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## EDUCATION

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<b>PhD</b>	The Johns Hopkins University, Structural Geology	1988
<b>MS</b>	The Johns Hopkins University, Structural Geology	1984
<b>BS</b>	Oberlin College, Geology	1981

## PROFESSIONAL CERTIFICATIONS

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California Licensed Professional Geologist – License Number 9672

## EMPLOYMENT

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2023 – 2023	Interim Associate Director for Research, Prairie Research Institute, University of Illinois Urbana-Champaign (January – September 2023)
2023 – present	Research Affiliate, Department of Civil Engineering, University of Illinois Urbana-Champaign
2022 – present	Research Associate Professor, Department of Geology, University of Illinois Urbana-Champaign
2018 – present	Research Scientist, Illinois State Geological Survey
2017 – 2018	Part-time Faculty, California State University, Northridge, CA
2017 – 2017	Part-time Faculty, California State University, Los Angeles, CA (2017 spring semester)
2012 – 2016	Senior Geological Advisor, Occidental Oil & Gas, Houston, TX
2011 – 2012	Chief Geologist, MicroSeismic Inc, Houston, TX
2008 – 2011	Geologic Advisor, MicroSeismic Inc, Houston, TX
2004 – 2008	Principal Geologist, Geo Team Leader, Midland Valley Exploration, Glasgow, UK
2004 – 2005	Faculty, Whittier College, Whittier, CA
2000 – 2002	Adjunct Faculty, University of Houston - Downtown, Houston, TX
1998 – 2004	Senior Research Scientist, Chevron Exploration & Production, Houston, TX
1996 – 1998	Staff Scientist for Program, U. S. Geological Survey, Denver, CO
1988 – 1996	Research Scientist, U. S. Geological Survey, Denver, CO

## MAJOR RESEARCH INTERESTS

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Induced seismicity from subsurface storage of fluids  
Sustainability of natural resource utilization  
Data Analytics and machine learning from improved subsurface imaging  
Fault and fracture development in the subsurface, fluid flow in fractures for reservoir characterization  
Subsurface tomographic imaging using ambient noise

## HONORS AND AWARDS

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<b>AAPG Distinguished Lecturer</b>	2023 – 2024
Atmospheric and Social Climate Change: Implications for the Future Geoscience Workforce	
<b>AAPG Honorary Member</b>	2022
For “tireless work on diversity and many contributions to understanding induced seismicity”	
<b>Mentoring Excellence in Technology</b>	3/2000 – 3/2001
Mentee in 1-year Texaco training program for future technology leaders	
<b>AAPG Bulletin Citation of Excellence</b>	2001
For technical paper review	
<b>USGS “Star Award”</b>	1997
Exceptional accomplishment in the job of Staff Scientist for Program in support of the reorganization of the USGS Central Region Publications Group	
<b>Sigma-Xi Grant in Aid of Research</b>	1984
<b>National Science Foundation Minority Graduate Fellowship</b>	1982 – 1985
<b>American Geological Institute Scholarship</b>	1982 – 1985
Minority Participation in Earth Sciences	

## TEACHING EXPERIENCE

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*Induced Seismicity in the Energy Industry*, Guest Lecturer, Civil & Environmental Engineering course, “GeoEnergy Systems”, University of Illinois, Fall 2021 & Fall 2023.  
*Geology of Planet Earth*, California State University – Northridge, Fall 2017 & Spring 2018  
*Natural Hazards*, California State University – Los Angeles, Spring 2017  
*Southern California Geologic Field Course*, Whittier College, Whittier, CA, Winter 2005  
*Introduction to Earth Science*, Whittier College, Whittier, CA, Fall 2004  
*Structural Geology*, Whittier College, Whittier, CA, Fall 2004  
*Introductory Physical Geology*, University of Houston – Downtown, Fall 2000 – Spring 2002  
*Keck Geology Consortium Field Camp*, Butte, Montana, Summer 1996

## LEADERSHIP EXPERIENCE

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*Working Group Leader, HBCU STEM to Geoscience Pipeline Initiative, University of Illinois Urbana-Champaign (June 2020 – present)*

Responsibilities: Develop concept, recruit partners, and organize informational workshop for an educational program to increase the number of black students choosing to study geoscience through a partnership between Historically Black Colleges and Universities and Predominantly White Institutions (PWIs). Facilitate development and adoption of MOAs and MOUs between institutions. Communicate and coordinate with potential stakeholders for student scholarship and internship support, coordinate with community organizations working with pre-college students for recruitment, develop funding proposals from government funding sources such as the National Science Foundation.

*Chief Geologist, MicroSeismic Inc., Houston, TX (2010 – 2012)*

Responsibilities: Lead development of geological tools and analysis products and their integration with microseismic monitoring technology. Recruited, mentored, and evaluated new geologist hires. Quality control of all geological product deliverables, and reviewed and evaluated new geological products developed by geology team members for market-readiness and patent potential.

*GeoTeam Leader and Principal Geologist, Midland Valley Exploration, Glasgow, UK (2004 – 2008)*

Responsibilities: Managed the team of 10 to 12 project geologists performing technical analysis in structural geology to energy and mining companies. Facilitated resource scheduling and reviewed projects before delivery to clients. Strategic business planning. Coordinated and performed internal training, professional mentoring new employees. Business development lead for Middle East and North American portfolios. Geologist lead coordinating with software developer for fracture modeling software.

*Staff Scientist for Program, US Geological Survey, Denver, CO (1996 – 1998)*

Responsibilities: Oversight of internal programs of the Central Region USGS Geologic Division. The managers of the Shared Facilities: National Reactor Facility, National Ice Core Laboratory, Core Research Center, Central Publications Support Services, and the Geologic Division Microbeam Lab reported to me. Facilitate planning and development, reviewed proposals and budgets, accomplished, or supervised special internal projects involving safety, human resources, and EEO issues, chaired committee to develop recommendations for implementing revised cost structure for USGS publications.

## **ACTIVE RESEARCH PROJECTS**

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PI and Task leader for University of Illinois Urbana-Champaign (UIUC) participation in the DOE SMART (Science-Informed Machine Learning to Accelerate Real Time Decisions in Subsurface Applications) Initiative that has participation from 8 National Labs and 7 Universities. SMART Co-lead for Task, “Imaging Faults and Fractures in the Subsurface”, now in Phase II.

Key Personnel on Illinois Storage Corridor CarbonSAFE project funded by DOE, to accelerate commercial deployment of carbon capture, utilization, and storage in the Illinois Basin.

Co-PI on Mitch CarbonSAFE Phase II project funded by DOE, to characterize potential storage complexes under the Heidelberg Materials Cement Plant in Mitchell, Indiana, Technical lead for structural geology of the site, and Lead for Task 2, addressing SCI and development of Community Stakeholder Outreach Plan, and

Co-PI on “Mapping Soil Contamination from Coal Ash with Remote Sensing Analysis to Determine the Spatial Distribution and Impact on Soil Chemistry of Hyperaccumulator Plant Species”, awarded to Kentucky State University.

Key Personnel on “Characterizing basement-involved geologic structures in a subregion of the Central and Eastern United States, and assessing their spatial relationship to seismicity”, USGS funded project.

#### **SUBMITTED PROPOSALS**

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Preliminary Planning Grant Proposal for Industry-University Cooperative Research Center (IUCRC) for Advanced Research on Carbon Utilization and Storage (ARCUS), University of Illinois Urbana-Champaign lead site, with Oklahoma State University as partner site, submitted to the National Science Foundation.

NSF Convergence Accelerator, Track L: Integrated Wireless Smart Chemical Sensing with Wireless Telemetry for Measuring Critical Subsurface Parameters Associated with CO<sub>2</sub> Storage, with lead institution University of Kansas, submitted to the National Science Foundation.

#### **PROPOSALS IN PREPARATION**

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Collaborative Research: Sustained Resources: Next Generation Earthquake Simulators (NGES) Infrastructure for Digital Twins of Crustal Volumes; collaboration with University of Illinois Urbana-Champaign (lead institution), University of California San Diego, and University of Southern California, to be submitted to the National Science Foundation.

Implementation Grant: Community Science Education and Collaboration – Understanding Natural and Induced Seismicity in the Midwestern U.S.; collaboration with University of Illinois Urbana-Champaign (lead institution), and University of Kansas, Indiana University, Purdue University, University of Kentucky, and Ohio State University, to be submitted to the National Science Foundation.

#### **SCIENTIFIC LEADERSHIP EXPERIENCE**

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***Reviewer (invited) for National Science Foundation’s Regional Innovation Engines Type-2 awards – in-person Site Visits:*** this is a 3-day visit to review one of the candidate sites to evaluate their coverage of the critical areas needed for NSF Engines, including translation, workforce development, R&D, governance, economic development, and DEIA (diversity, equity, inclusion, and accessibility).

***National Petroleum Council (Oil and Natural Gas Advisory Committee to the Secretary of Energy):*** Member of Coordinating Subcommittee, Natural Gas Greenhouse Gases Study (2022 – present). This study will evaluate the feasibility and effectiveness of different approaches to reduce and/or offset GHG emissions across the existing and evolving natural gas value chain.

***National Academy of Sciences, Engineering, and Medicine:*** Member of the Committee on Geodynamics (2015 – 2019). Served 4 years on this standing committee that serves the National Academy of Sciences. This committee serves as the focal point for community discussion and community-agency interaction on issues related to the structure, dynamics, and evolution of the Earth. Was co-leader for two of the twice annual workshops held by the committee while serving.

**American Rock Mechanics Association:** Member of Technical Committee on Discrete Fracture Network Modelling (DFNTC), and Subgroup lead for the Discrete Fracture Network (DFN) in Energy (Oil & Gas, Renewables, and CCUS). Member of Underground Storage & Utilization Technical Community

**American Association of Petroleum Geologists:** Chair of Core and Sample Preservation Committee (2004 – 2006), Vice Chair (2002 – 2004)

## PUBLICATIONS

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### *Journal Publications*

- Wang, H., **Williams-Stroud, S.**, Crandall, D. and Chen, C. (2022). Machine Learning and Deep Learning for Mineralogy Interpretation and CO<sub>2</sub> Saturation Estimation in Geological Carbon Storage: A case study of CCS in Illinois Basin. *Submitted to Fuel (Elsevier)*.
- Schultz, R. A., **Williams-Stroud, S.**, Horváth, B., Wickens, J., Bernhardt, H., Cao, W., Capuano, P., Dewars, T. A., Goswick, R. A., Lei, Q., McClure, M., Prasad, U., Schwartz, B. A., Yu, Ha., Voegeli, S., Zhao, Q. (2023). Underground energy-related product storage and sequestration: site characterization, risk analysis, and monitoring. Geological Society, London, Special Publications (Vol. 528). *The Geological Society Special Publications*. <https://doi.org/10.1144/sp528-2022-66>
- Leetaru, H. E., **Williams-Stroud, S.**, Freiburg, J., McBride, J., & Whittaker, S. (2022). Geologic Risk and Uncertainty for Underground Storage of Buoyant Fluids, Lessons Learned in Illinois. *Geological Society, London, Special Publications*, 528(1). <https://doi.org/10.1144/SP528-2022-85>
- Bondarenko, N., **Williams-Stroud, S.**, Freiburg, J., & Makhnenko, R. (2021). Geomechanical aspects of induced microseismicity during CO<sub>2</sub> injection in Illinois Basin. *The Leading Edge*, Society of Exploration Geophysicists, 40(11), 823–830. <https://doi.org/10.1190/TLE40110823.1>
- Dichiarante, A. M., Langet, N., Bauer, R. A., Goertz-Allmann, B. P., **Williams-Stroud, S.**, Kühn, D., Oye, V., Greenberg, S.E, Dando, B.D.E. (2021). Identifying geological structures through microseismic cluster and burst analyses complementing active seismic interpretation. *Tectonophysics*, 820, 229107. <https://doi.org/10.1016/J.TECTO.2021.229107>
- Velasco, A.A., Aderhold, K., Alfaro-Diaz, R., Brown, W., Brudzinski, M.R., Fraiser, M., Holt, M.M., Mori, J., Noriega, G., Scharer, K., Templeton, D., Terra, F., **Williams-Stroud, S.**; News and Notes: SSA Task Force on Diversity, Equity, and Inclusion: Toward a Changing, Inclusive Future in Earthquake Science. *Seismological Research Letters* 2021; 92 (5): 3267–3275. <https://doi.org/10.1785/0220210170>
- Williams-Stroud, S.**, Bauer, R., Leetaru, H., Oye, V., Stanek, F., Greenberg, S., & Langet, N. (2020). Analysis of microseismicity and reactivated fault size to assess the potential for felt events by CO<sub>2</sub> injection in the Illinois Basin. *Bulletin of the Seismological Society of America*, 110(5):2188-2204. <https://doi.org/10.1785/0120200112>
- Williams-Stroud, S.** (2020). Seeking Diversity in the Geosciences when Black Lives Matter, *GSA Today*

- Langet, N., Goertz-Allmann, B., Oye, V., Bauer, R. A., **Williams-Stroud, S.**, Dichiarante, A. M., & Greenberg, S. E. (2020). Joint focal mechanism inversion using downhole and surface monitoring at the decatur, illinois CO<sub>2</sub> injection site. *Bulletin of the Seismological Society of America*, 110(5): 2168-2187.  
<https://doi.org/10.1785/0120200075>
- Holt, N. M., Garcia-Veigas, J., Lowenstein, T. K., Giles, P. S., and **Williams-Stroud, S. C.** (2014), The major-ion composition of Carboniferous seawater, *Geochemica et Cosmochemica Acta*, v. 134, pp. 317-334
- Duncan, P. M., Smith, P. G., Smith, K., Barker, W. B., **Williams-Stroud, S.**, and Eisner, L. (2013), Microseismic Monitoring in Early Haynesville Development, in *Geology of the Haynesville Gas Shale in East Texas and West Louisiana, AAPG Memoir 105*, Chapter 12, pp. 219-236
- Williams-Stroud, S.C.**, Ozgen, C., and Billingsley, R. (2012), Microseismicity-constrained discrete fracture network models for stimulated reservoir simulation, *Geophysics*, 78(1), <https://doi.org/10.1190/geo2011-0061.1>
- Wessels, S. A., De La Pena, A., Kratz, M., **Williams-Stroud, S.**, Jbeili, T. (2011), Identifying faults and fractures in unconventional reservoirs through microseismic monitoring, *First Break*, 29, July 2011.
- Eisner, L., **Williams-Stroud, S. C.**, Hill, A., Duncan, P., and Thornton, M. (2010), Beyond the dots in the box: Microseismicity-constrained fracture models for reservoir simulation, *The Leading Edge*, vol. 29, 326-333.
- Petrychenko, O. Y., **Williams-Stroud, S.**, C. and Peryt, T. M. (2012), The relationship of brine chemistry of the Paradox Evaporite Basin (southwestern USA) to secular variation in seawater chemistry, *Geological Quarterly*, vol. 56, p. 25-40.
- Williams-Stroud, S. C.**, Kilpatrick, J. E. Cornette, B., Eisner, L. and Hall, M. (2010), Moving outside of the borehole: Characterizing natural fractures through microseismic monitoring, *First Break*, 28, no. 7.
- Sweetkind, D. S., Anna, L. O., **Williams-Stroud, S. C.**, and Coe, J. A. (1997), Characterizing the fracture network at Yucca Mountain, Nevada, Part 1, Integration of field data for numerical simulations, Hoak, T. E., Klawitter, A. L., and Blomquist, P. K., eds., *Fractured Reservoirs: Characterization and Modeling*, p. 185-196.
- Williams-Stroud, S.**, and Paul, J. (1997), Initiation and growth of gypsum piercement structures in the Zechstein Basin, *Journal of Structural Geology*, 19 (7), p. 897-907.
- Williams-Stroud, S.** (1995), Solution to the Paradox? Results of some chemical equilibrium models and mass balance calculations as applied to the Paradox basin evaporite deposit, *American Journal of Science*, vol. 294, p. 1189-1228.
- Williams-Stroud, S.** (1994), Evolution of an inland sea of marine origin to a non-marine saline Lake: The Pennsylvanian Paradox salt deposit, *SEPM Special Publication 50*, p. 293-306.
- Williams, S.** (1988), The shear strength of gypsum single crystals on three cleavage planes, *Tectonophysics*, v. 148, p. 163-173.
- Williams, S.** (1988), The shear strength of gypsum single and polycrystals and its implications for petrofabric analysis. Unpublished Ph.D. dissertation, The John Hopkins University, 152 p.

### ***Conference Proceedings/Expanded Abstracts***

- Williams-Stroud, S.,** Stanek, F., Dichiarante, A.M., Langet, N., Leetaru, H., Eisner, L. Greenberg, S. (2022). Integrating Induced Seismicity for Enhanced Subsurface Structural Interpretation at the Decatur, Illinois Sequestration Site. In *16th International Conference on Greenhouse Gas Control Technologies GHGT-16*, <http://dx.doi.org/10.2139/ssrn.4287276>
- Bromhal, G., Mishra, S., Guthrie, G., Alumbaugh, D., Crandall, D., White, J.A., **Williams-Stroud, S.,** Azzolina, N.A., McGuire, T., Pawar, R. and Schuetter, J. (2022). The SMART Initiative: Applying Machine Learning to Enable Efficient and Effective Real-Time Decisions for Geological Carbon Storage Operations. In *16th International Conference on Greenhouse Gas Control Technologies GHGT-16*.
- Williams-Stroud, S.,** Lee, S.-Y., & Zaluski, W. (2022). Creating simulation model permeability in fractured impermeable rocks using DFN modeling at the Decatur, Illinois CCS site. 3rd International Discrete Fracture Network Conference. Santa Fe, NM: DFNE / ARMA.
- Goertz-Allmann, B., Dando, B., Langet, N., Dichiarante, A.M., Kühn, D., Oye, V., Jordan, M., **Williams-Stroud, S.,** Bauer, R.A. and Greenberg, S.E., (2021). Long-term Seismic Monitoring of Reservoir Dynamics at Decatur. Proceedings of the 15th Greenhouse Gas Control Technologies Conference 15-18 March 2021, <http://dx.doi.org/10.2139/ssrn.3820454>
- Stanek, F., **S. Williams-Stroud,** R. Bauer, and L. Eisner (2020). Importance of monitoring seismicity induced by CO<sub>2</sub> sequestration at Illinois Basin – Decatur Project, in SEG Technical Program Expanded Abstracts, Society of Exploration Geophysicists, 2226–2230.
- Williams-Stroud, S.,** Leetaru, H., Bauer, R., Greenberg, S., Whittaker, S. (2019), Overview of active and passive seismic data acquisition and monitoring at the Illinois Basin – Decatur Project, SEG Technical Program Expanded Abstracts.
- Williams-Stroud, S.** (2018), Calculating Fault and Fracture Plane Size from Microseismic Events and Rock Elastic Properties, 2<sup>nd</sup> International Discrete Fracture Network Engineering Conference, Seattle, ARMA-DFNE-18-1384.
- Williams-Stroud, S.** (2017), Earth stress and seismic hazard from the size-frequency distribution of seismic events, 51<sup>st</sup> US Rock Mechanics/Geomechanics Symposium, San Francisco, ARMA 17-985.
- Williams-Stroud, S.,** (2017), A geological approach to seismicity b-values: Implications for hazard assessment, SEG Technical Program Expanded Abstracts, pp. 5381-5385
- Neuhaus, C., **Williams-Stroud, S.,** Remington, C., Barker, W., Blair, K., Neshyba, G., and McCay, T. (2012), Integrated microseismic monitoring for field optimization in the Marcellus Shale – A case study, SPE Canadian Unconventional Resources Conference, Calgary, AB, SPE161965
- Williams-Stroud, S.,** Neuhaus, C., Telker, C., Remington, C., Barker, W., Neshyba, G., and Blair, K. (2012), Temporal evolution of stress states from hydraulic fracturing source mechanisms in the Marcellus Shale, SPE Canadian Unconventional Resources Conference, Calgary, AB, SPE162786



- Detring, J.P., **Williams-Stroud, S.** (2012), Using Microseismicity to Understand Subsurface Fracture Systems and Increase the Effectiveness of Completions: Eagle Ford Shale, TX. Paper presented at the SPE Canadian Unconventional Resources Conference, Calgary, Alberta, Canada, October 2012. doi: <https://doi.org/10.2118/162845-MS>
- Williams-Stroud, S.**, Barker, W., Smith, K. (2012), Induced Hydraulic Fractures or Reactivated Natural Fractures? Modeling the Response of Natural Fracture Networks to Stimulation Treatments, ARMA 12-667, 46<sup>th</sup> US Rock Mechanics/Geomechanics Symposium, Chicago, IL.
- Williams-Stroud, S. C.**, Barker, W. B., and Smith, K. L. (2011), Linear bi-wing fracture trends do not indicate induced hydraulic fractures, 73<sup>rd</sup> EAGE Conference & Exhibition, Vienna, Austria.
- Williams-Stroud, S. C.**, and Eisner, L. (2010), Stimulated fractured reservoir DFN models calibrated with Microseismic source mechanisms, 44<sup>th</sup> US Rock Mechanics Symposium and 5<sup>th</sup> US-Canada Rock Mechanics Symposium, Salt Lake City, UT, ARMA 10-520.
- Williams-Stroud, S. C.**, and R. L. Billingsley (2010), Techniques to estimate fracture effectiveness when mapping low-magnitude microseismicity, SEG Expanded Abstracts, pp. 2075-2079.
- Williams-Stroud, S. C.** (2008), Using microseismic events to constrain fracture network models and implications for generating fracture flow properties for reservoir simulation, SPE Shale Gas Production Conference, Fort Worth Texas, doi:10.2118/119895-MS.
- Conference Presentation Abstracts*
- Williams-Stroud, S.**, Leetaru, H., Bauer, R., Greenberg, S., Langet, N. (2021). What induced seismicity from CO<sub>2</sub> injection can tell us about fluid migration pathways, Seismological Society of America 2020 Annual Meeting.
- Williams-Stroud, S.**, Leetaru, H., Eisner, L., Stanek, F. (2020), Integration of induced seismicity with subsurface fault interpretations at the Illinois Basin – Decatur Project, AAPG Annual Conference and Exhibition.
- Williams-Stroud, S.** (2019), Deterministic DFN modeling: A methodology to estimate actual fracture plane size using rock lithology and microseismic event source information, AAPG Annual Conference and Exhibition, San Antonio, TX.
- Williams-Stroud, S.** and Leetaru, H. (2018), Geological Characterization of Seismicity in the Illinois Basin, Geological Society of America Annual Meeting, Indianapolis, IN.
- Williams-Stroud, S.**, and Yielding, G. (2017), Earth stress and seismic hazard from the size-frequency distribution of seismic events, abstract, AAPG Annual Conference and Exhibition, Houston, TX.
- Williams-Stroud, S. C.**, Zhou, R., and Hulsey, B., (2012), Fracture Mechanics Interpreted from Stress Inversion Analysis on Microseismic Event Source Mechanisms in the Marcellus Shale, AAPG 2012 Annual Conference and Exhibition, Long Beach, CA
- Williams-Stroud, S.**, and Hulsey, B. J. (2011), Stress analysis using source mechanisms from failure along joints and faults in the Marcellus Formation during hydraulic fracture stimulation treatment, AAPG International Conference and Exhibition, Milan, Italy



- Eisner, L., Grechka, V., and **Williams-Stroud, S.** (2011), Future of microseismic analysis – Integration of monitoring and reservoir simulation, AAPG Annual Conference and Exhibition, Houston, TX.
- Abbott, D., **Williams-Stroud, S.**, and Shaffer, R. (2009), Surface Microseismic Monitoring of Hydraulic Fracture Stimulations, Bakken Formation, Nesson Anticline, Williston Basin, North Dakota, AAPG Annual Convention, Denver, CO.
- Williams-Stroud, S.** (2008), Integration of Structural Analysis with Microseismic Fracture Mapping, American Association of Petroleum Geologists Eastern Section Meeting.
- Williams-Stroud, S.**, Griest, S., and Meddaugh, S. (2006), A geologic strain and attribute-based fracture network (DFN) model of the Humma Field, Partitioned Neutral Zone, AAPG Annual Convention.
- Williams-Stroud, S.**, Griest, S., and Meddaugh, S. (2006), Building a discrete feature network model of fractures within the reservoir property model: Humma Field, PNZ, Kuwait and Saudi Arabia, GEO 2006 Middle East Conference and Exhibition.
- Williams-Stroud, S. C.** and Barton, C. (2000), Stress magnitudes associated with flexural slip in a hanging wall anticline, Geological Society of America Annual Meeting.
- Sweetkind, D. S., and **Williams-Stroud, S.** (1995), Controls on the genesis of fracture networks, Paintbrush Group, Yucca Mountain, Nevada, EOS, Transactions, American Geophysical Union, 76 (46, Suppl.), p. 597, American Geophysical Union 1995 fall meeting, San Francisco, CA
- Dean, W. E., Peryt, T. M., Czapowski, G., **Williams-Stroud, S.**, Johnson, K. S., Gasiewicz, A. (1995), Comparative anatomy of large Permian evaporite basins: the Zechstein basin of Poland and the Permian Basin of southwestern United States, XIII Carboniferous-Permian Congress, Krakow, Poland.
- Petrychenko, O., **Williams-Stroud, S.** (1995), Chemical composition of water in the Late Carboniferous evaporite Paradox Basin (USA), XIII Carboniferous-Permian Congress, Krakow, Poland.
- Dean, W. E., Peryt, T. M., Czapowski, G., Paul, J., **Williams-Stroud, S.** (1994), Comparative anatomy of large evaporite basins: The Zechstein Basin of central Europe and the Delaware Basin of Texas and New Mexico, AAPG Annual Convention Program.
- Williams-Stroud, S.C.**, and Kyser, T. K. (1994), Evolution of basin brines in the Paradox Formation, Western United States: Evidence from sedimentary textures, fluid inclusions, and stable isotopes, AAPG Annual Convention Program.
- Williams-Stroud, S.C.** (1993), Fluid inclusion evidence for multiple generations of halite crystallization in the Paradox Formation, Colorado and Utah, Geological Society of America Annual Meeting, Boston, MA.
- Herring, J.R., Piper, D.Z., **Williams-Stroud, S.**, Spirakis, C.S. and Sheppard, R.A. (1991), U.S. Geological Survey research on agricultural industrial minerals in the United States--Implications for Exploration, in Good, E.E., Slack, J.F., and Kotra, R.K., eds., U.S. Geological Circular 1062, USGS Research on Mineral Resources 1991 programs and abstracts p. 38-39
- Williams-Stroud, S.** (1991), The Evolution of an inland sea of Marine Origin to a non-marine saline lake: The Pennsylvanian Paradox Salt Deposit, Conference on Sedimentary and

Paleolimnological Records of Saline Lakes, Saskatoon, Saskatchewan, Canada, Aug. 13-16, 1991.

**Williams, S.** (1986), Experimental pressure solution of gypsum, American Association of Petroleum Geologists Annual Convention.

**Williams, S.** (1986), Deformation mechanisms observed during in-situ deformation of gypsum, American Geophysical Union Spring Meeting.

#### ***Other Publications***

Duncan, P., and **Williams-Stroud, S.**, 2009, Marcellus Microseismic, OilandGasInvestor.com, November 2009

**Williams-Stroud, S.C.** and Peter M. Duncan, 2008, Fracturing Technology: Microseismic mapping – the geological factor, Hart's E&P Magazine, September 2008

**Williams-Stroud, S. C.**, 2007, Fast DFN Generation for Reservoir Properties Scenario Analysis, Petroleum Africa Technology and Solutions article, December 2007

#### **PATENTS**

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**Williams-Stroud et al.**, United States Patent 8902710, "Method for determining discrete fracture networks from passive seismic signals and its application to subsurface reservoir simulation"

#### **INVITED LECTURES AND KEYNOTE PRESENTATIONS**

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*"Fun with Microseismic Events: Improved understanding of reservoir geomechanics through building DFNs constrained by induced seismicity"* Texas A&M University Department of Geology and Geophysics Seminar Series, March 2023.\*

*"The Illinois Basin – Decatur Project: Characterization, Monitoring, and Machine Teaching"* Earth and Planetary Sciences Spring 2023 Seminar Series, American Museum of Natural History, May 2023.\*

*"Monitoring CO<sub>2</sub> Injection at the Decatur, Illinois Sequestration Site"*, California Resources Corporation Seminar, 1 December 2022.

*"Integrating Induced Seismicity with Fault Interpretation at the Decatur, IL CCS Projects"*, Speaker and Panelist, Oklahoma and the Energy Transition OGS Workshop 2022, 16 November 2022.\*

*"Monitoring CO<sub>2</sub> Injection at the Decatur, Illinois Sequestration Site"* University of Illinois Chicago, Earth and Environmental Sciences Seminar, 15 September 2022.\*

*"Monitoring CO<sub>2</sub> Injection at the Decatur, Illinois Sequestration Site"* University of Kentucky Rast-Holbrook Seminar Series, 25 August 2022.\*

*"Looking to the Future – Career Opportunities in the Geosciences"* Kentucky State University College of Agriculture, Community and the Sciences, 26 August 2022.\*

*"Integrating induced seismicity with fault interpretation at the Illinois Basin – Decatur Project"* Colorado School of Mines Center for Rock & Fluid Multiphysics, Heiland Lecture Series, 16 February 2022.

*"Active and passive imaging of the deep subsurface for geological carbon storage"* Illinois-Sandia Climate Security Workshops: Geologic Carbon Storage, 19 November 2021.

*“Enhanced Structural Interpretation using Seismic Data from the Decatur, Illinois Sequestration Site”* American Rock Mechanics Association, Technical Committee on Induced Seismicity Webinar series, 5 November 2021.

*“Reservoir characterization for carbon sequestration”* Panelist for SEG Special Education Session: Opportunities Beyond Oil and Gas, 29 September 2021.\*

*“The Future of Energy Geoscience”* Keynote presentation at the National Association of Black Geoscientists Annual Conference, 10 September 2021.

*“Monitoring CO<sub>2</sub> Injection at the Decatur, Illinois Sequestration Site”* University of Iowa Earth & Environmental Sciences Department Seminar, 3 September 2021.\*

*“Induced Microseismicity from Energy-Related Fluid Injection: Overview and Case Studies”* USGS SynerGEM Seminar Series. 31 August 2021.

*“Geothermal Energy: A ‘1 of the Above’ Solution to a Carbon Neutral Future”* Los Alamos National Lab’s EES-CSES Frontiers in Geoscience Seminar Series. 23 August 2021.

*“Enhanced Structural Interpretation using Seismic Data from the Decatur, Illinois Sequestration Site”* Keynote talk in the First EAGE (European Association of Geoscientists and Engineers) Workshop on Faults in Groundwater, CO<sub>2</sub> Hydrocarbons in Asia Pacific. 23 August 2021.

*“Reservoir Response to Injection at the Decatur, Illinois CO<sub>2</sub> Sequestration Site”* AWOOG (Austin Women in Oil and Gas). 8 March 2021.

*“Monitoring CO<sub>2</sub> Injection at the Decatur, Illinois Sequestration Site”* European Association of Geoscientists and Engineers, Czech Republic Local Chapter Seminar Series. 11 May 2021.

*“Geothermal Energy”* Keynote talk in National Science Foundation Rift2Ridge Workshop 2021. 8 June 2021.

*“Enhanced Structural Interpretation using Seismic Data from the Decatur, Illinois Sequestration Site”* AAPG Petroleum Structure and Geodynamic Division Speaker Series. 10 June 2021.

*“Interpreting Induced Seismicity from Fluid Injection Operations”* Brigham Young University Winter Semester Geoscience Seminar. 11 February 2021.

*“Rock Fractures and Geo-Energy”* Wesleyan University Earth & Environmental Sciences Colloquium. 6 October 2020.

*“Induced Seismicity at the Illinois Basin – Decatur Project: Lessons for Moving Monitoring from Site-Scale to Large Scale CCS”* Regional Induced Seismicity Collaborative (RISC) webinar series. 4 August 2020.

*“Subsurface Structure Interpretation using Active and Passive Seismic at the Decatur, Illinois CO<sub>2</sub> Sequestration Site”* American Rock Mechanics Association USUTC webinar. 30 September 2020.

*“Geological Characterization of Seismicity in the Illinois Basin”* Association of Environmental & Engineering Geologists Dinner Meeting, Invited Speaker. November 2019.\*

(\* Indicates in-person presentation)

## PROFESSIONAL AFFILIATIONS

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American Association of Petroleum Geologists (1998 – present)  
American Geophysical Union (1995 – present)  
American Rock Mechanics Association (2008 – present)  
Association of American State Geologists, Associate Member (2022 – present)  
European Association of Geoscientists and Engineers (2004 – present)  
Geological Society of America (1990 – present)  
National Association of Black Geoscientists (2000 – present)  
Seismological Society of America (2016 – present)  
Society of Exploration Geophysicists (2008 – present)

## PROFESSIONAL SERVICE

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**Vice President** – AAPG Division of Environmental Geosciences (2022-2023)  
**Organizing Committee** – 2022 Discrete Fracture Network Engineering Conference  
**Chair** – Geological Society of America Committee on Diversity (2020-2022)  
**Member** – Seismological Society of America Diversity, Equity, and Inclusion Task force (2020-2021)  
**Organizing committee** – AAPG Petroleum Geomechanics & Structure Division meeting, 2019 and 2020.  
**Organizing Committee** – 2016 American Rock Mechanics Association (ARMA) Annual Symposium  
**Technical Program Committee, Chair** – National Association of Black Geoscientists Annual Convention, 2010 (San Antonio, TX), and 2011 (San Francisco, CA)  
**Co-Leader** – Mini-Summit on Diversity in AAPG, American Association of Petroleum Geologists Leadership Meeting, Tulsa, OK, 2002.  
**Chair** – U.S. Geological Survey Geologic Division Ethnic Minority Advisory Committee, 1992-1995

### Technical Peer-Reviewer:

- American Association of Petroleum Geologists Bulletin
- Journal of Structural Geology
- Seismological Research Letters
- Geophysics
- Geological Society of America Memoir
- Geological Society of London, Special Publications
- Geochemistry, Geophysics, Geosystems Journal
- Fuel
- Geophysical Prospecting

## EDUCATION AND OUTREACH ACTIVITIES

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*Ars Technica*: Interviewed for web article: “[Could deep boreholes solve our nuclear waste problem?](#)” published online February 2023.

SEG EVOLVE Carbon Solutions 22, Mentor for students doing virtual internships in multidisciplinary teams to build foundational knowledge through integration of technical and commercial data for business decisions, sponsored by the Society of Exploration Geophysicists.

*Everyday Superheroes: Women in STEM – Energy Careers*. One of 34 women in STEM featured in the children’s book released in July 2022 and participating in ongoing additional activities related to the book, including developing a virtual activity for Girl Scouts overseas in April 2023.

*University of Illinois Urbana-Champaign*: Working Group Leader, [Black in Geoscience STEM Pipeline \(BiG STEM Pipeline\)](#) initiative to increase the number of black students in geology: A partnership between Land-Grant Universities and Geological Surveys in the Midwest.

*Incorporated Research Institutions of Seismology (IRIS)* – Interviewed about geoscience careers for the IRIS Earthquake Science series on YouTube:  
<https://www.youtube.com/watch?v=YMeK1OeHc8E>

*National Academies of Science, Engineering, and Medicine, Committee on Earth Resources*: Panelist for Virtual Career Forum for Undergraduates from Underrepresented Groups, November 4, 2021.

*National Academies of Science, Engineering, and Medicine, Committee on Earth Resources*: Panel Moderator, Fall 2020 Meeting: Pathways Toward the Future Just, Equitable, Diverse, and Inclusive (JEDI) Energy Workforce, December 1, 2020.

*American Association of Petroleum Geologists*: Documentary Narrator in Parts 2 and 5 of “Rock Stars: Pioneering Women in Petroleum Geology”

1. <https://www.aapg.org/videos/prowess/ArticleId/44996/rock-stars-part-1-first-steps-first-barriers>
2. <https://www.aapg.org/videos/prowess/ArticleId/44997/rock-stars-part-2-flexing-their-muscles>
3. <https://www.aapg.org/videos/prowess/ArticleId/44998/rock-stars-part-3-when-worlds-collide>
4. <https://www.aapg.org/videos/prowess/ArticleId/45000/rock-stars-part-4-the-walls-come-tumbling-down>
5. <https://www.aapg.org/videos/prowess/ArticleId/45001/rock-stars-part-5-one-small-step-for-a-woman>

and profiled in the associated book “[Anomalies: Pioneering Women in Petroleum Geology 1917-2017](#)”

*American Association of Petroleum Geologists*: Visiting Geoscientist, since October 2014.

*AAPG-SEG West Coast 2013 Student Expo*: Taught Mini-Course, “Possible Pitfalls for Interpreting b-values as a Stress Meter – Geological Considerations for Earthquake Swarms to Microseismic Event Sets”, California State University, Northridge, CA, USA

*AAPG-SEG West Coast 2011 Student Expo: Taught Mini-Course, “Surface-Based Monitoring of Microseismicity from Hydraulic Fracture Stimulation Treatments, California State University, Northridge, CA, USA*

*Harvard-Smithsonian Center for Astrophysics: Guest Scientist in Annenberg/CPB video “Earth & Space Science: Session 6. Restless Landscapes” 2004*

<https://www.learner.org/series/essential-science-for-teachers-earth-and-space-science/restless-landscapes/> (starting @timestamp 16:49)

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## LANGUAGES

**English:** Native Language

**German:** Conversational (spoken), Scientific (reading)

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## COMPUTER SKILLS

**Programming:** Basic scriptwriting in SAS, IDL and R

**Applications:** FracMan (Golder Associates) fractured reservoir analysis and modeling software, Move™ (Petex) structural analysis and modeling software, Aspen SKUA (Gocad) geological modeling software, Petrel (Schlumberger) geologic modeling software, JMP (SAS) statistical analysis software, OpenWorks/SeisWorks seismic interpretation and well data management system, 3D Slicer visualization and medical image computing, ArcGIS geographic information systems and mapping software, Graphics software packages: GIMP, Canvas, Adobe Illustrator, Affinity Designer

**Platforms:** Windows, Linux, Unix