
Daryl L. Moorhead

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EDUCATION:

- Ph.D. Ecology (March 1985), University of Tennessee, Knoxville. Dissertation title: Development and application of an upland boreal forest succession model.
- M.S. Biology (December 1981), Texas A&M University, College Station. Thesis title: The effects of atrazine on the algal communities of some laboratory streams.
- B.S. Botany and with distinction in Zoology (Cum Laude, June 1978), Ohio State University, Columbus. Honors thesis title: Follicular development and ovulation frequency in white-tailed deer (*Odocoileus virginianus*).

PROFESSIONAL EMPLOYMENT:

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| 2007-present | <u>Professor</u> , Department of Environmental Sciences, University of Toledo |
| 2006-2008 | <u>Director</u> , Stranahan Arboretum, University of Toledo |
| 2000-2007 | <u>Associate Professor</u> , Department of Environmental Sciences, University of Toledo |
| 1999-2000 | <u>Associate Professor</u> , Department of Biology, University of Toledo |
| 1994-1999 | <u>Associate Professor</u> , Department of Biological Sciences, Texas Tech University |
| 1990-1994 | <u>Assistant Professor</u> , Department of Biological Sciences, Texas Tech University |
| 1989-1990 | <u>Associate Research Scientist</u> , Systems Ecology Research Group, San Diego State University |
| 1986-1989 | <u>Assistant Research Scientist</u> , Systems Ecology Research Group, San Diego State University |
| 1984-1986 | <u>Postdoctoral Fellow</u> , Desert Research Group, New Mexico State University |

PROFESSIONAL AND HONORARY SOCIETIES. AWARDS:

- Sigma Xi, Soil Ecology Society of America, Ecological Society of America; Dean's Merit Award 2000-2001, University of Toledo, Faculty excellence award 2009-2010, University of Toledo

UNIVERSITY CLASSES TAUGHT:

- Human Ecology: Non-majors environmental science
- Environmental Problems Laboratory: Non-majors science laboratory
- Introductory Botany: Non-majors, laboratory science
- Introductory Ecology: Biology majors core course requirement
- Honors Introductory Ecology: Biology majors core course requirement
- Advanced Ecology: Principles of ecology for graduate students
- Foundations of Ecology: Graduate course exploring conceptual milestones in ecology
- Systems Ecology: Graduate course in systems ecology
- Graduate Seminar: Graduate seminar in ecology
- Graduate Special Topics: Graduate advanced topics in ecology

OTHER EDUCATIONAL ACTIVITIES:

- Quality Matters Higher Education Training Workshop 27 March 2015 and 3 April 2015 (participant)
- Innovations in Teaching Awards Proposal 30 April 2015 (coauthor)

Open Textbook Network Seminar 14 April 2016 (participant)
Course Design Institute Training Workshop 9-13 May 2016 (participant)
Innovations in Teaching Awards Proposal 27 April 2016 (lead)

GRADUATE STUDENTS DIRECTED:

Ms. Özlen Konu Grantham (MS; 1992), Mr. Craig Wolf (MS; 1996), Mr. Max Westerfield (MS; 1996), Mr. Shane Davis (MS; withdrew), Ms. Carla Gutherie (MS; 1999), Ms. Jamie Schmeling (MS; 2001), Ms. Laura Burnett (MS; 2000), Ms. Mandy Comes (MS; 2003), Mr. Tony Kufel (MS; withdrew), Ms. Susan Tran (MS; 2004), Ms. Kerry McKenna (PhD; 2006), Mr. Qinglin Li (PhD; 2006), Mr. Ryan Argo (MS; 2006), Mr. Tom Weicht (PhD; withdrew), Ms. Sarah Petree (MS; withdrew), Mr. John Herman (PhD; 2010), Ms. Erin Hammer (MS; 2010), Ms. Elizabeth Pisarczyk (MS; 2009), Mr. Nicholas Bryan (MS; 2013)

GRADUATE STUDENT ADVISOR (NON-THESIS SECONDARY SCHOOL TEACHERS):

Michelle Reed (MS; 2012), John Herd (MS; 2013), Jamie Iffland (MS; 2014), Christa Leopold (MS; 2013), Gwen McLaughlin (MS; 2013), Kelly Meinhart (MS; 2014), Blake Parquette (MS; 2013), Adam Russell (MS; 2013), Jeanette Utter (MS; 2014), Elaine Dunn (2015), CoAdvisor for Robert Raymond (MES; 2015), Christina Florence (MS; 2016), Mitra Zargari (MS; in progress)

GRADUATE STUDENT COMMITTEES:

Joel Grise (MS), Yan Wu (MS), John Carey (MS), Doris Anders (PhD), Gerardo Camilo (PhD), Qishui Zhang (PhD), Javier Alvarez (PhD), Judy York (PhD), Dianne Hall (PhD), Brian Croyle (MS), Richard Stephens (MS), Michelle Secrest (MS), Jennifer Jefferies (MS), Steve Presley (PhD), Stephen Cox (PhD), Lynn Hamilton (PhD), Johanna Sholtis (PhD), Chris Bloch (PhD), Kerry McKenna (MS), Julie Blakley (MS), Kelly Driscoll (MS), Kathleen Britton (MS), Marcy Gallo (MS), Rachael Amonetta (MS), Roberta Veluci (MS), Siyan Ma (PhD), Brian Darby (MS), Jacob LaCroix (PhD), Amy Concilio (MS), Melanie McLaughlin (MS), Matt Neilson (PhD), Josh Brown (PhD), Nan Lu (PhD), Chris Barnswell (PhD), Audra Croskey (MS), Justin Selden (MS), Zachary Rinkes (PhD), Tamara Smith (MS), Nichole Lightle (MS), Chris Collier (MS), Stephanie Nummer (MS), Kawthar Esseili (MS), Jessica Sherman (PhD), Stephen Timmons (MS), Cameron McMillan (MS), Megan Niner (PhD), Breanna Caton (PhD), Kristen Coleman (PhD), Jessica Susser (MS)

UNDERGRADUATE STUDENT RESEARCH:

Sunil Ganjoo (1990), Pamela Yeh (Clark Scholar 1992), Anthony Boucher (1993), Lottie Lynd (1993), Ryan Butler (1994), Richard Pannel (1995), Casey Norris (1995), Kara Endlich (1996), Sarah Dunkle (1996), Mary Roberson (1996-1997), James Furgeson (1996-1997), Sara Dukie (2001), Lori Staszak (200-2001), Josh Morris (2002-2003), Kelsey Friemouth (2011-2013)

REFEREED PUBLICATIONS:

Harder, J. D. and D. L. Moorhead. 1980. Development of corpora lutea and plasma progesterone levels associated with the onset of the breeding season in white-tailed deer (*Odocoileus virginianus*). *Biology of Reproduction* 22:185-91.
Moorhead, D. L. and R. J. Kosinski. 1986. The effect of atrazine on the productivity of artificial stream algal communities. *Bulletin of Environmental Contamination and Toxicology* 37:330-336.

- Moorhead, D. L., J. F. Reynolds and W. G. Whitford. 1986. A conceptual model for primary productivity, decomposition and nitrogen cycling in the Chihuahuan creosotebush desert. *Tree Physiology* 2:215-222.
- Moorhead, D. L., D. W. Freckman, J. F. Reynolds and W. G. Whitford. 1987. A simulation model of a bacterial feeding nematode (*Acrobeloides* sp.) population dynamics. *Pedobiologia* 30:361-372.
- Moorhead, D. L., F. M. Fisher and W. G. Whitford. 1988. Cover of spring annuals on nitrogen-rich kangaroo rat mounds in a Chihuahuan Desert grassland. *American Midland Naturalist* 120:443-447.
- Moorhead, D. L., and J. F. Reynolds. 1989. Mechanisms of surface litter decomposition in the northern Chihuahuan desert: A reinterpretation. *Journal of Arid Environments* 16:157-163.
- Moorhead, D. L. and J. F. Reynolds. 1989. The contribution of abiotic processes to buried litter decomposition in the northern Chihuahuan desert. *Oecologia* 79:133-135.
- Moorhead, D. L., J. F. Reynolds and P. J. Fonteyn. 1989. Patterns of stratified soil water loss in a Chihuahuan Desert community. *Soil Science* 148:244-249.
- Moorhead, D. L. and J. F. Reynolds. 1991. A general model of litter decomposition in the northern Chihuahuan Desert. *Ecological Modelling* 59:197-219.
- Moorhead, D. L. and J. F. Reynolds. 1992. Modeling the contributions of decomposer fungi in nutrient cycling. Chapter 35. pp. 691-714 *In* G. C. Carroll and D. T. Wicklow (eds) *The fungal community: Its organization and role in the ecosystem*. Marcel Dekker.
- Moorhead, D. L., C. A. Kroehler, A. E. Linkins and J. F. Reynolds. 1993. Dynamics of extracellular phosphatase activities in *Eriophorum vaginatum* tussocks. *Arctic and Alpine Research* 25:50-55.
- Moorhead, D. L. and J. F. Reynolds. 1993. Changing carbon chemistry during decomposition of creosotebush fine litter in the northern Chihuahuan Desert. *American Midland Naturalist* 130:83-89.
- Moorhead, D. L. and J. F. Reynolds. 1993. Effects of climate change on decomposition in arctic tussock tundra: A modeling synthesis. *Arctic and Alpine Research* 25:403-412.
- Grantham, Ö. K., D. L. Moorhead and M. R. Willig. 1993. Feeding preferences of *Marisa cornuarietis*: Phytochemistry as a determinant of diet choice. *Journal of the North American Benthological Society* 12:431-437.
- Moorhead, D. L. and T. R. Callaghan. 1994. Potential effects of increasing UV-B radiation on litter decay and site fertility. *Biology and Fertility of Soil* 18:19-26.
- Sinsabaugh, R. L. and D. L. Moorhead. 1994. Resource allocation to extracellular enzyme production: A model for nitrogen and phosphorus control of litter decomposition. *Soil Biology and Biochemistry* 26:1305-1311.
- Zak, J. C., M. R. Willig, D. L. Moorhead and H. G. Wildman. 1994. Functional diversity of microbial communities: A quantitative approach. *Soil Biology and Biochemistry* 26:1101-1108.
- Sinsabaugh, R. L., D. L. Moorhead and A. E. Linkins. 1994. The enzymic basis of plant litter decomposition: Mechanisms underlying an ecological process. *Applied Soil Ecology* 1:97-111.
- Moorhead, D. L. and R. A. Wharton, Jr. 1994. Primary production model of benthic microbial mats in Lake Hoare, Antarctica. *Antarctic Journal* 29:241-243.
- Grantham, Ö. K., D. L. Moorhead and M. R. Willig. 1995. Foraging strategy of the giant rams-horn snail, *Marisa cornuarietis*: An interpretive model. *Oikos* 72:333-342.
- Moorhead, D. L., R. L. Sinsabaugh, A. E. Linkins and J. F. Reynolds. 1996. Decomposition processes: Modelling approaches and applications. *Science of the Total Environment*. 183:137-149.
- Moorhead, D. L. and J. F. Reynolds. 1996. Modeling decomposition in arctic ecosystems. Chapter 16. pp. 347-367. *In* J. F. Reynolds and J. D. Tenhunen (eds) *Landscape function: Implications for ecosystem response to disturbance, A case study in arctic tundra*. Springer-Verlag, Ecological Studies Series Vol. 120.

- Reynolds J., J. Tenhunen, P. Leadley, H. Li, D. Moorhead, B. Ostendorf and F. S. Chapin, III. 1996. Patch and landscape models of arctic tundra: Potentials and limitations. Chapter 14. pp. 293-324. In J. F. Reynolds and J. D. Tenhunen (eds) Landscape function: Implications for ecosystem response to disturbance, A case study in arctic tundra. Springer-Verlag, Ecological Studies Series Vol. 120.
- Reynolds, J. F., P. R. Kemp, B. Acock, J.-L. Chen and D. L. Moorhead. 1996. Limitations and uncertainties in modeling the effects of elevated CO₂ on plants and ecosystems. Chapter 19. pp. 347-380. In G. W. Koch and H. Mooney (eds) Terrestrial ecosystem response to elevated CO₂. Academic Press. Physiological Ecology Series.
- Hall, D. L., D. L. Wood, D. L. Moorhead, and R. W. Sites. 1996. The efficiency of combining flotation and staining techniques when sorting benthic invertebrates. Entomological News 107:33-35.
- Moorhead, D. L., A. E. Linkins and K. R. Everett. 1996. Road dust alters extracellular enzyme activities in tussock tundra soils, Alaska, USA. Arctic and Alpine Research 28:346-351.
- Willig, M. R., D. L. Moorhead, S. B. Cox and J. C. Zak. 1996. Functional diversity of soil bacterial communities in the tabonuco forest: The interaction of anthropogenic and natural disturbance. Biotropica 28(4a):471-483.
- Moorhead, D. L., D. McKnight and C. Tate. 1996. McMurdo Dry Valleys LTER: Stream discharge as a function of ambient temperature and incoming shortwave radiation in Taylor Valley, Antarctica. Antarctic Journal of the US. 31:196-197.
- Moorhead, D. L. and A. E. Linkins. 1997. Elevated CO₂ alters belowground exoenzyme activities in tussock tundra. Plant and Soil 189:321-329.
- Moorhead, D. L., W. S. Davis and R. A. Wharton. 1997. Carbon dynamics of aquatic microbial mats in the Antarctic dry valleys: A modelling synthesis. pp. 181-196 IN W. B. Lyons, C. Howard-Williams and I. Hawes (editors) Ecosystem Processes in Antarctic Ice-free Landscapes. A. A. Balkema, Brookfield, VT. 281 pp.
- Moorhead, D. L., C. F. Wolf and R. A. Wharton. 1997. Impact of light regimes on productivity patterns of benthic microbial mats in an Antarctic lake: A modelling study. Limnology and Oceanography 42:83-91
- Moorhead, D. L., D. McKnight and C. Tate. 1998. Modeling nitrogen transformations in Antarctic streams. American Geophysical Union. American Geophysical Union. Antarctic Research Series. 72:141-151.
- Lyons, W. B., K. A. Welch, K. Neumann, J. K. Toxey, R. McArthur, C. Williams, D. McKnight and D. Moorhead. 1998. Geochemical linkages among glaciers, streams and lakes within the Taylor Valley, Antarctica. American Geophysical Union. Antarctic Research Series. 72:77-92
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- Moorhead, D. L., W. S. Davis and C. F. Wolf. 1998. Coliform densities in urban playas of West Texas. Journal of Environmental Health. 60:14-18.
- Moorhead, D. L., M. Westerfield and J. C. Zak. 1998. Plants retard litter decay in a nutrient-limited soil: A case of exploitative competition? Oecologia 4:530-536
- Moorhead, D. L., D. L. Hall and M. R. Willig. 1998. Succession of macroinvertebrates in playas of the Southern High Plains, USA. Journal of the North American Benthological Society 17:430-442.
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- Moorhead, D. L., and R. L. Sinsabaugh. 2000. Simulated patterns of litter decay predict patterns of extracellular enzyme activities. Applied Soil Ecology 14:71-79
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- Guthrie, C. G. and D. L. Moorhead. 2002. Density-dependent habitat selection: evaluating isoleg theory. Oikos 97:184-194
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- Walsh, J. E., P. T. Doran, J. C. Priscu, W. B. Lyons, A. G. fountain, D. M. McKnight, D. L. Moorhead, R. A. Virginia, D. H. Wall, G. D. Clow, C. H. Fritsen, C. P. McKay and A. N. Parsons. 2002. Recent Temperature Trends in the Antarctic. Nature 418:291-292.
- Moorhead, D. L., J. E. Barrett, R. A. Virginia, D. W. Wall and D. Porazinska. 2003. Organic matter and soil biota of upland wetlands in Taylor Valley, Antarctica. Polar Biology. 26:567-576.
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- Moorhead, D., J. Schmeling and I. Hawes. 2005. Contributions of benthic microbial mats to net primary production in Lake Hoare, Antarctica. *Antarctic Science* 17:33-45
- Yee, S. H., M. R. Willig and D. L. Moorhead. 2005. Tadpole shrimp structure macroinvertebrate communities in playa lake microcosms. *Hydrobiologia* 541:139-148.
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- Doran PT, Priscu JC, Lyons WB, et al. 2005. Comment on “El Nino suppresses Antarctic warming” by N. Bertler et al. *Geophysical Research Letters* 32:7
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- Burnett, L. D. Moorhead, I. Hawes and C. Howard-Williams. 2006. Environmental factors associated with deep chlorophyll maxima in dry valley lakes, South Victoria Land, Antarctica. *Arctic, Antarctic and Alpine Research* 38:179-189
- Moorhead, D. L. and R. L. Sinsabaugh. 2006. A theoretical model of litter decay and microbial interaction. *Ecological Monographs* 76:151-174
- Choi, W. I., D. L. Moorhead and D. A. Neher. 2006. A modeling study of soil temperature and moisture effects on population dynamics of *Paronychiurus kimi* (Collembola: Onychiuridae). *Biology and Fertility of Soils* 43:69-75
- Tran, S. L., and D. L. Moorhead. 2006. A note on effective basking trap size. *Herpetological Review* 37:307.
- Doran P. T., J. C. Priscu, W. B. Lyons, J. E. Walsh, A. G. Fountain, D. M. McKnight, D. L. Moorhead, R. A. Virginia, D. H. Wall, G. D. Clow, C. H. Fritsen, C. P. McKay, A. N. Parsons. 2005. Comment on “El Nino suppresses Antarctic warming” by N. Bertler et al. *Geophysical Research Letters* 32:7
- Barrett, J. E., Virginia, R. A., Hopkins, D. W., Aislabie, J., Bargagli, R., Bockheim, J. G., Campbell, I. B., Lyons, W. B., Moorhead, D. L., Nkem, J. N., Sletten, R. S., Steltzer, H., Wall, D. H., Wallenstein, M. D. 2006. Terrestrial ecosystem processes of Victoria Land, Antarctica. *Soil Biology & Biochemistry* 38(10, Sp. Iss. SI). p.3019-3034
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- Herman, J, D Moorhead and B Berg. 2008. The relationship between rates of lignin and cellulose decay in aboveground forest litter. *Soil Biology and Biochemistry* 40:2620-2626.
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- Sinsabaugh, RL, S. Manzoni, DL Moorhead and A Richter. 2013. Carbon use efficiency of microbial communities: Stoichiometry, methodology and modeling. *Ecology Letters* 16:930-939.
- Bryan, NJ, CV Florence, TD Crail and DL Moorhead. 2013. Freshwater mussel community response to warm water discharge in western Lake Erie. *Journal of Great Lakes Research*. 39:449-454. doi: 10.1016/j.jglr.2013.06.07
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- Moorhead, DL, ZL Rinkes, RL Sinsabaugh and MN Weintraub. 2013. Dynamic relationships between microbial biomass, respiration, inorganic nutrients and enzyme activities: informing enzyme based decomposition models. *Frontiers in Terrestrial Microbiology* 4:1-12. doi: 10.3389/fmicb.2013.0023
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- Amin, BAZ, B Chabbert, D Moorhead and I Bertrand. 2014. Impact of fine litter chemistry on lignocellulolytic enzyme efficiency during decomposition of maize leaf and root in soil. *Biogeochemistry* 117:169-193. DOI 10.1007/s10533-013-9856-y
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- Bryan, NJ, DL Moorhead and TD Crail. 2014. Habitat characteristics of a unionid refuge in the thermal plume of a power plant in western Lake Erie. *Journal of Great Lakes Research*. *Journal of Great Lakes Research* 40:699704.
- Moorhead, DL, G Lashermes, S Recous and I Bertrand. 2014. Interacting microbe and litter quality controls on litter decomposition: A modeling analysis. *PLOS One* 9(9):e108769: 1-12.
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- Sinsabaugh, RL, JJ Follstad Shah, SG Findlay, KA Kuehn and DL Moorhead. 2015. Scaling microbial biomass, metabolism and resource supply. *Biogeochemistry* 122:175-190 DOI 10.1007/s10533-014-0058-z
- Helbing, CM, DL Moorhead and L Mitchell. 2015. Seasonal replacement of *Culex restuans* (Diptera: Culicidae) by *Culex pipiens* (Diptera: Culicidae) in Northwest Ohio: A case study in habitat partitioning between mosquitoes. *Journal of Environmental Entomology* 94:1-7, DOI 10.1093/ee/nvv094
- Helbing, CM, DL Moorhead and L Mitchell. 2015. Erratum: *Environmental Entomology* 2015, 1-1, doi: 10.1093/ee/nvv166
- Moorhead, DL, RL Sinsabaugh, BH Hill and MR Weintraub. 2016. Vector analysis of ecoenzyme activities reveal constraints on coupled C, N and P dynamics. *Soil Biology and Biochemistry* 93:1-7.
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- Fanin, N, D Moorhead and I Bertrand. 2016. Linking eco-enzymatic stoichiometry and enzymatic vectors to contrasting decomposers communities reveal differential C, N, P dynamics along a land-use gradient. *Biogeochemistry* 129:21-36
- Sinsabaugh, R, D Moorhead, X Xu, and M Litvak. 2017. Plant, microbial and ecosystem carbon use efficiencies interact to stabilize microbial growth as a fraction of gross primary production. *New Phytologist* 214:1518-1526

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- Sherman, J, D Moorhead, B Parquette and T Crail. Assessing impacts of environmental engagement of students using the New Ecological Paradigm (NEP) scale. National Council of Science for the Environment. Washington DC. 28-30 January 2014
- Weintraub, MN and DL Moorhead. IMoLD: Interactive model of litter decay. National Council for Science and the Environment. National Council of Science for the Environment. Washington DC. 28-30 January 2014
- Moorhead, DL, G Lashermes, RL Sinsabaugh and MN Weintraub. Theoretical modeling C- and N-acquiring exoenzyme activities to balance microbial demands. ESA, Sacramento, CA, 11-14 August 2014

- Sinsabaugh, RL, JJ Follstad Shah, SG Findlay, KA Kuehn, DL Moorhead and CR Kuske. Ecological stoichiometry and metabolic elasticity of microbial community organization. Soil Ecology Society. Colorado Springs, CO. 9-12 June 2015
- DeForest, JL, KA Smemo, R Dorkoski, M Weintraub and D Moorhead. Using soil enzymatic stoichiometry to understand ecosystem nutrient economies. ESA, Baltimore, MD, 9-14 August 2015
- Caton, B, C Stepien, D Dwyer, D Moorhead, J Turner and W Von Sigler. Development of a novel testing protocol to increase the sensitivity of environmental DNA (eDNA) monitoring for aquatic organisms. North American Congress for Conservation Biology. Madison, Wisconsin. 17-20 July 2016
- Moorhead, DL and MN Weintraub. Vector analysis: A simple method for quantifying coupled C, N, and P enzyme activities. Enzymes in the environment, Ecology, Activity and Applications. Bangor, Wales. 25-28 July 2016
- Fanin, N, D Moorhead and I Bertrand. Eco-enzymatic stoichiometry and enzymatic vectors in decaying litter reveal differential C, N, P dynamics along a land-use gradient. EcoSummit. Montpellier, France. 19 August—1 September 2016
- Fanin, N, D Moorhead and I Bertrand. Eco-enzymatic stoichiometry and enzymatic vectors in decaying litter reveal differential C,N,P dynamic along a land-use gradient. Organic Phosphorus Workshop: Organic Phosphorus in the Environment: Solutions for Phosphorus Security. Windemere, England. 5-9 September 2016
- Mayes, MA, G Wang, RZ Abramoff, X Xu, MD Hartman, W Feng, E Davidson, A Finzi, D Moorhead, J Schimel, SL O'Brien and PE Thornton. Measureable pools of soil carbon for carbon cycling modeling. American Geophysical Union AGU. San Francisco, CA. 12-16 December 2016

SCIENTIFIC WORKSHOPS:

1986. Invited participant in Carbon Dioxide Plant Modeling Workshop. Presented "Developing a modular approach to a generic ecosystem model." Raleigh, North Carolina. Sponsored by U.S. Dept. of Energy, Office of Carbon Dioxide Research. March.
1986. Co-hosted Workshop on Uncertainty Analysis in Ecological Modeling. New Mexico State University. Sponsored by U.S. Dept. of Energy, Office of Carbon Dioxide Research. July.
1986. Co-hosted Chihuahuan Desert Ecosystem Modeling Workshop. San Diego State University. Sponsored by National Science Foundation. October.
1988. Invited participant in Carbon Dioxide Workshop: The Effects of Elevated Carbon Dioxide on Plants and Ecosystems. Presented "A generic model of litter decomposition processes." San Diego State University. Sponsored by U.S. Dept. of Energy, Office of Carbon Dioxide Research. January.
1988. Invited participant in R4D Project Review. Presented "Decomposition processes in a cold-dominated soil system." Annapolis, Maryland. Sponsored by U.S. Dept. of Energy, Arctic Research Division. April.
1991. Invited participant in Antarctic Workshop: Terrestrial and Aquatic Ecosystems of the Antarctic Dry Valleys. Institute of Ecosystem Studies Workshop, Millbrook, NY. Sponsored by National Science Foundation.
1992. Invited participant at International Scientific Committee on Problems of the Environment (SCOPE) Workshop: Effects of increased UV radiation on aquatic and terrestrial ecosystems. Presented "Potential effects of increasing UV-B radiation on litter decay and site fertility." Corisa-Tramariglio, Sardinia, Italy. September 28-October 3.
1994. Invited participant at NATO Advanced Research Workshop. Ecosystem modeling: Delineating the possible from the impossible. Presented "Decomposition processes: Modelling approaches and applications." Bischofsgrün, Germany. February 20-25.

1996. Participant in LIDET: Long-term Intersite Decomposition Experiment Team Workshop. Presented "Climate and litter quality controls on decomposition: An analysis of modeling approaches." University of New Mexico field station. Socorro, New Mexico. March 24-25.
1996. Invited participant at the Mathematics for Undergraduate Life Sciences Students Conference. Presented "Interactive models add intuitive insight to classroom presentations of ecological relationships." Iowa State University. Ames, Iowa. May 17-18.
1996. Invited participant at the International Workshop on Polar Desert Ecosystems. Presented "Carbon dynamics of aquatic microbial mats in the Antarctic Dry Valleys: A modeling synthesis." National Institute of Water and Atmospheric Research, Ltd. Christchurch, New Zealand. July 1-4.
1996. Member of Coordination Committee for SOLA: "Science on-line, Antarctica." University of Nevada—Reno, Reno, Nevada. September 24-26.
1997. Member of Ecological Committee on FIFRA Risk Assessment Methods (ECOFRAM). US-EPA, Office of Pesticides Program. June 1997-June 1998.
2000. Legacies workshop at the Long-Term Ecological Research network All Scientist Meeting (ASM)
2001. Network analysis workshop, funded by the LTER network office, Sevilleta LTER, New Mexico
2003. Legacies workshop, funded by the LTER network office, Sevilleta LTER, New Mexico
2004. Microbial impacts on ecosystem processes. National Center for Ecological Assessment and Synthesis (NCEAS), Santa Barbara, California
2004. Carbon flux and storage in mixed oak forests of the Ozark landscape. Missouri Department of Conservation. MOFEP workshop, Jefferson City, Missouri, 27-30 November 2004
2005. Synthesis of Soil Biodiversity and Ecosystem Functioning in Victoria Land, Antarctica: An NSF Sponsored Workshop, Jekyll Island, Georgia. 21-23 April
2005. Lessons from large-scale manipulations of ecosystems and landscapes. Ecological Society of America annual meeting. Montreal, Canada. 7 August
2006. MICDIF—Linking microbial diversity and ecosystem functions across scales and interfaces. Vienna, Austria. August 20-25
2012. 2nd International Enzymes in the Environment RCN workshop. Ft. Collins, Colorado. May 15-18.
2016. International year of soil workshop—Carbon cycle interagency working group. Boulder, Colorado. 14-16 March 2016

SEMINARS:

1985. The effects of soil moisture and temperature regimes on upland boreal forest succession patterns. Biology Department, New Mexico State University.
1985. Productivity, decomposition and nutrient cycling in a desert creosotebush ecosystem: A synthesis of available data. Jornada Long Term Ecological Research Site information meeting, New Mexico State University.
1986. A model of nematode population dynamics as affected by temperature and moisture. Biology Department, San Diego State University. January.
1988. A simulation model of soil freeze-thaw dynamics in an arctic tundra ecosystem. Department of Energy, Arctic Research Division meeting, San Diego State University. January.
1988. A general model of litter decomposition and heterotroph population dynamics. Department of Energy, Arctic Research Division meeting, San Diego State University. January.
1988. Carbon and nitrogen flows in a warm desert ecosystem: Decomposition processes. Department of Biology, California State University—Northridge. April.
1989. Modeling decomposition processes in an arctic tundra and a desert ecosystem. United States Department of the Interior, Environmental Protection Agency. Corvallis. March.

1989. Belowground decomposition processes in a desert ecosystem: A modeling synthesis. Institute of Ecology, University of Georgia, Athens. April.
1989. A modeling synthesis of decomposition processes in a semi-arid ecosystem. Department of Biological Sciences, Texas Tech University, Lubbock. May.
1991. Modeling decomposition in extreme environments: Arctic tundra and shrub desert ecosystems. Department of Biology, Clarkson University, Potsdam, NY. January.
1991. A general model of decomposition processes in contrasting environments. Department of Biology, Southwest Texas State University, San Marcos. November.
1992. Effects of global climate change on arctic tussock tundra: A modeling synthesis. College of Sciences, Clarkson University, Potsdam, NY. May.
1993. Pattern and process of litter decay: Hierarchical perspectives. Department of Biological Sciences, Texas Tech University, Lubbock. September.
1995. Life at the edge: An Antarctic Long-Term Ecological Research Project. Department of Biological Sciences, Texas Tech University, Lubbock. September.
1996. Impacts of disturbance and landuse patterns on the biological diversity of microbial communities in soil and water. University of Illinois—Urbana. April
1998. Structure and function of ephemeral aquatic ecosystems: Case studies from urban, rural and polar environments. Department of Biological Sciences, University of Toledo. April.
1998. A simulation model of density-dependent habitat selection. Department of Biological Sciences, University of Toledo. April.
1999. Contemporaneous Disequilibria in Antarctic Ecosystems: The Role of Legacies in Long-Term Dynamics. Department of Biological Sciences, University of Toledo, April
1999. Resource legacies: Inter-millennial links between ecosystems in the antarctic dry valleys. Department of Biological Sciences, Bowling Green University, December
2000. Uncertain controls on bacterial contamination of urban waters in West Texas, Department of Geography and Urban Planning, University of Toledo, January
2000. A model of carbon fluxes within the pelagic food web of an Antarctic lake. National Institute of Water and Atmospheric Research, Christchurch, New Zealand, May.
2000. A model of nitrogen uptake in an Antarctic stream. National Institute of Water and Atmospheric Research, Christchurch, New Zealand, May.
2000. Long-term biotic and abiotic controls on ecosystem dynamics in the Antarctic Dry Valleys. Department of Earth, Ecology and Environmental Sciences. University of Toledo.
2002. The C:N Stoichiometry of the pelagic food web in Lake Fryxell, Taylor Valley, Antarctica. Department of Earth, Ecology and Environmental Sciences. University of Toledo.
2005. The Edge of Life: Survival in Antarctic Lakes. Lake Erie Center Seminar Series, University of Toledo, September.
2005. The Edge of Life: Ecosystems in Antarctic Dry Valleys. Department of Biology, Lakehead University, Ontario, October.
2005. The Changing Water Quality in Maumee Bay. Department of Geology, Bowling Green State University, November
2006. Complexities of decay: An emergent process. Faculty seminar at IIASA, Vienna, Austria. August 22
2006. Complexities of decay: An emergent process. Biology Department seminar at University of Vienna, Austria. August 23
2007. A microbial view of litter: Substrate and resource. Department of Plant and Soil Sciences. University of Vermont. 12 October
2009. Modeling basic mechanisms of litter decomposition. French National Institute of Agricultural Research (INRA), Reims, France. 25 May
2010. Moorhead D. Analysis and interpretation of fine-scale chemical controls on microbial activity and litter decay. UMR-FARE INRA, working group meeting. Reims, France. 17 September 2010.

2011. Moorhead, D. Modeling interacting microbial & litter quality controls on decomposition. UMR-CNRS INRA, invited speaker seminar. Grignon, France. 25 January 2011.
2011. Moorhead, D. Modeling interacting microbial and litter quality controls on early stages of litter decomposition. INRA. 10 January 2011. Reims, France
2015. Moorhead, D. Using extracellular enzyme activities to interpret & *model* decomposition. INRA. 1 June 2015. Reims, France
2015. Moorhead, D. Using extracellular enzyme activities to interpret & *model* decomposition. INRA. 8 June 2015. Montpellier, France

GRANT SUPPORT:

- 1990-1991 Moorhead, D., An analysis of litter carbon dynamics during decomposition in the northern Chihuahuan Desert. TTU-ORS (REF). \$4,400
- 1991-1996 M. E. Harmon, J. Melillo, W. J. Parton, D. Moorhead, E. Rastetter and J. D. Aber. Long-term Intersite Experiments of Leaf and Fine Root Decomposition. NSF BSR-9108329. \$450,227
- 1992-1994 Moorhead, D., R. Sinsabaugh and A. E. Linkins. Exoenzyme activities underlying lignocellulose degradation: A modeling synthesis. USDA. \$86,248
- 1992-1995 Reynolds, R. F., P. R. Kemp, J.-L. Chen, D. L. Moorhead and R. Whitney. Modeling the response of plants and ecosystems to CO₂ and climate change. DOE/OHER grant DE-FG60386ER60490. \$1,275,000
- 1992 Moorhead, D. L., Developing a core computer-teaching facility in the department of biological sciences, TTU. Higher Education Assistance Funds, State of Texas. \$20,700
- 1993-1999 Wharton, R., D. Freckman, B. Lyons, D. McKnight, D. Moorhead and C. Tate. An Antarctic Dry Valley Long Term Ecological Research Site. NSF DPP-921173. \$3,514,000
- 1993 Moorhead, D. L., Biodiversity and microbiology of urban playas: City of Lubbock. TTU-ORS. \$4,470
- 1993 Zak, J. C. and D. L. Moorhead. The importance of woodrat middens to the functioning of desert ecosystems: Associated nitrogen dynamics. TTU-ORS. \$3,630
- 1993-1995 Willig, M. R, D. L. Moorhead, T. R. Mollhagen and E. B. Fish. Integrated indicators of stress in playa lakes: Wetland ecosystems in a sea of aridity and agriculture. EPA. \$299,850
- 1993 Moorhead, D. L. and M. R. Willig. Expanding the core computer-teaching facility in the department of biological sciences: Adding a network server. Higher Education Assistance Funds, State of Texas. \$2,849
- 1994 Moorhead, D. L. and M. R. Willig. Expanding the computer-teaching capabilities within biological sciences. Higher Education Assistance Funds, State of Texas. \$17,749
- 1995-1996 Co-Investigator with Schlesinger, W. and G. Hendrey (project directors) Forest-atmosphere carbon transfer and storage (FACTS-I): Joint Duke/Brookhaven free-atmospheric carbon dioxide exchange (FACE) facility. DOE-OHER. \$1,050,000 (Phase I—Construction)
- 1996-1997 Co-Investigator with Schlesinger, W. and G. Hendrey (project directors) Forest-atmosphere carbon transfer and storage (FACTS-II): Joint Duke/Brookhaven free-atmospheric carbon dioxide exchange (FACE) facility. DOE-OHER. \$950,000 (Phase II—Science Program)
- 1997 Moorhead, D. L. and R. Strauss. Adding PC-compatibility to the core computer-teaching facility in the department of biological sciences. Higher Education Assistance Funds, State of Texas. \$15,447

- 1999-2005 Lyons B., P. Doran, D. Freckman, A. Fountain, D. McKnight, D. Moorhead and J. Prisco. 2000-2006. An Antarctic Dry Valley Long Term Ecological Research Site. NSF DPP-921173. \$4,199,999
- 1999-2001 Sinsabaugh, R., D. Nehrer and D. Moorhead. Impact of atmospheric CO₂ enrichment on rhizosphere function. USDA 9804651. \$298,000
- 1999-2001 Moorhead, D. L. Ecosystem dynamics in the McMurdo Dry Valleys, Antarctica: A modeling synthesis. NSF-International Programs. \$24,000
- 1999 Moorhead, D. L. Linking interspecific competition to habitat selection with a coupled Lotka-Volterra model. University Research Awards and Fellowships. \$9000
- 1999 Czajkowski, K, T. Bailey and D. Moorhead. Integration of social, physical and ecological research to address interdisciplinary environmental problems in pursuit of future funding. Lake Erie Center, University of Toledo. \$10,000
- 2000 Moorhead, D. L. Database and synthesis of environmental characteristics of the Maumee river Watershed and Maumee Bay. University of Toledo Research Awards and Fellowships Program (RAFP). \$8,982
- 2000 Neher, D., A. Sponberg, D. Moorhead, S. Goldman, J. Gray, S. Leisner, R. Sayre and D. Verma. Biotechnology for phytoremediation of heavy metal contaminated soils in Ohio. Ohio Plant Biotechnology Consortium. \$40,000
- 2000-2003 Sinsabaugh, R. , D. Moorhead and D. Zak. Mechanics of soil carbon sequestration by nitrogen deposition. US-DOE \$600,000.
- 2001-2004 Goldman, S., R. Sinsabaugh,, D. Moorhead and J. Bridgeman. Western basin water quality monitoring program. US-EPA \$468,000
- 2002-2005 Chen, J and D Moorhead. 2002-2005. Carbon flux and storage in mixed oak forests of the Ozark Landcape. Missouri Department of Conservation MOFEP \$119,122.
- 2001 2003 Moorhead, D. Response of Native Turtles in the Ottawa National Wildlife Refuge to Habitat Variation and an Exotic Invader, *Trachemys scripta elegans* University of Toledo Research Awards and Fellowships Program (URAF). \$9000
- 2004-2006 Sinsabaugh, R. , D. Moorhead and D. Zak. Mechanics controlling soil carbon sequestration under atmospheric nitrogen deposition. US-DOE \$200,000.
- 2005-2007 Moorhead,D. Interacting microbial x chemical x nitrogen controls on litter-to-humus transformation. United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service (CSREES), National Research Initiative Competitive Grants Program (NRICGP). \$89,599
- 2007-2008 Moorhead, D, C Stepien, J Chen, A Sponberg, P Lindquist, K Czajkowski, B Pryor, C Blatz, K Kilbert, A Kumar, C Gruden, D Apul, S Milz, B Fink & F Akbar. Integrating Environmental and Public Health of Urban Ecosystems. Programs in Academic Excellence, Office of the Provost, UT. \$15,000.
- 2007-2012 Stepien, CA, C Gruden, DL Moorhead, TB Bridgeman, and TG Fisher. Graduate Teaching Fellows in STEM High School Education: An Environmental Science Learning Community at the Land-Lake Ecosystem Interface NSF GK-12. \$2,468,505
- 2008-2012 Moorhead, D and C Czerniak. Inquiry Masters Program for Advancing Content for Teachers (IMPACT). US Dept Education: Teachers for a Competitive Tomorrow Program. \$937,260
- 2009-2011 Moorhead, D. EAGER: MSB: Collaborative Research: Chemical and Microbial Mechanisms Linking Litter Quality and Decomposition Rate. NSF. \$67,239 (UT portion of collaborative grant)
- 2009-2013 Martin, G, T Kvale, D Moorhead & B Randoff, & C Gilbert. Building Ohio talent for a sustainable energy future (BOTSEF). Ohio Board of Regents (OBOR) \$1,563,000
- 2009-2013 Weintraub, M, C Blackwood, D Moorhead & R Sinsabaugh. Microbial control of litter decay at the cellulose-lignin interface. NSF. \$631,515.

OTHER PROFESSIONAL ACTIVITIES:

2016-present	Graduate Council, member
2016	Panelist for NSF Ecosystems Program, Division of Environmental Biology
2012-present	Graduate Advisor, Department of Environmental Sciences, University of Toledo
2007-2010	Interdisciplinary Studies Committee, University of Toledo
2007-2009	Senior Fellow, Humanities Institute, University of Toledo
2007	Campus Beautification Committee, University of Toledo
2006-2007	Faculty Senate, University of Toledo
2005, 07 & 08	Panelist for NSF Program, Ecology of Infectious Diseases.
2004	Member, Lake Erie Center Advisory Committee
2003-2010	Member, Advisory committee, Urban Affairs Center, University of Toledo
2000-2003	Member, Executive committee, Plant and Environmental Sciences Research Centers, University of Toledo
2000-2011	Member, Department of Earth, Ecology and Environmental Sciences Graduate Student Selection Committee, University of Toledo
1999-2010	Member, interdepartmental organizing committee for Department of Earth, Ecology and Environmental Sciences, University of Toledo
1999-2009	Member, users group, Plant Sciences Research Center, University of Toledo
1999-2012	Member, Department of Biological Sciences Computer Coordination Committee, University of Toledo
1999-2000	Member, Department of Biological Sciences Graduate Student Selection Committee, University of Toledo
1999	Member, Department of Biological Sciences Vision Graphic Committee
1998-1999	Member, Department of Biological Sciences Environmental Sciences Faculty Awards Committee, Texas Tech University (TTU)
1995-1999	Chairman, Department of Biological Sciences Environmental Sciences Course Committee, TTU
1994-1999	Member, Environmental Technology Management Program Advisory Board, TTU
1990-1999	Member, Ecology Research Group, Department of Biological Sciences, TTU
1990-1998	Member, Institute of Environmental Studies, TTU
1995-1998	Member, Department of Biological Sciences Tenure and Promotion Committee, TTU
1994-1998	Chairman, Ecology Research Group, Department of Biological Sciences, TTU
1994-1995	Member, Department of Biological Sciences Graduate Student Selection Committee, TTU
1990-1998	Chairman, Department of Biological Sciences Computer Coordination Committee, TTU
1991-1994	Member, Department of Biological Sciences Seminar Committee, TTU
1992	Member, Southwestern Association of Naturalists Organizing Committee
1992	Member, National Science Foundation Dissertation Improvement Awards Program review panel
1990-1991	Executive Board Member, Institute of Environmental Studies, Texas Tech University
1988-1990	Member of Systems Ecology Research Group Advisory Council, San Diego State University