

**LAUREN BIRGENHEIER**

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**FIELDS OF EXPERTISE**

Sedimentology and stratigraphy, sequence stratigraphy, geochemistry, hydrocarbon/ petroleum geology, deep-time paleoclimate, reservoir characterization, unconventional resources

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**EDUCATION AND EMPLOYMENT**

Associate Professor, University of Utah, Geology & Geophysics: 2019-present

Assistant Professor, University of Utah, Geology & Geophysics: 2011-2019

Research Assistant Professor, University of Utah, Geology & Geophysics: 2010-2011

Instructional Research Staff, University of Utah, Energy & Geoscience Institute: 2009-2011

Postdoctoral Research Associate, University of Utah, Energy & Geoscience Institute: 2008-2009

Postdoctoral Research Associate, University of Nebraska-Lincoln, Earth & Atmospheric Sciences: 2008

Instructor, University of Nebraska-Lincoln, Earth & Atmospheric Sciences: 2007

Visiting Instructor, Colorado College, Geology: 2007

Ph.D., Geosciences with Geology specialization, University of Nebraska-Lincoln, Advisors Drs. Christopher Fielding and Tracy Frank: 2007

B.A., Geology, *cum laude*, Colorado College, Colorado Springs, Thesis advisor Dr. Paul Myrow: 2002

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**RESEARCH**, Select topics highlighted

*Assistant & Associate Professor, University of Utah, Geology & Geophysics: 2011-present*

- Geochemical and stratigraphic evaluation of Utah and western Colorado coal-bearing rocks for non-fuel resources, such as critical minerals, rare earth elements, carbon fiber, and resin.
- Sedimentology and sequence stratigraphy of mudstone (shale) successions, including Cretaceous Mancos Shale (Utah, Colorado, New Mexico), Eocene Green River Formation (Utah), Cretaceous Agrio Formation (Argentina), Pennsylvanian-Permian Wolfcamp Shale (Texas)
- Impact of abrupt, deep time climate transitions on depositional style of fluvial-lacustrine systems, Paleocene-Eocene Wasatch and Green River Formations, Utah,
- Integrating sedimentology, stratigraphy and stable isotope geochemistry to identify Paleocene-Eocene climate transitions and events in the terrestrial record
- Integrating organic geochemistry with sedimentary facies and stratigraphy to identify and predict source rock potential in unconventional resources, like shale gas and shale oil plays
- Integrating sedimentary geology and geomechanical testing to investigate and quantify the impact of mudstone heterogeneity on induced hydraulic fracture propagation in unconventional shale gas and shale oil drilling
- Building 3D basin models of unconventional shale oil and shale gas systems to quantify potential and predict drilling targets.

*Postdoctoral Research Associate & Research Assistant Professor, Energy & Geoscience Institute, University of Utah: 2008-2011*

- Integrating outcrop, well log, and 3D seismic data to predict subsurface fluvial channel morphology, Dakota Formation, Uinta Basin, Utah

- Stratigraphic correlation of coal-bearing strata of the upper Cretaceous Muley Canyon and Masuk Formation, Henry Mountain Syncline, Utah
- Pre-salt lacustrine to shallow marine carbonate succession of Angola
- European unconventional shale gas play assessment
- Jordanian Cretaceous oil shales
- Shale gas evaluation of Marcellus Shale, New York
- Modeling gas adsorption in shales
- Small angle X-ray scatter (SAXS) as a method to quantify pore %, shape and distribution in shales
- Sedimentology, stratigraphy and geochemistry of the Wasatch and lower to middle Green River Formation, Nine Mile Canyon, Uinta Basin, Utah
- Oil shale assessment of lacustrine Green River Formation, Uinta Basin, Utah
- Stable isotope geochemistry record of coal-bearing Permian succession, Queensland, for unconventional resource and paleoclimate assessment.

*Postdoctoral Research Associate*, University of Nebraska-Lincoln, Earth & Atmospheric Sciences: 2008

- Sedimentology and sequence stratigraphy of the fluvial to shallow marine upper Cretaceous succession, Henry Mountain Syncline, Utah

*Ph.D. student*, Geosciences, University of Nebraska-Lincoln: 2004-2007

- Sedimentary indicators of ancient glacial deposition, Late Paleozoic Ice Age, E. Australia
- Stable isotope and organic geochemistry proxies for paleoclimate, Late Paleozoic Ice Age, E. Australia
- Fluvial, coal-bearing paralic, shallow marine siliciclastic and carbonate, and lacustrine Carboniferous and Permian successions, E. Australia

*Undergraduate student*, Geology, Colorado College: 1998-2002

- Sedimentology, biostratigraphy, and chemostratigraphy of Ordovician shallow marine carbonate deposits, Gallatin Formation, Northern Wyoming and Southern Montana

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## HONORS AND AWARDS

Taft-Nicholson Center Summer Faculty Fellow, University of Utah, 2021

Experience Energy's [GRIT Award winner](#), Team category with Dr. Cari Johnson, Team name: "ShePersisted, University of Utah Energy." for "creating welcoming, inclusive cultures where a new generation of energy industry professionals want to work", 2019

Top 20 most downloaded article in *Sedimentology*, 2017-2018, Birgenheier et al., 2017, A depositional model for offshore deposits of the lower Blue Gate Member, Mancos Shale, Uinta Basin, Utah, USA, *Sedimentology*, <https://doi.org/10.1111/sed.12359>

[Inspirational Geoscience Educator Award](#), American Association of Petroleum Geologists (AAPG) Foundation, International level, 2018

Nominee, University of Utah Early Career Teaching Award, 2018

Outstanding Faculty Teaching Award, College of Mines and Earth Science, University of Utah, 2016

Outstanding Faculty Teaching Award, Geology & Geophysics Department, University of Utah, 2016

2<sup>nd</sup> place in Rocky Mountain region for Imperial Barrel Award competition. Primary advisor for U of Utah student team in annual international petroleum exploration competition organized by AAPG, 2015 & 2017.

Imperial Barrel Award. Faculty co-advisor with L. Stright for 1<sup>st</sup> place U of Utah student team in annual international petroleum exploration competition organized by AAPG; 107 university teams (535 students) entered, 2013

Myerly-Martin Prize for Excellence in Graduate Research: University of Nebraska-Lincoln, Department of Geosciences, 2008

Geological Society of America (GSA) Coal Division Best Paper at 2006 GSA Annual Conference, 2007

Othmer Fellow, University of Nebraska-Lincoln, 2004 - 2007

Phi Beta Kappa, 2002

Outstanding Senior Undergraduate Geology Student: Rocky Mountain Assoc. of Geologists, 2002

Award for Excellence: Association of Women Geoscientists, 2002

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## PUBLICATIONS

[Google scholar profile](#); Total citations = 2163; h-index = 15; i10-index = 19

\* 1<sup>st</sup> author student advisee.

### Peer-reviewed manuscripts (N = 27)

27. **Birgenheier, L.P.**, in prep. The last muddy decade in sedimentology: a critical synthesis and innovative future. *Sedimentology*.
26. **Birgenheier, L.P.**, Toms, L.C., in revision. Paleoenvironmental reconstructions along the southern margin of Eocene Lake Uinta during a period of climatic variability: the middle to upper Green River Formation, Uinta Basin, Utah, Utah. In *Utah Geological Association Guidebook: The Lacustrine Green River Formation: Hydrocarbon Potential and Eocene Climate Record*.
25. Kernen, R., Abu, C., Allen, J., Ahmed, S., Avary, K. L., **Birgenheier, L.**, George, T., Gomez, K., López Vega, A., Onwumelu, C., Rysak, B., Hart-Wagoner, N., in revision. Creating and Promoting Gender Equity and Diversity in Professional Geological Societies. *American Association of Petroleum Geologists Bulletin*. Pre-print: <https://doi.org/10.31223/X5FC7W>
24. Ochoa, R.I.\*, **Birgenheier, L.P.**, Schwarz, E., Salazar, J., revised. Calibrated Petrophysical Model for Source Rock Prediction and Identifying Unconventional Targets: Agrio Formation, Neuquén Basin, Argentina. *Journal of Marine and Petroleum Geology*.
23. Melstrom, E.\*, **Birgenheier L.P.**, 2021. Stratigraphic architecture of climate-influenced hyperpynal mouthbars. *Sedimentology*, v. 68, no. 4, p. 1598-1605 <https://doi.org/10.1111/sed.12854>
22. Moore, S.A.\*, **Birgenheier, L.P.**, Greb, M.D., Minisini, D., Tunik, M., Omarini, J., 2020. Integrated depositional model and hydrocarbon potential of distal ramp deposits, Agrio Formation, Neuquén Basin, Argentina. *Journal of Sedimentary Research*, v. 90, no. 5, p 533–570. <https://doi.org/10.2110/jsr.2020.25>
21. **Birgenheier, L.P.**, Plink-Bjorklund, P., Vanden Berg, M., Rosencrans, E.M.\*, Toms, L.\*, Rosenberg, M.\*, Gall, R.\*, 2020. Climate driven fluvial style changes: the impact on terminal continental lake evolution, Eocene Green River Formation, Uinta Basin, Utah, *Geological Society of America Bulletin*, v. 132, no. 3-4, p. 562–587 <https://doi.org/10.1130/B31808.1>
20. DeReuil, A.A.\*, **Birgenheier L.P.**, McLennan, J., 2019. Effects of Anisotropy and Saturation on Geomechanical Behavior of Mudstone, *Journal of Geophysical Research: Solid Earth*, v. 124, no. 8, 8101-8216. <https://doi.org/10.1029/2018JB017034>
19. **Birgenheier, L.P.**, Moore, S.A., 2018. Carbonate mud deposited below storm wave base: a critical review, *The Sedimentary Record*, v. 16, no. 4, p. 4 – 10. <https://doi.org/10.2110/sedred.2018.4.4>
18. DeReuil, A.A\*, and **Birgenheier, L.P.**, 2018. Depositional framework of the Juana Lopez member, Mancos Shale, Uinta Basin, Utah, *Sedimentology*, v. 66, no. 3, 1002 – 1041. <https://onlinelibrary.wiley.com/doi/abs/10.1111/sed.12532>
17. Gall, R.D.\*, **Birgenheier, L.P.**, Vanden Berg, M.D., 2017. Highly seasonal and perennial fluvial deposits of the Green River Formation, Utah, *Journal of Sedimentary Research*, v. 87, p.1019 – 1047. <https://doi.org/10.2110/jsr.2017.54>
16. **Birgenheier, L.P.**, Horton, B., McCauley, A., Johnson, C. J., Kennedy, A., 2017. A depositional model for offshore deposits of the Lower Blue Gate Member, Mancos Shale, Uinta Basin, Utah, U.S.A. *Sedimentology*. v. 64, p. 1402 – 1438. <https://doi.org/10.1111/sed.12359>
15. Vanden Berg, M.D., **Birgenheier, L.P.**, 2017. An examination of the saline phases of Eocene Lake Uinta, Upper Green River Formation, Uinta Basin, Utah. *Journal of Paleolimnology*, v. 58, p. 353 – 371.

14. Vanden Berg, M.D., **Birgenheier, L.P.**, 2016. Evaluation of the Upper Green River Formation's oil shale resource in the Uinta Basin, Utah; in ed. Spinti, J., *Utah Oil Shale: Science, Technology, and Policy Perspectives*, CRC Press/Taylor and Francis Group, p. 59 - 86.  
<http://www.ebooks.com/2655861/utah-oil-shale/spinti-jennifer/?fc=US&gclid=COTf-33t88CFZNcfgodgn4NNg>
13. Hobbs, D.J.\*, **Birgenheier, L.P.**, Johnson, C.L., Greb, M.D., 2015. Unconventional Petroleum System Analysis using a 3D Basin Model: Mancos Shale, Uinta Basin, Utah; in eds., Vanden Berg, M.D., Resselar, R., and Birgenheier, L.P., *Geology of Utah's Uinta Basin and Uinta Mountains: Utah Geological Association Publication 44*, p. 417-453.
12. Rosenberg, M.J.\*, **Birgenheier, L.P.**, Vanden Berg, M.D., 2015. Facies, stratigraphic architecture, and lake evolution of the oil shale bearing Green River Formation, eastern Uinta Basin, Utah, in eds., Smith, M., Gierlowski-Kordesch, E., *Stratigraphy and Paleolimnogeology of the Eocene Green River Formation*, Springer, p. 211- 249.
11. Corbett, M.J., Fielding, C.R., **Birgenheier, L.P.**, 2011. Stratigraphy of a Cretaceous coastal plain fluvial succession: The Campanian Masuk Formation, Henry Mountains Syncline, Utah, *Journal of Sedimentary Research*, v. 81, p. 80-96.
10. Fielding, C.R., Antia, J., **Birgenheier, L.P.**, Corbett, M.J., 2010. A field guide to the Cretaceous succession of the western Henry Mountains Syncline, south-central Utah, in Carney, S.M., Tabet, D.E., and Johnson, C.L., eds., *Geology of South-Central Utah, Utah Geological Association Publication 39*, p. 276 - 316.
9. **Birgenheier, L.P.**, Frank, T.D., Fielding, C.R., Rygel, M.C., 2010, Coupled carbon isotopic and sedimentologic records from the Permian system of eastern Australia reveal the response of atmospheric carbon dioxide to glacial growth and decay during the late Palaeozoic ice age, *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 286, p. 178-193.
8. **Birgenheier, L.P.**, Fielding, C.R., Rygel, M.C., Frank, T.D., Roberts, J., 2009, Evidence for dynamic climate change on sub-10<sup>6</sup>-yr scales from the late Paleozoic glacial record, Tamworth Belt, New South Wales, Australia, *Journal of Sedimentary Research*. v. 79, p. 56-82.
7. Fielding, C.R., Frank, T.D., **Birgenheier, L.P.**, Rygel, M.C., Jones, A.T., Roberts, J., 2008, Stratigraphic record and facies associations of the late Paleozoic ice age in eastern Australia (New South Wales and Queensland) , in Fielding, C.R., Frank, T.D., Isbell, J.L., eds., *Resolving the Late Paleozoic Ice Age in Time and Space, Geological Society of America Special Paper 441*, p. 41-57.
6. Frank, T.D., **Birgenheier, L.P.**, Montañez, I.P., Fielding, C.R., Rygel, M.C., 2008, Late Paleozoic climate dynamics revealed by comparison of ice-proximal stratigraphic and ice-distal isotopic records, in Fielding, C.R., Frank, T.D., Isbell, J.L., eds., *Resolving the Late Paleozoic Ice Age in Time and Space, Geological Society of America Special Paper 441*, p. 331-342.
5. Rygel, M.C., Fielding, C.R., Bann, K., Frank, T.D., **Birgenheier, L.**, & Tye, S.C., 2008, The early Permian Wasp Head Formation, Sydney Basin, High-latitude shallow marine sedimentation following the late Asselian-early Sakmarian glacial event in eastern Australia, *Sedimentology*, v. 55, 1517-1540.
4. Rygel, M.C., Fielding, C.R., Frank, T.D., **Birgenheier, L.P.**, 2008, The magnitude of late Paleozoic glacioeustatic fluctuations: a synthesis, *Journal of Sedimentary Research*, v. 78, p. 500-511.
3. Fielding, C.R., Frank, T.D., **Birgenheier, L.P.**, Rygel, M.C., Jones, A.T., Roberts, J., 2008, Stratigraphic imprint of the Late Palaeozoic Ice Age in eastern Australia: a record of alternating glacial and nonglacial climate regime, *Journal of the Geological Society of London*, v. 165, p.129-140.
2. Montanez, I.P., Tabor, N.J., Niemeier, D., DiMichele, W.A., Frank, T.R., Fielding, C.R., Isbell, J.L., **Birgenheier, L.P.**, Rygel, M.C., 2007, CO<sub>2</sub>-forced climate instability and linkages to tropical vegetation during late Paleozoic deglaciation, *Science*, v. 315, p. 87-91. DOI: 10.1126/science.1134207
1. Myrow, P.M., **Tice, L.\*\***, Archuleta, B., Clark, B., Taylor, J.F., & Ripperdan, R.L, 2004, Flat-pebble conglomerate: its multiple origins and relationship to meter-scale depositional cycles. *Sedimentology*, v. 51, p. 973-996.

\*\*Maiden name is Tice.

**Peer-reviewed technical reports and conference papers** (N = 9)

9. Kasumu, A.S., Kelly, K., **Birgenheier, L.P.**, Life Cycle Assessment of Greenhouse Gas Emissions from Liquefied Natural Gas Exports from North America's West Coast for Coal-Displaced Electricity Generation in Asia, Wester States and Tribal Nations Natural Gas Initiative Report, 54 p., <https://trustlands.utah.gov/wp-content/uploads/2021/09/Kasumu-and-others-2021-Life-cycle-assessment-of-GHG-emissions-from-LNG-exports-from-N.-Americas-west-coast.pdf>.
8. Gall, R., Birgenheier, L., Wiseman, T., 2020. Geologic Characterization and Production Potential of the Mancos B Interval, Eastern Uinta Basin, Utah. Utah Geological Survey Report prepared for the Utah School and Institutional Trust Lands Administration, 89 p., [https://trustlands.utah.gov/wp-content/uploads/2021/09/Gall-and-others-2020-Geologic-characterization-and-production-potential Mancos-B-interval.pdf](https://trustlands.utah.gov/wp-content/uploads/2021/09/Gall-and-others-2020-Geologic-characterization-and-production-potential-Mancos-B-interval.pdf).
7. Gall, R., Birgenheier, L., 2020. Addendum Petrographic Reservoir Characterization of the Mancos B Interval of the Mancos Shale, Southeastern Uinta Basin, Utah. Utah Geological Survey Report prepared for the Utah School and Institutional Trust Lands Administration, 21 p.
6. Omarini, J., Tunik, M., Aguirre-Urreta, B., Brea, F., Lescano, M., Milicich, R., Moore, S., **Birgenheier, L.**, Martínez, M., Giusiano, A., 2018. Geochemistry of the Agrio Formation (Early Cretaceous) in El Portón, Neuquén Basin: Preliminary Results., accepted, in review. 10<sup>th</sup> Congreso de Exploración y Desarrollo de Hidrocarburos, Instituto Argentino del Petróleo y del Gas.
5. Greenberger, R.N., Ehlmann, B.L., Jewell, P.W., **Birgenheier, L.P.**, Green, R.O., 2016. Detection of organic-rich oil shales of the Green River Formation, Utah, with ground-based imaging spectroscopy. Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, paper no. 93. 5 p.
4. Resselar, R., **Birgenheier, L.P.**, 2015. Cretaceous Mancos Shale Uinta Basin, Utah: Resource potential and best practices for an emerging shale gas play, DOE technical report, Research Partnership to Secure Energy for America/ U.S. Department of Energy subcontract no. 09122-07, 645 p.
3. Welker, C., Hall, D., Philp, R.P., **Birgenheier, L.P.**, Johnson, C., 2015. Analysis of Trapped Fluids in the Mancos Shale, Uinta Basin, Utah. Unconventional Resources Technology Conference Paper, Society of Petroleum Engineers, SPE-178603-MS. 20 p.
2. **Birgenheier, L.P.**, Vanden Berg M.D., 2011. Core-based integrated sedimentologic, stratigraphic, and geochemical analysis of the oil shale bearing Green River Formation, Uinta Basin, Utah. U.S. Department of Energy/National Energy Technology Lab Topical Report, DOE Award No.: DE-FE0001243, 30 p. [7 citations]
1. **Birgenheier, L.P.**, Fielding, C.R., Corbett, M.J., Kesler, C., 2009. Sequence stratigraphic assessment of the Muley Canyon Sandstone and Masuk Formation, Henry Mountains Syncline: Implications for understanding the Muley Canyon Coal Zone, Utah Geological Survey Open File Report 557, 72 p. [6 citations]

**Non peer-reviewed technical reports** (N = 6)

6. **Birgenheier, L.P.**, Ochoa, R., 2021. Agrio Formation Neuquén Shale Project Final Report to project sponsor, Chevron, 11 p.
5. **Birgenheier, L.P.**, Moore, S., Thul, D., Tunik, M., Omarini, J., 2018. Unconventional Play Assessment of the Agrio Formation, Neuquén Basin, Argentina, Energy & Geoscience Report I-01250, 46 p.
4. **Birgenheier, L.P.**, Luna, J., 2017. High Resolution Sedimentological, Stratigraphic, and Elemental Analysis of Late Paleozoic Mudstones, Midland Basin, Texas, Final project report submitted to Chevron, project sponsor, 23 p.
3. **Birgenheier, L.P.**, 2017. Green River Formation Stratigraphy Final Report to project sponsor, Total S.A., 67p.
2. Plink-Bjorklund, P., **Birgenheier, L.P.**, Golab, J., 2009. Alluvial Depositional Models Consortium year end report, 167 p.
1. Plink-Bjorklund, P., **Birgenheier, L.P.**, 2008. Alluvial Depositional Models Consortium year end report, 49p.

**Monographs** (N = 2)

2. Birgenheier, L.P., 2007, A sedimentologic, stratigraphic, and geochemical study of the late Paleozoic ice age, eastern Australia, Ph.D. thesis, University of Nebraska-Lincoln, 263 p. **[6 citations]**
1. Tice, L.P., 2002, Sedimentology and biostratigraphy of Cambrian-Ordovician deposits: Northern Wyoming and Southern Montana, Honors thesis, Colorado College, 95 p.

\*\*Maiden name is Tice.

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**CONFERENCE ABSTRACTS** (N = 89), full abstract list provided at the end of CV

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**FUNDING**

**\$2,996,654 total contracted at University of Utah as PI**

**Awards as PI**

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|-------------|--|
| 2021-2023   | U.S. Department of Energy (DOE) to U of Utah (L. Birgenheier – co-PI; GEO team lead; PI - M. Free) - <i>Transforming Uinta Basin Earth Materials for Advanced Products (TUBE-MAP)</i> – DE-FOA-0002364, Carbon Ore, Rare Earth and Critical Minerals (CORE-CM) Initiative for U.S. Basins (Geology and Geophysics, L. Birgenheier: <b>\$600,000</b> ; Total Award Amount: \$1.5 Million) |
| 2020 - 2021 | Utah Geological Survey subcontract to L. Birgenheier (100%); Project awarded to Utah Geological Survey from Utah School and Institutional Trust Lands Administration (SITLA) - : <i>Facies Characterization and Production Potential in the Green River Formation, Northeastern Uinta Basin, Utah</i> (University of Utah: <b>\$10,000</b> ; Total Award Amount: \$50,000).              |
| 2019 – 2021 | Chevron to L. Birgenheier (100%) - <i>Agrio Formation Neuquén Shale Project</i> , ( <b>\$198,031</b> ).  |
| 2019-2022   | U.S. Department of Energy (DOE) to L. Birgenheier through Energy and Geoscience Institute (PI: B. McPherson) - <i>Improving Production in Utah's Emerging Northern Paradox Unconventional Oil Play</i> (Geology and Geophysics, L. Birgenheier: <b>\$102,000</b> ; Total Award Amount: \$10.3 Million)   |
| 2019-2020   | Utah Geological Survey subcontract to L. Birgenheier (100%); Project awarded to Utah Geological Survey from Utah School and Institutional Trust Lands Administration (SITLA)- <i>Geologic characterization and production potential of the Mancos B and other Mancos targets in the eastern Uinta Basin, Utah</i> (University of Utah: <b>\$10,000</b> ; Total Award Amount: \$60,000).  |
| 2017-2022   | Utah Science, Technology and Research (USTAR) Initiative Energy Research Triangle Scholars Grant, <i>Predicting fracture response using a shale heterogeneity index – new technology for efficient resource development</i> , to Ph.D. student A. DeReuil, PI L. Birgenheier ( <b>\$15,000</b> ).  |
| 2015 – 2016 | Chevron to L. Birgenheier (100%) - <i>Shale Mechanical Sedimentology and Stratigraphy Project</i> ( <b>\$180,000 contracted, \$60,000 paid</b> due to economic downturn).  |
| 2014 – 2016 | Total S.A. to L. Birgenheier (100%) – <i>Green River Formation Stratigraphy (GRF Strat) Project Phase 2</i> ( <b>\$375,000</b> ).  |
| 2013 – 2016 | ConocoPhillips to L. Birgenheier (100%) - <i>Shale Mechanical Sedimentology and Stratigraphy Project</i> ( <b>\$180,000</b> ).   |
| 2012-2014   | Total S.A. to L. Birgenheier (100%) – <i>Green River Formation Stratigraphy (GRF Strat) Project</i> ( <b>\$300,827</b> ).  |
| 2014        | EOG Resources to L. Birgenheier (100%) – Birgenheier research, <i>Shale Mechanical Sedimentology and Stratigraphy Project</i> ( <b>\$40,000</b> ).   |



- 2010-2015 DOE subcontractor Research Partnership to Secure Energy for America (RPSEA) Unconventional Onshore Program to C. Morgan (Utah Geological Survey), L. Birgenheier as University of Utah lead – *Cretaceous Mancos Shale Uinta Basin, Utah: Resource Potential and Best Practices for an Emerging Shale Gas Play* (Total Award Amount: \$1,084,029; University of Utah, L. Birgenheier: **\$757,077**).
- 2012-2013 Questar, Wexpro Company to L. Birgenheier (100%) – Birgenheier research, *Shale Mechanical Sedimentology and Stratigraphy Project* (**\$50,000**).
- 2011-2013 DOE to L. Birgenheier through Institute for Clean and Secure Energy, Clean and Secure Energy from Coal, Oil Shale, and Oil Sands Program (PI: Phil Smith, Chem Eng, U of Utah) - *Developing a Geologic Model of the Green River Oil Shale, Uinta Basin* (L. Birgenheier: **\$110,000**; Total award amount: \$3.2 million).
- 2011-2013 Colorado School of Mines/Utah Geological Survey subcontract to L. Birgenheier (100%) through Center for Oil Shale Technology and Research (COSTAR) - *Green River Formation investigation, Eastern Uinta Basin, Utah* (**\$36,814**).
- 2011-2012 Utah Geological Survey to L. Birgenheier (100%) through Hydrocarbon Research Grants Program - *Sequence stratigraphic analysis of the oil shale-bearing Green River Formation, eastern Uinta Basin* (**\$24,927**).
- 2011 University of Queensland Subcontract to L. Birgenheier (100%) – *Carbonaceous Mudrock Geochemical Analysis Phase 2* (**\$8,685**).
- 2010 University of Queensland Subcontract to L. Birgenheier (100%) – *Carbonaceous Mudrock Geochemical Analysis* (**\$6,579**).
- 2010 Energy & Geoscience Institute Corporate Associates Program (TAQA) to L. Birgenheier (100%) - Oil Shale of Jordan and Morocco, Phase 1 (**\$29,765**).
- 2008-2010 Colorado School of Mines Industrial Associates Program (Devon Energy, Bill Barrett Corporation, Berry Petroleum Company) to P. Plink-Bjorklund; L. Birgenheier subcontract (**25%**) - *Alluvial Depositional Models Consortium: An Industrial Associates Program on Alluvial Architecture and Facies. Specific Focus: Paleocene-Eocene alluvial-lacustrine strata of the southern Uinta Basin, Utah* (Total: \$210,000, **University of Utah subcontract: \$52,500**).
- 2008-2009 Utah Geological Survey (UGS) to L. Birgenheier (100%) - *Subsurface to Surface Correlation of Muley Canyon Coal Zone (Muley Canyon Sandstone and Masuk Formation), Henry Mountain Basin, Utah: A Scientific Foundation for Accurate Economic Coal Resource Assessment* (**\$29,449**).

#### ***Awards as collaborator***

- 2020 - 2021 Utah Geological Survey from Utah School and Institutional Trust Lands Administration (SITLA) to K. Kelly (PI), Chem Eng., U of Utah, and L. Birgenheier (collaborator)- *Western States LNG Emissions Study: Phase 1*; (**\$15,000**).
- 2015 – 2017 Shell to D. Thul, EGI (PI), Birgenheier (collaborator) - *Sedimentologic, Stratigraphic and geochemical evaluation of the Agrio Formation, Neuquén Basin, Argentina* (**\$125,000**).
- 2014 - 2015 Utah Geological Survey (UGS) to P. Jewell (PI), L. Birgenheier and L. Stright through Hydrocarbon Research Grants Program - *Digital Lithofacies Characterization of the Green River Formation, Eastern Utah* (**\$25,000**).
- 2007-2009 Utah Science, Technology and Research (USTAR) initiative to W. Keach - *Uinta Basin Technology Application and Technology Transfer: Using 3-D Seismic to Predict Fairways in the Dakota/Morrison Formation Interval* (**\$100,000**).
- 2009-2010 ENI S.p.A., an Italian multinational oil and gas company, to J. McLennan and M. Segall – *Global Distribution of Shale Gas Resources* (**\$76,574**).
- 2008-2010 United States Department of Energy (DOE) to Institute of Clean & Secure Energy, University of Utah – *Clean and Secure Energy from Coal, Oil Shale and Oil Sands* (**\$4,132,894**).

***Student research funding***

**~\$100K in student research funds** garnered by graduate student advisees from sources like Geological Society of America, American Association of Petroleum Geosciences, Society for Sedimentary Geology (SEPM), American Federation of Mineralogical Societies, Utah Science, Technology and Research (USTAR), Center for Latin American Studies at University of Utah, ExxonMobil, Dominion Energy.

**~\$250K in graduate student fellowships** awarded to graduate student advisees including Chevron Fellowship, ConocoPhillips Fellowship, Global Change and Sustainability Fellowship, Emerging Diversity Scholars Fellowship, University Teaching Assistant, and Cooper Hansen Fellowship at University of Utah.

***Petroleum geology programmatic funding*** (co-solicited and co-managed with Dr. Cari Johnson)

**\$40,194** raised for fall 2019 Energy Geoscience Initiatives fundraising event from 98 alumni supporters in the energy industry. <http://c-fund.us/n7z> Demonstrates the value our alumni place on the petroleum geology training they received toward their careers. All \$\$ go to support students and curriculum, not faculty salaries.

**~\$600K from 2011-2018**, have been donated to the Geology & Geophysics Department from energy industry companies to support students. Funds are used to support international field trips, short courses, and petroleum geology relevant curriculum development. I maintain and foster relationships with industry recruiters and alumni, which supports donations.

Industry software donations include Petra, Petrel, Kingdom Suite, and PetroMod. Equivalent market value = **~\$30 million.**

***Conference funding***

Raised **\$12,500 in sponsorship** for an Unconscious Bias Luncheon event, with guest speaker Dr. Carlee Beth Hawkins, Project Implicit, Harvard, at the annual AAPG conference in Salt Lake City, May 2018.

**TEACHING*****Pedagogical grants***

Wrote and was awarded a 2019-2020 (two semester) University Teaching Assistant grant for GEO 110 Evolving Earth, a new geo core curriculum course for majors, for Ph.D. advisee, Raul Ochoa, Proposal title: "Evolving Earth: Flipping the light switch on student learning."

***University of Utah***

GEO1100 – Evolving Earth, new core undergraduate curriculum course for geo majors (3 cr., Spring 2019, 2021, Fall 2022)

GEO 6520/5520 Petroleum Industry Career Path (PICP) 1b Intro to Petroleum Systems (1.5 cr., Fall 2013, '15, '16, '18, '20)

GEO 6950 Reviews of Earth Science (3 cr., Fall 2012, '13, '14, '17, '18, '20)

GEO 5200/6200 Depositional Environments (3 cr., Spring 2012, '14, '16, '18, '22)

GEO 6540/5540 Petroleum Industry Career Path (PICP) 3b Capstone – Imperial Barrel Award (IBA) competition (2 cr., Spring 2013, '15, '17) (co-taught w L. Stright in 2013 only)

GEO 6535/5535 Petroleum Industry Career Path (PICP) 3a Capstone – Unconventional resources and IBA preparation (1.5 cr., Fall 2014)

GEO 5510/6510 Petroleum Industry Career Path (PICP) 1a (1.5 cr., Fall 2013)  
Intro to Petroleum Geology; field based

GEO1000 Natural Disasters (3 cr., Fall 2011), co-taught w/ L. Stright

GEO 5920/6920 Fundamentals of Applied Earth Science (1.5 cr.; Spring 2010, '11)

Industry short courses and field trips led through Energy & Geoscience Institute (2008 – 2011)



**Previous Institutions**

Geologic Natural Hazards (3 cr.), University of Nebraska-Lincoln (Fall 2007)

Geology of the Pikes Peak Region (3 cr.), Colorado College (Summer 2007)

**GRADUATE STUDENT ADVISING**

Advised **15 graduate students** (3 Ph.D., 12 M.S.; 1 current, 14 graduated or defended) at University of Utah . 75% (11/15) from underrepresented STEM groups, mostly women (53% Female/47% Male), 20% from under-represented minority groups in STEM

**13 of 14** graduated or defended students have or had **post-graduate placement/position in the energy industry**. **13 out of 15** did **industry internships**.

**Advisor role, current**

R. Ochoa      University of Utah, Ph.D. Advisor, Topic: Basin scale sedimentology and stratigraphy of the early Cretaceous Agrio Formation, Neuquén Basin and Mendoza, Argentina. Estimated grad. Spring 2023.

**Advisor role, graduated or defended**

C. Valery      University of Utah, M.S. Advisor, Topic: Outcrop based sedimentology and stratigraphy of the El Pilmatué Member of the Agrio Formation, Mendoza, Argentina. Grad. May 2020. Post-grad placement/position at ExxonMobil, Houston, TX.

R. Fults      University of Utah, M.S. Advisor, Topic: Depositional controls on the stratigraphic variability of sedimentary cycles, Green River Formation, Uinta Basin, Utah. Grad. May 2020. Post-grad placement/position at Dominion Energy, Salt Lake City, UT.

A. DeReuil      University of Utah, Ph.D. Advisor, Topic: Shale Mechanical Sedimentology and Stratigraphy. May 2019. Post-grad placement/position at Chevron, Houston, TX.

J. Luna      University of Utah, Ph.D. Advisor, Topic: Late Pennsylvanian-early Permian Wolfcamp Shale sedimentology, stratigraphy, geochemistry, and geostatistical evaluation, Permian Basin, West Texas. May 2019. Post-grad placement/position at Chevron, Houston, TX.

J. Morris      University of Utah, M.S. Advisor, Topic: Depositional controls on the stratigraphic variability of sedimentary cycles, Green River Formation, Uinta Basin, Utah. Defended April 2018.

S. Moore      University of Utah, M.S. Advisor, Topic: Outcrop characterization of the Cretaceous Agrio Formation, Neuquen Basin, Argentina: sequence stratigraphy and unconventional hydrocarbon potential. Aug 2018. Post-grad placement/position at Hess Corporation, Houston, TX.

R. Gall      University of Utah, M.S. Advisor, Topic: Outcrop characterization of the Green River Formation, Main Canyon, central Uinta Basin, Utah. May 2017. Post-grad placement/position at Earth Science Agency (ESA), Denver, CO. Now at Utah Geological Survey.

E. Rosencrans      University of Utah, M.Sc. Advisor, Topic: Stratigraphic architecture of deltaic mouthbar (now Melstrom) deposits during the early Eocene climatic optimum, Green River Formation, Uinta Basin, Utah. Dec 2015. Post-grad placement/position at EOG Resources, San Antonio, TX.

D. Hobbs      University of Utah, M.Sc. Co-advisor with Cari Johnson, Unconventional petroleum system analysis using 3D basin model: Mancos Shale, Uinta Basin, Utah. Dec 2015. Post-grad placement/ position at Exxon-Mobil, Houston, TX.

L. Toms      University of Utah, M.Sc. Advisor, Topic: Spatial and temporal variations in lacustrine depositional controls from the middle to upper Green River Formation, central and western Uinta Basin, Utah. Dec 2014. Post-grad placement/position at Chevron, Houston, TX. Now at Beach Energy, Adelaide, Australia.

- A. McCauley University of Utah, M.Sc. Advisor, Thesis Title: Sequence stratigraphy, depositional history, and hydrocarbon potential of the Mancos Shale, Uinta Basin, Utah. Dec 2013. Post-grad placement/position at Apache Corporation, Houston, TX. Now at Oxy, Houston, TX.
- M. Rosenberg University of Utah, M.Sc. Advisor, Thesis Title: Facies, stratigraphic architecture, and lake evolution of the oil shale bearing Green River Formation, eastern Uinta Basin, Utah. Aug 2013. Post-grad placement/position at ConocoPhillips, Houston, TX. Now at Bank of America, Houston, TX.
- B. Horton University of Utah, M.Sc. Advisor, Thesis Title: Variability of the Mancos Shale: a depositional and sequence stratigraphic model of a developing shale gas play. Aug 2012. Post-grad placement/position at Chevron, Houston, TX.
- A. Kennedy University of Utah, M.Sc. Co-advisor with Cari Johnson, Thesis Title: Geologic Predictors of the Hydrocarbon Extraction Potential of the Mancos Shale. Dec 2011. Post-grad placement/position at ConocoPhillips, Houston, TX. Now at EP Energy, Houston, TX.

***Dissertation committee member role*** (N = 11)

**3 Ph.D. students** have had post-graduate placement/positions in the energy industry.

- | Name             | Degree, dept., institution, advisor, grad. date, post-grad industry placement (as applicable)              |
|------------------|--|
| E. Cunningham    | Ph.D., Geology & Geophysics, University of Utah, Sarah Lambert.  |
| T. Rust          | Ph.D., Geological Sciences, Binghamton University, Jeff Pietras, Ph.D. candidate.                          |
| B. Fischer-Femal | Ph.D., Geology & Geophysics, University of Utah, Gabe Bowen, Ph.D. candidate.                              |
| C. Meiowitz      | Ph.D., Geology & Geophysics, University of Utah, Lisa Stright, Ph.D. candidate, Exxon-Mobil, Houston, TX.  |
| J. Bernau        | Ph.D., Geology & Geophysics, University of Utah, Brenda Bowen, Ph.D. candidate, May 2022.                  |
| Z. Wistort       | Ph.D., Geology & Geophysics, University of Utah, Kathleen Ritterbush, Dec. 2021                            |
| E. Reat-Wersan   | Ph.D., Geology & Geophysics, University of Utah, Cari Johnson, Aug. 2021, Chevron, Houston, TX.            |
| G. St. Pierre    | Ph.D., Geology & Geophysics, University of Utah, Cari Johnson, May 2021, Chevron, Houston, TX.             |
| D. Beti          | Ph.D., Chemical Engineering, University of Utah, Terry Ring., May 2020.                                    |
| J. Mulhern       | Ph.D., Geology & Geophysics, University of Utah, Cari Johnson, Dec 2016, Shell, New Orleans, LA.           |
| J. Korus         | Ph.D., Earth & Atmospheric Sciences, University of Nebraska-Lincoln, Christopher Fielding, grad. Dec 2015. |

***Thesis committee member role*** (N=18)

**13 of 18 M.S. students** have had post-graduate placement/positions in the energy industry.

- | Name        | Degree, dept., institution, advisor, grad. date, post-grad industry placement (as applicable)           |
|-------------|---|
| C. Atlas    | M.S., Geology & Geophysics, University of Utah, Cari Johnson, estimated May 2022, Chevron, Midland, TX. |
| A. Stanczyk | M.S., Geology & Geophysics, University of Utah, Jeff Moore., May 2019.                                  |
| S. Hood     | M.S., Geology & Geophysics, University of Utah, Kathleen Ritterbush, not graduated.                     |
| A. Koch     | M.S., Geology & Geophysics, University of Utah, Cari Johnson, Dec 2018, Chevron, Bakersfield, TX.       |
| N. Morton   | M.E., Chemical Engineering, University of Utah, John McLennan, Aug 2018, Shell, New Orleans, LA.        |
| J. Primm    | M.S., Geology & Geophysics, University of Utah, Cari Johnson, Aug 2016.                                 |

D. Watford	M.S., Geology & Geophysics, University of Utah, Gabe Bowen, Dec 2015.
R. Purcell	M.S., Geology & Geophysics, University of Utah, Cari Johnson, Aug 2015, Anadarko, Houston, TX.
W. Benhallam	M.S., Geology & Geophysics, University of Utah, Cari Johnson, Aug 2015, Quantum Reservoir Impact, Houston, TX.
A. Jackson	M.S., Geology & Geophysics, University of Utah, Lisa Stright, Dec 2014, Anadarko, Denver, CO.
B. Chentnik	M.S., Geology & Geophysics, University of Utah, Cari Johnson, Dec 2014, ConocoPhillips, Houston, TX.
C. Welker	M.S., Geology & Geophysics, University of Utah, Lisa Stright, Aug 2014, Fluid Inclusion Technologies, Tulsa, OK.
A. Turner	M.S., Geology & Geophysics, University of Utah, Lisa Stright, May 2014, Chevron, Houston, TX.
A. Gonzalez	M.S., Geology & Geophysics, University of Utah, Brenda Bowen, Dec 2013, Apache, Midland, TX.
B. Maibauer	M.S., Geology & Geophysics, University of Utah, Gabe Bowen, Dec 2013, Chevron, Houston, TX.
P. Dooling	M.S., Geology & Geophysics, University of Utah, Cari Johnson, Dec 2012, ConocoPhillips, Houston, TX.
L. Pettinga	M.S., Geology & Geophysics, University of Utah, Cari Johnson, Dec 2012, ConocoPhillips, Houston, TX.
J. Golab	M.S., Geology & Geological Engineering, Colorado School of Mines, Piret Plink-Björklund, Dec 2010.
W. Gallin	M.S., Geology & Geophysics, University of Utah, Cari Johnson, Dec 2010, Hess Corporation, Houston, TX.

### **CAREER ADVISING, JOB PLACEMENT**

Between 2010 and 2021, Dr. Cari Johnson and I have co-advised and mentored graduate students in the Geology and Geophysics Dept. at University of Utah in energy industry recruiting efforts, placing students in **70 summer energy company internship positions**. During this same period **48 graduate students** accepted post-graduate placement positions.

Between 2010 and 2019,

~**45%** of our total grad students **gained experience in the energy industry** through internships.

~**27%** of our grad students had **job placement in the energy industry** upon graduation.

### **UNDERGRADUATE STUDENT ADVISING**

Advised **11 undergraduate research projects** at University of Utah.

#### ***Undergraduate research advisor, current***

M. Clow            Petrographic examination and thin section and SEM imaging of Cane Creek Shale, Paradox Basin, Utah.

#### ***Undergraduate research advisor, past***

K. Worms            University of Utah Undergraduate Research Opportunity Program (UROP) project. The use of X-ray Florescence and Optical Photographs to analyze how the paleoredox Conditions and depositional Environment of the Eocene lake system of the Green River Formation changed over time. Completed an undergraduate honors thesis. Now a Ph.D. student at Oregon State University.

J. Ammon            University of Utah Undergraduate Research Opportunity Program(UROP) project. Fracture Propagation Networks: Comparing Strength Properties of Wet and Dry Heterogeneous Mudstone. Jens presented his work as a poster at the annual 2018 AAPG conference in Salt Lake City.

- P. Archer Field and lab preparation work on Green River Formation sedimentology and stratigraphy project, Uinta Basin, Utah. Helped graduate student, R. Gall, with field work. Performed organic carbon isotope sample preparation in lab including, powdering, acidifying and weighing.
- S. Hollingsworth Field and lab preparation work on Green River Formation sedimentology and stratigraphy project, Uinta Basin, Utah.
- A. Pandey Handheld X-Ray fluorescence analysis of mudstone cores for Shale Mechanical Sedimentology and Stratigraphy, working also with graduate student J. Luna.
- K. Worms University of Utah ACCESS program for women in STEM. Performing organic carbon isotope sample preparation in lab including, powdering, acidifying and weighing for organic rich samples from the Cretaceous John Henry Member, Kaipairowitz Plateau, in collaboration with Drs. C. Johnson and R. Irmis.
- J. Paige Field assistant and spanish to english literature interpreter for Agrio Shale, Nequen Basin, Argentina project, collaborative with David Thul at Energy & Geoscience Institute, working also with graduate student S. Moore.
- S. Rosendahl University of Utah, UROP project, Geology & Geophysics Dept., Paleoclimate evaluation of the GrGreen River Formation, Uinta Basin, using organic carbon isotopic analysis.
- Z. Yuan University of Utah, Undergraduate research project, Geology & Geophysics Dept., co-advised with Dr. John Bartley, Topic: Natural fracture characterization of the Mancos Shale, Uinta Basin, from Formation Image Log reports.
- L. Larsen University of Utah, Undergraduate research project, co-advised with John McLennan, Chemical Engineering, Topic: Water saturation study of the Mancos Shale, Uinta Basin.

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## INVITED PRESENTATIONS

SedsOnline, International Association of Sedimentologists online lecture series, invited presentation, scheduled for May 2022.

AAPG Annual meeting, IMAGE 2022, invited keynote presentation in "Siliciclastic Systems: New Techniques in Age, Provenance and Paleoclimate", scheduled for Sept 2022.

Gulf Coast Section, Society for Sedimentary Geology (GCSSEPM) Foundation Perkins-Rosen Research Conference, Houston, TX, invited presentation on Cenomanian-Turonian mudstone record from western North America, Dec. 2020; delayed to Dec 2022.

Geological Society of America – Rocky Mountain Section conference, Calgary, Alberta, Canada, invited presentation, "Cretaceous Stratigraphy of the North American Foreland" session, 2017.

Houston Geological Society Applied Geoscience Conference invited presentation, "A depositional model and stratigraphic framework of the Green River Formation, Uinta Basin, Utah, 2015.

University of Utah Department of Geology and Geophysics Distinguished Lecture Series, The Mancos Shale, 2014.

1 day invited workshop on ancient lacustrine depositional systems for Hess Corporation, 2013.

Utah State University Geology Department lecture series, Depositional model, sequence stratigraphic framework and hydrocarbon potential of the Mancos Shale, Uinta Basin, 2013.

Utah Geological Association lecture series, A facies and sequence stratigraphic model for the Mancos Shale, Uinta Basin: Identifying unconventional horizontal targets, 2013.

University of Utah Unconventional Fuels Conference, Constructing a basin-scale geologic model of the Green River Formation, 2013.

University of Utah Unconventional Fuels Conference, Geologic Characterization of Utah Oil Shale Deposits, 2010.

Boise State Geosciences Department lecture series, Late Paleozoic Ice Age, 2009.

## **MEDIA COVERAGE**

Sept 2021: U of Utah press release, U researchers to study potential of Uinta Basin mineral resources with \$1.5M grant. <https://attheu.utah.edu/announcements/u-researchers-to-study-potential-of-utahs-natural-resources-with-1-5m-grant/>

Oct 2021: KUER News story, Coal Resources near Uinta Basin could be used for electronics and renewable energy products. <https://www.kuer.org/health-science-environment/2021-10-01/coal-resources-near-uinta-basin-could-be-used-for-electronics-and-renewable-energy-products>

May 2021: Interview on EGeos podcast, a podcast that features geologists working in many settings and professions toward the energy transition, by Rachele Kernen, <https://egeos.org/season-1b>; [SoundCloud link here](#).

Dec 2019: Invited as a role model for interview on Road Trip Nation, PBS television series, for a documentary on single mothers training for STEM careers titled, "Single Mom's Story: Together We Thrive."

Documentary released Nov 2020.

Documentary and trailer: <https://roadtripnation.com/roadtrip/single-mothers>

Birgenheier interview profile: <https://roadtripnation.com/interviews/lauren-birgenheier>

Oct 2019: GRIT Award winner, team category: ShePersisted, University of Utah Energy <https://csistars.com/rar/recognizing-the-2019-grit-award-winners/>

June 2018: *AAPG Foundation's Excellence in Teaching Award recipients announced*, American Association of Petroleum Geologists Explorer <https://www.aapg.org/publications/blogs/events/article/articleid/49004/aapg-foundations-excellence-in-teaching-award-recipients-announced>

May 2018 Interview: Meet Lauren Birgenheier, 2018 Inspirational Geoscience Educator Awardee, American Association of Petroleum Geologists (AAPG) Foundation <https://www.facebook.com/AAPGFoundation/videos/708681289498931/>

April 2018: *Moving Beyond Bias: Annual Convention and Exhibition session provides strategies for increasing fairness in the workplace*, American Association of Petroleum Geologists Explorer <http://www.aapg.org/publications/blogs/events/article/articleid/46555/moving-beyond-bias>

July 2013: *SPOTLIGHT ON - Department-wide effort, Utah Won as a Team*, American Association of Petroleum Geologists Explorer <http://www.aapg.org/publications/blogs/student-outlook/article/articleid/46554/utah-won-as-a-team>

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## **EDITORIAL SERVICE**

### **Editor**

2020-current: Associate Editor, *Sedimentology*, an IAS peer-reviewed publication.

2018-2020: Editor of *The Sedimentary Record*, a quarterly publication of the Society for Sedimentary Geology (SEPM), secured submissions, peer reviews and edited science articles for publication.

2020-2021: Co-editor of *Utah Geological Association Guidebook: The Lacustrine Green River Formation: Hydrocarbon Potential and Eocene Climate Record*

2014: Co-editor of *2015 Utah Geological Association Guidebook: The Uinta Basin and Uinta Mountains*

### **Manuscript reviews**

2021: 4 manuscript reviews; 2 for *Geology*, 1 for *Sedimentology*, 1 for *Journal of Sedimentary Research*

2020: 3 manuscripts; 2 for *Geology*, 1 for *Earth Science Reviews*

2019: 9 manuscripts; 1 for *Sedimentology*, 2 for *Journal of Sedimentary Research*, 1 for *Sedimentary Geology*, 1 for *The Depositional Record*, 2 for *Earth Science Reviews*, 1 for *Paleo3*, 1 for an *International Association of Sedimentologists special publication*

2018: 7 manuscripts; 1 manuscript for *AAPG Bulletin*, 1 for *Marine and Petroleum Geology*, 1 for *GSA Bulletin*, 1 for *Journal of Sedimentary Research*, 1 for *Sedimentology*, 1 for *Sedimentary Geology*, 1 for an *International Association of Sedimentologists (IAS) Special Publication*

2017: 3 manuscripts; 1 manuscript for *Marine and Petroleum Geology*, 1 for *Sedimentary Geology*; 1 for *AAPG Bulletin*.

2016: 1 manuscript for *Sedimentology*.

2015: 4 manuscripts; 2 manuscripts for *Journal of Sedimentary Research*; 1 manuscript for *Palaeogeography, Palaeoclimatology and Palaeoecology*; 1 manuscript for *Marine and Petroleum Geology*.

2014: 4 manuscripts; 3 manuscripts for *Journal of Sedimentary Research*; 1 manuscript for *Sedimentology*.

2013: 1 manuscript for *Journal of Sedimentary Research*.

2012: 4 manuscripts; 2 for *Journal of Sedimentary Research*, 1 for *Geology*, 1 for a *Utah Geological Survey Special Publication*

2011: 2 manuscripts; 1 for *Palaeogeography, Palaeoclimatology and Palaeoecology*, 1 for a *Geological Society of London Lyell Collection Special Publication*.

### **Proposal reviews**

2020: 1 American Chemical Society-Petroleum Research Fund (ACS-PRF) proposal

2019: 1 ACS-PRF proposal

2018: 1 National Science Foundation (NSF) proposal

2017: 1 NSF proposal

2012 – 2013: 2 NSF proposals

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### **EXTERNAL SERVICE**

AAPG Annual Conference, IMAGE 2022 abstract reviewer

SEPM Pettijohn Medal Selection Committee, 2021

Invited Panelist for “diversity in geosciences and new directions in the energy industry” session to advise the National Academy of Sciences Engineering and Medicine (NASEM) Catalyzing Opportunities for Research in the Earth Sciences [\(CORES\) committee](#) (a decadal survey for NSF’s Division of Earth Sciences), Houston, TX, Mar. 14, 2019 Session goal: inform the committee on approaches that lead to increasing and sustaining diversity in the geosciences and on scientific and technological directions for the energy sector in the coming decade.

Technical Program Chair – American Association of Petroleum Geologists (AAPG) Annual Convention & Exhibition, Salt Lake City, Utah, May 20 – 23, 2018.

Organizer – “Unconscious Bias Luncheon” at American Association of Petroleum Geologists (AAPG) Annual Convention & Exhibition, Salt Lake City, Utah, May 20 – 23, 2018.

Invited Panel Moderator – “The Future Geoscientist” Forum, Special session at American Association of Petroleum Geologists (AAPG) Annual Convention & Exhibition, Salt Lake City, Utah, May 20 – 23, 2018.

Invited Panelist for AGI Workforce Panel to advise the American Geosciences Institute (AGI) Foundation Trustees on “How the Energy Sector is Changing and Implications on How Organizations Attract and Prepare the Future Workforce,” Salt Lake City, Utah, May 22, 2018.



Field trip co-leader with G. Bowen: "Uinta and Flagstaff paleo-basins, Utah" 2 day post-meeting field trip for Climate and Biotic Events of the Paleogene 2017 conference in Snowbird, Utah, Sept. 3 – 7, 2017.

"Stratigraphy" Session Chair – Geological Society of America Annual Conference, Denver, Colorado, Sept. 25 – 28, 2016.

Field trip leader: Nine Mile Canyon sedimentology and stratigraphy, Uinta Basin, Utah, Rocky Mountain Section (RMS) AAPG conference, Salt Lake City, Sept. 25, 2013.

Short course co-leader with J. McLennan: Shale Geology and Geomechanics short course at Terra Tek, RMS-AAPG conference, Salt Lake City, Sept. 21, 2013.

Volunteer committee chair for RMS-AAPG conference, Salt Lake City, Sept. 22-24, 2013.

Geological Society of America (GSA) Sedimentary Geology Division Joint Technical Program Committee (JTPC) Representative, 2010-2013.

Vice-Chair of Oil Shale Committee, Energy and Minerals Division (EMD), American Association of Petroleum Geologists (AAPG), 2010 – present.

## INTERNAL SERVICE

*University of Utah, Geology & Geophysics Dept. & College of Mines and Earth Science*

- 2020 – present American Association of Petroleum Geologists University of Utah Student Chapter Faculty advisor; helped organized 2020-2021 Energy lecture virtual series with monthly speakers, Sept 2022 Bonneville Salt Flats field trip, Jan 2022 Critical Minerals Short Course, Feb 2022 Ichnology Short Course, and Apr 2022 four day Book Cliffs field trip for students.
- 2021 – 2022 Co-chair, Committee for Advancement of Inclusion and Diversity (CAID), College of Mines and Earth Science, responsible for moving forward with new policy changes resulting from URGE deliverables, as well as RPT policy changes with DEI requirements.
- 2020 – 2022 Chair, Diversity and Climate Committee, Geology & Geophysics Department
- 2021 – 2022 Curriculum Committee member, Geology & Geophysics Department
- 2022 Faculty Search Committee member, 2 positions: Environmental Earth Science & Solid Earth, Geology & Geophysics Department
- 2021 – 2022 College Advisory committee, College of Mines and Earth Sciences, RPT review.
- 2021 Unlearning Racism in Geoscience (URGE) University of Utah pod leader, responsible for organizing and moderating a group of College of Mines and Earth Sciences faculty, students and staff in an NSF-funded curriculum including bi-weekly readings, interviews, zoom discussions, and developing deliverables, as well as coordinating with two other U of Utah pods.
- 2020 & 2021 Wrote and submitted, revised and re-submitted AGU Bridge Partnership Program proposal for the University of Utah Geology and Geophysics Department, jointly with the Atmospheric Sciences Department, to become an AGU Bridge Program Partnership Institution to develop, adopt, and share inclusive practices for recruiting, admitting and retaining women and underrepresented students in STEM graduate programs.
- 2020 – 2021 Outreach Committee member
- 2018 – 2019 Chair, Working Group on Ethics
- 2018 – 2019 Chair, Infrastructure, Space Committee
- 2018 Working Group on Ethics member - Drafted a professionalism policy and standards, including sexual harassment professional misconduct, approved by faculty May 2018.
- 2019 – 2021 Organized departmental energy industry fundraising for students as well as maintained and nurtured recruiting relationships

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2013 – 2019	Petroleum Industry Career Path (PICP) committee member; Includes organization of department student recruiting visits from between three and nine oil and gas companies
2020 – 2022	Graduate Affairs Committee member
2017 – 2019	
2013 – 2015	
2017 – 2018	Infrastructure, Space Committee member
2016 – 2017	Chair, Outstanding Faculty and Teaching Assistant Teaching Awards Selection Committee
2016 – 2017	College Naming Committee
2015 – 2016	Distinguished Lecture Series Committee
2011 - 2012	
2014 – 2015	Faculty Search Committee member, Paleontology position
2011 – 2016	Website Committee
2012 – 2013	Merit Review Committee
2011 – 2013	Undergraduate Affairs Committee

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### **PROFESSIONAL ORGANIZATION MEMBERSHIP**

2001-present	Geological Society of America
2004-present	SEPM Society for Sedimentary Geology
2004-present	American Association of Petroleum Geologists (AAPG)
2004-present	International Association of Sedimentologists
2006-present	Association of Women Geoscientists
2012-present	Utah Geological Association

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### **PROFESSIONAL DEVELOPMENT ACTIVITIES**

2021	<i>Faculty Success Program</i> – National Center for Faculty Development & Diversity 14 week online program to boost career success and productivity.
2021	<i>Unlearning Racism in Geoscience</i> – NSF-funded, 16 week, online and virtually hosted curriculum to raise awareness and combat racism in geoscience.
2020	<i>Whiteness at Work</i> – summer online training from The Adaway Group. Participated in four webinar modules and with following college-wide discussions.
2019	<i>Center for the Improvement of Mentored Experiences in Research (CIMER) Train-the-trainers: Facilitating Entering Mentoring workshop at Univ. Wisc.-Madison</i> 2-day workshop to learn to train others in fostering more effective research mentoring relationships at all career stages as critical to developing a diversified research workforce, May 14 <sup>th</sup> – 15 <sup>th</sup> .
2017	<i>Unconscious Bias workshop, College of Mines and Earth Science, University of Utah</i> Participant in half-day workshop on the evidenced-based impacts of unconscious bias and recommended practices to counteract impacts, Dec 12.
2013	<i>NSF Workshop: Sedimentary Geology Community Workshop on EarthCube Cyberinfrastructure</i> 2-day workshop to identify the cyberinfrastructure (CI) needs and applications of the broad sedimentary geology community (SGC), March 25 <sup>th</sup> – 26 <sup>th</sup> .
2013	<i>Rheology, Creep, and Viscoplasticity: It's About Time, an American Rock Mechanics Association Forum</i>

- 2 day interdisciplinary forum on applications, March 18<sup>th</sup> – 19<sup>th</sup>.
- 2011 *The Application of Shale Petrophysics Using Ancient to Modern Logs for Shale Gas and Oil Exploration*  
American Association of Petroleum Geologists Short Course, April 9.
- 2010 *Sequence-Stratigraphic Analysis of Shales: Key to Paleoclimate Archives, Subsurface, Fluid Flow and Hydrocarbon Source, Reservoir and Seal*  
American Association of Petroleum Geologists Short Course, April 10.
- 2007 *NSF Workshop: On the Cutting Edge - Preparing for an Academic Career in Geoscience Workshop*  
4-day workshop sponsored by National Science Foundation. Provided useful tools, tips, and specific plans of action for embarking on the job search process, developing teaching skills and thoughtful analysis, and launching a successful research career.
- 2006 *Preparing Future Faculty Program, University of Nebraska-Lincoln*  
5-week summer seminar focused on professional development skills followed by a semester long faculty mentoring experience.
- 2006 *Reservoir Characterization and Modeling of Deepwater Confined Channel Complexes*  
4-day field-based course focused on stratigraphic architecture of deepwater systems and modeling fluid flow through reservoir rock, the Pliocene Capistrano Formation, San Diego, CA. Sponsored by ExxonMobil.
- 2006 *Seismic Stratigraphy for Graduate Students Short Course*  
2-day Society for Sedimentary Geology (SEPM) course, sponsored by ExxonMobil
- 2006 *Ichnology and Facies Analysis for Petroleum Exploration Short Course*  
3-day seminar and field work aimed at introducing basic ichnologic concepts and ichnofacies identification as a tool for improving paleoenvironmental diagnosis; Instructor: Dr. Kerrie Bann, Ichnofacies Ltd. Pty.
- 2006 *Risk Assessment in Petroleum Exploration Short Course*  
Emphasized geologically informed financial decision making in the petroleum industry through a 3-day mock exercise in which students assessed and quantified risk in each element of a petroleum play, culminating in a bid on leases and resulting well production; Instructor: Dr. Andrew Pullham, Earth Science Associates Consulting and Training
- 2005 *University of Nebraska College of Arts & Sciences Teaching Assistant Workshop*  
3-day seminar focused on improving teaching skills and increasing student involvement and interest in the classroom culminating in personalized feedback and videotape of your own teaching demonstration.

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#### CONFERENCE ABSTRACTS (N = 89), full list provided here

- Birgenheier, L., Mudstones in siliciclastic systems: transport and paleoclimate archive, American Association of Petroleum Geologists Annual Meeting IMAGE Conference, Sept. 2022. (invited keynote speaker)
- Vanden Berg, M.D., Jagniecki, E., Ochoa, R., Birgenheier, L., Szymanski, E., Maxwell, G., List, D., Edelman, E., Esser, R., Cummings, K., Geologic characterization of the newly acquired State 16-2 Cane Creek research core, Pennsylvanian Paradox Formation, northern Paradox Basin, southeastern Utah. Rocky Mountain Section of American Association of Petroleum Geologists Annual Meeting Conference, Denver, CO, Jul. 2022.
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