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EDUCATION

- Ph.D. in Soil and Water Sciences, University of California—Riverside, 2008
Dissertation: Surface Processes, Pedology, and Soil-Landscape Modeling of the Southern Fry Mountain Bolson, Mojave Desert, California
- M.S. in Soil Science, Texas Tech University, 2003
Thesis: Degradation of Pedogenic Calcretes in West Texas
- B.A. in Biology, Texas A&M University, 1999

ACADEMIC APPOINTMENTS

- Professor and B.L. Allen Endowed Chair of Pedology, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX, 2023–Present
- Associate Professor, Department of Environmental Sciences, University of California—Riverside, Riverside, CA, 2018–2022
- Visiting Research Scholar, Department of Environmental Sciences, Rutgers University, New Brunswick, NJ, Fall 2014 (Sabbatical)
- Associate Professor, Department of Geography and Atmospheric Science, University of Kansas, Lawrence, KS, 2014–2018
- Courtesy Appointment, Environmental Studies Program, University of Kansas, Lawrence, KS, 2009–2018
- Assistant Professor, Department of Geography, University of Kansas, Lawrence, KS, 2008–2014

PUBLICATIONS (*italics indicate students*)

Articles

- Souza, L.F.T., **D.R. Hirmas**, P.L. Sullivan, D.C. Reuman, M.F. Kirk, L. Li, H. Ajami, H. Wen, M.V.M. Sarto, T.D. Loেকে, A.K. Rudick, C.W. Rice, and S.A. Billings. 2023. Root distributions, precipitation, and soil structure converge to govern soil organic carbon depth distributions. *Geoderma*. (In review)

- *Koop, A.N., D.R. Hirmas, S.A. Billings, L. Li, A. Cueva, X. Zhang, H. Wen, A. Nemes, L.F.T. de Souza, H. Ajami, A.N. Flores, A.K. Rudick, A. Guthrie, L.M. Klamm, M. Unruh, and P.L. Sullivan.* 2022. Is macroporosity controlled by complexed clay and soil organic carbon? *Geoderma*. (In review)
- *Sheikh-Abdullah, S.M., D.R. Hirmas, and A.N. Koop.* 2022. A simple method to determine the reactivity of calcium carbonate in soils. *Soil Science Society of America Journal*. (In press)
- *Hauser, E., P.L. Sullivan, A.N. Flores, D.R. Hirmas, and S.A. Billings.* 2022. Global-scale shifts in rooting depths due to Anthropocene land cover changes pose unexamined consequences for critical zone functioning. *Earth's Future* 10:e2022EF002897. doi: 10.1029/2022EF002897
- *Salley, K.A., R.L. Stotler, W.C. Johnson, D.J. Burt, D.R. Hirmas, K. Fiefield, M.W. Bowen, J.H. Kastens, and Y.-G. Ryuh.* 2022. Hydrology of a hydroperiod: Assessing recharge to the High Plains Aquifer through a playa in Western Kansas. *Journal of Hydrology* 612:128141. doi: 10.1016/j.jhydrol.2022.128141
- *Wen, H., P.L. Sullivan, S.A. Billings, H. Ajami, A. Cueva, A. Flores, D.R. Hirmas, A.N. Koop, K. Murenbeeld, X. Zhang., and L. Li.* 2022. From soils to streams: Connecting terrestrial carbon transformation, chemical weathering, and solute export across hydrological regimes. *Water Resources Research* 58:e2022WR032314. doi: 10.1029/2022WR032314
- *Bouma, J., A. Bonfante, A. Basile, J. van Tol, M.J.D. Hack-ten Broeke, M. Mulder, M. Heinen, D.G. Rossiter, L. Poggio, and D.R. Hirmas.* 2022. How can pedology and soil classification contribute towards sustainable development as a data source and information carrier? *Geoderma* 424:115988. doi: 10.1016/j.geoderma.2022.115988
- *Sullivan, P.L., S. Billings, D.R. Hirmas, L. Li, X. Zhang, S. Ziegler, K. Murenbeeld, H. Ajami, A. Guthrie, K. Singha, D. Giménez, A.M. Duro, V. Moreno, A. Flores, A. Cueva, A.N. Koop, E. Aronson, H. Barnard, S. Banwart, R. Keen, A. Nemes, N. Nikolaidis, J. Nippert, D. Richter, D. Robinson, K. Sadayappan, L. Souza, M. Unruh, and H. Wen.* 2022. Embracing the dynamic nature of soil structure: A paradigm illuminating the role of life in critical zones of the Anthropocene. *Earth-Science Reviews* 225:103873. doi: 10.1016/j.earscirev.2021.103873
- *Koop, A.N., D.R. Hirmas, P.L. Sullivan, and A.K. Mohammed.* 2020. A generalizable index of soil development. *Geoderma* 360:113898. doi: <https://doi.org/10.1016/j.geoderma.2019.113898>
- *Mohammed, A.K., D.R. Hirmas, A. Nemes, and D. Giménez.* 2020. Exogenous and endogenous controls on the development of soil structure. *Geoderma* 357:113935. doi: <https://doi.org/10.1016/j.geoderma.2019.113945>
- *Sullivan, P.L., M.W. Stops, G.L. Macpherson, L. Li, D.R. Hirmas, and W.K. Dodds.* 2019. How landscape heterogeneity governs stream water concentration-discharge behavior in carbonate terrains (Konza Prairie, USA). *Chemical Geology* 527. doi: <https://doi.org/10.1016/j.chemgeo.2018.12.002>
- *Caplan, J.S., D. Giménez, D.R. Hirmas, N.A. Brunzell, J.M. Blair, and A.K. Knapp.* 2019. Decadal-scale shifts in soil hydraulic properties induced by altered precipitation. *Science Advances* 5:eaau6635. doi: <https://doi.org/10.1126/sciadv.aau6635>

- Ziyae, A., **D.R. Hirmas**, A. Karimi, M. Kehl, G.L. Macpherson, and A. Lakzian. 2019. Geogenic and anthropogenic sources of potentially toxic elements in airborne dust in northeastern Iran. *Aeolian Research* 41:100540. doi: <https://doi.org/10.1016/j.aeolia.2019.100540>
- **Hirmas, D.R.**, D. Giménez, A. Nemes, R. Kerry, N.A. Brunsell, and C.J. Wilson. 2018. Climate-induced changes in continental-scale soil macroporosity may intensify water cycle. *Nature* 561:100-103. doi: <https://doi.org/10.1038/s41586-018-0463-x>
- Roshanizarmehri, M., A. Fotovat, H. Emami, M. Kehl, **D.R. Hirmas**, M. Hosseinalizadeh, and N. Ramzanian. 2018. Combined effects of polyacrylamide and nanomagnetite amendment on soil and water quality, Khorasan Razavi, Iran. *Journal of Environmental Management* 223:703-712. doi: <https://doi.org/10.1016/j.jenvman.2018.06.061>
- Ziyae, A., A. Karimi, **D.R. Hirmas**, M. Kehl, A. Lakzian, H. Khademi, and D.B. Mechem. 2018. Spatial and temporal variations of airborne dust fallout in Khorasan Razavi Province, North-eastern Iran. *Geoderma* 326:42-55. doi: <https://doi.org/10.1016/j.geoderma.2018.04.010>
- Billings, S., **D.R. Hirmas**, P.L. Sullivan, C. Lehmeier, S. Bagchi, K. Min, Z. Brecheisen, E. Hauser, R. Stair, R. Flournoy, and D.deB. Richter. 2018. Loss of deep roots limits biogenic agents of soil development that are only partially restored by decades of forest regeneration. *Elementa: Science of the Anthropocene* 6:34. doi: <https://doi.org/10.1525/elementa.287>
- **Hirmas, D.R.**, and D. Giménez. 2017. A geometric equation for representing morphological field information in horizons with compound structures. *Soil Science Society of America Journal* 81:863-867. doi: [10.2136/sssaj2016.12.0396n](https://doi.org/10.2136/sssaj2016.12.0396n)
- Mohammed, A.K., **D.R. Hirmas**, D. Giménez, R.D. Mandel, and J.R. Miller. 2016. A digital morphometric approach for quantifying ped shape. *Soil Science Society of America Journal* 80:1604-1618. doi: [10.2136/sssaj2016.06.0203](https://doi.org/10.2136/sssaj2016.06.0203)
- Katz, B.S., R.L. Stotler, **D.R. Hirmas**, G. Ludvigson, J.J. Smith, and D.O. Whittemore. 2016. Geochemical recharge estimation and the effects of a declining water table. *Vadose Zone Journal* 15(10). doi: [10.2136/vzj2016.04.0031](https://doi.org/10.2136/vzj2016.04.0031)
- Kim, D., **D.R. Hirmas**, R.W. McEwan, T.G. Mueller, S.J. Park, P. Šamonil, J.A. Thompson, and O. Wendroth. 2016. Predicting the influence of multi-scale spatial autocorrelation on soil-landform modeling. *Soil Science Society of America Journal* 80:409-419. doi: [10.2136/sssaj2015.10.0370](https://doi.org/10.2136/sssaj2015.10.0370)
- Drager, K., **D.R. Hirmas**, S.T. Hasiotis, and T.C. Bents. 2016. Effects of ant (*Formica subsericea*) nest development on physical and hydrological properties in a coarse-textured soil. *Soil Science* 181:166-174. doi: [10.1097/SS.0000000000000145](https://doi.org/10.1097/SS.0000000000000145)
- Drager, K., **D.R. Hirmas**, and S.T. Hasiotis. 2016. Effects of ant (*Formica subsericea*) bioturbation on physical and hydrological properties of a fine-textured soil. *Soil Science Society of America Journal* 80:364-375. doi: [10.2136/sssaj2015.08.0300](https://doi.org/10.2136/sssaj2015.08.0300)
- Eck, D.V., M. Qin, **D.R. Hirmas**, D. Giménez, and N.A. Brunsell. 2016. Relating quantitative soil structure metrics to saturated hydraulic conductivity. *Vadose Zone Journal* 15(1). doi: [10.2136/vzj2015.05.0083](https://doi.org/10.2136/vzj2015.05.0083)

- *Klopfenstein, S.T., D.R. Hirmas, and W.C. Johnson.* 2015. Relationships between soil organic carbon and precipitation along a climosequence in loess-derived soils of the central Great Plains, USA. *Catena* 133:25-34. doi: 10.1016/j.catena.2015.04.015
- *Rabenhorst, M.C., A. Schmeehling, J.A. Thompson, D.R. Hirmas, R.C. Graham, and A.M. Rossi.* 2015. Reliability of soil color standards. *Soil Science Society of America Journal* 79:193-199. doi: 10.2136/sssaj2014.10.0401
- *Halfen, A.F., T. White, T.A. Slocum, D.R. Hirmas, D. McDermott, P. Atchley, W.C. Johnson, S. Egbert, and A. Gilbreath.* 2014. A new stereoscopic (3D) media database and teaching strategy for use in large-lecture introductory geoscience courses. *Journal of Geoscience Education* 62:515-531. doi: <https://doi.org/10.5408/13-017.1>
- *Hirmas, D.R., T.A. Slocum, A.F. Halfen, T. White, E. Zautner, P. Atchley, H. Liu, W.C. Johnson, S. Egbert, and D. McDermott.* 2014. Effects of seating location and stereoscopic display on learning outcomes in an introductory physical geography class. *Journal of Geoscience Education* 62:126-137. doi: <https://doi.org/10.5408/12-362.1>
- *Hirmas, D.R., D. Giménez, V. Subroy, and B.F. Platt.* 2013. Fractal distribution of mass from the millimeter- to decimeter-scale in two soils under native and restored tallgrass prairie. *Geoderma* 207-208:121-130. doi: <https://doi.org/10.1016/j.geoderma.2013.05.009>
- *Eck, D.V., D.R. Hirmas, and D. Giménez.* 2013. Quantifying soil structure from field excavation walls using multistripe laser triangulation scanning. *Soil Science Society of America Journal* 77:1319-1328. doi: 10.2136/sssaj2012.0421
- *Hirmas, D.R.* 2013. A simple method for removing artifacts from moist fine-textured soil faces. *Soil Science Society of America Journal* 77:591-593. doi: 10.2136/sssaj2012.0418n
- *Platt, B.F., S.T. Hasiotis, and D.R. Hirmas.* 2012. Empirical determination of physical controls on megafaunal footprint formation through neochronological experiments with elephants. *PALAIOS* 27:725-737. doi: <https://doi.org/10.2110/palo.2012.p12-006r>
- *Subroy, V., D. Giménez, D.R. Hirmas, and P. Takhistov.* 2012. On determining soil aggregate bulk density by displacement in two immiscible liquids. *Soil Science Society of America Journal* 76:1212-1216. doi: 10.2136/sssaj2011.0333
- *Hirmas, D.R., B.F. Platt, and S.T. Hasiotis.* 2012. Determination of calcite and dolomite content in soils and paleosols by continuous coulometric titration. *Soil Science Society of America Journal* 76:1100-1106. doi: 10.2136/sssaj2011.0278
- *Hirmas, D.R., R.C. Graham, and K.J. Kendrick.* 2011. Soil-geomorphic significance of land surface characteristics in an arid mountain range, Mojave Desert, USA. *Catena* 87:408-420. doi: <https://doi.org/10.1016/j.catena.2011.07.011>
- *Hirmas, D.R., and R.C. Graham.* 2011. Pedogenesis and soil-geomorphic relationships in an arid mountain range, Mojave Desert, California. *Soil Science Society of America Journal* 75:192-206. doi: 10.2136/sssaj2010.0152
- *Platt, B.F., S.T. Hasiotis, and D.R. Hirmas.* 2010. Use of low-cost multistripe laser triangulation scanning technology for three-dimensional, quantitative paleoichnological and neochronological studies. *Journal of Sedimentary Research* 80:590-610. doi: <https://doi.org/10.2110/jsr.2010.059>

- **Hirmas, D.R.**, C. Amrhein, and R.C. Graham. 2010. Spatial and process-based modeling of soil inorganic carbon storage in an arid piedmont. *Geoderma* 154:486-494. doi: <https://doi.org/10.1016/j.geoderma.2009.05.005>
- *Rossi, A.M.*, **D.R. Hirmas**, R.C. Graham, and P.D. Sternberg. 2008. Bulk density determination by automated three-dimensional laser scanning. *Soil Science Society of America Journal* 72:1591-1593. doi: 10.2136/sssaj2008.0072N
- Graham, R.C., **D.R. Hirmas**, Y.A. Wood, and C. Amrhein. 2008. Large near-surface nitrate pools in soils capped by desert pavement in the Mojave Desert, California. *Geology* 36:259-262. doi: <https://doi.org/10.1130/G24343A.1>
- **Hirmas, D.R.**, and B.L. Allen. 2007. Degradation of pedogenic calcretes in West Texas. *Soil Science Society of America Journal* 71:1878-1888. doi: 10.2136/sssaj2006.0351
- **Hirmas, D.R.**, and S.A.C. *Furquim*. 2006. A simple modification of the clod method for determining bulk density of very gravelly soils. *Communications in Soil Science and Plant Analysis* 37:899-906. doi: <https://doi.org/10.1080/00103620600588579>

Book Chapters

- Billings, S.A., P.L. Sullivan, **D.R. Hirmas**, J.B. Nippert, and D.deB. Richter. 2021. The CZ as an ecological problem: How the interplay of biotic and abiotic actors determines the functioning of Earth's living skin. *In* T. White (ed.) *Critical Zone and Ecosystems Dynamics*, Springer, Dordrecht, Netherlands. (In review)
- **Hirmas, D.R.**, and R.D. Mandel. 2017. Soils of the Great Plains. p. 131-164. *In* L. West et al. (eds.) *Soils of the USA*, Springer, Dordrecht, Netherlands.
- **Hirmas, D.R.**, D. Giménez, E.A. Mome Filho, M. Patterson, K. Drager, B.F. Platt, and D.V. Eck. 2016. Quantifying soil structure and porosity using three-dimensional laser scanning. p. 19-35. *In* A. Hartemink and B. Minasny (eds.) *Digital Soil Morphometrics*, Springer, Dordrecht, Netherlands.
- Kraus, C., **D. Hirmas**, and J. Roberts. 2015. Compressive strength of blood stabilized earthen architecture. p. 217-220. *In* C. Mileto, F. Vegas, L. García Soriano, and V. Christini (eds.) *Earthen Architecture: Past, Present and Future*. Taylor & Francis Group, London, UK.
- Kraus, C., **D. Hirmas**, and J. Roberts. 2013. Microbially indurated rammed earth: A long awaited next phase of earthen architecture. p. 58-65. *In* C. Jarrett, K.-H. Kim, and N. Senske (eds.) *The Visibility of Research, Proceedings of the 2013 Architectural Research Centers Consortium*, University of North Carolina Charlotte, NC.
- Wysocki, D.A., P.J. Schoeneberger, **D.R. Hirmas**, and H.E. LaGarry. 2012. Geomorphology of Soil Landscapes. p. 29-1–29-26. *In* P.M. Huang, Y. Li, and M.E. Sumner (eds.) *Handbook of Soil Sciences: Properties and Processes*, 2nd ed. CRC Press, Boca Raton, FL.

Technical Reports

- Johnson, W.C., R.L. Stotler, M.W. Bowen, J.H. Kastens, **D.R. Hirmas**, D.J. Burt, and K.A. Salley. 2019. Assessing playas as point sources for recharge of the High Plains Aquifer, western Kansas. Prepared for the USEPA and Kansas Water Office. Kansas Geological Survey Open-File Report 2019-2.

Minor Publications

- Sullivan, P.L., A. Wymore, W.H. McDowell, S. Aarons, S. Aciego, A.M. Anders, S. Anderson, E. Aronson, L. Arvin, R. Bales, A.A. Berhe, S. Billings, S.L. Brantley, P. Brooks, C. Carey, J. Chorover, X. Comas, M. Covington, A. Dere, W.E. Dietrich, J. Druhan, A. Fryar, I. Giesbrecht, P. Groffman, S. Hall, C. Harman, S. Hart, J. Hayes, E. Herndon, **D. Hirmas**, D. Karwan, L. Kinsman-Costello, P. Kumar, L. Li, K. Lohse, L. Ma, G.L. Macpherson, J. Marshall, J.B. Martin, A.J. Miller, J. Moore, T. Papnicolauo, B. Prado, A.J. Reisinger, D. deB. Richter, C. Riebe, D. Rempe, A. Ward, D. Ward, N. West, C. Welty, T. White, and W. Yang. 2017. New Opportunities for Critical Zone Science. White Booklet, Report of the 2017 Arlington CZO All Hands Meeting (Available online at <http://criticalzone.org/2017-white-booklet>).
- **Hirmas, D.R.** 2017. The four most important things I learned from CTE. Reflections from the Classroom 19:11-12. (Available online at <https://cte.ku.edu/reflections-classroom>)
- Giménez, D., and **D.R. Hirmas**. 2017. Macroporosity. p. 1388-1391. *In* R. Lal (ed.) Encyclopedia of Soil Science, Vol. 2, 3rd Ed. CRC Press, Boca Raton, FL. doi: 10.1081/E-ESS3-120053869
- **Hirmas, D.R.**, and M. Cooper. 2016. Introduction to the special issue on soil macrofauna as ecosystem engineers. *Soil Science* 181:89-90. doi: 10.1097/SS.000000000000149
- **Hirmas, D.R.** 2016. To flip or not to flip? That is not the question. KU Center for Teaching Excellence, *Teaching Matters* 19(2):4. (Available online at <https://cte.ku.edu/teaching-matters>)
- Stotler, R.L., D.O. Whittemore, J.J. Smith, B.S. Katz, A. Yoerg, J.J. Butler, Jr., G.A. Ludvigson, and **D.R. Hirmas**. 2015. Isotopic composition of the Ogallala-High Plains aquifer and vadose zone. *Procedia Earth and Planetary Science* 13:39-42. doi: 10.1016/j.proeps.2015.07.009
- **Hirmas, D.R.** 2013. Establishing disciplinary foundations with discussion, lecture, and writing. University of Kansas Center for Teaching Excellence, Portfolio (Available online at <http://cte.ku.edu/portfolios/hirmas>).
- Stiles, C.A., E.C. Brevik, and **D. Hirmas**. 2013. Guidelines for posters and oral presentations for the graduate student competition. Division S-5 Pedology, Soil Science Society of America (Available online at <https://www.soils.org/files/membership/divisions/s05/division-s-5-presentation-guidelines-vs2012-final.pdf>).
- McDermott, D., **D.R. Hirmas**, T. Slocum, A.F. Halfen, T. White, S. Egbert, P. Atchley, W.C. Johnson and A. Gilbreath. 2012. Do stereoscopic displays improve learning in introductory physical geography classes? *In* Proceedings, AutoCarto 2012, Columbus, OH. 16-18 Sep. 2012. Cartography and Geographic Information Society. (Available online at <https://cartogis.org/auto-carto-proceedings-papers-2012/>)
- **Hirmas, D.R.**, and R.C. Graham. 2011. Response to “Comment on ‘Pedogenesis and soil-geomorphic relationships in an arid mountain range, Mojave Desert, California.’” *Soil Science Society of America Journal* 75:1173. doi: 10.2136/sssaj2011.0022r

Highlighted Contributions

- Research Spotlights. 2022. The world’s roots are getting shallower. *Eos* 103. doi: 10.1029/2022EO220534
- EurekaAlert! 2019. Soils could be affected by climate change, impacting water and food. AAAS. (https://www.eurekaalert.org/pub_releases/2019-09/ru-scb090919.php)

- News. 2019. Climate change: A dirt-y business. UC Riverside. (<https://news.ucr.edu/articles/2019/09/10/climate-change-dirt-y-business>)
- News. 2018. Climate-induced soil changes may cause more erosion and flash flooding. UC Riverside. (<https://news.ucr.edu/articles/2018/09/12/climate-induced-soil-changes-may-cause-more-erosion-and-flash-flooding>)
- Society Science. 2017. A digital morphometric approach for quantifying ped shape. *CSA News* 62(1):10.
- Digital Library News. 2016. A digital morphometric approach for quantifying ped shape. Alliance of Crop, Soil, and Environmental Science Societies. (<https://dl.sciencesocieties.org/story/2016/dec/tue/a-digital-morphometric-approach-for-quantifying-ped-shape>)
- News. 2016. Laser reveals water's secret life in soil. Soil Science Society of America. (<https://www.soils.org/discover-soils/story/laser-reveals-waters-secret-life-soil>)
- Society Science. 2013. Quantifying soil structure in the field. *CSA News* 58(8):12.
- Featured Articles. 2012. Empirical determination of physical controls on megafaunal footprint formation through neoichnological experiments with elephants. *BioOne*. (<http://www.bionone.org/action/showDois>)
- Science. 2011. Arid mountains affect soil-geomorphic evolution and biogeochemical cycling in desert soilscapes. *CSA News* 56(3):14.
- Research and Industry. 2009. Soil bulk density determination by automated three-dimensional laser scanning. *CSA News* 54(1):4.
- Research Highlights. 2008. Nitrate under the pavement. *Nature Geoscience* 1:210.

PRESENTATIONS

Invited Research Presentations

- Optimizing soil structure for multi-benefit nature-based solutions. 3rd Los Angeles Urban Soils Symposium, TreePeople. 26 Oct 2022. (Virtual)
- Parkway potential - healthier parkway trees through soil management. 3rd Los Angeles Urban Soils Symposium, TreePeople. 26 Oct 2022. (Co-author; presented by Alejandro Fabian; Virtual)
- Towards a predictive understanding of the biotic drivers of soil structure. Cross-Divisional Symposium, Interactions between chemistry, physics, and (micro)biology: Water, pores, and biota across scales, 2021 SSSA Annual Meetings, Salt Lake City, UT. 7-10 Nov. 2021. (Co-author; presented by S.A. Billings)
- How sensitive is the rate of bedrock weathering to near-surface changes in critical zone architecture? Connects 2021, Geological Society of America, Portland, OR, 10-13 Oct 2021. (Co-author; presented by P.L. Sullivan)
- Do root-regolith-rock interactions govern critical zone-climate feedbacks over decades to centuries? Goldshmidt 2021, Lyon, France, 4-9 Jul 2021. (Co-author; presented by P.L. Sullivan)

- Potential effects of climate change on soil properties. Learn at Home Series, TreePeople. 9 Sep 2020. (Virtual)
- Emerging technology for urban soil characterization. Los Angeles Urban Soils Symposium, TreePeople. 26 Jun 2020. (Virtual)
- Local to continental-scale, climate-induced changes in soil hydraulic properties: Evidence and implications. Association of Environmental and Engineering Geologists, Inland Empire Chapter (AEG-IE), Colton, CA. 19 Feb 2020.
- Could climate change drive alterations in soil structure and hydraulic properties within anthropogenically-relevant timescales? EGU General Assembly 2019, European Geosciences Union, Vienna, Austria. 7-12 April 2019. (Lead author; presented by A. Nemes)
- Designing models to forecast changing soil systems in the Anthropocene: Projecting terrestrial water storage and ecosystem nutrient fluxes. NSF/DARPA/ARPA-E Signals in the Soil Awardees Conference, Alexandria, VA. 10-11 April 2019. (Co-author; presented by S.A. Billings)
- Arranging Particles and Pores: The Development, Function, and Sensitivity of Soil Structure. Seminar, Department of Agronomy, Purdue University. 18 Feb. 2019.
- Recent advances and future directions in the measurement and modeling of soil structure. Seminar, Department of Geology, Kansas State University. 3 May 2018.
- Linking atmospheric, landscape, and ecohydrologic processes through quantitative pedology. Seminar, Department of Environmental Sciences, University of California—Riverside. 26 Feb. 2018.
- Experimental and observational evidence for rapid soil fabric alterations induced by climate. Seminar, Kansas Biological Survey. 1 Dec. 2017.
- More than a boundary condition: Why soils matter to global climate change. Red Hot Research, The Commons, University of Kansas. 29 Sep. 2017
- Recent advances and future directions in the measurement and modeling of pedogenic properties and processes. Department of Plant and Soil Sciences, University of Kentucky. 18 Sep. 2017.
- Development of digital soil morphometric methods for integrating pedological and soil hydrological investigations. Department für Ökologie und Ökosystemmanagement, Technische Universität München, Freising, Germany. 14 Apr. 2016.
- Transcending transnational and cultural borders in university research, teaching, and service. Colloquium, Department of Geography and Atmospheric Science, University of Kansas. 25 Mar. 2016.
- Novel strategies and teaching materials to enhance student learning in the soil and environmental sciences. Department of Soil and Water Science Seminar, University of Sulaimani, KRG, Iraq. 17 Jan. 2016.
- Application of pedomimicry to stabilize materials for Earthen architecture. Department of Soil and Water Science Seminar, University of Sulaimani, KRG, Iraq. 17 Jan. 2016.

- Continental-scale relationships between soil structure, macroporosity, and climate. Department of Soil and Water Science Seminar, University of Sulaimani, KRG, Iraq. 11 Jan. 2016.
- Application of multistripe laser triangulation (MLT) scanning to measuring soil physical properties. Department of Soil and Water Science Seminar, University of Sulaimani, KRG, Iraq. 11 Jan. 2016.
- Quantification of soil architecture using a variety of novel approaches. Department of Soil and Water Science Seminar, University of Sulaimani, KRG, Iraq. 4 Jan. 2016.
- Challenges for the new century of soil survey: Quantification and representation in the age of big data. Pedology Symposium, Soil Survey: Present and Future, 2015 SSSA Annual Meetings, Minneapolis, MN. 15-18 Nov. 2015.
- Quantitative soil morphology: Emerging technologies, new discoveries, and future directions. Seminar, Department of Crop and Soil Science, Oregon State University. 11 June 2015.
- Soil architecture: Quantitative methods, new discoveries, and future directions. Seminar, Department of Agronomy, Purdue University. 30 Mar. 2015.
- Application of structured-light scanning to quantify soil architecture at the sub-millimeter to meter scale. Seminar, Department of Geology, University of Kansas. 13 Mar. 2014.
- Integrating soil morphological and hydraulic properties. Colloquium, Department of Geography, University of Kansas. 20 Sep. 2013.
- Integrating hydrogeology in Critical Zone investigations. Karst Critical Zone Observatory Workshop, University of Kentucky. 25 Sep 2012.
- Quantifying soil architecture: Application of structured-light scanning to soil morphology from the horizon to pit scale. Natural Resources Conservation Service—National Soil Survey Center. 8 Aug 2012.
- Soil geomorphology and biogeochemistry of an arid mountain bolson, Mojave Desert, USA. University of Kansas Ecosystems Research Group, Kansas Biological Survey. 24 Sep. 2010.
- Land-use effects on soil architecture and near-surface hydrology in eastern Kansas. Seminar, Department of Geological and Atmospheric Sciences, Iowa State University. 10 Sep. 2010.
- Soil Architecture of the Rockefeller Experimental Tract: Initial Findings and Implications. Seminar, KU Field Station and Ecological Reserves, Kansas Biological Survey. 13 Nov. 2009.
- Soil Geomorphology of an Arid Mountain Bolson, Mojave Desert, USA. Seminar, Department of Geography, Kansas State University. 11 Sep. 2009.
- Geomorphology, pedology, and soil-landscape modeling of the southern Fry Mountain bolson, Mojave Desert, USA. Department of Environmental Sciences, Rutgers University. 30 Jun. 2009.
- Surface processes, pedology, and soil-landscape modeling, Mojave Desert, California. Colloquium Series, Department of Geography, University of Kansas. 25 Feb. 2008.
- Spatial distribution of inorganic carbon storage in an arid landscape. Seminar, Soil and Water Sciences Program, Department of Environmental Sciences, University of California–Riverside. 3 Dec. 2007.

Invited Teaching Presentations

- US Soil Taxonomy. Structural Analysis of Soil Coverage guest lecture, University of São Paulo, Brazil. 26 Oct. 2021.
- Soil morphological methods in Pedology. Structural Analysis of Soil Coverage guest lecture, University of São Paulo, Brazil. 25 Oct. 2021.
- Modern methods in Pedology. Structural Analysis of Soil Coverage guest lecture, University of São Paulo, Brazil. 3 Nov. 2020.
- Soil and paleosol geochemistry. Paleopedology guest lecture, Department of Geology, University of Kansas. 27 Apr. 2017.
- Grassland soils of Iraq. (Co-led with A.K. Mohammed) Grasslandia: A Workshop for K-12 Teachers and Education Students, Center for Global and International Studies, University of Kansas. 1 Apr. 2017.
- Developing quantitative problem solving skills using in-class group exercises. C21 Course Redesign Consortium, Center for Teaching Excellence, University of Kansas. 9 Dec. 2016.
- Documenting teaching. Doctoral Seminar guest lecture, Department of Architecture, University of Kansas. 13 Oct. 2016.
- 3-D Printing: An emerging tool in universal design for learning. (Co-led with S.J. Smith) Teaching Summit, University of Kansas. 18 Aug. 2016.
- Active teaching strategies: An example from an introductory geoscience course. Faculty of Science Seminar, University of Sulaimani, KRG, Iraq, 22 May 2016.
- Soil and paleosol geochemistry. Paleopedology guest lecture, Department of Geology, University of Kansas. 3 May 2016.
- Active teaching strategies for enhancing undergraduate student learning. University Seminar, University of Sulaimani, KRG, Iraq, 25 Jan. 2016.
- Preparation of manuscripts for publication in common soil science journals. Workshop, Department of Soil and Water Science, University of Sulaimani, KRG, Iraq, 24 Jan. 2016.
- What to give up? Lessons from GEOG 104. C21 Course Redesign Consortium, Center for Teaching Excellence, University of Kansas. 11 Sep. 2015.
- Promoting student buy-in with new teaching strategies. (Co-led with A.F. Greenhoot and A.E. Rossomondo) Teaching Summit, University of Kansas. 20 Aug. 2015.
- What the flip! Redesigning a core physical geography course to maximize student learning. (Co-presented with A.F. Halfen.) Colloquium, Department of Geography, University of Kansas. 18 Apr. 2014.
- Soil architecture/Earthen architecture. (Co-presented with C. Kraus.) University of Kansas Mini-College. 4 Jun. 2012.
- Untethered teaching: Combining the iPad with AppleTV. Instructional Technology demonstration, University of Kansas. 28 Nov. 2012.

- Soil and paleosol geochemistry. Paleopedology guest lecture, Department of Geology, University of Kansas. 23 Apr. 2012.
- Soil and paleosol geochemistry. Paleopedology guest lecture, Department of Geology, University of Kansas. 28 Apr. 2010.
- Soil-biota relationships. Introduction to Soil Geography guest lecture, Department of Geography, University of Kansas. 26 Feb. 2008.
- Soils. 6th-grade class period guest lecture, Heritage K8 Charter School, Escondido, CA. 17 Jan. 2008.
- What is soil science? Four class periods of 10th-grade Integrated Science guest lectures, Rancho Buena Vista High School, Vista, CA. 22 Feb. 2007.

Volunteered Research Presentations (*italics indicate students*)

- Fang, L., Y. Chen, D. Herrmann, **D.R. Hirmas**, M. Pranger, C. Ham, M. Michael, and R. Pouyat. 2023. Healthy Soils for Healthy Parks: Los Angeles Urban Carbon Farm at Griffith Park. COMPOST2023, US Composting Council. 23-27 Jan 2023. Ontario, CA.
- van der Ploeg, M.J., A. Nemes, A. Degre, **D.R. Hirmas**, M. Young, J.K. Koestel, and Q. de Jong van Lier. 2022. Requirements to measurements and auxiliary information for improvement and field validity of pedotransfer functions for land surface models. *In* 2022 Fall Meeting Program, AGU. 12-16 Dec 2022. AGU, Washington, DC.
- *Bixby, L.C., P.L. Sullivan, S.A. Billings, H.R. Barnard, L. Li, D.R. Hirmas, J. Rickenbach, J. Pachón, V. Varikuti, K. Johnson, K.M. Jarecke, A. Navarre-Sitchler, and A. Mollhagen.* 2022. Sensitivity of soil organic carbon and chemical weathering dynamics to variations in land-cover, lithology, and aspect in high elevation montane systems. *In* 2022 Fall Meeting Program, AGU. 12-16 Dec 2022. AGU, Washington, DC.
- Wen, H., P.L. Sullivan, S.A. Billings, H. Ajami, A. Cueva, A. Flores, **D.R. Hirmas**, A.N. Koop, K. Murenbeeld, X. Zhang, and L. Li. 2022. From soils to streams: Connecting terrestrial carbon transformation, chemical weathering, and solute export across hydrological regimes. *In* 2022 Fall Meeting Program, AGU. 12-16 Dec 2022. AGU, Washington, DC.
- **Hirmas, D.R.**, X. Zhang, P.L. Sullivan, H. Ajami, S.A. Billings, M. Sena, L.F.T. de Souza, L. Li, J.C. Pachon, and A. Flores. 2022. Predicting rapid macroporosity and hydraulic conductivity response to soil moisture *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Baltimore, MD. 6-9 Nov 2021. ASA, Madison, WI.
- *Moreno, V., P.L. Sullivan, A. Duro, D.R. Hirmas, S.A. Billings, H. Ajami, L. Li, K. Jarecke, and V. Bailey.* 2022. Do indirect effects of forest stand age and aspect govern SOC stability via their influence on soil aggregate development? *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Baltimore, MD. 6-9 Nov 2021. ASA, Madison, WI.
- *Guthrie, A.V., D.R. Hirmas, P.L. Sullivan, L. Li, H. Wen, H. Ajami, J. Nippert, K. Singha, A. Flores, and S.A. Billings.* 2022. Evidence for rapid and wide-spread root-induced soil structural changes in response to land use. Goldschmidt2022, Geochemical Society. 10-15 July 2022. Honolulu, HI.
- *Begum, K., Z. Cheng, T. Muth, P. Groffman, D. Giménez, D.R. Hirmas, G.V. Pizarro, M. Vega, J. Velazquez, D. Parizek, and R. Shaw.* 2022. Development of soil survey methods for ur-

ban areas. 2022 Northeastern Section Meeting, GSA. 20-22 Mar 2022. Lancaster, PA. doi: <https://doi.org/10.1130/abs/2022NE-375265>

- **Hirmas, D.R.**, X. Zhang, P.L. Sullivan, S.A., Billings, *L.F.T. de Souza*, L. Li, H. Ajami, M.G. Sena, A.N. Flores. 2021. A novel method for predicting rapid changes in soil structure and hydraulic conductivity. *In* 2021 Fall Meeting Program, AGU. 13-17 Dec 2021. AGU, Washington, DC.
- Billings, S.A., P.L. Sullivan, **D.R. Hirmas**, *A. Guthrie, L.F.T. de Souza, E. Hauser, H. Wen, L. Li, D.deB. Richter, E.L. Aronson, H. Ajami, H.R. Barnard, J.B. Nippert, K. Singha, A.N. Flores., and L. Bixby*. 2021. Roots as agents of rapid soil structural change in the Anthropocene. *In* 2021 Fall Meeting Program, AGU. 13-17 Dec 2021. AGU, Washington, DC.
- Sullivan, P.L., S.A. Billings, **D.R. Hirmas**, L. Li, H. Ajami, A.N. Flores, K. Singha, H.R. Barnard, *E. Hauser, A.N. Koop, X. Zhang, K.J. Murenbeeld*. 2021. When and where do top-down processes govern critical zone structure and feedback to influence climate? *In* 2021 Fall Meeting Program, AGU. 13-17 Dec 2021. AGU, Washington, DC.
- Wen, H., P.L. Sullivan, S.A. Billings, H. Ajami, A. Cueva, A.N. Flores, **D.R. Hirmas**, *A.N. Koop, K.J. Murenbeeld, X. Zhang, and L. Li*. 2021. The predominant control of hydroclimatic conditions on carbon and weathering fluxes at the hillslope scale. *In* 2021 Fall Meeting Program, AGU. 13-17 Dec 2021. AGU, Washington, DC.
- *Tomar, S., D.R. Hirmas, M. Cole, R.C. Graham, and E. Blake*. 2021. Effects of dust on the morphology and development of soils in an arid mountain ecosystem. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Salt Lake City, UT. 7-10 Nov 2021. ASA, Madison, WI.
- *Duro, A.M., D.R. Hirmas, H. Ajami, D. Giménez, P.L. Sullivan, and S.A. Billings*. 2021. A VisNIR spectroscopy calibration library for mapping high-resolution, horizon-scale chemistry of rough soil surfaces. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Salt Lake City, UT. 7-10 Nov 2021. ASA, Madison, WI.
- *de Souza, L.F.T., D.R. Hirmas, P.L. Sullivan, K. Lang, P. Hansen, C.W. Rice, B. Sikes, and S.A. Billings*. 2021. Land use change mediates soil organic carbon depth distributions and mechanisms of protection across a precipitation gradient. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Salt Lake City, UT. 7-10 Nov 2021. ASA, Madison, WI.
- *Moreno, V., P.L. Sullivan, X. Zhang, R. Keen, J. Nippert, A. Duro, D.R. Hirmas, K. Sadayappan, and Li Li*. 2021. Contrasting soil structure and biogeochemistry under grassy and woody encroached land. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Salt Lake City, UT. 7-10 Nov 2021. ASA, Madison, WI.
- Zhang, X., P.L. Sullivan, S.A. Billings, **D.R. Hirmas**, and *L.F.T. de Souza*. 2021. How does land use mediate changes in soil structure dynamics and subsurface hydrologic processes with carbon decomposition? *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Salt Lake City, UT. 7-10 Nov 2021. ASA, Madison, WI.
- *de Souza, L.F.T., D.R. Hirmas, P.L. Sullivan., K. Lang, C.W. Rice, T.D. Loecke, and S.A. Billings*. 2020. Rooting abundance governs how soil organic C promotes soil aggregation across a steep precipitation gradient. *In* 2020 Fall Meeting Program, AGU. 1-17 Dec 2020. AGU, Washington, DC. (Virtual)

- Zhang X., S.A. Billings, D.R. Hirmas, A. Nemes, A.N. Koop, A. Cueva, L. Li, H. Wen, A. Flores, and P.L. Sullivan. Responses of critical zone soil processes to climate: A meta-analysis. *In* 2020 Fall Meeting Program, AGU. 1-17 Dec 2020. AGU, Washington, DC. (Virtual)
- Cueva, A., **D.R. Hirmas**, A. Nemes, S.A. Billings, A. Flores, L. Li, H. Wen, X. Zhang, and P.L. Sullivan. 2020. A new framework to predict soil saturated hydraulic conductivity. *In* 2020 Fall Meeting Program, AGU. 1-17 Dec 2020. AGU, Washington, DC. (Virtual)
- Wen, H., P.L. Sullivan, S.A. Billings, **D.R. Hirmas**, A. Cueva, A. Flores, X. Zhang, and L. Li. 2020. Subsurface structure controls water transit time, carbon transformation, and carbonate weathering at the hillslope scale. *In* 2020 Fall Meeting Program, AGU. 1-17 Dec 2020. AGU, Washington, DC. (Virtual)
- *Simmi*, **D.R. Hirmas**, R.C. Graham, and M. Cole. 2020. Soil hydrological response to bioclimatic changes in the White Mountains, eastern California. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Phoenix, AZ. 8-11 Nov 2020. ASA, Madison, WI. (Virtual)
- Zhang, X., S.A. Billings, **D.R. Hirmas**, and P.L. Sullivan. 2020. Climate-induced changes in soil structure: Pore-size distributions vary with precipitation at the continental scale. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Phoenix, AZ. 8-11 Nov 2020. ASA, Madison, WI. (Virtual)
- *de Souza*, L.F.T., **D.R. Hirmas**, P.L. Sullivan., *K. Lang*, C.W. Rice, T.D. Loecke, and S.A. Billings. 2020. Belowground fingerprints of the Anthropocene: How humans are promoting physical and biogeochemical changes in deep soils. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Phoenix, AZ. 8-11 Nov 20120. ASA, Madison, WI. (Virtual)
- Zhang, X., S.A. Billings, A.N. Koop, **D.R. Hirmas**, and P.L. Sullivan. 2020. Unraveling the role of climate in soil development in the critical zone using a continental-scale dataset. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Phoenix, AZ. 8-11 Nov 2020. ASA, Madison, WI. (Virtual)
- Sullivan, P.L., S.A. Billings, **D.R. Hirmas**, L. Li, A. Flores, H. Wen, C. Nash, A. Cueva, and X. Zhang. 2020. Are rate changes in biotic processes altering subsurface hydrologic partitioning in the Anthropocene? CSDMS 2020: Linking Ecosphere and Geosphere, Community Surface Dynamics Modeling System, Boulder, CO. 19-21 May 2020. (Virtual)
- Cueva, A., **D.R. Hirmas**, A. Nemes, and P.L. Sullivan. 2020. From pedo to pedon: Towards the next generation of transfer functions to estimate saturated hydraulic conductivity. EGU General Assembly 2020, European Geosciences Union, Vienna, Austria. 3-8 May 2020. (Virtual)
- Nash, C., A. Flores, P.L. Sullivan, **D.R. Hirmas**, S.A. Billings, L. Li, and H. Wen. 2019. Modelling continental-scale effects of climate-responsive soil parameters on hydrologic stores and fluxes in the Community Land Model (CLM) 5.0. *In* 2019 Fall Meeting Program, AGU, Washington, DC. 9-13 Dec 2019. AGU, Washington, DC.
- Billings, S.A., P.L. Sullivan, *L. Souza*, *E Hauser*, *K. Lang*, **D.R. Hirmas**, *D.deB. Richter*, A. Cherkinsky, and D. Markewitz. 2019. Anthropogenic declines in deep roots constrain deep soil organic carbon forms and fluxes. *In* 2019 Fall Meeting Program, AGU, Washington, DC. 9-13 Dec 2019. AGU, Washington, DC.

- Sullivan, P.L., S.A. Billings, **D.R. Hirmas**, L. Li, A.N. Flores, M. Sena, H. Wen, M. Okeson, C. Nash., L. Souza, and K. Lang. 2019. Do we need to account for dynamic changes in subsurface plumbing to project blue water stocks and fluxes? *In* 2019 Fall Meeting Program, AGU, Washington, DC. 9-13 Dec 2019. AGU, Washington, DC.
- Okeson, M., P.L. Sullivan, C. Zhang, M. Behm., **D.R. Hirmas**. 2019. How does hydrologic connectivity on hillslopes mantled by soils with shrink-swell properties respond to changing precipitation patterns? *In* 2019 Fall Meeting Program, AGU, Washington, DC. 9-13 Dec 2019. AGU, Washington, DC.
- Giménez, D., J.S. Caplan, **D.R. Hirmas**, J.M. Blair, N.A. Brunsell, and A.K. Knapp. 2019. Decadal-scale shifts in soil hydraulic properties induced by altered precipitation. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, San Antonio, TX. 10-13 Nov 2019. ASA, Madison, WI.
- Koop, A.N., **D.R. Hirmas**, P.L. Sullivan, and A.K. Mohammed. 2019. Exploring soil genesis across scales: A new development index independent of parent material. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, San Antonio, TX. 10-13 Nov 2019. ASA, Madison, WI.
- Cao, X., **D.R. Hirmas**, P.L. Sullivan, and M.G. Sena. 2019. A novel method for imaging pedon-scale arrangements of soil minerals, organic matter, and macropores. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, San Antonio, TX. 10-13 Nov 2019. ASA, Madison, WI.
- Sena, M.G., P.L. Sullivan, **D.R. Hirmas**, and S.A. Billings. 2019. Influence of precipitation and land use on pore geometry in soils with vertic properties. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, San Antonio, TX. 10-13 Nov 2019. ASA, Madison, WI.
- Koop, A.N., **D.R. Hirmas**, and P.L. Sullivan. 2019. Towards a generalizable index for soil development. 2018-2019 International Soils Meeting, SSSA, San Diego, CA. 6-9 Jan 2019.
- **Hirmas, D.R.**, D. Giménez, A. Nemes, R. Kerry, N.A. Brunsell, and C.J. Wilson. 2019. Continental-scale evidence for recent climate-driven changes in soil structure. 2018-2019 International Soils Meeting, SSSA, San Diego, CA. 6-9 Jan 2019.
- Mohammed, A.K., **D.R. Hirmas**, A. Nemes, and D. Giménez. 2019. Evaluating exogenous and endogenous controls on the development of soil structure over different climate regions. 2018-2019 International Soils Meeting, SSSA, San Diego, CA. 6-9 Jan 2019.
- Sullivan, P.L., Billings, S., **D.R. Hirmas**, A.N. Flores, M. Sena, A.K. Mohammed, L. Souza, and L. Li. 2018. Forecasting effects of climate and land use on terrestrial water dynamics, soil development, and biogeochemical cycling. *In* 2018 Fall Meeting Program, AGU, Washington, DC. 10-14 Dec 2018. AGU, Washington, DC.
- **Hirmas, D.R.**, D. Giménez, A. Nemes, R. Kerry, N.A. Brunsell, and C.J. Wilson. 2018. Rapid alterations in continental-scale soil macroporosity driven by climate. *In* 2018 Fall Meeting Program, AGU, Washington, DC. 10-14 Dec 2018. AGU, Washington, DC.
- Caplan, J.S., D. Giménez, **D.R. Hirmas**, N.A. Brunsell, J.M. Blair, and A.K. Knapp. 2018. Rapid shifts in soil hydraulic properties induced by decadal-scale precipitation change. *In* 2018 Fall Meeting Program, AGU, Washington, DC. 10-14 Dec 2018. AGU, Washington, DC.
- Mohammed, A.K., **D.R. Hirmas**, P.L. Sullivan, A. Nemes, and S.A. Billings. 2018. Development of climate-dependent pedotransfer functions for predicting soil hydraulic properties. *In* 2018 Fall Meeting Program, AGU, Washington, DC. 10-14 Dec 2018. AGU, Washington, DC.

- **Hirmas, D.R.**, D. Giménez, A. Nemes, R. Kerry, N.A. Brunsell, and C.J. Wilson. 2018. On the static representation of soil in regional and global climate models. International Soil Modeling Consortium Conference 2018, Wageningen, The Netherlands. 5-7 Nov 2018.
- Mohammed, A.K., **Hirmas, D.R.**, D. Giménez, and A. Nemes. 2018. Assessing continental-scale influences of exogenous and endogenous controls on soil structural development. p. 76. *In Proceedings of the 21st WCSS, 21st World Congress of Soil Science.* IUSS, Rio de Janeiro, Brazil. 12-17 August 2018.
- Billings, S., **D.R. Hirmas**, P.L. Sullivan, C. Lehmeier, S. Bagchi, K. Min, Z. Brecheisen, E. Hauser, R. Stair, R. Flournoy, and D.deB. Richter. 2017. Loss of deep roots limits biogenic agents of soil development only partially restored by 80 y of forest regeneration: Important subtleties of the Anthropocene. *In 2017 Fall Meeting Program, AGU, New Orleans, LA.* 11-15 Dec 2017. AGU, Washington, DC.
- Qin, M., D. Giménez, and **D.R. Hirmas**. 2017. Predicting saturated hydraulic conductivity values in a soil profile from various estimates of critical pore diameter. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL.* 22-25 Oct 2017. ASA, Madison, WI.
- **Hirmas, D.R.**, D. Giménez, A.J. Al-Sarraj, and A.K. Mohammed. 2017. Detection of fabricated macropore networks using 3-D laser scanning. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL.* 22-25 Oct 2017. ASA, Madison, WI.
- **Hirmas, D.R.**, and J.W. Schroeder. 2017. Do genetic soil horizons exist? *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL.* 22-25 Oct 2017. ASA, Madison, WI.
- Sheikh-Abdulla, S.M., **D.R. Hirmas**, and A.N. Koop. 2017. A simple method to determine the reactivity of calcium carbonate in soils. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL.* 22-25 Oct 2017. ASA, Madison, WI.
- Mohammed, A.K., **D.R. Hirmas**, D. Giménez, and A. Nemes. 2017. The influence of climate on the development of soil structure. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL.* 22-25 Oct 2017. ASA, Madison, WI.
- Koop, A.N., **D.R. Hirmas**, and W.C. Johnson. 2017. Pedostratigraphic influence of late-Quaternary loesses and paleosols on canyon morphology in the Arikaree Breaks, northwestern Kansas. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL.* 22-25 Oct 2017. ASA, Madison, WI.
- Caplan J.S., D. Giménez, **D.R. Hirmas**, N.A. Brunsell, J.M. Blair, and A. Knapp. 2017. Rapid shifts in soil hydraulic properties in response to simulated rainfall. *In Abstracts, Ecological Society of America, Portland, OR.* 6-11 Aug 2017. Washington, D.C.
- Ogg, C., M. Whited, and **D.R. Hirmas**. 2017. Field investigations focus team. National Cooperative Soil Survey (NCSS) National Conference, USDA-NRCS, Boise, ID. 25-29 Jun 2017.
- Mohammed, A.K., **D.R. Hirmas**, D. Giménez, A. Nemes. 2016. Exploring relationships between soil structure and climate across the conterminous USA. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Phoenix, AZ.* 6-9 Nov 2016. ASA, Madison, WI.
- Stotler R.L., J.J. Butler, Jr., **D.R. Hirmas**, B.S. Katz, S. Knobbe, A. Layzell, M. Long, G.A. Ludwigson, E. Reboulet, J.J. Smith, and D.O. Whittemore. 2016. Understanding the role of geology

on recharge to and production from the High Plains aquifer in Kansas. *In* GSA Abstracts with Programs, Annu. Meet., GSA, Denver, CO. 25-28 Sep 2016. GSA, Denver, CO.

- **Hirmas, D.R.**, M. Steffens, P. Sullivan, C. Zhang and D. Giménez. 2016. Coupling multi-stripe laser triangulation with hyperspectral imaging VisNIR spectroscopy to elucidate the feedbacks between soil structure, hydrology, and organic matter. *In* Geophysical Research Abstracts, Vol. 18, EGU General Assembly 2016, Vienna, Austria. 17-22 Apr 2016. EGU, Munich, Germany.
- Slocum, T.A., **D.R. Hirmas**, A.L. Johnson, J.R. Miller, S.T. Hasiotis, A.F. Halfen, and W.C. Johnson. 2016. Increasing conceptualization of soil structure through digital and 3-D printing technologies. *In* Abstracts and Programs, Annu. Meet., AAG, San Francisco, CA. 29 Mar-2 Apr 2016. AAG, Washington, DC.
- *Mohammed, A.K.*, J.H. Kastens, W.C. Johnson, and **D.R. Hirmas**. 2016. Predicting flood vulnerability in a developing urbanized environment: A modeling study for Sulaimanyah, Iraq. *In* Abstracts and Programs, Annu. Meet., AAG, San Francisco, CA. 29 Mar-2 Apr 2016. AAG, Washington, DC.
- Giménez, D., **D.R. Hirmas**, A.K. Mohammed. 2015. Investigating the potential of National Cooperative Soil Survey information for advancing soil science. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Minneapolis, MN. 15-18 Nov 2015. ASA, Madison, WI.
- **Hirmas, D.R.**, A.L. Johnson, J.R. Miller, T.A. Slocum, S.T. Hasiotis, A.F. Halfen, and W.C. Johnson. 2015. Do digital and 3-D printed specimens increase conceptualization of soil structure? *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Minneapolis, MN. 15-18 Nov 2015. ASA, Madison, WI.
- *Zautner, E.*, and **D.R. Hirmas**. 2015. Surface rock controls on the development of desert varnish in the Mojave Desert, California. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Minneapolis, MN. 15-18 Nov 2015. ASA, Madison, WI.
- *Mohammed, A.K.*, **D.R. Hirmas**, D. Giménez, and R.D. Mandel. 2015. A digital morphometric method for quantifying ped shape. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Minneapolis, MN. 15-18 Nov 2015. ASA, Madison, WI.
- *Patterson, M.*, D. Giménez, **D.R. Hirmas**, E. Ayres, and T.C. Bents. 2015. Monitoring and quantification of crack development in cores during evaporation experiments. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Minneapolis, MN. 15-18 Nov 2015. ASA, Madison, WI.
- Stotler R.L., D.O. Whittemore, J.J. Smith, B.S. Katz, A. Yoerg, J.J. Butler, Jr., G.A. Ludvigson, **D.R. Hirmas**, and M.J. Hendry. 2015. Isotopic composition of the Ogallala-High Plains aquifer and vadose zone. IAH-CNC 2015, Waterloo, Ontario. 27-30 Oct 2015.
- Stotler R.L., B.S. Katz, D.O. Whittemore, J.J. Butler, Jr., G.A. Ludvigson, J.J. Smith, and **D.R. Hirmas**. 2015. Implications of a falling water table for recharge estimations through a thick vadose zone beneath an irrigated field. 11th Applied Isotope Geochemistry Conference, French Geological Survey, Orléans, France. 21-25 Sep 2015.
- **Hirmas, D.R.**, D. Giménez, T.C. Bents, E.A. Mome Filho, M. Patterson, B.F. Platt, K. Drager, and D.V. Eck. 2015. Application of structured-light scanning to digital soil morphometrics. IUSS

Working Group, Digital Soil Morphometrics Global Workshop 2015, Madison WI. 1-4 June 2015.

- Stotler R.L., J.J. Smith, G.A. Ludvigson, B.S. Katz, D.O. Whittemore, J.J. Butler, Jr., and **D.R. Hirmas**. 2015. Assessing recharge sources and pathways with high resolution pore fluid geochemistry. AEEG NovCare 2015, Lawrence, KS. 19-21 May 2015.
- Friedman, R., O. Skyba, and **D.R. Hirmas**. 2014. Threshold concepts 2.0: Implementing the framework. NAGC 61st. Annual Convention and Exhibition. National Association for Gifted Children, Baltimore, MD. 13-16 Nov. 2014.
- Stotler R.L., B.S. Katz, **D.R. Hirmas**, D.O. Whittemore, J.J. Butler, Jr., J.J. Smith, and G.A. Ludvigson. 2014. Understanding recharge patterns in the High Plains Aquifer, Kansas. Governor's Conference on the Future of Water in Kansas. Manhattan, KS. 12-13 Nov 2014.
- Eck, D.V., **D.R. Hirmas**, D. Giménez, M. Qin, and N.A. Brunsell. 2014. Potential for linking hydraulic properties and quantitative characterization of soil architecture at NEON field sites. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Long Beach, CA. 2-5 Nov. 2014. ASA, Madison, WI.*
- Mohammed, A., **D.R. Hirmas**, D. Giménez, and A. Nemes. 2014. Investigating relationships between soil morphology, classification, and hydraulic properties. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Long Beach, CA. 2-5 Nov. 2014. ASA, Madison, WI.*
- Bents, T.C., and **D.R. Hirmas**. 2014. Relating soil structure to water retention using multistripe laser triangulation scanning. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Long Beach, CA. 2-5 Nov. 2014. ASA, Madison, WI.*
- **Hirmas, D.R.**, A.L. Johnson, J.R. Miller, T.A. Slocum, S.T. Hasiotis, A.F. Halfen, and W.C. Johnson. 2014. Use of digital and 3-D printed soil structure specimens in an introductory geoscience laboratory. *In GSA Abstracts with Programs, Annu. Meet., GSA, Vancouver, BC, Canada. 19-22 Oct. 2014. GSA, Denver, CO.*
- Kraus, C., **D.R. Hirmas**, J. Roberts, J. Boling, A. Bents, T. Bents, Z. Dawson, A. Johnson, B. Peek, and D. Versteeg. 2014. Compressive strength of blood stabilized earthen architecture. International Conference on Vernacular Heritage, Sustainability and Earthen Architecture, VerSus 2014–2nd MEDITERRA–2nd ResTAPIA, Valencia, Spain. 11-13 Sep. 2014.
- Stotler, R.L., B.S. Katz, J.J. Butler, D.O. Whittemore, E.C. Reboulet, **D.R. Hirmas**, J.J. Smith, and G.A. Ludvigson. 2014. Recharge in the High Plains Aquifer: Physical and Chemical Data. Goldschmidt2014, Sacramento, CA. 8-13 June 2014.
- Giménez, D., A. Nemes, and **D.R. Hirmas**. 2014. An index of soil structure derived from water retention and particle-size distribution. 20th World Congress of Soil Science, Jeju, Korea. 8-13 June 2014.
- Bents, T.C., and **D.R. Hirmas**. 2013. Relationships between quantitative descriptions of soil structure and basic soil properties. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL. 3-6 Nov. 2013. ASA, Madison, WI.*
- Drager, K., **D.R. Hirmas**, and S.T. Hasiotis. 2013. Effects of ant (*Formica subsericea*) bioturbation on soil physical and hydrological properties. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL. 3-6 Nov. 2013. ASA, Madison, WI.*

- **Hirmas, D.R.**, and D. Giménez. 2013. Investigating fractal distribution of mass from the millimeter- to decimeter-scale in two Kansas soils. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL. 3-6 Nov. 2013. ASA, Madison, WI.*
- **Hirmas, D.R.**, D. Giménez, N. Brunsell, and A. Nemes. 2013. Response of soil effective porosity to prevailing climates. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL. 3-6 Nov. 2013. ASA, Madison, WI.*
- D. Giménez, A. Nemes, **D.R. Hirmas**, and S. Kværnø. 2013. Using water retention data and particle size distribution to characterize soil structure using the European Hydropedological Data Inventory. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL. 3-6 Nov. 2013. ASA, Madison, WI.*
- Rabenhorst, M.C., R.C. Graham, **D.R. Hirmas**, J.A. Thompson, and A.M. Rossi. 2013. Reliability of soil color standards. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Tampa, FL. 3-6 Nov. 2013. ASA, Madison, WI.*
- *Murphy, L.R.*, **D.R. Hirmas**, S.C. Hurst, and E. Johnson. 2013. Quantifying archaeological preservation bias using a universal model of soil erosion. *In GSA Abstracts with Programs, Annu. Meet., GSA, Denver, CO. 27-30 Oct. 2013. GSA, Denver, CO.*
- *Koop, A.N.*, W.C. Johnson, and **D.R. Hirmas**. 2013. Using TLS to assess the influence of late-Quaternary sediments and paleosols on canyon development in the Central Great Plains. *In GSA Abstracts with Programs, Annu. Meet., GSA, Denver, CO. 27-30 Oct. 2013. GSA, Denver, CO.*
- *Katz, B.S.*, R.L. Stotler, **D.R. Hirmas**, D.O. Whittemore, J.J. Butler Jr., J.J. Smith, and G.A. Ludvigson. 2013. Implications of $\delta^{18}\text{O}$ and $\delta^2\text{H}$ stable isotopes for recharge to the high plains aquifer, northwestern Kansas. *In GSA Abstracts with Programs, Annu. Meet., GSA, Denver, CO. 27-30 Oct. 2013. GSA, Denver, CO.*
- *Klopfenstein, S.*, W.C. Johnson, and **D.R. Hirmas**. 2013. Pedogenesis along a climosequence in loess-derived soils of the Central Great Plains. *In GSA Abstracts with Programs, Annu. Meet., GSA, Denver, CO. 27-30 Oct. 2013. GSA, Denver, CO.*
- Hasiotis, S.T., A.F. Halfen, *J.W. Counts*, *H.N. Wasserman*, B.F. Platt, D.I. Hembree, *M.F. Jones*, **D.R. Hirmas**, and J.J. Smith. 2013. Exploring old and new frontiers in continental ichnology—evaluating its place in ichnology and its role in geology. *In GSA Abstracts with Programs, Annu. Meet., GSA, Denver, CO. 27-30 Oct. 2013. GSA, Denver, CO.*
- Stotler, R.L., J.J. Butler, Jr., D.O. Whittemore, E.C. Reboulet, *B.S. Katz*, **D.R. Hirmas**, J.J. Smith, and G.A. Ludvigson. 2013. Monitoring, groundwater age, and assessing water availability: Lessons from the High Plains Aquifer, Kansas, USA. Groundwater and Global Palaeoclimate Signals, ICSU-INQUA-IGCP-GRAPHIC Workshop, Bobole, Mozambique, 14-19 Oct. 2013.
- *Murphy, L.R.*, **D. Hirmas**, S.C. Hurst, and E. Johnson. 2013. Quantifying archaeological preservation bias using a universal model of soil erosion, Caprock Canyonlands, Northwest Texas, USA. Annual Meeting of the Society for Cenozoic Research (TerQua), Lawrence, KS. 25-26 May 2013.
- Kraus, C., **D. Hirmas**, and J. Roberts. 2013. Microbially indurated rammed earth: A long awaited next phase of earthen architecture. p. 58-65. *In C. Jarrett, K.-H. Kim, and N. Senske*

(eds.) *The Visibility of Research*, Proceedings of the 2013 Architectural Research Centers Consortium, University of North Carolina Charlotte, NC.

- *Halfen, A.F., D.R. Hirmas, T. Slocum, T. White, E. Zautner, P. Atchley, H. Liu, W.C. Johnson, S. Egbert, and D. McDermott.* 2012. A hybrid online/offline curriculum for implementing stereoscopic technology in large lectures. *GSA Abstracts with Programs* 44:149.
- **D.R. Hirmas**, N.A. Brunsell, and D.B. Mechem. 2012. Optimization of soil structure under differing climatic regimes. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Cincinnati, OH.* 21-24 Oct. 2012. ASA, Madison, WI.
- *Niehues, N.D., D.R. Hirmas, and D.V. Eck.* 2012. Effects of soil moisture on macropore geometry. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Cincinnati, OH.* 21-24 Oct. 2012. ASA, Madison, WI.
- McDermott, D., **D.R. Hirmas**, T. Slocum, *A.F. Halfen, T. White, S. Egbert, P. Atchley, W.C. Johnson and A. Gilbreath.* 2012. Do stereoscopic displays improve learning in introductory physical geography classes? *In Proceedings, AutoCarto 2012, Columbus, OH.* 16-18 Sep. 2012. Cartography and Geographic Information Society.
- Hasiotis, S.T., **D.R. Hirmas**, and *A.F. Halfen.* 2012. Sediment Mixing Depths and Rates in Continental Environments and the Creation of Macrochannels and Macropores: Lessons Learned and Implications for Alerting Porosity and Permeability by Bioturbation. *In AAPG Annu. Convention & Exhibition Abstracts, Long Beach, CA.* 22-25 Apr. 2012.
- **Hirmas, D.R.**, T. Slocum, *A.F. Halfen, T. White, P. Atchley, S. Egbert, D. McDermott, W.C. Johnson.* 2012. Mapping the effects of seating location and stereoscopic displays on learner outcomes in an introductory physical geography class. *In Abstracts and Programs, Annu. Meet., AAG, New York, NY.* 24-28 Feb. 2012. AAG, Washington, DC.
- *Eck, D.V., and D.R. Hirmas.* 2012. Characterizing geometries of preferential flow paths in soils using structured-light laser scanning. *In Abstracts and Programs, Annu. Meet., AAG, New York, NY.* 24-28 Feb. 2012. AAG, Washington, DC.
- *Halfen, A.F., T. Slocum, T. White, D.R. Hirmas, A. Gilbreath, D. McDermott, P. Atchley, S. Egbert, W.C. Johnson.* 2012. Assessing the impact of stereoscopic displays in introductory physical geography courses. *In Abstracts and Programs, Annu. Meet., AAG, New York, NY.* 24-28 Feb. 2012. AAG, Washington, DC.
- *Eck, D., and D.R. Hirmas.* 2012. Characterizing interpedal pore geometries in soils with vertic properties in eastern Kansas. p. 32. *In Proceedings, Kansas Natural Resources Conference, Wichita, KS.* 26-27 Jan. 2012. KCWF-KCAFC-GPSAF-KSSRM-KCSWCS, Wichita, KS.
- *Paxson, C., D.R. Hirmas, and K. Kindscher.* 2012. Evaluating impacts of concentrated animal feeding operations on nitrate levels of the Arkansas River, central Kansas. p. 35. *In Proceedings, Kansas Natural Resources Conference, Wichita, KS.* 26-27 Jan. 2012. KCWF-KCAFC-GPSAF-KSSRM-KCSWCS, Wichita, KS.
- *Eck, D.V., and D.R. Hirmas.* 2011. A novel method for characterizing geometries of interaggregate planar pores in soils with vertic properties. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, San Antonio, TX.* 16-19 Oct. 2011. ASA, Madison, WI.

- **Hirmas, D.R.**, B.F. Platt, and S.T. Hasiotis. 2011. Determination of calcite and dolomite content in soils and paleosols by continuous coulometric titration. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, San Antonio, TX. 16-19 Oct. 2011. ASA, Madison, WI.*
- Slocum, T., A. Halfen, T. White, **D. Hirmas**, S. Egbert, D. McDermott, and W. Johnson. 2011. Adoption of stereoscopic displays in geographic education: A persistent problem in geographic visualization. *In Proc. 25th Intern. Cartographic Conf., Paris, France. 3-8 July 2011. ICA/CFC, Saint-Mandé, France.*
- **Hirmas, D.R.**, and N. Brunsell. 2011. Application of wavelet and fractal techniques to the analysis of soil structure and color. *In Geophysical Research Abstracts, Vol. 13, EGU General Assembly 2011, Vienna, Austria. 3-8 Apr 2011. EGU, Munich, Germany.*
- Hasiotis, S.T., **D.R. Hirmas**, B.F. Platt, and J. Reynolds. 2011. New frontiers in ichnology using MLT (multistriple laser triangulation) and rapid prototyping technology for three-dimensional analysis, printing, and sharing of modern and ancient traces with other ichnophiles. *In GSA Abstracts with Programs, Northeastern and North-Central Annu. Joint Meet., GSA, Denver, CO. 20-22 Mar. 2011. GSA, Denver, CO.*
- **Hirmas, D.R.**, and J.A. Decker. 2010. Effects of land use on soil organic carbon and hydraulic properties in upland landscapes of eastern Kansas. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Long Beach, CA. 31 Oct.-4 Nov. 2010. ASA, Madison, WI.*
- **Hirmas, D.R.**, N.A. Brunsell, and B.L. Allen. 2010. Soil morphological applications of wavelet and fractal analyses. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Long Beach, CA. 31 Oct.-4 Nov. 2010. ASA, Madison, WI.*
- **Hirmas, D.R.**, and S.T. Hasiotis. 2010. Development of three-dimensional virtual models to enhance conceptualization of soil morphology. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Long Beach, CA. 31 Oct.-4 Nov. 2010. ASA, Madison, WI.*
- **Hirmas, D.R.**, S.T. Hasiotis, and B.F. Platt. 2010. Field application of multistriple laser triangulation (MLT) scanning to enhance and quantify descriptions of soil and exogenic trace morphology. *In GSA Abstracts with Programs, Annu. Meet., GSA, Denver, CO. 31 Oct.-3 Nov. 2010. GSA, Denver, CO.*
- Reynolds, J., S.T. Hasiotis, and **D.R. Hirmas**. 2010. Utilizing three-dimensional image scanning and printed models of traces and trace fossils in K-12 classrooms. *In GSA Abstracts with Programs, Annu. Meet., GSA, Denver, CO. 31 Oct.-3 Nov. 2010. GSA, Denver, CO.*
- Decker, J.A., and **D.R. Hirmas**. 2010. Effects of land use on hydraulic properties in upland landscapes of eastern Kansas. *Annu. Meet. Rocky Mount. Div. AAG, Lawrence, KS. 8-9 Oct. 2010.*
- Platt, B.F., S.T. Hasiotis, and **D.R. Hirmas**. 2010. Three dimensional ichnofossil analyses using multistriple laser triangulation (MLT) technology: Quantifying trace-fossil morphology, bioturbation patterns, and ichnopedologic fabrics in sedimentary rocks. *AAPG Annu. Convention & Exhibition., New Orleans, LA. 13 Apr. 2010.*
- **Hirmas, D.R.**, D. Giménez, and X. Li. 2009. Characterization of soil structure and pore architecture from the aggregate to horizon scale. *In Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Pittsburgh, PA. 1-4 Nov. 2009. ASA, Madison, WI.*

- Zautner, E.J., **D.R. Hirmas**, and J. de Koff. 2009. A rapid and accurate field test for the analysis of soil phosphate. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Pittsburgh, PA. 1-4 Nov. 2009. ASA, Madison, WI.
- Platt, B.F., **D.R. Hirmas**, and S.T. Hasiotis. 2009. Footprints in the landscape: Quantifying bioturbation in soils and paleosols with multistriple laser triangulation (MLT) technology. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Pittsburgh, PA. 1-4 Nov. 2009. ASA, Madison, WI.
- Rossi, A.M., **D.R. Hirmas**, R.C. Graham, and P.D. Sternberg. 2009. Bulk density determination by automated three-dimensional laser scanning. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Pittsburgh, PA. 1-4 Nov. 2009. ASA, Madison, WI.
- Platt, B.F., S.T. Hasiotis, and **D.R. Hirmas**. 2009. Use of multistriple laser triangulation (MLT) technology for quantitative, three-dimensional analyses of trace fossils. *In* GSA Abstracts with Programs, Vol. 41, Annu. Meet., GSA, Portland, OR. 18-21 Oct. 2009. GSA, Denver, CO.
- **Hirmas, D.R.**, R.C. Graham, and M. Harlow. 2008. Links between land surface characteristics and near-surface accumulations of dust, soluble salts, nitrate-nitrogen, and carbonate in the southern Fry Mountains, Mojave Desert, USA. *In* Abstracts with Programs, Joint. Annu. Meet., GSA/ASA-CSSA-SSSA/GCAGS/HGS, Houston, TX. 5-9 Nov. 2008. GSA, Boulder, CO.
- Pietrasiak, N., **D.R. Hirmas**, R.C. Graham, and K.N. Bozhilov. 2008. Mineralogy of a paralythic horizon (well weathered bedrock) in the Mojave Desert. *In* Abstracts with Programs, Joint. Annu. Meet., GSA/ASA-CSSA-SSSA/GCAGS/HGS, Houston, TX. 5-9 Nov. 2008. GSA, Boulder, CO.
- Graham, R.C., **D.R. Hirmas**, Y.A. Wood, and C. Amrhein. 2008. Nitrate in soils capped by desert pavement, Mojave Desert, California. *In* Abstracts with Programs, Joint. Annu. Meet., GSA/ASA-CSSA-SSSA/GCAGS/HGS, Houston, TX. 5-9 Nov. 2008. GSA, Boulder, CO.
- **Hirmas, D.R.**, and R.C. Graham. 2007. Spatial distribution of inorganic carbon storage in an arid landscape. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, New Orleans, LA. 4-8 Nov. 2007. ASA, Madison, WI.
- **Hirmas, D.R.**, and R.C. Graham. 2007. Soil-geomorphic classification of an arid mountain range, Mojave Desert, USA. *In* Abstracts of the 88th Annu. Meet. AAAS, Pacific Division, Boise, ID. 17-21 June 2007.
- **Hirmas, D.R.**, and R.C. Graham. 2006. Pedology of an arid mountain range, Mojave Desert, CA. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Indianapolis, IN. 12-16 Nov. 2006. ASA, Madison, WI.
- **Hirmas, D.R.**, and R.C. Graham. 2006. Soil surface properties of Mojave Desert landforms. *In* Abstracts, 18th World Congress of Soil Science. IUSS, Philadelphia, PA. 9-15 July 2006.
- **Hirmas, D.R.** 2005. Spatial and process-based modeling of inorganic carbon storage in the Mojave Desert. Kearney Foundation Conf., Davis, CA. 24 May 2005.
- **Hirmas, D.R.**, and R.C. Graham. 2004. Relationships between soil surface characteristics and geomorphology in the Mojave Desert. 3rd Annu. Mojave Desert Science Symposium, Redlands, CA. 16-18 Nov. 2004.

- **Hirmas, D.R.**, and R.C. Graham. 2004. Relationships between soil surface characteristics and geomorphology in the Mojave Desert. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Seattle, WA. 1-4 Nov. 2004. ASA, Madison, WI.
- **Hirmas, D.R.**, and B.L. Allen. 2003. Degradation of pedogenic calcretes in West Texas. *In* Abstracts, Intern. Annu. Meet., ASA-CSSA-SSSA, Denver, CO. 2-6 Nov. 2003. ASA, Madison, WI.

GRANTS, AWARDS AND HONORS

External Research Grants (*funded*)

- The Norwegian Research Council: KLIMAFORSK, Quantifying climate and land use effects on continental-scale coupling of water and carbon cycles, Partner (Co-Principal Investigator), 2021–2027 (11,985,000 NOK total; 1,787,000 NOK UCR subaward portion)
- National Science Foundation: NSF 20-509, Collaborative Research: How roots, regolith, rock and climate interact over decades to centuries—the R3–C Frontier, Principal Investigator, 2021–2025 (\$532,558)
- US Department of Agriculture–National Institute of Food and Agriculture, SitS: Collaborative Research: Soils are signaling shifts in aggregate life-cycles: What does this mean for water, carbon and climate feedbacks in the Anthropocene?, Principal Investigator, 2021–2025 (\$232,369)
- US Department of Agriculture–Natural Resources Conservation Service–Soil and Plant Science Division, Wildfire impacts on dynamic soil properties in steep shrublands, Co-Principal Investigator, 2021–2024, (\$249,793)
- Accelerate Resilience LA, Los Angeles Urban Soil Collaborative: Soil Connects Us All, Co-Principal Investigator, 2021–2022 (\$403,808 total; \$14,396 UCR subcontract portion)
- US Department of Agriculture–Natural Resources Conservation Service–Soil and Plant Science Division, Development of soil survey methods for urban areas, Co-Principal Investigator, 2019–2023 (\$148,737 total; \$12,425 UCR subaward portion)
- National Science Foundation: NSF 18-047, RAISE-SitS: Designing models to forecast how biogeochemical fluctuations in soil systems govern soil development, terrestrial water storage and ecosystem nutrient fluxes, Co-Principal Investigator, 2018–2022 (\$738,562 total; \$113,292 UCR subaward portion)
- US Environmental Protection Agency, Investigation of Playa Lake Recharge in the Ogallala Aquifer, Co-Investigator, 2014–2016 (\$132,040)
- National Science Foundation: NSF 12-505, Enhancements to Internet and Communication Systems at the KU Field Station, Co-Principal Investigator, 2013–2016 (\$349,714)
- US Environmental Protection Agency: EPA P3, Biostabilization of Rammed Earth for Reduction of Waste and CO₂ Emissions, Co-Principal Investigator, 2013–2014 (\$14,980)
- Bioforsk (Norwegian Institute for Agricultural and Environmental Research), Validating a novel concept to quantify the structural development of soils using a new international soil database, Co-Principal Investigator, 2013 (180,000 NOK).

- National Science Foundation: NSF 10-544, Developing virtual and physical models to enhance conceptualization of soil and biogenic structures in undergraduate geoscience classes, Principal Investigator, 2012–2017 (\$199,999)
- Kansas Water Resources Institute/USGS, Investigation of recharge to the High Plains Aquifer, Northwestern, Kansas, Co-Principal Investigator, 2012–2014 (\$30,000)
- National Science Foundation: NSF 05-550, Facilities to Enhance Research and Teaching at the University of Kansas Field Station, Co-Investigator, 2011–2014 (\$329,890)
- US Environmental Protection Agency, Office of Water, National Wetland Condition Assessment, Field Sampling Services for National Aquatic Resource Surveys, Co-Investigator on Central Plains Center for BioAssessment (CPCB) subcontract, 2011 (\$142,407 CPCB subcontract portion)
- Kearney Foundation of Soil Science Graduate Fellowship, 2004–2006 (\$64,965)

External Research Grants (*pending*)

- Los Angeles County Safe Clean Water Program, Ground truth: Guiding a soils-based strategy for impactful nature-based solutions, Co-Principal Investigator, 2024–2025 (\$498,430 total; \$285,880 UCR subcontract portion)

Internal Research Grants (*funded*)

- UCR Agricultural Experiment Station, Research and GSR Funding Support Program (USDA Hatch Funds), 2022 (\$30,600)
- UCR Agricultural Experiment Station, Research and GSR Funding Support Program (USDA Hatch Funds), 2021-2022 (\$17,344)
- UCR Academic Senate, Committee on Research Grant, 2020-2022 (\$5,000)
- KU Spencer Museum of Art, Integrated Arts Research Initiative Summer Fellowship, 2017 (\$3,000)
- KU Center for Research: Major Project Planning Grant, Leveraging a karst CZO end member on the spectrum of system reactivity as an exemplar of Earth's CZ trajectories. Co-Principal Investigator, 2017-2018 (\$32,966)
- KU Office of International Programs, Effects of long-term wastewater irrigation on soil health, Sulaimani, KRG, Iraq, Principal Investigator, 2016 (\$3,000)
- KU Research Investment Council: Level II, Building Data Infrastructure, Network Capacity, and Research Engagement at the KU Field Station, Co-Principal Investigator, 2014 (\$38,196)
- KU General Research Fellowship, 2012-2013 (\$2,596)
- KU General Research Fellowship, 2011-2012 (\$3,656)
- KU New Faculty General Research Program Grant, 2010-2011 (\$7,950)
- KU Field Station Small Grants Program, 2010 (\$250)
- Frank T. Bingham Memorial Fellowship, 2006-2007 (\$2,000)
- Albert Marsh Environmental Sciences Scholarship, 2006-2007 (\$400)

- UCR Graduate Dean’s Dissertation Research Grant, 2006 (\$1,000)
- UCR Dean’s Fellowship, 2003-2004 (\$33,527)

Internal Teaching Grants (*funded*)

- KU Center for Teaching Excellence, Teaching-Related Education and Travel Fund, 2013 (\$900)
- KU CLAS Instructional Technology Grant, 2012-2013 (\$10,271)
- KU Center for Teaching Excellence, Faculty Seminar Participant, 2011 (\$1,000)
- KU Center for Teaching Excellence, BPI Faculty Facilitator, 2011 (\$1,000)
- KU Center for Teaching Excellence, Best Practices Institute, 2010 (\$700)

Travel Grants (*funded*)

- KU College of Liberal Arts and Sciences Faculty Travel Award, 2008–2017 (\$6,500 in total)
- Stolzy-Letey Environmental Science Travel Scholarship, 2007 (\$750)
- AAAS Pacific Division Student Travel Award, 2007 (\$150)
- UCR Academic Senate Omnibus Field Research Travel Grant, 2006 (\$500)
- UCR Graduate Student Association Conference Travel Grants, 2004–2007 (\$2,180 in total)

Awards and Honors

- SSSA Lloyd R. Frederick Soil Teaching Travel Study Award, 2015 (\$5,000)
- Fellow, Center for Teaching Excellence, University of Kansas, 2015-2017
- National Association of Geoscience Teachers – On the Cutting Edge, “Soil Profile Homework” exercise added to the Exemplary Teaching Activity collection, 2015
- Soil Science Society of America Journal, Citation of Excellence for Associate Editors, 2015
- National Association of Geoscience Teachers – On the Cutting Edge, “Final Project for Introductory Soils Course” exercise added to the Exemplary Teaching Activity collection, 2014
- AAAS Pacific Division J. Thomas Dutro, Jr. Geosciences Award, 2007 (\$275)
- Western Soil Science Society / AAAS Pacific Division 1st Place Poster Award, 2007 (\$150)
- Sigma Gamma Epsilon Geological Honor Society: Alpha Beta Chapter, Texas Tech University, 2002-2003

COURSES TAUGHT**University of Kansas, Lawrence, KS**

- GEOG 104 Principles of Physical Geography, Spring 2009, Fall 2009, 11–13, 15
- GEOG 316 Methods of Analyzing Geographical Data, Fall 2015–17
- GEOG 331 Regional Geomorphology of the United States, Fall 2008

- GEOG 335 Introduction to Soil Geography, Fall 2009–13, 15–17
- GEOG 500 Senior Capstone in Geography, Spring 2017
- GEOG 531 Topics in Physical Geography: Soil Physics, Spring 2013
- GEOG 535 Soil Geography, Fall 2008–13, 15–17
- GEOG 538 Environmental Soil Physics and Chemistry, Spring 2010, 12
- GEOG 538 Soil Chemistry, Spring 2014
- GEOG 635 Soil Physics, Spring 2014, 18
- GEOG 735 Soil Geomorphology, Spring 2010, 12–13
- LA&S 792 Topics in: Being an Effective College Teacher, Spring 2016
- GEOG 935 Soil Geography Seminar, Spring 2009

Rutgers University, New Brunswick, NJ

- 16:375:625 Advanced Special Problem in Environmental Sciences: Environmental Data Analysis with R, Fall 2014

University of Sulaimani, KRG, Iraq

- Soil and Environmental Data Analysis with R, Spring 2016

University of California, Riverside, CA

- NASC 093 Freshman Advising Seminar in the Natural and Agricultural Sciences, Fall 2018
- ENSC 138 Soils of Natural Ecosystems and Landforms, Spring 2019
- ENSC 138 Pedology, Spring 2021–22
- ENSC 191 Seminar in Professional Development in Environmental Sciences, Spring 2020–21
- ENSC 265 Special Topics in Earth and Environmental Sciences: Soil Geomorphology, Fall 2020
- ENSC 275 Research Seminar in Environmental Sciences, Winter 2020, 22, Fall 2021, Spring 2022

GRADUATE STUDENTS

Committee Chair—Masters Students

- Banafsheh Nematollahi (M.S., Environmental Sciences, UCR, completed June 2021)
- Eric Zautner (M.S., Geography, KU, completed July 2016)
- Aaron N. Koop (M.S., Geography, KU, completed June 2016; co-chair with Prof. William Johnson)
- Timothy Bents (M.S., Geography, KU, completed November 2015)
- Kim Drager (M.S., Geography, KU, completed February 2015; co-chair with Prof. Stephen Hasiotis)

- Scott Klopfenstein (M.A., Geography, KU, completed April 2014; co-chair with Prof. William Johnson)
- Dennis V. Eck (M.S., Geography, KU, completed March 2014)

Committee Chair—Doctoral Students

- Benjamin Newcomb (Ph.D., Environmental Sciences, UCR, in progress, co-chair with Prof. Andrew Gray)
- Vaishnavi Varikuti (Ph.D., Environmental Sciences, UCR, in progress, co-chair with Prof. Hoori Ajami)
- Alyssa M. Duro (Ph.D., Environmental Sciences, UCR, in progress, co-chair with Prof. Hoori Ajami)
- Simmi Tomar (Ph.D., Environmental Sciences, UCR, in progress)
- Aaron N. Koop (Ph.D., Geography, KU, completed May 2022; co-chair with Prof. Pamela Sullivan at OSU)
- Zhino K. Mohammed (Ph.D., Soil and Water Science, University of Sulaimani, completed Sep 2020; co-chair with Prof. Khasraw Rashid)
- Aoesta K. Mohammed (Ph.D., Geography, KU, completed May 2018)

Committee Member—Masters Students

- Lola M. Klamm (M.A. Ecology and Evolutionary Biology, KU, in progress)
- R. Mason Niquette (M.A. Anthropology, KU, completed July 2018)
- Joshua Boling (M.S., Geology, KU, completed November 2015)
- Britney Katz (M.S., Geology, KU, completed September 2014)
- Kathryn Clark (M.S., Atmospheric Science, KU, completed March 2013)
- Kristopher West (M.A., Anthropology, KU, completed December 2012)
- Patrick Green (M.A., Anthropology, KU, completed January 2012)
- Daniel Keating (M.A., Anthropology, KU, completed January 2012)
- Garrett Welch (M.A., Anthropology, KU, completed January 2012)
- Tyler Buck (M.S., Atmospheric Science, KU, completed June 2010)

Committee Member—Doctoral Students

- Elizah Stephens (Ph.D., Environmental Sciences, UCR, in progress)
- James Guilinger (Ph.D., Environmental Sciences, UCR, completed August 2021)
- Kien Nguyen (Ph.D., Civil, Environmental and Architectural Engineering, KU, completed July 2018)
- Mackenzie Cremeans (Ph.D., Geology, KU, completed April 2018)
- Travis White (Ph.D., Geography, KU, completed December 2017)

- Michael Bergervoet (Ph.D., Geography, KU, completed December 2017)
- Andrew Gottsfield (Ph.D., Anthropology, KU, completed March 2017)
- Benjamin Keil (Ph.D., Philosophy, KU, completed April 2015)
- Anthony Layzell (Ph.D., Geography, KU, completed March 2015)
- Laura Murphy (Ph.D., Anthropology, KU, completed March 2015)
- Terri Woodburn (Ph.D., Geography, KU, completed December 2014)
- Rubina Firdous (Ph.D., Geology, KU, completed, September 2013)
- Erin Dempsey (Ph.D., Anthropology KU, completed, April 2012)
- Alan Halfen (Ph.D., Geography, KU, completed, April 2012)
- Brian F. Platt (Ph.D., Geology, KU, completed, April 2012)
- Mark Bowen (Ph.D., Geography, KU, completed March 2011)
- Karen Willey (Ph.D., Geography, KU, completed July 2009)

International Mentor—Doctoral Students

- Jéssica Rafaela da Costa (Ph.D., Physical Geography, University of São Paulo, Brazil, September–October 2019)
- Mohammadreza Roshanizarmehri (Ph.D., Soil Science, Ferdowsi University of Mashhad, Iran, December 2016–June 2017)
- Atefeh Ziyaaee (Ph.D., Soil Science, Ferdowsi University of Mashhad, Iran, December 2016–June 2017)

External Dissertation Evaluator—Doctoral Students

- Pei-Ling Wang (Ph.D., Geography, University of Victoria, BC, Canada, July–August 2021)
- Mario Fajardo Pedraza (Ph.D., Agriculture, University of Sydney, Australia, May 2016)

Preceptor—Masters Students

- Acelia Larios (MPH, Environmental Health Sciences, School of Public Health, University of California, Berkeley, May–August 2022)

SCHOLARS

Post-Doctoral Scholar

- Julio Pachón, 2022–2023
- Alejandro Cueva Rodriguez, 2019–2020
- Aoesta K. Mohammed, 2018–2019

Visiting Research Scientist

- Xiaoyang Cao (Zaozhuang University), 2018–2019

PROFESSIONAL SERVICE**International**

- Associate Editor, *Journal of Geophysical Research—Earth Surface*, 2023–2025
- Member, Scientific Committee for the 3rd International Conference on Agricultural Sciences, College of Agricultural Engineering Sciences, University of Sulaimani, Iraq, 2022
- Reviewer, *Global and Planetary Change*, 2022
- Reviewer, *Nature Geoscience*, 2021
- Reviewer, *Nature*, 2021
- Reviewer, *Geoderma Regional*, 2020–2021
- Reviewer, *Biogeochemistry*, 2019
- Reviewer, *Nature Communications*, 2019
- Reviewer, *Journal of Geophysical Research—Earth Surface*, 2019, 2022
- Reviewer, *The Holocene*, 2019
- Reviewer, *Scientific Reports*, 2018
- Reviewer, *Chemical Geology*, 2018
- Member, Scientific Committee for the Pedometrics 2017 Conference, International Union of Soil Sciences, 2016–2017
- Discussion Leader, Preparation of manuscripts for publication in common soil science journals, Workshop, University of Sulaimani, KRG, Iraq, 28 Jan. 2016
- Session Chair, Soil Profile Properties, Inaugural Global Workshop on Digital Soil Morphometrics, International Union of Soil Sciences and UW Department of Soil Science, Madison, WI, 2015
- Editorial Board Member, *Geoderma*, 2015–2019
- Reviewer, *Entropy*, 2015
- Reviewer, United States-Israel Binational Science Foundation (BSF) Proposal, 2015
- Reviewer, *Soil & Tillage Research*, 2015, 2019–2020, 2022
- Reviewer, *Catena*, 2013–2015
- Reviewer, *Geoderma*, 2013–2017, 2019–2022
- Reviewer, *Analytical Methods*, 2012
- Book Proposal Reviewer, Cambridge University Press, 2011
- Reviewer, *European Journal of Soil Science*, 2011
- Reviewer, *Plant and Soil*, 2011
- Editorial Board Member, *Open Journal of Soil Science (OJSS)*, 2011–2012

National

- Co-Organizer, Panel Discussion—Interactions between physics and (micro)biology: Water, pores, and biota, Soil Physics and Hydrology Division–Soil Biology and Biochemistry Division–Pedology Division–Soil Chemistry Division, Baltimore, Maryland, 6-9 Nov. 2022
- Co-Organizer, Cross-Divisional Symposium—Interactions between physics and (micro)biology: Water, pores, and biota, Soil Physics and Hydrology Division–Soil Biology and Biochemistry Division–Pedology Division–Soil Chemistry Division, Baltimore, Maryland, 6-9 Nov. 2022
- Member, Nominations Committee for the SSSA Presidential Candidate (S101), Soil Science Society of America, 2022
- Co-Organizer, New developments in soil mineral identification, modeling, and interpretation, Soil Mineralogy Division, ASA-CSSA-SSSA, Baltimore, Maryland, 6-9 Nov. 2022
- External Reviewer for Advancement to Associate Professor with tenure, UC Davis, 2022
- Chair, Nominations Committee for the Fundamental Soil Science Group Representative to the Board of Directors (S112.03), Soil Science Society of America, 2021
- Co-Organizer and Co-Moderator, Cross-Divisional Symposium—Interactions between chemistry, physics, and (micro)biology: Water, pores, and biota across scales, Soil Physics and Hydrology Division–Soil Biology and Biochemistry Division–Pedology Division–Soil Chemistry Division, ASA-CSSA-SSSA, Salt Lake City, Utah, 7-10 Nov. 2021
- Co-Organizer and Co-Moderator, Co-Sponsored Session—Linking microscale processes in soil pores to soil properties Oral I and II, Soil Physics and Hydrology Division–Pedology Division, ASA-CSSA-SSSA, Salt Lake City, Utah, 7-10 Nov. 2021
- Organizer, Pedology Oral I and II, Pedology Division, ASA-CSSA-SSSA, Salt Lake City, Utah, 7-10 Nov. 2021
- Organizer, Pedology Poster I and II, Pedology Division, ASA-CSSA-SSSA, Salt Lake City, Utah, 7-10 Nov. 2021
- Review Panel Member, National Science Foundation, Directorate for Biological Sciences, 2021
- Member, Soil and Plant Science Division (SPSD) Soil Survey Research Advisory Team, USDA-NRCS, 2021
- Judge, Student Presentation Competition, Soil Mineralogy Division, Soil Science Society of America, 2020
- External Reviewer for Advancement to Upper Level Professor and Specialist of Cooperative Extension, UC Davis, 2020
- Co-facilitator, Morning and afternoon breakout sessions, Virtual Los Angeles Urban Soil Symposium, TreePeople, 26 Jun. 2020
- Proposal Reviewer, SEEDS: The College of food, Agricultural, and Environmental Sciences (CFAES) Research Competitive Grants Program, Ohio Agricultural Research and Development Center, The Ohio State University, 2019

- Reviewer, *Physical Geography*, 2019
- Chair, Pedology Division, Soil Science Society of America, 2020–2022
- External Reviewer for tenure and promotion, Tennessee State University, 2019
- Proposal Reviewer, Kentucky Agricultural Experiment Station (KAES) and the USDA Cooperative State Research, Education, and Extension Service (CSREES), 2019
- Session Moderator, *Deep, Wide, and Alive: Expanding Our View of Soils in a Changing Environment*, Soil Mineralogy Division, ASA-CSSA-SSSA, San Antonio, Texas, 10-13 Nov. 2019
- Co-Organizer, Cross Divisional Symposium—*Deep, Wide, and Alive: Expanding Our View of Soils in a Changing Environment*, Soil Mineralogy Division, ASA-CSSA-SSSA, San Antonio, Texas, 10-13 Nov. 2019
- External Reviewer for tenure and promotion to Associate Professor, Claremont McKenna, Pitzer, and Scripps Colleges, 2017
- Member, Soil Survey Division (SSD) Research Focus Team, Charged with recommending changes and providing guidance on future research directions to the Steering Team of the National Cooperative Soil Survey, USDA-NRCS, 2017-2018
- Co-Organizer and Presiding Officer, *Quantitative Pedon Descriptions and Modeling—Digital Soil Morphometrics*, Pedology Division, ASA-CSSA-SSSA, Phoenix, Arizona, 6-9 Nov. 2016
- Co-Organizer, *Bugs and Dirt: Four Letter Words that Go Together*, Soil Mineralogy Division, ASA-CSSA-SSSA, Minneapolis, Minnesota, 17 Nov. 2015
- Presiding Officer, *General Soil Mineralogy Session*, Soil Mineralogy Division, ASA-CSSA-SSSA, Minneapolis, Minnesota, 16 Nov. 2015
- External Reviewer for appointment to tenure track, Tennessee State University, 2015
- Reviewer, *Geology*, 2014
- Member, ACS320.1 Methods of Soil Analysis Subcommittee, Soil Science Society of America, 2014–2016
- Chair, Soil Mineralogy Division, Soil Science Society of America, 2014–2016
- Co-Leader, *Desert Pedology, Land Use and Wild Lands—Las Vegas to Long Beach (Mohave National Preserve)*, Pre-Meeting Pedology Tour, Soil Science Society of America, 2014
- Associate Editor, *Soil Science Society of America Journal*, 2013-2018
- External Reviewer for reappointment to Assistant Professor, Claremont McKenna, Pitzer, and Scripps Colleges, 2014
- External Reviewer for promotion to Associate Professor, Rutgers University, 2014
- Proposal Reviewer, Lewis and Clark Fund for Exploration and Field Research, American Philosophical Society, 2013
- Reviewer, *Vadose Zone Journal*, 2013, 2018

- Lead Judge, Student Presentation Competition. Div. S05 Soil Science Society of America, 2013–2015
- Presiding Officer, Ecosystem-Mineral Interactions–II Symposium, Div. S05 & S09, ASA-CSSA-SSSA, Cincinnati, Ohio, 21-24 Oct. 2012
- Proposal Reviewer, National Science Foundation, 2012–2016, 2018–2019, 2022
- Chair, Soil Micromorphology Committee, Soil Science Society of America, 2013–2015
- Member, Soil Micromorphology Committee, Soil Science Society of America, 2011–2012
- Reviewer, Soil Science Society of America Journal, 2011–2013, 2016, 2018–2020
- Reviewer, SEPM Special Publication, 2011
- Reviewer, *The Professional Geographer*, 2011
- Presenter and Participant, Two iQuest camp panels to engage learning among underrepresented and economically disadvantaged 7th and 8th grade students (primarily Hispanic, African American, Native American, and women) for the NSF ITEST program, 15 & 22 July 2010
- Session Organizer, Soil Characterization, Modeling, and Prediction using Novel Instrumentation and Techniques, Div. S05, ASA-CSSA-SSSA, Pittsburgh, PA. 1-4 Nov. 2009
- Presenter and Participant, iQuest camp panel to engage learning among underrepresented and economically disadvantaged middle-school students (primarily Hispanic and Native American) for the NSF ITEST program 16 July 2009
- Mentor, Hosted and trained a high-school Earth science teacher in standard soil analyses, 18-24 Jun. 2009
- Reviewer, *Soil Science*, 2008–2012, 2014, 2019
- Presiding Officer, Mineralogical Controls on Soil Physical, Chemical, and Biological Processes, Div. S09, ASA-CSSA-SSSA, New Orleans, LA, 4-8 Nov. 2007
- Presiding Officer, Pedologic Progress, Philosophy, and Perspectives, Div. S05, ASA-CSSA-SSSA, Indianapolis, IN, 12-16 Nov. 2006

Institutional

- Invited Participant, Western Association of Schools and Colleges (WASC) – Senior College and University Commission (WSCUC) Accreditation Site Visit: Assessment 2 Meeting, UCR Office of the Provost, 2022
- Graduate Advisor for Continuing Students, UCR Environmental Sciences Graduate Program, 2022
- Member, Faculty Association for Education Abroad (FAfEA), UCR, 2021
- Graduate Advisor, UCR Environmental Sciences Graduate Program, 2020–2021
- Member, Awards Committee, UCR College of Natural and Agricultural Sciences, 2019
- Chair, Scholarships and Awards Committee, UCR Department of Environmental Sciences, 2018-2019

- Member, Undergraduate Education Committee, UCR Department of Environmental Sciences, 2018-2019
- Departmental Representative, Computing Committee, Informational Technology, University of Kansas, 2017
- Member, Outstanding Masters Thesis or Research Project Award Committee, College Office of Graduate Affairs, University of Kansas, 2017–2018
- Member, KGS Director Search Committee, Kansas Geological Survey, University of Kansas, 2016–2017
- Member, Advisory Committee for the KU Postdoctoral Association, University of Kansas, 2016–2017
- Chair, Curriculum Committee, KU Department of Geography and Atmospheric Science, 2015–2018
- Member, Ecohydrologist Search Committee, KU Department of Geography, 2013–2014
- Outside Member, Hydrogeochemist Search Committee, KU Department of Geology, 2013–2014
- Co-Organizer/Instructor, Graduate Field Experience, KU Department of Geography, 2013
- Member, Documenting Learning Specialist Search Committee, KU Center for Teaching Excellence, 2012–2013
- Member, Scholarship Committee, KU Environmental Studies Program, 2012–2013
- Member, Graduate Affairs Committee, KU Department of Geography, 2012–2014
- Co-Organizer/Instructor, 2-Day Graduate Field Experience, KU Department of Geography, 2012
- Member, Atmospheric Science Search Committee, KU Department of Geography, 2011–2012
- Member, Executive Committee, KU Field Station, Kansas Biological Survey, 2010–2018
- Member, Honors Committee, KU Department of Geography, 2010–2011
- Member, Outreach Committee, KU Department of Geography, 2009–2010
- Member, Curriculum Committee, KU Department of Geography, 2008–2009, 2011-2012

Teaching-Related Service

- Discussion Leader, Graduate Teaching Assistant Follow-Up Sessions (6)—“Teaching in STEM,” KU Center for Teaching Excellence, Fall 2017
- Discussion Leader, About Teaching: A Conference for New GTAs—“Fostering Learning and Engagement for All Your Students,” KU Center for Teaching Excellence, Fall 2017
- Faculty Facilitator, Ecosphere Studies Workshop on Process, KU and The Land Institute Perennial Agriculture Project, 14-15 Jul. 2017
- Faculty Facilitator, Best Practices Institute, KU Center for Teaching Excellence, 2017

- Discussion Leader, Graduate Teaching Assistant Follow-Up Sessions (6)—“Teaching in STEM,” KU Center for Teaching Excellence, Fall 2016–Spring 2017
- Discussion Leader, About Teaching: A Conference for New GTAs—“Fostering Learning and Engagement for All Your Students,” KU Center for Teaching Excellence, Fall 2016
- Coordinator, Department Teaching Grant funded by the KU Center for Teaching Excellence (\$3,500)—“Mapping the Undergraduate Curriculum in Geography to Increase and Assess Student Learning,” Department of Geography and Atmospheric Science, Fall 2015–Spring 2016
- Discussion Leader, Graduate Teaching Assistant Follow-Up Sessions (6)—“Teaching in STEM,” KU Center for Teaching Excellence, Fall 2015–Spring 2016
- Discussion Leader, About Teaching: A Conference for New GTAs—“Motivating Students and Using Active Learning,” KU Center for Teaching Excellence, Fall 2015
- Discussion Leader and Co-Organizer, Threshold Concepts Working Group, KU Center for Teaching Excellence, Spring 2014
- Discussion Leader, Graduate Teaching Assistant Workshop—“Teaching in the Natural Sciences,” KU Center for Teaching Excellence, 27 Feb. 2014
- Faculty Facilitator, Best Practices Institute, KU Center for Teaching Excellence, 2011
- Center for Teaching Excellence Ambassador, KU Department of Geography, 2010-2013

Public Service

- Member, Steering Committee for the Healthy Soils for Healthy Communities Initiative, Phase Two: Los Angeles Urban Soil Collaborative—Soil Connects Us All, TreePeople, 2021-2022
- Member, Steering Committee for the Healthy Soils for Healthy Communities Initiative, Phase One: Needs Assessment, TreePeople, 2020
- Science Coach, 7th-Grade Science Fair, Classical Conversations Riverside Cal Ave, 2020
- Judge, 6-8th-Grade Science Fair, St. Catherine of Alexandria, 2020
- Judge, 7th-Grade Science Fair, Classical Conversations Riverside East Hills, 2019

PROFESSIONAL ADVANCEMENT

- Pre-Meeting Pedology Tour: Carbon Dynamics in Wet Soils of the Outer Coastal Plain, Soil Science Society of America, 2022
- Professional Soil Scientists Association of California (PSSAC) Annual Meeting, 2021–2022
- Pre-Meeting Pedology Tour, Soil Science Society of America, 2021
- Los Angeles Urban Soils Symposium, TreePeople, 2020, 2022
- Signals in the Soil Virtual Workshop, National Science Foundation, 2020
- American Geophysical Union Fall Meeting, 2018
- Urban Soils, Agriculture, and Brownfields—Los Angeles Basin Tour, Soil Science Society of America, 2014

- Teaching Hydrogeology, Soils, and Low-T Geochemistry in the 21st Century, National Association of Geoscience Teachers–On the Cutting Edge, University of New Mexico, 2013
- Southwest Ohio Soils Tour, Soil Science Society of America, 2012
- Field Indicator of Hydric Soils in the United States Tour, Soil Science Society of America, 2012
- Association of American Geographers Annual Meeting, 2012
- Geological Society of America Annual Meeting, 2008
- Western Society of Soil Science/AAAS Pacific Division, 2007
- Desert Project Tour, 2007
- World Congress of Soil Science, 2006, 2018
- Friends of the Pleistocene, Pacific Cell, 2005
- International Salinity Forum, 2005
- Learning ArcGIS 9, Online Course, UCR Extension/ESRI, 2005
- Mojave Desert Science Symposium, 2004
- Soil Science Society of America Annual Meeting, 2002–2022
- International Conference on Aeolian Research (ICAR-5), 2002
- Nematode Identification Short Course, Clemson University, 2000

PROFESSIONAL AFFILIATIONS

- Professional Soil Scientists Association of California (PSSAC), 2021–Present
- American Association for the Advancement of Science (AAAS), 2018–Present
- National Association of Geoscience Teachers (NAGT), 2013–Present
- SACNAS, 2013–Present
- National Council for Geographic Education (NCGE), 2013–2018
- European Geosciences Union (EGU), 2011–Present
- Association of American Geographers (AAG), 2009–2018
- International Union of Soil Sciences (IUSS), 2002–Present
- American Geophysical Union (AGU), 2002–Present
- Soil Science Society of America (SSSA), 2001–Present
- Association of Analytical Chemists (AOAC) International, 1999–2003