

Atlanta Geological Society Newsletter

**Next meeting of the Atlanta Geological Society is
March 31, 2009**

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

Editor's Prerogative...

MARCH 2009

Our thanks go out to Dave Jenkins for a very interesting talk last month about China with a discussion of the geology along the way. And this month's discussion of the State-Wide Water Management Plan should be informative. I believe that a plan is necessary and perhaps past due (kind of like the State transportation plan but that's a different topic).

I've noticed several stories lately that are facets of the water supply story. A farmer in the Sacramento Valley sold 100 acres of his water allotment back to the State for \$90K. He might have been able to sell his rice crop for about \$380K. The farmer gets his cash up front, the State gets water for about 200 families for a year but the rice market is shorted 700K lbs of rice. Which is the better trade off - food or water?

A company wants to build a coal fired power plant in western Nevada but their neighbors in California have grave concerns about the overall water budget of the project in an arid climate. Nuclear power plants use a lot of water in their cooling process with about a 3% evaporative loss. As Georgia Power applies for a new nuclear reactor along the Savannah River, would that 3% make a difference if the droughts continue? Which is the better trade off - energy or water? A water budget just might be the deciding factor to push renewable resources like wind turbines forward.

Recent NY Times and Ground Water articles touted good employment prospects for hydrogeologists but with warnings about dwindling enrollment in the geology schools. Our own organization has fewer paid members this year compared to last year. Clearly there is a big picture need for trained scientists to help society address these complex issues food, energy and water. The Ground Water article discusses the need to inspire children with the fun of geosciences and older students of the decent employment possibilities in this field. Personally, there have been some lean times but I love the science. I'd love to hear your experiences and ideas

on how we as geologists can help our country grapple with the new crop of difficult issues. Look forward to seeing you on Tuesday.

Ben Bentkowski

Newsletter Editor

Bentkowski.Ben@epa.gov

The March Meeting

Join us Tuesday, March 31, 2008 at the Fernbank Museum of Natural History, 760 Clifton Road NE, Atlanta GA. The pre meeting social starts at 6:30 pm and the meeting will start at 7 p.m. The evening's program will be provided by Dr. Jim Kennedy, the State Geologist. The topic of the evening will be the State-Wide Water Management Plan that is described in detail on the next page.

The sponsor of the evening is Tony Trettle of Drilling Solutions, Inc. Drilling Solutions is a drilling company licensed in many states across the Southeast. You might not see Tony at the next meeting as he is busy and that's a good thing. Please contact him for your drilling needs at the address below.

Mr. Tony Trettle

Drilling Solutions, Inc.

180 Gateway Drive

Canton, GA 30115

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Georgia Comprehensive State-Wide Water Management Plan

James Kennedy, Ph.D., P.G.

State Geologist - Georgia Environmental Protection Division

The water quantity policy of the State water plan is to manage the consumptive use of water on the basis of defined hydrologic systems of surface water and groundwater so that sufficient amounts remain within a water source to allow all present and future users and uses reasonable opportunities to benefit from the values provided by the resources. Resource assessments will determine sustainable yields and consumptive uses of hydrologic units based on dry year conditions. A comprehensive accounting of the sustainable yields of all aquifers in Georgia would have been extraordinarily expensive, time consuming, and may not have produced results that are equally useful for each aquifer and therefore aquifer assessments of sustainable yield were prioritized. Aquifers were prioritized based on functional characteristics of the aquifer, existing evidence of adverse effects due to withdrawals from the aquifer, forecasts suggesting significant increases in demands placed on the aquifer, and whether unacceptable impacts are likely or not from increases in withdrawals. Unacceptable impacts include progressive reduction of the groundwater resource as indicated by dropping water levels that do not recover, development of uneconomic pumping conditions, degradation of groundwater quality, interference with prior water rights, land subsidence caused by lowered groundwater levels, salt water intrusion, and sinkhole development. Information on sustainable yield will be estimated from the current U.S. Geological Survey (USGS) finite element model of the Upper Floridan aquifer in the Dougherty Plain of Georgia. A numerical regional model will be prepared based on the USGS model of southeastern coastal plain elastic aquifers in Georgia and adjacent parts of Alabama and South Carolina. Model layer 1 in the USGS model representing the Upper Floridan aquifer will be changed from a fixed head boundary to an active layer. Local-scale groundwater flow models will be developed from the calibrated regional model. Water budget models will be developed for the crystalline rock and Paleozoic aquifers in northern Georgia where creation of numerical models is not practical.

Biographical Sketch

James Kennedy is the State Geologist of Georgia and holds B.S. and M.S. degrees in physics and geophysical sciences from Georgia Institute of Technology and a Ph.D. in geology from Texas A&M University where he did research on reclaimed lignite mines. He is a registered professional geologist in Georgia and a member of the Georgia State Board of Registration for Professional Geologists. His areas of expertise are groundwater hydrology and engineering geology. As State Geologist, Dr. Kennedy has worked on the Coastal Sound Science Initiative to manage salt-water intrusion into the Upper Floridan aquifer, permitting of coastal groundwater supply wells, and the State Water Plan. He also has provided expert testimony at the Office of State Administrative Hearings in support of landfill, quarry, and water withdrawal permits issued by the Georgia Environmental Protection Division (EPD). Prior to joining the EPD Dr. Kennedy worked as a consultant and conducted engineering geology, groundwater supply, and environmental remediation projects in various areas of the United States and Europe.

What Determines The Size Of Giant Dunes?

Science Daily (Mar. 8, 2009) — Physicists at the Laboratory of Physics and Mechanics of Heterogeneous Media (CNRS / Université Paris Diderot / ESPCI ParisTech / Université Pierre et Marie Curie) have shown, in collaboration with scientists from the US and Algeria, that the size of giant dunes is controlled by the depth of the atmospheric convective boundary layer.

More specifically, the physicists have shown that such dunes grow through the accumulation of small superimposed dunes, and that their growth is limited by interaction with a part of the atmosphere called the inversion layer, which confines wind flow around the dunes.

The dynamics of dunes are the result of the interaction between the wind, which by transporting sand grains remodels their shape, and the shape of the dune which, in return, controls atmospheric flow. Dunes can take the form of crescents, stars or parallel waves. The smallest dunes appear spontaneously in the form of waves on the sand's surface, with a distance between their crests of a few tens of meters. Physicists have previously shown that this basic size is controlled by the inertia of the grain, which itself depends on the size and density of the grain as well as the density of the fluid sand.

This time, the aim of the researchers was to understand what determines the size of the biggest dunes. They first measured the distance between giant dunes in all the world's deserts by means of satellite images. This distance varies from an average of 300 meters for coastal deserts (along the coasts of Namibia or Peru, for example) to 3,500 meters in the interior of continents (in central China or in the two Great Ergs in Algeria).

This difference in size is linked to the vertical structure of the atmosphere. The lowest layer is the convective boundary layer, which is directly in contact with the Earth's surface: at this level, warming of the ground by the Sun gives rise to thermal convection. Above this, a thin layer called the inversion layer ⁽¹⁾ separates the convective layer from the stable part of the atmosphere, located at higher altitude.

The researchers showed that giant dunes form by gradual accumulation of smaller wind-driven structures. This growth process would be unlimited but for the fact that the dunes end up interacting with the inversion layer. This is because the inversion layer confines wind flow around the dunes. As a result, the dunes stabilize at a size that corresponds to the altitude of the inversion layer (or the depth of the convective layer). To obtain this result the researchers used a novel method to estimate the height of the inversion layer. It turns out that the greater the variation in annual temperature, the greater is the height of the inversion layer.

For instance, in an oceanic climate, where temperatures only vary by a few degrees between winter and summer, the inversion layer is on average located at an altitude of a few hundreds of meters. This is precisely the order of magnitude of the size of giant dunes in coastal deserts. Conversely, in a continental climate, where temperatures vary greatly over the year, the inversion layer is located several kilometers above the ground, which is the order of magnitude of continental giant dunes.

By combining field measurements, remote sensing and aerodynamic calculations, the scientists have shown the existence of a proportionality relationship between the size of giant dunes and the mean depth of the convective layer, regardless of the shape of the dunes. This interdisciplinary work has made it possible to better understand the phenomena at work when sediments such as sand interact with a fluid (in this case, the atmosphere).

Journal reference: Andreotti et al. **Giant aeolian dune size determined by the average depth of the atmospheric boundary layer.** *Nature*, 2009; 457 (7233): 1120 DOI: [10.1038/nature07787](https://doi.org/10.1038/nature07787)

<http://www.sciencedaily.com/releases/2009/03/090304133400.htm>

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

Upcoming Conference

Notice to Atlanta Geological Society Members:

The American Institute of Professional Geologists is hosting a conference titled 'Emerging Issues in Water Resources in Florida and the Southeast Region' and will be held at the Casa Monica Hotel in St. Augustine, Florida, April 30-May 2, 2009. This conference may interest many of your members working and living in this area as well.

Our conference website link is below.

http://www.aipg.org/Seminars/water_conf.htm

Thank you for your time and consideration.

Cathy Duran

Cathy Duran

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Upcoming Conference

The AEG Carolinas Section is hosting a short course on Principles of Soil and Groundwater Geochemistry in Raleigh, NC on May 4 and 5, 2009. Details of the course and registration details are included on the attached announcement.

Briefly, the course:

- is designed for practicing professionals to provide specialized geochemistry training that is directly applicable to your needs.
- will cover specific information on the geochemical aspects of site characterization and contaminant fate and transport.
- is taught by Bill Deutsch, a geochemist with 30 years of experience who has taught over 100 similar courses in environmental geochemistry.
- has been very well received by participants of previous courses.
- is a two day course at a very affordable cost.
- provides 16 hours of continuing education credit hours.

We hope to see you in Raleigh on May 4!

Gary Rogers, P.G., Past Chair of AEG Carolinas Section

Schnabel Engineering

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336-274-9456 grogers@schnabel-eng.com

Ed Note: Please see attached file for the registration information, course description, schedule, instructor bio and other important info.

NEWS FLASH

After 35 years, the USGS is changing the way it refers to that aqueous substance often found in the subsurface. No longer will it use separate words for ground water when it uses it as a noun. Also, it will no longer use a hyphen when it uses it as an adjective as in ground-water characterization. From now on it will be one word - groundwater. Apparently the Merriam Webster dictionary has had it as one word since 1998. Now if a certain professional journal of the same name shortens it name just slightly, we'll all be on the same page.

Editor

AGS PROFESSIONAL GEOLOGIST WORKSHOP MARCH 28, 2009

The next AGS PG Candidate workshop will be held this Saturday, March 28, 2009 at the Fernbank Science Center. The class will be led by Mr. Richard (Rick) Eppihimer discussing economic geology keying on the coal industry.

Mr. Eppihimer is a long time AGS member and has served the Society as editor of the newsletter. Currently, Rick serves as Director of the Geology, Geotechnical & Materials Engineering Division at Moreland Altobelli Associates, Inc. in Norcross, Georgia. He earned a B.S. in Physics from the University of Georgia in 1975 and an M.S. in Geology in 1978, also from the University of Georgia. Prior to joining Moreland Altobelli, Mr. Eppihimer managed EPA grants to Georgia's Groundwater Management Program at the Georgia Environmental Protection Division and assisted in the development of the criteria for the establishment of Georgia's Well Head Protection Program. He has performed hydrocarbon exploration for Exxon USA's Eastern Exploration Division; performed gravity and magnetic data collection, processing and interpretation for Exxon USA's Eastern Division, Northern Alaska Group, and Exxon Corporation's affiliates in the United Kingdom, Norway, and Australia. Mr. Eppihimer performed marine gravity data collection and processing aboard U.S. Navy oceanographic ships and did seismic interpretations for offshore tract evaluation in the Gulf of Mexico. He has provided hydrological and geological assistance to coal mine operators to enable them to meet the requirements of the Surface Mining Control and Reclamation Act of 1977. Rick is licensed professional geologist in Georgia and Alabama.

The class will be held in the Human Development Classroom in the annex of the Fernbank Science Center from 10:00 am to 12:00 pm. The Fernbank Science Center is located at 156 Heaton Park Drive, Decatur, Ga., and is approximately 1-mile north of the Fernbank Museum. The Center does not open until 10:00, just knock on the front door anytime after 9:00 am and you will be let in. For more information on this venue, go to <http://fsc.fernbank.edu>.

The class is open to everyone and two Professional Development Hours are available for attendees. If you are not an AGS member, please consider joining.

Ken Simonton, P.G.

AGS Career Development Committee

www.atlantageologicalsociety.org

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

On Exhibit:

- New Permanent Exhibit: *Conveyed in Clay: Stories from St Catherines Island*
- New Permanent Gallery: *Curators Corner: Highlights from the Permanent Collection*
- *Dinosaurs: Ancient Fossils, New Discoveries*
- *Scenic Stone Mountain: Photographs by Larry Winslett*

Upcoming Public Programs:

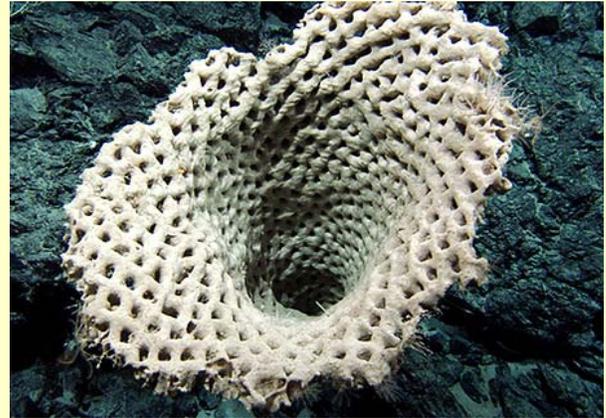
- **Archaeology Open House.** Saturday, March 21, 11 a.m. - 3 p.m. Included with Museum membership or admission.

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

- *Under the Sea*
- *Dinosaurs Alive!*
- *Africa's Elephant Kingdom (Friday nights only)*

Martinis and IMAX: Friday evenings, 5:30 p.m. – 10 p.m.

NEW SPECIES OF SPONGE



National Geographic has recently reported new discoveries from an underwater expedition near Tasmania. They say it is a new species of sponge but I say it is a bleached out waffle fry from Chick-Fil-A. At 1.5 feet wide and 6.5 feet tall that would make it one of the largest waffle fries I've ever seen. Plenty of other cool pictures from this expedition and others at the link below.

Ed.

<http://news.nationalgeographic.com/news/2009/01/photogalleries/deepsea/photo3.html>

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.

AGS Treasurer Report - March 2009

Membership Dues Payment Status:

	Professional	Student	Corporate	Complimentary
2008	56	5	8	0
2009	44	5	12	
Delinquent*	62	-	-	0

*Members >2 years delinquent.

Finances: Account Balance as of March 20, 2009 - \$2,582.56

Contact the Treasurer if you wish to receive a copy of the 2008 financial summary

ANNOUNCEMENTS FROM THE TREASURER

PayPal is coming to AGS !!!

Now that the new web site is up and running and our electronic banking account is established, we will soon have a PayPal Account for dues payments. Please watch the AGS Web Site for the link to PayPal to simplify your dues payments.

2009 Membership Dues

AGS operates on a calendar year, and your 2009 dues were due in January 2009. The AGS Treasurer is accepting 2009 payments now. If you cannot attend a meeting then please consider mailing your dues to the AGS Treasurer along with the completed last page of this newsletter. Also, *please make sure that we have your most current e-mail address.*

Membership Mailing List to be Purged

In April 2009 the E-Mail will be purged of delinquent members that are > 2 years delinquent on membership dues. Please check your membership status so you won't be dropped from the meeting reminders and newsletter distribution. Once you are dropped you'll realize that there is a void in your life, as you'll suddenly remember that you aren't getting the AGS meeting announcements and the monthly newsletter alerts. Please contact the AGS Treasurer to avoid such an interruption in your routine.

Please contact Ken Bechely if you are unsure of your membership status. If you know of a member that no longer is receiving the newsletter notification, have them contact the Treasurer.

Ken Bechely
AGS Treasurer
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 Phone (404) 463-0679

Treasurer: Ken Bechely
ken.bechely@aecom.com
 Phone (770) 990-1415

AGS 2009 Meeting Dates

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

March 31 – Dr. Jim Kennedy, State-Wide Water Management Plan for Georgia.

April 28 – Special Joint meeting with AEG and AIPG presenting Dr. Edmund Medley, the 2009 Jahns Distinguished speaker presenting the Sea Cliffs Forensic Investigation
<http://www.aegweb.org/files/public/MedleyJahns2009.pdf>

May 26 - Raj Mahadevaiah & Alan Sanders, New Environmental Technologies

June 30 – Annual Social – BBQ and IMAX

NOTE TO SELF: Start planning your donation to the door prizes for the Annual Social now. It is always more fun to give and or receive something a little special.

AGS Committees

AGS Publications: Allison Keefer
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SPEAKER FOR THE APRIL JOINT MEETING

Edmund Medley, Ph.D, PE, CEG, F.ASCE is the 2009 *Richard H. Jahns Distinguished Lecturer in Engineering Geology*. The selection committee for this award is composed of representatives of the Association of Environmental and Engineering Geologists (AEG) and the Engineering Geology Division of the Geological Society of America (GSA). The intent of the partially-funded Lectureship is to encourage student and professional awareness of engineering geology through a series of lectures presented across North America during the award year. The award was established in 1988 to commemorate Professor Richard H. Jahns (1915-1983), who had an influential and diverse career in academia, consulting and government.

Lacking math and science pre-requisites, Dr. Medley began his academic life in 1973 as a “mature student”, admitted to the Mining Technology program at the British Columbia Institute of Technology, in Burnaby, British Columbia. Transferred to the University of British Columbia, in Vancouver, British Columbia, he graduated in 1978 with a B. Appl. Science in Geological Engineering (Geotechnical Option), winning the first Aro A. Aho Medal for academic excellence in Geological Engineering. He earned a mid-career M.S. in 1991 and a Ph.D. in 1994, both in Geotechnical Engineering, from the University of California at Berkeley. He was the AEG Marliave Scholar in 1993, awarded for outstanding scholarship in Engineering Geology and Geological Engineering. For his Ph.D. research he pioneered approaches to the engineering and geological characterization of bimrocks (block-in-matrix rocks), complex geological mixtures of rock and soil such as mélanges, fault rocks and weathered rocks. Dr. Medley has authored/co-authored about 50 professional contributions, many on bimrocks. Most of his professional and research contributions are available at bimrocks.geoengineer.org and edmedley.com. He has also presented over 150 professional and academic lectures, Short Courses and MCLE Credit courses.

Dr Medley is a Senior Consultant in the Oakland, California office of Geosyntec Consultants. He began his career in the Applied Earth Sciences in 1969, and now has over 30 years of unusually varied international experience in geotechnical and geological engineering consulting, mineral exploration prospecting, failure investigation, litigation testifying and research. He has consulted on major landslides, rockfall hazards, expansive/collapsing soils, tunnel failures, coastal erosion, sinkholes and other ground movements. He is licensed/registered/chartered as an engineer and geologist in the USA, Canada and the United Kingdom. Affiliated with several international geosciences and engineering organizations. Dr. Medley has been a member of the GSA and AEG for many years. He was the San Francisco AEG Section Membership Committee Chairman between 1991 and 1993 and the San Francisco Section Short Course Chairman between 1995 and 1996. He currently contributes time to several professional committees, Editorial Boards, and as a peer reviewer, to professional journals.

Join the Atlanta Geological Society

Membership Application/Information Update Form

Annual membership dues for the Atlanta Geological Society are \$25 for professional membership, **\$5 for students (new reduced rate)**, and \$100 for corporate sponsorship (which includes up to 4 professional memberships). For further details, contact the AGS Treasurer:

Ken Bechely

Phone: 770-990-1415

Email: ken.bechely@aecom.com

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

Atlanta Geological Society

Ken Bechely, Treasurer
1455 Old Alabama Rd., Ste. 170
Roswell, GA 30076

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.