

AMELIA N. (PAUKERT) VANKEUREN

California State University Sacramento, 6000 J Street, Sacramento, CA 95819-6043
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EDUCATION:

Columbia University, New York, NY

Ph.D., Earth and Environmental Sciences, August 2014

Dissertation: *Mineral Carbonation in Mantle Peridotite of the Samail Ophiolite, Oman: Implications for permanent geological carbon dioxide capture and storage*

M.Phil., Earth and Environmental Sciences, May 2012

M.A., Earth and Environmental Sciences, May 2010

University of Southern California, Los Angeles, CA

B.S., Geological Sciences, December 2006, Summa Cum Laude, Departmental Honors

B.A., International Relations, December 2006

POSTDOCTORAL TRAINING:

U.S. Dept of Energy National Energy Technology Laboratory, Pittsburgh, PA 2014-2015

Oak Ridge Institute for Science & Education Postgraduate Research Fellow

APPOINTMENTS:

California State University, Sacramento, CA

August 2015-present

Assistant Professor of Hydrogeology, Geology Department

U.S. DOE National Energy Technology Laboratory, Pittsburgh, PA

August 2015-present

Oak Ridge Institute for Science & Education Faculty Research Participant

PUBLICATIONS:

Peer-reviewed journal articles

Paukert, A.N., Matter, J.M., Kelemen, P.B., Shock, E.L., Havig, J.R., 2012. Reaction path modeling of enhanced *in situ* CO₂ mineralization for carbon sequestration in the peridotite of the Samail Ophiolite, Sultanate of Oman. *Chemical Geology* 330-331, 86-100.

Falk, E. S., Guo, W., **Paukert, A. N.**, Matter, J. M., Mervine, E. M., Kelemen, P. B., 2016. Controls on the stable isotope compositions of travertine from hyperalkaline springs in Oman: Insights from clumped isotope measurements. *Geochimica et Cosmochimica Acta*. June 2016, online ahead of print.

Esther, T. A., Hammond, D. E., Hautala, S. L., Paul Johnson, H., Schwartz, R. J., **Paukert, A. N.**, 2010. Evaluation of the budget for silicic acid in Cascadia Basin deep water. *Deep Sea Research Part I: Oceanographic Research Papers* 57(5), 677-686.

Conference proceedings

Paukert, A.N., Matter, J.M., Kelemen, P.B., Shock, E., Havig, J. CO₂ Capture and Storage in Peridotite Aquifers of the Samail Ophiolite, Sultanate of Oman. *Proceedings of the International Conference on the Geology of the Arabian Plate and the Oman Mountains*. Muscat, Oman. 01/08/12

Articles in preparation

Paukert, A.N., Hakala, J.A., Jarvis, K., in preparation. Mineral Reactions in Shale Reservoirs during Hydraulic Fracturing. For submission to *Environmental Science & Technology*.

Paukert, A.N., Matter, J.M., Stute, M., Kelemen, P.B., in preparation. Groundwater Ages in Peridotite Aquifers Within the Samail Ophiolite, Sultanate of Oman. For submission to *Journal of Hydrology*.

Phan, T., **Paukert, A.N.**, Hakala, J.A., in preparation. Effect of Water-Rock Interactions on the Isotopic Composition of Marcellus Shale Natural Gas Produced Waters. For submission to *Journal of Coal Geology*.

FELLOWSHIPS:

- NSF Graduate Research Fellow, 2010-2013
- Fulbright Fellow, Almaty, Kazakhstan, 2007-2008
- USC Trustee Scholar- academic scholarship for full tuition, 2002-2006

GRANTS AND AWARDS:

- Sacramento State Research and Creative Activity Faculty Award (2016)
- Sacramento State Provost's Research Initiative Fund (2015)
- Departmental Best TA Award, given by Columbia University Earth and Environmental Sciences Undergraduate Student Committee (2014)
- Geochemical Society Goldschmidt2013 Travel Grant (Summer 2013)
- Chevron Student Initiative Fund, group proposal (Fall 2012)
- Lamont Doherty Earth Observatory Climate Center grant (Spring 2012)
- Earth Institute Travel Grant (Fall 2011)
- Sara Langer Prize for contributions to academic and student life at LDEO (2011)
- USC Renaissance Scholar 2007 Prize Winner (\$10,000 towards graduate school)

RESEARCH EXPERIENCE:

Assistant Professor 2015 – present
California State University Sacramento, Sacramento, CA

Groundwater contamination from disposal of oil and gas wastewater. Geochemical reactions between aquifer formations and water during enhanced aquifer recharge for groundwater storage. Geochemical reactions within shale gas reservoirs during hydraulic fracturing.

Oak Ridge Institute for Science & Education Postdoctoral Fellow 2014 – 2015
National Energy Technology Laboratory, Pittsburgh, PA

Geochemistry of unconventional gas extraction with a focus on water-rock reactions within shale gas reservoirs and the potential for groundwater contamination. Involves field sampling, high pressure and temperature experimental work, reaction path modeling.

Graduate Research Fellow 2008 – 2014
Lamont-Doherty Earth Observatory, Palisades, NY

Evaluated prospects for permanent geological CO₂ storage in mantle peridotites using the Oman Ophiolite as a natural analog. Determined the timescale and limiting factors for natural CO₂ storage, and modeled methods for accelerating CO₂ sequestration. Involved remote field sampling, lab geochemical analyses, reactive transport modeling of CO₂ injection.

Fulbright Fellow 2007 – 2008
Institute for International Education, Almaty, Kazakhstan

Researched implementation of water rights treaties between Central Asian countries governing the Syr Darya River. Examined treaty terms and interviewed local farmers to investigate water consumption patterns and develop incentives for conservation.

Undergraduate Research

2004 – 2006

USC Department of Earth Sciences, Los Angeles, CA

Research cruise in the Cascadia Basin analyzing dissolved oxygen in the water column to determine method of exchange for basin water, help identify local silica plume source. Also worked on nutrient cycling in San Pedro Bay and residence time determination of water in beach sands.

PRESENTATIONS:

Invited talks

- Paukert, A.N.**, Hakala, J.A., Jarvis, K. What's going on down there? Fracking fluid reaction with shale gas reservoirs. Sacramento State's Geology-Ecology-Environmental Science Colloquium. Talk. 3/8/16.
- Paukert, A.N.**, Matter, J.M., Kelemen, P.B., Stute, M. Prospects for permanent geological CO₂ storage in mantle peridotite: lessons from the Oman ophiolite. University of Pittsburgh Department of Geology and Planetary Science Colloquium. Talk. 9/18/14.
- Matter, J.M., **Paukert, A.N.** (presenting author). Mineral carbonation in mafic and ultramafic rocks for enhanced Geologic carbon dioxide capture and storage. Le Studium Conference: Geochemical reactivity in CO₂ geological storage sites. Orleans, France. Talk. 02/26/13.

Professional meetings

- Paukert, A.N.**, Hakala, J.A., Jarvis, K. Hydraulic Fracturing Fluid Reaction with Shale in Experiments at Unconventional Gas Reservoir Conditions. American Geophysical Union Fall Meeting. San Francisco, CA. Poster. 12/17/15.
- Paukert, A.N.**, Hakala, J.A., Scheuermann, P., Lopano, C., Guthrie, G. Potential for Secondary Mineral Precipitation Down-Hole in Shale Gas Extraction Wells. American Association of Petroleum Geologists Annual Convention and Exhibition. Denver, CO. Poster. 6/3/15.
- Paukert, A.N.**, Matter, J.M., Kelemen, P.B. Timescales and rates for peridotite-groundwater reactions in the Samail Ophiolite, Oman. American Geophysical Union Fall Meeting. San Francisco, CA. Poster. 12/19/14.
- Paukert, A.N.**, Sonnenthal, E., Matter, J.M., Kelemen, P.B. Modeling reaction-driven cracking during mineral carbonation in peridotite for CO₂ sequestration. American Geophysical Union Fall Meeting. San Francisco, CA. Talk. 12/10/13.
- Paukert, A.N.**, Matter, J.M., Kelemen, P.B., Sonnenthal, E. Reactive transport modeling to assess geological CO₂ storage via mineral carbonation in peridotite. Goldschmidt2013. Florence, Italy. Poster. 08/27/13.
- Paukert, A.N.**, Matter, J.M., Kelemen, P.B., Marsala, P., Shock, E. Carbonation of mantle peridotites: implications for permanent geological CO₂ capture and storage. American Geophysical Union Fall Meeting. San Francisco, CA. Poster. 12/04/12.
- Paukert, A.N.**, Matter, J.M., Kelemen, P.B., Shock, E., Havig, J. CO₂ Capture and Storage in Peridotite Aquifers of the Samail Ophiolite, Sultanate of Oman. International Conference on the Geology of the Arabian Plate and the Oman Mountains. Muscat, Oman. Poster. 01/08/12.
- Paukert, A.N.**, Matter, J.M., Kelemen, P.B., Shock, E., Havig, J. Prospects for Enhancing *In Situ* CO₂ Mineralization in the Peridotite Aquifer of the Samail Ophiolite. American Geophysical Union Fall Meeting. San Francisco, CA. Poster. 12/09/11.

Public lectures

Paukert, A.N. Geology rocks! Life as a field scientist. K.I. Jones Elementary School.
Presentation for 6th grade classes. Talk. 12/19/13.

Paukert, A.N. Mitigating Climate Change: What can we do about CO₂? Lamont-Doherty Earth
Observatory Open House Lecture. Talk. 10/06/12.

TEACHING EXPERIENCE:

Professor of Geology August 2015- present

California State University Sacramento

Undergraduate courses: Hydrogeology, Geology of Mexico (lecture and laboratory section),
Physical Geology, Structural Geology Field, Geological Field Trip

Graduate courses: Advanced Hydrogeology

TEACHING EXPERIENCE (CONTINUED):

Mentor for undergraduate students Spring 2016

California State University Sacramento

Mentored three undergraduate students, and trained them in water well monitoring methods

Mentor for undergraduate students Summer 2014

Lamont-Doherty Earth Observatory, Palisades, NY

Mentored two Barnard College undergraduates and trained them in geochemistry lab
practices such as gas chromatography and CO₂ extraction for radiocarbon dating

Teaching Assistant

Columbia University, New York, NY

Field Geology - led week-long field trip for senior undergraduates to Barbados Spring 2014

Taught laboratory sections for the following classes:

Hydrology- Masters in Environmental Science Policy course Summer 2010

Climatology - Masters in Environmental Science Policy course Summer 2010

Climate Systems – undergraduate course Spring 2010

Solid Earth Systems – undergraduate course Fall 2009

New York Academy of Science Education Fellow Fall 2011

New York Academy of Science, New York, NY

Led Earth Science club in afterschool program for groups traditionally underrepresented in
the STEM fields. Included two curriculum workshops on teaching and mentoring techniques

Earth Science Curriculum Developer Spring 2003

Southern California Earthquake Center, Los Angeles, CA

Worked as a member of the Community, Education, and Outreach team to develop geology
lesson plans for USC undergraduates to teach in local neighborhood classrooms

SERVICE AND OUTREACH:

- Scientist for Dinner with a Scientist (2015, 2016)
- American Geophysical Union Fall Meeting Session Convener and Chair (2013, 2015)
- CSUS Geology Department Graduate Advisory Committee
- CSUS Geology Department Assessment Committee
- CSUS Geology Department Budget Committee
- CSUS Geology Department Scholarship Committee
- CSUS Geology-Ecology-Environmental Science Colloquium Steering Committee

- Manuscript reviewer for *Geochimica et Cosmochimica Acta*, *Applied Geochemistry*, *Mineralogical Magazine* (2014)
- NETL Groundwater Liaison - National Risk Assessment Partnership for CO₂ storage (2014)
- Lamont-Doherty Earth Observatory Colloquium Steering Committee (2013 – 2014)
- Columbia Department of Earth and Environmental Science (DEES) Graduate Student Committee Chair (2010–2012)
- Lamont-Doherty Earth Observatory Open House volunteer (annually 2008 – 2012)
- Columbia DEES graduate student fieldtrip co-leader (summer 2010, 2011)
- Women in Science at Columbia – Girls Science Day volunteer (annually 2009, 2010)

PROFESSIONAL ORGANIZATIONS:

American Geophysical Union American Association of Petroleum Geologists
National Association of Geoscience Teachers CSU Water Resources and Policy Initiatives
Groundwater Resources Association of California

PROFESSIONAL TRAINING:

Service Learning Faculty Learning Community	2016
<i>California State University Sacramento</i>	
Class on how to incorporating service learning into a course curriculum. At the end of the course I will have developed a syllabus that integrates service learning into my Hydrogeology class.	
Center for Teaching and Learning Summer Teaching Institute	Summer 2016
<i>California State University Sacramento</i>	
Summer workshop to redesign a course (Advanced Hydrogeology) and improve it by better incorporation of technology, equity, and student engagement in class.	
Preparing for an Academic Career Workshop	Summer 2014
<i>National Association of Geoscience Teachers, Pittsburgh, PA</i>	
Workshop on preparing to become a professor, including instruction on course design with an emphasis on active, experiential learning	
Scientists Teaching Science Workshop	Spring 2013
<i>New York Academy of Science, New York, NY</i>	
Workshop on improving teaching techniques, course objectives, and active learning	
Media Training Workshop	Fall 2012
<i>Columbia University Earth Institute, New York, NY</i>	
Communication Workshop	Spring 2012
<i>Inter-University Student Initiative in Carbon Sequestration, New York, NY</i>	
The Craft of Scientific Presentations	Fall 2011
<i>New York Academy of Sciences, New York, NY</i>	
Teaching and Learning Concepts in Earth Science course	Spring 2010
<i>Teachers College, Columbia University, New York, NY</i>	
Semester-long course on how to teach an introductory level undergraduate class. Designed a Pedagogical Content Knowledge guide that included learning goals, learning performances, assessments, inquiry experiences, field trips, laboratory exercises, and representations (maps, models, etc.) for a course of my choosing (Groundwater Resources)	

REFERENCES:

Juerg Matter, Ph.D., Reader in Geoengineering, Department of Ocean and Earth Science
National Oceanography Centre Southampton, University of Southampton, UK
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J. Alexandra Hakala, Ph.D., Research Geochemist and Biogeochemistry Team Lead, Office of
Research and Development, National Energy Technology Laboratory, Pittsburgh, PA
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