ELIZABETH N. SMITH, PH.D.

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CURRENT APPOINTMENT

NOAA – National Severe Storms Laboratory NORMAN, OK
Research Meteorologist 2020 – PRESENT

- Specialize in atmospheric observations, including boundary-layer profilers and uncrewed aircraft systems (UAS).
- Develop next-generation observing networks to understand processes relevant to convection initiation and pre-storm environments.
- Learn more about my work online.

University of Oklahoma School of Meteorology NORMAN, OK
Affiliate Assistant Professor 2021 –PRESENT

- Mentor undergraduate research assistants and interns.
- Advise MS and Ph.D. students.
- Periodically teach, including designing and instructing an elective undergraduate/graduate level course: Advanced Observations for Lower Atmospheric Research.

EDUCATION

University of Oklahoma | Ph. D. Meteorology DEC. 2018

- Dissertation: The Great Plains Nocturnal Low-Level Jet: Spatial and Temporal Evolution
- Advisors: Dr. Petra Klein and Dr. Evgeni Fedorovich
- Non-thesis M.S. degree awarded concurrently with Ph.D. studies based on General Examination for Ph.D. Candidacy (2017).

California University of Pennsylvania | B.S. Earth Sci.-Meteorology MAY 2014

University now known as PennWest–California

- *Summa Cum Laude*
- Minors: Mathematics; Geographic Information Science–Emergency Management

PROFESSIONAL EXPERIENCE

Cooperative Institute for Mesoscale Meteorological Studies NORMAN, OK
Post-Doctoral Research Associate 2019

- Focused on development and deployment of NSSL boundary-layer profiling systems.
- Explored experimental systems for advancing understanding of severe convective weather.
- Considered systems to enhance the NOAA upper-air observing network.

University of Oklahoma - School of Meteorology NORMAN, OK
Graduate Research Assistant 2014–2018

- Researched nocturnal low-level jets and boundary layers using numerical simulation methods and meteorological observing platforms as part of the BLISS group.
- Served as part of the first group of CLAMPS-1 operators.
- Assisted in the initial development of CLAMPS-2.

NOAA Education Hollings Intern - National Weather Service — CHEYENNE, WY

NWS WFO CYS Intern — 2013

- Examined the role of two-inch soil temperatures on early- and late-season snowfall accumulation.
- Worked with forecasters to understand forecast problems and develop trial guidance based on visibility observations.
- Awarded first place among Hollings cohort for research project.
- Assisted on the operations floor with forecasts, warnings, community decision support, and completed warning event simulations.

WOWK Channel 13 — CHARLESTON, WV

Meteorology Intern — 2012

- Prepared forecasts and weather graphics for the Charleston viewing area and a West Virginia state-wide broadcast.
- Operated the Emergency Alert Crawler during severe weather days.
- Fielded calls and social media messages from the public and ran the NWS Chat system.

TEACHING EXPERIENCE

University of Oklahoma - School of Meteorology — NORMAN, OK

Instructor — 2021–PRESENT

- Developed and instruct a new slash-listed course: Advanced Observations for Lower Atmospheric Research, which is Focused on first-hand student experience with research-grade instruments, group instruction, guest lectures, and data-focused projects.
- Implemented an ungrading approach in 2024.
- Course materials available online.

Instructor, BUL Seminar Series — 2019–PRESENT

- Led the Boundary Layer, Urban Meteorology, & Land-Surface Processes Seminar series, including scheduling, moderating, and instructing and evaluating enrolled students.
- Involved with implementing peer-review activities and providing additional development opportunities.

Instructor, Independent Study — 2019–PRESENT

- Serve as instructor/advisor for several research hour courses.
- Instructed multiple independent studies including METR4990 (2022, Doyle–Field Programs), METR5990 (2024, Tweedie–Remote Sensors, Ammon–Intro to WRF).

Guest Lecturer — 2019–PRESENT

- Provided guest lectures for courses including METR4922 Senior Capstone (2019), METR4424 Synoptic (2023), and METR2613 Instrumentation (2025).

Teaching Assistant — 2015–2018

- Instructed and helped develop the lab portion of Meteorological Measurement Systems, a junior-level, writing-intensive course.
- Taught observation techniques from calibration to characterization.
- Developed new material to enhance scientific writing instruction, modernized lab experiments, and created Python coding assignments.
- Offered coding/writing help sessions and guest lectured for the lecture component.

LEAD-AUTHOR PUBLICATIONS

**denotes student mentee author*

Smith, E. N., and J. T. Carlin, 2024: A multi-instrument fuzzy logic boundary-layer top detection algorithm, Atmos. Meas. Tech., 17, 4087-4107. doi: 10.5194/amt-17-4087-2024

Smith, E. N., *B. R. Greene, *T. M. Bell, W. G. Blumberg, *R. Wakefield, *D. Reif, *Q. Niu, *Q. Wang, D. D. Turner, 2021: Evaluation and applications of multi-instrument boundary layer thermodynamic retrieval profiles, Boundary-Layer Meteorol. 181, 95–123. doi: 10.1007/s10546-021-00640-

Smith, E. N., J. G. Gebauer, P. M. Klein, E. Fedorovich, and J. A. Gibbs, 2019: The Great Plains low-level jet during PECAN: observed and simulated characteristics. Mon. Wea. Rev, **147**, 1845–1869. doi:10.1175/MWR-D-18-0293.1

Smith, E. N., J. A. Gibbs, E. Fedorovich, P. M. Klein, 2018: WRF model study of the great plains low-level jet: Effects of Grid Spacing and Boundary Layer Parameterization. J. Appl. Meteor. Climatol., **57**, 2375-2397. doi:10.1175/JAMC-D-17-0361.1

Smith, E. N., E. Fedorovich, A. Shapiro, 2016: Comparison of analytical descriptions of nocturnal low-level jets within the Ekman model framework. Environ. Fluid. Mech., **17**, 485-495. doi:10.1007/s10652-016-9502-z

COLLABORATIVE PUBLICATIONS

**denotes student mentee author*

*Ammon, M., T. M. Bell, **E. N. Smith**, J. G. Gebauer, 2025: Using Ground-Based Remote Profilers to Explore Terrain Heterogeneity Effects on Boundary Layer Processes Impacting the Evolution of Severe Convection and Tornadoes, *in press* at Mon. Wea. Rev.

Jensen, M. P., and Coauthors, 2025: Studying Aerosol, Clouds, and Air Quality in the Coastal Urban Environment of Southeastern Texas. Bull. Amer. Meteor. Soc., doi:10.1175/BAMS-D-23-0331.1

Abraham, A., Puccioni, M., *Jordan, A., Maric, E., Bodini, N., Hamilton, N., Letizia, S., Klein, P. M., **Smith, E. N.**, Wharton, S., Gero, J., Jacob, J. D., Krishnamurthy, R., Newsom, R. K., Pekour, M., Radünz, W., and Moriarty, P.: Operational wind plants increase planetary boundary layer height: an observational study, Wind Energ. Sci., 10, 1681–1705, doi:10-1681-2025

Jordan, A. J., **E. N. Smith**, P. K. Klein, J. G. Gebauer, S. W. Wharton, 2024: Probing the atmospheric boundary layer with integrated remote-sensing platforms during the American Wake ExperimeNt (AWAKEN) campaign, *a*t J Renew. Sustain. Energy. 16 (6): 063305.

Carlin, J. T., **E. N. Smith**, and *K. Giannakopolous, 2024: Contextualizing Polarimetric Retrievals of Boundary Layer Height using State-of-the-Art Boundary Layer Profiling, J. Appl. Meteorol. Climatol., 63, 765-780. 10.1175/JAMC-D-23-0231.1

Kosiba, K. A., and Coauthors, 2024: The Propagation, Evolution, and Rotation in Linear Storms (PERiLS) Project. Bull. Amer. Meteor. Soc., doi: 10.1175/BAMS-D-22-0064.1

Lamer, K., Z. Mages, B. Puigdomenech Tresarras, P. Waler, Z. Shu, A. Rapp, C. Zowotarski, S. Brooks, J. Flynn, M. Sharma, P. Klein, *M. Spencer, **E. N. Smith**, J. Gebauer, T. Bell, L. Bunting,

T. Griggs, T. Wagner, K. McKeown, 2024: Spatially distributed atmospheric boundary layer properties in Houston – A value-added observational dataset. Nature Sci. Data, 11 (661), doi: 10.1038/s41597-024-03477-9

Lappin, F., de Boer, G., Klein, P., Hamilton, J., *Spencer, M., Calmer, R., Segales, A. R., Rhodes, M., Bell, T. M., Buchli, J., Britt, K., Asher, E., *Medina, I., Butterworth, B., Otterstatter, L., Ritsch, M., Puxley, B., Miller, A., *Jordan, A., Gomez-Faulk, C., **Smith, E. N**, Borenstein, S., Thornberry, T., Argrow, B., and Pillar-Little, E. 2024: Data collected using small uncrewed aircraft systems during the TRacking Aerosol Convection interactions ExpeRiment (TRACER), Earth Syst. Sci. Data, 16, 2525–2541, doi:10.5194/essd-16-2525-2024

de Boer, G., ...**E. N. Smith**, ...and Coauthors, 2023: Supporting Advancement in Weather and Water Prediction in the Upper Colorado River Basin: The SPLASH Campaign. Bull. Amer. Meteor. Soc., 104, E1853–E1874

Adler, B, J. M. Wliczak, L. Bianco, L. Bartiteau, C. Cox, G. de Boer, I. V. Djalalova, M. R. Gallagher, J. Intrieri, T. Meyers, T. A. Myers, J. Olson, S. Pezoa, J. Sedlar, **E. N. Smith**, D. D. Turner, A. B. White, 2022: Passive remote sensing of the atmospheric boundary layer in Colorado's East River Valley during the seasonal change from snow-free to snow- covered ground, JGR Atmospheres 128, doi: 10.1029/2023JD038497

Laser, J. J. , M. C. Coniglio, P. S., Skinner, **E. N. Smith**, 2022: Doppler Lidar and Mobile Radiosonde Observation-Based Evaluation of Warn-on-Forecast System Predicted Near-Supercell Environments during TORUS 2019, Wea. Forecasting, 37 (10), 1783-1804. doi: 10.1175/WAF-D-21-0190.1

Duncan Jr., J. B., Bianco, L., Adler, B., Bell, T., Djalalova, I. V., Riihimaki, L., Sedlar, J., **Smith, E. N.**, Turner, D. D., Wagner, T. J., and Wilczak, J. M., 2022: Evaluating convective planetary boundary layer height estimations resolved by both active and passive remote sensing instruments during the CHEESEHEAD19 field campaign, Atmos. Meas. Tech., 15, 2479–2502

Butterworth, B. J., A. R. Desai, S. Metzger, P. A. Townsend, M. D. Schwartz, G. W. Petyy, M. Mauder, H. Vogelmann, ... **E. N. Smith**, ... and co-authors, 2021: Connecting Land-Atmosphere Interactions to Surface Heterogeneity in CHEESEHEAD 2019. Bull. Amer. Meteor. Soc., 102(2), E421-E445.

McFarquhar, G., **E. N. Smith**, E. Pillar-Little, ... and co-authors, 2020: Workshop on Current and Future Uses of UASs for Improved Forecasts/Warnings and Scientific Studies. Bull. Amer. Meteor. Soc., 101 (8), E1322-E1328

Potvin, C. K., P. S. Skinner, K. A. Hoogewind, M. C. Coniglio, J. A. Gibbs, A. J. Clark, M. L. Flora, A. E. Reinhart, J. R. Carley, **E. N. Smith**, 2020: Assessing systematic impacts of PBL schemes in the NOAA Warn-on-Forecast System. Mon. Wea. Rev., 148, 2567–2590

FUNDED & DEVELOPING RESEARCH

Observing the Air-Sea Transition Zone Using Coordinated UxS 2025-2027

- $731K – Recommended (pending funding availability)
- Co-PI, NOAA CPO TPEX-Central
- PIs: Chidong Zhang (PMEL, PI), Scott Stalin (PMEL, Co-PI), Derek Coffman (PMEL, Co-

PI), Antonio Segales (CIWRO, Co-PI)
- Deploys coordinated uncrewed systems (UUV, USV, UAV) to make simultaneous, collocated air-sea interface measurements.

Impacts of Terrain Heterogeneity on BL and Convection Processes 2025-2027
- $1.3M – Declined
- Collaborator, DOE-FOA 0003420 Southeast US AMF Bankhead
- PIs: Tyler M. Bell (CIWRO, PI), Otavio Acevdo (OU, Co-PI), Rachel Miller (CIWRO, Co-PI), Joshua Gebauer (CIWRO, Co-PI), Matt Ammon (CIWRO, Co-PI), Matt Flournoy (NSSL, collab), Anthony Lyza (collab)
- Leverages a network of profiling sites (including CLAMPS) to examine how land-surface and canopy heterogeneity affect boundary-layer and convective processes in the SE US.

Identifying and Evaluating the Impact of Observed Boundary-layer Vertical Vorticity Structures on Tornadogenesis Efficiency 2025-2027
- $412K – Declined
- Collaborator, NOAA WPO VORTEX-USA Program
- PIs: Joshua Gebauer (CIWRO, PI), Tyler M. Bell (CIWRO, Co-PI), Mike Coniglio (NSSL, collaborator)
- Uses VORTEX-USA observation/radar data to evaluate if near-surface vertical vorticity structures impact tornadogenesis likelihood.

Longitudinal Analysis of the Tree-Fall Pattern Method for Tornado Intensity Estimation 2025-2027
- $600K – Declined
- Collaborator, NOAA WPO VORTEX-USA Program
- PIs: Elizabeth Tirone (CIWRO, PI), Frank Lomabardo (UICU, Co-PI), Tony Lyza (NSSL, Collaborator), Daniel Rhee (NIST, Collaborator)
- Builds a longitudinal study comparing UAS/satellite-observed tree-fall patterns to ground surveys and radar data to validate tornado intensity estimation.

CopterSonde LAAIRS: Laboratory for Advanced Atmospheric Investigation using Robotic Sondes 2025-2027
- $1M – Funded
- PI, UxSOC Breakthrough in UxS RFP
- PIs: Antonio R. Segales (CIWRO, Co-PI), Tyler M. Bell (CIWRO, Co-PI), Joshua Gebauer (CIWRO, Co-PI), Chidong Zhang (PMEL, Co-PI), Scott Stalin (PMEL, Co-PI), Noah Lawrence-Slavas (PMEL, Co-PI)
- Aims to enable unattended, autonomous CopterSonde operations by developing precision landing, automated charging, remote communication, and environmental resilience.

Precision Landing and Auto-Charging for Weather-Sensing UAS 2023-2025
- $25.5K – Funded
- Collaborator, CIWRO Director's Discretionary Research Fund
- PIs: Antonio Segales (CIWRO, PI), Tyler Bell (CIWRO, Co-PI), Joshua Gebauer, (CIWRO, Co-PI), Doug Kennedy (NSSL, Collaborator)
- Supported the proof-of-concept design for CopterSonde precision landing/auto-charging; role included conceptual design and capstone team supervision.

PRODIGEE-UAS: Progressive Research and Optimization of a Durable and Independent Generation of Uncrewed Aircraft Systems 2023-2025

- $432.5K – Funded
- PI, NOAA UxSRTO Research and Development
- PIs: Antonio Segales (CIWRO, Co-PI), Tyler Bell (CIWRO, Co-PI), Joshua Gebauer, (CIWRO, Co-PI), Robert Palmer (OU, Collaborator)
- Advances CopterSonde UAS capabilities through R&D in hardware, autopilot functions, immediate data dissemination, and supporting software/SOPs.

Venturing Into the Vertical: Optimizing Boundary Layer Profiling in Mesonets 2023-2025

- $600K – Funded
- Co-PI, NOAA/WPO Mesonet BL Observations/Innovative Observing Technologies
- PIs: Joshua Gebauer (CIWRO, PI), Tyler Bell (CIWRO, Co-PI), Antonio Segales, (CIWRO, Co-PI)
- Performs Observing System Simulation Experiments (OSSEs) to determine the optimal design of a 3D boundary-layer profiling mesonet to fill data gaps.

Deep learning calibration of surface wind forecasts from the NSSL Warn-on-Forecast System 2023-2025

- $239,225 – Declined
- Co-PI, NOAA Incubator
- PIs: Corey Potvin (NSSL-PI), Monte Flora (CIRWO, CO-PI), Nathan Dahl (CIWRO, Co-PI), Joshua Gebauer (CIWRO, Co-PI), Tyler Bell (CIWRO, Co-PI)
- Proposed to compile an AI-ready 10-m wind gust dataset to train convolutional neural networks (CNNs) for improving WoFS wind forecasts.

American Wake Experiment (AWAKEN) 2022-2023

- $24.5K – Funded
- Co-PI, NOAA - DOE Inter-agency Agreement Year 2
- PI: David D. Turner (GSL, PI)
- Led the deployment and oversight of the CLAMPS2 facility to sample flow undisturbed by turbine wakes as part of the AWAKEN campaign.

Deployment of CLAMPS + UAS Network-in-Network Profilers 2022-2024

- $80K – Funded
- PI, NOAA VORTEX-USA – CLAMPS + UAS
- PIs: Tyler Bell (CIWRO, Co-PI), Tony Segales(CIWRO, Collaborator)
- Coupled ground-based profilers (CLAMPS) with UAS platforms to measure properties critical to high-impact weather in the SE US, parallel to the PERiLS effort.

Assessment of Renewable energy ImpactS on the Environment 2022-2024

- $800K – Declined
- Co-PI, NSF – ARISE
- PIs: Julie Lundquist (CU-Boulder, Lead PI), Petra Klein(OU-Local PI)
- Proposed a regional-scale deployment to assess how wakes from >7000 wind turbines in north-central Oklahoma impact ABL evolution and weather propagation.

Idealized Planar-Array Study for Quantifying Spatial heterogeneity in warm boundary layers 2020-2022

- $400K – Declined
- Co-PI, DOE/OSBER/ASR – IPAQS-WBL
- PIs: Eric Pardyjak (Univ. Utah, PI), Marc Calaf (Univ. Utah, Co-PI), Jeremy Gibbs (NSSL, Co-PI)

- Proposed to study how combined surface heterogeneities (roughness, heat, moisture) interact to form persistent secondary circulations.

Analysis and OSEs of UAS observations for improved high impact weather forecasts 2020-2022

- $575K – Funded
- Collaborator, NOAA/WPO – UAS and High Impact Weather
- PIs: Nusrat Yussof (CIMMS/NSSL, PI), et al.
- Deployed UAS to collect vertical profiles for analysis, assimilation into NSSL's Warn on Forecast System, and exploration with NWS forecasters.

American Wake Experiment (AWAKEN) 2020-2021

- $12.5K – Funded
- Co-PI, NOAA - DOE Inter-agency Agreement Year 1
- PIs: David D. Turner (GSL, PI), et al.
- Contributed to experimental design and provided expertise on ground-based thermodynamic profiling to understand how turbine wakes affect wind farm efficiency.

SPLASH–SAIL and continued PBL Analyses 2021

- $117K – Funded
- PI, NOAA/OAR/OWAQ – Boundary Layer Continued Support
- PI: Tyler Bell (CIMMS, Co-PI)
- Supported analysis of CHEESHEAD data and the deployment of CLAMPS2 to Crested Butte, CO, for the SPLASH-SAIL campaign to evaluate PBL evolution.

Coastal Urban Boundary-layer Interactions with Convection (CUBIC) 2020-2022

- $300K – Funded
- Co-PI, DOE/OSBER/ASR – TRACER–CUBIC
- PIs: Petra M. Klein (OU, PI), Jeremy A. Gibbs (CIMMS, Co-PI), Elizabeth N. Smith (NSSL, Co-PI), et al.
- Supported collection of high-resolution data on boundary layer processes and thermal circulation in a coastal urban region, adding value to the TRACER project.

Evaluating Polarimetric Retrievals of Boundary Layer Height Using State-of-the-Art Boundary Layer Profiling 2020-2021

- $37K – Funded
- Co-PI, CIMMS Director's Discretionary Research Fund
- PI: Jacob Carlin (CIMMS, PI)
- Supported data collection and analysis to evaluate a proposed method for boundary layer height detection from operational WSR-88D radar.

CHEESEHEAD Analysis 2020-2021

- $117K – Funded
- PI, NOAA/OAR/OWAQ – Boundary Layer Analysis Next:
- PIs: Petra M. Klein (OU, Co-PI), Michael C. Coniglio (NSSL, Co-PI), Tyler Bell (CIMMS, Co-PI)
- Supported the analysis of data collected during the CHEESHEAD deployment period.

Defining the capabilities of boundary layer profiling systems for operations in the southeastern United States 2019-2021

- $300K – Funded
- PI, NOAA/OAR/OWAQ – VORTEX-SE

- PIs: Michael C. Coniglio (NSSL, Co-PI), Sean M. Waugh (NSSL, Co-PI), David D. Turner (ESRL, Collaborator)
- Used VORTEX-SE boundary layer profile observations to evaluate profiling platforms, inform future deployments, and assess operational forecast tools.

CHEESEHEAD Data Collection 2019
- $142K – Funded
- PI, NOAA/OAR/OWAQ – Boundary Layer
- PIs: Petra M. Klein (OU, Co-PI), Michael C. Coniglio (NSSL, Co-PI), Pamela Heinselman (NSSL, Co-PI), Doug Kennedy (NSSL, Collaborator)
- Supported the deployment of both CLAMPS platforms in northern Wisconsin to characterize surface conditions and the overlying atmosphere.

PROFESSIONAL SERVICE

Subject Matter Editor | American Meteorological Society 2022–present
Bulletin of the American Meteorological Society, Observations

Faculty Search Committee | OU School of Meteorology 2022
BL/Dynamics Open Rank, BL Observations Asst.

Group Lead | BLISS Group 2020–present
Boundary Layer Integrated Sensing and Simulation Group
Re-founded, organized, and currently co-lead the BLISS cross-institution group. See White Paper.

Associate Editor | American Meteorological Society 2020–present
Monthly Weather Review (2020–Present); Journal of Atmospheric Science (2020–2024).

Alt. Rep. for NSSL | NOAA OAR EEO Advisory Committee 2020–present

Outreach and Engagement | NSSL 2020–present
I regularly participate in educational outreach, media engagement, public facing appearances, and recruitment events (e.g., National Weather Festival, OU AGS Career Fair, NSSL video spot for Twisters, student visits, etc.). I also commonly facilitate others' outreach by supplying models and materials.

NSSL Book Club Lead | NSSL 2020–2022
I designed and led a book club for NSSL employees, serving both to foster community and to approach and discuss important themes such as race, gender, class, and other intersectional experiences.

Board of Trustees | National Weather Museum 2019–present
I serve as member of the board of trustees, guiding the vision and future of the museum, and recruiting volunteers.

Museum Docent | National Weather Museum 2018–present
I volunteer at the National Weather Museum and Science Center giving tours to patrons and assisting with museum upkeep and events.

Student Conference Volunteer | American Meteorological Society 2018–2019
Poster competition judge.

Graduate Studies Committee | OU School of Meteorology 2017
Student representative for Direct-Track Ph.D. documentation in the Graduate Student Handbook.

Peer-reviewer | Various Journals 2016–present
Atmospheric Measurement Techniques, Boundary layer meteorology, Monthly Weather Review, Quarterly Journal of the Royal Meteorological Society, Journal of Applied Meteorology and Climatology, Tellus, and more.

Student Affairs Committee | OU School of Meteorology 2016–2018
Doctoral representative. I planned two large fundraiser event for the NWC community and developed a student-focused professional development series in this role.

Faculty Search Committee | OU School of Meteorology 2016–2017
Student representative to the search committee for two new faculty hires.

BUL Seminar Series | OU School of Meteorology 2015–2019
Co-Convener and webpage manager for the Boundary-Layer, Urban Meteorology, and Land-Surface Processes. In late 2018, I moved up to convene the series as the full instructor (see teaching section)

Local Chapter Affairs Committee | American Meteorological Soc. 2013–2016
Member (2013-2015) and Chair (2016) serving to connect and enhance local chapters of the AMS.

SOCIALLY COMPETENT LEADERSHIP AND ENGAGEMENT

I place high value on the need for institutional and community efforts to build capacity to cross social and cultural gaps in STEM spaces. I have highlighted my own work in this area separate from other service efforts here. I did not include related training in this section, but it can be found in the Professional Training section below.

Sexual Assault Awareness and Prevention Month Learning | Attendee 2024
NOAA OAR
Attended NOAA WVPR Webinar on Moving from Institutional Betrayal to Institutional Courage with Dr. Jennifer Freyd.

NSSL's DEIA Strategic Implementation Plan | Author and Contributor 2022-2024
NSSL NDIST
Authored sections of the plan from scratch, reviewed the plan, and contributed to the development of the overall vision for the plan.

Implicit Bias Training | Trainee 2023
NOAA Lapenta Mentor Training
Completed the training.

Working Group Safety and Inclusivity during Fieldwork | Contributor 2022
NOAA ODIAC
Contributed materials and to meetings as able; shared NSSL's experience. NOAA WVPR now produces materials based on concepts developed at NSSL (e.g., pocket contact cards).

Fieldwork Initiative to Stop Sexualized Trauma (FISST Training) | Trainee 2022
NOAA WVPR
Completed the training.

Fieldwork Toolkit Leadership Training Series | Trainee 2022
UC Riverside-Online
Completed the webinar series.

Fieldwork Training Implementation | Champion and Administrator 2022
NSSL/OU/CIWRO
Championed and administered the first required project-wide fieldwork training regarding interpersonal safety topics.

Women of AG&S Panel and Discussion | Panelist and Leader 2021
OU College of Atmospheric and Geographic Sciences
Served as panelist and leader on the topic "Women in Fieldwork and Beyond".

Letters to a Pre-scientist | Pen-pal Letter Writer 2020–present
Pen-pal letter writer.

College of Atmospheric and Geographic Science D&I Council | Affiliate Member and NSSL Liaison 2020–present
OU College of Atmospheric and Geographic Sciences
Affiliate member and NSSL liaison.

NSSL Diversity and Inclusion Sustainability Team (NDIST) | Member 2020–present
NSSL
Member of the team formed as part of the 2017 NSSL Diversity and Inclusion Plan.

TORUS Training Development | Contributor 2019–2020
CIMMS/NSSL
Worked with the TORUS PI-team ahead of field-deployment to develop training procedures and provide clear documentation of unacceptable behavior, repercussions, and reporting procedures.

EPSCoR-OK Women in Science Conference | Demo Leader 2019
SoM/CIMMS/NSSL
Worked with a team of SoM, CIMMS, and NSSL women at the grade 6-12 Women in Science Conference to engage girls in hands-on science activities and provide information on STEM careers.

National Weather Center Protocol | Author 2019

National Weather Center

Authored a document for participants in NWC partner activities to prevent negative behaviors (harassment, discrimination, assault) and provide support to victims. This document was approved by the OU Legal office and is now used by all NWC partners.

Diversity and Inclusion Committee | Founding Member 2018–2020

CIMMS

Member of the founding committee.

Classroom Outreach | Volunteer Scientist 2017–present

via Skype-A-Scientist and Local Visits

Video chat (via Skype-A-Scientist) or visit several K-12th grade classrooms across the US. I identify as a female first-generation college graduate from a rural, blue-collar upbringing to highlight diversity in what scientists look like and that science needs people from all walks-of-life.

Women in the School of Meteorology Survey | Researcher 2017

OU School of Meteorology

Conducted a survey reviewing women's experiences in the SoM for Academic Performance Review and to assist administration in efforts to improve the experience of women in science.

SKILLS

Technical Python (proficient), LaTeX (proficient), Weather Research and Forecast (WRF) Model (proficient), MATLAB (working knowledge), HTML (working knowledge), Unix (working knowledge), ArcGIS (working knowledge), HPC platforms (working knowledge)

Uncrewed Aircraft Systems NOAA UAS Mission Commander, FAA Certificated UAS Pilot, Certified on CopterSonde (3D/SWX-Q, iMet3) and NSSL UAS platforms (Trinity F90+, Skydio2)

HONORS AND AWARDS

OAR EEO/Diversity Award for a Group – EEO Advisory Committee 2022
NOAA OAR

OAR EEO/Diversity Award for Exemplary Service 2020
NOAA OAR

Douglas Lilly Paper Award (for 2019 MWR Publication) 2019
OU School of Meteorology

Outstanding Poster Award 2018
Oklahoma Women Impacting STEM and Entrepreneurship Conference

Director's Recognition for Service to the Department 2017
OU School of Meteorology

First Place Student Oral Presentation, 24th Conference on NWP 2017
American Meteorological Society

Faculty Recognition for Outstanding Performance as a Graduate Student 2016
OU School of Meteorology

Lockheed Martin Graduate Fellowship 2014–2015
American Meteorological Society

Michael A Roberts, Jr. Undergraduate Scholarship 2013
American Meteorological Society

NOAA Science and Education Symposium Award 2013
National Oceanic and Atmospheric Administration

NOAA Ernest F. Hollings Scholarship 2012–2014
National Oceanic and Atmospheric Administration

Phillips Family Scholarship 2012
National Weather Association

Presidential Scholar 2010-2014
California University of Pennsylvania

OUTREACH & MEDIA APPEARANCES

TV & Video

ABC News Impact x Nightline
ABC News / Hulu
Full Episode on Hulu • Watch Shortened News Format

Oklahoma's Wicked Weather 2025
KFOR Oklahoma's News 4
(watch here)

OU grads develop cutting-edge weather drone as storm season kicks off in Oklahoma
Oklahoma News Report (via YouTube)
(watch here)

NOAA: Drones and Twisters Video
NOAA
Watch

KOCO Interview about UAS at OU/NSSL
KOCO 5 News
(watch here)

Yes! Science Show | Interview JULY 2019
Yes! Science Show
Click here to watch the video.

Observations on the Go | Featured Scientist
National Severe Storms Laboratory
Discussed the CLAMPS platform. Watch the video.

Print & Web Articles

How geoscientists are making their field more welcoming
Nature
Read the Article

Designing the real, wild, storm-chasing trucks behind Twisters
Fast Company Magazine
Read the Article

'Twister' gave rise to a generation of storm chasers...
CNN
Read the Article

Between Twister and Twisters, Tornado Science Has Improved a Lot...
Scientific American
Read the Article

A career twist of fate? | Article Feature
NOAA Heritage Stories
Read the Article

Researchers study lower atmosphere to answer remaining questions
Inside NSSL / NSSL News
Read the Article

Unmanned Systems Elevate Weather Research at OU
University of Oklahoma
Read the Article

Podcasts

Planet NOAA Podcast | Episode 7: Class is in session!
NOAA
Featured in the last segment. Listen to the Podcast

Weather Brains | Episode 807
Weather Brains
Joined the crew to discuss work at NSSL and the National Weather Museum. Listen here.

Obsessed with the Weather | Episode 18
Steve Maguire Podcast
Featured on episode 18. Listen here.

Pulsar Podcast
Boston Museum of Science
Featured in podcast series. Podcast recording and transcripts in English and Spanish here.

Talks & Panels

Invited Talk at AMS Student Conference | Mind, Body, Attitude Session
American Meteorological Society
(watch here)

Sam Noble Museum, Fieldwork While Female | Panelist
Sam Noble Museum
Recordings online.

NSSL Virtual Live Panel | Panelist — Oct. 2020
National Severe Storms Laboratory
Highlights the diverse paths of four NSSL scientists. Click here to watch.

Lunch w/ a Scientist | Invited Speaker — May 2020
Headwaters Institute
Click here to watch the video. • Accompanying exercise (8-11 grade)

PROFESSIONAL TRAINING

2024 AMS Summer Policy Colloquium — 2024
AMS/NSSL
NSSL supported my attendance and participation in the 2024 AMS Summer Policy Colloquium. I attended the full policy-immersion workshop with approximately 30 Earth scientists from various sectors to explore the critical intersection of science and policy at the federal level. I was able to attend meetings with high-level policy officials, engage in dialogues about the role of science in policy-making, learn about the intricacies of the federal policy and budget processes, and network with peers from diverse backgrounds in Earth

sciences. The insights I gained from this experience helped me better understand how to communicate research findings to stakeholders, including policymakers; understand the policy implications of our work and the importance of aligning our efforts with federal priorities; and identify opportunities for our research to provide information critical for decision makers.

2024 NOAA Leadership Seminar 2024

NOAA Human Capital Services

Power of the Past—Force of the Future. This event is a virtual developmental opportunity open to all NOAA Federal employees to learn about the importance of inclusive leadership and how to apply it at their office.

NOAA Working Well Together Summit 2021

NOAA Workplace Violence Prevention Response

This multi-day summit offered education on elevating workplace culture so it is free of intolerance, harassment, and unacceptable behaviors. The goal was to provide the tools to not only improve workplace culture but also chart a course toward your own wellness.

2021 NOAA Leadership Seminar 2021

NOAA Human Capital Services

ECQ2: Leading People. This core qualification involves the ability to lead people toward meeting the organization's vision, mission, and goals. Inherent to this ECQ is the ability to provide an inclusive workplace that fosters the development of others, facilitates cooperation and teamwork, and supports constructive resolution of conflicts.

Office of Diversity and Inclusion's Unlearning Series 2020

University of Oklahoma

The "Unlearning" series is intended to help the campus community have safe and meaningful conversations about differences, to increase awareness of personal and community bias, and to promote inclusion at work and in the classroom. The 4-part series includes Unlearning Racism, Ableism, Sexism, and Classism.

Leadership Skills for Success in the Scientific Workforce 2019

Earth Science Women's Network

Supported by NOAA, UCAR/NCAR, and CU-Boulder, this 2.5 day workshop was intended for people who identify as women and are employed in the sciences, especially those employed in scientific agencies and scientific organizations. Workshop topics included understanding your own strengths and weaknesses, strategies for effective communication, team building to promote motivation and trust, guidance in giving and receiving feedback, articulating your personal value, and strategies for identifying and overcoming challenges to becoming a more effective leader. This workshop offered a unique opportunity for women across scientific disciplines and career levels to build their leadership and management skills.

Addressing Bias in Professional Relationships: From the Office to the Field 2019

Association of Polar Early Career Scientists

This webinar format short training covered discussion of bias (particularly experienced by women) in science careers and tools to address it both as a target and as a bystander.

'Our Voice' Active Bystander Training 2019

University of Oklahoma

The mission of the Our Voice campaign is to educate the campus community on the realities of gender-based violence and how to intervene when they encounter problematic behavior or instances of sexual harassment, sexual assault, dating violence, or stalking.

LGBTQ Ally Training 2015

University of Oklahoma

Completing LGBTQ Ally training provides the awareness, knowledge, and skills to confront injustice and advocate for equality, while supporting all persons, regardless of perceived or actual sexual orientation, gender identity, or gender expression, who are experiencing discrimination in the OU community.

Professional Ethics Training – Responsible Conduct of Research 2015

University of Oklahoma

This two-day workshop was developed by NIH- and NSF-funded researchers in OU's Center for Applied Social Research. It provides graduate students with realistic, work-based strategies for identifying and resolving complex ethical dilemmas.

ARM Summer Training and Scientific Applications event 2015

US Dept. of Energy - ARM

Organized by the Atmospheric Radiation Measurement (ARM) Climate Research facility, this summer training provided theoretical and practical instruction on instruments from the Southern Great Plains site and encouraged innovative methods for using ARM facilities to address complex scientific inquiries.

FIELD WORK

WHy2MSIE | NSSL Operations Lead 2024

NASA/NESDIS

- Participated in NASA planetary boundary-layer (PBL) mission prototype by operating CLAMPS-1 (OU), CLAMPS-2 (NSSL), and deploying CopterSondes during NASA ER-2 aircraft overflights.
- Led coordination of these deployments and oversaw data collection.

SCALES | Lead/MesoSCALES Lead 2024

ISARRA/National Severe Storms Laboratory

- Led the design, organization, and execution of the Small-UAS Coordination for Atmospheric Low-Level Environmental Sampling (SCALES) project, which operated as the 2024 ISARRA Flight Week.
- Coordinated international participants from government, academic, and private sectors.
- Project goals included: MesoSCALES (3D mesonet deployment), MicroSCALES (urban Tulsa deployment), and Technical (UAS safety case).
- Served as the largest US component and final part of the WMO's UAS Demonstration Campaign.

AWAKEN | NSSL/OU Profiling Lead 2022-2023

DOE/NOAA/National Severe Storms Laboratory

- Planned and executed the AWAKEN CLAMPS missions, deploying both CLAMPS1 and CLAMPS2 in northern Oklahoma.
- Collaborated with DOE laboratories (e.g., LLNL, PNNL, NREL), private wind energy companies, and other NOAA labs.

TRACER | NSSL Profiling Lead 2022

DOE/NOAA/National Severe Storms Laboratory

- Served as NSSL profiling PI, leading the CLAMPS planning and deployment of the CLAMPS2 platform to Houston, TX.
- Assisted with the CopterSonde and GeoCarb missions on site.
- Coordinated with local partners for hurricane deployments and collaborated with the OU CLAMPS and Univ. of Wisconsin SPARC teams.

PERiLS | NSSL Profiling Lead 2022-2023

NOAA/NSF/National Severe Storms Laboratory

- Served as NSSL profiling PI, leading CLAMPS deployment planning and execution.
- Led and managed the CopterSonde project, including NOAA UAS processes and executing 100+ flights.
- Worked as part of the PI team during the field season and designed/led local field safety training.

SPLASH | Lead 2021-2022

OAR/National Severe Storms Laboratory

- Led NSSL's planning, execution, and collaboration for participation in the SPLASH campaign.
- Managed the technically difficult deployment of CLAMPS in Crested Butte, CO (10K ft) from October-January, continuing cross-OAR lab collaborations.

CLAMPS-EOL Collaboration | Science Lead 2021

OU/CIMMS/National Severe Storms Laboratory

- Led the design of a month-long CLAMPS-1 facility deployment to the Marshal field site in Boulder, CO.
- Deployment supported EOL's progress toward LOTOS and built new collaborations between EOL and BLISS communities.

BLISS-FUL | Field and Science Lead 2021

OU/CIMMS/National Severe Storms Laboratory

- Led the design, proposal, and execution of the BLISS Field Universalization Lab, a month-long test deployment of NWC community boundary layer sensors.
- Provided opportunities for students to submit their own IOP requests to practice planning field missions.

UAS Damage Survey Project | Field Support Scientist 2021–2022

CIMMS/National Severe Storms Laboratory

- Deployed multiple times to the SE US to support a project imaging and collecting measurements over tornado paths.
- Work included traditional damage surveys, NWS collaboration, public interaction, and implementation of state-of-the-art platforms.

VORTEX-SE/PERiLS | Field Planning Lead 2021

National Severe Storms Laboratory

- Moved into a leading role in planning boundary layer profiling deployments for future missions after COVID-19 delays.
- Involved working with academic and research partners from several institutions.

CIMMS DDRF - Boundary Layer Height | Field Lead 2020

CIMMS/National Severe Storms Laboratory

- Led the design, organization, and 4-week deployment of two mobile boundary layer profiling platforms across three sites.
- Role included oversight, management, data collection/management, and development of new BL height detection algorithms.

Targeted Observation by Radars and UAS of Supercells | Field Scientist 2019-2023

CIMMS/National Severe Storms Laboratory

- Assisted in development (hardware/software) and led deployment of a platform for mobile single- and dual-lidar observations near storms.
- Role included independent leadership, student mentoring, advising PI team, and coordinating mobile lidar deployments.

Perdigão | Field Scientist 2017

OU School of Meteorology

- Served as group lead for the OU team operating a profiling system (mini-CLAMPS).
- Assisted NCAR in releasing radiosondes to measure atmospheric flow in complex terrain in Perdigão, Portugal.

Mini-Mesoscale Predictability Experiment (mini-MPEX) | Field Scientist 2016

National Severe Storms Laboratory

- Operated a mobile profiling platform (NOAA-NSSL CLAMPS2) and released radiosondes to observe near- and far-field environments near severe supercell thunderstorms.

Plains Elevated Convection At Night (PECAN) | Field Scientist 2015

OU School of Meteorology

- Operated a mobile profiling platform (OU-NSSL CLAMPS1) and released radiosondes to observe nocturnal environments (e.g., MCSs, bores, low-level jets) in the Great Plains.

STUDENT MENTORING & PERSONNEL MANAGEMENT

Alejandro Medina | Mentor/Advisor 2025

NOAA EPP/MSI CESSRT NERTO

- Advised this Engineering M.S. (University of Texas at El Paso) during his 12-week experience at a NOAA facility as part of his studies as a NOAA EPP/MSI CESSRT Graduate Scholar.

Elizabeth Tirone | Mentor/Technical Lead 2024–present
CIWRO/NSSL

- Support, advise, and provide professional mentoring to a CIWRO postdoctoral research associate focused on imaging UAS work and big data processing. As of 2025, this postdoc is now a research scientist.
- Provide program-level support and advising regarding fieldwork and data collection.

Engineering Senior Capstone | Mentor/Advisor 2023–2024
University of Oklahoma, Aerospace Engineering

- Advised a group of four students (Logan Garret, Jacob Kulhman, Mark Metzger, An Nguyen) for their senior capstone project on automated landing and charging for weather-sensing UAS.

Josh Ostazewski | Mentor/Advisor 2023
NOAA Lapenta Program, NSSL

- Mentored intern's project on exploring boundary-layer profile field data to unravel new questions about near- and pre-storm environments.
- Examined creating combinations of lidar and Ka-band systems for future use.

Abdullah al Tasim | Mentor/Funding PI 2022–2025
University of Oklahoma, CIWRO/Mechanical Engineering

- Provided funding support for this M.S. student from NOAA OMAO UAS programs.
- Provided informal mentoring and assistance throughout his M.S. (2025) and subsequent Ph.D. studies.

Lydia Bunting | Technical Lead 2022–present
CIWRO/NSSL

- Support and 'daily manage' a full-time CIWRO research associate who serves as a data manager for CLAMPS and other boundary-layer observation systems.

Antonio Segales | Mentor/Technical Lead 2022–present
CIWRO

- Act as technical supervisor for a CIWRO research engineer associated with the Copter-Sonde UAS, a critical platform for NSSL research projects.
- Assist in forming job roles and provide daily/monthly task follow-ups on projects.

Michelle (Spencer) Storm | Advisor 2022–2025
University of Oklahoma, School of Meteorology/CIWRO/NSSL

- Co-advised and co-chaired committee for a Ph.D. student on the funded TRACER-CUBIC project (co-advised by Dr. Petra Klein).
- Student used state-of-the-art observations and high-resolution numerical simulations to study sea breezes and urban boundary layer effects.

Nadiyah Williams | Advisor 2022
NOAA Lapenta Program, NSSL

- Advised virtual Lapenta intern on a project comparing wind observations from lidar and sonde measurements in the boundary layer.
- Project evaluated instrument performance in moderate to severe weather and assessed the relevance of wind observations in varying conditions.

Joshua Gebauer | Technical Lead 2022–present

CIWRO/NSSL

- Support and 'daily manage' a full-time CIWRO research scientist associated with the VORTEX-USA CLAMPS+UAS project.
- Researcher focuses on evaluation, development, and analysis of networked observations and value-added products.

Matt Ammon | Advisor 2022–present

University of Oklahoma, School of Meteorology/CIWRO

- Currently advising as Ph.D. student; previously advised (and chaired committee) for M.S. (2025) on a networked observations and OSSEs project.
- Supervised as an undergraduate on a project completing in-depth case studies of CLAMPS observations from VORTEX-SE, leading to a publication in MWR (Ammon et al, 2025).

Victor Alvarez | Supervisor 2021–2023

University of Oklahoma, CIWRO

- Supervised work to update, modernize, and visualize the CLAMPS historical archive, including a rebuild of the CLAMPS webviewer tool.

Isaac Medina | Mentor/Supervisor 2021–2024

University of Oklahoma, NWC REU/NSSL

- Mentored in the NWC REU program (Summer 2021) on a project comparing dual-pol radar, CLAMPS, and UAS boundary-layer height estimates.
- Subsequently hired student through the NSSL Director's Office program to support a VORTEX-SE project using CLAMPS and model data.

Arianna Jordan | Advisor 2020–present

University of Oklahoma, School of Meteorology/CIMMS/NSSL

- Co-advise and co-chair committee for a Ph.D. student in collaboration with Pacific Northwest National Laboratory (co-advised by Dr. Petra Klein, OU & Dr. Sonia Wharton, PNNL).
- Student uses observations and simulations to study boundary layers near large wind energy farms.

Tyler Bell | Mentor/Technical Lead 2020–2025

CIWRO/NSSL, University of Oklahoma

- Supported and managed a full-time CIMMS research associate/scientist funded through a NOAA/OWAQ/VORTEX-SE grant.
- Researcher focuses on development and support of thermodynamic retrieval algorithms and data system workflows; employment opportunity also allowed completion of a doctoral degree.

Tyler Pardun | Supervisor 2019–2021

University of Oklahoma, School of Meteorology/CIMMS/NSSL

- Supported and managed an undergraduate student researcher (funded by NOAA/OWAQ/VORTEX-SE grant).
- Student gathered, quality checked, and synthesized boundary layer observations from VORTEX-SE deployments.

Marshall Baldwin | Supervisor 2021–2023

University of Oklahoma, CIWRO

- Supervised work to update, modernize, and visualize the CLAMPS historical archive.

Nolan Meister | Advisor 2020–2022

University of Oklahoma, School of Meteorology/CIMMS/NSSL

- Co-advised a master's student (funded by CHEESEHEAD analysis award) on quantifying boundary layer characteristics during CHEESEHEAD.
- Work included a case study of a 2-day severe linear storm event, involving observation analysis and evaluation of the NSSL Warn On Forecast System.

Dana Pawlowski | Mentor/Advisor 2021

East Carolina University, National Weather Center REU

- Remotely-mentored an REU student on a project using CLAMPS data to complete an in-depth case study on a discrete mode convection case.

Katie Giannakopolous | Supervisor 2020–2022

University of Oklahoma, School of Meteorology

- Oversaw an undergraduate student researcher (funded by 2020 CIMMS DDRF) working with CLAMPS and dual-pol radar data to retrieve boundary layer height.

Jordan Laser | Adviser 2019–2021

University of Oklahoma, School of Meteorology/CIMMS/NSSL

- Served as an unofficial but involved advisory committee member for an M.S. student.
- Assisted student with the use of mobile Doppler lidar data in a storm-scale ensemble model verification experiment.

Capstone Team | Capstone Mentor 2019–2020

University of Oklahoma, School of Meteorology

- Mentored a senior capstone team (Nolan Meister and James Cuellar) on a project focused on mechanisms supporting updraft generation ahead of outflow boundaries using TORUS lidar observations.

Capstone Team | Capstone Mentor 2019–2020

University of Oklahoma, School of Meteorology

- Mentored a senior capstone team (Marisa Nuzzo and Maci Gibson) on a project evaluating the relationship between hodograph shape and supercell/environmental characteristics.

Michelle Spencer | Mentor/Adviser 2019–2021

Metropolitan State Univ. Denver, National Weather Center REU

- Mentored an undergraduate (2019 REU) on a research project focused on the connections between nocturnal low-level jets and convection initiation.
- Continued collaboration as student pursued M.S., resulting in an AMS presentation and a planned article submission.