
Brian R. Ellis
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Education

Princeton University Princeton, New Jersey

Ph.D., Civil & Environmental Engineering June 2012
M.A., Civil & Environmental Engineering Jan. 2009

University of Michigan Ann Arbor, Michigan

B.S. with high distinction, Geological Sciences (honors) May 2006
B.S. with high distinction, Economics May 2006

Appointments

2022 – Division Chair, Environmental and Water Resources Engineering, Civil & Environmental Engineering, University of Michigan
2020 – Associate Professor, Civil & Environmental Engineering, University of Michigan
2016 – 2019 Faculty Research Scholar, U.S. DOE National Energy Technology Laboratory
2014 – 2020 Assistant Professor, Civil & Environmental Engineering, University of Michigan
2012 – 2017 NSF Science, Engineering and Education for Sustainability (SEES) Fellow
2012 – 2014 Michigan Society of Fellows Postdoctoral Scholar, Civil & Environmental Engineering, University of Michigan
2006 – 2012 Graduate Research Assistant and Ph.D. candidate, Princeton University
Advisor: Dr. Catherine A. Peters
Areas of Study: Geological sequestration of CO₂, environmental geochemistry, geochemical modeling, flow in porous media
Ph.D. Thesis: “*Geologic Carbon Sequestration in Deep Saline Aquifers: Brine Acidification and Geochemical Alterations of Reactive Leakage Pathways*”

Awards and Honors

2020 National Science Foundation Early CAREER award
2019 CEE Faculty Excellence Award, University of Michigan College of Engineering
2018 National Academy of Engineering US Frontiers of Engineering Symposium (participant)
2015 ASCE ExCEED Fellowship
2015 Doctoral New Investigator award, American Chemical Society Petroleum Research Fund
2014 National Academies of Science, Arab American Frontiers of Science, Engineering, Medicine (invited speaker and participant)
2013 ACS Certificate of Merit (in recognition of presentation given by W. Fan)
2012 NSF Science, Engineering and Education for Sustainability (SEES) Fellow
2012 Junior Fellow, Michigan Society of Fellows
2010 Freeman Fellowship, American Society of Civil Engineers
2009 NSF-AEESP Grand Challenge Student Paper Award

2009 Science, Technology & Environmental Policy Fellowship, Princeton Environmental Institute
 2009 – 2011 ORISE Fellow, U.S. Department of Energy Professional Internship appointment

Peer Reviewed Publications (advisees: student, postdoc)

1. Albalghiti, E.M., **Ellis, B.R.** (2026). Clay content mediates the contribution of suspended *Sporosarcina Pasteurii* to Microbial Mineralization in Sandstones. *Water Resources Research*, 62, e2025WR040790.
2. Hu, W.H., Zhu, H., An, Y., Bhutta, A., Zapsas, G., Nasser, W. **Ellis, B.R.**, Li, V.C. (2026). Development of volcanic ash based self-stressing engineered cementitious composites (ECC). *Cement and Concrete Composites*, 162, 106468.
3. Perea, E.J., Driovinto, T.Q.C., **Ellis, B.R.**, Spilde, M., Peterson, E.J., Ali, A-M.S., Benavidez, A., Thomson, B., Stormont, J.C., Cerrato, J.M. (2025). Wellbore Integrity in Energy Applications: Precipitation Products After Reaction with Produced Water from the Permian Basin. *Environmental Engineering Science*, 42 (10), 434-444.
4. Zhang, D., Feng, B., Jaworska, B., **Ellis, B.R.**, Fancy, S., Sick, V., Li, V.C. (2025). Pilot-scale validation of CO₂ utilization for greener and tougher infrastructure through carbonation curing of bendable concrete. *Journal of Cleaner Production*, 491, 144845.
5. Albalghiti, E.M., **Ellis, B.R.** (2024). Hydrodynamic limitations of biomineralization-induced permeability reduction. *ACS Earth and Space Chemistry*, 8 (3), 575-585.
6. Lim, T.H., Foster, J.E., **Ellis, B.R.**, Skerlos, S.J. (2024). Microwave-based CO₂ desorption for enhanced direct air capture: Experimental validation and techno-economic perspectives. *Environmental Research Letters*, 19, 034002.
7. Liu, L., Miranda, M.M., Bielicki, J.M., **Ellis, B.R.**, Johnson, J.X. (2024). Life cycle greenhouse gas emissions of CO₂-enabled sedimentary basin geothermal. *Environmental Science and Technology*, 58 (4), 1882-1893.
8. Hu, W.H., Zhang, D., Ftwi, E., **Ellis, B.R.**, Li, V. (2023). Development of sustainable low carbon Engineered Cementitious Composites with waste polyethylene fiber, sisal fiber and carbonation curing. *Resources, Conservation and Recycling*, 197, 107096.
9. Thompson, E.P., **Ellis, B.R.** (2023). Persistent homology as a heterogeneity metric for predicting pore size change in dissolving carbonates. *Water Resources Research*, 59 (9), e2023WR034559.
10. Lim, T., **Ellis, B.R.**, Skerlos, S.J. (2023). Life cycle assessment of railway ties fabricated with ductile cementitious composites and carbonation curing. *Journal of Cleaner Production*, 413, 137276.
11. Hu, W.H., Zhang, D., **Ellis, B.R.**, Li, V.C. (2023). The impact of carbonation curing on the fatigue behavior of polyvinyl alcohol engineered cementitious composites (PVA-ECC). *Journal of Advanced Concrete Technology*, 21 (4), 322-336.
12. Bielicki, J.M., Leveni, M., Johnson, J.X., **Ellis, B.R.** (2023). The promise of coupling geologic CO₂ storage with sedimentary basin geothermal power generation. *Iscience*, 26 (2), 105618.
13. Zhang, D., **Ellis, B.R.**, Jaworska, B., Wu, H., Li, V.C. (2021). Carbonation curing for precast engineered cementitious composites. *Construction and Building Materials*, 313, 125502.
14. Wu, H., Zhang, D., **Ellis, B.R.**, Li, V.C. (2021). Mechanical behavior of carbonated MgO-based Engineered Cementitious Composite (ECC) after high temperatures exposure. *Cement and Concrete Composites*, 124, 104255.
15. Thompson, E.P., Tomenchok, K., Olson, T., **Ellis, B.R.** (2021). Reducing user bias in X-ray computed tomography-derived rock parameters through image filtering. *Transport in Porous Media*, 140, 493-509.

16. Menefee, A.H., **Ellis, B.R.** (2021). Carbon Mineralization in Reactive Silicate Zones. *ACS ES&T Engineering*, 1 (8), 1193-1204.
17. Menefee, A.H., Welch, N.J., Frash, L.P., Hicks, W., Carey, J.W., **Ellis, B.R.** (2020). Rapid mineral precipitation during shear fracturing of carbonate-rich shales. *Journal of Geophysical Research – Solid Earth*, 125 (6), e2019JB018864.
18. Menefee, A.H., **Ellis, B.R.** (2020). Regional-scale greenhouse gas utilization strategies for enhanced shale oil recovery and carbon management. *Energy & Fuels*, 34 (5), 6136-6147.
19. Menefee, A.H., **Ellis, B.R.** (2020). Wastewater management strategies for sustained shale gas production. *Environmental Research Letters*, 15 (2), 024001.
20. Zhang, D., Jing, Y., Wu, H.L., Jaworska, B., **Ellis, B.R.**, Li, V.C. (2020). Discontinuous micro-fibers as intrinsic ductile reinforcement for Engineered Cementitious Composites (ECC). *Composites Part B*, 184, 107741.
21. Adeoye, J.T., Zhang, D., Li, V.C., **Ellis, B.R.** (2020). Novel ductile wellbore cementitious composite for geologic CO₂ storage, *International Journal of Greenhouse Gas Control*, 94, 102896.
22. Zhang, D., Hu, W.L., Li, V.C., **Ellis, B.R.** (2020). Autogenous healing of Engineered Cementitious Composites (ECC) based on MgO-fly ash binary system activated by carbonation curing. *Construction and Building Materials*, 238, 117672.
23. Lim, T., **Ellis, B.R.**, Skerlos, S.J. (2019). Mitigating CO₂ emissions of concrete manufacturing through CO₂-enabled binder reduction. *Environmental Research Letters*, 14 (11), 114014.
24. Zhang, D., Li, V.C., **Ellis, B.R.** (2019). Ettringite-related dimensional stability of CO₂-cured Portland cement mortars. *ACS Sustainable Chemistry & Engineering*, 7(19), 16310-16319.
25. Fazeli, H., Patel, R.A., **Ellis, B.R.**, Hellevang, H. (2019). Three-dimensional pore-scale modeling of fracture evolution in heterogeneous carbonate caprock subjected to CO₂-enriched brine. *Environmental Science and Technology*, 53(8), 4630-4639.
26. Das, S., Adeoye, J., Dhiman, I., Bilheux, H., **Ellis, B.R.** (2019). Imbibition of mixed charge surfactant fluids in shale fractures. *Energy & Fuels*, 33(4), 2839-2847.
27. Adeoye, J., Beversluis, C., Murphy, A., Li, V.C., **Ellis, B.R.** (2019). Physical and chemical alterations of engineered cementitious composite under geologic CO₂ storage conditions. *International Journal of Greenhouse Gas Control*, 83, 282-292.
28. Zhang, D., Li, V.C., **Ellis, B.R.** (2018). Optimal pre-hydration age for CO₂ sequestration through Portland cement carbonation. *ACS Sustainable Chemistry & Engineering*, 6(12), 15976-15981.
29. Kim, Y., Marcano, M.C., **Ellis, B.R.**, Becker, U. (2018). Photocatalytic reduction of uranyl: Effects of organic ligands and UV light wavelengths. *American Journal of Science*, 318(9), 949-968.
30. Wu, H.L., Zhang, D., **Ellis, B.R.**, Li, V.C. (2018). Development of reactive MgO-based engineered cementitious composite (ECC) through accelerated carbonation curing. *Construction and Building Materials*, 191, 23-31.
31. Fan, W., Hayes, K.F., **Ellis, B.R.** (2018). Estimating radium activity in shale gas produced brine. *Environmental Science and Technology*, 52(18), 10839-10847.
32. Menefee, A.H., Giammar, D.E., **Ellis, B.R.** (2018). Permanent CO₂ trapping through localized and chemical gradient-driven basalt carbonation. *Environmental Science and Technology*, 52(15), 8954-8964.
33. Chen, L., Miller, S.A., **Ellis, B.R.** (2017). Comparative human toxicity impact of electricity produced from shale gas and coal. *Environmental Science and Technology*, 51(21), 13018–13027.
34. Xiong, W., Wells, R.K., Menefee, A.H., Skemer, P., **Ellis, B.R.**, Giammar, D.E. (2017). CO₂ mineral trapping in fractured basalt. *International Journal of Greenhouse Gas Control*, 63, 310-320.

35. Olson, T.M., Wax, M., Yonts, J., Heidecorn, K., Haig, S.J., Yeoman, D., Hayes, Z., Raskin, L., **Ellis, B.R.** (2017). Forensic Estimates of lead release from lead service lines during the water crisis in Flint, Michigan. *Environmental Science and Technology Letters*, 4, 356–361.
36. Menefee, A.H., Li, P., Giammar, D.E., **Ellis, B.R.** (2017). The roles of transport limitations and mineral heterogeneity in carbonation of fractured basalts. *Environmental Science and Technology*, 51(16), 9352–9362.
37. Adeoye, J., Menefee, A.H., Xiong, W., Wells, R., Skemer, P., Giammar, D.E., **Ellis, B.R.** (2017). Effect of transport limitations and fluid properties on reaction products in fractures of unaltered and serpentinized basalt exposed to high P_{CO2} fluids. *International Journal of Greenhouse Gas Control*, 63, 310-320.
38. Kim, Y., Yuan, K., **Ellis, B.R.**, Becker, U. (2017). Redox reactions of selenium as catalyzed by magnetite: Lessons learnt from using electrochemistry and spectroscopic methods. *Geochimica et Cosmochimica Acta*, 199, 304-323.
39. Jayawan, I.S., Demond, A.H., **Ellis, B.R.**, (2016). Using an analytical solution approach to permit high volume groundwater withdrawals. *Environmental Science: Water Research and Technology*, 2, 942-952. (Invited submission, Emerging Investigators Series)
40. Zhou, L., Das, S., **Ellis, B.R.** (2016). Effect of surfactant adsorption on the wettability alteration of gas-bearing shales. *Environmental Engineering Science*, 33(10), 766-777.
41. Bi, Y., Zhang, H., **Ellis, B.R.**, Hayes, K.F. (2016). Removal of radium from brines associated with shale gas production. *Environmental Engineering Science*, 33(10), 791-798.
42. **Ellis, B.R.**, Peters, C.A. (2016). 3D calcite mapping and a demonstration of its relevance to permeability evolution in reactive fractures. *Advances in Water Resources*, 95, 246-253.
43. Wen, T., Castro, M.C., **Ellis, B.R.**, Hall, C.M., Lohmann, K.C. (2015). Assessing compositional variability and migration of natural gas in the Antrim Shale in the Michigan Basin using noble gas geochemistry. *Chemical Geology*, 417, 356-370.
44. Burton, G.A., Basu, N., **Ellis, B.R.**, Kapo, K., Entrekin, S., Nadelhoffer, K.J. (2014). Hydraulic ‘fracking’: Are surface water impacts a concern? *Environmental Toxicology and Chemistry*, 30(8), 1679-1689.
45. Bibby, K.J., Brantley, S.L., Reible, D.D., Linden, K.G., Mouser, P.J., Gregory, K.B., **Ellis, B.R.**, Vidic, R.D. (2013). Suggested reporting parameters for research studies investigating wastewaters from unconventional shale gas extraction. *Environmental Science and Technology*, 47(23), 13220-13221.
46. Ernstoff, A.S., **Ellis, B.R.** (2013). Clearing the waters of the fracking debate. *Michigan Journal of Sustainability*, 1, 109-129. DOI: 10.3998/mjs.12333712.0001.009 (Invited Submission)
47. Deng, H., **Ellis, B.R.**, Peters, C.A., Fitts, J.P., Crandall, D., Bromhal, G.S. (2013). Modifications of carbonate fracture hydrodynamic properties by CO₂-acidified brine flow. *Energy & Fuels*, 27(8), 4221-4231.
48. **Ellis, B.R.**, Fitts, J.P., Bromhal, G.S., McIntyre, D.L., Tappero, R., Peters, C.A. (2013). Dissolution-driven permeability reduction of a fractured carbonate caprock. *Environmental Engineering Science*, 30(4), 187–193. (Featured Article)
49. **Ellis, B.R.**, Peters, C.A., Fitts, J.P., Bromhal, G.S., McIntyre, D.L., Warzinski, R.P., Rosenbaum E.J. (2011). Deterioration of a fractured carbonate caprock exposed to CO₂-acidified brine flow. *Greenhouse Gases: Science and Technology*, 1, 248–260.
50. **Ellis, B.R.**, Crandell, L.E., Peters, C.A. (2010). Limitations for brine acidification due to SO₂ co-injection in geologic carbon sequestration. *International Journal of Greenhouse Gas Control*, 4(3), 575–582.

51. Crandell, L.E., **Ellis, B.R.**, Peters, C.A. (2010), Dissolution potential of SO₂ co-injected with CO₂ in geologic sequestration. *Environmental Science and Technology*, 44(1), 349–355.
52. Castro, M.C., Hall, C.M., Patriarche, D., Goblet, P., **Ellis, B.R.** (2007), A noble gas paleoclimate record in Texas - Basic assumptions revisited. *Earth and Planetary Science Letters*, 257, 170–187.

Peer Reviewed Technical Reports

1. **Ellis, B.R.** (2013). “*Hydraulic Fracturing in Michigan Integrated Assessment: Geology/Hydrogeology Technical Report*”, UM Graham Sustainability Institute Integrated Assessment Report Series, 2(3): 25p. <<http://graham.umich.edu/media/files/HF-03-Geology-Hydrogeology.pdf>>

Conference Proceedings

1. Levini, M., Bielicki, J.M., **Ellis, B.R.** (2024). “Impact of operational conditions on CO₂-based Subsurface Energy technology: Leveraging heterogeneity.” GHGT-17, Calgary, Canada, 2024. -- Conference Paper: DOI: 10.2139/ssrn.5052565
2. J.P. Fitts, **B.R. Ellis**, H. Deng, C. A. Peters (2012). “Geochemical controls on fracture evolution in carbon sequestration” ARMA 12-549. American Rock Mechanics Association, 46th US Rock Mechanics / Geomechanics Symposium, Chicago IL June 2012. Vol. 12, p 549.
3. **Ellis, B.R.**, Bromhal, G.S., McIntyre, D.L., Peters, C.A. (2011), “Changes in caprock integrity due to vertical migration of CO₂-enriched brine”. *Energy Procedia*, 4, 5327–5334. DOI: 10.1016/j.egypro.2011.02.514

Conference Presentations (advisees: student, postdoc)

1. Chacon, P., **Ellis, B.R.** (2025). “Controlling silica activity and pH for enhanced geologic hydrogen production.” AGU Fall Meeting, 12/2025.
2. Albalghiti, E.M., **Ellis, B.R.** (2025). “Real rock microfluidics investigation of biofilm-mediated processes in fractured porous media.” AGU Fall Meeting, 12/2025.
3. **Ellis, B.R.**, Adriaens, P., Mathieu, J. (2025). “Expanding learning opportunities in environmental engineering to meet future workforce needs: The case for climate risk mitigation, transitioning, and adaptation.” AEESP Research and Education Conference, Durham, NC, 06/2025.
4. Albalghiti, E.M., **Ellis, B.R.** (2024) “Microbial transport in complex porous media: What can we predict from a picture?” AGU Fall Meeting, 12/2024.
5. Albalghiti, E.M., **Ellis, B.R.** (2024). “Suspended biomass contributes significantly to continuous-flow biomineralization processes.” Gordon Research Conference: Flow and Transport in Permeable Media, 07/2024.
6. Albalghiti, E., **Ellis, B.R.** (2023). “Influence of mineralogy on *Sporosarcina pasteurii* attachment in engineered and natural porous media”, InterPore2023 Conference, Edinburgh, Scotland, 05/2023.
7. **Ellis B.R.**, Johnson J.X., Leveni, M., Bielicki J. (2022). “CO₂ utilization for geothermal energy production and renewable energy storage”, AEESP Research and Education Conference, St. Louis, MO, 06/2022.
8. Liu L., Bielicki J.M., Miranda M., **Ellis B.R.**, Johnson J.X. (2022). “Life Cycle Greenhouse Gas Emissions of Sedimentary Basin CO₂-enabled Geothermal”, AEESP Research and Education Conference, St. Louis, MO, 6/2022.
9. Thompson E.P., Tomenchok K., Olson T., **Ellis B.R.** (2022). “Reducing User Bias in X-ray Computed Tomography-Derived Rock Parameters through Image Filtering”, AEESP Research and Education Conference, St. Louis, MO, 6/2022.

10. Albalghiti, E., **Ellis B.R.** (2022). “Deconvoluting the effects of pore size and mineral distribution in subsurface processes through random sampling of 3D image stacks”, AEESP Research and Education Conference, St. Louis, MO, 6/2022.
11. **Ellis, B.R.**, Ernesto J.P., Casuse Driovinto, T.Q., Spilde, M., Peterson, E., Stormont, J.C., Cerrato, J.M. (2022). "Interfacial Reactions in the Microannulus of a Wellbore System with Produced Water Brine from the Permian Basin", AEESP Research and Education Conference, St. Louis, MO, 6/2022.
12. Johnson, J.X., Liu, X., Bielicki, J., Miranda, M., **Ellis, B.R.** (2021). “A Life Cycle Approach To Determine The Net Greenhouse Gas Emissions From CO₂ Plume Geothermal,” INFORMS Annual Conference, 10/2021.
13. Johnson, J.X., Liu, X., Bielicki, J., Miranda, M., **Ellis, B.R.** (2021). “Life Cycle Greenhouse Gas Emissions of CO₂-enabled Sedimentary Basin Geothermal,” AGU Fall Meeting, 12/2021.
14. Hu, W. H., Zhang, D., Li, V.C., **Ellis, B.R.** (2021). "Innovating a Bendable Concrete Railroad Tie with Enhanced Fatigue Durability via CO₂ Utilization". AIChE Annual Meeting, Boston, MA, 10/2021.
15. Albalghiti, E., Landa-Marban, D., Gasda, S., Tveit, S., **Ellis, B.R.** (2021). "Pore size distribution influences permeability change during microbially-induced calcite precipitation (MICP)". AGU Fall Meeting, 12/2021.
16. Thompson, E., Tomenchok, K., Olson, T., **Ellis, B.R.** (2020). "Assessing the Impact of Pre-segmentation Image Processing Filters on Rock Characteristics Derived from CT Datasets". AGU Fall Meeting, (virtual presentation)
17. Menefee, A.H., Welch, N.J., Frash, L.P., Hicks, W., Carey, J.W., **Ellis, B.R.**, "Decarbonizing energy through engineered subsurface systems", AEESP Research and Education Conference, Tempe, AZ, 05/2019
18. **Ellis, B.R.**, Skerlos, S.J., Daly, S.R. (2019). "Necessary Conditions and Skills for Student Environmental Engineers to Practice Sustainable Engineering", AEESP Research and Education Conference, Tempe, AZ, 05/2019
19. Menefee, A.H., Welch, N.J., Frash, L.P., Hicks, W., Carey, J.W., **Ellis, B.R.** (2019), “Rapid Mineral Precipitation During Shear Fracturing of Carbonate-rich Shales”, AGU Fall Meeting, San Francisco, CA, 12/2019.
20. Tomenchok, K., Thompson, E.P., **Ellis, B.R.** (2019), “Developing an Improved Approach for Segmenting Rock Core X-ray Computed Tomography Data”, AGU Fall Meeting, San Francisco, CA, 12/2019.
21. Thompson, E.P., Wang, Z., Tomenchok, K., **Ellis, B.R.** (2019), “Modeling Porosity-Permeability Evolution of Carbonates due to Reactive Flow using OpenFOAM”, AGU Fall Meeting, San Francisco, CA, 12/2019.
22. **Ellis, B.R.** (2019), “Influence of slickwater additives on fate of residual fracturing fluids and flowback composition in shale gas reservoirs”, ACS National Meeting, Orlando FL, March 31 - April 4. (*Invited Speaker*)
23. Adeoye, J., Li, V.C., **Ellis, B.R.** (2018). “Mechanical integrity of engineered cementitious composite during geologic carbon storage.” American Geophysical Union Fall Meeting, Washington, D.C., December 10-14.
24. Menefee, A.H., **Ellis, B. R.** (2018). “Impact of reactive silicate zones on CO₂ trapping in natural basalt.” American Geophysical Union Fall Meeting, Washington, D.C., December 10-14.

25. Thompson, E.P., Marciano, M.C., Becker, U., **Ellis, B.R.** (2018). "Mapping 3D surface charge distribution in nanoporous shales." American Geophysical Union Fall Meeting, Washington, D.C., December 10-14.
26. Menefee, A.H., Giammar, D.E., **Ellis, B.R.** (2018). "Controls on mineral carbonation reactions in basalt fracture networks." 14th International Conference on Greenhouse Gas Control Technologies, Melbourne, Australia, October 22-25.
27. Menefee, A.H., **Ellis, B. R.** (2018). "Regional-scale GHG utilization strategies for enhanced shale oil recovery and sustained carbon management." 14th International Conference on Greenhouse Gas Control Technologies, Melbourne, Australia, October 22-25.
28. Fan, W., Hayes, K.F., **Ellis, B.R.** (2017). "Trace element mobilization in carbonate-rich shales during hydraulic fracturing: A reactive transport modeling study," AGU Fall Meeting, New Orleans, LA, December 11-15.
29. Menefee, A.H., Giammar, D.E., **Ellis, B.R.** (2017). "Hyper-localized carbon mineralization in diffusion-limited basalt fractures," AGU Fall Meeting, New Orleans, LA, December 11-15.
30. Menefee, A.H., Giammar, D.E., Crandall, D. **Ellis, B.R.** (2017). "Characterization of reaction fronts associated with mineral carbonation of fractured basalts", Goldschmidt Conference, Paris, France, August 13-18.
31. Adeoye, J., Beversluis, C., Murphy, A., Li, V.C., **Ellis, B.R.** (2017). "Self-healing and chemical alteration of engineered cementitious composites under geologic carbon sequestration conditions," 2017 AEESP Research and Education Conference, Ann Arbor, MI, Jun 20-22.
32. Fan, W., Hayes, K.F., **Ellis, B.R.** (2017). "Toxic element leaching from shales: A reactive transport modeling study," 2017 AEESP Research and Education Conference, Ann Arbor, MI, Jun 20-22.
33. Das, S., Adeoye, J., **Ellis B.R.** (2017). "Determining pore accessibility of mixed surfactant fracturing fluids in organic-rich shale," 2017 AEESP Research and Education Conference, Ann Arbor, MI, Jun 20-22.
34. Jayawan, I.S., Yin, L.Y., Demond, A.H., **Ellis, B.R.** (2017). "Understanding stakeholders' mental model regarding high volume groundwater withdrawals in the State of Michigan," 2017 AEESP Research and Education Conference, Ann Arbor, MI, Jun 20-22.
35. Menefee, A.H., Giammar, D.E., **Ellis, B.R.** (2017). "Reaction fronts associated with mineral carbonation of fractured basalts," 2017 AEESP Research and Education Conference, Ann Arbor, MI, Jun 20-22.
36. Fan, W., Hayes, K.F., **Ellis, B.R.** (2017). "Arsenic mobilization in carbonate-rich shales during hydraulic fracturing", ACS Spring meeting, San Francisco CA, April 3-7. (*Invited Speaker*)
37. Das, S., **Ellis B.R.** (2017). "Mapping shale surface charge heterogeneity and surfactant adsorption via atomic force microscopy", ACS Spring meeting, San Francisco CA, April 3-7.
38. Das, S., Adeoye, J., Anovitz, L.M., Bilheux, H., **Ellis, B.R.** (2017). "Effect of surfactant adsorption on pore accessibility and water uptake in organic-rich shales", ACS Spring meeting, San Francisco CA, April 3-7.
39. Jayawan, I.S., Yin, L.Y., Demond, A.H, **Ellis, B.R.** (2017). "High volume water withdrawal in Michigan: Understanding experts & non-experts' mental models on groundwater withdrawal in the State of Michigan", Borchardt Conference, Feb 21-22, Ann Arbor, MI.
40. Jayawan, I.S., Demond, A.H, **Ellis, B.R.** (2017). "Using an analytical solution approach to permit high volume groundwater withdrawals", Borchardt Conference, Feb 21-22, Ann Arbor, MI.
41. Fan, W., Hayes, K.F., **Ellis, B.R.** (2017), "Impact of water-rock interaction on water quality related to shale gas production", Borchardt Conference, Feb 21-22, Ann Arbor, MI

42. **Ellis, B.R., Das, S.** “Micron-scale Mineral Heterogeneity as a Controlling Factor for Surfactant Adsorption and Water Imbibition in Fractured Shale”, AGU Fall Meeting, San Francisco CA, December 12-16, 2016 (*Invited Speaker*)
43. Wells, R.K, Xiong, W, **Adeoye, J., Menefee, A.H., Ellis, B.R.**, Skemer, P., Giammar, D.E. (2016). “Impact of dissolution and carbonate precipitation on carbon storage in basalt.” AGU Fall Meeting, San Francisco CA, December 12-16, 2016.
44. **Ellis, B.R., Das, S.** “Role of Mineralogy in Controlling Water Uptake in Shales Exposed to Mixed Surfactant Fracturing Fluids.” 252nd ACS National Meeting, Philadelphia, PA, August 21-25, 2016. (*Invited Speaker*)
45. **Ellis, B.R., Das, S.** “Role of Mineralogy in Controlling Water Uptake in Shales Exposed to Mixed Surfactant Fracturing Fluids.” Gordon Research Conference: *Flow and Transport in Permeable Media*, Catalonia, Spain, July 31-August 5, 2016.
46. **Ellis, B. R.** “Managing risk in the context of emerging subsurface energy technologies.” 6th Annual meeting of the American Institute of Professional Geologists Michigan Section; Roscommon, MI, June 14-15, 2016. (*Keynote lecture*)
47. **Fan, W., Hayes, K.F., Ellis, B.R.** (2016). “Impact of Carbonate Dissolution on Arsenic Release during Shale Gas Extraction,” Goldschmidt Conference, Yokohama, Japan, June 27-July 1, 2016.
48. **Adeoye, J., Menefee, A.H., Xiong, W., Wells, R., Skemer, P., Giammar, D.E., Ellis, B.R.** (2016). “Reaction products and evolution of permeability during carbon sequestration in fractures of unaltered and serpentinized basalt,” Goldschmidt Conference, Yokohama, Japan, June 27-July 1, 2016.
49. **Menefee, A.H., Li, P., Giammar, D.E., Ellis, B.R.** (2016). “CO₂ storage in fractured basalt: Coupling experimental analyses with reactive transport modelling,” Goldschmidt Conference, Yokohama, Japan, June 27-July 1, 2016.
50. **Das, S., Zhou, L., Ellis, B.R.** (2016). “Effect of surfactant adsorption on shale wettability,” 251st ACS National Meeting, San Diego CA, March 14-18, 2016.
51. **Fan, W., Hayes, K.F., Ellis, B.R.** (2016). “Exploring the origin of Radium in shale gas produced water,” 251st ACS National Meeting, San Diego CA, March 14-18, 2016.
52. **Menefee, A.H., Ellis, B.R.** (2016). “Unconventional approaches to unconventional resources: Regional-scale waste management strategies for sustainable shale gas development,” 251st ACS National Meeting, San Diego CA, March 14-18, 2016.
53. Bi, Y., **Fan, W., Yavarski, T. Ellis, B.R., Hayes, K.F.** (2016). “Direct Analysis of Radium-226 in Shale-Gas Wastewater Using Inductively Coupled Plasma - Mass Spectrometry,” PITTCON, Atlanta GA, March 6-10, 2016.
54. **Fan, W., Hayes, K.F., Ellis, B.R.** (2015). “Assessing Radium Activity in Shale Gas Produced Brine,” AGU Fall Meeting, San Francisco CA, December 14-18, 2015
55. Wen, T., Castro, M.C., **Ellis, B.R.**, Hall, C.M., Lohmann, K.C. and Bouvier, L. (2015), “Assessing Compositional Variability and Migration of Natural Gas in the Antrim Shale in the Michigan Basin Using Noble Gas Geochemistry,” AGU Fall Meeting, San Francisco CA, December 14-18, 2015
56. Wells, R., Xiong, W., Bae, Y., Sesti, E., Skemer, P. Giammar, D., Conradi, M., **Ellis, B.R., Hayes, S.** (2015). “Dissolution-precipitation reactions and permeability evolution from reactions of CO₂-rich aqueous solutions with fractured basalt,” AGU Fall Meeting, San Francisco CA, December 14-18, 2015.
57. **W. Fan, K.F. Hayes, B.R. Ellis**, “Assessing Radium Activity in Shale Gas Produced Brine,” 2015 AGU Fall Meeting, San Francisco CA, December 14-18, 2015

58. **B.R. Ellis**, W. Fan, M. Tang, K.F. Hayes, W. Xiong, D. E. Giammar, and P. Skemer, “Alteration of Fracture Geometries During Flow of Acidic Fluids: Implications for Subsurface Energy Technologies,” 250th ACS National Meeting, Boston MA, August 16- 20, 2015. (*Invited Speaker*)
59. Jayawan, I., Demond, A.H., **Ellis, B.R.** (2015). “Sustainable water management in the context of hydraulic fracturing,” Association of Environmental Engineering and Science Professors, New Haven, CT.
60. Wen, T., Castro, M.C., **Ellis, B.R.**, Hall, C.M., Lohmann, K.C., Bouvier, L. (2015), “Assessing the Compositional Variability and Migration of Natural Gas in Antrim Shale in the Michigan Basin Using Noble Gas Geochemistry,” AAPG ACE; 2015 May 31-June 3; Denver, CO.
61. Bi, Y., Zhang, H., Hayes, K.F., **Ellis, B.R.** “Removal of Radium from Shale Gas Wastewater Using Cation Exchange Resin,” 249th ACS National Meeting Denver, Colorado, March 22-26, 2015.
62. Jayawan, I., Demond, A.H., **Ellis, B.R.** (2014). “Assessing the Impact of Transient High-Volume Groundwater Withdrawals on Headwater Streams,” 2014 AGU Fall Meeting, San Francisco, December 15 -19, 2014.
63. Fan, W., Hayes, K.F., **Ellis, B.R.** (2014). “Investigation of Controlling Factors Impacting Water Quality in Shale Gas Produced Brine”, 2014 AGU Fall Meeting, San Francisco, December 15 -19, 2014.
64. Wen, T., Castro, M.C., **Ellis, B.R.**, Hall, C.M., Lohmann, K.C., Bouvier, L. (2014), “Noble Gas Signatures in Antrim Shale Gas in the Michigan Basin - Assessing Compositional Variability and Transport Processes”, AGU, Fall Meeting; 2014 Dec 15-19.
65. **Ellis, B.R.**, Demond, A.H., Jayawan, I. A.H. (2014). “Assessing the Assessment Tool: Developing Improved Modeling Frameworks for Evaluating Hydraulic Fracturing Water Withdrawals in Michigan,” University of Michigan Water Center Symposium, Ann Arbor, MI, December 11, 2014.
66. **Ellis, B.R.**, Hayes, K.F. and Fan, W. (2014). “Evaluating Naturally Occurring Radioactive Materials in Michigan Basin Shale Gas Produced Fluids,” at 2014 SSSA Session on "Environmental Impacts of Hydraulic Fracturing, ISR U Mining, and Alternative Energy" in Long Beach, CA, Nov. 2-5, 2014. (*Invited Speaker*)
67. Fan, W., Zhang, T., Carpenter, J., Hayes, K.F., **Ellis, B.R.** (2014). “Experimental investigations of trace metal and radionuclide leaching from shales in contact with hydraulic fracturing fluids”. Oral presentation at 2014 American Chemical Society Spring Meeting, Dallas, TX.
68. **Ellis, B.R.** (2014). “Exploring the Water Quality Challenges of Hydraulic Fracturing”. Oral presentation at 2014 Borchardt Conference, University of Michigan, Ann Arbor, MI.
69. **Ellis, B.R.**, Long, D., Manley, J. (2013). “Reducing the environmental impact of drilling, hydraulic fracturing, and production by the use of greener chemistry”. Oral presentation at the 2013 Michigan Department of Environmental Quality *greenUp* Conference, Grand Rapids, MI.
70. **Ellis, B.R.**, Hayes, K.F. (2013). “Geochemical investigations of Michigan Basin organic-rich shales in contact with hydraulic fracturing fluids”. Oral presentation at 2013 American Chemical Society Fall Meeting, Indianapolis, IN.
71. **Ellis, B.R.**, Hayes, K.F. (2013). “Water quality concerns surrounding shale gas development in the Michigan Basin”. Oral presentation at Engineering Conferences International meeting: *Overcoming the technical and community challenges of hydraulic fracturing for shale gas*. Boulder, CO.
72. **Ellis, B.R.**, Hayes, K.F. (2013). “Assessing the state of play for unconventional drilling in the Michigan Basin”. Oral presentation at 2013 meeting of the Association of Environmental Engineering and Science Professors, Golden, CO.
73. **Ellis, B.R.**, Fitts, J.P, Peters, C.A. (2012). “Mineral spatial heterogeneity constrains permeability evolution in a limestone fracture”. Poster presentation at 2012 American Geophysical Union Fall Meeting, San Francisco, CA.

74. A.F. Clarens; S. Wang; B. Liang; C.A. Peters; J.P. Fitts; H. Deng; **B.R. Ellis**, "An integrated experimental program to understanding leakage from geologic carbon sequestration sites across scales", Abstract H14D-05 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec
75. Deng, H., **Ellis, B.R.**, Peters, C.A., "Modification of Fracture Hydraulic Properties by CO₂-Acidified Brine Flow" 2012 AIChE Annual Meeting Pittsburgh, PA.
76. Fitts, J.P., **Ellis, B.R.**, Deng H., Tappero, R., Peters, C.A. "Calcite dissolution and caprock fracture surface deterioration at high P/T: dependence on reactive fluid velocity and mineral spatial heterogeneity" NSF CMMI Engineering Research and Innovation Conference, Program Area: Geomechanics and Geomaterials, C133, Boston, MA July 2012. (Poster)
77. Fitts, J.P., **Ellis, B.R.**, Deng H., Tappero, R., Peters, C.A. "Geochemical controls on fracture evolution in carbon sequestration" American Rock Mechanics Association Annual Meeting (ARMA), Chicago, IL, June 25, 2012. Oral Presentation & Conference Proceeding
78. **Ellis, B.R.**, Peters, C.A., Fitts, J.P., Nogues, J., Celia, M.A., Dobossy, M., Janzen, A. (2011), "Alteration of caprock fracture geometries during flow of CO₂-acidified brine: Informing basin-scale leakage models from pore-scale modeling and core-scale experiments". Oral presentation at 2011 American Geophysical Union Fall Meeting, San Francisco, CA.
79. Deng H., Crandall, D., King, S., **Ellis, B.R.**, Bromhal, G., Fitts, J.P., Peters, C.A. "Change in fracture permeability after the flow-through of CO₂-acidified brine" AGU Fall Meeting, San Francisco, CA, December 2011.
80. **Ellis, B.R.**, Peters, C.A., Fitts, J.P., Bromhal, G.S., McIntyre, D.L., Warzinski, R.P. (2011), "Geochemical alteration of fracture geometry during leakage of CO₂". Oral presentation at the 2011 Goldschmidt Conference, Prague, Czech Republic.
81. **Ellis, B.R.**, Peters, C.A., Fitts, J.P., Bromhal, G.S., McIntyre, D.L., Warzinski, R.P. (2011), "Investigation of caprock fracture evolution after CO₂-brine flow". Poster presentation at 2011 meeting of the Association of Environmental Engineering and Science Professors, Tampa, FL.
82. Peters, C.A., Clarens, A.F., Fitts, J.P., Oldenburg, C.M., Dobson, P.F., Wang, J.S.Y., Guglielmi, Y., **Ellis, B.R.**, Wang, S. "Safe and Effective Geologic Sequestration of CO₂: Partnerships for MultiScaled Experimental Studies" AEESP, USF, Jul. 10-12, 2011. (Abstract)
83. **Ellis, B.R.**, Peters, C.A., Fitts, J.P., Bromhal, G.S., McIntyre, D.L., Warzinski, R.P. (2011), "Investigation of caprock fracture evolution after CO₂-brine flow". Oral presentation at 10th Annual Conference on Carbon Capture & Sequestration, Pittsburgh, PA.
84. **Ellis, B.R.**, Fitts, J.P., Bromhal, G.S., McIntyre, D.L., Warzinski, R.P., Rosenbaum, E., Peters, C.A. (2010), "Computed tomography analysis of alterations in fractured caprock resulting from CO₂-acidified brine". Poster presentation at the Geological Society of America 2010 conference, Denver, CO.
85. **Ellis, B.R.**, Bromhal, G.S., McIntyre, D.L., Peters, C.A. (2010), "Changes in caprock integrity due to vertical leakage of CO₂-enriched brine". Poster presentation at the Greenhouse Gas Control Technologies 10 conference, Amsterdam, Netherlands.
86. **Ellis, B.R.**, Hui, W.C.E., Peters, C.A., Fitts, J.P., Bhatt, V. (2010), "Potential benefits of retrofitting power plants with combined CO₂-SO₂ emission control for co-injection in geologic carbon sequestration". Oral presentation at Ninth Annual Conference on Carbon Capture & Sequestration, Pittsburgh, PA.
87. **Ellis, B.R.**, Crandell, L.E., Peters, C.A. (2009), "Limitations for brine acidification due to SO₂ co-injection in geologic carbon sequestration". Student paper award, oral presentation at the 2009 meeting of the Association of Environmental Engineering and Science Professors, Iowa City, IA.

88. **Ellis, B.R.**, Crandell, L.E., Peters, C.A. (2008), "Co-injection of SO₂ with CO₂ in geologic sequestration: Potential for acidification of formation brines". Poster presentation at 2008 American Geophysical Union Fall Meeting, San Francisco, CA.
89. Crandell, L E, B R Ellis, C A Peters, (2008). "Solubility and Diffusivity of SO₂ for Co-injection with CO₂ in Geological Sequestration", Eos Trans. AGU, 89(53), Fall Meet. Suppl., Abstract H23D-0995.
90. Crandell, L.E., B. R. Ellis, J. Cheung, C. A. Peters. "Injection of CO₂ and co-contaminant gases: Are separation costs justifiable?", Seventh Annual Conference on Carbon Capture & Sequestration, Pittsburgh, PA. May 2008.
91. **Ellis, B. R.**, Peters, C. A., Buschkuehle, M. 2007. "Formation Buffering Potential Pertaining to Geological Storage of Carbon Dioxide", EOS Trans. AGU, 88(52) Fall Meet. Suppl. Abstract U43C-1378.
92. Castro M.C., Hall, C.M., Patriarche D., Goblet P., and **Ellis, B.R.** (2007), A New Noble Gas Paleoclimate Record from Texas: Perils and Promise Explained, Eos Trans. AGU, 88(52), Fall Meet. Suppl., Abstract U13B-1147
93. **Ellis, B.R.**, Bowman, K.M., Peters, C.A., Buschkuehle, M. "Consideration of formation buffering potential and reactive mineral availability pertaining to geological storage of carbon dioxide" Goldschmidt 2007. *Geochim. Cosmochim. Acta* 71 (15): A255-A255 Suppl. S, AUG 2007
94. Peters, C.A., Bowman, K.M., **Ellis, B.R.** (2007). "Imaging Viking Sandstones for Quantification of Reactive Minerals and Surfaces", 2007 AEESP Conference: Interactions at the Interface – Making the Connections Between Environments, Disciplines and Nations, Virginia Tech.
95. Hall C.M., Castro, M. C., Patriarche, D., Goblet, P., **Ellis, B.R.** (2007), A New Noble Gas Paleoclimate Record from Texas: One Swallow Does Not a Summer, or Ice Age, Make, 4th Mini Conference on Noble Gases in Hydrology and in Natural Gas Reservoirs, GFZ Potsdam, Germany

Funded Research (\$6M total; \$3.4M as PI)

2025-2028	MDOT	Michigan Department of Transportation, " <i>Measurement and Performance of Riprap</i> ", co-PI (w/ Estefan Garcia (PI), Roman Hryciw), \$306,927
2020-2025	NSF	CBET, " <i>CAREER: Carbon Negative Subsurface Energy Technologies</i> ", PI, \$506,393
2020-2023	Sloan	Sloan Foundation, " <i>CO₂ Utilization for Geothermal Energy Production and Renewable Energy Storage</i> ", PI (co-PIs: J.M. Bielicki, J.X. Johnson), \$613,144 (\$309,289 to Ellis)
2019-2021	DOE	SBIR, " <i>CO₂ Plume Geothermal (CPG™) – Innovative, dispatchable geothermal power production using non-water working fluids</i> ", co-PI (PI: TerraCOH, Inc.), \$1M (\$37,962 to Ellis)
2017-2020	DOE	NETL, " <i>Storing CO₂ in built infrastructure: CO₂ carbonation of precast concrete products</i> ", PI, (co-PIs: V.C. Li, S.J. Skerlos), \$1.25M
2015-2017	UM	M-Cubed, " <i>Radium removal from shale-gas ("fracking") flow-back water</i> ", PI, (co-PIs: U. Becker, K.F. Hayes), \$60,000
2015-2017	ACS	Petroleum Research Fund, " <i>Investigating the Role of Wettability in Enhancing Shale Gas Production</i> ", PI, \$110,000
2014-2017	DOE	NETL, " <i>Impact of Microstructure on the Containment and Migration of CO₂ in Fractured Basalts</i> ", co-PI (w/ Dan Giammar (PI), M. Conradi, S. Hayes, P. Skemer), \$1.28M (\$393k to Ellis)

2014-2015	UM	Water Center, “ <i>Assessing the Assessment Tool: Developing Improved Modeling Frameworks for Evaluating Hydraulic Fracturing Water Withdrawals in Michigan</i> ”, PI, (co-PI: A.H. Demond), \$49,813
2013-2016	NSF	CBET, “ <i>Extraction of Radioactive and Toxic Element Contaminants From Organic-rich Shales in Contact with Hydraulic Fracturing Fluids</i> ”, PI, (co-PI: K.F. Hayes), \$353,590
2012-2014	UM	M-Cubed, “ <i>Hydraulic Fracturing of Shales: Water Contamination Risks, Treatment Options, and Fate of Fracking Fluids</i> ”, PI, (co-PI: M.C. Castro, A.H. Demond, K.F. Hayes, K.C. Lohmann, S.A. Miller), \$120,000
2012-2016	NSF	CBET, “ <i>SEES Fellows: Sustainable Development of Shale-gas Resources in Pennsylvania - Bridging Science, Policy and Economics of Hydraulic Fracturing</i> ”, PI, \$332,769

Teaching Experience

Courses taught at the University of Michigan:

Instructor (UM):

CEE 265	Sustainable Engineering Principles
CEE 428	Groundwater Hydrology
CEE 481/581	Aquatic Chemistry
CEE 501	Subsurface Energy Systems
CEE 881	Environmental Engineering Graduate Seminar

Guest Lecturer:

CEE 200	Introduction to Civil and Environmental Engineering
CEE 564	Greenhouse Gas Control
CEE 567	Energy Infrastructure Systems
EES 219	Introduction to Environmental Science
EES 284	Environmental Geology
ENG 110	The Engineering Profession

Student Mentoring

Ph.D. committee activity

Chair:

1. Seohyun Kim, 2029, *TBD*
Student Current Position: Ph.D. student, Civil and Environmental Engineering
2. Phillip Chacon, 2028, *Engineered Production of Geological Hydrogen*
Student Current Position: Ph.D. candidate, Civil and Environmental Engineering
3. Eva Albalghiti, 2026, *Microbially-enable Approaches to Subsurface Engineering*
Student Current Position: Ph.D. candidate, Civil and Environmental Engineering
4. Ellen Thompson, 2023, *Developing Heterogeneity-based Porosity-Permeability Relationships for Improved Subsurface Energy Resource Management*
Student Current Position: Assistant Professor
Place of Employment: Iron Range Engineering (Minnesota State Univ.), Virginia, MN
5. Anne Menefee, 2020, *CO₂ storage in fractured basalt: Mineral Carbonation and Reactive Fracturing*
Student Current Position: Assistant Professor, Pennsylvania State University
6. Jubilee Adeoye, 2019, *Application of Engineered Cementitious Composites (ECC) as Wellbore Cements under Geological Carbon Sequestration (GCS) Conditions*

Student Current Position: Analyst and Management Consultant

Place of Employment: Strategy& (part of PWC), Orlando, FL

Co-Chair:

1. Wei-Hsiu Hu, 2023, *CO₂ Sequestration in Ductile Cementitious Composites*
Co-Chair: Victor Li
Student Current Position: Assistant Professor, National Taiwan University
2. Tae Lim, 2021, *Mitigating CO₂ Emissions Through Novel Capture and Utilization Strategies*
Co-Chair: Steven Skerlos
Student Current Position: Staff Scientist, Lawrence Berkeley National Lab
3. Ivan Jayawan, 2019, *Evaluation of Modeling Framework and Social Perspectives Regarding Sustainable Groundwater Management in Michigan*
Co-Chair: Avery H. Demond
Student Current Position: Director of Engineering
Place of Employment: PT. Duta Wahana Sentosa, Jakarta, Indonesia
4. Wenjia Fan, 2018, *The Influence of Water-Rock Interaction on Trace Element Mobilization during Shale Gas Production*
Co-Chair: Kim F. Hayes
Student Current Position: Owner and lead scientific graphic designer
Place of Employment: W. Design Studio, Hockessin, DE

Member:

1. Sally Keating, Earth and Environmental Sciences, 2026, *Critical Zone Processes within Active Orogens: The Development and Role of the Shallow Subsurface in Landscape Evolution*
2. Junwon Yang, Civil & Environmental Engineering, 2025, *Reconstruction and Analysis of a Genome-Scale Metabolic Model for Enhanced Methane Valorization in Methanotrophs*
3. Sooyeon Kim, Earth and Environmental Sciences, 2022, *Exploration of environmental and energy related reactions at mineral-fluid interfaces at the molecular level*
4. Yi Wang, Earth and Environmental Sciences, 2020, *Local and remote forcing of Holocene oxygenation history in Southern California.*
5. Christina Reynolds, Civil & Environmental Engineering, 2019, *Mobile Carbon Capture for Heavy-Duty Freight Shipping*
6. Maggie Reuter, Civil & Environmental Engineering, 2019, *Chlorine Dioxide Disinfectant Reactivity with Lead Corrosion Minerals*
7. Youngjae Kim, Earth and Environmental Sciences, 2019, *Experimental and Quantum-mechanical Approaches to Explore Oxide, Phosphate, and Sulfate Minerals as Redox Catalysts, Geochemical Probes, and the Stability of Their Solid Solutions*
8. Will Bender, Earth and Environmental Sciences, 2019, *Quantum-Mechanical Evaluation of the Thermodynamics and Kinetics of Environmentally- Relevant Actinide Reactions*
9. Tao Wen, Earth and Environmental Sciences, 2017, *Development of Noble Gas Techniques to Fingerprint Shale Gas and Trace Sources of Hydrocarbon in Groundwater*
10. Sarah Walker, Earth and Environmental Sciences, 2017, *The Atomic and Electronic Structure of Contaminants at the Mineral-Fluid Interface*
11. Samantha Nemkin, Earth and Environmental Sciences, 2017, *Paleomagnetism of Carbonates and the Synfolding Test in the North American Cordillera*
12. Ben Gebarski, Earth and Environmental Sciences, 2017, *The Electronic and Atomic Structure of Actinide Contaminants at the Mineral-Fluid Interface*
13. Bhagyalakshmi Kalidass, Civil & Environmental Engineering, 2016, *Investigating the Impact of Metals and Methanobactin on Gene Expression in Methylosinus Trichosporium OB3b*
14. Derya Ayral Cinar, Civil and Environmental Engineering, 2015, *Impact of Clay-DNAPL*

Interactions on the Transport of Chlorinated Solvents in Low Permeability Subsurface Zones

15. Jiangfeng Wu, Electrical Engineering, 2015, *Radar Sub-surface Sensing for Mapping the Extent of Hydraulic Fractures and for Monitoring Lake Ice and Design of Some Novel Antennas*
16. Yuqiang Bi, Civil & Environmental Engineering, 2014, *Investigating the Role of Iron Sulfide on the Long-Term Stability of Reduced Uranium under Oxidic Groundwater Conditions*

M.S. students advised/co-advised

Advised:

1. Martin Tan, 2025 – present, Underground hydrogen storage leakage risk assessment
2. Dengfeng Qin, 2021, Basalt powder incorporation in carbon sequestering ECC
3. Patrick West, 2020 - 2021, Reactive transport modeling in geothermal reservoirs
4. Rafael Herrera, 2018 – 2020, Reservoir simulations of CO₂-based geothermal energy systems
5. Kira Tomenchok, 2018 - 2020, Coupling mineral spatial distribution with porosity-permeability evolution in dissolving carbonates
6. Ellen Thompson, 2017 - 2019, Mapping 3D surface charge distribution in nanoporous shales
7. Zixian Wang, 2017 - 2018, Chelator-enhanced removal of barium and radium from high salinity oilfield brines
8. Minmeng Tang, 2015 - 2016, CO₂ storage in fractured basalts
9. Peiyuan Li, 2015 - 2016, Reactive transport modeling of CO₂ sequestration in fractured basalt
10. Letian Zhou, 2014 - 2015, Role of wettability in enhancing shale gas production
11. Qi Zhang, 2013 - 2013, 3D Mineralogical characterization of potential CO₂ caprocks
12. Vidya Ramalingam, 2013 - 2013, Unconventional shale gas waste management strategies

Co-Advised:

1. Lu Chen, 2015 - 2016, Human toxicity impact of shale gas and coal
2. Hui Zhang, 2014 - 2015, Optimizing selective removal of radium from shale gas wastewater
3. Tianshu Zhang, 2012 - 2013, Trace metal and radionuclide release from hydraulically fractured shales

Undergraduate major projects directed

1. Project Title: Critical minerals recovery from Buffalo Reef mine tailings, 2023-2025; Number of Students: 2; (Amelia Francisco, Alexander Thompson)
2. Aparna Krisnamurthy, Senior Honors Capstone Project: *Softening Basin Replacement Ann Arbor Water Treatment Plant*, April 2024
3. Project Title: Basin-scale modeling of CO₂-plume geothermal systems, 2018, Number of Students: 1; (Alberto Navarro Garre)
4. Project Title: Modeling pressure solution and fracture closure in carbonate rocks, 2016 - 2017, Number of Students: 1; (Yuecheng Liu)
5. Project Title: Sustainable groundwater management in Michigan: Perception of high-volume water withdrawals, 2016 - 2017, Number of Students: 1; (Leyi Yin)
6. Project Title: Use of engineered cementitious composites for enhanced wellbore integrity, 2016 - 2017, Number of Students: 2; (Cameron Beversluis, Alessandra Murphy)
7. Project Title: CO₂ carbonation of olivine sands, 2015 - 2015, Number of Students: 1; (Megan Bushlow)
8. Project Title: Trace metal and radionuclide release from hydraulically fractured shales, 2013 - 2016, Number of Students: 2; (Maria DeMuri, Marie St. Peter)

Student Awards:

1. Rackham Predoctoral Fellowship (Eva Albalghiti), 2025
2. Rackham Merit Fellowship (Phillip Chacon), 2024
3. ProQuest Distinguished Dissertation Award (Anne Menefee), 2020
4. Rackham Merit Fellowship (Eva Albalghiti), 2020
5. Richard and Eleanor Towner Prize for Distinguished Academic Achievement (Ellen Thompson), 2019
6. U.S. Department of Energy Office of Science Graduate Student Research (SCGSR) award (Anne Menefee), 2018
7. CEE Outstanding Graduate Student Instructor Award (Ivan Jayawan), 2018
8. Rackham Predoctoral Fellowship (Jubilee Adeoye), 2018
9. CEE Distinguished Achievement Undergraduate Award (Megan Bushlow), 2017
10. DOW Postdoctoral Sustainability Fellow (Dr. Saikat Das), 2016
11. NSF Graduate Research Fellowship (Anne Menefee), 2016

Other Service

Professional Service and Membership:

- Co-convener, mini-symposia at the 2023 InterPore, Edinburgh, Scotland
- Co-convener, mini-symposia at the 2022 InterPore, Abu Dhabi, UAE
- Founding Member, Northeast-Midwest US Chapter of InterPore (International Society for Porous Media), 2022
- Co-convener, 2020 Fall Meeting of the American Geophysical Union; *virtual meeting*
- Member, ASCE, Environmentally Responsible Energy Production Committee, 2017 - 2021
- Co-convener, (T154) *Imaging the Rock and Fluid Interactions of Geologic Carbon Sequestration* at 2017 meeting of the Geological Society of America (Seattle, WA), October 2017
- Poster Session Co-Chair; Member of conference leadership team, 2017 AEESP Biennial Conference, 2017
- Session Chair, 2014 ASCE Shale Energy Engineering Conference (Pittsburgh, PA);
Water Resources Management in Shale Oil & Gas Development: Groundwater Protection
- co-Convener, 2014 ACS Spring Meeting (Dallas, TX); ENVR: *Water Quality Stewardship in Pursuit of Unconventional Oil and Natural Gas Reservoirs* (w/ K.F. Hayes)
- Moderator, NSF-sponsored workshop on Hydraulic Fracturing (University of Arkansas, Little Rock, AR); Session: *Characteristics and behavior of fracturing fluids and green alternatives*
- Reviewer, Journals: *Science*; *Environmental Science and Technology*; *Environmental Science and Technology Letters*; *Water Resources Research*; *Geophysical Research Letters*; *Green Chemistry*, *International Journal of Greenhouse Gas Control*; *Chemical Geology*; *Energy and Fuels*; *Journal of Geophysical Research – Solid Earth*; *Greenhouse Gases: Science and Technology*; *Environmental Engineering Science*; *Energy Technology*;
Proposals: NSF CBET; NSF CMMI; SUNY 4E Network of Excellence; Alfred P. Sloan Foundation; ORNL and SSRL user proposals
- Member, American Chemical Society
- Member, Association of Environmental Engineering & Science Professors

Member, American Geophysical Union

Significant service assignments

Department

1. Member, Alumni Engagement Committee, 2024 - 2025
2. Member, Recruitment Committee, 2023-2024
3. Member, EWRE Faculty Search Committee, 2021-2022
4. Member, Strategic Implementation Committee, 2020 - 2023
5. Member, Undergraduate Committee, 2019 - 2021
6. Member, Offset Policy Review Committee (ad hoc), 2018
7. Member, Graduate Committee, 2017 - 2019
8. Member (2015 – Present), Chair (2019 – 2020), CEE Undergraduate Recruitment Committee
9. Coordinating Faculty Member, CEE Tech Day (ad hoc), 2015 - 2016
10. Chair, Visit Day Committee (ad hoc), 2015
11. Member, Graduate Committee, 01/2014 - 2014
12. Member, Grand Challenges Workshop Leadership Team, 2014
13. Examiner (total exams administered: 37), Environmental Engineering Ph.D. Qualifying Exam Committee, 2013 - Present
14. Member, Undergraduate Committee, 2013 - 2017
15. Member, Safety Committee, 2012 – 2016

College

1. Chair, CoE Sustainability Student Awards Committee, 2023 - present
2. CoE Representative, Graham Sustainability Institute's Dow Sustainability Masters Fellowship final review panel, 2015 - 2016
3. Member, Dow Sustainability Masters Fellowship Review Committee, 2014 - 2016

University

1. Steering Committee Member, U-M Water Center, 2025 - present
2. Steering Committee Member, Institute for Energy Solutions, 2024 - present
3. Curricular Advisor, Michigan Sustainability Cases (SEAS), 2017 - 2018