated NSSL-NWS Workshops on Severe Weather Warning Technology (July 2005, July 2007).

Group Manager, (2000-2004), National Severe Storms Laboratory Severe Weather Warning Applications and Technology Transfer National Weather Service (SWAT-N) Group. Responsible for facilitation of the administrative activities of a 9 member team of meteorologists and students developing severe weather warning applications for the National Weather Service and other related projects. Other duties similar to former team leadership position.

Meteorologist Research Associate, (1/92 to 2/04; PROMOTION from previous position), National Severe Storms Laboratory (NSSL) and Cooperative Institute for Mesoscale Meteorological Studies - University of Oklahoma, Norman, Oklahoma. Led group development effort of innovative prototype multiple-radar and multiple-sensor severe weather applications for the National Weather Service (NWS) and other users using the Warning Decision Support System - Integrated Information (WDSSII). Developed enhanced Mesocyclone Detection Algorithm for the National Weather Service (NWS) WSR-88D radar to be fielded spring 2004. Responsible for technical leadership of several project scientists and undergraduate students. Gained extensive experience in Doppler radar analysis and detection of severe convective storms of many varieties. Helped design the NSSL Warning Decision Support System (WDSS and WDSSII) for innovative severe weather application development and real-time prototyping. Helped develop NWS Tornado Warning Guidance documentation in 1997, and was Chief Editor of the 1999

guidance document. Supervised student team to develop 2002 Tornado Warning Guidance. Presented seminars at NSSL, American Meteorological Society local chapter meetings, schools, and various workshops, symposia, conferences and annual meetings in the U.S. and other countries, and am well-published (see separate listing). Participated in a variety of field projects (see separate listing) and led the NSSL effort to conduct severe storm damage surveys for the NWS. Work includes collaboration with a number of world-renowned scientists in the field of tornado and supercell research. Held group management positions for the Severe Weather Warning Applications and Technology Transfer (SWAT) team, the SWAT-Vortex Applications Focus Group (SWAT-V), and the SWAT-National Weather Service (SWAT-N) Group as well as Operations Director for several field projects (see Supervisory Position information). Held budgetary responsibilities for several WSR-88D Radar Operations Center (ROC)/NSSL Memorandum of Understanding (MOU), an MOU with the NWS Warning Decision Training Branch (WDTB), an MOU with the Australian Bureau of Meteorology, an MOU with the Federal Aviation Administration (FAA) for work supporting NSSL's Phased Array Radar (PAR) project (see Budgetary Responsibilities information), and several Cooperative Research And Development Agreements (CRADA) with private companies.

Meteorologist Research Assistant, (3/89 to 1/92), National Severe Storms Laboratory and Cooperative Institute for Mesoscale Meteorological Studies, University of Oklahoma, Norman, Oklahoma. Developed new automated computer techniques to detect severe weather phenomena using data from Doppler radar, for aviation interests (the Terminal Doppler Weather Radar program). Utilized skills in interpreting thunderstorm outflow structure, wind shear, severe weather, and forecasting. Utilized computers to develop programs, visualize data, produce reports, documents, and graphics.

Meteorologist Intern, (9/88 to 3/89), Mesoscale and Microscale Meteorology Division, National Center for Atmospheric Research, Boulder, Colorado. Developed computer programs to manage rawinsonde sounding data set for the Taiwan Meteorological Experiment.

Graduate Research Assistant, (8/86 to 8/88), Department of Atmospheric Sciences, Colorado State University, Fort Collins. Carried out research leading to master's degree thesis. Work included analysis and interpretation of mesoscale convective systems. Assisted in various research tasks for the Preliminary Regional Experiment for Stormscale Operational Regional Meteorology project. Teaching assistant for Synoptic Weather Lab and Atmospheric Dynamics.

Emergency Planning Intern, (8/85 to 8/86), New York Power Authority's James A. Fitzpatrick Nuclear Power Plant, Fulton. Created graphical two-dimensional radiological plume display for Gaussian one-dimensional radiation-release dose assessment computer model.

Meteorologist Intern, (1/85 to 5/85), The Weather Channel, Atlanta, Georgia. Prepared on-air graphical products. Created several procedures to save work time. Assisted in forecast operations.

Undergraduate Research Assistant, (7/84 to 9/84, and 5/85 to 8/85), Lake Ontario Lake Breeze Project, State University of New York College at Oswego. Developed and managed coastal mesoscale regime climatological data base.

Field project experience:

National Weather Center Hazardous Weather Testbed Experimental Warning Program Spring Experiment, Norman, OK, Operations Coordinator (2008-present), Participant (2007).

Verification of the Origins of Rotation in Tornadoes Experiment 2 (VORTEX2), storm updraft stereo photogrammetry team, National Severe Storms Laboratory, Norman, Oklahoma (Spring 2009).

National Weather Service Warning Decision Support System-II Proof-of-Concept Test (WDSSII PoCT), Participant (Norman OK 2004-2005).

National Weather Service Warning Decision Support System-II Proof-of-Concept Test (WDSSII PoCT), Operations Manager (Jackson MS 2002-2003; Wichita KS 2003).

Severe Thunderstorm Electrification and Precipitation Studies 2000 (STEPS), storm-intercept team leader based from Goodland Kansas, National Severe Storms Laboratory, Norman, Oklahoma (Spring 2000).

May 3 1999 Tornado Damage Survey, led the formal survey of the F5 tornado series that passed through the Oklahoma City metropolitan area (AStorm A@). Compiled ground and aerial survey information to develop high-resolution damage survey maps (see related publication).

Verification of the Origins of Rotation in Tornadoes sub-EXperiment 1997, 1998, 1999 (sub-VORTEX), storm-intercept field coordinator team, mobile mesonet team, and camera team; nowcaster (when not in field), National Severe Storms Laboratory, Norman, Oklahoma (Spring 1997, Spring 1998).

National Weather Service Warning Decision Support System Proof-of-Concept Test (WDSS PoCT), Operations Manager (Fort Worth, 1995, 1996, 1997, 1998, 1999; Minneapolis 1996; Kansas City 1997), Operations Observer (Phoenix, 1994; Atlanta 1995; Indianapolis 1996; Melbourne, 1996, Kansas City 1998), Trainer (Albany 1997).

Verification of the Origins of Rotation in Tornadoes EXperiment (VORTEX), storm-intercept team leader, tornado damage surveys, National Severe Storms Laboratory, Norman, Oklahoma (Spring 1994, 1995).

SouthWest Area Monsoon Project (SWAMP), real-time radar algorithm testing (1994, 1993), storm intercept (1994).

Cimarron Algorithm Test and Evaluation (CAT&E '92), Project Leader and Operations Director, real-time algorithm testing, National Severe Storms Laboratory, Norman, Oklahoma (Spring 1992).

Terminal Doppler Weather Radar (TDWR), real-time algorithm testing, Massachusetts Institute of Technology Lincoln Laboratory FL-2 Doppler radar site, Kansas City (Summer 1989) and Orlando (Summers 1990-1992).

Stormscale Regional Meteorology Fronts Experiment and Systems Test (STORM-FEST), nowcasting, National Weather Service Experimental Forecast Facility at Norman, Oklahoma (Winter 1992).

Cooperative Oklahoma Profiler Studies (COPS), nowcasting and real-time radar algorithm system monitoring, National Severe Storms Laboratory, Norman, Oklahoma (Spring 1991).

WSR-88D (NEXRAD) Intensive Operational Test and Evaluation II (IOT&E II), severe storm intercept, National Severe Storms Laboratory, Norman, Oklahoma (Spring 1989).

Professional educational experience:

ArcGIS, (June 2003), Center for Spatial Analysis, University of Oklahoma, Norman.

Geographic Information Systems, (Spring 2001), University of Oklahoma course.

National Weather Service Warning Decision Making Workshop III (March 2001), COoperative program for Operational Meteorology, Education, and Training (COMET), University Corporation for Atmospheric Research (UCAR), Boulder, Colorado.

National Weather Service Warning Decision Making Workshop II (February 2000), COoperative program for Operational Meteorology, Education, and Training (COMET), University Corporation for Atmospheric Research (UCAR), Boulder, Colorado.

NOAA Media Training Workshop, (Oct 1999).

Mastering the Basics of PowerPoint, (Mar 1999), CompEd Solutions National Seminar, Fort Worth, Texas.

Forecast Verification and Decision Making (Fall 1998), University of Oklahoma course.

C for Programmers (Jan 1998), Deitel & Deitel and Associates, Norman, Oklahoma.

Management Problems of the Technical Person in a Leadership Role (Jan 1998), Fred Pryor Seminars, Oklahoma City, Oklahoma.

AMS Allan Murphy Short Course on Probability in Forecasting (Jan 1998), Phoenix, Arizona.

NSSL Proposal Writing Workshop (Oct 1997), National Severe Storms Laboratory, Norman, Oklahoma.

COMET Mesoscale Analysis and Prediction (COMAP) (August-September 1997), COoperative program for Operational Meteorology, Education, and Training (COMET), University Corporation for Atmospheric Research (UCAR), Boulder, Colorado. Providing an in-depth review of mesoscale meteorology, this *eight-week* instructional course was designed to increase knowledge of mesoscale meteorology and new observing systems, and to enhance capabilities in forecasting, leading training programs, and participating in research activities. Was taught at the graduate level, and included case studies to illustrate mesoscale phenomena, displaced real-time cases to simulate the forecasting environment, seminars by visiting scientists, discussions of new observing systems, and supervised interactions with local Boulder scientists on independent research projects.

National Weather Service (NWS) Warning Decision Making Workshop (March 1997), NWS Operational Support Facility, Norman, Oklahoma.

NWS Science and Operations Officer Tropical Workshop (Jan 1997), NWS Operational Support Facility, Norman, Oklahoma.

Hydrometeorology (Spring 1994), University of Oklahoma course.

WSR-88D Users Conference and Mesocyclone-recognition Workshop (1994), NWS Operational Support Facility, Norman, Oklahoma.

NWS Science and Operations Officer Convective Workshop (February 1994), NWS Operational Support Facility, Norman, Oklahoma.

Lessons in Leadership (1994), Oklahoma City, Oklahoma.

Managing Projects and Deadlines (1992), Fred Pryor Seminars, Oklahoma City, Oklahoma.

Technical Writing (Spring 1991), University of Oklahoma course.

Awards:

National Oceanic and Atmospheric Administration Technology Transfer Award (Aug 2008). For team participation during the development of the Warning Decision Support System – Integrated Information and for fostering its adopted use in the private sector.

Best Presentation - Technology Transfer to Operations (Oct 2003), *U. S. Dept. Of Commerce High Performance Computing and Communications, NOAATECH 2004*. Recognizing excellence in the research and applications of advanced computing and Internet technologies to further NOAA's service to the Nation.

National Oceanic and Atmospheric Administration/Department of Commerce Bronze Medal (Oct 2003). For rapid and innovative actions in collecting, archiving, and analyzing weather radar data to assist the Shuttle Columbia accident investigation.

Federal Aviation Administration Excellence in Aviation Award (Dec 2002). For contributions to the FAA's Aviation Weather Research Program, which was organized to generate more accurate and accessible aviation weather observations, warnings and forecasts.

Honorable Mention student poster presentation, *21st Conference on Severe Local Storms*, San Antonio, Texas (see publications).

Department of Commerce Silver Medal (Dec 1999). For developing an important prototype Warning Decision Support System for weather forecasters and making significant enhancements to the NEXRAD system, resulting in more timely and reliable warnings.

University of Oklahoma Service Award (Mar 1999). For ten years of service.

National Oceanic and Atmospheric Administration/Department of Commerce Bronze Medal (Dec 1997). For dramatic improvements to NEXRAD severe weather detection algorithms that have improved the skill by 50% leading to reduced personal injuries and economic losses.

Best poster presentation, *18th Conference on Severe Local Storms*, San Francisco, California (see publications).

Best paper, *The Mid-American Symposium on Emerging Computer Technologies*, Norman, Oklahoma (see publications).

Professional and Academic Organizations and Committees:

National Weather Service Quick Response Team for Tornado Damage Assessment, (2002 - present).

AMS Program Committee for the 20th Conference on Severe Local Storms, (June 1999 - Mar 2001).

National Weather Service Roadmap Team, (2000) Member of team charged with defining the paths to reduce tornado warning false alarms.

NWA Home Page Advisory Committee, (1998-2002) Member.

National Weather Association (NWA), (1998 - present) Member.

AMS Scientific Technical Advisory Committee on Artificial Intelligence, (1996-1998) Member.

TEexas Severe Storms Association (TESSA), (1995 - present) Member.

National Severe Storms Laboratory/Storm Prediction Center Employees Association (NSEA), Treasurer (2001-2003), President (1995), Vice President (1994).

American Meteorological Society (AMS), (1984 - 2008), Member.

Master's Student Representative, (5/87 to 5/88), Atmospheric Sciences Faculty Committee, Colorado State University.

Oswego Student Chapter of the American Meteorological Society, President (1984 to 1985), Treasurer (1983 to 1984).

Personal interests:

Storm Chasing, bicycling, electronic music composition, outdoor photography, racquetball, and fishing.

Internet information:

Professional Web Page: <http://www.cimms.ou.edu/~stumpf>

BIBLIOGRAPHY - GREG STUMPF

Refereed Journal Publications:

- Stumpf, G. J., R. H. Johnson, and B. F. Smull, 1991: The wake low in a midlatitude mesoscale convective system having complex convective organization. *Mon. Wea. Rev.*, **119**, 134-158.
- Hermes, L. G., A. Witt, S. D. Smith, D. Klinge-Wilson, D. Morris, G. J. Stumpf, and M. D. Eilts, 1993: The Gust Front Detection and Wind Shift Algorithms of the Terminal Doppler Weather Radar system. *J. Atmos. and Oceanic Tech.*, **10**, 693-709.
- Marzban, C. and G. J. Stumpf, 1996: A neural network for tornado prediction based on Doppler radar-derived attributes. *J. Applied Meteor.*, **35**, 617-626.
- Marzban, C., and G. J. Stumpf, 1998: A neural network for damaging wind prediction. *Wea. Forecasting*, **13**, 151-163.
- Marzban C., H. Paik, and G. J. Stumpf, 1998: Neural networks versus Gaussian discriminant analysis. *Artificial Intelligence Applications*, **10**, 49-58.
- Marzban, C., and G. J. Stumpf, 1998: A neural network for tornado and/or damaging wind prediction based on Doppler radar-derived attributes. *International Journal of Microcomputer Applications*, **17**, 21-28.
- Johnson, J. T., P. L. MacKeen, A. Witt, E. D. Mitchell, G. J. Stumpf, M. D. Eilts, and K. W. Thomas, 1998: The Storm Cell Identification and Tracking (SCIT) algorithm: An enhanced WSR-88D algorithm. *Wea. Forecasting*, **13**, 263-276.
- Mitchell, E. D., S. V. Vasiloff, G. J. Stumpf, M. D. Eilts, A. Witt, J. T. Johnson, and K. W. Thomas, 1998: The National Severe Storms Laboratory Tornado Detection Algorithm. *Wea. Forecasting*, **13**, 352-366.
- Stumpf, G. J., A. Witt, E. D. Mitchell, P. L. Spencer, J. T. Johnson, M. D. Eilts, K. W. Thomas, and D. W. Burgess, 1998: The National Severe Storms Laboratory mesocyclone detection algorithm for the WSR-88D. *Wea. Forecasting*, **13**, 304-326.
- Witt, A., M. D. Eilts, G. J. Stumpf, J. T. Johnson, E. D. Mitchell, and K. W. Thomas, 1998: An enhanced hail detection algorithm for the WSR-88D. *Wea. Forecasting*, **13**, 286-303.
- Witt, A., M. D. Eilts, G. J. Stumpf, E. D. Mitchell, J. T. Johnson, and K. W. Thomas, 1998: Evaluating the performance of WSR-88D severe storm detection algorithms. *Wea. Forecasting*, **13**, 513-518.
- Marzban, C., E. D. Mitchell, and G. J. Stumpf, 1999: On the notion of Abest predictors: An application to tornado prediction. *Wea. Forecasting*, **14**, 1007-1016.
- Monteverdi, J. P., W. Blier, G. J. Stumpf, W. Pi, and K. Anderson, 2001: First WSR-88D documentation of an anticyclonic supercell with anticyclonic tornadoes: the Sunnyvale/Los Altos tornadoes of 4 May 1998. *Mon. Wea. Rev.*, **129**, 2805-2814.
- 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. *Bull. Amer. Soc.*, **82**, 2251-2258.
- Speheger, D. A., C.A. Doswell III, and G. J. Stumpf, 2002: The tornadoes of 3 May 1999: event verification in central Oklahoma and related issues. *Wea. Forecasting*, **17**, 362-381.
- Stumpf, G. J., T. M. Smith, and C. Thomas, 2003: The National Severe Storms Laboratory's contribution to severe weather warning improvement: Multiple-sensor severe weather applications. *Atmos. Research*, **66**, 657-669.
- Joe, P., D. W. Burgess, R. Potts, T. Keenan, G. J. Stumpf and A. Treloar, 2004: The S2K severe weather detection algorithms and their performance. *Wea. Forecasting*, **19**, 43-63.

- Trapp, R., J., G. J. Stumpf, and K. L. Manross. 2005: A reassessment of the percentage of tornadic mesocyclones. *Wea. Forecasting*, **20**, 680–687.
- Lakshmanan, V., T. Smith, K. Hondl, G. J. Stumpf, and A. Witt, 2006: A real-time, three dimensional, rapidly updating, heterogeneous radar merger technique for reflectivity, velocity and derived products. *Wea. Forecasting*, **21**, 802-823.
- Lakshmanan, V., A. Fritz, T. Smith, K. Hondl, G. J. Stumpf, 2007: An automated technique to quality control radar reflectivity data. *J. Appl. Meteor.*, **46**, 288-305.
- Lakshmanan, V., T. M. Smith, G. J. Stumpf, K. D. Hondl, 2007: The Warning Decision Support System—Integrated Information. *Wea. Forecasting*, **22**, 596-612.

Conference/Workshop/Symposium manuscripts and presentations:

- Stumpf, G. J., and R. H. Johnson, 1988: Lower tropospheric profiling needs in relation to the initiation of mesoscale convective systems. Preprints, *Symp. on Lower Tropospheric Profiling: Needs and Technologies*, Boulder, CO, Amer. Meteor. Soc., 29-30.
- Stumpf, G. J. and W. A. Gallus, Jr., 1989: An examination of new convective development with a PRE-STORM squall line case. Preprints, *24th Conf. on Radar Meteor.*, Tallahassee, FL, Amer. Meteor. Soc., 506-509.
- Stumpf, G. J., 1990: The gust front detection algorithm for the Terminal Doppler Weather Radar: impact of NEXRAD scan strategies; detecting non-gust front phenomena. Preprints, *10th Annual Int'l. Geosciences & Remote Sensing Symp.*, College Park, MD, IEEE Geosci. and Remote Sensing Soc./Int'l. Union of Radio Sci., 743-746.
- Johnson, R. H., S. Chen, G. J. Stumpf, and D. L. Bartels, 1990: The vertical structure of a midtropospheric vortex within the stratiform region of a mesoscale convective system. Preprints, *4th Conf. on Mesoscale Processes*, Boulder, CO, Amer. Meteor. Soc., 216-217.
- Stumpf, G. J., R. H. Johnson, and B. F. Smull, 1990: The wake low in a midlatitude mesoscale convective system having complex convective organization. Preprints, *16th Conf. on Severe Local Storms*, Kananaskis Provincial Park, Alberta, Canada, Amer. Meteor. Soc., 461-466.
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- Eilts, M. D., S. H. Olson, G. J. Stumpf, L. G. Hermes, A. Abrevaya, J. Culbert, K. W. Thomas, K. Hondl, and D. Klinge-Wilson, 1991: An improved gust front detection algorithm for the TDWR. Preprints, *4th Int'l. Conf. on Aviation Wea. Systems*, Paris, France, Amer. Meteor. Soc., J37-J42.
- Stumpf, G. J., and D. W. Burgess, 1993: Observations of lower-tropospheric mesocyclones along the leading edge of a bow echo thunderstorm. Preprints, *26th Int'l. Conf. on Radar Meteor.*, Norman, OK, Amer. Meteor. Soc., 215-217.
- Vasiloff, S. V., M. H. Jain, D. L. Keller, A. Witt, V. T. Wood, P. L. Spencer, G. J. Stumpf, and M. D. Eilts, 1993: An evaluation of two Doppler radar mesocyclone detection algorithms. Preprints, *26th Int'l. Conf. on Radar Meteor.*, Norman, OK, Amer. Meteor. Soc., 657-659.
- Stumpf, G. J., and K. D. Hondl, 1993: The use of radar wind profiles to remove TDWR gust front algorithm false alarms caused by vertical wind shear. Preprints, *5th Int'l. Conf. on Aviation Wea. Systems*, Vienna, VA, Amer. Meteor. Soc., 192-195.
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- Stumpf, G. J., C. Marzban, and E. N. Rasmussen, 1995: The New NSSL Mesocyclone Detection Algorithm: A paradigm shift in the understanding of storm-scale circulation detection. Preprints, *27th Conf. on Radar Meteor.*, Vail, CO, Amer. Meteor. Soc., 208-210.
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- Stumpf, G. J., and M. P. Foster, 1996: The 1995 NSSL Warning Decision Support System test at the Fort Worth National Weather Service Forecast Office. Preprints, *18th Conf. on Severe Local Storms*, San Francisco, CA, Amer. Meteor. Soc., 570-573.
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- Marzban, C., and G. J. Stumpf, 1996: A neural network for tornado and/or severe weather prediction based on Doppler radar-derived attributes. *The Mid-American Symposium on Emerging Computer Technologies*, Norman, OK. [*Awarded best paper at symposium*]
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- Stuart, N. A., H. D. Cobb, and G. J. Stumpf, 1997: A comparison of the storm-scale vortex detection capability between the WSR-88D mesocyclone detection algorithm and the National Severe Storms Laboratory mesocyclone detection algorithm during Tropical Storm Bertha. Preprints, *28th Conf. on Radar Meteor.*, Austin, TX, Amer. Meteor. Soc., 361-363.
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