



## **Carolinas Chapter Dinner/Meeting**

*The Carolinas Chapter of the  
Association of Environmental & Engineering Geologists presents*

Guest Speaker:

**Rick Wooten, P.G. (Jahns Engineering Geology Lecture Series Presentation)**



**Presentation:**

*Going Against the Grain: Linking Brittle Cross-Structures  
with Landslides, Hydrogeology, and Earthquakes in the North  
Carolina Blue Ridge and Piedmont*

Dinner and Talk: 5:30-9:00 PM

Thursday, January 27, 2022

Room C of the Whitewater Center in Charlotte, NC

## AEG Carolina's Chapter 1/27/22 Charlotte Whitewater Center Meeting

**Description:** Good day AEG Carolinas members! Please mark your calendars and plan to attend what will certainly be an informative, entertaining, and even adventurous experience. We all desperately need to reconnect in-person, and what better place than the Charlotte Whitewater Center. Plan to arrive early with your ice skates, mountain bike or climbing shoes and a co-worker/colleague to enjoy a little exercise and *GEO-CAMRADERIE!* So far, there's a mountain biking trip planned to meet in the SE corner of the parking lot (<https://whitewater.org/plan-your-visit/facility-map/>) at 2PM (ride starts at 2:30).

**Place:** Charlotte Whitewater Center

**Address:** Room C, 5000 Whitewater Center Pkwy, Charlotte, NC 28214

**Date:** Thursday, January 27, 2022

**Time:** 5:30 PM socializing begins, 7:00 buffet dinner, 8:00 Rick's talk

**Food:** Cookout Style Meal and possibly 1-2 beer (pending sponsorships). To Sponsor the meeting and/or to reserve your vegetarian meal option, email [communications@aegcarolinas.org](mailto:communications@aegcarolinas.org)

**Cost:** AEG members \$35; non-members \$50; public-sector employees and teachers \$25, students **free** w/ college ID

The Whitewater Center charges \$6 for parking, but this provides access to all the hiking/biking trails. Climbing, ice-skating, challenge courses are extra. <https://whitewater.org/things-to-do/activities/>

**RSVP/Questions:** [communications@aegcarolinas.org](mailto:communications@aegcarolinas.org) or contact your AEG Carolinas board members (<http://aegcarolinas.org/contact-us/>)

**Meeting Sponsors/Volunteers:** TBD. Please contact [communications@aegcarolinas.org](mailto:communications@aegcarolinas.org)

### Rick's Abstract

Geologic studies from the 1990's to present have identified brittle, post-orogenic bedrock structures that cut across the overall SW-NE structural and topographic pattern of the Blue Ridge and Piedmont of North Carolina. These families of brittle faults and associated fracture (joint) systems overprint older ductile structures, and correspond with ESE-WNW, WSW-ENE, and E-W topographic lineaments. Detailed geologic investigations indicate that some of these cross-structures can be linked to landslide occurrence, the hydrogeology of fractured rocks, and seismicity. Landslide hazard mapping in the Blue Ridge of Watauga County in 2008 identified an ESE-WNW trending zone of rock slope instability associated with brittle faulting that overprints a segment Linville Falls fault, a ductile thrust fault bounding the Grandfather Mountain window. Subsequent investigations identified this zone of brittle deformation as the Boone fault, located in an area that experienced 2013-14 seismicity. Topographic lineaments that parallel the Boone fault project into the Deep Gap reentrant on the Blue Ridge Escarpment (BRE) where the remnants of an August 1940 tropical cyclone triggered over 600 landslides. Recently completed landslide hazard mapping in Polk County identified an E-W trending fracture set that controls the North Pacolet River reentrant into the BRE, an area of concentrated landslide activity from a May 18, 2018 storm that triggered over 240 landslides. Investigations in 2010 for the CTS superfund site in the Blue Ridge near Asheville identified the ESE-WNW trending Mills Gap fault and fracture zone that cross-cuts metasedimentary and

meta-igneous rocks of the Ashe Metamorphic Suite. Detailed geologic and hydrogeologic studies identified the Mills Gap fault zone as primary structural feature that provides a pathway for groundwater flow to transmit contaminants. A strand of the Mills Gap fault juxtaposes weathered bedrock with deformed colluvial deposits indicating Cenozoic movement along the fault, which is in the epicentral area of the 1916 M5.2 Skyland earthquake. A series of ESE-WNW trending topographic lineaments extends through the Mills Gap fault zone into the Hickory Nut Gorge reentrant on the BRE, a location of concentrated landslide activity in Rutherford County. Anecdotal reports of rockfalls during an 1848-1874 earthquake swarm hint at the possibility of a link between seismicity and rock slope failures in Hickory Nut Gorge.

### **Rick's Bio**

Rick has over 40 years of experience in applied geology in the Cascade Mountains of Washington State, and applied geologic research in the Piedmont, and Blue Ridge Mountains of North Carolina. He earned his B.S. and M.S. degrees in geology at the University of Georgia in 1973 and 1980. Rick recently retired from the North Carolina Geological Survey where he was the Senior Geologist for Geohazards and Engineering Geology from 1990 to 2021. His previous work includes mapping geologic resources and conditions for land-use planning, landslide investigations and applied geotechnical geology for the USDA-Forest Service on the Gifford Pinchot National Forest in Washington State from 1980 to 1990. His work with the North Carolina Geological Survey includes the scientific regulatory review and field investigations for a low-level radioactive waste disposal project, and bedrock geologic mapping in the Piedmont and Blue Ridge Mountains. Since 2003 his main focus has been on landslide hazard mapping and research, and responding to landslide events North Carolina Blue Ridge. He has a special interest in the relationships of ductile and brittle bedrock structures with geomorphology and landslides processes, and communicating landslide hazards information with stakeholders.