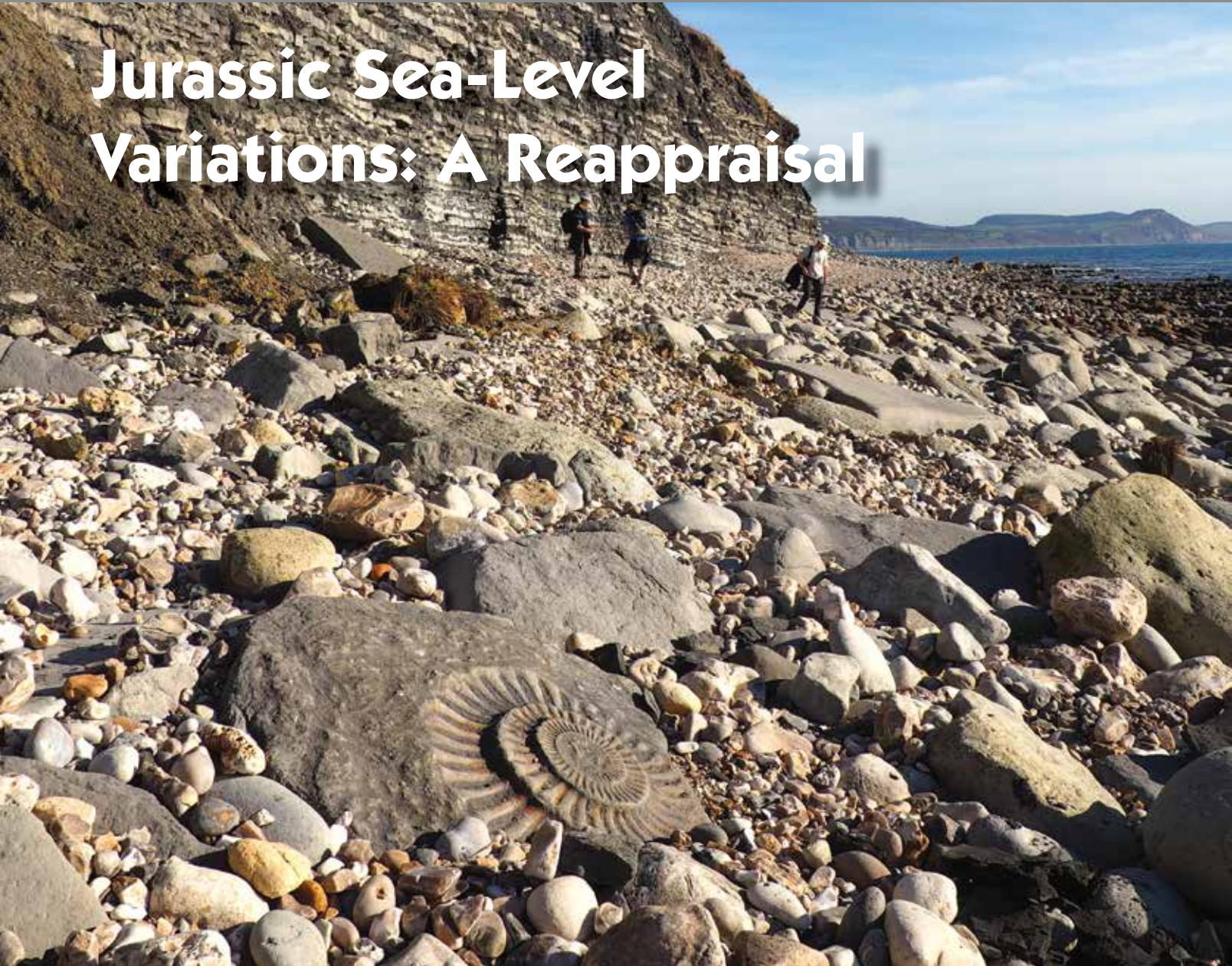


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## Jurassic Sea-Level Variations: A Reappraisal





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2018



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## SCIENCE

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**Cover:** Early Jurassic Blue Lias Formation at Lyme Regis, Dorset, UK. Abundant ammonite fossils form the basis for a highly resolved biostratigraphy that allows correlation of depositional sequences on regional and, in some cases, global scales. Photo by Steven Andrews, Camborne School of Mines, University of Exeter, UK. See related article, p. 4–10.



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# Jurassic Sea-Level Variations: A Reappraisal

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## ABSTRACT

An accurate chronostratigraphy of the timing and magnitude of global sea-level trends and their short-term variations is an indispensable tool in high-resolution correlations, exploration, and paleoenvironmental and geodynamic models. This paper is a reappraisal of the Jurassic sea-level history in view of recent updates in time scales and a large body of new chronostratigraphic data accrued since 1998, when the last such synthesis was presented. A review of the Jurassic sea-level history has also been keenly awaited by explorationists given that the Jurassic continues to be a major exploration target for the industry. As in previous eustatic models of this period, the updated Jurassic sea-level curve remains largely Eurocentric due to the limitations imposed by biostratigraphic correlation criteria (provinciality of ammonite and microfossil zones), though it can now be extended to some parts of the Tethys toward the east. The updated long-term curve indicates that there was a general rise of sea level through the Jurassic that began close to a level similar to or below the present-day mean sea level (pdmsl) in the early Jurassic, culminating in the peak high in the late Kimmeridgian–early Tithonian interval, before stabilizing in the earliest Cretaceous at ~110 m above pdmsl. Within this long-term trend are relative second-order highs in the Toarcian and Aalenian, and at Bathonian–Callovian and Kimmeridgian–Oxfordian boundaries. Superimposed are 64 third- and fourth-order fluctuations of which 15 are considered major with base-level falls of more than 75 m, although precise amplitudes of drawdowns are often difficult to establish. Higher resolution fourth-order cyclicity (~410 k.y.) is also observable in many Jurassic sections whenever sedimentation rates were high. Causes for the third-order

cyclicity, in the absence of major ice sheets in the Jurassic, remains enigmatic.

## INTRODUCTION

A record of sea-level variations of the past inferred from the stratigraphy of continental margins and interior basins (where the movements of the shoreline can be best documented) is a key predictive tool in hydrocarbon exploration. These data can provide insights into several pre-drill assessment criteria, including the migration of reservoir facies in response to rises and falls of sea level, the frequency and duration of subaerial exposure during lowstands, and the generation and preservation of source rocks during transgressions and highstands. The broad trends in Jurassic sea-level variations have been known for some time (Vail et al., 1977; Hallam, 1978, 2001; Haq et al., 1987, 1988; Hardenbol et al., 1998; Haq and Al-Qahtani, 2005), but recent updates of time scales and the accrual of new stratigraphic data from the period dictate a reappraisal of Jurassic eustatic history, especially at the third-order (shorter-term) time scales. A reappraisal of the long- and short-term trends of the base level would also be useful for academic research because such information can be the basis of stratigraphic, paleoenvironmental, and geodynamic models. In this communication, a brief summary of the updated version of the Jurassic sea-level history is presented so that it can be expediently made available to the research community.

The Jurassic period is currently estimated to have lasted some 55.6 m.y. (201.3–145.7 Ma) (Ogg et al., 2016). The period saw relatively low sea levels in the Early Jurassic, with the exception of the early Toarcian, which witnessed a relative high, a variable overall lowstand in the Middle Jurassic, and a gradual rise thereafter that lasted through much of the Late

Jurassic. Climates also paralleled these trends. Faunal and isotopic data imply relatively warm climates for most of the Jurassic, with some exceptions, lacking credible evidence for widespread glaciations in much of this period. However, the relative warmth of the Hettangian through Toarcian interval seems to have been interrupted by a cooler late Pliensbachian through early Toarcian (Hinnov and Park, 1999; Dera et al., 2009; Suan et al., 2010; Korte and Hesselbo, 2011; Korte et al., 2015). Korte and Hesselbo (2011) believe that the Early Jurassic may have fluctuated between greenhouse and icehouse conditions. There may also have been some cooler intervals in the Aalenian, Bajocian, Bathonian, and early Callovian (Rogov and Zakharov, 2010), as well as a cold spell near the Middle–Late Jurassic transition (in the late Callovian) (Dromart et al., 2003). Most of the Late Jurassic is interpreted to have been relatively warmer and equable, experiencing peak warmth in the Kimmeridgian (Frakes et al., 1992; Zakharov et al., 2006; Brigaud et al., 2008). Although actual global temperatures and atmospheric or oceanic latitudinal thermal gradients of the Jurassic are only conjectured, modeling indicates that  $p\text{CO}_2$  levels may have been a minimum of four times the present-day levels (see, e.g., Sellwood and Valdes, 2008). The long-term sea level and climatic trends also show an apparent correspondence.

## JURASSIC TIME SCALE

Jurassic time scales have been in a significant state of flux since the last third-order sea-level curve for this period was published by Haq et al. (1988) or the later update by Hardenbol et al. (1998). Considerable advancements have been made to better delimit the stage boundaries of the Jurassic, and the most recent effort to update this time scale was presented by

Ogg and Hinnov (2012) and Ogg et al. (2016). The last version of the Jurassic time scale is partially based on constraints from best fits of numerical radiometric ages, partially on cyclostratigraphy in strata of various stages and oxygen and other isotopic data. Magnetostratigraphy was helpful only in the Bajocian through Tithonian interval (with a hiatus at Callovian-Oxfordian transition) where the low-amplitude seafloor magnetic anomalies (from Ocean Drilling Program site 801 on the older part of eastern Pacific Plate) could be tied to magnetostratigraphy. The attempts to astronomically fine-tune discrete intervals of the Jurassic (see, e.g., Strasser, 2007, and a summary by Huang *in* Ogg and Hinnov, 2012) may help with duration of some zonal intervals, but such piecemeal efforts do not alleviate the precision issues of all of the stage boundaries that are exacerbated by the lack of reproducible radiometric control for much of the Middle and Late Jurassic. This implies that, in general, the time scale of the Jurassic and precision of the ages of many biostratigraphic zonal boundaries still remain less than well constrained. As Ogg and Hinnov (2012) state, the Jurassic scale “should be considered a work in progress” and although new constraints have refined the overall numerical chronology, “several intervals lack adequate constraints.” Any future modifications of the time scale will obviously necessitate the recalibration of the sea-level chronology.

## REVISION OF THE JURASSIC SEA-LEVEL CURVE

The main correlative tool in the Jurassic marine strata is ammonite biostratigraphy, occasionally assisted by other fossil groups, such as dinoflagellates, radiolaria, calcareous nannofossils, and calpionellids (the last only in the Late Jurassic). In the earlier Meso-Cenozoic sequence chronostratigraphy of third-order sea-level changes (Haq et al., 1988, and later by Hardenbol et al., 1998), the Jurassic sequence chronostratigraphy was based on sections in northern and central Europe (northern and southern coasts of England, west-central France, southern Germany, and Switzerland) and their ammonite and microfossil content (mostly dinoflagellates,

foraminifera, nannoplankton, and calpionellids). In that Meso-Cenozoic synthesis (Haq et al., 1988; Hardenbol et al., 1998), a special attempt was made to study all available stage stratotype (or neo-stratotype) sections (including those from the Jurassic) that form the basis (or a global standard) for biochronostratigraphy. For the Mesozoic, most of these sections happen to have been chosen in NW Europe. Another reason for the Eurocentricity of the Jurassic sea-level curve was the limitations posed by the provinciality of the ammonite zones that do not permit precise correlations for a truly globally based chronology of eustatic events. These correlations become somewhat easier in the latest Jurassic (Tithonian) where one can draw on multiple correlative tools, but for much of the Jurassic the correlation limitations persist. In the current synthesis, all available additional studies in Jurassic stratigraphic sections (from 1988 through 2017) with good biostratigraphic data were reevaluated. As a result, the correlation net has now been widened somewhat to include other areas to the east in the Tethyan realm and to the Southern Hemisphere; i.e., Argentina’s Neuquén Basin, where a nearly complete Jurassic record is preserved (e.g., Legarreta and Uliana, 1996). The heavy dependence on ammonite zones for correlation means that there is a built-in uncertainty in the ages of the sequence boundaries. While the sequence boundaries are placed according to their relative stratigraphic position within an ammonite zone (e.g., at the base, middle, top, or at the zonal boundary), theoretically the error bar could extend to the entire duration of the zone or subzone in question.

The long-term sea-level trends are similar to those shown in Haq et al. (1987, 1988) and Hardenbol et al. (1998). The original long-term curve for the Jurassic was based on continental flooding data, but unlike the Cretaceous (see Haq, 2014), knowledge of the oceanic crustal production rates for the Jurassic (i.e., variations in the mean age of the oceanic lithosphere, variations in the production rates at mid-ocean ridges, duration of the emplacement of seamounts, and large igneous provinces on the seafloor) is fragmentary because most

of the seafloor of Jurassic age has since been subducted.

The documentation of the shorter-term sea-level changes (third-order events) are, of course, based on sequence-stratigraphic information from some relatively longer duration sections, but in most locations this information is pieced together from several sections within the Jurassic. Data from these studies were evaluated (and sequence-stratigraphically reinterpreted, as needed) before inclusion in the current synthesis. The Jurassic paleontological cross-correlations (i.e., zonal schemes based on different fossil groups and in different regions; Hardenbol et al., 1998) proved to be invaluable in aiding correlations in some cases. The sequence-stratigraphic interpretation criteria are well established and do not need repetition; however, in addition to these, other lithological and paleontological criteria (originally listed in Haq and Schutter, 2008; Haq, 2014) can also aid in the identification of system tracts, depositional surfaces, and sequence boundaries in outcrop and well-log sections. These include forced regressive facies, condensed section deposits, transgressive coals, evaporites, carbonate megabreccias, exposure-related deposits (i.e., incised valley fills, autochthonous coals, eolian sandstones, and karst in carbonates), as well as laterite/bauxite deposits. General trends in oxygen-isotopic data, in as much as they reflect broad climatic trends, can also lend greater confidence to the longer-term eustatic trends, and when the shorter-term isotopic excursions are distinctive, they can aid in the positioning of the timing of the sequence boundaries within a long-duration biostratigraphic zone (see Haq, 2014, for further discussion). In this synthesis,  $\delta^{18}\text{O}$  isotopic data from Jurassic belemnites collected from the European sections (from the Sinemurian through Tithonian interval; see Martinez and Dera, 2015) were plotted against the sea-level curve (and smoothed by Robust Lowess Regression) for comparison (see GSA Data Repository Fig. S1<sup>1</sup>). The general trends in these data (which represent broad climatic variations) show an apparent similarity to the long-term sea-level curve, even though the ice-volume

<sup>1</sup>GSA Data Repository Item 2017387, documentation of depositional sequences comprising the new Jurassic sea-level curve, is online at [www.geosociety.org/pubs/ft2017.htm](http://www.geosociety.org/pubs/ft2017.htm).

component in the oxygen-isotopic signal is considered negligible in the Jurassic.

An examination of the available sequence-stratigraphic reports of the Jurassic (up to 2017) revealed that many sections around the world cannot be correlated with precision with the European stage stratotypes due to the provincial nature of ammonites, though other fossil groups can be helpful for cross-correlations. The earlier syntheses presented by Haq et al. (1988) and Hardenbol et al. (1998) still form the basis of the current synthesis. Additional information on third-order sequences that form a part of this reappraisal comes from Britain and France (Wignall, 1991, from Kimmeridgian of Dorset and France; Partington et al., 1993, Kimmeridgian to Ryazanian of North Sea; Herbin et al., 1995, Kimmeridgian and Tithonian of Dorset and Yorkshire in the UK and Boulonnais Basin in France; Taylor et al., 2001, Late Jurassic of Wessex-Weald Basin; Williams et al., 2001, Kimmeridgian and Tithonian of Wessex Basin; Hesselbo, 2008, from the Jurassic onshore sections of Britain); Poland (Pienkowski, 2004, Early Jurassic of Polish Basins); Greenland (Surlyk, 1990, Jurassic of East Greenland); Russia (Sahagian et al., 1996, mid- to Late Jurassic of Russian Platform; Pinous et al., 1999, Callovian to Oxfordian of western Siberia); Portugal (Leinfelder, 1993, Kimmeridgian of Lusitanian Basin); Denmark (Johannessen et al., 1996, and Johannessen, 2003, Late Jurassic of North Sea and Danish Central Graben); and northern Switzerland (Gygi et al., 1998, Oxfordian-Kimmeridgian; Colombié and Ramell, 2007, Kimmeridgian). Other areas of the Tethys include the Arabian Platform (Sharland et al., 2001, 2004; Haq and Al-Qahtani, 2005, mid- to Late Jurassic; Al-Husseini and Matthews, 2006, Oxfordian–early Kimmeridgian), and India (Krishna, 2005, mid- to Late Jurassic of Kutch Basin). For the depositional cycles identified in Tibet, where a nearly complete Jurassic record exists (Li and Grant-Mackie, 1993), direct correlation with the sub-boreal third-order cycles of Europe and those from the western Tethys could not be established due to differences in ammonite assemblages, but the authors show similarity in trends, and even tie some of the major sequence boundaries with those in Europe. From the Southern Hemisphere the only data that could be considered for this synthesis

come from Argentina (Mitchum and Uliana, 1985; Legarreta and Uliana, 1996, Jurassic of the Neuquén Basin). A number of other studies of the Jurassic that were undertaken at the broader (second-order) scales were not considered relevant for a third-order scale synthesis, but they do sometimes provide additional constraints for the long-term trends. As our ability to more precisely correlate sequences improves in the future (through ancillary fossil biozones and other multiple, overlapping, correlative criteria, such as chemostratigraphic methods), these depositional cycles may be extended to other parts of the globe where the marine Jurassic record is well preserved, such as New Zealand.

## RESULTS

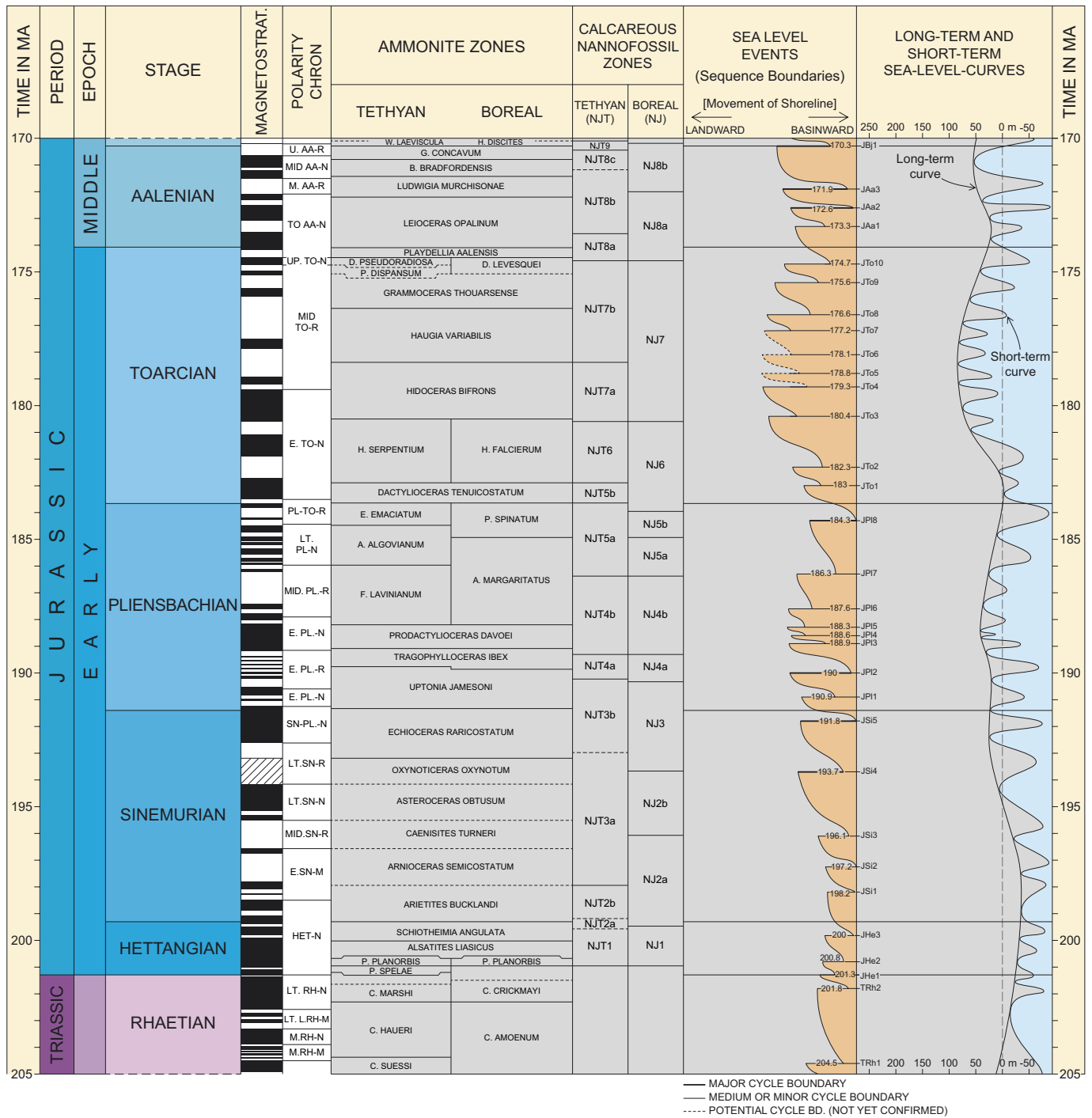
The cycle chart resulting from the reappraisal of global stratigraphic data of the Jurassic is presented as two figures (Fig. 1 for the Early Jurassic and Fig. 2 for the Middle and Late Jurassic). The figures represent the established biochronostratigraphy of the Jurassic, plotted against the results of the current synthesis of the sequence cycles, their revised ages (and an updated numbering system partly adapted from Hardenbol et al., 1998). A sea-level curve based on the onlap record is the final product of the synthesis. The biochronostratigraphic parts of the figures show the latest (GTS 2016 of Ogg et al., 2016) age model from the Rhaetian (latest Triassic stage) through Berriasian (the early Cretaceous stage). This is tied to a composite paleomagnetic reversal scale that remains tentative below the Bajocian. The seafloor magnetic anomaly record is fragmentary below this level because the older Jurassic oceanic lithosphere has been largely subducted. Even for the Bajocian through Tithonian interval, it is dependent on a single site from the eastern Pacific (ODP site 801). The polarity scale from the Oxfordian to Tithonian is, nevertheless, fairly well verified in multiple sections and basins. The stages, Hettangian to Tithonian, currently considered standard subdivisions for the Jurassic, are tied to ammonite zones that, much like in the Cretaceous, are the most common fossil group for correlation in the Jurassic. The cross-correlation between zones from the relatively warm-water Tethyan regions and cooler-water boreal/sub-boreal regions

(though still a part of the western Tethys) follow those suggested by Hardenbol et al. (1998) and later by Ogg and Hinnov (2012). Calcareous nannofossil zones of the Jurassic, also included, are mostly of long duration and of limited correlative utility in this period. However, sometimes they do provide additional criteria for correlations.

The two columns on the right in Figures 1 and 2 show sea-level events (mostly third-order and some consistent fourth-order sequence boundaries) and sea-level curves (long-term and short-term) for the Jurassic. When sequence boundaries are correlatable in several basins they are considered widespread (though global validity cannot be verified due to the Eurocentric nature of most of the data). The criteria for the long-term curves (shown in the last column on the right) have been discussed earlier in this paper, and the shorter-term sea-level curve that is derived from the sequence-stratigraphic data to its left. The amplitudes of third-order sea-level changes (rise and falls in meters) shown here are averaged from stratigraphic estimates in several basins and should be considered approximate (see discussion in Haq, 2014). They are subdivided into three magnitude categories of sea-level falls: major (>75 m), medium (25–75 m), and minor (<25 m). Most sea-level events fall within the medium category.

The long-term sea-level envelope (indicating the maximum flooding of continental margins and interior basins) shows that sea level remained close to or below present-day mean sea level (pdmsl) from the latest Triassic through the Hettangian and early Sinemurian, rising only a few tens of meters above pdmsl in the late Sinemurian–Pliensbachian, and by the late Pliensbachian it reverted back to levels comparable to pdmsl. In the Toarcian, there is an apparent long-term rise that may have peaked at ~75 m above pdmsl. In the latest Toarcian, the sea levels fell again to a few tens of meters above pdmsl, a trend that continued into the early Aalenian. From the late Aalenian onward, there is a gradual sea-level rise trend, with a few tens of meters of dip in the Bajocian and another in the latest Callovian–earliest Oxfordian that culminated in the peak high of the Jurassic in the late Kimmeridgian–early Tithonian. Near the Kimmeridgian–Tithonian boundary, the sea level may have been as high as ~140 m above pdmsl.





**Figure 1.** Early Jurassic sequences and variations of sea level. Time scale after Ogg et al. (2016). Biozone cross-correlations are after Hardenbol et al. (1998). Sequence boundaries (sea-level fall events) are redesignated following a numbering scheme suggested by Hardenbol et al. (1998) and Snedden and Liu (2010); however, the letters Tr, J, and K are prefixed to each designation for convenience to make the numbers unique and not to confuse them with similar numbers in other periods. (Three events in the Toarcian [JT<sub>05</sub>–JT<sub>07</sub>] are included provisionally, pending documentation of more widespread occurrence.)

In the late Tithonian, the sea level is seen to fall somewhat (from the peak high to ~100 m above pdmsl at the Tithonian-Berriasian boundary) before stabilizing in the earliest Cretaceous at ~110 m above pdmsl. It needs to be underscored that these amplitudes are at best guesstimates

based on available data, which are not always definitive.

As mentioned, the short-term sea-level curve is largely a record of the third-order events (modeled as temporary removal or storage of water causing sea-level falls) that have been documented consistently in

several basins and are thus considered widespread. These third-order events show variation in both the duration and magnitude of sea-level falls. The timing of the sea-level falls is accurate within a biozone (or subzone), but their numerical placement is approximated from their position

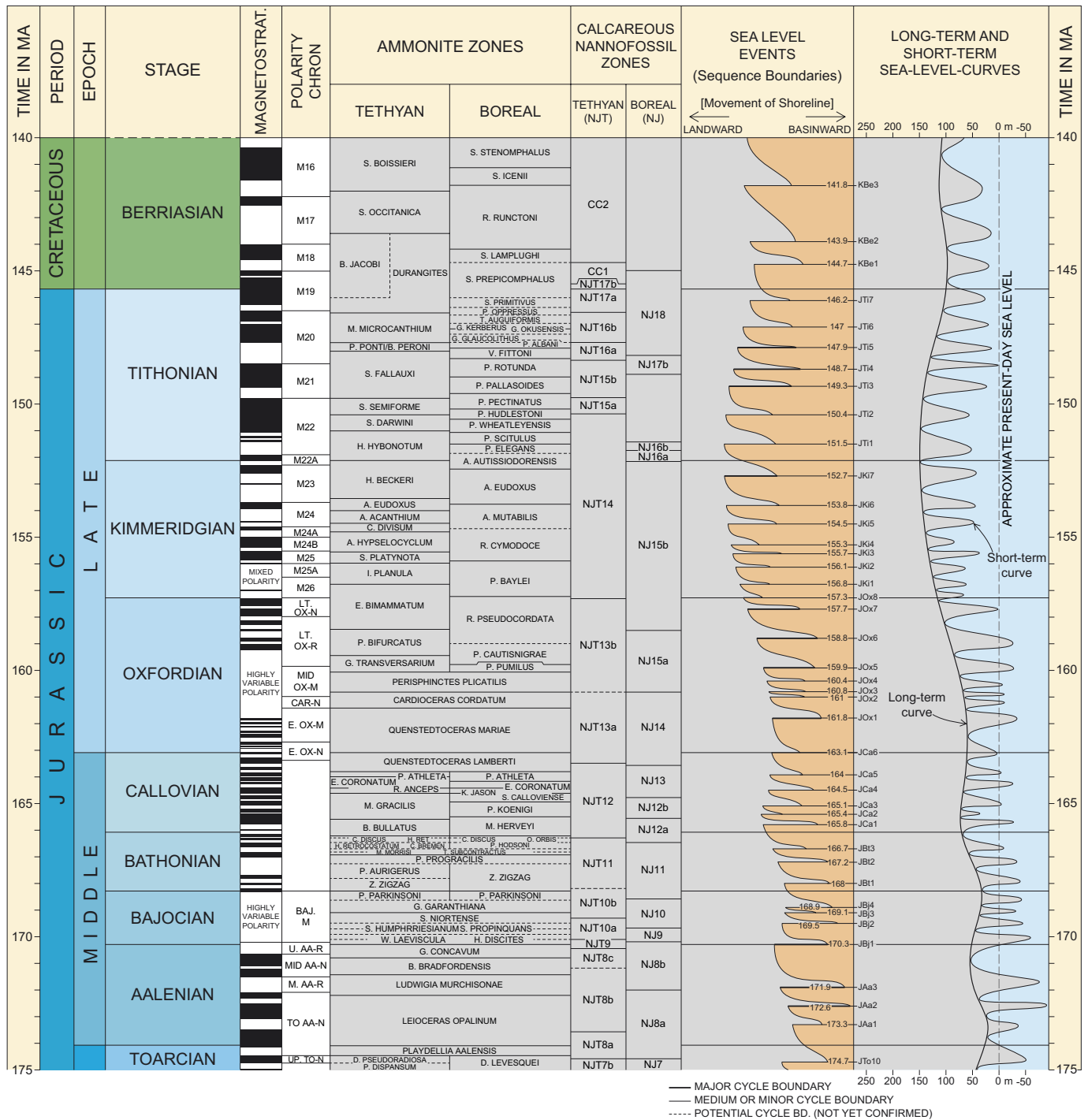


Figure 2. Middle-Late Jurassic sequences and variations of the sea level. (See Fig. 1 caption for details.)

in the outcrop sections (when sedimentation rates can be calculated), and sometimes when oxygen-isotopic data are available that show distinct excursions from the overall trends (see the GSA Data Repository [see footnote 1]). The magnitude (amplitude) of sea-level falls as shown on the curves is, however, more difficult to estimate and has to be averaged from several

sections (see discussion in Haq, 2014). Fifty-six third- and eight fourth-order consistently occurring events have been identified in the Jurassic of the sub-boreal and Tethyan regions, of which 25 are additional to the older synthesis (Haq et al., 1988). Three events in the Toarcian (JT5–JT7) are included here tentatively, pending wider confirmation. Fourteen sea-level

falls are considered as major, with draw-down of more than 75 m (JSi4 in Sinemurian; JPI2 and JPI8 in Pliensbachian; JAa2, JAa3 in Aalenian; JBJ1 at the base of Bajocian; JOx1, JOx5, JOx6, JOx7 in Oxfordian; JK17 in Kimmeridgian; and JT3, JT4, JT5 in Tithonian). All other events are within the medium or minor range. The amplitude of sea-level falls is



estimated to range from as little as <25 m for minor falls, to as much as ~150 m for major falls. The average duration of the third-order events is just over a million years, while fourth-order events average at ~410 k.y. Much like the Cretaceous (see Haq, 2014), the fourth-order cyclicity also seems to be a common feature in the Jurassic and is observable locally in sections with relatively high sedimentation rates. This higher-order cyclicity is considered to represent the long-period orbital eccentricity control on depositional cycles.

## DISCUSSION AND CONCLUSIONS

The causes for third-order cyclicity in the Jurassic, in a period where there is little direct evidence of major ice sheets, remain unresolved (see a discussion in Haq and Huber, 2016). A variety of solid-Earth tectonic influences can affect sea-level changes (see, e.g., Conrad, 2013; Haq, 2014). But these influences can only provide some explanations for the local, very short time-scale changes of hundreds of years to 100 k.y. (such as those due to isostatic elastic and viscous responses of the lithosphere due to ice and water loading and unloading), or for the widespread but much longer time-scale changes on multiple millions of years (see a discussion in Haq, 2014, and Cloetingh and Haq, 2015). They fail to account for changes on third-order time scales of ~1 m.y./cycle. As an example, dynamic topography (see, e.g., Gurnis, 1993; Flament et al., 2013) can explain the reasons for the amplitude disparities of sea-level falls as measured physically along different margins, but the time scales involved in dynamic topographic changes are several million years and do not shed light on third-order cyclicity. The conclusions reached in the earlier synthesis of Cretaceous cyclicity (Haq, 2014; Cloetingh and Haq, 2015) that all measures of sea-level change are eurybatic (i.e., local or regional), and that an estimate of eustatic amplitude of sea-level falls cannot be inferred from any single basin or continental margin and must be averaged from global data, are valid for the Jurassic as well. The current synthesis reinforces these inferences. Jurassic sections also display the fourth-order cyclicity of ~410 k.y. whenever the sedimentation rates are high enough to resolve higher-resolution cycles. This periodicity is presumed to be driven by long-term orbital eccentricity,

and its occurrence in the Jurassic as well as other periods supports the conclusion that the 410-k.y. periodicity may be considered as a basic element of most sequences, controlled largely by the long-term climatic trends.

## ACKNOWLEDGMENTS

This paper is dedicated to the memory of a fellow paleoceanographer and friend, Wolfgang Berger, a scientist extraordinaire, who generously shared his insights with all his colleagues. The author extends his thanks to Mathieu Martinez and Guillaume Dera for providing the stable isotopic data on European belemnites from the Jurassic. Special thanks are due to James Ogg, and two anonymous reviewers, for the detailed review and many suggestions that improved this paper. Thanks are also due to Alexandre Lethiers (University of Pierre and Marie Curie, Paris) for carefully drafting the sea-level curves through several iterations.

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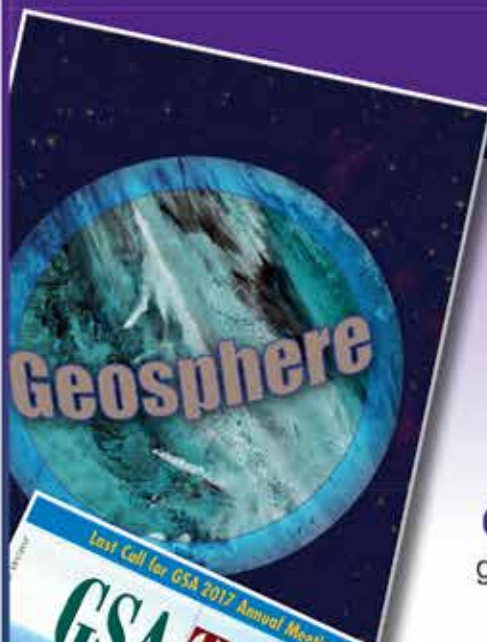
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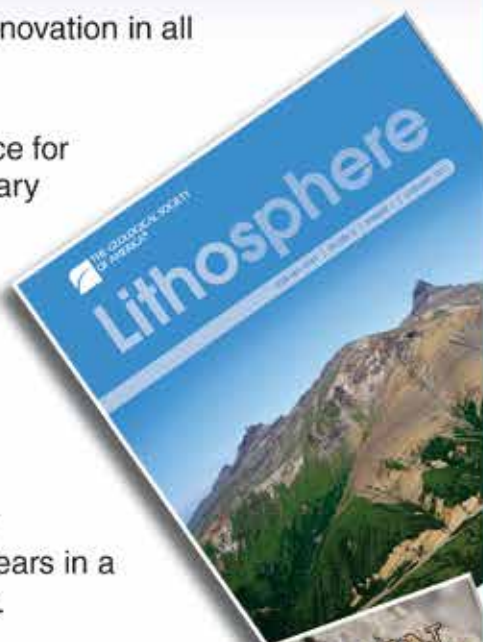
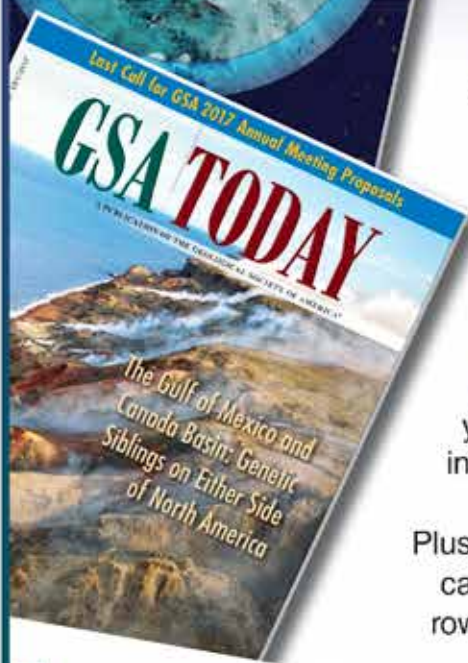
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# GSA 2017 Annual Meeting & Exposition

## WRAP-UP

I would like to give a very heartfelt thank you to all our attendees, exhibitors, volunteers, and sponsors for making GSA 2017 in Seattle, Washington, USA, such a success. We hope you enjoyed the meeting and found it worthwhile. If you did not attend, we are sorry we missed you.

While we take a look back at GSA 2017 by the numbers, I want to remind you that *you* shape these meetings. Whether it's by proposing sessions, special events, field trips, or short courses; or by submitting abstracts, attending, and engaging with your colleagues and peers—it takes the greater geoscience community to make these meetings what they are.

We hope to see you in Indianapolis, Indiana, USA, next November, or at any of our meetings along the way!

—Melissa Cummiskey, GSA Sr. Director of Meetings & Events

### GSA 2017 BY THE NUMBERS

- **Attendees:** 7,105
- **Professionals:** 2,800
- **Early career professionals:** 700
- **Students:** 2,600
- **K–12 teachers:** 100
- **On To the Future scholars:** 70
- **Members of the media:** 30
- **Countries represented:** 54
- **Sessions:** 393
- **Abstracts accepted:** 4,950 (2,000 posters, 2,950 talks)
- **Field Trips:** 20 trips with 525 participants
- **Short Courses:** 18 courses with 440 participants
- **Exhibitors:** Companies: 211, Booths: 250
- **Amount donated by attendees toward the GSA Student Travel Fund:** US\$7200
- **Local area field trip for high school students viewing GSA:** 150
- **Local geocaching community viewing GSA public lectures:** 100

### Thanks to the GSA 2017 Organizing Committee

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## 2018 GSA Medals and Awards

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- Penrose Medal
- Day Medal
- Honorary Fellow
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- 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

**Nomination deadline:** 1 March

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

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## John C. Frye Environmental Geology Award

**Nomination deadline:** 31 March

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

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- 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

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- 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

**Nomination deadline:** 1 Feb. 2018

Submit nominations for the following awards at [www.americangeosciences.org/awards](http://www.americangeosciences.org/awards).

- The **AGI Medal in Memory of Ian Campbell for Superlative Service to the Geosciences** recognizes singular performance in and contribution to the profession of geology.
- The **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.

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- Volunteer to serve on a GSA committee or Council—help guide the Society;
- Mentor at a Section or Annual Meeting—Share your experience and career advice with students;
- Encourage your students to be involved in GSA by becoming a Campus Rep;
- Recognize an outstanding colleague—Nominate a colleague for Fellowship, committee service, or an award; and
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If you are interested in finding out more about these or any of GSA's volunteer opportunities, please contact Kory Potzler at [kpotzler@geosociety.org](mailto:kpotzler@geosociety.org).



## CALL FOR NOMINATIONS

# GSA Division Awards



### ARCHAEOLOGICAL GEOLOGY DIVISION

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**Nominations due** 20 Sept.

Submit nominations to [gsa.agd@gmail.com](mailto: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 archaeological geology. 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.

#### Claude C. Albritton, Jr., Award

**Nominations due** 5 Mar.

Submit nominations to [gsa.agd@gmail.com](mailto:gsa.agd@gmail.com).

Under the auspices of the Archaeological Geology Division, family, friends, and close associates of Claude C. Albritton, Jr., have formed a memorial fund in his honor through the GSA Foundation. Initially, the fund was set up with a gift of several thousand dollars. Members of the Division, other GSA members, and those who knew Albritton are asked to consider contributing to this fund. 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.

#### Rip Rapp Award

**Nominations due** 15 Feb.

Submit nominations to [mandel@ku.edu](mailto: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 are due 15 Feb. and should include a biographical sketch, a statement of outstanding achievements, and a selected bibliography of the nominee.

### ENERGY GEOLOGY DIVISION

#### Gilbert H. Cady Award

**Nominations due** 28 Feb.

Submit nominations to Jen O'Keefe at [j.okeefe@moreheadstate.edu](mailto: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](http://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](mailto:mccalpin@geohaz.com).

The Edward Burwell, Jr., Award, established by the Division in 1968, honors the memory of one of the founding members of the Division and the first chief geologist of the U.S. Army Corps of Engineers. This award is made to the author or authors of a published paper of distinction that advances knowledge concerning principles or practice of engineering geology, or of related fields of applied soil or rock mechanics where the role of geology is emphasized. The paper that receives the award must: (1) deal with engineering geology or a closely related field, and (2) have been published no more than 5 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/about](http://community.geosociety.org/eegdivision/awards/about).

#### Richard H. Jahns Distinguished Lecturer

**Nominations due** 28 Feb.

Submit nominations to Matt Crawford at [mcrawford@uky.edu](mailto: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/about](http://community.geosociety.org/eegdivision/awards/about).

## GEINFORMATICS 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](http://community.geosociety.org/geoinformaticsdivision/awards).

## GEPHYSICS DIVISION

### George P. Woollard Award

**Nominations due** 15 Feb.

Submit nominations to Carol A. Stein, [cstein@uic.edu](mailto:cstein@uic.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 Carol Stein, chair, Geophysics Division, [cstein@uic.edu](mailto:cstein@uic.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 nominations form is online at <https://goo.gl/BMRCzj>. Any questions should be directed to [GEOEDGSA@gmail.com](mailto:GEOEDGSA@gmail.com).

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, the GSA Geoscience Education Division, and GSA's Education and Outreach Program. 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](http://community.geosociety.org/gedivision/awards/biggsaward).

## 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](mailto: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/](http://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](mailto: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. For more information, go to [community.geosociety.org/histphildiv/awards#dsa](http://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](mailto:kathylohff@msn.com).

The History and Philosophy of Geology Division is soliciting proposals for a student award for the amount of US\$1000 for a paper to be given at the national GSA meeting. This award, established in 2004, is made possible by a bequest from the estate of Mary C. Rabbitt. Consideration will be given to both undergraduate and graduate students. While both oral and poster



presentations are acceptable, 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. 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/etc. After the applications have been received and reviewed by the Awards Committee, the winner will be notified. The winner should then register for the GSA Annual Meeting and present his or her paper at the History and Philosophy of Geology Division disciplinary session. A ticket to the History and Philosophy of Geology luncheon will be provided. The award will be presented at the time the paper is presented, and the student will also be recognized at the annual luncheon. If there are multiple authors, the cash award will be presented to the senior author, and further distribution is up to that person. For more information, go to [community.geosociety.org/histphildiv/awards/#student](http://community.geosociety.org/histphildiv/awards/#student).

## **HYDROGEOLOGY DIVISION**

### **O.E. Meinzer Award**

**Nominations due 1 Feb.**

Submit nominations to [gsa.hydro.nominations@gmail.com](mailto: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](mailto:dlpark@usgs.gov). More information is online at [community.geosociety.org/hydrodivision/awards/meinzer](http://community.geosociety.org/hydrodivision/awards/meinzer).

### **George Burke Maxey Distinguished Service Award**

**Nominations due 1 Feb.**

Submit nominations to [gsa.hydro.nominations@gmail.com](mailto: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](http://community.geosociety.org/hydrodivision/awards/serviceaward).

### **Kohout Early Career Award**

**Nominations due 1 Feb.**

Submit nominations to [gsa.hydro.nominations@gmail.com](mailto: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](http://community.geosociety.org/hydrodivision/awards/kohout).

### **Birdsall-Dreiss Distinguished Lecturer**

**Nominations due 1 Feb.**

Submit nominations to [gsa.hydro.nominations@gmail.com](mailto: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/about2017](http://community.geosociety.org/hydrodivision/birdsall/about2017).

## **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.

### **MGPV Distinguished Geologic Career Award**

**Nominations due 31 Mar.**

This 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. More information is online at [community.geosociety.org/mgpvdivision/awards/dgca](http://community.geosociety.org/mgpvdivision/awards/dgca).

### **MGPV Early Career Award**

**Nominations due 31 Mar.**

This 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. 2015 will include all candidates whose final degree was awarded no earlier than 1 Jan. 2008. Extensions of up to two years will be made for nominees who have taken career breaks for family reasons or caused by serious illness. Nominees need not be citizens or residents of the United States, and 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](mailto:jaspeer@minsocam.org). More information is online at [community.geosociety.org/mgpvdivision/awards/earlycareer](http://community.geosociety.org/mgpvdivision/awards/earlycareer).

## PLANETARY GEOLOGY DIVISION

### Shoemaker Award

**Nominations due** 26 Aug.

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 Planetary Geology Division (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

### 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 Tammy Rittenour, [tammy.rittenour.edu](mailto:tammy.rittenour@tammy.rittenour.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](http://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](mailto: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](http://community.geosociety.org/qggdivision/awards/distinguished-career).

### 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](mailto:sarah.lewis@oregonstate.edu)). Please submit electronically unless hardcopy previously approved. Kirk Bryan Award-winning papers are listed on the QG&G website, and more information is online at [community.geosociety.org/qgdivision/awards/kirkbryanaward](http://community.geosociety.org/qgdivision/awards/kirkbryanaward).

## 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, [lckah@utk.edu](mailto:lckah@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](http://community.geosociety.org/sedimentarygeologydiv/awards/sloss).

*Sedimentary Geology Division and Structural Geology and Tectonic 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 application requirements, go to [community.geosociety.org/sedimentarygeologydiv/awards/laubach](http://community.geosociety.org/sedimentarygeologydiv/awards/laubach).

## STRUCTURAL GEOLOGY AND TECTONIC 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, whom to send the nomination to, and a list of past recipients is online at <http://rock.geosociety.org/sgt/CareerAward.htm>.

### Outstanding Publication Award

**Nominations due 12 Aug.**

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, whom to send the nomination to, and a list of past recipients is online at <http://rock.geosociety.org/sgt/BestPaperAward.htm>.

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For more information, contact [researchgrants@geosociety.org](mailto:researchgrants@geosociety.org) or call +1-303-357-1025.

*The GSA Graduate Student Research Grant Program is supported by the National Science Foundation under grant no. 1354519.*



## PANGEA AND GEOLOGICAL GLOBES



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## Second Announcement and Call for Papers

# NORTH-CENTRAL SECTION

**52nd Annual Meeting of North-Central  
Section, GSA**  
**Iowa State University in Ames, Iowa, USA**  
**16–17 April 2018**  
[www.geosociety.org/nc-mtg](http://www.geosociety.org/nc-mtg)



View of the Campanile on the Iowa State University campus. Photograph by Bri Gerke.

## Geoscience Returns to the Heartland

### LOCATION

The 52nd Annual Meeting of GSA's North-Central Section returns to the location of its 30th Annual Meeting at the Iowa State University Conference Center in the Scheman Building, located on the campus of Iowa State University, in Ames, Iowa, USA. As a premiere university-based convention and meeting location, Ames is centrally located in America's Heartland. Known for one of the most beautiful campuses in the nation, Iowa State University is easy to navigate, and the Conference Center offers easy access to community and campus amenities. Whether you're looking for unique dining options or distinctive shopping experiences, you'll enjoy the Midwestern hospitality in Ames. If you're driving, Ames is easily accessible from both I-35 and I-80. If flying, the Des Moines International Airport is served by all major airlines and is 45 minutes from Ames by car. We look forward to presentations and posters that highlight advancements in

the geosciences, including current or emerging research issues at the boundary of geoscience and related disciplines.

### REGISTRATION

**Early registration deadline:** 5 March

**Cancellation deadline:** 12 March

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

	Early		Standard	
	Full Mtg.	One Day	Full Mtg.	One day
Professional Member	\$215	\$170	\$250	\$195
Professional Member 70+	\$100	\$80	\$130	\$100
Professional Nonmember	\$250	\$190	\$295	\$205
Early Career	\$150	\$110	\$180	\$130
Student Member	\$90	\$60	\$110	\$70
Student Nonmember	\$125	\$75	\$135	\$90
K–12 Professional	\$65	\$50	\$85	\$70
Guest or Spouse	\$55	\$50	\$60	\$55
Field Trip/Workshop Only	\$50	n/a	\$50	n/a

### ACCOMMODATIONS

**Deadline:** 26 March

Rooms have been reserved at three hotels conveniently located adjacent to each other at the interchange of U.S. Highway 30 and University Blvd., just a short drive or walk from the conference center and the ISU campus.

- The Best Western Plus University Park Inn and Suites features great amenities, including a full hot breakfast that is included in the room rate of \$109/night plus tax. For reservations, call +1-515-296-2500, and ask for the GSA conference rate.
- The Gateway Hotel and Conference Center, located across the street, is a full-service property with onsite bar, restaurant, and full amenities, with room rates of \$129/night plus tax. For reservations, call +1-515-292-8600, and reference NC-GSA (<http://gatewayames.com/>).
- Additional rooms are available at the Holiday Inn Hotel and Conference Center at a rate of \$114.99/night plus tax. For reservations, call +1-515-268-8808 and ask for the NC-GSA block (<https://www.ihg.com/holidayinn/hotels/us/en/ames/amwia/hoteldetail>).

### CALL FOR PAPERS

**Abstract deadline:** 16 January 2018

Submit online at [www.geosociety.org/nc-mtg](http://www.geosociety.org/nc-mtg).

Abstract submission fee: US\$18 for students; US\$30 for all others. If you cannot submit an abstract online, please contact Heather Clark, +1-303-357-1018, [hclark@geosociety.org](mailto:hclark@geosociety.org). In addition to Theme Sessions, we are soliciting abstracts for general discipline sessions. Please direct questions on these sessions to the technical program co-chairs: Neal Iverson ([niverson@iastate.edu](mailto:niverson@iastate.edu)) and Kristie Franz ([kfranz@iastate.edu](mailto:kfranz@iastate.edu)).

### Theme Sessions

- T1. **Ancient Life on Earth and Elsewhere: Evidence from Modern and Fossil Systems.** *Cosponsored by Paleontological Society; GSA Planetary Geology Division; GSA Geobiology and Geomicrobiology Division.* Andy

- Czaja, Univ. of Cincinnati, andrew.czaja@uc.edu; Jeff Havig, Univ. of Minnesota, jeffhavig@gmail.com; Trinity Hamilton, Univ. of Minnesota, hamil689@umn.edu; Andrew Gangidine, Univ. of Cincinnati, agangidine@gmail.com.
- T2. **Fossil Insights into Paleoclimatic and Paleoenvironmental Change.** *Cosponsored by GSA Sedimentary Geology Division.* Aaron R. Wood, Iowa State Univ., awood@iastate.edu; Natalie Thompson, Iowa State Univ., nst27@iastate.edu.
- T3. **Climate Reconstructions from Speleothems.** *Cosponsored by GSA Karst Division; GSA Quaternary Geology and Geomorphology Division.* Rhawn Denniston, Cornell College, rdenniston@cornellcollege.edu; Jeffrey Dorale, Univ. of Iowa, jeffrey-dorale@uiowa.edu.
- T4. **Landlocked But Not Left Out: Contributions to Oceanography by Mid-Continent Scientists.** *Cosponsored by GSA Sedimentary Geology Division; GSA Geobiology & Geomicrobiology Division; GSA Quaternary Geology and Geomorphology Division; GSA Environmental and Engineering Geology Division.* Beth E. Caissie, Iowa State Univ., bethc@iastate.edu; Sally Zellers, Univ. of Central Missouri, szellers@ucmo.edu; Anna Nesterovich, Iowa State Univ., annanest@iastate.edu; Nina Whitney, Iowa State Univ., nwhitney@iastate.edu.
- T5. **Potential Impact of Climate Change on Water Quality and Quantity.** *Cosponsored by GSA Hydrogeology Division; GSA Geology and Society Division.* Zelalem Bedaso, Univ. of Dayton, zbedasol@udayton.edu; Shuang-Ye Wu, Univ. of Dayton, swu001@udayton.edu; Mike Ekberg, Miami Conservancy District, mekberg@mcwater.com.
- T6. **Assessing Groundwater in the Midwestern U.S.—How Much, How Good, and for How Long?** *Cosponsored by GSA Hydrogeology Division.* Bob Libra, blibra999@gmail.com; Michael Anderson, Iowa Department of Natural Resources, michael.anderson@dnr.iowa.gov.
- T7. **Agricultural Impacts on Hydrology and Water Quality in the Midwest.** *Cosponsored by GSA Hydrogeology Division; GSA Geology and Society Division.* William Simpkins, Iowa State Univ., bsimp@iastate.edu; Michael Burkart, USDA-ARS (retired), mburkart@iastate.edu; Nathan Young, Iowa State Univ., nlyoung@iastate.edu.
- T8. **Hydrology and Water Quality in Urban and Suburban Watersheds.** *Cosponsored by GSA Hydrogeology Division; GSA Environmental and Engineering Geology Division.* Eric W. Peterson, Illinois State Univ., ewpeter@ilstu.edu; Walt Kelly, Illinois State Water Survey, wkelly@illinois.edu; Janette Thompson, Iowa State Univ., jrjt@iastate.edu.
- T9. **Pathogens and Other Contaminants of Concern in the Environment.** *Cosponsored by GSA Hydrogeology Division; GSA Geology and Health Division; GSA Environmental and Engineering Geology Division.* Claire Hruby, Iowa Department of Natural Resources, Claire.Hruby@dnr.iowa.gov; Sarah Elliott, U.S. Geological Survey, selliot@usgs.gov.
- T10. **Natural Contaminants in Groundwater Drinking Water Sources: When Natural Doesn't Mean Healthy.** *Cosponsored by GSA Hydrogeology Division; GSA Geology and Health Division; GSA Geology and Society Division.* Melinda L. Erickson, U.S. Geological Survey, merickso@usgs.gov; Paul Stackelberg, U.S. Geological Survey, pestack@usgs.gov; Brandy Toner, Univ. of Minnesota, toner@umn.edu.
- T11. **Biogeochemistry of Water, Sediments, and Interfaces.** *Cosponsored by GSA Limnogeology Division; GSA Geobiology and Geomicrobiology Division; GSA Hydrogeology Division.* Elizabeth Swanner, Iowa State Univ., eswanner@iastate.edu; Chad Wittkop, Minnesota State Univ.–Mankato, chad.wittkop@mnsu.edu; Amy Myrbo, Univ. of Minnesota, LacCore, amyrb@umn.edu.
- T12. **Environmental Impacts of Urbanization.** *Cosponsored by GSA Environmental and Engineering Geology Division; GSA Hydrogeology Division.* Yuyu Zhou, Iowa State Univ., yuyuzhou@iastate.edu; Madeline Gotkowitz, Wisconsin Geological and Natural History Survey, mbgotkow@wisc.edu.
- T13. **Hydrogeology in Fractured Rock.** *Cosponsored by GSA Hydrogeology Division.* Michael Cardiff, Univ. Wisconsin–Madison, cardiff@wisc.edu; Dave Hart, Wisconsin Geological and Natural History Survey, dave.hart@wgnhs.uwex.edu.
- T14. **Recent Advances in Midwestern Karst Hydrogeology.** *Cosponsored by GSA Hydrogeology Division.* Douglas Gouzie, Missouri State Univ., douglasgouzie@missouristate.edu; Eric Peterson, Illinois State Univ., ewpeter@ilstu.edu.
- T15. **Watershed Modeling: Current Approaches and Future Directions.** *Cosponsored by GSA Hydrogeology Division; GSA Geology and Society Division.* Kristie J. Franz, Iowa State Univ., kfranz@iastate.edu; David Dziubanski, Iowa State Univ., dave470@iastate.edu; Angela Bowman, Iowa State Univ., albowman73@gmail.com.
- T16. **Applied Geology: Environmental, Engineering, Hydro, Geotechnical, and Exploration Geophysics.** *Cosponsored by GSA Engineering and Environmental Geology Division.* Terry R. West, Purdue Univ., trwest@purdue.edu.
- T17. **Critical Zone Science in the Midcontinent.** *Cosponsored by GSA Soils and Soil Processes Interdisciplinary Interest Group; GSA Quaternary Geology and Geomorphology Division; GSA Hydrogeology Division.* Alison Anders, Univ. of Illinois, amanders@illinois.edu; David Grimley, Univ. of Illinois, dgrimley@illinois.edu; Art Bettis, Univ. of Iowa, art-bettis@uiowa.edu.
- T18. **Soils in the Critical Zone: Health, Function, Losses, and Transformations.** *Cosponsored by GSA Soils and Soil Processes Interdisciplinary Interest Group.* Ashlee Dere, Univ. of Nebraska–Omaha, adere@unomah.edu; Marshall McDaniel, Iowa State Univ., marsh@iastate.edu; Lee Burras, Iowa State Univ., lburras@iastate.edu.
- T19. **Eolian Systems of the Midcontinent.** *Cosponsored by GSA Quaternary Geology and Geomorphology Division; GSA Soils and Soil Processes Interdisciplinary Interest Group.* Joe Mason, Univ. of Wisconsin–Madison, mason@geography.wisc.edu; Paul Hanson, Univ. of Nebraska–Lincoln, phanson2@unl.edu; Peter Jacobs, Univ. of Wisconsin–Whitewater, jacobsp@uww.edu.
- T20. **Slope Stability in the Midwest.** *Cosponsored by GSA Quaternary Geology and Geomorphology Division;*

*GSA Environmental and Engineering Geology Division.*  
Lucas Zoet, Univ. of Wisconsin-Madison, lzoet@wisc.edu;  
Carrie Jennings, The Freshwater Society, cjennings@freshwater.org.

- T21. **Sediments, Landforms, and Chronology of the Laurentide Ice Sheet: Analog or Anomaly?** *Cosponsored by GSA Quaternary Geology and Geomorphology Division.* Neal Iverson, Iowa State Univ., niverson@iastate.edu; Lucas Zoet, Univ. of Wisconsin-Madison, lzoet@wisc.edu; Carrie Jennings, The Freshwater Society, cjennings@freshwater.org.
- T22. **Reconstructing Glacial Lakes in the Midwest and Great Lakes Regions I: Environments.** *Cosponsored by GSA Quaternary Geology and Geomorphology Division.* Timothy G. Fisher, Univ. of Toledo, timothy.fisher@utoledo.edu; B. Brandon Curry, Illinois State Geological Survey, bcurry@illinois.edu.
- T23. **Reconstructing Glacial Lakes in the Midwest and Great Lakes Regions II: Chronology.** *Cosponsored by GSA Quaternary Geology and Geomorphology Division.* Kenneth E. Lepper, North Dakota State Univ., ken.lepper@ndsu.edu; Timothy G. Fisher, Univ. of Toledo, timothy.fisher@utoledo.edu.
- T24. **Geophysics in Glacial Landscapes: Methods, Applications, and Innovations.** *Cosponsored by GSA Quaternary Geology and Geomorphology Division.* Jason Thomason, Illinois State Geological Survey, jthomaso@illinois.edu; Luke Zoet, Univ. of Wisconsin-Madison, lzoet@wisc.edu.
- T25. **Digital Landscapes: Investigating Geomorphic Processes Using High-Resolution Topographic Data.** *Cosponsored by GSA Quaternary Geology and Geomorphology Division.* Andrew Wickert, Univ. of Minnesota-Twin Cities, awickert@umn.edu; Karen Gran, Univ. of Minnesota-Duluth, kgran@d.umn.edu; Fiona Clubb, Univ. of Edinburgh, fclubb@ed.ac.uk; Andy Breckenridge, Univ. of Wisconsin-Superior, abrecken@uwsuper.edu; Stephen DeLong, USGS, sdelong@usgs.gov.
- T26. **GIS Applications and Analysis in the Geosciences.** Stephen Crabtree, Univ. of Minnesota-Morris, crabt012@morris.umn.edu; Chris Harding, Iowa State Univ., charding@iastate.edu.
- T27. **Revolutions in Remote Sensing: Applications of UAVs to Field Mapping and Surface Analytics.** Dylan Blumentritt, Winona State Univ., dblumentritt@winona.edu; Toby Dogwiler, Missouri State Univ., tdogwiler@missouristate.edu.
- T28. **Advances Using Digital Data Systems for Geology.** Doug Walker, Univ. of Kansas, jdwalker@ku.edu; Basil Tikoff, Univ. of Wisconsin-Madison, basil@geology.wisc.edu.
- T29. **Structural Geology and Tectonics in a Quantitative World.** *Cosponsored by GSA Structural Geology and Tectonics Division.* Jacqueline Reber, Iowa State Univ., jreber@iastate.edu; Sven Morgan, Iowa State Univ., smorgan@iastate.edu.
- T30. **Compelling Cores from the North-Central Section: A Core-Poster Session.** *Cosponsored by GSA Sedimentary Geology Division.* Franciszek Hasiuk, Iowa State Univ., franek@iastate.edu; Ryan Clark, Iowa Geological Survey, ryan-j-clark@uiowa.edu.
- T31. **Economic Geology, Igneous and Metamorphic Petrology, Mineralogy.** *Cosponsored by GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division.* Paul G. Spry, Iowa State Univ., pgspry@iastate.edu; Kevin L. Shelton, Univ. of Missouri-Columbia, sheltonkl@missouri.edu.
- T32. **Geoscience in the Southeastern South Dakota, Southwestern Minnesota, Northeastern Nebraska, and Northwestern Iowa Area.** Sarah Chadima, South Dakota Geological Survey, sarah.chadima@usd.edu; George Shurr, GeoShurr Resources, georghshurr@gmail.com; Richard Hammond, Heine Electric & Irrigation, rhhhei@gmail.com.
- T33. **Collaborative Learning in Geoscience Classrooms and Labs: Examples, Demonstrations, Best Practices, and Assessment.** *Cosponsored by GSA Geoscience Education Division.* Cinzia Cervato, Iowa State Univ., cinzia@iastate.edu; Charles Kerton, Iowa State Univ., kerton@iastate.edu; Theresa Halligan, Iowa State Univ., theresah@iastate.edu.
- T34. **Integrating Technology and Geoscience Education: Innovations in the Classroom and the Field.** *Cosponsored by National Association of Geoscience Teachers Central Section; GSA Geoscience Education Division.* Beth Johnson, Univ. of Wisconsin-Fox Valley, beth.a.johnson@uwc.edu.
- T35. **Geoscience Outreach and Engagement.** *Cosponsored by Geological Outreach at Museums, Parks, & Surveys Group; GSA Geoscience Education Division.* Lisa Anderson, Michigan State Univ. Extension, ande1874@msu.edu; Peter Voice, Western Michigan Univ., peter.voice@wmich.edu.
- T36. **Undergraduate Research Poster Session.** *Cosponsored by Geosciences Division-Council on Undergraduate Research.* Robert D. Shuster, Univ. of Nebraska, rshuster@unomaha.edu.
- T37. **Current Developments in Paleozoic and Early Mesozoic Conodont Biostratigraphy, Systematics, and Paleocology: The 51st Pander Society Symposium.** James (Jed) Day, Illinois State Univ., jeday@ilstu.edu; Jeffrey Over, SUNY Geneseo, over@geneseo.edu.
- T38. **Twenty-First Century Aggregates.** Franciszek Hasiuk, Iowa State University, franek@iastate.edu; Ryan Clark, Iowa Geological Survey, ryan-j-clark@uiowa.edu. Associated with Field Trip 1.
- T39. **Fluvial Adjustments in the Highly Altered Agricultural Landscape of the Postglacial Upper Midwest.** John Thomas, Hungry Canyons Alliance, john@goldenhillsrca.org; Peter Moore, Iowa State University, pmoore@iastate.edu.

## WORKSHOPS

Questions about workshops should be directed to Yuyu Zhou, yuyuzhou@iastate.edu, and Chris Harding, charding@iastate.edu.

- W1. **Geologic Mapping Using GIS.** Sita Karki, GIS Coordinator, Michigan Geological Survey, sita.karki@wmich.edu. Sun., 15 Apr., 8 a.m.–noon. Cost US\$30; includes materials and refreshments. Limit: 18.
- W2. **3D Printing of Terrain Models.** Chris Harding, Iowa State Univ., charding@iastate.edu; Franciszek Hasiuk, Iowa State Univ., franek@iastate.edu. Sun., 15 Apr., 1–5 p.m. Cost US\$30; includes materials and refreshments. Limit: 12.
- W3. **Collecting Geological Field Data Using the StraboSpot Data System.** Doug Walker, Univ. of Kansas, jdwalker@

ku.edu. Sun., 15 Apr., 8 a.m.–5 p.m. Room 208. Cost US\$50; includes workshop book, box lunch, morning and afternoon refreshments.

- W4. **Effective Science Communication for Geoscientists.** Carol McCartney, University of Wisconsin–Madison, carol.mccartney@wgnhs.uwex.edu; Michael Dahlstrom, Iowa State University, mfd@iastate.edu; Dara Wald, Iowa State University, dwald@iastate.edu. Mon., 16 Apr., noon–1:30 p.m. Room 208. Cost US\$30; includes box lunch.
- W5. **NSF’s Portal to the Public: Partnering Researchers with Science Centers to Create Interactive Demonstrations to Bring Research to the Public.** Renee Harmon, Science Center of Iowa, renee.harmon@sciowa.org. Tues., 17 Apr., noon–1:30 p.m. Room 208. Cost US\$30; includes box lunch.

## FIELD TRIPS

For additional information, please contact the field trip co-chairs, Franciszek Hasiuk, franek@iastate.edu, and Aaron Wood, awood@iastate.edu, the field trip leaders, or check the meeting website. All trips depart from the Scheman Building at the Iowa State Center.

### During Meeting

1. **Twenty-First Century Aggregates Field Trip.** Associated with Theme Session 38. *Cosponsored by GSA Sedimentary Geology Division; GSA Engineering and Environmental Geology Division.* Mon., 16 Apr., 1–5 p.m. Cost: US\$50; includes guidebook, transportation, box lunch, and refreshments. Franciszek Hasiuk, Iowa State University, franek@iastate.edu; Ryan Clark, Iowa Geological Survey, ryan-j-clark@uiowa.edu.

### Pre-Meeting

2. **Geomorphic Evolution of the Upper Mississippi Valley.** *Cosponsored by GSA Quaternary Geology and Geomorphology Division.* Sat.–Sun., 14–15 Apr., 7 a.m.–4 p.m. Cost: US\$165; includes guidebook, transportation, one breakfast (15 Apr.), lodging on Sat., 14 Apr. (double occupancy), and refreshments. Lunch on 14 Apr. and lunch and dinner on 15 Apr. are on your own. Andrew Wickert, University of Minnesota–Twin Cities, awickert@umn.edu; Carrie Jennings, Freshwater Society, cjennings@freshwater.org; Karen Gran, University of Minnesota–Duluth, kgran@d.umn.edu; Brandon Curry, Illinois State Geological Survey, b-curry@illinois.edu.
3. **Geologic Controls on Surface and Groundwater Quality in the Cambrian-Ordovician Aquifer System of the “Driftless” Area of Southeastern Minnesota.** *Cosponsored by GSA Hydrogeology Division; GSA Karst Division; GSA Environmental and Engineering Geology Division.* Sat.–Sun., 14–15 Apr., 7 a.m.–4 p.m. Cost: US\$215; includes guidebook, transportation, one breakfast, two lunches, one dinner, lodging on Sat., 14 Apr. (double occupancy), and refreshments. Robert Tipping, Minnesota Geological Survey, tipping001@umn.edu; Tony Runkel, Minnesota Geological Survey, runke001@umn.edu; Julia Steenberg, Minnesota Geological Survey, and01006@umn.edu; Andrew Retzler, Minnesota Geological Survey, aretzler@umn.edu.

4. **Pennsylvanian Sandstones and Cyclothem of Central Iowa.** *Cosponsored by GSA Sedimentary Geology Division; Great Lakes Section SEPM (Society for Sedimentary Geology).* Sun., 15 Apr., 7:30 a.m.–4 p.m. Cost: US\$60; includes guidebook, transportation, and refreshments. Lunch is on your own. Philip Heckel, University of Iowa, philip-heckel@uiowa.edu; Emily Finzel, University of Iowa, emily-finzel@uiowa.edu; John Paul Pope, Northwest Missouri State University, jppope@nwmissouri.edu.
5. **Geoscience in Your Backyard: A Field Trip for Educators.** *Cosponsored by GSA Geoscience Education Division.* Sun., 15 Apr., 1–5 p.m. Cost: US\$35; includes guidebook, transportation, and refreshments. Collin Reichert, Ames Community Schools, collin.reichert@ames.k12.ia.us.
6. **Hydrogeology of the Ames Aquifer and Its Award-Winning Drinking Water.** *Cosponsored by GSA Hydrogeology Division; GSA Geology and Society Division.* Sun., 15 Apr., 8 a.m.–noon. Cost: US\$35; includes guidebook, transportation, and refreshments. William Simpkins, Iowa State University, bsimp@iastate.edu; Lyle Hammes, Ames Water and Pollution Control Department, lhammes@cityofames.org.

### Post-Meeting

7. **Cambrian-Ordovician Industrial Sand Resources and Stratigraphy of Iowa, Wisconsin, and Minnesota, USA.** *Cosponsored by GSA Sedimentary Geology Division; GSA Environmental and Engineering Geology Division; Great Lakes Section SEPM (Society for Sedimentary Geology).* Wed.–Thurs., 18–19 Apr., 7 a.m.–5 p.m. Cost: US\$175; includes guidebook, transportation, one breakfast, two lunches, lodging on Wed., 18 Apr. (double occupancy), and refreshments. Dinner on Wed., 18 Apr., is on your own. Jay Zambito, Wisconsin Geological Survey, jay.zambito@uwex.edu; Bob Libra, blibra999@gmail.com; Tony Runkel, Minnesota Geological Survey, runke001@umn.edu.
8. **Pipes, Pigs, and Peaks: Human and Animal Impacts on Hydrology, Water Quality, and Soils in Central Iowa.** *Cosponsored by GSA Hydrogeology Division; GSA Geology and Society Division; GSA Soils and Soil Processes Interdisciplinary Interest Group.* Wed., 18 Apr., 8 a.m.–4 p.m. Cost: US\$80; includes guidebook, transportation, lunch, and refreshments. William Simpkins, Iowa State University, bsimp@iastate.edu; Lee Burras, Iowa State University, lburras@iastate.edu; Kristie Franz, Iowa State University, kfranz@iastate.edu; Nathan Young, Iowa State University, nlyoung@iastate.edu; Katherine Taylor, Iowa State University.

## OPPORTUNITIES FOR STUDENTS

### Presentation Awards

Awards for the best graduate and undergraduate student posters and papers are supported by the GSA North-Central Section and by the Great Lakes Section–SEPM (Society for Sedimentary Geology). To be eligible, students must be lead authors and presenters, and should be capable of answering detailed questions about their research.



## Student Travel Grants

**Deadline:** 5 March

Students who are GSA members and who register for the meeting are eligible to apply for student travel grants. For further information, go to [www.geosociety.org/gsa/grants/ncgrant.aspx](http://www.geosociety.org/gsa/grants/ncgrant.aspx).

## Mentor Programs

For more information, contact Jennifer Nocerino at [jnocerino@geosociety.org](mailto:jnocerino@geosociety.org).

### Roy J. Shlemon Mentor Program in Applied Geoscience

**Luncheon.** Mon., 16 Apr. Students will have the opportunity to discuss career prospects and challenges with professional geoscientists from multiple disciplines over a FREE lunch.

### John Mann Mentors in Applied Hydrogeology Program

**Luncheon.** Tues., 17 Apr. Students 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

For more information, contact Jennifer Nocerino at [jnocerino@geosociety.org](mailto:jnocerino@geosociety.org).

**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 helping you to learn important résumé dos and don'ts.

## LOCAL COMMITTEE

**General Chair:** William Simpkins, [bsimp@iastate.edu](mailto:bsimp@iastate.edu)

**Vice Chair and Sponsorship:** Alan Wanamaker, [adw@iastate.edu](mailto:adw@iastate.edu).

**Technical Program Co-Chairs:** Neal Iverson, [niverson@iastate.edu](mailto:niverson@iastate.edu); Kristie Franz, [kfranz@iastate.edu](mailto:kfranz@iastate.edu).

**Short Course/Workshop Co-Chairs:** Yuyu Zhou, [yuyuzhou@iastate.edu](mailto:yuyuzhou@iastate.edu); Chris Harding, [charding@iastate.edu](mailto:charding@iastate.edu).

**Field Trip Co-Chairs:** Franciszek Hasiuk, [franek@iastate.edu](mailto:franek@iastate.edu); Aaron Wood, [awood@iastate.edu](mailto:awood@iastate.edu)

**Budget/Logistics:** DeAnn Frisk, [dfrisk@iastate.edu](mailto:dfrisk@iastate.edu)

**Exhibits:** Betsy Swanner, [eswanner@iastate.edu](mailto:eswanner@iastate.edu)

**Student Volunteers:** Suzanne Ankerstjerne, [ankerssm@iastate.edu](mailto:ankerssm@iastate.edu)

**K-12 and Informal Education Co-Chairs:** Beth Caissie, [bethc@iastate.edu](mailto:bethc@iastate.edu); Aaron Wood, [awood@iastate.edu](mailto:awood@iastate.edu)

**Activities Co-Chairs:** Jacqueline Reber, [jreber@iastate.edu](mailto:jreber@iastate.edu); Jane Dawson, [jpdawson@iastate.edu](mailto:jpdawson@iastate.edu)

**Student Judging:** Paul Spry, [pgspry@iastate.edu](mailto:pgspry@iastate.edu)

**IT Liaison:** Mark Mathison, [mathison@iastate.edu](mailto:mathison@iastate.edu)

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## Second Announcement

# SOUTHEASTERN SECTION

**67th Annual Meeting of the Southeastern Section, GSA  
Knoxville, Tennessee, USA  
12–13 April 2018**

[www.geosociety.org/se-mtg](http://www.geosociety.org/se-mtg)



Knoxville skyline.

## *Geology at Every Scale*

### LOCATION

The 2018 Southeastern Section Meeting of the Geological Society of America will be held in the Knoxville Convention Center in World's Fair Park, Knoxville, Tennessee, USA. Surrounded by the natural beauty of the Appalachian Mountains, and situated on the banks of the Tennessee River, Knoxville has a lot to offer visitors. The downtown area offers live music, eclectic shopping, and highly acclaimed cuisine. Learn about the region's geologic setting and industries, or delve into its rich cultural history, from the first Native Americans to inhabit the Valley and Ridge, through the colonial and Civil War periods, at one of the several museums and historic homes within walking distance of the Knoxville Convention Center. Numerous other attractions are within easy driving distance, from the Knoxville Zoo and the Great Smoky Mountains National Park, to the family-friendly fun of Gatlinburg and Pigeon Forge.

### REGISTRATION

**Early registration deadline:** 5 March

**Cancellation deadline:** 12 March

**Registration fees** (in U. S. dollars)

	Early		Standard	
	Full Mtg.	One Day	Full Mtg.	One day
Professional member	\$220	\$130	\$250	\$155
Professional non-member	\$240	\$155	\$275	\$175
Early career professional member	\$160	\$100	\$175	\$110
Student member	\$85	\$65	\$100	\$75
Student non-member	\$100	\$90	\$130	\$100
K–12 professional	\$45	\$55	\$50	\$40
Guest	\$50	\$40	\$50	\$45
Field Trip only	\$40	n/a	\$45	n/a

### ACCOMMODATIONS

A block of rooms has been reserved for meeting participants at the Hilton Knoxville in historic downtown Knoxville. The meeting rate (guaranteed until Tues., 20 March) is US\$139/night plus tax, single or double with US\$10 extra for third and fourth occupants. Parking in adjacent lots is about US\$10–US\$15 per day for self-park.

### TECHNICAL PROGRAM

#### Keynote Address

**The Co-Evolution of the Geosphere and Biosphere: A “Big-Data” Approach.** Dr. Robert Hazen, Carnegie Institute for Science and George Mason University.

#### Symposia

- S1. Longstanding Problems and New Ideas about the Structure and Tectonic Evolution of the Southern Appalachians and Other Mountain Belts: In Honor of the Career of Robert D. Hatcher Jr.** Arthur J. Merschat, USGS, [amerschat@usgs.gov](mailto:amerschat@usgs.gov); J. Ryan Thigpen, University of Kentucky, [ryan.thigpen@uky.edu](mailto:ryan.thigpen@uky.edu); Elizabeth McClellan, Radford University, [emccellan@radford.edu](mailto:emccellan@radford.edu); Mark W. Carter, USGS, [mccarter@usgs.gov](mailto:mccarter@usgs.gov).
- S2. From Diamonds to the Moon, Advances in the Understanding of Planet Formation: In Honor of the Career of Lawrence August Taylor.** Geoffrey Howarth, University of Georgia, [ghhowarth@gmail.com](mailto:ghhowarth@gmail.com); Linda C. Kah, University of Tennessee, [lckah@utk.edu](mailto:lckah@utk.edu).

### THEME SESSIONS

- T1. Seismic Hazards in the Eastern United States.** Christine Powell, University of Memphis, [capowell@memphis.edu](mailto:capowell@memphis.edu); Chris Cramer, University of Memphis, [ccramer@memphis.edu](mailto:ccramer@memphis.edu); Martin Chapman, Virginia Polytechnic Institute and State University, [mcc@vt.edu](mailto:mcc@vt.edu).
- T2. Recent Advances in Our Understanding of the Crust and Upper Mantle in the Southeastern United States.** Robert B. Hawman, University of Georgia, [hawman@uga.edu](mailto:hawman@uga.edu); James H. Knapp, University of South Carolina, [knapp@geol.sc.edu](mailto:knapp@geol.sc.edu).

- T3. **Geomorphic Anomalies and Underlying Geologic Controls Identified from Surficial and Bedrock Mapping, Southeastern United States.** Kathleen M. Farrell, North Carolina Geological Survey, kathleen.farrell@ncdenr.gov; Christopher S. Swezey, USGS, cswezey@usgs.gov.
- T4. **Chemostratigraphy as a Tool for Reconstruction of Past Environments.** *Cosponsored by GSA Sedimentary Geology Division.* Linda C. Kah, University of Tennessee, lckah@utk.edu; Miles A. Henderson, University of Tennessee, mhende16@vols.utk.edu.
- T5. **Environmental Problems and Solutions Associated with Appalachian Shale Plays and Coal Mining.** Anna Szykiewicz, University of Tennessee, aszynkie@utk.edu; Nathaniel Warner, Pennsylvania State University, nrw6@enr.psu.edu.
- T6. **Karstology: Mechanisms and Case Studies in the Southeastern United States.** *Cosponsored by GSA Hydrogeology Division.* Terri Brown, Lincoln Memorial University, tbrown23@vols.utk.edu.
- T7. **Linkages among Subterranean Ecosystems and Geological Events in the Eastern United States.** Nicholas S. Gladstone, University of Tennessee, ngladsto@vols.utk.edu; Matthew L. Niemiller, University of Alabama, cavemander17@gmail.com; Evin T. Carter, University of Tennessee, ecarte19@vols.utk.edu; Michael L. McKinney, University of Tennessee, mmckinne@utk.edu; Sarah W. Keenan, University of Tennessee, skeenan1@vols.utk.edu.
- T8. **Geomicrobiology of Microbes and Minerals: Influence across Ecosystem Scales.** University of Tennessee, jmikucki@utk.edu; Caleb Schuler, University of Tennessee, cschuler@vols.utk.edu.
- T9. **Nutrient Hotspots through Time: Taphonomy in Modern and Fossil Ecosystems.** Sarah W. Keenan, University of Tennessee, skeenan1@vols.utk.edu; Jennifer M. DeBruyn, University of Tennessee, jdebruyn@utk.edu; Sean M. Schaeffer, University of Tennessee, sschae5@utk.edu.
- T10. **Biogeochemical Cycling and Microbial Dynamics in Response to Pulse Events.** Sean Schaeffer, University of Tennessee, sschae5@utk.edu; Jennifer DeBruyn, University of Tennessee, jdebruyn@utk.edu.
- T11. **Morphology and Evolutionary Trends.** *Cosponsored by Paleontological Society.* Bradley Deline, University of West Georgia, bdeline@westga.edu; Maggie R. Limbeck, University of Tennessee, mlimbeck@vols.utk.edu.
- T12. **Taphonomy: The Good, the Bad, and the Ugly.** *Cosponsored by Paleontological Society.* Rebecca Freeman, University of Kentucky, rebecca.freeman@uky.edu; Linda McCall, University of Texas at Austin, lndmccall02@yahoo.com; Simon Darroch, Vanderbilt University, simon.a.darroch@vanderbilt.edu.
- T13. **Neontological Approaches to Paleontological Questions.** Stephanie K. Drumheller, University of Tennessee, sdrumhel@utk.edu; Matthew A. Tibbits, Broward College, matthew.a.tibbits@gmail.com.
- T14. **Geologic Mapping from the Appalachians to the Planets.** *Cosponsored by GSA Planetary Division.* Robert Jacobsen, University of Tennessee, rjacobs@vols.utk.edu; Keenan B. Golder, University of Tennessee, kgolder@vols.utk.edu.
- T15. **Planetary Surface Processes.** Devon M. Burr, University of Tennessee, dburrl@utk.edu; Bradley J. Thomson, University of Tennessee, bthomsol@utk.edu.
- T16. **Structure, Stratigraphy, and Tectonics of the Craton in the Southeastern United States.** Mark Abolins, Middle Tennessee State University, mark.abolins@mtsu.edu.
- T17. **Teaching Geosciences at the College Level—Resources and Projects for Community College Students.** Renee Mazurek, ABTech Community College, reneemazurek@abtech.edu.
- T18. **Undergraduate Research (Posters).** *Cosponsored by Council on Undergraduate Research.* Lee Phillips, University of North Carolina at Greensboro, plphilli@uncg.edu; Jeff Ryan, University of South Florida, ryan@mail.usf.edu.

## FIELD TRIPS

All trips will depart from the Hilton Knoxville lobby, unless otherwise noted below.

### Pre-Meeting

1. **Quaternary Faulting along the Dandridge-Vonore Fault Zone in the Eastern Tennessee Seismic Zone.** 11 April, 7:30 a.m.–4:30 p.m. Max: 20. US\$105. Principal organizer: Robert D. Hatcher, Jr., University of Tennessee–Knoxville; co-organizer: Randel Tom Cox, University of Memphis.
2. **The Blue Ridge Basement Complex of the Eastern Great Smoky Mountains: New Insight into Old Rocks from New U-Pb Geochronology.** 11 April. Max: 20. US\$60. Participants should arrange their own lodging for the night of 10 April in the Maggie Valley–Dellwood–Waynesville area, North Carolina. Trip will depart from the parking lot of the Maggie Valley Inn & Conference Center (<http://maggievalleyhotel.com/>), North Carolina, at 8 a.m., returning mid-day. Principal organizer: David Moecher, University of Kentucky.

### Post-Meeting

3. **Blue Ridge–Inner Piedmont Geotraverse from the Great Smoky Thrust to the Inner Piedmont: Upper Crust to Upper Lower Crust, Terranes, Large Faults, and Sutures.** 5 p.m., 13 April–5:30 p.m., 15 April. Max: 30. US\$290. Principal organizer: Arthur J. Merschat, USGS; co-organizers: J. Ryan Thigpen, University of Kentucky; Elizabeth McClellan, Radford University; Mark W. Carter, USGS; Robert D. Hatcher, Jr., University of Tennessee–Knoxville.
4. **Steaming through the Ordovician.** 14 April, 6:45 a.m.–2 p.m. Max: 200. US\$65. Principal organizer: C. Howard Capito, Knoxville, Tennessee; co-organizer: Stephanie Drumheller-Horton, University of Tennessee–Knoxville.
5. **Lessons from Limestone: How to Teach All Sciences with Limestone.** 14 April, 7:30 a.m.–5 p.m. Max: 34. US\$35. Principal organizer: Michael A. Gibson, University of Tennessee–Martin; co-organizer: Don Byerly, University of Tennessee–Knoxville.
6. **Revisiting the Flynn Creek Impact Structure, Jackson County Tennessee.** 14 April, 7:30 a.m.–6:30 p.m. Max: 32. US\$130. Principal organizer: Steven J. Jaret, Stony Brook University; co-organizer: David T. King, Jr., Auburn University.

7. **Nutrient Hotspots through Time: Taphonomy in Modern and Fossil Ecosystems.** 14 April, 8 a.m.–5:30 p.m. Max: 20. US\$130. Principal organizer: Sarah W. Keenan, University of Tennessee–Knoxville; co-organizers: Christopher Widga, East Tennessee State University; Jennifer M. DeBruyn, University of Tennessee–Knoxville; Sean M. Schaeffer, University of Tennessee–Knoxville.
8. **Hydrogeology and Structure of Tuckaleechee Cove and Vicinity.** 14 April, 8:30 a.m.–6 p.m. Max: 22. US\$130. Principal organizer: Ben Miller, USGS–Nashville; co-organizer: Terri Brown, University of Tennessee–Knoxville.
9. **Mesoscale Structures, Macroscale Folds, and Inferred Cratonic Basement Structures, Nashville Dome, Central Tennessee.** 9 a.m., 14 April–4 p.m., 15 April. Max: 11. US\$195. Principal organizer: Mark Abolins, Middle Tennessee State University.

## OPPORTUNITIES FOR STUDENTS

### Mentor Programs

For more information, contact Jennifer Nocerino at [jnocerino@geosociety.org](mailto:jnocerino@geosociety.org).

**Roy J. Shlemon Mentor Program in Applied Geoscience Luncheon.** Thurs., 12 April. Students will have the opportunity to discuss career prospects and challenges with professional geoscientists from multiple disciplines over a FREE lunch.

**John Mann Mentors in Applied Hydrogeology Program Luncheon.** Fri., 13 April. Students 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

For more information, contact Jennifer Nocerino at [jnocerino@geosociety.org](mailto:jnocerino@geosociety.org).

**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 of 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 on the job market 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.

### Travel Grants

**Deadline to apply:** 5 March

GSA's Southeastern Section is pleased to offer support for the cost of student travel to its Section Meeting. For more information, go to [www.geosociety.org/gsa/events/sections/se/2018mtg/students.aspx](http://www.geosociety.org/gsa/events/sections/se/2018mtg/students.aspx).

### LOCAL COMMITTEE

**General Chair:** Colin Sumrall, [csumrall@utk.edu](mailto:csumrall@utk.edu)

**Technical Program Chairs:** Linda Kah, [lckah@utk.edu](mailto:lckah@utk.edu), and Bob Hatcher, [bobmap@utk.edu](mailto:bobmap@utk.edu)

**Field Trip Co-Chairs:** Annette Engel [aengel1@utk.edu](mailto:aengel1@utk.edu), and Bob Hatcher, [bobmap@utk.edu](mailto:bobmap@utk.edu)

**Treasurer:** Hap McSween, [mcsween@utk.edu](mailto:mcsween@utk.edu)

**Exhibits Chair:** Brad Thompson, [bthomsol@utk.edu](mailto:bthomsol@utk.edu)

**Sponsorship Co-Chairs:** Ed Perfect, [eperfect@utk.edu](mailto:eperfect@utk.edu), and Larry McKay, [lmckay@utk.edu](mailto:lmckay@utk.edu)



## 2018 GeoCareers Section Meeting Programs

# Geoscience Career Workshops

For more information, contact Jennifer Nocerino at [jnocerino@geosociety.org](mailto:jnocerino@geosociety.org).

**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 of 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 examples to help you learn important résumé dos and don'ts.

## Mentor Programs

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

**South-Central Section Meeting**, Little Rock, Arkansas, USA  
Shlemon Mentor Luncheon Program: Monday, 12 March  
Mann Mentors in Applied Hydrology Luncheon: Tuesday, 13 March

**Northeastern Section Meeting**, Burlington, Vermont, USA  
Shlemon Mentor Luncheon Program: Monday, 19 March  
Mann Mentors in Applied Hydrology Luncheon: Tuesday, 20 March

**Southeastern Section Meeting**, Knoxville, Tennessee, USA  
Shlemon Mentor Luncheon Program: Thursday, 12 April  
Mann Mentors in Applied Hydrology Luncheon: Friday, 13 April

**North-Central Section Meeting**, Ames, Iowa, USA  
Shlemon Mentor Luncheon Program: Monday, 16 April  
Mann Mentors in Applied Hydrology Luncheon: Tuesday, 17 April

**Rocky Mountain & Cordilleran Joint Section Meeting**, Flagstaff, Arizona, USA  
Shlemon Mentor Luncheon Program: Tuesday, 15 May  
Mann Mentors in Applied Hydrology Luncheon: Wednesday, 16 May



For photo credits, see inside front cover.



# Welcome New GSA Members!

The following geoscientists were elected to GSA membership at the GSA Council's fall meeting (joined 16 March–23 August 2017).

## PROFESSIONALS

Blessing Adeoti  
Shamsuzzaman Ahmed  
Charles Ahrens  
Akintunde Isaac Akintola  
Mitchell Albert  
Edward Albin  
Juan Carlos Alzate  
Sebnem Arslan  
Justin Bailey  
Marc Bardoux  
Elizabeth A. Barnett  
Thomas G. Beaman Jr.  
Gary Gill Bible  
Magali I. Billen  
Cyrus Bina  
David L.S. Blackwell  
Charles T. Blay  
David Blood  
Kathleen Flora Bolger  
Elizabeth W. Boyer  
Sharon Marie Brady  
Scott E. Brame  
Gregory Allen Buckley  
Agi Burra  
Michael R. Carroll  
Patrick N. Casey  
Aaron John Clark  
Lorrie V. Coiner  
Kenneth L. Cole  
Kimberly J. Cook

Rafael Coutin  
Don Curtis  
Blanka Cvetko Tesovic  
Patricia d'Almeida  
Fiona Darbyshire  
Maria Davila Ordonez  
Vivian Dayong  
Michiel Cornelis De Wit  
Stephen B. Deoreo  
Thomas E. Dube  
Deborah Eason  
Kurt Eckerstrom  
Emmanuel Egbu  
Aly I. El-kadi  
Aaron Kale Evans  
James K. Feathers  
Matthew Ferlicchi  
Erin Field  
Aleta Finnilla  
Gregory P. Fournier  
Tad C. Fox  
Glenn Gaetani  
James R. Garey  
Martha Gerdes  
Laurent Gernigon  
Micah Gilbert  
Cari Gomes  
Steven J. Gordon  
David Green  
Herbert Gary Greene  
Heather Noelle Gregory

Changbao Guo  
Semih Gursu  
Terence Martyn Hackwill  
Wayne Andrew Hamilton  
David Carl Hamren  
David A. Hannam  
Renee Hardy  
Ciaran Harman  
Matthew Rogan Harrell  
Adam Harris  
Mike Haufler  
S. Hawk  
Ao Hong  
Robert R. Howell  
Mangesh Madhukar Jagtap  
Peter Kahn  
Ranbir Singh Kang  
Katherine Jane Keller  
Mustafa Kumral  
Laurie Kurilla  
Nicole Lautze  
Zoe Lefebvre  
Nadav G. Lensky  
Lijun Liu  
David Macdonald  
Andrew S. Madof  
Todd Maguire  
Lisa Maher  
Brian Charles Mallick  
Adriana Cecilia Mancuso  
Murlu Manghnani  
Rolf W. Mathewes  
Edmond Mathez  
Ben V. Miller  
Lisa Anne Milligan  
David J. Mills  
Richard Mitchell  
James Moffatt  
Joy Moses-Hall  
Marcelo Batista Mot  
Juan Moya  
Craig Lee Moyer  
Latoya Myles  
Joanna Marie Nield  
Thomas Norris  
Aleeza Oshry  
Ali Değer Özbakir

Luis Palazzesi  
Kwan-nang Pang  
Laura Pangalozzi  
Julian Pearce  
Capitola Dianne Phillips  
Kari Alyssa Prassack  
Cindi C. Preller  
Edward Ralston  
Todd Ringler  
Ian Saginor  
Kiff Samuelson  
Roberto L. Sanchez  
Phylicia Saner  
Hiroaki Sato  
Kaleb Christian Scarberry  
Chelsea Scott  
James Shulmeister  
Alicia Siegel  
David Gordon Smith  
Quinn Eric Smith  
Keith Snyder  
Sanjoy Som  
Thomas Stack  
Steve Stadelman  
Linda R. Sternbach  
Robert D. Stewart  
Mike W. Thomas  
John H. Thompson  
Ronnie C. Torres  
Kathy Goetz Troost  
Haim Tsoar  
Bruce Uszynski  
David Wayne Valentine  
Gajanan Wagh  
Wenfeng Wang  
Marian J. Warren  
Michael Keith Watkeys  
James M. Watkins  
James D. Webster  
Elisabeth Anne Wheeler  
Derek Winogradoff  
Zhihua Yang  
Najel Yaseen  
David Raymond Yesner  
Fan Zhang  
Tianshu Zhang

### Top professional interests of new students:

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



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**EARLY CAREER  
PROFESSIONALS**

Amir Allam  
Tyler Joseph Allen  
Sarah Al-rdani  
Davin Bagdonas  
Dustin Ballat  
Jessica J. Barnes  
Kimberly A. Beatty  
Alexander Beck  
Kassia Bennett  
Andrew Bergman  
Andrea R. Biedermann  
Kimberly Blisniuk  
Roseann Bowe  
Kaleigh Bruce  
Angela M. Bulla  
Alex Burton-Johnson  
Kyung won Chang  
Kuang-jung Chen  
Tiggi Choanji  
Katherine L. Clifton  
Katie Susanna Collins  
Samantha Cooper  
Kayla Cox  
Carston T. Curd  
Katie E. Davis  
Eli Jacob Denbesten  
Alice Doughty  
Robert Grayson Dowlearn  
Joseph Fackrell  
Edgar Fennie  
Maria Fernandes Martins  
Benjamin David Fischer  
Octavio Flores Jr.  
Verena Foerster  
Sarah Marie Franssen  
Masakazu Fujii  
Zoe Gentes  
Shannon E. Graham  
Jennifer Hanley  
Peter Hopper  
Patricia Irizarry  
Sarah M. Jacquet  
Giovanny Jimenez-Diaz  
Christine Elizabeth Johnson  
Jordan Johnson  
Rail Ilgizarovich Kadyrov  
Seth Matthew Kanich  
Jessica Karrasch  
Tom Knott  
Mohammad Koneshloo  
Jill Marie Kuharsky  
Tisha L. Kuhns  
Dawn Lawrence  
Pilar Lecumberri-Sanchez  
Jerusha Isabel Lederman

Sarah Lemon  
Olkeba Tolessa Leta  
Carolyn Levitt  
Yanan Li  
Kathryn Lindenschmidt  
Bastien Linol  
Awei Mabi  
Ashley Martin  
Julieta C. Martinelli  
Andrew Masterson  
William Andrew Matthews  
Daniel Mccuan  
Aaron Meilijson  
Paul Antone Meister  
Elizabeth A. Meyer  
Joel Elliott Milsom  
Naomi Morgan  
David Morin  
Rafal Nawrot  
Jonathan Eric Oelsner  
Samantha Kathleen Olex  
Christopher Pederson  
Daniel A. Petrash  
Caroline Pew  
Erin Phillips  
Ikhane Reuben Phillips  
Raquel De Castro Portes  
Kunfeng Qiu  
Robert Reece  
Jeremy Ross  
Joseph Rosso  
Indranil Saha  
Afif Saputra  
Brian Edward Scheib  
Christian Schiffer  
James Robert Schmidt  
Thomas Shea  
Lisa Shepard  
Alexander Newton Steely  
Jasmine Nicole Stefansky  
Michael Nikolaos Styllas  
Patrick Lee Sweeney  
Limei Tang  
Natalie Maria Tanski  
Stephani Tavarez  
Brian Raymond Terbush  
Matthew A. Thomas  
Lucy Elizabeth Treado  
Antoine Triantafyllou  
Irene Tunno  
Amy Tuzzolino  
Sarah M. Tweedt  
Leonardo Uieda  
Tyler Joseph Urban  
Lydia Arleen Velez  
Jennifer Von Erden  
Huapei Wang

Matthew Karl Wetzel  
Dara Wilson  
Erin Wirth  
Di Wu  
Cianna Wyschnytsky  
Jin Zhang  
Xinyuan Zheng  
Daniel W. Zietlow

**STUDENTS**  
(*listed by professional interest*)

**Archaeological Geology**

Morgan Sierra Abbott  
Betty Adams  
Jenna Nicole Fischer  
Susannah Joy Howard  
Jacquelynn Miller  
Bridget M. Murray  
Jason Neale Neale  
Lara Miyori Shinsato  
Duncan Widman  
Qiu Yahui

**Biogeosciences**

Rogers Clark Caldwell Buntin II  
Madison Davis  
Sandrine Marie Duboscq  
Victoria E. Frazier  
Claire Allison Grant  
Brody Hovatter  
Amanda Michelle King  
Noah Levine  
Taleen Mahseredjian  
John A. Moretti  
Emma Irene Rigby  
Christina Ayako Turner  
Erin L. Williamson

**Climatology/Meteorology**

John E. Benedict  
Joshua C. Bregy  
Terry Stephen Henninger  
Andrea L. Moore  
Zachary Naiman  
Maria Reimi  
Eric Ricks  
Dakota Smith

**Economic Geology**

Sommer Casady  
James Farquharson  
Holly Gina Gregorich  
Christa R. Loucks  
Parth Rohit Samani  
Valentina Tellez  
Matthew James Trembath  
Kelsey Marie Tucker

Christophe Simbo Wakamya Sr.  
Alexandra Leigh Wallenberg  
Yuanyuan Xia

**Energy Geology**

Faizan Ahmad  
Beril Alkan Gun  
Erik Allder  
Nathaniel Applegate  
Sanki Biswas  
Anne Clare Brennan  
Travis Benjamin Broadhurst  
Jordan Rigdon Caylor  
Josh Cichy  
Virginia L. Cistaro  
Dylan Marshall Crain  
David Gates  
Garrett Marshall Goettel  
Emily J. Gross  
Liam Francis Harrison  
E.B. Hawley  
Candise Henry  
Jeffrey Hensley  
Dannity Oseyande Isiwele  
Makayla R. Jacobs  
David Kilcoyne  
Kristie Linstead  
Samuel Abraham List  
Jacob Roy Manninen  
Taylor Shepherd Newton  
Temitayo Akintunde Olajubaje  
Daniel Lee Olive  
Steven Andrew Ransom  
Matthew James Rasmussen  
Andrew Richard Scholz  
Steven Michael Sewell  
Yi Shu  
Jack Andrew Simmons  
Sebastian F. Smith  
Jerson J. Tellez  
Natalie Ann Volk  
Jasmine Jeanay White

**Engineering Geology**

Daniel Adcock  
Badee Abdulqawi Alshameri  
Macneill Balboa  
Katherine Bane  
Paul Henry Beadle Jr.  
Tomia Bradshaw  
Kyle Robert Howe  
Justin Johnsen  
Tiffany E. Justice  
Amandie Renee Laurens  
Majid Mohamad  
Monica Christine Powers  
Francisco J. Saldana

Payton Shlemon  
Luke Simms  
James F. Smith IV  
Jessica Tyszka  
Noah Zorsky

#### **Environmental Science**

Jenna Nicole Abrahamson  
Samantha Addis  
Daniel Baratta  
Alok Panray Beeharry  
Christopher Blake  
Patrick Brodhagen  
Cindy Brownson  
Connor Cain  
Corrinn Compton  
Jordan Douglas Cruzan  
Kellie G. Dennis  
Caroline E. Dickey  
Anisha Dongol  
Luke Fredenberg  
Henry Frentzel  
Elvira Garcia  
Grace Michaela Graham  
Stephanie Joan Hibberts  
Chantal Iosso  
Elizabeth Kaptein  
Victoria R. Kaptein  
Laura Korman  
Mary Legawiec  
Laura Lehnhoff  
Bryan Anthony Leneghan  
Jaime Salvador Lopez  
Haley M. Marston  
Kristian Kainalu McDonald  
Costin McQueen  
Augusta M. Mery  
Anna J. Miller  
Gabriela Marie Navarrete  
Kelsey D. Rodgers  
Andrew R. Shaughnessy  
Amanda R. Sherman  
John Russell St. Denny  
Kammie-Dominique Tavares  
Rebekah Thielman  
Ashley Turner  
Cameron James Wallenbrock  
Rachel Weibel  
Alex Werner  
Maya Williams

#### **Geography**

Erika Dovre Bjorkman  
Sean C. Frangos  
Da Huo  
John Tarver Langstaff  
Tyler M. Ward

Cole David Wilkinson  
Qian Zhang

#### **Geoinformatics**

Elaina Cole  
James Howard Covington  
Michaela Ashley Donahoo  
Amy Ferguson  
Abdullah Othman  
Edward Pencak

#### **Geology and Health**

Natalie Crnosija  
Mercedes Carolina Navarro-  
O'Hara  
Seun Oladipupo  
Rebecca Owens

#### **Geophysics/Tectonophysics**

Md saiful Alam  
Reilly Mathew Blocho  
Daniel Boyd  
Zhiqing Chen  
Eric Christiani  
William Eymold  
Gabriel Ferragut  
Sarah Elizabeth Greene  
Abdulhaq Kamil Hadi  
Melissa S. Hartwig  
Olivia Helprin  
Bassil Kanan  
Lingyun Kong  
Mei Liu  
Connor James Lofton  
Bradford Mack  
Benjamin Patrick Magnin  
Phillip Kenneth McFarland  
Kirsty Anne McKenzie  
Cassie Mohkami  
Alexandra Whitney Pleus  
Addison Kaye Richter  
Jodi Lee Schoonover  
Kittipong Somchat  
Bryan Reynolds Thomas

#### **Geoscience Education**

Michael Alvernaz  
Emily Josephine Correia  
Megan E. D'Errico  
Hope Duke  
Meghann Kenkel  
Scott Liming  
Maranda McMillian  
Anthony Perez  
Jeanette Pirlo  
Caroline E. Pritchard  
Marsha F. Small

Matthew Smith  
Tyler G. Smith  
Bradley Earl Thompson  
Kyle Tollefson

#### **Geothermal**

John Allard III  
Deirdre Seyl Bonfield  
Isabel Perez Martinez  
Horthing V. Zimik

#### **History/Philosophy of Geology**

Caleb N. Miller

#### **Hydrogeology/Hydrology**

Katherine Andrews  
Bradly A. Baldwin  
Lillian Beaman  
Samuel Harrison Caldwell  
Ryan N. Cascarano  
Hayden Chamberlain  
Jessica Chang  
Nicole Cordoba  
Chantelle Davis  
James Burton Deemy  
Samantha M. Denham  
Danielle Jeanay Deweerd  
John Taylor Durica  
Alissa Flatley  
John Goodin  
Hadlie P. Green  
Stacy Henderson  
Madeline Hille  
Ashley Diane Horton  
Holly Hutcheson  
Kingsley Egharevba Jerome  
Candace Johnston  
Rachel Anne Kaiser  
Samuel F. Kasten  
Yayah Desalegn Kebte  
Evan L. Kipnis  
Maribeth L. Kniffin  
Timothy J. Korff  
David Litwin  
Jesse Marcus  
Rebecca Miriam Matecha

Jeremy Scott McDowell  
Jacob Morgan  
Hiroko Mori  
Mathew Connor O'Brien  
Brytne Okuhata  
Zachary Oretsky  
Erik Patton  
Stivaly Paulino  
Eric Fletcher Perry  
Niomi J. Phillips  
Xinsheng Qin  
Sara Ann Ramos  
Monique Margretha Rutte  
Anna Schartman  
Chelsea L. Sica  
Jenny Soonthornrangsang  
Annabel Spranger  
Carl Vitevitch  
Jordan Wachholtz  
Andrew Lawrence Watson  
Zachary Alexander Boeing  
Werber  
Robert Wu  
Kai Xiao

#### **Karst**

James L. Berglund

#### **Limnogeology**

Bailee Nicole Hodelka  
Trent R. Logan

#### **Mineralogy, Geochemistry, Petrology, Volcanology**

Vedanta Adak  
Ian Anderson  
Francisco Apen  
Subarna Baidya  
Timothy S. Baker  
Nathan Ashby Bauer  
Brooke Erin Benz  
Jessica Bersson  
Gabriela Boaventura  
Julia Boyles  
Melissa Chambers  
Julia Ann Chen

#### **Top 3 reasons for joining:**

1. Meetings
2. Career development
3. Publications



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Joy Cline  
Peter Cameron Davidson  
Benjamin Joel Deans  
Donovan Desjardins  
Paula Andrea Diaz Melo  
Carlos Errazuriz Henao  
Gabriela Farfan  
Gloria Charlotte Ferguson  
Caleb Fifer  
Garrett Gay  
Jonathan Gladwell  
Ashley Grengs  
Amanda Jean Haddock  
Manoshi Hazra  
Casey Hecox  
Melody L. Hildebrand  
Christopher M. Hodge  
Tianzheng Huang  
Amy Hughes  
Amanda Hultz  
Amanda G. Jackson  
Issac James Jacques  
Quinn Alexandra Kaufman  
Mustafa Kaya  
Danielle Megan Ketrow  
Thomas Kimler  
Cassi R. King  
Josh Kite  
Rachel Koons  
Kristine Larson  
Josie Lauren Little  
Harrison F. Love  
Brittany Lovett  
Guilherme Madrid Pereira  
Samuel D. Marolt  
Derek Mart  
Nicholas Franklin Meszaros  
Sumit Mishra  
Ashley Mitchell  
Aniruddha Mitra  
Tess Murray  
Tyler J. Myrman  
Tiera Naber  
Jayson Tyler Olivera  
Desiree Camille Otilio  
Colin Padget  
Corey Palmer  
Mattia Parolari  
Jacob Parra  
Reed G. Patrick  
Mitchell Phillips  
Maxwell Gerard Pizarro  
Eimy Aixa Quispe  
John Randall  
Robert B. Reid  
Svana Roxcliffe

Douglas R. Schaub  
Tyler David Schlieder  
Jesse Scholpp  
Kaily A. Scott  
Tiffany Snider  
Madelaine Stearn  
Luke Steenberg  
Travis Scott Stephens  
Katie Stubbs  
Joseph C. Syzdek  
Olivia Terry  
Kaya Micha Trepp  
Nicholas David Udy  
Karissa Brianna Vermillion  
Brenda Lorraine Waters

#### **Oceanography/Marine**

**Geology**  
Sarah Lyn Chahin  
Caleb Scott Drake  
Andrew William Flack  
Gabriella Vianne Flores  
Clint Henning  
Kelly Jones  
Mark Lapan  
Brandi Lyn Lenz  
Bobbie Blue Marcoux  
Pedro Israel Matos-Llavona  
Hanna R. Siddon  
Philip Harlan Swanson

#### **Paleo Sciences**

Jasmine Ariel Anderson  
Marie Bartlett  
Orla Grace Bath Enright  
Jacquelyn Y. Belock  
Melissa Marie Brainard  
Nicole K.S. Brooks  
Tessa Browne  
Samuel Elio Bruno  
Serena Marissa Celestino  
Adam Lee Crawley  
Kate Louisa Eiloart  
Genway Gao  
Sam Garvey  
Emily Susanne Hauf  
Kayla M. Irizarry  
Kristopher Lee Juntunen  
Stephen Kruse  
Peishu Li  
Shawna Little  
Kayla Alexis Mitchell  
John Christian Munson  
Bailey Coleen Nash  
Margot Dianne Nelson  
Erikka Olson

Reed Patterson  
Dustin Perriguet  
Matthew John Pruden  
Ceara K.Q. Purcell  
Dean Robert Richmond  
Iris S. Romo  
Delaney Ryan  
Bryan Shirley  
Sinjini Sinha  
Diogo Noses Spinola  
Michael R. Stoller  
David Leo Stuk  
Ryan Thummel  
Lucas Nile Weaver  
Klara Widrig  
Greg Wilbert

#### **Planetary/Space Science**

Heni Amanda Barnes  
Jonathan Beltran  
Graysen Benamati  
Kiera Bolinder  
Marissa E. Cameron  
Emily Chiappe  
Morgan Alice Cox  
Joseph Blake Darragh  
Jemila Edmond  
Jessica J. Ende  
Thomas Farron  
Emily Fischer  
Cassidie A. Fisher-Price  
Maxton Gabbert  
Andy Garcia  
Miranda Brooke Gilbert  
Sara Goldenbaum  
Byron J. Hines  
Catherine Hobart  
Caelum Skye Hubl  
Madison Nicole Hughes  
Sonny James Hutchinson  
Erik M. Isaksen  
Lynna Jezek  
Matt Jones  
Alex Kugler  
Justice Joelle Lira  
Jason A. Mackie

Alyssa Marie Marrero  
Shane Nichols-O'Neill  
Mara Nutt  
Jack Robert Seeley  
Nathaniel Stein  
Grant Vinson  
Matthew N. Zerilli

#### **Policy/Regulatory**

Abigail Heath

#### **Quaternary Geology/ Geomorphology**

Elliott Frank Allen  
Nina Atae  
Elizabeth Davis  
Francis John Derosé  
Wesley Randall Farnsworth  
Alicia Brooke Fischer  
Luke Hibbs Fisher  
Laura A. Hempel  
Carah Ashley Humphrey  
Kristi Kotrapu  
Charles Linneman  
Zachary Hunter-Lee Little  
Tebogo Vincent Makhubela  
Evelyn Meador  
Runze Miao  
Tyler Joseph Mikula  
Paige Morkner  
Nathalie Neagu  
Mariel Nelson  
Benjamin Atieno Opiyo  
Allison M. Pfeiffer  
Zachary Phillips  
Michael Shahin  
Brad Sion  
William Struble  
Claire Ellen Vavrus

#### **Seismology**

Yulio Araya  
Megan Banaski  
Jessica Anne Bowling  
Ariane Ducellier  
Kevin Lally

#### **Total new members: 924**

Professionals: 155 (16.8%)  
Early Career Professionals: 120 (13.0%)  
Students: 605 (65.5%)  
K-12 Teachers 17 (1.8%)  
Affiliates: 27 (2.9%)



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Tianze Liu  
Kevin M. Voelz  
**Soil Science**  
Kate Andrzejewski  
Alicia Manzo  
Kennedy Ogonda Oginga

**Stratigraphy/Sedimentology**

Jonathan R. Adams  
Abigail Beckham  
Nick Brown  
Tyler Buchanan  
Brandon Glenn Burke  
Chloe Claire Chateau  
Tisha Cleavenger (McKinney)  
Trevor Cole  
Natasha Cyples  
Alexander R. Dolcimascolo  
Neveen Elsayed  
Mariya Galochkina  
Lindsey Alaine Gipson  
Evan Charles Gross  
Iwan M.K. Hainim  
Ethan J. Heyrman  
Chuqiao Huang  
Luke Michael Johnson  
Pim Kaskes  
Kaci Bradbury Kus  
Larry Syu-Heng Lai  
Lucas Jerome Loveall  
Juan Pablo Lovecchio  
Tanner Mills  
Dennis Mmasa  
Megan A. Mueller  
Quintin Edward Muhlenkamp  
Carlos E. Nunez  
Benjamin Steven Roberts  
Joao Silveira Meyers  
Samuel Sinkler  
Alexandra C. Stodden  
Samantha Super  
Patrick Taaffee  
Holly Emily Turner  
Leigh Van drecht  
James B. West  
Lindsey Ann-Morehouse Wiley  
Kenneth Lee Wright Jr.  
Jingyu Zhang  
Wenyu Zhao  
Kai Zhou

**Structural Geology/Tectonics**

Hunter Adams  
Caleb Adkins  
Marta Anson Sanchez  
Victoria Ashlee Arnold

Erin Arntson  
Alex Taub Bacon  
Neta Bar  
Jared Brabazon  
Victoria M. Buford  
Arka Pratim Chatterjee  
Joseph Edgley  
Joel Edwards  
Rebecca Margaret Ely  
Pablo Guillermo Farias  
Jeannie Lyndsey Fehr  
James Andrew Fisher  
Humaad Ghani  
Amy Gilliland  
Cleber Peralta Gomes Jr.  
Robin Hankins  
Reuben Hansman  
Sebastian Santiago Herrera  
Alison Elizabeth Horst  
John Johnson  
Linnea Lea Johnson  
Steven Johnson  
Amanda Johnston  
Meghan Gleason Klapper  
Alice Macente  
Lauren Madronich  
Rajdeep Mondal  
Artem Moskalenko  
Fatima Niazy  
Alexander Peck  
Joseph Phillips  
Cameron Ramsey  
Tessa Renee Sever  
Barkha Singh  
Jason Paul Titus  
Lianna Vice  
Christine Marie Ward  
Yuxing Wu

**Other**

Elvis Agyemang Jr.  
Mario Salvador Bermudez  
Hannah Blaylock  
Drew Timothy Bledsoe  
Phillip Charles Boan  
Megan Borel  
June Bowman  
Rachel Buzeta  
Anabel Castro  
Julio Ceniceros  
Carla Ivanna Cerda  
Melody Che  
Josephine Chiarello  
Tia Nicole Curry  
Robert Lewis Fisher Jr.  
Sophia Godinez

Christina Gray  
Carolina Guijarro  
Kristen Guthrie  
John Paul Hunt  
Ayanna Jayla Jones  
Meghan King  
Micah John Kipple  
Talia Klein  
Jillian Taylor Laird  
Nora Lopez  
Clara Ma  
Jake B. Marotta  
Jacob S. Milton  
Henriett Modes Lindeke  
Lisa NurMarini Mohd Kamal  
Sukanya Mondal  
Emily P. Morris  
Gwynn Caitlin Neilson  
Tyler Newman  
Andra Nordin  
Chadlin Ostrander  
Aedan C. Parkes  
Lillian Gabrielle Petty  
Sophia Ptacek  
Dalia Rodriguez  
Ranita Saha  
Guzhaliayi Sataer  
Ashley Brooke Scott  
Arianna Soldati  
Sebastian Sotomayor  
Catherine Jean Steck  
Amy Eileen Tiemeyer  
Ivy Gisselle Trevizo  
Ailin Del Carmen Valdivia-  
McCarthy  
Estefanía Vicens  
Teagan Marie Whaley  
Aspen Rose Wheeler  
Katherine Winchell  
Pinkie Lee Young

**K-12 TEACHERS**

Karen O. Blount  
Olga Crnosija  
Charlie Starr Estrada  
Michael Freedman  
Turtle Haste  
Dieuwertje Kast  
Yolanda Lee-Gorishti  
Laura Preston  
Meaghan Richardson  
Samuel N. Saenz  
James Harris Sammons III  
Joseph Anthony Schrank  
Ryan Martin Serrette  
Pamela Simmons-Brooks

Meri Spezialetti  
Jill E. Weaver  
Ralph Winrich

**AFFILIATES**

Judson B. Clifton  
Catherine D'aragon  
James Scot Gillmore  
Sarah Grimm  
Melanie Holmes  
Charles R. Hutchinson Jr.  
John Johnson  
Raymond Kaspar  
Malcolm Katzenbach  
Linda M. Kilmer  
Edward Lee  
Scott Liming  
Kenneth W. Marks  
Tammy C. Marks  
Soraya McKee  
James Martin Miller  
Pamela S. Nelson  
Chappuis Philippe  
Wesley Quinn  
Klaus Peter Rettcher  
Marshall Rich  
Helia Rivera  
Stephen Sepe  
David I. Spanagel  
John Francis Turpin  
Mark H. Valentin  
Robert W. Wagner

# 2017–2018 Division and Interdisciplinary Interest Groups (IIG) Officers and Past Chairs

## ■ ARCHAEOLOGICAL GEOLOGY DIVISION

Richard Dunn, Chair  
Laura Murphy, Vice-Chair  
Judson Finley, Secretary-Treasurer  
Cynthia M. Fadem, Past Chair

## ■ ENERGY GEOLOGY DIVISION

Marc L. Buursink, Chair  
Laura S. Ruhl, First Vice-Chair  
Travis McLing, Second Vice-Chair  
Cortland F. Eble, Secretary-Treasurer  
J. Fred McLaughlin, Past Chair

## ■ ENVIRONMENTAL & ENGINEERING GEOLOGY DIVISION

Jessica E. Witt, Chair  
Stephen L. Slaughter, Chair-Elect  
Ann Carter Witt, Secretary  
Thad A. Waskiewicz, Past Chair

## ■ GEOBIOLOGY AND GEOMICROBIOLOGY DIVISION

Simon A. F. Darroch, Chair  
Rowan Martindale, Vice Chair  
Lydia Tackett, Secretary  
Victoria Petryshyn, Treasurer  
Marc Laflamme, Past Chair

## ■ GEOINFORMATICS DIVISION

Leslie Hsu, Chair  
Xiaogang Ma, First Vice-Chair  
TBD, Second Vice-Chair  
Anders Noren, Secretary-Treasurer  
Denise J. Hills, Past Chair

## ■ GEOLOGY AND HEALTH DIVISION

Saugata Datta, Chair  
Nelson Eby, First Vice-Chair  
Malcolm Siegel, Second Vice-Chair  
Jean Morrison, Secretary-Treasurer  
Thomas H. Darrah, Past Chair

## ■ GEOLOGY AND SOCIETY DIVISION

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John A. Chermak, First Vice-Chair  
Beth Bartel, Second Vice-Chair  
James Heller, Secretary-Treasurer  
David W. Szymanski, Past Chair

## ■ GEOPHYSICS DIVISION

Carol A. Stein, Chair  
Diane Doser, Vice-Chair  
Benjamin Drenth, Secretary-Treasurer  
Nicholas C. Schmerr, Past Chair

## ■ GEOSCIENCE EDUCATION DIVISION

Natalie Bursztyn, Chair  
Robyn Mieko Dahl, First Vice-Chair  
Elizabeth Petrie, Second Vice-Chair  
Andy Darling, Secretary-Treasurer  
Shane V. Smith, Past Chair

## ■ HISTORY AND PHILOSOPHY OF GEOLOGY DIVISION

Dorothy Sack, Chair  
Michael S. Smith, First Vice-Chair  
Yildirim Dilek, Second Vice-Chair  
Kathleen Lohff, Secretary-Treasurer  
Joanne Bourgeois, Past Chair

## ■ HYDROGEOLOGY DIVISION

Stephen J. Van der Hoven, Chair  
William (Bill) L. Cunningham, First Vice-Chair  
Ben Rostron, Second Vice-Chair  
Eric W. Peterson, Secretary-Treasurer  
Abe E. Springer, Past Chair

## ■ KARST DIVISION

Jason Polk, Chair  
Jonathan B. Sumrall, First Vice-Chair  
Joshua Feinberg, Secretary  
Ben Tobin, Treasurer  
Pat Kambesis, Webmaster/Social Media  
Cory W. BlackEagle, Past Chair

## ■ LIMNOGEOLOGY DIVISION

Scott W. Starratt, Chair  
Lisa E. Park Boush, Vice-Chair/Chair-Elect  
Michelle F. Goman, Secretary  
David B. Finkelstein, Treasurer  
Johan C. Varekamp, Past Chair

## ■ MINERALOGY, GEOCHEMISTRY, PETROLOGY, AND VOLCANOLOGY DIVISION

Anita L. Grunder, Chair  
John W. Shervais, First Vice-Chair  
Rosemary Hickey-Vargas, Second Vice-Chair  
J. Alexander Speer, Secretary-Treasurer  
Wendy A. Bohrsen, Past Chair

## ■ PLANETARY GEOLOGY DIVISION

Bradley J. Thomson, Chair  
Sharon A. Wilson Purdy, First Vice-Chair  
Emily Martin, Second Vice-Chair  
Bedra Hurwitz Needham, Secretary-Treasurer  
James J. Wray, Past Chair

■ **QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION**

Tammy M. Rittenour, Chair  
Grant Meyer, First Vice-Chair  
Martha Eppes, Second Vice-Chair  
Sarah Brown Lewis, Secretary  
Scott F. Burns, Treasurer  
Anne J. Jefferson, Newsletter Editor/Web Manager  
Glenn D. Thackray, Past Chair

■ **SEDIMENTARY GEOLOGY DIVISION**

Gary L. Gianniny, Chair  
Amy Weislogel, Vice-Chair  
Linda C. Kah, Secretary-Treasurer  
Katherine A. Giles, Past Chair

■ **STRUCTURAL GEOLOGY AND TECTONICS DIVISION**

Margaret E. Rusmore, Chair  
Paul Umhoefer, First Vice-Chair  
Nancye Dawers, Second Vice-Chair  
Eric Cowgill, Secretary-Treasurer  
James (Jim) P. Evans, Past Chair

**INTERDISCIPLINARY INTEREST GROUPS (IIG)**

■ **SOILS IIG**

Zsuzsanna Balogh-Brunstad, Chair  
Gary Stinchcomb, Chair-Elect  
Neil J. Tabor, Past Chair

■ **INTERNATIONAL IIG**

Gregory Hoke, Chair  
TBD, Community Administrator

■ **CONTINENTAL SCIENTIFIC DRILLING IIG**

James Russell, Chair



## In Memoriam



The Society notes with regret the deaths of the following members (notifications received between 1 Sept. and 31 Oct. 2017).

**Charles F. Berkstresser Jr.**  
Carmichael, California, USA  
Date of death: 22 Sept. 2017

**Lawrence Tilford Larson**  
Sparks, Nevada, USA  
Date of death: 5 Dec. 2016

**Luther F. Rogers Jr.**  
New Orleans, Louisiana, USA  
Date of death: 21 Nov. 2016

**Milton C. Blake Jr.**  
Bellingham, Washington, USA  
Date of death: 5 Aug. 2017

**Richard Byrd McMullen**  
Kensington, Maryland, USA  
Date of death: 10 June 2017

**Michael J.P. Welland**  
London, UK  
Date of death: 12 Oct. 2017

**William C. Corea**  
San Ramon, California, USA  
Date of death: 11 Sept. 2017

**John D.A. Mollard**  
Regina, Saskatchewan, Canada  
Date of death: 13 Sept. 2017

**John R. Wilson**  
Ojai, California, USA  
Date notified: 12 Sept. 2017

**Jim L. Jackson Sr.**  
Kent, Ohio, USA  
Date of death: 25 May 2017

**John Pojeta Jr.**  
Rockville, Maryland, USA  
Date of death: 6 July 2017

**Vincent T. Larsen**  
Billings, Montana, USA  
Date of death: 26 Mar. 2017

**Charles L. Rice**  
Elon, North Carolina, USA  
Date of death: 19 Aug. 2017



# SCIENCE EDITOR

## OPENINGS FOR 2019

GSA is soliciting applications and nominations for science co-editors with **four-year terms beginning 1 January 2019**. 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** If applicable, research interests that complement the continuing editors are listed.

**ENVIRONMENTAL & ENGINEERING GEOSCIENCE** Hydrogeology; low-T geochemistry; geomorphology; and/or environmental geophysics.

**GSA BOOKS** Editor duties include soliciting high-quality book proposals and ensuring proper peer review procedures. The successful candidate will have a wide range of interests and expertise, prior editing experience, and a strong publication record.

**LITHOSPHERE** Tectonics and structural geology; geomorphology and neotectonics; metamorphic geology.

**GSA BULLETIN** Deformation; geochemistry; paleoclimatology; Precambrian geology; seismology; stratigraphy; structural geology; volcanology.

**GSATODAY**, one of the most widely read earth science publications in the world, seeks an editor who has a wide range of interests and expertise, the ability to identify research topics of both high quality and broad appeal, a strong publication record, and prior editing experience.

**GEOSPHERE** Deformation; geodynamics; geophysics; marine geophysics; seismology; structural geology; tectonics; geodesy; tectonophysics.

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](mailto: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 2018**.

**E&EG** ▶ 1 position

**GSA Books** ▶ 1 position

**Lithosphere** ▶ 1 position

**GSA Bulletin** ▶ 1 position

**GSA Today** ▶ 1 position

**Geosphere** ▶ 1 position

### 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.

## Call for GSA Committee Service

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

**Deadline:** 15 June 2018

**Terms begin 1 July 2019** (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.

View open positions and access the nomination form at [www.geosociety.org/nominate](http://www.geosociety.org/nominate). GSA Headquarters Contact: Dominique Olvera, GSA, P.O. Box 9140, Boulder, CO 80301-9140, USA; fax: +1-303-357-1060; [dolvera@geosociety.org](mailto:dolvera@geosociety.org).

**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.

### ANNUAL PROGRAM COMMITTEE

**Two vacancies: one Member-at-Large (4-year term; B, E, M); one Member-at-Large student (2-year term; B, E, M)**

This committee is charged with developing a plan for increasing the quality of the annual and other society-sponsored meetings in terms of science, education, and outreach; evaluate the technical and scientific programs annually to identify modifications necessary for accomplishing the Societies long-range goals; conduct short and long-range planning for the society meetings as a whole; and develop a long-term logistical plan/strategy for the technical programs of all GSA meetings and other society-sponsored meetings. One member-at-large should have previous meeting experience.

### ARTHUR L. DAY MEDAL AWARD

**Two Member-at-Large vacancies (3-year term; 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.

### DIVERSITY IN THE GEOSCIENCES COMMITTEE

**Two Member-at-Large vacancies (3-year term; E, M)**

This committee provides advice and support to GSA Council and initiates activities and programs that will increase opportunities for people of an 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

**Three vacancies: One Four-Year College Faculty Representative (4-year term; B, E, M), one Member-at-Large (4-year term; B, E, M), one Graduate 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.

### GEOLOGIC MAPPING AWARD COMMITTEE

**Two vacancies: One Member-at-Large (3-year term; E); one Student Member-at-Large (3-year term; E)**

The purpose of this committee is to generate, receive, and evaluate candidates for the 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. The objective is to encourage training and support toward the production of excellent, accurate, detailed, purposeful geologic maps and cross sections. With respect to size or scale, there are no restrictions on map products. GSA’s Geologic Mapping Award will be made on an annual basis, leaving the option open for multiple awards to be given under unusual circumstance in any given year; or to make no award in any given year.

### GEOLOGY AND PUBLIC POLICY COMMITTEE

**One vacancy: Member-at-Large (3-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 the 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: Member-at-Large, Secretary, IIG Chair, and Chair (4-year terms; E, M)**

Serve as GSA's coordination and communication resource 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 in international issues and serve as a channel for member-generated proposals for international themes.

## JOINT TECHNICAL PROGRAM COMMITTEE

### **Two vacancies: Member-at-Large, Member-at-Large–Marine/Coastal Geology (2-year term 1 Dec. 2018–30 Nov. 2020; 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: Member-at-Large–Academia (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. **Qualifications:** 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.

## NOMINATIONS COMMITTEE

### **Two Member-at-Large vacancies (3-year term; 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 CONFERENCES AND FIELD FORUMS COMMITTEE

### **Two Member-at-Large vacancies (3-year term; E)**

This committee reviews and approves Penrose Conference and Field Forum proposals and recommends and implements guidelines for the success of these meetings. **Qualifications:** Committee members must be past conveners of a Penrose Conference or Field Forum.

## PENROSE MEDAL AWARD COMMITTEE

### **Two Member-at-Large vacancies (3-year term; 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 vacancies: Student Member-at-Large (3-year term; E), Former Councilor (3-year term; 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.

## PUBLICATIONS COMMITTEE

### **One vacancy: Member-at-Large (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 with an annual report to Council that includes 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 financial information.

## RESEARCH GRANTS COMMITTEE

### **Nine Members-at-Large vacancies with various specialties (3-year term; 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

### **Two vacancies: Member-at-Large, Councilor/former Councilor (3-year term; 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!

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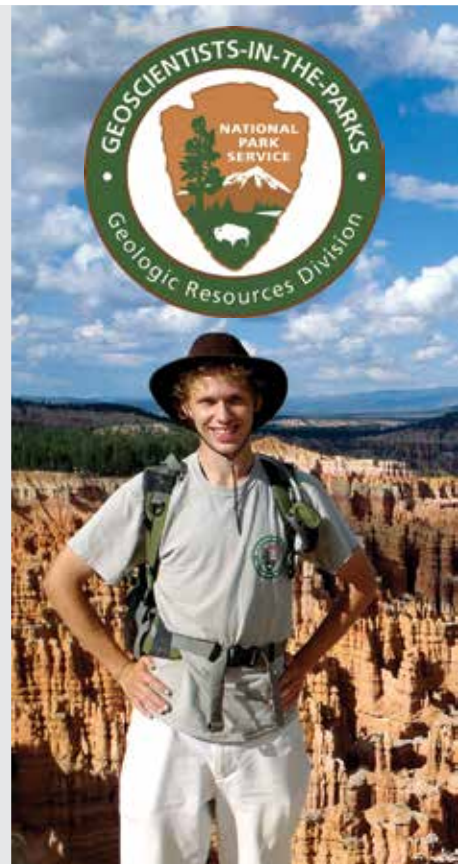
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[www.geosociety.org/gip](http://www.geosociety.org/gip)



# K-12 Field Workshop Schedule for 2018

Revisions to GSA's GeoTeachers program to create a series of annual professional development workshops are well under way, as can be seen on the updated GeoTeachers website ([www.geosociety.org/geoteachers](http://www.geosociety.org/geoteachers)). During the multi-day workshops, teachers will:

- Focus on the local geology, geoscience processes, and hazards;
- Explore sites where geologic resource extraction, refining, and waste mitigation can be observed;
- Learn from geologists in academia, industry, and government;
- Participate in activities tied to classroom needs and local standards presented by master teachers;
- Obtain field guides, hand samples, and other resource materials for classroom use;
- Earn continuing education/graduate credit for professional development purposes;
- Join a community of practice with follow-up webinars and activities designed to assist classroom implementation.

## Tentative Workshops for 2018

Kansas—Lawrence: Earth Educator Rendezvous GeoTeachers Field Trip: 12–15 July

Arizona—Flagstaff: 23–27 July

Colorado—Colorado Springs: 31 July–3 August

Indiana—Indianapolis: Annual Meeting Mini Workshop: 2–4 November

Details on the specific workshops will be announced on the GeoTeachers website as they become available. Teachers interested in participating in these workshops should register their interest at <http://bit.ly/2eHUssk> to be included on the workshop-specific mailing list.

Geoscience educators, scientists, and practicing geologists interested in sharing their expertise, field knowledge, or contacts related to these or future GeoTeachers workshops should register their interest at <http://bit.ly/2y7SveW>.

For more information contact Dean Moosavi, [smoosavi@geosociety.org](mailto:smoosavi@geosociety.org), +1-303-357-1015, or go to [www.geosociety.org/geoteachers](http://www.geosociety.org/geoteachers).



## GeoCorps Enterprise

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# FIELD CAMP Scholarships

GSA and the GSA Foundation are proud to announce that Field Camp Scholarships will be available to undergraduate geology students for the summer of 2018. 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. Applications will be due in February 2018. Questions? Contact Jennifer Nocerino at [jnocerino@geosociety.org](mailto:jnocerino@geosociety.org).



**GSA FOUNDATION**

# Position Statement DRAFT

## Removing Barriers to Career Progression for Women in the Geosciences

GSA members are invited to submit comments and suggestions regarding the following Position Statement draft by 15 Feb. 2018 at [www.geosociety.org/PositionStatements](http://www.geosociety.org/PositionStatements).

### STATEMENT

The Geological Society of America (GSA) strongly endorses the right for all to work in a safe and supportive environment where trust, respect, equity, fairness, accountability, and justice are honored. Data reveal that women are underrepresented in the geoscience workplace and women of color even more so. Women frequently face systemic challenges: They are often paid less than men for the same jobs; receive fewer professional awards to recognize their accomplishments; are disproportionately burdened by service roles; are disadvantaged if they follow alternative career paths due to life circumstances; and often are perceived as less competent than males with identical accomplishments and qualifications. In addition, women of color experience the double bind of gender and racial discrimination, which provides additional challenges to equity. GSA is committed to policies, programs, and services that will ensure the success of women in the geoscience professions.

### Purpose

This position statement (1) affirms the pressing need for a change in professional culture so that all people are welcomed, supported, and thrive in the geoscience profession, and for policies that aspire to the highest standards of conduct as a professional society; (2) advocates for resolving implicit and explicit biases and the elimination of harassment, including bullying and sexual misconduct in the workplace; and (3) recommends elevated personal and professional responsibility and evidence-based policies that extend beyond civil and legal remedies, to promote inclusive, safe, and productive environments in the geoscience classroom, office, laboratory, and field.

### RATIONALE

#### Underrepresentation of Women in the Workplace

Women account for 47% of the United States workforce, but only 28% of geoscientists and environmental scientists. Furthermore, in the geosciences women hold only 15% of full professor positions despite earning 43% of doctoral degrees. Women of color represent less than 5% of geoscience degrees and less than 1% of all geoscience faculty positions, despite minority women comprising 18% of the United States population. The geoscience profession, and society at large, cannot afford to lose this human capital if we are to remain at the forefront of discovery and innovation critical to understanding Earth and its interactions with human society.

## Summary of Systemic Challenges to the Success of Women in the Geosciences

Research indicates that women routinely face more challenges in career advancement than men. The recommended reading list at the end of this document provides the research foundation that supports the rationale for this position statement. Challenges faced by women include both “push” and “pull” factors. Push factors are those that nudge women out of their chosen career paths; e.g., a negative culture toward women in STEM, implicit bias, micro-aggressions, and other subtle hostilities; and the less subtle sexual harassment, harassment in general, and bullying. Inequities such as lower salaries, lower performance reviews, less mentoring, fewer opportunities for informal networking within a male-dominated field, and diminished opportunities for professional rewards and recognition are well documented. Pull factors impact women by pulling them away from the workplace. For example, women are more likely than men to bear a disproportionate burden of familial responsibilities, particularly when the workplace lacks family-friendly policies and flexible career paths for women. Dual career situations may also disadvantage women (the male partner is more likely to have more lucrative compensation). Research shows that women with children are far less likely to enter a tenure-track position compared to men with children; whereas women without children are roughly as successful as men with children in obtaining tenure-track positions.

### Pressing Need for Resolving Implicit and Explicit Biases

Implicit and explicit biases are beliefs and associations that impact our perceptions and decision-making processes. These biases result from prevailing stereotypes in society and can include race, gender, age, religion, appearance, disability, etc. To ensure equity in the geoscience community, these biases must be acknowledged and proactively addressed by the entire geoscience community. The consequences of such biases are numerous and well-documented in both STEM and non-STEM fields. Women are far less likely than men to receive glowing letters of recommendation and are more likely to receive negative teaching evaluations compared to equivalent males. They are perceived as less competent than men with similar qualifications, and are more likely to be assigned manual labor and supporting roles rather than big picture ideas and leadership. Women make up a disproportionately small percentage of reviewers for geoscience journals. Research also suggests that male co-authors are perceived as having contributed more than female co-authors. In addition, women are more likely than men to be criticized for assertive behavior—women who negotiate higher salaries are perceived as “bossy” or “too aggressive” compared to men. Women also hesitate to accept leadership positions because of the negative stereotype of aggressiveness associated with such positions. This is compounded by the observation that women have less access to senior leaders, even though mentorship by senior leaders is considered essential for professional success. Women and minorities are also less likely to receive enthusiastic Ph.D. mentorship compared to white male students and are underrepresented in the



number of professional awards conferred in the geoscience profession. Further troubling is that women of color experience the double bind of gender as well as racial and ethnic biases, also known as intersectionality. For example, a study found that almost half of black and Latina women scientists had been mistaken as janitors and support staff. In a similar vein, black Ph.D. scientists are less likely to receive grant funding compared to white Ph.D. scientists with a similar research record, and CVs with traditionally white names are significantly more likely to receive callbacks for job interviews compared to identical CVs with ethnic names.

### Pressing Need for Elimination of Harassment

Women scientists disproportionately face the threat of harassment. These threats range from sexual assault (unwanted physical contact) and coercion (*quid pro quo*), to unwanted sexual attention, bullying, insulting, and other demeaning behaviors that derive from asymmetric and hierarchical power distributions. Further compounding the problem is reluctance on the part of many male faculty members to accept evidence of gender bias and to be more likely to deny any occurrence of sexual misconduct in the workplace. Silence is complicity, and neutrality in situations where harassment arises is not an acceptable option. Empowering bystanders to act and developing ally networks are essential steps toward changing the culture of acceptance.

### Advocating for a Change in Professional Culture

Addressing systemic injustices and barriers to career progression for women in the geosciences requires recognition and resolution of bias and elimination of harassment. This can only be achieved by changing the factors and conditions that affect our professional culture. Depending on civil or criminal remedies is not enough and deflects away from the personal, professional, and moral responsibility that we must own. In order to change our professional culture, we advocate for evidence-based strategies to overcome barriers and increase the recruitment, retention, and re-entry of women in the geosciences. These include the following:

- Educating the geoscience workforce on the presence, nature, and impact of implicit biases. This includes promoting fair assessments by using blind evaluations (removing gender, race, maternity, age, disability, and ethnicity identifiers where possible); establishing and communicating clear criteria for success before reviewing candidate applications; and having people on every evaluative committee with training on the impact of implicit bias on evaluations.
- Establishing zero tolerance for sexual harassment, harassment, and bullying.
- Establishing family-friendly policies that will enable the full participation of women regardless of their personal or professional situation.
- Promoting flexible career paths that accept and value alternate pathways to and within the geoscience profession.

### PUBLIC POLICY ASPECTS

GSA is strongly committed to adopting policies that promote a professional culture that is welcoming, inclusive, supportive, and fair to all. These policies should identify and address issues that unjustly impact the professional development of women in the

geosciences, and should be applied to all GSA functions, such as membership, governance, meeting and field-trip participation, and award consideration.

This statement recommends that GSA promote awareness of implicit and explicit bias by disseminating the data that demonstrate bias in candidate selection for scholarships, graduate school admission, honors and awards, and geoscience jobs. GSA should produce collaborative op-eds and research papers on this topic, distribute this information at workshops, set high standards of conduct at all GSA events, and circulate this information in GSA governance to increase the recognition of bias and thereby reduce its impact.

### RECOMMENDATIONS

GSA leadership and its members are encouraged to take the following actions to actively promote the success of women in the geosciences following the principles of diversity and equality:

- GSA should ensure that all members understand their responsibility to behave in a professional manner. GSA is encouraged to implement and vigorously oversee the Respectful Inclusive Scientific Events (RISE) program, which requires professional conduct among members and the safety of all who participate in GSA-sponsored activities.
- GSA should ensure that representative voices are present, heard, and respected in all GSA service roles.
- GSA should advocate for and promote policies that support families, such as providing recommendations on dual career, workforce re-entry, stop-the-clock, and family support programs.
- GSA should continue developing and promoting scholarship and mentoring programs for students from underrepresented groups and fund those initiatives with demonstrated success.
- GSA should provide Implicit Bias and Bystander Intervention training to all GSA employees, Division and committee leadership, Council members, Foundation Trustees, and awards canvassing and selection committee members. This training is needed to ensure that implicit bias is minimized in GSA governance and award selection.
- GSA members should serve as mentors, allies, advocates, and champions of women in their career progression.
- GSA should encourage further study of barriers and remedies to the full participation and career progression of women in the geosciences by promoting conference sessions, workshops, publication of rigorous studies thereof, and monitoring and evaluation.

### RECOMMENDED READINGS

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## The Tectonic Setting and Origin of Cretaceous Batholiths within the North American Cordillera

The Case for Slab Failure Magmatism and Its Significance for Crustal Growth

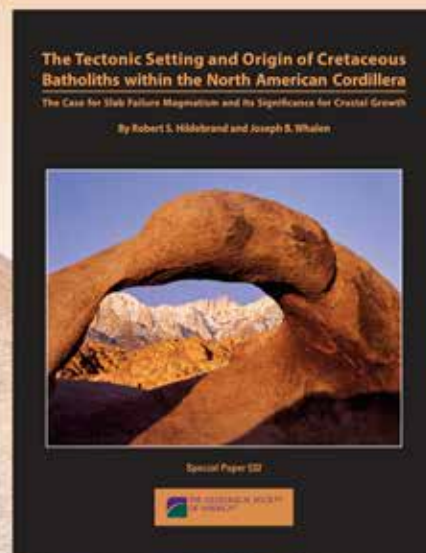
By Robert S. Hildebrand and Joseph B. Whalen

In this Special Paper, Hildebrand and Whalen present a big-picture, paradigm-busting synthesis that examines the tectonic setting, temporal relations, and geochemistry of many plutons within Cretaceous batholithic terranes of the North American Cordillera. In addition to their compelling tectonic synthesis, they argue that most of the batholiths are not products of arc magmatism as commonly believed, but instead were formed by slab failure during and after collision. They show that slab window and Precambrian TTG suites share many geochemical similarities with Cretaceous slab failure rocks. Geochemical and isotopic data indicate that the slab failure magmas were derived dominantly from the mantle and thus have been one of the largest contributors to growth of continental crust. The authors also note that slab failure plutons emplaced into the epizone are commonly associated with Cu-Au porphyries, as well as Li-Cs-Ta pegmatites.

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# Position Statements

GSA Council approved a new position statement, Geoscience and Energy Policy, at its October 2017 meeting. Council also approved minor revisions to four position statements: Data Access, Geoscience Data Preservation, Improving Natural Hazards Policies through Geoscience, and Visas for Foreign Scientists and Students. Full versions of these and other position statements are available at [www.geosociety.org/PositionStatements](http://www.geosociety.org/PositionStatements).

### **Geosciences and Energy Policy**

Development of a comprehensive energy policy that significantly reduces greenhouse gas emissions is essential for the future economic vitality, environmental well-being, and health and security of the citizens of the United States as well as other nations. Geoscientists locate, quantify, and help develop energy resources, and, along with professionals in other disciplines, assess and mitigate the impact of energy-resource development, operations, and use on the environment. Accordingly, input from geoscientists must be an integral part of all energy policy deliberations.

### **Data Access**

GSA strongly supports open access to scientific data to promote advancement in research, support education, and improve the economic progress, health, and welfare of society.

### **Geoscience Data Preservation**

GSA supports the preservation of geoscience samples and data sets for the public good and urges public and private sector organizations and individuals to routinely catalog and preserve their collections and make them widely accessible.

### **Improving Natural Hazards Policies through Geoscience**

Natural hazards are the results of Earth processes, which in some circumstances are exacerbated by human activity. Reducing the vulnerability of human populations, the built environment, and ecosystems to disastrous consequences from natural hazards is a social responsibility and an achievable policy imperative. Policy makers should address vulnerability to hazard impacts through promotion and adoption of effective strategies for risk reduction and resilience. Public policies that rely on geoscience are needed to investigate the causes of natural hazards, avoid those that are preventable, and limit the negative effects of hazards on public health, safety, and the environment. GSA urges scientists, policy makers, risk managers, and the

public to work together to reduce our vulnerability to natural hazards. GSA strongly endorses greater integration of geoscience into prevention and mitigation programs, policies, and practices through:

- Government investment in research, monitoring, and outreach programs to better characterize the nature and distribution of natural hazards and their impacts on modern society;
- Increased focus on geohazards literacy in natural hazards awareness campaigns;
- Enlisting the resources of the private sector in hazards and disaster risk-reduction strategies;
- Effective communication and implementation of geoscience research and monitoring results into functional public policy and private sector decision-making for mutual benefit; and
- Incorporation of geoscience into scientifically sound educational programs at all levels.

### **Visas for Foreign Scientists and Students**

GSA endorses a United States visa system that supports international scientific exchange and cooperation. Government visa policy is especially important to the earth sciences as earth science is inherently an international endeavor because it is not possible to understand Earth by studying only those parts of the planet that fall within the boundaries of a single country. Progress in earth science requires international field research, participation in international conferences, access to international research facilities, and other activities that involve international exchange and cooperation. Delays in issuing visas to earth scientists responding to natural disasters—such as earthquakes, tsunamis, volcanic eruptions, and floods—can result in loss of life, loss of property, and loss of scientific opportunities. Earth scientists can help prevent some natural hazards from becoming natural disasters through international exchange and collaboration.

## Geoscience Jobs & Opportunities

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

Classification	Per Line for 1st month	Per line each addtl' month (same ad)
Positions Open	\$9.30	\$9.25
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Opportunities for Students		
First 25 lines	\$0.00	\$5.00
Additional lines	\$5.00	\$5.00

### Positions Open

#### ASSISTANT PROFESSOR STRUCTURAL GEOLOGY

##### TARLETON STATE UNIVERSITY

The Department of Chemistry, Geosciences, and Physics at Tarleton State University, in Stephenville, Texas, invites applications for an Assistant Professor tenure-track position in structural geology to start Fall 2018. The successful candidate will support the geosciences program through engaging, student-centered teaching, develop an active research program that involves undergraduates, and actively contribute to service and outreach initiatives that advance the department, college, and university. Candidates will be expected to instruct the following courses: Structural Geology, Plate Tectonics, Basin Analysis, Physical Geology, Natural Disasters, and other courses as deemed fitting. All submissions must be made electronically through Tarleton's employment site, <https://jobs.tarleton.edu>. Review of applications will begin February 1, 2018, and continue until the position is filled. Tarleton State University is an Equal Opportunity/Affirmative Action/Veterans/Disability Employer. As a member of The Texas A&M System, Tarleton will provide equal opportunity for employment to all persons regardless of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation or gender identity and will strive to achieve full and equal employment opportunity through The Texas A&M System.

**Required Qualification:** Candidates must hold a Ph.D. in structural geology or a related field. ABD status may be considered as long as all degree requirements, including dissertation, defense of dissertation, and comprehensive examinations, have been successfully completed by time of appointment—September 1, 2018. Candidates must have the ability to apply and teach in a dynamic field environment. In addition, candidates must demonstrate potential for outstanding teaching, potential to develop an active research program that involves students, and strong verbal and written communication skills.

**Preferred Qualifications:** Ability to teach additional courses from wider background is preferred, but not essential. A candidate whose research complements a growing concentration in petroleum geology, particularly those focusing on regional or basin-scale tectonics, petroleum exploration, or subsurface fracturing and fluid flow is ideal.

#### ENDOWED CHAIR IN STRUCTURAL GEOLOGY JACKSON SCHOOL OF GEOSCIENCES UNIVERSITY OF TEXAS AT AUSTIN

The Department of Geological Sciences in the Jackson School of Geosciences at the University of Texas at Austin is looking for an Endowed Chair in Structural Geology to take up a tenured position at the full professor level.

We seek a creative individual with a vigorous science program who uses constraints from the field to enhance our understanding of the processes that shape the planet. We take a broad view of the often inter- and cross-disciplinary research addressed by structural geology but an ability to extract constraints on the ground, teach structural geology, and mentor field-based students is required.

We also put emphasis on synergy and collegiality and seek an individual who complements the range of research efforts at the department and the Jackson School, and whose interests are aligned with departmental strengths such as in lithospheric dynamics.

The appointee is expected to establish a world-class research program and fulfill regular teaching, mentoring, and service roles at the department and should have a proven record of obtaining external research funding. The department is interested in building a culturally diverse intellectual community; we strongly encourage applications from all underrepresented groups.

As part of the Jackson School of Geosciences, the Department of Geological Sciences has ~50 faculty and a community of ~90 research scientists in the Institute for Geophysics and Bureau of Economic Geology, with a broad range of specialties, as well as access to outstanding research facilities and support.

Applicants should submit a letter of application, curriculum vitae, 2-page statements of research and teaching interests, and contact information for five references. Submit electronic copies of these materials online at [apply.interfolio.com/47139](https://apply.interfolio.com/47139). For questions related to the search, please contact [dgs@jsge.utexas.edu](mailto:dgs@jsge.utexas.edu). Review of applications will begin immediately and continue until the position is filled.

#### TENURE TRACK ASSISTANT PROFESSOR, PETROLOGY TULANE UNIVERSITY

Department of Earth & Environmental Sciences

The Department of Earth and Environmental Sciences at Tulane University invites applications for a tenure track faculty position in petrology, at the rank of Assistant Professor. We seek a broad-based Earth scientist who complements current faculty expertise and will build an externally funded research program that will attract high caliber Ph.D.-level graduate students. Possible areas of core expertise include, but are not limited to: igneous petrology, volcanology, high-temperature geochemistry, metamorphic petrology and thermochronometry. Applicants must hold a doctorate in an appropriate field and have a demonstrated ability to conduct outstanding research. We seek

applicants committed to mentoring undergraduate and graduate students; teaching duties are at both the graduate and undergraduate levels. For full consideration, applications should be received by January 15, 2018, but the position will remain open until filled. Applications should include a curriculum vitae, research and teaching statements that articulate how the mission of the department would be enhanced, and the names and contact information of at least three references. Applications must be submitted electronically via the following link: [apply.interfolio.com/46806](https://apply.interfolio.com/46806). Any inquiries may be directed to Dr. Nancye Dawers, Department of Earth and Environmental Sciences, Tulane University, 6823 St. Charles Ave., New Orleans, LA 70118-5698 ([ndawers@tulane.edu](mailto:ndawers@tulane.edu)). Further information about the department and university can be obtained at <http://tulane.edu/sse/eens>. Tulane University is an EEO/ADA/AA employer.

#### ASSOCIATE DIRECTOR CLIMATE & GLOBAL DYNAMICS NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

The National Center for Atmospheric Research (NCAR) in Boulder, Colorado, has a job opening for NCAR Associate Director—Climate & Global Dynamics (CGD)

To submit an application: <https://ucar.silkroad.com/epostings/index.cfm?fuseaction=app.jobinfo&jobid=218270&version=1#.Wh3uOHX5lh8.gmail>.

**What You Will Do:** Reporting to the NCAR Director, the Associate Director for CGD is responsible for the overall scientific and strategic mission, productivity, and excellence of the Laboratory. This includes CGD's vision and mission and the leadership and management of the implementation of long and short-term planning that supports the CGD and NCAR mission. The Director is responsible for the effective management and administration of the Laboratory.

The Director fosters interaction and collaboration between NCAR, University Corporation for Atmospheric Research (UCAR) staff and programs. In addition, the Director is responsible for program advocacy in a number of forums including government agencies, UCAR member and non-member institutions and the scientific community at large.

As a member of the NCAR Executive Committee, the director shares in NCAR management deliberations and decisions, and providing advice on matters such as scientific goals, initiatives and standards, budgets, priorities, policies, and programs.

**Education Requirement:** Ph.D. in a science discipline relevant to the mission of the laboratory and at least ten years' experience managing complex science programs, or an equivalent combination of education and experience.

#### TENURE-TRACK, ASSISTANT PROFESSOR, CRUSTAL DYNAMICS UNIVERSITY OF WYOMING

The University of Wyoming Department of Geology & Geophysics invites applications for a tenure-track, Assistant Professor position in Crustal Dynamics. The successful candidate will be



expected to build a vibrant, extramurally funded research program in the broadly defined area of crustal processes and contribute to the teaching mission of the department. We seek applicants who complement existing research strengths within the department and across the university. Research focus is open including, but not limited to, lithospheric deformation, basin analysis, Earth surface processes, and the interplay of crustal processes with the biosphere or atmosphere. We particularly encourage applicants who address questions from the grain scale to the global scale and who integrate field, theoretical, experimental, and/or modeling approaches. The complete advertisement and online application system can be found at <https://tinyurl.com/UWyoGeoJob1>.

**ASSISTANT PROFESSOR  
GEOLOGICAL SCIENCES  
UNIVERSITY OF MISSOURI**

The Department of Geological Sciences at the University of Missouri invites applications for a tenure-track position at the rank of Assistant Professor, with an anticipated Fall 2018 start. A Ph.D. in Geological Sciences or a related area is required. Successful applicants should have a demonstrated potential to conduct independent research, and effectively teach students across the curriculum at the graduate and undergraduate levels. We aim to recruit a faculty member with potential for scholarly excellence in one or more of the areas of mineralogy, petrology, structural geology, and tectonics.

The successful candidate will build on existing strengths in geochemistry and petrology, geophysics, and paleobiology. Our Department occupies a building dedicated to Geological Sciences, and houses analytical facilities [<https://geology.missouri.edu/research-facilities>] including a new X-ray Computed Tomography and Scanning Electron Microscopy laboratory, experimental petrology laboratories, and a high-performance computing cluster. Elsewhere on campus is a wide variety of geochemical instrumentation at the MU Research Reactor [<http://murr.missouri.edu>] and at other research core facilities [<https://research.missouri.edu/about/cores>].

Columbia, Missouri, is ranked among the top ten college towns in the U.S. As Missouri's largest public research university, MU has an enrollment of 30,000 students, and is a member of the Association of American Universities. The University of Missouri and the Department of Geological Sciences are fully committed to achieving the goal of a diverse and inclusive academic community of faculty, staff, and students. We encourage applications from individuals who can provide high-quality mentoring to a diverse group of students. The University of Missouri is an Equal Opportunity/Access/Affirmative Action/Pro Disabled & Veteran Employer.

Please apply on line at: <http://hrs.missouri.edu/find-a-job/academic>. Use the online application to upload (a) a letter of application that describes your teaching and research experience; (b) a CV; (c) a statement describing research and teaching interests, and plans of how to attract students to the geological sciences, including those students

who traditionally have been underrepresented. Three reference letters are required and should be sent (electronically or hard copy) to the Chair of the Search Committee ([SheltonKL@missouri.edu](mailto:SheltonKL@missouri.edu)). Applicants may contact the Chair of the Search Committee with any questions. Contact MU Human Resource Services ([muhrs@missouri.edu](mailto:muhrs@missouri.edu)) with specific questions about the application process. To request ADA accommodations, please contact the Office of Accessibility & ADA Education at +1-573-884-7278 or [CheekA@missouri.edu](mailto:CheekA@missouri.edu).

Review of application materials will begin January 15, 2018. To ensure full consideration, applications should be complete (including reference letters) by this date. The position will remain open until filled. The University of Missouri is an Equal Opportunity/Access/Affirmative Action/Pro Disabled & Veteran Employer.

**THOMAS VOGEL  
ENDOWED PROFESSORSHIP  
MICHIGAN STATE UNIVERSITY**

The Department of Earth and Environmental Sciences at Michigan State University is seeking an outstanding faculty candidate to fill the Thomas Vogel Endowed Professorship of the Solid Earth at the full professor rank with tenure. Exceptional candidates at the associate professor level may also be considered. This position contributes toward our mission of expanding upon a vigorous, internationally recognized Solid Earth program at MSU, serving to complement our dramatic growth in geophysics over the past few years.

Broadly defined as Solid Earth, we invite applicants with areas of expertise including, but not limited to, geochemistry, geophysics, geochronology, petrology, and lithospheric dynamics. Particular interest will be given to candidates with research that complements our current research strengths in geochemistry, mineral physics, geodynamics, and seismology. The successful applicant for this position will be expected to leverage substantial annual endowed resources that come with the professorship toward developing and maintaining a strong externally-funded research program.

A Ph.D. in Geological Sciences or related field is required. Applicants are expected to be leaders in the Solid Earth community and must have well-funded research programs and an exemplary record of scholarship. Although initial review of applications will begin on January 2, 2018, new applications will continue to be considered until the position is filled. Additional information and instructions for applying can be found on [www.careers.msu.edu](http://www.careers.msu.edu) (Posting 478215), and questions can be sent to the Search Chair, Allen McNamara, [allenmc@msu.edu](mailto:allenmc@msu.edu).

MSU is an affirmative action, equal opportunity employer and is committed to achieving excellence through diversity. All qualified applicants will receive consideration without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law. We endeavor to facilitate employment assistance to spouses or partners of candidates for faculty and academic staff positions.

**TENURE-TRACK FACULTY POSITION  
SEDIMENTOLOGY/SEDIMENTARY  
PETROLOGY, UNIVERSITY OF HOUSTON**

The Department of Earth and Atmospheric Sciences at the University of Houston invites applicants for a faculty appointment at the Assistant Professor level in the broad areas of sedimentology and sedimentary petrology. We encourage applicants with a research focus on any aspect of modern or ancient sedimentary systems who integrates field, laboratory, theoretical, and/or modeling approaches to the study of sedimentary deposits.

The successful candidate will join a department of 32 tenure-track faculty with diverse expertise in tectonics, petroleum geology, exploration geophysics, isotope geochemistry, remote sensing, and anticipated growth in the study of sedimentology/sedimentary petrology. The successful candidate will be expected to build a vigorous externally funded research program and demonstrate productivity via peer-reviewed publication. Candidates will also be expected to teach at both the undergraduate and graduate levels as well as to mentor M.S. and Ph.D. students. We expect to fill this position by August, 2018. Candidates must have a Ph.D. in Earth Science or a related field at the time of the appointment. We will begin reviewing applications by December 1, 2017.

Application Procedures: Candidates should submit: 1) a letter of application including statement of teaching and research interests, 2) a curriculum vitae, 3) a list of possible references. Applications should be submitted online through: <https://jobs.uh.edu/>. A background check is required prior to interviewing. Further information can be obtained on the departmental web page at <http://www.eas.uh.edu> or by calling 713-743-3399.

The University of Houston is an Equal Opportunity/Affirmative Action Employer. Minorities, women, veterans, and persons with disabilities are encouraged to apply.

The University of Houston is responsive to the needs of dual career couples.

The University of Houston, with one of the most diverse student bodies in the nation, seeks to recruit and retain a diverse community of scholars.

**Opportunities for Students**

**Graduate Student Opportunities (MS), Ohio University.** The Department of Geological Sciences at Ohio University invites applications to its graduate program for the Fall of 2018. 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](mailto:hembree@ohio.edu)). Review of applications begins February 1, 2018.

**Doctoral Fellowships Available, Montclair State University.** Ph.D. in Environmental Management, Montclair State University. Full financial support (stipend and tuition) is available for outstanding students interested in a Ph.D. in Environmental Management at Montclair State University, starting September 2018. Our Ph.D. in Environmental Management program is unique in integrating natural and physical science with social science, economics, policy, and project management to prepare environmental managers to tackle society's most complex and pressing environmental problems. We seek highly motivated students to pursue research in areas related to any of following:

- Earth Systems Science and Climate Change
- Environmental Quality and Remediation
- Urban Ecology, Biodiversity, and Ecosystem Management
- Watershed and Coastal Management
- Applications of Deterministic and Stochastic Dynamical Systems to Environmental Problems
- Environmental Economics and Alternative Energy Markets and Policy
- Resource Management and Conservation
- Business and Sustainability

Candidates please visit us at <http://www.montclair.edu/csam/environmental-management-phd/> and contact an Environmental Management doctoral faculty member to identify potential faculty mentors and research projects.

Qualifications: At a minimum, a bachelors (masters preferred) in biology, chemistry, computer science, economics, earth and environmen-

tal science, environmental policy, engineering, geography, geoscience, management, mathematics, sustainability science, or other field related to environmental management.

Candidates should apply online at <http://www.montclair.edu/graduate/prospective-students/applications/>. Apply before January 15 to start this unique program in September 2018. Please contact the program director, Dr. Mark Chopping ([choppingm@montclair.edu](mailto:choppingm@montclair.edu)) for more information.

## Hiring?

Find those qualified geoscientists to fill vacancies. Use print issues of *GSA Today* and GSA's Geoscience Job Board ([geosociety.org/jobs](http://geosociety.org/jobs)).

Bundle and save for best pricing options.

That unique candidate is waiting to be found.

## URBAN METRO TRAVEL GRANT TO NEGSA 2018

**Application deadline: 23 Feb.**

Do you work full-time or care for dependents while earning your undergraduate degree? You may be eligible to apply for a travel award to attend the Northeastern Section Meeting (NEGSA), 18–20 March 2018 in Burlington, Vermont, USA. Check the student tab on the Northeastern Section website ([www.geosociety.org/ne-mtg](http://www.geosociety.org/ne-mtg)) for eligibility guidelines and an application. If you have questions, please email Tahlia Bear at [tbear@geosociety.org](mailto:tbear@geosociety.org).



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Photo by Bret Webster.

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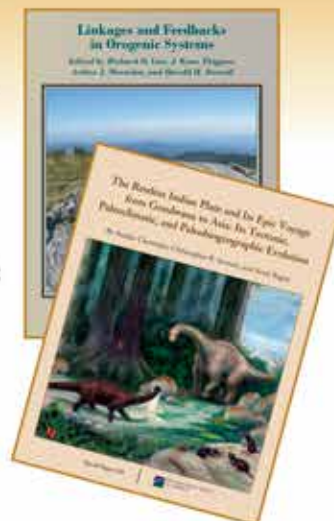
Special Papers and Memoirs are two of the book series published by GSA. Volumes in these series are:

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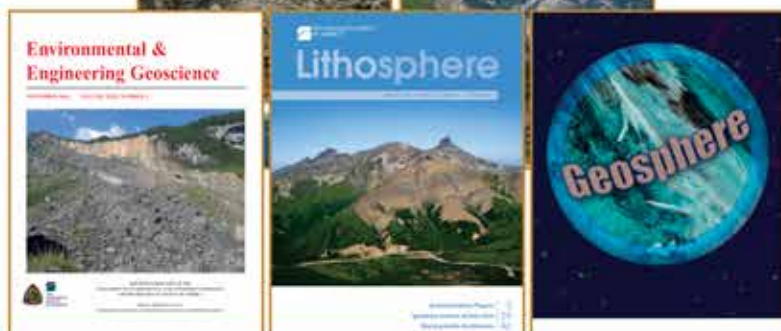
Science Editors:

- ▶ **Richard A. "Skip" Davis Jr.**  
Harte Research Institute, Texas A&M University
- ▶ **Christian Koeberl**, University of Vienna

Details: <http://tinyurl.com/GSA-book-guide>  
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# MAKE AN IMPACT: Publish with GSA



#### NEW IN 2018

*Geosphere* and *Lithosphere* will be 100% open access beginning in January 2018.

ALSO: GSA members will continue to have free online access to *Geology* in 2018.

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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 during the GSA 2017 Annual Meeting & Exposition in Seattle, Washington, USA, at our booth and at various programs throughout the meeting.



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 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 hear presentations on the progression of fieldwork, from past to future. Many of you support important fieldwork opportunities through GSAF.



Graduate Student Research Grant recipients were recognized at the GSA Foundation's Penrose Circle donor reception. Many attendees help make these awards possible.



# Meet the New Editors

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

GSA thanks the editors whose terms ended 31 December 2017 for their service to the Society and to the science: Brendan Murphy, *Geology*; David Schofield, *GSA Bulletin*; and Steven J. Whitmeyer, *GSA Today*.

*Geosphere* science editor **Shan de Silva** has been appointed to a second term.

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

*Geology*, **Christopher Clark**, Curtin University

*Geosphere*, **David Fastovsky**, University of Rhode Island (starts June 2018)

*GSA Bulletin*, **Rob Strachan**, University of Portsmouth

*GSA Today*, **Mihai Ducea**, University of Arizona

The current list of editors is posted at [www.geosociety.org/GSA/Pubs/editors.aspx](http://www.geosociety.org/GSA/Pubs/editors.aspx).



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## SOME OF THE GEOLOGIC HIGHLIGHTS COVERED IN THIS BOOK

- Bruneau Sand Dunes State Park
- Hagerman Fossil Beds National Monument
- Box Canyon State Park
- Shoshone Falls and the Snake River Canyon
- Sculpted Rock at Black Magic Canyon
- Redfish Lake and the Sawtooth Range
- Malm Gulch's Fossilized Forests
- Beaverhead Meteor Impact at Leaton Gulch
- Fissure Eruption at Kings Bowl
- City of Rocks National Reserve
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- Soda Springs Geyser and Travertine
- Minnetonka Cave

## Southern Idaho is a Geologic Jackpot!



Within its rugged mountains, youthful lava fields, and steep-walled canyons lies compelling evidence of amazing geologic events. Join author Shawn Willsey as he uses clear prose, concise illustrations, and dramatic photographs to tell the stories of 23 amazing geologic sites. Learn how Ice Age floods sculpted the Snake River Canyon, how tree molds and lava tubes formed at Craters of the Moon, where the land surface ruptured during the 1983 Borah Peak earthquake, and much more.

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Call for Short Course and Technical Session Proposals Due 1 February

# GSA 2018 Indianapolis Meeting



**4-7 November**

Indianapolis, Indiana, USA



Photo courtesy of Lavengood Photography

It's time to plan for our 2018 Annual Meeting in Indianapolis, Indiana, USA. Help ensure that your area of research and expertise is represented this year. Any individual or geosciences organization is welcome to submit proposals.

**Exchange** the geology by organizing and chairing a technical session.

**Technical Session deadline:** 1 Feb. 2018

Proposals are being taken for both Pardee Keynote and Topical Sessions. The proposal form is online at <https://gsa.confex.com/gsa/2018AM/cfs.cgi>.

**Share** the geology as an instructor through a Short Course.

**Short Course proposal deadline:** 1 Feb. 2018

Courses run the Friday and Saturday before the Annual Meeting and are typically half a day to two full days. The proposal form is online at <https://gsa.confex.com/gsa/2018AM/shortcourse/cfs.cgi>.



Photo courtesy of Go Ape.



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[www.geosociety.org/AnnualMeeting](http://www.geosociety.org/AnnualMeeting)



VOLUME I

VOLUME II

**SPECIAL PAPER 500:  
The Web of Geological Sciences:  
Advances, Impacts, and Interactions**

*Edited by Marion E. Bickford*

Written by leading scientists in most of the important sub-disciplines of the geological sciences, the 19 chapters in this book examine the question "What advances have been made in the past 50 years?" Advances from 1963 to 2013 include the development and understanding of plate tectonics, exploration of the Moon and Mars, the development of new computing and analytical technologies, and the understanding of the role of microbiology in geologic processes, to name but a few. Certain to become a frequently cited classic, this volume will be of great interest to professional scientists and will be particularly useful for students.

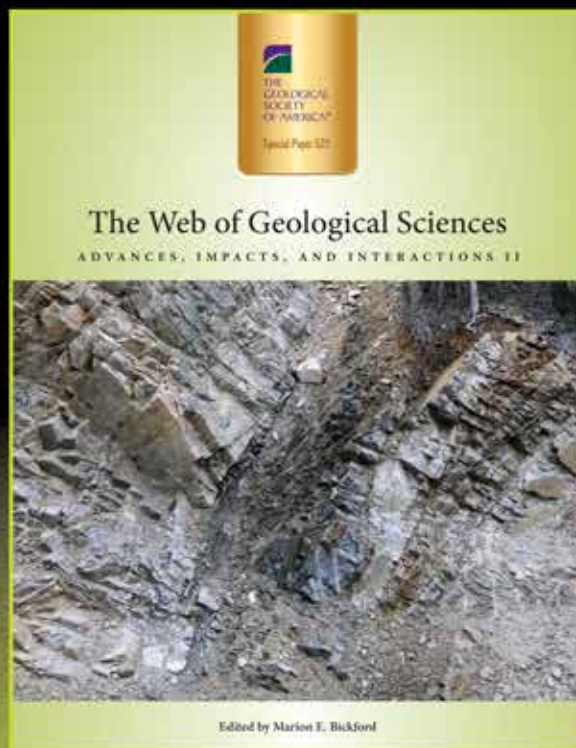
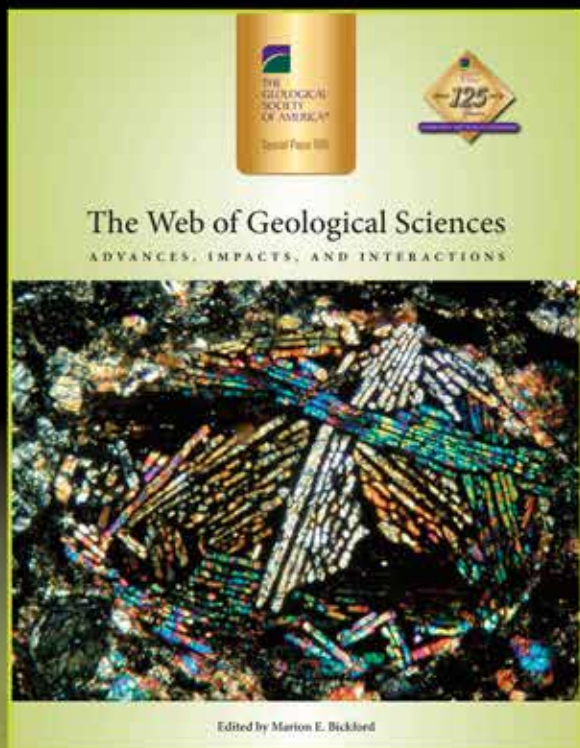
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**SPECIAL PAPER 523:  
The Web of Geological Sciences:  
Advances, Impacts, and Interactions II**

*Edited by Marion E. Bickford*

This book is a follow-up to Special Paper 500, which was prepared to celebrate the 125th anniversary of the founding of GSA, and whose theme was "What have we learned in the last fifty years?" Three important disciplines that were not covered in the first book are engagingly presented here: "Earth's dynamic surface: The past 50 years in geomorphology" by Ellen Wohl et al.; "The metamorphosis of metamorphic petrology" by Frank Spear et al.; and "The Archean-Hadean Earth: Modern paradigms and ancient processes" by Paul Mueller and Allen Nutman. Readers will find these chapters comprehensive and readable. They will appeal to professional scientists and especially to teachers.

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