

GEONews

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

SUMMER 2014

SAVE THE DATE

Asheville Weekend Blowout!
Summer Meeting, Field
Trip, and Camping
Asheville, September 5-7,
2014

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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, 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

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Cover: (Rick Wooten) The ongoing stabilization efforts at the Piney Mountain Landslide site in Asheville, NC.

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MESSAGE FROM THE CHAIR

By Alex Rutledge, PG, PE
Chair—AEG Carolinas Section

The mid-year AEG national Board of Directors meeting was held in Golden, CO in April. As many of you know, the Chair of each AEG Section serves on this board, so I serve as the representative for the Carolinas. **Dale Andrews**, the AEG national Secretary, has written a summary report of the board meeting, which is reprinted in this issue of GeoNews (page 15). If you are interested in learning about the changes AEG's board is taking to improve the future of AEG, and the Carolinas Section, I encourage you to read this summary entitled "Bracing for Positive Change." Important decisions are being made to streamline and improve AEG's communications, member benefits, committees and resource alignment. However, the most significant decisions, and likely to be the most misunderstood by AEG members, are related to AEG's governance structure.

AEGs governance structure is unique among professional societies, and was identified through the Needs Assessment process that it is having unintended negative consequences that are impacting Association growth, member benefits, and national governance. Change is required to minimize or eliminate these negative consequences. Examples include:

- (1) AEG currently has a 30 member board which is extraordinarily large for a 3000-member association. To streamline Board efficiency, the Board is looking to reduce the number of Directors to 15;
- (2) Currently, locally elected Section Chairs must serve on the national board. The duties of these two roles are very different, and the Board wishes to separate the elections for these positions so that there is more focused attention to each of these critical roles;
- (3) Under AEGs current bylaws, Chapters that form locally within their Section receive no membership dues for supporting their Chapter's efforts and do not have a defined link to nationals. The Board wants to provide every opportunity for our members to have support and benefit from local member activities even when they do not live near a current Section member hub (Charleston, SC is a good example of this in our Section). The Board is seeking to eliminate this disconnect by seeking out new chapter locations, simplifying the chapter creation process, and providing equal and fair benefits to all the chapters.

I am of the opinion that the direction the Board is currently moving the society will have little effect on the Carolinas Section's local activities, but it will have a major positive impact on the health and longevity of AEG. So again, I encourage you to read the Mid-Year Meeting Report

Summary to get the details of the proposed changes.

This year's spring Visiting Professional presentations were very successful, thanks in part to the organizational efforts of **Rick Kolb**. We had six Visiting Professionals presentations this spring including North Carolina State University, UNC-Chapel Hill, UNC-Charlotte, East Carolina University, Western Carolina University, and Wake Tech Community College, and we plan to visit Clemson University in the fall.

As part of our outreach responsibilities, we recently donated \$200 each to the natural history fund of the SC State Museum and the NC Museum of Natural Science. We also donated \$700 to assist with efforts in shipping well supplies to Haiti.

The Carolinas Section Board met in Greensboro for a full-day Board meeting on June 8. It has been two years since our last face-to-face Board meeting. We had many issues to address and resolve, including upcoming field trips, the 2015 Jahns Lecture Tour, membership renewals, Section Board elections, communications and social media strategy, scholarships, donations, and the outcome of the recent national Board meeting. Much of this and more is discussed in this issue of GeoNews, so enjoy the read.

As always, we appreciate any feedback you have to give, so I encourage you to contact me or other members of the Board with your suggestions or concerns related to our section.

Sincerely,



Alex Rutledge, PG, PE
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AEG Carolinas Section Chair



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AEG CAROLINAS SECTION 1st QUARTER TREASURER'S REPORT*By Dr. Briget Doyle, Section Treasurer***AEG Carolinas Section Treasurer's Quarterly Report****January 1, 2014 to March 31, 2014****BALANCE As Of January 1, 2014**

Checking Account	\$3,722.13
Savings Account	\$11,679.00
	<u>\$15,401.13</u>

INCOME**Dinner Meetings**

Winter Meeting - Concord	\$785.00
Spring Meeting - Raliegh	\$1,170.00

Conferences and Field Trips

Vapor Intrusion Conference	\$4,853.00
Section Field Trip	\$250.00

Member Dues

Dues from AEG National	\$200.00
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Sponsorships

14 Sponsorships	\$4,000.00
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Interest

Savings account	\$1.44
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SUBTOTAL - INCOME	<u>\$11,259.44</u>
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EXPENSES**Dinner Meetings**

Winter Meeting - Concord	\$1,445.37
Spring Meeting - Raliegh	\$1,822.30

Banking Fees

Credit Card Reader Fees	\$119.50
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Field Trip Expenses

Transportation	\$1,032.00
Meals	\$217.59

Additional Expenses

Web Site Expenses	\$140.00
AEG President's Visit	\$120.80
Name Tags for Meetings	\$26.68

SUBTOTAL - EXPENSES	<u>\$4,924.24</u>
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BALANCE As Of March 31, 2014

Checking Account	\$10,055.89
Savings Account	\$11,680.44

TOTAL	<u>\$21,736.33</u>
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ASHEVILLE WEEKEND BLOWOUT!



The Asheville Weekend Blowout will include the AEG Carolinas summer section meeting, camping on Friday and Saturday nights, and a field trip on Saturday. Details of the section meeting and field trip are included in this article. Group camping details will be distributed at a later date. Photo courtesy of www.exploreasheville.com

Summer Section Meeting

Piney Mountain Landslide - a Team Perspective

Speakers: Stephen Fuemmeler, LG, Principle Geologist and co-owner of Appalachian Landslide Consultants, PLLC; Will Gentry, PE, President of Gentry Geotechnical Engineering, PLLC; Chris Young CPSWPPP, CISEC, CCIS, Director of Erosion Control and Site Stabilization, AEI Consultants

When: Friday, September 5, 2014, 5:30 to 9PM

Where: Asiana Grand Buffet, 1968 Hendersonville Rd. Asheville, NC

Summer Field Trip

Faults and Landslides - Geologic Structures, Processes, and Landforms Important to Engineering and Hydrogeology Projects in the Blue Ridge of Western North Carolina

Field trip leaders: Rick Wooten, Bart Cattanach, and Nick Bozdog, North Carolina Geological Survey; Stephen Fuemmeler, Appalachian Landslide Consultants, PLLC.

When: Saturday, September 6, 2014.

Where: The Blue Ridge Mountains of western North Carolina near Marion and Asheville. The field trip will depart from the Department of Environment and Natural Resources (DENR) Asheville Regional Office at 8:00

a.m. and return around 5:30-6:00 p.m. Parking is available at the DENR office at 2090 U.S. Highway 70, Swannanoa, North Carolina 28778 (latitude 35.596149°; longitude -82.423655°). Beware – Google Earth and Google Maps may send you to the wrong place in nearby downtown Swannanoa if you search using the street address.

Logistics: Transportation, box lunches, and a short field trip guidebook will be included in the field trip fee. Hiking will be limited to one stop in the Pisgah National Forest; all others will be roadside stops. The hike will be along a forest trail for approximately 0.25 miles, with an optional hundred yards or so of cross country walking in a National Forest setting. Snakes, ticks and chiggers will be alive and well this fall, and wearing a good set of field boots is recommended. Hard hats and rain jackets are recommended.

The field trip will feature investigations of faults and landslides done by the North Carolina Geological Survey, and Appalachian Landslide Consultants, PLLC. One stop will highlight a newly described locality of the Alleghanian Linville Falls fault on U.S. 221 north of Marion, where



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sample collecting is allowed. Here the ~1-billion year-old Proterozoic Cranberry Gneiss, is thrust over dolomitic marble of the Cambrian Shady Dolomite within the Grandfather Mountain Window (above photo). In contrast to the Linville Falls fault, we will see faults and fractures associated with the Mills Gap fault zone (photo next page), a WNW-ENE trending, normal and oblique-normal brittle fault zone in metasedimentary rocks of the Ashe Metamorphic Suite. The brittle fault zone is interpreted to be a transtensional flower structure that is Mesozoic or younger in age. The NCGS recently identified the Mills Gap fault zone during detailed geologic mapping to support investigations by U.S. EPA and U.S. Geological Survey of the CTS Superfund Site in south Asheville.

Landslide stops will feature recent investigations into landslides by Appalachian Landslide Consultants, and work done by the NCGS for the landslide hazard maps of Buncombe County.



ALC will lead a stop at the site of a 600 foot long by 130 foot wide landslide in Asheville that has recently undergone a large-scale stabilization effort (bottom left). This landslide had been moving slowly for several years and began to accelerate at the beginning of 2013 due to an unusually wet season. A neighborhood immediately downslope of the landslide was threatened and work moved quickly to stabilize the slide with the construction of an upper soil nail wall and a lower soldier pile wall.

Time allowing we will do one or both of these stops:

We will also visit an active landslide along Highway 19 just east of Maggie Valley. This landslide has been encroaching on Hwy 19 for decades and has been a routine maintenance problem for NCDOT. Recent work by ALC has revealed that this landslide encompasses approximately 3 acres and is much larger than previously known. The upper portion of the slide is moving slower than the lower portion and at least 3 houses are being affected. The lower portion exemplifies active and newly forming scarps.

In the Pisgah National Forest near the N.C. Arboretum we will look at the deposits and landforms associated with November 1977 debris flows, and older (prehistoric?) debris deposits delineated in the landslide hazard maps for Buncombe County. Boulder trains, imbricated boulders, and disrupted drainage patterns characterize exposures of the 1977 deposits. Poorly sorted, matrix- to clast-supported bouldery deposits, and lobe- and stringer-shaped landforms readily identified in maps derived from LiDAR digital elevation models characterize debris deposits from past mass-wasting events.

About the field trip leaders:

Rick Wooten is the Senior Geologist for the Geohazards and Engineering Geology division at the North Carolina Geological Survey (NCGS) in the Asheville Regional Office. He has studied geologic landslide hazards and slope movement for nearly 30 years. Bart Cattanach, Senior Geologist, and Nick Bozdog, Geologist I, also work at the NCGS Asheville Office and support the Blue Ridge Province and Western Piedmont Mapping project. The responsibilities of these geologists are geologic mapping, geologic hazards mapping, including landslides, and mineral resources within the mountain region of North Carolina.

Stephen Fuemmeler is a project manager and part-owner of Appalachian Landslide Consultants, PLLC (ALC). ALC provides landslide hazard identification using geologic hazards mapping, modeling, and GIS services to assist and educate public and private property owners on how to identify potential hazard areas prior to property development.

MORE HAITI WELL SUPPLIES!

By: Dave Duncklee, Doug Rakoczy, and Rick Kolb

In the spring of 2011, the Carolinas Section of AEG and others combined donations to pay for shipment of well supplies, provided by section sponsor Geologic Exploration, to Haiti. The 2011 Spring edition of our section newsletter provided an overview of the work done in Haiti by Susan and Doug Rakoczy with Lifewater Haiti. Doug was formerly an environmental consultant with Duncklee & Dunham in Cary. You can access that newsletter on the section website, www.aegcarolinas.org; it provides a good summary of the wonderful work they are doing.



About a year ago, Doug and Susan contacted Dave Duncklee again for a request for more well supplies. Once again, Geologic Exploration provided the riser pipe and well screen for shipment to Florida, from which it would go to Haiti. The board of directors for the Carolinas Section of AEG approved a donation of \$700, which was combined with donations by geologists Dave Duncklee, Tom Dunham, and Tom Proctor that totaled almost \$2000 for shipping the supplies and to cover import duties. Our effort took significantly longer this time, but we have finally succeeded and the well supplies are on their way to Haiti. Below is the text of several emails from Doug that explain how we are helping Lifewater provide training and equipment so that Haitians can install wells and supply their own citizens with potable well water.

Hi Dave,

I had been meaning to write before but with school so busy I just hadn't had time. Now that school is over, I wanted to send a note to thank you, Tom, Rick, Tom P, Steve T., and everyone else involved in trying to get the screen and casing to Haiti. I know things haven't gone as smoothly as last time, but that is why Susan and I appreciate everyone's efforts even more. Believe me, that screen

and casing makes a BIG difference in the lives of many people.

It would be impossible to spend almost 3 years living in Haiti and not come away significantly changed by the experience. The level of poverty is hard to describe, and many people live without the basic necessities of life that we take for granted here in the US. The Lifewater people (and I mean all of the Haitians who work with us in the north of Haiti) work really hard each day to try and provide one basic necessity for life - clean water. Lack of clean water is a huge factor (probably the most important) in many health-related issues in third-world countries. When we first moved to Haiti, they were in the midst of a cholera outbreak that has since caused thousands of deaths. Cholera is easily treatable in this day and age, but you need to have access to clean water.

The drilling we're doing is wash/mud rotary drilling with drills that are not very powerful. Two of the drills do not have any hydraulics and so it takes a long time to get the drill rods out of the ground, and we have to use 5-foot rod lengths because there is no mast. One other drill does have a small mast but we can still only use 10-foot rods. It's hard to get the holes to stay open and get the wells set sometimes, especially if we're drilling to 100' or greater (which is often necessary to get a good well). That is why having the threaded casing is so important. It's quicker and less labor intensive to set the wells because the guys don't have to set 20-foot sections and glue them and wait for the glue to dry before they can put the next section on. It's also hard to set 20-feet of casing at a time, especially if you don't have a mast to lift up the casing. There are also times when it is hard to find 4"Sch 40 PVC. It's not like being in the US where you can always quickly find whatever you need.



Having the factory-cut screens is really important to the quality of the well. It's very time-consuming to have to use a saw to cut the slots by hand, it's not good for the structural integrity of the screen, and it's difficult to evenly space the slots so you can control the velocity of the water

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entering the well. There are a lot of issues with high turbidity and sediment in the well when you have to hand-cut the screens, even if you take your time and do everything correct when you're constructing the well.



The overwhelming majority of people Lifewater drills wells for (and we drill wells that MANY people use because we are drilling for communities, churches, and schools) do NOT have indoor plumbing or bathrooms or any kind of running water. They have to take their buckets or containers to the well and, using a hand-pump, get whatever water they need for all of their essential activities - drinking, cooking, washing, etc. They need to have good quality water because it is essential to their life, and having proper casing and screen goes a long way toward allowing them to have something that we in the United States and Canada take for granted because we can just go to the sink or bathroom and get all the clean water we need whenever we need it.

I know it has been really challenging to get the casing and screen into Haiti this time. Susan and I have come to understand that is the way it goes sometimes and you just do your best to keep trying. That is why we appreciate everyone's efforts even more. *Lavi se difisil anpil nan Haiti, li se yon peyi di* (Life is very difficult in Haiti, it is a hard country). But there are many wonderful, faithful, inspiring people who live there, and what all of you guys are doing does make a difference to them.

Can you please forward this e-mail to everyone involved and tell them thank you very much from not only Susan and I but also Hanania, Edrick, Homil, Rony, Feden, Richard, Marvin, Junior, Henel, Merlyn, and everyone at Lifewater Haiti. We appreciate your help so much.

Here is what Doug writes about the locations of the water-supply wells:

The work is done in the northern plain of Haiti around

Cap Haitien (the second largest city in Haiti, which is located on the northern coast, trending toward the northeast portion of Haiti). The lithology in the northern plain is sands grading into fine gravel with clay layers. There is an area from Plain du Nord down to Lory and Laggosett where there is a clay layer from about 75 or 80 feet that is up to 40 or 50 feet thick. If you get through that layer into the underlying sands we have had some flowing wells that produce up to 10 gallons a minute. You transition into the mountains pretty quickly if you get to far northwest, west, or south of the northern plain. The mountains are either volcanic rock or limestone. We obviously can't drill in rock with the drills we have.

We asked Doug if they could use a rig for drilling in rock. His response:

It would be expensive to get and operate a bigger drill that is capable of drilling in rock, and it would be hard to get to a lot of places because the roads are so bad (and in many places non-existent compared to what we consider to be roads). It would be expensive to purchase a bigger drill and very expensive to get it into Haiti. In the mountains people use cisterns or bio-sand filters (to treat whatever water they can find) or if they are lucky maybe someone comes in on rare occasions with a bigger drill and people have to walk a long way to get to a well. There are some springs in the mountains in some places. Water is a problem in the mountains.



Maybe you would like to do a small part and help support Lifewater's efforts to provide a safe water supply to Haitians. To make a donation, you can go to www.lifewater.ca -- this is Lifewater Canada's website; Doug and Susan worked with them. Lifewater Haiti is the Haiti operation of Lifewater Canada. Alternately, you can contact Susan at lifewater.haiti@yahoo.com or feel free to contact Dave Duncklee at dave@dunckleedunham.com if you would like to be included in our team that is going to begin preparing a third shipment of supplies to Haiti.

Announcing the 2014-2015 Richard H. Jahns Distinguished Lecturer



Eldon Gath has been named the 2014-2015 Richard H. Jahns Distinguished Lecturer in Applied Geology. The lectureship is awarded jointly by the [Environmental and Engineering Geology](#) Division (EEGD) of the Geological Society of America [GSA (awarded at the Vancouver, BC Annual Meet-

ing, October 2014)] and the Association of Environmental and Engineering Geologists [AEG (awarded at the Scottsdale Annual Meeting, September 2014)]. The purpose of the lectureship is to promote student awareness of Applied Geology. The Jahns' Lectureship has been jointly awarded annually since 1988.

Please consider helping Eldon to contact potentially interested University Geology (Environmental, Geological and Geotechnical Engineering) Departments and professional groups for the topic presentations noted below. (Abstracts are below and available online via AEG & GSA or from Eldon.)

Please contact Eldon (gath@earthconsultants.com or 714-412-2653) to discuss a presentation for your organization.

Biography

Eldon, a consulting engineering geologist, has more than 30 years of experience in the identification, investigation, and remediation of geologic hazards, involving land use planning, environmental assessments, field exploration programs, and presentation of findings. He has particular experience with the evaluation of active faults for construction site planning, the development of seismic safety programs and policies, and is currently engaged in efforts to modernize California's 40-year old active fault zoning act (Alquist-Priolo Earthquake Fault Zoning Act).

Eldon is the President of Earth Consultants International, a geological consulting firm [*helping our clients solve complex earth-science problems around the world*] that he co-founded in 1997, following 12 years with Leighton Consulting in southern California. He has considerable international experience including field projects in Turkey, Panama, Mexico, Costa Rica and Papua New Guinea, as well as project involvement in many others.

Eldon is a graduate of the University of Minnesota, Insti-

tute of Technology, with a BS degree in Geology in 1978. He has been in graduate school ever since; MS program at Cal State LA (1982-1990), PhD program at UC Riverside (1993-1996), PhD program at UC Irvine (1998-2008), but despite getting very close, he has never managed to complete the degree due to his busy consulting responsibilities, professional organization involvement, and travel schedules; or conflicted priorities, if you ask his advisors.

Eldon has received several research grants from the U.S. Geological Survey's National Earthquake Hazard Research Program, the Southern California Earthquake Center, and the National Science Foundation for earthquake geology research in California, including paleoseismology of the Whittier fault, tectonic development of the San Joaquin Hills, tectonic geomorphology of the Eastern Los Angeles Basin, and the seismic hazards of the Santa Ana Mountains. He served as the geosciences member on a National Research Council panel to develop the research agenda for the NEES program, he served on the LA County Land Development Technical Advisory Committee for a decade, served on the California Board for Engineering, Land Surveyors and Geologists' Technical Advisory Committee for two years, and has participated multiple times as an Occupational Expert for the US Department of Labor.

Eldon is a frequently invited speaker to local southern California colleges. Since his first professional presentation on the Whittier fault at AGU in 1987, he has given over one hundred presentations before professional, academic, and public groups, and has published dozens of papers on a wide range of geological and professional practice topics, several of which have received awards for outstanding presentations and papers.

In 1995 he was awarded the Aki Award for Outstanding Paper Presentation at the California Academy of Sciences Annual Meeting for *Active tectonic structures in the eastern Los Angeles basin*, then in 2007 received the Outstanding Presentation Award at the AAPG Annual Meeting for *Quaternary geomorphic development and seismic hazards of Orange County, California*. Along with coauthors, he has received the 2010 GSA E.B. Burwell Outstanding Paper Award for *The Geology of Los Angeles*, and the 2012

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AEG Claire P. Holdredge Outstanding Paper Award for *Paleoseismology of the Pedro Miguel fault, Panama Canal*. He served as South Coast Geological Society (SCGS) President in 1987, AEG Southern California Section Chair from 1990-1992, AEG Treasurer, Vice President, and President from 1993-1997, received the AEG Floyd T. Johnston Service Award in 2008, was elected a Fellow by GSA in 2011, and was made an Honorary Member of the SCGS in 2012. He is a member of AEG, GSA, AIPG, AAPG, EERI, IAEG, IAPG, AAAS, AGU, SSA, PDAC, and all local geological societies.

Abstracts:

Eldon is offering a broad range of talks, including several that focus on the process and methodology of the work that would be suitable to a classroom presentation, as well as several results-oriented science talks that would be good for a graduate symposium. All talks are aimed for 45 minutes, though questions and discussions can go on forever if interest remains and schedules permit. The talks offered are:

The Santa Ana Mountains: Indenter Tectonics and the Earthquake Hazards of "The OC"

This talk explains the tectonic geomorphic evolution of Orange County in Southern California over the past one million years. The talk is an analysis of the modern seismic hazards and causal mechanisms for the recent earthquakes, and proposes a new collisional indenter model to explain the interaction of strike-slip and thrust faults in the eastern Los Angeles Basin. The talk concludes with a question as to how the implications for broadly distributed ground deformation, predicted by this model, will affect landuse planning, and how and what engineering geologists will need to do address this issue.

Tectonic Geomorphic and Paleoseismic Investigations for the Panama Canal

This talk summarizes five years of geological exploration

in Panama to quantify the fault hazards to the Panama Canal and the Canal Expansion Project, using tectonic geomorphic mapping and analysis, paleoseismic trenching, and seismic hazard analysis. Faults that were investigated include the Gatún, Limón, Azota, Pedro Miguel, Miraflores, and Agua Blanca. The talk will illustrate techniques of field reconnaissance, trench site selection, 3-D trenching of strike slip faults, and how to assemble into a seismic hazard model. If extra time is available, an overview of the Panama Canal and the Canal Expansion Project can also be presented.

Quantitative Kinematic Investigation of the AD 1621 Pedro Miguel Fault Rupture for Design of the Panama Canal's Borinquen Dam

This talk focuses on a detailed analysis of the AD 1621 Panama Viejo earthquake, how the source fault was identified using archeoseismology along the Camino de Cruces (Spanish trail), and how several quantitative 3-D paleoseismic trenching studies of the Pedro Miguel fault were used to quantify the coseismic displacement kinematics of that earthquake for design of a major Canal expansion project dam across the fault. The talk presents a successful case study of the use of tectonic geomorphology, paleoseismology and archeology to advance the awareness of earthquake risk for a globally important infrastructure project – the Panama Canal. Portions of the talk are based upon the paper: Rockwell, T., E. Gath, T. Gonzalez, C. Madden, D. Verdugo, C. Lippencott, T. Dawson, L.A. Owen, M. Fuchs, A. Cadena, P. Williams, E. Weldon, and P. Franceschi, 2010, Neotectonics and Paleoseismology of the Limón and Pedro Miguel faults in Panamá: Earthquake Hazard to the Panama Canal; Bulletin of the Seismological Society of America, Vol. 100, No. 6, pp. 3097-3129, doi: 10.1785/0120090342. [Received the 2012 Claire P. Holdredge Award from the Association of Engineering Geologists for a publication that is judged to be an outstanding contribution to the Engineering Geology profession.]

Active Faulting and Beverly Hills High School: An Unexpected Journey into Geo-Ethics

This talk is oriented towards the ethics of hazard disclosure, using the case of an "Active Fault Map" that was recently released by a public agency, and which showed multiple active faults through Beverly Hills High School, plus numerous other high rise buildings in the Century

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City area of western Los Angeles. The High School immediately undertook a comprehensive fault hazard investigation; the methodology and findings of which are detailed in this talk. How this public release was handled, and the on-going consequences of its release, are the core of the talk. But when it is shown that none of the "active faults" were actually observed in making the map, and that none have yet been found in the flurry of geological investigations the map triggered, is when the real ethical questions start.

Natural Hazard Identification, Impact Analysis, and Risk Assessment for Community Disaster Mitigation Planning

This talk presents the methodology of hazard map preparation for use by city and county governments for land use planning, hazard mitigation, and loss prevention. Examples will be shown for several southern California cities and counties, including active fault and seismicity, landslide and slope instability, flooding, wildfire, liquefaction, tsunami, and other types of hazard maps. These maps provide the foundation for all public Safety Elements in California and for Disaster Mitigation Plans nationwide. Illustrating the hazard, communicating how hazard becomes risk, and helping our communities mitigate that risk is a critical skill set for engineering geologists to develop.

Engineering Geology: An Overview of the Profession

This talk presents an overview of the broad scope of the engineering geology profession, based on my personal experience from 35 years as a consulting engineering geologist working in Turkey, Portugal, Costa Rica, Mexico, Papua New Guinea, Panama, the western US, and more to come. Note that I have never worked in a large company or in government, but have frequently worked for them, [and I do not do hazardous waste], so my paradigms are based on only a modest sample set of the various career opportunities out there. But it has been a fun career so far. This talk is fast, shallow, and opinionated – suitable for an informal [think pizza] setting of students interested in what types of projects and jobs are out there, what I think is important academically, how to get in front of the hiring bus, and just an opportunity to talk and answer questions.



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GEORAMBLINGS

By Charles W. Welby

The other evening at home I happened to pick up a book of songs that long ago entered into my family as music to be played on a piano beyond the “A,B – C,D” stage. For several of the songs water is an essential element in the thoughts expressed by the words and actually by the music itself. Many of us have sung at some time or another during the course of our lives “Clementine,” or “My Bonnie” (she lies over the ocean), “Sweet Afton,” “Anchors Aweigh,” and others.

One perhaps less well known is “The Old Oaken Bucket.” The essence of the words lies in describing how refreshing the water is which is withdrawn from the well in the Old Oaken Bucket, the moss-covered bucket. The words, “moss-covered” immediately brings to mind issues of water quality and whether or not the water coming from what must be a dug well might or might not be the “purest” in quality. Or does the presence of the moss imply that the water is potable. How often does one find moss growing around a hillside spring? And do we assume from the presence of the moss that the water is safe to drink?

I would suppose that if a salamander family was around the spring, and perhaps there were individual salamanders in a small pool fed by the spring that the water is potable.

Moving in thought on from springs to the other side of the “coin,” *i.e.* droughts, and how they affect peoples of the world, we know from history that droughts have come and gone with their deleterious effects upon the populace. Today in the U.S. as well as elsewhere we rely upon dams on rivers to control the availability of water to places nearby as well as great distances, of continental dimensions, away from the dam or dams. Think the Colorado River and Hoover Dam and the Los Angeles basin.

With variations in climatic factors the water accumulated behind a dam may shrink in volume, and planned upon water supplies become non-existent. Or as is the case in North Carolina in one instance at least, a dam and its resulting lake was “pitched” as a flood control mechanism, but almost immediately after the basin had filled the lake became a “water supply” lake. Predictable water quality issues have come to the fore.

The effects of drought eventually catch up with us. A good example is the Falls Lake which supplies water to Raleigh and environs. A period of lesser rainfall leads to less water behind the dam and a resultant need to limit the use of water in the areas supplied by the water from the Falls Lake. In a way, one can envision the volume of water in a lake like a bank account: “Money in and

money out and keep a positive balance.”

One can turn to the development and existence of the drought in the 1930s. It led to catastrophic conditions in the Midwest of the U.S. with failure of crops, much soil erosion. It also provided the opportunity for some interesting literature, Steinbeck’s “Grapes of Wrath.” We have had periods of drought in the Carolinas, and newspaper stories of the past describe the effects upon the corn and tobacco crops of our region.

Today in the U.S. droughts are reported in California. The effects upon that “breadbasket” of the U.S. are not yet totally assessed. Certainly the current forest fires are aided by the lack of moisture. The fact that Folsom Lake in Northern California is nearly empty, only emphasizes the problems which face us food-wise, culture-wise, habitation-wise, and country club swimming pool-wise.

For those of you who have had an opportunity to fly into Las Vegas from the east, you have had the opportunity to observe the “bathtub ring” on Lake Meade which records the lower volume of water available from that reservoir and the fact that a dry period is upon us.

As happens every once in a while, I took a trip last February to the southern end of the San Joaquin Valley. Driving from the Los Angeles Basin across the Transverse ranges into the “Valley,” I was struck by the lack of green grass on the slopes on either side of I-5 along with the absence of traditional wild flowers (lupines and California poppies) that in the past have coated the rounded slopes and the inter-range valleys at that time of the year. In fact, historically there was a time when tours were organized in the Los Angeles area whose purpose was the observation of the wild flowers in the southwestern corner of the San Joaquin Valley and along the “Ridge Route.”

So climate variations to the wetter and drier sides of some mean are with us as they have been in the past, and the matter of water supply becomes a difficult, political, economic and environmental matrix of decisions.

(Continued on page 13)



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(Continued from page 12)

As an acquaintance of long ago in a comment about water supply on eastern Long Island and the on-going lowering of the artesian head in the deep aquifer in association with the growing population observed, “Maybe we should take fewer baths.”

I ran across a “Teen Age” novel a year or so ago in which the book focuses on a drought and the availability of water in a pond on the central character’s property. The opening pages of the book describe the existence of a drought in the country together with the owner of a small pond at the base of a hill just below where her house is situated. The owner of the pond and the house sits watching the pond for intruders, two-legged or four-legged, who to take water from the pond or simply to have a drink. She is equipped with a high powered rifle with a telescopic lens to be used on the intruder headed for the pond. Since I have not finished reading the book, I cannot tell you the “whole story.” But the opening pages perhaps emphasize what Mark Twain is reportedly to have written or said, “Whiskey is for Drinking, Water is for fighting.” (A bit of an aside, if you ever get a chance to visit Hartford, CT, a trip to Mark Twain’s home is well worth the visit.) I would suspect that there will be some “fights” over water in the coming years as we see the coming and going of drought conditions. We should have learned lessons about water and populations from those areas that are overpopulated with respect to the available water.

QED

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.

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AEG CAROLINAS SECTION BOARD MEETING AGENDA

By Susan Kelly

Call to Order

Roll Call – Determination of Quorum

Carolinas Section Finances – Briget, Rick, and Alex
Review of section treasurer’s report

Discussion on VI Conference finances and coordination
with national

Discussion of changes in national reporting of financials

Asheville Section meeting

Designate meeting organizer

Discuss potential speakers for Asheville and future meet-
ings

Do we want to stick with Friday night instead of a Thurs-
day meeting?

2014-2015 Jahns Lecture Tour

Eldon Gath has been named the 2014-2015 Jahns Distin-
guished Lecturer

Do we want to schedule him for the spring again?

Which topic would be good for our section meeting

Social Committee –Adam

Any updates?

Any ideas from board members?

Sponsorship Update – Rick

Section Field Trip Chair – Sue

Update on summer field trip in Asheville

Any leads on future field trips?

Update on membership renewals – Eric

Newsletter – Jennifer Thomas

Do you have everything you need for the summer issue?

Fall Board Elections

With Briget stepping down from the Treasurer position,
we’ll have one seat to fill.

I would like Susan K. to move into the Treasurer position.
Any volunteers or suggestions for Secretary?

Mid-year Board Meeting Recap– April 25 – 27, Golden/
Denver, CO

Review Secretary’s BOD Midyear Meeting Report Sum-
mary

(Continued on page 14)

(Continued from page 13)

"Engineering Geology" in North Carolina

Currently against the law to use this term for marketing of services in NC without a PE

Many geologist would like to see an exemption in the law for "Engineering Geology" as a subset of Geology

This may be accomplished by modifying NC General Statute § 89C-25 to add an exemption for the use of the term "Engineering Geology."

The California regulations state: "Engineering Geology" means the application of geologic data, principles and interpretation so that geologic factors affecting planning, design, construction and maintenance of civil engineering works are properly recognized and utilized.

Communication and Social Media

Review current avenues of communication for our section
Is there still a need to maintain the AEG Blog on our section website?

Discuss our Section LinkedIn Group page

I propose our Section Secretary spearhead the efforts of Social Media communication, especially Facebook and LinkedIn.

Use of profits from the recent VI conference

Donation opportunities to AEG National - one-time donation to the Treasurers Reserve. The AEG Foundation would be another option.

Scholarship fund – Should we establish the Carolinas Fund through the AEG Foundation?

Discuss details and challenges, including: who would be eligible, would it be limited geographically, what would the funds be for, etc.

Other thoughts?

NC Science Teachers Association Conference and Awards

Outstanding Teacher (OEST) and Educator (OESE) awards have been funded in the past at \$250 each

Earth Science kits have been funded for years (~\$3000)

Randy Bechtel has requested \$1000 to secure an Earth Science Presentation Room at the NCSTA Conference that would be organized and schedule by Randy. This would allow geoscience education sessions to be scheduled in order and it would negate conflicts of multiple geoscience sessions being held all at once. There would also be AEG signage acknowledging sponsorship and I am sure we there would be a place for promotional materials. There is also the possibility of local radio coverage through a science program managed by the SciWorks Museum. This room would also be a place where the Carolinas Section could have a direct connection to the teachers through promotional material and other forms of communication that we suggest. The AEG room would also be promoted in the conference guide and AEG acknowledged as a generous sponsor.



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BRACING FOR POSITIVE CHANGE

By Dale Andrews, 2013-2014 National AEG Secretary

This Board of Directors' (BOD) meeting, like several of the recent past meetings, focused heavily on AEG's Needs Assessment. However, what made this meeting different was that after nearly two years of working to identify how we can make AEG an even better organization, this meeting provided an opportunity to showcase the developed plans that will take us there.

The Needs Assessment study identified four broad areas where AEG could improve: Communications, Member Benefits, Resource Alignment, and Governance Structure. Last September, four focus group committees were formed to develop strategies to address each of these areas respectively. A workshop, led by **Duane Kreuger**, provided an opportunity for each of the focus group committees to present their recommendations to the BOD. I will summarize each committee's strategy below.

Communications: Broadly speaking, communications includes any form of communication used by AEG to transfer or share information. **Nate Saraceno** presented this focus group's recommendations to the BOD. Suggested actions included:

- Establish a social media plan to coordinate and disseminate information in a more consistent manner and encourage members to follow AEG on Facebook, Twitter, LinkedIn, Google+ and YouTube;
- Review the technology (software, applications, etc.) that we currently use to manage our files and digital publications to improve efficiency, flexibility, and potentially lower costs.
- Survey our existing publications with our readers, specifically the new *Insider*, to determine if they are meeting our members' expectations.
- Gather and digitize all the past field trip guide books that have been developed over the years for member use.
- Grow our Communications Committee to support the implementation of the above recommendations.

Member Benefits: This focus group recognized that our Association's committees are the predominate means by which we provide unique services to our members. Our committees are why we are able to put on national sponsored meetings, keep our website and publications relevant and strategize for our Association's future; they provide an opportunity for our student members, working members and retired members to work collectively towards shared goals; quite simply, they are the life blood of the Association.

Duane Kreuger outlined recommendations to the BOD that would allow our committees to perform more efficiently and with less volunteer burnout. Committees that had overlapping responsibilities were combined, committees that require constant attention (e.g., website, advertising) are going to be contracted out and have Executive Council oversight. The focus group also identified the importance of reinvigorating two committees that would directly benefit

our members. The first is a continuing education committee that will work to seek out, develop and support activities that provide opportunities for our members to acquire continued education. The second, a committee dedicated to membership growth and retention by facilitating exit surveys with members that decide not to renew, facilitating membership drives and thanking the employers that encourage association involvement of their employees.

Resource Alignment: This committee focused on the need to redevelop AEG resource uses with regard to committees and committee structure/duties; and effective realignment of volunteer/committee, staff and financial resource to match capacity. As a first step, the committee evaluated resources and services to ensure proper alignment; identified critical programs requiring additional as well as existing services that should be eliminated; and developed a system and procedure for successful committee and staff operations.

Moving forward, the primary request of this focus area is to evaluate our Association needs as they relate to our existing vendors/contractors to help facilitate the upcoming workshop and assist with providing a clear summary of our vendors roles and costs to the Board as they requested. **Patty Bryan** outlined each of the contracts and committees that we have in place today, and identified their charter. The focus area was not ready to submit a strategy at this meeting, but intends to at the Annual BOD meeting this fall. This information will be very useful for the BOD at that time because the BOD is planning to dedicate time at Annual BOD meeting to revisit all of our current large contracts, outline the services each are providing, assess the value AEG is receiving from them, determine what is working and what is not working, and potentially move into the future with revised contracts for our exiting vendors or new contracts with new vendors. The goal of this effort is to maximize the level of service, member satisfaction, and benefit-to-cost ratio as we move into 2015 and beyond.

Governance Structure: This focus group was tasked with the following: 1) determine if changing how our Association operates would result in more engaged Directors; and 2) determine if changing how our Association governs would provide better opportunities for members that do not reside near their Section's activities... and the answer to both was YES!

Dale Andrews and **Dave Bieber** outlined the recommendations from the Needs Assessment and the options that had been vetted through their focus area committee. From this, the BOD discussed, voted and passed several impactful changes that, with member approval, will significantly impact how AEG is governed. The changes outlined below are dependent on amending a sentence in AEG constitution and any change to the constitution requires membership consent by vote. So, this year, along with the Executive Council ballot, all Full Members can expect to have the opportunity to vote to accept or reject the BOD proposed constitutional amendment. The changes endorsed by the BOD, and to be further vetted by a newly formed Governance Structure Ad-hoc Committee, are:

- Direct the membership to vote on a constitutional amendment that would separate the election and duties of the Section chairperson and Association Director. As written today, one person fills the two positions simultaneously. The intent is to be able to fill the very different positions with people that are excited and dedicated to each specific role. However, this change would not preclude the possibility of someone from being elected for both positions simultaneously.

- Assuming passage of the amendment, the BOD directed that they be provided bylaw revisions at the fall meeting for them to vote on that would reduce the number of Directors from thirty (30) to fifteen (15). These Directors would be nominated and elected from within the geographic region they reside. A smaller BOD will help ensure a more engaged and nimble Board. Also, the justification for a smaller Board is that the BOD voted to make the Director position a three year term, as opposed to the one or two year terms that most Directors are elected to today. An added responsibility of regionally elected Directors will be adequately communicating with each of the local Boards within their region and to act as a liaison between all local (within their region) and national activities.
- Assuming passage of the amendment and allowing an opportunity for members to weigh in, the Board will have to adopt a model that separates the United States into ten (10) distinct regions that will act as the new boundaries from which Directors will be individually nominated and elected. Currently, AEG is made up of twenty-five (25) Sections for this purpose. This reduction in number will likely impact how our Sections are defined today, but are not expected to have any impact on local activities.
- The last change is dependent on the BOD voting, likely this fall, on how Section Dues will be distributed under the new ten region model. Once the finance piece is worked out, the BOD voted to revise the way that Chapters (not Student Chapters) can form. Today, they are dependent on their Section to provide them a portion of the Section dues and they are not guaranteed the opportunity to have a voice regarding national level decisions. Under the new region model, the BOD voted to remove differences that exist today between our Chapters and Sections and allow them to not only operate the same, but have the same title. The consensus seemed to be that under the new model we refer to all local entities as Chapters and eliminate the term Section, but this was not voted on.

Another result of the Needs Assessment was the confirmation that our conferences and field trips are two of our Association's greatest strengths. As such, the BOD discussed a 5-year plan attempting to put on two Shlemon Specialty Conferences per year beginning in 2015 and these typically include an amazing field trip.

As I hope you can see, AEG is has taken a hard look at itself and, as a result of this meeting, has begun setting the course for very positive change. As such, you can expect a more detailed explanation and justification for the proposed changes this summer. Lastly, speaking for all of us on the Executive Council, we want to say **THANK YOU** to each of you that have dedicated yourselves to exploring, vetting, and presenting changes that will allow AEG to better serve its members and the profession.

The Piedmont and Mountain Aquifer Compartment

by Harry LeGrand

Ground-water conditions are easier to analyze
If we first outline a compartment as to size
A compartment is a distinctive topographic space
Among similar ones on the ground we can trace.

It is the aquifer system lying beneath a hilltop and creek
It may be further bounded by small lateral spurs that peak.
Compartments represent slopes and gentle topographic
lows

Into which local insulated ground water gathers and flows.

Not naturally affected by adjoining compartments,
Each has its own distinctive but similar departments.
Thus, there are thousands of mini-aquifers in each county
Some similarities of each can represent a study bounty.

Knowledge of general factors of a compartment to a degree
Offers transfer knowledge to other compartments, we see
We should not collect data about a compartment uselessly
If our generalized model shows equivalent information
readily.

Time for a Brewpub Social!

Boylan Bridge Brewpub
201 South Boylan Avenue, Raleigh
Thursday, July 17, 2014
5:30-7:30 PM

Summer is here, no section meetings are planned, and it's hot outside, so the time is right for an informal get-together of geologists at the picnic tables of Boylan Bridge Brewpub. It's a long lull between the spring meeting last March and the next meeting in September, so let's get some AEG members and section sponsors together for a few beers on a Thursday evening. We'll even invite non-members and geology majors who are still in the Triangle for the summer, and see if we can persuade them to join AEG. And feel free to bring your non-geology friends/spouses/SO's so they can see what geologists do in their free time (besides talk about disaster projects). As with previous brewpub socials, this is strictly a social event. There will be no admission charge, no speakers, and no dinners (unless you decide to buy your own); just lots of conversation in an informal atmosphere. Shorts might not be a bad idea, seeing that the patio faces west and it is summer. But then the beer should serve its function of keeping you cool and hydrated.

There is no need to RSVP, but if you would like to, send an email to section social chair Adam Phillips at aphillips@prismlabs.com or Rick Kolb at rick.kolb1@gmail.com. Look for the AEG logos that we'll post near our table so y'all know where to gather.

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EDUCATION SECTION

NC STATE STUDENT CHAPTER NEWS

By Kevin Barnes, NC State AEG Student Chapter President

The 2013-14 school year has been a busy one for the NCSU Geology Club. Under the helm of the club president, Kevin Barnes, the club has seen its fair share of new members, club socials, and volunteer events. The club has helped out several organizations over the course of the year, volunteering at events like AEG's Vapor Intrusion: The Conference in January and the Oconeechee Council Merit Badge College in March. The 2014-15 school year promises to be just as exciting as Gardner Pierson steps into the role of club president. He will be joined by Daniel McGimsey, who will be continuing to serve as vice president, and Katie Sapko, who will be taking over as secretary.'

UNC CHARLOTTE STUDENT CHAPTER NEWS

By Alisa Kotash, UNCC AEG Student

The Geology and Earth Sciences Organization (GEO) at UNC Charlotte is an advocate for the geosciences and promotes principles of professional responsibility and public service. During the 2014 spring semester, GEO club participated in the annual Student Club Showcase to advertise the club's contribution to the sciences and also to the Charlotte community. New officers were elected in April, specifically Alisa Kotash as President, Melissa Sybert as Vice-President, and Blake Simpson as Treasurer. The GEO club continues to grow with over 23 active members currently.

In mid-April, two local middle school students contacted the GEO club asking for some assistance in identifying minerals and rocks for the upcoming North Carolina Sci-

ence Olympiads. The two students met weekly with the President of GEO, Alisa Kotash, and prepped for the competition that was held in Florida later that month. Overall the students did great at the Olympiads and moved on to Nationals. For future competitions, the GEO club will be in close correspondence with the middle school to prep for next year's Science Olympiads.



During the first week of June, several GEO members headed out to Morrow Mountain State Park to canoe, go hiking, and camp for the night. The trip was a success and future adventures are on the horizon for the GEO club.

Along with GEO club, the department of Earth Sciences at UNC Charlotte also developed a Sigma Gamma Epsilon chapter. The Society of Sigma Gamma Epsilon (SGE) was established in 1915 to recognize scholarship and professionalism in the Earth Sciences and is an associated society of the Geological Society of America. Nearly 200 chapters throughout the United States have been inaugurated and are run by student members. Qualification for membership into this prestigious honors society includes having completed at least 10 semester hours in Earth Science courses and has maintained a minimum 3.0 G.P.A. (on a 4.0 system) in all Earth Science courses together with an overall

(Continued on page 20)

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EDUCATION SECTION

(Continued from page 19)

G.P.A. of 2.67 in all college courses. There are currently 12 active members in the chapter at UNC Charlotte. The chapter's student government was elected in April with Alisa Kotash as President, Melissa Sybert as Vice President, and Victoria Kingsley as Secretary-Treasurer. The SGE chapter of UNC Charlotte is dedicated to unite scholarly members of the Earth Sciences to enhance and support the further understanding of the earth and the environment. This chapter provides a place for Earth Science individuals to meet and discuss current global concerns as well as assist in finding employment in related geoscience fields.



EDUCATION SECTION

EDUCATION NEWS FROM THE NORTH CAROLINA GEOLOGICAL SURVEY

*By Randy Bechtel, North Carolina
Geological Survey*

The 2014 National Science Teachers Association Conference will be in Winston-Salem at the Benton Convention Center November 6-7, 2014. www.ncsta.org

The Outstanding Earth Teacher and Educator awards will be presented the evening of November 6. The NC Aggregates Associations will be hosting the Rock Give-Away.

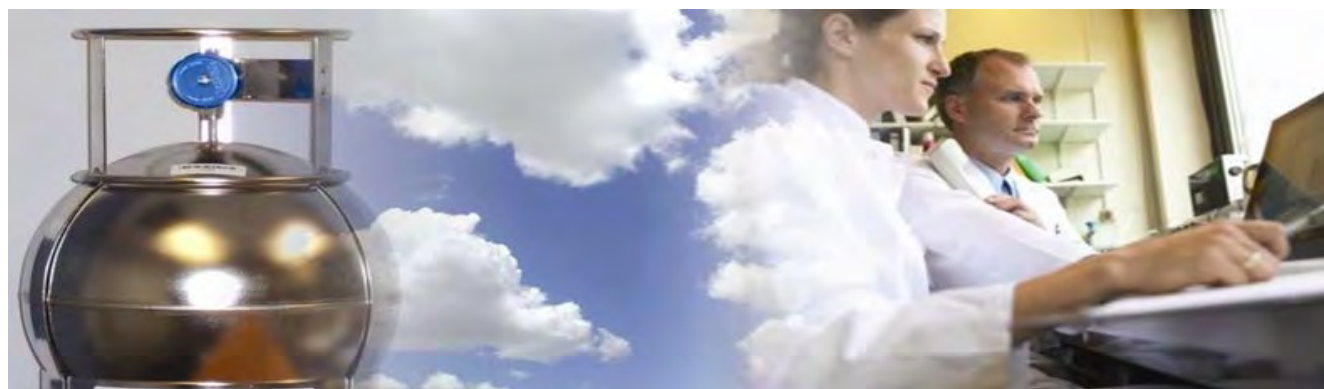
2013-2014 VISITING PROFESSIONAL PRESENTATIONS

By Rick Kolb, Section Student Liaison

Geologists from the Carolinas Section and a few non-members made presentations on geology careers during the past academic year. These presentations provide students an overview by practicing professionals of what jobs are out there in the consulting world and public sector. We thank this year's presenters for volunteering their time to educate students of geology on career opportunities, and especially those that presented for the first time. Without volunteers, these presentations would not be possible. The on the following page summarizes our visits for the past academic year.

East Carolina was the largest and most enthusiastic group of students to which we presented. Many of the students stayed after our presentations to ask the presenters questions. Typically we see a few after presentations, but we had a large group at ECI.

(Continued on page 22)



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EDUCATION SECTION

Visiting Professional Presentations

School	Presenters
East Carolina University	Lee Stone, Rosemarie Ballance, Brad Worley, Rick Kolb
North Carolina State University	Hank Lyon, Kenneth Taylor, Brad Worley, Rick Kolb
UNC-Charlotte	Brandy Costner, Greg Icenhour, Rick Kolb
UNC-Chapel Hill	Christine Bruinsma, Kenneth Taylor, Paul Weaver, Rick Kolb
Wake Technical Community College	Eric Cross, Brian Smith, Rick Kolb
Western Carolina University	Susan Kelly, Brett Laverty, Rick Wooten

(Continued from page 21)

Typically we have conducted these presentations during the spring semester. This year, Southeast GSA was in Blacksburg, and several schools that we usually visit were unable to accommodate us due to conflicts with SE GSA and other events. We expect to return to the schools we skipped this year: East Tennessee State University, UNC-Wilmington, and Furman University.

Rick Wooten of the North Carolina Geological Survey also presented at Clemson University but it was not exactly a Visiting Professional presentation. However, we now have contacts there, and expect to begin making regulatory presentations at Clemson starting next fall.

Our student/faculty audiences range in size from a handful at the smaller schools to 50 at the larger schools. As we've done in the past, we bought pizzas and soft drinks to kick off our presentations, which generally started on Thursday afternoon between 5:00 and 6:00, and we finished before 8:00. It is common for several students to stay behind and ask questions one-on-one to the presenters. Partly as a result of our visits to these schools, the Carolinas Section now has a healthy contingent of student members, many of which attend our section meetings. Through the generous support of our section's sponsors, we can bring the pizzas and soft drinks to these presenta-

tions, and pay for dinners of student members at our section meetings. Section meetings provide an invaluable experience for students to network with practicing professionals.

Are you interested in interacting with the future geology professionals? It is a lot of fun and very informal. We invite and encourage you to participate in our presentations to colleges, especially your alma mater. Contact Rick Kolb at rick.kolb1@gmail.com if you are interested in participating in this program.



Mark Lassiter, P.G.
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Social Event Outing

*The Carolinas Section of the
Association of Environmental & Engineering Geologists*

Durham Bulls vs. Norfolk Tide

Social Outing: 5:30PM - "Whenever" (Game time is 7:05)

Thursday, August 21, 2014

Tobacco Road Sports Café

Overlooking the Durham Bulls Athletic Park (DBAP)

Durham, North Carolina

<http://www.tobaccoroadsportscafe.com/about/index.html>



Cost is FREE (but food and drinks not included)

Please make reservations with Adam Phillips by 5:00 PM on Monday, August 18,
2014.email: aphillips@prismlabs.com

ANNOUNCEMENTS

Young Professional Travel Grant

A \$500 travel grant to help defer the cost of attending the next AEG Annual Meeting will be awarded to at most two qualified professionals under 35 whose employers cannot support their attendance. A flyer with more information is included on page 25.

Groundwater Professionals of North Carolina Meeting and Annual Golf Tournament July 10-11, 2014

The GWP golf tournament will be held at the Hampton Inn & Suites, Pinehurst/Southern Pines. The meeting will be held the evening of Thursday, July 10 with the golf tourney on the following day. A flyer with more information is included on page 27.

New Membership Chair

AEG Carolinas Section is pleased to welcome Eric Cross of Pyramid Environmental and Engineering as our new Membership Chair. Please contact him at eric@pyramidenvironmental.com with questions regarding AEG membership.



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- Multiple Sampling Ports
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CALENDAR OF EVENTS - 2014

Geological Events in the Carolinas

Courtesy of AEG Carolinas Section – www.aegcarolinas.org. Last updated June 16, 2014

Send updates/corrections to Rick Kolb, Duncklee & Dunham, rick.kolb1@gmail.com

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

Date: Tuesday, July 1, 2014 (meetings are held on the first Tuesday of the month)

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 300; Raleigh

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

Date: Thursday, July 10, 2014

Event: Summer Meeting, Ground Water Professionals of North Carolina

Speaker: Vance Johnson, NCDENR UST Trust Fund

Cost: Cost \$25, includes appetizers and two drink tickets

Location: Hampton Inn & Suites, 200 Columbus Drive, Aberdeen

Details: 5:30 social, 7:00 dinner, 8:00 presentation

Contact/RSVP: Mike Stanforth, mstanforth@excelengr.com

Date: Friday, July 11, 2014

Event: Ground Water Professionals of North Carolina Annual Golf Tournament

Cost: Cost \$50, includes golf and lunch

Location: Legacy Golf Club, 12615 U.S. 15, Aberdeen

Details: Shotgun start, time TBD

Contact/RSVP: Haynes Campbell, hcampbell@esclabsciences.com

Date: Thursday, July 17, 2014

Event: Brewpub social – all are welcome to “a section meeting without the dinner and speaker”

Location: On the picnic tables at Boylan Bridge Brewpub, 5:30-7:30 PM, 201 S. Boylan Avenue, Raleigh

Contact: Adam Phillips, section Social Chair at aphillips@prismlabs.net or Rick Kolb at rick.kolb1@gmail.com

Date: Thursday, July 17, 2014 (meetings are held on the third Thursday of the month)

Event: Meeting of South Carolina Association of Environmental Professionals

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

Location: 6:30-8:00 at Edens Real Estate, 1221 Main Street, Suite 1000 in Columbia, South Carolina

Contact: Chuck Clymer at (803) 212-0054 or cclymer@terracon.com

Date: Tuesday, August 5, 2014 (meetings are held on the first Tuesday of the month)

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 300; Raleigh

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

Date: Tuesday, August 12, 2014

Event: Quarterly meeting of the North Carolina Board for the Licensing of Geologists

Location: Starts at 9:00 AM at Upton Associates, 3733 Benson Dr. in Raleigh; morning session open to the public

Contact: ncblg@bellsouth.net

Date: Thursday, August 21, 2014

Event: Section Social Outing, Durham Bulls vs. Norfolk Tide

Location: Tobacco Road Sports Café, overlooking the Durham Bulls Athletic Park, social starts at 5:30, game at 7:05 PM

RSVP: Adam Phillips, section Social Chair – aphillips@prismlabs.net

(Continued on page 27)

(Continued from page 26)

Date: Thursday, August 21, 2014
(meetings are held on the third Thursday of the month)

Event: Meeting of South Carolina Association of Environmental Professionals

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

Location: 6:30-8:00 at Edens Real Estate, 1221 Main Street, Suite 1000 in Columbia, South Carolina

Contact: Chuck Clymer at (803) 212-0054 or crcllymer@terracon.com

Date: Tuesday, September 2, 2014
(meetings are held on the first Tuesday of the month)

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 300; Raleigh

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

Date: Friday, September 5, 2014

Event: AEG Carolinas Section summer meeting held jointly with ASCE Western Branch

Speaker: Steve Fuemmeler, Appalachian Landslide Consultants; Will Gentry, Gentry Geotechnical Engineering; and Chris Young, AEI Consultants

Talk: Piney Mountain Landslide – A Team Perspective (one on the stops on Saturday's field trip)

Location: Asiana Grand Buffet, 1968 Hendersonville Road, Asheville

Cost: \$25 for members, \$30 for non-members, **FREE for students**



Chris Schappell
Branch Manager

P.O. Box 5621
Aiken, South Carolina 29804
Phone: 803.230.7992

Email: jcs@terrasonicinternational.com
www.terrasonicinternational.com

Details: 5:30-7:00 social, 7:00-8:00 buffet dinner, 8:00-9:00 presentation

Contact/RSVP: Susan Kelly, susan.kelly@amec.com

Date: Saturday, September 6, 2014

Event: AEG Carolinas Section field trip

Topic: Faults and Landslides - Geologic Structures, Processes, and Landforms Important to Engineering and Hydrogeology Projects in the Blue Ridge of Western North Carolina

Leaders: Rick Wooten, Bart Cattanach, and Nick Bozdog, NCGS; Rick Fuemmeler, Appalachian Landslide Consultants

Cost: \$75 for members/non-members; \$25 for students

Location: Departs 8:00 AM from the Asheville Regional Office of NCDENR in Swannanoa, returns by 6:00 PM



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(Continued from page 27)

Date: September 16-17, 2014

Event: Geosciences Congressional Visits Day

More information: <http://www.agiweb.org/gap/events/geocvd/>

Location: Washington, D.C.

Contact: Rick Kolb, AEG Advocacy Committee, rick.kolb1@gmail.com

**Date: Thursday, September 18, 2014
(meetings are held on the third Thursday of the month)**

Event: Meeting of South Carolina Association of Environmental Professionals

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

Location: 6:30-8:00 at Edens Real Estate, 1221 Main Street, Suite 1000 in Columbia, South Carolina

Contact: Chuck Clymer at (803) 212-0054 or crcllymer@terracon.com

Date: September 21-27, 2014

Event: AEG Annual Meeting

Location: The Doubletree Scottsdale in Scottsdale, Arizona

Details: <http://www.aegweb.org/about-aeg/events/aeg-annual-meeting/2014-scottsdale>

Date: Friday, October 10, 2014

Event: ASBOG Geology Exam

Details: Deadline to apply to take the exams is August 22, 2014 (and preapproval to take the exam before that)

Location: McKimmon Center, NC State University, Raleigh

Contact: www.ncblg.org

Date: October 19-22, 2014

Event: Geological Society of America Annual Meeting

Location: Vancouver, British Columbia, Canada

Information: <http://www.community.geosociety.org/gsa2014/home/>

Date: Tuesday, November 18, 2014

Event: Quarterly meeting of the North Carolina Board for the Licensing of Geologists

Location: Starts at 9:00 AM at Room 1132, Jordan Hall, NC State University; morning session open to the public

Contact: ncblg@bellsouth.net

Date: April 19-20, 2015

Event: Southeastern Section, GSA 64th Annual Meeting

Location: The Chattanooga Hotel; Chattanooga, Tennessee

Details: <http://www.geosociety.org/sections/se/2015mtg/>

Date: September 20-26, 2015

Event: AEG Annual Meeting

Location: Pittsburgh Pennsylvania

Date: September 18-24, 2016

Event: AEG Annual Meeting

Location: Kona, Hawaii

Date: September 2017 (dates to be determined)

Event: AEG Annual Meeting

Location: Denver, Colorado

Date: September 2019 (dates to be determined)

Event: AEG Annual Meeting

Location: Asheville, North Carolina



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ASSOCIATION OF ENVIRONMENTAL &
ENGINEERING GEOLOGISTS
-Carolinas Section



**Faults and Landslides – Geologic Structures, Processes, and Landforms
Important to Engineering and Hydrogeology Projects in the Blue Ridge of
Western North Carolina**

AEG Carolinas Section Field Trip, September 6, 2014

Cost: \$75 for members, professionals, and geo-enthusiasts, \$25 for students

Registration Deadline: Friday, August 29, 2014

Registration Details: Use attached registration form

Field Trip Waiver: Please sign and date field trip waiver

Continuing Education Credits: 8 credits for field trip participation

Field Trip Leaders

Rick Wooten is the Senior Geologist for the Geohazards and Engineering Geology division at the North Carolina Geological Survey (NCGS) in the Asheville Regional Office. He has studied geologic landslide hazards and slope movement for nearly 30 years. Bart Cattanaach, Senior Geologist, and Nick Bozdog, Geologist I, also work at the NCGS Asheville Office and support the Blue Ridge Province and Western Piedmont Mapping project. The responsibilities of these geologists are geologic mapping, geologic hazards mapping, including landslides, and mineral resources within the mountain region of North Carolina.

Stephen Fuemmeler is a project manager and part-owner of Appalachian Landslide Consultants, PLLC (ALC). ALC provides landslide hazard identification using geologic hazards mapping, modeling, and GIS services to assist and educate public and private property owners on how to identify potential hazard areas prior to property development.

What to Expect

The field trip will feature investigations of faults and landslides done by the North Carolina Geological Survey (NCGS), and Appalachian Landslide Consultants, PLLC (ALC), in the Blue Ridge Mountains of western North Carolina near Marion and Asheville. One stop will highlight a newly described locality of the Alleghanian Linville Falls fault on U.S. 221 north of Marion, where sample collecting is allowed. Here the ~1-billion year-old Proterozoic Cranberry Gneiss, is thrust over dolomitic marble of the Cambrian Shady Dolomite within the Grandfather Mountain Window. In contrast to the Linville Falls fault, we will see faults and fractures associated with the Mills Gap fault zone, a WNW-ENE trending, normal and oblique-normal brittle fault zone in metasedimentary rocks of the Ashe Metamorphic Suite. The brittle fault zone is interpreted to be a transtensional flower structure that is Mesozoic or younger in age. The NCGS recently identified the Mills Gap fault zone during detailed geologic mapping to support investigations by U.S. EPA and U.S. Geological Survey of the CTS Superfund Site in south Asheville.

Landslide stops will feature recent investigations into landslides by ALC, and work done by the NCGS for the landslide hazard maps of Buncombe County. ALC will lead a stop at the site of a 600 foot long by 130 foot wide landslide in Asheville that has recently undergone a large-scale stabilization effort. This landslide had been moving slowly for several years and began to accelerate at the beginning of 2013 due to an unusually wet season. A neighborhood immediately downslope of the landslide was threatened and work moved quickly to stabilize the slide with the construction of an upper soil nail wall and a lower soldier pile wall.

Time allowing we will do one or both of these stops:

We will also visit an active landslide along Highway 19 just east of Maggie Valley. This landslide has been encroaching on Hwy 19 for decades and has been a routine maintenance problem for NCDOT. Recent work by ALC has revealed that this landslide encompasses approximately 3 acres and is much larger than previously known. The upper portion of the slide is moving slower than the lower portion and at least 3 houses are being affected. The lower portion exemplifies active and newly forming scarps.

In the Pisgah National Forest near the N.C. Arboretum we will look at the deposits and landforms associated with November 1977 debris flows, and older (prehistoric?) debris deposits delineated in the landslide hazard maps for Buncombe County. Boulder trains, imbricated boulders, and disrupted drainage patterns characterize exposures of the 1977 deposits. Poorly sorted, matrix- to clast-supported bouldery deposits, and lobe- and stringer-shaped landforms readily identified in maps derived from LiDAR digital elevation models characterize debris deposits from past mass-wasting events.

Logistics

The field trip will depart from the Department of Environment and Natural Resources (DENR) Asheville Regional Office at 8:00 a.m. and return around 5:30-6:00 p.m. on Saturday, September 6, 2014. Parking is available at the DENR office at 2090 U.S. Highway 70, Swannanoa, North Carolina 28778 (latitude 35.596149°; longitude -82.423655°). Beware – Google Earth and Google Maps may send you to the wrong place in nearby downtown Swannanoa if you search using the street address. Transportation, box lunches, and a short field trip guidebook will be included in the field trip fee.

Hiking will be limited to one stop in the Pisgah National Forest; all others will be roadside stops. The hike will be along a forest trail for approximately 0.25 miles, with an optional hundred yards or so of cross country walking in a National Forest setting. Snakes, ticks and chiggers will be alive and well this Fall, and wearing a good set of field boots is recommended. Hard hats and rain jackets are recommended.

REGISTRATION FORM**Faults and Landslides – Geologic Structures, Processes, and Landforms
Important to Engineering and Hydrogeology Projects in the Blue Ridge of
Western North Carolina****AEG Carolinas Section Field Trip, September 6, 2014**Name of Attendee(s): _____

Company: _____

Address (Street, City, State, Zip): _____

Phone (office, home, or cell): _____ Fax: _____

Email: _____

PAYMENT METHOD (Payment MUST accompany this registration form.)

Check (Payable to AEG Carolinas Section): _____

Payment amount (\$75 members and non-members, or \$25 for students): _____

Credit Card: Mastercard _____ Visa _____ Corporate card? _____

Card Number: _____ Exp. Date: _____

CVV Number (the three digit code on the back of card): _____

Name on card (print): _____

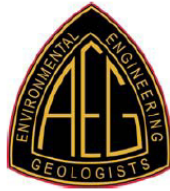
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Mail form and check (if paying by check) to:

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Greensboro, NC 27407**

ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

**LIABILITY WAIVER FOR FIELD TRIP PARTICIPANTS**

The undersigned having been fully advised as to the nature and possible dangers and hazards of the field trip, hereby acknowledges and agrees this _____ day of _____, 20____, that:

1. (please print) _____ (herein referred to as "Participant") intends to participate in one or more field trips sponsored by the Association of Environmental & Engineering Geologists (herein referred to as "AEG").

The field trip for which this waiver is being made is to be held on September 6, 2014, in the area of Asheville and Marion, North Carolina.

2. Participant agrees and understands that during such field trip(s), he/she will be under the direction and control of the trip leader approved by the AEG, and specifically agrees to comply with all reasonable directions and instructions by the trip director during the course thereof.

3. Participant understands and acknowledges that there are risks of injury to person and/or property that are associated with field trips, including without limitation risks related to travel hazards, terrain, weather, eating and sleeping arrangements, and other circumstances. Participant hereby voluntarily assumes all risks connected with or arising out of his/her participation in field trip activities, and waives any claim against AEG, its officers, directors, employees, agents and members for any injury, harm, damage or other liability arising out of field trip activities.

4. Participant understands and acknowledges that the AEG assumes no liability for personal injuries or property damages to participants or to third persons arising out of field trip activities. Participant agrees to hold AEG harmless from any liability for harm arising out of the acts or omissions of AEG or Participant during any such field trip, and indemnify AEG against any and all awards or judgments against AEG in favor of third parties for losses and damages (including attorney's fees and any costs involved because of said claims), on account of injury, death or property damage, or inconvenience or loss of money due to delay that may arise, by reason of Participant's participation in field trip activities.

5. I understand that my use of alcohol or drugs would impair my judgment and coordination, and I hereby waive, and will hold the AEG harmless from, any and all claims of bodily injury or other harm arising from my use of either. I will indemnify AEG against awards or judgments in favor of third parties for losses or damages (including attorney's fees and costs), of whatever nature, arising out of my use of alcohol or drugs while participating in field trip activities.

Date: _____ Signed: _____

(Participant's Signature)

Mail Liability Waiver to:

Sue Buchanan
Schnabel Engineering
11A Oak Branch Drive
Greensboro, NC 27407

Or email: sbuchanan@schnabel-eng.com



ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

Connecting Professionals, Practice and the Public

Page 1 of 2

Young Professional Travel Grant Application

The intent of the Young Professional Travel Grant is to help defer the cost of attending the AEG Annual Meeting for young professionals when an employer is unable to support their attendance. This is a competitive \$500 grant, and will be awarded to at most two applicants based on availability of funds and quality of applications.

- Requirements:**
- ~ Applicant must be a Professional Member of AEG.
 - ~ Applicant must be 35 years of age or younger at the time of the Annual Meeting for which this application is submitted.
 - ~ This must be the first year attending the AEG Annual Meeting as a Professional Member.
 - ~ Applicant must complete all parts of this application and submit completed application in accordance with the instructions specified at the end of the second page.

Please print or type your responses to each of the following questions:

Name: _____ Email Address: _____

Phone Number: _____

Mailing Address: _____

Will you be registering for the whole meeting? If not, how many days will you be attending? _____

Will you be presenting at the meeting, if so an oral or poster presentation? _____

Were you a Student Member of AEG? _____

When did you graduate from undergraduate, graduate school? _____

How many years have you been a Professional Member of AEG? _____

Will this be your first annual meeting as a Professional Member? _____

What distance will you need to travel to attend the Annual Meeting? _____

Are you involved in your Section (attend meetings, hold a position, visiting professionals program, etc.)? Explain.

(Please continue to page two)



ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS
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Young Professional Travel Grant Application

Page 2 of 2

Applicant Name

Are you receiving any support from your employer or external funding sources? If so, how much support will you receive?

AEG would like to thank your supervisor for letting you attend the Annual Meeting. Please submit your Supervisor's contact information:

Supervisor Name: _____

Phone: _____ Email: _____

Mailing Address:

Why do you want to attend the Annual Meeting?

[illegible]

SUBMITTAL INSTRUCTIONS:

Please submit this application to aeg@aegweb.org by the August 1st preceding the Annual Meeting for which this application is being submitted. Notification of grant will be sent by August 15th. Upon submittal of expense report (form to be provided by AEG with notification), the treasurer will mail the recipient a check.



GROUNDWATER PROFESSIONALS OF NORTH CAROLINA

SUMMER MEETING AND ANNUAL GOLF TOURNAMENT JULY 10-11, 2014

Dinner Meeting - Thursday, July 10th; 5:30 – 9 PM

*Hampton Inn & Suites - Southern Pines / Pinehurst
200 Columbus Drive, Aberdeen, North Carolina (910) 693-4330*

Call for Group Lodging Rate

**** Free Appetizers and two drink tickets ****

Speaker:

***Vance Jackson, Head
UST Trust Fund Branch
NCDENR-DWM-UST Section***

Captain's Choice Golf Tournament - Friday, July 11th; 9:00 (shotgun)

***Legacy Golf Club
12615 U.S. 15, Aberdeen, NC 28315
\$50 per person, includes golf and lunch***

RSVP-Haynes Campbell HCampbell@esclabsciences.com 919-210-5148

SPONSORS NEEDED FOR EVENT

RSVP-Mike Stanforth mstanforth@excelengr.com 704-913-7614

2014 GWPNC CORPORATE MEMBERSHIPS

GOLD MEMBERSHIP

ANNUAL MEMBERSHIP: \$800

One dinner at each quarterly meeting (does not carry forward)
Sponsorship at three (3) meetings
Golf Sponsorship (Includes 4 golfers)
Link to company website on GWPNC
Acknowledgement on sponsorship sign(s) at meetings

SEMIANNUAL MEMBERSHIP: \$500

One dinner at three (3) quarterly mtgs.
Sponsorship at two (2) quarterly mtgs.
Golf Sponsorship (Includes 3 golfers)
Link to company website on GWPNC
Acknowledgement on meeting signs

SILVER MEMBERSHIP

ANNUAL MEMBERSHIP: \$600

One dinner at each quarterly meeting (does not carry forward)
Sponsorship at two (2) meetings
Golf Sponsorship (Includes 2 golfers)
Link to company website on GWPNC
Acknowledgement on sponsorship sign(s) at meetings

SEMIANNUAL MEMBERSHIP: \$400

One dinner at two (2) quarterly mtgs.
Sponsorship at one (1) quarterly mtg.
Golf Sponsorship (Includes 2 golfers)
website Link to GWPNC website
Acknowledgement on meeting signs

BRONZE MEMBERSHIP

ANNUAL MEMBERSHIP: \$300

One dinner at two (2) quarterly meetings (does not carry forward)
Sponsorship at one (1) meeting
Link to company website on GWPNC website
Acknowledgement on sponsor sign at meetings

SEMIANNUAL MEMBERSHIP: \$250

One dinner at one (1) quarterly mtg.
Sponsorship at one (1) quarterly mtg.

ADDITIONAL MEMBERSHIP OPPORTUNITIES

GOLF SPONSOR ONLY: \$350

Two (2) paid golfers
Acknowledgement on sponsorship sign(s) at tournament

TOURNAMENT BEVERAGE CART: \$500

Two (2) paid golfers
Acknowledgement on tournament signs

QUARTERLY MEETING SPONSOR: \$300

One dinner at subject quarterly mtg.
Acknowledgement on meeting flyer

MEMBERSHIP APPLICATION



ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

MEMBER:

- ☐ **New Member Dues – \$95.00** First year of membership only.
☐ **Full Member Dues – \$140.00***

Applicants for Member Class, including Full and New Members, 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, the applicant shall be practicing in the field of Engineering Geology, Environmental Geology or Hydrogeology.

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

Date of Birth: _____
Required to authorize payment

Preferred Address: ☐ Home ☐ Work ☐ School

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Annual Dues Amount*: _____
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(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.

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: 720-230-4846
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Connecting Professionals, Practice and the Public



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Please check one: ☐ Student ☐ New Graduate

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Phone: 303-757-2926; FAX: 303-757-2969;

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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 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.

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Business Card	\$ 40.00
Quarter Page	\$ 60.00
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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).

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

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