SARA KIMBERLEY BIDDLE

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Professional Appointments

Postdoctoral Researcher, University of Texas at Austin Marine Science Institute, January 2026 - Present
Principal Investigator: Dr. Kelly Dorgan
Focus: Characterization and fossilization potential of meiofauna-mud interactions

Education

PhD., University of Alberta, 2020 – 2025
Program: Geology
Advisor: Dr. Murray Gingras
Focus: Ichnology of globally diverse Cretaceous Oceanic Anoxic Event 2 (OAE2) intervals

MSc., University of Alberta, 2017 – 2020
Program: Geology
Advisor: Dr. Murray Gingras
Focus: Fine-detail paleo-depositional reconstruction of Devonian organic-rich mudstones

BSc., Honours, University of Calgary, 2013 – 2017
Program: Geology
Undergraduate thesis topic: Sedimentology and Ichnology of the Cretaceous Viking Formation

Teaching Experience

Instructor, University of Alberta, Edmonton AB
"Earth Sciences I" (EAS201 online, Summer 2024, Summer 2025)
"Introduction to Earth Sciences" (EAS 100/201 combined online, Winter 2024)

Instructor, NorQuest College, Edmonton AB
"Introduction to Earth Sciences" (EASC1002, Winter 2023)

Course Designer, NorQuest College, Edmonton AB, Fall 2022
"Introduction to Earth Sciences" (EASC1002)

Lead Teaching Assistant, University of Alberta
"Stratigraphy and Sedimentation" (EAS 222, Winter 2020, 2021, 2022)
"Engineering Earth Science" (EAS 210, Fall 2019)

Teaching Assistant, University of Alberta
"Advanced Sedimentology" (EAS 460/560 and 465/565, Winter 2025, Fall 2025)
"Advanced Ichnology" (EAS 460/560, Winter 2025)

"Introduction to Earth Science" (EAS 100, Fall 2024)
"Stratigraphy and Sedimentation" (EAS 222, Winter 2019)
"Engineering Earth Science" (EAS 210, Fall 2018, 2020, 2021)

Mentorship and Supervisory Experience

See the Sea: CC High School Scholars Academic Mentorship Grants (Primary Supervisor), Fall 2026
Project title: *"The microscopic effect of small infauna on bay sediments, and how it can help decode animal change in the rock record"*

Undergraduate Honours Thesis Student (Primary Graduate Supervisor), 2024-2025
Project title: "*Identifying Enigmatic Microbial Mats in Devonian Organic Rich Mudstones from the Horn River Group, Northwest Territories, Canada"*

Additional Coursework and Training

An Introduction to Evidence-based Undergraduate STEM Teaching (Summer 2022)
CornellX 8-week online course

Key learning principles such as the role of mental models in learning and the importance of practice and feedback. Fundamental elements of course design, including the development of learning objectives and assessments of learning aligned with those objectives. Teaching strategies for fostering active learning and inclusive classroom environments.

Industry Experience

Geology Summer Student, Tourmaline Oil Corp., May – August 2021

Geophysical Data Student, ConocoPhillips, May – August 2015

Funded Grants

(2026) Ecological Dissertations in the Aquatic Sciences (Eco-DAS) Award: Full participant funding (travel, lodging, and field symposium support) awarded via competitive national peer review. Funded by the National Science Foundation (NSF) and ASLO; Honolulu, HI.

(2025, 2026) **First Alternate* (top 10%), Stengl-Wyer Scholar Postdoctoral Fellowship (University of Texas at Austin): *"Deciphering the record of small macrofauna in ancient marine mudstones: Implications in understanding metazoan evolutionary timelines and changing paleoenvironmental conditions".* $70 000 USD/yr for 3 years (~$300 000 CAD total).

(2022-2025) Natural Sciences and Engineering Research Council of Canada Postgraduate Scholarship (NSERC - PGSD): "*Geological Characteristics of Global Anoxic Events: Ichnological and Sedimentological Analysis of Mid-Cretaceous Oceanic Anoxia Events in Southeast France and Western Canada".* $21 000 CAD/yr for 2 years, $40 000 for 3rd year ($82 000 CAD total).

(2024) Travel grants for ICHNIA conference: *"Using Process Ichnology to Elucidate Oxygen Fluctuations Over the Cretaceous Oceanic Anoxic Event 2 in Western Canada".* **1)** Society for Sedimentary Geology (SEPM) Student Presentation Travel, $276 USD ($375 CAD); **2)** Faculty of Graduate Studies Travel Grant, $2000 CAD.

(2023) Geological Society of America (GSA) Student Research Grant: "*Geological Characteristics of a Global Anoxic Event: Ichnological and Sedimentological Analysis of the Mid-Cretaceous Oceanic Anoxia Events I and II in the Vocontian Basin Southeast France and Western North America".* $2200 USD ($2900 CAD).

(2020) Society for Sedimentary Geology (SEPM) Student Presentation Travel Grant for ISGC: "*Petrographic Intricacies of Black Shale Reservoirs and their Implication in Physiochemical Depositional Interpretations: A Study of the Hare Indian and Canol Formations, Central Mackenzie Valley, Northwest Territories".* $300 USD ($405 CAD). Conference cancelled due to Covid-19.

(2018) Field trip funding: *"Stratigraphy and Sedimentology of Cretaceous Southern Alberta, Dinosaur Provincial Park, Alberta".* **1)** Canadian Society of Petroleum Geologists (CSPG) University Student Event Grants, $1000 CAD, **2)** Imperial University Sponsorship Grant, $1500 CAD, **3)** Shell SELF Grant, $2200 CAD.

Scientific Communication Awards

PhD, University of Alberta

- 2025 – Semi-finalist, University of Alberta Images of Research Competition: *"Worm World"* (internal award)
- 2024 – Finalist, University of Alberta Three Minute Thesis Competition: *"Can Ancient Worms Help Predict the Future?"* (internal award)
- 2021 - CSPG Baillie Student Award at the CSPG Core Conference, best student presentation ($1000 CAD; external award)
- 2020 - SEPM Best Student Research Poster at the Geological Society of America Annual Convention and Exhibition, online conference ($500 USD; external award)

MSc, University of Alberta

- 2019 - SEPM Best Student Research Poster at the American Association of Petroleum Geologists Annual Convention and Exhibition, San Antonio, Texas ($500 USD; external award)

Scholarships

University of Alberta

- 2024 - Alberta Graduate Excellence Scholarship ($12 000 CAD)
- 2024 - President's Doctoral Prize of Distinction ($7 000 CAD)
- 2023 - Alberta Graduate Excellence Scholarship ($12 000 CAD)
- 2023 - President's Doctoral Prize of Distinction ($7 000 CAD)
- 2022 - President's Doctoral Prize of Distinction ($10 000 CAD)
- 2022 - Christopher Scarfe Memorial Graduate Scholarship in Geology ($2300 CAD)
- 2021 - Alberta Graduate Excellence Scholarship ($12 000 CAD)
- 2020 - University of Alberta Doctoral Recruitment Scholarship ($10 000 CAD)
- 2020 - Vega Graduate Scholarship ($1150 CAD)
- 2019 - Canadian Association of Petroleum Producers Graduate Scholarship in Geology ($5000 CAD)

University of Calgary

- 2016 - BP Canada Energy Scholarship in Geology ($5000 CAD)

- 2016 - Louise McKinney Scholarship ($2500 CAD)
- 2016 – Jason Lang Scholarship ($1000 CAD)
- 2015 - Suncor Energy Emerging Leaders Scholarship ($4000 CAD)
- 2015 – Jason Lang Scholarship ($1000 CAD)
- 2015 - University of Calgary Merit Award ($500 CAD)
- 2014 – Jason Lang Scholarship ($1000 CAD)
- 2014 - University of Calgary Merit Award ($500 CAD)

Invited talks

- **Guest lecturer** for "Applied Ichnology", University of Alaska Fairbanks (September 2026)
- **UT Marine Science Institute Departmental Seminar** (February 2026): *'Why worms matter: using ancient and modern worms to unlock Earth's history'*
- **Edmonton Public Library's On the Edge: Emerging Scholars speaker series** (March 2025): '*Worms of Wisdom: using ancient worm burrows to understand Earth's history'*
- **Guest lecturer** for "Geology of Western Canada", University of Alberta (May 2020)
- **Lunch & Learn talk for Paramount Resources Ltd.** (June 2019): *'Outlining the micro-scale sedimentary features in the Horn River Group mudstones'*

Academic Service

- **Reviewer for:** Sedimentary Geology, Ichnos
- **Sedimentologika** *(open-access journal)* **Steering Committee Member** (Winter 2026 - present)
- **Sedimentologika** *(open-access journal)* **Copy Editorial Board Member** (2025 – 2026)
- **SEPM Award Nomination Sub-Committee Member** (Summer 2023, 2024, 2025)
- **SEPM Nomination Council Member** (Summer 2022)
- **PAIALIOS Editor Council Member** (Summer 2022)
- **Volunteer for the CSPG Core Conference** (June 2022)
- **Student volunteer for the Yellowknife Geoscience Forum** (2018, 2019)
- **Coordinator for the Ichnology Research Group and AAPG Student Chapter 2018 Field Trip** (August 2018), *'Stratigraphy and Sedimentation of Dinosaur Provincial Park, Drumheller, Alberta'*
- **Museum guide for the University of Alberta Paleontology and Mineralogy Museums** (2018-2019)

Community Service

- **'Letters to a pre-scientist' Pen Pal** (2026-2027)
- **'Semester by the Sea' weekend field trip volunteer**, Port Aransas TX (February 2026)
- **Calgary Therapeutic Riding Association**, Bragg Creek/Cochrane AB (February 2024 – May 2025)
- **Volunteer for the Teesdale Outdoor Tournament** (horse show, August 2022)
- **Volunteer for the Teesdale Novice Rider Horse Show** (April 2022)
- **Little Bits Therapeutic Riding Program,** Whitemud Equestrian Learning Center, Edmonton (weekly, Jan 2020 – May 2021)
- **Earth Science Outreach Volunteer**, Yellowknife Geoscience Forum (2018, 2019)

Positions Held

(2018-2022) **AAPG Student Chapter President**, University of Alberta

Field Experience

(2026, Spring and Fall) Deep-sea research cruise (modern), California: Sampling, describing, and processing deep-sea (500 m – 3300 m water depth) sediments and infauna from across the oxygen minimum zone along the California coast (26 days).

(2026) Corpus Christi Bay (modern), Texas: Deep piston coring and gravity coring of central bay sediments, X-ray imaging of sediment cores, macrofaunal sampling, infauna sorting and photography (8 days).

(2023) Willapa Bay (modern), Washington: Pore water sampling beneath tidal flat microbial mats using rhizons, sediment core sampling (6 days).

(2022) Vocontian Basin (Cretaceous), Southeast France: analyzing bioturbation throughout oceanic anoxic events, outcrop description and logging, sampling for thin sections and geochemical analysis (7 days).

(2020) Falher Formation (Cretaceous), Mt. Speiker, British Columbia: outcrop description and logging, portable gamma-ray analysis, drone photogrammetry (7 days).

(2018) Horn River Group (Devonian), Mackenzie Mountains, Northwest Territories: outcrop description and logging, sampling for thin section and geochemical analyses, portable gamma-ray analysis, drone photogrammetry (21 days).

Media Coverage

- **2025 Edmonton Public Library On the Edge** (speaker biography)
- **2024 Three Minute Thesis** (finalist interview)

Professional Memberships

- International Association of Sedimentologists (IAS)
- International Ichnological Association (IIA)
- Society for Sedimentary Geology (SEPM)
- The Geological Society of America (GSA)
- American Association of Petroleum Geologists (AAPG)
- The Paleontological Society

Manuscripts in preparation

Biddle, S.K., Ayala, M.A., Kisskadon, E., Dorgan, K.M. (*To be submitted early 2027)*. Time-travelling detectives: How past and present marine animals help decode ancient Earth. As part of a special collection for *Frontiers for Young Minds*.

Biddle, S.K., Harris, B.S., Acikelli, A., Gingras, M.K. (*To be submitted early 2027*). Spatial variability in geochemical paleoproxy signatures of an organic-rich mudstone: A case study from the Cenomanian-Turonian Oceanic Anoxic Event 2 from the Vocontian Basin, SE France.

Biddle, S.K., Gingras, M.K. (*To be submitted early 2027*). Missing players: The unexpected absence of *Chondrites* from the low-oxygen Cenomanian-Turonian Oceanic Anoxic Event 2, west-central Alberta.

Peer-Reviewed Publications

[12] **Biddle, S.K.,** Harris, B.S., Herrle, J., Gingras, M.K. (2026). An ichnological record of oxygen fluctuations over the Cenomanian-Turonian Oceanic Anoxic Event 2 from the Vocontian Basin, SE France. *Sedimentary Geology*, 501, 107126. https://doi.org/10.1016/j.sedgeo.2026.107126

[11] **Biddle, S.K.,** Gingras, M.K. (2026). Small talk: a guide for recognizing and describing the influence of burrowing meiofauna in marine mudstones. *Earth-Science Reviews,* 277, 105440. https://doi.org/10.1016/j.earscirev.2026.105440

[10] **Biddle, S.K.,** Gingras, M.K. (2026). A semi-quantitative ichnological approach to relative oxygen reconstruction: A case study over the Cenomanian-Turonian Oceanic Anoxic Event 2 in west-central Alberta, Canada. *Palaeogeography, Palaeoclimatology, Palaeoecology,* 685, 113539. https://doi.org/10.1016/j.palaeo.2025.113539

[9] **Biddle, S.K.,** Gingras, M.K. (2025). Ichnological Insights into Deoxygenation Across the Cenomanian-Turonian Boundary Oceanic Anoxic Event 2 in the Northern Extent of Western Interior Seaway (west-central Alberta). *Sedimentology.* https://doi.org/10.1111/sed.70063

[8] Harris, B.S., **Biddle, S.K.,** LaGrange, M.T., Melnyk, S., Lazowski, C.N., Spence, J., Alessi, D., Kavanaugh, J., Konhauser, K.O., Gingras, M.K. (2025). Microbial mats and thalassinid shrimp: spatial and geochemical interactions in a modern intertidal environment. *Sedimentology.* https://doi.org/10.1111/sed.70047

[7] LaGrange, M.T., Harris, B.S., **Biddle, S.K.,** Dhiman, S., Catuneanu, O., Konhauser, K.O., Terlaky, V., Gingras, M.K. (2025). Integrating Chemostratigraphy and Sedimentology for Sequence Stratigraphy in an Enigmatic Middle to Late Devonian Mudstone. *Sedimentologika, 3*(1). https://doi.org/10.57035/journals/sdk.2025.e31.1695

[6] **Biddle, S.K.,** LaGrange, M.T., Harris, B.S., Egenhoff, S., Gingras, M.K. (2025). Current concepts in mudstone description and deposition: A synthesis for mudstone initiates. *Sedimentologika*, *3*(1), 1-36. https://doi.org/10.57035/journals/sdk.2025.e31.1621

[5] LaGrange, M.T., Li, K., Li, L., Kabanov, P., Konhauser, K.O., Harris, B.S., **Biddle, S.K.**, Terlaky, V., Gingras, M.K. (2023). An Example of the Middle to Late Devonian Marine Nitrogen Cycle from Mudstones of the Horn River Group, Northwest Territories, Canada. *Palaeogeography, Palaeoclimatology, Palaeoecology,* 618, 111512. https://doi.org/10.1016/j.palaeo.2023.111512

[4] LaGrange, M.T., Atienza, N.M., **Biddle, S.K.**, Harris, B.S., Fiess, K.M., Konhauser, K.O., and Gingras, M.K. (2022). The nature, origin, and predictors of porosity in the Middle to Late Devonian Horn River Group of the Central Mackenzie Valley, Northwest Territories, Canada. *Marine and Petroleum Geology*, 105738. https://doi.org/10.1016/j.marpetgeo.2022.105738

[3] Harris, B., La Grange, M., **Biddle, S.K.**, Playter, T., Fiess, K., Gingras, M. (2022). Chemostratigraphy as a tool for sequence stratigraphy in the Devonian Hare Indian Formation in the Mackenzie Mountains and Central Mackenzie Valley, Northwest Territories, Canada. *Canadian Journal of Earth Sciences*, 59, 29-45. https://doi.org/10.1139/cjes-2020-0198

[2] **Biddle, S.K.**, LaGrange Rao, M., Harris, B., Fiess, K.M., Terlaky, V., Gingras, M.K. (2021). A Fine Detail Physicochemical Depositional Model for Devonian Organic-Rich Mudstones: A Petrographic Study of the Hare Indian and Canol Formations, Central Mackenzie Valley, Northwest Territories. *Sedimentary Geology*, 414, 105838. https://doi.org/10.1016/j.sedgeo.2020.105838

[1] Xang, X., Kuru, E., Gingras, M., **Biddle, S.**, Lin, Z., Iremonger, S. (2021). Characterization of the Microstructure of the Cement-Rock Interface Using Environmental Scanning Electron Microscopy and Micro-Computed Tomography Scan. *SPE Journal*, SPE-205512-PA. https://doi.org/10.2118/205512-PA

Technical Reports and Dissertations

[3] **Biddle, S.K.** (2025). Ichnological Approaches for Deciphering Global Deoxygenation Events in Fine-Grained Siliciclastic Deposits. [Doctoral Thesis, University of Alberta]. https://doi.org/10.7939/84002

[2] **Biddle, S.K.** (2020). A Fine Detail Physicochemical Depositional Model for Devonian Organic-Rich Mudstones: A Petrographic Study of the Hare Indian and Canol Formations, Central Mackenzie Valley, Northwest Territories [Masters Thesis, University of Alberta]. https://doi.org/10.7939/r3-jacj-jp38

[1] LaGrange Rao, M., Harris, B., **Biddle, S**., Atienza, N. M., Fiess, K., Gingras, M. (2020). Preliminary data for an integrated depositional and sequence stratigraphic framework for the Hare Indian and Canol formations (Horn River Group), Central Mackenzie Valley and Mackenzie Mountains, Northwest Territories — Part II. *Northwest Territories Geological Survey Open Report* 2019–02, (16 pp).

Conference Presentations

*Supervised undergraduate student

[14] *Asmar Cruz, A., **Biddle, S.K.,** Harris, B.S., Kimitsuki, R., Gingras, M.K. (2025, April). *Identifying Enigmatic Microbial Mats in Devonian Organic Rich Mudstones from the Horn River Group, Northwest Territories, Canada.* ATLAS Symposium, Edmonton, Alberta (abstract and poster presentation).

[13] **Biddle, S.K.,** Gingras, M.K. (2025, April). *A Quantitative Ichnological Approach to Relative Deoxygenation Across the Cenomanian-Turonian Boundary Oceanic Anoxic Event 2 in the Alberta Portion of Western Interior Seaway (west-central Alberta)*. ATLAS Symposium, Edmonton, Alberta (oral presentation).

[12] **Biddle, S.K**., Gingras, M.K., (2024, April). *Using Process Ichnology to Elucidate Oxygen Fluctuations Over the Cretaceous Oceanic Anoxic Event 2 in Western Canada*. International Congress on Ichnology (ICHNIA), Florianopolis, Brazil (abstract and oral presentation).

[11] Harris, B.S., **Biddle, S.K**., LaGrange, M.T., Melnyk, S., Lazowski, C., Alessi, D., Gingras, M.K. (2024, April). *Spatial Interactions Between Microbial Mats and Intertidal Organisms, Willapa Bay, Washington, USA*. International Congress on Ichnology (ICHNIA), Florianopolis, Brazil (abstract and oral presentation).

[10] LaGrange, M.T., Li, K., Li, L., Konhauser, K.O., Harris, B.S., **Biddle, S.K.**, Terlaky, V., Gingras, M.K. (2022, July). *Biological productivity and primary producers recorded in the depositional record of Middle to Late Devonian mudstones from the Horn River Group, Northwest Territories, Canada*. Goldschmidt Conference, Hawaii (abstract and poster presentation).

[9] **Biddle, S.**, Harris, B., LaGrange Rao, M., Gingras, M.K. (2021, June). *Lithofacies, Microfacies, and Chemofacies Comparison in a Devonian Organic-Rich Mudstone.* CSPG Core Conference, Online Conference (abstract and oral presentation).

[8] **Biddle, S.**, LaGrange Rao, M., Harris, B., Gingras, M.K. (2021, June). *Petrographic Intricacies of Black Shale Reservoirs and their Implication in Physiochemical Depositional Interpretations: A Study of the Hare Indian and Canol Formations, Central Mackenzie Valley, Northwest Territories.* SEPM International

Sedimentary Geoscience Congress Virtual Student and Early Career Sessions, Online Conference (abstract and oral presentation).

[7] **Biddle, S.**, LaGrange Rao, M., Harris, B., Fiess, K.M., Gingras, M.K. (2020, Oct.). *Recognizing the Influence of Burrowing Meiofauna in Marine Mudrocks and what it Means for Paleoredox: A Case Study of Microscopic Trace Fossils in the Organic Rich Horn River Group Devonian Mudrocks, Northwest Territories.* Geological Society of America Connects Online, Online Conference (abstract and poster presentation).

[6] Harris, B.S., LaGrange, M.T., **Biddle, S.K.**, Fiess, K., Gingras, M.K. (2020, Oct.). *Comparing the lithofacies, chemofacies and microfacies analyses of the Hare Indian Formation, Northwest Territories, Canada.* Geological Society of America Connects Online, Online Conference (abstract and poster presentation).

[5] **Biddle, S.**, LaGrange Rao, M., Harris, B., Fiess, K.M., Terlaky, V., Gingras, M.K. (2019, Nov). *Constructing a Fine Scale Physiochemical Depositional Model for Devonian Black Shales: A Petrographic Study of the Canol and Hare Indian Formations, Central Mackenzie Valley, Northwest Territories.* Yellowknife Geoscience Forum, Yellowknife, Northwest Territories (abstract and oral presentation).

[4] **Biddle, S.**, LaGrange Rao, M., Harris, B., Fiess, K.M., Terlaky, V., Gingras, M.K. (2019, May). *Ichnological Expressions of Low Oxygen Settings: An Ichnological Analysis of the Canol Formation, Northwest Territories, Canada.* American Association of Petroleum Geologists Annual Convention and Exhibition, San Antonio, Texas (abstract and poster presentation).

[3] **Biddle, S**., LaGrange Rao, M., Harris, B., Gingras, M.K. (2019, April). *Petrographic Ichnological Analysis of the Canol Formation, Northwest Territories, Canada*. ATLAS Symposium, Edmonton, Alberta (oral presentation).

[2] **Biddle, S.**, LaGrange Rao, M., Harris, B., Fiess, K.M., Terlaky, V., Gingras, M.K. (2018, Nov.). *Ichnological Expressions of Low Oxygen Settings: An Ichnological Analysis of the Canol Formation, Northwest Territories, Canada.* Yellowknife Geoscience Forum, Yellowknife, Northwest Territories (abstract and poster presentation).

[1] LaGrange, M.T. Harris, B.S., **Biddle, S**., Fiess, K.M, Terlaky, V., Gingras, M.K. (2018, May). *Establishing a sequence stratigraphic framework for the Hare Indian and Canol formations (Central Mackenzie Valley, Northwest Territories, Canada) by integrating high-resolution chemostratigraphy with sedimentological and ichnological datasets*. American Association of Petroleum Geologists Annual Convention and Exhibition, Salt Lake City, Utah (abstract and poster presentation).