

Shasta McGee Marrero

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Education:

- *May 2008-Present* PhD student in Hydrology at New Mexico Tech
Advisor: Fred M. Phillips
Committee: Rob Bowman, Nelia Dunbar, Brian Borchers, John Stone (University of Washington), Bruce Harrison
- *Aug 2004-Jan 2009* M.S. in hydrology at New Mexico Tech.
Title: Chlorine-36 Production Rate Calibration Using Shorelines from Pleistocene Lake Bonneville, Utah
Degree Conferral in May 2009. Graduate GPA: 3.93
Advisor: Fred M. Phillips Committee: Rob Bowman, Nelia Dunbar
- *Jan 2004-July 2004* Classes at UW-Madison as a special student.
- *Sept 1999-Dec 2003* UW-Madison, BS in Chemistry & Geology
Overall undergraduate GPA: 3.841
- *Aug 2001-Aug. 2002* Study Abroad in Aix-en-Provence, France
- *1996-1999* Tremper High School, WI, Valedictorian.

Research Topic: Cosmogenic Chlorine-36 Systematics

This project is to identify the discrepancy in chlorine-36 production rate calculations and create a new set of production rate parameters based on measurements from whole rock and mineral separates from geologic calibration sites worldwide. Further individual applications of chlorine-36 to geologic and hydrologic problems will also be performed.

Skills:

- Solid math and science background. Excellent writing, organizational, and teaching skills. Strong leadership and public speaking skills. Proficient in French.
- Hydrology skills include well tests, HYDRUS-1D modeling, simple well installation, use of pressure transducers, and data analysis.
- Lab skills include experience from organic, analytical, physical, and instrumental chemistry courses, as well as current research and classes.
- Familiar with general lab technique and equipment, NMR, gas and thin layer chromatography, and IR, FTIR, ICP, AA spectroscopy.

Other Projects:

- Petroleum age prediction with application to hydrology and forensics (Fall 2005).
- Project on tributaries to the Rio Grande and the amount and timing of their contributions (Spring 2005).

Experience:**Research Assistant in Hydrology – New Mexico Tech**

Cosmogenic isotopic laboratory. Chemical preparation of rock and water samples for chlorine-36 analysis. Laboratory management of cosmogenic nuclide procedures as well as other soil and water analysis. Involves crushing, work with acids and other chemicals, and purification steps. Includes analysis of data. Field work in Utah (2005), Kyrgyzstan (2006), and Scotland (2006). Field work often involves extensive physical labor such as using hammers, rock saws, or other tools to remove rock specimens. Also requires extended periods of primitive camping and hiking.

August 2004 - Present

Laboratory Assistant in Geology – UW-Madison

Cosmogenic Isotopic Laboratory run by Brad Singer. Prepare rock samples for aluminum and beryllium analysis, including grinding, separation, and acid etching steps.

October 2002 – May 2004

Laboratory Assistant in Organic Chemistry – UW-Madison

Organic Chemistry Research Laboratory, Zimmerman Group

Working with a post-doc to synthesize organic molecules involved in research.

November 2002 – May 2003

Presentations:

- “Cosmogenic Chlorine-36 Calibration of Potassium Production Rates,” Goldschmidt 2008, Vancouver, Canada. Oral presentation, July 2008. Coauthors: Fred M. Phillips, John O. Stone, Brian Borchers.
- “Constraints on Chlorine-36 Production Rates Using Beryllium-10 at Lake Bonneville, UT,” poster presentation at American Geophysical Union Annual Fall Meeting 2007, poster presentation December 10-14, 2007, San Francisco, CA. Coauthor: Fred M. Phillips.
- “Chlorine-36 in the Rio Grande Valley,” poster presentation at the New Mexico Geological Society Annual Meeting, April 13, 2007, Socorro, NM. Coauthors: Marty Frisbee, Fred M. Phillips.
- “Paleoclimate Implications of Cosmogenic Chlorine-36 Dating of Shoreline Deposits in Panamint Valley, CA,” oral presentation at American Geophysical Union Annual Fall Meeting, December 11-15, 2006, San Francisco, CA. Coauthors: Fred M. Phillips, Steve Roof, R.S.U Smith. Presided as session chair.
- “Comparison of Chlorine-36 Production Rates Using the Radiocarbon Age-Constrained Lake Bonneville and Provo Shorelines, UT,” oral presentation at the Graduate Student Association Research Conference, February 16-17, 2006, Socorro, NM.
- “Comparison of Chlorine-36 Production Rates Using the Age-Constrained Lake Bonneville and Provo Shorelines, UT,” poster presentation at American Geophysical Union Annual Fall Meeting, December 5-9, 2005, San Francisco, CA. Coauthor: Fred M. Phillips.
- “Amount and Variability in Tributary Inflows to the Rio Grande,” poster presentation at the New Mexico Water Resources Research Institute annual meeting, August 16, 2005,

Socorro, NM. Coauthors: Marissa Reno, Enrique Vivoni.

Conferences attended (in addition to those listed above):

Goldschmidt Annual Meeting (May 2005), GSA Annual Meeting (October 2004), WRR (August 2006), GSA Annual Meeting (October 2006).

Coauthored Presentations:

- Phillips, F. M., Marrero, S. M., Roof, S., Smith, R., Jayko, A. “Cosmogenic Chlorine-36 Chronology for Pleistocene Shoreline Deposits in Panamint Valley, California” poster presentation at Goldschmidt 2008, Vancouver, Canada. July 2008.

Professional memberships:

National Groundwater Association
American Geophysical Union
Geochemical Society

Geological Society of America
Society of Women Geoscientists

Publications

Kirby, E., S. Anandkrishnan, F. Phillips, and S. Marrero (2008), Late Pleistocene slip rate along the Owens Valley fault, eastern California, *Geophys. Res. Lett.*, 35, L01304, doi:10.1029/2007GL031970.

Awards:

- Best Poster at New Mexico Geological Society (April 13, 2007)
- Best Geoscience presentation at the NMT research conference (Feb 2006)
- Member of Sigma Gamma Epsilon (2004-5)
- Nomination for the Field Camp Internship for UW-Madison (August 2004)
- Geology Distinguished Senior Award UW-Madison (2003)
- Geology Outstanding Junior Award UW-Madison (2002)
- UW-Madison’s Dean’s List all semesters in US
- Girl Scout Gold Award (1999)
- Mayor’s Youth Award, Kenosha, WI (1999)

Service:

- President of the Graduate Student Association (December 2007-Present)
- President of the Earth Science Club (Fall 2007-Summer 2008)
- Student representative to the Hydrology faculty (Fall 2006-Summer 2008)
- Member of search committee for new hydro faculty 2007
- Member of the Student Health Insurance Committee at New Mexico Tech
- Treasurer of Earth Science Club (2006-2007)
- Student Research Conference Chair 2007

Other Interests: Martial arts, camping, traveling, swing dancing, trumpet playing,

acting, gardening, and volunteering.

Certifications: Lab Chemical Safety, PADI Open Water Scuba Diver, CPR & First Aid