TIMOTHY J. KNEAFSEY, P.E., Ph.D.
Energy Geosciences Division
Hydrocarbon Resources Program Lead
Lawrence Berkeley National Laboratory
(510) 486-4414, tjkneafsey@lbl.gov

EDUCATION

Ph.D., Civil/Environmental Engineering, University of California at Berkeley, 1996, Minors: Chemical Engineering, Transport in Porous Media
M.S., Civil/Environmental Engineering, University of California at Berkeley, 1989, with honors
B.S., Civil Engineering, University of New Mexico, 1987, with distinction
B.S., Mechanical Engineering, University of New Mexico, 1983, with distinction

REGISTRATION

Professional Civil Engineer in California

HONORS

Outstanding Contributions in Geoscience Research, 2010, with Karsten Pruess, given by Geosciences Research Program, Office of Basic Energy Sciences, U.S. Department of Energy
Outstanding Performance Award, Lawrence Berkeley National Laboratory, June, 2006

RESEARCH INTERESTS

Experimental studies in reservoir processes and subsurface hydrology, including multiphase flow, phase change, thermal processes, thermal-chemical processes, gas hydrates, coal bed methane, tight gas, and carbon dioxide sequestration. Other interests include imaging tools to investigate flow processes.

RESEARCH EXPERIENCE

Staff Earth Scientist, Lawrence Berkeley National Laboratory, 2012 - Present
Mechanical Engineer, Lawrence Berkeley National Laboratory, 2007 - 2012
Geological Scientist, Lawrence Berkeley National Laboratory, 1999 - 2007
Post-Doctoral Research Fellow, Lawrence Berkeley National Laboratory, 1996 - 1999
Graduate Research Assistant, University of California at Berkeley, 1991 - 1996

TEACHING EXPERIENCE

Teaching Assistant, University of California at Berkeley 1992 - 1993
Secondary School Mathematics Teacher, U.S. Peace Corps, Holy Rosary Secondary School, Pujehun, Sierra Leone, 1983 - 1985

PROFESSIONAL EXPERIENCE

Environmental Engineer, Kennedy/Jenks Consultants, San Francisco, California, 1989 - 1991
Environmental Engineer, U.S. Environmental Protection Agency, San Francisco, California, 1987 - 1989

PATENT

Freifeld, B.M., **T.J. Kneafsey**, J. Pruess, L. Tomutsa, P.A. Reiter, and T.M. deCastro, Portable imaging system method and apparatus, United States Patent 7,082,185, July 25, 2006

RESEARCH SUPERVISION

Yunkai Ji, Ph.D. Student, China University of Petroleum, East China, Lattice Boltzman Modeling of Gas and Water Relative Permeabilities in Methane Hydrate-Bearing Media

Bowen Yao, Ph.D. Student, (Advisor Yu-Shu Wu) Colorado School of Mines, Carbon Dioxide Injection-induced Fracturing
Jonathan Wells, Ph.D. Student, (Advisor Carolyn Koh) Colorado School of Mines, Properties of CO_2 Hydrate
Chun Chang, Post-Doctoral Researcher, Lawrence Berkeley National Laboratory, China University of Mining Technology Beijing, processes in CO_2 sequestration
Naif B. Alqahtani, PhD. Student, (Advisor Jennifer Miskimins) Colorado School of Mines, Use of cryogens in fracturing
Dylan Myer, Ph.D. Student, University of Texas, (Advisor Peter Flemings) Three-phase stability in gas hydrate deposits
Mario Magliocco, Post-Doctoral Researcher, Lawrence Berkeley National Laboratory, Ph.D. Student, (Advisor Steven Glaser) University of California at Berkeley, Use of supercritical CO_2 as a heat transfer fluid in enhanced geothermal systems
Emily V. Rees, Post-Doctoral Researcher, Lawrence Berkeley National Laboratory, Gas hydrate formation/properties of gas hydrates in porous media
Tae-Hyuk Kwon, Post-Doctoral Researcher, Lawrence Berkeley National Laboratory, Mixed methane/CO_2 hydrate properties
Matthew Walsh, Ph.D. Student, (Advisor E. Dendy Sloan) Colorado School of Mines, Capillary pressure of hydrate-bearing sediments
Arvind Gupta, Ph.D. Candidate, (Advisor E. Dendy Sloan) Colorado School of Mines, Gas hydrate imaging, heat and mass transfer in gas hydrate-bearing porous media
Heather Elsen, Ph.D. Student, University of California at Berkeley, Gas hydrate formation and dissociation in porous media
Nefeli Moridis, Undergraduate Student, University of Texas, Gas Hydrate image analysis
Gordon Wu, Undergraduate Student, University of California at Berkeley, Validation of thermal property estimation technique
Jacob Pruess, Undergraduate Student, University of California at Berkeley, Portable x-ray CT Scanner, various investigations
Paul Reiter, Undergraduate Student, Princeton University, Portable x-ray CT scanner

LBNL SERVICE
Earth Sciences Safety Committee Chairperson/Member, 2005 – 2010, 2012 - present
LBNL Building Emergency Team Member, 2001 – 2009
Hydrocarbon Resources Program Lead, 2017 – present
LBNL Director's Awards Committee, 2020 – present
COVID Activity Team Lead, 2020 – present

JOURNAL SERVICE
Guest Editor, Energy Conversion and Management, 2006

PUBLICATIONS
Journal Papers/Conference Papers/Book Chapters
1. Birkholzer, J.T., Morris, J., Bargar, J.R., Brondolo, F., Cihan, A., Crandall, D., Deng, H., Fan, W., Fu, W., Fu, P., Hakala, A., Hao, Y., Huang, J., Jew, A.D., **Kneafsey, T**., Li, Z., Lopano, C., Moore, J., Moridis, G., Nakagawa, S., Noël, V., Reagan, M., Sherman, C.S., Settgast, R., Steefel, C., Voltolini, M., Xiong, W. and Ciezobka, J., 2021. A New Modeling Framework for Multi-Scale Simulation of Hydraulic Fracturing and Production from Unconventional Reservoirs. Energies, 14(3).

2. Guglielmi, Y., Cook, P., Soom, F., Schoenball, M., Dobson, P. and **Kneafsey, T**., 2021. In Situ Continuous Monitoring of Borehole Displacements Induced by Stimulated Hydrofracture Growth. Geophysical Research Letters, n/a(n/a): e2020GL090782.
3. Dobson, P.F., **Kneafsey, T.J**., Nakagawa, S., Sonnenthal, E.L., Voltolini, M., Smith, J.T. and Borglin, S.E., 2021. Fracture Sustainability in Enhanced Geothermal Systems: Experimental and Modeling Constraints. Journal of Energy Resources Technology, 143(10).
4. Wu, H., Fu, P., Morris, J.P., Mattson, E.D., Neupane, G., Smith, M.M., Hawkins, A.J., Zhang, Y. and **Kneafsey, T**., 2021. Characterization of flow and transport in a fracture network at the EGS Collab field experiment through stochastic modeling of tracer recovery. Journal of Hydrology, 593: 125888.
5. Chang, C., **T. J. Kneafsey**, J. Wan, T. K. Tokunaga and S. Nakagawa (2020). "Impacts of Mixed-Wettability on Brine Drainage and Supercritical CO2 Storage Efficiency in a 2.5-D Heterogeneous Micromodel." Water Resources Research **56**(7): e2019WR026789.
6. Frash, L.P., Fu, P., Morris, J., Gutierrez, M., Neupane, G., Hampton, J., Welch, N.J., Carey, J.W. and **Kneafsey, T**., 2021. Fracture Caging to Limit Induced Seismicity. Geophysical Research Letters, 48(1): e2020GL090648.
7. Schoenball, M., Ajo-Franklin, J.B., Blankenship, D., Chai, C., Chakravarty, A., Dobson, P., Hopp, C., **Kneafsey, T.,** Knox, H.A., Maceira, M., Robertson, M.C., Sprinkle, P., Strickland, C., Templeton, D., Schwering, P.C., Ulrich, C., Wood, T. and the EGS Collab Team., (2020), Creation of a Mixed-Mode Fracture Network at Mesoscale Through Hydraulic Fracturing and Shear Stimulation, *Journal of Geophysical Research: Solid Earth*, *125*(12), e2020JB019807, doi:https://doi.org/10.1029/2020JB019807.
8. White, M.D., **Kneafsey, T.J**., Seol, Y., Waite, W.F., Uchida, S., Lin, J.S., Myshakin, E.M., Gai, X., Gupta, S., Reagan, M.T., Queiruga, A.F., Kimoto, S., Baker, R.C., Boswell, R., Ciferno, J., Collett, T., Choi, J., Dai, S., De La Fuente, M., Fu, P., Fujii, T., Intihar, C.G., Jang, J., Ju, X., Kang, J., Kim, J.H., Kim, J.T., Kim, S.J., Koh, C., Konno, Y., Kumagai, K., Lee, J.Y., Lee, W.S., Lei, L., Liu, F., Luo, H., Moridis, G.J., Morris, J., Nole, M., Otsuki, S., Sanchez, M., Shang, S., Shin, C., Shin, H.S., Soga, K., Sun, X., Suzuki, S., Tenma, N., Xu, T., Yamamoto, K., Yoneda, J., Yonkofski, C.M., Yoon, H.C., You, K., Yuan, Y., Zerpa, L. and Zyrianova, M., 2020. An international code comparison study on coupled thermal, hydrologic and geomechanical processes of natural gas hydrate-bearing sediments. Marine and Petroleum Geology, 120: 104566.
9. Choi, J.-H., Myshakin, E.M., Lei, L., **Kneafsey, T.J**. and Seol, Y., 2020. An experimental system and procedure of unsteady-state relative permeability test for gas hydrate-bearing sediments. Journal of Natural Gas Science and Engineering, 83: 103545.
10. Wells, J.D., Majid, A.A.A., Creek, J.L., Sloan, E.D., Borglin, S.E., **Kneafsey, T.J.** and Koh, C.A., 2020. Water content of carbon dioxide at hydrate forming conditions. Fuel, 279: 118430.
11. Wales, N.A., J.D. Gomez-Velez, B.D. Newman, C.J. Wilson, B. Dafflon, **T.J. Kneafsey**, F. Soom, and S.D. Wullschleger, *Understanding the relative importance of vertical and horizontal flow in ice-wedge polygons.* Hydrol. Earth Syst. Sci., 2020. **24**(3): p. 1109-1129.
12. Lei, L., Y. Seol, J.-H. Choi, and **T.J. Kneafsey**, *Pore habit of methane hydrate and its evolution in sediment matrix – Laboratory visualization with phase-contrast micro-CT.* Marine and Petroleum Geology, 2019. **104**: p. 451-467.
13. **Kneafsey, T.J.,** and S. Borglin (2019), Flow of Gas and Liquid in Natural Media Containing Nanoporous Regions, in *Shale Subsurface Science and Engineering, Geophysical Monograph 245*, edited by T. Dewers, J. Heath and M. Sánchez, p. 20, American Geophysical Union.

14. C. Chang, Q. Zhou, M. Oostrom, **T.J. Kneafsey**, H. Mehta (2019), Scaling the Impacts of Pore-Scale Characteristics on Unstable Supercritical CO_2-Water Drainage Using a Complete Capillary Number, International Journal of Greenhouse Gas Control, accepted, April 15, 2019
15. Müller, O., T. Bang-Andreasen, R. A. White Iii, B. Elberling, N. Taş, **T. Kneafsey**, J. K. Jansson, and L. Øvreås (2018), Disentangling the complexity of permafrost soil by using high resolution profiling of microbial community composition, key functions and respiration rates, *Environmental Microbiology*, *20*(12), 4328-4342, doi:10.1111/1462-2920.14348.
16. Chang, C., Q. Zhou, **T.J. Kneafsey**, M. Oostrom, and Y. Ju (2018), Coupled Supercritical CO_2 Dissolution and Water Flow in Pore-Scale Micromodels, *Advances in Water Resources*, doi:https://doi.org/10.1016/j.advwatres.2018.11.004.
17. Meyer, D.W., P.B. Flemings, D. DiCarlo, K. You, S.C. Phillips, and **T.J. Kneafsey** (2018), Experimental Investigation of Gas Flow and Hydrate Formation Within the Hydrate Stability Zone, *Journal of Geophysical Research: Solid Earth*, *123*(7), 5350-5371, doi:10.1029/2018JB015748..
18. Li, Y., C. David Emmanuel, S. Nakagawa, T.J. Kneafsey, D.R. Schmitt, and I. Jackson (2018), A Broadband Laboratory Study of the Seismic Properties of Cracked and Fluid-Saturated Synthetic Glass Media, *Journal of Geophysical Research: Solid Earth*, *123*, 3501–3538, doi:10.1029/2017JB014671.
19. Wu, Y, C. Ulrich, **T.J. Kneafsey**, R. Lopez, C Chou, J. Geller, K. McKnight, B. Dafflon, F. Soom, J. Peterson, S. Hubbard (2018), Depth-Resolved Physicochemical Characteristics of Active Layer and Permafrost Soils in an Arctic Polygonal Tundra Region, *Journal of Geophysical Research: Biogeosciences*, *123*(4), 1366-1386, doi:10.1002/2018JG004413.
20. S. Nakagawa and **T.J. Kneafsey**, Seismic response of fractured sandstone during geological sequestration of CO_2—Laboratory seismic measurements at mid (sonic) frequencies and X-ray CT fluid phase visualization, requested by and submitted to AGU/Wiley volume Geophysical Monitoring for Geologic Carbon Storage and Utilization edited by Lianjie Huang
21. Han, G., T. H. Kwon, J. Y. Lee, and **T.J. Kneafsey** (2018), Depressurization-Induced Fines Migration in Sediments Containing Methane Hydrate: X-Ray Computed Tomography Imaging Experiments, *Journal of Geological Research - Solid Earth*, *123*(4), 19.
22. Taş, N., E. Prestat, S. Wang, Y. Wu, C. Ulrich, **T. Kneafsey**, S. G. Tringe, M. S. Torn, S. S. Hubbard, and J. K. Jansson (2018), Landscape topography structures the soil microbiome in arctic polygonal tundra, *Nature Communications*, *9*(1), 777, doi:10.1038/s41467-018-03089-z.
23. Hao, Z., H. A. Bechtel, **T. Kneafsey**, B. Gilbert, and P. S. Nico (2018), Cross-Scale Molecular Analysis of Chemical Heterogeneity in Shale Rocks, *Scientific Reports*, *8*(1), 2552, doi:10.1038/s41598-018-20365-6.
24. **Kneafsey, T.J.** (2018), Laboratory Studies to Investigate Subsurface Fracture Mechanics, in *Hydraulic Fracture Modeling*, edited by Y.-S. Wu, p. 543, Gulf Professional Publishing.
25. Min, Y., Q. Li, M. Voltolini, **T. Kneafsey**, and Y.-S. Jun (2017), Wollastonite Carbonation in Water-Bearing Supercritical CO_2: Effects of Particle Size, *Environmental Science & Technology*, *51*(21), 13044-13053, doi:10.1021/acs.est.7b04475.
26. Wu, Y., S. Nakagawa, **T.J. Kneafsey**, B. Dafflon, and S. Hubbard (2017), Electrical and seismic response of saline permafrost soil during freeze - Thaw transition, *Journal of Applied Geophysics*, *146*, 16-26, doi:https://doi.org/10.1016/j.jappgeo.2017.08.008.
27. Tsang, C.-F., et al. (2018), Commemorating Dr. Gudmundur "Bo" Bodvarsson (1951–2006), a Leader of the Deep Unsaturated Flow and Transport Investigations, *Water*, *10*(1), doi:10.3390/w10010018.
28. Wang, L., B. Yao, H. Xie, P. H. Winterfeld, **T.J. Kneafsey**, X. Yin, and Y.-S. Wu (2017), CO_2 injection-induced fracturing in naturally fractured shale rocks, *Energy*, *139*, 1094-1110, doi:https://doi.org/10.1016/j.energy.2017.08.031.

29. Ding, X., B. Mack Kennedy, S. Molins, **T. Kneafsey**, and W. C. Evans (2017), Experimental studies and model analysis of noble gas fractionation in low-permeability porous media, *Geochimica et Cosmochimica Acta*, *205*, 149-167, doi:https://doi.org/10.1016/j.gca.2017.02.005.
30. Wang, L., B. Yao, H. Xie, **T.J. Kneafsey**, P.H. Winterfield, X. Yin, and Y. Wu, Experimental investigation of injection-induced fracturing during supercritical CO_2 sequestration, *International Journal of Greenhouse Gas Control*, accepted May 9, 2017
31. Beckingham, L. E., Steefel, C. I., Swift, A. M., Voltolini, M., Yang, L., Anovitz, L. M., Sheets, J.M., Cole, D.R., **Kneafsey, T.J**., Mitnick, E.H., Zhang, S., Landrot, G., Ajo-Franklin, J.B., DePaolo, D.J., Mito, S., Xue, Z. (2017). Evaluation of accessible mineral surface areas for improved prediction of mineral reaction rates in porous media. *Geochimica et Cosmochimica Acta, 205*, 31-49. doi:https://doi.org/10.1016/j.gca.2017.02.006
32. Ilgen, A. G., Heath, J. E., Yucel Akkutlu, I., Taras Bryndzia, L., Cole, D. R., Kharaka, Y. K., **Kneafsey, T. J**., Millikien, K. L., Pyrak-Nolte, L. P., Suarez-Rivera, R. Shales at all scales: Exploring coupled processes in mudrocks. *Earth-Science Reviews*. doi:http://dx.doi.org/10.1016/j.earscirev.2016.12.013
33. Raz-Yaseef, N., M. S. Torn, Y. Wu, D. P. Billesbach, A. K. Liljedahl, **T. J. Kneafsey**, V. E. Romanovsky, D. R. Cook, and S. D. Wullschleger (2016), Large CO_2 and CH_4 emissions from polygonal tundra during spring thaw in northern Alaska, *Geophys. Res. Lett.*, 43,doi:10.1002/2016GL071220.
34. Chang, C., Zhou, Q., Oostrom, M., **Kneafsey, T. J**., & Mehta, H. (2017). Pore-scale supercritical CO_2 dissolution and mass transfer under drainage conditions. *Advances in Water Resources, 100*, 14-25. doi:http://dx.doi.org/10.1016/j.advwatres.2016.12.003
35. Bikkina, P., J. Wan, Y. Kim, **T.J. Kneafsey** and T. K. Tokunaga (2016). "Influence of wettability and permeability heterogeneity on miscible CO_2 flooding efficiency." Fuel **166**: 219-226, doi:10.1016/j.fuel.2015.10.090.
36. Chang, C., Q. Zhou, **T.J. Kneafsey**, M. Oostrom, T. W. Wietsma and Q. Yu (2016). "Pore-scale supercritical CO_2 dissolution and mass transfer under imbibition conditions." *Advances in Water Resources* **92**: 142-158, doi:10.1016/j.advwatres.2016.03.015.
37. Dafflon, B., S. Hubbard, C. Ulrich, J. Peterson, Y. Wu, H. Wainwright and **T. Kneafsey** (2016). "Geophysical estimation of shallow permafrost distribution and properties in an ice-wedge polygon-dominated Arctic tundra region." *GEOPHYSICS* **81**(1): WA247-WA263, doi: 10.1190/geo2015-0175.
38. Zhang, S., DePaolo, D. J., Voltolini, M., & **Kneafsey, T.** (2015). CO_2 mineralization in volcanogenic sandstones: geochemical characterization of the Etchegoin formation, San Joaquin Basin. *Greenhouse Gases: Science and Technology*, 5: 622-644. doi: 10.1002/ghg.1508
39. Magliocco, M., Glaser, S., & **Kneafsey, T.** (2015). Laboratory and Numerical Studies of Heat Extraction from Hot Porous Media by Means of Supercritical CO_2. *Transport in Porous Media*, 108(1), 85-104. doi: 10.1007/s11242-015-0474-0
40. You, K., **Kneafsey, T.J.**, Flemings, P.B., Polito, P., & Bryant, S.L. (2015). Salinity-buffered methane hydrate formation and dissociation in gas-rich systems. *Journal of Geophysical Research: Solid Earth*, 120(2), 643-661. doi: 10.1002/2014JB011190
41. **Kneafsey, T.J**. and G. J. Moridis (2014). "X-Ray computed tomography examination and comparison of gas hydrate dissociation in NGHP-01 expedition (India) and Mount Elbert (Alaska) sediment cores: Experimental observations and numerical modeling." *Marine and Petroleum Geology* **58, Part A**(0): 526-539.
42. Cha, M., Yin, X., **Kneafsey, T**., Johanson, B., Alqahtani, N., Miskimins, J., . . . Wu, Y.-S. (2014). Cryogenic fracturing for reservoir stimulation – Laboratory studies. *Journal of Petroleum Science and*

Engineering, 124(0), 436-450. doi:http://dx.doi.org/10.1016/j.petrol.2014.09.003

43. Nakagawa, S., **Kneafsey, T.J**., Daley, T.M., Freifeld, B.M. and Rees, E.V., 2013. Laboratory seismic monitoring of supercritical CO_2 flooding in sandstone cores using the Split Hopkinson Resonant Bar technique with concurrent x-ray Computed Tomography imaging. *Geophysical Prospecting,* 61(2): 254-269.
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54. **Kneafsey, T**., Pruess, K. (2010). Laboratory Flow Experiments for Visualizing Carbon Dioxide-Induced, Density-Driven Brine Convection. *Transport in Porous Media, 82*(1), 123-139. doi:10.1007/s11242-009-9482-2
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56. **Kneafsey, T.J.**, Y. Seol, G.J. Moridis, L. Tomutsa, B.M. Freifeld, "Laboratory measurements on core-scale sediment and hydrate samples to predict reservoir behavior," in T. Collett, A. Johnson, C. Knapp, and R. Boswell, eds., *Natural gas hydrates – Energy resource potential and associated geologic hazards: AAPG Memoir 89*, p. 705–713. 2009, LBNL-59085
57. **Kneafsey, T.J.** and K. Pruess, Laboratory Flow Experiments for Visualizing Carbon Dioxide-Induced, Density-Driven Brine Convection, *Transport in Porous Media* DOI 10.1007/s11242-009-9482-2, October, 2009, LBNL-2731E

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    ***Top Twenty Most Cited Articles 2007-2010, Journal of Petroleum Science and Engineering (Journal's Second Most Cited Article)**
65. Gupta, A., **T.J. Kneafsey**, G.J. Moridis, Y. Seol, M.B. Kowalsky, E.D. Sloan Jr., "Methane hydrate thermal conductivity in a large heterogeneous porous sample," *J. Phys. Chem. B*; 2006; ASAP Web Release Date: 02-Aug-2006; DOI: 10.1021/jp0619639LBNL-59088
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PRESENTATIONS

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22. J.B. Ajo Franklin, M. Schoenball, T. Wood, M. Robertson, P. Petrov, L.Huang, **T.J. Kneafsey**, P. Schwering, D. Blankenship, H. Knox and EGS Collab Team, Abstract H32C-07 Imaging Hydraulic Fracture Propagation Using Semi-Permanent Continuous Active Seismic Source Monitoring: Results from the DOE EGS Collab Experiment, presented at 2018 AGU Fall Meeting, Washington, D.C., 10-14 Dec.
23. *M.D. White, **T.J. Kneafsey**, and Y. Seol, Abstract OS31F-1850 Modeling of Coupled Thermal, Hydrologic, and Geomechanical Processes in Gas Hydrate Bearing Porous Media: The 2nd International Gas Hydrate Code Comparison Study, presented at 2018 AGU Fall Meeting, Washington, D.C., 10-14 Dec. *Invited*
24. ***T.J. Kneafsey**, D. Blankenship, P.F. Dobson, J. Morris, M.D. White, H. Knox, J. B. Ajo Franklin, R.K. Podgorney, T.C. Johnson, L.Huang, H, Johnston, T. Doe, P. Fu, P. Schwering, W. Roggenthen, A. Ghassemi, M.M. Smith, E.Mattson, J. Weers, Y. Polsky and EGS Collab Team, Abstract H32C-05 Overview of the EGS Collab Project: Stimulation and Validation, presented at 2018 AGU Fall Meeting, Washington, D.C., 10-14 Dec. *Invited*

25. C. Chang, **T.J. Kneafsey**, Q. Zhou, M. Oostrom, Y. Ju and Q. Yu, Abstract H41K-2221 Pore- and Core-Scale Supercritical CO_2 Dissolution and Mass Transfer under Drainage and Imbibition Conditions, presented at 2018 AGU Fall Meeting, Washington, D.C., 10-14 Dec.
26. *__T.J. Kneafsey__, D. Blankenship, P.F. Dobson, H.A. Knox, T.C. Johnson, P.C. Schwering, J. Morris, J.B. Ajo Franklin, M.D. White, P. Fu, L. Huang, R.K. Podgorney, J.A. Burghardt, C.E. Strickland, E. Mattson, T. Doe, A. Ghassemi, W. Roggenthen, Y. Guglielmi, P.J Cook, M.M. Smith and EGS Collab Team, Abstract H21P-1919 Investigations in Stimulating Crystalline Rock: Hypotheses and Uncertainties, presented at 2018 AGU Fall Meeting, Washington, D.C., 10-14 Dec. *Invited*
27. Z. Hao and **T.J. Kneafsey**, Abstract S14A-05 Evaluation of Production Quality from Molecular Signatures of Organic Matter and Mineralogy in Shale Rocks, presented at 2018 AGU Fall Meeting, Washington, D.C., 10-14 Dec.
28. Z. Xu, J. Sheets, L. Zhang, D. Kim, **T.J. Kneafsey**, D.R. Cole, Y-S Jun and L.J. Pyrak-Nolte (2017) Abstract H33E-1940 Acoustic Monitoring of Gravity-Driven Controls on CaCO3 Precipitates in a Fracture, presented at 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec.
29. C. Chang, **T.J. Kneafsey**, J. Wan and T.K, Tokunaga Abstract H13R-03 Pore-Scale Supercritical CO_2- Brine Drainage Fingering in Mixed-Wet Micromodels, presented at 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec.
30. P.F. Dobson, C.M. Oldenburg, Y.Wu, P.J. Cook, **T.J. Kneafsey**, S. Nakagawa, C. Ulrich, D.L. Siler, Y. Guglielmi, J.B. Ajo Franklin, J. Rutqvist, T.M. Daley, J.T. Birkholzer, H.F. Wang, N. Lord, B.C. Haimson, H. Sone, P.Vigilante, W. Roggenthen, T. Doe, M. Lee, M.D. Ingraham, H. Huang, E. Mattson, T.C. Johnson, J. Zhou, M.D. Zoback, J. Morris, J.A White, P.A. Johnson, D.D. Coblentz and J. Heise, Abstract H23A-1720 kISMET: Stress analysis and intermediate-scale hydraulic fracturing at the Sanford Underground Research Facility, presented at 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec.
31. **T.J. Kneafsey**, D. Blankenship, Abstract H23A-1719 The EGS Collab Project: Stimulation Investigations for Geothermal Modeling Analysis and Validation, presented at 2017 AGU Fall Meeting, New Orleans, LA, 11-15 Dec. *Invited*
32. ***T.J. Kneafsey**, The status and direction of hydrate research – a discussion (Invited), 2016 AGU Fall Meeting, San Francisco, CA, 12-16 December 2016
33. F. Soom, C. Ulrich, B Dafflon, Y. Wu, **T.J. Kneafsey**, R.D. Lopez, J. Peterson, S.S. Hubbard, B43C-0627: Estimating the spatial distribution of soil organic matter density and geochemical properties in a polygonal shaped Arctic Tundra using core sample analysis and X-ray computed tomography, 2016 AGU Fall Meeting, San Francisco, CA, 12-16 December 2016
34. C.M. Oldenburg, P.F. Dobson, T.M. Daley, J.T. Birkholzer, P.J. Cook, J.B. Ajo-Franklin, J. Rutqvist, D. Siler, **T.J. Kneafsey**, S. Nakagawa, Y. Wu, Y. Gugliemi, C. Ulrich, P. Marchesini, H.F.Wang, B.C. Haimson, H. Sone, P Vigilante, W. Roggenthen, T. Doe, M. Lee, E. Mattson, H. Huang, T.C. Johnson, J. Morris, J.A. White, P.A. Johnson, D.D. Coblentz, J. Heise, H13G-1492: kISMET: Stress and fracture characterization in a deep mine, 2016 AGU Fall Meeting, San Francisco, CA, 12-16 December 2016
35. *Z. Hao, H. Bechtel, F. Sannibale, **T.J. Kneafse**y, B. Gilbert, P.S. Nico H21J-03: Molecular Imaging of Kerogen and Minerals in Shale Rocks across Micro- and Nano- Scales (Invited), 2016 AGU Fall Meeting, San Francisco, CA, 12-16 December
36. Z. Xu, Q. Li, J. Sheets, **T.J. Kneafsey**, Y-S. Jun, D.R. Cole, L.J. Pyrak-Nolte, H51C-1491: The Effect of fluid buoyancy and fracture orientation on $CaCO_3$ Formation in a Fracture, 2016 AGU Fall Meeting, San Francisco, CA, 12-16 December 2016

37. S. Nakagawa, **T. J. Kneafsey**, S. E. Borglin, Laboratory Visualization of Hydraulic Fracture Propagation and Interaction with a Network of Preexisting Fractures, 2015 AGU Fall Meeting, San Francisco CA, December 14-18, 2015
38. N. Raz Yaseef, M. S. Torn, D. P. Billesbach, Y. Wu, **T. J. Kneafsey**, V. E. Romanovsky, D. R. Cook, R. Commane, J. Henderson, C. E. Miller, S. D. Wullschleger, Multi-scale Evidence of Large CO_2 and CH_4 Emissions from Permafrost During Spring Thaw in Northern Alaska, 2015 AGU Fall Meeting, San Francisco CA, December 14-18, 2015
39. C. Ulrich, B. Dafflon, Y. Wu, **T. J. Kneafsey**, R. D. López, J. Peterson, S. S. Hubbard, Lab-Scale Investigation of Multi-dimensional Relationships between Soil Intrinsic Properties to Improve Estimation of Soil Organic and Ice Content using Novel Core Imaging and Geophysical Techniques in Arctic Tundra, 2015 AGU Fall Meeting, San Francisco CA, December 14-18, 2015
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47. ***Kneafsey, T.J.,** Shale pore network characterization and modeling for flow, chemistry, and mechanics, Shale at All Scales: Exploring Coupled Processes, Santa Fe, New Mexico, June 9-11, 2015
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49. Y. Wu, **T.J. Kneafsey,** N. Tas, M. Bill, C. Ulrich, S. Hubbard, Controlled Freeze-thaw Experiments to Study Biogeochemical Process and its Effects on Greenhouse Gas Release in Arctic Soil Columns, American Geophysical Union Fall Meeting, San Francisco CA, December 15-19, 2014

50. S. Nakagawa, **T.J. Kneafsey**, C. Chang, E. Harper, Laboratory Mid-frequency (Kilohertz) Range Seismic Property Measurements and X-ray CT Imaging of Fractured Sandstone Cores During Supercritical CO_2 Injection, American Geophysical Union Fall Meeting, San Francisco CA, December 15-19, 2014
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53. **T.J. Kneafsey**, S. Nakagawa, Y. Wu, S. Mukhopadhyay, Laboratory Visualization Experiments of Temperature-induced Fractures Around a Borehole (Cryogenic Fracturing) in Shale and Analogue Rock Sample, American Geophysical Union Fall Meeting, San Francisco CA, December 15-19, 2014
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