

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 Edmonson, 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

2021	Anubhav Agarwal	Transfer learning for geological image segmentation
2021	Hugh Shields	Transfer learning for geological image segmentation
2021	Anna Krokhine	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

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

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

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

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