**Dr. Yvette P. Richardson**

Associate Dean for Undergraduate Education, Penn State College of Earth and Mineral Sciences

Professor, Department of Meteorology, Penn State University

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**Education**

Ph.D. in Meteorology, University of Oklahoma, 1999

Dissertation Title: *The Influence of Horizontal Variations in Vertical Shear and Low-Level Moisture on Numerically Simulated Convective Storms*

Advisor: Kelvin K. Droegemeier

M.S. in Meteorology, University of Oklahoma, 1993

Thesis Title: *Verification of NMC Short-Range Models Using Wind Profiler Data*

Advisor: Frederick H. Carr

B.S. in Physics, University of Wisconsin, River Falls, 1990

**Professional Appointments**

Associate Dean for Undergraduate Education, College of Earth and Mineral Sciences, Penn State, 2016-present

Professor of Meteorology, Penn State University, 2016-present

Associate Professor of Meteorology, Penn State University, 2008-2016

Assistant Professor of Meteorology, Penn State University, 2002-2008

Research Scientist, University of Oklahoma, 2000-2001

Visiting Assistant Professor, University of Oklahoma 1998-2000

Graduate Research Assistant, University of Oklahoma, 1990-1998

ECOLE D’ETE DE PHYSIQUE THEORIQUE, NATO Advanced Study Institute on Computational Fluid Dynamics, Les Houches France, Summer 1993

Summer Institute on Atmospheric Science, NASA Goddard Space Flight Center, Greenbelt MD, 1989

**Research Interests**

Theoretical Severe Storm Dynamics, Cloud and Mesoscale Modeling, Fluid Mechanics, Radar Observations of Thunderstorms and Tornadoes, Convective Initiation

**Research Grants**

“Improving Our Understanding of Tornadic Storms Using VORTEX2 Observations and Idealized Simulations,” $899,953, PI w/Markowski, NSF, 2015-2018

“Advancing Storm-Scale Forecasts over Nested Domains for High-Impact Weather,” $447,490, co-PI w/Stensrud and Markowski, NOAA, 2015-2017

“Improving Warning Decision Support for Convective Storm Events in the Eastern United States,” $375,000, co-PI w/Markowski and Kumjian, NOAA CSTAR, 2014-2017

“Using the Second Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX2) Observations and Idealized Simulations to Understand the Lifecycle of Tornadoes,” $1,076,764, PI w/Markowski, NSF, 2012-2015 (in no-cost)

“Collaborative Research: Multi-scale and multi-platform study of tornadoes, supercell thunderstorms, and their environments in VORTEX2,” $964,389 for PSU, PI for PSU, NSF, 2008-2012

Supplement to "Collaborative Research: VORTEX2--Multi-Scale and Multi-Platform Study of Tornadoes, Supercell Thunderstorms, and Their Environments", $49,870., 2009-2010

“Collaborative Research: Data Assimilation Analysis of the Boundary Layer and Convection Initiation During International H2O Project (IHOP),” $329,763 for PSU, sole PI for PSU, NSF, 2007-2010

“Collaborative Research: Study of the Genesis, Evolution, Structure, and Dynamic Climatology of Tornadoes and Their Environments,” $510,000 for PSU, PI for PSU, NSF, 2005-2008

“Improvement of Fine-mesh Numerical Meteorological Modeling,” $488,000, co-PI w/Wyngaard, NSF, 2004-2007

“Collaborative Research: Doppler on Wheels International H2O Project Participation and Studies of Convective Initiation,” $298,459 for PSU, Project PI, NSF, 2002-2006

"Dynamics of Rotation and Scale Selection in Deep Convective Storms", $472,935, co-PI w/Droegemeier, NSF, 2000-2004

“The Pennsylvania Area Mobile Radar Experiment,” $45,000, PI w/Markowski and Verlinde, Deike Research Grant, College of Earth and Mineral Sciences, Penn State University, 2003-2006

**National and International Service**

American Meteorological Society (AMS)

Planning Commissioner, 2017-present

Planning Commission, 2015-present

Science and Technology Activities Commission (STAC) Mesoscale Processes Committee, 2012-present

Beacon, 2012-present

Editor, *Monthly Weather Review*, 2015-2016 (Silver Star in 2015)

Councilor (elected by membership), 2013-2016

Associate Editor, *Monthly Weather Review*, 2003-2004, 2010-2014

Ad-hoc Committee on Statements, 2013-2014

Selection Committee for Battan Book Award K-12, 2012-2013

Board on Women and Minorities, 2010-2013

Annual Meeting Oversight Committee (AMOC), 2009-2012

STAC Committee on Severe Local Storms, 2003-2008 (Chair, 2004-2008)

Ad-hoc Committee on Statements, 2005

Summer Policy Colloquium, 2001

Instructor and ‘Hands-On’ Course Developer, AMS Short Course ‘Introduction to Meteorological Instrumentation and Observation,’ Jan. 2001

Member, 2000-present

University Corporation for Atmospheric Research (UCAR)/National Center for Atmospheric Research (NCAR)/National Science Foundation (NSF)

Member Representative for Penn State, 2017-present

UCAR Governance Task Group (GTG), 2012-present

UCAR President’s Advisory Committee on University Relations (PACUR), 2010-2016 (Chair, 2013-2016)

UCAR President Search Committee, 2015-2016

Observing Facilities Assessment Panel (OFAP), Co-Chair for multiple meetings, 2010-2014

PACUR subcommittee for non-core proposal review, 2012-2014

NCAR Director Search Committee, 2013

National Science Foundation (NSF) external review panel for the NCAR Research Applications Laboratory (RAL), 2011

NSF Atmospheric Sciences Supercomputing Advisory Panel, 2007-2008

National Oceanic and Atmospheric Administration (NOAA)

VORTEX-SE Steering Committee (Chair for Physical Science Component) 2015-present

External review panel for the Cooperative Institute for Mesoscale Meteorological Studies, 2015

Organizing Committee for VORTEX-SE Workshop, 2015

Invited Participant, National Weather Service Storm Prediction Center Hazardous Weather Testbed Spring Forecast Experiment, 2013

Organizing Committee for the Weather Ready Nation Research Agenda workshop, Birmingham, AL, April 2012

Invited Participant, NCEP/NSF Weather Ready Nation workshop, 2011

Review panel for the National Center for Environmental Prediction (NCEP) Aviation Weather Center (AWC) and Storm Prediction Center (SPC), 2008-2010

Invited Visiting Scientist, Storm Prediction Center Spring Program 2004

National Academy of Sciences (NAS)/National Research Council (NRC)

NAS Committee on Advancing Social and Behavioral Science Research and Application within the Weather Enterprise, 2016-present

Invited Reviewer, NRC Review of the NSF AGS Draft Goals and Objectives Document, 2014

Invited Participant, NRC Workshop to Review NSF AGS Goals and Objectives, 2014

Invited Participant, NAS BASC Summer Study workshop on “Progress and Priorities of U.S. Weather Research and Research-to-Operations Activities,” 2009

Invited Reviewer, National Academy of Sciences (NAS) Board on Atmospheric Sciences and Climate (BASC) report, “Observing Weather and Climate from the Ground Up: A Nationwide Network of Networks,” 2008

Field Project Planning

VORTEX-SE Steering Committee, 2015-present (Co-Chair, 2016-present)

VORTEX2 Steering Committee Member, 2003-2010

Other National Service

University of Wisconsin-River Falls Physics Department Advisory Board, 2013-present

Scientific Consultant for Giant Screen Films IMAX movie *Tornado Alley* and accompanying educational material, 2011-2012

Invited Briefer, U.S. Congress Natural Hazards Caucus, 2011

Scientific Consultant and featured scientist for the Chicago Museum of Science and Industry permanent display *Science Storms*, 2009

Conference Planning

Program Chair for the 22nd AMS Conference on Severe Local Storms, 2004

Conference Program Committees:

AMS Conference on Mesoscale Processes 2013, 2015, 2017

European Conference on Severe Storms, 2013

AMS Symposium on Challenges in Severe Local Storm, 2006

AMS Douglas Lilly Symposium, 2006

23rd AMS Conference on Severe Local Storms, 2006

22nd AMS Conference on Severe Local Storms, 2004

AMS 21st Conference on Severe Local Storms, 2002

Conference session chair or co-chair:

28th Conference on Severe Local Storms, 2016

27th Conference on Severe Local Storms, 2014

26th Conference on Severe Local Storms, 2012

25th Conference on Severe Local Storms, 2010

John Wyngaard Symposium, 2010

AMS Douglas Lilly Symposium, 2006

AMS Symposium on Challenges in Severe Local Storms, 2006

22nd Conference on Severe Local Storms, 2004

2nd International H2O Project Workshop, 2004

31st Conference on Radar Meteorology, 2003

21st Conference on Severe Local Storms, 2002

20th Conference on Severe Local Storms, 2000

**Local Service**

Pennsylvania State University (PSU) Search Committee for the Associate Vice Provost for Global Programs, 2016-2017

PSU Research Computing and Cyberinfrastructure (RCCI) Advisory Council; Co-Chair of Data Governance Working Group, 2016-present

PSU Academic Council on Undergraduate Education (ACUE), 2016-present

PSU Digital Learning Academic Council (DLAC), 2016-present

PSU Millennium Scholars Program Internal Steering Committee, 2016-present

PSU Department of Meteorology Undergraduate Programs (UGAP) committee, 2008-present (chair, 2008-2012)

PSU Department of Meteorology Society for Women in Meteorology (SWIM), Founder and Faculty Advisor, 2009-present

PSU Department of Meteorology and Atmospheric Science Faculty Search Committee, 2016-2017

PSU University Teaching Awards Selection Committee, 2017

PSU Department of Meteorology Graduate Admissions Committee, 2015-2016

PSU Department of Meteorology Undergraduate Enrollment Task Force, 2015-2016

PSU Department of Meteorology Candidacy Evaluation Committee, 2013-2014

PSU Department of Meteorology Faculty Search Committee, 2012-2013

College of Earth and Mineral Sciences Ad hoc Committee on Infrastructure, 2009

PSU Department of Meteorology, Opportunities Committee, 2002-2008

PSU Department of Meteorology Ad hoc Committee on Renovations, 2007-2008

PSU Department of Meteorology Ad hoc Committee on Facilities, 2005-2006

PSU Department of Meteorology Ad hoc Committee on Undergraduate Laboratory Classes, 2005-2006

PSU Department of Meteorology Ad hoc General Education Committee, 2004

PSU College of Earth and Mineral Sciences Faculty Advisory Committee, 2003-2006

### Faculty Participant in the Total Orientation to Earth and Mineral Sciences (TOTEMS), 3-Day Retreat for Incoming Freshman, 2003

**Other Honors, Awards and Service**

College of Earth and Mineral Sciences Faculty Advising Award, 2015

Deike Research Grant, College of Earth and Mineral Sciences, 2003

Patricia Roberts Harris Fellowship, University of Oklahoma, 1992-1996

Chairperson, Student Affairs Committee, School of Meteorology, University of Oklahoma, 1993-1994

School of Meteorology Representative to Annual Meeting of the American Meteorological Society, 1993

University of Oklahoma Student Representative to Annual Meeting of the National Association of Graduate and Professional Students, Washington D.C., 1992

School of Meteorology Representative to Graduate Student Senate, University of Oklahoma, 1992-1993

Student Representative on Graduate College Academic Appeals Board, University of Oklahoma, 1992

Centennial Research Assistantship, University of Oklahoma, 1990-1992

President, Society of Physics Students, University of Wisconsin, River Falls, 1989-1990

3M Undergraduate Research Grant, 1988

Phi Kappa Phi Honor Society

Sigma Pi Sigma (Physics) Honor Society

Senior Special Academic Honors (equivalent to Summa Cum Laude), University of Wisconsin, River Falls, 1990

Wisconsin Jaycees ‘Outstanding Young Adult’ award ‘in recognition of outstanding leadership and community service’ (one of six in the state of Wisconsin), 1987

Dean’s List, University of Wisconsin, River Falls, 1986-1990

Numerous Undergraduate Merit Scholarships, 1986-1990

**Interviews**

Richardson, Y., 2016: *Weather Geeks.* The Weather Channel. Atlanta, GA. Available at https://weather.com/tv/shows/wx-geeks/video/life-cycle-of-a-tornado

Richardson, Y., 2013: *WeatherBrains* interview. Available at <http://weatherbrains.com/weatherbrains/?p=3916>.

Numerous media interviews regarding VORTEX2, including The Washington Post, Good Morning America, NBC Nightly News, NBC VORTEX2 special, The Collegian, The Weather Channel (multiple), NSF Science Nation, Chicago Museum of Science and Industry, featured scientist in VORTEX2: Making a Difference produced by The Weather Channel, The Centre Daily Times, UCAR magazine, Weather World, Austin News (KXAN), Discovery channel, WPSU, Popular Science, and Scientific American.

**Invited Talks**

Richardson, Y., 2017: Our current understanding of tornadic storm dynamics. University of Connecticut, Marine Sciences Department, Avery Point, CT.

Richardson, Y., 2017: Observations of severe storm cold pools and environments. American Meteorological Society Special Symposium on Severe Local Storms. Seattle, WA.

Richardson, Y., 2017: Synoptic and mesoscale environments: Setting the scale for tornadic storms. American Meteorological Society Lance Bosart Symposium. Seattle, WA.

Richardson, Y., 2016: Intro to Research Series. Millennium Science Program, Penn State University.

Richardson, Y., 2016: Investigating tornadoes. Mount Nittany Middle School, State College, PA.

Richardson, Y., 2016: Diurnal changes in near-storm environments and potential influences on tornado probability. National Weather Service Convective Workshop, State College, PA.

Richardson, Y., 2016: Our current understanding of tornadic storm dynamics. Severe Convection and Climate Workshop, Columbia University.

Richardson, Y., 2016: Chasing storms. Penn State University Chase Club.

Richardson, Y., 2016: Investigating tornadoes. Grier School, Birmingham, PA

Richardson, Y., 2015: Tornado warning skill as a function of environment. National Weather Service Sub-Regional Workshop. Binghamton, NY.

Richardson, Y. 2015: Our current understanding of tornadic storms. Ohio University Department of Geography.

Richardson, Y. 2015: Our current understanding of tornadic storms. Penn State University Department of Physics.

Richardson, Y., 2015: Chasing storms. Penn State University Chase Club.

Y. Richardson, P. Markowski, M. Kumjian, A. Anderson-Frey, and B. Katona, 2015: CSTAR-PSU: Improving warning decision support for convective storm events in the eastern United States. National Weather Service Spring Workshop, State College, PA.

Richardson, Y., 2014: Lecture series at Peking University, Beijing, China.

“Storm modes and supercell overview”

“Supercell dynamics: Midlevel rotation”

“Supercell dynamics: Updraft propagation and favoring of right flank with curved hodographs”

“Supercell dynamics: Low-level rotation and tornadogenesis”

“Tornado structure”

“Microbursts and downbursts”

“Flash floods”

“Hail”

Richardson, Y., 2014: Investigations of tornado maintenance and demise. Peking University, Department Seminar, Beijing, China

Richardson, Y., 2014: An investigation of tornado maintenance and demise during VORTEX2. Colorado State University, Fort Collins, CO

Richardson, Y., 2014: Considerations when chasing. Penn State University Chase Club

Markowski, P., Y. Richardson, and M. Kumjian, 2014: CSTAR-PSU: Improving warning decision support for convective storm events in the eastern United States. National Weather Service Spring Workshop, State College, PA (presented in three individual parts)

Richardson, Y., 2013: The effects of environmental heterogeneity on convective storms. Workshop on “How cities modify their environment: The hydrometeorological implications of extensive urbanization.” Princeton University

Richardson, Y., 2013: Recent developments in our understanding of tornadic storms. 7th European Conference on Severe Storms. Helsinki, Finland.

Richardson, Y., 2013: Tornado maintenance and demise in the Goshen County, Wyoming supercell of 5 June 2009 intercepted by VORTEX2. National Weather Service Webinar.

Richardson, Y., 2013: Our understanding of tornadic storms from initiation to tornado maintenance based on theory, numerical modeling, and field observations. Workshop on Severe Convection and Climate. Columbia University (Lamont-Doherty Campus)

Richardson, Y.P., 2012: Ground-based mobile radars. NSF Community Workshop on Radar Technologies. Boulder, CO.

Richardson, Y.P., 2012: Disciplinary Group A report. Weather Ready Nation Research Agenda Workshop, Birmingham, AL.

Richardson, Y.P., 2011: Panel: Improving NOAA forecasts and warnings for severe weather. Weather Ready Nation, A Vital Conversation Workshop, Norman, OK

Richardson, Y.P., 2011: Tornadoes: Increasing our understanding through basic science. Public briefing of the Congressional Hazards Caucus, U.S. Congress, Washington, D.C.

Richardson, Y.P., 2011: VORTEX2: Scientific motivation and summary of the field phase. Purdue University Seminar Series, West Lafayette, IN

Richardson, Y.P., 2011: VORTEX2: Scientific motivation and summary of the field phase. National Storm Chaser Convention, Denver, CO.

Richardson, Y.P., 2011: Panel: Verification of the Origins of Rotation in Tornadoes Experiment 2 (VORTEX2) update session. AMS Student Conference, Seattle, WA.

Richardson, Y.P., 2010: The VORTEX2 field project: Motivation, strategies, and highlights from Year 1. Iowa State University, Ames, Iowa.

Richardson, Y.P., 2010: Tornadic storms: Our current understanding and remaining puzzles for VORTEX2. National Weather Association 14th Annual Severe Storms and Doppler Radar Conference, West Des Moines, Iowa.

Richardson, Y.P., 2010: VORTEX2: Highlights from Year 1. National Weather Service State College Office Warm Season Workshop, State College, PA.

Richardson, Y.P., and P.M. Markowski, 2010 (joint presentation): VORTEX2 highlights. Penn State University Department of Meteorology 75th Anniversary Celebration, University Park, PA.

Richardson, Y.P., 2010: A history of storm-scale research using idealized modeling at the University of Oklahoma. University of Oklahoma School of Meteorology 50th Anniversary. Norman, OK.

Richardson, Y.P., and P.M. Markwoski, 2010: VORTEX2 Highlights. Penn State University Department of Meteorology Frank Talks Series. University Park, PA.

Richardson, Y.P., 2009: VORTEX2: The VORTEX2 field project: Motivation, strategies, and highlights from Year 1. College of DuPage Severe Weather Symposium, Downers Grove, IL.

Richardson, Y.P, 2009: VORTEX2: The Second Verification of the Origins of Rotation in Tornadoes Experiment. Millersville University Chapter of the American Meteorology Society Russell L. DeSouza Banquet, Millersville, PA.

Richardson, Y.P., 2009: Tornadogenesis: Our current understanding and unanswered questions for VORTEX2. 13th Annual Northern Plains Weather Workshop, Rapid City, SD.

Richardson, Y.P., and P.M. Markowski, 2009 (joint presentation):VORTEX2: The Second Verification of the Origins of Rotation in Tornadoes Experiment. Pennsylvania State University Department of Meteorology Spring Banquet, State College, PA.

Richardson, Y.P, 2009.: Tornadogenesis: Our current understanding and unanswered questions for VORTEX2. Kansas City AMS Chapter Meeting, Kansas City, MO.

Richardson, Y.P, 2009.: Tornadogenesis: Our current understanding and unanswered questions for VORTEX2. Omaha/Offutt AMS Chapter Meeting, Omaha, NE.

Richardson, Y.P, 2009.: Tornadogenesis: Our current understanding and unanswered questions for VORTEX2. University of Nebraska – Lincoln Department of Geosciences Seminar Series, Lincoln, NE.

Richardson, Y.P., 2008: Tornadogenesis: Current understanding and unanswered questions. Juniata College physics department seminar series.

Richardson, Y.P., and P.M. Markowski, 2008 (joint presentation): VORTEX2: The Second Verification of the Origins of Rotation in Tornadoes Experiment. The National Academies Board on Atmospheric Sciences and Climate Forum on Cutting Edge Research & Development in the Observation, Understanding, and Prediction of Severe Weather.

Richardson, Y.P., and P.M. Markowski, 2008: Overview of VORTEX2 for Town Hall Meeting. 24th AMS Conference on Severe Local Storms, Savannah, GA.

Richardson, Y.P., 2008: Understanding severe storms through numerical simulations and mobile radar observations. University of Wisconsin Department of Atmospheric and Oceanic Sciences colloquium series, Madison, Wisconsin.

Richardson, Y.P., and P.M. Markowski, 2008: Convective-storm research at Penn State. National Weather Center seminar series and colloquium, Norman, OK.

Richardson, Y.P., 2008: Convective-storm research at Penn State. National Weather Service Warm Season Convective Workshop, State College.

Richardson, Y.P., 2008: VORTEX2: The second verification of the origin of rotation in tornadoes experiment. National Weather Service Media Workshop, State College.

Richardson, Y.P., 2007: Interview for “*Weatherworld*” television show. Pennsylvania Cable Network.

Richardson, Y.P., 2007: Convective Storms: What happens when the environment changes in space or time? National Weather Service Warm Season Workshop, State College.

Richardson, Y.P., 2006: “Conversations with Professionals”, Amer. Meter. Soc. Student Conference, Atlanta, GA.

Richardson, Y.P., 2006: Theoretical aspects of severe local storm dynamics. *Doug Lilly Symposium*, Atlanta, GA, Amer. Meteor. Soc.

Richardson, Y., 2005: Studies of severe storms and convection initiation using mobile Doppler radar. University of North Dakota Seminar Series, September, 2005.

Richardson, Y.P., 2003: Understanding severe storms through theory, modeling, and observations, *3rd Symposium of the Atmospheric Sciences*, California University of Pennsylvania; April, 2003 (keynote speaker)

Richardson, Y.P., 2002: Panel Discussion on Career Opportunities in Meteorology, *Northeastern Severe Storms Conference*, Lyndon State College, Lyndonville, Vermont. (panel member)

Richardson, Y.P., P. Markowski, K. Davis, S. Richardson, 2002: The International H2O Project: It’s not about pancakes”, Penn State Department of Meteorology Colloquium Series. (jointly presented by all authors)

Richardson, Y.P., 2001:The International H2O Project, University of Oklahoma Student Chapter of the AMS, Norman, Oklahoma.

D. Schultz, L. Dilling, S. Richardson, Y. Richardson, R. Schneider, M. Shafer, 2001: What we did on our summer break: The AMS summer policy colloquium. University of Oklahoma Seminar Series (jointly presented by all authors)

D. Schultz, L. Dilling, S. Richardson, Y. Richardson, R. Schneider, M. Shafer, 2001: What we did on our summer break: The AMS summer policy colloquium. National Oceanic and Atmospheric Administration National Severe Storms Laboratory Seminar Series (jointly presented by all authors)

Richardson, Y.P., 2001: Understanding Severe Storms through Numerical Simulation and Observation”, National Oceanic and Atmospheric Administration (NOAA) Storm Prediction Center, Norman, Oklahoma.

Richardson, Y.P., 2000: Understanding Severe Storms through Numerical Simulation and Observation”, Penn State University Department of Meteorology Colloquium, University Park, Pennsylvania.

Richardson, Y.P., 2000: The influence of horizontal variations in vertical shear and low-level moisture on numerically simulated convective storms. NASA Goddard Space Flight Center, Greenbelt, MD.

Richardson, Y.P., 1999: The Influence of horizontal variations in vertical shear and moisture on numerically simulated convective storms, University of Oklahoma School of Meteorology, Norman, Oklahoma.

**Field Program Experience**

Second Phase of the Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX2), *Steering Committee Member, Co-coordinator for Mobile Mesonets*,

Pennsylvania Mobile Radar Experiment (PAMREX), 2003-2004

International H2O Project (IHOP), PI for DOW Radars, 2002

Radar Observations of Thunderstorms and Tornadoes Experiment (ROTATE), 2000, 2001, 2004

Verification of the Origins of Rotation in Tornadoes Experiment VORTEX (1994-1995) *Co-Team Leader, Mobile CLASS Soundings*

**Teaching and Mentoring Experience**

Graduate Student Advisees:

*Eli Dennis, M.S., 2015-present*

*Alexandra Anderson-Frey, Ph.D., 2012-present*

*Alicia Klees, M.S. 2014, Ph.D. 2014-present*

*Ryan Hastings, M.S., 2009; Ph.D., 2013*

*Tim Hatlee (co-advisor), M.S. 2012*

*Jim Marquis, M.S., 2005; Ph.D. 2010*

*Benjamin Scarino, M.S., 2010*

*Zack Byko (co-advisor), M.S. 2007*

*Brian Monahan, M.S. Fall , 2006*

*Pete Mangione (non-thesis), M.S., 2005*

*Nettie Arnott, M.S., 2004*

*Jackie Kost, M.S., 2004*

*Jeff Kron, M.S., 2004*

Courses Taught (Penn State University):

*EMSC 100S: First-Year Seminar (Fall 2015, 2016)*

*METEO 411: Introduction to Synoptic Lab (Fall 2002, 2003, 2004)*

*METEO 414: Mesoscale Meteorology (Spring 2004, 2007, 2008, 2012, 2013, 2016, Fall 2009, 2010, 2013, 2014)*

*METEO 431: Atmospheric Thermodynamics (Fall 2008)*

*METEO 480W: Undergraduate Research (Spring 2006)*

*METEO 497/597: Introduction to Radar Analysis and Observations (Fall 2003,2004, Spring 2004, 2005)*

*New course designed to give students hands-on experience operating mobile radars, collecting and analyzing their data, and reporting the results. Required many hours in the field during the 8-week IOP and many hours organizing the logistics of the field experiment.*

*METEO 529: Mesoscale Dynamics (Spring 2006, 2009, 2011; Fall 2012, Spring 2015)*

*METEO 538: Atmospheric Convection (Fall 2007, Spring 2010, Spring 2014)*

*METEO 574: Atmospheric Dynamics Seminar (Fall 2004, 2005, 2006, 2007, Spring 2005, 2006 ,2007, 2008)*

Courses Taught (University of Oklahoma):

*METR 1004: Introduction to Meteorology (Fall 1998; Spring 1999, 2000)*

*METR 1014: Weather and Climate (Fall 1999)*

*METR 2413: Introduction to Synoptic Meteorology (Spring 1999)*

*METR 2603: Severe and Unusual Weather (Spring 2000)*

*METR 3613: Meteorological Measurements (Fall 1998,1999)*

*METR 5413: Advanced Synoptic Meteorology (Spring 1999)*

Faculty participant in "Adopt-a-Faculty" program (Fall 2000, Spring 2001)

UNIV 1210: Freshman Mentoring (Fall 1999, Fall 2000)

Teaching Assistant/Instructor, Severe and Unusual Weather, 1996

Co-mentor, Research Experience for Undergraduates, University of Oklahoma, 1991

**Op-Eds**

Markowski, P. H. Brooks, Y. Richardson, R. Trapp, J. Allen, and N. Diffenbaugh, 2013: The real truth about tornadoes. LiveScience.

**Books Published**

Markowski and Richardson, 2010: *Mesoscale Meteorology in Midlatitudes*, Wiley-Blackwell, 407pp.

**Magazine Articles**

Markowski, P., and Y. Richardson, 2014: What we know and don’t know about tornado formation. *Physics Today*, 26-31.

Markowski, P., and Y. Richardson, 2013: How to Make a Tornado. *Weatherwise*, July/August, 12-19.

**Refereed Journal Publications**

(\* denotes a student or post-doc supervised by Richardson)

\*Anderson-Frey, A., Y. P. Richardson, A. R. Dean, R. L. Thompson, and B. T. Smith, 2017: Self-organizing maps for the investigation of tornadic near-storm environments. *Weather and Forecasting,* accepted pending minor revisions.

Markowski, P. M., and Y. P. Richardson, 2017: Large sensitivity of near-surface vertical vorticity development to heat sink location in idealized simulations of supercell-like storms. *Journal of the Atmospheric Sciences,* **74**, 1095-1104.

\*Anderson-Frey, A., Y. P. Richardson, A. R. Dean, R. L. Thompson, and B. T. Smith, 2016: Investigation of near-storm environments for tornado events and warnings. *Weather and Forecasting*, **31,** 1771-1790.

Marquis, J., Y. Richardson, P. Markowski, J. Wurman, and K. Kosiba, 2016: An investigation of the Goshen County, Wyoming, tornadic supercell of 5 June 2009 using EnKF assimilation of mobile mesonet and radar observations collected during VORTEX2. Part II: Mesocyclone-scale processes affecting tornado formation, maintenance, and decay. *Monthly Weather Review*, **144,** 3441-3463.

\*Klees, A. M., Y. P. Richardson, P. M. Markowski, C. Weiss, J. M. Wurman, K. K. Kosiba, 2016: Comparison of the tornadic and nontornadic supercells intercepted by VORTEX2 on 10 June 2010. *Monthly Weather Review*, **144,** 3201-3231.

\*Hastings, R. and Y. Richardson, 2016: Long-term morphological changes in simulated supercells following mergers with nascent supercells in directionally varying shear. *Monthly Weather Review,* **144,** 471-499*.*

Weiss, C., D. C. Dowell, J. L. Schroeder, P. S. Skinner, A. E. Reinhart, P. M. Markowski, and Y. P. Richardson, 2015: A comparison of near-surface buoyancy and baroclinity across three VORTEX2 supercell intercepts. *Monthly Weather Review*, **143**, 2736-2753.

Markowski, P., Y. Richardson, M. Kumjian, A. Anderson-Frey, G. Jimenez, B. Katona, A. Klees, R. Schrom, and D. Tobin, 2015: Comments on “Observations of Wall Cloud Formation in Supercell Thunderstorms during VORTEX2.” *Monthly Weather Review*, **143**, 4278-4281.

Nowotarski, C.N., P.M. Markowski, Y.P. Richardson, G.H. Bryan, 2015: Supercell low-level mesocyclones in simulations with a sheared convective boundary layer. *Monthly Weather Review*, **143**, 272-297.

Bluestein, J.B., R.M. Rauber, D.W. Burgess, B. Albrecht, S.M. Ellis, Y.P. Richardson, D.P. Jorgensen, S.J. Frasier, P. Chilson, R.D. Palmer, S.E. Yuter, W.C. Lee, D.C. Dowell, P.L. Smith, P.M. Markowski, K. Friedrich, and T.M. Weckwerth, 2014: Summary of the 2012 National Science Foundation Community Workshop on Radar Technologies. *Bulletin of the American Meteorological Society,* **95**, 1850-1861.

Schultz, D. M., Y. P. Richardson, P. Markowski, C. Doswell III, 2014: Tornadoes in the central United States and the “Clash of the Air Masses.” *Bulletin of the American Meteorological Society,* **95**, 1704-1712.

Nowotarski, C.N., P.M. Markowski, Y.P. Richardson, G.H. Bryan, 2014: Properties of a simulated convective boundary layer in an idealized supercell thunderstorm environment. *Monthly Weather Review*, **142**, 3955-3976.

Markowski, P., Y. Richardson, G. Bryan, 2014: The origins of vortex sheets in a simulated supercell thunderstorm. *Monthly Weather Review*, **142**, 3944-3954.

Skinner, P.S., C. C. Weiss, M. M. French, H. B. Bluestein, P. M. Markowski, Y. P. Richardson, 2014: VORTEX2 observations of a low-level mesocyclone with multiple internal rear-flank downdraft momentum surges in the 18 May 2010, Dumas, Texas supercell. *Monthly Weather Review*, **142**, 2935-2960.

\*Marquis, J.M., Y. Richardson, P. Markowski, D. Dowell, J. Wurman, K. Kosiba, and P. Robinson, 2014: An investigation of the Goshen County, Wyoming, tornadic supercell of 5 June 2009 using EnKF assimilation of mobile mesonet and radar observations collected during VORTEX2. Part I: Experiment design and verification of the EnKF analyses. *Monthly Weather Review*, **142,** 530-554.

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