David S. Ebert
Data Institute for Societal Challenges **405-325-4158**
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Education

B.A.	Computer and Information Science	Ohio State University	1986
M.S.	Computer and Information Science	Ohio State University	1987
Ph.D.	Computer and Information Science	Ohio State University	1991

Professional Experience

2020 - present, Gallogly Professor of ECE and CS, The University of Oklahoma, Norman, OK
Associate Vice President of Research and Partnerships

2009 - 2020 School of ECE, Purdue University, West Lafayette, IN
Silicon Valley Professor

2006 - 2020 School of ECE, Purdue University, West Lafayette, IN
Professor

2000 - 2006 School of ECE, Purdue University, West Lafayette, IN
Assoc. Professor

2000 - 2000 Electronics Arts Inc, Research, Redwood City, CA
Graphics Consultant

2000 - 2000 Computer Science, Stanford University, Stanford, CA
Visiting Assoc. Professor

1998 - 2000 CSEE, U. of Maryland Baltimore County, Baltimore, MD
Assoc. Professor

1998 - 1998, National Library of Medicine, Bethesda, MD
Visualization Consultant

1994 - 1998 Summer Faculty Fellow, NASA GSFC, Greenbelt, MD
Visualization Consultant

1993 - 1998 CSEE, U. of Maryland Baltimore County, Baltimore, MD
Assist. Professor

1991 - 1993 CIS, The Ohio State University, Columbus, OH
Instructor

Representative publications on emissions from oil and gas systems:

1. Ko S, Zhao J, Xia J, Afzal S, Wang X, Abram G, Elmqvist N, Kne L, Van Riper D, Gaither K. Vasa: Interactive computational steering of large asynchronous simulation pipelines for societal infrastructure. IEEE Transactions on Visualization and Computer Graphics. 2014; 20(12):1853- 1862. DOI: 10.1109/tvcg.2014.2346911
2. Zhao J, Karimzadeh M, Masjedi A, Wang T, Zhang X, Crawford M, Ebert D. FeatureExplorer: Interactive Feature Selection and Exploration of Regression Models for Hyperspectral Images. 2019 IEEE Visualization Conference (VIS). 2019 IEEE Visualization Conference (VIS);; Vancouver, BC, Canada. IEEE; c2019. Available from: https://ieeexplore.ieee.org/document/8933619/ DOI: 10.1109/VISUAL.2019.8933619
3. Arthur D, Lasher-Trapp S, Abdel-Haleem A, Klosterman N, Ebert D. A New ThreeDimensional Visualization System for Combining Aircraft and Radar Data and Its Application to RICO Observations. Journal of Atmospheric and Oceanic Technology. 2010 May 01; 27(5):811-828. Available from: http://journals.ametsoc.org/doi/10.1175/2009JTECHA1395.1 DOI: 10.1175/2009JTECHA1395.1
4. Zhang R, Lukasczyk J, Wang F, Ebert D, Shakarian P, Mack E, Maciejewski R. Exploring geographic hotspots using topological data analysis. Transactions in GIS. 2021. DOI: 10.1111/tgis.12816
5. Song Y, Ye J, Svakhine N, Lasher-Trapp S, Baldwin M, Ebert D. An Atmospheric Visual Analysis and Exploration System. IEEE Transactions on Visualization and Computer Graphics. 2006; 12(5):1157-1164. Available from: http://ieeexplore.ieee.org/document/4015477/ DOI: 10.1109/TVCG.2006.117
6. Masjedi A, Zhao J, Thompson A, Yang K, Flatt J, Crawford M, Ebert D, Tuinstra M, Hammer G, Chapman S. Sorghum Biomass Prediction Using Uav-Based Remote Sensing Data and Crop Model Simulation. IGARSS 2018 - 2018 IEEE International Geoscience and Remote Sensing Symposium. IGARSS 2018 - 2018 IEEE International Geoscience and Remote Sensing Symposium;; Valencia. IEEE; c2018. Available from: https://ieeexplore.ieee.org/document/8519034/ DOI: 10.1109/IGARSS.2018.8519034

Synergistic activities

1. Founded and directs the campus-wide Data Institute for Societal Challenges (DISC) that catalyzes data-enabled research and creative activities to address local to global challenges, seeds, forms, and manages diverse, convergent teams to solve real-world problems, and grows foundational data science research. DISC engages over 500 faculty and researchers across every college and all three OU campuses. Previously directed the Integrated Data Science Initiative at Purdue University that coordinated data science education and research across campus, including the Data Mine program – a 1000+ student data science living learning community.
2. Developed a network of minority-serving institution (MSI) faculty engaged in visual analytics research and teaching; created MSI faculty and MSI student summer visual analytics programs.

3. Co-founded and directed the DHS Center of Excellence Visual Analytics for Command, Control, and Interoperability Environments (VACCINE) with collaborating faculty from 38 universities in 4 countries.
4. Developed a public safety coalition of over 50 local, regional, and state law enforcement, fire, and emergency management agencies to test, deploy, and transition technology from VACCINE.
5. Served as 1st Vice President, Vice President of Publications, Treasurer, and Board of Governor member of IEEE Computer Society; Editor in Chief for IEEE Transactions on Visualization and Computer Graphics; SIGGRAPH Executive Committee member, and Executive Committee member of IEEE Technical Committee on Visualization and Graphics.

Select Patents

US Patent No. 11,191,227 – “Moisture Management & Perennial Crop Sustainability Decision System,” issued on December 7, 2021.

US Patent No. 10,506,201 – “Public Safety Camera Identification and Monitoring System and Method,” issued on December 10, 2019.

US Patent No. 8,924,332 – "Forecasting Hotspots Using Predictive Visual Analytics," issued on December 30, 2014.

US Patent No. 8,882,664 – "Animal Symptom Visual Analytics," issued on November 11, 2014.

US Patent No. 8,849,728 – "Visual Analytics Law Enforcement Tools," issued on September 30, 2014.

US Patent No. 8,605,592 – "Dietary assessment system and method," issued on December 10, 2013.

US Patent No. 8,363,913 – "Dietary assessment system and method," issued on January 29, 2013.

US Patent No. 8,115,766 – "System and Methods for Rendering Flows and Volumes," issued on February 14, 2012.

US Patent No. 7,724,258 – “Computer Modeling and Animation of Natural Phenomena,” issued on May 25, 2010.

Timothy R. Filley **(405)325-6524**
Professor of Geochemistry and Soil Science **filley@OU.edu**
Department of Geography and Environmental Sustainability; School of Geosciences
University of Oklahoma, Norman, OK 73019

Education

Loyola University of Chicago, Chicago, IL	Chemistry, B.S.	1990
The Pennsylvania State University, State College, PA	Geosciences, Ph.D.	1997
Carnegie Institution of Washington, Washington, DC	Geophysical Lab, Postdoc	1998-2000

Professional Experience

2021-present	Professor, Department of Geography and Environmental Sustainability; School of Geosciences, University of Oklahoma
2021-present	Executive Director, Institute for Resilient Environmental and Energy Systems, University of Oklahoma
2018 -2021	U.S. Director, the Arequipa Nexus Institute for Food, Energy, Water, and the Environment, Arequipa, Peru
2019-2021	Director, Center for the Environment, Purdue University
2013-2021	Professor, Department of Earth, Atmospheric, and Planetary Sciences and Department of Agronomy, Purdue University
2017-2018	Acting Director, Center for the Environment, Purdue University
2015	Visiting Professor, Civil and Environmental Engineering, Northwestern University, Evanston, IL.
2012-2016	U.S. Director, US-China EcoPartnership for Environmental Sustainability
May-Oct 2011	Visiting Senior Professor, Chinese Academy of Sciences
2007-2010	Associate Head, Department of Earth, Atmospheric, and Planetary Sciences, Purdue University
2007-2010	Graduate Committee Chair, Department of Earth, Atmospheric, and Planetary Sciences, Purdue University
2007-2008	Elected National Program Chair, Geochemistry Division of the American Chemical Society
2006-2013	Associate Professor, Department of Earth and Atmospheric Sciences, Purdue University
2006	Visiting Professor, Rangeland Ecology Department, Texas A&M University, College Station, TX.
2000-2006	Assistant Professor, Department of Earth and Atmospheric Sciences, Purdue University

Publication Summary

1. Kumar, P., Anders, A., Bauer, E., Blair, N., Cain, M., Dere, A., Druhan, J., **Filley, T**., Giannopoulos, C., Goodwell, A., Grimley, D., Karwan, D., Keefer, L., Kim, J., Marini, L., Muste, M., Papanicolaou, ANT, Rhoads, B., Hernandez, L., Roque-Malo, S., Schaeffer, S., Stumpf, A., Ward, A., Welp, L., Wilson, G., Yan, Q., Zho, S. (2023) Emergent role of

critical interfaces in the dynamics of intensively managed landscapes, Earth-Science Reviews, 104543
2. [P]Ccanccapa-Cartagena, A., Paredes, B., Vera, C., Chavez-Gonzales, F., Olson, E., Welp, L., Zyaykina, N., **Filley, T.R.,** Warsinger, M., Jafvert, C.T. (2021) Occurrence and probabilistic health risk assessment (PRA) of dissolved metals in surface water sources in Southern Peru. *Environmental Advances.* 5, 100102.
3. Brecheisen, Z., Hamp-Adams, N., Tomasek, A., [P]Foster, E.J., **Filley, T.R.,** Villalta Soto, M., Zuniga, L., , Lima Moraes, A., Schulze, D.G. (2020) Using Remote Sensing to Discover Historic Context of Human-Environmental Water Resource Dynamics. *Journal of Contemporary Water Research & Education* 171 (1), 74-92
4. Kumar, P., Le, P., Papanicolaou, T., Rhoads, B., Anders, A., Stumpf, A., Wilson, C., Bettis, E., Ward, A., **Filley, T.R.**, Lin, H., Keefer, L., Keefer, D., Lin, Y.F., Muste, M. Royer, T., Foufoula-Georgiou, E., Belmont, P., Blair, N. (2018) Critical Transition in Critical Zone of Intensively Managed Landscapes. *Anthropocene* 22, 10-19.
5. Chang, C.H., Szlavecz, K., **Filley, T.R.,** Buyer, J.S., Bernard, M.J., and Pitz S.L. (2015) Belowground competition among invading detritivores. *Ecology*. http://dx.doi.org/10.1890/15-0551.1
6. Hopkins, F.M., Filley, T.R., Gleixner, G., Lange, M., Top, S.M., Trumbore, S.E., (2014) Increased belowground carbon inputs and warming promote loss of soil organic carbon through complementary microbial pathways. *Soil Biology and Biochemistry* 76, 57-69.
7. Kleber, M., Nico, P., Plante, A., **Filley, T.R.,** Kramer, M., Swanston, C., Sollins, P. (2010) Old and stable soil organic matter is not necessarily chemically recalcitrant: Implications for modeling concepts and temperature sensitivity. *Global Change Biology*. DOI: 10.1111/j.1365-2486.2010.02278.x
8. Dalzell, B.J., **Filley, T.R.,** Harbor, J.M. (2007) The role of hydrology in annual organic carbon loads and terrestrial organic matter export from a midwestern agricultural watershed. *Geochim. Cosmochim. Acta* (2007), doi:10.1016/j.gca.2006.12.009.
9. **Filley, T.R.,** Boutton, T.W. (2006) Ecosystems in flux: Molecular and stable isotope assessments of soil organic matter storage and dynamics. *Soil Biology and Biochemistry* 38 (11): 3181-3183 (commentary).
10. **Filley, T.R.,** Filley, R.M., Eser, S., Freeman, K. (1997) Compound-specific isotope analyses of products from carbonization of a fluid catalytic cracking decant oil doped with C-13-enriched 4-methyldibenzothiophene. *Energy and Fuels*, 11, 637-646

Synergistic Activities

1. From 2012-2016, Filley served as the U.S. Director of the U.S.-China Ecopartnership for Environmental Sustainability (USCEES). Under his leadership, the program established a Visiting Scholar Network (including a searchable database for visiting scholar engagement), an internet portal to Purdue-developed technologies licensable in China, and a series of bi-national annual conferences, technical workshops, and joint research projects on Agroecosystem Dynamics.
2. Filley served as Director of Purdue's Center for the Environment (C4E) from 2017-2021. The C4E, housed in Purdue's Discovery Park, worked to promote proactive, interdisciplinary research, learning, and engagement, addressing important regional and global challenges related to the environmental and the sustainable use of natural

resources. The Center helped to connect its over 195 faculty affiliate members from across departments and disciplines to work on sustainability challenges, it supported innovative projects, and increases the impact of Purdue's work on important environmental issues through outreach and stakeholder engagement activities.

3. Filley co-directed the Purdue Stable Isotope (PSI) facility within the Department of Earth, Atmospheric, and Planetary Sciences from 2005-2021. PSI was a core Purdue University instrumentation facility specializing in analytical services utilizing light stable isotope mass spectrometry for analysis of ^{1}H, ^{2}H, ^{13}C, ^{12}C, ^{16}O, ^{17}O, ^{18}O, ^{14}N, ^{15}N in a variety of natural and synthetic materials. Since coming to the University of Oklahoma, he has embarked on construction of a new stable isotope biogeochemistry facility which will be completed by summer 2023.
4. Filley was the lead PI, architect, and co-Director of the Arequipa Nexus Institute for Sustainable Food, Energy, Water and the Environment (The Nexus). The Nexus, funded in Jan 2018, was created as a technical and research alliance program between Purdue University and the Universidad Nacional de San Agustin (UNSA) in the Arequipa region of Peru. The Nexus Institute continues to support a collaborative research, education and innovation ecosystem where transformative solutions to challenges faced by Arequipa, Peru, and Latin America are explored. It aims to understand the region's food, energy and water production and delivery systems in the context of the complex socio-economic-environmental challenges Arequipa faces such as a changing climate, diminishing resources, a legacy of environmental degradation, and diverse communities striving for prosperity and security. During the inaugural phase of the Nexus that was led by Filley (2018-2021), over 60 Purdue faculty spanning 7 colleges, 100 UNSA faculty, and 30 postdoctoral researchers were supported with this effort.
5. Filley is the inaugural director of the University of Oklahoma's Institute for Resilient Environmental and Energy Systems (IREES). IREES will work to connect OU faculty members from across disciplines with global and regional stakeholders to address challenges related to observing and predicting earth systems, transforming energy and infrastructure systems, and co-generating community resilience and environmental justice. IREES will serve as a collaborative space for transdisciplinary research teams providing administrative support, analytical research facilities, and research computing infrastructure dedicated to convergence research. IREES is one of four new institutes created in 2021 addressing four strategic areas of research focused on grand challenges in aerospace, defense, and global security; environment, energy, and sustainability; the future of health; and society and community transformation that support OU's *Lead On* Strategic Plan within the Office of the Vice President for Research and Partnerships (OVPRP).

Binbin Weng, PhD

Gerald Tuma Presidential Associate Professor
School of Electrical and Computer Engineering **Tel: (405) 325-6341**
The University of Oklahoma **Email: binbinweng@ou.edu**
Norman, Oklahoma 73019

Education

B.A.	Physics	Xiamen University	2006
M.S.	Semiconductor Physics	Zhejiang University	2008
Ph.D.	Electrical & Computer Engineering	University of Oklahoma	2012

Research and Professional Experience

2024 – present **Associate Professor of Electrical & Computer Engineering**
University of Oklahoma, Norman OK

2023 – present **Faculty Fellow of Institute of Resilient Environmental and Energy System**
University of Oklahoma, Norman OK

2018 – present **Faculty Director of University's Nanofab Laboratories**
University of Oklahoma, Norman OK

2015 – 2018 **Research Scientist of OU's Microfabrication Research & Education Center**
University of Oklahoma, Norman OK

2012 – 2015 **Postdoctoral Researcher of Opto-Electronic Research Group**
University of Oklahoma, Norman OK

Publications most closely related to the project

1. Weng, Binbin. "The road to climate change mitigation via methane emissions monitoring." *Nature Reviews Electrical Engineering* 1, no. 2 (2024): 69-70.
2. Xia, Lipeng, Yuheng Liu, Ray T. Chen, Binbin Weng, and Yi Zou. "Advancements in miniaturized infrared spectroscopic-based volatile organic compound sensors: A systematic review." *Applied Physics Reviews* 11, no. 3 (2024).
3. Weng, Binbin. "Photonic crystal gas sensor." U.S. Patent # 11,624,742, U.S. Patent and Trademark Office, (2023).
4. Hemati, Tahere, and Binbin Weng. "The mid-infrared photonic crystals for gas sensing applications." *Photonic Crystals—A Glimpse of the Current Research Trends* (2019).
5. Weng, Binbin, Jijun Qiu, Lihua Zhao, Zijian Yuan, Caleb Chang, and Zhisheng Shi. "Recent development on the uncooled mid-infrared PbSe detectors with high detectivity." In *Quantum Sensing and Nanophotonic Devices XI*, vol. 8993, pp. 178-185. SPIE, (2014).

Other significant publications whether or not related to the proposed project

6. Hemati, Tahere, Yi Zou, and Binbin Weng. "High-q surface light emission from active parity-time-symmetric gratings." *Physical Review Applied* 17, no. 4 (2022): 044023.

7. Arledge, Kiernan E., Bruno Uchoa, Yi Zou, and Binbin Weng. "Topological sensing with photonic arrays of resonant circular waveguides." *Physical Review Research* 3, no. 3 (2021): 033106.

8. Hemati, Tahere, Xintong Zhang, and Binbin Weng. "A direct oriented-attachment growth of lead-chalcogenide mid-infrared nanocrystals film on amorphous substrates." *Journal of Materials Chemistry C* 8, no. 38 (2020): 13205-13212.

9. Weng, Binbin, Jijun Qiu, Zijian Yuan, Preston R. Larson, Gregory W. Strout, and Zhisheng Shi. "Responsivity enhancement of mid-infrared PbSe detectors using CaF2 nano-structured antireflective coatings." *Applied Physics Letters* 104, no. 2 (2014).

10. Qiu, Jijun, Binbin Weng, Zijian Yuan, and Zhisheng Shi. "Study of sensitization process on mid-infrared uncooled PbSe photoconductive detectors leads to high detectivity." *Journal of applied physics* 113, no. 10 (2013).

Synergistic activities

1. *Project "AIMNet"*

   Dr. Weng is the lead investigator of this DOE funded technology implementation project to showcase a new surface sensing/modeling network in the Anadarko Basin's oil and gas land for monitoring and quantifying methane emission events at a basin scale.

2. *Other relevant contracts and grants*

   Dr. Weng is a co-lead investigator of a DOE iM4 program funded research initiative project to plan and formulate for an "all-in-one" integrated methane monitoring platform capable of continuous methane monitoring and reporting, facilitating swift responses to detected methane emissions.

3. *OU "Big Idea Challenge" Program*

   "Big Idea Challenge" is a Strategic Initiative launched by the OU Vice President for Research and Partnerships aiming at addressing global grand challenges. Dr. Weng was the lead investigator of a multi- disciplinary team of over 20 campus-wide researchers to tackle greenhouse-gas-emission-induced societal issues in the environment, health, energy, and community sustainability.

4. *Relevant media coverage on missions from oil and gas systems*

   OU's grand efforts on methane emission monitoring spearheaded by Dr. Weng has been reported/featured by OPTICA's Optical and Photonics News in the article "Monitoring Methane to Curb Climate Change"; Oklahoma Educational Television Authority (OETA) TV Channel (https://youtu.be/ek6O25Q2Pdo?si=BWGbGZNZwS-l3ZUA); and the university's sooner magazine https://soonermag.oufoundation.org/stories/pinpointing-the-problem.

Xiao-Ming Hu
Adjunct associate professor **(405)325-0402**
University of Oklahoma **xhu@ou.edu**
Norman, Oklahoma 73019

Education

BS	Atmospheric Science	Peking University	2001
MS	Atmospheric Physics and Environment	Peking University	2004
PHD	Air Quality	North Carolina State	2008

Professional Experience

2008 - 2011 Penn State University, University Park, Pennsylvania
Postdoctoral Researcher
2011 - present, University of Oklahoma, Norman, OK
Senior Research Scientist
2014 - present, University of Oklahoma, Norman, OK
Adjunct associate professor

Representative publications on emissions from oil and gas systems

1. Hu X, Crowell S, Wang Q, Zhang Y, Davis K, Xue M, Xiao X, Moore B, Wu X, Choi Y, DiGangi J. Dynamical Downscaling of CO 2 in 2016 Over the Contiguous United States Using WRF-VPRM, a Weather-Biosphere-Online-Coupled Model. Journal of Advances in Modeling Earth Systems. 2020 April 06; 12(4):-. Available from: https://onlinelibrary.wiley.com/doi/10.1029/2019MS001875 DOI: 10.1029/2019MS001875
2. Hu X, Hu J, Gao L, Cai C, Jiang Y, Xue M, Zhao T, Crowell S. Multisensor and Multimodel Monitoring and Investigation of a Wintertime Air Pollution Event Ahead of a Cold Front Over Eastern China. Journal of Geophysical Research: Atmospheres. 2021 May 25; 126(10):-. Available from: https://onlinelibrary.wiley.com/doi/10.1029/2020JD033538 DOI: 10.1029/2020JD033538
3. Hu X, Gourdji S, Davis K, Wang Q, Zhang Y, Xue M, Feng S, Moore B, Crowell S. Implementation of Improved Parameterization of Terrestrial Flux in WRF-VPRM Improves the Simulation of Nighttime CO 2 Peaks and a Daytime CO 2 Band Ahead of a Cold Front. Journal of Geophysical Research: Atmospheres. 2021 May 14; 126(10):-. Available from: https://onlinelibrary.wiley.com/doi/10.1029/2020JD034362 DOI: 10.1029/2020JD034362
4. Dong X, Yue M, Jiang Y, Hu X, Ma Q, Pu J, Zhou G. Analysis of CO₂ spatio-temporal variations in China using a weather–biosphere online coupled model. Atmospheric Chemistry and Physics. 2021 May 12; 21(9):7217-7233. Available from: https://acp.copernicus.org/articles/21/7217/2021/ DOI: 10.5194/acp-21-7217-2021
5. Xiao-Ming Hu, Ming Xue, Lan Gao, Sean Crowell. Impact of 2019 mid-west flood on CO2 and CH4 using yearly WRF-GHG simulations over the contiguous United States. 2021 October. Available from: https://doi.org/10.1002/essoar.10508159.1 DOI: 10.1002/essoar.10508159.1

Synergistic activities

1. 2017-2021: further development of the WRF-VPRM model to study CO2 (Hu et al., 2020, JAMES, 2021, JGR)
2. 2016-2019: developed the SREF-WRF/Chem ensemble air quality forecasting system to investigate the air quality issues in the south Great Plains (Hu et al., 2019, JGR)
3. 2015-2016: developed a slab dispersion model to investigate the boundary-layer air quality in the North China Plain (Hu et al., 2016, BLM)
4. 2008-2009: developed the EnKF parameter estimation system to optimize the boundary-layer schemes in the WRF model (Hu et al., 2010, GRL)
5. 2004-2008: incorporated the MADRID aerosol module into WRF/Chem and developed the air quality modeling system WRF/Chem-MARDRID (Hu et al., 2008, JGR)

Chenghao Wang
Assistant Professor
University of Oklahoma chenghao.wang@ou.edu
Norman, OK 73019

Education

BENG	Hydrology and Water Resources Engineering	China Three Gorges U	2015
MS	Civil, Environmental and Sustainable Engineering	Arizona State University	2018
Ph.D.	Civil, Environmental and Sustainable Engineering	Arizona State University	2019

Professional Experience

2024 – present National Center for Atmospheric Research, Boulder, CO
Visiting Scholar
2022 - present University of Oklahoma, School of Meteorology, Norman, OK
Assistant Professor
2022 - present, University of Oklahoma, Department of Geography and Environmental
Assistant Professor
2020 - 2022, Stanford University, Department of Earth System Science, Stanford, CA
Postdoctoral Research Fellow
2018 - 2018, Arizona State University, Ira A. Fulton Schools of Engineering, Tempe, AZ
Graduate Teaching Associate
2016 - 2017, Arizona State University, Ira A. Fulton Schools of Engineering, Tempe, AZ
Graduate Teaching Associate
2015 - 2019, Arizona State University, School of Sustainable Engineering and the Built Environment, Tempe, AZ
Graduate Research Associate

Representative publications on emissions from oil and gas systems

1. Wang C, Li Q, Wang ZH. Quantifying the impact of urban trees on passive pollutant dispersion using a coupled large-eddy simulation–Lagrangian stochastic model. Building and Environment. 2018; 145:33–49. DOI: 10.1016/j.buildenv.2018.09.014
2. Wang C, Wang Z, Yang J, Li Q. A Backward-Lagrangian-Stochastic Footprint Model for the Urban Environment. Boundary-Layer Meteorology. 2018; 168(1):59-80. Available from: http://link.springer.com/10.1007/s10546-018-0338-6 DOI: 10.1007/s10546-018-0338-6
3. Li Q, Padilla L, Thompson T, Xiao S, Mohr E, Zhou X, Kacharava N, Cui Y, Wang C. A modeling framework to assess fenceline monitoring and self-reported upset emissions of benzene from multiple oil refineries in Texas. Atmospheric Environment X, 2024; 100281. DOI: 10.1016/j.aeaoa.2024.100281
4. Zhu B, Lui N, Irvin J, Tadwalkar S, Wang C, Ouyang Z, Liu FY, Ng AY, Jackson RB. METER-ML: A multi-sensor Earth observation benchmark for automated methane source mapping. Proceedings of the Second Workshop on Complex Data Challenges in Earth

Observation (CDCEO 2022). 2022; 3207:33–43. Available from: http://ceurws.org/Vol-3207/paper6.pdf
5. Liu J, Xue F, Guo X, Yang Z, Kang M, Chen M, Ji D, Liu D, Xiao S, Wang, C. Methane dynamics altered by reservoir operations in a typical tributary of the Three Gorges Reservoir. Water Research. 2024; 122163. DOI: 10.1016/j.watres.2024.122163
6. Liu J, Xiao S, Wang C, Yang Z, Liu D, Guo X, Liu L, Lorke A. Spatial and temporal variability of dissolved methane concentrations and diffusive emissions in the Three Gorges Reservoir. Water Res. 2021; 207:117788. DOI: 10.1016/j.watres.2021.117788

Synergistic activities

1. Bibliography Committee of the International Association for Urban Climate (IAUC): Dr. Wang serves as the chair of the IAUC Bibliography Committee since 2020. The committee regularly reviews research advances in the broad field of urban climate and delivers them to the international community via quarterly newsletters
2. American Geophysical Union (AGU) June Bacon-Bercey Scholarship Committee: Dr. Wang serves as a member of the AGU June Bacon-Bercey Scholarship Committee. The committee evaluates scholarship applications to support women students with a demonstrated interest in atmospheric sciences and intersections with meteorology.
3. Conference Organization: Dr. Wang was the co-chair of the Representing Urban Processes and Dynamics in Models Across Scales session at the American Geophysical Union 2023 Fall Meeting, which was held in San Francisco, CA in Dec 2023.
4. Editorial Service: Dr. Wang serves as an associate editor for the Cell Press journal Heliyon since 2024.
5. Reviewer Service: Dr. Wang serves as a reviewer for the National Science Foundation and reviewed proposals for multiple programs since

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Wick Cary Associate Professor **(561)281-2672**
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University of Oklahoma,
Gibbs College of Architecture,
830 Van Vleet Oval, Gould Hall
Norman OK 73019

EDUCATION

B.A.	Sociology, History	Wheaton College	2001
M.S.	Planning, Concentration in Urban and Regional Planning for Developing Areas	Florida State University	2003
Ph.D	Urban and Regional Planning	Florida State University	2012

ADMINISTRATIVE APPOINTMENTS

2023-Present Director, Planning, Landscape Architecture, and Design (PLAD), University of Oklahoma

- Initiated, organized, and oversaw the process of consolidating four academic units (Regional and City Planning, Landscape Architecture, Environmental Design, and Urban Design) into a unified division
- Day-to-day management of four-degree programs on two campuses, with 180 enrolled students. Responsibilities include providing strategic leadership, maintaining accreditation of two externally accredited professional programs, growing enrollments and resources, managing budget, and overseeing 10 full-time faculty, 2 support staff, and 10 adjunct instructors and professors of practice.

2021-2023 Director, Division of Regional and City Planning (RCPL), University of Oklahoma

- Academic lead of an externally accredited master's degree program with 50 students, four fulltime faculty, three professors of practice, and one support staff.

2022-Present Executive Committee, OU Center for Peace and Development (CPD), University of Oklahoma

- Stepped down as CPD Director after being appointed Director of Regional and City Planning but remained on the Executive Committee.
- Maintained institutional partnerships with grassroots groups in northern Uganda through regular planning visits and CPD's study abroad program, which allows students across many disciplines to work with and learn from women's organizations in Uganda.

2017-2022 Founding Director, Center for Peace and Development (CPD), University of Oklahoma

- 2015-2017, Worked in a community organizing role, to establish the Center for Peace and Development (CPD) at the University of Oklahoma. CPD brought together university

and Ugandan partners as a hub for action research, study abroad, and critical reflection on global peacebuilding and development.

- Launched CPD as a founding member of the Security in Context Network (SiC), alongside six other universities worldwide. This network produces research and community engagement to reconceptualize security around human well-being, global solidarity and ecological sustainability.

FACULTY APPOINTMENTS

2024-Present	Wick Cary Professor of Planning, Landscape Architecture, and Design
2023-Present	Director, Division of Planning, Landscape Architecture, and Design
2021-2023	Director, Division of Regional and City Planning
2019-Present	Associate Professor of Regional and City Planning, Gibbs College of Architecture, University of Oklahoma
2018-Present	President's Associates Presidential Professor, University of Oklahoma
2016-Present	Affiliate Faculty Member, Department of Women and Gender Studies. University of Architecture
2016-Present	Affiliate Faculty Member, College of International Studies, University of Oklahoma
2016-Present	Affiliate Faculty Member, Division of Architecture, Gibbs College of Architecture, University of Oklahoma,
2013-2019	Assistant Professor of Regional and City Planning, Gibbs College of Architecture, University of Oklahoma
2012-2013	Visiting Lecture, Department of Urban and Regional Planning, Florida State University
2008-2011	Instructor, Department of Urban and Regional Planning, Florida State University

NON-ACADEMIC WORK EXPERIENCE

2012	**Urban Sanitation Consultant Waste Enterprisers/Bill and Melinda Gates Foundation, Accra, Ghana**
2005-2008	**Emergency Planning Specialist, Church Ecumenical Action Sudan, Mennonite Central Committee**
2003	**Planning Assistant, 1000 Friends of Florida, Tallahassee, FL**
2002	**Assistant Planner Jefferson County Planning Department, Monticello, FL**

PUBLICATIONS

1. Firat Demir, John Harris, Maria del Guadalupe Davidson. "Grassroots Organizations and Women's Empowerment in a Post-Conflict Region: Evidence from Women Organizations in Northern Uganda". Journal of Globalization and Development. 2024
2. C. Aujean Lee & John Harris. "Practitioner Perceptions of City-Subcontracted Community Organizing: An Exploratory Study in Oklahoma City". Journal of the American Planning Association. 2024
3. C. Aujean Lee & John Harris. "Outsourcing Neighborhood Planning Processes: A Case Study of a Nonprofit in the City of Oklahoma City" Journal of Planning Education and Research. 2022

4. John Harris, Daniel Komakech, David Monk, Maria del Guadalupe Davidson. “The gendered postconflict city: possibilities for more livable urban transformations in Gulu, northern Uganda” Journal of Urban Affairs. 2022
5. David Monk, Maria del Guadalupe Davidson, John C. Harris “Gender and Education in Uganda” in Oxford Research Encyclopedia of Education. 2021
6. John Harris, Christopher Lê, Maria del Guadalupe Davidson. “Reflections on Community Based Participatory Research Techniques in Global Planning and Design Courses” in The Routledge Companion to Architectural Education in the Global South. 2020
7. Grace Acan, Evelyn Amony, John Harris, and Maria del Guadalupe Davidson. “How formerly abducted women in post-conflict situations are reasserting their humanity in a hostile environment: Photovoice evidence from Northern Uganda” Gender and Development. 2019
8. Harris, J. and Little, S. “Mapping hope: How do vulnerable youth locate hope in informal settlements?” Urban Forum. 2019
9. Harris, J. “What are the land delivery and land holding mechanisms for African informal light manufacturing clusters?” Urban Forum. 2018
10. Harris, J. “Vulnerable youth’s perspectives and priorities for informal settlements: Photovoice evidence from Lusaka, Zambia” Journal of Planning Education and Research. 2017. Winner of the Best Faculty Paper Award from the Global Planning Educators Interest Group of the Association of Collegiate Schools of Planning.
11. Harris, J. "Joint Action In Nairobi’s Informal Production Clusters" International Development Planning Review, 38(3). 2016
12. Harris, J. “Accra’s unregulated market-oriented sanitation strategy: Problems and opportunity” in Allen, Lampis, and Swilling, eds., Untamed Urbanisms. Routledge. 2015
13. Harris, J. “Meeting the challenges of the handicraft industry in Africa: Evidence from Nairobi” Development in Practice 24(1). 2014
14. Harris, J. “The Messy Reality of Agglomeration Economies and Urban Informality” World Development. 61. 2014
15. Harris, J. "The Confounding Influence of Urban Informality on Innovation and Production Specialization in Production Clusters: Evidence from Nairobi” African Journal of Science, Technology, Innovation and Development 6(6). 2014

Wolfgang G. Jentner, PhD
Research Associate, Data Institute for Societal Challenges
University of Oklahoma **wjentner@ou.ed**
Norman, OK 73019 **(405) 325-4158**

Education and Training

B.Sc.	Computer and Information Science	University of Konstanz, Germany	2012
M.Sc.	Computer and Information Science	University of Konstanz, Germany	2016
Ph.D.	Computer and Information Science	University of Konstanz, Germany	2023

Research and Professional Experience

2023 – Present The University of Oklahoma, OK, USA
Research Associate, Data Institute for Societal Challenges

2012 – Present Own Business, Germany
IT Consultant

2022 – 2023 European Anti-Cybercrime Technology Development Association (EACTDA)
Technical Committee Member

2016 – 2023 University of Konstanz, Germany
Research Associate, Data Analysis and Visualization Group

2012 - 2015 Hewlett Packard Inc., Palo Alto, CA, USA
Visiting Researcher

2011 – 2016 University of Konstanz, Germany
Research Assistant, Data Analysis and Visualization Group

Representative publications on emissions from oil and gas systems

1. W. Jentner, G. Lindholz, H. Hauptmann, M. El-Assady, K.-L. Ma, D. A. Keim
   Visual Analytics of Co-Occurrences to Discover Subspaces in Structured Data
   ACM Transactions on Interactive Intelligent Systems, 2023
2. S. Gogos, L. Oneto, M. Anastasopoulos, D. Anguita, I. Baroni, R. Canepa, S. Petralli, C. Dambra, W. Jentner
   DAYDREAMS - Development of Prescriptive Analytics based on Artificial Intelligence for Railways Intelligent Asset Management Systems
   Transport Research Arena Conference, 2022
3. M. T. Fischer, S. D. Hirsbrunner, W. Jentner, M. Miller, D. A. Keim, P. Helm
   Promoting Ethical Awareness in Communication Analysis: Investigating Potentials and Limits of Visual Analytics for Intelligence Applications
   Proceedings of FAcct '22 : 2022 ACM Conference on Fairness, Accountability, and Transparency, 2022

4. R. Sevastjanova, W. Jentner, F. Sperrle, R. Kehlbeck, J. Bernard, M. El-Assady
   QuestionComb: A Gamification Approach for the Visual Explanation of Linguistic Phenomena through Interactive Labeling
   ACM Transactions on Interactive Intelligent Systems,, 2021
5. M. Kraus, T. Pollok, M. Miller, T. Kilian, T. Moritz, D. Schweitzer, J. Beyerer, D. A. Keim, C. Qu, W. Jentner
   Toward Mass Video Data Analysis: Interactive and Immersive 4D Scene Reconstruction
   Sensors; Special Issue Selected Papers from the 9th International Conference on Imaging for Crime Detection and Prevention (ICDP-19), 2020
6. M. El-Assady, W. Jentner, R. Kehlbeck, U. Schlegel, R. Sevastjanova, F. Sperrle, T. Spinner, D. A. Keim
   Towards XAI: structuring the processes of explanations
   Proceedings of the ACM Workshop on Human-Centered Machine Learning, Glasgow, UK, 2019
7. W. Jentner, J. Buchmüller, F. Sperrle, R. Sevastjanova, T. Spinner, U. Schlegel, D. Streeb, H. Schäfer
   N.E.A.T. - Novel Emergency Analysis Tool
   IEEE Conference on Visual Analytics Science and Technology (VAST Challenge 2019 Grand Challenge), 2019
8. U. Schlegel, W. Jentner, J. Buchmüller, E. Cakmak, G. Castiglia, R. Canepa, S. Petralli, L. Oneto, D. A. Keim, D. Anguita
   Visual Analytics for Supporting Conflict Resolution in Large Railway Networks
   2019 INNS Big Data and Deep Learning (INNSBDDL 2019), 2019
9. W. Jentner, R. Sevastjanova, F. Stoffel, D. A. Keim, J. Bernard, M. El-Assady
   Minions, Sheep, and Fruits: Metaphorical Narratives to Explain Artificial Intelligence and Build Trust
   Workshop on Visualization for AI Explainability, 2018
10. W. Jentner, D. Sacha, F. Stoffel, G. Ellis, L. Zhang, D. A. Keim
    Making Machine Intelligence Less Scary for Criminal Analysts: Reflections on Designing a Visual Comparative Case Analysis Tool
    The Visual Computer Journal, 2018

Synergistic Activities

1. Integration Lead: Resilient Supply and Demand Networks. Responsible for integrating all analysis and visual analytics methods (DARPA/USA).
2. Technical & Scientific Coordinator: PIPP: Predictive Intelligence for Pandemic Prevention (NSF/USA).
3. Technical & Scientific Coordinator: VIKING: Trusted Artificial Intelligence for Police Applications. Responsible for all scientific and technical R&D in the project (BMBF/Germany).
4. Technical & Scientific Coordinator: PEGASUS: Police acquisition and analysis of heterogeneous mass data to combat organized crime structures (BMBF/Germany).

5. Integration Lead: VICTORIA: Video analysis for Investigation of Criminal and TerrORIst Activities (EU Horizon 2020/Europe)
6. Integration Lead: VALCRI: Visual Analytics for Sense-making in CRiminal Intelligence analysis (EU Funding Programme 7/Europe)

Yessenia Torres

Data Institute for Societal Challenges **(405) 325-4158**
The University of Oklahoma **jimeney2@ou.edu**
Norman, OK 73019

Education

B.B.A.	Management, Minor in HR Management	University of Houston-Downtown	2015
M.B.A	Human Resources Concentration	University of Houston-Downtown	2017
Ph. D	Higher Education Leadership	Ferris State University	2022

Training

Professional Human Resources Certificate – University of Houston-Downtown, Davies College of Business – 2016

Project Management Professional – Project Management Institute

Professional Experience

2023 – present University of Oklahoma Norman, OK
Senior Managing Director Manage day-to-day operations as Senior Managing Director, serving as the primary point of contact for the Institute. Collaborate with the institute director, leadership team, affiliated faculty, and Office of the Vice President for Research and Partnerships to identify and develop research and funding opportunities.

2020 – 2023 University of Oklahoma, Norman, OK
Managing Director, Responsible for all aspects of day-to-day operations and designated as the lead point of contact for the Data Institute of Societal Challenges.

2017 – 2020 San Jacinto College District, Pasadena, TX
Manager, Strategic Initiative Projects, Managed logistics of major projects and events. Directed a variety of innovative and strategic start-up projects. Tracked key milestones and adjusted project plans accordingly

Jan 2017 – July 2017 Yancy Life, Houston, TX
Consultant – Bilingual Instructional Specialist/Sales Representative, Tutored students in both large and small groups. Maintained an accurate log of student progress and development. Reviewed testing data with students to support instructional content.

Feb 2016 – Jan 2017 Texas House of Representatives, Pasadena, TX
District Director, Managed and supervised legislative aides and interns. Managed constituent correspondence and case work. Met with constituents on behalf of Representative and throughout the District at regular intervals to keep abreast of local concerns

2015 - 2016 Texas House of Representatives, Pasadena, TX
Legislative Aide, Facilitated meetings with constituents, businesses, and advocacy groups on behalf of the Representative. Managed constituent correspondence and casework.

2014-2015 Houston East End Chamber of Commerce, Houston, TX
Office Coordinator, Prepared monthly bank reconciliations and financial reports. Utilized Quickbooks for accounting and record keeping, Planned and executed Chamber events. Maintained membership database.

Synergistic activities

- **Interdisciplinary Collaboration**: Leading and coordinating research and funding initiatives at DISC, bringing together faculty from diverse fields to address societal challenges through data-driven approaches.
- **Strategic Project Management**: Expertise in managing large-scale projects and initiatives at the University of Oklahoma and San Jacinto College to streamline operations, enhance project outcomes, and drive innovation.
- **Community Engagement and Outreach**: Expertise in legislative roles and community engagement.

Ming Xue
George Lynn Cross Professor **(405) 325-6037**
University of Oklahoma **mxue@ou.edu**
Norman, Oklahoma 73019

Education

BS	Atmospheric Science	Nanjing University	1984
Ph.D.	Meteorology	University of Reading	1989

Professional Experience

2018 – present, University of Oklahoma, Norman, OK
George Lynn Cross Professor
2010 - present, University of Oklahoma, Norman, OK
Weathernews Chair Professor
2008 – present, University of Oklahoma, Norman, OK
Professor, School of Meteorology
2003 - 2008, University of Oklahoma, Norman, OK
Associate Professor, School of Meteorology
1999 - 2003, University of Oklahoma, Norman, OK
Assistant Professor, School of Meteorology
1993 - 1999, University of Oklahoma, Norman, OK
Senior Research Scientist, CAPS,
1992 - 1993, University of Oklahoma, Norman, OK
Research Scientist, CAPS,

Appointments

2006 - present	Director, Center for Analysis and Prediction of Storms (CAPS), University of Oklahoma
1989 - 1992	Post doctoral fellow, Center for Analysis and Prediction of Storms (CAPS), University of Oklahoma, Norman, OK

Representative publications on emissions from oil and gas systems

1. Tong, M. and M. Xue, 2008: Simultaneous estimation of microphysical parameters and atmospheric state with radar data and ensemble Kalman filter. Part II: Parameter estimation experiments. Mon. Wea. Rev., 136, 1649-1668
2. Hu, X.-M., M. Xue, P. M. Klein, B. G. Illston, and S. Chen, 2016: Analysis of urban effects in Oklahoma City using a dense surface observing network. J. Appl. Meteor. Climatol, 55, 723-741.
3. Hu, X.-M., M. Xue, F. Kong, and H. Zhang, 2019: Meteorological conditions during an ozone episode in Dallas-Fort Worth, Texas and impact of their model uncertainties on air quality prediction J. Geophy. Res., 124, 1941-1961.
4. Wang, S., M. Xue, and J. Min, 2013: A four-dimensional asynchronous ensemble square-root filter (4DEnSRF) and tests with simulated radar data. Quart. J. Roy. Meteor. Soc., 139, 805–819.

5. Snook, N. A., M. Xue, and Y. Jung, 2015: Multi-scale EnKF assimilation of radar and conventional observations and ensemble forecasting for a tornadic mesoscale convective system. Mon. Wea Rev., 143, 1035-1057.

Synergistic activities

1. Fellow of American Meteorological Society and American Geophysical Union
2. Director, Center for Analysis and Prediction of Storms, University of Oklahoma (2006-present)
3. Co-editor-in-Chief, Advance in Atmospheric Science (2013- present)
4. International Scientific Steering Committee, Center for Earth System Prediction, Chinese Meteorological Administration (CMA). June 2019 – Present
5. NOAA Unified Forecasting System Steering Committee. (2018 – 2020)

Chengsi Liu
Center for Analysis and Prediction of Storms **(405) 325-5582**
The University of Oklahoma **cliu@ou.edu**
Norman, Oklahoma 73019

Education

B.A.	Atmosphere Science	Nanjing University of Informational Science and Technology	2002
M.S.	Atmosphere Science	Chinese Academic of Meteorological Sciences	2005
Ph.D.	Geophysical fluid dynamics	Institute of Atmospheric Physics	2008

Professional Experience

2012 – present Center for Analysis and Prediction of Storms (CAPS), University of Oklahoma
Senior Research Scientist, Data assimilation team lead(2019-present), responsible for development of data assimilation method and application for convective-scale weather. Principal Developer of APRS hybrid ensemble 3D/4D variational data assimilation system, and CAPS radar data assimilation capabilities within GSI-based and JEDI-based hybrid ensemble variational framework

2010 – 2012 Marine Science College, University of South Florida
Scientific researcher, developing an ensemble-based four-dimensional variational data assimilation scheme for Antarctic applications with advanced research WRF using real data

2008 – 2010 National Meteorological Center, China Meteorological Administration
Meteorologist, working for GPS total precipitation water data assimilation

2007 – 2008 Mesoscale and Microscale Meteorology Division, National Center for Atmospheric Research (NCAR)
Visiting scholar, developing an Ensemble-based four-dimensional variational data assimilation scheme

Appointments

2018 – present Senior Research scientist, Center for Analysis and Prediction of Storms (CAPS), Universality of Oklahoma (OU).
2012 – 2018 Research scientist, CAPS, OU.
2010 – 2012 Scientific researcher, Marine Science College, University of South Florida.
2008 – 2010 Meteorologist, National Meteorological Center/China Meteorological Administration, Beijing, R.P. China.
2007 – 2008 Visiting scholar, Mesoscale and Microscale Meteorology Division/National Center for Atmospheric Research (NCAR), United States.

Representative publications on data assimilation

1. Kong, R., M. Xue, E. R. Mansell, C. Liu, and A. O. Fierro, 2024: Assimilation of GOES-R Geostationary Lightning Mapper Flash Extent Density Data in GSI 3DVar, EnKF, and Hybrid

En3DVar for the Analysis and Short-Term Forecast of a Supercell Storm Case. Adv. Atmos. Sci., 41, 263-277.

2. Park, J., M. Xue, and C. Liu, 2023: Implementation and Testing of Radar Data Assimilation Capabilities within the Joint Effort for Data assimilation Integration (JEDI) Framework with Ensemble Transformation Kalman Filter coupled with FV3-LAM Model. Geophy. Res. Lett., 50, e2022GL102709, https://doi.org/10.1029/2022GL102709.
3. Liu, C., H. Li, M. Xue, Y. Jung, J. Park, L. Chen, R. Kong, and C.-C. Tong, 2022: Use of a Reflectivity Operator Based on Two-Moment Thompson Microphysics for Direct Assimilation of Radar Reflectivity in GSI-based Hybrid En3DVar. Mon. Wea. Rev., 150, 907-926. https://doi.org/10.1175/MWR-D-21-0040.1
4. Kong, R., M. Xue, C. Liu, A. O. Fierro, and E. R. Manselld, 2022: Development of new observation operators for assimilating GOES-R geostationary lightning mapper flash extent density data using GSI EnKF: Tests with two convective events over the US. Mon. Wea. Rev., https://doi.org/10.1175/MWR-D-21-0326.1.
5. Li, H., C. Liu, M. Xue, J. Park, L. Chen, Y. Jung, R. Kong, and C.-C. Tong , 2022: Use of power transform total number concentration as control variable for direct assimilation of radar reflectivity in GSI En3DVar and tests with six convective storms cases. Mon. Wea. Rev., 150, 821-842. https://doi.org/10.1175/MWR-D-21-0041.1
6. Chen, L., C. Liu, Y. Jung, P. Skinner, M. Xue, and R. Kong, 2022: Object-based Verification of GSI-based EnKF and Hybrid En3DVar Radar Data Assimilation and Convection-Allowing Forecasts within a Warn-on-Forecast Framework. Wea. Forecasting, 37, 639-658. https://doi.org/10.1175/WAF-D-20-0180.1
7. Chen, L., C. Liu, M. Xue, G. Zhao, R. Kong, and Y. Jung, 2021: Use of Power Transform Mixing Ratios as Hydrometeor Control Variables for Direct Assimilation of Radar Reflectivity in GSI-based En3DVar and Tests with Five Convective Storms Cases. Mon. Wea. Rev., 149, 645-659. https://doi.org/10.1175/MWR-D-20-0149.1
8. Labriola, J., Y. Jung, C. Liu and M. Xue, 2021: Evaluating forecast performance and sensitivity to the GSI EnKF data assimilation configuration for the 28-29 May 2017 mesoscale convective system case. Wea. Forecasting, 36, 127-146. https://doi.org/10.1175/WAF-D-20-0071.1.
9. Kong, R., M. Xue, C. Liu, and Y. Jung, 2021: Comparisons of Hybrid En3DVar with 3DVar, and EnKF for Radar Data Assimilation: Tests with the 10 May 2010 Oklahoma Tornado outbreak. Mon. Wea. Rev., https://doi.org/10.1175/MWR-D-20-0053.1
10. Liu, C., M. Xue, and R. Kong, 2020: Direct variational assimilation of radar reflectivity and radial velocity data: Issues with nonlinear reflectivity operator and solutions. Mon. Wea Rev., DOI: 10.1175/MWR-D-19-0149.1
11. Kong, R., M. Xue, A. O. Fierro, Y. Jung, C. Liu, E. R. Mansell, and D. R. MacGorman , 2020: Assimilation of GOES-16 Geostationary Lightning Mapper Flash Extent Density Data in GSI EnKF for the Analysis and Short Term Forecast of a Mesoscale Convective System. Mon. Wea. Rev., DOI: 10.1175/MWR-D-19-0192.1
12. Tong, C.-C., Y. Jung, M. Xue, and C. Liu, 2020: Direct assimilation of radar data within the National Weather Service operational GSI EnKF and hybrid En3DVar systems for the stand-alone regional FV3 model at a convection-allowing resolution. Geophy. Res. Lett., https://doi-org/10.1029/2020GL090179.

13. Liu, C., M. Xue, and R. Kong, 2019: Direct assimilation of radar reflectivity data using 3DVAR: Treatment of hydrometeor background errors and OSSE tests. Mon. Wea. Rev., 137, 17-29.
14. Kong, R., M. Xue, and C. Liu, 2018: Development of a hybrid en3DVar data assimilation system and comparisons with 3DVar and EnKF for radar data assimilation with observing system simulation experiments. Mon. Wea. Rev., 146, 175–198.
15. Liu, C., and M. Xue, 2016: Relationships among four-dimensional hybrid ensemble-variational data assimilation algorithms with full and approximate ensemble covariance localization. Mon. Wea. Rev., 144, 591-606.
16. Liu, C., and Q. Xiao, 2013: An ensemble-based four-dimensional variational data assimilation scheme. Part III: Antarctic applications with advanced research WRF using real data. Mon. Wea. Rev., 141, 2721–2739.
17. Chu K., Q. Xiao and C. Liu, 2013: Experiments of the WRF three-/four-dimensional variational (3/4DVAR) data assimilation in the forecasting of Antarctic cyclones. Meteorology and Atmospheric Physics 120 (3-4), 145-156
18. Liu, C., Q. Xiao, and B. Wang, 2009: An Ensemble-Based Four-Dimensional Variational Data Assimilation Scheme. Part II: Observing System Simulation Experiments with Advanced Research WRF (ARW). Mon. Wea. Rev., 137, 1687–1704.
19. Liu, C., Q. Xiao, and B. Wang, 2008: An Ensemble-Based Four-Dimensional Variational Data Assimilation Scheme. Part I: Technical Formulation and Preliminary Test. Mon. Wea. Rev., 136, 3363–3373.
20. Wang Bin, Liu Juanjuan, Wang Shudong, Cheng Wei, Liu Juan, Liu Chengsi, Qingnong Xiao and Ying-Hwa Kuo. 2010, An Economical Approach to Four-dimensional Variational Data Assimilation. Advances in Atmospheric Sciences, 27, 715-727.
21. Liu, C., and J. Xue. 2005: The Development of the Theory and Method of the EnKF. vol(6), JOURNAL OF TROPICAL METEOROLOGY, China.

Synergistic activities

1. Team lead of CAPS's data assimilation group
2. Principal Developer of APRS hybrid ensemble 3D/4D variational data assimilation system
3. Principal Developer of CAPS radar data assimilation capabilities within GSI-based and JEDI-based hybrid ensemble variational framework
4. PI of a NOAA JTTI, and Co-PI of NOAA grants of HWT, WoF, JTTI related to DA.
5. Peer Reviewer for the following journals: Monthly Weather Review, Advances in Atmospheric Sciences, Tellus, Quarterly Journal of the Royal Meteorological Society

Carrie M. Leslie
Department of Geography and Environmental Sustainability (DGES)
University of Oklahoma
carriemcleslie@ou.edu
Norman, Oklahoma
73069

Education

B.A.	Cultural Anthropology	Centre College	2002
M.A.	International Peace & Development Studies	Bancaja Center, Universitat Jaume I	2005
M.A.	Socio-Cultural Anthropology	University of Oklahoma	2018
Ph.D.	Sociology (Environmental)	University of Oklahoma	2024

Training

Collaborative Institutional Training Initiative (CITI) Program, Human Research, Social Behavioral, Institutional Review Board (IRB) Requirement – 2024
National Science Foundation (NSF) National Research Traineeship (NRT), Earth Observation Science for Society and Sustainability (EOS3) Certification – 2020-2022

Professional Experience

2024 – present University of Oklahoma (OU)
Faculty Lecturer for the Department of Geography and Environmental Sustainability (DGES) and teaching Environmental Studies courses, including a service-learning Capstone partnered with a local urban community

2023 – 2024 Institute for Resilient Environmental and Energy Systems (IREES), OU
Graduate Intern, Environmental and Energy Justice, Community Benefits Analysis, Environmental Health Equity, Methane sensing for reduction of Green Houses Gases (GHGs)

2022 (Spring) National Institutes for Health (NIH) Pilot Grant
Research Assistant, Network on Life Course Health Dynamics and Disparities (NLCHDD), evaluating the long-term effects of mortality from Safe Drinking Water Act (SDWA) violations to address public health disparities for underserved ethnoracial, socioeconomic, and rural populations

2022 – 2021 South Central Climate Adaptation Science Center (CASC), OU
Summer Research Assistant, conducted a systematic review of telecoupling research to determine if climate teleconnections are included, CASC Community of Practice "Understanding Teleconnections that Influence Ecosystem Resilience"

2022 – 2021 University of Oklahoma, Biological Survey, National Science Foundation (NSF)
NSF NRT Fellow, Interdisciplinary and Applied Research Training, Biodiversity conservation and ecosystem management, Aerosphere protections and eco-social habitat destruction

Appointments

2024 – Present Faculty Lecturer, University of Oklahoma, Department of Geography and Environmental Sustainability

2021 – 2024 Graduate Research Assistant, University of Oklahoma, Department of Sociology and Anthropology

2016 – 2024 Instructor and Graduate Teaching Assistant, University of Oklahoma, Department of Sociology and Anthropology

Representative publications

1. Kolbmann, Christina, **Carrie M. Leslie**, Chris Anderson, Justin Reedy, Lori Jervis, Jeremy Ross, Jeffrey Kelly, and Eli Bridge. 2023. "Perceptions of the crowded sky as assessed through response to aerial infrastructure." *Frontiers in Built Environment: Urban Science*. Volume 9.
2. Hekmatpour, Peyman and **Carrie M. Leslie.** 2022. "Ecologically Unequal Exchange and Disparate Death Rates from Air Pollution: A Comparative Study of 169 Countries from 1991 to 2017." *Environmental Research.* Volume 212, Part A, p. 113161.
3. **Leslie, Carrie M.**, Burns, Thomas J., & Hekmatpour, Peyman. 2022. "Bridging the Divide between Theory and Applied Research: New Ecological Measures as Pathways to Ecological Balance." *European Journal of Applied Sciences*, 10(6). 563-569.
4. Burns, Thomas J., Beth S. Caniglia, and **Carrie M. Leslie**. 2022. "Global Economy, Culture, and Unequal Ecological Exchange in Late Modernity: The Role of Fractal Institutional Processes in Addressing Imbalance." In M. Zafirovski (ed.), *International Handbook of Economic Sociology*. London: Routledge.
5. **Leslie, Carrie M.**, Alva I. Strand, Elizabeth A. Ross, Giovanni T. Ramos, Eli S. Bridge, Phillip B. Chilson, and Christopher E. Anderson. 2021. "Shifting the Balance among the 'Three Rs of Sustainability:' What Motivates Reducing and Reusing?" *Sustainability* 13, no. 18: 10093. https://doi.org/10.3390/su131810093
6. Burns, Thomas J., Tom W. Boyd, and **Carrie M. Leslie**. 2020. A Metatheoretical Framework for Understanding Interactions among Culture, Ecology, and Economics in Late Modernity. In Milan Zafirovski (Ed.), *A Modern Guide to Economic Sociology*. Cheltenham, U.K.: Edward Elgar.
7. Burns, Thomas J., Tom W. Boyd, and **Carrie M. Leslie**. 2019. "Regenerative Development and Environmental Ethics: Healing the Mismatch between Culture and the Environment in the Third Millennium." In Caniglia, B.S., B. Frank, J. Knott, K. Sagendorf, and E. Wilkerson (Eds.), *Regenerative Development: Urbanization, Climate Change & the Common Good*. New York: Routledge.
8. **Leslie, Carrie M.** 2009. "Wordless Communication in an International Context." In *Education—Identity—Globalization, Bildung—Identität—Globalisierung*. Barbara Schröttner and Christian Hofer, (Eds.) Grazer Universitätsverlag: Karl-Franzens Universität Graz.

In progress:

9. Mueller, J. Tom, Peyman Hekmatpour†, and **Carrie M. Leslie**†. "The environmentally unjust long-term association between unsafe drinking water and all-cause mortality in the United States." *Environmental Justice.* († Denotes equal author contribution)

Synergistic activities

1. Native Nations Center, Ethical Tribal Engagement Series, Designed Grant Researcher Certification and promotion of series to practice ethical research with Native Nation partners

2. JFK Neighborhood Association, Environmental Studies Service Learning, Capstone Instructor, Environmental Health Equity and Air Pollution Mitigation, Open Design Collective, Inc.'s EPA Environmental Justice Collaborative Problem Solving (EJCPS) Cooperative Agreement Program Grant Recipient, install PM 2.5 air quality monitors in cultural plaza, outdoor community space, Potential applicants of the EPA Community Change Grant

Catalin Teodoriu

Professor
University of Oklahoma
Norman, OK
cteodoriu@ou.edu

Education

MS	Mechanical Engineering	Oil-Gas University, Ploiesti, Romania	1996
MOTH	Equipment for Offshore Production	Oil-Gas University, Ploiesti, Romania	1997
PHd	Engineering and geoscience	Technical University of Clausthal, Clausthal-Zellerfeld, Germany	2003
PHD	Mechanical Engineering	Oil-Gas University, Ploiesti, Romania	2005
OTH	Drilling, Completion and Workover	Technical University of Clausthal, Clausthal-Zellerfeld, Germany	2011

Appointments

2021 - present Professor, The University of Oklahoma, Norman, OK, United States
2015 - 2021 Associate Professor, The University of Oklahoma, Norman, OK, United States
2012 - 2020 Associate Professor, Oil-Gas University, Ploiesti, Not Applicable, N/A, Romania
2009 - 2016 Adjunt Professor, Texas A&M University, College Station, Texas, United States
2009 - 2015 Head of Department, Technical University Clausthal, Clausthal-Zellerfeld, Not Applicable, N/A, Germany
2006 - 2009 Assistant Professor, Texas A&M University, College Station, Texas, United States
2003 - 2006 Research Supervisor, Technical University Clausthal, Clausthal-Zellerfeld, Not Applicable, N/A, Germany
2000 - 2003 Research Engineer, Technical University Clausthal, Clausthal-Zellerfeld, Not Applicable, N/A, Germany
1998 - 2000 Guest Scientist, Technical University Clausthal, Clausthal-Zellerfeld, Not Applicable, N/A, Germany
1996 - 1998 Mechanical Engineer, Institute for Research & Technology,, Campina, , Not Applicable, N/A, Romania

Products

Products Most Closely Related to the Proposed Project

1. Ejike C, Obuobi I, Avinu S, Abid K, Teodoriu C. Investigation and Analysis of Influential Parameters in Bottomhole Stick–Slip Calculation during Vertical Drilling Operations. Energies. 2024 January 27; 17(3):622-. Available from: https://www.mdpi.com/1996-1073/17/3/622 DOI: 10.3390/en17030622
2. Sharma A, Srivastava S, Teodoriu C. Experimental Design, Instrumentation, and Testing of a

Laboratory-Scale Test Rig for Torsional Vibrations—The Next Generation. Energies. 2020; 13(18):4750. issn: 1996-1073
3. Teodoriu C, Bello O. An outlook of drilling technologies and innovations: Present status and future trends. Energies. 2021; 14(15):4499. issn: 1996-1073
4. Sharma A, Srivastava S, Teodoriu C, Stan M. Experimental Comparison of PID Based RPM Control for Long Horizontal vs. Vertical Drillstring. [Preprint]. 2021 November 29. DOI: 10.20944/preprints202111.0536.v1
Other Significant Products, Whether or Not Related to the Proposed Project
1. Lambrescu I, Teodoriu C, Amani M. Experimental and Numerical Investigations of Cement Bonding Properties. Materials. 2021; 14(23):7235. issn: 1996-1944
2. Abid K, Sharma A, Ahmed S, Srivastava S, Toledo Velazco A, Teodoriu C. A review on geothermal energy and HPHT packers for geothermal applications. Energies. 2022; 15(19):7357. issn: 1996-1073
3. Lambrescu I, Teodoriu C. Experimental and Numerical Investigations of Cement Bonding Properties at Elevated Temperatures—The Effect of Sample Cooling. Materials. 2022 July 16; 15(14):4955-. Available from: https://www.mdpi.com/1996-1944/15/14/4955 DOI: 10.3390/ma15144955

Ephraim Kelley
Natural Resource & Land Management | ekelley@kiowatribe.org

Natural Resource Director
Kiowa Tribe – Carnegie, OK
March 2023-Present
managing natural resources and land conservation. Possessing a strong background in land management, environmental conservation, and sustainable development. Successfully led and managed several land conservation projects, collaborated with government agencies and stakeholders to promote sustainable use of natural resources, and developed strategies for improving land management practices.

- Develop and implement strategies for sustainable land management and natural resource conservation.
- Collaborate with government agencies, stakeholders, and community groups to promote sustainable land use practices.
- Identify and analyze environmental issues affecting natural resources and recommend solutions for conservation and protection.
- Develop and maintain positive relationships with key stakeholders, including community groups, government agencies, and private landowners.
- Monitor and evaluate the effectiveness of land management practices and recommend improvements.
- Develop and manage budgets for natural resource conservation projects.
- Conducted research and analysis of natural resource issues affecting land conservation.
- Developed strategies and policies to improve land management practices and promote sustainable land use.
- Managed budgets for land conservation projects.

REALTY SPECIALIST
LAND MANAGEMENT, SAC AND FOX NATION - Stroud, OK
June 2017 to October 2018
Confirms land ownership and availability for lease/purchase. Negotiates agreements with land owners for drilling or production rights. Drafts and administers contracts; ensures compliance with government & state regulations for R.O.W. and Oil and Gas leases. Performs in-house title information gathering, organizes and analyzes title documents to assess rights information, and performs internal title updates. Currently overseeing contracts and the budget for the Land & Cattle Corporation that is owned by the Sac and Fox Nation.

BUSINESS DEVELOPMENT
NATIVE AGRONOMICS INC - Auburn, WA
March 2018 to December 2018
Identified trendsetter ideas by researching the industry and related events, publications, and announcements; tracking individual contributors and their accomplishments. Located and

propose potential business deals by contacting potential partners; discovering and exploring opportunities. Screens potential business deals by analyzing market strategies, deal requirements, potential, and financials; evaluating options; resolving internal priorities; recommending equity investments.

SOCIAL SERVICE DIRECTOR
IOWA TRIBE OF OKLAHOMA - Perkins, OK
January 2015 to January 2016
Supervised the program that provides Indian Child Welfare Services for enrolled Iowa tribal members. Provided account management for program, which included compiling monthly and annual budget reports for grant. Funding through Bureau of Indian Affairs, Department of Interior. Assessed needs of program and employees. Made detailed budget request for program. Applied an in-depth knowledge of the Indian Child Welfare
Act to ensure removals of Indian children were within federal guidelines and that Native American Children were kept with Native American families. Additionally, responsible for court and child welfare notices under the Indian Child Welfare Act. Monitored both state and tribal court proceedings to verify families were reunited in a timely manner when possible. Provided diligent case management and advocacy. Developed rapport with clients and completed thorough evaluation of safety and underlying cause for behavior. Carried out time sensitive referral services for clients in need. Ensured the clients were served effectively through foster care and adoption services and prevention services for at risk families.

Indian Child Welfare Coordinator
Cheyenne and Arapaho Tribes - Concho, OK
July 2019 to July 2021
Supervised the program that provides Indian Child Welfare Services for enrolled Iowa tribal members. Provided account management for program, which included compiling monthly and annual budget reports for grant. Funding through Bureau of Indian Affairs, Department of Interior. Assessed needs of program and employees. Made detailed budget request for program. Applied an in depth knowledge of the Indian Child Welfare
Act to ensure removals of Indian children were within federal guidelines and that Native American Children were kept with Native American families. Additionally, responsible for court and child welfare notices under the Indian Child Welfare Act. Monitored both state and tribal court proceedings to verify families were reunited in a timely manner when possible. Provided diligent case management and advocacy. Developed rapport with clients and completed thorough evaluation of safety and underlying cause for behavior. Carried out time sensitive referral services for clients in need. Ensured the clients were served effectively through foster care and adoption services and prevention services for at risk families.

Education

B.S. in PSYCHOLOGY
UNIVERSITY OF SCIENCE & ARTS OF OKLAHOMA CHICKASHA - Chickasha, OK
2012

ERIC W. POLLARD
Telephone: (918) 290-9905
Email: ewpollard@gmail.com

EXPERIENCE:

Clean Cities Coordinator / Energy & Environmental Programs Manager
Association of Central Oklahoma Governments (ACOG) & Indian Nations Council of Governments (INCOG) July 2013 – Present

- Administered over $2 million state and federal grant funding
- Developed and implemented alternative fuel and energy efficiency grant and loan programs, including a $1.6 million dollar INCOG energy revolving loan fund
- Monitors alternative fuel funding opportunities, policy changes, and industry developments for public and private fleets and businesses in Oklahoma
- Manages data collection, analysis, and reporting of alternative fuel development to the U.S. Department of Energy (DOE)
- Provide technical assistance to public and private fleets
- Recruited and retained over 400 Clean Cities dues-paying members and stakeholders
- Managed website and social media accounts for coalitions
- Managed program staff and interns

Government Affairs Program Coordinator, Tulsa Regional Chamber
Tulsa, OK June 2012 – Present

- Managed logistics, programming, and communication for over 20 events between 20122013; events involved thousands of individuals
- Managed outreach to Tulsa-regional stakeholders including business leaders, city and county governments, chambers, education institutions, and economic development organizations
- Assisted in development of OneVoice legislative agenda endorsed by over 60 stakeholder organizations
- Developed peer-city government efficiency and municipal collaboration report which included recommendations for the Tulsa-region

Urban Redevelopment Intern, City of Oklahoma City Planning Department
Oklahoma City, OK June 2011 – May 2012

- Conducted Strong Neighborhood Initiative housing stock surveys, neighborhood data analysis, and research
- Conducted Downtown Strategic Initiative stakeholder engagement and presented a peer city review to staff
- Managed stakeholder engagement and co-wrote a briefing book for an Urban Land Institute suburban corridor improvement grant called Envision 240

Project Manager, Center for Energy Matters, AFM Systems LLC 2009

Data Analyst, Oklahoma Wind Power Initiative (OWPI), 2007 - 2008

Land Protection Intern, OK Department of Environmental Quality (ODEQ), Summer 2006

EDUCATION:

PRESIDIO GRADUATE SCHOOL OF MANAGEMENT San Francisco, CA
M.P.A. Sustainable Management May 2012

- A cross-sector management education that integrated systems thinking, sustainability and leadership into public & business administration coursework

UNIVERSITY OF OKLAHOMA Norman, OK
B.A. Political Science May 2008
Minor: Interdisciplinary Perspectives on the Environment

REFERENCES & COMMUNITY INVOLVEMENT AVAILABLE UPON REQUEST

Kiowa Tribe
125 E. Broadway • Anadarko, Oklahoma • 73005
Phone: (580) 654-6470
Natural Resources Department

Ephraim Kelley
Natural Resource & Land Management | ekelley@kiowatribe.org

Natural Resource Director
Kiowa Tribe of Carnegie, OK
March 2023-Present
managing natural resources and land conservation. Possessing a strong background in land management, environmental conservation, and sustainable development. Successfully led and managed several land conservation projects, collaborated with government agencies and stakeholders to promote sustainable use of natural resources, and developed strategies for improving land management practices.

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Confirms land ownership and availability for lease/purchase. Negotiates agreements with land owners for drilling or production rights. Drafts and administers contracts; ensures compliance with government & state regulations for R.O.W. and Oil and Gas leases. Performs in-house title information gathering, organizes and analyzes title documents to assess rights information, and performs internal title updates. Currently overseeing contracts and the budget for the Land & Cattle Corporation that is owned by the Sac and Fox Nation.

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Education

B.S. in PSYCHOLOGY
UNIVERSITY OF SCIENCE & ARTS OF OKLAHOMA CHICKASHA – CHICKASHA, OK
2012

Honors and Awards

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2019- Fifty Making a Difference Honoree, The Journal Record Woman of the Year

2015 to 2018 t W Œ •] v š [• , } v } Œ Z } o o U u Œ] v } o o P } (µ š] } v

2009 to 2010- Professional of the Year, Canadian Valley Technology Center

2002 to 2003- Teacher of the Year, Canadian Valley Technology Center

1991 to 1992- Sallie Mae First Year Teacher, National Award

1991 to 1992- Mid-Del District Rookie of the Year, Mid-Del Public Schools

SHANNON NICOLE STOKES
Center for Energy and Environmental Resources
The University of Texas at Austin
Austin, Texas 78712 **stokessn@austin.utexas.edu**

Shannon Stokes joined the Center for Energy and Environmental Resources at the University of Texas at Austin in 2019 and the Energy Emissions Modeling and Data Lab in 2024. She has contributed to and managed projects involving multiple universities, oil and gas operators and consulting companies. She has worked on projects with state and federal funding and has extensive experience proposing and planning measurement campaigns, incorporating insights on the measurement technology capabilities and the methane and VOC emission sources from oil and gas and non-oil and gas sources. Shannon has experience exploring a variety of data sources, including public databases (GHGRP reporting websites, gridded inventories, state and federal permitting sites) and published data from independent research (emissions observed in past campaigns) to obtain information to inform current projects. She also has experience estimating emissions using a variety of tools, from simple production-based estimates to time-series predictions using the Methane Emission Estimation Tool (MEET) and using these emission estimates to interpret data from measurement campaigns and other sources. She received her PhD in Environmental Engineering from the University of Texas at Austin and has a B.S. in Foreign Service from Georgetown University.

Education and Training

B.S.	Foreign Service 1999	Georgetown University
M.S.	Environmental and Water Resources Engineering 2002	The University of Texas at Austin
Ph.D.	Civil, Architectural and Environmental Engineering 2009	The University of Texas at Austin

Research and Professional Experience

2024 – present	Research Engineering/Science Associate IV, Center for Energy and Environmental Resources, The University of Texas at Austin
2020 – present	Lecturer, Cockrell School of Engineering, The University of Texas at Austin
2016 – 2024	Senior Field Trainer/ Analyst, Center for Energy and Environmental Resources, The University of Texas at Austin
2015 – 2016	Course Coordinator, OnRamps, The University of Texas at Austin
2012 – 2018	Lecturer, Department of Chemistry, The University of Texas at Austin
2013 – 2015	Curriculum Coordinator, Chembridge, Department of Chemistry, The University of Texas at Austin
2010 – 2014	Research Engineering/Science Associate IV, College of Natural Sciences, The University of Texas at Austin
2000 – 2009	Graduate Research Assistant, Environmental and Water Resources Engineering, The University of Texas at Austin

Publications on emissions from oil and gas systems:

1. Huang, L., Stokes, S., Chen, Q., Cardoso-Saldaña, F.J., Allen, D.T., Uncertainties in the Estimated Methane Emissions in Oil and Gas Production Regions Based on Aircraft Mass

Balance Flights, ACS Sustainable Chemistry & Engineering, 12 (29), 11024-11032, doi 10.1021/acssuschemeng.4c03945 (2024).
2. Huang, L., Stokes, S., Chen, Q., Cardoso-Saldaña, F.J., Allen, D.T., High spatial and temporal resolution simulations of methane column loadings due to routine emissions and emission events in oil and gas regions, ACS ES&T Air, 1, 706–713, doi: 10.1021/acsestair.4c00021 (2024).
3. Stokes, S., Tullos, E., Morris, L., Cardoso-Saldaña, F.J., Smith, M., Conley, S., Smith, B., Allen, D.T., Reconciling multiple methane detection and quantification systems at oil and gas tank battery sites, Environmental Science & Technology, 56, 6055–16061, doi: 10.1021/acs.est.2c02854 (2022).
4. Tullos, E.E., Stokes, S., Cardoso-Saldaña, F.J., Herndon, S.C., Smith, B., Allen, D.T., Use of short duration measurements to estimate methane emissions at oil and gas production sites, Environmental Science & Technology Letters, 8, 463–467 (2021).

Synergistic activities

1. *Project Astra Phase II* Dr. Stokes is a Senior/Key Personnel for Project Astra Phase II (www.projectastra.energy) which is will expand a network of continuous monitoring solutions to better understand emissions from natural gas compressor stations and natural gas processing plants in the Permian Basin (AOI2)
2. *The Marcellus Methane Monitoring (M3) Project* Dr. Stokes is also a Senior/Key Personnel facility-level methane emissions measurement and reconciliation protocol within the Marcellus shale basin (AOI3)

Erin E. Tullos
Center for Energy and Environmental Resources **(918) 327-4478**
The University of Texas at Austin **etullos@austin.utexas.edu**
Austin, Texas 78712

Education

B.A.	Chemistry	Texas A&M University	2002
Ph.D.	Chemistry	Texas A&M University	2007

Training

ExxonMobil Advanced Skills Milestone (Environmental Management, Reg Compliance) – 2016

Professional Experience

2023 – present University of Texas at Austin

Senior Research Scientist leading a research portfolio focused on measurement reconciliation and estimating methodologies for methane and other pollutants from both onshore and offshore oil and gas facilities. Leads development of global MMRV education initiatives.

2023 – present Astra Energy Group, LLC

Managing Member of woman-owned energy emissions and economics advisory. Provides advisory on clean air act issues, methane emissions measurement strategies, and regulatory compliance.

2021 – 2023 United Nations Environment Programme, International Methane Emissions Observatory

OGMP 2.0 Senior Advisor, responsible for technical guidance development, consulting with members on program requirements and measurement strategies, conformance assessments of submissions (three grading seasons), and member recruiting.

2022 – 2023 Validere

Senior Director Carbon Strategies, advising on product development, with an emphasis on measurement reconciliation, emissions measurement interpretation, and strategic advice.

2021 – 2022 ChampionX

Director of R&D, responsible for the aerial measurement program (legacy Scientific Aviation manned and unmanned aircraft measurements) and emissions research.

2021 – 2021 GTI

Senior Director, Gas Transition Solutions, developed Veritas program and recruited founding members.

2014 – 2021 ExxonMobil

Technology Development Team Lead (2017-2021), responsible for environmental research portfolio of projects (methane, produced water, environmental genomics, etc.), with individual research portfolio focused on global methane measurement, detection, and mitigation.
Air & GHG Advisor (2014-2017), managing a portfolio of federal clean air act rules, supporting compliance and advocacy activities across petrochemical refineries, chemical manufacturing, petroleum production, and National Ambient Air Quality Standards.

2007 – 2014 Phillips 66 (ConocoPhillips)

Environmental Scientist (2013-2014), responsible for regulatory compliance and environmental stewardship at the Sweeny Refinery.

Chief Scientist (2007-2013), scientist within the R&D organization, leading the air emissions research portfolio (majority of time), with contributions to the alternative energy and heavy metals research teams.

Appointments

2021 – 2023 Visiting Research Fellow, University of Texas at Austin
2021 – Present ESG Advisor, TRP Energy
2009 – 2012 Elected Representative to the Bartlesville City Council, Bartlesville, OK

Representative publications on emissions from oil and gas systems:

1. Daniel Ospina *et. al.* "Ten New Insights in Climate Science 2024." *One Earth. Submitted.* (2024).
2. Stokes, S., Tullos, E., Morris, L., Cardoso-Saldaña, F.J., Smith, M., Conley, S., Smith, B., Allen, D.T., Reconciling multiple methane detection and quantification systems at oil and gas tank battery sites, Environmental Science & Technology, 56, 6055–16061, doi: 10.1021/acs.est.2c02854 (2022).
3. Tullos, E.E., Stokes, S., Cardoso-Saldaña, F.J., Herndon, S.C., Smith, B., Allen, D.T., Use of short duration measurements to estimate methane emissions at oil and gas production sites, Environmental Science & Technology Letters, 8, 463–467 (2021).
4. Allen, David & Ravikumar, Arvind & Tullos, Erin. (2023). Scientific Challenges of Monitoring, Measuring, Reporting, and Verifying Greenhouse Gas Emissions from Natural Gas Systems. *ACS Sust. Res. Mgmt*. 1. 10.1021/acssusresmgt.3c00132.
5. Ravikumar, Arvind & Tullos, Erin & Allen, David & Cahill, Ben & Hamburg, Steven & Zimmerle, Daniel & Fox, Thomas & Caltagirone, Manfredi & Owens, Lara & Stout, Robert & Grimes, Andrew & Fernandez, Tania & Jenks, Carrie & Duren, Riley & Halff, Antoine & Bazilian, Morgan & Rucker, Stefanie. (2023). Measurement-based differentiation of low-emission global natural gas supply chains. *Nature Energy*. 8. 10.1038/s41560-023-01381-x.
6. United Nations Environment Programme (2023). An Eye on Methane — The road to radical transparency: International Methane Emissions Observatory 2023. Nairobi
7. Colette Schissel, Qining Chen, **Erin Tullos**, Arvind Ravikumar, and David Allen. "Comparing the emission reduction effectiveness of continuous monitoring to periodic Optical Gas Imaging surveys for methane emissions at oil and gas production sites." 10.26434/chemrxiv-2023-gcmkh. (2023)
8. An Eye on Methane: International Methane Emissions Observatory 2021 Report, October 31, 2022 contributing author. An Eye on Methane: International Methane Emissions Observatory 2022 Report | UNEP - UN Environment Programme
9. An Eye on Methane: International Methane Emissions Observatory 2022 Report, October 31, 2021 contributing author. An Eye on Methane: International Methane Emissions Observatory 2021 Report | UNEP - UN Environment Programme
10. Wally Contreras, Chris Hardy, Kaylene Tovar, Allison M. Piwetz, Chad R. Harris, **Erin E. Tullos**, Adam Bymaster, John McMichael, Ian J. Laurenzi. "Life Cycle greenhouse gas emissions of crude oil and natural gas from the Delaware Basin" J. Cleaner Production, 328, 129530 (2021).

Synergistic activities

1. *Project Astra* Dr. Tullos was the lead creator and continues to be involved with Project Astra (www.projectastra.energy) which is demonstrating the performance capabilities of shared ground measurement networks for methane emission detection and quantification
2. *OGMP 2.0* Dr. Tullos was the lead author on the Measurement Uncertainty & Reconciliation and related implementing Technical Guidance Documents for the Oil and Gas Methane Partnership, the only global, measurement based reporting framework for methane emissions from oil and gas assets, led by the United Nations Environment Programme. She was the lead expert for measurement, company recruiting in the Americas, and senior reporting assessor for the first three years of member reporting.
3. *Other relevant contracts and grants* Dr. Tullos is also a Principal Investigator on a research project to develop a protocol for evaluating the performance of technologies for measuring methane emissions from off-shore oil and gas platforms. Dr. Tullos also delivers training on methane measurement at source and site level and OGMP 2.0 particpatin
4. *National Petroleum Council service* Dr. Tullos participated on the writing team for two of the the National Petroleum Council's committees that responded to a request from the Secretary of Energy on greenhouse gas emissions from oil and gas production operations. National Petroleum Council. (2024). *Charting the Course - Reducing Greenhouse Gas Emissions from the Natural Gas Supply Chain.* https://chartingthecourse.npc.org/

Select Patents

1. EE Tullos. Automated Flare Control. US Patent 9,677,762, 2017**.**
2. EE Tullos, JM Hays, R Schmidt, JB Cross. Mercury removal with sorbents magnetically separable from treated fluids US Patent 8,043,510, 2011.
3. EE Tullos, JB Cross, SA Thomas. Mercury removal from water. US Patent App. 12/879,724, 2011.
4. JM Hays, EE Tullos, JB Cross. Mercury removal from hydrocarbons. US Patent 7,919,665, 2011.

MICHAEL CHAVEZ
San Antonio, TX · 210 – 863 - 3860
MichaelStuartChavez@gmail.com · linkedin.com/in/michaelstuartchavez

Ambitious and goal-driven professional, skilled in developing and implementing high-growth strategies with proven results. Solid track record of contributions to growth through increased revenue generation and product expansion. Successful team builder experienced in using lean practices to drive cultural innovation and ideation. Known for exceptional grit and determination, thriving in any area pursued due to a relentless passion to succeed.

EXPERIENCE

02/2024 – Present
Vice President of Growth, LongPath Technologies, Inc.
Boulder, CO (Remote)
Lead all growth initiatives for a leading company in continuous methane emissions monitoring, focusing on expanding market presence and driving revenue in the oil and gas sector.

- Develop and execute strategic plans that successfully penetrate new markets, including overseeing the launch of LongPath's groundbreaking Pathfinder program for emissions monitoring.
- Directly manage key accounts, including Chevron and Williams, ensuring high levels of customer satisfaction and long-term partnership growth.
- Identify and capitalize on the SB-1137 compliance market in California, successfully positioning LongPath within top operators and expanding the company's footprint in this significant market.
- Build and maintain strategic relationships with industry leaders, fostering partnerships that support LongPath's growth and innovation.
- Spearhead the creation of comprehensive sales and marketing strategies, resulting in the acquisition of key clients in the Permian Basin and other critical regions.

08/2022 – 02/2024
CHIEF REVENUE OFFICER, TURNTABLE TICKETS, INC
SAN ANTONIO, TX
Managed and oversaw all sales, marketing, and business development strategies for a nationwide, growth-stage, SaaS, and climate-focused certification company.

- Worked hand-in-hand with the executive team and leadership to support strategic goals to acquire new customers, deepen the engagement of existing customers, and increase profitability.
- Developed and implemented scalable processes to build, manage, and execute a balanced pipeline that supported the achievement of company growth.
- Leveraged extensive network and a challenger mindset to win new customers over with a strong value proposition offering.
- Worked closely with cross-functional teams including Product, Technology, Marketing, Finance, People, and Operations to align expectations and deliver a superior customer experience.
- Led complex contract negotiations, closed new deals, and maintained the highest level of customer satisfaction.

02/2022 – 09/2022
VICE PRESIDENT OF GROWTH, PROJECT CANARY

DENVER, CO (REMOTE)

Managed and oversaw all sales, marketing, and business development strategies for a nationwide, growth-stage, SaaS, and climate-focused certification company.

- Worked hand-in-hand with the executive team and leadership to support strategic goals to acquire new customers, deepen the engagement of existing customers, and increase profitability.
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- Led complex contract negotiations, closed new deals, and maintained the highest level of customer satisfaction.

10/2020 – 02/2022

CHIEF REVENUE OFFICER (INTERIM), TRANSECT

SAN ANTONIO, TX

Manage and align key areas of growth for an early-stage environmental B2B SaaS company.

- Developed and streamlined growth "flywheel", aligning the Sales, Customer Success, Marketing, and Product departments with company-wide goals.
- Developed a new sales process to align with the company growth plan, resulting in over 400% growth in ARR in 90 days.
- Hired and developed a Marketing team, and implemented KPIs to align with the growth strategy.
- Helped identify and integrate long-term leadership roles in Customer Success, Sales, and Marketing

07/2017 – 07/2020

VICE PRESIDENT OF SALES AND MARKETING, SITEPRO

SAN ANTONIO, TX

Manage and oversee all sales, marketing, and business development strategies for a nationwide multi-million-dollar software automation company.

- Effectively work hand-in-hand with executive team and leadership to support strategic goals to acquire new customers, and deepen engagement of existing customers to increase profitability.
- Hired, restructured, and developed a sales team to optimize sales coverage and growth while aligning with marketing initiatives.
- Doubled new customer acquisition in the first 6 months. Increased overall revenue by 207% over a 2-year period.
- Developed, implemented, and managed all marketing strategies and initiatives ranging from press releases, national publications, trade shows, digital campaigns, etc. resulting in a 6x increase in new leads.

04/2015 – 07/2017

DIRECTOR OF BUSINESS DEVELOPMENT, GENSCAPE (DIGITAL H2O)

CHICAGO, IL (REMOTE)

Led all marketing, sales, and product roadmap functions for an early-stage SaaS company resulting in high growth and eventual acquisition.

- Oversaw all revenue-generating activities, including marketing, sales, customer support, and client services.
- Increased revenue by 4.7x in first year.
  Job responsibility/achievement

04/2013 – 04/2015

DIRECTOR OF BUSINESS DEVELOPMENT & OPERATIONS, WELLAWARE

SAN ANTONIO, TX

Part of the founding team of 5 employees, helped grow the company to over 65 employees and $67M in capital raised

- Identified, developed, and marketed a new product line, which accounted for 25% of company revenue
- Managed operations personnel including engineers, supervisors, coordinators, and technicians.
- Identified and oversaw construction of 50,000+ square miles of RPMA wireless networks
- Managed and negotiated vendor and contractor relationships to include RFQs, proposals, and partnership agreements

09/2011 – 04/2013

AUTOMATION AND ELECTRICAL TECHNICIAN, CHESAPEAKE

Managed teams of contractors responsible for project construction, maintenance, and troubleshooting for a Fortune 500 oil and gas company.

- Led contractor selection/evaluation and RFQ's for multi-million-dollar projects.
- Commissioned the company's first oil terminal in South Texas under budget and ahead of the deadline (also a first for the company).

04/2006 – 10/2008

FIRE CONTROLMAN (E4), UNITED STATE NAVY – USS ARLEIGH BURKE

- Secret Clearance (expired)

EDUCATION

01/2009 – 04/2011

ELECTRICAL ENGINEERING, UNIVERSITY OF TEXAS AT SAN ANTONIO

SKILLS

- Entrepreneurial leader with a passion for building and leading high-performing teams
- Ability to develop direct and channel relationships to successfully deliver growth
- Ability to take calculated risks and make decisions to propel the business to the next level
- Proven ability to identify market opportunities and grow profitable businesses
- Track record of exceeding expectations and delivering on targets and goals
- Critical thinker with an understanding of how to analyze industry trends and opportunities

Identifying Information
Bon, Daniel
Program Manager, Energy and Public Health

Organization and Location
Carbon Mapper; Pasadena, CA, USA

Professional Preparation
University of Colorado, Boulder; Boulder, CO USA
Doctor of Philosophy; Aug 2004 – Aug 2011
Field of Study: Atmospheric & Analytical Chemistry

Western Washington University; Bellingham, WA USA
Master of Science; Aug 1995 – May 1999
Field of Study: Marine & Environmental Sciences

Carleton College; Northfield, MN USA
Bachelor of Arts; Aug 1986 – May 1990
Field of Study: Chemistry

Appointments and Positions

2023-Current
Program Manager, Energy and Public Health
Carbon Mapper
Pasadena, CA, USA

2021-2023
Air Toxics Measurement Group Supervisor
Colorado Department of Public Health and Environment
Denver, CO, USA

2016-2021
Mobile Laboratory Lead Investigator
Colorado Department of Public Health and Environment
Denver, CO, USA

2013-2016
Air Quality Planner
Colorado Department of Public Health and Environment
Denver, CO, USA

Products

(1)

a. Authors: Griffin J. Mead, Eleanor M. Waxman, Daniel Bon, Daniel I. Herman, Esther Baumann, Fabrizio R. Giorgetta, Jacob T. Friedlein, Gabriel Ycas, Nathan R. Newbury, Ian Coddington, Kevin C. Cossel
b. Title: Open-path dual-comb spectroscopy of methane and VOC emissions from an unconventional oil well development in Northern Colorado, 2023.
c. Date of Publication: 2023/06/01
d. URL: https://www.frontiersin.org/journals/chemistry/articles/10.3389/fchem.2023.1202255/full
e. DOI: https://doi.org/10.3389/fchem.2023.1202255

(2)

a. Authors: Tami S. McMullin, Alison M. Bamber, Daniel Bon, Daniel I. Vigil, Michael Van Dyke
b. Title: Exposures and Health Risks from Volatile Organic Compounds in Communities Located near Oil and Gas Exploration and Production Activities in Colorado (U.S.A.)
c. Date of Publication: 2018/07/07
d. URL: https://www.mdpi.com/1660-4601/15/7/1500
e. DOI: https://doi.org/10.3390/ijerph15071500

(3)

a. Authors: Frank Flocke, Gabriele Pfister, James H. Crawford, Kenneth E. Pickering, Gordon Pierce, Daniel Bon, Patrick Reddy
b. Title: Air Quality in the Northern Colorado Front Range Metro Area: The Front Range Air Pollution and Photochemistry Éxperiment (FRAPPÉ), 2019
c. Date of Publication: 2019/12/22
d. URL: https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2019JD031197
e. DOI: https://doi.org/10.1029/2019JD031197

(4)

a. Authors: Natalie Kille, Randall Chiu, Matthias Frey, Frank Hase, Mahesh K. Sha, Thomas Blumenstock, James W. Hannigan, Johannes Orphal, Daniel Bon, Rainer Volkamer.
b. Title: Separation of Methane Emissions From Agricultural and Natural Gas Sources in the Colorado Front Range, 2019
c. Date of Publication: 2019/03/21
d. URL: https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2019GL082132
e. DOI: https://doi.org/10.1029/2019GL082132

(5)

a. Authors: Amy Townsend-Small, E. Claire Botner, Kristine L. Jimenez, Jason R. Schroeder, Nicola J. Blake, Simone Meinardi, Donald R. Blake, Barkley C. Sive, Daniel Bon, James H. Crawford, Gabriele Pfister, Frank M. Flocke.
b. Title: Using stable isotopes of hydrogen to quantify biogenic and thermogenic atmospheric methane sources: A case study from the Colorado Front Range
c. Date of Publication: 2016/11/16
d. URL: https://agupubs.onlinelibrary.wiley.com/doi/10.1002/2016GL071438
e. DOI: https://doi.org/10.1002/2016GL071438

(6)

a. Authors: D. M. Bon, J. A. de Gouw, C. Warneke, W. C. Kuster, M. L. Alexander, A. Baker, A. Beyersdorf, D. Blake, R. Fall, J. L. Jimenez, S. C. Herndon, L. G. Huey, W. B. Knighton, J. Ortega, S. Springston, I. M. Ulbrich, and O. Vargas

b. Title: Measurements of Volatile Organic Compounds at a Suburban Ground Site (T1) in Mexico City during the MILAGRO 2006 Campaign: Measurement Comparison, Emission Ratios, and Source Attribution
c. Date of Publication: 2010/10/08
d. URL: https://acp.copernicus.org/preprints/10/23229/2010/acpd-10-23229-2010.pdf
e. DOI: doi:10.5194/acpd-10-23229-2010

Ross Cheung, Ph.D.
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EDUCATION

Ph.D. Atmospheric and Oceanic Sciences, Los Angeles, CA, December 2016
Thesis: MAX-DOAS measurements of aerosol, HCHO, and NO_2 over Los Angeles from an elevated mountaintop site, Advisor: Dr. Jochen Stutz

M.S. Atmospheric and Oceanic Sciences, Los Angeles, CA, June 2010.

B. S. Mathematical and Computational Sciences, **Stanford University**, Stanford, CA, June 2006

RESEARCH AND PROFESSIONAL EXPERIENCE

Senior Scientist - Insight M, Remote,
October 2021 - Present

- Supported R&D efforts to update sensor capabilities and core retrieval algorithms for spectroscopy, and modernize the analysis pipeline by contributing to the Python code base.
- Developed Data Science analysis tools, including building new models to understand and estimate basin-wide distributions of methane emissions.
- Improved Insight M's core algorithm and various legacy code through pipeline stabilization, improved testing, diagnosis of critical issues, and code refactoring/improvement

Data Scientist, Agency Enterprise Studio, Venice, California
September 2020 - September 2021

- Improved accuracy of a prototype brain-computer interface by training a 1-D Convolutional Neural Network in PyTorch to detect human activity.
- Developed and improved a computer vision algorithm to derive wellness scores of user's health from mobile phone images, for the core product of a client startup.
- Reduced customer service by building a Natural Language Processing-based machine learning model for better handling automated SMS-based responses.

Machine Learning Consultant, AI Photonics, Remote
December 2018 - September 2020

- Solved image processing-related algorithmic challenges for a commercial LIDAR system designed to aid architects and construction workers in making precise measurements of building dimensions
- Designed computer vision algorithms using Python, numpy, and sklearn to separate point clouds and highlight edges into planes using clustering and neural-network based techniques. Highlights include plane separation/edge detection using RANSAC and Hough Transform, and neural networks for point clouds.

Data Science Fellow, Insight Data Science, New York City, New York
January 2020 - May 2020

- Recommended best jobs to candidates from underprivileged backgrounds by building a recommendation system, using a novel cosine similarity and matrix factorization model in Python for a client.
- Merged data on 7 million data points from SQL databases, to find similarity scores between job seekers and job descriptions in order to train internal models.
- Delivered recommendations that improved the quality of job descriptions shown to users by 25%

Air Quality Specialist, South Coast AQMD, Diamond Bar, California
May 2017 - January 2020

- Aided affected community members by performing analysis of data on emitted pollutants directly affecting them, and communicated the results to policy makers seeking to draft legislation.
- Spearheaded the development of a Python codebase to analyze the capabilities of spectrometers to observe air pollutants and to visualize data real-time on maps on the web.
- Conducted atmospheric radiative transfer modeling to simulate and analyze the efficacy of atmospheric optical systems to detect and observe trace gas concentrations for continuous monitoring applications
- Built Python internal tools used for scientific and monitoring purposes at the AQMD.

Graduate Student Researcher, UCLA, Los Angeles, CA
October 2009-December 2016

- Conducted 2 million measurements of trace gas precursors to smog formation over Los Angeles over a five year period to better understand the chemistry behind air pollution over an urban area.
- Developed new techniques to filter for clouds in millions of atmospheric remote sensing measurements and perform inverse modeling techniques for atmospheric sounding.
- Conducted field campaign measurements of air quality over urban and remote areas, including the Los Angeles air basin, Houston, and rural Uintah basin.
- Published 10 papers during PhD research. Taught 7 different classes on climate, meteorology, and atmospheric chemistry, led discussion sessions of up to 30 people at a time.

PEER REVIEWED PUBLICATIONS (selected)

Tsai, C., M. Spolaor, S. F. Colosimo, O. Pikelnaya, **R. Cheung**, E. Williams, J. B. Gilman, B M. Lerner, R. J. Zamora, C. Warneke, J. M. Roberts, R. Ahmadov, J. de Gouw, T. Bates, P. K. Quinn, J. Stutz (2018). Nitrous acid formation in a snow-free wintertime polluted rural area. Atmos. Chem. Phys., 18, 1977–1996, https://doi.org/10.5194/acp-18-1977-2018.

Werner, B., J. Stutz, M. Spolaor, L. Scalone, R. Raecke, J. Festa, S. F. Colosimo, **R. Cheung**, C. Tsai, R. Hossaini, M. P. Chipperfield, G. S. Taverna, W. Feng, J. W. Elkins, D. W. Fahey, R.-S. Gao, E. J. Hintsa, T. D. Thornberry, F. L. Moore, M. A. Navarro, E. Atlas, B. Daube, J. Pittman, S. Wofsy, K. Pfeilsticker (2017). Probing the subtropical lowermost stratosphere, tropical upper troposphere, and tropopause layer for inorganic bromine, Atmos. Chem. Phys., 1-43, doi:10.5194/acp-2016-656.

Stutz, J., B. Werner, M. Spolaor, L. Scalone, J. Festa, C. Tsai, **R. Cheung**, S. F. Colosimo, U. Tricoli, R. Raecke, R. Hossaini, M. P. Chipperfield, W. Feng, R.-S. Gao, E.J. Hintsa, J. W. Elkins, F. L. Moore, B. Daube, J. Pittman, S. Wofsy, K. Pfeilsticker (2017). A New Differential Optical Absorption Spectroscopy Instrument to Study Atmospheric Chemistry from a High Altitude Unmanned Aircraft. Atmos. Meas. Tech. Discuss., 1-48, doi:10.5194/amt-2016-251.

Olaguer, E., J. Stutz, M. H. Erickson, S. C. Hurlock; **R. Cheung**, C. Tsai, S. F. Colosimo, J. Festa, A. Wijesinghe, B. S. Neish (2017). Real Time Measurement of Transient Event Emissions of Air Toxics by Tomographic Remote Sensing in Tandem with Mobile Monitoring. Atmospheric Environment., 150, 220-228.

Cheung, R., K. F. Li, S. H. Wang, T. Pongetti, R. P. Cageao, S. P. Sander, Y. L. Yung (2008). Atmospheric hydroxyl radical (OH) abundances from ground-based ultraviolet solar spectra: an improved retrieval method. Applied Optics, 47(33), 6277-6284.

Wang, S. H., H. M. Pickett, T. J. Pongetti, **R. Cheun**g, Y. L. Yung, C. Shim, Q. B. Li, T. Canty, R. J. Salawitch, K. W. Jucks, B. Drouin, S. P. Sander (2008). Validation of Aura Microwave Limb Sounder OH measurements with Fourier Transform Ultra-Violet Spectrometer total OH column measurements at Table Mountain, California. Journal of Geophysical Research-Atmospheres, 113(D22301). DOI: 10.1029/2008JD009883.

Name: Zachary Weller
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GTI Energy
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Summary of Experience

Dr. Weller is a Senior Manager, Data Science in the Digital Innovation group at GTI energy where he leads and supports projects using applied and advanced statistical data analysis techniques to derive insights from complex data. He is principal investigator for GTI Energy's iM4 Technologies AOI-4 project on an integrated methane monitoring platform and key personnel on the AOI-3 project on methane emissions from the Haynesville Basin. He has supported the writing, development, and company implementations of the Veritas Protocols. Dr. Weller was previously a Senior Data Scientist at Pacific Northwest National Lab and an Assistant Professor of Statistics at Colorado State University. Dr. Weller specializes in working with subject matter experts to apply and develop statistical methods to address problems in the energy, environment, and agricultural domains. He has researched methane emissions since 2017, supporting monitoring data analyses and leading a study that estimates and characterizes uncertainty for emissions from local distribution systems. Dr. Weller has authored or co-authored over 30 peer-reviewed publications.

Education and Training

Location	Degree	Area	Year
Concordia College	B.A.	Mathematics and Computer Science	2011
Colorado State University	Ph.D.	Statistics	2017
Colorado State University	Postdoc	Biology	2017

Research and Professional Experience

GTI Energy - Des Plaines, IL (remote), *Senior Manager – Data Science* **2023-Present**

- Leads and contributes to complex projects in data and digitalization applied to the energy sector
- Responsible for project structuring, coordination, reporting, and managing project personnel
- Thought leader and co-developer of the GTI Veritas Protocols – a standardized, scientific approach to measuring methane emissions from the oil and gas supply chain
- Collaborates with subject matter experts and applies statistical methods to design experiments, plan measurement campaigns, and analyze data to derive data-driven insights
- Applies statistical methods to quantify uncertainty in estimates

Pacific Northwest National Laboratory – Richland, WA (remote), *Senior Data Scientist* **2022-2023**

- Work with domain scientists to apply statistical data science methods to address problems in energy, environment, and national security
- Led and supported project proposals to numerous sponsors, including non-profit organizations and U.S. government agencies
- Collaborated with data scientists and software developers in the development of Visual Sample Plan software
- Communicated and disseminated findings through presentations and reports

Colorado State University – Fort Collins, CO, *Assistant Professor* **2017-2022**

- Collaborated and consulted with a wide range of domain experts as a consultant in the Graybill Statistics and Data Science Lab
- Advised and mentored undergraduate and graduate students to apply statistical methods
- Taught graduate and undergraduate students in statistics courses
- Communicated and disseminated findings through presentations and peer-reviewed papers

Sole Proprietor: Statistical Consulting – Fort Collins, CO, *Statistical Consultant* **2015-2022**

- Collaborated and consulted with a wide range of subject matter experts to apply statistical methods
- Supported projects and data analysis in a variety of domains including agriculture, environmental monitoring, healthcare, sports, and biology.
- Communicated and disseminated findings through presentations and peer-reviewed papers

5 Relevant Publications

Weller, Z.D., Hamburg, S., von Fischer, J.C. (2020). National Assessment of Methane Emissions from Natural Gas Distribution Systems. *Environmental Science and Technology*, 54(14), 8958-8967.

Weller, Z.D., Roscioli, J.R., Daube, W.C., Lamb, B.K., Ferrara, T.W., Brewer, P.E., von Fischer, J.C. (2018). Vehicle-Based Methane Surveys for Finding Natural Gas Leaks and Estimating Their Size: Validation and Uncertainty. *Environmental Science and Technology*. 52(20): 11922-11930. doi: 10.1021/acs.est.8b03135.

Weller, Z.D., Hoeting, J.A., & von Fischer, J.C. (2018). A Calibration-Capture-Recapture Model for Inferring Natural Gas Leak Population Characteristics Using Data from Google Street View Cars. Environmetrics. 29(7): e2519. doi: 10.1002/env.2519.

Luetschwager, E., von Fischer, J.C.,**Weller, Z.D.** (2021). Characterizing Sampling Characteristics of Mobile Surveys for Natural Gas Leaks. Elementa: Science of the Anthropocene 9(1), 00143.

Weller, Z.D., Yang, D.K., von Fischer, J.C. (2019). An Algorithm to Process Data from Mobile Methane Surveys. PloS One. 14(2). doi: 10.1371/journal.pone.0212287.

Other Selected Publications

Maazallahi, H., Fernandez, J. M., Menoud, M., Zavala-Araiza, D., **Weller, Z. D.,** Schwietzke, S., ... & Reockmann, T. (2020). Methane Mapping, Emission Quantification, and Attribution in Two European Cities: Utrecht (NL) and Hamburg (DE). Atmospheric Chemistry and Physics, 20(23), 14717-14740.

Diefenderfer, H.L., Borde, A.B., Sinks, I.A., McKeon, M.A., Zimmerman, S.A., Mackereth, K.F., and **Weller, Z.D.** (2023). Scientific Support for the Columbia Estuary Ecosystem Restoration Program, FY 2022 Annual Report. PNNL-33879. Richland, WA: Pacific Northwest National Laboratory.

Whittier, T. T., **Weller, Z. D.,** Fling, B. W. (2022). Novel Applications of Bayesian Inference Clarify Sensorimotor Uncertainty During Stepping Movements. Neuropsychologia, 173, 108310.

Young, B.N., Benka-Coker, W.O., **Weller, Z.D.,** Oliver, S., Schaefer, J.W., Magzmen, S. (2021). How Does Absenteeism Impact the Link Between School's Indoor Environmental Quality and Student Performance? Building and the Environment, 108053.

Barry, K.R., Thomas, C.H., Ezra, J.L., Twohy, C.H., Moore, K.A., **Weller, Z.D.,** Toohey, D.W., Reeves, M., Campos, T., Geiss, R., Schill, G.P., Fischer, E.V., Kreidenweis, S.M., DeMott, P.J. Observations of Ice Nucleating Particles in the Free Troposphere from Western US Wildfires. (2021). Journal of Geophysical Research: Atmospheres, 123(3), e2020JD033752.

Stuchiner, E. R., **Weller, Z. D.,** & von Fischer, J. C. (2021). An Approach for Calibrating Laser-Based N2O Isotopic Analyzers for Soil Biogeochemistry Research. Rapid Communications in Mass Spectrometry, 35(3), e8978.