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Education

Ph.D. Geography & Environmental Engineering, Johns Hopkins University, Baltimore, Maryland.
(2003). Dissertation: "Organic Nitrogen Isotope Stratigraphy, Palynology, and Sediment History of Freshwater Wetlands in the Chesapeake Bay Basin".

Advisor: Grace S. Brush

M.S., Geography & Environmental Engineering, Johns Hopkins University, Baltimore, Maryland.
(1999).

B.A. Environmental Science, University of Virginia, Charlottesville, Virginia. (1995).

Positions and Work Experience

University of Pittsburgh. Pittsburgh, Pennsylvania.

Department of Geology and Environmental Science.

Professor (April 2019 – present);

Associate Professor (September 2014 – April 2019);

Assistant Professor (January 2007- August 2014)

Director, *Pittsburgh Collaboratory for Water Research, Education, and Outreach* (Jan. 2018-present)

Director, *Pitt Isotope Tracers Lab* (2010-present)

U.S. Geological Survey. Menlo Park, California.

Physical Scientist/Postdoctoral Associate, Water Resources Division, September 2003-October 2006. Advisor: Carol Kendall

Honors and Awards

2021 Howard Hughes Medical Institute, Gilliam Fellow Mentor

2019 MCSI Sustainability Award, Faculty category, University of Pittsburgh.

2018 Sulzman Award for Excellence in Education and Mentoring. American Geophysical Union, Biogeosciences section. **Citation:** *Eos*, 99, <https://doi.org/10.1029/2018EO108293>.

2018 Sustainability Faculty Fellow, University of Pittsburgh, January-December 2018, \$25,000

2017 Sustainability Faculty Fellow, University of Pittsburgh, January-December 2017, \$25,000

2017 Carnegie Science Award, Environment Award Honorable Mention, 2017. "The Environmental Award recognizes outstanding achievements in the fields of

environmental protection and restoration that benefit the economy, health, and quality of life in our region.”

- 2015 Science and Engineering Ambassador, National Academy of Sciences and National Academy of Engineering. September 2015-2018.
- 2013 Blativnik Award for Young Scientists, University of Pittsburgh nominee, 2013.
- 2013 National Science Foundation CAREER award, 2013-2018. NSF’s “most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research”.
- 2013 Carnegie Science Award, Environment Award Honorable Mention, 2013. “The Environmental Award recognizes outstanding achievements in the fields of environmental protection and restoration that benefit the economy, health, and quality of life in our region.”
- 2002 Achievement Rewards for College Scientists (ARCS) Foundation Scholar, \$15,000.
- 2001 Achievement Rewards for College Scientists (ARCS) Foundation Scholar, \$15,000
- 2002 Geological Society of America (GSA) Graduate Student Research Award. “A Dual Isotope Approach for Reconstructing Nitrogen Sources and Fluxes to Wetlands.” May 2002, \$2,500.
- 1991 National Science Scholar

Research and Education Productivity Summary

Research Funding (as Sole PI, Lead PI, or Co-PI)

National Science Foundation:	\$ 4, 335,898
Other Federal Support:	\$ 982,205
Foundation Support:	\$ 1,115,000
Internal Competitive Sources:	\$ 118,000

Productivity (as of January 2022)

Citations: 3.937

h-index: 27, i10-index: 35

Journal Publications: 46 published

Book Chapters: 1 published

Published Abstracts: 59 published

Conference Presentations, excluding those accompanied by published abstracts: 69

Invited Research Seminars and Presentations: 44

PhD Students Supervised: 4 completed, 3 in progress

M.S. Students Supervised: 3 completed

Undergraduate Students Supervised: 13 completed, 2 in progress

Post-doctoral Researchers Supervised: 2 completed, 1 in progress

Graduate Program Development:

- 2019 Created new graduate core course, Science Communication (GEOL2001)
- 2018 Led development of a strategic hiring plan, Geospatial Science
- 2014 Chaired faculty search committee, Hydrology and Surface Processes
- 2013 Led attainment of new faculty position through Sustainability cluster hire

Undergraduate Program Development:

- 2019 Led establishment of a [Water Scholar Community](#), University Honors College
- 2016 Led proposal, creation of undergraduate [Sustainability Certificate](#)
- 2016 Developed new core course, Ecosystem Ecology (GEOL1641)
- 2015 Helped create, launch new major, [B.S. Environmental Science](#). [Press Release](#).

Leadership Roles and Responsibilities

Pittsburgh Water Collaboratory

Co-founder and Director, 2017-present

The [Pittsburgh Water Collaboratory](#) aims to expand water-related research of impact and community-engaged learning opportunities for faculty, researchers, and students across the University of Pittsburgh community. My role as Director includes:

- Lead conversations about visioning and strategic planning
- Facilitate development of strong relations with communities and water practitioners through outreach coordination, engagement efforts, and research projects that link faculty expertise to community needs
- Develop collaborative opportunities for researchers and students across the University of Pittsburgh on issues related to water and water sustainability
- Cultivate next generation workforces trained in water science and sustainability, community engagement, and science communication through job placement of program graduates
- Mobilize faculty, administrators, and students at the University of Pittsburgh
- Engage with foundation program officers, craft proposals, manage budget
- Supervise reporting, assessment, and activities of the Outreach Coordinator

Pitt Isotope Tracers Laboratory+

Director, 2010-present

+formerly called the “Regional Stable Isotope Laboratory for Earth and Environmental Science Research”

- Oversee development of new methods and applications of stable isotope tracers in Earth systems
- Disseminate findings through conference presentations and peer-reviewed publications
- Train graduate students and researchers in methods for stable isotope analyses

- Hire and supervise Laboratory Manager
- Manage budget; supervise cost center income and expenditures
- Facilitate use of stable isotope techniques by the broader community by maintaining cost center facility

National Atmospheric Deposition Program (NADP)

Executive Committee Chair (2016), Vice Chair (2015), Secretary (2014).

The National Atmospheric Deposition Program is a cooperative of partners that work together to monitor precipitation chemistry across the U.S. since 1978. The Executive Committee of the NADP executes decisions and actions brought forward by the subcommittees, advisory committees, science committees, and ad hoc groups; makes budgetary decisions; and ensures program continuity, stability, and balance. My responsibilities as Chair included

- presiding over spring and fall meetings of the Executive Committee,
- creating meeting agendas, and
- oversight of adhoc committees.

Research Support

Sole Principal Investigator (\$2.18M)

1. Resolving uncertainties in sewage subsidies to urban aquatic ecosystems using continuous sensing and stable isotopes. National Science Foundation- Hydrologic Sciences. \$389,205. 2/1/2020 to 1/31/2023.
2. CAREER: Air-ecosystem-water interactions of reactive nitrogen in urban systems. *National Science Foundation- Hydrologic Sciences*. \$550,000. 2/1/2013 to 1/31/2019.
3. Characterizing reactive nitrogen emissions and deposition associated with Marcellus Shale development activity. *Department of Energy- National Energy Technology Laboratory*. \$228,000. 1/1/2014 to 12/31/2016.
4. EMERGING TOPICS IN BIOGEOCHEMICAL CYCLES: A new tool for assessing nitrogen saturation status in forests— Mass-independent $\Delta^{17}\text{O}$ of nitrate. *National Science Foundation- Hydrologic Sciences*. \$515,033. 8/2009 to 7/2014.
5. Assessing the influence of nutrient sources to urban streams through the use of triple nitrate isotopes. *Pennsylvania Water Resources Research Institute*. \$20,000. 3/2011 to 2/2012.
6. The Stable Nitrogen Isotope Composition of Coal-Fired Power Plant NO_x: Phase 2. *Electric Power Research Institute*. \$40,012. 01/2010 to 12/2010.
7. An assessment of near-highway nitrogen deposition using stable isotope tracers and passive sampling techniques. *Maryland Department of Natural Resources, Power Plant Research Program*. \$14,508. 5/2009 to 4/2010;
8. The Stable Nitrogen Isotopic Composition of NO_x in Coal-Fired Power Plant Stacks *Electric Power Research Institute*. \$63,000. 12/2008 to 11/2009.

9. Stable Isotopes of Reactive Nitrogen and Particulate Matter: Improved Tools for Characterizing the Transport and Fate of Agricultural Emissions. *U.S. Department of Agricultural, CSREES, National Research Initiative, Air Quality Program*. \$400,000. 1/2008 to 12/2010.
10. Isotopic investigation of anthropogenic sources of atmospheric nitrogen and carbon to vegetation along an urban to rural gradient. *U.S. Forest Service, Northern Global Change Research Program*. \$40,000. 5/2007 to 4/2010.

Lead Principal Investigator (\$1.9M, \$480K pending)

11. Assessing harmful algal blooms in the Ohio River: Drinking Water in a Changing Climate. Hillman Family Foundation. Lead Principal Investigator. Co-Principal Investigator: John Gardner (GES, Pitt). \$300,000. 1/1/22 to 12/31/23.
12. Transcending Disciplines to Advance Regional Water Equity. University of Pittsburgh, Momentum Funds. Lead Principal Investigator. Co-Principal Investigators: Dan Bain (GES, Pitt), Jackie Smith (Sociology, Pitt), Marcela Gonzalez-Rivas (Graduate School of Public & International Affairs, Pitt), Noble Maseru (Public Health, Pitt), \$60,000. 9/1/21 to 8/30/22.
13. Partnering for Cleaner Rivers. University of Pittsburgh, Year of Engagement award. Lead Principal Investigator. Co-Principal Investigators: Dan Bain (GES, Pitt), Eitan Shelef (Pitt, GES). \$8,000. 7/1/21 to 6/30/22.
14. Pittsburgh Collaboratory for Water Research, Education and Outreach. Heinz Endowments. Lead Principal Investigator. Co-Principal Investigators Daniel Bain (GES, Pitt), Eitan Shelef (GES, Pitt), John Gardner (GES, Pitt). \$165,000. 7/1/21 to 6/30/22.
15. Pittsburgh Collaboratory for Water Research, Education and Outreach. Heinz Endowments. Lead Principal Investigator. Co-Principal Investigators Daniel Bain (GES, Pitt), Eitan Shelef (GES, Pitt). \$145,000. 7/1/20 to 6/30/21.
16. Pittsburgh Collaboratory for Water Research, Education and Outreach. Heinz Endowments. Lead Principal Investigator. Co-Principal Investigators Daniel Bain (GES, Pitt), Eitan Shelef (GES, Pitt), Brian Thomas (GES, Pitt). \$185,000. 1/1/19 to 12/31/20.
17. Pittsburgh Collaboratory for Water Research, Education and Outreach. Heinz Endowments. Lead Principal Investigator. Co-Principal Investigators Daniel Bain (GES, Pitt), Eitan Shelef (GES, Pitt), Brian Thomas (GES, Pitt). \$320,000. 1/1/18 to 12/31/18.
18. Energy, Environment and Society Learning Network (ENERGY NET): Enhancing opportunities for learning using an Earth systems science framework. National Science Foundation-Geoscience Education. Lead Principal Investigator. Co-Principal Investigators: Daniel Bain (GES, Pitt), Kevin Crowley (LRDC, Pitt), Mary Ann Steiner (Carnegie Museum of Natural History). \$500,000; \$299,000 (to UPitt) 9/1/2012 to 8/31/2016.
19. Early Career Investigator Support: Development of a Regional Stable Isotope Laboratory For Earth & Environmental Science Research. National Science Foundation- Earth Sciences, Instrumentation and Facilities. Lead Principal Investigator. Co-Principal Investigators: Daniel Bain (GES, Pitt), Mark Abbott (GES, Pitt), Mike Rosenmeier (GES, Pitt). \$185,000. 8/2009 to 7/2012.

Co-Principal Investigator (\$2.6M)

20. ECO-CBET: Sustainability from the Bottom Up- A Holistic Solution to Balancing the N-Cycle. National Science Foundation. Co-Principal Investigator. Principal Investigator: Leanne Gilberston (Pitt, CEE). Other Co-Principal Investigator: Steven Little (Pitt, ChemE). \$1,699,999. 9/1/21 to 8/30/25.
21. RAPID: Quantifying chemical and microbial changes in urban watersheds following phosphate addition to drinking water. National Science Foundation- Ecosystem Science. Co-Principal Investigator. Principal Investigator: Sarah Haig (Pitt, CEE). \$175,000. 4/1/2019 to 3/31/2020.
22. Collaborative Research: Cyanobacteria, nitrogen cycling, and export production in the Laurentian Great Lakes. NSF Chemical Oceanography. Co- Principal Investigator. Principal Investigator: Josef Werne (Pitt, GES). Other Co-Principal Investigators: Trinity Hamilton (University of Minnesota), Silvia Newell (Wright State University). \$585,050. 1/1/2020 to 12/31/2022.
23. Quantifying Reductions in Diesel-Related Air Pollution Exposures across Downtown Pittsburgh. Mascaro Center for Sustainable Innovation. Co-Principal Investigator. Principal Investigator: Jane Clougherty (Public Health, Pitt). \$50,000. 11/1/15 to 6/30/16.
24. US-Japan Joint Seminar on Responses of Catchment Hydrology and Forest Biogeochemistry to Climatic and Environmental Change National Science Foundation- Hydrologic Sciences. Co-Principal Investigator. Principal Investigator: Kevin McGuire (VaTech). Other Co-Principal Investigators: Brian McGlynn (Duke U.), Mark Green (Plymouths State U.), Steve Sebestyen (USFS). \$51,526. 2/1/2013 to 1/31/2014.
25. Early Career: Acquisition of an Inductively Coupled Plasma - Mass Spectrometer (ICP-MS) for Research in Geochemical, Environmental, and Paleoenvironmental Geoscience National Science Foundation- Hydrologic Sciences. Co-Principal Investigator. Principal Investigator: Daniel Bain (GES, Pitt). Other Co-Principal Investigators: Mark Abbott (GES, Pitt), Brian Stewart (GES, Pitt), Mike Rosenmeier (GES, Pitt). \$166,469. 6/2010 to 5/2012.

Publications

All publications are available electronically, as well as up-to-date Google Scholar and ResearcherID citation information: <http://www.pitt.edu/~eelliott>. *University of Pittsburgh advisee of EM Elliott. # International visiting scholar advised by EM Elliott.

Peer-Reviewed Publications (46 published)

1. #Huang, S, Fang, Y, Zhu F, Elliott EM, Felix JD, Wang F, Li S, Liu D, Song L, Li Z, Fu P, Fu S. 2021. Multi-year measurements on ¹⁵N natural abundance of precipitation nitrate at a rural forested site. Atmospheric Environment. 253. <https://doi.org/10.1016/j.atmosenv.2021.118353>

2. *Yu Z and **Elliott EM**. 2021. Nitrogen isotope fractionations during nitric oxide production in an agricultural soil. *Biogeosciences*. 18(3): 805-829.
<https://bg.copernicus.org/articles/18/805/2021/bg-18-805-2021.html>.
3. *Yu Z and **Elliott EM**. 2020. Nitrogen isotope fractionations during nitric oxide production in an agricultural soil. *Biogeosciences Discussion*. Published online 10.20.2020.
<https://doi.org/10.5194/bg-2020-344>.
4. Guillen, LA, Adams MB, **Elliott EM**, Hubbart J, Kelly C, McNeil B, Peterjohn W, Zegre W. 2021. The Fernow Experimental Forest, West Virginia, USA: Insights, datasets, and opportunities. *Hydrological Processes*. [10.22541/au.159708681.11369026](https://doi.org/10.22541/au.159708681.11369026)
5. #Huang, S., Wang, F., **Elliott, E.M.**, Zhu, F., Zhu, W., Koba, K., Yu, Z., Hobbie, E.A., Michalski, G., Kang, R., Wang, A., Zhu, J., Fu, S., Fang, Y. 2020. Multiyear Measurements on $\Delta^{17}\text{O}$ of Stream Nitrate Indicate High Nitrate Production in a Temperate Forest. *Environmental science & technology*. 54 (7), 4231-4239. <https://doi.org/10.1021/acs.est.9b07839>
6. *Coughlin JG, **Elliott EM**, *Rose LA, Pekney N, Reeder M. 2020. Quantifying atmospheric reactive nitrogen concentrations, deposition, and isotope dynamics surrounding a Marcellus Shale well pad. *Atmospheric Environment*. 223: 117196.
<https://doi.org/10.1016/j.atmosenv.2019.117196>
7. Wetherbee, GA, Benedict, KB, Murphy, SF, **Elliott, EM**. 2019. Inorganic nitrogen wet deposition gradients in the Denver-Boulder metropolitan area and Colorado Front Range - Preliminary implications for Rocky Mountain National Park and interpolated deposition maps. *Science of the Total Environment*. 691: 1027-1042.
<https://doi.org/10.1016/j.scitotenv.2019.06.528>
8. Walker, J.T., Beachley, G.M., Amos, H.M., Baron, J.S., Bash, J., Baumgardner, R., Bell, M.D., Benedict, K.B., Chen, X., Clow, D.W., Cole, A., *Coughlin, J.G., Cruz, K., Daly, R.W., Decina, S.M., **Elliott, E.M.**, Fenn, M.E., Ganzeveld, L., Gebhart, K., Isil, S.S., Kerschner, B.M., Larson, R.S., Lavery, T., Lear, G.G., Macy, T., Mast, M.A., Mishoe, K., Morris, K.H., Padgett, P.E., Pouyat, R.V., Puchalski, M., Pye, H.O.T., Rea, A.W., Rhodes, M.F., Rogers, C.M., Saylor, R., Scheffe, R., Schichtel, B.A., Schwede, D.B., Sexstone, G.A., Sive, B.C., Templer, P.H., Thompson, T., Tong, D., Wetherbee, G.A., Whitlow, T.H., Wu, Z., *Yu, Z., Zhang, L. 2019. Toward the improvement of total nitrogen deposition budgets in the United States. *Science of the Total Environment*. 691: 1328-1352.
<https://doi.org/10.1016/j.scitotenv.2019.07.058>
9. **Elliott, EM**, *Yu Z, Cole AS, *Coughlin JG. 2019. Isotopic advances in understanding reactive nitrogen deposition and atmospheric processing. *Science of the Total Environment*. Special Issue on Reactive Nitrogen Deposition. 662:393-403.
<https://doi.org/10.1016/j.scitotenv.2018.12.177>
10. #Huang, S, **Elliott, EM**, *Felix, JD, Pan, Y, Liu, D, Li, S, Li, Z, Zhu, F, Zhang, N, Fu, P, Fang, Y. 2019. Seasonal pattern of ammonium ^{15}N natural abundance in precipitation at a rural

- forested site and implications for NH₃ source partitioning. *Environmental Pollution*. 247:541-549. <https://doi.org/10.1016/j.envpol.2019.01.023>
11. *Rose, LA, *Yu, Z, Bain, DJ, **Elliott, EM**. 2019. High Resolution, Extreme Isotopic Variability of Precipitation Nitrate. *Atmospheric Environment*. 207:63-74. <https://doi.org/10.1016/j.atmosenv.2019.03.012>.
 12. Novak, M, Jackova, I, Curik, J, Pacherova, P, **Elliott, E**, Cejkova, B, Valkova, I, Prechova, E, Stepanova, M, Buzek, F. 2019. $\delta^{15}\text{N}$ systematics in two minerotrophic peatlands in the eastern U.S.: Insights into nitrogen cycling under moderate pollution. *Global Ecology & Conservation*. 17. e0057. <https://doi.org/10.1016/j.gecco.2019.e00571>
 13. Sebestyen, S ; Ross, D; Shanley, J; **Elliott, EM**; Kendall, C; Campbell, J; Dail, D; Fernandez, I; Goodale, C; Lawrence, G; Lovett, G; McHale, P; Mitchell, M; Nelson, S; Shattuck, M; Wickman, T; Barnes, R; Bostic, J; Buda, A; Burns, D; Eshleman, K; Finlay, J; Nelson, D; Ohte, N; Pardo, L; *Rose, L; Sabo, R; Schiff, S; Spoelstra, J; Williard, K. 2019. Unprocessed atmospheric nitrate in waters of the Northern Forest Region in the USA and Canada. *Environmental Science & Technology*. 53:3620-3633. <http://dx.doi.org/10.1021/acs.est.9b01276>
 14. *Yu, Z. and Elliott, EM. 2018. Probing soil nitrification and nitrate consumption using $\Delta 17\text{O}$ of soil nitrate. *Soil biology & biochemistry*. 127(187-199). <https://doi.org/10.1016/j.soilbio.2018.09.029>
 15. *Yu, Z and **Elliott EM**. 2017. A novel method for nitrogen isotopic analysis of soil-emitted nitric oxide (NO). *Environmental Science & Technology*. 51(11)6268-6278. DOI: [10.1021/acs.est.7b00592](https://doi.org/10.1021/acs.est.7b00592)
 16. *Coughlin, JG, Rose, LA, Bain, DJ, **Elliott, EM**. 2017. The Influence of Marcellus Shale Extraction Emissions on Regionally Monitored Dry Reactive Nitrogen Deposition. *Environmental Science & Technology*. 51(6) 3542-3549. <https://doi.org/10.1021/acs.est.6b05933>.
 17. *Coughlin, JG, Yu, Z, **Elliott, EM**. 2017. Efficacy for Passive NO₂ Sampler Collection of $\delta^{15}\text{N}$ -NO₂ under Varying Simulated Environmental Conditions. *Rapid Communications in Mass Spectrometry*. 31:1211-1220. DOI: <https://doi.org/10.1002/rcm.7885>
 18. *Felix, JD, **Elliott, EM**, Gay, DA. 2017. Spatial and temporal patterns of nitrogen isotopic composition of ammonia at U.S. ammonia monitoring network sites. *Atmospheric Environment*. 150:434-442. <http://dx.doi.org/10.1016/j.atmosenv.2016.11.039>
 19. Rossi, RJ, Bain, DJ, **Elliott, EM**, *Divers, M, O'Neill, B. 2016. Hillslope soil water flowpaths and the dynamics of roadside soil cation pools influenced by road deicers. *Hydrological Processes*. 31:177-190. DOI: <https://doi.org/10.1002/hyp.10989>
 20. *Rose L, **Elliott, EM**, Adams, MB. 2015. Triple nitrate isotopes indicate differing nitrate source contributions to streams across a nitrogen saturation gradient. *Ecosystems*. 18(7)1209-1223. DOI: [10.1007/s10021-015-9891-8](https://doi.org/10.1007/s10021-015-9891-8).

21. *Rose, L, Sebestyen, S, **Elliott EM**, Koba, K. 2015. Drivers of Atmospheric Nitrate Processing in Forested Catchments. Review Article. *Water Resources Research*. 51(2):1333-1352.
22. *Felix, JD, **Elliott, EM**, Avery, GB., Kieber, R, Mead, R, Willey J, Mullaugh, K. 2015. Isotopic composition of nitrate in sequential Hurricane Irene precipitation samples: Implications for changing NO_x sources. Short Communication. *Atmospheric Environment*. 106: 191-195.
23. *Divers MT, **Elliott, EM**, Bain, DJ. 2014. Quantification of Nitrate Sources to an Urban Stream Using Dual Nitrate Isotopes. *Environmental Science & Technology*. 48(18): 10,580-10,587.
24. Bain DJ, Copeland EM, *Divers MT, Hecht M, Hopkins KG, Hynicka J, Koryak M, Kostalos M, Brown L, **Elliott EM**, Fedor J, Gregorich M, Porter B, Smith B, Tracey C, Zak M. 2014. Characterizing a Major Urban Stream Restoration Project: Nine Mile Run (Pittsburgh, PA, USA). *Journal of the American Water Resources Association (JAWRA)*. 50(6): 1608-1621.
25. *Felix JD, **Elliott EM**, Gish T, Magrihang R, Clougherty J, Cambal, L. 2014. Examining the transport of ammonia emissions across landscapes using nitrogen isotope ratios. *Atmospheric Environment*. 95:563-570.
26. *Felix, JD and **Elliott, EM**. 2014. The isotopic composition of passively collected nitrogen dioxide emissions: Vehicle, soil and livestock source signatures. *Atmospheric Environment*. 92:359-366.
27. McGuire, KJ, Sebestyen, SD, Ohte, N, **Elliott, EM**, Gomi, T, Green, MG, McGlynn, ML, Tokuchim, N. 2014. Merging perspectives in the catchment sciences: the US-Japan Joint Seminar on catchment hydrology and forest biogeochemistry. *Hydrological Processes*. 28(5):2878-2880.
28. *Divers MT, **Elliott, EM**, Bain, DJ. 2013. Constraining nitrogen inputs to urban streams from leaking sewer infrastructure using inverse modeling: Implications for DIN retention in urban environments. *Environmental Science & Technology*. 47 (4): 1816–1823.
29. *Divers MT, Elliott, EM, Bain, DJ. 2013. Response to Comment on “Constraining Nitrogen Inputs to Urban Streams from Leaking Sewers Using Inverse Modeling: Implications for DIN Retention in Urban Environments”. *Environmental Science & Technology*. 47(12): 6721-6721.
30. *Felix, JD and Elliott, EM. 2013. The agricultural history of human-nitrogen interactions as recorded in ice core $\delta^{15}\text{N-NO}_3$. *Geophysical Research Letters*. 40, 1–5, doi:10.1002/grl.50209, 2013.
31. *Felix, JD, Elliott, EM, Gish, T, McConnell, L, Shaw, S. 2013. Characterizing the isotopic composition of atmospheric ammonia emission sources using passive samplers and a

- combined oxidation-bacterial denitrifier isotope ratio mass spectrometry method. *Rapid Communications in Mass Spectrometry*. 27 (20), 2239-2246.
32. Hastings, MG, Casciotti KL, Elliott, EM. 2013. Stable isotopes as tracers of anthropogenic nitrogen sources, deposition, and impacts. *Elements: An International Magazine of Mineralogy, Geochemistry, and Petrology*. 9 (5), 339-344. (Invited review for a special volume "Nitrogen and its (biogeocosmo)chemical cycling" edited by Gray Bebout, Marilyn Fogel, and Pierre Cartigny.)
 33. *Redling, KM, Elliott, EM, Bain, DJ, Sherwell, J. 2013. Highway contributions to reactive nitrogen deposition: Tracing the fate of vehicular NO_x using stable isotopes and plant biomonitors. *Biogeochemistry*. 116(1-3): 261-274.
 34. *Felix, JD, Elliott, EM, Shaw, SL. 2012. Nitrogen isotopic composition of coal-fired power plant NO_x: Influence of emission controls and implications for global emission inventories. *Environmental Science & Technology*. 46(6): 3528-3535.
 35. Bain, DJ, Green, MB, Campbell, J, Chamblee, J, Chaoka, S, Fraterrigo, J, Kaushal, S, Martin, S, Jordon, T, Parolari, T, Sobczak, B, Weller, D, Wollheim, WM, Boose, E, Duncan, J, Gettel, G, Hall, B, Kumar, P, Thompson, J, Vose, J, Elliott, EM, Leigh, D. 2012. Legacies in Material Flux: Structural Changes before Long-term Studies. *BioScience*. 62(6): 575:584.
 36. Kaushal, SS, Groffman, PM, Band, LE, Elliott, EM, Shields, CA, Kendall, C. 2011. Tracking nonpoint source nitrogen pollution in human-impacted watersheds. *Environmental Science & Technology*. 45(9): 8225-8232.
 37. Elliott, EM, Kendall, C, Boyer, EW, Burns, DA, Lear, GG, Golden, HE, Harlin, K, Bytnerowicz, A, Butler, TJ, Glatz R. 2009. Dual nitrate isotopes in dry deposition: Utility for partitioning NO_x source contributions to landscape nitrogen deposition. *Journal of Geophysical Research: Biogeosciences*. 114, G04020, doi:10.1029/2008JG000889.
 38. Burns, DA, Boyer, EW, Elliott, EM, Kendall, C. 2009. Sources and transformations of nitrate from streams draining varying land uses: Evidence from dual isotope analysis. *Journal of Environmental Quality*. 38: 1149-1159.
 39. Goodale CL, Thomas SA, Fredriksen G, Elliott, EM. 2009. Unusual seasonal patterns and inferred processes of nitrogen retention in forested headwaters of the Upper Susquehanna River. *Biogeochemistry*. 93:197-218.
 40. Chang, CCY, McCormick PV, Newman S, Elliott, EM. 2009. Isotopic indicators of environmental change in a subtropical wetland. *Ecological Indicators*. 9: 825-836.
 41. Golden, HE, Boyer, EW, Brown, MG, Elliott, EM, Lee DK. 2008. Simple approaches for measuring dry atmospheric nitrogen deposition to watersheds. *Water Resources Research*. 44:1-8. WOOD02.

42. Nanus, L, Williams, MW, Campbell, DH, Elliott, EM, Kendall, C. 2008. Evaluating regional patterns in nitrate sources to watersheds in National Parks of the Rocky Mountains using nitrate isotopes. *Environmental Science & Technology*. 42: 6487-6493.
43. Elliott, EM, Kendall, C, Wankel, SD, Burns, D.A., Boyer, E.W., Harlin, K., Bain, D.J., Butler, T.J. 2007. Nitrogen isotopes as indicators of NO_x source contributions to atmospheric nitrate deposition across the Midwestern and Northeastern United States. *Environmental Science & Technology*. 41: 7661-7667.
44. Elliott, EM, Brush, GS. 2006. Organic Nitrogen Isotopes Record Long-term Changes in Watershed Nitrogen Sources and Land Use. *Environmental Science & Technology*. 40(9): 2910-2916.
45. Bell ML, Hobbs BF, Elliott EM, Ellis H, Robinson Z. 2001. An evaluation of multi-criteria methods in integrated assessment in climate policy. *Journal of Multi-Criteria Decision Analysis*. 10:229–256.
46. Bell ML, Hobbs BF, Elliott EM, et al. 2000. An evaluation of multi-criteria decision-making methods in integrated assessment of climate policy. *Research and Practice in Multiple Criteria Decision Making*. 487: 228-237.

Book Contributions and Chapters (1)

**Kendall, C, Elliott EM, and Wankel, SD. 2007. Tracing Anthropogenic Inputs of Nitrogen to Ecosystems. In *Stable Isotopes in Ecology and Environmental Science* (2nd edition). Lajtha, K and Michener, RH (eds.) Blackwell Scientific Publications.

Other Publications (5)

- Elliott, Emily; Bain, Dan; Shelef, Eitan; Thomas, Brian; River, Mark; *Guy, Megan. 2020. Flooding in Southwestern Pennsylvania: Knowledge Gaps and Approaches. In conjunction with the Pittsburgh Collaboratory for Water Research. Pittsburgh, PA.
<http://dx.doi.org/10.18117/w8rj-wb49>
- Bain, Dan; Elliott, Emily; Thomas, Brian; Shelef, Eitan; River, Mark. 2019. Green Infrastructure for Stormwater Management: Knowledge Gaps and Approaches. In conjunction with the Pittsburgh Collaboratory for Water Research. Pittsburgh, PA. DOI.
<http://dx.doi.org/10.18117/p6tc9h>
- Bain, Daniel; Elliott, Emily; Shelef, Eitan; Thomas, Brian; River, Mark. 2019. Water Quality in Southwestern Pennsylvania: Knowledge Gaps and Approaches. In conjunction with the Pittsburgh Collaboratory for Water Research. Pittsburgh, PA.
<http://dx.doi.org/10.18117/5ch6-k459>
- Sebestyen, SD.; Kendall, C; Elliott, EM.; Schiff, SL.; Barnes, RT.; Bostic, JT.; Buda, AR.; Burns, DA.; Campbell, JL.; Dail, DB; Eshleman, KN.; Fernandez, IJ.; Finlay, JC.; Goodale, CL.; Griffiths, NA.; Hall, SJ.; Lawrence, GB.; Lovett, GM.; McHale, PJ.; Mitchell, MJ.; Nelson, DM.; Nelson, SJ.; Ohte, N; Pardo, LH.; *Rose, LA.; Ross, DS.; Sabo, RD.; Shanley, JB.; Shattuck, MD.; Spoelstra, J; Weintraub, SR.; Wickman, TR.; Williard, KW. 2019. Nitrate isotope database for meteoric

waters, surface waters, soil waters, and groundwaters. Fort Collins, CO: Forest Service Research Data Archive. <https://doi.org/10.2737/RDS-2019-0003>.

Walker, J.T., Beachley, G.M., Amos, H.M., Baron, J.S., Bash, J., Baumgardner, R., Bell, M.D., Benedict, K.B., Chen, X., Clow, D.W., Cole, A., *Coughlin, J.G., Cruz, K., Daly, R.W., Decina, S.M., Elliott, E.M., Fenn, M.E., Ganzeveld, L., Gebhart, K., Isil, S.S., Kerschner, B.M., Larson, R.S., Lavery, T., Lear, G.G., Macy, T., Mast, M.A., Mishoe, K., Morris, K.H., Padgett, P.E., Pouyat, R.V., Puchalski, M., Pye, H.O.T., Rea, A.W., Rhodes, M.F., Rogers, C.M., Saylor, R., Scheffe, R., Schichtel, B.A., Schwede, D.B., Sexstone, G.A., Sive, B.C., Templer, P.H., Thompson, T., Tong, D., Wetherbee, G.A., Whitlow, T.H., Wu, Z., *Yu, Z., Zhang, L. 2019. Science needs for continued development of total nitrogen deposition budgets in the United States. U.S. Environmental Protection Agency, Washington, DC, EPA 601/R-19/001. http://nadp.slh.wisc.edu/committees/tdep/reports/NADP_TDep_Nr_Deposition_White_Paper_v3.pdf

In review (3)

- *Balangoda A, *Forgrave R, *Zidar C, Dabundo R, *Hall E, Elliott EM. Ohio River Nutrient Trends and Hydrologic Change: 40 Years of Progress? In review, *Water Resources Research*.
- *Chung A, Elliott EM, Bain DB, Thomas BF, **River M, Nim CJ, ***Darden, J. Riverine Nitrogen Source and Yield in an Urban System. In review, *Frontiers in Ecology and the Environment*.
- *Forgrave, Elliott EM, Bain DB. Event-scale Hydrograph Responses Highlight Impacts of Widespread Stream Burial and Urban Infrastructure Failures. In review, *Hydrological Processes*.

Published Abstracts (60)

1. *Balangoda, A, Elliott, EM, *Dabundo, R, Spencer-Williams, I, Haig, S. The Impact of Large-Scale Drinking Water Orthophosphate Addition on Nutrient Dynamics in an Urban Stream Network. Fall Meeting of the American Geophysical Union. 2021
2. *Forgrave, R and Elliott, EM. Beyond flashy: assessing rapid chemical and flow event responses in a buried urban stream network in Pittsburgh, PA. Fall Meeting of the American Geophysical Union. 2021. Invited.
3. Elliott E.M., *Balangoda A, *Forgrave B, *Zidar, C, *Dabundo R, *Hall, E. Climate Change, Nutrient Trends, and Extensive Harmful Algal Blooms in the Ohio River System. Society for Freshwater Science Annual Meeting, Virtual, May 23-27 2021.
4. *Forgrave, R.K, and Elliott, E.M. The impact of sewage leak subsidies on baseflow diel nitrate fluctuations in Pittsburgh's Nine Mile Run. Society for Freshwater Science Annual Meeting, Virtual, May 23-27 2021.
5. *Balangoda, A., *Dabundo, R., Spencer-Williams, I. Haig, S., Elliott, E.M. Effects of Large-scale Drinking Water Orthophosphate Addition on Urban Stream Nutrient Dynamics and Eutrophication Potential. Society for Freshwater Science Annual Meeting. Virtual, May 23-27, 2021.

6. Elliott, E.M., *Balangoda, A., *Dabundo, R., Spencer-Williams, I., Haig, S. Biogeochemical Impacts of Drinking Water Orthophosphate Addition to an Urban Stream Network. ASLO-SFS Joint Annual Meeting, Madison, WI. June 2020. (Abstract accepted, event canceled due to Covid crisis).
7. *Forgrave, R., Elliott, E.M, Limitations of the concentration-discharge hysteresis framework for understanding water flowpaths in complex urban stream networks. ASLO-SFS Joint Annual Meeting, Madison, WI. June 2020. (Abstract accepted, event canceled due to COVID crisis).
8. Elliott, EM, *Rose LA, *Yu, Z. 2018. Deciphering land-atmosphere interactions of reactive nitrogen using high-frequency isotope analyses. Session: Stable isotopes and novel tracers in biogeochemical and atmospheric research. BG1.7. European Geophysical Union, Vienna, Austria 2018. Invited talk.
9. *Forgrave, R., Elliott, EM, Bain, DJ, Thomas, BF. Linking Hydrology and Nitrogen Biogeochemistry in an Urban Stream with Continuous Sensing and Stable Isotopes. Abstract # B53K-2206. December 10-14, 2018. Fall Meeting of the American Geophysical Union. Washington, D.C.
10. *Chung, AH, Elliott, EM, Nim, C, Sanchez, D, River, M. Characterization of Reactive Nitrogen Transport in Pittsburgh's Three Rivers During Dry-and Wet-Weather Conditions. Abstract #GC23H-1304. December 10-14, 2018. Fall Meeting of the American Geophysical Union. Washington, D.C.
11. Sebestyn, SD, Ross, D, Shanley J, Elliott, EM, et al. A database of nitrate isotopes in waters of the Northern Forest region in the USA and Canada. Abstract #H13J-1877. December 10-14, 2018. Fall Meeting of the American Geophysical Union. Washington, D.C.
12. *Yu, Zhongjie and Elliott, Emily. "Probing soil nitrogen transformations using triple nitrate isotopes", AGU Fall Meeting, 2017, New Orleans, LA.
13. *Yu, Z and Elliott EM. 2016. A novel method for collection of soil-emitted nitric oxide (NO) for natural abundance stable N isotope analysis . Abstract #B13F-0714. December 12-16, 2016. Fall Meeting of the American Geophysical Union. San Francisco, CA.
14. ‡*Yu, Z and Elliott EM. 2016. A novel dynamic flux chamber system for collection of soil-emitted nitric oxide (NO) for natural abundance stable N isotope analysis. Third Conference on Atmospheric Biogeosciences, American Meteorological Society. Salt Lake City, Utah. June 20-24, 2016. Outstanding Student Presentation.
15. *Coughlin JG, Rose L, Pekney N, Elliott EM. 2016. Reactive nitrogen emissions from Marcellus Shale natural gas activity and implications for regional deposition. 96th American Meteorological Society Annual Meeting. January 9-14, 2016. New Orleans, LA.
16. Rossi R, Elliott EM, Bain DJ, Crowley KJ, Steiner MA, *Divers MT, Hopkins KG, Giarratani L, Gilmore ME. 2014. ENERGY-NET (Energy, Environment and Society Learning Network): Best Practices to Enhance Informal Geoscience Learning. Abstract #ED51B-3432. December 15-19, 2014. Fall Meeting of the American Geophysical Union. San Francisco, CA.
17. *Rose, L and Elliott EM. Atmospheric and microbial nitrate contributions to streams across a regional nitrogen deposition gradient. Abstract #B11L-06. December 15-19, 2014. Fall Meeting of the American Geophysical Union. San Francisco, CA.

18. ‡*Rose, L and Elliott EM. Atmospheric Nitrate Processing in Forested Watersheds Along a Nitrogen Deposition Gradient. Abstract 1.5. May 11-15, 2014. American Meteorological Society, Second Conference on Atmospheric Biogeosciences. Portland, OR. Outstanding Student Presentation.
19. *Rose, L and Elliott EM. Extensive Microbial Processing of Atmospheric Nitrate Inputs Along a Nitrogen Deposition Gradient. Abstract #84560. March 06-09, 2014. Soil Science Society of America Ecosystem Services: Soil's Role in Restoring Ecosystem Services. Sacramento, CA.
20. *Rose, L and Elliott EM. Temporal Trends in Stream Nitrate Sources Across a Nitrogen Saturation Gradient. Abstract #B42D-03. December 9-15, 2013. Fall Meeting of the American Geophysical Union. San Francisco, CA.
21. *Felix, JD and Elliott EM. 2012. Investigating the sources, transport, and oxidation pathways of nitrogen oxide using nitrogen and oxygen stable isotopes. Abstract #A53N-0362. December 3-7, 2012. Fall Meeting of the American Geophysical Union. San Francisco, CA.
22. *Felix, J.D., Elliott, E.M. Examining the sources and transport of agricultural reactive N emissions using stable isotope techniques 244th American Chemical Society (ACS) National Meeting, August 19-23, 2012, Philadelphia, PA. Invited.
23. *Felix, JD and Elliott, EM. 2012. Investigating ammonia emission sources and transport using stable nitrogen isotopes. American Chemical Society National Meeting and Exposition. August 20, 2012, Philadelphia, PA. Abstract #106.
24. *Sikora, M.T., Elliott, E.M., Bain, D.J. 2012. Constraining nitrogen inputs to urban streams from leaking sewer infrastructure using inverse modeling: Implications for urban water quality. Abstract #H51P-06 presented at 2011 Fall Meeting, AGU, San Francisco, Calif. 5-9 Dec.
25. ‡*Rose L and Elliott EM. 2012. . Highly Variable $\delta^{15}\text{N}$ and $\delta^{18}\text{O}$ of Event-Based Precipitation Nitrate Indicate Dynamic Contributions from Biogenic and Anthropogenic NO_x Sources. Abstract #B41H-04. December 3-7, 2012. Fall Meeting of the American Geophysical Union. San Francisco, CA. Outstanding Student Presentation.
26. Cambal LK, Elliott EM, *Felix JD, Tunno B, Howell J, Michanowicz D, Carr JL, Gillooly S, Shields KN, Clougherty JE. Developing Methods to Determine the Nitrogen Isotopic Composition ($\delta^{15}\text{N}$) in NO_2 for Source Apportionment in an Urban Area. October 28 - November 1, 2012. 22nd Annual Meeting of the International Society of Exposure Science. Seattle, Washington.
27. Elliott EM, Bain DJ, *Divers MT, Crowley KJ, Povis-Tison K, Scardina A and Steiner MA. 2012. ENERGY-NET (Energy, Environment and Society Learning Network): Enhancing opportunities for learning using an Earth systems science framework. Abstract # ED33B-0768. December 3-7, 2012. Fall Meeting of the American Geophysical Union. San Francisco, CA.
28. Elliott, EM. From the landscape to the continent: Gaining insight into the sources and fate of atmospheric reactive nitrogen emissions using stable isotopes. Abstract #B41I-03. American Geophysical Union Fall Meeting, December 5 - 9, 2011 San Francisco, CA. Invited

29. *Felix, J.D., Elliott, E.M. Using stable isotopes of reactive N in dry and wet deposition to investigate the source, transport, and fate of NO_x and NH₃, American Geophysical Union Fall Meeting, December 5 - 9, 2011 San Francisco, CA. Invited
30. *Felix, J.D., Elliott, E.M., Maghirang, R., Briggs, J., McConnell, L., Gish, T., Hastings, M., Gay, D., 2012. Source apportionment and tracing of agricultural and fossil fuel reactive N emissions using stable isotopic composition. 242nd ACS National Meeting, August 28 to September 1, 2011, Denver, CO
31. *Redling, KM, Elliott, EM, Hom, JH. Sourcing dry N deposition in urban areas and implications for national N inventories. Abstract # B51F-0453. AGU Fall Meeting, December 5 - 9, 2011 San Francisco, CA.
32. Bain, DJ, *Sikora, MT, Wozniak, E, Fisher, KR, Carr, J, Elliott, EM. Quantifying Urban Water Subsidies with Hydrological Tracers of Domestic Water. Abstract# H53J-1542. AGU Fall Meeting, December 5 - 9, 2011 San Francisco, CA.
33. Bain, DJ, *Sikora, MT, Wozniak, EP, Fisher, KR, Elliott, EM. 2010. Adaptive management in urban stream restoration: Balancing water quality and channel structure. 95th Meeting of the Ecological Society of America. Pittsburgh, PA. Paper 6 in OOS 24.
34. Elliott, EM, *Middlecamp, KM, *Sikora MT. 2010. Spatial heterogeneity in atmospheric deposition and human engineering: Delivery of automobile emissions to aquatic systems. 95th Meeting of the Ecological Society of America. Pittsburgh, PA. August 2010. Paper 5 in SYMP20.
35. *Felix, JD and Elliott, EM. 2010. Apportionment of reactive N emissions using stable isotopes: Demonstrating proof of concept across spatial scales. EOS Trans. AGU, 91(52), Fall Meet. Suppl., Abstract #B42E-06. Invited.
36. *Felix, JD and Elliott, EM. 2010. Utilizing stable isotopes to characterize reactive nitrogen emissions and deposition. 95th Meeting of the Ecological Society of America. Pittsburgh, PA. Paper 173 in PS 47.
37. *Felix, JD, Elliott, EM, Shaw S. 2010. Stable nitrogen isotopes of NO_x at two coal-fired power plants. Air and Waste Management Association (AWMA), Symposium on Air Quality Measurement Methods and Technology, November 2-4, 2010, Los Angeles, CA. Control No.: 2010-A-86-ME-AWMA
38. Kaushal, S., Groffman, PM, Band, LE, Elliott, EM, Shields, CA, Kendall, C. 2010. Tracking nonpoint nitrogen pollution from urbanizing watersheds. EOS Trans. AGU, 91(52), Fall Meet. Suppl., Abstract #B41J-03.
39. Kaushal, SS, Groffman, PM, Band, LE, Elliott, EM, Shields, CA, Kendall, C, Mayer, P, Newcomer, TA . 2010. Tracking stream nitrogen sources using isotopes: implications for managing coastal eutrophication and urban sustainability. 95th Meeting of the Ecological Society of America. Pittsburgh, PA. Paper 4 in COS 26.
40. *Middlecamp, KM and Elliott, EM. 2010. Isotopic investigation of nitrogen deposition along a highway road gradient. 95th Meeting of the Ecological Society of America. Pittsburgh, PA. Paper 9 in COS 91.
41. *Rose, LA and Elliott, EM. 2010. $\Delta^{17}\text{O-NO}_3^-$: Application of a stable isotopic tracer to forest nitrogen saturation. 95th Meeting of the Ecological Society of America. Pittsburgh, PA. Paper 171 in PS 47.

42. *Middlecamp, KM, Elliott, E.M. 2009. Isotopic Investigation of Reactive Nitrogen Deposition Along a Highway Road Gradient. *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract #B11F-04
43. *Felix, JD, Elliott, EM., Ham, J., Gish, T., Adams, M., and McConnell, L. Distinguishing sources and fate of atmospheric reactive nitrogen and particulate matter using stable isotopes. 238th ACS National Meeting. August 16-20, 2009. Washington, DC.
44. Nanus, L, Campbell, DH, Ingersoll, G, Lehmann, C, Kendall C, Elliott, EM, Bohlke, JK. 2009. Determining Spatial and Temporal Variation in Sources of Nitrogen Deposition in the Rocky Mountains using Nitrogen Isotopes. *EOS Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract # H53D-0961.
45. *Sikora, MT, Elliott, E.M., Bain, D.J. 2009. Assessing the Role of Sewers and Atmospheric Deposition as Nitrate Contamination Sources to Urban Surface Waters using Stable Nitrate Isotopes. *EOS Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract # H42D-04.
46. Elliott, EM, Brush GS. 2009. A window to the landscape of Chesapeake's past: Reconstructing nitrogen dynamics and hydrologic conditions using stable isotope geochemistry and palynology. American Geophysical Union, Fall Meeting, December 14-18, 2009, San Francisco, CA. Abstract # H51J-04. Invited.
47. Burns, DA, Boyer, EW, Elliott, EM, Kendall, C. 2008. Sources and transformations of nitrate from streams draining varying land uses: Evidence from dual isotope analysis. *EOS Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract #H23J-07.
48. Elliott, EM, Kendall C, Tate C, Sprague L, Giddings E, Gregory MB, Falcone J. 2008. Nutrient sources to urban streams in three metropolitan areas of the United States using dual nitrate isotopes. *EOS Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract #H21H-0934.
49. Goodale, CL, Thomas, SA, Fredriksen, G, Elliott, EM, Flinn, KM, Butler, TJ. 2008. Unusual seasonal patterns and inferred processes of nitrogen retention in forested headwater catchments of the Upper Susquehanna basin. *EOS Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract #H11B-0749.
50. ‡*Sikora, MT, Elliott, EM, Bain, DJ. 2008. Nutrient input and dynamics in a restored urban stream impacted by mixed sewer systems. *EOS Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract #H21H-0935. Outstanding Student Presentation.
51. Elliott, E.M., Kendall, C., Boyer, E. W., Burns, D. A., Harlin, K., Lear, G., Wankel, S. D. Distinguishing NO_x Source Contributions to Wet and Dry Nitrate Deposition in the United States using Stable Isotopes. American Geophysical Union, Fall 2007. Invited.
52. Kendall, C, Elliott, EM, Wankel, SW, Boyer, EW, Burns, DA. 2007. Why do different anthropogenic sources of atmospheric nitrate have distinctive isotopic signatures? *EOS Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract B31A-0059.
53. Elliott, E.M., Kendall, C., Burns, D. A., Boyer, E. W., Harlin, K., Wankel, S. D., Butler, T. J., Carlton, R. 2006. Nitrate Isotopes in Precipitation to Distinguish NO_x Sources, Atmospheric Processes, and Source Areas in the United States, *EOS Trans. AGU*, 87(36), Jt. Assem. Suppl., Abstract H52B-01
54. Elliott, E.M.; Burns, D.A.; Boyer, E.W.; Kendall, C. 2006. Sources of Nitrogen to Streams of Varying Land Use as Determined Through Dual Isotope Analysis of Nitrate. *EOS Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract H12C-07.

55. Elliott, E.M.; Kendall, C, Harlin, K, Butler, TJ, Carlton, R, Wankel, SD, Boyer, EW, Burns, DA. 2005. What can nitrate isotopes in precipitation tell us about NO_x sources, atmospheric cycling, and source areas? Results from the first National survey in the United States. EOS Trans. AGU, 86(52), Fall Meet. Suppl., Abstract B54A-02.
56. Golden, HE, Boyer, EQ, Burns, DA, Elliott, EM, Kendall, C, Butler, TJ. 2005. Elucidating sources and factors affecting delivery of nitrogen to surface waters of New York state. EOS Trans. AGU, 86(52), Fall Meet. Suppl., Abstract B51A-0187.
57. Elliott, EM; Kendall, C; Harlin, K; Butler, T; Carlton, R; Wankel, SD. 2004. Mapping the Spatial and Temporal Distribution of N and O Isotopes in Precipitation Nitrate across the Northeastern and Mid-Atlantic United States. EOS Trans. AGU, 85(47), Fall Meet. Suppl., Abstract H52B-02, Invited.
58. Golden, HE, Boyer, EW, Elliott, EM, Kendall, C, Burns, DA, Butler, TJ. 2004. Quantifying atmospheric N sources in major watersheds of New York state. EOS Trans. AGU, 85(47), Fall Meet. Suppl., Abstract B13B-0219.
59. Elliott, EM, Brush, GS. 2002. Extending the Record: Using Isotopes to Infer Changing Nitrogen Sources to Wetlands. EOS Trans. AGU, 83(19), Spring Meet. Suppl., Abstract #H31B-06.
60. Elliott, EM, Brush, GS. 2001. Historical Variations in Nitrogen Source to Wetlands. Ecological Society of America Annual Symposium. August, 2001. Madison, Wisconsin. Abstract #35, Session #19.

Invited Research Seminars (45)

1. Elliott, EM. Climate change, nutrient trends, and extensive harmful algal blooms in the Ohio River system. May 16, 2021. Cornell University. Invited.
2. Elliott, EM. Excess nutrients, harmful algal blooms and threats to regional waterways. Department of Environmental and Occupational Health, School of Public Health, University of Pittsburgh. April 16, 2021.
3. Elliott, EM. Air-ecosystem-water interactions of reactive nitrogen in urban systems. National Science Foundation. Seminar hosted by Holly Barnard. August 1, 2019. Alexandria, VA. Invited.
4. Elliott, EM. 2017. Exploring AIR-WATER-ECOSYSTEM interactions of reactive nitrogen using stable isotope geochemistry. December 1, 2017. University of Iowa. Iowa City, IA.
5. Elliott, EM. 2017. Exploring AIR-WATER-ECOSYSTEM interactions of reactive nitrogen using stable isotope geochemistry. May 11, 2017. Pennsylvania State University. State College, PA.
6. Elliott, EM. 2017. Exploring AIR-WATER-ECOSYSTEM interactions of reactive nitrogen using stable isotope geochemistry. April 17, 2017. University of California-Merced. Merced, CA.
7. Elliott, EM. 2017. Exploring AIR-WATER-ECOSYSTEM interactions of reactive nitrogen using stable isotope geochemistry. March 27, 2017. University of Texas-San Antonio. San Antonio, TX.
8. Elliott, EM. 2017. Exploring AIR-WATER-ECOSYSTEM interactions of reactive nitrogen using stable isotope geochemistry. February 6, 2017. University of California-Irvine. Irvine, CA.

9. Elliott, EM. 2016. What goes up, must come down: An isotopic perspective on reactive nitrogen emissions and deposition. Water-Energy Nexus Seminar. Syracuse University. March 9, 2016. Syracuse, NY. Invited.
10. Elliott, EM. 2015. Emissions, Deposition, and Environmental Cycling of Atmospheric Nitrogen: An Isotope Perspective. 9th International Conference on Acid Deposition. October 21, 2015. Rochester, New York. Invited Keynote Address.
11. Elliott, EM. 2015. Nutrient Contamination Sources in a Changing Climate. The Third Annual Kent State University Water Symposium. October 15, 2015. Kent, Ohio. Invited Symposium Speaker and Panelist.
12. Elliott, EM. 2015. Reactive Nitrogen Emission Characterization from Unconventional Shale Extraction Activities. Pennsylvania Department of Conservation and Natural Resources (PA DCNR). February 11, 2015. Harrisburg, PA. Invited.
13. Elliott, EM. 2014. Urban atmospheric chemistry and reactive nitrogen deposition. Global Connection of Air and Water, Annual Technical Meeting of the National Atmospheric Deposition Program. October 21-24, 2014. Indianapolis, IN. Invited.
14. Elliott, EM. 2014. Using Isotopes to Help Understand Deposition Sources and Processes. Global Connection of Air and Water, Annual Technical Meeting of the National Atmospheric Deposition Program. October 21-24, 2014. Indianapolis, IN. Invited.
15. Elliott EM. 2014. Atomic number 7. Sloan Foundation Science and Technology symposium. Carnegie Mellon University. September 23, 2014. Pittsburgh, PA. Invited.
16. Elliott. EM. 2014. Investigating atmospheric-terrestrial-hydrologic interactions of reactive nitrogen using stable isotope geochemistry. February 7, 2104. University of Maryland-Baltimore County. Baltimore, MD. Invited.
17. Elliott, EM. 2014. Investigating atmospheric-terrestrial-hydrologic interactions of reactive nitrogen using stable isotope geochemistry. LandScales Workshop, Institute for Landscape Biogeochemistry. November 16, 2014. Müncheberg, Germany. Invited.
18. Elliott, EM. Reflections on the Department of Geography and Environmental Engineering (DoGEE): Collegiality, Humanity, and Interdisciplinarity. 75th Anniversary Celebration of Sanitation Engineering at Johns Hopkins University. April 20, 2013. Invited.
19. Elliott, EM. Investigating Atmospheric-Terrestrial-Hydrologic interactions of reactive nitrogen using stable isotope geochemistry. University of New Hampshire. April 2, 2013. Invited.
20. Elliott, EM. Investigating Atmospheric-Terrestrial-Hydrologic interactions of reactive nitrogen using stable isotope geochemistry. Department of Civil, Environmental, and Geodetic Engineering, Ohio State University. February 26, 2013. Invited.
21. Elliott, EM. Investigating Atmospheric-Terrestrial-Hydrologic interactions of reactive nitrogen using stable isotope geochemistry. Department of Chemistry and Biochemistry, University of North Carolina- Wilmington. November 16, 2012. Invited.
- 22.
23. Elliott, EM. Investigating Atmospheric-Terrestrial-Hydrologic interactions of reactive nitrogen using stable isotope geochemistry. University of Maryland, Appalachian Laboratory. September 20, 2012. Invited.

24. Elliott, EM. Investigating Atmospheric-Terrestrial-Hydrologic interactions of reactive nitrogen using stable isotope geochemistry. Department of Geography & Environmental Engineering, Johns Hopkins University. November 15, 2011. Invited.
25. Elliott, EM and *JD Felix. New insights about reactive nitrogen and agricultural ecosystem processes. National Atmospheric Deposition Program, Annual Meeting and Scientific Symposium. Providence, RI. October 26, 2011. Invited.
26. Elliott, EM. Investigating atmospheric-terrestrial-hydrologic interactions of reactive nitrogen using stable isotope geochemistry. School of the Environment and Natural Resources. Ohio State University, Columbus, OH. May 12, 2011. Invited
27. Elliott, EM. New frontiers in reactive nitrogen isotope geochemistry: Implications for water & air quality, ecosystem & human health. Department of Geology & Geography, West Virginia University, Morgantown, WV. April 1, 2011. Invited
28. Elliott, EM. Reactive nitrogen emissions, deposition, and impact on water quality and human health. Department of Civil and Environmental Engineering, University of Pittsburgh, April 8, 2011. Invited
29. Elliott, EM. 2010. Stable isotopes in the ecological sciences: Traditional applications and new frontiers. Northeastern Ecosystem Research Cooperative. Saratoga Springs, NY. November 8-10, 2010. Invited.
30. Elliott, EM. Understanding atmospheric nitrate sources to ecosystems and biogeochemical implications using stable isotopes. Pymatuning Laboratory of Ecology, University of Pittsburgh. June 24, 2009. Invited.
31. Elliott, EM. Distinguishing NO_x source contributions to wet and dry nitrate deposition using stable isotopes. Center for Atmospheric Particle Studies, Carnegie Mellon University. April 21, 2008. Invited.
32. Elliott, EM. Distinguishing NO_x source contributions to wet and dry nitrate deposition using stable isotopes. Electric Power Research Institute (EPRI) Annual Technical Meeting, Scottsdale, Arizona, February 12, 2008. Invited.
33. Elliott, EM. Nitrogen isotopes as indicators of NO_x source contributions to atmospheric nitrate deposition across the Midwestern and Northeastern United States. A Briefing to the Assistant Secretary for Water and Science, U.S. Geological Survey. October, 19 2007. Invited.
34. Elliott, EM. Nitrogen isotopes in dry deposition: Can CASTNET and passive samplers be used to partition contributions of NO_x sources? National Atmospheric Deposition Program 30th Annual Technical Meeting. September 2007. Boulder, CO. Invited.
35. Elliott, EM. Stable isotope techniques for tracing NO_x source contributions to nitrate deposition in the U.S. U.S. EPA, Clean Air Markets Division, Washington D.C., June 2007. Invited.
36. Elliott, EM. Insights into Sources and Fate of Nitrogenous Emissions Using Stable Isotope Techniques. Chesapeake Bay Scientific Advisory Committee, Workshop on Atmospheric Nitrogen Deposition, Binghamton University, New York, May 30, 2007. Invited.
37. Elliott, EM. Understanding atmospheric nitrate sources to ecosystems and biogeochemical implications using stable isotopes. University of Louisville, Department of Biology, April 2007. Invited.

38. Elliott. NO_x Sources, Source Areas, and Atmospheric Cycling In The United States. National Atmospheric Deposition Program 29th Annual Technical Meeting. October 2006. Norfolk, VA. Invited.
39. Elliott, EM. Using Nitrate Isotopes in Precipitation to Distinguish NO_x Sources, Atmospheric Cycling, and Source Areas in the United States. USGS Water Resources Division Research Seminar. Menlo Park, CA. May 2006. Invited.
40. Elliott, EM. Innovative stable isotope tools for understanding human impacts to nitrogen biogeochemistry. University of Illinois at Urbana-Champaign, Department of Natural Resources and Environmental Sciences, April 2006. Invited.
41. Elliott, EM. Innovative stable isotope tools for understanding human impacts to nitrogen biogeochemistry. North Carolina State University, Department of Forestry and Environmental Resources, March 2006. Invited.
42. Elliott, EM. Innovative stable isotope tools for understanding human impacts to nitrogen biogeochemistry. Wright State University, Department of Geological Sciences, March 2006. Invited.
43. Elliott, EM. Innovative stable isotope tools for understanding human impacts to nitrogen biogeochemistry. University of Pittsburgh, Department of Geology and Planetary Science, February 2006. Invited.
44. Elliott, EM; Kendall, C; Harlin, K; et al. A national survey of nitrate isotopes in precipitation: What can isotopes tell us about NO_x sources at multiple scales? National Atmospheric Deposition Program 28th Annual Technical Meeting: Science Supporting Resource Management. September 2005. Jackson, WY. Invited.
45. Elliott, EM; Brush, GS. Organic Nitrogen Isotope Stratigraphy, Palynology, and Sediment History of Freshwater Wetlands in the Chesapeake Bay Basin: Comparison with Land Use History. USGS Water Resources Division Research Seminar. Menlo Park, CA. November 2003. Invited.

Keynote, plenary and international talks

Invited talk. European Geophysical Union. 2018. Elliott, EM, Rose LA, Yu Z. “Deciphering land-atmosphere interactions of reactive nitrogen using high-frequency isotope analyses”. Vienna, Austria.

Invited Keynote Address: 9th International Conference on Acid Deposition, Oct 2015, Rochester, NY. “Emissions, Deposition, and Environmental Cycling of Atmospheric Nitrogen: An Isotope Perspective”.

Invited Plenary Address: BIOGEMON. 9th International Symposium on Ecosystem Behavior. Czech Republic. August 2017 (declined).

Invited Speaker: Trans-scale Solutions for Sustainability, Research Institute for Humanity and Nature (RIHN) Symposium, Kyoto, Japan. December 20-21, 2017 (declined).

Invited talk: BG1.7 Stable isotopes and novel tracers in biogeochemical and atmospheric research. European Geophysical Union, Vienna, Austria 2017. (declined).

Presentations without published abstracts (73)

*University of Pittsburgh advisee of EM Elliott. ‡**Outstanding student presentation award winner.**

1. Elliott, EM. Safe Water in Homewood and Throughout Pittsburgh. October 5, 2021. Science Revealed. Dietrich School of Arts & Sciences, University of Pittsburgh.
2. Elliott, EM. “Advancing Water Sustainability through Biogeochemistry”. University of Pittsburgh Green Speakeasy, April 2021.
3. Elliott, EM. Bottoms-up: Building a collaboratory to address regional water challenges. February 15, 2021. University of Pittsburgh, Community Engagement Forum.
4. Elliott, EM. “Reactive nitrogen in Pittsburgh streams and fluvial ecosystems”. University of Pittsburgh Science Spotlight presentation, Oct. 17, 2019. Pittsburgh, PA. Invited.
5. Elliott, EM, Bain D, Shelef E. Pitt and Water Resources: Building University-wide Capacity to Meet Water Sustainability Challenges. February 25, 2020.
6. Elliott, EM. Reactive nitrogen in Pittsburgh streams and fluvial ecosystems. A presentation to the Environmental Advisory Board, US Army Corp of Engineering, Pittsburgh District Office. April 22, 2019. Invited.
7. Elliott, EM. 2016. How is the air up there? Presented at The Air We Breathe: The State of Pollution Research in Pittsburgh. Sponsored and hosted by The Science & Engineering Ambassadors Program and Western Pennsylvania Regional Data Center. Pittsburgh, PA. June 2, 2016. Invited.
8. Elliott, EM. 2016. When science isn’t enough: finding interdisciplinary solutions to global nitrogen problems. Green Speakeasy. University of Pittsburgh. April 11, 2016. Pittsburgh, PA. Invited.
9. Elliott EM. 2014. Too Much Green: Excess Nitrogen in Urban Environments. Science 2014: Sustain It. University of Pittsburgh. October 2, 2014. Pittsburgh, PA. Invited.
10. *Balangoda, A. *Dabundo, R., Spencer-Williams, I. Haig, S., Elliott, E.M. Assessing the Impacts of Large-scale Drinking Water Orthophosphate Addition on Urban Stream Ecology. Duquesne University Lead in Our Water Webinar. August 18, 2020 (Invited talk).
11. *Balangoda, A., *Dabundo, R., Haig, S., Elliott, E.M. Assessing the Biogeochemical and Ecological Impacts of Drinking Water Orthophosphate Addition to an Urban Stream Network. 5th Symposium on Urbanization and Stream Ecology. February 12-15, 2020. Austin, TX, USA.
12. *Forgrave, R., Elliott, E.M, Combined sewer overflows create novel concentration-discharge hysteresis patterns in urban streams. 5th Symposium on Urban Stream Ecology, Austin, TX, February 12-15,2020
13. *Chung, A. H., Elliott, E. M., Nim, C. Characterization of reactive nitrogen transport in Pittsburgh’s Three Rivers, Universities Council on Water Resources (UCOWR) Annual Water Resources Conference. June 2018, Pittsburgh, PA.
14. *Forgrave, R.K. and Elliott, E.M. Using Continuous Sensing and Stable isotopes of nitrate to Improve Regional Water Quality Planning, Universities Council on Water Resources (UCOWR) Annual Water Resources Conference. June 2018, Pittsburgh, PA, 2018.

15. ‡*Forgrave, R.K, *Groszewski, K.L., Boyer, E.W and Elliott, E.M. Assessing Sources and Fluxes of Reactive Nitrogen Deposition to Urban Landscapes Using Ion Exchange Resins, National Atmospheric Deposition Program (NADP) Fall Meeting, San Diego, CA, 2017
16. *Forgrave, R.K, *Groszewski, K.L, and Elliott, E.M. Assessing Sources and Fluxes of Reactive Nitrogen Deposition to Urban Landscapes Using Ion Exchange Resins, Gordon Research Seminar: Catchment Science: Interactions of Hydrology, Biology & Geochemistry, Lewiston, ME, 2017
17. ‡*Chung, A. H., Elliott, E. M., Nim, C. Characterization of reactive nitrogen transport in Pittsburgh's Three Rivers, University of Pittsburgh Kenneth P. Dietrich School of Arts and Sciences Grad Expo poster session. March 24, 2017. Outstanding Student Presentation.
18. *Forgrave RK, *Groszewski KL, Chung AH, Elliott EM. Quantifying urban atmospheric nitrogen deposition fluxes using ion exchange resins. Northeastern-North Central Joint Meeting of the Geological Society of America. March 19-21, 2017, Pittsburgh PA.
19. *Chung, AH, Elliott EM, Nim C. Characterization of reactive nitrogen transport in Pittsburgh's Rivers. Northeastern-North Central Joint Meeting of the Geological Society of America. March 19-21, 2017, Pittsburgh PA.
20. Elliott, EM. "When science isn't enough: finding interdisciplinary solutions to global nitrogen problems." University of Pittsburgh Green Speakeasy. April 11, 2016.
21. *Coughlin JG, Rose L, Elliott EM. 2015. Reactive nitrogen emissions from unconventional natural gas well pads and implications for regional NOx emission inventories. 9th International Conference on Acid Deposition. October 19-23, 2015. Rochester, NY.
22. *Groszewski, KL and Elliott, EM. 2015. Stable Isotope Analysis of Aquatic Macroinvertebrates, Stream Water, and Algae in Nine Mile Run, Pittsburgh, PA; March 26, 2015. Nine Mile Run Monitoring Committee. Pittsburgh, PA.
23. *Groszewski, KL and Elliott, EM. 2015. Stable Isotope Analysis of Aquatic Macroinvertebrates, Stream Water, and Algae in Nine Mile Run, Pittsburgh, PA; March 19, 2015. Grad Expo, University of Pittsburgh. Pittsburgh, PA.
24. *Redling, KM and Elliott, EM. Sourcing dry N deposition in urban areas and implications for national N inventories. Global Connection of Air and Water, Annual Technical Meeting of the National Atmospheric Deposition Program. October 21-24, 2014. Indianapolis, IN.
25. Elliott EM, *Felix JD, Rose LA, Kendall C, Boyer EW, Burns DA. Soil NOx Emissions: Not So Innocuous? Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology & Geochemistry. June 16-21, 2013. Proctor Academy, Andover New Hampshire.
26. *Rose L and Elliott EM. 2013. Examining storm flow dynamics using dual nitrate isotopes in an nitrogen saturated system. U.S.-Japan Joint Seminar on Responses of Catchment Hydrology and Forest Biogeochemistry to Climatic and Environmental Change. Honolulu, Hawaii, March 3-7, 2013.
27. *Felix, JD and Elliott, EM. 2011. Utilizing the nitrogen isotopic composition of ammonia to investigate regional transport of ammonia emissions: $\delta^{15}\text{N-NH}_3$ values at AMoN sites. National Atmospheric Deposition Program, 2012 Fall Meeting and Scientific Symposium. Portland, Maine, October 4, 2012.

28. Bain, DJ, *Sikora, MT, Elliott, EM, Wozniak, EP, Fisher, KR. Urban stream restoration and water quality: the case of Nine Mile Run (Pittsburgh, PA). Northeastern and North-Central Joint Meeting of the Geological Society of America, March 22, 2011. Pittsburgh, PA.
29. Elliott, EM and *Felix, JD. Stable Isotopes of Reactive Nitrogen and Particulate Matter: Improved Tools for Characterizing the Transport and Fate of Agricultural Emissions. NIFA AFRI Air Quality Project Directors Meeting. June 7, 2011, Washington, DC.
30. Elliott, EM, *Redling, KM, *Sikora, MT, *Felix, JD. Spatial heterogeneity in atmospheric reactive nitrogen deposition to urbanizing landscapes: Implications for water quality, ecosystem, and human health. Northeastern and North-Central Joint Meeting of the Geological Society of America, March 22, 2011. Pittsburgh, PA.
31. *Felix, JD and Elliott, EM. 2011. Investigating the Source, Transport, and Fate of Ammonia Emissions Using Stable Isotopes. Isoscapes 2011. September 26 to 27, 2011, West Lafayette, IN.
32. *Felix, JD, Elliott, EM. Source apportionment of urban and rural reactive nitrogen emissions. Northeastern and North-Central Joint Meeting of the Geological Society of America, March 22, 2011. Pittsburgh, PA.
33. *Redling, KM and Elliott, EM. 2011. Isoscapes of dry nitrogen deposition across local and regional scales. Isoscapes 2011. September 26 to 27, 2011, West Lafayette, IN.
34. *Redling, KM, Elliott, EM, Hom, J. Isotopic investigation of dry nitrogen deposition along two urban to rural gradients. Northeastern and North-Central Joint Meeting of the Geological Society of America, March 22, 2011. Pittsburgh, PA.
35. *Rose, L; Elliott, EM. Using Stable Isotopes of Nitrate to Gauge Forest Nitrogen Saturation. University of Pittsburgh Graduate Student Expo March 25, 2011, Pittsburgh, PA. Outstanding Student Presentation.
36. *Sikora, MT, Elliott, E.M., Bain, D.J. Contributions of nutrient pollution from sewage and atmospheric deposition in urban watersheds determined through the use of stable isotopes. Northeastern and North-Central Joint Meeting of the Geological Society of America, March 22, 2011. Pittsburgh, PA.
37. *Sikora, MT, Elliott, EM, Bain, DJ. Contributions of nutrient pollution from sewage and atmospheric deposition in urban watersheds determined through the use of stable isotopes. Oral presentation at the Graduate Student Expo, University of Pittsburgh, March 24, 2011.
38. Whitlow, T, Elliott, EM, Pouyat, R, Yesilonis, I. Are street trees being subsidized by human waste? Northeastern and North-Central Joint Meeting of the Geological Society of America, March 22, 2011. Pittsburgh, PA.
39. *Brudnak, LA, Elliott EM. Using Mass-Independent $\Delta^{17}O$ of Nitrate to Assess Forest N Saturation. Fernow Experimental Forest Cooperator's Meeting. January 6, 2010. Parsons, WV.
40. Elliott, EM and *Felix, JD. 2010. Stable Isotopes of Reactive Nitrogen & Particulate Matter: Improved Tools for Characterizing the Transport and Fate of Agricultural Emissions. USDA National Research Initiative, Air Quality Project Director's Meeting. August 23-26, 2010. Amarillo, TX.

41. *Sikora, MT, Elliott, E.M., Bain D.J. (2010) Understanding urban pollution sources to the Monongahela River through the use of stable isotopes. Oral Presentation at the State of the Monongahela River Research Symposium, Thursday September 16, 2010.
42. *Sikora, MT, Elliott, EM, Bain, DJ. 2010. Understanding nitrogen dynamics in urban riparian systems through the use of stable isotopes. 95th Meeting of the Ecological Society of America. Pittsburgh, PA. Paper 6 in COS 112.
43. Elliott, EM, Brush GS. 2009. A window to the landscape of Chesapeake's past: Reconstructing nitrogen dynamics and hydrologic conditions using stable isotope geochemistry and palynology. EOS Trans. AGU, 90(52), Fall Meet. Suppl., Abstract # H51J-04.
44. *Felix, JD and Elliott, EM. Assessing the use of NH₃ isotopic composition collected by passive samplers to indicate regional NH₃ emission sources. NADP Annual Meeting and Scientific Symposium. October 6 – 8, 2009. Saratoga Springs, NY.
45. *Felix, JD and Elliott, EM. Stable Isotopes of Reactive Nitrogen and Particulate Matter: Improved Tools for Characterizing the Transport and Fate of Agricultural Emissions. USDA National Research Initiative, Air Quality Project Director's Meeting. June 2-4, 2009. Kansas City, MO.
46. *Middlecamp, KM and Elliott, EM. Isotopic Investigation of Reactive Nitrogen Deposition Along a Highway Road Gradient. NADP Annual Meeting and Scientific Symposium. October 6 – 8, 2009. Saratoga Springs, NY.
47. *Middlecamp, KM, Elliott, EM, Hom, J. Isotopic Investigation of N Deposition and Vegetation on a Road Gradient. University of Pittsburgh Graduate Student Expo March 16, 2009, Pittsburgh, PA.
48. ‡*Sikora, MT, Elliott, EM, Bain, DJ. Nutrient Input and Dynamics during Baseflow and a Storm Event in Nine Mile Run, a Restored Urban Stream. University of Pittsburgh Graduate Student Expo March 16, 2009, Pittsburgh, PA. Outstanding Student Presentation.
49. Elliott, EM, *Middlecamp, KM, Sikora, MT, Kendall, C, Boyer, EW, Burns, DA. Atmospheric nitrogen deposition and impacts to urban water quality. Ohio River Basin Consortium for Research and Education (ORBCRE) Annual Symposium, Oct 29-31, 2008, Carnegie Mellon University, Pittsburgh PA.
50. *Middlecamp, KM, Elliott, EM, Hom, J. "Isotopic investigation of anthropogenic sources of atmospheric nitrogen and carbon to vegetation along an urban to rural gradient." University of Pittsburgh Grad Expo, March 2008, Pittsburgh, PA.
51. *Middlecamp, KM, Elliott, EM, Hom, J. Isotopic Investigation of Anthropogenic Sources of Carbon and Nitrogen to Vegetation along a Road Gradient. Baltimore Ecosystem Study (BES) Annual Meeting October 15-16, 2008, Baltimore, MD.
52. *Middlecamp, KM, Elliott, EM, Hom, J. Isotopic Investigation of Anthropogenic Sources of Carbon and Nitrogen to Vegetation along a Road Gradient. Ohio River Basin Consortium for Research and Education (ORBCRE) Annual Symposium, Oct 29-31, 2008, Carnegie Mellon University, Pittsburgh PA.
53. *Sikora, MT, Elliott, E.M., Bain, D.J. Nine Mile Run - Water quality in a restored urban stream, Pittsburgh, PA. University of Pittsburgh Grad Expo, March 2008, Pittsburgh, PA.

54. *Sikora, MT, Elliott, EM, Bain, DJ. Nutrient Input and Dynamics in a Restored Urban Stream Impacted by Mixed Sewer Systems. Baltimore Ecosystem Study (BES) Annual Meeting October 15-16, 2008, Baltimore, MD.
55. *Sikora, MT, Elliott, EM, Bain, DJ. Nutrient input and dynamics in Nine Mile Run, a restored urban stream. Ohio River Basin Consortium for Research and Education (ORBCRE) Annual Symposium, Oct 29-31, 2008, Carnegie Mellon University, Pittsburgh PA.
56. Burns, DA, Boyer, EW, Elliott, EM, Kendall, C. Nitrate Isotopes as Tracers of Nitrogen Cycling Processes in Watershed of Varying Land Use in New York. Environmental Monitoring, Evaluation, and Protection Conference, New York State Energy Research and Development Authority (NYSERDA), Albany, New York, November 15-16, 2007.
57. Elliott, EM, Kendall, C, Boyer, EW, Burns, DA, Harlin, K, Lear, G, Wankel, SD. 2007. Distinguishing NO_x Source Contributions to Wet and Dry Nitrate Deposition in the United States using Stable Isotopes. EOS Trans. AGU, 88(52), Fall Meet. Suppl., Abstract B24A-03, Invited.
58. Elliott, EM, Kendall, C., Boyer, E. W., Burns, D. A. Tracing atmospheric sources of nitrogen to watersheds: Nitrate isotopes in precipitation in the Northeastern U.S. Environmental Monitoring, Evaluation, and Protection Conference, New York State Energy Research and Development Authority (NYSERDA), Albany, New York, November 15-16, 2007.
59. Elliott, EM. Testing hypotheses regarding nitrate deposition patterns and NO_x sources to landscapes using stable isotope techniques. Ninth Annual Scientific Meeting. Baltimore Ecosystem Study. October 17-18, 2007, Baltimore, MD.
60. Kendall, C, Elliott, EM, Boyer, EW, Burns, DA. Quantifying Atmospheric Nitrogen Sources with New Stable Isotope Techniques: What Have We Learned? Environmental Monitoring, Evaluation, and Protection Conference, New York State Energy Research and Development Authority (NYSERDA), Albany, New York, November 15-16, 2007.
61. Kendall, C, Elliott, EM, Wankel, SD, Boyer, EW, Burns, DA. Why do Different Anthropogenic Sources of Atmospheric Nitrate Have Distinctive Isotopic Signatures? Environmental Monitoring, Evaluation, and Protection Conference, New York State Energy Research and Development Authority (NYSERDA), Albany, New York, November 15-16, 2007.
62. *Middlecamp, KM, Elliott, EM, Hom, J. "Isotopic investigation of anthropogenic sources of atmospheric nitrogen and carbon to vegetation along an urban to rural gradient." Baltimore Ecosystem Study Annual Meeting, October 2007, Baltimore, MD.
63. *Sikora, MT, Elliott, E.M., Bain, D.J. (2007) Nine Mile Run -Monitoring Water Quality After the Restoration. State of the Watershed Meeting of the Nine Mile Run Watershed Association, Pittsburgh PA, September 2007.
64. *Sikora, MT, Elliott, E.M., Bain, D.J. (2007) Nine Mile Run - Water quality in a restored urban stream, Pittsburgh, PA. Baltimore Ecosystem Study Annual Meeting, October 2007, Baltimore, MD.
65. Elliott, EM; Kendall, C; Harlin, K et al. Tracing atmospheric sources of nitrogen to watersheds: Nitrate isotopes in precipitation in the Northeastern and continental U.S. Environmental Monitoring, Evaluation, and Protection in New York: Linking Science and Policy. October 2005. Albany, NY.

66. Elliott, EM; Kendall, C; Harlin, K; Butler, T; Carlton, R; Wankel, SD. 2005. Nitrate isotopes in precipitation across the United States: A new tool for distinguishing NO_x sources?. 7th International Conference on Acid Deposition. June 2005. Prague, Czech Republic.
67. Elliott, EM; Kendall, C; Harlin, K; Butler, T; Carlton, R; Wankel, SD. 2005. Isotopic Tracers Of Stationary Source NO_x Emissions In The Northeastern And Mid-Atlantic United States. UC-Riverside Symposium on Nitrogen Eutrophication in Xeric Wildlands. Jan 19-20, 2005, Riverside, CA.
68. Elliott, EM; Kendall, C; Harlin, K; Carlton, R; Butler, T; Wankel, SD; Glatz, R. Deciphering Atmospheric Sources of Nitrate to Watersheds: A National Survey of Nitrate Isotopes in Precipitation. Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology, and Geochemistry. July 2005. Waterville, ME.
69. Elliott, EM, Brush, GS. 2002. Inorganic Nitrogen and Sulfur Assimilation by Wetland Biota: A Paleoecological Perspective. USGS Isotope Tracers Nitrate Methods Workshop. February 2002. Menlo Park, California.
70. Elliott, EM, Brush, GS. 2002. Extending the Record: Using Isotopes to Infer Changing Nitrogen Sources to Wetlands. The 3rd International Conference on the Applications of Stable Isotope Techniques to Ecological Studies. Flagstaff, Arizona.
71. Elliott, EM, Brush, GS. 2001. Isotopes And Pollen: What Can They Tell Us About Land Use History And Nitrogen Source To Wetland Biota? Baltimore Ecosystem Study Annual Meeting. October, 2001. Baltimore, Maryland.
72. Elliott, EM, Brush GS. 2001. Historical Variations in Nitrogen Source to Wetlands. Gordon Research Conference on Forested Catchments. Andover, New Hampshire.
73. Bell, ML, Hobbs, BF, Elliott, EM, et al. 2000. An Evaluation of Multi-criteria Decision-Making Methods in Integrated Assessment of Climate Policy. Proceedings of the 14th International Conference on Multiple Criteria Decision Making. in: Haimes, Y.Y., Steuer, R.E. (Eds.), Proceedings of the 14th International Conference of Multi Criteria Decision Making, Research and Practice in Multiple Criteria Decision Making, Springer-Verlag.

Professional Affiliations

American Geophysical Union; Ecological Society of America; Association of Women in Science; Earth Science Women's Network; Global Lake Ecological Observatory Network; National Atmospheric Deposition Program

Advising, Mentoring, Student Research

Postdoctoral Research Advisees

Dr. Anusha Balangoda, August 2019-present

Ph.D. Environmental Science, North Dakota State University, 2015.

Dr. Mark River, June 2018-June 2019.

Ph.D., Ecology, Duke University, 2018.

Current position: Hydrologist, Weyerhaeuser

Dr. Lucy Rose, September 2014-August 2015

Ph.D., Geology & Planetary Science, University of Pittsburgh, 2014

Current position: Research Associate, University of Minnesota. Department of Forestry.

Graduate Student Advisees

Rebecca Forgrave, Ph.D. Candidate, August 2016-present.

- Awards: Henry Leighton Memorial Graduate Scholarship (2018), Dr. J. Frederick and Ann Sarg Research Award (2018), Elizabeth Baranger Excellence in Teaching Award (2018), National Atmospheric Deposition Program Fall Meeting, Best Student Talk (San Diego, CA. 2017), Andrew Mellon Fellowship (2018-19).

Elijah Hall, Ph.D. student, August 2019-present.

- Awards: NSF GRFP Recipient (2021-24), Howard Hughes Medical Institute, Gilliam Fellowship for Advanced Study (2021-24), Andrew Mellon Fellowship (2018-19).

Kate Zidar, Ph.D. student, August 2019-present.

- Awards: Andrew Mellon Fellowship (2018-19).

Angela Chung, M.S. August 2016-April 2019.

- Awards: Andrew Mellon Fellowship (2017-18). Geological Society of America, Graduate Student Research Grant (2017)
- Thesis: "Assessing Spatial and Temporal Variability of Reactive Nitrogen in an Urban Fluvial System". Defended April 5, 2019.
- Current position: Laboratory Associate, NASA Laboratory for Agnostic Biosignatures, Goddard Space Flight Center

Zhongjie Yu, Ph.D. August 2013-August 2018.

- Awards: Geological Society of America Graduate Research Fellowship (2015), Outstanding Student Presentation, American Meteorological Society, Third Conference on Atmospheric Biogeosciences (June 2016). Andrew Mellon Fellowship (2017-18, 2016-17). Henry Leighton Memorial Scholarship (2016).
- Dissertation: "Examining sources and dynamics of soil nitric oxide using stable isotope techniques". Defended August 10, 2018.
- Current position: Assistant Professor, University of Illinois-Champaign-Urbana

Justin Coughlin, M.S., August 2014-July 2016.

- Awards: Science Communication Fellowship, Phipps' Conservatory and Botanical Gardens (2015).
- Thesis: "Reactive Nitrogen Emissions and Deposition From Unconventional Natural Gas Extraction in the Marcellus Shale Basin". Defended July 22, 2016.
- Current position: US EPA Region 5, Air Quality Research Specialist (GS-12)

Kassia Groszewski, M.S. student, August 2013-October 2016

Lucy Rose (née Brudnak), Ph.D., Fall 2009-August 2014.

- Dissertation: "Application of Triple Nitrate Isotope Analysis to Nitrogen Saturated Appalachian Forests". Defended July 16, 2014.
- Pre-doctoral Fellowship, "Determination of Forest Nitrogen Saturation Status Using a Stable Isotope Tracer of Atmospheric Nitrate." USDA National Institute of Food & Agriculture, Agriculture & Food Research Initiative, 2012-2013, \$73,940

- Awards: Outstanding Student Presentation, American Meteorological Society, May 2014. Outstanding Student Paper Award, AGU, Biogeosciences Section, December 2012. Andrew Mellon Pre-doctoral Fellowship, University of Pittsburgh, \$18,165, Fall 2011-Spring 2012. Graduate Research Fellowship, Geological Society of America, April 2010. Fellowship Recipient, INTRAMIF (INitial TRAINing network in Mass Independent Isotope Fractionation, Marie Curie Initial Training Network), August 2010
- Current position: Researcher 6, Department of Forestry, University of Minnesota.

Marion Divers (née Sikora), Ph.D., September 2007-December 2013

- Dissertation: “Sources and Dynamics of Reactive Nitrogen to an Urban Watershed”. Defended November 21, 2013.
- Awards: Outstanding Student Paper Award, AGU, Hydrology Section (2008). Graduate Research Fellowship, Geological Society of America (April 2010). Andrew Mellon Pre-doctoral Fellowship (2010-2011).
- Current position: Senior Staff Scientist, Drummond-Carpenter PLLC.

J. David Felix, Ph.D., September 2008-December 2012

- Dissertation: “Examining the Sources and Transport of Reactive Nitrogen Emissions using Stable Isotope Techniques”.
- Awards: Graduate Research Fellowship, Geological Society of America (2010)
- Current position: Associate Professor, Texas A&M University- Corpus Christi, Department of Physical and Environmental Sciences. September 2015-present.

Katherine Redling (née Middlecamp), M.S., September 2007-December 2010

- Thesis: “Isotopic Investigation of Anthropogenic Sources of Atmospheric Nitrogen and Carbon Along Spatial Gradients”
- Awards: Outstanding Merit Award, Graduate Research Fellowship, Geological Society of America (2008).
- Current position: Full-time parent

Undergraduate Student Research Advisees

Katelyn Meyer. Summer 2020-Spring 2021. “Using Fluorescent Dissolved Organic Matter to Characterize Carbon Sources in Nine Mile Run”

Sarah Worthington. Fall 2020-Spring 2021. “C-N isotopic and trace metal analysis of Carnegie Museum Herbarium specimens.”

Vivian Feng. Fall 2016-Spring 2017. “Analysis and Comparison of Ogawa Filters and Triethanolamine (TEA) solution in field sampling of passively collected NO₂.”

Madeline Gray, Spring 2015-Fall 2016.

Troy Ferland, May 2014- July 2015. Undergraduate thesis: “Multivariable testing of Ogawa nitrogen dioxide passive samplers in the greater Pittsburgh region”

Katherine Colwell, May 2014-2015.

Mollie Kish, January 2012-2014. Undergraduate thesis: “Atmospheric Deposition of Nitrogen Compounds in an Urban Watershed”

Graham Gelzhiser, May 2013-2014.

Kathleen Tuite, May 2009-December 2010. “Determination of Atmospheric Nitrogen Deposition Within an Urban Watershed Using Ion Exchange Resins”

John Calas, Summer 2010-Spring 2011

Jim Tucker, Spring 2010

Andrew McCarty, Spring 2009

Talia Brinson, Spring 2009

Service on Graduate and Undergraduate Committees

Graduate Committee Member, Doctor of Philosophy

Jamie Vornlacher, Ph.D. student, Geology & Environmental Science, ongoing.

Timothy Suder, Ph.D. student, Geology & Environmental Science, ongoing.

Wesley Scott, Ph.D. student, Geology & Environmental Science, ongoing.

Memphis Hill, Ph.D. Candidate, Geology & Environmental Science, ongoing.

Rebecca Tisherman, Ph.D. Candidate, Geology & Environmental Science, 2022.

Marja Copeland, Ph.D. Candidate, Geology & Environmental Science, ongoing.

Arielle Woods, Ph.D. candidate, Geology & Environmental Science, 2018.

Adam Cadwallader, Ph.D., Department of Civil & Environmental Engineering, Carnegie Mellon University, 2018.

Elyse Stachler, Ph.D., Department of Civil & Environmental Engineering, 2017.

William Hector Clavjo, Ph.D., Department of Civil & Environmental Engineering, 2019.

Angela Mullins, Ph.D. Geology & Environmental Science, 2020

Molly O’Beirne, Ph.D., Geology & Environmental Science, 2018.

Erin Pfeil-McCullough, Ph.D., Geology & Environmental Science, 2017.

Robert Rossi, Ph.D., Geology & Environmental Science, 2016.

Kristina Hopkins, Ph.D., Department of Geology & Planetary Science, 2014.

Xiaobo Xue, Ph.D., Department of Civil and Environmental Engineering, 2011.

Broxton Bird Ph.D., Department of Geology & Planetary Science, 2009.

Liz Chapman Ph.D., Department of Geology & Planetary Science, 2011.

Tamara Misner, Ph.D., Department of Geology & Planetary Science, 2014.

Aubrey Hillman, Ph.D., Department of Geology & Planetary Science, 2015.

Leah Cambal, Doctor of Public Health (Dr. P.H.), 2015. Department of Environmental and Occupational Health, Graduate School of Public Health.

Graduate Committee Member, Master of Science

Sarah Cook, M.S., 2019, GES

Damara Strong, M.S., 2017, GES

Dervla Kumar, M.S., 2017, GES

Troy Ferland, M.S., 2017, GES

Kaitlin Clark, M.S. 2012, Department of Geology & Planetary Science

Undergraduate Committee Member, Bachelor of Philosophy

Justin Hynicka (2008)

Sarah Strano (2008)

Marion Sikora (2007)

Lindsey Whithaus (2007)

Teaching

Teaching Accomplishments

Established a new Water Scholars learning community in the University Honors College. 2020-present.

Lead effort to develop a new undergraduate certificate at the University of Pittsburgh in Sustainability, 2014-2016.

Aided in the design of a new major, "Environmental Science", 2015-2016

Helped spearhead an effort to change Department name from "Geology & Planetary Science" to "Geology & Environmental Science", 2014-2016.

Developed new courses: Watershed Hydrology and Biogeochemistry (GEOL 3853), Stable Isotope Geochemistry (GEOL 2525), Science Communication (GEOL2001), Ecosystem Ecology (GEOL1641)

Graduate courses

Ecosystems: Land, Water, Atmosphere Interactions (GEOL 3853) (3 credit). Examines surface water hydrology, biogeochemistry, and management of watersheds with a particular focus on how varying land uses influence the dynamics of hydrology and biogeochemistry. Taught in alternate years.

Scientific Communication (GEOL2001) (3 credit). Training in technical and non-technical writing, proposal preparation, constructive peer review, and public speaking. Taught in alternate years.

Answering Regional Challenges in Water Sustainability (GEOL2020) (3 credit). Analyze data on regional water challenges to develop science-based solutions through project-based learning. This course explored regional flooding in collaboration with AGU's Thriving Earth Exchange. Co-instructors: Drs. D Bain, B Thomas, E Shelef.

Stable Isotope Geochemistry (GEOL 2525) (3 credit). Introduction to the stable isotope systematics of light elements (hydrogen, carbon, nitrogen, oxygen, and sulfur) and their application to hydrological, geological, biological, and environmental systems.

Topics in Nitrogen Biogeochemistry (GEOL 3956). (2 credit). A graduate seminar focused on nutrient dynamics, fluxes, and issues across a range of Earth systems. Content is dynamic and changes may include development of grant- and manuscript-writing skills, critical reading and discussion of journal articles, presentation of laboratory and field results, and learning new software applications. Offered every semester.

Undergraduate courses

Ecosystem Ecology (GEOL1641 & 1642), University of Pittsburgh (4-credit) Introduction to the principles of ecosystem ecology and associated applications to environmental change. Taught annually.

Sustainability Capstone (ENGR 1907), University of Pittsburgh (3-credit).

Environmental Geochemistry (GEOL1515/2515), University of Pittsburgh (3-credit)

Service

National/international

- American Geophysical Union, Chair, Sulzman Award Committee (Biogeosciences), 2020.
- Science committee, Acid Rain 2023: The Future Environment and role of multiple air pollutants. Niigata, Japan.
- Science committee, BIOGEOMON 2020: 10th International Symposium on Ecosystem Behavior. Estonia. Postponed.
- Organizing Committee, Universities Council on Water Resources (UCOWR) Annual Water Resources Conference. Pittsburgh, PA, June 2018.
- Co-convener. A42F: Scaling and Interpreting Hot Spots and Hot Moments in Urban Atmospheric Biogeochemistry. American Geophysical Union, December 2017, New Orleans, LA.
- External reviewer, NSF-funded Shale Hills Critical Zone Observatory, May 2017. The review involved assessment of publications and presentations, culminating in a site visit.
- Co-convener, Northeastern-North Central Joint Meeting of the Geological Society of America. "Urban biogeochemistry and geochemistry" (March 2017, Pittsburgh PA).
- Co-convener, American Geophysical Union, Fall 2016 Annual Meeting, "Advances and Challenges in Unraveling the Impact of Nonpoint Source Fluxes on Groundwater, Vadose Zone, and Surface Waters" (Fall 2016)
- Host, Annual Board meeting of the Earth Science Women's Network. University of Pittsburgh, November 17-19, 2016.
- Advisory Board Member, Atmospheric Biogeosciences, American Meteorological Society, October 2015-January 2017.
- Chair, Executive Committee, National Atmospheric Deposition Program, October 2015 - October 2016.
- Vice-Chair, Executive Committee, National Atmospheric Deposition Program, October 2014 - October 2015.
- Secretary, Executive Committee, National Atmospheric Deposition Program, October 2013-October 2014.
- External reviewer for the LandScales project, Leibniz center for Agricultural Landscape Research (ZALF) and the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB), Germany. <http://www.landscales.de/>. November 2014.
- Co-convener, American Geophysical Union, Fall 2014 Annual Meeting, "Bio-atmospheric N cycle: N Emissions, Transformations, Deposition, and Terrestrial and Aquatic Ecosystem Impacts" (Fall 2014)
- Organizing Committee, 9th International Acid Rain Conference, 2015
- Executive Committee Secretary, National Atmospheric Deposition Program, October 9, 2013 to present.
- Co-convener, American Geophysical Union, Fall 2013 Annual Meeting, "Bio-atmospheric N cycle: N Emissions, Transformations, Deposition, and Terrestrial and Aquatic Ecosystem Impacts" (Fall 2013)

- Co-convener and co-organizer, U.S.-Japan Joint Seminar on Responses of Catchment Hydrology and Forest Biogeochemistry to Climatic and Environmental Change. Honolulu, Hawaii, March 3-7. 2013.
- Co-convener, American Geophysical Union, Fall 2012 Annual Meeting, “Bio-atmospheric N cycle: N Emissions, Transformations, Deposition, and Terrestrial and Aquatic Ecosystem Impacts” (Fall 2012)
- Co-chair, Subcommittee on Urban Atmospheric Monitoring, National Atmospheric Deposition Program (NADP). October 2012-present.
- Co-convener, American Geophysical Union, Fall 2011 Annual Meeting, “Bio-atmospheric N cycle: N Emissions, Transformations, Deposition, and Terrestrial and Aquatic Ecosystem Impacts” (Fall 2011)
- Co-convener, 46th Annual Meeting, Northeastern and North-Central Joint Meeting of the Geological Society of America. Pittsburgh, PA. “Urban Geochemistry”, March 22-23, 2011.
- Water Quality Technical Committee member, Hydrology Section, American Geophysical Union, 2009-2018.
- Co-convener, American Geophysical Union, Fall 2010 Annual Meeting, “Bio-atmospheric N cycle: N Emissions, Transformations, Deposition, and Terrestrial and Aquatic Ecosystem Impacts” (Fall 2010)
- Co-convener, American Geophysical Union, Fall 2009 Annual Meeting, “Bio-atmospheric N cycle: N Emissions, Transformations, Deposition, and Terrestrial and Aquatic Ecosystem Impacts” (Fall 2009)
- Co-convener, American Geophysical Union, Fall 2009 Annual Meeting, “Sources, Cycling, and Effects of Nutrients in Aquatic Systems” (Fall 2009)
- Panel Reviewer, U.S. Department of Agriculture, CRSEES National Research Initiative, Air Quality Program (Fall 2009)
- Invited reviewer for the NRSP3 support of the National Atmospheric Deposition Program, April 2008
- Scientific Advisory Board Member, “Indicators of Ecological Effects of Air Quality”, Heinz Center, Washington DC, August 2007
- NSF Panel reviewer: Division of Environmental Biology, Ecosystems Studies Cluster, April 2012
- Ad hoc NSF proposal reviewer: Earth Sciences: Instrumentation and Facilities, Geobiology and Low Temperature Geochemistry, Atmospheric Chemistry, Ecosystem Science, and Hydrological Sciences.
- Manuscript reviewer: *Ecosystems, Global Biogeochemical Cycles, Environmental Research Letters, Geophysical Research Letters, Atmospheric Environment, Ecological Applications, Biogeochemistry, Environmental Monitoring and Assessment, Science of the Total Environment, Hydrological Processes, Chemosphere, Journal of Geophysical Research-Atmospheres, Environmental Science and Technology, Water, Air, & Soil Pollution.*

University

- Faculty Excellence Mentoring Committee, Swanson School of Engineering, 2020-present
- University Honors College, Faculty Fellow, August 2020-present.

- Year of Engagement, Scholarship Committee, June 2020-present
- Restarting Research Committee, March-August 2020
- Chancellor’s committee, Socially Responsible Investing, University of Pittsburgh, January 2018.
- Successfully developed University of Pittsburgh’s application to join the national network of “Cooperative Ecosystem Study Units“, Great Lakes – Northern Forest Region (2017-2018).
- Search committee member, Chair of Environmental and Occupational Health, 2016-2018, University of Pittsburgh Graduate School of Public Health.
- Developed new undergraduate certificate in Sustainability in coordination with the Sustainability Task Force, 2013-2015.

Department

- Developed Strategic Growth plan for core of excellence in Geospatial Sciences, GES, (2017-2018)
- Search committee member, G&ES faculty search, 2015-16, Hydrology & Water Resources Sustainability
- Search committee member, G&ES lecturer/advisor search, 2016, Environmental Science
- Chair, G&ES Faculty search committee, 2014-2015, Geomorphology, Earth Surface Processes, & Sustainability
- University of Pittsburgh, Sustainability Task Force, September 2013-present
- Environmental Studies, Bachelor of Arts, Executive Committee, 2009-2017
- Chair, G&ES Development committee, 2015-present
- Member, G&ES Nominations committee, 2014-2017
- Member, G&ES Graduate committee, 2007-present
- Member, G&ES Scholarship committee, 2012-2017, 2022
- Member, G&ES Undergraduate curriculum committee, 2012-2017

Community Engagement & Outreach

- Pittsburgh Water Collaboratory, Community outreach meeting. Green Infrastructure for Stormwater Management. November 20, 2018. Jewish Community Center. A regional, multi-stakeholder research agenda meeting, PA. Event outcomes were synthesized in a community consensus report, [Green Infrastructure for Stormwater Management: Knowledge Gaps and Approaches](#).
- Pittsburgh Water Collaboratory, Community outreach meeting. Water Quality. January 28, 2019. Homewood Community Engagement Center. A regional, multi-stakeholder research agenda meeting. Event outcomes were synthesized in a community consensus report, [Water Quality in Southwestern Pennsylvania: Knowledge Gaps and Approaches](#).
- Pittsburgh Water Collaboratory, Community outreach meeting. [Flooding in Southwestern PA](#). April 2, 2019. Tree Pittsburgh, Pittsburgh, PA. A regional, multi-stakeholder research

agenda meeting Event outcomes were synthesized in a community consensus report, [Flooding in Southwestern Pennsylvania: Knowledge Gaps and Approaches](#).

- Pittsburgh Water Collaboratory, Let's Talk About Water. Sept 6, 2018. Event co-sponsored by the Pittsburgh Collaboratory for Water Research, Education and Outreach and CUASHI. Collaboratory launch and kick off.
- Pittsburgh Water Collaboratory. Spring 2018. In partnership with AGU's Thriving Earth Exchange, we undertook a semester-long effort to address community concerns regarding flooding in Connellsville, PA. Through this effort, Collaboratory faculty led a graduate-level project-based course dedicated to understanding regional and local flooding issues in Southwest PA.
- Pittsburgh Water Collaboratory and the Allegheny County Conservation District. Water Quality Monitoring Basics. September 22, 2020. Advocate for your Watershed Series. Pittsburgh, PA.
- Elliott, E., Bain, D. Gathering Water Urban Data Through Networks of Sensors and People Panel. The Role of Universities in Sustainable, Just & Inclusive Cities Conference. Pittsburgh, PA. January 22, 2021.
- Technical expert speaker for community dialog event with Triboro (Millvale, Sharpsburg, Etna) opinion leaders focused on air quality. June 25, 2018, Millvale Library, Pittsburgh PA. Participants included mayors, council presidents, and business leaders. Hosted by the NAS Science & Engineering Ambassadors.
- Elliott, EM. "Hard NOx: Pinning Down the Science of Nitrogen Oxide Pollution" A presentation at "[The Air We Breathe: The State of Pollution Research in Pittsburgh](#)". June 2, 2016, Homewood Branch Library, Pittsburgh PA. A community dialogue and workshop hosted by the NAS Science & Engineering Ambassadors focused on research-driven strategies for tackling the region's air quality challenges
- Energy-NET exhibit at the Carnegie Museum of Natural History. April 2013. "Make Choices Market: What Energy Goes into Your Food". Exhibit exploring the energy, carbon and water footprints associated with various food choices. (NSF grant #[1202631](#))
- Energy-NET exhibit at the Carnegie Museum of Natural History. August 2013. "The Energy-Water Nexus: Watt About It?" Interactive exhibit exploring the water footprint of various energy sources and the energy requirements for source water treatment. (NSF grant #[1202631](#))
- Energy-NET exhibit at the Carnegie Museum of Natural History. April 2014. "Water Wise- Give Rain a Home". This installation explored issues surrounding urban water and energy sustainability. (NSF grant #[1202631](#))
- Energy-NET exhibit at the Carnegie Museum of Natural History. April 2015. "Soil Grounded in Science: The Dirt on Contamination". This installation investigated the relationships

between Pittsburgh's industrial legacy, soil contamination, and human health. (NSF grant #[1202631](#))

- Energy-NET exhibit at the Carnegie Museum of Natural History. April 2016. "How's the Air Up There?". Installation explored issues surrounding air quality, energy, human and environmental health. (NSF grant #[1202631](#))

National news contributions

National Public Radio. May 19, 2020. Print story. [Traffic Is Way Down Because Of Lockdown, But Air Pollution? Not So Much](#). [On air interview](#).

Short Wave, NPR podcast. Podcast interview: The Pandemic Cut Down Car Traffic. Why Not Air Pollution?

Research Results Featured in Media

Pittsburgh Water Collaboratory research results featured in:

Next Pittsburgh. June 24, 2019. [5 minutes with Pitt's Emily Elliott: on tackling Pittsburgh's stormwater crisis](#)

Trib Live. Friday, April 5, 2019. [Pitt researchers receive \\$175K grant for Pittsburgh water study](#).

Eureka Alert. April 5, 2019. [Pitt faculty awarded NSF RAPID grant to study local water system anti-corrosion treatment](#).

Pittsburgh Green Story. October 28, 2019. [Pitt Collaboratory Cites Assessment, Public Education, as Keys to Addressing Regional Water Quality](#).

Phys.org. June 19, 2019. [Pitt researchers' report pushes for regional green infrastructure database](#)

WESA 90.5, The Confluence. August 6, 2019. In studio interview. [Pitt 'Collaboratory' Looks For Green Water Solutions](#).

Research results (Divers et al., 2013, ES&T) featured in:

The Academic Minute podcast from Northeast Public Radio, June 26, 2013. [Dr. Emily Elliott, University of Pittsburgh – Environmental Risk from Aging Sewers | WAMC](#)

University of Pittsburgh Press Release, March 6, 2013. [Pittsburgh's Leaky Faucet: How Aging Sewers Are Impacting Urban Watersheds](#)

The Atlantic Cities, March 18, 2013. [It's Not Just Overflow—Everyday Leaks From Sewer Systems Lead to Alarming Amounts of Sewage in Our Waterways](#)

Pittsburgh City Paper, March 20, 2013. [Just Plain Crap | Green Light | Pittsburgh | Pittsburgh City Paper \(pghcitypaper.com\)](#)

Research results (Felix et al., 2012, ES&T) featured in:

University of Pittsburgh Press Release, April 19, 2012. [University of Pittsburgh and Electric Power Research Institute Researchers Develop Method to Fingerprint Air Pollution:](#)

[This is first U.S. study to directly measure the isotopic fingerprint of power plant emissions](#)

Power Engineering Magazine. April 19, 2012. [Researchers find method of identifying sources of NOx emissions - Power Engineering \(power-eng.com\)](#)

Interview, Essential Public Radio, Pittsburgh (90.5). "Getting the Fingerprint of Pollution. April 20, 2012. <http://www.essentialpublicradio.org/story/2012-04-20/getting-fingerprint-pollution-10874>

Research results (Elliott et al., 2007, ES&T) featured in:

USGS Press Release, October 19, 2007. "USGS Study Identifies Major Source of Nitrate in Precipitation". <http://www.usgs.gov/newsroom/article.asp?ID=1809>

University of Pittsburgh Press Release, April 19, 2012. [Harmful Byproducts of Fossil Fuels Could Be Higher in Urban Areas Than Previously Thought, Pitt Professor's Research Suggests | University of Pittsburgh News](#)

Allegheny Front radio show, October 27, 2007. [Nitrates in Rain and Snow Tracked to Industrial Sources | The Allegheny Front.](#)

Professional Development

Big Proposal Bootcamp. University of Pittsburgh, Spring 2020.

Alan Alda Center for Communicating Science. "Communicating Science" workshop. University of Pittsburgh, May 2-3, 2019.

American Geophysical Union, "Sharing Science with any Audience" workshop, University of Pittsburgh, October 4, 2017.

Science and Engineering Ambassador, National Academies of Science and Engineering. 2015-2017. A two year-long program that focused on training leaders in science and engineering to be more effective communicators. Specific workshops included media training, effective oral presentations, and facilitating discussions.

"Building Career Success and Satisfaction", workshop participant. March 22-23, 2012. Women in Medicine and Science 2012 Forum sponsored by the University of Pittsburgh, Health Sciences.

"Basic Negotiations, Problem Solving, and Conflict Resolution", workshop participant. October 1, 2011. A COACH workshop sponsored by the University of Pittsburgh, Department of Chemistry.

"FORWARD to Professorship" workshop participant. May 23-25, 2011, Washington DC. A joint program of the George Washington and Gallaudet Universities funded by a National Science Foundation ADVANCE leadership award.

"Building Leadership Skills for Success in Scientific Organizations", workshop participant. December 12-14, 2008, San Francisco, CA. Sponsored by the Earth Science Women's Network.

University of Pittsburgh, Survival Skills Workshop, Effective Grant writing, Spring 2008.