

# Kitty L. Milliken

## Professional Summary

May 1, 2025

Business address: The University of Texas at Austin  
Bureau of Economic Geology  
10100 Burnet Rd., Bldg. 130  
Austin, TX 78758  
Telephone: (512) 471-6082  
E-mail address: kitty.milliken@beg.utexas.edu

## Professional Preparation

### Academic Background

Ph.D. Geology, The University of Texas at Austin, 1985

M.A. Geology, The University of Texas at Austin, 1977

B.A. Geology, Vanderbilt University, 1975

### Professional Appointments

Present Position: Senior Research Scientist, Bureau of Economic Geology (May 2008 - Present). ExxonMobil/BEG Unconventional Resources Project and Mudrock Systems Research Laboratory.

Senior Research Scientist, Jackson School of Geosciences, The University of Texas at Austin (2004 - May 2008). Microbeam and XRD facilities.

Research Scientist, Department of Geological Sciences, The University of Texas at Austin (1999 - 2004). Microbeam and XRD facilities.

Research Associate, Department of Geological Sciences, The University of Texas at Austin (1997 - 1999). Microbeam and XRD facilities.

Visiting Researcher, Institut Français du Pétrole (1996 - 1997).

Research Scientist Associate, Department of Geological Sciences (1987 - 1997).

Lecturer, Department of Geological Sciences (1991 - 1995). Also 1998-present.

Research Geologist, Exxon Production Research Company (1985 - 1986).

Research Associate, Bureau of Economic Geology, The University of Texas at Austin (1979 - 1980).

Teaching Assistant, Department of Geological Sciences, The University of Texas at Austin (1975 - 1979). Also in 1981.

Research Assistant, Geology Department, Vanderbilt University (1971 - 1975).

## Areas of Expertise

### Areas of Expertise

Combining petrographic and geochemical methods to decipher histories of chemical and mechanical modification in sedimentary rocks. I have experience with sandstone, limestone, mudrock, dolomite, chert, and serpentinite.

Geochemical methods: electron microprobe analysis; stable isotopes

Petrographic methods: conventional transmitted and reflected light microscopy; statistical

analysis of detrital and authigenic components; electron microbeam imaging techniques (secondary and back-scattered electron imaging; EDS X-ray mapping; cathodoluminescence imaging; charge-contrast imaging)

## Awards

### Awards and Honorary Societies

Doris Malkin Curtis Medal of the Gulf Coast Section of SEPM, 2023

Sidney Powers Memorial Award, American Association of Petroleum Geologists, 2023

Honorary Membership in the Society for Sedimentary Geology (SEPM), 2021

AAPG Distinguished Lecturer, 2016-2017

Pratt Award for Best Paper (2013) in AAPG Bulletin, 2015

Robert Berg Outstanding Research Award, AAPG, 2015

Bronze Award for "Teaching with Technology," IITAP Program, The University of Texas at Austin, 2008

Fellow, Geological Society of America, 2008

AAPG J. Ben Carsey Distinguished Lecturer, 2005 - 2006

Bronze Award for "Teaching with Technology," IITAP Program, The University of Texas at Austin, 2003

SEPM Excellence in Poster Presentation Award (with co-authors), 2001

Industry-Supported Fellowship, The University of Texas at Austin, 1982 - 1983

Petrography Award, The University of Texas at Austin, 1982

Second Place, GSA South-Central Section Annual Meeting, Best Presentation, 1977

Scholarships, Vanerbilt University, 1971 - 1975

Fellowship, National Association of Geology Teachers, 1974

## Service

### External Committees Participation

Co-Chair, Distinguished Lecture Committee, AAPG, June 1, 2017-May 31, 2020

Co-Chair, Gussow Conference Diagenesis Session, Canadian Society of Petroleum Geology, Banff, Canada, October 15-17, 2019

Member, Distinguished Lecture Committee, American Association of Petroleum Geologists, 2009 - 2011

Co-Chair, Siliciclastic Diagenesis--New Insights, 2009 Annual American Association of Petroleum Geologists Convention, Denver, Colorado June, 2009

Member, Readiness Assessment Team for the JOIDES Resolution, IODP Expedition 320T February, 2009

Shipboard Sedimentologist, Expedition 316, NanTroSEIZE, Shallow Megasplay and Frontal Thrusts, ODP/IODP, 2007 - 2008

Co-Editor, Journal of Sedimentary Research, SEPM (Society for Sedimentary Geology), 2004 - 2008

Co-Convenor, Folk Symposium on Petrographic Methods, Salt Lake City, Geological Society of America, 2005

At-Large Member, Education Committee, Geological Society of America, 2002 - 2005

Chair, Clastic Diagenesis Research Group, SEPM (Society for Sedimentary Geology), 1991 - 2003

Member, Committee for Core and Sample Preservation, American Association of Petroleum Geologists, 2000 - 2002

Associate Editor, Journal of Sedimentary Research, SEPM (Society for Sedimentary Geology), 1993 - 2000

Session Co-Chair, Sandstone Diagenesis and Reservoir Characteristics, American Association of Petroleum Geologists Annual Convention, Salt Lake City, 1998

Member, Publications Committee, American Association of Petroleum Geologists, 1990 - 1995

Shipboard Sedimentologist, Leg 149, Iberia Abyssal Plain, ODP/IODP, 1993

### Published Interviews

Milliken, K., 2020, Nash, S., 2020, Interview with Kitty Milliken, BEG--science and technology showcase: AAPG Learn! Blog, <https://www.aapg.org/publications/blogs/learn/article/articleid/57233/interview-with-kitty-milliken-beg-science-and-technology-showcase>.

### Outreach Activities

Instructor, GeoFORCE Young Geoscientists Program: West Texas and New Mexico, June 1-7, 2014.

### Teaching and Advising

#### University Courses Taught

Siliciclastic Petrology: presented to Jackson School of Geosciences, August to December from 2002 to present.

#### Continuing Education Courses Taught

Mudrock Petrology and Pore-Scale Imaging: presented to Society for Sedimentary Geology, presented at AAPG/SEPM Annual Meeting, Denver, Colorado, June 4, 2015.

Siliciclastic petrology for reservoir quality assessment: presented to Repsol S.A., Madrid, Spain, December 10-12, 2014.

Petrography in the 21st century: modern tools for elucidating reservoir quality in sandstone reservoirs: presented to AAPG, presented at Continuing Education Program, Houston, Texas, November 10, 2014.

Basic mudrock petrology for reservoir quality assessment: presented at Conoco-Phillips, Houston, Texas, April 14-15, 2012.

Basic Mudrock Petrology: presented (with Rob Reed) at MSRL meeting, Austin, Texas, June 2010.

Basic Mudrock Petrology: presented (with Rob Reed) at MSRL meeting, Austin, Texas, January 2010.

#### Student Committee Supervision

Supervisor, MS thesis committee, Maxwell Pommer, Quantitative Assessment of Pore Types and Pore Size Distribution Across Thermal Maturity, Eagle Ford Formation, South Texas, The University of Texas at Austin, Austin, Texas, 2014

Supervisor, MS thesis committee, Suzan Ergene, Lithologic Heterogeneity of the Eagle Ford Formation, The University of Texas at Austin, Austin, Texas, 2014

Co-Supervisor, M.S. Thesis Committee, David Hull, Stratigraphic architecture, depositional systems, and reservoir characteristics of the Pearsall shale-gas system, Lower Cretaceous, South Texas: The University of Texas at Austin, completed, 2011

Co-Supervisor, Ph.D. Dissertation Committee, Aysen Ozkan, The University of Texas at Austin, 2009

Supervisor, B.S. with Honors Thesis Committee, Emily Comer, The University of Texas at Austin, Graduated spring, 2009

Supervisor, M.A., Thesis, Glen Mackey, The University of Texas at Austin, 2009

## Student Committee Participation

Member, M.S. Thesis Committee, Benjamin Siks, Sedimentary, structural, and provenance record of the Cianza Basin, Puna Plateau-Eastern Cordilleran boundary, NW Argentina: The University of Texas at Austin, completed, 2012

## Presentations

### Invited Presentations

Mudrocks (shales, mudstones) at the scale of grains and pores: Current Understanding: presented to Department of Earth and Atmospheric Sciences, presented at University of Melbourne, Melbourne, Australia, October 5, 2023.

Mudrocks (Shales, Mudstones) at the Scale of Grains and Pores: Current Understanding: presented to School of Earth Sciences, Western Australia University, Perth, Australia, August 25, 2022.

Mudrocks (Shales, Mudstones) at the Scale of Grains and Pores: Current Understanding: presented to Curtin University/CSIRO; Geophysics research group, Perth, Australia, August 17, 2022.

Mudrock heterogeneity, rock properties, and reservoir quality---a survey of 18 shale units: presented to CSIRO Energy Group, Perth, Australia, March 24, 2022.

Quartz Cement in Mudrocks: Detection, Significance, and Distribution: presented to Curtin University, presented at departmental seminar, Perth, Australia (online), November 11, 2020.

Why Do We Care About Mudrocks? And, If We Do, How Can We Proceed to Study Them?: presented to graduate petrology course, Department of Geological Sciences, California State University, Northridge, online presentation, October 5, 2020.

Quantifying Mechanisms of Porosity Decline in Mudrocks: presented to Hildebrand Department of Petroleum and Geosystems Engineering, presented at The University of Texas at Austin, Austin, Texas, November 11, 2019.

How Depositional Environment, Diagenesis, and Thermal Maturity Affect the Evolution and Significance of Organic and Mineral Pore Systems in Unconventional Oil and Gas Reservoirs: Current Understanding and Future Research: presented at AAPG Hedberg Conference, Houston, Texas, March 4-May 6, 2019.

Cathodoluminescence for Understanding Cementation in Mudrocks: presented to Australian Microbeam Analysis Society, presented at 15th Biennial Symposium, Melbourne, Australia, February 13, 2019.

CL for Characterization of Components in Oil and Gas Shales: presented to Australian Microbeam Analysis Society, presented at Workshop on Cathodoluminescence Spectroscopy, Melbourne, Australia, February 12, 2019.

Mudrocks (Shales, Mudstones) at the Scale of Grains and Pores: Current Understanding: presented to Petroleum Exploration Society of Australia (PESA) monthly luncheon, Melbourne, Australia, October 17, 2018.

Keynote Speaker: Quantifying Mechanisms of Porosity Decline in Mudrocks: presented to International Sedimentological Congress, 20th meeting, Quebec City, Canada, August 13-17, 2018.

Cathodoluminescence Imaging for Understanding Mechanisms of Rock Property Evolution in Mudrocks: presented to Dallas Geological Society monthly luncheon, Dallas, Texas, March 20, 2018.

Quartz Cementation in Mudrocks: How Common Is It?: presented to Houston Geological Society Mudrocks Conference, Houston, Texas, March 6, 2018.

Mudrocks (shales, mudstones) at the scale of grains and pores: current understanding: presented to SIPES (Austin), presented at monthly luncheon meeting, Austin, Texas, November 2, 2017.

Mudrocks and the scale of grains and pores: presented to South Texas Geological Society, San Antonio, Texas, April 12, 2017.

AAPG Distinguished Lecture Tour: Mudrocks (shales, mudstones) at the scale of grains and pores: current understanding: presented to SUNY Binghamton, Virginia Tech, University of West Virginia, University of Nebraska, Pittsburgh Association of Petroleum Geologists, St. Mary's University (Halifax, Nova Scotia): March 19-31, 2017.

Diagenesis of mudrocks (day of lecture and laboratory exercises): presented to Colorado School of Mines, Golden, Colorado, March 7-10, 2017.

AAPG Distinguished Lecture Tour: Mudrocks (Shales, Mudstones) at the Scale of Grains and Pores: Current Understanding: presented to UT-El Paso, Panhandle Geological Society, Texas A&M University, Montana Geological Society, Tulsa Geological Society, Idaho State University, University of Saskatchewan, November 7-19, 2016.

Half-day short course on Micro- to Nano-scale Features of Mudrocks: presented to University of Saskatchewan, Saskatoon, Canada, November 18, 2016.

Cathodoluminescence imaging for linking cementation and compaction in mudrocks: presented to industry participants, presented at FEI Digital Rock Workshop, Houston, Texas, May 19, 2016.

Cementation and compaction in mudrocks: current understanding: presented to Aramco Services, presented at internal seminar, Houston, Texas, May 17, 2016.

Organic Matter under the SEM: presented to DPMS Shortcourse: Maturation of Carbonaceous Matter: Methods and Applications, presented at Section of Earth and Environmental Sciences, University of Geneva, Geneva, Switzerland, April 18-20, 2016.

Cathodoluminescence for Understanding Cementation in Mudrocks: presented to Department of Geology and Geological Engineering, presented at Colorado School of Mines, Golden, Colorado, March 8-11, 2016.

Shale Types and Shale Porosity: presented to Southern Gas Association, presented at BEG/SGA joint meeting, Austin, Texas, December 2, 2015.

Getting Kids Excited about Geoscience: presented to monthly learning session for volunteers, presented at Austin Nature Center, Austin, Texas, November 19, 2015.

Compositional Classification for Fine-Grained Sediments and Sedimentary Rocks: Foundation of Porosity Prediction: presented to AAPG Geoscience Technology Conference, Austin, Texas, November 3, 2015.

Pores in Fine-grained Sediments and Sedimentary Rocks: presented to AAPG Geoscience Technology Workshop, presented at Unconventionals Update, Austin, Texas, November 3, 2015.

Cements precipitate in shales, but when, where, and why?: presented to Sandia National Laboratory, presented at Shales at All Scales Conference, Santa Fe, New Mexico, June 8-11, 2015.

Proposed classification of fine-grained sedimentary rocks: presented to Tulsa Geological Society, presented at monthly luncheon, Tulsa, Oklahoma, May 12, 2015.

Lead-off discussion on the nature of porosity and its measurement: presented to Society of Petroleum Engineers, presented at SPE Forum on Physics and Chemistry in Nanoscale Rocks, La Jolla, California, April 22-26, 2015.

Proposed classification of fine-grained sedimentary rocks: presented to the local petroleum geology community and organized by FEI Company, presented at a workshop, Digital Rock Technology and Pore-Scale Imaging, Modeling, and Analysis, Denver, Colorado, April 1, 2015.

Proposed classification of fine-grained sedimentary rocks: presented to Rocky Mountain Section, Society for Sedimentary Geology (SEPM), presented at monthly luncheon, Denver, Colorado, March 31, 2015.

Seeing reservoir quality at the appropriate scale: a look at tools for high-resolution imaging and our evolving understanding of pore-scale processes in fine-grained systems: presented to American Geosciences Institute, presented at AGI Critical Issues Forum: America's Increasing Reliance on Natural Gas: Benefits and Risks of the Methane Economy, Fort Worth, Texas, November 19-20, 2014.

Mudrock (shale) heterogeneity: insights from high-resolution SEM imaging: presented to State Key Laboratory, presented at 2014 International Symposium on Unconventional Petroleum Exploration and Exploitation, Chengdu, China, July 25-26, 2014.

## **Presentations**

New Technology to Unlock the Secrets of Core: presented at Houston Research Center 10th Anniversary Celebration, Houston, Texas, May 2013.

Mudrock Heterogeneity: Insights from High-resolution SEM Imaging: presented at Special Plenary Session on Unconventionals; PGCE 2013, Kuala Lumpur, Malaysia, March 2013.

Petrologic Characterization of Oil and Gas Shales: sponsored by Geological Society of Malaysia and organized by EAGE, Kuala Lumpur, Malaysia, March 2013.

Organic-Rich Rocks: workshop presented at 49th Annual Meeting of the Clay Minerals Society, Golden, Colorado, July 7-8, 2012.

Seminar talk: presented at Baylor University, Waco, Texas, October 21, 2011.

Unconventional Reservoirs: Integrated Workflows (keynote speech): presented at Reservoir Quality Mini-Conference, ConocoPhillips, Houston, Texas, April 2011.

Rock-property evolution in the most abundant sedimentary rocks: presented at Unconventional Workshop sponsored by UT AAPG Student Chapter, Houston, Texas, April 10-13, 2011.

Keynote speech: presented at 2nd ExxonMobil Microscopy Symposium, Houston, Texas, October 2010.

Microscale imaging and controls on mudrock composition: toward an understanding of mudrock compaction and classification: presented at MSRL meeting, Austin, Texas, January 2010.

Mudrock deformation in early burial: Nankai accretionary prism: presented (with Rob Reed) at MSRL meeting, Austin, Texas, January 2010.

Particle sources and mudrock properties: contrasting examples from Cenozoic mudrocks of the Gulf of Mexico and Paleozoic siliceous mudrocks of the North American Mid-Continent: presented at Lunch and Learn Program, EnCana, Denver, Colorado, March 2009.

Heterogeneity in mudrocks: presented at the Department of Geological Sciences, The University of Texas at Arlington, Arlington, Texas, January 22, 2009.

Heterogeneity in mudrocks: presented at Society of Petrophysicists and Well Log Analysts Spring Topical Conference: Gas Shale Evaluation and Completions, Houston, Texas, 2009.

## Activities of a Professional Nature

### Professional Societies

American Association of Petroleum Geologists

Geological Society of America

SEPM (Society for Sedimentary Geology)

### Activities of a Professional Nature

President, SEPM (June 2014-June 2015)

Life on a Ship with a Big Hole in the Middle of It: presented at BEG summer seminar series, June 12, 2009

Rock and mineral ID at Identification Day, Texas Memorial Museum, August 30, 2009

Rock and mineral ID at Identification Day, Texas Memorial Museum, January 25, 2009

## Publications

### Peer Reviewed Authored Books

Marsaglia, K. M., and Milliken, K. L., 2023, Practical guide for description and analysis of sedimentary cores: practices developed aboard the JOIDES Resolution during ODP and IODP: College Station, Tex., International Ocean Discovery Program, Technical Note, v. 5, 83 p., <http://doi.org/10.14379/iodp.tn.5.2023>.

### Peer Reviewed Journal Articles

Perrotta, S., Barone, M., Marsaglia, K. M., Milliken, K. L., Perrone, V., and Critelli, S., 2024, Detrital signatures of clastic serpentinite in tectonically diverse settings and interpretation of an example from the Northern Apennines: *Journal of Sedimentary Research*, v. 94, no. 2, p. 207-230, <http://doi.org/10.2110/jsr.2022.093>.

Eakin, A. L., Reece, J. S., Milliken, K. L., Locklair, R., and Rathbun, A. P., 2023, Classification of elemental chemofacies as indicators of cement diagenesis in mudrocks of the Permian Spraberry Formation and Wolfcamp formation, western Texas: *AAPG Bulletin*, v. 107, no. 6, p. 863-886, <http://doi.org/https://doi.org/10.1306/10242221142>.

Bihani, A., Daigle, H., Santos, J. E., Landry, C., Prodanovic, M., and Milliken, K., 2022, MudrockNet: semantic segmentation of mudrock SEM images through deep learning: *Computers & Geosciences*, v. 158, no. 104952, 10 p., <http://doi.org/10.1016/j.cageo.2021.104952>.

Han, S., L?hr, S. C., Abbott, A. N., Baldermann, A., Farkas, J., McMahon, W., Milliken, K. L., Rafiei, M., Wheeler, C., and Owen, M., 2022, Earth system science applications of next-generation SEM-EDS automated mineral mapping: *Frontiers in Earth Science*, v. 10, no. 956912, 22 p., <http://doi.org/10.3389/feart.2022.956912>.

Lahiri, S., Milliken, K., Vrolijk, P., Desbois, G., and Urai, J. L., 2022, Mechanical compaction mechanisms in the input sediments of the Sumatra subduction complex - insights from microstructural analysis of cores from IODP Expedition 362: *Solid Earth*, v. 13, p. 1513-1539, <http://doi.org/10.5194/se-13-1513-2022>.

Shao, D., Zhang, T., Li, Y., Milliken, K. L., Zhang, Y., and Song, H., 2022, Effects of confining pressure and microscale heterogeneity on hydrocarbon retention and pore evolution from

artificial maturation of Eagle Ford Shale: *International Journal of Coal Geology*, v. 260, no. 104057, 18 p., <http://doi.org/10.1016/j.coal.2022.104057>.

Torres, M. E., Milliken, K. L., Hüpers, A., Kim, J.-H., and Lee, S.-G., 2022, Authigenic clays versus carbonate formation as products of marine silicate weathering in the input sequence to the Sumatra subduction zone: *Geochemistry, Geophysics, Geosystems*, v. 23, no. 4, article no. e2022GC010338, 17 p., <http://doi.org/10.1029/2022GC010338>.

Davletshin, A., Ko, L. T., Milliken, K., Periwai, P., Wang, C.-C., and Song, W., 2021, Detection of framboidal pyrite size distributions using convolutional neural networks: *Marine and Petroleum Geology*, v. 132, no. 105159, 11 p., <http://doi.org/10.1016/j.marpetgeo.2021.105159>.

Milliken, K. L., Zhang, T., Chen, J., and Ni, Y., 2021, Mineral diagenetic control of expulsion efficiency in organic-rich mudrocks, Bakken Formation (Devonian-Mississippian), Williston Basin, North Dakota, U.S.A.: *Marine and Petroleum Geology*, v. 127, no. 104869, 24 p., <http://doi.org/10.1016/j.marpetgeo.2020.104869>.

Ramirez, S. G., Hayman, N. W., Gulick, S. P. S., Milliken, K. L., Stockli, D. F., and Masago, H., 2021, Sediment provenance, routing and tectonic linkages in the Nankai forearc region, Japan: *Basin Research*, v. 33, no. 6, p. 3231-3255, <http://doi.org/10.1111/bre.12601>.

McNeill, L., Dugan, B., Petronotis, K., Milliken, K., Francis, J., and Expedition 362 scientists, 2020, Late Miocene wood recovered in Bengal-Nicobar submarine fan sediments by IODP Expedition 362: *Scientific Drilling*, v. 27, p. 49-52, <http://doi.org/10.5194/sd-27-49-2020>.

Peng, J., Milliken, K. L., and Fu, Q., 2020, Quartz types in the Upper Pennsylvanian organic-rich Cline Shale (Wolfcamp D), Midland Basin, Texas: Implications for silica diagenesis, porosity evolution and rock mechanical properties: *Sedimentology*, v. 67, no. 4, p. 2040-2064, <http://doi.org/10.1111/sed.12694>.

Peng, J., Milliken, K., Fu, Q., Janson, X., and Hamlin, H. S., 2020, Grain assemblages and diagenesis in organic-rich mudrocks, Upper Pennsylvanian Cline shale (Wolfcamp D), Midland Basin, Texas: *AAPG Bulletin*, v. 104, no. 7, p. 1593-1624, <http://doi.org/10.1306/03022018240>.

Pickering, K. T., Carter, A., Andò, A., Garzanti, E., Limonta, M., Vezzoli, G., and Milliken, K. L., 2020, Deciphering relationships between the Nicobar and Bengal submarine fans, Indian Ocean: *Earth and Planetary Science Letters*, v. 544, no. 116329, 14 p., <http://doi.org/10.1016/j.epsl.2020.116329>.

Pickering, K. T., Pouderoux, H., McNeill, L. C., Backman, J., Chemale, F., Kutterolf, S., Milliken, K. L., Mukoyoshi, H., Henstock, T. J., Stevens, D. E., Parnell, C., and Dugan, B., 2020, Sedimentology, stratigraphy and architecture of the Nicobar Fan (Bengal-Nicobar Fan System), Indian Ocean: results from International Ocean Discovery Program Expedition 362: *Sedimentology*, v. 67, no. 5, p. 2248-2281, <http://doi.org/10.1111/sed.12701>.

Tang, D. G., Milliken, K. L., and Spikes, K. T., 2020, Machine learning for point counting and segmentation of arenite in thin section: *Marine and Petroleum Geology*, v. 120, no. 104518, 17 p., <http://doi.org/10.1016/j.marpetgeo.2020.104518>.

Torres, M. E., Hong, W.-L., Solomon, E. A., Milliken, K., Kim, J.-H., Sample, J. C., Teichert, B. M. A., and Wallmann, K., 2020, Silicate weathering in anoxic marine sediment as a requirement for authigenic carbon burial: *Earth-Science Reviews*, v. 200, no. 102960, 15 p., <http://doi.org/10.1016/j.earscirev.2019.102960>.

Mehmani, A., Milliken, K., and Prodanovic, M., 2019, Predicting flow properties in diagenetically-altered media with multi-scale process-based modeling: A Wilcox Formation case study: *Marine and Petroleum Geology*, v. 100, p. 179-194, <http://doi.org/10.1016/j.marpetgeo.2018.09.001>.

Milliken, K. L., Reed, R. M., McCarty, D. K., Bishop, J., Lipinski, C. J., Fischer, T. B., Crousse, L., and Reijenstein, H., 2019, Grain assemblages and diagenesis in the Vaca Muerta Formation



(Jurassic-Cretaceous), Neuquén Basin, Argentina: *Sedimentary Geology*, v. 380, p. 45-64, <http://doi.org/10.1016/j.sedgeo.2018.11.007>.

Milliken, K., McCarty, D. K., and Derkowski, A., 2018, Grain assemblages and diagenesis in the tarl-dominated Lower Silurian mudrock succession of the western margin of the east European craton in Poland and Lithuania: *Sedimentary Geology*, v. 374, p. 115-133, <http://doi.org/10.1016/j.sedgeo.2018.07.011>.

Daigle, H., Hayman, N. W., Kelly, E. D., Milliken, K., and Jiang, H., 2017, Fracture capture of organic pores in shales: *Geophysical Research Letters*, v. 44, p. 2167-2176, <http://doi.org/10.1002/2016GL072165>.

Huepers, A., Torres, M. E., Owari, S., McNeill, L. C., Dugan, B., Henstock, T. J., Milliken, K. L., and 26 additional co-authors, 2017, Release of mineral-bound water prior to subduction tied to shallow seismogenic slip off Sumatra: *Science*, v. 356, p. 841-844, <http://doi.org/10.1126/science.aal3429>.

Ilgen, A. G., Heath, J. E., Akkutlu, I. Y., Bryndzia, T. L., Cole, D. R., Kharaka, Y. K., Kneafsey, T. J., Milliken, K., Pyrak-Nolte, L. J., and Suarez-Rivera, R., 2017, Shales at all scales: exploring coupled processes in mudrocks: *Earth-Science Reviews*, v. 166, p. 132-152, <http://doi.org/10.1016/j.earscirev.2016.12.013>.

Ko, L., Loucks, R. G., Milliken, K., Liang, Q., Zhang, T., Sun, X., Hackley, P. C., Ruppel, S. C., and Peng, S., 2017, Controls on pore types and pore-size distribution in the Upper Triassic Yanchang Formation, Ordos Basin, China: implications for pore-evolution models of lacustrine mudrocks: *Interpretation*, v. 5, no. 2, p. SF127-SF148, <http://doi.org/10.1190/INT-2016-0115.1>.

McNeill, L. C., Dugan, B., Backman, J., Pickering, K. T., Pouderoux, H. F. A., Henstock, T. J., Petronotis, K., Carter, A., Chemale, F., Milliken, K., and 25 additional co-authors, 2017, Understanding Himalayan erosion and the significance of the Nicobar Fan: *Earth and Planetary Science Letters*, v. 475, p. 134-142, <http://doi.org/10.1016/j.epsl.2017.07.019>.

Milliken, K., and Olson, T., 2017, Silica diagenesis, porosity evolution, and mechanical behavior in siliceous mudstones, Mowry Shale (Cretaceous), Rocky Mountains, U.S.A.: *Journal of Sedimentary Research*, v. 87, p. 366-387, <http://doi.org/10.2110/jsr.2017.24>.

Milliken, K., Shen, Y., Ko, L. T., and Liang, Q., 2017, Grain composition and diagenesis of organic-rich lacustrine tarls, Triassic Yanchang Formation, Ordos Basin, China: *Interpretation*, v. 5, no. 2, p. SF189-SF210, <http://doi.org/10.1190/INT-2016-0092.1>.

Rowe, H. D., Wang, X., Fa, B., Zhang, T., Ruppel, S. C., Milliken, K., Loucks, R. G., Shen, Y., Zhang, J., Liang, Q., and Sivil, J. E., 2017, Chemostratigraphic insights into fluvio-lacustrine deposition, Yanchang Formation, Upper Triassic, Ordos Basin, China: *Interpretation*, v. 5, no. 2, p. SF149-SF165, <http://doi.org/10.1190/INT-2016-0121.1>.

Zhang, T., Sun, X., Milliken, K., Ruppel, S. C., and Enriquez, D., 2017, Empirical relationship between gas composition and thermal maturity in Eagle Ford Shale, south Texas: *AAPG Bulletin*, v. 101, no. 8, p. 1277-1307, <http://doi.org/10.1306/09221615209>.

Zhang, T., Wang, X., Zeng, H., Fishman, N., Katz, B. J., Milliken, K., Wei, M., Loucks, R. G., and Ghanizadeh, A., 2017, Introduction to special section: Lacustrine shale characterization and shale resource potential in Ordos Basin, China: *Interpretation*, v. 5, no. 2, p. SFi-SFii, <http://doi.org/10.1190/INT-2017-0314-SPSEINTRO.1>.

Zhang, T., Wang, X., Zhang, J., Sun, X., Milliken, K., Ruppel, S. C., and Enriquez, D., 2017, Geochemical evidence for oil and gas expulsion in Triassic lacustrine organic-rich mudstone, Ordos Basin, China: *Interpretation*, v. 5, no. 2, p. SF41-SF61, <http://doi.org/10.1190/INT-2016-0104.1>.

Milliken, K., 2016, A compositional classification for grain assemblages in fine-grained sediments and sedimentary rocks--reply: *Journal of Sedimentary Research*, v. 86, p. 6-10,

<http://doi.org/10.2110/jsr.2016.2>.

Milliken, K., and Curtis, M. E., 2016, Imaging pores in sedimentary rocks: foundation of porosity prediction: *Marine and Petroleum Geology*, v. 73, p. 590-608, <http://doi.org/10.1016/j.marpetgeo.2016.03.020>.

Milliken, K., Ergene, S. M., and Ozkan, A., 2016, Quartz types, authigenic and detrital, in the Upper Cretaceous Eagle Ford Formation, South Texas, USA: *Sedimentary Geology*, v. 339, p. 273-288, <http://doi.org/10.1016/j.sedgeo.2016.03.012>.

Nole, M., Daigle, H., Milliken, K. L., and Prodanovic, M., 2016, A method for estimating microporosity of fine-grained sediments and sedimentary rocks via scanning electron microscope image analysis: *Sedimentology*, v. 63, no. 6, p. 1507-1521, <http://doi.org/10.1111/sed.12271>.

Ramirez, S. G., and Milliken, K., 2016, Data report: atlas of lithic grain types at Site C0002; reference for petrographic provenance analysis in the Kumano Basin and upper Nankai accretionary prism: *Proceedings of the Integrated Ocean Drilling Program*, v. 338, 33 p., <http://doi.org/10.2204/iodp.proc.338.204.2016>.

Sun, X., Zhang, T., Sun, Y., Milliken, K., and Sun, D., 2016, Geochemical evidence of organic matter source input and depositional environments in the lower and upper Eagle Ford Formation, south Texas: *Organic Geochemistry*, v. 98, p. 66-81, <http://doi.org/10.1016/j.orggeochem.2016.05.018>.

Pommer, M., and Milliken, K., 2015, Pore types and pore-size distributions across thermal maturity, Eagle Ford Formation, southern Texas: *AAPG Bulletin*, v. 99, no. 9, p. 1713-1744, <http://doi.org/10.1306/03051514151>.

Milliken, K., 2014, A compositional classification for grain assemblages in fine-grained sediments and sedimentary rocks: *Journal of Sedimentary Research*, v. 84, p. 1185-1199, <http://doi.org/10.2110/jsr.2014.92>.

Milliken, K., Ko, L., Pommer, M., and Marsaglia, K. M., 2014, SEM Petrography of Eastern Mediterranean sapropels: analogue data for assessing organic matter in oil and gas shales: *Journal of Sedimentary Research*, v. 84, p. 961-974, <http://doi.org/10.2110/jsr.2014.75>.

Zhang, T., Yang, R., Milliken, K., Ruppel, S. C., Pottorf, R. J., and Sun, X., 2014, Chemical and isotopic composition of gases released by crush methods from organic rich mudrocks: *Organic Geochemistry*, v. 73, p. 16-28, <http://doi.org/http://dx.doi.org/10.1016/j.orggeochem.2014.05.003>.

Milliken, K., Rudnicki, M., Awwiller, D. N., and Zhang, Tongwei, 2013, Organic matter-hosted pore system, Marcellus Formation (Devonian), Pennsylvania: *AAPG Bulletin*, v. 97, p. 177-200.

Steel, Ronald, and Milliken, K., 2013, Major advances in siliciclastic sedimentary geology, 1960-2012: *Geological Society of America Special Paper* 500, p. 121-167.

Ji, L., Zhang, T., Milliken, K., Qu, J., and Zhang, X., 2012, Experimental investigation of main controls to methane adsorption in clay-rich rocks: *Applied Geochemistry*, v. 27, p. 2533-2545.

Mackey, G. N., Horton, B. K., and Milliken, K. L., 2012, Provenance of the Paleocene-Eocene Wilcox Group, western Gulf of Mexico basin: evidence for integrated drainage of the southern Laramide Rocky Mountains and Cordilleran arc: *Geological Society of America Bulletin*, v. 124, no. 5/6, p. 1007-1024.

Milliken, K. L., Comer, E. E., and Marsaglia, K. M., 2012, Data report: modal sand composition at Sites C0004, C0006, C0007, and C0008, IODP Expedition 316, Nankai accretionary prism, in Kinoshita, M., Tobin, H., Ashi, J., Kimura, G., Lallemand, S., Screaton, E. J., Curewitz, D., Masago, H., Moe, K. T., and the Expedition 314/315/316 Scientists, *Proceedings of the Integrated Ocean Drilling Program*, v. 314/315/316, 21 p.

Milliken, K. L., Esch, W. L., Reed, R. M., and Zhang, T., 2012, Grain assemblages and strong diagenetic overprinting in siliceous mudrocks, Barnett Shale (Mississippian), Fort Worth Basin, Texas: AAPG Bulletin, v. 96, no. 8, p. 1553-1578.

Zhang, T., Ellis, G. S., Ruppel, S. C., Milliken, K., and Yang, R., 2012, Effect of organic-matter type and thermal maturity on methane adsorption in shale-gas systems: Organic Geochemistry, v. 47, p. 120-131.

Day-Stirrat, R. J., Milliken, K. L., Dutton, S. P., Loucks, R. G., Hillier, S., Aplin, A. C., and Schleicher, A. M., 2011, Discussion in response to Knut Bjørlykke regarding JMPG\_1376 "Open-System Chemical Behavior in Deep Wilcox Group Mudstones, Texas Gulf Coast, USA": Marine and Petroleum Geology, v. 28, p. 1383-1384.

Lu, Jiemin, Milliken, K., Reed, R. M., and Hovorka, S. D., 2011, Diagenesis and sealing capacity of the middle Tuscaloosa mudstone at the Cranfield carbon dioxide injection site, Mississippi: Environmental Geosciences, v. 18, no. 1, p. 35-53.

Ozkan, A., Cumella, S. P., Milliken, K. L., and Laubach, S. E., 2011, Prediction of lithofacies and reservoir quality using well logs, Late Cretaceous Williams Fork Formation, Mamm Creek field, Piceance Basin, Colorado: AAPG Bulletin, v. 95, no. 10, p. 1699-1725.

Day-Stirrat, R. J., Dutton, S. P., Milliken, K. L., Loucks, R. G., Aplin, A. C., Hillier, S., and van der Pluijm, B. E., 2010, Fabric anisotropy induced by primary depositional variations in the silt: clay ratio in two fine-grained slope fan complexes: Texas Gulf Coast and northern North Sea: Sedimentary Geology, v. 226, p. 42-53.

Day-Stirrat, R. J., Milliken, K., Dutton, S. P., Loucks, R. G., Hillier, S., Aplin, A. C., and Schleicher, A. M., 2010, Open-system chemical behavior in deep Wilcox Group mudstones, Texas Gulf Coast, USA: Marine and Petroleum Geology, v. 27, p. 1804-1818.

Makowitz, A., Lander, R. H., and Milliken, K. L., 2010, Chemical diagenetic constraints on the timing of cataclasis in deformed sandstone along the Pine Mountain overthrust, eastern Kentucky: Journal of Structural Geology, v. 32, p. 1923?-1932.

Milliken, K. L., and Reed, R. M., 2010, Multiple causes of diagenetic fabric anisotropy in weakly consolidated mud, Nankai accretionary prism, IODP Expedition 316: Journal of Structural Geology, v. 32, p. 1887-1898.

Landrum, J. T., Bennett, P. C., Engel, A. S., Pastén, P. A., and Milliken, K., 2009, Partitioning geochemistry of arsenic and antimony, El Tatio Geyser Field, Chile: Applied Geochemistry, v. 24, p. 664-676.

Barker, D. S., and Milliken, K. L., 2008, Cementation of the Footprint Tuff, Laetoli, Tanzania: The Canadian Mineralogist, v. 46, p. 831-841.

Chafetz, H. S., Wu, Z., and Milliken, K. L., 2008, Geochemistry of preserved Permian aragonitic cements in the tepees of the Guadalupe Mountains, West Texas and New Mexico: Journal of Sedimentary Research, v. 78, p. 187-198.

Day-Stirrat, R. J., Loucks, R. G., Milliken, K. L., Hillier, S., and van der Pluijm, B. A., 2008, Phyllosilicate orientation demonstrates early timing of compactional stabilization in calcite-cemented concretions in the Barnett Shale (Late Mississippian), Fort Worth Basin, Texas (U.S.A.): Sedimentary Geology, v. 28, no. 1-2, p. 27-35.

Milliken, K. L., 2007, Provenance and diagenesis of heavy minerals, Cenozoic units of the north-western Gulf of Mexico sedimentary basin, in Mange, M. A. and Wright, D. T., eds., Heavy minerals in use: Development in Sedimentology, v. 58, p. 247-261.

Milliken, K. L., Choh, S. -J., Papazis, P. K., and Schieber, J. S., 2007, "Cherty" stringers in the Barnett Shale are agglutinated foraminifera: Sedimentary Geology, doi:10.1016/j.sedgeo.2006.12.012

- Morgan, J. K., Clague, D. A., Borchers, D. C., Davis, A. S., and Milliken, K. L., 2007, Mauna Loa's submarine western flank: landsliding, deep volcanic spreading, and hydrothermal alteration: *Geochemistry, Geophysics, Geosystems*, v. 8, no. 5, Q05002, doi:10.1029/2006GC001420.
- Makowitz, A., Lander, R. H., and Milliken, K. L., 2006, Diagenetic modeling to assess the relative timing of quartz cementation and brittle grain processes during compaction: *AAPG Bulletin*, v. 90, p. 873-885.
- McBride, E. F., and Milliken, K. L., 2006, Giant calcite-cemented concretions, Dakota Formation, central Kansas, USA: *Sedimentology*, v. 53, p. 1161-1179.
- Drits, V. A., McCarty, D. K., Sakharov, B. A., and Milliken, K. L., 2005, Insight into structural and compositional homogeneity-heterogeneity of some ancient calcian dolomites: *Canadian Mineralogist*, v. 43, p. 1255-1290.
- Choh, S. -J., and Milliken, K. L., 2004, Virtual carbonate thin section using PDF: new method for interactive visualization and archiving: *Carbonates and Evaporites*, v. 19, p. 87-92.
- Roberts, J. A., Bennett, P. C., Gonzalez, L. A., Macpherson, G. L., and Milliken, K. L., 2004, Microbial precipitation of dolomite in methanogenic groundwater: *Geology*, v. 32, p. 277-280.
- Choh, S. -J., Milliken, K. L., and McBride, E. F., 2003, Architecture and development of an interactive program for teaching highly visual material: a tutorial for sandstone petrology: *Computers and Geosciences*, v. 29, p. 1127-1135.
- Makowitz, Astrid, and Milliken, K. L., 2003, Quantification of brittle deformation in compaction, Frio and Mt. Simon sandstones: *Journal of Sedimentary Research*, v. 73, p. 1007-1021.
- McBride, E. F., Picard, M. D., and Milliken, K. L., 2003, Calcite-cemented concretions in Cretaceous sandstone, Wyoming and Utah: *Journal of Sedimentary Research*, v. 73, p. 462-483.
- Milliken, K. L., 2003, Microscale distribution of kaolinite in Breathitt Formation sandstones (middle Pennsylvanian): implications for mass balance, in Worden, R. H., and Morad, S., eds., *Clay cements in sandstones: International Association of Sedimentologists, Special Publication No. 34*, Blackwell Science, p. 335-352.
- Milliken, K. L., Barufaldi, J. P., McBride, E. F., and Choh, S. -J., 2003, Assessment of an interactive digital tutorial for undergraduate-level sandstone petrology: *Journal of Geoscience Education*, v. 51, p. 381-386.
- Reed, R. M., and Milliken, K. L., 2003, How to overcome imaging problems associated with carbonate minerals on SEM-based cathodoluminescence systems: *Journal of Sedimentary Research*, v. 73, no. 2, p. 328-332.
- Milliken, K. L., 2002, Observation of microbial structures in rocks using 3D light microscopy: *Journal of Sedimentary Research*, v. 72, p. 220-224.
- Milliken, K. L., 2001, Diagenetic heterogeneity in sandstone at the outcrop scale, Breathitt Formation (Pennsylvanian), Eastern Kentucky: *AAPG Bulletin*, v. 84, p. 795-815.
- Wilkinson, M., Milliken, K. L., and Haszeldine, R. S., 2001, Systematic dissolution of K-feldspar in deeply buried rift and passive margin sandstones: *Journal of the Geological Society of London*, v. 158, p. 675-683.
- Land, L. S., and Milliken, K. L., 2000, Regional loss of SiO<sub>2</sub> and CaCO<sub>3</sub>, and gain of K<sub>2</sub>O during burial diagenesis of Gulf Coast mudrocks, USA, in Worden, R. H., and Morad, S., eds., *Quartz cementation in sandstones: International Association of Sedimentologists, Special Publication No. 29*, Blackwell Science, p. 183-198.
- Milliken, K. L., 1998, Carbonate diagenesis in non-marine foreland sandstones at the western edge of the Alleghanian overthrust belt, southern Appalachians, in Morad, S., ed., *Carbonate*

cementation in sandstones: IAS Special Volume 26, p. 87-105.

Milliken, K. L., McBride, E. F., Cavazza, W., Cibin, U., Fontana, D., Picard, M. D., and Zuffa, G. G., 1998, Geochemical history of calcite precipitation in Tertiary sandstones, Northern Apennines, Italy, in Morad, S., ed., Carbonate cementation in sandstones: IAS Special Volume 26, p. 213-240.

Land, L. S., Mack, L. E., Milliken, K. L., and Lynch, F. L., 1997, Burial metamorphism of argillaceous sediment, Gulf of Mexico sedimentary basin: a reexamination: Geological Society of America Bulletin, v. 109, p. 2-15.

Gibson, I., Beslier, M. -O., Cornen, G., Milliken, K. L., and Seifert, K., 1996, Major and trace-element seawater alteration profiles in serpentinite formed during the development of the Galicia Margin, ODP Site 897, in Whitmarsh, R. B., and others, Proceedings of the Ocean Drilling Program: scientific results: Ocean Drilling Program, College Station, v. 149, p. 519-528.

Gibson, I., Milliken, K. L., and Morgan, J. K., 1996, Serpentinite-breccia landslide deposits generated during oceanic crustal extension at the Galicia Margin, ODP Site 899, in Whitmarsh, R. B., and others, Proceedings of the Ocean Drilling Program: scientific results: Ocean Drilling Program, College Station, v. 149, p. 571-576.

Marsaglia, K. M., Garcia y Barragan, J. C., Padilla, I., and Milliken, K. L., 1996, The evolution of the Iberian Passive Margin as reflected in sand provenance, in Whitmarsh, R. B., and others, Proceedings of the Ocean Drilling Program: scientific results: Ocean Drilling Program, College Station, v. 149, p. 269-280.

Milliken, K. L., and Morgan, J. K., 1996, Chemical evidence for near-seafloor precipitation of calcite in serpentinites (Site 897) and serpentinite breccias (Site 899), Iberia Abyssal Plain, in Whitmarsh, R. B., and others, Proceedings of the Ocean Drilling Program: scientific results: Ocean Drilling Program, College Station, v. 149, p. 553-558.

Milliken, K. L., Lynch, F. L., and Seifert, K., 1996, Marine weathering of serpentinites and serpentinite breccias, Sites 897 and 899, Iberia Abyssal Plain, in Whitmarsh, R. B., and others, Proceedings of the Ocean Drilling Program: scientific results: Ocean Drilling Program, College Station, v. 149, p. 529-540.

Morgan, J. K., and Milliken, K. L., 1996, Petrography of calcite veins in serpentinitized peridotite basement rocks from the Iberia Abyssal Plain, Sites 897 and 899, in Whitmarsh, R. B., and others, Proceedings of the Ocean Drilling Program: scientific results: Ocean Drilling Program, College Station, v. 149, p. 559-569.

Dickinson, W. W., and Milliken, K. L., 1995, The diagenetic role of brittle deformation in compaction and pressure solution, Etjo Sandstone, Namibia: Journal of Geology, v. 103, p. 339-347.

McBride, E. F., Milliken, K. L., Cavazza, W., Cibin, U., Fontana, D., Picard, M. D., and Zuffa, G. G., 1995, Inhomogeneous distribution of calcite cement at the outcrop scale in Tertiary sandstones, northern Apennines, Italy: AAPG Bulletin, v. 79, p. 1044-1063.

Milliken, K. L., and Eustice, R. A., 1995, Historical data on graduate-level participation of women in a large geoscience department: Journal of Geological Education, v. 43, p. 221-226.

Boettcher, S., and Milliken, K. L., 1994, Mesozoic-Cenozoic unroofing of the southern Appalachian Basin: apatite fission track evidence from middle Pennsylvanian sandstones: Journal of Geology, v. 102, p. 655-668.

Fu, L., Milliken, K. L., and Sharp, J. M., Jr., 1994, Porosity and permeability variations in fractured and liesegang-banded Breathitt Sandstones (Middle Pennsylvanian), eastern Kentucky: diagenetic controls and implications for modeling dual-porosity systems: Journal of Hydrology, v. 154, p. 351-381.

Milliken, K. L., 1994, Cathodoluminescent textures and the origin of quartz silt in Oligocene

mudrocks, South Texas: *Journal of Sedimentary Research*, v. A64, p. 567-571.

Milliken, K. L., Mack, L. E., and Land, L. S., 1994, Elemental mobility in sandstones during burial: whole-rock chemical data, Frio Formation, South Texas: *Journal of Sedimentary Research*, v. A64, p. 788-796.

Cibin, U., Cavazza, W., Fontana, D., Milliken, K. L., and McBride, E. F., 1993, Comparison of composition and texture of calcite-cemented concretions and host sandstones, northern Apennines, Italy: *Journal of Sedimentary Petrology*, v. 63, p. 945-954.

Milliken, K. L., and Land, L. S., 1993, The origin and fate of silt-sized carbonate in subsurface Miocene-Oligocene mudrocks, South Texas Gulf Coast: *Sedimentology*, v. 40, p. 107-124.

Milliken, K. L., 1992, Chemical behavior of detrital feldspars in mudrocks versus sandstones, Frio Formation (Oligocene), South Texas: *Journal of Sedimentary Petrology*, v. 62, p. 790-801.

Milliken, K. L., and Mack, L. E., 1990, Subsurface dissolution of heavy minerals, Frio Formation sandstones of the ancestral Rio Grande province, South Texas: *Sedimentary Geology*, v. 68, p. 187-199.

Milliken, K. L., 1989, Petrography and composition of authigenic feldspars, Oligocene Frio Formation, South Texas: *Journal of Sedimentary Petrology*, v. 59, p. 361-374.

Milliken, K. L., McBride, E. F., and Land, L. S., 1989, Numerical assessment of dissolution versus replacement in the subsurface destruction of detrital feldspars, Oligocene Frio Formation, South Texas: *Journal of Sedimentary Petrology*, v. 59, p. 740-757.

Milliken, K. L., 1988, Loss of provenance information through subsurface diagenesis, Plio-Pleistocene sandstones, northern Gulf of Mexico: *Journal of Sedimentary Petrology*, v. 58, p. 992-1007.

Sharp, J. M., Jr., Galloway, W. E., Land, L. S., McBride, E. F., Blanchard, P. E., Bodner, D. P., Dutton, S. P., Farr, M. R., Gold, P. B., Jackson, T. J., Lundegard, P. E., MacPherson, Elise, and Milliken, K. L., 1988, Diagenetic processes in northwestern Gulf of Mexico sediments, in Chilingarian, G. V., and Wolf, K. H., eds., *Diagenesis II, developments in sedimentology 43*: New York, Elsevier: p. 43-113.

Land, L. S., Milliken, K. L., and McBride, E. F., 1987, Diagenetic evolution of Cenozoic sandstones, Gulf of Mexico sedimentary basin: *Sedimentary Geology*, v. 50, p. 195-225.

Land, L. S., and Milliken, K. L., 1981, Feldspar diagenesis in the Frio Formation, Brazoria County, Texas: *Geology*, v. 9, p. 314-318.

Milliken, K. L., Land, L. S., and Loucks, R. G., 1981, History of burial diagenesis, Frio Formation, Brazoria County, Texas: *American Association of Petroleum Geologist Bulletin*, v. 65, p. 1347-1413.

Milliken, K. L., 1979, The silicified evaporite syndrome: two aspects of silicification history of former evaporite nodules from southern Kentucky and northern Tennessee: *Journal of Sedimentary Petrology*, v. 49, p. 245-256.

## Peer Reviewed Book Chapters

Olson, T., and Milliken, K. L., 2021, Petrographic imaging methods for characterizing mudstone reservoirs, in Sorkhabi, R. (ed.), *Encyclopedia of petroleum geoscience*: Springer Nature Switzerland, *Encyclopedia of Earth Sciences series*, 29 p., [http://doi.org/10.1007/978-3-319-02330-4\\_309-1](http://doi.org/10.1007/978-3-319-02330-4_309-1).

Longman, M. W., Milliken, K., Olson, T. M., and Drake, W. R., 2020, A Comparison of Silica Diagenesis in the Devonian Woodford Shale (Central Basin Platform, West Texas) and Cretaceous Mowry Shale (Powder River Basin, Wyoming), in Camp, W., Milliken, K., Taylor, K., Fishman, N., Hackley, P., and Macquaker, J., eds., *Mudstone Diagenesis: Research Perspectives for Shale Hydrocarbon Reservoirs, Seals, and Source Rocks*: Tulsa, Okla., AAPG

Memoir, v. 120, p. 49-67, <http://doi.org/10.1306/13672210M12163>.

Milliken, K. L., and Hayman, N. W., 2020, Mudrock components and the genesis of bulk rock properties: review of current advances and challenges, in Dewers, T., Heath, J., and Sánchez, M., eds., *Shale: subsurface science and engineering*: Washington, D.C.; Hoboken, N.J., American Geophysical Union; Wiley, Geophysical Monograph, v. 245, p. 3-25, <http://doi.org/10.1002/9781119066699.ch1>.

Han, J., Daigle, H., Milliken, K. L., and Hayman, N. W., 2019, Porosity-deformation relationships in organic-rich shale, in Camp, W., Milliken, K., Taylor, K., Fishman, N., Hackley, P., and Macquaker, J., eds., *Mudstone diagenesis: research perspectives for shale hydrocarbon reservoirs, seals, and source rocks*: Tulsa, Okla., American Association of Petroleum Geologists, AAPG Memoir, v. 120, p. 149-163, <http://doi.org/10.1306/13672215M1213825>.

Milliken, K. L., 2019, Compactional and mass-balance constraints inferred from the volume of quartz cementation in mudrocks, in Camp, W., Milliken, K., Taylor, K., Fishman, N., Hackley, P., and Macquaker, J., eds., *Mudstone diagenesis: research perspectives for shale hydrocarbon reservoirs, seals, and source rocks*: Tulsa, Okla., American Association of Petroleum Geologists, AAPG Memoir, v. 120, p. 33-48, <http://doi.org/10.1306/13672209M121252>.

Milliken, K., and Olson, T., 2016, Amorphous and crystalline solids as artifacts in SEM images, in Olson, T., *Imaging Unconventional Reservoir Pore Systems*: AAPG Memoir, v. 112, p. 1-8, <http://doi.org/10.1306/13592013M112252>.

Amsler, H. E., Reusser, E., Milliken, K., and Strasser, M., 2015, Elemental distribution and microfabric characterization across a buried slump scar: new insights on the long-term development and reactivation of scar surfaces from a microscopic perspective, in Krastel, S., ed., *Submarine mass movements and their consequences: Switzerland*, Springer International Publishing, *Advances in Natural and Technological Hazards Research*, v. 37, p. 23-32, <http://doi.org/10.1007/978-3-319-00972-8>.

Milliken, K., and Day-Stirrat, R. J., 2013, Chapter 8: Cementation in mudrocks: Brief review with examples from cratonic basin mudrocks, in *Critical Assessment of Shale Resource Plays*, Chatellier, J.-Y. and D. Jarvie, eds.: AAPG Memoir 103, p. 133-150.

Milliken, K. L., Day-Stirrat, R. J., Papazis, P. K., and Dohse, C., 2012, Chapter 8. Carbonate lithologies of the Mississippian Barnett Shale, Fort Worth Basin, Texas, in Breyer, J. A., ed., *Shale reservoirs-giant resources for the 21st century*: American Association of Petroleum Geologists, Memoir 97, p. 290-321.

Milliken, K., Reed, R. M., and Laubach, S. E., 2005, Chapter 14. Quantifying compaction and cementation in deformation bands in porous sandstones, in Sorkhabi, R., and Tsuji, Y., eds., *Faults, fluid flow, and petroleum traps*: AAPG Memoir 85, p. 237-249.

Milliken, K. L., 2004, Chapter 5. Elemental transfer in sandstone-shale sequences, in Mackenzie, T., ed., *Sediments, diagenesis, and sedimentary rocks*, v. 7, *Treatise on geochemistry*: Elsevier, p. 159-190.

Milliken, K., and Laubach, S. E., 2000, Chapter 9. Brittle deformation in sandstone diagenesis as revealed by scanned cathodoluminescence imaging with application to characterization of fractured reservoirs, in Pagel, M., ed., *Cathodoluminescence and related techniques in geosciences and materials*: New York, Springer-Verlag, p. 225-243.

## Non Peer Reviewed Authored Books

McBride, E. F., Abdel-Wahab, A. A., and Milliken, K., 2002, *Petrography and diagenesis of a half-billion-year-old cratonic sandstone (Hickory), Llano region, Texas*: The University of Texas at Austin, Bureau of Economic Geology, Report of Investigations, no. 264, 77 p.

Loucks, R. G., Richmann, D. L., and Milliken, K., 1981, *Factors controlling reservoir quality in Tertiary sandstones and their significance to geopressured geothermal production*: The

University of Texas at Austin, Bureau of Economic Geology, Report of Investigations, no. 111, 41 p.

## Non Peer Reviewed Journal Articles

Milliken, K., McBride, E. F., and Land, L. S., 2018, Robert Louis Folk: The Journal of the Indian Association of Sedimentologists, v. 35, no. 2, p. 84-85.

Mehmani, A., Milliken, K., and Prodanovic, M., 2015, A quantitative pore-scale investigation on the paragenesis of Wilcox tight gas sandstone: Unconventional Resources Technology Conference, v. URTeC 2147717, 16 p.

Milliken, K., 2013, SEM-based cathodoluminescence imaging for discriminating quartz types in mudrocks: Unconventional Resources Technology Conference, Denver, Colorado, URTeC 1582467, 10 p.

Milliken, K. L., and Choh, S. -J., 2011, Carbonate Petrology, v. 1.0: An interactive petrography tutorial: Discovery Series No. 15, American Association of Petroleum Geologists, Tulsa, Oklahoma, DVD.

Milliken, K., McDonnell, Angela, and Day-Stirrat, R. J., 2009, Barnett Shale, in Laubach, S. E., and Tinker, S. W., eds., 2009, Earth's art: celebrating the Centennial of the Bureau of Economic Geology, 1909-2009: The University of Texas at Austin, Bureau of Economic Geology, p. 104-105.

Milliken, K. L., Choh, S. -J., and McBride, E. F., 2007, Sandstone petrology, v. 2.0: A tutorial petrographic image atlas, Multimedia CD-ROM: American Association of Petroleum Geologists/DataPages, Discovery Series No. 10 (Second Edition), Tulsa, Oklahoma, CD-ROM. Awarded AAPG Certificate of Merit.

de Oliveira, D. P. S., Reed, R. M., Milliken, K. L., Robb, L. J., Inverno, C. M. C., and d'Orey, F. L. C., 2003, (Meta)cherts, (meta)lydites, (meta)phtanites and quartzites of the Série Negra (Crato-S. Martinho), E. Portugal: towards a correct nomenclature based on mineralogy and cathodoluminescence studies, in Actas do VI Congresso Nacional de Geologia, Ciências da Terra, Universidade Nova de Lisboa, Lisboa, Special No. 5, CD-ROM, B68-B71.

de Oliveira, D. P. S., Reed, R. M., Milliken, K. L., Robb, L. J., Inverno, C. M. C., and d'Orey, F. L. C., 2003, Série Negra black quartzites--Tomar Cordoba Shear Zone, E. Portugal: mineralogy and cathodoluminescence studies: Cadernos Lab. Xeolóxico de Laxe Coruña, v. 28, p. 193-211

Milliken, K. L., 2003, "Diagenesis," in Middleton, G. V., et al., eds., Encyclopedia of sediments and sedimentary rocks: Kluwer Academic Publishers, p. 214-219.

Milliken, K. L., 2003, "Geodes," in Middleton, G. V., et al., eds., Encyclopedia of sediments and sedimentary rocks: Kluwer Academic Publishers, p. 306-308.

Milliken, K. L., Choh, S. -J., and McBride, E. F., 2003, Sandstone petrology, v. 1.0, A tutorial petrographic image atlas, multimedia CD-ROM: American Association of Petroleum Geologists/DataPages, Discovery Series No. 6, Tulsa, Oklahoma.

Makowitz, Astrid, and Milliken, K. L., 2002, Quantitative measurements of brittle deformation with burial compaction, Frio Formation, Gulf of Mexico Basin: Gulf Coast Association of Geological Societies Transactions, v. 52, p. 695-706.

Milliken, K. L., and Reed, R. M., 2002, Internal structure of deformation bands as revealed by cathodoluminescence imaging, Hickory Sandstone (Cambrian), Central Texas: Gulf Coast Association of Geological Societies Transactions, v. 52, p. 725-736.

Lynch, Leo, Milliken, K. L., Awwiller, D. N., Mack, L. E., Hutcheon, I. E., Bloch, J., and De Caritat, P., 1999, Tertiary volcanic rocks and the potassium content of Gulf Coast shales: the smoking gun: discussion and reply: Geology, v. 27, p. 663-665.

Laubach, S. E., and Milliken, K. L., 1996, New fracture characterization methods for siliciclastic



rocks, in Aubertin, Michel, Hassani, Ferri, and Mitri, Hani, eds., Rock mechanics: tools and techniques: Proceedings of the 2nd North American Rock Mechanics Symposium: Rotterdam, A. A. Balkema, v. 2, p. 1209-1213.

Maharaj, R. J., Dickinson, W. W., and Milliken, K. L., 1996, The diagenetic role of brittle deformation in compaction and pressure solution, Etjo Sandstone, Namibia: discussion and reply: *Journal of Geology*, v. 104, p. 506-508.

Milliken, K. L., 1996, Terrigenous (clastic) sediments and rocks, in Dasch, E. J., ed., *Macmillan encyclopedia of earth sciences*: Macmillan Publishing Co., p. 974-79.

Sharp, J. M., Jr., Kreisel, I., Milliken, K. L., Mace, R. E., and Robinson, N. I., 1996, Fracture skin properties and effects on solute transport: geotechnical and environmental implications, in *Proceedings, 2nd North American Rock Mechanics Symposium*: Montreal, Canada, A. A. Balkema, Rotterdam, v. 2, p. 1329-1335.

Sharp, J. M., Jr., Robinson, N. I., Smyth-Boulton, R. C., and Milliken, K. L., 1995, Fracture skin effects in groundwater transport, in Rossmanith, H.-P., and others, eds., *Mechanics of jointed and faulted rock*, in *Proceedings of the 2nd International Conference*, Vienna: Rotterdam, A.A. Balkema, p. 449-454.

Milliken, K. L., 1994, Scanning cathodoluminescence studies of siliciclastic rocks: EM Applications Note, Oxford Instruments, Oxford, England, 4 p.

Milliken, K. L., 1994, The widespread occurrence of healed microfractures in siliciclastic rocks: evidence from scanned cathodoluminescence imaging, in Nelson, P. P., and Laubach, S. E., eds., *Rock mechanics: models and measurements, challenges from industry: 1st North American Rock Mechanics Symposium*: Rotterdam, A. A. Balkema, p. 825-832.

Milliken, K. L., and Land, L. S., 1994, Evidence for fluid flow in microfractures in geopressured shales: discussion: *AAPG Bulletin*, v. 78, p. 1637-1640.

ODP Leg 149 Scientific Party (including Milliken, K. L.), 1994, Drilling at the West Iberia Margin: *Geotimes*, v. 39, no. 3, p. 18-21.

Landon, Susan, Thompson, M. R. A., Williams, P. L., Milliken, K. L., Rowley, P. D., and Boyles, J. M., 1983, The Jurassic Latady Formation, Southern Antarctic Peninsula, in Oliver, R. L., and others, eds., *Antarctic Earth science*: Cambridge, N.Y., Cambridge University Press, p. 308-314.

Milliken, K. L., and Land, L. S., 1982, Fluid dynamics for cap-rock formation in Gulf Coast: discussion: *AAPG Bulletin*, v. 66, p. 2685-2687.

Loucks, R. G., Richmann, D. L., and Milliken, K. L., 1980, Factors controlling porosity and permeability in geopressured Frio sandstone reservoirs, General Crude Oil/Department of Energy Pleasant Bayou test wells, Brazoria County, Texas, in *Fourth U.S. Gulf Coast Geopressured Geothermal Energy Conference*, Austin, Texas, p. 46-84.

Richmann, D. L., Milliken, K. L., Loucks, R. G., and Dodge, M. M., 1980, Mineralogy, diagenesis, and porosity in Vicksburg sandstone, McAllen Ranch Field, Hidalgo County, Texas: *Gulf Coast Association of Geological Societies Transactions*, v. 30, p. 473-482.

## Non Peer Reviewed Atlases and Maps

Marsaglia, K. M., Milliken, K., Leckie, R. M., Tentori, D., and Doran, L., 2015, Smear slide digital reference for sediment analysis of marine mud: part 2: methodology and atlas of biogenic components: IODP, Technical Note, no. 2, 382 p.

Marsaglia, K. M., Milliken, K., and Doran, L., 2013, Smear slides of marine mud for IODP core description, Volume I. Part 1: Methodology and atlas of siliciclastic and volcanogenic components: IODP, Technical Note 1, no. doi:10.2204/iodp.tn.1.2013.

## Conference Proceedings

Sawyer, D. S., Whitmarsh, R. B., Klaus, A., et al. (including Milliken, K. L.), 1994, Proceedings of the Ocean Drilling Program, 149, Initial Reports, College Station, 719 p.

## Contract Reports

Loucks, R. G., Richmann, D. L., and Milliken, K. L., 1980, Factors controlling reservoir quality in Tertiary sandstones and their significance to geopressed geothermal production: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for U.S. Department of Energy, Division of Geothermal Energy, under contract no. DE-AC08-79ET2711, 188 p.

## Course Notes

Ruppel, S. C., Baumgardner, R. W., Jr., Eastwood, R., Frébourg, G., Javadpour, F., Loucks, R. G., Ko, L., Milliken, K., Nance, H. S., Reed, R. M., Rowe, H., and Zhang, T., 2013, Extended Abstracts: Mudrock System Research Laboratory Annual Meeting: The University of Texas at Austin, Bureau of Economic Geology, 281 p.

## Workshop Workbooks

Laubach, S. E., Milliken, K. L., Marrett, R. A., and Wright, P., 1996, Methods to quantify natural fracture attributes: sponsored by the Gas Research Institute, Austin, Texas, March.

## Computer Applications and Internet

Milliken, K. L., compiler, 2006, Getting Started with Understanding Diagenetic Controls on Sandstone Reservoir Quality: AAPG/DataPages Getting Started Series, No. 4, CD-ROM.

Choh, S. -J., Milliken, K. L., and McBride, E. F., 2002, Interactive sandstone petrology: a digital tutorial for future reservoir geologists: Search and Discovery, invited submittal, <http://www.searchanddiscovery.com/documents/choh/index.htm>

## Published Abstracts

Davletshin, A., Ko, L., Milliken, K., Periwai, P., Wang, C.-C., and Song, W., 2022, Object detection in SEM images using CNN: Geological application on size distribution of pyrites in Mudrocks (abs.): Microscopy and Microanalysis, Cambridge University Press, v. 28, no. S1, p. 2964-2965.

Davletshin, A., Ko, L., Milliken, K., Periwai, P., Wang, M. C.-C., and Song, W., 2020, Object detection in SEM images using convolutional neural networks: application on pyrite framboid size-distribution in fine-grained sediments (abs.): American Geophysical Union Fall Meeting Abstracts, v. 2020, p. IN028-07.

Reed, R. M., Milliken, K., and Loucks, R. G., 2018, Radical diagenesis: recognizing complex replacement and infilling of radiolarian tests (abs.): Geological Society of America Abstracts with Programs, v. 50, no. 6, 1 p., <http://doi.org/10.1130/abs/2018AM-315850>.

Reed, R. M., Milliken, K., Lipinski, C. J., and Bishop, J. W., 2017, Pore systems in a volcanogenic-grain-bearing mudrock: the Jurassic-Cretaceous Vaca Muerta Shale of Argentina (abs.): AAPG Datapages/Search and Discovery Article, no. 90291, 1 p.

Milliken, K., 2015, Compositional classification for fine-grained sediments and sedimentary rocks: foundation for bulk rock property prediction (abs.): 2015 AAPG Annual Meeting, Denver, Colorado.

Reed, R. M., Loucks, R. G., and Milliken, K., 2015, Cementation and grain replacement in an organic-matter-rich mudrock: examples from the Mississippian Barnett Shale, Fort Worth Basin, Texas (abs.): Geological Society of America Abstracts with Programs, v. 47, no. 7, p. 671.

Rowe, H. D., Wang, X., Fan, B., Zhang, T., Milliken, K., Shen, Y., and Zhang, J., 2015, Chemostratigraphic insights into fluvio-lacustrine deposition, Yangchang Formation, Upper Triassic, Ordos Basin, China (abs.): AAPG-SEG International Conference and Exhibition,

Melbourne, Australia.

Rowe, H. D., Wang, X., Fan, B., Zhang, T., Milliken, K., Shen, Y., and Zhang, J., 2015, Chemostratigraphy of the Triassic Yanchang Fluvio-Lacustrine Succession, Ordos Basin, Shaanxi Province, China (abs.): AAPG Annual Meeting abstracts, Denver, Colorado.

Hull, D., Phelps, R., Loucks, R. G., and Milliken, K., 2014, Sedimentological and geochemical record of oceanic anoxic events (OAE's) in the Aptian-Albian Pearsall Formation of South Texas (abs.): in American Association of Petroleum Geologists Annual Convention and Exhibition, Houston, Texas, April 6-9, abstracts, CD-ROM.

Ozkan, A., Bonnell, L., Milliken, K., Laubach, S. E., and Cumella, S., 2014, How tight was the Williams Fork tight gas sandstone at the time of gas generation and fracturing, Piceance Basin, Colorado? (abs.): American Association of Petroleum Geologists Annual Convention and Exhibition, Houston, Texas.

Sun, X., Zhang, Tongwei, Milliken, K., 2014, Geochemical characterization of organic matter from the Eagle Ford Formation and indication of thermal maturity and depositional redox conditions (abs.): American Association of Petroleum Geologists Annual Convention and Exhibition, Houston, Texas, April 6-9, abstracts, CD-ROM.

Sun, X., Zhang, Tongwei, Milliken, K., 2014, Geochemical evidence of organic matter sources and depositional environments, Lower and Upper Eagle Ford Formation (ext. abs.): 2014 Meeting of Mudrock Systems Research Laboratory, March 5-6, 2014, no. 231-242.

Zhang, Tongwei, Sun, X., Milliken, K., 2014, Oil and gas generation and pore evolution of artificially-matured Eagle Ford shale by non-hydrous gold-tube pyrolysis (ext. abs.): 2014 Meeting of Mudrock Systems Research Laboratory, March 5-6, 2014, no. 231-242.

Zhang, Tongwei, Sun, X., Milliken, K., 2014, Pore characterization of Eagle Ford shales by N<sub>2</sub> adsorption and desorption isotherms and pore evaluation in organic matter during thermal maturation (abs.): AAPG Annual Convention and Exhibition, Houston, Texas, April 6-9, abstracts, CD-ROM.

Ko, L., Loucks, R. G., Ruppel, S. C., Rowe, H., and Milliken, K., 2013, Depositional and mineralogical controls on organic and inorganic pore distribution in the Lower Cretaceous Pearsall mudrock system, South Texas (abs.): in American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 19-22, abstracts, CD-ROM.

Ozkan, A., Milliken, K., Macaulay, C., Johnston, M., Minisini, D., Eldrett, J. S., Bergman, S., and Kelley, A., 2013, Influence of primary rock texture, diagenesis, and thermal maturity on Eagle Ford pore systems (abs.): in American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 19-22, abstracts, CD-ROM.

Zhang, T., Milliken, K., Ruppel, S. C., and Sun, X., 2013, Geochemical controls on gas adsorption and preservation in organic-rich shale systems (abs.): in American Association of Petroleum Geologists Annual Convention and Exhibition, Pittsburgh, Pennsylvania, May 19-22, abstracts, CD-ROM.

Zhang, Tongwei, Ellis, G. S., Ruppel, S. C., Milliken, K., and Xun, S., 2013, Effect of organic matter properties, clay mineral type and thermal maturity on gas adsorption in organic-rich systems: Unconventional Resources Technology Conference (URTeC) in Denver, Colorado, extended abstract 1583690.

Hull, D., Loucks, R. G., and Milliken, K., 2012, Lower Cretaceous Pearsall oceanic anoxic events and associated development of shale-gas reservoirs in South Texas (abs.): American Association of Petroleum Geologists, Annual Convention, Abstract 1217862, 1 p.

Milliken, K., Esch, W. L., and Reed, R. M., 2012, Petrology of high-maturity samples of the Barnett Shale (abs.): American Association of Petroleum Geologists, Annual Convention, Abstract 1227176, 1 p.

Milliken, K., Esch, W. L., Reed, R. M., and Zhang, Tongwei, 2012, The weak textural and compositional control on rock properties in the Barnett Shale (Mississippian), Fort Worth Basin, Texas, USA (abs.): American Association of Petroleum Geologists, Annual Convention, Abstract 1227135, 1 p.

Milliken, K., Macquaker, J., and Taylor, K., 2012, Early diagenetic kaolinite precipitation: a widespread phenomenon in organic-rich mudrocks (abs.): Gulf Coast Association of Geological Societies Transactions, v. 62, p. 763.

Ozkan, A., Laubach, S. E., Milliken, K., and Bonnell, L., 2012, Constraining uplift in the Piceance Basin using diagenetic modeling of quartz cementation in Late Cretaceous Williams Fork Sandstones, Colorado (abs.): American Association of Petroleum Geologists, Annual Convention, Abstract 1240512, 1 p.

Reed, R. M., Loucks, R. G., and Milliken, K., 2012, Heterogeneity of shape and microscale spatial distribution in organic-matter-hosted pores of gas shales (abs.): American Association of Petroleum Geologists, Annual Convention, Abstract 1236631, 1 p.

Day-Stirrat, R. J., Milliken, K., Dutton, S. P., Loucks, R. G., Hillier, S., Aplin, A. C., and Schleicher, A. M., 2011, Open-system chemical behavior in deep Wilcox Group mudstones, Texas Gulf Coast, USA (abs.): American Association of Petroleum Geologists Annual Convention & Exhibition Abstracts Volume, v. 20, p. 41.

Ozkan, A., Milliken, K., Laubach, S. E., Holder, Jon, and Olson, J., 2011, Quantification of effects of cementation on subcritical crack index by comparison of outcrop and subsurface samples of Williams Fork Formation, Piceance Basin (abs.): American Association of Petroleum Geologists Annual Convention & Exhibition Abstracts Volume, v. 20, p. 136.

Zhang, Tongwei, Ruppel, S. C., Milliken, K., and Yang, R., 2011, Experimental gas extraction by rock crushing: evidence for preservation of methane in core samples from the mudstones of the Eagle Ford Formation (abs.): American Association of Petroleum Geologists Annual Convention & Exhibition Abstracts Volume, v. 20, p. 205.

Kordi, M., Hovorka, S. D., Milliken, K., Treviño, R. H., and Lu, Jiemin, 2010, Diagenesis and reservoir heterogeneity in the lower Tuscaloosa Formation at Cranfield field, Mississippi (abs.): Gulf Coast Association of Geological Societies Transactions, v. 60, p. 809.

Lu, J., and Milliken, K., 2010, Characterization of a Tuscaloosa Mudrock seal at the Cranfield CO<sub>2</sub> sequestration site (abs.), in Mudrock Systems Research Laboratory Annual Meeting, BEG, The University of Texas at Austin, January, Austin, Texas, USA.

Lu, J., Milliken, K., Reed, R. M., and Hovorka, S. D., 2010, Seal heterogeneity and sealing capacity for CO<sub>2</sub> injection at Cranfield field, Mississippi, USA (abs.) In Ninth Annual Conference on Carbon Capture & Sequestration, Pittsburgh, May 10-13, CD-ROM.

Lu, J., Reed, R. M., Milliken, K., Meckel, T., and Hovorka, S. D., 2010, Seal characterization for Cranfield CO<sub>2</sub> injection site, Mississippi, USA (abs.). in Global Climate and Energy Project and U.S. Geological Survey, Caprocks and Seals for Geologic Carbon Sequestration, January, Monterey, CA.

Lu, Jiemin, Milliken, K., Reed, R. M., and Hovorka, S. D., 2010, Seal heterogeneity and sealing capacity for CO<sub>2</sub> injection at Cranfield field, Mississippi, USA (abs.), in Ninth Annual Carbon Capture and Sequestration Conference, May 12, Pittsburgh.

Mackey, G. N., Milliken, K., and Horton, B. D., 2010, Provenance of the South Texas Paleocene-Eocene Wilcox Group, western Gulf of Mexico basin: insights from sandstone modal compositions and detrital zircon geochronology (abs.): American Association of Petroleum Geologists Annual Convention & Exhibition, v. 19, p. 157.

Milliken, K. L., and Day-Stirrat, R. J., 2010, Cementation in mudrocks: current understanding (abs.), in AAPG/SEG/SPE/SPWLA Hedberg Conference, Critical assessment of shale resource

plays, December 5-10, Austin, Texas.

Milliken, K., and Reed, R. M., 2009, Particle sources and mudrock properties: contrasting examples from the Cenozoic mudrocks of the Gulf of Mexico and Paleozoic siliceous mudrocks of the North American Mid-Continent (abs.), in Houston Geological Society and AAPG Energy Minerals Division Applied Geoscience Mudstone Conference (AGC), U.S. Gulf Region Mudstones as Unconventional Shale Gas/Oil Reservoirs, Houston, Texas.

Milliken, K., Papazis, P. K., Dohse, C., and Day-Stirrat, R. J., 2009, Carbonate lithologies of the Barnett Shale (abs.): Geological Society of America, South-Central Section, Abstracts with Programs, v. 41, no. 2, p. 6.

Ozkan, A., Cumella, S. P., Milliken, K., and Laubach, S. E., 2009, Prediction of diagenesis and reservoir quality using well logs, Williams Fork Formation, Mamm Creek field, Piceance Basin (abs.): American Association of Petroleum Geologists Annual Convention, v. 18, p. 159.

Reed, R. M., Loucks, R. G., and Milliken, K., 2009, SEM-based observation of micro- and nanopores in mudrocks using argon-ion-beam milled samples (abs.): American Association of Petroleum Geologists Annual Convention, v. 18, p. 174-175.

Day-Stirrat, R. J., Loucks, R. G., Milliken, K. L., and van der Pluijm, B. E., 2008, Mississippian Barnett Shale: characterization and concretions (abs.): AAPG 2008 Annual Convention and Exhibition Abstracts Volume, v. 17, p. 40.

Laubach, S. E., Milliken, K. L., Eichhubl, Peter, Lander, R., Bonnell, L., Olson, J., and Thomas, Andrew, 2008, Structural diagenesis: the integration of structural geology and diagenesis (abs.): AAPG 2008 Annual Convention and Exhibition Abstracts Volume, v. 17, p. 116.

Milliken, K. L., Makowitz, A., and Lander, R., 2008, Quartz cementation modeling to elucidate the timing of deformation along the Pine Mountain Overthrust, eastern Kentucky (abs.): Geological Society of American Abstracts with Programs, v. 40, no. 6, p. 446.

Day-Stirrat, R. J., Milliken, K. L., Loucks, R. G., and van der Pluijm, B. E., 2007, Characterization of clay mineral assemblages in the Barnett Shale; its diversity explored (abs.), in 44th Annual Meeting of the Clay Minerals Society, Santa Fe New Mexico, Program and Abstracts, p. 74.

Day-Stirrat, R. J., Milliken, K. L., Loucks, R. G., and van der Pluijm, B. E., 2007, Characterization of clay mineral assemblages in the Barnett Shale; its diversity explored (abs.), in 44th Annual Meeting of the Clay Minerals Society, Santa Fe New Mexico, Program and Abstracts, p. 74.

Dutton, S. P., Loucks, R. G., and Milliken, K. L., 2007, Extending feldspar diagenetic trends with data from deep to ultradeep Eocene Wilcox sandstones of the northern Texas Gulf of Mexico Coast (abs.): Geological Society of America Abstracts with Programs, v. 39, no. 6, p. 506.

Milliken, K. L., and Barker, D. S., 2007, Diagenesis of the Footprint Tuff (Pliocene), Laetoli, Tanzania (abs.): Geological Society of America Abstracts with Programs, v. 39, no. 6, p. 173.

Milliken, K. L., and Choh, S. -J., 2007, Teaching carbonate petrology using digital methods (abs.): Geological Society of America Abstracts with Programs, v. 39, no. 6, p. 147.

Landrum, J. T., Engel, A. S., Milliken, K. L., and Bennett, P. C., 2006, Biogeochemistry of antimony and arsenic in hydrothermal fluids and opaline deposits from El Tatio Geyser Field, Chile (abs.): Geological Society of America Abstracts with Programs, v. 38, no. 7 p. 546.

Milliken, K. L., and Choh, S. -J., 2006, Using petrographic data from electron microbeam instrumentation in the curriculum: Digital resources can help (abs.): Geological Society of America Abstracts with Programs, v. 38, no. 7, p. 258. Invited submission.

Milliken, K. L., and Park, A., 2006, Petrographic characterization of chemical reactions in clastic diagenesis (abs.): American Association of Petroleum Geologists International Meeting, (Perth,

Australia).

Park, A., and Milliken, K. L., 2006, Mass balance approach to clastic sediment diagenesis modeling: feldspar and calcite interaction (abs.): American Association of Petroleum Geologists International Meeting, (Perth, Australia), Abstracts volume.

Park, A., and Milliken, K. L., 2006, Sandstone-shale interaction of Gulf Coast: calcite mobilization in response to varying concentrations of CO<sub>2</sub>(g) and acetates, and feldspar buffering capacity (abs.): American Association of Petroleum Geologists Annual Meeting, (Houston, Texas), Abstracts volume, p. 81.

Laubach, S. E., Olson, J. E., Lander, R., and Milliken, K., 2005, Structural diagenesis--linked chemical and mechanical processes in sedimentary basins (abs.), in AAPG Paris International Meeting

Milliken, K. L., and Choh, S. -J., 2005, An interactive digital carbonate petrology tutorial for next generation geoscientists (abs.): Geological Society of America Abstracts with Programs, v. 37, no. 7, p. 254.

Milliken, K. L., and McBride, E. F., 2005, X-ray mapping of trace elements in concretionary calcite (abs.): Geological Society of America Abstracts with Programs, v. 37, no. 7, p. 254.

Papazis, P. K., and Milliken, K. L., 2005, Cathodoluminescent textures and the origin of quartz in the Mississippian Barnett Shale, Fort Worth Basin, Texas (abs.): American Association of Petroleum Geologists Annual Meeting (Calgary, Canada), Abstracts volume, p. A105.

Papazis, P. K., Milliken, K. L., Choh, S. -J., Schieber, J. S., and Macquaker, J., 2005, The widespread occurrence of agglutinated foraminifera in black shales (abs.): Geological Society of America Abstracts with Programs, v. 37, no. 7, p. 188.

Park, A., and Milliken, K. L., 2005, Diagenetic sub-meter scale mass-redistribution between sandstones and shales: delineating various mineral reactions as sources and sinks of various cations (abs.): American Association of Petroleum Geologists Annual Meeting (Calgary, Canada), Abstracts volume, p. A105.

VanBerkle, D., and Milliken, K. L., 2005, Heterogeneities controlled by interbedding of eolian and fluvial deposits and its impact on reservoir quality, Weber and Maroon Formations, Rangely Field, Colorado, U.S.A. (abs.): American Association of Petroleum Geologists Annual Meeting (Calgary, Canada), Abstracts volume, A144-45.

Chafetz, H. S., Folk, R. L., and Milliken, K. L., 2004, Carbonate and Mn- and Fe-rich hot spring deposits, Belen (New Mexico, USA), Yellowstone National Park (Wyoming, USA), and northeastern Morocco (abs.): International Geological Congress, Florence (Italy) (Abstracts), CD-ROM.

Choh, S. -J., and Milliken, K. L., 2004, Constructing an interactive sandstone petrology CD for undergraduates: bringing a classical subject into the digital age (abs.): Geological Society of America Abstracts with Programs, v. 36, no. 5, p. 236.

Laubach, S. E., and Milliken, K. L., 2004, Opening keynote address: Opportunities for interdisciplinary studies in sedimentary basins: an introduction to the Hedberg Conference on Structural Diagenesis (abs.), in Lander, Rob, Olson, Jon, Welton, Joann, and Woodward, Nick, conveners, Structural diagenesis: fundamental advances and new applications from a holistic view of mechanical and chemical processes: AAPG Hedberg Research Conference, Austin, Texas: American Association of Petroleum Geologists, unpaginated.

Laubach, S. E., and Milliken, K. L., 2004, Opportunities for interdisciplinary studies in sedimentary basins: an introduction to the Hedberg Conference on Structural Diagenesis (abs.), in AAPG Hedberg Conference, Structural diagenesis: fundamental advances and new applications from a holistic view of mechanical and chemical processes, February 8-11, unpaginated [1 p.].

Makowitz, Astrid, and Milliken, K. L., 2004, Brittle deformation in burial compaction of porous sandstones (abs.): International Geological Congress, Florence (Italy) (Abstracts), CD-ROM.

Makowitz, Astrid, and Milliken, K. L., 2003, Quantifying brittle deformation during burial compaction of sand-stones: a comparison of values from the Frio and Mount Simon Formations (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. A112.

Reed, R. M., and Milliken, K. L., 2003, SEM-based cathodoluminescence imaging in sandstone provenance analysis: quartz and feldspar grains, zircons, and siliceous rock fragments (abs.): Geological Society of America Abstracts with Programs, v. 34, no. 7, p. 391.

Milliken, K. L., 2002, Petrography of ankerite cement, grain replacement, and fracture fill in foreland sandstones of the central Rocky Mountains (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. A123.

Reed, R. M., and Milliken, K. L., 2002, A technique for avoiding imaging problems associated with carbonate minerals on SEM-based cathodoluminescence systems (abs.): Geological Society of America Northeastern Section Meeting, Abstracts with Programs, v. 34, no. 1, p. A-9.

Choh, S. -J., Milliken, K. L., and McBride, E. F., 2001, Interactive sandstone petrology: A digital tutorial for future reservoir geologists (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. A35.

Choh, S. -J., Milliken, K. L., and McBride, E. F., 2001, Multimedia "sandstone petrology tutorial" for under-graduate sedimentary rocks laboratory: will enhanced learning lead to improved enrollment? (abs.): Geological Society of America Abstracts with Programs, v. 33, no. 6.

Makowitz, Astrid, and Milliken, K. L., 2001, New data on the role of mechanical burial compaction in diagenesis: Frio Formation, Gulf of Mexico Basin (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. 123-24.

Milliken, K. L., 2001, Endolithic microbial communities in fractures: insights gleaned from mineralized filaments in Cretaceous-age calcite veins in serpentinized peridotites, Iberia Abyssal Plain (ext. abs.): 32nd Lunar and Planetary Sciences Conference, Houston, Texas, CD-ROM.

Milliken, K. L., 2001, Trace element geochemistry of associated carbonate cements and fracture fills in foreland basin sandstones, Wind River and Piceance Basins (abs.): Geological Society of American Annual Meeting and Exposition (Abstracts), v. 33, no. 6.

Ortega, Orlando, Marrett, Randall, Laubach, S. E., Milliken, K. L., Olson, J., and Reed, R. M., 2001, Outcrop analogs for fractured reservoir characterization, Rangely field, Colorado (abs.): American Association of Petroleum Geologists Annual Convention Official Program, v. 10, p. A148.

Folk, R. L., and Milliken, K. L., 2000, Morphological evidence for microbes associated with iron oxides in modern precipitates, laterites, jaspers, and BIFs: 3D light microscopy and SEM observations (abs.): Geological Society of America, Southeastern Section Meeting, Abstracts with Programs, v. 32, no. 2.

Milliken, K. L., 2000, Diagenetic heterogeneity in a sandstone bed, Breathitt Formation, eastern Kentucky (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. A99.

Milliken, K. L., 2000, Mineralized filaments in deep sea calcitized serpentinite interpreted as fossils of fracture-dwelling microbes (abs.): Geological Society of American Abstracts with Programs, v. 32, no. 7.

Wilkinson, M., Haszeldine, R. S., and Milliken, K. L., 2000, Secondary porosity in deep prospects: implications of alkali feldspar dissolution (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. A158.

Abdel-Wahab, A. A., McBride, E. F., and Milliken, K. L., 1999, Shallow diagenesis of the cratonic

Hickory Sandstone (Late Cambrian), Llano Region (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. A1.

Milliken, K. L., and Kirkland, B. L., 1999, 3-D light microscopy of microbial structures in sparry calcite (abs.): Geological Society of America Abstracts with Programs, v. 31, no. 7.

Johns, M. K., Laubach, S. E., and Milliken, K. L., 1997, Syncementation crack-tip and crack-seal microtextures and their implications for fracture connectivity and porosity interpretation (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. A56.

Clift, S. J., and Milliken, K. L., 1996, Classification of microfractures in siliciclastic oil and gas reservoirs using scanned CL (abs.): Geological Society of America, South-Central Section, Abstracts with Programs, v. 28, no. 1, p. 9.

Laubach, S. E., and Milliken, K. L., 1996, Using CL observations to evaluate fractures in siliciclastic petroleum reservoirs (abs.): International Conference on Cathodoluminescence and Related Techniques in Geosciences and Geomaterials, Nancy, France, p. 83-84.

Laubach, S. E., Milliken, K. L., Clift, S. J., Burns, Sara, and Reed, R. M., 1996, New subsurface fracture characterization methods for siliciclastic rocks (abs.): Geological Society of America, South-Central Section Meeting, Abstracts with Programs, v. 28, no. 1.

Milliken, K. L., 1996, Brittle deformation in sandstones as revealed by scanned cathodoluminescence imaging (abs.): International Conference on Cathodoluminescence and Related Techniques in Geosciences and Geo-materials, Nancy, France, p. 101-102.

Milliken, K. L., 1996, Deformation bands formed by interrelated cementation and brittle fracture in porous sand-stones, Hickory Formation, Central Texas: synkinematic diagenesis revealed by cathodoluminescence imaging (abs.): invited, American Association of Petroleum Geologists Annual Meeting (Abstracts), p. A98.

Milliken, K. L., 1996, Polyphase emplacement of authigenic quartz in quartzose sandstones during fracturing (abs.): Geological Society of America, South-Central Section Meeting, Abstracts with Programs, v. 28, no. 1.

Johns, M. K., Laubach, S. E., and Milliken, K. L., 1995, New microtextural evidence of syncementation fracturing in sandstone (abs.): Geological Society of America Abstracts with Programs, v. 27, no. 6, p. A-216.

Land, L. S., Lynch, Leo, Mack, L. E., and Milliken, K. L., 1995, Regionally inhomogeneous potash meta-somatism, Paleogene mudrocks, Texas Gulf Coast (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. 53A.

Marsaglia, K. M., Garcia y Barragan, J. C., Padilla, I., and Milliken, K. L., 1995, Passive margin evolution and sand provenance: A preliminary model (abs.): Geological Society of America Abstracts with Programs, v. 27, no. 6.

Milliken, K. L., 1995, Petrographic evidence of open-system chemical reactions in mudrocks in the Gulf of Mexico sedimentary basin (abs.): Geological Society of America Abstracts with Programs, v. 27, no. 6.

Milliken, K. L., Clift, S. J., and Burns, Sara, 1995, New subsurface characterization methods for fractured siliciclastic rocks (abs.): Geological Society of America, South-Central Section, Abstracts with Programs, v. 28, no. 1, p. 49.

Marsaglia, K. M., Garcia y Barragan, J. C., Padilla, I., Comas, M. C., Milliken, K. L., and Milkert, D., 1994, Stratigraphy, sedimentology, and sand provenance of Leg 149 sites, Iberian margin (abs.): EOS Transactions, American Geophysical Union, Fall Meeting Supplement, v. 75, no. 44.

McBride, E. F., Milliken, K. L., Cavazza, W., Cibir, U., Fontana, D., Picard, M. D., and Zuffa, G. G., 1994, Patterns of calcite cementation at the outcrop scale in Tertiary sandstones, Northern



Apennines (abs.): American Association Petroleum Geologists Annual Meeting (Abstracts), p. 209.

Milliken, K. L., and Dickinson, W. W., 1994, Generation of apparent pressure solution fabrics by a brittle mechanism in quartz-rich sandstones (abs.): Geological Society of America Abstracts with Programs, v. 26, no. 7.

Milliken, K. L., and Morgan, J. K., 1994, Crack-seal origin of calcite veins in formerly 'exposed' mantle, ODP Sites 897 and 899, Iberia Abyssal Plain (abs.): EOS Transactions, American Geophysical Union, Fall Meeting Supplement, v. 75, no. 44.

Whitemarsh, R. B., Sawyer, D. S., and ODP Leg 149 Scientific Party (including Milliken, K. L.), 1994, Upper mantle drilling in the ocean-continent transition west of Iberia (ext. abs.): Terra Nova, v. 5, p. 327-331.

Dickinson, W. W., and Milliken, K. L., 1993, Sandstone compaction by interrelated brittle deformation and pressure solution, Etjo Sandstone, Namibia (abs.): Geological Society of America Abstracts with Programs, v. 25, no. 6.

Kugler, R. L., and Milliken, K. L., 1993, Imaging of low-intensity cathodoluminescence in authigenic quartz, Norphlet sandstone, offshore Alabama (abs.): Journal of the Alabama Academy of Science, v. 64, no. 2, p. 117.

Milliken, K. L., and Land, L. S., 1993, Luminescent textures in quartz silt from Eocene and Oligocene shales, Texas Gulf Coast (abs.): Geological Society of America Abstracts with Programs, v. 25, no. 6.

Wood, J. R., and Milliken, K. L., 1993, Plagioclase diagenesis in subsiding basins (abs.): Geological Society of Canada/Mineralogical Society of Canada, Joint Annual Meeting 18, Abstract no. 555.

Boettcher, S., and Milliken, K. L., 1992, Apatite fission track evidence for post-Early Cretaceous erosional unroofing of middle Pennsylvanian sandstones from the southern Appalachian basin in Kentucky and Virginia (abs.): Geological Society of America Abstracts with Programs, v. 24, no. 7.

Fu, L., Milliken, K. L., and Sharp, J. M., Jr., 1992, Permeability variations in liesegang-banded Breathitt sandstone (Pennsylvanian)--diagenetic controls (abs.): Geological Society of America Abstracts with Programs, v. 24, no. 7.

Milliken, K. L., 1992, Petrographic documentation of reactions affecting detrital feldspars in mudrocks (abs.): American Association of Petroleum Geologists Annual Meeting (Abstracts), p. 89.

Milliken, K. L., 1992, Regional diagenetic variations in middle Pennsylvanian foreland basin sandstones of the southern Appalachians (abs.): Geological Society of America Abstracts with Programs, v. 24, no. 7.

Land, L. S., and Milliken, K. L., 1991, Reverse weathering, the carbonate-feldspar system, and porosity evolution during burial of sandstones (abs.): AAPG Bulletin, v. 75, p. 636.

Milliken, K. L., Land, L. S., Mack, L. E., and Awwiller, D. N., 1991, Depth-related potassium gain and other elemental trends in mudrocks, Oligocene Frio Formation, South Texas (abs.): Society of Economic Paleontologists and Mineralogists Annual Theme Meeting, Portland, Ore., p. 22-23.

Land, L. S., Mack, L. E., MacPherson, Elise, and Milliken, K. L., 1990, Open system diagenesis and the loss of provenance signatures: elemental and isotopic data from sandstones, Frio Formation, South Texas (abs.): AAPG Bulletin, v. 74, p. 699.

Milliken, K. L., and Land, L. S., 1990, Petrography of silt (>10  $\mu$ ) in Miocene-Oligocene mudrocks of South Texas (abs.): Geological Society of America Abstracts with Programs, v. 22, no. 7.

Milliken, K. L., and Mack, L. E., 1989, Comparison of detrital and authigenic heavy minerals in the modern Rio Grande and the Oligocene Frio Formation, South Texas (abs.): Geological Society of America Abstracts with Programs, v. 21, no. 6.

Milliken, K. L., Land, L. S., and McBride, E. F., 1988, Feldspar diagenesis in the zone of partial alteration (abs.): Mid-year Meeting Abstracts, Society of Economic Paleontologists and Mineralogists, v. 5.

Milliken, K. L., McBride, E. F., and Land, L. S., 1988, Effect of feldspar diagenesis on modal composition, Frio Formation (Oligocene), South Texas (abs.): Geological Society of America Abstracts with Programs, v. 20, no. 7.

Land, L. S., and Milliken, K. L., 1986, Diagenesis of Gulf Coast Sediments--synthesis (abs.): 12th International Sedimentological Congress, Canberra (Australia), Abstracts, p. 174.

Kugler, R. L., and Milliken, K. L., 1985, Subsurface feldspar alteration and the loss of provenance information (abs.): Mid-year Meeting Abstracts, Society of Economic Paleontologists and Mineralogists, v. 11.

Land, L. S., and Milliken, K. L., 1985, Diagenetic evolution in Cenozoic sandstones, Gulf of Mexico (abs.): Geological Association of Canada/Mineralogical Association of Canada, Joint Annual Meeting, Abstracts, v. 10, p. A33.

Milliken, K. L., 1985, Subsurface diagenesis of feldspars in Cenozoic sediments, northern and western margins, Gulf of Mexico sedimentary basin--summary (ext. abs.), in McBride, E. F. and Ferrel, R. E., eds., Timing of siliciclastic diagenesis: relation to hydrocarbon migration: 6th Annual Research Conference of Gulf Coast Section, Society of Economic Paleontologists and Mineralogists, Program and Abstracts, p. 25-26.

Milliken, K. L., Gold, P. B., and Land, L. S., 1985, Feldspar diagenesis in Neogene sediments, northern Gulf of Mexico (abs.): AAPG Bulletin, v. 69, p. 288.

Milliken, K. L., 1984, Alteration of detrital mineral assemblages in Cenozoic sediments of the Texas-Louisiana Gulf Coast (abs.): Geological Society of America Abstracts with Programs, v. 16, no. 6.

Milliken, K. L., 1984, Detrital composition of Plio-Pleistocene sands, offshore Louisiana (abs.): Gulf Coast Association of Geological Societies Transactions, v. 34, p. 395.

Milliken, K. L., 1978, Non-sabkha evaporites (silicified) from Carboniferous limestones of southern Kentucky and northern Tennessee (abs.): AAPG Bulletin, v. 62, p. 544.

Milliken, K. L., and Pigott, J. D., 1977, Variation of oceanic Mg/Ca ratio through time--implications of the calcite sea (abs.): Geological Society of America, South-Central Section Meeting, Abstracts with Programs, v. 9, no. 1.

## Published Datasets

Milliken, K. L., Torres, M., Hupers, A., Kim, J.-H., and Lee, S.-G., 2022, Fluid-rock interaction, Nicobar Fan: Texas Data Repository, <http://doi.org/10.18738/T8/AMUHST>, 551 files with metadata.