

GEONEWS

Newsletter of the Association of Environmental & Engineering Geologists, Carolinas Chapter 2009, 2011, 2013, and 2016 AEG Chapter of the Year

IN THIS ISSUE

Solid as a Rock?	6
AEG Carolinas Turns 40	8
Vapor Intrusion Conference Coming to	16



SAVE THE DATE

April 5, 2017 Spring Meeting 1705 Prime, Raleigh

Wednesday, April 22, 2017 Spring Field Trip Haw River

GEONEWS SPRING 2017 Issue Date: December 21, 2016 TABLE OF CONTENTS

Articles and Reports A Big Thank You to Our AEG Foundation Donors by Jane Gill-Shaler
Columns and Regular Features Message from the Chair by Madeline German3 GeoRamblings by Dr. Charles Welby
Board Business Treasurer's Report by Eric Cross
Forms and Flyers Calendar of Events
Thanks to our Sponsors!

GeoNews is a publication of the Carolinas Chapter of AEG. There are four issues per year, with deadlines and issue publication dates listed below. We publish news of the profession, announcements, student member news, 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 21

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

AEG Carolinas Chapter Current Officers and Contacts

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AEG Carolinas Chapter Website <u>www.aegcarolinas.org</u>

AEG National Website www.aegweb.org

Cover: (Scott Anderson) A rock slope stability challenge on the General Hitchcock Highway on Mt. Lemmon, near Tucson, AZ

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MESSAGE FROM THE CHAIR

By Madeline German, P.G., Carolinas Chapter Chair

Greetings Carolinas Chapter!

2017 is going to be an exciting year! Not only is it the 60-year anniversary of AEG as a National Organization, it marks 40 years of AEG Carolinas!! Rick Kolb and Paul Weaver have assembled a fantastic history of our Chapter, I hope you enjoy, starting on page 8.

We started off the year with a bang! On January 19th at Draught in Charlotte, NC, AEG President Dale Andrews presented "The Chemical Modification of Soils" to a packed house. This meeting, held in conjunction with the local branch of ASCE, was attended by nearly 100 professionals, regulators, and students. Clean Vapor, Geo-Search and Eastern Solutions had exhibit tables with plenty of goodies and useful technical knowledge for the group. Eastern Solutions and Geo-Search also combined their efforts to provide 1 drink ticket per person!

Also at this meeting, we were able to honor our 2016 Outstanding Earth Science Educator, Ms. Lindsay Knippenberg. She spoke to the group for a few minutes and expressed her gratitude to the Carolinas Membership for their generosity.

In Charlotte, we raised an additional \$200 in support of the Carolinas Scholarship fund. Great job Carolinas! Scholarship applications are in and results are being evaluated. Look for an announcement of the Scholarship winner soon.

We have an upcoming all ages field trip planned this spring. The behind the scenes tour of the Geology Collection and the Paleontology Research Laboratory at the North Carolina Museum of Natural Sciences originally planned for early March has been re-scheduled. Attendees will earn two South Carolina PDH credits for attending.

The 2017 Jahns Lecturer, Dr. Scott Anderson, P.E., P.G., will be visiting the Carolinas the first week of April. See the calendar on page 23 for his tentative schedule. Dr. Anderson will be visiting Charleston, UNC-Chapel Hill, UNC-Wilmington, and Wake Tech. He will be presenting "Solid as a Rock: How Engineering Geology Relates to Transportation Asset Management" at our Raleigh Chapter Meeting on Wednesday April 5th. In this talk Dr. Anderson will discuss transportation infrastructure's expiring life and the risk-based strategies for asset management such as bridges, pavement, subgrade, embankments, walls and slopes, as well as looking at what performance requirements are expected, and what is actually needed. Settlement, heave, slope movements, longevity under the influence of scour, and corrosion are some of the ways this performance can be measured for structures of soil and rock. The engineering geologist can explain that change happens and relatively few things are 'solid as a

rock'. The change represents a risk that the engineering geologist can help characterize and view in parallel with risks from natural hazards. Please sign up via PayPal on our AEG Carolinas website or you can RSVP to Josh Hanks (joshhanks@gmail.com).

Mark your calendar for April 22, 2017! It will be a geological hike along the Haw River in Chatham County, NC. This field trip will involve a hike along two separate stretches of the Haw River on either side of HWY 64 within the Lower Haw River State Natural Area. The hike will present results of detailed geologic mapping by the NC Geological Survey in Chatham County and interpretations of various outcrops and landforms along the river. This portion of the Haw River is located within the Hyco Formation of the Carolina terrane. We will hike a portion of the river northwest of the Highway 64 bridge in the morning. Along this section we will visit outcrops of metamorphosed dacites, andesites and basalts of the Hyco Formation. After lunch, the hike will be on the southeast side of the river (south of Highway 64), where we will visit outcrops of dacites and volcano-sedimentary rocks. Lunch will be at Carolina Brewery in Pittsboro, and there is a rumor a brewery tour is also included. Additional information and the registration forms are provided on page 24. You can also visit the AEG Carolinas website for more info and to reserve your spot. I am looking forward to seeing you all there.

As AEG National progresses through the items relayed in the Needs Assessment, they are establishing small focus groups, with limited time commitments, to concentrate on issues that will be disbanded once their task is completed. There are currently four areas of focus:

- 1) Increase environmental presence within AEG,
- 2) Appeal to increase student members,
- 3) Disaster planning/response committee, and
- 4) Form new student chapters and reactivate old chapters.

If you are interested in becoming more involved with the

(Continued on page 4)



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(Continued from page 3)

AEG leadership, the focus groups, or AEG in general, please contact me or other members of the Carolinas Board. We are in need of several people to help fill supporting chapter roles. Professionals, regulators, teachers and students are all encouraged and welcome. I am looking forward to discussing potential volunteer opportunities with our fantastic membership.

If you are not already, please follow AEG on Facebook, Twitter and Linked In.

As always, your board and I look forward to hearing from each of you regarding your suggestions and/or concerns related to our Chapter. We are here to serve the needs of our membership, so your feedback is vital and welcome.

Cheers,

Maddie German, PG madeline@smithgardnerinc.com AEG Carolinas Chapter Chair







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A Big Thank You to Our AEG Foundation Donors

By Jane Gill-Shaler, AEG Foundation Director

A BIG THANK YOU to all the generous donors who have helped make the AEG Foundation such a success. We could not have done it without you! At a Carolinas Section meet a few years ago, I received a donation of \$5.00 from a student. Now, this student was struggling, as are most of them, and was apologetic that her donation was so small. Well, it wasn't small for her! And she was so surprised when I called her a DONOR. Yes, donors to the AEG Foundation come in all shapes and sizes, from \$5.00 to \$100,000. And, yes, it all counts toward our mission, advancing science, scholarship and education in environmental and engineering geology for the benefit of all. So, **THANK YOU!**

We raise funds for scholarships through our silent auction at the Annual Meeting, this year in Colorado Springs, through on-line recurring donations (my favorite way to planned and through giving www.aegfoundation.org/pdf/AEGF%20Planned% 20Giving.pdf). All the money raised from this year's Silent Auction will go towards the K-12 EDUCATION FUND: The purpose of this fund is to encourage K-12 students, K-12 teachers, and elementary, middle and high schools to explore methods and technologies to teach geology. You can read all about it on the AEG Foundation webpage, www.aegfoundation.org. We are so very grateful for our donors, who make all the scholarships, grant programs, and support programs possible. THANK YOU!

If you do not have items for the silent auction, please consider donating \$5 or \$500 or more to the AEG Foundation. You may donate online at www.aegfoundation.org/donate/, or you may send a check, written out to the AEG Foundation, to: AEG Foundation, 4123 Broadway #817, Oakland, CA 94611. The AEG Foundation is a 501 (c)3 non-profit, so all donations are tax deductible. We love our supporters, and will send you a thank you and an acknowledgement letter for your taxes.

Please call or email me at the numbers below if you have any questions. We look forward to seeing you in Colorado Springs! **THANK YOU!**

AEG CAROLINAS CHAPTER 4Q TREASURER'S REPORT

By Eric Cross, Chapter Treasurer

AEG Carolinas Section Treasurer's Quarterly Report October 1 - December 31, 2016

Meetings \$575.00 Charlotte Meeting \$160.00 Sponsors \$1,135.00 AEG National \$700.00 Chapter Award \$700.00 Savings Transfer \$2,000.00 Interest \$4,571.47 SUBTOTAL - INCOME \$4,571.47 EXPENSES Banking Fees Online deposit fees \$3.00 Card reader fees \$1.69 Meeting Expenses \$980.00 AEG Board of Directors Meeting \$915.62 GSO meeting speaker lunch and booth shipment \$134.36 Additional Expenses \$910.78 Jahns Lecturer Hotel Expenses \$910.78 Jahns Lecturer Plane Tickets \$880.30 Savings transfer \$2,000.00 SUBTOTAL - EXPENSES \$5,835.75 BALANCE As Of December 31, 2016 \$3,771.54 Checking Account \$10,701.82 TOTAL \$14,473.36	BALANCE As Checking Savings A		\$3,037.29 \$12,700.35 \$15,737.64
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Dr. Scott Anderson, 2016-17 Jahns Lecturer to Speak at Spring Meeting in Raleigh

tureship is named in honor of Dr. Richard H. Jahns (1915-1983), an engineering geologist who had a diverse and distinguished career in academia, consulting and government.

Dr. Anderson's Abstract

Highway systems were built over a short period of time and to an envisioned design life that is expiring. Owners of transportation infrastructure are finding a pressing need to get the most of what they have and to build new inventory with this kind of thought in mind. This requires riskbased strategies for management of assets such as bridges, pavement, subgrade, embankments, walls and slopes, and it also requires a clear look at what type of performance is expected, and what is actually needed. Settlement, heave, slope movements, longevity under the influence of scour, and corrosion are some of the ways this performance can be measured for structures of soil and rock. The engineering geologist can explain that change happens and relatively few things are 'solid as a rock'. The change represents a risk that the engineering geologist can help characterize and view in parallel with risks from natural hazards.

Dr. Anderson's Résumé

Dr. Anderson joined BGC Engineering as the Principal Geotechnical Engineer. Prior to joining BGC, he worked as the Geotechnical Engineering Technical Services Team Manager for the Federal Highway Administration's Resource Center, where he led a national team of geotechnical engineers that assisted state and local transportation agencies through technical assistance, training and the deployment of new technologies. Dr. Anderson has also previously worked in positions from Staff Geologist to Senior Consulting Engineer and Landslide Technology Leader for a major A/E design firm and spent four years as an Assistant Professor of Civil Engineering at the University of Hawaii. He earned his Bachelor's and Master's degrees in engineering geology from the University of Colorado at Boulder and Colorado State University, and Master's and Doctorate degrees in civil engineering from the University of California at Berkeley. He is a licensed engineer and practicing engineering geologist with over 30 years of experience and approximately 100 publications and invited presentations. Scott has grown and lived in many places along a general path from Boston to Honolulu, and now makes his home in Colorado, where he enjoys all the outdoor time he can get.

About the Jahns Lecturer

The Jahns Distinguished Lectureship was established in 1988 and is sponsored by AEG and the GSA Engineering Geology Division. Its purpose is to provide funding for distinguished engineering geologists to present lectures at colleges and universities in order to increase awareness of students about careers in engineering geology. The lec-

Spring Meeting

Place: 1705 Prime, 1705 East Millbrook

Road at Old Wake Forest Road, Ra-

leigh

Date: Wednesday, April 5, 2017

Time: 5:30 PM socializing begins, 7:00 PM

buffet dinner, 8:00 PM Dr. Ander-

son's talk

Cost: AEG and ASCE members \$30, non-

members \$40, public-sector employees \$15, teachers \$10, students <u>free</u> with college ID. Cost includes one drink ticket courtesy of Pace Analytical Laboratories and Contaminant Control, Inc. (CCI). Thanks to Korey Drew of Pace and Mark Vestal of

CCI

Reservations:

Please make reservations with Josh Hanks (joshmhanks@gmail.com) by 5:00 PM on Monday, April 3, 2016.



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Georamblings

By Charles W. Welby

The other day I was wondering about the Hollister brand of T-shirts. They are quite popular it seems. So I was wondering if they might not be torn as they are worn or even before they are put on. Why this passing thought? Well the fact of the matter is that Hollister, California has passing through it part of the San Andreas Fault. One can see in Hollister offset stream channels (usually no water in them because of the dry climate), and I suppose one can find some historical record of movement along the fault. I seem to have run across some sort of controversy about the use of the name Hollister for the T-shirts because some other place in California has a claim to that name.

Another idea that might be of some real importance as we look at the apparent warming of the climate. There are concerns about why the warming is occurring, and various explanations are provided, including the idea that the atmosphere is being affected by the chemicals that are coming from our industrial uses of petroleum and the cars we drive. Not to say that these ideas are incorrect, but one piece of interesting earth history may also indicate that a reason or part of a reason for the warming lies in a natural occurrence related to the earth itself.

What is known about the earth's movements around the sun is described as the Milankovitch Cycle. This is the collective effects of the changes in the earth's climate over thousands of years as the earth orbits about the sun. It would be interesting, of course, to have someone who truly understands the Milankovitch Cycle and has thought about the possibilities to address the matter in a paper. Perhaps it has already been done but is not found in the well-known geologic literature.

Just some thoughts in passing.







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A Look Back at the History of Our Chapter (Part 1)

By Rick Kolb and Paul Weaver



AEG was incorporated in 1960 in Sacramento California, on the other side of the country from the Carolinas, but it was not long before the need for representation from other parts of the country became apparent. As word spread, so did the outcry for chartered memberships. Norm Tilford, Dan Johnson, and Cal Swan of Ebasco Services, Inc. sent out a letter to AEG members in the area to suggest that being a member of the Southeastern Section was not advantageous, and that they should form their own Carolina Section. The timing was such that if a Carolina Section was not formed right away, the new AEG constitution, to be ratified in 1976, would have prohibited the formation of a new section. As a result of some frantic telephone calls and letters (this was before email, remember) and after a hastily convened meeting in Greensboro, we were chartered as the Carolina Section in 1977, 40 years ago.

Early section members worked for N.C. Department of Transportation, U.S. Army Corps of Engineers, Ebasco Services, Inc., American Foundations, Duke Power, and Carolina Power & Light, with Charles Welby of N.C. State Raleigh representing academia. South Carolina joined our section within a few years, and we eventually changed the name to the Carolinas Section to reflect that there were actually two states, North Carolina AND South



Charles Welby, with Jane Gill-Shafer

Carolina, in our section. Officers, including Section Chair, Vice Chair, Treasurer, and Secretary, were elected by the membership.

Carolinas Scholarship

Since 2011 AEG Carolinas has been working towards establishing a scholarship for undergraduate students attending college in North or South Carolina. Due to the large endowment \$15,000 to \$20,000 needed to establish the fund with the AEG Foundation this goal was tabled for many years. Following the success of the Vapor Intrusion Conference in 2014 the start-up funds were available to establish this scholarship. In 2016 the first scholarship was awarded to Ashleigh Nicole Kirker a rising junior at the College of Charleston. Since its establishment in 2015 AEG Carolinas has held a 50/50 raffle at each Dinner Meeting to raise funds for the scholarship. Additional conferences are planned to ensure the Carolinas Scholarship is available for students for many years to come.

(Continued on page 9)





(Continued from page 8)

Section/Chapter of the Year Awards

The Carolinas Section was the recipient of the AEG Section of the Year in 2009, 2011, 2013, and 2016.

Section Chairs:

1977	Bob Siesen
1978	Norm Tilford
1979	Norm Tilford
1980	Norm Tilford
1981	William D. (Dave) Bingham
1982	William D. (Dave) Bingham
1983	G. Dan Johnson
1984	G. Dan Johnson
1985	Henry (Tom) Hicks, Jr.
1986	Henry (Tom) Hicks, Jr.
1987	Phil W. Winchester, Jr.
1988	Phil W. Winchester, Jr.
1989	Charles A. Slagle
1990	Henning Fritz Koch
1991	Donald J. Hathaway
1992	Jay Bennett
1993	G. David Garrett
1994	Kerry D. Cato
1995	Richard M. Wooten
1996	Mark E. Landis
1997	Graham H. Simmerman
1998	Hannu Kemppinen
1999	Karen Clarke Wiggins
2000	Charles W. Welby
2001	Charles W. Welby
2002	Gary Rogers
2003	Brian K. Banks
2004	Tami Idol

Jennifer Bauer

2005

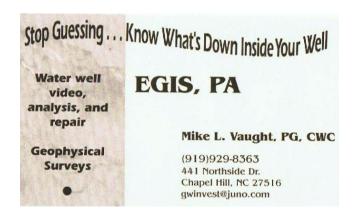


Jennifer Bauer and Brian K. Banks

2000	Tylei Ciaik
2007	Rick Kolb
2008	Rick Kolb
2009	Rick Kolb
2010	Paul Weaver
2011	Paul Weaver
2012	Paul Weaver
2013	Paul Weaver
2014	Alex Rutledge
2015	Alex Rutledge
2016	Madeline German
2017	Madeline German

Tyler Clark

2006





(Continued from page 9)

Service to Professionals

We serve the environmental and engineering geology profession and the public in North and South Carolina, holding quarterly meetings in North Carolina to provide opportunities for all our members and visitors to attend. On April 26, 1980, the Carolina Section began its continuing education efforts by joining with the ASCE in cosponsoring a symposium, "AEG-ASCE Symposium on Hazardous Waste Disposal." Since then, our meeting topics have ranged widely and have included a discussion on building a tunnel under an active airport runway, a report of a trip to China and the building of the Three Gorges Dam, a discussion of the geologic role in flooding and flood prevention, a talk on transmissivity and anisotropy, and current and future groundwater issues in North & South Carolina.

Looking back, on June 17, 1988, John Palmer discussed the possible applications of personal computers in the work of engineering geologists and the ways that his company was using personal computers in their work, with some emphasis on their use for graphics. My how things have changed.

We have also had meetings featuring talks on sea-level rise, site characterization for the design of effective groundwater-remediation projects, the geologic and disaster perspectives of Hurricane Katrina, a talk on GIS in environmental and engineering geology, hazardous waste disposal, and the technical controversies and geopolitics of Salt Lake City, Utah.

In April 2012, Jenn Bauer with others on the national board at that time participated in the Science/Engineering/ Technology Congressional Visits Day (CVD). On September 11-12, 2012 Brad Worley represented AEG Carolinas geologists at the 5th Annual Geosciences CVD. This was Brad's fourth CVD so he was allowed to proceed without a chaperone allowing for more one-on one interaction with the congress member or staffer providing him the opportunity to stress AEG's ability to assist members of Congress when they need help or information on certain legislative issues. He met with Senator Kay Hagan (D-NC) and her staffers as well as Dave Wegner and Katherine Waring, with the House Transportation Com-

mittee then Brandy Dillingham, staff member in Representative Brad Miller's (D-NC-13) office and finally Kirk Bell, staff member in Representative Howard Coble's (R-NC-6) office.

AEG Carolinas has helped with the ongoing service project to help provide clean water wells in Haiti since 2010 when Doug Rakoczy, former environmental geologist at Duncklee and Dunham, moved his family to Haiti.

Technical Symposia and Seminars

The Carolinas Section has conducted several special events and short courses in our region. The following is an abbreviated list of some of them.

April 1980, in conjunction with ASCE, *Symposium on Hazardous Waste Disposal.* This included 26 talks, and was very well attended by professionals, government employees, and academics from throughout the southeast.

May 1991 Symposium on Landfill Issues and New Technologies. This included talks on legal and regulatory issues, groundwater systems, status of landfill space in the southeast, and recycling and landfill planning.

September 1993, in conjunction with AIPG, a short course on the *Standards of Practice in Environmental Geology and Engineering Geology* was held in Raleigh at the University Club. The co-conveners were Charles Welby and Kerry Cato.

September 1995, co-sponsored by AIPG, a short course, *New Techniques in Environmental Geology and Engineering Geology*, again at the University Club in Raleigh. This course included classes in professional standards, innovative technology from a regulator's perspective, emerging trends in environmental enforcement, and other topical issues.

September 1998 in collaboration with the Carolina Section ASFE, conducted a seminar on contract basics in Raleigh on Friday, September 25, 1998.

February 2001, in conjunction with AIPG, we hosted the Symposium "Enigmas of Groundwater in Crystalline Rocks – Problems and Solutions," which featured over 9

(Continued on page 11)





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Cell: 314.302.0431 paul.konnik@contestlabs.com www.contestlabs.com



(Continued from page 10)

hours of technical talks, including question and answer sessions, on various technical aspects of the title subject. Some of the talks included were: "Hydraulic Well Tests to Characterize Fractured Bedrock,", "Hydraulic Properties of Piedmont Soils and Rocks," and "Primer on Legal Issues Regarding Groundwater Assessment and Remediation," and many others.

March 2003 - A 2-day "Tools of the Trade" seminar, included a full day of talks, posters, and presentations, and a field trip to two quarries and a gold mine. It was attended by 185 professionals. Some of the talks included "Geophysical Characterization of an Abandoned Gold Mine,", talks on CPT technologies and digital data collection, and a special geotechnical session by James Martin on "World Trade Center – Issues Related to the Clean Up and Stabilization of the Bathtub," describing the aftermath of the horrific incident that defines our times.

May 2009 – Principles of Soil and Groundwater Geochemistry, 2-day course by Bill Deutsch, held in Raleigh

February 2010 – Co-hosted with Redox Tech, LLC the 2 -day Second Biennial Southeastern In Situ Soil and Groundwater Remediation Conference

August 2011 – Shale-Gas Development in North Carolina: A Review of Economic and Environmental Issues
This two-day conference in Raleigh convened in partnership with the American Ground Water Trust that focused on the energy potential of North Carolina's Deep River Basin and the potential for shale gas believed to be present in other N.C. sedimentary basins. The conference provided a balanced information-exchange opportunity among the energy industry, the water industry, and citizens and communities with an interest in the economic potential of shale-gas development and the long-term environmental sustainability of water sources and water-dependent ecosystems.

October& November 2011 – *Field Techniques Symposia*: A day in the field for students from UNC Charlotte and NC State. They experienced drilling using Hollow Stem Augers and Geoprobe as well as collecting and screening soil and groundwater samples.

March 2012 – Co-hosted with Redox Tech, LLC the 2-day Third Biennial Southeastern In Situ Soil and Groundwater Remediation Conference

January 2014 – Vapor Intrusion: The Conference – Legal, Technical and Regulatory Perspectives, Raleigh: In conjunction with NCDENR, our section hosted a 2-day conference that featured 21 presentations by environmental consultants, federal and state regulators, remediation contractors, scientist, researchers, and attorneys.

March 2014 – Co-hosted with Redox Tech, LLC the 2-day Fourth Biennial Southeastern In Situ Soil and Groundwater Remediation Conference

October 2015 – Two 1-day classes in Raleigh by Bill Deutsch: *Introduction to Groundwater Geochemistry*, and *Application of Groundwater Geochemistry to Contaminant Migration and Remediation*.

Meeting Hosts

Carolinas Section hosted the 28th Annual Meeting of AEG in 1985, in Winston-Salem, with the late Norman R. Tilford as the Annual Meeting Chairman. The meeting "Site Selection, Characterization, and Design Exploration" was held in conjunction with the International Symposium on the Management of Hazardous Chemical Waste Sites sponsored by IAEG, and featured over 130 technical presentations as the section reached out to expand membership and service to environmental geologists. The meeting was attended by 850 professionals and academics from around the world, and was the largest ever for an AEG meeting up to that date.

We have also been instrumental in providing volunteers from our section to aid other organizations in the hosting and implementation of their events in our area. These include many joint meetings with Ground Water Professionals of North Carolina (GWPNC), AIPG, NCDOT, NCGS, and ASCE.

1985	28 th AEG Annual Meeting (Winston-Salem,
	NC)
1994	37 th AEG Annual Meeting (Williamsburg, VA)
2004	NC Science Teachers Association Meeting and
	Rock Swap (Winston-Salem, NC)
2006	42 nd Annual Int'l Geology of Industrial
	Minerals (Asheville)
2007	7 th Annual Technical Forum on Geohazards in
	Transportation in the Appalachian Region
	(Asheville)
2010	53 rd AEG Annual Meeting (Charleston, SC)
2019	62 nd AEG Annual Meeting (Asheville, NC)



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Arsenic? In my Groundwater? By Jennifer Thomas, Editor

My husband is taking earth science classes at the University of North Carolina Charlotte. When he mentioned he was attending a lecture on arsenic in groundwater as part of his coursework I thought it would be of professional interest to me and decided to join him. I also thought I would share some of what I learned, as it might be of interest to others practicing environmental geology.

Dr. Madeline Schreiber of the Virginia Tech Department of Geosciences has been studying the topic. Her research and experiments have explored the sources of arsenic in the environment, both natural and man-made, and the pathways by which arsenic is released, as well as uptake processes.

Arsenic naturally occurs in minerals such as realgar, orpiment, and scorodite. It is also associated with more common minerals such as iron oxide and pyrite. Man-made sources include mining waste, a wood preservative that was commonly used in the past, pesticides, and herbicides. Arsenic is also used in a chicken feed additive to improve weight gain and control infection.

Release mechanisms include oxidation of sulfides such as pyrite, reduction of oxides by bacteria, dissolution of both oxides and sulfides, and desorption of oxides and clays.

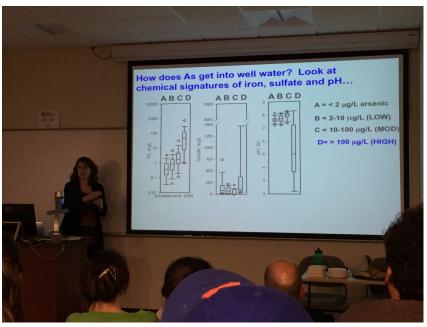
Dr. Schreiber discussed a research project she had completed in Northeast Wisconsin in an area where elevated levels of arsenic were found in groundwater. The county drew water from the St Peter Sandstone aquifer. A layer of pyrite overlying the aquifer was found to contain approximately 1% arsenic. Based on the chemical signatures of iron, sulfate, and low pH, Dr. Schreiber concluded that

the arsenic was being released into the water due to oxidation of the pyrite (iron sulfide).

Dr. Schreiber also did a project in Delaware where she studied arsenic from chickens fed with the arsenic-containing feed additive. Arsenic was found not to accumulate in the meat but elevated levels were excreted in the litter, measuring 40-80 ppm. This litter is used as fertilizer.

In her experiment, Dr. Schreiber spread the litter on a field and tested soil, water, and growing plants. The arsenic was found to be concentrated in a clay layer with little to none found in the water or plants. She concluded that the presence of the clay mitigated the problem of arsenic in groundwater in the area of the experiment. In soils with a





(Continued on page 14)

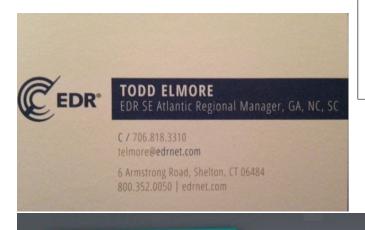
(Continued from page 13)

lower clay content, arsenic from chicken litter may be more of a problem.

The most interesting part of the lecture for me was the relationship between hydrocarbon plumes and arsenic. This relationship was found during studies of the Bemiji hydrocarbon plume in Michigan, a 35-year old release that is used for environmental geology research.

When microbes in soil break down hydrocarbons, they first use up the available oxygen. When the oxygen is depleted, they reduce iron. Trace amounts of arsenic in the soil attach to the reduced iron, concentrating arsenic at the edges of a plume. Levels of arsenic in the groundwater then become elevated. Therefore, arsenic can be a chemical of concern with hydrocarbon releases, even though the hydrocarbons don't actually contain arsenic.

It will be interesting to see where this research goes, since arsenic is not typically considered in the assessment and remediation of petroleum release sites. Perhaps we can get Dr. Shreiber to speak at a future meeting.





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AEG 2019 Annual Meeting Conference Call Minutes

By Rebecca Deal Tinnel

Attendees:

Arpita Nandi, Paul Weaver, Briget Doyle, Gary Rogers, Joanna Harbison, Rick Kolb, Rohit Warrier, Jenn Bauer, Cyrus Parker, Jane Gill-Shaler

Subcommittees

It appears that we need new Chairs for the Hospitality & Guest Activities and the Special Event subcommittees. Any volunteers/draftees?

> Publicity and Media chair Ray Knox has withdrawn,

Need someone to help with meeting app

Jenn Bauer will chair Special Event subcom-

We still need additional people to serve on the various subcommittees. Please have anyone you know that may be interested in helping contact Paul

We need to find a way to get the Atlanta Chapter involved as much as possible.

Paul is in contact with people in Atlanta There may be a Nashville Chapter by 2018 that could also assist in the meeting planning

Special Event

Jenn Bauer has several suggestions for possibilities for the special event:

La Zoom Comedy party trolley (that may not be what it is called)

Need to find out seating

Comedy troop leads comedy tour of Asheville

The Collider – brings together climate scientists On top floor of Science Museum – do museum tour and reception after at The Collider

NC Arboretum

Highland Brewing - first microbrew in Ashe-

ville; offer tours

Sierra Nevada Brewery

New Belgium Brewery on old brownfields site on river in River Arts District

Sierra Nevada brewery

Jenn will send out a poll so we can narrow down list to top 3

Paul thinks we should rule out the Biltmore because it will be too expensive and too difficult to make it really interesting

Biltmore will still be guest tour

As a reminder, we are expecting 50 to 75 people

Field Trips

Jenn, Rick W. and Susan have been narrowing down the list of potential field trips. These ideas are: **Engineering Geology**

Landslides and geology – possibly combine AEG Carolinas and CGS field trips

I-40 rock fall site

Dams

Mining in Spruce Pine

Environmental geology

New Belgium Brownfields site/River Arts District Environmental issues

Groundwater Contamination site

Coal ash site in Skyland and use of ash at airport (Arpita suggests contacting Brett

Leverty (?)) Have list of ideas and potential trip leaders, but have not contacted leaders yet

Need trips close to finalized by spring of next year (2018)

May be changing name from "field trips" to "technical field courses"

Short Courses

Maybe in class components combined with field com-

Drone usage;

Skip Watts suggested as contact, as well as Richard Steckel, and coordinators of drone

course at NASL conference

Using aerial photography for mapping Maybe mix with LiDAR

(Continued on page 17)



VI Conference Coming to Charlotte this Fall

By Rick Kolb

The Carolinas Chapter of AEG is organizing a reprise of our 2014 vapor intrusion conference, to be held at the Hilton Charlotte University Place on October 5 and 6, 2017. During our 2014 conference, we had over 200 registrants and many requests and queries for a follow-up conference. We expect that this year's conference will be equally or more successful. We will hold the conference in Charlotte to make it more convenient for our members in the western part of North Carolina, and with the hopes that we'll have an increase in attendance by those in South Carolina, Georgia, Alabama, and Tennessee. We expect to be able to offer continuing education units for geologists and engineers, and continuing legal education units for attorneys.

The conference will feature nationally known speakers that we have begun to invite, including speakers from our 2014 conference with updated presentations on regulations, technology, and legal implications. We will have presentations by researchers, regulators, and attorneys, and case studies from consultants. Dr. Blayne Hartman has already committed to being one of the keynote speakers at the event. We will provide regular updates by email and on social media on meeting details as these are finalized. We hope to again keep the price for the conference low and will offer a reduction for employees of the public sector and students.

A lot has happened with VI since early 2014, including a change in the political scene and pending changes at the U.S. EPA. Stay informed and knowledgeable of this important topic.

The planning committee for the conference is comprised of Rebecca Deal of Hart & Hickman, Joanna Harbison of Shield Engineering, Jennifer Thomas of JennTec LLC, Paul Konnik of Con-Test, Brian Smith of ECS Southeast, Walt Plekan of AECOM, Grady Shields of Wyrick Robbins Yates & Ponton, Rohit Warrier of Geosyntec, and Rick Kolb of Duncklee & Dunham. Feel free to contact any of them if you have thoughts on speakers you would like to see or to suggest topics for presentations.

Alan King

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Meeting Minutes (Continued from page 16)

3D visualization of projects
Could combine with aerial photography and LiDAR
Ultraviolet fluorescence to detect petroleum
in soil and groundwater

may be able to get vendor to do course with certification
Characterization of Rock Core and Borehole
Conditions for Engineering and Environmental Projects by Gary Rogers
Things to know for owners of small businesses

Relates to new partnership of AEG with Geo Business
Association

Logo and Theme

Theme of "Old Mountains, New Beginnings – Using the Past to Map the Future of Environmental and Engineering Geology" was accepted by the committee

Jane, how far along have you gotten with the logo design?

In draft

Sponsorship

Paul still needs to get up with Rick Kolb about starting to get word out to potential meeting sponsors so it will be on their radar. Rick, do you have any ideas to share?

Will talk to section sponsor chair; discuss at remediation conference

Guest Tours

Paul still needs to get together with Young transportation and the hotel to see what tours they may already have set up and what we would need to do in the form of coordination

We need to have a pretty good idea of what guest tours there will be and how they will be handled by this coming fall/spring at the latest

Partnering

Finding partnering organizations at this point seems pretty dead

Suggested to talk to Western Carolinas ASCE or ASCE Geotechnical group

Possible symposium with scientists at the Collider or NOAA

Jenn will contact Collider

Student Coordination

Nothing to be done for a while on this

Lessons from 2016 Kona Meeting

HQ working registration worked well Only one student needed at registration for all shifts (don't need two)

Using hotel's AV system went well. AEG recommends that all future meetings use either hotel's or outside AV

Moderators need to have better training and keep better control to keep sessions on track

(Continued on page 18)

Meeting Minutes (Continued from page 17)

Mobile app worked well. AEG recommends adding populating mobile app to volunteer committee list

Recommend limiting cash prize for posters to students, and require poster presenters to be onhand at designated times. Need to come up with way to may poster reception better attended

Recommend that field trip guide books continue to only be available on-line, but need to better communicate that guide book is available on-line and how to download it

Recommend continuing career discussion with students/young professionals but making it a free lunch paid for by sponsors

Recommend extending the student reception (before the ice breaker)

Recommend opening registration earlier than April 1 Getting attendance for short courses continues to be a challenge, especially when they conflict with field trips. Consider scheduling short courses during the meeting and/or make half-day courses and/or half-day course with half-day related field trip? Look at past short courses that did well.

To accommodate USACE, change from the name "field trips" to "technical field courses" to allow attendance.

Boycott of North Carolina Due to HB2

The N.C. legislature still refuses to repeal HB2 (the "bathroom" bill), despite no enforcement mechanism, despite no instances justifying the law, and despite the fact that numerous businesses, athletic events, concerts, and conventions have declared that they will not consider North Carolina as a location until the bill is repealed.

California and several other states have prohibited their employees from traveling to N.C. using any state funds

We still have 2 ½ years to go before our meeting, but if the law isn't repealed by then, there may be some AEG members who are state employees who will not be able to attend our meeting because they cannot get any reimbursement from their employers

If you believe that your N.C. legislators care what you think and have any interest in listening to you, please contact them and let them know that HB2 must be repealed for the welfare and financial well-being of the state, and so we can have people come to our meeting from all over the country and from other parts of the world to see what a great state we live in.

Upcoming Planning Committee Meetings

We'll probably hold another planning committee meeting in a few months



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EDUCATION

Education News

By Randy Bechtel, North Carolina Geological Survey

N.C. deadline to nominate for Outstanding Earth Science Teacher (OEST) and Educator (OESE) Awards is March 31, 2017!

- The Nomination Form and any supporting material need to be received by Randy Bechtel by March 31, 2017. The Nomination Form can be found at the bottom of this link (or google NC Geoscience Education): http://deq.nc.gov/about/divisions/energy-mineral-land-resources/north-carolina-geological-survey/geoscience-education/outstanding-educators-awards
- To see previous winners and find out more about the awards (or google NC Geoscience Education): http://deq.nc.gov/about/divisions/energy-mineral-land-resources/north-carolina-geological-survey/geoscience-education/previous-nc-outstanding-earth-science-educator-award-winners
- The North Carolina Science Teachers Association Professional Development Institute (NCSTA-PDI) www.ncsta.org will be held on October 19-20, 2017 at the Koury Convention Center in Greensboro, NC. The theme this year is "Modeling STEM: Ingenuity at Work!" Improving Science knowledge with three strands:
- Strand 1: "Mastering science material through technology and innovation" will consist of promoting the best science classroom practices through technology.
- Strand 2: "Science review & test-taking strategies: break through to excellence" will focus on improving learning content material
- Strand 3: "The science of design: Modeling past, present and future" will provide teachers with ways to incorporate different representations of science through hands-on learning.

We will also be offering our annual Literacy Workshop. More details coming soon.

First Grade Science Day!

This event was part of an elementary science event for all grades in the school. I was asked to present to four first-grade classes. This was just such a fun day that I decided to include a brief description of the activity and a couple of pictures. The main activity was a Rock Sort. I have an assortment of samples to exhibit a variety of textures, colors, lusters, and, yes, sample sizes for the students to experience. The students were in groups of four and had to work together to make their own rules to separate the group of rocks (and minerals) into two groups.

This activity allows the students to explore the samples and make their own observations as opposed to a geologist telling them what they should see. They had the opportunity to do the activity two times and then ask questions about the rocks. I had a few other samples to extend the conversation (i.e. pumice to float, mica in toothpaste, etc.). They asked great questions and were enthusiastic:

EDUCATION





First graders working in groups of four sorting rock samples



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- Delineate buried waste
- Many other applications....

Ned Billington, PG, 336-232-5211 geophysics@espassociates.com

www.espassociates.com



EDUCATION

The North Carolina Science Festival (NCSF)

The Festival (www.ncsciencefestival.org April 7-23, 2017) is a multi-day celebration showcasing science and technology. It highlights the educational, cultural and financial impact of science in our state. Through hands-on activities, science talks, lab tours, nature experiences, exhibits and performances, the Festival engages a wide range of public audiences while inspiring future generations. This event offers an opportunity to celebrate science in fun and welcoming settings. It provides the opportunity to cultivate a positive environment which encourages children to pursue science-related careers and encourages businesses to invest in North Carolina.

The North Carolina Science Festival is an initiative of Morehead Planetarium and Science Center.

Captain James Lovell is to speak as part of the 2017 North Carolina Science Festival at the University of North Carolina at Chapel Hill Thursday, April 6, 7:30 p.m. at Memorial Hall, Tickets go on sale Monday, March 6, 10 a.m.

Between 1959 and 1975, Morehead was called to serve not only the people of North Carolina but also the nation's burgeoning space program. During this time, nearly every astronaut who participated in the Mercury, Gemini, Apollo, Skylab and Apollo-Soyuz programs trained at More

head in star navigation. Now, the time-honored hero who actually put that knowledge to work in his calm and careful command of Apollo 13 in 1970 is coming back to UNC -Chapel Hill to share his wisdom and stories at a one-time event at Memorial Hall.

Capt. James Lovell stoically articulated the five-word message, "Houston, we have a problem," which quickly became part of the American lexicon. Through teamwork and decisive leadership, Lovell and his crew modified the lunar module into an effective lifeboat to safely return to Earth. As captain, he was thus transformed into a national hero who has since attracted generations of followers.

During his career, Lovell accumulated over 7,000 flight hours, including 4,500 in jet aircraft, 713 in space and 107 carrier landings. He received numerous medals and awards, including the Congressional Space Medal of Honor, Presidential Medal of Freedom, Navy Distinguished Service Medal, two Navy Distinguished Flying Crosses, NASA Distinguished and Exceptional Service Medals and the French Legion of Honor.



ANNOUNCEMENTS

April Field Trip

There is still time to sign up for the April field trip, a geology hike along the Haw River in Chatham County April 22 at 9 am. See flyer on page 23 for information and to sign up.

We Need Your Help Planning the 2019 Annual Meeting

Planning is underway for the 2019 annual meeting which we are hosting in Asheville! We need volunteers to chair the **Hospitality and Guest Activities** as well as the **Publicity and Media** committees. If leading a committee sounds like too much, you can also serve on a committee. If you are technologically inclined, we need help creating an app for the meeting. Contact Paul Weaver pweaver@espassociates.com if you are interested.

Third North American Symposium on Landslides

It's time to start planning your trip! This national symposium is coming up June 4-8, 2017 in Roanoke, which is in easy driving range for many Carolinas members. See flyer on page 22 for details.



CALENDAR OF EVENTS - 2017

Geological Events in the Carolinas

Courtesy of AEG Carolinas Chapter - www.aegcarolinas.org. Last updated December 21, 2016 Send updates/corrections to Josh Hanks, Duncklee & Dunham, josh@dunckleedunham.com Meeting Date, Time, and Location are Subject to Change – Please Verify Prior to the Meeting

Date: Thursday, March 23, 2017

Event: Ground Water Professionals of North Carolina Social and Meeting

Presentation: Brownfield: Stories of Success and Creativity by James Rudder of the NCDEQ **Brownfields Program**

Location: Hilton Garden Inn Greensboro; 4307 Big Tree Way, Greensboro, NC 27409

Cost: Standard \$45/Gov. Employee \$20/ Students

Details: Dinner Meeting and Speaker 5:30-9:00pm

RSVP: groundwaterprofessionalsnc@gmail.com

Date: Saturday, March 25, 2017

Event: AEG Carolinas Winter Field Trip – NC

Museum of natural Sciences Tour Time: 2:00 pm to 5:00 pm

Location: NC Museum of Natural Sciences; 11 West Jones Street, Raleigh, NC 27601

Contact/RSVP: Rick Kolb at rick.kolb1@gmail.com

Date: March 30-31, 2017

Event: Southeastern Section GSA 66th Annual Meeting

Location: Omni Richmond Hotel; 100 South 12th

Street, Richmond, VA 23219 Abstract Deadline: January 3, 2017 Hotel Registration Deadline: March 7, 2017 Details: https://rock.geosociety.org/Sections/ se/2017mtg/

Date: Monday, April 3, 2017

Presentation: Natural Hazards, Risk, and the Resilience of Transportation Infrastructure by Dr. Scott Anderson, 2016-17 Richard H. Jahns Distinguished Lecturer in Applied Geology

Location: College of Charleston, 202 Calhoun

Street

Date: Tuesday, April 4, 2017

Presentation: Natural Hazards, Risk, and the Resilience of Transportation Infrastructure by Dr. Scott Anderson, 2016-17 Richard H. Jahns Distinguished Lecturer in Applied Geology

Time: 1:00 pm

Location: UNC-Wilmington

Date: Wednesday, April 5, 2017

Presentation: Natural Hazards, Risk, and the Resilience of Transportation Infrastructure by Dr. Scott Anderson, 2016-17 Richard H. Jahns Distinguished Lecturer in Applied Geology Time: 9:00 am

Location: Wake Tech, Pucher LeMay (PLM) 241

Date: Wednesday, April 5, 2017

Presentation: Natural Hazards, Risk, and the Resilience of Transportation Infrastructure by Dr. Scott Anderson, 2016-17 Richard H. Jahns Distinguished Lecturer in Applied Geology

Time: 12:00 pm

Location: UNC-Chapel Hill, 121 Mitchell Hall (104 South Road)

Date: Wednesday, April 5, 2017

Presentation: Technical Observations from the 2014 Oso Landslide Reconnaissance by Dr. Scott Anderson, 2016-17 Richard H. Jahns Distinguished Lecturer in Applied Geology

Time: 4:00 pm

Location: North Carolina State, 1214 Jordan Hall Addition (2720 Faucette Drive)

Date: Wednesday, April 5, 2017

Event: AEG Carolinas/ASCE Raleigh Meeting Presentation: Solid as a Rock by Dr. Scott Anderson, 2016-17 Richard H. Jahns Distinguished Lecturer in Applied Geology

Cost: AEG/ASCE members \$30, non-members \$40, public sector employees \$15, teachers \$10, students free with college ID. Cost includes one drink ticket courtesy of Pace Analytical Laboratories and Contaminant Control, Inc.

Time: 5:30pm Social, 7:00pm Dinner, 8pm Presentation

Location: 1705 Prime; 1705 East Millbrook Road at Old Wake Forest Road, Raleigh

Contact/RSVP: Josh Hanks at

joshmhanks@gmail.com by 5:00pm on Monday April 3, 2016

Date: Thursday, April 6, 2017

Event: ASBOG Spring COE Workshop

Location: Flagstaff, Arizone Contact: ncblg@bellsouth.net

Date: Thursday, April 6, 2017

Event: Engineers Without Borders monthly meeting, Research Triangle Park Professional

Location: 6:30-8:00 PM at the offices of Camp Dresser & McKee; 5400 Glenwood Avenue, Suite 400; Raleigh

(Continued on page 24)

(Continued from page 23)

Details: www.meetup.com/EWB-USA-RTP-Professional-Chapter/

Date: Thursday, April 20, 2017 (meetings are held on the third Thursday of the month)

Event: Meeting of South Carolina Association of Environmental Professionals

Presentation: TBD

Cost: Annual fee of \$25 includes pizza, beer and soft drinks at all meetings

Time: 6:30pm Social with Pizza & Beverages, 7:00pm Presentation

Location: Jim Hamilton-L.B. Owens Airport – 1400 Jim Hamilton Boulevard, Columbia, SC

Contact/RSVP: Sharri Scott at sherri.scott@tersusenv.com

Date: April 21-22, 2017

Event: SME Carolinas-Georgia Joint Meeting and Field Trip

Topic: Haile Gold Mine: Introduction, Geology, Metallurgy/Processing, and Environmental Compliance

Location: Hilton garden Inn; 650 Tinsley Way, Rock Hill, SC 29730

Meeting Time: 1 pm Reception, 2-4 Presentation, 4-6 pm Dinner on Friday April 21

Field Trip: Haile Gold Mine; 6911 Snowy Owl Road, Kershaw, SC 29067 at 8am on Saturday on April 22

Cost: SME Members \$90, Non-members \$120, Students with college ID \$60 if registered by April 17

Details/Registration: http://aegcarolinas.org/2017-sme-carolinas-georgia-sections-joint-meeting-and-field-trip/

Contact: Dr. Hamid Akbari at hakbari@ncsu.edu

Date: Saturday, April 22, 2017

Event: AEG Carolinas Spring Field Trip

Topic: Geologic Hike along the Haw River, Chat-

ham County, NC

Trip Leader: Phil Bradley PG, Senior Geologist for the NC Geologic Survey for the Piedmont

Time: 9 AM to 4 PM

Cost: Members, Non-members, Public sector, Teachers \$50; Students with college ID \$20

Details: http://aegcarolinas.org/aeg-carolinas-spring-field-trip-april-22-2017/

Registration: Available on AEG Carolinas Chapter website in January 2017

Date: Thursday, May 4, 2017

Event: Engineers Without Borders monthly meeting, Research Triangle Park Professional Chapter

Location: 6:30-8:00 PM at the offices of Camp Dresser & McKee; 5400 Glenwood Avenue, Suite 400; Raleigh

Details: www.meetup.com/EWB-USA-RTP-Professional-Chapter/

Date: Thursday, May 18, 2017 (meetings are held on the third Thursday of the month)

Event: Meeting of South Carolina Association of Environmental Professionals

Presentation: TBD

Cost: Annual fee of \$25 includes pizza, beer and soft drinks at all meetings

Time: 6:30pm Social with Pizza & Beverages, 7:00pm Presentation

Location: Jim Hamilton-L.B. Owens Airport – 1400 Jim Hamilton Boulevard, Columbia, SC

Contact/RSVP: Sharri Scott at sherri.scott@tersusenv.com

Date: Thursday, June 1, 2017

Event: Engineers Without Borders monthly meeting, Research Triangle Park Professional Chapter

Location: 6:30-8:00 PM at the offices of Camp Dresser & McKee; 5400 Glenwood Avenue, Suite 400; Raleigh

Details: www.meetup.com/EWB-USA-RTP-

(Continued on page 25)



(Continued from page 24)
Professional-Chapter/

Date: October 5-6, 2017

Event: AEG Vapor Intrusion Conference

Location: Hilton Charlotte University Place; 8629 J. M. Keynes Drive, Charlotte, NC 28262

Details/Registration: TBD

Date: October 6, 2017

Event: ASBOG Geology Exam

Details: Deadline to apply for the exam is August 18, 2017(and preapproval to take the exam before

that)

Location: McKimmon Center, NC State Universi-

ty, Raleigh

Contact: www.ncblg.org

Date: October 22-25, 2017

Event: Geological Society of America Annual

Meeting

Location: Seattle, Washington

Technical Session and Short Course Proposal

Deadlines: August 1, 2017

Information: http://community.geosociety.org/

gsa2017/home

Date: Tuesday, October 31, 2017 Event: ASBOG Annual Meeting Location: Portland, Oregon Contact: ncblg@bellsouth.net

Date: September 10 – September 16, 2017

Event: AEG Annual Meeting

Location: Antlers Hilton Colorado Springs; Four South Cascade, Colorado Springs, Colorado,

80903-1685

Contact: contact@aegweb.org

Date: September 2019 (dates to be determined)

Event: AEG Annual Meeting Location: Asheville, North Carolina

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Third North American Symposium on Landslides

> Roanoke, Virginia, USA June 4-8, 2017



THEME

Landslides: Putting Experience, Knowledge and Emerging Technologies into Practice

The 1st North American Symposium on Landslides held in 2007 in Colorado and of 2nd North American Symposium on Landslides held in 2012 at Banff, Alberta, Canada.

THE OBJECTIVE OF THESE SYMPOSIA

The main objective of the symposia is to provide a stimulating forum for geoscientists, engineers, planners, economists, program managers, and other decision makers concerned with landslide hazards and their impact on society. Papers related to investigation, classification, monitoring, analysis and mitigation of landslides, as well as case studies on innovative analysis techniques and solutions will be presented.

THE TECHNICAL PROGRAM

- Sunday Workshops
- Sunday Evening "Ice-Breaker" Reception
- Three days of Technical Presentations with Morning Plenary Sessions and Afternoon Concurrent Sessions
- Exhibition Space
- Included Luncheons and Refreshment Breaks
- Selection of Full-day Field Trips on Wednesday
- Poster Sessions
- · Electronic Proceedings

ROANOKE ATTRACTIONS

The Symposium Hotel is in central Roanoke, the largest city, shopping, and dining destination in the "Virginia Mountains Region." Roanoke is an entry point for the Blue Ridge Parkway – "America's Most Scenic Drive." Local points of interest include several museums, the Historic Roanoke City Market, various craft breweries, and one of Virginia's favorite hikes, McAfee Knob. Nearby areas are a playground for outdoor enthusiasts with lakes to boat, rivers to fish, and peaks to conquer. But that's not all, there are many historical and cultural attractions. So consider a family vacation before or after the Symposium!!



ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS - Carolinas Chapter

Geological Hike along the Haw River, Chatham County, NC

Reservations: You can register and prepay for the field trip by (1) mail (see last pages) or (2) under the News and Events Page of our website at http://aegcarolinas.org/. Everyone (including online registers) must fill out the Registration and Liability Waiver Forms to attend the field trip.

THIS FIELD TRIP IS LIMITED TO 50 PARTICIPANTS. FIELD TRIP RESERVATION DEADLINE: 5PM Friday, April 14, 2017.

Spring Field Trip Saturday, April 22, 2017, 9:00 am to 5:30 pm

Meeting Location: 9:00 am Lower Haw River State Natural Area parking lot (see instructions for parking)

Cost: Members, Non-members, Public-sector, Teachers \$50; Students with college ID \$25

Field Trip Waiver: Please sign/date and return field trip waiver to Sue Buchanan by April 14, 2017

South Carolina Continuing Education Credits: 5 credits

Travel Accommodations: A block of rooms will not be reserved by AEG for this event. A list of nearby accommodations follows. Please carpool as the parking area cannot accommodate many vehicles.

This field trip is limited to 50 participants due to limited space available at Carolina Brewery restaurant.

Field Trip Summary

This field trip will involve a hike along two separate stretches of the Haw River on either side of HWY 64 within the Lower Haw River State Natural Area. The Lower Haw River State Natural Area is administered by the NC State Parks and includes 1,100 acres of land along both sides of the Haw River in Chatham County extending from the Town of Bynum to Jordan Lake.

The hike will present results of detailed geologic mapping by the NC Geological Survey in Chatham County and interpretations of various outcrops and landforms along the river. This portion of the Haw River is located within the Hyco Formation of the Carolina terrane. Generally, the Hyco Formation includes metamorphosed volcanic, volcaniclastic-sedimentary and intrusive rocks associated with a volcanic island arc active ca. 612 - 630 ma.

We will hike a portion of the river northwest of the HWY 64 bridge in the morning. Along this section we will visit outcrops of metamorphosed dacites, andesites, and basalts of the Hyco Formation. After lunch, the hike will be on the southeast side of the river (south of HWY 64); where we will visit outcrops of dacites and volcano-sedimentary rocks.







Field Trip Logistics

Participants will park at the Lower Haw River State Natural area gravel parking lot on the west side of the Haw. The lot is accessed from the eastbound lane of HWY 64 off of Foxfire Trace. River Access Road which leads to the parking lot is a left turn immediately off of Foxfire Trace. Please carpool as the parking area at the Haw River cannot accommodate many vehicles. Excess cars can park at the Lowe's Home Improvement Store at 121 Lowes Drive, located a few minutes west of the Haw River parking lot off Hwy 64 in Pittsboro. Field trip starts shortly after 9 am, so please coordinate carpooling and car parking logistics before 9 am meeting time.

After a brief introduction to the field trip, we will walk under the HWY 64 bridge to the northwest along the river. The trail includes areas of roots, loose and slippery rock and may require the crossing of small streams. Hiking boots are recommended. Downed trees may require stooping or climbing at times. The morning section should take approximately 2 to 3 hours to complete with an estimated return to the parking lot at lunch time.

From 12:00pm to 3:00pm, lunch will be at Carolina Brewery in Pittsboro (120 Lowes Drive #100). A limited lunch menu has been selected which includes tea, water, and soft drinks. Alcoholic beverages are not included. A 30 minute brewery tour at Carolina Brewery will start about 2:00pm. We strongly encourage that participants who choose to drink alcohol, limit alcoholic beverages to one drink as driving is required back to the Haw River and more hiking continues after lunch. After lunch, the group will walk over the HWY 84 bridge and begin another approximate 2-hour hike on the southeast section of the river.

Nearby hotels in Apex, NC (about 20 miles from the Haw River parking lot): Comfort Inn (1411 E Williams Street, 919-387-4600); Candlewood Suites (1005 Marco Drive, 919-387-8595); Holiday Inn Express (1006 Marco Drive, 919-387-3636).

Field Trip Leader

Phil Bradley is the Senior Geologist for the North Carolina Geological Survey for the Piedmont. He has 20 years of experience in project management and technical oversight in geological sciences including groundwater and soil investigations, geoscience education, and geologic mapping. His main duties involve geologic mapping in the Piedmont of North Carolina.

Published Geologic Map of area: https://ncdenr.s3.amazonaws.com/s3fspublic/Energy%20Mineral%20and%20Land%20Resources/Geological%20Survey/GEOLOGIC Geopd fs/NCGS OFR 2012-02 NW Merry Oaks.pdf

General information about Lower Haw River State Natural Area http://hawriver.org/wp-content/uploads/2016/10/LHRSNA-brochure-1.pdf

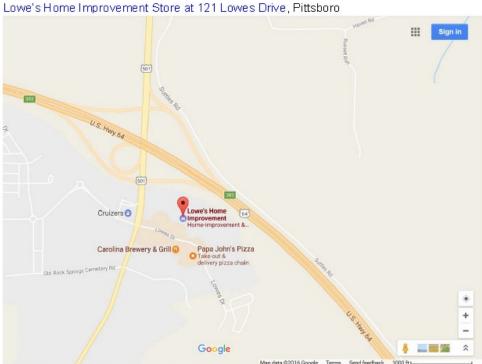


386

Google

Haw River Parking: Space is limited in the parking area. Please carpool if possible. Lower Haw River State Natural area gravel parking lot









Name of Participant:

AEG Carolinas Chapter REGISTRATION AND LIABILITY WAIVER FORMS

Field Trip, Chatham County, NC April 22, 2017

Instructions: Each participant will need to complete the registration form and waiver form to attend this AEG event. Payment must be made to complete your registration and reserve your spot on the field trip. After completion of the forms, send forms and payment (check) to:

> Sue Buchanan (sbuchanan@schnabel-eng.com), Schnabel Engineering, 11A Oak Branch Drive, Greensboro, NC 27407

Address (Street, City, State, Zip):	·				
Phone (office, home, or cell):		Email:			
The Field Trip will include lunch at C	arolina Brewery, 1	20 Lowes Drive	#100, Pittsbor	o (limited lunc	h menu).
Each participant must complet	e the table below	for this A EG (Carolinas Cha	pter event.	
Event	Member	Non- Member	Public- Sector	Teacher	Student
Field Trip (Saturday, April 22, 2017)	\$50	\$50	\$50	\$50	\$25
Total Payment Amount:					
	•				
Boumant Ontions					
Payment Options:					
1) CHECK: Check box if paid via check,	, payable to <i>AEG</i> (Carolinas Chapt	<i>er</i> . Send check	to Sue Buch:	anan.
		·			
				ancarolinae o	ra/) under
2) PAYPAL: Check box if paid via PayPa	ol on the AEG Card	olinas Chapter v	vebsite (<u>http://a</u>	icgcarollitas.o	<u> </u>
2) PAYPAL:					





ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS



LIABILITY WAIVER FOR FIELD TRIP PARTICIPANTS

The undersigned having been fully advised as to the nature and possible da hereby acknowledges and agrees thisday of,	
(please print) (herei participate in one or more field trips sponsored by the Associa Geologists (herein referred to as "AEG").	n referred to as "Participant") intends to ition of Environmental & Engineering
The field trip for which this waiver is being made is to be held on Saturd: North Carolina.	ay, April 22, 2017, in Chatham County,
 Participant agrees and understands that during such field trip(s), he/s of the trip leader approved by the AEG, and specifically agrees to co instructions by the trip director during the course thereof. 	
3. Participant understands and acknowledges that there are risks of i associated with field trips, including without limitation risks related to trasleeping arrangements, and other circumstances. Participant hereby volor arising out of his/her participation in field trip activities, and waiv directors, employees, agents and members for any injury, harm, damagactivities.	vel hazards, terrain, weather, eating and untarily assumes all risks connected with es any claim against AEG, its officers
4. Participant understands and acknowledges that the AEG assumes n damages to participants or to third persons arising out of field trip act hamless from any liability for harm arising out of the acts or omiss such field trip, and indemnify AEG against any and all awards or judgment losses and damages (including attorney's fees and any costs involved bec death or property damage, or inconvenience or loss of money due Participant's participation in field trip activities.	ivities. Participant agrees to hold AEG ions of AEG or Participant during any is against AEG in favor of third parties fo ause of said claims), on account of injury
5. I understand that my use of alcohol or drugs would impair my ju waive, and will hold the AEG harmless from, any and all claims of bodily of either. I will indemnify AEG against awards or judgments in favor (including attorney's fees and costs), of whatever nature, arising out participating in field trip activities.	injury or other harm arising from my use of third parties for losses or damages
Participant's Signature:	Date:
 I hereby state that I am at least twenty-one (21) years old, am am legally permitted to consume alcoholic beverages. 	competent to sign this document, and
Participant's Signature:	Date:
 I hereby state that I am not at least twenty-one (21) years old and am not legally permitted to consume alcoholic beverages. 	I, am competent to sign this document
Participant's Signature:	Date:
Mail waiver form to: Sue Buchanan, Schnabel Engineering, 11A Oak Brar Or email form to: Sue Buchanan, sbuchanan@schnabel-eng.com	nch Drive, Greensboro, NC 27407
/AEGweb @AEGweb Association of Environmental 8	& Engineering Geologists – AEG



Recd

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••	Sign up for Teacher membership at www.aegweb.org4join mber Class shall be engaged in full-time teaching at the Primary, ary level in the area of Earth Science education or a related subject.	AEG News AEG Annual Report and Directory AEG News print publication is availab		
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Signature			ease DONOT list mycontact information in the AEG Directory	
My signature attests that, to	the best of my knowledge, I meet the academic and practice requirements	for the membership class requested and	that all information on this application are true and correct.	
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6. SEND YOUR COMP	LETED FORM WITH PAYMENT TO THE ADDRESS ABOVE.	To join online, please visit www.ae	egweb.org.	
	Thank you! We appreciate your support of the As-	sociation of Environmental & Enginee	ring Geologists.	
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Amt \$

REVISED October 2016

Ackd

*AEG dues are not deductible as a charitable contribution for US Federal income tax purposes, but may be deductible as a business expense. However, Full and Affiliate members of AEG contribute to the AEG Legislative fund along with their Member Dues and this portion does not qualify for any tax deduction. AEG estimates the 2017 legislative contribution made on your behalf to be \$10 for those who reside outside CA. For CA residents, who already have an established member supported lobbying effort, AEG estimates the 2017 legislative contribution made on your behalf to be \$5. Chapter fees are non-deductible.

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<u>Application of Consent</u>. Your consent above applies to ALL communications from AEG, including without limitation meeting and event notices, member records and other information and communications provided to you by AEG. Unless it is withdrawn as provided below, the consent will continue to apply as long as you are an AEG member.

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Advancing the science, scholarship and education in environmental and engineering geology for the benefit of all.
Established by three Past Presidents of the Association of Engineering Geologists (AEG) in 1992, the AEG Foundation plays a key role in the success of our profession.

The AEG Foundation's vision is to create a culture of giving back to the profession, and to instill complete confidence in donors that their money is well-invested and well-spent. Our core programs emphasize scholarship, research, and professional development to improve professional practice. We support outreach to increase the public's appreciation of environmental and engineering geology in geo-hazard evaluation and risk reduction.

AEG CAROLINAS CHAPTER – SPONSOR INFORMATION

The Carolinas Chapter 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 large quantities of 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 clients in an informal setting.

Our sponsors provide the financial support that allows us to have reasonably priced dinner meetings, host seminars, provide discounted dinner meeting costs for students and teachers, underwrite the cost of newsletters and our web site, provide geoscience mentors for students and young professionals, and support science education tools to our teachers and in our schools. 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 (\$275):

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 Chapter email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Chapter Web Page, www.aegcarolinas.org, with a link to your site.

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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 Chapter email announcement (our email list is

Web Page: Acknowledgement on the AEG Carolinas Chapter Web Page, www.aegcarolinas.org, with a link to your site.

Platinum Sponsor (\$550):

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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 Chapter email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Chapter Web Page, www.aegcarolinas.org, with a link to your site.

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Please complete the form below and send to Jennifer Thomas, AEG Carolinas newsletter editor at jen@jenntecllc.com. Please call or email if you have any questions (contact information below).

AEG Carolinas Chapter Sponsorship Form

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Please enclose a business card or email ad in jpg, pdf, or doc to Walt Plekan at walt.plekan@aecom.com.

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Nicole Manning, 919-369-1001, nicole@choice-enviro.com, Steve Jenkins, , steve@choice-enviro.com; Choice Environmental Services, LLC. We carry or rent backpack & handheld GPS, EEM2000, TVA1000B, Survey Equipment, Generators, Laptops, anemometers, monsoon pumps, peristaltic pumps, bladder pumps, and more. We also rent the Kawasaki Mule 3010.

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Mike Vaught, 9199298363, gwinvest@juno.com, Lynn Bressler, 9199298363, ; EGIS, PA specializes in downhole geophysical and borehole video inspection services. We can assist in well development and rehabilitation.

Thank You, AEG Carolinas Sponsors!!

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