



FALL 2010

# GEONews

Newsletter of the Association of Environmental  
& Engineering Geologists, Carolinas Section

**SAVE THE DATE!**  
**September 20-25**  
**AEG 2010**  
**Charleston,**  
**South Carolina**

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**GEONEWS FALL 2010**

Issue Date: September 15, 2010

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**Cover:** *The Charleston Waterfront and Historic District*  
photo by Mitchell Golgan.

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**GeoNews** is a publication of the Carolinas Section of AEG. There are four issues per year, with deadlines and issue publication dates listed below. We publish news of the profession, technical articles, and job openings.

**Deadlines for submittal to AEG Carolinas GeoNews**

*(can be flexible depending on events)*

Spring – deadline March 1, issue date March 21
Summer – deadline June 1, issue date June 21
Fall – deadline September 1, issue date Sept. 15
..... <i>(one week earlier because of AEG 2010 Sep 20-25)</i>
Winter – deadline December 1, issue date December 21

**Deadlines for submittal for the National AEG News:**

March issue – January 15
June issue – April 15
September issue – July 15
December issue – October 15

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[www.aegweb.org](http://www.aegweb.org)

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**Geophysical  
Surveys**

## MESSAGE FROM THE CHAIR

By Paul Weaver, PG,  
Carolinas Section Chair

The Carolinas Section of AEG held our summer section meeting in Asheville in August. This was a joint meeting with the western section of ASCE, and we had approximately 68 people in attendance. The talk was on the rock slides along I-40 this winter, and was very informative. To those of you who didn't attend the summer meeting this year, I urge you to try and attend next year's meeting in Asheville.

By the time you read this article, we will probably have had the AEG National meeting in Charleston. It looks like we are going to have a very good turnout. I will be sure to provide some numbers on the meeting for the winter edition of AEG News.

Ballots were sent out in July for the Vice Chair, Secretary, and Treasurer's positions for the Carolinas Section Board. I am pleased to tell you that Brad Worley has been reelected as Vice Chair, and Dave Dunklee has been reelected as Treasurer. Our new Secretary is Alex Rutledge.

We are tentatively planning to have a fall section meeting in Greensboro at Natty Greene's again this year. Our plan at this time is not to have a speaker but instead to have a social to celebrate pulling off a successful national meeting in Charleston. A notice will be sent out to all of the membership once we have this meeting finalized.

Speaking of the national meeting in Charleston, I would like to thank all of the people who volunteer so much of their time to keep the Carolinas Section vibrant. Most of these people also were very

involved in making the national meeting a success. Continuing on this theme, I want to make volunteerism to the Carolinas Section the theme of this article.

There are many instances among professional associations where a core group of volunteers worked for many years to keep their respective section of that association active and viable. However, new "blood" did not step up to assist and eventually take over the duties of these volunteers, the core group became burnt out, and the section perished due to lack of anyone willing to do the work necessary to keep the section going. The Carolinas Section of AEG is a very active section and is the envy of much of AEG across the nation. However, I can foresee the same thing happening to us that has happened to these other groups if we don't have members step up and volunteer their time and energy to give long serving members a break and to build a new leadership. It won't take much of your time and I think you will find it very rewarding.

Our most pressing needs right now are:

- Someone to take over the newsletter editor's position for Jane Gill-Shaler. Jane has faithfully put together GeoNews for seven years but she has done more than her share and desperately needs someone to assist her and eventually take over the majority of the work she currently does as newsletter editor.
- Someone to take over the webmaster duties for our section website. Tami Idol, who has served as our webmaster for many years, needs someone to work with her and eventually take over the webmaster duties. Tami has been instrumental in getting our new website up and running

(Continued on page 4)

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## AEG CAROLINAS SECTION TREASURER'S REPORT

By David Duncklee, Treasurer

### AEG Carolinas Section Treasurer's Report

April 1 to June 30, 2010

#### Balance As Of March 31, 2010

Checking Account	\$4,858.02
Money Market Account	\$12,090.00
Charleston Planning Account	\$2,528.04

#### INCOME

Dinner Meetings	\$819.00
Sponsorships	\$2,175.00
AEG Dues rebates	\$480.00
Defined donations	
AGI Toolkits	\$0.00
Scholarships	\$0.00
Short Courses	
AEG Short Course Sponsors	\$0.00
Interest	
Charleston 2010 Account	\$0.57
Money Market	\$1.51
<b>SUBTOTAL</b>	<b>\$3,456.08</b>

#### EXPENSES

Dinner Meetings	
Raleigh Meeting Venue and Food	\$1,524.17
Cake	\$88.50
Educational Programs	
Visiting Professionals to Local Universities	\$0.00
Virginia Tech	\$90.70
NCSU	\$259.49
UNC-Ch	\$191.94
Furman	\$101.80
Student Memberships	\$125.00
Student Travel Grants	\$0.00
Paul Marinos Lecturer Expenses	\$341.65
Section President Hotel at Annual Bd. Mtg.	\$188.18
Administrative	
Checks	\$18.00
Charleston 2010 National Meeting	
Yorktown Event Sponsorship	\$500.00
	<b>\$3,409.43</b>

#### BALANCE As Of June 30, 2010

Checking Account	\$4,900.59
Money Market Account	\$12,091.51
Charleston Planning Account	\$2,528.61
<b>TOTAL</b>	<b>\$19,520.71</b>

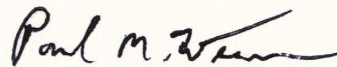
(Continued from page 3)

and as such has gone way beyond the call of duty.

Please help us keep the Carolinas Section of AEG strong, and maybe make us even stronger, by volunteering your time and energy in whatever capacity you can.

Please feel free to contact me with questions, concerns, or ideas to help make the Carolinas Section of AEG even stronger. My work number is 336-668-0093 ext. 138, or you can email me a [pweaver@kleinfelder.com](mailto:pweaver@kleinfelder.com). I look forward to seeing and meeting each of you at one of our quarterly section meetings.

Thank you!



Paul M. Weaver  
AEG Carolinas Section Chair

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SEPTEMBER 20-25 at BOOTH # 25

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## WHAT TO DO WHILE YOU ARE IN CHARLESTON SC

*From the Charleston Area Convention and Visitors Bureau website*

My husband and I are really looking forward to our trip to Charleston next week! Not only are we going on the two day field trip, attending many of the interesting and informative technical sessions, and meeting and networking with colleagues and friends from all over the country, we are also going to spend some time visiting the City herself.

Charleston is ranked by a recent Conde Nast poll as the number two city to visit in the United States, only after San Francisco. Famous golf courses, top-rated tennis courts, pristine beaches, monumental battleships and beautifully preserved architecture barely scratches the surface of attractions in Charleston. You can be as adventurous or as tame as you like. Best of all, our mild climate means you can enjoy most of our sights year-round.

Stand on the site of the first shot in the Civil War. Come face to face with a giant sea turtle. Take a tour of an antebellum mansion. Climb aboard a

WWII aircraft carrier. There are so many blossoming gardens, so many photo opportunities and so many reasons to come back to see us again.

The Charleston Museum, America's first museum, showcases a variety of cultural and natural history artifacts that tell the story of the Low Country. Visitors will be transported back through time, viewing artifacts from ancient fossils and an enormous whale skeleton, to elegant costumes and Charleston silver.

Karpeles Manuscript Museum is open from W-Sa 11am-4pm. This spectacular museum houses the largest private collection of historically significant manuscripts in the world (more than 1 million). Philanthropist David Karpeles supports seven museums across the nation and his collection ranges from Ancient Egypt to the Apollo moon landing. For the thrifty traveler, this is free.

There are many more things to see in Charleston. For more options, go to the Charleston Area Convention and Visitors Bureau website, at <http://www.charlestoncvb.com/>, or to the Trip Advisor site at [http://www.tripadvisor.com/Attractions-g54171-Activities-Charleston\\_South\\_Carolina.html](http://www.tripadvisor.com/Attractions-g54171-Activities-Charleston_South_Carolina.html). See you in Charleston!

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## AEG•2010

## Charleston, SC

Francis Marion Hotel  
September 20 – 25, 2010

AEG-2010 features short courses, field trips, technical sessions, symposia, and more!



### ◆ Meeting Hotel

The Francis Marion Hotel, located in the heart of historic Charleston, South Carolina, was the largest and grandest in the Carolinas when it opened in 1924. Named for General Francis Marion, the "Swamp Fox" of the American Revolution, the Francis Marion Hotel in Charleston re-opened in 1996 after a \$12 million National Trust award-winning restoration, and is once again Charleston's Grand Hotel.

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AEG 2010 Charleston



Appalachians to the Atlantic.....  
Landslides, Earthquakes, and Hurricanes, OH, MY!

## AEG•2010

ASSOCIATION OF ENVIRONMENTAL &  
ENGINEERING GEOLOGISTS

53<sup>rd</sup> ANNUAL MEETING

Charleston, SC  
Francis Marion Hotel  
September 20 – 25, 2010

For more information:

[www.aegweb.org](http://www.aegweb.org)



## AEG•2010

### About Charleston ....

With a rich 300 year history, Charleston today is America's most beautifully preserved architectural and historical treasure. The city's past is a testament to the spirit and tenacity of its citizens. Its appeal has been described as a "living museum." As Charleston native Elizabeth O'Neill Verner once said, "It is impossible for me to enter Charleston from any side, whether by land or by sea, and not feel that here the land is precious; here is a place worth keeping..." Visit [www.charlestoncub.com](http://www.charlestoncub.com) to check out all that the area has to offer.

### Join us for a week of education, networking, and fun in Charleston!

#### ♦ Field Trips

- ♦ **Coast to the Mountains:** Overnight trip between Charleston and the North Carolina mountains. Includes stops at a pumped storage project in Western SC, waterfalls and a dam in Western NC, landfills along the Blue Ridge Parkway, and a reclaimed gold mine in Central SC.
- ♦ **Savannah River Site Visit:** 1 day trip to a decommissioned nuclear defense materials plant to see environmental remediation and other clean-up technologies at work.
- ♦ **Effects of Coastal Processes on Kiawah and Seabrook Islands, South Carolina:** 1 day trip to local barrier islands to discuss inlet dynamics, island stratigraphy and geomorphology, and how these processes and human activities interact.
- ♦ **Charleston Earthquake Walking Tour:** 2-3 hours, may run several during meeting as both field trips and guest tours. Shows and discusses evidence of 1886 M7 Charleston Earthquake on structures in downtown Charleston. (With geologists & prof. leader, 3-4 hrs.)
- ♦ **Macroeffects of the 1886 Charleston Earthquake:** 1 day trip to explore evidence and effects of 1886 Charleston earthquake and paleo-earthquakes throughout the Charleston Region, including structural damage to buildings, paleo-liquefaction evidence, and other earthquake-induced features.

**\*\*Planning for the meeting is in progress. The currently planned Field Trips and Technical Program topics are preliminary.**

#### ♦ Technical Program

In conjunction with the meeting theme, the technical program (September 22, 23 & 24, 2010) will focus on:

##### Geologic Hazards

- Earthquakes, seismic hazards and their mitigation
- Paleoseismology and Faulting
- Landsliding and their mitigation
- Subsidence and fissuring due to withdrawal

##### Geologic Characterizations

- Rock mass Characterization, rock mechanics
- Soil Characterization, expansive soils, liquefaction

##### Construction Materials Investigations

##### Geologic Studies for Engineering Structures

- Dams
- Tunnels
- Levees
- Transportation
- Lifelines
- Forensic Studies of Failures

##### Environmental Hazards

- Contaminant geology and its remediation
- Mining reclamation
- Naturally occurring environmental hazards and their remediation

##### Environmental and Resource Protection

- Groundwater Resource Characterization, conjunctive use
- Coastal Geology
- Surficial Geology, watershed restoration, wetlands, sedimentation, erosion

##### Geologic Investigations and Reporting

- Field investigations, mapping
- Geophysics
- Computer applications, GIS
- Geo-visualizations techniques

##### Professional Education and Practice

- History of Engineering Geology
- Future of Engineering Geology
- Business of EG practice
- Regulatory practice
- Geologic education
- Professional registration

#### ♦ Special Event: USS Yorktown



- ♦ WWII aircraft carrier YORKTOWN, all 888 feet of her, is the flagship of the fleet at Patriots Point Naval & Maritime Museum. Patriots Point features 25 aircraft ranging from the fighters and bombers of WWII up to a modern F-14 Tomcat. Talk about hands-on history! Sit in the cockpit of an F-9 COUGAR, the first model used by the fabled Navy Blue Angels. Plus, strap in and hold tight inside our Navy Flight Simulator. Then, head to the bridge of the carrier with its commanding view of Charleston Harbor and take the actual wheel of this massive, floating city of steel. Feel what life was like for the more than 3,000 sailors who lived, fought, and sometimes died in epic Pacific battles. See where Japanese Kamikazes became fighting men and fighting men, in moments of greatness, became national heroes. Their stories are told in the Congressional Medal of Honor Museum onboard YORKTOWN. Our special event will feature private tours of the USS Yorktown and dinner/entertainment on board the ship. Visit [www.patriotspoint.org](http://www.patriotspoint.org)

## VIRGINIA GEOLOGICAL FIELD CONFERENCE OCTOBER 8&9

The 2010 Virginia Geological Field Conference will be held this year in the Heart of Virginia - the central Piedmont - on October 8th-9th, 2010. The conference will be based at Bear Creek Lake State Park near Cumberland, and camping and cabins are both available in the park. For those who prefer more refined creature comforts, motel accommodations are located in Dillwyn, Fork Union, and Zion's Crossroads 20 to 45 minutes from Bear Creek Lake State Park.

As is typical, there will be a Friday evening business meeting/trip introduction and an all-day Saturday field trip. Brent Owens of William & Mary College will lead a field trip to some great exposures of metamorphic rocks in the Chopawamsic arc terrane. Transportation, lunch, and guidebooks will be provided. The pre-registration deadline is Sept. 20th. For links and more information checkout the VGFC website at <http://web.wm.edu/geology/vgfc/2010.php>.

**Patrick Hicks, Ph.D.**

Vice President

**WAVEFRONT**

**Phone:** 919.424.7563

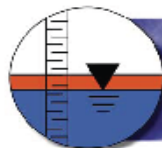
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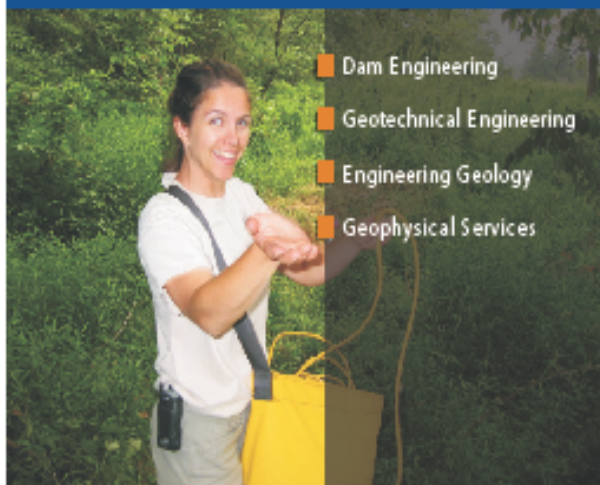
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Regional Contact (Raleigh, NC)  
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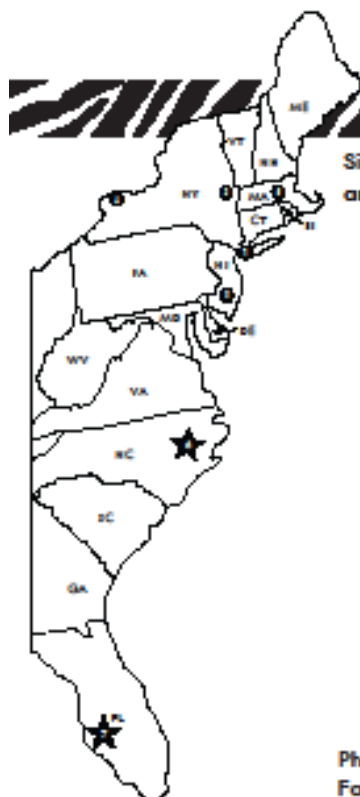
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- EC - Electrical Conductivity
- 2D & 3D Computer Graphic Visualizations
- Web based data sharing capabilities

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- In situ Chemical oxidation products
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- Multiple tank platforms from 150 gal. to 500 gal. cans

### INSTALLATION SERVICES

- Proprietary screens installed with 3.5" DPT casing
- Soil Vapor Implants & conventional well screens
- Re-injectable remediation product points
- Continuous Multi-channel tubing (CMT)

For More Information Please Contact:

Michael Early, Southeast Regional Mgr.

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## GEORAMBLINGS

By Dr. Charles W. Welby

The Friday 13th meeting of the Carolinas Section of AEG in Asheville certainly provided an interesting dietary experience along with the “networking” that occurs at such meetings. It was good to see friends and former students (friends also) and to have a chance to meet some of the new faces belonging to people who are contributing to the geologic profession in North and South Carolina and nationally.

During the time I drove to Asheville on Thursday afternoon I began to think about some of the past AEG meetings that I have attended in Asheville. Some of the get-togethers involved field trips on a Saturday morning after an evening meeting on Friday. Three of the meetings have emerged slightly from the fog of time (and misfiling of notes and field trip guides) although the exact dates of the meetings did not accompany the musings.

One field trip involved the improvements made in US 70 and now I-40 in the vicinity of exits 55 and 59. Questions of land sliding tendencies of

the rock in the cut slopes and the construction of the fill required to widen the road bed were points of discussion. For this trip I remember a rather crisp, beautiful fall day.

Another meeting devoted its attention to the construction of the I-240 road cut across (through) Beaucatcher Mountain. Potential mass wasting and the nature of the exploration program preceding the actual construction of the road were the focus of the trip. (There must be some local “legend” related to the name of the mountain which gave its name to the road cut as well as the tunnel which preceded it.)

The construction of I-26 in the Asheville area was the focus of another field trip for the Carolinas Section of AEG. It is my recollection that Jody Khune, our speaker on August 13, was one of the workers on the project and one of the leaders for the field trip along with Russell Glass. The careful exploration for the construction of the route across the metamorphic rocks accompanied later by a design that used the information well seems to have made a difference in the mass wasting characteristics of the I-26 corridor when compared with the similar characteristics of the Pigeon River route of I-40.

Another trip whose time I do not recall was set up to examine the construction of the “viaduct” around Grandfather Mountain. What was particularly interesting was the location of the viaduct and how it was constructed to avoid some environmental problems and to protect the forest. The “fun” part of the trip for those interested in their youth with playing with erector sets and toy trucks was how the concrete was distributed to the right of way as it “soared” on pillars above the slopes. The concrete plant was located “off site” at the western end of the strip being constructed. The concrete trucks would drive out to the end of the constructed road and off-

(Continued on page 11)



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(Continued from page 10)

load their concrete onto the “platform” on which the road was being constructed. The road soars above the trees in places in broad sweeping curves and is an interesting stretch of highway through the mountains (or around them). The location of the road provides some spectacular views along the front of the mountains, and its location and method of construction restricted the changes in the appearance of the mountains.

On March 5, 1985, a few months before the Annual Meeting of AEG in Winston-Salem, NC, a major mass wasting event occurred on I-40 in Pigeon River Gorge. The rock and soil mass blocked the eastern end of a tunnel in a position about 42.3 miles from Asheville (approximately 36.764 N, 83.042 West), and it also provided an opportunity for an interesting field trip in conjunction with the AEG Annual meeting. Rick Wooten kindly provided the details of the location of the landslide.



Since land sliding and mass wasting in other forms occur in the mountains of North Carolina and make the headlines, it seems appropriate at this point in time to mention the landslide mapping program of the North Carolina Geological Survey. The web site for the uninitiated, non-geologist and geologist alike provides important information regarding hazards, possible limits to land use, and places to find information. Considering a California court decision about responsibility for knowing the land slide haz-

ard at a site, people in general and realtors in particular should be knowledgeable about landslide hazards, where to find information about them, and whom to consult about possible risks.

From the “Google Files” one can obtain from the web page of the North Carolina Geological Survey a road log summarizing the geology along I-26 corridor from the South Carolina/North Carolina border to the end of I-26 about 4 miles southwest of Asheville. Try ([www.proj\\_earth/I26roadlog.htm](http://www.proj_earth/I26roadlog.htm)). Although I have not taken the route in some years, the log can prove very useful in acquainting one with

a part of the geology of North Carolina and perhaps can play a role in broadening the education of various age groups in North Carolina about the state’s geology.

Wandering along the Blue Ridge Parkway on Saturday after our meeting, I drove in some thick fog. The fog did not obscure completely the mass wasting possibilities along the Parkway, some of which I had observed years ago, nor the

places where the Parkway has been affected by “recent” mass wasting events. Sometime back in the early Triassic when I first came to North Carolina, preliminary work had been undertaken by two faculty members at NC State University. One was a geologist who had practiced in California and the other a geotechnically trained civil engineer. They had identified some of the potentials for mass wasting.

A stop at the Cradle of Forestry reminded me that in one of the buildings along the path through the campus and in which classes were held for the Biltmore School of Forestry there is a re-

(Continued on page 13)



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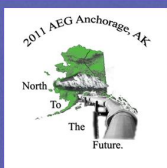
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(Continued from page 11)

cording in which an actor portraying Carl A. Schenck gives a lecture about various subjects related to the practice of forestry as a profession. During the lecture the voice reminds the students (and the visitors) of the importance of geology to the practice of Forestry.

The title of this column seems to allow for the injection of a little bit of general geomorphology. TO WIT:

What does the accompanying photograph of the mountains behind the local Five-Star Hotel complex shown in the photograph (*on page 11*) tell us about the geology of the scene? Similar geomorphic features are found in Nevada in places as well as elsewhere in the western part of the U.S. The latitude of the "Hotel" is about N47.6 degrees and the longitude is about E108.4degrees. The picture was taken from the top of a ridge above the "Hotel." The hill and adjoining ridge are underlain by coarse-grained pink granite which is bordered by some thick bands or beds of milky quartz, and interbedded with the quartz beds and the granite on one side of the exposure are amphibolite-appearing thin bands.

Have you heard this one? Once there was a

gentleman with some mineralogical interests who at breakfast was asked by his wife if he knew what special day it was. He did not respond. Late in the morning after the gentleman had gone to work, a package arrived addressed to his wife. An opal ring and a pair of diamond ear rings were in it. About 1:30 PM a bouquet of red roses was delivered with her name on it. Just before dinner a box of Mother See's candy (You see this is a western story.) arrived for the wife. Subsequently, when the gentleman came home, he asked his wife how her day went. Her reply was, "I have never had such an exciting Groundhog Day!"

*Charles W. Welby*

*Dr. Charles W. Welby is a former Section Chair for AEG Carolinas and a regular contributor to this newsletter. He may be reached at [cww\\_ral@hotmail.com](mailto:cww_ral@hotmail.com).*

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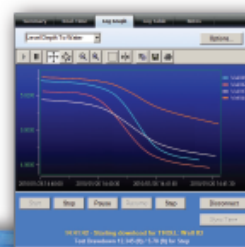
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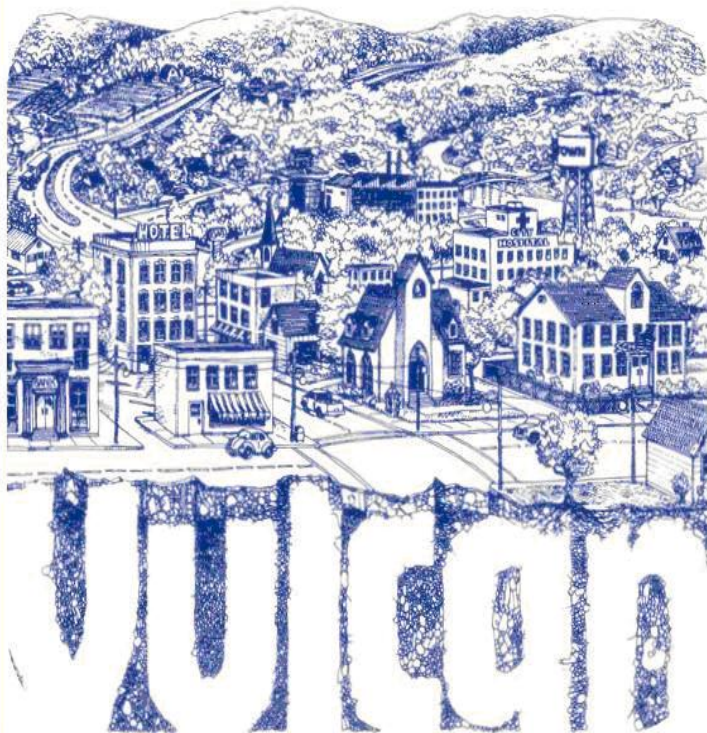
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## EDUCATION SECTION

### 2010 JAHNS LECTURER TO VISIT THE TRIANGLE IN SEPTEMBER

*By Rick Kolb, Duncklee & Dunham*

The 2010 Jahns Lecturer, Paul Marinos, will visit the Triangle area after the annual meeting in Charleston. As shown in the calendar on page 28 of this newsletter, Paul will make afternoon presentations to students at the NC State University and UNC-Chapel Hill on September 27 and 28, respectively, and to a luncheon meeting of the Eastern Branch of the American Society of Civil Engineers on Wednesday, September 29 at the NCSU University Club in Raleigh. You may remember that Paul has already visited our section and presented at three universities in South Carolina, three in North Carolina, two in Virginia and one in Tennessee, so now is your last chance to see him when he comes to Raleigh. AEG members will pay the member cost of lunch (\$20) at the ASCE meeting.

Dr. Paul Marinos received a Mining Engineering degree from the School of Mines of the National Technical University of Athens, Greece in 1966, a postgraduate degree in Applied Geology from the University of Grenoble, France, and his Doctorate in Engineering Geology from the same University in 1969. He worked for French and Greek design and construction companies until 1977 and then was elected as Professor at Democritus University in Northern Greece. Since 1988 Dr. Marinos has been Professor of Engineering Geology in the School of Civil Engineering in the National Technical University of Athens and has served as head of the Geotechnical Section of the School for several years. From 2001 to 2004 and from 2006 to 2008 he was the Director of a Graduate Course in Tunneling

and Underground Construction. He was a visiting Professor in the Geology Department of the University of Grenoble (1987) and of the School of Mines in Paris (2003).

Dr. Marinos is a member of AEG and GSA and fellow of the Geological Society of London. He is a past President of the International Association of Engineering Geology and the Environment (IAEG), immediate past president of the Geological Society of Greece and honorary member of the International Association of Hydrogeologists (IAH).

Dr. Marinos has received several awards, including the Hans Cloos medal of IAEG, and the Andre Dumont medal of the Geological Society of Belgium. He was selected for the presentation of named lectures, including the 6th Glossop Lecture in London (2002), the 19th Rocha Lecture in Lisbon (2002), the 33rd Cross Canada Lectures Tour (2005), and the Rock Mechanics annual Lecture in Madrid (2006).

Dr. Marinos and his team conduct research on a variety of applications of geology to engineering, mainly rock mass characterization, weak rock properties and behavior, with special emphasis to tunnel design. His work also covers landslides, dam geology, and engineering in karstic terrain. His other significant interest is the protection of historic monuments and archeological sites. Dr. Marinos has authored or co-authored over 300 papers in journals or major conference proceedings. He was a key or invited lecturer in more than 40 conferences or special events. He has given lectures to university courses and workshops, among them the Federal Technical University (EPFL) in Lausanne, Switzerland, the Polytechnico of Turin, Italy, the University of Durham in the United Kingdom, the University of Coimbra in Portugal, the University of Kobe in Japan, the Black Sea University Romania, the Aristotle University of Thessalonica in Greece, and the Griffiths University in Australia. He has edited proceedings published by international publishers. Dr. Marinos is a member of the Editorial Board of a number of prominent journals as "Engineering Geology", "Bulletin of the International Association of Geology", "Landslides", "Environmental Geology", "Rock Mechanics" and from 2009 "Environmental and Engineering Geosciences."

Dr. Marinos has extensive industrial experience having served as consultant, independent re-

*(Continued on page 19)*

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## EDUCATION SECTION

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To become a mentor or protégé, simply log on to the website <http://www.mentornet.net/>, and click on the link that says "Sign Me Up". Then, you simply create a username and password, answer some eligibility questions, pick your areas of interest, and then wait for protégés to contact you. Note, the AEG was given complimentary Association Membership through a NSF Grant to MentorNet, and the funding will expire in one year.

If you participate in the program, please let AEG HQ know if you think it is valuable for AEG to continue in the future.

*(Jahns Lecturer—Continued from page 18)*

viewer and member of consulting boards or panel of experts on major civil engineering projects in Greece, Ecuador, France, India, Iran, Israel Jordan, Morocco, Portugal, Saudi Arabia, South East Asia, Spain, Sweden, and Turkey.

#### Abstract

The integration of site geology with engineering requirements is the basis of Engineering Geology. Despite the record of case histories and the development of field and laboratory investigation techniques, there continues to be a need to describe site geology in terms appropriate for the analyses of deformation and stability of ground in situ. Two developments hold the potential to improve such description: the characterization of soil and rock, and the wider use of numerical modeling. Methods of characterization can now be tested with the aid of numerical analyses, and the suitability of the predictions they lead to can be tested with site instrumentation.

Since the attempt by Terzaghi in 1946 to describe the characteristics of rock masses, numerous rock mass classifications have been developed and the best known are those of Barton et al (1974)

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AEG Carolinas is again planning to participate in the Earth Science Kit Giveaway this year. Our part in all of this is twofold: 1) to purchase quantities of earth science kits developed by the American Geological Institute (AGI) for Earth Science Week, and 2) to provide volunteers to help give away kits at the North Carolina Science Teachers Association (NCSTA) 2010 Professional Development Conference in Greensboro NC November 11-12. More information about the NCSTA Conference is at <http://www.ncsta.org/>.

"Exploring Energy," the theme of Earth Science Week 2010, will engage young people and the public in learning about Earth's energy resources. The 2010 Earth Science Week Toolkit includes many resources for K-12 science teachers:

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and Bieniawski (1976). These classification systems played an important role in tunnel design before the development of the numerical models. They continue to play an important role in providing initial estimates of the range of problems likely to be encountered and of solutions that can be considered

*(Continued on page 20)*

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*(Jahns Lecturer—Continued from page 19)*

and also in estimating rock mass properties for input into numerical models.

Hoek and Brown (1980) considered that more detailed rock mass property information would be required, as numerical modelling became more readily available and more widely used in design. They set out to develop a failure criterion and a classification system, the Geological Strength Index (GSI), specifically for the purpose of designing tunnels, slopes or foundations in rocks (Hoek and Marinos 2000). Here the geological character of rock material, together with a visual assessment of the mass that forms, are used as a direct input for the selection of parameters relevant for the prediction of rock mass strength and deformability. Where anisotropy is not a dominant factor, this approach enables a rock mass to be considered as a mechanical continuum without losing the influence that its geology has on its mechanical properties. The GSI has thus considerable potential for use in rock engineering because it permits the manifold aspects of rock to be quantified, enhancing geological logic and reducing engineering uncertainty.

A detailed description of GSI is presented with suggestions for its use and discussion on its limitations. One of the advantages of the index is that the geological reasoning it embodies allows adjustments of its ratings to cover a wide range of rock masses and conditions including complex rock masses with lithologic variety.

A number of examples from designs of engineering structures conclude the presentation.



## ANNOUNCEMENTS

**Dunklee & Dunham, P.C.** is pleased to announce the addition of **Richard “Rick” A. Kolb** to our firm. Rick has over 20 years experience in managing and providing technical review of over 3,000 Phase I Environmental Site Assessments (ESAs) at locations across the United States, Puerto Rico and Mexico. He has managed hundreds of site-contamination assessments, including soil and groundwater contamination resulting from leaking aboveground and underground storage tank systems, surface discharges such as dry cleaners, leaking wastewater lagoons, and unknown sources. As a project manager, Rick’s responsibilities have included keeping in regular contact with clients, establishing project budgets and completion dates; coordinating, mentoring and supervising field personnel; and consulting with regulatory personnel both in NCDENR’s regional offices and in the central offices.

As a new member of our team, Rick will be able to provide clients with expertise regarding Phase I ESAs, involving:

- Property transactions involving merger and acquisition activities for commercial/industrial clients and law firms, and
- Assisting our Brownfields Services Group with the preparation of ESAs under our existing Environmental Protection Agency Brownfield grant projects.

Please feel free to contact Rick at (919) 858-9898, extension 210, or at [rkolb@dunkleedunham.com](mailto:rkolb@dunkleedunham.com) and he will be happy to answer any questions you may have. Further information on our firm and our team is available at [www.dunkleedunham.com](http://www.dunkleedunham.com).

We just got a note from Mark Lassiter, President of **A.E. Drilling Services, LLC** of Greenville, SC. They has been busy on the water as of late, completing projects at Linville Dam for Duke Energy on the dam face, and the Linville River (see photo at left). The company has also been at work completing a preliminary drilling program three miles offshore of Georgetown, SC for Santee Cooper’s proposed wind farm, and doing several DOT & tunneling projects in upstate South Carolina lakes.

**A.E. Drilling Services, LLC** has been providing national clientele high quality environmental,

geotechnical, mineral exploration, geothermal, and water supply drilling services since 1969. A.E. Drilling Services is located at 2 United Way, Greenville, SC 29607. Mark Lassiter may be reached at (864) 288-1986 (phone), or (864) 979-4082 (cell) or at [mlassiter@aedrilling.com](mailto:mlassiter@aedrilling.com). He is a longtime AEG Carolinas Section Sponsor, and the company is going to be sponsoring Field Trip #1, from the Atlantic to the Appalachians and Back!, at AEG 2010 in Charleston SC September 20-25. Thanks Mark!



A.E. Drilling Services at Santee Cooper’s proposed wind farm three miles offshore of Georgetown, SC.



AE Drilling Services at Linville-Bridgewater Dam



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Without the help and financial support of the following individuals and companies, it would be impossible to plan the quality meeting to which AEG members have become accustomed. Many sponsors support not only the committee members' time in planning the meeting, but have generously given start up funds as well as constant staff support to make everyone's job easier.

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Duane Kreuger, 314-997-7440,

[D\\_Kreuger@geotechnology.com](mailto:D_Kreuger@geotechnology.com)

Allen V. Shaw, PG, 514.394.4492, [avshaw@bechtel.com](mailto:avshaw@bechtel.com)

##### **Field Trip #4 and #6: 1886 Charleston Earthquake Walking Tour**

Briget C. Doyle, 843-569-7087, [doyleb@cofc.edu](mailto:doyleb@cofc.edu)

##### **Field Trip #5: Macroseismic Effects of the 1886 Charleston Earthquake**

College of Charleston Department of Geology

Mitch Colgan, [ColganM@cofc.edu](mailto:ColganM@cofc.edu)



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The Carolinas Section of AEG serves the environmental and engineering geology profession and the public in North Carolina and South Carolina. The Carolinas Section actively seeks section sponsors for our programs, and each year we offer many services to the geological community. We have purchased over 1,500 AGI earth science toolkits for distribution at meetings of the North Carolina Science Teachers Association, we have provided travel grants for university students to attend and present at AEG annual meetings, we provide free admission to chapter dinner meetings for students, and we were the first AEG section to pay for student memberships, which currently number nearly 80. We have an active Visiting Professionals Program, and in



the past three years have made presentations to geology departments at 13 colleges and universities in North and South Carolina, Virginia and Tennessee. We are fortunate in being the Host Section for this year's Annual Meeting, and thank Drs. Brigit Doyle and Norm Levine for all their efforts in leading our team of volunteers in putting on the meeting. The Carolinas Section welcomes you to the beautiful city of Charleston, where history lives.

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##### **Major Drilling**

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## TECHNICAL SECTION

### Accelerated Site Cleanup Using a Sulfate-Enhanced In Situ Remediation Strategy

By G.M. Birk(1), S.L. Knox(2), and M.C. Yeh(3)

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3. EOS Remediation, LLC, Yatsu 6-22-7-805, Narashino City, Chiba 275-0026, Japan, Phone: +81.90.9858.1344, [mei.yeh@eosremediation.com](mailto:mei.yeh@eosremediation.com)

Soil and groundwater clean-up is critical to sustainable business practices across many industries. The conventional wisdom for remediation of aquifers contaminated with petroleum hydrocarbons (PHCs) is to add oxygen. A paradigm shift in the remediation of petroleum hydrocarbons has occurred

drocarbon plumes are anaerobic and depleted of sulfate. Other studies such as Wilson et al. (2002) showed that of these natural anaerobic processes, sulfate reduction accounts for most of the degradation. Cuthbertson et al. (2006) presented case studies that demonstrated the benefits of adding electron acceptors such as EAS™ (U.S. Patent # 7,138,060) to stimulate the biodegradation of petroleum contaminants in groundwater under field conditions at various sites.

The availability of electron acceptors controls the rate of in situ biodegradation. In the presence of petroleum hydrocarbons, terminal electron acceptors are depleted at a rate significantly higher than can be naturally replenished, thus inhibiting biological degradation. The introduction of additional electron acceptors to the subsurface can accelerate the rate of biological degradation (Cuthbertson et al., 2009).

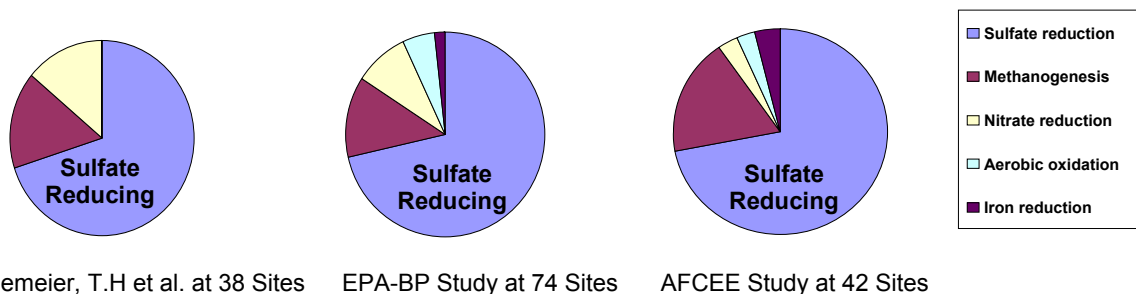


Figure 1. Sulfate-Utilizing Microbes Dominant Processes at Most Sites

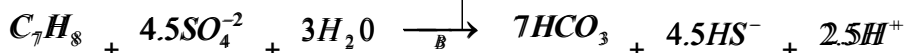
that employs a sulfate-enhanced in situ remediation strategy.

It was once thought that aromatic hydrocarbons do not biodegrade under anaerobic conditions. However, the importance of naturally occurring anaerobic oxidation processes in the biodegradation of PHCs is now firmly established and is considered the dominant driving force in natural attenuation of PHCs in the subsurface. Sulfate reduction and methanogenesis appear to be the dominant natural degradation processes at most sites (Wiedemeier et al., 1999). A recent British Petroleum/EPA study (Kolhatkar et al., 2000) has concluded that most hy-

Based on a solid body of published scientific evidence, adding electron acceptors such as EAS™ to groundwater will aid in increased degradation. EAS™ addition will stimulate biodegradation by providing a soluble, readily available electron acceptor. In the presence of elevated sulfate ( $\text{SO}_4^{2-}$ ), anaerobic groundwater bacteria use the PHCs for carbon and energy while mineralizing the hydrocarbons to carbon dioxide ( $\text{CO}_2$ ) and water ( $\text{H}_2\text{O}$ ).

The following chemical equation illustrates this concept for the biodegradation of toluene ( $\text{C}_7\text{H}_8$ ) under sulfate reducing condition where “B” represents bacterial metabolism.

(Continued on page 27)



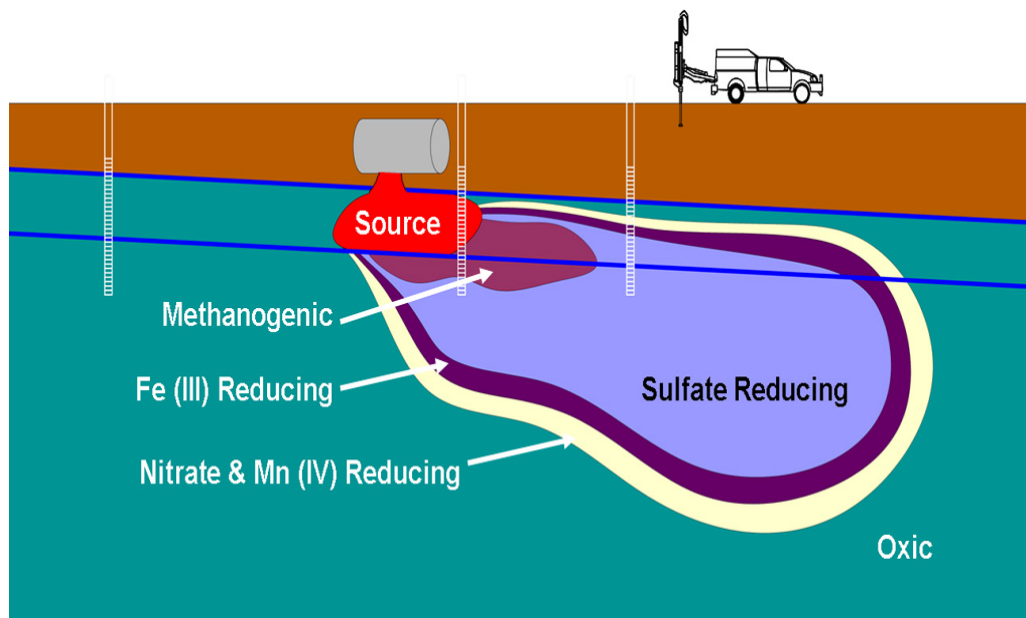


Figure 2. Typical Hydrocarbon-Impacted Aquifer (Most dissolved hydrocarbon plumes are depleted of “electron acceptors” - DO, nitrate, sulfate, iron, etc.)

(Continued from page 26)

This reaction results in complete degradation of the PHCs (e.g., Benzene, Ethylbenzene, Toluene and Xylenes). Ongoing project results indicate that the EAS™ technology can cost-effectively turn land once deemed unusable into productive real estate.

In addition, SO<sub>4</sub>-2 reduction consumes protons increasing the pH and enhancing methanogenesis. At pH of approximately 6.8 and higher, hydrogen sulfide (H<sub>2</sub>S) does not form easily. Most of the sulfide is bound as bisulfide (HS-) and it stays dissociated from H<sup>+</sup> ions.

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## CALENDAR OF EVENTS - 2010

### *Geological Events in the Carolinas*

Courtesy of AEG Carolinas Section – [www.aegcarolinas.org](http://www.aegcarolinas.org). Last updated September 16, 2010

Send updates/corrections to Rick Kolb, Duncklee & Dunham, [rkolb0915@aol.com](mailto:rkolb0915@aol.com).

*Meeting Date, Time, and Location are Subject to Change – Please Verify Prior to the Meeting*

**Date: September 20-25, 2010**

Event: AEG Annual Meeting

Location: Francis Marion Hotel; Charleston, South Carolina

Contact: Briget Doyle; [doyleb@cofc.edu](mailto:doyleb@cofc.edu)

Est. PDH: see the website: [www.aegweb.org](http://www.aegweb.org)

**Date: Tuesday, September 21, 2010**

Event: North Carolina Association of Environmental Professionals meeting- Bruce Nicholson of NCDENR will speak about the NC Brownfield Program, and Chris Hamblet from S&ME will speak about Phase I Environmental Site Assessments.

Location: BB&Y restaurant, 3700 National Drive (Koger Center), Raleigh, 5:30-8:00 PM

Contact: register online at <http://ncaoep.camp9.org/Default.aspx?pageId=691582>

**Date: September 21-22, 2010**

Event: AGI's Geoscience Congressional Visit Days

Location: Starting at 12:00n at AGU Headquarters; Washington, D.C.

Contact: <http://www.agiweb.org/gap/events/geocvd09/index.html>.

**Date: Monday, September 27, 2010**

Event: Presentation by 2010 Jahns Lecturer Paul Marinos -- Geology in dam engineering - an evolving contribution of engineering geology for safety and efficiency

Location: Jordan Hall, North Carolina State University, Raleigh; Reception at 3:00 PM in Room 1132; talk at 3:30 in Room 1216

**Date: Tuesday, September 28, 2010**

Event: Presentation by 2010 Jahns Lecturer Paul Marinos -- Geological constraints and geotechnical issues in mechanized tunneling

Location: Mitchell Hall, University of North Carolina at Chapel Hill, 3:00 PM

**Date: Wednesday, September 29, 2010**

Event: Presentation by 2010 Jahns Lecturer Paul Marinos -- Rock mass characterization; a vehicle to translate geology into the design of engineering structures

Location: NCSU University Club, 4200 Hillsborough Street; Raleigh; noon

Contact: Jeremy Hamm, Falcon Engineers, [jhamm@falconengineers.com](mailto:jhamm@falconengineers.com), (919) 871-0800

**Date: September 30-October 1, 2010**

Event: ASCE North Carolina Section 2010 Annual Conference

Events include six breakout sessions, two joint sessions, a Blue Ridge Parkway Geological Field Trip, a UNCC Campus Construction Tour, Downtown Touring and a Golf Tournament

Location: Renaissance Hotel; Asheville, North Carolina

Contact: Jesse Jacobson, section vice president; [jjacobson@smeinc.com](mailto:jjacobson@smeinc.com)

PDH's: 9 or 10

**Date: October 4-7, 2010**

Event: The Environmental Sampling Field Course

Location: Las Cruces, New Mexico

Contact: The Nielsen Environmental Field School; [www.envirofieldschool.com](http://www.envirofieldschool.com)

**Date: October 5 and 6, 2010**

Event: Aquifer Testing for Improved Hydrogeologic Site Characterization

Location: In-Situ, Inc. Headquarters; Ft. Collins, Colorado

Contact: Midwest Geosciences Group, [www.midwestgeo.com](http://www.midwestgeo.com); (763) 607-0092

**Date: October 5-8, 2010**

Event: The New MODFLOW Course: Theory and Hands-on Applications (short course #259)

Location: Princeton, New Jersey

(Continued on page 29)

(Continued from page 28)

Contact: National Ground Water Association;  
www.ngwa.org; (800) 551-7379

**Date: October 25-29, 2010**

Event: The Remediation Course

Location: Orlando, Florida

Contact: Princeton Groundwater, Inc.;  
www.princeton-groundwater.com; (813)  
964-0800

**Date: November 8-12, 2010**

Event: The Complete Ground-Water Monitoring Field Course

Location: Las Cruces, New Mexico

Contact: The Nielsen Environmental Field School; www.envirofieldschool.com

**Date: November 8-9, 2010**

Event: The Ground-Water Monitoring Well Design, Construction and Development Field Course

Location: Las Cruces, New Mexico

Contact: The Nielsen Environmental Field School; www.envirofieldschool.com

**Date: November 10-12, 2010**

Event: The Complete Ground-Water Sampling Field Course

Location: Las Cruces, New Mexico

Contact: The Nielsen Environmental Field School; www.envirofieldschool.com

**Date: December 7-10, 2010**

Event: 2010 National Ground Water Association Groundwater Expo

Location: Las Vegas, Nevada

Contact: National Ground Water Association;  
www.ngwa.org

**Date: December 9, 2010**

Event: Petroleum Hydrocarbons and Organic Chemicals in Ground Water Forum

Location: Las Vegas, Nevada

Contact: National Ground Water Association;  
www.ngwa.org

**Date: January 11-13, 2011**

Event: 2011 North American Environmental Field Conference and Exposition

Location: Hilton Resort Hotel on Mission Bay; San Diego, California

Contact: The Nielsen Environmental Field School; www.envirofieldconference.com; (575) 532-5535

**Date: September 19-24, 2011**

Event: AEG Annual Meeting

Location: Anchorage Hilton Hotel; Anchorage, Alaska

**Date: November 4-7, 2012**

Event: Geological Society of America Annual Meeting

Location: Charlotte, North Carolina

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AND SPONSORING A TECHNICAL SESSION BREAK!**



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**Orlando, FL Lab:**

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Fax: 407-850-6945

**Jacksonville, FL Lab:**

[ENCOJAX@encolabs.com](mailto:ENCOJAX@encolabs.com)

Tel: 904-296-3007

Fax: 904-296-6210

**Corporate Office:**

10775 Central Port Drive,  
Orlando, FL 32824



## MEMBER BENEFITS

Networking, with colleagues at meetings, through technical publications and on the AEG web page, is a valuable professional development benefit because it allows a member to:

- ♦ Broaden and update technical, practical, and business knowledge.
- ♦ Keep career paths open by assuring that the value, utility and scope of engineering geology is recognized in the scientific, technical, legal, and regulatory arenas.
- ♦ Explore numerous opportunities for career enhancement through contacts at technical meetings and in continuing education programs.
- ♦ Influence the profession of environmental and engineering geology as it serves society and as it is regulated.
- ♦ Establish the standards of the profession.

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AEG members receive our quarterly professional journal, *Environmental and Engineering Geoscience* and six-issues of the *AEG NEWS* as a regular dues benefit.

Members also enjoy a 20% "member discount" on all special publications, registration fees at meetings, short courses, and field trips.

## PROFESSIONAL DEVELOPMENT

*AEG -- Serving Professionals in Environmental, Ground-Water and Engineering Geology since 1957*

- ♦ AEG sponsors workshops and short courses for which official Continuing Education Units are offered.
- ♦ AEG encourages its members to participate in activities of mutual interest with other societies and organizations.
- ♦ The annual Richard H. Jahns Distinguished Lecturer in Engineering Geology is co-sponsored by AEG and the GSA Engineering Geology Division.
- ♦ AEG members make presentations and lead field trips for students at all levels.
- ♦ AEG's Technical and Professional Practice Committees keep the Association in a position of influence through their wide-ranging activities.
- ♦ AEG's 25 Sections and 20 Student Chapters provide educational and networking opportunities for members through regular meetings, field trips and local newsletters.
- ♦ Students compete for scholarships and awards, and interact with practicing professionals.
- ♦ Short courses, field trips, and technical sessions provide opportunities for AEG members to enhance their professional practice.
- ♦ International members are found in more than 20 countries and Designated Correspondents enhance technology transfer among more than a dozen countries.

## MEMBERSHIP APPLICATION

## ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS



The Association of Environmental & Engineering Geologists (AEG) is an international, non-profit scientific and technical society, whose 3,000 members include geologists specializing in engineering geology, environmental geology, and ground-water geology as well as other professionals in affiliated fields such as civil and mining engineering, land-use planning, public policy and education.

Through its technical and professional activities, AEG strives to promote the value and importance of geologic practice in:

- ♦ detecting, containing, and remediating contaminated soil and ground water;
- ♦ recognizing and mitigating hazardous geologic processes to promote public safety and welfare; and
- ♦ siting, planning, designing, constructing, and maintaining engineered works.

Check Us Out  
[www.aegweb.org](http://www.aegweb.org)

## MEMBERSHIP REQUIREMENTS

**MEMBER:** Applicants for Member Class shall hold a degree in geology, engineering geology or geological engineering, or a degree in a related professional field with 30 semester-hours of credit in the geosciences. In addition an applicant shall be practicing in the field of Engineering Geology, Environmental Geology or Hydrogeology. Annual Dues for new (first-time) Members = \$75.00 per year for the first year of membership. Otherwise Annual Dues = \$115.00. Applicants who qualify for Member Class, but are engaged in full-time teaching at the Primary or Secondary (K-12) level are eligible for Teacher Status (Annual Dues = \$35.00).

**AFFILIATE:** Applicants for Affiliate Member Class shall be scientists or engineers who work with engineering geologists; teachers engaged in middle-school and high school Earth Science education; or persons interested in engineering geology. Annual Dues = \$75.00 (Teacher Dues = \$35.00)

**STUDENT:** Applicants for Student Member Class shall be full-time students enrolled in an academic program in the geosciences or in a related field in engineering. Annual Dues = \$25.00

**INTERNATIONAL:** Applicants shall hold the same requirements as for Member Class, but may select from the following dues schedule: \$35, which includes the *Environmental and Engineering Geology Journal*; \$45 with the *Journal*, the *Annual Directory* and the *Annual Meeting Abstracts*; or \$55 with the *Journal*, *Annual Directory*, *Annual Meeting Abstracts* and the *AEG News*.

AEG memberships are based on calendar year. Applications received after October 1 will be entered for following calendar year.

## APPLICATION FORM

Please complete this form and mail it with your Annual Dues payment to the Association's Headquarters office for processing. New member applicants do not pay Section dues for their initial year of membership.

Name: \_\_\_\_\_ (Please print your name as you would like it shown on your membership certificate.)

PREFERRED ADDRESS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

WORK PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_

PREFERRED E-MAIL: \_\_\_\_\_

Second Address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Home Phone: \_\_\_\_\_

DESIRED CLASS OF MEMBERSHIP: \_\_\_\_\_ ANNUAL DUES AMOUNT: \_\_\_\_\_

### CERTIFICATION:

(Signature)

My signature attests that, to the best of my knowledge, I meet the academic and practice requirements for the membership class I have requested and that all entries on this application are true and correct. I also authorize AEG to charge my credit card for the dues payment, if I selected the credit card payment option.

☐ Enclosed is my check for the amount of Annual Dues of \$ \_\_\_\_\_

### Credit Card Payment Option

☐ Discover ☐ Master Card ☐ Visa

Amount of Dues to be charged to my card = \$ \_\_\_\_\_

Card Number: \_\_\_\_\_

Expiration Date: \_\_\_\_\_

**SUBMISSION:** Send this form with your check or credit card authorization to:  
 Association of Environmental & Engineering Geologists, PO Box 460518, Denver, CO 80246  
 Phone: 303-757-2926; FAX: 303-757-2969; AEG Web: [www.aegweb.org](http://www.aegweb.org)





## AEG CAROLINAS SECTION – SPONSOR INFORMATION

The Carolinas Section of AEG supports many of its activities with financial assistance provided by our sponsors. Our activities include quarterly meetings, periodic field trips and seminars, a quarterly newsletter, and email announcements about our meetings and geoscience related activities. In addition, we donate educational resources to science teachers.

We offer several levels of sponsorship, but they all have one goal: to keep the sponsor's name in front of our members and to bring you business. We have a real commitment to connecting our sponsors to potential buyers and will do all we can to help you build your business. Most of our members are practicing professionals with responsibility for selecting subcontractors, so our group is a great place to find new customers and to catch up with existing customers in an informal setting.

Our sponsors provide financial support that allows us to have reasonably priced dinner meetings, host seminars, provide discounted dinner meeting costs for students, underwrite the cost of newsletters and our web site, support science education tools to our teachers and in our schools, and provide funding for two \$500 scholarships each year. All costs listed below are per year and end in December. New sponsorships received after October will continue to December of the following year.

### Silver Sponsor (\$250):

GeoNews Newsletter: Business card size ad (2" high x 3-1/2" wide), four times per year.

Meetings: Listing on a Sponsor Poster, located at sign-in table. Verbal acknowledgement by name in Chairman's introductory comments.

Meeting Exhibits: Space for tabletop display at one meeting. Cost of meeting waived for one person on the exhibit date.

Email Announcements: Listing of your company name on each AEG Carolinas Section email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Section Web Page, [www.aegcarolinas.org](http://www.aegcarolinas.org), with a link to your site.

### Gold Sponsor (\$375):

GeoNews Newsletter: Quarter-Page ad (4-1/2" high x 3-1/2" wide), four times per year.

Meetings: Listing on a Sponsor Poster, located at sign in table. Verbal acknowledgement by name in Chairman's introductory comments.

Meeting Exhibits: Space for tabletop display at two meetings. Cost of meeting waived for one person on the exhibit date.

Email Announcements: Listing of your company name on each AEG Carolinas Section email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Section Web Page, [www.aegcarolinas.org](http://www.aegcarolinas.org), with a link to your site.

### Platinum Sponsor (\$500):

GeoNews Newsletter: Half-page ad (4-1/2" high x 7" wide), four times per year.

Meetings: Listing on a Sponsor Poster, located at sign in table. Verbal acknowledgement by name in Chairman's introductory comments.

Meeting Exhibit: Space for tabletop display at three meetings. Cost of meeting waived for one person on the exhibit date.

Email Announcements: Listing of your company name on each AEG - Carolinas Section email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Section Web Page, [www.aegcarolinas.org](http://www.aegcarolinas.org), with a link to your site.

### GeoNews Newsletter Sponsorship Only

Businesses or individuals can also advertise in GeoNews without being a full sponsor. The annual rates for advertising in GeoNews are as follows:

Business Card	\$ 40.00
Quarter Page	\$ 60.00
Half Page	\$ 100.00
Full Page	\$ 200.00

Please complete the form below and mail to Jane Gill-Shaler, AEG Carolinas newsletter editor. Please call or email if you have any questions (contact information below).

### AEG Carolinas Section Sponsorship Form

Please begin our sponsorship of the Carolinas Section of the Association of Engineering Geologists. Our sponsorship level is:

- \_\_\_\_\_ Platinum Section Sponsorship, \$500/year  
 \_\_\_\_\_ Gold Section Sponsorship, \$375/year  
 \_\_\_\_\_ Silver Section Sponsorship, \$250/year  
 \_\_\_\_\_ GeoNews Newsletter Sponsor Only (see above)

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Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Cell: \_\_\_\_\_

Email: \_\_\_\_\_

Website URL: \_\_\_\_\_

Date of Payment: \_\_\_\_\_

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Please enclose a business card or email ad in jpg, pdf, or doc To Jane Gill-Shaler at [janehgill@aol.com](mailto:janehgill@aol.com).

### MAKE CHECK OUT TO AEG CAROLINAS

Snail mail form and payment to:

Jane Gill-Shaler, AEG Carolinas Newsletter Editor  
 1636 West Lexington Ave., High Point, NC 27262  
[JaneHGill@aol.com](mailto:JaneHGill@aol.com)

## Thank You, AEG Carolinas Sponsors!!

### PLATINUM SPONSORS

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**Geobrugg North America**, Frank Amend, 252-937-2552, [frank.amend@geobrugg.com](mailto:frank.amend@geobrugg.com), [www.geobrugg.com](http://www.geobrugg.com). GeoBrugg North America is a premier supplier of engineered rockfall protection and slope stabilization systems. Our wirework-based, unobtrusive, and ecology-friendly systems blend well with the natural surroundings. Well-proven anti-corrosion processes permit achieving a useful life up to 100 years and our installed systems require virtually no maintenance. See us at AEG 2010 in Charleston September 20-25 at BOOTH #13!

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**Pine Environmental, Inc.**, Paul Federline, 866-646-7463, [pfederline@pine-environmental.com](mailto:pfederline@pine-environmental.com). Pine is the leading provider of rental equipment in the nation with the latest instruments available. Pine Environmental Services, Inc. takes pride in their unprecedented customer support and competitive pricing. Extended hours of operation and after-hour emergency support are on hand. See us at AEG 2010 in Charleston September 20-25 at BOOTH #19!

**TRS Environmental**, Susan Boutwell, 972-456-4000, [trs@trs-environmental.com](mailto:trs@trs-environmental.com), <http://www.trs-environmental.com>. We provide a wide variety of environmental monitoring, sampling, and field and safety supplies for rent, lease, or sale.

**Vulcan Materials Company**, Jim Stroud, 336-767-4600, [Stroudj@VMCMAIL.com](mailto:Stroudj@VMCMAIL.com), [www.vulcanmaterials.com](http://www.vulcanmaterials.com). Vulcan is the nation's leading producer of crushed stone. *(Editor's note: Vulcan has sponsored AEG Carolinas for over 30 years, and currently prints and mails out our newsletter every quarter. If you see someone from Vulcan at a professional meeting, buy some rock!)*

**Zebra Environmental, Inc.**, Mike Early, 919-424-6122, [MikeE@zebraenv.com](mailto:MikeE@zebraenv.com), [www.teamzebra.com](http://www.teamzebra.com). ZEBRA is a specialized environmental contracting company dedicated to providing high quality subsurface sampling, installation, injection and data collection services to engineering and consulting firms. Since 1992, ZEBRA has earned a solid reputation as the most experienced, best equipped and most reliable direct push/probing service provider on the East Coast.

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**Nicholson Construction**, Brian M. O'Gara, 412 221 4500, [BOGara@NicholsonConstruction.com](mailto:BOGara@NicholsonConstruction.com), <http://www.nicholsonconstruction.com>. Nicholson Construction Company has been setting the industry standard for performance and technical innovation in geotechnical construction. As the North American business unit of the Soletanche Bachy Group, Nicholson is part of a global network of unparalleled geotechnical resources and expertise. See us at AEG 2010 in Charleston September 20-25 at BOOTH #25!

*(Continued on page 34)*



## Thank You, AEG Carolinas Sponsors!!

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**AE Drilling Services, Inc.** Mark Lassiter, 864 288 1986, [mlas-siter@aedrilling.com](mailto:mlas-siter@aedrilling.com), [www.aedrilling.com](http://www.aedrilling.com). AE Drilling Services LLC performs geotechnical, environmental, mineral exploration, and water supply drilling services throughout the southeastern U.S. Services include ATV auger, coring, air & mud rotary drilling, probing & reagent injection, inclined drilling, deep & large diameter mud & air rotary drilling, & well rehabilitation. See us at AEG 2010 in Charleston September 20-25 co-sponsoring the Atlantic to the Appalachians and Back Field Trip!

**ChemRem International.** Travis Bowman (704) 728 5800, [tbowman@chemrem.com](mailto:tbowman@chemrem.com). Jim Studer, (505) 858 3136, [jstuder@chemrem.com](mailto:jstuder@chemrem.com). [www.chemrem.com](http://www.chemrem.com). North American manufacturer's representative for FMC's environmental products; Klorz persulfate; PermeOx Plus; Klorz CR.

**ENCO Laboratories, Inc.** Jim Hays, 919-467-3090, [jhays@encolabs.com](mailto:jhays@encolabs.com), <http://www.encolabs.com>. A network of environmental laboratories that has been providing analytical testing services since 1988. See us at AEG 2010 in Charleston September 20-25 sponsoring the 9/22 Tech Session Break!

**Environmental Products and Services of Vermont, Inc.** Peter Marotta, 919-852-3595, [pmarotta@epsofvermont.com](mailto:pmarotta@epsofvermont.com), [www.epsofvermont.com](http://www.epsofvermont.com). EP&S is a comprehensive environmental and industrial contractor providing a wide range of services from Emergency Spill Response, Vacuum Truck Services, Soft Utility Excavations, Tank Removal and Cleaning, Industrial Cleaning and Maintenance Services, Site Remediation, Hazardous and Non-Hazardous Waste Disposal and more.

**ESC Lab Sciences.** Barry C. Kroll, 1-(800) 767-5859, [bkroll@esclabsciences.com](mailto:bkroll@esclabsciences.com), [www.esclabsciences.com](http://www.esclabsciences.com). ESC Lab Sciences is a nationally accredited environmental laboratory certified for the analysis of soil, water, and air by numerous certifying agencies.

**Garco, Inc.** Al King, 336-683-0911, [alk@egarco.com](mailto:alk@egarco.com), <http://www.egarco.com>. GARCO, Inc. provides environmental, industrial, waste transportation, disposal and recycling services to industrial and consulting clientele throughout the Southeast.

**Geotech Environmental Equipment, Inc.** David Hathaway, 919-460-0604, 919-460-0984, [davidh@geotechenv.com](mailto:davidh@geotechenv.com), <http://www.geotechenv.com>. Geotech manufactures and distributes sampling, filtration, analytical and remediation products for the ground and surface water industry.

**Joyce Engineering, Inc., Greensboro Office.** Hannu Kemp-pinen, 336-323-0092, [hkemp-pin@joyceengineering.com](mailto:hkemp-pin@joyceengineering.com), [www.joyceengineering.com](http://www.joyceengineering.com). Joyce Engineering is a full-service solid waste management consulting firm dedicated solely to the solid waste industry. throughout the Mid-Atlantic and Southeastern United States.

**KB Labs,** Todd Romero, 352-472-5830, [toddr@kbmobilelabs.com](mailto:toddr@kbmobilelabs.com), [www.kbmobilelabs.com](http://www.kbmobilelabs.com). Our mission is to provide high quality mobile analytical and MIP direct sensing technology services meeting the on-site needs of engineering and consulting firms requiring rapid characterization of environmental contaminants.

**Parratt-Wolff, Inc.** Robert "Butch" Stevens, 800-627-7920, [bstevens@pwinc.com](mailto:bstevens@pwinc.com), [www.pwinc.com](http://www.pwinc.com). Groundwater Monitoring and Subsurface Exploration Services. See us at AEG 2010 in Charleston September 20-25 sponsoring the 9/22 Tech Session Break

**Regenesis.** Drew Baird, 864-240-9181 or 864-884-4346, [dbaird@regenesi.com](mailto:dbaird@regenesi.com), [www.regenesis.com](http://www.regenesis.com). Regenesis develops, manufactures, and markets innovative technologies to clean up the environment. We are headquartered in San Clemente, CA with a regional office in Greenville, SC. See us at AEG 2010 in Charleston September 20-25 sponsoring the Groundwater Chemistry Short Course

**SAEDACCO.** Pete Byer, 803-548-2180, [pbyer@saedacco.com](mailto:pbyer@saedacco.com), [www.saedacco.com](http://www.saedacco.com). SAEDACCO is a southeast regional environmental services company headquartered in Fort Mill, SC. SAEDACCO is structured to provide turnkey environmental services including geoprobe, drilling, UST removals, remediation system installations and remediation system fabrication. See us at AEG 2010 in Charleston September 20-25 at BOOTH #31!

**SGS Environmental, Wilmington Lab.** Adam Phillips, 910-350-1903, [Adam.Phillips@sgs.com](mailto:Adam.Phillips@sgs.com), [www.sgs.com](http://www.sgs.com). Present in more than 40 countries with 91 offices and 52 laboratories, SGS Group has the capability to meet the environmental needs of international, as well as domestic industries, service organizations and governments.

**WaveFront.** Patrick Hicks, (919) 424-7563, [patrickh@onthewavefront.com](mailto:patrickh@onthewavefront.com), [www.onthewavefront.com](http://www.onthewavefront.com). Wavefront provides technology to enhance fluid injection into saturated porous media.

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