Elizabeth A. Pillar-Little

Research Scientist I
Cooperative Institute for Severe and High-Impact Weather Research and Operations (CIWRO)
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Research Interests

Atmospheric and environmental chemistry, land-atmosphere interactions, aerosol composition and aging, aerosol-climate interactions, air quality, aerosol-cloud interactions, uncrewed aircraft systems (UAS), wildfires

Education

2011 – 2017 Ph.D. Chemistry; University of Kentucky, August 2017
Thesis: Mechanisms of Heterogeneous Oxidation at Model Aerosol Interfaces by Ozone and Hydroxyl Radicals
Advisor: Marcelo I. Guzman

2005 – 2009 B.S. Biochemistry, B.S. Applied Forensic Science; Mercyhurst University, Nov 2009

Appointments

2021 – present Research Scientist I, Cooperative Institute for Severe and High-Impact Weather Research and Operations (CIWRO), University of Oklahoma, Norman, OK

2018 – 2021 Assistant Director, Center for Autonomous Sensing and Sampling, University of Oklahoma, Norman, OK

2018 – 2021 Research Scientist, School of Meteorology, University of Oklahoma, Norman, OK

2017 – 2018 Postdoctoral Research Associate, Center for Autonomous Sensing and Sampling, University of Oklahoma, Norman, OK
Advisor: Phillip B. Chilson

2012 – 2017 Graduate Research Assistant, University of Kentucky, Lexington, KY
Advisor: Marcelo I. Guzman

Peer-Reviewed Publications (* = student author)

Lappin, F.M.,* T.M. Bell,* P.B. Chilson, and **E.A. Pillar-Little.** Low-level buoyancy as a tool to understand boundary layer transitions. *Atmos. Meas. Tech.,* **in review**.

Martin, E. R., E. A. Pillar-Little, and G. B. H. de Azevedo*, 2021: Assessing the Greenhouse Gas Carbon Dioxide in the Atmospheric Boundary Layer. *Fundamentals of Capturing of Capturing and Processing Drone Imagery and Data*. A. E. Frasier and K. K. Singh, Eds., CRC Press, 385 pp.

Fiebrich, C.A., J.R. Ziolkowska, P.B. Chilson, and **E.A. Pillar-Little**. Potential Socio-Economic and Environmental Benefits and Beneficiaries of Atmospheric Profiles from a 3D Mesonet. *Weather. Clim. Soc.,* **2021**, *13*, 377.

Pillar-Little, E. A., B. R. Greene*, A. R. Segales,* G. B. H. de Azevedo,* T. M. Bell,* W. Doyle, D. D. Tripp,* S. T. Kanneganti*, and P. B. Chilson. Observations of the thermodynamic and kinematic state of the planetary boundary layer over the San Luis Valley, CO using remotely piloted aircraft systems during the LAPSE-RATE field campaign. Earth Syst. Sci. Data, **2021**, *13*, 269.

de Boer, G., A.L. Houston, J.D. Jacob, P.B. Chilson, S.W. Smith, B. Argrow, D. Lawrence, J. Elston, D. Brus, O. Kemppinen, P.M. Klein, J.K. Lundquist, S. Waugh, S.C.C. Bailey, A.E. Frasier, M.P. Sama, C. Crick, D Schmale, J. Pinto, **E.A. Pillar-Little**, V. Natale, and A.A. Jensen. Data Generated during the 2018 LAPSE-RATE Campaign: An Introduction and Overview. *Earth Syst. Sci. Data,* **2020**, *12*, 3357.

de Boer, G., C. Diehl, J.D. Jacob, A.L. Houston, S.W. Smith, P.B. Chilson, D.G. Schmale, J. Intrieri, J. Pinto, J. Elston, D. Brus, O. Kemppinen, A. Clark, D. Lawrence, S.C.C. Bailey, M.P. Sama, A.E. Frazier, C. Crick, V. Natalie, **E.A. Pillar-Little**, P.M. Klein, S. Waugh, J.K. Lundquist, L. Barbieri,* S.T. Kral,* A.A. Jensen, C. Dixon, S. Borenstein, D. Hesselius, K. Human, P. Hall, B. Argrow, T. Thornberry, R. Wright, and J.T. Kelly. Development of community, capabilities and understanding through unmanned aircraft-based atmospheric research: The LAPSE-RATE campaign. *Bull. Amer. Meteor. Soc.,* **2020**, *101* (5), E684.

McFarquhar, G. M., E. Smith, **E.A. Pillar-Little**, K. Brewster, P. B. Chilson, T. R. Lee, S. Waugh, N. Yussouf, X. Wang, M. Xue, G. de Boer, J. A. Gibbs, C. Fiebrich, B. Baker, J. Brotzge, F. Carr, H. Christophersen, M. Fengler, P. Hall, T. Hock, A. Houston, R. Huck, J. Jacob, R. Palmer, P. K. Quinn, M. Wagner, and Y. R. Zhang. Workshop on current and future uses of unmanned aircraft systems (UASs) for improved forecasts/warnings and scientific studies. *Bull. Amer. Meteor. Soc*., **2020**, *101* (8), E1322.

Segales, A.R.,* B.R. Greene,* T.M. Bell,* W. Doyle, J.J. Martin, **E.A. Pillar-Little**, and P.B. Chilson. The CopterSonde: An insight into the development of a smart UAS for atmospheric boundary layer research. *Atmos. Meas. Tech.,* **2020**, *13*, 2833.

Kral, S. T.*, J. Reuder, T. Vihma, I. Suomi, L. Baserud,* K. Flacke Haualand,* G. H. Urbanic, B. R. Greene*, G.-J. Steeneveld, T. Lorenz, B. Maronga, M.O. Jonassen, H.Ajosenpää, L. Båserud,* P. B. Chilson, A. A. M. Holtslag, A.D Jenkins, R. Kouznetsov, S. Meyer, **E. A. Pillar-Little**, A. Rautenberg, J. Schwenkel, A.W. Seidl,* and B. Wrenger. The Innovative Strategies for Observations in the Arctic Boundary Layer Project (ISOBAR) —Unique fine-scale observations under stable and very stable conditions. *Bull. Amer. Meteorol. Soc.,* **2020**, *102* (2), E218.

Greene, B.R.,* A.R. Segales,* T.M. Bell,* **E.A. Pillar-Little**, and P.B. Chilson. Environmental and sensor integration influences on temperature measurements by rotary-wing unmanned aircraft systems. *Sensors*, **2019**, *19(6)*, 1470.

Pillar-Little, E.A. and M.I. Guzman. An Overview of Dynamic Heterogeneous Oxidations in the Troposphere. *Environments*, **2018,** *5(9),* 104.

Alvarez, L.V., H.A. Moreno, A.R. Segales,* T.G. Pham,* **E.A. Pillar-Little**, and P.B. Chilson. Merging Unmanned Aerial Systems (UAS) Imagery and Echo Soundings with an Adaptive Sampling Technique for Bathymetric Surveys. *Remote Sens.*, **2018,** *10,* 1362.

Pillar-Little, E.A.* and M.I. Guzman. Oxidation of Substituted Catechols at the Air-Water Interface: Production of Carboxylic Acids, Quinones, and Polyphenols. *Environ. Sci. Tech.*, **2017,** *51*, 4951.

Pillar-Little, E.A.,* R. Zhou,* and M.I. Guzman. Heterogeneous Oxidation of Catechol. *J. Phys. Chem. A.*, **2015,** 115, 10349. *Selected for Atmospheric Physical Chemistry Special Issue*

Pillar-Little, E.A.,* R.C. Camm,* and M.I. Guzman. Catechol Oxidation by Ozone and Hydroxyl Radicals at the Air-Water Interface. *Environ. Sci. Tech.*, **2014**, *48*, 14352.

Pillar-Little, E.A.,* M.I. Guzman, and J.M. Rodriguez. Conversion of Iodide to Hypoiodous Acid and Iodine in Aqueous Microdroplets Exposed to Ozone. *Environ. Sci. Tech.,* **2013,** *47,* 10971.

Funding Awards

2021-2022	Co-PI, Analysis and OSEs of UAS observations for improved high impact weather forecasts. National Oceanic and Atmospheric Administration, $299,577. PI: Nusrat Yussouf.
2021-2026	Senior Personnel, Real-World Research Experiences at the National Weather Center. National Science Foundation. PI: Daphne LaDue.
2021	Senior Personnel, X-GEM: Enhancing Future Community Sustainability via Greenhouse Gas Emission Monitoring. University of Oklahoma Big Idea Challenge, $50,000. PI: Binbin Weng.
2020-2023	Co-PI, Measurements of TRACER pre-convective conditions and mesoscale circulations using small unmanned aircraft systems (sUAS). Department of Energy Atmospheric System Research, $383,493. PI: Gijs de Boer.

Honors and Awards

2016	Early Career Scientist Travel Award, 14th Annual International Global Atmospheric Chemistry (IGAC) Science Conference, Breckenridge, CO.
2016	2015 – 2016 Outstanding Graduate Research Award. Department of Chemistry, University of Kentucky, Lexington, KY
2015	Women's Club Fellowship. University of Kentucky, Lexington, KY
2013	Outstanding Student Paper Award in Atmospheric Sciences. American Geophysical Union Fall Meeting, San Francisco, CA
2013	First Place, Student Poster Competition at the 39th Naff Symposium. Lexington, KY
2012 – 2017	Max Steckler Fellowship (yearly award). Department of Chemistry, University of Kentucky, Lexington, KY
2012	2011 – 2012 Fast Start Award. Department of Chemistry, University of Kentucky, Lexington, KY

Teaching Experience

2021-present Instructor, School of Meteorology, University of Oklahoma, Norman, OK
Classes Covered: Advanced Measurements, BUL Seminar

2016 – 2017 Guest Lecturer, Department of Chemistry, University of Kentucky, Lexington, KY
Classes Covered: Environmental Chemistry, Atmospheric Chemistry

2011 – 2017 Graduate Teaching Assistant, Department of Chemistry, University of Kentucky, Lexington, KY
Classes Taught: General Chemistry I Recitation, Organic Chemistry I Laboratory, Organic Chemistry II Laboratory
Advisor: Manjiri Patwardhan

2011 Presenter, Science Theaters, Carnegie Science Center, Pittsburgh, PA

2006 – 2009 Peer Tutor, Mercyhurst University, Erie, PA
Subjects Tutored: Cell Biology, Genetics, General Chemistry I & II, Statistics

Undergraduate Research Advising

2021-current Seabrook Whyte, CIWRO Undergraduate Research Assistant, University of Oklahoma.

2020-2021 Lindsey Deluga and Daniel Kubalek. Senior Capstone Research Project, School of Meteorology, University of Oklahoma

2020-2021 Lindsey Deluga. CASS Undergraduate Research Assistant, University of Oklahoma.

2020 Theresa Lincheck and Jordan Robinson. NWC REU students from Cleveland State University and Rhodes College.

2019-2020 Austin Perroux and Martin Lattimore. Senior Capstone Research Project, School of Meteorology, University of Oklahoma

2019-current Marshall Baldwin and Joseph Rotondo. Four Year Research Experience (FYRE) Honors College Thesis Research, and CIWRO Undergraduate Research Assistants, University of Oklahoma

2019-2021 Steven Trellis. McNair Scholars Program, University of Oklahoma.

2019 Cha'lita Thompson. NWC REU student from University of Central Oklahoma

Professional Affiliations

Member, American Meteorological Society (AGU)

Member, International Society for Atmospheric Research using Remotely piloted Aircraft (ISARRA)

Professional External Services

2021 Reviewer, Journal of Atmospheric and Oceanic Technology

2019 Reviewer, Grant Proposal, NSF Research in Undergraduate Institutions (RUI)

2019 Student Poster Judge, 18th Annual Student Conference, The 99th AMS Annual Meeting, Phoenix, Arizona

Recent Conference Presentations

2019 **Pillar-Little, E.A.**, G. Britto Hupsel de Azevedo, E.R. Martin, and P.B. Chilson. Measurements of the Vertical Structure of Carbon Dioxide in the Atmospheric Boundary Layer and the Atmospheric Surface Layer using RPAS. 8th ISARRA Annual Meeting, Lugo, Spain, Oral presentation.

2019 **Pillar-Little, E.A.**, G. Britto Hupsel de Azevedo, S. M. Baschky, E.R. Martin, and P.B. Chilson. Measurements of the Vertical Structure of Carbon Dioxide in the Atmospheric Boundary Layer and the Atmospheric Surface Layer using UAS. 21st Conference on Atmospheric Chemistry at the 99th AMS Annual Meeting, Phoenix, Arizona, Oral presentation.

2018 **Pillar-Little, E.A.**, S. Mazuera, M. Neill, S. M. Baschky, E.R. Martin, and P.B. Chilson. Development of a Robust CO_2 Sensing Platform for Fixed Wing or Multirotor UAS. 7th ISARRA Annual Meeting, Boulder, CO, Poster presentation.

2016 **Pillar, E.A,** T.J. Schuyler, S.C.C Bailey, and M.I. Guzman. Development of an Economic, Portable Sensor Network for the Monitoring of Trace Tropospheric Gases. 6th Annual Tracy Farmer Institute Sustainability Forum, Lexington, KY, Poster presentation.

2016 **Pillar, E.A.** and M.I. Guzman. Ozonolysis of Catechol at the Gas-Solid Interface. 47th Central Regional Meeting of the American Chemical Society, Covington, KY, Oral presentation.

2016 **Pillar, E.A.**, J. Kaindu, and M.I. Guzman. Development of an Economic, Portable Sensor Network for the Monitoring of Trace Tropospheric Gases. 14th Annual International Global Atmospheric Chemistry Science Conference, Breckenridge, CO, Poster presentation.

2015 **Pillar, E.A.** and M.I. Guzman. Ozonolysis of Catechol at the Gas-Solid Interface. 250th National Meeting of the American Chemical Society, Boston, MA, Oral presentation.

2015 Guzman, M.I. and **E.A Pillar**. Catechol Oxidation by Ozone and Hydroxyl Radicals at the Air-Water Interface. Kentucky EPSCoR Annual Conference, Lexington, KY, Poster presentation.

2015 **Pillar, E.A.** and M.I. Guzman. Ozonolysis of Catechol at the Gas-Solid Interface. 41st Annual Naff Symposium on Chemistry and Molecular Biology, Lexington, KY, Poster presentation.

2014 **Pillar, E.A.** and Guzman, M.I. Transformation of Chlorinated Pesticides at the Air-Water Interface. 66th Annual Southeastern Regional Meeting of the American Chemical Society, Nashville, TN, Oral presentation.

2014 Guzman, M.I and **Pillar, E.A.** Oxidation of Polyphenols at the Air-Water Interface. 66th Annual Southeastern Regional Meeting of the American Chemical Society, Nashville, TN, Oral presentation.

2013 **Pillar, E.A.** and M.I. Guzman. Heterogeneous Reactions of Ozone with Aqueous Iodide. American Geophysical Union Fall Meeting, San Francisco, CA, Poster presentation.

2013 **Pillar, E.A.** and and M.I. Guzman. Heterogeneous Reactions of Ozone with Aqueous Iodide. 65th Annual Southeastern Regional Meeting of the American Chemical Society, Atlanta, GA, Oral presentation.

2013 Guzman, M.I. and **E.A. Pillar**. Ozone Loss Catalyzed by Iodide at the Air-Water Interface. Kentucky EPSCoR Annual Conference, Lousiville, KY, Poster presentation.

2013 **Pillar, E.A.** and M.I. Guzman. Heterogeneous Reactions of Ozone with Aqueous Iodide. 39th Annual Naff Symposium on Chemistry and Molecular Biology, Lexington, KY, Poster presentation.