

SARAH A. TRUEBE

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EDUCATION

University of Arizona, Tucson, AZ

Ph.D. Paleoclimatology, Geosciences, Minor: Global Change, expected May 2014
Advisors: Julia Cole & Jonathan Overpeck.
Committee: Jay Quade, Joellen Russell, Andrew Comrie, Andrew Cohen. GPA: 4.0
Title: *Past climates, modern caves, and future resource management in speleothem paleoclimatology*

Stanford University, Stanford, CA

M.S. Climate Change & Human/Environment Interaction, Earth Systems Program, June 2007
Advisor: Julie Kennedy. GPA: 4.015

B.S. Earth Science and Global Change, Earth Systems Program, June 2007
With Distinction
With Interschool Honors in Environmental Science, Policy, and Technology
Phi Beta Kappa
Advisors: Peter Vitousek, Robert Dunbar. GPA: 3.985
Honors thesis title: *The Paleocology of Benson Pond: Climate, Disturbance, and Human Interaction with the Biological Earth System*
Coursework: Geology, Biogeochemistry, Ecology, Climate Change, Oceans Science, Economics, Energy Resources, Public Policy, Anthropology, Land Management, Remote Sensing

AWARDS, HONORS, FELLOWSHIPS, & GRANTS

Awards

College of Science Service Award, University of Arizona (Roy P. Drachman Galileo Circle Scholarship)	\$1000	04/2013
Department of Geosciences Service Award, University of Arizona	\$100	03/2013
Best Poster, Arizona Geological Society	\$500	04/2012
Best Poster, 40 th Annual GeoDaze Symposium, University of Arizona	\$500	03/2012
Young Karst Researcher Prize, International Association of Hydrogeologists, Karst Hydrology and Ecosystems Conference, 7-9 June 2011, Bowling Green, KY		06/2011
Galileo Circle Scholar, University of Arizona	\$1000	06/2010
Best Environmental Sciences Talk, 37 th Annual GeoDaze Symposium, UA	\$300	03/2009
Earth Systems Award for Undergraduate Academic Excellence, Stanford		06/2006
The Rhoda Goldman Award for Outstanding Honors Thesis, Stanford		06/2006
Outstanding Woman Geoscientist of 2006 (Stanford), Association of Women Geoscientists, Bay Area, CA		06/2006
Phi Beta Kappa, Beta Chapter of California, Stanford University		06/2005
President's Award for Academic Excellence in the Freshman Year, Stanford		06/2003

Fellowships

Philanthropic Educational Organization Scholar Award, PEO International	\$15,000	03/2011
National Defense Science and Engineering Graduate Research Fellowship, US Department of Defense (includes tuition waiver, health insurance, stipend)	~\$100,000	03/2009
Science Foundation Arizona Graduate Research Fellowship, UA	~\$30,000	03/2008

Grants from External Agencies

Arizona Board of Regents Doctoral Research Grant	\$5000	10/2012
Association of Women Geoscientists Takken Travel Award to Fall 2011 AGU Meeting	\$500	09/2011
Science Foundation Arizona Travel Grant to PAGES YSM/OSM in Corvallis, OR	\$500	05/2009

University Grants for Research and Travel

Global Change (PhD Minor Program) Dissertation Improvement Grant	\$1000	05/2013
Herbert E. Carter Travel Grant to attend Fall 2012 AGU Meeting (<i>declined</i>)	\$600	09/2012
Institute of the Environment Travel Grant to the Belize Archaeology and Anthropology Symposium, Belize City, Belize	\$500	06/2012
Institute of the Environment Travel Grant to The Karst Record 6 th Annual Conference on Climate Change, Birmingham, UK	\$500	06/2011
Sulzer Scholarship for summer research, University of Arizona Geosciences	\$500	05/2011
Kartchner Caverns Scholarship for summer research, University of Arizona, Geos.	\$809	05/2011
Graduate and Professional Student Council Travel Grant to Fall 2010 AGU Meeting	\$500	10/2010
Global Change (PhD Minor Program) Dissertation Improvement Grant for summer expenses, including fieldwork, travel to CCSM Tutorial, lab supplies, etc.	\$1000	05/2010
Maxwell Short Scholarship for summer research, University of Arizona Geosciences	\$552	05/2010
Wilson Thompson Scholarship for summer research, University of Arizona, Geos.	\$639	05/2009
Stanford Earth Systems Program Travel Grant to attend the 2007 INQUA Conference in Cairns, Australia	\$2500	07/2007
Stanford Undergraduate Advising and Research Program Travel Grant to 2007 AGU Meeting in Acapulco, Mexico	\$970	05/2007
Stanford McGee Grant in Earth Sciences awarded to geosciences students for pioneering research work	\$850	06/2006
Stanford University United Postal Service Grants to the Earth Systems Program for honors thesis research expenses	\$1000	05/2005
Stanford University United Postal Service Grants to the Earth Systems Program for honors thesis research expenses	\$500	05/2004

Scholarships

George N. Huppert Scholarship for attendance and lodging at the National Cave and Karst Management Symposium, Carlsbad, NM		08/2013
National Cave Rescue Commission scholarship to attend the Weeklong Training (<i>declined</i>)	\$250	04/2013
Southwestern Region Scholarship (National Speleological Society) to attend the National Cave Rescue Commission Weeklong Training	\$599	04/2012
George N. Huppert Scholarship for attendance and lodging at the National Cave and Karst Management Symposium, Midway, UT		08/2011
Chuck and Roberta Katz Scholarship for Earth Science Students, Stanford		2004-2006
Friends of Music Scholarship for private flute lessons		2003-2007

PUBLICATIONS

Peer-reviewed publications

Published:

- Payne, J.L., **Truebe, S.**, Nützel, A., Chang, E.T. 2011. Local and global abundance associated with extinction risk in late Paleozoic and early Mesozoic gastropods. *Paleobiology* **37**(4): 616-632.
- Truebe, S.A.**, Ault, T.R., Cole, J.E. 2010. A forward model of cave dripwater $\delta^{18}\text{O}$ and application to speleothem records. *IoP Conference Series: Earth and Environmental Science* **9**(1): doi: 10.1088/1755-1315/9/1/012022.

In Prep:

Truebe, S.A., Cole, J.E., Barnett, H., Henderson, G., Wagner, J.D.M., and Hlohowskyj, S.R. *In prep.* Spatial heterogeneity of speleothem records of North American monsoon rainfall: cave or climate? For submission to *Nature Geoscience*.

Truebe, S.A., Arora, M., and Comrie, A.C. *In prep.* Epidemiology of Wilderness Search and Rescue in Tucson, Arizona. For submission to *Wilderness and Environmental Medicine*.

Other publications

Truebe, S.A., Cole, J., Lee, M., and Barnett, H. 2012. Reconciling speleothem sampling for paleoclimate research with cave conservation. *National Cave and Karst Management Symposium Proceedings 2011*: 149-153.

Newsletters & magazine articles

Truebe, S.A. 2012. Onyx Cave Water Monitoring Project Update #2: Preliminary Cave Microclimate Data. *Desert Caver* **41**. Tucson, AZ.

Truebe, S.A. 2009. Onyx Cave Water Monitoring Project Update #1: Setup and Project Motivation. *Desert Caver* **39**. Tucson, AZ.

Web content

Truebe, S.A. 2011. Welcome back to “Wind-ter”: the Winter 2011-2012 Outlook for the Southwest. *Southwest Climate Blog*, Climate Assessment for the Southwest (CLIMAS). Available online: <http://www.southwestclimatechange.org/blog/13182>.

Truebe, S.A. 2011. The North American (paleo)monsoon: What can the last few thousand years tell us about our future? *Southwest Climate Blog*, Climate Assessment for the Southwest (CLIMAS). Available online: <http://www.southwestclimatechange.org/blog/12325>.

Truebe, S.A. 2010. Climate Models Versus Weather Models: Different Approaches for Different Needs. *Southwest Climate Blog*, Climate Assessment for the Southwest (CLIMAS). Available online: <http://www.southwestclimatechange.org/blog/9601>.

Truebe, S.A. 2010. The Southwest Monsoon Under Climate Change: What the Models Tell (and Don't Tell) Us. *Southwest Climate Blog*, Climate Assessment for the Southwest (CLIMAS). Available online: <http://www.southwestclimatechange.org/blog/9674>.

PRESENTATIONS

Conference presentations

Truebe, S., Cole, J., Ault, T., Kimbrough, A., Henderson, G., Hlohowskyj, S. 2013. Heterogeneity in speleothem records of North American monsoon rainfall. WiscSIMS High Resolution Proxies of Paleoclimate Workshop, Madison, WI. 23-26 June 2013.

Truebe, S., Cole, J., Ault, T., Kimbrough, A., Henderson, G., Barnett, H., and Hlohowskyj, S. 2013. Cave or climate? Heterogeneity in speleothem records of North American monsoon rainfall. 41st Annual GeoDaze Symposium, Dept. of Geosciences, University of Arizona, AZ. 12-13 Apr 2013.

Truebe, S.A., Cole, J.E., Ault, T.R., Kimbrough, A.K., Henderson, G.M., Barnett, H., and Hlohowskyj, S.R. 2012. Heterogeneity of speleothem records of North American monsoon rainfall: Cave or climate? American Geophysical Union Fall Meeting 2012, Sa Francisco, CA. Abstract GC33D-1050 (poster).

Truebe, S., Cole, J., Barnett, H., Henderson, G., Wagner, J.D.M., and Hlohowskyj, S. 2012. How important is isotopic equilibrium for paleoclimate records from caves? A case study from Southern Arizona. 40th Annual GeoDaze Symposium, Dept. of Geosciences, University of Arizona, AZ. 29 Mar – 1 Apr 2012 (poster).

Truebe, S.A., Cole, J., Barnett, H., Henderson, G., and Wagner, J. 2011. Is isotopic equilibrium important for speleothem climate records? A case study of rainfall reconstruction from Cave of the Bells, AZ, USA. American Geophysical Union Fall Meeting 2011, Abstract PP22B-08, San Francisco, CA, 5-9 Dec.

Truebe, S.A., Cole, J., Lee, M., and Barnett, H. 2011. Reconciling speleothem sampling for paleoclimate research with cave conservation. National Cave and Karst Management Symposium, 3 -7 October 2011. Midway, UT (poster).

- Truebe, S.A.**, Cole, J.E., Ault, T.R., Barnett, H., Henderson, G. 2011. Holocene climate variability in Southern Arizona: a new speleothem record from Cave of the Bells (or) How important is isotopic equilibrium? Climate Change: The Karst Record, 6th Conference, 27 -29 Jun 2011. Birmingham, UK (poster).
- Truebe, S.A.**, Ault, T.R., Cole, J.E. 2011. A process model of cave dripwater $\delta^{18}\text{O}$ values: A test of reconstructing decadal variability in speleothem climate records. 2011 International Conference on Karst Hydrogeology and Ecosystems. 7-9 June 2011, Bowling Green, KY.
- Truebe, S.A.**, Cole, J.E., Ault, T.R., Barnett, H., Henderson, G. 2011. Holocene climate variability in Southern Arizona: a new speleothem record from Cave of the Bells. 39th Annual GeoDaze Symposium, Dept. of Geosciences, University of Arizona, AZ. 30 Mar – 1 Apr 2011.
- Truebe, S. A.**, Ault, T.R., and Cole, J.E. 2010. Can caves capture decadal climate variability? Evaluating uncertainty in cave speleothem $\delta^{18}\text{O}$ records using a simple process model. American Geophysical Union Fall Meeting 2010, San Francisco, CA. Abstract PP43A-1649 (poster).
- Truebe, S.A.**, Ault, T.R., and Cole, J.E. 2009. The Progression of Precipitation: A scale analysis of controls on oxygen isotopic variability in caves of the Southwest. PAGES 1st YSM & 3rd OSM. 6-11 July, 2009, Corvallis, OR (poster).
- Truebe, S.A.**, Ault, T.R., and Cole, J.E. 2009. The Progression of Precipitation: A model of oxygen isotope variability in caves of the Southwest. 37th Annual GeoDaze Symposium, Dept. of Geosciences, University of Arizona, AZ.
- Truebe, S.A.**, Oswald, W.W., Foster, D.R., and Doughty, E. 2007. Lake Sediment Evidence for Variation in Mid-Holocene Climate and Vegetation in Western Massachusetts, Eos Trans. AGU 88(23), Jt. Assem. Suppl. Abstract PP43C-01 (poster).
- Truebe, S.A.** 2005. Mid-Holocene Vegetation and Climate Change in New England. 13th Annual Harvard Forest Summer Research Symposium, Harvard Forest, Harvard University, MA.
- Truebe, S.A.** 2004. Investigating links between climate and the Mid-Holocene Tsuga decline. 12th Annual Harvard Forest Summer Research Symposium. Harvard Forest, Harvard University, MA.

Presentations by collaborators (* denotes undergraduate presenter)

- Bechtel, T., Hedden, C., Mizer, J.D., Bellmann, U., **Truebe, S.**, Dresang, K., Bechtel, E. 2012. In-Cave and Surface Geophysics to Detect a “Lost” River in the Upper Levels of the Mammoth Cave System, Kentucky. 39th International Association of Hydrogeologists Annual Meeting. 16-21 Sept 2012. Niagara Falls, NY.
- Murray, R., Cole, J., and **Truebe, S.** 2012. Long-term climate cycles and seasonal precipitation balance in Arizona: Evidence from a speleothem oxygen isotope record. 40th Annual GeoDaze Symposium, Dept. of Geosciences, University of Arizona, AZ. 29 Mar – 1 Apr 2011.
- *Hernandez, E., Stokes, P.J., Zumbusch, J., Flessa, K.W., Leon, M., **Truebe, S.**, Murray, K., and Conway, N. 2012. Digging for the next generation of geologists: The effectiveness of Saturday Science Academy. 40th Annual GeoDaze Symposium, Dept. of Geosciences, University of Arizona, AZ. 29 Mar – 1 Apr 2011 (poster).
- Ault, T.R., Kimbrough, A., McKay, N., **Truebe, S.**, and Cole, J. 2011. Monte-Carlo Age-model Families for Interpretation and Analysis (MAFIA): New tools for paleoclimate studies. 39th Annual GeoDaze Symposium, Dept. of Geosciences, University of Arizona, AZ. 30 Mar – 1 Apr 2011.
- *Hernandez, E.N., Stokes, P.J., Levine, R., Fuhrman, M., Flessa, K., Leon, M., **Truebe, S.**, Murray, K., and Conway, N. 2011. Digging for the Next Generation of Geologists: the Effectiveness of Saturday Science Academy. 39th Annual GeoDaze Symposium, Dept. of Geosciences, University of Arizona, AZ. 30 Mar – 1 Apr 2011 (poster).
- *Saenz, N., Ash, J., Stokes, P., **Truebe, S.**, Murray, K., and Sternberg, B. 2010. Saturday Science Academy at the University of Arizona: An opportunity to assess the effects of earth science outreach on Tucson’s students. 38th Annual GeoDaze Symposium, Department of Geosciences, University of Arizona, AZ (poster).

Public lectures & talks

Scientific Poster Presentations: How I went from really bad to...better. Society of Earth Science Students

(Geoscience undergraduate club). Tucson, AZ. 1 February 2013. Invited.
Preliminary Isotope Hydrology of Kartchner Caverns. Arizona Regional Association of the National Speleological Society Winter Technical Talks and Papers. 26 Jan 2013. Invited.
How can we learn about the past 7000 years of monsoon history? Philanthropic Educational Organization, 18 Jan 2012. Tucson, AZ. Invited.
How can we learn about the past 7000 years of monsoon history? Menudo Society, 14 Sept 2011. Tucson, AZ. Invited.
A history of the North American monsoon. School of Social & Behavioral Sciences Annual Retreat. 27 April 2011. Tucson, AZ. Invited.
A tale of two caves (or) One climate to rule them, one climate to bind them. Arizona Regional Association of the National Speleological Society Winter Technical Talks and Papers. 29 Jan 2011. Invited.
Southern Arizona Hydrology and Dripwater Geochemistry. Arizona Regional Association of the National Speleological Society Winter Technical Talks and Papers. 30 Jan 2010. Invited.

RESEARCH EXPERIENCE

RESEARCH INTERESTS: Paleoclimatology, monsoons, fire, drought, deserts, cave systems, cave geology, isotope geochemistry, global change, human-environment interaction, terrestrial biogeochemistry, earth systems science, technical rescue science, wilderness rescue epidemiology

- Belize Cave Research Project: Researcher**, University of California - Merced 2012
 Reconnoitered 6 caves in central and northern Belize for future paleoclimate research
 Assisted archaeologists led by Dr. Holley Moyes in surveying human usage of Belize caves
 Provided medical support as needed in remote jungle settings
- Cole (Cave/Carbonate) Lab: Graduate Research Assistant**, Geosciences, UA 2008-pres.
 Monitoring up to 7 Arizona caves, collecting dripwater and modern calcite for isotopic analysis.
 Obtained and processed speleothem cores for U/Th dating and oxygen isotopic analysis.
 Model water flow processes and map subsurface geology at cave locations.
 Helped supervise undergraduates (Alena Kimbrough, Lou Shanley, Sydnie Lemieux, Yadi Wang).
- Overpeck (Environmental Studies) Lab: Graduate Research Assistant**, Geosciences, UA 2008-pres.
 Collected sediments from Arizona lakes for monsoon variability research.
 Developing and assessing speleothem paleoclimatology methods nationally and internationally.
- Payne (Paleobiology) Lab: Research Assistant & Lab Manager**, Geological and Environmental Sciences, Stanford University 2007-08
 Researched Mollusc evolution (of body size), mass extinction events, and diversity.
 Processed samples for isotope analysis.
 Assisted graduate students with research goals.
 Compiled, maintained, and analyzed a database of Permian-Jurassic gastropods using Filemaker Pro, SAS (Statistics), and SigmaPlot 11.0.
 Helped supervise high school student interns (Warren Ou, Kendrick Diaz).
- Vitousek (Ecosystem Ecology) Lab: Student Researcher**, Biological Sciences, Stanford 2006-08
 Wrote successful proposal for individual work in Hawai'i: "Macrofossil analysis at tree line on Maui, HI: Tropical Environmental Change."
 Collected leaf material from Maui and the Big Island across precipitation and temperature gradients.
 Supervised and mentored an undergraduate student (Daniel Block) who helped complete labwork for the project.

Independent Project (Paleobotany): Student Researcher , Centre for Marine Studies, University of Queensland, Australia	2006
Collaborated with Dr. Mike Pole to collect and use modern leaf litter from climatically dissimilar sites in NE Australia in conjunction with paleoclimate models to “forecast” modern climate and test the usefulness of paleobotany/paleoclimate models.	
Harvard Forest: NSF Research Experience for Undergraduates Intern , Harvard Forest, Petersham, MA (summers only)	2004-05
Investigated paleoecological change at the Harvard Forest using lake sediment cores Worked one-on-one with Dr. Wyatt Oswald Processed and analyzed lake sediments for pollen, charcoal, and organic content. Synthesized pollen data and reconstructed vegetation/climate for the Holocene Epoch. Presented research annually at the Harvard Forest Research Symposium.	
National Weather Service Intern , Tucson, AZ	2002
Shadowed NWS scientists once a week to understand the nature of forecast meteorology. Worked one-on-one with Dr. David Bright investigating the strengths and weaknesses of weather forecast models in arid regions such as southern Arizona.	
Maya Research Program: Volunteer , Blue Creek, Belize (summers only)	2001-03
Excavated Maya House mounds, quarry refuse piles, and other architecture. Surveyed in small groups with TDS, EDM, and GPS technologies to understand locations of structures on the landscape and the nature of interactions between hinterland areas and site centers.	

TEACHING & MENTORING EXPERIENCE

Courses Developed

Co-developed graduate seminar: <i>Paleoclimate Studies in Caves</i> with Dr. Jay Quade, University of Arizona (6 graduate students)	01-05/2011
Co-designed and delivered weeklong seminar on <i>Global Change and Health</i> , Sophomore Fellows Program, Stanford University	03/3004

Invited lectures given

<u>Expert Climate Panelist for “The Global Warming Debate”</u> , Earth: From Birth to Death (GEOS 170A1, Dr. Kapp), University of Arizona	04/2013
<u>Paleoclimatology</u> , Paleontology (GEOS 308, Drs. Flessa and Schmidt), University of Arizona	11/2012
<u>Speleothem Geochemistry</u> , Stable Isotopes in Paleoclimatology (GEOS 466/566, Drs. Quade and Dettman), University of Arizona	11/2012
<u>Mass Extinctions and Global Change</u> , <u>Biology and Global Change</u> (ES 111, Drs. Vitousek and Arrigo), Stanford University	03/2007

Teaching Assistantships

Teaching Associate, <i>Global Change</i> (GEOS 478/578), University of Arizona Grade exams and homework, lead discussion sections (50 grad/undergrad majors)	08-12/2013
Teaching Associate, <i>Life on Earth</i> (GEOS 170C), University of Arizona Grade exams and homework, judge participation (300 undergraduate non-majors)	01-05/2013
Teaching Associate, <i>Paleontology</i> (GEOS 308), University of Arizona Teach labs, grade labs, teach review sessions (50 undergraduate majors)	08-12/2012
Teaching Assistant, <i>Field Studies in Earth Systems</i> (ES 189), Stanford University Coordinate field activities, lead geology lectures and experiments (13 graduates)	03-06/2007
Teaching Assistant, <i>Introduction to Earth Systems</i> (ES 10), Stanford University Teach discussion sections, design and grade all homeworks, exams (150 undergraduates)	01-03/2007

Teaching Assistant, *Introduction to Earth Systems* (ES 10), Stanford University 01-03/2006
 Teach discussion sections, design and grade all homeworks, exams (150 undergraduates)

Course Assistantships

Course Assistant, *Biology and Global Change* (ES 111), Stanford University 01-03/2007
 Lead review sessions, grade homeworks and exams (30 undergraduate students)

Other Instruction

Assistant Instructor, Personal Rope Skills, Southern Arizona Rescue Assn., Tucson AZ 06/2013
 Lead Instructor, Cave Rescue, Southern Arizona Rescue Assn., Tucson, AZ 06/2013
 Assistant Instructor, Basic Training, Southern Arizona Rescue Assn., Tucson, AZ 2012-13
 Workshop teacher to 5th grade students, Sunrise Elementary, Tucson, AZ 2011
 Workshop leader, Earth Sciences Saturday Academy, Geosciences, University of Arizona 2009
 Flute Teacher to K-12 students, Tucson, AZ and Stanford, CA 1997-2004

Advisees (* denotes co-advised)

*Yadi Wang: UA student (from China), assisting in mass spec sample prep and cave fieldwork 2012-13
 *Sydnie Lemieux: UA Honors student, assisting in cave sample processing and cave fieldwork 2012-13
 *Lou Shanley: UA Honors student, cave sample processing & fieldwork, independent project 2012-13
 *Angelina Uribe: UA student, now graduated taking time off before grad school 2012
 Jeanine Ash: UA student, now at University of California - Los Angeles (PhD) 2008-10
 *Alena Kimbrough: UA student, now at Australian National Uni., Canberra, Australia (PhD) 2008-11
 Kendrick Diaz: High school student intern, Payne Paleobiology Lab, Stanford 2008
 Daniel Block: Assisted with Hawaii leaf sample processing, Stanford 2007
 Warren Ou: High school student intern, Payne Paleobiology Lab, Stanford 2007

Other Mentoring

Resident Assistant, Twain House, Stanford University 2004-05
 Peer Academic Advisor, Stanford University 2003-04

FIELD EXPERIENCE

Projects led

Cave systems and paleoclimate reconstruction at Kartchner Caverns, Arizona 2010-pres.
 Sampled 1 speleothem for paleoclimate reconstruction (9-11/2012)
 Sampled 6 speleothems with a small core bit for U-Th dating (2/2010)
 Continue ongoing dripwater monitoring program (2010-present)

Southern Arizona Cave Monitoring Project 2009-2013
 Led monthly trips to 2-7 caves in southern Arizona
 Trained assistants to help sample dripwaters and modern calcite in rigorous cave environment
 Rigged all drops, trained assistants on vertical single rope techniques, etc.
 Removed all reptiles and other wildlife occupying cave entrances

North American monsoon variability over the last 6000 years Summer 2010
 Reconnoitered for a lake study on past rainfall variation in Arizona
 Funded by a Maxwell Short Scholarship, Geosciences, University of Arizona

Macrofossil analysis at tree line on Maui, HI: Tropical Environmental Change Summer 2006
 Helicoptered and backpacked at tree line on Maui
 Collected leaves from tree canopy with slingshot method
 Funded by a McGee Grant in the Earth Sciences, Stanford University

Projects assisted

Belize Cave Research Project, Belize	Summer 2012
El Niño variability from lakes, Galapagos Islands, Ecuador	Autumn 2009
Harvard Forest, Harvard University, Petersham, MA, USA	Summer 2005
Harvard Forest, Harvard University, Petersham, MA, USA	Summer 2004
Maya Research Program, Blue Creek, Belize	Summers 2001-2003
High Guadalupe Mountains Cave Restoration Project, NM, USA	Summer 2000

Non-academic field experience

Search and Rescue Volunteer, Southern Arizona Rescue Association	2010-pres.
Devoted hundreds of volunteer hours to master technical disciplines including: rope, cave, mine, swiftwater, alpine rescue, etc.	
Served hundreds of hours on over 40 missions over the last two years.	
Instructed new candidates in the basics of technical rope rescue.	

SERVICE & LEADERSHIP

Reviewer

Geology

Proceedings, National Cave and Karst Management Symposium
The Climate Literacy and Energy Awareness Network (<http://cleanet.org/index.html>), NSF-funded
Graduate and Professional Student Council Travel Grant Program student reviewer

University Service

Graduate student representative, Global Change PhD Minor Executive Committee, UA	2011-pres.
Co-Chair, 40 th Annual GeoDaze Symposium, Geosciences, UA	2011-12
Co-coordinator and Founder, Geosciences Brown Bag Talk Series, UA	2010-11
Treasurer, Associate Graduate Council of the College of Science, UA	2010-11
Outreach/Registration Committee Co-Chair, 38 th Annual GeoDaze Symposium, UA	2010
Vice-President, Associate Graduate Council of the College of Science, UA	2009-10
Outreach/Registration Committee Co-Chair, 37 th Annual GeoDaze Symposium, UA	2009
Mentor, Geosciences, SAGUARO Program, UA	2009-11
Representative, Associate Graduate Council of the College of Science, UA	2008-09
Co-Representative, Graduate Student Advisory Comm., School of Earth Sciences, Stanford	2006-07

K-12 Service

Ambassador, Saguaro National Park, National Geographic BioBlitz (22 Oct 2011)	2011
Volunteer, 3 rd Annual Earth Sciences Saturday Academy, Geosciences/MESA/SAGUARO, University of Arizona (>100 students)	11/2011
Co-coordinator, 2 nd Annual Earth Sciences Saturday Academy, Geosciences/MESA/SAGUARO, University of Arizona (>100 students)	11/2010
Co-coordinator and Founder, Earth Sciences Saturday Academy, Geosciences/MESA/SAGUARO, University of Arizona (>100 students)	11/2009
Bilingual Mentor, Western Hemispheres Institute, University of Arizona	2009
GeoKids! Volunteer for 1 st grade students, School of Earth Sciences, Stanford University	2007-08

Caving Service

Site Coordinator, National Cave Rescue Comm. Orientation to Cave Rescue, Tucson, AZ	2013
President, Arizona Regional Association of the National Speleological Society (two terms)	2012-13
Chair, Winter Technical Talks & Papers, Arizona Regional Association of the National Speleological Society, Tucson, AZ	2012
Board Member-At-Large, Escabrosa Grotto, Inc, Tucson, AZ	2012

Vice-President, Arizona Regional Association of the National Speleological Society	2011
Cave Conservation Volunteer, High Guadalupe Mountains Restoration Project, NM	2000

Musical Service

Music Director, Gaieties 2005, Ram’s Head Theatrical Society, Stanford University	2005
Music Director & Founder, Flute Society, Stanford University	2003-07

PROFESSIONAL MEMBERSHIPS

Arizona Geological Society , Student Member	2011-pres.
Association of Women Geoscientists , Regular Member	2011-2012
Earth Science Women’s Network , Regular Member	2009-pres.
National Speleological Society (NSS) , Associate Member, Member No. 61563	2009-pres.
American Geophysical Union (AGU) , Student Member	2007-pres.

CERTIFICATIONS

Emergency Medical Technician , Nationally Registered and Arizona, exp. 8/2015	2013-pres.
Rescue Team Member , Southern Arizona Rescue Association (Mountain Rescue Association) Pima County Sherriff’s Office, AZ	2010-pres.
Ham Radio License , callsign: KF7RLV	2011-pres.
Wilderness First Responder , Wilderness Medical Associates, Tucson, AZ, expired 7/2013	
First Aid , American Red Cross, Tucson, AZ, expired 11/2012	

OTHER TRAINING

Academic

Expert Witness Training Academy, William Mitchell College of Law, MN	08/2013
WiscSIMS High Resolution Proxies of Paleoclimate, UW Madison	06/2013
Future Faculty Workshop, Rice University	09/2012
Southwest Climate Summit, University of Arizona	06/2012
Community Earth System Model Tutorial, National Center for Atmospheric Research	07/2009

Other

Small Party Assisted Rescue Seminar, National Cave Rescue Commission, Logan, UT	06/2013
National Cave Rescue Commission Weeklong Operations and Management Seminar Level 1, Mentone, AL	05/2012

MULTIMEDIA

Multimedia Created

Video about caving conceptualized and produced for “Clearing the Air: Arizona’s Voice for Climate Science”:
<http://www.youtube.com/watch?v=tipO822vYAk>

Media Coverage

Behind the Black blog:

<http://behindtheblack.com/behind-the-black/essays-and-commentaries/underground-again-today>

Green Valley News:

http://www.gvnews.com/news/local/article_518e7baa-8673-11e0-844b-001cc4c03286.html

Monsoon 2010: KOLD-13 TV interview available on request.

Geosciences Saturday Academy coverage: <http://uanews.org/node/28719>

Discography

“The One, The Only”, Leland Stanford Junior University Marching Band (LSJUMB), piccolo 2008

SKILLS

Computer

Proficient with Excel, Sigma Plot 11.0, Image processing (Adobe Suite), Filemaker Pro 8.0

Proficient programmer in Matlab, SAS; Beginning programmer in R

Laboratory Equipment

ThermoFinnegan GasBench II

Delta XP Continuous Flow Isotope Ratio Mass Spectrometer

Micromass Optima Dual-Inlet Isotope Ratio Mass Spectrometer

Los Gatos DLT-100 laser Liquid Water Isotope Analyzer

CNC Sherline Micromill for speleothem processing

Laboratory Methods

Proficient in lake sediment processing for pollen and charcoal.

Proficient with microscopes (pollen, petrographic, and dissecting).

Familiar with U-series dating pre-processing methods.

Familiar with carbonate rock processing and polishing methods.

Proficient in Northeastern North American pollen identification.

Field Equipment

Livingstone lake sediment corer

Universal lake corer

TDS, EDM, and GPS survey technology

Ceptometer, LAI 2000, and Licor 6400 (familiarity only)

Field Methods

Proficient with basic vertical (single rope) technique and knots for vertical caving, as well as basic technical rescue (simple lower and mechanical advantage haul systems) and cave rescue (National Cave Rescue Commission Level 1 class completed); Member of the Mountain Rescue Association

Proficient in archaeological excavation

Familiar with geologic mapping techniques

Language

Spanish — fluent speaking, reading, & writing

Portuguese — fluent reading, basic speaking & writing

Italian — basic speaking reading, & writing

American Sign — rudimentary

Mandarin — rudimentary

Music — *Full music resume available on request.*

Flute (20 years)

Piccolo (16 years)

Music direction: pit orchestra, flute choirs, etc.