

# PATRICK I. MCLAUGHLIN PhD

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## Office Address:

Illinois State Geological Survey  
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## EDUCATION:

Post-doctoral study, 2006-2010, University of Cincinnati, Cincinnati, Ohio

Title: *High-resolution sequence and event stratigraphy of mid-Silurian strata in eastern North America and Avalonia*, Mentors Drs. Carlton Brett and Warren Huff

PhD in Geology, completed 5/2006, University of Cincinnati, Cincinnati, Ohio

Dissertation: *Cratonic sequence stratigraphy: advances from analysis of mixed carbonate-siliciclastic successions*  
Supervisor Dr. Carlton Brett

Master of Science in Geology, completed 6/2002, University of Cincinnati, Cincinnati, Ohio

Thesis: *Upper Ordovician seismites of Kentucky and Ohio: a sedimentological and sequence stratigraphic approach*, Supervisor Dr. Carlton Brett

Bachelor of Science, completed 6/1999 Illinois State University, Normal, Illinois

Senior Thesis: *Finite strain analysis of deformed quartzite clasts within the Proterozoic Nemo Conglomerate, Nemo, South Dakota*, Supervisor Dr. David Malone

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## CURRENT POSITIONS:

1/4/2022-present: **Assistant Research Scientist**, Illinois State Geological Survey, Prairie Research Institute, University of Illinois Urbana-Champaign

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## OTHER PROFESSIONAL EXPERIENCE

2006-present	Consulting Geologist (part time)
2015-2021	Research Geologist, Indiana Geological and Water Survey (IGWS), Indiana University–Bloomington
2014-2015	Associate Professor (with tenure), Wisconsin Geological and Natural History Survey/Department of Environmental Sciences, University of Wisconsin, Madison, Wisconsin
2013-2015	Bedrock Group Leader, WGNHS
2007-2015	Affiliate faculty, Department of Geoscience, University of Wisconsin-Madison, Madison, Wisconsin
2007-2014	Assistant Professor, WGNHS/Department of Environmental Sciences, University of Wisconsin-Extension, Madison, Wisconsin
2006-2007	Assistant Professor (visiting), Bucknell University, Lewisburg, Pennsylvania

2005 Adjunct Professor, University of Cincinnati, Cincinnati, Ohio  
2004 Summer Intern, Gulf of Mexico 3D seismic interpretation, BP America Inc., Houston, Texas

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#### **AWARDS AND HONORS:**

2002-2005 Distinguished Graduate Fellowship, University of Cincinnati (only student to be awarded and complete this fellowship in the history of the Department of Geology)  
2002 SEPM—Best Student Paper, GSA North-Central Section Meeting  
1999-2002 Graduate Teaching Assistantship, University of Cincinnati  
1999 Cum Laude, Illinois State University  
1999 Harry O. Lathrup Award, Department of Geography and Geology, Illinois State University (awarded annually to one outstanding geology major)

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#### **ADDITIONAL EDUCATION AND WORKSHOPS**

2019-2023 U.S. Geological Survey, Annual Earth MRI Workshop (critical minerals initiative)  
2008 Teaching Field Methods in Geology Using Rugged Tablet Computers, GPS, and Digital Data. GSA Annual Meeting 2008, short course  
2006 Workshop on the Teaching of Writing, Bucknell University (four days of lectures, discussions, and exercises focused on improving student writing as active learning)  
2005 Preparing for an Academic Career in the Geosciences: A workshop from graduate students and post-doctoral fellows; NSF-funded workshop, Penn State University  
2002 Advanced Coral Reef Ecology of Curacao, Netherlands Antilles; Miami University  
2001 Introductory Coral Reef Ecology of Curacao, Netherlands Antilles; Miami University  
2001 Sequence Stratigraphy for Graduate Students; GSA Short Course (taught by Vitor Abreu)  
2000 Carbonate Depositional Environments, Florida Keys, San Salvador Island, Bahamas; Miami U.

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#### **PROFESSIONAL SOCIETY MEMBERSHIP**

Society for Sedimentary Geology  
Geological Society of America  
American Association of Petroleum Geologists  
ICS Subcommittee on Ordovician Stratigraphy (voting member)  
ICS Subcommittee on Silurian Stratigraphy (corresponding member)

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## GRANTS AND CONTRACTS (> \$3.3 million)

2025-2028	U.S. Geological Survey (USGS) Earth Mapping Resources Initiative (EMRI); <i>Geological mapping of critical minerals enrichment in the Pennsylvanian Excello and Mecca Quarry black shales in north-central Illinois</i> (\$419,000, PI)
2024-2027	USGS EMRI; <i>Geological mapping of the rare earth element-enriched Graf phosphorite (Upper Ordovician) in northwestern Illinois</i> (\$330,000, PI)
2023-2026	USGS EMRI; <i>Critical minerals in metalliferous Devonian black shales of the Illinois Basin</i> (\$660,000, PI)
2023-2025	USGS Data Preservation, Critical Minerals Priority 3: <i>Resurrecting the White County core; key reference section for critical minerals studied in the Midwest Paleozoic</i> (\$26,000, co-PI)
2023-2026	USGS EMRI; <i>Critical minerals in Pennsylvanian black shales of the US midcontinent</i> (\$225,000, scientific lead, subcontract University of Kansas)
2022-2026	Research Foundation Flanders (FWO); <i>Monsters of the Apocalypse: A link between Anoxia, Mutation, Extinction, and Stratabound REE Ores</i> (\$450,000 collaborative project with University of Ghent (Belgium), ISGS, and USGS. All funds to U. Ghent, supporting multiple graduate students and field work in Illinois and surrounding states, coauthor)
2022-2024	USGS Data Preservation, Critical Minerals Priority 2: <i>Photography of ISGS Devonian black shale cores</i> (\$20,000, co-author)
2021-2024	USGS EMRI; <i>Geochemical Reconnaissance of Ordovician-age Rare Earth Element-Enriched Sedimentary Phosphate in the Central United States</i> (\$85,000, scientific lead, subcontract University of Iowa)
2020-2024	USGS EMRI; <i>Geochemical Sampling (Appalachian Basin) and Regional Interpretation (Illinois and Appalachian Basins) of Devonian-Aged Rare Earth Element-Enriched Sedimentary Phosphatic Stratigraphic Units in the Central and Eastern United States</i> (\$125,000, PI)
2019-2020	National Cooperative Geologic Mapping Program (NCGMP) StateMap: <i>Chicago East Quadrangle (1:100,000 scale)</i> (\$65,000, PI)
2018-2019	NCGMP StateMap: <i>Knox Quadrangle (1: 100,000 scale)</i> ; (\$115,000, PI)
2016-2018	NCGMP StateMap: <i>Logansport Quadrangle (1:100,000 scale)</i> ; (\$260,000, PI)
2016-2017	U.S. Geological Survey contract: <i>Silurian conodont geochemistry</i> (\$20,000, PI)
2016	Faculty Research Support Program-Seed Funding, Office of the Vice Provost for Research, Indiana University: <i>pXRF chemical stratigraphy: transforming understanding of mass extinctions in the geologic record</i> (\$36,000, lead PI)
2015-2016	NCGMP StateMap: <i>Morgan County, Indiana</i> (\$185,000, PI)
2012-2014	NCGMP StateMap: <i>Manitowoc County, Wisconsin</i> (\$180,000, PI)
2012-2014	NCGMP StateMap: <i>Columbia County, Wisconsin</i> (\$118,000, PI)
2012-2013	USGS contract: <i>Chronomap pilot project</i> (\$15,000, lead PI)
2012-2013	USGS contract: <i>US Rare Earth Element Enriched-Phosphate Resources</i> (\$130,000, PI)

2011-2012	Madison Water Utility contract: Potential sources of naturally occurring chromium in municipal drinking water wells (\$8000, co-PI)
2010-2011	NCGMP StateMap: <i>Sheboygan County, Wisconsin</i> (\$341,000, PI)
2008-2013	NSF Collaborative Research Grant (EAR 081920): <i>Foreland basin development and biotic change in Late Ordovician trilobite faunas of eastern North America</i> (\$10,000, outside collaborator)
2008	UW-Extension Project Innovation Grant: <i>Wisconsin Geological Record—A community-based, web archive for geologic data</i> (\$30,000, lead PI)
2006-2010	NSF Collaborative Research Grant (EAR 0518511): <i>High-resolution sequence and event stratigraphy of mid-Silurian strata in eastern North America and Avalonia</i> (\$50,000, postdoctoral and collaborative study)
2001	Geological Society of America— <i>Student Research Grant</i> (\$1200)
1999	American Association of Petroleum Geologists— <i>Research Grant in Aid</i> (\$1500)

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## STUDENT ADVISING AND MENTORING

2026-2029	Tim Paton (PhD, co-advised with Craig Deitsch, University of Cincinnati): Geochronology of Pennsylvanian critical mineral-enriched black shales in eastern North America
2025-2026	Gabby Montano (BS research project, Illinois State University): Graptolite biostratigraphy of the Maquoketa Group in Illinois (collaboration with Dan Goldman, U. Dayton, retired) ( <i>anticipated completion 5/2026</i> )
2024-summer	Addie Bowen (ISGS Potter Intern): Critical minerals in Devonian black shales of Illinois ( <i>completed; currently MS student at Indiana University</i> )
2024-summer	Amira Harris-Bommarito (ISGS Potter Intern): Critical minerals in Pennsylvanian black shales ( <i>completed</i> )
2024-summer	Nina Athanasopolis (ISGS Potter Intern): Geochemistry of Pennsylvanian cyclothems in Illinois ( <i>completed</i> )
2023-2025	Kaatje Peirs (MS co-advised with Dr. Thijs Vandenbroucke, University of Ghent, Belgium): Distal expression of the REE-enriched Ordovician Graf phosphorite ( <i>completed 6/2025</i> )
2023-2025	Lena Lardinois (MS co-advised with Dr. Thijs Vandenbroucke, University of Ghent, Belgium): Phosphogenesis during Elkhorn Event in the southern Midcontinent Basin ( <i>completed 6/2025</i> )
2022-present	Iris Vancoppenolle (PhD, co-advised with Dr. Thijs Vandenbroucke, University of Ghent, Belgium and Poul Emsbo, U.S. Geological Survey): Signatures of oceanic anoxia during the Silurian Ireviken Events ( <i>anticipated completion 2027</i> )
2021-present	Carolina Klock (PhD, co-advised with Dr. Thijs Vandenbroucke, University of Ghent, Belgium and Poul Emsbo, U.S. Geological Survey): Metal-induced malformations in fossil zooplankton from Silurian oceanic anoxic events ( <i>anticipated completion 10/2025</i> )
2019-present	Cristiana Esteves (PhD, co-advised with Dr. Thijs Vandenbroucke, University of Ghent, Belgium): High-resolution temporal framework for the Late Ordovician mass extinction in the Illinois Basin ( <i>anticipated completion 3/2026</i> )
2016-2026	Julie De Weirdt (PhD, committee member, University of Ghent): Metal-induced malformations in fossil zooplankton associated with early Paleozoic mass extinctions ( <i>anticipated completion 12/2026</i> )

2023-summer	Anna Weldon (ISGS Potter Internship): Distribution of REE-enriched Devonian phosphorites in western Illinois subsurface ( <i>completed 8/2023; currently MS student at University of Kansas</i> )
2022-2023	Rosalia-Alba Vittiglio (MS co-advised with Dr. Thijs Vandenbroucke, University of Ghent, Belgium): A chitinozoan biostratigraphic framework for the top of the phosphate-REE-bearing Maquoketa Group in the US Midcontinent. ( <i>completed 9/8/2023</i> )
2014-2023	Allison Young (PhD, co-advised with Dr. Carlton Brett, University of Cincinnati) (partially supported by Hess Corp.): Chemostratigraphic correlation of organic-rich deep-water shales to platform carbonates (Utica-Point Pleasant system; Upper Ordovician, Ohio-Kentucky) ( <i>completed 6/2023, currently Project Manager with Tetra Tech in Kentucky</i> )
2020-2022	Michael Sell (MS, committee member, Illinois State University): Geology, Geochronology, and Preliminary Rare-Earth Element (REE) Occurrence in the Bald Mountain 7.5-Minute Quadrangle, North Central Wyoming, USA ( <i>completed 3/2022</i> )
2018-2019	Wiebe Degraeuwe (MS, co-advised with Dr. Thijs Vandenbroucke, University of Ghent) Chitinozoan biostratigraphy of the Fernvale Limestone and Cape de Croix Shale (Upper Ordovician, Delphi, Indiana) ( <i>completed 9/2019</i> )
2016-2020	Matthias Sinnesael (PhD, committee member, Vrije Universiteit Brussels, Belgium) Ordovician cyclostratigraphy ( <i>completed 7/2020, currently post-doc at Observatoire de Paris, 4/2025 begins Assistant Professorship at Trinity College, Dublin, Ireland</i> )
2016-2020	Matthew Rine (PhD, co-advisor, Western Michigan University): Silurian reef facies and chronostratigraphy of Michigan Basin, USA ( <i>completed 3/2019; currently Geologist with Consumers Energy in Michigan</i> )
2017-2018	Tim De Backer (MS, committee member, University of Ghent): Palynology of the Upper Ordovician Maquoketa Group, western Michigan Basin ( <i>completed 6/2017, currently PhD candidate at Ghent University, Belgium</i> )
2014-2017	Michael Hurth (MS, committee member, Colorado School of Mines): Iron formations associated with the Sturtian glacial event: Katangan basin and Damaran platform ( <i>completed 5/2017, currently MS student at UC Berkeley</i> )
2015-2016	Jules Vellerman (MS, committee member, Ghent University, Belgium): Chitinozoan biostratigraphy of the Maysvillian (Upper Ordovician) type-area ( <i>completed 6/2016</i> )
2011-2013	Nicholas Sullivan (MS, co-advised with Dr. Carlton Brett, University of Cincinnati): Refinements to the depositional history of Lower Silurian strata ( <i>completed 6/2013; currently PhD candidate at University of Wisconsin-Madison</i> )
2010-2012	Michael Hurth (BS, co-advised with Dr. Shanan Peters, UW-Madison): The Ordovician-Silurian boundary in Wisconsin ( <i>completed 6/2012, currently MS student at UC Berkeley</i> )
2006-2007	Anya Hess (BS, co-advised with Dr. Jeff Trop, Bucknell University): Sequence stratigraphy and carbon isotope geochemistry of the Siluro-Devonian boundary interval in central Pennsylvania ( <i>completed 6/2017; currently PhD student at Rutgers University</i> )

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## EMPLOYEE MANAGING AND MENTORING

2025-present	Yelena St. Clair: ISGS, pXRF Laboratory Technician, part time student hourly, fully supported
2024-present	Aidan Jones: ISGS, Stable isotope laboratory assistant, full time hourly, fully supported
2023-present	Greg Cane: ISGS, Stable Isotope Laboratory Manager, full time academic staff, partially supported

2024-present	Nina Athanasopoulos: ISGS, pXRF Laboratory Technician, part time student hourly, fully supported
2023-2024	Katie Spaulding: ISGS, pXRF Laboratory Technician, full time hourly staff, partially supported
2023-2023	Anthony Kilber: ISGS, pXRF Laboratory Technician, full time hourly staff, fully supported ( <i>currently lab technician with the Illinois Water Survey</i> )
2022-present	Tim Paton: ISGS, Project Geologist, full time academic staff, partially supported
2022-summer	Teddy Lowe: ISGS, academic hourly, fully supported ( <i>completed MS in geology at University of Kansas</i> )
2020-2022	Katherine Tucker: IGWS, Laboratory Analyst, academic hourly, fully supported ( <i>continues at the IGWS</i> )
2017-2019	Kristin Brethova: IGWS, academic hourly, fully supported ( <i>currently Research Assistant at Indiana University</i> )
2016-2017	Alyssa Bancroft: IGWS, Bedrock Geologist, full time academic staff, partially supported ( <i>currently Bedrock Geologist at Iowa Geological Survey</i> )
2016-2017	Michael Lara: IGWS, Laboratory Analyst, student hourly, fully supported ( <i>PhD candidate at Rice University</i> )
2015-2016	Veronica Biesiada: IGWS, Laboratory Analyst, student hourly, fully supported ( <i>currently Professional Geologist in Oregon</i> )
2014-2015	Sarah Bremmer: WGNHS, Laboratory Assistant, academic hourly, fully supported ( <i>Geoscientist with WGNHS</i> )
2013-2015	Jay Zambito: WGNHS, Assistant Professor, full time, no support ( <i>currently full Professor and Geology Department head at Beloit College</i> )
2012-2015	Esther Stewart: WGNHS, Bedrock Geologist, full time academic staff, no support ( <i>continues as Geoscientist with WGNHS</i> )
2013-2015	William (Bill) Batten: WGNHS, Geologist, full time academic staff, no support ( <i>now retired</i> )
2011-2013	Jason Huberty: WGNHS, Collections Manager, full time academic staff, partial support
2010-2012	Michael Hurth WGNHS, Laboratory and Field Assistant, student hourly, fully supported
2008-2009	Ethan Mamer: WGNHS, Laboratory Assistant, student hourly, supported

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## SERVICE EVENTS/INVITED TALKS

2023	USGS Earth MRI Workshop, Reston, Virginia, invited talk: <i>Distribution and composition of Ordovician REE-enriched phosphorites in the Central US</i>
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- 2022 Oklahoma Geological Survey Workshop, Oklahoma and the Energy Transition, invited talk and panel discussion: *Rare earth elements in sedimentary phosphate: solution to the global REE crisis?*
- 2022 Illinois State University, Colloquium: *Rare earth elements in sedimentary phosphate: Active Earth MRI phase 2 targets*
- 2021 USGS Earth MRI Workshop (online): *Preliminary ERMI results from REE phosphorites (eastern US)*
- 2019 Indiana Professional Geologists, invited talk: *The rise of pinnacle reefs: A step change in marine evolution triggered by perturbation of the global carbon cycle*
- 2019 Indiana Oil and Gas Association, Annual Meeting, invited lecture: *The rise of pinnacle reefs: A step change in marine evolution triggered by perturbation of the global carbon cycle*
- 2018 Illinois State Geological Survey, Lecture Series: *The transformative power of chemostratigraphy for bedrock studies in the Illinois Basin*
- 2018 Tallin University of Technology and University of Tartu (Estonia), Summer School for Geology Graduate Students (two invited lectures): (1) *Phanerozoic carbonates*; (2) *Chemostratigraphic calibration of time-rock correlation: new frontiers in sequence stratigraphy*
- 2017 IU Department of Earth and Atmospheric Sciences, Colloquium: *Frontiers in chemostratigraphy: transformative framework for Earth systems science*
- 2017 Indiana Oil and Gas Association, Annual Meeting, invited lecture: *Chemostratigraphy in the Illinois Basin*
- 2016 Indiana University, Coral Reefs course, guest lecturer: *The origin and economic importance of ancient reefs*
- 2015 Indiana Professional Geologists, Invited talk: *New time-rock stratigraphy for the Silurian of Indiana and beyond*
- 2015 University of Cincinnati Department of Geology, Career Day: *Work at a state geological survey*
- 2015 Indiana Geological Survey, Fall Speaker Series: *New tools to advance Midwestern stratigraphy and geologic mapping*
- 2014 Quarry Quest, Michels Materials Quarry, Neenah, Wisconsin: presented educational booth and drill rig
- 2014 Wisconsin Public Radio, Joy Cardin Show, interview about rocks, minerals, and fossils
- 2014 Illinois State University, Colloquium: *Assessing US Phosphate Reserves*
- 2014 GeoFrankfurt (German sedimentary geology meeting held at Goethe University in Frankfurt), invited keynote speaker: *Composite chronostratigraphy pathway to comprehensive geochronology*
- 2014 Wisconsin Water Well Drillers Association, Annual Convention: *Drill cuttings and geology; what you need to know to work smarter, not harder*
- 2013 Quarry Quest, Michels Materials Quarry, Neenah, Wisconsin: presented educational booth and drill rig

- 2013 Wisconsin Public Television, Wednesday Night @ The Lab, *Assessing US Phosphate Reserves*
- 2013 Utica Shale Congress, invited speaker: *Time-stratigraphic distribution of the Utica facies*
- 2013 Aggregate Producers of Wisconsin, Convention: *The future of the Wisconsin Geological and Natural History Survey (WGNHS)*
- 2012 Quarry Quest, Michels Materials Quarry, Neenah, Wisconsin: presented WGNHS educational booth and gave tours of the Survey's drill rig
- 2010 WGNHS, Research Collections and Education Center Open House, organized and hosted
- 2012 WGNHS, Brown Bag Lecture: *Sampling the Nation's phosphorites*
- 2012 UW-Eau Claire, Colloquium: *Catastrophes in Paleozoic Wisconsin*
- 2011 Presentation on geology of northern Wisconsin iron range to elected state government officials.
- 2011 Wisconsin Ground Water Association Field Meeting, invited lecture: *Naturally occurring sources of groundwater contamination in Wisconsin Paleozoic Bedrock*
- 2011 WGNHS, Brown Bag Lecture: *Sedimentary and geochemical signatures of global catastrophes*
- 2011 Wisconsin Public Television, Wednesday Night @ The Lab: *Catastrophies in Paleozoic Wisconsin*
- 2011 Minnesota Geological Survey, Lecture Series: *Advances in Paleozoic chronostratigraphy*
- 2010 WGNHS, Research Collections and Education Center Open House, organized and hosted
- 2009 Texas A&M, Colloquium Lecture: *High resolution cratonic sequence stratigraphy*
- 2008 University of Wisconsin, Department of Geology, Weeks Lecture: *High resolution cratonic sequence stratigraphy*
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#### **TEACHING ACTIVITIES:**

##### University of Indiana-Bloomington

2016 SP16 Advanced Geology Seminar

##### University of Wisconsin-Madison

2015 GEOSCI 875 Carbonate Stratigraphy

2008-2014 GEOSCI 875 Sed-Paleo Seminar (faculty co-leader and participant)

##### Bucknell University

Spring 2007 GEOL 213 Paleontology

Spring 2007 GEOL 104 Evolution of the Earth

Fall 2006 GEOL 103 The Dynamic Earth

Fall 2006 GEOL 104 Evolution of the Earth

##### University of Cincinnati



Fall 2005	GEOL 205 Geobiology I—Processes of Earth History
Summer 2005	GEOL 107 Field Geology of the Cincinnati Region
Summer 2005	GEOL 134A Earth Revealed (online)
Summer 2005	GEOL 134B Earth Revealed (online)

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## ORGANISATION OF SCIENTIFIC MEETINGS

2022	Technical Session Co-chair, <i>Integrated Studies of Black Shales</i> , GSA Joint North-central–Southeastern Section Meeting, Cincinnati, Ohio
2019	Technical Session Co-chair, <i>Testing the Fidelity of C-isotope Records as Proxies for Global Carbon Cycle History—Across Time, Space, and Composition</i> , GSA Annual Meeting, Phoenix, Arizona
2015	Technical Session Co-chair, <i>Bridging the Gap Between Empirical and Model-driven Views of Geologic History: New Tools and Approaches</i> , North-central Section Meeting, Madison, Wisconsin
2012	Co-leader, Annual field meeting, Subcommittee on Silurian Stratigraphy, Cincinnati, Ohio
2010	Technical Session Co-chair, <i>Time-Specific Facies: The Color and Texture of Biotic Events</i> , International Palaeontological Congress, London, England
2008	Technical Session Co-chair, <i>New Approaches and Initiatives in Paleozoic High-resolution Stratigraphy: A Session Commemorating 15 Years of Views from the Craton</i> , GSA North-central Section Meeting, Evanston, Indiana
2005	Co-leader, International Geoscience Program, Project 503: <i>Ordovician Palaeogeography and Palaeoclimate</i> : Field meeting, Cincinnati, Ohio

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## PROFESSIONAL FIELD TRIPS LED

2023	Great Lakes SEPM Annual Field Trip: Paleozoic bedrock history of the southern Mississippi Valley (co-leaders Joe Devera and Jed Day)
2018	Geological Society of America, Annual Meeting, (Indianapolis, Indiana): The Rise of Silurian Pinnacle Reefs: Islands of Diversity in Seas of Despair. (co-leader: Alyssa Bancroft)
2018	Geological Society of America, Annual Meeting (Indianapolis, Indiana): Paleozoic Geology of the Louisville, Kentucky Region. (co-leaders: Carlton Brett, Kyle Hartshorn, Chris Waid)
2015	North-central Geological Society of America Meeting (Madison, Wisconsin): Cambrian sequence stratigraphy of the Wisconsin Arch (co-leader: Jay Zambito)
2013	"Utica-Point Pleasant" Regional Stratigraphy Workshop, HESS and CONSOL energy companies (co-leaders: Carl Brett and Peter Holterhoff)
2012	Silurian Subcommittee on Stratigraphy regional field trips: Appalachian Basin to Michigan Basin (Kentucky to Illinois) (co-leaders: Carl Brett and Don Mikulic)

- 2011 Geological Society of America, Annual Meeting, Minneapolis: Distal signatures of Late Ordovician oceanic anoxia—new data from a classic ramp transect (co-leaders: Norlene Emerson, Brian Witzke, Bryan Sell, Poul Emsbo)
- 2010 Great Lakes SEPM/Tristate Field Trip: Silurian Geology of the Niagara Escarpment in Wisconsin (co-leaders: Don Mikulic and Joanne Kluessendorf)
- 2009 North American Paleontological Convention: Sequence stratigraphy of the Cincinnati Arch (co-leaders: Carl Brett, Susie McLaughlin)
- 2008 North-central Geological Society of America, Annual Meeting: Silurian sequence stratigraphy and oceanographic events recorded across the Appalachian Basin and Cincinnati Arch (co-leaders: Brad Cramer, Carl Brett, and Mark Kleffner)
- 2005 IGCP 503: Ordovician palaeogeography and palaeoclimate, North American field conference. Upper Ordovician sequence stratigraphy and paleoecology of the Cincinnati Arch (co-leaders: Carl Brett and Steve Holland)

## PUBLICATIONS (1806 CITATIONS AS OF 9/2023)

### *Volumes Edited*

Special Issue: Time-Specific Facies: the color and texture of biotic events, 2012. Ferretti, A., Histon, K., **McLaughlin, P.I.**, Brett, C.E. (Eds.). *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 367-368, 272 p.

Archean to Anthropocene: Field Guides to the Geology of the Mid-Continent of North America, 2011. Miller, J.D., Hudak, G.J., Wittkop, C., **McLaughlin, P.I.** (Eds.), Geological Society of America, v. 24, 585 p.

Stratigraphic Renaissance in the Cincinnati Arch: Implications for Implication for Upper Ordovician Paleontology and Paleocology, 2008. **McLaughlin, P.I.**, Brett, C.E., Storres, G., Holland, S.M., (Eds.), Cincinnati Museum Center, 280 p.

### *Refereed Journal Articles*

De Backer, T., Day, J.E., Emsbo, P., **McLaughlin, P.I.**, Vandenbroucke, T.R.A., 2023. Chitnozoan response to the ‘Kellwasser events’: population dynamics and morphological deformities across the Frasnian-Famennian mass extinction. *Papers in Palaeontology*.

Stevens Goddard, A.L., Thurston, O.G., Malone, D.H., **McLaughlin, P.I.**, and Stewart, J., 2023. Cratonic basins as effective sediment barriers in continental-scale sediment routing systems of Paleozoic North America. *Scientific Reports*. <https://doi.org/10.1038/s41598-023-37863-x>

Sinnesael, M., **McLaughlin, P.I.**, Desrochers, A., Mauviel, A., De Weirtdt, J., Claeys, P., Vandenbroucke, T.R.A., 2021. Precession-driven climate cycles and time scale prior to the Hirnantian glacial maximum. *Geology* 49, 1295-1300, <https://doi.org/10.1130/G49083.1>

Rine, M.J., **McLaughlin, P.I.**, Bancroft, A.M., Harrison, W.B. III, Kuglitsch, J., Caruthers, A.H., Kaczmarek, S.E., Emsbo, P., 2020. Linked Silurian carbon cycle perturbations, bursts of pinnacle reef growth, extreme sea-level oscillations, and evaporite deposition (Michigan Basin, USA). *Palaeogeography, Palaeoclimatology, Palaeoecology* 554, 109806.

Mastalerz, M., Drobniak, A., Eble, C., Ames, P., and **McLaughlin P.**, 2020. Rare earth elements and yttrium in Pennsylvanian coals and shales in the eastern part of the Illinois Basin. *International Journal of Coal Geology* 231, 103620.

- Teng, J., Mastalerz, M., Lui, B., Gognat, T., Hauser, E., **McLaughlin, P.**, 2020. Variations of organic matter transformation in response to hydrothermal fluids: Example from the Indiana part of the Illinois Basin. *International Journal of Coal Geology* 219, 103410.
- McLaughlin, P.I.**, Emsbo, P., Bancroft, A., Brett, C.E., Desrochers, A., Vandenbroucke, T.R.A., 2019. The rise of pinnacle reefs: A step change in marine evolution triggered by perturbation of the global carbon cycle. *Earth and Planetary Science Letters* 515, 13-25.
- Mastalerz, M., Drobniak, A., Ames, P., and **McLaughlin P.**, 2019. Application of pXRF elemental analysis and organic petrography in correlation of Pennsylvanian strata: An example from the Indiana part of the Illinois Basin, USA. *International Journal of Coal Geology* 216, 12 p.
- Emsbo, P., Premo, W.R., **McLaughlin, P. I.**, Neymark, L.A., Vandenbroucke, T.R.A., Day, J.E., du Bray, E.A., Manning, A.H., Bancroft, A.M., 2018. Impact of sedimentary-exhalative hydrothermal systems on marine chemistry and mass extinctions: Applications for ore genesis research and mineral exploration. *In* A.M. Arribas and J.L. Maul (eds.), *Metals, Minerals and Society*, Society of Economic Geologists Special Publications Series 21, 75-87.
- Brett, C.E., Zambito, J.J., **McLaughlin, P.I.**, Emsbo, P., 2018. Revised perspectives on Devonian biozonation and environmental volatility in the wake of recent time-scale revisions. *Palaeogeography, Palaeoclimatology, Palaeoecology*.
- Amberg, C.E.A., Vandenbroucke, T.R.A., Nielsen, A.T., Munnecke, A., **McLaughlin, P.I.**, 2017. Chitinozoan biostratigraphy and carbon isotope stratigraphy from the Upper Ordovician Skogerholmen Formation in the Oslo Region. A new perspective for the Hirnantian lower boundary in Baltica. *Review of Palaeobotany and Palynology* 246, 109-119.
- Malone, D.H., Craddock, J.P., **McLaughlin, P.I.**, Konstantinou, A., and McGillivray, K., 2017. Detrital zircon geochronology of the Bighorn Dolomite, Wyoming, USA: Evidence for Trans-Hudson dust deposition on the western Laurentian carbonate platform. *Journal of Geology* 125, 261-269. DOI:10.1086/690213.
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