

AEG SAN JOAQUIN VALLEY CHAPTER

March 2013

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### **Chair**

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### **Editor**

Tiffany Steinert  
Graduate Student  
California State University, Fresno  
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Hello to all of the new and returning members of the San Joaquin Valley AEG Chapter. I would like to thank Dr. Jim McCalpin of Geo-Haz Consulting, Inc. for his talk at our February AEG meeting which examined why damage and loss of life due to large earthquakes continues to occur despite our efforts to plan for and mitigate earthquake hazard.

Our next AEG meeting is this Thursday March, 21, 2013 (tomorrow!!), so please join us! This month, we are pleased to announce that Dr. Beth Weinman an assistant professor at California State University, Fresno will be our speaker. She will be joining us for dinner at the Elbow Room. Following dinner, Dr. Weinman will present information on the origin of groundwater constituents. Her past focus has been on arsenic with study sites in Bangladesh, Vietnam, and Nepal, and she has begun working on similar problems in the Central Valley and Sierra Nevada. We would like to thank her for presenting on short notice due two speaker cancellations resulting from “the sequester”.

We are still trying to schedule upcoming speakers for the rest of the year, so if anyone has any research that they would like to present or would like to suggest a speaker, please contact us. Also, the GSA Cordilleran Section conference will be taking place in Fresno this May! More information regarding this conference and the associated field trips can be found at the end of this newsletter. Please stay tuned for up-dates and I hope to see you at the next meeting.

Sincerely,  
*Tiffany Steinert*

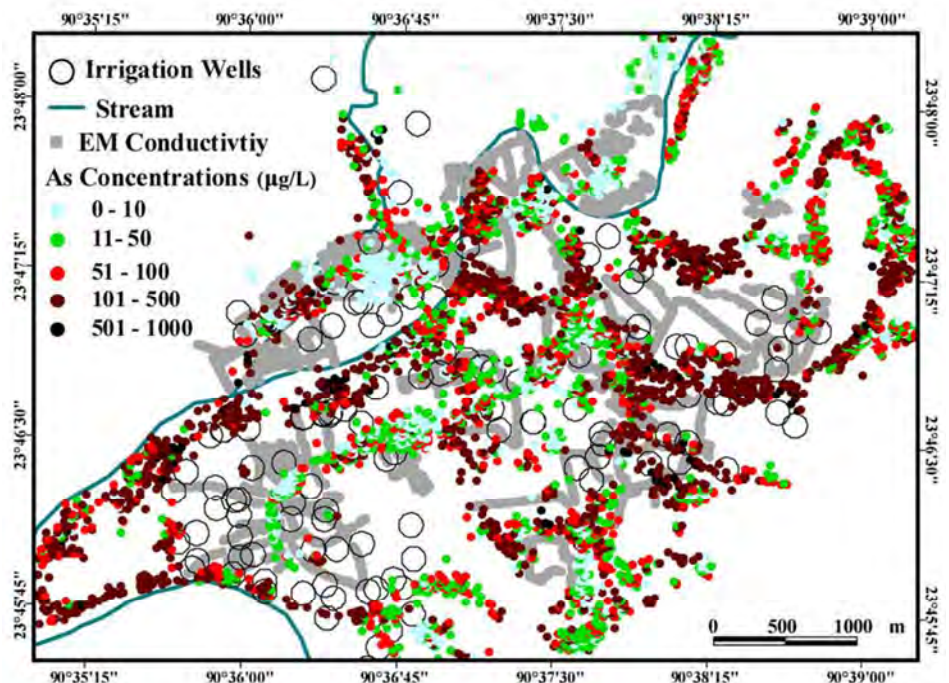
# CHEMICAL-WEATHERING RATES OF AQUIFERS AND SOILS: USING SEDIMENT-AGE-DATING AND GEOCHEMICAL MASS-BALANCE TECHNIQUES TO UNDERSTAND HOW GROUNDWATER GETS ITS GEOCHEMISTRY

*Beth Weinman*

bweinman@mail.fresnostate.edu

March 21, 2013

An important aspect of sourcing and maintaining our water supply deals with understanding how usable fresh-water resources gain their natural geochemistries. In not knowing from exactly where groundwater is gaining its geochemistry, the goal of this work tries to identify from where groundwater is gaining most of its geochemistry. In South and Southeast Asia, where many developing countries have natural arsenic contamination in their groundwaters, some work suggests that arsenic is sourced from an aquifer's overlying soils, while others surmise it to be due to weathering of the underlying aquifer matrix. Based on past research showing that "younger" material weathers faster than "older" material, one objective of this work was to test whether aquifer age was a determinant parameter in arsenic groundwater chemistry. Luminescent ages (OSL) of aquifer sands from several study sites in Bangladesh, Vietnam, and Nepal show that there is an age-difference between aquifer units that explains much of the shallow groundwater arsenic heterogeneity. Aquifers in sediments deposited >10,000 years ago have low arsenic (<10 [g/L), while aquifers in recently deposited sediments have increasingly higher arsenic concentrations (>50-500 [g/L). This, along with some recent studies on soil-formation in the Sierra Nevada, overarchingly supports the idea that chemical weathering in the overlying soils plays a negligible or marginal role in groundwater geochemistry. In summary, we attempted to combine the dating of sediments using OSL and other chronometric methods with chemical sediment analysis to: 1) constrain the provenance of arsenic and, 2) derive the rates of aquifer weathering. The rationale for this work, along with the results, will be presented.



Beth Weinman's work focuses on understanding how elements, like arsenic, naturally weather from rock into soil and groundwater. Studying heterogeneous aquifer distributions of groundwater arsenic throughout Asia, she received her B.S. in geology from CUNY Queens College, an M.S. in ocean and atmospheric science at Stony Brook University, followed by a Ph.D. in environmental sciences at Vanderbilt University. Beth is currently an assistant professor at California State University, Fresno

# March 2013 AEG Meeting RSVP Sheet



Fax or E-mail to the address below:

To: Richard Fink  
Fax: 559.442.5081

E-mail: [rfink@kleinfelder.com](mailto:rfink@kleinfelder.com)

From: \_\_\_\_\_ E-mail: \_\_\_\_\_

Subject: March AEG San Joaquin Valley Chapter Meeting

Date: March 21, 2013

Place: The Elbow Room (Located at Fig Garden Shopping Center)

Time: 6:00 - 7:00 PM - Sign in & Social hour  
7:00 - 8:00 PM - Dinner & Announcements  
8:00 - 9:00 PM - AEG meeting & Speaker presentation  
9:00 - 9:30 PM - Questions & Answers

On the Menu: Choice of:

Cost (circle one) : \$10 for students \$25 for non-students



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One-eighth page logo advertising in 2012 – 2013 newsletters

### **Gold - \$500/year**

Speak at one meeting for 10 minutes to describe company  
Set up a booth at one meeting  
One-half page advertising area in 2012 – 2013 newsletters

For more information contact our Treasurer, Jamie Persico, at [jamielpersico@gmail.com](mailto:jamielpersico@gmail.com)

## ***Calendar of Events***

### **March 21<sup>st</sup>, 2013**

Beth Weinman  
*California State University, Fresno*

### **April 18<sup>th</sup>, 2013**

TBA

### **May 20-22<sup>nd</sup>**

*No meeting this month due to the GSA Cordilleran Section Meeting here in Fresno. See the following pages and <http://www.geosociety.org/sections/cord/2013mtg/>*

## Final Announcement & Call for Papers

# CORDILLERAN

109th Annual Meeting of the Cordilleran  
Section, GSA

Fresno, California, USA

20–22 May 2013

[www.geosociety.org/Sections/cord/2013mtg/](http://www.geosociety.org/Sections/cord/2013mtg/)



Looking north toward Mount Whitney and the Sierra Nevada from Mount Langley, California, USA. Photo by Mel Stoutsenberger; used with permission via Wikimedia Commons.

## LOCATION

Fresno is ideally located for exploring the best of Cordilleran geology—nestled at the foot of the Sierra Nevada yet still within a short drive time of the geologic wonders of the California Coast Ranges. The field trips for this meeting fully exploit these advantages. We expect guest activities to include tours of Yosemite and Sequoia–Kings Canyon National Parks.

## REGISTRATION

**Early Registration deadline:** 15 April

**Cancellation deadline:** 22 April

**REGISTRATION FEES** (all fees are in U.S. dollars)

	EARLY		STANDARD	
	Full Mtg.	One Day	Full Mtg.	One Day
Professional Member	\$160	\$100	\$195	\$115
Professional Nonmember	\$180	\$140	\$220	\$170
Professional 70+	\$65	\$55	\$70	\$60
Student Member	\$60	\$45	\$80	\$55
Student Nonmember	\$85	\$65	\$110	\$80
K–12 Teacher	\$50	\$30	\$60	\$40
Guest/Spouse	\$50	n/a	\$60	n/a
Field Trip/Workshop Only	\$35	n/a	\$45	n/a

## ACCOMMODATIONS

**Hotel reservation deadline:** 29 April

A large block of rooms is being held for the meeting at the Radisson Hotel and Conference Center, 2233 Ventura Street, Fresno, CA 93721, USA. Room rate: US\$109 per night plus taxes, with free wireless high-speed Internet, and a complimentary airport/Amtrak/bus shuttle. Reserve your room via [www.geosociety.org/Sections/cord/2013mtg/lodging.htm](http://www.geosociety.org/Sections/cord/2013mtg/lodging.htm).

## TECHNICAL PROGRAM

**Abstract deadline:** 19 February

**Abstract submission fee:** US\$10 for students; US\$15 for all others. Contact Nancy Wright, +1-303-357-1061, [nwright@geosociety.org](mailto:nwright@geosociety.org), if you are unable to submit your abstract online.

## THEME SESSIONS

- T1. Tectonic Processes that Build the Stratigraphic and Structural Record of Ancient and Modern Convergent Margins.** David Scholl, USGS, [dscholl@usgs.gov](mailto:dscholl@usgs.gov); Roland von Huene, Univ. of California Davis, [rhuene@mindspring.com](mailto:rhuene@mindspring.com); Trevor A. Dumitru, Stanford, [tdumitru@stanford.edu](mailto:tdumitru@stanford.edu); John Wakabayashi, California State Univ. Fresno, [jwakabayashi@csufresno.edu](mailto:jwakabayashi@csufresno.edu).
- T2. Mélanges: Comparison and Contrast between Circum-Pacific and Tethyan Chaotic Rock Bodies, and Modern Submarine Analogues.** Yildirim Dilek, Miami Univ., [dileky@muohio.edu](mailto:dileky@muohio.edu); Andrea Festa, Università di Torino, [andrea.festa@unito.it](mailto:andrea.festa@unito.it); Yujiro Ogawa, Century Tsukuba-Miraidaira, [fyogawa45@yahoo.co.jp](mailto:fyogawa45@yahoo.co.jp).
- T3. Oceanic Petrogenesis of Pacific-Type Convergent Margins.** Tatsuki Tsujimori, Okayama Univ. Misasa, [tatsukix@misasa.okayama-u.ac.jp](mailto:tatsukix@misasa.okayama-u.ac.jp); W.G. Ernst, Stanford, [wernst@stanford.edu](mailto:wernst@stanford.edu); John Wakabayashi, California State Univ. Fresno, [jwakabayashi@csufresno.edu](mailto:jwakabayashi@csufresno.edu).
- T4. Ophiolites and Suture Zones.** Yildirim Dilek, Miami Univ., [dileky@muohio.edu](mailto:dileky@muohio.edu); John Wakabayashi, California State Univ. Fresno, [jwakabayashi@csufresno.edu](mailto:jwakabayashi@csufresno.edu); John Shervais, Utah State Univ., [john.shervais@usu.edu](mailto:john.shervais@usu.edu).
- T5. Critical Zone: Where Rock Meets Water and Life at Earth's Surface.** Clifford S. Riebe, Univ. of Wyoming, [criebe@uwyo.edu](mailto:criebe@uwyo.edu); Leonard S. Sklar, San Francisco State Univ., [leonard@sfsu.edu](mailto:leonard@sfsu.edu); Kate Maher, Stanford, [kmaher@stanford.edu](mailto:kmaher@stanford.edu).
- T6. Using Detrital Zircon Age Data to Reassemble the Cordilleran Jigsaw Puzzle.** Trevor Dumitru, Stanford, [tdumitru@stanford.edu](mailto:tdumitru@stanford.edu); Elizabeth Miller, Stanford, [elmiller@stanford.edu](mailto:elmiller@stanford.edu).
- T7. Hydrogeologic Issues of Irrigated Agricultural Regions—Problems and Solutions.** C. John Suen, California State Univ. Fresno, [johns@csufresno.edu](mailto:johns@csufresno.edu); Dong Wang, USDA Agricultural Research Service, [dwang@fresno.ars.usda.gov](mailto:dwang@fresno.ars.usda.gov).
- T8. Quantitative Approaches in Sedimentology and Stratigraphy.** Mara Brady, California State Univ. Fresno, [mbrady@csufresno.edu](mailto:mbrady@csufresno.edu).
- T9. AFC Processes in the Formation of Intermediate Magmas from Mantle to Crust.** Michael Farner, Rice Univ., [mfarner01@gmail.com](mailto:mfarner01@gmail.com); Cin-Ty Lee, Rice Univ., [ctlee@rice.edu](mailto:ctlee@rice.edu).
- T10. Reconstructing the Pacific–North America Plate Boundary through Late Cenozoic Time.** Scott Bennett, Univ. of

**T10. Reconstructing the Pacific–North America Plate Boundary through Late Cenozoic Time.** Scott Bennett, Univ. of California–Davis, [sekbennett@ucdavis.edu](mailto:sekbennett@ucdavis.edu); Rebecca Dorsey, Univ. of Oregon, [rdorsey@uoregon.edu](mailto:rdorsey@uoregon.edu); Michael Oskin, Univ. of California–Davis, [meoskin@ucdavis.edu](mailto:meoskin@ucdavis.edu); Michael Darin, ConocoPhillips, [mike.h.darin@conocophillips.com](mailto:mike.h.darin@conocophillips.com). Relevant field trips: 1, 3, and 6.

**T11. The Engineering Geology of Transporting Water in the Western United States.** *Cosponsors: GSA Environmental Engineering Geology Division and Association of Environmental and Engineering Geologists (San Joaquin Valley Chapter, Sacramento Section).* Jerome V. De Graff, USDA Forest Service, [jdegraff@csufresno.edu](mailto:jdegraff@csufresno.edu). Relevant field trips: 2, 6, and 8.

**T12. Quaternary Environmental Change; The Cordilleran Record and Its Implication for Our Future in a Changing World.** Peter K. Van de Water, California State Univ.–Fresno, [pvandewater@csufresno.edu](mailto:pvandewater@csufresno.edu); Mathieu Richaud, California State Univ.–Fresno, [mathieu@csufresno.edu](mailto:mathieu@csufresno.edu). Relevant field trips: 1, 2, and 6.

**T13. Irvingtonian Paleocology of Western North America.** Robert G. Dundas, California State Univ.–Fresno, [rdundas@csufresno.edu](mailto:rdundas@csufresno.edu); Eric Scott, San Bernardino County Museum, [escott@sbcem.sbcounty.gov](mailto:escott@sbcem.sbcounty.gov). Relevant field trip: 8.

**T14. Quaternary Geology of California's Central Valley and Its Relevance to Water Infrastructure.** Justin Pearce, [j.pearce@fugro.com](mailto:j.pearce@fugro.com); Janet Sowers, [j.sowers@fugro.com](mailto:j.sowers@fugro.com); Jennifer Wilson, [jn.wilson@fugro.com](mailto:jn.wilson@fugro.com); Cooper Brossy, [c.brossy@fugro.com](mailto:c.brossy@fugro.com)—all with Fugro Consultants Inc. Relevant field trip: 3.

**T15. Undergraduate Research Posters.** Chris Pluhar, California State Univ.–Fresno, [cpluhar@csufresno.edu](mailto:cpluhar@csufresno.edu).

## FIELD TRIPS

- 1. Critical Zones in the NW Sierra Nevada.** 18–19 May; if two days, or 17–19 May if three days. Beth Weinman, California State Univ.–Fresno, [bweinman@csufresno.edu](mailto:bweinman@csufresno.edu). Relevant theme sessions: T5, T10, and T12.
- 2. Granite, Glaciation, and Rockfall in Yosemite Valley, California, USA.** 18–19 May. Allen Glazner, Univ. of North Carolina, [afg@unc.edu](mailto:afg@unc.edu); Greg Stock, NPS Yosemite National Park, [greg\\_stock@nps.gov](mailto:greg_stock@nps.gov); Roger Putnam, Univ. of North Carolina, [rputnam@live.unc.edu](mailto:rputnam@live.unc.edu); John Bartley, Univ. of Utah, [john.bartley@utah.edu](mailto:john.bartley@utah.edu). Relevant theme sessions: T9 and T12.
- 3. From Deep to Modern Time along the Western Sierra Nevada Foothills–San Joaquin to Kern Drainages.** 18–19 May. Jason Saleeby, [jason@gps.caltech.edu](mailto:jason@gps.caltech.edu); Zorka Saleeby, [zorka@gps.caltech.edu](mailto:zorka@gps.caltech.edu); Frank Sousa, [sousa@gps.caltech.edu](mailto:sousa@gps.caltech.edu)—all with Caltech Tectonics Observatory. Relevant theme sessions: T1, T2, T3, T4, and T6.
- 4. Middle Irvingtonian Fairmead Landfill Fossil Site and Fossil Discovery Center of Madera County, California.** 19 May. Robert Dundas, California State Univ.–Fresno, [rdundas@csufresno.edu](mailto:rdundas@csufresno.edu). Relevant theme session: T13.
- 5. LOCKED ROCKS: Hard-to-Access Outcrops of the Mesozoic Metasedimentary Framework and Gabbroids of the Early Cretaceous Sierra Nevada Batholith.** 23 May. Diane Clemens-Knott, California State Univ.–Fullerton, [dclemensknott@fullerton.edu](mailto:dclemensknott@fullerton.edu); Jason Saleeby, Caltech,

[jason@gps.caltech.edu](mailto:jason@gps.caltech.edu). Relevant theme sessions: T1, T3, T6, and T9.

- 6. New Views on the Evolution of the San Andreas Fault Zone in Central California and the Carrizo Plain.** 23–25 May. Sinan Akciz, Univ. of California–Irvine, [sakciz@uci.edu](mailto:sakciz@uci.edu); Ramon Arrowsmith, Arizona State Univ., [ramon.arrowsmith@asu.edu](mailto:ramon.arrowsmith@asu.edu); Robert Zatkun. Relevant theme sessions: T10 and T12.
- 7. Mélanges, HP Metamorphism, Subduction Accretion and Erosion, Subduction Megathrusts and Ophiolites: The Franciscan and Related Rocks.** 23–24 May. John Wakabayashi, California State Univ.–Fresno, [jwakabayashi@csufresno.edu](mailto:jwakabayashi@csufresno.edu). Relevant theme sessions: T1, T3, T4, and T6.
- 8. Debris Flows in Recently Burned Watersheds in the Southeastern Sierra Nevada.** 23–25 May. Dave Wagner, California Geological Survey, [dave.wagner@suddenlink.net](mailto:dave.wagner@suddenlink.net); Jerry DeGraff, Sierra National Forest, [jdegraff@fs.fed.us](mailto:jdegraff@fs.fed.us); Jeremy Lancaster, California Geological Survey, [jeremy.lancaster@conservation.ca.gov](mailto:jeremy.lancaster@conservation.ca.gov). Relevant theme session: T11.

## Housing Information

A large block of rooms is being held for the meeting at the Radisson Hotel & Conference Center Fresno, 2233 Ventura Street, Fresno, CA 93721, USA. Rates are \$109/night (up to quadruple occupancy), plus tax. This is also the conference facility where all meeting activities will take place.

## Local Committee Members

**Local Committee & Technical Program Chair:** John Wakabayashi, [jwakabayashi@csufresno.edu](mailto:jwakabayashi@csufresno.edu)

**Field Trip Chair:** Keith Putirka, [kputirka@csufresno.edu](mailto:kputirka@csufresno.edu)

**Student Volunteer Coordinator:** Robert Dundas, [rdundas@csufresno.edu](mailto:rdundas@csufresno.edu)

**Community Liaison:** Stephen D. Lewis, [slewis@csufresno.edu](mailto:slewis@csufresno.edu)



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