

SEAN PATRICK BRYAN

Woods Hole Oceanographic Institution
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EDUCATION

2010 Ph.D, Geological Sciences, University of Colorado, Boulder

Graduate Certificate in Oceanography

Dissertation: *An Investigation of the Oceanic Redistribution of Carbon During the Last Deglaciation*

Advisors: Dr. Thomas Marchitto and Dr. Scott Lehman

2007 M.S., Geological Sciences, University of Colorado, Boulder

Thesis: *Calibration of Multiple Trace Element Paleoceanographic Proxies in Benthic Foraminifera*

Advisor: Dr. Thomas Marchitto

2004 B.A. (*magna cum laude*), Geology, Carleton College

Thesis: *Basin Morphology, Sedimentology and History of a Small Proglacial Lake, Matanuska Glacier, Alaska*

APPOINTMENTS

Visiting Assistant Professor, Environmental Studies Program, Luther College, beginning Jan. 2013

Visiting Investigator, Department of Marine Geology and Geophysics, Woods Hole Oceanographic Institution, Oct. 2012 - present

Postdoctoral Scholar, Department of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, 2010 – 2012

Graduate Research Assistant, Institute of Arctic and Alpine Research, University of Colorado, 2005 - 2010

Graduate Student Instructor, Department of Geological Sciences, University of Colorado, 2006 - 2007

Analyst, U.S. Geological Survey National Earthquake Information Center, 2004 – 2005

PUBLICATIONS

Bryan, S. P., T. M. Marchitto, and S. J. Lehman (2010), The release of ^{14}C -depleted carbon from the deep ocean during the last deglaciation: evidence from the Arabian Sea, *Earth and Planetary Science Letters*, 298, 244-254.

Bryan, S. P., and T. M. Marchitto (2010), Testing the utility of paleonutrient proxies Cd/Ca and Zn/Ca in benthic foraminifera from thermocline waters, *Geochemistry Geophysics Geosystems*, 11, Q01005, doi:10.1029/2009GC002780.

Bryan, S. P., and T. M. Marchitto (2008), The Mg/Ca - temperature proxy in benthic foraminifera: New calibrations from the Florida Straits and a hypothesis regarding Mg/Li, *Paleoceanography*, 23(2), PA2220, doi:10.1029/2007PA001553.

Marchitto, T. M., **S. P. Bryan**, W. B. Curry, and D. C. McCorkle (2007), Mg/Ca temperature calibration for the benthic foraminifer *Cibicidoides pachyderma*, *Paleoceanography*, 22(1), PA1203, doi:10.1029/2006PA001287.

Works in Progress:

Bryan, S. P., S. J. Lehman, T. M. Marchitto, and U. S. Ninnemann, Ventilation of intermediate waters along the Chile margin during the last deglaciation.

Bryan, S. P., S. J. Lehman, and T. M. Marchitto, Constraints on deep ocean organic carbon remineralization rates during the Last Glacial Maximum.

Bryan, S. P., K. A. Hughen, and J. T. Farrar, Annually resolved records of southwest Asian monsoon strength for the last 250 years from Red Sea corals.

GRANTS AND AWARDS

Pending: "Reconstructing Multi-Decadal to Centennial Scale Variability in Labrador Sea Convection during the Late Holocene," PIs: S. Bryan, D. Thornalley and L. Keigwin, submitted to NSF Paleo Perspectives on Climate Change, October 2012, \$204,273

Ocean and Climate Change Institute Postdoctoral Scholarship, Woods Hole Oceanographic Institution, 2010 - 2012

Harold T. Stearns Fellowship Award, Geological Society of America, 2009, \$3,900

ExxonMobil Geoscience Grant, 2009, \$7,500

Shell Graduate Student Research Grant, Dept. of Geological Sciences, University of Colorado, 2008, \$2,500

Best Student Poster Award, 9th International Conference on Paleoceanography, 2007

Distinction on senior thesis, Dept. of Geology, Carleton College, 2004

RESEARCH EXPERIENCE

Postdoctoral Scholar, Woods Hole Oceanographic Institution, Dec. 2010 – Oct. 2012

Paleo-environmental records from the Red Sea using coral geochemistry

Examining the controls on coralline Ba/Ca and exploring its use as a proxy for monsoon-driven dust input to the Red Sea. Analysis of coral trace/minor element geochemistry by ICP-MS.

Graduate Research Assistant, Institute of Arctic and Alpine Research (INSTAAR), University of Colorado, Boulder, July 2005 – Nov. 2010

Mechanisms of deglacial CO₂ rise using marine ¹⁴C reconstructions

Investigated the mechanisms responsible for glacial-interglacial atmospheric CO₂ changes using reconstructions of seawater radiocarbon during the last deglaciation. Conducted radiocarbon and stable isotopic analysis of planktonic and benthic foraminifera from marine sediment cores.

Development and calibration of paleoceanographic proxies

Used sediment core-tops and instrumental records to calibrate existing paleoceanographic proxies for seawater temperature and nutrient concentrations using trace and minor element concentrations in benthic foraminifera. Developed an improved method for reconstructing seawater temperature using Mg/Li.

TEACHING EXPERIENCE

University of Colorado at Boulder

Graduate Student Instructor, GEOL 1030: Introduction to Physical Geology Laboratory, Fall 2006 and Spring 2007

Instructor of record for two sections each semester of a stand-alone laboratory and field course. Students were mostly non-science majors. Designed syllabi, homework assignments and exams; developed field trips; gave short lectures; and lead discussions.

Lead an informal paleoclimatology seminar, Spring 2008, Fall 2009

Initiated and coordinated a reading group focused on paleoclimatology for faculty and graduate students; assigned papers to read and lead discussion.

Guest Lecturer

GEOL 5430: Paleooceanography and Paleoclimatology, Fall 2009

Delivered a lecture on past monsoon variability.

GEOL 1060: Global Change 1, Spring 2007

Delivered a lecture on the use of the geochemistry of foraminifera in paleoceanography.

Tutor, Department of Geological Sciences, Fall 2008 – Spring 2010

Tutored students in GEOL 1010: Intro to Geology 1, GEOL 1020: Intro to Geology 2, GEOL 1060: Global Change, GEOL 3070: Intro to Oceanography

Carleton College

Undergraduate Teaching Assistant, Intro to Geology, Fall 2002; Paleobiology, Spring 2004

ACADEMIC SERVICE

Participant in the PAGES Ocean2k Project, 2012

Co-convenor of a session at the 2012 AGU Fall Meeting, B18: Development and Application of Paleo-environment Proxies in Biogenic Carbonates

Judge for Outstanding Student Paper Awards, AGU Fall Meeting, 2011

Ad hoc reviewer of proposals for the National Science Foundation

Ad hoc reviewer of journal articles for: *Geochemistry, Geophysics, Geosystems, and Earth and Planetary Science Letters*

Mentor to a MIT-WHOI Joint Program graduate student, 2011 - 2012

Graduate student representative to the INSTAAR Directorate, 2008 – 2009

Mentor to new University of Colorado Geological Sciences graduate students, 2007-2010

Coordinated the INSTAAR Graduate Student Seminar Series, 2006-2007

Judge for elementary and high school science fairs

PROFESSIONAL DEVELOPMENT

COSEE Professional Development Workshop on science communication, 2012

Marine Geoscience Leadership Symposium, Consortium for Ocean Leadership, 2011

Seminar on Teaching and Learning, University of Colorado MCDB 5650, Spring 2008

Professional Affiliations: American Geophysical Union, Geological Society of America, Geochemical Society

CONFERENCE ABSTRACTS

- Bryan, S. P.**, K. A. Hughen, and J. T. Farrar (upcoming Dec. 2012), Investigating dust input to the Red Sea using barium in corals, *American Geophysical Union Fall Meeting*.
- Goodkin, N. F., T. T. Yang, R. Yeung, **S. P. Bryan**, and K. A. Hughen (upcoming Dec. 2012), Hong Kong corals: a cautionary tale, *American Geophysical Union Fall Meeting*.
- PAGES/Ocean2k Working Group (upcoming Dec. 2012), Synthesis of marine sediment-derived SST records for the past 2 millennia: First-order results from the PAGES/Ocean2k project, *American Geophysical Union Fall Meeting*.
- Bryan, S. P.**, S. J. Lehman, T. M. Marchitto, and U. S. Ninnemann (2011), Intermediate water radiocarbon anomalies during the last deglaciation (*Invited*), *American Geophysical Union Fall Meeting*.
- Bryan, S. P.**, S. J. Lehman, and T. M. Marchitto (2011), The relationship between $\Delta^{14}\text{C}$ and $\delta^{13}\text{C}$ of DIC in the LGM Ocean, *Goldschmidt Conference*.
- Marchitto, T. M., S. J. Lehman, C. Lindsay, **S. P. Bryan**, J. D. Ortiz and A. van Geen (2011), Low latitude surface ocean contribution to the deglacial atmospheric radiocarbon decline, *Goldschmidt Conference*.
- Bryan, S. P.**, T. M. Marchitto, S. J. Lehman, and U. S. Ninnemann (2010), Ventilation of intermediate waters along the southern Chile margin during the last deglaciation, *10th International Conference on Paleoceanography*.
- Bryan, S. P.**, T. M. Marchitto, and S. J. Lehman (2009), Intermediate water radiocarbon evidence for the demise of an isolated deep ocean water mass during the last deglaciation (*Invited*). *American Geophysical Union Fall Meeting*.
- Bryan, S. P.**, T. M. Marchitto, and S. J. Lehman (2009), Millennial-scale changes in deep ocean circulation and carbon cycling during the last deglaciation: Evidence from the Arabian Sea, *AGU Chapman Conference on Abrupt Climate Change*.
- Marchitto, T., **S. Bryan**, P. Montagna, and M. McCulloch (2008), Li/Mg in biogenic aragonite as a potential paleotemperature proxy, *American Geophysical Union Fall Meeting*.
- Marchitto, T. M., **S. P. Bryan**, W. B. Curry, J. Lynch-Stieglitz, and D. C. Lund (2008), Precise calibration of Oxygen isotope paleotemperature equations for several taxa of benthic foraminifera, *Goldschmidt Conference*.
- Bryan, S. P.** and T. M. Marchitto (2007), Calibration of Paleonutrient Proxies Cd/Ca and Zn/Ca in Benthic Foraminifera from Thermocline Waters, *9th International Conference on Paleoceanography*.
- Bryan, S. P.** and T. M. Marchitto (2006), Constraining the Mg/Ca Temperature Proxy in Benthic Foraminifera, *American Geophysical Union Fall Meeting*.
- Bryan, S. P.**, T. M. Marchitto, and W. B. Curry (2005), Calibration of Multiple Trace Metal Proxies in Benthic Foraminifera, *American Geophysical Union Fall Meeting*.
- Bryan, S. P.**, N. R. Ham, S. L. Goetz, M. Savina, G. S. Baker, and K. Pyke (2004), Basin morphology, sedimentology and history of a small proglacial lake, Matanuska Glacier, Alaska, *Geological Society of America North-Central Section Meeting*.

SEMINARS

- 2012 Woods Hole Oceanographic Institution, Marine Chemistry and Geochemistry Department Seminar, "Exploring the use of coralline Ba/Ca as a proxy for the monsoon-driven dust input to the Red Sea."
- 2012 University of Rochester, Dept. of Earth and Environmental Sciences Seminar, "Insights into the glacial to interglacial atmospheric CO₂ rise from marine radiocarbon."
- 2012 University of Rochester, Dept. of Earth and Environmental Sciences Brown Bag Seminar, "What can carbon isotopes tell us about the carbon cycle during the last glacial maximum?"
- 2011 Woods Hole Oceanographic Institution, Post-doc Symposium, "Paleoclimate and paleo-environmental records from Red Sea corals."
- 2010 University of Michigan, Dept. of Geological Sciences Smith Lecture Series, "The release of ¹⁴C-depleted carbon from the deep ocean during the last glacial termination."
- 2009 University of Colorado, Institute of Arctic and Alpine Research Graduate Student Seminar, "Intermediate water radiocarbon evidence for the demise of an isolated deep ocean water mass during the last deglaciation."
- 2008 University of Colorado, Institute of Arctic and Alpine Research Graduate Student Seminar, "Changes in Deep Ocean Circulation and Carbon Cycling During the Last Deglaciation: Evidence from the Arabian Sea."
- 2006 University of Colorado, Institute of Arctic and Alpine Research Graduate Student Seminar, "Searching for Earth's past climate in old mud: The process of deep sea sediment coring."
- 2006 University of Colorado, Institute of Arctic and Alpine Research Graduate Student Seminar, "Conversations with forams: interpreting past ocean conditions."
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