

Katherine A. Allen

- CONTACT Department of Earth & Environmental Sciences, Columbia University office: 845-365-8668
121 Comer Building, Lamont-Doherty Earth Observatory mobile: 207-233-3442
61 Route 9W, Palisades, NY 10964, USA katalen@ldeo.columbia.edu
- INTERESTS I investigate physical and chemical properties of seawater through time, with the aim of understanding the ocean's role in climate change throughout Earth history. Seawater contains a fascinating mixture of solids, gases, and dissolved material that is linked to atmospheric composition, cryosphere activity, marine ecosystem function, continental weathering, and marine sedimentation. I am especially interested in the relationship between ocean circulation and ice ages. My approach to unraveling such puzzles includes both the development of paleo-environment proxies via culturing of live foraminifera, and the application of these proxies to marine sediment archives.
- EDUCATION **Columbia University**, New York, USA 2007 - 2012 (expected)
Ph.D. candidate in Paleoceanography
Thesis: Boron in Foraminiferal Calcite as an Indicator of Seawater Carbonate Chemistry
- Cambridge University**, Cambridge, England 2006 - 2007
M.Phil. in Geochemistry
- Case Western Reserve University**, Cleveland, USA 2002 - 2006
B.S. in Geological Sciences
- University of Canterbury**, Christchurch, New Zealand 2005
Semester abroad, Geology
- FIELD WORK Experimental culturing of marine plankton
Puerto Rico March-April 2010
Catalina Island, California July-August 2008
- Tidal wetlands: carbon sequestration, plankton dynamics
Piermont Marsh, New York 2010-2012
- Tropical lake sediment: field collection and geochemistry
Lake Tanganyika, Tanzania June-July 2006
- PUBLICATIONS Allen, K.A., Hönisch, B., Eggins, S.M., Rosenthal, Y., 2012. Environmental controls on B/Ca in calcite tests of the tropical planktic foraminifer species *Globigerinoides ruber* and *Globigerinoides sacculifer*. *Earth and Planetary Science Letters*, v. 351-352, 270-280.
- Allen, K.A., Hönisch, B., 2012. The planktic foraminiferal B/Ca proxy for seawater carbonate chemistry: A critical evaluation. *Earth and Planetary Science Letters*, v. 345-348, 203-211.
- Allen, K.A., Hönisch, B., Eggins, S.M., Yu, J., Spero, H.J., Elderfield, H., 2011. Controls on boron incorporation in cultured tests of the planktic foraminifer *Orbulina universa*. *Earth and Planetary Science Letters*, v. 309, 291-301.
- Hönisch, B., Allen, K.A., Russell, A.D., Eggins, S.M., Bijma, J., Spero, H.J., Lea, D.W., Yu, J., 2011. Planktic foraminifera as recorders of seawater Ba/Ca. *Marine Micropaleontology*, v. 79, issue 1-2, 52-57.
- Hönisch, B., Allen, K.A., in press. Carbon cycle proxies ($\delta^{11}\text{B}$, $\delta^{13}\text{C}_{\text{calcite}}$, $\delta^{13}\text{C}_{\text{organic}}$, shell weights, B/Ca, U/Ca, Zn/Ca, Ba/Ca) *Encyclopedia of Quaternary Science*, 2nd edition.
- Allen, K., 2008. Geochemistry of Lake Tanganyika Sediment: Insights into the Ge/Si opal proxy and East African paleoclimate from isotopes and trace elements M.Phil. thesis at Cambridge University, England.

FELLOWSHIPS AND AWARDS	Columbia University Presidential Teaching Award (\$5,000)	2011
	NSF Graduate K-12 Fellowship (\$81,000)	2010-2012
	Chevron Student Initiative Fund (\$400)	2011
	Department of Earth Science Teaching Assistant Award (\$250)	2010
	Student Poster Award, International Conference on Paleoclimate	2010
	Sara Langer Book Prize for Contributions to Student Life	2009
	Columbia Climate Center Grant (\$8,000)	2009
	Winston Churchill Foundation Scholarship (\$50,000)	2006-2007
	Senior Project Award, Case Western Reserve University	2006
	Adelbert-Squire Scholarship, Case Western Reserve University	2002-2006
PROFESSIONAL TRAINING	Presenting Data and Information, Edward Tufte Workshop	2012
	Summer School in Paleoceanography, Urbino, Italy	2010
	Scientific SCUBA Diving Certification, American Academy of Underwater Sciences	2008
	Experimental Methods in Culturing Planktonic Foraminifera, Catalina Island	2007
	NSF Research Experience for Undergraduates in Tropical Lakes, University of Arizona	2006
	Laboratory Assistant in Geochemistry, Case Western Reserve University	2005
	NSF Research Experience for Undergraduates in Mineral Physics, SUNY Stony Brook	2004
TEACHING	Teaching Fellow , National Science Foundation Graduate K-12 Program	2010-2012
	The Young Women's Leadership School of East Harlem	
	Learning Through Ecology and Environmental Field Studies Program	
	Mentor , Young Science Achievers Program	2010-2012
	New York City and INTEL International Science & Engineering Fair	
	Teaching Assistant , Columbia University Introduction to Climate Systems	Spring & Fall 2009
INVITED TALKS	Demonstrator (Teaching Assistant) , Cambridge University Introductory Geology, Isle of Arran Field Trip	2006-2007
	What controls B/Ca in planktic foraminifera? (2012) Woods Hole Oceanographic Institute.	
	Insight into the B/Ca proxy for past ocean chemistry from culture experiments with tropical foraminifera (2011) Queens College, New York.	
TALKS, POSTERS (*PRESENTER)	What controls boron incorporation into foraminiferal calcite? (upcoming 2012) American Geophysical Union Meeting, San Francisco.	
	Influence of seawater carbonate chemistry on B/Ca in cultured planktic foraminifera (2012) K. Allen*, B. Hönisch, S. Eggins, Y. Rosenthal. Talk, Goldschmidt Conference on Geochemistry, Montréal, Canada.	
	Secondary Schools Field Research Programs: A Model for Raising Student Achievement (2012) S. Vincent*, R. Newton*, K. Allen*. Workshop, The National Conference on Girls Education, Washington, D.C.	
	Carbonate system and salinity controls on B/Ca of tropical and subtropical planktic foraminifera: Insight from culture experiments (2011) K. Allen*, B. Hönisch, S. M. Eggins, Y. Rosenthal. Poster, American Geophysical Union Fall meeting, San Francisco, California.	
	Culture experiments reveal carbonate system and salinity controls on B/Ca of three planktic foraminifer species (2011) K. Allen. Talk, Princeton University Graduate Student Symposium.	

B/Ca and Mg/Ca in *O. universa* and *G. sacculifer*: Comparison of cultured and sediment-core material (2010) K. Allen*, B. Hönisch, S. Eggins, Y. Rosenthal, J. Yu, H.J. Spero, J.N. Richey. Poster, International Conference on Paleoclimatology, San Diego, California. *Received ICP student poster award*

Comparing planktic foraminiferal B/Ca and boron isotopes as paleo-CO₂ proxies (2010) K. Allen and B. Hönisch*. Poster, American Geophysical Union Ocean Sciences Meeting.

Reduced temperature sensitivity of foraminiferal Mg/Ca thermometry in ancient oceans (2010) S. Eggins*, B. Hönisch, S. Doo, L. Vetter, K. Allen, H.J. Spero, A.D. Russell. American Geophysical Union Ocean Sciences Meeting.

Validating the B/Ca proxy for seawater carbonate chemistry: evidence from culture experiments with the planktic foraminifer *Orbulina universa* (2009) K. Allen*, B. Hönisch, S. Eggins, H.J. Spero, J. Yu, H. Elderfield. Talk, American Geophysical Union Fall Meeting.

Insights into B/Ca from culturing experiments (2009) K. Allen* and B. Hönisch, Lamont-Doherty Earth Observatory Boron Meeting.

Effects of pH and temperature on calcification of the planktic foraminifer *O. universa* (2008) K. Allen*, B. Hönisch, K. James, S. Eggins, H.J. Spero. Poster, American Geophysical Union Fall Meeting.

Impacts of ocean acidification on zooplankton (2008) V. Fabry*, K. Allen, S. Eggins, B. Hönisch, F. Lombard, H.J. Spero. The Second Symposium on the Ocean in a High-CO₂ World, Monaco.

Geochemistry of Lake Tanganyika sediments: what can we learn from Ge/Si? (2007) K. Allen, Lamont-Doherty Earth Observatory Geochemistry Seminar.

Mid- to Late Holocene environmental changes recorded by sediment from Lake Erie's eastern basin (2006) K. Allen*, B. Saylor, E. Barrerra. Talk, North-Central Geological Society of America Meeting.

Dependence of Water Solubility in Mantle Olivine on the Silica Activity (2004) K. Allen, L. Wang*, J. Chen, D.J. Weidner, Z. Liu. Poster, American Geophysical Union Fall Meeting.

Select presentations by mentored high school students (†)

Carbon Storage in Piermont Marsh, Hudson River Estuary (2012) Destiny Torres, Rossibel Fernández, Areej Haroon, Amira Chowdhury, Shiyong Feng, Cristal Lopez, Marshalee Lopez, Susan Vincent, Katherine Allen, Dorothy Peteet. Poster, INTECOL International Wetlands Conference, Orlando, Florida.

Carbon content of sediment in Piermont Marsh, Hudson River Estuary (2012) D. Torres†, R. Fernández†, A. Haroon†. Poster, New York City Science and Engineering Fair at the American Museum of Natural History. 2nd Place Award.

Influence of vegetation type on the carbon content of sediment in Piermont Marsh, Hudson River Estuary (2011) D. Torres†, R. Fernandez†, M. Lopez†, C. Lopez†, A. Haroon†, D. Peteet, K. Allen, and S. Vincent. Poster, Geological Society of America Annual Meeting, Minnesota.

Contrasting reproductive success of female stream fishes across drainages in northwestern Florida: A life history study on the *Gambusia holbrooki* (2011) M. Chowdhury† and M. Diaw†. Poster, NYCSEF 1st Place Award. Participants at ISEF International Science and Engineering Fair, Los Angeles.

PUBLIC TALKS
AND EVENTS

Guest Eco-Expert for The Big Green Theater, Brooklyn	2012
Pan American High School	2011
Lamont Open House	2010, 2012
Columbia University Girls Science Day	2009
Hudson River Snapshot Day	2008

RELEVANT COURSEWORK	Chemical Oceanography, Physical Oceanography, Paleobiology, Terrestrial Paleoclimate, Quantitative Methods of Data Analysis, Chemical Geology, Chemistry of Continental Waters, Carbon Cycle, Geochronology & Thermochronology, Isotope Geology, Sedimentary Geology, Structural Geology, Mineralogy, Igneous & Metamorphic Petrology, Introduction to Field Mapping, Iceland Field Trip, Mono Lake Field Trip (California), Biomolecular Tools in Earth Sciences, Geophysical Fluid Dynamics Seminar on The Warming Papers.								
MEMBERSHIPS	<table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">Geological Society of America</td> <td style="text-align: right;">2006-present</td> </tr> <tr> <td>American Geophysical Union</td> <td style="text-align: right;">2007-present</td> </tr> <tr> <td>Geochemical Society</td> <td style="text-align: right;">2008-present</td> </tr> <tr> <td>Society for Wetland Scientists</td> <td style="text-align: right;">2012-present</td> </tr> </table>	Geological Society of America	2006-present	American Geophysical Union	2007-present	Geochemical Society	2008-present	Society for Wetland Scientists	2012-present
Geological Society of America	2006-present								
American Geophysical Union	2007-present								
Geochemical Society	2008-present								
Society for Wetland Scientists	2012-present								
REFERENCES	<p>Bärbel Hönisch, Ph.D. primary advisor (845) 365-8828, hoenisch@ldeo.columbia.edu Lamont-Doherty Earth Observatory 61 Route 9W, Palisades, NY 10960</p> <p>Robert F. Anderson, Ph.D. committee (845) 365-8508, boba@ldeo.columbia.edu Lamont-Doherty Earth Observatory 61 Route 9W, Palisades, NY 10960</p> <p>Peter deMenocal, Ph.D. committee (845) 365-8483, peter@ldeo.columbia.edu Lamont-Doherty Earth Observatory 61 Route 9W, Palisades, NY 10960</p> <p>Yair Rosenthal, mentor and collaborator +972-52 655 4439 (through December 2012) (732) 932-6555 (permanent) rosentha@marine.rutgers.edu Institute of Marine and Coastal Science, Rutgers University 71 Dudley Road, New Brunswick, NJ 08901-8525</p>								