

Javier Vilcáez, Ph.D.**Professor****Hamm Institute for American Energy Faculty Fellow****Fulbright U.S. Scholar (2024-2025), United States of America****Monbusho (MEXT) Scholar (2003-2009), Japan****Boone Pickens School of Geology, Oklahoma State University, Stillwater, OK 74078****Phone: 405-744-6361; Fax: 405-744-7841; Email: vilcaez@okstate.edu****<https://vilcaez.wordpress.com/>**

My research program is on the Water-Energy-CO₂ Nexus. This program is to contribute toward a net-zero emissions energy transition. I conduct experimental and computational research on the elucidation of hydrological, geochemical, and microbiological factors and interactions that control the multiphase bio-geochemical reactive transport of gas, aqueous, and hydrocarbon fluids in deep and shallow geological formations of complex heterogeneous porous media such as carbonates, at both the pore- and field-scale levels. The focus is on biological and hydrothermal hydrogen generation, enhanced oil recovery, geological carbon and hydrogen storage under biotic conditions, petroleum produced water treatment and disposal, and mining of critical metals from surface and subsurface brine. The goal is to develop new environmental technologies and computational methodologies to minimize the environmental burden of and optimize the development of subsurface energy, mineral, and groundwater resources. My research incorporates the utilization of global optimization, machine learning, and environmental data analytical tools and techniques. Earth to me is a spherical shape reactor undergoing chemical reactions coupled with mass and energy transfer processes driven by an unbalanced distribution of matter and energy, predictable and reproducible.

EDUCATION

Ph.D.	Geosystems & Energy Sciences, Tohoku University, Japan, 2009.
M.Eng.	Civil Engineering, Gunma University, Japan, 2006.
B.Eng.	Chemical Engineering, Universidad San Francisco Xavier de Chuquisaca, Bolivia, 1998.

PROFESSIONAL EXPERIENCE

2025.7 – Present	Professor of Geofluids & Hydrogeology Boone Pickens School of Geology, Oklahoma State University, USA.
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2021.11 – 2024.7	Graduate Director Boone Pickens School of Geology, Oklahoma State University, USA.
2020.7 – 2025.6	Associate Professor of Geofluids & Hydrogeology Boone Pickens School of Geology, Oklahoma State University, USA.
2014.8 – 2020.7	Assistant Professor of Geofluids & Hydrogeology Boone Pickens School of Geology, Oklahoma State University, USA.
2011 – 2014	Assistant Professor of Energy Fluids (tenure-track) Frontier Research Center for Energy and Resources (FRCER), Graduate School of Engineering, The University of Tokyo, Japan.
2010 – 2011	Postdoctoral Scholar of Computational Modeling & Geosystems Production , Department of Energy and Mineral Engineering, The Pennsylvania State University, USA.
2009 – 2010	Postdoctoral Fellow of Energy Security New Industry Creation Hatchery Center (NICHe), Tohoku University, Japan.
2000 – 2003	Drilling Fluids and Production Chemicals Engineer MI-SWACO, Bolivia.
1998 – 2000	Computer Programmer Center of Digital Computation, Bolivia.

RESEARCH

2014 – Present

Water-Energy-CO₂ nexus

(Oklahoma State University)

- Petroleum produced water treatment and disposal
- Mining of critical metals from petroleum produced water
- Geological hydrogen storage in depleted oil reservoirs
- Carbon capture, utilization, and storage in depleted oil reservoirs

2011 – Present

Machine learning and environmental data analysis

(Oklahoma State University; The University of Tokyo)

- Pore-scale machine learning modeling of petrophysical properties of rocks
- Numerical optimization and uncertainty analysis of fluids injection/disposal into subsurface
- Geostatistical analysis of groundwater and hydrocarbon reservoirs

2006 – Present**Mathematical modeling and simulation of multiphase reactive transport processes**

(Oklahoma State University; The University of Tokyo; The Pennsylvania State University; Tohoku University; Gunma University)

- Groundwater flow
- Enhanced oil recovery
- Geological carbon and hydrogen storage
- Heap and underground leaching of minerals
- Transport and transformation of pollutants in underground water

2009 – 2014**Hydrothermal technology**

(Tohoku University)

- Upgrading of heavy oil with supercritical water
- Hydrothermal hydrogen generation

2006 – Present**Petroleum and mineral biotechnology**

(Oklahoma State University; The University of Tokyo, Tohoku University; Gunma University)

- Biogenic recycling of CO₂ to CH₄
- Biogenic production of hydrogen from residual oil in depleted oil reservoirs
- Microbial enhanced hydrocarbon recovery
- Bio & hydrometallurgy
- Biological treatment of waters

TEACHING

Universidad Privada Boliviana, Bolivia (Fulbright U.S. Scholar)

- Industry and the Environment (PU8053):
Fall 2024

Oklahoma State University, USA (Faculty)

- Advanced Petrophysics (GEOL 4343/5343)
Fall 2026
- Petroleum Rocks and Fluids (PETE 4303):
Fall 2025
- Environmental Data Analytics (GEOL 4583/5583):
Fall 2021, Fall 2023
- Applied Geostatistics (GEOL 4433/5333):
Spring 2020, Spring 2022, Spring 2024, Spring 2026
- Groundwater Modeling (GEOL 5453):

Spring 2015, Spring 2017, Spring 2019, Spring 2021, Spring 2023, Spring 2025

- Contaminant Transport (GEOL 6553):
Spring 2016
- Geochemistry (GEOL 4403/5990):
Fall 2015, Fall 2016, Fall 2017
- Geology and Human Affairs (GEOL 1014):
Fall 2021, Fall 2022, Fall 2023
- Exploring Earth: An Introduction to Geology (GEOL 1013):
Fall 2018 (2 sections), Fall 2019, Fall 2020
- Geology Colloquium (GEOL 5300):
Spring 2017
- Advanced Studies in Geology (GEOL 5990):
Fall 2014 - present
- Special Problems in Earth Science (GEOL 4990):
Fall 2014 - present
- Doctoral Dissertation Research (GEOL 6000):
Fall 2014 - present
- Master's Thesis (GEOL 5000):
Fall 2014 - present

University of Tokyo, Japan (Faculty)

- Advances in Simulation:
Fall 2014, co-teaching
- Global Environment:
Fall 2011, Fall 2013
- Environmental Petroleum and Mineral Engineering:
Spring 2011, Spring 2012, co-teaching

The Pennsylvania State University, USA (Teaching Assistant)

- Applied Reservoir Engineering:
Spring 2010

Univ. of St. Francis Xavier, Bolivia (Teaching Assistant)

- Chemical Reactors Design:
Spring 1998, Fall 1998

COMPETITIVE AWARDS AND RECOGNITIONS

- Hamm Institute for American Energy Faculty Fellow (2025-2027). Oklahoma State University
- Fulbright U.S. Scholar (2024-2025). Research and Teaching Award: “Energy transition and mining of critical minerals for energy in Bolivia”. U.S. Department of State.
- Top 5 most cited paper in the *International Journal of Mineral Processing* since 2007: “Bioleaching of chalcopyrite with thermophiles. Temperature-pH-ORP dependence” by Vilcáez, Suto, and Inoue.
- Top 25 Hottest Article in *Minerals Engineering* (October to December 2008): “Response of thermophiles to the simultaneous addition of sulfur and ferric ion to enhance the bioleaching of chalcopyrite” by Vilcáez, Suto, and Inoue.
- Top 25 Hottest Article in *Hydrometallurgy* (January to March 2009): “Effect of pH reduction and ferric ion addition on the leaching of chalcopyrite at thermophilic temperatures” by Vilcáez, Yamada, and Inoue.
- Recognition for Outstanding Academic Accomplishment, Graduate School of Environmental Studies, Tohoku University, Japan, 2009.
- Monbukagakusho Scholarship for Graduates (Doctor Course), Japanese Ministry of Education, Culture, Sports, Science and Technology, Japan, 2006 - 2009.
- Monbukagakusho Scholarship for Graduates (Master course). Japanese Ministry of Education, Culture, Sports, Science and Technology, Japan, 2003 - 2009.
- Recognition for Outstanding Undergraduate Thesis Dissertation, Faculty of Technology, University of Saint Francis Xavier, Bolivia, 1998.
- Jaime Escalante Scholarship Award for Undergraduates, Jaime Escalante Foundation, Bolivia, 1993.

GRANTS

Competitive research grants (*Denotes Principal Investigator)

2026

1. ***J. Vilcáez (PI)**, C. Neil. Project: “AI-driven critical metals recovery from shale reservoirs”. *Department of Energy, The Genesis Mission: Transforming Science and Energy with AI* – \$684,992 total funding (July 2026 – April 2027). **Pending.**
2. ***J. Vilcáez (PI)**, M. Elshahed. Project: “Biogenic hydrogen production under geological carbon storage conditions”. *National Science Foundation (NSF), Life and Environments Through Time (LET) Program* – \$954,637 total funding (August 2026 – July 2029). **Awarded.** ([Read](#))

3. ***J. Vilcáez (PI)**. Project: “Supercritical CO₂-enhanced microbial oil removal integrated with dolomite-mediated metals recovery from produced water”. *Hamm Institute for American Energy, OSU* – \$25,000 total funding, seed grant (July 2026 – June 2027). **Awarded**. ([Read](#))

2025

4. ***P. Bikkina (PI), P. Jaiswal, J. Vilcáez**. Project: “Characterizing and estimating white hydrogen resources in Oklahoma and beyond: A planning grant proposal”. *Hamm Institute for American Energy* – \$20,000 total funding (July 2025 – June 2026). **Awarded**. ([Read](#))

2023

5. ***J. Vilcáez (PI)**. Project: “Energy transition and mining of critical minerals for energy in Bolivia”. *Fulbright U.S. Scholar Program* – \$29,110 total funding. **Awarded**. ([Read](#))

2022

6. ***J. Vilcáez (PI)**. Project: “Removal of metals from petroleum produced water by dolomite”. *National Science Foundation (NSF), CBET-Environmental Engineering and Sustainability Program* – \$390,444 total funding (September 2022 – August 2026). **Awarded**. ([Read](#))

2021

7. ***J. Vilcáez (PI)**. Project: “Pore-scale machine-learning modeling of flow and transport properties of carbonate rocks”. *National Science Foundation (NSF), EAR-Hydrologic Sciences Program* – \$282,444 total funding (April 2021 – February 2026). **Awarded**. ([Read](#))

2020

8. ***J. Vilcáez (PI)**. Project: “A new dolomite filtration technology to remove heavy metals and NORM from produced water”. *USGS 104(b) Program* – \$25,000 (March 2020 – December 2022). **Awarded**. ([Read](#))

2019

9. ***J. Vilcáez (PI), B. Shabani, M. Elshahed**. Project: “Beneficial use of produced water to convert crude oil to methane gas in depleted oil reservoirs”. *Oklahoma Water Resources Center* – \$5,000 total funding (February 2019 – January 2020). **Awarded**. ([Read](#))
10. ***J. Vilcáez (PI)**. Project: “Beneficial use of produced water: In-situ crude oil conversion to methane gas”. *Oklahoma State University-College of Arts & Sciences, FY 2020 Fall Travel Program* – \$1,000 total funding. **Awarded**.

2017

11. ***J. Vilcáez (PI)**. Project: “Risk assessment of groundwater pollution by hydraulic fracturing fluid migration”. *Oklahoma State University-College of Arts & Sciences, FY 2017 A&S Summer Research and +1 Supplement Program* – \$7,778 + \$1,000 total funding. **Awarded**.

2016

12. ***J. Vilcáez (PI)**. Project: “Restoration of CH₄ deposits driven by the injection of CO₂ and stimulating nutrients”. *Oklahoma State University-College of Arts & Sciences, FY 2016 A&S Summer Research and +1 Supplement Program* – \$7,778 + \$1,000 total funding. **Awarded**.

2015

13. ***J. Vilcáez (PI)**. Project: “Biogenic recycling of geologically stored CO₂ to CH₄”. *Oklahoma State University-College of Arts & Sciences, FY 2015 Spring Travel Program* – \$1,000 total funding. **Awarded**.

2014

14. ***J. Vilcáez (PI)**. Project: “Reactive transport modeling and simulation of microbial CH₄ generation in depleted oil reservoirs”. *Arai Science and Technology Foundation Research Grant* – 1,000,000 JY (\$10,000) total funding (April 2013 – March 2014). **Awarded**.

2013

15. ***J. Vilcáez (PI)**. Project: “Development of an organic matter-injection method for biogenic restoration of subsurface methane gas deposits”. *Japan Oil, Gas and Metals National Corporation (JOGMEC), Collaborative Research with the University of Tokyo* – 2,000,000 JY (\$20,000) total funding (April 2012 – March 2013). **Awarded**.

PUBLICATIONS IN PEER-REVIEWED JOURNALS as Professor at Oklahoma State University, since 2025.8

***Denotes corresponding author – PI, **Denotes my student**

2026

1. ****S. Senevirathna, *J. Vilcáez**. “Stochastic pore-network modeling with OpenPNM for absolute permeability predictions in dolomites”. 2026. Under review.

2. **C. Unigwe, ***J Vilcáez**. “Dolomite filtration for lithium and cobalt recovery from produced water: Feasibility and mechanistic insights”. *Hydrometallurgy*, Vol 243 (2026), Article 106746. doi.org/10.1016/j.hydromet.2026.106746. (IF 5.3).

2025

3. **A.J.B. Alhallaf, **J Vilcáez**, Ye Liang. “Investigating the Impact of Meteorological Factors on Sea-Level Variability in the Northwestern Arabian Gulf: A Case Study Using Deep Learning and Advanced Statistical Models for Enhanced Forecasting”. *Ocean Modelling*, Vol 199 (2025), Article 102648. doi.org/10.1016/j.ocemod.2025.102648. (IF 2.9).
4. **M. Elshebli, ***J. Vilcáez**. “Lithium and cobalt recovery from petroleum produced water using dolomite: impact of pH, temperature, and surface area”. *Science of The Total Environment*, Vol 1003 (2025), Article 180743. doi.org/10.1016/j.scitotenv.2025.180743. (IF 8.0)
5. **A.J.B. Alhallaf, **J Vilcáez**, P. Rudra, A.A. Lafta. “Predicting sea level variations for early warning using SARIMA model and deep learning techniques in the northwest Arabian Gulf”. *Discovery Geosciences* (2025) 3:158. doi.org/10.1007/s44288-025-00270-y.
6. ***J. Vilcáez**, **E. Chowdhury. “Biogenic hydrogen production from oil hydrocarbons at geological carbon storage conditions”. *Energy Conservation and Management*, Vol 235 (2025), Article 119438. doi.org/10.1016/j.enconman.2024.119438. (IF 9.9).

PUBLICATIONS IN PEER-REVIEWED JOURNALS as Associate Professor at Oklahoma State University, since 2020

*Denotes corresponding author – PI, **Denotes my student

2024

7. **O. Ishola, ***J. Vilcáez**. “Augmenting Xray micro-CT data with MICP data for high resolution pore-microstructural and flow modelling of carbonate rocks.” *Geoenergy Science and Engineering*, Vol. 239 (2024), Article 212982. doi.org/10.1016/j.geoen.2024.212982. (IF 5.168).
8. **K. Omar, ***J. Vilcáez**. “The role of alkalinity on metals removal from petroleum produced water by dolomite.” *Applied Geochemistry*, Vol. 161 (2024), Article 105879. doi.org/10.1016/j.apgeochem.2023.105879. (IF 3.4).

2023

9. A. Arshad, *A. Mirchi, **J. Vilcáez**, M.U. Akbar, K. Madani. “Reconstructing high-resolution

gap-filled groundwater level data using a hybrid random forest machine learning model for monitoring distributed groundwater changes.” *Journal of Hydrology* (2023), Article 130535. doi.org/10.1016/j.jhydrol.2023.130535. (IF 6.4).

10. **K. Omar, ***J. Vilcáez**. “Transport of Ba, Sr, Cd, Pd, and As in dolomite saline aquifers injected with petroleum produced water”. *Geoenergy Science and Engineering*, Vol. 231 (2023), Article 21234. doi.org/10.1016/j.geoen.2023.212342. (IF 5.168).
11. **V. Ezennubia, ***J. Vilcáez**. “Removal of oil hydrocarbons from petroleum produced water by indigenous oil degrading microbial communities”. *Journal of Water Process Engineering*, Vol. 51 (2023), Article 103400. doi.org/10.1016/j.jwpe.2022.103400. (IF 7.3)

2022

12. *J. Fields, T. Halihan, **J. Vilcáez**, A. Sharpley, M. Daniels. “Hydrogeophysical characterization of swine effluent amended soils in mantled karst.” *Journal of the ASABE*, Vol. 65, Issue 6, pp. 1317-1332. 2022. doi.org/10.13031/ja.15259. (IF 1.2).
13. **O. Ishola, A. Alexander, ***J. Vilcáez**. “Statistical and neural network analysis of the relationship between the stochastic nature of pore connectivity and flow properties of heterogeneous rocks.” *Journal of Natural Gas Science and Engineering*, Vol. 105 (2022), Article 10479. doi.org/10.1016/j.jngse.2022.104719. (IF 5.285).
14. ***J. Vilcáez**. “System and method of removing oil and toxic metals from petroleum produced water”. US Patent App. 17/526,734, 2022.
15. **K. Omar, ***J. Vilcáez**. “Removal of toxic metals from petroleum produced water by dolomite filtration.” *Journal of Water Process Engineering*, Vol. 47 (2022), Article 102982. doi.org/10.1016/j.fuel.2022.124044. (IF 7.3).
16. **O. Ishola, ***J. Vilcáez**. “Machine learning modeling of permeability in 3D heterogeneous porous media using a novel stochastic pore-scale simulation approach.” *Fuel*, Vol. 321 (2022), Article 124044. doi.org/10.1016/j.fuel.2022.124044. (IF 8.03).

2020

17. ***J. Vilcáez**. “Reactive transport modeling of produced water disposal into dolomite aquifers: Controls of barium transport.” *Journal of Contaminant Hydrology*, Vol. 233 (2020), Article 103600. doi.org/10.1016/j.jconhyd.2020.103600. (IF 4.184).
18. **B. Shabani, J. Pashin, ***J. Vilcáez**. “TOUGHREACT-CO2Bio – A new module to simulate geological carbon storage under biotic conditions (Part 2): The bio- geochemical reactive transport of CO₂-CH₄-H₂-H₂S gas mixtures.” *Journal of Natural Gas Science and Engineering*, Vol. 76 (2020), Article 103190. doi.org/10.1016/j.jngse.2020.103190. (IF 5.285).

19. A. Yadav, **J. Vilcáez**, I. F. Farag, B. Johnson, K. Mueller, N.H. Youssef, *M.S. Elshahed. "Genomic characterization of a novel candidate phylum (ARYD3) from a high temperature, high salinity tertiary oil reservoir in north central Oklahoma, USA." *Systematic and Applied Microbiology*, Vol. 43 (2020), Article 126057. doi.org/10.1016/j.syapm.2020.126057 (IF 2.808).

PUBLICATIONS IN PEER-REVIEWED JOURNALS as Assistant Professor at Oklahoma State University, 2014-2019.7

***Denotes corresponding author – PI, **Denotes my student**

2019

20. **B. Shabani, ***J. Vilcáez**. "TOUGHREACT-CO2Bio – a new module to simulate GCS under biotic conditions (Part 1): The multiphase flow of CO₂-CH₄-H₂-H₂S gas mixtures." *Journal of Natural Gas Science and Engineering*, Vol. 63, 2019, pp. 85-94. doi.org/10.1016/j.jngse.2019.01.013. (IF 5.285).
21. **P. Ebrahimi, ***J. Vilcáez**. "Transport of barium in fractured dolomite and sandstone saline aquifers." *Science of the Total Environment*, Vol. 647, 2019, pp. 323-333. doi.org/10.1016/j.scitotenv.2018.08.008. (IF 10.753).

2018

22. ***J. Vilcáez**, **J. York, N. Youssef, M. Elshahed. "Stimulation of crude oil biodegradation via methanogenesis in depleted oil reservoirs." *Fuel*, Vol. 232, 2018, pp. 581-590. doi.org/10.1016/j.fuel.2018.06.018. (IF 6.6).
23. **P. Ebrahimi, ***J. Vilcáez**. "Petroleum produced water disposal: Mobility and transport of barium in sandstone and dolomite rocks." *Science of the Total Environment*, Vol. 634, 2018, pp. 1054-1063. doi.org/10.1016/j.scitotenv.2018.04.067. (IF 10.753).
24. **P. Ebrahimi, ***J. Vilcáez**. "Effect of brine salinity and guar gum on the transport of barium through dolomite rocks: implications for unconventional oil and gas wastewater disposal." *Journal of Environmental Management*, Vol. 214, 2018, pp. 370-378. doi.org/10.1016/j.jenvman.2018.03.008. (IF 8.91).
25. **B. Shabani, ***J. Vilcáez**. "A fast and robust TOUGH2 module to simulate CO₂ storage in saline aquifers." *Computers & Geosciences*, Vol. 111, 2018, pp. 58-66. doi.org/10.1016/j.cageo.2017.10.012. (IF 5.168).

2017

26. ***J. Vilcáez**, S. Morad, N. Shikazono. "Pore-scale simulation of transport properties of carbonate rocks using FIB-SEM 3D microstructure: implications for field scale solute transport simulations." *Journal of Natural Gas Science and Engineering*, Vol. 42, 2017,

pp. 13-22. doi.org/10.1016/j.jngse.2017.02.044. (IF 5.285).

27. **B. Shabani, ***J. Vilcáez**. "Prediction of CO₂-CH₄-H₂S-N₂ gas mixtures solubility in brine using a non-iterative fugacity-activity model relevant to CO₂-MEOR." *Journal of Petroleum Science and Engineering*, Vol. 150, 2017, pp. 162-179. doi.org/10.1016/j.petrol.2016.12.012. (IF 5.168).

2015

28. ***J. Vilcáez**. "Numerical modeling and simulation of microbial methanogenesis in geological CO₂ storage sites." *Journal of Petroleum Science and Engineering*, Vol. 135, 2015, pp. 583-595. doi.org/10.1016/j.petrol.2015.10.015. (IF 5.168).
29. ***J. Vilcáez**. "Stimulating effect of protein-rich matter on the biogenic conversion of CO₂ to CH₄." *Journal of CO₂ Utilization*, Vol. 10, 2015, pp. 60-66. doi.org/10.1016/j.jcou.2015.04.002. (IF 8.321).
30. ***J. Vilcáez**. "On the mechanism of chalcopyrite bioleaching with thermophiles." *Austin J. Earth Sci.* 2015; 2(2): id1014.

PUBLICATIONS IN PEER-REVIEWED JOURNALS as Assistant Professor at the University of Tokyo, 2011-2014

*Denotes corresponding author

2013

31. V. Attavittkamthorn, ***J. Vilcáez**, K. Sato. "Metamodeling of gas flooding EOR in Pattani Basin, Thailand." *Journal of the Japanese Association for Petroleum Technology*, Vol. 78, Issue 6, 2013, pp. 508-519. doi.org/10.3720/japt.78.508. (IF 0.83).
32. H. Kobayashi, N. Saito, K. Fu, H. Kawaguchi, **J. Vilcáez**, T. Wakayama, H. Maeda, *K. Sato. "Bio-electrochemical property and phylogenetic diversity of microbial communities associated with bioelectrodes of an electromethanogenic reactor." *Journal of Bioscience and Bioengineering*, Vol. 116, Issue 1, 2013, pp. 114-117. doi.org/10.1016/j.jbiosc.2013.01.001. (IF 3.185).
33. Q. Fu, H. Kobayashi, H. Kawaguchi, **J. Vilcáez**, H. Wakayama, H. Maeda, *K. Sato. "Electrochemical and phylogenetic analyses of current-generating microorganisms in a thermophilic microbial fuel cell." *Journal of Bioscience and Bioengineering*, Vol. 115, Issue 3, 2013, pp. 268-271. doi.org/10.1016/j.jbiosc.2012.10.007. (IF 3.185).

PUBLICATIONS IN PEER-REVIEWED JOURNALS as Postdoctoral Scholar at the Pennsylvania State University, 2010-2011

***Denotes corresponding author**

2013

34. **J. Vilcáez**, *L. Li, S.S. Hubbard. "A new model for the biodegradation kinetics of oil droplets: application to the Deepwater Horizon oil spill in the Gulf of Mexico." *Geochemical Transactions*, Vol. 14, Issue 4, 2013. doi.org/10.1186/1467-4866-14-4. (IF 2.615).
35. ***J. Vilcáez**, L. Li, D. Wu, S.S. Hubbard. "Reactive transport modeling of induced selective plugging by *Leuconostoc mesenteroides* in carbonate formations." *Geomicrobiology Journal*, Vol. 30, Issue 9, 2013, pp. 813-828. doi.org/10.1080/01490451.2013.774074. (IF 2.615).

PUBLICATIONS IN PEER-REVIEWED JOURNALS as Postdoctoral Fellow at Tohoku University, 2009-2010

***Denotes corresponding author**

2012

36. ***J. Vilcáez**, M. Watanabe, N. Watanabe, A. Kishita, T. Adschiri. "Hydrothermal extractive upgrading of bitumen without coke formation." *Fuel*, Vol. 102, 2012, pp. 379-385. doi.org/10.1016/j.fuel.2012.07.024. (IF 6.6).

2011

37. P. Setiani, **J. Vilcáez**, N. Watanabe, A. Kishita, *N. Tsuchiya. "Enhanced hydrogen production from biomass via the sulfur redox cycle under hydrothermal conditions." *International Journal of Hydrogen Energy*, Vol. 36, Issue 17, 2011, pp. 10674-10682. doi.org/10.1016/j.ijhydene.2011.06.012. (IF 7.139).

PUBLICATIONS IN PEER-REVIEWED JOURNALS as Graduate Student (M.S. and Ph.D.), 2007-2009***Denotes corresponding author****2009**

38. ***J. Vilcáez**, T. Watanabe. "Inhibitory effect of gamma-irradiated chitosan on the growth of denitrifying bacteria." *International Journal of Microbiology*, Vol. 2009, Article ID 418595. [dx.doi.org/10.1155/2009/418595](https://doi.org/10.1155/2009/418595). (IF 3.4).
39. ***J. Vilcáez**, C. Inoue. "Mathematical modeling of thermophilic bioleaching of chalcopryrite." *Minerals Engineering*, Vol. 22, Issue 11, 2009, pp. 951-960. doi.org/10.1016/j.mineng.2009.03.001. (IF 3.315).
40. ***J. Vilcáez**, R. Yamada, C. Inoue. "Effect of pH reduction and ferric ion addition on the leaching of chalcopryrite at thermophilic temperatures." *Hydrometallurgy*, Vol. 96, Issues 1-2, 2009, pp. 62-71. doi.org/10.1016/j.hydromet.2008.08.003. (IF 3.465).

2008

41. ***J. Vilcáez**, K. Suto, C. Inoue. "Response of thermophiles to the simultaneous addition of sulfur and ferric ion to enhance the bioleaching of chalcopryrite." *Minerals Engineering*, Vol. 21, Issue 15, 2008, pp. 1063-1074. doi.org/10.1016/j.mineng.2007.11.005. (IF 3.315).
42. ***J. Vilcáez**, K. Suto, C. Inoue. "Modeling the auto-thermal performance of a thermophilic bioleaching heap employing mesophilic and thermophilic microbes." *Hydrometallurgy*, Vol. 94, Issues 1-4, 2008, pp. 82-92. doi.org/10.1016/j.hydromet.2008.05.007. (IF 3.465).
43. ***J. Vilcáez**, K. Suto, C. Inoue. "Bioleaching of chalcopryrite with thermophiles. Temperature-pH-ORP dependence." *International Journal of Mineral Processing*, Vol. 88, Issues 1-2, 2008, pp. 37-44. doi.org/10.1016/j.minpro.2008.06.002. (IF 3.315).

2007

44. ***J. Vilcáez**, S. Miyazawa, K. Suto, C. Inoue. "Numerical evaluation of biocide treatment against sulfate reducing bacteria in oilfield water pipelines." *Journal of the Japan Petroleum Institute*, Vol. 50, No.4, 2007, pp. 208-217. doi.org/10.1627/jpi.50.208. (IF 0.631).

PUBLICATIONS IN PEER-REVIEWED CONFERENCE PROCEEDINGS

***Denotes corresponding author – PI, **Denotes my student**

2020

45. **O. Ishola, ***J. Vilcáez**. "Predicting Permeability in Carbonate Rocks Using a Pore- Scale Stochastic Simulation Approach." *Conference Proceedings, 82nd EAGE Annual Conference & Exhibition*, July 2020, Vol. 2020, pp.1-5. doi.org/10.3997/2214-4609.202010360.

2013

46. **V. Attavithamthorn, **J. Vilcáez**, *K. Sato. "Integrated CCS aspect into CO₂ EOR project under wide range of reservoir properties and operating conditions." *Energy Procedia*, Vol. 37, 2013, pp. 6901-6908. GHGT-11. Kyoto-Japan. November 18-22, 2012. doi.org/10.1016/j.egypro.2013.06.622.
47. **K. Tanaka, **J. Vilcáez**, *K. Sato. "Improvement of CO₂ geological storage efficiency by injection and production well design." *Energy Procedia*, Vol. 37, 2013, pp. 4591- 4597. GHGT-11. Kyoto-Japan. November 18-22, 2012. doi.org/10.1016/j.egypro.2013.06.367.
48. **Y. Kuramochi, Q. Fu, H. Kobayashi, M. Ikarashi, T. Wakayama, H. Kawaguchi, **J. Vilcáez**, H. Maeda, *K. Sato. "Electromethanogenic CO₂ conversion by subsurface-reservoir microorganisms." *Energy Procedia*, Vol. 37, 2013, pp. 7014-7020. GHGT-11. Kyoto-Japan. November 18-22, 2012. doi.org/10.1016/j.egypro.2013.06.636.
49. **M. Hara, H. Kobayashi, H. Kawaguchi, **J. Vilcáez**, *K. Sato. "Mechanism of Electromethanogenic Reduction of CO₂ by a Thermophilic Methanogen." *Energy Procedia*, Vol. 37, 2013, pp. 7006-7013. GHGT-11. Kyoto-Japan. November 18-22, 2012. doi.org/10.1016/j.egypro.2013.06.637.
50. **Q. Fu, Y. Onaka, H. Kobayashi, H. Kawaguchi, **J. Vilcáez**, *K. Sato. "Identification of new microbial mediators for electromethanogenic reduction of geologically stored carbon dioxide." *Energy Procedia*, Vol. 37, 2013, pp. 7021-7028. GHGT-11. Kyoto- Japan. November 18-22, 2012. doi.org/10.1016/j.egypro.2013.06.635.

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51. **P. Setiani, **J. Vilcáez**, N. Watanabe, A. Kishita, *N. Tsuchiya. "Sustainable and enhanced hydrogen production from biomass through sulfur redox cycle using georeactor." *Geothermal Resources Council Transaction*, Vol. 35, 2011, pp. 135-138. Geothermal Resources Council 35th Annual Meeting. San Diego-USA, October 23-26, 2011.
52. **A. Nuryadi, *A. Kishita, N. Watanabe, **J. Vilcáez**, N. Kawai. "EOR simulation by in situ nitrogen production via denitrifying bacteria and performance improvement by nitrogen

alternating surfactant injection.” *SPE Asia Pacific Oil & Gas Conference and Exhibition 2011*. Jakarta-Indonesia. September 20-22, 2011. doi.org/10.2118/147823-MS.

2010

53. ***J. Vilcáez**, T. Watanabe. “Antibacterial activity of gamma-irradiated chitosan against denitrifying bacteria.” *AIP Conference Proceedings*, Vol. 1251, 2010, pp. 161-164. 2nd International Symposium on Aqua Science, Water Resource and Low Carbon Energy. Sanya-China. December 7-10, 2009. doi.org/10.1063/1.3529265.

2009

54. *A. Kishita, **J. Vilcáez**, N. Watanabe. “Observation of the heavy crude oil dissolution behavior under supercritical condition of water.” *Proceedings of International Petroleum Technology Conference*, CD-ROM, IPTC 13898. Doha-Qatar. December 7-9, 2009. doi.org/10.2523/IPTC-13891-MS.
55. ***J. Vilcáez**, K. Suto, C. Inoue. “Studies on thermophilic bioleaching of chalcopryrite toward heap application.” *Advanced Materials Research*, Vol. 71-73, 2009, pp. 357-360. 18th International Biohydrometallurgy Symposium. Bariloche-Argentina. September 13-17, 2009. doi.org/10.4028/www.scientific.net/AMR.71-73.357.
56. ***J. Vilcáez**, C. Inoue. “Enhancement and inhibition of bioleaching chalcopryrite with thermophiles.” *Proceedings of the symposium of the Mining and Materials Processing Institute of Japan*, Spring-2009, pp. 215-216. Tokyo, Japan. March 26-28, 2009.

2008

57. ***J. Vilcáez**, C. Inoue. “Mathematical modeling of the thermophilic bioleaching of chalcopryrite.” *Proceedings of Computational Modelling in Mineral processing*, 2008, CD-ROM. Cape Town-South Africa. November 13-14.
58. ***J. Vilcáez**, K. Suto, C. Inoue. “Bioleaching of chalcopryrite with thermophiles: temperature-pH-ORP dependence.” In: Wang D.Z., et al. (Eds.) *Proceedings of XXIV International Mineral Processing Congress*, 2008, pp. 2779-2788. Beijing-China. September 23-28, 2008. ISBN: [9787030227119](https://doi.org/10.1007/9787030227119).
59. ***J. Vilcáez**, R. Yamada, C. Inoue. “Effect of pH reduction and ferric ion addition on the leaching of chalcopryrite at high temperatures.” In: Young C.A., et al. (Eds.), *Hydrometallurgy 2008, Proceedings of the Sixth International Symposium Honoring Robert S. Shoemaker*, 2008, pp. 980-988. Phoenix-USA. August 17-20, 2008. ISBN: [9780873352666](https://doi.org/10.1007/9780873352666).
60. ***J. Vilcáez**, K. Suto, C. Inoue. “Chemical leaching of chalcopryrite at high temperatures and low pH.” *Proceedings of the symposium of the Mining and Materials Processing Institute of Japan*, Spring-2008, pp. 185-186. Tokyo-Japan. March 27-29, 2008.

2007

61. ***J. Vilcáez**, K. Suto, C. Inoue. "Modeling the auto-thermal performance of a thermophilic bioleaching heap employing mesophilic and thermophilic microbes." *Advanced Materials Research*, Vol. 20-21, 2007, pp. 70-74. 17th International Biohydrometallurgy Symposium. Frankfurt am Main-Germany. September 2-5, 2007.
doi.org/10.4028/www.scientific.net/AMR.20-21.70.
62. ***J. Vilcáez**, K. Suto, C. Inoue. "Response of thermophiles to the simultaneous addition of sulfur and ferric ion." *Proceedings of 3rd International Symposium on Bio & Hydrometallurgy*, 2007, CD-ROM. Falmouth-UK. May 1-2, 2007.
63. ***J. Vilcáez**, K. Suto, C. Inoue. "Effect of temperature on the bioleaching of chalcopyrite using thermophiles." *Proceedings of the symposium of the Mining and Materials Processing Institute of Japan*, Summer-2007, pp. 44. Nagoya-Japan. September 25- 27, 2007.

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64. ***J. Vilcáez**, K. Suto, C. Inoue. "A numerical evaluation on the viability of heap thermophilic bioleaching." *AIP Conference Proceedings*, Vol. 898, 2007, pp. 217-222. 4th International Workshop on Water Dynamics. Sendai-Japan. November 7-8, 2006.
doi.org/10.1063/1.2721284.

ABSTRACTS IN CONFERENCE PROCEEDINGS as Professor at Oklahoma State University, since 2025.8

***Denotes corresponding author – PI, **Denotes my student**

2025

1. ****S. Senevirathna, *J. Vilcáez**. "Stochastic Modeling and Pore Scale Simulation of Fluid Flow for Permeability Predictions in Carbonates" *GSA Connects 2025*. San Antonio, Texas, USA, 19-22 October 2025. Poster presentation. doi.org/10.1130/abs/2025AM-5590.
2. ****M. Elshebli, *J. Vilcáez**. "Recovering lithium and cobalt from petroleum produced water using dolomite: pH, temperature, and surface area factors" *GSA Connects 2025*. San Antonio, Texas, USA, 19-22 October 2025. Poster presentation. doi.org/10.1130/abs/2025AM-4800.
3. ****C. Unigwe, *J. Vilcáez**. "Dolomite filtration of lithium and cobalt from petroleum produced water" *GSA Connects 2025*. San Antonio, Texas, USA, 19-22 October 2025. Poster presentation. doi.org/10.1130/abs/2025AM-6475.

ABSTRACTS IN CONFERENCE PROCEEDINGS as Associate Professor at Oklahoma State University, 2020-2025.7***Denotes corresponding author – PI, **Denotes my student****2024**

4. **E. Chowdhury, ***J. Vilcáez**. “Biogenic H₂ production in depleted oil reservoirs used for geologic carbon storage”. AGU 2024. Washington D.C., USA, 9-13 December 2024. Poster presentation.
5. **M. Elshebli, ***J. Vilcáez**. “Estimating zeta potential in dolomite-subsurface brine system for critical metal recovery from Oil Field Brine.” *GSA Connects 2024*. Anaheim, California, USA, 22-23 September 2024. Poster presentation.
6. ***J. Vilcáez**, Emranul Chowdhury. “Modeling and simulation of hydrogen storage in depleted oil reservoirs under biotic conditions.” *GSA 2024 Joint North-Central and South-Central Section Meeting*. Springfield, Missouri, USA, 21-23 April 2024. Poster presentation.
7. **C. Unigwe, ***J. Vilcáez**. “Feasibility of critical metals recovery from petroleum produced water by dolomite.” *GSA 2024 Joint North-Central and South-Central Section Meeting*. Springfield, Missouri, USA, 21-23 April 2024. Oral presentation.

2023

8. O. Ishola, ***J. Vilcáez**. “The significance of pore throat length in pore-scale fluid flow from the perspective of boundary layer theory.” *GSA South-Central Section Meeting*. Stillwater, Oklahoma, USA, March 2023. Poster presentation.
9. **K. H. Omar, ***J. Vilcáez**. “Dolomite filtration: a new method of removing toxic metals and metalloids from petroleum produced water.” *GSA South-Central Section Meeting*. Stillwater, Oklahoma, USA, March 2023. Oral presentation.

2022

10. **K. H. Omar, ***J. Vilcáez**. “Removal of toxic metals from petroleum produced water by dolomite filtration.” *American Geophysical Union (AGU)*, Fall Meeting 2022. Chicago, Illinois, USA. December 12- 16, 2022. Online poster presentation.
11. *A. Arshad, A. Mirchi, **J. Vilcáez**. “Reconstructing gap-filled groundwater level database for defective observational wells in the Irrigated Indus Basin.” *American Geophysical Union (AGU)*, Fall Meeting 2022. Chicago, Illinois, USA. December 12-16, 2022. Poster presentation.
12. **O. Ishola, ***J. Vilcáez**. “A numerical investigation into the effect of pore shapes on single-phase flow through heterogenous porous media.” *American Geophysical Union (AGU)*, Fall

Meeting 2022. Chicago, Illinois, USA. December 12-16, 2022. Poster presentation.

13. ***J. Vilcáez** ****V. Ezennubia**. “Physicochemical controls of methanogenic oil degradation from petroleum produced water.” *American Geophysical Union (AGU)*, Fall Meeting 2022. Chicago, Illinois, USA. December 12-16, 2022. Oral presentation.
14. ****O. Ishola**, ***J. Vilcáez**. “A novel stochastic pore-scale simulation approach for permeability prediction in heterogeneous porous media from MICP and/or micro-CT data.” *Geological Society of America (GSA)*, Annual meeting 2022. Denver, Colorado, USA. October 9-12, 2022. Oral presentation.
15. ****K. H. Omar**, ***J. Vilcáez**. “Removal of a mixture of toxic metals from petroleum produced water by dolomite.” *Association of Environmental & Engineering Geologists (AEG)*, 65th Annual meeting 2022. Las Vegas, Nevada, USA. September 12-17, 2022. Oral & poster presentations.
16. ***J. Vilcáez**. “Carbon Utilization in Depleted Oil Reservoirs for Enhancing Oil Recovery as Methane.” *American Association of Petroleum Geologists (AAPG)*, Carbon Capture, Utilization, and Storage (CCUS) Conference. Houston, Texas, USA. March 29- 31, 2022. Oral presentation.
17. ****K. H. Omar**, ***J. Vilcáez**. “Removal of a mixture of toxic metals from petroleum produced water by dolomite.” *Geological Society of America (GSA)*, South-Central Section – 56th Annual meeting 2022. McAllen, Texas, USA. March 14-15, 2022. Oral presentation.
18. ****V. Ezennubia**, ***J. Vilcáez**. “Methanogenic degradation of dissolved oil hydrocarbons in petroleum produced water.” *Geological Society of America (GSA)*, South-Central Section – 56th Annual meeting 2022. McAllen, Texas, USA. March 14-15, 2022. Oral presentation.

2021

19. ****K. H. Omar**, ***J. Vilcáez**. “Removal of mixture heavy metals and metalloids from petroleum produced water by dolomite filtration.” *American Association of Petroleum Geologists (AAPG)*, 2021 Mid-Continent Section Convention. Tulsa, Oklahoma, USA. October 3-5, 2021. Poster presentation.
20. ****O. Ishola**, **T. Benson**, ***J. Vilcáez**. “Insights from machine learning application to flow prediction in highly heterogeneous porous media.” *International Meeting for Applied Geosciences & Energy 2021 (IMAGE’21)*. Colorado, Denver, USA. September 26-29, 2021. Oral presentation.
21. ****O. Ishola**, **T. Benson**, ***J. Vilcáez**. “Application of Machine Learning to Predict Hydraulic Tortuosity of Highly Heterogeneous Porous Media.” *American Chemical Society (ACS)*, Spring Meeting 2021. Online Everywhere, USA. April 5-30, 2021. Oral presentation.
22. **M. Culver**, **G.W. Sewell**, ***T. Halihan**, **J. Vilcáez**. Evaluating karst groundwater connections

for enhanced aquifer recharge. *Geological Society of America (GSA)*, Joint 55th Annual North-Central / 55th Annual South-Central Section online meeting 2021. April 18-20, 2021. Oral presentation.

2020

23. ***J. Vilcáez**. "Treatment of produced water for dissolved oil and heavy metals: Methanogenic degradation coupled to dolomite filtration." *American Geophysical Union (AGU)*, Fall Meeting 2020. Online Everywhere, USA. December 1-17, 2020. Oral presentation.
24. ****O. Ishola, *J. Vilcáez**. "A pore-scale numerical investigation on the impact of heterogeneity in predicting flow properties of carbonate rocks." *American Geophysical Union (AGU)*, Fall Meeting 2020. Online Everywhere, USA. December 1-17, 2020. Poster presentation.
25. ****K.H. Omar, *J. Vilcáez**. "A new dolomite filtration method to remove heavy metals from produced water." *American Geophysical Union (AGU)*, Fall Meeting 2020. Online Everywhere, USA. December 1-17, 2020. Poster presentation.
26. ****O. Ishola, *J. Vilcáez**. "A stochastic pore-scale numerical approach to permeability and tortuosity prediction in carbonate systems." *Geological Society of America (GSA)*, Annual Meeting 2020. Connects Online, USA. October 26-30, 2020. Oral presentation.
27. Ibukun Bode-Omoleye*, **J. Vilcáez**, M. Grammer. «Three-Dimensional investigation of pore architecture characteristics and variation in carbonate-Rich mudrocks: Insights into the controls of pore development." *2020 AAPG Annual Convention & Exhibition Online*, September 29 - October 1, 2020.

ABSTRACTS IN CONFERENCE PROCEEDINGS as Assistant Professor at Oklahoma State University, 2014-2019.7

***Denotes corresponding author – PI, **Denotes my student**

2019

28. ***J. Vilcáez**. "A new economic treatment method of produced water for dissolved oil and heavy metals." *American Chemical Society (ACS)*, Midwest Regional Meeting (MWRM). Wichita, Kansas, USA. October 16-19, 2019. Oral presentation.
29. ***J. Vilcáez, **B. Shabani**. "Beneficial use of produced water in depleted oil reservoirs: in situ crude oil conversion to methane gas." *Geological Society of America (GSA)*, Annual Meeting 2019. Phoenix, Arizona, USA. September 22-25, 2019. Oral presentation.

2018

30. **B. Shabani, **J. Vilcáez**. “A new TOUGHREACT module to simulate geological carbon storage under biotic conditions.” *Geological Society of America (GSA)*, Annual Meeting 2018. Indianapolis, Indiana, USA. November 4-7, 2018. Poster Presentation.
31. ***J. Vilcáez**. “Field-scale simulation of barium transport in Class II wastewater disposal wells.” *Geological Society of America (GSA)*, Annual Meeting 2018. Indianapolis, Indiana, USA. November 4-7, 2018. Oral presentation.
32. A. Yadav, I. F. Farag, **J. Vilcáez**, N. H. Youssef, and M. S. Elshahed. “Enrichment and genomic analysis of a novel bacterial phylum from formation waters in a tertiary oil reservoir in Cushing, OK.” *Annual Symposium of the Department of Microbiology and Molecular Genetics*, Oklahoma State University. Stillwater, Oklahoma. April 27, 2018. Poster presentation.
33. ***J. Vilcáez**, **P. Ebrahimi, **B. Shabani. “Coupling the disposal of CO₂ and petroleum produced water: A new MEOR method.” *Geological Society of America (GSA)*, South-Central Section – 52nd Annual meeting 2018. Little Rock, Arkansas, USA. March 12-13, 2018. Oral presentation.

2017

34. ***J. Vilcáez**. “Disposal of produced water into depleted oil reservoirs: economic use and risk of USDW pollution”. *National Ground Water Association (NGWA)*, Summit 2017. Nashville, Tennessee, USA. December 4-7, 2017. Oral presentation.
35. **P. Ebrahimi, ***J. Vilcáez**. “Transport of barium through dolomite rocks under the presence of guar gum and brine salinities of hydraulic fracturing wastewater.” *American Geophysical Union (AGU)*, Fall Meeting 2017. New Orleans, Florida, USA. December 11- 15, 2017. Poster presentation.
36. **B. Shabani, ***J. Vilcáez**. “An improved TOUGH2 module to simulate geological CO₂ storage in saline aquifers.” *Geological Society of America (GSA)*, Annual Meeting 2017. Seattle, Washington, USA. October 22-25, 2017. Poster presentation.
37. **P. Ebrahimi, ***J. Vilcáez**. “Experimental and modeling results of barium transport through dolomite under the presence of high salinity and guar gum of fracturing wastewater.” *American association of petroleum geologist (AAPG)*, 2017 Mid-continent section meeting. Oklahoma City, Oklahoma, USA. October 2-3, 2017. Poster presentation.
38. ***J. Vilcáez**. “Transport of heavy metals through shale rock fractures due to the injection of fracturing fluids: modeling and simulation.” *Geological Society of America (GSA)*, South-Central Section - 51st Annual meeting 2017. San Antonio, Texas, USA. March 12-14, 2017. Oral presentation.

2016

39. ***J. Vilcáez**, **J. York, **T. Seabeck. “Stimulation of microbial methanogenesis from oil and CO₂ in the Cushing oil field.” *American Geophysical Union (AGU)*, Fall Meeting 2016. San Francisco, California, USA. December 12-16, 2016. Poster presentation.
40. **P. Ebrahimi, ***J. Vilcáez**. “Effect of guar gum on the mobility of barium in disposal wells of the Arbuckle formation.” *Geological Society of America (GSA)*, Annual Meeting 2016. Denver, Colorado, USA. September 25-28, 2016. Oral presentation.
41. **B. Shabani, ***J. Vilcáez**. “Prediction of CO₂-CH₄-H₂S-N₂ gas mixtures solubility in brine using a non-iterative fugacity-activity model relevant to MEOR.” *Geological Society of America (GSA)*, Annual Meeting 2016. Denver, Colorado, USA. September 25-28, 2016. Oral presentation.
42. ***J. Vilcáez**. “Reactive transport modeling of biocide reagents in unconventional hydrocarbon reservoirs.” *American Chemical Society (ACS)*, 251st National Meeting & Exposition. San Diego, California, USA. March 14-17, 2016. Oral presentation.

2015

43. ***J. Vilcáez**. “Microbial methanogenesis in oil reservoirs subjected to the injection of CO₂.” *Geological Society of America (GSA)*, Annual Meeting 2015. Baltimore, Maryland, USA. November 1-4, 2015. Oral presentation.
44. ***J. Vilcáez**. “Pore-scale simulation of transport properties of carbonate rocks using nanoscale FIB-SEM 3D images.” *Geological Society of America (GSA)*, Annual Meeting 2015. Baltimore, Maryland, USA. November 1-4, 2015. Oral presentation.
45. ***J. Vilcáez**. “Stimulating effect of protein-rich matter on the biogenic conversion of CO₂ to CH₄.” *American Chemical Society (ACS)*, 249th National Meeting & Exposition. Denver, Colorado, USA. March 22-26, 2015. Oral presentation.

2014

46. ***J. Vilcáez**. “Mathematical modeling as a tool to assess microbial community responses to CO₂ injection.” *American Geophysical Union (AGU)*, Fall Meeting 2014. San Francisco, California, USA, December 15-17, 2014. Poster presentation.
47. ***J. Vilcáez**, L. Li, K. Sato. “Horizontal wells placement optimization for CO₂ geological storage in confined aquifers subjected to brine recycling.” *Japan Geosciences Union (JGU)*, Meeting 2014, Yokohama, Japan. April 28-May 2, 2014. Oral presentation.

ABSTRACTS IN CONFERENCE PROCEEDINGS prior to joining Oklahoma State University

*Denotes corresponding author – PI

2012

48. ***J. Vilcáez**. “Restoration of methane gas deposits through stimulation of indigenous methanogens: modeling and simulation.” *JOGMEC-TRC Week 2012*, toward actualization of a pilot project focused on the technology of microbial methane generation. Tokyo, Japan. November 28, 2012. Oral presentation.

2010

49. ***J. Vilcáez**, L. Li, S. Hubbard, T. Hazen. “Biodegradation of Deep-Sea Oil Spill at the Gulf of Mexico: An Estimate of Half Lifetime.” *American Geophysical Union (AGU)*, Fall Meeting 2010. San Francisco, California, USA. December 13-17, 2010. Poster presentation.

INVITED SEMINARS AND PRESENTATIONS

2025

1. School of Civil and Environmental Engineering, Oklahoma State University. Stillwater, Oklahoma. September 12, 2025. “Environmental biomineralization of energy and mineral earth resources”. Seminar series.
2. Boone Pickens School of Geology, Oklahoma State University. Stillwater, Oklahoma. February 15, 2025. “Fulbright U.S. Scholar program for Bolivia: Mining of critical metals from brines for energy – Our research pathway on this topic”. Seminar series.

2024

3. Universidad Privada Boliviana. Cochabamba, Bolivia, October 10, 2024, “Water-Energy-CO₂ nexus: toward a net-zero emissions energy transition”. Hydrogeology Workshop.
4. Universidad Privada Boliviana. Cochabamba, Bolivia, October 2, 2024, “Water-Energy-CO₂ nexus: toward a net-zero emissions energy transition” Colloquium #6 VRI.

2023

5. Faculty of Technology, University of Saint Francis Xavier. Sucre, Bolivia. July 11, 2023, “Academic discussion of postgraduate studies” Seminar series.

2022

6. Oklahoma State University Petroleum Engineering Graduate Seminar. Stillwater, Oklahoma. November 9, 2022. "Carbon capture, utilization, and storage (CCUS): multiphase biogeochemical reactive transport in geological carbon storage sites". Seminar series.
7. The summer Oklahoma Water Resources Center Water Research Advisory Board meeting. Oklahoma State University, Stillwater, Oklahoma. August 12, 2022. "A new dolomite filtration technology to remove heavy metals and NORM from produced water". Report (Online).

2021

8. New Seminar Series: Produced Water and Reuse. Oklahoma Water Resources Center. Oklahoma State University, Stillwater, Oklahoma. August 13, 2021. "A new methanogenic biodegradation method to remove oil from petroleum produced water". Seminar series (Online).

2019

9. American Chemical Society (ACS) Midwest Regional Meeting (MWRM). Wichita, Kansas. October 17, 2019. "A new economic treatment method of produced water for dissolved oil and heavy metals". Invited speaker.
10. Department of Petroleum and Natural Gas Engineering, Bolivian Private University (UPB). Cochabamba, Bolivia. July 6, 2019. "Water-Energy-CO₂ Nexus". Seminar series.
11. Department of Petroleum and Natural Gas Engineering, University of Saint Francis Xavier. Monteagudo, Bolivia. July 1, 2019. "Water-Energy-CO₂ Nexus". Seminar series.

2018

12. Department of Geological Sciences, Texas Cristian University, Fort Worth, Texas. November 30, 2018. "Beneficial use and safe disposal of petroleum produced water in Oklahoma". Seminar series.
13. Department of Geology, Kansas State University, Manhattan, Kansas. March 1, 2018. "Computational modeling of subsurface bio-hydro-geochemical processes". Seminar series.

2017

14. Department of Microbiology and Molecular Genetics, Oklahoma State University. Stillwater, Oklahoma. February 20, 2017. "Stimulation of microbial methanogenesis in depleted oil reservoirs". Seminar series.

2016

15. Department of Geosciences and Geological and Petroleum Engineering, Missouri

University of Science and Technology. Rolla, Missouri. November 28, 2016. “Coupling geological carbon storage (GCS) and microbial enhanced hydrocarbon recovery (MEHR) in depleted oil reservoirs”. Seminar series.

16. Department of Geography, Geology and Planning, Missouri State University. Springfield, Missouri. November 18, 2016. “Bio-geochemical reactive transport modeling of geological CO₂ storage in depleted oil reservoirs”. Seminar series.
17. U.S. Environmental Protection Agency (EPA) Seminar Series, R.S. Kerr Environmental Research Center. Ada, Oklahoma. May 11, 2016. “Reactive transport modeling of biocide treatments in unconventional hydrocarbon reservoirs”. Seminar series.
18. The University of Texas Rio Grande Valley (UTRGV) Oil and Gas Conference. McAllen, Texas. March 23-25, 2016. “Restoration of depleted CH₄ gas deposits via microbial methanogenesis driven by the injection of CO₂ and stimulating nutrients”. Invited speaker.

2015

19. Annual meeting of Geological Society of America 2015. Baltimore, Maryland. November 1-4, 2015. “Microbial methanogenesis in oil reservoirs subjected to the injection of CO₂”. Invited speaker.

2014

20. Boon Pickens School of Geology Seminar Series, Oklahoma State University. Stillwater, Oklahoma. October 17, 2014. “Reactive transport modeling of CO₂ geological storage: methanogenesis from CO₂”. Seminar series.

2012

21. Japan Oil, Gas and Metals National Corporation (JOGMEC)-TRC Week 2012, Tokyo-Japan. November 28, 2012. “Restoration of methane gas deposits through stimulation of indigenous methanogens: modeling and simulation”. Invited speaker.

CHAIRING CONFERENCE SESSIONS

2026

- Chair of “Advances in Understanding and Predicting the Geochemical and Microbiological Conversion and Transport of Hydrogen in Deep Geological Repositories” at GSA Connects 2026. Denver, Colorado, USA, October 2026.

2023

- Chair of “From Pore- to Field-Scale Petrophysical and Elastic Characterization of Rocks and

Fluid Flow Simulations” at GSA South-Central Section Meeting. Stillwater, Oklahoma, USA, March 2023.

2022

- Chair of “Petroleum-Produced Water” at GSA South-Central Section Meeting. McAllen, Texas, USA, March 2022.

2018

- Co-chair of “Hydrogeology and Water Quality of the Mid-Continent U.S. and Mexico” at GSA South-Central Section – 52nd Annual meeting. Little Rock, Arkansas, USA. March 2018.

2015

- Chair of “Advances in Groundwater Modeling” at GSA 2015 Annual Meeting & Exposition. Baltimore, Maryland, USA. November 2015.
- Co-chair of “Hydrology, Geochemistry, and Environment Geoscience” at GSA South-Central Section – 49th Annual meeting. Stillwater, Oklahoma, USA, March 2015.

2013

- Chair of “Mining of unconventional energy and mineral resources in Chile and Japan” at UTokyo Forum Global Emergence of Frontier Knowledge. Santiago, Chile, November 2013.

INVITED RESEARCH GRANT REVIEWER/PANELIST

2025

- Reviewer: National Science Foundation (NSF), Water, Landscape, and Critical Zone Processes (WaLCZ) Program - Proposal No. 2548718. October 15, 2025.
- Panelist & Reviewer: National Science Foundation (NSF), Life and Environments Through Time (LET). Proposals No 2449035, 2452380, 2516257, 2449550, 2450531, and 2501963. May 13 – May 15, 2025.
- Reviewer: French National Research Agency (ANR) - CE50-Basic Energy Science. Proposal No 35020_TRAFIC. April 30, 2025.

2024

- Reviewer: Department of Energy (DOE), The Office of Basic Energy Sciences (BES) – Proposal No. 0000285607. August 28, 2024.

2023

- Reviewer: National Science Foundation (NSF), Division of Earth Sciences, Geobiology and

Low-Temperature Geochemistry Program (GG) - Proposal No. 2338737. November 6, 2023.

- Reviewer: National Science Foundation (NSF), Division of Earth Sciences, NSF Earth Sciences Postdoctoral Fellowships (EAR-PF) - Proposal No. 2305556. February 10, 2023.

2022

- Reviewer: National Science Foundation (NSF), Division of Earth Sciences, Hydrologic Sciences Program (EAR/HS) - Proposal No. 2231272. August 30, 2022.
- Panelist & Reviewer: National Science Foundation (NSF), EPSCoR Research Infrastructure Improvement (RII) Track-4 - Proposals No. 2229019, 2229080, 2229371, 2229698, 2229736, 2229770. July 14-15, 2022.
- Reviewer: National Science Foundation (NSF), Division of Earth Sciences, Hydrologic Sciences Program (EAR/HS) - Proposal No 2202104. March 28, 2022.

2021

- Reviewer: National Science Foundation (NSF), Division of Earth Sciences, Geoinformatics Program (EAR/GI) - Proposal No. 2149090. November 7, 2021.

2019

- Panelist/Reviewer: National Science Foundation (NSF), Directorate of engineering, Chemical, Bioengineering, Environmental and Transport Systems, Environmental Engineering Program (CBET-EE). March 1, 2019.

2018

- Reviewer: American Chemical Society (ACS), Petroleum Research Fund. February 22, 2018.

2017

- Reviewer: Geological Sciences & Engineering, Missouri University of Science & Technology. 2016, 2017.

INVITED EXTERNAL TENURE FILE & GRADUATE PROGRAM REVIEWER

2024

- External graduate program reviewer: Department of Geosciences, Texas Tech University (Spring 2024)

2022

- Tenure file reviewer: Department of Geosciences, Mississippi State University (Fall 2022)
- Tenure file reviewer: Department of Geology, Kansas State University (Fall 2022)

INVITED JOURNAL REVIEWER

2009 – 2013

- Bioresources Technology (IF 5.8)
- Journal of Hazardous Materials (IF 6.4)
- Environmental Technology (IF 1.7)
- Industrial and Engineering Chemistry Research (IF 3.1)
- Hydrometallurgy (IF 3.3); 3 manuscripts
- Energy & Fuels (IF 3.0)
- Journal of Petroleum Science and Engineering (IF 2.4)

22.

2014

- Environmental Science & Technology (IF 6.4)

2016

- Energy & Fuels (IF 3.0)
- Geochemical Transactions (IF 1.7)
- Journal of Natural Gas Science & Engineering (IF 3.84)

2017

- Geochimica et Cosmochimica Acta (IF 4.7)
- Hydrometallurgy (IF 3.3)
- ACS Sustainable Chemistry & Engineering (IF 6.1)

2018

- Hydrometallurgy (IF 3.3)
- Journal of Natural Gas Science & Engineering (IF 3.84); 3 manuscripts
- Scientific Reports (IF 4.6)
- Frontiers in Microbiology (IF 4.0)
- Water Resources Research (IF 4.4)
- Advances in Water Resources (IF 3.5)
- Energy & Fuels (IF 3.0)
- Fuel (IF 4.9)

2019

- Water Resources Research (IF 4.4)
- Catalysis Today (IF 4.9)
- Energy & Fuels (IF 3.0)
- Euro-Mediterranean Journal for Environmental Integration (IF N/A)
- Journal of Natural Gas Science & Engineering (IF 3.84)

2020

- Hydrogeology Journal (IF 3.3)
- Fuel (IF 7.4); 2 manuscripts
- Journal of Natural Gas Science & Engineering (IF 5.285); 2 manuscripts
- Science of the Total Environment (IF 9.8)
- Water Research (IF 12.8)

2021

- AIChE Journal (IF 3.62)
- Chemical Geology (IF 4.015)

2022

- Chemical Engineering Journal (IF 13.27); 2 manuscripts
- Fuel (IF 7.4)
- Journal of Natural Gas Science & Engineering (IF 3.84)
- Journal of Water Process Engineering (IF 5.48)

2023

- Journal of Natural Gas Science & Engineering (IF 5.285)
- Science of the Total Environment (IF 9.8)
- Journal of Energy Storage (IF 9.4)
- Fuel (IF 7.4)
- Water Research (IF 12.8)

2024

- Engineering Geology (IF 7.4)
- Resources, Conservation & Recycling (IF 13.2)
- Minerals Engineering (IF 4.8)
- Water Research (IF 12.8)
- Science of the Total Environment (IF 9.8)
- Hydrogeology Journal (IF 3.3)

2025

- Scientific Reports (IF 3.9)
- Journal of Hydrogeology (IF 6.3); 2 manuscripts
- Journal of Energy Storage (IF 9.4)

2026

- Environmental Science & Technology (IF 11.3)

23.

EDITORIAL BOARD

- 2015 - Present Austin Journal of Earth Science

SERVICE TO THE SCHOOL AND COLLEGE

- College of Arts and Science Retention (CAS) Reappointment, Promotion and Tenure (RPT) Committee (Fall 2025 – Present).
- Personnel committee (Fall 2025 – Spring 2027)
- Preliminary examination committee (Fall 2023, Spring 2024)
- Reviewer of the Holistic Science Prizes for faculty and students (Spring 2024)
- Personnel committee (Fall 2023 – Spring 2024)
- Energy Transition Geosciences search committee (Spring 2024)
- Graduate Director (Fall 2021 – Summer 2024)
- Hydrogeology search committee (Fall 2021)
- Hydro-geochemistry search committee (Fall 2018, Fall 2019)
- Reviewer for the annual President's Cup (Fall 2018)
- Paleontology search committee (Fall 2017)
- Graduate committee (Fall 2016 – Spring 2024)
- Student enrichment fund committee, (Fall 2014 – Spring 2024; Chair 2017 – Spring 2024)
- A&S Faculty council college scholarship committee (Fall 2015 - Fall 2018)
- Personnel committee (Fall 2017 – Fall 2018)
- Safety/ergonomics committee (Fall 2017 – Spring 2022)

PROFESSIONAL DEVELOPMENT

- CAS General Education Teaching Workshop. Stillwater, Oklahoma, USA. August 12, 2019.
- Alan Alda Science Communication Workshop for STEM scientists. Stillwater, Oklahoma, USA. January 9-10, 2018.
- 2015 NSF CAREER Proposal Writing Workshop, National Science Foundation. Boston, Massachusetts, USA. April 27 - 28, 2015.
- Early Career Geoscience Faculty Workshop Program, College of William and Mary. Williamsburg, Virginia, USA. July 26 - 31, 2015.
- Scholarship of Teaching and Learning (SoTL), Institute for Teaching & Learning Excellence (ITLE), Oklahoma State University. Stillwater, Oklahoma, USA. Spring 2015.
- Grant Writers' Seminar and Workshops, Oklahoma State University. Stillwater, Oklahoma, USA. October 14, 2015.

ADVISEES

Oklahoma State University

Current Ph.D. Students

- **Shaluka Senevirathna:**
Pore-scale machine learning modeling of multiphase flow in carbonate rocks.
Fall 2024 - present
- **Marwa Elshebli:**
Mining of Lithium from brine deposits using dolomite.
Fall 2023 - present
- **Chinanu Unigwe:**
Critical metals recovery from petroleum produced water using dolomite.
Spring 2023 - present
- **Abather Alhallaf:**
Machine learning modeling of tidal waves in the Arab coast.
Spring 2021 - present

Past Ph.D. Students

- **Khalid Omar:**
Chemical and physical controls of toxic metals removal from petroleum produced water by dolomite filtration. ([Read](#))
Fall 2019 - Spring 2023. **Completed**
Current position: EHS Engineer at Imperium 3 New York, Inc.
- **Olubukola Ishola:**

New Stochastic Pore-Scale Simulation and Machine Learning Approach to Predicting Permeability and Tortuosity of Heterogeneous Porous Media. ([Read](#))

Fall 2019 - Spring 2023. **Completed**

Current Position: AI/ML Engineer at GSK.

- **Babak Shabani:**

Beneficial use of produced water and CO₂ in depleted oil reservoirs: In-situ microbial conversion of crude oil to CH₄. ([Read](#))

Fall 2015 - Spring 2019. **Completed**

Past position: Research Scientist at Indiana Geological & Water Survey. Indiana University. Bloomington.

Current position: Geoscientists at INTERA Incorporated

- **Pouyan Ebrahimi:**

Studies on the mobility and transport of barium present in unconventional petroleum produced water disposed into saline aquifers. ([Read](#))

Fall 2014 - Spring 2018. **Completed**

Past position: Postdoctoral Scholar at the Department of Geological and Petroleum Engineering, Missouri University of Science & Technology.

Current position: Computer Engineer/Environmental Engineer at LG&E and KU Energy LLC

Oklahoma State University

Past Master Students

- **Emranul Chowdhury:**

Biogenic hydrogen production from residual oil in geological carbon storage sites. ([Read](#)).

Spring 2023 – Fall 2024

Current position: PhD student, Virginia Tech University

- **Valentine Ezennubia:**

Removal of Oil Hydrocarbons from Petroleum Produced Water by Indigenous Methanogenic Oil Degrading Microbial Communities. ([Read](#))

Spring 2021 - Fall 2022

Current position: Hybrid Mud logger II at Diversified Logging, LLC

- **Joshua York:**

Stimulation of microbial methanogenesis from CO₂ and oil in the Cushing oil field.

Fall 2015 - Spring 2017

- **Tristan Seabeck:**

Reactive transport simulation of CO₂ injection into depleted carbonate oil reservoirs.

Spring 2015 - Fall 2016

- **Kyle Obenberger:**

Impact of CO₂ injection on the petrophysical properties of clay bearing porous media.

Fall 2014 - Fall 2015

- **Jesse Blumenthal:**

Fate and transport of biocide reagents (Glutaraldehyde) in tight porous media at deep geological formation conditions.

Fall 2014 - Spring 2015

Oklahoma State University

Undergraduate Students

- **Daniela Ferguson:**
Treatment of produced water for dissolved oil.
Spring 2021
- **Katie Spencer:**
Mobility of glutaraldehyde in hydraulically fractured shale gas reservoirs.
Fall 2017
- **Toby Williams:**
Reactive transport of biocide reagents through shale gas and dolomite rocks.
Fall 2015 - Spring 2016

University of Tokyo (co-advising)

Master Students

- **Omer Ishag:**
Uncertainty analysis of maximum sustainable injection rate in CO₂ geological storage.
Spring 2012 - Spring 2014
- **Hualong Li:**
Global optimization of well placement for CO₂ injection and brine production based on an iterative Latin hypercube sampling method.
Spring 2012 - Spring 2014
- **Vitsarut Attavitkamthorn:**
Metamodeling of gas flooding EOR in Pattani Basin, Thailand.
Spring 2011 - Spring 2013

ACCOMPLISHMENTS OF ADVISEES at Oklahoma State University

2026

- E. Russell Lloyd Scholarship through the West Texas Geological Foundation (WTGF) (\$1,000) (Marwa Elshebli)
- E. Russell Lloyd Scholarship through the West Texas Geological Foundation (WTGF) (\$1,000) (Chinanu Unigwe)
- Geoscience Foundation of Tulsa Outstanding Geoscience Student Award (\$1,500) (Marwa Elshebli)

2025

- Geological Society of America (GSA) - Alexander & Geraldine Wanek Fund (\$3,000) (Marwa Elshebli)
- West Texas Geological Foundation (WTGF) - John Emery Adams Scholarship (\$2,000) (Marwa Elshebli)
- Oklahoma Geological Foundation Graduate Fellowship (\$2,500) (Shaluka Senevirathna)
- Geoscience Foundation of Tulsa Outstanding Geoscience Student Award (\$1,500) (Shaluka Senevirathna)
- Geoscience Foundation of Tulsa Outstanding Geoscience Student Award (\$1,500) (Chinanu Unigwe)

2024

- South-Central Section of the Geological Society of America travel grant (\$300) (Marwa Elshebli)
- Texas Geological Foundation Adams Scholarship (\$1,000) (Chinanu Unigwe)
- Texas Geological Foundation Women in GeoScience (\$3,000) (Marwa Elshebli)
- Oklahoma Geological Foundation Geology Fellowship (\$5,000) (Chinanu Unigwe)
- Oklahoma Geological Foundation Geology Fellowship (\$3,000) (Emranul Chowdhury)
- South-Central Section of the Geological Society of America travel grant (\$250) (Chinanu Unigwe)

2023

- Department of Mathematics and College of Arts and Sciences, Oklahoma State University. Holistic Science Prize (\$3,000 doctoral prize) (Olubukola Ishola)

2022

- Society of Petrophysicists and Well Log Analysts (SPWLA) Foundation Award, in the amount of \$1,500. (Olubukola Ishola)
- Society of Exploration Geophysicists (SEG) scholarship for the 2022-2023 academic year in the amount of \$7,309. (Olubukola Ishola)
- West Texas Geology Foundation (WTGF) - John Emery Adams Scholarships in the amount of \$4,000. (Olubukola Ishola)
- Association of Petroleum Geologist Foundation (AAPG) Grants-in-Aid award, in the amount of \$3,000. (Khalid H. Omar)
- Outstanding Geoscience Student Award from the Geoscience Foundation of Tulsa, in the amount of \$1,900. (Olubukola Ishola)
- Dr. Homer & Mrs. May Tang Graduate Fellowship in the amount of \$1,900. (Olubukola Ishola)

2021

- Second Best Poster Presentation Award, American Association of Petroleum Geologists (AAPG) Mid-Continent Section Convention. (Khalid H. Omar)
- Society of Petrophysicists and Well Log Analysts (SPWLA) Foundation Award, in the

amount of \$1,500. (Olubukola Ishola)

- Oklahoma Geology Foundation (OGF) Fellowship, in the amount of \$2,500. (Khalid H. Omar)
- Oklahoma Geology Foundation (OGF) Fellowship, in the amount of \$2,500. (Olubukola Ishola)

2020

- American Geophysical Union (AGU) Virtual Student Travel Grant, in the amount of \$1,000. (Olubukola Ishola)
- General Scholarship sponsored by the Oklahoma City Section of Society of Petroleum Engineers (SPE), in the amount of \$1,000. (Olubukola Ishola)
- American Association of Petroleum Geologist Foundation (AAPG) Grants-in-Aid award, in the amount of \$3,000. (Olubukola Ishola)

2019

- Third-place prize award for app idea FlowCalc 1.0, Oklahoma State University's annual app competition, in the amount of \$500. (Olubukola Ishola)
- Oklahoma State University Holistic Science Prize. In the amount of \$5,000. (Babak Shabani)
- Oklahoma Water Resources Center Research Grant, in the amount of \$5,000. (Babak Shabani)

2018

- Best Presentation Award, 37th Annual Technical Conference, National Association of Black Geologists (NABG). (Pouyan Ebrahimi)
- Geological Society of America (GSA) Graduate Student Research Grant, in the amount of \$2,000. (Babak Shabani)
- Recognized as the Outstanding Graduate Teaching Assistant, Oklahoma State University Graduate College. (Pouyan Ebrahimi)

2017

- Society of Petrophysics and Well Logging Analysts Research Grant (SPWLA), in the amount of \$3,500. (Pouyan Ebrahimi)
- Graduate Student Research Grant, Geological Society of America (GSA), in the amount of \$1,325. (Pouyan Ebrahimi)

2016

- Roberson Summer Research Fellowships/Grants, Oklahoma State University Graduate College, in the amount of \$4,000. (Pouyan Ebrahimi)
- Unconventional Resources Special Interest Group Scholarship (UR-SIG), in the amount of \$2,000. (Pouyan Ebrahimi)

DISSERTATION & THESIS COMMITTEE MEMBER

Oklahoma State University

Ph.D. Students

- Israel Momoh (Petroleum Engineering)
Proppant transport modeling in enhanced geothermal systems using CFD-DEM and physics-informed neural networks. Summer 2026 - present
- Godwin Mnyika (Geology)
Spring 2025 - present
- Evans Odunna (Petroleum Engineering)
Spring 2026 – present
- Prathamesh Sapale (Petroleum Engineering)
Fall 2025 - present
- Jon Fields (Geology)
Spring 2026 – present
- Omar Handy (Petroleum Engineering)
Spring 2026 – present
- Maryam Azari Rad (Geology)
Spring 2026 – present
- Peter Adetokunbo (Geology):
Dam embankment characterization and seepage detection at the Chimney Rock Dam OK. Fall 2024 – Spring 2025. Completed
- Jordon Massey (Geology):
Hydrological controls on pseudokarst in a permian sandstone siltstone aquifer, Oklahoma. Fall 2022 - present
- Prathamesh Sapale (Petroleum Engineering):
Screening Reservoirs in Oklahoma and Beyond for Enhanced Oil & Gas Recovery Using Novel Nitrogen-Assisted Nanofluid Systems.
Spring 2024 - present
- Silas Samuel (Geology):
Integrated post-stack seismic inversion, multi-attribute analysis, and machine learning for carbon storage.
Fall 2023 – Spring 2025. Completed
- Joshua Ademilola (Geology):
Geological and Geomechanical Modeling for CO₂ Sequestration and Enhanced Hydrocarbon Recovery in Offshore, Central Gulf of Mexico.
Fall 2023 – Summer 2025. Completed
- Arfan Arshad (Biosystems and Agricultural Engineering):
Understanding changes in terrestrial water storage and groundwater depletion using space observations, land-hydro models, and machine-learning.

- Fall 2020 - Summer 2024. Completed
- Sushobhan, Pradhan (Chemical Engineering):
Microfluidics based enhanced oil recovery (EOR).
Fall 2017 - Summer 2021. Completed
- Md Ibrahim (Integrative Biology):
Interactions of chloride in the toxicity, accumulation, and bio-reactivity of copper and silver in fish. Completed
Fall 2017 - Summer 2022. Completed
- Nelly Ruiz (Biosystems and Agricultural Engineering):
Assessing potential links between hydrocarbon production and reported water pollution in Oklahoma. Fall 2016 - Spring 2019. Completed
- Ibukunoluwa, Bode-Omoleye (Geology):
An integrated characterization of micro- to nano-porosity in carbonate rocks.
Spring 2015 - Summer 2019. Completed
- Rob Agnew (Environmental Sciences):
Degasification of groundwater.
Fall 2016 - Spring 2019. Completed.
- Liang Xu (Geology):
Morpho-tectonic analysis of the east African rift system.
Spring 2017 - Summer 2018. Completed.

Oklahoma State University

Master Students

- Daniel Duah-Boakye (Geology):
Impact of fault-controlled fluid pathways in 3D magnetotelluric inversion for geothermal sources
Fall 2024 – Spring 2026. Completed
- Ayush Joshi (Petroleum Engineering):
Investigation of Rock-fluid interactions using geomaterial microfluidics.
Fall 2021 - Spring 2023. Completed
- Madison Culver (Geology):
Production and laboratory testing of groundwater tracing particles.
Fall 2021-Spring 2023. Completed
- Peter Loree (Geology):
Qualifying classes of organic compounds within unprocessed produced water using H-NMR analysis.
Fall 2020 - Fall 2022. Completed
- Jordon Massey (Geology):
Hydrological controls on pseudokarst in a permian sandstone siltstone aquifer, Oklahoma.
Spring 2019 - Fall 2021. Completed
- Rupom, Bhattacharjee (Chemical Engineering):
Preparation of clay-coated glass surfaces for microfluidics-based study of clay-fluid

interaction.

Fall 2018 - Summer 2021. Completed

- Jhon Hager (Geology):
Evaluating macropore flow with temporal ERI in riparian areas.
Fall 2018 - Spring 2021. Completed
- Braden Hrencher (Geology):
Hydrologic Processes at interfaces cause changes in geophysical signatures.
Fall 2015 - Spring 2018. Completed
- Ines Barrios Galindez (Geology):
Evaluation of geomorphic proxies from high resolution topographic DEMs in oblique subduction zones: Western Puerto Rico.
Fall 2015 - Spring 2018. Completed
- Charles Missi (Geology):
Physical, chemical, and isotopic characteristics of groundwater and surface water in the lake Chilwa basin, Malawi.
Fall 2015 - Spring 2018. Completed
- Cullen Pickens (Geology):
Field evaluation of diesel mass removal in dolomite karst.
Spring 2015 - Fall 2016. Completed
- Jon Fields (Geology):
Hydrogeophysical characterization of swine effluent amend soils in mantled karst.
Fall 2014 - Fall 2016. Completed
- Sundeep Sharma (Geology):
Seismic imaging of biofilm in porous media.
Fall 2014 - Fall 2016. Completed.

MEMBERSHIPS

1. American Geophysical Union (AGU).
2. Society of Petroleum Engineers (SPE).
3. American Chemical Society (ACS).
4. Geological Society of America (GSA).
5. Geochemical Society (GS).