

David R. Lyon, Ph.D.

Environmental Defense Fund

[REDACTED]
Austin, TX 78701
[REDACTED]
[REDACTED]

<https://www.edf.org/people/david-lyon>

EDUCATION

University of Arkansas, Fayetteville, AR

Ph.D. in Environmental Dynamics (May 2016)

- Dissertation: *Quantifying, Assessing, and Mitigating Methane Emissions from Super-emitters in the Oil and Gas Supply Chain*
- Honors: 4.0 GPA; Doctoral Academy Fellowship

University of Kentucky, Lexington, KY

M.S. in Forestry (May 2004)

- Thesis: *Persistent Effects of Eastern Redcedar on Calcareous Glade Soils and Plant Community*
- Honors: 4.0 GPA; Garden Club of America 2003 Fellowship in Ecological Restoration

Hendrix College, Conway, AR

B.A. in Biology with Chemistry Minor (June 2002)

- Honors: 3.95 GPA; Summa Cum Laude with Distinction; Phi Beta Kappa

WORK EXPERIENCE

Environmental Defense Fund, Austin, TX

Scientist (March 2014 – present)

- Contribute to the design, planning, execution, and analysis of EDF-sponsored research studies on quantifying methane emissions from the oil and gas supply chain
- Advise internal and external projects on innovative approaches for leak detection and mitigation
- Prepare and review manuscripts for submission to peer-reviewed journals
- Communicate science and advocacy through presentations, briefings, and media interviews
- Provide scientific expertise to other EDF programs and external groups

Environmental Defense Fund, Austin, TX

Research Analyst (June 2012 – March 2014)

- Research, analyze, synthesize, and interpret data related to oil and gas methane emissions

- Analyze, interpret, and communicate data to policymakers, industry, the scientific community, and other stakeholders in support of EDF advocacy on environmental policy
- Write reports, blogs, and other communication materials for general audiences

University of Arkansas at Little Rock, Little Rock, AR

Part-time Lecturer (January 2012 – May 2012)

- Taught senior-level environmental science course *Fundamentals of Air Pollution*

Arkansas Department of Environmental Quality, North Little Rock, AR

Environmental Program Coordinator (January 2009 – May 2012)

- Obtained EPA funding, managed project, and authored report on a study to develop an emissions inventory and monitor air quality impacts of natural gas development in the Fayetteville Shale
- Managed \$500,000 project to develop and implement a web-based emissions inventory reporting system for a multi-state consortium of environmental agencies
- Led the state's air pollution emissions inventory program, which included approximately 175 regulated facilities and several nonpoint emission source categories
- Analyzed emissions data and produced reports for the agency and public
- Analyzed current and proposed federal air regulations to assist agency planning
- Supervised up to four staff

University of Arkansas, Fayetteville, AR

Graduate Assistant (August 2004 – December 2008)

- Performed research on the effects of nutrient enrichment on stream carbon cycling
- Assisted students in general ecology laboratory

University of Kentucky, Lexington, KY

Graduate Assistant (June 2002 – June 2004)

- Performed research in restoration ecology and soil biogeochemistry of calcareous glades
- Taught dendrology and tree species identification to undergraduate students

PUBLICATIONS

Lyon, D. R. (2016). Methane emissions from the natural gas supply chain. In: Kaden, D.A. and Rose, T.L. eds. *Environmental and Health Issues in Unconventional Oil and Gas Development*. Elsevier. pp. 33-48.

Lyon, D. R., Alvarez, R. A., Zavala-Araiza, D., Brandt, A. R., Jackson, R. B., & Hamburg, S. P. (2016). Aerial surveys of elevated hydrocarbon emissions from oil and gas production sites. *Environmental Science & Technology*, 50 (9), pp 4877–4886, DOI: 10.1021/acs.est.6b00705.

Lyon, D. R., Zavala-Araiza, D., Alvarez, R. A., Harriss, R., Palacios, V., Lan, X., ... & Herndon, S. C. (2015). Constructing a spatially resolved methane emission inventory for the Barnett Shale region. *Environmental science & technology*, 49(13), 8147-8157.

- Alvarez, R. A., Zavala-Araiza, D., Lyon, D. R., Allen, D. T., Barkley, Z. R., Brandt, A. R., ... & Kort, E. A. (2018). Assessment of methane emissions from the US oil and gas supply chain. *Science*, eaar7204.
- Englander, J. G., Brandt, A. R., Conley, S., Lyon, D. R., & Jackson, R. B. (2018). Aerial Interyear Comparison and Quantification of Methane Emissions Persistence in the Bakken Formation of North Dakota, USA. *Environmental science & technology*, 52(15), 8947-8953.
- Lavoie, T. N., Shepson, P. B., Cambaliza, M. O., Stirm, B. H., Conley, S., Mehrotra, S., ... & Lyon, D. (2017). Spatiotemporal variability of methane emissions at oil and natural gas operations in the Eagle Ford Basin. *Environmental science & technology*, 51(14), 8001-8009.
- Lavoie, T. N., Shepson, P. B., Gore, C. A., Stirm, B. H., Kaeser, R., Wulle, B., Lyon, D. & Rudek, J. (2017). Assessing the methane emissions from natural gas-fired power plants and oil refineries. *Environmental science & technology*, 51(6), 3373-3381.
- Zavala-Araiza, D., Alvarez, R. A., Lyon, D. R., Allen, D. T., Marchese, A. J., Zimmerle, D. J., & Hamburg, S. P. (2017). Super-emitters in natural gas infrastructure are caused by abnormal process conditions. *Nature communications*, 8, 14012.
- Alvarez, R. A., Lyon, D. R., Marchese, A. J., Robinson, A. L., & Hamburg, S. P. (2016). Possible malfunction in widely used methane sampler deserves attention but poses limited implications for supply chain emission estimates. *Elementa*, 4.
- Marrero, J. E., Townsend-Small, A., Lyon, D. R., Tsai, T. R., Meinardi, S., & Blake, D. R. (2016). Estimating Emissions of Toxic Hydrocarbons from Natural Gas Production Sites in the Barnett Shale Region of Northern Texas. *Environmental Science & Technology*, 50(19), 10756-10764.
- Lamb, B. K., Cambaliza, M. O., Davis, K. J., Edburg, S. L., Ferrara, T. W., Floerchinger, C., ... & Lyon, D. R. (2016). Direct and indirect measurements and modeling of methane emissions in Indianapolis, Indiana. *Environmental Science & Technology*, 50(16), 8910-8917.
- Townsend-Small, A., Ferrara, T. W., Lyon, D. R., Fries, A. E., & Lamb, B. K. (2016). Emissions of coalbed and natural gas methane from abandoned oil and gas wells in the United States. *Geophysical Research Letters*, 43(5), 2283-2290, DOI: 10.1002/2015GL067623.
- Zavala-Araiza, D., Lyon, D. R., Alvarez, R. A., Davis, K. J., Harriss, R., Herndon, S. C., ... & Marchese, A. J. (2015). Reconciling divergent estimates of oil and gas methane emissions. *Proceedings of the National Academy of Sciences*, 112(51), 15597-15602, DOI: 10.1073/pnas.1522126112
- Zavala-Araiza, D.; Lyon, D. R.; Alvarez, R. A.; Palacios, V.; Harriss, R.; Lan, X.; Talbot, R.; Hamburg, S. P. (2015). Towards a Functional Definition of Methane Super-Emitters: Application to Natural Gas Production Sites. *Environmental Science & Technology*, 49, DOI: 10.1021/acs.est.5b00133.

Karion, A.; Sweeney, C.; Kort, E. A.; Shepson, P. B.; Brewer, A.; Cambaliza, M. O. L.; Conley, S.; Davis, K. J.; Deng, A.; Hardesty, M.; Herndon, S. C.; Lauvaux, T.; Lavoie, T.; Lyon, D. R.; Newberger, T.; Petron, G.; Rella, C.; Smith, M.; Wolter, S.; Yacovitch, T.; Tans, P. (2015). Aircraft-based estimate of total methane emissions from the Barnett Shale region. *Environmental Science & Technology*, 49, DOI: 10.1021/acs.est.5b00217.

Yacovitch, T. I.; Herndon, S. C.; Pétron, G.; Kofler, J.; Lyon, D. R. ; Zahniser, M. S.; Kolb, C. E. (2015). Mobile Laboratory Observations of Methane Emissions in the Barnett. *Environmental Science & Technology*, 49, DOI: 10.1021/es506352j.

Lavoie, T. N.; Shepson, P. B.; Cambaliza, M. O. L.; Stirm, B. H.; Karion, A.; Sweeney, C.; Yacovitch, T. I.; Herndon, S. C.; Lan, X.; Lyon, D. R. (2015). Aircraft-Based Measurements of Point Source Methane Emissions in the Barnett Shale Basin. *Environmental Science & Technology*, 49, DOI: 10.1021/acs.est.5b00410.

Harriss, R.; Alvarez, R. A.; Lyon, D. R.; Zavala-Araiza, D.; Nelson, D.; Hamburg, S. P. (2015). Using Multi-Scale Measurements to Improve Methane Emission Estimates from Oil and Gas Operations in the Barnett Shale Region, Texas. *Environmental Science & Technology*, 49, DOI: 10.1021/acs.est.5b02305.