

Bolton Howes
Postdoctoral Researcher
Department of Marine Geology
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Education

- 2017–2023* **Princeton University**, Princeton, NJ
Ph.D., Geosciences
Dissertation: Developing physical paleoenvironmental proxies: from ooids to extinction
Advisor: Adam Maloof
- 2015–2017* **University of Georgia**, Athens, GA
M.Sc., Geology
Thesis: The application of sequence stratigraphic principles to constrain the onset of thrust load-induced subsidence: the Jurassic Twin Creek Limestone of Southwest Wyoming
Advisor: Steven Holland
- 2011–2015* **Macalester College**, St. Paul, MN
B.A., Geology
Thesis: Characterization of a regionally significant terrestrial bounding surface in the Upper Cretaceous Two Medicine Formation, northwestern Montana
Advisor: Raymond Rogers

Professional Experience

- 2023–2024* **University of Miami (RSMAS)**
Postdoctoral Researcher, Marine Geology
Paleoclimatology and remote sensing to determine the natural hazard risk on the coasts of the Red Sea
Advisor: Sam Purkis
- funded for
2024–2026* **University of Washington & Western Washington University**
NSF Postdoctoral Fellow
Linking the past to the future: Using PETM fluvial records to understand the effects of climate change on rivers.
Advisors: Akshay Mehra and Brady Foreman

Awards and Honors

- 2023* NSF EAR Postdoctoral Fellowship (\$180,000)
- 2017* Masters Student of the Year, University of Georgia
- 2015–2017* Graduate Student Assistantship. University of Georgia (fully funded masters program)
- 2016* Graduate Research Grant, Geological Society of America
- 2016* Watts-Wheeler Research Award, University of Georgia
- 2015* Henry Lepp Award for Dedication to Scientific Research, Macalester College

Publications

- 2023 **Bolton Howes**, Akshay Mehra, Emily Geyman, Julia Wilcots, Ryan Manzuk, Curtis Deutsch, Adam Maloof. The where, when, and how of ooid formation: what ooids tell us about ancient seawater chemistry. in review at EPSL.
- 2023 Galle Duchtellier, Amanda M. Oehlert, Hannah Shernisky, Clment G.L. Pollier, Peter K. Swart, **Bolton Howes**, Sam J. Purkis. Sedimentary porewaters record regional tectonic and climate events that perturbed a deep-sea brine pool in the Gulf of Aqaba, Red Sea. in review at Science of the Total Environment.
- 2022 Akshay Mehra, **Bolton Howes**, Ryan Manzuk, Alec Spatzier, Bradley Samuels, Adam Maloof. A novel technique for producing three-dimensional data using serial sectioning and semi-automatic image classification. Microscopy and Microanalysis.
- 2022 Emily Geyman, Ziman Wu, Matthew Nadeau, Stacey Edmonsond, Andrew Turner, Sam Purkis, **Bolton Howes**, Blake Dyer, Anne-Sophie Ahm, Nan Yao. and Curtis Deutsch. The origin of carbonate mud and implications for global climate. PNAS.
- 2021 **Bolton Howes**, Akshay Mehra, and Adam Maloof. Three-Dimensional Morphometry of Ooids in Oolites: a new tool for more accurate and precise paleoenvironmental interpretation. Journal of Geophysical Research: Earth Surface.
- 2021 Paul Hoffman, Galen Halverson, Daniel Schrag, John Higgins, ... **Bolton Howes**. Snowballs in Africa: sectioning a long-lived Neoproterozoic carbonate platform and its bathyal foreslope (NW Namibia). Earth-Science Reviews

Undergraduates Advised

- | | | |
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| 2021 | Anubhav Agarwal | Transfer learning for geological image segmentation |
| 2021 | Hugh Shields | Transfer learning for geological image segmentation |
| 2021 | Anna Krokhhine | Numerical models of ooid growth |
| 2020 | Emilio Cano-Renteria | Geological image segmentation and ooid growth |
| 2019 | Sarah Brown | K–Pg boundary stratigraphy of Bolivia |
| 2018 | Celia Aranda-Reina | Climate variability during the K–Pg in Spain |

Undergraduate included in fieldwork

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| 2019 | Sarah Brown | 5 weeks | Bolivia |
| 2019 | Galen Cadley | 5 weeks | Yukon, Canada |
| 2018 | Celia Aranda-Reina | 4 weeks | Spain |
| 2016 | Tony Moraes | 4 weeks | western Wyoming |

Teaching Experience

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| Spring 2021 | Teaching Assistant | ENV 354-GEO 368 Climate and Weather: Order in the Chaos |
| Fall 2019 * | Teaching Assistant | FRS 161: Earth: Crops, Culture, and Climate (in Italy) |
| Fall 2018 * | Teaching Assistant | GEOL 201: Measuring Climate Change: Data Analysis and Science Writing |
| 2016–2017 | Geology Tutor | University of Georgia Student-Athlete Academic Center |
| Spring 2015 | Teaching Assistant | GEOL 165: History and Evolution of the Earth |
| Fall 2014 | Teaching Assistant | GEOL 300: Paleobiology |

* Indicates courses that included a fieldwork component consisting of a week-long trip (Utah and Italy) to make observations for research projects. My teaching duties included preparing supplies and logistics and helping students with both data collection—especially with drones, differential GPS, and surveying equipment—and data analysis. The data collected during fieldwork was part of a semester-long project.

Fieldwork Experience

2023	Red Sea	3 weeks	Geomorphology and stratigraphy to evaluate natural hazard risk
2019 & 2022	Bolivia	12 weeks	The K–Pg Boundary in lacustrine and fluvial settings
2021	southern Utah	2 weeks	Cyclicity in the Late Paleozoic Ice Age
2019	Calabria, Italy	1 week	Measuring climate change in olive orchards
2019	Yukon, Canada	5 weeks	Archeocyathid reefs and the Cambrian Explosion
2018	Spain and Italy	6 weeks	The K–Pg Boundary and slope sediments
2018	southern Namibia	4 weeks	Neoproterozoic and Paleozoic glacial deposits
2018	Western Australia	1 week	Modern and recent carbonate platforms
2018	Nevada/Arizona	3 weeks	Stratigraphy and Geochemistry of the late Paleozoic ice age
2017	northern Namibia	6 weeks	Field assist. to Paul Hoffman: Strat. and mapping of Snowball Earth deposits of the Otavi Group
2016	western Wyoming	6 week	Sequence strat. of the Twin Creek Limestone
2014	NW Montana	2 weeks	Sequence strat. and strat. paleobiology of the Two Medicine Formation
2014	Patagonia, Chile	12 weeks	Restoration ecology and conservation biology in the Aysén Region
2013 & 2014	NW Wyoming	5 weeks	Terrestrial Stratigraphy and paleobiology of the Cloverly Formation
2014	Tall Dhiban, Jordan	6 weeks	Archeological excavation Early Bronze Age through the 19th century

Conference Abstracts

- 2022 **Bolton Howes**, Ryan Manzuk, Akshay Mehra, Adam Maloof. Tales of transport and chemistry from three-dimensional growth histories of ooids. AGU Fall Meeting (Chicago, Illinois).
- 2022 Ryan Manzuk, **Bolton Howes**, Emily Geyman, Indu Panigrahi, Dave Singh, Adam Maloof. Multispectral petrography image analysis as a method for paleoenvironmental and paleoecological reconstruction; applications to earths first reefs. AGU Fall Meeting (Chicago, Illinois).
- 2022 Cedric Hagen, John Higgins, Adam Maloof, Stacey Edmonsond, Ryan Manzuk, **Bolton Howes**, John Higgins, Pingping Zhao. Machine learning and computational image analysis leveraged to probe relationships between carbonate isotopic composition, diagenetic alteration, and sedimentary facies isotopic variability. AGU Fall Meeting (Chicago, Illinois).
- 2022 Adam Maloof, Ryan Manzuk, Emily Geyman, Akshay Mehra, Jaap Kaandorp, Mark Webster, Stacey Edmonsond, **Bolton Howes**, and Cedric Hagen. From modern analogs to three dimensions: Lessons learned for interpreting the stratigraphic record of the Proterozoic–Phanerozoic transition. GSA Annual Meeting (Denver, Colorado).
- 2018 **Bolton Howes**, Akshay Mehra, and Adam Maloof. Three-dimensional reconstructions of Holocene and Neoproterozoic oolites to measure porosity, permeability, and volume-shape evolution of ooids. GSA Annual Meeting (Indianapolis, Indiana).
- 2014 **Bolton Howes** and Raymond Rogers. Revisiting a regionally significant terrestrial bounding surface in the Upper Cretaceous (Campanian) Two Medicine Formation, northwestern Montana. GSA Annual Meeting (Vancouver, British Columbia).

Invited Talks

- 2023 University of Miami, Geotopics
- 2020 Macalester College, Graduate School Open House
- 2018 Macalester College, Sed/Strat Seminar

Leadership and Service

- 2023 SIFP Fellow (mentoring first-gen. students), Princeton University
- 2018–2021 Residential Graduate Student, Princeton University
- 2016–2017 Student Volunteer, Geological Society of America
- 2015 Leadership Committee of Macalester College Fellowship of Christian Athletes
- 2012–2013 Resident Assistant, Macalester College
- 2011–2014 Captain of Macalester College Football Team

Continued Education

- 2018* Agouron Advanced Astrobiology and Geobiology Field School in central Namibia, Agouron Institute
- 2016* Reservoir Engineering, ExxonMobil
- 2016* Geochemistry of the Cretaceous Western Interior Seaway, Geological Society of America
- 2015* Sequence Stratigraphy for Graduate Students, ExxonMobil