

# Kyle H. Broach

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## Education

### **University of California Santa Cruz**

In Progress Ph.D., Earth and Planetary Sciences – Biogeochemistry

### **Vanderbilt University**

2012 B.A., Chemistry, *cum laude*

2012 B.A. with Honors, Earth and Environmental Sciences, *cum laude*

### **Indiana University**

2012 Judson Mead Geologic Field Station, Montana, USA

### **University of Canterbury, New Zealand**

2010 Westport Field Station, Westport, NZ

## Professional Preparation

- 2015 *Selected Participant*, National Science Foundation International Research Experience for Students designed to foster building collaborative projects
- 2012–2013 *Research Intern*, Dept. of Earth and Environmental Sciences, Vanderbilt University (Molly Miller, mentor)
- 2012 *Lab Intern*, Vanderbilt Student Volunteers for Science, Dept. of Chemistry, Vanderbilt University (Pat Tellinghuisen, supervisor)
- 2009–2012 *Research Assistant*, Dept. of Earth and Environmental Sciences, Vanderbilt University (Molly Miller, mentor)

## Additional Research Experience

- 2007–2008 *Research Intern*, Vanderbilt Institute of Nanoscale Science and Engineering, Vanderbilt University (Tobias Hertel, mentor)
- 2006–2007 *Research Intern*, Radiation Oncology, Vanderbilt University Medical Center (Hanako Kobayashi, mentor)

## Field Experience

- 2015 Carlsbad, CA – water sampling off of newly constructed desalination plant
- 2015 Ducks Unlimited de Mexico (DUMAC) – sediment coring and water sampling in shallow carbonate lagoonal ecosystems
- 2012 Judson Mead Geologic Field Station (IUGFS) – mapping geologic structure and stratigraphy with emphasis on interpretation and reconstruction of tectonic history
- 2010 McMurdo Station and Taylor Dry Valley, Antarctica – Aquarium lab experimentation and deep field sedimentological data collection
- 2010 Westport Field Station, NZ – geologic structure and stratigraphy with emphasis on standard field techniques

## Publications

- 2016 **Broach, K.H.**, Miller, M.F., and Bowser, S.S. Bioturbation by the common Antarctic scallop (*Adamussium colbecki*) and ophiuroid (*Ophionotus victoriae*) under multi-year sea

ice: ecologic and stratigraphic implications." *Palaios* 31.6 (2016): 280-290.

### Projects and Abstracts

- Present **Broach, K.H.**, Paytan, A., et al. Paleoprecipitation in the Yucatan Peninsula, Mexico over the Holocene.
- 2014 **Broach, K.H.**, Paytan, A., and Street, J.H. Salinity proxy comparison in four tropical biogenic carbonates for suitability in paleohydrologic reconstruction. *American Geophysical Union*, San Francisco, CA
- 2014 Rachmallu, M., **Broach K.H.**, Paytan, A., and Street, J.H. Increased Precipitation over the Yucatan Peninsula Inferred from the Spatial and Temporal Distribution of Late Holocene Foram Assemblages. *American Geophysical Union*, San Francisco, CA
- 2012 **Broach, K.H.** and Miller, M.F. Rates and styles of bioturbation by shallow-water Antarctic epifauna (scallop and brittle stars): Implications for the stratigraphic record. *Abstracts with programs - Geological Society of America*. Boulder, CO: Geological Society of America.
- 2011 **Broach, K.H.**, Miller, M.F., and Bowser, S.S. Rates and styles of bioturbation by the Antarctic scallop *Adamussium colbecki* and ophiuroid *Ophionotus victoriae*. P. 547 in *11th International Symposium on Antarctic Earth Sciences Programme and Abstracts*. Available online at: <http://www.isaes2011.org.uk/programme.html>
- 2011 Miller, M.F., Bowser, S.S., **Broach, K.H.**, Murray, K.T., and Walker, B.J. Shoreline processes, benthic communities and modern facies under multi-year sea ice, Explorers Cove, Antarctica. P. 374 in *11th International Symposium on Antarctic Earth Sciences Programme and Abstracts*. Available online at: <http://www.isaes2011.org.uk/programme.html>
- 2009 **Broach, K.H.**, Miller, M.F., Mead, K.A., Richardson, E.R., Murray, K.T., Furbish, D.J., Roseberry, J.C., Walker, S.E., & Bowser, S.S. Observed vs. modeled abundance of the Antarctic scallop *Adamussium colbecki* in the recent sedimentary record, Explorers Cove Antarctica. *Abstracts with programs - Geological Society of America*. Boulder, CO: Geological Society of America.
- 2009 Mead, K.A., Miller, M.F., **Broach, K.H.**, Walker, S.E., & Bowsers, S.S. Bioturbation on Antarctica's Explorers Cove seafloor: why animal activity has a greater impact on the sedimentary record than animal abundance. *Abstracts with programs - Geological Society of America*. Boulder, CO: Geological Society of America.

### Conferences and Presentations

- 2016 *Invited participant*, BASE-LiNE Earth Isotopes Workshop, Prague, Czech Republic
- 2016 *Oral presentation*, Expo presentation for the Monterey Area Research Institutions Network for Education (MARINE) Oceans Colloquium conference.
- 2015 *Oral presentation*, Interuniversity Institute for Marine Science (Eilat, Israel). Antarctic Benthic Stratigraphy.
- 2012 *Oral presentation*, Geological Society of America (Charlotte, NC). Rates and styles of bioturbation by shallow-water Antarctic epifauna (scallop and brittle stars): Implications for the stratigraphic record.
- 2011 *Poster*, International Symposium on Antarctic Earth Sciences (Edinburgh, Scotland). Rates and styles of bioturbation by the Antarctic scallop *Adamussium colbecki* and ophiuroid *Ophionotus victoriae*.
- 2009 *Oral presentation*, Geological Society of America (Portland, OR). Observed vs.

modeled abundance of the Antarctic scallop *Adamussium colbecki* in the recent sedimentary record, Explorers Cove Antarctica.

### Honors and Awards

- 2016 UC MEXUS Small Grants Award (\$1,500 awarded)
- 2016 NSF East Asia Summer Pacific Institute Fellowship – Taiwan (\$4,000 awarded)
- 2015 NSF International Research Experience for Students Program - Israel
- 2015 Nomination for AAAS/Science Magazine Program of Excellence in Science
- 2013 University of California Regents Fellowship
- 2013 UC Santa Cruz Earth and Planetary Sciences First Year Graduate Fellowship
- 2013 NSF Graduate Research Fellowship Program (GRFP) Award
- 2013 USGS-NAGT Internship (interrupted by federal budget sequester)
- 2012 Nominated for USGS-NAGT Internship 2013
- 2012 ConocoPhillips Full Tuition Merit Scholarship to IUGFS
- 2012 Vanderbilt University Honors Thesis: Analytical and Numerical Modeling of Animal-Sediment Dynamics and Taphonomy in Explorers Cove, Antarctica
- 2012 Antarctica Service Medal of the United States of America
- 2012 Phi Beta Kappa Honors Fraternity
- 2011 Vanderbilt University Summer Research Project Grant (\$4,000 awarded)
- 2011 Vanderbilt Magnolia Awards – McGill Award (\$2,000 awarded)
- 2011 Vanderbilt Green Fund – Efficient Lighting Project (\$15,000 awarded)
- 2008–2012 Vanderbilt University Dean’s List, seven semesters

### Service and Leadership

- 2017 *Student Liaison*, Monterey Area Research Institutions’ Network for Education
- 2017 *Organizer*, CC-RISE Internship Program, UCSC, Santa Cruz, CA
- 2015-2017 *Outreach Officer*, UCSC Women in Science and Engineering
- 2016 *Leader*, Invited to lead geologic hikes at The Nature Conservancy’s Dye Creek Preserve, Los Molinos, CA
- 2016 *Organizer*, Monterey Area Research Institutes Network for Education (MARINE) Oceans Colloquium conference
- 2015 *Geology lecturer*, Naturalists at Large outdoor program, Pinnacles National Park
- 2015 *Leader*, Wild about Cumberland marshlands tour, Delaware Bay, New Jersey
- 2014 *Mentor*, UCSC High School Summer Internship program for science
- 2013 *Lesson Planner*, Expand Your Horizons STEM for aspiring female scientists
- 2011-2012 *Fossil Consultant, Lesson Leader*, Aspirnaut remote STEM classes for rural students
- 2011-2012 *Vice President*, Geoscene Geology Club, Vanderbilt University
- 2011-2012 *President*, McGill Project for Philosophy and Fine Arts, Vanderbilt University
- 2009-2012 *General Council*, McGill Project for Philosophy and Fine Arts, Vanderbilt University
- 2010-2012 *Board Training Committee*, Vanderbilt Student Volunteers for Science, Vanderbilt University
- 2011-2012 *Orientation Leader*, ConnectDores Transfer Student Organization, Vanderbilt University
- 2009-2012 *Panelist, Speaker’s Bureau* for underrepresented sexuality minorities, Vanderbilt University K.C. Potter Center
- 2008-2009 *Vice President*, East House Council for Student Programming, Vanderbilt University

2008 *Musical Volunteer*, Tri-M Music Honors Society - music for the elderly

### Mentored Undergraduate Students

2016 CJ Vigil, *senior honors thesis*, carbon and nitrogen isotopes in lagoon sediments

2016 Audrey Taylor, *senior capstone*, lagoon foraminifera assemblages

2014 Chelsey Lindo, lagoon foraminifera assemblages

### Certifications

2015 Wilderness First Aid

2015 Hydrofluoric Acid Safety Certification

2014 Hazardous Materials Management Certification

### Professional Memberships

American Chemical Society

American Geophysical Union

Geological Society of America

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