

Matthew A. Miller

Research Focus

I conduct research related to clouds and precipitation. I specialize in mining large remote sensing datasets (100s of TB) to distill new insights impacting weather and climate. I have specialized experience in a variety of skills used in analysis of geospatial remote sensing data including image segmentation, computer vision, self-organizing maps, time series analysis, spectral analysis, feature tracking, and machine learning. I developed a low-cost, high-precision pressure sensor network for atmospheric gravity wave detection and a thermal IR all-sky camera.

Education

2010	Ph.D.	North Carolina State University	Marine, Earth, and Atmospheric Sciences Dissertation Title: <i>Satellite observations of low marine clouds</i>
2008		North Carolina State University	Graduate Certificate in Geographic Information Systems
2007	M.S.	North Carolina State University	Marine, Earth, and Atmospheric Sciences Thesis title: <i>Evaluation of TRMM satellite precipitation retrievals and satellite-observed characteristics of marine shallow clouds</i>
2004	B.S.	North Carolina State University	Meteorology <i>Magna Cum Laude</i> Minor: Graphic Communications

Employment

2016-	Senior Research Scholar	North Carolina State University	Raleigh, NC
2011-2016	Postdoc. Research Scholar	North Carolina State University	Raleigh, NC
2010-2010	Research & Lab. Specialist	North Carolina State University	Raleigh, NC
2006-2010	Research Assistant	North Carolina State University	Raleigh, NC
2005-2006	Forecaster	North American Plant Disease Forecast Center	Raleigh, NC

Field Research Experience

2024-	Co-Chief Scientist and Instrument Supervisor (Micro Rain Radar (MRR), Parsivel laser distrometer, Campbell Scientific SunScout, Vaisala CL61 Ceilometer, Lufft CHM 15k ceilometer, visible all-sky camera, thermal IR all-sky camera, Apogee radiation frost sensor) <i>Eastern Carolina Atmospheric Observing Site, Plymouth, NC</i>
2014-2023	Instrument Supervisor (Multi-angle Snowflake Camera (MASC), Micro Rain Radar (MRR), Snow Pixel, Ceilometers, Sun Scout, surface met.) <i>NSF sponsored data collection at Stony Brook University; Plymouth, NC</i>

- 2019-2023 Lead Mission Scientist, P-3 aircraft scientist, ER-2 aircraft scientist
NASA IMPACTS
- 2014 Supervisor and Radar Operator
Radar Observations of Storms for Education
- 2008 Ship Doppler Radar Scientist
VAMOS Ocean Cloud Atmosphere Land Study

Awards and Fellowships

- 2007-2010 NASA Earth and Space Science Fellowship

Peer-Reviewed Publications

- Yorks, J. E., M. A. Miller, T. J. Lang, J. A. Finlon, L. S. Adams, B. A. Colle, S. J. Greybush, A. J. Heymsfield, G. M. Heymsfield, R. Kroodsma, S. LeBlanc, M. W. McLinden, G. M. McFarquhar, R. M. Rauber, S. E. Yuter, T. Zaremba, and L. McMurdie, 2025: Sampling strategies to optimize coincident remote sensing and in situ cloud and precipitation measurements from multiple aircraft. *Bull. Amer. Met. Soc.*, doi.org/10.1175/BAMS-D-24-0280.1.
- McLaurin, L. K., S. E. Yuter, K. D. Burris, and M. A. Miller, 2025: The power of hourly weather data: Observed air temperature climate trends for pragmatic decision-making. *PLOS Climate*, doi.org/10.1371/journal.pclm.0000736
- Allen, L. R., S. E. Yuter, D. M. Crowe, M. A. Miller, and K. Lee 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.*, doi.org/10.5194/acp-25-6679-2025.
- 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.
- 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.*, doi.org/10.5194/acp-25-9999-2025.
- 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.
- 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.
- 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.

- 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: 10.5194/amt-15-5515-2022
- 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
- Miller, M. A., S.E. Yuter, N. P. Hoban, L. M. Tomkins, and B. A. Colle, 2022: Detecting wave features in Doppler radial velocity radar observations, *Atmos. Meas. Tech.*, DOI: 10.5194/amt-15-1689-2022.
- Patel, R. N., S. E. Yuter, 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.
- Perry, L. Baker, S. E. Yuter, T. Matthews, P. Wagnon, A. Khadka, D. Aryal, D. Shrestha, A. Tait, M. A. Miller, Alex O'Neill, S. R. Rhodes, I. Koch, T. G. Sherpa, S. Tuladhar, S. K. Baidya, S. Elvin, A. C. Elmore, A. Gajurel, P. A. Mayewski, 2020: Direct Observations of a Mt. Everest Snowstorm from the World's Highest Surface-Based Radar Observations, *Weather*, DOI: 10.1002/wea.3854.
- 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.
- Mechem, D. B., C. S. Wittman, M. A. Miller, S. E. Yuter, and S. P. deSzoek, 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.
- Wilbanks, M., S. E. Yuter, S. P. deSzoek, W. A. Brewer, M. A. Miller, A. M. Hall, and C. D. Burleyson, 2015: Near-surface density currents observed in the southeast Pacific stratocumulus-topped marine boundary layer, *Mon. Wea. Rev.*, 143, 3532–3555, doi: 10.1175/MWR-D-14-00359.1.
- Wood, R., M. Wyant, C. S. Bretherton, J. Rémillard, P. Kollias, J. Fletcher, J. Stemmler, S. deSzoek, 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.
- 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.
- 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.
- Miller, M. A., and S. E. Yuter, 2008: Lack of correlation between chlorophyll a and cloud droplet effective radius in shallow marine clouds. *Geophys. Res. Lett.*, 35, L13807, doi:10.1029/2008GL034354.

Conference Presentations, Posters, Abstracts, and Reports

- Miller, M. A. and S. E. Yuter, 2026: All-Sky Camera Upward-looking Thermal Infrared Cloud Characteristics. EGU 2026, A1.15 Advancing understanding of the circulation-coupling and Lagrangian evolution of clouds, May 2026, Vienna, Austria.
- Lewis, W. E., S. E. Yuter, and M.A. Miller, 2026: Is ERA5 Fit for Purpose? A Global Multi-Variable Evaluation of Reanalysis Strengths and Weaknesses. Abstracts, EGU 2026, AS1.1 Numerical weather prediction, data assimilation and ensemble forecasting, May 2026, Vienna, Austria.
- Johnson, W. S. E. Yuter, M. A. Miller, 2026: Differences among cloud water to rain water transitions within prevalent microphysics schemes. Abstracts, 30th AMS 25th Student Conference, January 2026, Houston, TX.
- Moore, R, S. E. Yuter, M. A. Miller, 2026: Solar radiation, low-level cloud, and boundary layer characteristics over eastern North Carolina. Abstracts, 30th AMS 25th Student Conference, January 2026, Houston, TX.
- Price, L., S. E. Yuter, M. A. Miller, and R. Moore, 2026: Detection and movement of low clouds by combining several types of upward-looking observations. Abstracts, 30th AMS 25th Student Conference, January 2026, Houston, TX.
- Zimmer, P., M. A. Miller, S. E. Yuter, and L. B. Perry, 2026: Historical weather observations and potential future climate trends for the Summit Lake, Nevada region. Abstracts, 30th AMS 25th Student Conference, January 2026, Houston, TX.
- Peng, X., D. Tyndall, C. Camacho, M. Janiga, B. Ruston, M. Liu, W. Lewis, S. Yuter, M. Miller, H. Christopherson, N. Baker, P. Pauley, T. Whitcomb, 2026: Introduction to the Navy Global Environmental Model Reanalysis (NAVGEM-RA), Abstracts, 30th Conference on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface, January 2026, Houston, TX.
- Yuter, S. E., P. E. Zimmer, M. A. Miller, and L. B. Perry, 2025: Historical Weather Observations and Potential Future Climate Scenarios for Summit Lake, Nevada Region – Information for Summit Lake Paiute Tribe Climate Adaptation Plan. 21 pp.
- McMurdie, L. A., R. M. Rauber, J. A. Finlon, B. Colle, C. Helms, G. Heymsfield, A. Janiszkeski, N. Leonardo, K. Lundstrom, M. Miller, L. Tomkins, P. Yeh, J. Yorks, S. Yuter, and T. Zaremba, 2025: Radar investigations of precipitation bands and elevated convection within winter cyclones during NASA IMPACTS. Abstracts, AMS 41st Conference on Radar Meteorology, August 2025, Toronto, Canada.
- Rauber, R. M. L. A. McMurdie, G. M. McFarquhar, S. Yuter, A. Heymsfield, G. Heymsfield, J. Yorks, J. Finlon, T. Zaremba, V. Garcia, L. Allen, P. Roy, M. A. Miller, M. Han, A. Bansemmer, E.L. Dunnavan, S. D. Nicholls, S. Zhang, A. DeLaFrance, J. Douglas, P. Brechner, J. Schima, 2025: Radar investigations of the microphysical structure of winter cyclones and arctic frontal systems during NASA IMPACTS. Abstracts, AMS 41st Conference on Radar Meteorology, August 2025, Toronto, Canada.
- 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.
- Miller, M. A., 2024: Diode Laser Hygrometer (DLH) vs P-3 Chilled-Mirror Hygrometer Dew Point Comparisons. NASA IMPACTS 2024 Science Team Meeting, July 2024, Boston, MA.
- 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.
- 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
- 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.
- Tomkins, L. M., S. E. Yuter and M. A. Miller, 2023: 3D Characteristics of Snow Bands and Implications for Surface Snowfall in Northeast Winter Storms. Abstracts, AMS 20th Conference on Mesoscale Processes, July 2023, Madison, WI.
- Miller, M. A., S. E. Yuter, and L. M. Tomkins, 2023: Passive Microwave Observations of Mesoscale Snow Bands from NASA IMPACTS. Abstracts, AMS 20th Conference on Mesoscale Processes, July 2023, Madison, WI.

- Kennedy, R., S. E. Yuter and M. A. Miller, 2023: Assessing the Meteorological Skill of the Navy Weather Model (COAMPS). Abstracts, AMS 28th Conference on Numerical Weather Prediction, July 2023, Madison, WI.
- Aponte Torres, A., L. Tomkins, S. Yuter, M. Miller, 2023: Advection of Falling Snow Particles by Horizontal Winds within Winter Storms using NASA IMPACTS Airborne Radar Data. Abstracts, AMS Annual Meeting Student Conference, January 2023, Denver, CO.
- Crowe, D., L. Allen, S. Yuter, L. Tomkins, and M. Miller, 2023: Airborne Observations of Environments for Ice Growth and Shrinkage in Winter and Summer Storms. Abstracts, AMS Annual Meeting Student Conference, January 2023, Denver, CO.
- Fritz, F., S. Yuter, L. Tomkins, R. Kennedy, and M. Miller, 2023: Evaluating Weather Forecasts of Winter Precipitation Start and End Times. Abstracts, AMS Annual Meeting Student Conference, January 2023, Denver, CO.
- McLaurin, L., L. Allen, S. Yuter, T. Peele, M. Miller, and L. Tomkins, 2023: Characteristics of Nearby Ice Particles in Winter Storms Sampled During NASA IMPACTS. Abstracts, AMS Annual Meeting Student Conference, January 2023, Denver, CO.
- Yuter, S. E., S. R. Rhodes, M. A. Miller, and D. B. Mechem, 2022: Marine stratocumulus cloud liquid water path diurnal and seasonal variations in the southeast Pacific and southeast Atlantic. Abstracts, AGU Fall Meeting, December 2022, Chicago, IL.
- McLaurin, L., S. E. Yuter, K. Burris, and M. Miller, 2022: Utilizing hourly weather station data to support pragmatic climate adaptation. Abstracts, KIETS 2022 Climate Leaders Symposium, 10-11 October 2022, Raleigh, NC.
- Allen, L. R., S. E. Yuter, D. Crowe and M. A. Miller, 2022: IMPACTS in situ observations in the context of previous field studies and model simulations. NASA IMPACTS Science Team Meeting, 26-28 July 2022, Boulder, CO.
- Burris, K., D. S. E. Yuter, M. A. Miller, L. M. Tomkins, and L. R. Allen, 2022: Specialized vertical profiles of winter storms to aid physical interpretation. NASA IMPACTS Science Team Meeting, 26- 28 July 2022, Boulder, CO.
- Miller, M. A., 2022: Proposed Updates to Flight Leg Module: Improving aircraft coordination for the 2023 Season. NASA IMPACTS Science Team Meeting, 26-28 July 2022, Boulder, CO.
- Tomkins, L. M., S. E. Yuter, A. Aponte-Torres, and M. A. Miller, , 2022: Analysis of ER-2 data to elucidate how the trajectories of ice particles are modified by horizontal air motions and wind shear. NASA IMPACTS Science Team Meeting, 26-28 July 2022, Boulder, CO.
- Yuter, S. E., M. A. Miller, L. R. Allen, L. M. Tomkins, and K. D. Burris, 2022: Constraints on interpretation of cause and effect between kinematic and microphysical structures within storms and potential remedies. Abstracts, Richard H. Johnson Symposium, AMS Annual Meeting, January 2022, Houston, TX.

- Peters, M. S. E. Yuter, A. Aponte, M. A. Miller, and L. R. Tomkins, 2022: The impacts of different building materials on nearby temperatures in the summer season in Raleigh, NC. Abstracts, AMS Annual Meeting Student Conference, January 2022, Houston, TX.
- Allen, L. R., L. M. Tomkins, S. E. Yuter, M. A. Miller, T. Peele, D. Hueholt, and R. Harley, 2021: Ambient environments for ice mass growth and shrinkage in the context of winter storm structure. NASA IMPACTS Science Team Meeting, September 2021, Seattle, WA.
- Peele, T., L. R. Allen, S. E. Yuter, R. Harley, D. Hueholt, M. A. Miller, and L. R. Tomkins, 2021: Ice growth environments and snow geometries samples during NASA IMPACTS January-February 2020. NASA IMPACTS Science Team Meeting, September 2021, Seattle, WA.
- Allen, L. R., M. A. Miller, S. E. Yuter, L. M. Tomkins, 2021: Analysis of 1 Hz, High Precision Pressure Sensor Data to Identify Gravity Waves. Abstracts, AGU Fall Meeting, December 2021, New Orleans, LA.
- Tomkins, L. M., S. E. Yuter, M. A. Miller, M. Petters, L. Allen, A. Aponte-Torres, 2021: Image muting of mixed precipitation to improve identification of regions of heavy snow from radar data. Abstracts, AGU Fall Meeting, December 2021, New Orleans, LA
- Patel, Ronak, S. E. Yuter, M. A. Miller, S. R. Rhodes, L. McCarthy, T. Peele, 2020: Frequent GFS Biases in Winter Seasons Surface Forecasts. Abstracts, Unified Forecast System Users' Workshop, July 2020, Virtual.
- Rhodes, S., S. E. Yuter, M. A. Miller, R. N. Patel, D. B. Mechem, and L. M. Tomkins, 2019: Large-scale environments associated with marine stratocumulus cloud-eroding boundaries. Abstracts, 18th Conference on Mesoscale Processes, July 2019, Savannah, GA.
- Tomkins, L. M., D. B. Mechem, S. R. Rhodes, S. E. Yuter and M. A. Miller, 2019: Exploring mechanisms of stratocumulus clearing over the southeast Atlantic. Abstracts, 18th Conference on Mesoscale Processes, July 2019, Savannah, GA.
- Yuter, S. E., D. M. Hueholt, M. A. Miller, P. C. Kennedy, S. R. Rhodes, M. T. Bryant, and R. N. Patel, 2019: Local environments for ice growth in winter storms. Abstracts, 18th Conference on Mesoscale Processes, July 2019, Savannah, GA.
- Rhodes, S., L. Hochstatter, M. A. Miller, S. E. Yuter, 2019: Motion characteristics of propagating clouderoding boundaries in the subtropical southeast Atlantic. Abstracts, AMS 18th Annual Student Conference, January 2019, Phoenix, AZ.
- Hueholt, D., S. E. Yuter, M. A. Miller, L. Lovell and P. Kennedy, 2019: High-resolution spatial and temporal observations of generating cells and waves in Colorado snowstorms. Abstracts, AMS 18th Annual Student Conference, January 2019, Phoenix, AZ.
- Patel, R. N., S. E. Yuter, M. A. Miller, 2019: Variability of the urban heat island in Raleigh, NC. Abstracts, AMS 18th Annual Student Conference, January 2019, Phoenix, AZ.
- Tomkins, L. M., D. B. Mechem, S. E. Yuter, M. A. Miller and S. Rhodes, 2019: WRF simulations of episodes of stratocumulus clearing over the southeast Atlantic. Abstracts, AMS Symposium on Aerosol-Cloud-Climate Interactions, January 2019, Phoenix, AZ.

- Miller, M.A., N. P. Hoban, and S. E. Yuter, 2018: Detecting waves in Doppler radial velocity observations. Abstracts, AGU Fall 2018 Meeting, 10 Dec 2018, Washington, D.C.
<https://agu.confex.com/agu/fm18/meetingapp.cgi/Paper/420923>
- Allen, L. S. E. Yuter, L. Tomkins and M. A. Miller, 2018: Snow band movement and rain occurrence in northeast U.S. winter storms. Abstracts, AMS 17th Annual Student Conference, January 2018, Austin, TX.
- Hueholt, D., S. E. Yuter, M. A. Miller, L. Lovell and L. Allen, 2018: Characteristics of temperature inversions in wintery mix precipitation events. Abstracts, AMS 17th Annual Student Conference, January 2018, Austin, TX.
- Lovell, L., S. E. Yuter, M.A. Miller and E. Scott, 2018: Snowflake mixtures in coastal northeast United States winter storms. Abstracts, AMS 17th Annual Student Conference, January 2018, Austin, TX.
- Miller, M. A., S. E. Yuter, S. Rhodes, E. Scott, L. Lovell, B. A. Colle, L. Allen, M.T. Bryant, D. M. Hueholt and L. M. Tomkins, Complex aggregates within coastal northeast U.S. snow storms. Abstracts, 17th Conference on Mesoscale Processes, 3-6 24-27 July 2017, San Diego, CA.
- Yuter, S. E., N. P. Hoban, S. A. Ganetis, M. A. Miller, B. A. Colle, L. M. Tomkins, L. Lovell, E. M. Scott, L. R. Allen, D. M. Hueholt, and M. T. Bryant, 2017: Snow bands and velocity waves within northeast U.S. snow storms. Abstracts, 17th Conference on Mesoscale Processes, 3-6 24-27 July 2017, San Diego, CA.
- Hoban, N. P., S. E. Yuter, L. Tomkins, S. A. Ganetis, M. A. Miller, L. Lovell, S. R. Rhodes, E. Scott, and B. A. Colle, 2017: Observed characteristics of mesoscale banding in coastal northeast U.S. snow storms. Abstracts, 28th Conference on Weather Analysis and Forecasting, January 2017, Seattle, WA.
- Tomkins, L., N. Hoban, M. Miller and S. Yuter, 2017: Storm-relative movements of mesoscale snow bands within coastal Northeast U.S. storms. Abstracts, AMS 16th Annual Student Conference, January 2017, Seattle, WA.
- Amanatides, M., S. Berry, N. A. Corbin, J. Endries, M. A. Miller, and S. E. Yuter, 2015: Radar observations of storms for education. Abstracts, 14th Annual AMS Student Conference, 4 Jan 2015.
- Miller, M. A., M. L. Frey, and S. E. Yuter, 2015: Regional and interannual comparisons of marine stratocumulus precipitation detected using an AMSR-E 89-GHz passive microwave based method. Abstracts, 20th Conference on Satellite Meteorology and Oceanography, AMS Annual Meeting, Jan 2015.
- Yuter, S. E., N. A. Corbin, M. A. Miller, S. M. Ellis, and P. C. Kennedy, 2015: Radar Observations of Storms for Education: A bridge between idealized conceptual diagrams and real weather. Abstracts, 24th Symposium on Education, AMS Annual Meeting, 4-8 Jan 2015.
- Yuter, S. E., N. A. Corbin, M. A. Miller, S. M. Ellis, and P. C. Kennedy, 2015: Radar Observations of Storms for Education: Real storm examples for the mesoscale course classroom. Abstracts, 16th Conference on Mesoscale Processes, 3-6 August 2015, Boston, MA.
- Fish, C. S., D. B. Mechem, M. A. Miller, S. E. Yuter, and S. P. de Szoeke, 2013: Quantifying the variability of cloud and synoptic properties over the ARM NEA Azores site. DOE ASR Joint Working Group Meeting, Rockville, MD, Nov. 2013,

Miller, M. A. and S. E. Yuter, 2013: Satellite Context for the Azores: Advection and Evolution. DOE ASR Joint Working Group Meeting, Rockville, MD, Nov. 2013.

Burleyson, C. D, S. E. Yuter, and M. A. Miller, 2012: Observations of cloud fraction variability within southeast Pacific marine stratocumulus clouds. Abstracts, AGU Fall Meeting, Dec 2012.

Frey, M., S. E. Yuter, and M. A. Miller, 2012: Regional comparisons of marine stratocumulus precipitation patterns. Abstracts, AGU Fall Meeting, Dec 2012.

Miller, M. A. and S. E. Yuter: 2010 Satellite Observations of Atypically Thick Low Marine Clouds 35th Annual Climate Diagnostics and Prediction Workshop Raleigh, NC.

Miller, M. A. and S. E. Yuter, 2008: Characteristics of shallow non-precipitating clouds as observed by the Tropical Rainfall Measuring Mission satellite. Abstracts, AGU 2008 Joint Assembly, May 2008, Ft. Lauderdale, FL.

Miller, M. A. and S. E. Yuter, 2008: Spurious precipitation in TMI retrievals within marine stratus. Abstracts, TRMM 3rd NASA/JAXA International Science Conference, February 2008, Las Vegas, NV.

Miller, M. A. and S. Yuter, 2006: Phantom precipitation and other problems in TRMM products. Proceedings, 3rd Workshop on Precipitation Measurements, Melbourne, Australia, 23-27 October 2006, International Precipitation Working Group, 10 pp.

Yuter, S., M. Miller, J. Stout, R. Wood, J. Kwiatkowski, D. Horn, and C. Spooner, 2006: Remaining challenges in satellite precipitation estimation for the Tropical Rainfall Measuring Mission. Preprints, 4th European Conference on Radar in Meteorology and Hydrology. 18-22 September 2006, Barcelona, Spain, 11.6.

Supervisory Experience

I train graduate and undergraduate students in the fundamentals of geospatial data analysis. I also provide research mentorship wherein I advise on methods, interpretation of data, directions of inquiry, and communication of results. I have been a primary research supervisor for 2 graduate students and an ancillary advisor to 13 others since 2010.

Professional Activities

- Reviewer for Atmospheric Chemistry and Physics, Journal of Geophysical Research, Journal of Applied Meteorology and Climatology, Journal of Atmospheric Sciences, Weather and Forecasting, and Tellus B
- Member of the American Geophysical Union, American Meteorological Society, and IEEE

University Service

- Department staff representative to the college IT Advisory Committee
- Department research staff representative to the department's Department Affairs Committee

Technical Skills

- Expert in the use of Matlab for data exploration, manipulation, fusion, analysis, and visualization
- Expert in the use of ArcGIS for geospatial analysis and model building

- Expert in the use of tools such as Photoshop for raster image manipulation and preparation of publication graphics
- Proficient in the basic aspects of website development, including the principles of HTML, CSS, the implementation of open-source CMS, and the use of Python-based platforms such as Dash
- Proficient in the construction, troubleshooting, and maintenance of computer workstations and large-scale storage (hundreds of TBs) servers
- Productive in the use of Python and Python-based web frameworks such as Plotly/Dash combined with MySQL to analyze and visualize geospatial data
- Productive with the use of parametric design software such as Autodesk Fusion for mechanical design for additive and traditional manufacturing.
- Experience with developing instruments and dataloggers based on commercial, off-the-shelf ICs and MCUs. I developed a low cost, high precision pressure sensor network for detecting atmospheric gravity waves using a combination of Raspberry Pi single board computers and high-precision pressure sensors intended for drones. I fabricated a visible all-sky camera. I designed and fabricated a thermal IR all-sky camera. Both cameras utilize commercial off-the-shelf components. I've also designed a robust, all-season weatherproof enclosure for a visible all-sky camera which includes custom designed 3D-printed parts.

Funding and Proposal Writing

As PI or Co-PI

Dates	Funder	Title	Role	Amount
2025/05-2026/12	Office of Naval Research	Cloud and boundary layer forecast evaluations	Co-PI	\$648,898
2025/05-2025/09	U. Nevada	Summit Lake Paiute Tribe Climate Adaptation Planning for Ecosystems and Community	PI	\$54,401
2021/01-2024/12	Office of Naval Research	Marine Boundary Layer Characteristics, Clouds, and Air-Sea Interactions Matching Observations and Model Forecasts to Diagnose COAMPS and NEPTUNE Weaknesses	Co-PI	\$461,021
2019/06-2021/06	Delta Airlines	Delta Air Lines Task Order (Meteorology: Weather Prediction Model Verification)	Co-PI	\$256,147
2019/05-2019/06	NC State Climate Office	Data aggregations and comparisons of model reanalysis and climate observations dataset including GHCN, ERA-Interim, and ERA5	Consultant	\$8,100
2015/09-2018/08	NASA (Stony Brook University Subcontract)	Nowcasting severe storm evolution and tracking storm life cycles in the northeast United States using GOES-R	PI	\$90,000
2007/09-2010/09	NASA	Earth and Space Science Fellowship	Student Lead	\$83,960

As Senior Personnel

Dates	Funder	Title	Amount
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2019/08-2023/06	NSF	Collaborative Research: Extensive Field Observations and Modeling to Understand Multi-band Precipitation Processes within Winter Storms	\$404,434
2019/01-2025/12	NASA	The Investigation of Microphysics and Precipitation for Atlantic Coastal Threatening Snowstorms (IMPACTS)	\$519,510
2017/07-2022/01	NSF	Collaborative Research: Mechanisms governing synoptic-scale, rapid cloud dissipation in subtropical marine low clouds	\$460,187
2014/05-2017/02	NSF	Real examples of classic storm structures for classroom use based on data from FRONT-PORCH	\$92,479
2014/02-2019/01	NSF	Collaborative Research: Observations and modeling of mesoscale precipitation banding in cool-season storms	\$462,319
2011/09-2016/09	DOE	Collaborative Research: Cloudiness transitions within marine clouds near the Azores	\$510,182
2009/09-2012/08	NASA	Global characteristics of marine stratocumulus clouds and drizzle	\$337,985

Teaching Experience

Instructor	MEA 135: Introduction to Weather and Climate Lab Introductory course for non-majors	3 sections
Lab Instructor	MEA 213: Fundamentals of Meteorology I Introductory course for freshman meteorology majors	1 section
Guest Lecturer	MEA 215: Introduction to Atmospheric Sciences Undergraduate-level course for first-semester atmospheric science majors Lecture topics: atmospheric moisture	
Guest Lecturer	MEA 511: Introduction to Meteorological Remote Sensing Graduate-level course on remote sensing Lecture topics: Radar hardware and system design principles	
Guest Lecturer	MEA 593o: Introduction to Remote Sensing Graduate-level course on remote sensing Lecture topics: Satellite orbits, satellite precipitation measurement, and lidar	
Guest Lecturer	MEA 591: Remote Sensing of Earth Systems Graduate-level course on remote sensing Lecture topics: Passive microwave measurement of precipitation	
Guest Lecturer	MEA 593: Geoengineering and Weather Modification Graduate-level course on the underlying physical science, pragmatic implementation, potential risks, and societal impacts of proposed deliberate interventions in the Earth system to reduce climate and weather risks Lecture topics: Pragmatic feasibility of stratospheric aerosol injection	