Timothy R. Filley
Professor of Geochemistry and Soil Science
Department of Geography and Environmental Sustainability; Department of Geosciences
University of Oklahoma, Norman, OK 73019
filley@OU.edu;

Professional Preparation

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

Research and Professional Experience

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

Awards and Honors

2004, 2018, 2019	Purdue University Seeds for Success Award (presented to faculty who have secured a sponsored research grant awarded to Purdue in excess of one million dollars in one year)
2011	Senior Foreign Research Scholar, Chinese Academy of Sciences, Institute of Applied Ecology, Shenyang China.
2015-2017	Foreign Expert for Nanjing Agricultural University, Jiangsu Province, China
2016	Alumnus of the year, Department of Chemistry and Biochemistry, Loyola University of Chicago

Research Summary

Filley's research explores the biogeochemical and physical processes that transform organic matter in terrestrial and aquatic ecosystems within natural and intensively managed landscapes. An overarching

goal of his work is to demonstrate that detailed mechanistic information about soil organic matter (SOM) dynamics can lead to better understanding of society's vulnerability to climate and land use change, as well as to the potential risks from emerging pollutants. His work includes fundamental research into upcycling of waste biomass (e.g. wooden railroad ties) into high value products like biochar for use as adsorbents or soil amendments for land restoration and ecosystem carbon sequestration. Filley uses isotope geochemistry, molecular biology, and analytical chemistry to study the complex factors that drive organic geochemical transformations in the environment. Filley's group has produced numerous "first of its kind" studies related to emerging pollutant fate in soil, measurements of in-situ decay rates of natural chemicals in soil, and novel application of analytical tools to identify the molecular composition and reactivity of SOM. Filley also works to connect chemical transformations that primarily occur at the submicron scale to the ecosystem scale for an improved understanding of how environments respond to stresses such as invasive plants and animals, climate warming, and land use change. His work provides the foundational chemistry for many national and international, large-scale ecosystem projects such as the NSF Critical Zone Observatory (CZO) Network. His effort to create the Arequipa Nexus Institute for Food, Energy, Water and the Environment (Nexus Institute) in 2018 resulted in one of the largest cross-college collaborative efforts in Purdue's history and continues to be one of the largest foreign investments in Purdue research. Filley currently co-directs, along with his counterpart at the Universidad Nacional de San Agustin, the Nexus Institute which recently received a five-year continuation to 2025.

Research Leadership Experience

From 2012-2016, Filley served as the director of the U.S.-China Ecopartnership for Environmental Sustainability (USCEES). The USCEES also included founding members of the University of Tennessee's Institute for a Secure and Sustainable Environment, Oak Ridge National Laboratories Joint Institute for Biological Sciences, and the Chinese Academy of Sciences' IAE, Institute of Geographic Sciences and Natural Resources Research, and the Research Center for Eco-environmental Sciences. The program was approved as a US-China Ecopartnership by the US Department of State and the National Development and Reform Commission of the People's Republic of China. As U.S. Director, Filley worked to foster bilateral research innovation, communication, and entrepreneurship by developing a strategy for subnational scientific collaborations. Under his leadership, the program established a Visiting Scholar Network (including a searchable database for visiting scholar engagement), an internet portal to Purdue-developed technologies licensable in China, and a series of bi-national annual conferences, technical workshops, and joint research projects on Agroecosystem Dynamics. Underpinning these activities was a strong effort to build cross-cultural exchange among the participating researchers—although both the U.S. and China have embraced a future based on science, technology, and innovation, these two nations have vastly different cultural, political, and demographic legacies that challenge uniform solutions or mandated collaborative networks.

Filley served as director of Purdue's Center for the Environment (C4E) from 2017-2021. The C4E, housed in Purdue's Discovery Park, worked to promote proactive, interdisciplinary research, learning, and engagement, addressing important regional and global challenges related to the environmental and the sustainable use of natural resources. The Center helped to connect its over 195 faculty affiliate members from across departments and disciplines to work on sustainability challenges, it supported innovative projects, and increases the impact of Purdue's work on important environmental issues through outreach and stakeholder engagement activities. The Center focused on supporting efforts to address three overlapping aspects of the environmental challenges facing the world: challenges to ecosystem functioning, environmental challenges to community health and well-being, and environmental decision-making and behavior. By emphasizing the deep connection between human society and the ecosystems that support us, the Center sought more promising solutions to environmental challenges than those that focus exclusively on technical or scientific fixes, or on social, political, or economic considerations in isolation.

Filley was co-director of the Purdue Stable Isotope Instrumentation (PSI) facility within the Department of Earth, Atmospheric, and Planetary Sciences from 2005-2021. PSI is core Purdue University instrumentation facility specializing in analytical services utilizing light stable isotope mass spectrometry for analysis of ^{1}H, ^{2}H, ^{13}C, ^{12}C, ^{16}O, ^{17}O, ^{18}O, ^{14}N, ^{15}N in a variety of natural and synthetic materials.

Filley was the lead PI, architect, and co-director of the Nexus Institute for Sustainable Food, Energy, Water and the Environment (The Nexus) - https://www.purdue.edu/discoverypark/arequipa-nexus/en/index.php The Nexus, funded in Jan 2018, was created as a technical and research alliance program between Purdue University and the Universidad Nacional de San Agustin (UNSA) in the Arequipa region of Peru. The Nexus Institute continues to support a collaborative research, education and innovation ecosystem where transformative solutions to challenges faced by Arequipa, Peru, and Latin America are explored. It aims to understand the region's food, energy and water production and delivery systems in the context of the complex socio-economic-environmental challenges Arequipa faces such as a changing climate, diminishing resources, a legacy of environmental degradation, and diverse communities striving for prosperity and security. During the 4 years lead the Nexus, over 60 Purdue faculty spanning 7 colleges, 100 UNSA faculty, and 30 postdoctoral researchers were supported with this effort.

Filley is the inaugural director of the University of Oklahoma's Institute for Resilient Environmental and Energy Systems (IREES). IREES will work to connect OU faculty members from across disciplines with global and regional stakeholders to address challenges related to observing and predicting earth systems, transforming energy and infrastructure systems, and co-generating community resilience and environmental justice. IREES will serve as a collaborative space for transdisciplinary research teams providing administrative support, analytical research facilities, and research computing infrastructure dedicated to convergence research. IREES is one of four new institutes addressing four strategic areas of research focused on grand challenges in aerospace, defense, and global security; environment, energy, and sustainability; the future of health; and society and community transformation that support OU's Lead On Strategic Plan.

Publication Summary

Google Scholar Citation Report (as of August, 2021): **h-index 42, i10 = 92, 7973 citations**

[P] = Post-doc in Filley's group; [U] = undergraduate researcher in Filley's group; underlined = Graduate students in Filley's group; * = Visiting scholars in Filley's group

114) Wang, X., Dai, W., **Filley, T.R.**, Wang, C., Bai, E (2021). Aboveground litter addition for five years changes the chemical composition of soil organic matter in a temperate deciduous forest. *Soil Biology and Biochemistry*, 108381

113) Keiser, A.D., Warren, R., **Filley, T.R.**, Bradford, M.A. (2021) Signatures of an abiotic decomposition pathway in temperate forest leaf litter. *Biogeochemistry*, 1-14

112) Blair, N., Bettis III, E.A., **Filley, T.R.**, Moravek, J., Papanicolaou, A.N., Ward, A.S., Wilson, C.G., Zhou, N., Kazmierczak, B., Kim, J., (2021) The Spatiotemporal Evolution of Storm Pulse Particulate Organic Carbon in a Low Gradient, Agriculturally Dominated Watershed. *Frontiers in Water* 3, 9

111) Waimin, J., Jiang, H., Detwiler, D.A., [P]Jimenez-Castaneda, M.E., Mutlu, Z., Cakmak, M., **Filley, T.R.,** Rahimi, R. (2021) Noninvasive assessment of microbial activity by real time monitoring degradation of cellulose acetate via electrochemical impedance measurement. *Sensors & Actuators: A. Physical (In* Press)

110) Hou, T., **Filley, T.R.**, Tong, Y., Abban, B.K., Singh, S., Papanicolaou, A.T., Wacha, K.M., Wilson, and C.G., Chaubey, I. (2021) Tillage-induced surface soil roughness controls the chemistry and physics of eroded particles at early erosion stage. *Soil and Tillage Research*, (207, 104807).

109) [P]Ramson, J., León-Salas, W.D., [P]Brecheisen, Z., [P]Foster, E.F., Johnston, C.T., Schulze, D.G., **Filley, T.R.**, Rahimi, R., Villalta Soto, M., Lopa Bolivar, J., Postigo Málaga, M. (2021) A Self-

Powered, Real-Time, LoRaWAN IoT-based Soil Health Monitoring System. *IEEE Internet of Things Journal* 10.1109/JIOT.2021.3056586

108) [P]Brecheisen, Z., Hamp-Adams, N., Tomasek, A., [P]Foster, E.J., **Filley, T.R.,** Villalta Soto, M., Zuniga, L., , Lima Moraes, A., Schulze, D.G. (2020) Using Remote Sensing to Discover Historic Context of Human-Environmental Water Resource Dynamics. *Journal of Contemporary Water Research & Education* 171 (1), 74-92

107) *Li, M., [P]Foster, E.J., Le, P.V.V., Yan, Q., Stumpf, A., Hou, T., Papanicolaou, ANT., Wacha, K.M., Wilson, C.G., Wang, J., Kumar, P., **Filley, T.R.** (2020) A new dynamic wetness index predicts soil moisture persistence and correlates with key indicators of surface soil geochemistry. *Geoderma* 368, 114239.

106) Ding, X., Chen, S., Zhang, B., He, H., **Filley, T.R.,** Horwath, W.R. (2020) Warming yields distinct accumulation patterns of microbial residues in dry and wet alpine grasslands on the Qinghai-Tibetan Plateau. *Biology and Fertility of Soils* 56, 881-892.

105) Wacha, K.M., Papanicolaou, A.N.T., Abban, B.K., Wilson, C.G., Giannopoulos, C.P., Hou, T., **Filley, T.R.,** Hatfield, J. (2020) The impact of tillage row orientation on physical and chemical sediment enrichment. *Agrosystems, Geosciences & Environment* 3 (1), e20007

104) *Jin, X., Gall, A.R., Saeed, M.F., Li, S., **Filley, T.R.**, Wang, J. (2020) Plastic film mulching and nitrogen fertilization enhance the conversion of newly-added maize straw to water-soluble organic carbon. *Soil and Tillage Research* 197, 104527

103) Li, Z., Wang, D., Dai, H., Wang, X., Liang, S., Xu, J., Yang, J.,Wang, L., **Filley, T.R**. et. al, (2020) Background and Research Prospect of Geo-ecological Survey and Monitor in the Critical Zone of Black Soil. *Acta Geologica Sinica-English Edition* 93 (S3), 126-129

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100) Ceja-Navarro, J., Karaoz, Bill, M., Hao, Z., White, R., Arellano, A., Ramanculova, L., **Filley, T.R.,** Berry, T., Conrad, M., Blackwell, M., Nicora, C., Kim, Y-M., Reardon, P., Lipton, M., Adkins, J., Pett-Ridge, J., Brodie, E. (2019) Gut anatomical properties and microbial functional assembly promote lignocellulose deconstruction and colony subsistence of a wood-feeding beetle. *Nature-Microbiology* 4(5), 864.

99) Ma, Y., Szlavecz, K., McCormick, K., **Filley, T.R.** (2019) Controls on soil organic carbon stability and temperature sensitivity with increased aboveground litter input in deciduous forests at different forest ages. *Soil Biology & Biochemistry* 134, 90-99.

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97) Yan, Q. Le, PVV., Woo, D.K., Hou, T., **Filley, T.R.**, Kumar, P. (2019) 3-D Modeling of the Co-evolution of Landscape and Soil Organic Carbon. *Water Resources Research,* 55, 1218-1241.

96) Wacha, K., Papanicolaou, T., Giannopoulos, C., Abban, B., Wilson, C., Zhou, S., Hatfield, J., **Filley, T.R**., Hou, T. (2018) The Role of Hydraulic Connectivity and Management on Soil Aggregate Size and Stability in the Clear Creek Watershed, Iowa. *Geosciences* 8 (12), 470.

95) Gibson, C., Hatton P.J., Bird, J.A., Nadelhoffer, K.J., Ward, C., Stark, R., **Filley, T.R.** (2018) Interacting Controls of Pyrolysis Temperature and Plant Taxa on the Degradability of PyOM in Fire-Prone Northern Temperate Forest. *Soil Systems* 2 (3), 48.

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93) Hou, T., Berry, T., Singh, S., Hughes, M[U]., Tong, Y., Papanicolaou, T., Wacha, K., Wilson, C., Chaubey, I., **Filley, T.R.** (2018) Control of tillage disturbance on the chemistry and proportion of raindrop-liberated particles from soil aggregates *Geoderma* 330, 19-29.

92) Szlavecz, K. Chang, C.H., Bernard, M.J., Pitz, S.L., Ma, Y., McCormick, M.K., **Filley, T.R.,** Yarwood, S.A., Yesilonis, I.D., Csuzdi, C. (2018) Litter quality, dispersal and invasion drive earthworm community dynamics and forest soil development. *Oecologia* 1-14.

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90) Jin, X*., An, T., Gall, A.R., Li, S., **Filley, T.R**., Wang, J. (2018) Enhanced conversion of newly-added maize straw to soil microbial biomass C under plastic film mulching and organic manure management. *Geoderma.* 313, 154-162

89) De Oliveira, S.A., Camberato, J.j., Coram, T., **Filley, T.R**., Vyn, T.J. (2017) Applicability of a multi-stage pulse-labeling 15N approach to phenotype N dynamics in maize plant components during the growing season. *Frontiers in Plant Science* 8, 1360.

88) Baskaran, M., Bianchi, T.S., **Filley, T.R.** (2017) Inconsistencies between 14C and short-lived radionuclides-based sediment accumulation rates: Effects of long-term remineralization. *Journal of Environmental Radioactivity*. 174, 10-16. http://dx.doi.org/10.1016/j.jenvrad.2016.07.028.

87) Wang, R*., Gibson, C., Berry, T.D., Jiang, Y., Bird, J.A., **Filley, T.R**. (2017) Photooxidation of pyrogenic organic matter reduces its reactive, labile C pool and the apparent soil oxidative microbial enzyme response. *Geoderma* 293, 10–18.

86) Ding, X*., Qiao, Y., **Filley, T**., Wang, H., Lü, X., Zhang, B*., Wang, J (2017) Long-term changes in land use impact the accumulation of microbial residues in the particle-size fractions of a Mollisol. *Biology and Fertility of Soils*, 53, 281-286.

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83) Hatton P.J., Chatterjee, S., **Filley, T.R.,** Dastmalchi, K., Plante, A.F., Abiven, S., Gao, X., Masiello, C.A., Leavitt, S., Nadelhoffer, K.J., Stark, R. E., Bird, J.A. (2016) Tree taxa and pyrolysis temperature interact to control the efficacy of pyrogenic organic matter formation. *Biogeochemistry.* 130 (1-2), 103-116.

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81) Creamer, C.A., **Filley, T.R.,** Boutton, T.W., Rowe, H.I. (2016) Grassland to woodland transitions: dynamic response of microbial community structure and carbon use patterns. *Journal of Geophysical Research: Biogeosciences*. 121(6) 1675-1688. **DOI:** 10.1002/2016JG003347

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75) Gibson, C., Berry, T.D., Wang, R*., Spencer, J.A., Johnston, C.T., Jiang, Y., Bird, J.A., **Filley, T.R.** (2016) Weathering of pyrogenic organic matter induces fungal oxidative enzyme response in single culture inoculation experiments. *Organic Geochemistry,* 32-41. DOI: 10.1016/j.orggeochem.2015.12.003

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22). Bianchi, T.S., Wysocki, L.A., Stewart, M., **Filley, T.R**. (2007) Temporal variability in terrestrially-derived sources of particulate organic carbon in the lower Mississippi River and its upper tributaries. *Geochimica et Cosmochimica Acta* 71, 4425-4437.

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17). **Filley, T.R.,** Boutton, T.W. (2006) Ecosystems in flux: Molecular and stable isotope assessments of soil organic matter storage and dynamics. *Soil Biology and Biochemistry* 38 (11): 3181-3183 (commentary).

16). Dalzell, B.J., **Filley, T.R.,** Harbor, J.M. (2005) Flood pulse influences on terrestrial organic matter export from an agricultural watershed. *Journal of Geophysical Research: Biogeosciences,*

15). Cody, G.D., Boctor, N.Z., Brandes, J.A., **Filley, T.R.,** Hazen, R.M. and Yoder, Jr. H.S. (2004) Assaying the catalytic potential of transition metal sulfides for abiotic carbon fixation. *Geochimica et Cosmochimica Acta,* 68, 2185-2196.

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13). Grannas, A.M., Shepson, P.B., **Filley, T.R.** (2004) Photochemistry and nature of organic matter in Arctic and Antarctic snow. *Global Biogeochemical Cycles* 18 (1): doi:10.1029/2003GB002133.

12). Bianchi, T.S., **Filley, T.R.,** Dria, K., and Hatcher, P.G. (2004) Temporal Variability in Sources of Dissolved Organic Carbon in the Lower Mississippi River. *Geochimica et Cosmochimica Acta* 66, 959-967.

11). **Filley, T.R** (2003) Assessment of fungal wood decay by lignin analysis using tetramethyl-ammonium hydroxide (TMAH) and C-13-labeled TMAH thermochemolysis In: *Wood*

Deterioration and Preservation-Advances in our Changing World. Editors: Goodell B; Nicholas DD; Schultz TP, ACS SYMPOSIUM SERIES: 845, 119-139.

10). **Filley, T.R.,** Freeman, K.H., Wilkin, R.T., et al., (2002) Biogeochemical controls on reaction of sedimentary organic matter and aqueous sulfides in Holocene sediments of Mud Lake, Florida, *Geochimica et Cosmochimica Acta* ,66, 937-954

9). **Filley, T.R.,** Cody, G.D., Goodell, B. et al. (2002) Lignin demethylation and polysaccharide decomposition in spruce sapwood degraded by brown rot fungi. *Organic Geochemistry*, 33, 111-124.

8). **Filley, T.R.,** Blanchette, R.A., Simpson, E., Fogel, M. (2001) Nitrogen cycling by wood decomposing soft-rot fungi in the "King Midas tomb," Gordion, Turkey. *Proceedings of the National Academy of Sciences-USA*, 98, 13346-13350.

7). **Filley, T.R.,** Freeman, K.H., Bianchi, T.S., Hatcher, P. (2001) An isotopic biogeochemical assessment of shifts in organic matter input to Holocene sediments from Mud Lake, Florida *Organic Geochemistry*, 32, 1153-1167

6). Hazen, R.M., **Filley, T.R.,** Goodfriend G.A. (2001) Selective adsorption of L- and D-amino acids on calcite: Implications for biochemical homochirality *Proceedings of the National Academy of Sciences-USA*, 98, 5487-5490.

5). Cody, G.D., Boctor, N.Z., **Filley, T.R.,** et al. (2000) Primordial carbonylated iron-sulfur compounds and the synthesis of pyruvate. *Science.* 289, 1337-1340.

4). **Filley, T.R.,** Hatcher, P.G., Shortle, W.C., et al. (2000) The application of C-13-labeled tetramethylammonium hydroxide (C-13-TMAH) thermochemolysis to the study of fungal degradation of wood. *Organic Geochemistry*, 31, 181-198.

3). **Filley, T.R.,** Minard, R.D., Hatcher, P.G. (1999) Tetramethylammonium hydroxide (TMAH) thermochemolysis: proposed mechanisms based upon the application of C-13-labeled TMAH to a synthetic model lignin dimer. *Organic Geochemistry*, 30, 607-621.

2). **Filley, T.R.,** Filley, R.M., Eser, S., Freeman, K. (1997) Compound-specific isotope analyses of products from carbonization of a fluid catalytic cracking decant oil doped with C-13-enriched 4-methyldibenzothiophene. *Energy and Fuels*, 11, 637-646

1). **Filley, T.R.,** Freeman, K.H., Hatcher, P.G. (1996) Carbon isotope relationships between sulfide-bound steroids and their proposed sterol precursors in the sediments from Santa Barbara Basin, CA. *Organic Geochemistry,* 25, 367-377.

Reports and Briefs

Aines, R., Amador, G., Bennett, D., Cave, E., Chen, W.. Dipple, G., Field, J., Filley, T., Friedmann, S., Funk, J., Jacobson, R., Kelemen, P., Lackjner, K., Lehmann, J., Levy, C., Lucas, M., Matchett, K., McCarty, J., Mooney, S., Neale, N., Park, A.A., Pett-Ridge, J., Powell, P., Sanchez, D., Song, C., Stechel, E., Sun, N., Swan, A., Wilcox, J., Woodbury, P., Zelikova, J (2018) Building A New Carbon Economy: An Innovation Plan. *A Product of the New Carbon Economy Consortia*

Graduate Student and Postdoctoral Researchers Advised
Serving/served as major professor or co-major professor

Graduate Students
Dr. Brent Dalzell, PhD 2005
Ms. Wang Yang, MS 2005 (co-advised with Yuch Ning Shieh.)
Mr. Keith Crooker, MS 2006
Ms. Katie Schreiner, MS 2009
Dr. Courtney Creamer, PhD 2012
Dr. Yini Ma, PhD 2013
Dr. Sara Top, PhD 2013
Ms. Olivia Miller, MS 2014

Dr. Timothy Berry, PhD 2016
Dr. Ruzhen Wang, PhD 2015 (co-advised with Yong Jiang, Institute of Applied Ecology, Chinese Academy of Sciences)
Dr. Nana Wu, PhD 2014 (co-advised with Prof. Edith Bai, Institute of Applied Ecology, Chinese Academy of Sciences)
Dr. Yuanyuan Li, PhD 2015 (co-advised with Prof Dong Shikui, Beijing Normal University)
Dr. Christy Gibson, PhD 2017
Ms. Ming Li, 2014-present (co-advised with Prof Jingkuan Wang, Shenyang Agricultural University)
Ms. Ulyssa Hester, MS 2017
Mr. Jake Kastenbauer, MS 2020
Ms. Lucia Zuniga, MS 2020
Dr. Tingyu Hou, PhD 2021
Mr. Gordon MacLeod, PhD 2018-present
Mr. Ian Frantal, MS 2021-present

Postdoctoral Researchers
Dr. Karl Dria, 2004-2005
Dr. Mi-Youn Ahn, 2005-2006
Dr. Susan Crow, 2006-2007
Dr Tim Berry, 2016
Dr. Christy Gibson, 2017-2018
Dr. Erika Forster, 2018-present
Dr Alexander Ccanccapa, 2019
Dr. Martha Jimenez, 2019-present

Summary of Extramural Funding
Dr. Filley and colleagues have generated over $25,000,000 for 25 research projects from a number of different funding sources including DOE, EPA, USDA, NSF, as well as international agencies, and industry. These projects were highly collaborative efforts.

Current Research Support

1. *CINET – Critical Interfaces Network*. 9/2020 – 8/2025. $455,000/$5,500,000 National Science Foundation. Multi University Grant. (Filley-Purdue PI), with Lisa Welp (Purdue CoPI) in a consortium of 8 universities, Praveen Kumar (Univ. of Illinois Campaign, Lead PI).
2. *Arequipa Nexus Institute for Food, Energy, Water and the Environment.* 1/2018 - 12/2021, $14,400,000. Funded through the Peru Mining Canon as a cooperative technical alliance with the National University of Saint Augustin (UNSA), Arequipa, Peru. (T. Filley lead PI along with 21 CoPI and 38 collaborative investigators at Purdue).
3. *Critical Zone Observatory for Intensively Managed Landscapes* (IML-CZO). 8/13-11/2021, $560,000/$5,000,000. National Science Foundation. Multi University Grant. (Filley-Purdue PI), with Indrajeet Chaubey (Purdue CoPI) in a consortium of 10 universities, Praveen Kumar (Univ. of Illinois Campaign, Lead PI).
4. *Revisiting an Old Invader: Unraveling Interactions Between Japanese Beetle and the Soil Environment*; USDA/NIFA. 5/1/18-4/30/22, $455,000.00. (Filley-CoPI with Ron Turco, and Doug Richmond (PI).
5. *Upcycling Spent Railroad Ties into a Value-Added Biochar to Improve Water Quality*. 10/15/20 – 2/28/22, $150,000. RR Consortia. Filley CoPI with Chad Javert, Cliff Johnston, Abby Engelberth (PI).

Completed Research Support

6. *Collaborative Research: Linking the Chemical Structure of Black Carbon to its Biological Degradation and Transport Dynamics in a Northern Temperate Forest Soil.* 10/11-09/17,; $406,506/$1,300,00.00. National Science Foundation. (Filley Purdue PI) with K. Nadelhoffer (PI), J. Bird (PI).
7. *Collaborative Research: Investigating the Soil-Earthworm-Litter System Controls on the Stabilization of Organic Matter in Eastern Deciduous Forests*, 08/08 to 09/12, $383,000/$680,000. National Science Foundation. (Filley-Lead PI) with C. Johnston (CoPI), K. Szlavecz (PI), M. McCormick (PI).
8. Research Experience for Undergraduates (REU) Supplement to *Investigating the Soil-Earthworm-Litter System Controls on the Stabilization of Organic Matter in Eastern Deciduous Forests,* 06/10-05/12, $25,000. National Science Foundation. (Filley-Lead PI).
9. *Acquisition of a Gas Chromatograph-Quadrupole Mass Spectrometer and Upgrade to an Existing Stable Isotope Mass Spectrometer for Continued Biogeochemical Research.* 06/09-06/10, $188,209. National Science Foundation (Filley Lead PI).
10. *Lignin as a Facilitator, not a Barrier, during Saccarification by Brown Rot Fungi*. 09/08-08/12, $158,000. USDA-DOE (Univ MN), (Filley-Co-PI) with R. Blanchette (CoPI), J. Schilling (PI).
11. Research Experience for Undergraduates (REU) Supplement to *Impacts of Vegetation Change on Stabilization and Microbial Accessibility of Soil Organic Matter.* 06/09-05/10, $4,924. National Science Foundation (Filley-PI).
12. *Mentoring Native American Students for Success in Geoscience Graduate Programs*. 08/06 to 07/10, $500,000. National Science Foundation. (Filley-Co-PI) with G. Parker (CoPI), P. Welle (CoPI), T. Kroeger (CoPI), S. Zurn-Birkhimer (PI).
13. *Collaborative Research: Impacts of Vegetation Change on the Stabilization and Microbial Accessibility of Organic Matter: A Microbiological, Isotopic, and Molecular Study.* 08/05 to 07/09, $254,00/$454,000. National Science Foundation. (Filley-Lead PI) with T. Boutton (CoPI).
14. *Key Role of Nitrogenous Compounds in Soil Organic Matter Stabilization via Interactions with Mineral Surfaces.* 08/05 to 07/08, $91,885. United State Department of Agriculture / sub contract through Oregon State University. (Filley Co-PI) with K. Lajtha (CoPI), B. Caldwell (CoPI), M. Kramer (CoPI), C. Swanston (CoPI), M. Kleber (CoPI), P. Sollins (PI).
15. *Nanoscale Initiative Research Teams (NIRT): Response of Aquatic and Terrestrial Microorganisms to Carbon-Based Manufactured Nanoparticles*. 07/04 to 06/08, $320,000/$1,600,00. National Science Foundation. (Filley-Co-PI) with B. Applegate (CoPI), C. Jafvert (CoPI), R. Balanchette (CoPI), L. Nies (CoPI), R. Turco (PI).
16. *Understanding the survival microorganisms in tile drainage and surface water.* 09/04 to 08/06, $110,000. United State Department of Agriculture. (Co-PI) with R. Turco (PI).
17. *Watershed Tracking of Allochthonous Organic Matter and Nutrients to Geist, Eagle, and Morse Reservoirs, Indiana, Sub project 5*. 10/04 to 01/06, $33,000. Central Indiana Water Resources Partnership. (Filley-PI).
18. *Repercussion of Carbon Based Manufactured Nanoparticles on Microbial Processes in Environmental Systems*. 10/04 to 09/07, $83,750. Environmental Protection Agency, (Filley Co-PI) with R. Turco (PI).
19. *Hydrologic and land use control on the nature and cycling of allochthonous organic carbon in mixed land use water sheds within Central Indiana*. 03/04 to 02/06, $27,000. United States Geological Survey-Indiana Water Resources Research Center, (Filley PI).
20. *Collaborative Research: Orchid-fungal interactions - a system for testing hypothesis about the ecological role and distribution of mycorrhizal fungi in affecting plant distribution*. 09/03 to 07/06, $100,000. National Science Foundation, (Filley Purdue PI) with M. McCormick (CoPI), D. Whigham (PI).
21. *Anaerobic Microbial Reductive Debromination of Polybrominated Diphenyl Ethers*. 09/02 to 09/06, $94,000. Environmental Protection Agency, (Filley CoPI) with L. Nies (PI).
22. *Consortium for Agricultural Soils Mitigation of Greenhouse Gases - Purdue University Tasks 1, 2, 3 and 5*. 03/02 to 08/05, $90,000. United State Department of Agriculture. (Filley CoPI) with R. Turco (Purdue PI) through Kansas State University.

23. *Environmental Photochemistry of Polybrominated Diphenylethers*. 10/02 to 09/06, $67,000. Environmental Protection Agency. (Filley CoPI) with C Jafvert (PI).
24. *Role of Fungal Decomposition of Woody Tissue in the Sulfurization of Lignin in Sulfidic Sediments*. 6/02 to 6/04, $35,000. American Chemical Society, (Filley PI).
25. *Wood Modification by Brown Rot Fungi*. 11/00 to 11/02, $28,600. United State Department of Agriculture-sub contract to the University of Maine, (Filley CoPI) with B. Goodall (PI) and J. Jellison (CoPI).

Professional Affiliations

Soil Science Society of America
American Chemical Society
American Geophysical Union

Service

Professional Organizations

Facilitated the coordination of the joint meeting between The Geochemistry Division of the American Chemical Society and The Clay Minerals Society, New Orleans, LA, 2007.

Elected National Chair and Program Chair -Geochemistry Division of the American Chemical Society, 2007-2008.

Member of Editorial Board for Geochemical Transactions, Official Journal of the ACS Division of Geochemistry, 2008-2011.

Purdue University

Discovery Park and University Service

Provost's Academic Committee for Diversity and Inclusion, College of Science representative, Oct 2020-present.

Search Committee, EVPRP Director of Research Communication, Oct 2020-present.

COVID-19 Purdue Research Ramp-up Committee, Mar 2020-Jan 2021.

Co-Chair (with Bernie Engel). Giant Leaps Toward a Sustainable Economy & Planet: Innovate today for a sustainable tomorrow. Purdue 105th anniversary celebration, 2018-2019.

Director, Purdue Center for the Environment, 2019-present.

Acting Director, Purdue Center for the Environment, 2017-2018.

ESE graduate admission committee, 2017-present.

Purdue Center for the Environment Executive Committee, 2013-2017.

Purdue Director of the US-China EcoPartnership for Environmental Sustainability, 2012-2016.

ESE governance committee, 2008-2010.

Purdue Climate Change Research Center Executive Committee, 2004-2012.

Served on four faculty search committees for the Purdue Climate Change Research Center COALESCE joint-college hires, 2004-2009.

Department of Earth, Atmospheric, and Planetary Sciences

EAPS Diversity, Equity, Inclusion Committee, 2020-present.

Environmental Geosciences Major Visioning Team, 2016-2018.

Chaired four successful EAPS faculty search committees (resulted in hires of N. Diffenbaugh, G. Michalski, G. Bowen, L. Welp) and served on three additional searches.

EAS Strategic Planning Committee, 2004, 2009, 2013, 2019.

Chair of EAPS Department Diversity Committee, 2011-2012.

EAS representative to the CIC Department Heads Meeting, 2009.

EAS Associate head, 2007-2010.

EAS Department Leadership team, 2007-2010.

EAS Graduate Committee Chair, 2007-2010.

EAS graduate committee, 2004-2010.

Outreach to educators: Volunteer participant in the Fall Purdue University Standards-Based Inquiry Workshop for grade 5-12 teachers, 2003-2005.

College of Science

CoS Faculty Council, 2017-2019.

CoS Faculty Council, 2011-2012.

CoS Faculty Diversity Committee, 2012.

College of Science Dean's Diversity Committee, 2005.

College of Science COALESCE Committee to review, cull, and merge 56 new focus area white papers, 2003.

Co-Authored Climate Change hiring initiative and the formation of the Purdue Climate Change Research Center, 2003.

Faculty representative to the College of Science Dean's Advisory Committee, 2003.

Scientific Community

Inaugural Member of the New Carbon Economy Consortium, 2017-present.

NSF Isobank Working Group, 2019-present.

Member of the Committee of Environmental Director and Deans of the National Council of Science and the Arts, 2018-present (now Global Council for Science and the Environment).

Member of the NSF Critical Zone Observatory Network soil carbon group, 2015-2019.

AGU Session Co-Convener: B020: Comparative Organic Geochemistry of Soils and Aquatic Sediments: A New View in the 21st Century, Washington D.C., Dec 10-14, 2018.

AGU Session Co-Convener: B041E: Soil Carbon Dynamics at Broad Scales: Linking Mechanistic Knowledge to Broad-Scale Applications, New Orleans, LA., Dec 11-15, 2017.

Goldschmidt Conference Organic Geochemistry Co-organizer, Yokohama, Japan, June 26-July 1, 2016.

Organizing Co-Chair, Conference and Workshop on Critical Zone Science, Sustainability, and Services in a Changing World. Jointly organized by the USCEES and the cross-CZO Working Group on Organic Matter Dynamics, Purdue University, West Lafayette, IN, Oct 23-25, 2015.

Co-Organizer of a CUAHSI hands-on short course on the role of runoff and erosion on soil carbon stocks: from soilscapes to landscapes, Purdue University, Oct 21-22, 2015.

Invited Participant, Sino-U.S. CZO Workshop, Guiyang, China, Oct. 6-7, 2015.

Scientific Committee, International Conferences on Biochar and Green Agriculture, April 14-18, 2015.

Co-Organizer, the U.S.-China Joint Ecopartnership Symposium on Land Use, Ecosystem Services, and Sustainable Development, HeFei China, Nov 16-18, 2014.

External Advisory Board Member of the Utah-Qinghai Ecopartnership, 2014-2016.

NSF Proposal Panel Member, Low Temperature Geochemistry and Geobiology, 2014, 2009, 2008.

Co-Organizer, symposium entitled “Environmental Fate and Reactivity of Highly Condensed Aromatic Carbon,” at 246th American Chemical Society National Meeting, Indianapolis, IN, Sept 2013.

Organizer, international workshop and symposium on “Opportunities and Challenges in US-China Intellectual Property Agreements” at the 246th National Meeting of the American-Chemical-Society, Indianapolis, IN, Sept 08-12, 2013.

NSF Proposal Panel Member, Ecosystems (Division of Environmental Biology), 2012, 2013.

Co-Organizer, The U.S.-China Joint Ecopartnership Symposium on Land Use, Ecosystem Services, and Sustainable Development, Gatlinburg, TN, Nov 16-18, 2013.

AGU session Co-Organizer, symposium on Dryland Biogeochemistry, San Francisco, CA, December 2012.

Co-Organizer - The U.S.-China Joint Ecopartnership Symposium on Land Use, Ecosystem Services, and Sustainable Development, Shenyang China, Sep 7 17-20, 2012.

Invited workshop participant on the biogeochemical applications of moving wire 14C AMS technology, Lawrence Livermore National Laboratory, Feb 8-10, 2012.

Invited participant in the European Cooperation in Science and Technology (COST) workshop on Stable Isotopes in Biosphere-Atmosphere-Earth System Research (SIBAE). Ghent, Belgium. Working group III. June 21-22, 2012.

Editor, Chicago Wilderness Climate Action plan, Sept 2011.

NSF Workshop committee member; committee to outline future research initiatives for the NSF Geobiology and Low Temperature Geochemistry Program (G&G), August 2010.

Presenter, Rotary Club World Congress, Climate Change Lecture and Discussion, March 2008.

NSF Carbon and Water Proposal Panel Member, 2007.

Guest editor (with Tom Boutton) of a special issue of *Soil Biology and Biochemistry* "Ecosystems in Flux: Molecular and Isotopic Indicators of Soil Organic Matter Dynamics," Vol 38, 2006.

Co-organizer of an international conference on the "Mechanisms of Organic Matter Stabilization and Destabilization in Soils," Asilomar Conference Center in Monterey, CA, October 9-13, 2005.

Invited participant in the development of the Great Lakes and Central States Ecological Session Organizer-fall American Geophysical Union Fall Meeting (2004). Co-organized (with Tom Boutton, Texas A&M) and chaired a session on "Ecosystems in Flux: Molecular and Isotopic Indicators of Soil Organic Matter Dynamics."

Participant in planning session for the Great Lakes and Central US Ecological Observatory (GLACEO), a NEON infrastructure initiative. Presented and led discussion on the needs associated with "o*rganic compound-specific stable isotope analysis in NEON."* University of Michigan Biological Research Station. Oct 15-17, 2004.

Rapporteur, NCAR Biogeosciences Workshop on "Development of a Science Plan for Integrated Studies of Coupled Biosphere-Atmosphere Carbon and Nitrogen Cycles," Boulder, CO, Nov 15-17, 2003.

Session Organizer at the American Chemical Society National, co-organized with John Hedges, University of Washington; chair of session on Terrestrial Biogeochemistry, San Diego, CA, 2001.

NASA proposal panel member: Round-2 NASA Astrobiology Institutes, Ames, CA, 2001.

Diversity-Related Activities

College of Science representative on Provost's Academic Committee for Diversity and Inclusion, Oct 2020-present.

Co-Chair of EAPS Department Recruitment and Outreach Committee, 2015-present.

Chair of EAPS Department Diversity Committee, 2011-2012.

Member Purdue College of Sciences Faculty Diversity Committee, 2012-2013.

Co-principal investigator of NSF STEM education related grant, "Mentoring Native American Students for Success in Geoscience Graduate Programs." Mentored and taught Native American tribal college students soil ecological/chemical principles through field-based learning, 2006-2010.

Principal Investigator, NSF REU supplements to engage both African American and Native American students in STEM disciplines in laboratory and field-based learning, 2009-2010.

Visiting Scientists Hosted

Professor NaNa Wu, Visiting Professor, Shenyang Jianzhu University, July 2019-July 2020.

Ms. Xiaoyu Peng, PhD student and Visiting Scholar, Northwest Agricultural and Forestry University, Dec 2017-Dec 2019.

Ms. Xinxin Jin, PhD student and Visiting Scholar, Shenyang Agricultural University, Oct 2016-Feb 2018.

Ms. Wang Xin, PhD student and Visiting Scholar, Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang, Dec 2017-Dec 2018.

Professor Jufeng Zheng, EcoPartnership Visiting Scholar in the IML-CZO, Nanjing Agricultural University, Oct 2015-Oct 2016.

Ms. Ming Li, PhD student and EcoPartnership Visiting Scholar in the IML-CZO, Shenyang Agricultural University, Oct 2015-Oct 2017.

Professor Ge TiDa, EcoPartnership Visiting Scholar, Institute of Subtropical Agriculture, Chinese Academy of Sciences, Mar 2015-Mar 2016.

Professor Yun Zhang, EcoPartnership Visiting Scholar in the IML-CZO, Shenyang Agricultural University, Sept 2014-Sept 2015.

Professor Na Yu, EcoPartnership Visiting Scholar in the IML-CZO, Shenyang Agricultural University, Sept 2014 - Sept 2015.

Ms. Tingyu Hou, PhD student and EcoPartnership Visiting Scholar in the IML-CZO, Northwest Agriculture and Forestry University, Sept 2014-Sept 2016.

Ms. Nana Wu PhD, PhD student and EcoPartnership Visiting Scholar, Institute of Applied Ecology, Chinese Academy of Sciences, Aug 2012-Aug 2013.

Ms. Yuanyuan Li, PhD student and EcoPartnership Visiting Scholar, Department of Environmental Sciences, Beijing Normal University, Sept 2013-Sept 2014.

Mr. Li Bo, EcoPartnership Visiting Scholar. PhD student, Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang, Mar 2013-Mar 2014.

Mr. Ruzhen Wang, PhD student and EcoPartnership Visiting Scholar, Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang, May 2012-Aug 2013.

Professor Shenjun Qin, EcoPartnership Visiting Professor, Hebei University of Engineering, Mar 2013-Feb 2014.

Dr. Jennie DeMarco, Postdoctoral Research Associate, Department of Biology at New Mexico State University, Summer 2012.

Professor Anindya Sarkar, Dept. of Geology IIT Kharagpur, India, sabbatical stay in Filley Lab, Feb-Sept 2010.

Professor Joyanto Routh, Dept of Geology and Geochemistry, Stockholm University Stockholm, Sweden, Mar-Apr 2009.

Professor Akiko Nagawa-Izumi, Tsukuba Universit, sabbatical stay in Filley Lab, Jun 2007-Mar 2008.

Professor Tom Boutton, Texas A&M, sabbatical stay in Filley Lab, Aug 2006-Dec 2006.

Dr. David Bielman, Postdoctoral Scientist, University Southern California, Dept. Geography, Summer 2007.

Dr. Klaas Nierop, Research Scientist, University of Amsterdam, Department of Geography, Apr 2004.

Dr. Katherine Ficken, Research Scientist, University of Wales, Department of Geography, Feb 2004.

Ms. Susan Crow, PhD student, Soils-Oregon State University, Sept 2006**.**

Dr. Jennifer Boeckman, Research Scientist, National Soil Tilth Lab, Aug 2003.

Ms. Felicity Ku, PhD student, Taiwan National University, Geology, 2002-2003.