

CHANDRA M. RICHARDS

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EDUCATION

Ph.D. Soil Biogeochemistry, University of California, Berkeley Dec. 2016
Department of Environmental Science, Policy, & Management (ESPM) *Berkeley, CA*

B.S. Chemistry and B.S. Mathematics, The Pennsylvania State University 2009
Cum Laude, Schreyer Honors College, 2005-2009 *State College, PA*

RESEARCH EXPERIENCES

University of California, Berkeley, Department of ESPM

Graduate Research in Soil Biogeochemistry 2011 - 2016

- Developed an integrative understanding of sulfur redox cycling in the Pescadero Estuary
- Directed a year-long fieldwork sampling campaign of estuarine water and sediment
- Measured water quality parameters (DO, pH, H₂S) *in situ* and sediment conditions monthly
- Performed sediment reduction and oxidation experiments to mimic field conditions
- Measured water and sediment characteristics with ion chromatograph and spectrophotometry
- Analyzed large datasets using *ArcGIS* on spatial, depth-based, and temporal scales
- Linked experimental water conditions to the field and EPA criteria limits for aquatic life

The Pennsylvania State University, Department of Chemistry

Undergraduate Honors Research in Materials and Environmental Sciences 2006 - 2009

- Studied dissolution kinetics of covalent attachment of TFS hydroxyl groups to silica gel
- Performed condensation reactions of silica gel to hydrolyzed TFS molecule
- Quantified TFS chemisorbed to surface with high-resolution ¹⁹F solid-state NMR
- Calculated activation energy of condensation reaction for model systems

Honors Project in Environmental Chemistry 2005

- Designed project to measure lead in paint on Penn State buildings around campus
- Collected and analyzed samples using atomic absorption spectroscopy
- Verified that paint on Penn State buildings are in compliance with EPA regulations

PUBLICATIONS

- Richards, C. M.** and Pallud C. (2016). “Kinetics of sulfate reduction and sulfide precipitation rates in sediments of a bar-built estuary (Pescadero, California),” *Water Research*. **94**: 86-102.
- Richards, C. M.** (2016). “Biogeochemical Sulfur Cycling in the Bar-Built Pescadero Estuary: Interdisciplinary Investigations into Near-Annual Fish Mortality Events.” Doctoral Dissertation, University of California, Berkeley.
- Richards, C. M.**, van Puffelen, J., and Pallud C. (2017). “Effects of sediment resuspension on the oxidation of acid-volatile sulfides and release of metals (Fe, Mn, Zn) in estuarine sediments (Pescadero, CA).” In preparation for submission to *Environmental Toxicology and Chemistry*.
- Richards, C. M.**, Moal, O., and Pallud C. (2017). “Temporal evolution in water quality in a bar-built estuary (Pescadero, CA): Geochemical investigations of sulfur redox cycling as a main driver of poor conditions.” In preparation for submission to *Geochimica et Cosmochimica Acta*.
- Richards, C. M.** and Pallud C. (2017). “The predominance of sulfur geochemical redox cycling in a northern California bar-built estuary (Pescadero, CA).” In preparation for submission to *Marine Chemistry*.

ABSTRACTS

- Richards, C. M.** and Pallud C. (2015). “Spatio-temporal physical and geochemical characterization of a California bar-built estuary,” *Goldschmidt2015 Abstracts*, **2724**.
- Richards, C. M.** and Pallud, C. (2014). “Sulfur redox processes in littoral sediments of the intermittent Pescadero Estuary.” *Abstracts of Papers of the American Chemical Society*, **248**.
- Richards, C. M.** and Pallud C. (2014). “Microbial sulfate reduction in littoral sediments of the intermittent Pescadero Estuary,” *Goldschmidt2014 Abstracts*, **2071**.
- Richards, C. M.** and Pallud, C. (2013). “Environmental and biogeochemical controls of iron cycling on reduction rates in surficial aquatic sediments.” *Abstracts of Papers of the American Chemical Society*, **245**.
- Richards, C. M.**, Mueller, K. T., and Washton, N. M. (2009). “Kinetics and energetics of 3, 3, 3-(trifluoropropyl)dimethylchlorosilane condensation with silica gel.” *Abstracts of Papers of the American Chemical Society*, **237**.
- Richards, C. M.**, Stoffregen, S. A., and Jenks, W. S. (2008). “CHED 670-Computational estimates of energy barriers to pyramidal inversion of sulfur ylides.” *Abstracts of Papers of the American Chemical Society*, **235**.

INVITED LECTURES

Smithsonian Environmental Research Center Seminar, 2016. “Understanding the impacts of physical hydrodynamics on estuarine sediments, water quality, and near-annual fish kills in the bar-built Pescadero Estuary,” Edgewater, MD.

UC Berkeley, ESPM Seminar Series, 2016. “A biogeochemical study of sulfur cycling in the bar-built Pescadero Estuary: Interdisciplinary investigations into near-annual fish kills,” Berkeley, CA.

UC Berkeley, Climatology Seminar Series, 2015. “Hydroclimates: Biogeochemical impacts of flooding, drainage, and drought in California bar-built estuaries,” Berkeley, CA.

San Francisco State University, Romberg Tiburon Center Rosenberg Institute Seminar Series. 2015. “An interdisciplinary study of fish mortality events in the intermittent Pescadero Estuary,” Tiburon, CA.

PRESENTATIONS AT CONFERENCES

Richards, C. M. and Pallud C. (2015). “Spatio-temporal physical and geochemical characterization of a California bar-built estuary,” *Goldschmidt Conference*, Prague, Czech Republic, **Talk**.

Huber, E., Jankovitz, J., **Richards, C. M.**, Largier, J., Carlson, S.M., and Sloan, R. (2015). “California drought causes apparent loss of steelhead estuarine nursery habitat,” *American Fisheries Society California-Nevada Chapter meeting*, Santa Cruz, CA, **Talk**.

Richards, C. M. and Pallud C. (2014). “Microbial sulfate reduction and sulfide oxidation in littoral sediments of the intermittent Pescadero Estuary,” *Restore America’s Estuaries 7th National Summit on Coastal and Estuarine Restoration*, Washington, DC, **Talk**.

Richards, C. M. and Pallud C. (2014). “Safeguarding from Sulfide: Can Pescadero Estuary be restored?,” *Restore America’s Estuaries 7th National Summit on Coastal and Estuarine Restoration*, Washington, DC, **Sea Grant Association Best Student Poster**.

Richards, C. M. and Pallud C. (2014). “Sulfur redox processes in littoral sediments of the intermittent Pescadero Estuary,” *American Chemical Society 248th National Meeting & Exposition*, San Francisco, CA, **Talk**.

Richards, C. M. and Pallud C. (2014). “Microbial sulfate reduction in littoral sediments of the intermittent Pescadero Estuary,” *Goldschmidt Conference*, Sacramento, CA, USA, **Talk**.

Richards, C. M. and Pallud C. (2013). “Kinetics of microbial Fe(III) reduction in Colorado subalpine wetland soils,” *American Chemical Society 245th National Meeting & Exposition*, New Orleans, LA, **Poster**.

Richards, C. M., Washton, N., and Mueller, K. T. (2009). “Kinetics of 3,3,3-(trifluoropropyl)dimethylchlorosilane Attachment to Silica Gel,” *American Chemical Society 237th National Meeting & Exposition*, Salt Lake City, UT, **Poster**.

Richards, C. M., Stoffregen, S. A., and Jenks, W. S. (2008). “Computational Estimates of Energy Barriers to Pyramidal Inversion of Sulfur Ylides,” *American Chemical Society 235th National Meeting & Exposition*, New Orleans, LA, **Poster**.

TEACHING AND MENTORING EXPERIENCES

Research Supervisor, University of California, Berkeley Two masters' students, nine undergraduate students, one summer student	2012 - 2016
Public and Environmental Health Essay Grader, Touro University California	2013 - 2016
Graduate Student Instructor, University of California, Berkeley CHEM 182: Atmospheric/Physical Chemistry CHEM 1A: General Chemistry	2009 - 2011

ACADEMIC SERVICE AND OUTREACH ACTIVITIES

Search Committee, ESPM Wildland Watershed Hydrology Professor position	2014 - 2015
Consultant, San Francisco Bay Regional Water Quality Control Board	2013 - 2016
Consultant, Pescadero Estuary managers in USFWS and NOAA	2013 - 2016
Volunteer, San Francisco Renew the Zoo, Habitat conservation	2010 - 2016
Volunteer, Science Lions, to foster science interest in K-12 students	2007 - 2009

RESEARCH GRANTS, FELLOWSHIPS, AND AWARDS

ESPM Graduate Division Summer Grant, UC Berkeley	2013, 2014, 2016
James P. Bennett Agricultural Fund Award, UC Berkeley	2015
California Sea Grant Graduate Traineeship	2015
Sea Grant Association Best Student Poster, RAE-TCS Summit	2014
Bay Area Water Quality Fellowship, UC Berkeley	2013
ESPM Division of Ecosystem Sciences Grant, UC Berkeley	2012
John and Elizabeth Teas Scholarship, Department of Chemistry, Penn State	2008
Alumni Memorial Scholarship, Schreyer Honors College, Penn State	2005 - 2009
Braddock Scholarship, Eberly College of Science, Penn State	2005 - 2009
Bunton-Waller Scholarship, Penn State	2005 - 2009

PROFESSIONAL AFFILIATIONS

Geochemical Society	2014 - present
Iota Sigma Pi - Hydrogen Chapter, UC Berkeley	2010 - 2016
American Geophysical Union	2009 - present
American Chemical Society	2008 - present
Nittany Chemical Society, affiliated with American Chemical Society	2005 - 2009