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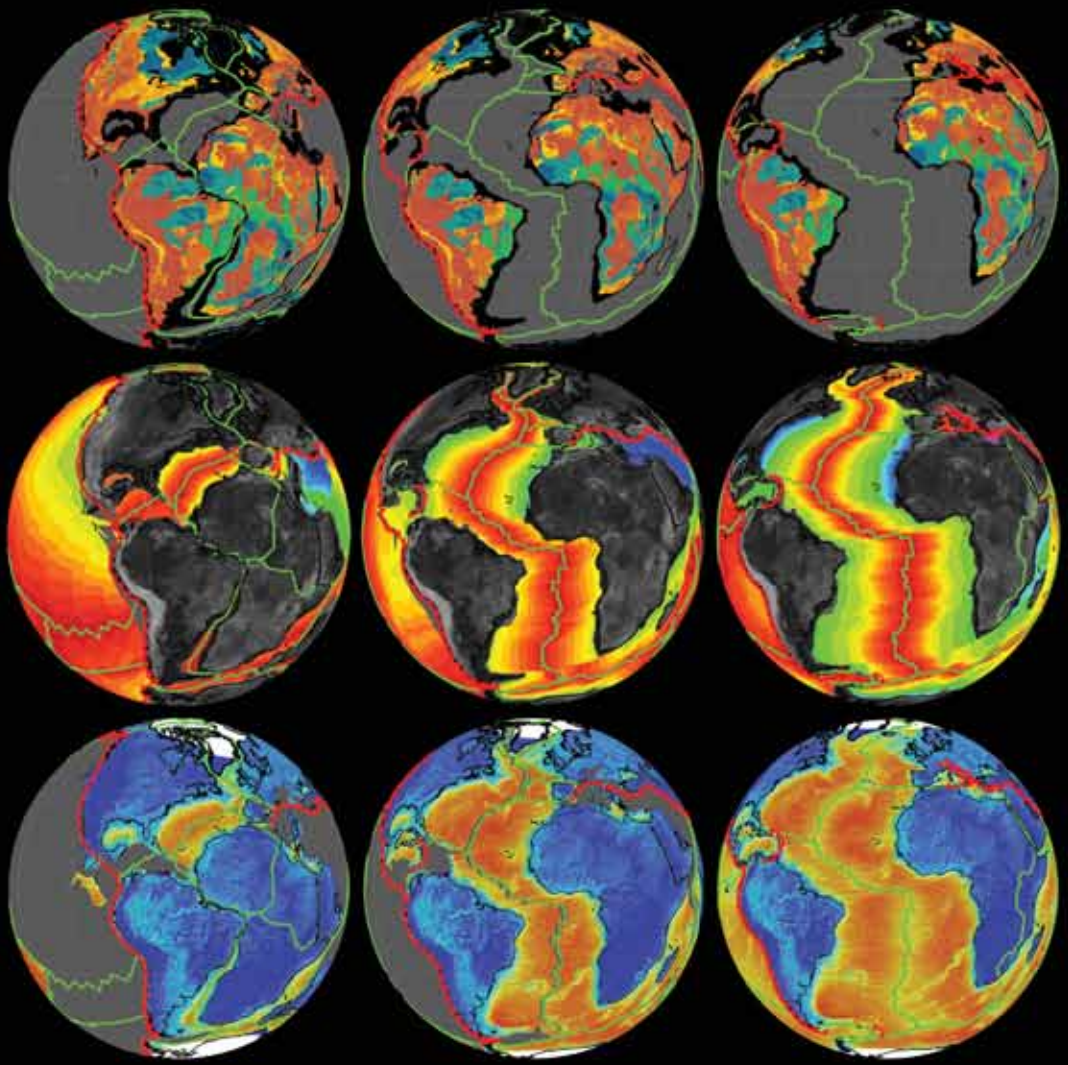

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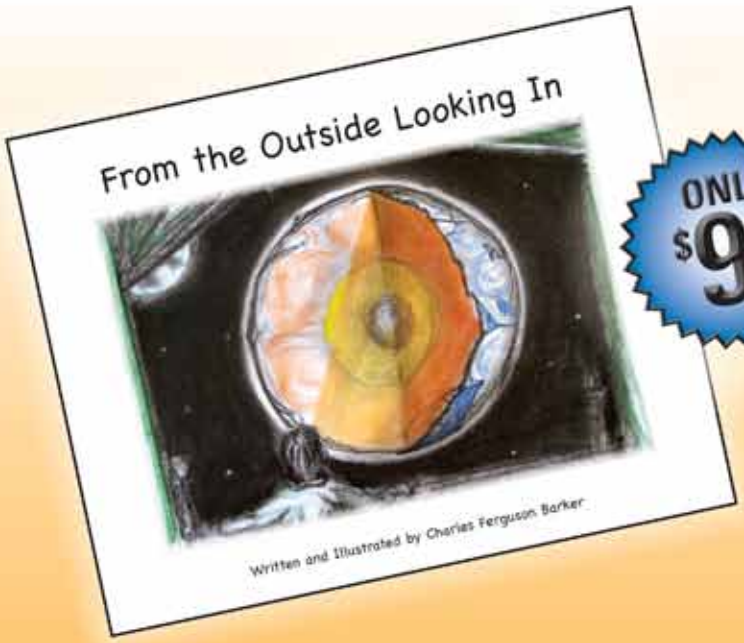

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Charles Ferguson Barker earned his bachelor's degree in geology at Arizona State University, where he first learned about plate tectonics from his professor Dr. Robert S. Dietz, who coined the phrase "seafloor spreading." After earning his master's degree in geology at Boston University, Barker decided to write and illustrate a book for children, introducing the basic concepts of plate tectonics. Barker teaches geology, presents lectures to elementary school students about geology, and works in the environmental consulting field.

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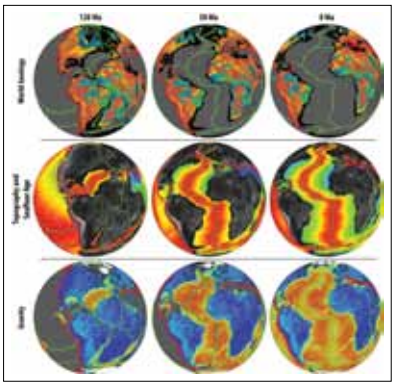
SCIENCE ARTICLE



Cover: Plate tectonic reconstructions of geological and geophysical data prepared using GPlates. Top: raster of surface geology; middle: reconstructed topography onshore with seafloor paleoage; bottom: reconstructed grids of Bouguer gravity anomalies. Each data set is shown reconstructed to 120 Ma (left) and 50 Ma (center), together with the present-day configuration (right). Image courtesy Sabin Zahirovic, EarthByte Group. See related article, p. 4–9.

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An open-source software environment for visualizing and refining plate tectonic reconstructions using high-resolution geological and geophysical data sets

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ABSTRACT

We describe a powerful method to explore spatio-temporal relationships within geological and geophysical data sets by analyzing the data within the context of tectonic reconstructions. GPlates is part of a new generation of plate reconstruction software that incorporates functionality familiar from GIS software with the added dimension of geological time. Here we use GPlates to reconstruct geological terranes, geophysical grids, and paleomagnetic data within alternative tectonic models of the assembly of Western Australia and the configuration of Rodinia. With the ability to rapidly visualize a diverse range of geological and geophysical constraints within different reconstructions, users can easily investigate the implications of different tectonic models for reconciling a variety of observations and make more informed choices between different models and data.

INTRODUCTION

Geoscientists have come to rely strongly on computing technology. Until a few decades ago, geological maps and cross sections were assembled on paper. Now, Geographic Information System (GIS) software has revolutionized the way we store and work with geospatial data (Whitmeyer et al., 2010). It is now possible to rapidly integrate vast arrays of geoscientific data into single digital maps that enable complex present-day spatial relationships to be explored and understood. Within a GIS, we can interactively add data, modify symbologies, arrange data into layers, and create and modify interpretations. At the same time, geoscientists are cognizant that the data they are collecting and analyzing has reached its present-day location as a result of complex tectonic histories—there are often important spatio-temporal relationships between samples that are now far apart but that were once much more proximal to each other.

Plate tectonic models have implications for geoscientists in a wide range of disciplines—fields as diverse as determining the geodynamic controls on arc-magmatism (e.g., Straub et al., 2009) and ore deposit formation; modeling the evolution of ocean current circulation (e.g., Berggren and Hollister, 1977); understanding the global fossil record by identifying pathways for species migration (e.g., Ali and Aitchison, 2008); and interpreting the signatures in mantle seismic tomography images (e.g., van der Meer et al., 2010). They all invoke plate kinematic models to support their hypotheses.

A notable early illustration of plate tectonics was presented in the continental drift "flipbook" of Scotese (1976). Since then, animations illustrating the relative motions of Earth's tectonic plates over geological time scales have become widely available. However, these animations are essentially a series of static images—maps that cannot be modified or interacted with—and the ability for users to incorporate their own data or images into the plate tectonic animation has remained largely elusive. Suppose we have a plate tectonic animation for an area that we are studying and for which we have additional data sets. How can we relate our own data (which contain information about geological events but are expressed in their present-day locations) to the plate configuration and motions at the time of these events? Such a scenario illustrates the need for tools combining the functionality typical of GIS software with the capability to quickly and easily reconstruct and visualize geospatial data back through time. Therefore, there is a need for a tool that loads geospatial data, whether in point, vector, or raster format (akin to standard GIS software), and then visualizes these data in their plate tectonic context based on available plate motion models and time-varying properties. Additionally, such software should enable users to develop and modify their own plate models.

THE NEXT GENERATION OF PLATE RECONSTRUCTION SOFTWARE

To respond to these needs, the past decade has seen the development of several tools for tectonic reconstruction. Some of these tools are proprietary software for commercial use, aimed, for example, mainly at understanding the formation of petroleum and ore deposit systems in a paleogeographic context. For the wider scientific community, there are several publically available (and in some cases open source) plate tectonic softwares (e.g., GMAP, Torsvik and Smethurst, 1999; PaleoMac, Cogné, 2003; PLACA, Matias et al., 2005; PPlates, Smith et al., 2007), some of which have a specific emphasis on the analysis of paleomagnetic data in a plate tectonic context or on plate deformation.

Here, we describe GPlates, part of a new generation of software tools enabling geoscientists from a broad range of disciplines to work with plate tectonic models and efficiently link these models to their own data. GPlates software (Boyden et al., 2011; Gurnis et al., 2012), an open-source, cross platform Geographic Information System (GIS), was developed in collaboration with the University of Sydney, the California Institute of Technology, and the Geological Survey of Norway. It is a virtual globe in the same

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manner as Google Earth, with the added dimension of geological time, thus enabling 4-D visualizations to refine and improve the quality of tectonic reconstruction. Importantly, GPlates can reconstruct a wide variety of data types, including high-resolution geophysical images, which is of particular importance for optimizing and critically assessing plate motion models. All figures in this paper were created using GPlates.

The following is a typical workflow using GPlates to easily load and reconstruct data and then create custom animations of the reconstruction (see footnote 1 for a link to more detailed step-by-step instructions):

1. **Load vector data into GPlates.** Point, line, and polygon data can be loaded into GPlates. Currently, a number of prevalent formats for the transfer of GIS and geoscientific vector data can be loaded (and written), including ESRI shapefiles and open standards-based XML formats such as GML (Geographic Markup Language) and GeoSciML (GeoSciML, 2011). GPlates incorporates support for a native XML-based format called GPML (GPlates Markup Language), based on GML, and provides direct access to data available through Web Feature Services.
2. **Load raster data into GPlates.** Raster data can be loaded into GPlates either as an image file (.jpg, .png, etc.) or as a netCDF grid. These input raster files/images may cover the entire globe or part of the globe (see the Australian use-case described in a following section).
3. **"Cookie-cut" data.** All loaded data can be attached to a plate-tectonic reference with a few simple steps via an underlying plate model so that the data are assigned to the appropriate plates and reconstructed accordingly. Plate models typically comprise a global set of polygons, which define the extent of each of Earth's tectonic plates. Any loaded vector or raster data can be "cookie-cut" based on these plate definitions; subsequently, each vector or raster fragment is reconstructed individually according to a selected reconstruction model. For areas of oceanic crust, reconstructed rasters are progressively masked based on the crustal age at the pixel location using a grid of ocean floor age (Müller et al., 2008).
4. **Reconstruct and explore data.** Once prepared, data sets (including rasters) can be continuously reconstructed on-the-fly backward and forward in time. This is made possible by taking advantage of desktop graphics hardware via the OpenGL programming interface, where an innovative approach has been used to map spherical spatial data into graphics constructs. The vast majority of desktop graphics hardware manufactured in the last decade is more than capable of displaying raster data at interactive frame rates, provided that culling and level-of-detail techniques are employed to reduce the CPU workload. High-resolution images are decomposed into sets of tiles at several levels of resolution so that the highest resolution images are only used when the zoom level is high.
5. **Export reconstructed data, images, and animations.** Snapshots of reconstructed data can be exported from GPlates in a number of vector (shapefiles, SVG, GMT ASCII) and raster (e.g., .jpg, .tif) formats for a variety of uses, such as creating figures for publications and animations for presentations.

RECONSTRUCTING SUPERCONTINENTS

Plate tectonic software is only useful if we have—or want to create—realistic models for Earth's plate tectonic evolution. For the Cretaceous and Tertiary periods, models based primarily on ocean-floor magnetic and fracture zone data are now well constrained for most of the ocean basins, and several global-scale models (Müller et al., 2008; Torsvik et al., 2008; Schettino and Scotese, 2005) have been published. Our supplementary material (see footnote 1) includes an example of reconstructing data within Pangea using publically available global plate models.

Figures 1 and 2 illustrate reconstructing data within the supercontinent Rodinia, one of Pangea's predecessors. A range of plate tectonic models has been proposed for the assembly and subsequent breakup of Rodinia during the Meso- to Neoproterozoic. Compared to reconstructions of Pangea, alternative Rodinia models differ widely in their basic characteristics, both at the global scale (e.g., Pisarevsky et al., 2003; Li et al., 2008; Evans, 2009) or in terms of the fit of individual continents. For example, there is considerable debate over Proterozoic connections between Laurentia, Australia, and Antarctica—models include the SWEAT model linking the Southwestern United States to East Antarctica (e.g., Dalziel, 1997); the AUSWUS model linking Australia to the Southwestern United States (e.g., Karlstrom et al., 1999); and the AUSMEX model linking Australia to Mexico (Wingate et al., 2002).

Reconstructions for these times rely on a diverse range of data sets. Paleomagnetic data can provide constraints on the paleo-latitudes and relative rotations between adjacent continental blocks (e.g., Evans, 2009). Further evidence can be accumulated via correlation of geological signatures between continents, such as the alignment of linear trends of basement terranes interpreted from geophysical and geological mapping and matching ages and/or geochemical signatures of magmatism. Integrating all these data is not trivial but can be simplified and made accessible to a wider community of geoscientists through plate tectonic modeling software. Figure 1 shows how GPlates can be used to quickly reconstruct the same geological data within alternative reconstruction models. The figure shows the distribution of large igneous provinces formed during the Meso- and Neoproterozoic, digitized based on a shapefile from Ernst et al. (2008) and reconstructed following the SWEAT, AUSWUS, and AUSMEX scenarios.

Geophysical images are another important constraint on these reconstructions. Aeromagnetic data have been used to constrain tectonic reconstructions at various scales, including constraining

[1] All figures in this paper were created using freely available data and software. The data sets used to make Figures 3 and 4, as well as a more detailed GPlates tutorial, are provided in appendices S1–S2 at ftp://ftp.earthbyte.org/earthbyte/GSA_Today_2012. GPlates is open-source, cross-platform software available at www.gplates.org.

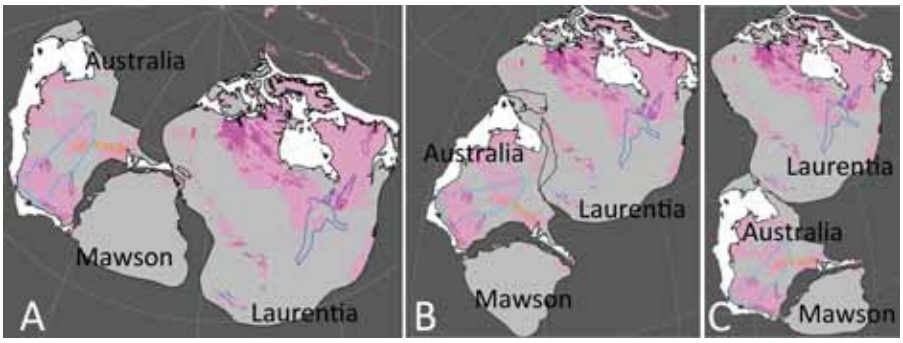

Figure 1. Screenshots of reconstructions generated in GPlates, geological vector data loaded into three different proposed scenarios for the configuration of Laurentia, Australia, and East Antarctica ca. 780 Ma. The data displayed are areas of outcropping Precambrian rocks (Bouysse, 2010, pink polygons) and Proterozoic large igneous provinces from Ernst et al. (2008—colored by age): (A) SWEAT (poles of rotation from Dalziel, 1997); (B) AUSWUS (poles of rotation from Karlstrom et al., 1999); (C) AUSMEX (poles of rotation from Wingate et al., 2002).

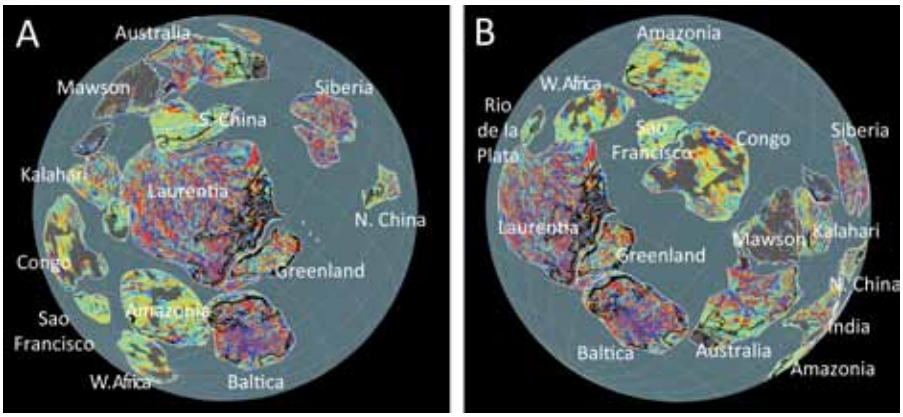

Figure 2. Plate tectonic reconstruction in GPlates at 780 Ma, following two contrasting models for the configuration of Rodinia: (A) is based on the block definitions and poles of rotation of Li et al. (2008); (B) uses the same block definitions but the poles of rotation of Evans (2009). The data are the world magnetic anomaly map (EMAG2, Maus et al., 2009). Coastlines are shown in black; cratonic block boundaries are shown in white.

the relative position of Australia and Antarctica using satellite magnetics (Goodge and Finn, 2010); the evolution of an early Paleozoic volcanic arc (Greenfield et al., 2010); Proterozoic tectonics within Australia (Aitken and Betts, 2008); and displacements across individual faults (Cather et al., 2006). For reconstructing ancient continents, continuous data coverage allows the extent and fabric of mapped basement units to be extended beneath more recent cover rocks (Finn and Pisarevsky, 2007). In Figure 2, we show the global crustal magnetic anomaly map EMAG2 (Maus et al., 2009). These data are loaded into GPlates as a georeferenced .jpg, then reconstructed within two alternative global models for the configuration of Rodinia ca. 780 Ma—the models of Li et al. (2008) and Evans (2009).

Figures 1 and 2 illustrate striking differences between alternative Rodinia interpretations. Our supplemental material (see footnote 1) includes a tutorial explaining how to load, reconstruct, and interact with such data. Next, we focus on a regional example—the Proterozoic evolution of Australia. This allows us to make use of the much higher resolution magnetic anomaly compilation available for this continent.

A USE CASE—THE PROTEROZOIC EVOLUTION OF AUSTRALIA

While eastern Australia is composed of a series of Phanerozoic accretionary belts, areas of the Australian continent to the west of the so-called "Tasman Line" (Direen and Crawford, 2003) (Fig. 3A) have been relatively stable throughout the Phanerozoic. However, continent-scale geological structures provide evidence for earlier major tectonic events related to relative motions between ancient cratonic blocks that comprise the western two-thirds of Australia.

The older parts of Australia are generally described in terms of the North, West, and South Australian cratons (Myers et al., 1996), from here on abbreviated to NAC, WAC, and SAC, respectively (see Fig. 3A and supplementary material [footnote 1]). These cratons are separated by younger (Neoproterozoic to early Paleozoic) orogenic belts. To piece together the basic crustal evolution of Australia during the Proterozoic, we need to establish how these three blocks have moved relative to one another (as well as the other blocks within Rodinia) and at what point they assembled into the configuration we see today.

A recent study by Li and Evans (2011) proposes a 40° rotation of the NAC relative to the SAC and WAC. The rotation is interpreted from paleomagnetic data, which indicate that relative motion postdates 750 Ma. In their present-day configuration, the NAC and SAC/WAC are separated by units of the Petermann and Paterson Orogens, a ca. 600–530 Ma intracontinental tectonic event (Raimondo et al., 2010) interpreted to involve significant convergence and dextral shear between the NAC and SAC/WAC. Li and Evans (2011) suggest that, prior to the Neoproterozoic rotation, the relative NAC/WAC juxtaposition may have persisted since 1800 Ma.

Such a model has implications for the alignment of any geological structures between the two blocks (NAC and SAC/WAC) that predate the rotation. A number of authors have emphasized the similarities in the age and geochemical compositions of Paleoproterozoic units within the Mount Isa Block on the NAC and the Broken Hill Inlier within the Curnamona province on the SAC (e.g., Giles et al., 2004). Presently, Mount Isa and Broken Hill lie >1000 km apart, and some authors have argued that these provinces were more closely juxtaposed during the geodynamic events that formed these units. For example, Giles et al. (2004) juxtapose Mount Isa and Curnamona prior to 1300 Ma by invoking a 52° rotation of the SAC relative to the NAC/WAC. In this model, the NAC and WAC are assumed to be fixed together in their present-day configuration from ca. 1700 Ma onward, in contrast to the Li

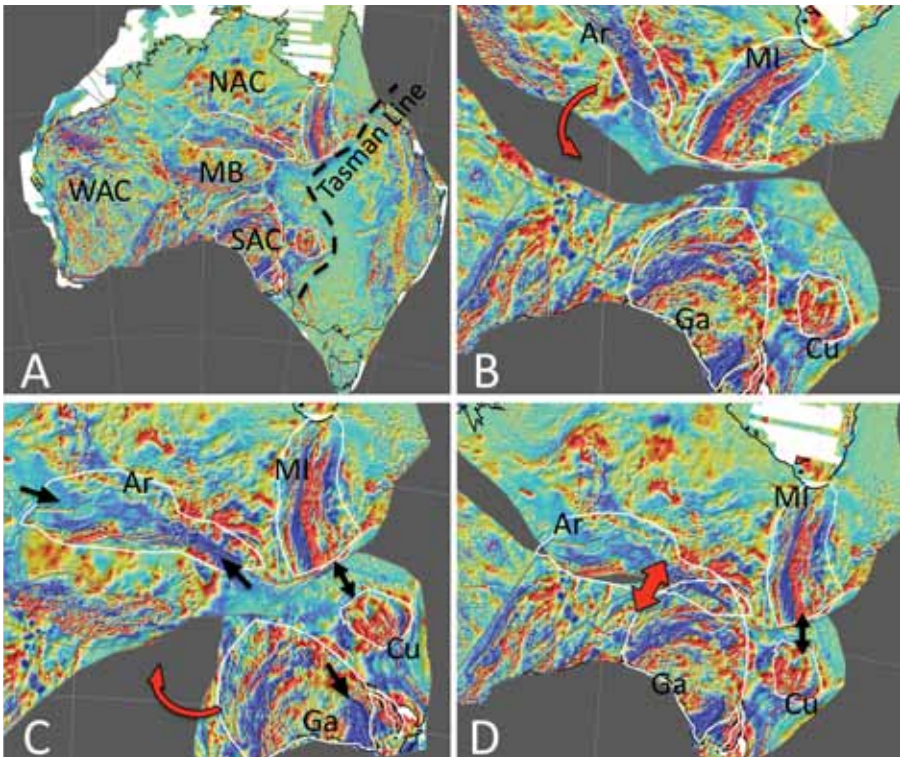

Figure 3. (A) Reduced-to-pole magnetic anomalies for Australia. The North, South, and West Australian cratons are labeled NAC, SAC, and WAC respectively. MB—Musgrave Block (see text). (B–D) Magnetic data reconstructed using three candidate plate configurations proposed for Australia since the early Mesoproterozoic (ca. 1600 Ma): (B) after Li and Evans (2011), a 40° rotation of NAC; (C) Giles et al. (2004), 52° rotation of SAC; (D) after Henson et al. (2011), translation of NAC relative to WAC and SAC. White outlines show the Curnamona Province (Cu) and Mount Isa Block (MI), Arunta Inlier (Ar) and Gawler craton (Ga); these are discussed in the text (adapted from Cawood and Korsch [2008]). The graticule interval is 10°.

and Evans (2011) interpretation. Alternatively, translation (without relative rotation) of the NAC relative to the SAC could restore Curnamona toward Mount Isa—for example, by invoking a 600-km, NE-SW sinistral strike-slip displacement (Wilson, 1987) or broadly N-S translation (Henson et al., 2011), implying subsequent net extension between the NAC and SAC.

Each of these models makes testable predictions. The relative rotation should result in lateral offsets between older geological features that were previously adjacent and/or aligned. Reconstructing geological and geophysical data that describe these features allows us to evaluate different tectonic scenarios much more effectively than if we simply view all of these ancient structures in their present-day configuration.

Figure 3 shows magnetic data reconstructed using the different proposed reconstruction scenarios for Proterozoic Australia. Here we have used the fifth edition of the magnetic anomaly map for Australia (Milligan et al., 2010). The data have been reduced to the pole (RTP) using a variable magnetic inclination RTP algorithm to remove the latitude dependence of the induced anomaly shapes (P.R. Milligan, 2011, personal commun.). The reconstructed configurations of Giles et al. (2004) and Henson et al. (2011) bring into closer juxtaposition the distinctive anomaly patterns in the Mount Isa and Curnamona Province regions. The Li and Evans (2011) model (Fig. 3B) leaves Mount Isa and Curnamona widely separated (instead, the regional lineation trend of anomalies in the Mount Isa region broadly aligns with regional anomaly trends between the SAC and WAC, possibly related to the Mesoproterozoic Albany Fraser Orogen). The magnetic anomalies also reveal the structural grain within the Gawler craton and Arunta Inlier. Giles et al. (2004) argue that these two provinces formed a continuous orogenic belt along Australia's southern margin during the late Paleoproterozoic. Figure 3C illustrates how the rotation of the SAC yields continuity in the grain of the magnetic anomalies between the Gawler and Arunta provinces (cf. figure 4 *in* Giles et al., 2004). By comparison, the magnetic fabric between these provinces appears less continuous within the reconstruction of Li and Evans (2011).

Next, we explore the paleomagnetic data available to constrain these models. Schmidt et al. (2006) analyzed available paleomagnetic data for volcanic rocks from ca. 1070 Ma, including parts of the Warakurna Large Igneous Province, with sample sites distributed across the SAC, NAC, and WAC. Figure 4 shows the virtual geomagnetic poles from ca. 1070 Ma used by Li and Evans (2011)—one from the WAC (the Bangemall Sills) and two from the NAC (from the Stuart Dikes and Alcurra Dikes respectively—the latter lying on the Musgrave Block, assumed to be part of the NAC since this time). These poles are important lines of evidence for their interpretation and are clearly better aligned with their proposed rotation of the NAC, whereas the model of Giles et al. (2004) does not attempt to reconcile these data. We also plot an additional pole used by Schmidt et al. (2006) for the Gawler Dikes on the SAC, originally taken from Giddings and Embleton (1976). This pole is not used by Li and Evans (2011), possibly because the Gawler Dikes from which the pole is derived are not directly dated—rather, the age is inferred by Schmidt et al. (2006) from nearby volcanic rocks that have been dated. If this inference is correct and the paleopole is reliable, then the configuration shown in Figure 4 would need to be further revised to reconcile this additional constraint. Schmidt et al. (2006) conclude that each of the three ancient Australian cratonic blocks may have had independent polar wander paths throughout the Paleo- and Mesoproterozoic and did not reach their final assembly until after the Warakurna event.

Many other data sets can provide clues to the Proterozoic configuration of Australia. In the supplementary material (see footnote 1), we include an additional geological data set to

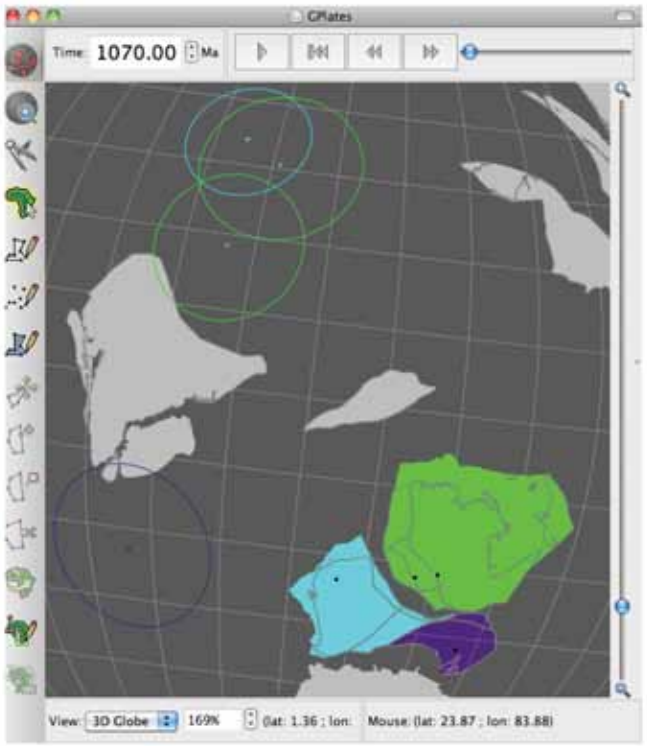

Figure 4. Plate tectonic reconstruction in GPlates for 1070 Ma. The configuration of Rodinia is taken from the model of Li et al. (2008), with additional motion between the North, South, and West Australian cratons (NAC and SAC/WAC) based on Li and Evans (2011). The rotation of the NAC proposed by Li and Evans to occur ca. 600 Ma reconciles paleomagnetic data for the NAC and WAC (green and cyan) at 1070 Ma; however, this model does not reconcile these poles with an additional pole from the SAC (purple) used by Schmidt et al. (2006). The reconstruction is shown in a fixed West Australia reference frame. The graticule interval is 10°.

accompany the Australia use case—age-code polygons representing the extent of different Proterozoic mafic-ultramafic magmatic events generated by Geoscience Australia (Claoué-Long and Hoatson, 2009). Many of these magmatic events predate the various proposed block motions we discussed earlier, so the configurations in Figure 3 represent candidates for the crustal configuration at the time of this magmatism.

CONCLUSIONS AND IMPLICATIONS

The broader aim of this article is to illustrate the way geoscientists can use plate tectonic modeling software to critically evaluate existing reconstructions, better understand their own data within the context of these models, identify correlations or inconsistencies between different data sets, and ultimately generate more robust geological interpretations. To make such software relevant to a wide range of geoscientists, the software needs to be accessible and contain functionality that allows workers to easily load and interrogate their data. Cutting up and reconstructing raster data can be achieved to some extent using computer software that allows image manipulation or by simply printing an image and cutting it up with scissors. However, performing these tasks within plate modeling software has a number of advantages:

1. Within a GIS environment, with a series of images and vector data as layers, we can apply a candidate plate motion and immediately see its consequences for all the neighboring plates and data sets involved.
2. The data are positioned on a spherical Earth, and rotated shapes are not distorted.
3. Plate modeling software like GPlates can also be used to modify existing models or to create new plate tectonic models from scratch. Such software can easily determine the Euler poles of rotation that describe the best-fitting reconstructions, save them to use again, distribute these models to colleagues, and publish them.

Our discussion has concentrated on what has recently become possible within GPlates, such as the visualization and rapid reconstruction of large vector and raster data sets in a GIS-like environment. In the future, the enormous growth of digital data sets, the increasing detail of plate tectonic models, and the diversity of both spatial data types and their respective subcommunities call for systematic, quantitative workflows and methodologies.

As a simple, freely available software package, GPlates has applications beyond pure research problems. It is already used as a teaching tool to facilitate learning about Earth's geological history and processes. Visualizations created in GPlates provide a means for geoscientists to more effectively communicate the outcomes of their research to the general public.

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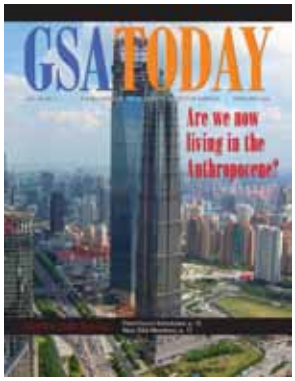

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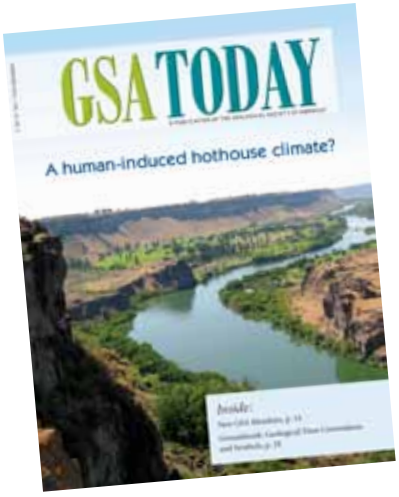

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View to west of Tablerock Mountain (high peak to south) and Hawksbill Mountain (high peak to north) in North Carolina Blue Ridge Mountains. Photo by Andy R. Bobyarchick, 2008.

Dick Berg Technical Program Chair

WELCOME

The 2012 Technical Session Abstract Season Kicks Off!

I am very excited about this year's technical program in Charlotte, North Carolina, USA, where a GSA Annual Meeting has never occurred and in the southeast region that has not seen a GSA Annual Meeting in 27 years. With 181 proposed topical sessions, over 100 discipline sessions, six Pardee sessions, and a few special sessions, 4–7 November 2012 are surely days to anticipate. From geomicrobiology to planetary geology, marine/coastal geology to petroleum geology, Quaternary geology to metamorphic petrology, and geoscience education to paleoclimatology (to name just a few), this year's program will exhibit outstanding pure science that is well balanced with applied science and education.

The success of this meeting depends on GSA's members and affiliated attendees. Look carefully at the proposed topical sessions and seize the opportunity to submit an abstract to a session that satisfies your scientific endeavors or educational needs. Select your mode of presentation as oral or poster. Perhaps partake in a digital poster session, which was very popular last year in Minneapolis. If you are unsure whether a topical session is the right fit for your presentation, select a discipline category instead, and we will form a great session including your presentation.

The overall experience of attending a GSA Annual Meeting with more than 6,000 colleagues presenting more than 3,500 talks is one of the few opportunities that truly enriches your career, broadens your perspective of the discipline, and particularly emphasizes why your discipline is important and how it significantly addresses numerous water and mineral resource, environmental, and economic development issues at local to international scales. It provides the venue for you to be heard scientifically and professionally and to "tell your story." This entire experience is enhanced when you submit your abstract. So, regardless of whether you are a student, professor, government or industry geoscientist, or K–12 educator, there truly is something for everyone.

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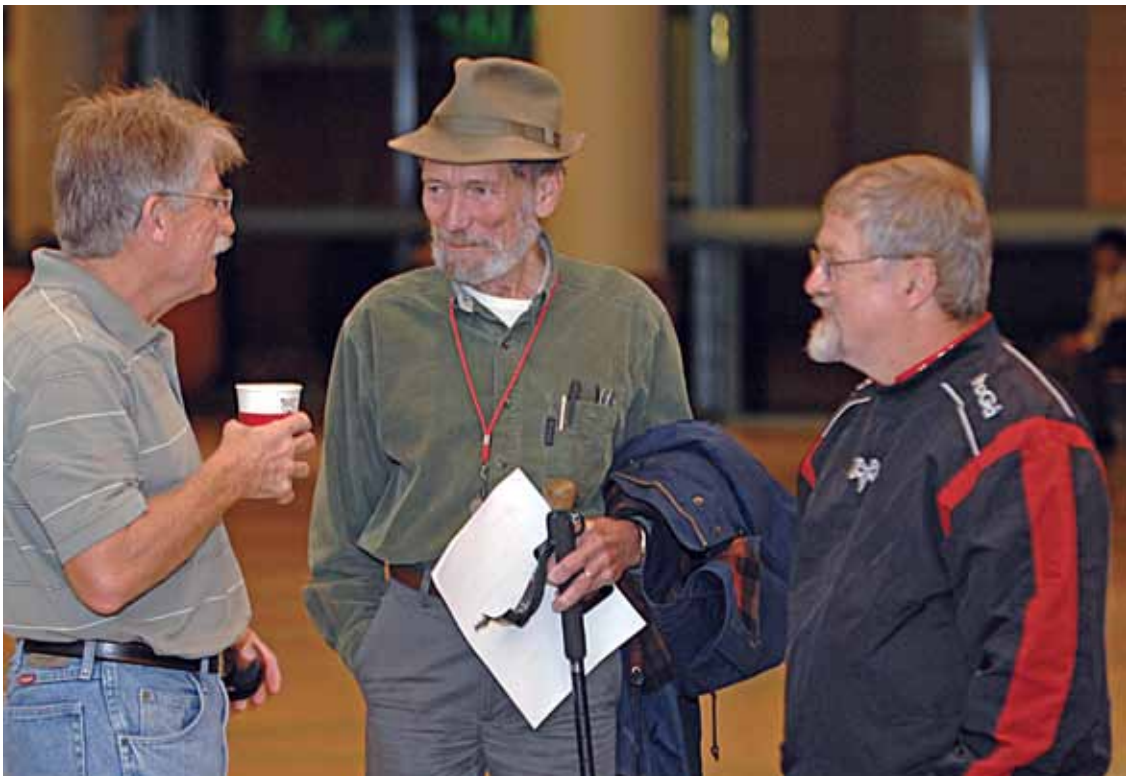

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—Callan Bentley, Mountain Beltway blog (12 Oct. 2011).

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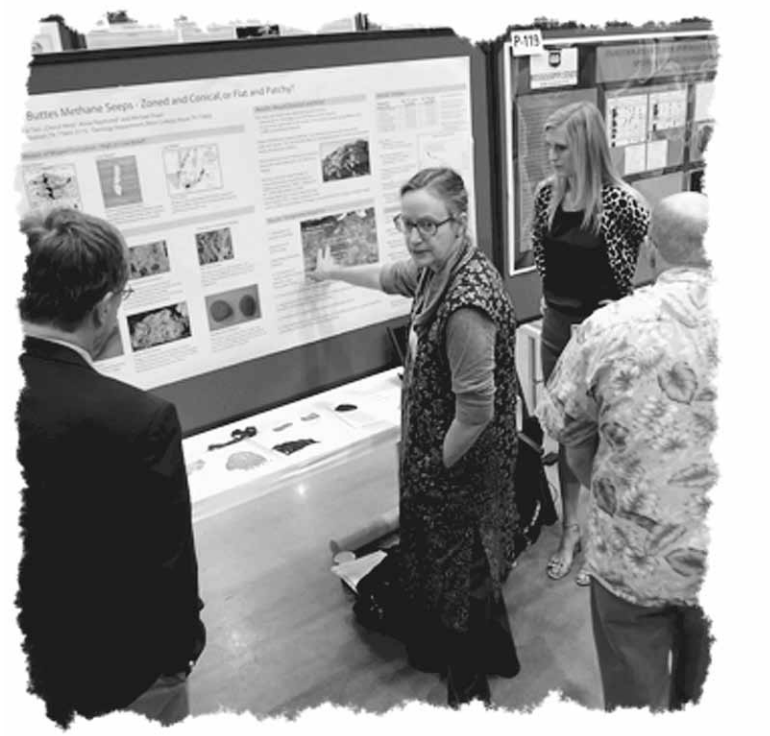

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CONTENTS

TOPICAL SESSIONS

DETAILS & DESCRIPTIONS

These sessions are topically focused, with a mix of invited and volunteered papers. They are sorted by **primary discipline,** *but most sessions are designed to be interdisciplinary.* Related disciplines are listed with each session; further details are online at **www.geosociety.org/meetings/2012/.**

GEOCHEMISTRY

T1. Sources, Transport, Fate, and Toxicology of Trace Elements and Organics in the Environment
Disciplines: Geochemistry; Environmental Geoscience; Geology and Health
Advocates: David T. Long, Michigan State Univ.; W.B. Lyons, The Ohio State Univ.; LeeAnn Munk, Univ. of Alaska

Basic and applied research on trace elements and organics in the environment are encouraged. Topics include those that relate to understanding and modeling sources, transport and fate; human and ecosystem health; and environmental assessment and remediation.

T2. Understanding Earth through Carbon
Disciplines: Geochemistry; Geomicrobiology; Mineralogy/Crystallography
Advocates: Craig M. Schiffries, Carnegie Institution of Washington; Robert M. Hazen, Carnegie Institution of Washington; Russell J. Hemley, Carnegie Institution of Washington

A transformational understanding of Earth's deep carbon cycle will advance our understanding of the planet. This session features research on deep carbon reservoirs and fluxes, deep organic synthesis, and deep microbial life.

T3. Sigma Gamma Epsilon Undergraduate Research (Posters)
Disciplines: Geochemistry; Hydrogeology; Petrology, Igneous
Advocate: Erika R. Elswick, Indiana Univ.

The goal of this session is to highlight recent and ongoing undergraduate research in a student-friendly forum. The session is open to students and faculty co-authors working in any area of the geosciences.

T4. Geochemical Proxies for Ancient Ocean Chemistry: Implications for Links between Ocean Chemistry, Plate Tectonics, Sea Level, and Climate throughout the Late Precambrian and Phanerozoic
Disciplines: Geochemistry; Paleoclimatology/Paleoceanography
Advocates: Cara K. Thompson, SUNY Stony Brook; Troy Rasbury, SUNY Stony Brook

This topical session will feature geochemical proxy studies that link ancient ocean chemistry with changes in climate state, sea level, plate tectonics, and the biosphere. Topics include isotope, major, trace, and rare earth element studies.

T5. Mercury Biogeochemistry in Riparian-Floodplain–Influenced Stream Ecosystems
Disciplines: Geochemistry; Hydrogeology; Geochemistry, Organic
Advocates: Paul M. Bradley, USGS; Celeste A. Journey, USGS

Session on geochemical and hydrologic processes affecting mercury bioaccumulation in riparian-floodplain ecosystems, with an emphasis on factors influencing methylmercury production in wetlands, transport to aquatic habitats, and biotic uptake and trophic transfer.

T6. Advances in Aqueous Geochemistry of Boron and Heavy Metals
Disciplines: Geochemistry; Economic Geology; Mineralogy/Crystallography
Advocate: Ziya S. Cetiner, Canakkale

New experimental studies concerning aqueous geochemistry of boron and heavy metals are emerging. These new results would contribute to refinement of low-temperature and high-geochemical models. Recent advances in this area will be summarized.

T7. Progress in Forensic Geochemistry
Disciplines: Geochemistry; Environmental Geoscience
Advocates: Russell Harmon, ERDC International Research Office, Ruislip, UK; Jose R. Almirall, Florida International Univ.

The scope of forensic geochemistry has expanded due to rapid development of analytical tools for elemental and isotope ratio analyses. This session covers geochemical approaches to tracing environmental contaminants, materials provenancing, and other forensic applications.

T8. Hydrochemistry and Biogeochemistry of Tropical Mountainous Rivers and Estuaries
Disciplines: Geochemistry; Geochemistry, Organic; Limnogeology
Advocates: Steven Goldsmith, Villanova Univ.; Russell Harmon, ERDC International Research Office, Ruislip, UK; Ryan Moyer, Florida Fish and Wildlife Research Institute

We seek contributions that examine the hydrochemistry of tropical mountainous rivers and/or the biogeochemical cycling and fluxes of material delivered by tropical mountainous rivers to their associated estuarine and coastal waters.

T9. Geochemistry of Urban Environments
Disciplines: Geochemistry; Environmental Geoscience; Geology and Health
Advocates: W.B. Lyons, The Ohio State Univ.; David T. Long, Michigan State Univ.; Russell Harmon, ERDC International Research Office, Ruislip, UK

This session encourages presentations that qualify and quantify the geochemical and biogeochemical impacts of urbanization and urban activities on soil, water, and air resources as well as human and ecosystem health.

T10. Impact of Geological Processes on the Structural and Chemical Signatures of Organic Compounds: Tracing Fossilization, Fluid-Rock Interactions, and Diagenesis-Metamorphism
Disciplines: Geochemistry, Organic; Petrology, Metamorphic; Paleontology, Paleoecology/Taphonomy
Advocates: Olivier Beyssac, IMPMC Paris; Sylvain Bernard, MNHN Paris

This interdisciplinary session is dedicated to the formation, evolution, and fate of carbonaceous materials in geological processes with implications for fossilization, fluid-rock interactions, and diagenesis-metamorphism. Progress in analytical techniques will be discussed.

GEOARCHAEOLOGY

T11. New Developments and Applications in Sclerochronology
Disciplines: Archaeological Geology; Paleoclimatology/Paleoceanography; Paleontology, Paleoecology/Taphonomy
Advocates: C. Fred T. Andrus, Univ. of Alabama; Donna Surge, Univ. of North Carolina

Sclerochronology, the study of physical and chemical records in accretionary skeletons, is increasingly important in several disciplines. This session will highlight new geochemical methods, species validation studies, and applications in archaeology, ecology, paleoclimatology, and paleontology.

T12. A Healthy Dose of Quaternary Geochronology at the Shoreline: Applications of Luminescence and Other Dating Techniques to Resolving the Timing of Coastal, Estuarine, and Lake Shore Processes
Disciplines: Archaeological Geology; Geomorphology; Quaternary Geology
Advocates: Shannon A. Mahan, USGS; Kenneth Lepper, North Dakota State Univ.

We encourage presentations on applications and refinements for dating methods, such as OSL, ESR, fission track, radiocarbon, and cosmogenics, with a focus on constraining the timing and rates of Quaternary geologic processes around coastal shorelines.

T13. Geoarchaeological Approaches to Paleoenvironments and Landscapes
Disciplines: Archaeological Geology; Geomorphology; Quaternary Geology
Advocates: Katherine A. Adelsberger, Knox College; Justin A. Holcomb, Oregon State Univ.

Geoarchaeologists utilize a variety of proxy records as primary evidence for landscape and environmental change in archaeological contexts. This session welcomes interdisciplinary papers focused on understanding human interactions with past environments throughout the Quaternary.

T14. Archaeological Geology (Posters)
Disciplines: Archaeological Geology; Geomorphology; Quaternary Geology
Advocate: Katherine A. Adelsberger, Knox College

This session welcomes poster presentations on interdisciplinary topics in geoarchaeology.

T15. Geoarchaeology and the Late Quaternary Depositional Record in the Ohio Valley
Disciplines: Archaeological Geology; Quaternary Geology; Geomorphology
Advocate: G. William Monaghan, Indiana Univ.

Session examines the depositional sequences and cycles, chronology, and geoarchaeology of the Ohio River Valley by focusing on the late Quaternary and Holocene history through studies in Quaternary geology, geomorphology, sedimentology, and geoarchaeology.

QUATERNARY GEOLOGY

T16. Cenozoic Ostracode Research: Developments in Paleoclimatology, Paleohydrology, Paleoecology, and Phylogenetics
Disciplines: Quaternary Geology; Paleoclimatology/Paleoceanography; Paleontology, Phylogenetic/Morphological Patterns
Advocates: Alison J. Smith, Kent State Univ.; Dave Horne, Queen Mary Univ. of London; B. Brandon Curry, Illinois State Geological Survey

This session will focus on novel approaches in ostracode research (marine and non-marine) related to Cenozoic paleoclimate, paleohydrology, phylogenetics, and geochemistry. Highlights will include the PETM, Miocene and Pliocene warmth, and Quaternary environmental change.

T17. Quaternary Sedimentary Architecture as a Prerequisite to Hydrogeological Modeling of Glaciated Terrains
Disciplines: Quaternary Geology; Hydrogeology; Geomorphology
Advocates: Richard C. Berg, Illinois State Geological Survey; Michel Parent, Geological Survey of Canada

Establishment of robust Quaternary sedimentary architectural models is essential prior to hydrogeological modeling. These process-based models allow for better prediction of sediments between and beyond observations, and better characterization of regional and local heterogeneity.

T18. The Evolution of Karst Landscapes through Time in Response to Changing Hydrologic, Geomorphic, and Tectonic Conditions
Disciplines: Quaternary Geology; Geomorphology; Hydrogeology
Advocate: Cory W. Blackeagle, Univ. of Kentucky

How do the characteristics of karst terrain change in response to changes in hydrology, geomorphology, and tectonism? How are these changes reflected in the landscape and hydrogeology? Recent advances in methodology will also be highlighted.

T19. Recent Sea-Level Change in a Late Holocene Context
Disciplines: Quaternary Geology; Paleoclimatology/Paleoceanography; Marine/Coastal Science
Advocate: Benjamin Horton, Univ. of Pennsylvania

Regional sea-level records from proxy reconstructions and tide-gauges provide appropriate and necessary context for current and projected rates of rise. Such records constrain the timing and magnitude of sea-level changes and their relationship to climate.

T20. Quaternary Atlantic Coastal Plain Formation and Evolution
Disciplines: Quaternary Geology; Stratigraphy; Sediments, Clastic
Advocate: M. Scott Harris, College of Charleston

This session will focus on the surficial sedimentary deposits of the eastern U.S. Atlantic Coastal Plain. Papers on geomorphic investigations, stratigraphic delineation and nomenclature, landscape development and modification, geochronological understanding, and recent tectonics are welcomed.

T21. Geological Records of Earthquakes and Tsunamis on Passive and Active Margins Coasts
Disciplines: Quaternary Geology; Geomorphology; Tectonics
Advocates: Simon E. Engelhart, Univ. of Pennsylvania; Alan R. Nelson, USGS

Coastal stratigraphic studies are the only means of reconstructing the frequency and size of the largest earthquakes and highest tsunamis, which is critical for assessing hazards on active and passive continental margin coasts.

T22. Using Buried Soils to Reconstruct Past Climates: Opportunities and Considerations
Disciplines: Quaternary Geology; Paleoclimatology/Paleoceanography; Geochemistry
Advocates: Holly A. Meier, Baylor Univ.; Jessica L.B. Monson, Univ. of Iowa; Ashley B. Zung, Univ. of Kansas

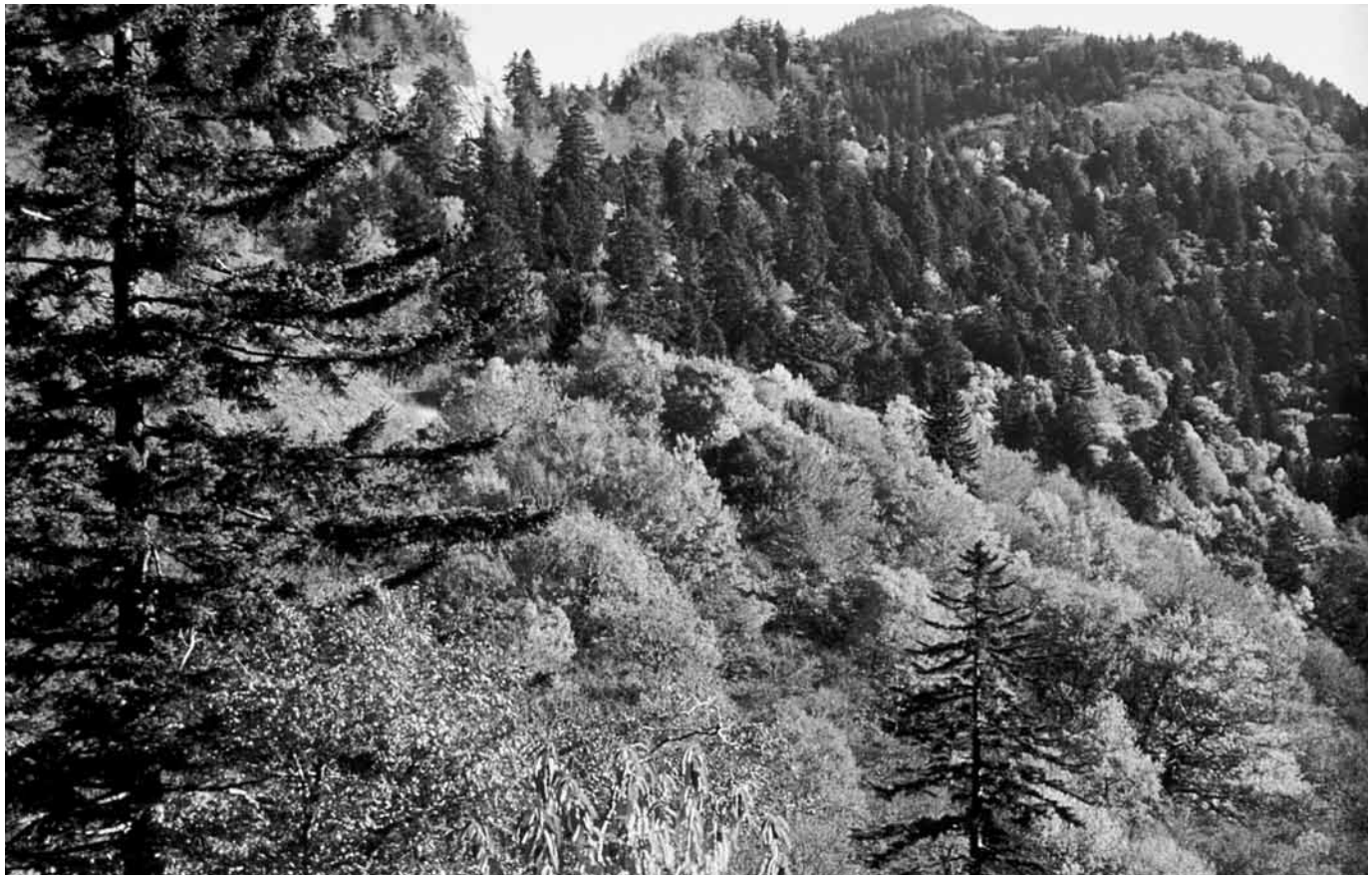
This session aims to (1) further investigate "soils as archives of past climates" using preserved pedogenic features, and (2) evaluate developed proxies for modern and ancient systems.

T23. Gullies in the Landscape
Disciplines: Quaternary Geology; Engineering Geology; Public Policy
Advocate: Ronadh Cox, Williams College

This session addresses all aspects of gullying, including field and remote-sensing studies of gully occurrence, mechanics of gully formation, environmental and sedimentological consequences, engineering challenges, and the relative roles of humans and natural forcing factors.

T24. Geomorphology of the Anthropocene: The Surficial Legacy of Past and Present Human Activities
Disciplines: Geomorphology; Quaternary Geology; Archaeological Geology
Advocates: Anne J. Jefferson, Univ. of North Carolina; Karl W. Wegmann, North Carolina State Univ.; Anne Chin, Univ. of Colorado

This session explores the legacy of human activities and land use on earth surface processes and landforms. Studies on the impacts of agriculture, mining, urbanization, and forestry in prehistoric, historic, and modern times are welcome.



Great Smoky Mountains National Park, with its vast forests connecting North Carolina and Tennessee, is America's most visited national park, according to the U.S. National Park Service (NPS). Photo courtesy NPS.

GEOMORPHOLOGY

T25. Landslides and Debris Flows: Global Problems, Local Solutions
Disciplines: Geomorphology; Engineering Geology
Advocates: Dennis M. Staley, USGS; Rex L. Baum, USGS; Thad A. Wasklewicz, East Carolina Univ.

This session explores current understanding of past and present landslides and debris flows and our ability to predict future events. Contributions that address problems associated with any type of landslide or debris flow are encouraged.

T26. Linking Coastal and Aeolian Geomorphology at the Beach-Dune Interface
Disciplines: Geomorphology; Marine/Coastal Science
Advocate: Chris Houser, Texas A&M Univ.

Exploring coastal and aeolian processes and landforms, their linkages at the beach-dune interface, and the implications for coastal response and recovery from storms are the main themes for this session.

T27. Post-Glacial Landscape Evolution: Landforms and Processes in Alpine and Sub-Alpine Areas
Disciplines: Geomorphology; Quaternary Geology
Advocates: Bradley G. Johnson, Davidson College; Michael O'Neal, Univ. of Delaware; Jacqueline A. Smith, The College of Saint Rose; Edward Evenson, Lehigh Univ.; Jeffrey S. Munroe, Middlebury College

This session focuses on landscape evolution in alpine and sub-alpine areas after the last glacial maximum. We encourage contributions focused on Holocene glaciation, pedogenic processes, rock glacier evolution, mass wasting, and hillslope modeling.

Sunset from the Clingmans Dome Observation Tower, the highest point in Great Smoky Mountains National Park (6,643 ft. elevation). Photo by Lance Goodman, Northamptonshire, UK; image provided by the U.S. National Park Service.

T28. Channel Morphology and Hydraulic Geometry of Channelized Flows: Linking Observations from a Variety of Environments and Scales
Disciplines: Geomorphology; Sediments, Clastic; Planetary Geology
Advocates: Kory Matthew Konsoer, Univ. of Illinois Urbana-Champaign; Jessica Ann Zinger, Univ. of Illinois Urbana-Champaign

This session welcomes contributions using field measurements, remotely sensed data, and laboratory experiments to understand channel morphology and hydraulic geometry in a variety of environments, ranging from rivers to submarine channels to Martian valley networks.

T29. Advances in the Study of Physical Weathering Processes and Their Influence on Landscape Evolution
Disciplines: Geomorphology; Quaternary Geology; Planetary Geology
Advocates: Martha Cary Eppes, Univ. of North Carolina; Bernard Hallet, Univ. of Washington; Leslie D. McFadden, Univ. of New Mexico

This session welcomes all field, instrumentation, and modeling studies of physical weathering, including documentation of rates and processes of rock degradation as well as links to the evolution of the surface of Earth or other planets.

T30. The Fluvial System: The Legacy of Stanley A. Schumm (Posters)
Disciplines: Geomorphology; Environmental Geoscience; Quaternary Geology
Advocates: Allen C. Gellis, USGS; Benjamin Hayes, Bucknell Univ.

This session will honor Stan Schumm and be centered on key paradigms Stan established: dynamic equilibrium, episodic response, sediment and channel morphology, river variability and complexity, base-level change and tectonics, and climate-watershed dynamics.

T31. Geological and Anthropogenic Influences on East Coast Stream Systems
Disciplines: Geomorphology; Hydrogeology; Stratigraphy
Advocates: James Pizzuto, Univ. of Delaware; Michael O'Neal, Univ. of Delaware

We solicit papers from geomorphologists, stratigraphers, modelers, and experimentalists studying East Coast stream systems from an interdisciplinary perspective.

COAL GEOLOGY

T32. 50 Years of the Centralia, Pennsylvania, Coal Fire: What We Have Learned from This and Other Coal Fires
Disciplines: Coal Geology; Environmental Geoscience
Advocate: Jennifer M. Elick, Susquehanna Univ.

This session will review what we have learned from the Centralia coal fire in Pennsylvania and will examine current research being conducted at other locations where coal fires influence the landscape.

T33. Frontiers in Coal Science: From Basic Research to Applied Technology
Disciplines: Coal Geology; Geology and Health; Environmental Geoscience
Advocates: Kevin B. Jones, USGS; Margo D. Corum, USGS

This session highlights recent advances in coal science. Topics include environmental effects of coal utilization, characterization of coal combustion products, coal gasification/liquefaction, economics of coal use, carbon sequestration, coal petrology, and sedimentology.

PETROLEUM GEOLOGY

T34. Shale and Mudrock Energy Sources: Explore the Life of a Shale Oil or Gas Project: Discover the Characteristics of a Shale Resource, Global Locations of Proven and Potential Shale Reservoirs, and How Reservoir Characterization Determines Drilling and Recovery Methods
Disciplines: Petroleum Geology; Geochemistry; Economic Geology
Advocate: Ann Vasko Givan, iReservoir.com

What are shale play characteristics? Locate proven or potential shale resources. Identify knowledge critical to acquire from varied geo-disciplines and how it is integrated into the project workflow. Enhance your understanding of unconventional shale resources.

ECONOMIC GEOLOGY

T35. Consequences of a 21st-Century Paradigm Shift in Natural Resource Exploration, along with a Parallel Shift in Exploring for, and Developing a Diverse, Highly Qualified Workforce
Disciplines: Economic Geology; History and Philosophy of Geology; Geoscience Information/Communication
Advocate: Ann Vasko Givan, iReservoir.com

A paradigm shift occurred in the last millennia, dramatically altering the way business is done. Technological advances changed how energy resources are produced and rapid information transfer altered the face of the workplace and workforce.

T36. Geology and Mineral Resources of the Carolina Slate Belt: A Tribute to Robert Carpenter
Disciplines: Economic Geology; Petrology, Igneous; Geochemistry
Advocates: James A. Saunders, Auburn Univ.; Jeffrey C. Reid, North Carolina Div. of Land Resources; Doug Crowe, Univ. of Georgia

The Carolina Slate belt is an accreted Cambrian island arc terrane with significant past mining history, and a modern-day gold rush ongoing.

T37. Cutting-Edge Developments in Energy and Other Natural Resources
Disciplines: Economic Geology; Mineralogy/Crystallography
Advocates: Ann Vasko Givan, iReservoir.com; Robbie Gries, Priority Oil and Gas LLC

The opportunity to hear from highly acclaimed scientists, recognized by their professional peers, of their recent innovations, discoveries, novel solutions, challenges, and applications associated with energy. Traditional and alternative resource topics will be represented.

T38. Subduction-Related Mantle Preparation and Subsequent Magmatism and Orogenesis
Disciplines: Economic Geology; Petrology, Igneous; Geochemistry
Advocate: James A. Saunders, Auburn Univ.

This session explores how subduction at convergent plate boundaries enriches the overlying lithospheric mantle with volatiles and metal(loids)that are easily incorporated into late- or post-subduction magma- and ore-forming processes.

T39. Weathering of Mineral Deposits in Semi-Tropical and Tropical Climates
Disciplines: Economic Geology; Environmental Geoscience; Geochemistry
Advocate: James A. Saunders, Auburn Univ.

Weathering can upgrade the value of mineral resources, allows for geochemical exploration for them, can lead to the formation of new (secondary) mineral resources, and also can cause substantial environmental problems.

ENGINEERING GEOLOGY, REMOTE SENSING/ GEOGRAPHIC INFO SYSTEM

T40. Practical Applications of Environmental and Engineering Geology
Disciplines: Engineering Geology; Environmental Geoscience; Hydrogeology
Advocate: Paul Weaver, Association of Environmental and Engineering Geologists–Carolinas Section

This session will focus on applied geology projects in order to provide insight into how geology is currently being used to investigate and provide practical solutions to geological issues.

T41. Technical and Non-Technical Guidelines and Best Practices for Hazard Studies
Disciplines: Engineering Geology; Environmental Geoscience; Geoscience Information/Communication
Advocate: Peter T. Bobrowsky, Ottawa, Ontario, Canada

This session provides a forum for geotechnical engineers, engineering geologists, and geoscientists to review guidelines and best practice and protocol documents that address the practice, obligations, and accreditation concerns of geosciences.

The Great Smoky Mountains. Photo courtesy the U.S. National Park Service.

T42. Characterizing and Quantifying Hazardous Natural Processes: Beyond Inventory Maps
Disciplines: Engineering Geology; Environmental Geoscience; Public Policy
Advocates: Jeffrey R. Keaton, AMEC Environment & Infrastructure Inc.; Norman S. Levine, College of Charleston; Bruce R. Hilton, Kleinfelder Inc.; Samantha E. Hansen, Univ. of Alabama

Hazardous processes characterized by simple inventories do not provide location, magnitude, and frequency of future events needed for mitigation decisions and response planning. This session will focus on challenges to society and opportunities for geologists.

T43. Insights into Geological Processes and Hazards Acquired through Recent Technological Advances
Disciplines: Engineering Geology; Geomorphology; Environmental Geoscience
Advocates: William J. Burns, Oregon Dept. of Geology and Mineral Industries; William H. Schulz, USGS; Richard M. Wooten, North Carolina Geological Survey

Continuing advances in remote sensing, in-situ monitoring, laboratory and field testing, and computing tools are providing new insights into geological processes. This session will explore the use of these tools in engineering geology and geomorphology.

T44. GIS and Remote Sensing Applications in Environmental and Engineering Geology
Disciplines: Remote Sensing/Geographic Info System; Engineering Geology; Environmental Geoscience
Advocates: Norman S. Levine, College of Charleston; Khalid A. Ali, College of Charleston; John Chadwick, College of Charleston

GIS and remote sensing technologies are essential tools in environmental and engineering geology. This session will highlight case studies and cutting-edge applications of the technologies for visualization and interpretation of applied geologic problems.

T45. Perspectives in Floodplain System Science
Disciplines: Environmental Geoscience; Geomorphology; Geochemistry
Advocates: David C. Shelley, Congaree National Park; Paul M. Bradley, USGS

This interdisciplinary session encourages studies related to modern and/or ancient floodplains. This includes studies of specific physical, chemical, and biological processes as well as studies related to function, development, architecture, management, and associated economic resources.

T46. Determining Chronological Environmental Records with Short Lived Isotopes: Problems and Solutions
Disciplines: Environmental Geoscience; Geochemistry; Geomorphology
Advocates: Charles W. Homes, Environchron; Gregg R. Brooks, Eckerd College

In many projects using of radioisotopes to establish chronologies of sedimentary systems, the criteria concerning the distribution of the radioisotopes are assumed or ignored resulting in misinterpretations. This session seeks presentations that address these problems.

T47. Geological CO_2 Storage Monitoring and Characterization from Injection Intervals to the Vadose Zone: Detection Methods and Field Applications
Disciplines: Environmental Geoscience; Engineering Geology; Hydrogeology
Advocates: Jean-Philippe Nicot, The Univ. of Texas at Austin; Seyyed A. Hosseini, The Univ. of Texas at Austin

Covering qualitative and quantitative CO_2 storage monitoring and detection methods, including characterization of seals and leakage pathways from injection intervals to the vadose-zone along with interdisciplinary talks in the area of environmental and engineering geosciences.

T48. Lessons from Fukushima: An Investigation of the Intersection between Geoscience and Nuclear Energy
Disciplines: Environmental Geoscience; Engineering Geology; Public Policy
Advocates: Craig Cooper, Idaho National Laboratory; J.E. Fryxell, California State Univ.; James Davis, Cosmos

This session investigates how an improved understanding and appreciation of geoscientific knowledge can help make nuclear energy more sustainable. Fukushima provides a focal point, but we also seek investigations that provide broader lessons.

T49. Geology in the National Forests and Grasslands—Stewardship, Education, and Research
Disciplines: Environmental Geoscience; Geoscience Education; Public Policy
Advocates: Christopher P. Carlson, Arlington, Va.; Michael A. Crump, USDA Forest Service

This session will explore aspects of the geological sciences related to the National Forests and Grasslands. Topics include paleontology, geomorphology, hydrogeology, geoecology, natural-hazard mitigation, cave and karst resources, and interpretive and recreational geology.

GEOLOGY AND HEALTH

T50. Alterations in Water Environment and Human Health Consequences
Disciplines: Geology and Health; Hydrogeology; Environmental Geoscience
Advocates: Motomu Ibaraki, The Ohio State Univ.; Jiyoung Lee, The Ohio State Univ.; Song Liang, The Ohio State Univ.

This session will highlight a wide range of issues associated with human health impacts of natural and anthropogenic alterations of the water environment and resources.

T51. Geology and Health: Getting the Word Out
Disciplines: Geology and Health; Geoscience Education; Public Policy
Advocates: Julia Linnaea Wise, Univ. of Cincinnati; Robert B. Finkelman, Univ. of Texas at Dallas

This session will highlight examples of how to successfully communicate the value of geoscience input in health to the health/biomedical communities, decision makers, and to the public.

GEOMICROBIOLOGY

T52. The Role of Mineralogy in Geobiology: Nanoscale Studies
Disciplines: Geomicrobiology; Mineralogy/Crystallography
Advocates: Gordon E. Brown, Stanford Univ.; Georges Calas, Univ. of Paris; Francois Guyot, Institut de Physique du Globe de Paris (IPGP), Paris

This MSA-sponsored session honoring Karim Benzerara, a 2012 MSA Awardee, will explore the impact of microorganisms on a variety of geochemical and mineralogical processes, including biomineralization, microbe–earth material–metal ion interactions, and biogeochemical cycling of elements.

GEOPHYSICS/TECTONOPHYSICS/SEISMOLOGY

T53. EarthScope and Geoprisms in Eastern North America: Ongoing Endeavors and a Look Ahead
Disciplines: Geophysics/Tectonophysics/Seismology; Structural Geology; Geochemistry
Advocates: Lara S. Wagner, Univ. of North Carolina; Maria Beatrice Magnani, Univ. of Memphis

We seek abstracts about ongoing and upcoming EarthScope and GeoPRISMS research in eastern North America, looking at tectonic processes, such as (but not limited to) continent growth, rifting initiation, and the role of inherited structures.

T54. Combining Geophysics and Geology: The George P. Woollard Award Session
Disciplines: Geophysics/Tectonophysics/Seismology; Tectonics
Advocates: Audrey Huerta, Central Washington Univ.; Samantha E. Hansen, Univ. of Alabama

This session honors the recipient of the George P. Woollard recipient for his or her outstanding geophysics contributions that advance our understanding of geology. Contributions combining geophysics and geology to solve geologic problems are welcome.

Ramsey Cascades. Photo courtesy the U.S. National Park Service.

GSA Annual Meetings

Look Toward the Future

2013—*125th Anniversary Event*
27–30 October
Denver, Colorado, USA
(*see p. 52 to learn more*)

2014
19–22 October
Vancouver, British Columbia, Canada

2015
1–4 November
Baltimore, Maryland, USA

2016
6–9 November (tentative)
Denver, Colorado, USA

2017
22–25 October
Seattle, Washington, USA

2018
4–7 November
Indianapolis, Indiana, USA

T55. Dynamic Views of North America from EarthScope-Related Research (Digital Posters)
Disciplines: Geophysics/Tectonophysics/Seismology; Structural Geology; Tectonics
Advocates: Steve Whitmeyer, James Madison Univ.; John A. Hole, Virginia Tech

The continental-scale EarthScope project has produced compelling images with new insights into the structure and deformation of North America. This digital poster session will highlight visualizations associated with EarthScope-related projects—past, present, and future.

T56. Phase Transformations and Geodynamics: Mineralogy in Action: Devoted to Harry Green, 2012 Roebling Medalist
Disciplines: Geophysics/Tectonophysics/Seismology; Petrology, Experimental; Mineralogy/Crystallography
Advocates: Larissa Dobrzhinetskaya, Univ. of California; Russell Hemley, Carnegie Institution of Washington; Michael Brown, Univ. of Maryland

We seek contributions on high-pressure rheology, petrology, shearing instabilities, phase transformations, and rock exhumation from great depths. Experiments, modeling that examine mineral-reaction–enabling flow/failure in spreading centers, subduction zones, and continental collision terranes are encouraged.

GEOSCIENCE EDUCATION

T57. Building a Professional Portfolio through Hands-On Research Activities in the Geosciences: Focusing on Early Involvement of Undergraduate and K–12 Students (Posters)
Disciplines: Geoscience Education; Geoscience Information/Communication; Environmental Geoscience
Advocates: Nazrul I. Khandaker, York College of CUNY; Stanley Schleifer, York College of CUNY

This session is open to faculty mentors and students interested in general geology and environmental topics that warrant field, computational, and laboratory-based data as part of their research tools. Domestic and international geoscience-related issues are highly welcome.

T58. Formative Assessment in Geoscience Education (Posters)
Discipline: Geoscience Education
Advocates: Matthew A. Ludwig, Western Michigan Univ.; Heather L. Petcovic, Western Michigan Univ.

Classroom formative assessment can significantly improve student achievement through feedback during the learning process, rather than by grading. This poster session explores research, practical examples, and technology related to formative assessment in college geoscience courses.

T59. Seeing through the Eyes of the Geologist: Eye Tracking, Video, and Image Analysis in Geoscience Education and Geocognition Research (Digital Posters)
Discipline: Geoscience Education
Advocates: Caitlin N. Callahan, Western Michigan Univ.; Julie Libarkin, Michigan State Univ.

This session focuses on the use and analysis of eye-tracking, video, and still images within empirical research in geoscience education and geocognition. Presentations may describe novel methodologies, applications, and/or results from research studies.

T60. EarthScope in Geoscience Education and Outreach: Past Successes and Future Opportunities
Disciplines: Geoscience Education; Geoscience Information/Communication; Geophysics/Tectonophysics/Seismology
Advocates: Steven Semken, Arizona State Univ.; J. Ramón Arrowsmith, Arizona State Univ.; Steven J. Whitmeyer, James Madison Univ.

Educators and scientists who use EarthScope facilities, projects, data, or scientific findings in support of geoscience education and outreach for students, teachers, decision makers, and the public can feature and share their practices, materials, and outcomes.

T61. Research and Instructional Approaches of Access and Inclusion to Increase Diversity in the Geosciences
Disciplines: Geoscience Education; Geology and Health; Geoscience Information/Communication
Advocates: Christopher Atchison, Georgia State Univ.; Sharon Locke, Southern Illinois Univ.

Geoscience educators and students are encouraged to disseminate research findings and instructional experiences that promotes the enhancement of a diverse participation in the geosciences through increased access and inclusion.

T62. Geology Careers for New Geology Graduates
Disciplines: Geoscience Education; Geoscience Information/Communication
Advocates: John M. Stewart, ECS Limited; Ronald J. Wallace, Georgia Dept. of Natural Resources

Geologists working in different areas of employment will advise students regarding their career opportunities and highlight many areas where jobs are available about which students may not be aware.

T63. Digital Education Resources and Strategies: Best Practices and Content That Support Hybrid Learning K–20 and Professionally
Disciplines: Geoscience Education; Geoscience Information/Communication
Advocates: Christopher Thomas, North Carolina School of Science and Math; Jennifer A. Nelson, IUPUI; Karin B. Kirk, Carleton College

This session showcases strategies for digital instructional content, collections, or teaching/training strategies that enhance or replace traditional face-to-face approaches. The emphasis is on approaches that are researched and assessed and are shareable, open source, and scaleable.

T64. Informal Geosciences Education and Learning Environments
Disciplines: Geoscience Education; Geoscience Information/Communication; Public Policy
Advocates: Andy R. Bobyarchick, Univ. of North Carolina; David K. Pugalee, Univ. of North Carolina

Informal learning environments support community science literacy beyond traditional academic venues through the use of designed spaces where people pursue interests in science, engage in inquiry, and reflect on those experiences.

T65. Student Use of Smart Phone/Tablet Technology in the Field or Classroom: An Educational Resource or the Bane of Your Existence? (Posters)
Disciplines: Geoscience Education; Geoscience Information/Communication; Remote Sensing/Geographic Info System
Advocate: J. Armour, Univ. of North Carolina

This session addresses the costs/benefits and successes/failures in student use of smart phone and tablet technology within geoscience learning environments.

T66. New Strategies for Teaching Mineralogy, Petrology, Geochemistry, and Volcanology (MPGV) to Geoscience Majors and General Education Students (Posters)
Disciplines: Geoscience Education; Mineralogy/Crystallography; Petrology, Igneous
Advocates: Elizabeth A. Johnson, James Madison Univ.; Jodie Hayob, Univ. of Mary Washington; Shelley Jaye, Northern Virginia Community College; Elizabeth McClellan, Radford Univ.

This session explores (1) strategies for teaching MPGV topics, including energy and mineral resources, to geoscience majors or students in introductory courses, and (2) ways to transfer pedagogy and content between introductory and advanced courses.

T67. Innovative Classroom Approaches to Teaching Biogeochemistry
Disciplines: Geoscience Education; Geochemistry; Limnogeology
Advocates: Steven Goldsmith, Villanova Univ.; Sarah K. Fortner, Wittenberg Univ.; Stephen Levas, The Ohio State Univ.

We seek contributions that entail innovative classroom approaches to teaching biogeochemistry at a variety of levels (K–12, undergraduate, and graduate). Of particular interest are approaches that blend research and classroom experiences.

T68. Undergraduate Research as Teaching Practice
Discipline: Geoscience Education
Advocates: Patricia Manley, Middlebury College; Jeff Ryan, Tampa, Fla.; Edward C. Hansen, Hope College

This session will deal with educational aspects of undergraduate research ranging from assessments of the pedagogical effectiveness of different approaches, mentoring students, and the nuts and bolts of setting up and doing research with students.

T69. Uncertainty in Earth and Climate Science: Integrating Uncertainty in the Classroom
Disciplines: Geoscience Education; Environmental Geoscience
Advocate: Amy Pallant, The Concord Consortium

The session introduces the High-Adventure Science project, which created computer-based investigations around compelling unanswered questions in Earth and space science and assessments that stimulate students to explore evidence and certainty in the science under study.

T70. Fostering the Next Generation: Support for Pre-College Teachers and Students by Professional Societies, Institutions, and Federal Agencies
Discipline: Geoscience Education
Advocate: Michael J. Passow, Englewood, N.J.

Sharing examples of programs created by professional societies, educational institutions, organizations, and federal agencies that effectively support K–12 teachers and students and foster the next generation of geoscientists is the focus of this session.

T71. Climate Literacy: Research and Evaluation Outcomes from Informal and Formal Climate Education Efforts
Discipline: Geoscience Education
Advocates: Susan Buhr, Univ. of Colorado; Karen S. McNeal, Mississippi State Univ.

This session encourages abstracts that provide evidence-based knowledge and guidance for the climate education community from a variety of formal and informal educational contexts.

T72. Geology in the National Parks: Research, Mapping, and Resource Management
Disciplines: Geoscience Education; Geoscience Information/Communication; Marine/Coastal Science
Advocates: Bruce A. Heise, National Park Service; Jason P. Kenworthy, Geologic Resources Division

This session addresses the role of geoscience in the National Parks. Presentations on geologic research, geologic mapping, paleontology, coastal geology and geomorphology, and resource management in National Parks, Monuments, Seashores, and Historic Sites are encouraged.

Mount Le Conte (6,593 ft. elevation), Great Smoky Mountains National Park. Photo courtesy the U.S. National Park Service.

T73. Successful Strategies for Teaching Online Geoscience Courses
Disciplines: Geoscience Education; Geoscience Information/Communication
Advocate: Shane V. Smith, Fairleigh Dickinson Univ.

This session will focus on successful pedagogical strategies, laboratory activities, and assessment tools that can be used to improve and support teaching and learning in online geoscience courses.

T74. Teaching Controversy in the K–16 Earth Science Classroom
Discipline: Geoscience Education
Advocates: Laura A. Guertin, Penn State Brandywine; Tanya Furman, The Pennsylvania State Univ.

Evolution, climate change, offshore drilling, nuclear energy—all are topics rich in content and controversial in nature. We seek presenters to share approaches and strategies for introducing controversy in the K–16 classroom.

T75. Climate Literacy: Formal and Informal Educational Activities and Community Outreach to Support an Informed Society
Disciplines: Geoscience Education; Geoscience Information/Communication; Public Policy
Advocates: Tamara Shapiro Ledley, TERC; Jeffrey Ryan, Univ. of South Florida

This session will focus on descriptions of efforts for pre-college (students & teachers), higher education, informal education audiences, and community outreach, including materials, activities, curriculum, capstone projects, service learning, professional development programs, and community activities.

T76. Teaching Teachers: Examples of Successful Geoscience Content Courses and Workshops for Pre-Service and In-Service Teachers
Discipline: Geoscience Education
Advocates: Kyle Gray, Univ. of Northern Iowa; Jennifer Anderson, Winona State Univ.; Amy L. Ellwein, Western State College

This technical session brings together presentations that illustrate courses or lessons designed for pre-service or in-service teachers including geoscience content courses, field-based courses, and summer workshops.

T77. Innovations and Challenges in Non-Major Instruction in Two- and Four-Year Colleges
Discipline: Geoscience Education
Advocates: David H. Voorhees, Waubonsee Community College; Suzanne T. Metlay, Front Range Community College

This session explores innovative pedagogy of part- and full-time faculty in geoscience classes predominantly of diverse students solely seeking general education requirements. This requires innovative strategies to ensure engagement and success in all learning environments.

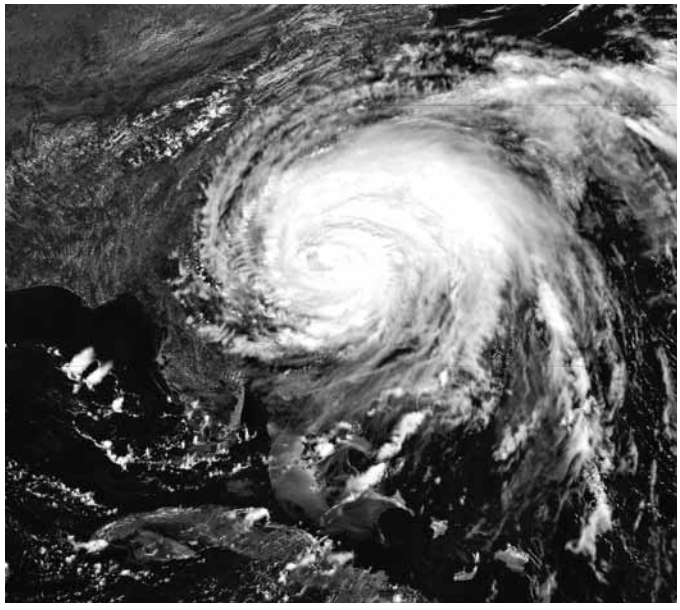
GEOSCIENCE INFORMATION/COMMUNICATION

T78. Citizen Science, Mobile Applications, and Geoscience (Posters)
Disciplines: Geoscience Information/Communication; Hydrogeology; Environmental Geoscience
Advocates: Christopher Lowry, Univ. at Buffalo; Michael N. Fienen, USGS

The focus of this session will be to demonstrate the use and applications of both citizen science projects and mobile applications within the geosciences.

T79. Uncertainty in Earth and Climate Science: Communicating Uncertainty to the Public
Disciplines: Geoscience Information/Communication; Geoscience Education; Public Policy
Advocates: David W. Szymanski, Bentley Univ.; J.E. Fryxell, California State Univ.; Tamara Shapiro Ledley, TERC

The term "uncertainty" carries a dramatically different meaning in the public realm compared to the way it is used by scientists. This session will cover pitfalls and strategies in communicating uncertainty in scientific data.



Hurricane Irene just off the Carolinas. Irene made landfall in Cape Lookout, North Carolina, USA, at 8 a.m. EDT as a Category 1 hurricane with maximum sustained winds near 85 mph. Image captured 26 Aug. 2011 at 12:30 p.m. EDT by the Moderate Resolution Imaging Spectroradiometer (MODIS) aboard NASA's *Terra* satellite; courtesy NASA Goddard MODIS Rapid Response Team, http://www.nasa.gov/mission_pages/hurricanes/archives/2011/h2011_Irene.html.

T80. Geoscience Information: Investing in the Future
Disciplines: Geoscience Information/Communication; Geoinformatics; Geoscience Education
Advocate: Robert L. Tolliver, The Pennsylvania State Univ.

How are libraries investing in the future of geoscience information? This session will look at traditional print and online publications, non-traditional information sources, data management and digital repositories, preservation, and other future information resources.

T81. Don't be a Dinosaur: Geoscience Information in the 21st Century (Posters)
Disciplines: Geoscience Information/Communication; Geoinformatics; Geoscience Education
Advocate: Robert L. Tolliver, The Pennsylvania State Univ.

This poster session will provide a glimpse of the different ways that geoscience librarians and others are addressing the information challenges of the 21st century.

T82. Geologic Maps, Digital Geologic Maps, and Derivatives from Geologic and Geophysical Maps (Posters)
Disciplines: Geoscience Information/Communication; Hydrogeology; Engineering Geology
Advocates: Richard C. Berg, Prairie Research Institute, Univ. of Illinois; Ralph F. Crawford, The Geologic Mapping Institute; Michael W. Higgins, The Geologic Mapping Institute; Linda Jacobsen, USGS; E. Donald McKay, Illinois State Geological Survey; Hazen A.J. Russell, Ottawa, Ontario, Canada; David R. Soller, USGS; Harvey Thorleifson, Univ. of Minnesota

This poster session will highlight new geologic maps, mapping programs, and innovations in geological mapping, including data management, web accessibility, 3-D, and applications in water and land management.

PUBLIC POLICY

T83. Issues in Geology and Public Policy: A Clash of Cultures/ An Intersection of Interests
Disciplines: Public Policy; Environmental Geoscience; Geoscience Information/Communication
Advocates: Michael A. Phillips, Illinois Valley Community College; David W. Szymanski, Bentley Univ.

This session will present examples of when geologists have worked with federal, state, and local leaders to ensure the geologic perspective was a valuable component in public decision making or the development of public policy.

HISTORY AND PHILOSOPHY OF GEOLOGY

T84. "It Appears on Examination That Some of the Hills are Rich in Gold"—The History and Legacy of Gold Mining in the Southeastern United States: 1800 to 2012
Disciplines: History and Philosophy of Geology; Economic Geology; Environmental Geoscience
Advocate: Michael S. Smith, Univ. of North Carolina

In the 1800s, the discovery of gold in North Carolina fomented a regional gold rush and economic boom in the South. Later gold rushes in the region have nurtured both economic development and environmental concerns.

T85. The Great Charleston Earthquake (1886) and the Development of Seismology and Earthquake Engineering
Disciplines: History and Philosophy of Geology; Geophysics/Tectonophysics/Seismology; Engineering Geology
Advocate: K.R. Aalto, Humboldt State Univ.

Clarence Dutton, who investigated the 1886 Charleston earthquake, was a pioneer in seismology and earthquake engineering. This session will explore their late 19th-century development in North America and worldwide, as linked to specific earthquake events.

HYDROGEOLOGY

T86. Estimation Techniques and Controls on Natural and Artificial Recharge
Disciplines: Hydrogeology; Environmental Geoscience; Geochemistry
Advocates: H.S. Nance, The Univ. of Texas at Austin; John Izbicki, USGS; Bridget Scanlon, The Univ. of Texas at Austin

This session focuses on physical, chemical, and isotopic techniques for estimating natural and artificial recharge. Field studies and modeling analyses will be used to assess controls on groundwater recharge at varying spatial and temporal scales.

T87. Building Capacity for Hydrologic Science in Water-Stressed Regions of the World (Posters)
Disciplines: Hydrogeology; Geoscience Education
Advocates: Alan E. Fryar, Univ. of Kentucky; Adam Milewski, Univ. of Georgia; Mohamed I. Sultan, Western Michigan Univ.

The development and prudent management of water resources depends upon the appropriate training of hydrologists. We seek posters on integrating hydrologic education with research and practice in water-stressed regions, especially in Africa and Asia.

T88. Geological and Hydrogeological Characterization Studies at CO_2 Sequestration Sites
Disciplines: Hydrogeology; Geochemistry; Environmental Geoscience
Advocate: Benjamin J. Rostron, Univ. of Alberta

There are numerous geological CO_2 sequestration projects planned and underway worldwide. This session addresses results of geological, geochemical, and hydrogeological characterization studies conducted at CO_2 sequestration sites.

T89. Groundwater–Surface Water Interactions: Approaches for Improved Decision Making for Water Resource Issues
Disciplines: Hydrogeology; Limnogeology; Marine/Coastal Science
Advocates: Brewster Conant, Univ. of Waterloo; Donald O. Rosenberry, USGS

Our understanding of groundwater–surface water interactions continues to improve. This session seeks presentations that demonstrate how new techniques and characterization approaches have resulted in better management and/or decision making relating to water-resource issues.

T90. Coastal Surface Water–Groundwater Interactions
Disciplines: Hydrogeology; Marine/Coastal Science; Environmental Geoscience
Advocates: Jaye E. Cable, Univ. of North Carolina; Clare E. Robinson, The Univ. of Western Ontario; Audrey H. Sawyer, Univ. of Delaware

This session highlights surface water–groundwater interactions and their influence on water quality, biogeochemical cycles, and ecosystem processes in settings from coastal rivers to the continental shelf. Studies at all spatial and temporal scales are welcome.

T91. The Hydrology of Headwater Catchments (Posters)
Disciplines: Hydrogeology; Environmental Geoscience; Geochemistry
Advocates: Weston R. Dripps, Furman Univ.; C. Brannon Andersen, Furman Univ.

This session focuses on hydrologic research in headwater catchments. Headwater catchments influence the physical, chemical, and biological integrity of downstream rivers and are particularly vulnerable to anthropogenic factors, including urbanization, land-cover change, and pollution.

T92. Eogenetic Karst Aquifers: Water Resources and Water Quality
Disciplines: Hydrogeology; Marine/Coastal Science; Sediments, Carbonates
Advocates: Lewis A. Land, New Mexico Tech; Lee J. Florea, Ball State Univ.

Eogenetic karst aquifers in coastal areas are particularly vulnerable to natural and anthropogenic contamination. Papers are welcome on water resource and water quality issues in such aquifers, as well as methods used to characterize and remediate them.

T93. Advances in Hydrology and Sustainable Water Management in Coastal Environments
Disciplines: Hydrogeology; Environmental Geoscience; Marine/Coastal Science
Advocates: Alex K. Manda, East Carolina Univ.; Michael A. O'Driscoll, East Carolina Univ.

This session focuses on water sources, water fluxes, and water quality issues in coastal environments. Topics include coastal plain and barrier island hydrology, saltwater intrusion, groundwater–surface water interactions, modeling, water quality, and management challenges.

T94. Dissolved Gases and Bubbles in Groundwater: Applications and Emerging Topics
Disciplines: Hydrogeology; Geochemistry
Advocate: Karl B. Haase, USGS

This session provides an opportunity to present advances and studies using dissolved gases in groundwater systems, including information about processes that can modify levels of dissolved gases in the vadose zone and aquifer system.

T95. Biscayne Aquifer
Disciplines: Hydrogeology; Geophysics/Tectonophysics/Seismology; Geochemistry
Advocates: Michael C. Sukop, Florida International Univ.; Dean Whitman, Florida International Univ.; Virginia Walsh, Miami-Dade County Water and Sewer Dept.; Joseph D. Hughes, USGS; Jayantha Obeysekera, South Florida Water Management District; Jefferson B. Giddings, South Florida Water Management District

We encourage presentations dealing with all aspects of the geology, physics, chemistry, hydrogeology, geophysics, simulation, protection, and management of the Biscayne Aquifer and its role in the water supply and ecology of southeast Florida.

T96. Riparian Ecohydrology and Stream-Aquifer Interactions: Fluxes across the Surface-Subsurface Interface
Disciplines: Hydrogeology; Environmental Geoscience; Geochemistry, Organic
Advocates: Adam S. Ward, Univ. of Iowa; Steven P. Loheide, Univ. of Wisconsin; Laurel G. Larsen, National Research Program; Christopher Lowry, Univ. at Buffalo; Eric G. Booth, Univ. of Wisconsin

This session encourages studies of riparian zones as a mediator for fluxes of water, solutes, and particulate matter through coupled stream-aquifer-hillslope systems, feedbacks between these end-members, and the implications for water quality and ecosystem function.

T97. Novel Techniques for the Identification and Quantification of Regional Groundwater Contributions to Streamflow and Related Processes
Disciplines: Hydrogeology; Geochemistry; Geomorphology
Advocates: Marty D. Frisbee, New Mexico Tech; W. Payton Gardner, Albuquerque, N.Mex.; Jesus D. Gomez, New Mexico Tech; John L. Wilson, New Mexico Tech

The goal of this session is to promote a greater understanding of the role of deep, basin-scale groundwater in streamflow generation and related processes by presenting new and innovative observational and modeling approaches and techniques.

T98. Hydrogeology and Geochemistry of Shales
Disciplines: Hydrogeology; Geochemistry; Engineering Geology
Advocates: Madeline E. Schreiber, Virginia Tech; John Chermak, Virginia Tech

This session will explore the hydrogeologic and geochemical characteristics of shale formations and their potential controls on water quality.

T99. Effective Aquifer Management: Connecting Aquifer Management and Regulation to Hydrogeologic Science
Discipline: Hydrogeology
Advocates: Jack Eggleston, Water Resources Division; Robert E. Mace, Austin, Tex.

Stress on water-supply aquifers has increased dramatically along with the importance of effective aquifer management and regulation. This session examines regulatory and managerial strategies for regional water supply aquifers threatened by unsustainable water use.

T100. Biogeochemical Processes Influence the Environmental Fate of Contaminants: The Role of Hydrology and Ecology in the Chemical Evolution of Water
Disciplines: Hydrogeology; Geochemistry; Geomicrobiology
Advocates: Janet S. Herman, Univ. of Virginia; Karen C. Rice, Univ. of Virginia; Chuanhui Gu, Appalachian State Univ.

Elucidation of the biogeochemical processes in watersheds that determine the chemical evolution of water improves our predictions of the environmental fate of contaminants. New insights depend upon interdisciplinary study including hydrology and ecology.

T101. Hydrology of Urban Groundwater, Streams, and Watersheds
Disciplines: Hydrogeology; Environmental Geoscience; Engineering Geology
Advocates: Anne J. Jefferson, Univ. of North Carolina; John M. Sharp, Jackson School of Geosciences

This session explores how urbanization affects water quantity, quality, and ecohydrology in groundwater and surface water systems. Field and modeling studies of flow, recharge, water balance, groundwater-stream interactions, water quality, and contamination are welcome.

T102. Hydraulic Fracturing for Resource Development or Remediation: Methods, Results, and Industry-Regulatory Response to Environmental Impacts on Ground and Surface Waters
Disciplines: Hydrogeology; Economic Geology; Environmental Geoscience
Advocates: Gerry V. Winter, Kuna, Idaho; Neil Coleman, Univ. of Pittsburgh

Hydraulic fracturing is important for developing oil, gas, and water in low-permeability formations and is used in remediation of contaminated sites, but the process can result in unintended consequences that adversely affect the environment.

T103. Groundwater Model Calibration and Uncertainty Analysis
Disciplines: Hydrogeology; Environmental Geoscience; Geoinformatics
Advocates: Ming Ye, Florida State Univ.; Ye Zhang, Univ. of Wyoming; L. Shawn Matott, Univ. at Buffalo; Shuiquan Li, Univ. of Wyoming

This session is focused on new ideas and methods for hydrogeologic inverse modeling and quantification and reduction of uncertainties impacting hydrogeologic models of processes occurring wholly or in part in the subsurface.

T104. Quantifying Net Recharge: Precipitation and Evapotranspiration as the Major Water-Budget Components
Discipline: Hydrogeology
Advocates: Troy P. Bernier, Florida Memorial Univ.; Eric D. Swain, USGS

Spatial interpretation involves many assumptions; there can be gross errors when not considering the numerous variables that affect the latent heat value. We present studies involving the comparison and estimation of precipitation and evapotranspiration.

T105. Groundwater–Surface Water Interactions: Advances in Measurement and Modeling Techniques
Discipline: Hydrogeology
Advocates: Andrea E. Brookfield, Univ. of Kansas; Brewster Conant, Univ. of Waterloo; Christine Hatch, Univ. of Massachusetts

Groundwater–surface water interactions are complex and difficult to characterize. This session focuses on new and innovative field, laboratory, and modeling methods for identifying and quantifying these interactions across a range of temporal and spatial scales.

T106. Arsenic: Fate and Transport in Natural Waters and Aquifers from Basin to Pore-Space Scale
Disciplines: Hydrogeology; Geochemistry; Environmental Geoscience
Advocates: Prosun Bhattacharya, Royal Institute of Technology (KTH); Abhijit Mukherjee, Indian Institute of Technology (IIT); Ratan Dhar, York College of City Univ. of New York; Karen H. Johannesson, Tulane Univ.; Lois Ongley, Unity College

All aspects of earth and anthropogenic systems that may impact the occurrence, fate, transport, biogeochemical cycling, and sustainable mitigation of arsenic in water, rocks, and biological organisms will be discussed.

Special Events Space Requests

Please let us know about your non-technical events by submitting them through our online space request system. This includes any gathering you would like listed in the program book and the personal scheduler. You will be notified of your event location in July. Deadline: 5 June.

www.geosociety.org/meetings/2012/

T107. Comparisons of Flow and Chemistry in Eogenetic and Telogentic Karst Aquifers
Disciplines: Hydrogeology; Sediments, Carbonates; Environmental Geoscience
Advocates: Jason Gulley, Austin, Tex.; Corinne Wong, The Univ. of Texas at Austin

This session seeks to understand how differences in porosity between eogenetic (primary matrix porosity) and telogenetic (fractured matrix porosity) karst systems influence the hydrological and geochemical processes in karst aquifers, including cave formation.

LIMNOGEOLOGY

T108. Modern and Ancient Saline Lakes
Disciplines: Limnogeology; Geochemistry; Quaternary Geology
Advocates: Daniel Deocampo, Georgia State Univ.; Cynthia M. Liutkus, Appalachian State Univ.

Papers are encouraged from any discipline studying saline lakes and paleolakes, including hydrologic, geochemical, biological, and sedimentary studies, from polar latitudes to equatorial regions.

T109. Wetlands: Form, Function and History
Disciplines: Limnogeology; Geomorphology; Hydrogeology
Advocates: Michelle F. Goman, Sonoma State Univ.; Gail M. Ashley, Rutgers Univ.

Wetlands are found globally from sea level to high elevations; show incredible geomorphic, sedimentologic, and floral diversity; and provide vital environmental functions. This session welcomes papers that examine all aspects of wetland history and complexity.

T110. New Perspectives on Modern and Ancient Rift Lakes
Disciplines: Limnogeology; Paleoclimatology/Paleoceanography; Geochemistry
Advocates: David B. Finkelstein, Univ. of Massachusetts; Elizabeth Gierlowski-Kordesch, Ohio Univ.

This session explores paleoclimate, geomicrobiology, geophysical, and geochemical signatures of modern and ancient rift lake environments and sediments. Topics will include geophysical, geochemical, and isotopic signatures of waters, microbes, and mineral facies.

T111. Lake Systems through Space and Time
Disciplines: Limnogeology; Sediments, Carbonates; Sediments, Clastic
Advocate: Elizabeth H. Gierlowski-Kordesch, Ohio Univ.

The study of lake systems includes the fields of sedimentology, paleontology, stratigraphy, geomorphology, and hydrogeology. Precambrian, Phanerozoic, and Holocene to Recent lake sediments are archives of tectonic evolution and climatic change.

T112. Lacustrine Microbialites Past and Present: Hydrology, Water Chemistry, Sedimentology, and Stratigraphy
Disciplines: Limnogeology; Sediments, Carbonates; Geomicrobiology
Advocate: H. Paul Buchheim, Loma Linda Univ.

This session will explore the conditions under which microbialites formed in ancient and modern lacustrine environments. Presentations will address the sedimentologic-stratigraphic records as well as the hydrologic and chemical conditions that favor microbialite formation.

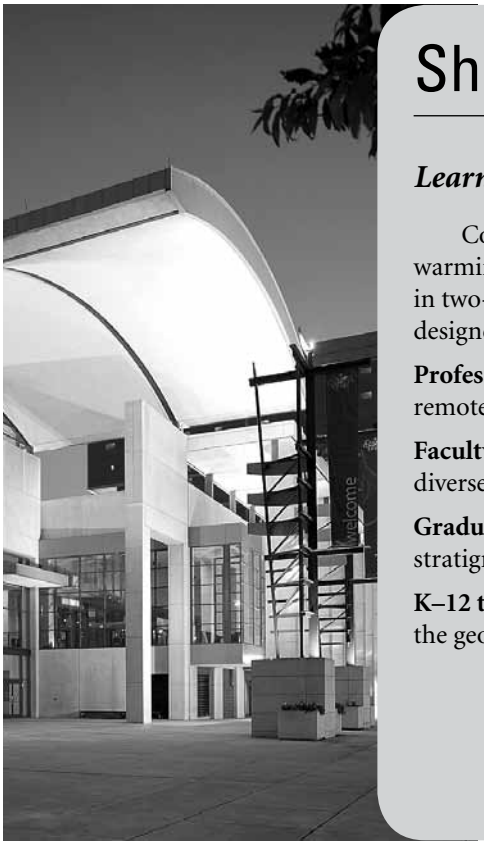
MARINE/COASTAL SCIENCE

T113. Morphological Responses of Salt Marshes to Interactive Stressors
Discipline: Marine/Coastal Science
Advocates: Kristin R. Wilson, Allegheny College; Joseph Kelley, Univ. of Maine

Salt marsh morphology is influenced by climate change, sea-level rise, eutrophication, land-use change, and biotic interactions, among others. This session shares new insights into how these stressors and interactions between them shape salt marsh morphology.

T114. Coastal-Plain Watershed-River-Estuarine Connectivity, Material Transport, and Sedimentation in a Changing Environment
Disciplines: Marine/Coastal Science; Sediments, Clastic; Geochemistry
Advocates: Antonio B. Rodriguez, Univ. of North Carolina; Brent McKee, Univ. of North Carolina

Studies focusing on the impacts of changes in climate, sea level, and/or land use on the coastal-plain watershed-river-estuarine continuum, which includes floodplains, bay-head deltas, and marshes, over geological or historical time scales are encouraged.



Short Courses

Learn & Explore!

Courses cover a variety of topics, including hazards, 3-D geologic mapping, global warming, Mars for Earthlings, education research, undergraduate research, geoscience in two-year colleges, effective field experiences, and field safety. Some courses are designed for specific groups:

Professionals: estimating groundwater recharge, optical mineralogy, and introductory remote sensing

Faculty: geophysics, ground-based LiDAR, and science communication training to diverse audiences

Graduate students: sequence stratigraphy, seismic structural interpretation, and stratigraphic concepts applied to basin exploration

K–12 teachers: hands-on, inquiry-based geoscience activities, quantitative literacy, and the geology of U.S. National Parks

www.geosociety.org/meetings/2012/courses.htm

T115. Recent Sea-Level Rise: Accelerating or Not?
Disciplines: Marine/Coastal Science; Public Policy; Quaternary Geology
Advocates: Rob Young, Western Carolina Univ.; Asbury H. Sallenger, USGS

This session will examine the direct and indirect evidence for changes in the rate of sea-level rise over the past 100–200 years.

T116. Constructing Deltaic Depositional Systems: Integrating Field Examples, Theory, and Modeling
Disciplines: Marine/Coastal Science; Sediments, Clastic; Stratigraphy
Advocate: John Snedden, The Univ. of Texas at Austin

This session brings together researchers interested in understanding both the physics of deltaic construction from experimental or numerical models as well as the constraints on architectural organization determined from modern and ancient field examples.

T117. Submerged Shorelines: Field Evidence and Computer Modeling of Former Sea Levels
Disciplines: Marine/Coastal Science; Quaternary Geology; Archaeological Geology
Advocate: James Andrew Cooper, Univ. of Ulster

The record of postglacial sea-level change is drowned on the continental shelf, but growing numbers of stratigraphic and geomorphic observations are revealing a record that is at odds with numerical simulations.

T118. Paleotempestology: Proxy Record Development and Climate Forcing Mechanisms
Disciplines: Marine/Coastal Science; Geomorphology; Paleoclimatology/Paleoceanography
Advocates: Andrea D. Hawkes, Woods Hole Oceanographic Institution; Jon Woodruff, Univ. of Massachusetts; Daria Nikitina, West Chester Univ.

We will explore new findings in paleotempestology record development, which identifies the timing and frequency/intensity of tropical cyclones. We welcome studies highlighting forcing mechanisms responsible for past/future cyclone variability. Integrated field, lab, and model analyses are encouraged.

T119. The Role of Microfossils in Environmental Monitoring
Disciplines: Marine/Coastal Science; Environmental Geoscience; Paleoclimatology/Paleoceanography
Advocates: Elizabeth A. Nesbitt, Univ. of Washington; Ruth A. Martin, Univ. of Washington

This session focuses on the use of microorganisms, living or fossil, as indicators of environmental stress, including pollution, hypoxia, acidification, and climate change in coastal and estuarine settings.

T120. Coastal Hazards—Common Themes of Storm and Tsunami Processes and Impacts
Disciplines: Marine/Coastal Science; Quaternary Geology; Public Policy
Advocates: Robert Weiss, Virginia Tech; Joanne Bourgeois, Univ. of Washington; Jonathan D. Woodruff, Univ. of Massachusetts

We highlight projects that study storms and tsunamis from different perspectives (e.g., science, engineering, education) to develop priorities for interdisciplinary research and for how such research can increase awareness of and preparedness for coastal hazards.

T121. Rapid Sea-Level Rise and Its Impacts: Past, Present, and Future
Disciplines: Marine/Coastal Science; Paleoclimatology/Paleoceanography; Environmental Geoscience
Advocates: George T. Stone, Milwaukee Area Technical College; Michael E. Mann, Penn State Univ.; Stanley R. Riggs, East Carolina Univ.; Andrew M. Buddington, Spokane Community College

This session convenes leading scientists from diverse disciplines to present current research on one of the most compelling issues in the geosciences: rapid sea-level rise and the attendant threat to coastlines worldwide.

PALEOCLIMATOLOGY/PALEOCEANOGRAPHY

T122. Fossils Plants as Paleoenvironmental Recorders
Disciplines: Paleoclimatology/Paleoceanography; Paleontology, Paleoecology/Taphonomy; Geochemistry, Organic
Advocates: Dana L. Royer, Wesleyan Univ.; Daniel J. Peppe, Baylor Univ.

There are a growing number of tools for reconstructing paleoenvironments using fossil plants, ranging from isotopes to anatomy. This session will highlight paleobotanical proxy development and fossil case studies for reconstructing paleoclimate and paleoecology.

T123. Biotracers, Mineralogical and Geochemical Properties of Circum-Arctic Sediment Sources, and Runoff toward the Arctic Ocean
Disciplines: Paleoclimatology/Paleoceanography; Sediments, Clastic; Marine/Coastal Science
Advocate: Dennis Darby, Old Dominion Univ.

Reviews and new information about the mineralogy, geochemistry, and biotracer content of sediment sources and abstracts on circum-Arctic continental erosion are encouraged for this session on the prospect of future Arctic IODP drilling.

T124. Oceans and Climates through Earth History: From Proxy Reconstructions to Model Assessments (Posters)
Disciplines: Paleoclimatology/Paleoceanography; Geochemistry; Paleontology, Diversity, Extinction, Origination
Advocates: Miriam E. Katz, Rensselaer Polytechnic Institute; Beth A. Christensen, Adelphi Univ.; David P. Gillikin, Union College; Alicia C.M. Kahn, Chevron Corp.

This session brings together proxy and modeling studies to improve our understanding of rapid ocean and climate events, and shifts between long-term climate states, within the context of normal climate variability throughout Earth's history.

T125. Quantitative Cenozoic Terrestrial Climate Reconstructions in the Northern Hemisphere: Evidence from Paleo-Proxies and Beyond
Disciplines: Paleoclimatology/Paleoceanography; Paleontology, Paleoecology/Taphonomy; Paleontology, Diversity, Extinction, Origination
Advocates: Yusheng (Christopher) Liu, East Tennessee State Univ.; Torsten Utescher, Bonn Univ./Senckenberg Research Institute

The session will address the Cenozoic terrestrial climate reconstructions in the Northern Hemisphere by integrating evidence from various paleo-proxies and modeling experiments.

T126. Late Triassic Climates, Environments, and Life on Pangaean North America
Disciplines: Paleoclimatology/Paleoceanography; Stratigraphy; Geochemistry
Advocates: S.I. Dworkin, Baylor Univ.; Lee Nordt, Baylor Univ.; Stacy Atchley, Baylor Univ.

This session evaluates the state of research concerning Late Triassic environmental conditions preceding the Tr/Jr mass extinction. Disciplines reviewed include paleogeography, paleobotany, paleontology, palynology, paleopedology, stratigraphy, and paleoceanographic conditions.

T127. Terrestrial Proxies of Paleoclimate and Paleoenvironment in Deep Time
Disciplines: Paleoclimatology/Paleoceanography; Geochemistry; Sediments, Clastic
Advocates: Lauren A. Michel, Baylor Univ.; Jennifer M. Cotton, Univ. of Michigan; Ethan Hyland, Univ. of Michigan

This session focuses on advances in new proxy techniques as well as reconstructions of past environmental and climatic conditions for the terrestrial ecosystems as analogs for the impacts of future anthropogenically driven climate change.

MINERALOGY/CRYSTALLOGRAPHY

T128. Investigating the Future of Uranium in the Geosciences: An Examination of Environmental Studies and Applications
Disciplines: Mineralogy/Crystallography; Geochemistry; Environmental Geoscience
Advocates: Jessica M. Morrison, Univ. of Notre Dame; Ginger E. Sigmon, Univ. of Notre Dame; Peter C. Burns, Univ. of Notre Dame

A diverse body of work spanning atomic-scale studies of uranium in the solid-state to environmental remediation of actinide contaminants will be presented with insights from speakers on topics including bioremediation, contaminant transport, and Fukushima.

T129. Advances in Spectroscopy for Geological and Mineralogical Analysis
Disciplines: Mineralogy/Crystallography; Petrology, Igneous; Geochemistry
Advocates: Thomas Tague, Bruker Optics; Sheila Seaman, Univ. of Massachusetts

This session will focus on the application of a growing variety of spectroscopic techniques to geologic problems and further understanding of structures and properties of minerals, glasses, and other geologic materials.

T130. Bloss Mineralogical Session: In Honor of the Life-Time Accomplishments of F. Donald Bloss, Emeritus Alumni Distinguished Professor, Virginia Tech, as a Researcher, Author, and Teacher in the Field of Optical Mineralogy
Disciplines: Mineralogy/Crystallography; Petrology, Experimental; Geoscience Education
Advocates: Mickey E. Gunter, Univ. of Idaho; Nancy Ross, Virginia Tech

Contributions are broadly oriented toward teaching and research in optical mineralogy and applications of polarized light microscopy (e.g., petrology, forensics, asbestos identification, etc.) and those wishing to honor Professor Bloss for his contributions in mineralogy.

PETROLOGY

T131. The Relationship between Silicic Plutons and Ignimbrites: Exploring the Contradictions
Disciplines: Petrology, Igneous; Geochemistry; Geophysics/Tectonophysics/Seismology
Advocates: Craig C. Lundstrom, Univ. of Illinois; D.S. Coleman, Univ. of North Carolina

We solicit contributions aimed at discussion of the problem of upper crustal magmatic processes leading to formation of silicic plutons or silicic caldera systems and their relationship to each other.

T132. From Composition and Modal Space, to Biopyriboles, to the Thermodynamics of Metamorphism: The Influence of James B. Thompson, Jr., on Present and Future Mineralogy, Metamorphic Petrology, and Northern Appalachian Geology
Disciplines: Petrology, Metamorphic; Mineralogy/Crystallography; Geochemistry
Advocates: Jo Laird, Univ. of New Hampshire; Mark J. Caddick, ETH Zürich

This session will contain a wide range of talks that reflect the profound influence of JBT on 20th-century mineralogy and petrology and New England geology as well as those that celebrate his continuing influence into the 21st century.

T133. Getting to the Root of It—Metamorphism, Tectonics, and Crustal Evolution
Disciplines: Petrology, Metamorphic; Mineralogy/Crystallography; Tectonics
Advocates: Nigel M. Kelly, Colorado School of Mines; Callum J. Hetherington, Texas Tech Univ.; Julien Allaz, Univ. of Massachusetts

A robust understanding of continental crustal evolution demands integrated approaches to metamorphic petrology. This session will showcase new research using multi-technique approaches to understanding metamorphic processes operating from subgrain- to orogen-scales.

PALEONTOLOGY, BIOGEOGRAPHY/ BIOSTRATIGRAPHY

T134. Advances in Cenozoic Foraminiferal Biostratigraphy, Chemostratigraphy, and Paleoecology
Disciplines: Paleontology, Biogeography/Biostratigraphy; Paleontology, Diversity, Extinction, Origination; Stratigraphy
Advocate: Thomas W. Dignes, Chevron Energy Technology Co.

Marine Cenozoic rocks continue to drive both academic and energy resource interest around the world. This session will gather the latest research advances in the foraminiferal biostratigraphy, chemostratigraphy, and paleoecology of those sediments.

T135. Advances in Mesozoic Foraminiferal Biostratigraphy, Chemostratigraphy, and Paleoecology
Disciplines: Paleontology, Biogeography/Biostratigraphy; Paleontology, Diversity, Extinction, Origination; Stratigraphy
Advocate: Thomas W. Dignes, Chevron Energy Technology Co.

Marine Mesozoic rocks continue to drive both academic and energy resource interest around the world. This session will gather the latest research advances in the foraminiferal biostratigraphy, chemostratigraphy, and paleoecology of those sediments.

T136. Advances in Paleozoic Foraminiferal Biostratigraphy, Chemostratigraphy, and Paleoecology
Disciplines: Paleontology, Biogeography/Biostratigraphy; Paleontology, Diversity, Extinction, Origination; Stratigraphy
Advocate: Thomas W. Dignes, Chevron Energy Technology Co.

Marine Paleozoic rocks continue to drive both academic and energy resource interest around the world. This session will gather the latest research advances in the foraminiferal biostratigraphy, chemostratigraphy, and paleoecology of those sediments.

PALEONTOLOGY, DIVERSITY, EXTINCTION

T137. The Evolution of Biomineralization
Disciplines: Paleontology, Diversity, Extinction, Origination; Paleontology, Phylogenetic/Morphological Patterns; Geochemistry
Advocates: Uwe Balthasar, Univ. of Glasgow; Susannah M. Porter, Univ. of California

Biomineralization is one of the most important processes linking the biosphere to the oceans, atmosphere, and lithosphere. This session is aimed at large-scale patterns in the evolution of biomineralization and their feedbacks with the environment.

T138. Fossil Preservation, Biological Evolution, and Environmental Change at the Dawn of Animal Radiation: An Examination of Geobiological Events across the Ediacaran–Cambrian Transition
Disciplines: Paleontology, Diversity, Extinction, Origination; Paleontology, Paleoecology/Taphonomy; Geochemistry
Advocates: James D. Schiffbauer, Virginia Tech; Shuhai Xiao, Virginia Tech

"Preservation, evolution, and environmental change" aims to bring together diverse research on events framing the Ediacaran–Cambrian transition to further our understanding of biogeochemical, evolutionary, and paleoenvironmental factors influencing this time of global change.

T139. Divided Oceans and Connected Continents: Advances in Geology and Paleontology of the Tropical Americas
Disciplines: Paleontology, Diversity, Extinction, Origination; Paleontology, Biogeography/Biostratigraphy; Tectonics
Advocates: Austin J.W. Hendy, Smithsonian Tropical Research Institute; David W. Farris, Florida State Univ.; Carlos Jaramillo, Smithsonian Tropical Research Institute

The geological and fossil record of the Neotropics is critical to understanding major events in biogeography, evolution, and climate change. This session explores diverse new data and interpretations on the Cenozoic history of this region.

T140. The Big Kill: Paleobiological, Geochemical, and Modeling Studies of the Permian–Triassic Boundary Mass Extinction
Disciplines: Paleontology, Diversity, Extinction, Origination; Paleoclimatology/Paleoceanography; Geochemistry
Advocates: Arne M.E. Winguth, The Univ. of Texas at Arlington; Thomas J. Algeo, Univ. of Cincinnati; David Bottjer, Univ. of Southern California

This session features recent research of sedimentary, geochemical, paleobiological, and paleogeographical records and modeling studies to improve the understanding of the mass extinction near the Permian–Triassic boundary.

T141. Pantropical Paleontology of the Marine Cenozoic
Disciplines: Paleontology, Diversity, Extinction, Origination; Paleoclimatology/Paleoceanography; Paleontology, Paleoecology/Taphonomy
Advocates: Paul D. Taylor, Natural History Museum, London, UK; Kenneth G. Johnson, Natural History Museum, London, UK; Willem Renema, Nationaal Natuurhistorisch Museum Naturalis, Leiden, Netherlands

The evolution of high marine biodiversity in the tropics is poorly understood. Recent research in the Caribbean, Mediterranean, and Indo-Pacific makes it opportune to discuss new findings and ways forward.

PALEONTOLOGY, PALEOECOLOGY/TAPHONOMY

T142. Topics in Paleoecology: Predation/Biotic Interactions, Fidelity/Taphonomy, and Community Ecology/Whole Organism Paleoecology
Disciplines: Paleontology, Paleoecology/Taphonomy; Paleontology, Diversity, Extinction, Origination; Paleontology, Biogeography/Biostratigraphy
Advocates: Carrie L. Tyler, Virginia Tech; Amelinda E. Webb, Yale Univ.; Frank L. Forcino, Univ. of Alberta; Emily S. Stafford, Univ. of Alberta; Simon A.F. Darroch, Yale Univ.

We encourage a variety of studies to highlight the diversity of research on both modern and ancient systems within paleoecology. Topics will be organized in a framework of biotic interactions, community ecology, and taphonomic fidelity.

T143. Out of Our Depth: The Paleontology, Ichnology, and Sedimentology of Deeper Water Environments in the Ancient Tropics
Disciplines: Paleontology, Paleoecology/Taphonomy; Sediments, Carbonates; Sediments, Clastic
Advocates: Stephen K. Donovan, NCB Naturalis (Leiden, Netherlands); David A.T. Harper, Univ. of Durham

Uplift of ancient, tropical deep-water sedimentary successions makes them more accessible for study than modern analogs. This session will explore the paleontology, sedimentology, and ichnology of ancient deep seas away from the reefs.

PALEONTOLOGY, PHYLOGENETIC/ MORPHOLOGICAL PATTERNS

T144. Virtual Paleontology: Computer-Aided Analysis of Fossil Form and Function
Disciplines: Paleontology, Phylogenetic/Morphological Patterns
Advocates: Imran A. Rahman, Univ. of Birmingham; Selena Y. Smith, Univ. of Michigan

This session will bring together all those interested in three-dimensional, computer-aided visualization in paleontology and virtual analysis of fossil functional morphology to present and discuss methods and results.

T145. The Origins of Arthropod Diversity: Phylogenetic Insights from the Living and the Dead
Disciplines: Paleontology, Phylogenetic/Morphological Patterns; Paleontology, Diversity, Extinction, Origination
Advocates: Thomas Hegna, Western Illinois Univ.; Jo Wolfe, Yale Univ.

This session will highlight advances in our understanding of the origins of arthropod diversity through integrating modern and paleontological data.

T146. Taxonomy and Technology: Application of Biometry, Computer Vision, and Machine Learning to Classification Problems in Paleontology
Disciplines: Paleontology, Phylogenetic/Morphological Patterns; Paleontology, Diversity, Extinction, Origination; Paleontology, Biogeography/Biostratigraphy
Advocates: Luke Mander, Univ. of Illinois Urbana-Champaign; N. MacLeod, The Natural History Museum, London, UK; Surangi W. Punyasena, Univ. of Illinois Urbana-Champaign

This session aims to draw together contributions from researchers developing or applying tools from fields such as pattern recognition, computer vision, and machine learning to problems related to the taxonomic classification of fossil specimens.

PLANETARY GEOLOGY

T147. Tectonics of Icy Bodies and Their Analogs
Disciplines: Planetary Geology; Tectonics; Structural Geology
Advocates: D. Alex Patthoff, Univ. of Idaho; Emily S. Martin, Univ. of Idaho; Simon A. Kattenhorn, Univ. of Idaho

We seek abstracts relating to the structure and tectonics of the surfaces and interiors of icy satellites, KBOs, and planetary analogs; this includes experimental, observational, and numerical modeling approaches.

T148. Geochemistry, Mineralogy, and Petrology of Mars
Disciplines: Planetary Geology; Geochemistry; Petrology, Igneous
Advocates: A. Deanne Rogers, Stony Brook Univ.; James J. Wray, Georgia Institute of Technology; Suniti Karunatillake, Rider Univ.

This session will focus on advances made in understanding the formation, evolution, and alteration of the martian crust through geochemical and mineralogical analyses. Presentations that utilize spacecraft data analysis, experiments, models, and/or analog studies are welcome.

T149. Shock Processes and Shock Attenuation Associated with Hypervelocity Impact Events
Disciplines: Planetary Geology; Mineralogy/Crystallography; Petrology, Metamorphic
Advocates: John G. Spray, Univ. of New Brunswick

Shock due to hypervelocity impact is an important aspect of planet building and planet modification. This session seeks to link shock damage effects to the radial distribution of shock via experimental and field-based observations.

T150. The Geology of Asteroid 4 Vesta as Seen by *Dawn*: Results from One Year in Orbit
Disciplines: Planetary Geology; Structural Geology; Geochemistry

Advocates: R. Aileen Yingst, Planetary Science Institute; Scott C. Mest, Planetary Science Institute; W. Brent Garry, Planetary Science Institute

This session will present the exciting results from analysis of the data from *Dawn*'s year at Vesta, including results from geologic mapping at global and local scales.

T151. Linking Earth-Observing Data and Planetary Mission Data in the Teaching and Presentation of Basic Geoscience to K–12 Students, Teachers, and the General Public
Disciplines: Planetary Geology; Geoscience Education; Remote Sensing/Geographic Info System
Advocates: Jayne C. Aubele, New Mexico Museum of Natural History and Science; Eric J. Pyle, James Madison Univ.; Jeannie Allen, Sigma Space Corp at NASA/GSFC

We encourage abstracts on programs that combine NASA's Earth Observing Data with Planetary Mission Data to teach geoscience at all levels and to present geoscience topics in museums and other informal science education venues.

T152. New Moon Rising: The Latest Geologic Results from the Lunar Surface
Disciplines: Planetary Geology; Geomorphology; Geophysics/Tectonophysics/Seismology
Advocates: R. Aileen Yingst, Planetary Science Institute; Noah Petro, NASA/GSFC; Scott C. Mest, Planetary Science Institute

Earth's Moon continues to be a prime target for remote exploration and analysis. This session will highlight the latest developments in lunar surface geology, geomorphology, and mineralogy as revealed by recent missions.

T153. The Moon, Inside and Out: New Results in Lunar Geophysics, Structure, and Interior
Disciplines: Planetary Geology; Geomorphology; Geophysics/Tectonophysics/Seismology
Advocates: Gwendolyn D. Bart, Univ. of Idaho; James W. Head, Brown Univ.; Maria T. Zuber, Massachusetts Institute of Technology

This session focuses on our expanding understanding of lunar geophysics, as well as the Moon's present interior structure and evolution, by presenting new results from recent spacecraft missions.

T154. Observation and Analysis of Impact Cratering and Its Effects: The G.K. Gilbert Award Session
Discipline: Planetary Geology
Advocates: Simon A. Kattenhorn, Univ. of Idaho; David Crawford, Sandia National Lab

This session celebrates the career and accomplishments of the 2012 recipient of the Planetary Geology Division's G.K. Gilbert Award. Talks will be presented by the awardee and the awardee's colleagues and former students.

T155. The Heart of an Explorer: A Tribute to Ronald Greeley
Disciplines: Planetary Geology; Volcanology; Sediments, Clastic
Advocate: David A. Williams, Arizona State Univ.

Ronald Greeley, a leader in planetary geology, passed away in October 2011. In tribute to Ron's memory, we are seeking presentations to discuss recent results from the field or techniques or missions, in which Ron participated.

T156. Geologic Analog Studies of the Rocky Planets: Understanding Planetary Geologic Evolution and Surface Processes
Discipline: Planetary Geology
Advocates: Larry S. Crumpler, New Mexico Museum of Natural History & Science; Jayne C. Aubele, New Mexico Museum of Natural History and Science

We seek abstracts that analyze past, present, and potential analog studies of the rocky planets of our solar system and their usefulness in understanding planetary geologic evolution and in future mission planning.

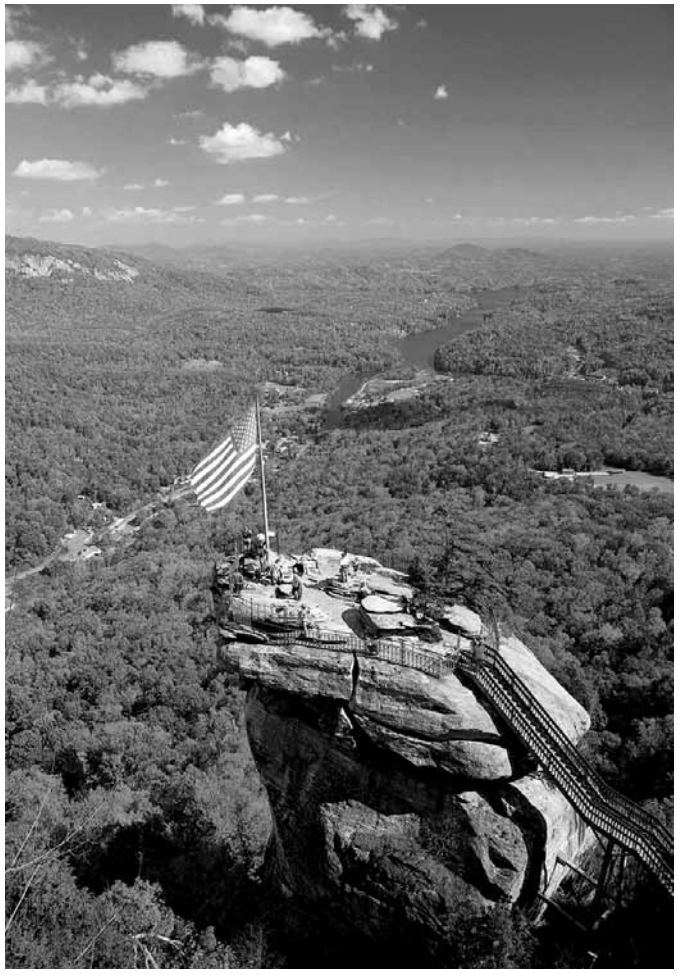
Oblique aerial photograph taken 30 Aug. 2011 of Pea Island National Wildlife Refuge, North Carolina, USA, looking north along the coast. Hurricane Irene made landfall near here on 27 Aug. 2011. At this location, two breaches were carved through the island, severing NC Hwy 12. Arrow points to the Pea Island ranger station. Image courtesy USGS; learn more at http://coastal.er.usgs.gov/hurricanes/irene/photo-comparisons/.

T157. Gridview Image Manipulation for LOLA and MOLA Topographical Data (Posters)
Disciplines: Planetary Geology; Geomorphology; Geoscience Education
Advocate: Rosemary A. Millham, NASA/GSFC/SSAI and SUNY New Paltz

GRIDVIEW software, an image manipulation tool, is decidedly an innovative tool for use in the study of planetary geomorphology using IDL created data images for Earth's Moon and Mars.

T158. Impact Cratering in the Solar System: Processes and Products
Disciplines: Planetary Geology; Structural Geology; Geochemistry
Advocates: Christian Koeberl, Univ. of Vienna; Jeffrey Plescia, Johns Hopkins Univ.

This session focuses on the nature of solar system impacts. Contributions regarding impact morphology, shock processes and materials, modeling, and impactor evolution are solicited. Comparisons of cratering among planets, small bodies, and satellites are encouraged.



Chimney Rock. Photo courtesy of Chimney Rock State Park.

SEDIMENTS, CARBONATES

T159. Surf's Up: New Insights on the Geology, Karst, and Paleontology of Carbonate Systems of the Bahama Archipelago
Disciplines: Sediments, Carbonates; Quaternary Geology; Paleontology, Paleoecology/Taphonomy
Advocates: H. Allen Curran, Smith College; John E. Mylroie, Mississippi State Univ.

Presentations demonstrating new dimensions of carbonates research within the Bahama Archipelago (including Turks and Caicos) are encouraged. Emphasis on shallow-marine sedimentology and emergent island geology, karst, paleontology, geobiology, and geochemistry, with closely related topics will be considered.

T160. Heterozoan Carbonates in Time and Space: Distribution, Deposition, and Diagenesis
Disciplines: Sediments, Carbonates; Stratigraphy; Marine/Coastal Science
Advocates: Tracy D. Frank, Univ. of Nebraska; Noel P. James, Queen's Univ.

In this session we strive to refine understanding of the distribution, formation, and preservation of heterozoan carbonate deposits. We encourage contributions that discuss modern and ancient systems that formed in tropical, temperate, and polar settings.

SEDIMENTS, CLASTIC

T161. Detrital Zircon Provenance of Neoproterozoic to Lower Paleozoic Strata of Northern and Western Laurentia
Disciplines: Sediments, Clastic; Tectonics; Stratigraphy
Advocates: Michael C. Pope, Texas A&M Univ.; Rob Rainbird, Natural Resources Canada

This session focuses on detrital zircon provenance research of Neoproterozoic to Lower Paleozoic strata, particularly from northern and western Laurentia, to determine their sediment dispersal patterns, evolution of sediment provenance, and subtle tectonic events.

STRATIGRAPHY

T162. Integrative Studies of Sedimentary Marine and Fluvial Cretaceous Deposits along the Western Margin of the North Atlantic Basin (Posters)
Disciplines: Stratigraphy; Paleontology, Biogeography/Biostratigraphy; Paleoclimatology/Paleoceanography
Advocate: William Burleigh Harris, Univ. of North Carolina

This session will bring together scientists with a variety of backgrounds to discuss how Cretaceous interactions among the oceans, biosphere, and climate affected deposition and sedimentation on the western edge of the Atlantic Continental Margin.

T163. Geologic Timescale—Current Status, Future Enhancement, and Applications
Disciplines: Stratigraphy; Geoscience Information/Communication; Paleontology, Diversity, Extinction, Origination

Advocates: James G. Ogg, Purdue Univ.; Linda Hinnov, Johns Hopkins Univ.; Mark D. Schmitz, Boise State Univ.

Earth's surface history is a complex interplay of climate, evolution, and other processes framed within a geologic timescale with numerical ages. This session focuses on big-picture aspects and new methodologies to decipher Earth's history.

T164. Carolina Geological Society 75th Anniversary: The Geology of the Carolinas
Disciplines: Stratigraphy; Tectonics; Geophysics/Tectonophysics/Seismology
Advocates: Allen J. Dennis, Univ. of South Carolina; Philip J. Bradley, North Carolina Geological Survey

This forum on the outstanding issues in the geology of the Carolinas is for researchers and attendees seeking a current overview of the geology of the southeastern region.

T165. Preservation of Environmental Signals in Deep-Water Depositional Systems
Disciplines: Stratigraphy; Sediments, Clastic; Geomorphology
Advocates: Jacob A. Covault, Chevron Energy Technology Co.; John Snedden, The Univ. of Texas at Austin

This session aims to evaluate preservation of environmental signals in the deep-water stratigraphic record. Studies of Quaternary sedimentary systems on the seafloor, successions of outcropping and subsurface sedimentary rocks, and numerical models are welcome contributions.

T166. Controls on Terrestrial Dispersed Organic Carbon $\delta^{13}C$ Values from Diagenesis to Climate
Disciplines: Stratigraphy; Geochemistry, Organic; Paleoclimatology/Paleoceanography
Advocates: Brady Z. Foreman, Univ. of Wyoming; A. Baczynski, Northwestern Univ.; Clement Bataille, Purdue Univ.; Aaron Wood, Univ. of Florida

We seek presentations that evaluate potential causes for $\delta^{13}C$ variability in dispersed organic carbon. The sources of variation can include sample preparation, diagenetic alteration, facies dependence, vegetation regime, atmospheric CO_2, and local environmental conditions.

T167. The Plio-Pleistocene Section of the Atlantic and Gulf Coastal Plains: Impact on Stratigraphic Interpretations Caused by Recent Revisions to the Quaternary and Pleistocene
Disciplines: Stratigraphy; Quaternary Geology; Paleontology, Biogeography/Biostratigraphy
Advocates: Kathleen M. Farrell, Raleigh Field Office and Core Repository; William Burleigh Harris, Univ. of North Carolina

Case studies will show how the IUGS reassignment (2009) of the Quaternary Period and Pleistocene Epoch to be coterminous with the base of the Gelasian Stage at 2.58 Ma has impacted stratigraphic investigations.

T168. Mid-Atlantic Coastal Plain Stratigraphy and Paleontology
Disciplines: Stratigraphy; Paleontology, Biogeography/Biostratigraphy; Marine/Coastal Science
Advocates: David S. Powars, USGS; Lucy Edwards, USGS

Sequence stratigraphy, biostratigraphy, lithostratigraphy, hydrostratigraphy, and geologic mapping complement each other in various ways. This session focuses on current advances and promising avenues of research in regional framework synthesis of the Coastal Plain and offshore.

T169. Cyclicity and Hierarchy in the Clastic Stratigraphic Record
Disciplines: Stratigraphy; Sediments, Clastic; Paleoclimatology/Paleoceanography
Advocates: Brian W. Romans, Virginia Tech; Jacob A. Covault, Chevron Energy Technology Co.; Stephen M. Hubbard, Univ. of Calgary

The documentation of cyclical and hierarchical patterns in the stratigraphic record has led to interpretations of systematic forcings and apparently improved predictability. This session will explore these themes at a range of scales.

STRUCTURAL GEOLOGY

T170. Central Virginia Earthquakes of 2011: Geology, Geophysics, and Significance for Seismic Hazards in Eastern North America
Disciplines: Structural Geology; Geophysics/Tectonophysics/Seismology; Neotectonics/Paleoseismology
Advocates: J. Wright Horton, USGS; Martin C. Chapman, Virginia Tech

An M_W5.8 earthquake in the central Virginia seismic zone caused significant damage, and remarkable aftershock data offer unprecedented opportunities to understand their significance for intraplate earthquakes and seismic hazards in eastern North America.

T171. The Role of Structure and Diagenesis in Governing Fluid Storage and Flow in Deep Sedimentary Basins with Applications to Unconventional Oil and Gas Reservoirs
Disciplines: Structural Geology; Sediments, Clastic; Sediments, Carbonates
Advocates: Stephen E. Laubach, The Univ. of Texas at Austin; Christoph Hilgers, RWTH Aachen Univ.; Mark A. Evans, Central Connecticut State Univ.

The aim of this session is to provide a broad exploration of chemical reactions and structures—primarily faults and opening-mode fractures—and their interrelationships on crustal fluid flow, strength, seismic response, and other attributes.

T172. Appalachian-Ouachita-Marathon Fold-Thrust Belts and Foreland Basins: Their Stratigraphy, Sedimentology, Structural Evolution, and Economic Significance
Disciplines: Structural Geology; Tectonics; Geophysics/Tectonophysics/Seismology
Advocates: Ibrahim Çemen, Univ. of Alabama; Jack Pashin, Geological Survey of Alabama; Andrew Goodliffe, Univ. of Alabama; Delores Robinson, Univ. of Alabama

This session will bring together researchers studying fold-thrust belts and associated foreland basins of the Appalachians-Ouachita-Marathon Orogenies and provide a formal discussion for understanding many important questions related to their sedimentology, stratigraphy, structure, and tectonics.

T173. Deformation Processes in Lithospheric High-Strain Zones
Disciplines: Structural Geology; Tectonics; Geophysics/Tectonophysics/Seismology
Advocates: Micah Jessup, Univ. of Tennessee; Christopher Bailey, College of William and Mary; Dazhi Jiang, Univ. of Western Ontario

High-strain zones are important lithospheric structures. This session will highlight new research that (1) quantifies deformation in high-strain zones, (2) models strain localization/flow, and (3) seeks to understand the tectonic significance of major high-strain zones.

TECTONICS

T174. Multidisciplinary Studies of Convergent Plate Boundaries: In Honor of Jason Saleeby, 2012 MGPV Distinguished Geologic Career Awardee
Disciplines: Tectonics; Geochemistry; Petrology, Igneous
Advocates: G. Gehrels, Univ. of Arizona; Mihai N. Ducea, Univ. of Arizona; Cathy J. Busby, Univ. of California

This session honors the fundamental contributions of Dr. Jason B. Saleeby, who has transformed our understanding of convergent margin systems through the creative and rigorous integration of information from geochronology, petrology, stratigraphy, and geophysics.

T175. Heredity of Appalachian Crust
Disciplines: Tectonics; Precambrian Geology; Geochemistry
Advocate: Arthur J. Merschat, USGS

We seek abstracts that address the tectonic heritage of Appalachian crust and terranes and the subsequent amalgamation of these terranes into the orogen through various approaches including geochronology, isotopic, provenance, geochemical, petrologic, and field studies.

T176. Large-Scale Strike-Slip Fault Systems: Insights into 4-D Evolution through Lateral and Vertical Juxtaposition Recorded in the Rock Record, Geophysical Imaging, and Associated Basin Formation via Large-Scale Translation and Transpression
Disciplines: Tectonics; Sediments, Clastic; Geophysics/Tectonophysics/Seismology
Advocates: Sarah M. Roeske, Univ. of California; Jeff A. Benowitz, Univ. of Alaska; Paul G. Fitzgerald, Syracuse Univ.

Understanding material flux along and through strike-slip fault systems includes syntheses of fault zone rock history, basin and mountain development, and geometry at depth on multiple spatial and temporal scales.

T177. Supercontinent Cycles through Earth History (Posters)
Disciplines: Tectonics; Geophysics/Tectonophysics/Seismology; Geochemistry
Advocates: A. Krishna Sinha, Virginia Tech; Kent Condie, New Mexico Tech; Robert D. Hatcher, Univ. of Tennessee

Geologic framework of Supercontinent Cycles through Earth's history: Implications of tectonic, petrologic, geochronologic, and biologic processes.

T178. Geology and Tectonics of the Aegean Region
Disciplines: Tectonics; Geochemistry; Petrology, Metamorphic
Advocates: Elizabeth Catlos, The Univ. of Texas at Austin; Yucel Yilmaz, Kadir Has Univ.

This session provides an opportunity for geologists from a range of disciplines (e.g., structural geology, tectonics, petrology, volcanology, natural hazards) to interact and share new results and information about their research in the Aegean area.

T179. Dynamics of Gneiss Domes, Core Complexes, and Orogenic Plateaux
Disciplines: Tectonics; Petrology, Metamorphic; Geomorphology
Advocate: Christian Teyssier, Univ. of Minnesota

The flow of crust at plate boundaries is recorded in rocks, structures, and topography. This session features contributions on the mechanisms, trajectories, magnitude, duration, rates, and consequences of crustal flow in continental and oceanic settings.

T180. Paleoseismology and Active Tectonics of Eastern North America
Disciplines: Tectonics; Structural Geology; Geophysics/Tectonophysics/Seismology
Advocates: Roy B. Van Arsdale, Univ. of Memphis; Randel T. Cox, Univ. of Memphis

This session will explore the threat of intraplate seismicity in eastern North America through the application of paleoseismology and active tectonics research.

T181. Integrated Detrital Records of Orogenic Systems
Disciplines: Tectonics; Stratigraphy; Structural Geology
Advocates: Brian W. Romans, Virginia Tech; Amy L. Weislogel, West Virginia Univ.; Julie C. Fosdick, Univ. of Arizona

The record of orogenesis is contained within detritus deposited in sedimentary basins. This interdisciplinary session will highlight innovations in using detrital geo-/thermo-chronology and other geochemical provenance methods to better understand relationships of tectonics and sedimentation.

2012 Charlotte Local Organizing Committee

The following member-volunteers have combined their time and talent toward producing an exceptional meeting experience for all.

General Chair

John Diemer, Univ. of North Carolina at Charlotte (UNC-Charlotte), jadiemer@uncc.edu

Technical Program Chair

Richard C. Berg, Illinois Geological Survey, rberg@illinois.edu

Field Trip Co-Chairs

Missy Eppes, UNC-Charlotte, meppes@uncc.edu

Jerry Bartholomew, University of Memphis, jbrthlm1@memphis.edu

Special Session/Short Course Chair

Andy Bobyarchick, UNC-Charlotte, arbobyar@uncc.edu

K–12 Education Chair

Jake Armour, UNC-Charlotte, jarmour@uncc.edu

K–12 Education Co-Chairs

Randy Bechtel, North Carolina Geological Survey, randy.bechtel@ncdenr.gov

Eric Pyle, James Madison University, pyleej@jmu.edu

Special Events/Community Education Chairs

John Bender, UNC-Charlotte, jfbender@uncc.edu

Scott Hippensteel, UNC-Charlotte, shippens@uncc.edu

Ken Taylor, North Carolina Geological Survey, kenneth.b.taylor@ncdenr.gov

2012 GSA ANNUAL MEETING & EXPOSITION

2012

Riverscape Fountains. Photo courtesy Dayton Montgomery County and Visitors Bureau.

NORTH-CENTRAL
23–24 April
Dayton, Ohio, USA
Local Committee Co-Chairs:
Charles Ciampaglio and
Angie Clayton

ROCKY MOUNTAIN
9–11 May
Albuquerque, New Mexico, USA
Local Committee Chair: Laura Crossey
Early reg. deadline: 9 Apr. 2012

The Rio Grande in autumn.
Credit: MarbleStreetStudio.com.

GSA Section Meetings

GSA Position Statement Process

The Geological Society of America is committed to issuing position statements on topics related to geoscience that positively influence practices and policies in a broad range of institutions, from state and federal government to universities and the private sector. As a scientific Society, GSA follows an objective, consistent, and well-informed process, guided by policies established by GSA Council and the body of scientific evidence generated by our disciplines. The process includes

1. Having a broadly representative Geology and Public Policy Committee (GPPC) whose responsibilities include formulating and recommending position statements;
2. Inviting all GSA members to propose possible topics for position statements and encouraging them to serve on the GPPC;
3. Identifying balanced panels composed of individuals with disciplinary and topical expertise from academia, industry, and government to draft position statements;
4. Soliciting comments from members by making draft versions of all position statements available to GSA membership in print and electronic format for a specified, six-week time period;
5. Revising drafts based on input from Society members;
6. Deliberating and voting by GSA Council on every document; and
7. Ensuring each position statement is thoroughly reviewed within a five-year interval, during which GPPC members monitor responses, reactions, comments, and further input to the statement.

The GPPC also uses input from the general geoscience community to assess whether the position statement has run its course, needs revision, or should be retained without major changes. Via these methods, GSA provides informed, timely, and meaningful position statements. Unlike most scientific papers, position statements take an editorial voice in order to represent the community GSA serves. Through this process, GSA plays a vital role in societal discourse, an arena where the voice of geoscience is too often absent.

GSA invites and strongly encourages all members to become involved in geoscience policy. GSA position statements are unique among those put forth by most scientific societies, as each includes specific suggestions for how GSA members can get involved in advocacy, in addition to providing recommendations for decision makers.

THE GEOLOGICAL SOCIETY OF AMERICA®

View all of GSA's position statements and learn more about the process at
http://www.geosociety.org/positions/

CALL FOR AWARD NOMINATIONS & APPLICATIONS

GSA DIVISION AWARDS

Award funds are administered by the GSA Foundation.
To learn more go to www.geosociety.org/awards/divisions/.

Deadline: 2 April

Quaternary Geology and Geomorphology Division *Farouk El-Baz Award for Desert Research*: Submit nominations of colleagues who have demonstrated excellence in desert geomorphology research to Jim O'Connor, U.S. Geological Survey, 2130 SW 5th Ave., Portland, OR 97201, USA; oconnor@usgs.gov. Nominations should include (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. Please submit via e-mail; hardcopy submission must be previously approved.

Deadline: 15 April

The *Stephen E. Laubach Structural Diagenesis Research Award* offered by **GSA's Sedimentary Geology & Structural Geology and Tectonics Divisions** promotes research combining structural geology and diagenesis and curriculum development in structural diagenesis. Donors to this fund believe multi-disciplinary approaches often reveal new insights into long-standing problems and expose productive avenues for enquiry. To help promote this cross-disciplinary emphasis, the two Divisions have been designated to jointly select the recipient. *Graduate students, postgraduate, and faculty-level researchers are eligible.* For more information see http://rock.geosociety.org/sgt/Laubach.htm or contact Dr. Charles M. Onasch, conasch@bgsu.edu.

GSA DIVISIONS STUDENT AWARDS

Award funds are administered by the GSA Foundation.
To learn more go to www.geosociety.org/awards/divisions/.

Deadline: 1 May

The **GSA History and Philosophy of Geology Division** *History and Philosophy of Geology Student Award* offers US$1,000 for student presentation proposals for future GSA Annual Meetings. The presentation topic may be, but is not limited to, (1) the history of geology, (2) a literature review of ideas for a technical work or thesis/dissertation, or (3) some imaginative aspect of the history of geology we have not thought of before. The application and guidelines are online at **http://gsahist.org/HoGaward/awards.htm.** If you have questions, please contact the Division secretary-treasurer, Jane P. Davidson, at jdhexen@unr.edu.

Deadline: 1 August

The Kerry Kelts Student Research Awards of the Limnogeology Division recognize undergraduate or graduate student research and are named in honor of Kerry Kelts, a visionary limnogeologist and inspiring teacher. This year, **one** award of US$1,000 for research related to limnogeology, limnology, or paleolimnology is offered. To apply, send a summary of the proposed research, its significance, and how the award will be used (five-page max.) in PDF format (include your name in all PDF file titles) along with a short (two-page max.) CV to the chair of the Limnogeology Division, Daniel M. Deocampo, at deocampo@gsu.edu. **Division members:** GSA hopes to increase the number of these awards in the future, and your membership dues help with this important activity. Please be sure to renew your Division membership or join today. If you are interested in supporting this awards program more substantially, please send your donations, designated for the Kerry Kelts Research Awards of the Limnogeology Division, to GSA Grants, Awards & Recognition, P.O. Box 9140, Boulder, CO 80301-9140, USA.

2013 MINERALOGY, GEOCHEMISTRY, PETROLOGY, AND VOLCANOLOGY (MGPV) DIVISION DISTINGUISHED GEOLOGIC CAREER AWARD

Deadline: 15 July

Submit a cover letter (three-page max.) from an MGPV Division member summarizing the nominee's most important accomplishments in geologic approaches to mineralogy, geochemistry, petrology, and/or volcanology, along with the nominee's CV. Special attention should be paid to describing how the nominee's published work demonstrates field-based multidisciplinary geologic accomplishments of a groundbreaking nature. The letter should include the name, address, and contact information of the nominator and information on those from whom letters of support can be expected (three letters are required; individuals need not be members of GSA or the MGPV Division). Send nomination materials to J. Alex Speer, Mineralogical Society of America, 3635 Concorde Pkwy., Suite 500, Chantilly VA 20151-1110, USA; jaspeer@minsocam.org. Nominees need not be citizens or residents of the United States, and GSA membership is not required. For more information on this award, go to www.geosociety.org/divisions/mgpv/documents/awardNoms.pdf.

Questions? Contact GSA Grants, Awards & Recognition, P.O. Box 9140, 3300 Penrose Place, Boulder, CO 80301-9140, USA, +1-303-357-1028, awards@geosociety.org.

THE GEOLOGICAL SOCIETY OF AMERICA®

GSA FOUNDATION

Call for GSA Committee Service

Invest in the Future—Serve on a Committee!

2013–2014 Committee Vacancies

Deadline for nominations & volunteer applications: 15 July 2012
Terms begin 1 July 2013 (unless otherwise indicated)

ACADEMIC AND APPLIED GEOSCIENCE RELATIONS COMMITTEE
Three members-at-large vacancies (3-year terms; AM, T/E)
This committee is charged with strengthening and expanding relations between GSA Members in applied and academic geosciences. As such, it proactively coordinates the Society's effort to facilitate greater cooperation between academia, industry, and government geoscientists. **Qualifications:** Committee members must work in academia, industry, or government and be committed to developing better integration of applied and academic science in GSA meetings, publications, short courses, field trips, and education and outreach programs. Members must also be active in one or more GSA Divisions.

ANNUAL PROGRAM COMMITTEE
One member-at-large vacancy, one Councilor/former Councilor vacancy (4-year terms), and one student representative vacancy (2-year term) (AM, B/E)
This committee develops a long-range plan for increasing the quality of the annual meeting and other Society-sponsored meetings in terms of science, education, and outreach, and evaluates the technical and scientific programs of the annual meeting. **Qualifications:** Committee members must have a broad familiarity with different disciplines as well as previous program experience or active involvement in applying geologic knowledge to benefit society and to raise awareness of critical issues.

ARTHUR L. DAY MEDAL AWARD
Two member-at-large vacancies (3-year terms; T/E)
This committee selects candidates for the Arthur L. Day Medal Award. **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."

DIVERSITY IN THE GEOSCIENCES COMMITTEE
Three member-at-large vacancies (3-year terms; AM, T/E)
This committee provides advice and support to GSA Council and initiates activities and programs that will increase opportunities for people of ethnic minority, women, and persons with disabilities and raise awareness in the geosciences community of the positive role these groups play within the geosciences. The committee is also charged with stimulating recruitment and promoting positive career development for these groups. **Qualifications:** Members of this committee must be familiar with the employment issues these groups face; expertise and leadership experience in such areas as human resources and education is also desired.

E-GSA COMMITTEE
One member-at-large vacancy and one M.S. student vacancy (3-year terms; AM, T/E)
This committee is charged with improving communications with and among all GSA stakeholders. **Qualifications:** Members must have experience beyond basic e-mail and telephone media, such as SMS (testing) and MMS (multi-media messaging service), and facility with social networks, virtual communities, blogs, or other emerging technologies.

COMMITTEE ON EDUCATION
One member-at-large vacancy; one pre-college educator (K–12) vacancy; one two-year college faculty vacancy (4-year terms); one graduate student vacancy (2-year term) (AM, B/E, T/E)
This committee works with GSA members representing a wide range of education sectors to develop informal, pre-college (K–12), undergraduate, and graduate earth-science education and outreach objectives and initiatives. **Qualifications:** Members of this committee must have the ability to work with other interested scientific organizations and science teachers' groups.

GEOLOGY AND PUBLIC POLICY
One member-at-large vacancy (3-year term; AM, B/E & T/E)
This committee provides advice on public policy matters to Council and GSA leadership by monitoring and assessing international, national, and regional science policy; formulating and recommending position statements; and sponsoring topical white papers. This committee also encourages active engagement in geoscience policy by GSA members. **Qualifications:** Members should have experience with public-policy issues involving the science of geology; ability to develop, disseminate, and translate information from the geologic sciences into useful forms for the general public and for GSA Members; and familiarity with appropriate techniques for the dissemination of information.

JOINT TECHNICAL PROGRAM COMMITTEE
Two environmental geoscience vacancies; one marine/coastal geology vacancy (2-year terms run 1 Dec. 2012–30 Nov. 2014; T/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.

AM—Meets at the Annual Meeting • B/E—Meets in Boulder or elsewhere • T/E—Communicates by phone or electronically

MEMBERSHIP
Two member-at-large vacancies (academia) (3-year terms; B/E)
This committee draws its members from academia, industry, and government; contributes to the growth of GSA membership; and attends to the changing needs of Society members by focusing on attracting and retaining students, professionals working in industry, and those studying and working outside the United States. This committee also reviews and makes recommendations for Fellowship to Council. **Qualifications:** Committee members should have experience in benefit, recruitment, and retention programs.

NOMINATIONS
Two member-at-large vacancies (3-year terms; B/E & T/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
Two members-at-large vacancies (3-year terms; T/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 a Field Forum.

PENROSE MEDAL AWARD
Two member-at-large vacancies (3-year terms; T/E)
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.

PROFESSIONAL DEVELOPMENT
One student representative vacancy and one councilor/former councilor vacancy (3-year terms; T/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
One member-at-large vacancy (4-year term; AM, B/E & T/E)
This committee nominates candidates for science editor positions, approves editorial boards, reviews the quality and health of Society publications, and explores the initiation of new ventures, including electronic publishing. **Qualifications:** Members must have extensive publications experience.

RESEARCH GRANTS
Six member-at-large vacancies (3-year terms; B/E)
Committee members evaluate student research grant applications and select grant recipients. **Qualifications:** Members should have experience in directing research projects and in evaluating research grant applications. **Extensive time commitment required** 15 Feb.–15 Apr. 2014.

YOUNG SCIENTIST AWARD (DONATH MEDAL)
One member-at large and one councilor/former councilor vacancy (3-year terms; T/E)
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."

GSA REPRESENTATIVES TO OTHER ORGANIZATIONS

GSA & AASG Selection Committee for the John C. Frye Memorial Award in Environmental Geology
One vacancy (3-year term begins 1 July 2013)
Fosters communications within the community about issues related to serving the broader international community; helps identify and focus on the highest priority environmental informational needs and issues best addressed by the geoscience community. **Qualifications:** Members must be well-acquainted with GSA's environmental geoscience programs.

North American Commission on Stratigraphic Nomenclature
One vacancy (three-year term runs Nov. 2013–Nov. 2016; AM, possibly B/E)
This committee develops statements of stratigraphic principles, recommends procedures applicable to classification and nomenclature of stratigraphic and related units, reviews problems in classifying and naming stratigraphic and related units, and formulates expressions of judgment on these matters.

Committee, Section, and Division Volunteers: Council

Thanks You!

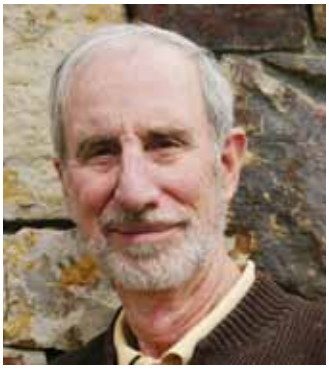
GSA Council acknowledges the many member-volunteers who, over the years, have contributed to the Society and to geoscience through involvement in the affairs of the GSA. Your time, talent, and expertise are the bedrock of a solid and lasting Society.

THE GEOLOGICAL SOCIETY OF AMERICA®

AM—Meets at the Annual Meeting • B/E—Meets in Boulder or elsewhere • T/E—Communicates by phone or electronically

P. Geoffrey Feiss, GSA Foundation President

Back to Our Roots



Whether you are a retired geologist or a student, you probably agree that our science is rooted in field observations. The introduction to the skills, the science, and, at times, the art of making effective field observations happens in many ways and in many places. It may be a course-embedded field trip, a weekend excursion, or a field conference. It might be the classic multi-week summer field camp or, depending on where you went to school, a semester-long field course with extensive field exercises. Perhaps it's an undergraduate research project—or maybe all of the above.

For many, as our careers progress, we are less and less in the field. We may become remote-sensing specialists, mathematical modelers, mass spectroscopists, even administrators. Regardless, we are better earth scientists if we know the joys, the frustrations, and the limitations of making observations in the field.

As GSA looks back over 124 years as a professional society—one whose early years were dominated by pioneers in field geology—and looks forward to our future—in which computational capacity and new analytical instruments and sensing devices open whole new realms of research and understanding of Earth and the planets at all scales, I find myself asking, "What is the essential set of field experiences for a twenty-first–century geoscientist?"

I worry about the barriers between today's students and these experiences. For too many, the financial obligations of the summer field course are daunting—not just because of tuition, fees, and travel expenses but also the impact of lost summer job income. For others, especially non-traditional students and first-generation college goers, family commitments make extended absences from home while an undergraduate an insurmountable hurdle.

Many of us came to geology with a love of the outdoors nurtured by scouting or summer trips or other activities because we grew up in non-urban settings. Today, many young college men and women have not had such experiences. As a profession, we cannot afford to exclude their talent, creativity, and energy. Whether these students come to the sciences from traditionally underrepresented cultural and ethnic groups or simply grew up in an increasingly urban and technological world with few opportunities to enjoy the outdoors, we need their talents.

GeoCorps™ America participant Levi Moxness, National Park Service, Badlands National Park.

GeoCorps™ America participant Julia Schwarz, National Park Service, Chesapeake and Ohio Canal National Historic Park.

This line of thinking raises two questions:

1. What are the essential field educational experiences that every geoscientist should have? The answer is one for the broader GSA community to discuss in the context of its planning for the future on the eve of our 125th Anniversary in 2013.

2. How can we assure that, whatever the answer to question 1 is, no aspiring geoscientist is denied such experiences? The GSA Foundation is eager to accept the challenge of finding the financial resources that will allow our profession to continue to prosper.

For example, the Foundation has partnered with ExxonMobil to provide field camp scholarships and allow aspiring young scientists to attend ExxonMobil's Field Seminar in the Bighorn Basin. There is much more that can be done.

I invite your participation in this venture. We are eager to hear your thoughts and ideas on how to assure that the next generation of geoscientists is connected to our roots. Perhaps we can talk at an upcoming section meeting or the annual meeting in Charlotte. Feel free to e-mail, phone, or write to me as you consider how the GSA Foundation can serve our student members now and in the future.

P. Geoffrey Feiss
GSA Foundation President
3300 Penrose Place, P.O. Box 9140
Boulder, CO 80301-9140, USA
+1-303-357-1011 • gfeiss@geosociety.org

www.gsafweb.org

If you would like to make a contribution to the Foundation for field education or any other purpose, please go to www.gsafweb.org/makeadonation.html or contact Anna Christensen, GSA Foundation chief development officer, +1-303-357-1090, achristensen@geosociety.org.

Classified Rates—2012

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. To estimate cost, count 54 characters per line, including punctuation and spaces. Actual cost may differ if you use capitals, boldface type, or special characters. Rates are in U.S. dollars.

Classification	Per Line for 1st month	Per line each addt'l month (same ad)
Positions Open	$8.95	$8.70
Fellowship Opportunities	$8.95	$8.70
Opportunities for Students		
First 25 lines	$0.00	$4.75
Additional lines	$4.75	$4.75

Positions Open

CARBONATE SYSTEMS AND RESERVOIR CHARACTERIZATION POSITION
BERG-HUGHES CENTER AND
DEPT. OF GEOLOGY & GEOPHYSICS
TEXAS A&M UNIVERSITY

The Berg-Hughes Center for Sedimentary and Petroleum Systems and the Department of Geology and Geophysics at Texas A&M University invite applications from individuals for a non-tenure-track, three-year renewable contract position as a research professor at the assistant or associate level in Carbonate Systems and Reservoir Characterization beginning in January 2013. This position will be a joint appointment with teaching, research and service responsibilities in the Berg-Hughes Center and Department of Geology and Geophysics.

We seek candidates who are enthusiastic about teaching integrative courses, contributing as a team member on multi-disciplinary research projects, and developing an externally funded research program in Carbonate Systems and Reservoir Characterization. This includes but is not limited to one or more of the following research topics: reservoir characterization, sequence stratigraphy, sedimentology, depositional systems, petrophysics, and diagenesis. We seek applicants with strong potential to collaborate with faculty in geoscience and petroleum engineering and with geoscientists in the petroleum industry.

Applicants must have an earned Ph.D. at the time of appointment. Successful applicants will be expected to teach effectively at the undergraduate and graduate levels in their specialty and in team taught courses, including classes in the Petroleum Certificate curriculum and to supervise undergraduate, M.S. and Ph.D. research, including students who are interested in pursuing careers in the petroleum industry. Applicants are expected to participate in and build on collaborative teaching and research programs with colleagues in the College of Geosciences, the Berg-Hughes Center, the Department of Geology and Geophysics, the Department of Petroleum Engineering, and other energy related groups at Texas A&M University and the Texas A&M University System and with geoscientists in the petroleum industry.

Interested candidates should submit electronic versions of a curriculum vita, statement of research interests and teaching philosophy, and the names and email addresses of at least three references to the Chair of the Carbonate Search Committee (mancini@neo.tamu.edu). Screening of applications for the position will begin 1 Aug. 2012 and will continue until the position is filled. The Berg-Hughes Center (berg-hughes.tamu.edu) and the Department of Geology and Geophysics (geoweb.tamu.edu) are part of the College of Geosciences, which also includes the Departments of Atmospheric Sciences, Geography, and Oceanography; the Geochemical and Environmental Research Group (GERG); and the Integrated Ocean Drilling Program (IODP). Texas A&M University, a land-, sea-, and space-grant university, is located in a metropolitan area with a dynamic and international community of 172,000 people. Texas A&M University is an affirmative action/equal opportunity employer committed to excellence through the recruitment and retention of a diverse faculty and student body and compliance with the Americans with Disabilities Act. We encourage applications from minorities, women, veterans, and persons with disabilities. Texas A&M University also has a policy of being responsive to the needs of dual-career partners.

GEOLOGY INSTRUCTOR
UNIVERSITY OF ARKANSAS AT LITTLE ROCK

The University of Arkansas at Little Rock Department of Earth Sciences invites applications for Geology Instructor. Primary teaching responsibilities include introductory geology and possibly courses in the candidate's specialty. Minimum requirement for the position is a M.S. in Geology or a related field. The Department of Earth Sciences, with over 70 undergraduate geology majors, offers a BS in Geology, a Graduate Certificate in Geospatial Technology, and participates in college graduate programs.

Submit applications electronically in PDF format to jbconnelly@ualr.edu. Please use the subject line Geology Instructor-R97334. Applications should include a cover letter, curriculum vitae, statement of teaching interests and goals, and contact information for at least three professional references. The position begins 15 Aug. 2012. Review of applications will begin 1 March and will continue until the position is filled. For more information, please contact Dr. Jeffrey Connelly, Chair, Department of Earth Sciences, jbconnelly@ualr.edu.

The University of Arkansas at Little Rock is an equal opportunity, affirmative action employer and actively seeks candidacy of women, minorities and individuals with disabilities. Persons hired must provide proof of legal authority to work in the United States. Under Arkansas law, all applications are subject to disclosure.

Opportunities for Students

Fellowship Opportunity in IODP for Minority Students at U.S. Universities and Colleges. The Integrated Ocean Drilling Program–U.S. Implementing Organization (IODP-USIO) is currently accepting applications for the **Minorities in Scientific Ocean Drilling Fellowship** (30 April 2012 deadline). The Fellowship will award US$30,000 to an outstanding student whose research is using data and/or materials obtained from scientific ocean drilling, or who is developing technology that will help advance science or engineering in scientific ocean drilling research.

For full details about this unique opportunity, including the application process, visit www.oceanleadership.org/education/diversity/minorities-in-scientific-ocean-drilling-fellowship/.

Connect with GSA *through the Web and Social Media*

GSA CONNECTION

GSA's monthly e-news magazine brings you current information on GSA programs, events, books, government and international affairs, pending deadlines, and media coverage. Read it now at **www.geosociety.org/GSA_Connection/.**

GSA TODAY

GSA Today is always open access at **www.geosociety.org/gsatoday/.** Issues from 1995 to the present are posted online; we are working now to get the first five years of *GSA Today* onto the web. We'll keep you posted!

FACEBOOK

"Like" us on Facebook at **www.facebook.com/GSA.1888.** Check here for publication updates, photos, and links to journals, events, *and more.*

TWITTER

Follow GSA on Twitter at @geosociety. Peruse our profile, updates, and followers at **twitter.com/geosociety.** Most of GSA's 4,500 followers are "geotweeps"—your fellow scientists, students, and colleagues.

LINKEDIN

GSA is LinkedIn at **www.linkedin.com/company/52036.** We invite GSA members and interested geoscience professionals to use this space for discussion and networking opportunities.

www.geosociety.org/community/

2012 Section Meeting Mentor Programs

Plan now to attend a Shlemon and/or a Mann Mentor luncheon at your 2012 Section Meeting to chat one-on-one with professional geoscientists. These volunteers will answer your questions and share insights on how to get a job after graduation.

Lunches served at these events are FREE. Students will receive lunch tickets with their registration badge. These events are very popular, and space is limited, so try to arrive early to ensure your participation. For further information, contact Jennifer Nocerino at jnocerino@geosociety.org.

The John Mann Mentors in Applied Hydrogeology Program is designed to acquaint undergraduate, graduate, and recent graduate students with careers in applied hydrogeology through mentoring opportunities with practicing professionals. The Roy J. Shlemon Mentor Program in Applied Geoscience is designed to acquaint advanced undergraduate and beginning graduate students with careers in applied geoscience.

NORTH-CENTRAL SECTION MEETING
23–24 April • Dayton, Ohio, USA
Shlemon Mentors Luncheon: Mon., 23 April
Mann Mentors Luncheon: Tues., 24 April

Wright Flyer with crowd. Photo courtesy Dayton Montgomery County and Visitors Bureau.

ROCKY MOUNTAIN SECTION MEETING
9–11 May • Albuquerque, New Mexico, USA
Shlemon Mentors Luncheon: Thurs., 10 May
Mann Mentors Luncheon: Fri., 11 May

Petroglyph National Monument. Credit: Petroglyph National Monument.

STUDENTS—*Mark Your Calendars!*

Celebrating GSA's 125th Anniversary in 2013

THE GEOLOGICAL SOCIETY OF AMERICA®

1888 125 2013 Years

CELEBRATING ADVANCES IN GEOSCIENCE

The Geological Society of America will celebrate its 125th anniversary in 2013 with a year-long series of events focusing on *Celebrating Advances in Geosciences—Our Science, Societal Impact, and Unique Thought Processes.*

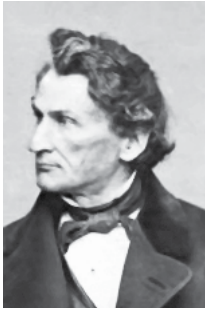
GSA invites you to help us plan the celebration.

The geosciences have evolved greatly over the past 50 years, let alone over 125 years, both in terms of science and relevance to society, and are posed to make informed predictions for the future. During our celebratory year, we want to look back at how far we have come since 1963 but also to look forward with predictions for the future.

- What scientific advances have we made over the last 50 years?
- What new disciplines do we have now?
- How has our impact on society changed our importance?
- What critical geoscientific issues have we addressed?
- Where do we stand on resolving the controversial questions of 50 years ago?
- Is the way geoscientists think unique, and how have these thought processes changed?

Past GSA Presidents

Alexander Winchell
1824–1891



James Dwight Dana
1813–1895

James Hall
1811–1898

NOW IS THE TIME TO PLAN

We are calling on GSA members, Divisions, Sections, and Associated Societies to help us plan our celebration.

Here are some ways to get involved:

- **Plan field trips** to classic localities that demonstrate our scientific advances, to take place at Section Meetings, the 2013 annual meeting, or throughout the year.
- **Propose Penrose Conferences and Field Forums** to explore current controversies, drawing on our advances and planning for future resolution of current debates. It takes over a year to organize such events, so begin planning now for 2013.
- **GSA Sections** have great opportunities to get involved, through special sessions, field trips, workshops, lectures, and more, both during Section Meetings or throughout the year. Sections Meetings for 2013 are already in the planning stages: Please contact your Section officers and general meeting chairs for more information (see www.geosociety.org/sections/).
- **Publications and abstracts:** Put together a themed issue of *Geosphere*, or create and submit special lectures, topical sessions, and Pardee sessions for the 2013 Annual Meeting.
- **Members of GSA's Associated Societies**—Sponsor sessions at your society's annual meetings or at GSA; sponsor a field trip, publication, or meeting; or create other events to celebrate the geosciences.

WE ALREADY HAVE SOME GOOD THINGS STARTED!

- **Antarctica and the Scotia Sea—Tectonics, Climate & Life:** This trip of a lifetime, from 27 December 2012 through 20 January 2013, will kick off our celebration. Explore the geology, tectonics, climate, and glaciology of the Falkland, South Georgia, and Orkney Islands and the Antarctic Peninsula with Ian Dalziel (The University of Texas at Austin), Richard Alley (Penn State University), Rob Dunbar (Stanford University), and Rudolph Trouw (Federal University of Rio de Janeiro). Learn more at www.cheesemans.com/antarctica_jsg.html.
- **Scottish Highland Field Trips:** The Geological Society of London has preliminary plans to sponsor two field trips in May exploring (1) the volcanic and magmatic systems that make up the Isle of Rum and Skye, and (2) the Moine thrust belt of the NW Scottish Highlands.
- ***GSA Bulletin* will include special review articles:** 19 are already underway!
- **The GSA books department is developing three dedicated volumes**: (1) *Science*—Advances in our traditional disciplines plus new fields of research; (2) *Geosciences' Role in Society* (Pat Bickford, editor for volumes 1 & 2); and (3) *Fabric of Geology*—How geologic thinking has evolved over time (Vic Baker, editor).

◆

Our celebration will culminate with the 27–30 October 2013 Annual Meeting & Exposition in Denver. Pardee sessions will cover reoccurring controversies and themes over the past 50 years, focusing on current perspectives, and we encourage Topical Sessions focusing on this theme as well.

◆

Send your ideas to GSA125@geosociety.org and help make the 125th Anniversary Celebration an event to remember for the next 125 years!

www.geosociety.org/125/

Send us your ideas—We ARE the geosciences; let's celebrate!

THE GEOLOGICAL SOCIETY OF AMERICA®

GeoCorps™ America
Fall/Winter 2012–2013

All fall/winter GeoCorps positions will appear on the GeoCorps website and applications will open starting 1 May.

GeoCorps America provides paid, short-term geoscience opportunities with the National Park Service, the U.S. Forest Service, the Bureau of Land Management, and now, the California Abandoned Mine Lands Program.

Application deadline is **2 July**

All levels of geologists—students, educators, professionals, retirees, and others—are encouraged to apply.

Details are at www.geosociety.org/geocorps/.

Top left to right: Win McLaughlin, geologist/paleontologist, John Day Fossil Beds National Monument, Oregon. Maisie Richards and Nancy Parker, paleontologists/GIS technicians, Denali National Park, Alaska. Corrie Floyd, geomorphology technician, Mount Rainier National Park, Washington.

THE GEOLOGICAL SOCIETY OF AMERICA®

Publications Highlights

GSA ADDS 7,000 PAGES OF MICROFICHE CONTENT

In December 1978, in an attempt to reduce cost, increase speed of publication, and publish more papers, *GSA Bulletin* began printing short summaries of articles in the Part I version of the journal. Complete articles were located in Part II, which was only available in microfiche.

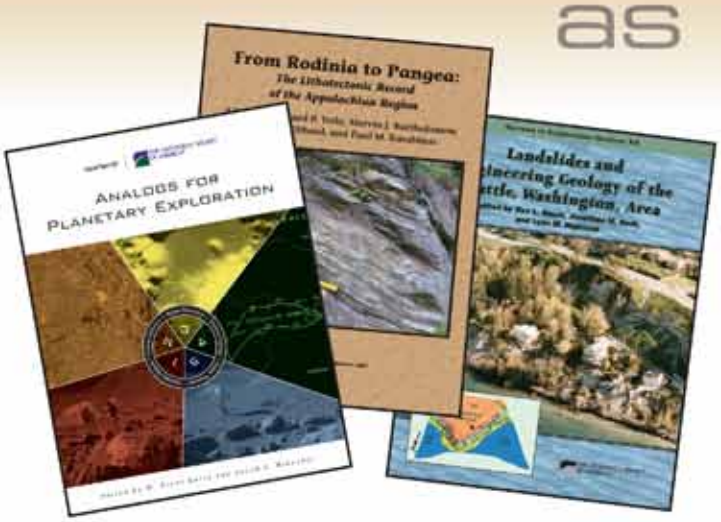
By November 1981, H.R. Gould, in his retiring address as president of The Geological Society of America, acknowledged that "Most authors didn't want to write for microfiche, and most readers didn't want to read articles in that format." The journal subsequently abandoned the microfiche experiment, and the papers that appeared in that format were practically lost to history.

Until now.

GSA is pleased to announce that all of the microfiche-only content prepared from 1979 to 1981 is now available online.

Start reading at **www.gsapubs.org.**

Publish Your Research as a GSA Book



SPECIAL PAPERS are state-of-the-art treatments of rapidly evolving subjects; most symposium-based volumes fall into this category.

MEMOIRS are likely to remain the authoritative reference on a subject for a number of years.

REVIEWS IN ENGINEERING GEOLOGY are produced in cooperation with GSA's Environmental and Engineering Geology Division, which is responsible for the selection, review, and acceptance of manuscripts for this series.

- **TO PROPOSE A BOOK YOU HAVE AUTHORED (NOT COMPILED):** Include the table of contents, the background and significance of the proposed book, and the abstract.
- **TO PROPOSE AN EDITED VOLUME:** Include a list of paper titles and authors with affiliations, the background and significance of the proposed volume, and any available abstracts.
- **ADDITIONAL INFORMATION** is posted at http://www.geosociety.org/pubs/bookguid7.htm, or contact a GSA Books science editor through books@geosociety.org with specific questions about your project.
- **GSA BOOKS SCIENCE EDITORS**
  Kent Condie | New Mexico Tech
  F. Edwin Harvey | University of Nebraska, Lincoln

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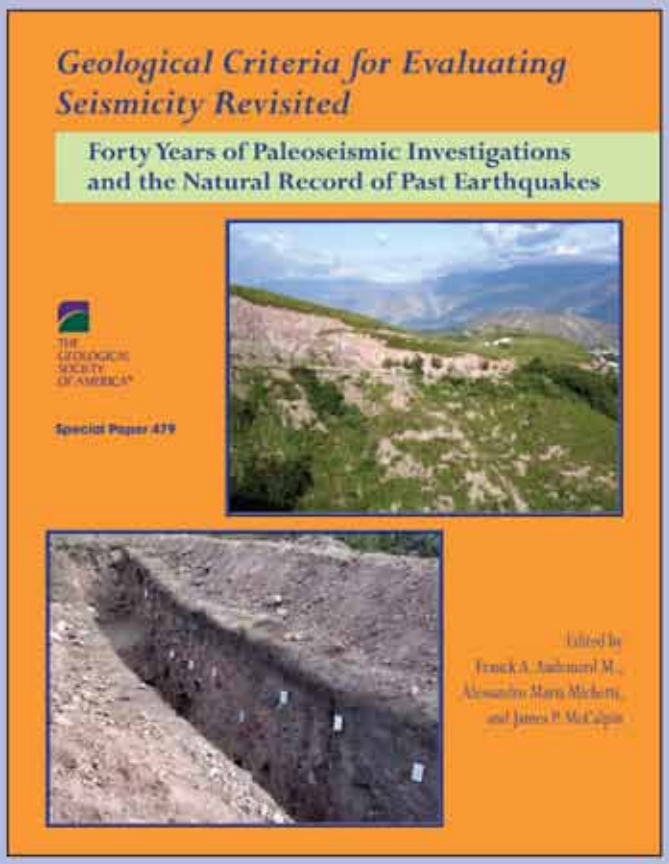
www.gsapubs.org

Geological Criteria for Evaluating Seismicity Revisited:

Forty Years of Paleoseismic Investigations and the Natural Record of Past Earthquakes

Edited by Franck A. Audemard M., Alessandro Maria Michetti, and James P. McCalpin



Many of the 10 chapters in this volume deal with conventional paleoseismology by trenching, covering the entire spectrum of tectonic environments (strike-slip, normal, and thrust faults). Special Paper 479 also contains two overview papers. The first one, which is the book's introduction, explores and explains how the seismic history of a given active fault can be discovered by geologic means (using direct or indirect indicators) for a particular tectonic setting. The second one describes and discusses how to approach lakes and their sedimentary record for paleoseismic purposes. Additionally, one chapter addresses paleoseismology of slide-dammed lakes. Last but not least, the final chapter analyzes paleoseismic data from the perspective of seismic hazard assessment.

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