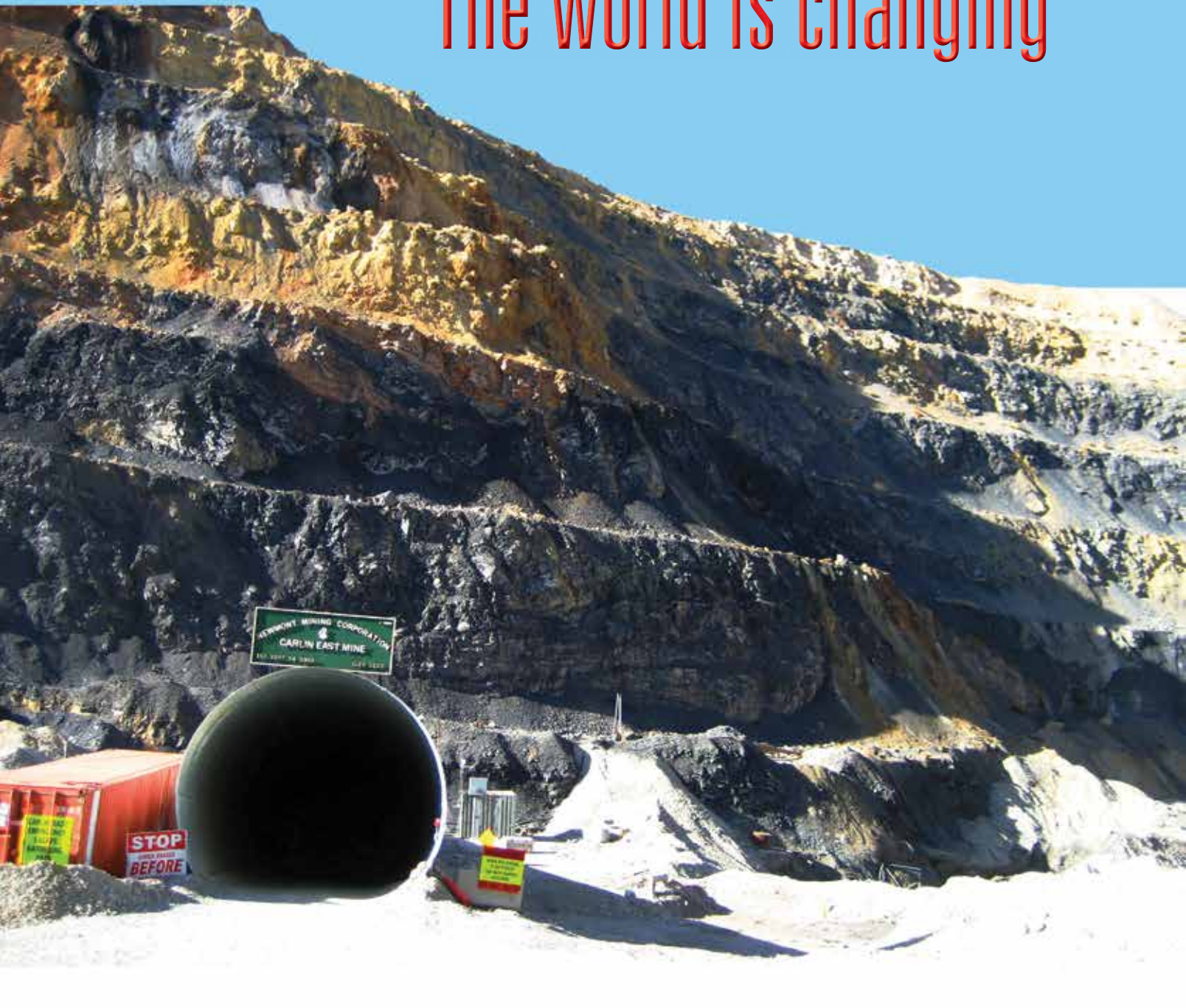


GSA TODAY

A PUBLICATION OF THE GEOLOGICAL SOCIETY OF AMERICA®

The world is changing



SCIENCE EDITOR

OPENINGS

2017

GSA is soliciting applications and nominations for science co-editors for the journals *Geology* and *Lithosphere* with four-year terms beginning 1 January 2017. *Geology* has been ranked by the Journal Citation Reports (JCR) as the #1 geology journal for the ninth year in a row, and up-and-coming *Lithosphere's* impact factor has increased 4 out of the 5 years it has been ranked by the JCR.

POSITIONS AVAILABLE

The research interests listed would best complement those of the continuing editors. Note that candidates should not feel they must have expertise in every area listed; however, editors may need to handle papers outside of their main disciplines.

GEOLOGY (position 1) geomorphology/surface processes, neotectonics, tectonophysics, geodynamics, planetary geology, volcanology

GEOLOGY (position 2) seismology, structural geology, tectonics, numerical modeling of earth processes, microstructure, rock mechanics, geofluids, planetary geology

LITHOSPHERE deformation, geodynamics, geophysics, paleomagnetism, Precambrian geology, structural geology, tectonics, neotectonics, tectonophysics, geochronology

Geology ▶ position 1

Geology ▶ position 2

Lithosphere ▶ 1 position

INTERESTED?

- ▶ Please submit a curriculum vitae and a letter describing why you are suited for the position to Jeanette Hammann, jhammann@geosociety.org.
- ▶ To nominate another, submit a nomination letter and the person's written permission and CV.

Editors work out of their current locations at work or at home. The positions are considered voluntary, but GSA provides an annual stipend and funds for office expenses.

DEADLINE Nominations or applications received by 15 February 2016 will be given first consideration.

A SUCCESSFUL EDITOR WILL HAVE

- ▶ a broad interest and experience in geosciences, including familiarity with new trends;
- ▶ international recognition and familiarity with many geoscientists and their work;
- ▶ a progressive attitude and a willingness to take risks and encourage innovation;
- ▶ experience with online manuscript systems and the ability to make timely decisions; and
- ▶ a sense of perspective and humor.

GSA TODAY

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Featured Article

2015 GSA PRESIDENTIAL ADDRESS

4 The world is changing

Jonathan G. Price

Cover: View of the Carlin East pit and portal 2000, Newmont Mining Corporation, Nevada, USA, one of the top gold-mining areas in the world. See related article, p. 4–10.



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Errata:

In the June 2015 *GSA Today* Groundwork article (v. 25, no. 6, p. 42–43) Louise H. Kellogg's middle initial was listed as "K" instead of "H".

In the December 2015 *GSA Today* science article (v. 25, no. 12, p. 4–10), "Imaging spectroscopy of geological samples and outcrops: Novel insights from microns to meters," by Rebecca N. Greenberger et al., the scale bars for Figure 2 were inadvertently removed. The corrected figure is on p. 50. *GSA Today* regrets this error.

The world is changing

Jonathan G. Price, LLC, 2210 Andromeda Way, Reno, Nevada 89509, USA

The world is changing. Our science is increasingly global, as we recognize the challenges of understanding interconnected Earth systems, meeting the rising global demand for mineral and energy resources, handling tradeoffs regarding sustainable development, and reducing the risks of natural disasters that impact the global economy. The geosciences are vital to meeting these societal challenges. The future is bright for the geosciences, from many perspectives.

Demand is high for nearly every mineral and energy resource. This high demand provides many opportunities for geoscientists to contribute throughout the life cycles of these resources (from exploration and mining to reclamation and recycling) and to continually improve environmentally responsible and economically sustainable extractive activities.

Global production of copper (Fig. 1) illustrates the high demand. Copper is vital in modern society, primarily as a conductor of electricity. Demand is high in part because the world population continues to rise and in part because per capita consumption is also rising (illustrated in Fig. 1 as annual mine production divided by population). More people want the conveniences that electricity provides—lighting, heating, motors, refrigerators, computers, etc. Since 1900, world population has increased approximately four-fold, whereas copper production has increased by a factor of 38, and per capita consumption has risen nine-fold. Although some ups and downs (due to recessions and wars) in production are apparent, the trends are clearly toward more copper mined and more use per person each year.

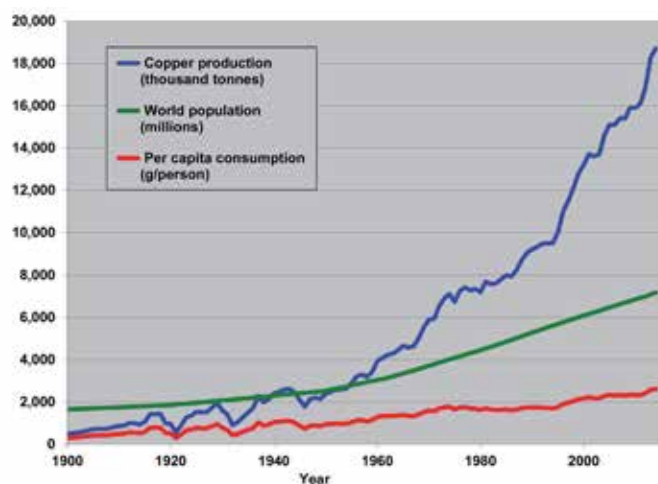


Figure 1. Annual global copper production, 1900–2014 (production data from U.S. Geological Survey and U.S. Bureau of Mines; population data from U.S. Central Intelligence Agency; updated from Price, 2013).

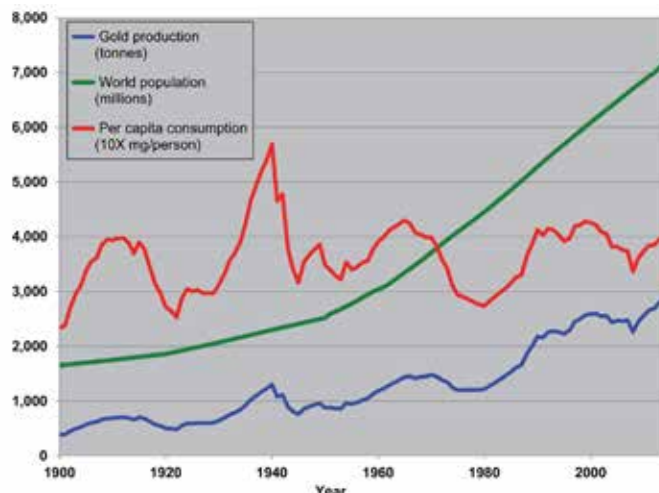


Figure 2. Annual global gold production, 1900–2014 (production data from U.S. Geological Survey and U.S. Bureau of Mines; population data from U.S. Central Intelligence Agency; updated from Price, 2013).

A somewhat similar situation is illustrated by gold production (Fig. 2). Although gold has many industrial uses (vital for conducting electricity in computers and cell phones and in reflecting heat), its primary use is as money, either in the form of bullion, coins, or, in much of the world, jewelry. Since 1900, gold production has increased by a factor of seven, and per capita consumption has fluctuated but overall increased by a factor of about two.

Mine production of gold in 2014 reached the historically high amount of 2,860 metric tons, according to the U.S. Geological Survey (2015). For the geological community, this is a staggering amount. In comparison, the Carlin trend in Nevada (Fig. 3), one of the top gold-mining areas in the world, has produced ~2,500 metric tons of gold (worth approximately US\$100 billion at last year's average price) in its entire history (including modern-day production after the discovery of the Carlin deposit in 1961). Assuming that mine production, from hundreds of mines throughout the world, continues at this rate, geoscientists will need to find the equivalent of at least one new Carlin trend each year to keep up with global demand.

We are in the midst of the biggest gold-mining boom in history, both globally (Fig. 2) and in the United States (Fig. 4). The current boom has exceeded previous booms in terms of total production, peak annual production, and longevity. Yet the world of gold mining has changed. For decades the Witwatersrand in South Africa dominated global gold production, but in 2007, China overtook South Africa to become the number 1 producer (Fig. 5). China is the world's most populous country, with 19% of the global population (Fig. 6), and if one assumes even geographic distribution of mineral resources, one might expect China to produce roughly 19% of most commodities. China's growth in the last decade has



Figure 3. Photograph of the Carlin East pit and portal in 2000, Newmont Mining Corporation, Nevada, USA.

been dramatic. To meet its demand for mineral resources needed for domestic infrastructure, domestic consumption, and exports of products, China far exceeds 19% of global production for many mineral commodities (Fig. 6). That is, the world of mining has changed, with China far exceeding other countries in production.

China also leads the world in coal production, with 46% of the global total in 2013. Like most of the other mineral resources, global annual coal production has been rising in recent years (Fig. 7), largely due to China's demand. Coal is used primarily in the generation of electricity, but metallurgical coal is also used in the production of steel, for which China produced 50% of the global supply in 2014. Annual global coal production (~7.8 billion metric tons in 2013) is significant in terms of both impacts to the land and to the atmosphere. Assuming an average coal-seam thickness of 3 m (Fig. 8), the global amount of coal production would cover an area of ~1860 km². There are indications that China is slowing down its coal production, in part due to the health hazards of air pollution. With changing technology in energy production, it is likely that we will one day see a peak in coal production, much like the peak in flint production (Fig. 9), which was caused by technological advances.

Climate is changing, with many opportunities for geoscientists to contribute to mitigation and adaptation. It seems clear that the burning of coal and other fossil fuels is contributing to the

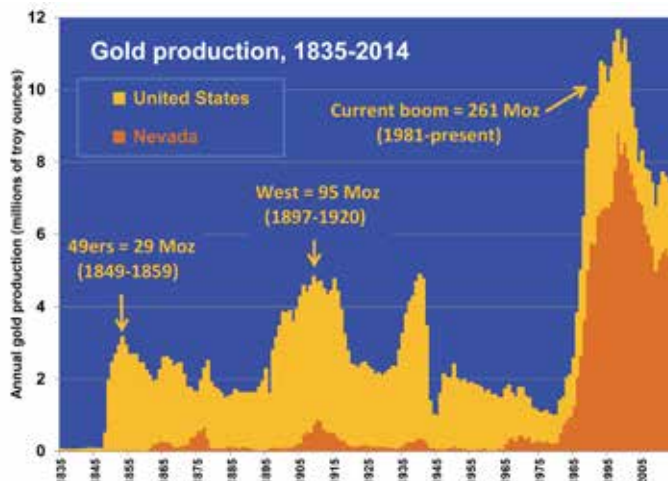


Figure 4. Gold production in the United States and in Nevada, 1835–2014 (data from Dobra, 2002, U.S. Geological Survey, U.S. Bureau of Mines, and Nevada Bureau of Mines and Geology; updated from Price, 2013).

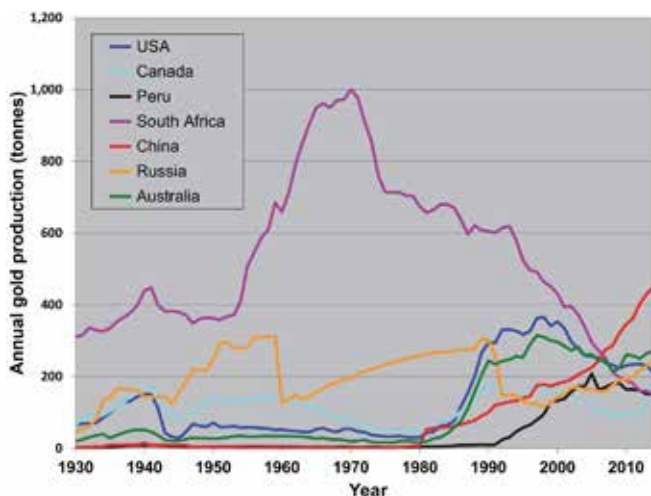


Figure 5. Annual gold production by major producing countries, 1930–2014 (data from U.S. Geological Survey and U.S. Bureau of Mines; updated from Price, 2013).

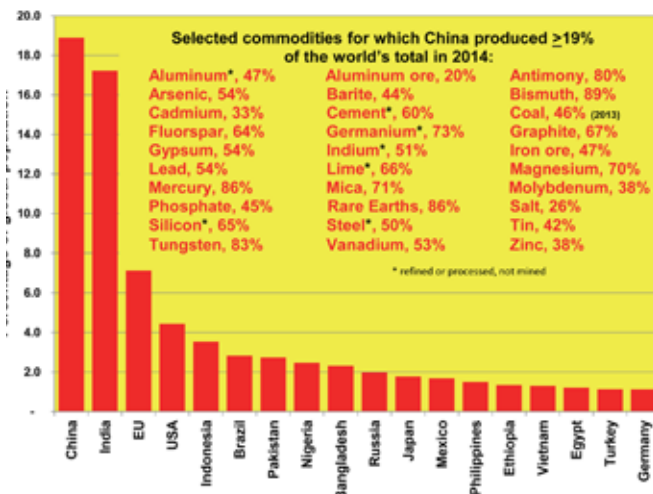


Figure 6. Most populous countries and China's percentage of global production for selected commodities (data from U.S. Geological Survey, U.S. Department of Energy, and U.S. Central Intelligence Agency; EU—European Union; updated from Price, 2013).

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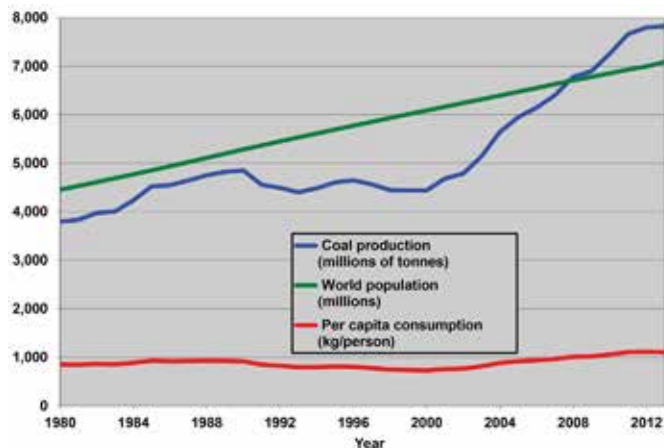


Figure 7. Annual global coal production, 1900–2013 (production data from U.S. Department of Energy and World Coal Association; population data from U.S. Central Intelligence Agency).

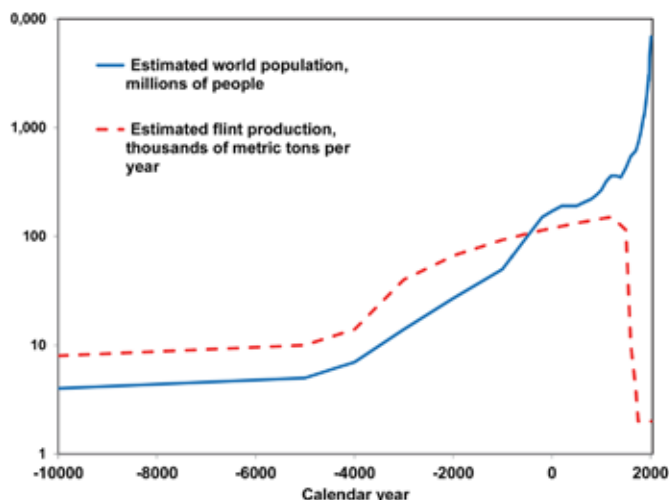


Figure 9. Estimated world population and production of flint over time, illustrating peak flint production (from Price, 2013).



Figure 8. Coal seams near Healy, Alaska, USA, 1999. Seams as thick as 3 m are not uncommon in better coal fields.

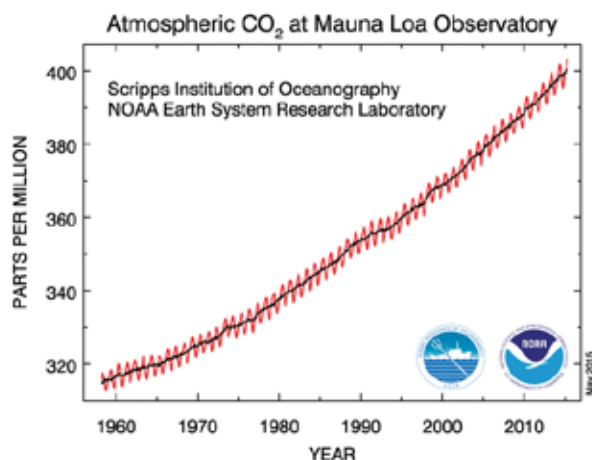


Figure 10. Rising CO₂ in the atmosphere (from National Oceanic & Atmospheric Administration, 2015).

observed rise in CO₂ in the atmosphere (Fig. 10). As estimated from the calculation below, the amount of CO₂ released from burning of coal in 2013 would have been enough, even with natural reduction from plant growth, rain, and other processes, to raise the concentration of CO₂ in the atmosphere by ~2.9 parts per million by volume (ppmv), a bit more than the recent global trend of CO₂ increasing ~2 ppmv per year.

$$(7.823 \times 10^{15} \text{ g coal burned in 2013}) \times (\sim 0.8 \text{ g C/g coal}) \\ \times (3.6642 \text{ g CO}_2/\text{g C}) / (5.15 \times 10^{21} \text{ g air in the atmosphere}) \\ \times (28.97 \text{ g air}) / (\text{mole air}) \times (1 \text{ mole CO}_2) / (44.0095 \text{ g CO}_2) \\ \times 10^6 \text{ ppmv CO}_2 / (\text{mole CO}_2 / \text{mole air}) = \sim 2.9 \text{ ppmv CO}_2 \\ \text{potentially added to the atmosphere}$$

Geoscientists will have opportunities to contribute to mitigation through exploration and development of the mineral resources needed for renewable and carbon-minimal energy production and more efficient use of electricity. Examples include uranium and

thorium for nuclear power; neodymium, iron, and boron for high-strength magnets in wind turbines; and terbium and europium in highly efficient fluorescent light bulbs. Geoscientists will also contribute to safe disposal of waste from energy production, including evaluating the safety of nuclear waste repositories and injection of CO₂ in permeable strata without generating damaging earthquakes.

As all geologists know, the world is literally changing. Plate tectonics slowly moves the ocean floors and continents. Erosion sculpts the landscape. Volcanism modifies climate. What has changed, though, in my lifetime, is that we are now measuring many of the changes directly. With the advent of the global positioning system (GPS), we are now able to accurately measure how the world is changing, with a myriad of applications from basic science to natural hazards. We are able to directly measure tectonic rates of change (Fig. 11), which are increasingly being used in earthquake-hazard assessment and communication to the public (Figs. 12 and 13). Such communication is slowly helping to

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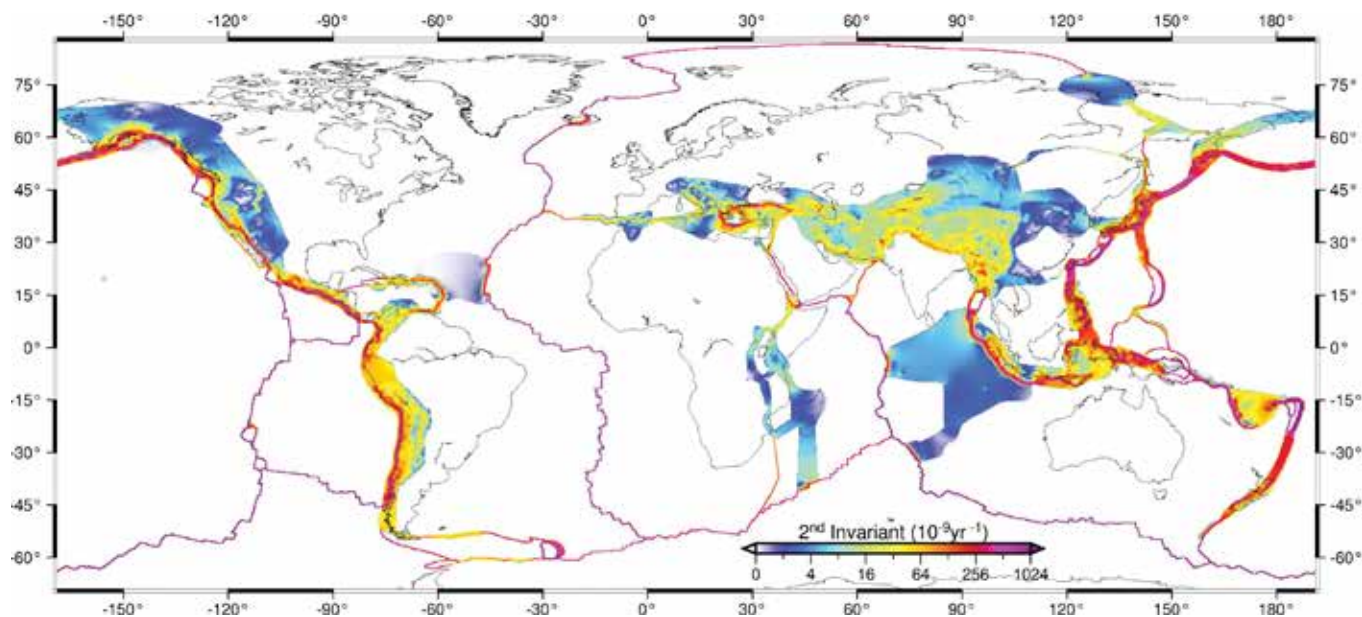


Figure 11. Global strain-rate model derived from over 22,000 horizontal GPS velocities; white areas assumed to be rigid plates (figure courtesy of Corné Kreemer, modified from Kreemer et al., 2014).

improve building codes and limit losses from collapse of unreinforced masonry buildings during earthquakes (Fig. 14). As technology evolves, we can expect many new discoveries and exciting new applications in geology.

The demographics of our science have evolved. Not only is the world changing, but we geoscientists are changing as well (Fig. 15). The American Geosciences Institute's Workforce Program (Wilson, 2014) reported on recent gains among women in all college majors (Fig. 16) and in the geosciences (Fig. 17). The representation of women in the geosciences is approaching, but not quite at, the percentage in the population (at least in the U.S.). We have a long way to go, however, in terms of minorities in the geosciences (Fig. 18). Also, few statistics are available on the percentage of individuals with disabilities within our profession. To attract the best and brightest to our profession, we must have attractive career paths and opportunities for all people. I'm pleased that GSA actively supports opening the profession to all, through such programs as *On To the Future*, which is bringing students from underrepresented groups to our annual meetings.

Our profession is changing. Neuendorf et al. (2005) defined *geology* as "the study of the planet Earth, the materials of which it is made, the processes that act on those materials, the products formed, and the history of the planet and its life forms since its origin." They also defined *geologist* as "one who is trained in and works in any of the geological sciences." I am somewhat disappointed about the evolution of the terminology for geologists. What was once broadly labeled as a geologist became a "geological scientist," presumably partly to not offend some geophysicists and geochemists. We also use the term "Earth scientist," but that might offend some planetary scientists. We now promote the term "geoscientist." I actually prefer the label "geo." In the international mining business, geos include geophysicists, geochemists, structural geologists, economic geologists,

mineralogists, sedimentologists, stratigraphers, paleontologists, volcanologists, petrologists, environmental geologists, geological engineers, geotechnicians, etc.; and they work with biologists and other scientists, engineers, skilled laborers, and community-relations and business professionals to benefit society.

GSA has **Divisions**, but we work together on our mission to advance geoscience research and discovery, service to society, stewardship of Earth and the geosciences profession. Perhaps the word *Division* isn't the best term. It implies that we are divided, when so many of our issues, such as mining in an economically and environmentally acceptable manner, require multidisciplinary approaches. Maybe we need to change the name from Divisions to something else. Multiplications doesn't make sense, nor does Exponentials, but along those lines, perhaps Dimensions could be better. The string-theory physicists have about 10 dimensions. We have at least 18, the current number of GSA divisions (GSA¹⁸), or 20, if you add the Soils and International Interest Groups (GSA²⁰), or 90+, if you add the Associated Societies and their disciplinary, professional, and geographic dimensions (GSA⁹⁰⁺).

GSA's world is changing as well. A huge change, which will benefit our members, authors, the general public, and science, is the fact that our journals will be freely accessible on the Web upon publication, with *Geology* first in 2017.

Let's envision GSA and our science in the future journals. GSA publications will continue to be rigorously peer reviewed and edited. GSA publications will attract many of the best papers, books, and maps in the geological sciences. Electronic access will be available anywhere—in the office, lab, or field. We might even expect that the public will make sound decisions on the basis of our science. GSA publications will be accessible to everyone, and we will attract the best and brightest students from diverse backgrounds, thereby increasing the likelihood of meeting societal challenges.

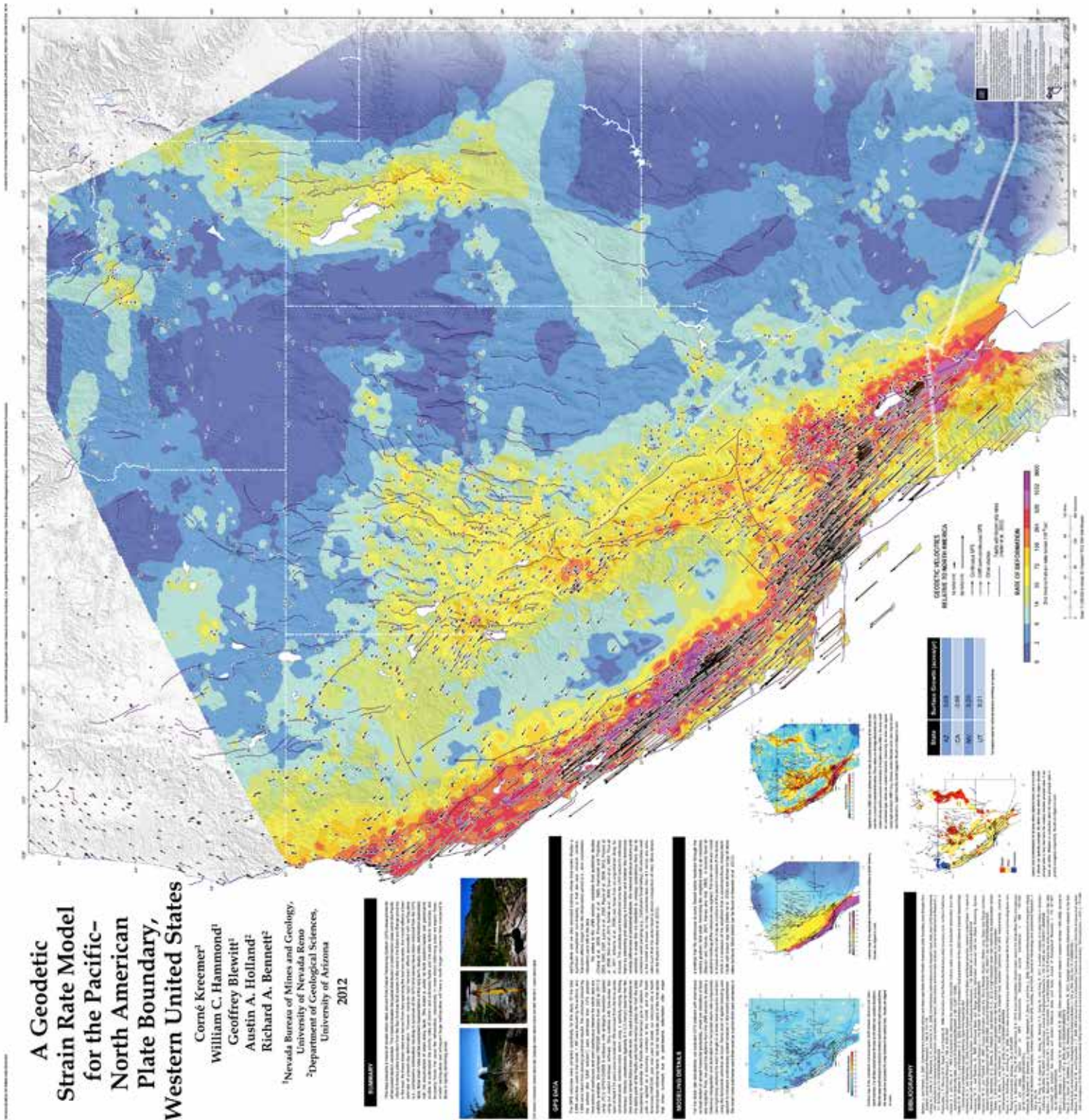


Figure 12. Geodetic strain in part of the western United States, information that is used, along with seismic and neotectonic data, in earthquake-hazard assessment and communication of hazard information to the public (warmer colors and longer arrows illustrate areas of relatively higher strain; figure from Kreemer et al., 2012). A full-size copy of this map is available at <http://pubs.nbgm.unr.edu/Geod-strain-rate-full-size-p/m178.htm>.

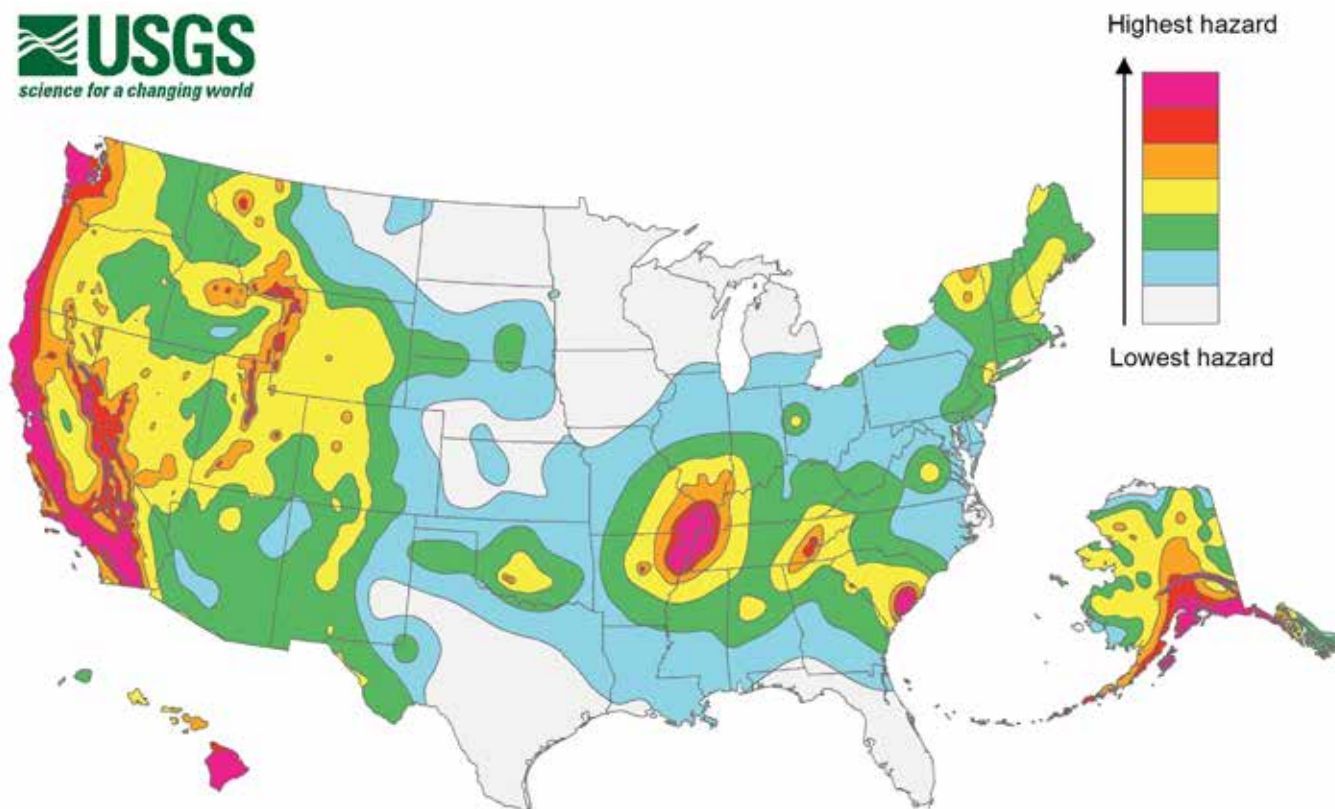


Figure 13. The U.S. Geological Survey integrates neotectonic (fault), earthquake, and geodetic data into its probabilistic seismic hazard analysis, which, in turn, is incorporated into model building codes. Image from U.S. Geological Survey (2014).



Figure 14. Front (left) and back (right) of an unreinforced masonry (URM) building damaged in the 21 Feb. 2008 Wells earthquake in Nevada, USA.



Figure 15. Illustration of the evolution of the modern geologist, *Geo sapiens* (graphic courtesy of Opal Adams, Enviroscientists).

Technological advances in such areas as multiple sensors on airborne drones, submersibles, and vehicles on other planets will permit geoscientists to go places previously considered impossible for many abled and disabled individuals, further expanding the inclusiveness of the geoscience profession. GSA's outreach efforts, including opportunities to visit informative exposures in the field, will also increase the accessibility of our exciting science to the public. GSA Meetings—annual, section, specialty/collaborative with other geo-societies, Penrose Conferences, Thompson Field Forums—will be attended in person and virtually, thereby reaching the global membership and global public. Research interest groups will flourish with the aid of virtual meetings and discussions. Language and cultural barriers will drop with the aid of translation technology.

In summary, the world is changing. The future is bright for geosciences from many perspectives, including mineral, energy, and water resources; adapting to and mitigating climate change and natural hazards; likely scientific discoveries; demographics and technologies that will attract the best and brightest; and GSA's dimensions.

It is an honor to serve as this year's GSA President. Thank you.

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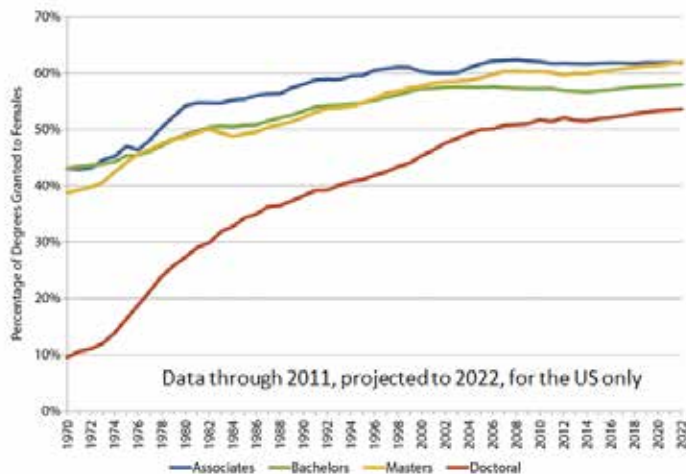


Figure 16. Percentage of degrees granted to women by degree level, all majors (illustration courtesy of the American Geosciences Institute; from Wilson, 2014).

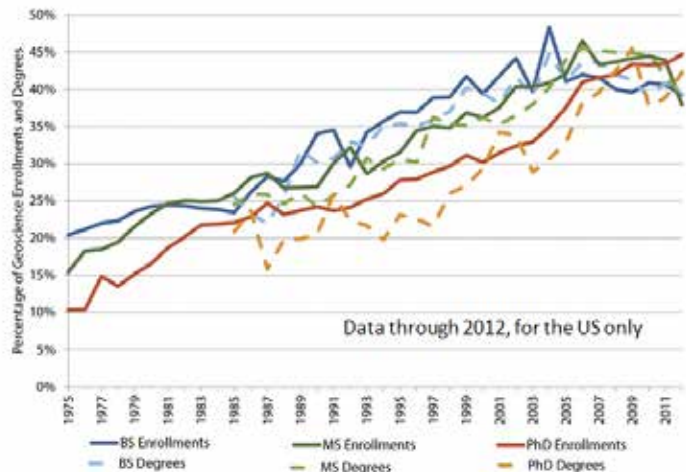


Figure 17. Participation of women in geoscience programs (illustration courtesy of the American Geosciences Institute; from Wilson, 2014).

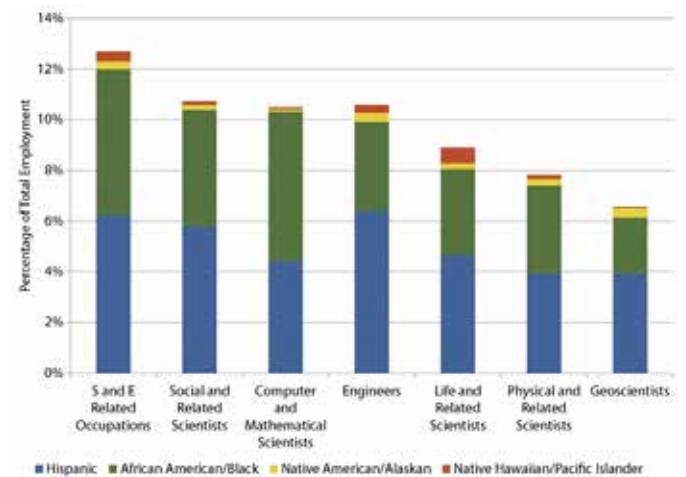


Figure 18. Percentage of underrepresented minorities in geoscience and other science and engineering occupations (illustration courtesy of the American Geosciences Institute; from Wilson, 2014).

Call for Proposals



25-28 SEPTEMBER

GSA2016

Denver, Colorado, USA

Technical Session Proposals

Deadline: 1 Feb. 2016

Help ensure that your area of research and expertise is represented in this year's technical program. Individuals and geoscience organizations are welcome to suggest topics and submit proposals for both **Topical Sessions** and **Pardee Keynote Symposia**. Pardee Symposia are high-profile sessions on significant scientific developments, with invited speakers only. Topical Sessions are a combination of invited and volunteered papers. Unique formats are allowed, but must be outlined in the proposal along with the technical support needs. Upload your proposal at <https://gsa.confex.com/gsa/2016AM/cfs.cgi>.

Short Course Proposals

Deadline: 1 Feb. 2016

Have something that your peers need to know? Lead a Short Course at the GSA 2016 Annual Meeting in Denver. Courses can be run to develop professional, teaching, and research skills at all levels. Proposal guidelines are available at www.geosociety.org/meetings/scProposals.htm or by contacting Jennifer Nocerino at jnocerino@geosociety.org.



Photo courtesy of the Denver Metro Convention & Visitors Bureau.



Annual Meeting & Exposition

1-4 NOVEMBER

GSA 2015

Baltimore, Maryland, USA



WRAP-UP

On behalf of all of the staff, volunteers, and Society leaders, I extend a hearty thank you to all who participated in the GSA 2015 Annual Meeting & Exposition in Baltimore. I especially recognize our organizing committee and meeting sponsors. Meeting memories: You'll find photos, media coverage, and links to GSA TV on the meeting website, community.geosociety.org/gsa2015/.

—Melissa Cummiskey, GSA Senior Director of Meetings & Events

General Chair: David A. Vanko

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Field Trip Co-Chairs: David K. Brezinski and Jeffrey P. Halka

Sponsorship Chair: David A. Vanko

K-12 Education Chair: Michael Passow

Special Events Chair: Michael S. Kelley

Student Committee: Hannah Susorney and Sophie Lehmann

GSA 2015 BY THE NUMBERS

Attendees: 7,400

Presentations by Students: 1,995

Countries Represented: 58

Field Trips: 29

Students & Early Career Professionals: 3,333

Short Courses: 15

On To the Future Scholars: 115

Exhibit Booths: 251

Abstracts Accepted: 4,709

App Downloads: 2,479

Technical Sessions: 342

Tweets: 1,258 tweeps used hashtag #GSA2015 nearly 4,500 times, reaching >5.8 million Twitter followers

Presentations by Professionals: 2,705

We look forward to seeing you at GSA 2016 on 25–28 September (note the unusually early date), in Denver, Colorado, USA. Remember: You make the meeting—and you still have time to propose a **technical session** or **short course** (1 Feb., see p. 11).



25-28 SEPTEMBER

GSA 2016

Denver, Colorado, USA

Learn more at

www.geosociety.org/meetings/2016

Thank You Sponsors!

Your support of The Geological Society of America's Annual Meeting & Exposition continues a tradition of more than 125 years of serving science and the profession. The Society appreciates your investment in the growth of current and future leaders in the geoscience community.

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The GSA Foundation is proud to continue its work in support of GSA and its programs.

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UPCOMING GSA PROGRAM DEADLINES

2016 STUDENT RESEARCH GRANTS

Submission deadline: 1 Feb. 2016 at 5 p.m. MST

GSA is proud to offer research grants to its highly qualified student members. The primary role of the GSA research grants program is to provide partial support of master's and doctoral thesis research in the geological sciences for graduate students enrolled in universities in the United States, Canada, Mexico, and Central America. In 2015, US\$723,570 was awarded to 391 graduate students (784 students applied), with an average grant of US\$1,851.

Students may receive a total of two GSA graduate student grants in their entire academic career, regardless of what program currently enrolled in. The maximum award per grant is US\$2,500. Students may be eligible for specialized awards, in which case the total funding awarded could be greater than US\$2,500.

The GSA student research grant application process is available online only; no paper applications or letters will be accepted. Apply online at www.geosociety.org/grants/gradgrants.htm. If you have questions, please call +1-303-357-1060, or e-mail awards@geosociety.org.



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GSA MEDALS, AWARDS & RECOGNITION

Deadlines are **1 Feb. 2016** unless otherwise noted. To learn more about the awards and the nomination process, go to www.geosociety.org/awards/aboutAwards.htm or contact GSA Grants and Awards at awards@geosociety.org, +1-303-357-1060; go to <https://rock.geosociety.org/forms/Awardform.asp> to submit your nomination.

2016 GSA Medals and Awards

- Penrose Medal
- Day Medal
- Young Scientist Award (Donath Medal)
- GSA Public Service Award
- Randolph W. "Bill" and Cecile T. Bromery Award for Minorities
- GSA Distinguished Service Award
- Doris M. Curtis Outstanding Woman in Science Award
- Geologic Mapping Award in Honor of Florence Bascom
- Honorary Fellow

GSA Fellowship

Elevation to GSA Fellowship is an honor bestowed on the best of our profession at each spring GSA Council meeting. **GSA Fellows** may support two nominees each year but only **one** as a primary nominator; **GSA members** who are not Fellows may be secondary nominators for up to **two** nominees. To nominate a member for GSA Fellowship, go to www.geosociety.org/members/fellow.htm.

2016 Post-Doctoral Research Awards

- Gladys W. Cole Memorial Research Award
- W. Storrs Cole Memorial Research Award

Learn more at www.geosociety.org/grants/postdoc.htm.

John C. Frye Environmental Geology Award

Nomination deadline: 31 March

In cooperation with the Association of American State Geologists and supported by endowment income from the GSA Foundation's John C. Frye Memorial Fund, this annual award recognizes the best paper on environmental geology published either by GSA or by a state geological survey.

Learn more at www.stategeologists.org/awards_honors.php?id=19&award_information=details.

UPCOMING GSA PROGRAM DEADLINES

OTHER AWARDS

American Geosciences Institute (AGI)

Deadline: 1 February

- AGI Medal in Memory of Ian Campbell
- AGI Marcus Milling Legendary Geoscientist Medal

Go to www.agiweb.org/direct/awards.html to submit your nominations.

National Awards

Nomination deadlines vary.

- William T. Pecora Award (sponsored by the U.S. Department of the Interior and NASA): <http://remotesensing.usgs.gov/pecora.php>
- National Medal of Science (presented by the President of the United States): www.nsf.gov/od/nms/medal.jsp

Travel Awards To NEGSA 2016

Application deadline: 5 February

Non-traditional students in the geosciences have the opportunity to apply for a generous travel award to attend the 2016 Northeastern Section Meeting, 21–23 March in Albany, New York, USA. Students who work full-time, are financially independent, or care for dependents while earning an undergraduate degree are highly encouraged to apply. Check the NEGSA website at www.geosociety.org/Sections/ne/2016mtg/ for details or contact Tahlia Bear at tbear@geosociety.org.

GEOCORPS™ AMERICA

Summer 2016

Application deadline: 19 February

GSA is now accepting applications for paid, short-term geoscience opportunities on public lands throughout the United States. All levels of geoscientists—students, educators, professionals, retirees, and others—are encouraged to apply.



Learn more at

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UPCOMING GSA PROGRAM DEADLINES

GSA DIVISION AWARDS

■ ARCHAEOLOGICAL GEOLOGY DIVISION

For more information, go to www.geosociety.org/arch/.

- **Rip Rapp Award:** Nominations due **15 February**; send materials to mandel@ku.edu. George “Rip” Rapp, Jr., was one of the founding members of this Division and generously established an award fund with the GSA Foundation. Nominations should include a biographical sketch, a statement of outstanding achievements, and a selected bibliography of the nominee.
- **Richard Hay Student Paper/Poster Award:** Nominations due **20 August**; send materials to gsa.agd@gmail.com. Richard Hay had a distinguished career in sedimentary geology, mineralogy, and archaeological geology. The award is in the form of a travel grant for a student (undergraduate or graduate) presenting a paper or poster at GSA’s annual meeting. The grant is competitive and is awarded based on the evaluation of the scientific merit of the research topic and the clarity of an expanded abstract prepared by a student for presentation in the Division’s technical session.
- **Claude C. Albritton, Jr., Award:** Nominations due **5 March**; send materials to gsa.agd@gmail.com. This fund (managed by the GSA Foundation) provides research scholarships and fellowships for graduate students in archaeology or the earth sciences. Recipients must have interest in (1) achieving a master’s or Ph.D. degree in earth sciences or archaeology; (2) applying earth-science methods to archaeological research; and (3) a career in teaching and academic research. Awards in the amount of US\$650 are given in support of thesis or dissertation research, with emphasis on field and/or laboratory work. The Division also invites contributions to this award fund.

■ ENERGY GEOLOGY DIVISION

- **Gilbert H. Cady Award:** Nominations due **28 February**; send materials to [Jen O’Keefe at j.okeefe@moreheadstate.edu](mailto:Jen O’Keefe@j.okeefe@moreheadstate.edu). This award recognizes outstanding contributions in the field of coal geology that advance the science both within and outside of North America. Learn more at www.uky.edu/KGS/coal/GSA/awards.htm.

■ ENVIRONMENTAL AND ENGINEERING GEOLOGY DIVISION

- **E.B. Burwell, Jr., Award:** Nominations due **1 February**; send materials to [Dennis Staley at dstaley@usgs.gov](mailto:Dennis Staley@dstaley@usgs.gov). This award 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. It recognizes the author or authors of a published paper of distinction that advances knowledge concerning principles or practice of engineering geology or of related fields, such as applied soil or rock mechanics, where the role of geology is emphasized. The paper must (1) deal with the engineering geology or a closely related field, and (2) have been

published no more than five years prior to its selection. There are no restrictions on the publisher of the paper. Learn more at <http://rock.geosociety.org/egd/Awards.html#Burwell>.

- **Richard H. Jahns Distinguished Lecturer:** Nominations due **28 February**; submit materials to [Matt Crawford at mrcrawford@uky.edu](mailto:Matt Crawford@mrcrawford@uky.edu). This lectureship is awarded to an individual who through research or practice has made outstanding contributions to the advancement of environmental and/or engineering geology. The awardee will speak on topics of earth processes and the consequences of human interaction with these processes, or the application of geology to environmental and/or engineering works. Award funds are administered by the GSA Foundation. Learn more at <http://rock.geosociety.org/egd/Awards.html#Jahns>.

■ GEOPHYSICS DIVISION

- **George P. Woollard Award:** Nominations due **15 February**; send materials to Nick Schmerr, nschmerr@umd.edu. Please provide the nominee’s name, contact information, and a short paragraph statement on the nominee’s qualifications, including a short summary of their specific work or outcomes and how these have contributed to geology. A curriculum vitae helps, but is not required. This award recognizes outstanding contributions to geology through the application of the principles and techniques of geophysics. A highlight of the presentation is the honorary George P. Woollard Technical Lecture by the recipient before the award ceremony. Award funds are administered by the GSA Foundation. Learn more at www.geosociety.org/divisions/geop/Awards.htm.

■ GEOSCIENCE EDUCATION DIVISION

- **Biggs Award for Excellence in Earth Science Teaching:** Nominations due **15 February**; submit nominations to <http://community.geosociety.org/gedivision/news/awards/biggsaward>. Any questions should be directed to GEOEDGSA@gmail.com. This award recognizes innovative and effective teaching in college-level earth science. Earth-science instructors and faculty members from any academic institution engaged in undergraduate education who have been teaching full-time for 10 years or fewer are eligible (part-time teaching is not counted in this requirement). Both peer- and self-nominations will be accepted. This award is administered by the GSA Foundation. An additional travel reimbursement is also available to the recipient to enable him or her to attend the award presentation at the GSA Annual Meeting. Learn more at <http://community.geosociety.org/gedivision/news/awards/biggsaward>.

■ HISTORY AND PHILOSOPHY OF GEOLOGY DIVISION

For more information, go to <http://community.geosociety.org/histphildiv/awards#dsa>.

UPCOMING GSA PROGRAM DEADLINES

GSA DIVISION AWARDS

- **Mary C. Rabbitt History and Philosophy of Geology Award:** Nominations due **15 February**; send materials to Kathleen Lohff, kathylohff@msn.com. This award recognizes an individual's exceptional scholarly contributions of fundamental importance to understanding the history of the geological sciences. Achievements deserving of the award include, but are not limited to, publication of papers or books that contribute new and profound insights into the history of geology based on original research or a synthesis of existing knowledge. Nominators and nominees do not have to be members of the Division or of GSA. The nomination packet should include (1) a letter detailing the contributions that warrant the award; and (2) the nominee's current curriculum vitae, including name, title, affiliation, education, degrees, honors and awards, and major career events. Award funds are administered by the GSA Foundation.
- **Gerald M. and Sue T. Friedman Distinguished Service Award:** Nominations due **15 February**; send materials to Kathleen Lohff, kathylohff@msn.com. This award is presented for exceptional service in advancing the knowledge of the history and philosophy of the geological sciences. Nominators and nominees do not have to be members of the Division or of GSA. Service to the history and philosophy of geology may include, but is not limited to, the discovery of and making available rare source materials; comprehensive bibliographic surveys; organizing meetings and symposia on the history and philosophy of geology; and exceptional service to the Division. The nomination packet should include (1) a letter detailing the contributions that warrant the award; and (2) the nominee's current curriculum vitae including name, title, affiliation, education, degrees, honors and awards, and major career events. Funds for this award, made possible by a bequest from the estate of Mary C. Rabbitt, are administered by the GSA Foundation.
- **History and Philosophy of Geology Student Award:** Nominations due **15 June**; send materials to Kathleen Lohff, kathylohff@msn.com. This award in the amount of US\$1,000 recognizes excellence in a student paper to be given at GSA's annual meeting. Awards may also be given for second place. Oral presentations are preferred. Faculty advisors may be listed as second author, but not as the lead author of the paper. The proposed paper may be (1) on the history or philosophy of geology; or (2) a literature review of ideas for a technical work or thesis/dissertation; or (3) some imaginative aspect of the history or philosophy of geology we have not thought of before. Students should submit an abstract of their proposed talk and a 1,500–2,000 word prospectus. The Awards Committee will assist the winner(s) with an abstract to facilitate presentation according to GSA standards. Currently enrolled undergraduates and graduate students are eligible, as are students who received their degrees at the end of the fall or spring terms immediately preceding GSA's annual meeting. It is open to all students regardless of discipline, provided the proposed paper is related

to the history or philosophy of a geological idea or person. Funds for the award, made possible by a bequest from the estate of Mary C. Rabbitt, are administered by the GSA Foundation.

■ HYDROGEOLOGY DIVISION

Nominations for the following four awards are due **1 February**; send materials to gsa.hydro.nominations@gmail.com.

- The **O.E. Meinzer Award** recognizes the author or authors of a publication or body of publications that have significantly advanced the science of hydrogeology or a closely related field. The nomination must cite the publication(s) on which the nomination is based and describe the role of the publication(s) in advancing hydrogeology or a closely related discipline. Inclusion of up to three additional third-party letters in support of the nomination is encouraged. If you have questions, please contact David Parkhurst at dlpark@usgs.gov. For more information, go to <http://gsahydrogeology.org/OEMeinzer.htm>.
- The **George Burke Maxey Distinguished Service Award** will be made in recognition of distinguished personal service to the hydrogeology profession and to the Hydrogeology Division, based on a history of sustained creditable service. Please submit a letter of nomination that describes the distinguished service that warrants the nomination. Supporting letters are helpful but not required. If you have questions, please contact Brian Katz at brian.katz@dep.state.fl.us. For more information, go to <http://gsahydrogeology.org/DistinguishedService.htm>.
- The **Kohout Early Career Award** will be presented to a distinguished early career scientist (35 years of age or younger throughout the year in which the award is to be presented or within 5 years of receiving their highest degree or diploma) for outstanding achievement in contributing to the hydrogeologic profession through original research and service and for the demonstrated potential for continued excellence throughout their career. The nomination package must include (1) at least one letter of nomination with a description of the significant contributions or accomplishments; (2) a copy of the nominee's curriculum vitae with complete bibliography; and (3) at least four supporting letters. If you have questions, please contact Steve van der Hoven at sjvanderhoven@gmail.com. For more information, go to <http://gsahydrogeology.org/Kohout.htm>.
- The **Birdsall-Dreiss Distinguished Lecturer** is selected based on outstanding contributions to hydrogeology or a closely related field through original research and public communication, as well as a potential for continued contributions to the profession. To nominate, include at least one letter of nomination, a copy of the nominee's curriculum vitae, and at least two supporting letters describing the significant contributions or accomplishments constituting the basis for the nomination. If you have questions, please contact Dani Or at dani.or@env.ethz.ch. For more information, go to <http://gsahydrogeology.org/BirdsallDreiss.htm>.

UPCOMING GSA PROGRAM DEADLINES

GSA DIVISION AWARDS

■ MINERALOGY, GEOCHEMISTRY, PETROLOGY, AND VOLCANOLOGY (MGPV) DIVISION

Nominations due **15 July**. For each of the following awards, send materials to J. Alex Speer, Mineralogical Society of America, 3635 Concorde Pkwy Suite 500, Chantilly VA 20151-1110, USA; jaspeer@minsocam.org. MGPV awards emphasize achievements in geologic and multidisciplinary approaches. Geologic work is by nature generalistic and has an important field component, with Earth as the natural laboratory. Send (1) a cover letter from an MGPV Division member, no longer than three pages, summarizing the nominee's most important accomplishments in geologic approaches to mineralogy, geochemistry, petrology, and/or volcanology. Special attention should be paid to describing how the nominee's published work demonstrates field-based multidisciplinary geologic accomplishments of a ground-breaking nature. The letter should include the name, address, and contact information of the nominator as well as from whom letters of support can be expected; (2) a curriculum vitae of the nominee; and (3) three letters of support that can be either from members or non-members of GSA or the MGPV Division. For more information, go to www.geosociety.org/divisions/mgpv/awards.htm.

- The **MGPV Distinguished Geologic Career Award** will go to an individual who, throughout his or her career, has made distinguished contributions in one or more of the following fields of research: mineralogy, geochemistry, petrology, and/or volcanology, with emphasis on multidisciplinary, field-based contributions. Nominees need not be citizens or residents of the United States, and GSA membership is not required.
- The **MGPV Early Career Award** will go to an individual near the beginning of his or her professional career who has made distinguished contributions in one or more of the following fields of research: mineralogy, geochemistry, petrology, and/or volcanology, with emphasis on multidisciplinary, field-based contributions. Nominations are restricted to those who are within eight years of receiving their final degree. For example, awards decided before 31 Dec. 2015 will include all candidates whose final degree was awarded no earlier than 1 Jan. 2008. Extensions of up to two years will be made for nominees who have taken career breaks for family reasons or caused by serious illness. Nominees need not be citizens or residents of the United States, and GSA membership is not required.

■ QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION

- **Kirk Bryan Award for Research Excellence:** Nominations due **15 January**. Send materials to Sarah Lewis, sarah.lewis@oregonstate.edu. This award will go to the author or authors of a published paper of distinction that advances the science of

geomorphology or some related field, such as [Pleistocene] Quaternary geology. The paper must fulfill the following requirements: (1) it will deal with geomorphology or with a bordering field related to geomorphology; and (2) it will have been published not more than five years prior to its selection for the award. Nominations should include (1) a letter (one to three pages long) by the chief nominator outlining the significance and importance of the nominated publication; (2) a copy of the publication; (3) reviews of the publications that have appeared in journals, newsletters, or books (if any); and (4) one or more letters from other supporters of the nomination.

- **Farouk El-Baz Award for Desert Research:** Nominations due **1 April**; send materials to Anne Chin, anne.chin@ucdenver.edu, including (1) a statement of the significance of the nominee's research; (2) a curriculum vitae; (3) letters of support; and (4) copies of no more than five of the nominee's most significant publications related to desert research. This award recognizes excellence in desert geomorphology research worldwide. It is intended to stimulate research in desert environments by recognizing an individual whose research has significantly advanced the understanding of the Quaternary geology and geomorphology of deserts. Any scientist from any country may be nominated. Neither nominators nor nominees need be GSA members; self-nomination is not permitted. Award funds are administered by the GSA Foundation.
- **Distinguished Career Award:** Nominations due **1 April**; send materials to Sarah Lewis, sarah.lewis@oregonstate.edu, including (1) a brief biographical sketch, (2) a statement of no more than 200 words describing the candidate's scientific contributions to Quaternary geology and geomorphology, (3) a selected bibliography of no more than 20 titles, and (4) a minimum of four letters from colleagues supporting the nomination. This award is presented annually to a Quaternary geologist or geomorphologist who has demonstrated excellence in their contributions to science. Neither nominators nor nominees need be GSA members; self-nomination is not permitted.

■ SEDIMENTARY GEOLOGY DIVISION

- **Laurence L. Sloss Award for Sedimentary Geology:** Nominations due **1 March**; send materials to Linda Kah, lckah@utk.edu, including (1) a cover letter describing the nominee's accomplishments in sedimentary geology and contributions to GSA, (2) a curriculum vitae, and (3) any additional supporting letters. Nomination materials remain active for three years. This award is given annually to a sedimentary geologist whose lifetime achievements best exemplify those of Larry Sloss (i.e., achievements that contribute widely to the field of sedimentary geology and service to GSA). Award funds are administered by the GSA Foundation. Learn more at http://rock.geosociety.org/sed/SGD_Awards2.html#Sloss.

UPCOMING GSA PROGRAM DEADLINES

GSA DIVISION AWARDS

■ SEDIMENTARY GEOLOGY DIVISION/ STRUCTURAL GEOLOGY AND TECTONICS DIVISION JOINT AWARD

- **Stephen E. Laubach Structural Diagenesis Research Award:** Nominations due **1 April**; for more information, go to <http://rock.geosociety.org/sgt/Laubach.htm>. This award promotes research that combines structural geology and diagenesis and also curriculum development in structural diagenesis. It addresses the rapidly growing recognition that fracturing, cement precipitation and dissolution, evolving rock mechanical properties, and other structural diagenetic processes can govern recovery of resources and sequestration of material in deeply buried, diagenetically altered and fractured sedimentary rocks. The award also highlights the growing need to break down disciplinary boundaries between structural geology and sedimentary petrology, as exemplified by the work of Dr. Stephen Laubach and colleagues. Graduate students, postgraduates, and faculty-level researchers are eligible. Note that the application includes a budget page; we anticipate giving one award of US\$2500 in 2016.

■ STRUCTURAL GEOLOGY AND TECTONICS DIVISION

- **Career Contribution Award:** Nominations due **1 March**; for more information, go to <http://rock.geosociety.org/sgt/CareerAward.htm>. This award is for an individual who, throughout his or her career, has made numerous distinguished contributions that have clearly advanced the science of structural geology or tectonics. Nominees do not need to be U.S. citizens or residents, and GSA membership is not required. Nominations should include (1) name of nominee, present institutional affiliation, and address; (2) summary statement of nominee's major career contributions to the science of structural geology and tectonics; (3) selected key published works of the nominee; and (4) name and address of nominator.
- **Outstanding Publication Award:** Nominations due **1 March**; for more information, go to <http://rock.geosociety.org/sgt/BestPaperAward.htm>. This award is given annually for a published work (paper, book, or map) of exceptional distinction that clearly advances the science of structural geology or tectonics. Nominations should include (1) a full citation; (2) nomination (as short as a paragraph; letters or reviews may also be included); and (3) name and address of nominator.

35th IGC

Mentoring & Travel Grant Program

Cape Town, South Africa * 27 Aug.–4 Sept. 2016

Application deadline: 20 Feb.

GSA is accepting applications for the mentoring and travel grant program for the 35th International Geological Congress (IGC) in Cape Town, South Africa. Students and early career scientists (those within seven years of receiving their Ph.D.) are welcome to apply.

Applicants must be residents or citizens of the United States and be enrolled in, or employed at, a U.S. institution. Award max.: US\$3,500 per awardee. The online application and supplemental material must be received electronically no later than 20 Feb. Applicants will be notified of the results by 30 April.

In addition to the online form/résumé, the following supplemental information is required: (a) a cover letter addressing your reasons for attending the meeting and a prioritized budget of expenses; (b) proof of abstract submission and a copy of the submitted abstract; and (c) two letters of reference.

This program is organized in collaboration with the GSA Foundation, the U.S. National Committee for Geological Sciences (of the National Academy of Sciences), and the American Geosciences Institute.

Questions? Please contact Jennifer Nocerino at jnocerino@geosociety.org.



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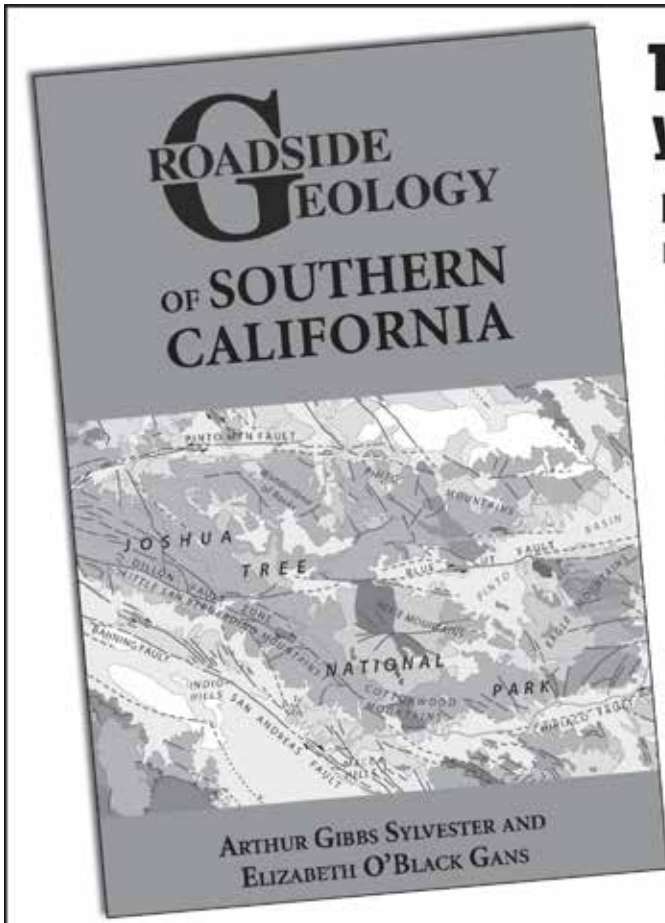
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Second Announcement

SOUTHEASTERN SECTION

65th Annual Meeting of the Southeastern Section, GSA
Columbia, South Carolina, USA
31 March–1 April 2016

www.geosociety.org/sections/se/2016mtg/



Photo courtesy of Columbia Metropolitan Convention & Visitors Bureau.

Ready to Rock Your World!

REGISTRATION

Early registration deadline: 29 February

Cancellation deadline: 7 March

REGISTRATION FEES (all fees are in U.S. dollars)

	Early		Standard	
	Full	1 Day	Full	1 Day
Professional member	\$220	\$130	\$250	\$155
Professional nonmember	\$240	\$155	\$275	\$175
Student member	\$85	\$65	\$100	\$75
Student nonmember	\$100	\$90	\$130	\$100
K–12 teacher	\$45	\$40	\$55	\$45
Guest/Spouse	\$45	n/a	\$55	n/a
Short Course/Field Trip only	\$40	n/a	\$45	n/a

ACCOMMODATIONS

Reservation deadline: 8 March

Blocks of rooms have been reserved at the Hyatt Place Columbia, 819 Gervais Street, Columbia, SC 29201, USA, +1-803-978-2013, and the Hampton Inn Columbia, 822 Gervais Street, Columbia, SC 29201, USA, +1-803-231-2000. Both venues are located in The Vista, within a short walking distance to the Columbia Convention Center. To make your reservations, please call the hotels and be sure to mention you are attending the GSA Southeastern Section meeting.

TECHNICAL PROGRAM

For more information, please see the meeting website.

Symposium

- S1. **Evolving Perspectives on Piedmont Geology: Terrane Studies, Structural Analyses, New Mapping, and Complementary Studies.**

Theme Sessions

- T1. **Gold Exploration in South Carolina:** Ken Gillon, James Berry, James Kellogg.
- T2. **New Insights on Crustal Structure and Geologic Evolution of the Southeastern U.S. Continental Margin:** Susie Boote, James H. Knapp.
- T3. **Surface Water–Groundwater Interactions and Biogeochemical Processes in the Coastal Zone:** Alicia Wilson, Tim Callahan.
- T4. **Groundwater Availability in the Atlantic Coastal Plain:** Bruce Campbell, Joe Gellici.
- T5. **Paleolimnological Reconstructions: New Insights from the Tried and True to the Unique and New:** Nathan M. Rabideaux, Chris Tidwell, Alex Simpson.
- T6. **Current Studies in Sedimentology and Stratigraphy:** Andrew Leier.
- T7. **Geohazards along the East Coast of the U.S.:** Robert Weiss.
- T8. **Issues in Environmental and Climate Education:** Pamela J.W. Gore, William Witherspoon.
- T9. **Evolution Teaching Practices and Data-Rich Research:** Frank Forcino, Rachel Salter.
- T10. **Ecohydrology:** Jeff Wilcox.
- T11. **Large Datasets and Interactive Visualizations in Undergraduate Research:** Steven Whitmeyer, Jeffrey Ryan.
- T12. **Coastal Processes and Geologic Framework: Insights from Geological and Geophysical Surveys across the Continental Margin:** Jenna C. Hill, Richard F. Viso.
- T13. **Synergistic Paleontology: The FOSSIL Project and Amateur Contributions to the Field:** Eleanor Gardner, Bruce MacFadden, Linda McCall, Chuck Ferrara, Lisa Lundgren.
- T14. **Fossil Vertebrates of the Southeastern United States:** Kathlyn M. Smith, Alexander K. Hastings, Jenny McGuire.
- T15. **Barrier Island Geology along the Southeast U.S. Coast: Contrasting Recent Change with Long-Term Evolution:** Antonio B. Rodriguez, Ethan J. Theuerkauf.
- T16. **Estuarine and Intertidal Sedimentary Processes and Environments as Geologic Archives of Coastal Change:** Clark Alexander, John M. Jaeger.

- T17. **Geology of the Southeastern Atlantic Continental Margin: A Poster Session with Cores, Rock Samples, and Coffee (Posters):** Kathleen M. Farrell, Will Doar, Joe Gellici.
- T18. **Coastal Resiliency, Storm-Damage Reduction, Navigation, and Other Applied Geological Studies or Projects Focused on the Land-Sea Transition:** Katie Luciano, J.P. Walsh.
- T19. **Quaternary Eolian Systems of the Southeastern United States:** Christopher Swezey, Rich Whittecar.
- T20. **Undergraduate Research (Posters):** Lee Phillips.
- T21. **Extreme Rainfall Effects in South Carolina, October 2015:** Venkat Lakshmi, Raymond Torres.
- T22. **Seismology and Tectonics in the Southeastern U.S.:** Erin Derrick, James Knapp.
- T23. **Earth Biogeochemistry:** Lori Ziolkowski, Claudia Benitez-Nelson.
4. **Neoproterozoic Arc Terranes of the Eastern Piedmont of South Carolina and Georgia, and Their Alleghanian Tectonothermal Overprint:** Sat., 2 April. Max.: 30. US\$100. Principal organizer: Allen J. Dennis, University of South Carolina Aiken.
5. **Geology and Geomorphology of the Carolina Sandhills, Chesterfield County, South Carolina:** Sat.–Sun., 2–3 April. Max.: 30. US\$230. Principal organizer: Christopher S. Swezey, USGS.
6. **Upper Eocene Marine Strata of the Giant Cement Quarry, Holly Hill, South Carolina:** Sun., 3 April. Max.: 22. US\$75. Principal organizers: David Cicimurri, South Carolina State Museum; Jim Knight.

SHORT COURSE

Seismic Reflection Processing: Wed., 30 March, 9 a.m.–4 p.m. Fee: US\$50. Min.: 10; max.: 20. Camelia Knapp, University of South Carolina, camelia@geol.sc.edu. This hands-on short course is designed for geologists and geophysicists who wish to understand the basic concepts involved in seismic data processing.

FIELD TRIPS

For more information, please check the meeting website.

Pre-Meeting

- Geology of Ediacaran–Middle Cambrian Rocks of the Western Carolina Terrane in South Carolina:** Mon.–Wed., 28–30 March. Max.: 30. US\$350. Principal organizer: Allen J. Dennis, University of South Carolina Aiken.
- A Neoproterozoic Epithermal Gold Deposit—Haile Gold Mine Field Trip:** Wed., 30 March. Max.: 40. US\$100. Principal organizer: James M. Berry, Romarco Exploration Inc.

Post-Meeting

- Deep Time in the Congaree: An Educator Field Workshop:** Sat., 2 April. Max.: 30. US\$75. Principal organizer: David C. Shelley, Old-Growth Bottomland Forest Research and Education Center, Congaree National Park.

OPPORTUNITIES FOR STUDENTS

For mentor program and career workshop descriptions and On To the Future information, see p. 29.

Career Workshops

- Geoscience Career Workshop Part 1: Career Planning and Informational Interviewing:** Thurs., 31 March, 8–9 a.m.
- Geoscience Career Workshop Part 2: Geoscience Career Exploration:** Thurs., 31 March, 9–10 a.m.
- Geoscience Career Workshop Part 3: Cover Letters, Résumés, and CVs:** Fri., 1 April, 9–10 a.m.

Mentor Programs

- Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon:** Thurs., 31 March.
- John Mann Mentors in Applied Hydrogeology Program Luncheon:** Fri., 1 April.

LOCAL COMMITTEE

General Chair: Venkat Lakshmi, vlakshmi@geol.sc.edu

Technical Program Chair: Jim Knapp, knapp@geol.sc.edu

Field Trip Chair: Will Doar, doarw@dnr.sc.gov

Undergraduate Volunteer Chair: Michael Bizimis, mbizimis@geol.sc.edu



Photo courtesy of Columbia Metropolitan Convention & Visitors Bureau.

Second Announcement

CORDILLERAN SECTION

112th Annual Meeting of the Cordilleran
Section, GSA
Ontario, California, USA
4–6 April 2016

www.geosociety.org/sections/cord/2016mtg/

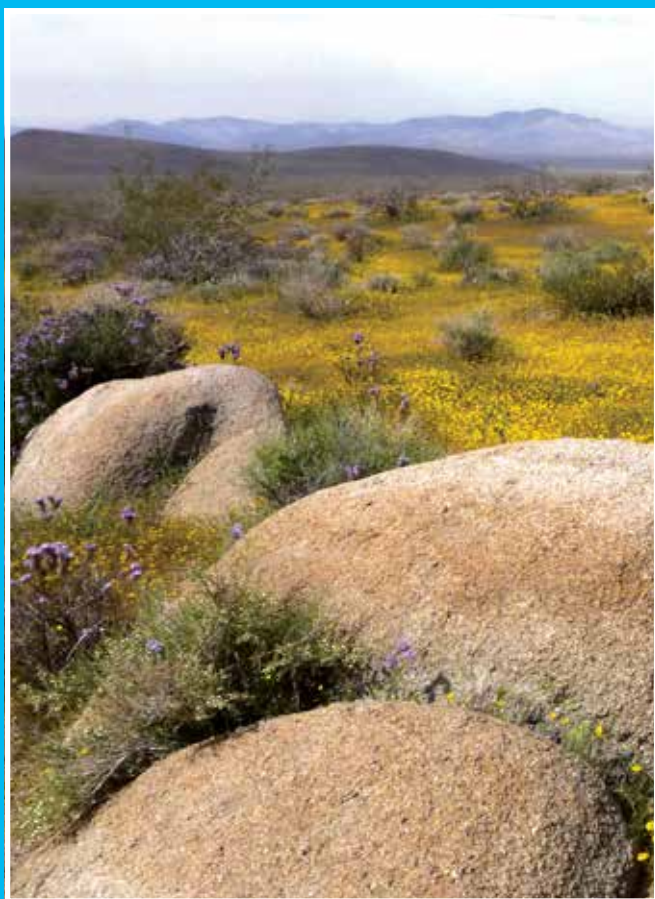


Photo courtesy of Jade Star Lackey.

LOCATION

Ontario is ~60 km from the U.S. Pacific coast in the “Inland Empire” of the greater Los Angeles Basin. The city is surrounded by the San Gabriel, San Bernardino, and Santa Ana Mountains, with the San Andreas fault 25 km to the northeast and other iconic geologic sites such as the Mojave Desert, Joshua Tree National Park, the Peninsular Ranges, and Salton Trough one to three hours away.

REGISTRATION

Early registration deadline: 29 February

Cancellation deadline: 7 March

REGISTRATION FEES (all fees are in U.S. dollars)

	Early		Standard	
	Full	1 Day	Full	1 Day
Professional member	\$195	\$175	\$230	\$190
Professional member 70+	\$115	\$100	\$130	\$120
Professional nonmember	\$250	\$225	\$300	\$240
Student member	\$75	\$60	\$90	\$70
Student nonmember	\$85	\$75	\$95	\$85
K–12 teacher	\$40	\$30	\$50	\$40
Guest/spouse	\$30	n/a	\$30	n/a
Field Trip/Short Course only	\$20	n/a	\$40	n/a

ACCOMMODATIONS

Reservation deadline: 14 March

The meeting will be held in the Ontario Convention Center, which is a two-minute walk from the headquarters hotel, the DoubleTree by Hilton, at 222 N. Vineyard Ave., Ontario, California 91764, USA. GSA has secured a meeting rate of US\$129 per night plus tax for single and double occupancy. Reservations can be made via the meeting website, or you can call the DoubleTree at +1-909-418-4873 (local) or toll-free at +1-800-222-8733; reference the group code “Geological Society of America.”

TECHNICAL PROGRAM

Abstract deadline: 5 January

Submit your abstract online at www.geosociety.org/Sections/cord/2016mtg/techprog.htm. Fee: US\$15 for students; US\$20 for all others. If you cannot submit an abstract online, please contact Heather Clark, hclark@geosociety.org, +1-303-357-1018.

- T1. Neotectonics and Magmatism in Death Valley and Southwestern Basin and Range:** Jim Calzia, J.R. Knott.
- T2. Magma Sources to Volcanoes—Exploring Processes, Volumes, Storage, and Interconnectivity in Continental Arcs:** Vali Memeti, Robinson Cecil, Adam Ianno, Ana María Martínez Ardila.
- T3. Causes and Consequences of Magmatic and Tectonic Tempos in Continental and Oceanic Arcs:** Scott Paterson, Barbara Ratschbacher, Joshua Schwartz, Ben Clausen.
- T4. Linking Mesozoic Arcs, Tectonics, and Mineral Deposits:** Jason Price, Claire Bucholz, John Dilles.
- T5. Insights into the Late Cenozoic Evolution of Crustal Blocks in Southern California from New Geologic, Geophysical, and Geomorphic Data:** Victoria Langenheim, Robert Powell, Jonathan Matti, Gary Fuis.
- T6. Integrated Volcanic Systems: Coupling and Feedbacks between Volcanic, Sedimentary, Geomorphic, Climatic, and Environmental Processes:** Benjamin S. Murphy, Nicole E. Moore.
- T7. Hydrogeology of Complex Geologic Settings:** Matt Becker, Thomas M. Seckington.
- T8. Hydrogeological Impacts of Urbanization:** Barry Hibbs, W. Richard Laton.

- T9. **Eco-Hydrogeology/Contaminant Hydrogeology:** M. Hassan Rezaie-Boroon, Andre Ellis.
- T10. **Unraveling Structural Complexity along the San Andreas Fault Zone, Southern California: Using Geochronology in Conjunction with Geologic and Geomorphic Mapping:** Shannon Mahan, Robert Powell, Katherine Kendrick.
- T11. **Investigating Environmental Changes using the Coastal and Marine Sedimentary Record:** Joseph Carlin, Alex Simms.
- T12. **Paleontology and Paleoecology of Western North America:** Nicole Bonuso, Adam Woods.
- T13. **In the Spotlight: Paleontology and the Public:** Alton C. Dooley Jr., Gabriel Santos.
- T14. **Undergraduate Research Posters:** Mark Boryta, David Mrofka, Jeff Marshall.
- T15. **Spatial and Temporal Variability of California Climate: Implications for Landscape Evolution:** Richard Heermance, Andrew Cyr.

FIELD TRIPS

Trip fees include transportation and lodging for multi-day trips, and most include meals. For more information, see the meeting website.

Pre-Meeting

- Arc Magmatism, Tectonics, and Tempos in Mesozoic Arc Crustal Sections of the Peninsular and Transverse Ranges, Southern California:** Fri.–Sun., 1–3 April. US\$370. Scott R. Paterson, Univ. of Southern California, paterson@usc.edu; Adam Ianno, Juniata College, adam.ianno@gmail.com; Valbone Memeti, California State Univ. Fullerton, vmemeti@fullerton.edu; Ben Clausen, Loma Linda Univ., bclausen@llu.edu; Josh Schwartz, California State Univ. Northridge, joshua.j.schwartz@gmail.com.
- Geology and Vertebrate Paleontology of Tule Springs Fossil Beds National Monument:** Fri.–Sun., 1–3 April. US\$345. Kathleen Spring, Univ. of California Riverside and USGS, kspringer@usgs.gov; Eric Scott, Cooper Center, California State Univ. Fullerton, erscott@fullerton.edu; Jeff Pigati, USGS, jpigati@usgs.gov.
- Large Earthquakes and Rates of Slip on the San Jacinto–San Andreas Fault System:** Sun., 3 April. US\$65. Doug Yule, California State Univ. Northridge, doug.yule@csun.edu; Sally McGill, California State Univ. San Bernardino, smcgill@csusb.edu; Nate Onderdonk, California State Univ. Long Beach, nate.underdonk@csulb.edu.
- Stratigraphy and Paleontology of the Palos Verdes Peninsula:** Sun., 3 April. US\$80. Austin Hendy, Natural History Museum of Los Angeles County, ahendy@nhm.org; Jann Vendetti, Natural History Museum of Los Angeles County, jvendett@nhm.org; Lindsey Groves, Natural History Museum of Los Angeles County, lgroves@nhm.org; Howell Thomas, Natural History Museum of Los Angeles County, hthomas@nhm.org; Jorge Velez-Juarbe, Natural History Museum of Los Angeles County, jvelezjuar@nhm.org.

Post-Meeting

- Geology, Stratigraphy, and Paleontology of the Santa Ana Mountains, Orange County, California:** Thurs., 7 April. US\$80. Jere Lipps, Cooper Archaeological & Paleontological Center, OC Parks & California State Univ. Fullerton, jlipps@fullerton.edu; Eric Scott, Cooper Archaeological & Paleontological Center, OC Parks & California State Univ. Fullerton, erscott@fullerton.edu; Lisa Babilonia, Orange County Parks, lisa.babilonia@ocparks.com; Richard Lozinsky, Fullerton College, rlozinsky@fullcoll.edu.
- Geology of Some Major Industrial Mineral Deposits in the Mojave Desert Area, Southern California:** Thurs.–Fri., 7–8 April. US\$175. Howard Brown, Howard Brown Geological Consulting LLC, hbjbm@aol.com; Dinah Shumway, Terramins Inc., terramins@gmail.com.
- Neogene Sedimentation, Volcanic Activity, and Faulting in the Coyote Mountains, Salton Trough, California:** Thurs.–Sat., 7–9 April. US\$260. Ann Bykerk-Kauffman, California State Univ. Chico, abykerk-kauffman@csuchico.edu; Michael Parker, California State Univ. Chico, michaelpparker@sbcglobal.net; Amy Gentry, California State Univ. Chico, kitsune556@gmail.com; David Teimoorian, California State Univ. Chico, davidteimoorian@gmail.com.
- Late Cretaceous to Neogene Assembly and Disaggregation of the Southern Sierra Nevada Region:** Thurs.–Fri., 7–8 April. US\$240. Alan Chapman, Macalester College, chapman@macalester.edu; Jason Saleeby, California Institute of Technology, jason@gps.caltech.edu; David Wood, djwd@swbell.net.
- Vertebrate Paleontology of Death Valley National Park, California:** Thurs.–Sat., 7–9 April. US\$320. Torrey Nyborg, Loma Linda Univ., tnyborg06g@llu.edu; Steve Rowland, Univ. of Nevada Las Vegas, steve.rowland@unlv.edu.

WORKSHOPS

The following teaching workshops will be held at the DoubleTree Hotel. Generous sponsorships allow the organizers to offer these workshops at no charge, except for the normal meeting registration fee. Space is limited, so register early. See the meeting website for more information.

- California Earthquake Hazards & Mineral Resources—NGSS:** *Cosponsored by California Mineral Education Foundation (CMEF); Southern California Earthquake Center (SCEC); Women In Mining (WIM).* Sun., 3 April, 8 a.m.–3 p.m. Limit: 25; refreshments included, but participants need to provide their own lunch. Cynthia L. Pridmore, California Geological Survey, cpridmore@consvr.ca.gov; Robert De Groot, Southern California Earthquake Center; Joyce Pulliam-Fitzgerald, Elementis Specialties Inc.
- Creating Dual-Enrollment Honors Geology Classes at High Schools:** *Sponsored by National Association of Geoscience Teachers, Far Western Section.* Sun., 3 April, 8 a.m.–noon. Limit: 20; refreshments included. Dirk Baron, California State Univ. Bakersfield, dbaron@csu.edu.

OPPORTUNITIES FOR STUDENTS

For mentor program and career workshop descriptions and On To the Future information, see p. 29.

Mentor Programs

Roy J. Shlemon Mentor Program in Applied Geosciences

Luncheon: Mon., 4 April.

John Mann Mentors in Applied Hydrogeology Program

Luncheon: Tues., 5 April.

Career Workshops

1. **Career Planning & Informational Interviewing:** Mon., 4 April, 8–9 a.m.
2. **Geoscience Career Exploration:** Mon., 4 April, 9–10 a.m.
3. **Cover Letters, Résumés & CVs:** Tues., 5 April, 9–10 a.m.

Undergraduate and Graduate Student Presentation Awards

To recognize exceptional work, the Cordilleran Section will offer awards for outstanding posters and oral presentations to both graduate and undergraduate students.

Professional members: If you are interested in helping evaluate these presentations, please contact Jade Star Lackey, jadestar.lackey@pomona.edu.

Travel Grants

Deadline to apply: 29 February

To qualify, (1) you must be a GSA student member; (2) you must be registered for the meeting before you can apply for a grant; and (3) you'll need to complete the online travel grant application form. Checks will be available for grant recipients to pick up at the meeting (in person, with photo ID). Learn more and access applications at www.geosociety.org/sections/cord/travelGrants.htm.

Volunteering

Deadline to apply: 29 February

Students are encouraged to volunteer to assist with different meeting activities in exchange for free registration, if they commit to their given work assignment (max. of six hours). Please contact Hilary Lackey, hlackey@mtsac.edu, for more information.

LOCAL COMMITTEE

Conference Chair: Jade Star Lackey, Pomona College, JadeStar.Lackey@pomona.edu

Field Trip Chair: Brian Kraatz, Western University of Health Sciences, bkraatz@westernu.edu

Technical Program Co-Chairs: Colin Robins, Claremont McKenna, Pitzer, and Scripps Colleges, crobins@kecksci.claremont.edu; Robert Gaines, Pomona College, robert.gaines@pomona.edu

Exhibits and Sponsorship: Joan Fryxell, CSU–San Bernardino, jfryxell@csusb.edu

Student Volunteers: Hilary Lackey, Mount San Antonio College, hlackey@mtsac.edu



Ontario DoubleTree by Hilton.

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Preliminary Announcement and Call for Papers

ROCKY MOUNTAIN SECTION

68th Annual Meeting of the Rocky Mountain Section, GSA
Moscow, Idaho, USA
18–19 May 2016

www.geosociety.org/Sections/rm/2016mtg/



Layered basalt flows of the Miocene Columbia River Basalt Group, exposed in Hells Canyon. These basalts host the aquifers from which much of the region draws its water. Photo courtesy Idaho Soil and Land Resources Division.

Moscow, Idaho, USA, is located in the beautiful Palouse region of north-central Idaho. It is an ideal base for exploring the lavas of the Columbia River Basalts, granites of the Idaho Batholith, tremendous flood features of the Channeled Scablands, metamorphic Precambrian Belt rocks, agriculturally rich tephra-influenced loess soils, and the breathtaking landscape features of this tectonically active region.

ACCOMMODATIONS

Reservation deadline: 15 April

A block of rooms has been reserved for meeting attendees at the Best Western University Inn, located just north of the Univ. of Idaho campus at 1516 Pullman Road (State Hwy 8), +1-800-325-8765. Room rate: \$109.99, plus tax, for up to 4 guests; please mention the GSA room block.

CALL FOR PAPERS

Abstract deadline: 1 March

Submit your abstract online at www.geosociety.org/Sections/rm/2016mtg/. Fee: US\$15 for students; US\$20 for all others. If you cannot submit an abstract online, please contact Heather Clark, +1-303-357-1018, hclark@geosociety.org.

Theme Sessions

1. **Megafloods, Paleohydrology, and Fluvial Processes on Earth and Beyond: In Recognition of the Scientific Contributions of Victor R. Baker:** Jim O'Connor, USGS, ooconnor@usgs.gov; Virginia Gulick, NASA Ames/SETI Institute, virginia.c.gulick@nasa.gov; Lisa Ely, Central

- Washington Univ., ely@geology.cwu.edu; Brian Yanites, Univ. of Idaho, byanites@uidaho.edu.
2. **Quaternary Geochronology and Mapping: Applications to Geomorphic Problems in the Intermountain Western North America:** Cal Ruleman, USGS, cruleman@usgs.gov; Shannon Mahan, USGS, smahan@usgs.gov.
3. **(Bio)Geochemical Processes in Soils:** Carmen Nezat, Eastern Washington Univ., cnezat@ewu.edu; Abir Biswas, Evergreen State College, biswasa@evergreen.edu.
4. **Paleogene-Neogene (?) Gravels of the Interior Plains of Western North America:** Dale Leckie, Univ. of Calgary, leckied@shaw.ca; Andrew Leier, Univ. of South Carolina, aleier@geol.sc.edu.
5. **Source to Sink, Proterozoic to Today: Erosion, Sediment Transport, and the Stratigraphic Record of Surface Processes:** Robert Mahon, Univ. of Wyoming, mahon1@uwyo.edu; Claire Lukens, Univ. of Wyoming, clukens@uwyo.edu; Paul Link, Idaho State Univ., linkpaul@isu.edu.
6. **Lagerstätten through Time and Space:** Julien Kimmig, Univ. of Saskatchewan, jkimmig@gmail.com; Amy Singer, Univ. of Montana, amy.singer@umontana.edu.
7. **Late Paleozoic Ice Age: Gondwana Systems and Proxies in the U.S. Cordillera:** Peter Isaacson, Univ. of Idaho, isaacson@uidaho.edu.
8. **Volcanic Hazards: Products, Processes, and Perspectives:** Brittany Brand, Boise State Univ., brittanybrand@boisestate.edu; Shannon Kobs Nawotniak, Idaho State Univ., kobssh@isu.edu.
9. **Seismic and Landslide Hazards in the Inland Northwest:** Suzette Payne, Idaho National Laboratory, suzette.payne@inl.gov; Bill Phillips, Idaho Geologic Survey, phillips@uidaho.edu; Daisuke Kobayashi, Univ. of Idaho, dice.k.koba@gmail.com.
10. **Energy Resources and New Plays in Western North America:** John Welhan, Idaho Geologic Survey, weljohn@isu.edu; Ed Ratchford, Idaho Geologic Survey, edratchford@uidaho.edu; Jerry Fairley, Univ. of Idaho, jfairley@uidaho.edu; Renee Breedlovestrout, Idaho Geologic Survey, reneeb@uidaho.edu.
11. **Mineral Deposits and Metallogeny of Western North America:** Chris Dail, Midas Gold, dail@midasgoldinc.com; Eric Jones, Thunder Mountain Gold; Lauren Perreault, HDR; Virginia Gillerman, Idaho Geologic Survey, edratchford@uidaho.edu.
12. **Geologic Setting and Hydrogeology of the Columbia River Basalt Group and the Snake River Plain:** Attila Fölnagy, Montana DNRC, afolnagy@mt.gov; Tom Wood, Univ. of Idaho, twood@uidaho.edu.
13. **Cenozoic Volcanism in the Inland Northwestern United States:** John Wolff, Washington State Univ., jawolff@wsu.edu; Scott Boroughs, Washington State Univ., geoentoptics@gmail.com; Jesse Mosolf, Montana Tech, jmosolf@mtech.edu; Bill Bonnicksen, Univ. of Idaho, billb@uidaho.edu.
14. **Geochronology of Igneous Processes:** Vince Isakson, Boise State Univ., vincenisakson@u.boisestate.edu; Mark Schmitz, Boise State Univ., markschmitz@boisestate.edu.

15. **Geologic Evolution of Accretion-Related Orogenic Belts and Associated Elements of the Central North American Cordillera:** Keith Gray, Wichita State Univ., k.gray@wichita.edu; Keegan Schmidt, Lewis Clark State College, klschmidt@lsc.edu.
16. **Constraints on the Formation, Assembly, and Evolution of Precambrian Rocks in the Rockies:** Julie Baldwin, Univ. of Montana, julie.baldwin@umontana.edu; Jeff Vervoort, Washington State Univ., vervoort@wsu.edu; Da Wang, Washington State Univ., binglian454@gmail.com.
17. **Planetary Science: Insights from Remote Sensing, Field, and the Laboratory:** Deepak Dhingra, Univ. of Idaho, deepdpes@uidaho.edu.
18. **Undergraduate Geologic and Multidisciplinary Research: Faculty Examples and Student Experiences in the Field:** Chad Pritchard, Eastern Washington Univ., cpritchard@ewu.edu.
8. **Geology and Geologic History of the Moscow-Pullman Basin, Idaho and Washington, from Late Grande Ronde to Late Saddle Mountains Time:** Fri., 20 May. John Bush, Emeritus, Univ. of Idaho; Dean L. Garwood, Spokane Community College; Pamela Dunlap, Emeritus, USGS.
9. **Accretionary Tectonics of West-Central Idaho and Relationships to the Greater Rocky Mountain Orogen:** Fri.–Sun., 20–22 May. Keegan Schmidt, Lewis-Clark State College; Keith Gray, Wichita State Univ.; Reed Lewis, Idaho Geological Survey.
10. **Pre-Belt Basement Tour: Late Archean–Early Proterozoic Rocks of the Cougar Gulch Area, Southern Priest River Complex:** Fri., 20 May. Andy Buddington, Spokane Community College; Da Wang, Washington State Univ.; P. Ted Doughty, PRISEM Geoscience.
11. **Precious and Base Metal Deposits of the Coeur d’Alene Mining District:** Fri.–Sat., 20–21 May. Chris Dail, Midas Gold Inc.; Sadae Lortz, U.S. Silver and Gold; John Etienne, New Jersey Mining; Virginia Gillerman, Idaho Geological Survey; Grant Brackebusch, New Jersey Mining; Dan Hussey, U.S. Silver and Gold; Kathryn Dehn, U.S. Silver and Gold; Aaron Gross, U.S. Silver and Gold.

FIELD TRIPS

For additional information, please see the meeting website or contact field trip co-chairs Reed Lewis, reedl@uidaho.edu, or Keegan Schmidt, klschmidt@lsc.edu.

Pre-Meeting

1. **Pleistocene Megaflood Landscapes of the Channeled Scabland:** Sun.–Tues., 15–17 May. Victor Baker, Univ. of Arizona; Bruce Bjornstad, Richland, Washington; David Gaylord, Washington State Univ. Vans depart from Spokane, Washington, on Sunday; the trip ends in Moscow, Idaho, on Tuesday.
2. **The Columbia River Basalt Group of Western Idaho and Eastern Washington—Dikes, Vents, Flows, and Tectonics along the Eastern Margin of the Flood Basalt Province:** Mon.–Tues., 16–17 May. Stephen Reidel, Washington State Univ.; Victor Camp, San Diego State Univ.; Barton Martin, Ohio Wesleyan Univ.; Terry Tolan, Intera Inc.; John Wolff, Washington State Univ.
3. **Miocene Fossils in the Clarkia Area: Classic Lagerstätten:** Tues., 17 May. Bill Rember, Univ. of Idaho.
4. **Geology of the Wallowa Terrane in the Northern Part of Hells Canyon:** Tues., 17 May. Keegan Schmidt, Lewis-Clark State College; Tracy Vallier, Emeritus, USGS.
5. **Metamorphic History of the Belt Supergroup and Underlying Paleoproterozoic Basement Rocks in the Western Part of the Clearwater Complex:** Tues., 17 May. Julie Baldwin, Univ. of Montana; Reed Lewis, Idaho Geological Survey; Jeff Vervoort, Washington State Univ.

Post-Meeting

6. **Miocene to Pleistocene Volcanism of the Yellowstone Hotspot: Western and Central Snake River Plain:** Fri.–Mon., 20–23 May. Scott Boroughs, Washington State Univ.; Bill Bonnicksen, Idaho Geological Survey; Martha Godchaux, Washington State Univ.; John Wolff, Washington State Univ. Optional drop-off at Boise Airport on Sun., 22 May.
7. **Geologic and Anthropogenic History of the Palouse Falls Area: Floods, Fractures, Clastic Dikes, and the Receding Falls:** Fri., 20 May. Chad Pritchard, Eastern Washington Univ.; Larry Cebula, Eastern Washington Univ. and Washington State Digital Archives.

OPPORTUNITIES FOR STUDENTS

For mentor program and career workshop descriptions and On To the Future information, see p. 29.

Career Workshops

1. **Geoscience Career Workshop Part 1: Career Planning and Informational Interviewing:** Wed., 18 May, 8–9 a.m.
2. **Geoscience Career Workshop Part 2: Geoscience Career Exploration:** Wed., 18 May, 9–10 a.m.
3. **Geoscience Career Workshop Part 3: Cover Letters, Résumés, and CVs:** Thurs., 19 May, 9–10 a.m.

Mentor Programs

Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon: Wed., 18 May.

John Mann Mentors in Applied Hydrogeology Program Luncheon: Thurs., 19 May.

LOCAL COMMITTEE

General Co-Chairs: Leslie Baker, lbaker@uidaho.edu; Brian Yanites, byanites@uidaho.edu

Technical Program Co-Chairs: Tom Williams, tomw@uidaho.edu; Peter Isaacson, isaacson@uidaho.edu

Field Trip Co-Chairs: Reed Lewis, reedl@uidaho.edu; Keegan Schmidt, klschmidt@lsc.edu

Student Volunteer Chair: Cary Lindsey, carylindsey@gmail.com

Student Mentoring/Programs Coordinator: Judy Parrish, jparrish@uidaho.edu

GSA Education & Outreach Programs: 2016 Section Meetings

ON TO THE FUTURE (OTF)

Stop by the GSA Foundation booth at your Section Meeting's Welcome Reception to find out about applying to OTF, which provides travel support to students underrepresented in the geosciences to attend their first GSA Annual Meeting (the next one is 25–28 Sept. 2016 in Denver, Colorado, USA).

CAREER WORKSHOPS

Geoscience Career Workshop Part 1: Career Planning and Informational Interviewing

Your job-hunting process should begin with career planning, not when you apply for jobs. This workshop will help you begin the process and will introduce you to informational interviewing. This section is highly recommended for freshmen, sophomores, and juniors. The earlier you start your career planning the better.

Geoscience Career Workshop Part 2: Geoscience Career Exploration

What do geologists in various sectors earn? What do they do? What are the pros and cons of working in academia, government, and industry? Workshop presenters, and professionals in the field, will address these issues.

Geoscience Career Workshop Part 3: Cover Letters, Résumés, and CVs

How do you prepare a cover letter? Does your résumé need a good edit? Whether you are currently on the job market or not, learn how to prepare the best résumé possible. You will review numerous résumés to help you learn the important dos and don'ts of the process.

MENTOR PROGRAMS

Enjoy a free lunch while meeting with geoscience mentors working in the applied sector. The popularity of these programs means that space is limited, so plan to arrive early, because lunch is first-come, first-served. For further information, contact Jennifer Nocerino at jnocerino@geosociety.org.

South-Central Section: Baton Rouge, Louisiana, USA
Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon: Monday, 21 March
John Mann Mentors in Applied Hydrogeology Luncheon: Tuesday, 22 March

Northeastern Section: Albany, New York, USA
Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon: Monday, 21 March
John Mann Mentors in Applied Hydrogeology Luncheon: Tuesday, 22 March

Southeastern Section, Columbia, South Carolina, USA
Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon: Thursday, 31 March
John Mann Mentors in Applied Hydrogeology Luncheon: Friday, 1 April

Cordilleran Section, Ontario, California, USA
Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon: Monday, 4 April
John Mann Mentors in Applied Hydrogeology Luncheon: Tuesday, 5 April

North-Central Section, Champaign, Illinois, USA
Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon: Monday, 18 April
John Mann Mentors in Applied Hydrogeology Luncheon: Tuesday, 19 April

Rocky Mountain Section, Moscow, Idaho, USA
Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon: Wednesday, 18 May
John Mann Mentors in Applied Hydrogeology Luncheon: Thursday, 19 May

GSA Section Meetings Call for Mentors



PROFESSIONALS: Interested in sharing information about your applied geoscience career with students? Being a mentor is a rewarding experience. If you are interested in serving as a mentor at one of GSA's Section Meetings, contact Jennifer Nocerino at jnocerino@geosociety.org.



NOW AT GSA: Your Time to Shine

Volunteer or nominate a colleague to serve as a GSA Officer, Councilor, or committee member. Deadline: **15 June** (terms begin July 2017). Student members are especially encouraged to bring their unique points of view to GSA leadership.

Links to Learn More

Officers & Councilors: www.geosociety.org/aboutus/officers.htm

Committees: www.geosociety.org/aboutus/committees



ELECTIONS: GSA OFFICERS and COUNCILORS

GSA ELECTIONS BEGIN 10 MARCH 2016

GSA's success depends on you—its members—and the work of the officers serving on GSA's Executive Committee and Council. Members will receive instructions for accessing a member-only electronic ballot via our secure website, and biographical information on the nominees will be online for review at that time. Paper versions of both the ballot and candidate information will also be available upon request. Contact Susan Lofton, slofton@geosociety.org, for more information. Ballots must be submitted electronically, faxed to GSA Headquarters, or postmarked by **10 April 2016**.

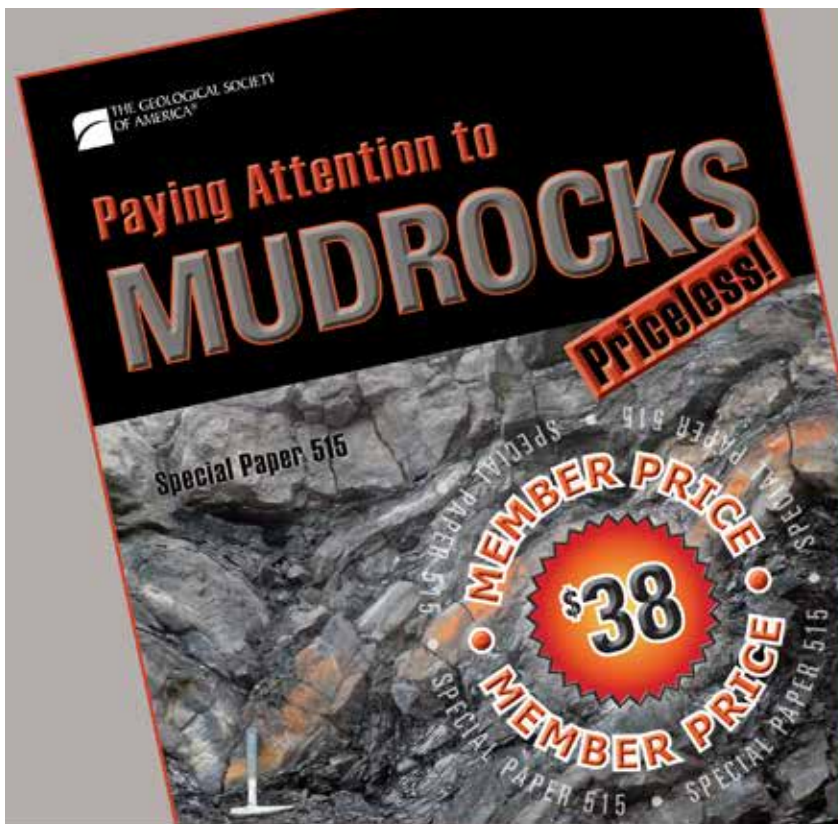
2016 OFFICER NOMINEES

<p>PRESIDENT (July 2016–June 2017) Claudia I. Mora Los Alamos National Laboratory Los Alamos, New Mexico, USA <i>We congratulate our incoming president!</i></p>	<p>VICE PRESIDENT/PRESIDENT-ELECT (July 2016–June 2018) Isabel Montanez University of California Davis Davis, California, USA</p>	<p>TREASURER (continuing term, July 2015–June 2016) Bruce R. Clark The Leighton Group Inc. Irvine, California, USA</p>
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2016 COUNCIL NOMINEES

<p>COUNCILOR POSITION 1 (July 2016–June 2020) F. Edwin Harvey National Park Service Denver, Colorado, USA Second candidate to be confirmed</p>	<p>COUNCILOR POSITION 2 (July 2016–June 2020) Mark Little University of North Carolina Chapel Hill, North Carolina, USA David W. Szymanski Bentley University Waltham, Massachusetts, USA</p>	<p>COUNCILOR POSITION 3 (July 2016–June 2020) Donna Whitney University of Minnesota Minneapolis, Minnesota, USA Marjorie Chan University of Utah Salt Lake City, Utah, USA</p>
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Ballots must be submitted electronically or postmarked by 10 April 2016.



Paying Attention to Mudrocks: Priceless!

Edited by Daniel Larsen, Sven O. Egenhoff, and Neil S. Fishman

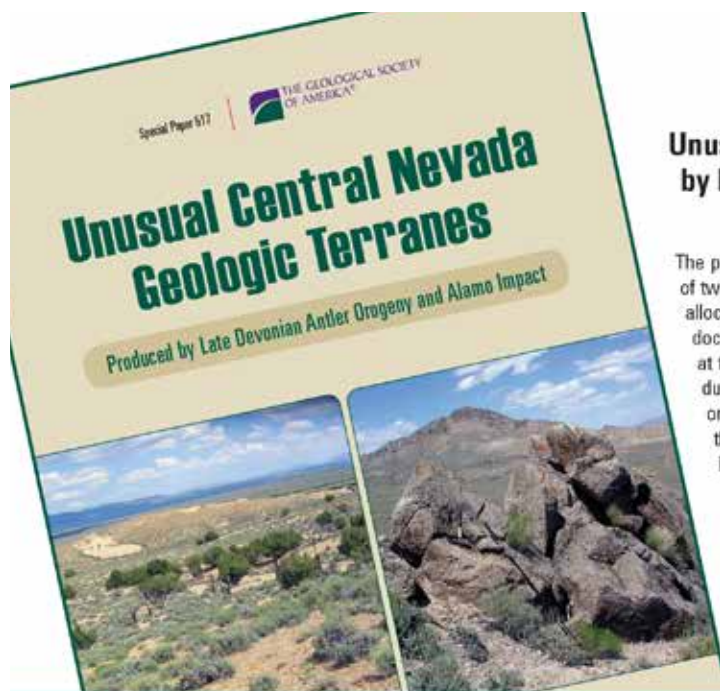
Siliciclastic mudrocks, often termed shales, represent more than two thirds of all sedimentary rocks on Earth, yet they are probably the least understood. This volume brings together current research of academic and industry importance that helps clarify key aspects of sedimentology, mineralogy, origin, and resource distribution in mudrocks.

SPE515, 168 p., ISBN 9780813725154
list price \$55.00 | member price \$38.00



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SPECIAL PAPER 517

Unusual Central Nevada Geologic Terranes Produced by Late Devonian Antler Orogeny and Alamo Impact

by Forrest G. Poole and Charles A. Sandberg

The product of nearly 25 years of geologic investigations, this volume is an exposition of two small areas, both less than 25 km east of the Mississippian Roberts Mountains allochthon, but each displaying a different, unique geologic terrane, previously undocumented in Nevada and perhaps in North America. One area, the Bisoni-McKay, at the south end of the Fish Creek Range, displays an olistostrome, shed eastward during the late Late Devonian (early Famennian) from an eastward-migrating Antler orogenic forebulge. The other, the Warm Springs-Milk Spring, at the south end of the Hot Creek Range, displays a deeper marine terrane affected by the early Late Devonian (middle Frasnian) Alamo impact. New data show that the Antler orogeny began in latest Middle Devonian time, much earlier than previously thought. Detailed geologic maps support the conclusions, interpretations, and hypotheses presented in the text. The authors identified and dated Paleozoic rock units by studying nearly 100 acid-dissolved carbonate conodont samples and at least 50 collections of conodonts on siltstone bedding planes; they also redated Tertiary volcanic rocks and evaluated mineral and petroleum resources.

SPE517, 104 p. + 2 plates, ISBN 9780813725178 | list price \$55.00



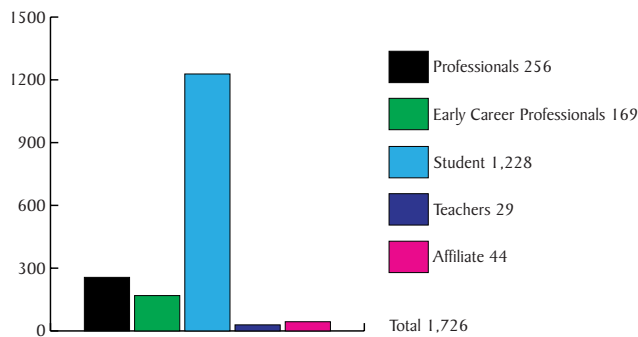
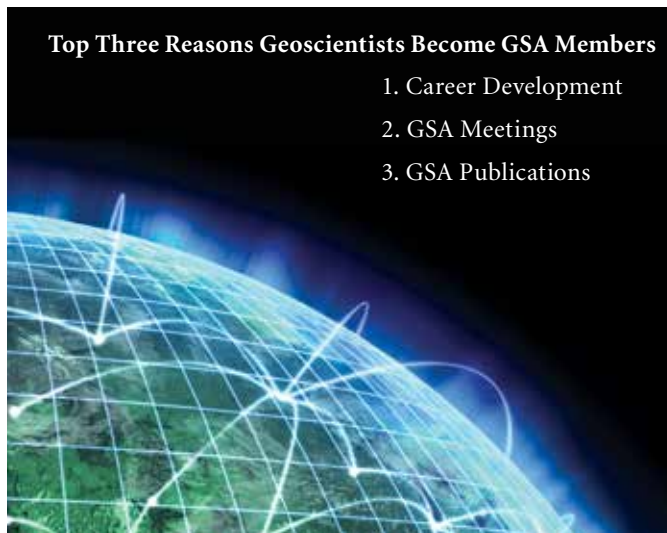
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Welcome New GSA Members!

The following individuals submitted their applications for GSA membership between 17 April 2015 and 31 August 2015 and were approved by GSA Council at its October 2015 meeting.



PROFESSIONALS

Mohd Shafiq Firdaus Abdul Razak
Bill Ackland
Lufadeju O. Aderinola
Muhammad Adnan
Musaad Abdul Algarawi
Gabriel Ernesto Aliaga
Mohammed Musa Aliyu
Guillermo Almaguer Sr.
Arafat A. Alshuaibi
Wagner Silva Amaral
Fadhil Ahmed Ameen

R. Anand
Perseo Anaya
Bryan J. Anderson
Jacob Lee Anderson
Ryan L. Anderson
Alessandra Ascione
Lea Anne Scott Atwell
Muhammad Awais
Arthur Paul Baclawski
Wayne E. Baldwin
Charles Baltzer
David Baskin
Grace Margaret Beaudoin

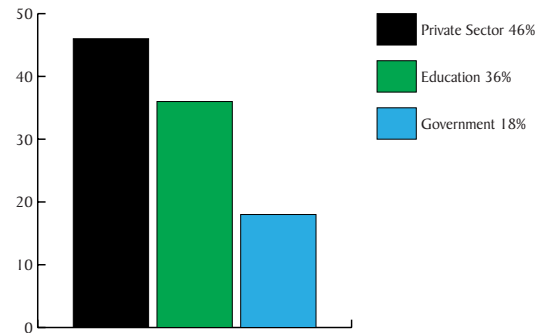
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Gretchen Benedix
Karen Berry
Warwick Stuart Board
Michael Boiardi
David Boleneus
Ryan James Bonney
Rich Booth
William Andrew Bratney
Suzanna Brauer
Jonathan Andrew Brewer
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Andrew Alexander Buchanan
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Simon D'haenens
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Francesco Dela Pierre
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Adekunle Oluwafemi Ditiolu
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Stuart J. Dykstra
Kevin Eastham
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Christianna Kay Ellingson

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Curtis Evans
Anthony Faiia
Silvio Ferrero
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Stephen Mike Futrell
Yuan Gao
George Gaprindashvili
Isaias Gebredngle Gebreweldi
Teamrat A. Ghezzehei
Margaret G. Gilliland
Christopher A. Gomez
Aida Juliana Gomez Ramirez
Richard Goodsell Sr.
Ethem Gorgun
Simon Goring
Tolga Gorum
Andrew Graham
Mott Tuthill Greene
Luigi Guerriero
Brian Gulbranson
Birgit Hagedorn
Jeffrey Halka
Casey M. Hall
Frank Reginald Hall
Jessi Jean Halligan
John S. Hanna
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Lindy Marie Hanson
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Sean Hartman
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Andrew Heinowski
Elizabeth Herndon
Andrew Heyes
Sharon Susanna Hoffmann
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Ernest R. Houston
Kalin Joseph Howell
Christopher Charles Humphrey
Teddy Iu
Jose Maria Jaramillo
Fred Jee
Byron J. Jenkinson
Thomas Jerome
Carol A. Johnson
Kurt J. Johnson
Brian Johnston
Graham Johnston
Mindy Juergensen
Abdalnasser A. Kahla
Ji-hoon Kang

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 Hiromi Konishi
 Margaret Emily Kroehler
 Yikyun Kwon
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 Sarah Lambert
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 Jonathan Mead
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 Sean Murphy
 James B. Nelson
 Hefer Emilec Nomesqui Ortiz
 Peter Abuchukwu Obiajunwa
 Gregory S. Olsen
 Soichi Omori
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 Olanrewaju O. Osho
 Nancy Oyer
 Unnikrishnan MP
 Marlene A. Patterson
 Sierra V. Petersen
 Joshua G. Phillips
 Megan F. Plenge
 Rhonda L. Quinn
 Douglas B. Reed
 John K. Reed
 Paul W. Reimus
 Meredith Reitz
 Benjamin Andrew Reynolds
 Janet Rith
 Anthony Rodriguez
 Alan Rosenthal
 Prabodha Ranjan Sahoo
 Sergio Salinas
 Kartono Sani

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 Daniel Sasu
 Ted Satterfield
 Ed Schenk
 Paul William Scholar II
 Andrew Schwendemann
 Alberto Ayala Seibane
 Christopher L. Shaffer
 Laura Sherrod
 Anil D. Shukla
 Nancy S. Simon
 Lydia Sinemus
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 Tarek Slama
 Stuart Smith
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 Yadong Sun
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 Charley S. Thompson
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 Peter Townsend
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 Christina Turpin
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 Bishal Nath Upreti
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 Michael Villar
 Christina Viviano-Beck
 Andrew D. Waggener
 Diana H. Wall
 Rachel Lucy Walters
 Yuan Wang
 Britton Wanlass
 Kathleen Ann Welch
 Carol A. White
 Carolyn Wiarda
 James Dana Williams
 Olivia Williams
 Rob J. Wilson
 Rosilee Winn
 Gabriel Wolken
 Benjamin Daily Wright
 Paul Asthor Yecyec
 Brian Yerkes
 Celeste Thomson Yoshinobu
 Xuan Yu
 Andy Zdon

New Professional Members Employment Type



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Thomas Afton
 Shan Ahmad
 Merja Alam
 Adam K. Aleksinski
 Kari Amick
 Robbie Arnone
 Nicole Arres
 Ethan M. Arten
 Margaret R. Atterbury
 Erik Bagley
 Jordan W. Barnes
 Satyajit Barthakur
 Casey Leigh Barton
 Kelsey Batz
 Laura Baumann
 Andrew M. Bayles
 John Travis Berger
 Robert Bridgeford Jr.
 Steven C. Brost
 Christine Brownfield
 Paige Alison Buckner
 Sean Daniel Burns
 Carolyn H. Canterbury
 Derek David Carr
 Theresa Carranza-Fulmer
 Alexandra Caruso
 Queenie Chang
 Jenna Chervin
 Saebyul Choe
 Allyson L. Clabough
 Justin Andrew Clark
 Bonny Kingham Clarke
 John Patrick Cleary
 Ted J. Coleman
 Case T. Collins
 Budoïn-Brutus Cooper
 Antonio Cusumano
 Silvia Danise
 Dylan K. Davis
 Sara D. Delfin
 Victoria Marie Desjardins

Lauren Devito
 Giuliana Andrea Diaz
 Mendoza
 Nancy Diaz-Garcia
 Michael Dickens
 Petter Dischington
 Brian Dowd
 Dylan Michael Dwyer
 Zachary M. Edgar
 Coty Lee Elsken
 Matthew Emmett
 Michael Evans
 Christopher John Everett
 Sarahi Felix
 Jenna B. Flitcroft
 Caleb Brooks Fogel
 John David Fortner
 Andrew Charles Francis
 Kristin Michelle Franks
 Brian Kelly Frett
 Eric James Freudenberger
 Jorge A. Garcia Jr.
 Janelle Ann Gaun
 Zachary Ben Gordon
 Tyler Grabner
 David Matthew Greening
 Joshua Shane Phillip Greer
 Thomas Michael Gregory Jr.
 Gessika Lee Guerra
 Xiaofeng Guo
 Ejaz Hafeji
 Shahan Haq
 Anja Helfrich
 Cyanna L. Hicks
 Grace Hilbert
 Jana Hillenbrand
 Jefferson Lindsay Hopper
 Emily Hughes
 Paul Jackson
 Corbin Russell Jensen
 Heather Johnson
 David Michael Johnston
 Allison Jones
 Rachel Amy Joseph

Michael Jewell Jury
 Hannah Catherine Keck
 Heather Lelah Keck
 Md. Mahmudur Rahman Khan
 Nikki Kovalcheck
 John Nathan Lafferty
 Kellen Olen Lamp
 Ronny Maik Leder
 Jordan Leech
 Keely Barbara Lewis
 Robert W.D. Lodge
 Kyle Long
 Tiffany A. Lopez
 Mark Lower
 Sarah Elizabeth Lyter
 Stephanie Macdonald
 Arielle Maines
 Chase Thomas Martin
 Joshua Alexander Matherson
 Chloe Mayne
 Elle McFarlane
 Charles McGaw III
 Jorge Mendoza
 Lacey Rye Morrison
 Catherine Ngarami Mushi
 Gregory Howard Myers
 Julianna Joseph Nyikos
 Alexander D. Oliver
 Dana E. Olsen
 Julius Odafehogba Omoefe
 Cheyenne Paden
 Janette Perez-Jimenez
 Brett Anthony Pertunen
 Ryan Eli Phillip
 Gavin Kyle Phillips
 Kevin A. Pruitt
 Rynne A. Rahjes
 Cari Rand
 Jeremy Randolph-Flagg
 Bradley J. Ratliff
 Corey Rattray
 Ian Reeves
 Jill L. Riddell
 Miles Thomas Ridgway
 Brian Michael Roberge
 Chelsea Roston
 Brian P. Rumschlag
 Amber Rutter
 Alex Newton Sayre
 Andrew Quaid Schnabl
 Stephen J. Schoch
 Emily Rose Schottenfels
 Joseph Thomas Schultz
 David A. Sinclair
 Clayton Zimmerman Smith
 Sarah Yael Solnit
 Ryan Dennis Sommers
 Cameron Stanley

Jonah William Stoecker
 Alex M. Stoll
 Karah A. Swiger
 Madeline Tarasar
 Glenn Elliot Tigner
 Juan Sebastian Trujillo
 Jarrett M. Uriegas
 Sara C. Vaughan
 Joe Wagenbrenner
 Chelsea Walsh
 Emily Marie Walsh
 Michael C. Walsh
 Ben Weber
 Sydney Weitkunt
 Jacob Nicholas Whitbeck
 Erica Anne Wicker
 Alexandria Wilkins
 Scottie Jo Williams
 Trevor Michael Williams
 Grace Windler
 Erin Wolfe
 Chloe Suzanne Wonnell
 Kelsey Lynn Wood
 Wenjiao Wu
 Veselina Todorova Yakimova
 Kyle Yarmush
 Ahmet Murat Yazici

STUDENTS
 (listed by professional interest)

Archaeological Geology

Adrena M. Bentley
 Jason Chambers
 Stephanie Michelle Clark
 Ethan J. Cole
 Kristy May Ely
 Adam Hudak
 Jaafar Jotheri
 Emanuel Villa Joya
 McKenzie Rivers Juarez
 Markos Kapes
 Peter A. Leach
 Ian M. Macadam
 Cody Wayne Martin
 Sibajene Moono
 Molly Ann Murphy
 Alexandra Rocca
 Tyler Christian Treadwell
 Kelsey D. Watson

Biogeosciences

Renaud Bernard
 Morgan K. Black
 Kirsten Rebecca Butcher
 Paul Chisholm
 Timothy J. Hieger
 An An Hua
 Gurleen Kaur



Top Five Reasons Students Become GSA Members

1. GSA Meetings
2. Career Development
3. GeoCorps America
4. Free Online Journal Access
5. Research Grants

Belkasim Kh Khameiss
 Amanda Leane Labrado
 Tabitha Lindsley
 Katlyn Marie Lonergan
 Steven E. Mendonca
 Bingjie Ouyang
 Bryan Paul
 Eron Raines
 Daniel L.L. Russell
 Colby Sameshima
 Alec Luis Schassburger
 Laikin Stephens
 Alma Margaret Stott
 Haley Thomas
 Zoe Verlaak
 Kendra Emily Walters
 Regina Wilpiseszki
 Laura A. Zinke

Climatology/Meteorology

Allison M. Chartrand
 Sarah Farley
 Rachael E. Grube
 Natasha Henderson
 Christopher B. Hornung
 Michael Krasowski
 Kory Everett Leech
 Ryan Pajela
 Brennan Michael Voorheis

Economic Geology

Connor Louis Abendschein
 Jason Michael Burwell
 Nicholas J. Butterfield
 Nicholas Camper
 Bijal Mahendra Chudasama
 Guinevere Collins
 Elizabeth R. Hollingsworth
 Brock Howell
 Steven G. Johnson

Mackenzie N. Kester
 Dustin Brian Leavitt
 Madeline Morones
 Logan Wade Nagel
 Piper Lee Poe
 James Luke Price
 Mark M. Roth Jr.
 Zachary L. Rymski
 Robert B. Salinas
 Jethro Sanz-Robinson
 Kyle Lee Schusler
 Harrison G. Tarr
 Berhanemeskel Michael Teklu
 Terence Vomocil
 Nathan Williams
 Jared Wolfe

Energy Geology

Brittany Abbuhl
 Onema Christopher Adojoh
 Barby Allen
 Hunter Mclean Allen
 Nicolas Argy
 Josh J. Arneson
 Norbert Mtire Assey
 Hannah Rose Azouz
 Lauren Taylor Bane
 Oriana Battifarano
 Alicia Liddell Bonar
 Nathaniel Bootes
 Colleen Bransford
 Joseph D. Brazelton
 Seth W.R. Brickey
 Travis A. Brizendine
 Eric A. Brooks
 Diego Burgos
 William Burns
 Rodrigo Gomes Cavalcante
 Matthew D. Chatterton
 Paul Thomas Cicconetti

Ryan Clements
 Nathan G. Cote
 Meghan Curtis
 Sarah Kathryn Dailey
 Hilary Davis
 Evan Dean
 Jennifer Grace Dixon-Gonzales
 James Duquemin
 Andrew Martin Dyrhood
 Matt Edgin
 Daniel A. Enriquez
 Eric Michael Eubanks
 Nicole Fenton
 Dylan J. Fisher
 Katherine Victoria Gass
 Joshua Phillip Gavin
 Emma Lyn Giddens
 Benjamin Michael Ginter
 Austin Michael Gion
 Jenna Marie Graham
 Jennifer L. Graham
 Leslie Grove
 Abdul Haq III
 Nicholas Heasley
 Tyler J. Hebert
 Scarlett Henson
 Amy Hickmon
 Micha Hough
 Jackson Jakeway
 Hunter M. Johnson
 Onyechege Patrick Kelechi
 Zachary Aidan Keller-Coffey
 Michael V. Kennedy
 John Tyler Kieffer
 Adam Russell Kreider
 Brian Scott Kubik
 Nathan Lentsch
 Jordan Alexander Levy
 Lauren Michelle Lloyd
 Gerald David Mackay
 Telemachos Andrew Manos
 Zachary Alan Mansour
 Robert W. Martin
 Makuachukwu Federa
 Mbaegbu
 Joseph Bodie McCosby
 Connor Thomas McCoy
 Andrew McKenna
 Ross Meyer
 Sandra Cecilia Miano
 Michael Mulligan
 Kingsley K. Nwozor
 Cole Nypaver
 Davidson C. Okoko
 Samuel Orta
 Brandon Padgett
 Julia Peacock
 Corrin J. Peters
 Gregory Hugh Peters

Travis Pohl
 Mallory Ramos
 Meredith Ann Raphelson
 David Rowan
 Ross Conley Sanor
 Emiliano D. Santin
 Gabrielle Sasseville
 Jacob Saurer
 Austin M. Savage
 Bryan Thomas Sheppard
 Kris Sittheeamorn
 Jessica Maire Soliz
 Ben Stone
 Emma Sue Swaninger
 Ana Lucia Swor
 Frank M. Tamakloe
 Tyler Tanner
 Matthew Thimsen
 Travis Tillman
 Iva Tomljenovi
 Houston A. Vincent
 J. Sage Wagner III
 Lindsay Walsh
 Kevin J. Warner
 Holly Young

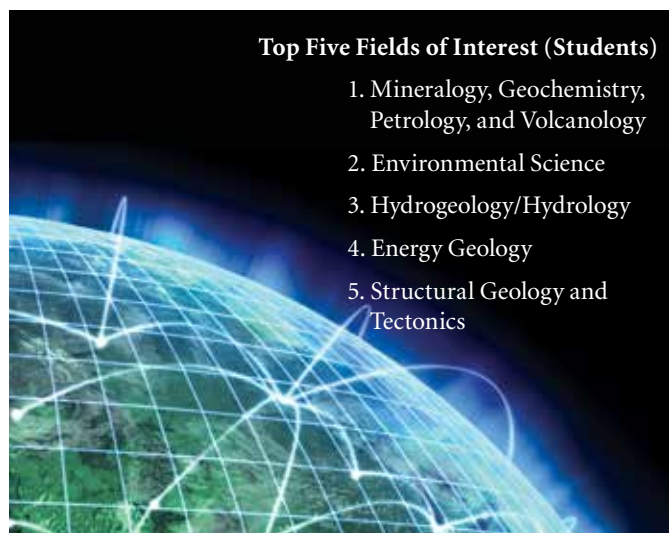
Engineering Geology

Zachary Albert
 Elliott Joseph Andelman
 Parker Wells Aubin
 Jodutt Marwan Basrawi
 Allison Renee Bieda
 John Breiner
 Abby Buarapha
 Christine Rosalynn Cano
 Yonesha Yashelle Donaldson
 Anna Elgqvist
 Allan William Foster III
 Brendan J. Gaylord
 Sumaya Hamdi
 Kelly Hickcox
 Jasmin Jamal
 Sruthi Kakuturu
 Samantha Lynne Kephart
 Kelly Kindgren
 Justin T. King
 Zachary J. Klang
 Brenton Koby Kreiger
 Nicholas Lippincott
 Joshua Joseph Mack
 Caleb Andrew Marhoover
 Amber Rene Menegay
 Jennifer Nguyen
 Kevin Patrick Ormerod
 Abby Preston
 José Luis Rueda Escobar
 Daniel Henry Sammon
 Wesley David Mcadam Silvey
 Benjamin Matthew Stark

Environmental Science

Frida Akerstrom
 Amineh B. Albashaireh
 Carmen Amos
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Laura C. Erichsen
 Emma L. Fain
 Emily J. Fairfax
 Elizabeth Farrell
 Michael Joseph Felzan
 Tyler Fincannon
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 Richard James
 Laura Anthem Jaynes
 Anjelica Johnson
 Carol A. Johnson
 Ej Marie Johnstone
 Zachary Snow Kaufman
 Joseph Kennedy
 Brett Michael Kenning
 Spencer Kennard Kiessling
 William Koerner Kite
 Tori Ann Klotz



Top Five Fields of Interest (Students)

1. Mineralogy, Geochemistry, Petrology, and Volcanology
2. Environmental Science
3. Hydrogeology/Hydrology
4. Energy Geology
5. Structural Geology and Tectonics

Carolyn Koebel
 Melanie Koerth
 Rachel Krueger
 Michelle Lanzoni
 David A. Lawrence
 Sydney Le Cras
 Katharine Leopold Schiller
 Cliff Lewis
 Austin Thomas Luecke
 Katie Lyon
 Kevins Magouirk
 Jillian C. Matz
 Georgiana Marie Mcswane
 Cameron W. Mercer
 Kevin J. Meyer
 Michael Michno
 Haley Caitlyn Miller
 Olivia Michael Minella
 Allison Marie Mitchell
 Scott M. Morgan
 Julie Mui
 Marc Muraoka
 Jeffrey Murl
 Peter T. Nguyen
 Aleksandra Novak
 Juliana Elizabeth Olsen-Valdez
 Larry B. Page
 Andrea Pain
 Rusha Pal
 Saumik Panja
 Elaine M. Panuccio
 Erin Peeling
 Christina Penna
 Jeff Perkins
 Margaret L. Perme
 Emma Jean Peterson
 William Alfred Peterson
 Challenga Pinckney
 Katrina Lynne Ponder
 Allison Pourquoi
 Patrik C. Prouse
 Scott A. Raulerson
 Rachel Elise Rea
 Emilie Michelle Richard
 David Riera
 Samantha Robillard
 Gabrielle Russell
 Devon Rowe Rutledge
 Kelly Margaret Schwinghamer
 April M. Seeley
 Evan R. Shalagan
 Melika Sharifironizi
 Shabnam Shomail
 Tammy Leigh Slagle
 Kelsey Marie Slayton
 Katelynn Smith
 Mathew J. Stanek
 Graham Stewart
 Marleen Stuhr

Ayana Suber
 Ryan Keenan Sullivan
 Nicholas Anthony Suraci
 Lucas George Tatarko
 Hope Telder
 Christina Tenison
 McKay B. Tenney
 Heather Rose Thole
 Daniel H. Thompson
 Torrance Tyrell Tolle
 Matthew Henry Vander Loop
 Michelle Pamela Waddington
 Katarzyna Walkowska
 Gregory A. Wall
 Meghan Walsh
 Tina M. Williams
 Changhong Wu
 Lindsey Danese Yazbek
 Jenny Jie Zheng

Geography

Hannah Rae Adams
 Eric Paul Armstrong
 James P. Bando
 Steven G. Braund
 Carla M. Castillo
 Elizabeth Dreimiller
 Robert Gannon
 Wenjie Ji
 Ashley Kochlett Larsen
 Max J. Parada
 Brad Peter
 Elizabeth Ann Plascencia
 Julia D. Scott
 Diana C. Stack
 Quentin Stubbs
 Alan Tanwi
 Celines Villegas
 Greta Hoe Wells

Geoinformatics

Matthew Joseph Acree
 Aman Arora
 Phachara Henry Boucher
 Robbyn Ferris
 Alexis Ho-Liu
 John A. Kanehann
 Jennifer Christine Lewis
 Sam Lockshin
 Myriam Loving
 Michael Perkins
 Alan L. Pongratz
 Joseph Anthony Saunders
 Thomas Smith

Geology and Health

Natalie Nicole Buch
 Benjamin M. Durel
 Eric Arthur Escoto

Jacob Kiyoshi Kato
 Naomi Ty Asha Plummer
 Tyler Jacob Rust
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Why GSA Membership Is Important to Me



Susan Stover at Machu Picchu, Peru.

What is the value of GSA for a mid-career, government agency geoscientist? For me, it has brought a surge of energy from interacting with the members, reconnecting with people from past posts, and meeting new people engaged in a wide range of research and policy efforts. I've served on the Geology and Public Policy Committee for the past several years and have had the pleasure of working with interesting, motivated, and engaged committee members. Each, in their own area of expertise, is working to improve the world in ways large and small. My advice is to join a committee or two, be an active volunteer, attend meetings, and take in (or lead!) a field trip. What you get out of GSA is directly related to what you are willing to contribute. GSA is a large tent open to new ideas and challenges to those ideas. Whether you are motivated to expand your network of smart, adventurous geoscientists or want to follow up on a research interest that got left behind in graduate school, there is sure to be a committee or GSA Division to nurture your interest. GSA membership has enriched my life professionally and intellectually.

Susan Stover, P.G.
*Geologist, Outreach Manager
 Kansas Geological Survey*

*GSA member since 2010;
 GSA Fellow since 2015*

IN MEMORIAM



The Society notes with regret the death of the following members (notifications received between 1 August and 28 October 2015).

Ronald Barton

Manchester, UK
Date of death: 15 Sept. 2015

Gerald P. Brophy

Amherst, Massachusetts, USA
GSA notified: 9 Sept. 2015

Harold F. Bonham Jr.

Sparks, Nevada, USA
Date of death: 6 June 2015

Willard E. Cox

Payson, Arizona, USA
Date of death: 3 Apr. 2015

I.G. Grossman

Media, Pennsylvania, USA
Date of death: 1 July 2015

Anne E. Harding

Corvallis, Oregon, USA
Date of death: 6 June 2015

Dennis E. Haynes

Palisades, New York, USA
Date of death: 4 Apr. 2015

Michael W. Higgins

Clayton, Georgia, USA
Date of death: 4 Apr. 2015

Augustus S. Knight Jr.

Chester, New Jersey, USA
Date of death: 25 Aug. 2015

Mervin Kontrovitz

Monroe, Louisiana, USA
Date of death: 4 Sept. 2015

H. Richard Lane

Washington, D.C.
Date of death: 16 Oct. 2015

Milton R. Marks

Lake Oswego, Oregon, USA
Date of death: 3 Aug. 2015

Haydn H. Murray

Bloomington, Indiana, USA
Date of death: 4 Feb. 2015

Peter Popenoe

Woods Hole, Massachusetts, USA
Date of death: 23 July 2015

David B. Stewart

Reston, Virginia, USA
Date of death: 12 Apr. 2015

Berry Sutherland

San Antonio, Texas, USA
Date of death: 12 Sept. 2015

Alfred Traverse

State College, Pennsylvania, USA
GSA notified: 21 Sept. 2015

H. Jesse Walker

Baton Rouge, Louisiana, USA
GSA notified: 7 Oct. 2015

Joseph L. Weitz

Fort Collins, Colorado, USA
Date of death: 22 July 2015

John R. Williams

La Jolla, California, USA
Date of death: 30 Sept. 2015

William I. Woods

Lawrence, Kansas, USA
GSA notified: 30 Sept. 2015

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Call for Applications

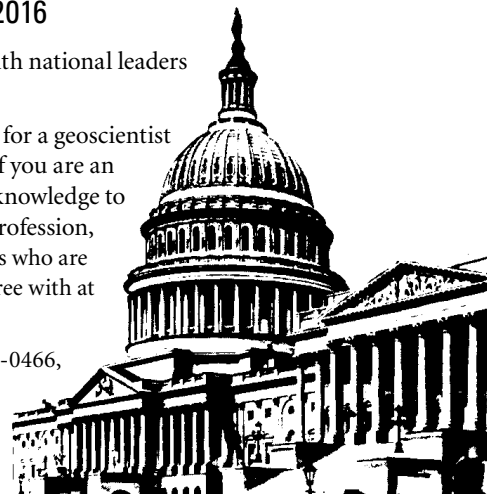
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Application deadline: 1 Feb. 2016

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Geoscientists Visit Capitol Hill during Annual Outreach Event

Elizabeth Goldbaum, GSA Science Policy Fellow

On 29–30 September 2015, geoscientists from across the nation visited Capitol Hill to share their research and voice their concern over fizzling federal support for earth sciences with policymakers from states as diverse as Wyoming, Florida, Texas, and California. GSA, along with many fellow geoscience societies (www.americangeosciences.org/policy/get-involved/events/GEO-CVD), organized this, the 8th Annual Geoscience Congressional Visits Day (www.geosociety.org/geopolicy/CVD/), or “GeoCVD.”

Established and emerging geoscientists from academia, industry, and government attended a workshop and reception on 29 Sept. to welcome and prepare them to make the most of their visit. The following day they met with their representatives, senators, their staffers, and congressional committees in small teams to talk about how strong federal investment in geoscience research and education can enhance national security, support resilient communities, sustain a highly skilled workforce, and strengthen the nation’s global and economic competitiveness.

A Crash Course on Current Science Policy

During the orientation, organizers from the many hosting geoscience societies gave participants a refresher on how Congress works, focusing on the current status of federal geoscience funding. Kasey White, GSA’s Director for Geoscience Policy, spoke about H.R.1806, the “America COMPETES Reauthorization Act of 2015,” and its stipulations to cut NSF funding for geosciences, despite increasing overall funding for NSF. White also detailed cuts to many geoscience research programs at the Department of Energy contained in the bill. The House passed the bill back in May 2015. The Senate has been holding roundtables and seeking feedback before releasing a draft bill.

White also discussed the “NASA Authorization Act of 2016 and 2017 (H.R.2039),” which includes deep authorization cuts to NASA’s Earth Science Division and cuts to geoscience research in the House appropriations bills.

Participants heard from current geoscience congressional fellows, including GSA-USGS Congressional Science Fellow

Susanna Blair. Congressional Science Fellows work for a year as staff members for members of Congress or congressional committees. The fellows shared their experiences and lessons learned about effective meetings from their time on the Hill with the participants.

Once participants were up to speed on the latest science policy legislation, they had the opportunity to practice their message with fellow team members. Each team had between two to five people and was matched with congressional offices from a state or pair of states, as well as congressional committees. Teams came up with strategies to find a local, resonating message to bring to Congress that highlighted geoscience research.

For instance, Annika Deurlington, an undergraduate student at Claremont College who was awarded travel funding by GSA’s Cordilleran Section, told Tom McClintock’s (R-CA) office that she appreciated his dedication to finding ways to store water and also asked him “to promote groundwater storage wherever possible,” Deurlington said in an email.

Representatives Who Support Federally Funded Geoscience Research

Participants ended their first day on Capitol Hill at a reception hosted by the USGS Coalition, of which GSA and other societies are members.

More than 150 people attended the event, which honored two members for “their efforts to advance the scientific

fields that further our understanding of Earth’s living and non-living systems,” Robert Gropp, the chairman of the USGS Coalition and interim co-executive director of the American Institute of Biological Sciences, said in a statement.

GSA Executive Director Vicki McConnell presented Representative Suzanne Bonamici (D-OR) with the USGS Coalition Leadership Award and said that Bonamici “really gets it” when it comes to the importance of federally funding geoscience. McConnell commended Bonamici for her work on H.R.34, the “Tsunami Warning, Education, and Research Act of 2015,” which authorizes and strengthens tsunami detection, forecast, warning, research, and mitigation program. In her thanks,



GSA Executive Director Vicki McConnell (right) presenting Representative Suzanne Bonamici (D-OR) with the USGS Coalition Leadership Award.

Bonamici said that she is on geoscientists' side and will continue to be an advocate for funding scientific research.

Elizabeth Duffy, the government relations director for the Seismological Society of America, then honored Representative Tom Cole (R-OK) for his support of geoscience research and his wise management of natural resources. Cole expressed his thanks and said that he is "not used to getting these kinds of accolades," but supports up-and-coming science.

David Applegate, the acting deputy director of the USGS, echoed the speakers' gratitude for the Representatives' support during his speech at the reception.

Reaching Out to Congress

Participants began their next day back on Capitol Hill meeting with their members. Participants were clear in their message on the importance of sustained funding for geoscience and enthusiastic when sharing their research with policymakers.

"My hope is that I was a tangible reminder to congressional staffers that money spent on education and research translates into professionals who can perform tasks that benefit society," Deurlington said. Jon Price, GSA's current president, connected with his local Nevada Representative's office. The office returned Price's interest and sent a staffer to an open house of the Nevada Bureau of Mines and Geology to learn about geological hazards and mineral and energy resources. Marisa Repasch, a graduate student at the University of New Mexico who received travel support from GSA's Rocky Mountain Section, visited Representative Michelle Lujan Grisham's (D-NM) office. Along with her team members, Repasch closely connected with Grisham's office and discovered that Grisham is interested in New Mexico's geoscience research, especially the environmental impacts of the Gold King Mine spill into the Animas River, which flows through New Mexico.

"Geology is a significant part of New Mexico's economy, culture, and health, and it is impossible to have a functioning society without geoscientists," Repasch said in an email. "I am excited about all the new connections that were created between congress and their geoscientist constituents. I am sure that our actions on Capitol Hill will have a positive impact on the federal funding appropriated for geoscience research."

2015–2016 GSA-USGS Congressional Science Fellow



Karen Paczkowski

GSA is pleased to announce that Karen Paczkowski is serving as the 2015–2016 GSA-USGS Congressional Science Fellow in Senator Edward Markey's office. During her year on the Hill, Paczkowski hopes to tackle national challenges in energy, the environment, and STEM education. She plans to work on topics including (but not limited to) U.S. energy security, clean energy, protection and sustainable use of natural resources, climate change mitigation and adaptation, development of a competitive STEM workforce, and federal investment in STEM research and education.

Paczkowski holds a B.S. in mechanical engineering from Boston University and both an M.S. in mechanical engineering and a Ph.D. in geology and geophysics from Yale University. Her research focused on determining the physical processes that control lithospheric drip instabilities and mantle flow in subduction zones, and demonstrated that anomalous observations in many regions can be explained as extensions to the theory of plate tectonics.

Paczkowski has worked in industry, academia, and at non-profits on topics that span science, engineering, and policy. She has conducted research on blood flow, mantle convection, and earthquake dynamics; designed airplane thermodynamic systems; and worked with policymakers to broaden support for investment in STEM research and education.

This past year, Paczkowski served as GSA's Science Policy Fellow. Paczkowski's primary role as the GSA Fellow was to act as a liaison between scientists and policy makers. She trained scientists to better communicate the value of their science to both policymakers and the public through communications workshops, webinars, and on-site training sessions. She kept GSA members updated and involved in the policy process by publishing articles about upcoming legislation, science policy events, and the importance of federal investment in science. She also worked with coalitions of science organizations to write strategic communications and plan Hill events for policymakers on the possible ramifications of upcoming science related legislation.



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Geoscience Jobs & Opportunities

Ads (or cancellations) must reach the GSA advertising office no later than the first of the month, one month prior to the issue in which they are to be published. Contact advertising@geosociety.org, +1.800.472.1988 ext. 1053, or +1.303.357.1053. All correspondence must include complete contact information, including e-mail and mailing addresses. Rates are in U.S. dollars.

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Positions Open

ASSISTANT PROFESSOR IN TECTONICS/STRUCTURAL GEOLOGY DEPARTMENT OF GEOLOGY

UNIVERSITY OF MARYLAND, COLLEGE PARK

The Dept. of Geology at the University of Maryland invites applications for a tenure-track assistant professor in Tectonics/Structural Geology, broadly defined. Possible research areas of interest include, but are not limited to: active tectonics and natural hazards, basin analysis, climate-tectonics interactions, crustal evolution, geodesy, microtectonics, orogenesis, planetary geology, and tectonophysics. The appointee will be expected to develop and maintain an active, externally funded research program that will involve both graduate and undergraduate students, and to participate fully in teaching at all levels, including structural geology. We particularly encourage applications from those who integrate across traditional disciplinary boundaries both within the Dept. of Geology (<http://www.geology.umd.edu>) and throughout the College of Computer, Mathematics, and Natural Sciences (<http://www.cmns.umd.edu>). Candidates from underrepresented groups are encouraged to apply.

A Ph.D. in Geology or a related discipline is required at the time of appointment. The appointment may begin as early as August 1, 2016. Applications should be submitted online at <http://ejobs.umd.edu/postings/38311> and should include the following: a letter of application stating research and teaching goals; a complete CV; and contact information for three (3) professional references. Review of applications will begin in January 2016, and will be ongoing until the position is filled.

The University of Maryland, College Park, an equal opportunity/affirmative action employer, complies with all applicable federal and state laws and regulations regarding nondiscrimination and affirmative action; all qualified applicants will receive consideration for employment. The University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, national origin, physical or mental disability, protected veteran status, age, gender identity or expression, sexual orientation, creed, marital status, political affiliation, personal appearance, or on the basis of rights secured by the First Amendment, in all aspects of employment, educational programs and activities, and admissions.

PROFESSOR AND HEAD DEPARTMENT OF GEOSCIENCES VIRGINIA TECH

The Dept. of Geosciences, in the College of Science at Virginia Tech, invites applications from visionary, creative, and energetic leaders for the position of Department Head. With an international reputation for excellence, we are 22 faculty members, 10 support staff, 2 instructors, 15 postdocs/research scientists, 65 graduate students and 130 undergraduates with research interests organized around interdisciplinary studies of processes, materials, life, hazards, water, and resources. With our many young faculty and support of new university initiatives including Beyond Boundaries (www.beyond-boundaries.vt.edu), the new position offers a unique opportunity to reinvent the geological sciences for the 21st century. Our main campus in Blacksburg and other campuses in Northern Virginia are well-positioned to foster interactions with academic and government organizations in the Washington DC metro region.

The successful applicant will be an advocate for the research and teaching missions of the department, will work to grow collaborations with groups across the university and nationally and internationally, and will focus on achieving strategic goals within the department and university. Potential candidates must have a Ph.D. in Geosciences or closely related fields, demonstrated administrative and programmatic leadership experience, a broad understanding of geosciences, and exceptional professional achievements as evidenced by outstanding research. The appointment will be at the level of tenured Full Professor.

Interested candidates should submit a current CV, letter of interest and listing of four professional references upon applying through www.jobs.vt.edu posting number TR0150178 or via the link: <https://listings.jobs.vt.edu/postings/62036>. Review of applications will begin on Jan. 29, 2016 and will continue until the position is filled. If you are an individual with a disability and desire an accommodation, please contact Ms. Sharon Collins (sharon72@vt.edu).

Inquiries regarding the position should be directed to Professor Shuhai Xiao, Search Chair (xiao@vt.edu); Dept. of Geosciences, Virginia Tech, Blacksburg, VA 24061, USA; (540) 231-6521. Further information about the Department is available at www.geos.vt.edu/.

Virginia Tech does not discriminate against employees, students, or applicants on the basis of age, color, disability, gender, national origin, political affiliation, race, religion, sexual orientation, genetic information, veteran status, or any other basis protected by law.

ASSISTANT PROFESSOR SOFT ROCK GEOLOGY MERCYHURST UNIVERSITY

The Mercyhurst University Dept. of Geology in Erie, Pennsylvania, invites applications for a tenure track Assistant Professor position to begin August 2016. We seek a soft rock-oriented geologist committed to teaching excellence in the liberal arts tradition. Teaching responsibilities may include intro geology

STEPHEN F. AUSTIN STATE UNIVERSITY

NACOGDOCHES, TEXAS

ASSISTANT PROFESSOR DEPARTMENT OF GEOLOGY

The Stephen F. Austin State University Department of Geology is accepting applications for a tenure-track position at the assistant (or associate) professor level with a specialty in igneous/metamorphic petrology. Applicants should have a doctoral degree in geology, a strong commitment to excellence in teaching and willingness to direct Master of Science geology graduate students in research. Additionally, applicants should have a strong interest in and aptitude for teaching summer field camp. Teaching responsibilities include introductory courses, upper-level and graduate courses in the applicant's specialty, and occasional weekend field trip courses. Other expectations include research, university service and continuing professional development.

Submit a letter of application, CV, transcripts, statement of research philosophy, statement of teaching philosophy and contact information for three references to <https://careers.sfasu.edu> (posting 0603954).

Also, mail official transcripts to:
Dr. Wesley Brown
Search Committee Chair
Stephen F. Austin State University
Department of Geology
P.O. Box 13011, SFA Station
Nacogdoches, TX 75962-3011
(936) 468-3701

Review of applications will begin Feb. 1, 2016 and continue until the position is filled. SFA is an equal opportunity employer. This is a security-sensitive position and will be subject to a criminal history check.



courses, Sed/Strat, Geomorphology, Hydrogeology, Soils, GIS, and courses in one's area of expertise. Contributing to the department's field courses will be expected. Preference will be given to candidates with a background in Quaternary processes and who have demonstrated a willingness and ability to work with students from diverse backgrounds. The successful candidate will be expected to work closely with the university's environmental science program and to develop a strong research program involving undergraduates. Completion of the PhD is required at the time of appointment. An application that includes a cover letter, cv, statements of teaching philosophy and research interests, and contact information for three references should be emailed as a single pdf to Nick Lang PhD (nlang@mercyhurst.edu). Applications must be received by February 1st, 2016 to receive full consideration. Mercyhurst University is an equal opportunity employer who encourages members of diverse groups to apply. More information about Mercyhurst may be found at: <http://www.mercyhurst.edu/>.

ASSISTANT PROFESSOR OF HYDROLOGY COLUMBUS STATE UNIVERSITY

The Dept. of Earth and Space Sciences at Columbus State University invites applications for a tenure-track Assistant Professor position with a specialization in Hydrology/Hydrogeology to begin Fall 2016.

Candidates must demonstrate potential for research and effective teaching of university level courses. The successful candidate will be expected to maintain an active research program, including mentoring graduate and undergraduate students, leading to publications in peer-reviewed journals; assist with academic advising; and contribute to the service needs of the university. Teaching responsibilities will include: introductory geology and/or environmental science courses in addition to hydrology/hydrogeology, as well as other undergraduate/graduate courses within the area of expertise.

The Dept. of Earth and Space Sciences is strongly interdisciplinary with tracks in Astrophysics and Planetary Geology, Environmental Science, Geology, and Secondary Education within the BS Earth and Space Sciences program, as well as degree tracks in Geoscience and Environmental Science within the MS Natural Sciences program. Earth and Space Sciences faculty have a strong tradition of incorporating both undergraduate and graduate students in faculty research.

Columbus State University provides a creative, deeply personal and relevant college experience. Serving the Southeast while attracting students from around the world, Columbus State thrives on community partnerships to deliver excellence for students who want to achieve personal and professional success in an increasingly global environment. Just 100 miles southwest of Atlanta, Columbus State University is a proud member of the University System of Georgia, enrolling more than 8,400 students in a wide variety of degree programs, from online degrees to a doctorate in education. Among public regional universities in the South, Columbus State University recently ranked No. 46 in the "Best Colleges" rankings by *U.S. News & World Report*.

CSU has a nationally recognized track record of partnership and outreach through efforts such as the Cunningham Center for Leadership Development, Coca-Cola Space Science Center, Oxbow Meadows Environmental Learning Center, and its own residence—the Spencer House—in Oxford, England. The University has two primary campus locations in Columbus, Georgia: the original campus on 150 acres in midtown Columbus and a beautiful campus in historic downtown Columbus overlooking the Chattahoochee River. The Columbus region, with more than 350,000 residents, is home to world-class enterprises such as Aflac, Synovus, W.C. Bradley Company, TSYS and Ft. Benning, the U.S. Army's Maneuver Center of Excellence headquarters. For additional information about the University visit our website at www.ColumbusState.edu.

Candidates should have an earned doctorate in the broad field of Earth Science, Hydrology, Environmental Science, or Engineering prior to the start date of August 2016. Experience teaching at the baccalaureate level is desired.

Candidates with interdisciplinary interests are preferred.

Review of applications will begin immediately and will continue until the position has been filled. Applications for part-time and full-time faculty positions must include transcripts of all academic work, and official transcripts must be presented prior to campus visit if selected for interview. Applicants must have the ability to meet Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) requirements, in particular a minimum of 18 graduate hours in the teaching discipline. Columbus State University is an Affirmative Action/Equal Opportunity Employer, Committed to Diversity in Hiring.

A successful criminal background check will be required as a condition of employment.

Required Documents to Submit with Online Application

- Unofficial Transcripts
- Cover Letter/Letter of Application
- Curriculum Vitae
- Statement of Teaching Philosophy
- Other document 1: Statement of Research Interests
- Other document 2: Contact information for 3 persons willing to provide letters of reference

All applications and required documents must be submitted using the Columbus State University's online employment site. To access the Columbus State University's online employment site, please visit <https://columbusstate.peopleadmin.com>.

If you have any questions, please contact Dr. Troy Keller, Dept. of Earth and Space Sciences, Columbus State University, 4225 University Avenue, Columbus, GA 31907; or e-mail to keller_troy@columbusstate.edu.

ASSISTANT PROFESSOR (TENURE TRACK) STRUCTURAL GEOLOGY

NEVADA BUREAU OF MINES AND GEOLOGY
The Nevada Bureau of Mines and Geology (NBMG) at the University of Nevada, Reno (UNR) seeks applicants with expertise in field-oriented structural geology. NBMG is a public service unit of UNR and

serves as both the state geologic survey of Nevada and as a research department in the UNR College of Science. Faculty at NBMG have tenure-track academic appointments, with both research and teaching obligations.

Position Responsibilities: Primary responsibilities of this position include development of productive externally funded, research programs in the field of structural geology. Research will focus on structural geology as it relates to the tectonic evolution of Nevada, utilizing innovative approaches to detailed geologic mapping, structural analysis of faults and folds, and geochronology. The successful candidate will also be expected to contribute to understanding natural resources and geologic hazards in the context of structural settings and deformational events. Duties will include supervising graduate students and teaching courses in the candidate's area of expertise within the Dept. of Geological Sciences and Engineering (DGSE).

Qualifications: Applicants must have a doctorate in geology or a related geoscience field by the time of hire and a demonstrated record of research on topics related to Structural Geology, as indicated by dissertation research, industry experience, and/or peer-reviewed publications. The successful candidate must also have experience in field-oriented research and a desire to conduct such research on future projects. Expertise in geologic mapping, fault kinematics, rock mechanics, and/or geochronology will be valued. Excellent communication skills, as demonstrated in written application materials; commitment to public service; potential for, or established record of publications; and ability to attract funding are essential. We encourage candidates to explain achievable plans for funded research on Nevada-focused topics in Structural Geology in their letters of interest.

Salary and Date of Appointment: The position will be a tenure-track faculty appointment at the assistant professor level with an academic-year base salary that is competitive with other research universities. Starting date will be July 1, 2016 or shortly thereafter, depending on availability of the successful candidate.

To apply, please visit: <https://www.unrsearch.com/postings/19454>. Please submit a letter expressing your interest in the position and research plans; names, e-mail addresses, postal addresses, and telephone numbers of at least three references; a complete curriculum vitae; and electronic copies of up to three of your publications to <http://jobs.unr.edu/>. Application deadline is February 1, 2016. For further information about NBMG, please consult our website (<http://www.nbm.unr.edu>).

EEO/AA. Women, under-represented groups, individuals with disabilities, and veterans are encouraged to apply.

FACULTY POSITIONS DEPARTMENT OF GEOSCIENCES NATIONAL TAIWAN UNIVERSITY

The Dept. of Geosciences at NTU is seeking active scientists to fill faculty positions starting from 1st August 2016. The positions are open to all fields in geosciences, but those who have strong background in the fields of mineralogy and petrology,

geo-resources, stratigraphy, sedimentology, structural geology and applied geology will receive more favored consideration. Applicants are requested to submit the following documents: CV, list of publications, three to five copies of refereed articles published within the last seven years (one of which shall be designated as representative paper and must be published after 1st August, 2011), plans for teaching and research in WORD or PDF files, and names of three potential referees. Application materials should be sent to Professor Ya-Hsuan Liou, the Chairman of the Searching Committee, by post or emails at yhliou@ntu.edu.tw. Address: Dept. of Geosciences, National Taiwan University, No. 1, Sec. 4, Roosevelt Rd., Taipei 106, Taiwan.

Deadline for application: 15th January 2016. Web site: <http://web.gl.ntu.edu.tw/>.

**ENDOWED CHAIR
(ASSOCIATE/FULL PROFESSOR)
OF UNCONVENTIONAL ENERGY
PURDUE UNIVERSITY**

The Dept. of Earth, Atmospheric, and Planetary Sciences at Purdue University invite applications for the Steven and Karen Brand Chair in unconventional energy resources. Candidates with a core expertise in unconventional energy with a strong and consistent track record of applying this expertise to unconventional petroleum resources will be considered. Candidates with expertise including, but not limited to, unconventional exploration and production, tight reservoir characterization, geophysics and seismic data analysis, subsurface integration, hydraulic fracture mechanics, pore/fluid interactions, water and environmental issues, and enhanced oil and gas recovery are encouraged to apply. Excellence in and/or commitment to multidisciplinary research and teaching is a requirement. It is expected that the candidate hired would significantly enhance Purdue's visibility and impact in this key area; increase opportunities for industry collaboration and grant funding; and inspire and train the next generation of leaders in the field.

This is an open-rank search; senior or mid-career scientists with academic, national laboratory, and industry background are all encouraged to apply. Applicant must hold a doctorate in an appropriate field; salary and rank are commensurate with qualifications and experience. The Dept. of Earth, Atmospheric, and Planetary Sciences, and the College of Science at Purdue embrace diversity and seek candidates who will create a climate that attracts students of all races, nationalities, and genders. We strongly encourage women and under-represented minorities to apply.

The department, in collaboration with other departments, has expertise in solid earth geophysics and crustal seismology, fracture mechanics, fluid flow in porous media, hydrogeology, clay mineralogy and surface chemistry, and basin analysis. The department has a long tradition of training students for careers in the petroleum industry and is part of a new multidisciplinary initiative at Purdue University aimed at addressing the energy needs of the country and is affiliated with the newly established Enhanced Oil Recovery Laboratory located in Discovery Park. Faculty members have a long history of working

closely with and providing leadership to various Purdue University Discovery Park Centers (www.purdue.edu/DP). The successful applicant will conduct research, will advise graduate students, will teach undergraduate and graduate level courses, and will perform service. The successful applicant will be expected to work across these existing areas of Purdue expertise and build on them with a focus on unconventional resources. Applicants should have a vision for the design and execution of a cross-functional program that achieves the intended mission as described above.

Interested applicants should visit <https://hiring.science.purdue.edu>; submit a curriculum vitae, a research statement, a vision statement, a teaching statement, and complete contact information for at least 3 references. Review of applications will begin January 15, 2016, and continue until the position is filled. Questions related to this position should be sent to Drs. John Cushman or Ken Ridgway, Co-Chairs of the Search Committee (phone: 765-494-3258, email jcushman@purdue.edu or ridge@purdue.edu). Applications will be accepted until the position is filled.

Purdue University is a dynamic, growing university and a great place to work. Our inclusive community of scholars, students and staff impart an uncommon sense of larger purpose and contribute creative ideas to further the university's mission of teaching, discovery and engagement.

Purdue University is an EOE/AA employer. Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. All qualified applicants for employment will receive consideration without regard to race, religion, color, sex, national origin or ancestry, genetic information, marital status, parental status, sexual orientation, gender identity and expression, disability or status as a veteran.

**ASSISTANT PROFESSOR OF GEOLOGY
COLUMBUS STATE UNIVERSITY**

The Dept. of Earth and Space Sciences at Columbus State University invites applications for a tenure-track Assistant Professor position with specialization in Sedimentology/Stratigraphy to begin Fall 2016.

Candidates must demonstrate potential for research and effective teaching of university level courses. The successful candidate will be expected to maintain an active research program, including mentoring graduate and undergraduate students, leading to publications in peer-reviewed journals; assist with academic advising; and contribute to the service needs of the university. Teaching responsibilities will include: introductory geology, sedimentary geology, stratigraphy and basin analysis, as well as other undergraduate/graduate courses within the area of expertise.

The Dept. of Earth and Space Sciences is strongly interdisciplinary with tracks in Astrophysics and Planetary Geology, Environmental Science, Geology, and Secondary Education within the BS Earth and Space Sciences program, as well as degree tracks in Geoscience and Environmental Science within the

MS Natural Sciences program. Earth and Space Sciences faculty have a strong tradition of incorporating both undergraduate and graduate students in faculty research.

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Candidates should have an earned doctorate in the broad field of Geoscience prior to the start date of August 2016. Experience teaching at the baccalaureate level is desired.

Candidates with interdisciplinary interests are preferred.

Review of applications will begin immediately and will continue until the position has been filled. Applications for part-time and full-time faculty positions must include transcripts of all academic work, and official transcripts must be presented prior to campus visit if selected for interview. Applicants must have the ability to meet Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) requirements, in particular a minimum of 18 graduate hours in the teaching discipline. Columbus State University is an Affirmative Action/Equal Opportunity Employer, Committed to Diversity in Hiring.

A successful criminal background check will be required as a condition of employment.

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 - Other document 1: Statement of Research Interests
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- All applications and required documents must

be submitted using the Columbus State University's online employment site. To access the Columbus State University's online employment site, please visit <https://columbusstate.peopleadmin.com/>.

If you have any questions, please contact Dr. David Schwimmer, Dept. of Earth and Space Sciences, Columbus State University, 4225 University Avenue, Columbus, GA 31907; Phone: 706-569-3028; or e-mail to schwimmer_david@columbusstate.edu.

FULL TIME, ASSISTANT RESEARCHER (COLLECTION MANAGER) KU BIODIVERSITY INSTITUTE

The KU Biodiversity Institute seeks a full time Assistant Researcher (Collection Manager) to oversee its world-class collections of invertebrate fossils. Required qualifications include master's degree in museum studies, geology, systematics, or paleontology, knowledge of invertebrate fossil taxonomy and identification, knowledge of care and management of natural history collections, and familiarity with biodiversity informatics. For additional information and complete application instructions please visit <https://employment.ku.edu/staff/4566BR>. KU is an EO/AAE. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex (including pregnancy), age, national origin, disability, genetic information or protected Veteran status. Review begins 1 Feb. 2016.

THREE ASSISTANT PROFESSOR POSITIONS, DEPARTMENT OF GEOLOGY & GEOGRAPHY, WEST VIRGINIA UNIVERSITY

The Dept. of Geology and Geography at West Virginia University seeks to fill three geology faculty positions. Applicants should have a PhD or equivalent degree in geology, earth science or related field by the start date. Review of applications for all positions will begin January 15, 2016 and continue until each position is filled; start date for all positions is August 15, 2016.

Paleobiology: We seek to hire a full-time (9-month), tenure-track Assistant Professor specializing in Paleobiology, which could include expertise in Invertebrate or Vertebrate Paleontology, Micropaleontology, Paleoecology, Paleobotany/Palynology, Ichnology, or related fields. The successful candidate will be expected to develop a vigorous externally-funded research program, teach core undergraduate classes in paleontology, graduate courses in the area of his/her expertise, and mentor graduate and undergraduate students. Candidates should demonstrate potential to establish a strong externally-funded research program, publish in peer-reviewed journals, and excel in teaching at the undergraduate and graduate levels. To apply, please visit jobs.wvu.edu and navigate to the position title listed above. Upload (1) a single PDF file containing a curriculum vitae, statement of research interests, statement of teaching philosophy, and names, titles, and full contact information for 3 references; and (2) PDF files of up to 3 publications. In addition, arrange for 3 letters of reference to be sent to Paleobiology@mail.wvu.edu. For additional information, please see pages.geo.wvu.edu/Paleobiology or

contact the search chair, Amy Weislogel, at Paleobiology@mail.wvu.edu or (304) 293-6721.

Quantitative Structural Geology or Geomechanics: We seek to hire a full-time (9-month), tenure-track Assistant Professor specializing in quantitative structural geology with interests in the study of fractured reservoirs and geomechanics. The successful candidate will be expected to develop a vigorous externally-funded research program, teach undergraduate classes in structural geology or geomechanics, teach graduate courses in the area of his/her expertise, and mentor graduate and undergraduate students. Candidates should demonstrate potential to establish a strong externally-funded research program, publish in peer-reviewed journals, and excel in teaching at the undergraduate and graduate levels. To apply, please visit jobs.wvu.edu and navigate to the position title listed above. Upload (1) a single PDF file containing a curriculum vitae, statement of research interests, statement of teaching philosophy, and names, titles, and full contact information for 3 references; and (2) PDF files of up to 3 publications. In addition, arrange for 3 letters of reference to be sent to Geomechanics@mail.wvu.edu. For additional information, please see pages.geo.wvu.edu/Geomechanics or contact the search chair, Dengliang Gao, at Geomechanics@mail.wvu.edu or (304) 293-3310.

Teaching Assistant Professor of Geology: We seek to hire a full-time (9-month), non-tenure track Teaching Assistant Professor. The successful candidate will teach a variety of undergraduate courses, including both large introductory and smaller upper-division classes, in the classroom and online, and the field component of the B.S. capstone course, Geology Field Camp (the last with an additional summer stipend). Specialty area is open. Teaching Assistant Professors at WVU are eligible for promotion; however, promotion to senior ranks is not a requirement for institutional commitment and career stability. This position is a nine-month renewable appointment (no maximum number of terms) and includes full benefits. The position carries an 80% teaching (4 courses per semester) and 20% service assignment. The successful candidate will join a faculty that takes great pride in having members recognized at the university, state, and national levels for excellence in teaching. The Department occupies the recently renovated Brooks Hall with state-of-the-art teaching technologies and facilities. To apply for this position, interested candidates should visit jobs.wvu.edu and navigate to the position title listed above. Upload a single PDF file containing a curriculum vitae, statement of teaching interests and philosophy, teaching evaluations as available, and full contact information for 3 references. In addition, please arrange for three letters of reference to be sent directly to GeologyTAP@mail.wvu.edu. For additional information, please see pages.geo.wvu.edu/GeologyTAP or contact the search chair, Thomas Kammer, at GeologyTAP@mail.wvu.edu or (304) 293-9663.

WVU is an EEO/Affirmative Action Employer and welcomes applications from all qualified individuals, including minorities, females, individuals with disabilities, and veterans. For additional information about the department visit www.geo.wvu.edu.

Opportunities for Students

Ph.D. Fellowships in Hydrologic Sciences at the University of Nevada Reno and the Desert Research Institute. The Graduate Program of Hydrologic Sciences at the University of Nevada, Reno and the Desert Research Institute seeks Ph.D. candidates in hydrology and hydrogeology to fill graduate teaching and research assistant positions beginning in Fall 2016. Three year research fellowships are available for a wide range of topics, including effects of halophytic plants on soil quality; climate patterns and tree rings; groundwater residence times and aquatic ecology of springs; snow ecohydrology; and Nevada water resources. Details are available at http://www.hydro.unr.edu/research/research_funding.aspx.

New Mexico Highlands University, Graduate Assistantship. Graduate assistantships are available for students wishing to pursue an MS in Geology beginning Fall 2016 term. The NMHU Environmental Geology Program strengths are in mineralogy, petrology, geochemistry, rock-paleomagnetism, structural geology, volcanology, and collaborative endeavors with the Forestry and the New Mexico Forest and Watershed Restoration Institute. The NSF-Funded Paleomagnetism-Rock Magnetism, Powder X-Ray Diffraction, and Water Chemistry laboratories support wide-ranging analytical research. The NMHU campus in Las Vegas, New Mexico, is situated at the boundary of the Great Plains and the Sangre de Cristo Mountains and is located within one to two hours from Cenozoic volcanic fields, Precambrian rock exposures, glaciated valleys, desert terrains, and several world-renowned geologic features - the Valles Caldera, the Rio Grande Rift, and the Harding Pegmatite. A low student:faculty ratio, state-of-the-art laboratory facilities, and committed faculty provide students with a superior learning experience. The graduate assistantship includes a nine-month stipend and tuition waiver per academic year. Application review begins 03/16/16. For more information, contact Dr. Michael Petronis, Environmental Geology, Natural Resource Management Dept., New Mexico Highlands University, Box 9000, Las Vegas, New Mexico 87701, mspetro@nmhu.edu. For disabled access or services call 505-454-3513 or TDD# 505-454-3003. AA/EOE Employer.

Graduate Student Opportunities, Ohio University. The Dept. of Geological Sciences at Ohio University invites applications to its graduate program for the Fall of 2016. The department offers an MS degree in Geological Sciences and areas of emphasis within three research clusters: paleobiology and sedimentary geology, solid earth and planetary dynamics, and environmental and surficial processes. Prospective students are encouraged to contact faculty directly to discuss potential research topics. Qualified students are eligible to receive teaching or research assistantships that carry a full tuition scholarship and a competitive stipend. For additional program and application information, visit the department website at <http://www.ohio.edu/cas/geology> or contact the graduate chair, Dr. Alycia Stigall (stigall@ohio.edu). Review of applications begins 1 February.

Graduate Opportunities in Planetary Geology at North Carolina State University. The Dept. of Marine, Earth, and Atmospheric Sciences (MEAS) at North Carolina State University invites applications from prospective M.Sc. and Ph.D. students in the broad field of planetary geology. Opportunities in the new MEAS Planetary Research Group exist in particular for tectonic and volcanic comparative planetology projects, using a combination of analogue modeling, field work, and remote sensing from unmanned aerial systems. Applicants must have a B.S. or M.Sc. in geology or a related discipline; experience in remote sensing, GIS, and/or fieldwork is desirable. Financial support is available through a combination of research and teaching assistantships.

MEAS is one of the largest interdisciplinary geoscience departments in the nation. Review of applications will begin on January 31, 2016, and initial decisions will be made as early as February 2016. Information about MEAS, its graduate programs, and the application procedure can be found at www.meas.ncsu.edu. Applications can be submitted at www.ncsu.edu/grad/applygrad.htm. For more information, prospective applicants can contact Dr. Paul Byrne at paul.byrne@ncsu.edu.

Multiple Graduate Assistantships Available in Geology and Meteorology at Iowa State University. Motivated and talented graduate students are invited to apply to M.S. and Ph.D. programs offered in geology and meteorology to fill multiple graduate assistant positions beginning in Fall 2016.

Although we strongly encourage students with interests in all fields of geoscience to apply, we particularly encourage students with a strong background in chemistry as some teaching assignments may include introductory chemistry laboratory classes. Summer support is also likely beyond the nine-month academic year. In addition, the geology program will consider one or two outstanding Ph.D. applicants for the recently endowed David Morehouse Fellowships that will cover full-tuition and a stipend for the first year (12 months) of studies. Faculty and student research covers five broad focus areas: Climate and Quaternary Studies, Geoscience Education, Hydrological Sciences, Microscale and Mesoscale Meteorology, and Solid Earth Processes. Information about the graduate program and the Dept. of Geological and Atmospheric Sciences can be found at <http://www.ge-at.iastate.edu/>. Applicants should initially contact individual faculty members as soon as possible to indicate interest, but should do so no later than the university application deadline of February 1, 2016. All qualified students will receive consideration for acceptance without regard to race, color, religion, sex, national origin, disability, or protected Veteran status. Questions regarding the positions should be directed to the Department Chair (Bill Simpkins; bsimp@iastate.edu).

The Jonathan O. Davis Scholarship supports graduate students working on the Quaternary geology of the Great Basin. The national scholarship is \$7,500 and the University of Nevada, Reno, stipend is

\$7,500. The national scholarship is open to graduate students enrolled in an M.S. or Ph.D. program at any university in the United States. The Nevada stipend is open to graduate students enrolled in an M.S. or Ph.D. program at the University of Nevada, Reno. Details on application requirements can be found at: <http://www.dri.edu/GradPrograms/Opportunities/JonathanDavis>. Applications must be post-marked by February 17, 2016. Proposals will not be returned. Applications should be addressed to: Executive Director Division of Earth and Ecosystem Sciences, Attn: Davis Scholarship, Desert Research Institute, 2215 Raggio Parkway, Reno, Nevada, 89512

Lindahl Ph.D. Scholarships, Department of Geological Sciences, The University of Alabama. The University of Alabama Dept. of Geological Sciences seeks highly qualified Ph.D. students with specializations in topics that complement faculty research interests. Exceptional students will receive Research or Teaching Assistantships and a Lindahl Scholarship totaling \$22,000 for a nine month appointment. The University of Alabama covers the cost of non-resident tuition and fee waivers. Funding is renewable for at least 4 years if expectations are met. Other fellowships are available from the Graduate School on a competitive basis. Further details are at <http://www.geo.ua.edu/>. Applicants should contact Dr. Delores Robinson (dmr@ua.edu) to express interest. Review of applications for Fall 2016 admission will begin January 15, 2016.

Penrose Conference—Snake River, Twin Falls, Idaho, USA, 9–13 September 2009. Photo by Kai Calks.



March 2012 Penrose Conference location: Castelvecchio Pascoli, Lucca, Italy.

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Erratum

In the December 2015 *GSA Today* science article (v. 25, no. 12, p. 4–10), “Imaging spectroscopy of geological samples and outcrops: Novel insights from microns to meters,” by Rebecca N. Greenberger et al., the scale bars for Figure 2 were inadvertently removed. The corrected figure is below. *GSA Today* regrets this error.

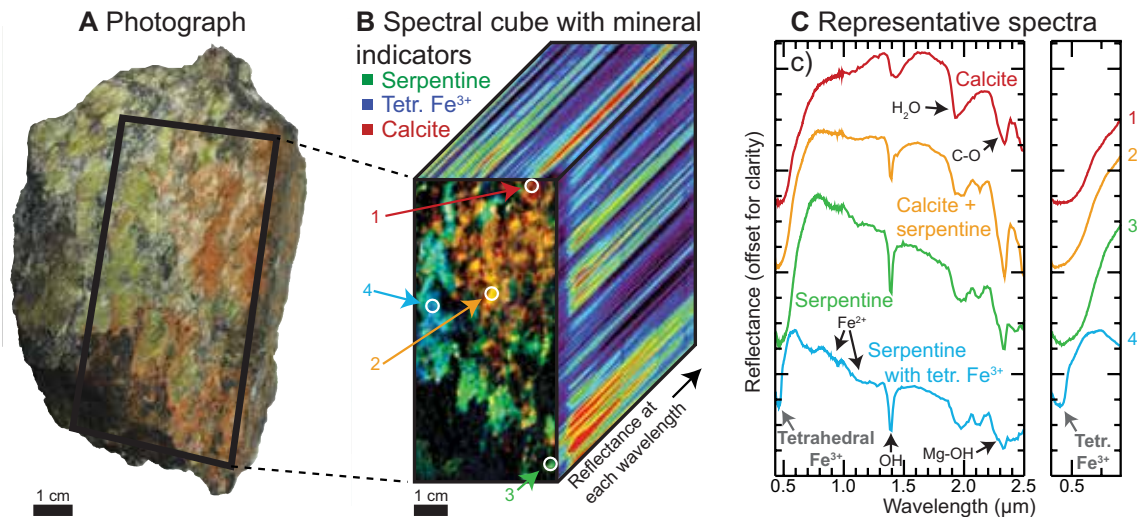


Figure 2. Hyperspectral image of a serpentinite sample with red and green coatings (Nor4-14, described in Greenberger et al., 2015b) from Norbestos, Quebec, Canada. (A) Photograph of the full rock. (B) Image showing spectral parameters that map calcite (red), serpentine (green), and a feature at 0.45 μm (BD450; blue) due to tetrahedral Fe^{3+} within serpentine. The third dimension shows the reflectance as a function of wavelength for each pixel within the image, with black and purple being low and red high. (C) Plot with representative spectra of different units within the hyperspectral image. Colors correspond to colors in the spectral parameter image with locations numbered. Close-up views of the 0.45 μm feature are shown on the right. These images were acquired with Headwall Photonics Inc. High Efficiency Hyperspec[®] visible–near-infrared E-series (0.4–1.0 μm , 7 nm spectral resolution, 0.382 mrad instantaneous field of view) and High Efficiency Hyperspec[®] shortwave infrared X-series pushbroom systems (1.0–2.5 μm , 12 nm spectral resolution, 1.2 mrad instantaneous field of view) imaging spectrometers (see GSA Supplemental Data Repository item no. 2015342 for more information).

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The Tooth of Time, an icon of Philmont Scout Ranch.

Philmont Scout Ranch Volunteer Geologist Program Marks 25th Year

Cimarron, New Mexico, USA

Sponsored by the Rocky Mountain Association of Geologists



Map of Cimarron's location (in red), New Mexico, USA. Image by Arkyan; Creative Commons license BY-SA.

Philmont Scout Ranch is one of three national high-adventure bases owned and operated by the Boy Scouts of America. Located in the southern Sangre de Cristo Mountains of northern New Mexico, Philmont is a 137,000-acre ranch dedicated to outdoor activities. The twelve-day backpacking experience serves more than 27,000 high-school-age boys and girls from all over the USA as well as several foreign countries. Learn more about the geology of the area at http://pubs.usgs.gov/pp/pp_505/html/pdf.html.

Fifty-four volunteer positions are open this year, to be filled on a first-come, first-served basis. Volunteers will receive a sign-up packet with scout applications (you have to be a scout, at least for the summer!), medical forms, and brochures in May 2016. Students who would like to volunteer must show proof of enrollment in a graduate-level program. The 2016 season begins on Saturday, 11 June; the last week of the program begins on Saturday, 6 August.

For more information and to sign up, contact Ed Warner, 62 South Ash Street, Denver, CO 80246, USA, +1-303-331-7737, cell +1-720-490-5152, ewarn@ix.netcom.com. Alternate contact: Bob Horning, P.O. Box 460, Tesuque, NM 87574, USA, +1-505-820-9290, rrhorning@gmail.com.

Volunteer to Teach and Demonstrate Area Geology in Back-Country New Mexico this Summer!



Public Policy Programs

Every day on Capitol Hill, lawmakers and leaders create and enact the policies that fund the majority of earth-science research, regulate natural resources and drive energy exploration, and shape the broader landscape of science education.

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GSA's Washington, D.C., office coordinates the Society's advocacy work in cooperation with the GSA Geology and Public Policy Committee and the GSA Geology and Society Division. The office provides opportunities to touch policy work at the national, state, and local levels through a more informed membership base. See

"Geoscientists Visit Capitol Hill during Annual Outreach Event," on p. 42 of this issue to learn more.

The GSA-USGS Congressional Science Fellow Program is celebrating its 30th year. Each year, in partnership with the U.S. Geological Survey, GSA selects and funds a Congressional Science Fellow who brings geoscience expertise to Capitol Hill by serving on the staff of a Member of Congress or congressional committee. Past GSA-USGS Congressional Fellows now serve important roles in academia and policy organizations.

Three years ago, GSA created the **Policy Fellow** position to work alongside the GSA Director for Geoscience Policy in the Washington, D.C., office. The Policy Fellow provides GSA with critical staff power while gaining unique professional and political experience.

Thank you for your support of these important, proven, and innovative programs designed to serve our members. This is an important area to invest in for GSA's future.



Karen Paczkowski, 2015–2016 GSA-USGS Congressional Science Fellow



Elizabeth Goldbaum, 2015–2016 GSA Policy Fellow



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GSA Publications Highlights

GSA depends on the volunteer efforts of many science editors, associate editors, and editorial board members to ensure the timeliness and quality of our publications.

GSA thanks the editors whose terms ended 31 December 2015 for their service to the Society and to the science: Rónadh Cox and Ellen Thomas, *Geology*; Christian Koeberl, *GSA Bulletin*; Kent Condie, Books; Eric Kirby, *Lithosphere*; and Doug Walker, Maps and Charts.

GSA Today's science editors **Steve Whitmeyer** and **Jerry Dickens** remain on-board for another year.

Please join us in welcoming the science editors starting terms this month:

GSA Books, **Christian Koeberl**, University of Vienna

Lithosphere, **Damian Nance**, Ohio University

Geology, **Judy Parrish**, University of Idaho

Geology, **Jim Schmitt**, Montana State University

GSA Bulletin, **Brad Singer**, University of Wisconsin–Madison

GSA Maps and Charts, **John Van Hoesen**, Green Mountain College

The current list of editors is posted at www.geosociety.org/pubs/editors.htm.



Thanks to All Our Science Editors

2016 GSA Section Meetings



SOUTH-CENTRAL

21–22 March
Hilton Baton Rouge Capitol Center,
Baton Rouge, Louisiana, USA



NORTHEASTERN

21–23 March
Albany Convention Center,
Albany, New York, USA



SOUTHEASTERN

31 March–1 April
Columbia Metropolitan Convention Center,
Columbia, South Carolina, USA



CORDILLERAN

4–6 April
Ontario Convention Center,
Ontario, California, USA



NORTH-CENTRAL

18–19 April
I-Hotel and Conference Center,
Champaign, Illinois, USA



ROCKY MOUNTAIN

18–19 May
University of Idaho,
Moscow, Idaho, USA



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Large Meteorite Impacts and Planetary Evolution V

Edited by Gordon R. Osinski

Large Meteorite Impacts and Planetary Evolution V

*Edited by Gordon R. Osinski
and David A. Kring*

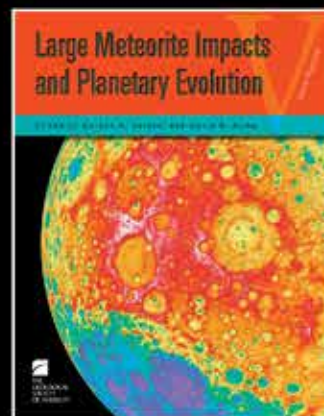
Impact cratering is one of the most fundamental geological processes. On many planets, impact craters are the dominant geological landform. On Earth, erosion, plate tectonics, and volcanic resurfacing continually destroy the impact cratering record, but even here, the geological, biological, and environmental effects of impact cratering are apparent. Impact events are destructive and have been linked to at least one of the "big five" mass extinctions over the past 540 Ma. Intriguingly, impact craters can also have beneficial effects. Many impact craters are associated with economic metalliferous ore deposits and hydrocarbon reservoirs. This Special Paper provides an up-to-date synthesis of impact cratering processes; the role of meteorite impacts in the origin of life, products, and effects; and the techniques used to study impact craters on Earth and other planetary bodies. This volume resulted from the Large Meteorite Impacts and Planetary Evolution V conference held in Sudbury, Canada, in August 2013.

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