

BLAKE DYER

LAMONT-DOHERTY EARTH OBSERVATORY, COLUMBIA UNIVERSITY
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EDUCATION

Ph.D. Geosciences — Adviser: Adam C. Maloof **2010-2015**

Princeton University, Princeton, NJ

Dissertation: “Stratigraphic expression and numerical modeling of meteoric diagenesis in carbonate platforms during the Late Paleozoic Ice Age”

B.S. Earth Sciences (Geochemistry) — Adviser: Cin-Ty A. Lee **2006-2010**

Rice University, Houston, TX

Research Focus: “Open-system behavior during pluton–wall-rock interaction as constrained from a study of endoskarns in the Sierra Nevada Batholith, California”

PROFESSIONAL EXPERIENCE

Postdoctoral Research Scientist, **2016→**

Lamont-Doherty Earth Observatory of Columbia University

I am currently working in the Bahamas on reconstructing past sea level, glacial isostatic adjustment, and climate during the last interglacial (MIS 5e).

Postdoctoral Research Associate, Princeton University **2015-2016**

I developed a numerical method to quantify the likelihood that a sequence of sedimentary facies encodes information about changing water depths.

RESEARCH INTERESTS

The goal of my research is to use sedimentary rocks to better understand how the Earth-system responds to changing boundary conditions. The history of life and climate on Earth is intricately tied to the coevolution of the biosphere, atmosphere, and lithosphere over billions of years. Ancient sediments are the fragmented historical record of these systems, and detailed reconstructions of key moments in the development of our planet offer a critical perspective on the rarity and role of life in our universe. Moreover, the ancient sedimentary record provides a baseline to differentiate naturally occurring change from human caused change and can reveal feedbacks that may become critically important in future climate change. I investigate this sedimentary record by merging modern data science tools and models with geospatial, geochemical, and stratigraphic data collected during detailed field work. My PhD research focused specifically on the relationships between sea level fall, diagenesis, and the global carbon cycle during the late Paleozoic Ice Age. More recent projects include developing methods to convert discrete sequences of sedimentary facies into quantified signals of environmental change (such as changing water depth), and collecting sedimentary data from the Bahamas to refine the mantle rheology assumptions that are key to estimating sea level during the last interglacial.

SUBMITTED

- 7 **Dyer, B.**, Maloof, A.C., Purkis, S.J., P.M. Harris, 2017. Extracting water depth change from carbonate stratigraphy, *Sedimentary Geology*, *Under Review*.

PUBLISHED

- 6 Rovere, A., Casella, E., Harris, D.L., Lorscheid, T., Nandasena, N.A.K., **Dyer, B.**, Sandstrom, M.R., Stocchi, P., D'Andrea, W.J., Raymo, M.E. 2017. Giant boulders and Last Interglacial storm intensity in the North Atlantic, *Proceedings of the National Academy of Sciences*, doi:10.1073/pnas.1712433114.
- 5 Lee, C.T. A, Caves, J., Jiang, H., Cao, W., Lenardic, A., McKenzie, N.R., Shorttle, O., Yin, Q.Z., **Dyer, B.**, 2017. Deep mantle roots and continental emergence: implications for whole-Earth elemental cycling, long-term climate, and the Cambrian explosion, *International Geology Review*, 1-18.
- 4 **Dyer, B.**, Higgins, J.A., Maloof, A.C. 2017. A probabilistic analysis of meteorically altered $\delta^{13}\text{C}$ chemostratigraphy from Late Paleozoic Ice Age carbonate platforms, *Geology*, 45(2), 135-138, doi: <https://doi.org/10.1130/G38513.1>.
- 3 **Dyer, B.**, Maloof, A.C., Higgins, J.A. 2015. Glacioeustasy, meteoric diagenesis, and the carbon cycle during the middle Carboniferous, *Geochemistry, Geophysics, Geosystems*, 16, doi:10.1002/2015GC006002.
- 2 **Dyer, B.**, Maloof, A.C. 2015. Physical and chemical stratigraphy suggest small or absent glacioeustatic variation during formation of the Paradox Basin cyclothems, *Earth and Planetary Science Letters*, 419: 63-70.
- 1 **Dyer, B.**, Lee, C. T. A., Leeman, W. P., Tice, M. 2011. Open-system behavior during pluton–wall-rock interaction as constrained from a study of endoskarns in the Sierra Nevada Batholith, California, *J. Petrology* 52 (10): 1987-2008.

WRITING IN PROGRESS

- 8 **Dyer, B.**, D'Andrea, W.J., Sandstrom, M.R., Austermann, J., Rovere, A., Raymo, M.E., 2017. The history of sea level and isostatic adjustment recorded in Bahamian geomorphology. *In Prep*.
- 9 **Dyer, B.**, Higgins, J.A., Maloof, A.C. 2017. Ca isotope stratigraphic expression of meteoric diagenesis, *In Prep*.

PROFESSIONAL PRESENTATIONS

ORAL: MIT COG ³ Seminar	(upcoming) 06 Apr 2018
ORAL: UCSB Earth Science (department seminar)	(upcoming) 08 Feb 2018
ORAL: PALSEA2: PALeo constraints on SEA level rise	06 Nov 2017
ORAL: GSA Annual Meeting (invited)	Oct 22 2017
ORAL: UCLA Earth and Planetary Sciences (department seminar)	29 Feb 2017
ORAL: IRESS: Industry-Rice Earth Science Symposia (invited)	24 Feb 2017
ORAL: Penn State Geosciences Colloquium (department seminar)	14 Feb 2017
POSTER: AGU Fall Meeting	16 Dec 2016
ORAL: BPE Seminar LDEO-Columbia University	21 Nov 2016
ORAL: Rutgers University EPS Colloquium (department seminar)	16 Nov 2016
ORAL: PALSEA2: PALeo constraints on SEA level rise	19 Sep 2016
ORAL: Northeastern Geobiology Symposium - Harvard University	29 Apr 2016
ORAL: GSA Annual Meeting	04 Nov 2015
POSTER: GSA Annual Meeting	03 Nov 2015
POSTER: Goldschmidt Conference	20 Aug 2015
ORAL: Northeastern Geobiology Symposium - Princeton University	07 Feb 2015
ORAL: University of Copenhagen	14 Jan 2015
POSTER: AAPG Annual Convention and Exhibition	20 May 2013
POSTER: AGU Fall Meeting	14 Dec 2007

FUNDING (\$27,500 TOTAL)

The Climate Center of Lamont Doherty Earth Observatory – \$10,000 <i>Strand plains and banana holes: Improving MIS 5e sea-level reconstructions from the Bahamian Archipelago</i> (with W.J. D’Andrea)	2017
NSF EAR, Marine Geology and Geophysics <i>Collaborative Research: Reconstructing last interglacial sea level by integrating field observations with improved models of solid Earth deformation</i> (with J. Austermann and J.R. Creveling)	(declined – expected resubmission)
The Climate Center of Lamont Doherty Earth Observatory – \$10,000 <i>A robust chronology for the interglacial stratigraphic record of the Bahamas</i>	2016
ExxonMobil Graduate Student Geoscience Grant – \$7,500 <i>High resolution coupled physical and chemical stratigraphy of Late Paleozoic Ice Age Cyclothems</i>	2011

GEOLOGIC FIELD WORK (15 MONTHS)

The Bahamas [3 months] <i>Constraining the effect of glacial isotostatic adjustment and global mean sea level on the stratigraphic record of the last interglacial</i>	2016 & 2017
The Western US [9 months] <i>Stratigraphic expression and numerical modeling of meteoric diagenesis in carbonate platforms during the Late Paleozoic Ice Age</i>	2010-2014
South Australia [3 months] <i>The Marinoan glaciation and the Wonoka anomaly</i>	2010
California [1 week] <i>Xenoliths of the Owens Valley cinder cones</i>	2009

MENTORING EXPERIENCE

Since 2010, I have advised 6 high school students in both lab and programming based projects. Outside of regular coursework, I have helped train 8 students (undergraduate and early graduate) in stratigraphy and field methods during 11 months of field work, and I have directly supervised 11 undergraduates in a lab dedicated to measuring the carbon and oxygen isotopes of carbonate rocks. I am currently mentoring two Columbia University PhD students (Michael Sandstrom and Miranda Cashman).

TEACHING EXPERIENCE

Princeton University [as teaching assistant]: GEO 370/570: Sedimentology	2014, 2016
GEO 203: Introduction to the Solid Earth	2013
Rice University [as teaching assistant]: ESCI 334: Geologic and Geophysical Techniques	2010
Rice University [as primary instructor]: WIES 117: Natural History Through Backpacking	2009