Issue 8

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# Geology Newsletter

*Virginia Board for Geology*

## Welcome!

*The Virginia Board for Geology would like to welcome one of its newer members, Warren "Ted" Dean. Mr. Dean is president of ATS International, Inc. in Christiansburg, Virginia. He earned a B.S. degree in geology from Radford University, and an M.S. degree in geology from Texas A&M University. After graduating from Texas A&M, Mr. Dean worked in the environmental consulting industry where he obtained experience in site characterization and assessment, risk assessment, aqueous geochemical modeling, groundwater flow and transport modeling, and 3D spatial data modeling and visualization. In 1998, Mr. Dean founded ATS International, Inc., a company that provides a broad spectrum of geologic services to industry, government, and the legal profession. These services include groundwater supply development, computer modeling of hydrologic systems, engineering geology and geophysical analyses, assessing impacts of soil and groundwater contamination, evaluation and implementation of remedial strategies, and providing expert testimony. Mr. Dean is a Virginia Certified Professional Geologist. He is also licensed as a Professional Geologist in North Carolina and South Carolina.*

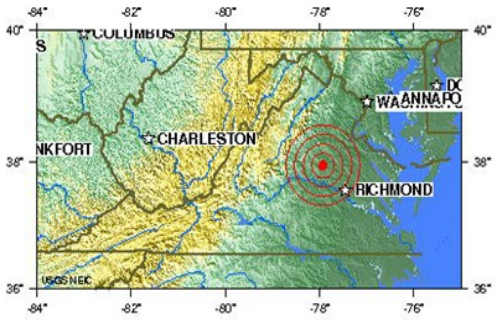


**Inside this issue:**

# Earthquake!

"Where were you when the earth shook?" Months later, people are still asking that question. From Alabama to Quebec, from Boston to Chicago, people were panicked by the most severe ground shaking that most of them had ever experienced. But what exactly happened on the afternoon of August 23, 2011?

Three miles beneath a little crossroads called "Cuckoo" in Louisa County, Virginia, an unnamed, poorly-known fault jiggled. Close to the epicenter, walls cracked, chimneys fell, and people ran from their houses. Farther away, people were jolted from their daily routine as buildings rattled and items fell from shelves. Even in some of these farther locales, such as Culpeper and Fredericksburg, unreinforced masonry structures were damaged. In Washington, DC, the National Cathedral, the Smithsonian Castle, and the Washington Monument were significantly damaged. The North Anna Nuclear Power Station, less than 12 miles from the epicenter, automatically shut down as fuel rods rattled within its two reactors, the first time an earthquake ever caused a nuclear power plant to shut down in the U.S. Fortunately, no serious injuries were reported.




It took local, state, and federal officials nearly a month to catalog the damage in central Virginia, and the final count was surprising. Thirty-three homes were damaged to the point that they must be permanently condemned and razed. Over 1000 other homes sustained moderate to serious damage. Total damage to residences, businesses, and local government buildings amounted to over $100 million.

Should we have been so surprised? After all, this quake occurred in the Central Virginia Seismic Zone, an area known for its history of earthquakes. Records show that earthquakes of magnitude 3.5 or less occur almost every year in the seismic zone, which extends from Richmond to Charlottesville and Appomattox to Fredericksburg. In the past 200 years, there have been only a handful of larger earthquakes, some of which caused minor damage, but nothing like this one. At a magnitude of 5.8, this event was nine times as powerful as the next-largest historical earthquake in central Virginia, a M4.9 in 1875.

As geologists, we naturally want to know the geological conditions that spawned this quake. We expect large earthquakes on the west coast, where we have a tectonically active plate margin, and we expect large earthquakes in the Mississippi Valley, where we know there's a failed rift system. But what about the east coast? Aren't we in the middle of a tectonic plate where seismic activity is supposed to be minimal? True, the Central Virginia Seismic Zone is in the middle of the North American Plate, but that hasn't always been the case. This was once a tectonically active plate margin. Part of the evidence is in the number of faults here, mostly old compressional faults from the tectonic collision that formed the Appalachian Mountains about 300 million years ago, and extensional faults formed during continental rifting and the opening of the Atlantic Ocean about 180 million years ago. If one looks at a geological map of the eastern U.S., there seem to be faults everywhere. If one then plots historic earthquakes over the top of that map, they cluster in just a few areas, not along every fault. Why is that? Apparently there are localized areas of stress in the earth's crust that cause these earthquakes. Is the stress leftover from Appalachian mountain building? Is it leftover from Atlantic rifting? Or is it modern stress from the pushing of the spreading mid-Atlantic ridge against eastern North America? No one really knows, but one thing is for certain – we have now been reminded that we need to be concerned about the possibility of damaging earthquakes in the east.

What can we expect in the future? The historical pattern is likely to continue – small earthquakes almost every year, with rare larger ones. How large? Can we ever have a larger earthquake than this one? Martin Chapman, the director of the Virginia Tech Seismological Observatory, was asked that question on a conference call with the Governor's staff and state safety officials two weeks after the earthquake. "We can definitely expect a larger earthquake in central Virginia… sometime in the next 1000 years."

*By David Spears, State Geologist*

# Proposed Amendments to the Virginia Board for Geology Regulations

Did you know that some colleges and universities require students graduating with degrees in geology to take the Fundamentals of Geology (FG) exam as part of their degree program? In Mississippi, students graduating with a baccalaureate degree in geology from Mississippi State University, the University of Southern Mississippi, and the University of Mississippi are required to take the FG exam as an exit exam.

Currently, the Virginia Board for Geology (Board) regulations require individuals obtaining certification as a Virginia Certified Professional Geologist, by examination, to have met the Board's education requirements, to have completed at least seven years of geological work, and to have passed the Fundamentals of Geology and the Practice of Geology (PG) examinations.

The ASBOG (National Association of State Boards of Geology) website, www.asbog.org, reveals a national passing rate of 57% for the FG exam administered in March of 2011, and 71% for the PG exam administered in March of 2011.

The Board believes that allowing individuals to take the FG exam shortly after completion of required course work, rather than years after course work completion, may result in a higher passing rate for individuals taking the FG exam and an increase in the number of individuals who pursue certification as Virginia Certified Professional Geologists. Consequently, during its July 21, 2011, board meeting, the Board unanimously agreed, by vote, to follow the Fast-Track Rulemaking process to amend its regulations. The fast-track process is being used because the proposed amendments are less restrictive than the current regulation, are expected to be non-controversial, and are consistent with other professions. Individuals seeking licensure as land surveyors and professional engineers are allowed to sit for qualifying examinations prior to completing the experience requirements contained in the professions' regulations.

The proposed amendments change the qualifications for applicants applying to sit for the FG exam by removing the work experience requirement and by allowing not only college graduates with baccalaureate or higher degrees, but also undergraduate college students within 12 months of completing undergraduate degree requirements, and graduate college students within 6 months of completing graduate degree requirements to apply to sit for the FG exam. The proposed language further amends the regulations to allow individuals who have passed the FG exam, completed the required geological science course work and obtained a baccalaureate or higher degree to apply for the designation of Geologist-in-Training (GIT). The GIT designation does not allow individuals to practice as certified professional geologists in Virginia. To obtain certification as a Virginia Certified Professional Geologist, an individual must meet all education, examination, and experience requirements set forth in the Board's regulations.

You may view and track the Board's proposed amendments on the Virginia Regulatory Town Hall at www.townhall.virginia.gov. The Town Hall website provides information regarding regulatory actions, board meetings, and board minutes. It also offers you the opportunity to comment on regulatory matters. As a registered public user, you will receive notification by e-mail of regulatory actions and meetings.

Virginia DPOR
DEPARTMENT OF PROFESSIONAL AND OCCUPATIONAL REGULATION

*Virginia Board for Geology*

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If you want to be included on the Board's electronic mailing list, send an e-mail to Geology@dpor.virginia.gov. You will be notified each time a newsletter is published.

## Returning from Active Duty Military Service?

If your Virginia Certified Professional Geologist certificate expired during your service outside of the United States, you have 60 days from the date of your release from active duty to renew your certificate without any penalty. To qualify, please send a copy of your DD-214 or other documentation, as appropriate, to verify your active duty status to the Board for Geology at DPOR, 9960 Mayland Drive, Suite 400, Richmond, VA 23233.

## *Geology Board Members:*

Warren "Ted" Dean—Certified Geologist

Robin E. Reed—Certified Geologist

J. Meade R. Anderson—Certified Geologist

Katherine S. White—Citizen Member

James Liu—Citizen Member

David Spears—Virginia State Geologist

## *We Want To Hear From You!*

Virginia certified professional geologists are working on interesting projects, both nationally and internationally. If you would like your experience published in the *Geology Newsletter*, please email a brief story to Geology@dpor.virginia.gov. Be sure to include your contact information.

## 2012 Virginia Board for Geology Meetings

Wednesday, March 7, 2012, Board Room 3

Wednesday, June 13, 2012, Board Room 3

Wednesday, September 12, 2012, Board Room 3

Wednesday, December 5, 2012, Board Room 3

*Location of Meetings:*
*Department of Professional and Occupational Regulation*
*Perimeter Center, 9960 Mayland Drive, Suite 200*
*Richmond, VA 23233*

## Change of Address or Name?

**Be sure to notify the Board office in writing!**

As a Virginia certified professional geologist, you are required to notify the Board, in writing, of a change of address or name. The written notice must be sent to the Board within 30 days after the change of address or name. For name changes, an official document (e.g., marriage license, divorce decree, etc.) that verifies the name change must accompany the written request. A Name and Address Change Form is available on the Board for Geology webpage at: www.dpor.virginia.gov/dporweb/namechange_main.cfm.
Failure to receive a renewal notice does not relieve you of the requirement to renew your certificate.