

Atlanta Geological Society Newsletter

Next meeting of the Atlanta Geological Society is
August 31, 2010

Fernbank Museum of Natural History (Clifton Road)
Social begins at 6:30 pm – Meeting begins at 7:00 pm

August

AUGUST SPEAKER

The speaker for this month's meeting will be Dr. Mark W. Evans from the Agency for Toxic Substances and Disease Registry. The title of his talk is:

Potential Public Health Implications of Exposure to Arsenic from Drinking Water and Soil

Please look for further details and a biographical sketch in the following pages of the newsletter. He is listed as an environmental geologist in one reference and another paper talks about the hydrogeology of a particular topic. He should fit right in with the rest of us.

Remember the Social starts at 6:30 and the meeting will proceed approximately at 7:00 p. m.

www.atlantageologicalsociety.org

The August Meeting

Our annual June Social was made possible with the generous help of our sponsors. This year they were:

ASI -Analytical Services, Inc.

Eagle Instruments

ECOVAC Services

EMServices

Field Environmental Instruments, Inc

Piedmont Environmental Drilling

Triad Environmental Solutions

United Consulting

Thanks again to these folks and please consider them for use in an upcoming project.

Please note that there is a PG study class this Saturday August 28th and the next AGS meeting will be August 31, 2010. The Society and the newsletter editor will take a brief break.

See you next Tuesday.

Ben Bentkowski

Newsletter Editor

AGS PG Workshop

Professional Geologist Career Development

The next Atlanta Geological Society Professional Geologist Candidate Workshop will be held Saturday, August 28, 2010 from **10:00 am to 12:00 pm** (back to the normal time slot) at the Fernbank Science Center. The class will be at the Fernbank Science Center, located at 156 Heaton Park Drive, N.E. Atlanta, GA 30307, phone: 678-874-7102. The Science Center is about a mile north of the Fernbank Science Museum off Ponce DeLeon. For more information about the Science Center, go to <http://fsc.fernbank.edu/>.

Subject: Structural Geology Lecturer: Dr. Tim Chowns, Ph.D.

We will review the basic kinds of faults and folds with their definitions and terminology. In particular the way in which these structures influence the outcrop patterns on geologic maps. The interpretation of structure from geologic maps is an important skill often included on basic geology tests.

Tim is a professor of Geology at the University of West Georgia. He was educated in England (BSc University of Leicester, PhD University of Newcastle upon Tyne) and immigrated in 1968. After teaching at the University of Georgia for a few years he moved to West Georgia in 1973. His main interests are in Sedimentation and Stratigraphy and especially the Geology of Georgia, but he also teaches courses in Physical and Historical Geology, Oceanography and Optical Mineralogy. Some areas of research include the origin of geodes, Pre-Cretaceous rocks below the Georgia Coastal Plain, stratigraphy and depositional environment of the Birmingham iron ores, and most recently changes in the location of inlets on the Georgia coast related to Holocene transgression.

Two hours of professional development hours are available to attendees. The classes are open to all; membership in the AGS is not required. If you are not a member, please consider joining. The AGS is the most active geologic organization in the Southeast. Please forward this invitation to anyone interested in becoming a professional geologist or whom you think might be interested in the subject.

Thanks,

Ken Simonton, P.G.

kws876@yahoo.com

Atlanta Geological Society

AGS Continuing Education Committee

Coordinated by: Ken Simonton 10:00 pm - 12:00 noon

Held in the Classroom Annex of the

[Fernbank Science Center](#)

156 Heaton Park Dr. NE

Atlanta, GA 30307 678-874-7102

Potential Public Health Implications of Exposure to Arsenic from Drinking Water and Soil

Mark W. Evans, DHAC, ATSDR, Atlanta, GA 30333

Abstract

Groundwater Exposures: Arsenic exposures and health effects have been the subject of a large number of public health studies in recent years. There has been significant controversy over the dose levels at which adverse health effects may occur as well as numerous local or regional studies of arsenic concentrations in drinking water sources. This paper addresses the potential exposures to contaminants in the drinking water of millions of Americans supplied via private (domestic) drinking water wells. There are several aspects to the public health issue of arsenic in private drinking water wells that are very much interrelated. These questions are; what is the water concentration or exposure dose at which adverse health effects may occur, and where are the wells or aquifer systems that have arsenic concentrations of public health concern.

Potential exposure doses of arsenic are calculated using the frequency distributions of measured arsenic concentrations in major aquifer systems that are significant sources for private wells. Comparison of the resulting probability distributions of potential exposure doses compared with dose effect levels indicates that adverse health effects from arsenic exposure are unlikely for the vast majority of Americans obtaining water from private wells.

Soil Exposures: Arsenic is ubiquitous in soils with naturally-occurring concentrations that are log-normally distributed. There are also a number of man-made processes that create elevated localized soil and water concentrations, such as mining and ore-processing, application of arsenical pesticides and runoff or leachate from coal ash and landfills. In order to determine doses likely to produce adverse health effects, potential doses must be calculated from soil concentrations and intake rates.

A number of studies have examined soil As exposure by measurement of urinary As concentrations of residents living on properties with high As soil concentrations. Several of these studies have derived empirical, linear relationships between soil As concentrations and urine As concentrations. These linear soil-urine equations have significantly lower slopes relative to the calculated dose-soil concentration equation. None of these studies have shown a statistically elevated urinary As concentrations (above population norms or control groups) at soil concentrations less than 100 mg/kg. When these dose evaluations are compared with state-mandated As soil clean-up levels that range from 0.14 mg/kg to 250 mg/kg, it is very clear that we are either not uniformly protecting the public, or spending way too much on unnecessary soil remediation.

AGS Members...The Professional Registration Committee Needs YOU...

If you are an AGS member and would like to contribute to the Professional Registration Committee by leading a lecture on one of the subjects listed below, then please contact me either by e-mail or at the monthly AGS meetings. The lecture should be for one hour followed by a Q&A session. We need different speakers for each workshop. Your volunteering to teach on one of these subjects is essential to the success of the Professional Registration Committee – we need more widespread participation by the AGS membership. Speakers can be compensated for expenses and will receive certificates to acknowledge their participation.

The following content domains are covered in the Georgia Professional Geologist exams:

- | | |
|---|---|
| A. General Geology | B. Mineralogy, Petrology, & Petrography |
| C. Sedimentology, Stratigraphy, & Paleontology | D. Economic Geology & Energy Resources |
| E. Structure, Tectonics, & Seismology | F. Hydrology & Environmental Geochemistry |
| G. Engineering Geology | |
| H. Quaternary Geology, Geomorphology, & Surficial Processes | |

We do not "teach the test" our aim is to review fundamental concepts of the earth sciences and acquaint candidates with industry specific information not easily obtainable from the literature. Please inform anyone who might be interested in becoming a professional geologist of our workshop. Please consider joining us even if you are not a P.G. candidate. The workshops are interesting and informative.

Ken Simonton, P.G., Chair
Professional Registration Committee

www.atlantageologicalsociety.org

Biographical Trivia: Mark W. Evans

Ph.D/M.S. in Marine Geology from the University of South Florida, St. Pete, Florida
B.A. (Environmental Science) from New College, Sarasota, Florida

Currently an environmental geologist, Site and Radiological Assessment Branch, Division of Health Assessment and Consultation, Agency for Toxic Substances and Disease Registry, Atlanta, GA. At ATSDR I conduct exposure analyses, review and evaluate information related to environmental releases of hazardous substances, and evaluate public health implications of hazardous substance releases.

In the past, I have taught geology and environmental public health classes at Emory University, the University of Rhode Island, and the College of Charleston. Past field experience includes extensive geological field work in Florida and other areas. I have also written a few papers, made numerous presentations at scientific and public meetings and completed many public health studies of hazardous waste sites.

Primary research interests are in developing a cost-effective repeatable procedure for smoking brisket, establishing techniques for creating copious amounts of sawdust from expensive hardwoods, and determining how to eat as much as I want without getting fat (ter).

Fernbank Museum of Natural History
Upcoming Public Programs and Events
 (All programs require reservations, including free programs)

**Fernbank
 Museum of Natural History**

767 Clifton Rd, NE Atlanta, GA
 404-929-6400

For tickets and details on exhibits, films, and events, please visit our website at www.fernbankmuseum.org Follow us on facebook or twitter for the latest news and updates!

On Exhibit:

- *Entrance Plaza, featuring a family of Lophorhynchon dinosaurs*

**Now Showing in IMAX Friday Evenings:
 (Check our website for special screenings)**

- *Martinis and IMAX:* Friday evenings, 5:30 p.m. – 10 p.m.
- **Pulse: A STOMP Odyssey and Cirque du Soleil Journey of Man**

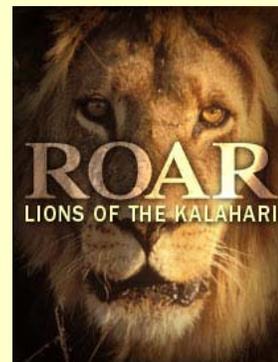
**Now Showing in the Fernbank
 IMAX movie theater:**

(Check our website for special screenings)

• **Daytime Schedule:**



Bugs: A
 Rainforest
 Adventure
 through
 September 30



**Lions of the
 Kalahari**
 through
 September 30

Martinis & IMAX® is presented at the Fernbank Museum of Natural History every Friday evening, January through November; from 5:30 p.m. to 10 p.m. Enjoy no cover charge when you visit us between 5:30 p.m. to 6:30 p.m. This event includes a wine bar, where featured wines can be purchased by the glass and by the bottle. Dinner is also served in the Dining Room, where smaller parties can order chef-prepared dishes-from gourmet pizzas to prime entrées-and dine together in a more intimate and sophisticated setting. Desserts and coffee are available as well.

As always, a full cash bar is offered in the Great Hall where patrons can enjoy a lively atmosphere and musical performances by some of Atlanta's best jazz artists. Bands perform live from 6:30 p.m. to 10 p.m. IMAX® film tickets are \$10. For those who wish to enjoy the atmosphere of Martinis & IMAX® without attending a film presentation, there is a \$5 cover charge after 6:30 p.m. The cover charge is waived for members and patrons who purchase an IMAX® ticket. To purchase tickets in advance, call 404.929.6400.

Fernbank Museum of Natural History

767 Clifton Rd, NE Atlanta, GA 404-929-6400

Special Exhibits On View:

- **LAST CHANCE!** *Geckos: From Tails to Toepads* Explore the amazing world of geckos in this collection of more than 15 live gecko species and accompanying interactives and media presentations. Final day is September 6
- **Curators' Corner: DeSoto's Footsteps** New archeological evidence from Georgia (runs through March 2011)
- **Winged Beauties: Butterflies and Other Insects**
- **Opening October 2: Water: H2O = Life**

Upcoming Public Programs:

- August 29 12:30 – 3:30 and September 4 10 a.m. – 2 p.m.- **BUG OUT!** Included in Museum admission; free to members
- September 6 Labor Day Fernbank open normal hours
- **Educator Appreciation Weekend, September 11-12** Free admission for teachers, discounted admission for teacher's guests, discounts in the Museum Store and Fernbank Café' and MORE. Advanced registration at 404.929.6400.

Please check the website for details and updates as may be necessary

American geologist arrested in China, sentenced to 8 years in prison

An American geologist held and tortured by [China's state security](#) agents was sentenced to eight years in prison Monday for gathering data on the Chinese oil industry in a case that highlights the government's use of vague secrets laws to restrict business information.

Xue Feng was arrested more than two and a half years ago and supporters allege that state security agents tortured him. They say the database was publicly available and classified only after its sale, underlining concerns about China's broad, opaque and ambiguous state secrets law.

<http://www.fgnpr.com/4949/american-geologist-arrested-in-china-sentenced-to-8-years-in-prison>

KEPLER DISCOVERS MULTIPLE PLANETS TRANSITING A SINGLE STAR

August 26, 2010: NASA's Kepler spacecraft has discovered the first confirmed planetary system with more than one planet crossing in front of, or transiting, the same star.

The transit signatures of two distinct Saturn-sized planets were seen in the data for a sun-like star designated "Kepler-9." The planets were named Kepler-9b and 9c. The discovery incorporates seven months of observations of more than 156,000 stars as part of an ongoing search for Earth-sized planets outside our solar system. The findings will be published in Thursday's issue of the journal *Science*.

Kepler's ultra-precise camera measures tiny decreases in the stars' brightness that occur when a planet transits them. The size of the planet can be derived from these temporary dips.



An artist's concept of two Saturn-sized planets in the Kepler-9 planetary system. [\[larger image\]](#)

The distance of the planet from the star can be calculated by measuring the time between successive dips as the planet orbits the star. Small variations in the regularity of these dips can be used to determine the masses of planets and detect other non-transiting planets in the system.

In June, mission scientists submitted findings for peer review that identified more than 700 planet candidates in the first 43 days of Kepler data. The data included five additional candidate systems that appear to exhibit more than one transiting planet. The Kepler team recently identified a sixth target exhibiting multiple transits and accumulated enough follow-up data to confirm this multi-planet system.

"Kepler's high quality data and round-the-clock coverage of transiting objects enable a whole host of unique measurements to be made of the parent stars and their planetary systems," said Doug Hudgins, the Kepler program scientist at NASA Headquarters in Washington DC.

Scientists refined the estimates of the masses of the planets using observations from the W.M. Keck Observatory in Hawaii. The observations show Kepler-9b is the larger of the two planets, and both have masses similar to but less than Saturn. Kepler-9b lies closest to the star with an orbit of about 19 days, while Kepler-9c has an orbit of about 38 days. By observing several transits by each planet over the seven months of data, the time between successive transits could be analyzed.

For more information about the Kepler mission, visit <http://www.nasa.gov/kepler>

AGS Officers

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AGS 2010 Meeting Dates

Listed below are the planned meeting dates for 2009. Please mark your calendar and make plans to attend.

August 31 Mark W. Evans ATSDR –
 Exposure to Arsenic

September 28 – TBD

October 26 - TBD

November 30 - TBD

AGS Committees

AGS Publications: Allison Keefer
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www.atlantageologicalsociety.org

New View of Tectonic Plates: Computer Modeling of Earth's Mantle Flow, Plate Motions, and Fault Zones

ScienceDaily (Aug. 26, 2010) — Computational scientists and geophysicists at the University of Texas at Austin and the California Institute of Technology (Caltech) have developed new computer algorithms that for the first time allow for the simultaneous modeling of Earth's mantle flow, large-scale tectonic plate motions, and the behavior of individual fault zones, to produce an unprecedented view of plate tectonics and the forces that drive it.

A paper describing the whole-earth model and its underlying algorithms will be published in the August 27 issue of the journal *Science* and also featured on the cover.

The work "illustrates the interplay between making important advances in science and pushing the envelope of computational science," says Michael Gurnis, the John E. and Hazel S. Smits Professor of Geophysics, director of the Caltech Seismological Laboratory, and a coauthor of the *Science* paper.

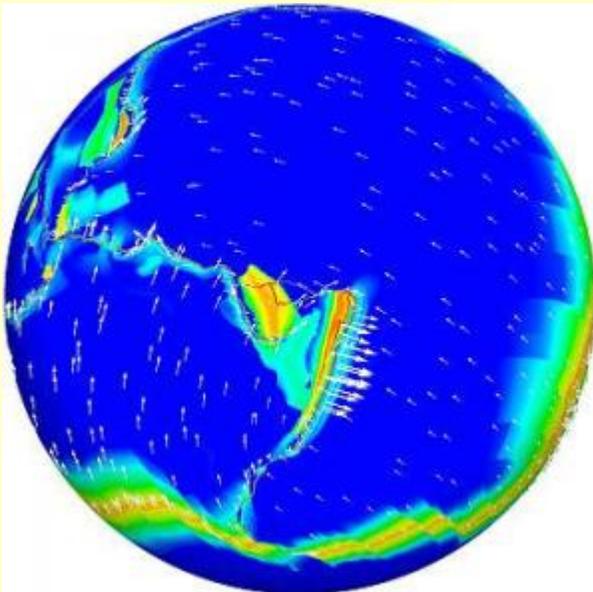


Plate boundaries, which can be seen as narrow red lines are resolved using an adaptively refined mesh with 1km local resolution. Shown are the Pacific and the Australian tectonic plates and the New Hebrides and Tonga microplates (Credit: Georg Stadler, Institute for Computational Engineering & Sciences, UT Austin).

In the new model, the researchers were able to resolve the largest fault zones, creating a mesh with a resolution of about one kilometer near the plate boundaries. Included in the simulation were seismological data as well as data pertaining to the temperature of the rocks, their density, and their viscosity -- or how strong or weak the rocks are, which affects how easily they deform. That deformation is nonlinear -- with simple changes producing unexpected and complex effects.

Reference California Institute of Technology (2010, August 26). New view of tectonic plates: Computer modeling of Earth's mantle flow, plate motions, and fault zones. *ScienceDaily*. Retrieved August 27, 2010, from <http://www.sciencedaily.com/releases/2010/08/100827092828.htm>

Join the Atlanta Geological Society

Membership Application/Information Update Form

Annual membership dues for the Atlanta Geological Society are \$25 for professional membership, \$10 for students, and \$100 for corporate sponsorship (which includes up to 4 professional memberships). For further details, contact the AGS Treasurer:

Stacy Durden
Phone: 770-617-1146
Email: Stacy.Durden@gmail.com

Make checks payable to the "Atlanta Geological Society" and remit with the completed form to:

Atlanta Geological Society
Stacy Durden, Treasurer
2534 Centennial Commons View
Acworth, GA 30102

Name: _____

Organization: _____

Address: _____

Mailing Address: _____

Phone: (Work) _____ (Home) _____ (Cell) _____

Fax: _____

Email 1: _____

Email 2: _____

Ready to Serve the Society?

Remember that although we have officers and various standing committees, it is ultimately the membership that keeps the Atlanta Geological Society active and growing. We have a world of experience within our membership. Please consider volunteering. Your Atlanta Geological Society needs you.