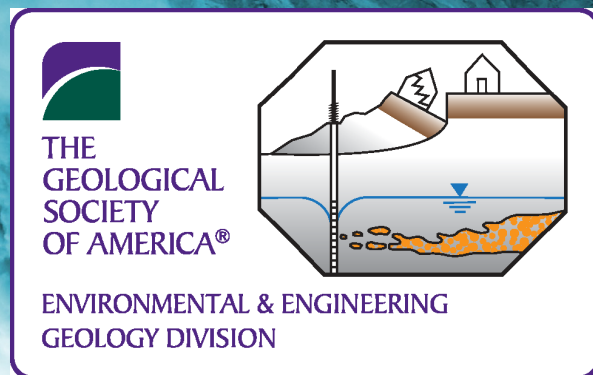


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THE ENGINEERING GEOLOGIST

Newsletter of the
Environmental and Engineering
Geology Division



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**Bill Schulz, Chair
Environmental and Engineering
Geology Division**

I'd like to take this opportunity to thank you, my fellow Environmental and Engineering Geology Division members, for electing me to this position. It is an honor to follow in the footsteps of so many excellent Chairs and to chair the oldest division of GSA during its 65th year. However, it is a greater honor and significant responsibility to serve you, my fellow members, because you comprise our profession and I view our profession as one of the most underappreciated and important for protecting human safety and the built and natural environments. Our importance becomes clearer every day as humans continue their encroachment into geologically hazardous areas and are more frequently exposed to environmental hazards that often result from human activities. Recent episodes involving widespread loss of life from normal geological processes provide tragic examples of why we are so important: 230,000 killed by the 2004 Sumatra earthquake and tsunami; 79,000 killed by the 2005 Kashmir earthquake and landslides; 70,000 killed by the 2008 Wenchuan, China earthquake and landslides; 316,000 killed by the 2010 Haiti earthquake; and 20,000 killed by the 2011 Tohoku, Japan earthquake, tsunami, and landslides. Of course, there are numerous examples of less significant catastrophes caused by geological hazards, and

we all are likely acquainted with some. Easily forgotten, however, are the countless successes we and our colleagues have had around the world. Every day, we are responsible for cleaning the soil and groundwater contamination that affects many areas, for ensuring that adverse geological conditions are accounted for in siting and engineering design and construction, for improving our understanding of geological processes, and for so many other activities that have such great impact on society. Certainly, our responsibilities are very great!

I've touched on what I view as our responsibilities as environmental and engineering geologists. Now permit me to explain what I view as some of my responsibilities to you. It should be clear to all of us that our respective specialties have plenty of room for advancement; we can and must better serve society in the future. This advancement is facilitated by each of us improving our knowledge and capabilities, and GSA and EEGD are primary venues that provide opportunities for us to make such improvements. Hence, my responsibilities to

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Photograph above: EGD Chair Bill Schulz leading a field trip to the Slumgullion landslide during the 1st North American Landslide Conference.

Cover Photograph: Landslide dam, Karakoram region, Hunza River Valley, Pakistan
Modified from: [www.pamirtimes.net/Inayat Ali](http://www.pamirtimes.net/Inayat_Ali)

you include ensuring that you are aware of these opportunities and improving upon them, while also increasing the visibility of our Division and, by extension, our profession. GSA and EEGD offer opportunities for professional growth by publishing important advances in our fields of specialty, by holding technical sessions, field trips, and short courses at sectional and annual meetings, by providing Roy J. Shlemon Scholarships for student research and attendance at GSA meetings, and by supporting the Richard H. Jahns Distinguished lecturer, whose goal it is to expose students to environmental and engineering geology. The Jahns lectureship is a perennial success, with academic institutions often wrangling for the lecturer's services. We've had outstanding Shlemon scholars, but you'd be surprised by how few students apply for the scholarships. In recent years, I've advocated reimbursing EEGD members who attend sponsored field trips at the Annual Meeting; thus far we have not been overwhelmed with requests. We number nearly 800 members and have for many years. However, GSA membership typically grows annually, and certainly many new students and professionals join the ranks of environmental and engineering geologists annually, as well. Therefore, we don't seem to be acquiring new members and retaining existing members as we should. Additionally, only about 100 EEGD members attended the last few annual meetings. It appears that EEGD is not sufficiently visible and our offerings are insufficient or, at a minimum, not sufficiently publicized or readily available. It is my goal to begin implementing strategies to remedy these insufficiencies and I think that your Management Board is making good progress in this respect, as I'll describe below.

Meetings are likely the most important venue we have for offering opportunities to improve our knowledge and expertise and to meet other GSA members with whom we can share ideas and develop collaborations. Although I and other Management Board members regularly propose and chair sessions at meetings, EEGD

has a very diverse membership with a broad range of expertise and interest. Your Board cannot and should not dictate what subject matter is covered at meetings, rather, this must be determined by you. Hence, we will continue to encourage you to be more involved in determining the content of meeting sessions, short courses, and field trips. Perhaps recent encouragement was successful. For example, during the 2011 Annual Meeting, we sponsored 25 technical sessions on subjects including groundwater modeling and remediation of contamination, recent developments in geologic data acquisition and visualization, impacts of geologic conditions on development in the US and internationally, complexities of characterizing karst environments and groundwater flow therein, and understanding of landslide processes. We also sponsored 1 short course and 2 field trips. We are sponsoring 40 sessions with similar breadth of subject matter and at least 1 field trip proposed for the 2012 Annual Meeting to be held November 4-9 in Charlotte, North Carolina. Hopefully, you will agree that the number of sessions and wide range of subjects covered by them is impressive and will encourage more of you to attend future meetings. As with recent years, your Management Board is sure to remind you of sessions in which you may be interested in presenting your work or that you may be interested in attending. We understand that attending meetings is costly, especially during these economically difficult times. To encourage participation in EEGD-sponsored short courses and field trips, we'll be partly reimbursing EEGD members for attendance fees, with special emphasis toward student attendees. Finally, in honor of our 65th anniversary, we'll be holding a Celebration and Awards event at the 2012 Annual Meeting that all are encouraged to attend. In contrast with our usual luncheon and awards ceremony (which will not be held at the 2012 meeting), the Celebration and Awards event will be held in the evening and members will attend for

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free, or perhaps for a nominal fee. We hope to create a more relaxed environment in which potential members, students, and existing members can more readily learn about what we do and what we have to offer as individuals and as an organization. In addition, we hope that the more comfortable setting will allow our members to catch up with old acquaintances, hear about innovative research and projects, and establish new relationships that will be fruitful for many years to come. We will provide additional details as we get closer to the event.

Your Management Board has much more in store for the Division during the upcoming year, in addition to improving our offerings at meetings. We're currently redesigning the EEGD webpage to provide you with easier access to information, and we're exploring use of social media and online forums through which you can access information and exchange ideas, recent advances, and opportunities for collaboration and employment. We're working closely with the management board of the Association of Environmental & Engineering Geologists to develop a protocol for co-promoting the offerings of each organization, which we hope will increase opportunities to improve your knowledge and expertise while also increasing our membership. Finally, we recently designed a logo to provide a visual identity for our Division, and we'll soon be offering merchandise with the logo that will improve our visibility. I hope that each of these changes will make us a more useful, visible organization.

One important change that occurred during the past year was the modification of our name to the Environmental and Engineering Geology Division. Your Management Board proposed this change and about 78% of you who voted approved. The name change was proposed because many of you specialize in environmental geology or spend at least some of your time addressing environmental concerns, and there often is significant overlap

between environmental and engineering geologic issues. Hence, this change should make many of you feel more "at home" in the Division and also encourage others with environmental focus to join.

I'm very optimistic about the future of our Division. While the 65th year often signifies retirement, I hope this year signifies our transition into a new era of enhanced communication, support, and dissemination of advances in science and engineering. Hopefully the changes we are making will encourage all of you to become more involved and encourage new members to join us, while also improving our ability to serve society. I'm excited about the year ahead and I hope that you are, too. Please do not hesitate to contact me with any questions, comments, or suggestions. I can be reached at wschulz@usgs.gov or (303) 273-8404.

Regards,
Bill Schulz



EEGD 65th Anniversary! Let's Celebrate!

Please join us in celebrating 65 years of providing technical venues and practical information for engineering and environmental geologists! We are the oldest division in GSA, but we also want to be the most vibrant, so help us recruit new members – especially students.

SCIENCE UPDATE

Summary of EGD Sessions at 2011 Annual GSA meeting

Quaternary Geology and Its Applications: In Honor of David M. Mickelson

Submitted by Bill Mode

Abstracts may be found at:

http://gsa.confex.com/gsa/2011AM/finalprogram/session_28412.htm

This session honored Professor Emeritus Dave Mickelson of the Department of Geology and Geophysics at the University of Wisconsin for his diverse contributions to glacial and Quaternary geology, hydrogeology, and engineering geology. It contained 11 glacial papers, one paper on hydrogeology of glaciated terrains, and two papers on engineering geology of glacial deposits. Tuncer Edil, Dave's long-time collaborator on shoreline erosion, contributed a paper in which predictions were made of shoreline changes in Lakes Michigan and Superior under forecasted climate-change scenarios. Significant changes in lake levels, rainfall and storm intensity will likely cause accelerated erosion along both lake shores. Greg Reuter reported a comparison of field and laboratory measurements of shear strength in glacial lake clays near Duluth, Minnesota. This work demonstrated that piezocone penetration tests made in the field correlate well with laboratory measurements. Bill Simpkins reviewed work on glacial aquifers and aquitards near Des Moines where consultants and regulators need to better understand both vertical and lateral variations in glacial strata and their impact on the hydrogeology and hydrogeochemistry. Richard Becker presented the first large-scale surficial materials map of Glacier Bay National Park. Kent Syverson argued that ice-marginal channels can form in more than one paleoglaciologic setting. Eric Carson (Holocene alluvial fans), Ben Laabs (glaciology), and Jeff Munroe (Neoglacial chronology) each presented a paper on some aspect of glacial geology and geomorphology in the Rocky Mountains. Mark Johnson discussed stagnant-ice processes and landforms of the Late Wisconsin Laurentide Ice Sheet. Steve Brown detailed the way that Late Wisconsin ice-margin fluctuations influenced deposition of glacial, glacialfluvial, and glaciallacustrine sediments in northeastern Illinois. Dave Ullman's new cosmogenic isotope ages suggest that the Laurentide Ice Sheet began retreating from its glacial maximum position in Wisconsin about 22 ka BP; this is earlier than previous radiocarbon dating had indicated. Anders Carlson compared the chronology of late Wisconsin deglaciation in Wisconsin with that of North Atlantic climate noting that glacial advance and retreat in the State controlled routing of meltwater to either the Gulf of Mexico or the North Atlantic or

western Canada. Tony Fleming linked glacial outburst floods to spectacular landforms and landscapes that attract many geo-tourists in northeastern Indiana. The quality and diversity of the papers were high and served as testimony to the contributions of Dave Mickelson throughout his career.

Innovative Field Investigations to Assess Natural Attenuation and Engineered Remediation of Subsurface Contamination

Submitted by Melinda L. Erickson

Oral presentation abstracts may be found at:

http://gsa.confex.com/gsa/2011AM/finalprogram/session_28691.htm

Poster presentation abstracts may be found at:

http://gsa.confex.com/gsa/2011AM/finalprogram/session_29945.htm

These oral and poster sessions covered innovative chemical, physical, and microbiologic in situ methods developed to elucidate the fate of contaminants in a variety of hydrogeologic environments, with a focus on natural attenuation and remediation reaction progress.

Several talks presented results from active research at the long-term National Crude Oil Spill Fate and Natural Attenuation Research Site, located near Bemidji, Minnesota. These talks included the latest results from biodegradation studies using several innovative parameters and less-invasive monitoring techniques, including temperature (Ean Warren et al.), surficial gas effluxes (Natasha Sihota and Ulrich Mayer), and electrical and magnetic measurements (Lee Slater et al.). Other topics presented from work at the Bemidji 'outdoor laboratory' included characterization of hydrophobic soils more than 30 years after the initial spill (John Nieber et al.), and wetland and aquifer push-pull tests to evaluate fate and transport of BTEX and ethanol (Jennifer McGuire et al.).

Researchers from other sites around the world also presented innovative results. Studies included a field-scale transport experiment (Dirk Radny and Traugott Scheytt), microcosm studies in a fracture rock aquifer and wetland (Michelle Lorah et al.), the use of stable isotopes as tracers of bioaugmentation progress (Kinga Revesz et al.), a comparison of in situ microcosm arrays vs. standard laboratory assessments (Kristin McClelland et al.), stimulation of natural remediation of acid-mine drainage (Richard Yuretech and Anna Gillmor), in situ radiation measurements in subsurface investigations (Douglas Killey et al.), and microbial characterization of groundwater (Simcha Stroes-Gascoyne).

Poster presentations included a wide range of topics, including understanding long-term natural attenuation dynamics at the Bemidji site (Jared Trost et al.), determining dissolution characteristics of weathered petroleum deposits from the 2010 Deepwater Horizon blowout (Miles Ellenberg et al.), comparing wetland vs. aquifer BTEX biodegradation in microcosms (Laurel Ackison et al.), using in situ microcosm arrays for conducting treatability studies (Tomasz Kalinowski et al.), evaluating surfactant-enhanced TCE recovery (Gyu Sang Lee et al.), evaluating organic substrates for acid mine drainage sulfate removal (Sang-Woo Ji et al.), using an aluminum-based tetracycline sorbent for drinking water (Pravin Punamiya et al.), and using goethite-coated silica nanoparticles for arsenic adsorption (Ramesh Attinti et al.).

On behalf of my co-conveners, I thank all of the speakers and poster authors for presenting their results at these sessions.

Landslides and Debris Flows: Understanding Past, Present, and Future Events

Submitted by Bill Shulz

Oral presentation abstracts may be found at:

http://gsa.confex.com/gsa/2011AM/finalprogram/session_28781.htm

Poster presentation abstracts may be found at:

http://gsa.confex.com/gsa/2011AM/finalprogram/session_29797.htm

The session “Landslides and Debris Flows: Understanding Past, Present, and Future Events” featured talks on a broad range of landslide-related subject matter. William Burns introduced SLIDO-2, which is a comprehensive, GIS-based landslide inventory for the state of Oregon that includes a wealth of detailed landslide information and establishes a framework for future landslide catalogs. Paulo Ruiz studied coseismic landsliding at Poas Volcano (Costa Rica) and provided new understanding of coseismic landslide stability in differing materials and how coseismic landsliding affects geomorphic evolution. Matthew Crawford shared his experiences with using LIDAR to create landslide inventories for parts of Kentucky and how these inventories can be used to reduce losses from landslides. Jordan Garrett described GIS-based models he is using to evaluate landslide susceptibility in Colorado Springs, Colorado and use of these models for rapidly obtaining estimates of the likelihood of landsliding on a regional basis. Jason Kean described how his measurements of debris-flow movement and growth highlight the importance of progressive erosion by overriding flows. Jason also presented work by Dennis Staley, himself, and others that provides an objective means of identifying rainfall intensity-duration thresholds for initiating debris

flows. Chester Watts described a fracture permeater he developed for measuring cleft water pressures and how its use has demonstrated that cleft water pressures can reach critical (landslide-triggering) levels under many circumstances. William Schulz provided evidence that great earthquakes along the Cascadia subduction zone (US Pacific Northwest) trigger very large rockslides that likely could not be otherwise formed, such as from gravitational loading, pore-water pressure increase and strain softening. Bruce Molnia described evidence indicating that glacial meltwater likely triggered a massive landslide from below the summit of Mount Stellar, Alaska, and possibly other landslides, as well. Shaun Cordes discussed use of mapping and dating techniques to identify whether boulders in Yosemite Valley, Yosemite National Park, were deposited by landslides or glaciers. William Haneberg concluded the session with the Richard H. Jahns Distinguished Lecture, during which he described the challenges of landslide hazard mitigation in remote settings and with very limited means.

Roy J. Shlemon Scholarship Awards

Please encourage students to apply for the **Shlemon Scholarships**. These awards are given to graduate students to support thesis research within the broad field of engineering geology. At least two \$1000 scholarships will be awarded; one for Master’s level and one for Doctoral level research. The program is competitive and there is no guarantee of funding. The Scholarship Awards Committee strongly encourages women, minorities, and persons with disabilities to participate fully in this program. Eligibility is restricted to student members of the Engineering Geology Division.

Roy J. Shlemon Meeting Awards

are given to graduate and undergraduate students to encourage participation in field trips and short courses held at annual and sectional meetings. Participation on field trips is especially encouraged. The only criteria are that you must be a student member of the Engineering Geology Division of GSA and making satisfactory progress toward your degree. In the event that requests for awards exceed available funding, requests for attending field trips will be given preference over requests for short courses.

Details and applications for both types of awards may be found at the EGD website (<http://rock.geosociety.org/egd/index.html>), under the “Scholarships” tab.

TANTALIZING TECHNOLOGY

Sometimes the line between fascinating and freaky is very thin. We've assembled a few engineering geology-type snippets that blur the line between these categories, and hopefully these are not the same old links that have been circulating back and forth all year. Enjoy!

Liquefaction song with Christchurch footage - <http://www.youtube.com/watch?v=F6-knLM7MZA>

Cornwall rockfall - <http://www.guardian.co.uk/science/2011/oct/07/massive-cornwall-rockfall-on-video>

Flash flood (hyperconcentrated mudflow) in Hawaii -
<http://www.youtube.com/watch?v=4HVL9M2zPrc&feature=related>

Sea cliff undermines house in Pacifica, CA - <http://www.youtube.com/watch?v=Hw6sDulj7GA&feature=related>

Tsunami in Japan - <http://www.youtube.com/watch?v=5-zfCBCq-8I&feature=relmfu>

Mudflow in Bernese Alps (Switzerland) - <http://youtu.be/XI9vaaUBwIw>

Christchurch earthquake - <http://www.youtube.com/watch?v=duoS7hwJlU&feature=fvwp&NR=1>

Landslide near Dalhousie (India) - <http://www.youtube.com/watch?v=Vc6ouosXk0Q&feature=related>

Mer de Glace (near Chamonix, France) debris flow - <http://www.youtube.com/watch?v=SK0ZtaDPzZw>

Liquefaction in Japan - <http://www.youtube.com/watch?v=TzlodnjPAuc&feature=related>

Time lapse photography under a glacier - <http://www.youtube.com/watch?v=njTjfJcAsBg>

Rockfall on Mt. Rainier - <http://www.youtube.com/watch?v=fzRhLs5GkYs&feature=related>

Japanese tsunami hits Santa Cruz, CA - <http://www.youtube.com/watch?v=7B-ACV3pPqc>

Italian flood (Monterosso) - <http://www.youtube.com/watch?v=I6n4uxy6IzQ&feature=related>

Flood and rescue in Brazil - http://www.youtube.com/watch?v=j_ZfM06qY0k

Highway 1 landslide - <http://www.youtube.com/watch?v=Lwn-7PBZypI&feature=related>

Extreme ice survey glacier time lapse - http://www.extremeicesurvey.org/index.php/new_gallery/timelapse_71/
http://www.extremeicesurvey.org/index.php/new_gallery/timelapse_121/
http://www.extremeicesurvey.org/index.php/new_gallery/timelapse_162/

DIVISION AWARDS

Distinguished Practice Award

The Distinguished Practice Award recognizes outstanding individuals for their continuing contributions to the technical and/or professional stature of engineering geology. The 2011 award was given to **Gardiner W. Cross**.



Meritorious Service Award

The Meritorious Awards are for outstanding service to the Engineering Geology Division. In 2011 there were two awards:

J. David Rogers – for support to the Division over a number of years

Jerome V. DeGraff – as newsletter editor for the last 13 years, and other support to the Division and GSA



Roy J. Shlemon Scholarships

These awards are given to graduate students whose thesis research is judged to be outstanding. The 2011 recipient is:

Daniel R. Pratt - Colorado School of Mines

E.B. Burwell Award

The Edward Burwell, Jr., Award, established by the Division in 1968, honors the memory of one of the founding members of the Division and the first chief geologist of the U.S. Army Corps of Engineers. This award is made to the author or authors of a published paper of distinction that advances knowledge concerning principles or practice of engineering geology, or of related fields of applied soil or rock mechanics where the role of geology is emphasized. The 2011 award was given to **Lynn Highland and Peter Bobrowski** for their publication "The Landslide Handbook – A Guide to Understanding Landslides," published as USGS Circular 1325, available online at <http://pubs.usgs.gov/circ/1325/>. Award citation and response may be found at <http://www.geosociety.org/awards/divisions.htm#burwell>.



Richard H. Jahns Distinguished Lecturer

The Richard H. Jahns Distinguished Lectureship was established in 1988 by the Engineering Geology Division and the Association of Engineering Geologists, jointly, to commemorate him and to promote student awareness of engineering geology through a series of annual lectures at academic institutions. The named lecturer for 2012 is **Dr. Scott Burns**. To learn more or to schedule a lecture, please visit:

<http://www.aegweb.org/i4a/pages/index.cfm?pageID=5541>



BULLETIN BOARD

AEG Annual Meeting

Salt Lake City, Utah – 15-23 Sept.
<http://www.aegweb.org>

Other Meeting of Interest

25-29 March, Geo-Institutue of ASCE:
[Geo-Congress 2012](#), Oakland, CA

10-13 April, [EERI 2012 Annual Meeting and National Earthquake Conference](#), Memphis, TN

7-10 May, [2012 Highway Geology Symposium](#), Redding, CA

2-8 June, [11th International / 2nd North American Symposium on Landslides](#), Banff, Alberta

24-27 June, [46th US Rock Mechanics / Geomechanics Symposium](#), Chicago, IL

20-21 September, [International Symposium on Coastal Engineering Geology](#), Shanghai, China

GSA Regional Meetings

Northeastern
Hartford, Connecticut - 18-20 March
<http://www.geosociety.org/Sections/ne/2012mtg/>

North-Central
Dayton, Ohio – 23-24 April
<http://www.geosociety.org/Sections/nc/2012mtg/>

South-Central
Alpine, Texas - 8-9 March
<http://www.geosociety.org/Sections/sc/2012mtg/>

Southeastern
Asheville, North Carolina – 1-2 April
<http://www.geosociety.org/Sections/se/2012mtg/>

Cordilleran
Queretaro, Mexico – 29-31 March
<http://www.geosociety.org/Sections/cord/2012mtg/>

Rocky Mountain
Albuquerque, New Mexico – 9-11 May
<http://www.geosociety.org/Sections/rm/2012mtg/>

GSA National Meetings

2012 - Charlotte, NC: 4–7 November
2013 - Denver, CO: 27–30 October
2014 - Vancouver, BC, Canada: 19–22 October
2015 - Baltimore, MD: 1–4 November

From the Editor ...

I really hope this issue was informative and useful. If you have any comments, suggestions, or ideas for columns or articles, please contact me at psanti@mines.edu. I need your input to make the newsletter valuable!

Paul Santi, Editor
The Engineering Geologist



Engineering Geology Division Contacts

2011-12 Management Board

Chair: Bill Schulz (wschulz@usgs.gov)
Vice-Chair: Norm Levine (levinen@cofc.edu)
Secretary: Dennis Staley (dstaley@usgs.gov)
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(bill.burns@dogami.state.or.us)
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GSA Sectional Meeting Division Coordinator
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Richard H. Jahns Distinguished Lecturer Award
Bill Schulz
Norm Levine
(Jennifer Bauer and Matt Morris, AEG Representatives)

Roy J. Shlemon Scholarship Awards Committee
Robert A. Larson, Chair
Scott Burns
Jerome V. DeGraff
Betsy Mathieson
Roy J. Shlemon

Division Awards Committee

Bill Schulz, Chair
Norman Levine
Dennis Staley

Nominations Committee

John Jens, Chair
Dave Rogers
Abdul Shakoor

GSA Joint Technical Program Committee

Norm Levine
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Terry West, Co-Chair
Paul Santi
John Keefer
Abdul Shakoor
Chester Watts
John Williams

Student Paper Awards Committee

Scott Burns, Chair
Terry West
Jerry Higgins



2011-12 EEGD Management Board (not pictured,
Dennis Staley)

THE ENGINEERING GEOLOGIST

The Engineering Geologist is a publication of the Engineering Geology Division of the Geological Society of America. It is issued twice a year, to communicate news of interest to members of the Division. Issues of the newsletter may be accessed at:
<http://rock.geosociety.org/egd/index.html>.

Contributions to The Engineering Geologist are most welcome, and should be directed to the Editor. Submission as Word documents or jpg photographs is most expedient.

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