

## DR. JESSE R. FARMER

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### EDUCATION AND PROFESSIONAL EXPERIENCE

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**Postdoctoral Associate, Department of Geosciences, Princeton University** 2017-  
**and Department of Climate Geochemistry, Max-Planck-Institute für Chemie**

• Advisors: Dr. Daniel Sigman, Dr. Gerald Haug & Dr. Alfredo Martinez-Garcia

**Ph.D., Department of Earth and Environmental Sciences, Columbia University** 2011-2017

• Dissertation: “Quaternary carbon cycling in the Atlantic Ocean: Insights from boron and radiocarbon proxies”

• Advisor: Dr. Bärbel Hönisch. Committee: Dr. Jerry McManus and Dr. Peter deMenocal

**M.A., Department of Earth and Environmental Sciences, Columbia University** 2011-2013

• Master’s Thesis: “Investigating the boron isotopic composition of deep-sea bamboo corals: seawater pH, calcification, and ocean acidification”

**Research Assistant, U.S. Geological Survey** 2009-2011

• Eastern Geology and Paleoclimate Science Center, Reston, VA.

• Advisor: Dr. Thomas Cronin

**Sc.B Geological Sciences (Honors), Brown University** 2005-2009

• Senior Honors Thesis: “Evaluating the Use of Organic Paleotemperature Proxies in Estuaries: Application of  $U^{K}_{37}$  and  $TEX_{86}$  to Narragansett Bay, Rhode Island”

• Advisors: Dr. Timothy Herbert and Dr. Warren Prell

### FUNDING

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National Science Foundation Graduate Research Fellowship, \$136,000 2012-2016

LDEO Climate Center, “Late Quaternary Arctic Ocean Paleoceanography and Carbon Cycling”, J. Farmer (PI), \$10,000 2015-2016

USGS Technical Liaison, “Boron isotope measurements on Arctic Ocean benthic foraminifers”, B. Hönisch (PI) and J. Farmer (co-PI), \$13,770 2013-2014

National Science Foundation Scholarship for Urbino Summer School (USSP), \$3,000 2012

### PEER-REVIEWED PUBLICATIONS

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16. Farmer, J., B. Hönisch, L. Haynes, D. Kroon, S. Jung, H. Ford, M. Raymo, D. Bell, M. Jaume-Seguí, S. Goldstein, L. Pena, M. Yehudai and J. Kim, 2019. Deep Atlantic Ocean carbon storage and the rise of 100,000-year glacial cycles. *Nature Geoscience* 12, 355-360.

15. Salacup, J.M., J. Farmer, T. Herbert and W. Prell, 2019. Alkenone paleothermometry in coastal settings: Evaluating the potential for highly resolved time series of sea surface temperature. *Paleoceanography and Paleoclimatology*, doi:10.1029/2018PA003416.

14. Flöter, S., J. Fietzke, M. Gutjahr, J. Farmer, B. Hönisch, G. Nehrke, and A. Eisenhauer, 2019. The influence of skeletal micro-structures on potential proxy records in a bamboo coral. *Geochimica et Cosmochimica Acta* 248, 43-60.
13. Farmer, J., O. Branson, J. Uchikawa, D. Penman, B. Hönisch, and R. Zeebe, 2019. Boric acid and borate incorporation in inorganic calcite inferred from B/Ca, boron isotopes and surface kinetic modeling. *Geochimica et Cosmochimica Acta* 244, 229-247.
12. Osborne, E.B., T.M. Cronin and J. Farmer, 2017. Paleoceanographic Perspectives on Arctic Ocean Change [in Arctic Report Card 2017], <http://www.arctic.noaa.gov/Report-Card>.
11. Cronin, T.M., G.S. Dwyer, E. Caverly, J. Farmer, L.H. DeNinno, J. Rodriguez-Lazaro and L. Gemery, 2017. Enhanced Arctic Amplification Began at the Mid-Brunhes Event ~400,000 years ago. *Scientific Reports* 7, doi:10.1038/s41598-017-13821-2.
10. Saenger, C., R. Gabitov, J. Farmer, J. Watkins and R. Stone, 2017. Linear correlations in bamboo coral  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  sampled by SIMS and micromill: Evaluating paleoceanographic potential and biomineralization mechanisms using  $\delta^{11}\text{B}$  and  $\Delta_{47}$  composition. *Chemical Geology* 454, 1-14.
9. Dassié, E., et al. (including J. Farmer), 2017. Saving our Marine Archives. *EOS* 98.
8. Farmer, J., B. Hönisch and J. Uchikawa, 2016. Single laboratory comparison of MC-ICP-MS and N-TIMS boron isotope analyses in marine carbonates. *Chemical Geology* 447, 173-182.
7. Welte, C., L. Wacker, B. Hattendorf, M. Christi, J. Fohlmeister, S.F.M. Breitenbach, L.F. Robinson, A.H. Andrews, A. Freiwald, J. Farmer, C. Yeman, H.-A. Synal and D. Günther, 2016, Laser ablation-accelerator mass spectrometry: An approach for rapid radiocarbon analyses of carbonate archives at high spatial resolution, *Analytical Chemistry* 88(17), 8570-8576.
6. Farmer, J., L. Robinson and B. Hönisch, 2015. Growth rate determinations from radiocarbon in bamboo corals (genus *Keratoisis*). *Deep-Sea Research I* 105, 26-40.
5. Farmer, J., B. Hönisch, L. Robinson and T. Hill, 2015. Effects of seawater-pH and biomineralization on the boron isotopic composition of deep-sea bamboo corals. *Geochimica et Cosmochimica Acta* 155, 86-106.
4. Cronin, T.M., J. Farmer, R. Marzen, E. Thomas and J.C. Varekamp, 2014. Late Holocene sea level variability and Atlantic Meridional Overturning Circulation. *Paleoceanography* 29, 765-777.
3. Farmer, J., T.M. Cronin and G.S. Dwyer, 2012. Ostracode Mg/Ca Paleothermometry in the North Atlantic and Arctic Oceans: Evaluation of a Carbonate Ion Effect. *Paleoceanography* 27, PA2212.
2. Cronin, T.M., G.S. Dwyer, J. Farmer, H. Bauch, R. Spielhagen, M. Jakobsson, J. Nilsson, W.M. Briggs, Jr. and A. Stepanova, 2012. Deep Arctic Ocean warming during the last glacial cycle. *Nature Geoscience* 5, 631-634.

1. Farmer, J., T.M. Cronin, A. de Vernal, G.S. Dwyer, L.D. Keigwin and R. Thunell, 2011. Western Arctic Ocean temperature variability during the last 8000 years. *Geophysical Research Letters*, L049714.

## **ORAL PRESENTATIONS**

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“A new perspective on Holocene North Atlantic Subpolar Gyre variability from deep-sea coral nitrogen isotopes,” AGU Fall Meet. 2018, PP23B-02.

“Ocean carbon cycle disruptions: Their role in past and present climate shifts,” Lafayette College and Pomona College Department Seminars, Fall 2018.

“Evolution of Late Pleistocene Ocean Carbon Cycle-Climate Feedbacks,” California Institute of Technology, October 2018.

“Deep Atlantic Ocean Carbon Storage and the Rise of 100,000-year Glacial Cycles,” Environmental Geology and Geochemistry Seminar, Princeton University, September 2017.

“Paired B/Ca and  $\delta^{11}\text{B}$  measurements on inorganic calcite: Constraints on boron incorporation and implications for boron proxies” (invited), Goldschmidt 2017.

“Ocean Amplification of Plio-Pleistocene Climate Evolution,” Max Planck Institut für Chemie, March 2017.

“Bring out the Boron:  $\delta^{11}\text{B}$  offsets and deep ocean carbon storage at the Mid-Pleistocene Transition,” Yale University, November 2016.

“Boron isotopes in Bamboo corals: The deep-sea coral pH proxy challenge” National Oceanography Centre Southampton, UK and University of Bristol, UK Seminar, August 2014.

“Western Arctic Ocean temperature variability during the last 8000 years,” Lamont-Doherty Geochemistry Seminar, March 2012.

## **POSTER PRESENTATIONS (first author only)**

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Farmer, J., D.M. Sigman, J. Granger and F. Fripiat. 2019. Past constraints on the Arctic Ocean fixed nitrogen cycle from foraminifera-bound N isotopes. Goldschmidt 2019.

Farmer, J., A. Martínez-García, R. Schiebel, D.M. Sigman and G.H. Haug. 2018. Nitrogen isotopic evidence for Pliocene closure of the Central American Seaway. Goldschmidt 2018.

Farmer, J., B. Hönisch, L. Haynes, D. Kroon, D.B. Bell, S. Jung, M. Jaume-Seguí, M.E. Raymo, S. Goldstein and L.D. Pena. 2016. Trace element evidence for abrupt changes in deep South Atlantic Ocean nutrient and carbonate chemistry across the Mid-Pleistocene Transition. AGU Fall Meet. 2016, PP31B-2279.

Farmer, J., B. Hönisch, L. Robinson and T. Hill. 2013. What controls the boron isotopic composition of deep-sea bamboo corals? Seawater pH vs. biomineralization. Int'l Conference in Paleoceanography XI.

Farmer, J., B. Hönisch, T. Hill, M. LaVigne and L. Robinson. 2011. Boron isotopes in deep-sea bamboo corals: pH, vital effects, and environmental factors. AGU Fall Meet. 2011, PP41A-1740.

Farmer, J., T.M. Cronin, R. Thunell, L.D. Keigwin, G.S. Dwyer and D. Willard. 2010. Holocene climate variability in the Beaufort Sea, Arctic Ocean from benthic foraminifers, stable isotopes and pollen. AGU Fall Meet. 2010, PP21B-1689.

## **TEACHING EXPERIENCE**

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### **Teaching Assistant for “Introduction to Chemical Oceanography” 2015**

Taught lectures on carbonate chemistry and marine sediments; Trained students in use of data visualization software; Designed and graded problem sets and class project on ocean chemistry

### **Teaching Assistant for “Chemistry of Continental Waters” 2014**

Taught lectures on atmospheric structure, composition, and chemistry; Designed and graded problem sets and class project on precipitation chemistry

### **Teaching Assistant for “Oceanography” 2012 & 2013**

Taught lectures on history of oceanography, paleoceanography, and co-led Arctic Ocean Case Study; Led weekly office hours and review sessions; Designed homework and exam questions

### **Teaching Assistant for “Stratigraphy and Sedimentation” and “Earth: Evolution of a Habitable Planet” 2008 & 2009**

Assisted fellow undergraduate students in developing science writing skills and data analysis techniques

## **PROFESSIONAL AND VOLUNTEER ACTIVITIES**

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Co-convenor, 2018 Goldschmidt Conference Session 08d “Dynamics and Mechanisms of Warm Climates and Climate Transitions”

Invited Guest Lecturer, 2017 National Geographic Expeditions “Exploring Patagonia”

Lead Organizer, 2015 Department of Earth and Environmental Sciences, Columbia University Graduate Student Field Trip: Reading the Carbonate Record, Exuma, Bahamas

Lead Convener, 2013 AGU Fall Meeting Session “Reconstructing Past Carbon Cycle Perturbations: Novel Developments and Applications”

Ad-hoc reviewer for: *Biogeosciences*, *Chemical Geology*, *Geophysical Research Letters*, *Nature Geoscience*, *Nature Scientific Reports*, *Quaternary Science Reviews*, *The Holocene*, and National Science Foundation MGG and P2C2 Programs

Science blogger for *State of the Planet*, *Coastal Review Online*, and *J Farmer’s Almanac*

## **FIELD EXPERIENCE**

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Piston coring of mangrove swamps, sinkholes, and back-beach lagoons **2015**

Exuma, Bahamas

Laboratory culturing of live-collected planktic foraminifera, Catalina Island CA	<b>2013</b>
Vibracoring of Nottoway Swamp, Courtland VA	<b>2010</b>
Atlantic Coastal Plain coring of Pliocene-age Yorktown Formation	<b>2010</b>
Box-coring of Western North Atlantic continental slope for ostracode Mg/Ca calibration <i>R/V Oceanus</i> Expedition 461, 5 days	<b>2010</b>
Abrupt Glacial Lake Drainage Study: Coring of Champlain Sea sediments	<b>2009</b>
Livingston coring of Narragansett Bay, RI estuarine sediments	<b>2008</b>
SeaBird CTD profiling of hypoxic events, Narragansett Bay, RI	<b>2007</b>

## **AWARDS**

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Finalist, Columbia University Graduate Student Presidential Teaching Award	<b>2015</b>
Sara Fitzgerald Langer Book Prize, Lamont-Doherty Earth Observatory "To a pre-oral graduate student who has contributed to both academic and student life"	<b>2012</b>
National Science Foundation Graduate Research Fellowship	<b>2012</b>
Senior Award, Brown University "In recognition of outstanding academics, research and service to the Department of Geological Sciences"	<b>2009</b>