

Earth system observations for weather and climate research: Applied research in weather decision support using big data, machine learning, and deep learning. Use of weather observations to inform climate adaptation. Extensive experience distilling large data sets, designing observing strategies, and combining information from multiple sources including multispectral satellite, radar, lidar, in situ meteorological measurements, and numerical weather model output. Basic research focus areas include winter weather, marine clouds, orographic precipitation, and tropical convection.

Education

- 1996 Ph.D., University of Washington, Atmospheric Sciences
Thesis: Characteristics of Precipitating Tropical Convection
Graduate supervisor: Robert A. Houze, Jr.
- 1985-1986 Additional coursework, University of Southern California,
Artificial Intelligence and Probability Theory.
- 1983 B.S., Brown University, Geology-Physics/Mathematics, magna cum laude

Professional Employment

- 2005- Distinguished Professor (2018-), Professor (2011-2018), Associate Professor (2007-2011) Assistant Professor (2005-2007), Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, Raleigh, NC
- 2022- President and CEO, Atmometrics, Inc.
- 1999-2005 Research Associate Professor (2004-2005), Research Assistant Professor (1999-2004), Department of Atmospheric Sciences, University of Washington, Seattle, WA
- 1996-1999 Research Scientist, Mesoscale Group, Department of Atmospheric Sciences, University of Washington, Seattle, WA
- 1988-1990 Software Engineer III, Research Applications Program, National Center for Atmospheric Research, Boulder, CO
- 1986-1988 Technical Marketing Engineer, Graphics Division, Symbolics Inc., Los Angeles, CA
- 1983-1986 Member of Technical Staff, Data Systems Laboratory, TRW Defense Systems Group, Redondo Beach, CA

Awards, Editorships, Affiliations, Committees, and Fellowships

- 2017 Fellow, American Meteorological Society
- 2012-2021 Editor, American Meteorological Society Journal of Applied Meteorology and Climatology
- 2024- International Precipitation Working Group -- Machine Learning Focus Group, Member
- 2024 Participant, NSF Workshop – Exploring the Ethical Considerations and Governance Requirements of Climate Intervention
- 2024 NASA Group Achievement Award to IMPACTS Team
- 2023- International Precipitation Working Group -- Snowfall/Particle Scattering Focus Group, Member
- 2023 Finalist, NCSU Graduate School Outstanding Graduate Faculty Mentor Award

2021 Board of Trustees Member, University Corporation for Atmospheric Research, Boulder, Colorado

2020 NOAA Physical Sciences Laboratory 5-year Review Panel Member

2017- Faculty Fellow at the Center for Geospatial Analytics, North Carolina State University

2016- Adjunct Professor, School of Marine and Atmospheric Sciences, Stony Brook University

2016-2024 Affiliate Faculty, Department of Geography and Planning, Appalachian State University, North Carolina

2016 Thank a Teacher Recognition, North Carolina State University

2015-2021 NCAR Earth Observing Laboratory External Advisory Committee

2013 American Meteorological Society, Committee on Researcher Involvement in the AMS

2012 American Meteorological Society, Membership Subcommittee

2011-2016 DOE Atmospheric System Research Science Team

2011-2014 NASA MODIS Science Team

2010-2014 NCAR Earth Observing Laboratory-Observing Facilities Assessment Panel

2009-2010 DOE ARM Climate Research Facility Science Advisory Board Member

2009 NOAA National Severe Storms Laboratory Review Board Member

2008-2009 Co-chair, American Meteorological Society, 13th Conference on Mesoscale Processes

2006-2008 DOE ARM Climate Research Facility Science Advisory Board Member

2006-2011 American Meteorological Society, Mesoscale Processes Committee

2005-2007 Co-chair, Sierra Hydrometeorology Atmospheric River Experiment (SHARE) Scientific Steering Committee

2005-2007 World Meteorological Organization/IUGG Science Assessment of Aerosol Effects on Precipitation Working Group

2005-2006 NASA Global Precipitation Mission, Advisory Panel on Ground Measurements

2003-2005 NASA Global Precipitation Mission, Ground Validation International Steering Group

2003 NASA Certificate of Appreciation for contributions to the Instrument Incubator Program and to the Earth Science Enterprise

2001- American Geophysical Union, Atmospheric Sciences/Precipitation and Cloud Committee

2001-2003 Co-chair, NASA Global Precipitation Mission, Calibration and Validation of Satellite Precipitation Measurements Working Group

2000-2006 NASA Precipitation Measurement Missions Science Team

1996 Promise of Excellence Award, Seattle Chapter, Women in Communications, Inc.

1992-1995 EOS Global Change Fellowship

1990-1992 NASA Space Grant Fellowship

1983 Sigma Xi Scientific Research Society

1979 Westinghouse Science Talent Search Honors for project on hydroponics for space missions.

Field Project Leadership

2019-2023 NASA Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms: Science Team PI and Mission Scientist

2014 Radar Observations of Storms for Education, Colorado, Chief Scientist

2007-2023 Stony Brook, NY, Meteorological Observatory, Co-chief Scientist

2006-2009 Poga Mountain, NC, Meteorological Observatory, Chief Scientist

2001 EPIC Stratocumulus Study: Southeastern Pacific, NOAA Ship Ronald H. Brown, Senior Scientist

1998-1999 KWAJEX: Kwajalein, Marshall Islands, Project Science Coordinator, Project Scientist-NASA and NOAA project with over 100 scientists and engineers

1997 PACS TEPPS: Tropical eastern Pacific, First research cruise of NOAA Ship Ronald H. Brown, Chief Scientist

Other Field Project Experience

2011-2015 Wasatch Hydrometeor Aggregation and Riming Experiment, Alta, Utah, Radar Scientist

2010	Inhibition of Snowfall by Pollution Aerosols: Colorado, Radar scientist
2008	VAMOS Ocean Cloud Atmosphere Land Study (VOCALS): Southeastern Pacific, Radar scientist
2004	HYDROMET 2004: California, Disdrometer scientist
2003	PACJET 2003: California, Disdrometer scientist IMPROVE II: Oregon, Disdrometer scientist
1995	COAST II: Washington, Aircraft flight planning and mission summary preparation
1993	COAST: Washington, Aircraft radar scientist and cloud physics scientist
1992-1993	TOGA-COARE: Honiara, Solomon Islands, Aircraft radar and cloud physics scientist
1991	CaPE: Florida, Doppler and dual polarization radar scientist, aircraft scientist, radar scan coordinator
1988-1990	Several field projects in Denver, CO area related to demonstration of Terminal Doppler Weather Radar (TDWR) and nowcasting for the FAA

Peer-reviewed articles and book chapters (underlined names are students, post-docs and science staff directly supervised)

- (94) Tomkins, L. M., S. E. Yuter, M. A. Miller, M. Oue, and C. N. Helms, 2025: Synthesis of surface snowfall rates and radar-observed storm structures in 10+ years of Northeast US winter storms. *Atmos. Chem. Phys. Disc.*, conditionally accepted 3/2025.
- (93) Allen, L. R., S. E. Yuter, D. M. Crowe, M. A. Miller, and K. L. Thornhill, 2025: In-cloud characteristics observed in US Northeast and Midwest non-orographic winter storms with implications for ice particle mass growth and residence time. *Atmos. Chem. Phys. Disc.*, conditionally accepted 1/2025.
- (92) Yuter, S. E., M. M. Sevier, K. D. Burris, and M. A. Miller, 2025: Characteristics of observed electromagnetic wave ducts in tropical, subtropical, and middle latitude locations. *Atmosphere*, doi.org/10.3390/atmos16030336.
- (91) Yuter, S. E., 2025: "Precipitation Radar" in the Encyclopedia of Atmospheric Sciences, 3rd edition, edited by A. Detwiler, W. Robinson, Elsevier Ltd., Oxford, UK, in press.
- (90) Allen, L. R., S. E. Yuter, M. A. Miller, and L. M. Tomkins, 2025: Hunting for gravity waves in non-orographic winter storms using 3+ years of regional surface air pressure networks and radar observations. *Atmos. Chem. Phys.*, doi.org/10.5194/acp-25-1765-2025.
- (89) Tomkins, L. M., S. E. Yuter, and M. A. Miller, 2024: Dual adaptive differential threshold method for automated detection of faint and strong echo features in radar observations of winter storms. *Atmos. Meas. Tech.*, doi.org/10.5194/amt-17-3377-2024.
- (88) Oue, M., B. A. Colle, S. E. Yuter, P. Kollias, P. Yeh and L. M. Tomkins, 2024: Microscale updrafts within the U.S. Northeast coastal snowstorms using high-resolution cloud radar measurements. *Mon. Wea. Rev.* 10.1175/MWR-D-23-0055.1.
- (87) Allen, L. R., S. E. Yuter, M. A. Miller, and L. M. Tomkins, 2024: Objective identification of pressure wave events from networks of 1-Hz high-precision sensors. *Atmos. Meas. Tech.*, doi.org/10.5194/amt-17-113-2024.
- (86) Tomkins, L. M., S. E. Yuter, M. A. Miller, and L. R. Allen, 2022: Image muting of mixed precipitation to improve identification of regions of heavy snow in radar data. *Atmos. Meas. Tech.*, doi.org/10.5194/amt-15-5515-2022.
- (85) Hueholt, D. M., S. E. Yuter, and M. A. Miller, 2022: Revisiting diagrams of ice growth environments. *Bull. Amer. Meteor. Soc.*, DOI 10.1175/BAMS-D-21-0271.1
- (84) McMurdie, L. A., G. M. Heymsfield, J. E. Yorks, S. A. Braun, G. Skofronick-Jackson, R. M. Rauber, S. Yuter, B. Colle, G. M. McFarquhar, M. Poellot, D. R. Novak, T. J. Lang, R. Kroodsma, M. McLinden, M. Oue, P. Kollias, M. R. Kumjian, S. J. Greybush, A. J. Heymsfield, J. A. Finlon, V. L. McDonald, S. Nicholls, 2022: Chasing snowstorms: The Investigation of Microphysics and

Precipitation for Atlantic Coast-threatening Snowstorms (IMPACTS) campaign. *Bull. Amer. Meteor. Soc.*, doi.org/10.1175/BAMS-D-20-0246.1

- (83) Miller, M.A., S. E. Yuter, N. P. Hoban, L. M. Tomkins and B. A. Colle, 2022: Detecting wave features in Doppler radar velocity observations. *Atmos. Meas. Tech.*, 1689–1702, doi.org/10.5194/amt-15-1689-2022
- (82) Patel, R. N., S. E. Yuter, and M. A. Miller, S. R. Rhodes, L. Bain, and T. Peele, 2021: The diurnal cycle of winter season temperature errors in the operational Global Forecast System (GFS), *Geophys. Res. Lett.*, DOI: 10.1029/2021GL095101.
- (81) Tomkins, L. M., D. B. Mechem, S. E. Yuter, and S. R. Rhodes, 2021: Regional flow conditions associated with stratocumulus cloud-eroding boundaries over the southeast Atlantic. *Mon. Wea. Rev.*, DOI:10.1175/MWR-D-20-0250.1
- (80) Perry, L. B., S. E. Yuter, T. K. Matthews, P. Wagon, A. Khadka, D. Aryal, D. Shrestha, A. Tait, M. A. Miller, A. O’Neill, S. R. Rhodes, I. Koch, T. Sherpa, S. Tuladhur, S. K. Baidya, S. Elvin, A. C. Elmore, A. Gajurel, and P. A. Mayewski, 2020: Observations of an Everest snowstorm from the world’s highest surface-based radar observations. *Weather*, DOI:10.1002/wea.3854
- (79) Yuter, S. E., 2019: The Weather Around Us. Chapter 15 Introduction for *The Good Earth: Introduction to Earth Science*, McGraw Hill, 416-417.
- (78) Ganetis, S. A., B. A. Colle, S. E. Yuter, N. P. Hoban, 2018: Environmental conditions associated with observed snowband structures within northeast U.S. winter storms. *Mon. Wea. Rev.*, 146, 3675-3690, DOI:10.1175/MWR-D-18-0054.1.
- (77) Yuter, S. E., J. D. Hader, M. A. Miller, D. B. Mechem, 2018: Abrupt cloud clearing of marine stratocumulus in the subtropical southeast Atlantic, *Science*, DOI: 10.1126/science.aar5836.
- (76) Endries, J. L., L. B. Perry, S. E. Yuter, A. Seimon, M. Andrade-Flores, R. Winkelmann, N. Quispe, M. Rado, N. Montoya, F. Velarde, and S. Arias, 2018: Radar-observed characteristics of precipitation in the tropical high Andes of southern Peru and Boliva. *J. Appl. Meteor. Clim.*, **57**, 1441-1458, doi.org/10.1175/JAMC-D-17-0248.1
- (75) Mechem, D. B., C. S. Wittman, M. A. Miller, S. E. Yuter, and S. P. deSzoeki, 2018: Joint synoptic and cloud variability over the northeast Atlantic near the Azores. *J. Appl. Meteor. Clim.*, **57**, 1273-1290, DOI: 10.1175/JAMC-D-17-0211.1.
- (74) Perry, L. B., A. Seimon, M. Andrade, J. L. Endries, S. E. Yuter, F. Velarde, S. Arias, M. Bonshoms, E. J. Burton, R. Winkelmann, C. M. Cooper, G. Mamani, M. Rado, M. Montoya, M. Quispe, 2017: Modes of precipitation delivery in the Cordillera Vilcanoto of Peru and Cordillera Real of Bolivia. *Annals of the Assoc. of American Geographers*, **107**, 309-322. DOI: 10.1080/24694452.2016.1260439
- (73) deSzoeki, S. P., K. L. Verlinder, S. E. Yuter and D. B. Mechem, 2016: The timescales of variability of marine low clouds. *J. Climate*, doi: 10.1175/JCLI-D-15-0460.1
- (72) Molthan, A. L., B. A. Colle, D. Stark and S. E. Yuter, 2016: Comparisons among modeled and observed reflectivity and fall speeds for snowfall of varied riming degree during winter storms on Long Island, NY. *Mon. Wea. Rev.*, http://dx.doi.org/10.1175/MWR-D-15-0397.1.
- (71) Wood, R., M. P. Jensen, J. Wang, C. S. Bretherton, S. M. Burrows, A. D. Del Genio, A. M. Fridlind, S. J. Ghan, V. P. Ghate, P. Kollias, S. K. Krueger, R. L. McGraw, M. A. Miller, D. Painemal, L. M. Russell, S. E. Yuter, P. Zuidema: 2016: Planning the next decade of coordinated research to better understand and simulate marine low clouds. *Bull. Amer. Meteor. Soc.*, **97**, 1699-1702, DOI:10.1175/BAMS-D-16-0160.1
- (70) Yu, C.-K., P.-R. Hsieh, S. E. Yuter, L.-W. Cheng, C.-L. Tsai, and Y. Chen, 2016: Measuring droplet fall speed with a high-speed camera: Accuracy and outdoor applications. *Atmos. Meas. Tech.*, doi:10.5194/amt-9-1755-2016.

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- (65) Wood, R., M. Wyant, C. S. Bretherton, J. Rémillard, P. Kollias, J. Fletcher, J. Stemmler, S. deSzoeko, S. Yuter, M. Miller, D. Mechem, G. Tselioudis, C. Chiu, J. Mann, E. O'Connor, R. Hogan, X. Dong, M. Miller, V. Ghate, A. Jefferson, Q. Min, P. Minnis, R. Palinkonda, B. Albrecht, E. Luke, C. Hannay, Y. Lin, 2015: Clouds, aerosol, and precipitation in the marine boundary layer: An ARM Mobile Facility deployment, *Bull. Amer. Met. Soc.*, **96**, 419-440.
- (64) Bluestein, H. 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, 2015: Radar in atmospheric sciences and related research: Current systems, emerging technologies and future needs. *Bull. Amer. Met. Soc.*, **95**, 1850-1861.
- (63) Colle, B. A., D. Stark, and S. E. Yuter, 2014: Surface microphysical observations within East Coast winter storms on Long Island, NY. *Mon. Wea. Rev.*, **142**, 3126-3146. 10.1175/MWR-D-14-00407.1
- (62) Cunningham, J. G. and S. E. Yuter, 2014: Atmospheric characteristics of cool-season intermittent precipitation near Portland, Oregon. *Mon. Wea. Rev.*, **142**, 1738-1757. 10.1175/MWR-D-13-00133.1
- (61) Garrett, T. J. and S. E. Yuter, 2014: Observed influence of riming, temperature, and turbulence on the fall speed of solid precipitation. *Geophys. Res. Lett.*, doi:10.1002/2014GL061016.
- (60) Mechoso, C. R., R. Wood, R. Weller, C. S. Bretherton, A. D. Clarke, H. Coe, C. Fairall, J. T. Farrar, G. Feingold, R. Garreaud, C. Grados, J. C. McWilliams, S. P. deSzoeko, S. E. Yuter, and P. Zuidema. 2014: Ocean-cloud-atmosphere-land interactions in the southeastern Pacific: The VOCALS Program. *Bull. Amer. Met. Soc.*, **95**, 357-375.
- (59) Yuter, S. E., 2014: "Precipitation Radar" in the Encyclopedia of Atmospheric Sciences, 2nd edition, edited by G. R. North, J. Pyle and F. Zhang. Academic Press, London, pp 455-469.
- (58) Biasutti, M. and S. E. Yuter, 2013: Observed frequency and intensity of tropical precipitation from instantaneous estimates. *J. Geophys. Res.*, **118**, 9534–9551, doi:10.1002/jgrd.50694.
- (57) Burleyson, C. D., S. P. deSzoeko, S. E. Yuter, M. Wilbanks and W. A. Brewer, 2013: Ship-based observations of the diurnal cycle of southeast Pacific marine stratocumulus clouds and precipitation. *J. Atmos. Sci.*, **70**, 3876-3894, doi:10.1175/JAS-D-13-01.1.
- (56) Kingsmill, D. E., P. J. Neiman, B. J. Moore. M. Hughes, S. E. Yuter, and F. M. Ralph, 2013: Kinematic and thermodynamic structures of Sierra barrier jets and overrunning atmospheric rivers during a land-falling winter storm in northern California. *Mon. Wea. Rev.*, **141**, 2015-2036.
- (55) Lin, Y., B. A. Colle, and S. E. Yuter 2013: Impact of moisture flux and freezing level on simulated orographic precipitation errors over the Pacific Northwest, *J. Hydromet.*, **14**, 140-152.
- (54) Miller, M. A, and S. E. Yuter, 2013: Detection and characterization of drizzle cells within marine stratocumulus using AMSR-E 89 GHz passive microwave measurements. *Atmos. Meas. Tech.*, **6**, 1-13, doi:10.5194/amt-6-1-2013.
- (53) Stark, D., B. A. Colle and S. E. Yuter, 2013: Observed microphysical evolution for two East Coast winter storms and the associated snow bands. *Mon. Wea. Rev.*, **141**, 2037-2057.

- (52) Yuter, S. E., M. A. Miller, M. D. Parker, P. M. Markowski, Y. Richardson, H. Brooks, and J. M. Straka, 2013: Comment on "Why do tornadoes rest on weekends?" by D. Rosenfeld and T. Bell. *J. Geophys. Res.*, doi:10.1029/2012JD018622.
- (51) Allen, G., G. Vaughan, T. Toniazzo, H. Coe, P. Connolly, S. E. Yuter, C. D. Burleyson, P. Minnis, and J. K. Ayers, 2013: Gravity wave--induced perturbations in marine stratocumulus, *Q. J. Roy. Met. Soc.*, doi:10.1002/qj.1952.
- (50) deSzoeki, S. P., S. E. Yuter, D. B. Mechem, C. W. Fairall, C. D. Burleyson, P. Zuidema 2012: Observations of stratocumulus clouds and their effect on the eastern Pacific surface heat budget along 20 °S, *J. Climate*, **25**, 8542-8567, 10.1175/jcli-d-11-00618.1.
- (49) Mechem, D. B., S. E. Yuter, and S. P. deSzoeki, 2012: Thermodynamic and aerosol controls in Southeast Pacific stratocumulus. *J. Atmos. Sci.*, **69**, 1250-1266.
- (48) Waliser, D. E., M. Moncrieff, D. Burridge, A. Fink, D. Gochis, B. N. Goswami, B. Guan, P. Harr, J. Heming, H.-H. Hsu, C. Jakob, M. Janiga, R. Johnson, S. Jones, P. Knippertz, J. Marengo, H. Nguyen, M. Pope, Y. Serra, C. Thorncroft, M. Wheeler, R. Wood, and S. Yuter, 2012: The "Year" of Tropical Convection (May 2008 to April 2010): Climate Variability and Weather Highlights, *Bulletin of the American Meteorological Society*, **93**, 1189-1218.
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- (44) Wood, R., C. S. Bretherton, C. R. Mechoso, R. A. Weller, B. Huebert, B. Albrecht, H. Coe, G. Allen, G. Vaughan, P. Daum, C. Fairall, D. Chand, L. Gallardo Klenner, C. Grado Quispe, D. S. Covert, T. S. Bates, R. Krejci, F. Straneo, L. M. Russell, S. de Szoeki, A. Brewer, S. E. Yuter, A. Chaigneau, T. Toniazzo, P. Minnis, S. Abel, W. Brown, and S. Williams, 2011: The VAMOS Ocean-Cloud-Atmosphere-Land Study Regional Experiment (VOCALS-REx): Goals, platforms, and field operations. *Atmos. Chem. Phys.*, **11**, 627-654. doi:10.5194/acp-11-627-2011.
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- (42) Smith, B. L., S. E. Yuter, P. J. Neiman, and D. E. Kingsmill, 2010: Water vapor fluxes and orographic precipitation over Northern California associated with a land-falling atmospheric river. *Mon. Wea. Rev.*, **138**, 74-100.
- (41) Keighton, S., L. Lee, B. Holloway, D. Hotz, S. Zubrick, J. Hovis, G. Votaw, B. Perry, G. Lackmann, S. Yuter, C. Konrad, D. Miller, and B. Etherton, 2009: A collaborative approach to study northwest flow snow in the southern Appalachians. *Bull. Amer. Meteor. Soc.*, **90**, 979-991.
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- (37) Cotton, W. and S. Yuter, 2008: Ch 2—Principles of Cloud and Precipitation Formation in *Aerosol pollution impacts on precipitation: A scientific review*. WMO/IUGG International Aerosol Precipitation Science Assessment Group, Springer, 13-43.

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- (30) Colle, B. A., and S. E. Yuter, 2007: The impact of coastal boundaries and small hills on the precipitation distribution across southern Connecticut and Long Island, NY. *Mon. Wea. Rev.*, **135**, 933-954.
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Reports (not peer-reviewed)

- Burleyson, C. D., S. E. Yuter, and L. Rose, 2011: Atmospheric Observations Feasibility Study for the Lake Victoria Basin Commission. 16 pp.
- Yuter, S. E., J. Koistinen, S. Di Michele, M. Hagen, A. Illingworth, S. Shimizu, and D. Wolff, 2004: GPM Ground Validation Basic Radar Products and Implications for Observation Strategies. Accessible at: www.arxiv.org, arXiv:physics/0401101, 11 pp.
- Adkins, W., and S. E. Yuter, 2002: Report on Potential Tropical Open Ocean Precipitation Validation Sites, NASA Global Precipitation Mission Reports, *NASA/TM-2002-210010*, 77 pages.
- Yuter, S., R. Houze, V. Chandrasekar, E. Foufoula-Georgiou, M. Hagen, R. Johnson, D. Kingsmill, R. Lawrence, F. Marks, S. Rutledge, and J. Weinman, 2002: GPM Draft Science Implementation Plan Ground Validation Chapter. Accessible at www.arxiv.org, arXiv:physics/0211095, 22 pp.
- Yuter, S. E., 1984: Preliminary results of albedo correlation between Europa and Ganymede. *Advances in Planetary Geology*, NASA TM-86247, 212-216.

Research Data Public Archive Contributions:

- Tomkins, L., S. Yuter, M. Miller, N. Corbin, N. Hoban, (2023). Northeast US Regional NEXRAD radar mosaics of winter storms from 1996-2023, part 1 [Dataset]. Dryad. <https://doi.org/10.5061/dryad.zcrjdfnk6>
- Tomkins, L., S. Yuter, M. Miller, N. Corbin, N. Hoban (2023). Northeast US Regional NEXRAD radar mosaics of winter storms from 1996-2023, part 2 [Dataset]. Dryad. <https://doi.org/10.5061/dryad.rbnzs7hj9>

Funded Research Grants: total of over \$7M since July 2000

start date	end date	agency	title	role	collaborators	amount (\$)
Mar-2025		Robinson Brown - donation	Support for undergraduate research	PI		\$5000
May-24	Dec-27	Office of Naval Research	Cloud and boundary layer forecast evaluations	PI		\$648,898
May-21	Sept-24	Robinson Brown - donation	Ground Climate Study – support for undergraduate research	PI		\$10,000
Jan-21	Dec-24	Office of Naval Research	Marine Boundary Layer Characteristics, Clouds, and Air-Sea Interactions Matching Observations and Model Forecasts to Diagnose COAMPS and NEPTUNE Weaknesses	PI		\$461,021

Aug-19	Jul-23	NSF	Collaborative Research: Extensive Field Observations and Modeling to Understand Multi-band Precipitation Processes within Winter Storms	PI	Colle-Stony Brook University	404,434
Jun-19	Jun-21	Delta Air Lines	Delta Air Lines Task Order (Meteorology: Weather Prediction Model Verification)	PI		256,147
Jan-19	Dec-25	NASA	The Investigation of Microphysics and Precipitation for Atlantic Coastal Threatening Snowstorms (IMPACTS)	PI	McMurdie-University of Washington	519,510
Nov-18	Jun-19	NCSU-STEM Education Initiative	Campus-scale weather data to compare to conceptual models of daily and storm passage air temperature and humidity changes	PI		2700
Nov-17	Jun-18	NCSU-STEM Education Initiative	Visualization of the movements of air that underlie weather	PI		2700
July-17	Jun-22	NSF	Collaborative Research: Mechanisms governing synoptic-scale, rapid cloud dissipation in subtropical marine low clouds	PI	Mechem-U. Kansas	460,187
Sep-15	Aug-18	subcontract from Stony Brook U (NASA prime)	Nowcasting severe storm evolution and tracking storm life cycles in the northeast United States using GOES-R	PI	French- Stony Brook University	90,000
Feb-14	Jan-19	NSF	Collaborative Research: Observations and modeling of mesoscale precipitation banding in cool-season storms	PI	Colle-Stony Brook University	462,319
Mar-14	Feb-17	NSF	Real examples of classic storm structures for classroom use based on data from FRONT-PORCH	PI		92,479
Sep-13	Aug-17	NSF	Flipping the Script: Using short videos to promote learning in introductory geoscience courses	co-PI	PI-McConnell NCSU	10,000 (Yuter portion)
Sep-11	Jul-14	NOAA	Cooperative Institute for Climate and Satellites (CICS) - Yuter subcontract	PI		125,180
Sep-11	Sep-16	DOE	Collaborative Research: Cloudiness transitions within marine clouds near the Azores	PI	Mechem - U Kansas and deSzoeki Oregon State	510,182
Sep-11	Aug-15	NSF	Collaborative Research: The Wasatch Hydrometeor Aggregation and Riming Experiment	PI	Garrett - U. Utah	129,546

Apr-11	Sep-11	Lake Victoria Basin Commission	Strengthening Meteorological Services on Lake Victoria to enhance safety of navigation and exploitation of natural resources	co-PI	PI-Semazzi-NCSU	130,000 (Yuter portion)
Sep-10	Aug-13	NASA	NASA Space and Earth Science Fellowship Casey Burleyson	PI		90,000
Sep-10	Feb-15	NASA	Global characteristics of marine stratocumulus clouds and drizzle	PI		337,985
Sep-09	Aug-12	NSF	Collaborative Research: Intermittent and steady state processes in orographic precipitation	PI	Colle-Stony Brook University	345,879
Aug-09	Aug-10	ASTREC	Optimal reconfiguration of multiple small satellites for environmental monitoring	PI	Rao-University of Florida	12,800
Dec-08	Nov-11	NSF	Collaborative Research: Inhibition of snowfall by pollution aerosols	PI	Cotton-Colorado State	69,467
Jun-08	Jun-12	NOAA	Collaborative Research: Ship-based observations of air-sea interactions and stratocumulus cloud-aerosol-drizzle processes in VOCALS	PI	Fairall-NOAA, deSzeoke Oregon State	298,764
Jan-08	Dec-08	UNC-GA	Improving snowfall forecasts in western North Carolina	PI	Perry-Appalachian State	18,614
Sep-07	Sep-10	NASA	NASA Space and Earth Science Fellowship Matthew Miller	PI		83,960
Feb-06	Jan-10	NSF	Average and variability characteristics of orographic precipitation at multiple scales	PI		330,000
Nov-03	Nov-04	NASA	Global and local site oceanic precipitation validation	PI		158,000
Nov-03	Nov-04	NASA	GPM oceanic validation leading to PDR	PI		130,000
May-02	Jun-06	NSF	Scale and characteristics of convective processes in orographic rainfall	PI		404,444
Mar-01	Feb-04	NSF	Soundings, C-band radar, data synthesis and model intercomparisons for the EPIC 2001 stratocumulus study	co-PI	Bretherton, Wood-University of Washington	178,149
Jul-00	Jun-04	NASA	Joint probability analysis of the natural variability of oceanic precipitation	PI		512,000

Courses taught at North Carolina State University:

Dr. Yuter uses research-validated teaching methods, including extensive use of active learning, in all of her classes:

Introduction to Atmospheric Sciences (MEA 215, 4-credit course with laboratory). Weather and climate introductory course for freshman meteorology majors and STEM majors. Taught this course and predecessor course since 2006.

Introduction to Meteorological Remote Sensing (MEA 511, 3-credit course for upper-level undergraduates and graduate students), Features a semester long project to design and justify a radar observing system for an assigned season and location in the U.S. Taught since 2006.

Atmospheric Convection (MEA 714) and *Dynamics of Mesoscale Convective Systems* (715) (3-credit graduate courses), co-taught with Dr. Matthew Parker. Offered alternating fall semesters from 2006-2023.

First Year Graduate Seminar (MEA 611/612/613), Guest lecture on Time Management, every fall since 2013.

Junior Seminar (MEA 495 Spring 2023, 1-credit course focused on junior-level student professional development, career goals, and plans. Discussions of professional opportunities, resources, and ethics. Co-taught with Dr. Catherine Davis (marine) and Dr. Adam Curry (geology).

Courses taught at University of Washington:

Meteorological Instruments and Observations (upper-level undergraduate course, co-taught with Dr. Dean Hegg)

Boundary Layer Meteorology (upper-level undergraduate course).

Professional Development Workshops:

NCSU NSF I-CORPS Entrepreneurial Training, participant (Oct-Nov 2021)

ADVANCE-GEO Workshop on Strategies for Responding to Harassment and Improving our Workplace Climate (23 March 2019), arranged for funding from Department and College and hosted workshop.

NCSU Building Future Faculty Program (20 March 2015), Presenter and Panelist.

On the Cutting Edge: *Preparing for an Academic Career in the Geosciences Workshop* (June 27-30, 2012, Chapel Hill NC), Workshop Leader.

Supervision of Graduate Students (chair or co-chair of committee)

23 graduate students: 7 Ph.D. students and 14 M.S. students completed degrees. Current students: 1 Ph.D. and 1 M.S.

University of Washington, Department of Atmospheric Sciences

Ph. D. Kimberly Comstock, 2006: Mesoscale variability and drizzle in southeast Pacific stratocumulus. Co-advised with Christopher Bretherton.

North Carolina State University, Department of Marine, Earth, and Atmospheric Sciences

Ph.D. Luke R. Allen, 2024: Observed mesoscale surface air pressure waves and in-cloud characteristics in the context of winter storm structures. Funded in part by the NCSU Center for Geospatial Analytics.

Ph.D. Laura M. Tomkins, 2024: Synthesis of radar-observed characteristics, storm structures, and surface snowfall rates in 10+ years of Northeast US winter storms. Funded in part by the NCSU Center for Geospatial Analytics.

Ph.D. Kevin D. Burris, 2023: Examining winter storm structures with high-resolution observed profiles. Funded by the U.S. Air Force.

Ph.D. Casey D. Burleyson, 2013: Environmental controls on stratocumulus cloud fraction. Funded in part by a NASA Earth and Space Science Fellowship.

- Ph.D. Jeffrey G. Cunningham, 2012: Atmospheric characteristics of cool season intermittent precipitation near Portland, Oregon. Funded by the U.S. Air Force.
- Ph. D. Matthew A. Miller, 2010: Satellite observations of low marine clouds. Funded in part by a NASA Earth and Space Science Fellowship.
- M.S. Rachel E. Kennedy, 2023: Assessing Numerical Weather Prediction Model Forecast Skill Under Different Weather Conditions Using Surface Observations
- M.S. Laura M. Kent, 2021: Multi-year analysis of ice streamers within coastal northeast US winter storms
- M.S. Spencer R. Rhodes, 2019: Large-scale environments associated with southeast Atlantic marine stratocumulus cloud-clearing boundaries.
- M. S. John D. Hader, 2016: Propagating, cloud-eroding boundaries in southeast Atlantic marine stratocumulus.
- M.S. Nicole P. Hoban, 2016: Observed characteristics of mesoscale banding in coastal northeast U.S. snow storms.
- M.S. Nicole A. Corbin, 2016: Northern California's Central Valley spatial precipitation patterns associated with atmospheric rivers under different environmental conditions.
- M. S. Andrew M. Hall, 2014: Lifecycle characteristics of marine stratocumulus precipitation in the southeast Pacific.
- M.S. Matt C. Wilbanks, 2013: Near surface density currents observed in the southeast Pacific stratocumulus-topped marine boundary layer.
- M.S. Margaret L. Frey, 2013: Regional and interannual comparisons of marine stratocumulus precipitation.
- M.S. Justin A. Crouch, 2009: Multi-season observational study of the thermodynamic, kinematic and precipitation structures within flooding and typical storms in the Oregon Cascades.
- M.S. Barrett L. Smith II, 2007: The interaction of moisture fluxes and orographic precipitation over the mountains of northern California associated with a landfalling atmospheric river.
- M.S. M. Jordan Payne, 2007: Three-dimensional microphysical and dynamical structures of winter storms in the U.S. Pacific Northwest.
- M.S. Matthew A. Miller, 2007: Evaluation of TRMM satellite precipitation retrievals and satellite-observed characteristics of marine shallow clouds.
- M.S. Christopher T. Holder, 2007: The mesoscale characteristics of tropical oceanic convection within Kelvin and mixed Rossby-gravity wave events.

Current graduate students: Warren Lewis (Ph.D), Happiness Mpunza (M.S.)

Advisor for non-thesis M.S. (dates are year when degree was completed): Katherine Rojowsky, 2010; John L'Heureux, 2012; Nan Zhang, 2012; Victoria Olivia, 2013, Christopher Harmon 2017.

Graduate committee member for students outside of NCSU: Kristin Goris (Ph. D., Duke U., 2009), David Stark (M.S., Stony Brook U., 2012), Sara Ganetis (Ph.D., Stony Brook U., 2017), Jason Endries (M.S., Appalachian State U., 2017), Laura Tomkins (M.S., U. Kansas, 2019), Sandra Vazquez Martin (Ph.D., Luleå University of Technology, Sweden, 2021), Phillip Yeh (Ph.D., Stony Brook U., in progress), Erin Leghart ((Ph.D., Stony Brook U., in progress), Ronak Patel (Ph.D. Caltech, in progress).

Undergraduate research supervision and mentoring: *41 undergraduates at NCSU* including 15 women, 1 disabled student, and 5 under-represented minority students (* denotes presented poster at University Research Symposium and/or other conference):

Casey Burleyson* (2006-07), David Stark* (2007-09), M. Tai Bryant* (2007-15), Lara Pagano (2007-08), John Boyer* (2007), Kevin Smith (2007), Jay Bozeman (2007), Clay McGee* (2008-10), Angel Adames* (2009), Christina Aldereguia* (2009-10), Andrew Hall* (2009-11) Jeremy Freeman (2009-10), Matt Woelfle (2010-12), Cameron White* (2011), Jennifer Dean (2012-13), Nicole Corbin* (2013-2015), Megan Amanatides* (2014-15), Sara Berry* (2014-15), Jason Endries* (2014-15), Spencer Rhodes* (2014-2016), Siu Kei (Edward) Chan* (2015-16), Emma Scott* (2015-17), Laura Tomkins* (2015-17), Levi Lovell* (2015-18), Luke Allen* (2017-18), Daniel Hueholt* (2017-2020), Lindsay Hochstatter* (2017-2019), Ronak Patel* (2018-2021), Toby Peele* (2019-2022), Lily Bain (2019-2021), McKenzie Peters* (2019-2022), Robert Harley (2019-2021), Anya Aponte-Torres* (2020-2023), Jordan Fritz* (2021-2024), Declan Crowe* (2021-2024), Logan McLaurin* (2021-), Cameron Gilbert* (2023-), McKenzie Sevier* (2023-), Nathan Faulk* (2024-), Wayne Johnson* (2024-), Rebecca Moore* (2024-), Lily Price (2025-), Philip Zimmer (2025-).

Invited talks (since 2018):

University of Maryland Earth System Science Interdisciplinary Center Seminar Series, “New insights on snowfall from observations of winter storms”, 4 December 2023. Online.

Lightning talk for GIS Week, Center for Geospatial Analytics, “The power of hourly weather data: Unveiling climate trends for pragmatic decision making”, 15 November 2023.

Guest Lecture on “Radar observations and their interpretation” for Colorado State University graduate class on Microphysics ATS 724, Professor Sonia Kreidenweis, 14 November 2023. Online.

International Precipitation Working Group, Snowfall Focus Group Seminar Series, Insights on Microphysics from Airborne and Surface-based Observations of Winter Storms, 8 November 2023. Online.

Naval Research Laboratory-Monterey: Weather-conditioned evaluations of COAMPS and GFS forecasts relative to surface observations. 7 August 2023, Monterey, CA

Richard H. Johnson Symposium at the 102th American Meteorological Society Annual Meeting: Constraints on the interpretation of cause and effect between kinematic and microphysical structures within storms and potential remedies. 26 Jan 2022, Online presentation at Virtual Conference.

Asheville Museum of Science, “Ask a Scientist” talk on Snowflake Variations and How They Form, moderated live on Facebook, 6 August 2021.

University of Illinois Champaign-Urbana, Department of Atmospheric Sciences: Snow characteristics, storm structures, and velocity waves in coastal northeast U.S. winter storms, 10 September 2019, Urbana, IL.

Naval Research Laboratory-Monterey: Abrupt cloud clearing of marine stratocumulus in the subtropical southeast Atlantic, 6 August 2019, Monterey, CA

Central North Carolina Chapter of the AMS: Snow characteristics, storm structures, and velocity waves in coastal Northeast U.S. winter storms, 17 Jan 2019, Raleigh, NC

National Weather Service Eastern Region, Winter 2018-2019 Professional Development Day: Snow characteristics, storm structures, and velocity waves in coastal Northeast U.S. winter storms, 14 Nov 2018, Online.

Columbia University SEAS Colloquium in Climate Science: Abrupt cloud clearing of marine stratocumulus in the subtropical southeast Atlantic. 8 Nov 2018, New York City, NY
Stony Brook University School of Marine and Atmospheric Sciences: Snow characteristics, storm structures, and velocity waves in coastal Northeast U.S. winter storms. 6 Sept 2018, Stony Brook, NY.
University of Utah Department of Atmospheric Sciences: Snow characteristics, storm structures, and velocity waves in coastal Northeast U.S. winter storms. 21 Feb 2018, Salt Lake City, UT.
University of North Carolina at Charlotte Department of Geography and Earth Sciences: Spatial frameworks for analysis of clouds and storms, 15 Feb 2018, Charlotte, NC.

Public Media and Outreach (since 2018)

Phys.org Beam me up: Using laser to detect moth migrations, posted 2/6/2024
<https://phys.org/news/2024-02-lasers-moth-migrations.html>

NCSU CALS News: Beam me up: Using laser to detect moth migrations, posted 2/5/2024
<https://cals.ncsu.edu/news/beam-me-up-using-lasers-to-detect-moth-migrations/>

NOAA WPC-HMT Winter Weather Experiment seminar series, 3D characteristics of snow bands and implications for surface snowfall in Northeast Winter Storms, 18 Jan 2024, online talk by Sandra Yuter and Laura Tomkins

NPR Short Wave Podcast, *Winter storm brings snow to the East Coast. But what's in a snowflake?*
<https://www.npr.org/2024/01/08/1198909104/short-wave-draft-01-08-2024>

NPR All Things Considered, Just how big can a snowflake get? It depends on what you mean by 'snowflake'
<https://www.npr.org/2023/12/25/1217356234/just-how-big-can-a-snowflake-get-it-depends-on-what-you-mean-by-snowflake>
aired 25 December 2023

Center for Geospatial Analytics Research News Spotlight (posted 15 November 2022) New Visualization Tool Helps Weather Forecasters and Researchers More Easily Identify and Study Bands of Heavy Snow
<https://cnr.ncsu.edu/geospatial/news/2022/11/15/new-visualization-tool-heavy-snow/>

Ladies Who Lunch Conversations with Leann Lavin (released 4 November 2022)
<https://www.facebook.com/LadiesWhoLunchConversations/videos/it-doesnt-get-more-exciting-topical-or-interesting-im-sure-youll-agree-it-was-su/431300802506609>

Deep Convection Podcast (released 5 July 2022), <https://deep-convection.org/2022/07/05/episode-7-sandra-yuter/>

NPR Marketplace, With helium in short supply, scientists are worried
<https://www.marketplace.org/2022/05/26/with-helium-in-short-supply-scientists-are-worried/>
aired 26 May 2022

NCSU Partnerships Blog: NC State Helps Delta Air Lines Fly Safer
<https://partnerships.ncsu.edu/blog/2022/04/12/nc-state-helps-delta-air-lines-fly-safer/>, published 12 April 2022

New York Times, Forecasters Face Loss of Data as Weather Balloon Flights Are Cut,
<https://nyti.ms/3uVqeIv>, published 5 April 2022.

WUNC 91.5 North Carolina Public Radio on NASA IMPACTS, piece aired on 10 March 2022 during morning local news.

Popular Science, NASA's storm-chasing planes fly through blizzards to improve snowfall forecasts. <https://www.popsci.com/science/nasa-planes-improve-snowstorm-forecasts/> , published 3 Feb 2022

WRAL TV on NASA IMPACTS field project, piece aired 8 Feb 2022 during 7 pm newscast.

Podcast for AAAS Science Magazine, 19 Jul 2018 [https://www.sciencemag-
org.prox.lib.ncsu.edu/podcast/why-platypus-gave-suckling-and-how-gravity-waves-clear-
clouds](https://www.sciencemag.org.prox.lib.ncsu.edu/podcast/why-platypus-gave-suckling-and-how-gravity-waves-clear-clouds)

NCSU Press release: <https://news.ncsu.edu/2018/07/yuter-cloud-clearing/>

Article on snowflake research featured at <https://news.ncsu.edu/2018/12/how-big-can-snowflakes-be/>

Conference Abstracts (underlined names are students, post-docs and scientific staff directly supervised)

Faulk, N., S. E. Yuter, and M. A. Miller, 2025: Lidar observations of aerosols, cloud bases, and inferred boundary layer stability. *Abstracts, AMS 24th Student Conference*, January 2025, New Orleans, LA.
Gilbert, C., S. E. Yuter, M. A. Miller, and W. Lewis, 2025: A Simple Neural Network to Improve GFS Temperature and Dew Point Forecasts. *Abstracts, AMS 24th Student Conference*, January 2025, New Orleans, LA.

Johnson, W., R. Moore, S. E. Yuter, and M. A. Miller, 2025: Observed Ambient Conditions in Winter Storm Cloud Sandwiches. *Abstracts, AMS 24th Student Conference*, January 2025, New Orleans, LA
Moore, R., W. Johnson, S. E. Yuter, and M. A. Miller, 2025: Observed Ice Crystal Characteristics and Atmospheric Conditions Near Cloud Top in Northeast U.S. Winter Storms. *Abstracts, AMS 24th Student Conference*, January 2025, New Orleans, LA.

Lewis, W., S. E. Yuter, and M.A. Miller, 2025: Evaluation of Global Reanalysis Strengths and Weaknesses using Surface Observations. *Abstracts, AMS 29th Conference on Numerical Weather Prediction (NWP)*, January 2025, New Orleans, LA.

Perry, B., A. Seimon, K. E. Kunkel, J. Steenburgh, P. Veals, B. Maxwell, S. E. Yuter, T. Matthews, M. Andrade, M. Miller, M. Rado, S. Arias, L. Ticona, N. Montoya , 2025: Observations and Storm Characteristics of Maximum Liquid Equivalent Hourly Snowfall Rates in the Tropical Andes and Comparisons to other Regions. *Abstracts, AMS 39th Conference on Hydrology*, January 2025, New Orleans, LA.

Fritz, J., L. M. Tomkins, S. E. Yuter, and M. A. Miller, 2024: Cataloging Snow Band Vertical Structure: Insights from NASA IMPACTS and NEXRAD Data. *Abstracts, AMS 23rd Annual Student Conference*, January 2024, Baltimore, MD.

Sevier, M., K. Burris, S. E. Yuter, and M.A. Miller, 2024: Characteristics of Electromagnetic Wave Ducts in Different Geographic Locations. *Abstracts, AMS 23rd Annual Student Conference*, January 2024, Baltimore, MD.

Gilbert, C. D., S. E. Yuter, R. E. Kennedy, and M. A. Miller, 2024: Numerical Weather Forecast Biases by Region and Climate Zones. *Abstracts, AMS 23rd Annual Student Conference*, January 2024, Baltimore, MD.

Hueholt, D. M., S. E. Yuter, and M. A. Miller, 2024: Diagrams of Ice Growth Diagrams Designed for Educational Use. *Abstracts, AMS First Symposium on Cloud Physics*, January 2024, Baltimore, MD

Warren, B. W., A. C. Michaelis, L. M. Tomkins, S. E. Yuter, A. M. Haberialie, V. A. Gensini, and W. S. Ashley, 2024, A Climatology and Characteristics of Midwest U.S. Heavy Snowfall Events, *Abstracts, AMS 28th Conference on Applied Climatology*, January 2024, Baltimore, MD

Allen, L., S. E. Yuter, M. A. Miller, and L. M. Tomkins, 2023: Characteristics of Observed Surface Pressure Waves (gravity waves) in the Contexts of Storm Structure and Reflectivity Features. *Abstracts, AMS 20th Conference on Mesoscale Processes*, July 2023, Madison, WI.

Oue, M., B. A. Colle, S. E. Yuter, P. Kollias, P. Yeh and L. M. Tomkins, 2023: Microscale updrafts within the U.S. Northeast coastal snowstorms using high-resolution cloud radar measurements. *Abstracts, AMS 20th Conference on Mesoscale Processes*, July 2023, Madison, WI.

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Service within NC State (last 5 years)

Faculty mentor for Assistant Professor Camilo Rey-Sanchez (2021-), MEAS Undergraduate Curriculum Committee (2022-), Faculty advisor to Broadcast Meteorology Club (2011-), College of Sciences Professors of Distinction Committee (2023-), Data Science Initiative Advisory Council (2016-2021), Chair of MEAS ETF Committee (2011-2021), College of Sciences ETF Committee (2019-2021), O. Max Gardner Award Committee (2018-2021), MEAS Faculty Search Committee (Boundary Layer position), (2020).