

JAMES M. FULTON

Assistant Research Professor
Baylor University
Department of Geology
One Bear Place #97354
james_fulton@baylor.edu; (254) 710-2158
www.fultonbiogeochemistry.weebly.com

EDUCATION

- PH.D.** **THE PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK, PA**
Department of Geosciences
Geosciences and Biogeochemistry dual degree (May 2010)
Dissertation: Interpreting Nitrogen Isotope Excursions in the Sedimentary Record
Advisors: Michael A. Arthur and Katherine H. Freeman
- M.A.** **BALL STATE UNIVERSITY, MUNCIE, IN**
Department of Educational Studies
Secondary Education (May 2000)
Teaching certification in Earth Science and Chemistry
- B.S.** **WHEATON COLLEGE, WHEATON, IL**
Department of Geology and Environmental Science
Geological Sciences (May 1997)

RESEARCH APPOINTMENTS

- 2013- **BAYLOR UNIVERSITY**
Assistant Research Professor—Department of Geology
- 2011-2013 **WOODS HOLE OCEANOGRAPHIC INSTITUTION**
Postdoctoral Investigator—Department of Marine Chemistry and Geochemistry
Supervisor: Benjamin Van Mooy
Projects: Membrane lipid dynamics in viral infection of *Emiliana huxleyi*
Degradation of intact polar lipids by natural populations of heterotrophic bacteria
- 2010-2011 **PENN STATE UNIVERSITY**
Postdoctoral Researcher—Biogeochemical Stable Isotopes Lab
Supervisor: Kate Freeman
Projects: C and N stable isotope analysis of scytonemin and coenzyme F430
Nitrogen isotope study of Permian-Triassic sediments
- 2003-2009 **PENN STATE UNIVERSITY**
Research Assistant—Department of Geosciences
Responsibilities:
Sample collection, preparation and analysis by EA-IRMS and HPLC-MSⁿ
Development of HPLC purification methods and nano-EA-IRMS methods
- 2005 **UNIVERSITY OF YORK, UK**
Visiting Researcher—Department of Chemistry
Host: Brendan Keely
Training in pigment analysis by HPLC-MSⁿ

TEACHING APPOINTMENTS

- 2014 BAYLOR UNIVERSITY
Lecturer—GEO1403: Environmental Geology
Coordinator—GEO5050: Geology Technical Sessions
- 2008 PENN STATE UNIVERSITY
Lab Instructor—GEOSC040: The Sea around Us
Teaching Assistant—GEOSC010: Geology of the National Parks
- 2002-2003 PENN STATE UNIVERSITY
Lab Instructor and Head TA—GEOSC020: Planet Earth
- 2000-2002 TALAWANDA HIGH SCHOOL, OXFORD, OH
Teacher—Comprehensive Science
- 2000 BALL STATE UNIVERSITY, MUNCIE, IN
Instructor—EDSEC150: Basic Concepts of Secondary Education
Instructor—EDSEC380: Principles of Teaching in Secondary Schools
- 1999 DELTA HIGH SCHOOL, MUNCIE, IN
Student Teacher—Earth Science, Physical Science

HONORS AND GRANTS

- 2013-2016 NSF EAR-1251946 “Tracing Aridity: Sedimentary Preservation of Scytonemin from Microbiotic Desert Soil Crusts” (Total \$251,000; Baylor \$188,334)
PI James Fulton and co-PI Benjamin Van Mooy
- 2010-2011 Pennsylvania Space Grant postdoctoral research grant
- 2009 PSU Krynine Fund Travel Grant—International Meeting on Organic Geochemistry
- 2009 PSU Biogeochemistry Dual Title Degree Program research fellowship
- 2009 2nd place oral presentation award, PSU Geosciences Graduate Student Colloquium
- 2005-2009 NSF EAR-0525464 “Assessing Microbial N Fixation in Ancient Euxinic Basins” to PI M. Arthur and co-PI K. Freeman (\$428,688).
As a Ph.D. student I contributed to developing this project, writing the proposal, and conducting and publishing research.
- 2008 Shell Oil Graduate Fund Travel Grant—AGU Fall Meeting
- 2008 1st place oral presentation award, PSU Geosciences Graduate Student Colloquium
- 2003-2006 NSF-IGERT “Biogeochemical Research Initiative for Education (BRIE)” fellowship
- 2005 Worldwide University Network Collaboration Grant—University of York, UK (\$5000)
- 2004 BRIE travel grant—AGU Fall Meeting
- 2004 BRIE student research grant (\$4000)

PEER-REVIEWED ARTICLES

- Fulton, J.M.**, Fredricks, H.F., Bidle, K.D., Vardi, A., Kendrick, B.J., DiTullio, G.R., and Van Mooy, B.A.S. Intact polar membrane lipids of *Emiliania huxleyi* during viral infection. (In review, Environmental Microbiology)

- Rose, S.L., **Fulton, J.M.**, Van Mooy, B.A.S. and Bidle, K.D. Isolation and characterization of lipid rafts in *Emiliania huxleyi*: a role for membrane microdomains in host-virus interactions (In review, Environmental Microbiology)
- Fulton, J.M.**, Arthur, M.A., and Freeman, K.H. (2012) Black Sea nitrogen cycling and the preservation of phytoplankton $\delta^{15}\text{N}$ signals during the Holocene. *Global Biogeochemical Cycles* **26**, GB2030, doi:10.1029/2011GB004196.
- Fulton, J.M.**, Arthur, M.A., and Freeman, K.H. (2012) Subboreal aridity and scytonemin in the Holocene Black Sea. *Organic Geochemistry* **49**, 47-55, doi:10.1016/j.orggeochem.2012.05.008.
- O'Neil, G.W., Carmichael, C.A., **Fulton, J.M.**, Goepfert, T.J., Knothe, G., Lau, C.P.L, Lindell, S., Mohammady, N.G-E., Van Mooy, B.A.S., and Reddy, C.M. (2012) Beyond fatty acid methyl esters: Expanding the renewable carbon profile with alkenones from *Isochrysis* sp. *Energy & Fuels* **26**, 2434-2441.
- Algeo, T., Henderson, C.M., Ellwood, B., Rowe, H., Elswick, E., Bates, S., Lyons, T., Hower, J.C., Smith, C., Maynard, B., Hayes, L.E., Summons, R.E., **Fulton, J.**, and Freeman, K.H. (2012) Evidence for a diachronous Late Permian marine crisis from the Canadian Arctic region. *GSA Bulletin* **124**, 1424-1448, doi:10.1130/B30505.1.
- Meyer, K.M., Macalady, J.L., **Fulton, J.M.**, Kump, L.R., Schaperdoth, I., and Freeman, K.H. (2011) Carotenoid biomarkers as an imperfect reflection of the anoxygenic phototrophic community in meromictic Fayetteville Green Lake. *Geobiology* **9**, 321-329.
- Polissar, P.J., **Fulton, J.M.**, Junium, C.K., Turich, C.T., and Freeman, K.H. (2009) Measurement of ^{13}C and ^{15}N isotopic composition on nanomolar quantities of C and N. *Analytical Chemistry* **81**, 755-763.

MANUSCRIPTS

- Fulton, J.M.**, Fredricks, H.F., Longnecker, K., and Van Mooy, B.A.S. Intact polar membrane lipid degradation in the North Atlantic. (In preparation, Organic Geochemistry)
- Fulton, J.M.**, Arthur, M.A., Keely, B.J., Thomas, R.B. and Freeman, K.H. C and N isotopes of bacterial pigments in redox-stratified basins. (In Preparation, Geobiology)

INVITED TALKS

- Feb. 2012 **Department of Geology, Kansas State University**, Manhattan, KS
Phytoplankton productivity in anoxic oceans
- Nov. 2010 **Chemical and Biological Signatures Group, PNNL**, Richland, WA
Biomarker pigments of cyanobacteria on land and in the oceans
- Oct. 2010 **Planetary Environments Lab., NASA Goddard Space Flight Center**, Greenbelt, MD
Detecting cyanobacteria in modern and ancient environments
- Feb. 2010 **Department of Geology, Baylor University**, Waco, TX
Organic geochemistry of pigments in the Black Sea and beyond
- Feb. 2009 **Department of Earth, Atmospheric and Planetary Sciences, MIT**, Cambridge, MA
Evaluating pigment-specific C and N stable isotopes as indicators of past N-fixation.

MEETING ABSTRACTS

- Fulton, J.M., Fredricks, H.F, Vardi, A., Kendrick, B.J., DiTullio, G.R., Bidle, K.D., and Van Mooy, B.A.S. Lipidome of the *Emiliania huxleyi*-coccolithovirus system in a changing ocean. ASLO Aquatic Sciences Meeting. New Orleans, LA. (Feb. 2013)

- Fulton, J.M., Fredricks, H.F., Vardi, A., DiTullio, G.R., Bidle, K.D., and Van Mooy, B.A.S. *Emiliana huxleyi* goes viral: Dynamic variation of intact polar lipids and alkenones. AGU Fall Meeting. San Francisco, CA. (Dec. 2012)
- Fulton, J.M., Longnecker, K., Fredricks, H.F., Van Mooy, B.A.S. Intact polar lipid degradation in the Sargasso Sea. Gordon Research Conference on Organic Geochemistry. Holderness, NH. (Aug. 2012)
- Fulton, J.M., Fredricks, H.F., Bidle, K.D., DiTullio, G.R., Vardi, A. and Van Mooy, B.A.S., Lipid-based mechanisms of viral infection and defense in *Emiliana huxleyi*. Aquatic Virus Workshop 6. Texel, The Netherlands. (Nov. 2011)
- Fulton, J.M., Bird, L.R., and Freeman, K.H., Coenzyme F430: A new approach to understanding methanotrophy in methane rich environments. Goldschmidt. Prague, Czech Republic. (Aug. 2011)
- Fulton, J.M., Freeman, K.H., Arthur, M.A., Kump, L.R., Keely, B.J., Chemocline and sedimentary pigment isotopes. Anaerobic Phototrophic Ecosystems workshop. Fayetteville, NY. (Oct. 2010)
- Fulton, J.M., Freeman, K.H. and Arthur, M.A., Compound-specific C and N isotope analysis of scytonemin, a cyanobacterial biomarker. Gordon Research Conference on Organic Geochemistry. Holderness, NH. (Aug. 2010)
- Fulton, J.M., Arthur, M.A., and Freeman, K.H., Scytonemin in Black Sea sediments. International Meeting on Organic Geochemistry (plenary talk). Bremen, Germany. (Sept. 2009)
- Fulton, J.M., Arthur, M.A., and Freeman, K.H., Hydrologic control on bacterial nitrogen fixation in the Holocene Black Sea. American Geophysical Union (AGU) Fall Meeting. San Francisco, CA. (Dec. 2008)
- Fulton, J.M. and Arthur, M.A., Lacustrine surface and deep water responses to historical deforestation. Geological Society of America, Northeast Section Annual Meeting. (March 2008)
- Fulton, J.M., Freeman, K.H., Keely, B.J., and Arthur, M.A., Sedimentary pigments and temporal changes in chemocline depth and N cycling in a meromictic lake (poster). International Meeting on Organic Geochemistry. Torquay, England. (Sept. 2007)
- Fulton, J.M., Polissar, P.J., Turich, C.T., and Freeman, K.H., Rapid nanomole-scale stable isotope measurements of N and C by *nanoEA* (poster). International Meeting on Organic Geochemistry. Torquay, England. (Sept. 2007)
- Fulton, J.M. and Arthur, M.A., Nitrogen isotopes and chemocline depth in stratified basins (poster). AGU Fall Meeting. San Francisco, CA. (Dec. 2006)
- Fulton, J.M. and Arthur, M.A., Nitrogen dynamics in the euxinic Holocene Black Sea. Biennial Meeting of the NASA Astrobiology Institute (poster). Boulder, CO. (April 2005)
- Fulton, J.M. and Arthur, M.A., Sedimentary N stable isotopes and variations in nutrient cycling in the Holocene Black Sea (poster). AGU Fall Meeting. San Francisco, CA. (Dec. 2004)

RESEARCH CRUISE PARTICIPATION

Massachusetts to Bermuda, North Atlantic, April-May 2012. R/V *Knorr*.
Sargasso Sea, North Atlantic, March 2011. R/V *Atlantic Explorer*.

MENTORING EXPERIENCE (undergraduate students)

2013	Jeremy Tagliaferre—WHOI part-time helper/Harvard University student
2010	Sharmila Giri—Penn State biology summer intern (Lipid analysis of coral larvae)
2009	Nisha Patel—Penn State astrobiology REU (Isotopic analysis of coenzyme F430)
2008-2010	Genevieve Ellsworth—Penn State sedimentary geology lab assistant (Several projects)
2007	Peter Linde—Penn State astrobiology REU (Scytonemin detection and isotopic analysis)
2007	Tricia Nardiello—Penn State biogeochemistry REU (Aquatic nitrogen cycle)

COLLABORATORS

Ben Van Mooy (WHOI); Jack Oviatt (Kansas State University); Kay Bidle (Rutgers University); Jack DiTullio (College of Charleston); Assaf Vardi (Weizmann Institute, Israel); Helen Fredricks (WHOI); Kate Freeman (Penn State); Mike Arthur (Penn State); Diane Newman, (Caltech); Thomas Algeo (University of Cincinnati); Brendan Keely (University of York, UK), Lee Kump (Penn State); Jenn Macalady (Penn State), Chris Junium (Syracuse University), Katja Meyer (Stanford University); Burt Thomas (USGS)

ACADEMIC SERVICE AND AFFILIATIONS

Proposal Reviewer	NASA Mars Fundamental Research Program (2012)
Manuscript Reviewer	Aquatic Microbial Ecology, Biogeosciences, Marine Ecology Progress Series, Organic Geochemistry
Student presentation judge	AGU Fall Meeting, ASLO Aquatic Sciences Meeting
Planning Committees	Penn State Environmental Chemistry Student Symposium Penn State Geosciences Graduate Student Colloquium
Memberships	American Geophysical Union, Geological Society of America, Association for the Sciences of Limnology and Oceanography