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## Marine sediment record from the East Antarctic margin reveals dynamics of ice sheet recession



### **Inside:**

### **Section Meetings:**

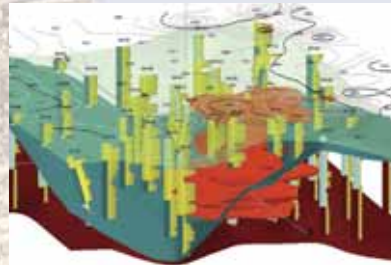
Northeastern Section, p. 14

Southeastern Section, p. 22

Upcoming Application and Nomination Deadlines, p. 13

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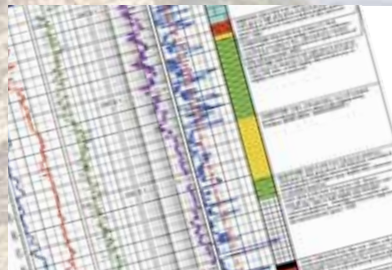


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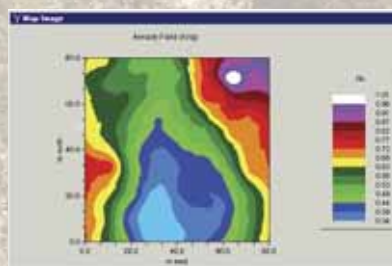


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**Cover:** Green iceberg, Iceberg Alley, Mac-Robertson Shelf, East Antarctic Margin. Photo taken March 2001 by Rob Dunbar, Dept. of Geological and Environmental Sciences, Stanford University. See "Marine sediment record from the East Antarctic margin reveals dynamics of ice sheet recession," by A. Leventer et al., p. 4–10.



## SCIENCE ARTICLE

### 4 **Marine sediment record from the East Antarctic margin reveals dynamics of ice sheet recession**

Amy Leventer, Eugene Domack, Robert Dunbar, Jennifer Pike, Catherine Stickley, Eleanor Maddison, Stefanie Brachfeld, Patricia Manley, and Charlie McClennen

### 11 **GSA Journals Honor Exceptional Reviewers**

### 12 **GSA Seeks Science Editors**

### 13 **Upcoming Application and Nomination Deadlines**

### 14 **Northeastern Section Meeting:** Final Announcement and Call for Papers

### 19 **Call for Geological Papers:** All 2007 GSA Section Meetings

### 22 **Southeastern Section Meeting:** Final Announcement and Call for Papers

### 28 **Student Mentor Programs:** 2007 Section Meetings

### 29 **GeoVentures™ 2007**

### 29 **In Memoriam**

### 29 **GSA Benefactor Inducted into National Mining Hall of Fame**

### 30 **GSA Foundation Update**

### 31 **Classified Advertising**

### 31 **Call for Applications:** 2007–2008 Congressional Science Fellow

### 38 **GeoCorps America™ 2007**

### 39 **GeoMart Geoscience Directory**

### 39 **Journal Highlights**



# Marine sediment record from the East Antarctic margin reveals dynamics of ice sheet recession

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## ABSTRACT

The Antarctic shelf is traversed by large-scale troughs developed by glacial erosion. Swath bathymetric, lithologic, and chronologic data from jumbo piston cores from four sites along the East Antarctic margin (Iceberg Alley, the Nielsen Basin, the Svenner Channel, and the Mertz-Ninnis Trough) are used to demonstrate that these cross-shelf features controlled development of calving bay reentrants in the Antarctic ice sheet during deglaciation. At all sites except the Mertz-Ninnis Trough, the transition between the Last Glacial Maximum and the Holocene is characterized by varved couplets deposited during a short interval of extremely high primary productivity in a fjord-like setting. Nearly monospecific layers of the diatom *Chaetoceros* alternate with slightly more terrigenous layers containing a mixed diatom assemblage. We propose that springtime diatom blooms dominated by *Chaetoceros* were generated within well-stratified and restricted surface waters of calving bays that were influenced by the input of iron-rich meltwater. Intervening post-bloom summer-fall laminae were formed through the downward flux of terrigenous material sourced from melting glacial ice combined with mixed diatom assemblages. Radiocarbon-based chronologies that constrain the timing of deposition of the varved sediments within calving bay reentrants along the East Antarctic margin place deglaciation between ca. 10,500–11,500 cal yr B.P., post-dating Meltwater Pulse 1A (14,200 cal yr B.P.) and indicating that retreat of ice from the East Antarctic margin was not the major contributor to this pulse of meltwater.

## INTRODUCTION

Cruise NBP0101 of the research vessel/icebreaker (RV/IB) *Nathaniel B. Palmer* conducted a marine geologic and geo-

physical investigation along the continental shelf of the East Antarctic margin from 58°E to 147°E (Fig. 1). Jumbo piston cores (JPCs) provide high-resolution sediment records of the transition from the last glacial to the Holocene, permitting assessment of the timing and nature of deglaciation. This paper presents swath bathymetric maps (Fig. 1) and radiocarbon-dated lithologic information (Fig. 2) that detail the chronology and processes involved in ice sheet retreat from four regions of the East Antarctic margin: Iceberg Alley (Mac.Robertson Shelf), the Nielsen Basin (Mac.Robertson Shelf), the Svenner Channel (eastern Prydz Bay), and the Mertz-Ninnis Trough (Wilkes Land margin). Each study target is a trough-shaped geomorphic feature that extends across the width of the East Antarctic shelf. As a consequence of their depth (400–1100 m), these troughs preserve a more complete section of sedimentation during deglaciation, in contrast to adjacent shallow parts of the shelf that were still affected by grounded ice and hence sites of nondeposition.

These East Antarctic margin sedimentary records, which are remarkably similar to one another and to a record from the Palmer Deep, Antarctic Peninsula (Domack et al., 2006), support the cohesive response of these regions to climate forcings at the end of the last glacial. Collectively, these data also provide important chronologic constraints for tracing northern versus southern hemisphere origins of deglacial meltwater pulses (Fairbanks, 1989; Bard et al., 1990), a controversial issue (i.e., Clark et al., 2002; Peltier, 2005).

## PHYSIOGRAPHY OF ICEBERG ALLEY, NIELSEN BASIN, SVENNER CHANNEL, AND MERTZ-NINNIS TROUGH

The morphology of transverse troughs separated by shallow banks is characteristic of the Antarctic continental margin (Vanney and Johnson, 1979; Johnson et al., 1982; Anderson, 1999). Physiographic maps of troughs in the study areas were made using SEABEAM® multibeam data collected continuously during the cruise and edited onboard by cruise participants. Sub-bottom profiles were collected with a Bathymetry 2000 3.5 kHz, hull-mounted chirp system with signal penetration to depths of ~50–100 m.

## Mac.Robertson Shelf–Iceberg Alley and Nielsen Basin

The rugged Mac.Robertson Shelf lies directly west of Prydz Bay, extending 400 km between ~60°E and 70°E (Fig. 1). The shelf is relatively narrow (~90 km wide) and composed of shallow banks (<200 m) cut by three deep troughs that are U-shaped in cross section, with steep sides and relatively flat floors. They were formed by glacial erosion during the Quaternary (O'Brien et al., 1994; ten Brink and Schneider, 1995; Harris and O'Brien, 1996). The intervening banks show evidence of both modern and ancient iceberg turbation (Harris and O'Brien, 1998). Iceberg Alley is linear, ~85 km long and 10–20 km wide. It reaches a depth of 850 m, but most of the

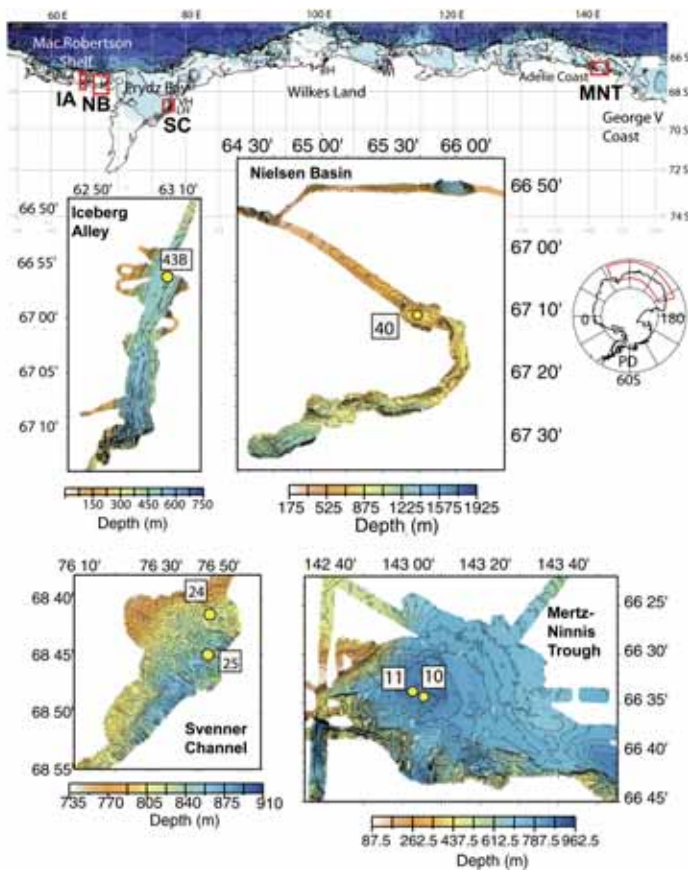


Figure 1. Location map and multibeam swath maps for Iceberg Alley (IA), the Nielsen Basin (NB), Svenner Channel (SC), and the Mertz-Ninnis Trough (MNT). Jumbo piston core sites are noted. General bathymetric chart of the oceans (GBCO) bathymetric contours are in 500 m intervals; note the transition from light blue to darker blues at the 1000 m contour. LH—Larsemann Hills; VH—Vestfold Hills; BH—Bunger Hills; WI—Windmill Islands; PD—Palmer Deep.

floor is ~475–575 m deep. The shallow banks on either side are lined with grounded icebergs; hence, its name. Nielsen Basin, bounded by western and eastern Storegg Bank, is deeper and more sinuous than Iceberg Alley, but its inner portion is similarly characterized by a “high relief ridge and valley topography” (Harris and O’Brien, 1998) formed by glacial incision. The deepest region (~1300 m) is located at the innermost part of the shelf, and depths shallow oceanward.

### Svenner Channel

Svenner Channel is an elongate (~180 km), glacially eroded trough in eastern Prydz Bay (Fig. 1) (Stagg, 1985). In the outer part of the channel, depths reach ~1000 m, while the deepest parts of the inner channel average ~800–850 m. Formation by glacial erosion is supported by observation of sediment ridges at the seafloor; the trend of these features, which are similar to drumlins or megafaults, most likely parallels former ice flow direction (O’Brien and Harris, 1996). Directly to the northwest is the Amery Depression, a broad basin averaging 600–800 m water depth. O’Brien and Harris (1996) suggest very rapid grounding zone retreat of the Lambert Glacier across the shelf due to the relatively deep water depths of the Amery Depression and its landward dip. Rapid ice retreat in the Amery Depression would suggest that similarly rapid ice retreat probably took place in Svenner Channel.

### Mertz-Ninnis Trough

The Mertz-Ninnis Trough, located along the Wilkes Land Margin between ~142°E and 146°E (Fig. 1), is a deep (>1300 m), linear feature bordered by the Adélie Bank to the west and the Mertz Bank to the northeast; both banks are relatively shallow (200–400 m). Surfaces of the banks show evidence of iceberg turbate structures (Barnes, 1987; Beaman and Harris, 2003) and are the sites of grounded icebergs today. During the Last Glacial Maximum, the Mertz Glacier expanded along the axis of the trough, as indicated by overcompacted sediments at the shelf break (Domack, 1982) and moraines on Mertz Bank

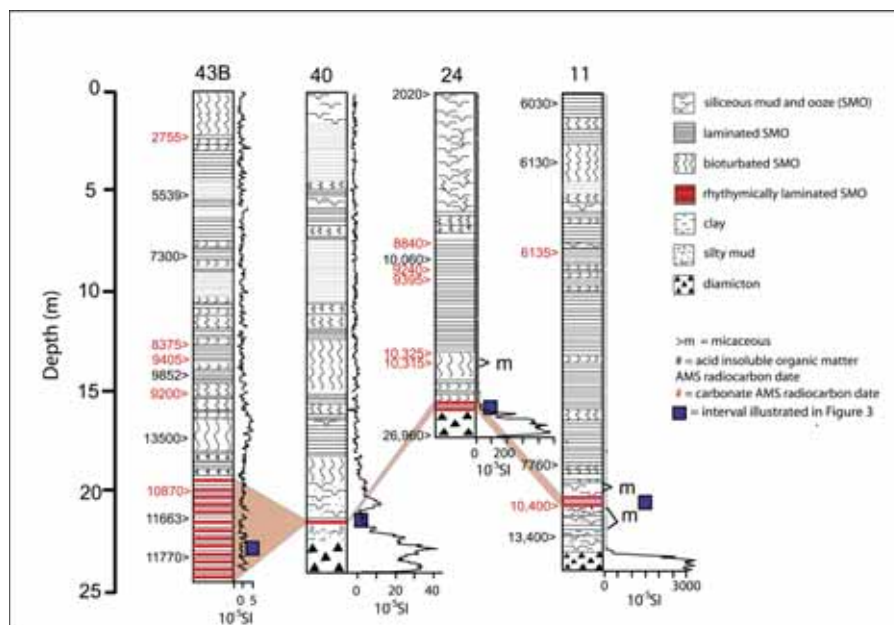


Figure 2. General lithologic columns for cores from JPC11 (Mertz-Ninnis Trough), JPC24 (Svenner Channel), JPC40 (Nielsen Basin), and JPC43B (Iceberg Alley). Uncorrected radiocarbon dates are noted for each core. See Table DR2 (see text footnote 1) for ranges on radiocarbon data. Shading indicates deglacial section described in paper. Curves to right of each lithologic log represent magnetic susceptibility for each core. Magnetic susceptibility was measured onboard ship using a Bartington magnetic susceptibility meter. Note increased magnetic susceptibility in the diamicton.

(Barnes, 1987; Domack et al., 1989; Beaman and Harris, 2003; and McMullen et al., 2006). Beaman and Harris (2003) also note seabed features characterized as “smooth diamicton” and glacially carved megaflutes that document more extensive glacial ice.

## CORE DESCRIPTIONS

JPCs were recovered using a 4.5” diameter jumbo piston coring system. The cores were stored under refrigeration and shipped to the Antarctic Research Facility at Florida State University, where they were opened, photographed, described, and sampled (GSA Data Repository, Table DR1<sup>1</sup>).

### Iceberg Alley

JPC43B is a 23.96 m core; the upper 19.13 m is alternately laminated and bioturbated biosiliceous ooze and mud (SMO). The lower 4.83 m is distinguished by its varves, rhythmically paired laminations that represent a single year of deposition (Stickley et al., 2005). This section could be as much as 5 m thicker, as ~30 m of post-glacial sediment was observed above a glacially scoured surface. Within each couplet, the lower lamination is diatom ooze, orange to orange-brown, comprised primarily of *Chaetoceros* spp. resting spores deposited during the annual spring bloom. The upper lamination of each couplet is comprised of a mixed diatom assemblage with a higher concentration of terrigenous material, including angular quartz sand, silt, and clay deposited during the summer and fall. Despite the presence of sublaminae, which makes it difficult to determine the exact number of years represented by the deglacial section, a total of 210 couplets (Stickley et al., 2006) were observed in this 4.83 m section, indicating that high productivity and sediment flux lasted for ~200 yr.

### Nielsen Basin

JPC40 penetrated to the underlying glacial section (21.55–23.92 m) (Figs. 2 and 3), which is comprised of dark greenish gray silty clay and granule-rich sand. Dropstones are present. The transition to the deglacial section is distinct, with graded couplets, similar to those in Iceberg Alley, from 21.08 to 21.55 m. Thirty-three couplets occur, indicating that this style of deposition lasted for <50 yr, a significantly shorter time frame than in Iceberg Alley. As in JPC43B, alternately laminated and bioturbated SMO overlies the varved section.

### Svenner Channel

JPC24 penetrated several meters of underlying glacial sediments (Figs. 2 and 3), greenish gray sandy and silty clay, with sand- to gravel-sized ice-rafted grains and granule-rich clay. The boundary between glacial diamict and overlying biosiliceous Holocene sediments is very sharp; note the color transition from greenish gray sediments to the overlying reddish sediment illustrated in Figure 3. Again, the transition is marked by paired laminations, but only 10 couplets occur between 15.58 and 15.80 m (Fig. 3). The ephemeral nature of the conditions responsible for the formation of these couplets, which in JPC24 likely span no more than a decade, is underscored by

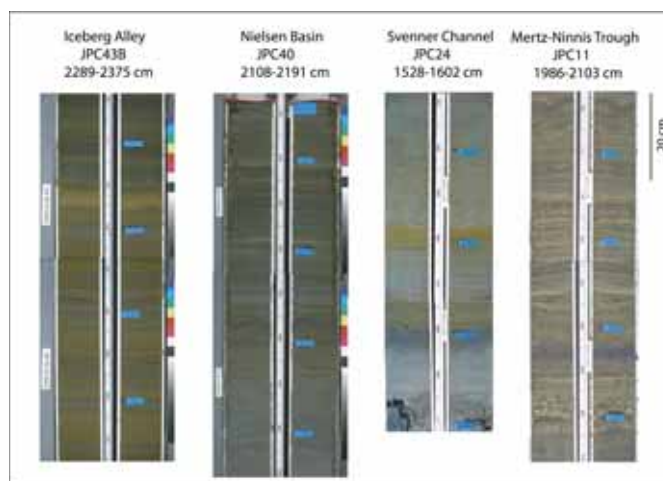


Figure 3. Photographs of laminated sediments deposited at the time of deglaciation, from four cores recovered from the East Antarctic margin. Note the mm- to cm-scale laminae and their regular alternation between an orange to orange-brown lamination and a more gray lamination in JPC43B, JPC40, and JPC24. These rhythmic laminations occur over a 483 cm interval in JPC43B, over a 47 cm interval in JPC40, and over a 22 cm interval in JPC24. In JPC11, paired laminations occur, but the pattern is not as regular.

the record from nearby JPC25, where the transition, though quite sharp at 8.88 m, is not marked by any varves. And again, the overlying sediments are comprised of alternately laminated and bioturbated SMO.

### Mertz-Ninnis Trough

JPC11, a 23.98-m-long core, penetrated glacial sediments, including well-consolidated, mud-supported gravels with a high concentration of ice-rafted material, at 22.92 m (Figs. 2 and 3). The transition to the Holocene is more complex as compared to the other East Antarctic margin cores. A moderately diatomaceous gray, muddy clay with sparsely scattered ice-rafted debris from 22.53 to 22.92 m records this transition and is interpreted as having a meltwater origin. The diatomaceous post-glacial clay is overlain by a diatom-rich, micaceous mud with scattered reddish layers comprised primarily of *Chaetoceros*.

Between 19.90 and 21.58 m, the sediment lithology alternates between bioturbated and thinly laminated SMO. Laminations generally alternate between a *Chaetoceros*-dominated layer and a layer with a more diverse diatom assemblage and a greater concentration of terrigenous material. The species succession, however, is more complicated, and though a seasonal pattern is recognized, it is not repeated as regularly as observed in the other cores (Maddison et al., 2006). Consequently, these sediments are not interpreted as varves. Such data suggest a less isolated setting and greater communication with open waters of the shelf during deglaciation. Also, given the bioturbated intervals that interrupt the finely laminated sequences, it is hard to develop as precise a chronology for deglaciation, particularly in contrast to the uninterrupted and simpler varved sections observed in the other East Antarctic margin cores.

<sup>1</sup>GSA Data Repository item 2006235, Tables DR1 and DR2, core location information and radiocarbon data of core samples, is available on the Web at [www.geosociety.org/pubs/ft2006.htm](http://www.geosociety.org/pubs/ft2006.htm). You can also obtain a copy of this item by writing to [editing@geosociety.org](mailto:editing@geosociety.org).

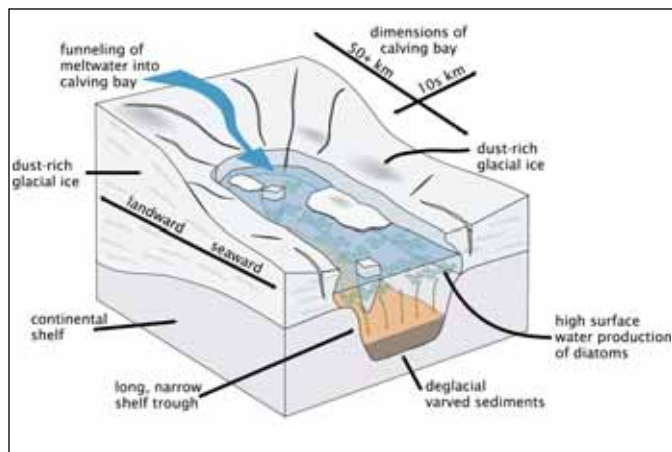


Figure 4. Generalized calving bay reentrant model. Glacial meltwater is funneled into the restricted bay, resulting in high springtime primary productivity. Summer and fall input of more terrigenous material results in a seasonal alternation of downward flux that is preserved at the seafloor as varves.

## CALVING BAY REENTRANT MODEL

### Model Basics

Hughes (2002) reviewed the history of the term “calving bay” and noted that calving bays—embayments characterized by rapid calving of glacial ice—could speed up ice sheet retreat as the bays migrated landward. More recently, Domack et al. (2006) presented a calving bay reentrant model for the Palmer Deep (western Antarctic Peninsula; Fig. 1) based on regional swath bathymetry that highlighted the importance of the physical configuration of the Palmer Deep as a control on the pattern of ice retreat, with retreat occurring much more rapidly over the deep trough while ice remained grounded on the shallower banks to either side. This style of bathymetry favors the formation of calving bay reentrants during deglaciation as well as the development of sedimentary regimes in which varved sediments were deposited (Fig. 4). Initial deglaciation was focused on these troughs, while ice remained grounded on the sides in a manner similar to that described for the Palmer Deep (Domack et al., 2006).

Varves are described from post-glacial sediments of the Palmer Deep (Domack, 2002; Leventer et al., 2002; Nederbragt and Thurow, 2001; Pike et al., 2001; Domack et al., 2006; Maddison et al., 2005) and, like the Iceberg Alley couplets, are composed of an alternation of primarily *Chaetoceros* resting spore-dominated diatom ooze and siliciclastic-rich diatom mud. A total of 176 couplets were observed in the ~3.5 m deglacial section from the Palmer Deep (Domack, 2002), similar to the number of couplets in the Iceberg Alley section, indicating that both Palmer Deep and Iceberg Alley persisted as calving bay reentrants for about two centuries. The Svenner Channel has the least extensive suite of varves, indicative of a calving bay reentrant that lasted on the order of only a decade. In between these two extremes is the Nielsen Basin, with a calving bay reentrant lasting several decades.

In the Mertz-Ninnis Trough, alternating laminated (but not varved) and bioturbated sediments, which occur at the glacial/

interglacial boundary, indicate a different history of deglaciation. The lack of varves in the Mertz-Ninnis Trough is probably related to its geometry. The large-scale and open bathymetry of this trough most likely prevented the formation of both a calving bay reentrant and a restricted oceanographic setting, which resulted in the varved sequences observed at the other sites.

### Elevated Primary Productivity, Preservation of Signal

The formation of varves requires the preservation of couplets that record the repetition of an annual cycle of deposition. The calving bay reentrants provided conditions that satisfied both the development of an annual signal and its preservation at the seafloor. Leventer et al. (2002) present a model for the Palmer Deep, applicable to the East Antarctic margin sites, that describes the annual succession of a springtime *Chaetoceros* bloom followed by lower levels of summer production and the added influx of terrigenous material. Here, we further develop that model with a focus on the lower, biogenic half of each couplet, which is dominated by diatoms of the genus *Chaetoceros*, a group commonly interpreted as indicative of high productivity. Convergence of surface slopes in the calving bay reentrants would have focused surface melt, concentrating large volumes of low salinity, low density glacial meltwater via preferential surface flow. Strong stabilization of the upper water column and reduced mixing of phytoplankton out of the photic zone would have enhanced primary production (Leventer et al., 1996). In contrast, along most parts of the coastline, spring and summer meltwater would not have been focused, and may have been diluted relatively quickly by wind-induced mixing, with consequently smaller phytoplankton blooms.

A second consideration is the potential for increased nutrient concentration within the upper water column. Stickley et al. (2005) review potential nutrient sources within the Iceberg Alley setting, including nutrients released from melting sea and glacial ice, and from incursions of Upper Circumpolar Deep Water. We suggest that the dominance of *Chaetoceros* in springtime blooms during the glacial-Holocene transition might have been influenced by the micronutrient iron. Since the early work of Martin et al. (1990), studies document the ability of introduced iron to induce phytoplankton blooms in the Southern Ocean (Coale et al., 2004; Boyd et al., 2000; Boyd and Law, 2001).

We suggest glacial meltwater as the source of iron fertilization within the calving bay reentrant. Melting of the ice margin occurs by surface melt percolating down through firn and refreezing until superimposed ice is formed, or if the melting is extensive enough, an ablation zone develops at the end of the melt season. The ice in the ablation zone melts at the surface, leaving behind and thus concentrating debris, including the dust contained within the ice. As meltwater drains out into the calving bay reentrant, it carries a suspended load with concentrated debris content. This debris includes iron-rich dust, delivered to the ice sheet via aeolian transport (Rea, 1994; Wolff et al., 2006). Under these conditions, each spring, iron-rich meltwater introduced into the surface waters could have fertilized extremely large algal blooms.

The dominance of *Chaetoceros* in the spring bloom lamination is relevant in light of the work of Tsuda et al. (2003), who

performed an iron enrichment experiment in the subarctic Pacific that led to a *Chaetoceros*-dominated bloom. They speculate that the high doubling rate of this small centric diatom resulted in the shift from an assemblage previously dominated by a pennate diatom. The situation described by Tsuda et al. (2003) might have parallels to the observations of the massive annual spring sedimentation of *Chaetoceros* resting spores in deglacial sediments from both the East Antarctic margin and the Palmer Deep.

The role of decreased ventilation of the deeper waters in preservation of the seasonally produced signal requires further investigation. In combination with the restricted geographic setting, low-salinity glacial meltwater at the sea surface may have decreased the density of brines resulting from winter sea ice formation, thus preventing them from displacing basin waters. Consequently, basin waters may have had limited ventilation, resulting in anoxia (Willmott et al., 2006), an environment that favors the preservation of laminated facies.

### Chronology of Deglaciation

Chronologies for these cores are based on accelerator mass spectrometry (AMS) radiocarbon-dated carbonate material and decalcified organic matter (GSA Data Repository, Table DR2 [see footnote 1]). All samples were analyzed at the Lawrence Livermore National Laboratory Center for Accelerator Mass Spectrometry. Radiocarbon ages were calibrated using CALIB 4.42 (©1986–2004, M. Stuiver and P.J. Reimer).

A chronology for JPC43B, in Iceberg Alley, presented by Stickle et al. (2005), is briefly described below. A total of 11 samples were AMS radiocarbon dated (Table DR1 [see footnote 1]). Radiocarbon ages were calibrated assuming a local reservoir age of 1700 yr  $\pm$  200 yr (P. Sedwick, 2004, personal commun.); the reservoir age is based on radiocarbon analyses of kasten cores from Iceberg Alley. The carbonate ages are slightly younger than the decalcified total organic carbon (TOC) dates. One anomalously old date from 17.25 to 17.30 m was disregarded and a second order polynomial was fit to the curve to develop the chronology. The varved section of the core, from 19.13 to 23.96 m, thus dates to ca. 11,200–11,400 cal yr B.P. High sediment accumulation rates inferred from the dated samples at the base of the core support the interpretation of the laminated sediments as varves.

The chronology for JPC24, Svenner Channel, was developed using seven AMS radiocarbon dates (Table DR1 [see footnote 1]). Radiocarbon ages were calibrated assuming a local reservoir age of 1280  $\pm$  200 yr, based on the age of a kasten core top at the same location. Again, the carbonate ages are slightly younger than the decalcified TOC dates. A best-fit line between the shell dates constrains the chronology of the lower part of the core; the varved section of JPC24 (15.58–15.80 m) dates to ca. 10,800 cal yr B.P. In JPC25, the glacial-interglacial transition occurs at 8.88 m. Three dates derived using carbonate shell material place deglaciation at ca. 11,100 cal yr B.P.

Previous work developing radiocarbon-based chronologies for sediment cores from the Mertz-Ninnis Trough has faced difficulties based on the presence of reworked organic material (Domack et al., 1989; Harris and Beaman, 2003); consequently, radiocarbon dates for the Mertz-Ninnis Trough have not been

calibrated. Finally, at this time, no radiocarbon data are available for the Nielsen Basin core.

### Timing of Deglaciation and Its Significance

Data constraining the timing of deglaciation along the East Antarctic margin are important in terms of their implication for the role of Antarctica in contributing to sea level rise at the end of the last glacial. The Barbados record of sea level during the late Quaternary (Fairbanks, 1989; Bard et al., 1990) documents two events of rapid sea-level rise at the end of the last glacial. The first, termed meltwater pulse 1A (mwp-1A), has been dated to ca. 14,200 cal yr B.P., and the second, meltwater pulse 1B (mwp-1B), began ca. 11,000 cal yr B.P. (Fairbanks, 1989). The source of the water for sea level rise during mwp-1A has been debated, with some researchers suggesting that the meltwater contributing to sea level rise came from the receding Laurentide Ice Sheet (Kennett and Shackleton, 1975; Leventer et al., 1982; Keigwin et al., 1991; Fairbanks et al., 1992; Peltier, 1994) and others suggesting an Antarctic source (Clark et al., 1996, 2002; Weaver et al., 2003; Bassett et al., 2005). Speculation concerning an Antarctic source was initiated by Clark et al. (1996), who reviewed the data indicating a Laurentide meltwater source; their reevaluation indicated that the Laurentide ice sheet could not be the sole source of mwp-1A.

Peltier (2005) recently reviewed this problem and its significance. Pinpointing the source of mwp-1A is crucial for several reasons. First, meltwater discharge, through its impact on oceanic circulation, can influence global climate. For example, Weaver et al. (2003) suggest that an Antarctic source for mwp-1A could have resulted in increased North Atlantic Deep Water production and the initiation of the Bølling-Allerød warm interval. Second, suggestions of an Antarctic source for mwp-1A are based on geophysical models of Earth's response to spatial differences in deglaciation, which can be evaluated through analysis of sea level records (Clark et al., 2002; Peltier, 2005). However, published geologic data from Antarctica do not support an Antarctic source for mwp-1A (Ackert et al., 1999; Conway et al., 1999; Domack et al., 1999; Baroni and Hall, 2004), resulting in a need to reconcile geophysical models and geologic data.

Our East Antarctic margin data constrain the timing of the calving bay reentrant phase of deglaciation and the deposition of the deglacial sediment facies. The data indicate that deglaciation on these portions of the margin began ca. 11,500 cal yr B.P., too late to contribute to the sea level rise indicated by mwp-1A, but potentially early enough to contribute to mwp-1B. Other East Antarctic margin marine records provide a similar time frame for deglaciation. Domack et al. (1991) note the initiation of open-marine conditions at Ocean Drilling Project (ODP) Leg 119 Site 740 in the Svenner Channel at 10,700 yr B.P. (dates corrected for Antarctic marine reservoir effect [AMRE] but not calibrated). Work by Harris and O'Brien (1998) and Sedwick et al. (1998, 2001) on the Mac.Robertson shelf places deglaciation at ca. 11,000 yr B.P. (dates corrected for AMRE but not calibrated), based on the initiation of deposition of siliceous muds and oozes. Of particular interest is the Sedwick et al. (2001, p. 223) observation of a bloom of *Chaetoceros* resting spores "associated with the retreat of permanent ice cover" in



outer Iceberg Alley at 10,800 yr B.P. (dates corrected for AMRE but not calibrated).

## CONCLUSIONS

Multibeam swath bathymetric data and lithologic and chronologic data from JPCs from the East Antarctic margin demonstrate the applicability of a calving bay reentrant model of deglaciation. These cross-shelf troughs were sites of early ice retreat and extremely high productivity, while glacial ice remained grounded on shallower portions of the shelf. High biogenic and terrigenous flux for periods ranging from only a decade to almost two centuries are recorded by varved sediments, in which nearly monospecific *Chaetoceros* layers alternate with slightly more terrigenous layers with mixed diatom assemblages. We propose that springtime blooms of *Chaetoceros* were generated within a stabilized water column characterized by the introduction of iron-rich meltwater into surface waters. Advection within the physically isolated conditions of the calving bay reentrant helped concentrate biogenic flux to the seafloor. The intervening post-bloom summer-fall laminae were formed through downward flux of terrigenous material sourced from the melting glacial ice combined with mixed diatom assemblages. The thickness of the deglacial varved unit—which does not exist at the Mertz-Ninnis Trough site but ranges from tens of centimeters in the Svenner Channel and Nielsen Basin to meters in Iceberg Alley—is driven by the specific configuration of each trough, which controlled the temporal persistence of the calving bay reentrant, ranging from decades to centuries. These records suggest that the Palmer Deep, West Antarctica, and these sites in East Antarctica responded in a similar way to sea level forcing at the end of the last glacial. Radiocarbon data from these cores place deglaciation along the East Antarctic margin between ca. 10,500–11,500 cal yr B.P. These data demonstrate that deglaciation at the study sites followed mwp-1A, thus indicating that East retreat of ice from the Antarctic margin was not the major contributor to this pulse of meltwater.

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## Medals and Awards

### Nominations Due: 1 February 2007

Candidate nominations are requested for the following medals and awards: Penrose Medal, Day Medal, Honorary Fellows, Young Scientist Award (Donath Medal), GSA Public Service Award, and GSA Distinguished Service Award. For details on the awards and nomination procedures, see the October 2006 issue of *GSA Today*. For the online nomination form, go to [www.geosociety.org/aboutus/awards/](http://www.geosociety.org/aboutus/awards/) or call +1-303-357-1028. Materials and supporting information for any of the nominations may be sent to Grants, Awards, and Recognition, GSA, 3300 Penrose Place, P.O. Box 9140, Boulder, CO 80301-9140, USA.

## GSA Fellows

### Nominations Due: 1 February 2007

The Committee on Membership requests nominations of members to be elevated to GSA Fellow status. Any GSA Fellow may nominate a Member for this honor. Two supporting letters in addition to the online nomination form are needed. For details on nomination procedures, see the October 2006 issue of *GSA Today*, go to [www.geosociety.org/members/fellow.htm](http://www.geosociety.org/members/fellow.htm), call +1-303-357-1028, or e-mail [awards@geosociety.org](mailto:awards@geosociety.org).

## 2007 Subaru Outstanding Woman in Science Award

(Sponsored by Subaru of America Inc.)

### Nominations Due: 1 February 2007

This award is given to a woman who has made a major impact on the field of the geosciences, based on her Ph.D. research. For details on the award and nomination procedures, see the October 2006 issue of *GSA Today*. For the new online nomination form, go to [www.geosociety.org/aboutus/awards/](http://www.geosociety.org/aboutus/awards/) or call +1-303-357-1028. Send nominations and supporting material to Grants, Awards, and Recognition, GSA, 3300 Penrose Place, P.O. Box 9140, Boulder, CO 80301-9140, USA.

## John C. Frye Environmental Geology Award

### Nominations Due: 31 March 2007

In cooperation with the Association of American State Geologists, GSA makes an annual award for the best paper on environmental geology published either by GSA or by one of the state geological surveys. For details, see the October 2006 issue of *GSA Today*, go to [www.geosociety.org/aboutus/awards/](http://www.geosociety.org/aboutus/awards/), or call +1-303-357-1028. Nominations must be sent to Grants, Awards, and Recognition, GSA, 3300 Penrose Place, P.O. Box 9140, Boulder, CO 80301-9140, USA.

## Student Research Grants 2007

**Apply online** at [www.geosociety.org/grants/gradgrants.htm](http://www.geosociety.org/grants/gradgrants.htm) starting late November. Application for a GSA student research grant is an **online-only** process. No paper applications or letters will be accepted. Online submission must be completed by **Thurs., 1 February 2007, at 11:59 p.m. (MST)**.

Students must be GSA members and may only receive a grant once at the master's level and once at the Ph.D. level. Those who have applied for grant funding but who did not receive a grant are welcome to apply again. The maximum award per grant is US\$3500.

For more information on GSA's 2007 research grant program, go to [www.geosociety.org/grants/gradgrants.htm](http://www.geosociety.org/grants/gradgrants.htm), call +1-303-357-1028, or e-mail [awards@geosociety.org](mailto:awards@geosociety.org).

## National Awards

### Nominations Due: 30 April 2007

Candidate nominations are needed for the following national awards: William T. Pecora Award, National Medal of Science, Vannevar Bush Award, and Alan T. Waterman Award. For details, see the October 2006 issue of *GSA Today*. Nominations should be sent to Grants, Awards, and Recognition, GSA, 3300 Penrose Place, P.O. Box 9140, Boulder, CO 80301-9140, USA.

## Research Awards in Geomorphology and Micropaleontology

Two of GSA's most prestigious research-support awards are made possible by the generosity of the late W. Storrs Cole. Qualified GSA Members and Fellows are urged to apply.

### Geomorphology

The **Gladys W. Cole Memorial Research Award** provides support for the investigation of the geomorphology of semiarid and arid terrains in the United States and Mexico. GSA Members and Fellows between the ages of 30 and 65 who have published one or more significant papers on geomorphology are eligible for the award. While the funds may not be used for work that is already finished, recipients of previous awards may reapply if they need additional support to complete their work. The 2007 award is US\$8700.

### Micropaleontology

The **W. Storrs Cole Memorial Research Award** supports research in invertebrate micropaleontology. This award carries a stipend of US\$7700 in 2007 and will go to a GSA Member or Fellow between the ages of 30 and 65 who has published one or more significant papers on micropaleontology.

### Deadline for applications: 1 February 2007.

Online application forms are now accepted at [www.geosociety.org/grants/postdoc.htm](http://www.geosociety.org/grants/postdoc.htm). Supplemental information may be e-mailed to [awards@geosociety.org](mailto:awards@geosociety.org) or sent to Grants, Awards and Recognition, 3300 Penrose Place, P.O. Box 9140, Boulder, CO 80301-9140, USA.

*The Gladys W. Cole and W. Storrs Cole award funds are managed by the GSA Foundation.*



THE GEOLOGICAL SOCIETY  
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## Final Announcement and Call for Papers

# NORTHEASTERN

**42nd Annual Meeting  
Northeastern Section, GSA  
Durham, New Hampshire, USA**

**12–14 March 2007**

Geoscientists from the University of New Hampshire, Keene State College, Plymouth State University, Dartmouth College, the Geological Society of New Hampshire, the New Hampshire Geological Survey, and the U.S. Geological Survey will host the 2007 meeting of the Northeastern Section of the Geological Society of America. The meeting will be at the University of New Hampshire's Holloway Commons and adjacent Memorial Union and Huddleston Hall (see a campus map at [www.unh.edu/welcome/campusmap.html](http://www.unh.edu/welcome/campusmap.html)) in downtown Durham. We will meet just upstream from the Great Bay estuary of seacoast New Hampshire and southern Maine.

### REGISTRATION

**Early registration deadline: 5 February 2007**

**Cancellation deadline: 12 February 2007**

Please register at [www.geosociety.org](http://www.geosociety.org). On-site registration will be at Holloway Commons during the meeting. Register early to qualify for lower fees; costs will increase after 5 February 2007. Full payment MUST accompany registration. Members of GSA and the GSA Associated Societies listed on the registration form receive discounts. Register only one person per form and retain a copy for your records. Registration is required for those attending technical sessions, field trips, short courses, and the exhibits hall. Guest registration is intended for nongeologist spouses or friends and does not include attendance at technical sessions, field trips, or short courses. Students and K–12 teachers must show a current ID at check-in to obtain special rates.

**GSA will be distributing all badges at the meeting registration desk;** badges will NOT be mailed to you prior to the meeting.

### On-site Registration and Badge Pickup Schedule

Main Street Entrance, Holloway Commons, UNH Campus	
Sunday, 11 March	4–8 p.m.
Monday, 12 March	8 a.m.–5 p.m.
Tuesday, 13 March	8 a.m.–5 p.m.
Wednesday, 14 March	8–11 a.m.

### Registration Fees

	Early		Standard	
	Full meeting	One day	Full meeting	One day
Professional Member	US\$145	US\$95	US\$175	US\$115
Professional Member (70+)	US\$75	US\$50	US\$100	US\$75
Professional Nonmember	US\$165	US\$115	US\$195	US\$145
Student Member	US\$50	US\$40	US\$70	US\$60
Student Nonmember	US\$60	US\$50	US\$80	US\$70
K–12 Professional	US\$50	US\$30	US\$60	US\$40
Guest or Spouse	US\$30		US\$40	
Field trip or short course only		US\$30		US\$40

### CANCELLATIONS, CHANGES, AND REFUNDS

All requests for additions, changes, and cancellations must be made in writing to GSA Headquarters and received by 12 February 2007. There will be no refunds for cancellations received after this date, and no refunds for on-site registration, *Abstracts with Programs*, and on-site ticket sales.

### ABSTRACTS

**Abstracts Deadline: 5 December 2006**

Papers are invited for theme and general discipline sessions in both oral and poster format. Volunteered papers will be considered for any general discipline session as listed on the GSA abstracts form. We encourage undergraduate students to consider presenting their research in either oral or poster format. Undergraduate research posters will be merged with other poster sessions, arranged by topic. Papers sponsored by the Council on Undergraduate Research, Geology Division, will be identified as such in the *Abstracts with Programs* volume.

Authors interested in submitting papers for symposia should contact the appropriate symposium conveners before submitting. An individual may be a presenter for only one volunteered paper (except symposia papers), but may be co-author on any number of abstracts. Those invited for symposia may present an additional paper. For further information, please contact technical program co-chairs Tim Allen, [tallen@keene.edu](mailto:tallen@keene.edu), or Jo Laird, [jl@cisunix.unh.edu](mailto:jl@cisunix.unh.edu). Abstracts of papers must be submitted using the electronic submission form at [www.geosociety.org](http://www.geosociety.org). An abstract submission fee of US\$10 will be charged. If you have questions regarding abstract submission, please contact Nancy Carlson, [ncarlson@geosociety.org](mailto:ncarlson@geosociety.org).

### ORAL SESSIONS

One laptop computer using Windows XP (no Macs available) and PowerPoint 2003, one LCD projector, and one screen will be provided for each oral session. Speakers may not use their own laptop computers for presentations. If a Mac has been used to produce a presentation, the speaker should run it on one of the speaker ready room laptops to see if it works properly. Slide projectors, overhead projectors, and multiple screens will not be available. If you have any special requests, you *must* contact the AV coordinator, Jake Crumb, [conferences@unh.edu](mailto:conferences@unh.edu), +1-603-862-1900, by 19 February 2007. PowerPoint presentations may be e-mailed before or during the meeting or brought on a CD or USB memory stick to the AV technician in

the speaker ready room, Holloway Center Salmon Falls Room. Detailed instructions on how to load a presentation will be e-mailed to presenters with abstract acceptance notices. Except in special sessions, speakers will have 15 minutes for presentation, and 5 minutes for discussion.

## POSTER SESSIONS

Poster sessions allow at least three hours of display time; presenters must be present for two hours of that time. All posters must fit on a single 8' × 4' display board. Electrical and network connections will not be available. Display boards will accommodate either Velcro or push pins.

## TECHNICAL PROGRAM

### Symposia

1. **New England Hydrology: A Tribute to S. Lawrence Dingman.** Ellen Douglas, UMass-Boston, ellen.douglas@unh.edu, +1-603-862-2730; Matthew Davis, University of New Hampshire, matt.davis@unh.edu, +1-603-862-1718.
2. **Rev. James W. Skehan SJ—Geologist, Teacher, Mentor, Priest: A Jesuit Journey.** Walter Anderson, Maine State Geologist Emeritus, waageo@verizon.net, +1-207-287-2801; Chris Hepburn, Boston College, hepburn@bc.edu, +1-617-552-3640.
3. **Geology in Service to the Public and the Revival of State and Provincial Geological Surveys in the Northeast.** David Wunsch, New Hampshire State Geologist, dwunsch@des.state.nh.us, +1-603-271-6482; Gary D. Johnson, Dartmouth College, gary.d.johnson@dartmouth.edu, +1-603-646-2371.

### Theme Sessions

1. **From Rodinia to Pangea—The Lithotectonic Record of Plate Convergence in Eastern North America.** Dick Tollo, George Washington University, rtollo@gwu.edu, +1-202-994-6960; Paul Karabinos, Williams College, paul.karabinos@williams.edu, +1-413-597-2079.
2. **The Neo-Adian Orogeny and Implications for Tectonic and Depositional Setting of Devonian—Carboniferous Rocks in the Appalachian Orogen.** M.D. Thompson, Wellesley College, mthompson@wellesley.edu, +1-781-283-3029; C.E. White, Nova Scotia Department of Natural Sciences, whitece@gov.ns.ca, +1-902-424-2519; Peter Robinson, Geological Survey of Norway, peter.robinson@ngu.no.
3. **Tectonic Setting of the Magmatic, Sedimentary, and Metamorphic Record of the Alleghanian Orogeny in the Appalachian Mountains.** Bob Wintsch, University of Indiana, wintsch@indiana.edu, +1-812-855-4018; C.K. Kerwin, Keene State College, ckerwin@keene.edu, +1-603-358-2405.
4. **Caledonian Magmatism: Cross-Atlantic Connections—Again.** John Hogan, University of Missouri–Rolla, jhogan@umr.edu, +1-573-341-4618; David Gibson, University of Maine–Farmington, dgibson@maine.edu, +1-207-778-7401; Dan Lux, University of Maine–Orono, dlux@maine.edu, +1-207-581-2152; Martin Feely, National University of Ireland–Galway, martin.feely@nuigalway.ie, +353-91-492129.

This session is associated with Field Trip 4, *Igneous Rocks of the Easternmost Three Terranes in Southeastern New England: Examples from NE Massachusetts and SE New Hampshire.*

5. **Mesozoic Extension, Exhumation, Sedimentation and Magmatism in the Northern Appalachians.** Mary Roden-Tice, SUNY-Plattsburgh, rodentmk@plattsburgh.edu, +1-518-564-4032; Greg McHone, University of Connecticut, gregmchone@snet.net, +1-860-486-1391.
6. **Isotopic and Other Indicators of Sediment Provenance and Basement Character.** Sandra Barr, Acadia University, sandra.barr@acadia.ca, +1-902-585-1340; Scott Samson, Syracuse University, sdsamson@syr.edu, +1-315-443-2672.
7. **Strain Partitioning and Rheological Evolution in Orogens.** Dyk Eusden, Bates College, deusden@bates.edu, +1-207-786-6152; Scott Johnson, University of Maine, johnsons@maine.edu, +1-207-581-2142.
8. **Sedimentological and Stratigraphic Studies in the Gulf of Maine.** Cosponsored by *Eastern Section, Society for Sedimentary Geology (SEPM)*. Larry Ward, Jackson Estuarine Laboratory, University of New Hampshire, larry.ward@unh.edu, +1-603-862-5132.
9. **New Insights in Atlantic Continental Margin Processes.** Cosponsored by *Eastern Section, Society for Sedimentary Geology (SEPM)*. Joel Johnson, University of New Hampshire, joel.johnson@unh.edu, +1-603-862-4080; Jim Gardner, Center for Coastal and Ocean Mapping, University of New Hampshire, jim.gardner@unh.edu, +1-603-862-3473.
10. **Geologic Records of Biotic Change.** Cosponsored by *Eastern Section, Society for Sedimentary Geology (SEPM)*. Will Clyde, University of New Hampshire, will.clyde@unh.edu, +1-603-862-3148.
11. **Teleconnecting Paleobasins Using Stratigraphic and Paleontological Approaches for High Resolution Intra- and Inter-Basin Correlations.** Cosponsored by *Eastern Section, Society for Sedimentary Geology (SEPM)*. Sean Cornell, Shippensburg University, srcornell@ship.edu, +1-315-229-5236; Diane Burns, St. Lawrence College, dburns@stlawu.edu, +1-315-229-5248; Alex Bartholomew, SUNY–New Paltz, alexbartholomew\_geo@hotmail.com, +1-518-388-6770.
12. **Atmospheric–Earth Surface Interactions: Solid, Liquid, and Gas.** Rob Griffin, University of New Hampshire and Climate Change Research Center, rob.griffin@unh.edu, +1-603-862-2021.
13. **Glacial and Paraglacial Coastal Systems.** Cosponsored by *Eastern Section, Society for Sedimentary Geology (SEPM)*. Dan Belknap, University of Maine, belknap@maine.edu, +1-207-581-2159; Duncan Fitzgerald, Boston University, dunc@bu.edu, +1-617-353-2530.
14. **Contaminants in Groundwater–Surface Water Systems: Sources, Pathways, and Toxicities.** Rudi Hon, Boston College, hon@bc.edu, +1-617-552-3656; Joe Ayotte, U.S. Geological Survey, jayotte@usgs.gov, +1-603-226-7810; Bill Brandon, EPA-Boston, brandon.bill@epamail.epa.gov, +1-617-918-1391.

## Northeastern

15. **Characterization and Remediation of Contaminated Bedrock Aquifers.** Nancy Kinner, University of New Hampshire, nancy.kinner@unh.edu, +1-603-862-1422.
16. **Treated Wastewater and Urban and Suburban Runoff as Aquifer Recharge: Issues for Protection of Groundwater Quality.** Denis R. LeBlanc, U.S. Geological Survey, Northborough, Mass., dleblanc@usgs.gov, +1-508-490-5030.
17. **Glacial and Postglacial Environments on the Frontier: Quaternary Studies in the New England–Canadian Border Region.** Woody Thompson, Maine Geological Survey, woodrow.b.thompson@maine.gov, +1-207-287-2211; P. Thompson Davis, Bentley College, pdavis@bentley.edu, +1-781-891-3479; Brian Fowler, Fowler Management Resources, b2fmr@metrocast.net, +1-603-524-8969.
18. **Advances in Paleoclimate from the Terrestrial Realm to the Deep Sea.** Amy Frappier, Boston College, a.frappier@unh.edu, +1-603-862-4046; Jon Woodruff, Woods Hole Oceanographic Institution, jwoodruff@whoi.edu, +1-508-289-3437.
19. **Earthquakes and Volcanoes—Past, Present, and Future, Regional and Global.** Jeffrey B. Johnson, University of New Hampshire, jeff.johnson@unh.edu, +1-603-862-0711; Pedro de Alba, University of New Hampshire, pedro.dealba@unh.edu, +1-603-862-1417.
20. **Mineral Properties: Geochemical, Petrological, and Environmental Applications.** Cosponsored by *Mineralogical Society of America*. Bruce Watson, RPI, watsoe@rpi.edu, +1-518-276-8838; Jonathan Price, RPI, pricej@rpi.edu, +1-518-276-6000.
21. **Elemental Cycling within Terrestrial Environments.** Julie Bryce, University of New Hampshire, julie.bryce@unh.edu, +1-603-862-3139; Scott Bailey, USDA Forest Service, swbailey@fs.fed.us, +1-603-535-3262; Kevin McGuire, Plymouth State University, kmcguire1@plymouth.edu, +1-603-535-3250; Steve Kahl, Plymouth State University, jskahl@plymouth.edu, +1-603-535-3154.
22. **Innovative Teaching Methods in the Earth Sciences (Posters).** Frank Revetta, SUNY-Potsdam, revetta@potsdam.edu, +1-315-267-2289. POSTERS ONLY.
23. **Health and Geology in the Northeast.** Coposponsored by *GSA Geology and Health Division*. Catherine Skinner, Yale University, catherine.skinner@yale.edu, +1-203-432-3787; Nelson Eby, University of Massachusetts–Lowell, nelson\_eby@uml.edu, +1-978-934-3907.
24. **History of Geological Ideas and Understanding of the Northern Appalachians.** Cosponsored by *GSA History of Geology Division*. William R. Brice, University of Pittsburgh–Johnstown, wbrice@pitt.edu, +1-814-269-3950.
25. **Google Earth Science: Geological Applications of Interactive Web-Based Maps.** Declan G. DePaor, Worcester Polytechnic Institute, declan@wpi.edu, +1-508-831-5116; Steve Whitmeyer, James Madison University, whitmesj@jmu.edu, +1-540-568-7119.

### FIELD TRIPS

For additional field trip information, please contact the field trip leader(s) indicated below, or the field trip coordinator, Peter Thompson, pit3@cisunix.unh.edu. All trips will take place before the meeting on Sunday, 11 March. They will leave from

the University of New Hampshire parking lot H at 8:30 a.m., except for Field Trip 1, which leaves at 11:30 a.m., and return in time for the 6 p.m. reception. March weather in New England can be unpredictable, so come prepared for rain or snow. Coastal conditions can be windier than inland. Field trips with fewer than ten registrants may be cancelled. Fees include transportation, guidebook, and, for all-day trips, lunch.

1. **Bottom Mapping and Characterization of the Great Bay Estuary and Adjacent Coastal Areas.** Sponsored by *Eastern Section, Society for Sedimentary Geology (SEPM)*. 11:30 a.m.–6 p.m. Larry Ward, larry.ward@unh.edu, +1-603-862-5132; Semme Dijkstra, semmed@cisunix.unh.edu, +1-603-862-0525; University of New Hampshire, Center for Coastal and Ocean Mapping, and the Jackson Estuarine Laboratory. Max.: 20; min.: 10. Cost: US\$60 for professionals, US\$50 for students.
2. **Structure of Late Paleozoic Brittle Dextral Strike-Slip Fault Zones in Coastal Maine Exposures.** Mark Swanson, University of Southern Maine, mswanson@maine.edu, +1-207-780-5024. Max.: 36. Cost: US\$40 for professionals, US\$30 for students.
3. **Glacial and Coastal Geology of Southeastern New Hampshire.** Sponsored by *Eastern Section, Society for Sedimentary Geology (SEPM)*. Joseph Licciardi, University of New Hampshire, joe.licciardi@unh.edu, +1-603-862-3135; P. Thompson Davis, Bentley College, pdavis@bentley.edu, +1-781-891-3479. Max.: 36. Cost: US\$40 for professionals, US\$30 for students.
4. **Igneous Rocks of the Easternmost Three Terranes in Southeastern New England: Examples from NE Massachusetts and SE New Hampshire.** Chris Hepburn, Boston College, hepburn@bc.edu, +1-617-552-3642; Rudolph Hon, Boston College, rudy.hon.1@bc.edu, +1-617-552-3640; Jo Laird, University of New Hampshire, jl@cisunix.unh.edu, +1-603-862-3140. Max.: 36. Cost: US\$40 for professionals, US\$30 for students.
5. **Geology of the May 2006 Suncook River Avulsion.** 8:30 a.m.–noon. David Wunsch, New Hampshire Geological Survey, dwunsch@des.state.nh.us, +1-603-271-6482; Rick Chormann, rchormann@des.state.nh.us, +1-603-271-1974; Chad Wittkop, University of Wisconsin at Eau Claire, wittkoca@uwec.edu. Max.: 25. Cost: US\$30 for professionals, US\$25 for students.
6. **Minerals and Ice Formations in Palermo Mine, North Groton, New Hampshire.** Robert Whitmore, Weare, N.H., mrpalermo@gsinet.net, +1-603-529-2621; Greg Kirby, New Hampshire Dept. of Environmental Services, gkirby@des.state.nh.us, +1-603-466-5214. Max.: 30. Cost: US\$40 for professionals, US\$30 for students.

### SHORT COURSES AND WORKSHOPS

Short courses and workshops will take place on Sunday, 11 March. Attendance is limited; please register early. For more information, contact the short course leader or short course coordinators Ray Talkington, rtalkington@geospherenh.com, +1-603-773-0075, and Lee Wilder, lwilder@des.nh.state.us, +1-603-271-1976.

1. **Your First Steps in the Profession and the Future.** 1–4:30 p.m., Cocheco Room, Holloway Commons. Raymond



W. Talkington, Geosphere Environmental Management, Inc., Exeter, N.H., [rtalkington@geospherenh.com](mailto:rtalkington@geospherenh.com), +1-603-773-0075; Robert Stewart, LFR, Inc., East Hartford, Conn., [bob.stewart@lfr.com](mailto:bob.stewart@lfr.com), +1-860-290-9300. Min.: 15. Cost: US\$20. The cost for the first 25 student registrants for this workshop will be covered by a corporate sponsor.

2. **Application of Geophysical Methods to Environmental Problems.** 9 a.m.–4:30 p.m., Piscataquis Room, Holloway Commons. Lee Slater, Rutgers University, [lslater@andromeda.rutgers.edu](mailto:lslater@andromeda.rutgers.edu), +1-973-353-5109. Min.: 10. Cost: US\$50 (includes lunch).
3. **Interactive Geospatial Data Visualization.** 9 a.m.–noon and 1–3:30 p.m., Chase Ocean Engineering Building. Erin Heffron, [ehffron@ivs3d.com](mailto:ehffron@ivs3d.com), +1-603-431-1773; Jim Gardner, [jim@cocom.unh.edu](mailto:jim@cocom.unh.edu), +1-603-862-3473. Max.: 12, min: 8. Cost: US\$20 (includes lunch).
4. **Digital Dynamic Mapping (DDM).** 9 a.m.–4:30 p.m., Squamscott Room, Holloway Commons. Chris Condit, UMass-Amherst, [ccondit@geo.umass.edu](mailto:ccondit@geo.umass.edu), +1-413-545-0272. Min.: 10. Cost: US\$85 (includes lunch).

## K–12 TEACHERS PROGRAM

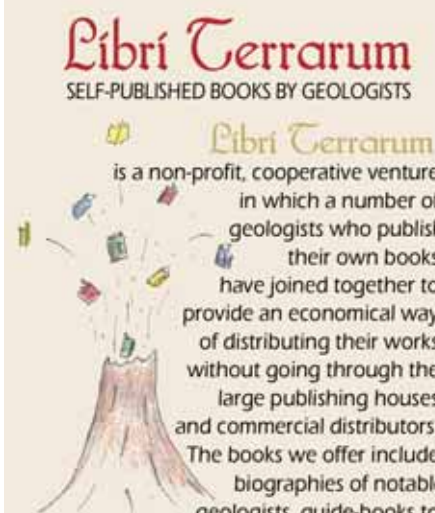
The K–12 Teachers program is sponsored by a grant from the Geological Society of New Hampshire and will provide reimbursement for part of teachers' workshop fees. On Sunday 11 March, two morning workshops will be offered, with a field trip in the afternoon. Location details will be sent to preregistrants. K–12 educational credit for contact hours will be given on site to participants requesting them. The cost for the two morning workshops and afternoon field trip is US\$20, which includes lunch and transportation to Adams Point.

1. **K–12: GIS and Google Earth.** 8:30 a.m.–12:15 p.m., James Hall, Room 20.

A. **GIS for Earth Science Teachers.** Derek Bennett of the New Hampshire Department of Environmental Services will provide a two-phase workshop on Geographic Information Systems (GIS) for Earth Science teachers. Phase one will cover the latest GIS technologies and how earth scientists currently employ GIS. Phase two will be a hands-on demonstration of ArcExplorer, a free GIS software package, which may be taken and used in the classroom. Earth Science educators will leave the workshop with a copy of ArcExplorer, a few New Hampshire GIS datasets, and an understanding of how to use GIS in the classroom.

B. **Google Earth.** In 2005, Google launched the revolutionary map service called "Google Earth." Building on previous Keyhole technology, it permits Web users to study the planet with a sophistication previously available only on high-end graphics workstations. Declan De Paor (Worcester Polytechnic Institute) and Steve Whitmeyer (James Madison University) will introduce teachers to practical aspects of importing geoscience data into Google Earth. Topics include virtual field trips, draping maps over the topography, adding text and graphics to place marks, and creating geological cross sections and 3-D models integral with Google Earth.

2. **K–16 Advancing Understanding of Groundwater Concepts Using Simulation and Role-Play in the Plume Busters Software.** P. Allen Macfarlane, Kansas Geological



**Libri Terrarum**  
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Libri Terrarum is a non-profit, cooperative venture in which a number of geologists who publish their own books have joined together to provide an economical way of distributing their works without going through the large publishing houses and commercial distributors. The books we offer include biographies of notable geologists, guide-books to scenic regions and national parks, books for the layman on environmental and historical topics, and even novels and poetry. If you are a self-published author, you are welcomed to join us. We have only started, but we think you will be impressed with our list of books and authors.

To learn more about who we are and what we have to offer, check our website:  
**libri-terrarum.com**  
or write to us at:  
[contact@libri-terrarum.com](mailto:contact@libri-terrarum.com)

Survey, [dowser@kgs.ku.edu](mailto:dowser@kgs.ku.edu), +1-785-864-2068. 8:30 a.m.–12:30 p.m., James Hall, Room 119.

Plume Busters is an innovative, "hands-on" educational software package in which students take on the role of an environmental consultant and apply groundwater principles to solve simulated groundwater contamination problems ranging from pipeline spills to industrial sites. This four-hour workshop will provide instructors with experience using the software and its built-in assessment features in undergraduate environmental science, environmental geology, and hydrogeology classes. Attendees are encouraged to bring a laptop computer and will be provided software and an instructor's guide free of charge.

## K–12 GEOLOGY FIELD TRIP TO ADAMS POINT

**"What happened here?"** 1–4:30 p.m., departing from James Hall. Teachers will spend the afternoon on a field trip to Adams Point in New Hampshire's estuary Great Bay. University of New Hampshire geologist Peter Thompson will show participants how geologists "read" bedrock outcrops and record their observations to construct a geological map. Data collected will be related to GIS techniques learned in the K–12 Teachers Program Workshop 1.

**K–12 Teachers:** You are also urged to submit papers and participate in **Theme Session 22**, "Innovative Teaching Methods in the Earth Sciences (Posters)," and **Theme Session 25**, "Google Earth Science: Geological Applications of Interactive Web-Based Maps."

# Northeastern

## GUEST ACTIVITIES

The Seacoast area of New Hampshire and Maine has a wide array of museums, parks, and other sites of historic and cultural interest. In addition to the information on the University of New Hampshire Web site, [www.unh.edu](http://www.unh.edu), many other destinations are described on [www.conferences.unh.edu/locationdestination.html](http://www.conferences.unh.edu/locationdestination.html), <http://seacoastnh.com/>, and [www.portsmouthnh.com/](http://www.portsmouthnh.com/).

## EXHIBITS

### Reservation and Payment Deadline: 5 February 2007

Exhibits will be located in the Rotunda and Sizzle areas of Holloway Commons. Exhibit rates are US\$100 for nonprofit organizations and US\$200 for others. Booth space will include 8' × 10' of space with draped framing and one table. Wireless access is available throughout the exhibition area. Electric access for the duration of the meeting will be an additional US\$35. For further information, to reserve booth space, or to make other arrangements, contact the exhibits coordinator, Stefanie Lamb, GZA GeoEnvironmental, Inc., Portland, Maine, [sgetlamb@gmail.com](mailto:sgetlamb@gmail.com), +1-603-486-7606.

## SPECIAL EVENTS

Other society and committee business meetings, breakfasts, and lunches may be scheduled by contacting the general chair, Wally Bothner, [wally.bothner@unh.edu](mailto:wally.bothner@unh.edu).

**Northeastern Section GSA, Management Board Meeting.** Sun., 11 March, 4–6 p.m. Lamprey Room, Holloway Commons.

**Opening Reception.** Sun., 11 March, 6–8:30 p.m. Holloway Commons Rotunda. Enjoy our opening reception and nearby exhibits and visit with friends and colleagues. Snacks provided, with a cash bar. A ticket for your first beverage comes with registration. The registration desk will be open until 8 p.m.

**Paleontological Society Luncheon and Business Meeting.** Mon., 12 March, noon–1:30 p.m. US\$15. Lamprey Room, Holloway Commons.

**Plenary Session 1, Special Hot Topic Lecture: "EARTH-TIME: Dates and Rates—From Magmatism to Mass Extinctions."** Mon., 12 March, 4:30–5:30 p.m., MUB Theatre 2. Samuel A. Bowring, Massachusetts Institute of Technology, will bring us the latest results applying high precision U/Pb geochronology to refine temporal sequencing of geologic processes and events.

**GSA Northeastern Section, Map Blast IX.** Mon., 12 March, 7–9:30 p.m. Informal session for display of newly published, unpublished, or in-progress geologic maps of any sort. All attendees are welcome to bring, post, and discuss ancient, recent, or planned mapping efforts. Holloway Commons Rotunda, pizza and beer cash bar.

**Plenary Session 2, Special Lecture "New Hampshire's Old Man of The Mountain—A Retrospective."** Tues., 13 March, 4:30–5:30 p.m., MUB Theatre 2. Brian Fowler, President of Fowler Resources Inc. In May 2003, the Old Man of The Mountains collapsed into Franconia Notch, ending a nearly 200-year relationship between the people of New England and the Profile. Fowler, who supervised more than 25 years of stability studies on the Profile for the state of New Hampshire, will present a uniquely illustrated "remembrance" that describes the Profile's formation, its geologic structure, the mechanisms

of its delicate stability and collapse, and some of the efforts that were made to save it.

**Society for Sedimentary Geology (SEPM) Northeast Section Business Meeting and Presidential Address.** Tues., 13 March, 5–6:30 p.m. Squamscott Room, Holloway Commons. Robert W. Dalrymple, Dept. of Geological Sciences and Geological Engineering, Queen's University, Kingston, Ontario, will discuss "Where Does the Mud Go? The Dispersal of Mud from Rivers and the Stratigraphic Implications."

**Association for Women Geoscientists Career Development Breakfast.** Tues., 13 March, 6:30–8 a.m. Professionals, US\$18; students, US\$9. Oak Room, Huddleston Hall.

**National Association of Geoscience Teachers Luncheon.** Time and location TBD. US\$15

**Conference Banquet.** Tues., 13 March, 7–9 p.m., Huddleston Hall banquet room. All attendees invited! Buffet with cash bar (open 6–7 p.m.): US\$35. You may sponsor a student to attend this event; simply purchase an additional banquet ticket for a student when you buy your own.

**Mount Washington EduTrip.** The Mount Washington Observatory is providing the opportunity for nine intrepid earth science adventurers to attend a Mount Washington EduTrip overnight at the top of New England's highest and "weathermost" point, 10–11 March 2007. Join geologist Mark Van Baalen of Harvard University in exploring the relationship between geological and biological processes and climate drivers over long periods of Earth's history. We will discuss both modern and ancient climates, as well as the controversial Snowball Earth hypothesis. See [www.mountwashington.org/education/edutrips/](http://www.mountwashington.org/education/edutrips/) for details.

## MENTORING PROGRAMS

**Roy J. Shlemon Mentor Program in Applied Geoscience.** Sponsored by *GSA Foundation*. Mon.–Tues., 12–13 March, 11:30 a.m.–1 p.m.

**The John Mann Mentors in Applied Hydrogeology Program.** Sponsored by *GSA Foundation*. Mann Mentors in Applied Hydrogeology Program: Mon., 12 March, 5–6:30 p.m.

For more information, see page 28 of this issue, go to [www.geosociety.org/students.htm](http://www.geosociety.org/students.htm), or contact Jennifer Nocerino, [jnocerino@geosociety.org](mailto:jnocerino@geosociety.org).

## SPONSORSHIP

Corporate sponsors for this meeting will have their names published in the meeting program. Interested parties may contact the meeting sponsorship coordinator, Tom Shevenell, [shevenell@aol.com](mailto:shevenell@aol.com).

## STUDENT TRAVEL GRANTS

### Application Deadline: 29 January 2007

Travel grants are available from GSA's Northeastern Section in cooperation with GSA Foundation. These grants are open to both undergraduate and graduate students who are GSA Members, currently enrolled in NE Section schools, and are presenting oral or poster papers at this meeting. Please apply online at [www.geosociety.org/sectdiv/northe/](http://www.geosociety.org/sectdiv/northe/). Contact Stephen Pollock, secretary-treasurer, GSA Northeastern Section, [pollock@usm.maine.edu](mailto:pollock@usm.maine.edu), with any questions.

## ACCOMMODATIONS

A block of rooms at special rates has been reserved until 17 February 2007 at the New England Center, +1-800-590-4334, and at the Holiday Inn Express, +1-888-465-4329, both within short walking distance of the campus conference center. Reservations may be made directly by phone; you MUST identify yourself as attending the Northeastern GSA meeting when making reservations to get the special rate. Additional housing may be available at the Three Chimneys Inn in Durham, +1-888-399-9777. Reserve early to be within walking distance. Details on hotels in the nearby towns of Dover, Newington, and Portsmouth, all less than 10 miles away, are posted at [www.unh.edu/esci/negsa2007.html](http://www.unh.edu/esci/negsa2007.html). Parking will be available on campus.

## ACCOMMODATIONS FOR REGISTRANTS WITH SPECIAL NEEDS

GSA and the University of New Hampshire are committed to ensuring full participation for conference attendees with disabilities. You may indicate special requirements on your registration form, and you should inform the local organizing committee of these requirements at least one month prior to the meeting. Accessible hotel rooms are available, but it's best to reserve your room early. Requests for special accommodations should be received before 12 February 2007.

## DIRECTIONS

Simple, clear directions to the University of New Hampshire (UNH) in Durham can be found at [www.unh.edu/transportation/visitor/directions.htm](http://www.unh.edu/transportation/visitor/directions.htm). Durham is served from Boston by C&J Trailways; advance reservations are not required. For more information, call +1-603-742-5111 or +1-800-258-7111, or go to [www.cjtrailways.com/schedule.htm](http://www.cjtrailways.com/schedule.htm). Amtrak's "Downeaster" services Durham (with an on-campus station) from Boston's North Station and Portland, but there is no evening return train to Boston on weekdays. See [www.amtrakdowneaster.com/](http://www.amtrakdowneaster.com/) for details. A map of the UNH campus is online at [www.unh.edu/welcome/campusmap.html](http://www.unh.edu/welcome/campusmap.html), and visitor parking information can be found at [www.unh.edu/transportation/visitor/visitorparking.htm](http://www.unh.edu/transportation/visitor/visitorparking.htm).

## CONTACT INFORMATION

Check the UNH Dept. of Earth Sciences NE GSA Meeting Web site, [www.unh.edu/esci/negsa07.html](http://www.unh.edu/esci/negsa07.html), or contact the general meeting chair, Wally Bothner, [wally.bothner@unh.edu](mailto:wally.bothner@unh.edu), if you have any questions. Please also check [www.geosociety.org](http://www.geosociety.org).



## Call for Geological Papers

# 2007 GSA Section Meetings

### Northeastern Section

12–14 March 2007

University of New Hampshire  
Durham, New Hampshire

**Abstract Deadline: 5 December 2006**

**Information:** Wally Bothner, University of New Hampshire, Dept. of Earth Sciences, James Hall, 56 College Rd., Durham, NH 03824-3578, USA, +1-603-862-3143, [wally.bothner@unh.edu](mailto:wally.bothner@unh.edu).

### Southeastern Section

29–30 March 2007

Hyatt Regency Savannah on the Historic Riverfront  
Savannah, Georgia

**Abstract Deadline: 12 December 2006**

**Information:** Pranoti Asher, Georgia Southern University, Dept. of Geology and Geography, Statesboro, GA 30460-8149, USA, +1-912-681-0338, [pasher@georgiasouthern.edu](mailto:pasher@georgiasouthern.edu).

Joint Meeting

### North-Central and South-Central Sections

11–13 April 2007

Kansas Memorial Union, University of Kansas  
Lawrence, Kansas

**Abstract Deadline: 23 January 2007**

**Information:** Greg Ludvigson, +1-785-864-2734, [gludvigson@kgs.ku.edu](mailto:gludvigson@kgs.ku.edu)—or—Greg Ohlmacher, +1-785-749-4502, [ohlmac@kgs.ku.edu](mailto:ohlmac@kgs.ku.edu); both at Kansas Geological Survey, University of Kansas, 1930 Constant Ave., Lawrence, Kansas 66047-5317, USA.

### Cordilleran Section

4–6 May 2007

Western Washington University  
Bellingham, Washington

**Abstract Deadline: 6 February 2007**

**Information:** Bernie Housen, Western Washington University, Dept. of Geology, MS 9080, 516 High St., Bellingham, WA 98225-5946, USA, +1-360-650-6573, [bernieh@cc.wvu.edu](mailto:bernieh@cc.wvu.edu).

### Rocky Mountain Section

7–9 May 2007

Dixie Center  
Saint George, Utah

**Abstract Deadline: 13 February 2007**

**Information:** Jerry Harris, Dixie State College, Science Building, 225 South 700 East, Saint George, UT 84770-3875, USA, +1-435-652-7758, [dinogami@gmail.com](mailto:dinogami@gmail.com).





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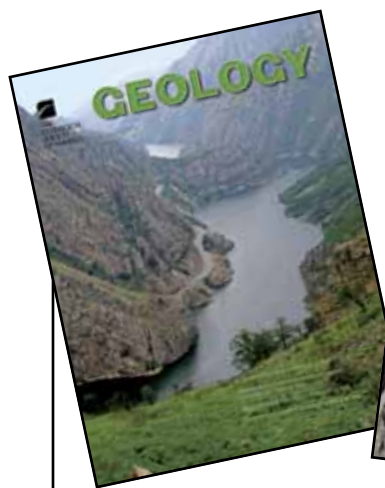
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## SOUTHEASTERN

56th Annual Meeting  
Southeastern Section, GSA  
Savannah, Georgia, USA

29–30 March 2007

The Department of Geology and Geography and the Applied Coastal Research Laboratory at Georgia Southern University and GSA's Southeastern Section proudly invite your attendance and participation on 29–30 March 2007 in Savannah, Georgia. GSA is one of the oldest and most prestigious scientific societies in the world; there is no better place than a GSA Section Meeting to showcase your science results, products, and services to the geoscience market. This meeting is growing in service and value to geoscientists; we encourage you to join the many other leading academic institutions, businesses, and organizations choosing to be a part of it!

### SAVANNAH

Savannah has a population of ~132,000. Georgia's First City and largest port, Savannah has some of the state's oldest houses, largest oak trees, and best restaurants. Sharing an eighteenth-century elegance with Charleston, Savannah has found recent fame through John Berendt's book, *Midnight in the Garden of Good and Evil*.

Savannah is on Georgia's Coastal Plain, where Cenozoic carbonates, claystones, and sands provide a rich environment for research. The lower Coastal Plain consists of a series of Quaternary shoreline complexes that parallel the modern coast and grow younger coastward. The most economically significant mineral resource of the Inner Coastal Plain is kaolinite, a mineral used in a variety of industries, from pharmaceuticals to paper. Heavy mineral sands constitute the major economic deposits of the Outer Coastal Plain. Groundwater is another major geologic resource in the Coastal Plain; the Floridan aquifer provides abundant groundwater for domestic consumption, for industry, and for agricultural irrigation. The Georgia coast and barrier islands are under intense pressure for development; while the Georgia coast has escaped a direct hurricane strike (Category 4 or greater) for 77 years, the potential property loss has grown enormously. Thus, the area provides ample opportunities for relevant geologic and environmental research.

Savannah enjoys a subtropical climate that makes outdoor activities possible year-round. The winters are mild; temperatures in March average around 59 °F.

### REGISTRATION

**Early Registration Deadline: 26 February 2007**

**Cancellation Deadline: 5 March 2007**

Please register at [www.geosociety.org](http://www.geosociety.org). During the meeting, on-site registration will be at the Hyatt Regency. Please note that **GSA will distribute all badges at the meeting** registration table; no badges will be mailed prior to the meeting.

### On-Site Registration and Registration Packet Pickup Schedule

Wed., March 28	5–9 p.m.
Thurs., March 29	7 a.m.–5 p.m.
Fri., March 30	7 a.m.–noon

### REGISTRATION FEES

	Early	Standard	One-day
Professional Member	US\$180	US\$190	US\$80
Professional Nonmember	US\$190	US\$200	US\$100
Student Member	US\$70	US\$80	US\$40
Student Nonmember	US\$80	US\$90	US\$45
Professional Member >70	US\$80	US\$90	US\$45
K–12 Teacher	US\$50	US\$50	US\$25
Guest or Spouse	US\$50	US\$60	N/A
Field Trip or Workshop only	US\$30	US\$40	N/A

### CANCELLATIONS, CHANGES, AND REFUNDS

Requests for additions, changes, and cancellations must be received at GSA Headquarters by 5 March 2007. No refunds will be made on cancellation notices received after this date. Refunds will be mailed from GSA after the meeting. Refunds for fees paid by credit card will be credited to the card identified on the registration form. No refunds will be available for on-site registration, *Abstracts with Programs*, or event ticket sales.

### ACCOMMODATIONS

**Hotel Registration Deadline: 5 March 2007**

A block of rooms has been reserved at the Hyatt Regency Savannah on the Historic Riverfront (2 West Bay Street, Savannah, Georgia 31401, USA; <http://savannah.hyatt.com/hyatt/hotels/>) at US\$160 per night for one to three occupants and US\$170 for four occupants (plus state, city, and hotel taxes). For reservations, please call the Hyatt reservation line, +1-800-233-1234, and request a reservation under "SE GSA 2007," or connect to the Hyatt's Web site, <http://savannah.hyatt.com/groupbooking/savrsgaa2007>.

### CALL FOR PAPERS

**Abstract Deadline: 12 December 2006**

**Submission form:** <http://gsa.confex.com/gsa/2007SE/index.epl>

Papers are invited from students and professionals for oral and poster presentations. An individual may present only one volunteered paper; however, a person may be a co-author on other papers. Individuals invited to participate in symposia may present an additional volunteered paper. Authors interested in submitting papers for symposia should contact the symposium convener before submitting. Submit abstracts online; an

abstract submission fee of US\$10 will be charged. If you cannot submit the abstract online, please contact Nancy Carlson, +1-303-357-1061, ncarlson@geosociety.org.

## TECHNICAL SESSIONS

Papers are invited for theme and general discipline sessions in both oral and poster format. Volunteered papers will be considered for any general discipline session as listed on GSA's electronic abstracts form. We encourage undergraduate students to consider oral presentations as well as poster sessions.

**Poster Sessions:** Poster presenters have one 4' x 8' horizontal (landscape) display, and will be scheduled for half-day sessions. Electrical hookups will not be available; all computer equipment must be battery-powered.

**Oral Sessions:** Oral presentations will be given in the Hyatt Regency. Conveners of all oral sessions are requested to keep their sessions on schedule. Each speaker will be allowed 20 minutes: ~15 minutes for presentation and ~5 minutes for questions. A computer projector, a screen, and a laptop will be provided for oral presentations. Personal laptops cannot be used for presentations. Slide projectors, overhead projectors, multiple screens, and zip drives *will not* be available. Authors should bring PowerPoint presentations on a CD-ROM or memory stick to the AV technician in the Speaker Ready Room (Sloan Room, Hyatt Regency) at least six hours before their session.

### Speaker Ready Room Hours:

Wed., 28 March 1 p.m.–11 p.m.  
Thurs., 29 March 6:30 a.m.–11 p.m.  
Fri., 30 March 6:30 a.m.–2 p.m.

## Symposia

- Understanding Earth's Interior: Geophysics in the Eastern United States from the Near-Surface to the Mantle.** Cosponsored by *GSA Geophysics Division*. Samuel (Sam) T. Peavy, Georgia Southwestern State University, speavy@canes.gsw.edu; Rob Hawman, University of Georgia, rob@3rdrock.gly.uga.edu. Oral and Poster.
- Coastal and Marine Sedimentary Geology in the Southeastern United States: A Session in Honor of Dr. V.J. "Jim" Henry.** Cosponsored by *Applied Coastal Research Laboratory; Skidaway Institute of Oceanography*. Clark Alexander, Skidaway Institute of Oceanography, clark.alexander@skio.usg.edu. Oral.
- Teaching Organic Evolution for K–16 Students and Pre-Service Teachers: Viewpoints, Techniques, and Approaches.** Cosponsored by *National Association for Geoscience Teachers; Southeastern Section, Paleontological Society*. Michael A. Gibson, University of Tennessee–Martin, mgibson@utm.edu; Colin Sumrall, University of Tennessee, csumrall@utk.edu. Oral.
- Hydrostratigraphy and Hydrostratigraphic Nomenclatural Problems in the Southeastern U.S. Coastal Plain.** Cosponsored by *GSA Hydrogeology Division; Florida Geological Survey–Dept. of Environmental Protection*. Thomas M. Scott, Florida Geological Survey, Florida Dept. of Environmental Protection, thomas.scott@dep.state.fl.us; Rick Copeland, Florida Geological Survey, Florida Dept. of Environmental Protection, rick.copeland@dep.state.fl.us. Oral.

- Cenozoic Tectonics in the Southeastern United States.** Cosponsored by *GSA Structural Geology and Tectonics Division*. Kevin Stewart, University of North Carolina, kgstewar@email.unc.edu; Charles H. (Chuck) Trupe, Georgia Southern University, chtrupe@georgiasouthern.edu. Oral.
- Geology and Ecology of Carolina Bays.** Eric Wright, Coastal Carolina University, ewright@coastal.edu; Thomas Ross, University of North Carolina–Pembroke, tom.ross@uncp.edu. Oral.

## Theme Sessions

- Building Strong Geoscience Departments in the Southeast.** Dallas D. Rhodes, Georgia Southern University, drhodes@georgiasouthern.edu; Geoff Feiss, College of William and Mary, pgfeis@wm.edu. Oral.
- Oh! Southern Skies: Latest Results in Southeastern Planetary Science.** Cosponsored by *GSA Planetary Geology Division*. Michael S. Kelley, Georgia Southern University, mkelley@georgiasouthern.edu; Nicholas Lang, University of Tennessee at Knoxville, nlang1@utk.edu. Oral.
- Place-Based Case Studies in Geoscience Education (Posters).** Cosponsored by *Southeastern Section, National Association for Geoscience Teachers*. John R. Wagner, Clemson University, jrwnr@clemson.edu; Thomas Hanley, Columbus State University, hanley\_tom@yahoo.com. Poster.
- Geologic Maps, Digital Geologic Maps, and Derivatives from Geologic Maps (Posters).** Cosponsored by *Georgia Section, American Institute of Professional Geologists*. Michael W. Higgins, The Geologic Mapping Institute, mhiggins@mindspring.com; Ralph F. Crawford, The Geologic Mapping Institute, crawford@sprintmail.com. Poster.
- Geology in the Public Interest.** Cosponsored by *GSA Geology and Society Division*. William E. Jones, Savannah River National Laboratory, w02.jones@srnl.doe.gov; Walter J. "Jerry" Sexton, Athena Technologies, walter\_sexton@athenatechnologies.com. Oral.
- Undergraduate Research (Posters).** Cosponsored by *Council for Undergraduate Research*. Brannon Anderson, Furman University, brannon.anderson@furman.edu; Jeff Ryan, University of South Florida, ryan@chuma.cas.usf.edu. Poster.
- Southeastern U.S. Earthquakes: Then and Now.** Norman Levine, College of Charleston, levinen@cofc.edu; Briget Doyle, College of Charleston, doyleb@cofc.edu; Steven Jaume, College of Charleston, jaumes@cofc.edu. Oral or Poster.
- Geospatial Technology Applications for Geologic and Environmental Mapping, Monitoring, and Risk Assessment (Posters).** Rebecca Dodge, University of West Georgia, rdodge@westga.edu. Poster.
- Economic Geology: Industrial and Metallic Mineral Resources.** Cosponsored by *Mineralogical Society of America*. R. Kelly Vance, Georgia Southern University, rk Vance@georgiasouthern.edu; Mark G. Adams, Unimin Corporation, madams@unimin.com. Oral.
- Fluvial Geomorphology and Watershed Studies in the Eastern United States.** Cosponsored by *GSA Quaternary*

(continued on page 25)



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## • Geological Society Special Publication 253

### Analogue and Numerical Modelling of Crustal-Scale Processes

*Edited by S. J. H. Buiter and G. Schreurs*

The crust of the Earth records the deformational processes of the inner Earth and the influence of the overlying atmosphere. The state of the Earth's crust at any time is therefore the result of internal and external processes, which occur on different time and spatial scales. In recent years important steps forward in the understanding of such complex processes have been made by integrating theory and observations with experimental and computer models. This volume presents state-of-the-art analogue and numerical models of processes that alter the Earth's crust. It shows the application of models in a broad range of geological problems with careful documentation of the modelling approach used. This volume contains contributions on analogue and numerical sandbox models, models of orogenic processes, models of sedimentary basins, models of surface processes and deformation, and models of faults and fluid flow.

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## • Geological Society Special Publication 252

### The Neuquén Basin, Argentina: A Case Study in Sequence Stratigraphy and Basin Dynamics

*Edited by G. D. Veiga, L. A. Spalletti, J. A. Howell and E. Schwarz*

The Neuquén Basin of northern Patagonia provides an excellent case study in basin analysis and sequence stratigraphy. The basin is one of the largest petroleum provinces in South America and includes a dramatic record of relative sea-level changes as well as a unique and globally important palaeontological record. Understanding this region is also central to unravelling the history of the Andes. The latest developments in the study of the area have been combined in this volume to give an integrated series of case studies that document the structural, igneous, sedimentological and palaeontological history of the region from the Triassic to the Recent. This publication provides an introduction into this fascinating region as well as a resource that includes the most complete and up-to-date studies of the area.

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*Geology and Geomorphology Division.* Suresh Muthukrishnan, Furman University, suresh.muthukrishnan@furman.edu; Ben Odhiambo Kisila, University of Mary Washington, bkisila@umw.edu. Oral and Poster.

11. **Sea Level in the Southeast: Past, Present, and Future.** Cosponsored by *Eastern Section, Society for Sedimentary Geology (SEPM)*. Gale Bishop, South Dakota School of Mines and Technology, gale.bishop@sdsmt.edu. Oral.
12. **Geologic Hazards of the Southeastern U.S. Region.** Norman Levine, College of Charleston, levinen@cofc.edu; Briget Doyle, College of Charleston, doyleb@cofc.edu; Steven Jaume, College of Charleston, jaumes@cofc.edu. Oral or Poster.
13. **Igneous and Metamorphic Petrology in the Southern Appalachians.** Sam Swanson, University of Georgia, sswanson@uga.edu; Loren Raymond, Appalachian State University, raymondla@appstate.edu. Oral.
14. **Structural Geology, Metamorphism, and Geochronology of the Southern Appalachian Blue Ridge.** Cosponsored by *GSA Structural Geology and Tectonics Division*. Charles H. Trupe, Georgia Southern University, chtrupe@georgiasouthern.edu; Mark Steltenpohl, Auburn University, steltmg@auburn.edu. Oral.
15. **Characterization of the Southeast Continental Shelf: Its Geology and Ecology.** Leslie Sautter, College of Charleston, sautterl@cofc.edu; Gorka Sancho, College of Charleston, sanchog@cofc.edu. Oral and Poster.
16. **Designing Engaging Field Experiences in the Southeast.** Cosponsored by *Southeastern Section, National Association for Geoscience Teachers*. Kent Ratajeski, University of West Georgia, kratajes@westga.edu. Oral and Poster.
17. **Integration of New Techniques and Technology to Geologic Problems in the Southeastern U.S. Region.** Norman Levine, College of Charleston, levinen@cofc.edu; Briget Doyle, College of Charleston, doyleb@cofc.edu. Oral or Poster.
18. **"Great" Unconformities in the Appalachians: Their Temporal and Tectonic Significance.** Chuck Bailey, College of William and Mary, cmbail@wm.edu; William Thomas, University of Kentucky, geowat@uky.edu. Oral.
19. **Using Geographic Information Technology for Geoscience Education (Posters).** Cosponsored by *Southeastern Section, National Association for Geoscience Teachers*. Wei Tu, Georgia Southern University, wtutu@georgiasouthern.edu. Poster.
20. **Surface and Groundwater Interactions on the Southeastern Coastal Plain (Posters).** Cosponsored by *GSA Hydrogeology Division*. James Reichard, Georgia Southern University, jreich@georgiasouthern.edu. Poster.
21. **Environmental Mineralogy in Coastal Plain Sediments.** Miles Denham, Savannah River National Laboratory, milesdenham@srnl.doe.gov; John Seaman, Savannah River Ecology Laboratory, seaman@srel.edu. Oral.
22. **Mafic and Ultramafic Rocks of the Southern Appalachians: New Insights and Tectonic Implications.** Jeff Ryan, University of South Florida, ryan@shell.cas.usf.edu. Oral.
23. **Hydrogeologic Attributes of Sedimentary Facies, Aquifers, and Confining Units of the Atlantic Coastal**

**Plain (Posters): A Combined Poster and Hands-On Core Workshop.** Cosponsored by *GSA Hydrogeology Division; GSA Sedimentary Geology Division*. Kathleen M. Farrell, North Carolina Geological Survey, kathleen.farrell@ncmail.net; Jean M. Self-Trail, U.S. Geological Survey, jstrail@usgs.gov. Poster.

24. **Coal Geology: 2007 and Beyond.** Cosponsored by *GSA Coal Geology Division*. Glenn Stracher, East Georgia College, stracher@ega.edu; Karen McCurdy, Georgia Southern University, kmccurdy@georgiasouthern.edu. Oral and Poster.
25. **Field-Based Science Education: In Honor of Teachers of Science.** Gale Bishop, South Dakota School of Mines and Technology (retired), gbishop@geotrec.org; Robert Kelly Vance, Georgia Southern University, rkvance@georgiasouthern.edu. Oral.
26. **Strategies for Effectively Teaching Oceanography to Undergraduates (Posters).** Eleanor Camann, Georgia Southern University, ecamann@georgiasouthern.edu; Mathieu Richaud, Georgia Southern University, mrichaud@georgiasouthern.edu. Poster.
27. **Hydrology, Ecology and Water Quality in Urban and Suburban Watersheds (Posters).** Cosponsored by *GSA Hydrogeology Division; GSA Geology and Society Division*. Gregory Hancock, College of William and Mary, gshanc@wm.edu, C. Brannon Andersen, Furman University, brannon.andersen@furman.edu. Poster.
28. **Sedimentation from Source to Sink (Posters).** J.P. Walsh, East Carolina University, walshj@ecu.edu; Reide Corbett, East Carolina University, corbettd@ecu.edu.

## FIELD TRIPS

### Premeeting

1. **Transgressive Barrier Island Features of St. Catherines Island, Georgia.** Mon.–Wed., 26–28 March. Gale Bishop, South Dakota School of Mines and Technology (retired), gbishop@geotrec.org; B. Rollins, University of Pittsburgh, haroldrollins@lycos.com; Fred Rich, Georgia Southern University, frich@georgiasouthern.edu; R. Kelly Vance, Georgia Southern University, rkvance@georgiasouthern.edu. Max.: 18; cost: US\$120 (meals and transportation to the island included).
2. **Geological Transect and Structural Characteristics of the Piedmont-Coastal Plain Provinces, Augusta to Savannah.** Tues.–Wed., 27–28 March. M.J. Bartholomew, University of Memphis, jbthlm1@memphis.edu; Fred Rich, Georgia Southern University, frich@georgiasouthern.edu. Max.: 22; cost: US\$90 (meals not included).
3. **Mafic-Ultramafic Rock Associations of the Cullowhee-Cartoogechaye Terrane, Central Blue Ridge.** Tues.–Wed., 27–28 March. Jeff Ryan, University of South Florida, ryan@chuma.cas.usf.edu; Steve Yurkovich, Western Carolina University, yurkovich@wcu.edu; Virginia Peterson, Grand Valley State University, petersvi@gvsu.edu. Max.: 20; cost: US\$140 (meals not included).

### Postmeeting

4. **Pleistocene Barrier Island Deposits and Their Relationship to Heavy-Mineral Deposits.** Sat.–Sun., 31 March–

## Southeastern

- 1 April. W. Pirkle, University of South Carolina—Aiken, billp@usca.edu; F. Pirkle, Gannet Fleming, Jacksonville, Fla. Max.: 45; cost: US\$180 (meals and hotel not included).
5. **Neoproterozoic Arc Terranes of the Eastern Piedmont of South Carolina and Georgia, and Their Alleghenian Tectonothermal Overprint.** Starts at 1 p.m. Fri.—Sat., 30–31 March. Allen Dennis, University of South Carolina—Aiken, allend@usca.edu; Don T. Secor, Jr., University of South Carolina—Columbia. Max.: 20; cost: US\$140 (includes lunch and snacks but does not include dinner).
  6. **Geological and Biological Histories of the Okefenokee Basin.** Sat., 31 March. Fred Rich, Georgia Southern University, frich@georgiasouthern.edu; R. Kelly Vance, Georgia Southern University, rk Vance@georgiasouthern.edu. Max.: 30; cost: US\$100 (includes lunch).
  7. **Tybee and Wassaw Islands—Comparing Developed and Undeveloped Barrier Islands.** Cosponsored by *National Association of Geoscience Teachers*. Sat., 31 March. Clark Alexander, Skidaway Institute of Oceanography, clark.alexander@skio.usg.edu; Jim Henry, Applied Coastal Research Laboratory, jim.henry@skio.usg.edu. Max.: 30; cost: US\$100 (meals not included).

### WORKSHOPS

1. **Basic HAZUS MH (Multi-Hazard) Overview.** 1–5 p.m., Wed., 28 March. J. Clayton Wine, Charleston County Building Services, jcwine@charlestoncounty.org; Norman S. Levine, College of Charleston, levinen@cofc.edu. Max.: 30; cost: US\$150.
2. **Using Environmental Observations and Earth Systems Perspectives to Enhance Standards-Based Science Education in Georgia.** 9 a.m.–5 p.m., Wed., 28 March. Rebecca L. Dodge, University of West Georgia, rdodge@westga.edu; Randa Harris, University of West Georgia. Max.: 30; cost: US\$80 (lunch not included).
3. **The Correlation of the Georgia Performance Standards to Topics in Paleontology.** Cosponsored by *Southeastern Section, National Association of Geoscience Teachers*. 9 a.m.–5 p.m., Fri., 30 March. Gregory Bailey, Whitfield County Schools, gbailey@whitfield.k12.ga.us; Pamela Gore, Georgia Perimeter College, pgore@gpc.edu. Max.: 25; cost: US\$10 (some refreshments included, but participants must pay for their own lunch). Workshop to be held at Armstrong Atlantic State University.

### GUEST PROGRAM

Several guest and spouse programs are being organized by the local committee. For more information, contact the local committee chair, Pranoti Asher, pasher@georgiasouthern.edu. You must sign up for tour #6 on the registration form. Activities 1–5 are open for you to enjoy at your leisure.

1. **Lunch at Lady and Sons Restaurant.** The Lady and Sons Restaurant features Food Network chef Paula Deen's famous southern home-cooking: fried chicken, collard greens, and other southern delicacies. The restaurant is at 102 W. Congress Street (two blocks from the convention hotel).
2. **Savannah River Cruise.** The 400-passenger Savannah River Queen and the 600-passenger Georgia Queen are triple-decker stern vessels that offer a variety of tours

- throughout the harbor. Tours leave the dock at 9 East River Street, just a block east of the Hyatt. A one-hour narrated sightseeing cruise begins at 2 p.m. and at 4 p.m. and costs about US\$20 (includes tax and port fees). A dinner entertainment cruise leaves at 7 p.m. and returns at 9 p.m. and costs about US\$56 (includes tax and port fees; cash bar). For reservations, call +1-800-786-6404 or +1-912-232-6404.
3. **The “Book” Tour.** Discover the secrets of John Berendt's *Midnight in the Garden of Good and Evil*. A walk through Bonaventure Cemetery, the original home of the infamous “Bird Girl” statue featured on the cover of “The Book,” is included. Reservations are required. Cost (includes tax) for adults: about US\$37; for children ages 7–17: about US\$16. Tour begins at 10:30 a.m., and pickup from the hotel can be arranged when you make your reservations. You'll find more information at [www.savannahtours.us/tours/tourDetail.cfm?tour\\_id=1730](http://www.savannahtours.us/tours/tourDetail.cfm?tour_id=1730).
  4. **Historic District Tour.** A walking tour of the historic district is the most delightful way to discover this oak-shaded coastal city rich with history, architecture, ironwork, and local culture and cuisine. Reservations are required. Cost (includes tax) for adults: US\$15; for children ages 6–14: US\$7. Two tours each day: one begins at 10 a.m.; the second begins at 1 p.m. Each tour is 90 minutes and leaves from Reynolds Square (corner of E. Congress and Abercorn) in the historic district. Go to [www.savannahwalks.com/stroll.html](http://www.savannahwalks.com/stroll.html) for more information.
  5. **Ghost Tour of Historic Savannah.** A walking tour with a spine-tingling presentation of stories about real people, true history, ghosts, and other tales from Savannah's spectral past. Reservations are requested but not required. Cost (includes tax) for adults: US\$17; for children ages 6–14: US\$5. Two tours each evening: one at 7 p.m. and a second at 9 p.m. Each tour is 90 minutes and leaves from Wright Square (corner of Bull and York). Go to [www.hauntingstour.com](http://www.hauntingstour.com) for more information.
  6. **Birding Trip to Jekyll and St. Simons Islands.** 8 a.m.–5 p.m., Fri., 30 March. Mark Welford, Georgia Southern University, mwelford@georgiasouthern.edu. Cost: US\$56 (includes transportation, entrance fees, and water). Lunch is on your own at a restaurant on St. Simons Island. A number of species have been observed on Jekyll and St. Simons islands, which serve as resting places in the spring and fall for migrating species on the Atlantic Flyway. Attendees are encouraged to bring binoculars.

### CALL FOR SPONSORS

GSA's Southeastern Section welcomes sponsors to help defray the costs of the meeting. We are seeking partial or full support for the welcoming party (6–9 p.m. at the Hyatt, 28 March 2007) and morning and afternoon refreshments (29–30 March 2007). When your company or organization sponsors an event, it will be recognized prominently at that event. For more information, please contact Dallas Rhodes, drhodes@georgiasouthern.edu.

### EXHIBITOR INFORMATION

#### Exhibitor Registration Deadline: 1 February 2007

This meeting will attract an array of both applied and academic geoscientists from the southeastern region, providing

exhibitors with an excellent opportunity to interact with potential customers, colleagues, and students. The exhibit area will overlook the Savannah River and the historic River Street district, ensuring maximum exposure to a majority of the attendees. The fee for companies is US\$275; for academic, nonprofit, and geoscience associations, the fee is US\$100. A 6-foot draped table and two chairs per table will be available. Electrical outlets, phone lines, and Internet access will be provided at extra cost after the booth has been assigned. Please direct your inquiries to Pranoti Asher, pasher@georgiasouthern.edu.

### STUDENT TRAVEL GRANTS

Travel grants are available from GSA's Southeastern Section and GSA Foundation for both undergraduate and graduate students who are presenting papers or poster sessions and are GSA Student Members. Please apply online at [www.geosociety.org/sectdiv/southe/](http://www.geosociety.org/sectdiv/southe/). Contact Don Neal, secretary-treasurer, GSA Southeastern Section, neald@ecu.edu, with any questions. **Application deadline: 19 February 2007.**

### STUDENT VOLUNTEERS

The local committee and officers of GSA's Southeastern Section would like to extend the opportunity for free registration to a limited number of students. We rely on student volunteers to help meetings run smoothly, and, to show our gratitude, we are pleased to offer student volunteers free registration for the meeting in return for 6 hours of volunteer work. The deadline for volunteering for SE GSA is 1 February 2007. Contact student volunteer coordinator Chuck Trupe, chtrupe@georgiasouthern.edu, for more information.

### MENTORING PROGRAMS

**Roy J. Shlemon Mentor Program in Applied Geoscience.** Sponsored by *GSA Foundation*. Thurs.–Fri., 29–30 March, 11:30 a.m.–1 p.m. Check at the on-site registration desk for location.

**The John Mann Mentors in Applied Hydrogeology Program.** Sponsored by *GSA Foundation*. Thurs., 29 March, 5–6:30 p.m. Check at the on-site registration desk for location.

For details, see page 28 of this issue, go to [www.geosociety.org/students.htm](http://www.geosociety.org/students.htm), or contact Jennifer Nocerino, jnocerino@geosociety.org.

### SPECIAL EVENTS

The following is a preliminary list of business meetings and other special events tentatively scheduled during the 2007 meeting. Please contact each representative for more information. If you are interested in hosting an alumni party for your department or institution, please contact R. Kelly Vance, rkvance@georgiasouthern.edu, for assistance in finding a venue for your event in the historic district of Savannah.

**SE GSA Management Board Meeting.** 4–6 p.m., Wed., 28 March, Westbrooke Room, Hyatt Regency. Contact: Don Neal, neald@ecu.edu.

**Welcoming Party.** 6–9 p.m., Wed., 28 March, Harborside East, Hyatt Regency. The welcoming reception and nearby open exhibits will help start off the meeting. Light hors d'oeuvres, one complimentary drink, and a cash bar will be available. Come visit with friends and colleagues. The registration desk will be open from 5–9 p.m. this evening.

**Session Chairs Orientation and Breakfast.** 6:30–8 a.m., Thurs.–Fri., 29–30 March, Westbrooke Room, Hyatt Regency.

**SE GSA Campus Liaison Breakfast.** 6:30–8:30 a.m., Thurs., 29 March, Savannah Room, Hyatt Regency. Contact: Gary Lewis, glewis@geosociety.org.

**SE NAGT Business Meeting.** Noon, Thurs., 29 March. Meet in the lobby of the Hyatt Regency. Contact: Pamela Gore, pgore@gpc.edu.

**Eastern Section, Society for Sedimentary Geology (ES-SEPM) Reception and Business Meeting.** Keynote address by Mary J. Kraus, Global SEPM President-Elect. 5–6 p.m., Thurs., 29 March, Hyatt Regency. Contact: Bosiljka Glumac, bglumac@email.smith.edu.

**SE GSA Earth Science Department Chairs Luncheon.** Noon–1:30 p.m., Fri., 30 March, Plimsoll Room, Hyatt Regency. Attendees will pay for their own lunch.

**Georgia Southern University Geology and Geography Alumni Party.** 6 p.m., Fri., 30 March, Moon River Brewing Company, 21 West Bay Street, Savannah, across from the Hyatt Regency. Cash bar.

### TRANSPORTATION AND DIRECTIONS

Savannah is near Interstate 95 in southeastern Georgia and has air transport through the Savannah–Hilton Head International Airport (Airport code: SAV). This airport is served by Delta–Delta Connection, United Express, AirTran, Continental Express, Northwest Airlines, and USAirways. Car rental is available through most major car rental companies. The Hyatt is ~8 miles south of the airport.

**From Savannah–Hilton Head International Airport or north of Savannah:** Take I-95 South to I-16 East, and exit at Montgomery Street. **From Florida:** Take I-95 North to I-16 East, and exit at Montgomery Street. **From west of Savannah:** Take I-16 East, and exit at Montgomery Street. After reaching Montgomery Street from any of these departure locations, turn right on Bay Street. Follow Bay Street for three blocks; the Hyatt Regency Savannah on the Historic Riverfront is on the left at 2 West Bay Street.

Transportation between the Savannah Airport and the Hyatt is also available via taxi and shuttle. Airport shuttle information is online at [www.lowcountryadventures.com/airport\\_transportation.asp](http://www.lowcountryadventures.com/airport_transportation.asp). Airport taxis are located at the curb outside the baggage claim area. The one-way taxi fare between the airport and the Hyatt is about US\$25.

### ACCESSIBILITY

GSA is committed to ensuring full participation for conference attendees with disabilities at all events. You may indicate special requirements on your registration form; please inform the local organizing committee of these requirements at least one month prior to the meeting. Accessible rooms are available and can be reserved.

### ADDITIONAL INFORMATION OR QUESTIONS?

For further information, or if you have special requirements, please contact the meeting chairs: local committee chair, Pranoti Asher, +1-912-681-0338, pasher@georgiasouthern.edu; technical program chair, Mike Kelley, +1-912-486-7913, mkelley@georgiasouthern.edu; both with the Department of Geology and Geography, Georgia Southern University, Statesboro, Georgia 30460-8149, USA.

# STUDENTS—Mark Your Calendars!

Plan now to attend a Shlemon Mentor Program and/or a Mann Mentor Program in Applied Hydrogeology at your 2007 Section Meeting to chat one-on-one with practicing geoscientists. These volunteers will answer your questions and share insights on how to get a job after graduation. When programs are scheduled for multiple days, each day's program will offer a different set of mentors.

**FREE lunches** will be served (students only) at the **Shlemon Mentor Programs**. Students will receive a free lunch ticket with their registration badge to attend each Shlemon Program. Space is limited, so plan to arrive early:

first come, first served. For further information, contact [jnocerino@geosociety.org](mailto:jnocerino@geosociety.org).

**FREE pizza suppers** will be served (students only) at the **Mann Mentor Programs**. Students will receive a free pizza supper ticket with their registration badge to attend the Mann Program. The Mann Program is geared toward careers in hydrology and hydrogeology. Whether you've already decided to head down this career path or if you would just like to know more about these career options, this meeting is for you! Space is limited, so plan to arrive early: first come, first served. For further information, contact [jnocerino@geosociety.org](mailto:jnocerino@geosociety.org).

## Mentor Programs for 2007 Section Meetings

*For program locations, ask at the Section Meeting registration desk.*

### NORTHEASTERN SECTION MEETING

University of New Hampshire, Durham, N.H., USA

**Shlemon Mentor Program Luncheons:**

Mon.–Tues., 12–13 March, 11:30 a.m.–1 p.m.

**Mann Mentors in Applied Hydrogeology Program:**

Mon., 12 March, 5–6:30 p.m.

### SOUTHEASTERN SECTION MEETING

Hyatt Regency Savannah  
on the Historic Riverfront, Savannah, Ga., USA

**Shlemon Mentor Program Luncheons:**

Thurs.–Fri., 29–30 March, 11:30 a.m.–1 p.m.

**Mann Mentors in Applied Hydrogeology Program:**

Thurs., 29 March, 5–6:30 p.m.



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### CORDILLERAN SECTION MEETING

Western Washington University, Bellingham, Wash., USA

**Shlemon Mentor Program Luncheons:**

Fri.–Sat., 4–5 May, 11:30 a.m.–1 p.m.

**Mann Mentors in Applied Hydrogeology Program:**

Fri., 4 May, 5–6:30 p.m.

### Joint Meeting

#### NORTH-CENTRAL SECTION

#### SOUTH-CENTRAL SECTION

Kansas Memorial Union,  
University of Kansas,  
Lawrence, Kans., USA

**Shlemon Mentor Program Luncheons:**

Thurs.–Fri., 12–13 April, 11:30 a.m.–1 p.m.

**Mann Mentors in Applied Hydrogeology Program:**

Thurs., 12 April, 5–6:30 p.m.

### ROCKY MOUNTAIN SECTION MEETING

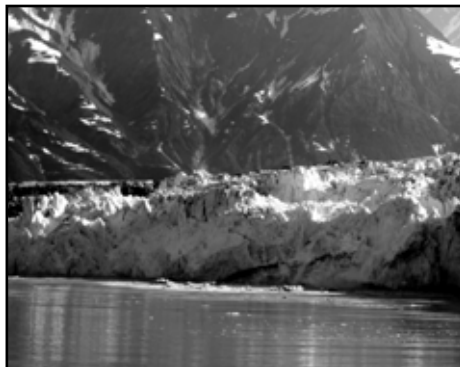
Dixie Center, Saint George, Utah, USA

**Shlemon Mentor Program Luncheons:**

Mon.–Tues., 7–8 May, 11:30 a.m.–1 p.m.

**Mann Mentors in Applied Hydrogeology Program:**

Mon., 7 May, 5–6:30 p.m.



**SAVE THE DATE** for a trip of a lifetime! Trip details will be coming soon for these exciting 2007 GeoVentures. Even more trips will be added to this excellent line-up, so be sure to check the January *GSA Today*.

## 2007 Trips

**Exploring Hawaii Volcanoes National Park (for teachers), 21–27 July 2007**

**Exploring Geoscience in Namibia, Africa (for teachers), 6–23 July 2007**

**The Geology and Environments of Costa Rica (for teachers), 27 June–5 July 2007**

**Geology of the Grand Canyon—River Trip, 2–9 June 2007**

**Alaska: Changing Glaciers—Changing Landscapes, 21–28 July 2007**

**China's Feathered Dinosaurs—Paleo-Expedition, 20–29 July 2007**

**Montana Dinosaur Expedition (for students), 7–16 July 2007**

Sign up for GeoVentures E-News at [www.geoventures.org](http://www.geoventures.org), and you will be the FIRST to know when new trip details are released!



## In Memoriam

**Thomas W. Amsden**  
Norman, Oklahoma  
Notified 12 September 2006

**Morris A. Balderman**  
Dana Point, California  
30 July 2006

**Manuel G. Bonilla**  
Palo Alto, California  
18 February 2006

**Aart Brouwer**  
Oegstgeest, Netherlands  
8 August 2006

**Robey H. Clark**  
Amarillo, Texas  
23 July 2006

**Gregorio M. Escalante**  
San José, Costa Rica  
6 September 2006

**Jane L. Forsyth**  
Bowling Green, Ohio  
Notified 25 September 2006

**Andrew E. Godfrey**  
Ogden, Utah  
18 August 2006

**A. William Laughlin**  
Santa Fe, New Mexico  
1 September 2006

**Edith M. McKee**  
Harbor Springs, Michigan  
Notified 27 September 2006

**Jerrold L. McNey**  
Fullerton, California  
23 June 2005

**Marcus Milling**  
Reston, Virginia  
17 October 2006

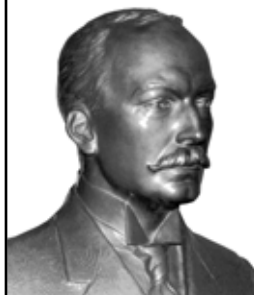
**William A. Oliver Jr.**  
Washington, D.C.  
1 November 2005

**Harold A. Winters**  
East Lansing, Michigan  
1 April 2005

Please contact the GSA Foundation at +1-303-357-1054 or [drussell@geosociety.org](mailto:drussell@geosociety.org) for information on contributing Memorial Fund.

## GSA Benefactor Inducted into National Mining Hall of Fame

9 September 2006: Leadville, Colorado, USA: Richard Alexander Fullerton Penrose Jr. (17 Dec. 1863–31 July 1931), better known as R.A.F. Penrose Jr., a mining geologist and investor, has been inducted into the National Mining Hall of Fame ([www.mininghalloffame.org](http://www.mininghalloffame.org)). Penrose established GSA's Penrose Medal in 1927, and upon his death in 1931, he left a generous bequest to GSA, which has served to support GSA and fund its research grants program. Penrose was elected to GSA in 1889, served on GSA Council from 1914 to 1916, was GSA vice president in 1919, a member of the finance committee from 1924 to 1929, and was GSA president in 1930.





## A Window of Opportunity

Robert L. Fuchs

It isn't often we receive good news out of Washington, but the Pension Protection Act of 2006 could benefit the GSA Foundation as well as Senior Members and Fellows of GSA. This legislation, which was signed into law by President George W. Bush on 17 August, includes Section 1201, which permits **charitable IRA rollovers**.

For Senior Members and Fellows of GSA, this means that a gift may be made directly from one's IRA to the GSA Foundation. The amount is not included in the donor's federal taxable income for the year; therefore, no tax will have to be paid on the withdrawal. Further, this rollover will qualify as part or all of one's required annual minimum distribution.

As always, this federal largesse comes with a few strings attached:

- The donor must be 70 and a half years of age or older. (So, if you are not a Senior Member, you can stop reading here.)
- Total rollover gifts cannot exceed \$100,000 per taxpayer per year.

- Rollover gifts are not tax deductible (but not included in income, either).
- Gifts must be made directly to GSA Foundation; i.e., not to a donor-advised fund or private foundation.

This really is a window of opportunity—open only for this year and next. If you have been concerned about taxes on money taken out of your IRA, this rollover provides the means to send that money to the Foundation intact, not reduced by income taxes.

There is still time to make an IRA rollover in 2006, and you are not limited by the amount you may have already taken as your required minimum distribution. Your IRA custodian will have the appropriate form for this withdrawal. If you are interested in learning more about using an IRA rollover as a gift to the Foundation, please contact Donna Russell at the Foundation office, +1-303-357-1054, drussell@geosociety.org. Your estate planner can also assist you.

*Bob Fuchs is a former President of the GSA Foundation now living in Fort Myers, Florida, where he assists several charities in their planned giving programs.*

### December 31—Deadline for 2006 Gifts

If you are planning to make a donation to the GSA Foundation before the end of 2006, your gift must be postmarked by 31 December 2006. Your gift may be designated for the Greatest Needs Fund or the GSA program of your choice.

Your donation can be structured as a pledge over a number of years if a one-time contribution is not convenient, or it can include gifts other than cash. You may make a donation using your credit card via the GSA Foundation Web site, www.gsafweb.org. Just click on "Make a Donation" and follow the instructions. Online gifts processed by December 31 are tax-deductible for 2006. Or, you may send a check to the Foundation in support of the program of your choice. If you need assistance, please call the Foundation office, +1-303-357-1054, or e-mail drussell@geosociety.org.

We thank you so much for your continued support of GSA and the GSA Foundation.



#### Most memorable early geologic experience:

In 1969, my summer work with the U.S. Geological Survey introduced me to the world of geology. I was able to work with world-class geologists and geophysicists; notable among them were Gordon Eaton, Don Mabey, M. Dean Kleinkopf, and Adel Zobdy. I worked on gravity, magnetic, and electrical resistivity surveys in Arizona, Idaho, and other states. From that work, my career was shaped.

—Charles E. Brown

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## Positions Available

### LOCK HAVEN UNIVERSITY OF PENNSYLVANIA TENURE TRACK INSTRUCTOR ASSISTANT PROFESSOR IN GEOLOGY

The university invites applications for a full-time, tenure track faculty in geology with specialization in mineralogy and petrology, structural geology, and geotechnical engineering beginning **August 18, 2007**. The successful candidate is expected to participate in an effective teaching, research, and service program commensurate with normal tenure-track faculty duties at LHUP. Teaching duties include general education and field-oriented, upper division major courses. A terminal degree in Geology is required. If a candidate without an appropriate terminal degree is selected, the position will be temporary for one year and not tenure-track. For expanded information, please visit [www.lhup.edu/HR/faculty/index.htm](http://www.lhup.edu/HR/faculty/index.htm).

### SURFACE PROCESSES COLLEGE OF WOOSTER

Applications are invited for a one-year visiting assistant professor or instructor position in the Department of Geology at The College of Wooster beginning in August 2007. The successful candidate will teach courses in the general area of surface processes which might include geomorphology, hydrogeology, and climate change. We expect the successful candidate to also teach one or more of our introductory geology courses that include Environmental Geology, Geology of Natural Hazards, Oceanography and History of Life. Wooster has a strong program in undergraduate research in which the successful candidate may also participate as an adviser. Applicants should have a Ph.D. or be ABD. Interested persons should send a letter of application, curriculum vitae, official graduate transcripts, and names and contact information for three references by January 15, 2007, to Dr. Robert J. Varga, Chair, Department of Geology, The College of Wooster, 1189 Beall Avenue, Wooster, OH 44691.

The College of Wooster is a highly selective liberal arts institution with an enrollment of approximately 1750 men and women. The Department of Geology comprises four faculty members and averages 25–40 undergraduate majors annually. Major research facilities within the department include the Tree Ring, Sediment Core Analysis, Paleomagnetism, Paleontology, Sample Preparation, Petrology/Fluid Inclusion, and Mineral Separation Laboratories.

Wooster seeks to ensure diversity by its policy of employing persons without regard to age, sex, color, race, creed, religion, national origin, disability, veteran status, sexual orientation, or political affiliation. The College of Wooster is an Equal Opportunity/Affirmative Action Employer.

### DEPARTMENT HEAD, GEOLOGY & GEOPHYSICS TEXAS A&M UNIVERSITY

The Department of Geology and Geophysics at Texas A&M University is seeking an experienced and visionary leader with exceptional communication skills, and an excellent record of scholarship for appointment as Department Head.

The Department of Geology, established in 1922, and the Department of Geophysics, established in 1966, merged in 1994 to form the Department of Geology and Geophysics (<http://geoweb.tamu.edu/>), combining a rich history of fundamental and applied research in the earth sciences. Its vision is to become one of the premier geology and geophysics departments in the nation. At present, it has 27 tenured or tenure track faculty appointments, 3 research support staff, 85 graduate students, and 88 undergraduate majors in their sophomore through senior year who seek one of 5 undergraduate degrees. The Department resides in the College of Geosciences (<http://geosciences.tamu.edu/>), which also includes the Departments of Oceanography, Atmospheric Sciences and Geography, as well as Sea Grant, the Geochemical and Environmental Research Group, and the Integrated Ocean Drilling Program.

The Department Head is responsible for the leadership of the Department, including strategic planning, academic administration, graduate student recruitment, development activities, and interfacing with the broader national and international community. The University is currently completing the final year of a 3-year effort to increase the faculty throughout the institution (<http://giving.tamu.edu/content/content.php?Vision2020>). The Department will see an increase of up to 5 new faculty members by the end of this hiring initiative, which should be largely completed by summer 2007. This hiring is targeted at building on existing strengths in environmental and engineering geoscience, geochemistry, geophysics, petrology, paleontology, sedimentology-stratigraphy, tectonophysics, and petroleum-system science. The new Head is expected to further

strengthen and enhance existing cross-disciplinary ties with Departments outside the College and will oversee hiring of several replacement faculty due to retirements over the next few years.

Candidates must have a nationally and/or internationally recognized reputation for scholarship, publication and grantsmanship that is appropriate for appointment as a tenured full professor at a major U.S. research institution. Candidates should submit a detailed curriculum vitae, statements of research interest, of educational philosophy, and of administrative philosophy, and three letters of references to: Dr. Paul J. Fox, Search Committee Chair, Integrated Ocean Drilling Program, Texas A&M University, 1000 Discovery Drive, College Station, TX 77845; [fox@iodp.tamu.edu](mailto:fox@iodp.tamu.edu). Screening of applicants will begin in early January, 2007; however, applications and nominations will continue to be accepted until the position is filled.

Texas A&M University is an Affirmative Action/Equal Opportunity Employer. The University is dedicated to the goal of building a culturally diverse and pluralistic community committed to teaching and working in a multicultural environment. We strongly encourage applications from women, underrepresented ethnic groups and individuals with disabilities.

### GEORGIA STATE UNIVERSITY DEPARTMENT OF GEOSCIENCES TENURE TRACK FACULTY POSITION SEDIMENTOLOGY-STRATIGRAPHY

The Department of Geosciences at Georgia State University seeks to fill a tenure-track faculty position in the area of sedimentology-stratigraphy at the rank of Assistant Professor. The successful candidate will teach an upper division undergraduate course in sedimentology-stratigraphy, introductory courses, and a graduate course in his/her research specialty. The area of research is open within the broad area of sedimentology-stratigraphy. We expect the successful candidate to be an excellent instructor, to develop a productive research program including the pursuit and acquisition of external funding, and to direct graduate student research. A Ph.D. degree is required at the time of appointment. Post-doctoral experience and prior college-level instructional experience are desirable. Further information about the department and facilities can be read at: <http://monarch.gsu.edu/geosciences/>

To ensure full consideration, please send your curriculum vitae (resume), statement of teaching and research interests, and the names and contact information of four references to: Prof. W. Crawford Elliott, Chair of the Sedimentology-Stratigraphy Search Committee, Department of Geosciences, P.O. Box 4105, Georgia State University, Atlanta, GA 30302-4105. Initial consideration of applications began on December 1, 2006. For full consideration, applications should be received by January 15, 2007. Applications will be accepted until the position is filled. Georgia State, a unit of the University System of Georgia, is an equal opportunity employer. Applications from underrepresented groups are particularly welcome.

### VISITING ASSISTANT PROFESSOR GEOMORPHOLOGY/PHYSICAL GEOGRAPHY PACIFIC LUTHERAN UNIVERSITY

The Department of Geosciences and the Environmental Studies Program at Pacific Lutheran University invite applications for a full-time 2-year visiting assistant professor in Geomorphology and/or Physical Geography to begin 1 September 2007. Over two years, teaching responsibilities will include (1) upper division Geomorphology and Cartography, (2) lower division Geologic Hazards, Meteorology, and Geology of National Parks, (3) an integrated Environmental Studies field course, and (4) mentoring senior capstone research projects. Summer research involving undergraduates is encouraged and competitively supported by the Division of Natural Sciences.

Commitment to effective teaching at the undergraduate level is required. Ph.D. is preferred. Pacific Lutheran University, near Seattle and Mount Rainier, enrolls 3700 students, with a mission of educating for lives of thoughtful inquiry, service, leadership, and care. It serves a diverse clientele and is a strongly EO/AA employer. See Web site [www.plu.edu/~geos/](http://www.plu.edu/~geos/).

Send complete CV, transcripts, statement of teaching philosophy, summary of research interests and three recommendation letters to: Search Committee, Department of Geosciences, Pacific Lutheran University, Tacoma, WA 98447. Application review begins 12/15/06.

### FACULTY POSITION IN SEDIMENTARY GEOLOGY UNIVERSITY OF WISCONSIN-MADISON.

The Department of Geology and Geophysics invites applications for a position as tenure-track assistant professor or associate professor, beginning August 2007. The evaluation of candidates will focus primarily on their potential for innovative scientific research and teaching. We invite applications from outstanding

candidates from a variety of fields within sedimentary geology. We encourage candidates who would engage in interdisciplinary research involving our existing programs, and who would complement our current research strengths (see [www.geology.wisc.edu](http://www.geology.wisc.edu)). Petroleum industry interest is also desirable. Teaching responsibilities are at both the graduate and undergraduate level, and include field-based courses. Ph.D. required by start of appointment. Applicants should submit a resume, statement of research and teaching interests, and names of three or more references to: Sedimentary Geology Search Committee Chair, Department of Geology and Geophysics, University of Wisconsin-Madison 1215 W. Dayton St., Madison, WI 53706-1692.

To ensure full consideration, applications must be received by December 15, 2006.

The University of Wisconsin-Madison is an equal-opportunity/affirmative action employer and encourages applications from women and minorities.

## Call for Applications:

### GSA-USGS Congressional Science Fellowship 2007–2008

Opportunities to serve as a Congressional Science Fellow are rare, unique experiences.

Work directly with national leaders using your expertise and experience to help shape science and technology policy on Capitol Hill.

The 2007–2008 Congressional Science Fellow will be selected from top competitors early in 2007. Prospective candidates should be GSA Members with a broad geoscience background and excellent written and oral communication skills. Minimum requirements are a master's degree with at least five years professional experience or a Ph.D. at the time of appointment. The fellowship is open to U.S. citizens or permanent U.S. residents.

### Deadline to apply: 1 February 2007

For application information, visit [www.geosociety.org/science/csf/index.htm](http://www.geosociety.org/science/csf/index.htm), or contact Ginger Williams, +1-303-357-1040, [gwilliams@geosociety.org](mailto:gwilliams@geosociety.org).



THE GEOLOGICAL SOCIETY  
OF AMERICA

**ASSISTANT PROFESSOR OF GEOLOGY—HARD ROCK  
ASSISTANT PROFESSOR OF GEOLOGY—SOFT ROCK  
EARTH SCIENCES**

**UNIVERSITY OF NORTHERN COLORADO**

Earth Sciences at the University of Northern Colorado seeks a tenure-track assistant professor specializing primarily in *hard rock geology*. We also seek a second tenure-track assistant professor specializing primarily in *soft rock geology*. The positions begin 8/20/07 and minimum requirements are a Ph.D. in geology/geosciences with evidence of potential for excellent teaching, research and service work. Preferred qualifications for the hard rock geologist include the capability to teach courses in general geology, physical geology, mineralogy/optics, structural, field techniques, and either groundwater, geomorphology/soils, or other specialty. Preferred qualifications for the soft rock geologist include the capability to teach courses in general geology, historical, paleontology, sed/strat, regional geology, and either groundwater, geomorphology/soils, or other specialty.

The geology program has significant commitments to field work and close collaboration with other scientific and teacher-education disciplines. The successful candidate will work with 3–4 other geologists and advise both undergraduate and graduate students.

UNC is a Doctoral/Research institution enrolling 12,000+ graduate and undergraduate students. Detailed information about the positions, Earth Sciences, the College of Natural and Health Sciences, and the University is available through [www.unco.edu/nhs/](http://www.unco.edu/nhs/).

Screening of applications begins 1 December 2006, and continues until the position is filled. The University of Northern Colorado is an AA/EO employer.

**ASSISTANT/ASSOCIATE PROFESSOR OF  
EARTH SCIENCES EDUCATION  
UNIVERSITY OF NORTHERN COLORADO**

Earth Sciences at the University of Northern Colorado seeks a national leader in earth sciences education to lead the teacher education effort. The successful candidate will deliver education and research programs in K–12 education and enhance graduate education aspects of Earth Sciences. The position begins 8/20/07 and minimum requirements are a completed Ph.D. in an Earth Sciences field with evidence of potential for excellent teaching, research, and service work. UNC is a Doctoral/Research institution enrolling 12,000+ graduate and undergraduate students. Detailed information about the positions, Earth Sciences, the College of Natural and Health Sciences, and the University is available through [www.unco.edu/nhs/](http://www.unco.edu/nhs/).

Screening of applications begins 1 December 2006, and continues until the position is filled. The University of Northern Colorado is an AA/EO employer.

**GEOMORPHOLOGY AND HYDROGEOLOGY  
WESTERN STATE COLLEGE OF COLORADO**

Western State College of Colorado invites applications for a tenure-track position in geology with an emphasis in geomorphology starting August 2007. Teaching responsibilities include introductory courses in geology, core courses in geomorphology and hydrogeology, and additional courses in the candidate's area of expertise. Requirements include a Ph.D. and preference will be given to candidates who can demonstrate potential for excellence in teaching and supervising undergraduate research. The candidate will be expected to participate in Western's environmental studies program. For full position information and application procedures visit [www.western.edu/hr/jobs](http://www.western.edu/hr/jobs). Screening of applications will begin 3 January 2007. AA/EOE.

**STATE UNIVERSITY OF NEW YORK  
COLLEGE AT ONEONTA  
DEPARTMENT OF EARTH SCIENCES  
ASSISTANT PROFESSOR  
GEOMORPHOLOGY/GLACIAL GEOLOGY**

The SUNY College at Oneonta invites applications for a tenure track position for an Assistant Professor of Geology, with a specialization in geomorphology/glacial geology, beginning August 2007. This is a continuing position with an initial appointment of two years. The expectations include teaching, research, student advisement, college service, and continuing professional development. The College at Oneonta has 5,800 students and 450 faculty and offers over 60 undergraduate majors and nine graduate programs. The student to faculty ratio is approximately 18:1. The nine-member Earth Sciences Department is multi-disciplinary with undergraduate programs in geology, water resources, earth science, earth science education, environmental earth science, and meteorology. There is also a master's degree program with optional concentrations in geology and hydrogeology. The department has a strong history of excellence in teaching, faculty-student mentoring,

and continued contact with alumni. For additional information, see the College's home page at [www.oneonta.edu](http://www.oneonta.edu) or visit our Chronicle Profile Web page at <http://chronicle.com/jobs/profiles/2557.htm>. Applications will be accepted until January 15, 2007. **Duties:** Teach undergraduate (and graduate-level where appropriate) courses in geomorphology, glacial geology, introductory geology, climate change, and hydrogeology. Conduct appropriate professional development. Advise and mentor undergraduate students majoring in the department's degree programs, and perform service on college/departmental committees. **Required Qualifications:** Ph.D. in geology or related field. Applicant must have a strong background in geomorphology/glacial geology. **Preferred Qualifications:** Expertise in fluvial geomorphology, hydrogeology, and soil science. Orientation toward field applications. **To Apply:** Send letter of application, resume, copies of graduate transcripts (official at time of appointment), and have three professional references send letters to: Dr. P. Jay Fleisher, Chair, Search Committee, Earth Sciences Department, Box GSA, #1030-E, SUNY Oneonta, Oneonta, NY 13820-4015. For other employment and regional opportunities, please visit our Web site at: [www.oneonta.edu/admin/humres/](http://www.oneonta.edu/admin/humres/) employment.

SUNY Oneonta values a diverse college community. The College does not discriminate on the basis of age, disability, marital or parental status, national or ethnic origin, race, religion, sex, sexual orientation and gender identity or veteran status. Moreover, the College is an EEO/AA/ADA employer. Women, persons of color, and persons with disabilities are encouraged to apply.

**FACULTY FELLOW, UNIVERSITY OF OREGON**

The Department of Geological Sciences invites applications for a residential fellowship as a Meierjürgen Faculty Fellow for one term during academic year 2007–2008. Requirements are one term in residence and one departmental seminar. The recipient will receive a \$15,000 stipend. Selection criteria include academic merit, collaborative ties with faculty, and likely use of departmental facilities or regional field areas. The Department and University house an array of modern instrumentation and are located in a geologically active region: for details see our Web site (<http://geology.uoregon.edu/2/main.htm>). U.S. citizenship is not required. Application consists of a one-page letter of intent indicating the desired term of residence and a complete curriculum vitae to the Meierjürgen Fellowship Committee, Department of Geological Sciences, 1272 University of Oregon, Eugene, Oregon 97403-1272. Review of applications will begin on 10 January 2007 and continue until the position is filled.

The University of Oregon is an equal opportunity employer committed to cultural diversity and the Americans with Disabilities Act. We invite applications from qualified candidates who share our commitment to diversity.

**IGNEOUS PETROLOGY/VOLCANOLOGY  
THE UNIVERSITY OF ALABAMA**

The Department of Geological Sciences invites applications for a tenure-track faculty position to be filled at the Assistant Professor level beginning in August 2007. The candidate will be expected to: teach introductory geology, undergraduate igneous & metamorphic petrology, an undergraduate elective (e.g., volcanology), and graduate courses in igneous petrology and/or volcanology; attract and supervise masters and doctoral students; and develop an externally-funded research program with strong field and lab components. Possible areas of research emphasis include the evolution of subduction or spreading center magmatic systems, and/or modeling of volcanic and magmatic processes. This position compliments existing research programs in metamorphic petrology, geophysics, and tectonics. Geological Sciences is an active and growing department within an expanding and dynamic university. Available equipment includes: an automated X-ray fluorescence spectrometer, an automated X-ray diffractometer, an inductively-coupled plasma mass spectrometer, an electron probe microanalyzer, a transmission electron microscope, and scanning electron microscopes. State-of-the-art computational resources and software are also available. Applicants should send a vita, statements of research and teaching interests, and contact information for 4 referees to Dr. Harold Stowell, Igneous Petrology & Volcanology Search Committee Chair, The University of Alabama, Department of Geological Sciences, Box 870338, Tuscaloosa, AL 35487-0338. Further information is available on our Web site at [www.geo.ua.edu](http://www.geo.ua.edu). Review of applications will begin on January 22, 2007, and continue until the position is filled.

The University of Alabama is an Equal Opportunity, Affirmative-Action Employer and applications are solicited from women and minority candidates.

**FOUR TENURE-TRACK FACULTY POSITIONS  
GEOLOGY & GEOPHYSICS  
TEXAS A&M UNIVERSITY**

As part of a university-wide effort to expand the faculty and to increase collaborations with the Integrated Ocean Drilling Program (IODP), the Department of Geology and Geophysics at Texas A&M University invites applications for four tenure-track faculty positions. All appointments are in the Department of G&G and budgeted at the assistant professor level. At least one position must be in a research area in support of IODP.

We seek outstanding, dynamic individuals in any area of geology and geophysics who can contribute to departmental research initiatives and/or to the IODP programmatic themes. Departmental research initiatives include: climate change, environmental and hydrologic sciences, physics and chemistry of the solid Earth; and energy resources. The programmatic themes of IODP are the deep biosphere and sub-sea-floor ocean; environmental change, processes and effects; and solid earth cycles and geodynamics ([www.iodp.org/isp](http://www.iodp.org/isp)).

Successful candidates will be expected to develop and maintain vigorous, externally funded research programs, interact with faculty in the Department and other research units in the College of Geosciences, and contribute to undergraduate and graduate teaching. Interested candidates should submit electronic versions of a curriculum vita, statement of research interests and teaching philosophy, the names and e-mail addresses of at least three references, and up to four reprints by e-mail attachments to Bruce Herbert, Chair Search Committee: [search@geo.tamu.edu](mailto:search@geo.tamu.edu). Screening of applications will begin 18 December 2006, and will continue until all positions are filled. The anticipated start date is September 2007 and a Ph.D. is required at the time of employment.

The Department of Geology and Geophysics ([geoweb.tamu.edu](http://geoweb.tamu.edu)) is part of the College of Geosciences, which also includes the Departments of Geography, Oceanography, and Atmospheric Sciences, Sea Grant, 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 152,000 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 ([hr.tamu.edu/employment/dual-career.html](http://hr.tamu.edu/employment/dual-career.html)).

**FACULTY POSITION  
SEDIMENTOLOGY-STRATIGRAPHY  
UNIVERSITY OF MASSACHUSETTS-AMHERST**

The Department of Geosciences at the University of Massachusetts-Amherst invites applications for a tenure-track faculty position to begin September 2007, pending available funds. The appointment is aimed at the assistant professor level; however, outstanding candidates at all levels will be considered. The ideal candidate will focus on broad, integrative research in sedimentology and physical stratigraphy, such as sequence stratigraphy, basin analysis, seismic stratigraphy, coastal processes, or tectonics and sedimentation. Emphasis will be placed on the applicant's potential to establish a successful, externally funded research program that complements existing strengths in the Department including surficial processes, global change studies, the solid earth, and human dimensions of Earth's integrated systems ([www.geo.umass.edu/research](http://www.geo.umass.edu/research)). A commitment to excellence in teaching at the undergraduate and graduate levels is also essential, with the picturesque Connecticut River Valley offering a natural teaching laboratory. The Department of Geosciences offers bachelors degrees in Geology, Earth Systems, and Geography, as well as MS (Geosciences, Geography) and Ph.D. (Geosciences) degrees. Candidates must hold a Ph.D. by the time of appointment; post-doctoral experience is preferred. Applicants should send a Curriculum Vitae, a concise statement of research and teaching interests, and contact information (including e-mail addresses) of at least three referees to: Sedimentology-Stratigraphy Search Committee, Department of Geosciences, 611 N. Pleasant St., University of Massachusetts, Amherst, MA 01003-9297 or e-mail application materials to [search@geo.umass.edu](mailto:search@geo.umass.edu). The Department of Geosciences is committed to increasing the diversity of the faculty, student body, and curriculum. Review of applications will begin November 1, 2006 and continue until a successful applicant is identified. The University of Massachusetts is an Equal Opportunity/Affirmative Action Employer; women and members of minority groups are encouraged to apply.



**HYDROGEOLOGIST  
GEORGE MASON UNIVERSITY**

The Department of Environmental Science and Policy invites applications for a full-time, tenure-track Assistant Professor position in hydrogeology for August 2007. We seek a dynamic person with expertise in groundwater flow dynamics and processes involving aspects of quantitative modeling, groundwater geochemistry, geomicrobiology, and basin-scale fluid flow. Experience with field-based research and groundwater pollution/contamination a plus. Preference given to candidates whose expertise complements existing departmental teaching and research areas. Successful candidate will be expected to pursue a vigorous externally-funded research program, aspire to teaching excellence, and engage in interdisciplinary collaboration. Teaching will be at the undergraduate and graduate level including hydrogeology, environmental geology, and in area of expertise. A Ph.D. is required.

The Department offers undergraduate degrees in Geology and Earth Science and MS/Ph.D. in Environmental Science and Policy. Our faculty includes ecologists, biologists, geologists, oceanographers, and policy specialists. Additional information about the Department and University may be found at [www.mason.gmu.edu/~espp](http://www.mason.gmu.edu/~espp) and [www.gmu.edu](http://www.gmu.edu), respectively.

Candidates should submit CV, letter of intent including statements of research and teaching interests, examples of published work, teaching evaluations (if available), and contact information (with e-mail addresses) of three references to Dr. Changwoo Ahn, Search Committee Chair, Dept. of Environmental Sciences and Policy, Mail Stop 5F2, George Mason University, Fairfax, VA 22030-4444. Review of applications will begin on 11 December 2006. George Mason University is an Affirmative Action/Equal Opportunity Employer. We strongly encourage women and minority candidates to apply.

**UALR  
ASSISTANT PROFESSOR**

The University of Arkansas at Little Rock Department (UALR) of Earth Sciences invites applications for a tenure-track assistant professor position in geochemistry or environmental geology. We seek a broadly trained scientist who supplements faculty strengths in structural geology, surficial processes, paleontology, sedimentology, stratigraphy, and oceanography.

We expect faculty to develop, maintain and publish an innovative, extramurally funded research program and to supervise undergraduate and graduate research projects. The successful applicant should have a Ph.D. at the time of appointment and demonstrated potential to perform teaching duties. Teaching duties will include introductory geology courses, undergraduate major courses and graduate level courses in the candidate's specialties.

The successful applicant will join a vibrant and growing department with over 40 undergraduate geology majors and active participation in the College's integrated science and mathematics master's degree program. The department has a new 20-seat geoinformatics teaching facility with site-licensed software, a student computer lab with the same software suites, new petrographic microscopes, GPS-equipped ruggedized tablet PCs, and individual faculty research lab spaces. More information about our department can be found at [www.ualr.edu/ersc/](http://www.ualr.edu/ersc/).

To apply: submit a letter of application and include job # (218), a CV, statement of research goals and teaching experience and interests, and contact information for at least three references to: Dr. Stephen A. Leslie, Chair, Department of Earth Sciences, University at Arkansas at Little Rock, 2801 South University Avenue, Little Rock, AR 72204. Electronic applications may be sent to [saleslie@ualr.edu](mailto:saleslie@ualr.edu). Applications should be complete by December 15th, 2006, and review of candidates will begin.

The University of Arkansas at Little Rock is an equal opportunity, affirmative action employer and actively seeks the 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.

**STRUCTURAL GEOLOGY FACULTY POSITION  
THE UNIVERSITY OF TENNESSEE-KNOXVILLE**

The Department of Earth and Planetary Sciences (<http://web.eps.utk.edu>) invites applications for a tenure-track faculty position in structural geology at the assistant professor level starting Fall 2007. Post-doctoral experience and the ability to complement one or more existing departmental strengths (crustal structure and processes; Earth systems history; geochemistry; hydrogeology, environmental geophysics, and environ-

mental science; and planetary geoscience) are desirable. The position is open to candidates with a Ph.D. in Earth Sciences, Geology, or a related discipline, with experience in structural geology and field geology, that focuses on almost any aspect of lithospheric deformation and related processes. Successful candidates are expected to develop strong, externally funded research programs involving graduate and undergraduate student supervision and publication, and teach undergraduate and graduate courses in his/her specialty, as well as participate in field geology course(s). Candidates are encouraged to take advantage of the regional geologic setting of the southern Appalachians. UT-Knoxville is the flagship campus for the UT system and is located in the southern Appalachians close to Oak Ridge National Laboratory and the Great Smoky Mountains National Park. The complex structure of the region provides numerous opportunities for educational and research experience. The Department comprises an energetic group of tenure-track, research and teaching faculty, post-doctoral researchers, and about 100 graduate and undergraduate students. Instrumentation available for research and teaching includes GC-IRMS, GC-MS, ICP-AES, LC-MS, AFM, XRD, XRF, EPMA, Vibroseis and seismic recording equipment, LANDMARK software license grant for 3D graphics and seismic processing, and other facilities. The university welcomes and honors people of all races, creeds, cultures, and sexual orientations, and values intellectual curiosity, pursuit of knowledge, and academic freedom and integrity. Applicants should e-mail their résumé, letter describing research and teaching interests, and list of 3 references in .pdf format to Dr. Robert D. Hatcher, Jr., Search Committee Chair, Dept. of Earth and Planetary Sciences, University of Tennessee, Knoxville, TN 37996-1410; Phone 865-974-6565; Fax 865-974-9326; E-mail: [bobmap@utk.edu](mailto:bobmap@utk.edu). Supplementary materials, such as copies of refereed publications, can be e-mailed or mailed to Dr. Hatcher at the above address. Review of applications will begin on December 15, 2006, and will continue until the position is filled. The University of Tennessee is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its education and employment programs and services.

**SURFICIAL PROCESSES  
WESTERN ILLINOIS UNIVERSITY  
FULL-TIME TENURE-TRACK ASSISTANT  
PROFESSOR**

The Department of Geology at Western Illinois University invites applications for a full-time tenure-track position in surficial processes to start Fall 2007. A Ph.D. in geosciences or a related field is required by the time of appointment; teaching experience a plus. We seek an applicant with experience in surficial processes; possible areas of interest include geomorphology, engineering geology, or environmental geology. The successful applicant will teach introductory physical geology and advanced courses such as Geomorphology, Engineering Geology, Environmental Geology, Glacial Geology and possibly new courses developed by the applicant. This individual is expected to develop a field-oriented research program involving undergraduates in active research.

The Department of Geology offers a B.S. in Geology, provides courses that satisfy general education science requirements, and actively mentors undergraduate research. Collaboration opportunities are available within the department and with the McDonough County GIS Center and the WIU Institute for Environmental Studies. More information about the department can be found on our Web site: [www.wiu.edu/geology/](http://www.wiu.edu/geology/).

Applicants should submit a letter of application, vita, teaching and research statements, and the names, addresses and phone numbers of three current references to: Search Committee, Department of Geology, Western Illinois University, 1 University Circle, Macomb, IL, 61455. Review of applications will begin 1 Feb. 2007 and will continue until the position is filled.

Western Illinois University is an Affirmative Action/Equal Opportunity employer and has a strong institutional commitment to diversity. WIU has a non-discrimination policy that includes sex, race, color, sexual orientation, religion, age, marital status, national origin, disability, or veteran status.

**DEPARTMENT OF EARTH AND OCEAN SCIENCES  
THE UNIVERSITY OF BRITISH COLUMBIA  
ASSISTANT PROFESSOR, PROCESS  
SEDIMENTOLOGY**

The Department of Earth and Ocean Sciences, University of British Columbia, seeks an individual with outstanding research and teaching capabilities for a tenure-track Assistant Professor position in the general field of process sedimentology. We especially seek an individual whose research is at the leading edge of

his/her field. Examples include, but are not limited to, application of sedimentary geology or stratigraphy to environmental processes or natural hazards, paleo-environmental systems, biogeochemical and diagenetic processes of sedimentary systems, sedimentary facies modeling, physical sedimentary systems and the interface of sedimentology/stratigraphy with 3-D seismic for hydrocarbon-related studies. An individual who combines field-based research with a strong quantitative component is desirable.

The successful candidate will have a Ph.D. and preferably postdoctoral experience. He/she will have a demonstrated capability or potential to carry on an active, externally funded research program of international caliber and to supervise graduate students. An ability to contribute to the undergraduate and graduate teaching needs in the various programs offered by the Department, and a willingness to engage in collaborative research with Departmental colleagues, will be criteria for selection. The Department comprises a diverse and dynamic faculty of 46 scientists with research expertise in the solid and environmental Earth sciences extending from Earth's mantle, through the crust, near-surface, oceans and atmosphere to the planets. For more information about the Department and its research and teaching programs, please visit our Web site at [www.eos.ubc.ca](http://www.eos.ubc.ca).

UBC hires on the basis of merit and is committed to employment equity. We encourage all qualified persons to apply. Canadians and permanent residents of Canada will be given priority. The position is subject to final budgetary approval. Although the appointment is advertised at the Assistant Professor level, applications from exceptionally qualified, more senior individuals will be considered, particularly if they address under-representation of designated equity groups such as women, aboriginal people, visible minorities or persons with disabilities.

Applicants should send their curriculum vitae, a statement of research capabilities and interests, a statement of teaching experience and interests, and the names and complete contact information for three persons of high standing who are willing to provide letters of reference to Dr. Paul L. Smith, Head, Department of Earth and Ocean Sciences, The University of British Columbia, 6339 Stores Road, Vancouver, BC V6T 1Z4 Canada. E-mail: [ProcessSed@eos.ubc.ca](mailto:ProcessSed@eos.ubc.ca); Confidential fax: 604-822-9014. The deadline for applications is January 22, 2007.

**SECTION CHIEF—ENERGY RESEARCH SECTION  
KANSAS GEOLOGICAL SURVEY  
THE UNIVERSITY OF KANSAS-LAWRENCE**

Full-time position at academic rank of senior scientist to lead the section, conduct advanced research, and disseminate information about Kansas energy resources. Requires Ph.D. in the geosciences, research emphasis in energy resources, record of peer-reviewed scientific publication, and experience developing and supervising a scientific program. Prefer background with an emphasis on petroleum. Possible academic appointment in appropriate department at the Univ. of Kansas. Women and minority candidates are especially encouraged to apply. Complete announcement and application instructions at [www.kgs.ku.edu/General/jobs.html](http://www.kgs.ku.edu/General/jobs.html). Priority date: Jan. 16, 2007. Annette Delaney, HR, [hr@kgs.ku.edu](mailto:hr@kgs.ku.edu) or +1-785-864-2152. KU is an EO/AA employer.

**THE UNIVERSITY OF WESTERN ONTARIO  
DEPARTMENT OF EARTH SCIENCES  
ASSISTANT PROFESSOR IN GEOPHYSICS**

The Department of Earth Sciences is pleased to announce a search for an Assistant Professor in Geophysics. The starting date for the appointment will be July 1, 2007 or thereafter.

The Department of Earth Sciences ([www.uwo.ca/earth](http://www.uwo.ca/earth)) at The University of Western Ontario is seeking a new junior faculty member to join its geophysics group. Building upon existing and developing areas of strength in mineral physics and seismology, this appointment is a direct outgrowth of the recently established NSERC and Benfield/ICLR Industrial Research Chair (IRC) in Earthquake Hazard Assessment. The successful candidate will normally be appointed at the rank of Assistant Professor (probationary tenure-track), and is expected to teach at both the undergraduate and graduate levels. The successful candidate will also be expected to establish and maintain a vigorous, independently funded research program.

Funded by both NSERC and an insurance industry partnership, the primary aim of the IRC program is to improve quantitative earthquake hazard studies and their scientific, engineering, and economic implications, through innovative research into earthquake forecasting,



NICHOLAS SCHOOL OF THE  
ENVIRONMENT AND EARTH SCIENCES  
DUKE UNIVERSITY

## Duke University Earth System Analysis Earth and Ocean Sciences (EOS)

Duke University's Division of Earth and Ocean Sciences in the Nicholas School of the Environment and Earth Sciences (NSEES) anticipates hiring a global hydrologist whose research emphasis is on climate change and water resources. We seek a natural scientist engaged in the interdisciplinary field of global hydrology, with a focus on the global water cycle, biogeochemical or geochemical properties of water resources, and/or human impacts from changes in global water systems. We seek a candidate with the ability to work at regional or global scales, using global earth systems models; advanced remote sensing technologies; and/or terrestrial observations of the amount and quality of surface and ground water. The candidate will be expected to work with Duke faculty to enhance existing scientific programs on climate change, water resources and hydrology. Additionally, the successful candidate may choose to work with researchers at the Nicholas Institute on Environmental Policy Solutions to establish an interface between climate change, changes in water cycling and quality and water policy.

The appointment is open at an assistant professor level. Candidates should possess a portfolio of experience and accomplishments, a strong interest in teaching and mentoring students, and the capacity for playing an active role in the School's water and climate change programs.

The Nicholas School includes 50 faculty representing a diversity of disciplines. We offer professional and graduate degrees, and we direct Duke's undergraduate environmental programs.

Letters of interest should include a curriculum vitae and names of three references, and be sent to Chair, Earth System Analysis Search Committee, Division of Earth and Ocean Sciences, Nicholas School of the Environment and Earth Sciences, Box 90227, Duke University, Durham, NC 27708. Applications are due by January 1, 2006.

Duke University is an equal-opportunity/affirmative action employer. Women and minorities are encouraged to apply.

hazard analysis, and the user-scientist communication interface. A synopsis of the IRC goals is available at [www.uwo.ca/earth](http://www.uwo.ca/earth). We are seeking applicants who will complement this program, ideally with expertise in one or more areas, such as: the physics of earthquakes; fracture mechanics; and modeling of earthquake dynamics. Researchers with expertise in other fields will also be considered. A rationale *must* be provided that clearly links the applicant's expertise to the IRC program.

The closing date for applications is January 15, 2007. A detailed curriculum vitae, a research plan, and the names of three referees should be sent to: Dr. H. Wayne Nesbitt, Chair, Department of Earth Sciences, The University of Western Ontario, London, Ontario CANADA N6A 5B7.

This position is subject to budgetary approval. Applicants should have fluent written and oral communication skills in English. All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. The University of Western Ontario is committed to employment equity and welcomes applications from all qualified women and men, including visible minorities, aboriginal people and persons with disabilities.

### TENURE TRACK POSITION IN MARINE GEOLOGY SAN FRANCISCO STATE UNIVERSITY

The Department of Geosciences at San Francisco State University invites applications for a tenure-track faculty position at the assistant professor level in marine geology, beginning August 2007. The position requires a Ph.D. in geology or a closely related field, and a strong commitment to excellence in teaching and research at the graduate and undergraduate levels. The ideal candidate will have an interdisciplinary background and be able to teach courses relevant to all our degree programs (B.S. in Geology, B.A. in Earth Sciences, B.S. in Atmospheric and Oceanic Sciences and MS in Applied Geosciences).

We prefer a marine geoscientist with expertise in the general area of coastal processes. Possible areas of focus include coastal response to changes in sediment transport patterns caused by human activities or natural events such as sea-level change or storms, coastal and marine slope stability and landslides, wetland and estuarine processes, and hazards caused by tsunamis or earthquakes. A background in geophysics, physical oceanography, and/or paleoclimatology would be desirable. The successful applicant will need to maintain an externally funded research program that involves graduate and undergraduate students. Salary for this position is to be negotiated and is commensurate with experience.

The Department of Geosciences includes programs in geology, meteorology, and oceanography and currently has approximately 50 undergraduate majors, 20 MS students and 11 tenured/tenure track faculty members. Department of Geosciences faculty and students have full access to the facilities of Romberg Tiburon Center (RTC), the University's marine field station located 30 minutes north of San Francisco. RTC is the only academic research facility situated on San Francisco Bay, the largest estuary on the west coast of the United States.

San Francisco State University, a large urban university, is part of the 23-campus California State University system and serves a diverse student body in liberal arts, sciences, and professional programs. The mission of the University is to maintain an environment for learning that promotes an appreciation of scholarship, freedom, and human diversity; fosters excellence in instruction and intellectual accomplishment; and to provide broadly accessible higher education. SFSU faculty are expected to be effective in teaching; to demonstrate professional achievement and growth through continued research, publications, and/or creative activities; and to contribute their academic expertise and leadership to the campus and community.

To apply, send a curriculum vitae, a statement of teaching and research interests, and three letters of reference to: Dr. Oswaldo Garcia, Chair, Dept. of Geosciences, San Francisco State University, San Francisco, CA 94132. Dr. Garcia can be contacted by phone at 415-338-1778 and by e-mail at [ogarcia@sfsu.edu](mailto:ogarcia@sfsu.edu). Applications should be received before December 22, 2006. San Francisco State University is an Equal Opportunity/Affirmative Action employer.

### TENURE-TRACK FACULTY POSITIONS STONY BROOK UNIVERSITY

Stony Brook University's Department of Geosciences is seeking to fill tenure-track faculty positions at the Assistant Professor level. Preference will be given to candidates who complement existing research strengths including planetary sciences and computational geosciences. *Required:* Ph.D. in Geoscience or closely related field and significant past research accomplishments based on

quality and originality in published work or manuscripts in preparation. The successful candidate will be expected to teach at the graduate and undergraduate levels and to develop a vigorous research program. Evaluation of applicants will begin December 15, 2006. Applicants should send curriculum vitae, statement of research interests, and names and complete contact information of three references to: Professor John B. Parise, Chair, Faculty Search Committee, Department of Geosciences, Stony Brook University, Stony Brook, NY 11794-2100. Equal Opportunity/Affirmative Action Employer. Information about the Department of Geosciences may be obtained at [www.geosciences.stonybrook.edu](http://www.geosciences.stonybrook.edu).

For more information, visit [www.stonybrook.edu/cjo](http://www.stonybrook.edu/cjo).

### GEOCHRONOLOGY UNIVERSITY OF KANSAS

The Department of Geology at the University of Kansas seeks applications for an academic year, tenure-track faculty member in the field of geochronology. We are seeking an individual with expertise in tectonic or petrological applications of high to moderate temperature geochronology and analytical methods (e.g., TIMS, MC-ICP-MS, etc.) who will complement existing programs in tectonics, petrology, and geo- and thermochronology. The successful candidate will be expected to establish an externally funded research program, direct graduate students, and participate in teaching at graduate and undergraduate levels, including courses in the fields of geochronology, petrology, and isotope geochemistry. Refer to [www.geo.ku.edu](http://www.geo.ku.edu) and links for additional information about our department and the University of Kansas. Appointment will begin August 18, 2007, with a later starting date possible.

Applicants must have a completed Ph.D. degree by the starting date. A letter of application outlining research and teaching interests, a complete resume, and names and contact information of at least three persons, who can be contacted for letters of reference, should be sent to Dr. Daniel Stockli, Department of Geology, University of Kansas, 120 Lindley Hall, 1475 Jayhawk Blvd., Lawrence, KS 66045 (tel. 785-864-7714, fax 785-864-5276, e-mail: [stockli@ku.edu](mailto:stockli@ku.edu)). Review of complete application will begin on December 20, 2006, and will continue until the position has been filled. EO/AA employer. The University is committed to increasing the ethnic and gender diversity of its faculty, and we strongly encourage women and minority candidates to apply.

### COLBY COLLEGE VISITING ASSISTANT PROFESSOR OR INSTRUCTOR OF GEOLOGY MINERALOGY/GEOCHEMISTRY

The Department of Geology invites applications for a one-year, non-tenure track, Visiting Assistant Professor or Instructor in mineralogy with complementary expertise in either geochemistry, diagenesis, or petrography/petrology, beginning 1 September 2007. The successful applicant will be expected to teach five undergraduate courses including: a 200-level Mineralogy with laboratory during Spring 2008 and an upper division laboratory course of his/her choice for geology majors in Fall 2007. The upper division course is an elective and should complement those presently offered in the department. The remainder of the teaching assignment will focus on course offerings for potential majors and non-majors. Additionally, the candidate may have the opportunity to direct one or more independent research projects. Colby is a highly selective liberal arts college recognized for excellence in undergraduate education and for close student-faculty interaction. Ph.D. with teaching experience at time of employment preferred; ABDs encouraged to apply. Applicants should submit a letter of application, curriculum vitae, transcripts, statement of teaching and research interests, and three letters of reference to Dr. Robert A. Gastaldo, Chair, Department of Geology, 5807 Mayflower Hill Drive, Waterville, ME 04901. Review of applications will begin on 15 December 2006 and will continue until the position is filled. Colby is an Equal Opportunity/Affirmative Action employer, committed to excellence through diversity, and strongly encourages applications and nominations of persons of color, women, and members of other under-represented groups. For more information about the College, please visit the Colby Web site: [www.colby.edu](http://www.colby.edu).

### COLBY COLLEGE VISITING ASSISTANT PROFESSOR OR INSTRUCTOR OF GEOLOGY STRUCTURE/GEOPHYSICS

The Department of Geology invites applications for a one-year, non-tenure track, Visiting Assistant Professor or Instructor in structure/tectonics and geophysics/remote sensing, beginning 1 September 2007. The successful applicant will be expected to teach five undergraduate courses including a 200-level Structural



## Duke University Environment and Earth Sciences

The Division of Earth and Ocean Sciences of Duke University's Nicholas School of the Environment and Earth Sciences (NSEES) anticipates hiring the second of two Jeffrey and Martha Gendell Chairs in Energy and the Environment. We seek a physical scientist who is a recognized authority on current and future energy resources. This individual's expertise would ideally encompass the availability of energy resources, the technologies and additional resources needed to extract, process, distribute and generate power from them, and the environmental impacts of the resource use. An understanding of the current and future demand for energy resources within the evolving geopolitical landscape of the world is highly desirable. So too are new ideas on the efficient utilization of energy resources. We are equally interested in candidates with a commitment to, and proven record of, interdisciplinary collaboration on problems at the intersection of energy with climate and water.

The appointment is open to all levels: assistant, associate and full professor. Candidates should possess a portfolio of experience and accomplishments commensurate with rank, a strong interest in teaching and mentoring students, and the capacity for playing an active role in the School's Energy & Environment Program. This role will include participating in collaborative initiatives between NSEES and other Duke Schools (Pratt School of Engineering, Fuqua School of Business, the Law School, the Terry Sanford Institute for Public Policy, and Trinity College) which are developing a broad, interdisciplinary program that addresses society's need for affordable, sustainable, safe and clean energy.

The Nicholas School includes 50 faculty representing a diversity of disciplines. We offer professional and graduate degrees, and we direct Duke's undergraduate environmental programs.

Letters of interest should include a curriculum vitae and names of three references, and be sent to Chair, Gendell Professorship Search Committee, Earth and Ocean Sciences, Nicholas School of the Environment and Earth Sciences, Box 90227, Duke University, Durham, NC 27708. Applications are due by January 1, 2005.

Duke University is an equal-opportunity/affirmative action employer. Women and minorities are encouraged to apply.

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Geology with laboratory during Fall '07 and an upper division laboratory course of his/her choice for geology majors in Spring '08. The upper division course should complement those already offered in the department. The remainder of the teaching assignment will focus on course offerings for potential majors and non-majors. Additionally, the candidate may have the opportunity to direct one or more independent research projects. Colby is a highly selective liberal arts college recognized for excellence in undergraduate education and for close student-faculty interaction. Ph.D. with teaching experience at time of employment preferred; ABDs encouraged to apply. Applicants should submit a letter of application, curriculum vitae, statement of teaching and research interests, and three letters of reference to Dr. Robert A. Galstado, Chair, Department of Geology, 5807 Mayflower Hill Drive, Waterville, ME 04901. Review of applications will begin on 19 January 2007 and will continue until the position is filled. Colby is an Equal Opportunity/Affirmative Action employer, committed to excellence through diversity, and strongly encourages applications and nominations of persons of color, women, and members of other under-represented groups. For more information about the College, please visit the Colby Web site: [www.colby.edu](http://www.colby.edu).

### UNIVERSITY OF WYOMING

**DISTINGUISHED PROFESSORSHIP, GEOPHYSICS**  
The Department of Geology and Geophysics at the University of Wyoming invites applications for a Distinguished Professor of Geophysics. This is an Endowed Chair position in the Department and in the newly created School of Energy Resources (SER) at the University of Wyoming, an institute dedicated to energy-related teaching and research in support of state, national, and international energy-related activities. This appointment may be made at any rank, including Associate and Full Professor. The position can begin as soon as July 1, 2007.

We seek an individual who directs an internationally recognized, externally funded research program in reservoir imaging using 3-D seismic technology and/or reservoir characterization using petrophysical techniques. The successful candidate will be involved in the undergraduate and graduate teaching mission of the Department of Geology and Geophysics, and will complement and expand on departmental strengths not only in geophysics, but also in areas including structural geology/tectonics, sedimentary geology, and environmental geology. We seek a person with the ability to cooperate productively with other SER professors in geology and geophysics, mathematics, chemical and petroleum engineering, economics, and other energy-related fields. The SER is an ambitious, new state-funded institute that requires innovative, forefront researchers with the ability to produce benefits tangible to SER stakeholders and supporters. Information about the School of Energy Resources is available at [uwyo.edu/SER](http://uwyo.edu/SER). Additional information on the Department of Geology and Geophysics can be obtained at <http://home.gg.uwyo.edu/>.

Applications should include a statement of research and teaching interests and accomplishments, curriculum vitae, and the names and contact information for three individuals who can provide letters of evaluation. Review of completed applications will begin immediately upon receipt; however, applications will be accepted until the position is filled. Send an electronic copy of your application to: Ms. Carol Pribyl at [cpribyl@uwyo.edu](mailto:cpribyl@uwyo.edu); if you have additional application materials to send, please direct them to the Geophysics Search Committee, Department of Geology and Geophysics, University of Wyoming, 1000 East University Avenue, Dept. 3006, Laramie, WY 82071-2000.

The University of Wyoming is an equal opportunity/affirmative action employer.

### BATEMAN POSTDOCTORAL FELLOWSHIPS FOR STUDY IN GEOSCIENCES, YALE UNIVERSITY

The Department of Geology and Geophysics announces an annual competition for one or more Bateman Postdoctoral Fellowships. We welcome applicants with research interests across the full range of disciplines within the Earth Sciences, including studies of the solid earth, oceans, atmosphere, climate dynamics, geochemistry, paleoclimatology, and the evolution of life. (See [www.geology.yale.edu](http://www.geology.yale.edu) for more information about our department.)

This fellowship is awarded for two years, and provides a stipend (\$43,000/yr) and research funds (\$5,000/yr), plus health care benefits and expenses for relocation. Applicants should submit a short (2-3 page) statement of research interests and proposed research, a curriculum vita, a list of publications, and reference letters from three referees. Applicants should also contact a sponsor in the Department to identify potential

research projects. The deadline for all application materials is January 2, 2007, and decisions will be announced by February 28, 2007. Successful candidates are expected to begin their program at Yale between July 1, 2007 and June 30, 2008.

Application materials and reference letters should be sent by e-mail to [bateman.fellowship@geology.yale.edu](mailto:bateman.fellowship@geology.yale.edu), or by mail to: Bateman Postdoctoral Fellowship, Department of Geology and Geophysics, P.O. Box 208109, 210 Whitney Avenue, Yale University, New Haven, CT 06520-8109. Yale University is an equal opportunity/affirmative action employer.

### UNIVERSITY OF SOUTHERN CALIFORNIA FACULTY POSITION IN GEOBIOLOGY

The University of Southern California seeks applicants for a tenure-track position in Geobiology at the level of assistant, associate or full professor. The University of Southern California is committed to the emerging field of Geobiology and has active research programs in earth sciences, molecular biology and marine environmental biology, all of which have strong interactions and share resources. The successful candidate is expected to establish an active research program in Geobiology with an emphasis on his/her particular area of interest. Candidates will be expected to teach courses in their home department and to take part in interdisciplinary teaching. A Ph.D. in earth sciences, biology, chemistry, or physics is required. Postdoctoral experience is encouraged.

Applicants with expertise in the following areas are particularly encouraged to apply: novel isotopic or trace element systems, microbe-mineral interaction, modeling geobiologic systems, and/or organic geochemistry.

Review of applications will begin December 1, 2006 and continue until the position is filled. The appointment will begin August 16, 2007. Applications should include curriculum vitae, statement of research interests, statement of teaching experience and interests, and the names, addresses, and e-mail addresses of at least three references.

Applicants should apply to: Dr. Kenneth H. Nealson, Geobiology Search Committee Chair, c/o Dana Coyle, Department of Earth Sciences, University of Southern California, Los Angeles, CA, 90089-0740.

USC is an affirmative action/equal opportunity employer.

### COAL GEOLOGY

#### SOUTHERN ILLINOIS UNIVERSITY-CARBONDALE

The Department of Geology at Southern Illinois University Carbondale invites applications for a tenure-track position in coal geology at the rank of assistant professor with a start date of 16 Aug. 2007. Post-doctoral experience is preferred. The applicant should demonstrate the existence of, or potential for developing, an internationally recognized, externally funded research program. We prefer a coal geologist who will advance our long-standing, internationally recognized coal petrology program (<http://mccoyle.lib.siu.edu/projects/crelling/>; <http://mccoyle.lib.siu.edu/projects/crelling2/atlas/>). The successful applicant is expected to teach courses in introductory geology and undergraduate and graduate courses in their area of expertise. Normal teaching load is one to two courses per semester. Applicants must hold a Ph.D. or show that they will complete all degree requirements by the time of appointment.

Review of applications will begin 15 February 2007 and continue until the position is filled. Applicants should submit a curriculum vitae, a statement of teaching and research interests, and the names and addresses of at least three referees to: Dr. Ken Anderson, Search Committee Chair, Department of Geology, Mail Code 4324, Southern Illinois University Carbondale, 1259 Lincoln Drive, Carbondale, IL 62901. Fax: +1-618-453-739, e-mail: [kanderson@geo.siu.edu](mailto:kanderson@geo.siu.edu).

Southern Illinois University Carbondale is a large, research-oriented institution situated in a pleasant small-town setting southeast of St. Louis. SIUC is seeking to enhance interdisciplinary research as it strives to be a top 75 public research university (<http://news.siu.edu/s150/>). The Geology Department has a full-time faculty of 10 with about 40 undergraduate and 30 graduate students and offers Bachelor and Master degree programs in geology and participates in the interdisciplinary Environmental Resources and Policy Ph.D. program. SIUC has energy programs and facilities that provide opportunities for collaborative research including the Coal Research Center, the Center for Advanced Friction Studies, and the Mining and Mineral Resources Program.

For further information, please visit our comprehensive Web site [www.science.siu.edu/geology](http://www.science.siu.edu/geology). SIUC is an affirmative action/equal opportunity employer that strives to enhance its ability to develop a diverse faculty and staff and to increase its potential to serve a diverse student population. All applications are welcomed and encouraged and will receive consideration.



## Faculty Position Rice University Department of Earth Science

The Rice Earth Science Department is expanding in faculty, staff, and facilities. We are interested in hiring three new faculty members in any Earth and planetary science field. We seek applicants who can integrate observations (field, experimental, laboratory) with theory.

Successful candidates are expected to supervise graduate research and teach courses for undergraduate and graduate students. Details about the department and its facilities can be found at <http://earthscience.rice.edu>.

Although we anticipate hiring at the assistant professor level, unusually well-qualified senior applicants will be considered. Applications received by January 1, 2007, are assured of receiving the fullest attention.

Please send a resume and names of five or more references to:  
Search Committee Chair  
Earth Science Department, MS-126  
Rice University  
PO Box 1892  
Houston, TX 77251-1892.

Rice is an equal opportunity affirmative action employer.

### DEPARTMENT OF EARTH SCIENCES FACULTY POSITION, ENVIRONMENTAL GEOSCIENCE

The Department of Earth Sciences at Laurentian University invites applications for a tenure-track faculty position in Environmental Geoscience, effective July 1, 2007. We are interested in candidates with strengths in one or more of the following: groundwater resources, including hydrogeology; climate change (impacts and adaptations); application of geochemical and isotopic methods to environmental problems; tailings remediation and acid-rock drainage; metals and contaminants in the environment; Quaternary geology; and environmental impact assessment related to the above. An ability to interact with government, industry, and the community on environmental geoscience is an asset.

The candidate will teach in the interdisciplinary undergraduate Environmental Earth Science (ENES) program, and the undergraduate and graduate Geology programs. The candidate will be expected to have a strong interest in interdisciplinary education and research, and to provide leadership in the ENES Program. Supervision of M.Sc. and Ph.D. students within a vigorous, externally-funded research program is expected. Applicants must hold a Ph.D. degree by the time of appointment.

The successful candidate will be based in the Department of Earth Sciences, but an interest and ability to interact with faculty in the Centre in Environmental Monitoring and the Departments of Geography, Chemistry & Biochemistry, and Biology is of value. The candidate will have access to outstanding computing and geochemical analytical facilities, including a wide array of state-of-the-art ICP-AES, ICP-MS, LA-ICP-MS, XRD, SEM-EDS, and WD-EPMA instrumentation. A 3D immersion Virtual Reality Theatre for scientific data visualization is available ([www.mirarco.org/aboutvr.php](http://www.mirarco.org/aboutvr.php)).

We will begin reviewing applications in early January 2007, but applications will be accepted until the position is filled. Applicants should send a signed Letter of Application, full curriculum vitae, a Statement of Research Interests, a Statement of Teaching Interests, and the names of three academic (3) references to: Dr. Harley d'Entremont, Vice-President Academic, Laurentian University, 935 Ramsey Lake Road, Sudbury, Ontario, Canada P3E 2C6. Email: [hdentremont@laurentian.ca](mailto:hdentremont@laurentian.ca). Further information regarding the ENES program and the Department of Earth Sciences can be found at

# momentum

At 40, the University of Calgary is hitting its stride — nearly 30,000 students, 110,000 alumni, 16 faculties, 53 departments and more than 30 research institutes and centres. Campus Calgary Digital Library, ISEEE (the Institute for Sustainable Energy, Environment and Economy), Urban Campus and our Faculty of Veterinary Medicine secure our position as a leader in North America's research community.



UNIVERSITY OF  
CALGARY  
Celebrate 40 years  
2006

The Department of Geology and Geophysics at the University of Calgary has instituted a Bachelor of Science with a concentration in Petroleum Geology program and Master of Science in Reservoir Characterization program and anticipates hiring several faculty members over the next three years in order to deliver these new programs. At this time, the department invites applications for five full-time tenure-track positions.

#### The positions:

We are currently inviting applications for the following positions:

**Tenure-Track Instructor or Senior Instructor, Geology or Geophysics (2 positions)**

**Associate Professor, Reservoir Geophysicist**

**Assistant Professor, Petroleum Geology**

**Associate or Full Professor, Petroleum Geologist**

The Faculty of Science at the University of Calgary has instituted a Bachelor of Science program in Natural Sciences with a concentration in Energy. The Department of Geology and Geophysics invites applications for a research Hydrologist or Hydrogeologist to deliver courses for this program.

#### The position:

We are currently inviting applications for the following position:

**Assistant Professor, Hydrologist or Hydrogeologist**

Further information about the Department is available at [www.geo.ucalgary.ca](http://www.geo.ucalgary.ca).

All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. *The University of Calgary respects, appreciates and encourages diversity.* To see these University of Calgary academic positions, please visit [www.ucalgary.ca/hr/career](http://www.ucalgary.ca/hr/career).

www.laurentian.ca/calendar/EnviroEarthScience06.pdf and www.laurentian.ca/geology.

Laurentian University is a bilingual institution and an equal opportunity employer. It has a policy of passive bilingualism (English/French) as a condition of tenure. The university is committed to equity in employment and encourages applications from aboriginal peoples, members of visible minorities, and persons with disabilities.

**TWO FACULTY POSITIONS  
DEPARTMENT OF GEOSCIENCES  
INDIANA UNIVERSITY-PURDUE UNIVERSITY  
FORT WAYNE (IPFW)**

IPFW seeks to fill two full-time, tenure-track positions at the Assistant Professor level in (1) sedimentology/stratigraphy/surface processes; and (2) structural geology/neotectonics/applied geophysics. The successful applicant for each position will be expected to share with other faculty responsibilities for teaching introductory geology, introductory planetary geology, introductory climatology, and regional field geology. Over a multi-year cycle, each successful applicant will teach additional courses in his/her specialty, including elementary field geology and sedimentology/stratigraphy (Position 1), and structural geology and geomorphology (Position 2). Familiarity and experience with GIS will be a plus. Geosciences faculty are expected to maintain an active research program and to involve undergraduate students in research. IPFW's geology research program is well-supported in both equipment (e.g. thin section lab, SEM, XRD) and opportunities for new faculty.

There are three other full-time faculty in the department. IPFW is a comprehensive university. Send a letter of application, statement of teaching and research interests, curriculum vitae, copies of transcripts, and the names and contact information for three references to: Prof. J. Farlow, Search Committee Chair, Department of Geosciences, Indiana University-Purdue University Fort Wayne, 2101 East Coliseum Boulevard, Fort Wayne, IN 46805. Review of applications will begin February 1, 2007. IPFW is an equal opportunity, equal access, Affirmative Action University.

**INSTRUCTOR**

**FIELD CAMP DIRECTOR/NON-TENURE TRACK  
DEPARTMENT OF GEOLOGY AND GEOPHYSICS**

The Department of Geology and Geophysics at Louisiana State University invites applications for a non-tenure track Instructor position (Field Camp Director) to

begin in June of 2007 (Fall semester 2007-2008). The initial one-year appointment can be renewed indefinitely.

Required Qualifications: Ph.D. in Geology, Geophysics, or a related field at time of appointment. Additional Qualification Desired: teaching experience. Special Requirement: ability and willingness to travel to Colorado when necessary. Responsibilities: oversees and operates the six-week, summer undergraduate instructional programs in field geology for entering freshmen and undergraduate majors at the LSU Geology Field Camp near Colorado Springs, Colorado; teaches introductory courses in geology each fall and spring semester; supervises graduate students in the teaching of introductory physical and historical geology laboratories.

The Department consists of 19 faculty members with a broad range of interests. There are well-equipped analytical and computational laboratories to support faculty teaching and student learning. Geology and Geophysics has strong support from the LSU administration. A major field endowment campaign is underway that will provide opportunities to enhance the field-training program. For more information about the department, visit our Web site at [www.geol.lsu.edu](http://www.geol.lsu.edu).

An offer of employment is contingent on a satisfactory pre-employment background check. Application deadline is December 15, 2006, and will continue until candidate is selected. Submit letter of application, copy of vita (including e-mail address), a statement of teaching philosophy and experience, available teaching evaluations, and the contact information for at least three referees to: Chair, Department of Geology and Geophysics, Louisiana State University, Ref: #028085, Baton Rouge, LA 70803.

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## Opportunities for Students

**Doctoral Opportunities in Paleontology, Volcanology, and Paleooceanography in New Zealand.** The University of Auckland, Geology Department, offers 4 Ph.D. scholarships in hydrocarbon-seep paleontology of eastern North Island, deep marine explosive volcanism in the Kermadecs, and global extinctions of deep sea foraminifera. Covers fees, stipend and research costs; start

first quarter of 2007. Applications will be reviewed from 1 November 2006. Details at [www.geology.auckland.ac.nz/uoa/science/about/departments/geology/phd\\_opportunities.cfm](http://www.geology.auckland.ac.nz/uoa/science/about/departments/geology/phd_opportunities.cfm). Inquiries: [ka.campbell@auckland.ac.nz](mailto:ka.campbell@auckland.ac.nz).

### Graduate Student Opportunities, Ohio University.

The Department of Geological Sciences at Ohio University is seeking qualified students for its graduate program. Positions are available beginning January or September 2007. The department offers a competitive program leading to an MS degree in geological sciences with areas of emphasis including paleontology, stratigraphy/sedimentology, hydrogeology, geochemistry, geomorphology, planetary geology, geophysics, and tectonics. Prospective students are encouraged to contact faculty directly to discuss potential research topics. Qualified students are eligible to receive teaching assistantships that carry a tuition scholarship and a stipend of \$12,150/year. For program and application information, visit the department Web site at [www.ohiou.edu/geology/](http://www.ohiou.edu/geology/) or contact graduate chair, David Schneider ([schneidd@ohio.edu](mailto:schneidd@ohio.edu)), for additional information.

### Graduate Student Opportunities in Earth and Planetary Science at University of California, Santa Cruz.

The Earth and Planetary Sciences Department at UCSC will have numerous opportunities for students wishing to begin graduate work in Fall 2007. Research topics include: seismology, rock and mineral physics, paleomagnetism, geodynamics, paleoclimate and climate change, coastal geology, structural geology, active tectonics, igneous geochemistry and volcanology, geochronology, paleoecology, hydrology and hydrogeology, atmospheric science, glaciology, and planetary science. The Earth and Planetary Sciences Department at UCSC has an outstanding reputation; our graduates are leaders in academia, research, and industry. The department currently includes 20 faculty, 60 graduate students, 120 undergraduate majors and minors, numerous researchers and technical support staff, and excellent facilities on a beautiful campus overlooking Monterey Bay.

Fellowships, teaching assistantships, and research assistantships are available. Please visit our Web site to learn about specific projects, and contact associated faculty and researchers directly for more information: <http://es.ucsc.edu>.

## POST-DOCTORAL POSITIONS (Computational Theorist and Experimentalist)

ExxonMobil Research and Engineering has immediate openings for two Postdoctoral Fellowship positions in Rock Physics and Chemistry at the Corporate Strategic Research Laboratories located in Annandale, NJ. We are looking for creative, resourceful scientists to join our research effort into the fundamental controls on the formation and evolution of sedimentary rocks, and the impact these processes have on their structure and physical properties. The complex 3D topology and multi-component structure of such systems create challenging problems of interest to a wide range of disciplines.

**Computational Theorist** – One postdoctoral position involves the calculation of rock properties at the micro- and mesoscale levels, investigating the relationship between rock structure and physical properties such as mechanical strength, compressibility, porosity, and permeability. Successful candidates will have experience in one or more of these soft condensed matter areas: elasticity and effective media theories, physics of granular materials, fractures, statistical mechanics, and random heterogeneous materials. The applicant should have a Ph.D. in Physics, Geophysics, Mechanical/Civil Engineering, Material Sciences, Applied Mathematics, Physical Chemistry, or a related field. Experience in coding high-performance modeling techniques such as computational fluid dynamics, discrete-element, finite-element, finite-difference, and molecular dynamics methods is highly desirable. Good knowledge of programming languages such as C or C++, and experience with Linux/MPI-based parallel computers are important skills.

**Experimentalist** – The second position will focus on laboratory studies of the evolution of porosity with mechanical and chemical processes of compaction. We will draw upon the science of granular media, rock mechanics, powder

technology, and composite materials. Emphasis will be placed upon the relation of stress-strain behavior to the structure of these porous media. The applicant should have a Ph.D. in Physics, Engineering, Geosciences Physical/Inorganic Chemistry, or a related field, with a solid background in the stress-strain behavior of condensed matter. Candidates should have experience in design and construction of experiments, sample characterization and data analysis. An interest in rock/soil mechanics, granular media, composite materials, mineralogy, or experimental geophysics is desirable. Experience with three-dimensional imaging techniques such as X-ray tomography would be a benefit.

For either position, we expect excellent oral and written presentation skills along with a strong record of publications and presentations. The ability of the candidate to grow into new science areas will be a critical characteristic.

ExxonMobil offers an excellent working environment and a competitive compensation and benefits package. Additional information about the positions can be obtained through e-mail by contacting Dr. Martin D. Lacasse [Martin.Lacasse@ExxonMobil.com](mailto:Martin.Lacasse@ExxonMobil.com) or Dr. Hubert King [Hubert.E.King@ExxonMobil.com](mailto:Hubert.E.King@ExxonMobil.com).

Please submit your cover letter and resume to our website at [www.exxonmobil.com/apply](http://www.exxonmobil.com/apply). Please apply to Post Doctoral Fellow and reference PDCTC-4033BR in both letter and resume.

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**Ph.D. Fellowships Available. \$30,000 NSF stipend plus tuition and fees IGERT in Adaptive Management.** The Center for Environmental Policy at the University of Florida has received an NSF-IGERT grant and is offering Ph.D. Fellowships. Our IGERT program in Adaptive Management focuses on research and training experiences for doctoral students that integrate the physical, biological, chemical, and social sciences to address the chosen research theme, Wise Use of Water, Wetlands, and Watersheds. The program links four colleges, fifteen departments, and three research centers at the University of Florida with international wetlands research centers in Africa, Mexico, South America, Australia, and south Florida. A core set of interdisciplinary team-taught courses are a key part of the educational experience of our fellows. In addition, fellows will spend each summer at one of the international research centers researching and exploring, first hand, Adaptive Management and the science, engineering, and policy frameworks that are necessary to drive it.

IGERT is an NSF-wide program intended to meet the challenges of educating U.S. Ph.D. scientists and engineers with the interdisciplinary background, deep knowledge in a chosen discipline, and the technical, professional, and personal skills needed for the career demands of the future. The program is intended to catalyze a cultural change in graduate education by establishing innovative new models for graduate education and training in a fertile environment for collaborative research that transcends traditional disciplinary boundaries.

Our NSF-IGERT fellowship awards include tuition waivers, funds for travel and some supplies. In accordance with NSF policy, applicants must be US citizens or permanent residents.

Additional information and application guidelines are on-line at <http://amw3igert.ufl.edu>.

CONTACT: Dr. Mark T. Brown, Director, Center for Environmental Policy P.O. Box 116350 University of Florida, Gainesville, FL 32611, [mtb@ufl.edu](mailto:mtb@ufl.edu), +1-352-392-2425.

**Ph.D. and M.S. Opportunities in Earth and Environmental Sciences—University of Illinois at Chicago.** The Department of Earth and Environmental Sciences, University of Illinois at Chicago, invites applications for graduate admission in Fall 2007. We are seeking students interested in Geobiology (including Geomicrobiology and Paleontology), Geochemistry (including Aqueous, Environmental, Isotopic, and Organic), Global Change (including ice sheet dynamics, Quaternary geomorphology, geochronology, paleoclimatology), Hydrology/Limnology, Geophysics, and Mineralogy. Financial support is available to suc-

cessful applicants through Research and Teaching Assistantships, and NSF-IGERT fellowships ([www.uic.edu/depts/bios/leap/](http://www.uic.edu/depts/bios/leap/)). Our research involves a variety of field investigations (e.g. Antarctica, Asia, Egypt, Yellowstone) and uses state-of-the-art laboratory instrumentation within the department, elsewhere at UIC, and at nearby facilities such as Argonne National Laboratory. We are located in a vibrant, growing urban neighborhood, with convenient access to all that the great city of Chicago has to offer. Application deadline is February 1, 2007. For more information and application procedures, visit [www.uic.edu/depts/geos/](http://www.uic.edu/depts/geos/) or contact Dr. Peter Doran at [pdoran@uic.edu](mailto:pdoran@uic.edu).

**Graduate Student Opportunities: The Department of Geological Sciences at Case Western Reserve University ([www.case.edu](http://www.case.edu))** is seeking qualified students for its graduate program. Current research strengths in the department include: surface processes, soil erosion, sediment transport, geologic sequestration of carbon, geochemistry, planetary materials, planetary geology and geophysics, and high-pressure mineral physics and chemistry. Financial assistance may be available for qualified applicants interested in pursuing M.S. or Ph.D. degrees. For more information, please see <http://geology.case.edu> or contact the department at [geo-gradinfo@case.edu](mailto:geo-gradinfo@case.edu).

Applications for graduate study at Case are accepted on a rolling basis; students requesting financial assistance in Fall 2007 are encouraged to apply by 1 February 2007.

Case is committed to diversity and equality. Students from all backgrounds are encouraged to apply.

**Graduate Research and Teaching Assistantships, Hydrologic Sciences Graduate Program, University of Nevada-Reno.** We are seeking applicants for three teaching assistantships for the introductory graduate courses in groundwater, fluid mechanics and aqueous geochemistry. The remainder will be research assistantships in the same general subject areas. The annual salary is \$17,000 for M.S. students and \$18,000 for Ph.D. students and includes medical benefits and tuition, for a total package worth up to \$31,000/year. Additional research assistantships may be available from the Desert Research Institute ([www.dri.edu](http://www.dri.edu)) and from the USGS Water Resources Division in Carson City ([nevada.usgs.gov](http://nevada.usgs.gov)). All applications shall be made to the UNR Hydrologic Sciences Program, regardless of the funding source. The Hydrologic Sciences Program at the University of Nevada-Reno is seeking to fill up to six graduate research and teaching assistantships starting

in July/August 2007. The Hydrologic Sciences Program has nearly 70 graduate students (30% Ph.D. and 70% M.S.) and more than 40 core faculty who teach courses, advise students, and conduct research in the hydrologic sciences. The program is consistently rated among the top ten nationally by the *U.S. News and World Report* Guide to Graduate Schools. General areas of research in the program include groundwater, surface water, aqueous geochemistry, contaminant transport, soil physics and chemistry, aquatic ecology, and fire science ecology. Approaches to research range from applied to theoretical. Students and faculty are very active in international water issues ([www.saiwi.org](http://www.saiwi.org)). Instructions for application to the program can be found on our Web site, [www.hydro.unr.edu](http://www.hydro.unr.edu), and on the graduate school's Web site: [www.vpr.unr.edu/grad2](http://www.vpr.unr.edu/grad2). Additional information can be obtained by contacting our program office at +1-775-784-6469 or [hydro@unr.edu](mailto:hydro@unr.edu).

**Graduate Fellowships and Assistantships, Water Science, Engineering, and Policy, University of Nebraska-Lincoln.** The University of Nebraska-Lincoln has graduate fellowships and assistantships available as part of a campus-wide Water Resources Research Initiative (WRRI), which integrates research and education in water science, policy, and law. The WRRI includes faculty and research programs from multiple units on campus, including the Departments of Geosciences, Biological Systems Engineering, Civil Engineering, Computer Science and Engineering, Chemistry, Agricultural Economics, the Public Policy Center, the College of Law, and the School of Natural Resources. Areas of research strength include limnology, water quality, watershed processes, stream biogeochemistry, remote sensing, hydrogeology, ecotoxicology, ecohydrology, meteorology/climatology, paleoclimate, decision-support technologies, water economics, and water use in agriculture. Four \$20,000 WRRI fellowships are available for top-ranked candidates, and additional fellowships and assistantships are available through individual departments. Faculty sponsors must nominate applicants for WRRI fellowships. For more information on departments, faculty, and the WRRI see <http://wrri.unl.edu/> or contact Lorrie Benson at [lbenson2@unl.edu](mailto:lbenson2@unl.edu) or +1-402-472-3305.

The University of Nebraska is committed to a pluralistic campus community through affirmative action and equal opportunity and is responsive to the needs of dual career couples. We assure reasonable accommodation under the Americans with Disabilities Act; contact the address and phone above for assistance.

## 2007 GeoCorps America™ Positions

The GeoCorps America program places GSA members in positions all across the country to assist the National Park Service, USDA Forest Service, and the BLM with geoscience projects. Positions receive a \$2,500 stipend. Either on-site housing or an additional housing allowance to cover expenses is also provided. The GeoCorps program is an excellent way to gain field experience or apply your knowledge on-the-ground. Plus, it's fun! **All application instructions are on the Web.**



Nicole Reynaud, Fossil Butte National Monument

The 2007 Summer GeoCorps America Program opens for applications **4 December 2006** and will close on **2 February 2007**.

**To apply for GeoCorps America, go to [www.geosociety.org/geocorps](http://www.geosociety.org/geocorps)** and view 40 summer positions on National Parks, National Forests, and Bureau of Land Management (BLM) lands around the country. If you are looking for exciting geoscience experience in some of the most beautiful natural areas in the United States, **Apply Today!**



Kate Wetherell, Craters of the Moon National Monument



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# Journal Highlights



#### NOVEMBER/DECEMBER GSA BULLETIN

A manifestation of the Shawinigan orogeny  
Mass extinction on land  
Great subduction earthquakes



#### OCTOBER GEOSPHERE

Electrical resistivity imaging produces results  
Aeromagnetic maps of New Mexico



#### DECEMBER GEOLOGY

Plates on the slide: Subduction-erosion along the Ecuadorian margin  
Tampering with Triassic time  
Small is beautiful: Spotlight on nanoparticles  
More than a pinch of salt: Diapirs in Arctic Canada



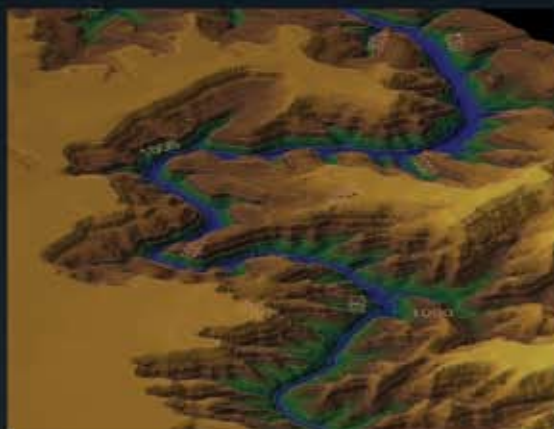
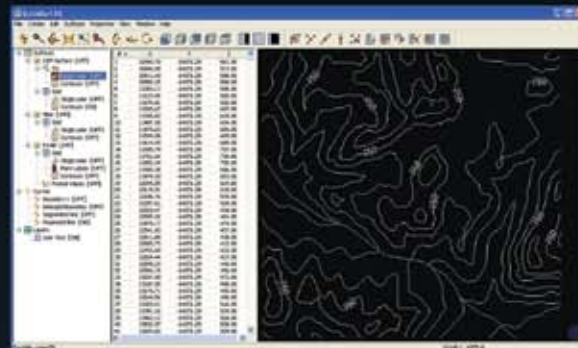
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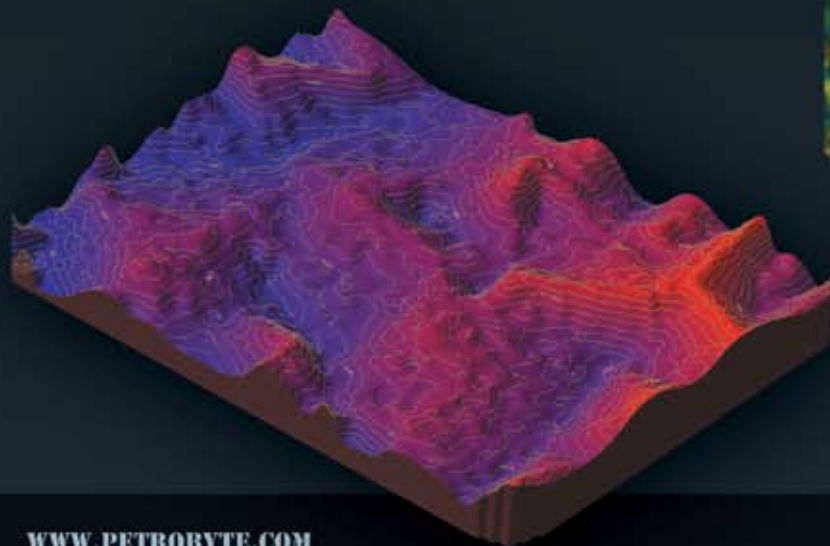
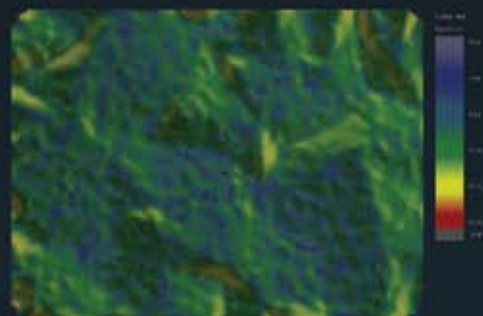
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