

Aaron F. Diefendorf

Assistant Professor, Department of Geology, University of Cincinnati

P.O. Box 210013, Cincinnati, OH, 45221-0013

Phone (513) 556-3787; E-mail: aaron.diefendorf@uc.edu

Website: aarondiefendorf.weebly.com

Curriculum Vitae

EDUCATION

- 2005 – 2010 **The Pennsylvania State University**, University Park, Pennsylvania, USA
Ph.D., Geosciences and Biogeochemistry
- 2002 – 2005 **University of Saskatchewan**, Saskatoon, Saskatchewan, Canada
M.S., Geological Sciences
- 1997 – 2002 **University of Tennessee**, Knoxville, Tennessee, USA
B.S., Honors Geology, Magna Cum Laude
B.F.A., Studio Art - Ceramics, Magna Cum Laude

PROFESSIONAL EMPLOYMENT

- 2012 – Present Director, Stable Isotope Laboratory, Department of Geology, University of Cincinnati
- 2011 – Present Assistant Professor, Department of Geology, University of Cincinnati
- 2005 – 2010 Graduate Research/Teaching Assistant, Department of Geosciences, Pennsylvania State University
- 2005 – 2006 NSF IGERT Research Fellow, Department of Geosciences, Pennsylvania State University
- 2002 – 2005 Graduate Research/Teaching Assistant, Department of Geological Sciences, University of Saskatchewan
- 2001 – 2002 Laboratory Assistant, Isotope Geochemistry Laboratory, Department of Geological Sciences, University of Tennessee

RESEARCH INTERESTS

My research uses stable isotope and organic biogeochemistry tools to solve critical questions in the areas of global climate change, carbon cycling, Earth's climate sensitivity, paleoclimatology, paleoecology, and paleohydrology. My research group is especially interested in bridging the gap between modern terrestrial biomarkers (chemical fossils) and their stable isotopes to biomarkers preserved in the geologic record. Removing this gap is critical to reduce uncertainties in past changes in the carbon cycle, paleovegetation, and associated changes in hydrology, especially for periods in Earth's past when climate was significantly different than today.

HONORS AND AWARDS

- 2015 Nominated for the 2015 Sarah Grant Barber Outstanding Advising Award
- 2009 Donald and Mary Tait Scholarship in Microbial Biogeochemistry, Pennsylvania State University
- 2009 Peter Deines Award for Best Oral Presentation, Pennsylvania State University
- 2009 Young Investigator Award, ISOCOMPOUND, Potsdam, Germany
- 2008 Poster Presentation Award, Environmental Chemistry Symposium, Pennsylvania State University
- 2007 Hiroshi and Koya Ohmoto Graduate Fellowship in Geosciences, Pennsylvania State University
- 2007 Conoco Philips Graduate Fellowship for Research, Pennsylvania State University
- 2007 Summer Research Fellowship, Center for Environmental Chemistry and Geochemistry, Pennsylvania State University
- 2006 Conoco Philips Graduate Fellowship for Research, Pennsylvania State University
- 2002 Outstanding Senior Award, Geosciences, University of Tennessee
- 2002 Coffee Cup Award, Highest Honors, University of Tennessee
- 2002 Don Jones Field Camp Scholarship, University of Tennessee
- 2000 James G. Wall Award, University of Tennessee

RESEARCH GRANTS AND AWARDS

Grants Pending

2016 *Hydrologic conditions in western North America during the Last Interglacial*. Korean Institute of Ocean Science and Technology (KIOST). Role: PI. \$30,004.

External Grants Funded

2016 *Collaborative Research: Identifying basin-specific controls on isotopic and chronological offsets of lake sediment leaf wax hydrogen isotope records*. National Science Foundation, EAR-1636740. Role: PI. \$222,636 (UC portion). Grant in the awarding process.

2016 *Evaluating plant carbon isotope fractionation as a pCO₂ proxy for the geologic record*. National Science Foundation (EAR). Role: PI. \$138,189. Active 9/01/2016 to 8/31/2018.

2016 Midwest Geobiology Symposium. Agouron Institute. Role: PI. \$8,000. Active 5/31/2016 to 10/31/2016

2015 *Northern hemisphere mid-latitude paleovegetation response to moisture changes during the late Quaternary*. Korean Institute of Ocean Science and Technology (KIOST). Role: PI. \$30,719.

2012 *MRI: Acquisition of stable isotope instrumentation for biogeochemical research and teaching at the University of Cincinnati*. National Science Foundation, EAR-1229114. Role: PI. \$400,000 (total award of \$571,428 with cost-sharing from UC and Ohio Board of Regents, see below). Active 09/15/2012 to 08/31/2016.

2012 *In support of NSF-MRI proposal*. Ohio Board of Regents Action Fund, OBR-1010052. Role: PI. \$85,714. Active 1/2012 to 12/2015.

2012 *Terrestrial biomarker transport mechanisms and implications for interpreting terrestrial biomarker signals in oils and bitumens*. American Chemical Society, Petroleum Research Fund, #51787-DN12. Role: PI. \$100,000. Active 1/2012 to 8/2016.

Internal Grants Funded

2015 *Travel to American Geophysical Union Annual Conference*. Faculty Development Council, University of Cincinnati. Role: PI, \$1,020

2014 *Travel to Goldschmidt 2014 Conference and Teaching Workshop*. Faculty Development Council, University of Cincinnati. Role: PI. \$3,468

2012 *Stable isotope ratio mass spectrometry training course*. Faculty Development Council, University of Cincinnati. Role: PI. \$2,782.

2012 *Extinction and education: documenting Late Pleistocene chronostratigraphy and Paleoenvironment of Big Bone Lick State Park*. University of Cincinnati Research Council. Role: co-PI. \$24,700. Active 2012-2013.

2012 *Surviving climate change*. University of Cincinnati Forward Teaching Initiative. Role: co-PI. \$5,700. Active 2012-2014.

Grants Funded Prior to Employment at the University of Cincinnati

2010 Krynine Memorial Scholarship, \$550, Pennsylvania State University

2009 Shell Oil, \$2,000, Pennsylvania State University

2009 Krynine Memorial Scholarship, \$850, Pennsylvania State University

2008 Sigma Xi Grant-in-Aid, \$1,000, Pennsylvania State University

2008 Geological Society of America Graduate Student Research Grant, \$1,000

- 2008 Krynine Memorial Scholarship for Research, \$750, Pennsylvania State University
- 2007 Krynine Memorial Scholarship for Research, \$450, Pennsylvania State University
- 2006 Biogeochemical Research Initiatives in Education Award, \$2,000, Pennsylvania State University
- 2005 Geological Society of America Graduate Student Research Grant, \$1,200
- 2004 Geological Society of America Graduate Student Research Grant, \$1,900
- 2003 Geological Society of America Graduate Student Research Grant, \$1,700

PUBLICATIONS (Including manuscripts and their status; all publications are in peer-reviewed journals; citations can be found on [Google Scholar](#); pdfs of all publications are available on my [website](#))

*graduate student author, †undergraduate student author

22. **Diefendorf, A.F.**, †Sberna, D., and Taylor, D.W., 2015. Effect of thermal maturation on plant-derived terpenoids and leaf wax *n*-alkyl components. *Organic Geochemistry* 89, 61-70. DOI: 10.1016/j.orggeochem.2015.10.006
21. *Kallenbach, C.M., Grandy, A.S., Frey, S.D., and **Diefendorf, A.F.**, 2015. Microbial physiology and necromass regulate agricultural soil carbon accumulation. *Soil Biology and Biochemistry* 91, 279-290. DOI:10.1016/j.soilbio.2015.09.005
20. **Diefendorf, A.F.**, Wing, S.L., and Leslie, A., 2015. Leaf wax composition and carbon isotopes vary among conifer groups. *Geochimica et Cosmochimica Acta* 170, 145-156. DOI: 10.1016/j.gca.2015.08.018.
19. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., Currano, E.D., and Mueller, K.E., 2015. Paleogene plants fractionated carbon isotopes similar to modern plants. *Earth and Planetary Science Letters* 429, 33-44. DOI: 10.1016/j.epsl.2015.07.029
18. *Giri, S.J., **Diefendorf, A.F.**, and Lowell, T.V., 2015. Origins and sedimentary fate of plant-derived terpenoids in a small river catchment and implications for terpenoids as quantitative paleovegetation proxies. *Organic Geochemistry* 82, 22-32. DOI: 10.1016/j.orggeochem.2015.02.002
17. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., 2014. A comparison of terpenoid and leaf fossil vegetation proxies in Paleocene and Eocene Bighorn Basin sediments. *Organic Geochemistry* 71, 30-42. DOI:10.1016/j.orggeochem.2014.04.004
16. Marin-Spiotta, E., *Chaopricha, N.T., Plante, A., **Diefendorf, A.F.**, Muller, C.W., Grandy, S., Mason, J.A., 2014. Rapid climate change leads to stabilization of soil carbon by fire and burial. *Nature Geoscience* 7, 428-432. DOI:10.1038/ngeo2169
15. Clyde, W.C., Gingerich, P.D., Wing, S.L., Röhl, U., Westerhold, T., Bowen, G., Johnson, K., *Baczynski, A.A., **Diefendorf, A.F.**, McInerney, F., Schnurrenberger, D., Noren, A., *Brady, K., and the BBCP Science Team, 2013. Bighorn Basin Coring Project (BBCP): a continental perspective on early Paleogene hyperthermals. *Scientific Drilling*, 16, 21–31. DOI: 10.5194/sd-16-21-2013
14. *Close, H.G., Shah, S.R., Ingalls, A.E., **Diefendorf, A.F.**, Brodie, E.L., Hansman, R.L., Freeman, K.H., Aluwihare, L.I., Pearson, A., 2013. Export of submicron particulate organic matter to mesopelagic depths in an oligotrophic gyre. *Proceedings of the National Academy of Sciences* 110, 12565-12570. DOI: 10.1073/pnas.1217514110
13. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., 2012. Distribution and carbon isotope patterns of diterpenoids and triterpenoids in modern temperate C₃ trees and their geochemical significance. *Geochimica et Cosmochimica Acta* 85, 342-356. DOI: 10.1016/j.gca.2012.02.016
12. *Cui, Y., Kump, L.R., Ridgwell, A.J., Charles, A.J., Junium, C.K., **Diefendorf, A.F.**, Freeman, K.H., Urban, N.M., Harding, I.C., 2012. Reply to 'Constraints on hyperthermals'. *Nature Geoscience* 5, 231-232. DOI: 10.1038/ngeo1424
11. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., Graham, H.V., 2011. Production of *n*-alkyl lipids in living plants and implications for the geologic past. *Geochimica et Cosmochimica Acta* 75, 7472-7485. DOI: 10.1016/j.gca.2011.09.028
10. Freeman, K.H., Mueller, K.E., **Diefendorf, A.F.**, Wing, S.L., Koch, P.L., 2011. Clarifying the influence of water availability and plant types on carbon isotope discrimination by C₃ plants. *Proceedings of the National Academy of Sciences* 108, E59-E60. DOI: 10.1073/pnas.1102556108

9. Cui, Y., Kump, L.R., Ridgwell, A.J., Charles, A.J., Junium, C.K., **Diefendorf, A.F.**, Freeman, K.H., Urban, N.M., Harding, I.C., 2011. Slow release of fossil carbon during the Palaeocene-Eocene Thermal Maximum. *Nature Geoscience* 4, 481-485. DOI: 10.1038/ngeo1179
8. Mueller, K.E., **Diefendorf, A.F.**, Freeman, K.H., Eissenstat, D.M., 2010. Appraising the roles of nutrient availability, global change, and functional traits during the angiosperm rise to dominance. *Ecology Letters* 13, E1-E6. DOI: 10.1111/j.1461-0248.2010.01455.x
7. **Diefendorf, A.F.**, Mueller, K.E., Wing, S.L., Koch, P.L., Freeman, K.H., 2010. Global patterns in leaf ¹³C discrimination and implications for studies of past and future climate. *Proceedings of the National Academy of Sciences* 107, 5738-5743. DOI: 10.1073/pnas.0910513107
6. Schouten, S., Hopmans, E.C., van der Meer, J., Mets, A., Bard, E., Bianchi, T.S., **Diefendorf, A.**, Escala, M., Freeman, K.H., Furukawa, Y., Hugué, C., Ingalls, A., Menot-Combes, G., Nederbragt, A.J., Oba, M., Pearson, A., Pearson, E.J., Rosell-Mele, A., Schaeffer, P., Shah, S.R., Shanahan, T.M., Smith, R.W., Smittenberg, R., Talbot, H.M., Uchida, M., Van Mooy, B.A.S., Yamamoto, M., Zhang, Z.H., Damste, J.S.S., 2009. An interlaboratory study of TEX86 and BIT analysis using high-performance liquid chromatography-mass spectrometry. *Geochemistry Geophysics Geosystems* 10, 13. DOI: 10.1029/2008GC002221
5. Wing, S.L., Bloch, J.I., Bowen, G.J., Boyer, D.M., Chester, S., **Diefendorf, A.F.**, Harrington, G.J., Kraus, M.J., Secord, R., Smith, F.A., 2009. Coordinated sedimentary and biotic change during the Paleocene-Eocene Thermal Maximum in the Bighorn Basin, Wyoming, USA, in: Crouch, E.M., Strong, C.P., Hollis, C.J. (Eds.), *Climatic and Biotic Events of the Paleogene (CBEP 2009)*, extended abstracts from an international conference in Wellington, New Zealand, 12-15 January 2009. GNS Science Miscellaneous Series 18, pp. 156-162.
4. **Diefendorf, A.F.**, Patterson, W.P., Holmden, C., Mullins, H.T., 2008. Carbon isotopes of marl and lake sediment organic matter reflect terrestrial landscape change during the late Glacial and early Holocene (16,800 to 5,540 cal yr BP): a multiproxy study of lacustrine sediments at Lough Inchiquin, western Ireland. *Journal of Paleolimnology* 39, 101-115. DOI: 10.1007/s10933-007-9099-9
3. Tibert, N.E., Patterson, W.P., **Diefendorf, A.F.**, Martini, A., Stanton, C., 2007. Holocene temperature variability in western Ireland: Evidence from limnic ostracode assemblages and stable isotope values. *Stratigraphy* 4, 353-361.
2. **Diefendorf, A.F.**, Patterson, W.P., Mullins, H.T., Tibert, N., Martini, A., 2006. Evidence for high-frequency late Glacial to mid-Holocene (16,800 to 5500 cal yr B.P.) climate variability from oxygen isotope values of Lough Inchiquin, Ireland. *Quaternary Research* 65, 78-86. DOI: 10.1016/j.yqres.2005.08.001
1. **Diefendorf, A.F.**, Patterson, W.P., 2005. Survey of stable isotope values in Irish surface waters. *Journal of Paleolimnology* 34, 257-269. DOI: 10.1007/s10933-005-3571-1

UNDERGRADUATE, MASTERS AND DOCTORAL THESES

- Diefendorf, A.F.**, 2010, Environmental and ecologic constraints on molecular and isotopic signatures in terrestrial organic carbon. Ph.D. Dissertation, The Pennsylvania State University, 319 pp.
- Diefendorf, A.F.**, 2005, Late-Glacial to Holocene climate variability in western Ireland. M.S. Thesis, University of Saskatchewan, Canada, 125 pp.
- Diefendorf, A.F.**, 2002, Systematic variations in stable carbon and oxygen isotopes in a vertisol climosequence across the Texas Coastal Prairie. University of Tennessee.

INVITED PRESENTATIONS (see below for invited conference presentations)

- 2015 University of Pittsburgh, Department of Geology and Environmental Science
- 2015 Kenyon College, Department of Biology
- 2013 Indiana University-Purdue University Indianapolis, Department of Earth Sciences
- 2013 Northwestern University, Department of Earth and Planetary Sciences
- 2012 Northern Illinois University, Department of Geology
- 2012 University of Kentucky, Department of Earth and Environmental Sciences
- 2012 Miami University of Ohio, Department of Geology
- 2011 *Hothouse Ecosystems, Greenhouse Gases, and Orbital Forcing in Deep Time Workshop*, Brown University
- 2010 *Deines Lecture*, Pennsylvania State University, Department of Geology
- 2010 Pacific Northwest National Laboratory
- 2010 University of Cincinnati, Department of Geology

PROFESSIONAL DEVELOPMENT ACTIVITIES

- Teaching and Learning Activities in Geochemistry: Examples and Applications*, Carl Wieman Science Education Initiative, Goldschmidt 2014 Annual Meeting, June 8, 2014, Sacramento, CA
- Isomass IRMS Training Courses* at the University of Ottawa, December 9-18, 2013, Ottawa, Canada
- National Science Foundation Cutting Edge Workshop: *Early Career Geoscience Faculty Workshop*, June 2012, College of William and Mary, Williamsburg, VA
- Isoscapes 2011* conference and workshop, September 26-27, 2011, Purdue University, West Lafayette, IN
- Write Winning Grants Workshop* by Dr. Steve Russell, March 31, 2011, University of Cincinnati, Cincinnati, OH
- Writing NSF CAREER Award Grants Workshop* by Dr. Steve Russell, April 1, 2011, University of Cincinnati, Cincinnati, OH
- Stable Isotope Ecology* laboratory and lecture short-course (ISOCAMP), Summer 2006, SIRFER Lab, University of Utah

PROFESSIONAL MEMBERSHIPS

- American Geophysical Union
- Geochemical Society, Division of Organic Geochemistry
- Geological Society of America
- Sigma Xi

SUPERVISION OF STUDENT RESEARCH

Graduate student advisees:

Julia Wise, Ph.D. Graduating Summer 2016. Now the Director of the Office of Science and Technology in the New Mexico Department of Economic Development.
Erika Freimuth, Ph.D. Candidate (passed Spring 2015), graduation expected in 2018
Yeon Jee Suh, Ph.D. Candidate (passed Fall 2015), graduation expected in 2017
Sharmila Giri, M.S. Geology, 2013. Now a Ph.D. Candidate at the Univ. of Miami under Dr. Peter Swart.
Zach Mergenthal, M.S. Geology, 2012 (co-advisory role)

Graduate student committees:

Stephanie Heath, Ph.D. Geology, expected 2018
Rachel Thornton, M.S. Geology, expected 2017
Jeff Osterhout, M.S. Geology, expected 2016
Matt Vrazo, Ph.D. Geology, expected 2016
Stella Mosher, M.S. Geology, 2015
Kelsey Feser, Ph.D. Geology, 2015
Rajarshi Dasgupta, M.S. Geology, 2014
Paul Wilcox, M.S. Geology, 2013
Zhenzhu Wan, Ph.D. Geology, 2012
Gianna Evans, M.S. Geology, 2012

Undergraduate students supervised:

Lindsay Sommer, UC Geology, expected 2018
Daniel Frost, UC Geology, expected 2016. Will start an M.S. at UC this fall.
Jed Ball (with Dr. Fricke), Colorado College, expected 2016
Katherine McNulty (with Dr. Lowell), expected 2017
Doug Sberna, UC Geology, 2014. Now a Ph.D. student at James Cook University under Dr. Michael Bird.
Brian Simpkins, UC Geology, 2013
Cheyenne Hassan, UC Geology, 2013
Jonathon Marsh, Miami University, 2013
Keegan McClannahan, UC Geology, 2012. Now a Ph.D. student at Western Kentucky University.
Katherine Finan, UC Geology WISE Student, 2011. Now pursuing a law degree at UC.

External thesis reviewer

Petra Zahajská, M.S. Geology 2016, Univerzita Karlova, Prague, Czech Republic

TEACHING

Courses taught at UC

Semester	Course #	Title	Enrollment
Spring 2016	GEOL6045	Geoscience Workshop: Techniques in Stable Isotopes (3 cr.)	10
Fall 2015	GEOL6028	Stable Isotope Biogeochemistry (3 cr.)	14
Spring 2015	GEOL1014	Geology Through Film (3 cr.)	94
	GEOL6045	Geoscience Workshop: Techniques in Stable Isotopes (3 cr.)	10
Fall 2014	GEOL6013	Organic Geochemistry (3 cr.)	15
Spring 2014	GEOL1014	Geology Through Film (3 cr.)	102
	GEOL7003	Molecular Biomarkers Seminar (3 cr.)	7
Fall 2013	GEOL6028	Stable Isotope Biogeochemistry (3 cr.)	26
Spring 2013	GEOL1014	Geology Through Film (3 cr.)	108
	GEOL7025	Geology Colloquium (1 cr.)	22
Fall 2012	GEOL6013	Organic Geochemistry (3 cr.)	11
	GEOL7025	Geology Colloquium (1 cr.)	22
Spring 2012	GEOL138	Geology Through Film (3 cr.)	96
	GEOL699	Geology Colloquium (1 cr.)	24
Winter 2012	GEOL699	Geology Colloquium (1 cr.)	23
	GEOL881	Special Problems Geology – Biomarker Seminar (3 cr.)	4
Fall 2011	GEOL699	Geology Colloquium (1 cr.)	25
Spring 2011	GEOL138	Geology Through Film (co-taught w/ K. Smilek; 3 cr.)	100
	GEOL881	Special Problems Geology – Stable Isotope Ecology (3 cr.)	3

**All of the above classes were developed from scratch, except Geology Colloquium*

Invited Guest Lectures in Colleagues' Courses

Intro to stable isotope instrumentation at UC (lab tour) for Dr. Yurena Yanes' Geology Foundations course, UC Geology, March 29, 2016

Biomarker proxies to constrain paleotemperature for Dr. Lewis Owen's Quaternary Research course, UC Geology, February 3, 2016

Carbon isotopes and biomarkers for Dr. Joe Werne, Organic Geochemistry Seminar, University of Pittsburgh Department of Geology and Environmental Science, November 19, 2015

Choosing a research topic, choosing and reading the relevant literature, reading the literature critically, Geology Graduate Research course, UC Geology, September 30, 2015

Molecular biomarkers to reconstruct ancient environments for Dr. Carl Brett's Paleontology course, UC Geology, November 5, 2012, October 30, 2013, December 1, 2014, November 4, 2015

A Cenozoic perspective on future climate change for Dr. Algeo's Introduction to Geology course, UC Geology, November 22, 2014

Organic and isotope geochemistry as tools for paleoclimate reconstruction for Dr. Lewis Owen's Quaternary Research course, UC Geology, November 1, 2012

Mass spectrometry in the Geosciences for Dr. Patrick Limbach's Mass Spectrometry course, UC Chemistry Dept., May 25, 2012

SERVICE

Service to the scientific community

- 2011 - Present Manuscript reviews (52 total) for *Earth and Planetary Science Letters*; *Earth-Science Reviews*; *Geochemistry, Geophysics, Geosystems (G³)*; *Geochimica et Cosmochimica Acta*; *Geology*; *Journal of Paleolimnology*; *Nature*; *Nature Geoscience*; *Oecologia*; *Organic Geochemistry*; *Palaeogeography, Palaeoclimatology, Palaeoecology*; *Palaios*; *Phytochemistry*; *PLoS ONE*; *Proceedings of the Royal Society B*; *Quaternary International*; *Quaternary Research*; *Quaternary Science Reviews*.
- 2011 - Present Proposal reviews (16 *ad hoc* and 43 on panels) for National Science Foundation, NASA, American Chemical Society, and the German DAAD
- 2016 Organizing and hosting the Midwestern Geobiology 2016 Conference at the University of Cincinnati, October 14th and 15th 2016
- 2016 – Present Scientific Committee member for the Climate and Biotic Events of the Paleogene (CBEP) meeting to be held September 4-7, 2017 at Snowbird, Utah
- 2015 Panel Reviewer for National Science Foundation EAR-P2C2
- 2014 Co-Convener, Chair, and Session Proposer, *Carbon and hydrogen isotopes: Extracting the signal from the noise to improve paleoclimate applications*, December 2014, American Geophysical Union Fall Meeting, San Francisco, CA
- 2014 Panel Reviewer for NASA Astrobiology Institute
- 2013 Panel Reviewer for Department of Energy University Review
- 2012 Outstanding Student Paper Award Judge at the American Geophysical Union Annual Conference
- 2011 Invited participant and presenter in the *Hothouse Ecosystems, Greenhouse Gases, and Orbital Forcing in Deep Time Workshop*, Brown University, August 2011
- 2011 – present Participating member of Quaternary and Anthropocene Research Group (QARG), University of Cincinnati
- Women in Science and Engineering mentor, University of Cincinnati, Summer 2011

Service to the University of Cincinnati

- 2016 - present Mentoring and assisting with *Icons in the Community*, a University of Cincinnati and Cincinnati Museum Center initiative to locate museum installations in the community and to provide content and presentations for the public and school groups
- 2012 Member, NSF MRI internal review committee
- 2011 Early participating member of the Urban Health Research Initiative

Service to the Department of Geology

- 2015 – present Member of the curriculum committee tasked with redesigning the Undergraduate Degree Program in Geology
- 2015 – present Faculty representative for Geology Department Health and Safety
- 2015 – present Faculty representative for Geology Department “Facilities”
- 2015 Invited and hosted colloquium speaker Dr. Broxton Bird from Indiana University–Purdue University Indianapolis

- 2014 University of Toledo, Department of Geology Geochemistry Class tour and introduction to Organic Geochemistry and Stable Isotope facilities at UC, November 2014
- 2013 Invited and hosted colloquium speaker Dr. Henry Fricke from Colorado College
- 2013 Participated in an *ad hoc* committee that developed a ‘Doctoral Program Enhancement Plan: Enhancing GeoDiversity in the Department of Geology’ that was awarded funding by the University of Cincinnati
- 2013 Invited and hosted colloquium speaker Dr. Justin Dodd from Northern Illinois University
- 2012 Invited and hosted colloquium speaker Dr. William Gilhooly from Indiana University–Purdue University Indianapolis
- 2011 – 2012 Served on three search committees for faculty positions in Biogeochemistry, Quaternary Geochronology, and Quaternary Research Faculty positions
- 2011 – 2013 Served as the Colloquium Director
- 2011 Contributed to *UC Graduate School Funds for Excellence Proposal: Research Faculty in Quaternary Science*, submitted by Drs. Owen, Dietsch, and Diefendorf. Proposal was funded and provides support for two research faculty within Department of Geology over 5 years.
- 2011 Co-organized a seminar by Dr. Susan Hough, USGS, with the Betts House remembering the New Madrid Earthquake and its effects on the Ohio River Valley
- 2011 Invited and hosted colloquium speakers Dr. Ellen Currano from Miami University of Ohio, Dr. Brett Tipple from the University of Utah, and Dr. David Winship Taylor from Southern Indiana University
- 2011 Served on the search committee for a faculty position in Biogeochemistry

Service to the local community

- 2013-14 Developed a new exhibit, [*Climate Change and Us*](#), at the Cincinnati Museum Center with Drs. Crowley and Plevyak. Opened to the public on April 22, 2014.
- 2014 Presented lecture *A deep time perspective on our future from plant fossils and organic geochemistry* to the Cincinnati DryDredgers Paleontology Association on February 28, 2014.
- 2013 Presented a lecture, *Ancient plants and chemical fossils*, at the 48th Annual Cincinnati GeoFair on May 4, 2013
- 2012 Characterizing organic and metal pollutants at the Findley Market Urban Farm in downtown Cincinnati with Drs. Maynard and Crowley
- 2012 Participated in home school tour of the Department of Geology including the Organic Geochemistry Laboratory

PUBLISHED CONFERENCE ABSTRACTS

([#]Invited presentation, *graduate student author, [†]undergraduate student author)

62. [#]**Diefendorf, A.F.**, *Freimuth, E., Lowell, T.V., and Wiles, G., 2015. Invited: The influence of source biases on sedimentary leaf waxes and their stable isotope compositions. American Geophysical Union Annual Meeting, San Francisco, USA.
61. *Wise, J., Bergamaschi, B., Van Horn, D., and **Diefendorf, A.F.**, 2015. The impacts of land use on dissolved organic matter in a dryland river system. American Geophysical Union Annual Meeting, San Francisco, USA.
60. Dodd, J.P., *Freimuth, E.J., *Olson, E., and **Diefendorf, A.F.**, 2015. Oxygen isotope values of tree ring α -cellulose as a proxy of hydroclimate variability in arid regions. American Geophysical Union Annual Meeting, San Francisco, USA.
59. *Arnold, T.E., **Diefendorf, A.F.**, Brenner, M., Freeman, K.H., and Curtis, J., 2015. Carbon and hydrogen isotope composition of plant biomarkers from lake sediments as proxies for precipitation changes across Heinrich Events in the subtropics. American Geophysical Union Annual Meeting, San Francisco, USA.
58. **Diefendorf, A.F.**, Leslie, A., Wing, S.L., 2015. Leaf Wax Molecular and Isotopic Composition Varies Among Conifer Groups. Midwest Geobiology Conference, Bloomington, IN, USA.
57. *Freimuth, E., **Diefendorf, A.F.**, Lowell, T.V., and Wiles, G. 2015. Quantifying hydrogen isotope fractionation in modern leaf waxes for improved paleohydrological reconstructions using sedimentary leaf waxes. Midwest Geobiology Conference, Bloomington, IN, USA.
56. *Suh, Y.J. and **Diefendorf, A.F.**, 2015. $\delta^{13}\text{C}$ values in temperate deciduous forest trees over the growing season and implications to geologic past. Midwest Geobiology Conference, Bloomington, IN, USA.
55. [†]McNulty, K.E., Lowell, T.V., **Diefendorf, A.F.**, *Freimuth, E.J., and Wiles, G.C., 2015. Evidence of drying in northern Ohio during the early Holocene. Northeastern Section Geological Society of America Meeting, Bretton Woods, NH, USA.
54. [#]**Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., and Currano, E.D., 2014. Invited: Carbon isotopes of plant biomarkers record past changes in the carbon cycle, but separating signal from noise is key to reducing uncertainties. American Geophysical Union Annual Meeting, San Francisco, USA.
53. **Diefendorf, A.F.**, Wing, S.L., Leslie, A., and Freeman, K.H., 2014. Some conifer clades contribute substantial amounts of leaf waxes to sedimentary archives. American Geophysical Union Annual Meeting, San Francisco, USA.
52. *Freimuth, E., **Diefendorf, A.F.**, and Lowell, T.V., 2014. From leaf synthesis to senescence: *n*-Alkyl lipid abundance and D/H composition among plant species in a deciduous forest at Brown's Lake Bog, Ohio, USA. American Geophysical Union Annual Meeting, San Francisco, USA.
51. *Suh, Y.J. and **Diefendorf, A.F.**, 2014. From buds to litter: seasonal changes in leaf wax concentration and carbon isotopes and implications for the geologic past. American Geophysical Union Annual Meeting, San Francisco, USA.
50. *Arnold, T.E., Freeman, K.H., Brenner, M., and **Diefendorf, A.F.**, 2014. Carbon and hydrogen isotope composition of plant biomarkers as proxies for precipitation changes across Heinrich Events in the subtropics. American Geophysical Union Annual Meeting, San Francisco, USA.
49. Currano, E.D., **Diefendorf, A.F.**, and Wing, S.L., 2014. Endemism in forest ecosystems during the Early Eocene Climatic Optimum in Wyoming. Geological Society of America Annual Meeting, Vancouver, Canada.
48. [#]**Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., and Currano, E.D., 2014. Keynote: Carbon isotope and biomarker records of climate and ecosystem change, extracting the most out of Cenozoic records. Goldschmidt, Sacramento, USA.

47. [¶]Sberna, D.T., **Diefendorf, A.F.**, [¶]Marsh, J.D., and Taylor, D.W., 2014. Characterizing leaf wax and terpenoid alteration and degradation with hydrous pyrolysis experiments. Goldschmidt, Sacramento, USA.
46. *Vrazo, M.B., Crowley, B.E., **Diefendorf, A.F.**, Brett, C.E., 2014. Can Stable isotopes in fossil marine arthropods serve as paleoecological indicators? 10th North American Paleontological Convention, Florida Museum of Natural History, Gainesville, USA.
45. *Bush, R.T., **Diefendorf, A.F.**, Wing, S.F., and McInerney, F.A., 2013. Influences of floral composition and environment on plant biomarkers across a Cretaceous landscape (Big Cedar Ridge). American Geophysical Union Annual Meeting, San Francisco, USA.
44. *Giri, S.J., **Diefendorf, A.F.**, and Lowell, T.V., 2013. Modern plant-derived terpenoids in an upper Michigan river basin and implications for interpreting the geologic record. American Geophysical Union Annual Meeting, San Francisco, USA.
43. **Diefendorf, A.F.**, Freeman, K.H., and Wing, S.L., 2013. Evaluation plant-derived terpenoids as paleovegetation proxies with Paleogene megafloras and plant biomarkers from the Bighorn Basin, USA. Midwestern Geobiology Conference, Indianapolis, USA.
42. *Wise, J.L., **Diefendorf, A.F.**, and Vaughn, L., 2013. Using the group level assessment to identify community needs and support citizen science in the geosciences. Geological Society of America Annual Meeting, Denver, USA.
41. *Wise, J.L., and **Diefendorf, A.F.**, 2013. Tracing bromide in a natural laboratory: implications for water treatment. 2013 Conference of the International Medical Geology Association. Arlington, VA.
40. **Diefendorf, A.F.**, Freeman, K.H., and Wing, S.L. 2012. Plant-derived terpenoids as paleovegetation proxies: evaluation of the proxy with Paleocene and Eocene megafloras and plant biomarkers in the Bighorn Basin, USA. American Geophysical Union Annual Meeting, San Francisco, USA.
39. Marin-Spiotta, E, *Chaopricha, N.T., Mueller, C., **Diefendorf, A.F.**, Plante, A.F., Grandy, S., Mason, J.A. 2012. Stabilization of ancient organic matter in deep buried paleosols. American Geophysical Union Annual Meeting, San Francisco, USA.
38. *Giri, S., **Diefendorf, A.F.**, and Lowell, T.V. 2012. Tracking plant-derived biomarkers from source to sink in the Miners River, Upper Peninsula of Michigan (USA). Origins, transport, and fate of plant-derived biomarkers in a small river catchment in the Upper Peninsula of Michigan (USA). American Geophysical Union Annual Meeting, San Francisco, USA.
37. *Giri, S., **Diefendorf, A.F.**, and Lowell, T.V. 2012. Origins, transport, and fate of plant-derived biomarkers in a small river catchment in the Upper Peninsula of Michigan (USA). Geological Society of America Annual Meeting, Charlotte, USA.
36. *Mergenthal, Z., **Diefendorf, A.F.**, and Lowell, T.V. 2012. Paleotemperatures derived from long-chain alkenones in East Greenland and the implications for Holocene paleoclimate. Geological Society of America North-Central Regional Meeting, Dayton, USA.
35. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., and Currano, E.D. 2011. Are molecular and isotopic patterns in modern plants representative of ancient floras? Examples from Paleocene and Eocene floras and sediments in the Bighorn Basin (WY, USA). American Geophysical Union Annual Meeting, San Francisco, USA.
34. [#]**Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., and Currano, E.D. 2011. Invited: Plant terpenoids and isotope tools to reconstruct the terrestrial carbon cycle and paleoecology: results from modern and ancient studies. Geological Society of America Annual Meeting, Minneapolis, USA.
33. *Cui, Y., Kump, L.R., **Diefendorf, A.F.**, and Freeman, K.H. 2011. Global carbon cycle perturbations and implications for Arctic hydrology during the Paleocene-Eocene Thermal Maximum. American Geophysical Union Annual Meeting, San Francisco, USA.
32. Hollander, D.J., Freeman, K.H., Ellis, G., **Diefendorf, A.F.**, Peebles, E.B., and Paul, J., 2010. Long-lived, sub-surface layers of toxic oil in the deep-sea: A molecular organic and isotopic geochemical approach to understanding their nature, molecular distribution, origin and impact to the northern Gulf

of Mexico, American Geophysical Union, San Francisco, CA.

31. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., and Curran, E.D., 2010. Biomarker and molecular isotope approaches to deconvolve the terrestrial carbon isotope record: modern and Eocene calibrations, American Geophysical Union, San Francisco, CA.
30. *Cui, Y., Kump, L.R., Ridgwell, A., Junium, C.K., **Diefendorf, A.F.**, Freeman, K.H., and Urban, N., 2010. Carbon addition during the Paleocene-Eocene Thermal Maximum: Model inversion of a new, high-resolution carbon isotope record from Svalbard, American Geophysical Union, San Francisco, CA.
29. *Cui, Y., Kump, L.R., Ridgwell, A., **Diefendorf, A.F.**, and Junium, C.K., 2010. A high-resolution record from Svalbard of carbon release during the Paleocene-Eocene Thermal Maximum. Extended abstract. *Journal of Earth Science* 21, 190-193. DOI: 10.1007/s12583-010-0208-8
28. Mueller, K.E., **Diefendorf, A.F.**, and Freeman, K.H., 2009. Variability in leaf ^{13}C discrimination of woody plants: Effects of phylogeny, leaf habit, and geography and implications for water use efficiency, *The Ecology Society of America*, Albuquerque, NM.
27. Freeman, K.H., **Diefendorf, A.F.**, Mueller, K.E., Wing, S.L., and Koch, K., 2009. Insights to PETM terrestrial records from global patterns in carbon isotope fractionation by modern plants, American Geophysical Union, San Francisco, CA.
26. **Diefendorf, A.F.**, Mueller, K.E., Wing, S.L., and Freeman, K.H., 2009. ^{13}C discrimination related to phylogeny and leaf habit in modern woody plant types: Implications for ecological controls on bulk, *n*-alkane, and terpenoid carbon isotope records preserved in Paleocene-Eocene terrestrial sediments, ISOCOMPOUND, Potsdam, Germany.
25. **Diefendorf, A.F.**, Mueller, K.E., Freeman, K.H., Wing, S.L., and Koch, P.L., 2009. Leaf fractionation relationships with phylogeny, leaf habit, and climate: Implications for interpreting paleoecology and paleoclimate, 41st Annual Graduate Student Colloquium, Department of Geosciences, Pennsylvania State University, PA.
24. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., Mueller, K.E., Graham, H.V., Magill, C., and Galligan, K., 2009. Carbon isotope fractionation differences in angiosperms and conifers: Implications for interpreting ancient terrestrial organic carbon, International Meeting of Organic Geochemistry (IMOG), Bremen, Germany.
23. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., and Smith, F.A., 2008. Carbon-isotope variability in terrestrial environments: examples from the early Paleogene sediments of the Bighorn Basin, Wyoming (USA), Environmental Chemistry Student Symposium, Pennsylvania State University, PA.
22. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., and Smith, F.A., 2008. Carbon-isotope variability in terrestrial environments: examples from the early Paleogene sediments of the Bighorn Basin, Wyoming (USA), 40th Annual Graduate Student Colloquium, Department of Geosciences, Pennsylvania State University, PA.
21. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., Mueller, K.E., and Magill, C., 2008. Mechanisms controlling terrestrial organic matter preservation and provenance: Examples from the Bighorn Basin, WY, Gordon Research Conference for Organic Geochemistry, New Hampshire.
20. Close, H.G., **Diefendorf, A.F.**, Freeman, K.H., and Pearson, A., 2008. A modern analogue for Proterozoic inverse carbon isotope signatures. *Eos Transactions. American Geophysical Union* 89(53), PP14A-07.
19. Burnett, A.W., Mullins, H.T., Patterson, W.P., Holmden, C., **Diefendorf, A.F.**, and Deegan, R., 2008. Circulation variability over western Ireland during the Younger Dryas: What can modern precipitation isotope and circulation data tell us? Association of American Geographers Annual Meeting, Boston, MA.
18. **Diefendorf, A.F.**, Freeman, K.H., Wing, S.L., and Smith, F.A., 2007. Carbon-isotope variability in terrestrial environments: examples from the Paleocene and Eocene sediments of the Bighorn Basin, Wyoming (USA). *Geological Society of America Abstracts with Programs* 39, 464.

17. **Diefendorf, A.F.**, Freeman, K.H., and Wing, S.L., 2007. Isotopic and molecular signatures in ancient soil organic matter: preliminary studies from the late Paleocene and early Eocene of the Bighorn Basin, WY, 39th Annual Graduate Student Colloquium. Department of Geosciences, Pennsylvania State University, PA, Pennsylvania State University, PA.
16. Smith, F.A., Wing, S.L., Freeman, K.H., and **Diefendorf, A.F.**, 2006. Plant biomarker signatures of floral change across the PETM. Penn State Astrobiology Annual Meeting, Pennsylvania State University, PA.
15. Regberg, A.B., **Diefendorf, A.F.**, Minyard, M., and Baumann, B., 2006. Soil toxicity at the Skytop road-cut on interstate I-99: Plant germination and growth experiments, Environmental Chemistry Student Symposium, Penn State University, PA.
14. Regberg, A.B., **Diefendorf, A.F.**, Minyard, M., and Baumann, B., 2006. Soil Toxicity at the Skytop Road-Cut on Interstate I-99: Plant Germination and Growth Experiments. North-Eastern Section, Geological Society of America Regional Meeting. Harrisburg, PA.
13. **Diefendorf, A.F.**, Patterson, W.P., Holmden, C., and Mullins, H.T., 2006. Carbon isotopes of lake sediments influenced by bedrock and terrestrial vegetation during the late Glacial and early Holocene: A multiproxy study of lacustrine sediments at Lough Inchiquin, western Ireland. 38th Annual Graduate Student Colloquium. Department of Geosciences, Pennsylvania State University, PA.
12. ¹⁴Ogilvie, P.L., **Diefendorf, A.F.**, Patterson, W.P., Holmden, C., and Mullins, H.T., 2005. Multiproxy stable isotope study of Holocene climate variability at Lough Gallaun, western Ireland. Western Inter-University Geological Conference. Saskatoon, SK, Canada.
11. Dietrich, K.A., Patterson, W.P., Holmden, C., and **Diefendorf, A.F.**, 2005. A survey of stable isotopes in modern surface waters of Iceland. Western Inter-University Geological Conference. Saskatoon, SK, Canada.
10. **Diefendorf, A.F.**, and Patterson, W.P., 2005. Spatial variation of stable isotope values of modern Irish surface waters: a foundation for multi-proxy paleoclimate investigations of Ireland. Western Inter-University Geological Conference. Saskatoon, SK, Canada.
9. ¹⁴Ogilvie, P., **Diefendorf, A.F.**, Patterson, W.P., Holmden, C., and Mullins, H.T., 2004. Multiproxy study of Late Pleistocene/Holocene climate variability at Lough Gallaun, western Ireland from stable isotope of lacustrine marl and organic sediment. Geological Society of America Annual Meeting, Denver, CO.
8. Dietrich, K., Patterson, W.P., Holmden, C., and **Diefendorf, A.F.**, 2004. A survey of stable isotopes in modern surface waters of Iceland. Geological Society of America Annual Meeting, Denver, CO.
7. **Diefendorf, A.F.**, and Patterson, W.P., 2004. Stable isotopes in modern Irish surface waters: a basis for paleoclimate investigations of Ireland. Geological Society of America Annual Meeting, Denver, CO.
6. **Diefendorf, A.F.**, Patterson, W.P., Mullins, H.T., Martini, A., and O'Connell, M., 2003. High-resolution Holocene climate variability at Lough Inchiquin, western Ireland: Evidence from stable carbon and oxygen isotope values of lacustrine sediment. Geological Society of America Annual Meeting, Seattle, WA.
5. **Diefendorf, A.F.**, Patterson, W.P., Mullins, H.T., and Martini, A., 2003. High-resolution Holocene climate variability: evidence from stable isotope values of lacustrine carbonate from western Ireland. Geological Association of Canada Annual Meeting. Vancouver, May 2003.
4. **Diefendorf, A.F.**, and Patterson, W.P., 2003. Late Glacial to Mid-Holocene climate change in western Ireland: Evidence from high-resolution stable isotope records of lacustrine marl. 16th Annual Keck Research Symposium in Geology Proceedings, Keck Geology Consortium. Beloit College, Beloit, WI.
3. Mora, C.I., Miller, D.L., **Diefendorf, A.F.**, Stiles, C.A., and Driese, S.G., 2002. Climate-isotope relationships in a modern Vertisol climosequence, coastal Texas, Geological Society of America Annual Meeting Abstracts, Denver, CO.

2. Mora, C.I., Miller, D.L., **Diefendorf, A.F.**, and Driese, S.G., 2002. Stable isotopes, climate and time: isotopic trends in a vertisol climosequence and chronosequence from the Texas Gulf Coastal Prairie, USA. Sixth International Symposium on the Geochemistry of the Earth's Surface East-West Center, Honolulu, Hawaii.
1. **Diefendorf, A.F.**, and Mora, C.I., 2002. Tracking Quaternary ecosystem shifts in a modern vertisol climosequence Texas Coastal Prairie. North-Central Section and Southeastern Section, Geological Society of America Joint Annual Meeting. Lexington, KY.