

Last Call for 2019 Annual Meeting Proposals

GSA TODAY

 THE GEOLOGICAL SOCIETY
OF AMERICA®

VOL. 29, NO. 1 | JANUARY 2019

Big Data and Artificial Intelligence Analytics in Geosciences: Promises and Potential



CALL FOR SHORT COURSE AND TECHNICAL SESSION PROPOSALS



It's already time to plan for our 2019 Annual Meeting in Phoenix, Arizona, USA. Help ensure that your area of research and expertise is represented at this year's annual meeting. Any individual or geoscience organization is welcome to submit proposals. The proposal form is online at www.geosociety.org/annualmeeting.

Exchange the geology by organizing and chairing a Technical Session.

Technical Session deadline: 1 Feb. 2019

Proposals are being taken for both Pardee Keynote and Topical Sessions.

Share the geology as an instructor through a Short Course.

Short Course proposal deadline: 1 Feb. 2019

Courses run the Friday and Saturday before the Annual Meeting and are typically a half day to two full days.



www.geosociety.org/meetings



GSA TODAY

GSA TODAY (ISSN 1052-5173 USPS 0456-530) prints news and information for more than 26,000 GSA member readers and subscribing libraries, with 11 monthly issues (March/April is a combined issue). *GSA TODAY* is published by The Geological Society of America® Inc. (GSA) with offices at 3300 Penrose Place, Boulder, Colorado, USA, and a mailing address of P.O. Box 9140, Boulder, CO 80301-9140, USA. GSA provides this and other forums for the presentation of diverse opinions and positions by scientists worldwide, regardless of race, citizenship, gender, sexual orientation, religion, or political viewpoint. Opinions presented in this publication do not reflect official positions of the Society.

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GSA Online: www.geosociety.org

GSA TODAY: www.geosociety.org/gsatoday

Printed in the USA using pure soy inks.



GROUNDWORK

- 42 **Big Data and Artificial Intelligence Analytics in Geosciences: Promises and Potential**
Roberto Spina
- 44 **GSA Tomorrow: An Open Challenge to Promote the Future of Geoscience**
Kristin M. Dorfler and Anke M. Friedrich

Cover: Adaptation of a digital map of major lithologies of seafloor sediments in Earth's ocean basins, based on Figure 2 from A. Dutkiewicz et al., 2015, <https://pubs.geoscienceworld.org/geology/article-lookup/43/9/795>. See related article, p. 42–43.



GSA News

- 4 **Final Call: GSA Awards & Medals**
- 4 **Call for GSA Fellowship Nominations**
- 5 **Call for Nominations: GSA Scientific Division Awards**
- 10 **GSA GeoCorps™ America Program**
- 10 **National Park Service Geoscientists-in-the-Parks (GIP) Opportunities**
- 11 **GeoCorps™ Enterprise**
- 11 **GSA/ExxonMobil Bighorn Basin Field Award**
- 12 **2019 Graduate Student Research Grants**
- 12 **Field Camp Scholar Awards**
- 13 **Call for GSA Committee Service**
- 15 **Speaking of Geoscience**
- 16 **Welcome New GSA Members**
- 23 **2019 GeoCareers Section Meetings Programs**
- 24 **Second Announcement: 2019 Northeastern Section Meeting**
- 26 **Student Funding to NEGSA 2019**
- 28 **Second Announcement: 2019 Joint Section Meeting**
- 31 **Miss Those Rock Stars Articles?**
- 33 **2019 Section Meetings Calendar**
- 34 **Commentary**
- 36 **Updated Position Statement**
- 37 **Geoscience Jobs & Opportunities**
- 41 **GSA Foundation Update**
- 46 **Call for Applications: 2019–2020 Congressional Science Fellowship**
- 46 **Meet the New Editors**

Erratum: On page 12 of the Dec. 2018 issue of *GSA Today*, GSA Honorary Fellow Bishal Upreti was noted to have been rector of Tribhuvan University. In fact, he was only acting rector for a short period. GSA regrets this error.



FINAL CALL

GSA Awards & Medals

www.geosociety.org/gsa/awards/nominate.aspx



For details, see the Oct. 2018 *GSA Today* or go to www.geosociety.org/awards. You can also email awards@geosociety.org.

2019 GSA Medals & Awards

Nominations due 1 Feb.

- Penrose Medal
- Day Medal
- Honorary Fellow
- 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

Nominations due 1 Mar.

- GSA International Distinguished Career Award
- James B. Thompson, Jr., Distinguished International Lecturer Award

John C. Frye Environmental Geology Award

Nominations due 31 Mar.

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

2019 Post-Doctoral Research Awards

Applications due 1 Feb.

Learn more at www.geosociety.org/gsa/grants/postdoc.aspx.

- The **Gladys W. Cole Memorial Research Award** for research on the geomorphology of semiarid and arid terrains in the United States and Mexico is awarded annually to a GSA member or Fellow between 30 and 65 years of age who has published one or more significant papers on geomorphology.
- The **W. Storrs Cole Memorial Research Award** for research on invertebrate micropaleontology is awarded annually to a GSA member or Fellow between 30 and 65 years of age who has published one or more significant papers on micropaleontology.

AGI Awards

Nominations due 1 Feb.

Submit nominations for the following awards at www.agiweb.org/direct/awards.html.

- AGI Medal in Memory of Ian Campbell for Superlative Service to the Geosciences recognizes singular performance in and contribution to the profession of geology.
- AGI Marcus Milling Legendary Geoscientist Medal is given to a recipient with consistent contributions of high-quality scientific achievements and service to the Earth sciences having lasting, historic value; who has been recognized for accomplishments in field(s) of expertise by professional societies, universities, or other organizations; and is a senior scientist nearing completion or has completed full-time regular employment.

For a list of other national awards and nomination forms, go to www.geosociety.org/gsa/awards/national.aspx. If you know of an award not listed, please send the details to awards@geosociety.org.

Call for GSA Fellowship Nominations

Deadline: 1 Feb.

Nominate a deserving colleague with the honor of GSA Fellowship. GSA members are elected to Fellowship in recognition of distinguished contributions to the geosciences.

How to Nominate

The primary nominator (who must be a GSA member *and* Fellow):

1. Completes the online nomination form at www.geosociety.org/FellowNoms;
2. Writes a letter of support;
3. Collects two additional letters of support (one must be from a Fellow; both must be GSA members); and
4. Obtains the nominee’s current CV or résumé.

Questions? Email awards@geosociety.org.



CALL FOR NOMINATIONS

GSA Scientific Division Awards



ENERGY GEOLOGY DIVISION

Gilbert H. Cady Award

Nominations due 28 Feb.

Submit nominations to Jen O'Keefe at j.okeefe@moreheadstate.edu.

The Gilbert H. Cady Award, first presented in 1973, recognizes outstanding contributions in the field of coal geology that advance the science both within and outside of North America. For more information, go to www.uky.edu/KGS/coal/GSA/awards.htm.

ENVIRONMENTAL AND ENGINEERING GEOLOGY DIVISION

E.B. Burwell, Jr., Award

Nominations due 1 Feb.

Submit nominations to Jim McCalpin at mccalpin@geohaz.com.

The Edward B. Burwell, Jr., Award, established by the Division in 1968, honors the memory of one of the founding members of the Division and the first chief geologist of the U.S. Army Corps of Engineers. This award is made to the author or authors of a published paper of distinction that advances knowledge concerning the principles or practice of engineering geology, or of related fields of applied soil or rock mechanics where the role of geology is emphasized. The paper that receives the award must: (1) deal with 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 or publishing agency of the paper. For more information, go to community.geosociety.org/eegdivision/awards/new-item2.

Richard H. Jahns Distinguished Lecturer

Nominations due 28 Feb.

Submit nominations to Matt Crawford at mcrawford@uky.edu.

The Richard H. Jahns Distinguished Lectureship was established in 1988 by the Environmental & Engineering Geology Division and the Association of Environmental & Engineering Geologists to commemorate him and to promote student awareness of engineering geology through an annual series of lectures at academic institutions. The award is given 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. For more information, go to community.geosociety.org/eegdivision/awards/jahns.

GEOARCHAEOLOGY DIVISION

Geoarchaeology Division awards, including application and nomination information, are online at <http://rock.geosociety.org/arch>.

Rip Rapp Award

Nominations due 15 Feb.

Submit nominations to mandel@ku.edu

In 1983, the Division established the "Archaeological Geology Division Award" for outstanding contributions to the interdisciplinary field of archaeological geology. In 1993, the award was officially renamed the "Rip Rapp Archaeological Geology Award" in honor of George "Rip" Rapp Jr. Rapp was one of the primary individuals responsible for establishment of the Division and generously established a Division award fund with the GSA Foundation. Donald L. Johnson was the first recipient of the renamed award. Nominations should include a biographical sketch, a statement of outstanding achievements, and a selected bibliography of the nominee.

Claude C. Albritton, Jr., Award

Nominations due 5 March

Submit nominations to gsa.agd@gmail.com

Under the auspices of the Geoarchaeology Division, family, friends, and close associates of Claude C. Albritton, Jr., formed a memorial fund in his honor through the GSA Foundation.

The Albritton Award Fund provides scholarships and fellowships for graduate students in the earth sciences or archaeology for research. Recipients of the award are students who have (1) an interest in achieving a master's or Ph.D. degree in earth sciences or archaeology; (2) an interest in applying earth-science methods to archaeological research; and (3) an interest in 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 the field and/or laboratory aspects of the research.

Richard Hay Student Paper/Poster Award

Nominations due 1 Sept.

Submit nominations to gsa.agd@gmail.com

At the 2006 Annual Meeting in Philadelphia, Pennsylvania, USA, the Division's management board elected to rename the student travel award for a distinguished scientist in geoarchaeology. After consulting with his family, the award was officially named the Richard Hay Student Paper/Poster Award. Hay was a long-standing member of the Division and had a long and distinguished career in sedimentary geology, mineralogy, and archaeological geology. He is particularly well known for his work on the Olduvai Gorge and Laetoli Hominid-bearing sites and was awarded the Division's Rip Rapp Award in 2000. The Division is

proud to have our student travel award bear his name.

The award is a travel grant for a student (undergraduate or graduate) presenting a paper or poster at GSA's annual meeting. The grant is competitive and will be awarded based on the evaluation of the scientific merit of the research topic and the clarity of an expanded abstract for the paper or poster prepared by a student for presentation in the Division's technical session at the meeting.

GEOINFORMATICS DIVISION

Outstanding Contributions in Geoinformatics Award

Nominations due 15 Feb.

The Outstanding Contributions in Geoinformatics award will be made to an individual who has contributed in an outstanding manner to geology through the application of the principles of geoinformatics. The individual should be a member of GSA. Normally, a single award will be made annually, but in any particular year may be withheld if the management board decides that no suitable candidate has been nominated. For more information, go to community.geosociety.org/geoinformaticsdivision/awards.

GEPHYSICS AND GEODYNAMICS DIVISION

George P. Woollard Award

Nominations due 1 Feb.

Submit nominations to Nick Schmerr, nschmerr@umd.edu

The George P. Woollard 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. To submit a nomination, please provide the nominee's name, contact information, and a short paragraph stating the nominee's qualifications, including a short summary of their specific work or outcomes and how these have contributed to geology. A curricula vitae, if available, helps, but is not required. Please send as email attachments to Nick Schmerr, nschmerr@umd.edu. Award funds are administered by the GSA Foundation. For more information, go to <https://goo.gl/9R2xJ1>.

GEOSCIENCE EDUCATION DIVISION

Biggs Award for Excellence in Earth Science Teaching

Nominations due 15 Mar.

The Biggs 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, administered by the GSA Foundation, is made possible by support from the Donald and Carolyn Biggs Fund. 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. For more information, go to community.geosociety.org/gedivision/awards/biggsaward.

Totten Award

The Iris Moreno Totten Geoscience Education Research Award Fund promotes research in geoscience education, geocognition, or related fields that investigate the ways in which people interact with, understand, and connect to Earth and earth processes. This award addresses the need to promote and disseminate high quality research into best practices for training the general public and students, fundamental characteristics of how people perceive and interact with the Earth, and relationships between knowledge, affect, and behavior. This award will be given to the author(s) of one or more studies presented at the annual meeting of the Geological Society of America. Undergraduate students, graduate students, postdoctoral researchers, and early career faculty and professionals are eligible to receive this award. For more information, go to community.geosociety.org/gedivision/awards/tottenaward.

HISTORY AND PHILOSOPHY OF GEOLOGY DIVISION

Mary C. Rabbitt History and Philosophy of Geology Award

Nominations due 15 Feb.

Submit nominations to Kathleen Lohff, secretary/treasurer, kathylohff@msn.com

The Mary C. Rabbitt History and Philosophy of Geology Award is presented annually to an individual for exceptional scholarly contributions of fundamental importance to our understanding of 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. The award was established by the History of Geology Division in 1981 and renamed in 2005 in memory of Mary C. Rabbitt, whose bequest has made this award possible. Neither the nominator nor the nominee need be a member 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, major career events, and contributions that warrant the award. Monies for the award are administered by the GSA Foundation. For more information, go to community.geosociety.org/histphildiv/awards/rabbitt.

Gerald M. and Sue T. Friedman Distinguished Service Award

Nominations due 15 Feb.

Submit nominations to Kathleen Lohff, secretary/treasurer, kathylohff@msn.com

The Gerald M. and Sue T. Friedman Distinguished Service Award, established in 2005, is presented for exceptional service to the advancement of our knowledge of the history and philosophy of the geological sciences. Neither the nominator nor the nominee has to be a member of the Division or of GSA. The 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 in 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, major career events, and the contributions that warrant the award. The award is made possible by a bequest from the estate of Mary C. Rabbitt. Monies for the award are administered by the GSA Foundation. For more information, go to community.geosociety.org/histphildiv/awards/dsa.

History and Philosophy of Geology Student Award

Nominations due 15 June

Submit nominations to Kathleen Lohff, secretary/treasurer, kathylohff@msn.com

The History and Philosophy of Geology Division provides a student award in the amount of US\$1000 for a paper to be given at the GSA annual meeting. Awards may also be given for second place. The award, established in 2004, is made possible by a bequest from the estate of Mary C. Rabbitt. 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) a paper in the history or philosophy of geology; (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 for consideration. The awards committee will assist the winner(s) with review of abstracts facilitating 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 the national GSA meeting. The award is open to all students regardless of discipline, provided the proposed paper is related to the history or philosophy of a geological idea/person. Monies for the award are administered by the GSA Foundation. For more information, go to community.geosociety.org/histphildiv/awards/student.

HYDROGEOLOGY DIVISION

O.E. Meinzer Award

Nominations due 1 Feb.

Submit nominations 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.

Nomination details: 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, Committee Chair, at dlpark@usgs.gov

More information is online at community.geosociety.org/hydrodivision/awards/meinzer.

George Burke Maxey Distinguished Service Award

Nominations due 1 Feb.

Submit nominations to gsa.hydro.nominations@gmail.com

The award will be made in recognition of distinguished personal service to the hydrogeology profession and to the Hydrogeology Division. The award is based on a history of sustained creditable service to the hydrogeology profession and to the Hydrogeology Division. Please submit a letter of nomination that describes the distinguished service that warrants the nomination. Supporting letters are helpful but not required. For more information, go to community.geosociety.org/hydrodivision/awards/serviceaward.

Kohout Early Career Award

Nominations due 1 Feb.

Submit nominations to gsa.hydro.nominations@gmail.com

The 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 five 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. How to nominate: The nomination package must include the following (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. More information is online at community.geosociety.org/hydrodivision/awards/kohout.

Birdsall-Dreiss Distinguished Lecturer

Nominations due 1 Feb.

Submit nominations to gsa.hydro.nominations@gmail.com

The lecturer shall be selected based on outstanding contributions to hydrogeology or a closely related field through original research and public communication, and the potential for continued contributions to the profession. How 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. More information is online at community.geosociety.org/hydrodivision/birdsall/about2019.

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

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. More information is online at community.geosociety.org/mgpvdivision/home.

MGPV Distinguished Geologic Career Award

Nominations due 31 Mar.

The MGPV award will go to an individual who, throughout his/her career, has made distinguished contributions in one or

more of the following fields of research: mineralogy, geochemistry, petrology, volcanology, with emphasis on multidisciplinary, field-based contributions. Nominees need not be citizens or residents of the United States, and membership in the Geological Society of America is not required. The award will not be given posthumously.

MGPV Early Career Award

Nominations due 31 Mar.

The MGPV award will go to an individual near the beginning of his/her professional career who has made distinguished contributions in one or more of the following fields of research: mineralogy, geochemistry, petrology, volcanology, with emphasis on multidisciplinary, field-based contributions. Nominations are restricted to those who are within eight years past the award of their final degree. For example, awards decided before 31 Dec. 2018 will include all candidates whose final degree was awarded no earlier than 1 Jan. 2011. 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 membership in the Geological Society of America is not a requirement. The award will not be given posthumously.

Submit (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) 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 to J. Alex Speer, Mineralogical Society of America, 3635 Concorde Pkwy Suite 500, Chantilly VA 20151-1110 USA; jaspeer@minsocam.org.

PLANETARY GEOLOGY DIVISION (PGD)

Shoemaker Award

Nominations due in August

The Eugene M. Shoemaker Impact Cratering Award is for undergraduate or graduate students, of any nationality, working in any country, in the disciplines of geology, geophysics, geochemistry, astronomy, or biology. The award, which will include US\$2500, is to be applied to the study of impact craters, either on Earth or on the other solid bodies in the solar system. Areas of study may include but shall not necessarily be limited to impact cratering processes; the bodies (asteroidal or cometary) that make the impacts; or the geological, chemical, or biological results of impact cratering. More information is online at <http://rock.geosociety.org/pgd/shoemaker.html>.

Pellas-Ryder Award

Nominations due 31 Jan.

This award, which is jointly sponsored by the Meteoritical Society and the Planetary Geology Division of the Geological

Society of America, is awarded to an undergraduate or graduate student who is first author of the best planetary science paper published in a peer-reviewed scientific journal during the year prior to the award. Potential topics are listed on the cover of *Meteoritics & Planetary Science*, and include asteroids, comets, craters, interplanetary dust, interstellar medium, lunar samples, meteors, meteorites, natural satellites, planets, tektites, and origin and history of the solar system. The award has been given since 2001 and honors the memories of meteoriticist Paul Pellas and lunar scientist Graham Ryder. More information is online at <http://rock.geosociety.org/pgd/pellas-ryder.html>.

Ronald Greeley Award for Distinguished Service

Nominations due 30 June

In 2011, the PGD established the Ronald Greeley Award for Distinguished Service. This award may be given to those members of the PGD, and those outside of the Division and GSA, who have rendered exceptional service to the PGD for a multi-year period. The award is not open to currently serving members of the management board, but may be awarded to past members of the management board who have provided exceptional service to the PGD after their term on the management board has ended. Nominations for the award, which should include a description of what the nominee has given to the PGD community, may be made by any PGD member to the management board. More information is online at <http://rock.geosociety.org/pgd/distinguished-service.html>.

QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION (QG&G)

Kirk Bryan Award for Research Excellence

Nominations due 1 Feb.

The Kirk Bryan Award is bestowed upon the author or authors of a published paper of distinction advancing the science of geomorphology or some related field, such as Quaternary geology. The paper constituting the basis of the award must fulfill the following requirements: (1) the paper will deal with geomorphology or with a bordering field; and (2) the paper will have been published not more than five years prior to its selection for the award. Submit nominations, including (1) a letter (1–3 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, via email to the Division secretary, Sarah Lewis, sarah.lewis@oregonstate.edu. Please submit electronically unless hardcopy previously approved. Kirk Bryan Award-winning papers are listed on the website, and more information is online at community.geosociety.org/qggdivision/awards/kirkbryanaward.

Farouk El-Baz Award for Desert Research

Nominations due 1 Apr.

Submit nominations, 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 to Anne Chin (anne.chin@ucdenver.edu). Please submit electronically unless hardcopy previously approved. The Farouk El-Baz Award for Desert Research rewards 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. Although the award primarily recognizes achievement in desert research, the funds that accompany it may be used for further research. The award is normally given to one person but may be shared by two people if the recognized research was the result of a coequal partnership. Any scientist from any country may be nominated. Because the award recognizes research excellence, self-nomination is not permitted. Neither nominators nor nominees need be GSA members. Monies for the award are derived from the annual interest income of the Farouk El-Baz Fund, administered by the GSA Foundation. More information is online at community.geosociety.org/qggdivision/awards/el-baz.

Distinguished Career Award

Nominations due 1 Apr.

Submit nominations, 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, via email to the Division secretary, Sarah Lewis (sarah.lewis@oregonstate.edu). Please submit electronically unless hardcopy previously approved. The Distinguished Career Award is presented annually to a Quaternary geologist or geomorphologist who has demonstrated excellence in their contributions to science. Because the award recognizes research excellence, self-nomination is not permitted. Neither nominators nor nominees need be GSA members. Previous recipients are listed on the QG&G website. More information is online at community.geosociety.org/qggdivision/awards/distinguished-career.

SEDIMENTARY GEOLOGY DIVISION

Laurence L. Sloss Award for Sedimentary Geology

Nominations due 15 Feb.

Submit (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 electronically to Linda Kah, Sedimentary Geology Division, lkah@utk.edu. Nomination materials remain active for three years. The Laurence L. Sloss Award for Sedimentary Geology 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. Monies for the award are derived from the annual interest income of the Laurence L. Sloss Award for Sedimentary Geology Fund, administered by the GSA Foundation. For more information, go to community.geosociety.org/sedimentarygeologydiv/awards/sloss.

Sedimentary Geology Division and Structural Geology and Tectonics Division Joint Award:

Stephen E. Laubach Structural Diagenesis Research Award

Nominations due 1 Apr.

The Stephen E. Laubach Structural Diagenesis Research Award Fund promotes research combining structural geology and diagenesis and curriculum development in structural diagenesis. This award 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 highlights the growing need to break down disciplinary boundaries between structural geology and sedimentary petrology, exemplified by the work of Dr. Stephen Laubach and colleagues. The award alternates between being awarded by the Sedimentary Geology Division on odd-numbered years, and the Structural Geology and Tectonics Division on even-numbered years, reflecting the focus of the award on this cycle. Graduate students, postgraduate, and faculty-level researchers are eligible. For information on application requirements, go to community.geosociety.org/sedimentarygeologydiv/awards/laubach.

STRUCTURAL GEOLOGY AND TECTONICS DIVISION

Career Contribution Award

Nominations due 1 Mar.

This award is for an individual who throughout his/her career has made numerous distinguished contributions that have clearly advanced the science of structural geology or tectonics. Nominees need not be citizens or residents of the United States, and membership in the Geological Society of America is not required. Nominations should include the following information: (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. More information for how to nominate, where to send the nomination, and a list of past recipients is online at <http://rock.geosociety.org/sgt/CareerAward.htm>.

Outstanding Publication Award

Nominations due 1 Mar.

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 include: (1) a full citation; (2) nomination (as short as a paragraph; letters or reviews may also be included); and (3) the name and address of the nominator.

More information for how to nominate, where to send the nomination, and a list of past recipients is online at <http://rock.geosociety.org/sgt/BestPaperAward.htm>.

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National Park Service Geoscientists-in-the-Parks (GIP) Opportunities

Summer geoscience projects in beautiful National Parks across the United States

Summer 2019 GIP Positions—Apply by 20 Jan.

The NPS GIP program places college students and early career professionals (18–35 years old) in National Park Service units for three months to one year to assist with geology and integrated science projects. This program is a partnership between the National Park Service, the Geological Society of America, and the Stewards Individual Placement Program.

www.geosociety.org/gip



Bureau of Land Management (BLM)



Forest Service
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GSA/ExxonMobil Bighorn Basin Field Award

Who should apply? Undergraduate students, graduate students, and faculty

Deadline: 5 April 2019

Field dates: 5–12 August 2019

This all-expenses-covered field seminar in the Bighorn Basin of north-central Wyoming, USA, emphasizes multidisciplinary integrated basin analysis.


Questions? Contact Jennifer Nocerino at jnocerino@geosociety.org.

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2019 Graduate Student Research Grants

GSA is proud to offer research grants to its highly qualified student members. Graduate students may receive a total of two GSA graduate student research grants in their entire academic career, regardless of what program they are currently enrolled in. The maximum award per grant is US\$2,500. Graduate students may also qualify for specialized awards; if so, the total awarded could be more than US\$2,500. Apply online, starting 1 Dec. 2018. Submissions must be completed by 1 Feb. 2019, at 5 p.m. MST. The GSA Graduate Student Research Grant Program is supported by the National Science Foundation under Grant No. 1712071. For more information, email researchgrants@geosociety.org or call +1-303-357-1025.

www.geosociety.org/grants



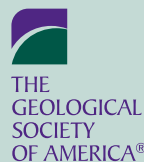
FIELD CAMP

Scholar Awards

GSA and the GSA Foundation are proud to announce that Field Camp Scholarships will be available to undergraduate geology students for the summer of 2019. These scholarships will provide students with US\$2,000 each to attend the field camp of their choice. Applications are reviewed based on diversity, economic/financial need, and merit.

Deadline: 15 April 2019

Questions? Contact Jennifer Nocerino at jnocerino@geosociety.org.



GSA FOUNDATION

<https://bit.ly/20yXD57>



CALL FOR GSA COMMITTEE SERVICE

Help Shape the Future of Geoscience —Serve on a GSA Committee!



Deadline: 15 June 2019

Terms begin 1 July 2020 (unless otherwise indicated)

If you are looking for the opportunity to work toward a common goal, give back to GSA, network, and make a difference, then we invite you to volunteer (or nominate a fellow GSA member) to serve on a Society committee or as a GSA representative to another organization.

Learn more and access the nomination form at <https://rock.geosociety.org/Nominations/CS.aspx>. Use the online form to make a nomination or self-nomination. Committee open positions and qualifications may be found at <https://rock.geosociety.org/forms/viewopenpositions.asp>. GSA headquarters contact: Dominique Olvera, GSA, P.O. Box 9140, Boulder, CO 80301-9140, USA; fax: +1-303-357-1060; dolvera@geosociety.org.

Key: **B**—Meets in Boulder or elsewhere; **E**—Communicates by phone or electronically; **M**—Meets at the Annual Meeting; **T**—Extensive time commitment required during application review period.

Academic and Applied Geoscience Relations Committee

**Member-at-Large vacancy (industry-related field)
(3-year term; E, M)**

This committee is charged with strengthening and expanding relations between GSA members in applied and academic geosciences. As such, it proactively coordinates the Society's effort to facilitate greater cooperation between academia, industry, and government geoscientists.

Qualifications: Committee members must work in academia, industry, or government and be committed to developing a better integration of applied and academic science in GSA meetings, publications, short courses, field trips, and education and outreach programs. Professional interests: environmental & engineering geology, hydrogeology, karst, Quaternary geology & geomorphology, structural geology & tectonics, and sedimentary geology. Members must also be active in one or more GSA Divisions.

Arthur L. Day Medal Award

Two Member-at-Large vacancies (3-year terms; E, T)

This committee selects candidates for the Arthur L. Day Medal.

Qualifications: Members should have knowledge of those who have made “distinct contributions to geologic knowledge through the application of physics and chemistry to the solution of geologic problems.” All of the committee's work will be accomplished during the months of February/March. All committee decisions must be made by 1 April.

Bascom Mapping Award Committee

Two Member-at-Large vacancies (industry and government-related fields) (3-year terms; E, T)

This committee selects candidates for the Florence Bascom Geologic Mapping Award. This award acknowledges contributions in published high-quality geologic mapping that led the recipient to publish significant new scientific or economic-resource discoveries, and to contribute greater understanding of fundamental geologic processes and concepts.

Qualifications: Members should be knowledgeable in the field of mapping.

Diversity in the Geosciences Committee

Four Member-at-Large vacancies (industry-related fields) (3-year terms; E, M), one Student Representative (2-year term; B, E, M)

This committee provides advice and support to GSA Council and initiates activities and programs that will increase opportunities for people of ethnic minority, women, and persons with disabilities and raise awareness in the geosciences community of the positive role these groups play within the geosciences. The committee is also charged with stimulating recruitment and promoting positive career development for these groups.

Qualifications: Members of this committee must be familiar with the employment issues these groups face; expertise and leadership experience in such areas as human resources and education is also desired.

Education Committee

One vacancy: Undergraduate Student Representative (2-year term; B, E, M)

This committee works with GSA members representing a wide range of education sectors to develop informal, pre-college (K–12), undergraduate, and graduate earth-science education and outreach objectives and initiatives.

Qualifications: Members of this committee must have the ability to work with other interested scientific organizations and science teachers' groups.

Geology and Public Policy Committee

Two Member-at-Large vacancies (3-year terms; E, M), one Student Representative (2-year term; B, E, M)

This committee provides advice on public policy matters to Council and GSA leadership by monitoring and assessing international, national, and regional science policy; formulating and recommending position statements; and sponsoring topical white papers. This committee also encourages active

engagement in geoscience policy by GSA members.

Qualifications: Members should have experience with public-policy issues involving the science of geology; ability to develop, disseminate, and translate information from the geologic sciences into useful forms for the general public and for GSA members; and familiarity with appropriate techniques for the dissemination of information.

GSA International

Four vacancies: Three Member-at-Large (4-year terms; E, M), one Student Representative (2-year term; E, M)

Serve as GSA's coordination and communication resources seeking to promote, create, and enhance opportunities for international cooperation related to the scientific, educational, and outreach missions shared by GSA and like-minded professional societies, educational institutions, and government agencies. Build collaborative relationships with Divisions and Associated Societies on international issues and serve as a channel for member generated proposals for international themes.

Joint Technical Program Committee

Two Member-at-Large vacancies: one Paleoclimatology & Paleoceanology and one Precambrian Geology (2-year terms 1 Dec. 2019–30 Nov. 2021; B, E).

Members of this committee help finalize the technical program for GSA's annual meetings by participating in the Web-based selection and scheduling of abstracts, as well as topical session proposal review.

Qualifications: Members must be familiar with computers and the Web, be a specialist in one of the specified fields, and be available in late July–mid-August for the organization of the annual meeting technical program.

Membership and Fellowship Committee

Two vacancies: One Member-at-Large–Industry (3-year term; B, T), one Student Member-at-Large (3-year term; B, T)

This committee contributes to the growth of the GSA membership, enhances the member experience, and serves a vital role in the selection of Fellows, with the goal of fostering a membership community as pertinent and global as our science. Committee members should understand what various segments of members want from GSA and should be familiar with outstanding achievers in the geosciences worthy of fellowship.

Qualifications: Committee members should have experience in benefit, recruitment, and retention programs.

Nominations Committee

Two Member-at-Large vacancies (3-year terms; B, E)

This committee recommends nominees to GSA Council for the positions of GSA Officers and Councilors, committee members, and Society representatives to other permanent groups.

Qualifications: Members must be familiar with a broad range of well-known and highly respected geoscientists.

Penrose Medal Award Committee

Two Member-at-Large vacancies (3-year terms; E, T)

Members of this committee select candidates for the Penrose

Medal Award. Emphasis is placed on “eminent research in pure geology, which marks a major advance in the science of geology.”

Qualifications: Members should be familiar with outstanding achievers in the geosciences worthy of consideration for the honor. All of the committee's work will be accomplished during the months of February/March. All committee decisions must be made by 1 April.

Professional Development Committee

Two Member-at-Large vacancies (3-year terms; E)

This committee directs, advises, and monitors GSA's professional development program; reviews and approves proposals; recommends and implements guideline changes; and monitors the scientific quality of courses offered.

Qualifications: Members must be familiar with professional development programs or have adult education teaching experience.

Public Service Award Committee

Member-at-Large vacancy (3-year term; E)

The purpose of this committee is to generate, receive, and evaluate candidates for the GSA Public Service Award and the AGI Outstanding Contributions to the Public Understanding of the Geosciences Award. These awards are in recognition of outstanding individual contributions to either public awareness of the earth sciences or the scientific resolution of earth-science problems of significant societal concern.

Publications Committee

One vacancy: Geoscience Information Society Library Representative (4-year term; B, E, M)

The primary responsibilities of the committee are nomination of candidates for editors when positions become vacant; reviewing the quality and health of each Society publication; and reporting to Council recommendations for changes in page charges, subsidies, or any other publishing matter on which Council must make a decision. To carry out this charge, headquarters will provide the committee with all necessary information.

Research Grants Committee

Twelve Member-at-Large vacancies with various specialties (3-year terms; B, T)

The primary function of this committee is to evaluate the research grant applications received, by delegation of the Council's authority and within the limits of the research grants budget, to award specific grants to chosen recipients. The committee will also act on the distribution of funds derived from any other gifts or memorial or award funds that are to be administered by it.

Qualifications: Members should have experience in directing research projects and in evaluating research grant applications. **Extensive time commitment required 15 Feb.–15 April.**

Young Scientist Award (Donath Medal) Committee

Three vacancies: Two Members-at-Large, one Councilor/former Councilor (3-year terms; E, T)

Committee members investigate the achievements of young

scientists who should be considered for this award and make recommendations to GSA Council.

Qualifications: Members should have knowledge of young scientists with “outstanding achievement(s) in contributing to geologic knowledge through original research which marks a major advance in the earth sciences.” All of the committee’s work will be accomplished during the months of February/ March. All committee decisions must be made by 1 April.

Committee, Section, and Division Volunteers: Council Thanks You!

GSA Council acknowledges the many member-volunteers who, over the years, have contributed to the Society and to our science through involvement in the affairs of the GSA. Your time, talent, and expertise help build a solid and lasting Society.

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Welcome New GSA Members



The following new members joined between 2 Mar. 2018 and 5 Sept. 2018 and were approved by GSA Council at its fall meeting.

PROFESSIONALS

Javier Aguilar Carrillo de Albornoz
 Syed Humayun Akhter
 Scott Anderson
 Mohammad Ashraf
 Timothy Lynn Baker
 Aislyn Barclay
 Mitchell Barklage
 Jeri Young Ben-horin
 Gary Thomas Blinkiewicz
 Patrick Boulas
 Wayne Bugden
 Meghan Burchell
 Erick R. Burns
 Charles Byers
 Edwin Cadena
 Connie E. Campbell-Brashear
 Steven Catalano
 Richard J. Chuchla
 Edward Clements
 William Clendenen
 Roy Cohen
 Leigh A. Cook
 Marta Corbin
 Thomas G. Correll
 Aaron Lee M. Daigh
 M. Chantale Damas

David Dean
 Lauren Dehoyos
 Kraig L. Derstler
 Keith A. Deterling
 Daniel Diehr
 David Egilman
 Adam Ellsworth
 Carlota Escutia
 Richard Anthony Esposito
 Jessica Fallon
 Chris Felling
 Adam Flege
 Bonnie Frey
 Franklin L. Fugitt
 Greg Fuhrmann
 Michael A. Giles
 David D. Gillette
 James Girona
 Stijn Goolaerts
 Andrew M. Gowen
 James Miller Graham
 Heraclio Israel Gutierrez-Moreno
 Andrea Hampel
 Fei Han
 Tina Marja Hariu
 Karin L. Hayman
 Christopher Hodges

William C. Hood
 Patrick Wayne Hook
 A.K.M. Azad Hossain
 Richard F. Inden
 Martin Insley
 Hiroshi Iwamoto
 César Jacques-Ayala
 David R. Janecky
 Upali De Silva Jayawardena
 Agata Jurkowska
 Joseph Kanney
 Matt Kaplinski
 Daniel L. Kelting
 Jerome J. Kendall
 Lais Kraus de Camargo
 Daniel Krisher
 Anil Kumar
 Roslyn Kygar
 Keith Landa
 Michael Barrett Lear
 Gabriel Leret-Verdú
 Jingjing Li
 Ivan Richard Linscott
 Guodong Liu
 Julien Louys
 Zunli Lu
 Subrota Mahato
 David F. Maloney
 Cynthia Maroney
 Janos Matyas
 Neyda C. Maymi
 Chris Mays
 Timothy Robert McBride
 Stephen McLoughlin
 Germán Martín Merino
 Moses P. Milazzo
 Brad Mitchell
 Xavier Ravi Moonan
 Angela M. Moore
 Morganne Morrison
 Kent Murray
 Reginald Reed Muskett
 Mannon Rashid Nazarov
 Catherine Neish
 Barbara Nist
 Olajide Oyetunde
 Margaret Palmer
 Travis Anthony Paris
 Nicholas G. Pelyk
 Patricia Persaud
 J. Cory Pettijohn
 Brian Pitts
 Michael Moritz Pollock
 Sid Quarrier
 David Freeman Quimby

Kaye Reed
 Junjie Ren
 James Riley
 Pedro Francisco Rodriguez Espinosa
 Jaime Roldan
 Chris J. Russo
 Conor Ryan
 Sean Schaeffer
 Masni H. Shabri
 Huasheng Shan
 Caryl Fiona Sheehan
 Andrew Byron Smith
 Mauro Gabriel Spagnuolo
 Carl Spandler
 David W. Sparks
 Russell E. Stands Over Bull
 Amber Steele
 Jennifer L. Stoffel
 Sara Summers
 James Sundys
 Jenise-Marie Honesto Thompson
 Katherine Tyler Thompson
 Brian Alex Tomkins
 Joan Torrebaddella Barat
 Adrian David Van Rythoven
 Carlos Manuel Villanes Sr.
 Carly Walton
 Karrie Champneys Wood
 Dong-Yoon Yang
 Claudia Beatriz Zaffarana
 John D. Zeise

EARLY CAREER PROFESSIONALS

John D. Ables
 Christa Lee Anhold
 Riley Balikian
 Sietske J. Batenburg
 Michael Beam
 Kylie Benz
 Brandon Thomas Bishop
 Laurel E. Blackman
 Casey Blakemore
 Jessica Bland
 Benjamin Booher
 Holly Buban
 Michael Thomas Buckelew
 Jackson Depaul Burke
 Samuel R. Carpenter
 Okwudili Wilson Chukwuma
 Christopher Colwell
 Taylor Cordle
 Hayley Jo Couture

Eliza Cronkite
Lindsay Ann Davis
Angela Delaloye
Meg Denmark-Melvin
John Dilworth
Patrick Dipasquale
Connor Emling
Andrea M. Erhardt
Robby C. Evans
Paula Marques Figueiredo
Anna Finigan
Seth Gainey
Stephen R. Gamble
Loraine Gourbet
David Immanuel Surya Green
Robin Gross
Zane William Grunewald
Catherine Hafdahl
Joshua Hale
Michael Joseph Hannon Jr.
Kaelan Hendrickson
Emily Hopper
Christopher Asuquo Jackson
Sinead Kalyssa Jahoor
Maria Helena Janebo
Lei Jiang
Ryan Kammer
Brendan R. Keegans
Aimee Michelle Kennedy
Joseph Blake Kniss
Franklin Kunkle
Amanda Laskoskie
Kirk Tyler Laxton
Nichole L. Leigey
An Li
Katarzyna Maria Liszewska
Xiaoguang Liu
Nalan Lom
Shannon Mackenzie
Sean Malloy
Ben Mandler
Xuegang Mao
Timothy Chris Maravegias
Alex Martinez
Sara Maslen
Skylar Robert Matthews
Paul Edward Maxwell
Samuel McDeid
Lukas J. McNally
Scott Mermelstein
Cody Meservy
Kathleen Meyer
Nicholas Ryan Montalbano
Thomas A. Nash Jr.
Charlotte Lucy O'Brien
Godwin Uchenna Okereafor
Hannah Pangrcic
Jamie Lynn Pawloski
Igor Araujo Pessoa

Rose A. Pettiette
Michael Philben
Mortaza Pirouz
Amaël Poulain
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Anooja Thomas
Rachel Toler
Sally June Tracy
M. Wynn Tranfield
Chloe Michele Turner
Sanjeet Kumar Verma
Donna Viola
Zhiqiang Wang
Joshua Cole Woosley
Wu Xia
Thayne Yazzie
Rebecca Young
Natalia V. Zakharova
Lijun Zhang
Cameron Michael Zundel

STUDENTS

(by Professional Interest)

Biogeosciences

Orion Farr
Ian James Forsythe
Kyle William Fouke
Javil Hansen
Timothy Glenn Paat Iringan
Nannan Jiang
Fanfan Kong
Alyssa Rae Larrinaga
Angela R. Lewis
Jiangsi Liu
Alexandra Meyer
Kathryn Lynn Mydica
Kendra D. Sadler
Laura Szymanski

Climatology/Meteorology

Katrina Miriam Baker
Keith Buchignani

Yating Chen
Heather Leanne Furlong
Rowan C. McMullen Cheng
Joseph B. Novak
Benjamin Serphen
Ellen Clare Weber

Economic Geology

Alexander Paul Bates
Matthew Ede Bell
Mengting Chen
Joshua Malidzo Chidzugwe
Nolan Conway
Herschel Scott Gapen II
Andrew Houston
Robert P. Howard
Muhammad Saddam Idris
Israel Jaramillo
Dylyn A. Loveless
Alec Jeffrey Martin
Ian Cameron McBride
Aran Khristian Aldaba
Mendoza
Riya Mondal
Bolorchimeg Nanzad
Lincoln Paul Alcontara Olayta
Erik Ovens
Michael David Suggs
Brandon James Sullivan
Peyton Weigel
Garnet James Williams
Ya-Fei Wu
Natascia Zuccarelli

Energy Geology

Adedoyin Adeyilola
Rebecca L. Baumgartner
Liam Blake
Logan Samuel Boyd
Nicholas H. Boyko
Timothy Andrew Brickey Sr.
Jared Scott Bullock
Malcolm Cross
Yanelis Delgado
Zachary Fernandes
Christopher Alexander
Forrester

Nicole Gonzalez
William Ray Guyton
Ashley Haas
Guolei Han
Mohammed S. Hashim
Kammie K. Hauger
Hagan Hunter
Olatunji Oluwagbemiga Ijaware
Dalila Jesus
Gustavo Adolfo Larramendi III
Alexander Laws
Sydney Paige Lee
Jarrett Levesh
Michael Lis
Ryan McKendry
Morrison Kpakolo Moiyallah
Michelle Elizabeth Myrick
Phillip Thomas Neumann
Jaclyn Rose Oliver
Deandre Reshaad Prince
Jordan Renner
Dionicio Salgado Jr.
Tyler Scott
Ganiyat Oluwaseun Shodunke
Chad M. Sims
Jason P. Spencer
Delcio Dombassi Teixeira
Allen Peter Tevyaw II
Connor Maxwell Watkins
Spencer L. Williams Jr.
Jared Timothy Wink

Engineering Geology

Hayden A. Babst
Isabella Brandon
Kathleen Marie Duckett
Kathryn Hanson
Seth Edward Harris
Jeremy James Cortez Jimenez
Alana Rubí Jiménez
Natalie Jones
Demetrius Delapp Kaisharis
William G. Kiskaddon
Augustin Loureiro
Mildred Mensah-Selby
Dainty Clarice Vicentino
Rabang

Top professional interests of new students:

1. Mineralogy, Geochemistry, Petrology, Volcanology
2. Environmental Science
3. Hydrogeology/Hydrology
4. Paleo Sciences
5. Other Professional Interests



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Environmental Science

Chidinma Kelechi Aham
Marisa Albrecht
Joshua Alland
Cristopher Alvarez Villa
Amanda M. Amory
Morgan Marie Balliet
Elizabeth Wilhelmina Bell
Brianna M. Black
Allison Burgess
Phillip Cabral
Michael James Cadag Cabrerros
Marcelo Pereira Camargo
Claire Carlson
Eliza Crane
Erin Renee Crone
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Max Eness
Omotayo Anuluwapo Fadina
John Faught
Sian Erin Ford
Joshua Allen Foust
Abby Friedman
Griffin Fruit
Katie J. Gallagher
Jhonard John Lopez Garcia
Katherine E. Gerdes
Kaela Jo Gollob
Zane Grissett
Andrea Lynn Hagen
Morgan Sierra Hall
Carena Hasara
Larissa Antoinette Howard
Caroline A. Johnstone
Sarah Jordan
Tori M. Kennedy
John William Koellmann II
Hannah-Elyse Konyecsni
Diane Lally
Tyler Lawson
Justin Lazaro
Kyle Lesinger
Jason Paul Lewis

Xiangmei Li
Matthew Ryan Loggins
Carmen Emilia Longo
Brenda S. Lower
Abigail Elizabeth Lown
Kathryn Lyons
Kayleigh Eryn MacDonald
Anya Marquez
Morgan James Mathews
Marissa Louise Mayfield
Hunter Paige McKenzie
Nathan Mroz
Idah Ngoma
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Michael R. Smith
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Sarah Thompson
Sandra Leighanne Walser
Robin M. Waltz
Miles Wehner
Terrance White
Marina Kylah Williams
Anabel Winitsky
Emilia Wozniak
Fatimatuz Zohora

Geoarchaeology

Stephanie Lynn Barr
Erin Marie Bell
Nicholas Koester Bentley
Alexandra Edwards
Andrew Fishback
William S. George
Angela K. Gore
Levi Michael Hendrickson
Michaela May
Chelsi McNeill-Jewer
Emily Beatrice Milton
Bailee Morrison
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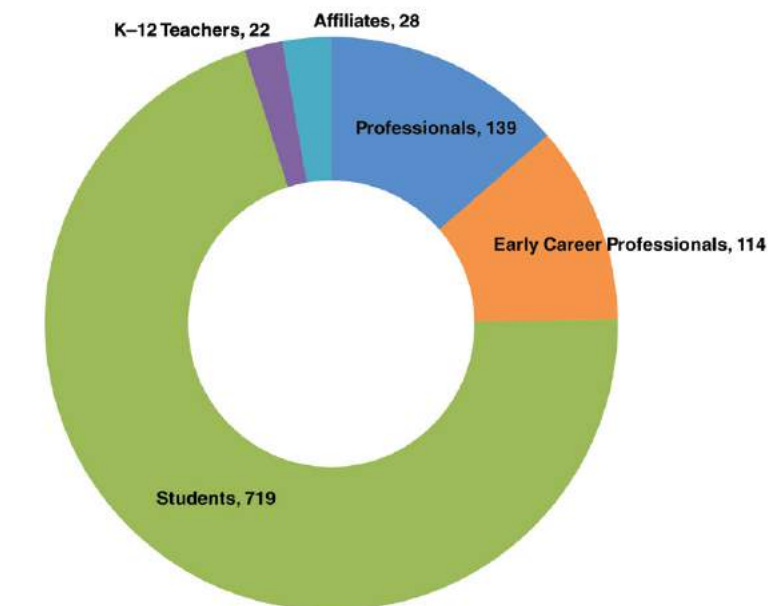
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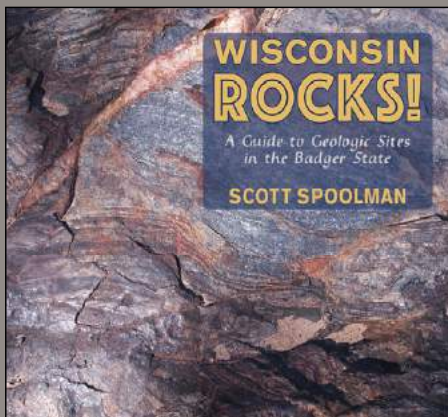
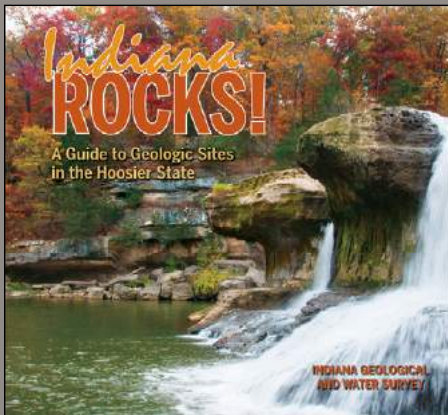
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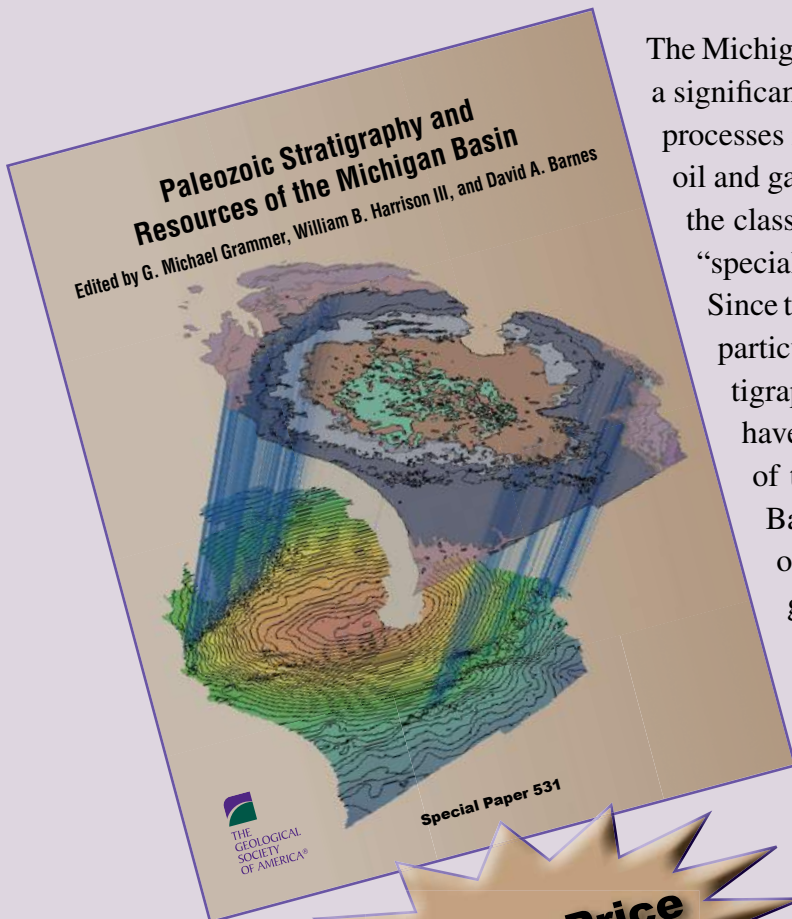
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2019 GeoCareers Section Meeting Programs

Geoscience Career Workshops

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 this 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.

Part 2: Geoscience Career Exploration: What do geologists in various sectors earn? What do they do? What are the pros and

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Workshop presenters and professionals in the field will address these issues.

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 in the market for a job or not, learn how to prepare the best résumé possible. You will review numerous examples to help you learn important résumé dos and don'ts.

Mentor Programs

Enjoy a free lunch while meeting with geoscience mentors working in applied sectors. The popularity of these programs means that space is limited, so plan to arrive early, because lunch is first-come, first-served.

Northeastern Section, Portland, Maine, USA

Shlemon Mentor Luncheon Program: Sunday, 17 March and Monday, 18 March

Mann Mentors in Applied Hydrology Luncheon: Monday, 18 March

Joint Section Meeting (Rocky Mountain, South-Central, North-Central), Manhattan, Kansas, USA

Shlemon Mentor Luncheon Program: Monday, 25 March, and Tuesday, 26 March

Mann Mentors in Applied Hydrology Luncheon: Wednesday, 27 March

Southeastern Section, Charleston, South Carolina, USA

Shlemon Mentor Luncheon Program: Thursday, 28 March

Mann Mentors in Applied Hydrology Luncheon: Friday, 29 March

Cordilleran Section, Portland, Oregon, USA

Shlemon Mentor Luncheon Program: Wednesday, 15 May

Mann Mentors in Applied Hydrology Luncheon: Thursday, 16 May

For more information, contact Jennifer Nocerino at jnocerino@geosociety.org.

Second Announcement

NORTHEASTERN SECTION

**54th Annual Meeting,
Northeastern Section, GSA
17–19 March 2019
Portland, Maine, USA**

www.geosociety.org/ne-mtg



Portland waterfront, Portland, Maine, USA. Photo courtesy Maine Office of Tourism.

LOCATION

The 54th Annual Meeting of GSA's Northeastern Section will take place in Portland, Maine, USA, at the Holiday Inn By The Bay, in downtown Portland. Portland is a welcoming city. Cultural sites and varied dining opportunities are within a short walk of the conference center. Portland is easily accessed by car via Interstate 95 and Interstate 295, by train via Amtrak's Downeaster, by air via Portland's Jetport (PWM), and by bus. We have developed a technical program that covers a diverse set of geologic topics and processes, including applied geology; education; northeastern tectonics; Quaternary geology and climate; coastal, groundwater, and river processes; geological hazards; and magmatism, metamorphism, and structural geology.

REGISTRATION

Early registration deadline: 11 Feb.

Cancellation deadline: 19 Feb.

For further information or if you need special accommodations, please contact the general chair, Stephen Pollock, stephen.pollock@maine.edu

	Early		Standard	
	Full Mtg	One day	Full Mtg	One day
Professional member	US\$195	US\$145	US\$240	US\$165
Professional member 70+	US\$115	US\$95	US\$145	US\$115
Professional nonmember	US\$215	US\$165	US\$265	US\$200
Early career professional member	US\$150	US\$115	US\$215	US\$180
Student member	US\$75	US\$55	US\$95	US\$75
Student nonmember	US\$85	US\$75	US\$105	US\$95
K–12 Professional	US\$80	US\$65	US\$100	US\$75
Guest	US\$65	US\$70	US\$75	US\$80
Field Trip Only	US\$45	n/a	US\$45	n/a

ACCOMMODATIONS

Hotel registration deadline: 28 Feb. (for the Holiday Inn)

Rooms have been reserved at The Holiday Inn By The Bay, the conference hotel, 88 Spring Street, Portland, ME 04101, USA. The meeting rate is US\$145 per night plus tax. Reservations should be made by calling the Holiday Inn at +1-800-315-2621 (toll free) or +1-207-775-2311 (local). Please be sure to mention that you are attending the GSA meeting.

TECHNICAL PROGRAM

Please direct questions to the Technical Program co-chairs: Robert G. Marvinney, robert.g.marvinney@maine.gov, and Amber H. Whittaker, amber.h.whittaker@maine.gov.

Symposia

S1. **Geology, Structure, Geochronology and Tectonics in Southern New England: An Eclectic Session in Honor of Robert P. Wintsch.** *Cosponsored by NETectonics.*

Greg Walsh, U.S. Geological Survey, gwalsh@usgs.gov; John Aleinikoff, U.S. Geological Survey, jaleinikoff@usgs.gov; Ryan McAleer, U.S. Geological Survey, rmcaleer@usgs.gov.

S2. **Late Wisconsinan Deglaciation of Northern New England and Adjacent Canada: A Symposium to Honor the Career and Contributions of Woodrow (Woody) B. Thompson.** Brian K. Fowler, New Hampshire Geologic Resources Advisory Committee; b2fmr@metrocast.net; P. Thompson Davis, Bentley Univ., pdavis@bentley.edu; Harold W. Borns, Univ. of Maine, harold.borns@maine.edu.

Theme Sessions

T1. **The Formation and Evolution of Iceland: Magmatic, Tectonic, and Geomorphological Processes.** Brennan Jordan, Univ. of South Dakota, brennan.jordan@usd.edu; Tamara Carley, Lafayette College, carleyt@lafayette.edu; Tenley Banik, Illinois State Univ., tjbanik@ilstu.edu.

T2. **Beyond Sustainability: The Anthropocene As a Paradigm for Thinking about the Earth across Disciplines.** Gary Gomby, Central Connecticut State Univ., garygomby@ccsu.edu; W. John Kress, Smithsonian Institution, kressj@si.edu.

- T3. **Intertwining Earth-Science Issues with the Nature of Science.** Patricia Millette, Mt. Blue High School, patti.millette@maine.edu; Daniel Frost, Thornton Academy, dan.frost@thorntonacademy.org.
- T4. **Best Practices in Geoscience Education.** Tarin Weiss, Westfield State Univ., tweiss@westfield.ma.edu; Lori Weeden, Univ. of Massachusetts–Lowell, lori_weeden@uml.edu.
- T5. **New Perspectives on Mineral Resources of the Northeast.** John F. Slack, U.S. Geological Survey (emeritus) and Memorial Univ. of Newfoundland, jfslack7@gmail.com; Martin G. Yates, Univ. of Maine, yates@maine.edu.
- T6. **Groundwater and Surface Water Hydrology in the Northeastern United States.** Ryan P. Gordon, Maine Geological Survey, ryan.gordon@maine.edu.
- T7. **Private Wells—Current Challenges and Opportunities.** Sille Larsen, Vermont Dept. of Health, sille.larsen@vermont.gov; Liz Royer, Vermont Rural Water Association, lroyer@vtruralwater.org; Paul Susca, New Hampshire Dept. of Environmental Services, paul.susca@des.nh.gov; Patti Casey, Vermont Agency of Agriculture, patti.casey@vermont.gov; Joe Ayotte, U.S. Geological Survey, jayotte@usgs.gov.
- T8. **Soils: Processes at the Bio-Geo Interface.** Zsuzsanna Balogh-Brunstad, Hartwick College, balogh_brunz@hartwick.edu; Dawn Cardace, Univ. of Rhode Island, cardace@uri.edu; Amanda Olsen, Univ. of Maine, amanda.a.olsen@maine.edu.
- T9. **Building from the Top Down? An Interdisciplinary Approach to Connections between Paleopedology and Ichnology.** Jesse Thornburg, Temple Univ., jesse.thornburg@temple.edu; Christopher Sparacio, Univ. of Connecticut, christopher.sparacio@uconn.edu.
- T10. **Regional Advances in Seafloor Mapping and Benthic Habitat Classification.** Matthew Nixon, Maine Coastal Zone Management Program, matthew.e.nixon@maine.gov; Dan Sampson, Massachusetts Office of Coastal Zone Management, daniel.sampson@state.ma.us.
- T11. **Current Research in Coastal and Marine Processes.** Mark Borrelli, Univ. of Massachusetts–Boston, mark.borrelli@umb.edu; Bryan A. Oakley, Eastern Connecticut State Univ., oakleyb@easternct.edu.
- T12. **Floods: Past, Present, and Future.** Brian Yellen, Univ. of Massachusetts–Amherst, yellen@geo.umass.edu; Jon Woodruff, Univ. of Massachusetts–Amherst, woodruff@geo.umass.edu; Michael Toomey, U.S. Geological Survey, mtoomey@usgs.gov; Tim Cook, Worcester State Univ., tcook3@worcester.edu.
- T13. **River Corridor Processes and Related Decision Making.** Sean Smith, Univ. of Maine, sean.m.smith@maine.edu; Anne Lightbody, Univ. of New Hampshire, anne.lightbody@unh.edu; Melissa E. Landon, Univ. of Maine, melissa.landon@maine.edu.
- T14. **Lake Sediments as Archives of Environmental Change.** Kevin M. Spigel, Unity College, kspigel@unity.edu.
- T15. **Reconstructing Past Climate from the Geologic Record of Ice Sheets and Mountain Glaciers.** Aaron Putnam, Univ. of Maine, aaron.putnam@maine.edu; Brenda Hall, Univ. of Maine, brendah@maine.edu; Thomas Lowell, Univ. of Cincinnati, lowelltv@ucmail.uc.edu.
- T16. **Insights on the Ongoing Dynamics of Northeastern North America from Geology and Geophysics.** William Menke, Columbia Univ., menke@ldeo.columbia.edu; Paul Karabinos, Williams College, pkarabin@williams.edu; Vadim Levin, Rutgers Univ., vlevin@eps.rutgers.edu; Michael Williams, Univ. of Massachusetts–Amherst, mlw@geo.umass.edu.
- T17. **Integrative and Innovative Appalachian Tectonics: Linking Novel Field and Laboratory Studies.** Adam Ianno, Juniata College, ianno@juniata.edu; Allison Severson, Colorado School of Mines, aseverson@mymail.mines.edu.
- T18. **Peri-Gondwanan Terranes and Their Origins: What Do We Really Know?** Yvette D. Kuiper, Colorado School of Mines, ykuiper@mines.edu; Margaret D. Thompson, Wellesley College, mthompso@wellesley.edu; R. Damian Nance, Ohio Univ., nance@ohio.edu.
- T19. **Detrital Mineral Constraints on Appalachian-Caledonide Tectonics.** Doug Reusch, Univ. of Maine at Farmington, reusch@maine.edu; Dave West, Middlebury College, dwest@middlebury.edu; Justin Strauss, Dartmouth College, justin.v.strauss@dartmouth.edu; Dwight Bradley, U.S. Geological Survey, dbradley@usgs.gov.
- T20. **Geology of the Grenville Orogeny and Adirondack Mountains.** Michelle Markley, Mount Holyoke College, mmarkley@mtholyoke.edu; Michael Williams, Univ. of Massachusetts, mlw@geo.umass.edu.
- T21. **Deciphering Tectonic Processes Using Metamorphic Petrology.** Wentao Cao, SUNY Fredonia, cao@fredonia.edu; Jesse Walters, Univ. of Maine, jesse.walters@maine.edu.
- T22. **Relating Rheology and Deformation in Earth's Lithosphere and Cryosphere.** Scott Johnson, Univ. of Maine, johnsons@maine.edu; Chris Gerbi, Univ. of Maine, christopher.gerbi@maine.edu; Walter A. Sullivan, Colby College, wasulliv@colby.edu.
- T23. **Simulation, Visualization, and Statistical Tools for Environmental Data Analysis.** Andrew Reeve, Univ. of Maine, asreeve@maine.edu.
- T24. **Geoarchaeology: Investigations and Techniques.** Alice R. Kelley, Univ. of Maine, akelley@maine.edu.
- T25. **The Roles of Geochronology and Geochemistry of Granitoid Plutons in Deciphering Orogenic Events.** David Gibson, Univ. of Maine–Farmington, dgibson@maine.edu; Sandra Barr, Acadia Univ., sandra.barr@acadiaua.ca.

FIELD TRIPS

For additional information, please contact the field trip chair, Myles Felch, mfelch@mainemineralmuseum.org.

Pre-Meeting

- FT1. **Maine Mineral and Gem Museum, Bethel, Maine.** Sat., 16 Mar., 9 a.m.–5 p.m. Cost: US\$30. Leader and coordinator: Myles Felch, Maine Mineral Museum, mfelch@mainemineralmuseum.org. Food is not included;

lunch is available at restaurants within walking distance of the museum (99 Main Street, Bethel, Maine, USA, 04217).

- FT2. **Landslides in the Presumpscot Formation.** Sat., 16 Mar., 9 a.m.–5 p.m. Cost: US\$15. Leader: Lindsay Spigel, Maine Geological Survey, lindsay.spigel@maine.gov. Participants need to bring food and beverages and dress for the weather conditions. Three stops are planned and each stop will involve walking one to three miles on well-maintained, easy to moderate trails. The trip will be run regardless of the amount of snow cover, and stops may vary depending upon the weather on the trip day.

Post-Meeting

Iceland: The Formation and Evolution of a Young, Dynamic, Volcanic Island. Wed.–Sun., 3 July–14 July. Cost*: US\$2,590. The fee covers ground transportation in Iceland, lodgings, museum- and site-entry fees, breakfasts, lunches, and dinner on two nights**. Field-trip size is limited to 23 participants. Leaders: Brennan Jordan, Univ. of South Dakota, brennan.jordan@usd.edu; Tenley Banik, Illinois State Univ., tjbanik@ilstu.edu; Tamara Carley, Lafayette College, carleyt@lafayette.edu. Lodgings: Rooms will be at varied facilities, to include a mixture of hotels and hostels. *Air transportation to Iceland is NOT covered in the trip fee. Roundtrip airfare to Iceland from the U.S. is estimated in the range of US\$600–US\$1,200 depending on flight origination point and airline choice. **Only two dinners are included in the field trip fee. Other dinners will be on your own at local restaurants. Learn more and register at <https://bit.ly/2EdNCZO>.

MENTOR PROGRAMS

Students: Plan to attend a Roy J. Shlemon Mentor Program in Applied Geoscience and/or a John Mann Mentors in Applied Hydrogeology Program to chat one-on-one with practicing geoscientists. These volunteers will answer your questions and share insights on how to get a job after graduation.

GEOSCIENCE CAREER WORKSHOPS

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 this 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.

Part 2: Geoscience Career Exploration. What do geologists in various sectors earn? What do they do? What are the pros and cons to working in academia, government, and industry?

Workshop presenters and professionals in the field will address these issues.

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 in the market for a job or not, learn how to prepare the best résumé possible. You will review numerous résumés to help you to learn important résumé dos and don'ts.

STUDENT VOLUNTEERS

We offer work opportunities that may earn free registration. Students interested in helping with the various aspects of the

meeting should contact David Gibson, Univ. of Maine–Farmington, dgibson@maine.edu.

NORTHEASTERN SECTION TRAVEL GRANT

Application deadline: 11 Feb.

The GSA Foundation has funds available for student travel grants. The money, when combined with funds from the Sections, is used to assist both undergraduates and graduate student members of GSA. You must be registered for the meeting BEFORE you can apply. For more information, contact the Section secretary, David P. West, at dwest@middlebury.edu.

LOCAL COMMITTEE

General Chair: Stephen Pollock, stephen.pollock@maine.edu

Technical Program Co-Chairs: Robert G. Marvinney, robert.g.marvinney@maine.gov; Amber H. Whittaker, amber.h.whittaker@maine.gov

Field Trip Chair: Myles Felch, mfelch@mainemineralmuseum.org

Exhibits: Irwin Novak, novak@maine.edu

Sponsorships: Clifford Lippitt, cliff.lippitt@swcole.com

Student Volunteers: David Gibson, dgibson@maine.edu

Short Courses and Workshops: Martin Yates, yates@maine.edu



STUDENT FUNDING TO NEGSA 2019

Students nationwide who work full-time or care for dependents while earning their undergraduate or graduate degrees are eligible to apply for a travel award to attend the GSA Northeastern Section Meeting, 17–19 March, in Portland, Maine, USA. Funding will cover meeting registration, lodging, transportation, food, and dependent care.

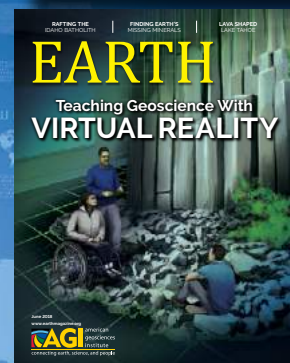
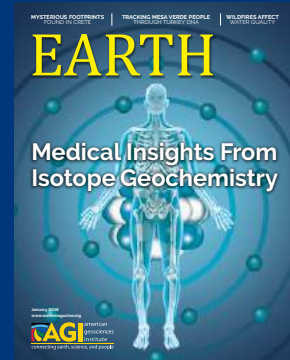
Go to <http://bit.ly/2F4mq15> to apply.

Deadline: 22 Feb.

Send questions to Tahlia Bear, tbear@geosociety.org.

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Second Announcement

JOINT GSA SECTION

53rd South-Central
53rd North-Central
71st Rocky Mountain
25–27 March 2019
Manhattan, Kansas, USA

www.geosociety.org/sc-mtg



Kansas, USA. Photo courtesy K-State Photo Services.

Source to Sink across the Midcontinent: Geosciences from the Rockies to the Gulf

LOCATION

Thriving as a lively, college environment in the Flint Hills, Manhattan, Kansas, USA, is home to delectable dining destinations, a vibrant nightlife, and exciting outdoor adventures. Take a short walk from the conference venue to explore downtown shops and restaurants or learn about the local history and ecology at the Flint Hills Discovery Center. Borrow a bike from the local bike share program and cruise along the Kansas River on the Linear Park Trail. Whether you want to explore some of the last remnants of native tallgrass prairie, poke around in the Permian bedrock, or soar through the trees on zipline, Manhattan is a great starting point for a wide-range of adventures. We have assembled an exciting and diverse program for this first-of-its-kind triple region meeting and look forward to seeing you in Manhattan.

REGISTRATION

Early registration deadline: 19 Feb.

Cancellation deadline: 25 Feb.

Registration fees (all fees are in U.S. dollars)

	Early		Standard	
	Full Mtg	One day	Full Mtg	One day
Professional member	US\$235	US\$150	US\$270	US\$190
Professional member 70+	US\$120	US\$85	US\$160	US\$125
Professional nonmember	US\$280	US\$180	US\$320	US\$220
Early career professional member	US\$160	US\$110	US\$200	US\$150
Early career professional nonmember	US\$180	US\$130	US\$215	US\$170
Student member	US\$85	US\$60	US\$105	US\$85
Student nonmember	US\$110	US\$75	US\$140	US\$100
K–12 Professional	US\$75	US\$50	US\$95	US\$70
Guest	US\$35	n/a	US\$55	n/a
Field trip/workshop only	US\$40	n/a	US\$65	n/a

TECHNICAL PROGRAM

For additional information, please contact the local Technical Program Chair, Joel Spencer, joelspen@ksu.edu, or see the meeting website.

- T1. Conventional and Unconventional Reservoir Rocks: Advances in Experiments, Modeling, and Simulations.** Principal organizer: Behzad Ghanbarian, Kansas State Univ., ghanbarian@ksu.edu. Co-organizers: Chi Zhang, Univ. of Kansas, chizhang@ku.edu; Reza Barati, Univ. of Kansas, rezab@ku.edu; Manika Prasad, Colorado School of Mines, mprasad@mines.edu.
- T2. Niobrara: Outcrop to Foreland Basin (Oral and Posters).** Principal organizer: Wayne K. Camp, Anadarko Petroleum Corporation, wayne.camp@anadarko.com. Co-organizer: Marc Burrsink, U.S. Geological Survey, burrsink.usgs@gmail.com.
- T3. Injection-Induced Seismicity in the U.S. Midcontinent: Where Are We after a Decade?** Principal organizer: Tandis Bidgoli, Univ. of Missouri Columbia, bidgolit@missouri.edu. Co-organizer: Jacob Walter, Oklahoma Geological Survey, jwalter@ou.edu.
- T4. Crustal Structure of the Midcontinent Using Geophysical and Geodynamic Data.** Principal organizer: Kevin Mickus, Missouri State Univ., kevinmickus@missouristate.edu.
- T5. Mantle Dynamics and Lithospheric Deformation.** Principal organizer: Claudia Adam, Kansas State Univ., cadam@ksu.edu.
- T6. Tectonic Processes and Characteristics of Laramide Foreland Deformation.** Principal organizer: Jacob Thacker, Univ. of New Mexico, jacoboliverthacker@gmail.com. Co-organizer: Shari Kelley, New Mexico Bureau of Geology, shari.kelley@nmt.edu.
- T7. Evolution of the Southern Rio Grande Rift.** Principal organizer: Jason Ricketts, Univ. of Texas at El Paso,

- jricketts@utep.edu. Co-organizer: Jesse Kelsch, Univ. of Texas at El Paso, jesse.veena@gmail.com.
- T8. **Cenozoic Magmatic and Tectonic Processes of Colorado–New Mexico: Understanding Voluminous Volcanism during the Transition from Laramide Contraction to Rio Grande Rift Extension.** Principal organizer: Gary Michelfelder, Missouri State Univ., garymichelfelder@missouristate.edu. Co-organizers: Jacob Thacker, Univ. of New Mexico, jacoboliverthacker@gmail.com; Conor O’Dowd, Missouri State Univ., odowd1@live.missouristate.edu; Brooke Benz, Missouri State Univ., benz5@live.missouristate.edu.
- T9. **Mafic and Ultramafic Magmatism in the Mid-Continent and Beyond.** Principal organizer: Matthew Brueseke, Kansas State Univ., brueseke@ksu.edu. Co-organizer: Pamela Kempton, Kansas State Univ., pkempton@ksu.edu.
- T10. **Rhyolite/Granite Magmatism.** Principal organizer: Don Parker, Baylor Univ., don_parker@baylor.edu. Co-organizers: Matthew Brueseke, Kansas State Univ., brueseke@ksu.edu; Richard Hanson, Texas Christian Univ., r.hanson@tcu.edu.
- T11. **Microanalyses, Macro Implications: Using Microscale Analyses to Decipher System-to-Regional Scale Processes.** Principal organizer: Tenley Banik, Illinois State Univ., tjbanik@ilstu.edu. Co-organizer: Benjamin Hallet, Univ. of Wisconsin Oshkosh, hallettb@uwosh.edu.
- T12. **Mineral and Energy Extraction: Impacts on Society and Health.** Principal organizer: Jackie D. Horn, Univ. of Texas Dallas, jdh130330@utdallas.edu. Co-organizers: Susan Stover, Kansas Geological Survey, susanstover@ku.edu; Leah Thompson, Univ. of Texas at Dallas, leah.thompson@utdallas.edu; Saugata Datta, Kansas State Univ., sdatta@ksu.edu; Sinjini Sinha, Univ. of Alberta, sinjinisinha.geo@gmail.com; Robert Finkelman, Univ. of Texas at Dallas, bobf@utdallas.edu.
- T13. **Women and Geology: Leading the Charge for Inclusion.** Principal organizer: Beth Johnson, Univ. of Wisconsin Fox Valley, beth.a.johnson@uwc.edu. Co-organizer: Susan Stover, Kansas Geological Survey, susanstover@ku.edu.
- T14. **Geoscience Outreach and Engagement.** Principal organizer: Lisa Anderson, Univ. of Purdue Extension, andel028@purdue.edu. Co-organizer: Peter Voice, Western Michigan Univ., peter.voice@wmich.edu.
- T15. **Innovative Approaches to Broadening Student Geoscience Experiences across the Midcontinent.** Principal organizer: Liane Stevens, Stephen F. Austin State Univ., stevenslm@sfasu.edu. Co-organizer: Michael DeAngelis, Univ. of Arkansas Little Rock, mtdeangelis@ualr.edu.
- T16. **Microbiomes in the Geosphere.** Principal organizer: Matthew Kirk, Kansas State Univ., mfkirk@ksu.edu. Co-organizers: Marcos Sarto, Kansas State Univ., sarto@ksu.edu; Christina Richardson, Kansas State Univ., crrichardson@ksu.edu.
- T17. **Natural and Artificial Tracers in Catchment Hydrologic and Biogeochemical Research.** Principal organizer: Lucy Rose, Univ. of Minnesota Twin Cities, larose@umn.edu. Co-organizer: Ethan Pawlowski, Univ. of Minnesota Twin Cities, pawlo026@umn.edu.
- T18. **Unconventional Aquifers and Aquifer Management.** Principal organizer: Andrea Croskrey, Texas Water Development Board, andrea.croskrey@twdb.texas.gov.
- T19. **Aquifer Storage and Recovery: Water Quantity and Quality Impacts.** Principal organizer: Mandy Stone, U.S. Geological Survey, mstone@usgs.gov.
- T20. **Advances in the Measurement and Modeling of Integrated Surface and Subsurface Hydrologic Systems.** Principal organizer: Andrea Brookfield, Univ. of Kansas, abrookfield@ku.edu. Co-organizers: Behzad Ghanbarian, Kansas State Univ., ghanbarian@ksu.edu; Vahid Rahmani, Kansas State Univ., vrahmani@ksu.edu; Rick Devlin, Univ. of Kansas, jfdevlin@ku.edu.
- T21. **Continuous Water Quality Monitoring.** Principal organizer: Brian Kelly, U.S. Geological Survey, bkelly@usgs.gov.
- T22. **Surface Water Quantity and Flood Risks.** Principal organizer: Craig Painter, U.S. Geological Survey, cpainter@usgs.gov.
- T23. **The Low-Down on the High Plains: Geologic and Hydrogeologic Studies of the High Plains Aquifer.** Principal organizer: Jon J. Smith, Kansas Geological Survey, jjsmith@kgs.ku.edu. Co-organizer: Randy L. Stotler, Univ. of Kansas, rstotler@ku.edu.
- T24. **Karst Processes and Speleology.** Principal organizer: Kaitlyn Gauvey, Fort Hays State Univ., klgauvey@mail.fhsu.edu. Co-organizer: Jonathan Sumrall, Fort Hays State Univ., jbsumrall@fhsu.edu.
- T25. **Climate and Land-Use Influences on Erosion and Sediment Flux and Impacts on Sustainable Water Management in Reservoirs.** Principal organizer: Vihad Rahmani, Kansas State Univ., vrahmani@ksu.edu. Co-organizers: Aleksey Sheshukov, Kansas State Univ., ashesh@ksu.edu; Abigail Langston, Kansas State Univ., alangston@ksu.edu; Arnaud Temme, Kansas State Univ., arnaudtemme@ksu.edu.
- T26. **Midcontinent Paleoclimatology.** Principal organizer: Karin Goldberg, Kansas State Univ., kgoldberg@ksu.edu. Co-organizer: Keith Miller, Kansas State Univ., keithbmill@gmail.com.
- T27. **Terrestrial Hydroclimate Variability through the Holocene: Causes and Impacts Based on Proxies and Models.** Principal organizer: Aubrey Hillman, Univ. of Louisiana Lafayette, aubrey.hillman@louisiana.edu. Co-organizer: Byron Steinman, Univ. of Minnesota Duluth, bsteinma@d.umn.edu.
- T28. **Exciting New Interdisciplinary Themes in Quaternary Geochronology.** Principal organizer: Shannon Mahan, U.S. Geological Survey, smahan@usgs.gov. Co-organizers: Sebastien Huot, Illinois State Geological Survey, shuot@illinois.edu; Tammy Rittenour, Utah State Univ., tammy.rittenour@usu.edu; Joel Spencer, Kansas State Univ., joelspen@ksu.edu.
- T29. **Quaternary Landscape Evolution in the Midcontinent: Improved Insights from Geochronology.** Principal organizer: Paul Hanson, Univ. of Nebraska Lincoln, phanson2@unl.edu. Co-organizer: Joel Spencer, Kansas State Univ., joelspen@ksu.edu.

- T30. **The Chronology of Big Pleistocene Events and Tracking Them from Source to Sink.** Principal organizer: Brandon B. Curry, Illinois State Geological Survey, bcurry@illinois.edu. Co-organizer: Sebastien Huot, Illinois State Geological Survey, shuot@illinois.edu.
- T31. **Past and Present Landform Deposition and Stabilization in Glacial and Periglacial Environments.** Principal organizer: Elizabeth Ceperly, Univ. of Wisconsin Madison, ceperley@wisc.edu. Co-organizers: Lucas Zoet, Univ. of Wisconsin Madison, lzoet@wisc.edu; J.E. Rawling III, Wisconsin Geological and Natural History Survey, elmo.rawling@wgnhs.uwex.edu.
- T32. **Geology of the Greater Kansas City Area (Posters).** Principal organizer: Richard Gentile, Univ. of Missouri Kansas City, gentiler@umkc.edu.
- T33. **Undergraduate Student Research (Posters).** Principal organizer: Robert Shuster, Univ. of Nebraska Omaha, rshuster@unomaha.edu.
- T34. **Pleistocene Records of Climatic and Environmental Change in the Rocky Mountains, Great Plains, and Midwest.** Principal organizer: Benjamin J.C. Laabs, North Dakota Univ., benjamin.laabs@ndsu.edu

FIELD TRIPS

For additional information, please contact the Field Trip co-chairs, Susan Stover, susanstover@ku.edu, and Rex Buchanan, rex@kgs.ku.edu; contact the trip leaders; or check the meeting website. All field trips depart from the Manhattan Hilton Garden Inn unless otherwise noted.

- FT1. **Looking Beneath the Plains: Geology of the Ogallala Formation and the Central High Plains of Kansas.** Sat.–Sun. 23–24 March, 7 a.m.–5:30 p.m. Cost: US\$245 (includes lunch, dinner, snacks, and lodging for overnight stay in Scott City, Kansas). Principal organizer: Jon Smith, Kansas Geological Survey, jjsmith@kgs.ku.edu. Co-organizer: Tony Layzell, Kansas Geological Survey, alayzell@kgs.ku.edu.
- FT3. **Late-Quaternary Landscape Evolution and Geoarchaeology in the Flint Hills of Northeastern Kansas: A Tale of Two Sites.** Sun., 24 March, 8:30 a.m.–4 p.m. Cost: US\$57 (includes lunch and snack). Principal organizer: Rolfe Mandel, Kansas Geological Survey, mandel@kgs.ku.edu
- FT5. **The Science and the Industry of the Permian Hutchinson Salt.** Sun., 24 March, 6:30 a.m.–9 p.m. Cost: US\$87 (includes lunch, snack, and entrance fee to underground salt caverns). Principal organizer: Marcia Schulmeister, Emporia State Univ., mschulme@emporia.edu. Co-organizers: Kathleen Counter Bennison, West Virginia Univ., kbennison@mail.wvu.edu; Anna Sofia Andeskie, West Virginia Univ., asandeskie@mail.wvu.edu.
- FT6. **Trails West, Kansas City Vicinity, Missouri and Kansas.** Sun., 24 March, 7 a.m.–6 p.m. Cost: US\$58 (includes snack). Principal organizer: James S. Aber, Emporia State Univ., jaber@g.emporia.edu. Co-organizer: Susan W. Aber, Emporia State Univ., abersusie@gmail.com.
- FT7. **Windows into the Cretaceous Mantle of the North American Mid-Continent—Kimberlites of Riley**

County. Sun., 24 March, 12:30–5 p.m. Cost: US\$40. Principal organizer: Pamela Kempton, Kansas State Univ., pkempton@ksu.edu. Co-organizers: Matt Brueseke, Kansas State Univ., brueseke@ksu.edu; Kayleigh Rogers, Kansas State Univ., kayleighr@ksu.edu.

- FT9. **Kansas River Alluvial Aquifer: Water Use and Real-Time Water-Level Monitoring.** Wed., 27 March, 1–5:30 p.m. Cost: US\$33. Principal organizer: Don Whittemore, Kansas Geological Survey, donwhitt@kgs.ku.edu.
- FT11. **Geology of the Flint Hills, Kansas: Sea Level and Climate Changes in the Permian.** Thurs., 28 March, 8 a.m.–5 p.m. Cost: US\$56 (includes lunch and snack). Principal organizer: Karin Goldberg, Kansas State Univ., kgoldberg@ksu.edu. Co-organizer: Keith Miller, Kansas State Univ. (retired), keithbmill@gmail.com

SHORT COURSES

- SC1. **Making Geoscience Animations and Videos and Assessing Them in the Classroom.** Sun., 24 March, 10 a.m.–4 p.m. Cost: US\$50 (includes two snacks and beverages). Principal organizer: Robert J. Stern, Univ. of Texas at Dallas, rjstern@utdallas.edu. Co-organizers: Ning Wang, Univ. of Texas at Dallas, ning.wang@utdallas.edu; Jeffrey Ryan, Univ. of South Florida, ryan@usf.edu; Lochlan Vaughn, Univ. of Texas at Dallas, lochlan.vaughn@utdallas.edu; Siloa Willis, Univ. of Texas at Dallas, siloa.willis@utdallas.edu.
- SC2. **GSA On To the Future Professional Skills Short Course for Students.** Sun., 24 March. 8 a.m.–5 p.m. Cost: Free; limited to 20 students. To register, email Tahlia Bear at tbear@geosociety.org. Principal organizers: Stephen K. Boss, Univ. of Arkansas, sboss@uark.edu; Tahlia Bear, Geological Society of America, tbear@geosociety.org. Co-organizer: Katherine Ellins, Univ. of Texas at Austin, kellins@jsg.utexas.edu.

OPPORTUNITIES FOR STUDENTS AND EARLY CAREER PROFESSIONALS Best Student Posters and Papers

Awards for the best student posters and papers are supported by the GSA South-Central, North-Central, and Rocky Mountain Sections. To be eligible, students must be lead authors and presenters and should be capable of answering detailed questions about their research. These awards will be announced Wed., 27 March, during the Student Awards Ceremony.

STUDENT TRAVEL GRANTS

Deadline: 19 Feb.

Students who are GSA members and who register for the meeting are eligible to apply for student travel grants. Find information and applications for student travel grants on the respective Section websites. Please review the eligibility guidelines and application procedure for your Section.

MENTOR PROGRAMS

Learn more at www.geosociety.org/mentors.
Roy J. Shlemon Mentor Program in Applied Geoscience. Mon., 25 March, and Tues., 26 March, noon–1:30 p.m. Students

and early career professionals will have the opportunity to discuss career prospects and challenges with applied geoscientists from various sectors over a FREE lunch.

John Mann Mentors in Applied Hydrogeology Program.

Wed., 27 March, noon–1:30 p.m. Students and early career professionals interested in applied hydrogeology or hydrology as a career will have the opportunity to network with professionals in these fields over a FREE lunch.

GEOSCIENCE CAREER WORKSHOPS

Part 1: Career Planning and Informational Interviewing.

Your job-hunting process should begin with career planning, not when you apply to jobs. This workshop will help you begin this 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.

Part 2: Geoscience Career Exploration. What do geologists in various sectors earn? What do they do? What are the pros and cons to working in academia, government, and industry?

Workshop presenters and professionals in the field will address these issues.

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 in the market for a job or not, learn how to prepare the best résumé possible. You will review

numerous résumés, helping you to learn important résumé dos and don'ts.

ACCOMMODATIONS

Hotel registration deadline: 4 March

A block of rooms has been reserved at the Hilton Garden Inn; the meeting rate is US\$109 per night plus tax for single or double occupancy. Reservations at the Hilton Garden Inn should be made by calling +1-785-532-9116. Please be sure to mention that you are attending the Geological Society of America meeting (the group code is GSA).

ORGANIZING COMMITTEE

Organizing Chairs: Matthew Kirk, mfkirk@ksu.edu; Tina Niemi, niemit@umkc.edu; Shannon Mahan, smahan@usgs.gov

Technical Session Chairs: Joel Spencer, joelspen@ksu.edu; Alison Graettinger, graettingera@umkc.edu; Shari Kelley, shari.kelley@nmt.edu

Field Trip Chairs: Susan Stover, susanstover@ku.edu; Rex Buchanan, rex@kgs.ku.edu

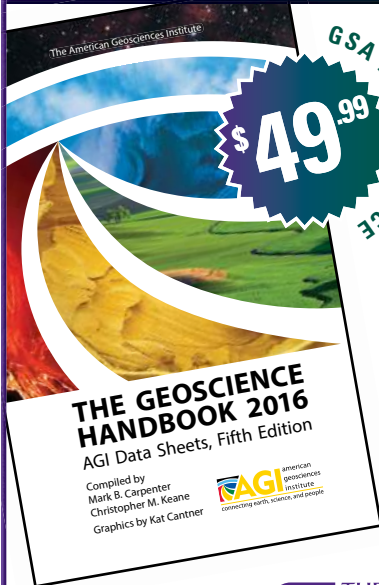
Sponsorship Chairs: Saugata Datta, sdatta@ksu.edu; JJ Lee, leej@umkc.edu

Student Volunteer Chair: Aida Farough, afarough@ksu.edu

Exhibits Chair: Matthew Brueseke, brueseke@ksu.edu

Graphics Chair: Alexandria Richard, allierichard@ksu.edu

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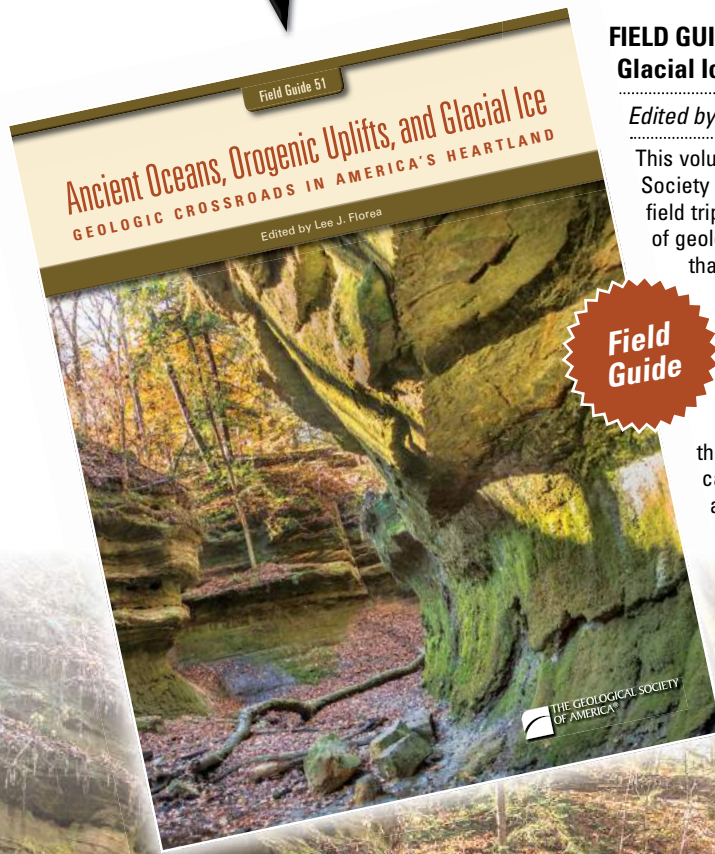


Submit a Story!

These two-page life stories of Rock Star geologists (read them all at www.geosociety.org/gsatoday/RockStars.htm) have enlivened GSA Today's pages for years, but we haven't had a new article since 2017. If you would like to submit a brief life story of a Rock Star geologist, see GSA's History & Philosophy of Geology Division's guidelines at <https://bit.ly/2QCEHqA>.



Take a Trip through the Heartland with GSA



Field
Guide

FIELD GUIDE 51 ▶ Ancient Oceans, Orogenic Uplifts, and Glacial Ice: Geologic Crossroads in America's Heartland

Edited by Lee J. Florea

This volume, prepared for the 130th Annual Meeting of the Geological Society of America in Indianapolis, includes compelling science and field trips in Indiana, Illinois, Kentucky, Michigan, and Ohio. A wealth of geologic and human history collides in the Midwest, a confluence that led to the growth of America's industry over the past two centuries. Guides in this volume depict this development from the establishment of New Harmony, the birthplace of American geology, through the construction of Indianapolis's modern skyline. Underpinning this growth were the widespread natural resources—limestone, coal, and water—that built, powered, and connected a growing nation. Take a journey through the Heartland to sand dunes, outcrops, quarries, rivers, caves, and springs that connect Paleozoic stratigraphy with the assembly of Gondwana, continental glaciation with Quaternary geomorphology and hydrology, and landscape with the human environment.

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SPE531: **Paleozoic Stratigraphy and Resources of the Michigan Basin**

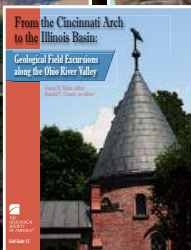
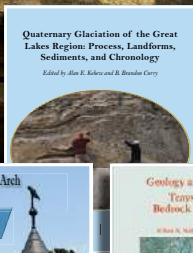
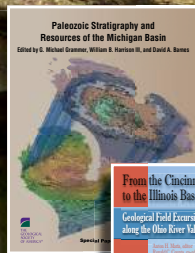
SPE530: **Quaternary Glaciation of the Great Lakes Region: Process, Landforms, Sediments, and Chronology**

FLD031P: **Insights into the Michigan Basin: Salt Deposits, Impact Structure, Youngest Basin Bedrock, Glacial Geomorphology, Dune Complexes, and Coastal Bluff Stability**

FLD012P: **From the Cincinnati Arch to the Illinois Basin: Geological Field Excursions along the Ohio River Valley**

SPE258P: **Geology and Hydrogeology of the Teays-Mahomet Bedrock Valley System**

Related Books



2019 GSA Section Meetings



Northeastern

17–19 March
Portland, Maine, USA
Meeting Chair: Steve Pollock, spollock@maine.rr.com
www.geosociety.org/ne-mtg



Joint South-Central/North-Central/ Rocky Mountain

25–27 March
Manhattan, Kansas, USA
Meeting Chairs: Matthew Kirk, matthew.f.kirk@gmail.com;
Tina Niemi, niemit@umkc.edu; Shannon Mahan,
smahan@usgs.gov
www.geosociety.org/sc-mtg



Southeastern

28–29 March
Charleston, South Carolina, USA
Meeting Chairs: Scott Harris, HarrisS@cofc.edu;
Katie Luciano, LucianoK@dnr.sc.gov
www.geosociety.org/se-mtg



Cordilleran

15–17 May
Portland, Oregon, USA
Meeting Chairs: Martin Streck, streckm@pdx.edu;
Jim O'Connor, oconnor@usgs.gov
www.geosociety.org/cd-mtg

Northeastern image: Portland waterfront, Portland, Maine, USA. Photo courtesy Maine Office of Tourism. Joint Meeting image: Manhattan, Kansas, USA. Photo courtesy K-State Photo Services. Southeastern image: Beach boardwalk, Charleston, South Carolina, USA. Photo courtesy Meetcharleston.com. Cordilleran image: Chanticleer Point, Portland, Oregon, USA. Photo by Martin Streck.

Your Paper in *Environmental & Engineering Geoscience* Can Unlock Unanticipated Benefits

Jerome V. De Graff, *California State University–Fresno; Chair, Environmental & Engineering Geoscience Editorial Board, jdegraff@csufresno.edu*

Despite the rapidly changing landscape of geoscience publication with expanding options, society journals remain an excellent venue for presenting research. Among these is *Environmental & Engineering Geoscience* (E&EG), a quarterly scientific journal jointly published by the Geological Society of America (GSA) and the Association of Environmental & Engineering Geologists (AEG) (<https://pubs.geoscienceworld.org/eeg>).

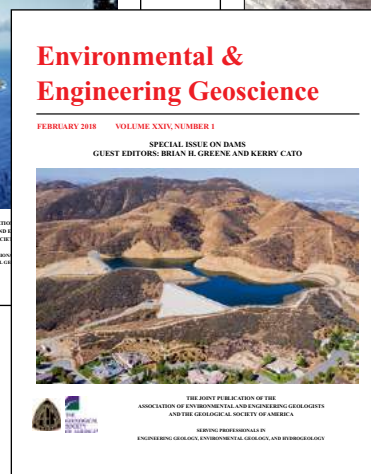
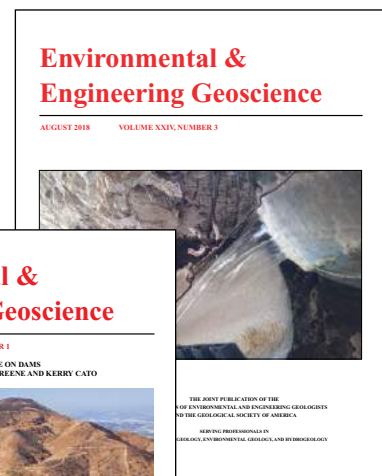
More than 20 years ago, GSA and AEG formed a partnership to create a peer-reviewed journal for those who are involved with applied geology research and its professional practice. Subscribers to E&EG have digital access to current and archived articles through GeoScienceWorld. GSA subscribers benefit from reading about environmental and engineering geology as it is currently being practiced in the USA and elsewhere. Articles illustrate how advances in geological knowledge and technology are being applied to solve environmental and engineering problems. The array of articles found in E&EG over time also reflects the changing societal needs for applied geology. Recently, newly accepted articles in E&EG started being available through online publication of accepted manuscripts. This ensures that publications can be credited to the author(s) earlier than the journal's quarterly format would permit.

Foremost among the benefits of publishing in E&EG and other GSA journals is the personal satisfaction of sharing research results. Having your paper in a peer-reviewed journal issued by two major professional societies with a heritage provides significant credibility. Publication in a recognized journal enhances your professional credentials for future advancement and becomes a tangible support when submitting grant proposals.

There are two additional benefits to publishing in E&EG. First, AEG presents an annual award for the paper deemed by the editors to be the best. This is valuable recognition for the author or authors and does not require membership in AEG. Second, the publication receiving the AEG award is forwarded to the E.B. Burwell, Jr., Memorial Award committee. The Burwell Award is a GSA Environmental & Engineering Geology Division honor bestowed in recognition of a publication being a distinguished contribution to the field of engineering geology. Given annually since 1969, this GSA award does not require the author or authors to be GSA members.

GSA members who are considering publication of their findings on applied geology topics should consider submission to *Environmental & Engineering Geoscience*. Publication in E&EG as well as other GSA journals and books supports GSA's longstanding mission of bringing high-quality research to our community and opens the opportunity for associated benefits. Information on preparation and submission of papers is online at https://eeg.allentrack.net/cgi-bin/main.plex?form_type=display_auth_instructions.

Publication in a recognized journal enhances your professional credentials for future advancement.



SCIENCE EDITOR

OPENINGS

2020

GSA is soliciting applications and nominations for science co-editors with **four-year terms beginning 1 January 2020**. Duties include: ensuring stringent peer review and expeditious processing of manuscripts; making final acceptance or rejection decisions after considering reviewer recommendations; and maintaining excellent content through active solicitation of diverse and definitive manuscripts.

POSITIONS AVAILABLE

GEOLOGY Research interests that complement those of the continuing editors include, but are not limited to: energy geology, engineering geology, geomorphology, neotectonics, paleobotany, paleoceanography, paleoclimatology, paleontology, paleoseismicity, Quaternary geology, sedimentary geology, seismology, soils, stratigraphy, tectonics, volcanology.

Geology ▶ 3 positions

GSA BOOKS Editor duties include soliciting high-quality book proposals and ensuring that proper peer review procedures are followed by volume editors. Editors handle the entire peer-review process for authored volumes. The successful candidate will have a wide range of interests and expertise, prior editing experience, and a strong publication record.

GSA Books ▶ 1 position

LITHOSPHERE Research interests that complement those of the continuing editors include, but are not limited to: geochronology, geodynamics, petrology, Precambrian geology, structural geology, tectonics.

Lithosphere ▶ 1 position

GSA BULLETIN Research interests that complement those of the continuing editors include, but are not limited to: geochemistry, geochronology, geomorphology, mineralogy, paleoclimatology, Quaternary geology, stratigraphy, thermochronology, volcanology.

GSA Bulletin ▶ 1 position

Note that candidates should not feel they must have expertise in *every* area listed; however, editors will sometimes need to handle papers outside of their main disciplines.

INTERESTED?

- ▶ Submit a curriculum vitae and a letter describing why you (or your nominee) are suited for the position to Jeanette Hammann, jhammann@geosociety.org.

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:** First consideration will be given to nominations or applications received by **15 February 2019**.

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.

FUTURE OPENINGS (terms begin January 2021):

GSA Bulletin (one position), *Geology* (one position), *Lithosphere* (one position), *GSA books* (one position).

Updated Position Statement

At its Nov. 2018 meeting, GSA Council approved minor revisions to the “Managing U.S. Coastal Hazards” position statement.

Summary: Storms, tsunamis, and rising sea levels threaten U.S. coastal communities and their economies. Much of the nation’s existing coastal infrastructure must be adapted to expected future conditions or relocated. New coastal development and post-storm reconstruction should be planned, sited, and maintained with coastal geologic hazards clearly in mind.

Full versions of all position statements are available online at www.geosociety.org/positionstatements. GSA members are encouraged to use the statements as geoscience communication tools when interacting with policymakers, students, colleagues, and the general public.



Photo by Bret Webster.

Lend your voice to your GSA Community

Build community and connect with your peers on GSA’s Member Community webpage. Log on to exchange knowledge, ignite connections, and collaborate with others throughout the world.



community.geosociety.org

Managing the Gulf Coast Using Geology and Engineering

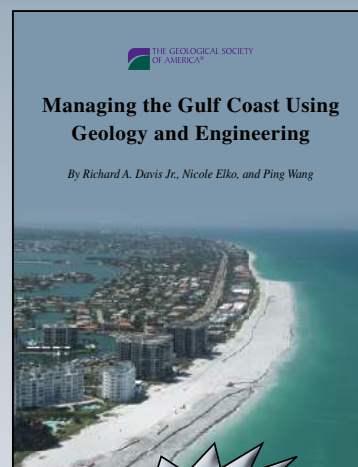
By Richard A. Davis Jr., Nicole Elko, and Ping Wang

This book looks at coastal management as it applies to the physical barrier/inlet system of the Gulf of Mexico. This is an excellent region for considering this topic because it has a wide range of situations to be considered in its management—remote areas, huge urban populations, and tidal inlets, including some natural, some dredged, and others that have been structured for more than a century. Discussing options for managing and protecting the various elements of the barrier/inlet system, the authors consider each approach in terms of costs, logistics, and success or failure. They extensively cover anthropogenic impact as well as management problems generated by natural processes, especially hurricanes and other severe storms. The authors discuss the impact of management decisions and related projects, providing decision makers with the proper information to make decisions on zoning, development, construction of major structures, environmental concerns, etc.

GULFMAN • 102 p. • ISBN 9780813741239 • \$28.00 • member price \$20.00



toll-free 1.888.443.4472
1.303.357.1000, option 3
gsaservice@geosociety.org



Buy online at <http://rock.geosociety.org/store/>

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. (Note: Combined March/April issue releases on March schedule). Print ads will also appear on the Geoscience Job Board to coincide with the month of print issue. **Contact: advertising@geosociety.org**, +1-800-472-1988 ext. 0153, or +1-303-357-1053. Email correspondence should include complete contact information (including phone and mailing address). Rates are in U.S. dollars.

Classification	Per Line for 1st month	Per line each add'l month (same ad)
Positions Open	\$9.35	\$9.30
Fellowship Opportunities	\$9.35	\$9.30
Opportunities for Students		
First 25 lines	FREE	\$5.00
Additional lines	\$5.00	\$5.00

POSITIONS OPEN

Assistant Professor, Hydrogeology/Fluvial Hydrology, Colorado Mesa University

The Geosciences Program in the Dept. of Physical and Environmental Sciences at Colorado Mesa University invites applications for a full-time, tenure-track faculty position beginning August 2019. The successful candidate will have a Ph.D. in Geosciences (by August 2019), a strong background in geology, and a specialization in ground water and/or fluvial hydrology. Fieldwork and modeling experience are desirable. Responsibilities include teaching 12 credit hours per semester, offering research opportunities to undergraduate students, advising, and participation in service to the program and university. Upper-division undergraduate course teaching responsibilities could include Hydrology, Ground Water, River Dynamics or a course in the candidate's area of expertise. Participation in our summer Field Camp course is desirable. Introductory-course teaching responsibilities could include Physical Geology, Field-based Physical Geology, Weather & Climate, and Oceanography. Demonstrated teaching and research experience with undergraduate students is desirable. Because of Grand Junction's spectacular geological setting, field-based course activities are encouraged.

The Geosciences program at Colorado Mesa University consists of ~70 undergraduate majors, 4 tenure-track faculty and 2 full-time instructors. More information about the Geosciences Program and faculty can be found at <http://www.colorado.mesa.edu/geosciences/index.html>.

Direct inquiries to Andres Aslan at +1-970-248-1614 or at aslan@coloradomesa.edu.

To apply, go to <https://coloradomesa.csod.com/ats/careersite/search.aspx?site=2&c=coloradomesa>.

Review of applications will begin February 3, 2019, and will continue until the position is filled.

AA/EOE, committed to a culturally diverse faculty, staff and student body.

Lecturer, Geology, Specializing in Environmental Geospatial Sciences, Department of Geology, University of Dayton

The Dept. of Geology invites applications for a nine month, annually renewable, non-tenure-track

lecturer position. This is a full time and benefit-eligible position. The successful candidate will be expected to teach four courses per semester. These courses include introductory lectures and labs in geography, geology, Geographic Information Systems (GIS), and environmental geology. Candidates will also mentor undergraduate students in GIS-related capstone projects. The position begins August 16, 2019.

Required qualifications: A Ph.D. in geography, geology, environmental geoscience, or a closely related field is required at the time of application, with an emphasis in geo-spatial information technology. Applicants must be able to teach introductory and advanced GIS courses using the ESRI ArcGIS software. They must also possess effective written communication skills.

For a complete list of qualifications and to apply, go to <http://jobs.udayton.edu/postings/27666>. A complete application consists of a cover letter of interest addressing the required and preferred qualifications, a complete CV, a statement of teaching philosophy, a sample syllabus for an introductory course in GIS; a copy of graduate transcripts, and three letters of recommendation, at least one of which should discuss the applicant's potential as a teacher. Optional materials include evidence of teaching effectiveness (i.e. summary of teaching evaluations).

Application deadline: February 15, 2019.

The Dept. of Geology offers BS degrees in Geology and Environmental Geology and a graduate certificate in Geographic Information Systems (GIS). It is also actively involved in the University's Sustainability Studies Program. For more information on the department, please visit <http://www.udayton.edu/artssciences/geology/index.php>.

The University of Dayton, founded in 1850 by the Society of Mary, is a top ten Catholic research university. The University seeks outstanding, diverse faculty and staff who value its mission and share its commitment to academic excellence in teaching, research and artistic creativity, the development of the whole person, and leadership and service in the local and global community.

To attain its Catholic and Marianist mission, the University is committed to the principles of diversity, inclusion and affirmative action and to equal opportunity policies and practices. As an Affirmative Action and Equal Opportunity Employer, we will not discriminate against minorities, females, protected veterans, individuals with disabilities, or on the basis of sexual orientation or gender identity.

Assistant Professor, Environmental Geoscience, Wichita State University

The Dept. of Geology at Wichita State University invites applications for a faculty position in environmental geoscience beginning August 2019. We are seeking to hire a tenure-eligible assistant professor with research expertise in shallow subsurface geophysical methods with application to environmental issues, including sustainability. In addition to developing an externally funded research program, successful candidates will be expected to teach introductory, major, and graduate level classes. The candidate must have a Ph.D.

in the Geosciences, and an established record of publication commensurate with the applicant's career stage. The candidate is expected to complement current departmental strengths in low-temperature geochemistry, hydrogeology, paleontology, petroleum geology, sedimentology/stratigraphy, and structural geology. The department strongly values our collegial atmosphere and encourages the candidate to interact and collaborate within the department and the broader segments of the WSU community.

Interested applicants should submit cover letter, curriculum vitae, statements of research and teaching interests, copies or links to relevant peer-reviewed publications, and contact information for at least three references. Candidates must go on line at <http://wichita.edu/wsujobs> to apply for the position. Applicants can send physical copies of relevant publications to the Search Committee Chair, Dept. of Geology, 1845 Fairmount Ave., Wichita State University, Wichita, KS 67260-0027. We will begin review of applications on January 15, 2019; however, applications will be accepted until the position is filled.

Wichita State does not discriminate in its employment practices, educational programs or activities on the basis of age, ancestry, color, gender, gender expression, gender identity, genetic information, marital status, national origin, political affiliation, pregnancy, race, religion, sex, sexual orientation, or status as a veteran.

Offers of employment are contingent upon completion of a satisfactory criminal background check as required by the Board of Regents policy.

All employees of Wichita State University are expected to support the WSU Vision, Mission and Values and to help foster an environment rich in diversity of culture, thoughts and experience. Candidates for faculty positions should be able to demonstrate the ability to effectively educate and empower a diverse student population.

Two Research Geologist Positions, Kentucky Geological Survey

The Kentucky Geological Survey, a research center at the University of Kentucky, seeks applications for two research geologist positions:

Geologist III (Geohealth and Environmental Geochemistry). The successful candidate will have a demonstrated ability to perform applied research and outreach related to geologic controls on the origin, transport, and fate of contaminants and carcinogens in Kentucky. Work will include continuation of existing KGS collaborations to investigate geological controls on indoor radon concentrations, heavy metal anomalies, and cancer clusters in addition to new research topics identified by the candidate and consistent with the KGS and UK strategic plans. Preference will be given to candidates with demonstrated experience in environmental or geohealth applications of geostatistics; development of innovative geochemical sampling or analysis methods; integration of geologic and epidemiological information; use of geologic information to support public policy decisions; and/or publication of geohealth research in major journals. This position will require CITI human subjects research certification (avail-

GEOSCIENCE JOBS & OPPORTUNITIES

able through UK after employment begins).

Geologist III (Quaternary Geology, Geomorphology, and Geohazards). The successful candidate will have a demonstrated ability to perform applied research and outreach on Quaternary geology, geomorphology, and near-surface geologic hazards such as landslides, debris flows, sinkholes, liquefaction, and fluvial erosion/sedimentation in Kentucky. Work will include responsibility for day-to-day operation of the KGS Digital Earth Analysis Lab; geomorphological, geochronological, and geohazard research relevant to Kentucky; and continuation of ongoing research collaborations, all in a manner consistent with the KGS and UK strategic plans. Preference will be given to candidates with demonstrated experience in LiDAR-based digital terrain modeling using large (e.g., statewide) data sets; geologic applications of structure-from-motion photogrammetry and/or UAV-based LiDAR data; Quaternary dating methods; use of geologic information to support engineering and/or public policy decisions; economic analysis of geohazards and mitigation strategies; and/or publication of research in major journals.

Both positions require:

- A Ph.D. in a relevant field at the time of appointment AND at least one degree in geology, geosciences, or geological sciences.
- Demonstrated proficiency in the use of modern computational tools such as Matlab, Mathematica, R, or Python, in addition to GIS, for advanced geologic data visualization, analysis, and/or simulation.
- Demonstrated ability to work toward common goals as part of a high-performance team.
- Demonstrated potential to (1) publish research results in peer-reviewed scientific journals, reports, and conference abstracts, (2) conceive and acquire outside funding for research projects relevant to Kentucky, (3) foster existing and develop new research collaborations within the University and the broader scientific community, and (4) engage in a program of continuous professional development leading to national or international stature in the candidate's field(s) of specialization.
- Ability to perform laboratory work, geological fieldwork, and general office work in support of KGS research and outreach objectives. This may include fieldwork in rough terrain or inclement weather, occasional lifting of 50 lbs or more, and occasional overnight travel.

About KGS. The Kentucky Geological Survey is a research center within the University of Kentucky, with an organizational history stretching back to the first publicly funded geological reconnaissance of Kentucky in 1838. With main offices on the UK campus in the heart of Kentucky's Bluegrass region, KGS comprises approximately 50 FTE scientists and support staff engaged in a wide range of geological research and service activities beneficial to the Commonwealth of Kentucky. This includes active collaborations with colleagues in the UK Departments of Earth and Environmental Sciences, Civil Engineering, Mining Engineering, Plant and Soil Sciences, Preventive Medicine and

Environmental Health, as well as the UK College of Nursing and other research centers such as the Kentucky Water Resources Research Institute and the UK Center for Applied Energy Research. Most KGS doctoral-level scientists have adjunct faculty appointments that offer optional opportunities for teaching and advising. UK, an R1 research university with 16 degree-granting colleges and more than 200 academic programs, is one of only eight institutions in the country with liberal arts, engineering, professional, agricultural, and medical colleges and disciplines on one contiguous campus. Lexington is a midsize city of about 320,000 people that offers a wide range of cultural, social, and recreational amenities in addition to easy commuting and an affordable cost of living. Please visit kgs.uky.edu for additional information about KGS.

To apply for job #RE RE15944 Geologist III (Geohealth and Environmental Geochemistry), submit a UK Online Application at <http://ukjobs.uky.edu/postings/204602>.

To apply for job #RE15931 Geologist III (Quaternary Geology, Geomorphology, and Geohazards), submit a UK Online Application at <http://ukjobs.uky.edu/postings/204454>.

If you have any questions, contact HR/Employment, phone (859) 257-9555, then press 2. Application deadline is Dec. 31, 2018.

The University of Kentucky is an Equal Opportunity University that values diversity and inclusion. Individuals with disabilities, minorities, veterans, women, and members of other underrepresented groups are encouraged to apply.

Paleontology and Historical Geology, Full-Time Lecturer (Non-Tenure-Track), Tufts University

Tufts University invites applications for a full-time lecturer in the Dept. of Earth and Ocean Sciences to begin September 1st 2019. This position is for a 1-year initial contract with possibility of continued renewal of multiyear contracts, and it is included in the union for full-time lecturers (Service Employees International Union). The lecturer will teach courses in Paleontology, Historical Geology, their specialty (with a preference for Geographic Information Systems), and labs for other introductory courses that include afternoon field trips. Earth and Ocean Sciences is an undergraduate-only program offering degrees in Environmental Geology and Geological Sciences. Full details and application materials via Interfolio at <https://apply.interfolio.com/53715>.

Hydrogeochemist, Geohydrology Section, Kansas Geological Survey, The University of Kansas, Lawrence

Full-time position to lead KGS hydrogeochemical investigations. Faculty-equivalent, sabbatical-eligible position at the rank of Assistant or entry-level Associate Scientist. Requires Ph.D. with an emphasis on aqueous geochemistry related to water resources and scientific leadership potential. Emphasis on state-of-the-science field studies and complementary theoretical research. Complete announcement/application info at www.kgs.ku.edu/General/jobs.html. Review of applica-

tions will begin March 4, 2019.

Apply online at <http://employment.ku.edu/academic/13299BR>. For further information contact Geoff Bohling (geoff@kgs.ku.edu) or Don Whittemore (donwhitt@kgs.ku.edu). For further information about other aspects of the position, contact Annette Delaney, HR, at adelaney@kgs.ku.edu or 785-864-2152. KU is an EO/AAE, <http://policy.ku.edu/IOA/nondiscrimination>.

Associate Director for Research, Kansas Geological Survey (KGS), University of Kansas, Lawrence

Full-time position to provide strategic collaborative research leadership that supports the KGS mission. The Associate Director for Research (ADR) will report to the Director and interact with Senior-rank academic staff; oversee approximately 14 Kansas Geological Survey (KGS) Assistant and Associate-rank academic and scientific research staff, and their research programs; align the unique strengths of current KGS research programs with research trends and new innovative research opportunities. The ADR also will be expected to lead an externally funded, active research program in an area relevant to Kansas. The KGS is a research and service division of the University of Kansas, and the successful candidate will have the opportunity to collaborate with KU faculty and students in other departments and research groups. Complete announcement/application info at www.kgs.ku.edu/General/jobs.html. Review of applications will begin Jan. 15, 2019.

Apply online at <http://employment.ku.edu/academic/13077BR>. For further information about the position contact Rolfe Mandel, mandel@ku.edu, 785-864-2171. For further information about other aspects of the position, contact Annette Delaney, HR, at adelaney@ku.edu or 785-864-2152. KU is an EO/AAE, <http://policy.ku.edu/IOA/nondiscrimination>.

FELLOWSHIP OPPORTUNITIES

Roger E. Deane Postdoctoral Fellow, Department of Earth Sciences, University of Toronto

The Dept. of Earth Sciences (<http://www.es.utoronto.ca/>) at the University of Toronto invites applications for the Roger E. Deane Postdoctoral Fellowship, a highly competitive fellowship in any field of Earth Science. The department is interested in supporting innovative research and outstanding young geoscientists to work in collaboration with one or more faculty members. Applicants are expected to contact potential hosts in advance to discuss areas of common interest and to develop proposal ideas.

Salary: The Deane Postdoctoral Fellowship has an annual salary of CAD\$55,000 and is awarded for a one-year period, with an anticipated extension for a second year.

Application Instructions: A complete application includes: a curriculum vitae, three references sent by referees directly to geol_sec@es.utoronto.ca (subject line: Deane Postdoctoral Fellowship),

an innovative research proposal written by the applicant (2 pages maximum excluding references), and a cover letter with the potential host's name clearly stated (1 page max).

The selection committee will evaluate research proposals for original thinking and to determine a candidate's ability to develop a research project that can be accomplished in the department.

Deadline: Applications are due March 8, 2019. Decisions will be made mid-May 2019.

EXPECTED START DATE: September 1, 2019
TERM: 1 year minimum, 2 year maximum
FTE: 100%

Submit electronic PDF applications to: Ampy Tolentino, geol_sec@es.utoronto.ca (subject line: Deane Postdoctoral Fellowship)

Employment as a Postdoctoral Fellow at the University of Toronto is covered by the terms of the CUPE 3902 Unit 5 Collective Agreement.

This job is posted in accordance with the CUPE 3902 Unit 5 Collective Agreement.

The University of Toronto is strongly committed to diversity within its community and especially welcomes applications from racialized persons / persons of colour, women, Indigenous / Aboriginal People of North America, persons with disabilities, LGBTQ persons, and others who may contribute to the further diversification of ideas.

Richard T. Buffler Post-Doctoral Fellowship, The Institute for Geophysics (UTIG), The University of Texas at Austin

A post-doctoral fellowship is being established within The Institute for Geophysics (UTIG), Jackson School of Geosciences (JSG), The University of Texas at Austin for the purpose of honoring Dr. Richard (Dick) T. Buffler, whose scientific research into the geology of the Gulf of Mexico (GOM) underpins our current rich understanding of this prolific hydrocarbon basin and the unique confluence of structural and stratigraphic processes related to its formation and fill.

Dick worked at UTIG from 1975 until his retirement in 2002, collecting and interpreting new seismic data from the Gulf basin. He participated in 12 GOM cruises (including co-chief scientist of DSDP Leg 77), and he authored or coauthored over 83 publications related to the Gulf. He also mentored 73 students many of whom produced Masters or PhD theses related to the Gulf (33), and he helped lead a major UTIG research effort in the GOM, the Gulf Basin Depositional Synthesis (GBDS) project, which has enjoyed 19 years of continuous industry support under Dr. William E. Galloway and now its

current director, Dr. John W. Snedden.

The successful applicant for this new position should have the following skills:

1. Demonstrated research interest in basin-scale depositional systems, ranging from alluvial to deep-water, siliciclastics and carbonates, Pleistocene to base Mesozoic
2. Competence in seismic interpretation, including experience with 2D or 3D seismic workstation software
3. Competence in geological interpretation of well logs
4. Knowledge of biostratigraphy and use of fossil datums for correlation
5. Excellent oral presentation and writing skills
6. Experience with ArcGIS and other computer software (Word, Excel, PowerPoint, etc.)

Essential job Functions

1. Identify and lead new research avenues in Gulf of Mexico depositional systems that support existing and future exploration efforts of the GBDS Industrial Associates
2. Generate scientific publications that enhance the technical reputation of UTIG, JSG, and The University of Texas at Austin
3. Conduct and present research to industrial associates with clarity and a deep understanding of their oil and gas industry challenges
4. Collaborate with UTIG and JSG researchers and faculty, where appropriate
5. Mentor undergraduate and graduate students as appropriate
6. Domestic travel as needed

The position will have two years of support and will be based in Austin, Texas. Interested persons should submit a detailed Curriculum Vitae (CV) that includes academic and professional experience, statement of research interests, and names and contact information of three references to PostDocUTIG@ig.utexas.edu. For full consideration, applications must be received no later than February 1, 2019.

Steve Fossett Postdoctoral Fellowship, Earth and Planetary Science, Washington University in St. Louis

The Dept. of Earth and Planetary Sciences at Washington University in St. Louis invites applications for the Steve Fossett Postdoctoral Fellowship. The Department seeks outstanding candidates who will strengthen and complement existing areas of study, including terrestrial and planetary geology, geochemistry, geophysics, geobiology, and climate science. Candidates will be encouraged to collaborate directly with faculty and students within the

Department, and will be invited to lead a seminar in their area of expertise. Ideal candidates will have trans-disciplinary interests, and will interact scientifically with a broad spectrum of the Department's members. This competitive postdoc is awarded for a one-year period, which may be extended to a second year. The annual salary is \$63,000 with additional research funds of \$5,000 per year. The appointment is anticipated to begin on or around July 1, 2019. Applicants should contact a potential faculty sponsor to discuss additional arrangements.

To apply, upload a cover letter, resume, statement of research interests, and names and contact information for three references to: <https://apply.interfolio.com/57692>

Applications will be considered until the search is concluded, but priority will be given to those received before January 15, 2019. Washington University is an equal opportunity/affirmative action employer.

OPPORTUNITIES FOR STUDENTS

Graduate Student Opportunities (MS), Ohio University. The Dept. of Geological Sciences at Ohio University invites applications to its graduate program for the Fall of 2019. The department offers thesis and non-thesis MS degrees in Geological Sciences with areas of emphasis in 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. Daniel Hembree (hembree@ohio.edu). Review of applications begins February 1, 2019.

Hiring?

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Edited by Raymond V. Ingersoll,
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Stepping Into the New Year, We Thank You.

You make a difference.

The GSA Foundation is extremely thankful to all of our friends and donors who contribute time, resources, ideas, and financial support toward the Geological Society of America's programs. It was our pleasure to visit with so many of you over the course of 2018, and especially at the Annual Meeting in Indianapolis at our booth and various programs throughout the meeting. We look forward to celebrating the impact you have made throughout 2019!



The GSA Foundation's Penrose Circle and Student Award Reception celebrates Graduate Student Research Grant recipients and brings them together with the donors who help make those awards possible.



Thanks to corporate partners, government representatives, and mentors from both sectors, GeoCareers Day included a room full of inquisitive students and recent graduates seeking information about career paths.



Thanks to contributions from many GSA members, On To the Future continues to bring students from groups underrepresented in the geosciences to their first GSA Annual Meeting, where they are paired with mentors, attend daily gatherings, and are introduced to networks of professional geologists in their fields of interest.



Meeting attendees joined us at the GSA Foundation booth each day of the Annual Meeting to learn more about the impact their support has had on GSA programs and members and to participate in our rock identification quiz.

Big Data and Artificial Intelligence Analytics in Geosciences: Promises and Potential

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ABSTRACT

Big data and machine learning are IT methodologies that are bringing substantial changes in the analysis and interpretation of scientific data. By adding GPU processing resources to the typical equipment of a server host, it is possible to speed up queries performed on large databases and reduce training time for deep learning architectures.

A recent pairing of the big data technologies, applied to old and new data, and artificial intelligence techniques has enabled a team of scientists to create an interactive virtual globe that shows a color mosaic of the seabed geology. This interactive model allows us to obtain robust reconstructions and predictions of climate changes and their impacts on the ocean environment. We suggest a possible evolution of such a model by means of the expansion of functionalities and performance improvements. We refer respectively to the implementation of isochronic layers of seabed lithologies and the addition of GPU resources to speed up the learning phase of the support vector machine (SVM) model. These additional features would allow us to establish broader correlations and extract additional information on large-scale geological phenomena.

INTRODUCTION

The Earth system generates continuous data, and our acquisition capacity has significantly increased over time. The growing availability of acquired geological data and the methods developed in the field of information technology make it possible to identify associations and understand patterns and trends within data (Big Data), solve difficult decision problems (artificial intelligence), and provide acceleration to data processing (GPU computing).

Big Data is a term that indicates very large databases (often by order of zettabytes, i.e., billions of terabytes) that

can contain huge amounts of heterogeneous, structured and unstructured data (text, numerical values, images, e-mail, GPS data, and data acquired from social networks), which can be extrapolated, analyzed, and correlated with each other.

Artificial Intelligence (AI) is a branch of computer science that studies the way in which the combination of hardware and software systems can simulate typical behaviors of the human brain. One of the most important applications consists of a complex algorithm, called machine learning, which is able to learn and make decisions.

GPU Parallel Computing (GPGPU) involves the processing of data by the processors present in the graphics card (GPU) and has allowed the computation, in relatively short times, of huge amounts of data with an efficiency of at least two orders of magnitude greater compared to the past.

There are several cases in which these technologies have been applied both in the field of potential earthquakes (Rouet-Leduc et al., 2017), volcanic eruptions (Ham et al., 2012), and to solve the problems of spatial modeling in the field of the assessment of landslide susceptibility (Korup and Stolle, 2014).

The following describes a mixed approach (AI and Big Data) in the field of geosciences—analyzing potentials and possible future developments.

CASE STUDY: BIG DATA AND AI MAP WORLD'S OCEAN FLOOR

An example of an application combining Big Data and machine learning technologies was implemented by a team of Australian scientists who created the first digital map of seabed lithologies (Dutkiewicz et al., 2015) through the analysis and cataloging of ~15,000 samples of sediments found in marine basins. Before such a map, the most recent map of oceanic lithologies was hand drawn ~40 years ago,

at the beginning of ocean exploration. Since then, the map has undergone few changes, with at most six types of sediment dominant in the ocean basins.

The digital map was created using an AI method consisting of the support vector machine (SVM) model. Through a cross-validation approach, the classifier was trained by adding new data gradually so as to allow its learning. Learning the parameter values, which optimize the classifier's performance on withheld data, is an important step in the workflow. In this way, the vast set of point data has been transformed into a continuous digital map with very high accuracy (up to 80%).

The new lithological map of the seabed is very important for the interpretation of global phenomena related to the evolution of ocean basins. An example of this is diatoms, siliceous phytoplankton that live in the oceans and that through chlorophyll photosynthesis produce about one-quarter of the oxygen present in the atmosphere, contributing to reduce global terrestrial warming. At their death, these organisms precipitate through the water column, accumulating on the underlying sea floor. Satellite surveys over the years have identified places where diatomaceous activity is more productive; that is, the marine areas in which there are the maximum concentrations of chlorophyll, considering that they should also correspond to the areas of maximum accumulation of these organisms in the sea floor. Surprisingly, the digital map of the seabed has revealed that there is a decoupling between the productivity of diatoms and the corresponding accumulation areas in the sea floor. The possibility of diatom ooze formation is however favored by the low surface temperature (0.9–5.7 °C), by salinity (33.8–34 PSS), and by the high concentration of nutrients, and therefore can represent an important indicator of the oceanographic variables of the surface of the sea (Cunningham and

Leventer, 1998). For this reason, the map will help scientists better understand how our oceans have responded and will respond to environmental changes.

POTENTIAL AND FUTURE PROSPECTS

Big Data and AI are having an impact on every commercial and scientific domain, and their application in the field of geosciences is making a great impact in the analysis and understanding of natural phenomena.

The intensive use of CPUs required by these two technologies has stimulated the search for alternative solutions to improve performance by using a mixed CPU-GPU approach. In this way it is possible to obtain rapid results from huge databases and the acceleration of the learning process for neural networks. These techniques are the basis of *deep learning*, an alternative model of machine learning, which achieves a very high degree of accuracy in recognizing objects and is able to learn features automatically from data without the need to extract them manually.

The joint application of Big Data–machine learning, described as a case study, allowed researchers to demonstrate the absence of correlation between diatom productivity and the corresponding diatom oozes: The accumulation of these organisms in the seabed seems rather to be linked to specific variations in sea-surface parameters. This is one of many cases where the integrated analysis of various parameters allows a different interpretation from what could be assumed by their disjoint analysis.

A possible evolution is to represent, on a similar map, in addition to the current surface lithologies, those present within the lithostratigraphic succession, making geochronological correlations between chronostratigraphic units. Using surveys carried out in various parts of the world, different layers could be defined, each corresponding to a specific age expressed in millions of years, representing the ocean lithologies existing in that particular geological period. Similarly to the previous case, the transition from a punctual to a continuous display could be obtained, for each layer, by applying the existing SVM model or an even more efficient version using GPU computing. Figure 1 shows a possible switching between current ocean

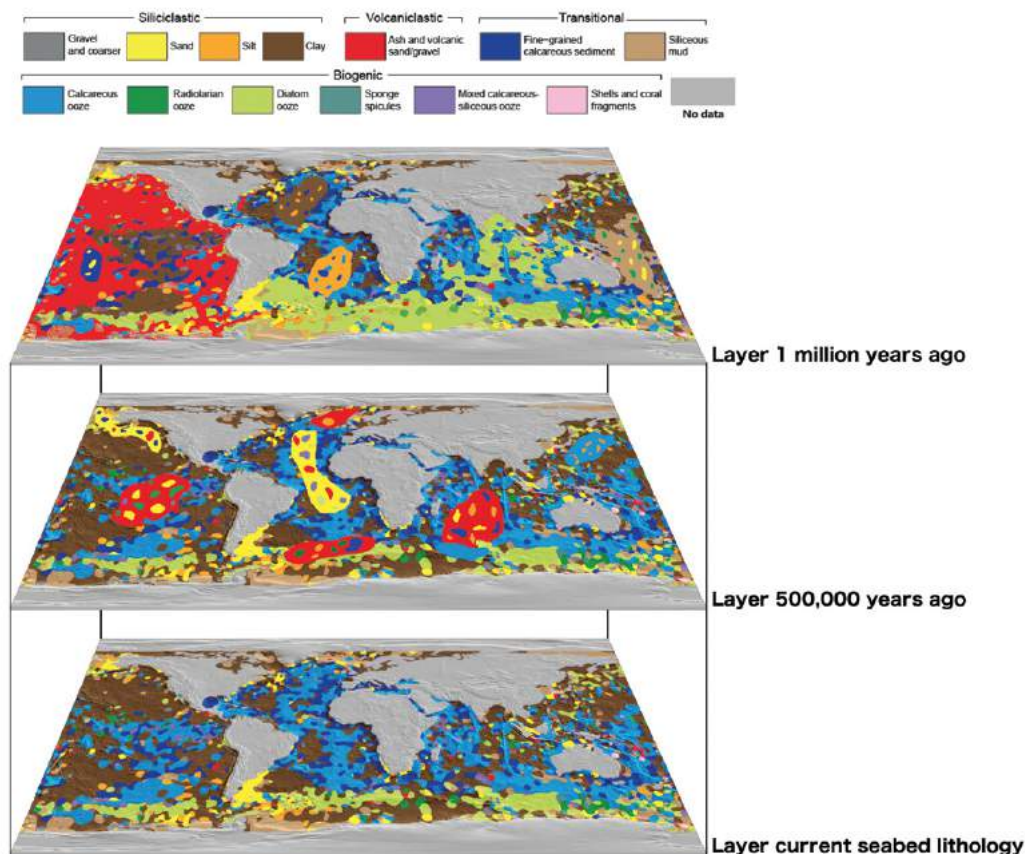


Figure 1. Example of a layered implementation of seabed lithology maps (modified from <https://portal.gplates.org>).

lithologies (<https://portal.gplates.org>) placed below and those existing respectively 500,000 and one million years ago (above). The oldest layers were made only for demonstration purposes and reproduce an artificial lithology of the seabed.

A system of this kind allows the carrying out of various operations that can be summarized as follows:

- display/hide isochronous levels obtaining different instantaneous representations of the ocean basins during the geological eras;
- using Big Data analytics to pair data sets (oceanographic, stratigraphic, paleontological, and micropaleontological) with one or more isochronous layers to analyze geological phenomena on a global scale (eustatic oscillations, glacial and interglacial periods...) and perform stratigraphic correlations between oceanic crustal sectors to identify evolutionary patterns.

The optimization introduced by IT methods lets us perform analyses on large heterogeneous data to discover hidden models and unknown correlations that allow for more solid reconstructions and forecasts on natural phenomena that have

had and will have a major impact on the ecosystems of our planet.

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MANUSCRIPT RECEIVED 4 JAN. 2018

REVISED MANUSCRIPT RECEIVED 22 JUNE 2018

MANUSCRIPT ACCEPTED 15 AUG. 2018



GSA Tomorrow: An Open Challenge to Promote the Future of Geoscience

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INTRODUCTION

The future of geoscience rests on your shoulders. Geologists are passionate about their science and discuss their interests with vigor, firmly understanding why geoscience is as important to society as physiology, agriculture, or engineering. In many cases, non-geologists don't see the clear importance and implication of the profession, outside of natural disasters and events that have immediate and apparent human effects. Countless geoscientists¹, including professionals, academics, and students, are already vocal self-advocates; however, in our currently digital world, where information can be instantly disseminated at the push of a button, it is time we took a collective effort as the Geological Society of America to actively emphasize the importance of science to the non-geologist, forming a movement to assertively advocate for our field. We invite you to contribute to this discussion by responding with succinct, measurable, and clear reasons on how what you do affects society. Our collective views could be used to guide non-geologists to advocate for geoscience just as non-physicians advocate for medical advances. GSA is as effective as its members, who make up 21 Scientific Divisions, which have numerous, tangible impacts on society. As GSA continues focusing efforts on the advancement of the Society into the twenty-first century, we are taking a critical look at what the Society is doing, whom it is doing it for, and how it could be doing it better.

PROGRESS IS A GOOD THING

The world has changed since GSA was founded in 1888. Integrated circuits have allowed us to use personal computers, we use antibiotics to fight deadly infections, wireless communication provides global access, and we can instantly transmit high-resolution videos to our friends. Technology advances because of society and society advances because of technology. Yet, technological advancement would not be possible without the discovery, understanding, and properties of raw materials, a direct outcome of the unending commitment of the geoscience community. We are all driven by an insatiable human desire for a better understanding of our world and everything it contains—not strictly speaking of geoscience, but all science, technology, engineering, and mathematics fields, and the humanities. What we learn now is different than what we learned in 1888. What university students learn in their geology courses today is different than what the authors of this contribution learned, and what the authors of this contribution learned is quite different from each other. This is the nature of progress. This is a good thing.

The tools we use to study geoscience are adapting, innovating, and modernizing the way we carry out our observations, research, and achievements. Instead of carrying a compass, paper topographic map, and notebook, students today have the option to download applications on a single smartphone to carry out the same functions. Many research groups use drone technology to assist with mapping

rather than risking their safety on dangerous cliffs or simply inferring an inaccessible terrane. The results from science conducted with modern tools can be just as accurate, if not more so, than work conducted with conventional technology. It's analogous to the way art has changed over tens of thousands of years—the tools have changed from carbon ash and hands, to mineral-based dyes and horse-hair brushes, pencils and ink pens, to computer software. The end product (from a petroglyph to a Monet) is still considered art but comparing pictographs to 3D graphics is like comparing William Smith's 1815 geologic map of Britain with the British Geological Survey's iGeology app, which provides multiple layers of geologic information, photos, and text about the country's geology at the touch of a screen. If our profession will continue to evolve based on discovery and innovation (both internal and external to geoscience), how do we visualize geoscience in the next 50 years? The next 100 years?

THE GEOSCIENCE DISCIPLINE

It's important to briefly reflect on how geoscience developed into what it is today. Ask a geoscientist "Who was the first geologist?" and the same few names are likely mentioned: Werner, Hutton and Smith, or Steno. Yet, Werner's paid profession was as a mining and mineralogy instructor, Hutton was a retired physician and farmer when he began to explore geology, Smith was a canal worker, and Steno was a professor of anatomy. Early "renaissance men" including Aristotle,

GSA Today, v. 29, <https://doi.org/10.1130/GSATG377GW.1>. Copyright 2018, The Geological Society of America. CC-BY-NC.

¹Geoscience/geoscientists is defined as all subdisciplines that are recognized as Scientific Divisions of GSA (geoarchaeology, karst, planetary geology, etc.), and may be extrapolated to areas that cross over to other subdisciplines that may not be strictly recognized as a GSA Scientific Division.

Pliny the Elder, Al-Biruni, and Shen Kuo ruminated about the origin of Earth, geomorphology, minerals, and geologic time, yet they weren't considered geoscientists. Mineralogy had been a well-regarded profession for decades, as had mining, metallurgy, cosmogony, and natural history (Woodward, 1911; Gohau, 1991). The first paid geologist was possibly B. Faujas de Saint-Fond, who, in 1793, was appointed to a geologist teaching position at the National Museum of Natural History in France (Gohau, 1991). The discipline of geoscience today coalesced from many fields and developed based on human needs through maturity of thought and understanding of the world around us—it changed as we advanced. Just as scientists take multiple “trains of thought” to come to a well-thought-out, logical conclusion, it has taken multiple lines of study to produce the (expansive) geoscience profession today. Would Smith be upset at the thought of our students mapping with ArcGIS software? Would Henry Sorby banish desktop scanning electron microscopes in his laboratory? Just as important, would Adam Smith be alarmed at how geological information and events (like the Eyjafjallajökull eruption) significantly impact our economy (Häggquist and Söderholm, 2015)? Other disciplines can be as reliant on geoscience as we are on them—everything is interdisciplinary to an extent. Yet, as we continue to catapult into a society based on manufacturing and development using novel, human-made materials, we are at the perfect opportunity to articulate the value of our earth-based profession.

THOUGHT EXPERIMENT

As a thought experiment, consider the question: what would happen if all geoscientists stopped practicing their science? Would the average person's life change? own their tools today, would the energy industry suffer? New resources for the rare earth minerals that power our smartphones may not be discovered if exploration geochemists walked away.

If hydrologists took a permanent vacation, would we still have clean drinking water? It could be argued that the outcomes of a study on mantle physics have as much of a personal significance as a study on natural hazards. Through geophysical research, we have detected that there is a lot more water in the earth than on it and that the water cycle, which is vital to life, may be closely tied to geologic processes (Pearson et al., 2014; Fei et al., 2017). Geochemical research on lead isotopes in the 1960s led to the awareness and understanding of lead contamination and poisoning, which are problems still facing society. From sedimentology, to petrology, to tectonics, to geophysics, if a geoscience field ceased to exist, how might human advancement be changed in ways that even the least geo-enthusiast could appreciate?

As a second thought experiment, consider how life might be altered if notable geologists never existed. For instance, what if F.W. Shotton never used hydrogeology to aid in development of potable water supplies for British forces in the Middle East and northern Africa during World War II (Rose and Clatworthy, 2008)? Through careful geological analysis and test drilling, Shotton derived safe drinking water from carbonate sediments, keeping the 8th Army hydrated and healthy to go on to defeat Nazi field marshal Erwin Rommel's army at El Alamein. If history was altered, how might our world look different today? If our modern geoscientist leaders step away, how might our world look different tomorrow?

CHALLENGE

Make a difference, get involved, and expand geoscience appreciation! If geoscience is vital to the betterment, sustainability, and continuity of humankind and society, it is our responsibility as geologists to educate the non-geologists who don't agree or understand why. We invite you to *contribute to this discussion* by coming up with your own succinct,

measurable, and clear reasons on the importance of your specific discipline in how it affects all aspects of society. Unconventional and unusual reasons are encouraged, and “succinct” is key: we ask you to add your thoughts to our challenge by sending a two-sentence e-mail to gsatoday@geosociety.org or, for those so inclined, posting your answer in a single Twitter or Instagram post. Be sure to tag @geosociety and #geotomorrow so that your responses may be collected. Responses will be made available for our geoscience community to use, adapt, and advocate with as we continue into the future. As the voice of the Geological Society of America, you are responsible to initiate a surge in geoscience appreciation and understanding. We know what *GSA Today* is—what is *GSA Tomorrow*?

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MANUSCRIPT RECEIVED 24 MAY 2018

REVISED MANUSCRIPT RECEIVED 30 SEPT. 2018

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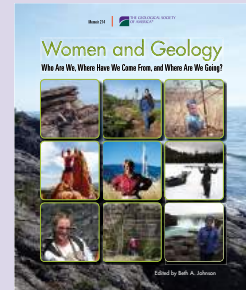
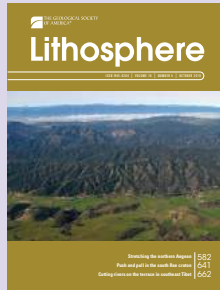
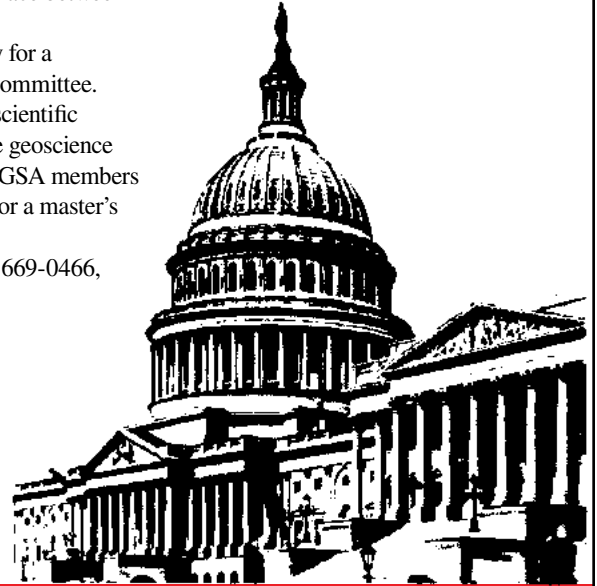
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brennan.jordan@usd.edu

Co-organizers: Tenley Banik, Illinois State University, tibanik@ilstu.edu;
and Tamara Carley, Lafayette College, carleyt@lafayette.edu

The trip will be a 10-day circuit of Iceland, visiting geologic sites along the Ring Road with excursions off of this route to experience the geologic and scenic diversity of the island. There will be an emphasis on magmatic and tectonic processes, but also including sites of geomorphological interest.

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Photos by Brennan Jordan.





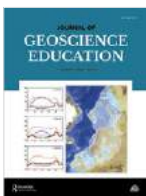
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