

Bolton Howes

NSF Postdoctoral Fellow

University of Washington & Western Washington University
(720)-937-9891, bhowes@princeton.edu

Professional Experience

- 2024–* **University of Washington & Western Washington University**
NSF Postdoctoral Fellow
Leveraging remote sensing, data science, and computational methods to understand how rivers respond to climate change
Advisors: Akshay Mehra and Brady Foreman
- 2023–2024* **University of Miami (RSMAS)**
Postdoctoral Researcher, Marine Geology
Remote sensing of sedimentology to determine the natural hazard risk on the coasts of the Red Sea
Advisor: Sam Purkis

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

Awards and Honors

- 2024* UW eScience Postdoctoral Fellowship [\$2,000+]
- 2023* NSF EAR Postdoctoral Fellowship [\$180,000]
- 2017–2022* Department of Geosciences Graduate Research Fund [3x\$5,000]
- 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* Miriam Watts-Wheeler Award, University of Georgia
- 2015* Henry Lepp Award for Dedication to Scientific Research, Macalester College

Publications

In Review

- 202X Brady Foreman, Delaney Todd, **Bolton Howes**, Katherine Sullivan. Increased river mobility and floodplain erosion during Paleocene-Eocene global warming event. in review *Geology*.
- 202X Morgan Chakraborty, Francesca Benzoni, Francois Tissot, Ali Pourmand, Marco Taviani, **Bolton Howes**, Peter Swart, Mattie Rodigue, Sam Purkis. Did the Red Sea Survive the Last Glacial Maximum? in review *PNAS*.
- 202X Sam Purkis, Steve Ward, **Bolton Howes**, Morgan Chakraborty, Jake Longenecker. Red Sea Brine Pools Record Intense Late Holocene Rainfall. in review *Science Advances*.
- 202X Keven I. Velez-Rosado, Olga Zalles-Grebetskaya, Jeffrey A. Wilson Mantilla, Blair Schoene, Adam Maloof, **Bolton Howes**. New material of *Dolichochoampsa minima* (Archosauria: Crocodylia) from the Cretaceous-Paleogene El Molino Formation of Bolivia sheds light on the early evolution of Gavialinae. *in review* at Journal of Systematic Paleontology.

Published

- 2024 **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. *Earth and Planetary Science Letters* (in press).
- 2024 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 press* 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, Curtis Deutsch, and Adam Maloof. 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*

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 (66 Weeks)

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| 2024 | Indonesia | 2 weeks | Mapping seafloor ecology and natural hazards |
| 2023 | NW Wyoming | 4 weeks | The fluvial response to the PETM |
| 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 assistant to Paul Hoffman. Mapping Snowball Earth |
| 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

- 2024 **Bolton Howes**, Morgan Chakraborty, Jake Longenecker, Akos Kalman, Sam Purkis. Climate and Completeness in Sedimentary Records of the Gulf of Aqaba and the Red Sea. SEPM-ISGC (Flagstaff, Arizona).
- 2024 Sam Purkis, Morgan Chakraborty, **Bolton Howes**, Jake Longenecker, Akos Kalman, Mattie Rodrigue. Deep-sea brine pools deliver an exquisite record of climate and tectonic events in the Gulf of Aqaba (Red Sea). SEPM-ISGC (Flagstaff, Arizona).
- 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

- 2024 Western Washington University
- 2024 Wheaton College
- 2024 SEPM-IGC Session: Measuring the imprint and implications of missing time in strata
- 2024 University of Miami, Geotopics
- 2020 Macalester College, Graduate School Open House
- 2018 Macalester College, Sed/Strat Seminar

Professional Activities

- Convener* 2019 GSA Annual Meeting technical session: Hello (ancient) world!: Exploring the Neoproterozoic to Cambrian interval by quantitatively probing the rock record
- Reviewer* NSF EAR Geoinformatics

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
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- 2023* SIFP Fellow (mentoring first-gen. students), Princeton University
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- 2016–2017* Student Volunteer, Geological Society of America
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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